HYDRA-MATIC 6L80

(6 Speed)

INDEX

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INTRODUCTION
6L80 (6 Speed)

1st Printing
July, 2007

The new Hydra-matic 6L80 (6 Speed) is a fully automatic, six speed, rear wheel drive, electronic controlled transmission that features clutch to clutch shifting. It was first introduced in the 2006 Corvette with the 6.0L engine, Cadillac STSV/XLRV with the 4.4L engine, and is scheduled for Pick-ups in 2007, as shown in Figure 1. It consists primarily of a four element torque converter, two planetary gear sets, five clutch packs, one sprag and a hydraulic pressurization and control system. Two planetary gear sets provide the six forward gear ratios and reverse. Changing gear ratios is fully automatic and is accomplished through the use of a Transmission Control Module (TCM), that is ***located within the transmission.*** The TCM receives and monitors various electronic sensor inputs, and uses this information to shift the transmission at the optimum time. The TCM commands shift solenoids and variable bleed Clutch Pressure Control (CPC) solenoids within the transmission to control shift timing. The TCM controls shift feel through the CPC solenoids. The TCM also controls the apply and release of the torque converter clutch which allows the engine to deliver the maximum fuel efficiency without sacrificing vehicle performance. This manual contains procedures necessary to diagnose, overhaul and/or repair the new 6L80 (6 Speed) transmission from General Motors.

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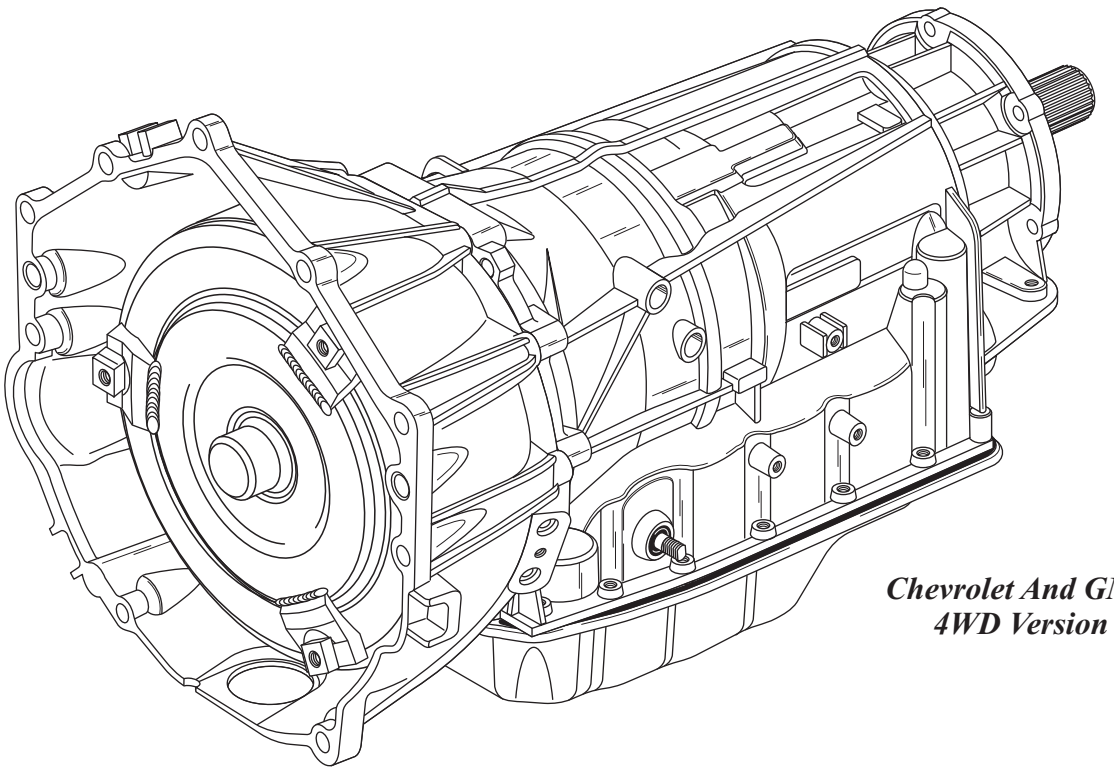
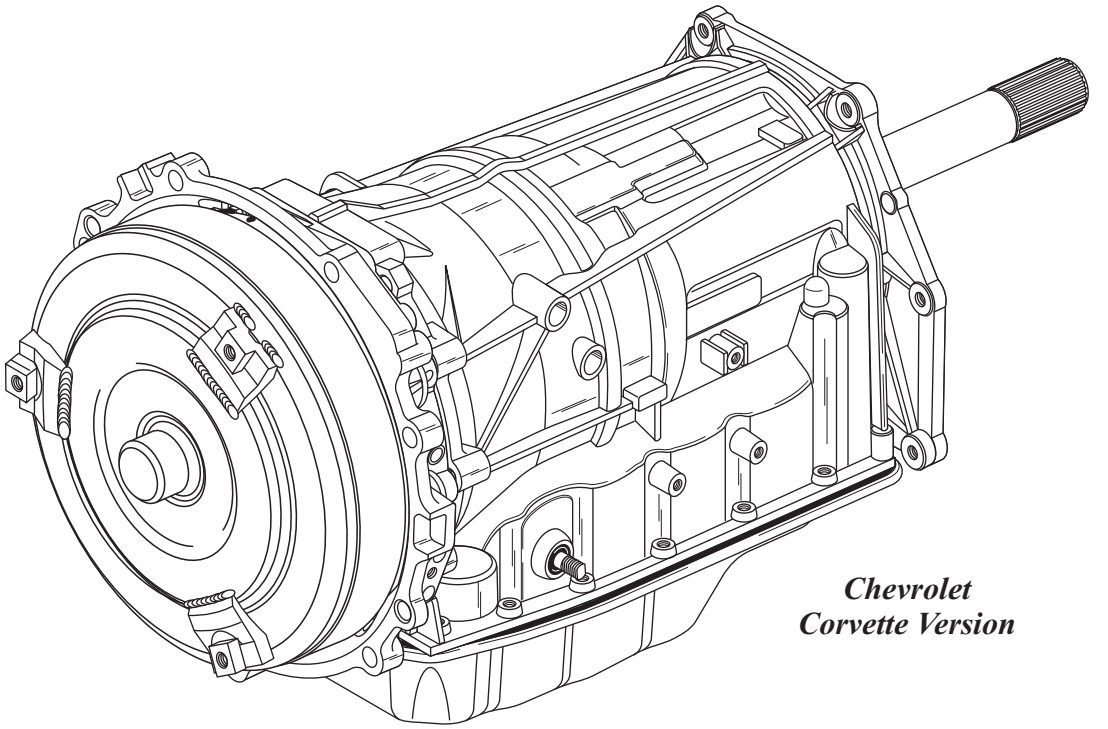


Chevrolet And GMC
4WD Version



Chevrolet
Corvette Version

Figure 1

GENERAL DESCRIPTION

The new Hydra-matic 6L80 (6 Speed) is a fully automatic, six speed, rear wheel drive, electronic controlled transmission that features clutch to clutch shifting. It consists primarily of a four element torque converter, two planetary gear sets, five clutch packs, one sprag and a hydraulic pressurization and control system.

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 transmission. 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 turbine shaft of the transmission.

The two planetary gear sets provide the six forward gear ratios and reverse. Changing gear ratios is fully automatic and is accomplished through the use of a Transmission Control Module (TCM) located within the transmission. The TCM receives and monitors various electronic sensor inputs, and uses this information to shift the transmission at the optimum time.

The TCM commands shift solenoids and variable bleed Clutch Pressure Control (CPC) solenoids within the transmission to control shift timing. The TCM controls shift feel through the CPC solenoids. The TCM also controls the apply and release of the torque converter clutch which allows the engine to deliver the maximum fuel efficiency without sacrificing vehicle performance.

The hydraulic system primarily consists of a vane type pump, two control valve bodies, converter housing and case. The pump maintains the working pressures needed to apply the clutch pistons that apply or release the friction components. These friction components, when applied or released, support the shifting qualities of the transmission.

The friction components used in this transmission consist of five multiple disc clutches. The multiple disc clutches combine with one mechanical sprag clutch, to deliver seven different gear ratios through the gearsets that then transfer torque through the output shaft. Refer to Figure 4 for the component application chart for this transmission.

SHIFT QUADRANTS

The transmission shift quadrants vary by model. There may be four to seven different positions shown on the shift quadrants, as shown in Figure 2 and in Figure 3.

Standard Shift Quadrant

P - Park position enables the engine to be started while preventing the vehicle from moving. For safety reasons, the vehicle's parking brake should always be used in addition to the "Park" position. 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.

D - Drive range should be used for all normal driving conditions for maximum efficiency and fuel economy. Drive range allows the transmission to operate in each of the six forward gear ratios. Downshifts to a lower gear are available for safe passing, by depressing the accelerator, or by manually selecting a lower gear with the shift lever.

Manual Shift Ranges

Some vehicles are equipped with a shift quadrant that allow manual range selection. For example, "M" manual range and/or manual range "2" or "1", as shown in Figure 2. These ranges can be used for conditions where it may be desirable to control the selection of gear ratios. These conditions include trailer towing, driving on hilly terrain, and are also helpful for engine braking when descending slight grades.

M - When manual mode is selected, the current gear range will be the highest attainable range with all of the lower gears available. Plus/Minus buttons may be used to select the desired range of gears for the current driving conditions.

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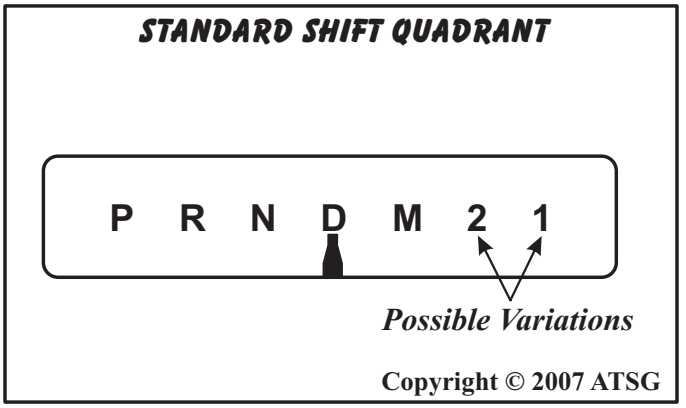


Figure 2

Standard Shift Quadrant (Cont'd)

2 - Manual 2nd just adds more performance for congested traffic and hilly terrain. It has the same starting ratio (1st gear) as the Drive range, but prevents the transmission from shifting above 2nd gear. Manual 2nd can be used to retain 2nd gear for acceleration and engine braking as desired. Manual 2nd can be selected at any vehicle speed, but will downshift into 2nd gear, only if vehicle speed is low enough not to over-rev the engine. This speed is calibrated in the TCM.

1 - Manual 1st has the same starting ratio as Drive range but prevents the transmission from shifting above 1st gear. Manual 1st can be used for heavy towing and engine braking as desired. Manual 1st can be selected at any vehicle speed but will downshift into 1st gear, only if vehicle speed is low enough not to over-rev the engine. This speed is calibrated in the TCM.

SHIFT QUADRANTS (CONT'D)

Driver Shift Control (DSC) Quadrant

Some vehicles are equipped with Driver Shift Control (DSC) version of the selector system, as shown in Figure 3. This configuration allows the driver to manually shift between forward gears.

P - Park position enables the engine to be started while preventing the vehicle from moving. For safety reasons, the vehicle's parking brake should always be used in addition to the "Park" position. Park position should not be selected until the vehicle has come to a complete stop.

Driver Shift Control (DSC) Quadrant (Cont'd)

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.

D - Drive range should be used for all normal driving conditions for maximum efficiency and fuel economy. Drive range allows the transmission to upshift and downshift in each of the six forward gear ratios, according to the normal shift pattern that is programed in the TCM.

M/S - In the M/S (Manual or Sport) position, the driver may manually select the range of gears by tapping the selector lever towards "+" or "-" to cause an upshift or downshift, as shown in Figure 3. The transmission will shift up or down depending on the request that is made by tapping the selector lever.

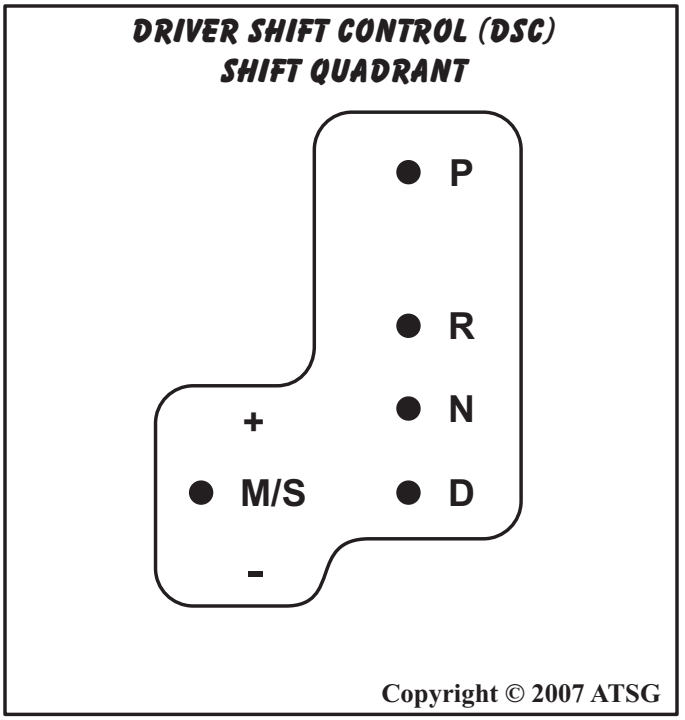
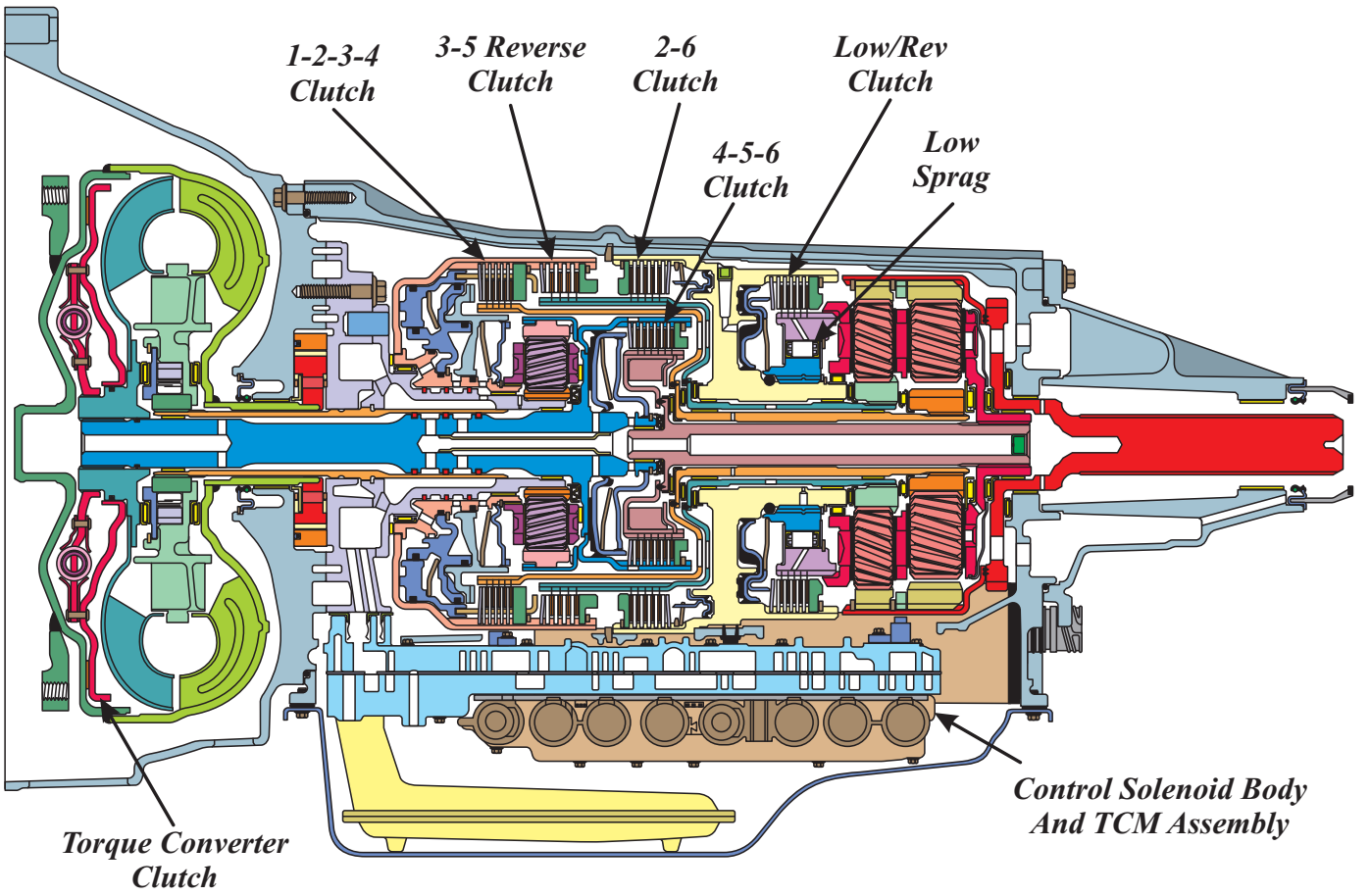


Figure 3

INTERNAL COMPONENT IDENTIFICATION AND LOCATION



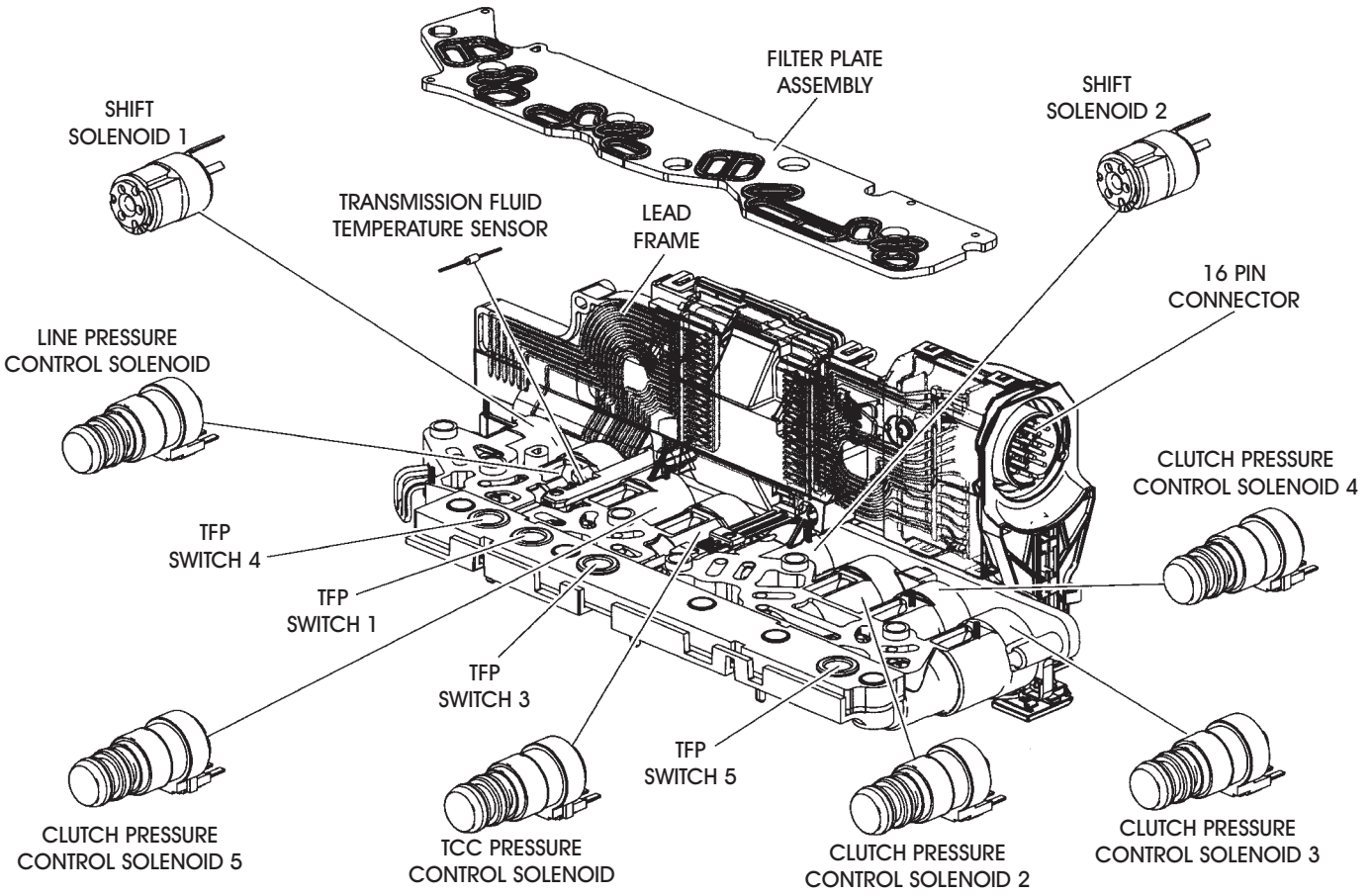
COMPONENT APPLICATION CHART

RANGE	1-2-3-4 Clutch	3-5, Rev Clutch	4-5-6 Clutch	2-6 Clutch	Low & Rev Clutch	Low Sprag	Torq Conv Clutch	GEAR RATIO	
Park					Applied				
Reverse		Applied			Applied			3.06	
Neutral					Applied				
"D"-1st	Applied				Applied	Holding		4.03	
"D"-2nd	Applied			Applied			Applied*	2.36	
"D"-3rd	Applied	Applied					Applied*	1.53	
"D"-4th	Applied		Applied				Applied*	1.15	
"D"-5th		Applied	Applied				Applied*	0.85	
"D"-6th			Applied	Applied			Applied*	0.67	
"M"-2nd	Applied			Applied			Applied*	2.36	
"M"-1st	Applied				Applied	Holding		4.03	

** TCC IS AVAILABLE IN 2ND THRU 6TH GEAR, BASED ON THROTTLE POSITION, FLUID TEMP AND VEHICLE SPEED.*

Figure 4

CONTROL SOLENOID BODY AND TCM ASSEMBLY



SOLENOID APPLICATION CHART

RANGE	Shift Sol. 1	Shift Sol. 2	CPC Sol. 5 1-2-3-4 CL. (N.L.)	CPC Sol. 4 2-6 CL. (N.L.)	CPC Sol. 2 3-5 Rev CL. (N.H.)	CPC Sol. 3 4-5-6, Low/Rev CL. (N.H.)	TCC PC Sol. Torq Conv CL. (N.L.)	LINE PC Sol. Line Pres Cont (N.H.)	GEAR RATIO
Park	ON	ON	OFF	OFF	ON	OFF	OFF	ON**	
Reverse	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON**	3.06
Neutral	ON	ON	OFF	OFF	ON	OFF	OFF	ON**	
"D"-1st	ON	ON	ON	OFF	ON	ON	OFF	ON**	4.03
"D"-2nd	OFF	ON	ON	ON	ON	ON	ON*	ON**	2.36
"D"-3rd	OFF	ON	ON	OFF	OFF	ON	ON*	ON**	1.53
"D"-4th	OFF	ON	ON	OFF	ON	OFF	ON*	ON**	1.15
"D"-5th	OFF	ON	OFF	OFF	OFF	OFF	ON*	ON**	0.85
"D"-6th	OFF	ON	OFF	ON	ON	OFF	ON*	ON**	0.67
"M"-2nd	OFF	ON	ON	ON	ON	ON	ON*	ON**	2.36
"M"-1st	ON	ON	ON	OFF	ON	OFF	OFF	ON**	4.03

FOR SHIFT SOLENOIDS 1 AND 2: "ON" = ENERGIZED (PRESSURIZED), "OFF" = DE-ENERGIZED (NO PRESSURE).
FOR CPC SOLENOIDS 2, 3: "ON" = NO PRESSURE, "OFF" = PRESSURIZED. FOR CPC SOLENOIDS 4, 5: "ON = PRESSURIZED, "OFF" = NO PRESSURE.
** TCC IS AVAILABLE IN 2ND THRU 6TH GEAR, BASED ON THROTTLE POSITION, FLUID TEMP AND VEHICLE SPEED.*
*** CONSTANTLY VARIES LINE PRESSURE BASED ON THROTTLE POSITION, FLUID TEMP, AND GEAR STATE.*

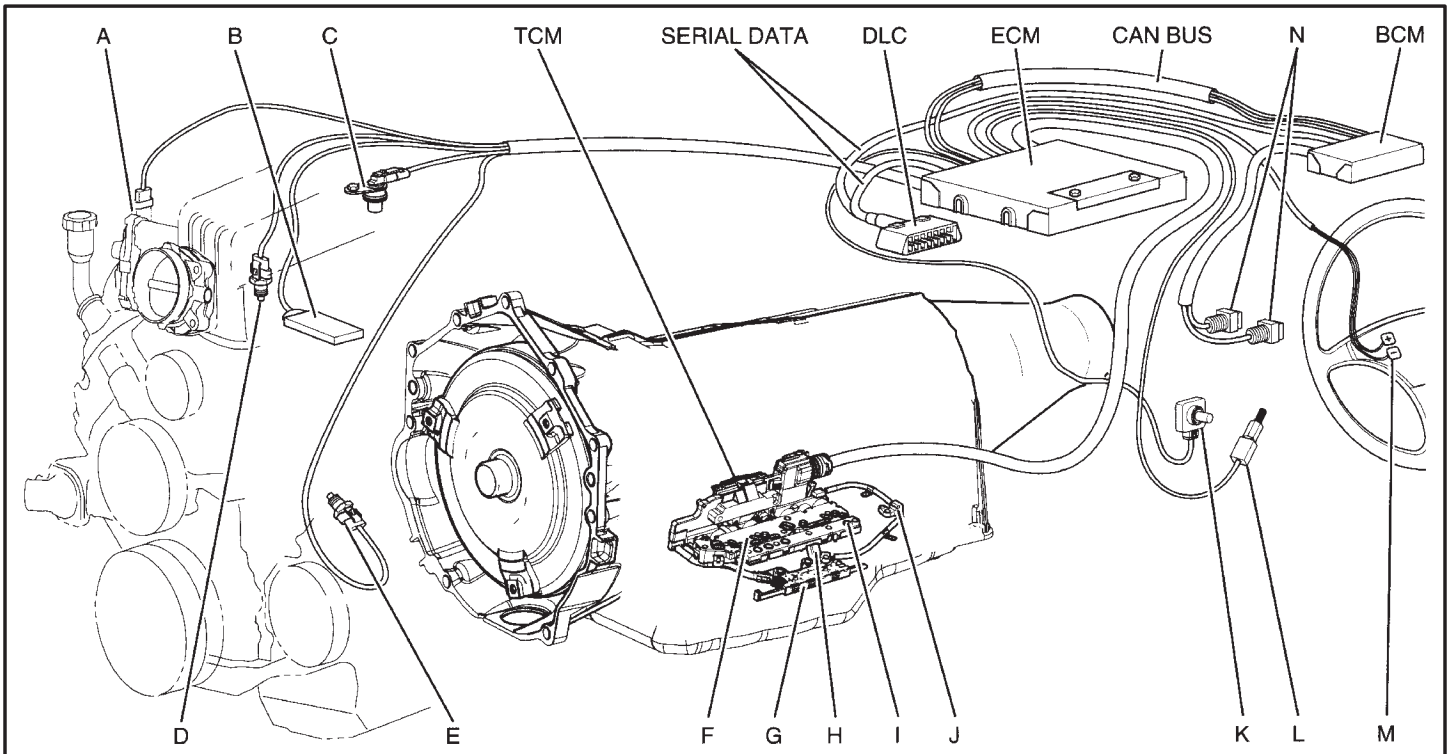
Figure 5

ELECTRONIC COMPONENTS

In the 6L80 transmission, the TCM, both shift solenoids, all 6 of the pressure control solenoids, the TFT sensor and fluid pressure switches are contained in one unit, the Control Solenoid Body and TCM Assembly, which is located in the bottom pan, as shown in Figure 6.

Electrical signals from various sensors provide information to the TCM about vehicle speed, throttle position, engine coolant temp, fluid temp, range selector position, engine speed, turbine speed and operating mode. The TCM uses this information to determine the precise moment to upshift or downshift, apply or release the TCC, and what pressure is needed to apply the clutches. This type of control provides consistent and precise shift points and shift quality based on the actual operating conditions of the vehicle.

Adaptive shift control technology enables the TCM to continually monitor and compare shift performance to the optimum shift, and make adjustments to the factory settings to continually deliver excellent shift quality.



INFORMATION SENSORS

A MULTI-PORT ELECTRONIC INJECTION
B MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
C ENGINE SPEED SENSOR
D MANIFOLD AIR TEMP (MAT) SENSOR
E ENGINE COOLANT TEMP (ECT) SENSOR
F TRANSMISSION FLUID TEMP (TFT) SENSOR
G TRANSMISSION MANUAL SHIFT SHAFT POSITION SWITCH ASSEMBLY
H INPUT SPEED SENSOR (ISS)
I TRANSMISSION FLUID PRESSURE SWITCHES
J OUTPUT SPEED SENSOR (OSS)
K ACCELERATOR PEDAL POSITION (APP) SENSOR
L BRAKE SWITCH
M DRIVER SHIFT CONTROL (DSC) SWITCHES
N OPERATING MODE SELECTION SWITCHES

ELECTRONIC CONTROLLERS

TRANSMISSION CONTROL MODULE (TCM)

ENGINE CONTROL MODULE (ECM)

BODY CONTROL MODULE (BCM)

DIAGNOSTIC LINK CONNECTOR (DLC)

ELECTRONICALLY CONTROLLED TRANSMISSION COMPONENTS

LINE PRESSURE CONTROL SOLENOID

CLUTCH PRES CONTROL SOLENOID 2

CLUTCH PRES CONTROL SOLENOID 3

CLUTCH PRES CONTROL SOLENOID 4

CLUTCH PRES CONTROL SOLENOID 5

TCC PRESSURE CONTROL SOLENOID

SHIFT SOLENOID 1

SHIFT SOLENOID 2

Figure 6

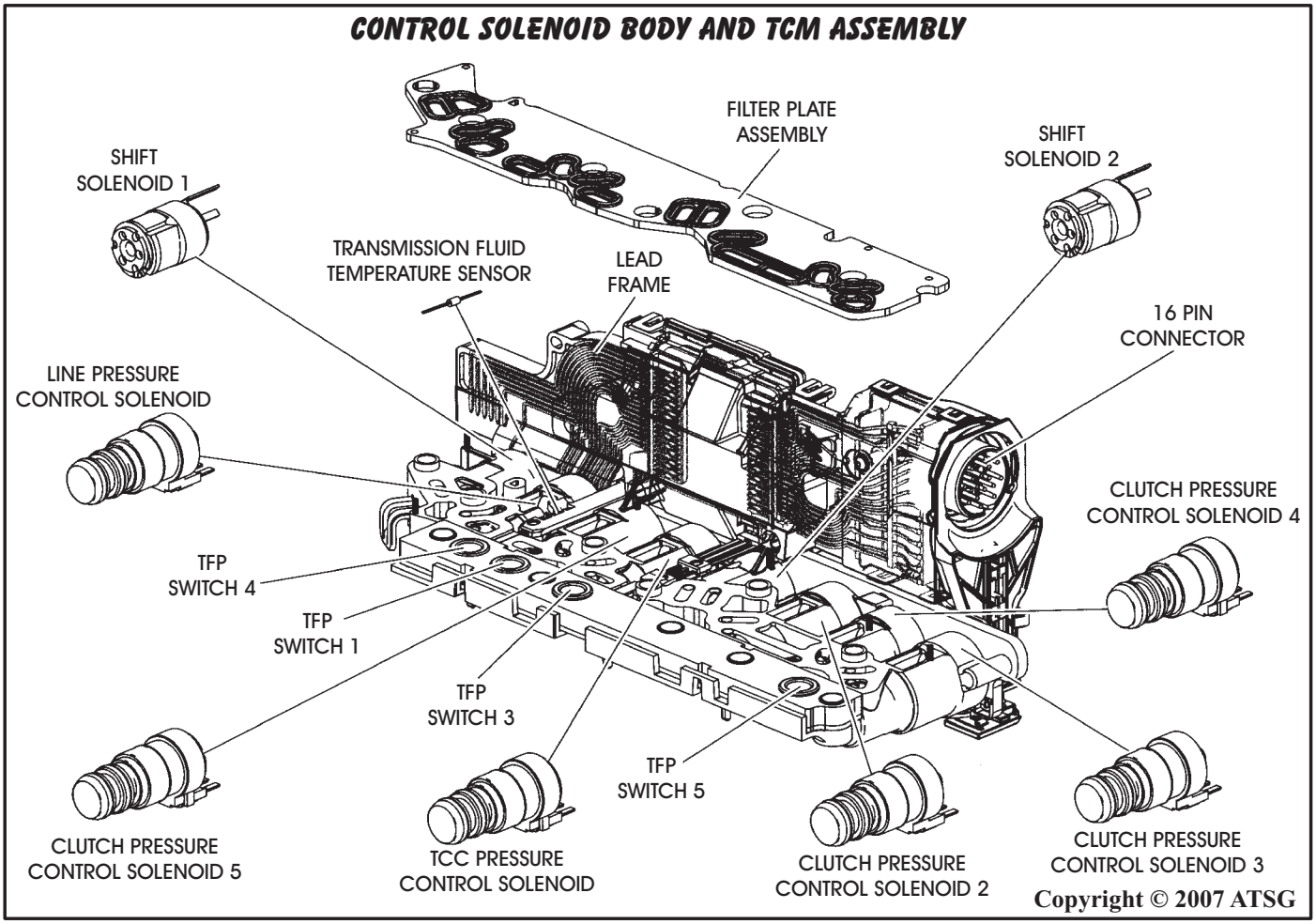


Figure 7

ELECTRONIC COMPONENTS (CONT'D)

Control Solenoid Body And TCM Assembly

The Control Solenoid Body and TCM Assembly bolts directly to the lower and upper valve body assemblies inside the transmission. The solenoid assembly utilizes a lead frame system to connect the components to the TCM, as shown in Figure 7. There are no wires used for these components. The Control Solenoid Body and TCM Assembly connect to the external harness 16 way connector using a pass-thru sleeve. All fluid passages to the switches and solenoids are protected from debris by a serviceable filter plate assembly, as shown in Figure 7. In addition to the components shown in Figure 7, there are two temperature sensors located ***inside*** the TCM that are not shown, the TCM Temperature Sensor and the Power Up Temperature Sensor.

