INTRODUCTION
THM 4T60-E

Updated
July, 2003

This booklet contains the procedures necessary to overhaul, repair or service the THM 4T60-E transaxle. The THM 4T60-E is a fully automatic front wheel drive transaxle that provides park, reverse, neutral and four forward speeds, with 4th gear being overdrive.

The shift pattern is controlled electronically with solenoids that receive a ground signal from the Powertrain Control Module (PCM). The PCM will vary shift points, as it is constantly interpreting numerous electronic signals from the various operational sensors located on the vehicle. The PCM also controls the application of the Torque Converter Clutch and the TCC apply feel electronically with solenoids. Line pressure and shift feel are still controlled by the vacuum modulator system..

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THM 4T60-E

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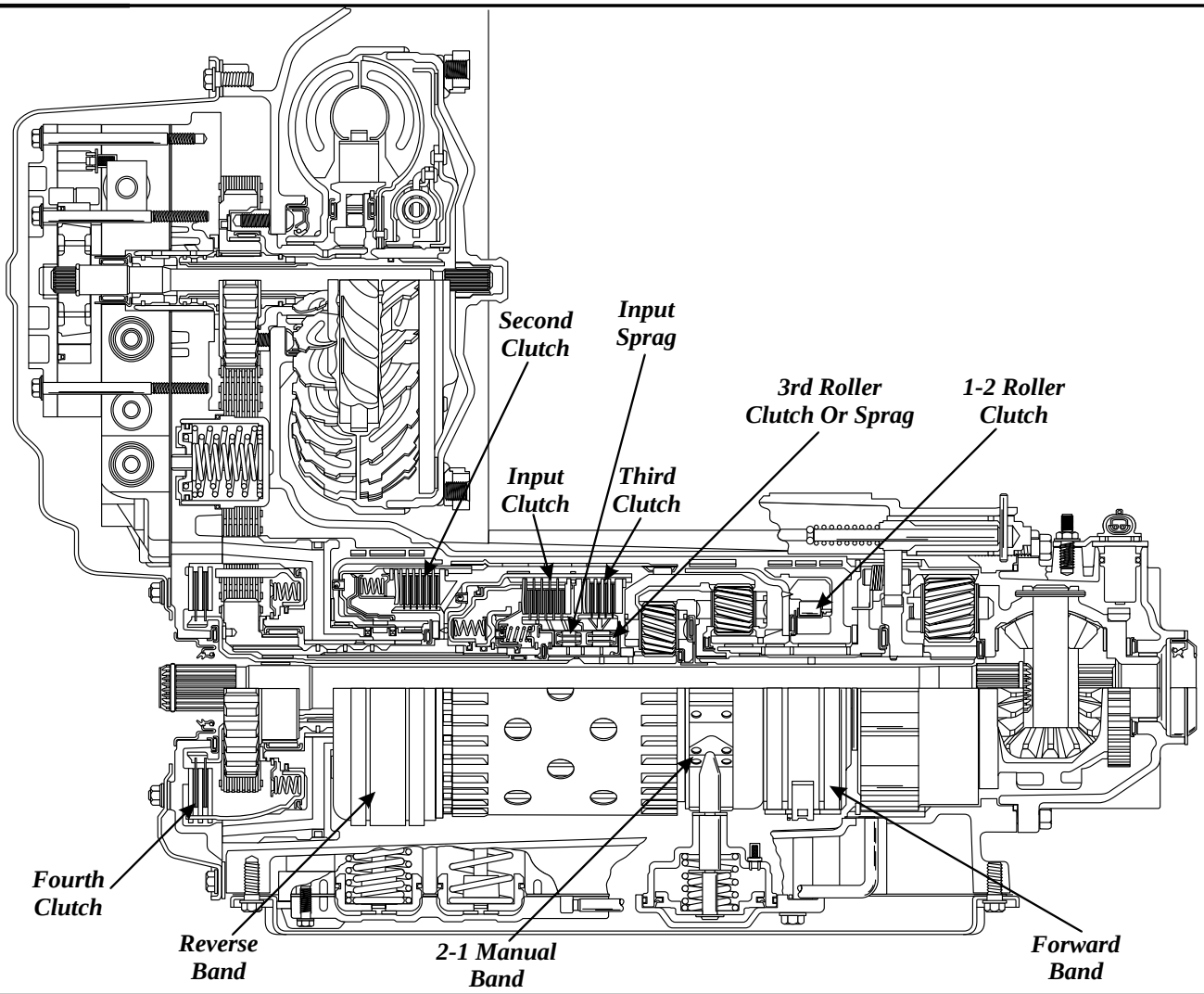


THM 4T60-E COMPONENT APPLICATION CHART

	INPUT CLUTCH	2ND CLUTCH	3RD CLUTCH	4TH CLUTCH	FORWARD BAND	D-2 BAND	REVERSE BAND	INPUT SPRAG	1-2 ROLR	3RD ROLR	SOLND "A"	SOLND "B"	GEAR RATIO
Park/Neut	*ON*										*ON*	*ON*	– –
D4-1st	*ON*				*ON*			*Hold*	*Hold*		*ON*	*ON*	*2.92*
D4-2nd	*ON*	*ON*			*ON*			*O/R*	*Hold*		*OFF*	*ON*	*1.56*
D4-3rd		*ON*	*ON*		*ON*				*O/R*	*Hold*	*OFF*	*OFF*	*1.00*
D4-4th		*ON*	*ON*	*ON*	*ON*					*O/R*	*ON*	*OFF*	*0.70*
D3-1st	*ON*				*ON*			*Hold*	*Hold*		*ON*	*ON*	*2.92*
D3-2nd	*ON*	*ON*			*ON*			*O/R*	*Hold*		*OFF*	*ON*	*1.56*
D3-3rd	*ON*	*ON*	*ON*		*ON*				*O/R*	*Hold*	*OFF*	*OFF*	*1.00*
D2-1st	*ON*				*ON*	*ON*		*Hold*	*Hold*		*ON*	*ON*	*2.92*
D2-2nd	*ON*	*ON*			*ON*	*ON*		*O/R*	*Hold*		*OFF*	*ON*	*1.56*
LO-1st	*ON*		*ON*		*ON*	*ON*		*Hold*	*Hold*	*Hold*	*ON*	*ON*	*2.92*
Reverse	*ON*						*ON*				*ON*	*ON*	*2.38*

Figure 1

GENERAL DESCRIPTION

The THM 4T60-E is a fully automatic 4 speed front wheel drive transaxle. It consists primarily of a four element torque converter, two planetary gear sets, various multi-disc clutches, a differential assembly, and a control valve body.

The four element torque converter contains a pump, a turbine, a pressure plate splined to the turbine, and a stator assembly. The torque converter acts as a fluid coupling to smoothly transmit power from the engine to the transaxle. It also hydraulically provides additional torque multiplication when required. The pressure plate, when applied, provides a mechanical "direct drive" coupling of the engine to the transaxle.

The two planetary gear sets provide the four forward gear ratios and reverse. Changing of the gear ratios is fully automatic and is accomplished through the use of various electronic engine sensors that provide input signals to the Powertrain Control Module (PCM). The PCM interprets these signals to control current to the various shift solenoids, converter clutch solenoids, or switches inside the transaxle, as shown in Figure 2.

By using electronics, the PCM controls shift points and torque converter apply and release, to provide proper gear ranges for maximum fuel economy and vehicle performance.

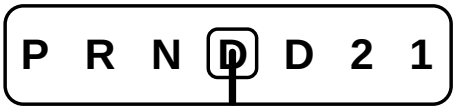
Four multiple-disc clutches, two sprags, a roller clutch, and three bands provide the friction elements required to obtain the various gear ratios with the planetary gear sets.

A hydraulic system which consists of the control valve body, pressurized by a vane type pump, provides the working pressure needed to operate the friction elements and automatic controls.

Several electronic switches, solenoids and sensors, as shown in Figure 2, are working in conjunction with the vehicles PCM or Electronic Control Module (ECM), control various shift points and the apply and release of the converter clutch.

EXPLANATION OF GEAR RANGES

The transaxle can be operated in any one of the seven different positions shown below on the shift quadrant.



P - Park position enables the engine to be started while preventing the vehicle from rolling either forward or backward. For safety reasons, the vehicle's parking brake should be used in addition to the transaxle "Park" position. Since the final drive differential and output shaft are mechanically locked to the case through the parking pawl and final drive ring gear, "Park" position should not be selected until the vehicle has come to a complete stop.

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

N - Neutral position enables the engine to start and operate without driving the vehicle. If necessary, this position should be selected to restart the engine while the vehicle is moving forward.

D - Overdrive position should be used for all normal driving conditions for maximum efficiency and fuel economy. Overdrive range allows the transaxle to operate in each of the four forward gear ratios. Downshifts to a lower gear, are available for safe passing by pressing the accelerator, or by manually selecting a lower gear with the selector lever.

The transaxle should not be operated in Overdrive when towing a trailer or driving in mountainous terrain. Under these conditions, that put an extra load on the engine, the transaxle should be driven in a lower manual gear selection for maximum efficiency.

D - Manual 3rd can be selected for conditions where it may be desirable to use only three forward gear ratios. These conditions include towing a trailer and driving on hilly terrain as described above. This range is also helpful for engine braking when descending slight grades. Upshifts and downshifts are the same as in Overdrive range for 1st, 2nd and 3rd gears, but the transaxle will not shift into 4th gear.

2 - Manual 2nd adds more performance for congested traffic and hilly terrain. The transaxle still starts out in 1st gear, but this position prevents the transaxle from shifting above 2nd gear. Manual 2 can also be selected to retain 2nd gear for acceleration and/or engine braking as desired. Manual 2 can be selected at any vehicle speed. If transaxle is in 3rd or 4th gear when Manual 2 is selected, it will immediately shift to 2nd gear.

1 - Manual 1st can be selected at any vehicle speed. If the transaxle is in 3rd or 4th gear it will immediately shift into 2nd gear. When vehicle speed slows to below approximately 35mph, the transaxle will then downshift into 1st gear. This is beneficial for maintaining maximum engine braking when descending steep grades.

ELECTRICAL COMPONENTS

The THM 4T60-E transaxle incorporates electronic controls that utilizes the Powertrain Control Module (PCM) to command shift points and, TCC apply and release. Electrical signals from numerous sensors provides information to the PCM about vehicle speed, throttle position, engine coolant temperature, gear range selection and braking. The PCM uses this information to determine the precise moment to energize or de-energize various solenoids located inside the transaxle. Accordingly, the transaxle is enabled to shift into the appropriate gear and apply or release the torque converter. This type of control provides for consistant and precise shift points for maximum effeciency.

If for any reason the entire electronic control system to the transaxle becomes disabled, both shift solenoids will be off, which is failsafe mode. This operating state of the solenoids permits the transaxle to operate in 3rd gear providing the gear selector lever is in the Overdrive or D3 Range.

However, if the gear selector lever is moved to the D2 or D1 range, with both solenoids disabeled, the transaxle will operate in 2nd gear. The purpose for this is to allow the transaxle to hydraulically function in these two ranges despite the disabled electronic system.

Another feature of the THM 4T60-E is the manual hydraulic override of the electronic control system. When D3 or D2 range is selected, the 3-4 shift valve or the 2-3 shift valve is hydraulically forced to move. The transaxle can now be operated in the selected gear range, regardless of the state of the shift solenoids.

When D1 (Manaul 1st) is selected however, the gear selection is completely electronic for safety, durability and pleaseability concerns. This means that the PCM must electronically command the solenoids to be in 1st gear, for Manual 1st gear operation to be achieved.

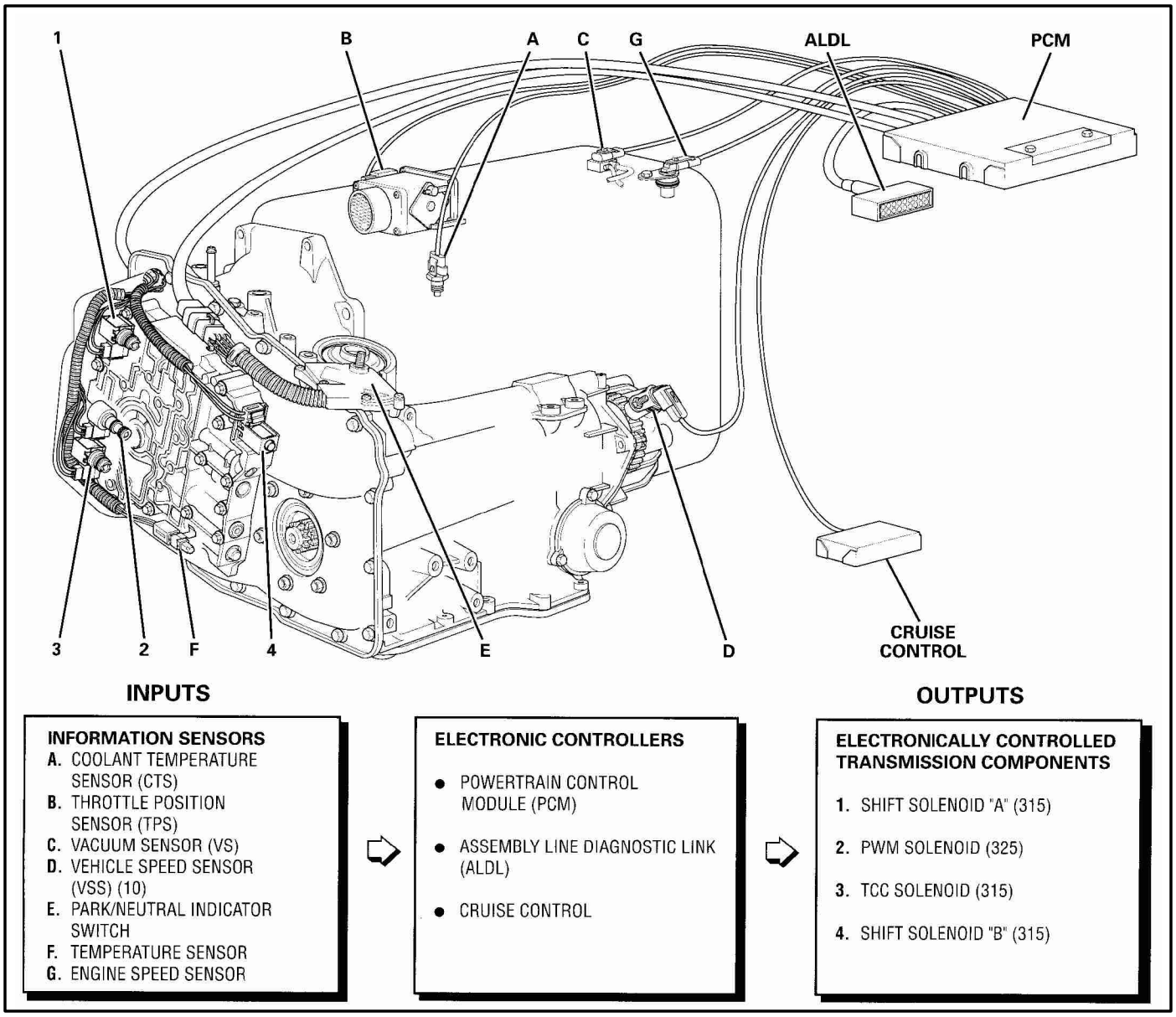
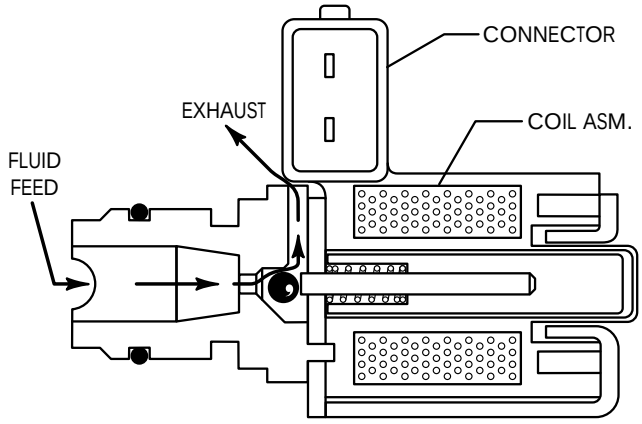


Figure 2

ELECTRICAL COMPONENTS (Cont'd)

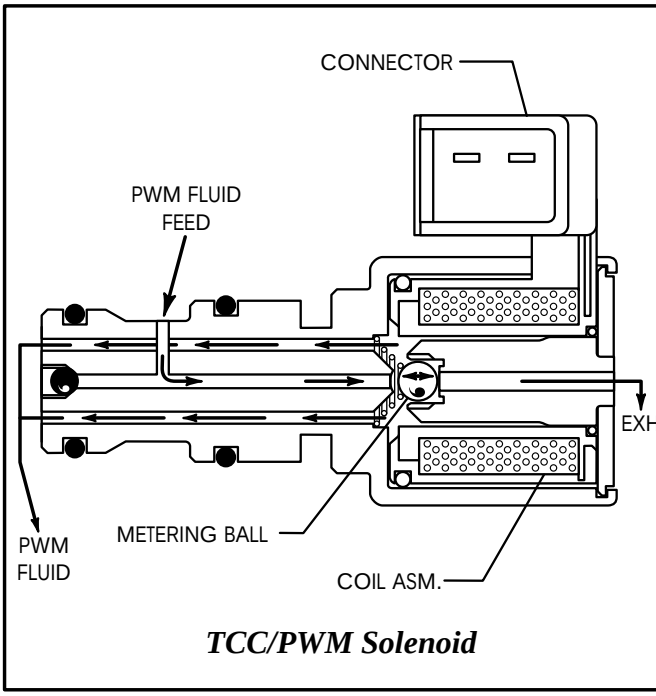
Shift Controls

The THM 4T60-E uses two ON/OFF (Normally Open) shift solenoids with a two port design that provides for all forward gear ranges. These shift solenoids work together in a combination of ON or OFF sequences to direct fluid pressures to the various shift valves and thus apply components. The component chart in Figure 1 shows the solenoid state for each gear range.



Shift "A", "B" & TCC Solenoids ON/OFF (Normally Open)

Figure 3



TCC/PWM Solenoid

Figure 4

Shift Solenoid "A"

The PCM controls the ground signal for shift solenoid "A" to control the solenoid ON or OFF, according to transaxle and vehicle operation. When the solenoid is OFF, filtered line pressure to the solenoid is exhausted (See Figure 3). When energized (ON), the exhaust port is blocked, stopping the exhaust of line pressure through the solenoid. Pressure on the end of the 1-2 shift valve moves the valve against spring force, sending line presure into the solenoid "A" passage to the 3-4 shift valve.

Shift Solenoid "B"

The PCM controls the ground signal for shift solenoid "B" to control the solenoid ON or OFF, according to transaxle and vehicle operation. When the solenoid is OFF, filtered line pressure to the solenoid is exhausted (See Figure 3). When energized (ON), the exhaust port is blocked, stopping the exhaust of line pressure through the solenoid, and directing it into the solenoid "B" passage. Solenoid "B" fluid pressure is then fed to the 4-3 manual downshift valve and the 3-2 manual downshift valve.

TCC CONTROLS

Most THM 4T60-E transaxles use two solenoids to control the apply and release of the TCC. The 1st solenoid is the pressure controlling solenoid (See Figure 4). It is a Pulse Width Modulated (PWM) solenoid that acts on the converter clutch regulator valve.

The 2nd solenoid is an ON/OFF solenoid and identical to the two shift solenoids, as shown in Figure 3.

TCC (ON/OFF) Solenoid

The PCM controls the ground signal for solenoid to control the solenoid ON or OFF, according to transaxle and vehicle operation. The only difference in operation is the ignition voltage is supplied through the normally closed brake switch to the TCC solenoid, on most models.

When the solenoid is OFF, and if the transaxle is operating in 2nd (some models), 3rd or 4th gear, TCC signal fluid is exhausted through the solenoid (See Figure 3). When energized (ON), the exhaust port is blocked, sending TCC signal fluid pressure to move the converter clutch valve against spring force and line pressure at the opposite end of the valve.

TCC (PWM) Solenoid

The PCM controls the TCC/PWM solenoid by varying its operating duty cycle (ON/OFF time) from 0% to 100%. Until the transaxle is operating in 2nd (some models) or 3rd gear, the PWM solenoid is OFF. In this state, filtered PWM feed pressure flows at maximum pressure through the solenoid and into the PWM passage (See Figure 4).

When the solenoid is energized, it operates at 32 Hz and from 0% to 100% duty cycle, depending on vehicle operation. The PWM solenoid is enabled to modulate the amount of PWM feed pressure passing through the solenoid and sending it to the converter clutch regulator valve. At 0% duty cycle, the TCC will apply at maximum capacity while 100% duty cycle applies it at minimum capacity.

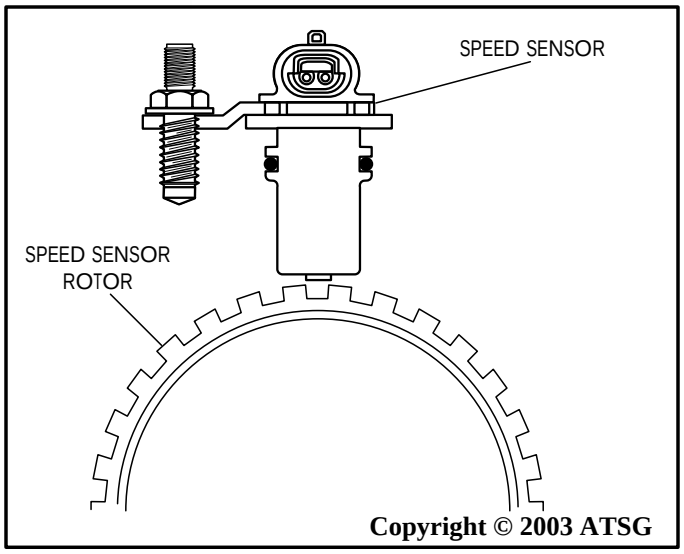


Figure 5

ELECTRICAL COMPONENTS (Cont'd)

Speed Sensor Assembly

The Vehicle Speed Sensor (VSS) system is a pulse generator, located in the extension housing and a "toothed" speed sensor rotor pressed onto the final drive assembly. As the vehicle is driven forward, the speed sensor rotor rotates with the final drive. This rotation produces a variable voltage signal in the pickup coil that is proportional to vehicle speed.
This information is then sent to the PCM to indicate how fast the vehicle is being driven and to develop the shift pattern for the transaxle. Other systems that use speed sensor information are TCC apply and release, cruise control, fuel delivery, and idle control systems.

Temperature Sensors

There are two different styles of temperature sensors that are used in the THM 4T60-E transaxles, as shown in Figure 6. One sensor, used in some models, is screwed into the channel plate near the TCC accumulator bore and monitors transaxle fluid temperatures in the "To Cooler" circuit. The other style sensor is incorporated into the internal wiring harness and clips to the valve body spacer plate. This type sensor monitors transaxle fluid temperatures in the side cover. Both styles of transaxle fluid temperature sensors are illustrated in Figure 6.

Temperature Sensor Function And Operation

Both style sensors are negative temperature coefficient thermisters and both provide transaxle fluid temperature information to the PCM. The PCM sends a 5 volt reference signal to the sensors and measures the voltage drop in the circuit. The internal resistance of the sensors will drop as the operating temperatures of the transaxle fluid increase. The PCM then uses this information for determining when to engage or disengage the Torque Converter Clutch (TCC) or the Viscous Converter Clutch (VCC).
The PCM inhibits TCC/VCC operation until transaxle fluid temperature reaches approximately 45°C (113°F). At this temperature, the PCM will allow the TCC/VCC to engage providing the throttle position, gear obtained, and other vehicle operating conditions are met.

Hot Mode Operation

If transaxle fluid temperatures become excessively high, above approximately 130°C (266°F), the PCM will modify shift pattern and TCC schedules to reduce the temperature.
If a situation occurs where a short or open is detected in the circuit, the PCM will store a code and use coolant temperature sensor information for transaxle temperature.

Continued on next Page.

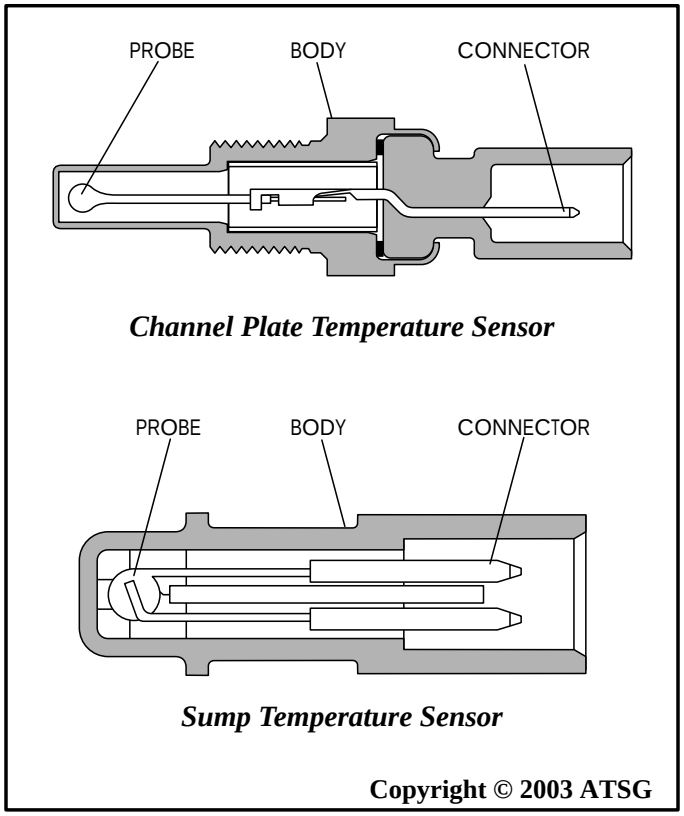


Figure 6

ELECTRICAL COMPONENTS (Cont'd)

Throttle Position Sensor (TPS)

The PCM monitors the variable voltage input signal from this sensor to calculate throttle position or angle. These input signals are then used by the PCM to determine the appropriate shift schedule for the transaxle and TCC apply and release.

Coolant Temperature Sensor (CTS)

The Coolant Temperature Sensor (CTS) provides variable resistance information to the PCM to determine engine coolant temperature. When the engine is cold, resistance will be high, and when the engine is hot, resistance through the sensor will be low. The PCM measures this resistance and will not command TCC apply until the engine coolant temperature is appropriate for the particular calibration.

Park/Neutral Switch

The Park/Neutral Switch, or PRNDL Switch, mounted on the transaxle manual shaft, provides the gear range selected information to the PCM. This information also allows the engine to be started in only Park or Neutral.

Brake Switch

On some models, the Brake Switch controls the TCC and cruise control operation by opening the circuit to disengage the TCC solenoid from the power feed source when the brake pedal is depressed. On some models, the brake switch is simply an ON/OFF discreet input to the PCM.

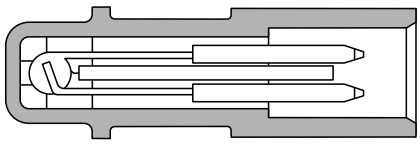
Engine Speed

Monitored by the PCM through the ignition module and is used to determine wide open throttle shift patterns and TCC apply and release.

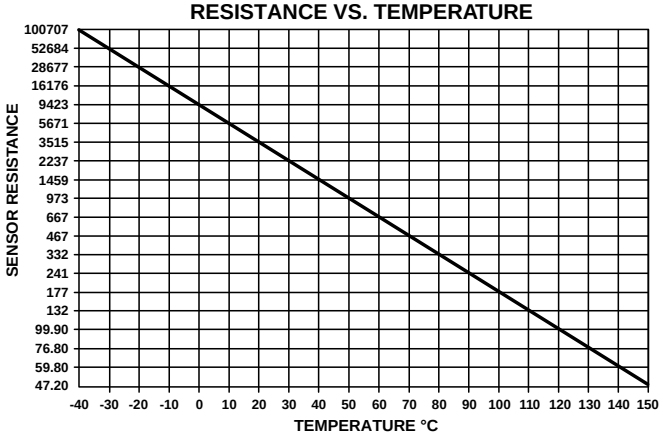
Cruise Control

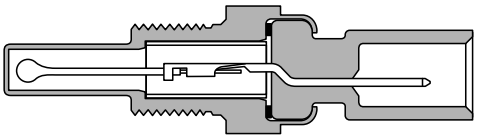
When this device is in operation, it provides a smooth pattern by requiring a time limit to be met during a 3-2 or 2-3 shift, and a 4-3 or 3-4 shift.

Ohms Resistance Chart	
Component	***Resistance @ 68°F***
Shift Solenoid "A"	***20-30 Ohms***
Shift Solenoid "B"	***20-30 Ohms***
TCC ON/OFF Solenoid	***20-30 Ohms***
TCC PWM Solenoid	***10-15 Ohms***
Vehicle Speed Sensor	***981-1864 Ohms***
TFT Sensor	***See Charts Below***



SPACER PLATE TEMPERATURE SENSOR RESISTANCE VS. TEMPERATURE





CHANNEL PLATE TEMPERATURE SENSOR RESISTANCE VS. TEMPERATURE

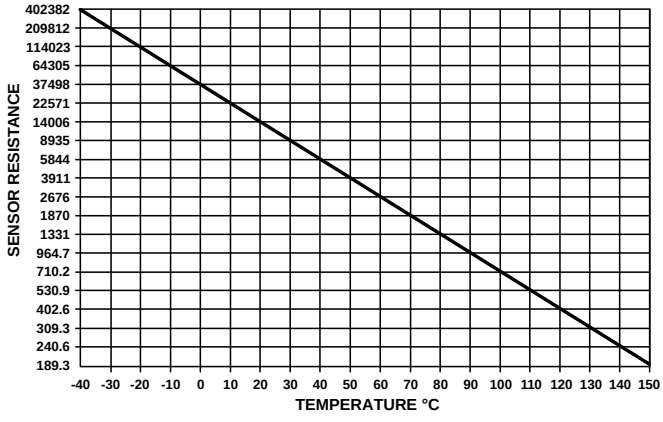
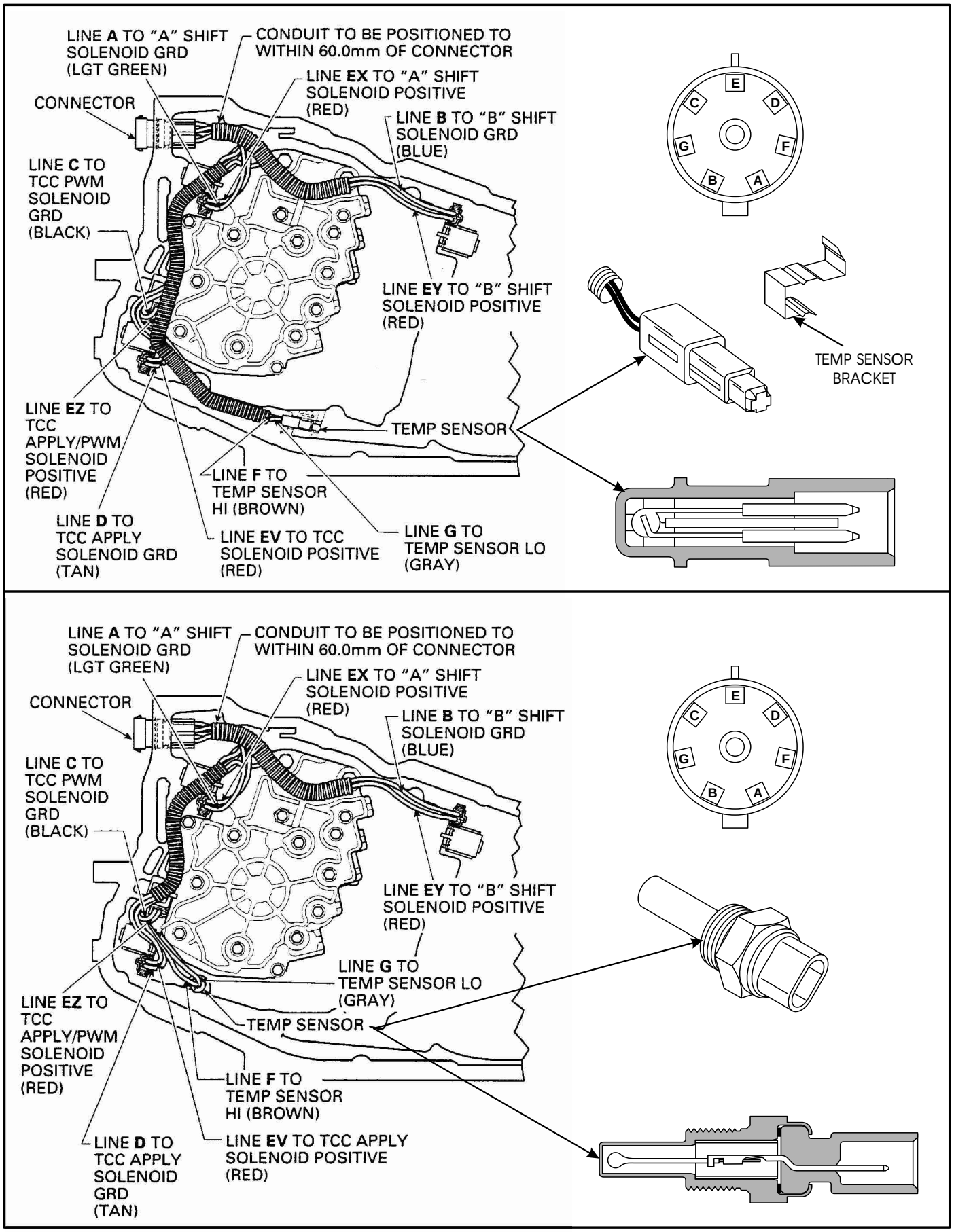


Figure 7


LINE A TO "A" SHIFT SOLENOID GRD (LGT GREEN)
CONDUIT TO BE POSITIONED TO WITHIN 60.0mm OF CONNECTOR
LINE EX TO "A" SHIFT SOLENOID POSITIVE (RED)
CONNECTOR
LINE B TO "B" SHIFT SOLENOID GRD (BLUE)
LINE C TO TCC PWM SOLENOID GRD (BLACK)
LINE EY TO "B" SHIFT SOLENOID POSITIVE (RED)
LINE EZ TO TCC APPLY/PWM SOLENOID POSITIVE (RED)
TEMP SENSOR
TEMP SENSOR BRACKET
LINE F TO TEMP SENSOR HI (BROWN)
LINE D TO TCC APPLY SOLENOID GRD (TAN)
LINE EV TO TCC SOLENOID POSITIVE (RED)
LINE G TO TEMP SENSOR LO (GRAY)
E
C
D
G
F
B
A
LINE A TO "A" SHIFT SOLENOID GRD (LGT GREEN)
CONDUIT TO BE POSITIONED TO WITHIN 60.0mm OF CONNECTOR
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TEMP SENSOR
LINE F TO TEMP SENSOR HI (BROWN)
LINE D TO TCC APPLY SOLENOID GRD (TAN)
LINE EV TO TCC APPLY SOLENOID POSITIVE (RED)
E
C
D
G
F
B
A

Figure 8

1991-1995 WIRE SCHEMATICS

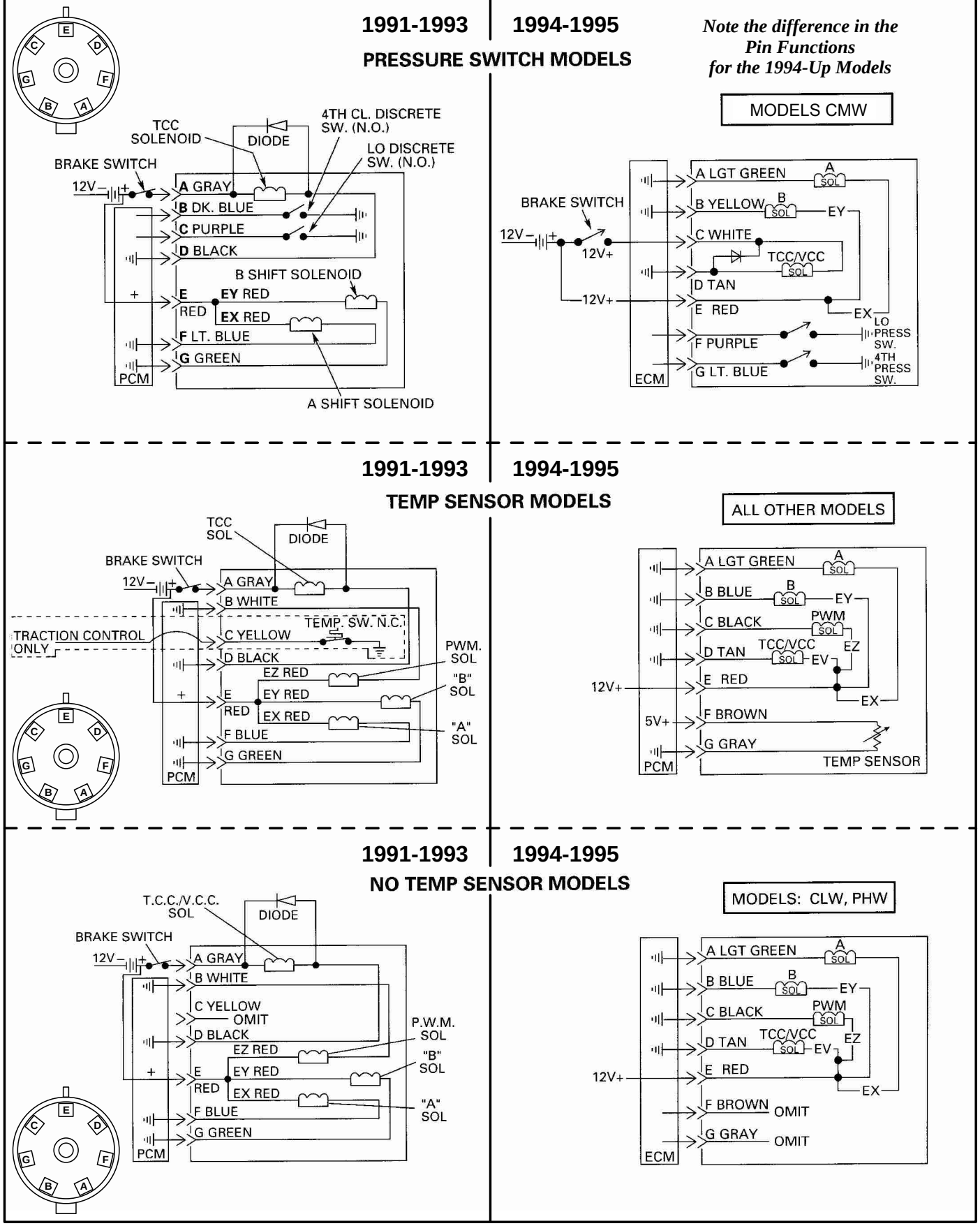


Figure 9

INTERNAL WIRE SCHEMATICS

CAUTION - - CAUTION - - CAUTION

The addition of the temperature sensor in the 1994 model 4T60-E transaxles required that the pin functions be completely re-assigned. Since the temperature sensor required 2 pins on the 7 way electrical connector and only one was available, it became necessary to combine the 12 volt power source to 1 pin, instead of the prior 2 pins.

The wiring schematics provided in Figures 9 and 10 reflect these changes, and this makes the internal wire harness Non-interchangeable.

Extra care is needed when checking the resistance through the external case connector, to ensure that you are on the proper pin cavities.

Example:

Notice in Figure 9 that Pin "A", for the 1991-1993 models, carries the 12 Volts from the brake switch in to the TCC Apply Solenoid.

Notice also in Figure 9 that Pin "A", for the 1994-1995 models, carries the ground signal from the PCM in to Shift Solenoid "A".

Lets assume that you want to check resistance for Shift Solenoid "A".

On 1991-1993 models you would use pin cavities "E" and "F".

On 1994-1995 models you would use pin cavities "E" and "A".

Ohms Resistance Chart	
Component	***Resistance @ 68°F***
Shift Solenoid "A"	***20-30 Ohms***
Shift Solenoid "B"	***20-30 Ohms***
TCC ON/OFF Solenoid	***20-30 Ohms***
TCC PWM Solenoid	***10-15 Ohms***
Vehicle Speed Sensor	***981-1864 Ohms***
TFT Sensor	***See Charts Page 8***

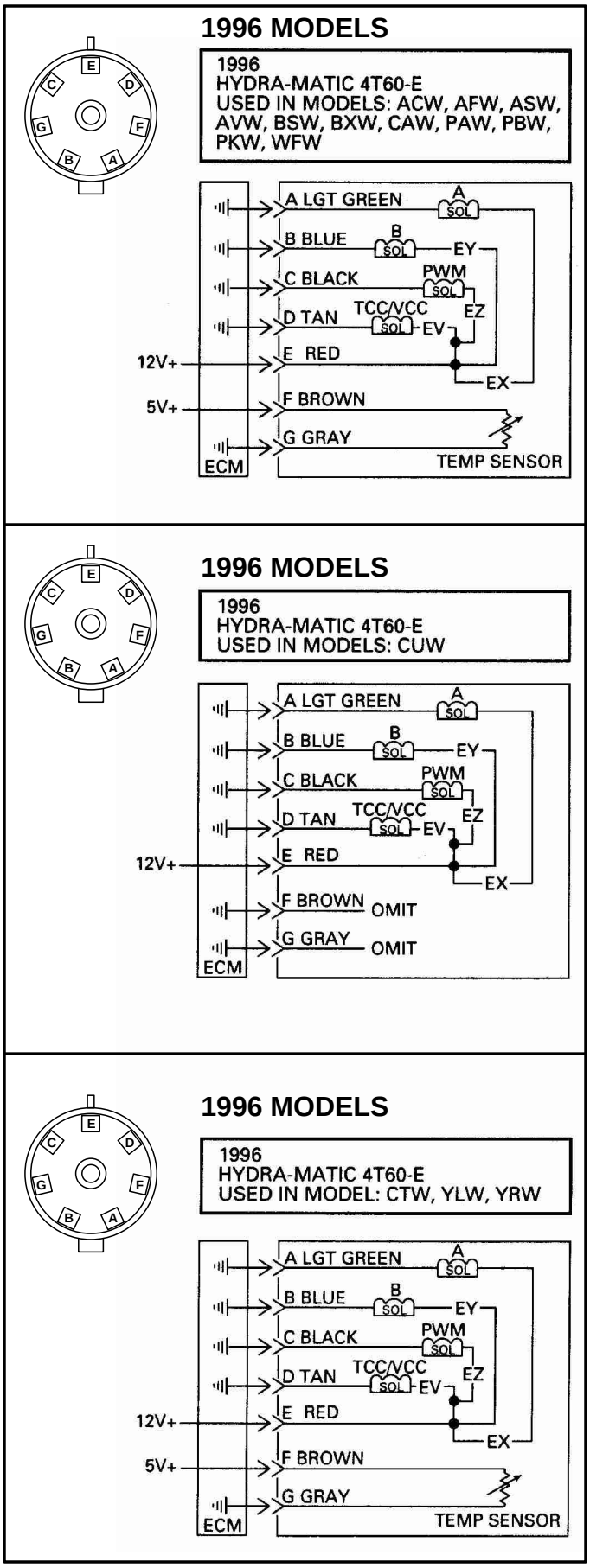


Figure 10

BODY TYPE & CAR LINE IDENTIFICATION	
Body Type	*Car Line*
"A" Body	*(94-95) Cutlass Cruiser* *(94-96) Century* *(94-96) Century Wagon* *(94-96) Cutlass Ciera* *(96) Cutlass Ciera Wagon*
"C" Body	*(91-93) Deville/Fleetwood* *(91-96) 98 Regency* *(91-97) Park Avenue/Ultra*
"E" Body	*(91-92) Toronado* *(91-93) Riviera* *(91-93) El Dorado*
"G" Body	*(94-96) Riviera*
"H" Body	*(92-97) Bonneville* *(92-97) 88 Royale* *(92-97) 88 Le Sabre*
"K" Body	*(91-93) Seville*
"K" Special	*(94-95) Deville*
"L" Body	*(94-96) Beretta* *(94-96) Corsica*
"N" Body	*(94-97) Achieva* *(94-97) Grand Am* *(94-97) Skylark* *(97) Malibu*
"U" Body	*(92-96) Lumina APV* *(92-97) Transport* *(92-97) Silhouette* *(97) Venture*
"W" Body	*(91-97) Cutlass Supreme* *(91-97) Grand Prix* *(91-97) Lumina* *(93-97) Regal* *(95-97) Monte Carlo* *(97) Century*
"Z" Body	*(91) Reatta*

Note: The number in parenthesis is year 4T60-E was in production with a specific car line.

Figure 11

DIAGNOSTIC TROUBLE CODES 1991-1992 MODELS ONLY	
DTC	*Description*
12	*No RPM Reference Pulse, Or Engine Is Off*
14	*Coolant Temp Signal Voltage Low*
15	*Coolant Temp Signal Voltage High*
21	*Throttle Position Sensor Signal Voltage High*
22	*Throttle Position Sensor Signal Voltage Low*
24	*Vehicle Speed Sensor Circuit*
26	*Quad Driver "A" Error (C, E, H, U and W Body Only)* *Note: Engine coolant fans, and Canister Purge, may be on this circuit. You must check the specific vehicle wire schematic.*
31	*Park/Neutral Switch (H And W Body Only)*
36	*Transaxle Shift Control Solenoid, Or Solenoid "B" Failed OFF*
38	*Brake Switch Error (C, E, H, And W Body Only)*
39	*TCC/VCC Circuit Failure Or, No RPM Drop When TCC Is Commanded ON*
56	*Quad Driver "B" Circuit (U Body Only)*

Figure 12

DIAGNOSTIC TROUBLE CODES 1993-1994 MODEL "TWO" DIGIT CODES				
DTC	***Description***		***DTC***	***Description***
12	***No RPM Reference Pulse, Or Engine Is Off***		***39***	***TCC/VCC Circuit Failure Or, No RPM Drop When TCC Is Commanded ON***
14	***Coolant Temp Signal Voltage Low***		***56***	***Quad Driver "B" Circuit (C, H, U and W Body Only)***
15	***Coolant Temp Signal Voltage High***		***58***	***TFT Sensor "High Temp" (L, N, and W Body Only)***
21	***Throttle Position Sensor Signal Voltage High***		***59***	***TFT Sensor "Low Temp" (L, N, and W Body Only)***
22	***Throttle Position Sensor Signal Voltage Low***		***72***	***Vehicle Speed Sensor Loss (1994 L and W Body Only)***
24	***Vehicle Speed Sensor Circuit***		***79***	***TFT Overtemp (1994 N and W Body)***
26	***Quad Driver "A" Error (C, E, H, U and W Body Only)*** ***Note: Engine coolant fans, and Canister Purge, may be on this circuit. You must check the specific vehicle wire schematic.***		***79***	***VSS Signal Voltage High (1993 Calif. W Body Only)***
27	***Quad Driver "A" Error (N Body Only)***		***80***	***VSS Signal Voltage Low (1993 Calif. W Body Only)***
28	***Gear Range Switch Circuit (L, N, W Body Only)***		***80/90***	***Transaxle Component Slipping (1994 L, N, and W Body Only)***
29	***Quad Driver Module No.3 Error (N Body Only)***		***82***	***Cam Sensor Circuit***
31	***Park/Neutral Switch (C, E, H, U and W Body Only)***			
36	***Transaxle Shift Control Solenoid, Or Solenoid "B" Failed OFF***			
38	***Brake Switch Error (C, E, H, And W Body Only)***			

Figure 13

DIAGNOSTIC TROUBLE CODES 1994-1995 MODEL "OBDII" CODES	
DTC	***Description***
P0117	***Coolant Temperature Sensor Signal Voltage Low***
P0118	***Coolant Temperature Sensor Signal Voltage High***
P0122	***Throttle Position Sensor Signal Voltage High***
P0123	***Throttle Position Sensor Signal Voltage Low***
P0501/502	***Vehicle Speed Sensor Circuit***
P0703	***TCC Brake Switch***
P0705	***Transaxle Range Switch***
P0712	***Transaxle Temperature Sensor Voltage High***
P0713	***Transaxle Temperature Sensor Voltage Low***
P0740	***TCC Circuit Error Or, No RPM Drop When TCC Commanded ON***
P0755	***Transaxle Shift Control Solenoid Or, Shift Solenoid "B" Failed OFF***
P1640	***Quad Driver Error (TCC Concern)***
P1650	***Quad Driver Error (Shift Solenoid Error)*** **Copyright © 2003 ATSG**

Figure 14

DIAGNOSTIC TROUBLE CODES 1996-1997 MODEL "OBDII" CODES	
P0502	***Vehicle Speed Sensor Circuit (Low Input)***
P0503	***Vehicle Speed Sensor Performance***
P0560	***Vehivle System Voltage Malfunction***
P0711	***Transaxle Temperature Sensor Performance***
P0712	***Transaxle Temperature Sensor Voltage High***
P0713	***Transaxle Temperature Sensor Voltage Low***
P0719	***Brake Switch Circuit Low Input Or Switch Stuck ON***
P0724	***Brake Switch Circuit High Input Or Switch Stuck OFF***
P0740	***TCC Circuit Inoperative, Electrical Concern***
P0742	***TCC Circuit Inoperative, Stuck ON***
P0751	***1-2 Shift Solenoid "A", Performance Problem***
P0753	***1-2 Shift Solenoid "A", Electrical Problem***
P0756	***2-3 Shift Solenoid "B", Performance Problem***
P0758	***2-3 Shift Solenoid "B", Electrical Problem***
P1812	***Transaxle Fluid Overheating***
P1860	***TCC PWM Solenoid Circuit, Electrical Problem***
P1864	***TCC Apply Solenoid Circuit, Electrical Problem (1996 Models)***
P1870	***Internal Transaxle Component Slipping*** **Copyright © 2003 ATSG**

Figure 15

LINE PRESSURE TEST

Minimum Line Pressure

1. Disconnect and plug the vacuum supply line at the vacuum modulator.
2. Install vacuum pump to modulator and apply 18 Inches of vacuum to the modulator.
3. Set parking brake, apply foot brake, start engine and record pressure readings in all gear ranges, with engine running at the proper RPM.
4. Compare recorded pressure readings with the information provided in chart below.

Maximum Line Pressure

1. Disconnect and plug the vacuum supply line at the vacuum modulator.
2. For the maximum line pressure test we want 0 Inches of vacuum to the modulator.
3. Set parking brake, apply foot brake, start engine and record pressure readings in all gear ranges, with engine running at the proper RPM.
4. Compare recorded pressure readings with the information provided in chart below.

Special Note:

Line pressure is boosted by manual valve position ***Only*** in the D1 position on this transaxle. All other manual lever positions rely on vacuum drop to raise line pressure.

Line pressure should increase instantly with throttle opening due to a decrease in vacuum supply to the vacuum modulator. After the tests above have been performed, the vacuum line should be reconnected to the vacuum modulator and verify that line pressure increases with throttle opening using the vehicles vacuum supply line. If pressure does not respond properly, it is usually due to carbon build up at the supply line where it enters the intake manifold, or an exhaust system restriction.

THM 4T60-E LINE PRESSURE CHART		
RANGE	***P.S.I. @ 18 In. Vac.***	***P.S.I. @ 0 In. Vac.***
P, R, N, @ 1250 RPM	***74-95***	***255-315***
D4, D3, D2, @ 1250 RPM	***74-95***	***165-205***
D1, @ 1250 RPM	***158-170***	***165-205***

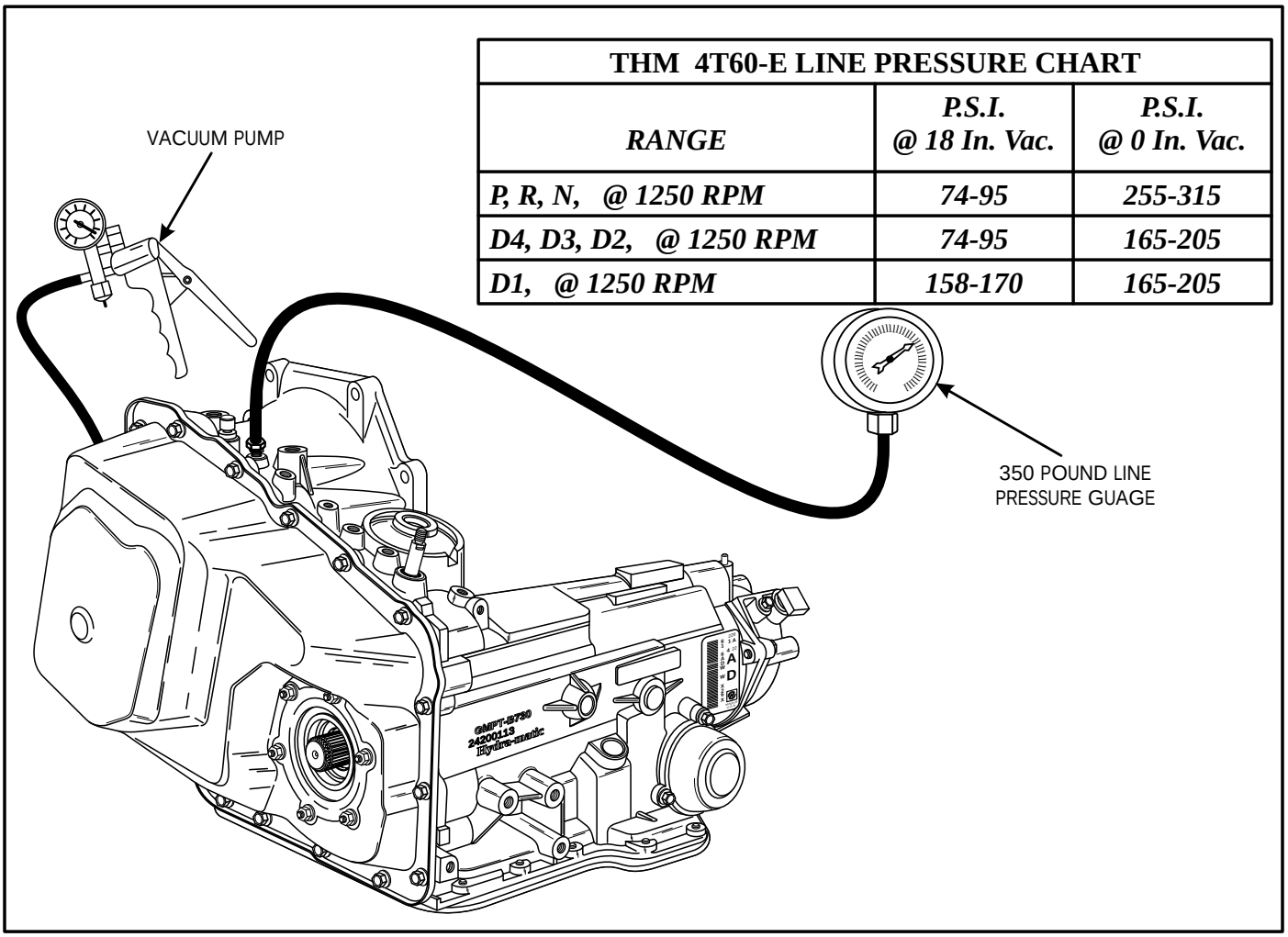


Figure 16

THM 4T60-E OIL PUMP PASSAGES "FRONT SIDE"

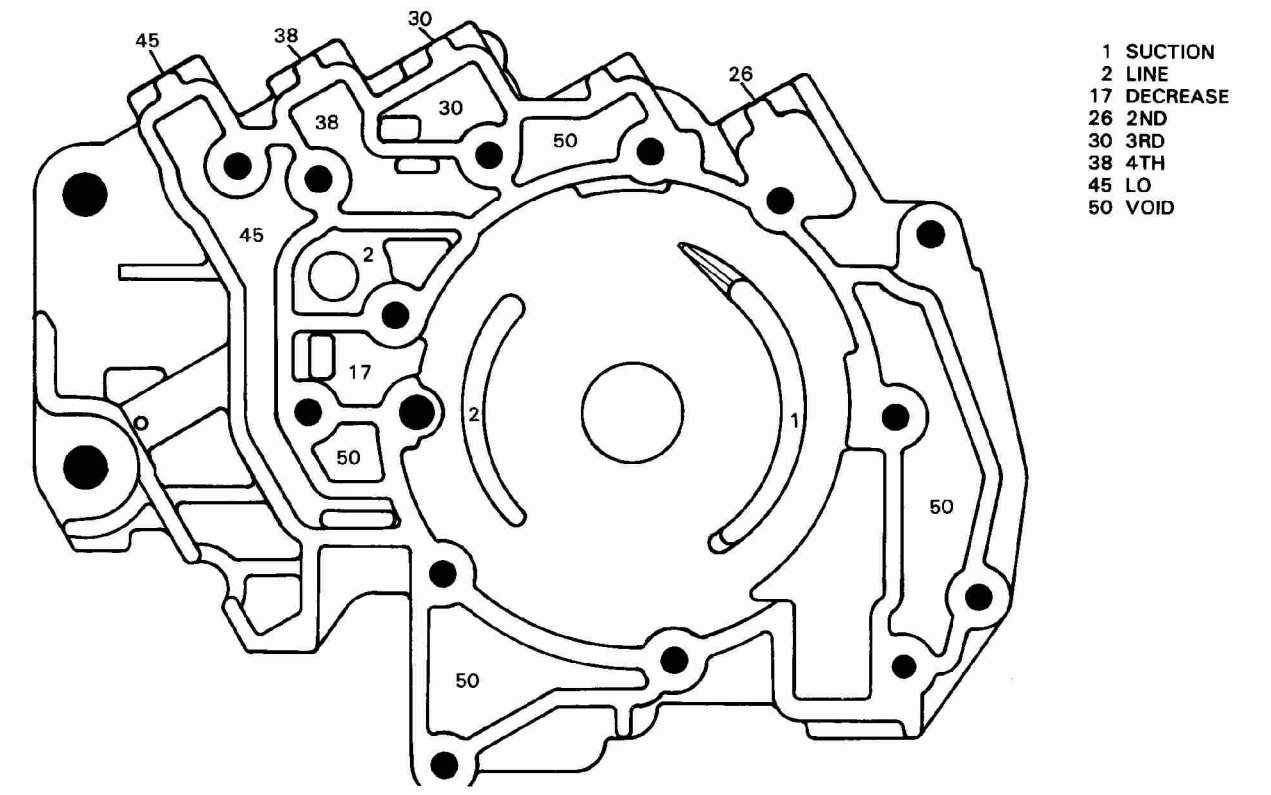


Figure 17

THM 4T60-E OIL PUMP PASSAGES "REAR SIDE"

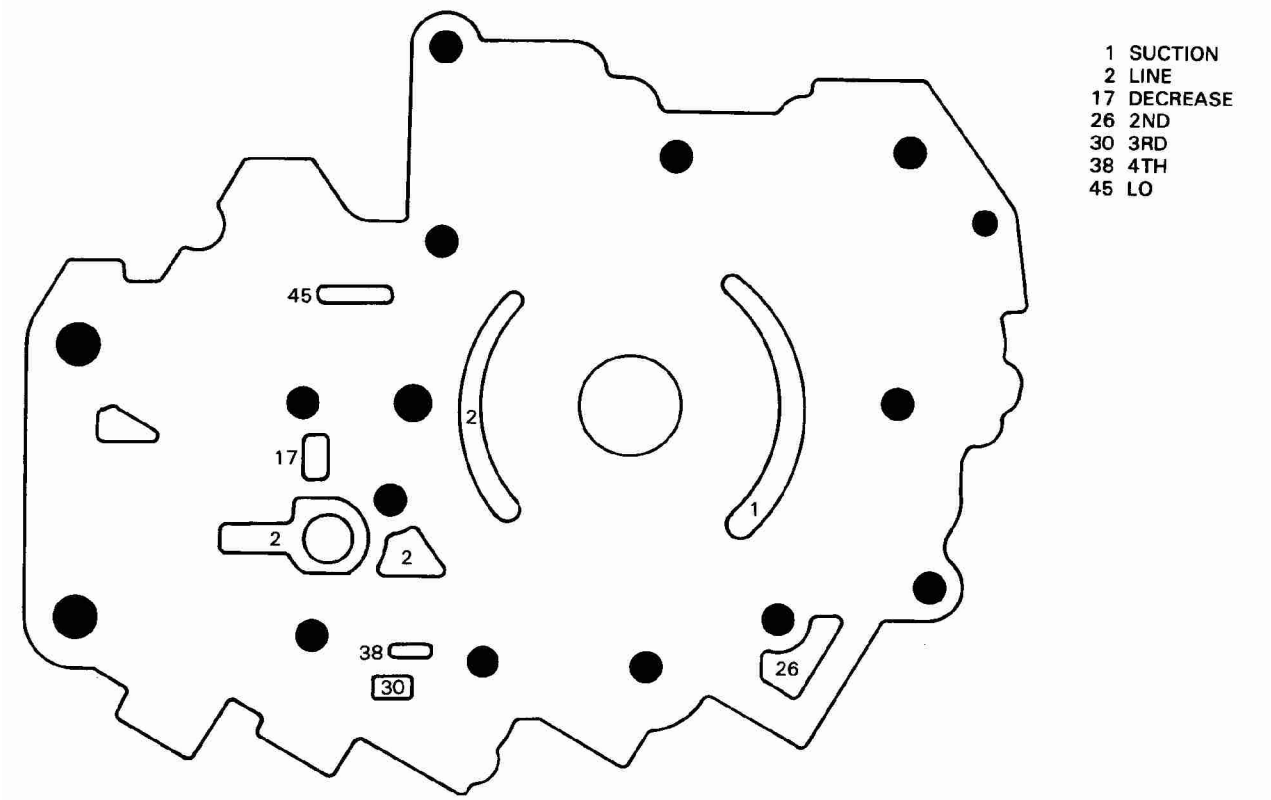


Figure 18

THM 4T60-E OIL PUMP COVER PASSAGES

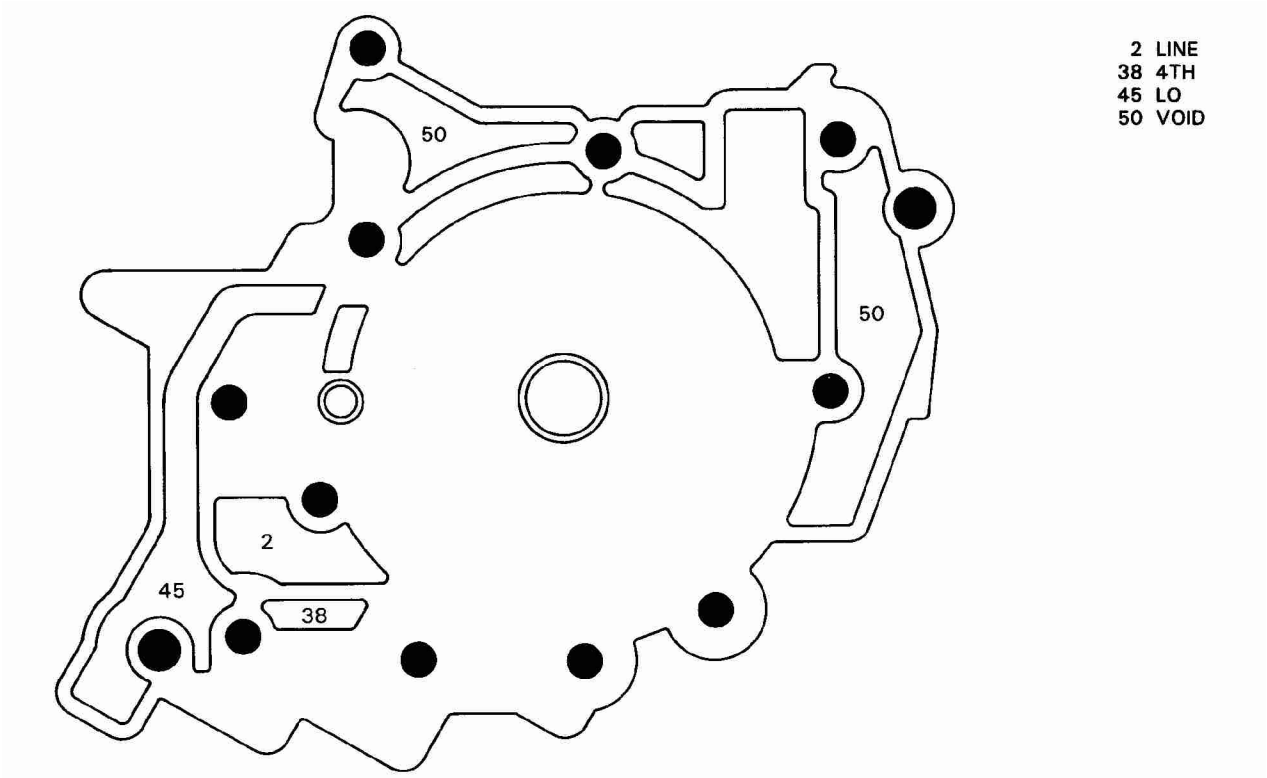
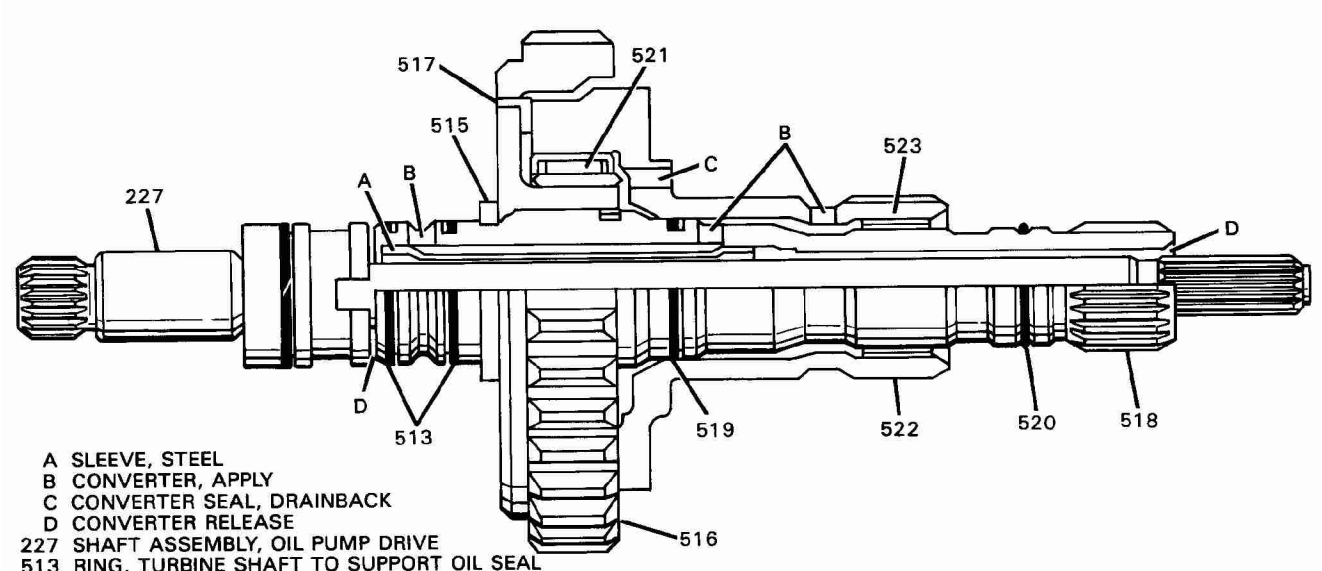


Figure 19

THM 4T60-E TURBINE AND PUMP DRIVE SHAFT PASSAGES



A SLEEVE, STEEL
B CONVERTER, APPLY
C CONVERTER SEAL, DRAINBACK
D CONVERTER RELEASE
227 SHAFT ASSEMBLY, OIL PUMP DRIVE
513 RING, TURBINE SHAFT TO SUPPORT OIL SEAL
515 RING, TURBINE SHAFT TO DRIVE SPROCKET (SNAP)
516 SPROCKET, DRIVE
517 WASHER, THRUST (DRIVE SPROCKET/SUPPORT)
518 SHAFT, TURBINE
519 RING, TURBINE SHAFT TO SUPPORT OIL SEAL
520 SEAL, O-RING (TURBINE SHAFT/HUB) GREEN
521 BEARING ASSEMBLY, DRIVE SUPPORT/SPROCKET (DRAW CUP)
522 SUPPORT, DRIVE SPROCKET
523 BUSHING, DRIVE SPROCKET SUPPORT

Figure 20

THM 4T60-E VALVE BODY PASSAGES "PUMP SIDE"

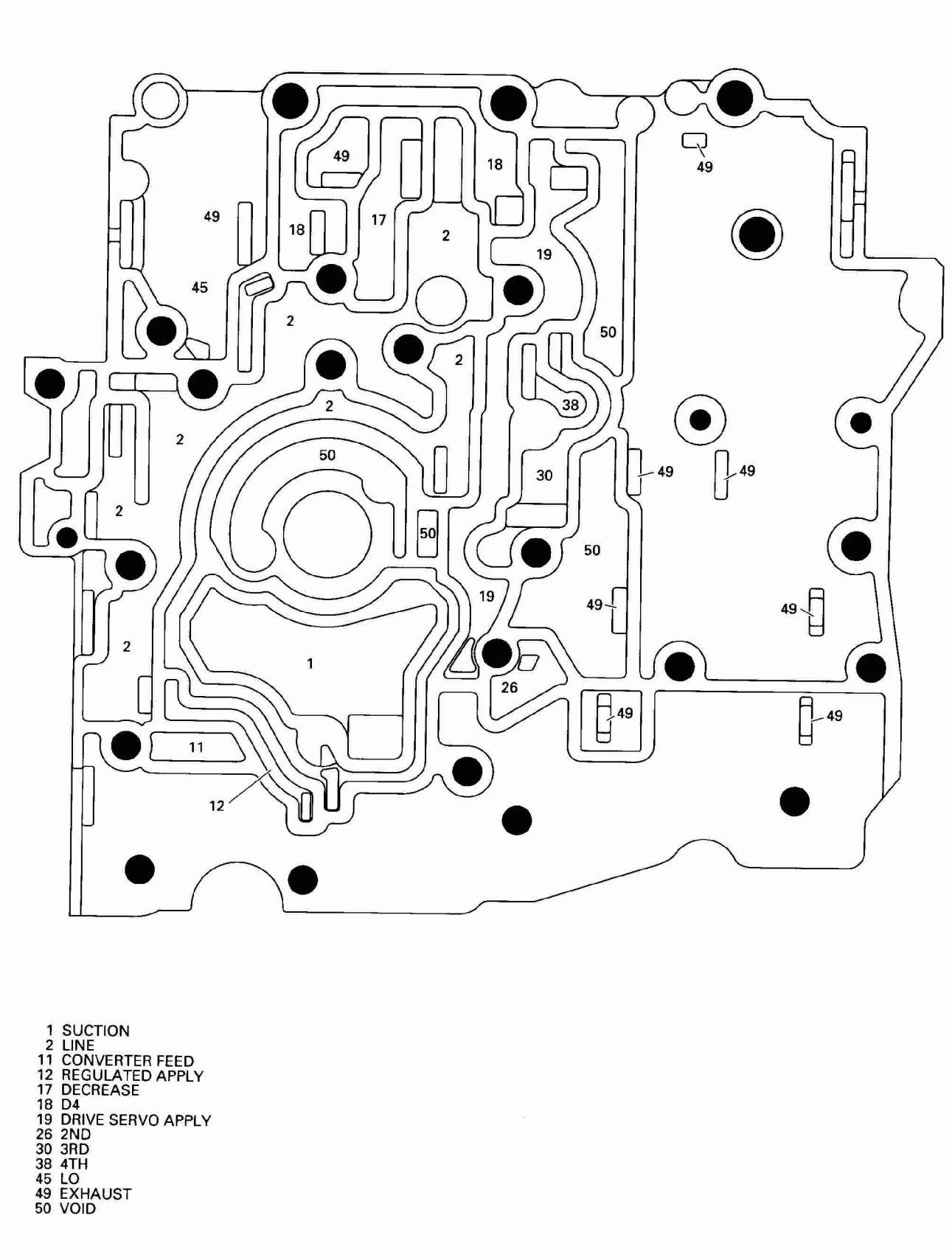
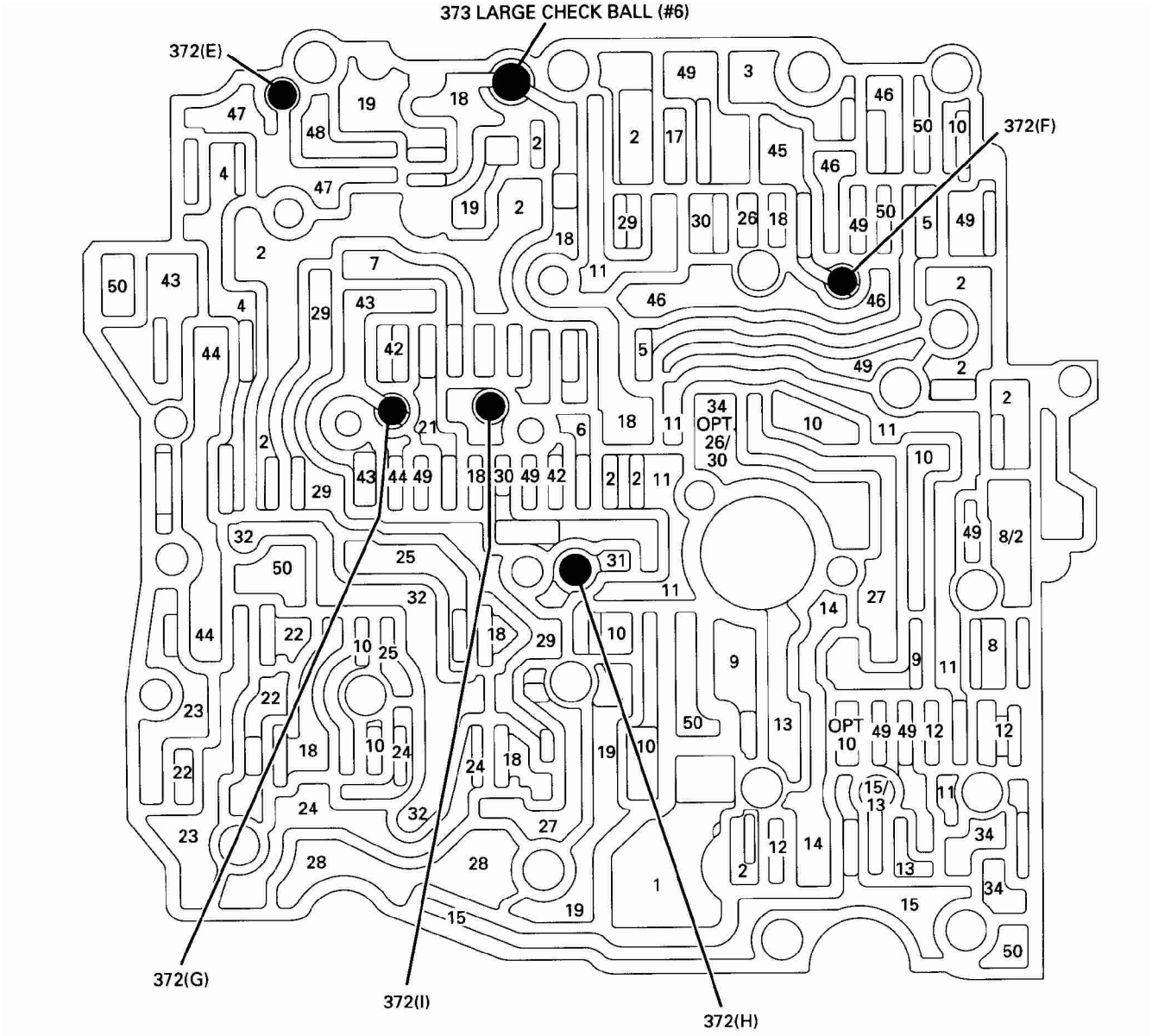


Figure 21

THM 4T60-E VALVE BODY PASSAGES "SPACER PLATE SIDE"

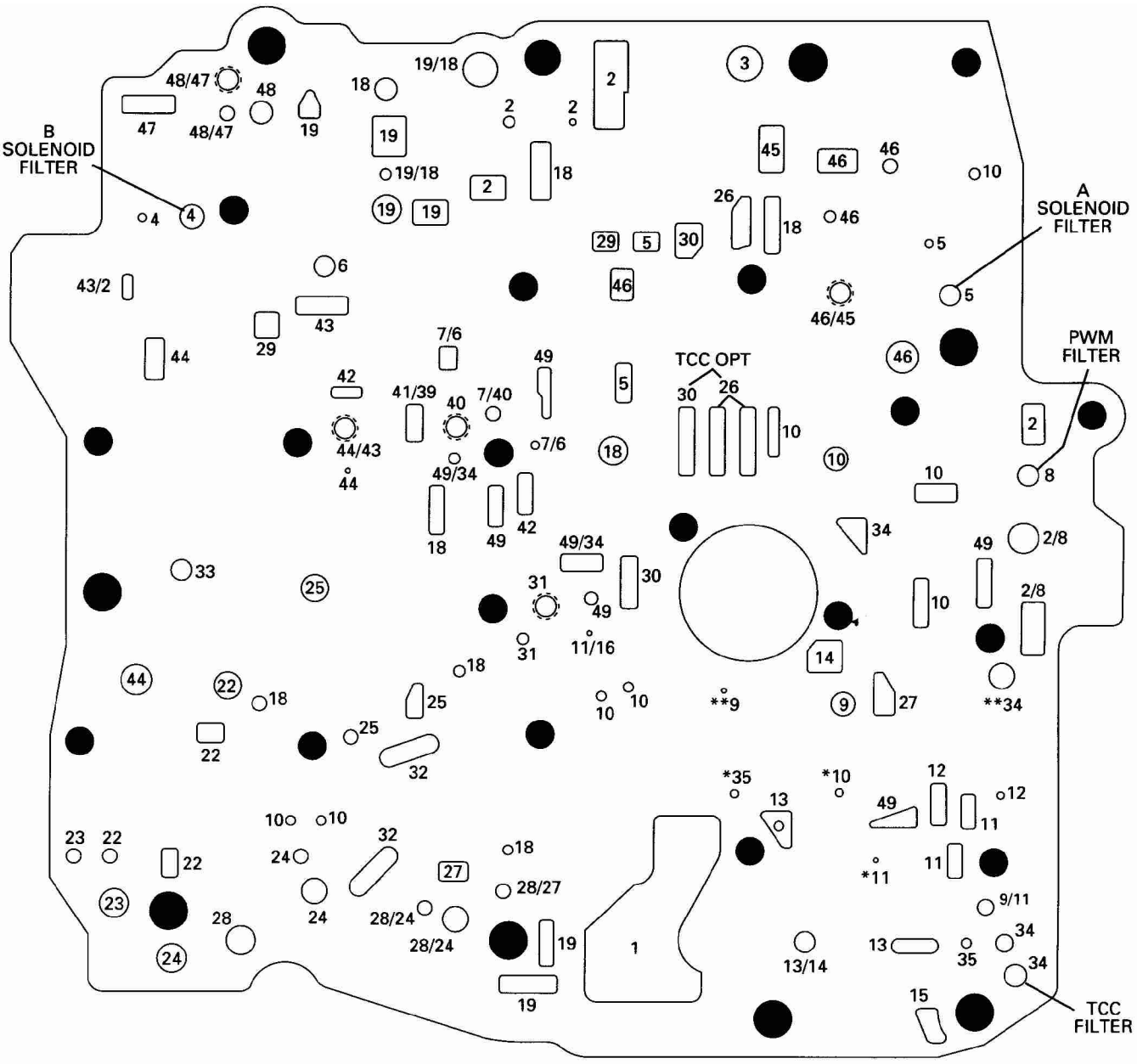


372(E) REVERSE - REV.SERVO (#5)
372(F) LO - LO/1ST (#7)
372(G) D2 - MANUAL 2-1 SERVO FEED (#8)
372(H) 3RD CL. - 3RD CL. EX. (#9)
372(I) 4TH - 4TH CL. (#10)
373 D4 - SERVO APPLY (#6)

1 SUCTION
2 LINE
3 PRN
4 B SHIFT SOLENOID
5 A SHIFT SOLENOID
6 INPUT CLUTCH FEED
7 INPUT CLUTCH
8 PWM FEED
9 PWM
10 MOD
11 CONVERTER FEED
12 REGULATED APPLY
13 RELEASE
14 APPLY
15 COOLER
16 LUBE
17 DECREASE
18 D4
19 DRIVE SERVO APPLY
20 SERVO APPLY
21 AUX INPUT CLUTCH FEED
22 PRIMARY TRIM
23 1-2 ACCUM
24 2-3 ACCUM
25 3-4 ACCUM
26 2ND
27 2ND/2ND EXHAUST
28 2ND CLUTCH
29 B SHIFT SOLENOID OFF
30 3RD
31 3RD/3RD EXHAUST
32 3RD CLUTCH
33 3RD CLUTCH/LO-1ST
34 TCC SIGNAL
35 TCC ACCUM FEED
36 TCC ACCUM FEED BLOW OFF
37 TCC RELEASE
38 4TH
39 4TH/4TH EXHAUST
40 4TH CLUTCH
41 4TH CLUTCH EXHAUST
42 D3
43 D2
44 MANUAL 2-1 SERVO
45 LO
46 LO-1ST
47 REVERSE
48 REVERSE SERVO
49 EXHAUST
50 VOID

Figure 22

TYPICAL SPACER PLATE PASSAGES

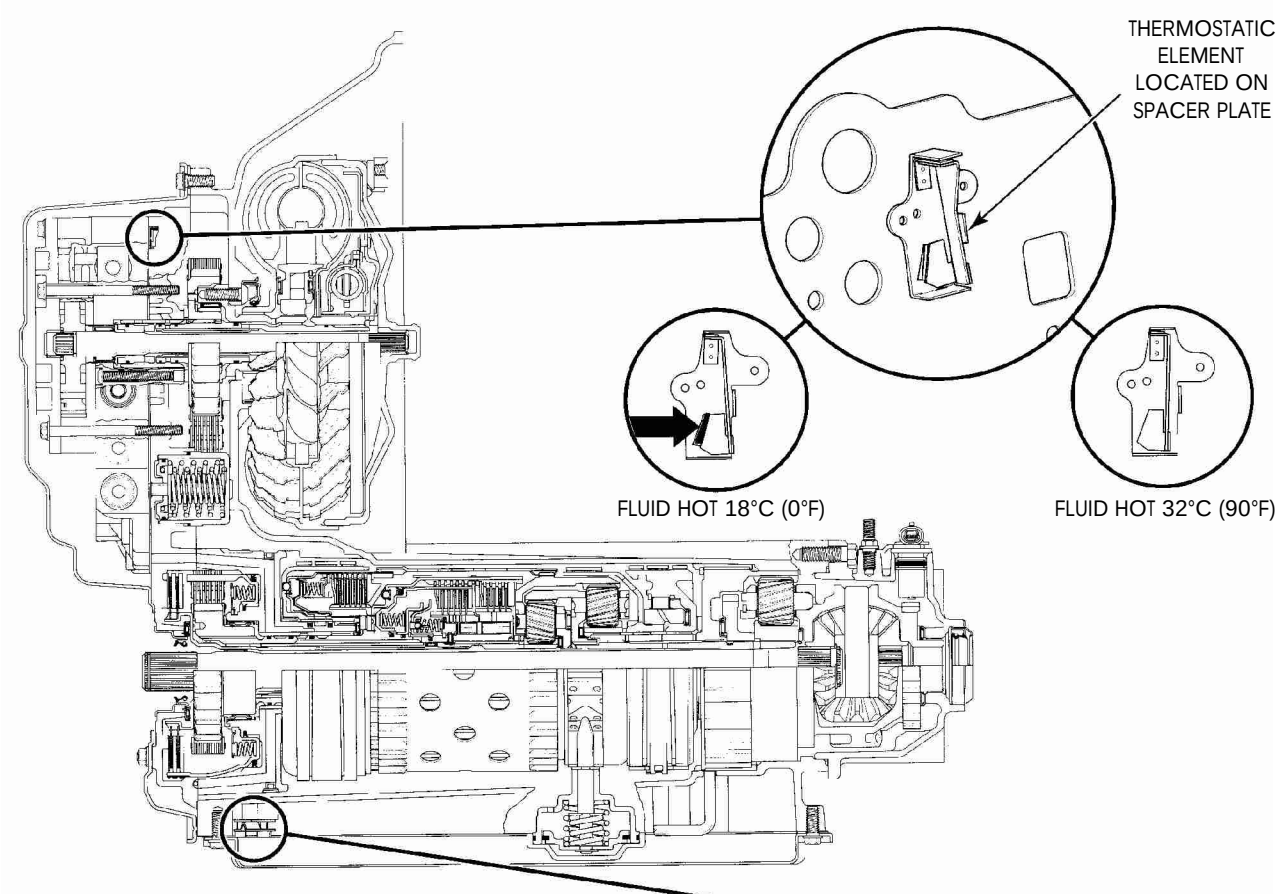


1 SUCTION
2 LINE
3 PRN
4 B SHIFT SOLENOID
5 A SHIFT SOLENOID
6 INPUT CLUTCH FEED
7 INPUT CLUTCH
8 PWM FEED
9 PWM
10 MOD
11 CONVERTER FEED
12 REGULATED APPLY
13 RELEASE
14 APPLY
15 COOLER
16 LUBE
17 DECREASE
18 D4
19 DRIVE SERVO APPLY
20 SERVO APPLY
21 AUX INPUT CLUTCH FEED
22 PRIMARY TRIM
23 1-2 ACCUM
24 2-3 ACCUM
25 3-4 ACCUM
26 2ND
27 2ND/2ND EXHAUST
28 2ND CLUTCH
29 B SHIFT SOLENOID OFF
30 3RD
31 3RD/3RD EXHAUST
32 3RD CLUTCH
33 3RD CLUTCH/LO-1ST
34 TCC SIGNAL
35 TCC ACCUM FEED
36 TCC ACCUM FEED BLOW OFF
37 TCC RELEASE
38 4TH
39 4TH/4TH EXHAUST
40 4TH CLUTCH
41 4TH CLUTCH EXHAUST
42 D3
43 D2
44 MANUAL 2-1 SERVO
45 LO
46 LO-1ST
47 REVERSE
48 REVERSE SERVO
49 EXHAUST
50 VOID

*OMITTED **WHEN** USING A PWM AND TCC SOLENOID

OMITTED WHEN **NOT USING A PWM AND TCC SOLENOID

Figure 23



THERMOSTATIC ELEMENTS

The THM 4T60-E transaxle utilizes two types of thermostatic elements to control fluid flow to various components inside the transaxle. These thermostatic elements contain temperature sensitive bi-metal strips that react to fluid temperature changes and open or close a fluid passage.