The components shown in Figure 7 are diagnosed seperately, but serviced as an assembly.

Transmission Fluid Temperature (TFT) Sensor

The TFT sensor is part of the control solenoid body and TCM assembly, and is not serviced seperately, as shown in Figure 7 and 8. The TFT sensor is a thermister, which changes value based on temperature. The sensor has a negative temperature coefficient, which means as the temp increases, the resistance decreases, and as the temp decreases, the resistance increases. The TCM supplies a voltage reference signal to the sensor and measures the voltage drop in the circuit. The TCM uses this information to maintain shift quality and torque converter clutch apply quality over the entire operating temperature range. If the TCM detects an improper signal from the TFT sensor, a DTC will be activated.

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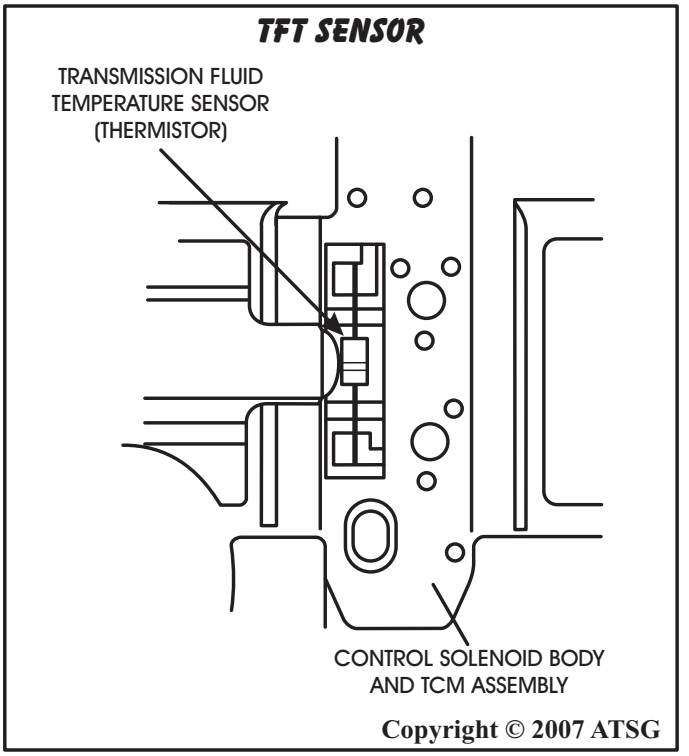
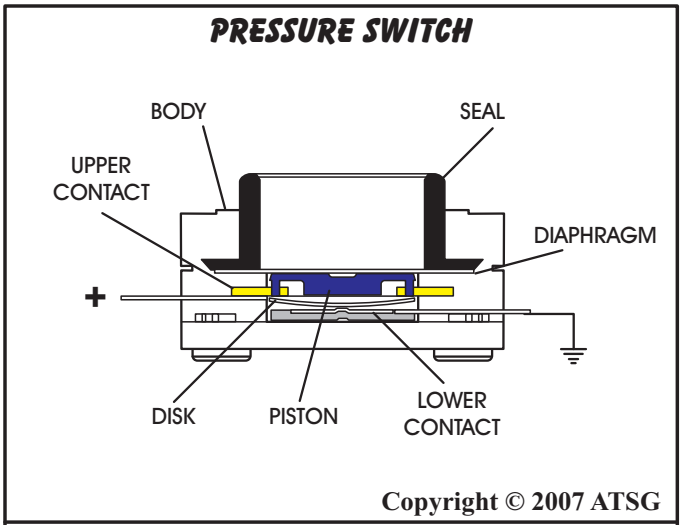


Figure 8



Pressure Switch Logic				
Selector Position	*Switch 1*	*Switch 3*	*Switch 4*	*Switch 5*
Park	*1*	*0*	*0*	*0*
Reverse	*0*	*0*	*0*	*0*
Neutral	*1*	*0*	*0*	*0*
"D"-1st	*1*	*1*	*0*	*1*
"D"-2nd	*1*	*0*	*0*	*1*
"D"-3rd	*0*	*1*	*0*	*1*
"D"-4th	*1*	*1*	*0*	*0*
"D"-5th	*0*	*1*	*1*	*0*
"D"-6th	*1*	*0*	*1*	*0*
"M"-1st	*1*	*1*	*0*	*0*
1 = Pressurized Open)		*0 = Exhausted (Closed)*		

Figure 9

ELECTRONIC COMPONENTS (CONT'D)

Fluid Pressure Switches

The transmission fluid pressure switches located in the control solenoid body and TCM assembly are normally closed. When closed, these switches allow current flow through the switch. When fluid pressure is routed to the switch, pressure moves the diaphragm, piston and disk such that the circuit opens and there is no current flow. See Figure 9 for a cut-away view and a pressure switch logic chart.

TFP switch 1 sends a signal to the TCM to indicate the state of the 3-5 and reverse clutch Reg. valve.

TFP switch 3 sends a signal to the TCM to indicate the state of the 2-6 clutch regulator valve.

TFP switch 4 sends a signal to the TCM to indicate the state of the 1-2-3-4 clutch regulator valve.

TFP switch 5 sends a signal to the TCM to indicate the state of CBR1/4-5-6 clutch regulator valve. (CBR1 = Clutch Braking 1st)

The fluid pressure switches are part of the Control Solenoid Body and TCM Assembly, and are not serviced seperately.

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ELECTRONIC COMPONENTS (CONT'D)

SHIFT SOLENOIDS 1 AND 2

Shift solenoids 1 and 2 are both identical, normally closed, 3 port, ON/OFF type solenoids controlled by the TCM. These shift solenoids work in combination with the clutch pressure control solenoids to control the various shift and clutch regulator valves in the valve body.

When the TCM provides a path to ground for the electrical circuit to energize (Turn ON) the solenoid, current flows through the coil assembly in the solenoid and creates a magnetic field. The magnetic field moves the plunger and metering ball assembly to the right, as shown in Figure 10, against the exhaust seat, thereby blocking the exhaust passage and creating solenoid control pressure.

Shift solenoids are de-energized (Turned OFF) when the TCM opens the path to ground for the solenoid's electrical circuit. With the solenoid OFF, solenoid spring force moves the plunger and metering ball assembly to the left, as shown in Figure 10, away from the exhaust seat and against the feed seat. This blocks actuator feed limit fluid from entering the solenoid and allows any existing solenoid control pressure to exhaust through the solenoid.

Shift Solenoids 1 and 2 are part of the Control Solenoid Body and TCM Assembly, and are not serviced seperately.

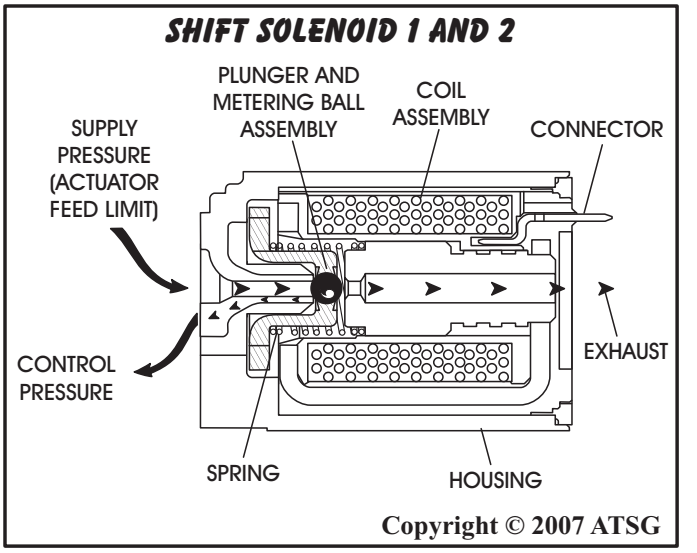


Figure 10

Shift Solenoid 1

Actuator feed limit fluid feeds the shift solenoid 1 fluid circuit to control clutch select valve 2. When shift solenoid 1 is energized (ON), actuator feed limit fluid is allowed to pass through the solenoid, thereby creating solenoid 1 control pressure, as shown in Figure 10. Solenoid 1 control pressure acts against clutch select valve 2 spring force, to move the valve to the apply position.

When shift solenoid 1 is de-energized (OFF), actuator feed limit fluid is blocked from feeding the solenoid 1 circuit, and any existing solenoid 1 control pressure exhausts through the solenoid, as shown in Figure 10.

Shift Solenoid 2

Actuator feed limit fluid feeds the shift solenoid 2 fluid circuit to control clutch select valve 3. When shift solenoid 1 is energized (ON), actuator feed limit fluid is allowed to pass through the solenoid, thereby creating solenoid 2 control pressure, as shown in Figure 10. Solenoid 2 control pressure acts against clutch select valve 3 spring force, to move the valve to the apply position.

When shift solenoid 2 is de-energized (OFF), actuator feed limit fluid is blocked from feeding the solenoid 2 circuit, and any existing solenoid 2 control pressure exhausts through the solenoid, as shown in Figure 10.

Fail-Safe or Protection Mode

If for any reason, the entire electronic control system of the transmission, or any one of the electrical components within the Control Solenoid Body and TCM Assembly becomes disabled, the transmission will default to fail-safe mode. If the transmission is in 1st, 2nd or 3rd gear during an electrical failure, the transmission will default to 3rd gear. If the transmission is in 4th, 5th or 6th gear during an electrical failure, the transmission will default to 5th gear.

ELECTRONIC COMPONENTS (CONT'D)

PRESSURE CONTROL SOLENOIDS

Line Pressure Control (PC) Solenoid

The line pressure (PC) solenoid is a precision electronic pressure regulator that controls line pressure based on current flow through its coil windings. The TCM varies current to the ***"normally-high"*** line pressure control (PC) solenoid from approximately 0.1 amp (maximum line pressure), to 1.0 amps (minimum line pressure). As current flow is increased, the magnetic field produced by the coil moves the solenoid's variable restriction further away from the exhaust port, as shown in Figure 11. Opening the exhaust port decreases the control pressure, which is routed to the isolator (boost) valve, as shown in Figure 11, which ultimately decreases line pressure. As the current flow is decreased, the reduced magnetic field allows the spring force to move the variable restriction to the left, as shown in Figure 11, closer to the exhaust port, increasing control pressure from the solenoid, which ultimately increases line pressure.

As the throttle position (engine torque) increases, the current flow is decreased by the TCM, which increases the pressure output of the line pressure (PC) solenoid. If the TCM detects a line pressure control solenoid electrical malfunction, a DTC will be activated.

The line pressure control (PC) solenoid is part of the Control Solenoid Body And TCM Assembly and is not serviced seperately.

If for any reason, the entire electronic control system of the transmission fails, the line pressure control solenoid will be OFF, and maximum line pressure will be the result. This will create harsh engagements.

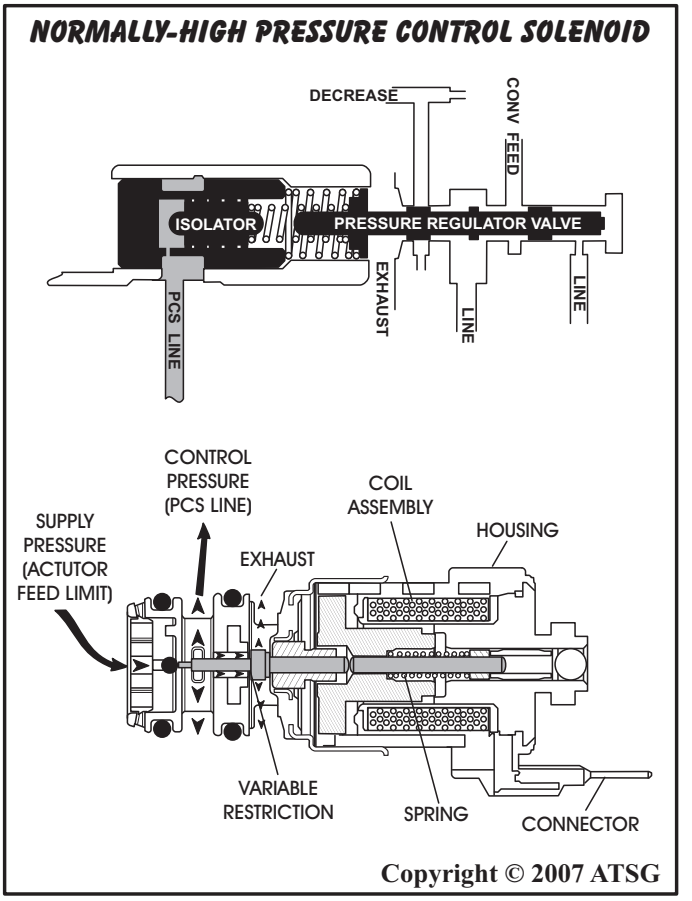


Figure 11

ELECTRONIC COMPONENTS (CONT'D)
TORQUE CONVERTER CLUTCH (TCC) SOLENOID

The Torque Converter Clutch (TCC) PC Solenoid is a ***"normally-low"***, electronic pressure regulator used to control the apply and release of the torque converter clutch based on current flow through its coil windings. The TCC PC solenoid regulates actuator feed limit fluid pressure to the TCC regulator valve, located in the lower valve body, and provides a signal pressure to shift the TCC control valve, located in the pump, to the apply position, as shown in Figure 12. When the TCM determines to apply the TCC, the TCC PC solenoid is commanded to specific pressures, dependent on vehicle operating conditions, resulting in a smooth apply or release of the TCC. The solenoid's ability to "Ramp" the TCC apply and release pressures result in a smoother TCC operation.

When vehicle operating conditions are appropriate to apply the TCC, the TCM increases current flow to allow the TCC PC solenoid to increase PCS TCC fluid pressure, to move the TCC control valve to the apply position, as shown in Figure 12, and move the TCC regulator valve to the regulating position to regulate fluid pressure porportional to solenoid pressure. Release pressure is directed to exhaust, and regulated apply pressure is directed to the apply side of the converter clutch plate/damper assembly. The TCM then increases the pressure to control a slippage of 20-80 RPM between the clutch plate and converter cover. This "Ramping" procedure provides improved dampening of engine vibrations and allows the TCC to apply at low engine speeds in 2nd, 3rd, 4th, 5th and 6th gear.

Release of the TCC is achieved by decreasing TCC solenoid pressure to a level low enough to allow spring force to move the TCC control valve and TCC regulating valve to the release position.

There are also some operating conditions that may prevent or enable TCC apply, such as engine temp, transmission temperature, brake switch activation.

If the TCM detects that the TCC system is stuck ON or OFF, a DTC will be activated.

The TCC PC Solenoid is part of the Control Solenoid Body And TCM Assembly and is not serviced seperately.

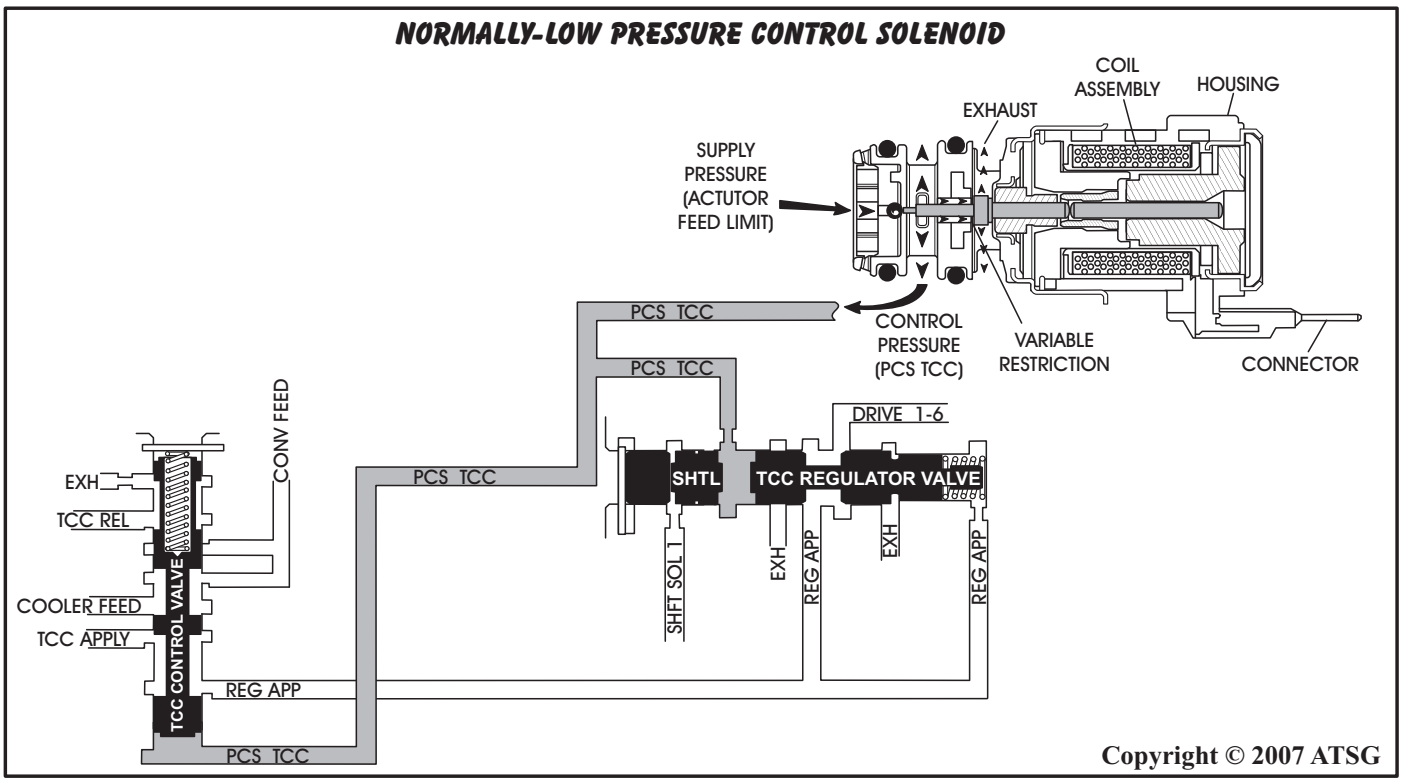


Figure 12

ELECTRONIC COMPONENTS (CONT'D)

CLUTCH PRESSURE CONTROL (CPC) SOLENOIDS 2,3,4 AND 5

There are two different types of clutch pressure control solenoids. Clutch pressure control (CPC) solenoids 2 and 3 are ***"normally-high"*** pressure control solenoids, as shown in Figure 14, and are identical to the line pressure control solenoid. Clutch pressure control (CPC) solenoids 4 and 5 are ***"normally-low"*** pressure control solenoids, as shown in Figure 13, and are identical to the TCC PC solenoid.

The Clutch Pressure Control PC Solenoids are part of the Control Solenoid Body And TCM Assembly and are not serviced seperately.

Clutch Pressure Control Solenoid 2

Clutch pressure control (CPC) solenoid 2 controls fluid flow to the 3-5/reverse clutch regulator valve and the 3-5/reverse boost valve. When commanded, the solenoid controls the flow of exhaust fluid out of the solenoid to maintain a specific commanded control pressure. This allows the TCM to control the apply and release of the 3-5 and reverse clutch.

Clutch Pressure Control Solenoid 3

Clutch pressure control (CPC) solenoid 3 controls fluid flow to the 4-5-6 clutch regulator valve and the 4-5-6 boost valve. When commanded, the solenoid controls the flow of exhaust fluid out of the solenoid to maintain a specific commanded control pressure. This allows the TCM to control the apply and release of the 4-5-6 clutch.

Clutch Pressure Control Solenoid 4

Clutch pressure control (CPC) solenoid 4 controls fluid flow to the 2-6 clutch regulator valve. When commanded, the solenoid controls the flow of exhaust fluid out of the solenoid to maintain a specific commanded control pressure. This allows the TCM to control the apply and release of the 2-6 clutch.

Clutch Pressure Control Solenoid 5

Clutch pressure control (CPC) solenoid 5 controls fluid flow to the 1-2-3-4 clutch regulator valve and the 1-2-3-4 boost valve. When commanded, the solenoid controls the flow of exhaust fluid out of the solenoid to maintain a specific commanded control pressure. This allows the TCM to control the apply and release of the 1-2-3-4 clutch.

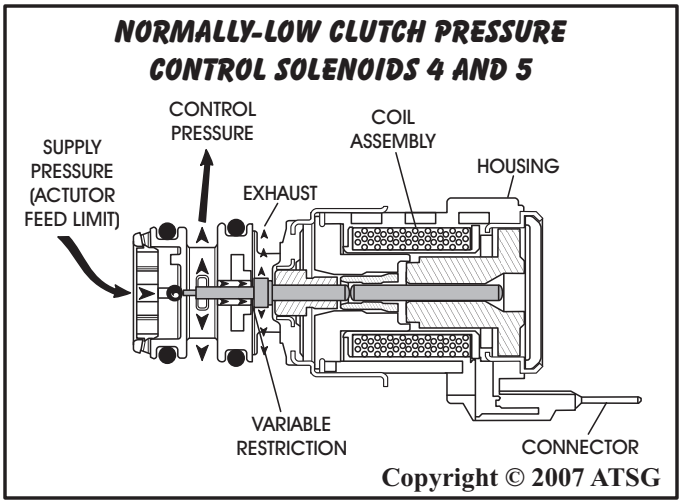


Figure 13

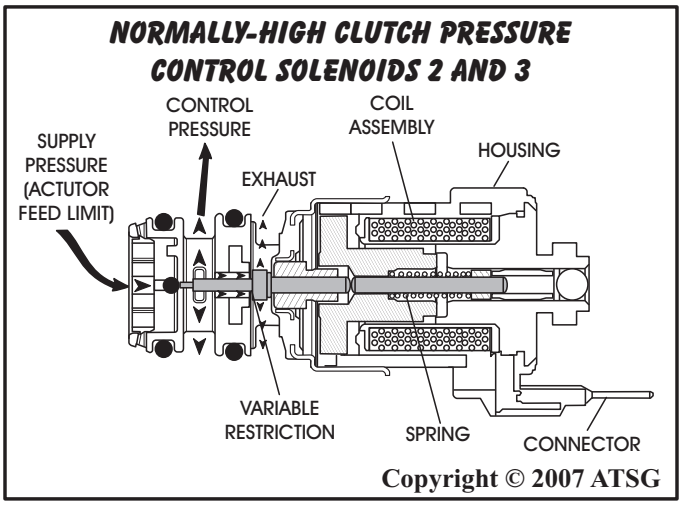


Figure 14

Transmission Adapt Function

Programming within the TCM also allows for automatic adjustments in shift pressure that are based on the changing characteristics of the transmission components. As the apply components within the transmission wear or change over time, the time required to apply a clutch increases or decreases. In order to compensate for these changes, the TCM adjusts the pressure commands to the various pressure control solenoids, to maintain the original calibrations. The automatic adjusting process is referred to as "Adaptive Learning" and is used to ensure consistent shift feel and increase the transmission's durability.

ELECTRONIC COMPONENTS (CONT'D)

TRANSMISSION MANUAL SHIFT POSITION SWITCH ASSEMBLY

The Transmission Manual Shift Position Switch Assembly, sometimes referred to as Internal Mode Switch (IMS), is a sliding contact switch that connects to the manual valve, with a connector that plugs into the control solenoid body and TCM assembly, and is shown in Figure 16.

There are four inputs to the TCM from the position switch assembly, that indicate which transmission gear range has been selected. The state of each input is available for display on the scan tool. The four input parameters represented are Signal A, Signal B, Signal C, and Signal P (Parity).

A fifth input signal "N" (P/N Start), does not input to the TCM, but goes directly to the ECM to determine a Park/Neutral state and allow the engine to be started. Routing Signal N to the ECM will allow the engine to be started, even with a dead TCM. Signal N is not a signal used by the TCM for manual shift selector position logic. A logic chart has been provided for you in Figure 15, and a partial wire schematic in Figure 17.

The Transmission Manual Shift Position Switch assembly is serviced seperately.

If the TCM detects an improper signal from the transmission manual shift position switch (IMS) assembly, a DTC will be activated.

INTERNAL MODE SWITCH LOGIC

Gear Selector Position	Signal A	Signal B	Signal C	Signal P
Park	LOW	HI	HI	LOW
Park/Reverse	LOW	LOW	HI	LOW
Reverse	LOW	LOW	HI	HI
Reverse/Neutral	HI	LOW	HI	HI
Neutral	HI	LOW	HI	LOW
Neutral/Drive 6	HI	LOW	LOW	LOW
Drive 6	HI	LOW	LOW	HI
Drive 6/Drive 4	LOW	LOW	LOW	HI
Drive 4	LOW	LOW	LOW	LOW
Drive 4/Drive 3	LOW	HI	LOW	LOW
Drive 3	LOW	HI	LOW	HI
Drive 3/Drive 2	HI	HI	LOW	HI
Drive 2	HI	HI	LOW	LOW
Open	HI	HI	HI	HI
Invalid	HI	HI	HI	LOW
Invalid	LOW	LOW	LOW	HI

HI = Ignition Voltage
LOW = 0 Volts

Internal Mode Switch Terminal Identification

Terminal	Function
A	Park/Neutral Sart Signal "N" (Direct to ECM)
B	Mode Switch Switch Signal "A"
C	Mode Switch Switch Signal "B"
D	Mode Switch Switch Signal "C"
E	Mode Switch Switch Signal "P"
F	Ignition Switch Voltage Feed

Figure 15

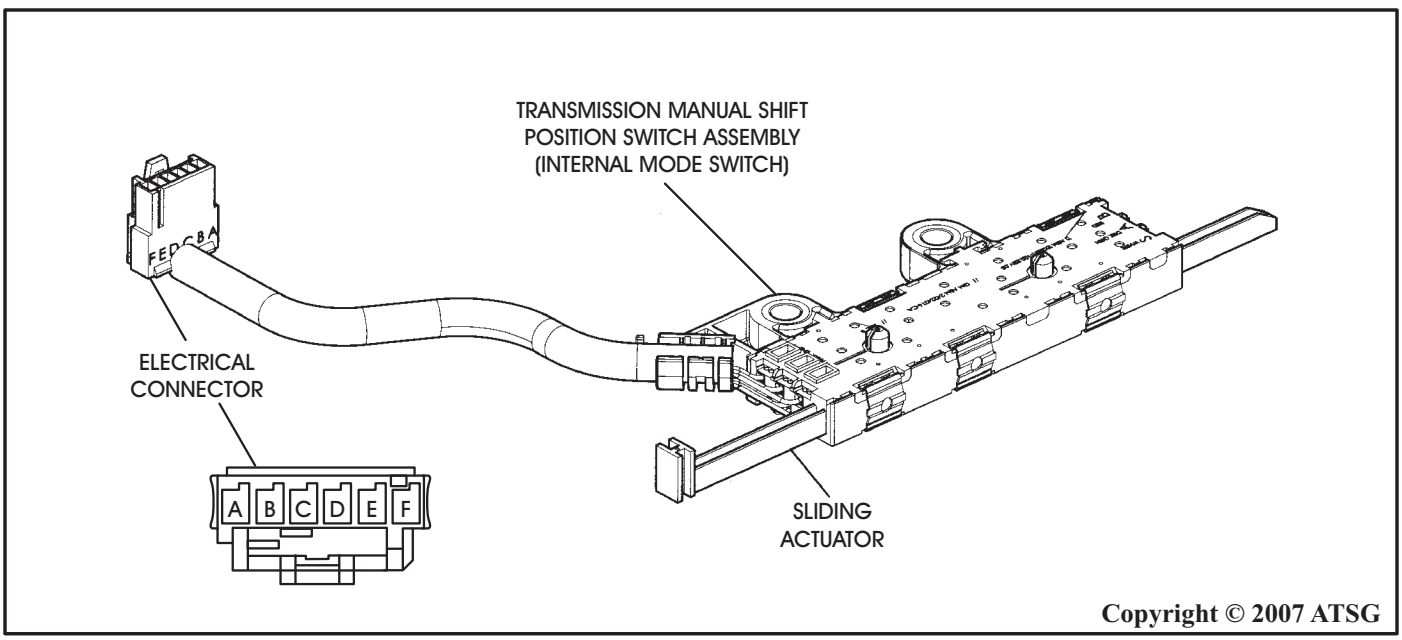


Figure 16

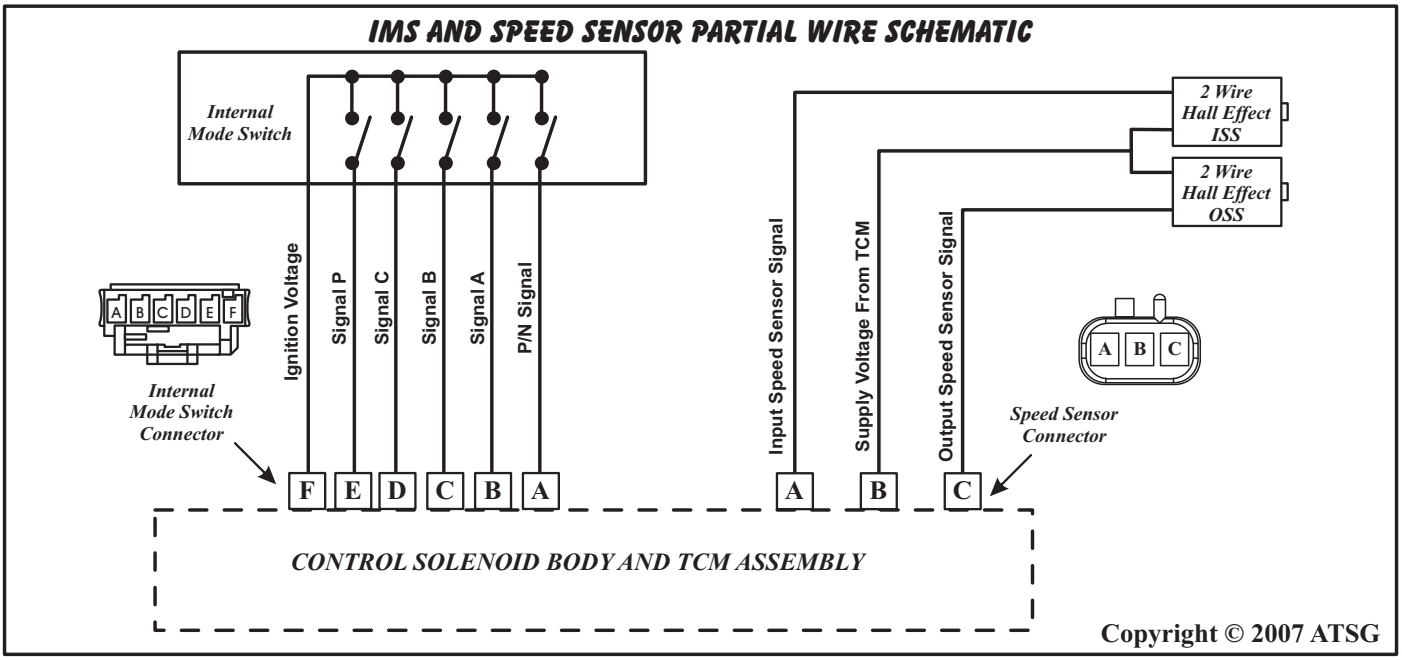


Figure 17

ELECTRONIC COMPOMENTS (CONT'D)

TRANSMISSION SPEED SENSORS

The speed sensors are both 2 wire hall-effect type sensors which bolt to the valve body assembly and connect to the control solenoid body and TCM assembly through a wire harness and connector, as shown in Figure 17 and 18.

If the TCM detects an improper signal from the input or output speed sensors, a DTC will be activated.

SPEED SENSOR TERMINAL IDENTIFICATION	
Terminal Number	*Function*
A	*Input Speed Sensor Signal*
B	*Supply Voltage From TCM*
C	*Output Speed Sensor Signal*

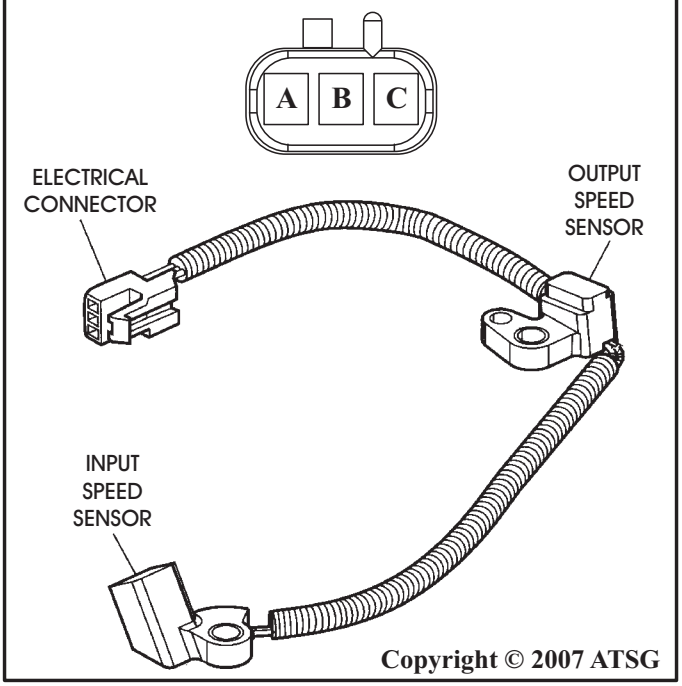


Figure 18

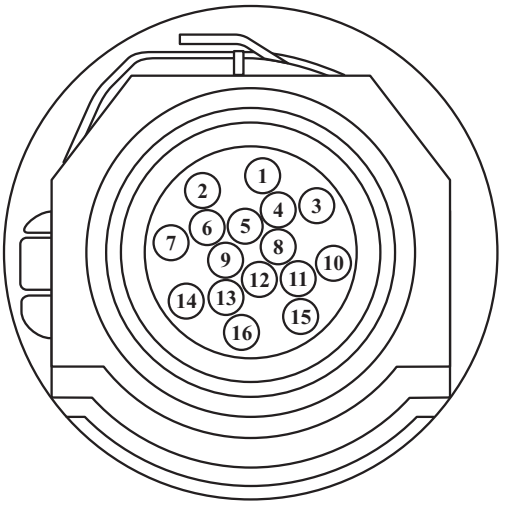
Input Speed Sensor Assembly

The input speed sensor faces the 1-2-3-4 and 3-5-R clutch housing and is triggered by splines on the housing outside diameter. The sensor receives 8.3-9.3 volts from the TCM, and produces a signal frequency based on the spline profile and rotation speed of the 1-2-3-4 clutch housing. The TCM uses this signal to determine line pressure, shift timing, TCC slip speed and gear ratio.

Output Speed Sensor Assembly

The output speed sensor faces the output shaft housing and is triggered by slots in the housing outside diameter. The sensor receives 8.3-9.3 volts from the TCM, and produces a signal frequency based on the machined slots and rotation speed of the output shaft housing. The TCM uses this signal to determine line pressure, shift timing, vehicle speed and gear ratio.

16-WAY CASE CONNECTOR TERMINAL IDENTIFICATION



View Looking Into 16-Way Case Connector

Pin No.	Function
1	Not Used
2	Not Used
3	Park/Neutral Signal
4	Battery Voltage Feed
5	Ground
6	Brake Pedal Apply Signal
7	Tap Up/Tap Down Switch
8	Not Used
9	Accessory Voltage Power
10	CAN Hi
11	CAN Lo
12	Run/Crank Voltage Power
13	CAN Lo 2
14	CAN Hi 2
15	Replicated OSS Signal
16	Not Used

Figure 19

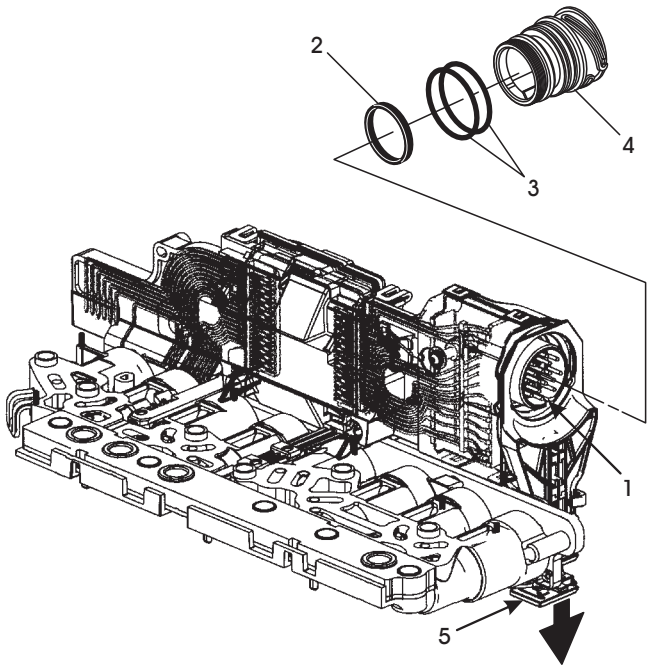
ELECTRONIC COMPOMENTS (CONT'D)

16-Way Case Connector

The 16-way transmission case connector is also part of the control solenoid body and TCM assembly, as shown in Figure 20, and ***is not*** serviced seperately. The case connector and the terminal identification chart are both illustrated in Figure 19, for diagnostic purposes. We have also provided a full wiring schematic in Figure 21.

Since the case connector is part of the TCM and is located internally, there is an additional sleeve with "O" rings and a seal required to seal the passage in the case, as shown in Figure 20. Once the control solenoid body and TCM assembly has been installed onto the valve body, you must pull the retaining tab down, as shown in Figure 20, install the pass through sleeve with the "O" rings and seal, and then press the retaining tab back up engaging the tab into the pass through sleeve.

TRANSMISSION CASE TO TCM SLEEVE ASSEMBLY



1 16-WAY TRANSMISSION CASE CONNECTOR.
2 TCM ASSEMBLY TO TRANSMISSION CASE SLEEVE SEAL.
3 CASE SLEEVE TO TRANSMISSION CASE "O" RING SEALS (2).
4 TRANSMISSION CASE SLEEVE ASSEMBLY.
5 TRANSMISSION CASE SLEEVE RETAINING TAB.

Figure 20

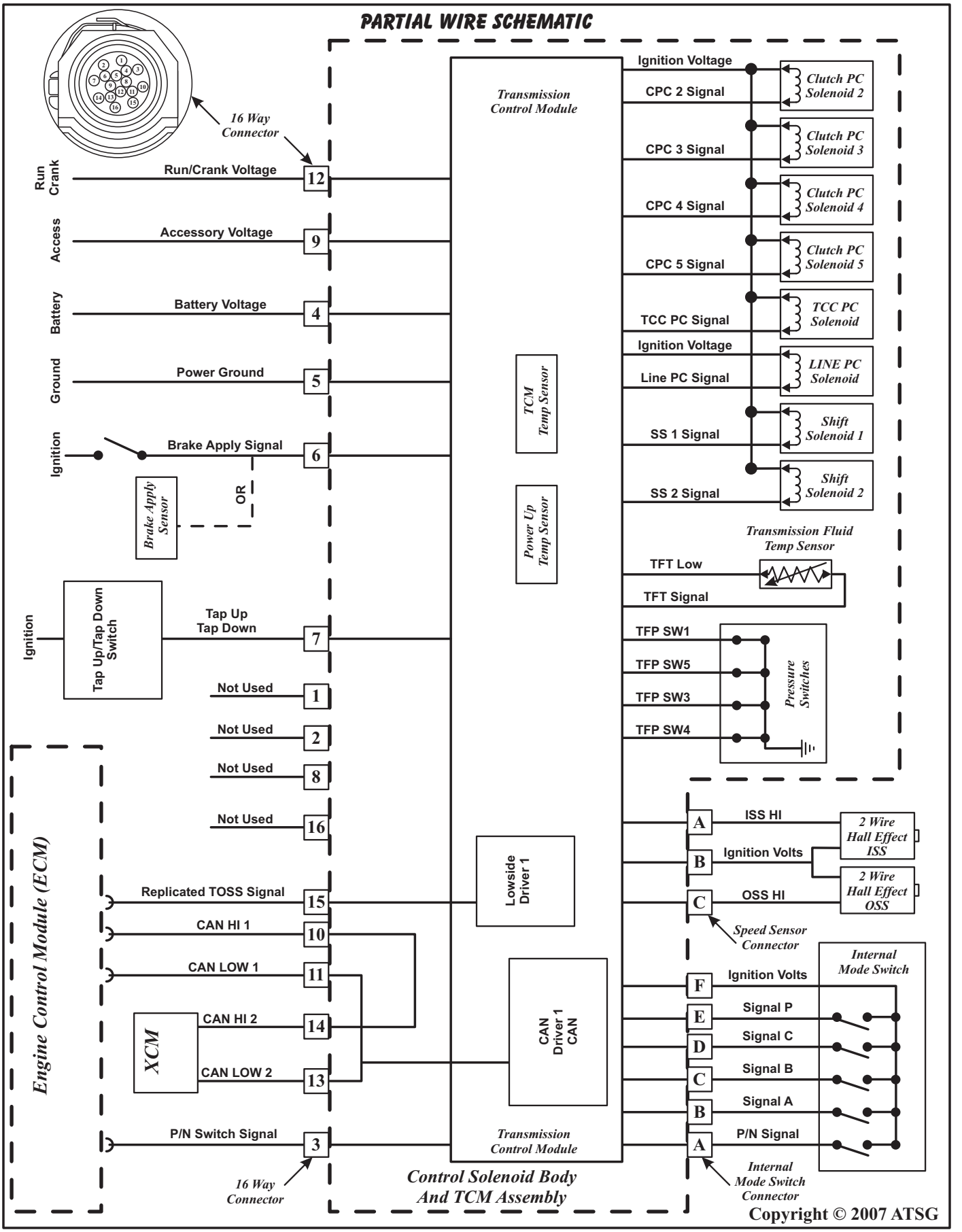

PARTIAL WIRE SCHEMATIC
16 Way Connector
Run Crank
Run/Crank Voltage
12
Access
Accessory Voltage
9
Battery
Battery Voltage
4
Ground
Power Ground
5
Ignition
Brake Apply Signal
6
Brake Apply Sensor
OR
Ignition
Tap Up/Tap Down Switch
Tap Up
Tap Down
7
Not Used
1
Not Used
2
Not Used
8
Not Used
16
Replicated TOSS Signal
15
CAN HI 1
10
CAN LOW 1
11
XCM
CAN HI 2
14
CAN LOW 2
13
P/N Switch Signal
3
16 Way Connector
Engine Control Module (ECM)
Transmission Control Module
TCM Temp Sensor
Power Up Temp Sensor
Lowside Driver 1
CAN Driver 1 CAN
Transmission Control Module
Control Solenoid Body And TCM Assembly
Ignition Voltage
CPC 2 Signal
Clutch PC Solenoid 2
CPC 3 Signal
Clutch PC Solenoid 3
CPC 4 Signal
Clutch PC Solenoid 4
CPC 5 Signal
Clutch PC Solenoid 5
TCC PC Signal
TCC PC Solenoid
Ignition Voltage
Line PC Signal
LINE PC Solenoid
SS 1 Signal
Shift Solenoid 1
SS 2 Signal
Shift Solenoid 2
Transmission Fluid Temp Sensor
TFT Low
TFT Signal
TFP SW1
TFP SW5
TFP SW3
TFP SW4
Pressure Switches
A
ISS HI
2 Wire Hall Effect ISS
B
Ignition Volts
C
OSS HI
2 Wire Hall Effect OSS
Speed Sensor Connector
Internal Mode Switch
F
Ignition Volts
E
Signal P
D
Signal C
C
Signal B
B
Signal A
A
P/N Signal
Internal Mode Switch Connector
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Figure 21

DIAGNOSTIC TROUBLE CODE (DTC) IDENTIFICATION		
DTC	**DESCRIPTION**	**DTC TYPE***
P0218	*Transmission Fluid Overtemperature, Over 270°F for 10 minutes.*	A
P0562	*System Voltage Low, 11 volts or less for 10 seconds.*	A
P0563	*System Voltage High, Greater than 18 volts for 12 seconds.*	A
P0601	*TCM (Internal), Read Only Memory (ROM).*	A
P0602	*TCM, Not Programmed.*	A
P0603	*TCM (Internal), Long term memory reset.*	A
P0604	*TCM (Internal), Random Access Memory (RAM).*	A
P0634	*TCM (Internal), Overtemperature.*	A
P0667	*TCM (Internal), Temperature Sensor Performance.*	A
P0668	*TCM (Internal), Temperature Sensor circuit voltage low.*	A
P0669	*TCM (Internal), Temperature Sensor circuit voltage high.*	A
P0703	*Brake Switch Circuit, signal is invalid for 4 seconds.*	A
P0711	*Transmission Fluid Temperature (TFT), Sensor performance.*	C
P0712	*Transmission Fluid Temperature (TFT), Sensor circuit voltage low.*	A
P0713	*Transmission Fluid Temperature (TFT), Sensor circuit voltage high.*	A
P0716	*Input Speed Sensor (ISS), Sensor performance.*	A
P0717	*Input Speed Sensor (ISS), Sensor circuit voltage low.*	A
P0719	*Brake Switch Circuit, Circuit voltage low.*	A
P0722	*Output Speed Sensor (OSS), Sensor circuit voltage low.*	C
P0723	*Output Speed Sensor (OSS), Sensor intermittent.*	B
P0724	*Brake Switch Circuit, Circuit voltage high.*	A
P0729	*Incorrect 6th Gear Ratio.*	C
P0731	*Incorrect 1st Gear Ratio.*	A
P0732	*Incorrect 2nd Gear Ratio.*	A
P0733	*Incorrect 3rd Gear Ratio.*	A
P0734	*Incorrect 4th Gear Ratio.*	A
P0735	*Incorrect 5th Gear Ratio.*	A
P0736	*Incorrect Reverse Gear Ratio.*	A
P0741	*Torque Converter Clutch (TCC), System Stuck OFF.*	A
P0742	*Torque Converter Clutch (TCC), System Stuck ON.*	B
P0751	*Shift Solenoid (SS) 1 Valve Performance, Stuck OFF.*	B
P0752	*Shift Solenoid (SS) 1 Valve Performance, Stuck ON.*	A

***DTC TYPES**

A - Emission-related, turns the MIL "ON" immediately after the 1st failure.

B - Emission-related, turns the MIL "ON" after two consecutive drive cycles with failure.

C - Non-emission-related, no lamps and may display message on driver information center.

Figure 22

DIAGNOSTIC TROUBLE CODE (DTC) IDENTIFICATION		
DTC	**DESCRIPTION**	**DTC TYPE***
P0776	*Clutch Pressure Control (CPC) Solenoid 2, Stuck OFF.*	A
P0777	*Clutch Pressure Control (CPC) Solenoid 2, Stuck ON.*	A
P0796	*Clutch Pressure Control (CPC) Solenoid 3, Stuck OFF.*	A
P0797	*Clutch Pressure Control (CPC) Solenoid 3, Stuck ON.*	A
P0815	*Upshift Switch Circuit Error.*	C
P0816	*Downshift Switch Circuit Error.*	C
P0826	*Upshift and Downshift Switch Circuit Error.*	C
P0842	*Transmission Fluid Pressure (TFP) Switch 1, Circuit Voltage Low.*	C
P0843	*Transmission Fluid Pressure (TFP) Switch 1, Circuit Voltage High.*	C
P0851	*Park/Neutral Position (PNP) Switch, Circuit Voltage Low.*	C
P0852	*Park/Neutral Position (PNP) Switch, Circuit Voltage High.*	C
P0872	*Transmission Fluid Pressure (TFP) Switch 3, Circuit Voltage Low.*	C
P0873	*Transmission Fluid Pressure (TFP) Switch 3, Circuit Voltage High.*	C
P0877	*Transmission Fluid Pressure (TFP) Switch 4, Circuit Voltage Low.*	C
P0878	*Transmission Fluid Pressure (TFP) Switch 4, Circuit Voltage High.*	C
P0961	*Line Pressure Control (PC) Solenoid, System Performance.*	A
P0962	*Line Pressure Control (PC) Solenoid, Circuit Voltage Low.*	A
P0963	*Line Pressure Control (PC) Solenoid, Circuit Voltage High.*	A
P0965	*Clutch Pressure Control (CPC) Solenoid 2, System Performance.*	A
P0966	*Clutch Pressure Control (CPC) Solenoid 2, Circuit Voltage Low.*	A
P0967	*Clutch Pressure Control (CPC) Solenoid 2, Circuit Voltage High.*	A
P0969	*Clutch Pressure Control (CPC) Solenoid 3, System Performance.*	A
P0970	*Clutch Pressure Control (CPC) Solenoid 3, Circuit Voltage Low.*	A
P0971	*Clutch Pressure Control (CPC) Solenoid 3, Circuit Voltage High.*	A
P0973	*Shift Solenoid 1 (SS), Control Circuit Voltage Low.*	A
P0974	*Shift Solenoid 1 (SS), Control Circuit Voltage High.*	A
P0976	*Shift Solenoid 2 (SS), Control Circuit Voltage Low.*	A
P0977	*Shift Solenoid 2 (SS), Control Circuit Voltage High.*	A
P0989	*Transmission Fluid Pressure (TFP) Switch 5, Circuit Voltage Low.*	C
P0990	*Transmission Fluid Pressure (TFP) Switch 5, Circuit Voltage High.*	C
P1621	*TCM (Internal), Long Term Memory Performance.*	A
P1684	*TCM (Internal), Power Up Temperature Sensor Performance.*	A

***DTC TYPES**

A - Emission-related, turns the MIL "ON" immediately after the 1st failure.

B - Emission-related, turns the MIL "ON" after two consecutive drive cycles with failure.

C - Non-emission-related, no lamps and may display message on driver information center.

Figure 23

DIAGNOSTIC TROUBLE CODE (DTC) IDENTIFICATION		
DTC	**DESCRIPTION**	**DTC TYPE***
P1685	*TCM (Internal), Power Up Temperature Sensor, Circuit Voltage Low.*	A
P1686	*TCM (Internal), Power Up Temperature Sensor, Circuit Voltage High.*	A
P1751	*Shift Valve 1, Performance of Clutch Select Valve 2.*	A
P1825	*Internal Mode Switch, Invalid Range*	A
P1831	*TCM (Internal), Driver No. 2, (Controls Line Pressure & Shift Lock Solenoids).*	A
P1832	*TCM (Internal), Driver No. 2, (Controls Line Pressure & Shift Lock Solenoids).*	C
P1876	*Up and Down Shift Switch Performance, Range Switch Not In D3.*	C
P1915	*Internal Mode Switch, Start In Wrong Range.*	A
P2534	*Ignition Switch, Start Circuit Voltage Low.*	A
P2714	*Clutch Pressure Control (CPC) Solenoid 4, Stuck OFF.*	A
P2715	*Clutch Pressure Control (CPC) Solenoid 4, Stuck ON.*	A
P2719	*Clutch Pressure Control (CPC) Solenoid 4, System Performance.*	A
P2720	*Clutch Pressure Control (CPC) Solenoid 4, Circuit Voltage Low.*	A
P2721	*Clutch Pressure Control (CPC) Solenoid 4, Circuit Voltage High.*	A
P2723	*Clutch Pressure Control (CPC) Solenoid 5, Stuck OFF.*	A
P2724	*Clutch Pressure Control (CPC) Solenoid 5, Stuck ON.*	A
P2728	*Clutch Pressure Control (CPC) Solenoid 5, System Performance.*	A
P2729	*Clutch Pressure Control (CPC) Solenoid 5, Circuit Voltage Low.*	A
P2730	*Clutch Pressure Control (CPC) Solenoid 5, Circuit Voltage High.*	A
P2762	*TCC Pressure Control (PC) Solenoid, System Performance.*	A
P2763	*TCC Pressure Control (PC) Solenoid, Circuit Voltage High.*	A
P2764	*TCC Pressure Control (PC) Solenoid, Circuit Voltage Low.*	A

***DTC TYPES**

A - Emission-related, turns the MIL "ON" immediately after the 1st failure.

B - Emission-related, turns the MIL "ON" after two consecutive drive cycles with failure.

C - Non-emission-related, no lamps and may display message on driver information center.

Figure 24

FAIL-SAFE OR PROTECTION MODE

If for any reason, the entire electronic control system of the transmission, or any one of the electrical components within the Control Solenoid Body and TCM Assembly becomes disabled, the transmission will default to fail-safe mode. If the transmission is in 1st, 2nd or 3rd gear during an electrical failure, the transmission will default to 3rd gear. If the transmission is in 4th, 5th or 6th gear during an electrical failure, the transmission will default to 5th gear.

If for any reason, the entire electronic control system of the transmission fails, the line pressure control solenoid will be OFF, and maximum line pressure will be the result. This will create harsh engagements. The TCC PC solenoid would also be OFF, resulting in no torque converter clutch apply.

6L80 CHECKBALL LOCATION AND FUNCTION

Number 1 Checkball

The number one checkball is located in the upper valve body, as shown in Figure 25. When the transmission is operating in Drive 1st, 2nd, 3rd, 4th, 5th or 6th gear, drive 1-6 fluid seats the checkball against the drive braking passage and enters the 2-6 clutch/1-2-3-4 clutch feed circuit to apply the 1-2-3-4 clutch.

Number 2 Checkball

The number two checkball is located in the upper valve body, as shown in Figure 25. This shuttle type checkball is seated against the reverse passage while the transmission is operating in Park, Neutral and Drive 1st. With the checkball in this position, shift solenoid 1 fluid enters the CSV2 enable circuit to the "clutch select valve 2". When the transmission is operating in Reverse, the checkball seats against shift solenoid 1 passage to allow reverse fluid to enter the CSV2 enable circuit and hold the "clutch select valve 2" in the applied position.

Number 3 Checkball

The number three checkball is located in the upper valve body, as shown in Figure 25. This shuttle type checkball is seated against the 4-5-6 clutch passage while the transmission is operating in Park, Reverse, Neutral, Drive 1st, 2nd and 3rd gear. With the checkball in this position, shift solenoid 2 fluid enters the CSV3 enable circuit to apply the "clutch select valve 3". When the transmission is operating in Drive 4th, 5th or 6th gear, the checkball seats against the shift solenoid 2 passage to allow 4-5-6 clutch fluid to enter the CSV3 enable circuit and hold the "clutch select valve 3" in the applied position.

Number 4 Checkball

The number four checkball is located in the upper valve body, as shown in Figure 25. This shuttle type checkball is seated against the 4-5-6 clutch passage by Pressure Solenoid 5 fluid, while the transmission is operating in Park, Reverse, Neutral, Drive 1st, 2nd and 3rd gear. With the checkball in this position, PS 5 fluid enters the CSV2 latch circuit to hold the "clutch select valve 2" in the released position. When the transmission is operating in Drive 4th, 5th or 6th gear, 4-5-6 clutch fluid seats the checkball against the PS 5 passage to allow 4-5-6 clutch fluid to enter the CSV2 latch circuit to hold the "clutch select valve 2" in released the position.

Number 5 Checkball

The number five checkball is located in the upper valve body, as shown in Figure 25. This shuttle type checkball is seated against the Drive 1-6 passage by 3-5/Reverse Feed fluid while the transmission is operating in Reverse. With the checkball in this position, 3-5/Reverse Feed fluid enters the 3-5/Reverse Supply circuit and is routed to the number 7 checkball. When the transmission is operating in Drive 1st, 2nd, 3rd, 4th, 5th or 6th gear, Drive 1-6 fluid seats the ball against the 3-5/Reverse Feed passage to allow Drive 1-6 fluid to enter the 3-5/Reverse Supply circuit.

Number 6 Checkball

The number six checkball is located in the upper valve body, as shown in Figure 25. This "one way orifice control" type checkball is used to differentiate the flow rate of fluid between applying and releasing the 1-2-3-4 clutch. 2-6 clutch/1-2-3-4 clutch feed fluid opens the checkball, while the transmission is operating in Drive 1st, 2nd, 3rd, 4th, 5th or 6th gear. With the ball in this position, 2-6 clutch/1-2-3-4 clutch feed fluid flows freely into the 1-2-3-4 clutch feed passage. When Park, Reverse or Neutral is selected after the transmission was operating in Drive, exhausting 1-2-3-4 clutch feed fluid seats the checkball, and forces exhausting fluid through orifice number 32, which allows for a controlled exhaust of the 1-2-3-4 clutch.

Number 7 Checkball

The number seven checkball is located in the upper valve body, as shown in Figure 25. This "one way orifice control" type checkball is used to differentiate the flow rate of fluid between applying and releasing the 3-5/Reverse clutch. 3-5/Reverse Supply fluid pressure seats the checkball against the 3-5/Reverse Feed passage, while the transmission is operating in Reverse, Drive 1st, 2nd, 3rd, 4th, 5th or 6th gear. With the checkball in this position, 3-5/Reverse Supply fluid is forced through orifice number 25 before entering the 3-5/Reverse Feed passage. The orifice helps control the apply rate of the 3-5/Reverse clutch when the transmission shifts into Reverse, 3rd or 5th gear. When Park or Neutral is selected after the transmission was operating in Drive, or Reverse, exhausting 3-5/Reverse Feed fluid unseats the checkball. This allows for a faster exhaust of 3-5/Reverse Feed fluid and a quick release of the 3-5/Reverse clutch.

6L80 CHECKBALL LOCATION AND FUNCTION

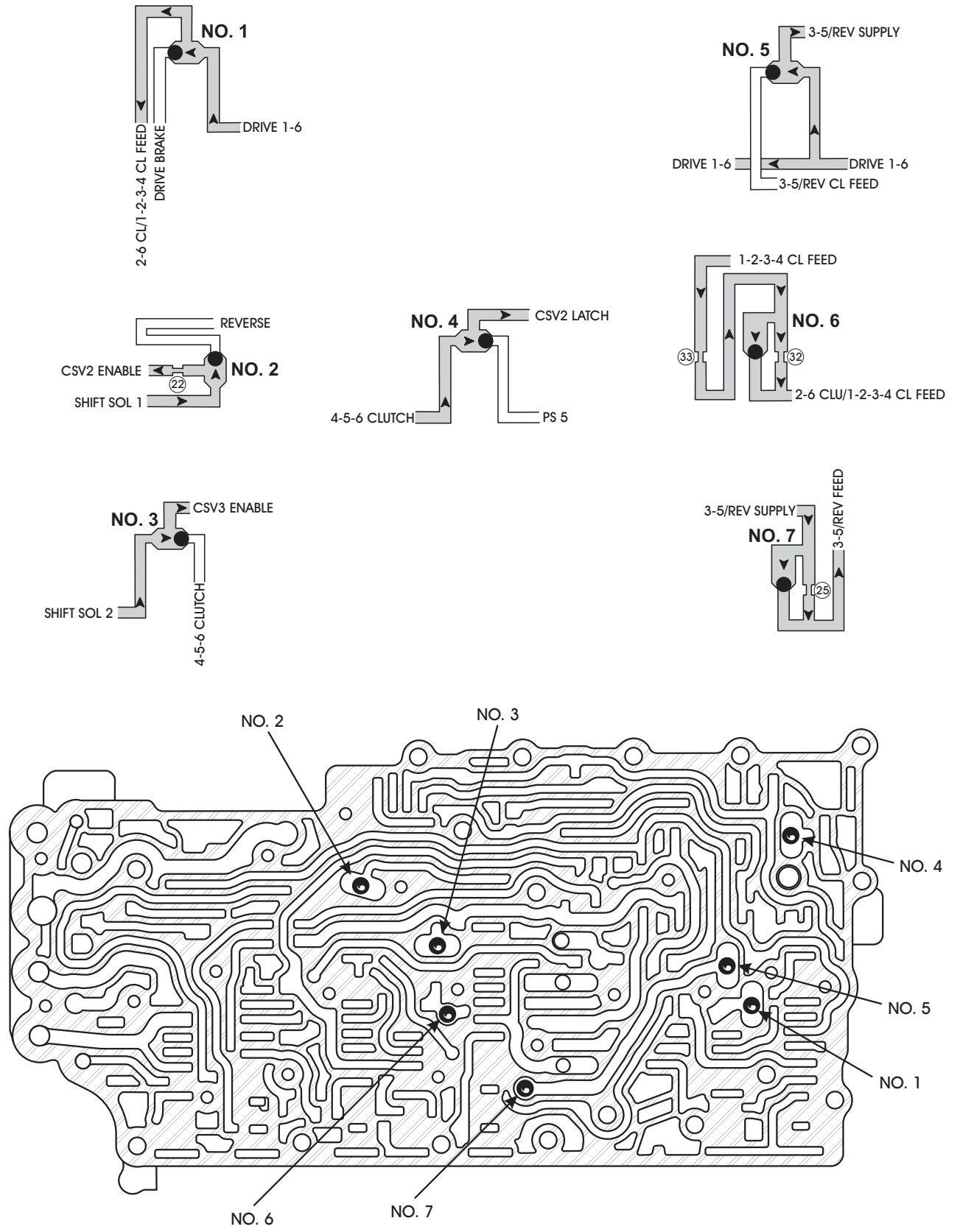
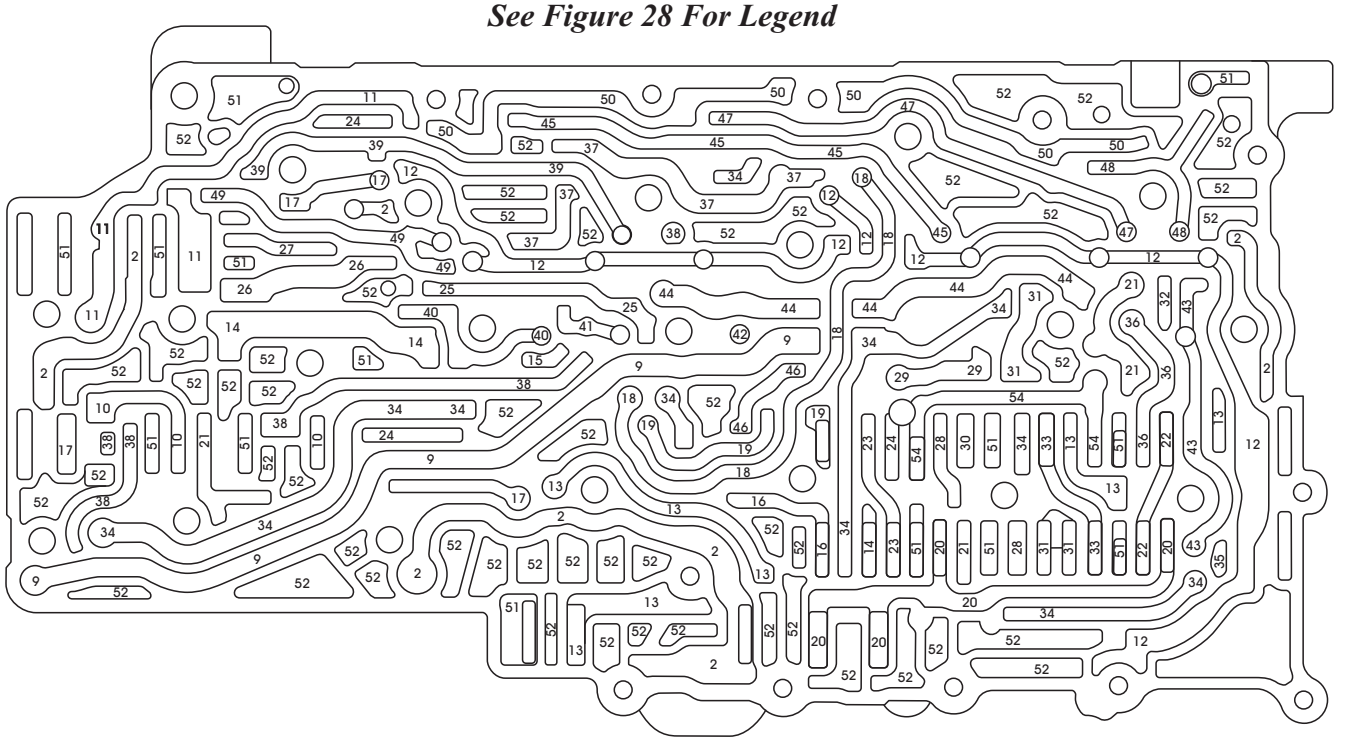


Figure 25

LOWER VALVE BODY, SPACER PLATE SIDE

See Figure 28 For Legend



LOWER VALVE BODY, TCM/SOLENOID BODY SIDE

See Figure 28 For Legend

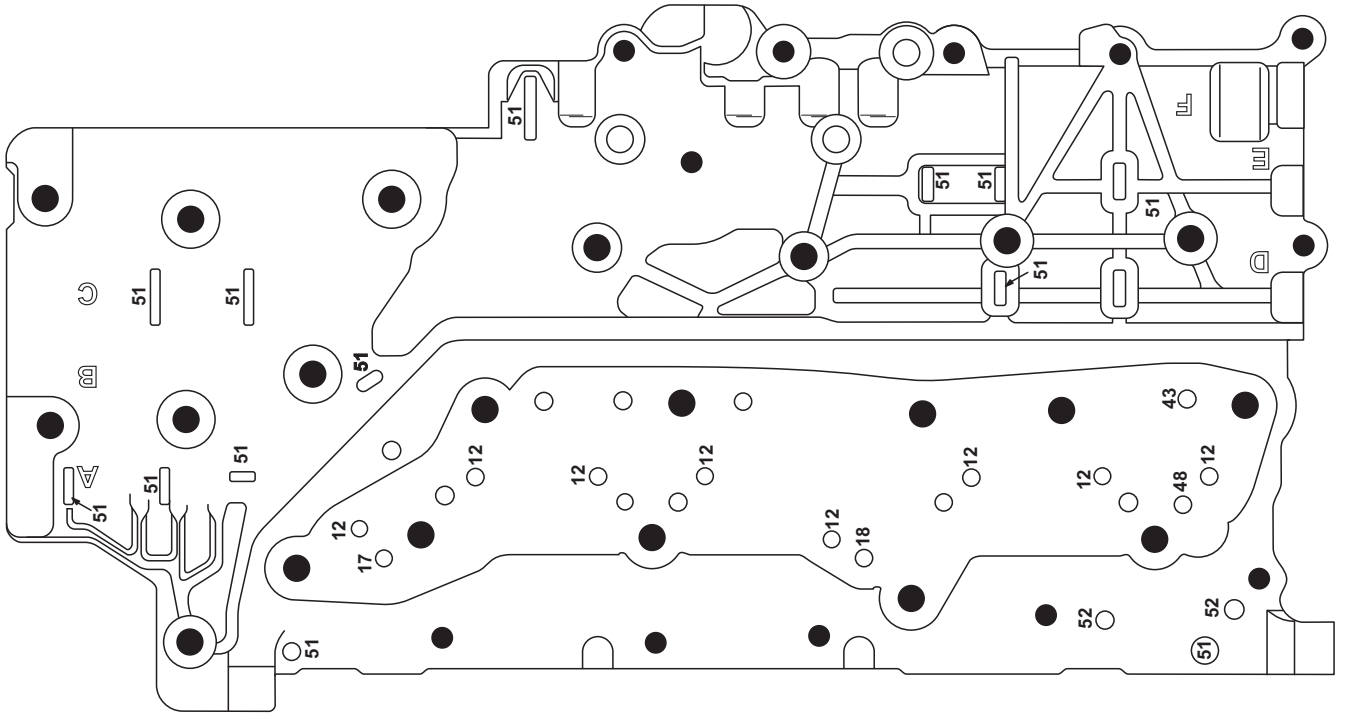
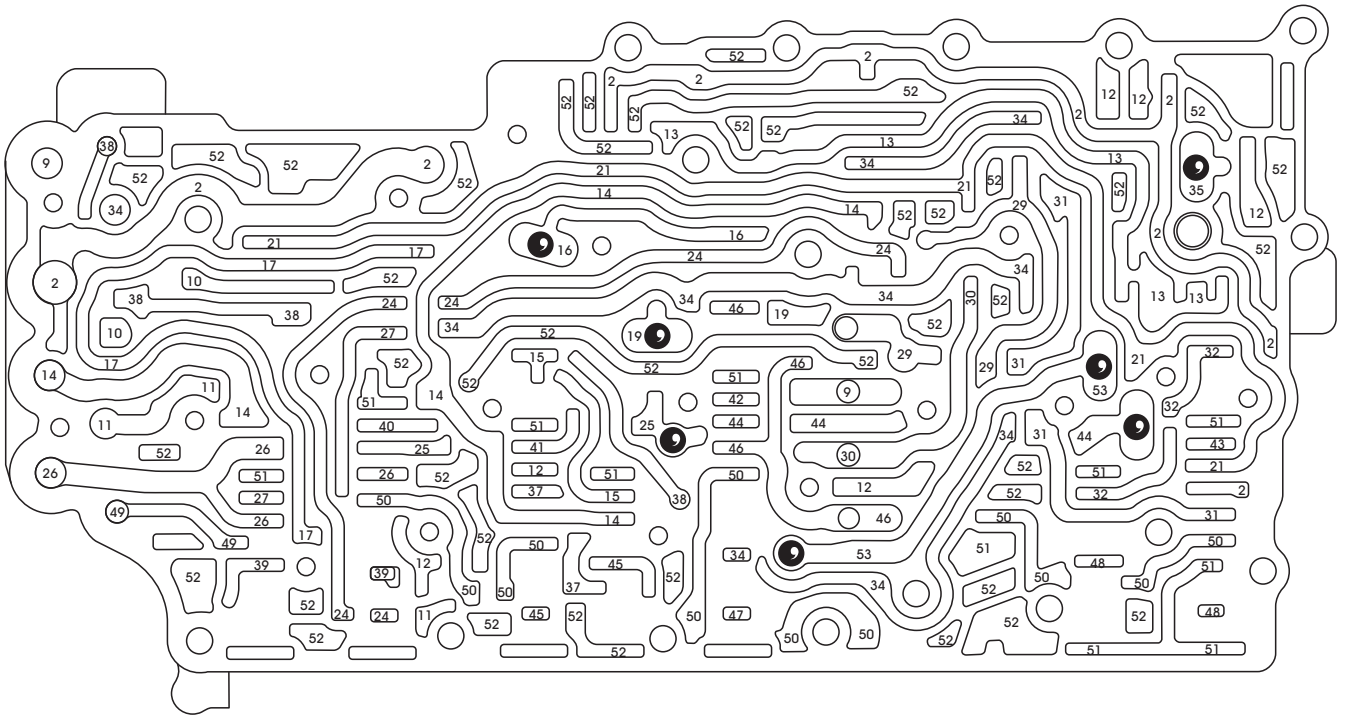