Forward Servo Thermo Element

This thermostatic element is located on the valve body spacer plate assembly and is designed to control, through an orifice, D4 fluid pressure that feeds the forward servo apply passage. Forward servo apply fluid is then routed to the forward servo assembly to apply the forward band.

The position of this thermo element varies from a fully open position when fluid temperature is at 18°C (0°F) to a fully closed position at 32°C (90°F). At low temperatures, the thermo element is fully open to provide a large feed orifice for D4 fluid to enter the drive servo apply circuit. As the fluid warms up and flows easier, the thermo element begins to close and restrict the feed orifice. When the fluid is warm, the thermo element is fully closed forcing D4 fluid through a single orifice to stroke the forward band servo assembly.

Case Thermo Element

This thermostatic element is located on the case and is designed to control the fluid level in the case side cover pan. At low temperatures, the thermostatic element exerts very little pressure on the thermo element plate allowing fluid to drain into the sump. As the temperature of the fluid increases, the thermo element begins to apply pressure to the thermo element plate, thereby trapping fluid in the case side cover pan. This level of transaxle fluid is necessary in order to maintain the operation of the hydraulic system.

It should be noted that when checking fluid level in a THM 4T60-E transaxle, it will be higher on the fluid level indicator when the fluid is cold. Conversely, the fluid level will drop when checked at operating temperatures. This event is a result of the thermostatic element functioning as explained.

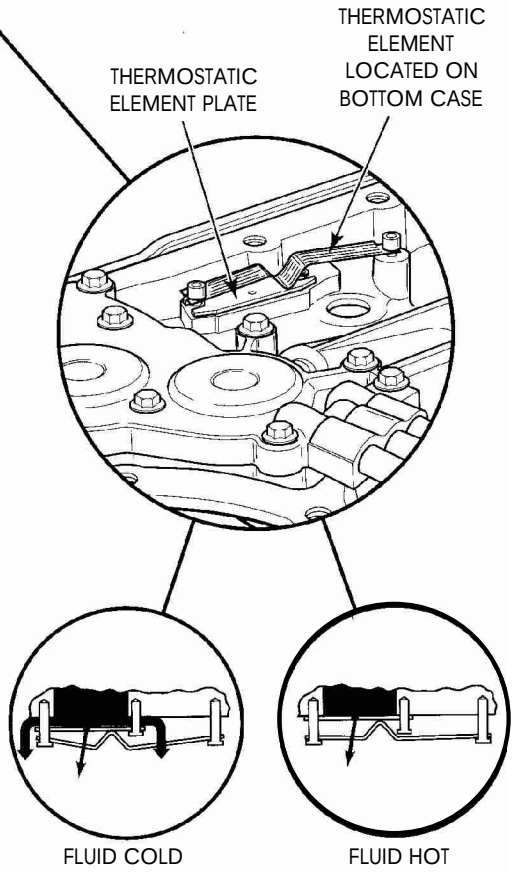
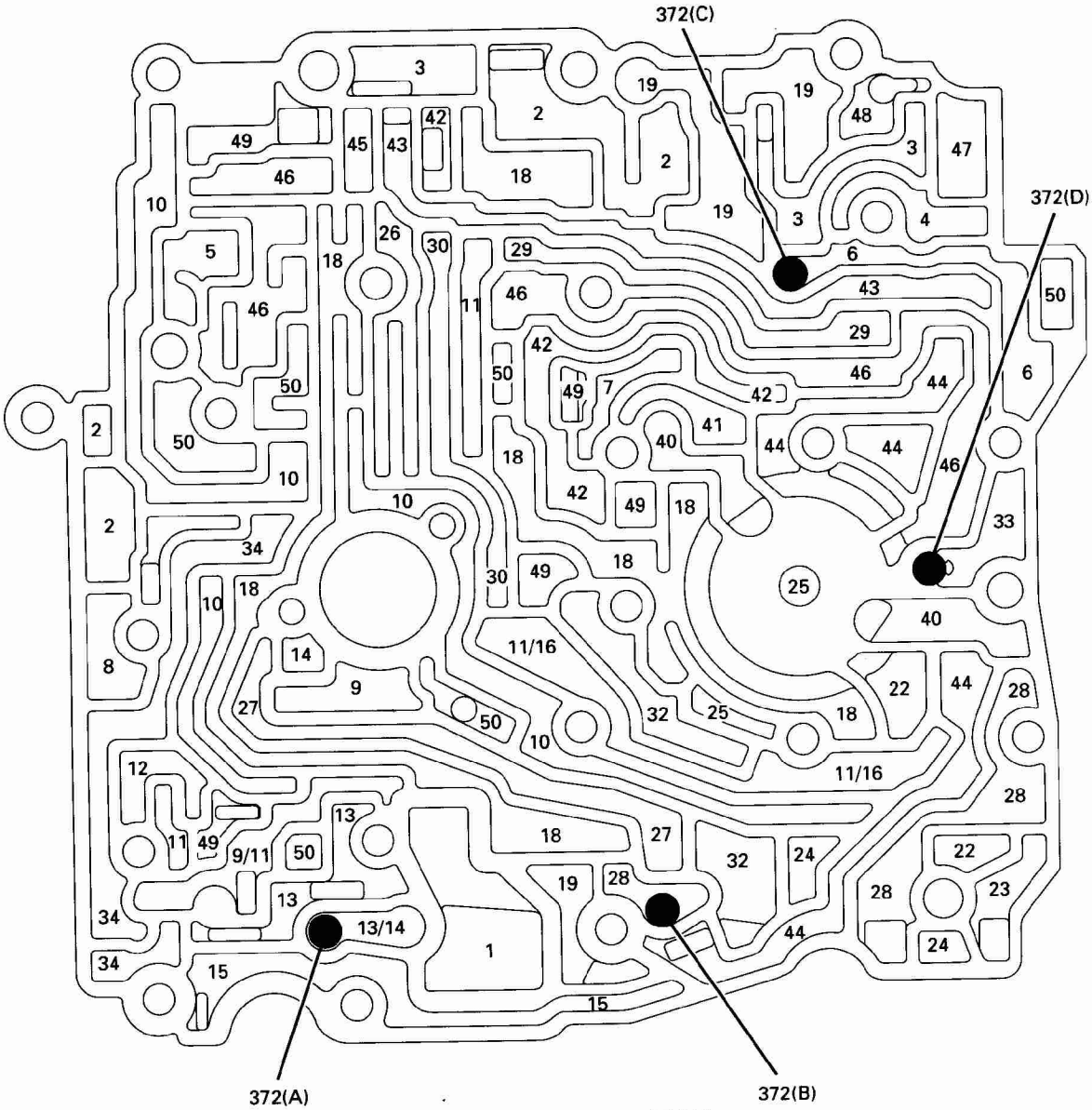


Figure 24

THM 4T60-E CHANNEL PLATE PASSAGES "VALVE BODY SIDE"

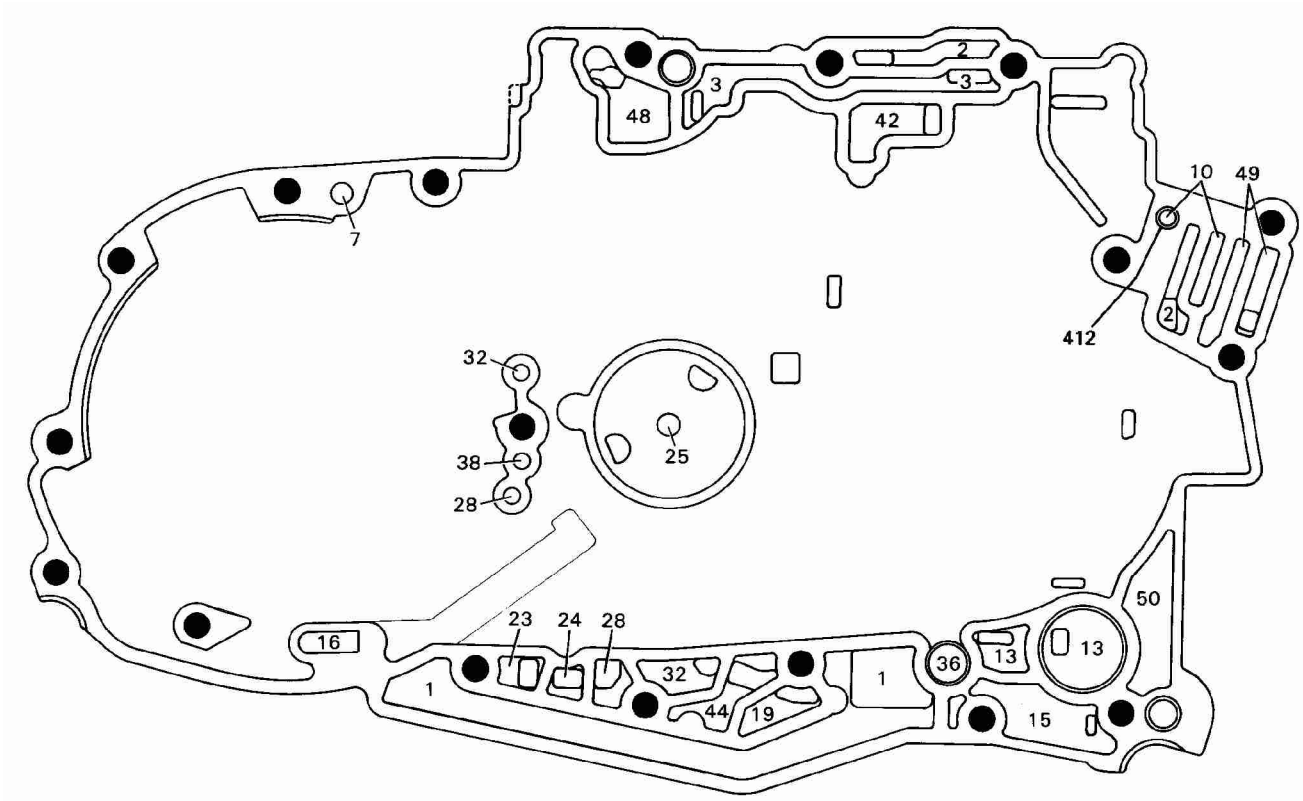


372(A) TCC APPLY - RELEASE (#1)
372(B) 2ND - 2ND CL. (#2)
372(C) INPUT CLUTCH - PRN (#3)
372(D) 3RD CLUTCH - LO/1ST (#4)

1 SUCTION
2 LINE
3 PRN
4 B SHIFT SOLENOID
5 A SHIFT SOLENOID
6 INPUT CLUTCH FEED
7 INPUT CLUTCH
8 PWM FEED
9 PWM
10 MOD
11 CONVERTER FEED
12 REGULATED APPLY
13 RELEASE
14 APPLY
15 COOLER
16 LUBE
17 DECREASE
18 D4
19 DRIVE SERVO APPLY
20 SERVO APPLY
21 AUX INPUT CLUTCH FEED
22 PRIMARY TRIM
23 1-2 ACCUM
24 2-3 ACCUM
25 3-4 ACCUM
26 2ND
27 2ND/2ND EXHAUST
28 2ND CLUTCH
29 B SHIFT SOLENOID OFF
30 3RD
31 3RD/3RD EXHAUST
32 3RD CLUTCH
33 3RD CLUTCH/LO-1ST
34 TCC SIGNAL
35 TCC ACCUM FEED
36 TCC ACCUM FEED BLOW OFF
37 TCC RELEASE
38 4TH
39 4TH/4TH EXHAUST
40 4TH CLUTCH
41 4TH CLUTCH EXHAUST
42 D3
43 D2
44 MANUAL 2-1 SERVO
45 LO
46 LO-1ST
47 REVERSE
48 REVERSE SERVO
49 EXHAUST
50 VOID

Figure 25

CHANNEL PLATE PASSAGES "CASE SIDE"



1 SUCTION
2 LINE
3 PRN
7 INPUT CLUTCH
10 MOD
13 RELEASE
15 COOLER
16 LUBE
19 DRIVE SERVO APPLY
23 1-2 ACCUM
24 2-3 ACCUM
25 3-4 ACCUM
28 2ND CLUTCH
32 3RD CLUTCH
35 TCC ACCUM FEED (RELEASE)
36 TCC ACCUM FEED BLOW OFF
38 4TH
42 D3
44 MANUAL 2-1 SERVO
48 REVERSE SERVO
49 EXHAUST
50 VOID
412 PLUG, CUP ORIFICED

Figure 26

THM 4T60-E CASE PASSAGES "CHANNEL PLATE SIDE"

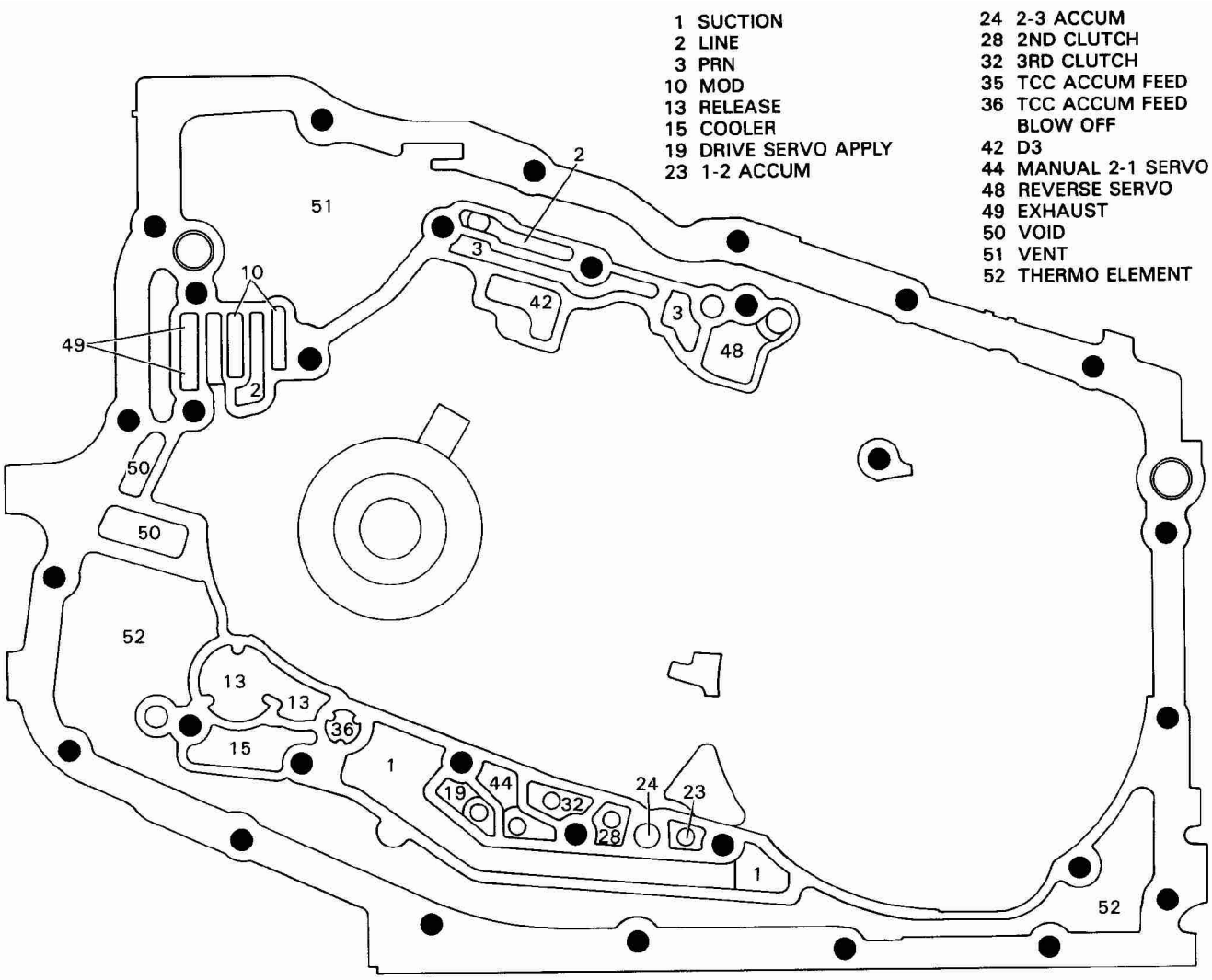


Figure 27

THM 4T60-E CASE PASSAGES "BOTTOM SIDE"

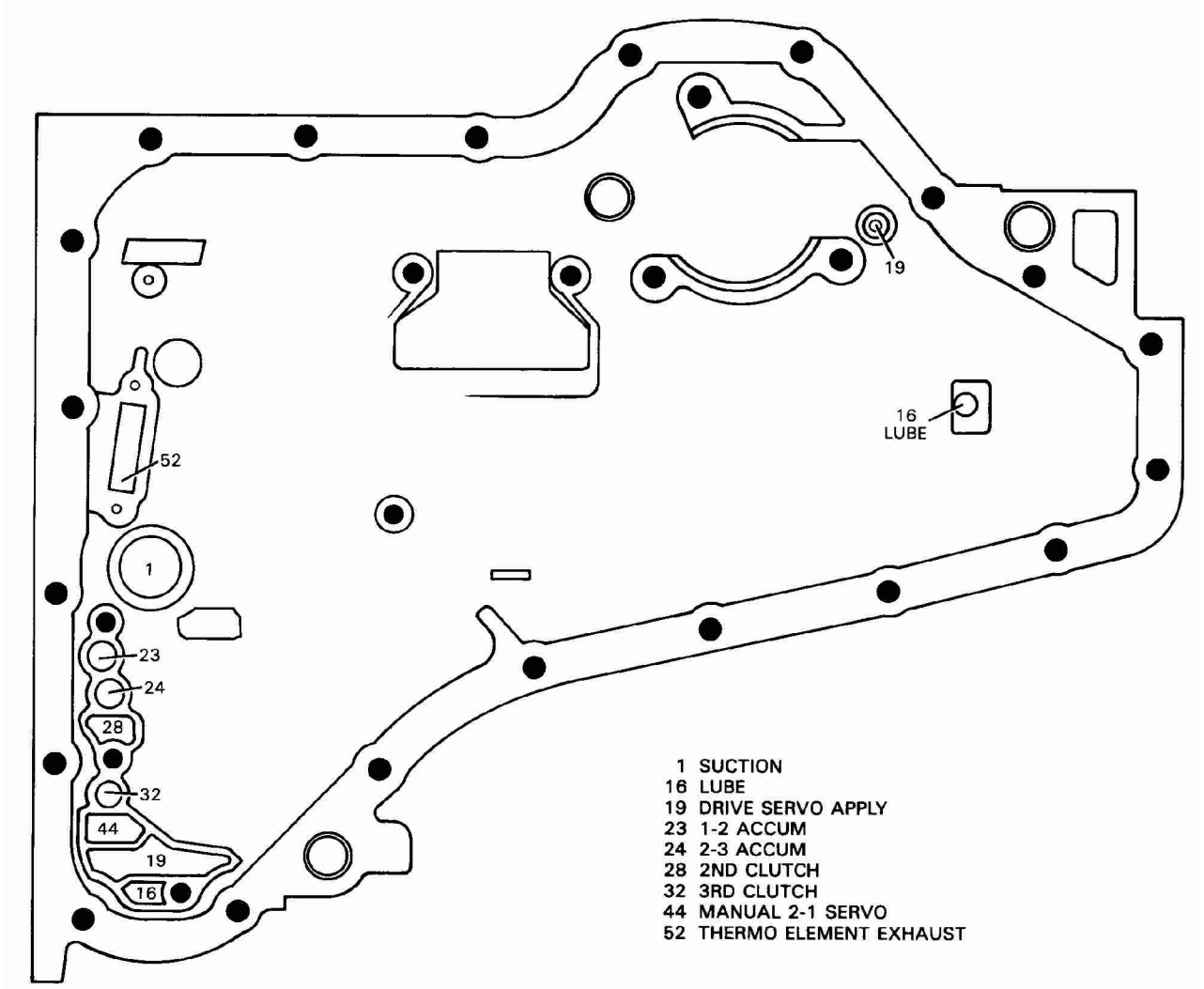


Figure 28

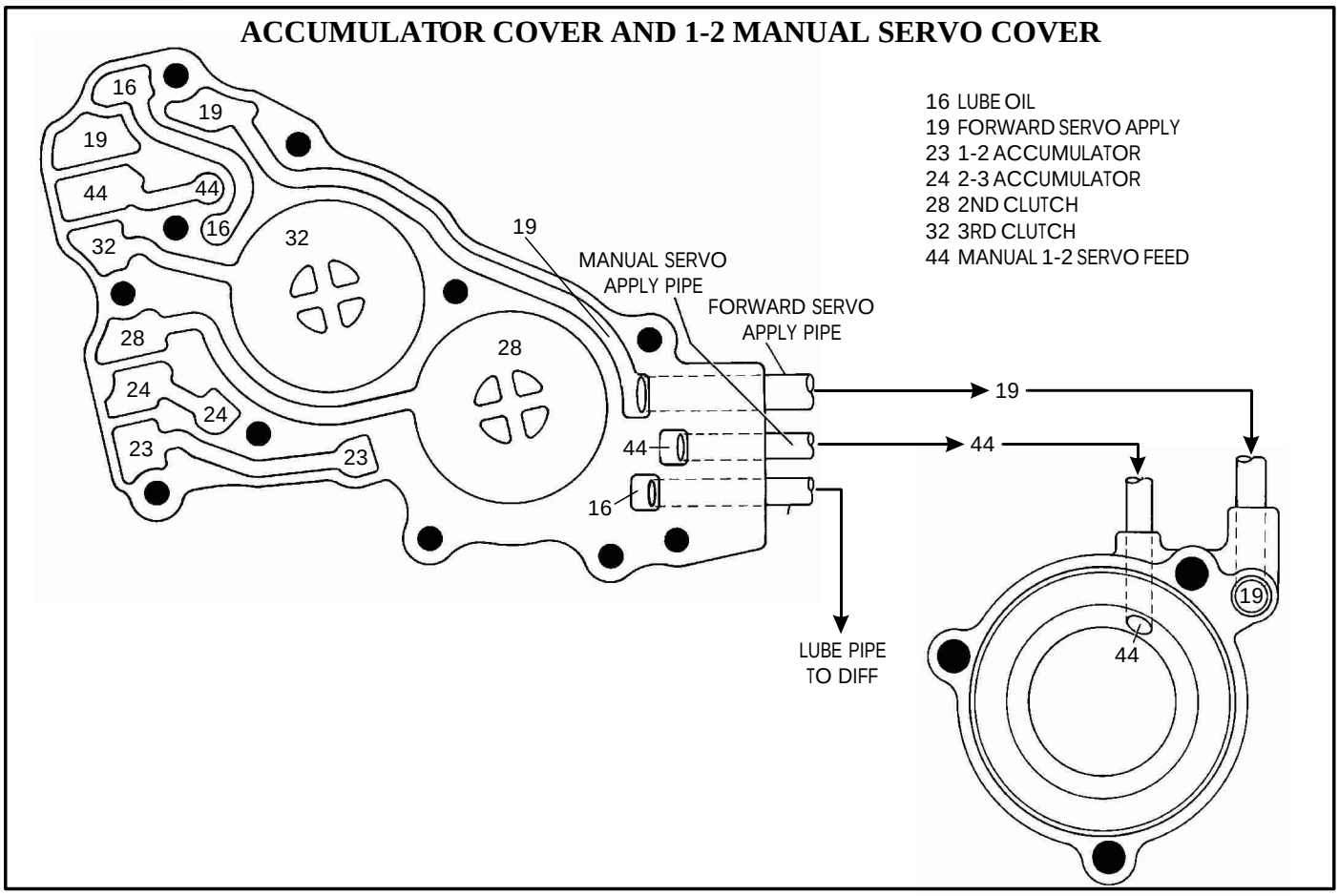


Figure 29

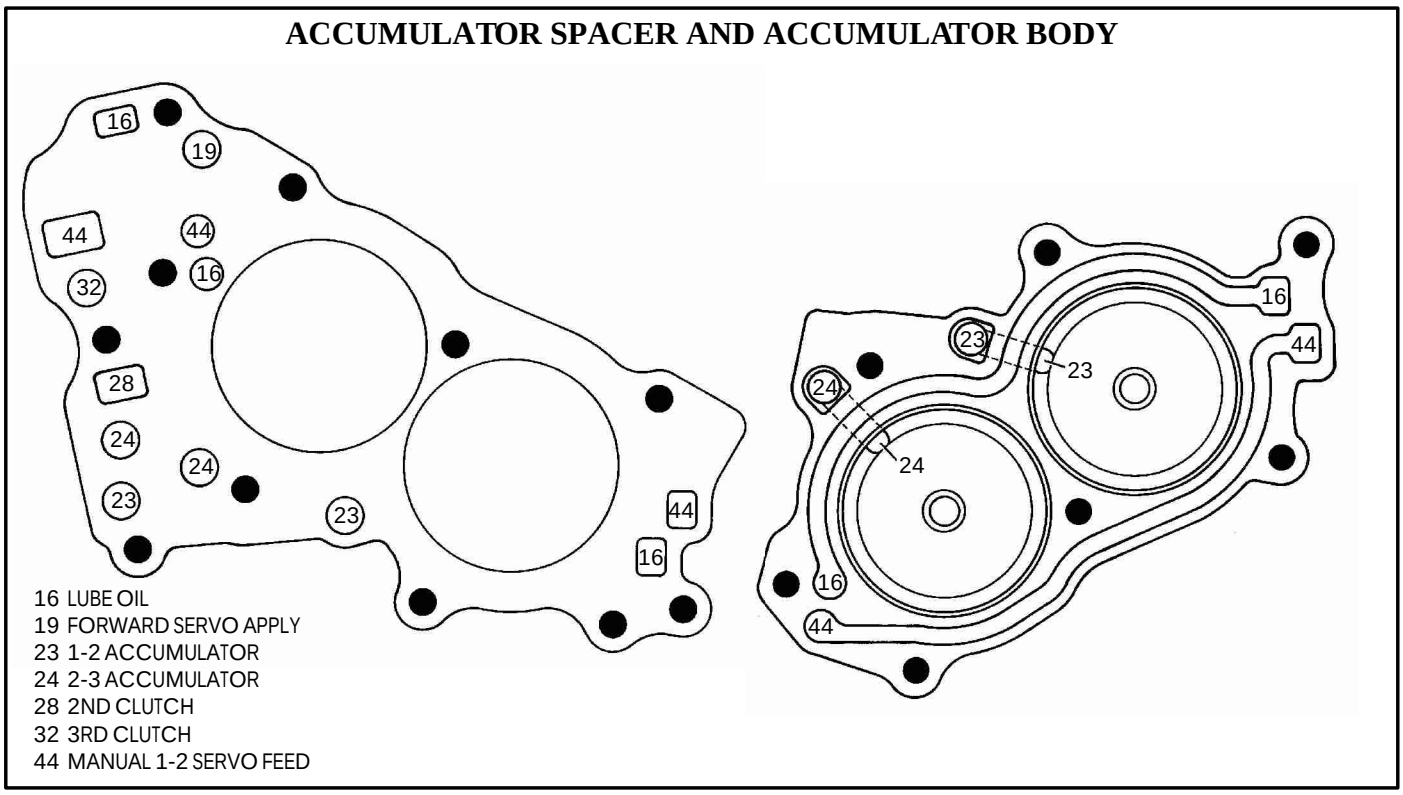


Figure 30

THM 4T60-E DRIVEN SPROCKET SUPPORT PASSAGES

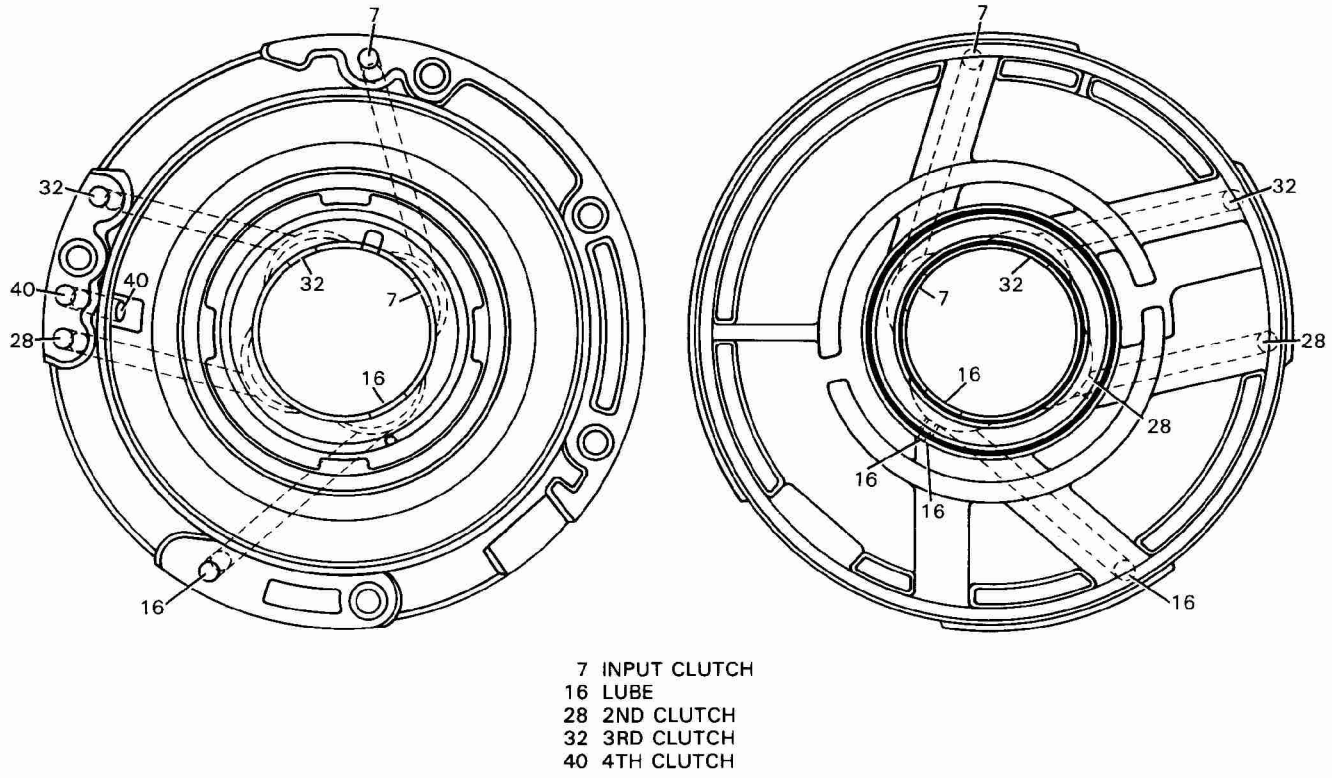


Figure 31

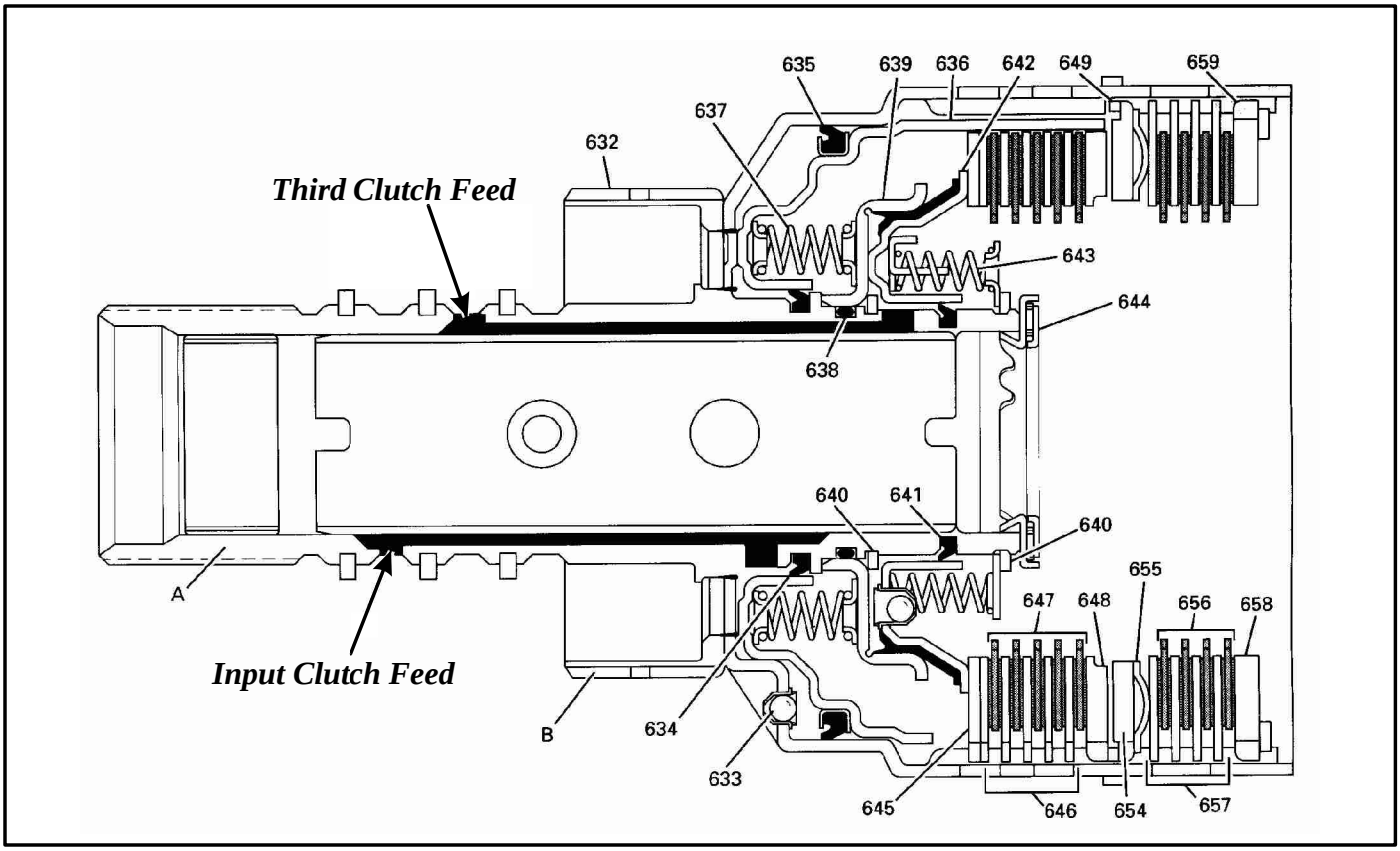


Figure 32

TRANSAXLE DISASSEMBLY

External Components

1. Clean the transaxle exterior thoroughly before beginning any of the disassembly process.
2. Ensure the work area is adequate and ***clean*** for the layout and inspection of components.
3. Remove the torque converter assembly from the transaxle, as shown in Figure 33.
4. Install a suitable fixture on the transaxle so it can be rotated in a bench fixture, such as the one shown in Figure 34.
5. Rotate the transaxle with the extension housing facing downward to allow fluid drainage.
6. Remove the "O" ring from the turbine shaft using a small screwdriver (See Figure 34).
7. Remove the vacuum modulator retaining bolt and bracket, as shown in Figure 35.
8. Remove and discard the vacuum modulator.
9. Remove the modulator valve from the transaxle case bore using a magnet (See Figure 35).
10. Remove output speed sensor from extension housing, as shown in Figure 36.
11. Using the support fixture as a pivot point, push the reverse servo cover down with the large screwdriver and remove the snap ring using a smaller screwdriver, as shown in Figure 37. ***Caution: The reverse servo is under pressure.***
12. Revove the reverse servo cover "O" ring by pulling it out and cutting it with sidecutters, as shown in Figure 38.
13. Revove the reverse servo assembly from case as shown in Figure 39.

Continued on Page 30.

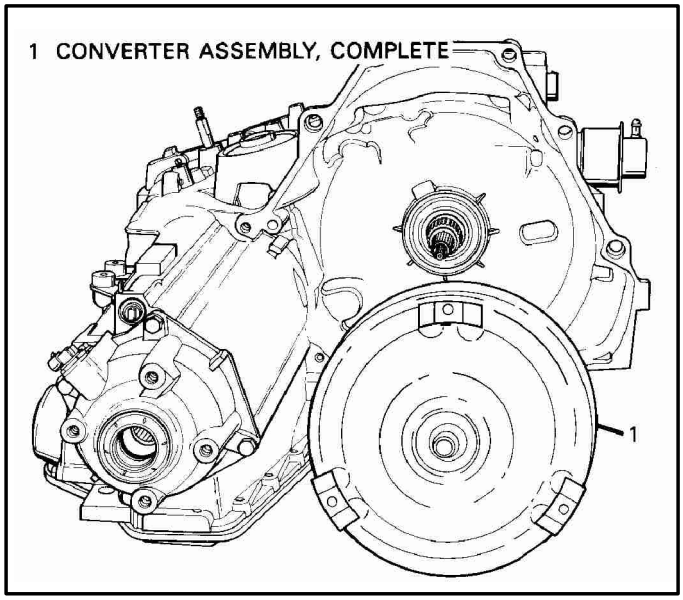


Figure 33

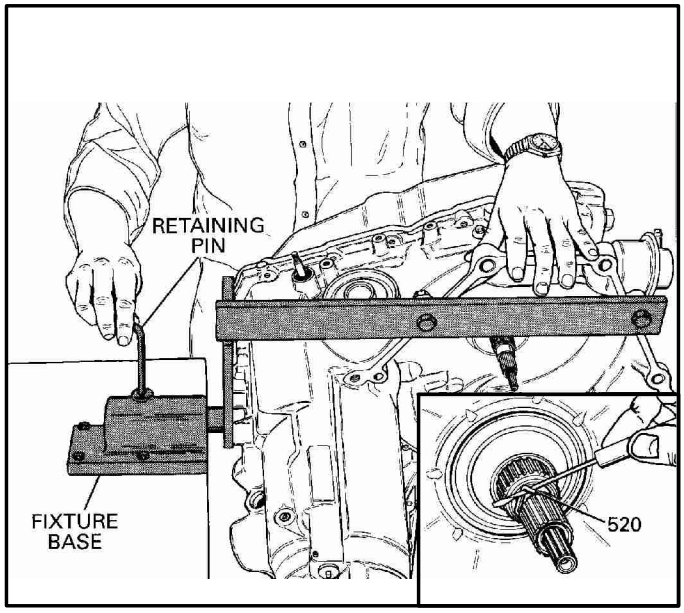


Figure 34

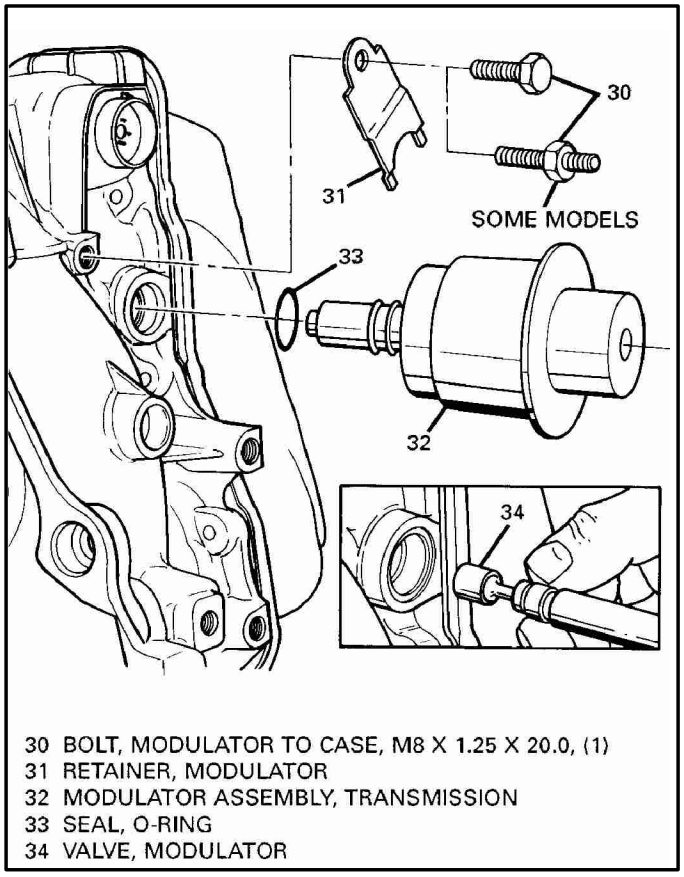


Figure 35

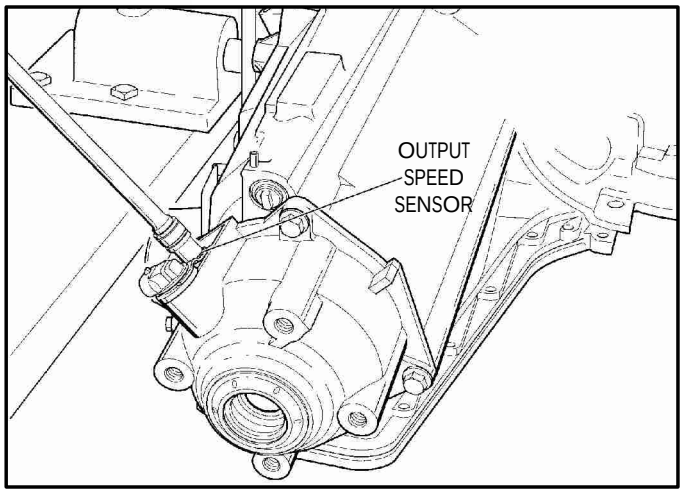


Figure 36

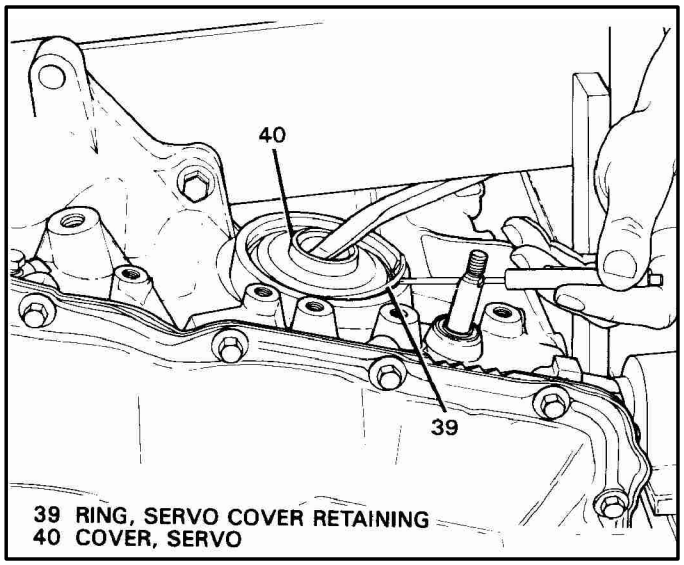


Figure 37

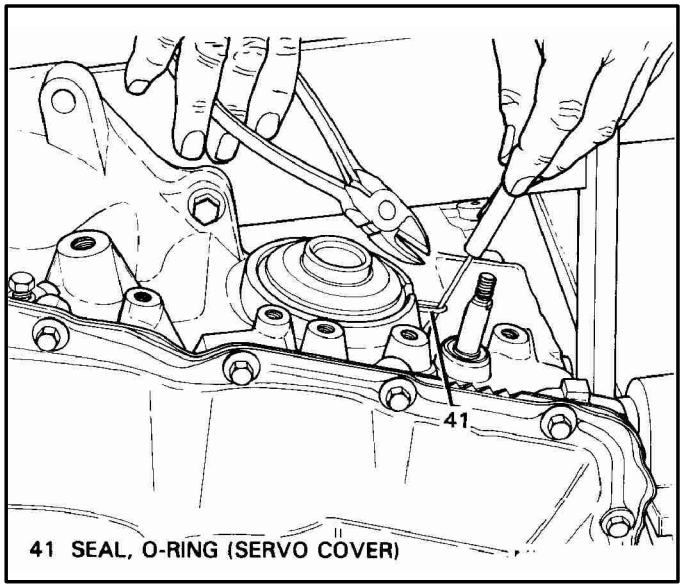


Figure 38

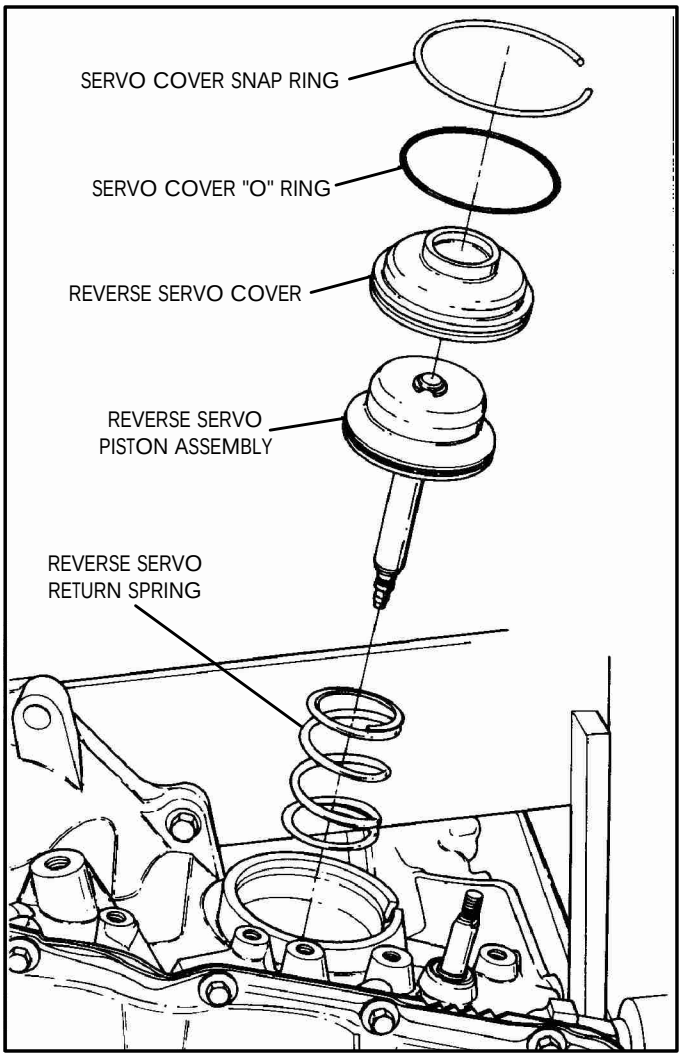


Figure 39

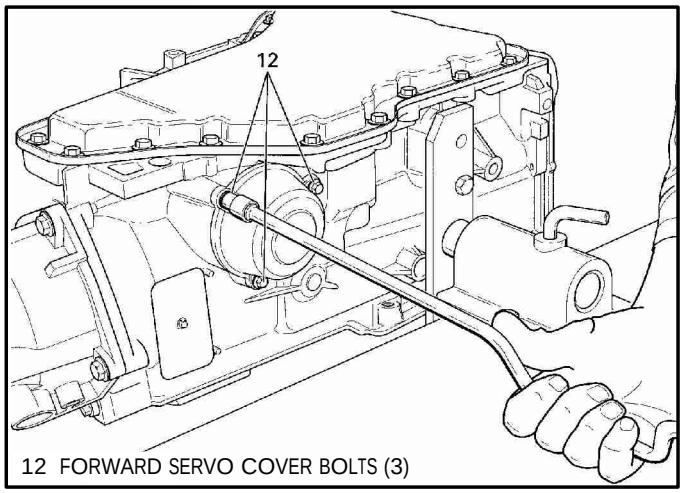


Figure 40

TRANSAXLE DISASSEMBLY (Cont'd)

External Components (Cont'd)

14. Using an 8mm socket attached to the speed handle, loosen the forward servo cover bolts, as shown in Figure 40.
    Note: Loosen only, servo is under pressure.
15. Apply pressure to the servo cover using the snap-ring screwdriver with its end against the edge of bench, as shown in Figure 41.
16. With pressure applied, use your free hand to completely remove the bolts, and slowly relieve the pressure and remove the forward servo assembly (See Figure 41).

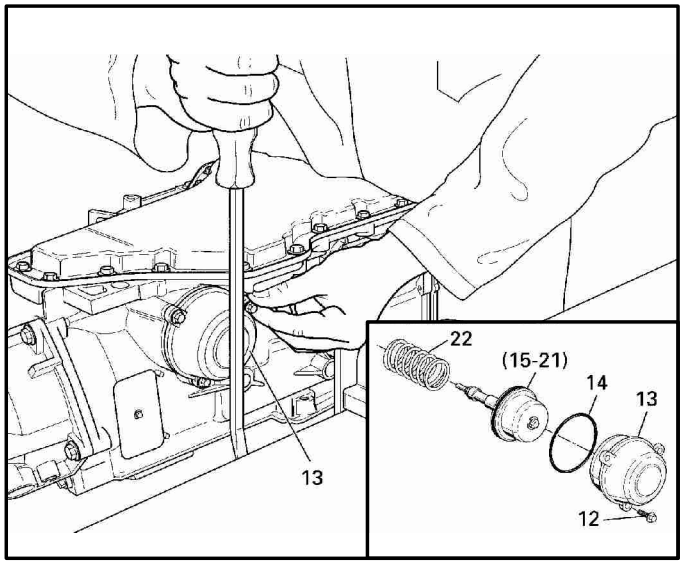
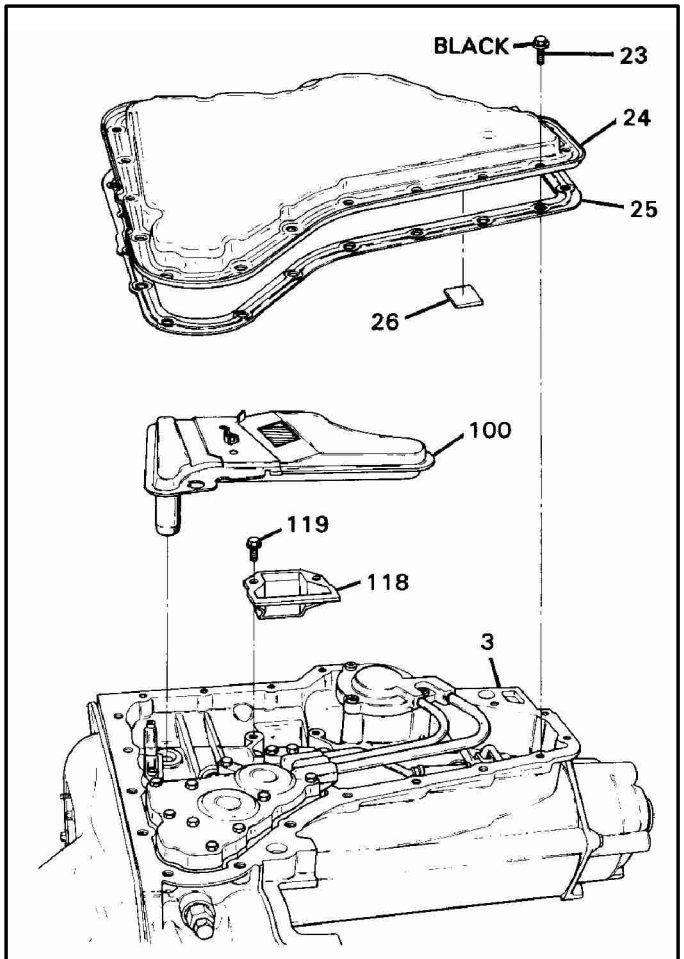


Figure 41



3 CASE, TRANSMISSION
23 BOLT, OIL PAN TO CASE, M8 X 1.25 X 18.0, (20)
24 PAN, TRANSMISSION OIL
25 GASKET, TRANSMISSION OIL PAN
26 MAGNET, CHIP COLLECTOR
100 FILTER ASSEMBLY, TRANSMISSION OIL
118 SCAVENGER, OIL SCOOP (BOTTOM PAN)
119 BOLT, SCAVENGING OIL SCOOP TO CASE, M8 X 1.25 X 20.0, (2)

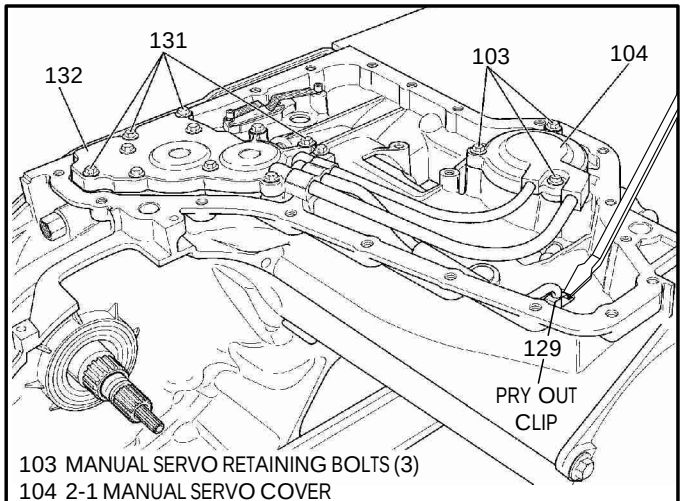
Figure 42

TRANSAXLE DISASSEMBLY (Cont'd)

Bottom Pan Components

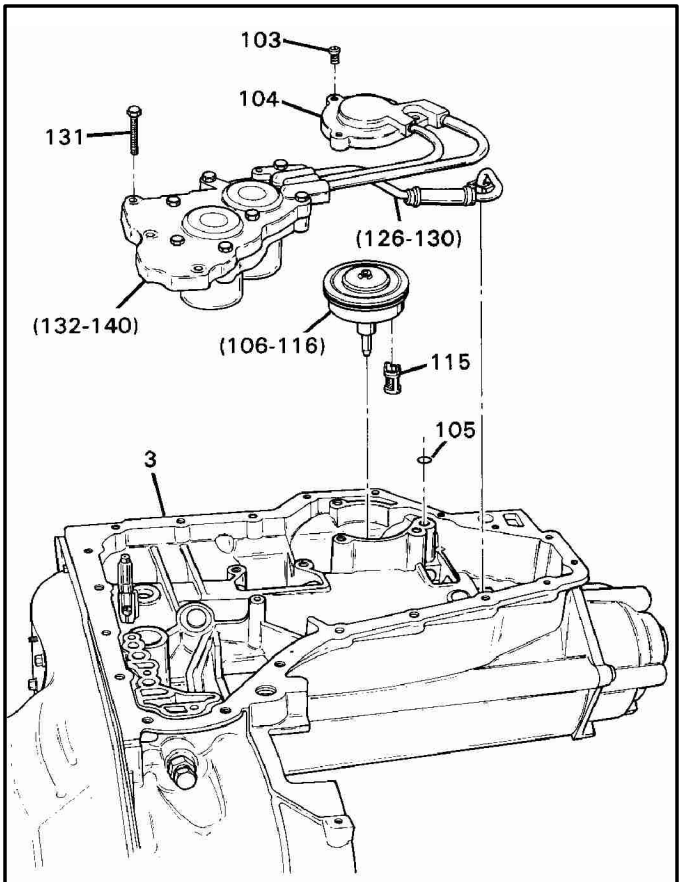
1. Remove the 20 bottom pan bolts and remove bottom pan, as shown in Figure 42.
2. Remove and discard bottom pan gasket, as shown in Figure 42.
3. Remove and discard the bottom pan filter, as shown in Figure 42.
4. Remove the oil scoop scavenger using a 13mm socket on speed handle (See Figure 42).
5. Remove only the four accumulator assembly bolts that are shown in Figure 43, item 131.
6. Remove the three 2-1 manual servo cover bolts as shown in Figure 43.
7. Pry out the final drive lube pipe retaining clip, as shown in Figure 43.
8. Remove the complete accumulator housing, feed pipes and 2-1 manual servo cover as an assembly, as shown in Figure 44, and set aside for component rebuild.
9. Remove the 2-1 manual servo assembly, as shown in Figure 44, and set aside for the component rebuild process.
10. Remove and discard the lathe-cut forward servo seal, as shown in Figure 44.

Continued on Page 32.



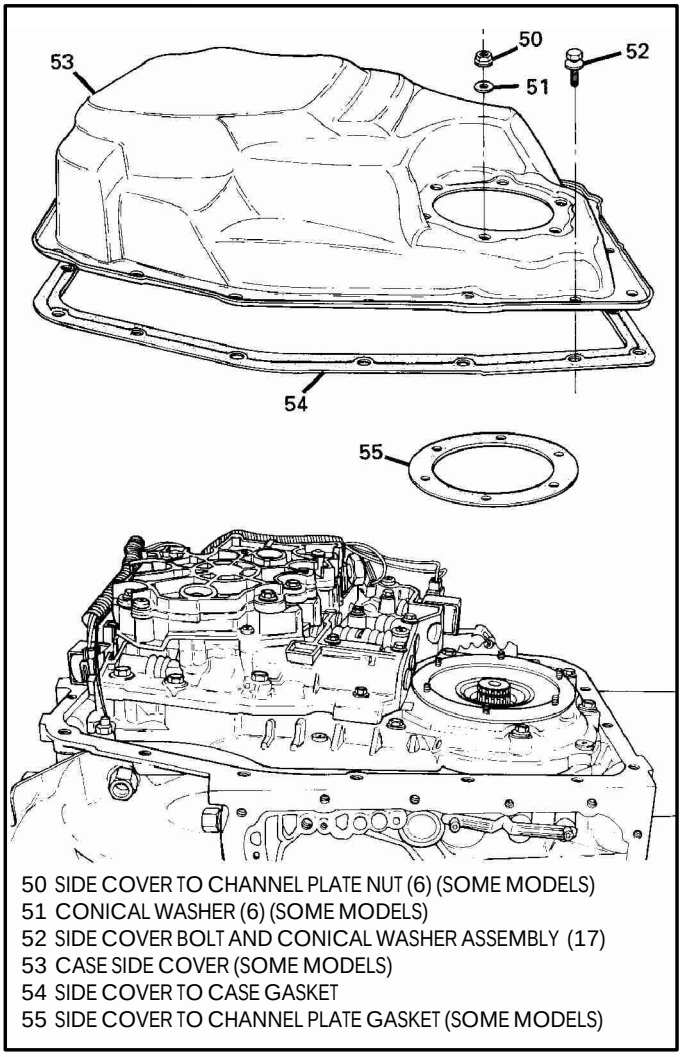
103 MANUAL SERVO RETAINING BOLTS (3)
104 2-1 MANUAL SERVO COVER
129 FINAL DRIVE LUBE PIPE RETAINING CLIP
131 ACCUMULATOR RETAINING BOLTS (4)
132 ACCUMULATOR ASSEMBLY

Figure 43



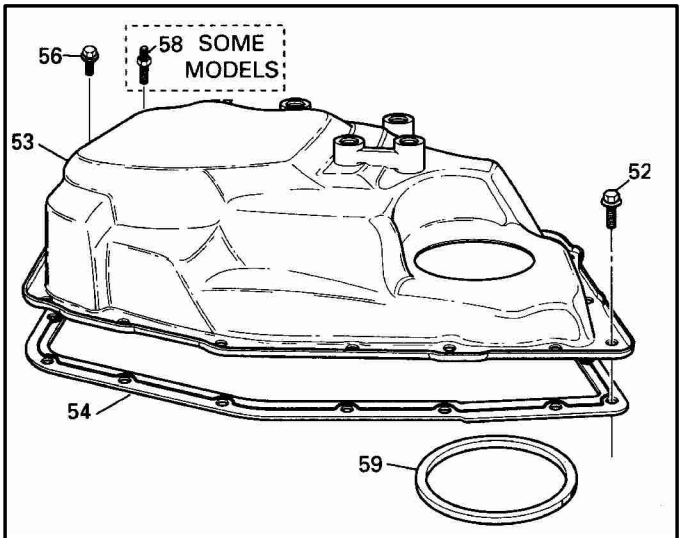
3 CASE, TRANSMISSION
103 BOLT, 2-1 SERVO COVER TO CASE, M8 X 1.25 X 25.0, (3)
104 COVER, 2/1 MANUAL SERVO BODY
105 SEAL, SQUARE CUT (2/1 SERVO)
106 CLIP, RETAINING (BOTTOM)
107 SEAL, LIP
108 PISTON, 2/1 MANUAL SERVO
109 SPRING, 2/1 MANUAL SERVO CUSHION
110 RETAINER, INT. SERVO SPRING MANUAL CUSHION
111 PIN, 2/1 MANUAL APPLY
112 SPRING, 2/1 MANUAL SERVO RETURN
113 SEAL, O-RING
114 BODY, 2/1 MANUAL SERVO
115 FILTER, 2/1 SERVO
116 CLIP, RETAINING (TOP)
126 PIPE, LUBE OIL
127 CLAMP, HOSE
128 HOSE, LUBE OIL
129 RETAINER, LUBE PIPE CLIP
130 PIPE AND WASHER ASSEMBLY
131 BOLT, ACCUMULATOR COVER TO CASE AND ACCUMULATOR HOUSING, M6 X 1.0 X 28.0, (11)
132 COVER, ACCUMULATOR
133 GASKET, ACCUMULATOR COVER
134 PLATE, ACCUMULATOR SPACER
135 PIN, 2-3 ACCUMULATOR
136 PISTON, 1-2 AND 2-3 ACCUMULATOR
137 RING, OIL SEAL ACCUMULATOR PISTON
138A SPRING, 2-3 ACCUMULATOR (INNER)
138B SPRING, 2-3 ACCUMULATOR (OUTER)
139 SPRING, 1-2 ACCUMULATOR
140 HOUSING, ACCUMULATOR (MACHINED)

Figure 44



50 SIDE COVER TO CHANNEL PLATE NUT (6) (SOME MODELS)
51 CONICAL WASHER (6) (SOME MODELS)
52 SIDE COVER BOLT AND CONICAL WASHER ASSEMBLY (17)
53 CASE SIDE COVER (SOME MODELS)
54 SIDE COVER TO CASE GASKET
55 SIDE COVER TO CHANNEL PLATE GASKET (SOME MODELS)

Figure 45



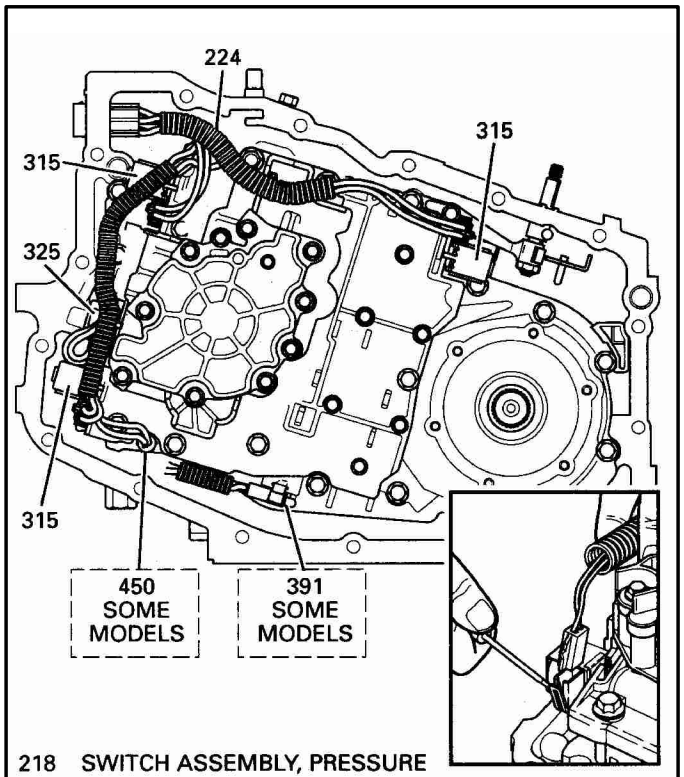
53 STRUCTURAL CASE SIDE COVER (SOME MODELS)
54 SIDE COVER TO CASE GASKET
58 SIDE COVER TO CASE STUD (SOME MODELS)
59 SIDE COVER TO CHANNEL PLATE GASKET (SOME MODELS)

Figure 46

TRANSAXLE DISASSEMBLY (Cont'd)

Internal Components

11. Rotate the transaxle so that the side cover is facing up, as shown in Figure 45.
12. Remove the 6 nuts and conical washers from side cover, if equipped (See Figure 45).
13. Remove the 17 side cover to case retaining bolts, as shown in Figure 45.
    Special Note: Some models are equipped with a stamped steel side cover with retaining nuts and conical washers, as shown in Figure 45. Other models are equipped with structural (cast aluminum) side covers that do not use the retaining nuts and conical washers, as shown in Figure 46.
14. Remove and discard the side cover to case and side cover to channel plate gaskets, as shown in Figures 45 and 46.
15. Remove the internal wiring harness using a small screwdriver to remove connectors from solenoids, as shown in Figure 47.
    Note: Notice that different models have the temperature sensor in different locations.



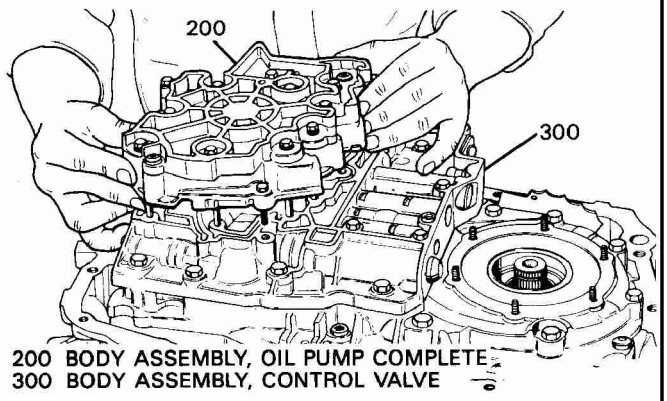
218 SWITCH ASSEMBLY, PRESSURE
224 HARNESS ASSEMBLY, WIRING
315 SOLENOID ASSEMBLY
391 SENSOR, TEMPERATURE (VALVE BODY)
450 SENSOR, TEMPERATURE (CHANNEL PLATE)

Figure 47

Internal Components (Cont'd)

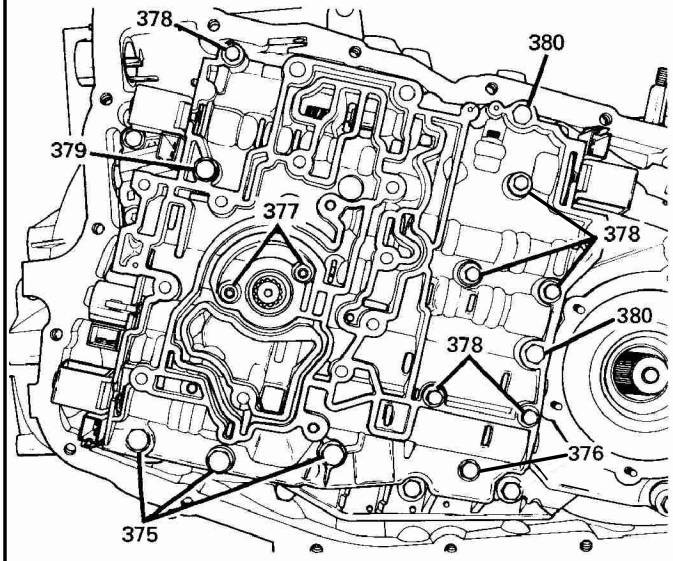
16. Remove the oil pump retaining bolts that are indicated in Figure 48.
17. Remove the oil pump assembly from transaxle, as shown in Figure 49, and set aside for the component rebuild process.
18. Remove the valve body retaining bolts that are indicated in Figure 50.

Continued on Page 34.