Figure 26

UPPER VALVE BODY, SPACER PLATE SIDE

See Figure 28 For Legend



UPPER VALVE BODY, CASE SIDE

See Figure 28 For Legend

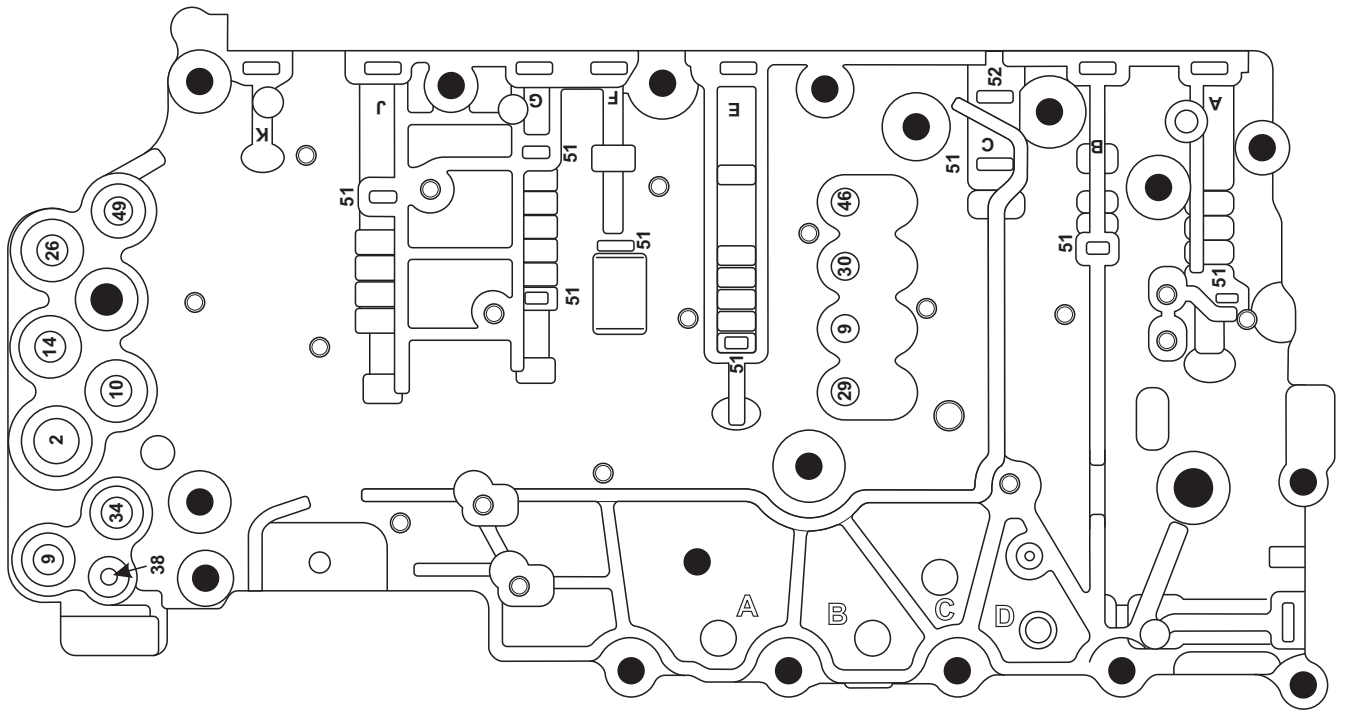


Figure 27

PASSAGE IDENTIFICATION LEGEND

1 SUCTION
2 LINE
3 DECREASE
4 CONVERTER FEED
5 CONVERTER FEED LIMIT
6 TCC RELEASE
7 TCC APPLY
8 COOLER FEED
9 CENTER LUBE
10 REGULATOR APPLY
11 COMPENSATOR FEED
12 ACTUATOR FEED LIMIT
13 REVERSE
14 3-5/REVERSE CLUTCH
15 3-5/REVERSE CLUTCH FEEDBACK
16 CSV2 ENABLE (Clutch Select Valve 2)
17 SHIFT SOLENOID 1
18 SHIFT SOLENOID 2
19 CSV3 ENABLE (Clutch Select Valve 3)
20 DRIVE
21 DRIVE 1-6
22 DRIVE BRAKE
23 1-2-3-4 CLUTCH DEFAULT FEED
24 1-2-3-4 CLUTCH DEFAULT
25 1-2-3-4 CLUTCH FEED
26 1-2-3-4 CLUTCH
27 1-2-3-4 CLUTCH FEEDBACK
28 CBR1/CBR FEED (Clutch Braking 1st)
29 CBR1 (Clutch Braking 1st)
30 CBR (Clutch Braking)
31 CBR1/4-5-6 CLUTCH FEED
32 CBR1 FEEDBACK
33 4-5-6 CLUTCH FEED
34 4-5-6 CLUTCH
35 CSV2 LATCH
36 DRIVE B
37 3-5/REVERSE FEED
38 PCS TCC (Pressure Control Solenoid)
39 PCS 1234 CLUTCH (Pressure Control Solenoid)
40 PCS 4 (Pressure Conrol Solenoid)
41 PCS 2
42 PCS 3
43 PCS 5
44 2-6 CLUTCH/1-2-3-4 CLUTCH FEED
45 PCS 3-5/REVERSE CLUTCH
46 2-6 CLUTCH
47 PCS 2-6 CLUTCH
48 PCS CBR1/4-5-6 CLUTCH
49 PCS LINE
50 EXHAUST BACKFILL
51 EXHAUST
52 VOID
53 3-5/REVERSE SUPPLY
54 3-5/REVERSE CLUTCH FEED
55 VENT
56 CONVERTER SEAL DRAINBACK
57 FRONT LUBE

Figure 28

TYPICAL SPACER PLATE

See Figure 28 For Legend

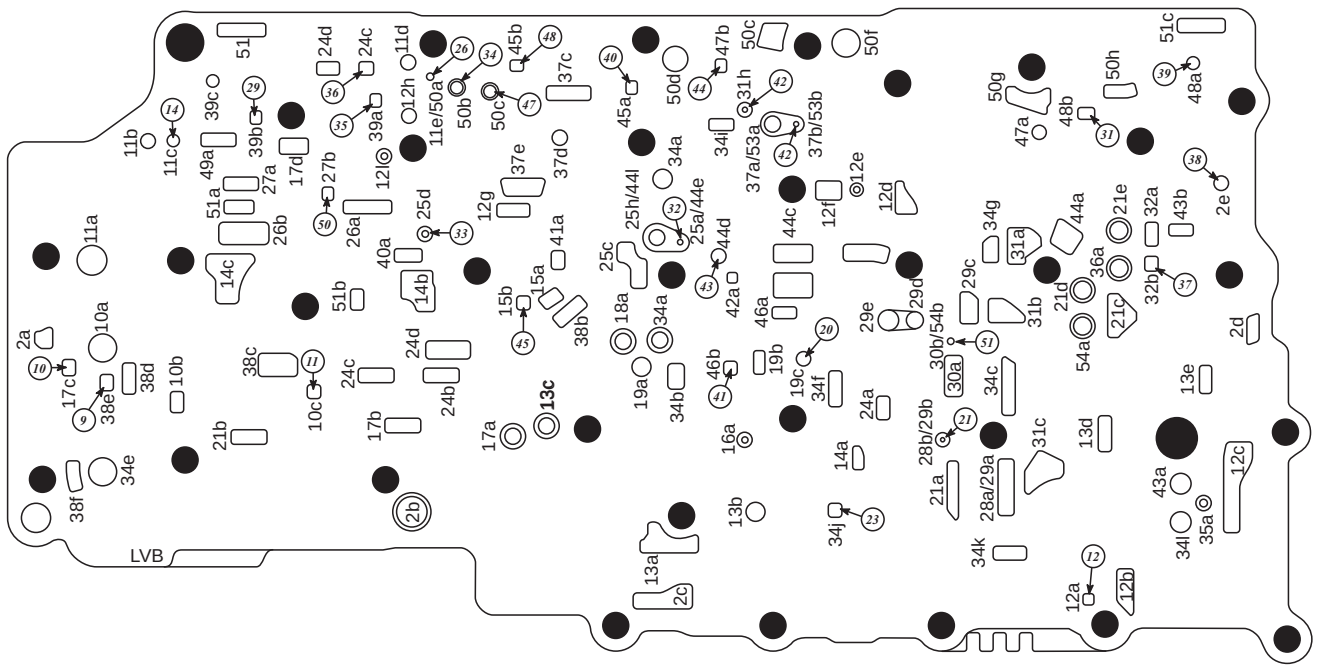


Figure 29

PASSAGE IDENTIFICATION LEGEND

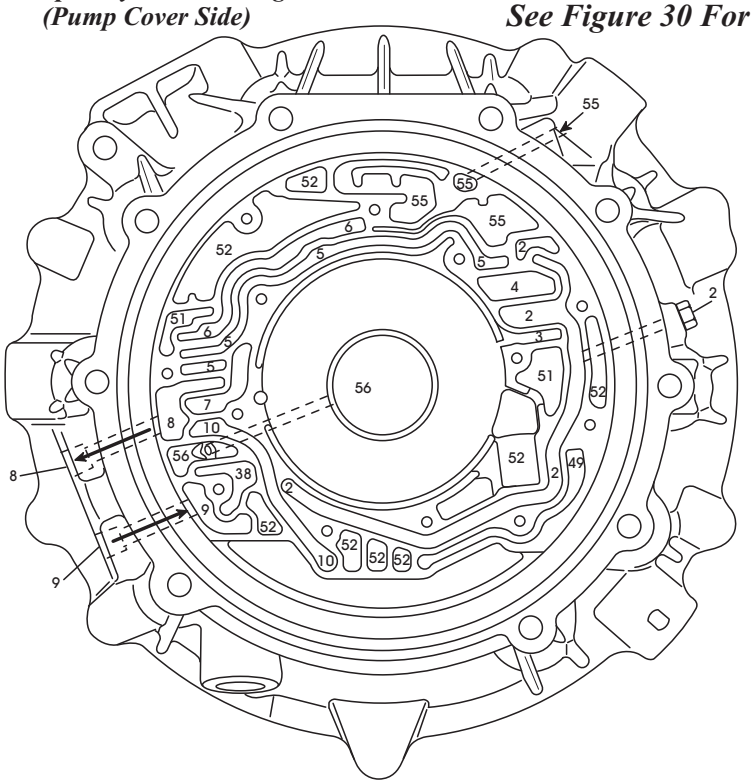
1 SUCTION
2 LINE
3 DECREASE
4 CONVERTER FEED
5 CONVERTER FEED LIMIT
6 TCC RELEASE
7 TCC APPLY
8 COOLER FEED
9 CENTER LUBE
10 REGULATOR APPLY
11 COMPENSATOR FEED
12 ACTUATOR FEED LIMIT
13 REVERSE
14 3-5/REVERSE CLUTCH
15 3-5/REVERSE CLUTCH FEEDBACK
16 CSV2 ENABLE (Clutch Select Valve 2)
17 SHIFT SOLENOID 1
18 SHIFT SOLENOID 2
19 CSV3 ENABLE (Clutch Select Valve 3)
20 DRIVE
21 DRIVE 1-6
22 DRIVE BRAKE
23 1-2-3-4 CLUTCH DEFAULT FEED
24 1-2-3-4 CLUTCH DEFAULT
25 1-2-3-4 CLUTCH FEED
26 1-2-3-4 CLUTCH
27 1-2-3-4 CLUTCH FEEDBACK
28 CBR1/CBR FEED (Clutch Braking 1st)
29 CBR1 (Clutch Braking 1st)
30 CBR (Clutch Braking)
31 CBR1/4-5-6 CLUTCH FEED
32 CBR1 FEEDBACK
33 4-5-6 CLUTCH FEED
34 4-5-6 CLUTCH
35 CSV2 LATCH
36 DRIVE B
37 3-5/REVERSE FEED
38 PCS TCC (Pressure Control Solenoid)
39 PCS 1234 CLUTCH (Pressure Control Solenoid)
40 PCS 4 (Pressure Conrol Solenoid)
41 PCS 2
42 PCS 3
43 PCS 5
44 2-6 CLUTCH/1-2-3-4 CLUTCH FEED
45 PCS 3-5/REVERSE CLUTCH
46 2-6 CLUTCH
47 PCS 2-6 CLUTCH
48 PCS CBR1/4-5-6 CLUTCH
49 PCS LINE
50 EXHAUST BACKFILL
51 EXHAUST
52 VOID
53 3-5/REVERSE SUPPLY
54 3-5/REVERSE CLUTCH FEED
55 VENT
56 CONVERTER SEAL DRAINBACK
57 FRONT LUBE

Figure 30

PUMP BODY AND PUMP COVER

See Figure 30 For Legend

Pump Body/Bell Housing (Pump Cover Side)



Pump Cover (Bell Housing Side)

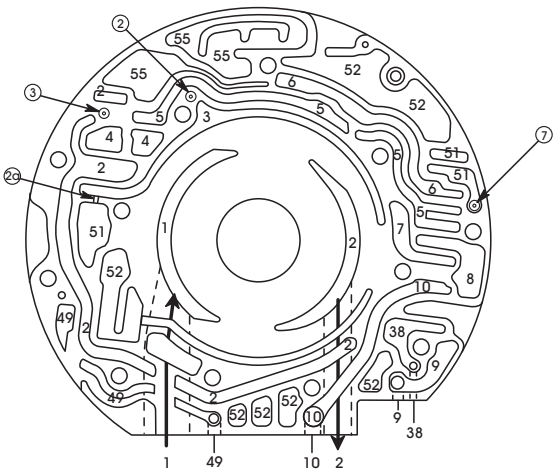


Figure 31

TRANSMISSION CASE

See Figure 30 For Legend

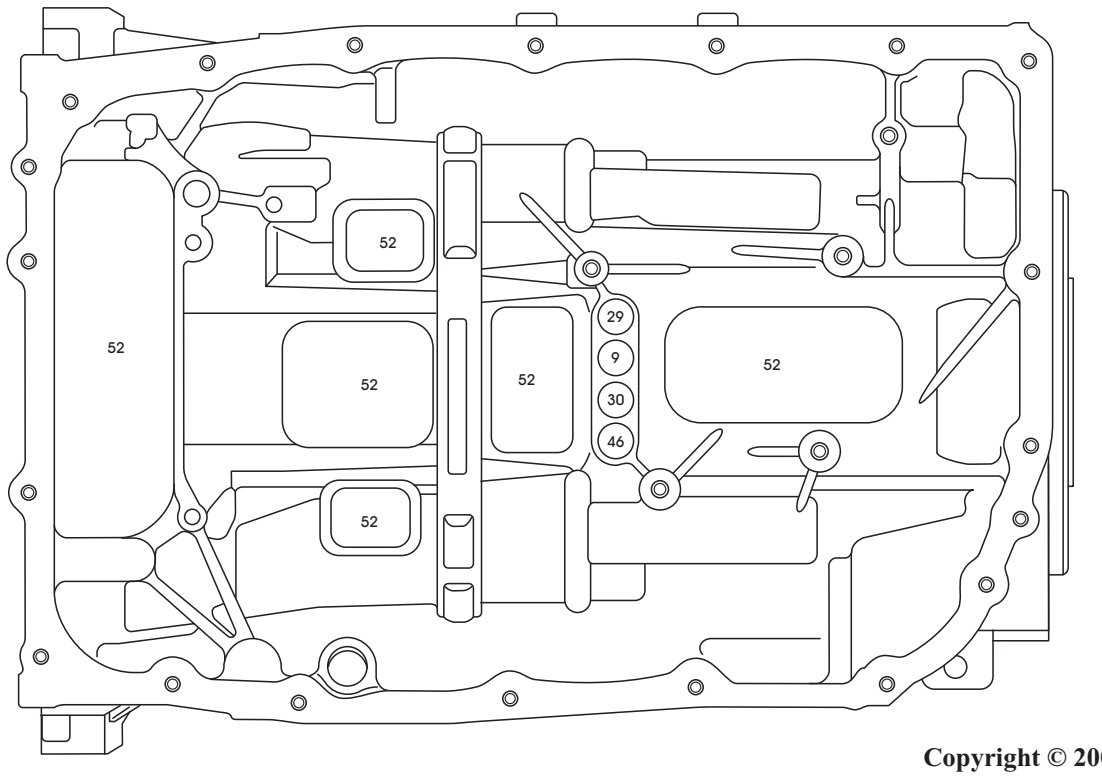
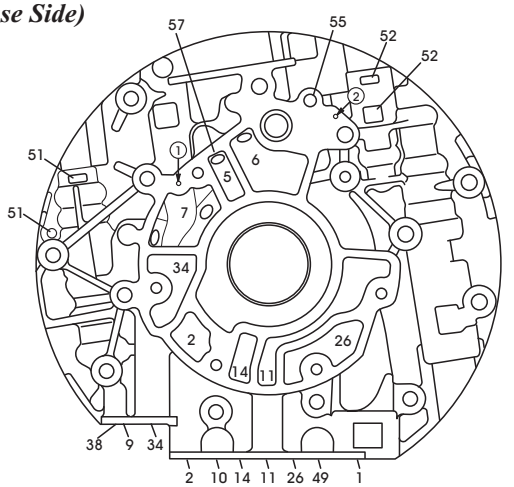


Figure 32

PUMP COVER AND CLUTCH SUPPORT

See Figure 30 For Legend

Pump Cover (Case Side)



Clutch Support (Pump Cover Side)

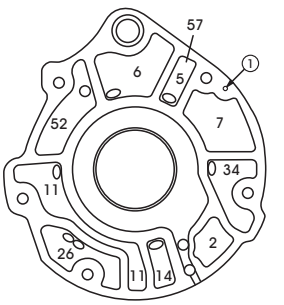
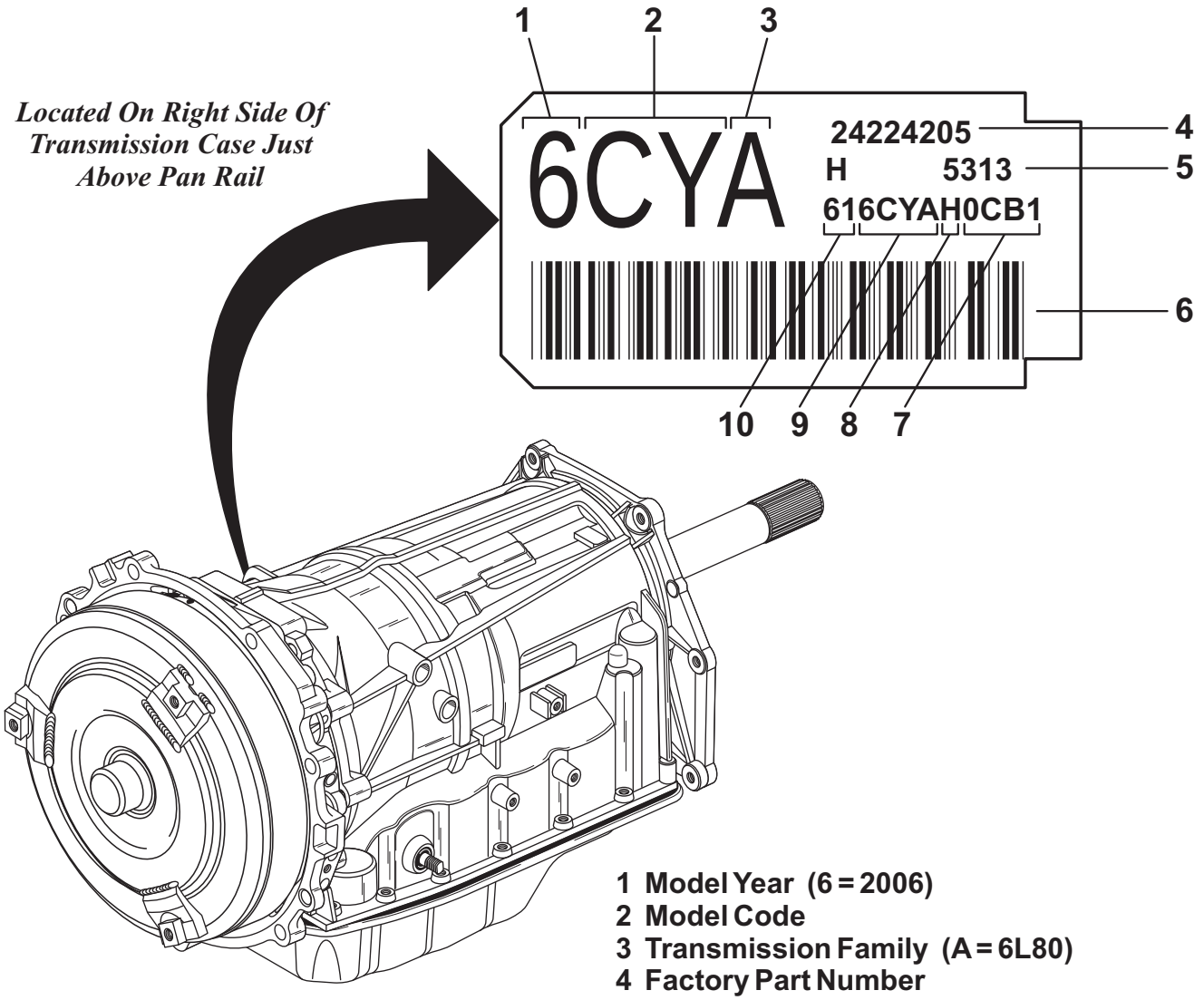


Figure 33

IDENTIFICATION TAG LOCATION AND INFORMATION



1 Model Year (6 = 2006)
2 Model Code
3 Transmission Family (A = 6L80)
4 Factory Part Number
5 Julian Date 5 = Year, 313 = Day Of Year
6 Bar Code
7 Sequential Serial Number
8 Assembly Plant Code
9 Broadcast Code
10 Transmission I.D.

Figure 34

DEXRON VI® TRANSMISSION FLUID REQUIREMENTS	DEXRON VI®
Pan Removal - Approximate Capacity	6.5 Quarts
Overhaul - Approximate Capacity (Cadillac STSV/XLRV)	10 Quarts
Overhaul - Approximate Capacity (Corvette)	12.5 Quarts

Figure 35

BELL HOUSING IDENTIFICATION

There are currently three different bell housing configurations, as shown in Figure 36. The is first is the Corvette version, in which the transmission is mounted in the rear of the vehicle, as it was with the 4L60E, and requires the torque tube from the engine to the rear of the vehicle. The second is the Cadillac STSV/XLRV version with the 4.4L engine, as shown in Figure 36. The third is the standard Chevrolet bell scheduled for trucks in 2007, as shown in Figure 36.

The converter housing also contains the pocket for the 13 vane rotor and slide assembly, with the pump cover bolting onto the back side of the converter housing, as shown in Figure 36. All three of the converter housings bolt to a 6L80 case and the 13 vane rotor and slide are common parts. The pump cover is also common, except for the calibration differences between the different 6L80 models.

This manual will use the Corvette version to illustrate and reference all procedures.

CONVERTER HOUSING IDENTIFICATION

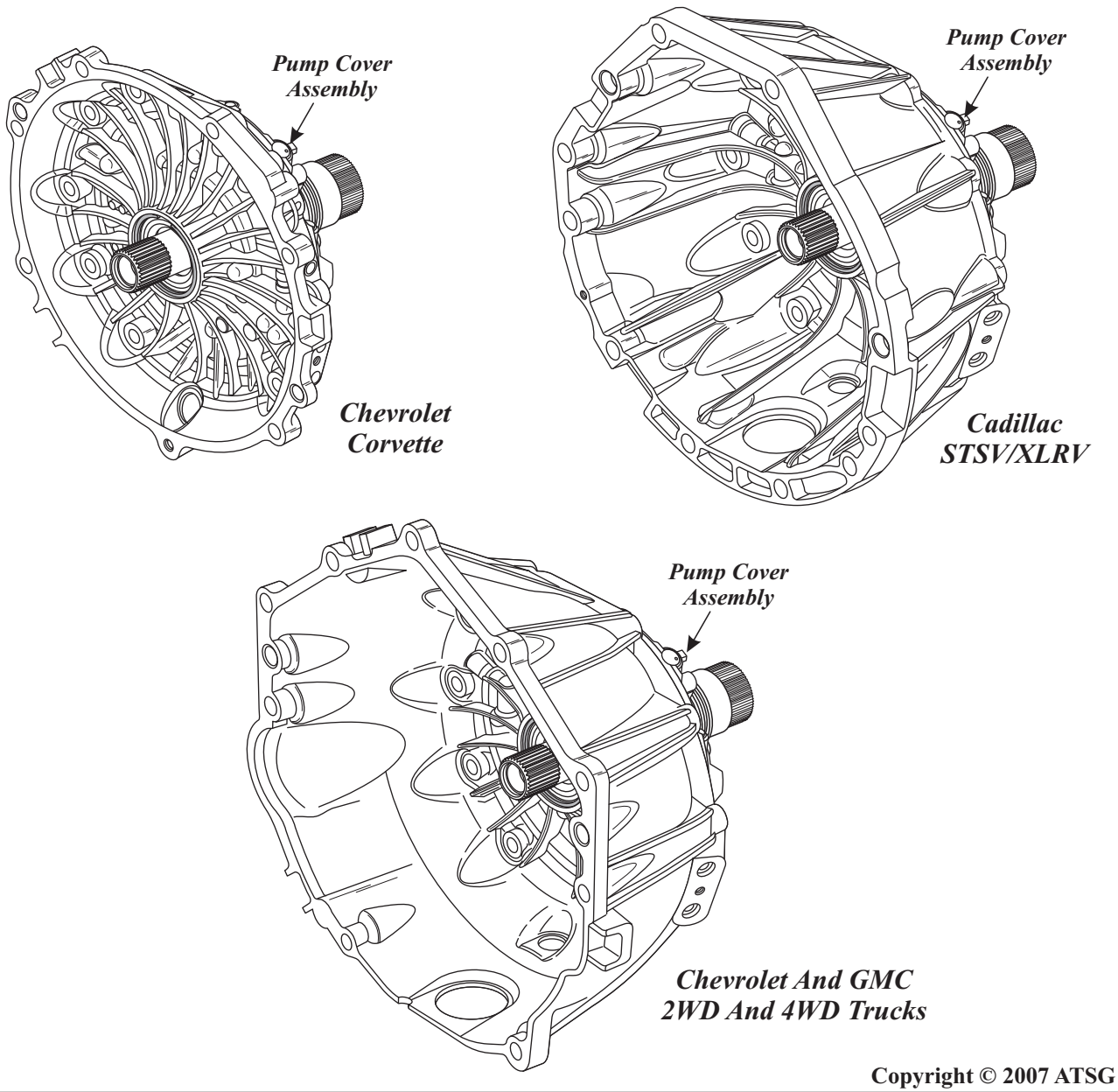


Figure 36

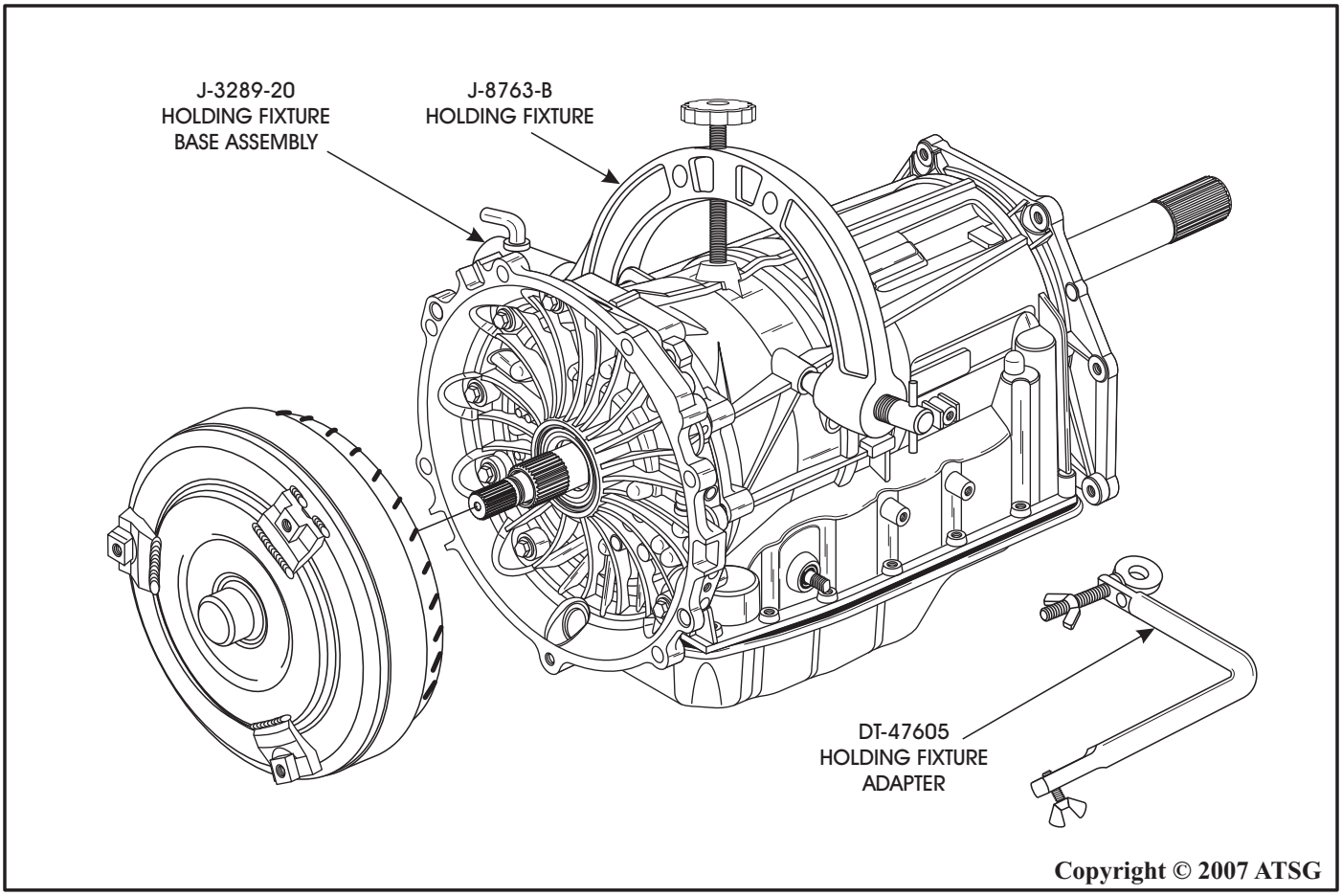


Figure 37

TRANSMISSION DISASSEMBLY

EXTERNAL PARTS

1. Remove the torque converter, as shown in Figure 37.
2. Install holding fixture J-8763-B, as shown in Figure 37, using fixture adapter DT-47605 if necessary and is shown in place in Figure 38.
3. Rotate transmission in fixture so that converter housing is facing up and secure with locking pin in fixture base.
4. Allow any remaining transmission fluid to drain from the extension housing.
5. Rotate transmission so that bottom pan is facing up as shown in Figure 39.

Continued on Page 32

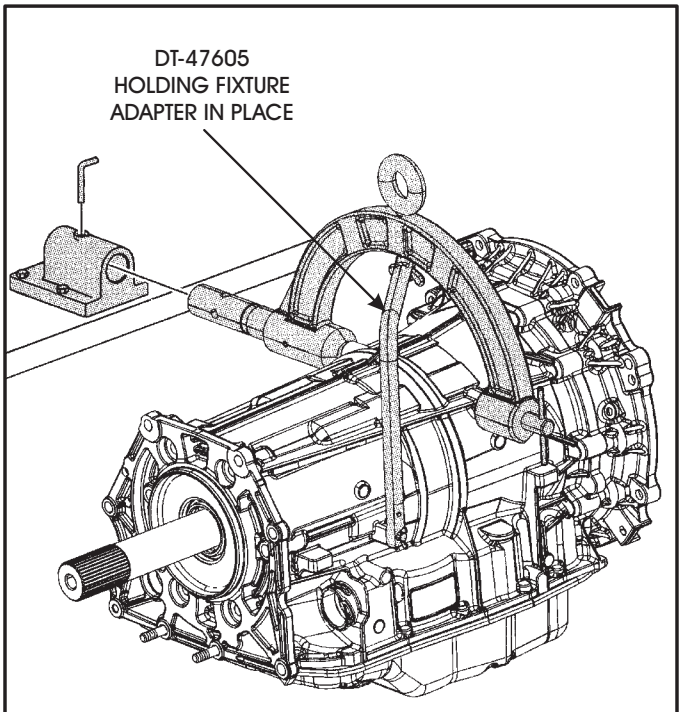


Figure 38

EXTERNAL PARTS (CONT'D)

6. Remove the six extension housing retaining bolts, as shown in Figure 39, and remove the extension housing.
   Note: Corvette version is illustrated.
7. The two wheel drive version is also shown in Figure 39.
8. Remove the oil pan bolts, oil pan, oil pan gasket and oil filter, as shown in Figure 40.
   Note: Pan gasket is reusable if not damaged.
9. Lift up on the electrical connector slide-lock, as shown in Figure 40, to remove the electrical connector.
   Note: Special Tool is available to remove the electrical connector and prevent any damage.
10. Remove electrical connector by pulling straight out. Damage will result to the connector pins if any twisting motion is used.
11. Remove and discard the electrical connector seal and "O" rings as shown in Figure 40.