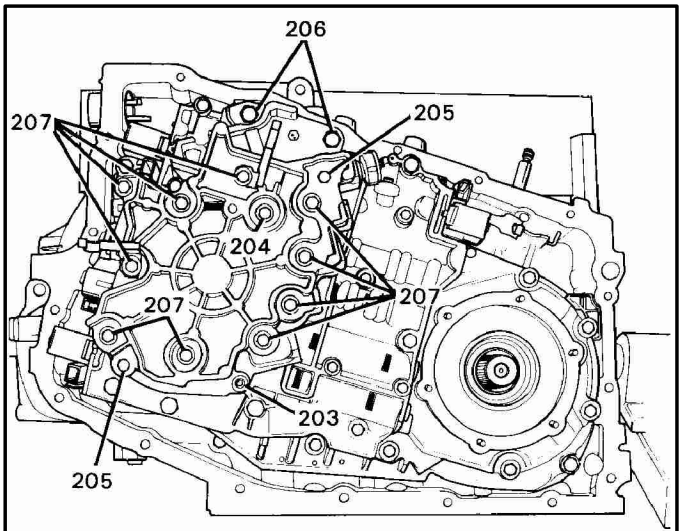
200 BODY ASSEMBLY, OIL PUMP COMPLETE
300 BODY ASSEMBLY, CONTROL VALVE

Figure 49



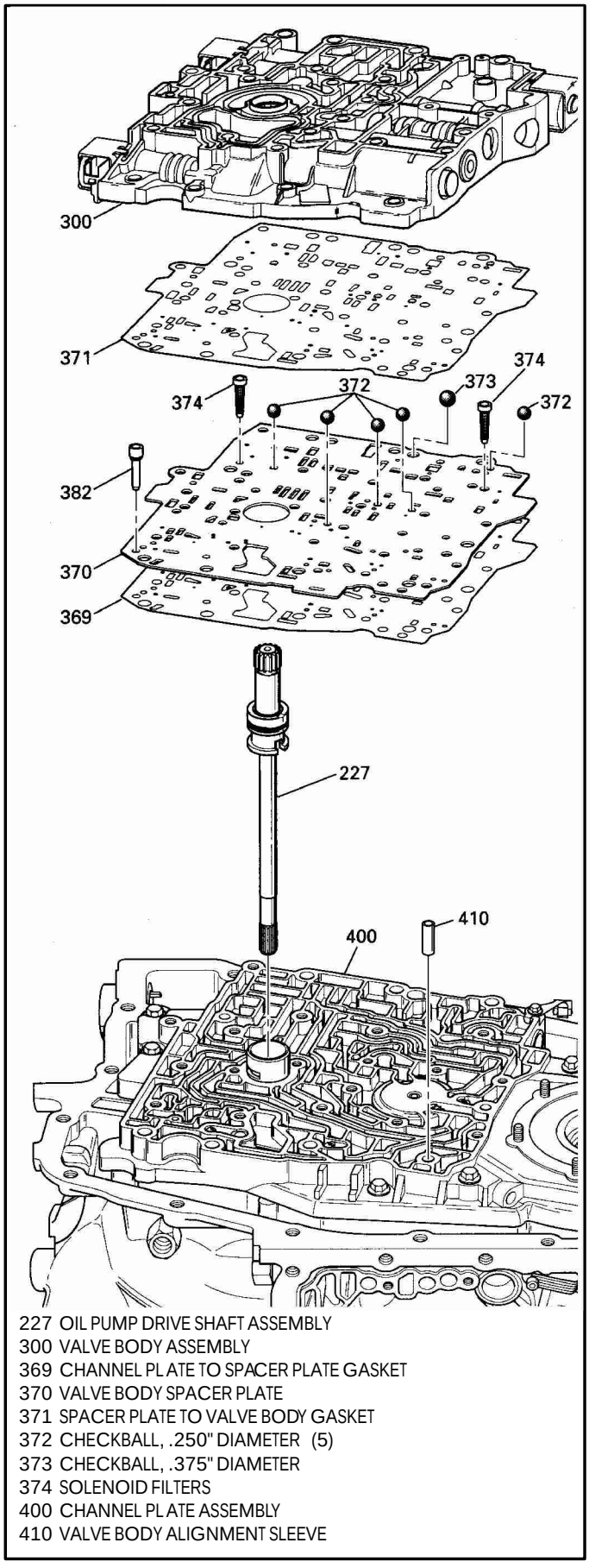
375 BOLT, VALVE BODY TO CASE, M8 X 1.25 X 70.0, (3)
376 BOLT, VALVE BODY TO CHANNEL PLATE, M6 X 1.0 X 35.0, (1)
377 BOLT, VALVE BODY TO CHANNEL PLATE (TORX HEAD), M6 X 1.0 X 45.0, (2)
378 BOLT, VALVE BODY TO CHANNEL PLATE, M6 X 1.0 X 55.0, (6)
379 BOLT, VALVE BODY TO CASE, M8 X 1.25 X 85.0, (1)
380 BOLT, VALVE BODY TO DRIVEN SPROCKET SUPPORT, M8 X 1.25 X 90.0, (1)

Figure 50



203 BOLT, PUMP BODY TO VALVE BODY, M8 X 1.25 X 30.0, (1)
204 BOLT, PUMP COVER TO VALVE BODY, M6 X 1.0 X 45.0, (1)
205 BOLT, PUMP COVER TO VALVE BODY, M8 X 1.25 X 20.0, (2)
206 BOLT, PUMP BODY TO CASE, M8 X 1.25 X 95.0, (2)
207 BOLT, PUMP COVER TO CHANNEL PLATE, M6 X 1.0 X 85.0, (10)

Figure 48



227 OIL PUMP DRIVE SHAFT ASSEMBLY
300 VALVE BODY ASSEMBLY
369 CHANNEL PLATE TO SPACER PLATE GASKET
370 VALVE BODY SPACER PLATE
371 SPACER PLATE TO VALVE BODY GASKET
372 CHECKBALL, .250" DIAMETER (5)
373 CHECKBALL, .375" DIAMETER
374 SOLENOID FILTERS
400 CHANNEL PLATE ASSEMBLY
410 VALVE BODY ALIGNMENT SLEEVE

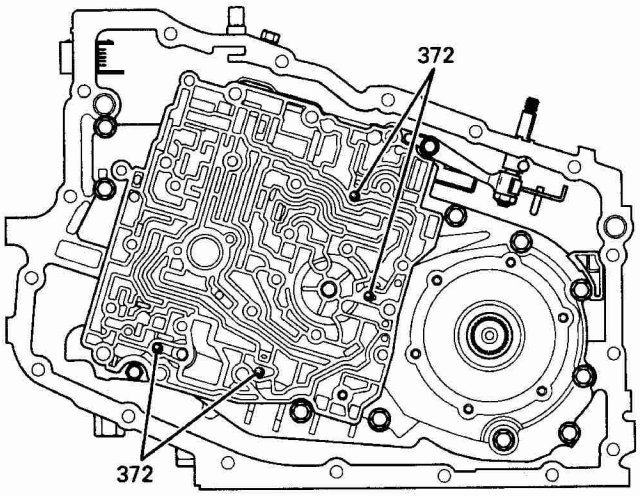
Figure 51

TRANSAXLE DISASSEMBLY (Cont'd)

Internal Components (Cont'd)

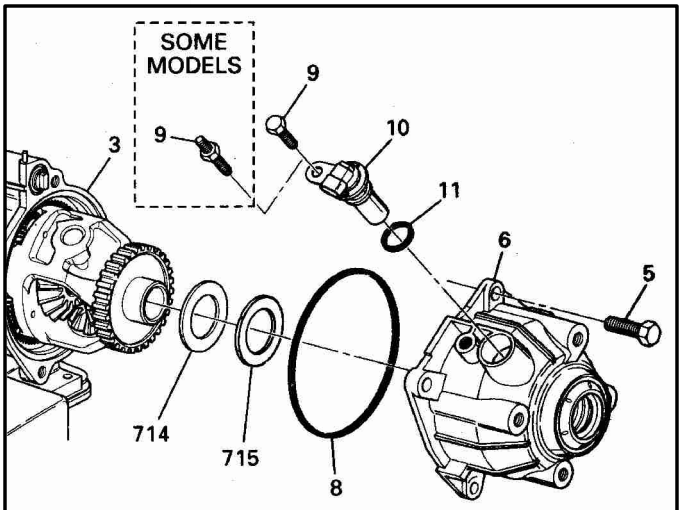
19. Remove the valve body assembly, as shown in Figure 51, and set aside for component rebuild.
20. Remove the checkballs and the valve body spacer plate, as shown in Figure 51.
21. Remove and discard the valve body gaskets, as shown in Figure 51.
22. Remove the valve body alignment sleeve from the channel plate, as shown in Figure 51.
23. Remove the oil pump drive shaft, as shown in Figure 51, remove and discard the sealing ring from pump drive shaft.
24. Remove the checkballs from the channel plate, as shown in Figure 52.
25. Rotate transaxle to position shown in Figure 53 and remove the four extension housing bolts and remove extension housing.
26. Remove and discard the extension housing to case "O" ring seal (See Figure 53)
27. Remove the output shaft retaining clip using tool shown in Figure 54. For a cross-section view, refer to Figure 55.
28. Remove the final drive carrier assembly, as shown in Figure 56, and set aside for the component rebuild section.
29. Remove the parking gear and final drive sun gear shaft, as shown in Figure 56.
30. Again, rotate transaxle so that the channel plate is facing up.

Continued on Page 36.



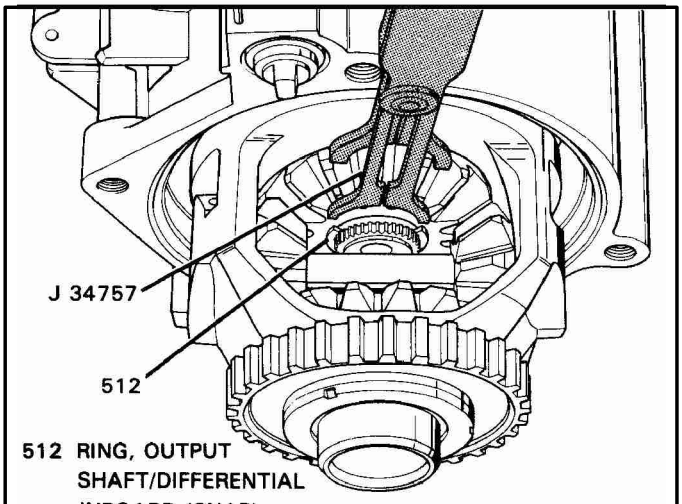
372 CHECKBALLS, .250" DIAMETER

Figure 52



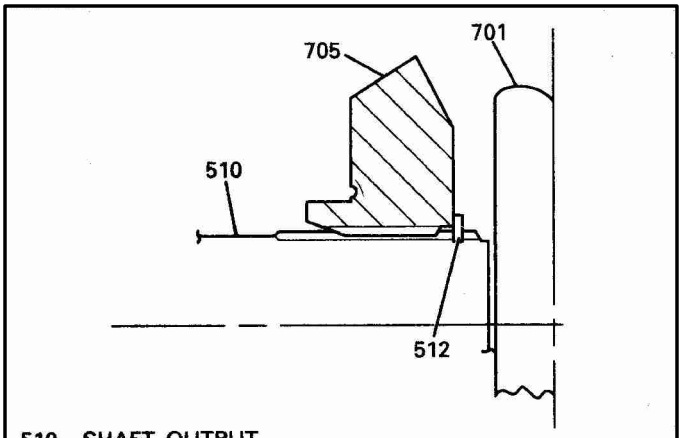
3 CASE, TRANSMISSION
5 BOLT, CASE EXTENSION TO CASE - M10 X 1.5 X 35.0 (4)
6 EXTENSION, CASE
8 SEAL, EXTENSION TO CASE
9 BOLT, SPEED SENSOR RETAINER TO CASE - M8 X 1.25 X 12.0 (1)
10 SPEED SENSOR ASSEMBLY, COMPLETE
11 SEAL, O-RING SPEED SENSOR
714 WASHER, DIFFERENTIAL CARRIER/CASE (THRUST)
715 BEARING ASSEMBLY,THRUST (DIFFERENTIAL CARRIER/CASE)

Figure 53



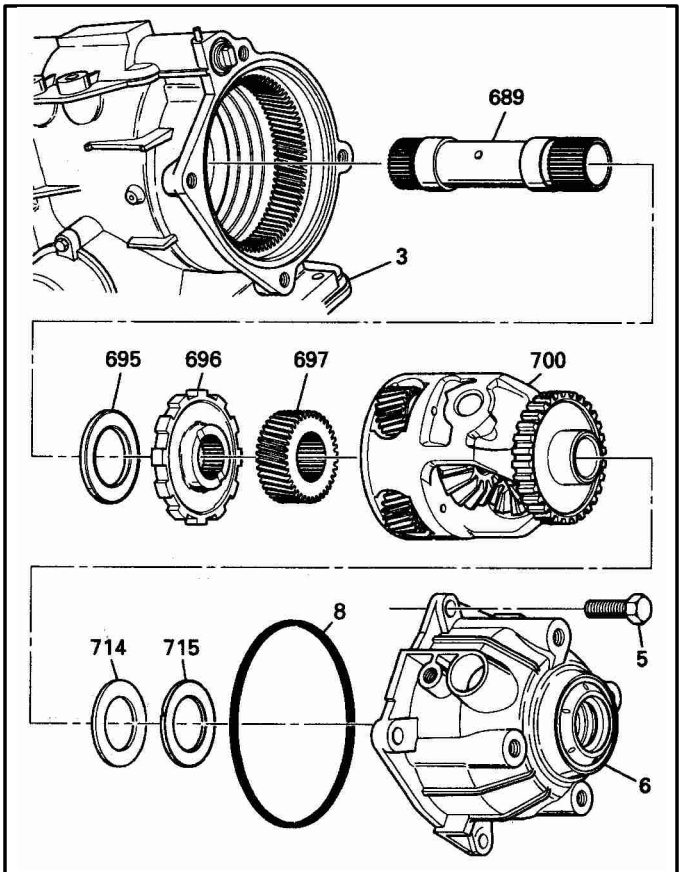
512 RING, OUTPUT SHAFT/DIFFERENTIAL INBOARD (SNAP)

Figure 54



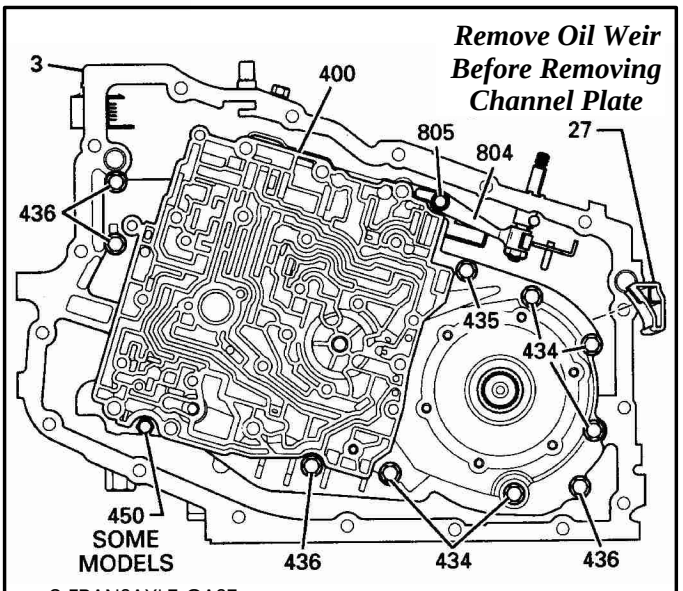
510 SHAFT, OUTPUT
512 RING, OUTPUT SHAFT/DIFFERENTIAL INBOARD (SNAP)
701 SHAFT, DIFFERENTIAL PINION
705 GEAR, DIFFERENTIAL SIDE

Figure 55



3 TRANSAXLE CASE
5 EXTENSION HOUSING TO CASE BOLT M10 X 1.5 X 35 (4)
6 EXTENSION HOUSING ASSEMBLY
8 EXTENSION HOUSING TO CASE SEAL
689 FINAL DRIVE SUN GEAR SHAFT
695 RING GEAR TO PARK GEAR THRUST BEARING
696 PARKING GEAR
697 FINAL DRIVE SUN GEAR
700 FINAL DRIVE CARRIER ASSEMBLY
714 FINAL DRIVE THRUST WASHER (SELECTIVE)
715 FINAL DRIVE TO CASE THRUST BEARING

Figure 56



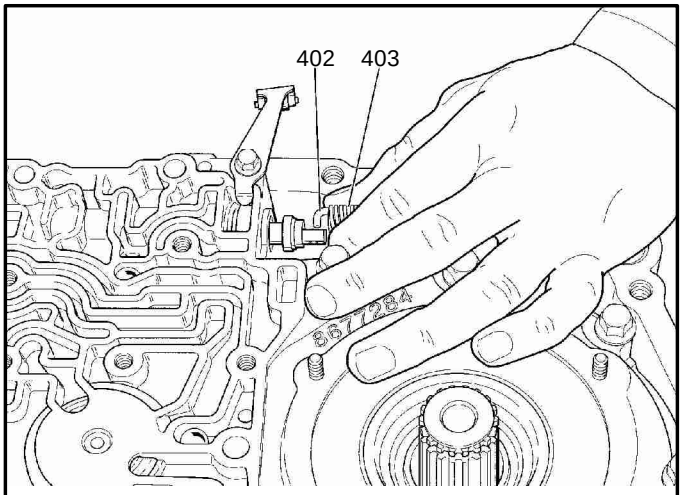
3 TRANSAXLE CASE
27 SIDE COVER RESERVOIR OIL WEIR
400 CHANNEL PLATE ASSEMBLY
434 CHANNEL PLATE TO CASE BOLT M8 X 1.25 X 45 (5)
435 CHANNEL PLATE TO CASE BOLT M8 X 1.25 X 50 (1)
436 CHANNEL PLATE TO CASE BOLT M8 X 1.25 X 30 (4)
450 TEMP SENSOR (SOME MODELS)
804 MANUAL DETENT SPRING AND ROLLER
805 MANUAL DETENT SPRING BOLT M6 X 1.0 X 16 (1)

Figure 57

TRANSAXLE DISASSEMBLY (Cont'd)

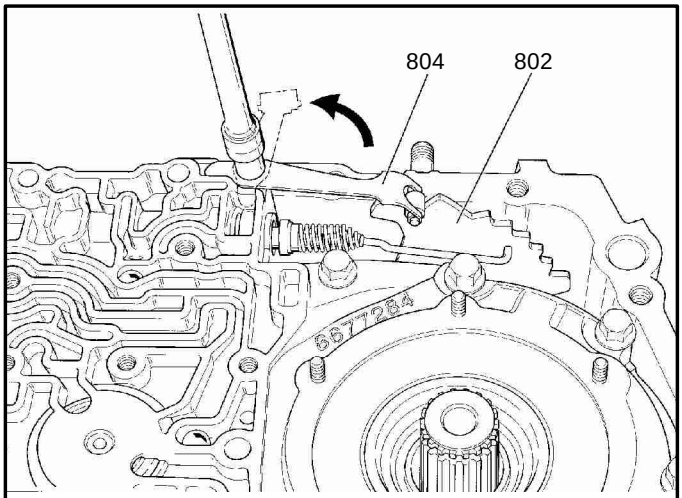
Internal Components (Cont'd)

31. Remove the side cover reservoir oil weir from case, as shown in Figure 57.
32. Loosen the manual detent spring retaining bolt and swing manual detent spring and roller, as shown in Figure 58.
33. Unhook the manual valve link by pulling back on the link retainer with your fingers and then unhooking the link, as shown in Figure 59.
34. Remove the remaining channel plate to case retaining bolts, shown in Figure 57, and lift off the channel plate while ensuring manual valve is held in place, as shown in Figure 60.



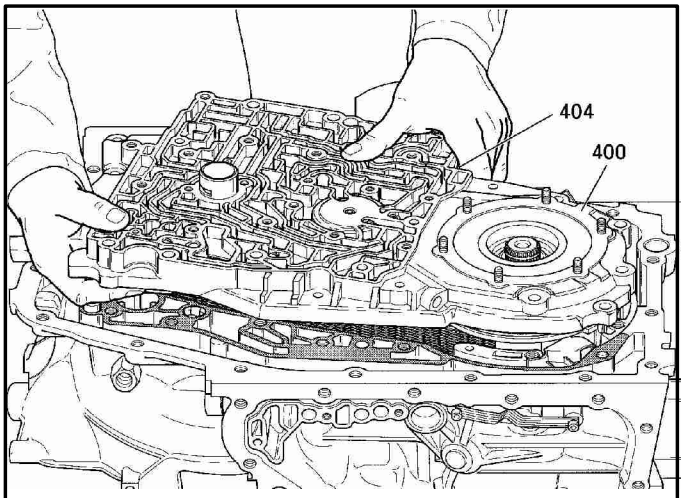
402 MANUAL VALVE LINK
403 MANUAL VALVE LINK RETAINER

Figure 59



802 INSIDE MANUAL DETENT LEVER
804 INSIDE DETENT LEVER SPRING AND ROLLER

Figure 58



400 CHANNEL PLATE ASSEMBLY
404 MANUAL VALVE

Figure 60

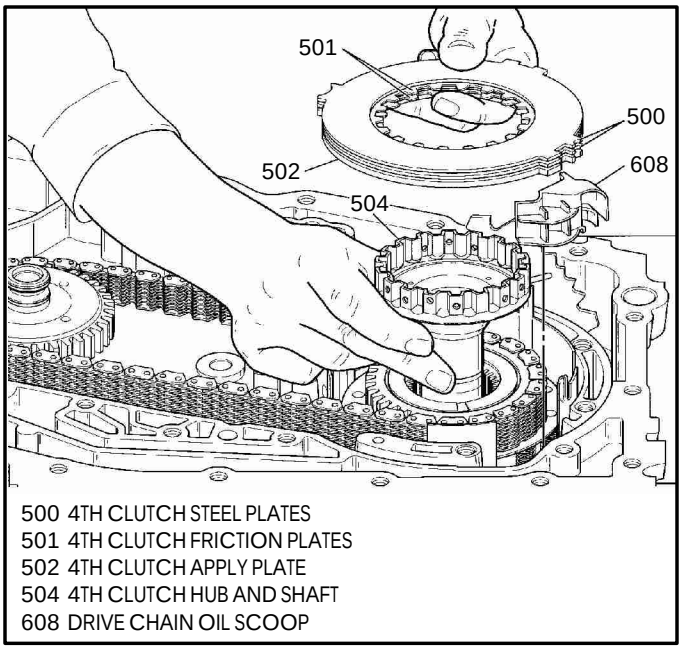
TRANSAXLE DISASSEMBLY (Cont'd)

Internal Components (Cont'd)

35. Set the channel plate assembly aside for the component rebuild section. Exploded view of channel plate components shown in Figure 61.
36. Remove and discard the channel plate to case gaskets (See Figures 60 and 61).
37. Remove the 4th clutch plates and apply plate, as shown in Figure 62.
38. Remove the 4th clutch hub and shaft assembly, as shown in Figure 62.
39. Remove the drive chain oil scoop, as shown in Figure 62.
40. Ensure that the turbine shaft "O" ring has been removed, as shown in Figure 63.
41. Remove the drive and driven sprockets and the drive chain as an assembly, by lifting straight up evenly, as shown in Figure 63.

    Note: The blackmaster link should be facing up. If not, reassemble drive chain the same way as found so that set wear pattern remains the same to reduce noise concerns.

Continued on Page 38.



500 4TH CLUTCH STEEL PLATES
501 4TH CLUTCH FRICTION PLATES
502 4TH CLUTCH APPLY PLATE
504 4TH CLUTCH HUB AND SHAFT
608 DRIVE CHAIN OIL SCOOP

Figure 62

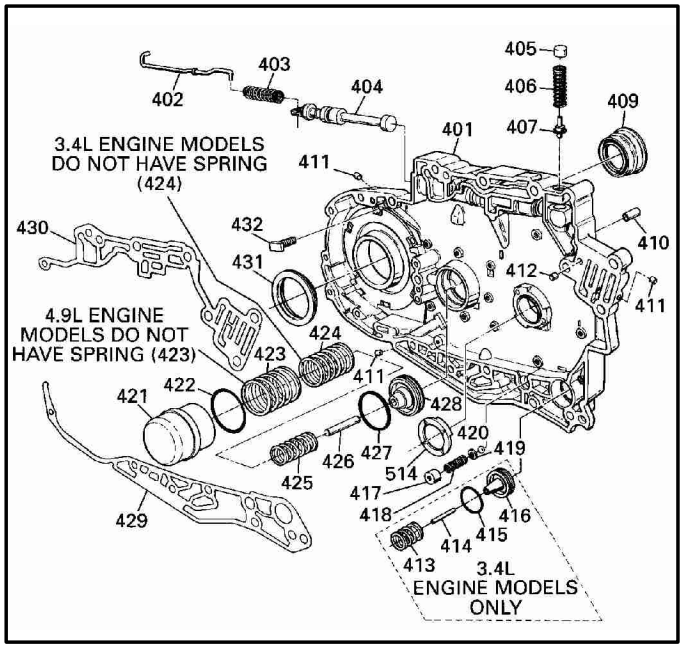
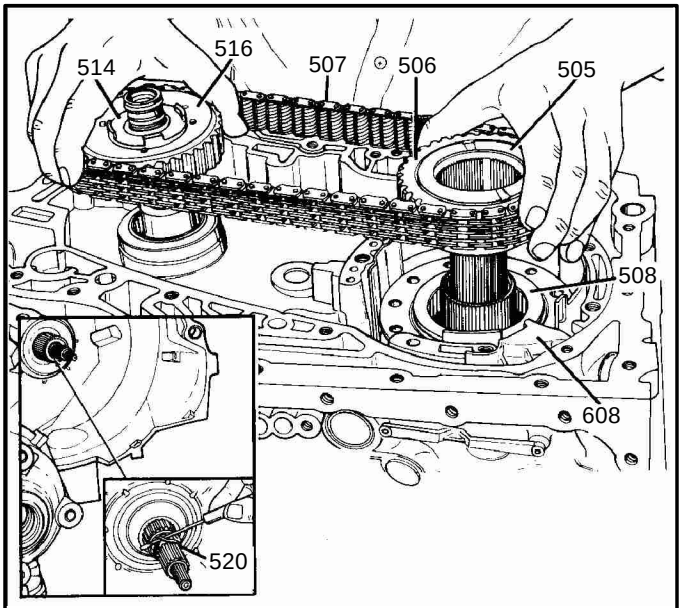


Figure 61



505 4TH CLUTCH HUB TO DRIVEN SPROCKET THRUST WASHER
506 DRIVEN SPROCKET
507 DRIVE CHAIN ASSEMBLY
508 DRIVEN SPROCKET TO 2ND CLUTCH DRUM THRUST WASHER
514 DRIVE SPROCKET TO CHANNEL PL ATE THRUST WASHER
516 DRIVE SPROCKET
520 TURBINE SHAFT "O" RING
608 DRIVE CHAIN OIL SCOOP

Figure 63

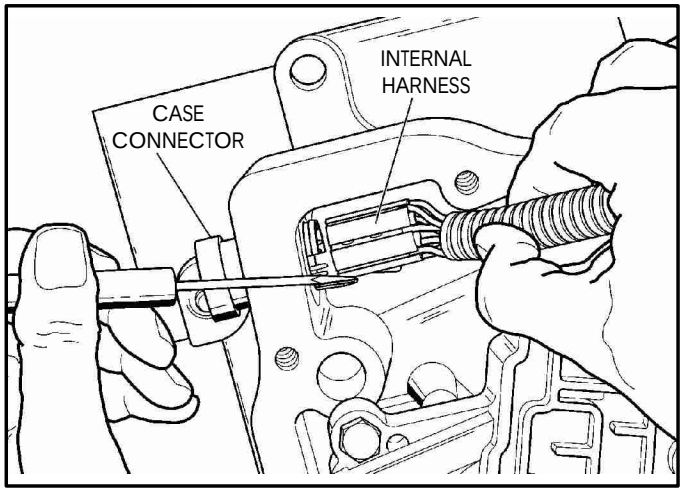


Figure 64

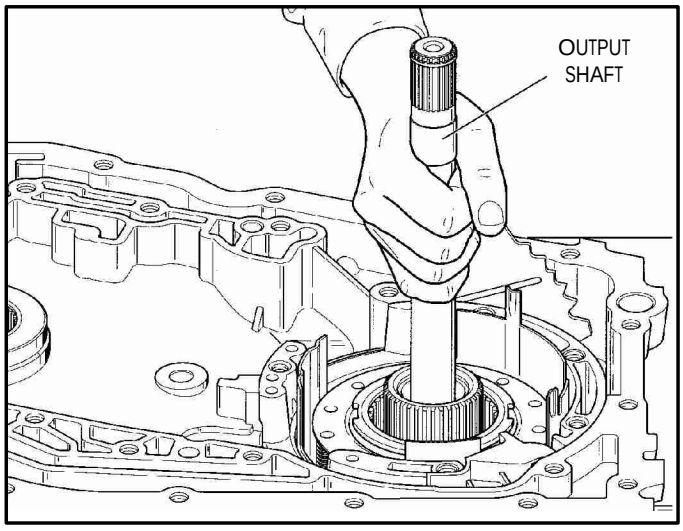


Figure 65

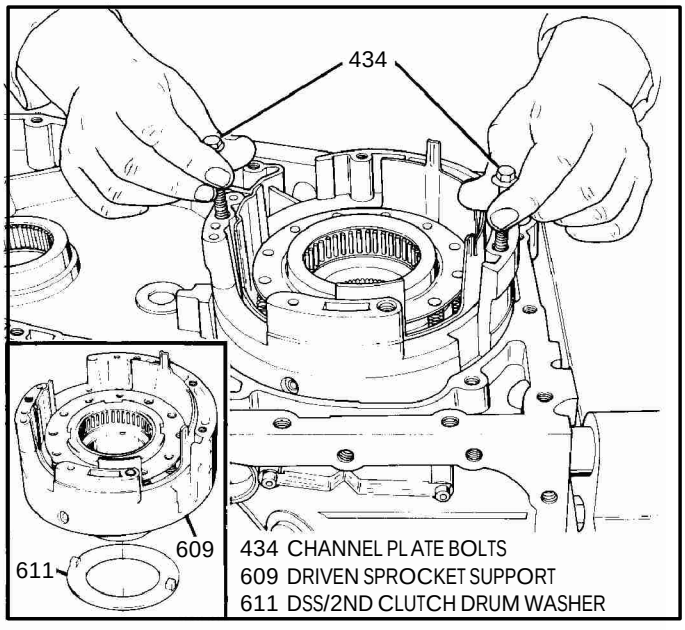


Figure 66

TRANSAXLE DISASSEMBLY (Cont'd)

Internal Components (Cont'd)

42. If it has not already been done, remove internal wire harness from case connector at this time, as shown in Figure 64.
43. Remove the output shaft assembly, as shown in Figure 65.
44. Using two of the channel plate bolts or two of the pump bolts, remove the driven sprocket support, as shown in Figure 66.
45. Install removal tool J-33381 into input housing as shown in Figure 68, and remove the input housing, 2nd clutch drum, both sprags and the input sun gear as an assembly.
46. Set all of these assemblies aside for component rebuild section in this manual.
47. If the reverse band is still in the transaxle case, remove it at this time as shown in Figure 67.
48. Remove the reverse reaction drum, as shown in Figure 69.
49. Remove the front planetary carrier, as shown in Figure 70.
50. Remove the rear planetary carrier and thrust bearing, as shown in Figure 71.

Continued on Page 40.

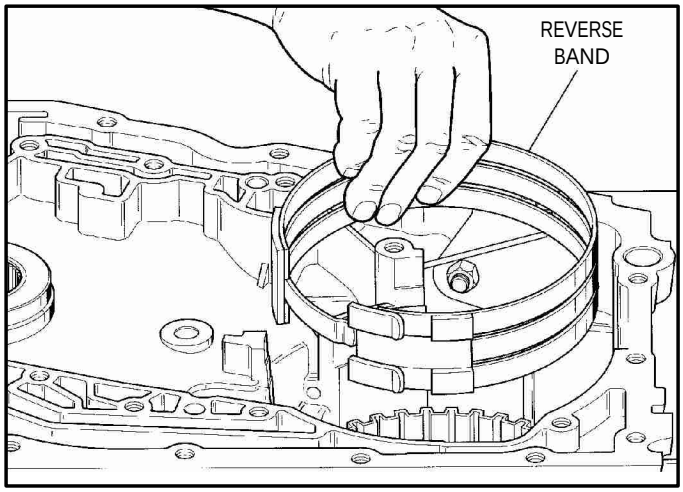
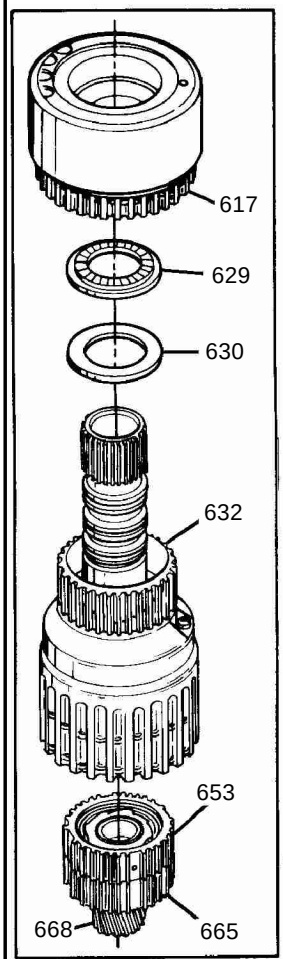
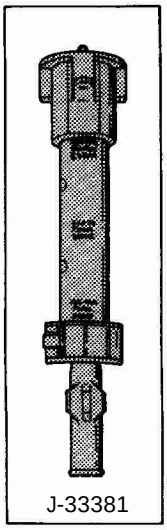
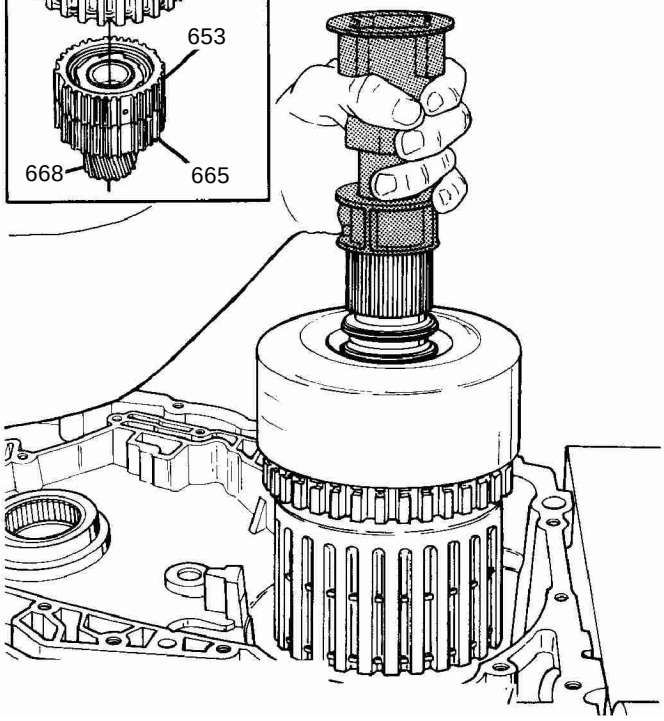


Figure 67







617 2ND CLUTCH HOUSING ASSEMBLY
629 SPROCKET SUPPORT TO INPUT HOUSING THRUST BEARING
630 THRUST BEARING TO INPUT HOUSING *SELECTIVE* WASHER
632 INPUT HOUSING ASSEMBLY
653 3RD ROLLER CLUTCH ASSEMBLY
665 INPUT SPRAG ASSEMBLY
668 INPUT SUN GEAR

Figure 68

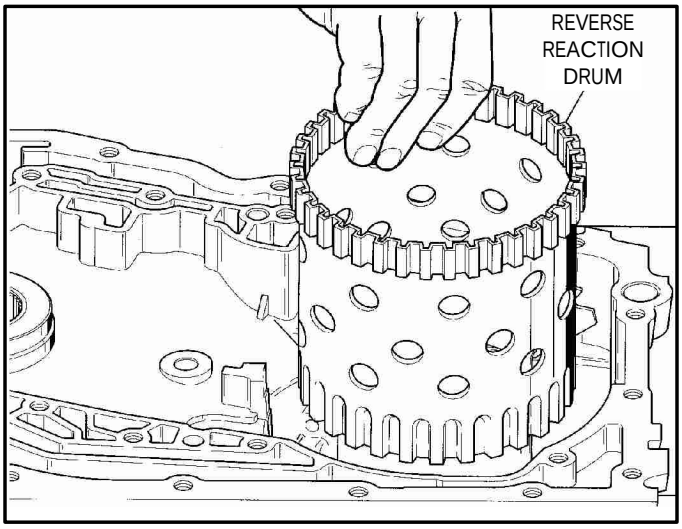


Figure 69

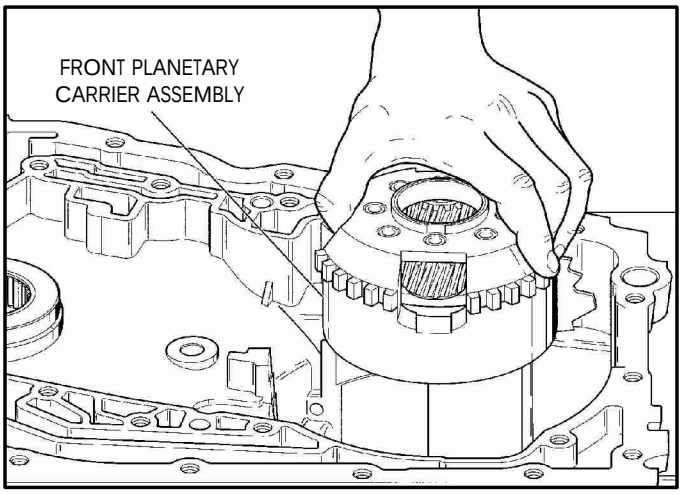
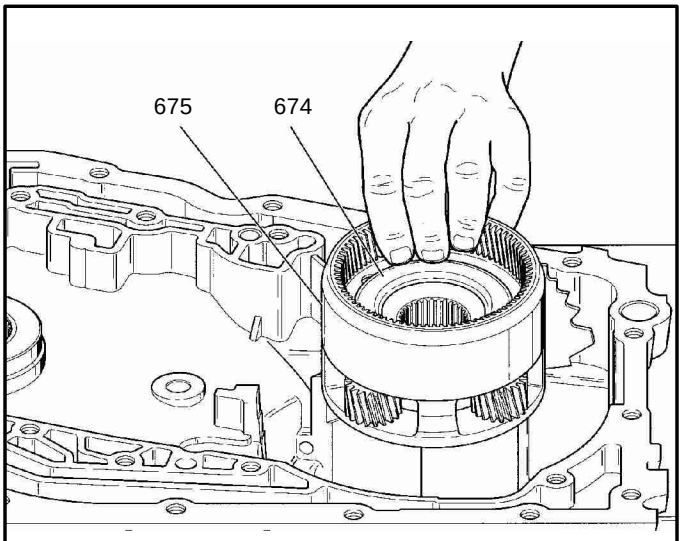
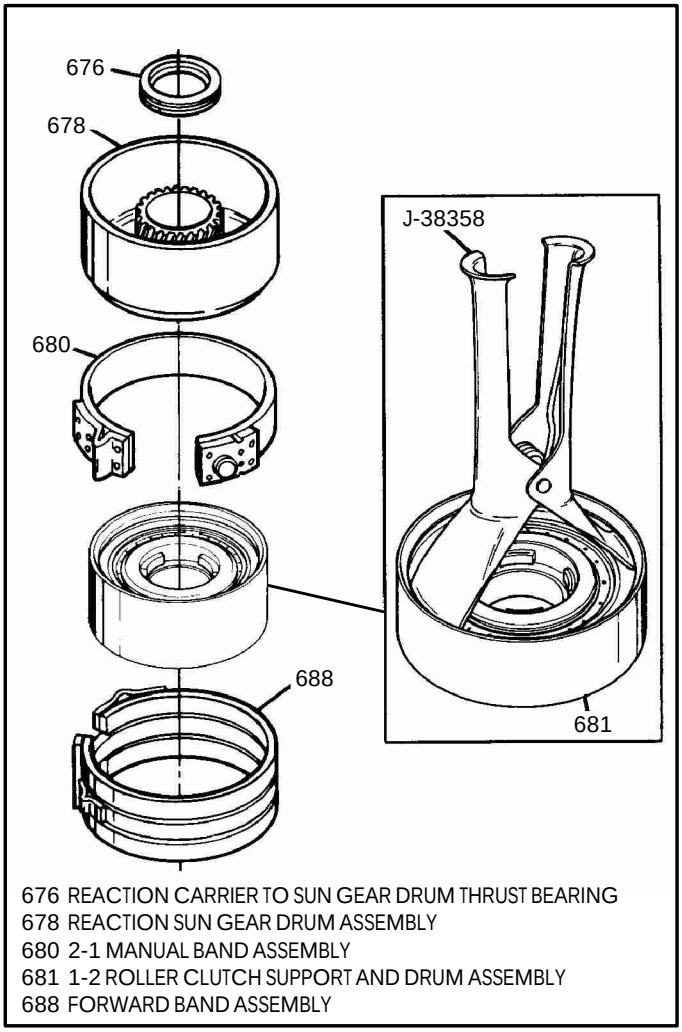


Figure 70



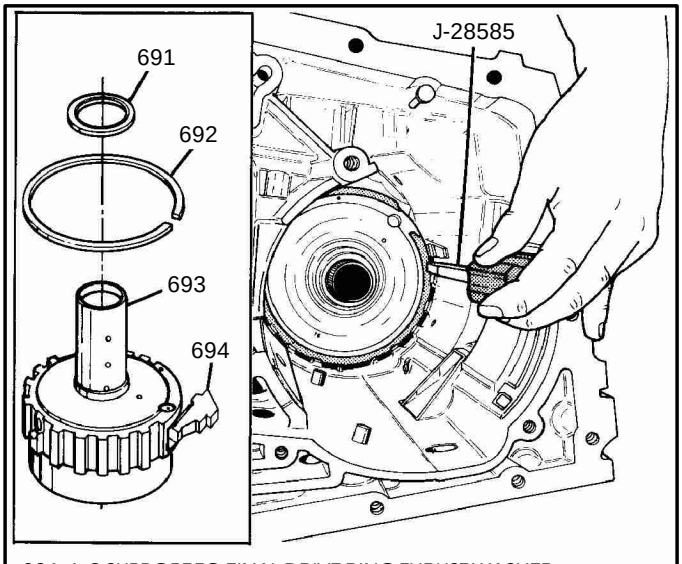
674 REAR PLANETARY TO FRONT PLANETARY THRUST BEARING
675 REAR PLANETARY CARRIER ASSEMBLY

Figure 71



676 REACTION CARRIER TO SUN GEAR DRUM THRUST BEARING
678 REACTION SUN GEAR DRUM ASSEMBLY
680 2-1 MANUAL BAND ASSEMBLY
681 1-2 ROLLER CLUTCH SUPPORT AND DRUM ASSEMBLY
688 FORWARD BAND ASSEMBLY

Figure 72



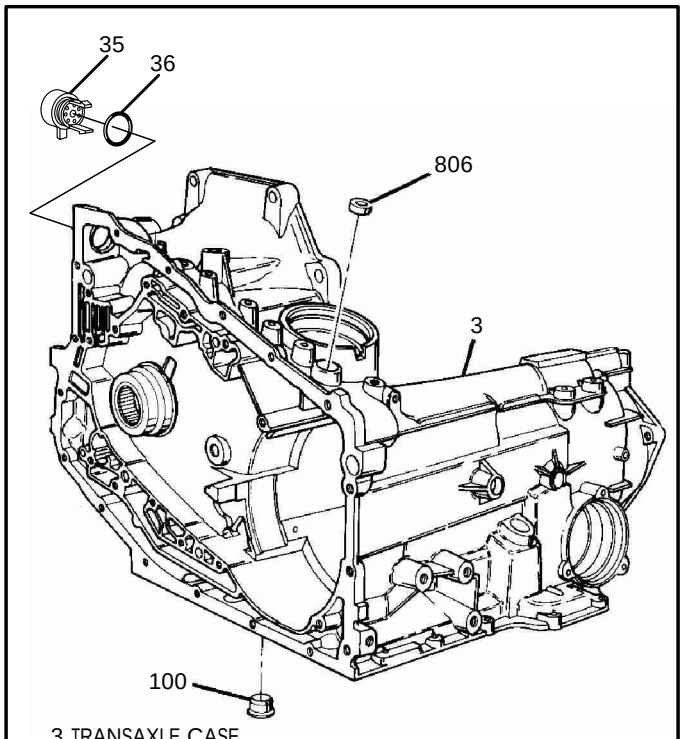
691 1-2 SUPPORT TO FINAL DRIVE RING THRUST WASHER
692 FINAL DRIVE RING GEAR SNAP RING
693 FINAL DRIVE RING GEAR ASSEMBLY
694 PARKING PAWL (PART OF RING GEAR ASSEMBLY)

Figure 73

TRANSAXLE DISASSEMBLY (Cont'd)

Internal Components (Cont'd)

51. Remove the reaction carrier to reaction sun gear drum thrust bearing (See Figure 72).
52. Remove the reaction sun gear drum assembly, as shown in Figure 72.
53. Remove the manual 2-1 band assembly from the case, as shown in Figure 72.
54. Using special tool J-38358, remove the 1-2 roller clutch support and drum assembly, as shown in Figure 72.
55. Remove the forward band assembly from the case, as shown in Figure 72.
56. Using the snap-ring screwdriver, as shown in Figure 73, remove the final drive ring gear snap ring from the case.
57. Remove the final drive ring gear fromthe case by lifting straight up (See Figure 73).
58. The thrust washer shown in Figure 73 may be a thrust bearing. The bearing was replaced by the washer in 1994 models.
59. Remove the case park linkage components using Figure 75 as a guide.



3 TRANSAXLE CASE
35 TRANSAXLE ELECTRICAL CASE CONNECTOR
36 TRANSAXLE CASE CONNECTOR "O" RING
100 BOTTOM PAN OIL FILTER SEAL
806 MANUAL SHAFT OIL SEAL

Figure 74

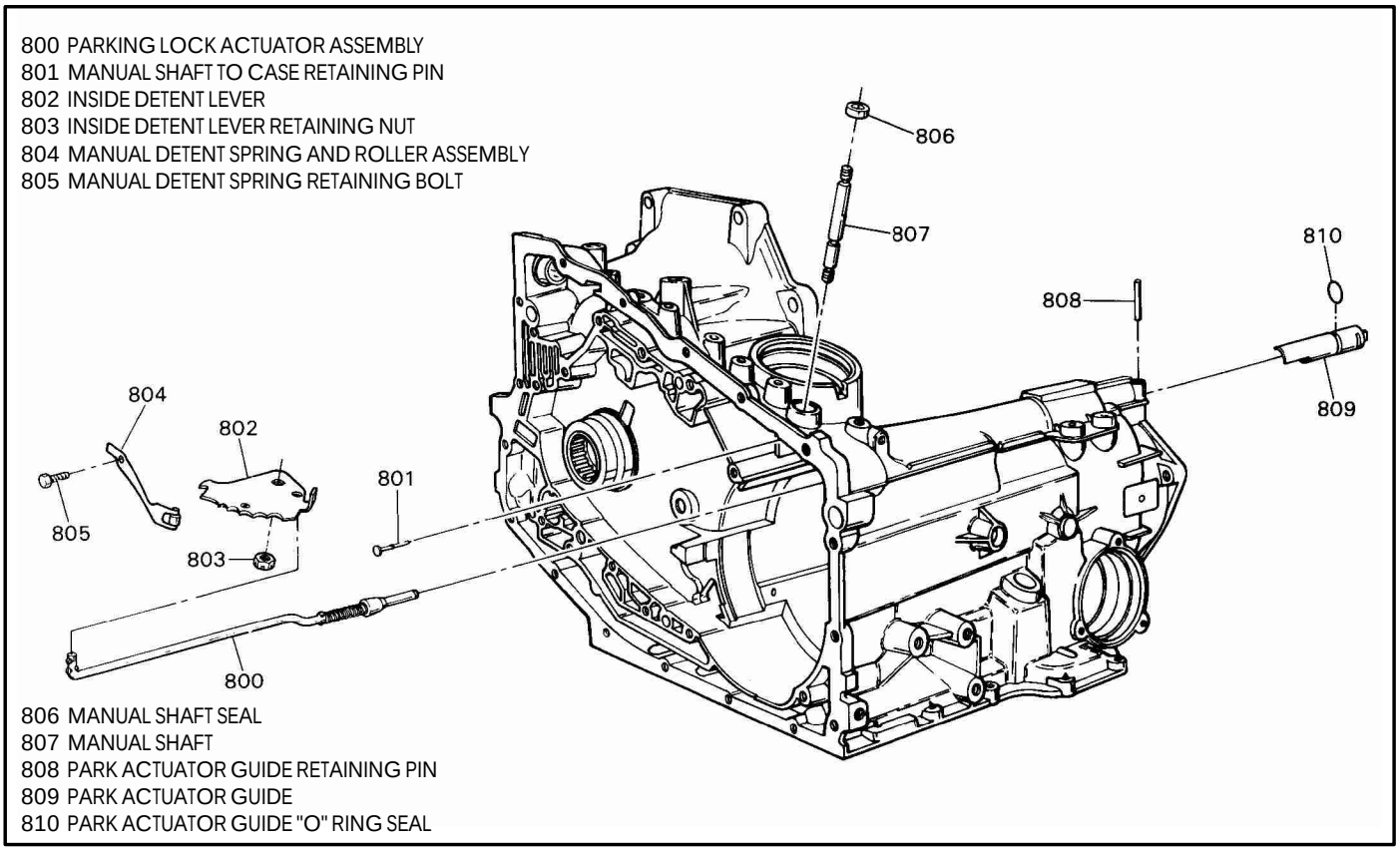


Figure 75

COMPONENT REBUILD SECTION

Transaxle Case Assembly

1. Clean all case parts thoroughly with cleaning solution and dry with compressed air.
2. Inspect all case parts thoroughly for any wear and/or damage.
3. Install new "O" ring seal onto transaxle case connector, as shown in Figure 74, and lube with small amount of Trans-Jel®
4. Install case connector into the transaxle case until it snaps into position (See Figure 74).
5. Install new oil filter seal into the case bore using the proper seal installer (See Figure 74).
6. Install new manual shaft seal and lubricate with small amount of Trans-Jel®, as shown in Figure 74. Use a 15mm deep socket to tap the seal into position in case.
7. Install new "O" ring on park actuator guide, lube with small amount of Trans-Jel®.
8. Install acutator guide into the transaxle case, as shown in Figure 75, align slot for retaining pin.
9. Install actuator guide retaining pin, as shown in Figure 75.
10. Install manual shaft into case and carefully through the manual shaft seal, align the slot for retaining pin, and install the retaining pin, as shown in Figure 75.
11. Install park lock actuator rod onto the inside detent lever (See Figure 75).
12. Install the assembly into the acuator guide and inside detent lever over the manual shaft, as shown in Figure 75.
13. Install the retaining nut onto the manual shaft and torque nut to 32 N·m (24 ft.lb.).
14. Remove the converter seal from transaxle case using the tools shown in Figure 76.
15. Install a new converter seal using the proper seal driver, as shown in Figure 76.
16. If it becomes necessary to replace the drive sprocket support bearing, use the special tools and procedures in Figure 77.
17. The transaxle case is now ready for the final assembly process.

Component Rebuild Continued on Page 42.

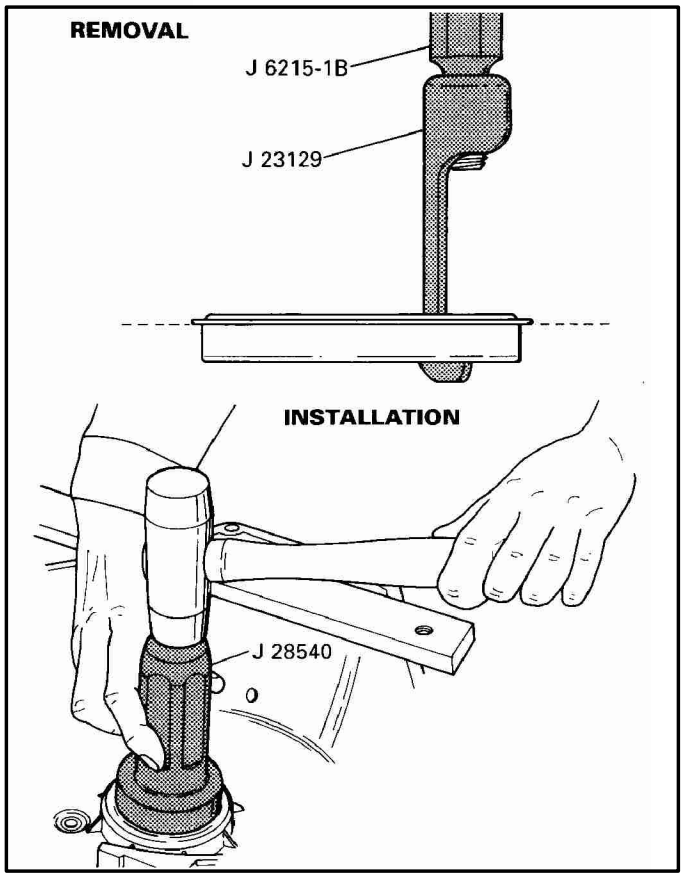


Figure 76

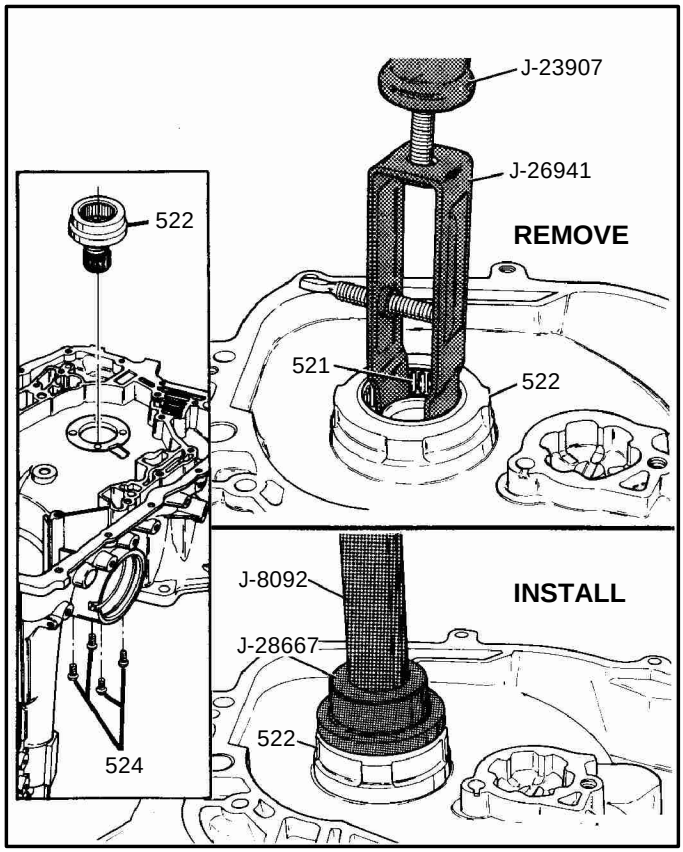


Figure 77

COMPONENT REBUILD (Cont'd)

Final Drive Assembly

1. Place the final drive carrier into a clean oil pan to ensure that no needle roller bearings are lost.
2. Remove the final drive carrier spiral snap ring as shown in Figure 78, using small screwdriver.
3. Remove planet pinion pin, pinion gear, pinion needle roller bearings, thrust washers and the spacer, as shown in Figures 79 and 80.
   Note: Ensure that planet pinion is re-installed the same direction as removed. If pinion gear is installed upside down, it may cause noise because of the change in set wear pattern.
4. Remove the sun gear to carrier thrust bearing as shown in Figure 79.
   Note: This thrust bearing is "trapped" in some ratios, and must be re-installed before you install the last pinion gear.
5. Apply Trans-Jel® to the inside of the pinion gear and install spacer on the pinion pin, as shown in Figure 81.
6. Pinion needle bearing spacer must be installed between the two rows of needle roller bearings, as shown in Figure 82.
7. Install needle roller bearings, one at a time, into planet pinion, as shown in Figure 82, install a washer on the bottom and repeat process for the other side.
8. Occasionally twist the pinion shaft so needle bearings will line up and allow all needles to be installed, as shown in Figure 82.
9. Repeat steps 5 thru 8 above until all pinions are loaded with needle bearings.

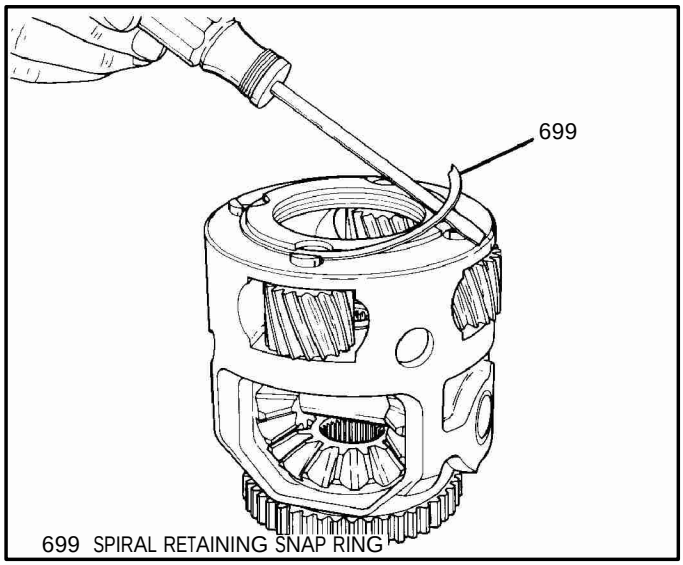
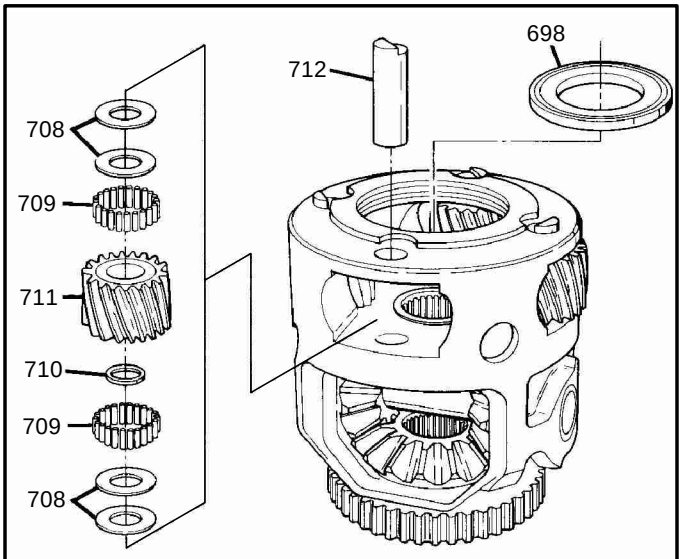


Figure 78

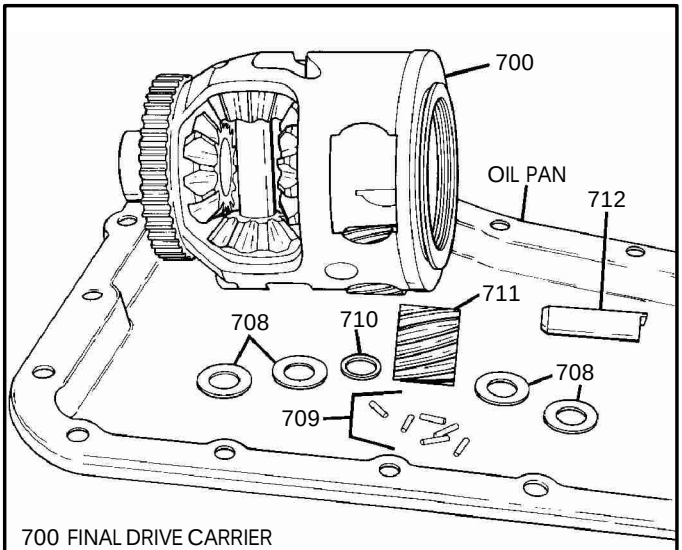
10. Install two of the pre-assembled pinion gears into the carrier with the washers towards the outside, as shown in Figure 83.

Continued on Page 44.



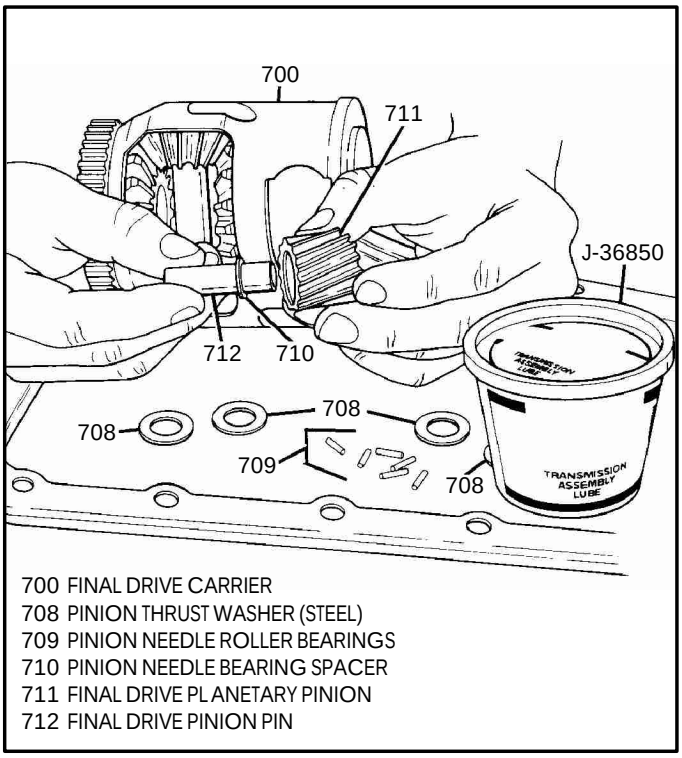
698 SUN GEAR TO CARRIER THRUST BEARING
708 PINION THRUST WASHER (STEEL)
709 PINION NEEDLE ROLLER BEARINGS
710 PINION NEEDLE BEARING SPACER
711 FINAL DRIVE PLANETARY PINION
712 FINAL DRIVE PINION PIN

Figure 79



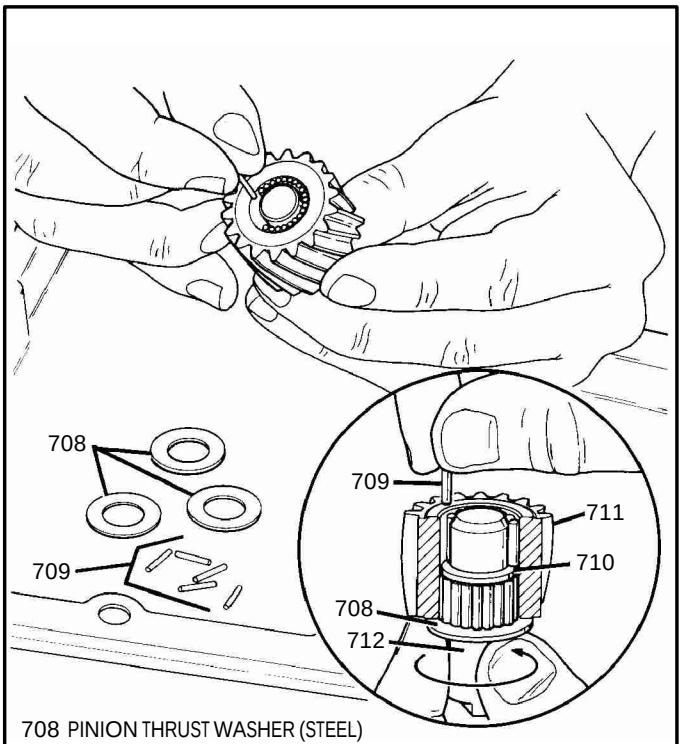
700 FINAL DRIVE CARRIER
708 PINION THRUST WASHER (STEEL)
709 PINION NEEDLE ROLLER BEARINGS
710 PINION NEEDLE BEARING SPACER
711 FINAL DRIVE PLANETARY PINION
712 FINAL DRIVE PINION PIN

Figure 80



700 FINAL DRIVE CARRIER
708 PINION THRUST WASHER (STEEL)
709 PINION NEEDLE ROLLER BEARINGS
710 PINION NEEDLE BEARING SPACER
711 FINAL DRIVE PLANETARY PINION
712 FINAL DRIVE PINION PIN

Figure 81



708 PINION THRUST WASHER (STEEL)
709 PINION NEEDLE ROLLER BEARINGS
710 PINION NEEDLE BEARING SPACER
711 FINAL DRIVE PLANETARY PINION
712 FINAL DRIVE PINION PIN

NEEDLE BEARING ROLLERS REQUIRED

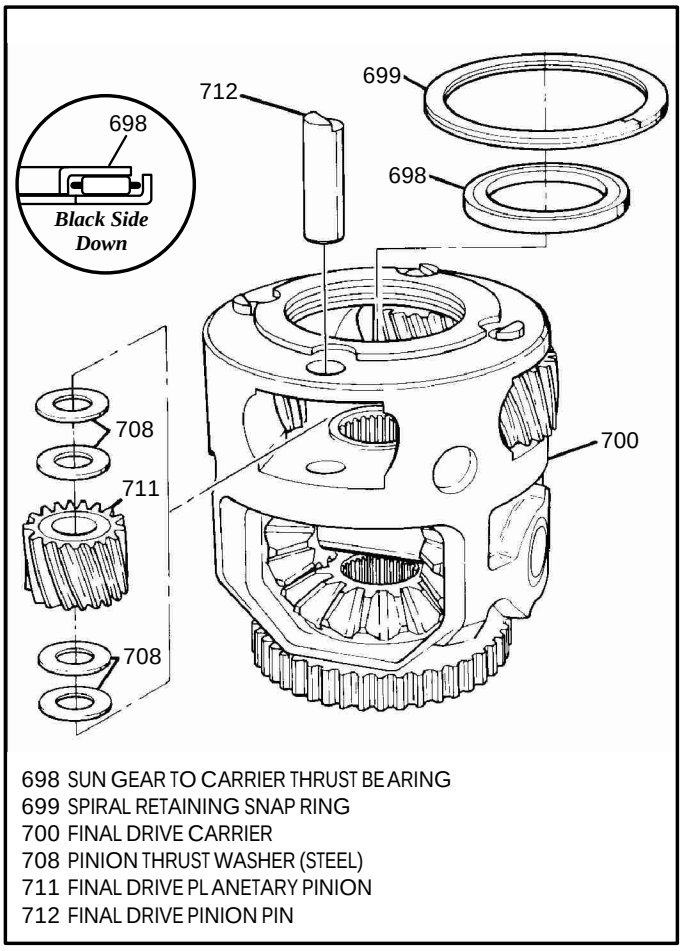
44 PER PINION (22 EACH ROW) FOR 3.06 AND 3.33 RATIOS
36 PER PINION (18 EACH ROW) FOR 2.84 RATIO

Figure 82

COMPONENT REBUILD (Cont'd)

Final Drive Assembly (Cont'd)

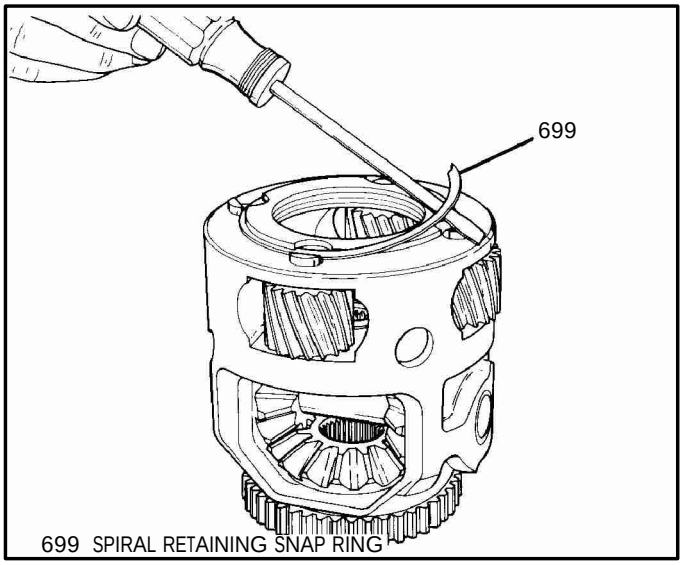
11. Install the sun gear to carrier thrust bearing into carrier in direction shown in Figure 83, before installing the other two pinions and pins.



698 SUN GEAR TO CARRIER THRUST BEARING
699 SPIRAL RETAINING SNAP RING
700 FINAL DRIVE CARRIER
708 PINION THRUST WASHER (STEEL)
711 FINAL DRIVE PLANETARY PINION
712 FINAL DRIVE PINION PIN

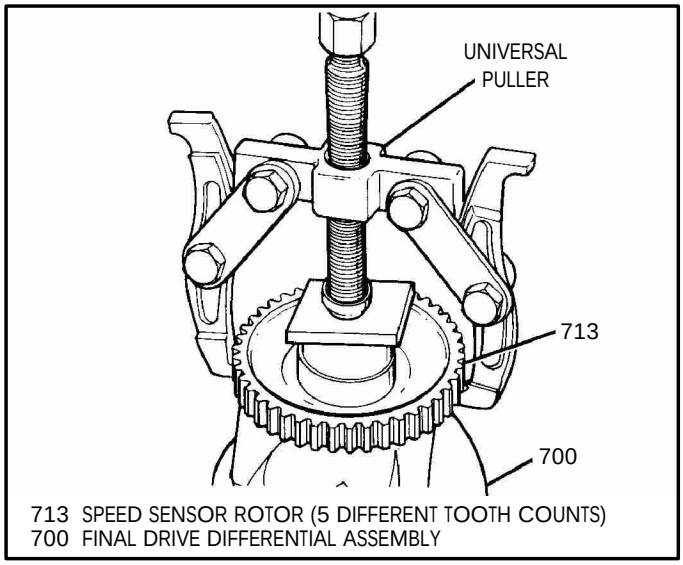
Figure 83

12. Install the remaining pinion gears and pinion pins, as shown in Figure 83.
13. Install the spiral snap ring that retains pinion pins in the final drive carrier (See Figure 84).
14. If it becomes necessary to remove the speed sensor rotor from the carrier, use the puller shown in Figure 85 to remove it with a thick flat washer to prevent damage to the carrier. ***NOTE: Do Not Remove Unless Damaged.***
15. Install new speed sensor rotor with a plastic mallet. It may be necessary to warm the rotor before installation.
    Note: There are currently 5 different tooth counts on these rotors so ensure that you install the correct rotor.
16. Install thrust washers onto the differential side gears and install them into carrier, as shown in Figure 86.
17. Install thrust washers onto differential pinion gears and retain with Trans-Jel®, as shown in Figure 86.
18. Install pinion gears with washers into carrier and slide pinion shaft through pinion gears for alignment, and then remove pinion shaft.
19. Rotate pinion gears into position in carrier and install pinion shaft through carrier.
20. Install pinion shaft retaining pin into carrier, as shown in Figure 86.
21. Check final drive pinion gears for the proper end play, as shown in Figure 87, and set the completed final drive aside for final assembly.



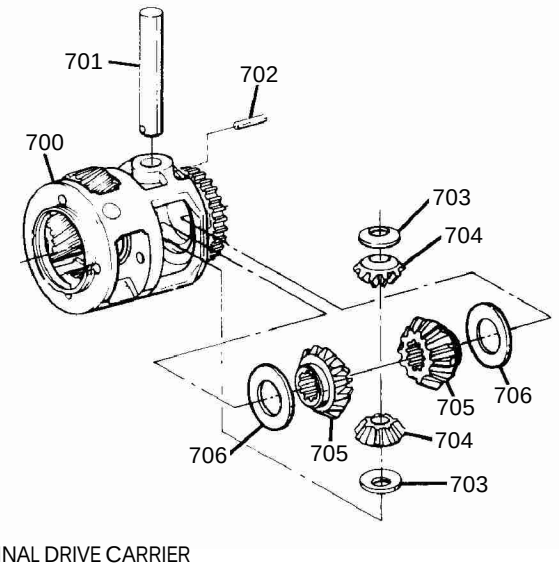
699 SPIRAL RETAINING SNAP RING

Figure 84



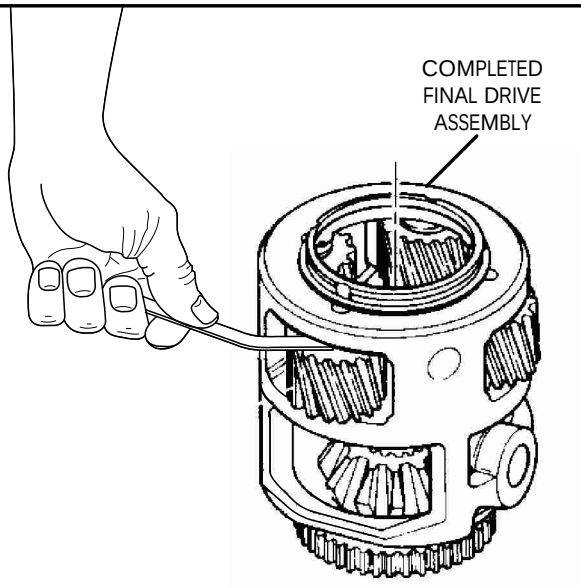
713 SPEED SENSOR ROTOR (5 DIFFERENT TOOTH COUNTS)
700 FINAL DRIVE DIFFERENTIAL ASSEMBLY

Figure 85



700 FINAL DRIVE CARRIER
701 FINAL DRIVE CROSS SHAFT
702 FINAL DRIVE CROSS SHAFT RETAINING PIN
703 DIFFERNETIAL PINION GEAR THRUST WASHER
704 DIFFERENTIAL PINION GEAR
705 DIFFERENTIAL SIDE GEAR
706 DIFFERENTIAL SIDE GEAR THRUST WASHER

Figure 86



Pinion End Play Should Be:
0.23 - 0.77mm (.009" - .030")
Check With Feeler Gage

Figure 87

FINAL DRIVE UPDATES

Beginning in model year 1995, General Motors introduced a "Fine Pitch" final drive assembly with the teeth cut in opposite direction of the 1st design. With the teeth cut in the opposite direction they were easy to identify from the 1st design. However, for the 1996 model year the "Fine Pitch" final drive assembly has the teeth cut in the same direction as the 1st design, and this sometimes makes it difficult to identify in case parts replacement is necessary. We now have nine different final drive combinations, and not all will interchange.

To complicate this even further there are five different tooth counts on the output speed sensor rotor on the different final drive carriers that will not interchange. We have provided you with all identification information to prevent you from making these mistakes.

The "Fine Pitch" final drive assemblies were introduced to address noise concerns.

Special Note:

If the wrong ratio final drive assembly or the wrong tooth count speed sensor rotor is used, the vehicle will have no 4th gear and/or no converter clutch operation.

Final Drive Internal Ring Gear

"Regular Pitch" This internal ring gear has 70 internal teeth for all three final drive ratios that are available, as illustrated in Figure 88.

"1995 Fine Pitch" This internal ring gear has 78 internal teeth for all three final drive ratios that are available, as illustrated in Figure 89. The internal teeth are also cut in the opposite direction of the regular pitch design.

"1996-Up Fine Pitch" This internal ring gear has 78 internal teeth for all three final drive ratios that are available, as illustrated in Figure 90. The internal teeth are cut in the same direction as the regular pitch design.

Continued on Page 46.

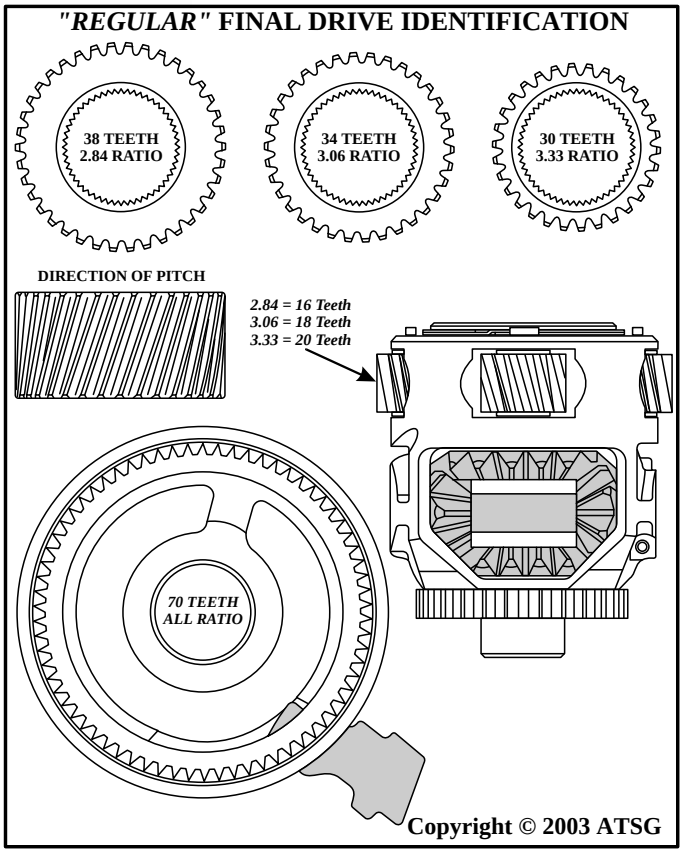


Figure 88

FINAL DRIVE UPDATES (Cont'd)

Final Drive Sun Gear

"Regular Pitch" There are three different ratios available as shown in Figure 88. The 2.84 ratio sun gear has 38 teeth, the 3.06 ratio sun gear has 34 teeth, and the 3.33 ratio has 30 teeth. The pitch direction is also illustrated in Figure 88.

"1995 Fine Pitch" There are three different ratios available as shown in Figure 89. The 2.86 ratio sun gear has 42 teeth, the 3.05 ratio sun gear has 38 teeth, and the 3.29 ratio has 34 teeth. Notice that the pitch direction is also the opposite direction of the regular pitch, as illustrated in Figure 89.

"1996-Up Fine Pitch" There are three different ratios available as shown in Figure 90. The 2.86 ratio sun gear has 42 teeth, the 3.05 ratio sun gear has 38 teeth, and the 3.29 ratio has 34 teeth. Notice that the pitch direction is the same as the direction of the regular pitch, as illustrated in Figure 90. When the pitch direction is changed, it changes the thrust direction of the final drive carrier.

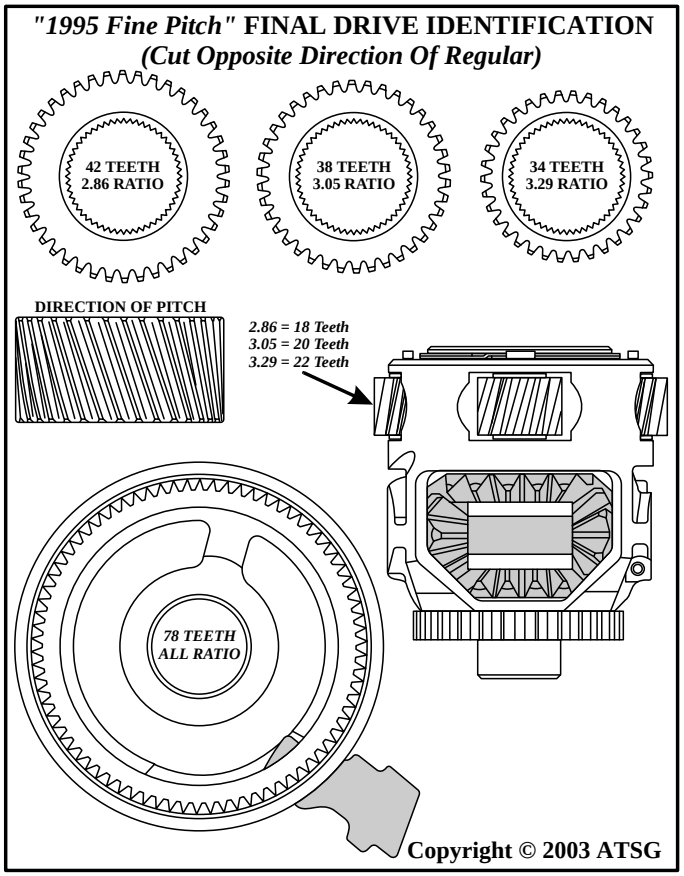


Figure 89

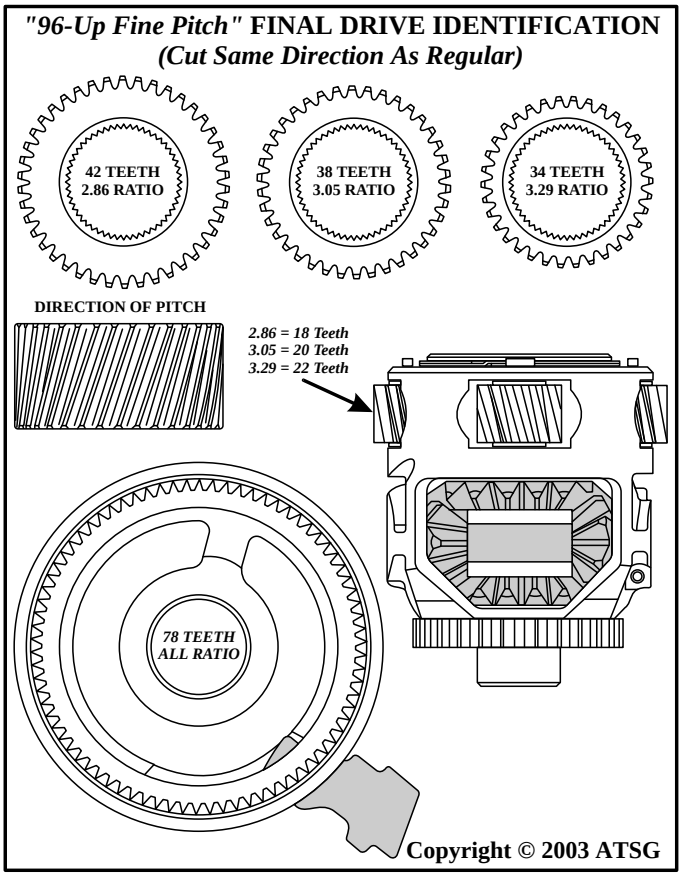


Figure 90

FINAL DRIVE UPDATES (Cont'd)

Final Drive Carrier

"Regular Pitch" There are three different final drive carrier ratios available. They are 2.84, 3.06, and 3.33. The 2.84 ratio final drive carrier has 16 teeth on the pinion gears, the 3.06 ratio has 18 teeth on the pinion gears, and the 3.33 has 20 teeth on the pinion gears as illustrated in Figure 88. Notice that the pitch angle of the planetary pinions is to the left as illustrated in Figure 88.