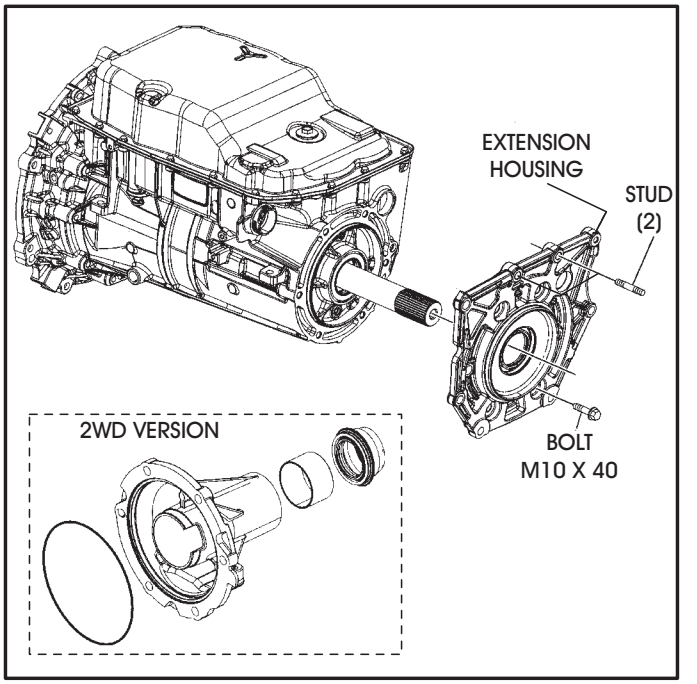


Figure 39

Continued on Page 33

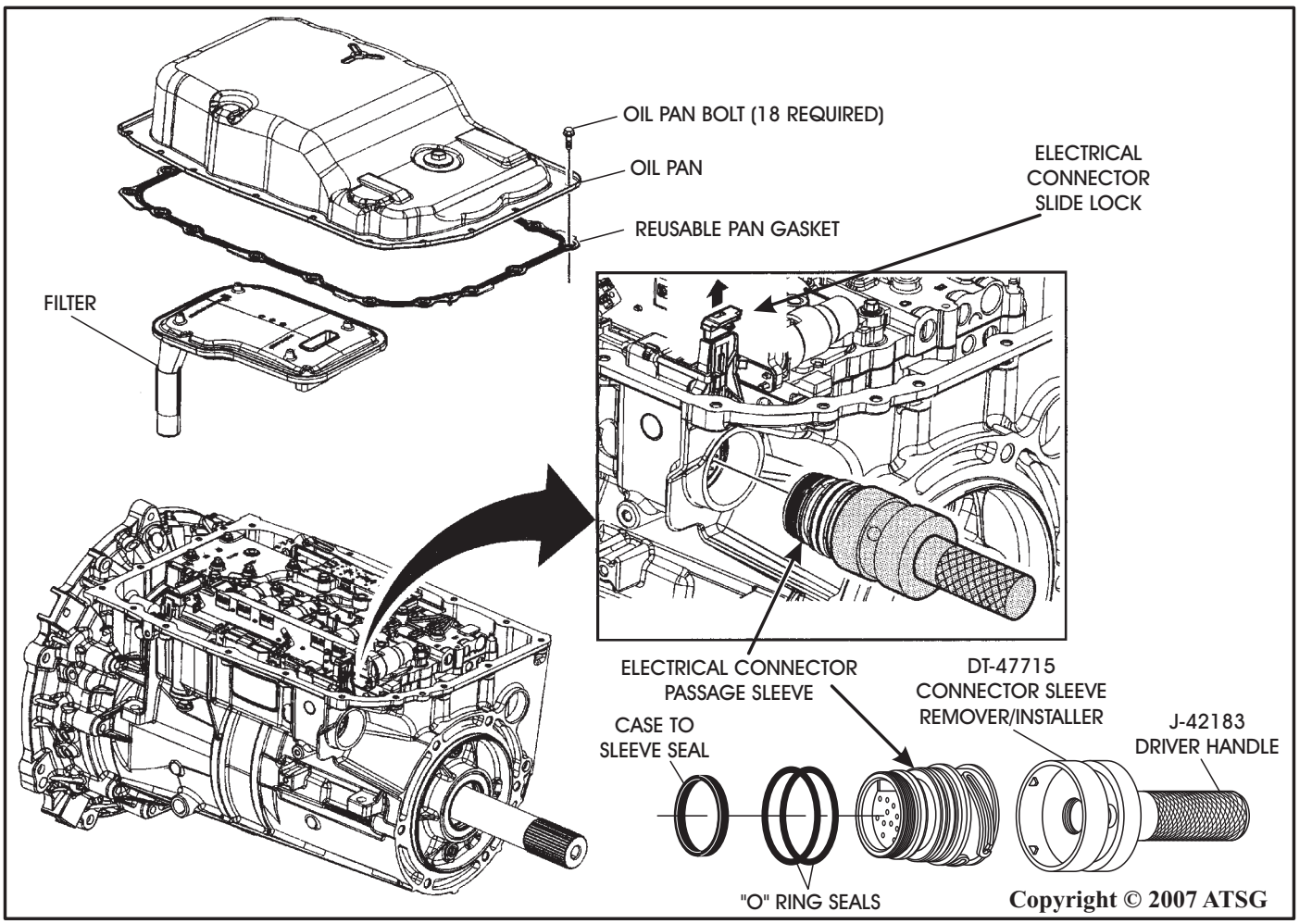


Figure 40

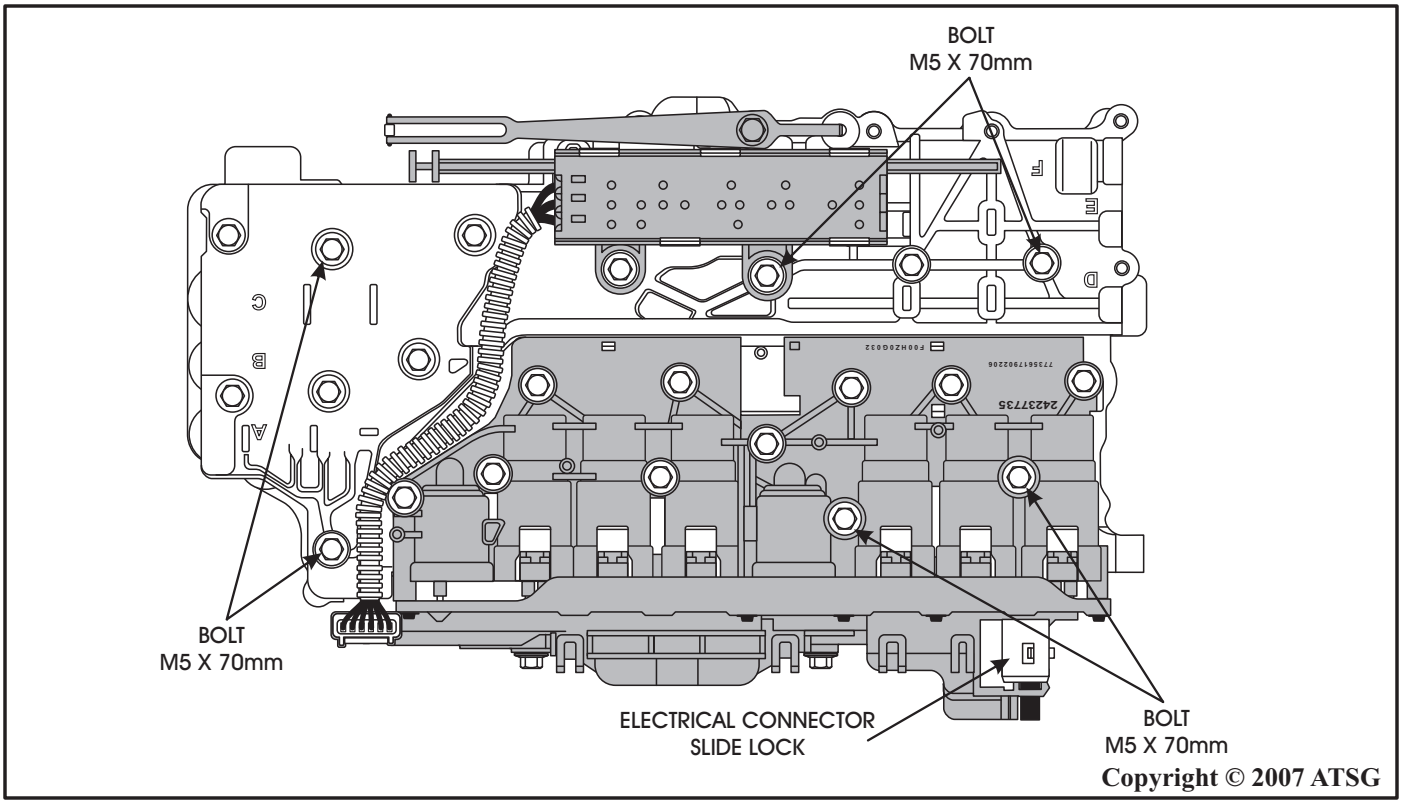


Figure 41

EXTERNAL PARTS (CONT'D)

12. Do not remove all the valve body assembly bolts. Remove only the bolts indicated in Figure 41.
13. Remove the valve body assembly, as shown in Figure 42.
    Note: Use care when handling the valve body as it also includes the TCM/Solenoid body.
14. Remove and discard the valve body to pump seals and the valve body to center support seal, as shown in Figure 42.
15. Set the valve body assembly aside for the component rebuild section.

Continued on Page 34

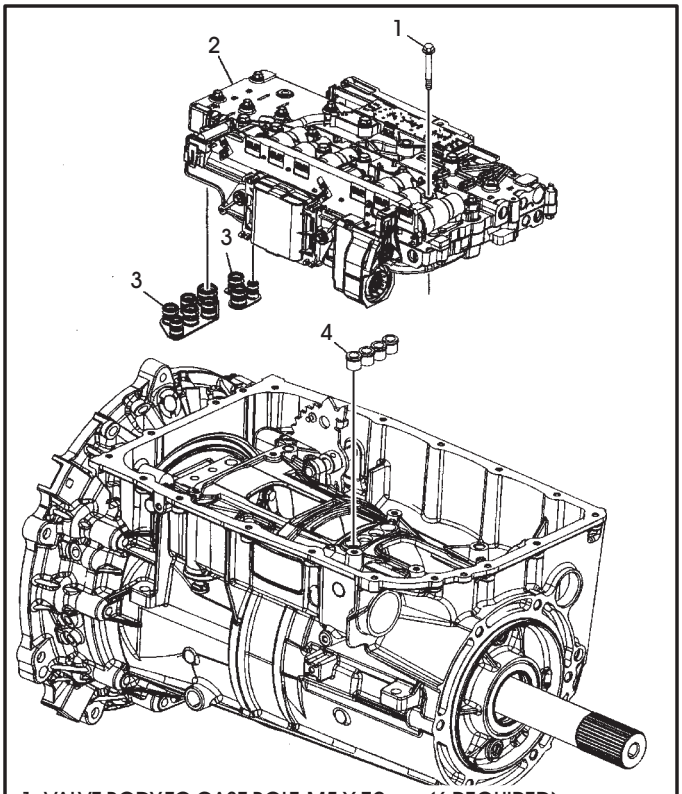


Figure 42

TRANSMISSION DISASSEMBLY

INTERNAL PARTS

1. Rotate the transmission so that the converter housing is facing up, as shown in Figure 44.
2. Remove the "O" ring from the turbine shaft, as shown in Figure 43.
3. Remove the nine converter housing to case bolts, as shown in Figure 44.
   Note: There are no washers on these bolts.
4. Remove the converter housing and oil pump assembly, as shown in Figure 44.
5. Remove and discard the converter housing to case "O" ring seal, as shown in Figure 44.
6. Set the converter housing/oil pump assembly aside for component rebuild section.

Continued on Page 35

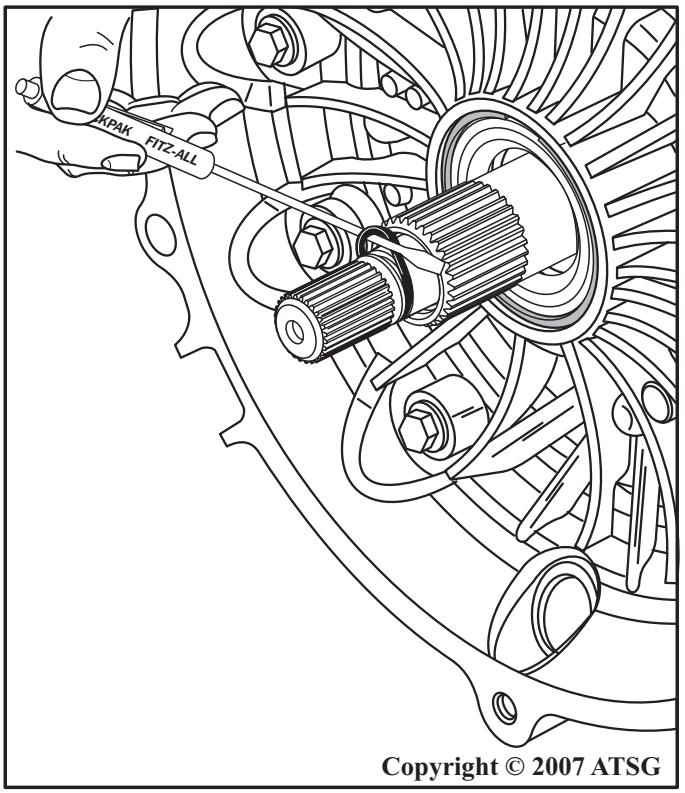
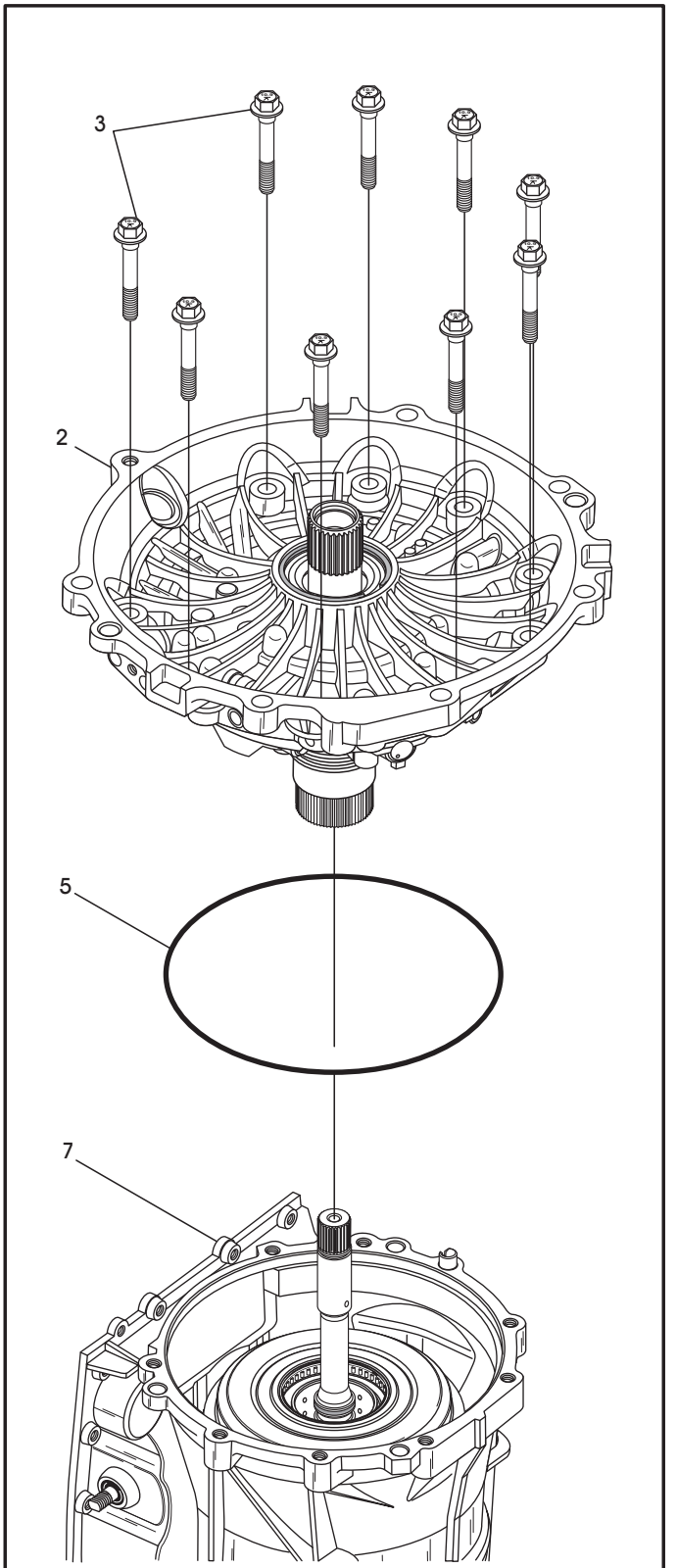


Figure 43



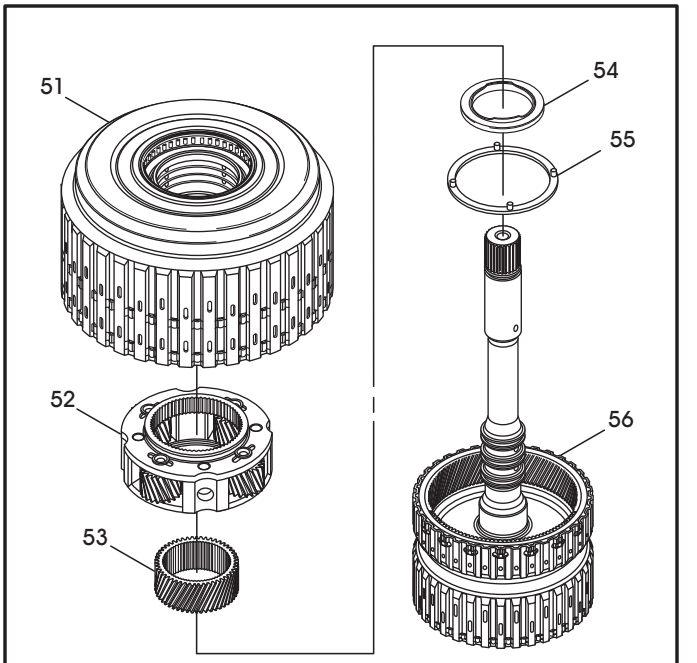
2 CONVERTER HOUSING AND OIL PUMP ASSEMBLY
3 CONVERTER HOUSING TO CASE BOLTS (9 REQUIRED)
5 CONVERTER HOUSING TO CASE "O" RING SEAL
7 TRANSMISSION CASE ASSEMBLY

Figure 44

INTERNAL PARTS (CONT'D)

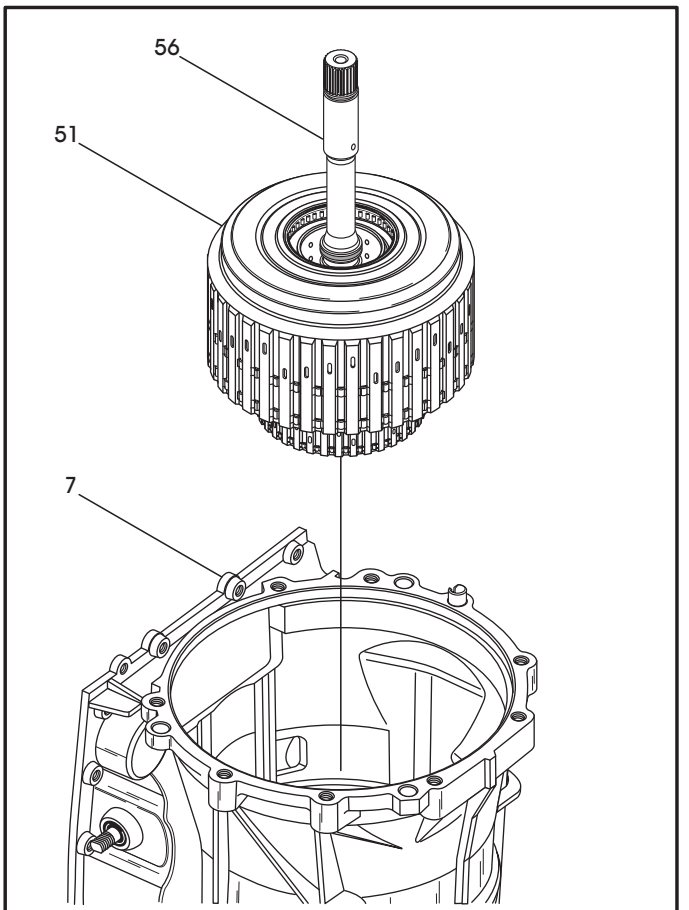
7. Remove the 4-5-6 Clutch Housing and the 3-5 Reverse Clutch drum as a complete assembly by lifting straight up using the turbine shaft, as shown in Figure 45.
8. Seperate all components removed, as shown in Figure 46, and set aside for component rebuild section.
9. Remove the 4-5-6 clutch hub and dampener assembly and thrust bearing, as shown in Figure 47.
10. Set the 4-5-6 clutch hub and the dampener assembly aside for component rebuild section.
11. Remove both clutch hub and shaft assemblies, all 3 bearings, as shown in Figure 48, and set aside for the component rebuild section.

Continued on Page 36



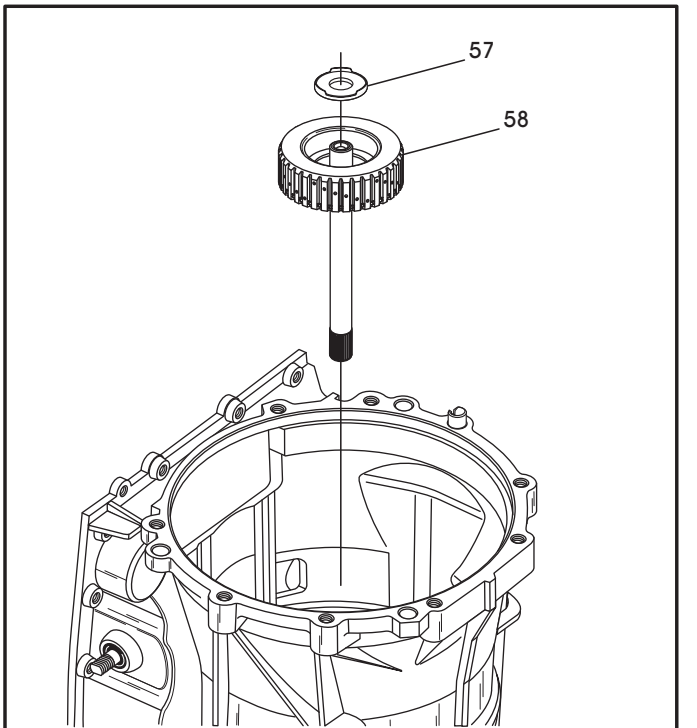
51 1-2-3-4 AND 3-5 REVERSE CLUTCH HOUSING ASSEMBLY
52 INPUT PLANETARY CARRIER ASSEMBLY
53 INPUT SUN GEAR
54 INPUT SUN GEAR THRUST BEARING (SNAPS IN PLACE)
55 INPUT PLANETARY CARRIER THRUST WASHER
56 4-5-6 CLUTCH HOUSING ASSEMBLY

Figure 46



7 TRANSMISSION CASE ASSEMBLY
51 1-2-3-4 AND 3-5 REVERSE CLUTCH ASSEMBLY
56 4-5-6 CLUTCH HOUSING ASSEMBLY, W/TURBINE SHAFT

Figure 45



57 4-5-6 CLUTCH HUB TO TURBINE SHAFT THRUST BEARING
58 4-5-6 CLUTCH HUB AND DAMPENER ASSEMBLY

Figure 47

INTERNAL PARTS (CONT'D)

12. Remove the center support snap ring using the J-45126 snap ring pliers along with DT-47773 adapter set, as shown in Figure 49.
Caution: This is a mandatory tool for snap ring removal to prevent bodily injury. Do not try to remove this snap ring with prying tools.
13. Remove the center support assembly, as shown in Figure 50, and set aside for the component rebuild section.

Continued on Page 37

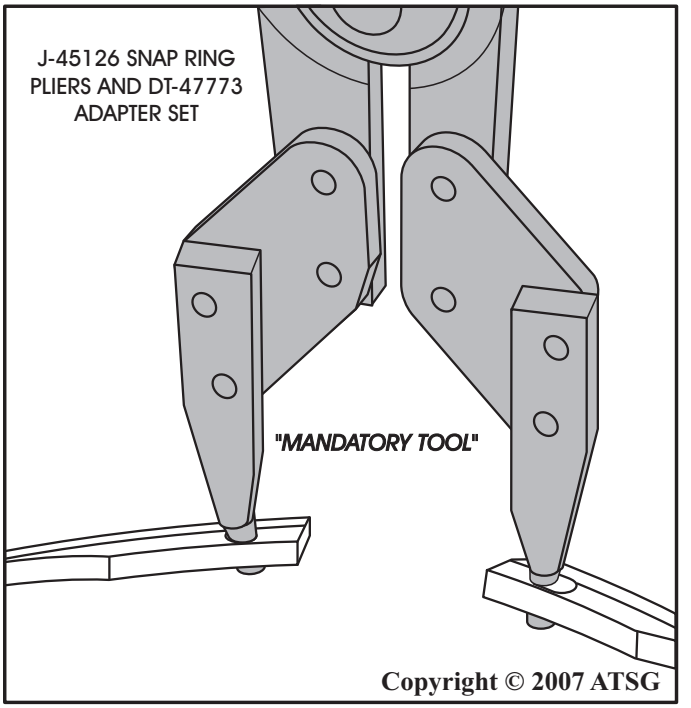


Figure 49

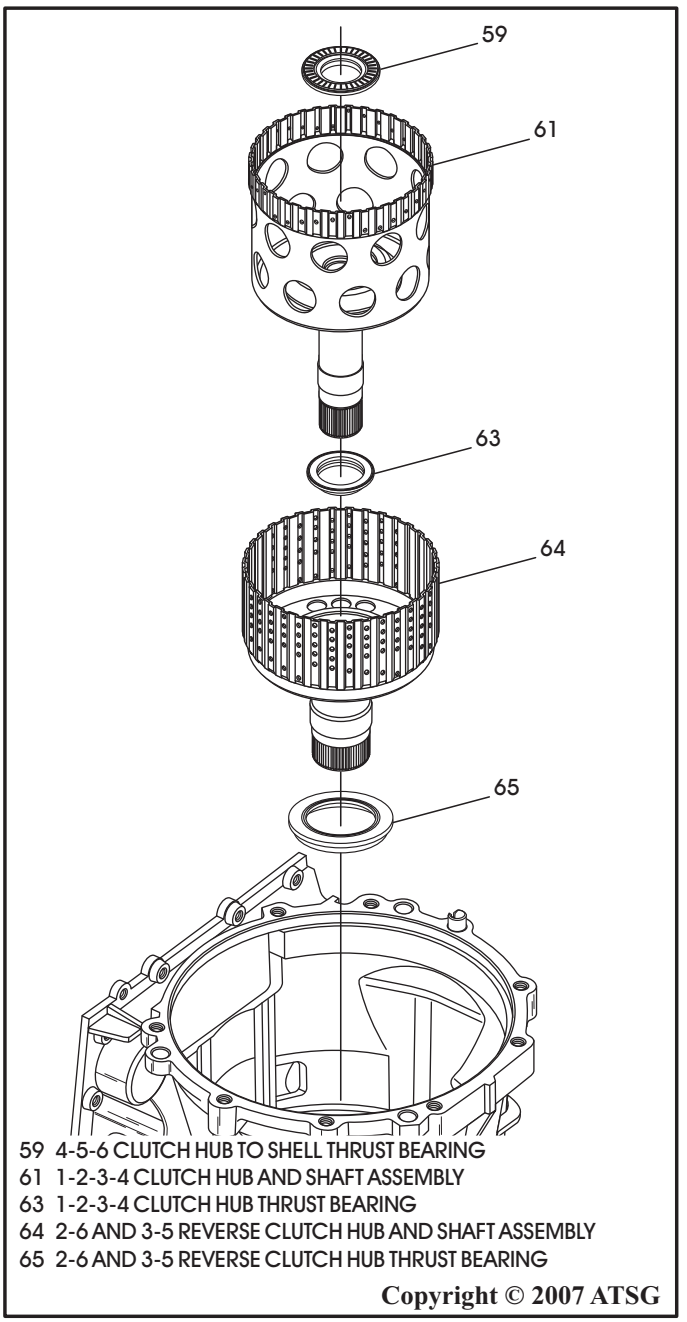


Figure 48

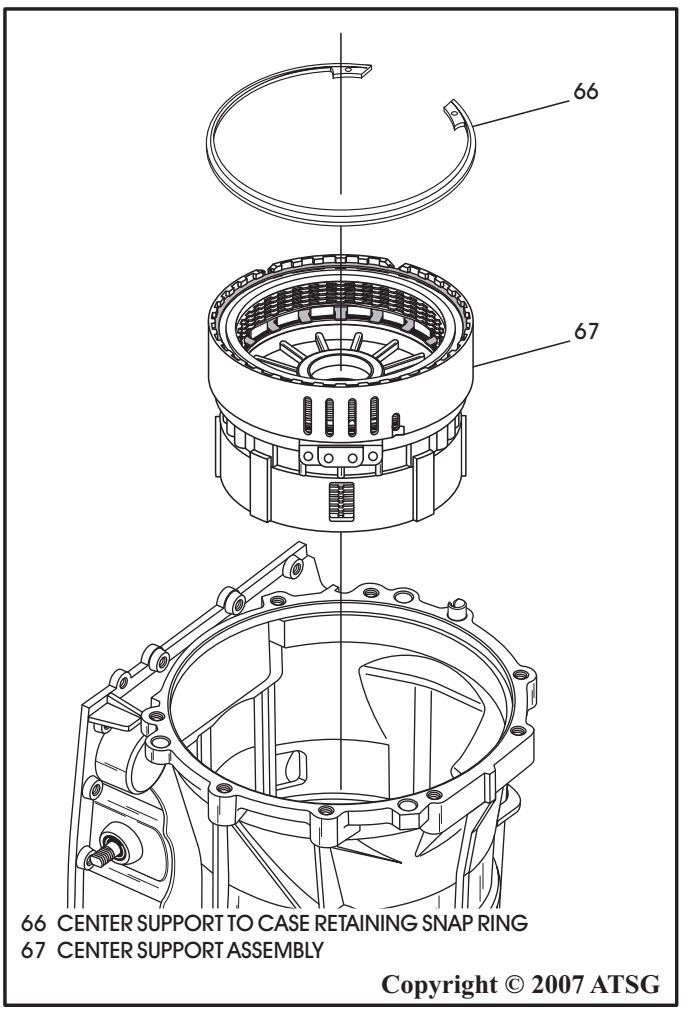


Figure 50

INTERNAL PARTS (CONT'D)

14. Remove the output carrier and output shaft assembly using the DT-47786 lifting tool, as shown in Figure 51.
15. Ensure the lifting tool is fully threaded into the output shaft assembly. Due to the weight of the assembly, incomplete threading may cause the assembly to break free from lifting tool, causing component damage or bodily injury.
16. Set output carrier and output shaft assembly aside for the component rebuild section.
17. Remove and discard the rear case seal, as shown in Figure 52.
18. Use care so as not to damage the case or the rear case bushing.