"1995 Fine Pitch" There are three different final drive carrier ratios available. They are 2.86, 3.05, and 3.29. The 2.86 ratio final drive carrier has 18 teeth on the pinion gears, the 3.05 ratio has 20 teeth on the pinion gears, and the 3.29 has 22 teeth on the pinion gears as illustrated in Figure 89. Notice that the pitch angle of the planetary pinions is the opposite, to the right, of the regular pitch as illustrated in Figure 89.

"1996-Up Fine Pitch" There are three different final drive carrier ratios available. They are 2.86, 3.05, and 3.29. The 2.86 ratio final drive carrier has 18 teeth on the pinion gears, the 3.05 ratio has 20 teeth on the pinion gears, and the 3.29 has 22 teeth on the pinion gears as illustrated in Figure 90. Notice that the pitch angle of the planetary pinions is the same, to the left, as the regular pitch as illustrated in Figure 90.

Interchangeability:

The 2.86 ratio will replace the 2.84 ratio with no adverse effects, as long as the proper speed sensor rotor tooth count is maintained for the model you are working on.

The 3.05 ratio will replace the 3.06 ratio with no adverse effects, as long as the proper speed sensor rotor tooth count is maintained for the model you are working on.

The 3.29 ratio will replace the 3.33 ratio with no adverse effects, as long as the proper speed sensor rotor tooth count is maintained for the model you are working on.

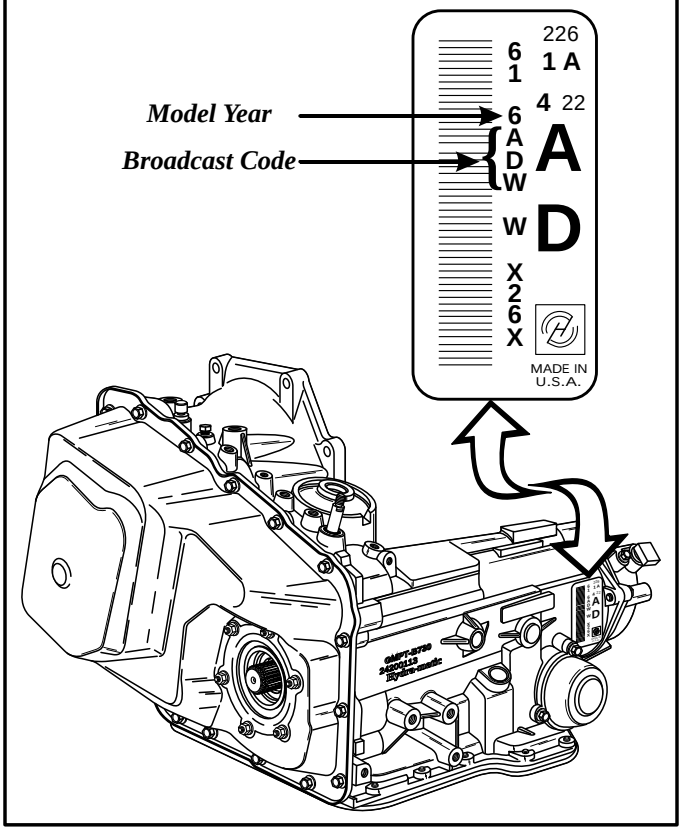
None of the individual components from the "Regular Pitch", "1995 Fine Pitch", or the "1996-Up Fine Pitch" will interchange with one another. You should not have any trouble here because they will not assemble.

TRANSAXLE IDENTIFICATION BY MODEL NUMBER AND RATIO

This bulletin will also help you identify 4T60-E transmissions by model number so that you get the right sprocket ratio, final drive ratio, and speed sensor rotor tooth count back into the proper vehicle. The first column gives you the broadcast code off of the I.D. tag, the second column gives you the engine size and vehicle that it came out of, the third column gives you the final drive ratio/speed sensor rotor tooth count, the fourth column gives you the drive/driven sprocket tooth count, the fifth column gives you the stall speed of the torque converter, and the last column tells you which structual side cover is required in that particular model if it requires one.

For 1991 Model vehicles, refer to Figure 91.
For 1992 Model vehicles, refer to Figure 92.
For 1993 Model vehicles, refer to Figure 93.
For 1994 Model vehicles, refer to Figure 94.
For 1995 Model vehicles, refer to Figure 94.
For 1996 Model vehicles, refer to Figure 95.
For 1997 Model vehicles, refer to Figure 96.
For 1998 Model vehicles, refer to Figure 96.
For 1999 Model vehicles, refer to Figure 96.

IDENTIFICATION TAG INFORMATION



1991 THM 4T60-E MODELS					
TRANSAXLE MODEL CODE	DESCRIPTION	FINAL DRIVE RATIO/ROTOR	SPROCKETS DRIVE/DRIVEN	STALL SPEED	STRUCTURAL SIDE COVER
1AHW, 1AVW	4.9L CADILLAC (EXPORT)	3.06/30	37/33	1825	
1AMW, 1A2W	4.9L CADILLAC E/K BODY	3.33/30	37/33	1825	
1APW, 1A4W	4.9L CADILLAC C/K BODY (EXPORT)	3.33/30	37/33	1825	
1AYW, 1A7W	4.9L CADILLAC E/K BODY (TOUR)	3.33/30	35/35	1825	
1AZW	4.9L CADILLAC C BODY (LIMO)	3.06/32	37/33	1825	
1YMW	3800 V6 C/H BODY	2.84/30	35/35	1420	
1YPW	3800 V6 REATTA	3.33/30	35/35	1897	
1YZW	3800 V6 C/H BODY	3.33/30	35/35	1897	
1CWW	3.4L DOHC W BODY (NON PWM)	3.06/30	33/37	2095	
1BTW	3800 V6 C BODY	3.33/31	37/33	1897	

Figure 91

1992 THM 4T60-E MODELS					
TRANSAXLE MODEL CODE	DESCRIPTION	FINAL DRIVE RATIO/ROTOR	SPROCKETS DRIVE/DRIVEN	STALL SPEED	STRUCTURAL SIDE COVER
2AVW, 2A5W	4.9L CADILLAC C - BODY (EXPORT)	3.06/30	37/33	1825	
2AMW, 2A2W	4.9L CADILLAC E/K - BODY	3.33/31	37/33	1825	
2ABW, 2A1W	4.9L CADILLAC C - BODY	3.06/30	37/33	1825	
2ANW, 2A3W	4.9L CADILLAC C - BODY	3.33/30	37/33	1825	
2APW, 2A4W	4.9L CADILLAC E/K - BODY (EXPORT)	3.33/31	37/33	1825	
2AWW, 2A6W	4.9L CADILLAC C - BODY (EXPORT)	3.33/30	37/33	1825	
2AZW, 2A8W	4.9L CADILLAC C - BODY (LIMO)	3.06/32	37/33	1825	
2AYW, 2A7W	4.9L CADILLAC E/K - BODY	3.33/31	35/35	1825	
2BTW, 2B1W	3.8L C - BODY	3.33/31	37/33	1897	
2BYW, 2B2W	3800 C/H - BODY SSE	3.06/31	35/35	1897	
2CLW, 2C1W	3800 C/H - BODY	2.84/30	35/35	1420	
2CSW, 2C2W	3800 C/H - BODY	3.06/30	35/35	1897	
2CTW, 2C3W	3800 C/H - BODY SSE	3.06/31	35/35	1897	
2CWW, 2C4W	3.4L W - BODY (NON PWM)	3.06/30	33/37	2095	
2CXW, 2C5W	3800 C - BODY	3.33/31	37/33	1897	
2CZW, 2C6W	3.8L H - BODY SSEI/SSE	3.33/31	37/33	1897	
2PHW, 2P1W	3.8L H - BODY SSE	3.33/31	37/33	1897	
2WAW, 2W1W	3800 C/H - BODY & GM200 (U - BODY)	3.06/31	35/35	1897	
2YLW, 2Y1W	3800 C/H - BODY	2.84/31	35/35	1420	
2YMW, 2Y2W	3800 C/H - BODY	2.84/30	35/35	1420	
2YZW, 2Y4W	3800 C/H - BODY	3.06/30	35/35	1897	

Figure 92

1993 THM 4T60-E MODELS					
TRANSAXLE MODEL CODE	DESCRIPTION	FINAL DRIVE RATIO/ROTOR	SPROCKETS DRIVE/DRIVEN	STALL SPEED	STRUCTURAL SIDE COVER
3ABW	4.9L CADILLAC C - BODY	306/30	37/33	1825	
3AMW	4.9L CADILLAC E/K - BODY	333/31	37/33	1825	
3ANW	4.9L CADILLAC C - BODY	333/30	37/33	1825	
3APW	4.9L CADILLAC E/K - BODY (EXPORT)	333/31	37/33	1825	
3AVW	4.9L CADILLAC C - BODY	306/30	37/33	1825	
3AWW	4.9L CADILLAC C - BODY (EXPORT)	333/30	37/33	1825	
3AZW	4.9L CADILLAC C - BODY (LIMO)	306/32	37/33	1825	
3BTW	3800 C - BODY	333/31	37/33	1897	
3BYW	3800 H - BODY	306/31	35/35	1897	
3CLW	3800 C/H - BODY	284/30	35/35	1420	
3CSW	3800 C/H - BODY (EXPORT)	333/30	35/35	1897	
3CTW	3800 H - BODY SSE	306/31	35/35	1897	
3CXW	3800 C - BODY	306/31	37/33	1897	
3CZW	3800 H - BODY SSEI/SSE	333/31	37/33	1897	
3PHW	3800 H - BODY SSE	333/31	37/33	1897	
3WAW	3800 C/H - BODY & GM200 (U - BODY)	306/31	35/35	1897	
3YMW	3800 C/H - BODY	284/30	35/35	1420	
3YZW	3800 C/H - BODY (EXPORT)	306/30	35/35	1897	
3CWW	3.4L W - BODY (NON PWM)	306/30	33/37	2095	
3CMW	3.1L W - BODY (NON PWM)	333/30	35/35	2060	
3YLW	3800 H - BODY	284/31	35/35	1420	
3YRW	3800 E - BODY	306/30	35/35	1897	
3BHW	3.1L W - BODY	333/30	35/35	2095	YES/4 BOLT

Figure 93

1994 THM 4T60-E MODELS					
TRANSAXLE MODEL CODE	DESCRIPTION	FINAL DRIVE RATIO/ROTOR	SPROCKETS DRIVE/DRIVEN	STALL SPEED	STRUCTURAL SIDE COVER
4ATW	4.9L CADILLAC K - BODY	306/31	37/33	1825	
4CLW	2.3L QUAD-4 N - BODY	306/29	33/37	2095	YES/6 BOLT
4PHW	2.3L QUAD-4 N - BODY	333/29	33/37	2363	YES/6 BOLT
4AFW	3.1L W - BODY	333/30	35/35	2095	YES/4 BOLT
4AJW	3.1L A - BODY (EXPORT)	333/29	37/33	1630	
4CMW	3.1L W - BODY (NON PWM)	333/30	35/35	2060	
4PAW	3.1L A - BODY	333/29	37/33	1630	
4WSW	3.1L L/N - BODY	333/29	37/33	1630	YES/6 BOLT
4PBW	3.4L W - BODY	306/30	33/37	2060	YES/4 BOLT
4BLW	3800 W - BODY	306/31	35/35	1897	YES/4 BOLT
4KUW	3800 U - BODY	306/31	35/35	1897	
4KHW	3800 SUPERCHARGED H - BODY	333/31	37/33	1897	
4PFW	3800 H - BODY	306/31	35/35	1897	
4WAW	3800 C/H - BODY	306/31	35/35	1897	
4YCW	3800 SUPERCHARGED C/H - BODY	333/31	37/33	1897	
4YMW	3800 H - BODY	284/30	35/35	1420	
4YZW	3800 H - BODY	306/30	35/35	1897	

1995 THM 4T60-E MODELS					
TRANSAXLE MODEL CODE	DESCRIPTION	FINAL DRIVE RATIO/ROTOR	SPROCKETS DRIVE/DRIVEN	STALL SPEED	STRUCTURAL SIDE COVER
5ATW	4.9L CADILLAC K - BODY	306/31	37/33	1825	
5PCW	2.3L QUAD 4 N - BODY	* 329/29	33/37	2363	YES/6 BOLT
5AFW	3.1L W - BODY	333/30	35/35	2095	YES/4 BOLT
5AJW	3.1L A - BODY (EXPORT)	333/29	37/33	1630	
5PAW	3.1L A - BODY	333/29	37/33	1630	
5WFW	3.1L L/N - BODY	* 329/29	37/33	1630	YES/6 BOLT
5PBW	3.4L W - BODY	306/30	33/37	2060	YES/4 BOLT
5BLW	3800 W - BODY	306/31	35/35	1897	YES/4 BOLT
5CAW	3800 G - BODY	* 305/31	35/35	1897	YES/6 BOLT
5BFW	3800 SUPERCHARGED G - BODY	* 329/31	37/33	1897	YES/6 BOLT
5KUW	3800 U - BODY	306/31	35/35	1897	
5PMW	3800 U - BODY (EXPORT)	306/30	35/35	1897	
5ACW	3800 C/H - BODY	306/30	35/35	1897	
5ASW	3800 C/H - BODY	284/30	35/35	1420	
5YZW	3800 H - BODY	306/30	35/35	1897	
5BXW	3800 H - BODY	306/31	35/35	1897	
5BKW	3800 H - BODY	306/31	35/35	1897	
5YMW	3800 H - BODY	284/30	35/35	1420	
5YDW	3800 SUPERCHARGED C/H - BODY	333/31	37/33	1897	
5YNW	3800 SUPERCHARGED H - BODY	333/31	37/33	1897	

** 3.05 AND 3,29 RATIOS ARE "FINE PITCH" FINAL DRIVES. SUN GEARS, INTERNAL RING GEARS AND PINION GEARS ARE NOT INTERCHANGEABLE WITH OTHER FINAL DRIVES.*

Figure 94

1996 THM 4T60-E MODELS					
TRANSAXLE MODEL CODE	DESCRIPTION	FINAL DRIVE RATIO/ROTOR	SPROCKETS DRIVE/DRIVEN	STALL SPEED	STRUCTURAL SIDE COVER
6CUW	2.4L N - BODY	* 305/30	33/37	2363	YES/6 BOLT
6AFW	3.1L W - BODY	333/30	35/35	2095	YES/4 BOLT
6AJW	3.1L A - BODY (EXPORT)	333/30	37/33	1630	
6PAW	3.1L A - BODY	333/30	37/33	1630	
6WFW	3.1L L - BODY	* 329/30	37/33	1630	YES/6 BOLT
6BSW	3.1L N - BODY	* 329/30	37/33	1630	YES/6 BOLT
6PBW	3.4L W - BODY	306/30	33/37	2060	YES/4 BOLT
6PKW	3.4L U - VAN	* 329/30	35/35	1897	
6CAW	3800 G - BODY	* 305/30	35/35	1897	YES/6 BOLT
6HBW	3800 W - BODY	306/30	35/35	1897	YES/4 BOLT
6ACW	3800 C/H - BODY	306/30	35/35	1897	
6ASW	3800 C/H - BODY	284/30	35/35	1420	
6BXW	3800 H - BODY	306/30	35/35	1897	
6YLW	3800 SUPERCHARGED C/H - BODY (H.D.)	* 329/30	37/33	1897	
6YRW	3800 SUPERCHARGED H - BODY (H.D.)	* 329/30	37/33	1897	
6CTW	3800 SUPERCHARGED G - BODY (H.D.)	* 329/30	37/33	1897	YES/6 BOLT

* 3.05 AND 3,29 RATIOS ARE "FINE PITCH" FINAL DRIVES. SUN GEARS, INTERNAL RING GEARS AND PINION GEARS ARE NOT INTERCHANGEABLE WITH OTHER FINAL DRIVES.

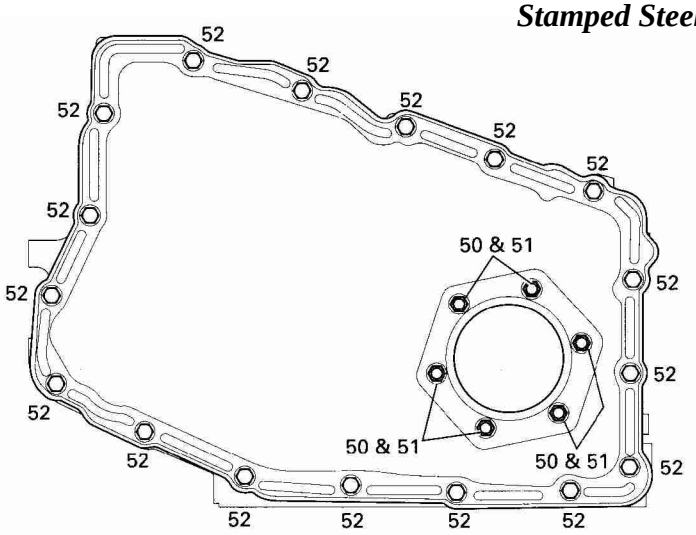
Figure 95

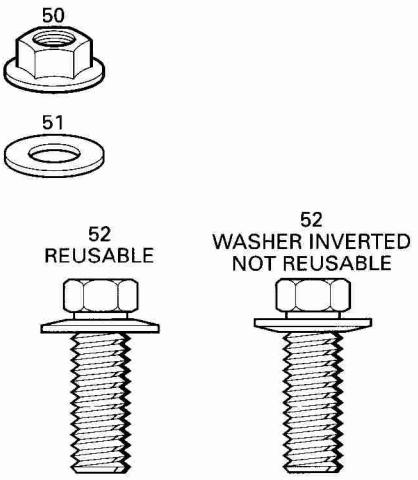
TRANSAXLE MODEL CODE	ENGINE/BODY	FINAL DRIVE RATIO/ROTOR	SPROCKETS DRIVE/DRIVEN	STALL SPEED
1997 THM 4T60-E MODELS				
7ACW	***3800 C/H - BODY***	***306/30***	***35/35***	***1897***
7AFW	***3.1L W - BODY***	***333/30***	***35/35***	***2095***
7AHW		**** 329/30***	***35/35***	
7ASW	***3800 C/H - BODY***	**** 286/30***	***35/35***	***1420***
7AWW		**** 329/30***	***35/35***	
7BSW	***3.1L N - BODY***	**** 329/30***	***37/33***	***1630***
7BXW		***306/30***	***35/35***	
7CUW		**** 305/30***	***33/37***	
7HBW	***3800 W - BODY***	**** 305/30***	***35/35***	***1897***
7YAW		**** 329/30***	***35/35***	
1998 THM 4T60-E MODELS				
8AHW		**** 329/30***	***35/35***	
8BSW	***3.1L N - BODY***	**** 329/30***	***37/33***	***1630***
8CUW		**** 305/30***	***33/37***	
8DKW		**** 329/30***	***35/35***	
1999 THM 4T60-E MODELS				
9AHW		**** 329/30***	***35/35***	

**** 2.86, 3.05 AND 3,29 RATIOS ARE "FINE PITCH" FINAL DRIVES. SUN GEARS, INTERNAL RING GEARS AND PINION GEARS ARE NOT INTERCHANGEABLE WITH OTHER FINAL DRIVES.***

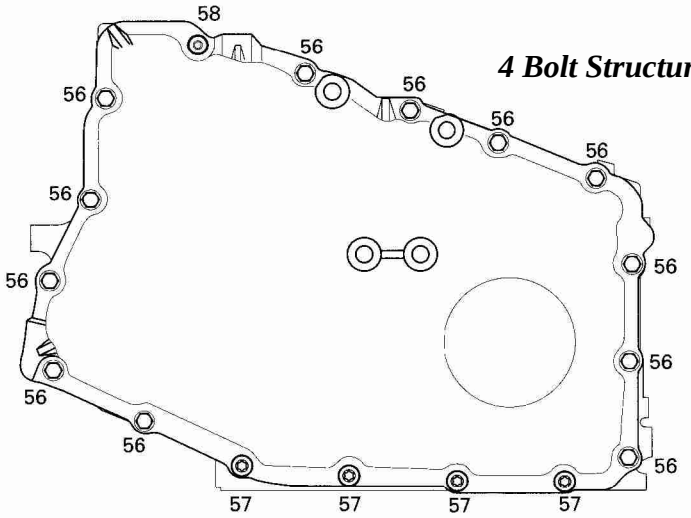
Figure 96

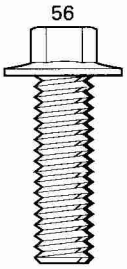
Stamped Steel Side Cover



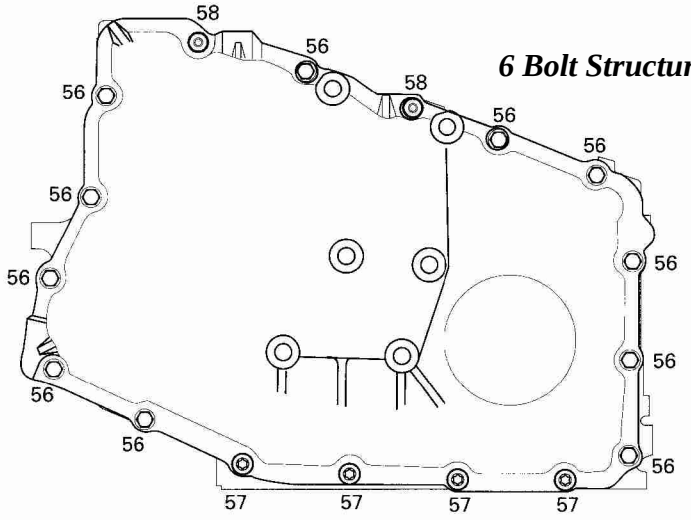


4 Bolt Structural Side Cover





6 Bolt Structural Side Cover



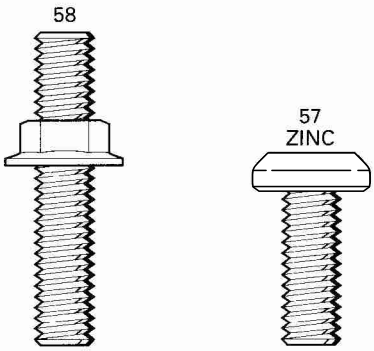


Figure 97

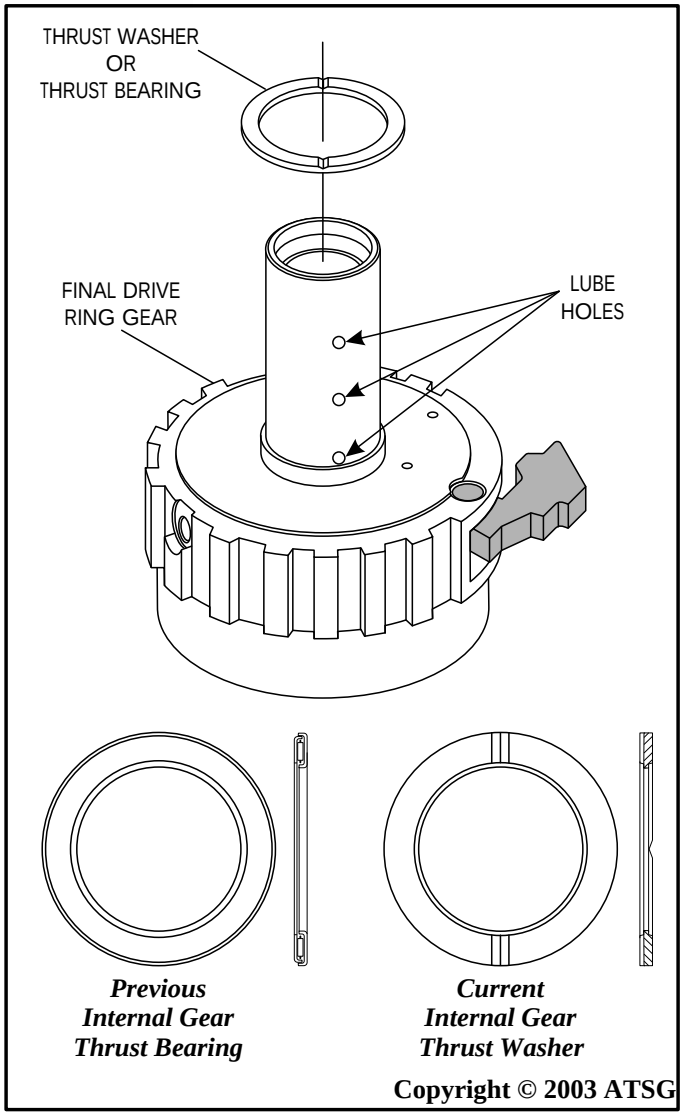


Figure 98

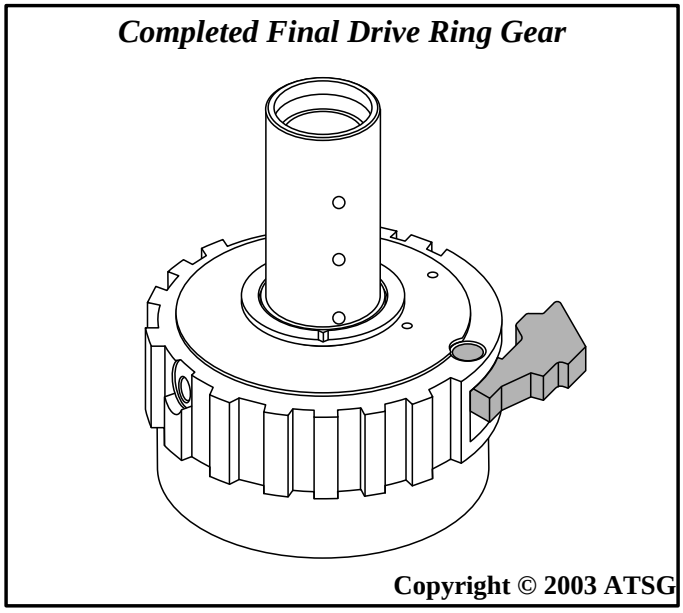


Figure 99

COMPONENT REBUILD (Cont'd)

Final Drive Ring Gear

1. Inspect the final drive ring gear and the parking pawl thoroughly for any wear and/or damage.
2. Ensure that lube holes are free and open, as shown in Figure 98.
3. Install the thrust bearing or the thrust washer, as shown in Figure 98. The thrust bearing was replaced by the thrust washer in 1994, either can be used in the 4T60-E transaxle.
4. Retain the thrust washer with a small amount of Trans-Jel®.
   Special Note: The thrust bearing assembly must still be used on the 440-T4 (4T60).
5. Set completed final drive ring gear assembly aside for final assembly (See Figure 99).

COMPONENT REBUILD (Cont'd)

1-2 Roller Clutch Support Changes
And The Parts Affected By The Change

Beginning at the start of production for 1996 model vehicles, all THM 4T60-E transaxles were built with a new design 1-2 roller clutch assembly, as shown in Figure 100.

This change eliminates a potential high speed freewheel failure and reduced the number of parts needed for the assembly process.

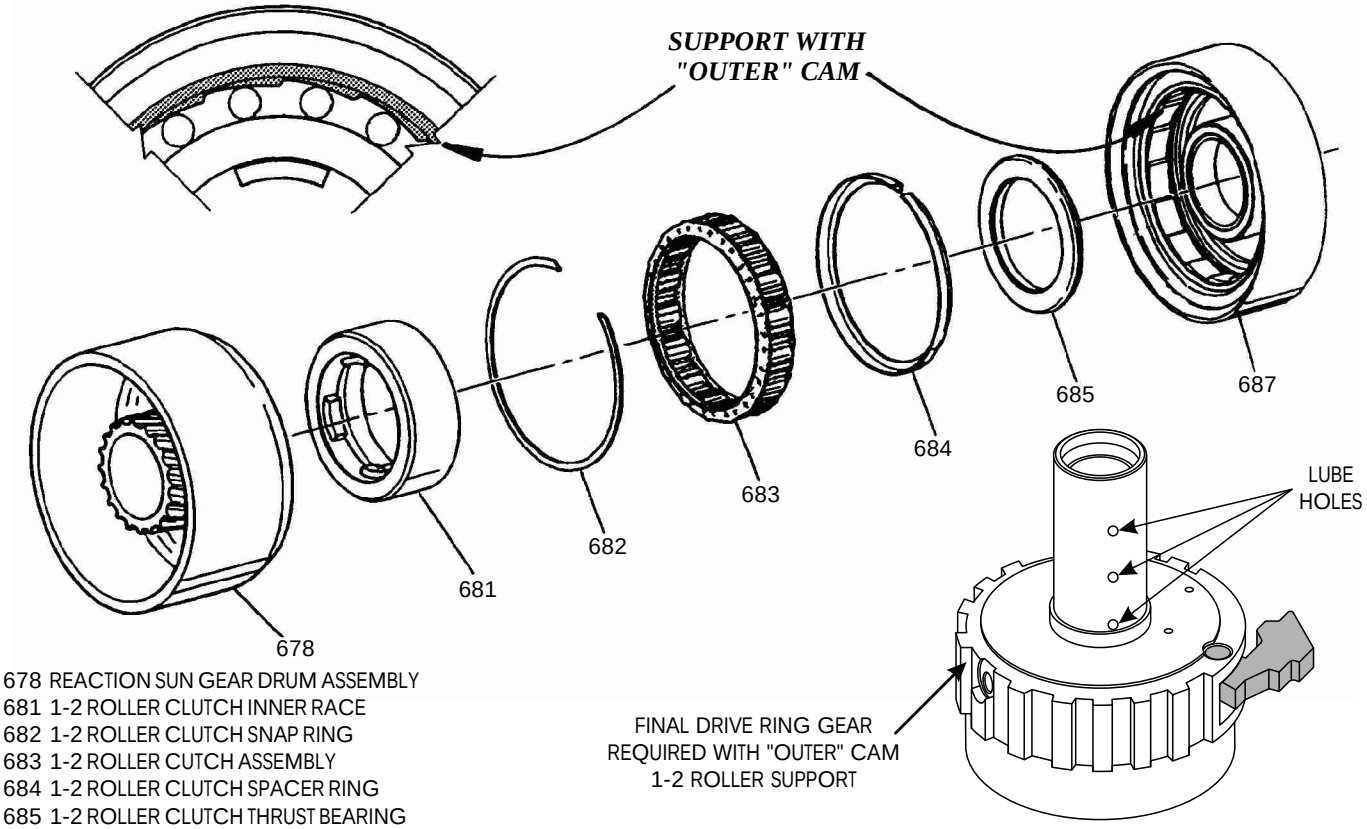
The 1-2 roller clutch cam is now the inside diameter design instead of the previous outside diameter design, and the bushing that supports it on the final drive ring gear has doubled in width, for much improved stability of the 1-2 roller clutch support, as shown in Figure 100.

The reaction sun gear drum now has the 1-2 roller clutch outer race made as part of the sun gear drum, to accommodate the new design 1-2 roller clutch parts, as shown in Figure 100.

The final drive ring gear is also unique to the new 1-2 roller clutch assembly, with revised lube hole sizes and locations, to accommodate the wider bushing, as shown in Figure 100.

The new design 1-2 Roller Clutch Assembly will back service all 4T60-E transaxles to 1991, however, all 2nd design parts must be used as a package.

1991-1995 1-2 ROLLER CLUTCH



678 REACTION SUN GEAR DRUM ASSEMBLY
681 1-2 ROLLER CLUTCH INNER RACE
682 1-2 ROLLER CLUTCH SNAP RING
683 1-2 ROLLER CUTCH ASSEMBLY
684 1-2 ROLLER CLUTCH SPACER RING
685 1-2 ROLLER CLUTCH THRUST BEARING
687 1-2 ROLLER CLUTCH SUPPORT ASSEMBLY

1996-1999 1-2 ROLLER CLUTCH

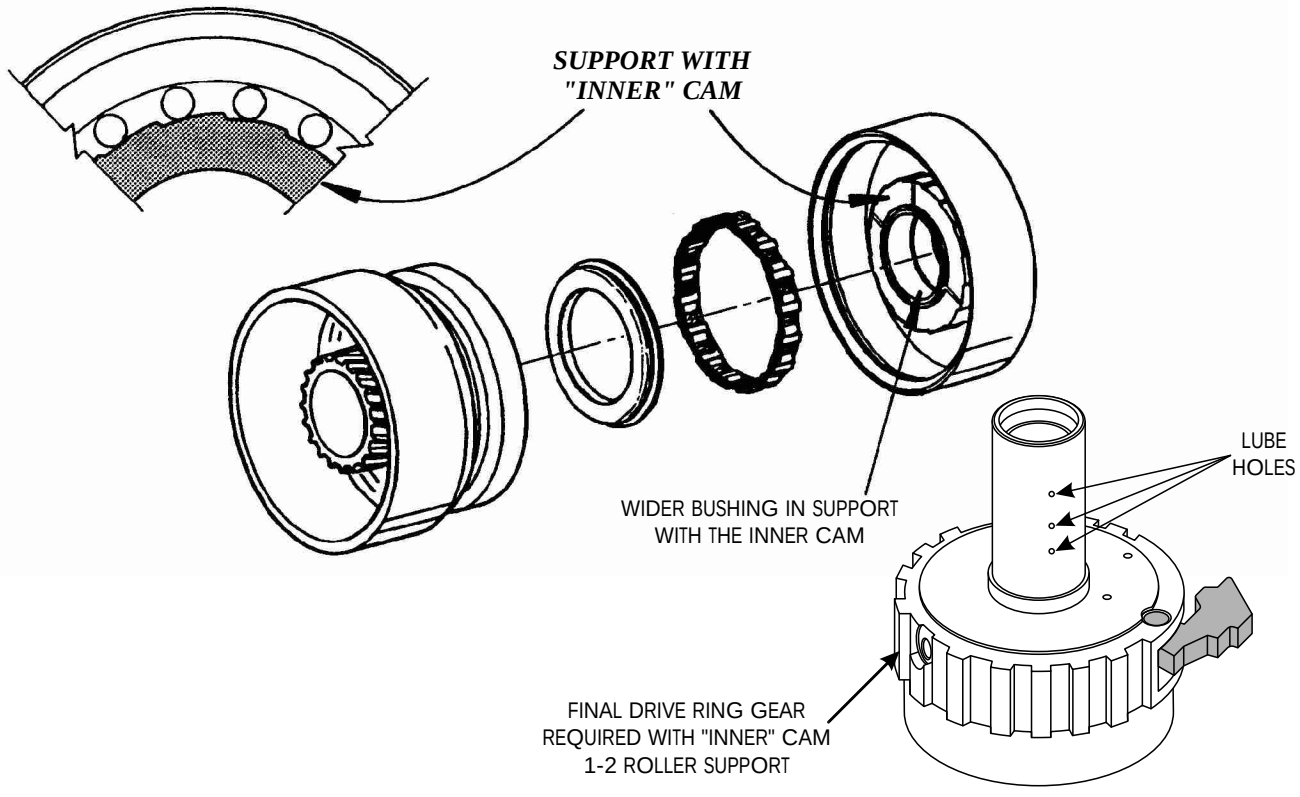
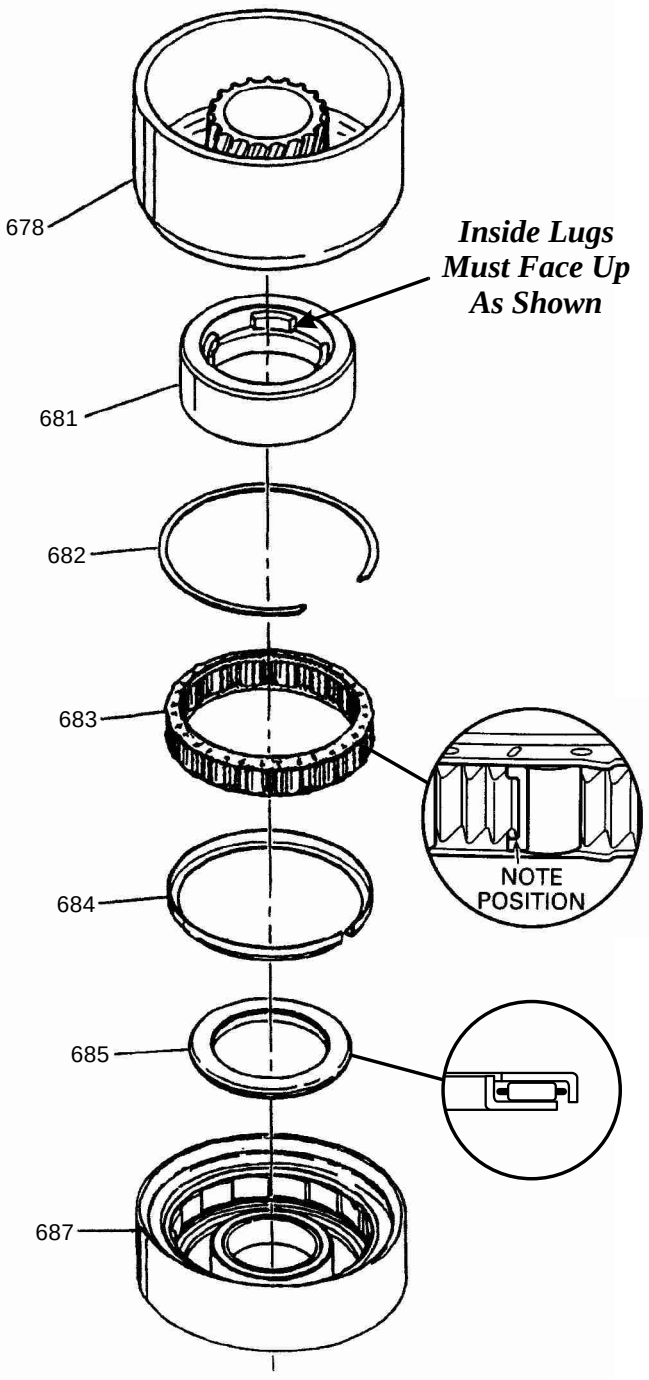


Figure 100

1991-1995 1-2 ROLLER CLUTCH



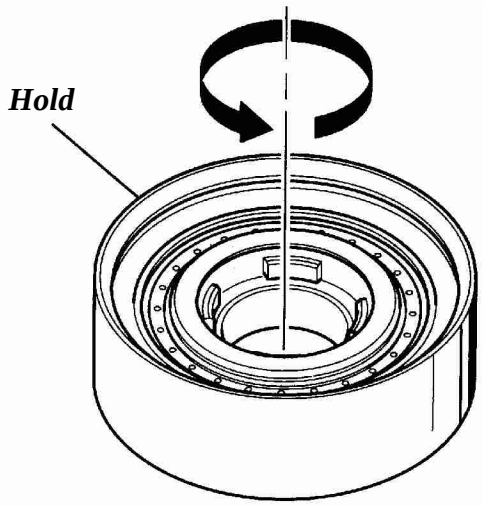
678 REACTION SUN GEAR DRUM ASSEMBLY
681 1-2 ROLLER CLUTCH INNER RACE
682 1-2 ROLLER CLUTCH SNAP RING
683 1-2 ROLLER CUTCH ASSEMBLY
684 1-2 ROLLER CLUTCH SPACER RING
685 1-2 ROLLER CLUTCH THRUST BEARING
687 1-2 ROLLER CLUTCH SUPPORT ASSEMBLY

Figure 101

COMPONENT REBUILD (Cont'd)

1991-1995 1-2 Roller Clutch Assembly

1. Inspect all 1-2 roller clutch parts thoroughly for any wear and/or damage.
2. Clean all 1-2 roller clutch parts thoroughly with cleaning solution and dry with compressed air.
3. Install the thrust bearing into 1-2 roller clutch support, in the direction shown in Figure 101.
4. Install the spacer ring, if it was removed, into roller clutch support as shown in Figure 101.
5. Install the roller clutch cage assembly into the 1-2 roller clutch support, in the direction shown in Figure 101, noting position of spring seats.
6. Install the retaining snap ring into the groove in support, ensuring that it is fully seated. Refer to Figure 101.
7. Install the 1-2 roller clutch inner race into the roller cage assembly, with the inside lugs up, using a counterclockwise motion, as shown in Figure 101, until fully seated against bearing.
8. Position the 1-2 support assembly on bench as it would be in unit (See Figure 102).
9. While holding the 1-2 roller clutch support, the inner race should rotate ***counterclockwise*** only, as shown in Figure 102.
10. Set the completed 1-2 roller clutch support assembly aside for final assembly process.



Inner Race Should Freewheel Counter-clockwise And Hold Clockwise As Shown Above

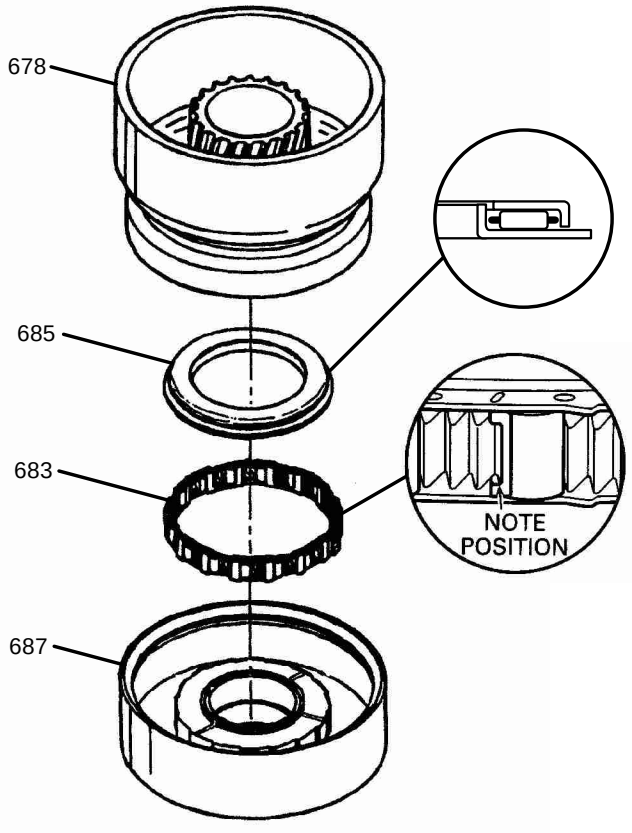
Figure 102

COMPONENT REBUILD (Cont'd)

1996-1999 1-2 Roller Clutch Assembly

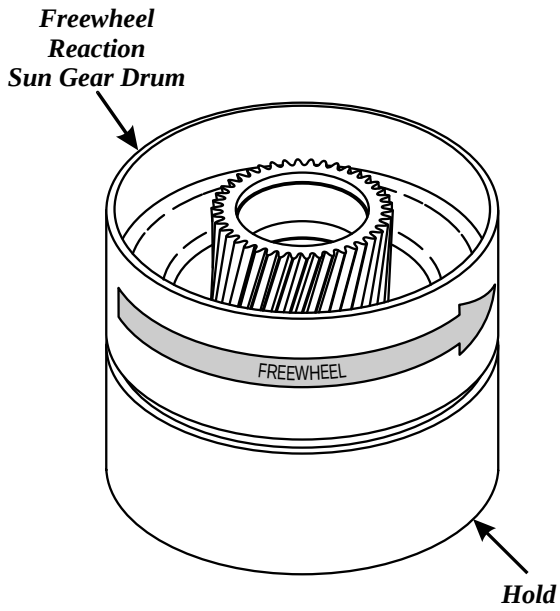
1. Inspect all 1-2 roller clutch parts thoroughly for any wear and/or damage.
2. Clean all 1-2 roller clutch parts thoroughly with cleaning solution and dry with compressed air.
3. Install the roller clutch cage assembly into the 1-2 roller clutch support, in the direction shown in Figure 103, noting position of spring seats.
4. Install the thrust bearing onto 1-2 roller clutch support, in the direction shown in Figure 103. ***Note: This bearing is pressed into position, so ensure that it is fully seated.***
5. Position the 1-2 support assembly on bench as it would be in unit (See Figure 104).
6. While holding the 1-2 roller clutch support, the sun gear drum should rotate ***counterclockwise*** only, as shown in Figure 104.
7. Set the completed 1-2 roller clutch support assembly aside for final assembly process.

1996-1999 1-2 ROLLER CLUTCH



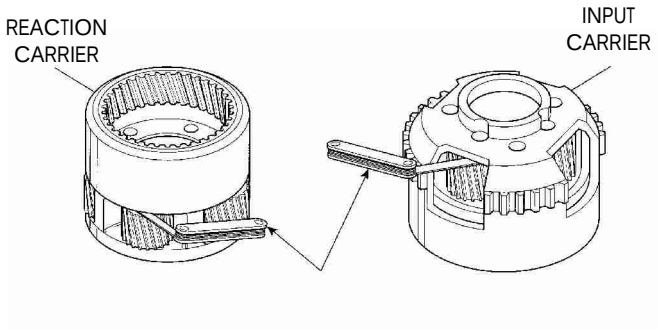
678 REACTION SUN GEAR DRUM ASSEMBLY
683 1-2 ROLLER CUTCH ASSEMBLY
685 1-2 ROLLER CLUTCH THRUST BEARING
687 1-2 ROLLER CLUTCH SUPPORT ASSEMBLY

Figure 103



Reaction Sun Gear Drum Should Freewheel Counter-clockwise And Hold Clockwise As Shown Above

Figure 104



Pinion End Play Should Be:
0.23 - 0.77mm (.009" - .030")
Check With Feeler Gage

Figure 105

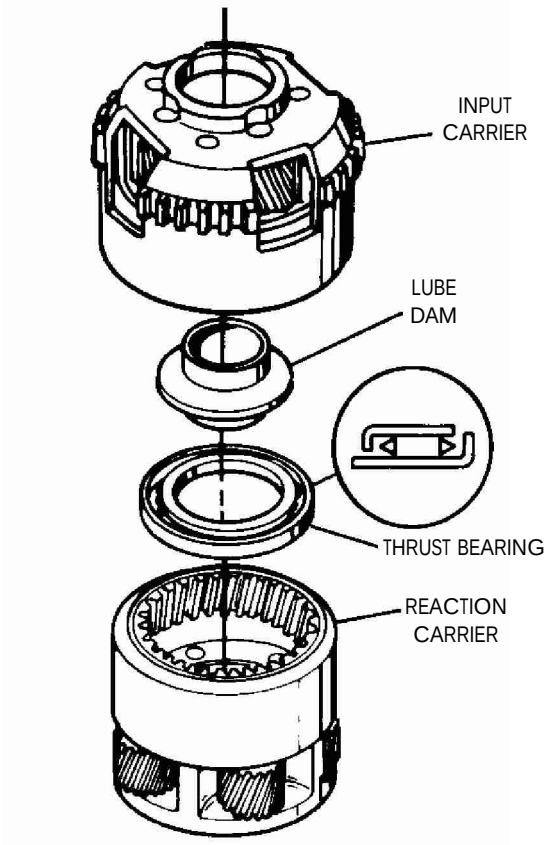


Figure 106

COMPONENT REBUILD (Cont'd)

Planetary Carrier Assemblies

1. Inspect both planetary carriers thoroughly for any wear and/or damage.
2. Check the planetary pinion end play with feeler gage, as shown in Figure 105. End play should be 0.23 - 0.77mm (.009" - .030").
3. Install lube dam into the input carrier, as shown in Figure 106.
4. Install input carrier to reaction carrier thrust bearing in the direction shown in Figure 106, and retain with small amount of Trans-Jel®.
5. Install input carrier assembly into the reaction carrier by rotating into position until fully seated.
6. Set the planetary carrier assemblies aside for the final assembly process.

COMPONENT REBUILD (Cont'd)

3rd Roller Clutch - 3rd Sprag Clutch
And Planetary Carrier Changes

A new design dual sprag assembly replaces the previous 3rd roller clutch and input sprag assembly, as shown in Figure 107. This change occured on February 1, 1993, as a running change. There are many dimensional changes that makes the component parts of these two different design levels non-interchangeable. The new design dual sprag assembly is only serviced as a complete assembly. The new design dual sprag also required a revised input planetary carrier, as shown in Figure 108.
However, when the new design dual sprag and new design input carrier are used as a service package, they will back service any 4T60-E transaxle, and are highly recommended.

Service Part Numbers At Time Of Printing:
Input Sun Gear 8682441
Input Sun Gear Spacer 8682442
Input & 3rd Sprag Assembly Complete ... 8682443
Input Carrier Asm (New Design) 8682461
Dual Sprag Conversion Package 8651935

Input Sprag and 3rd Roller Clutch Assembly procedures begin on Page 60.

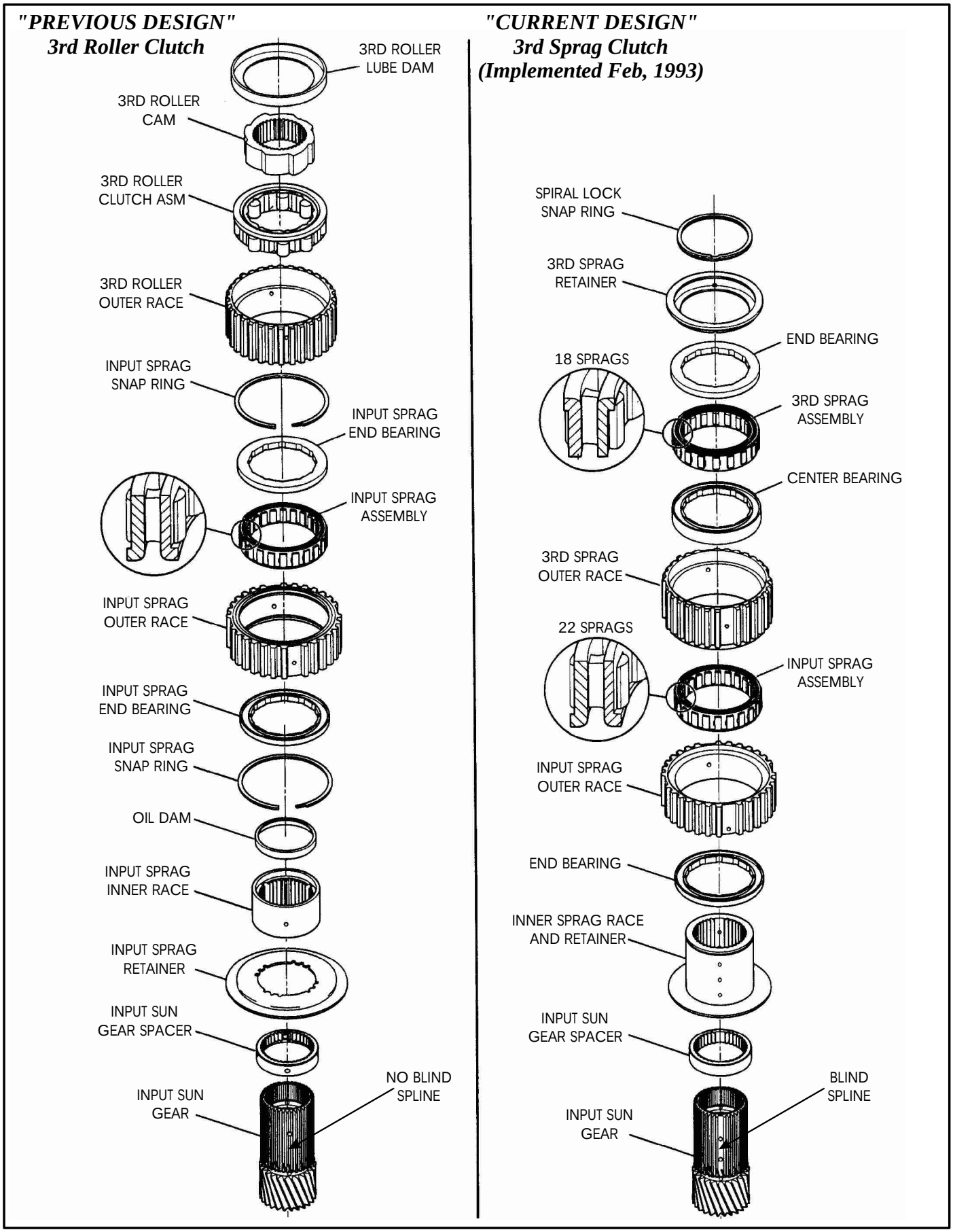


Figure 107

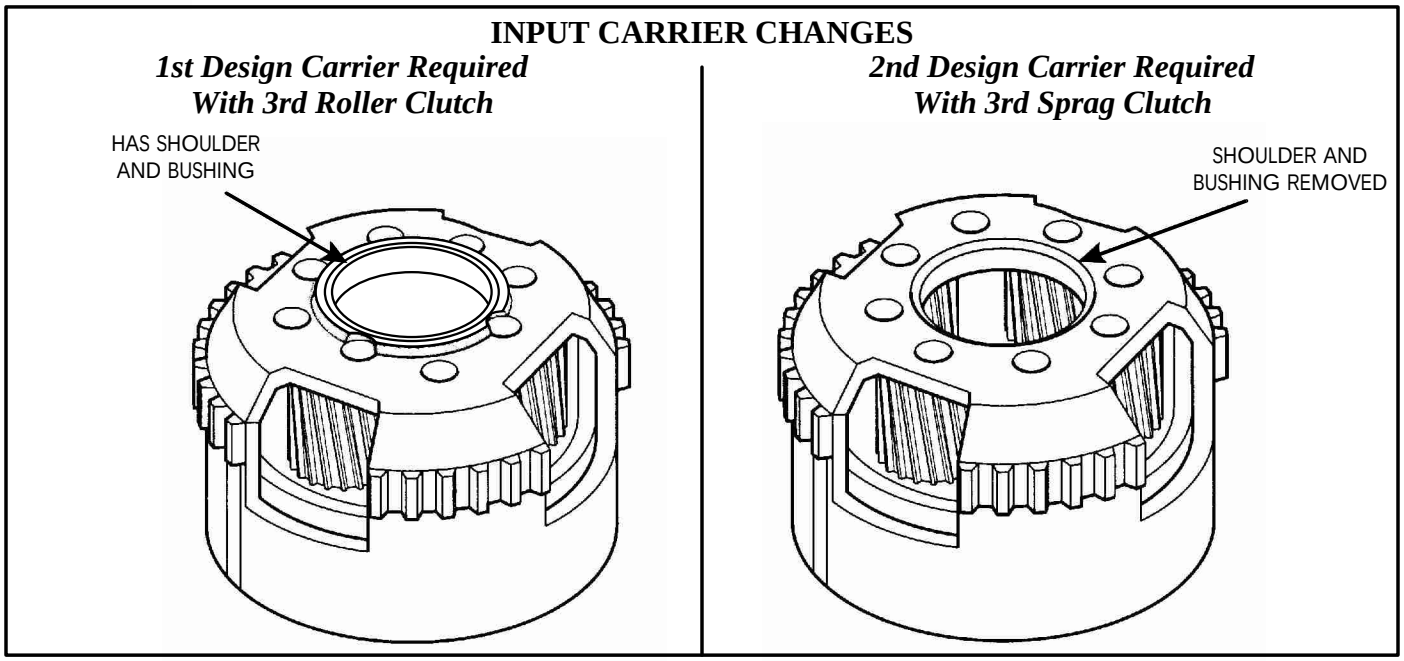


Figure 108

COMPONENT REBUILD (Cont'd)

Input Sprag & 3rd Roller Clutch Assembly

1. Inspect all sprag and 3rd roller parts thoroughly for any wear and/or damage.

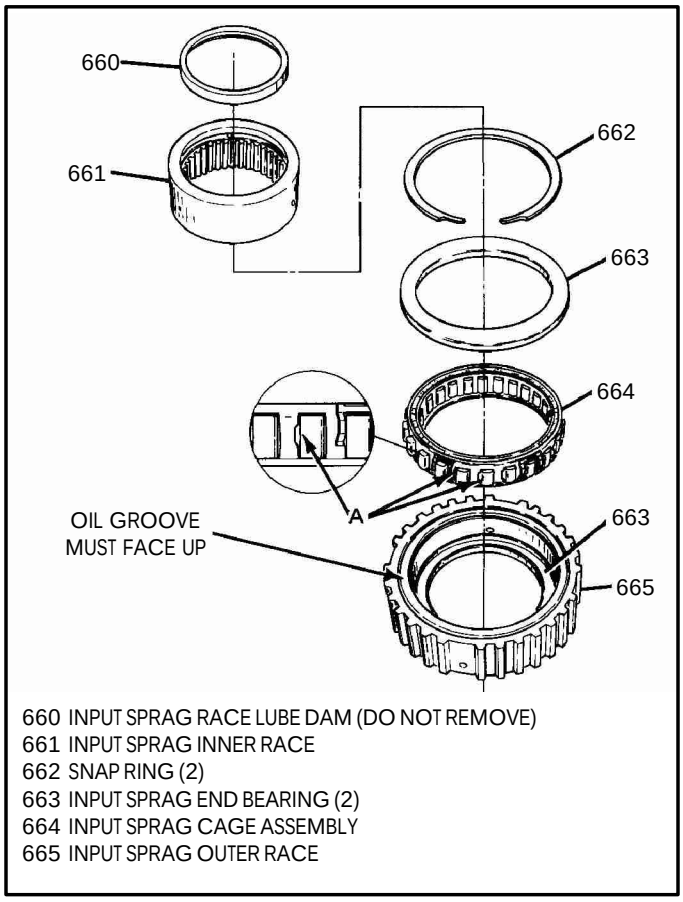


Figure 109

Input Sprag & 3rd Roller Clutch Asm (Cont'd)

2. Clean all sprag and 3rd roller parts thoroughly in cleaning solution, dry with compressed air.
3. Assemble 3rd roller clutch parts while using Figure 107 as a guide.
4. Install snap ring into groove in input sprag race on opposite side of lube groove, as shown in Figure 109.
   Note: Lube groove must face up as shown.
5. Install one end bearing with groove facing up, as shown in Figure 109.
6. Install input sprag cage assembly, with the "windows" to the left as shown in Figure 109.
7. Install the other end bearing with the groove facing down, as shown in Figure 109.
8. Install the other snap ring into groove in input sprag outer race (See Figure 109).
9. Install the sun gear spacer onto the sun gear, with the lube groove facing sun gear, as shown in Figure 107.
10. Install input sprag retainer onto the sun gear, with the recessed step facing the input sun gear spacer, as shown in Figure 107.
11. Complete the input sprag/3rd roller assembly process using Figure 107 as a guide.
12. Check for proper assembly. While holding the input sun gear, the outer races must freewheel in directions shown in Figure 110.

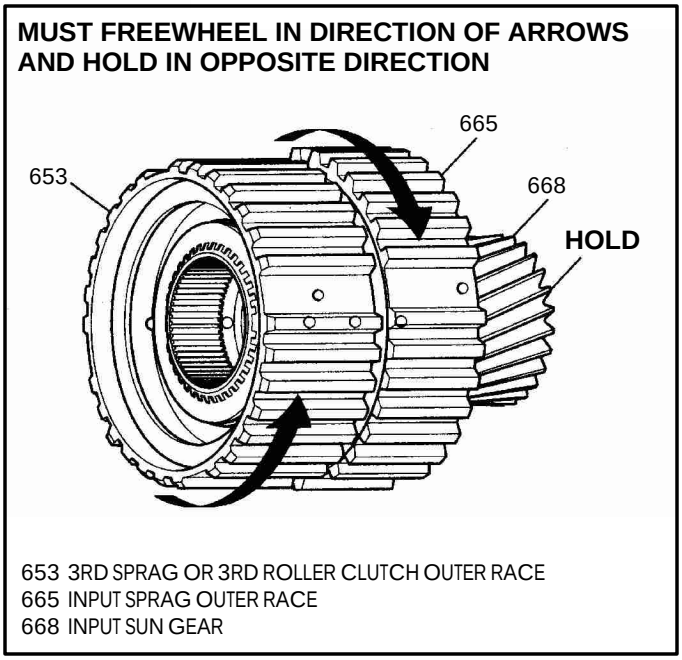


Figure 110

COMPONENT REBUILD (Cont'd)

"Dual Sprag" Clutch Assembly

1. Inspect all input and 3rd sprag parts thoroughly for any wear and/or damage.
2. Clean all input and 3rd sprag parts thoroughly in cleaning solution, dry with compressed air.
3. Disassembly begins by removing the spiral lock ring, as shown in Figure 111.
   Note: Spiral lock ring must be replaced when service is required.
4. Assemble input and 3rd sprag parts ***exactly*** as shown in Figure 111, one piece at a time.
5. Ensure that the input sprag cage assembly is installed with the lips facing the direction that is shown in Figure 111.
6. Ensure that the 3rd sprag cage assembly is installed with the lips facing the direction that is shown in Figure 111.
7. Complete the input and 3rd sprag assembly process using Figure 111 as a guide.
8. After completion, check for proper assembly. While holding the input sun gear, the outer races must freewheel in the directions that are shown in Figure 110.
9. Set the completed dual sprag assembly aside for the final assembly process.

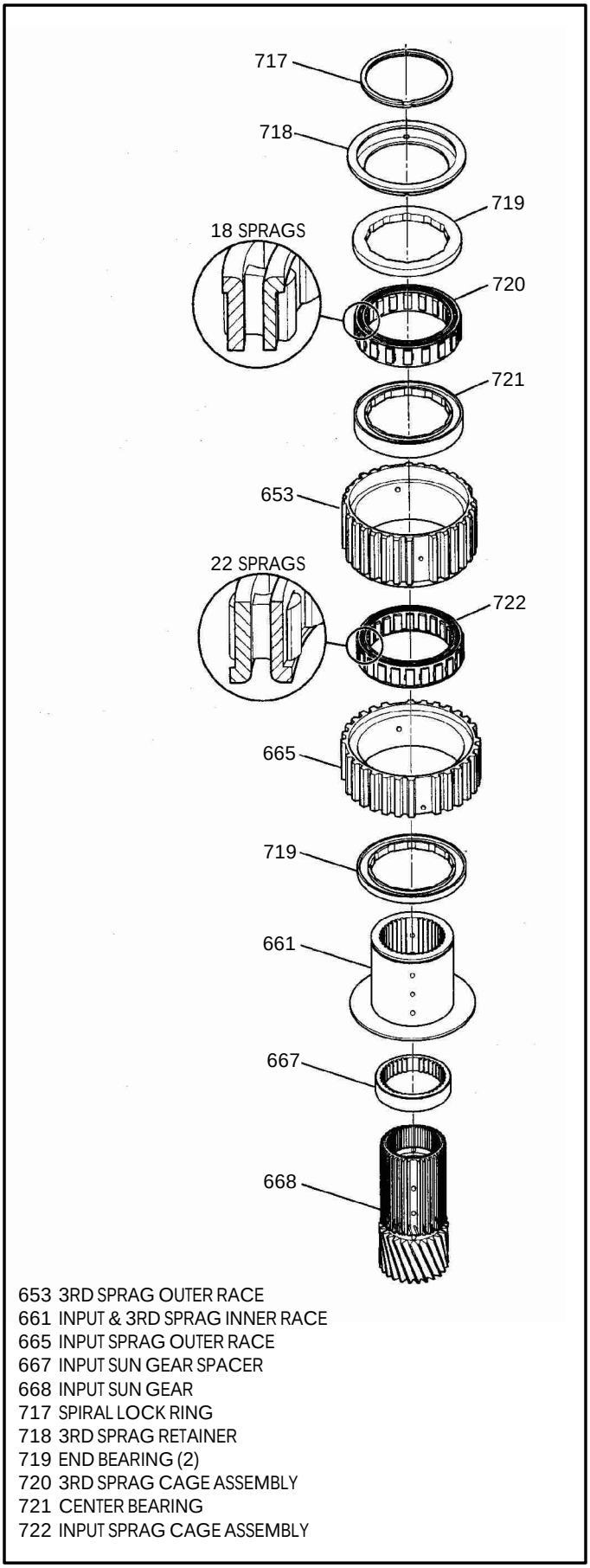
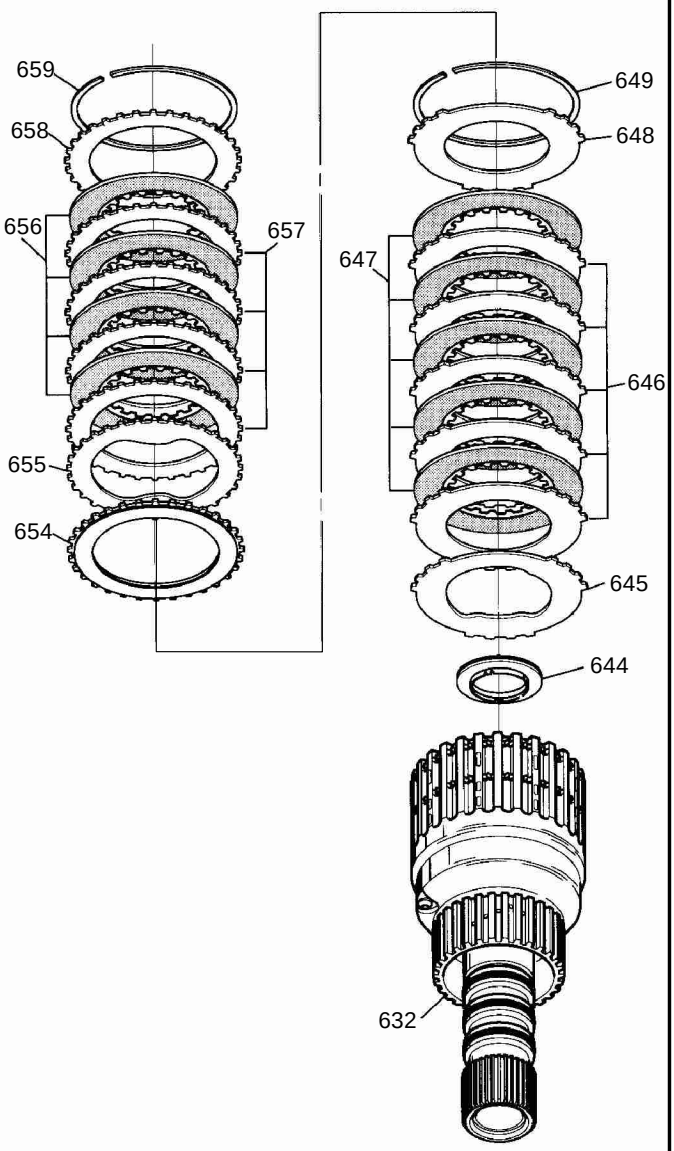


Figure 111



632 INPUT/3RD CLUTCH HOUSING ASSEMBLY
644 THRUST BEARING ASSEMBLY (SNAPS IN PLACE)
645 3RD CLUTCH "WAVED" PLATE
646 3RD CLUTCH "SINGLE SIDED" OUTSIDE SPLINE PLATES (5)
647 3RD CLUTCH "SINGLE SIDED" INSIDE SPLINE PLATES (5)
648 3RD CLUTCH BACKING PLATE
649 3RD CLUTCH BACKING PLATE SNAP RING
654 INPUT CLUTCH APPLY PLATE
655 INPUT CLUTCH "WAVED" PLATE
656 INPUT CLUTCH FRICTION PLATES (4)
657 INPUT CLUTCH STEEL PLATES (4)
658 INPUT CLUTCH BACKING PLATE
659 INPUT CLUTCH BACKING PLATE SNAP RING

Figure 112

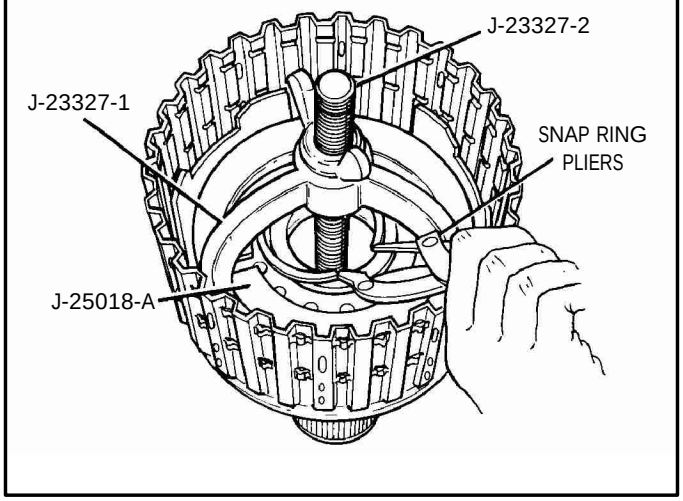
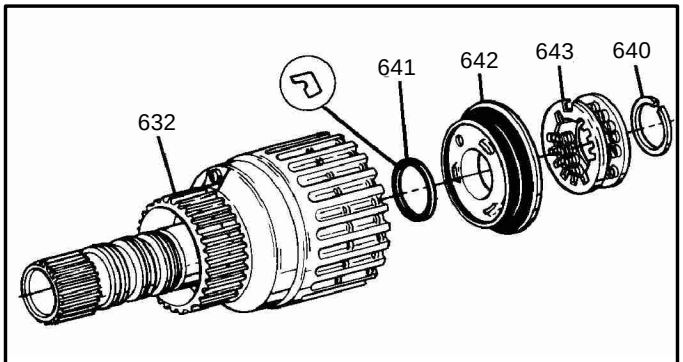


Figure 113



632 INPUT/3RD CLUTCH HOUSING ASSEMBLY
640 3RD CLUTCH RETURN SPRING SNAP RING
641 3RD CLUTCH INNER LIP SEAL
642 3RD CLUTCH MOLDED PISTON ASSEMBLY
643 3RD CLUTCH RETURN SPRING ASSEMBLY

Figure 114

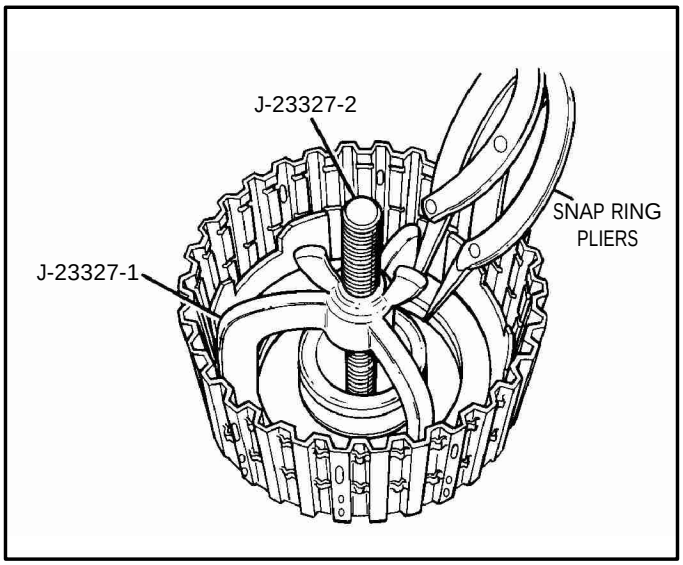
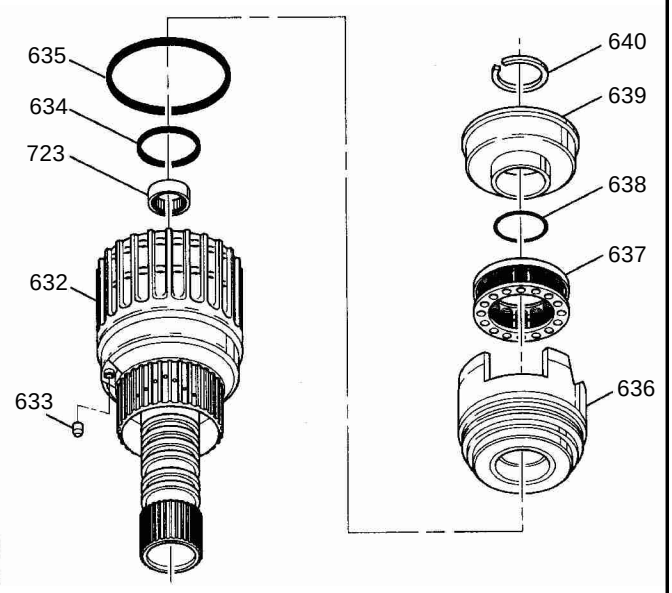


Figure 115



632 INPUT/3RD CLUTCH HOUSING ASSEMBLY
633 INPUT CLUTCH BALL CAPSULE *(REMOVE ONLY IF DAMAGED)*
634 INPUT CLUTCH PISTON INNER LIP SEAL
635 INPUT CLUTCH PISTON OUTER LIP SEAL
636 INPUT CLUTCH PISTON ASSEMBLY
637 INPUT CLUTCH PISTON RETURN SPRING ASSEMBLY
638 3RD CLUTCH HOUSING "O" RING SEAL
639 3RD CLUTCH HOUSING
640 3RD CLUTCH HOUSING SNAP RING
732 CAGED NEEDLE BEARING *(REMOVE ONLY IF DAMAGED)*

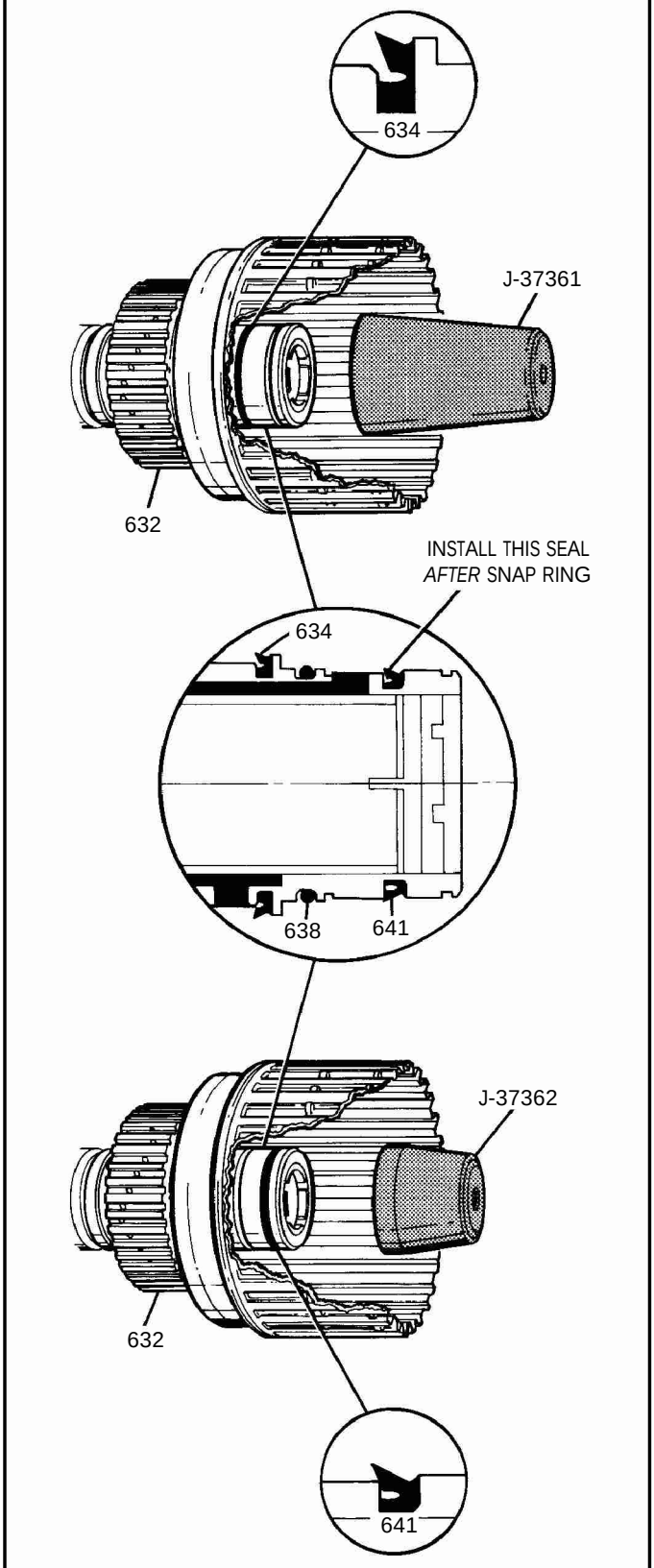
Figure 116

COMPONENT REBUILD (Cont'd)

Input/3rd Clutch Housing Assembly

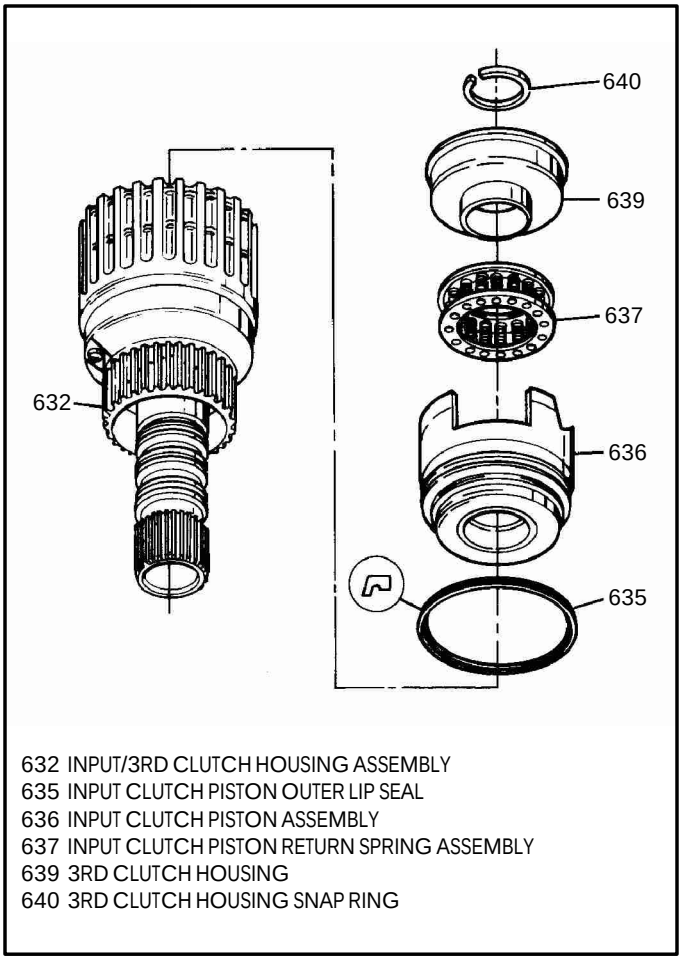
1. Disassemble the input/3rd clutch housing using Figures 112 thru 116 as a guide
2. Remove and discard all lip seals and "O" rings used in this housing.
3. Inspect all of the input/3rd clutch housing parts thoroughly for any wear and/or damage.
4. Clean all input/3rd clutch housing parts with cleaning solution and dry with compressed air.
5. Install a new input clutch piston inner lip seal into the input housing with the lip facing down, as shown in Figure 117.
6. Use the lip seal installer J-37361, as shown in Figure 117 to prevent seal damage.
7. Install the 3rd clutch housing "O" ring seal in the proper groove in input housing, as shown in Figure 117.
8. Lubricate both seals with a small amount of Trans-Jel®.

Continued on Page 64.



632 INPUT/3RD CLUTCH HOUSING ASSEMBLY
634 INPUT CLUTCH PISTON INNER LIP SEAL
638 3RD CLUTCH HOUSING "O" RING SEAL
641 3RD CLUTCH PISTON INNER LIP SEAL

Figure 117



632 INPUT/3RD CLUTCH HOUSING ASSEMBLY
635 INPUT CLUTCH PISTON OUTER LIP SEAL
636 INPUT CLUTCH PISTON ASSEMBLY
637 INPUT CLUTCH PISTON RETURN SPRING ASSEMBLY
639 3RD CLUTCH HOUSING
640 3RD CLUTCH HOUSING SNAP RING

Figure 118

COMPONENT REBUILD (Cont'd)

Input/3rd Clutch Housing Assembly (Cont'd)

9. Install a new lip seal into groove in the input clutch piston, with the lip facing down, as it is shown in Figure 118.
10. Lubricate the outer lip seal and inside diameter of input clutch piston with Trans-Jel®.
11. Install the input clutch piston assembly into the input/3rd clutch housing with a rotating motion (See Figure 118).
12. Install the input clutch piston return spring into input/3rd clutch housing, on top of piston, as shown in Figure 118.
13. Install the 3rd clutch housing into input/3rd clutch housing using care not to damage the "O" ring seal (See Figure 118).
14. Compress the 3rd clutch housing against input clutch piston return spring and install the snap ring, as shown in Figure 119.
15. Ensure that snap ring is fully seated in groove before releasing pressure.
16. Now install the 3rd clutch piston inner lip seal with lip facing down, as shown in Figure 117, and lubricate with small amount of Trans-Jel®.
17. Use the lip seal installer J-37362, as shown in Figure 117 to prevent seal damage.

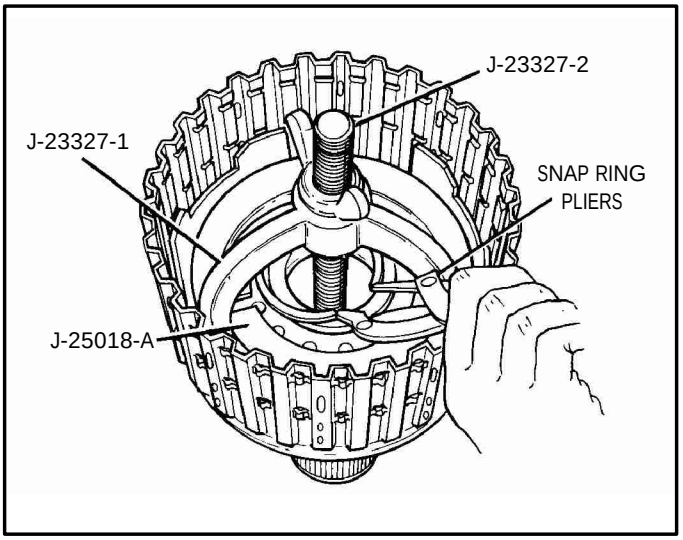
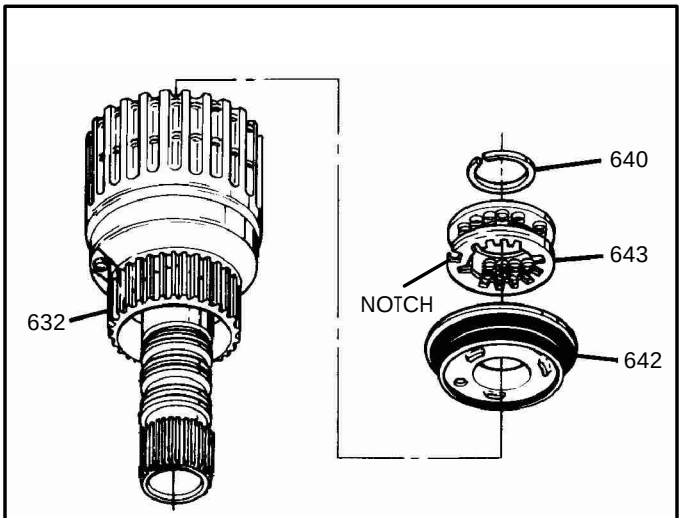


Figure 119



632 INPUT/3RD CLUTCH HOUSING ASSEMBLY
640 3RD CLUTCH RETURN SPRING SNAP RING
642 3RD CLUTCH MOLDED PISTON ASSEMBLY
643 3RD CLUTCH RETURN SPRING ASSEMBLY

Figure 120

COMPONENT REBUILD (Cont'd)

Input/3rd Clutch Housing Assembly (Cont'd)

18. Lubricate the 3rd clutch molded piston and install into 3rd clutch housing, as shown in Figure 120.
19. Install the 3rd clutch piston return spring onto the 3rd clutch piston, using care to orient the return spring so that notch in the return spring fits around the ball capsule (See Figure 120).
20. Compress 3rd clutch return spring and install the snap ring, as shown in Figure 121.
21. Install the thrust bearing (644) into input/3rd clutch housing, as shown in Figure 122. This thrust bearing "Snaps" into place, so ensure it is fully seated.
22. Install the 3rd clutch "Waved" plate into the housing, as shown in Figure 122.
23. Install the "single sided" 3rd clutch plates into housing, beginning with an "outside spline" plate first, & alternating with an "inside spline" plate, until you have installed five of each, as shown in Figure 122.
    Special Note: The lining on all single sided plates must be installed with lining facing up.
24. Install the 3rd clutch backing plate, as shown in Figure 122, with stamping "UP" facing up.
25. Install the 3rd clutch backing plate snap ring, as shown in Figure 122. This snap ring is the "Thinner" of the two backing plate snap rings.

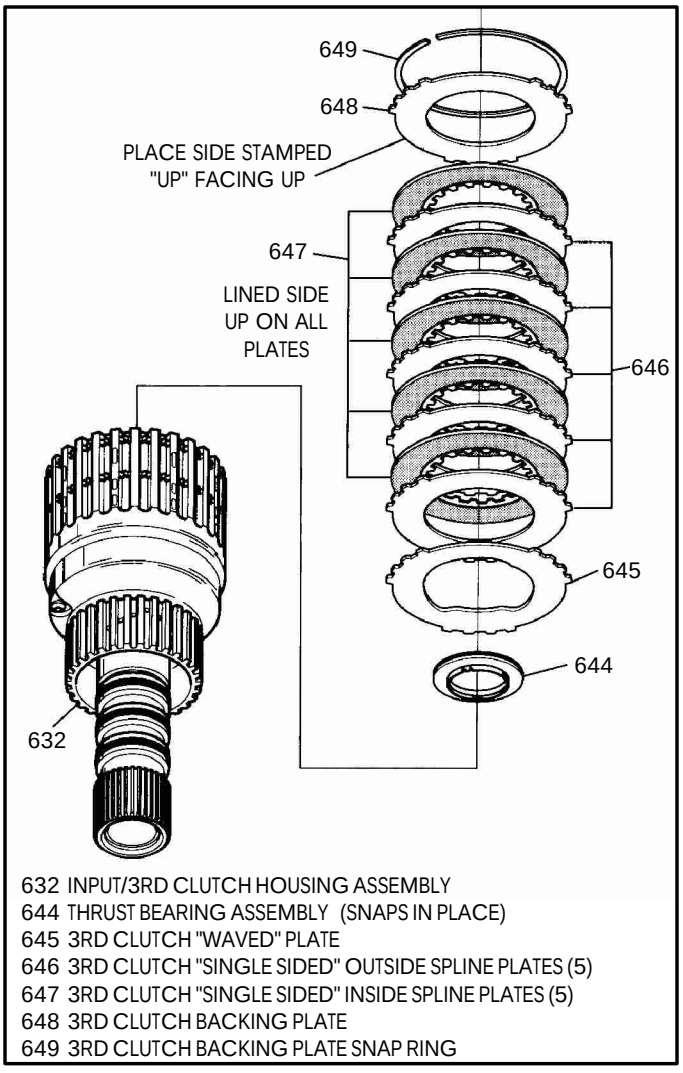


Figure 122

Continued on Page 66.

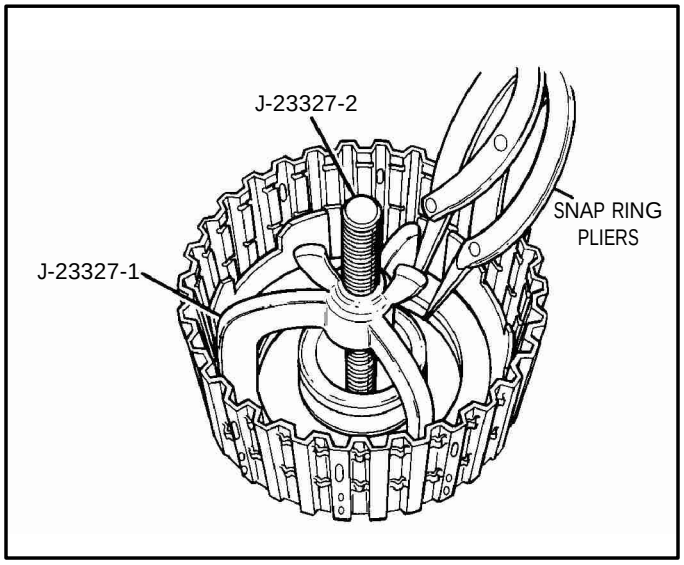
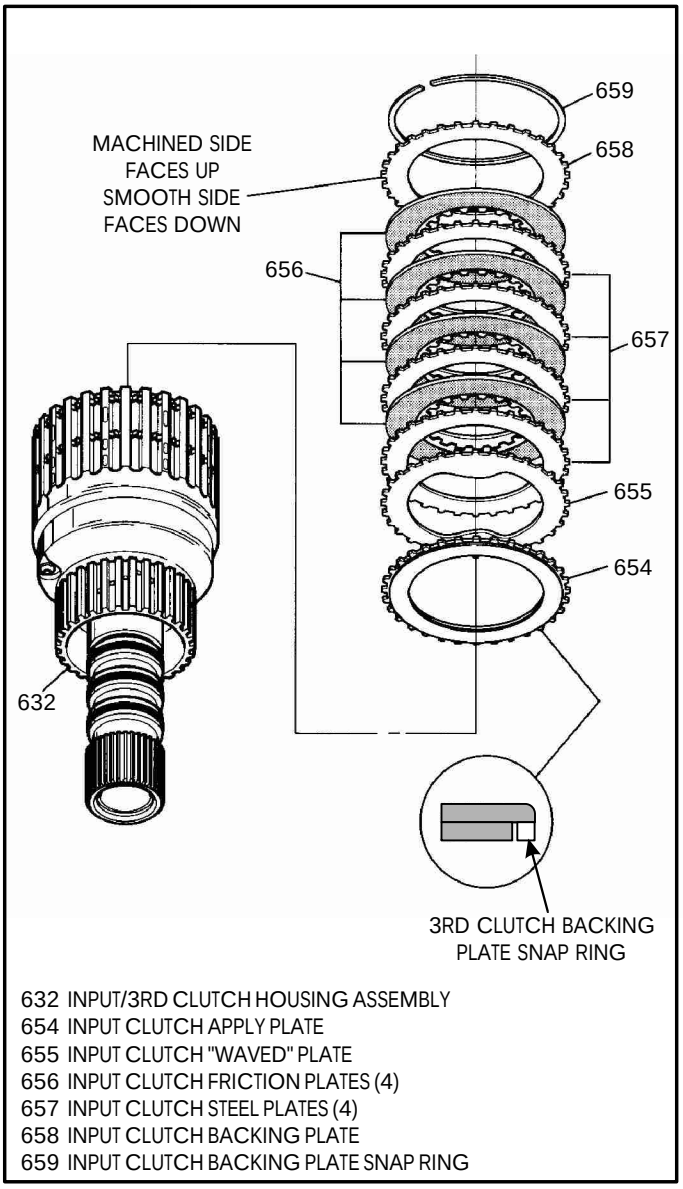


Figure 121



632 INPUT/3RD CLUTCH HOUSING ASSEMBLY
654 INPUT CLUTCH APPLY PLATE
655 INPUT CLUTCH "WAVED" PLATE
656 INPUT CLUTCH FRICTION PLATES (4)
657 INPUT CLUTCH STEEL PLATES (4)
658 INPUT CLUTCH BACKING PLATE
659 INPUT CLUTCH BACKING PLATE SNAP RING

Figure 123

COMPONENT REBUILD (Cont'd)

Input/3rd Clutch Housing Assembly (Cont'd)

26. Install the input clutch apply plate into the input/3rd clutch housing with the notched side facing down against the 3rd clutch snap ring, as shown in Figure 123.
27. Install the input clutch "Waved" plate into the housing, as shown in Figure 123.
28. Install input clutches into housing beginning with a steel plate and alternating with a lined plate, until you have installed four of each, as shown in Figure 123.
29. Install the input clutch backing plate with the smooth side facing down (See Figure 123).
30. Install the input clutch backing plate snap ring, as shown in Figure 123.
31. Using a rubber tipped air nozzle, apply air pressure regulated to maximum 30 psi to hole marked "D" as shown in Figure 125 and listen for 3rd clutch to apply.
32. Apply maximum 30 psi to hole marked "C", as shown in Figure 125 and listen for input clutch to apply.
33. Adjust J-34741-1 so that the bottom of the seal installer matches the correct seal ring groove, as shown in Figure 124.
34. Lube the first sealing ring with transaxle fluid and position it on J-34741-1.
35. Using J-34741-2, quickly slide the seal into the seal groove, as shown in Figure 124.
36. Repeat steps 33, 34, and 35 for the remaining two seals.
37. Install resizing tool J-34741-3 over the seals with a twisting motion to size the oil seals, as shown in Figure 124.
38. Leave the resizing tool in place and set aside, until you are ready to install input housing in the final assembly process.

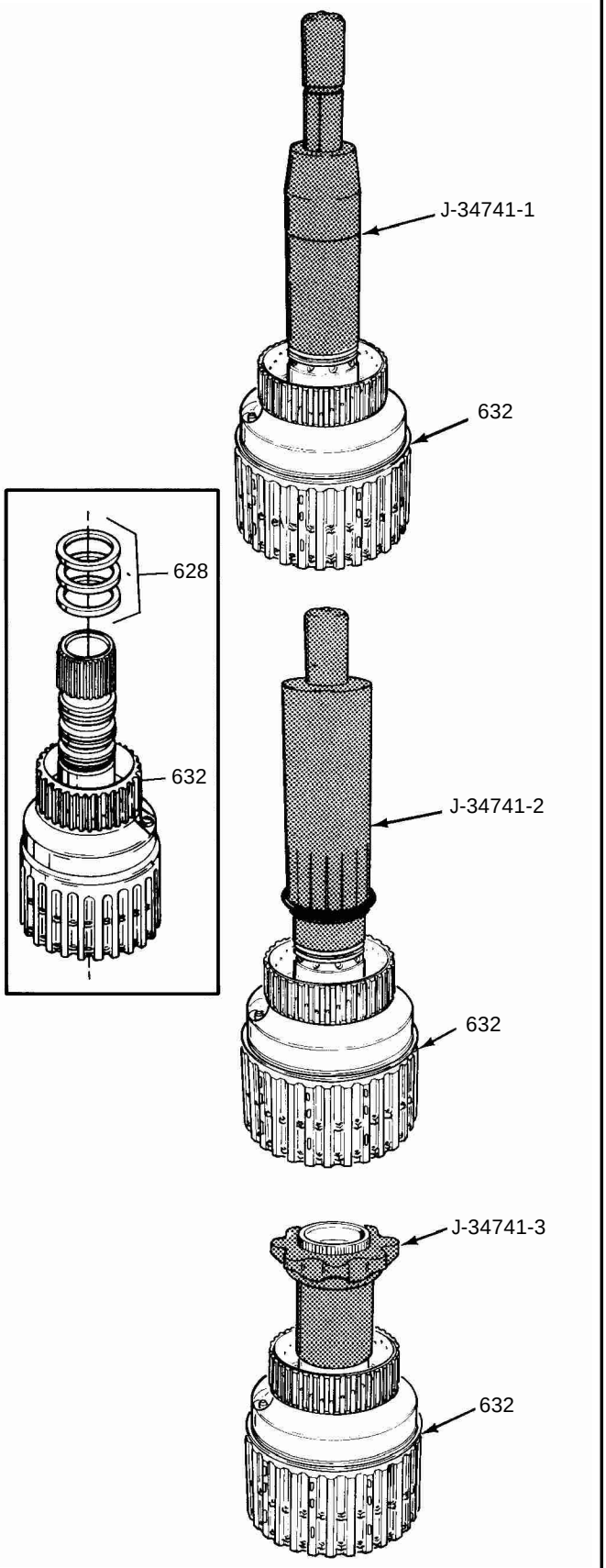
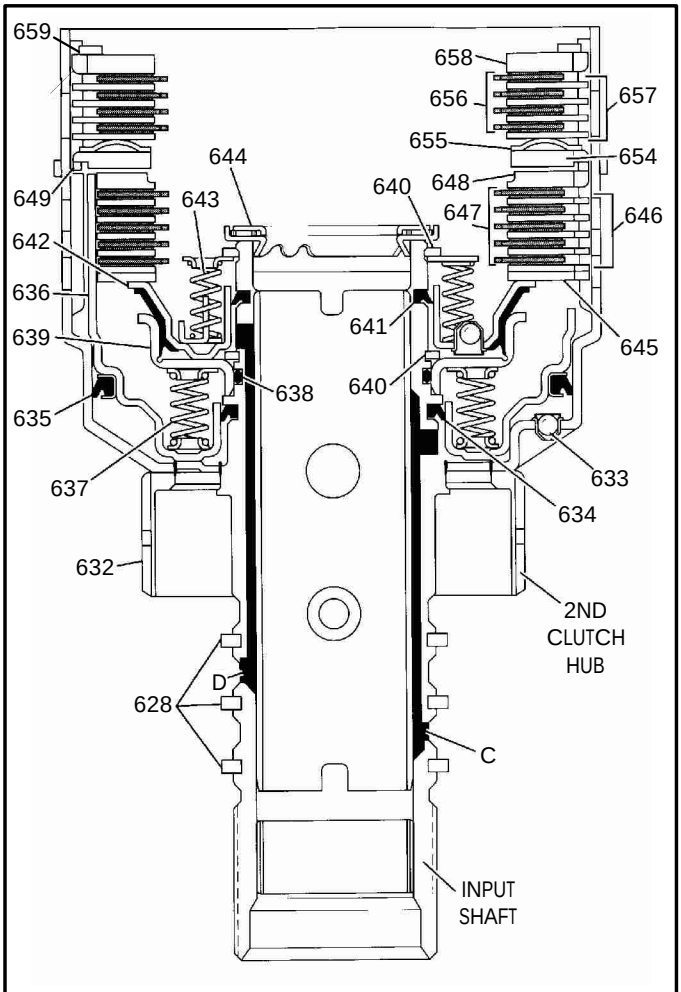


Figure 124



D INPUT CLUTCH FEED
C 3RD CLUTCH FEED

628 SOLID TEFLON OIL SEALING RINGS (3)
632 INPUT/3RD CLUTCH HOUSING ASSEMBLY
633 INPUT CLUTCH BALL CAPSULE
634 INPUT CLUTCH PISTON INNER LIP SEAL
635 INPUT CLUTCH OUTER LIP SEAL
636 INPUT CLUTCH PISTON
637 INPUT CLUTCH RETURN SPRING ASSEMBLY
638 3RD CLUTCH HOUSING "O" RING SEAL
639 3RD CLUTCH HOUSING
640 SNAP RINGS (2)
641 3RD CLUTCH PISTON INNER LIP SEAL
642 3RD CLUTCH MOLDED PISTON
643 3RD CLUTCH RETURN SPRING ASSEMBLY
644 THRUST BEARING ASSEMBLY
645 3RD CLUTCH "WAVED" PLATE
646 3RD CLUTCH "SINGLE SIDED" OUTSIDE SPLINE PLATES (5)
647 3RD CLUTCH "SINGLE SIDED" INSIDE SPLINE PLATES (5)
648 3RD CLUTCH BACKING PLATE
649 3RD CLUTCH BACKING PLATE SNAP RING
654 INPUT CLUTCH APPLY PLATE
655 INPUT CLUTCH "WAVED" PLATE
656 INPUT CLUTCH FRICTION PLATES (4)
657 INPUT CLUTCH STEEL PLATES (4)
658 INPUT CLUTCH BACKING PLATE
659 INPUT CLUTCH BACKING PLATE SNAP RING

Figure 125

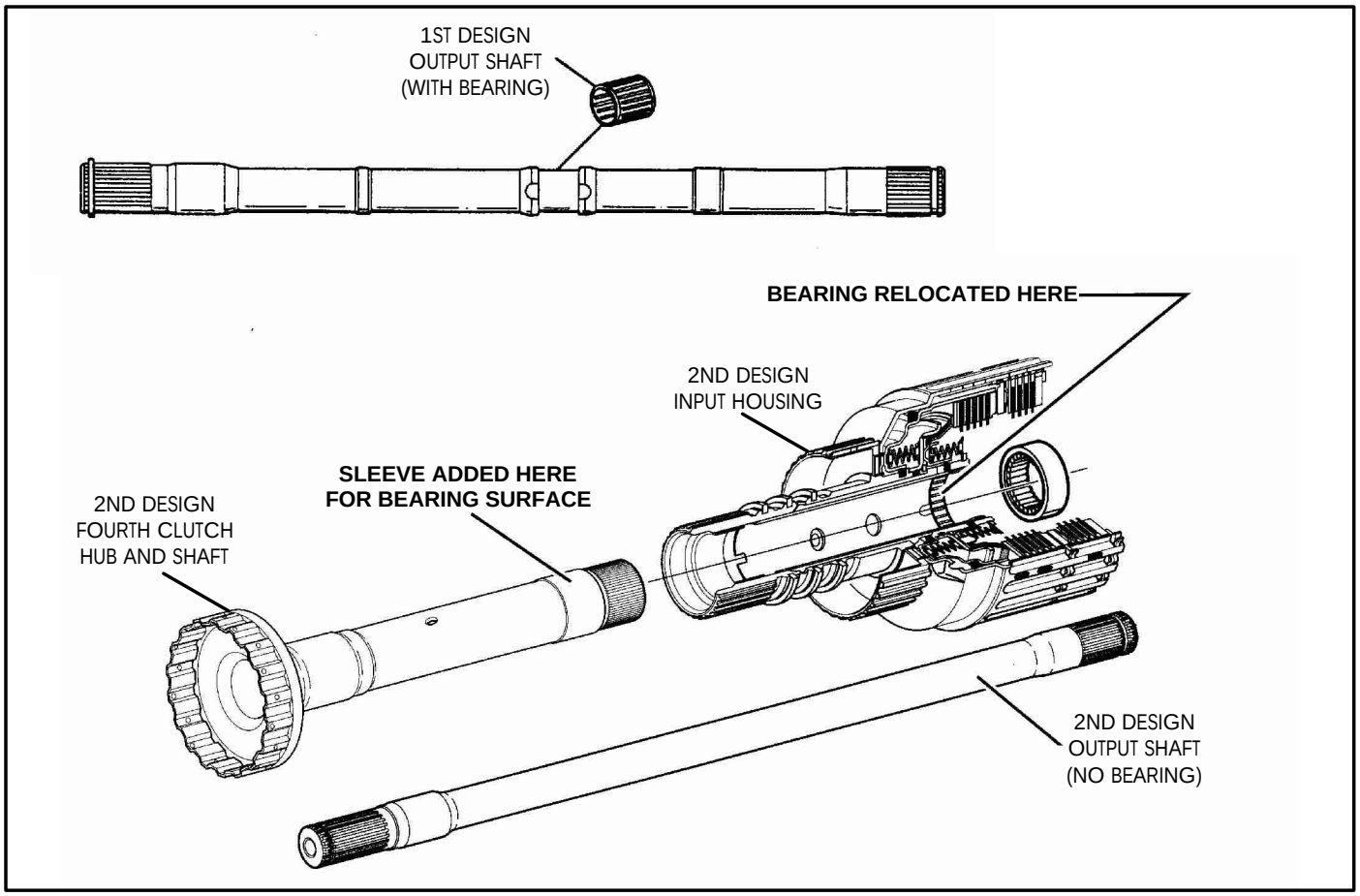


Figure 126

COMPONENT REBUILD (Cont'd)

Input/3rd Clutch Housing Changes & Updates

The input sun gear bearing and machined journal on the output shaft was removed from the output shaft as a running change during the 1993 model year. There was a new bearing added to the input/3rd clutch housing and a hardened sleeve added to the 4th clutch hub and shaft, as shown in Figure 126. The hardened sleeve now rides in the added caged needle bearing in the input housing to support the input sun gear instead of the previous bearing on the output shaft. Refer to Figure 126.

These changes were made to eliminate vibration concerns and does affect servicing the unit if parts replacement becomes necessary.

These components are not compatable with previous components, but will back service to 1991 when all parts are used as a package.

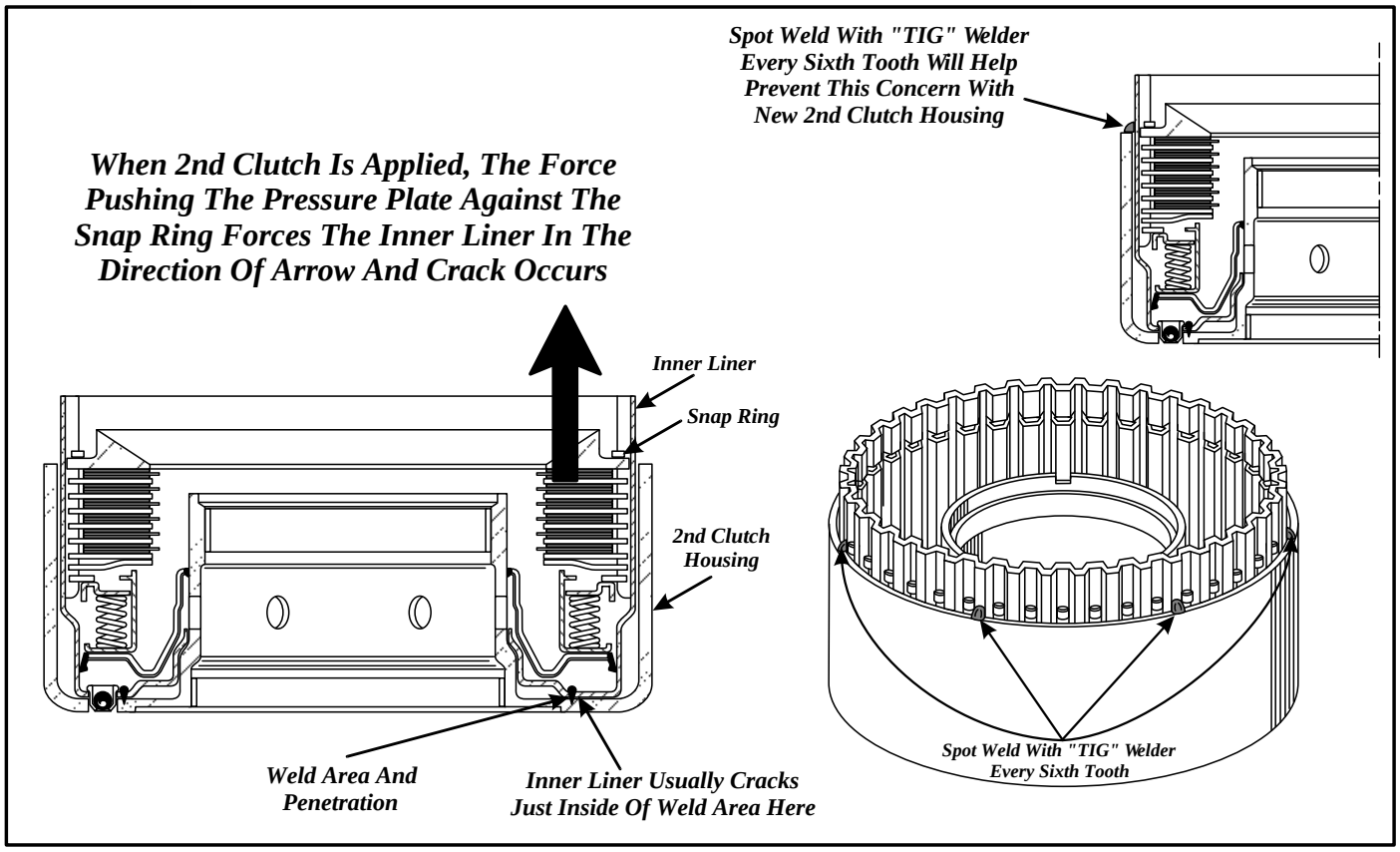


Figure 127

COMPONENT REBUILD (Cont'd)

2nd Clutch Housing Assembly

1. Disassemble the 2nd clutch housing assembly using Figure 129 as a guide.
2. Inspect all 2nd clutch housing parts thoroughly for any wear and/or damage.

2nd Clutch Housing Inspection

Special care must be used when inspecting the 2nd Clutch Housing to determine if the 2nd Clutch Housing Inner Liner is cracked. When this inner liner, that is "TIG" welded into the housing, is cracked it is impossible to detect with an air check of the 2nd clutch housing. The inner liner is cracked because of second clutch pressure applying force against the pressure plate snap ring. With the weld point being much inboard of the pressure point the inner liner will crack just outside of the weld, as illustrated in Figure 127.

The only successfull way to determine if the drum is cracked, is to pry upward on the inner liner using a screwdriver, with a ***very small*** amount of oil left in the bottom of the housing.

There ***must*** be a new 2nd Clutch Housing installed into the unit, as the cracked one cannot be successfully repaired. To prevent this from occuring again, spot weld the inner liner to the on the new second clutch housing with a "TIG" welder every sixth tooth around the housing, as illustrated in Figure 127.

Usually the unit comes in with the 2nd clutches destroyed and after rebuild, you ***will once again*** experience a condition of premature 2nd clutch failure, if you do not inspect properly now.

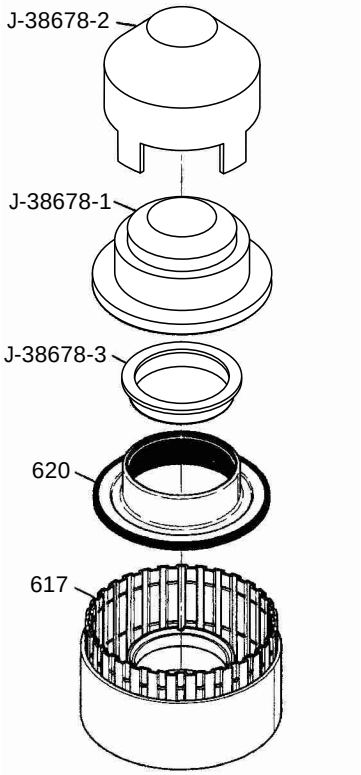
Continued on Page 70.

COMPONENT REBUILD (Cont'd)

2nd Clutch Housing Assembly

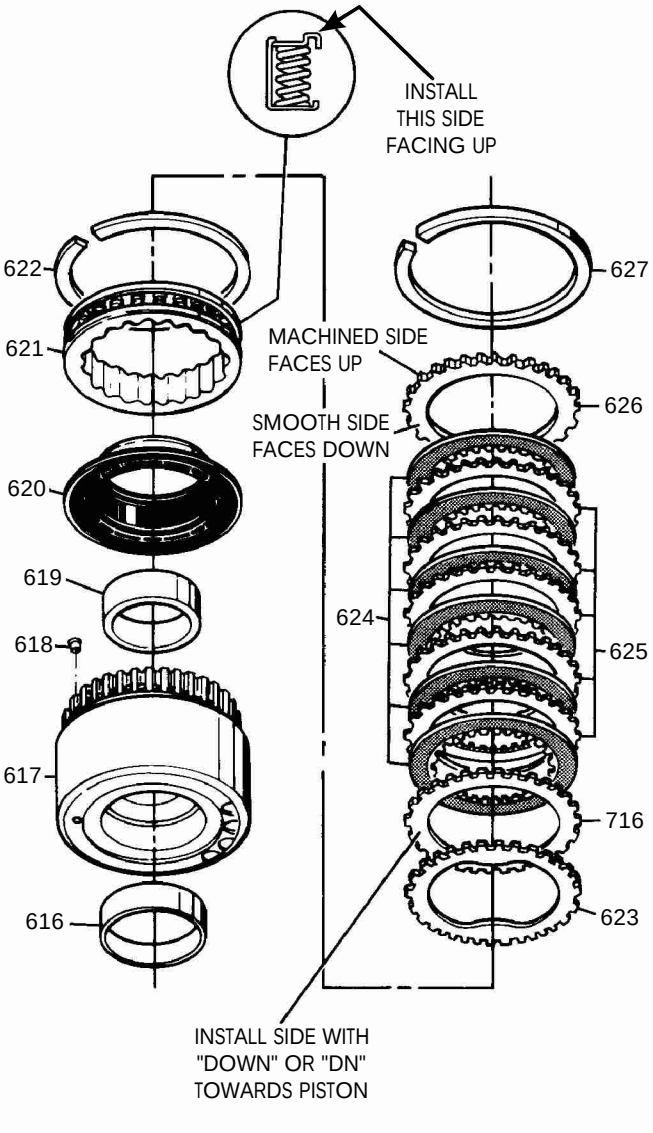
3. Clean all 2nd clutch housing parts with a good cleaning solution and dry with compressed air.
4. Lubricate the seal surfaces in the 2nd clutch housing with small amount of Trans-Jel®.
5. Lubricate the molded seals on the 2nd clutch piston with small amount of Trans-Jel®.
6. Install the 2nd clutch piston into the 2nd clutch housing with a twisting motion until it is fully seated (See Figure 129).
   Note: There are special installation tools available for 2nd clutch piston, as shown in Figure 128.
7. Install the 2nd clutch piston apply ring and return spring assembly, in the direction shown in Figure 129.
8. Install the 2nd clutch return spring snap ring into the bottom snap ring groove and ensure that it is fully seated.
   Note: If return spring is installed upside down, you will have no upshift.

Continued on Page 71.



617 2ND CLUTCH HOUSING ASSEMBLY
620 2ND CLUTCH MOLDED PISTON

Figure 128



616 BUSHING (NOT SERVICED)
617 2ND CLUTCH HOUSING ASSEMBLY
618 2ND CLUTCH HOUSING BALL CAPSULE
619 BUSHING (NOT SERVICED)
620 2ND CLUTCH MOLDED PISTON
621 2ND CLUTCH APPLY RING AND RETURN SPRING ASM
622 2ND CLUTCH RETURN SPRING SNAP RING
623 2ND CLUTCH "WAVED" PLATE
624 2ND CLUTCH FRICTION PLATES (6)
625 2ND CLUTCH STEEL PLATES (4)
626 2ND CLUTCH BACKING PLATE
627 2ND CLUTCH BACKING PLATE SNAP RING
716 2ND CLUTCH APPLY PLATE (TAPERED)

Figure 129

COMPONENT REBUILD (Cont'd)

2nd Clutch Housing Assembly (Cont'd)

9. Install the 2nd clutch "Waved" plate on top of return spring, as shown in Figure 129.
10. Install the 2nd clutch apply plate into housing as shown in Figure 129. The side stamped with "DOWN" or "DN" should be installed towards the piston.
11. Install the 2nd clutch plates beginning with a friction plate and alternating with steel plates until you have installed 6 friction and 4 steel plates, as shown in Figure 129 and130.
12. Install 2nd clutch backing plate with smooth side facing the last friction (See Figure 130).
13. Install the 2nd clutch backing plate snap ring, as shown in Figure 129 and 130.
14. Set the completed 2nd clutch housing aside for the final assembly process.

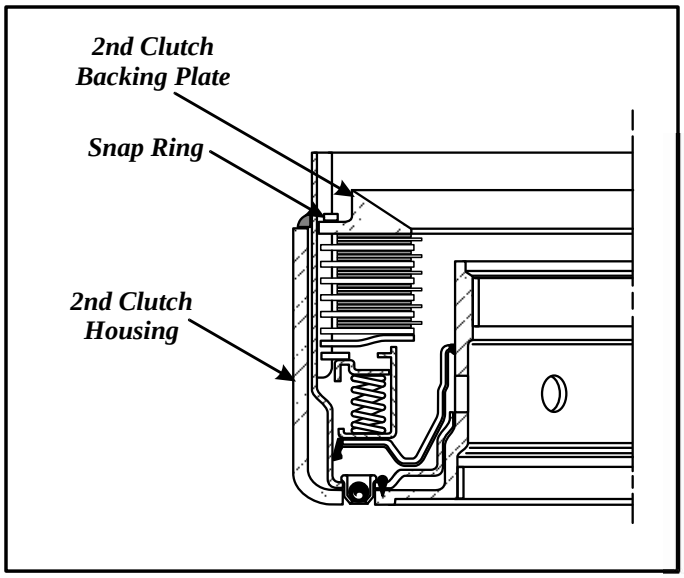


Figure 130

COMPONENT REBUILD (Cont'd)

Turbine Shaft Sealing Rings

1. Cut the oil sealing rings to remove them, and there is no need to remove turbine shaft from drive sprocket unless they are damaged.
2. Place J-29569-1 installer over the turbine shaft as shown in Figure 131, and coat with a small amount of Trans-Jel®.
3. Slide new turbine shaft seal over the installer and into position, as shown in Figure 131.
4. Repeat this procedure for the second seal ring on that same side of turbine shaft.
5. Place seal resizer J-29569-2 over the installed oil seal rings, as shown in Figure 131 and leave in place.
6. Place J-29829-1 installer over the opposite side of the turbine shaft (See Figure 131).
7. Slide new turbine shaft seal over the installer and into position.
8. Place seal resizer J-29829-2 over the installed oil seal rings and leave in place (Figure 131).

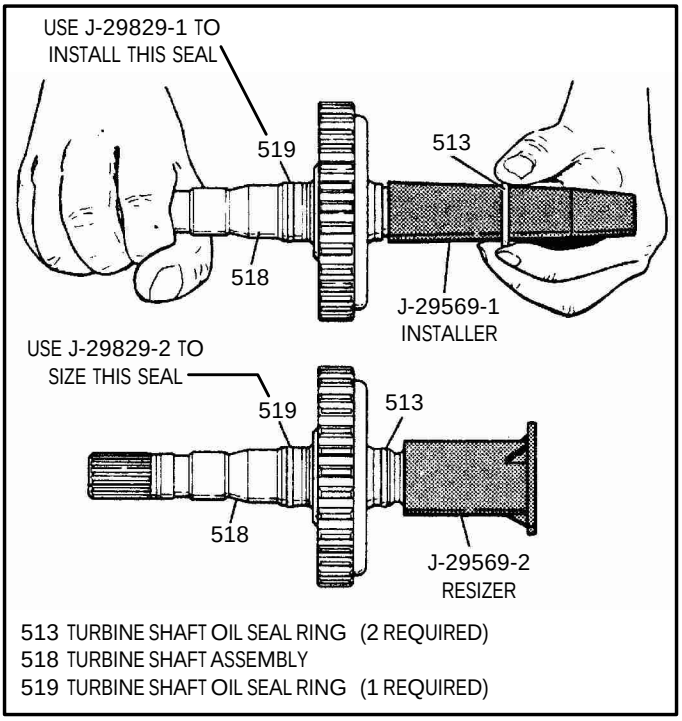


Figure 131

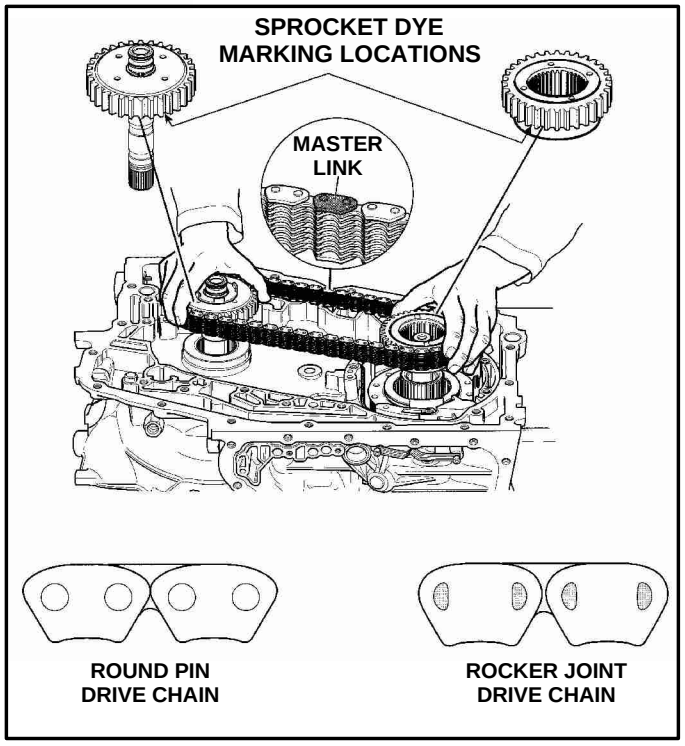


Figure 132

COMPONENT REBUILD (Cont'd)

Driven Chain And Sprockets

1. Install thrust washer on front side of the drive sprocket, as shown in Figure 133, and retain with Trans-Jel®.
2. Install thrust washers on both sides of driven sprocket, as shown in Figure 133, and retain with Trans-Jel®.
3. Set both sprockets aside for final assembly and leave the seal resizers in place.

Driven Chain And Sprocket "Changes"

The drive chain changed from a "Round" pin design to a "Rocker Joint" design in late 1993, and the type of drive chain that you are using can be identified by the shape of the pins, as shown in Figure 132.

The new design "Rocker Joint" drive chain required the tooth pitch and diameter of the sprockets to be changed at the same time, to accommodate the new design drive chain.

These changes may now create problems if parts replacement becomes necessary for any of the parts that we have mentioned. We will try to make this as easy as we can for identification.

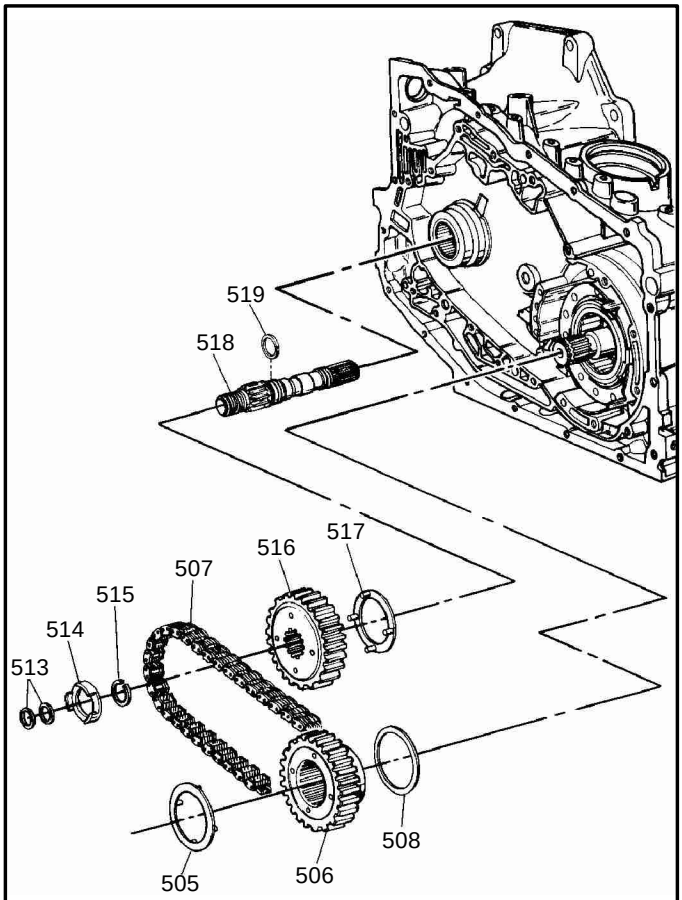
DRIVE CHAIN AND SPROCKET IDENTIFICATION

Driven Chain "Identification"

The drive chain changed from a "Round" pin design to a "Rocker Joint" design in late 1993, and the type of drive chain that you are using can be identified by the shape of the pins, as shown in Figure 132.

Another identification is the color of the master link. The "Rocker Joint" design master links are "Copper" in color, while the "Round" pin design master links are "Black" in color.

However, we have seen some of the "Rocker Joint" design drive chains with Black master links, so it is best to identify them with the shape of the pins, as shown in Figure 132.



505 4TH CLUTCH HUB/DRIVEN SPROCKET THRUST WASHER
506 DRIVEN SPROCKET ASSEMBLY
507 DRIVE CHAIN ASSEMBLY
508 DRIVEN SPROCKET TO SUPPORT THRUST WASHER
513 TURBINE SHAFT OIL SEAL RINGS (2 REQUIRED)
514 CHANNEL PLATE TO DRIVE SPROCKET THRUST WASHER
515 TURBINE SHAFT TO DRIVE SPROCKET SNAP RING
516 DRIVE SPROCKET ASSEMBLY
517 DRIVE SPROCKET TO SUPPORT THRUST WASHER
518 TURBINE SHAFT ASSEMBLY
519 TURBINE SHAFT OIL SEAL RING (1 REQUIRED)

Figure 133

Sprocket "Identification"

The new design "Rocker Joint" sprockets were marked in the locations shown in Figure 132 with the part number in Red dye. ***However***, the Red dye may wear off while the unit is in service.

We have provided you with the diameters of both design sprockets in the chart below for positive identification.

Drive Sprocket	*"Round" Pin Outside Dia.*	*"Rocker Joint" Outside Dia.*
37 Tooth	*4.233"*	*4.181"*
33 Tooth	*3.756"*	*3.700"*
Driven Sprocket	*"Round" Pin Outside Dia.*	*"Rocker Joint" Outside Dia.*
33 Tooth	*3.756"*	*3.700"*
37 Tooth	*4.233"*	*4.181"*

OEM PART NUMBERS

Listed below are the OEM part numbers for both 1st design "Round" Pin, and 2nd design "Rocker Joint" drive and driven sprockets. These part numbers were current at the time of printing this manual. Keep in mind that we have no control over when part numbers may change, but they will usually supercede to the current part number.

Drive Sprocket	*"Round" Pin Design*	*"Rocker Joint" Design*
37 Tooth	*8644679*	*8682597*
33 Tooth	*8651568*	*8682599*
35 Tooth	*8644677*	*8682598*
Driven Sprocket	*"Round" Pin Design*	*"Rocker Joint" Design*
33 Tooth	*8675035*	*8682600*
37 Tooth	*8678146*	*8682602*
35 Tooth	*8675036*	*8682601*
	"Round" Pin Design	*"Rocker Joint" Design*
Drive Chain	*8660099*	*8682603*

"Interchangeability" Information

The 2nd design "Rocker Joint" drive chain is not compatable with previous 1st design sprockets, nor is 1st design "Round" Pin drive chain compatable with 2nd design sprockets. Compatable parts ***must*** be used together.

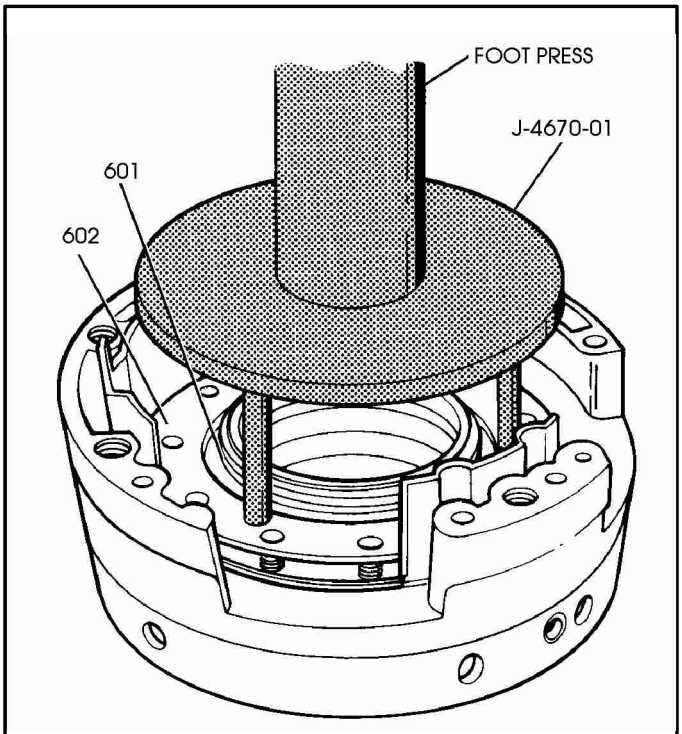
The "Rocker Joint" drive chain will back service all previous models, when used with the 2nd design sprockets.

COMPONENT REBUILD (Cont'd)

Driven Sprocket Support

1. Compress the 4th clutch return spring assembly and remove snap ring, as shown in Figure 134.
2. Remove the driven sprocket support parts using Figure 136 as a guide.
3. Remove and discard both of the 4th clutch lip seals (See Figure 136).
4. Inspect all driven sprocket support parts for any wear and/or damage.
5. Clean all driven sprocket support parts in good cleaning solution and dry with compressed air.

Continued on Page 74.



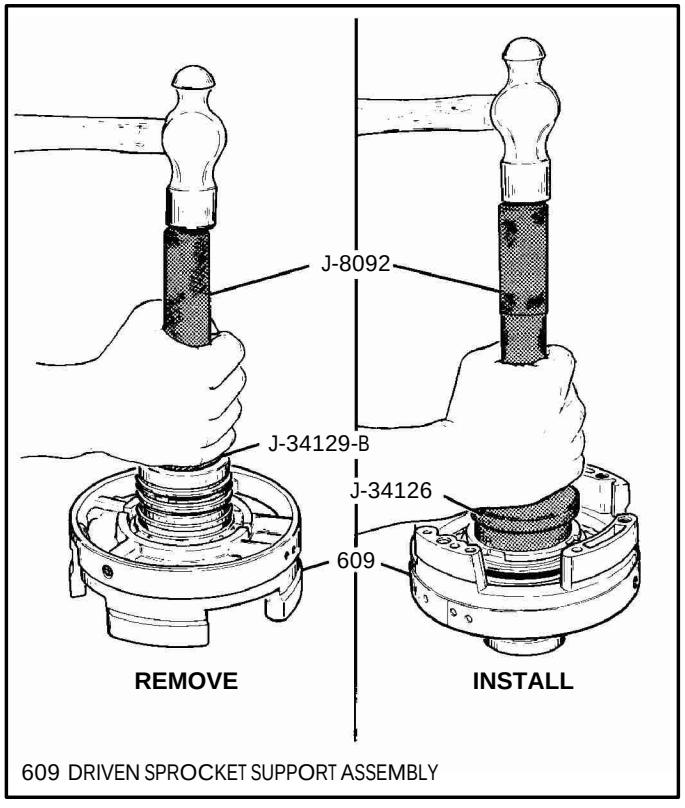
601 4TH CLUTCH RETURN SPRING SNAP RING
602 4TH CLUTCH PISTON RETURN SPRING ASSEMBLY

Figure 134

COMPONENT REBUILD (Cont'd)

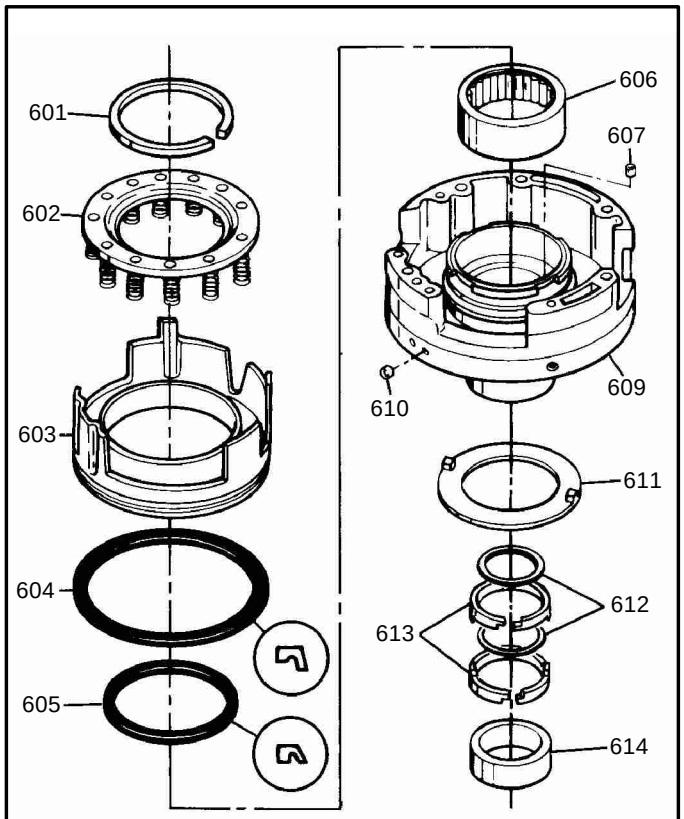
Driven Sprocket Support

6. If it becomes necessary to replace the driven sprocket support caged needle bearing, use the tools and drivers illustrated in Figure 135 to remove and install the bearing.
7. Install new 4th clutch piston seal into groove in piston, with the lip facing in the direction shown in Figure 136, and lube with Trans-Jel®.
8. Install new 4th clutch piston seal into groove in driven sprocket support, with lip facing in the direction shown in Figure 136, and lube with small amount of Trans-Jel®.
9. Install the 4th clutch piston into driven sprocket support, as shown in Figure 136.
   Note: Refer to Figure 138 for changes.
10. Install the 4th clutch piston return spring on top of the piston, as shown in Figure 136.
11. Compress return spring assembly, as shown in Figure 134, and install snap ring.
12. Turn driven sprocket support over and install new four lobbed rubber rings into the grooves in sprocket support (See Figures 136 & 137).
    Note: Ensure that the 4 lobe rubber rings are not twisted after installation.
13. Install the 2nd clutch sealing rings on top of the 4 lobe rubber rings (See Figures 136 & 137).
14. Install driven sprocket support assembly into the 2nd clutch drum assembly, as shown in Figure 137.
15. Apply air pressure regulated to 20 psi to feed hole marked "2", as shown in Figure 137, and listen for 2nd clutches to apply and hold the air pressure for 5 seconds.
16. Apply air pressure regulated to 20 psi to feed hole marked "4", as shown in Figure 137, and watch for 4th clutch piston to apply.
    Caution: Release air pressure immediately, to avoid injury, as continued pressure on 4th clutch piston will blow it out of support.
17. Remove the driven sprocket support from the 2nd clutch drum and set aside for the final assembly process.



609 DRIVEN SPROCKET SUPPORT ASSEMBLY

Figure 135



601 4TH CLUTCH RETURN SPRING SNAP RING
602 4TH CLUTCH PISTON RETURN SPRING ASSEMBLY
603 4TH CLUTCH PISTON ASSEMBLY
604 4TH CLUTCH PISTON "OUTER" LIP SEAL
605 4TH CLUTCH PISTON "INNER" LIP SEAL
606 DRIVEN SPROCKET SUPPORT CAGED NEEDLE BEARING
607 ORIFICE CUP PLUG
610 CUP PLUG
611 DRIVEN SPRKT. SUPP./2ND CLUTCH DRUM THRUST WASHER
612 FOUR LOBBED RING SEAL
613 2ND CLUTCH SEALING RINGS (PEAK)
614 DRIVEN SPROCKET SUPPORT BUSHING (NOT SERVICED)

Figure 136

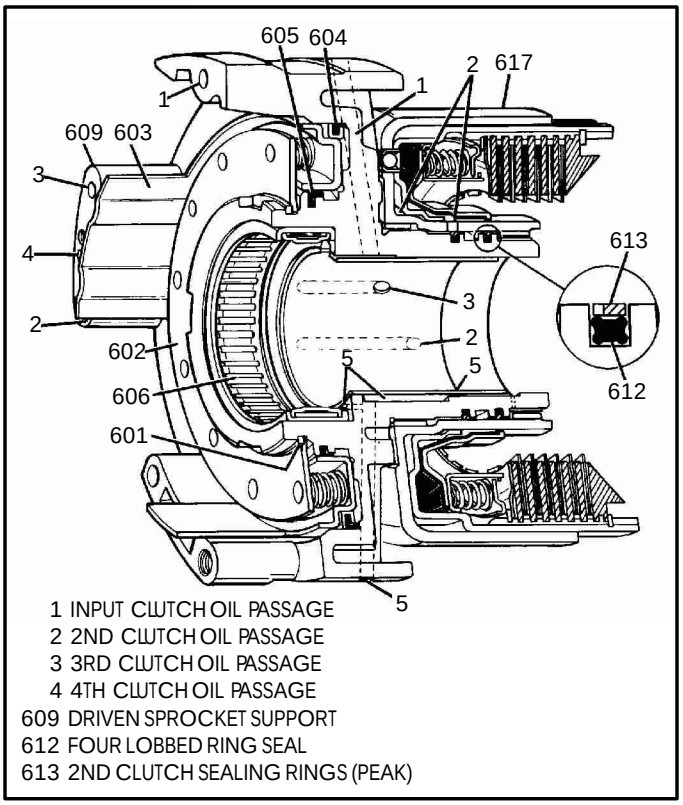


Figure 137

4th Clutch Parts Changes

The 4th clutch plates, both lined and steel plates, changed in the 1993 model year. All of the dimensional changes are illustrated in Figure 138, and this includes the 4th clutch piston assembly.

Caution: Whenever servicing a 4T60-E transaxle, compare and verify all of the components listed above that are removed, are identical to the new replacement components before reinstalling, as they are NOT interchangeable. (See Figure 138).

"Component Rebuild"
Continued on Page 77.

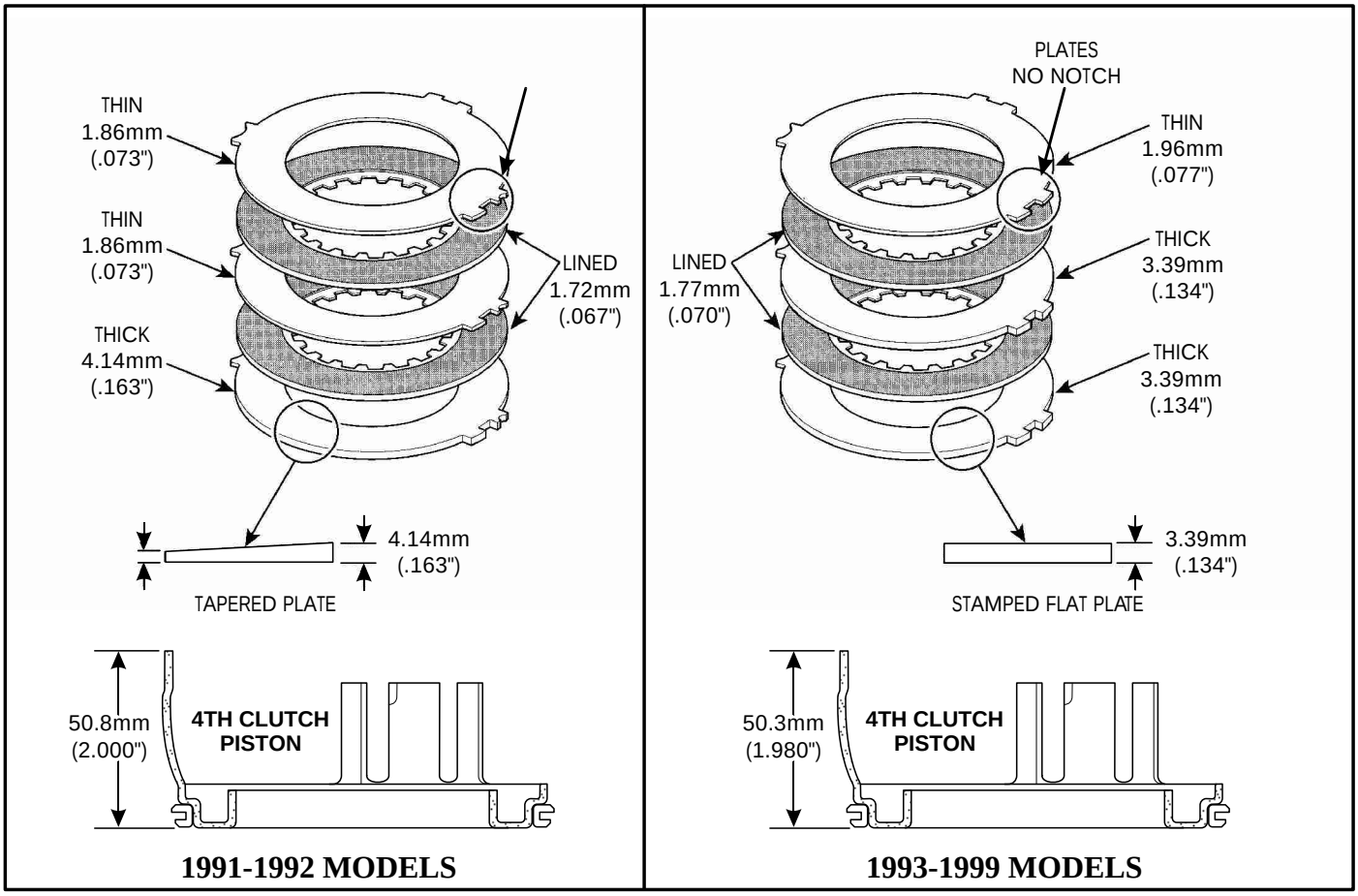
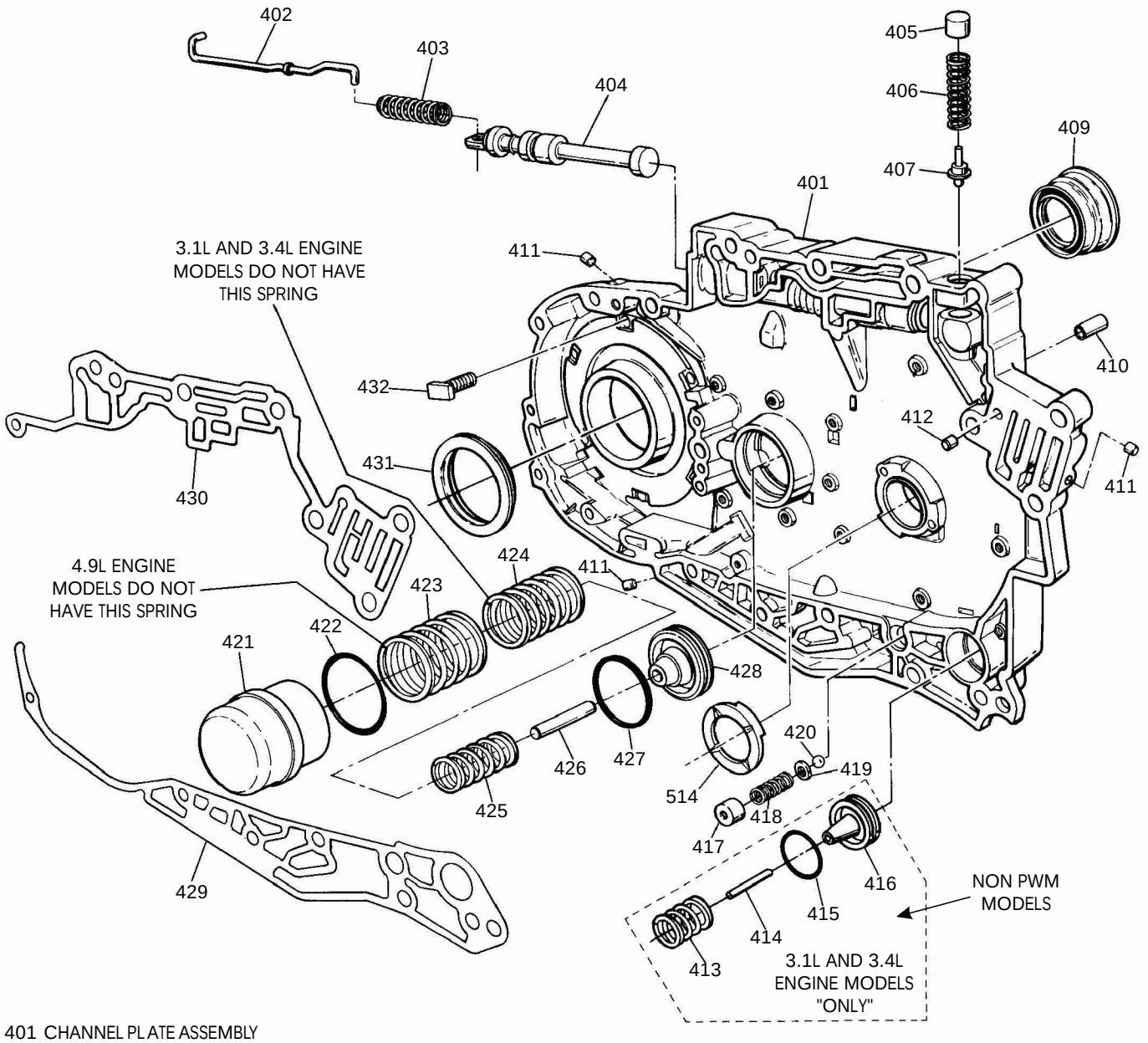


Figure 138



401 CHANNEL PLATE ASSEMBLY
402 MANUAL VALVE LINK
403 MANUAL VALVE LINK RETAINER
404 MANUAL VALVE
405 LOW BLOW OFF PLUG
406 LOW BLOW OFF VALVE SPRING
407 LOW BLOW OFF VALVE
409 LEFT HAND AXLE SEAL
410 VALVE BODY ALIGNMENT SLEEVE
411 CUP PLUGS
412 ORIFICED CUP PLUG
413 TCC ACCUMULATOR SPRING (SOME MODELS)
414 TCC ACCUMULATOR PIN (SOME MODELS)
415 TCC ACCUMULATOR SEAL (SOME MODELS)
416 TCC ACCUMULATOR PISTON (SOME MODELS)
417 TCC BLOW OFF CUP PLUG
418 TCC BLOW OFF SPRING
419 TCC BLOW OFF SPRING SEAT
420 TCC BLOW OFF BALL (.375" DIAMETER)

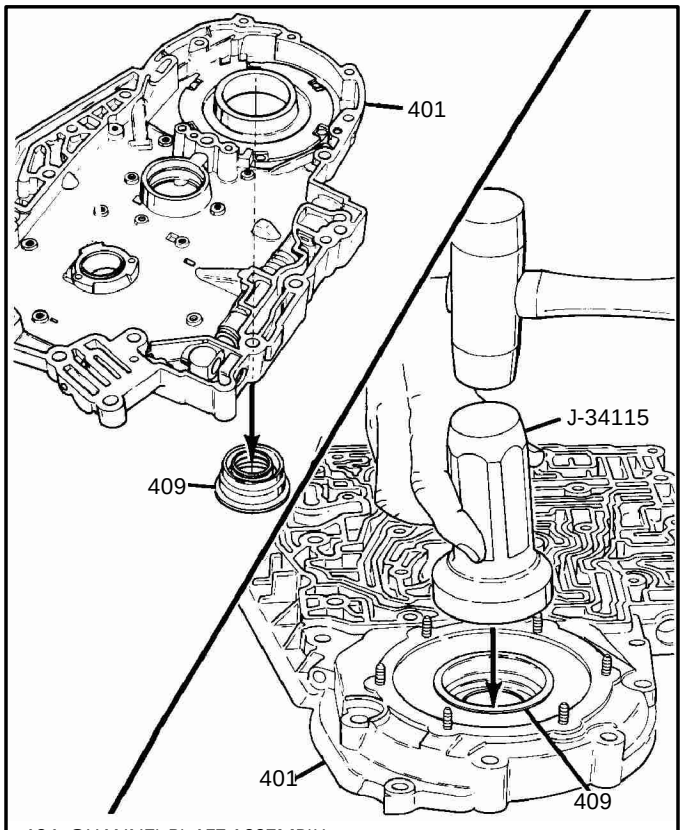
421 3-4 ACCUMULATOR COVER
422 3-4 ACCUMULATOR COVER "O" RING SEAL
423 3-4 ACCUMULATOR OUTER SPRING (SOME MODELS)
424 3-4 ACCUMULATOR CENTER SPRING (SOME MODELS)
425 3-4 ACCUMULATOR INNER SPRING (SOME MODELS)
426 3-4 ACCUMULATOR PISTON PIN
427 3-4 ACCUMULATOR PISTON SEAL RING
428 3-4 ACCUMULATOR PISTON
429 LOWER CHANNEL PLATE GASKET
430 UPPER CHANNEL PLATE GASKET
431 4TH CLUTCH HUB TO CHANNEL PLATE THRUST BEARING
432 CHANNEL PLATE STUD TO SIDE COVER (SOME MODELS)
514 DRIVE SPROCKET TO CHANNEL PLATE THRUST WASHER

Figure 139

COMPONENT REBUILD (Cont'd)

Channel Plate Assembly

1. Disassemble the channel plate assembly using Figure 139 as a guide.
2. Inspect all channel plate parts thoroughly for any wear and/or damage.
3. Clean all channel plate parts thoroughly and dry with compressed air.
4. Remove and discard all rubber seals from the accumulator pistons.
5. Remove the left hand axle seal from channel plate using proper seal driver (See Figure 140).
6. Install the left hand axle seal into the channel plate, using the J-34115 seal driver, as shown in Figure 140.
7. Install the TCC accumulator piston with a new seal into channel plate, if used, as shown in Figure 139,
8. Install 3-4 accumulator springs into the cover, as shown in Figure 139, ensuring that you have the proper springs for model you are building.
9. Install 3-4 accumulator piston into the cover with a new seal, as shown in Figure 139.



401 CHANNEL PLATE ASSEMBLY
409 LEFT HAND AXLE SEAL ASSEMBLY

Figure 140

Channel Plate Assembly (Cont'd)

10. Install the 3-4 accumulator pin through the piston in cover (See Figure 139).
11. Install the 3-4 accumulator assembly into the channel plate, using a new "O" ring seal, as shown in Figure 139.
12. Install drive sprocket to channel plate thrust washer onto channel plate, retain with a small amount of Trans-Jel®. (See Figure 139).
13. Install the 4th clutch hub to channel plate thrust bearing, by pressing it into channel plate, as shown in Figure 139.
14. Install the manual valve with link and retainer into channel plate, as shown in Figure 139.
15. Set the completed channel plate assembly aside for the final assembly process.

COMPONENT REBUILD (Cont'd)

CHANNEL PLATE AND VALVE BODY CHANGES IN 1993-1999 MODELS

Beginning at start the of production for 1993 model 4T60-E transaxles, a complete hydraulics change was implemented to improve shift feel, TCC apply and overall durability of the unit.

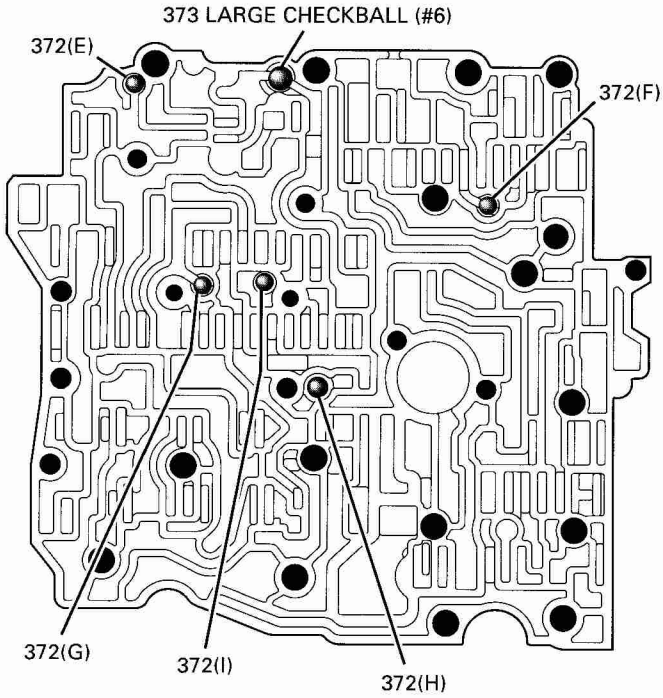
The parts that were affected by this change were the valve body casting, spacer plate, channel plate and both valve body gaskets. Refer to Figures 141, 142, 143, and 144, to identify the differences between the 91/92 hydraulics and the 93/99 hydraulics.

Caution: NONE of the parts listed above will interchange with previous design level parts. If you change one piece you must change them all.
The 93/99 hydraulics will back service all models when all pieces are used as a service package and are recommended.

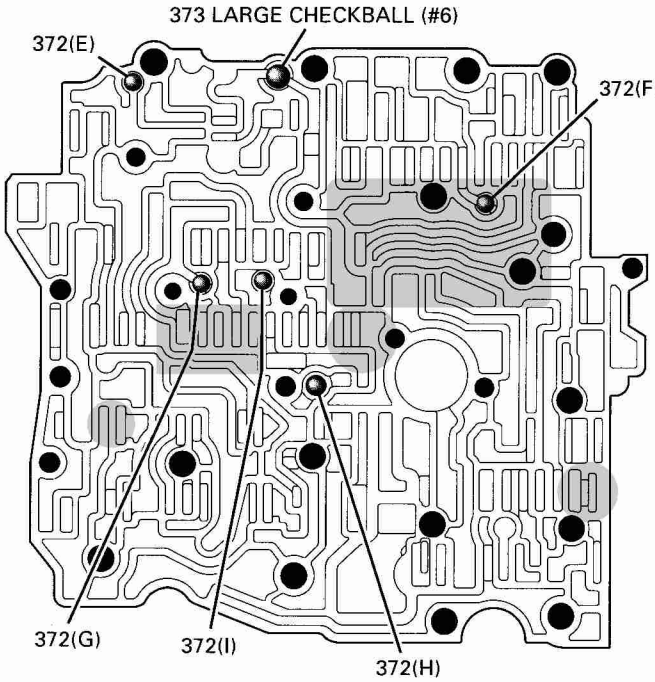
Please refer to Figures 141, 142, 143, and 144, to identify the differences in the two design levels.

"Component Rebuild"
Continued on Page 83.