Continued on Page 39

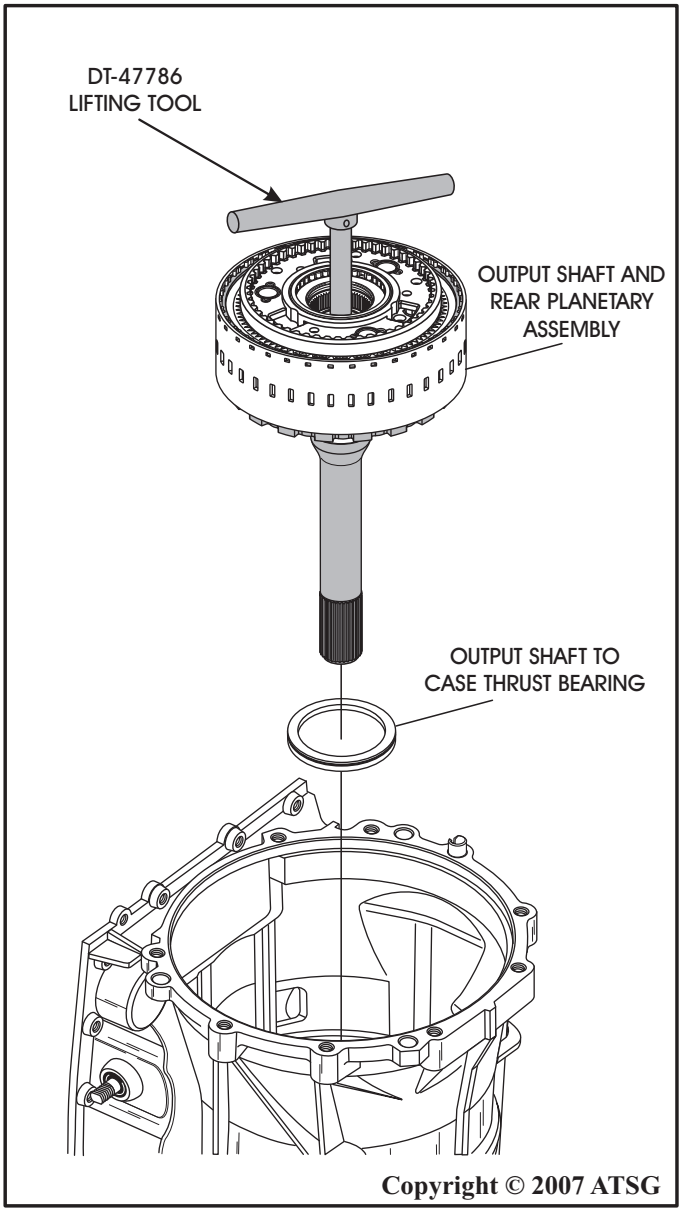


Figure 51

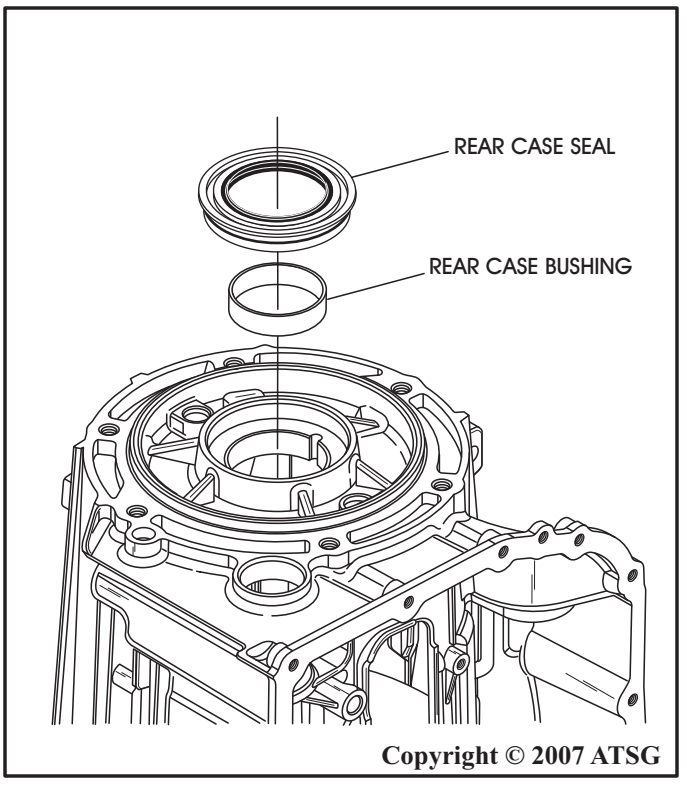
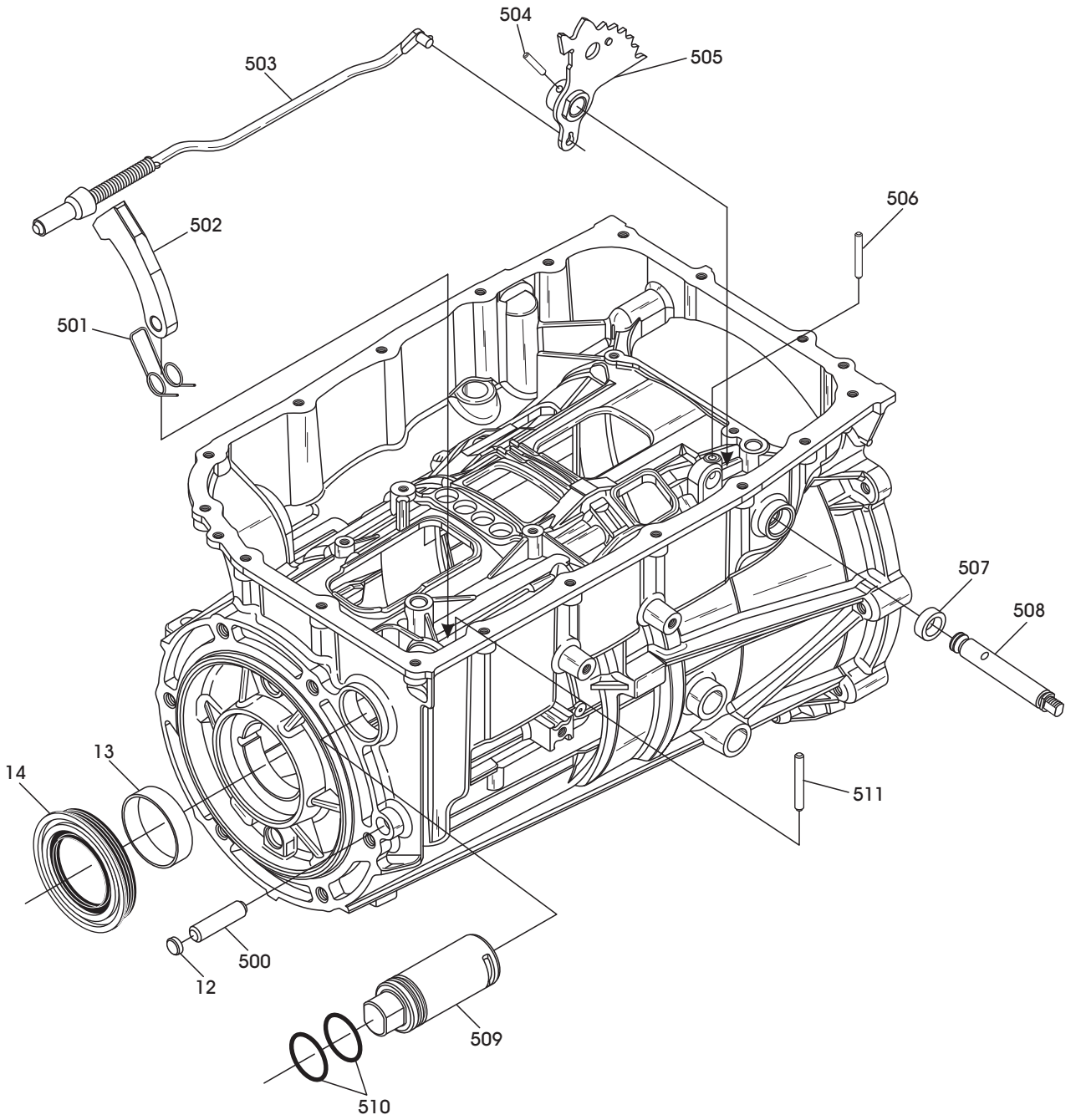


Figure 52

CASE AND RELATED PARTS EXPLODED VIEW



12 PARK PAWL SHAFT CASE PLUG
13 OUTPUT SHAFT CASE BUSHING
14 OUTPUT SHAFT CASE SEAL ASSEMBLY
500 PARK PAWL SHAFT
501 PARK PAWL SPRING (NOT SERVICED)
502 PARK PAWL (NOT SERVICED)
503 PARK PAWL ACTUATOR ASSEMBLY
504 MANUAL SHAFT DETENT LEVER RETAINING PIN
505 MANUAL SHAFT DETENT LEVER ASSEMBLY
506 MANUAL SHAFT RETAINING PIN
507 MANUAL SHAFT SEAL
508 MANUAL SHAFT
509 PARK PAWL ACTUATOR GUIDE
510 PARK PAWL ACTUATOR GUIDE "O" RING SEALS (2)
511 PARK PAWL ACTUATOR GUIDE RETAINING PIN

Figure 53

COMPONENT REBUILD

TRANSMISSION CASE ASSEMBLY

1. Clean the transmission case thoroughly and dry with compressed air.
2. Inspect the transmission case thoroughly for any wear or damage in the following areas:
   - *Front Case Sealing surfaces*
   - *Center Support Passage Seal Bores*
   - *Oil Pan Gasket Sealing Surface*
   - *Rear Case Plugs In Place*
   - *Rear Case Bushing*
   - *Fill Tube Bore*
   - *Electrical Connector Sleeve Bore*
   - *All Threaded Holes*
3. Remove the manual shaft from the case using Figure 53 as a guide, as the roll pins must be removed.
4. Remove and discard the manual shaft seal, as shown in Figure 55.
   Note: The special tool for the cooler line seal removal can also be used on the manual shaft seal for removal (See Figure 54).
5. Install a new manual shaft seal using the proper installation tool, as shown in Figure 55, and ensure that it is fully seated in the bore.
6. Reinstall the manual shaft and the roll pins, using Figure 53 as a guide.

Continued on Page 40

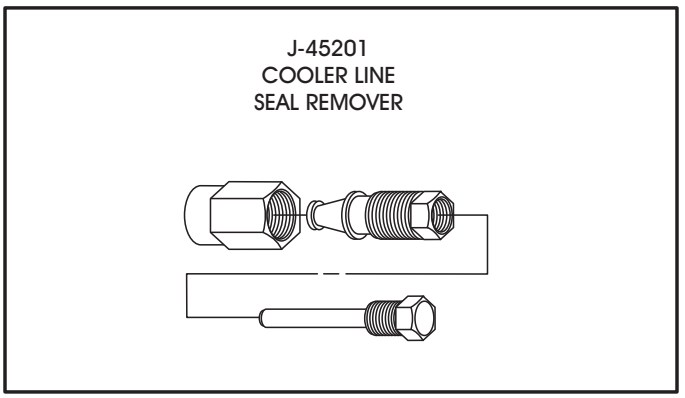


Figure 54

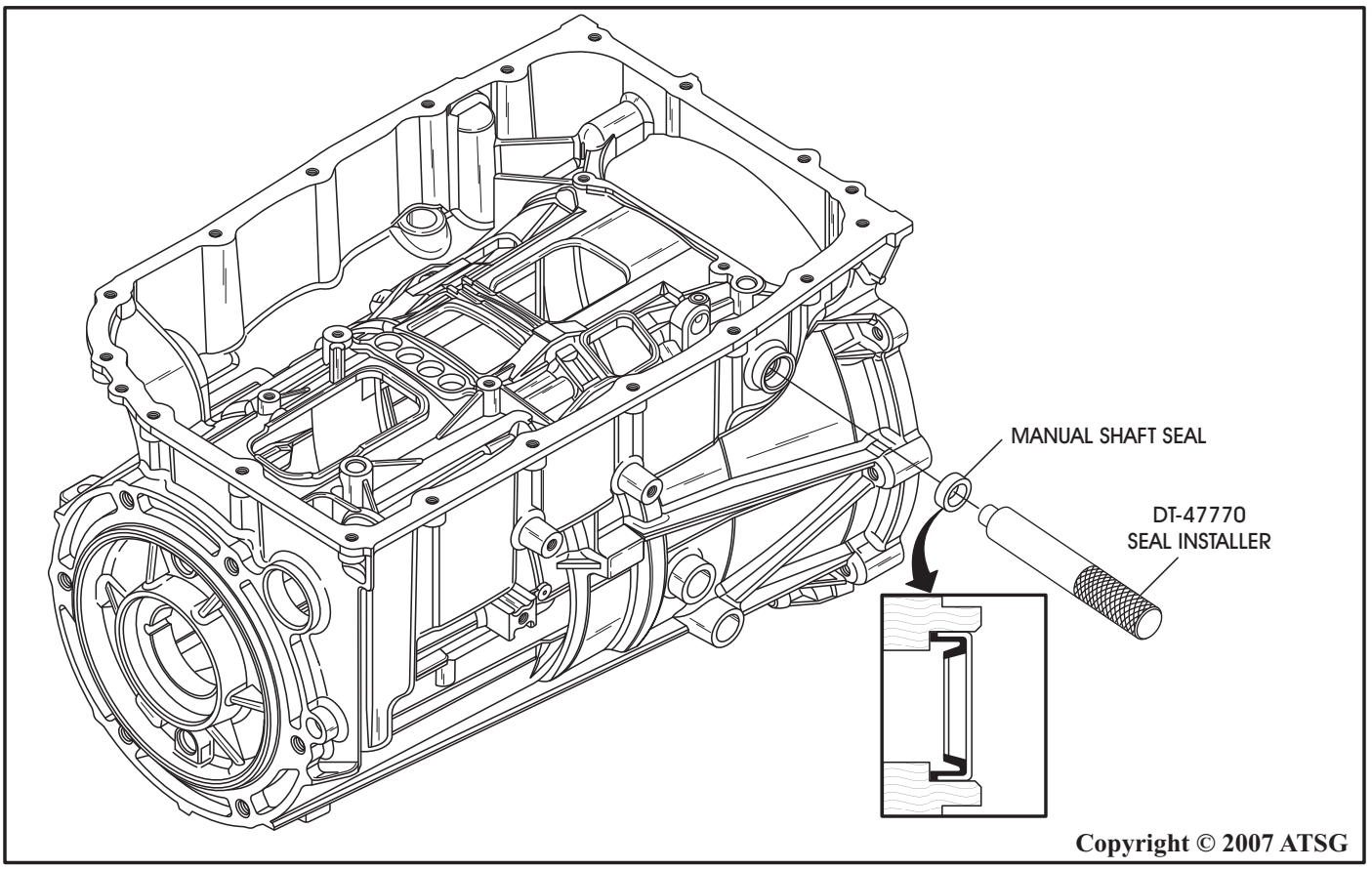


Figure 55

COMPONENT REBUILD
TRANSMISSION CASE ASSEMBLY (CONT'D)

7. Remove park pawl actuator guide retaining pin and actuator guide, as shown in Figure 56.
8. Remove and discard the park pawl actuator guide "O" rings.
9. Install new park pawl actuator guide "O" rings and lube with a small amount of Trans-Jel®.
10. Install the park pawl actuator guide, as shown in Figure 56, ensuring you do not damage the "O" ring seals.
11. Install the actuator guide retaining pin into the case, as shown in Figure 56.
12. Install new rear case seal using seal installer, as shown in Figure 57.
13. Install new case plugs as necessary, as shown in Figure 58.

Componet Rebuild
Continued on Page 41

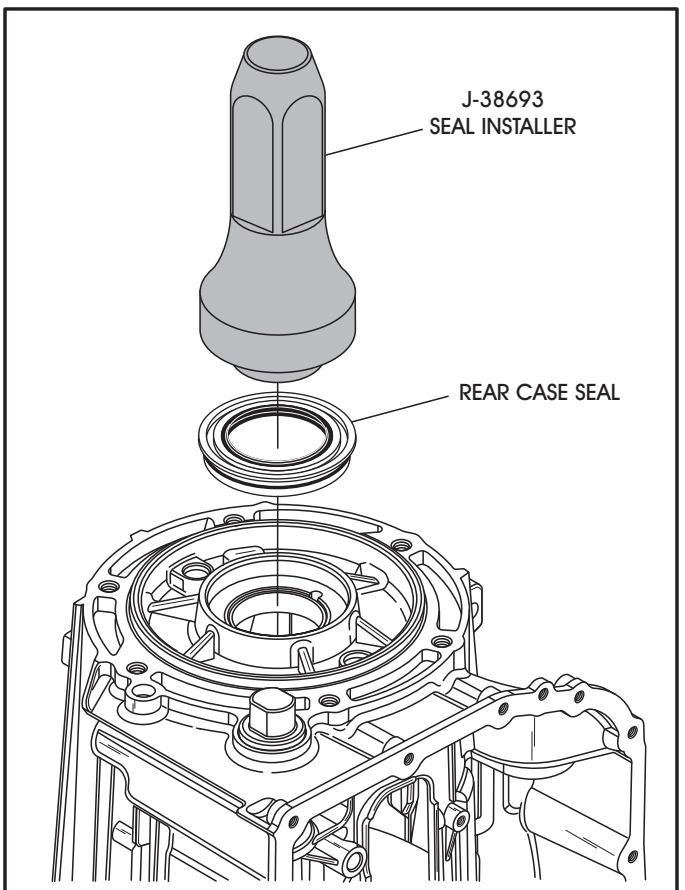


Figure 57

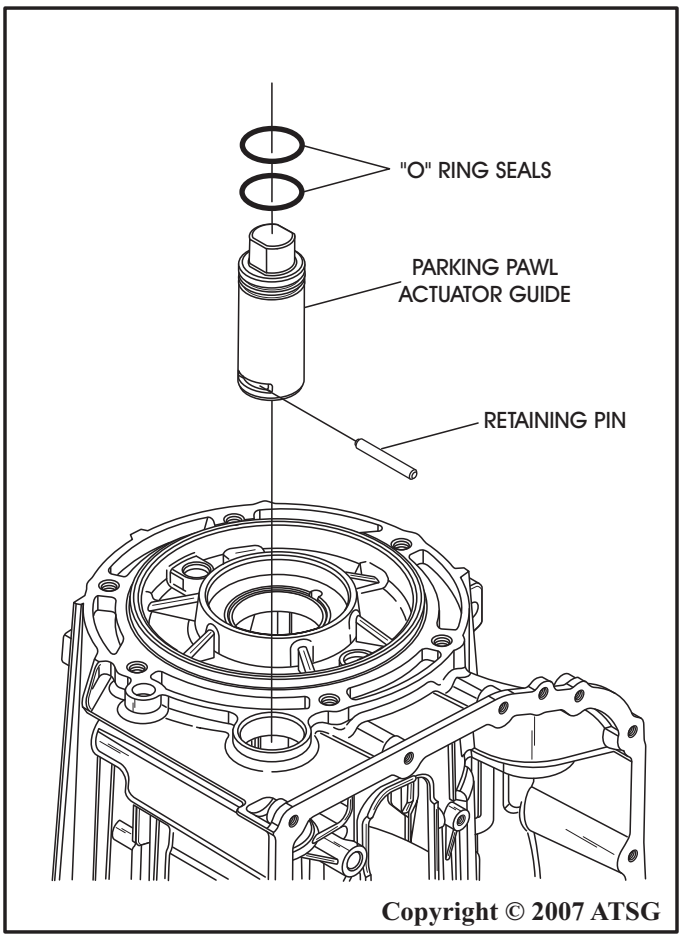


Figure 56

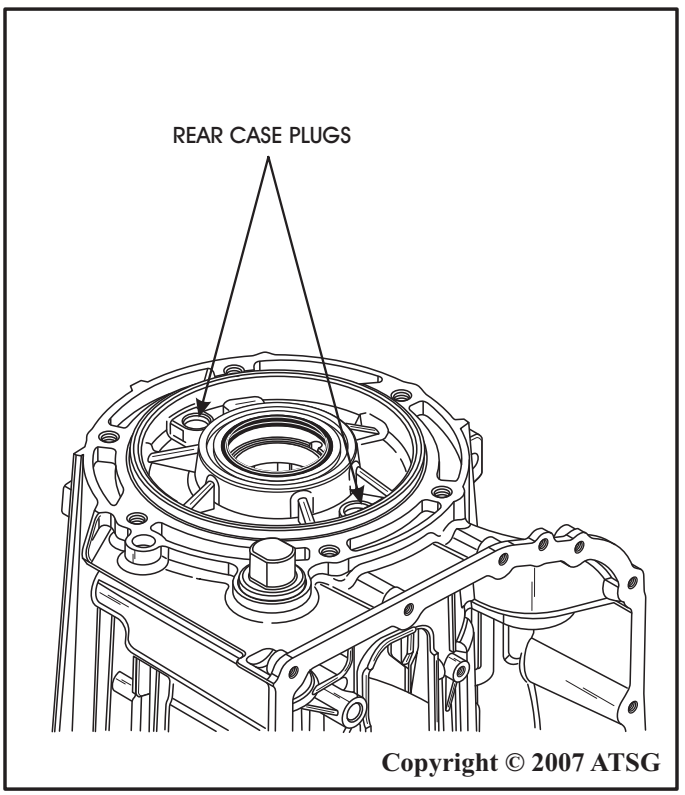


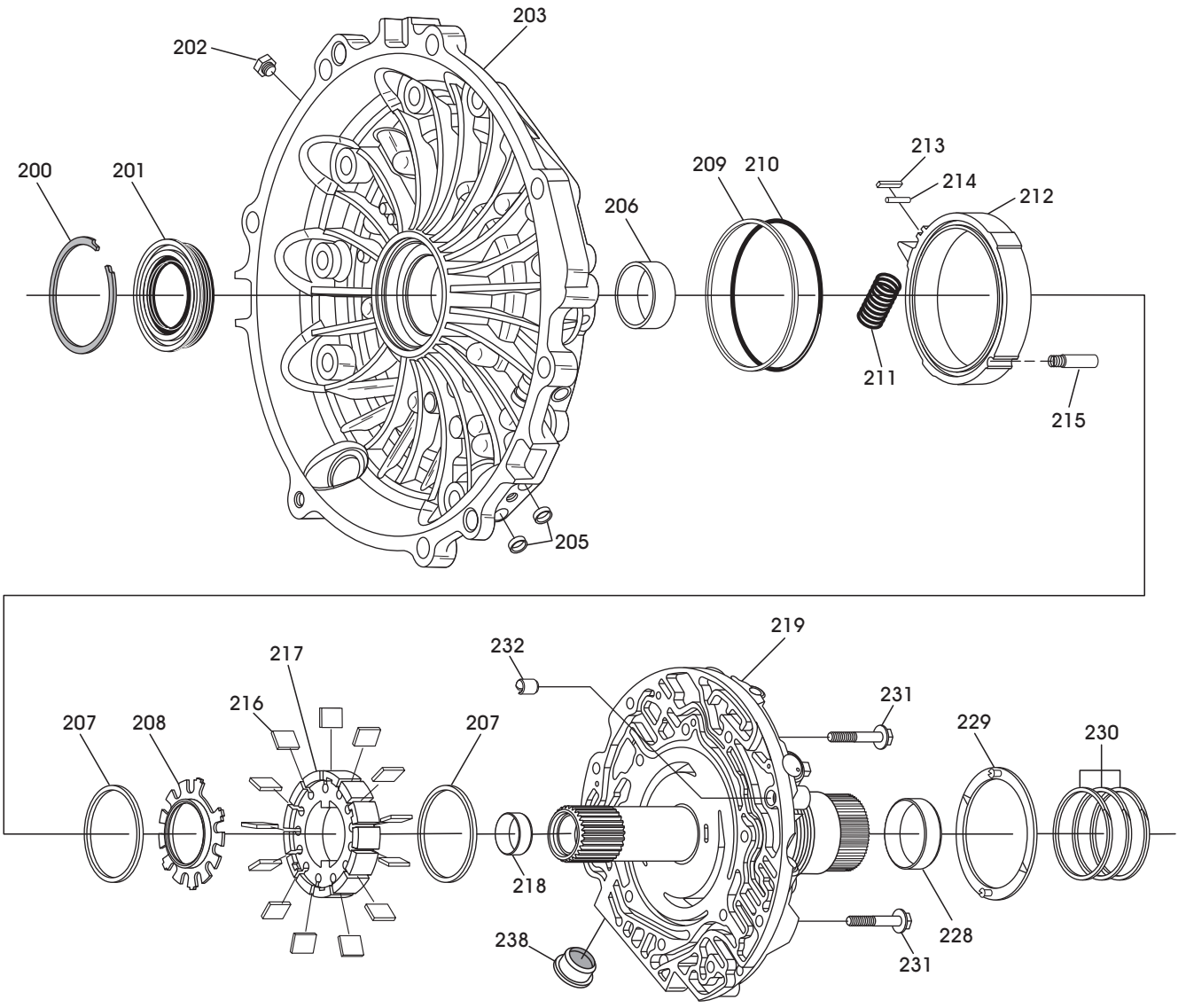
Figure 58

OIL PUMP ASSEMBLY

1. Clean the converter housing and oil pump thoroughly before disassembly to remove any large particles of dirt or debris.
2. All of the components shown in the exploded view in Figure 59 will not be disassembled during the rebuild process.

Continued on Page 42

OIL PUMP AND CONVERTER HOUSING ASSEMBLY EXPLODED VIEW



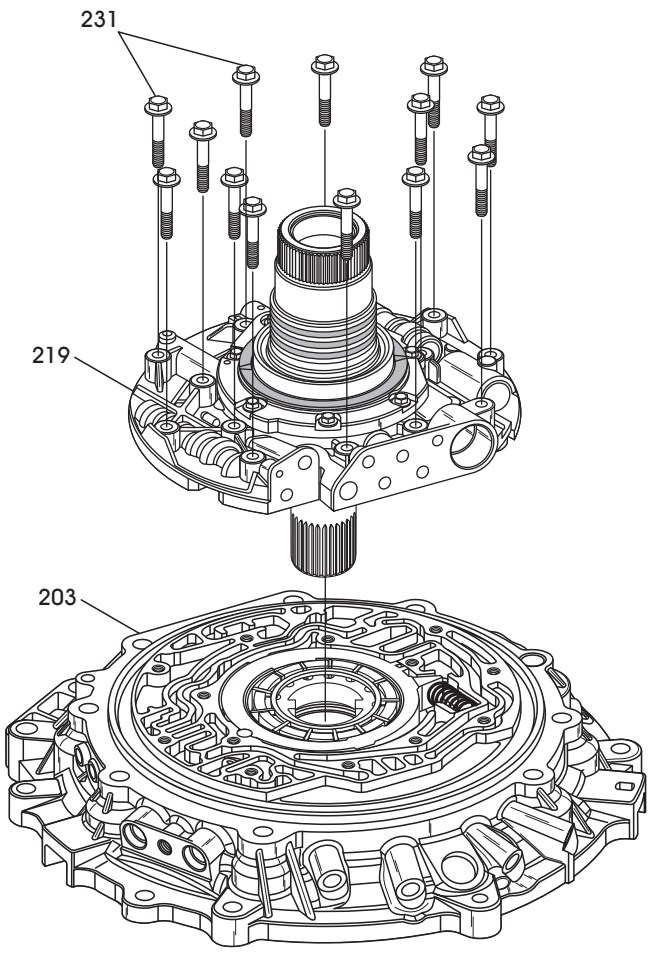
200 TORQUE CONVERTER SEAL RETAINING SNAP RING
201 TORQUE CONVERTER SEAL ASSEMBLY
202 LINE PRESSURE TEST PLUG
203 TORQUE CONVERTER HOUSING (MODEL DEPENDENT)
205 COOLER PIPE FITTING SEALS (2)
206 TORQUE CONVERTER HOUSING BUSHING
207 OIL PUMP ROTOR VANE RINGS (2)
208 OIL PUMP ROTOR GUIDE
209 OIL PUMP SLIDE SEAL RING
210 OIL PUMP SLIDE BACK-UP "O" RING SEAL
211 OIL PUMP SLIDE RETURN SPRING
212 OIL PUMP SLIDE (SELECTIVE)
213 OIL PUMP SLIDE TEFLON SEAL
214 OIL PUMP SLIDE TEFLON SEAL SUPPORT
215 OIL PUMP SLIDE PIVOT PIN AND SPRING ASSEMBLY
216 OIL PUMP ROTOR VANES (13)
217 OIL PUMP ROTOR (SELECTIVE)
218 TURBINE SHAFT FRONT BUSHING
219 OIL PUMP COVER ASSEMBLY
228 TURBINE SHAFT REAR BUSHING
229 THRUST WASHER
230 TEFLON SEAL RINGS (3)
231 PUMP COVER TO CONVERTER HOUSING BOLTS (13)
232 OIL PUMP TO CONVERTER HOUSING LOCATOR DOWEL
238 OIL FILTER SEAL

Figure 59

OIL PUMP ASSEMBLY (CONT'D)

3. Remove the 13 oil pump cover to converter housing bolts, as shown in Figure 60, and remove the oil pump cover assembly.
   Caution:"Do Not" remove the 6 bolts holding the stator shaft to the pump cover assembly. These bolts have been installed and torqued after specific clutch support rotational requirements (centered) have been met.
4. Set oil pump cover and stator shaft assembly aside for now.
5. Disassemble the rotor, vanes, and slide from the converter housing, as shown in Figure 61.
6. Remove and discard the pump slide "O" ring (210) and slide seals (213 & 214), as shown in Figure 61.

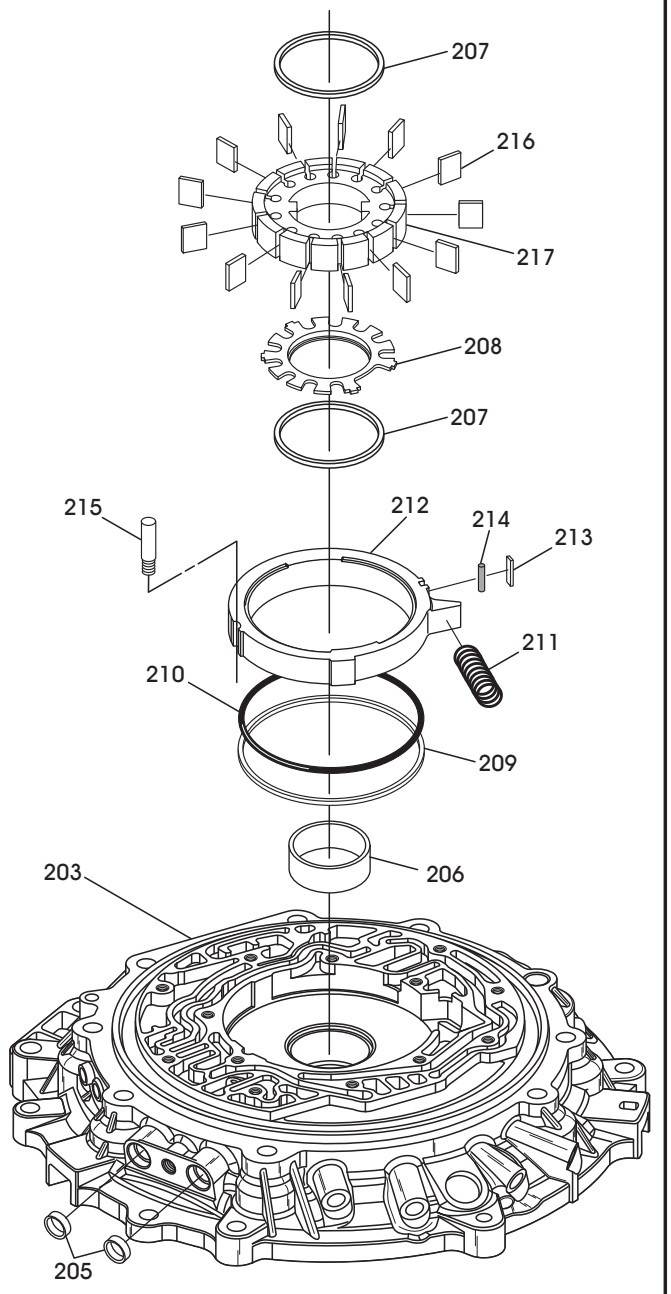
Continued on Page 43



203 TORQUE CONVERTER HOUSING (MODEL DEPENDENT)
219 OIL PUMP COVER ASSEMBLY
231 OIL PUMP COVER TO CONVERTER HOUSING BOLTS M6 X 40 MM (13 REQUIRED)

Figure 60

OIL PUMP AND BELL HOUSING ASSEMBLY EXPLODED VIEW



203 TORQUE CONVERTER HOUSING (MODEL DEPENDENT)
205 COOLER PIPE FITTING SEALS (2)
206 TORQUE CONVERTER HOUSING BUSHING
207 OIL PUMP ROTOR VANE RINGS (2)
208 OIL PUMP ROTOR GUIDE
209 OIL PUMP SLIDE SEAL RING
210 OIL PUMP SLIDE BACK-UP "O" RING SEAL
211 OIL PUMP SLIDE RETURN SPRING
212 OIL PUMP SLIDE (SELECTIVE)
213 OIL PUMP SLIDE TEFLON SEAL
214 OIL PUMP SLIDE TEFLON SEAL SUPPORT
215 OIL PUMP SLIDE PIVOT PIN AND SPRING ASSEMBLY
216 OIL PUMP ROTOR VANES (13)
217 OIL PUMP ROTOR (SELECTIVE)

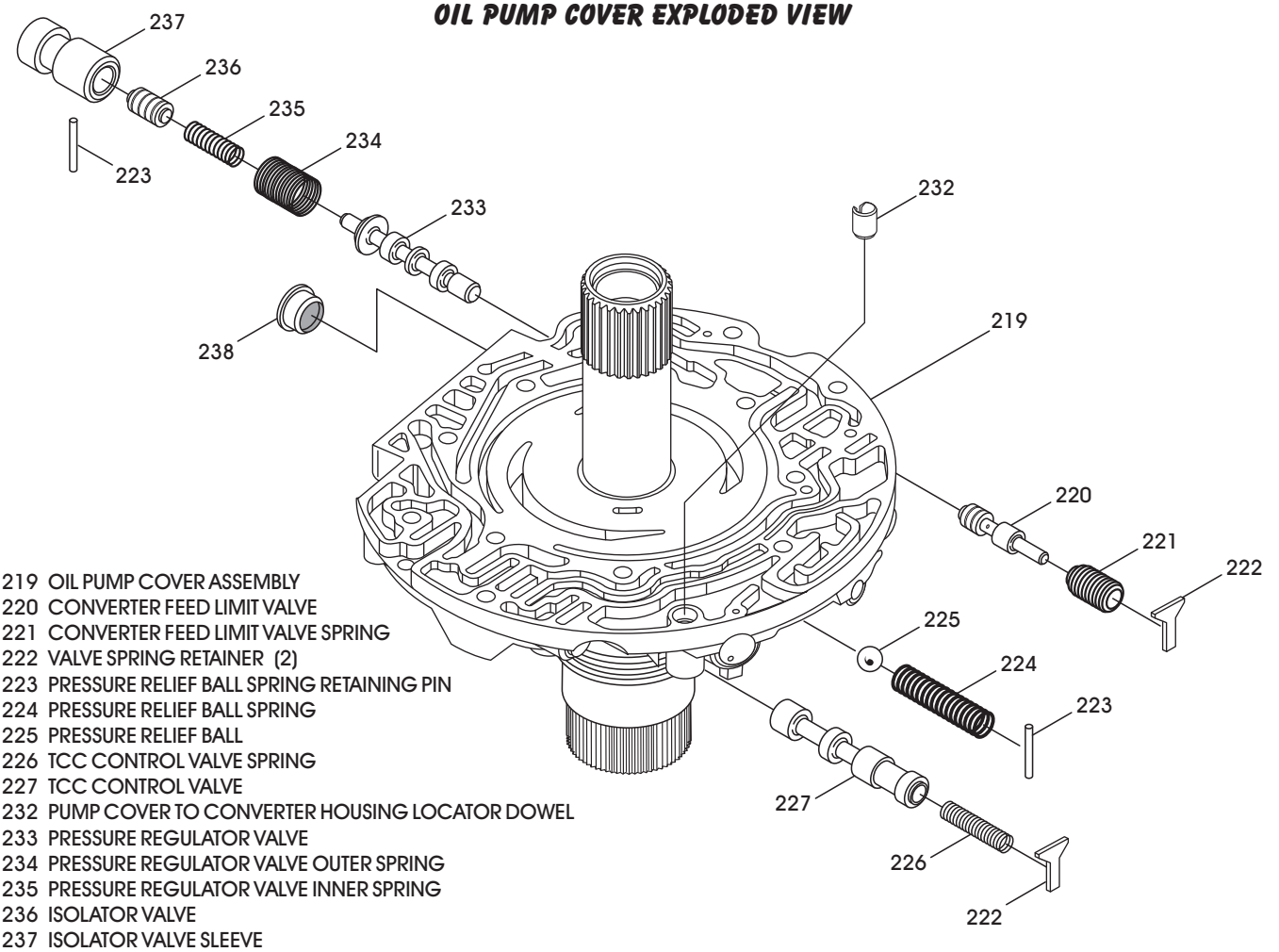
Figure 61

OIL PUMP ASSEMBLY (CONT'D)

7. Remove the oil pump cover thrust washer.
8. Remove and discard the three sealing rings from the oil pump cover.
9. Disassemble the pump cover assembly using Figure 62 as a guide.
10. Lay each valve line-up out in order as you remove them from the oil pump cover.
11. Inspect each valve, valve spring and retainer for any wear and/or damage.
12. Clean all oil pump cover parts thoroughly and dry with compressed air.
13. Install each valve train back into their bores *exactly* as shown in Figure 62.
    Note: Lubricate each valve train with a small amount of transmission fluid.
14. Be sure to install the locating dowel, as shown in Figure 62, if you removed it.
15. Install the oil pump cover thrust washer, as shown in Figure 63, and ensure it is fully seated in the thrust washer tab bores.
16. Install three new "lap joint" sealing rings, as shown in Figure 63.
17. Lubricate sealing rings and thrust washer with a small amount of transmission fluid, and set pump cover assembly aside for now.
    Note: Filter seal can be installed now, or wait until the pump cover has been installed onto the converter housing.