1991-1992 VALVE BODY
"CHANNEL PLATE SIDE"

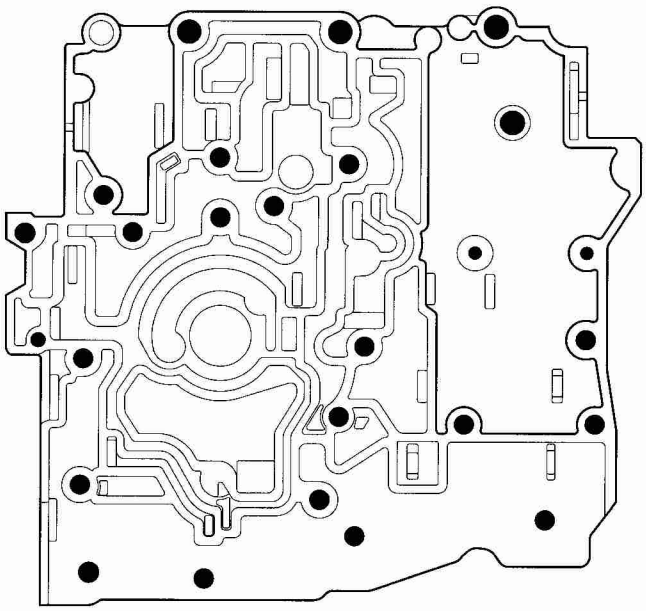


1993-1999 VALVE BODY
"CHANNEL PLATE SIDE"

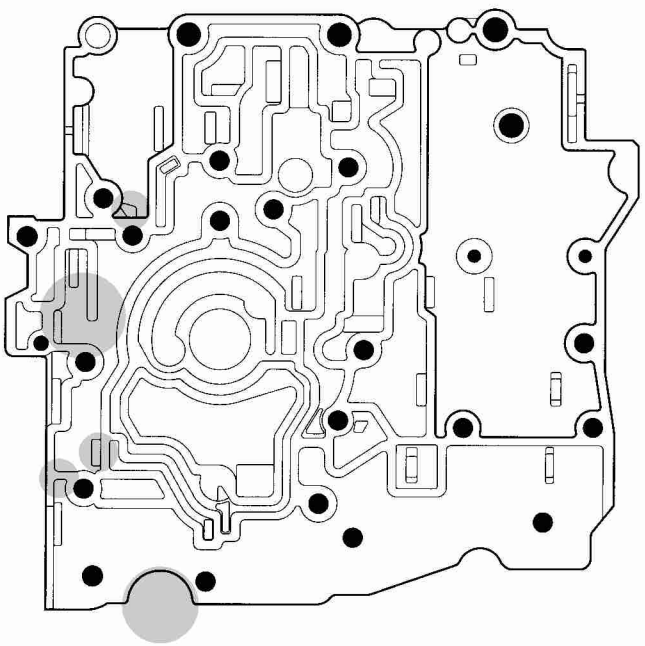


Gray Areas
Indicate Changes

1991-1992 VALVE BODY
"PUMP SIDE"



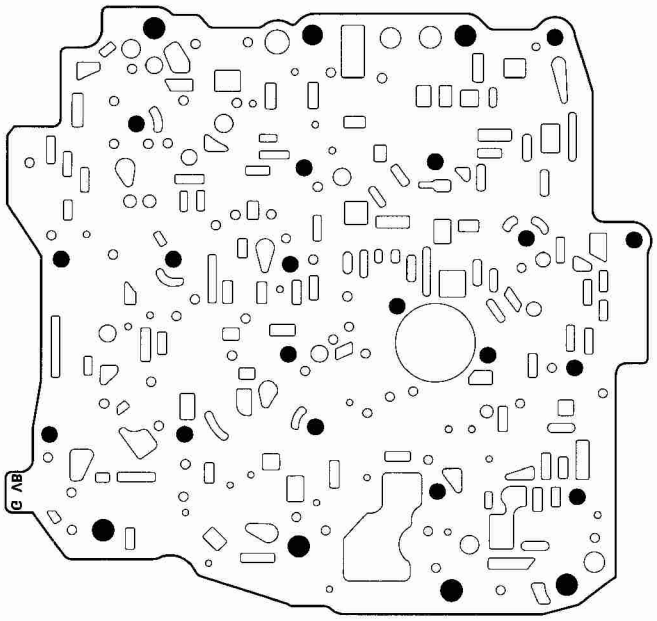
1993-1999 VALVE BODY
"PUMP SIDE"



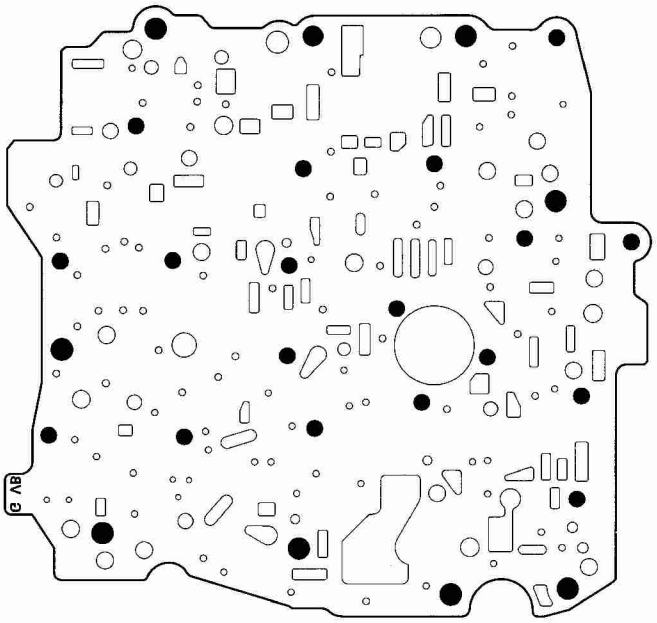
Gray Areas
Indicate Changes

Figure 141

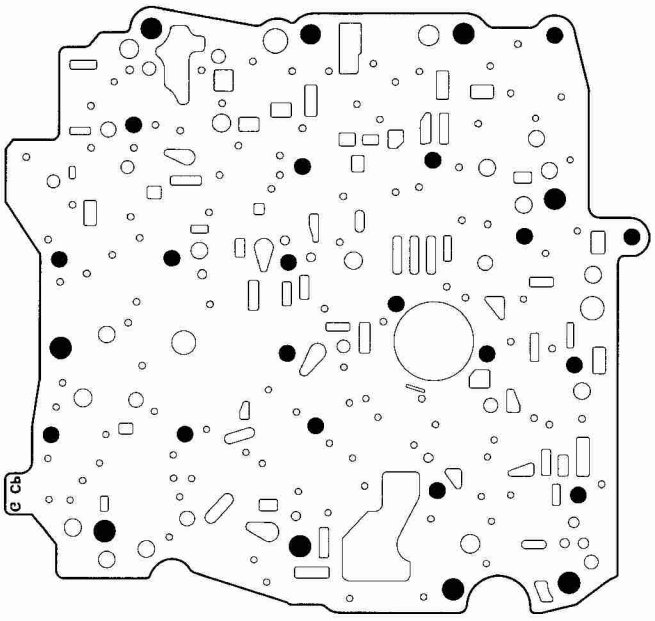
1991-1992 VALVE BODY TO SPACER PLATE GASKET



1993-1999 VALVE BODY TO SPACER PLATE GASKET



1991-1992 SPACER PLATE TO CHANNEL PLATE GASKET



1993-1999 SPACER PLATE TO CHANNEL PLATE GASKET

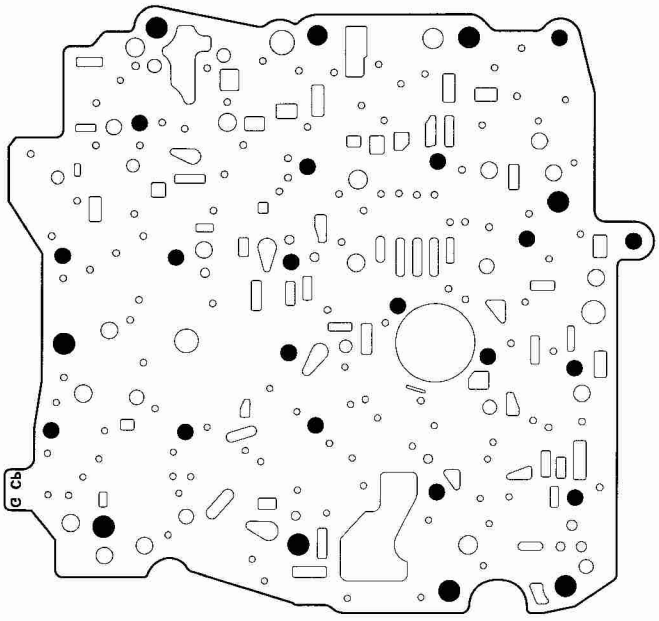


Figure 142

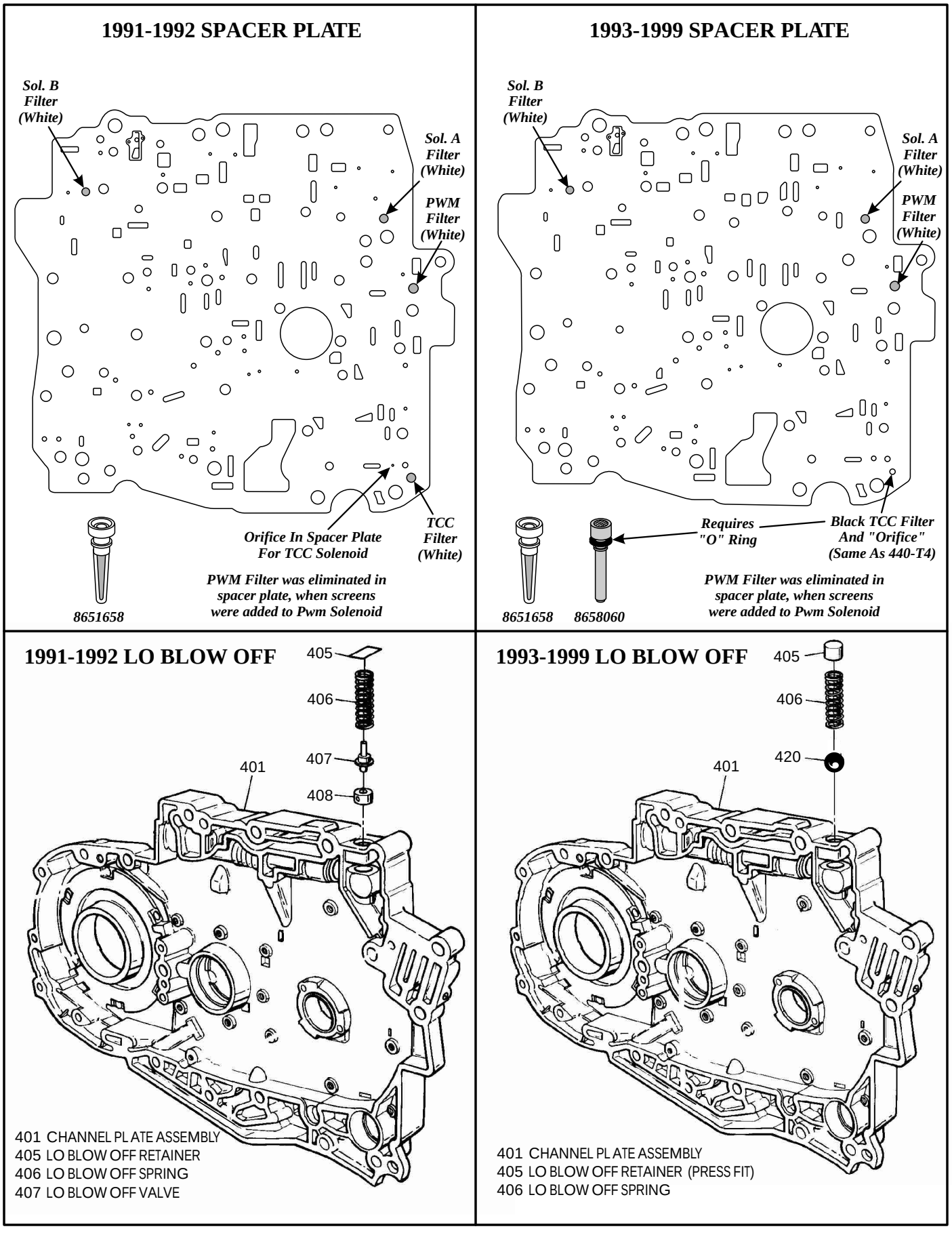
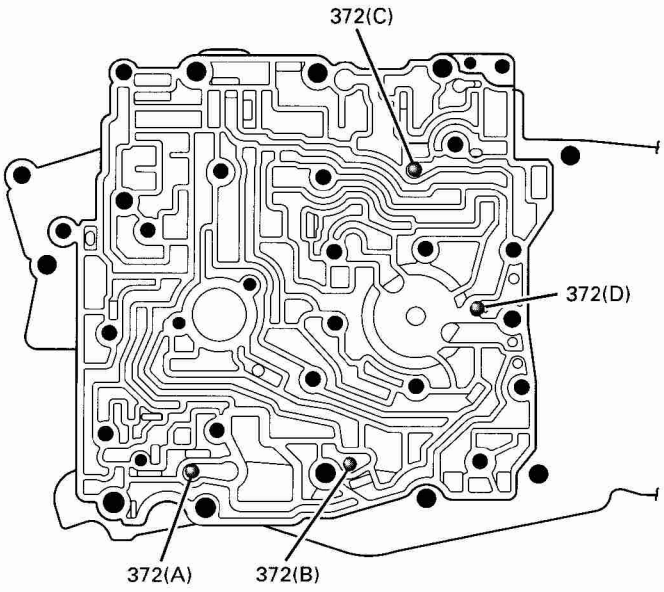
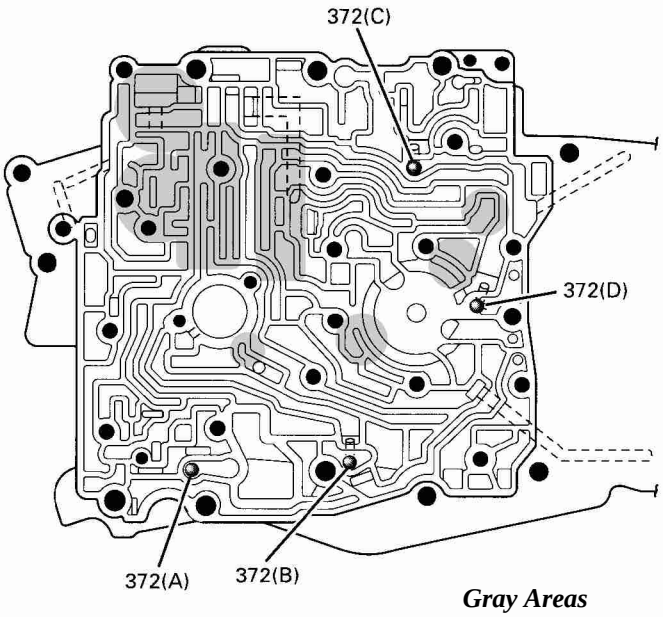


Figure 143

1991-1992 CHANNEL PLATE "VALVE BODY SIDE"

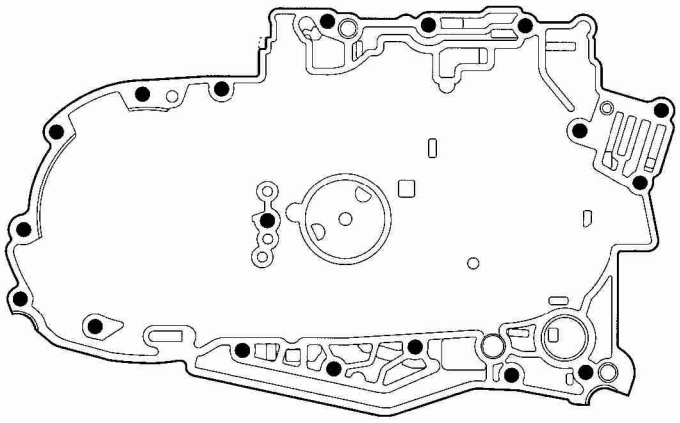


1993-1999 CHANNEL PLATE "VALVE BODY SIDE"

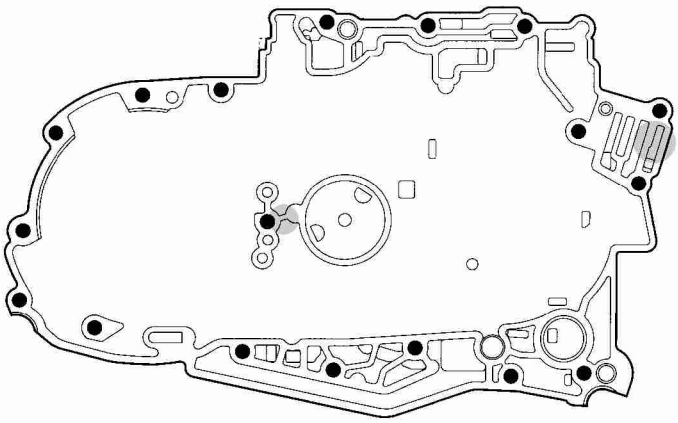


Gray Areas Indicate Changes

1991-1992 CHANNEL PLATE "CASE SIDE"

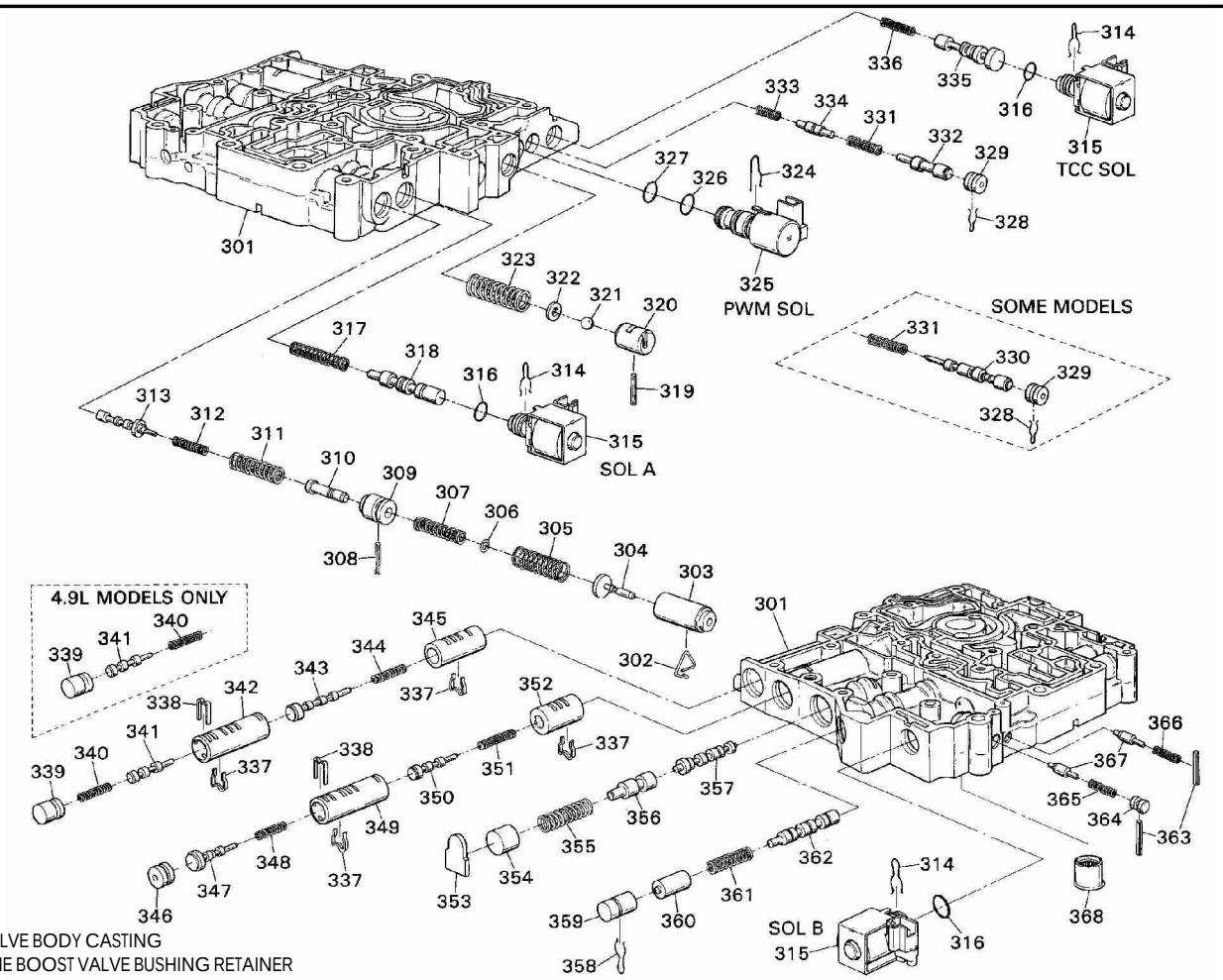


1993-1999 CHANNEL PLATE "CASE SIDE"



Gray Areas Indicate Changes

Figure 144



301 VALVE BODY CASTING
302 LINE BOOST VALVE BUSHING RETAINER
303 LINE BOOST VALVE BUSHING
304 LINE BOOST VALVE
305 LINE BOOST VALVE SPRING
306 REVERSE BOOST VALVE "E" CLIP
307 REVERSE BOOST VALVE SPRING
308 ROLLED PIN
309 REVERSE BOOST VALVE SLEEVE
310 REVERSE BOOST VALVE
311 OUTER PRESSURE REGUL ATOR VALVE SPRING
312 INNER PRESSURE REGUL ATOR VALVE SPRING
313 PRESSURE REGUL ATOR VALVE
314 SOLENOID RETAINING CLIP
315 SHIFT SOLENOID "A"
316 SHIFT SOLENOID "O" RING
317 1-2 SHIFT VALVE SPRING
318 1-2 SHIFT VALVE
319 ROLLED PIN
320 PUMP PRESSURE RELIEF BUSHING
321 PUMP PRESSURE RELIEF BALL (.375" DIAMETER)
322 PUMP PRESSURE RELIEF SPRING SEAT
323 PUMP PRESSURE RELIEF SPRING
324 PWM SOLENOID RETAINING CLIP
325 PWM SOLENOID ASSEMBLY
326 PWM SO LENOID "O" RING
327 PWM SO LENOID "O" RING
328 TCC REGULATOR PLUG RETAINER
329 TCC REGULATOR PLUG
330 TCC REGULATOR VALVE
331 TCC REGULATOR VALVE SPRING
332 TCC REGULATOR VALVE
333 TCC REGULATOR VALVE SPRING
334 TCC REGULATOR VALVE
335 CONVERTER CLUTCH APPLY VALVE
336 CONVERTER CLUTCH APPLY VALVE SPRING
337 VALVE BODY SLEEVE RETAINER
338 VALVE BODY SLEEVE RETAINER
339 PRIMARY 1-2 ACCUMULATOR PLUG
340 PRIMARY 1-2 ACCUMULATOR VALVE SPRING
341 PRIMARY 1-2 ACCUMULATOR VALVE
342 PRIMARY 1-2 ACCUMULATOR VALVE BUSHING
343 2-3 ACCUMULATOR VALVE
344 2-3 ACCUMULATOR VALVE SPRING
345 2-3 ACCUMULATOR VALVE BUSHING
346 SECONDARY 1-2 ACCUMULATOR VALVE PLUG
347 SECONDARY 1-2 ACCUMULATOR VALVE
348 SECONDARY 1-2 ACCUMULATOR VALVE SPRING
349 SECONDARY 1-2 ACCUMULATOR VALVE BUSHING
350 3-4 ACCUMULATOR VALVE
351 3-4 ACCUMULATOR VALVE SPRING
352 3-4 ACCUMULATOR VALVE BUSHING
353 2-3 SHIFT RETAINER
354 2-3 SHIFT VALVE BORE PLUG
355 3-2 DOWNSHIFT VALVE SPRING
356 3-2 MANUAL DOWNSHIFT VALVE
357 2-3 SHIFT VALVE
358 3-4 SHIFT VALVE BORE PLUG RETAINER
359 3-4 SHIFT VALVE BORE PLUG
360 4-3 MANUAL DOWNSHIFT VALVE
361 4-3 MANUAL DOWNSHIFT VALVE SPRING
362 3-4 SHIFT VALVE
363 ROLLED PIN
364 REVERSE SERVO BOOST VALVE BORE PLUG
365 REVERSE SERVO BOOST VALVE SPRING
366 FORWARD SERVO BOOST VALVE SPRING
367 FORWARD AND REVERSE SERVO BOOST VALVE
368 OIL PUMP DRIVE SHAFT CAGED NEEDLE BEARING

Figure 145

COMPONENT REBUILD (Cont'd)

Valve Body Assembly

1. Clean the complete valve body assembly with a good cleaning solution, and move the valves with a pick or small screwdriver to ensure that any dirt or debris is dislodged.
   Note: DO NOT clean solenoids in solvent.
2. Dry the complete valve body assembly with compressed air.
3. Place the valve body assembly on a clean, dry, flat work surface.
4. Remove and lay out the valve trains, one at a time and in order, ***exactly*** the way that they are removed, using Figure 145 as a guide.
   Note: Some valves are under spring pressure. Cover the end of the bore when removing.
5. Clean all valve body parts with a cleaning solution and dry with compressed air.
6. Inspect all valve body parts thoroughly for any wear and/or damage.
7. If it becomes necessary to replace the oil pump drive shaft caged needle bearing, remove with J-28698 as shown in Figure 146. Push out partially with tool and complete removal with screwdriver.
8. Press new bearing into place with J-28698, as shown in Figure 146, until fully seated.
9. Install new "O" rings on all solenoids and/or replace solenoids as necessary.
10. Install all of the bushings, springs, valves and solenoids, using Figure 145 as a guide.
    Note: Some configurations may vary.
11. Install five (5) 1/4" steel balls and one (1) 3/8" steel ball, in locations shown in Figure 147, and retain with ***small*** amount of Trans-Jel®.
12. Set the completed valve body assembly aside for the final assembly process.

"Component Rebuild" Continued on Page 84.

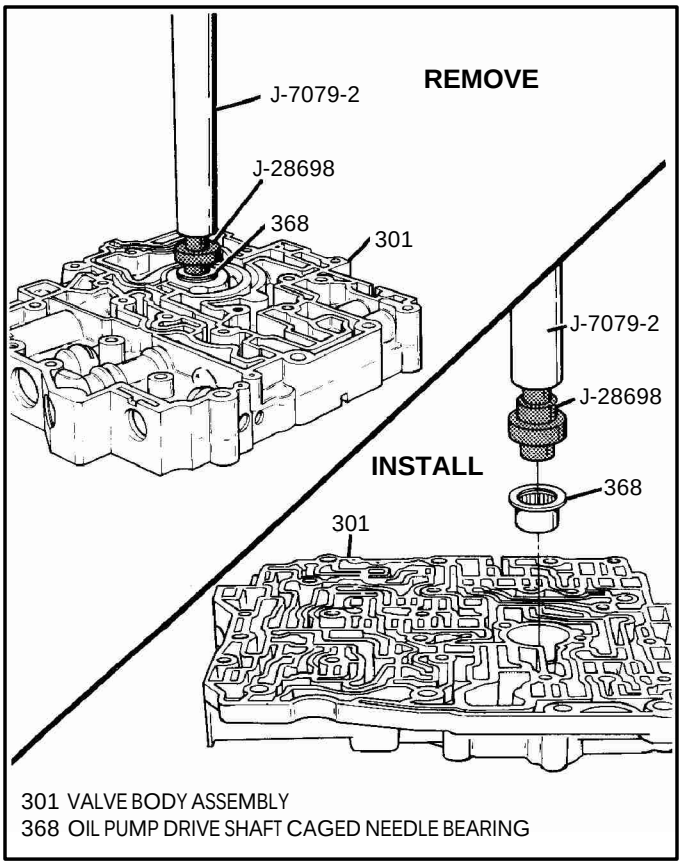


Figure 146

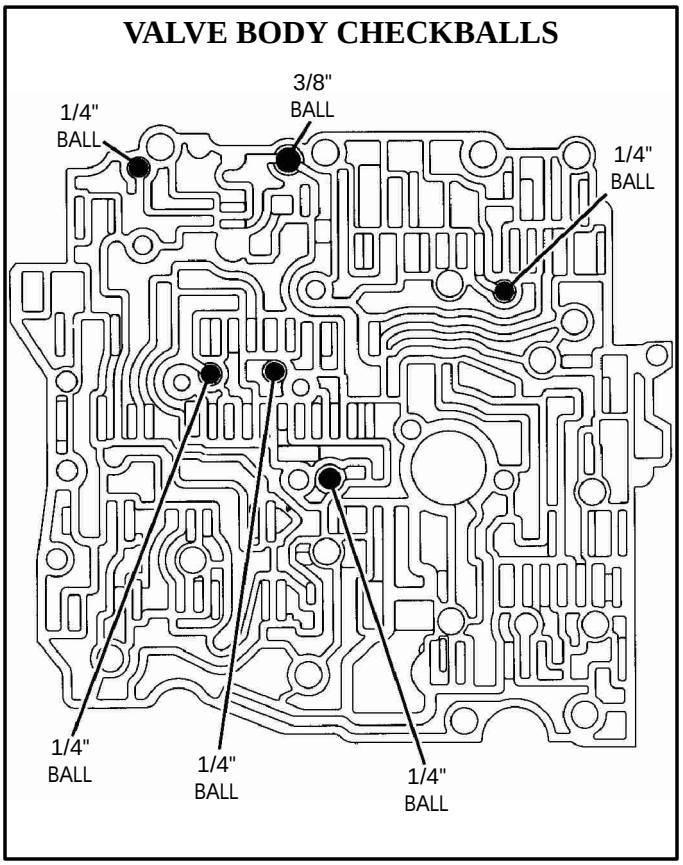


Figure 147

COMPONENT REBUILD (Cont'd)

Oil Pump "Changes"

Beginning at the start of production for 1994 models, all THM 4T60-E transaxles were produced with a new design "Tapered" pump rotor and new design pump casting with location changes for the suction passage. Refer to Figures 148, 149 and 151. Beginning at the start of production for 1996 models, another new "Light Weight" pump casting was introduced that also requires the tapered rotor. Refer to Figures 148, 149 and 152.

New tapered rotor increases pump capacity and reduces cavitation for improved durability, and the random vane spacing reduces a noise concern.

New design pump rotor is now "Tapered" instead of the previous straight rotor, as shown in Figure 148. The "L" Body and "N" Body vehicles were built using the random spacing of the pump rotor vanes (34°, 40° and 46°) similar to the 4L60-E design. All other models will use a "Tapered" rotor with equal spacing of the rotor vanes (40°) as shown in Figure 148 . All slides, rotors and vanes are still selective sizes.

The new design pump body for the tapered rotor has the suction slot in the pump pocket re-sized and moved closer to the center hole for the oil pump drive shaft as shown in Figure 149.

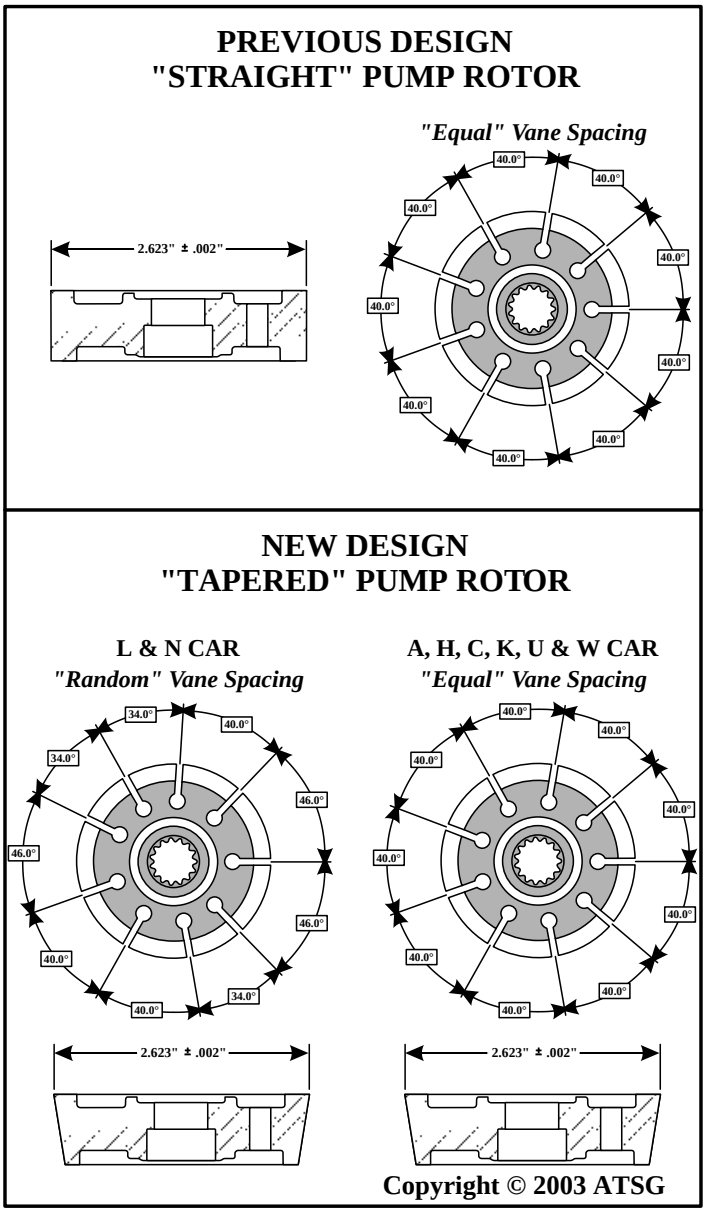


Figure 148

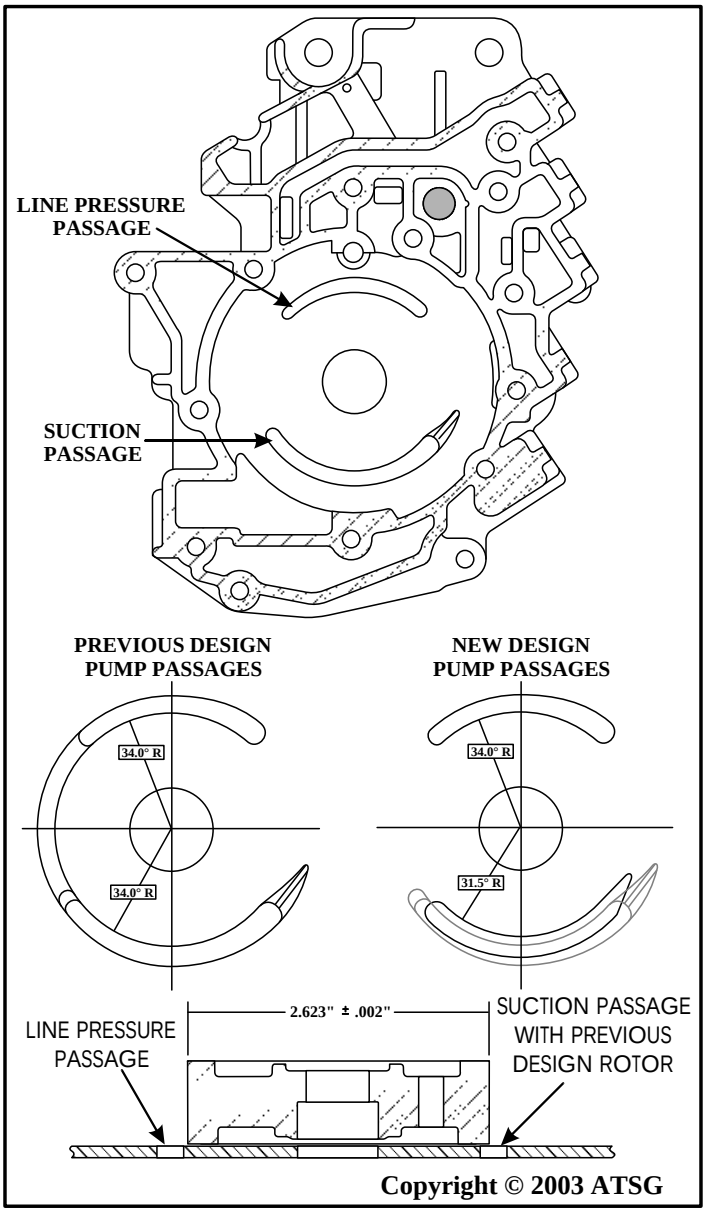
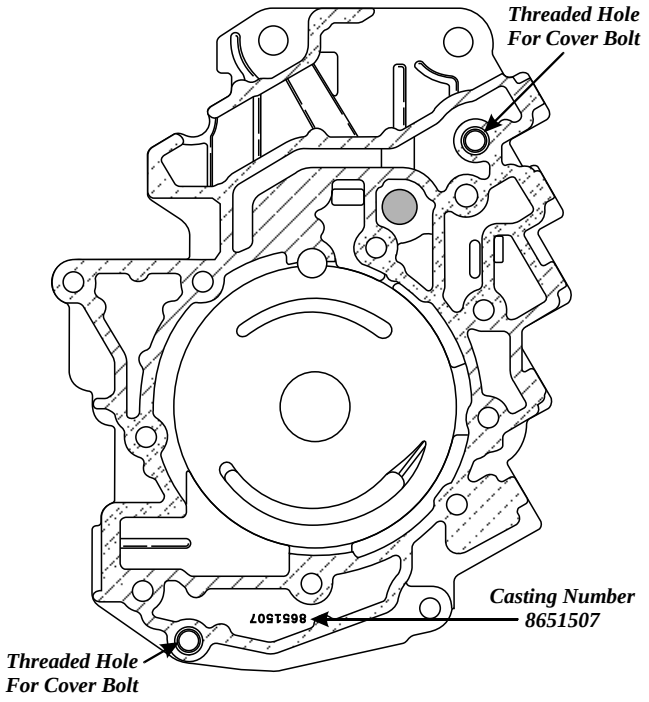


Figure 149

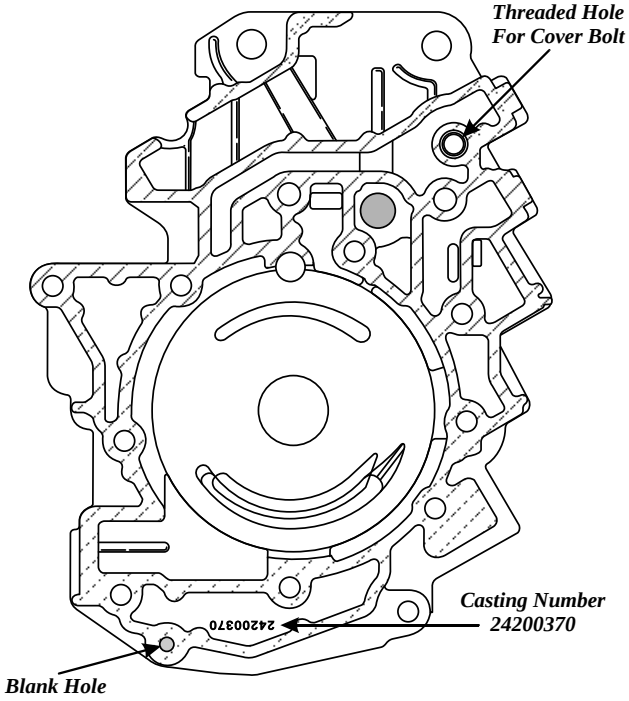
"1ST DESIGN" PUMP BODY CASTING



THIS PUMP CASTING CAN USE EITHER STRAIGHT OR TAPERED ROTOR

Figure 150

"2ND DESIGN" PUMP BODY CASTING



THIS PUMP CASTING "REQUIRES" TAPERED ROTOR

Figure 151

Oil Pump "Interchangeability"

1st Design Pump Casting - This pump casting can use either the straight rotor or the new design tapered rotor, as the tapered rotor will retro-fit back in all models of the 4T60-E transaxle. This pump casting can be identified with the presence of two threaded holes for the pump cover and by the casting number, as shown in Figure 150.

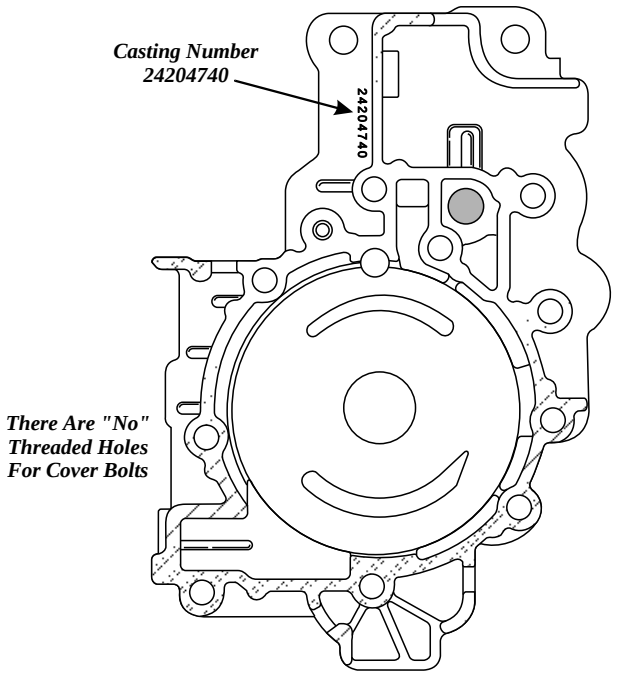
2nd Design Pump Casting - This pump casting ***requires*** the tapered rotor as the suction slot in the pump pocket was re-sized and moved closer to the center hole for the oil pump drive shaft, as shown in Figure 151. This pump casting can be identified by the presence of only one threaded hole for the pump cover and by the casting number, and is shown in Figure 151. This pump casting, with the tapered rotor will back service all models of the 4T60-E transaxle, but will not replace the 3rd design pump body.

3rd Design Pump Casting - This pump casting also ***requires*** the tapered rotor as the suction slot is in the same position as the 2nd design casting and is obviously a much lighter weight pump with the removal of much material, as shown in Figure 152. This pump also has a different casting number, and does not have ***any*** threaded holes for the pump cover, as shown in Figure 152. This pump casting ***will not*** retro-fit back on the first design valve body as it leaves open the second clutch passage.

If the previous design straight pump rotor is used in the pump castings shown in Figures 151 or 152, the rotor will cover a portion of the "suction slot" as shown in Figure 149, and will result in transaxle damage.

**"Oil Pump Changes"
Continued on Page 86.**

"3RD DESIGN" PUMP BODY CASTING



THIS PUMP CASTING *"REQUIRES"* TAPERED ROTOR AND *"WILL NOT"* BACK SERVICE PREVIOUS MODELS.

Figure 152

COMPONENT REBUILD (Cont'd)

Oil Pump "Changes"

Another small change that occured in the oil pump in model year 1993 was the oil pump slide pivot pin, as shown in Figure 153. The pivot pin now has a groove around the diameter to establish the air bleed in the decrease oil circuit, and the threaded brass air bleed plug that screwed into the pump casting has been eliminated as shown in Figure 153.

Note: When servicing models ***With*** the brass air bleed plug, the ***Solid*** pivot pin ***Must*** be used.

When servicing models ***Without*** the brass air bleed, the ***Grooved*** pivot pin ***Must*** be used. Refer to Figures 154 and 155.

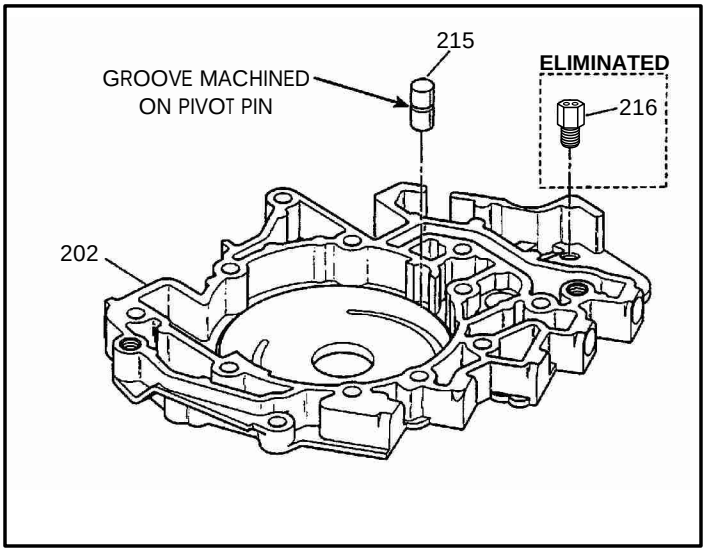


Figure 153

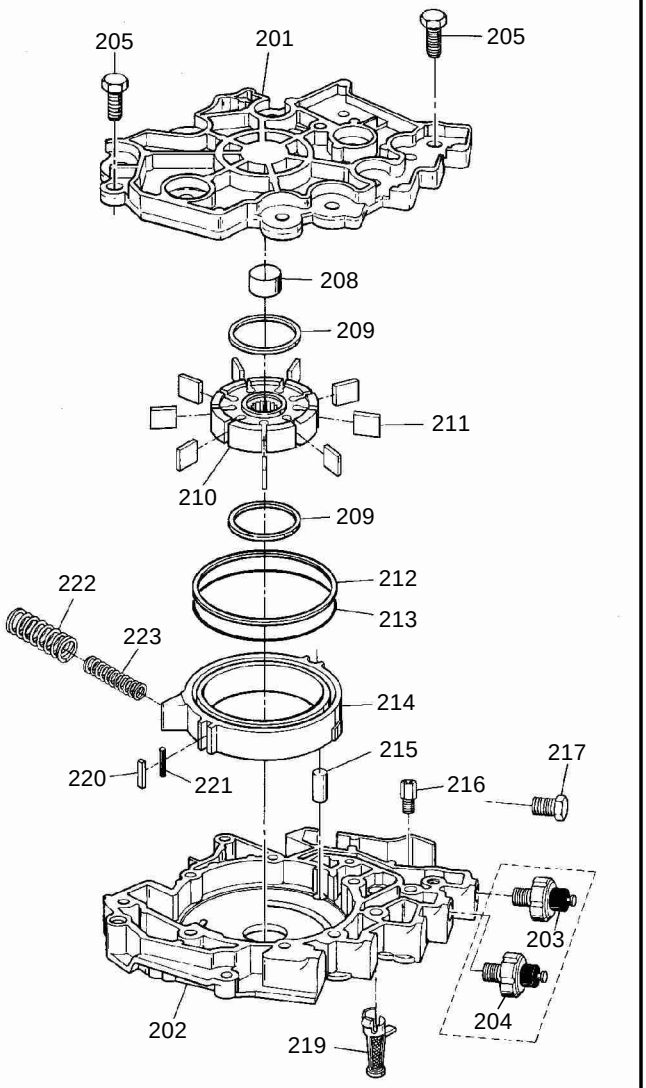
COMPONENT REBUILD (Cont'd)

Oil Pump Assembly

1. Disassemble the oil pump assembly using Figures 154 and 155 as a guide.
   Caution: Priming springs have high tension against the pump slide. Cover springs with a clean shop towel during removal to prevent personal injury.
2. Clean all oil pump parts thoroughly with good cleaning solution and dry with compressed air.
3. Inspect all oil pump parts thoroughly for any wear and/or damage.
   Note: The oil pump slide, slide seal, vanes and rotor are factory selected for size. If these parts need replacement, measurement will be necessary to ensure proper size.
4. Remove and discard all rubber and plastic seals from the pump assembly.

Continued on Page 88.

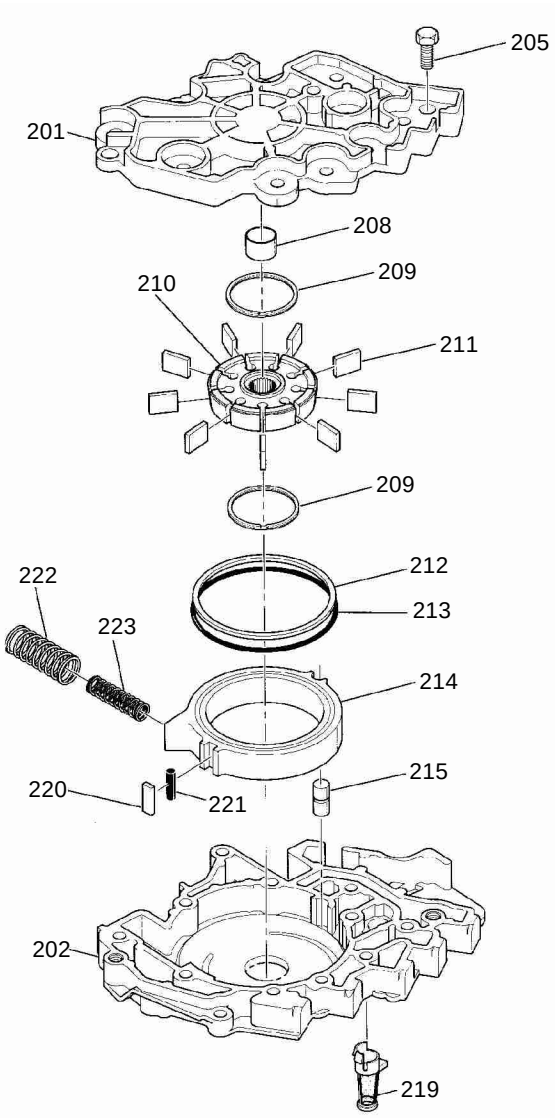
1991/1992 OIL PUMP ASSEMBLY



201 OIL PUMP COVER
202 OIL UPMP BODY
203 LO DISCRETE SWITCH (SOME MODELS)
204 4TH CLUTCH SWITCH (SOME MODELS)
205 OIL PUMP COVER BOLTS (2)
208 OIL PUMP COVER BUSHING
209 OIL PUMP VANE RINGS (2)
210 OIL PUMP TAPERED ROTOR, *SELECTIVE*
211 OIL PUMP VANES (9), *SELECTIVE*
212 SLIDE TO PUMP COVER SEAL, *SELECTIVE*
213 SLIDE TO PUMP COVER SEAL SUPPORT "O" RING
214 OIL PUMP SLIDE, *SELECTIVE*
215 OIL PUMP SLIDE PIVOT PIN
216 DECREASE OIL ORIFICE PLUG (SOME MODELS)
217 1/8" PIPE PLUG FOR SWITCH HOLES (SOME MODELS)
219 OIL PUMP PRESSURE SCREEN
220 OIL PUMP SLIDE SEAL
221 OIL PUMP SLIDE SEAL SUPPORT
222 OUTER OIL PUMP SLIDE SPRING
223 INNER OIL PUMP SLIDE SPRING

Figure 154

1993/1999 OIL PUMP ASSEMBLY



201 OIL PUMP COVER
202 OIL UPMP BODY
203 LO DISCRETE SWITCH (SOME MODELS)
204 4TH CLUTCH SWITCH (SOME MODELS)
205 OIL PUMP COVER BOLTS (1)
208 OIL PUMP COVER BUSHING
209 OIL PUMP VANE RINGS (2)
210 OIL PUMP TAPERED ROTOR, *SELECTIVE*
211 OIL PUMP VANES (9), *SELECTIVE*
212 SLIDE TO PUMP COVER SEAL, *SELECTIVE*
213 SLIDE TO PUMP COVER SEAL SUPPORT "O" RING
214 OIL PUMP SLIDE, *SELECTIVE*
215 OIL PUMP SLIDE PIVOT PIN
216 DECREASE OIL ORIFICE PLUG (SOME MODELS)
217 1/8" PIPE PLUG FOR SWITCH HOLES (SOME MODELS)
219 OIL PUMP PRESSURE SCREEN
220 OIL PUMP SLIDE SEAL
221 OIL PUMP SLIDE SEAL SUPPORT
222 OUTER OIL PUMP SLIDE SPRING
223 INNER OIL PUMP SLIDE SPRING

Figure 155

COMPONENT REBUILD (Cont'd)

Oil Pump Assembly (Cont'd)

5. If replacement of the rotor, vanes or the slide becomes necessary, measure an undamaged section, as shown in Figure 157.
6. Select the proper replacement size component using the chart in Figure 156.

Tapered Rotor Selection	
Thickness (mm)	Thickness (in)
17.953-17.963	0.7068-0.7072
17.963-17.973	0.7072-0.7076
17.973-17.983	0.7076-0.7080
Vane Selection	
Thickness (mm)	Thickness (in)
17.943-17.961	0.7064-0.7071
17.961-17.979	0.7071-0.7078
17.979-17.997	0.7078-0.7085
Slide Selection	
Thickness (mm)	Thickness (in)
17.983-17.993	0.7080-0.7084
17.993-18.003	0.7084-0.7088
18.003-18.013	0.7088-0.7092

Figure 156

COMPONENT REBUILD (Cont'd)

Oil Pump Assembly (Cont'd)

7. Install the backup support and slide seal in the groove, as shown in Figure 158, and retain with small amount of Trans-Jel®.
8. Carefully install slide assembly into the pump pocket, as shown in Figure 158.
9. Using your hand as a clamp, pull pump slide towards the slide seal, and install the proper pivot pin.
   Note: With brass air bleed "requires" solid pivot pin. Without brass air bleed "requires" pivot pin with groove.
10. Install the inner and outer slide springs using a large screwdriver (See Figure 158).
11. Install one vane ring into the pump pocket, as shown in Figure 158.
12. Install the ***proper*** rotor into the pump pocket as shown in Figure 158. If it requires tapered rotor, small diameter goes down.
13. Install nine vanes into the rotor, ensuring that the vanes are flush with top of rotor.
14. Install the second vane ring onto rotor inside of the vanes (See Figure 158).
15. Install the "O" ring seal and slide seal into the groove in pump slide, as shown in Figure 158, and lube parts with transaxle fluid.
16. Install pump cover and retaining bolts, hand tighten only, and ensure that the rotor will still turn freely.
17. Install the pump screen into pump body and set the completed oil pump assembly aside for the final assembly process.

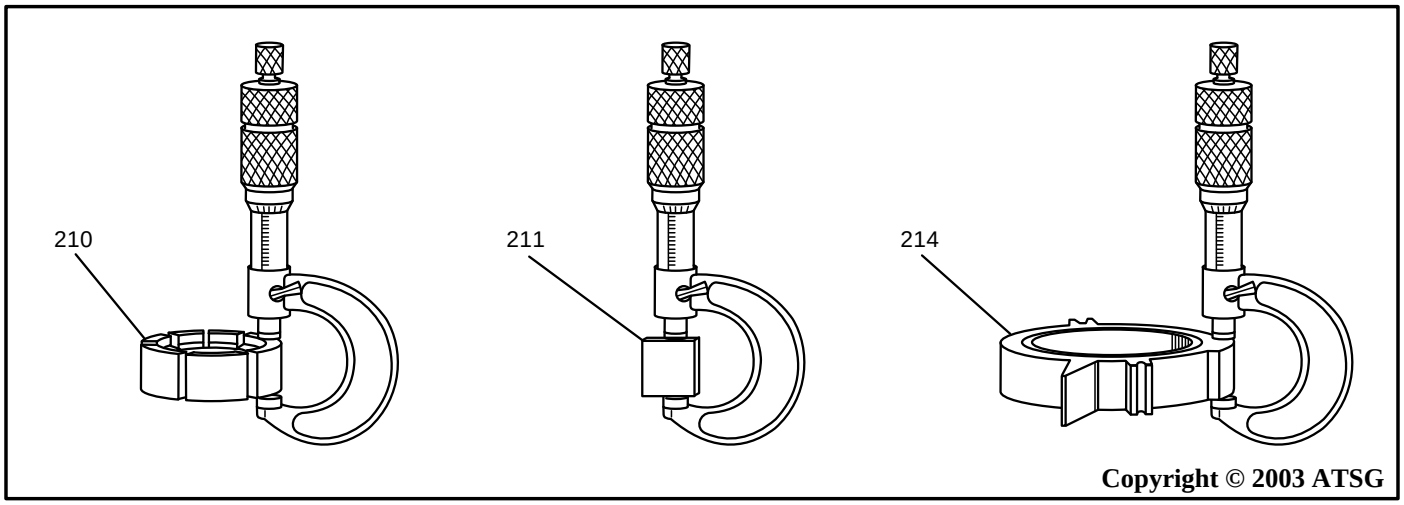
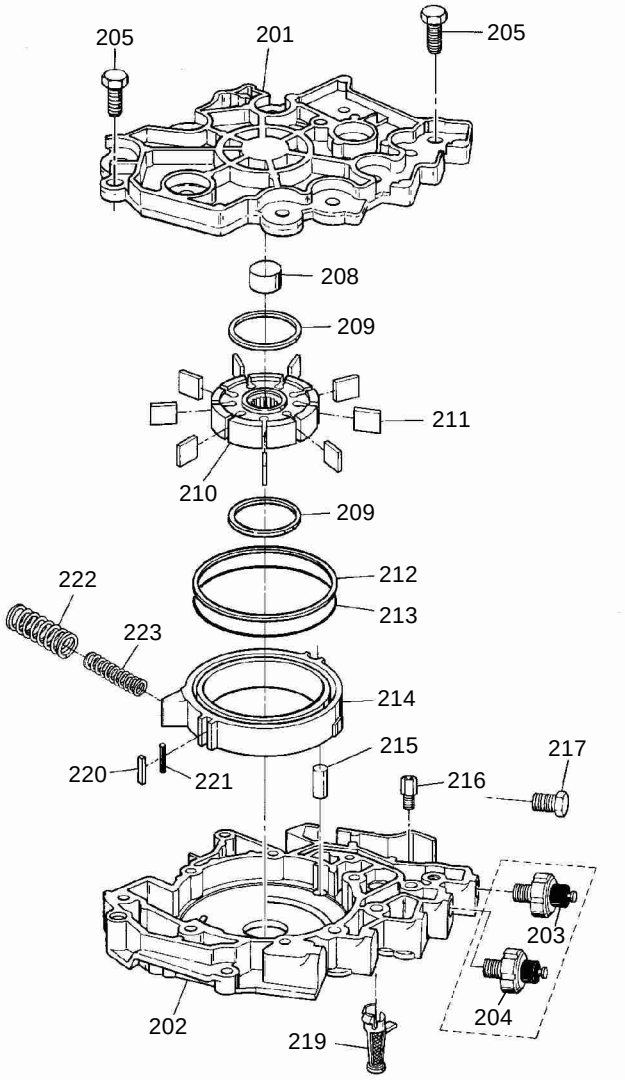


Figure 157

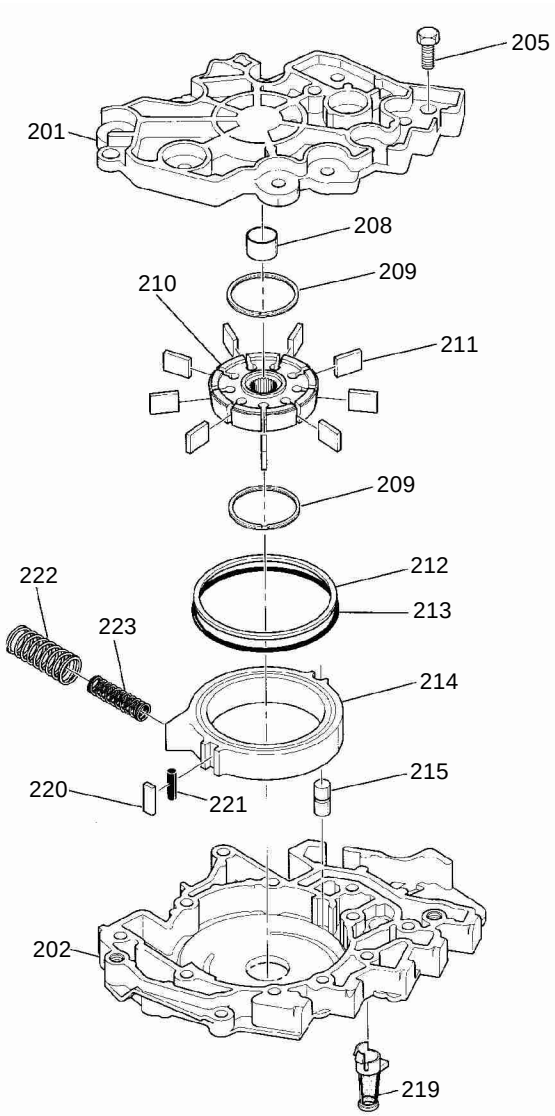
1991/1992 OIL PUMP ASSEMBLY



201 OIL PUMP COVER
202 OIL UPMP BODY
203 LO DISCRETE SWITCH (SOME MODELS)
204 4TH CLUTCH SWITCH (SOME MODELS)
205 OIL PUMP COVER BOLTS (2)
208 OIL PUMP COVER BUSHING
209 OIL PUMP VANE RINGS (2)
210 OIL PUMP TAPERED ROTOR, *SELECTIVE*
211 OIL PUMP VANES (9), *SELECTIVE*
212 SLIDE TO PUMP COVER SEAL, *SELECTIVE*
213 SLIDE TO PUMP COVER SEAL SUPPORT "O" RING
214 OIL PUMP SLIDE, *SELECTIVE*
215 OIL PUMP SLIDE PIVOT PIN
216 DECREASE OIL ORIFICE PLUG (SOME MODELS)
217 1/8" PIPE PLUG FOR SWITCH HOLES (SOME MODELS)
219 OIL PUMP PRESSURE SCREEN
220 OIL PUMP SLIDE SEAL
221 OIL PUMP SLIDE SEAL BACKUP SUPPORT
222 OUTER OIL PUMP SLIDE SPRING
223 INNER OIL PUMP SLIDE SPRING

Figure 158

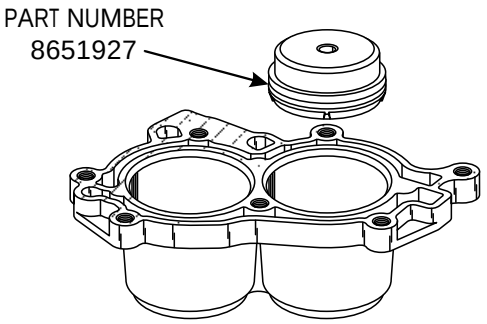
1993/1999 OIL PUMP ASSEMBLY



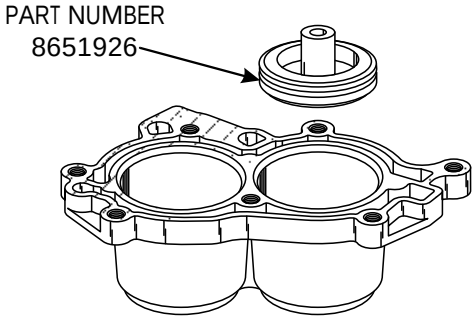
201 OIL PUMP COVER
202 OIL UPMP BODY
203 LO DISCRETE SWITCH (SOME MODELS)
204 4TH CLUTCH SWITCH (SOME MODELS)
205 OIL PUMP COVER BOLTS (1)
208 OIL PUMP COVER BUSHING
209 OIL PUMP VANE RINGS (2)
210 OIL PUMP TAPERED ROTOR, *SELECTIVE*
211 OIL PUMP VANES (9), *SELECTIVE*
212 SLIDE TO PUMP COVER SEAL, *SELECTIVE*
213 SLIDE TO PUMP COVER SEAL SUPPORT "O" RING
214 OIL PUMP SLIDE, *SELECTIVE*
215 OIL PUMP SLIDE PIVOT PIN
216 DECREASE OIL ORIFICE PLUG (SOME MODELS)
217 1/8" PIPE PLUG FOR SWITCH HOLES (SOME MODELS)
219 OIL PUMP PRESSURE SCREEN
220 OIL PUMP SLIDE SEAL
221 OIL PUMP SLIDE SEAL BACKUP SUPPORT
222 OUTER OIL PUMP SLIDE SPRING
223 INNER OIL PUMP SLIDE SPRING

Figure 159

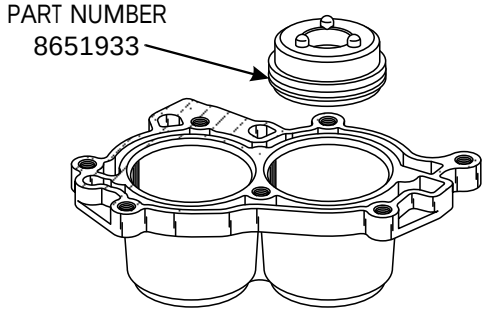
1ST DESIGN
1-2 ACCUMULATOR PISTON



2ND DESIGN
1-2 ACCUMULATOR PISTON



3RD DESIGN
1-2 ACCUMULATOR PISTON



2-3 ACCUMULATOR PISTON
ALL MODELS

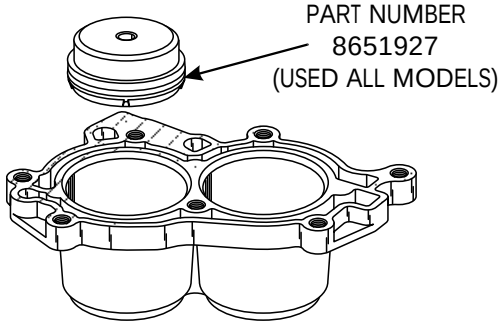


Figure 160

COMPONENT REBUILD (Cont'd)

1-2 And 2-3 Accumulator Spring Identification And Proper Assembly Procedure

Since the introduction of the 4T60-E transaxle in 1991, there have been three different design levels of the 1-2 Accumulator Piston used, and some of them are installed in different directions. The 2-3 Accumulator Piston has been the same through out the same period. Refer to Figure 160 for the three different design levels of the 1-2 Accumulator Piston and their part numbers.

The accumulator spring charts used in this information have been prepared using the "Broadcast Code" off of the identification tag on the transaxle, as shown in Figure 161 and is ***mandatory*** information for these charts to be accurate.

The information on Page 91, will refer you to a Chart number for component identification, and then a Figure number found in that chart for the proper assembly procedure, based on the OEM transaxle identification code.

Charts begin on Page 93 and are listed in numerical order.

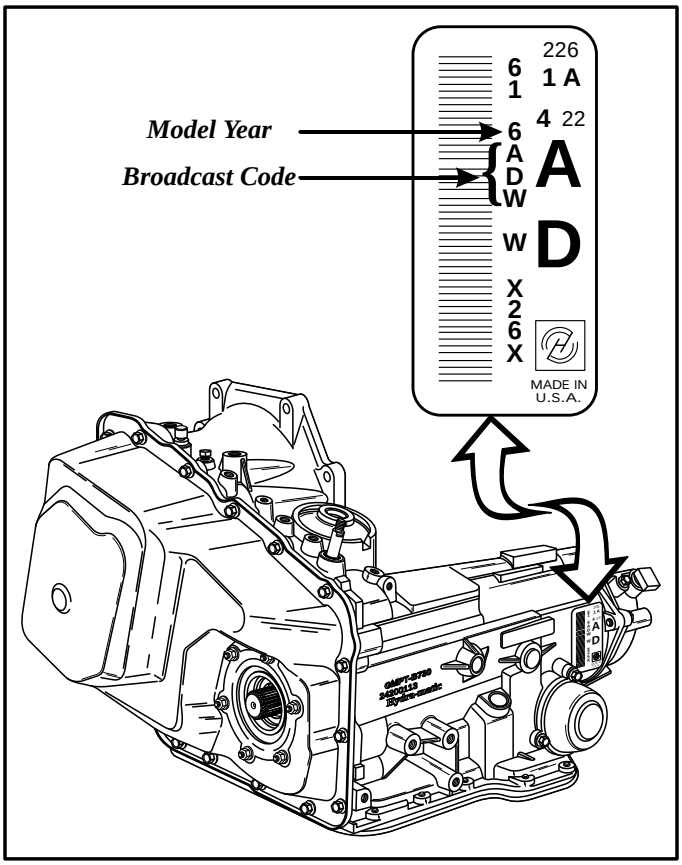


Figure 161

I.D. Codes 1A7W, 1AYW, 2A7W, 2AYW,
Use Chart Number 1 for component identification and Figure 163 for proper assembly procedure.

I.D. Codes 1BTW, 1CWW, 1YMW, 1YPW, 1YZW,
2B1W, 2B2W, 2BTW, 2BYW, 2C1W, 2C2W, 2C3W, 2C4W,
2C5W, 2C6W, 2CLW, 2CTW,
2CWW, 2CXW, 2CZW, 2P1W, 2PHW, 2W1W, 2WAW, 2Y1W,
2Y2W, 2Y4W, 2YLW, 2YMW,
2YXW,
3B1W, 3B2W, 3BTW, 3BYW, 3C1W, 3C2W, 3C3W, 3C4W,
3C5W, 3CLW, 3CMW, 3CSW,
3CTW, 3CWW, 3CXW, 3CZW, 3P1W, 3PHW, 3W1W, 3WAW,
3Y1W, 3Y2W, 3Y3W, 3YLW,
3YMW, 3YRW, 3YZW,
4PBW,
5A1W, 5ACW, 5B2W, 5B3W, 5BKW, 5BXW, 5C1W, 5CAW,
5PBW,
Use Chart Number 2 for component identification and Figure 162 for proper assembly procedure.

I.D. Codes 1A2W, 1AMW,
2A1W, 2A2W, 2A3W, 2A5W, 2A8W,
3ABW, 3AMW, 3ANW, 3AQW, 3AVW, 3AZW,
Use Chart Number 3 for component identification and Figure 163 for proper assembly procedure.

I.D. Codes 1A4W, 1APW,
2A4W, 2A6W,
3APW, 3AWW,
Use Chart Number 4 for component identification and Figure 163 for proper assembly procedure.

I.D. Codes 3BHW, 4AFW, 5AFW,
Use Chart Number 5 for component identification and Figure 163 for proper assembly procedure.

I.D. Codes 4ATW, 5ATW,
Use Chart Number 6 for component identification and Figure 163 for proper assembly procedure.

I.D. Codes 4YMW,
5Y3W, 5YMW, 5YQW,
7AWW,
Use Chart Number 7 for component identification and Figure 164 for proper assembly procedure.

I.D. Codes 4BLW, 4KUW, 4P1W, 4PFW, 4PMW, 4W1W, 4WAW, 4YZW,
5BLW, 5KUW, 5PMW, 5Y4W, 5YZW,
Use Chart Number 8 for component identification and Figure 162 for proper assembly procedure.

I.D. Codes 4KHW, 4YCW,
5B1W, 5BFW, 5Y1W, 5Y2W, 5YDW, 5YNW,
6CTW, 6YLW, 6YRW,
Use Chart Number 9 for component identification and Figure 162 for proper assembly procedure.

I.D. Codes 4CWW,
Use Chart Number 10 for component identification and Figure 162 for proper assembly procedure.

I.D. Codes 4PAW, 4WSW,
5WFW,
6BSW, 6WFW,
Use Chart Number 11 for component identification and Figure 162 for proper assembly procedure.

I.D. Codes 4CLW, 4PHW,
5PCW,
6CUW,
7CUW,
8BSW, 8CUW,
Use Chart Number 12 for component identification and Figure 162 for proper assembly procedure.

I.D. Codes 4CMW,
Use Chart Number 13 for component identification and Figure 164 for proper assembly procedure.

I.D. Codes 4AJW,
5AJW,
Use Chart Number 14 for component identification and Figure 164 for proper assembly procedure.

I.D. Codes 5A2W, 5AQW, 5ASW,
Use Chart Number 15 for component identification and Figure 164 for proper assembly procedure.

I.D. Codes 5PAW,
Use Chart Number 16 for component identification and Figure 162 for proper assembly procedure.

I.D. Codes 6AFW,
Use Chart Number 17 for component identification and Figure 163 for proper assembly procedure.

I.D. Codes 6PBW,
Use Chart Number 18 for component identification and Figure 164 for proper assembly procedure.

I.D. Codes 6ACW, 6ASW, 6BXW, 6CAW, 6HBW, 6QSW,
7ACW, 7ASW, 7BXW, 7HBW,
Use Chart Number 19 for component identification and Figure 164 for proper assembly procedure.

I.D. Codes 6PAW,
Use Chart Number 20 for component identification and Figure 164 for proper assembly procedure.

I.D. Codes 6PKW,
7YAW,
Use Chart Number 21 for component identification and Figure 164 for proper assembly procedure.

I.D. Codes 7AFW, 7AHW,
Use Chart Number 22 for component identification and Figure 163 for proper assembly procedure.

I.D. Codes 7BSW,
Use Chart Number 23 for component identification and Figure 162 for proper assembly procedure.

I.D. Codes 8AHW,
9AHW,
Use Chart Number 24 for component identification and Figure 163 for proper assembly procedure.

I.D. Codes 8DKW,
Use Chart Number 25 for component identification and Figure 162 for proper assembly procedure.

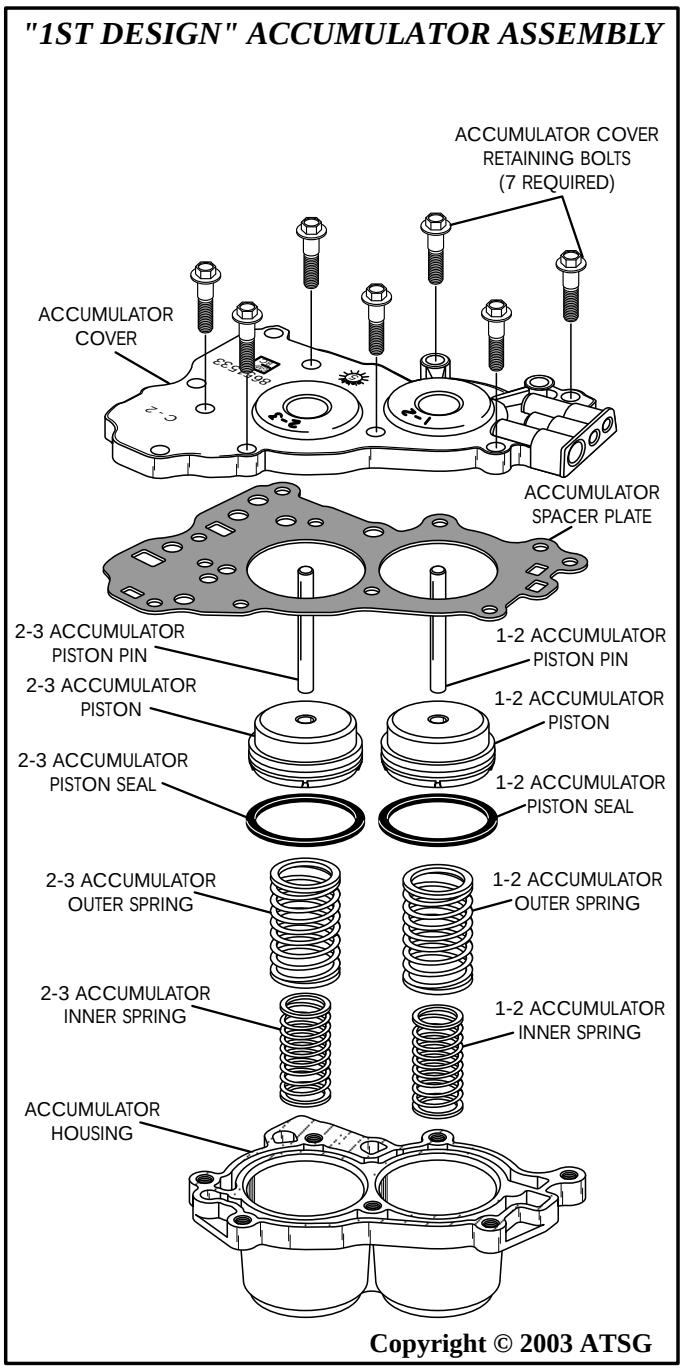


Figure 162

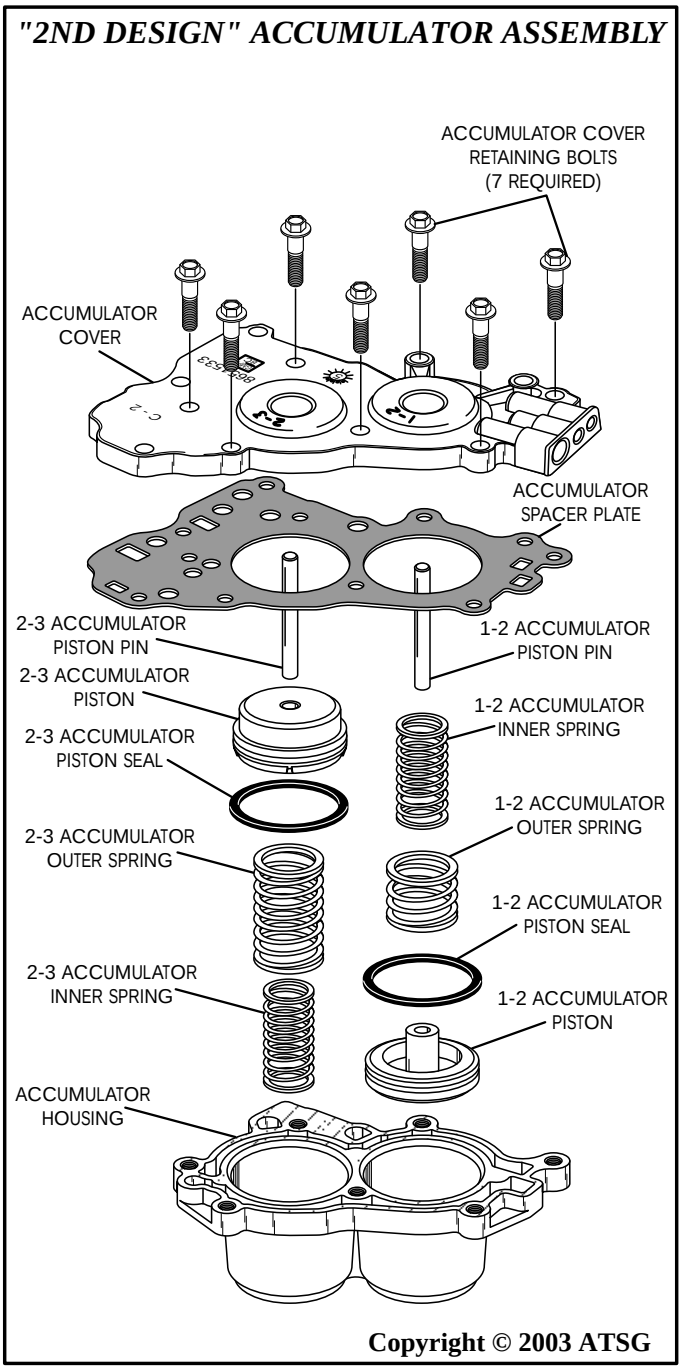


Figure 163

CHART NUMBER 1 (Assembly Number 8681206)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8679540	Lt Blue/Violet Or Pink/Violet
1-2 Accum. Inner Spring	8677661	Lt Green/Orange
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651926	Goes In Upside Down
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8668487	White/Lt Green
2-3 Accum. Inner Spring	None Used	None Used
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"2ND DESIGN" Use Figure 163 For Assembly Procedure		

CHART NUMBER 2 (Assembly Number 8681209)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8649091	No Color Or Orange
1-2 Accum. Inner Spring	None Used	None Used
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651927	Same As 2-3 Accum Piston
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8668487	White/Lt Green
2-3 Accum. Inner Spring	8681456	No Color
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"1ST DESIGN" Use Figure 162 For Assembly Procedure		

"3RD DESIGN" ACCUMULATOR ASSEMBLY

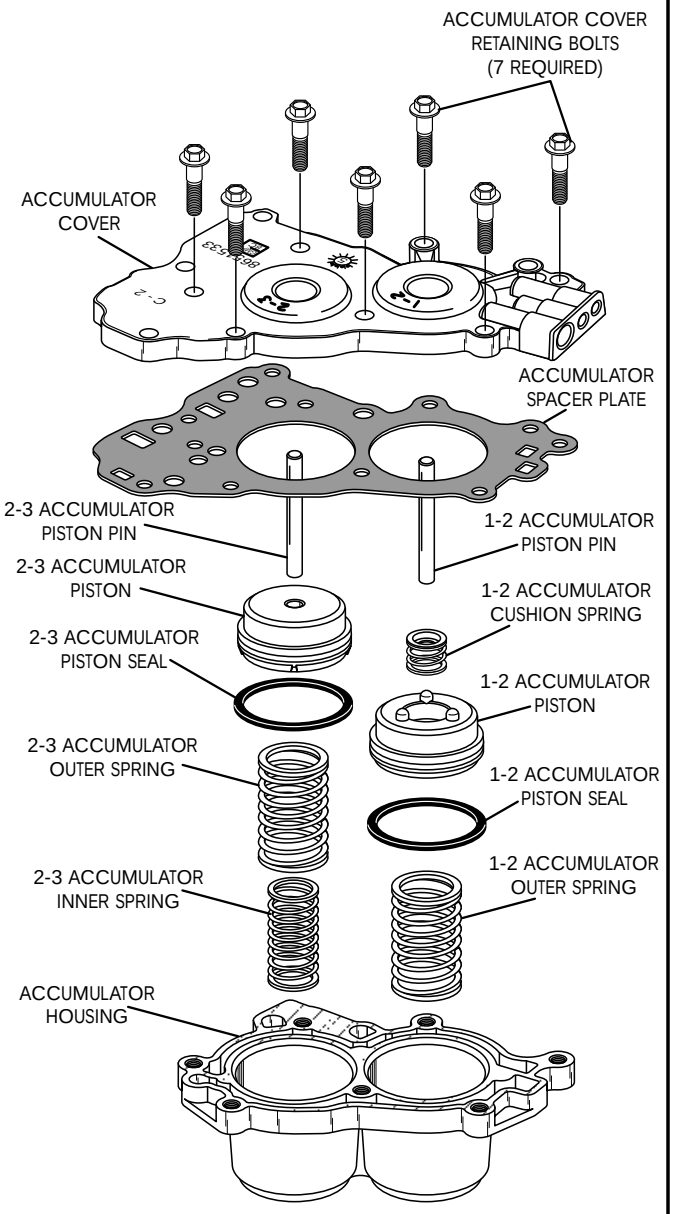


Figure 164

CHART NUMBER 3 (Assembly Number 8681211)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8679540	Lt Blue/Violet Or Pink/Violet
1-2 Accum. Inner Spring	8651774	White
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651926	Goes In Upside Down
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8668487	White/Lt Green
2-3 Accum. Inner Spring	8681456	No Color
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"2ND DESIGN" Use Figure 163 For Assembly Procedure		

CHART NUMBER 4 (Assembly Number 8681212)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8677427	Lt Blue/Dark Blue
1-2 Accum. Inner Spring	8651774	White
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651926	Goes In Upside Down
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8668487	White/Lt Green
2-3 Accum. Inner Spring	8681456	No Color
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"2ND DESIGN" Use Figure 163 For Assembly Procedure		

CHART NUMBER 5 (Assembly Number 8686138)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8682700	No Color
1-2 Accum. Inner Spring	8668631	Lt Green
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651926	Goes In Upside Down
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8668487	White/Lt Green
2-3 Accum. Inner Spring	8681456	No Color
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"2ND DESIGN" Use Figure 163 For Assembly Procedure		

CHART NUMBER 6 (Assembly Number 8685217)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8679540	Lt Blue/Violet Or Pink/Violet
1-2 Accum. Inner Spring	8651774	White
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651926	Goes In Upside Down
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8685219	White/Pink
2-3 Accum. Inner Spring	8685218	White/Dk Blue
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"2ND DESIGN" Use Figure 163 For Assembly Procedure		

CHART NUMBER 10 (Assembly Number 8683576)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8682513	Dark Green
1-2 Accum. Inner Spring	None Used	None Used
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651927	Same As 2-3 Accum Piston
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8668487	White/Lt Green
2-3 Accum. Inner Spring	8681456	No Color
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"1ST DESIGN" Use Figure 162 For Assembly Procedure		

CHART NUMBER 7 (Assembly Number 8685505)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8649091	No Color Or Orange
1-2 Accum Cushion Spring & Retainer	8685229	On Top Of Piston, Retainer Up
1-2 Accum. Inner Spring	None Used	None Used
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651933	"Bumps" On Top
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8668487	White/Lt Green
2-3 Accum. Inner Spring	8681456	No Color
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"3RD DESIGN" Use Figure 164 For Assembly Procedure		

CHART NUMBER 11 (Assembly Number 8685427)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8682513	Dark Green
1-2 Accum. Inner Spring	None Used	None Used
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651927	Same As 2-3 Accum Piston
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8668487	White/Lt Green
2-3 Accum. Inner Spring	8677661	Lt Green/Orange
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"1ST DESIGN" Use Figure 162 For Assembly Procedure		

CHART NUMBER 8 (Assembly Number 8683186)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8649091	No Color Or Orange
1-2 Accum. Inner Spring	None Used	None Used
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651927	Same As 2-3 Accum Piston
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8649091	No Color Or Orange
2-3 Accum. Inner Spring	8681456	No Color
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"1ST DESIGN" Use Figure 162 For Assembly Procedure		

CHART NUMBER 12 (Assembly Number 8685444)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8646400	White/Red
1-2 Accum. Inner Spring	None Used	None Used
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651927	Same As 2-3 Accum Piston
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8668487	White/Lt Green
2-3 Accum. Inner Spring	8681456	No Color
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"1ST DESIGN" Use Figure 162 For Assembly Procedure		

CHART NUMBER 9 (Assembly Number 8685648)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8649091	No Color Or Orange
1-2 Accum. Inner Spring	None Used	None Used
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651927	Same As 2-3 Accum Piston
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8685219	White/Pink
2-3 Accum. Inner Spring	8685218	White/Dk Blue
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"1ST DESIGN" Use Figure 162 For Assembly Procedure		

CHART NUMBER 13 (Assembly Number 24200236)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8682513	Dark Green
1-2 Accum Cushion Spring & Retainer	24200220	Top Of Piston, Retainer Up
1-2 Accum. Inner Spring	None Used	None Used
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651933	"Bumps" On Top Of Piston
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8668487	White/Lt Green
2-3 Accum. Inner Spring	8681456	No Color
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"3RD DESIGN" Use Figure 164 For Assembly Procedure		

CHART NUMBER 14 (Assembly Number 24200572)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8646400	White/Red
1-2 Accum Cushion Spring & Retainer	8685229	Top Of Piston, Retainer Up
1-2 Accum. Inner Spring	None Used	None Used
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651933	"Bumps" On Top Of Piston
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8668487	White/Lt Green
2-3 Accum. Inner Spring	8677661	Lt Green/Orange
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"3RD DESIGN" Use Figure 164 For Assembly Procedure		

CHART NUMBER 18 (Assembly Number 24204313)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8668487	White/Lt Green
1-2 Accum Cushion Spring & Retainer	8685229	Top Of Piston, Retainer Up
1-2 Accum. Inner Spring	None Used	None Used
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651933	"Bumps" On Top Of Piston
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8685219	White/Pink
2-3 Accum. Inner Spring	8685218	White/Dk Blue
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"3RD DESIGN" Use Figure 164 For Assembly Procedure		

CHART NUMBER 15 (Assembly Number 24201826)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8649091	No Color Or Orange
1-2 Accum Cushion Spring & Retainer	24200220	Top Of Piston, Retainer Up
1-2 Accum. Inner Spring	None Used	None Used
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651933	"Bumps" On Top Of Piston
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8649091	No Color Or Orange
2-3 Accum. Inner Spring	8685218	White/Dk Blue
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"3RD DESIGN" Use Figure 164 For Assembly Procedure		

CHART NUMBER 19 (Assembly Number 24204045)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8682513	Dark Green
1-2 Accum Cushion Spring & Retainer	8685229	Top Of Piston, Retainer Up
1-2 Accum. Inner Spring	None Used	None Used
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651933	"Bumps" On Top Of Piston
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8649091	No Color Or Orange
2-3 Accum. Inner Spring	8685218	White/Dk Blue
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"3RD DESIGN" Use Figure 164 For Assembly Procedure		

CHART NUMBER 16 (Assembly Number 24201454)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8649091	No Color Or Orange
1-2 Accum. Inner Spring	None Used	None Used
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651927	Same As 2-3 Accum Piston
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8668487	White/Lt Green
2-3 Accum. Inner Spring	8677661	Lt Green/Orange
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"1ST DESIGN" Use Figure 162 For Assembly Procedure		

CHART NUMBER 20 (Assembly Number 24203618)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8649091	No Color Or Orange
1-2 Accum Cushion Spring & Retainer	8685229	Top Of Piston, Retainer Up
1-2 Accum. Inner Spring	None Used	None Used
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651933	"Bumps" On Top Of Piston
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8668487	White/Lt Green
2-3 Accum. Inner Spring	8677661	Lt Green/Orange
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"3RD DESIGN" Use Figure 164 For Assembly Procedure		

CHART NUMBER 17 (Assembly Number 24204014)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8682700	No Color
1-2 Accum. Inner Spring	8668631	Lt Green
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651926	Goes In Upside Down
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8668487	White/Lt Green
2-3 Accum. Inner Spring	8651774	White
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"2ND DESIGN" Use Figure 163 For Assembly Procedure		

CHART NUMBER 21 (Assembly Number 24205108)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8682513	Dark Green
1-2 Accum Cushion Spring & Retainer	8685229	Top Of Piston, Retainer Up
1-2 Accum. Inner Spring	None Used	None Used
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651933	"Bumps" On Top Of Piston
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8685219	White/Pink
2-3 Accum. Inner Spring	8685218	White/Dk Blue
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"3RD DESIGN" Use Figure 164 For Assembly Procedure		

CHART NUMBER 22 (Assembly Number 24208179)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8682701	Lt Brown
1-2 Accum. Inner Spring	8668631	Lt Green
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651926	Goes In Upside Down
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8668487	White/Lt Green
2-3 Accum. Inner Spring	8651774	White
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"2ND DESIGN" Use Figure 163 For Assembly Procedure		

CHART NUMBER 23 (Assembly Number 24207199)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8646400	White/Red
1-2 Accum. Inner Spring	None Used	None Used
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651927	Same As 2-3 Accum Piston
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8668487	White/Lt Green
2-3 Accum. Inner Spring	8677661	Lt Green/Orange
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"1ST DESIGN" Use Figure 162 For Assembly Procedure		

CHART NUMBER 24 (Assembly Number 24210277)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8682701	Lt Brown
1-2 Accum. Inner Spring	8668631	Lt Green
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651926	Goes In Upside Down
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8682513	Dark Green
2-3 Accum. Inner Spring	8681456	No Color
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"2ND DESIGN" Use Figure 163 For Assembly Procedure		

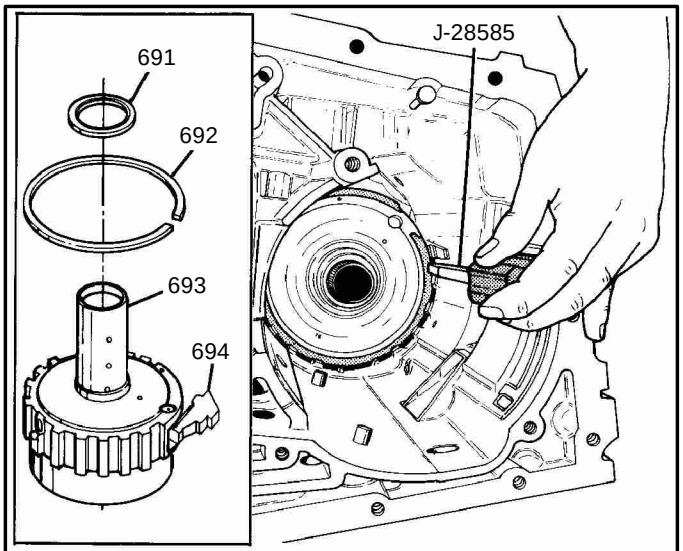
CHART NUMBER 25 (Assembly Number 24210296)		
Part Name	Part Number	Identification
Accumulator Housing	8677163	Used On All Models
1-2 Accum. Outer Spring	8646400	White/Red
1-2 Accum. Inner Spring	8651774	White
Accumulator Piston Seals	8678473	2 Required
1-2 Accum. Piston	8651927	Same As 2-3 Accum Piston
Accumulator Piston Pins	8644298	2 Required
2-3 Accum. Outer Spring	8685219	White/Pink
2-3 Accum. Inner Spring	8651774	White
2-3 Accum. Piston	8651927	Used On All Models
Spacer Plate And Gasket Assem.	8682085	Used On All Models
Accumulator Cover	8651533	Used On All Models
Accumulator Cover Bolts	8651722	Used On All Models
"1ST DESIGN" Use Figure 162 For Assembly Procedure		

TRANSAXLE ASSEMBLY

Internal Components

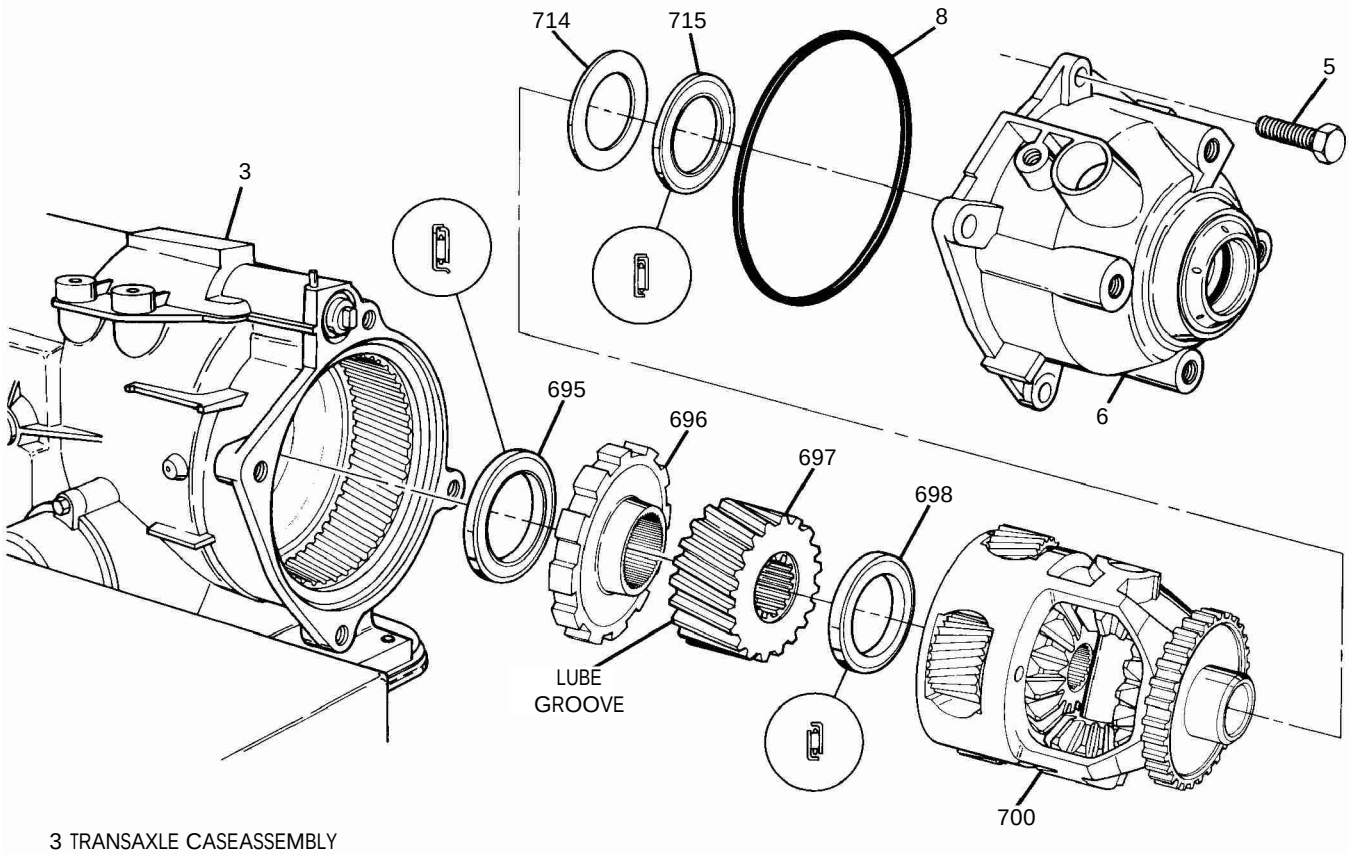
1. Install the final drive ring gear into the case and install snap ring, as shown in Figure 165. ***Note: Ensure that thrust washer or bearing is in place on ring gear (See Figure 165).***
2. Rotate transaxle in fixture so that bottom pan surface is facing down (See Figure 166).
3. Install final drive sun gear shaft, as shown in Figure 167.
4. Install the ring gear to park gear thrust bearing over sun gear shaft, as shown in Figure 168.
5. Install park gear and final drive sun gear onto splines of sun gear shaft (See Figure 168).
6. Install the pre-assembled final drive carrier on final drive sun gear by rotating into position until fully seated, as shown in Figure 166.
7. Install the "Selective" thrust washer onto the final drive, as shown in Figure 166.
8. Install the carrier to extension housing thrust bearing on final drive carrier (See Figure 166).
9. Install the extension housing, ***without*** "O" ring seal at this time, and retain with only two bolts for later removal. (See Figure 166).

Continued on Page 98.



691 1-2 SUPPORT TO FINAL DRIVE RING THRUST WASHER
692 FINAL DRIVE RING GEAR SNAP RING
693 FINAL DRIVE RING GEAR ASSEMBLY
694 PARKING PAWL (PART OF RING GEAR ASSEMBLY)

Figure 165



3 TRANSAXLE CASEASSEMBLY
5 EXTENSION HOUSING TO CASE BOLTS, M10 X 1.5 X 35 (4)
6 EXTENSION HOUSING
8 EXTENSION HOUSING TO CASE SEAL
695 RING GEAR TO PARK GEAR THRUST BEARING
696 PARKING GEAR
697 FINAL DRIVE SUN GEAR
698 SUN GEAR TO CARRIER THRUST BE ARING
700 FINAL DRIVE CARRIER ASSEMBLY
714 FINAL DRIVE TO CASE THRUST WASHER (SELECTIVE)
715 FINAL DRIVE TO CASE THRUST BEARING

Figure 166

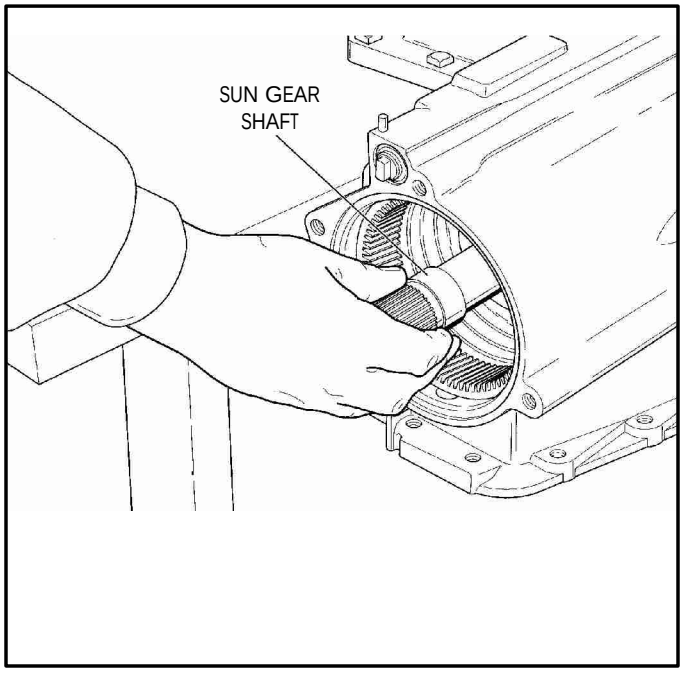
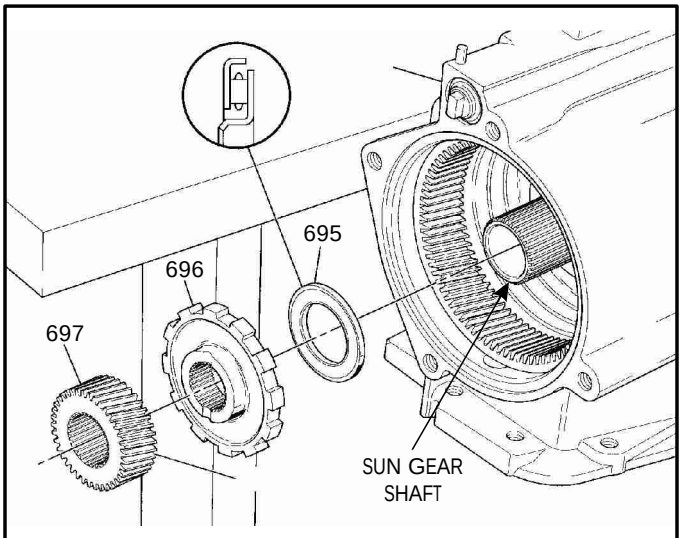


Figure 167



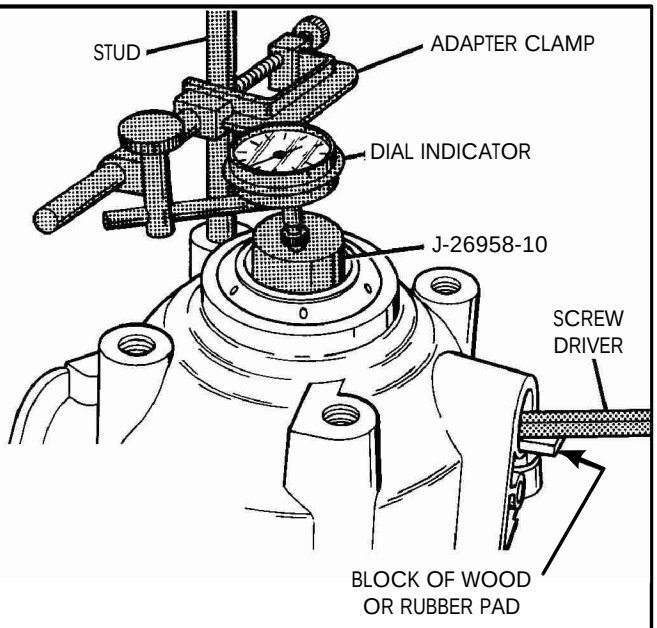
695 RING GEAR TO PARK GEAR THRUST BEARING
696 PARKING GEAR
697 FINAL DRIVE SUN GEAR

Figure 168

TRANSAXLE ASSEMBLY (Cont'd)

Internal Components (Cont'd)

10. Rotate transaxle so the extension is facing up, as shown in Figure 169.
11. Install adapter J-26958-10 through axle seal and into final drive carrier (See Figure 169).
12. Install dial indicator with stem contacting the adapter, as shown in Figure 169, and zero the dial indicator.
13. Using the large screwdriver with a small block of wood, as shown in Figure 169, measure the final drive end play.
    Note: Final drive end play should be; 0.12-0.62mm (.005" to .025").
14. Change selective thrust washer as necessary using the chart in Figure 169, to obtain proper final drive end play.
15. Remove dial indicator set, leaving J-26958-10 in place in final drive.
16. Install adapter J-38385 onto extension housing filling all bolt holes, and loading tool J-26958 as shown in Figure 170.
    Note: J-38385 must be bolted down using all bolt holes to minimize adapter bending.
17. Tighten loading tool to remove all final drive end play and prepare the internal parts for the transaxle end play check.
18. Rotate the transaxle so that side cover surface is facing up, as shown in Figure 171.
19. Ensure that final drive sun gear shaft is fully seated and that thrust washer or bearing is in place, as shown in Figure 171.
    Note: If thrust bearing is being used, Black side should be facing up.



FINAL DRIVE TO CASE END PLAY "SELECTIVE" THRUST WASHER

THICKNESS	IDENTIFICATION NUMBER/COLOR
1.40-1.50mm (.055" - .059")	"0"/Orange
1.50-1.60mm (.059" - .062")	"1"/White
1.60-1.70mm (.062" - .066")	"2"/Blue
1.70-1.80mm (.066" - .070")	"3"/Pink
1.80-1.90mm (.070" - .074")	"4"/Brown
1.90-2.00mm (.074" - .078")	"5"/Green
2.00-2.10mm (.078" - .082")	"6"/Black
2.10-2.20mm (.082" - .086")	"7"/Purple
2.20-2.30mm (.086" - .091")	"8"/Purple & White
2.30-2.40mm (.091" - .095")	"9"/purple & Blue

Figure 169

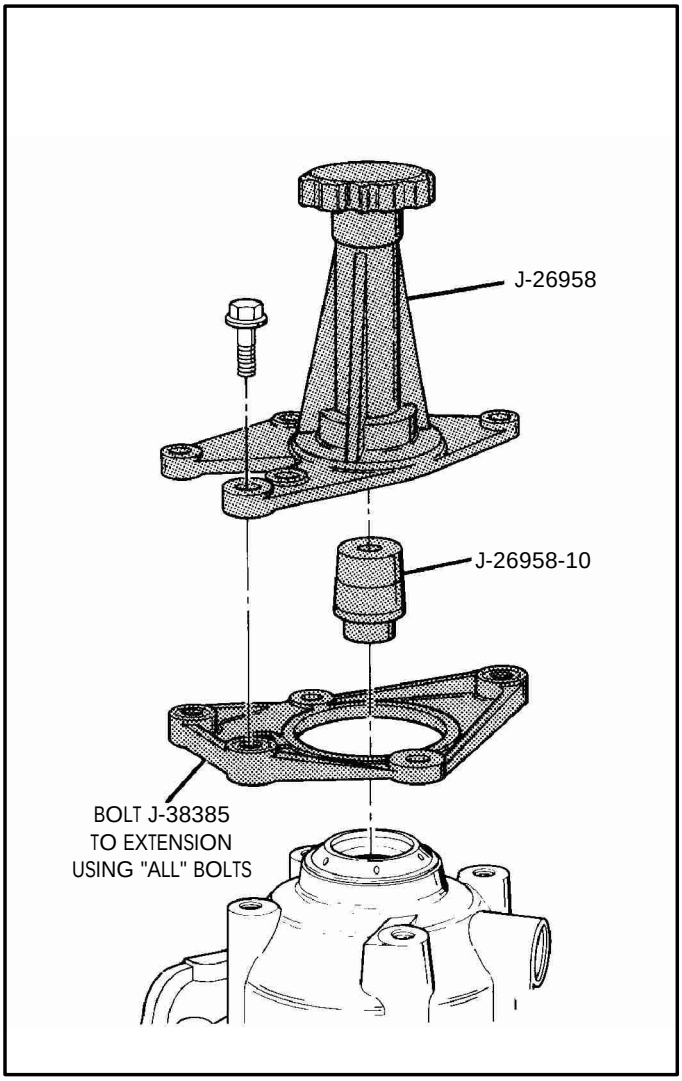


Figure 170

TRANSAXLE ASSEMBLY (Cont'd)

Internal Components (Cont'd)

20. Install the forward band assembly into the case as shown in Figure 171, ensuring that the band is engaged on the anchor pin.
21. Install the preassembled 1-2 roller clutch and support, as shown in Figure 172, using J-38358 and rotating into position until fully seated.
22. Install the manual 1-2 band assembly into case, as shown in Figure 173, ensuring engagement onto the band anchor in case.
23. Install the reaction sun gear drum into the case, as shown in Figure 174, by rotating until the drum is fully seated.

Continued on Page 100.

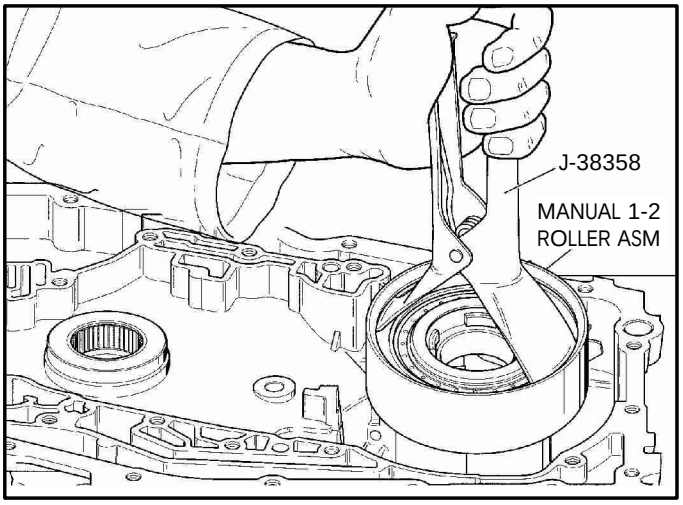


Figure 172

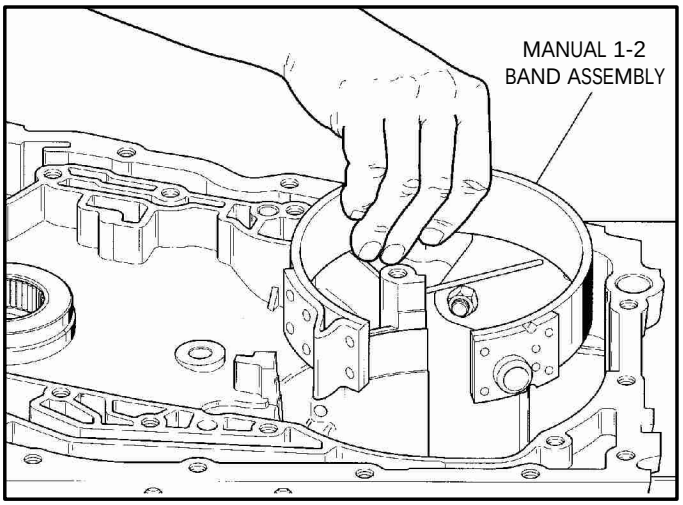


Figure 173

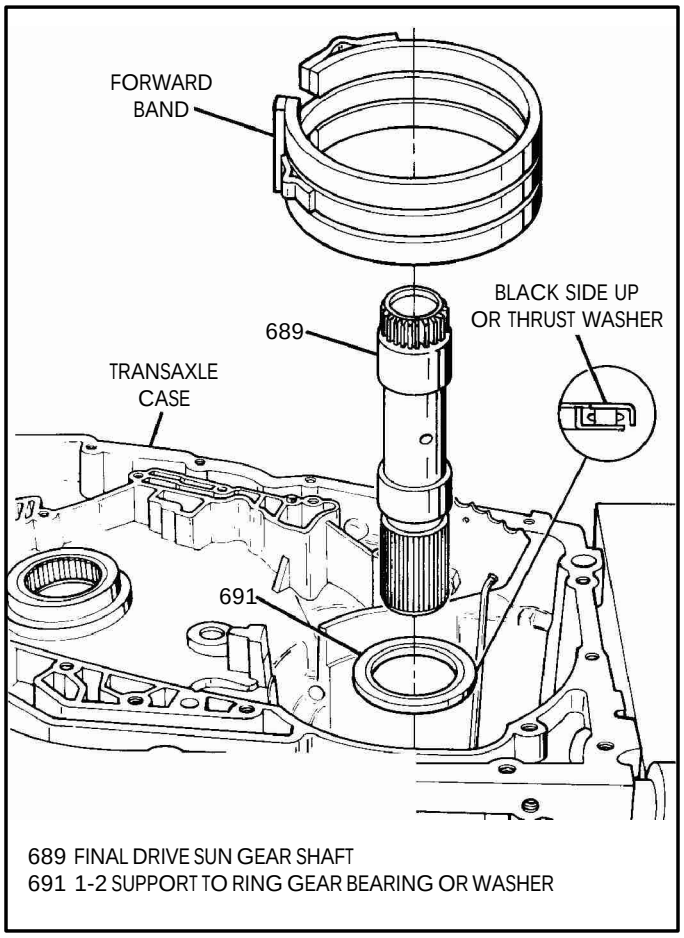


Figure 171

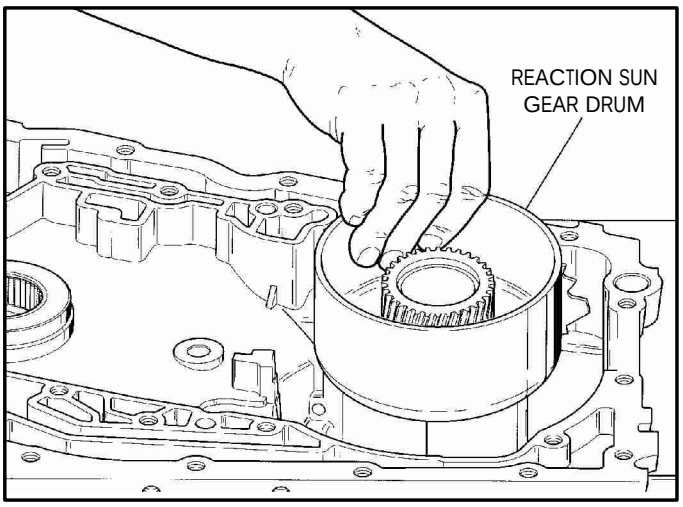
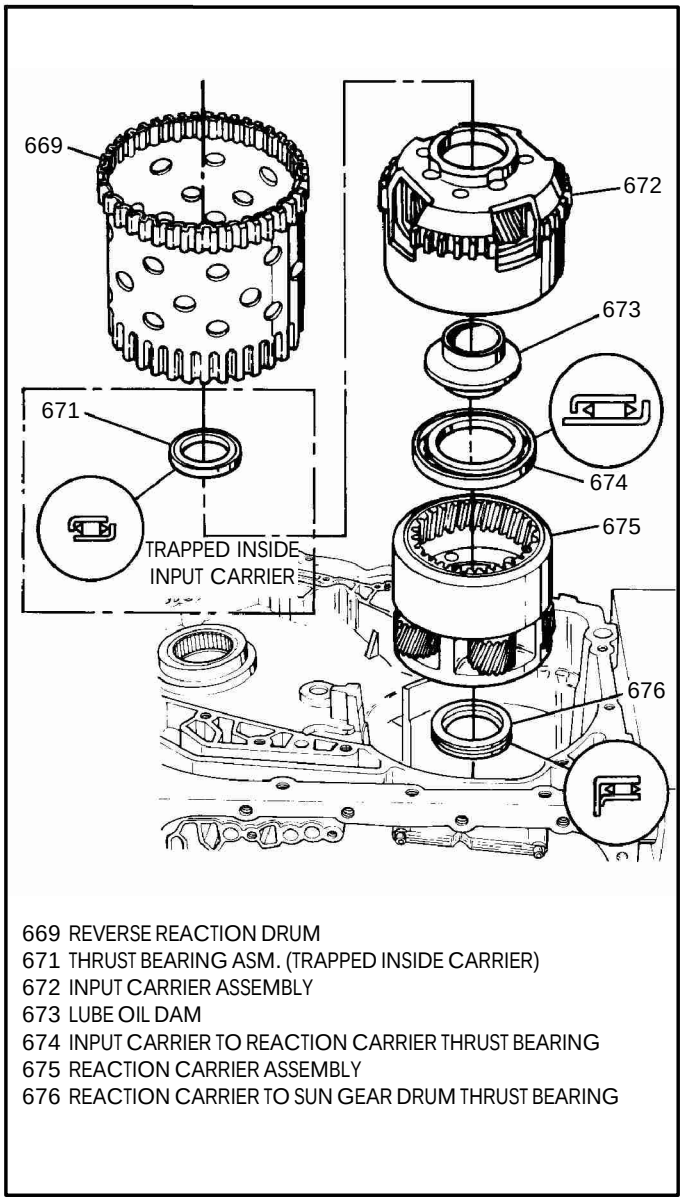


Figure 174



669 REVERSE REACTION DRUM
671 THRUST BEARING ASM. (TRAPPED INSIDE CARRIER)
672 INPUT CARRIER ASSEMBLY
673 LUBE OIL DAM
674 INPUT CARRIER TO REACTION CARRIER THRUST BEARING
675 REACTION CARRIER ASSEMBLY
676 REACTION CARRIER TO SUN GEAR DRUM THRUST BEARING

Figure 175

TRANSAXLE ASSEMBLY (Cont'd)

Internal Components (Cont'd)

24. Install the preassembled planetary carriers both together as a set, with two fingers down center of both carriers and rotate into position until they are fully seated.
    Note: Ensure thrust bearings are installed in the proper direction (See Figure 175).
25. Install the reverse reaction drum, as shown in Figure 176, and ensure it is engaged on input carrier splines.
26. Install the reverse band into the transaxle case, as shown in Figure 177, ensuring that band is engaged on case band anchor.
27. Lay the preassembled input/3rd clutch housing on its side, as shown in Figure 178, and install the preassembled sprag and roller clutch into input housing by rotating back and forth until they are fully seated.
28. Set the completed input housing and sprags up on the sun gear, as shown in Figure 179.
29. Install the selective thrust washer into the input housing, as shown in Figure 179, and install the thrust bearing on top of selective washer in the direction shown in Figure 179.
30. Install the preassembled 2nd clutch drum onto input housing and rotate back and forth until fully seated against thrust bearing, as shown in Figure 179.
31. Install tool J-33381, as shown in Figure 180, in the input and 2nd drum assembly and tighten the adjusting screw on top.
32. Lift the complete assembly and install into the transaxle by rotating into position, as shown in Figure 180.

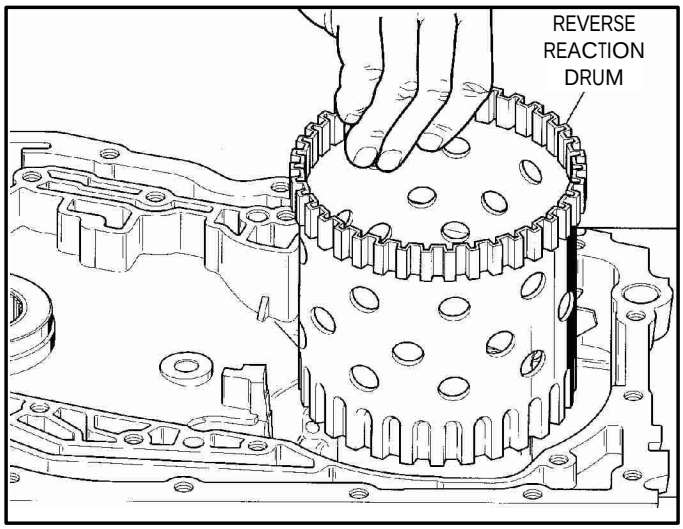


Figure 176

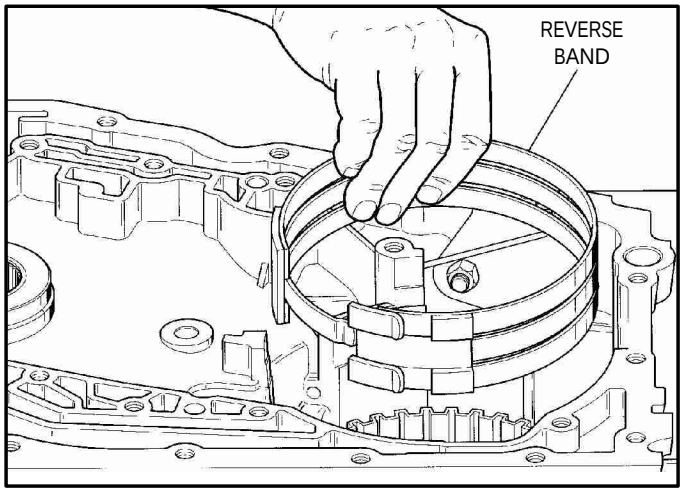


Figure 177

TRANSAXLE ASSEMBLY (Cont'd)

Internal Components (Cont'd)

33. Remove the installation tool from the input/3rd clutch housing.

Continued on Page 102.

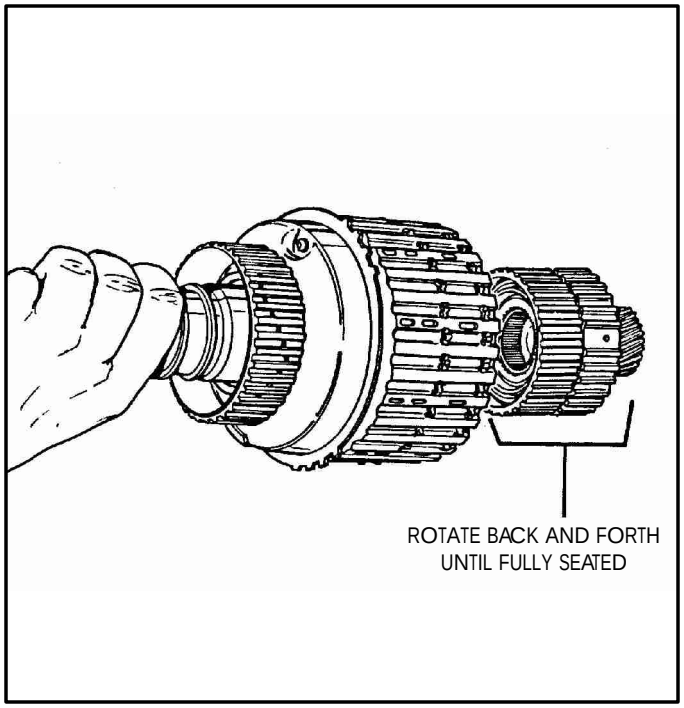
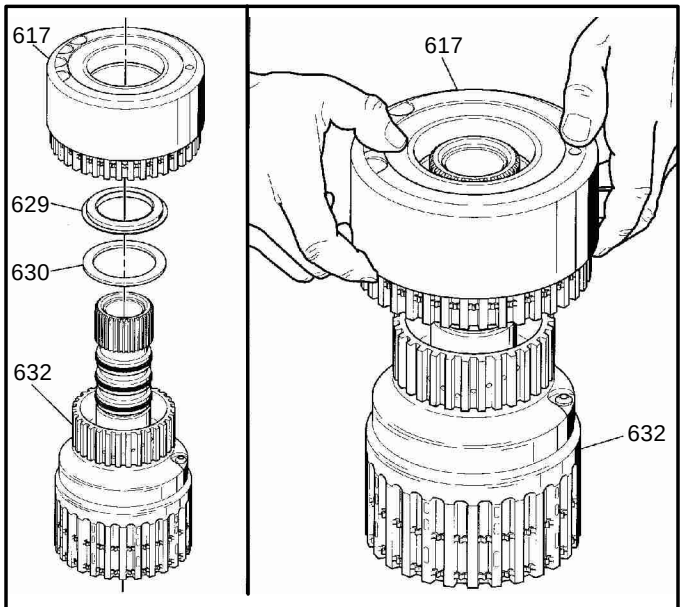
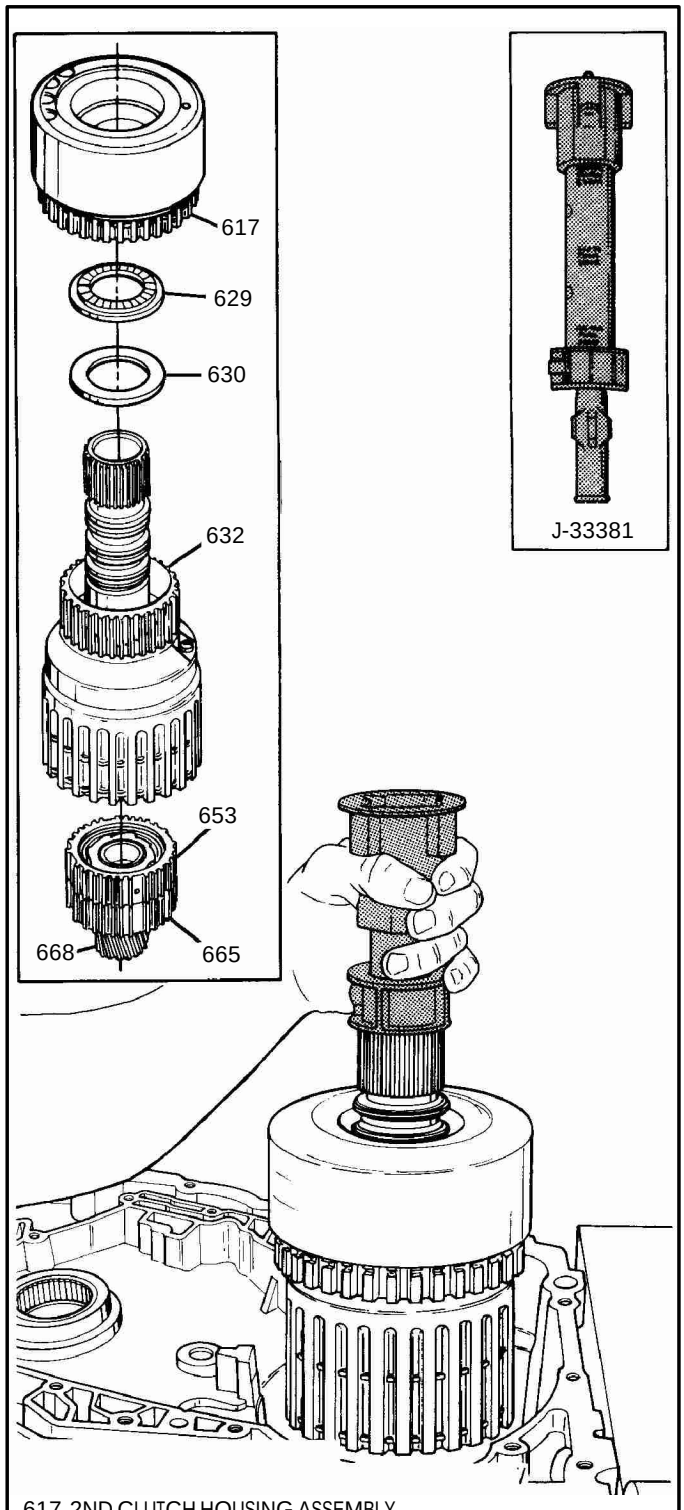


Figure 178



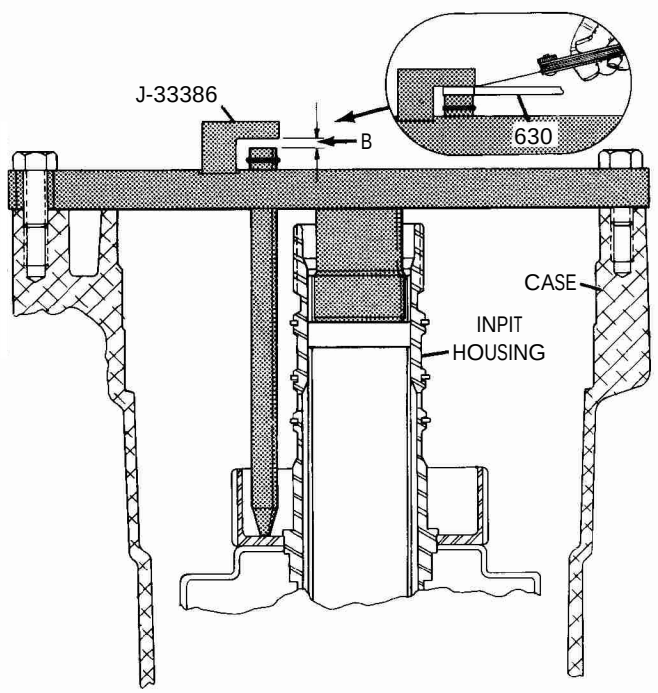
617 2ND CLUTCH HOUSING ASSEMBLY
629 2ND CLUTCH TO INPUT HOUSING THRUST BEARING
630 2ND CLUTCH TO INPUT THRUST WASHER (SELECTIVE)

Figure 179



617 2ND CLUTCH HOUSING ASSEMBLY
629 SPROCKET SUPPORT TO INPUT HOUSING THRUST BEARING
630 THRUST BEARING TO INPUT HOUSING *SELECTIVE* WASHER
632 INPUT HOUSING ASSEMBLY
653 3RD ROLLER CLUTCH ASSEMBLY
665 INPUT SPRAG ASSEMBLY
668 INPUT SUN GEAR

Figure 180



If a .152mm (.006") feeler gauge or larger can be inserted between thrust washer and tool, use next size larger thrust washer.

GUIDE FOR SELECTIVE THRUST WASHER

	DIMENSION		
I.D. NO.	MM	INCHES	INCHES
1	2.90-3.00	.114-.118	ORANGE/GREEN
2	3.05-3.15	.120-.124	ORANGE/BLACK
3	3.20-3.30	.126-.130	ORANGE
4	3.35-3.45	.132-.136	WHITE
5	3.50-3.60	.138-.142	BLUE
6	3.65-3.75	.144-.148	PINK
7	3.80-3.90	.150-.154	BROWN
8	3.95-4.05	.156-.159	GREEN
9	4.10-4.20	.161-.165	BLACK
10	4.25-4.35	.167-.171	PURPLE
11	4.40-4.50	.173-.177	PURPLE/WHITE
12	4.55-4.65	.179-.183	PURPLE/BLUE
13	4.70-4.80	.185-.189	PURPLE/PINK
14	4.85-4.95	.191-.195	PURPLE/BROWN
15	5.00-5.10	.197-.200	PURPLE/GREEN

Figure 181

TRANSAXLE ASSEMBLY (Cont'd)

Input End Play Measurement

There are two different methods to measure for the proper transaxle input end play. One of them is much easier and less costly, and yet delivers the same results. We will explain both methods, and let you decide.

Both methods "Must" have the loading tool that was installed earlier, tightened so that all final drive end play is removed.

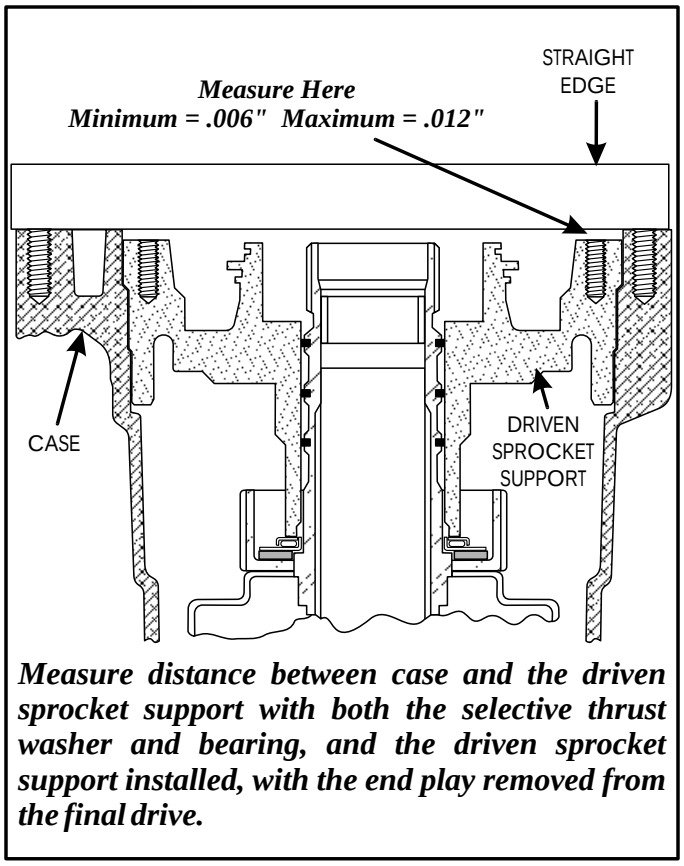
METHOD I

1. Install the J-33386, as shown in Figure 181, ***without*** the selective washer, bearing and the 2nd clutch drum.
2. If a .007" feeler gauge or larger can be inserted between thrust washer and J-33386, as shown in Figure 181, use the next size thicker thrust washer.
3. Use the chart shown in Figure 181 to select the proper thickness selective thrust washer.

METHOD II

1. Install the selective thrust washer and the thrust bearing that came with the unit, as shown in Figure 182.
2. Install the driven sprocket support, as shown in Figure 182.
3. Measure with feeler gauge and straight edge, as shown in Figure 182, between the straight edge and the driven sprocket support.
   Note: Driven Sprocket Support must "always" be below the case surface. If it is not, then you have mis-stacked somewhere below that and you must disassemble to correct.
4. The measurement should be, minimum .006" and maximum .012".
5. Use the chart shown in Figure 181 to select the proper thickness selective thrust washer.

**"Transaxle Assembly"
Continued on Page 103.**



Measure distance between case and the driven sprocket support with both the selective thrust washer and bearing, and the driven sprocket support installed, with the end play removed from the final drive.

Figure 182

TRANSAXLE ASSEMBLY (Cont'd)

Internal Components (Cont'd)

34. Install the large plastic thrust washer to bottom of driven sprocket support, if it has not already done, and retain with Trans-Jel®.
35. Install the two long 13mm bolts from the pump into the driven sprocket support across from one another. One of them should be located by the feed holes, as shown in Figure 183.
36. Using the two pump bolts as handles, install the driven sprocket support with a twisting motion into the case, as shown in Figure 183.
37. Driven sprocket support should be below the level of the case surface.
38. Install the output shaft into the transaxle, as shown in Figure 184.

Continued on Page 104.

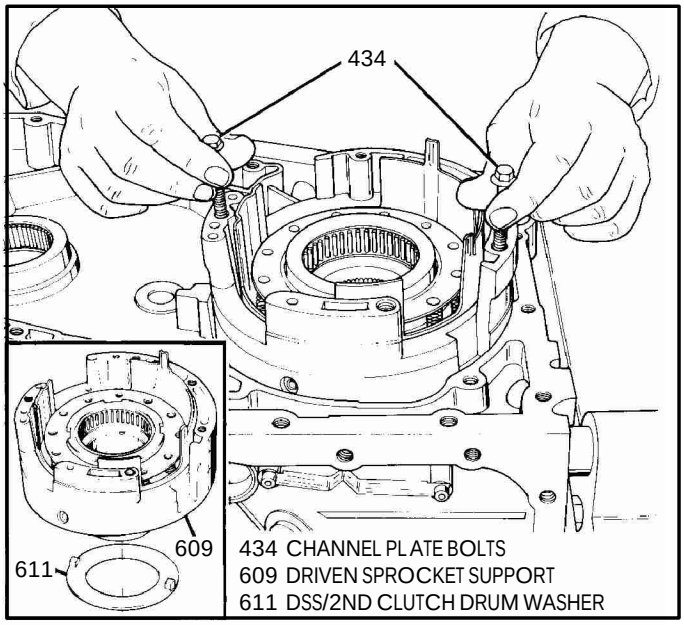


Figure 183

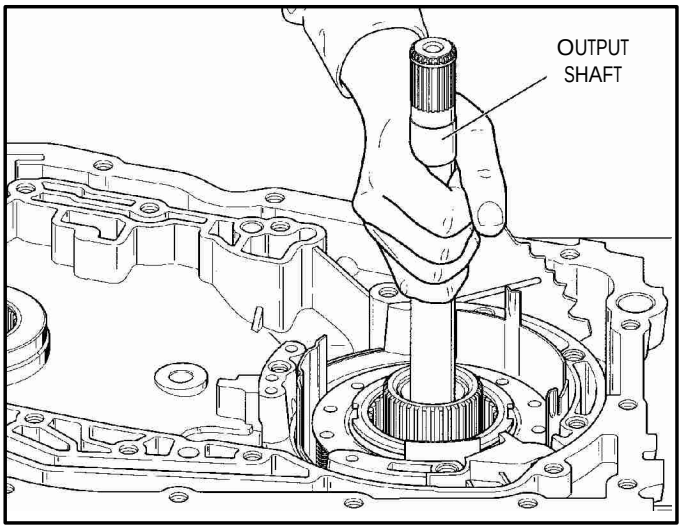
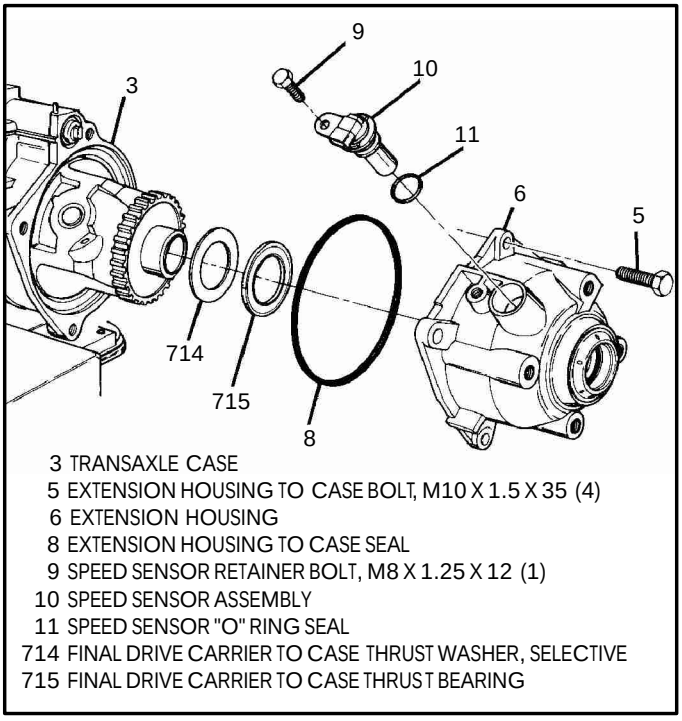


Figure 184

TRANSAXLE ASSEMBLY (Cont'd)

Internal Components (Cont'd)

39. Rotate the transaxle in fixture so that bottom pan surface is facing down (See Figure 185).



3 TRANSAXLE CASE
5 EXTENSION HOUSING TO CASE BOLT, M10 X 1.5 X 35 (4)
6 EXTENSION HOUSING
8 EXTENSION HOUSING TO CASE SEAL
9 SPEED SENSOR RETAINER BOLT, M8 X 1.25 X 12 (1)
10 SPEED SENSOR ASSEMBLY
11 SPEED SENSOR "O" RING SEAL
714 FINAL DRIVE CARRIER TO CASE THRUST WASHER, SELECTIVE
715 FINAL DRIVE CARRIER TO CASE THRUST BEARING

Figure 185

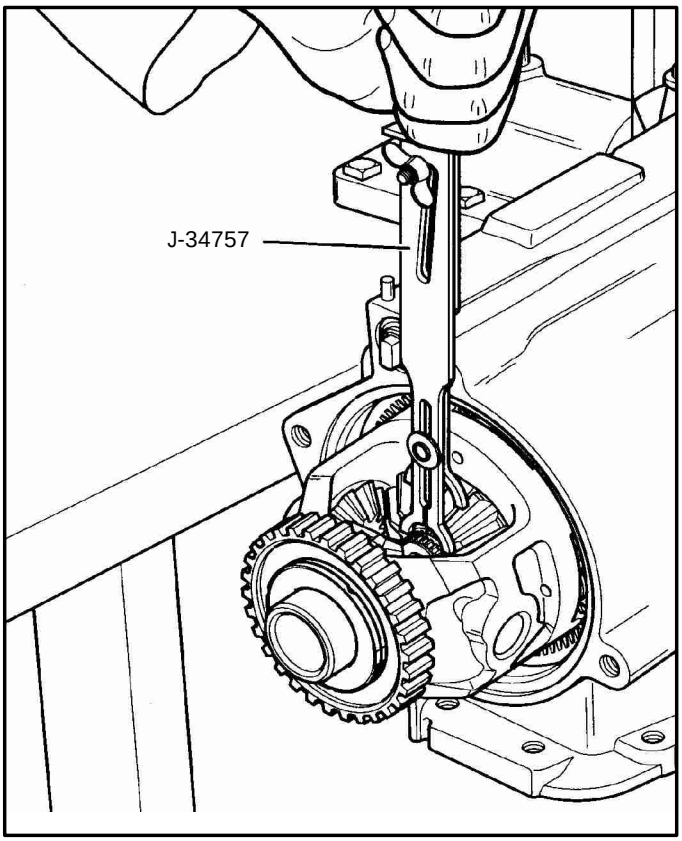
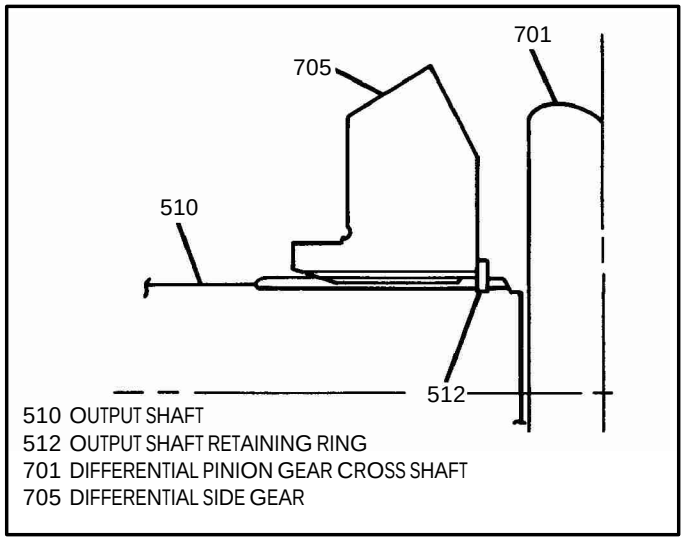


Figure 186

40. Remove the two temporary extension housing bolts and the extension housing, as shown in Figure 185.
41. Install the output shaft inboard retaining ring, using the installation tool J-34757, as shown in Figure 186.
42. Hold final drive and push retaining ring onto output shaft with J-34757, or "pop-on" using screwdriver (See Figure 186).
43. Ensure that the selective thrust washer and the thrust bearing are still in place, as shown in Figure 185.
44. Now install the extension housing "O" ring and reinstall the extension housing, as shown in Figure 185.
45. Install the 4 extension housing bolts and torque bolts to 36 N•m (27 ft.lb.).
46. Install speed sensor assembly and "O" ring into extension housing and torque retaining bolt to 11 N•m (98 in.lb.).
47. Rotate the transaxle so that side cover surface is facing up, as shown in Figure 188.
48. Install the preassembled sprockets and drive chain assembly, as shown in Figure 188, and ensure that they are fully seated.
    Note: Reassemble drive chain with sprockets the same way as found during disassembly, so the set wear pattern remains the same.
    If installing a new drive chain, install it with the black or copper link facing up.

49. Check the drive chain assembly for any wear The procedures are different for the Round Pin design and the Rocker Joint design, as shown in Figure 189.



510 OUTPUT SHAFT
512 OUTPUT SHAFT RETAINING RING
701 DIFFERENTIAL PINION GEAR CROSS SHAFT
705 DIFFERENTIAL SIDE GEAR

Figure 187

Checking Drive Chain Wear
"Round Pin" Design

50. Midway between sprockets push bottom part of drive chain towards top section until all of slack is removed, and mark case, as shown in Figure 189.
51. Pull drive chain in opposite direction until all slack is removed, and again mark the case, as shown in Figure 189.
52. Measure between the marks on case. If the dimension exceeds 27.4mm (1-1/16 inch), replace the drive chain.

"Rocker Joint" Design

53. Pull the drive chain towards the case in location shown in Figure 189.
54. Measure between the drive chain and case, as shown in Figure 189.
55. If measurement is less than 3.2mm (1/8 inch), replace the drive chain assembly.

Internal Components (Cont'd)

56. Install 4th clutch hub and shaft, drive chain oil scoop, as shown in Figure 190.
57. Install the 4th clutch plates over the 4th clutch piston and 4th clutch hub and shaft, as shown in Figure 190, depending on the model you are rebuilding.
    Note: Refer to Figure 191, for the proper 4th clutch stack-ups.

Continued on Page 106.

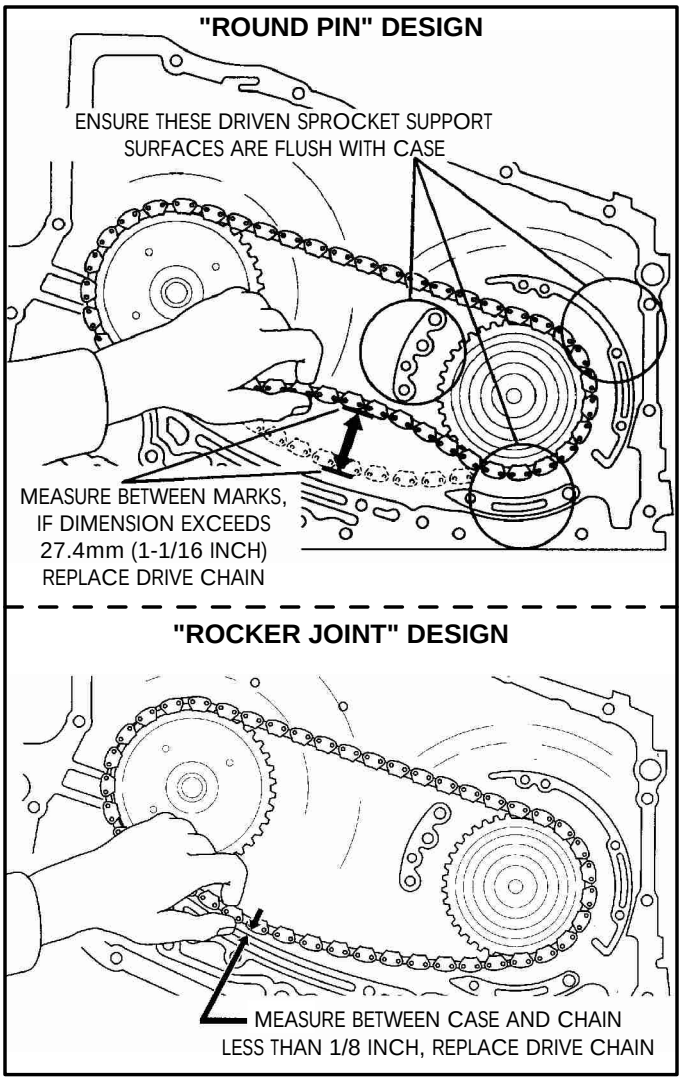


Figure 189

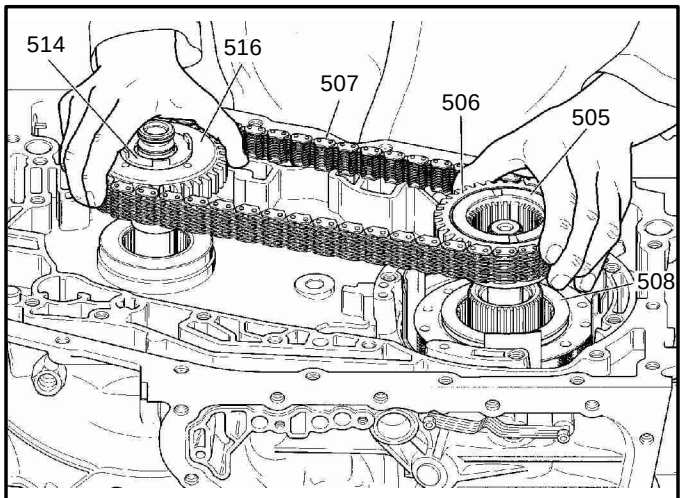


Figure 188

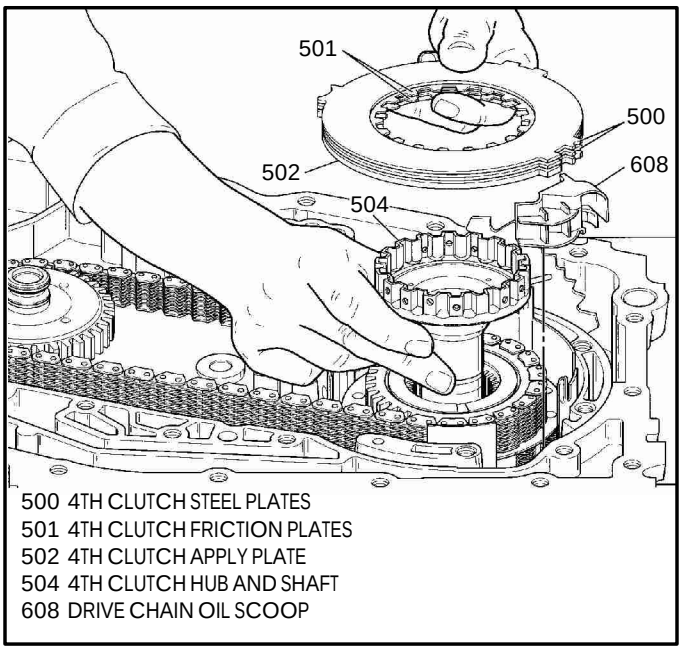


Figure 190

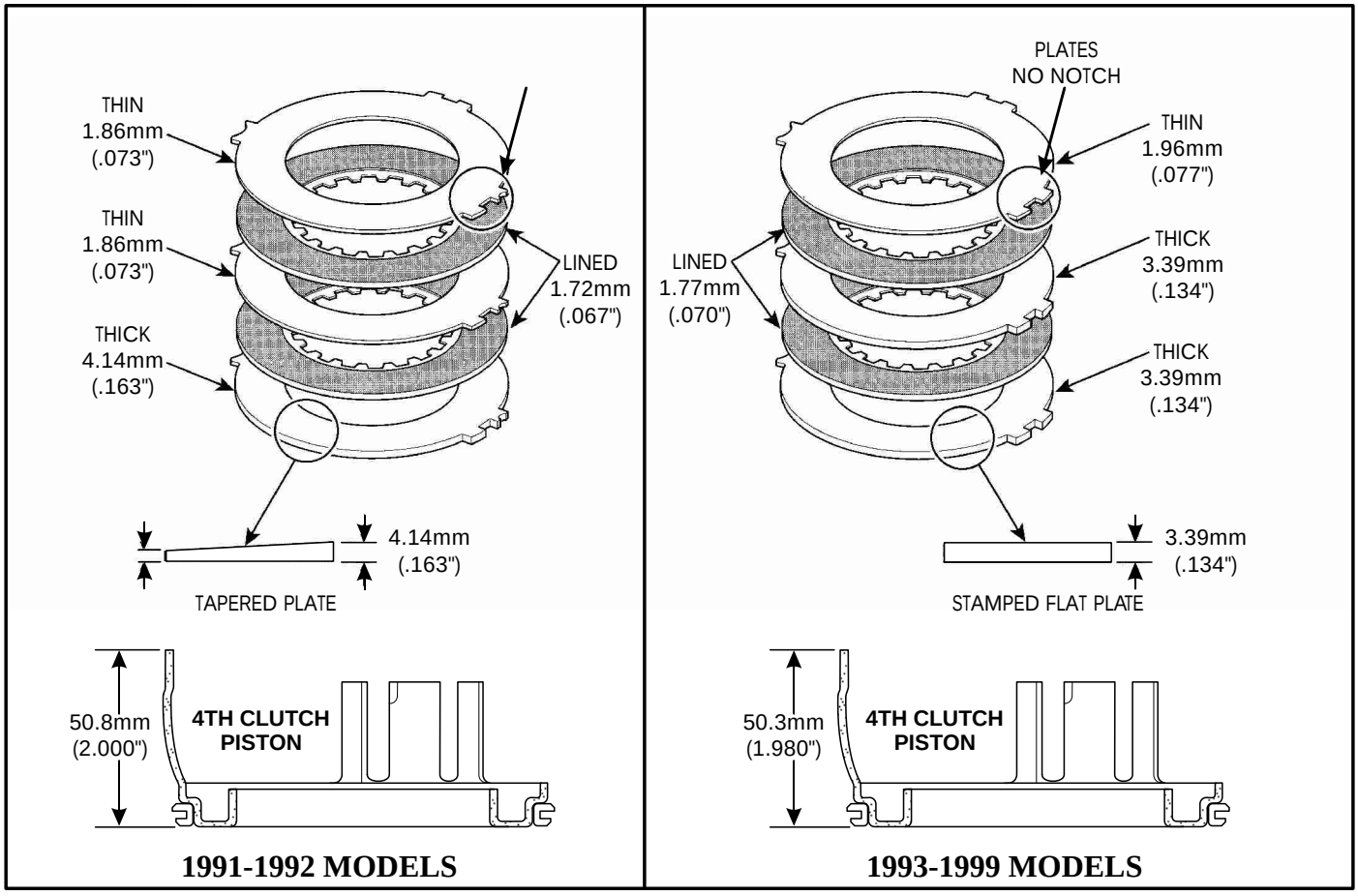


Figure 191

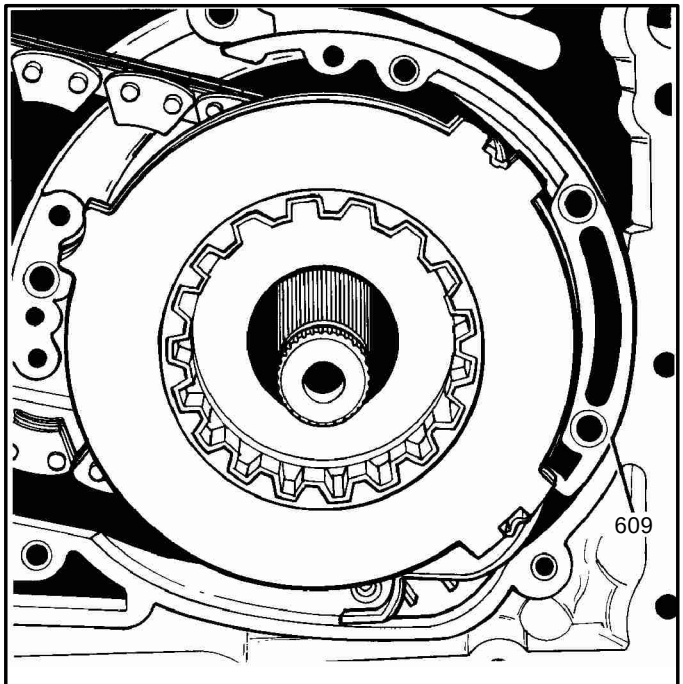


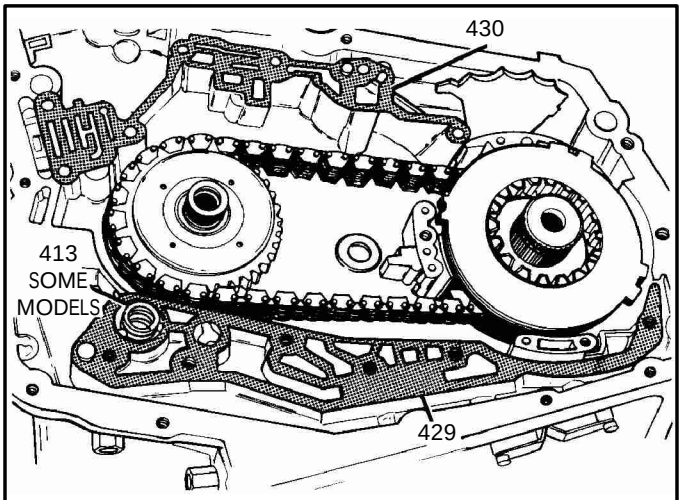
Figure 192

TRANSAXLE ASSEMBLY (Cont'd)

Internal Components (Cont'd)

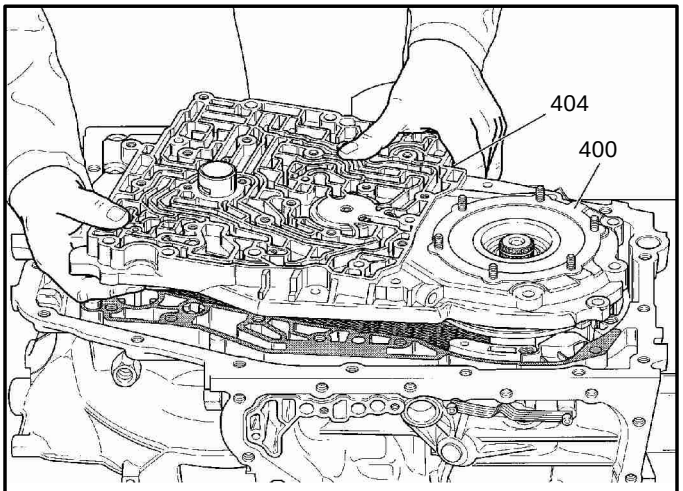
58. Align the 4th clutch piston in driven sprocket support, as shown in Figure 192.
59. Align the driven sprocket support, as shown in Figure 192.
60. Install upper and lower channel plate gaskets onto case, as shown in Figure 193, and retain with small amount of Trans-Jel®.
61. Install the TCC accumulator spring into case, as shown in Figure 193, if your model uses the TCC accumulator piston in the channel plate.
62. Install preassembled channel plate and ensuring that manual valve does not fall out, as shown in Figure 194.
63. Install the channel plate to case bolts in their proper locations, as shown in Figure 196, and ***hand tighten*** only with speed handle at this time, as shown in Figure 195.

Continued on Page 107.



413 TCC ACCUMULATOR PISTON SPRING (SOME MODELS)
429 LOWER CHANNEL PLATE GASKET
430 UPPER CHANNEL PLATE GASKET

Figure 193



400 CHANNEL PLATE ASSEMBLY
404 MANUAL VALVE

Figure 194

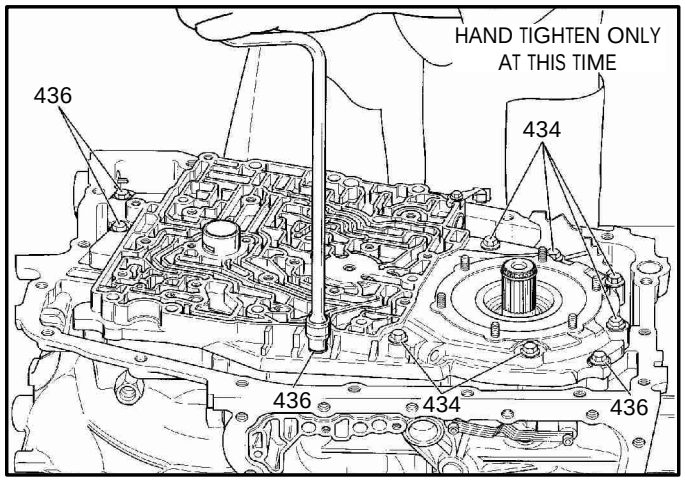
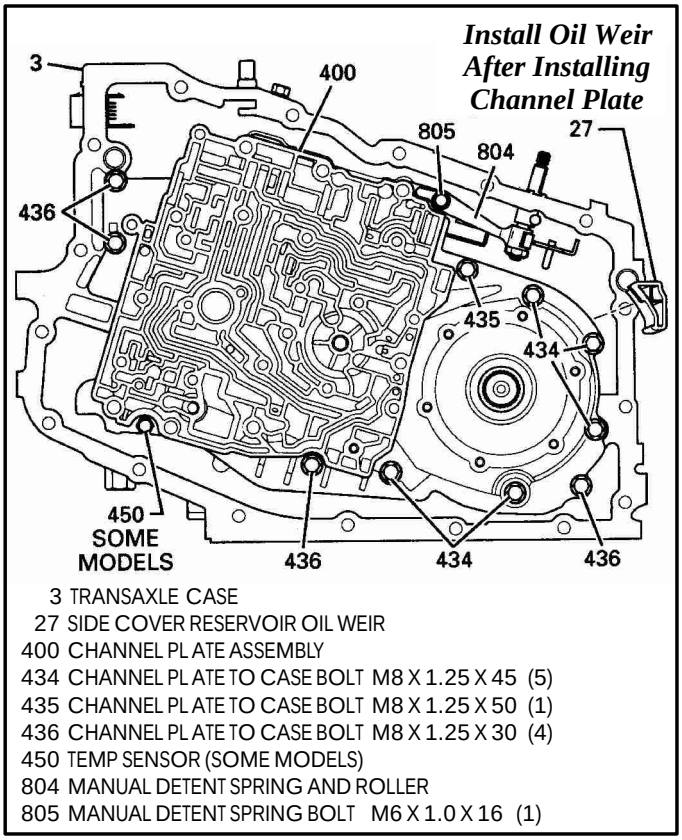


Figure 195



3 TRANSAXLE CASE
27 SIDE COVER RESERVOIR OIL WEIR
400 CHANNEL PLATE ASSEMBLY
434 CHANNEL PLATE TO CASE BOLT M8 X 1.25 X 45 (5)
435 CHANNEL PLATE TO CASE BOLT M8 X 1.25 X 50 (1)
436 CHANNEL PLATE TO CASE BOLT M8 X 1.25 X 30 (4)
450 TEMP SENSOR (SOME MODELS)
804 MANUAL DETENT SPRING AND ROLLER
805 MANUAL DETENT SPRING BOLT M6 X 1.0 X 16 (1)

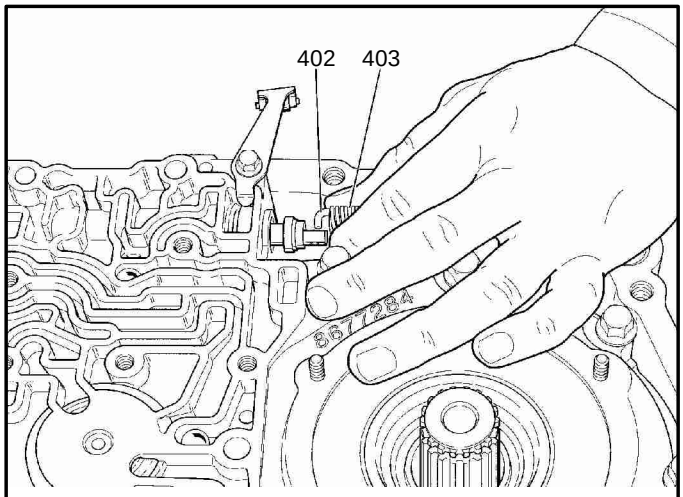
Figure 196

TRANSAXLE ASSEMBLY (Cont'd)

Internal Components (Cont'd)

64. Connect the manual valve by pulling back on the link retainer with your fingers and hooking the link in the manual valve (See Figure 197).