Continued on Page 44

OIL PUMP COVER EXPLODED VIEW



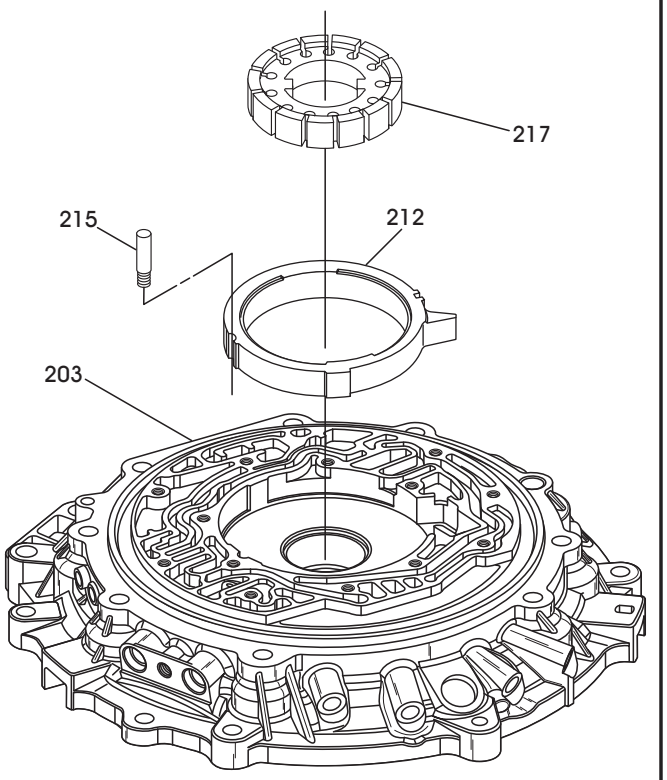
219 OIL PUMP COVER ASSEMBLY
220 CONVERTER FEED LIMIT VALVE
221 CONVERTER FEED LIMIT VALVE SPRING
222 VALVE SPRING RETAINER (2)
223 PRESSURE RELIEF BALL SPRING RETAINING PIN
224 PRESSURE RELIEF BALL SPRING
225 PRESSURE RELIEF BALL
226 TCC CONTROL VALVE SPRING
227 TCC CONTROL VALVE
232 PUMP COVER TO CONVERTER HOUSING LOCATOR DOWEL
233 PRESSURE REGULATOR VALVE
234 PRESSURE REGULATOR VALVE OUTER SPRING
235 PRESSURE REGULATOR VALVE INNER SPRING
236 ISOLATOR VALVE
237 ISOLATOR VALVE SLEEVE
238 OIL FILTER SEAL

Figure 62

OIL PUMP ASSEMBLY (CONT'D)

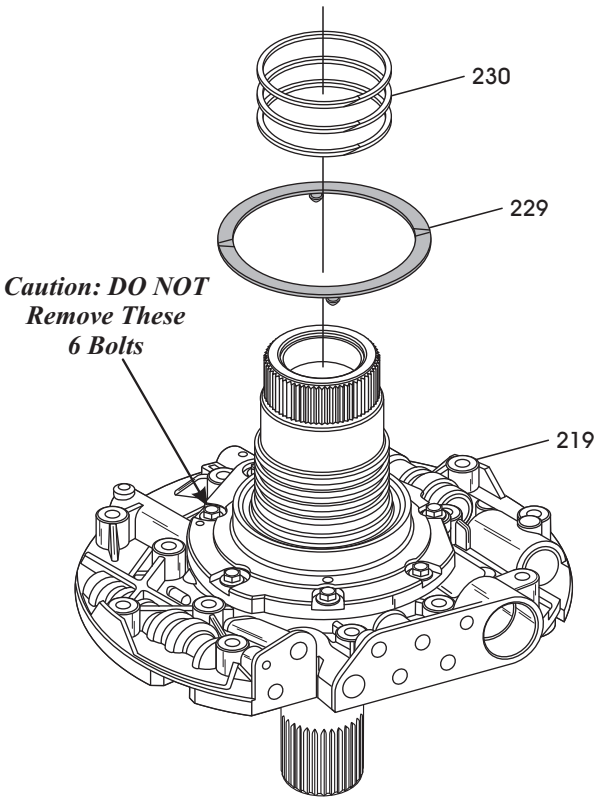
18. Place the converter housing on a flat surface with worm track surface facing up, as shown in Figure 64.
19. Ensure that all slide seals are left out.
20. Lay a straight edge across the surface over the slide and rotor, as shown in Figure 65.
21. Measure the clearance between the slide and the straight edge, as shown in Figure 65. The clearance should be .001"-.002" with no seals in the slide.
22. Measure the clearance between the rotor and the straight edge, as shown in Figure 65. The clearance should be .001"-.0015"
    Note: These measurements may also be done with a depth micrometer.
23. If replacements are needed, use the chart in Figure 66 to make your selections based on the clearance recorded and the thickness of the current slide and rotor.

Continued on Page 45



203 TORQUE CONVERTER HOUSING (MODEL DEPENDENT)
212 OIL PUMP SLIDE (SELECTIVE)
215 OIL PUMP SLIDE PIVOT PIN AND SPRING ASSEMBLY
217 OIL PUMP ROTOR (SELECTIVE)

Figure 64



219 OIL PUMP COVER ASSEMBLY
229 1-2-3-4 AND 3-5 REVERSE HOUSING THRUST WASHER
230 1-2-3-4 AND 3-5 REVERSE SEAL RINGS (3 REQUIRED)

Figure 63

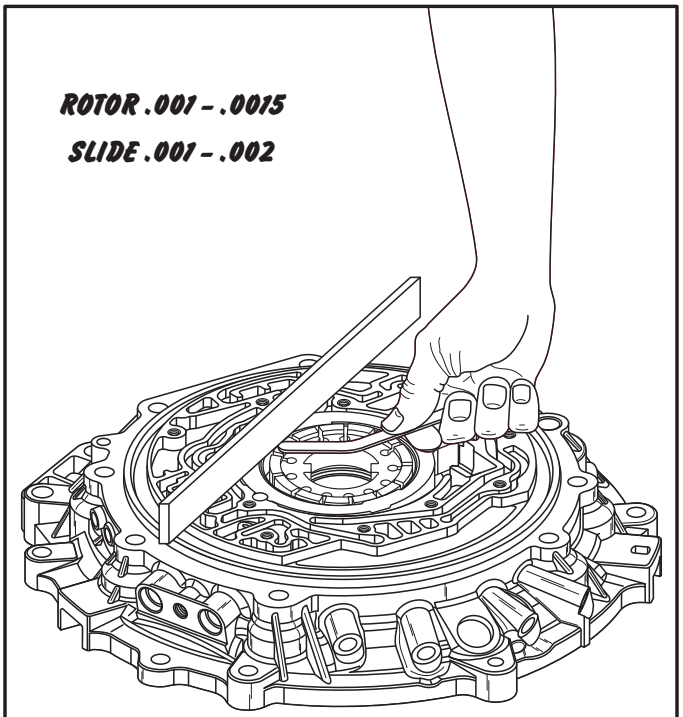
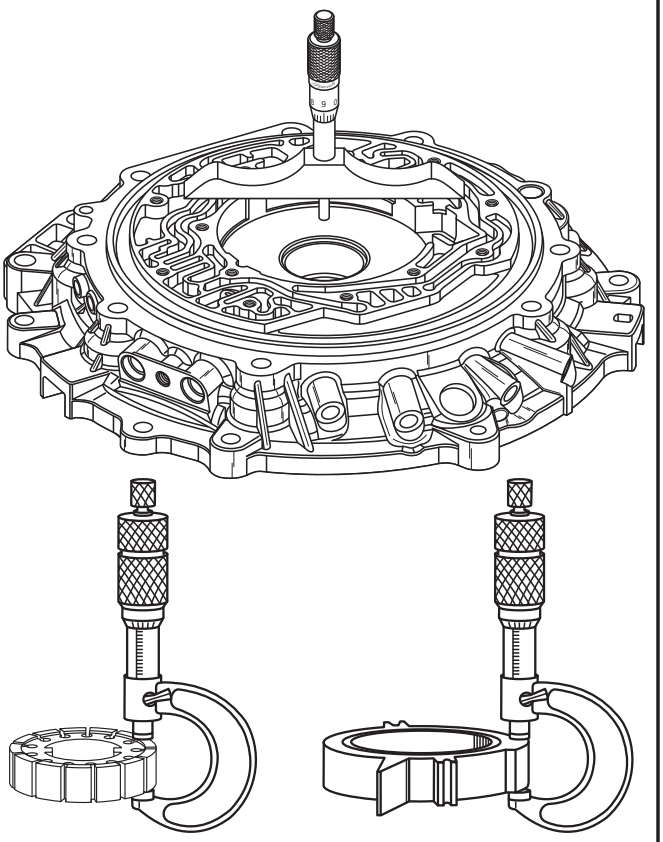


Figure 65

OIL PUMP ASSEMBLY (CONT'D)

24. Install new bushing as necessary in converter housing, as shown in Figure 67, using proper size bushing driver.
25. Install new converter housing seal using the proper size seal installer (See Figure 67).
26. Install the seal retaining snap ring, as shown in Figure 67, and ensure it is fully seated.
27. Install new cooler line seals into the converter housing, as shown in Figure 68, using the proper seal driver.

Continued on Page 46



PUMP POCKET DEPTH		
SIZE CLASSIFICATION	THICKNESS (MM)	THICKNESS (IN)
1	17.980-17.994	.7079" - .7084"
2	17.994-18.007	.7084" - .7089"
3	18.007-18.003	.7089" - .7100"
ROTOR SELECTION	THICKNESS (MM)	THICKNESS (IN)
1	17.948-17.961	.7066" - .7071"
2	17.961-17.974	.7071" - .7076"
3	17.974-17.987	.7076" - .7081"
SLIDE SELECTION	THICKNESS (MM)	THICKNESS (IN)
1	17.948-17.961	.7066" - .7071"
2	17.961-17.974	.7071" - .7076"
3	17.974-17.987	.7076" - .7081"

Figure 66

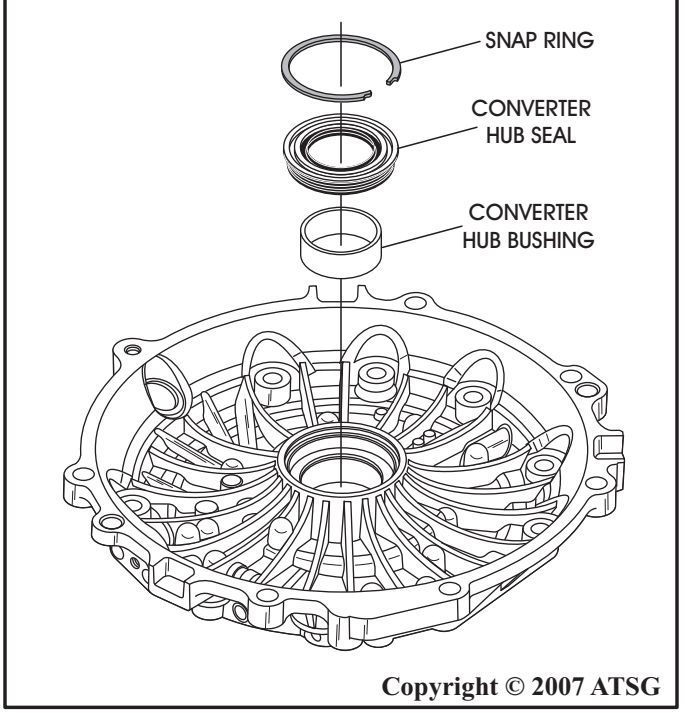


Figure 67

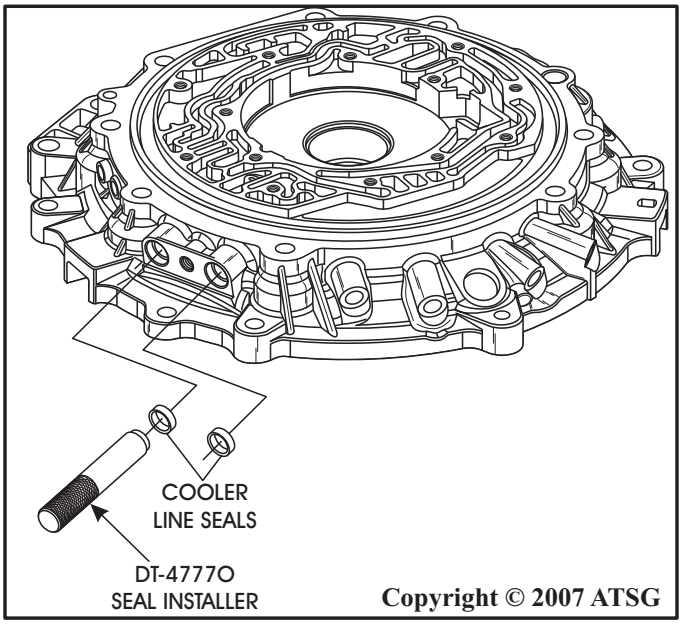
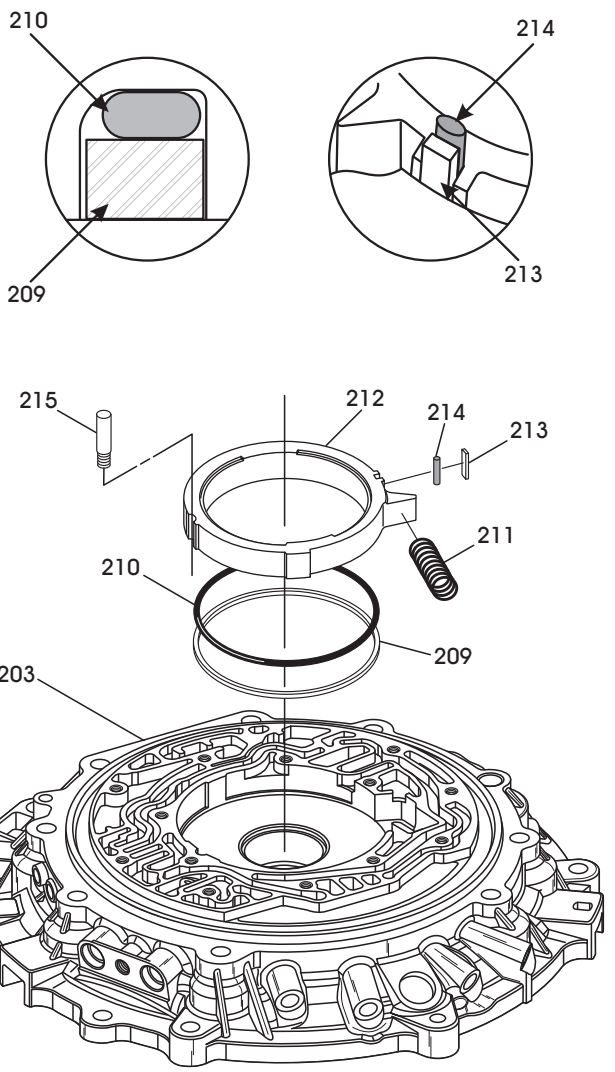


Figure 68

OIL PUMP ASSEMBLY (CONT'D)

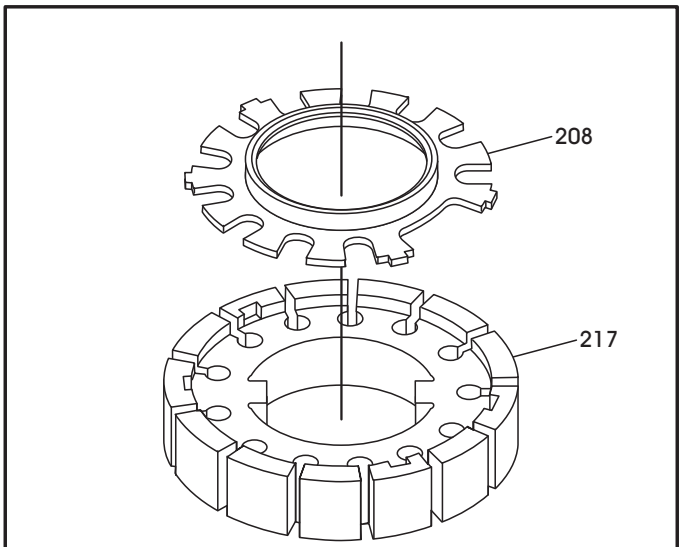
28. Install the pump slide pivot pin and spring, as shown in Figure 69.
29. Install oil pump slide back-up "O" ring (210) and pump slide seal ring (209) into groove in pump slide, as shown in Figure 69, and retain with a small amount of Trans-Jel®.
30. Install the oil pump slide into the pump pocket, as shown in Figure 69, with the seal ring (209) facing down.
31. Install the oil pump slide "Teflon" seal (213) by pulling the slide toward the pump pivot pin and sliding the seal down between the slide seal support (214) and converter housing, as shown in Figure 69.
32. Install the oil pump slide spring, as shown in Figure 69, using a screwdriver or installation tool.
33. Install the oil pump rotor guide into the rotor in the direction shown in Figure 70, and retain with a small amount of Trans-Jel®.
    Note: Align the rotor guide tabs to notches on the bottom of rotor (See Figure 70).

Continued on Page 47



203 TORQUE CONVERTER HOUSING (MODEL DEPENDENT)
209 OIL PUMP SLIDE SEAL RING
210 OIL PUMP SLIDE BACK-UP "O" RING SEAL
211 OIL PUMP SLIDE RETURN SPRING
212 OIL PUMP SLIDE (SELECTIVE)
213 OIL PUMP SLIDE TEFLON SEAL
214 OIL PUMP SLIDE TEFLON SEAL SUPPORT
215 OIL PUMP SLIDE PIVOT PIN AND SPRING ASSEMBLY

Figure 69



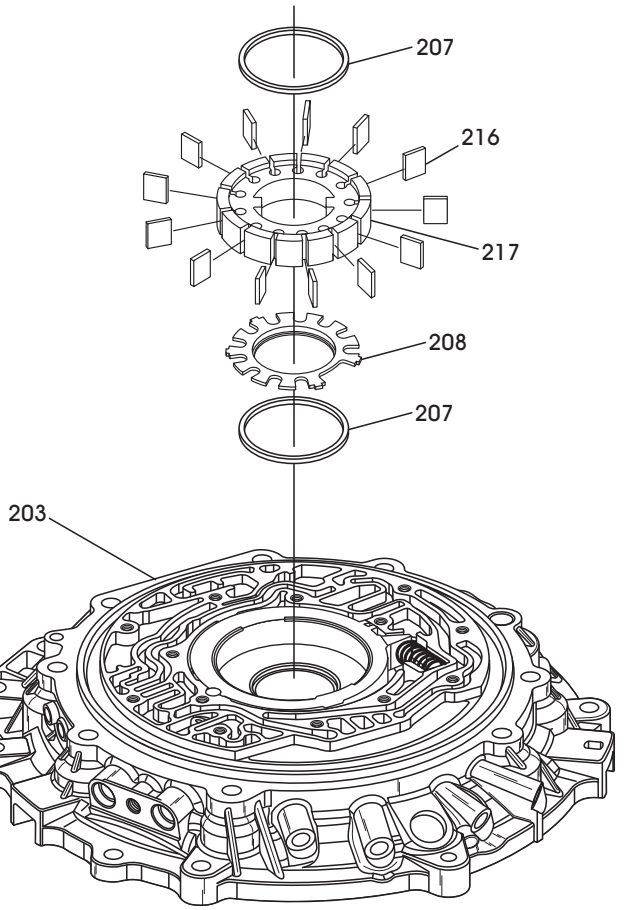
217 OIL PUMP ROTOR (SELECTIVE)
208 OIL PUMP ROTOR GUIDE

Figure 70

OIL PUMP ASSEMBLY (CONT'D)

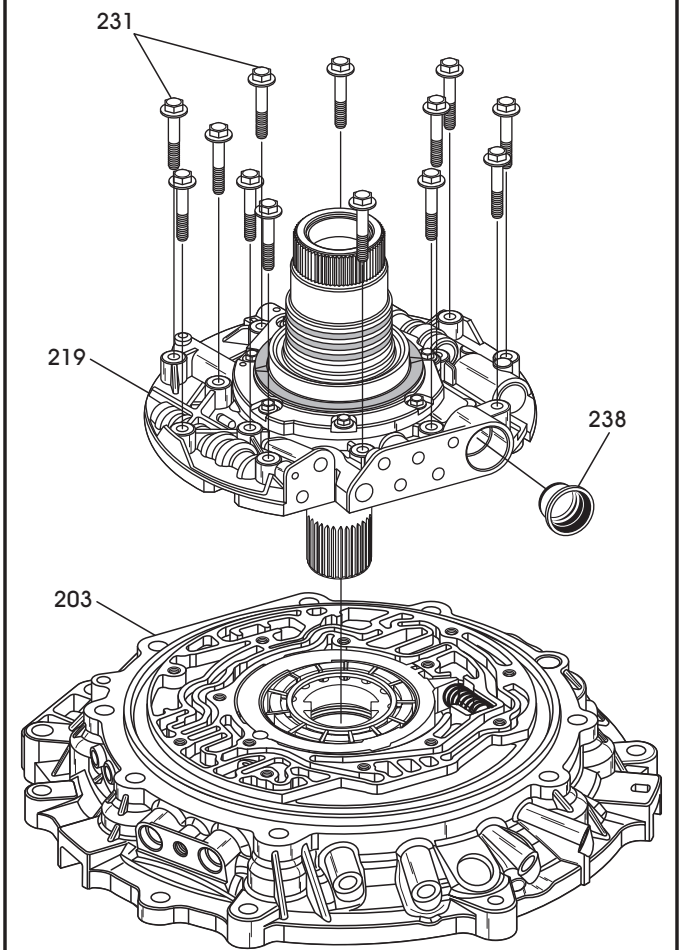
34. Install one of the oil pump vane rings into the pump pocket, as shown in Figure 71.
35. Install the previously assembled rotor guide and rotor assembly into the pump pocket and ensure that it is properly seated.
36. Install the 13 oil pump vanes into their slots in the rotor, as shown in Figure 71.
37. Install the other oil pump vane ring on top of the rotor and inside of the oil pump vanes. The finished assembly should look like illustration in Figure 72.
    Note: Lubricate rotor, vanes and slide with Dexron VI® fluid to prime the oil pump assembly.
38. Install the pre-assembled oil pump cover onto the converter housing, as shown in Figure 72.
    Note: Install the filter seal if not done previously in pump cover sub-assembly.
39. Install the oil pump cover to converter housing retaining bolts in their proper locations, as shown in Figure 72, and "hand tighten" only.

Continued on Page 48



203 TORQUE CONVERTER HOUSING (MODEL DEPENDENT)
207 OIL PUMP ROTOR VANE RINGS (2)
208 OIL PUMP ROTOR GUIDE
216 OIL PUMP ROTOR VANES (13)
217 OIL PUMP ROTOR (SELECTIVE)

Figure 71



203 TORQUE CONVERTER HOUSING (MODEL DEPENDENT)
219 OIL PUMP COVER ASSEMBLY
231 OIL PUMP COVER TO CONVERTER HOUSING BOLTS M6 X 40 MM (13 REQUIRED)
238 OIL FILTER SEAL

Figure 72

OIL PUMP ASSEMBLY (CONT'D)

40. Install the J-46664 pump alignment band and tighten, as shown in Figure 73.
    Note: This is a mandatory tool.
41. Torque the 13 oil pump cover retaining bolts to 11 Nm (97 in.lb.), as shown in Figure 73, and using the sequence shown in Figure 74.
42. Remove J-46664 pump alignment band.
43. Place the completed converter housing and oil pump assembly aside for final assembly. (See Figure 75).

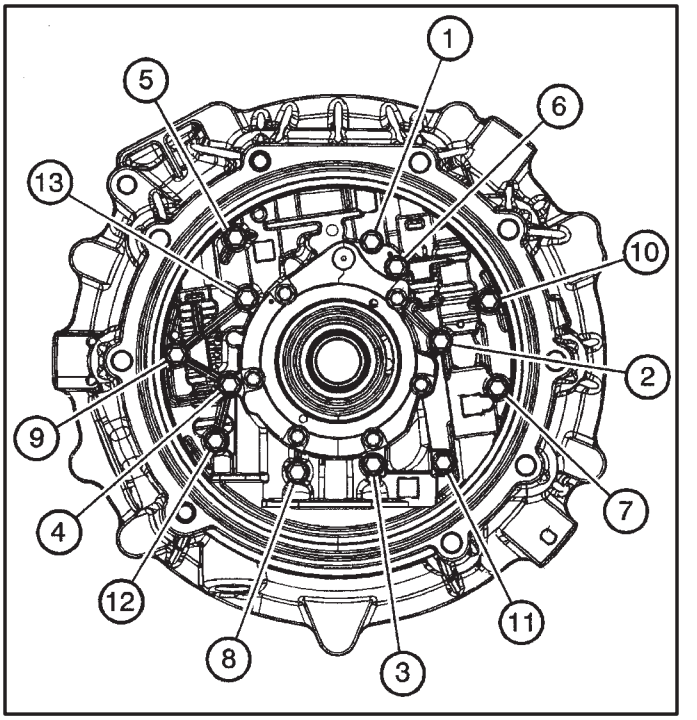


Figure 74

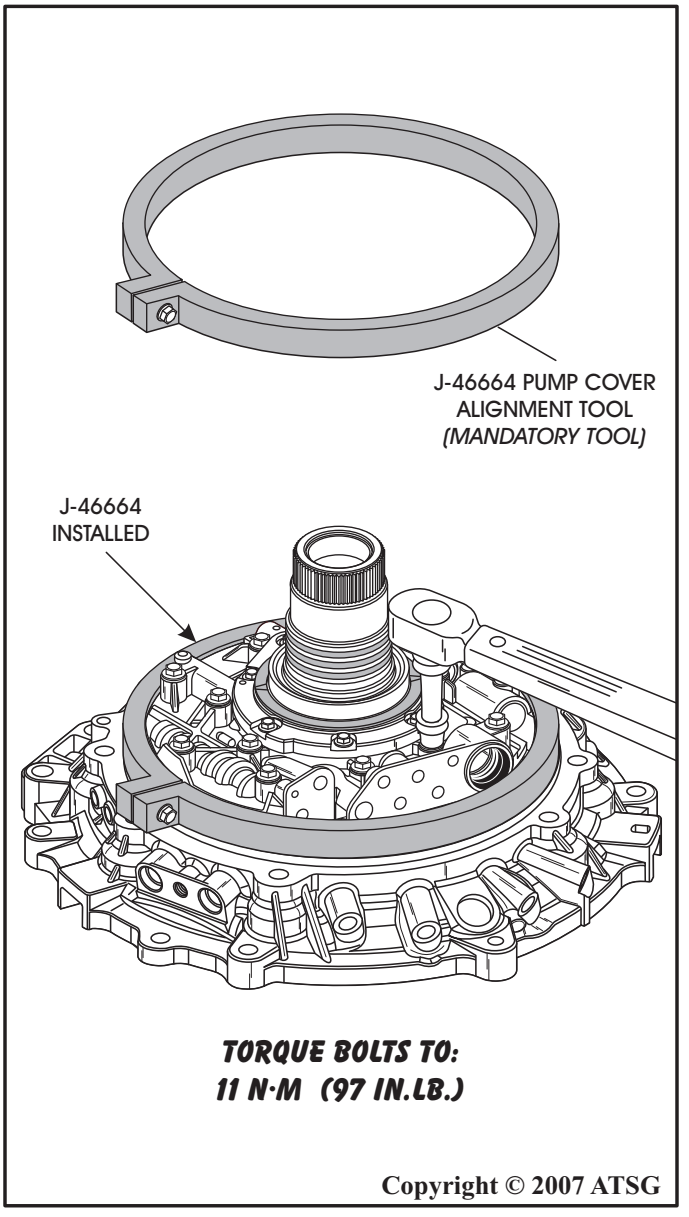


Figure 73

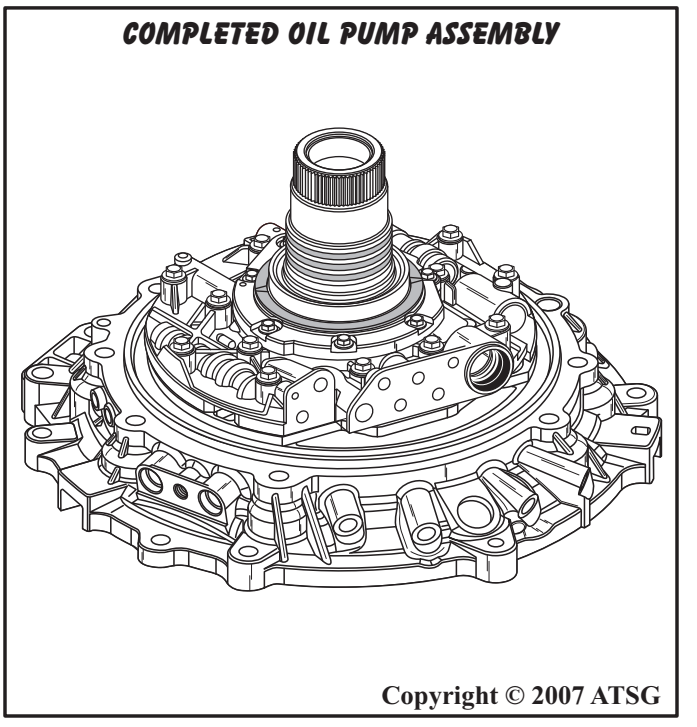
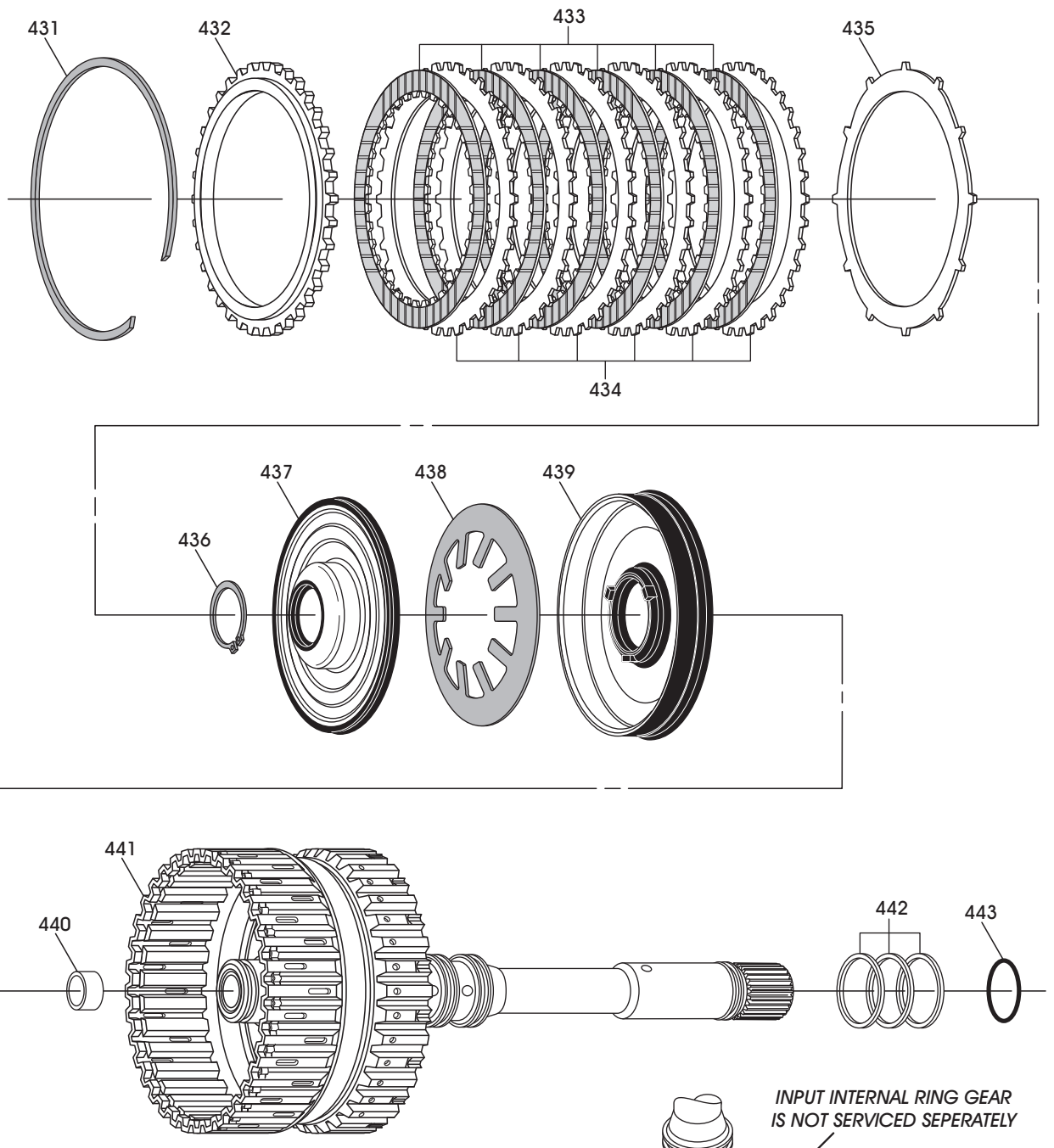