Continued on Page 108.



402 MANUAL VALVE LINK
403 MANUAL VALVE LINK RETAINER

Figure 197

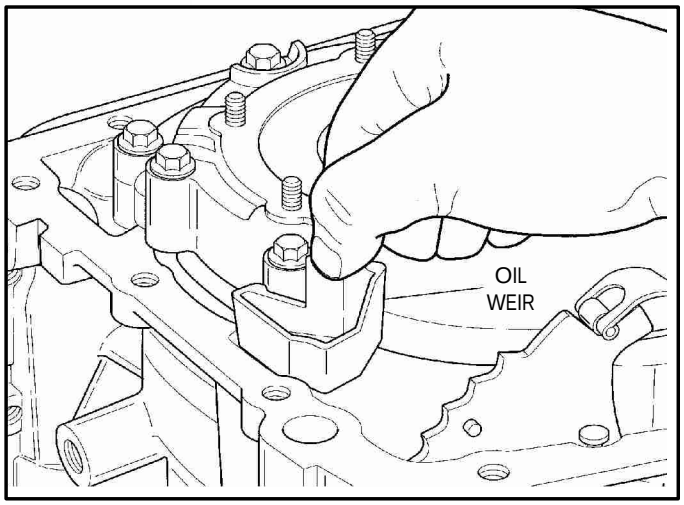


Figure 198

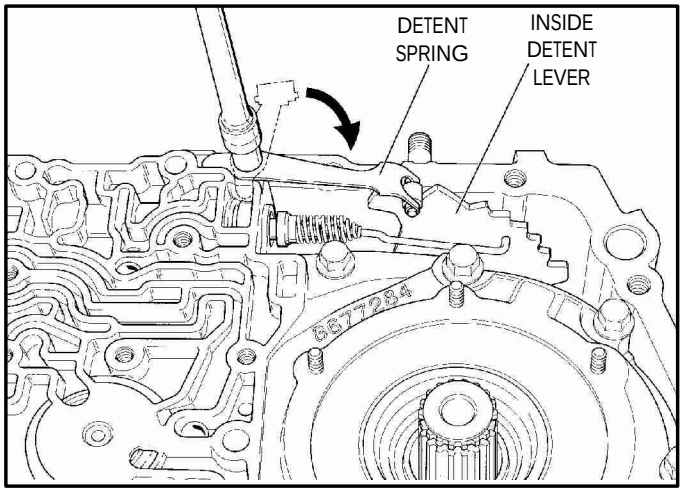


Figure 199

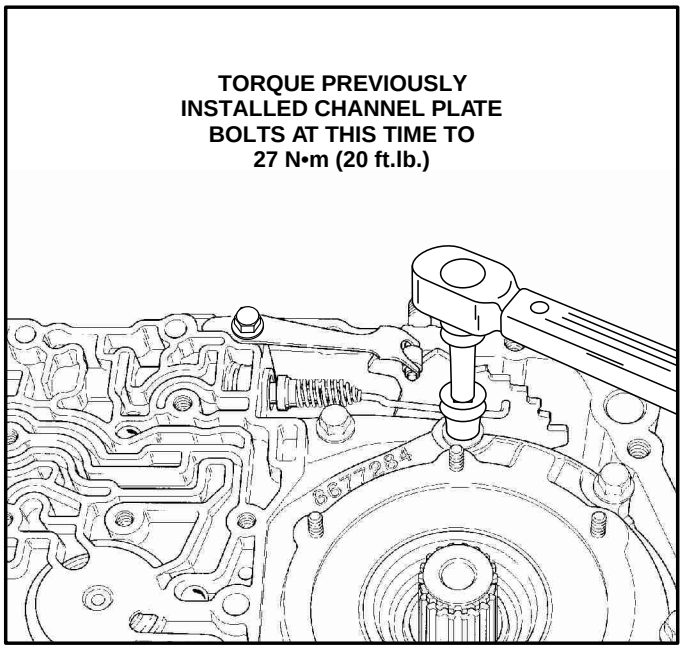


Figure 200

TRANSAXLE ASSEMBLY (Cont'd)

Internal Components (Cont'd)

65. Install the oil weir into transaxle case, resting on top of the channel plate ledge, as shown in Figure 198.
66. Swing the detent spring and roller over and on top of the inside detent lever (See Figure 199).
67. Torque the inside detent spring and roller to 7.5 N•m (66 in.lb.).
68. Torque the channel plate to case bolts that have been installed so far to 27 N•m (20 ft.lb.). as shown in Figure 200.
69. Install new sealing ring on the oil pump drive shaft and install pump drive shaft through the channel plate, as shown in Figure 203.
70. Install the valve body alignment dowel in the location shown in Figure 203.
71. Install the checkballs in channel plate pockets in the locations shown in Figure 201.
72. Install a new channel plate to spacer plate gasket onto the channel plate (See Figure 203).
73. Ensure that you have the spacer plate screens in their proper locations, and the correct screen for the model you are rebuilding.
    Note: Refer to Figure 204 for proper screen locations by model.
74. Install spacer plate on top of the channel plate gasket that you just installed (See Figure 203).
75. Install spacer plate to valve body gasket on top of the spacer plate as shown in Figure 203.
76. Ensure that the checkballs are still in the valve body in the locations shown in Figure 202.
77. Carefully install the preassembled valve body down on top of the gasket and over alignment dowel, as shown in Figure 203.

Continued on Page 110.

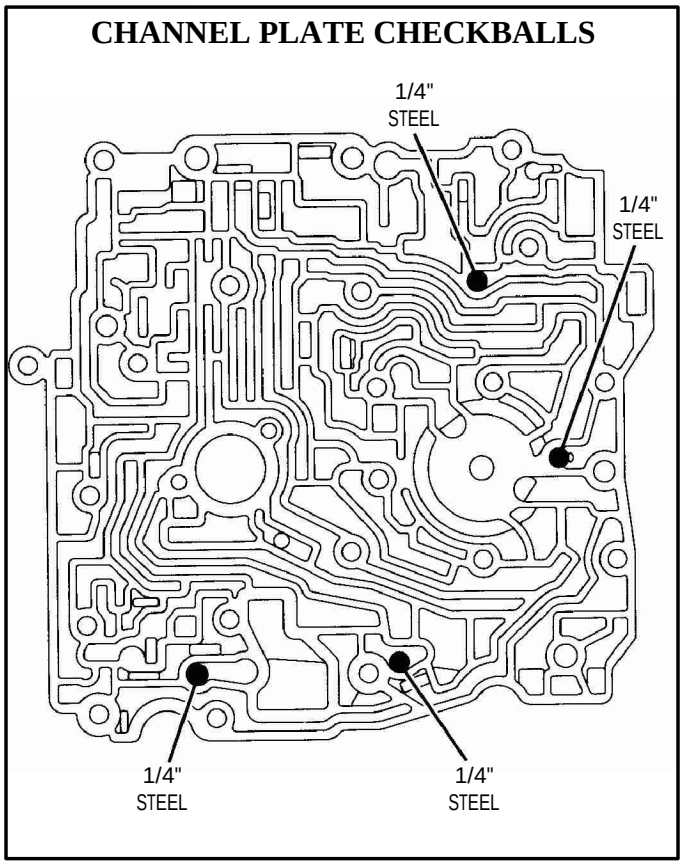


Figure 201

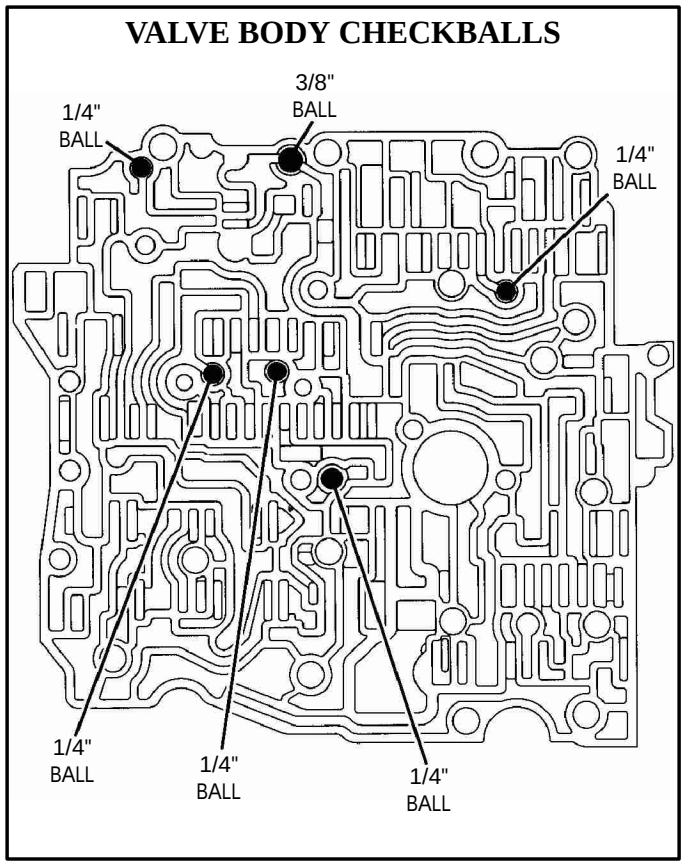


Figure 202

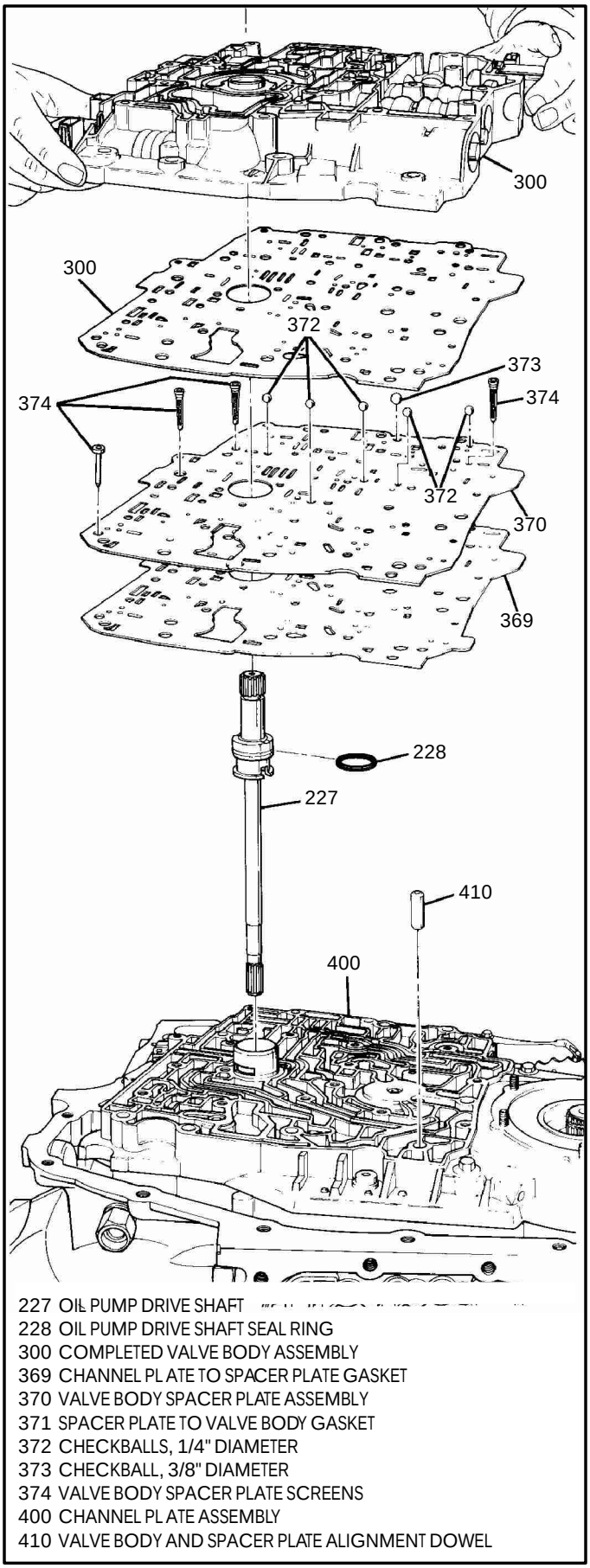


Figure 203

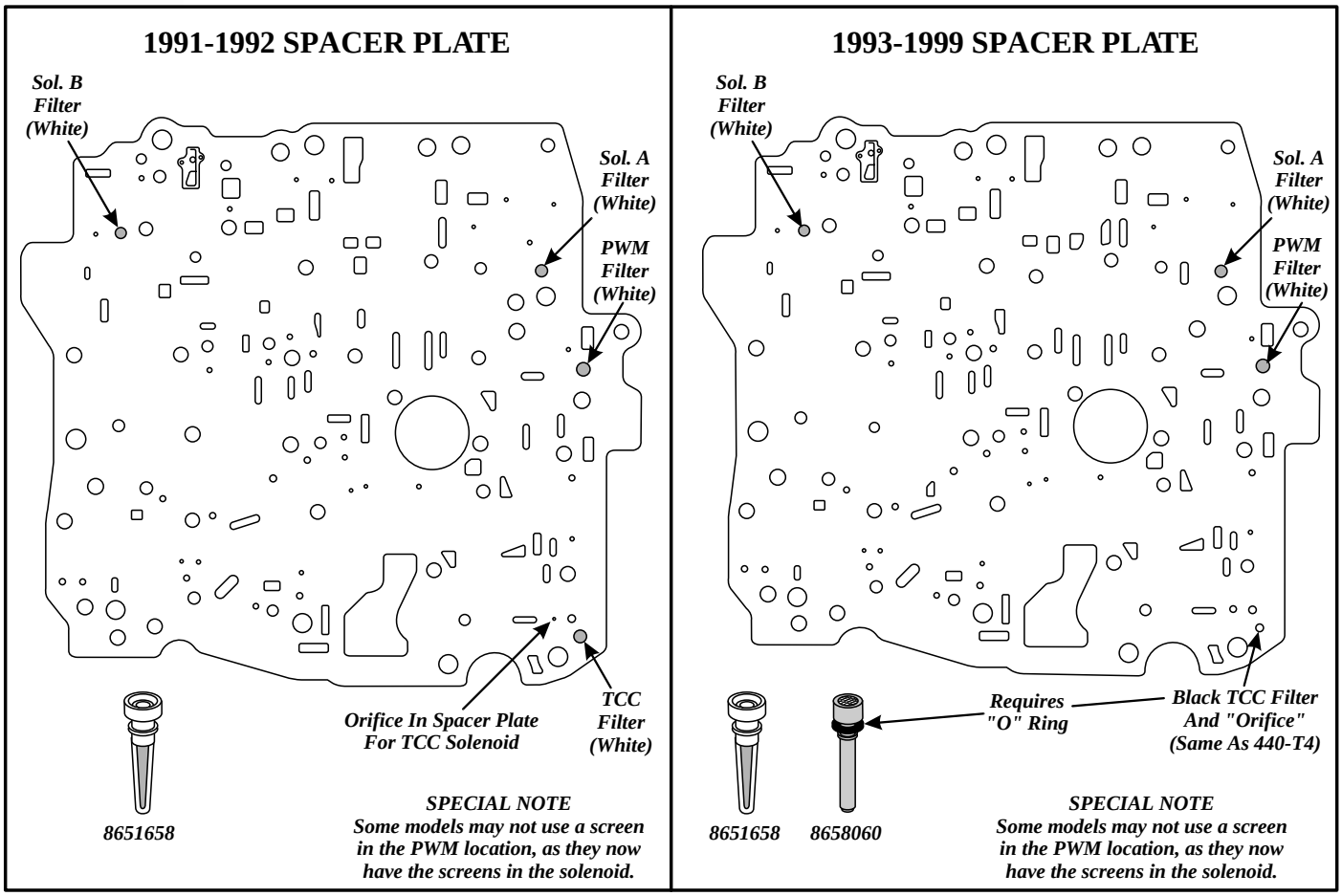


Figure 204

TRANSAXLE ASSEMBLY (Cont'd)

Internal Components (Cont'd)

78. Install the valve body retaining bolts in their proper locations, as shown in Figure 206. ***Note: Extra care is needed here to ensure that bolts are installed in proper locations.***
79. Torque the valve body bolts marked 376, 377, and 378 to 14 N·m (10 ft.lb.), beginning in the center and working in a spiral pattern. Refer to Figure 206 for bolt identification. ***Note: If bolts are torqued at random, valve bores may be distorted and inhibit valve operation.***
80. Torque the three valve body bolts marked 375 to 27 N·m (20 ft.lb.) (See Figure 206).
81. Torque the valve body bolt marked 379 down to 27 N·m (20 ft.lb.) (See Figure 206).
82. Torque the two valve body bolts marked 380 to 27 N·m (20 ft.lb.) (See Figure 206).
83. Install the internal wire harness into transaxle case connector, as shown in Figure 205, and ensure that it is fully seated.

Continued on Page 112.

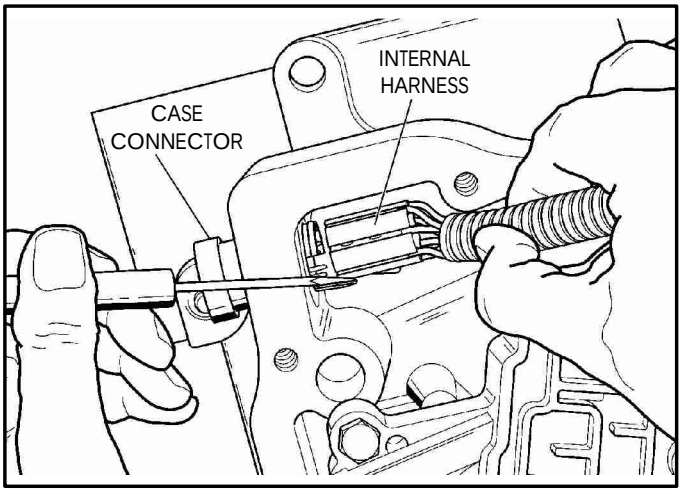
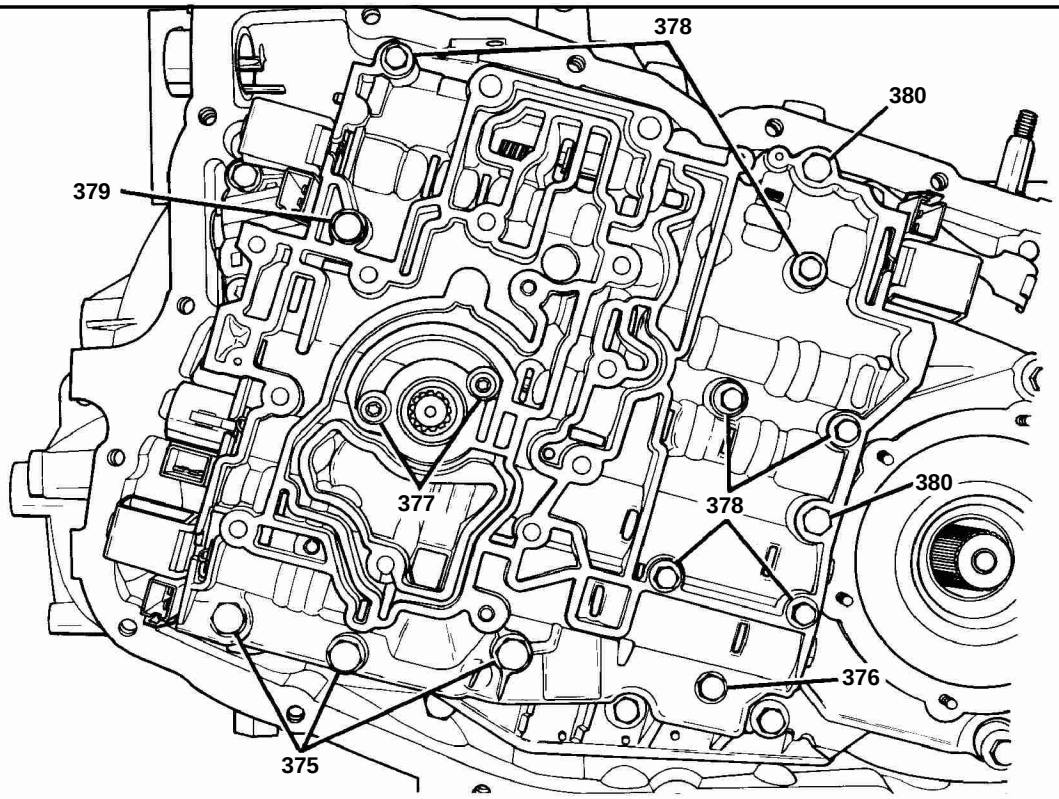


Figure 205



375 VALVE BODY, CHANNEL PLATE TO CASE BOLTS, M8 X 1.25 X 70 (REQUIRES 3)
376 VALVE BODY TO CHANNEL PLATE BOLT, M6 X 1.0 X 35 (REQUIRES 1)
377 VALVE BODY TO CHANNEL PLATE BOLTS, M6 X 1.0 X 45 (REQUIRES 2)
378 VALVE BODY TO CHANNEL PLATE BOLTS, M6 X 1.0 X 55 (REQUIRES 6)
379 VALVE BODY, CHANNEL PLATE TO CASE BOLT, M8 X 1.25 X 85 (REQUIRES 1, SPECIAL)
380 VALVE BODY TO DRIVEN SPROCKET SUPPORTBOLT, M8 X 1.25 X 90 (REQUIRES 1)
380 VALVE BODY, CHANNEL PLATE TO CASE BOLT, M8 X 1.25 X 90 (REQUIRES 1)

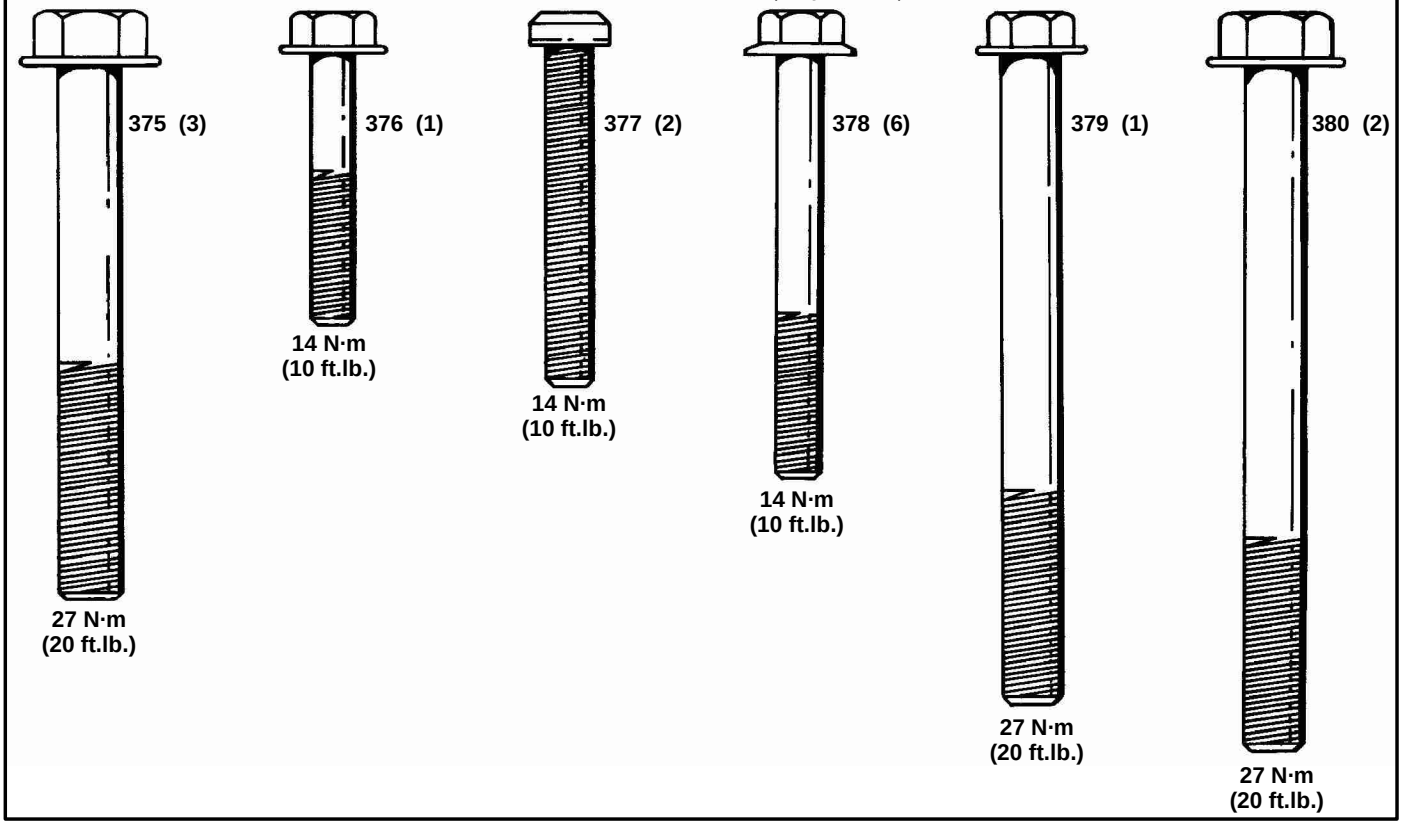
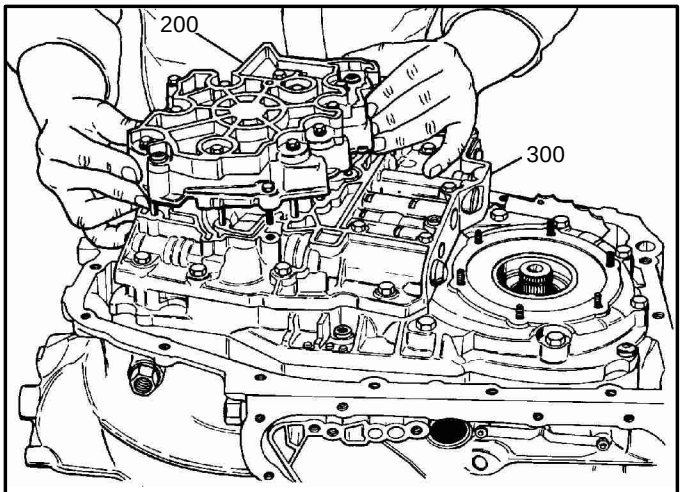
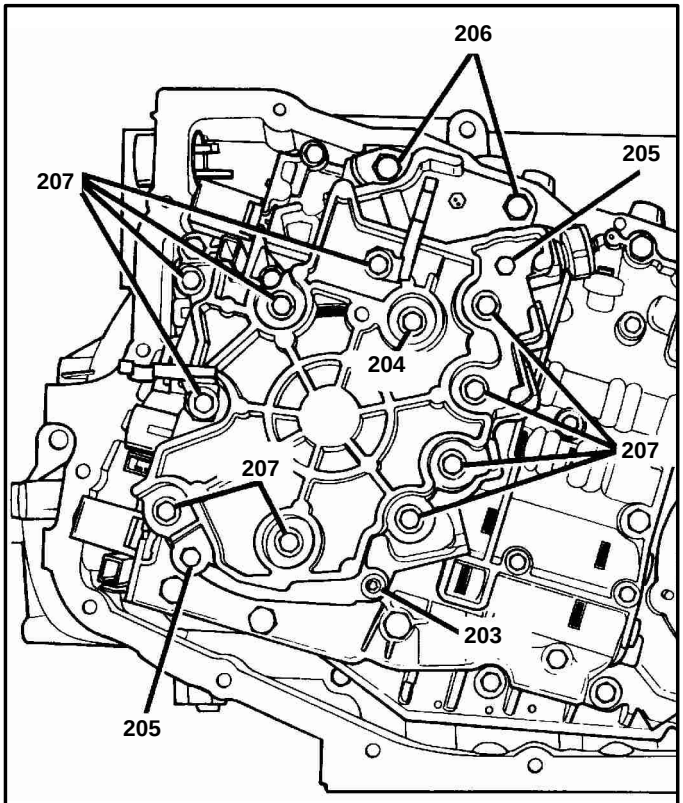


Figure 206



200 OIL PUMP ASSEMBLY
300 VALVE BODY ASSEMBLY

Figure 207



203 OIL PUMP BOLT, M8 X 1.25 X 30 (1)
204 OIL PUMP BOLT, M6 X 1.0 X 45 (1)
205 OIL PUMP COVER BOLT, M8 X 1.25 X 20 (1 OR 2 OR 0)
206 OIL PUMP TO CASE BOLT, M8 X 1.25 X 95 (2)
207 OIL PUMP BOLT, M6 X 1.0 X 85 (10)

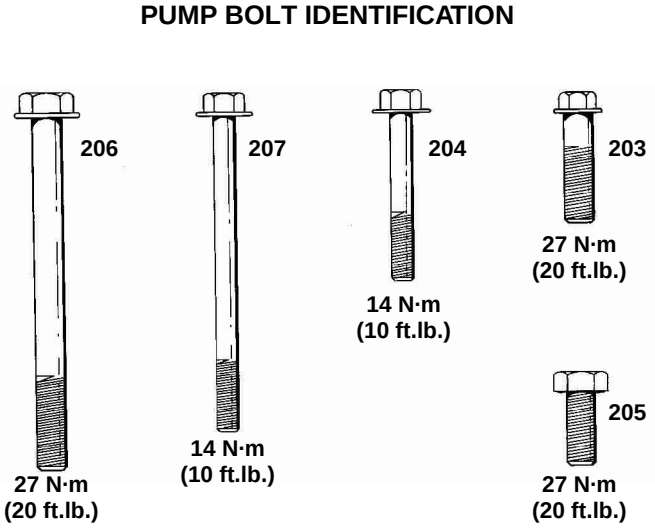
Figure 208

TRANSAXLE ASSEMBLY (Cont'd)

Internal Components (Cont'd)

84. Install the preassembled oil pump assembly on valve body, as shown in Figure 207, and rotate pump drive shaft to fully seat the oil pump.
85. Install oil pump retaining bolts in their proper locations, as shown in Figure 208.
    Note: Extra care is needed here to ensure that bolts are installed in proper locations.
86. Torque oil pump bolts marked 204 and 207 to 14 N·m (10 ft.lb.), beginning in the center and working in a spiral pattern. Refer to Figure 209 for bolt identification.
    Note: If bolts are torqued at random, pump may be distorted and inhibit proper pump slide operation.
87. Torque the remaining oil pump retaining bolts to 27 N·m (20 ft.lb.) (See Figures 208 & 209).
88. Install the internal wiring harness using small screwdriver, if necessary, to install connectors on solenoids, as shown in Figure 210.
    Note: Notice that different models have the temperature sensor in different locations.
89. Install new side cover to case and side cover to channel plate gaskets, as shown in Figures 211 and 212.

Continued on Page 113.



203 OIL PUMP BOLT, M8 X 1.25 X 30 (1)
204 OIL PUMP BOLT, M6 X 1.0 X 45 (1)
205 OIL PUMP COVER BOLT, M8 X 1.25 X 20 (1 OR 2 OR 0)
206 OIL PUMP TO CASE BOLT, M8 X 1.25 X 95 (2)
207 OIL PUMP BOLT, M6 X 1.0 X 85 (10)

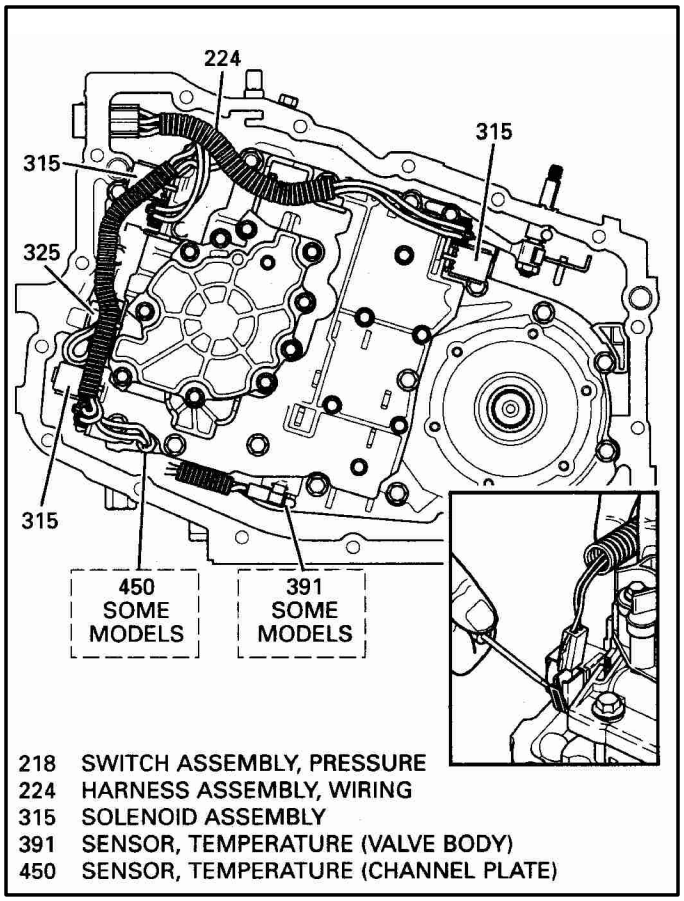
Figure 209

TRANSAXLE ASSEMBLY (Cont'd)

Internal Components (Cont'd)

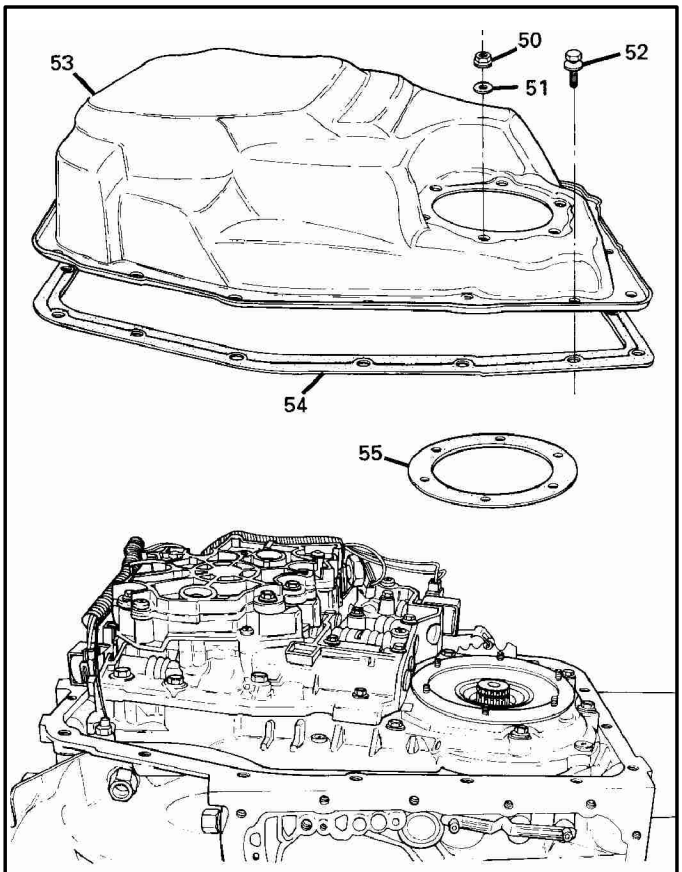
90. Install side cover and 17 side cover to case bolts, as shown in Figures 211 and 212.
Special Note: Some models are equipped with a stamped steel side cover with retaining nuts and conical washers, as shown in Figure 211. Other models are equipped with structural (cast aluminum) side covers that do not use the retaining nuts and conical washers, as shown in Figure 212.
91. Install the six nuts and conical washers onto side cover, if equipped (See Figure 211).
92. Torque the seventeen side cover to case bolts to 11 N·m (98 in.lb.) (See Figure 211).
93. Torque the six side cover to channel plate bolts to 8 N·m (71 in.lb.) (See Figure 211).
94. Rotate the transaxle in fixture so that bottom pan surface is facing up.

Continued on Page 114.



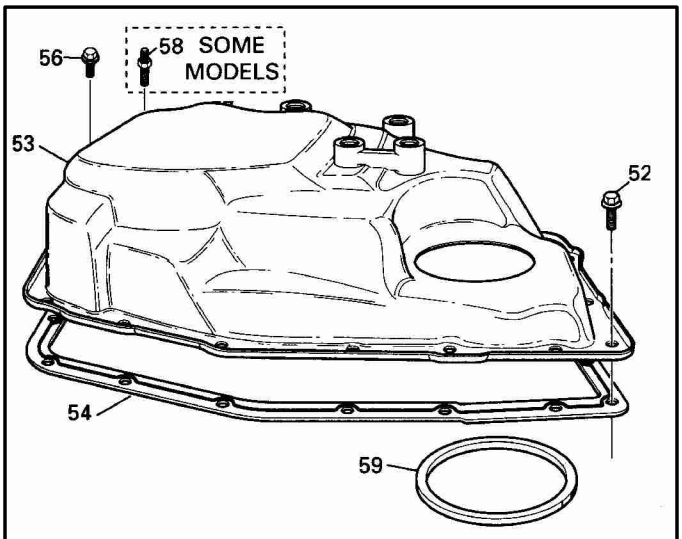
218 SWITCH ASSEMBLY, PRESSURE
224 HARNESS ASSEMBLY, WIRING
315 SOLENOID ASSEMBLY
391 SENSOR, TEMPERATURE (VALVE BODY)
450 SENSOR, TEMPERATURE (CHANNEL PLATE)

Figure 210



50 SIDE COVER TO CHANNEL PLATE NUT (6) (SOME MODELS)
51 CONICAL WASHER (6) (SOME MODELS)
52 SIDE COVER BOLT AND CONICAL WASHER ASSEMBLY (17)
53 CASE SIDE COVER (SOME MODELS)
54 SIDE COVER TO CASE GASKET
55 SIDE COVER TO CHANNEL PLATE GASKET (SOME MODELS)

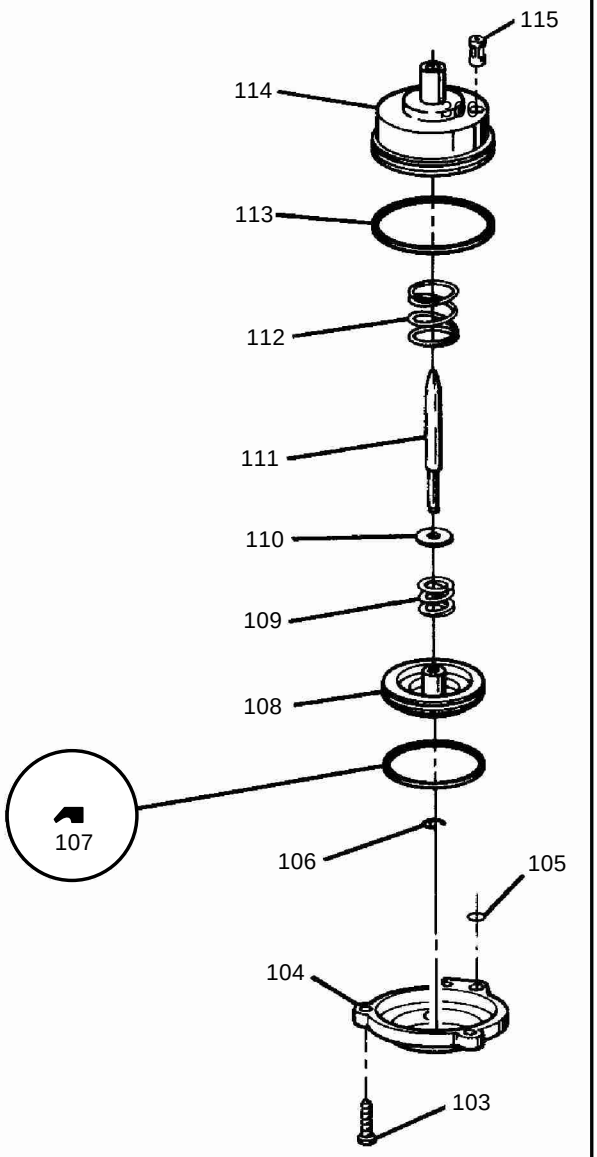
Figure 211



53 STRUCTURAL CASE SIDE COVER (SOME MODELS)
54 SIDE COVER TO CASE GASKET
58 SIDE COVER TO CASE STUD (SOME MODELS)
59 SIDE COVER TO CHANNEL PLATE GASKET (SOME MODELS)

Figure 212

2-1 MANUAL SERVO COMPONENTS



103 2-1 SERVO COVER TO CASE BOLT, M8 X 1.25 X 25 (3)
104 2-1 MANUAL SERVO COVER
105 2-1 MANUAL SERVO COVER TO CASE SQUARE CUT SEAL
106 RETAINING "E" CLIP
107 2-1 MANUAL SERVO PISTON LIP SEAL
108 2-1 MANUAL SERVO PISTON
109 2-1 MANUAL SERVO CUSHION SPRING
110 2-1 MANUAL SERVO CUSHION SPRING RETAINER
111 2-1 MANUAL SERVO APPLY PIN
112 2-1 MANUAL SERVO PISTON RETURN SPRING
113 2-1 MANUAL SERVO HOUSING "O" RING SEAL
114 2-1 MANUAL SERVO HOUSING
115 2-1 MANUAL SERVO HOUSING SCREEN

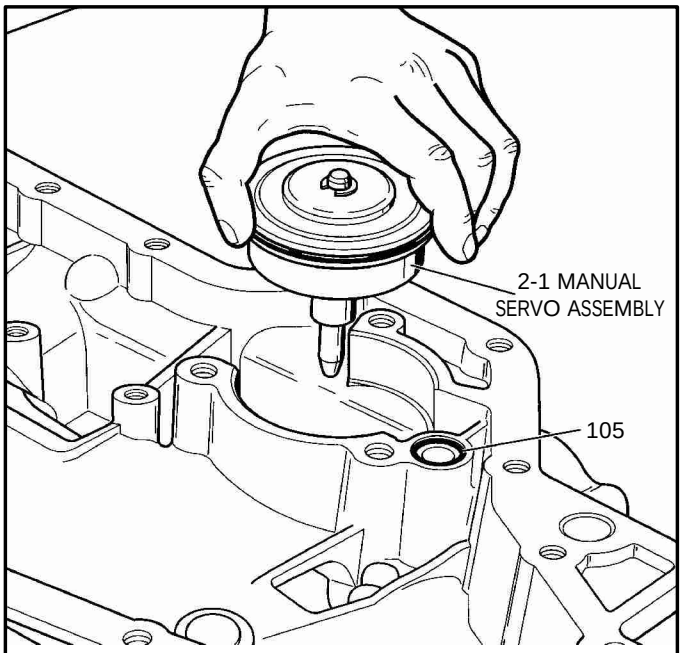
Figure 213

TRANSAXLE ASSEMBLY (Cont'd)

Bottom Pan Components

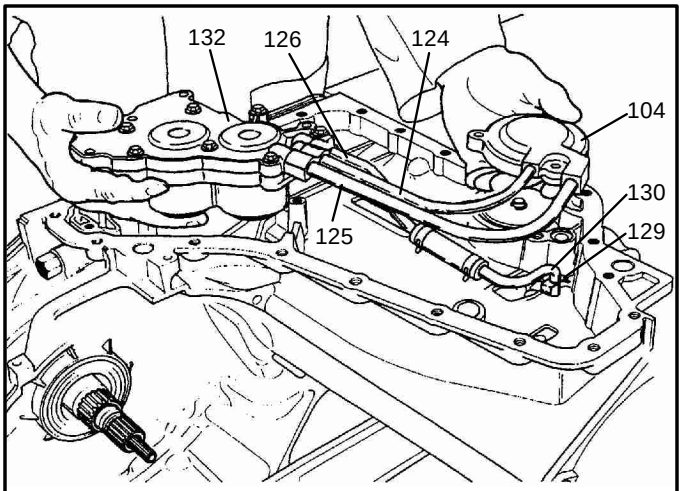
1. Assemble the 2-1 manual servo assembly, as shown in Figure 213.
2. Install new 2-1 manual servo cover to case seal into case pocket, as shown in Figure 214.
3. Install the 2-1 manual servo assembly into the case pocket, as shown in Figure 214.
4. Assemble lube pipes, 2-1 manual servo cover and the preassembled 1-2/2-3 accumulator assembly, as shown in Figure 215, and install on transaxle case.
5. Install the 4 accumulator bolts and the 3 servo cover bolts, as shown in Figure 216.
6. Torque the three 2-1 manual servo cover bolts to 24 N·m (18 ft.lb.) (See Figure 216).
7. Torque the four accumulator assembly bolts to 11 N·m (98 in.lb.) (See Figure 216).
8. Pry the final drive lube pipe clip into place, as shown in Figure 216.
9. Set the thermo element pins using J-34094-A, as shown in Figure 217.
10. Carefully install the thermo element between the two pins, as shown in Figure 217, without bending the element too much.
    Note: The "V" in thermo element "must" contact the element plate when installed.

Continued on Page 115.



105 2-1 MANUAL SERVO COVER TO CASE SQUARE CUT SEAL

Figure 214



104 2-1 MANUAL SERVO COVER
124 2-1 MANUAL SERVO FEED PIPE
125 FORWARD SERVO FEED PIPE
126 FRONT DIFFERENTIAL LUBE PIPE
129 REAR DIFFERENTIAL LUBE PIPE RETAINER
130 REAR DIFFERENTIAL LUBE PIPE
132 1-2/2-3 ACCUMULATOR ASSEMBLY

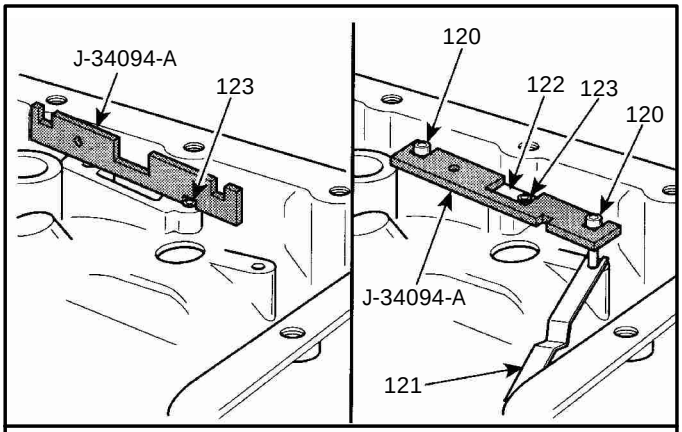
Figure 215

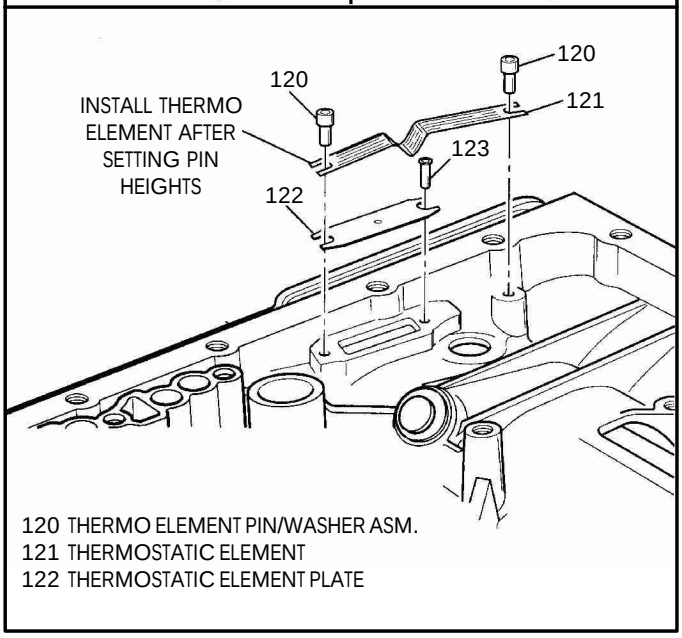
TRANSAXLE ASSEMBLY (Cont'd)

Bottom Pan Components (Cont'd)

11. Install bottom pan oil scoop into the transaxle case as, shown in Figure 218.
12. Torque the bottom pan oil scoop retaining bolts to 8 N·m (71 in.lb.)

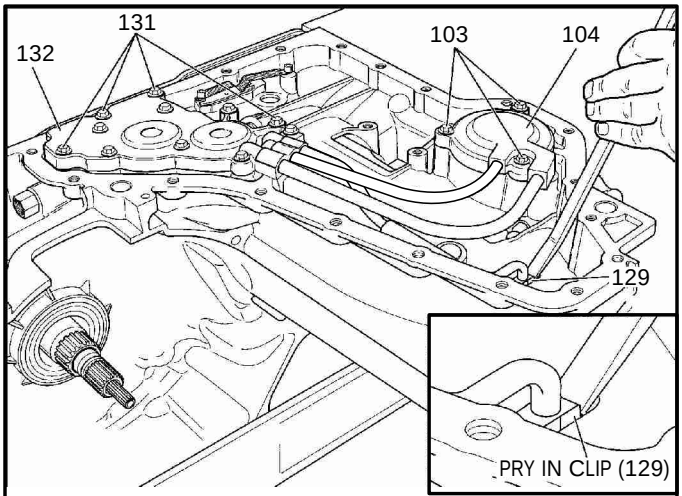
Continued on Page 116.





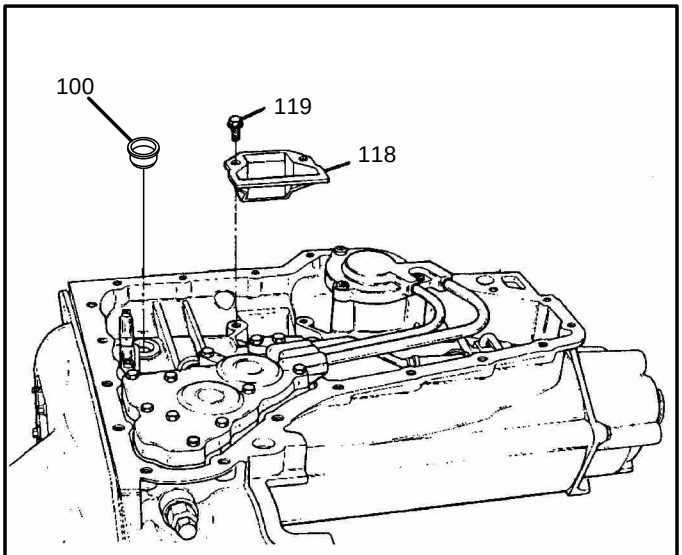
120 THERMO ELEMENT PIN/WASHER ASM.
121 THERMOSTATIC ELEMENT
122 THERMOSTATIC ELEMENT PLATE

Figure 217



103 2-1 MANUAL SERVO COVER RETAINING BOLTS (3)
104 2-1 MANUAL SERVO COVER
129 REAR DIFFERENTIAL LUBE PIPE RETAINER
131 1-2/2-3 ACCUMULATOR ASSEMBLY RETAINING BOLTS
132 1-2/2-3 ACCUMULATOR ASSEMBLY

Figure 216



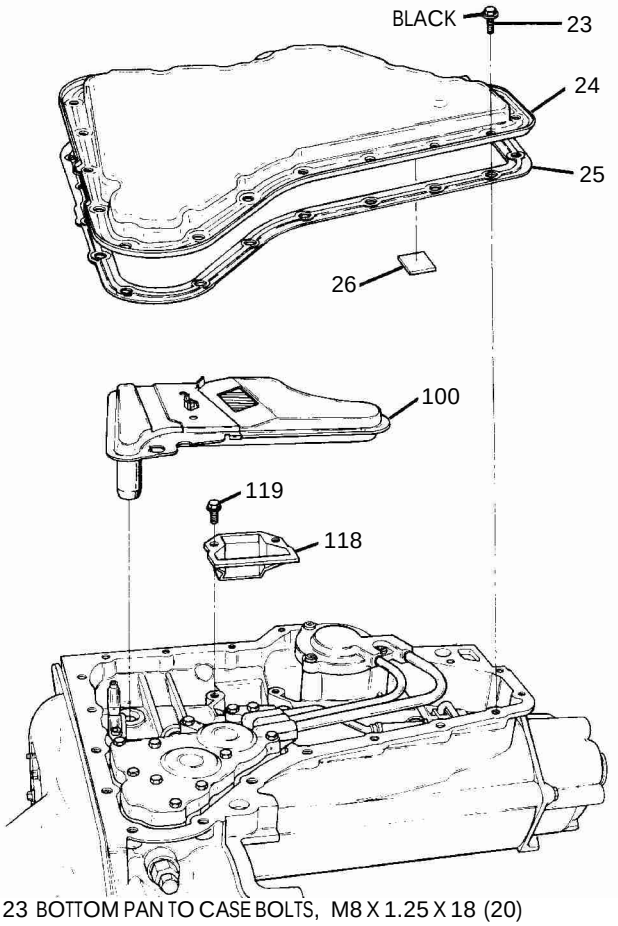
100 BOTTOM PAN OIL FILTER SEAL
118 BOTTOM PAN OIL SCOOP
119 BOTTOM PAN OIL SCOOP RETAINING BOLTS (2)

Figure 218

TRANSAXLE ASSEMBLY (Cont'd)

Bottom Pan Components (Cont'd)

13. Install new filter seal into the transaxle case, as shown in Figure 218.
14. Lube new bottom pan filter neck with a small amount of Trans-Jel®, and install filter into the seal, as shown in Figure 219.
15. Install new bottom pan gasket onto transaxle case, as shown in Figure 219.
    Note: Gasket is re-usable as long as ribs are not broken.
16. Install the bottom transaxle oil pan, as shown in Figure 219.
    Note: Ensure that the bottom pan magnet is in place before installing (See Figure 219).
17. Install the 20 bottom oil pan retaining bolts, as shown in Figure 219, and torque the bolts to 17 N·m (13 ft.lb.).



23 BOTTOM PAN TO CASE BOLTS, M8 X 1.25 X 18 (20)
24 TRANSAXLE BOTTOM OIL PAN
25 TRANSAXLE BOTTOM OIL PAN GASKET
26 BOTTOM OIL PAN MAGNET
100 BOTTOM PAN OIL FILTER
118 BOTTOM PAN SCAVENGING OIL SCOOP
119 OIL SCOOP TO CASE BOLTS, M8 X 1.25 X 20 (2)

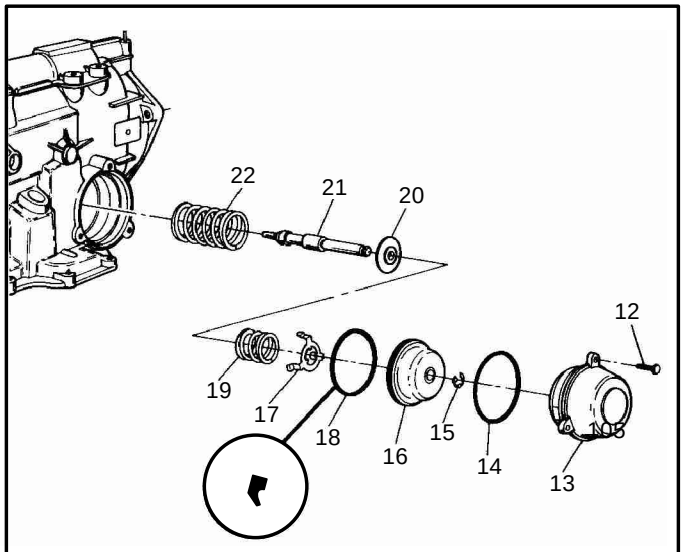
Figure 219

TRANSAXLE ASSEMBLY (Cont'd)

External Components

1. Assemble the forward servo parts exactly as shown in Figure 220.
2. Install new lip seal into groove in the forward servo piston, in direction shown in Figure 220, and lube with small amount of Trans-Jel®.
3. Install forward servo piston assembly into the forward servo cover (See Figure 220).
4. Install new "O" ring on forward servo cover, as shown in Figure 220.
5. Install the forward servo complete in transaxle case and use the snap ring screwdriver with its end prying against edge of bench to compress the servo cover, as shown in Figure 221.
6. With the cover seated against the case use your free hand to thread the servo cover bolts in, as shown in Figure 221.
   Note: Thread the bolts in completely before tightening with a socket.
7. Torque the forward servo cover bolts down to 10 N·m (89 in.lb.).

Continued on Page 117.



12 FORWARD SERVO COVER BOLTS, M6 X 1.0 X 20 (3)
13 FORWARD SERVO COVER
14 FORWARD SERVO COVER "O" RING SEAL
15 FORWARD SERVO "E" CLIP
16 FORWARD SERVO PISTON
17 FORWARD SERVO SPRING RETAINER
18 FORWARD SERVO PISTON LIP SEAL
19 FORWARD SERVO CUSHION SPRING
20 FORWARD SERVO CUSHION SPRING RETAINER
21 FORWARD SERVO APPLY PIN
22 FORWARD SERVO PISTON RETURN SPRING

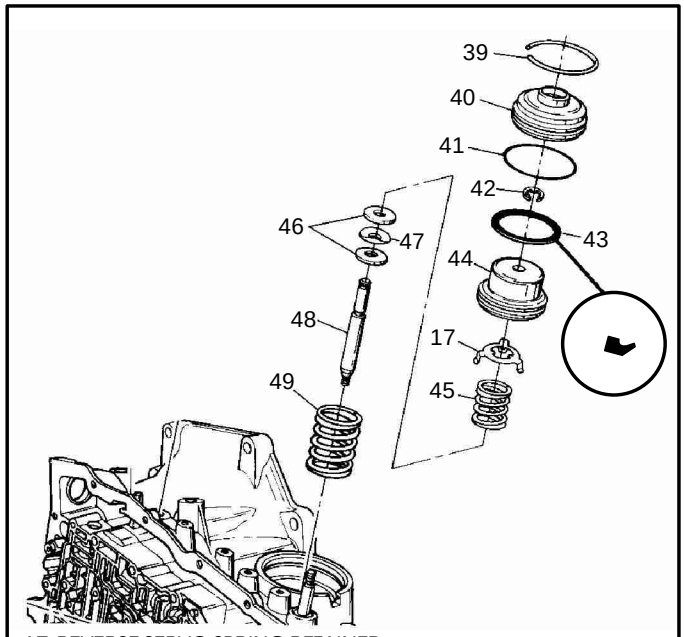
Figure 220

TRANSAXLE ASSEMBLY (Cont'd)

External Components (Cont'd)

8. Assemble the reverse servo parts exactly as shown in Figure 222.
9. Install new lip seal into groove in the reverse servo piston, in direction shown in Figure 222, and lube with small amount of Trans-Jel®.
10. Install reverse servo piston assembly into the transaxle case (See Figure 222).
11. Install new "O" ring on reverse servo cover, as shown in Figure 222, and lube with a small amount of Trans-Jel®.
12. Install reverse servo cover using the support fixture as a pivot point to push it down with the large snap ring screwdriver, as shown in Figure 223.
13. While the servo is compressed, slip one end of the snap ring into the retaining groove, then pry in the remainder of the snap ring with another screwdriver, as shown in Figure 223.

Continued on Page 118.



17 REVERSE SERVO SPRING RETAINER
39 REVERSE SERVO COVER SNAP RING
40 REVERSE SERVO COVER
41 REVERSE SERVO COVER "O" RING
42 RETAINING "E" CLIP
43 REVERSE SERVO PISTON LIP SEAL
44 REVERSE SERVO PISTON
45 REVERSE SERVO CUSHION SPRING
46 REVERSE SERVO CUSHION SPRING RETAINER
47 REVERSE SERVO CURVED SPRING
48 REVERSE SERVO APPLY PIN
49 REVERSE SERVO PISTON RETURN SPRING

Figure 222

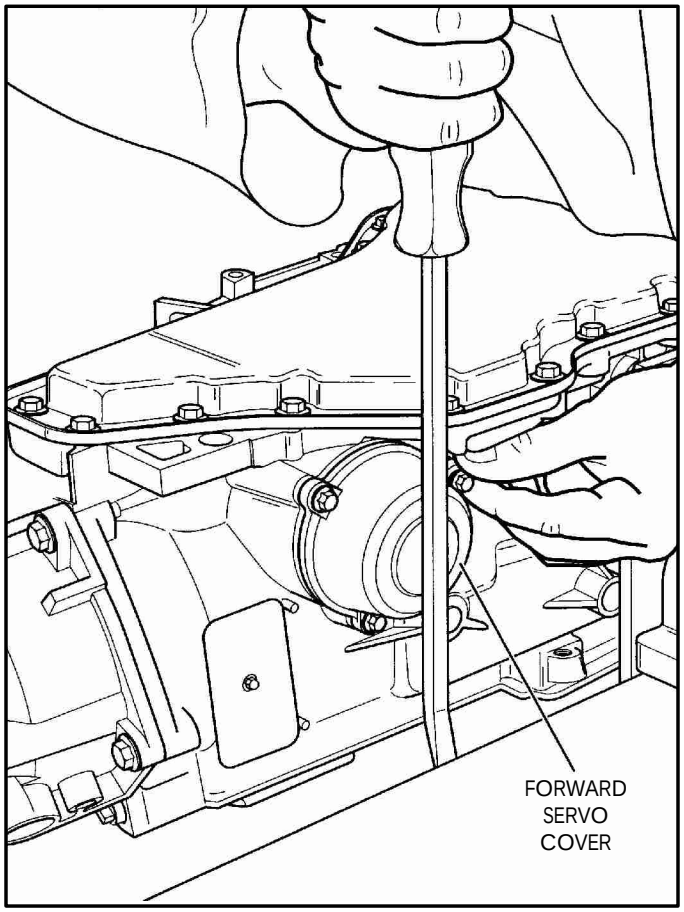
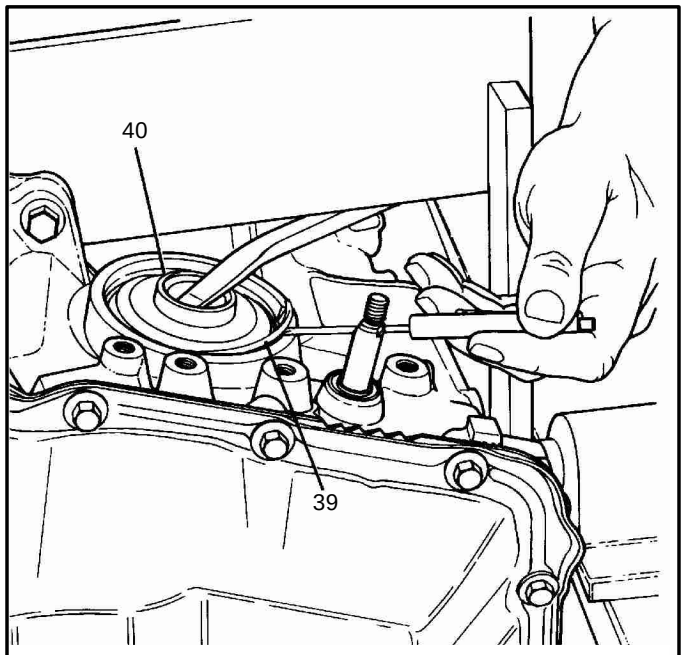


Figure 221



39 REVERSE SERVO COVER SNAP RING
40 REVERSE SERVO COVER

Figure 223

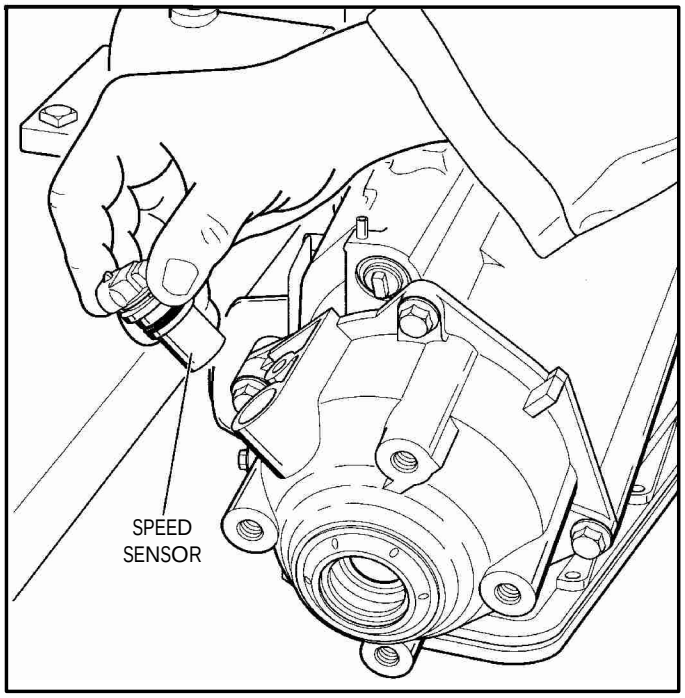


Figure 224

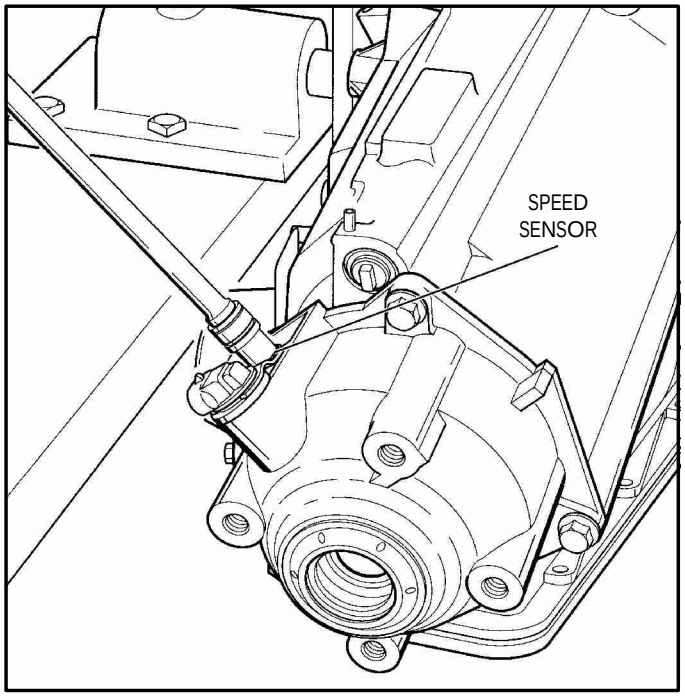


Figure 225

TRANSAXLE ASSEMBLY (Cont'd)

External Components (Cont'd)

14. Install new "O" ring on the speed sensor and install speed sensor into extension housing, as shown in Figure 224.
15. Install speed sensor retaining bolt and torque the bolt to 11 N·m (98 in.lb.), as shown in Figure 225.
16. Install the modulator valve into the case bore, as shown in Figure 226.
17. Install new "O" ring seal on a new modulator, as shown in Figure 226.
18. Install the modulator assembly into the case, as shown in Figure 226.
19. Install the modulator retainer and torque bolt to 24 N·m (18 ft.lb.). (See Figure 226).
20. Install new ***green*** "O" ring seal onto turbine shaft, as shown in Figure 227, and lubricate with small amount of Trans-Jel®.
    Note: There is a Blue "O" ring in the gasket sets that is very close to the dimensions of the green "O" ring. The blue "O" ring is for the parking pawl sleeve and is different material, that will create TCC concerns if used on the turbine shaft.
21. Remove the transaxle from fixture.

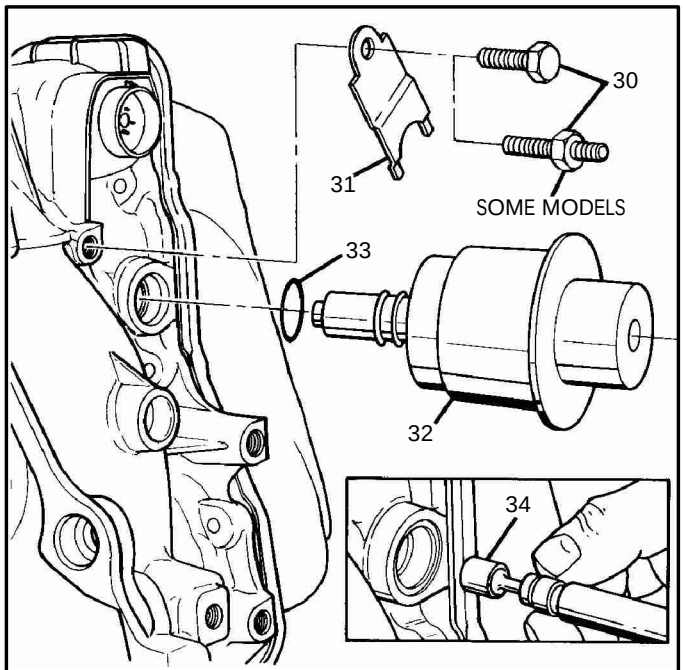


Figure 226

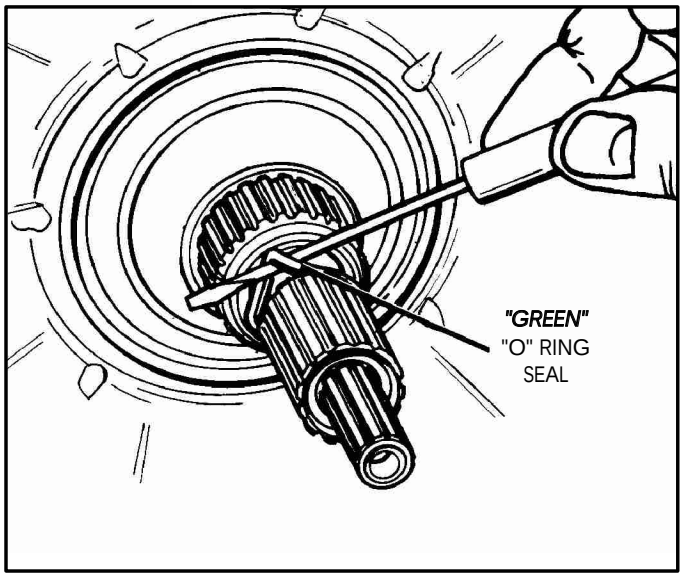


Figure 227

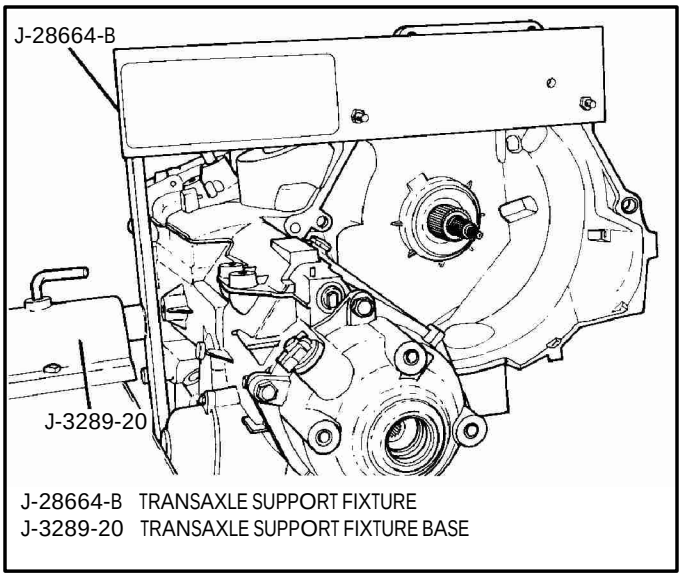


Figure 228

TORQUE SPECIFICATIONS

Part No.	Description Of Use	Qty.	Thread Size	Asm. Torque Specification		
				N•m	Lb. Ft.	Lb. In.
5	Bolt, Case Extension to Case	4	M10 X 1.5 X 35.0	30.0 - 41.0	22.0 - 30.0	
9	Bolt, Speed Sensor Retainer to Case	1	M8 X 1.25 X 12.0	8.0 - 14.0		71.0 - 124.0
12	Bolt, FWD Servo Cover to Case	3	M6 X 1.0 X 20.0	7.0 - 13.0		62.0 - 115.0
23	Bolt, Special Trans. Oil Pan to Case	20	M8 X 1.25 X 18.0	9.0 - 13.0		80.0 - 115.0
28	Ball Check Asm., Cooler Line	1	3/8 - 18	46.0 - 58.0	34.0 - 43.0	
29	Connector - Cooler Line (Inverted Flare Tube)	1	1/4 - 18 NPSF	32.0 - 44.0	23.5 - 32.5	
30	Bolt, Modulator to Case (Stud End)	1	M8 X 1.25 X 20.0	20.0 - 27.0	14.7 - 20.0	
30	Bolt, Modulator to Case (Heavy Hex. Head)	1	M8 X 1.25 X 20.0	20.0 - 27.0	14.7 - 20.0	
38	Plug, Pipe - Line Pressure	2	1/8 - 27 Dryseal, NPTF	7.0 - 14.0		62.0 - 124.0
50	Nut, Case Side Cover to Channel Plate	6	M6 X 1.0	5.0 - 11.0		45.0 - 97.4
52	Bolt, Special, Side Cover to Case - Conical Washer	17	M8 X 1.25 X 21.3	9.0 - 13.0		80.0 - 115.0
103	Bolt, 2-1 Servo Cover to Case	3	M8 X 1.25 X 25.0	20.0 - 27.0	14.7 - 20.0	
119	Bolt, Scavenging Oil Scoop to Case	2	M8 X 1.25 X 20.0	5.0 - 11.0		44.2 - 97.5
131	Bolt, Accumulator Cover to Case & Accum. Housing	11	M6 X 1.0 X 28.0	8.0 - 14.0		71.0 - 124.0
203	Bolt, Pump Body to Valve Body	1	M8 X 1.25 X 30.0	20.0 - 27.0	14.7 - 20.0	
204	Bolt, Pump Cover to Valve Body	1	M6 X 1.0 X 45.0	8.0 - 14.0		71.0 - 124.0
205	Bolt, Pump Cover to Pump Body	2	M8 X 1.25 X 20.0	20.0 - 27.0	14.7 - 20.0	
206	Bolt, Pump Body to Case	2	M8 X 1.25 X 95.0	20.0 - 27.0	14.7 - 20.0	
207	Bolt, Pump Cover to Channel Plate	10	M6 X 1.0 X 85.0	8.0 - 14.0		71.0 - 124.0
216	Plug - Air Bleed (Hex. Head Orificed)	1	1/16 - 27 PTF, SAE Short	5.0 - 9.5		46.5 - 88.5
217	Plug, Pipe - Pressure Switch	1	1/8 - 27 Dryseal, NPTF	7.0 - 14.0		62.0 - 124.0
218	Switch, Assembly Pressure	2	1/8 - 27 Dryseal, NPTF	7.0 - 14.0		62.0 - 124.0
375	Bolt, Valve Body to Case	3	M8 X 1.25 X 70.0	20.0 - 27.0	14.7 - 20.0	
376	Bolt, Valve Body to Channel Plate	1	M6 X 1.0 X 35.0	8.0 - 14.0		71.0 - 124.0
377	Bolt, Valve Body to Channel Plate (TORX Head)	2	M6 X 1.0 X 45.0	8.0 - 16.0	6.0 - 12.0	
378	Bolt, Valve Body to Channel Plate	6	M6 X 1.0 X 55.0	8.0 - 14.0		71.0 - 124.0
379	Bolt, Special, Valve Body to Case	1	M8 X 1.25 X 85.0	20.0 - 27.0	14.7 - 20.0	
380	Bolt, Valve Body to Driven Sprocket Support	1	M8 X 1.25 X 90.0	20.0 - 27.0	14.7 - 20.0	
434	Bolt, Channel Plate to Case	6	M8 X 1.25 X 45.0	20.0 - 27.0	14.7 - 20.0	
436	Bolt, Channel Plate to Case	4	M8 X 1.25 X 30.0	20.0 - 27.0	14.7 - 20.0	
450	Temperature Switch	1	1/8 - 27 Dryseal, SAE Sh.	6.5 - 7.5		57.5 - 66.5
524	Bolt, Case to Drive Sprocket Support	4	M8 X 1.25 X 23.5	20.0 - 27.0	14.7 - 20.0	
803	Nut, Manual Shaft to Inside Detent Lever	1	M10 X 1.5	27.0 - 36.0	20.0 - 26.5	
805	Bolt, Manual Detent Spring to Channel Plate	1	M6 X 1.0 X 16.0	8.0 - 14.0		71.0 - 124.0