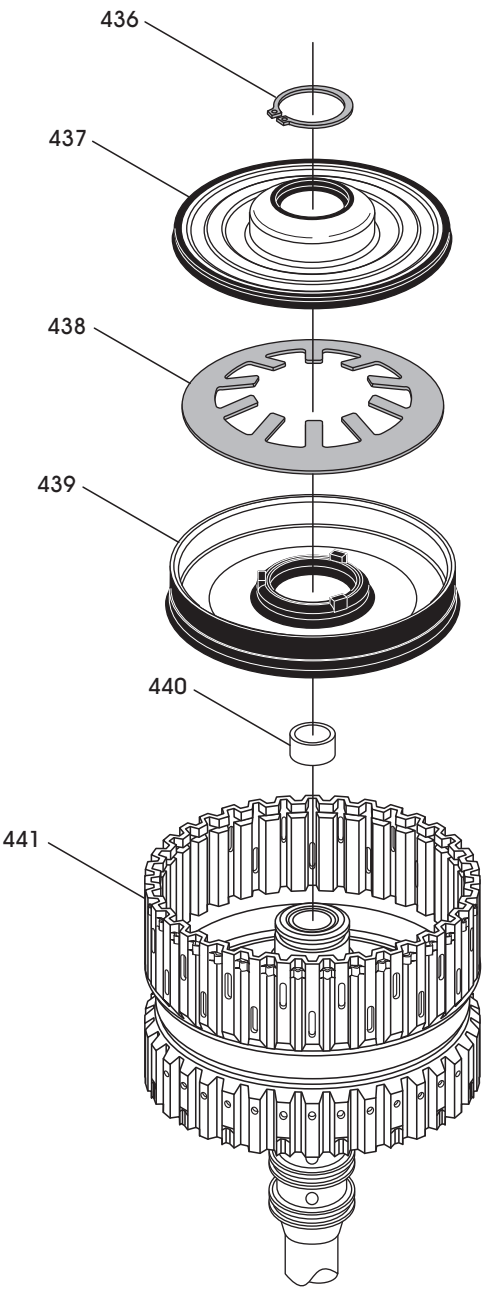
Figure 75

4-5-6 CLUTCH HOUSING EXPLODED VIEW



431 4-5-6 CLUTCH BACKING PLATE SNAP RING
432 4-5-6 CLUTCH BACKING PLATE
433 4-5-6 CLUTCH FRICTION PLATES
434 4-5-6 CLUTCH STEEL PLATES
435 4-5-6 CLUTCH "WAVED" PLATE
436 4-5-6 CLUTCH BALANCE PISTON SNAP RING
437 4-5-6 CLUTCH BALANCE PISTON
438 4-5-6 CLUTCH APPLY PISTON "BELLVILLE" RETURN SPRING
439 4-5-6 CLUTCH APPLY PISTON
440 4-5-6 CLUTCH HOUSING BUSHING (OUTPUT SHAFT)
441 4-5-6 CLUTCH HOUSING ASSEMBLY
442 TURBINE SHAFT SEALING RINGS (SOLID TEFLON)
443 TURBINE SHAFT "O" RING SEAL (CONVERTER CLUTCH)

Figure 76



436 4-5-6 CLUTCH BALANCE PISTON SNAP RING
437 4-5-6 CLUTCH BALANCE PISTON
438 4-5-6 CLUTCH APPLY PISTON "BELLVILLE" RETURN SPRING
439 4-5-6 CLUTCH APPLY PISTON
440 4-5-6 CLUTCH HOUSING BUSHING (OUTPUT SHAFT)
441 4-5-6 CLUTCH HOUSING ASSEMBLY

Figure 77

COMPONET REBUILD

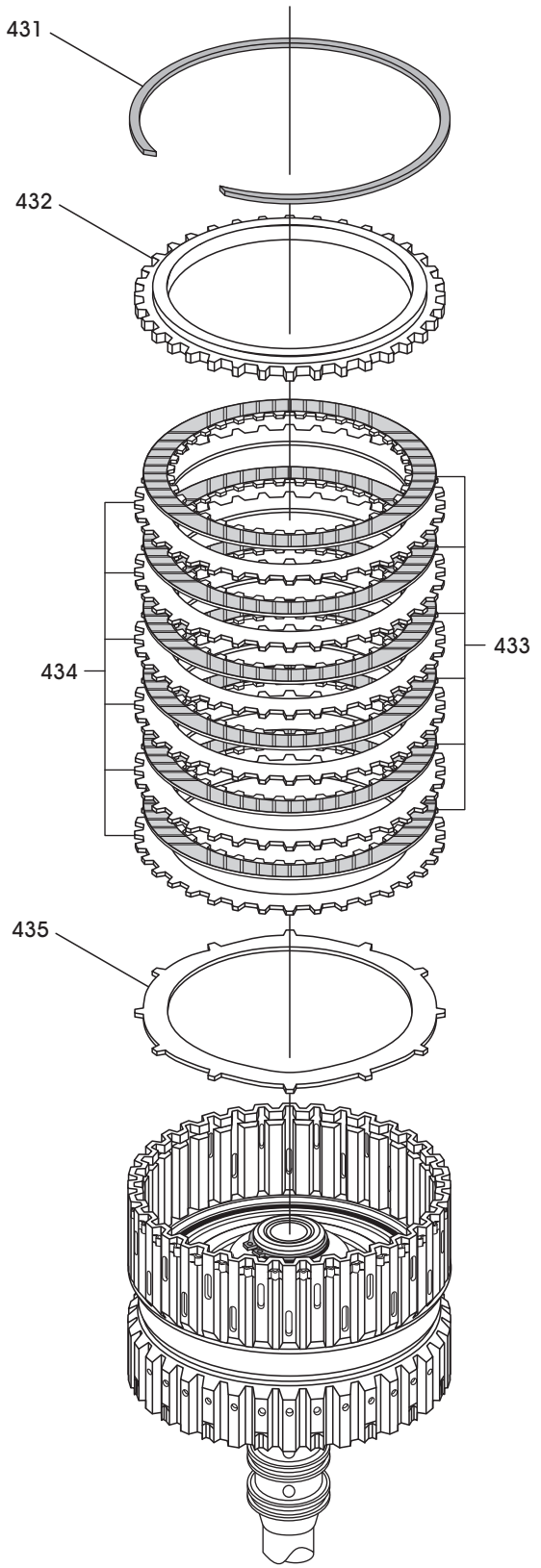
4-5-6 CLUTCH HOUSING ASSEMBLY

1. Disassemble the 4-5-6 clutch housing using Figure 76 as a guide.
   Note: Use care when compressing the return spring. Compressing the balance piston too far may create damage to the piston.
2. Remove and discard the 4-5-6 clutch balance piston snap ring.
3. Clean all 4-5-6 clutch housing parts thoroughly and dry with compressed air.
4. Inspect all 4-5-6 clutch housing parts for any wear and/or damage.
5. Replace the 4-5-6 clutch housing bushing as necessary (See Figure 77)
6. Lubricate a new 4-5-6 clutch piston with small amount of Trans-Jel® on both seal surfaces and install it into housing as shown in Figure 77, using a twisting motion.
7. Install the 4-5-6 clutch apply piston "bellville" type return spring, as shown in Figure 77, with the fingers facing up.
8. Lubricate a new 4-5-6 clutch balance piston with a small amount of Trans-Jel® on both of the seal surfaces and install into apply piston, as shown in Figure 77, with a twisting motion.
9. Compress the balance piston and return spring and install a ***new*** snap ring.
   Note: Use care when compressing the return spring. Compressing the balance piston too far may create damage to the piston.
10. Remove the spring compressor.

Special Note: ATSG recommends replacing all of the molded pistons, regardless of their condition.

Special Note: ATSG recommends pre-soaking the clutch pack friction plates in Dexron VI® for at least 30 minutes before assembly. This includes "All" clutch packs in this unit.

Continued on Page 51



431 4-5-6 CLUTCH BACKING PLATE SNAP RING
432 4-5-6 CLUTCH BACKING PLATE
433 4-5-6 CLUTCH FRICTION PLATES (6 REQUIRED)
434 4-5-6 CLUTCH STEEL PLATES (6 REQUIRED)
435 4-5-6 CLUTCH "WAVED" PLATE

Figure 78

4-5-6 CLUTCH HOUSING ASSEMBLY

11. Install the 4-5-6 clutch "wave" plate, as shown in Figure 78.
12. Install the 4-5-6 clutch plates beginning with a steel plate and alternating with friction plate until you have installed 6 of each, as shown in Figure 78.
13. Install the 4-5-6 clutch backing plate, as shown in Figure 78.
14. Install the 4-5-6 clutch backing plate selective snap ring, as shown in Figure 78.
15. Install and zero dial indicator on 4-5-6 clutch housing, as shown in Figure 79.
16. While one finger blocks top passage in turbine shaft, apply regulated air to the opposite top hole and observe dial indicator reading, as shown in Figure 79.
17. Change the selective snap ring as necessary, to get 1.28-1.89mm (.050" - .074"), using the chart in Figure 80

Continued on Page 52

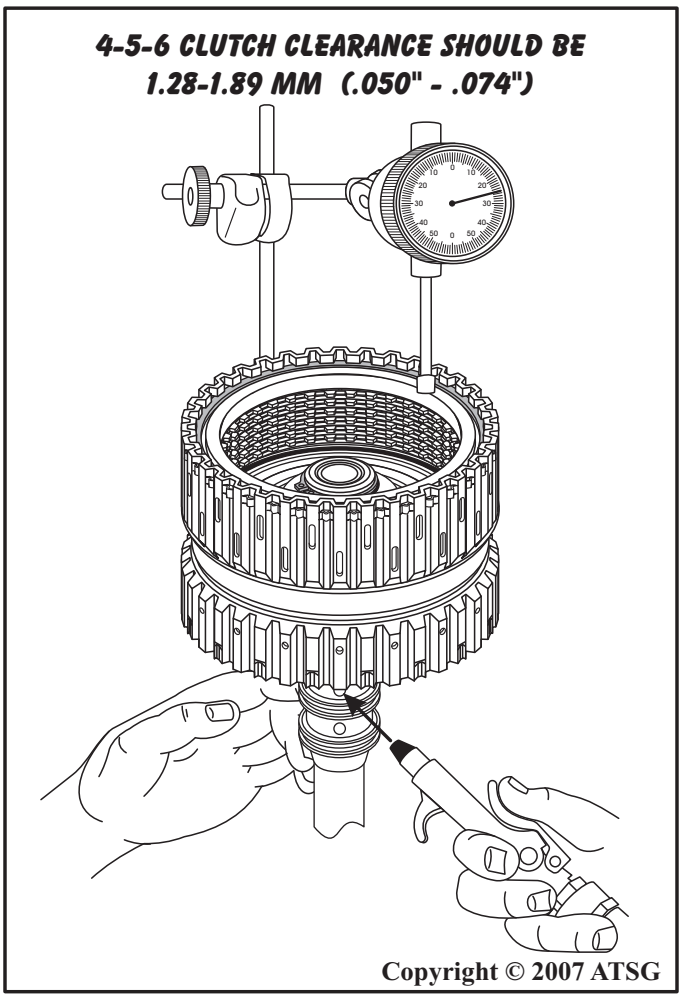


Figure 79

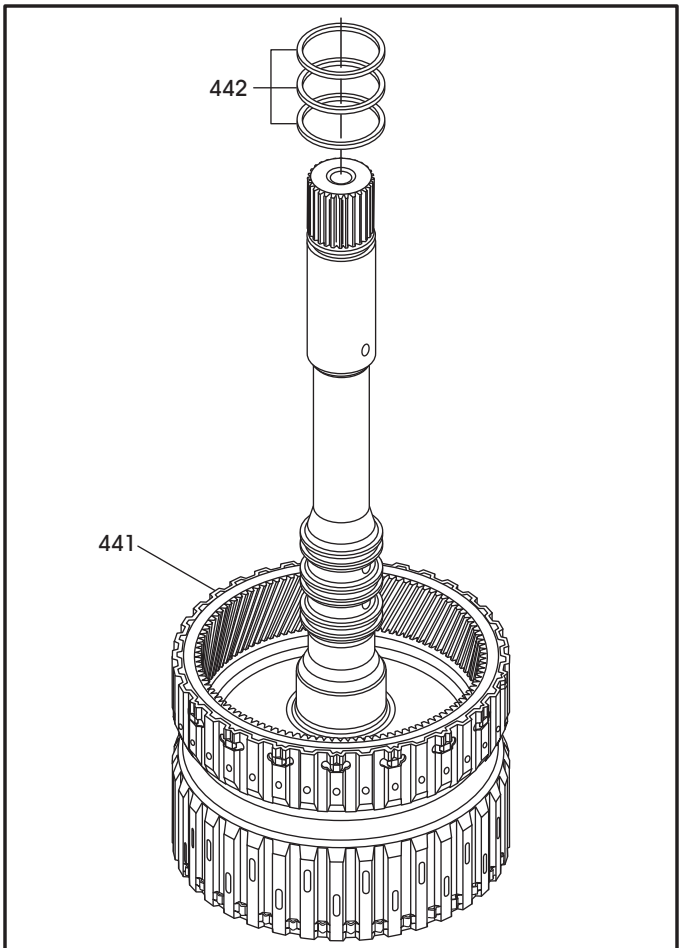
4-5-6 CLUTCH HOUSING ASSEMBLY (CONT'D)

18. Cut off and discard the three "Teflon" sealing rings on the turbine shaft (See Figure 82).
19. Install three new turbine shaft sealing rings as shown in Figure 82, using the installation tools shown in Figure 81.
20. Adjust the turn screw on the DT-47768-1 and install the bottom seal ring first.
21. After all three rings are installed, place the resizing tool over the three seals, as shown in Figure 83, and set aside for final assembly.

Componet Rebuild
Continued on Page 53

Thickness	*Color I.D.*
1.60-1.70mm (.063" - .067")	*Yellow*
2.02-2.12mm (.080" - .083")	*None*
2.44-2.54mm (.096" - .100")	*Purple*

Figure 80



441 4-5-6 CLUTCH HOUSING ASSEMBLY
442 TURBINE SHAFT SEALING RINGS (SOLID TEFLON)

Figure 82

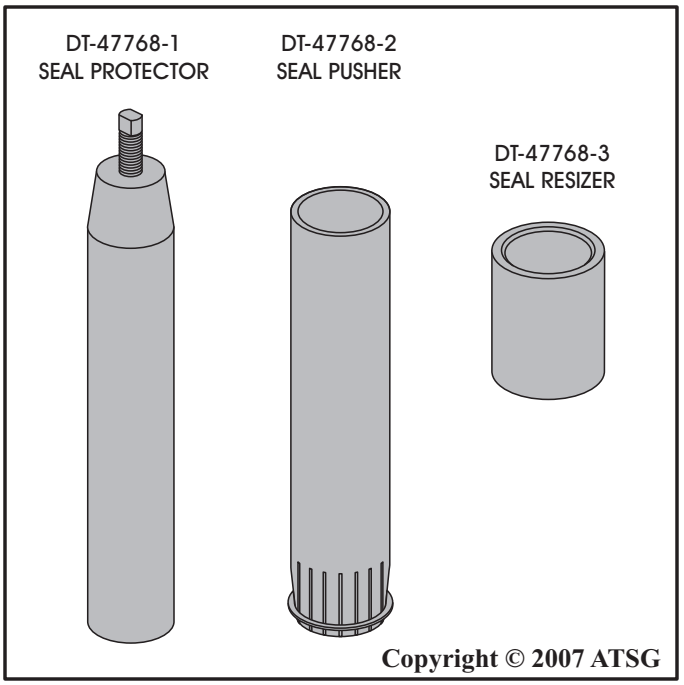


Figure 81

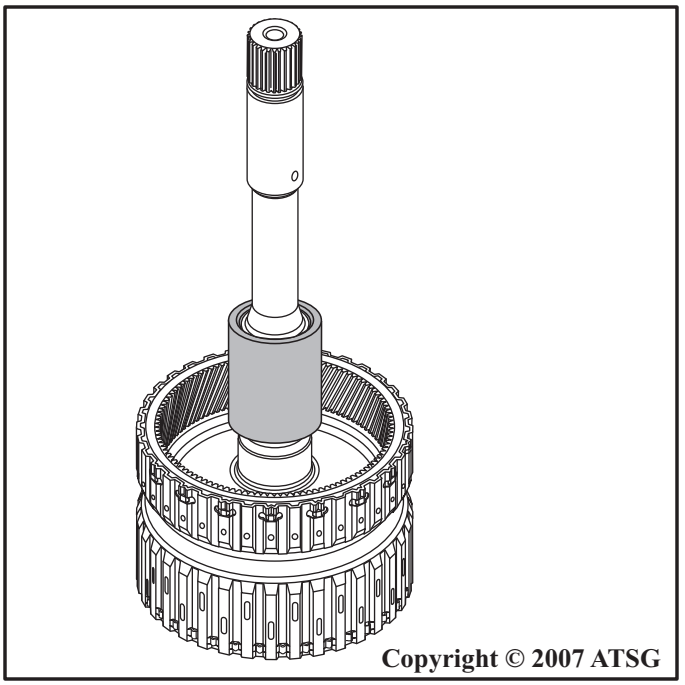
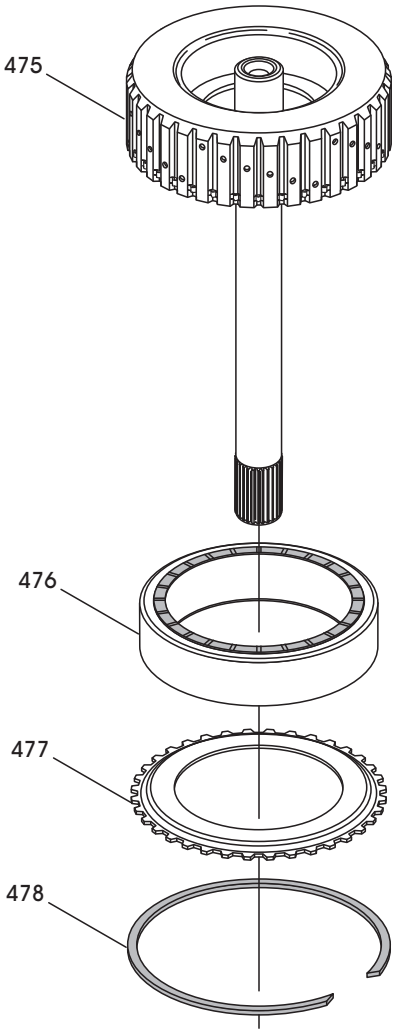


Figure 83

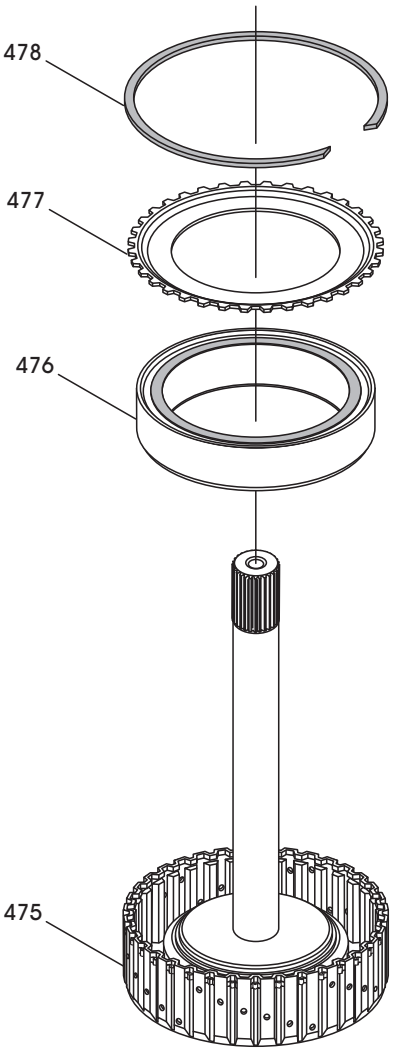
4-5-6 CLUTCH DAMPENER ASSEMBLY

1. Disassemble the 4-5-6 clutch dampener using Figure 84 as a guide.
2. Thoroughly clean and inspect all 4-5-6 parts and dry with compressed air.
3. Install the 4-5-6 dampener into the 4-5-6 clutch hub in the direction shown in Figure 85, with smooth side of dampener material facing up.
4. Install the dampener apply plate in the direction shown in Figure 85.
5. Install the 4-5-6 clutch dampener snap ring, as shown in Figure 85, and ensure snap ring is fully seated.
6. Set the 4-5-6 clutch dampener assembly aside for final assembly (See Figure 86).



475 4-5-6 CLUTCH HUB ASSEMBLY
476 4-5-6 CLUTCH DAMPENER ASSEMBLY
477 4-5-6 CLUTCH DAMPENER APPLY PLATE

Figure 84



475 4-5-6 CLUTCH HUB ASSEMBLY
476 4-5-6 CLUTCH DAMPENER ASSEMBLY
477 4-5-6 CLUTCH DAMPENER APPLY PLATE

Figure 85

COMPLETED 4-5-6 DAMPENER ASSEMBLY

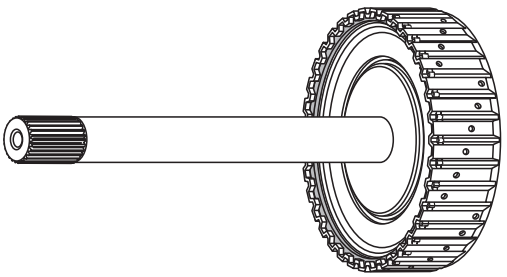
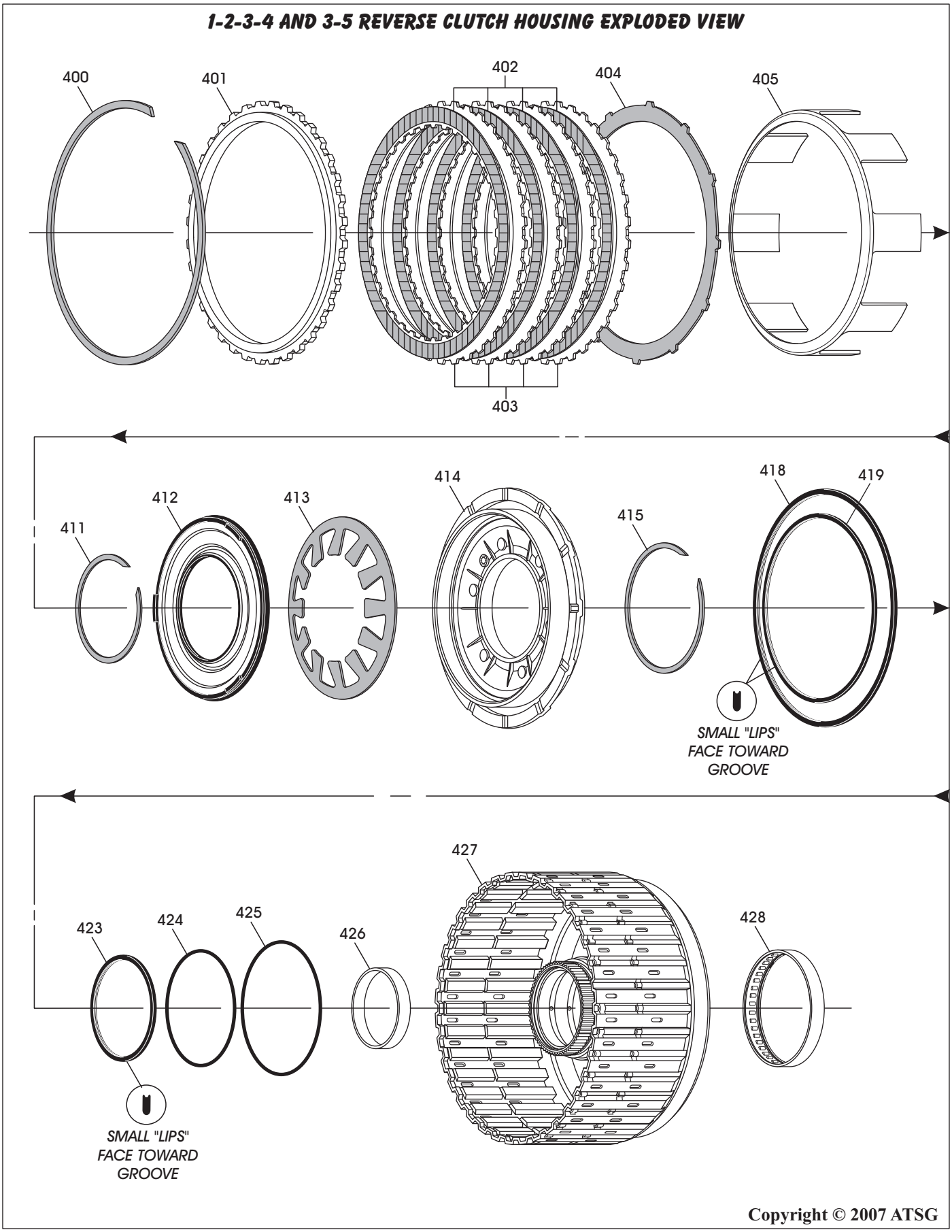


Figure 86


1-2-3-4 AND 3-5 REVERSE CLUTCH HOUSING EXPLODED VIEW
400
401
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SMALL "LIPS" FACE TOWARD GROOVE
423
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426
427
428
SMALL "LIPS" FACE TOWARD GROOVE
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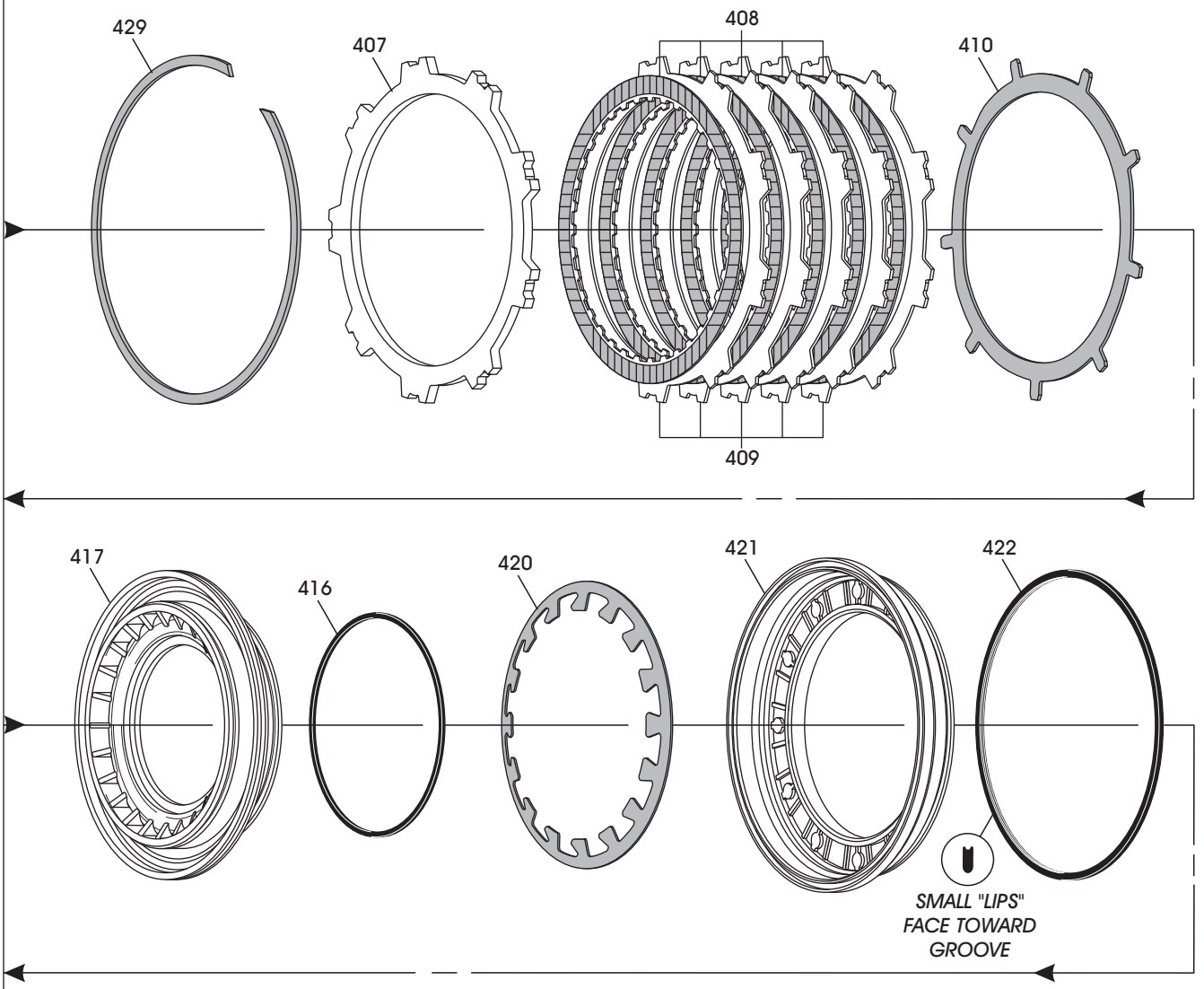
Figure 87

1-2-3-4 AND 3-5 REVERSE CLUTCH HOUSING EXPLODED VIEW



400 3-5 REVERSE CLUTCH BACKING PLATE SNAP RING
401 3-5 REVERSE CLUTCH BACKING PLATE
402 3-5 REVERSE CLUTCH FRICTION PLATES
403 3-5 REVERSE CLUTCH STEEL PLATES
404 3-5 REVERSE CLUTCH "WAVED" PLATE
405 3-5 REVERSE CLUTCH APPLY RING
407 1-2-3-4 CLUTCH BACKING PLATE
408 1-2-3-4 CLUTCH FRICTION PLATES
409 1-2-3-4 CLUTCH STEEL PLATES
410 1-2-3-4 CLUTCH "WAVED" PLATE
411 1-2-3-4 CLUTCH BALANCE PISTON SNAP RING
412 1-2-3-4 CLUTCH BALANCE PISTON
413 1-2-3-4 CLUTCH APPLY PISTON "BELLVILLE" RETURN SPRING
414 1-2-3-4 CLUTCH APPLY PISTON
415 1-2-3-4 CLUTCH PISTON HOUSING SNAP RING
416 1-2-3-4 CLUTCH APPLY PISTON SEAL
417 1-2-3-4 CLUITCH APPLY PISTON HOUSING
418 3-5 REVERSE CLUTCH PISTON DAM SEAL
419 3-5 REVERSE CLUTCH PISTON INNER SEAL (1ST DESIGN)
420 3-5 REVERSE CLUTCH APPLY PISTON "BELLVILLE" SPRING
421 3-5 REVERSE CLUTCH APPLY PISTON
422 3-5 REVERSE CLUTCH PISTON OUTER SEAL
423 1-2-3-4 CLUTCH PISTON INNER SEAL
424 1-2-3-4 CLUTCH PISTON HOUSING SEAL
425 1-2-3-4 CLUTCH PISTON HOUSING SEAL
426 3-5 REVERSE CLUTCH HOUSING REAR BUSHING
427 3-5 REVERSE CLUTCH HOUSING ASSEMBLY
428 3-5 REVERSE CLUTCH HOUSING BEARING ASSEMBLY
429 1-2-3-4 CLUTCH BACKING PLATE SNAP RING

Figure 88

COMPONENT REBUILD

1-2-3-4 AND 3-5 REVERSE HOUSING

1. Disassemble the 1-2-3-4 and 3-5 reverse clutch housing using Figure 87 and 88 as a guide.
2. Remove and discard all rubber piston seals and "O" rings (See Figure 87 and 88).
3. Clean all 1-2-3-4 and 3-5 reverse clutch parts thoroughly and dry with compressed air.
4. Inspect all 1-2-3-4 and 3-5 reverse clutch parts for any wear and/or damage.
5. Remove and discard the caged roller bearing with the puller shown in Figure 89.
   Note: General Motors recommends this bearing be replaced on all rebuilds because of the incorporated lip seal (See Figure 90).
6. Install a new caged roller bearing, as shown in Figure 90, with seal side facing up.
7. Install new bushing as necessary using proper bushing driver, as shown in Figure 91.

Continued on Page 57

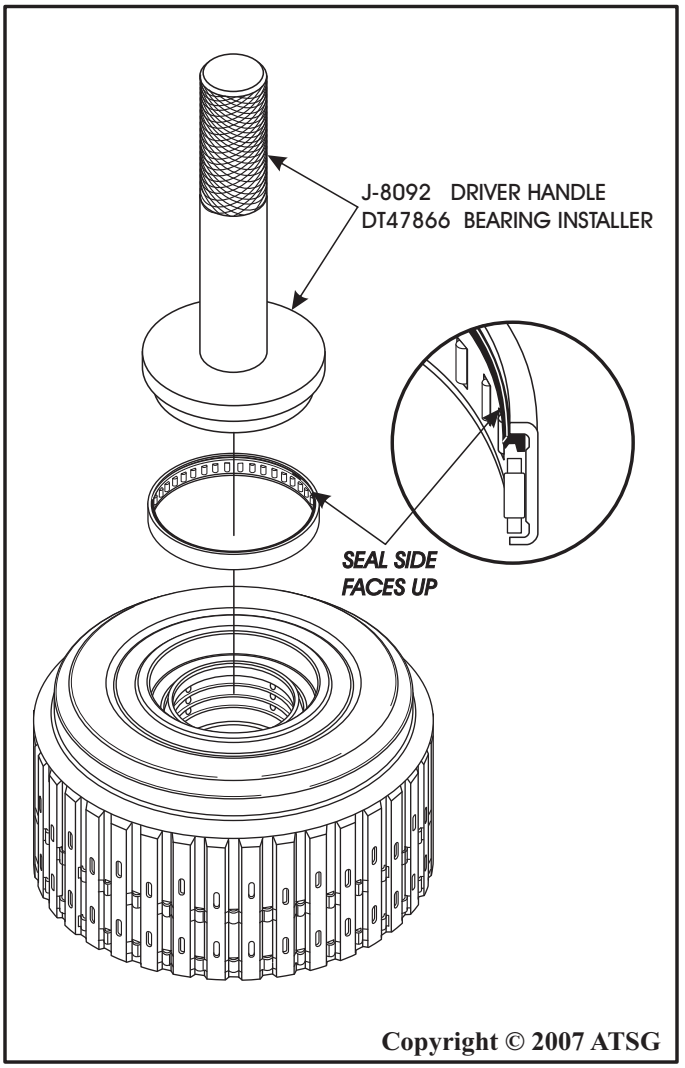


Figure 90

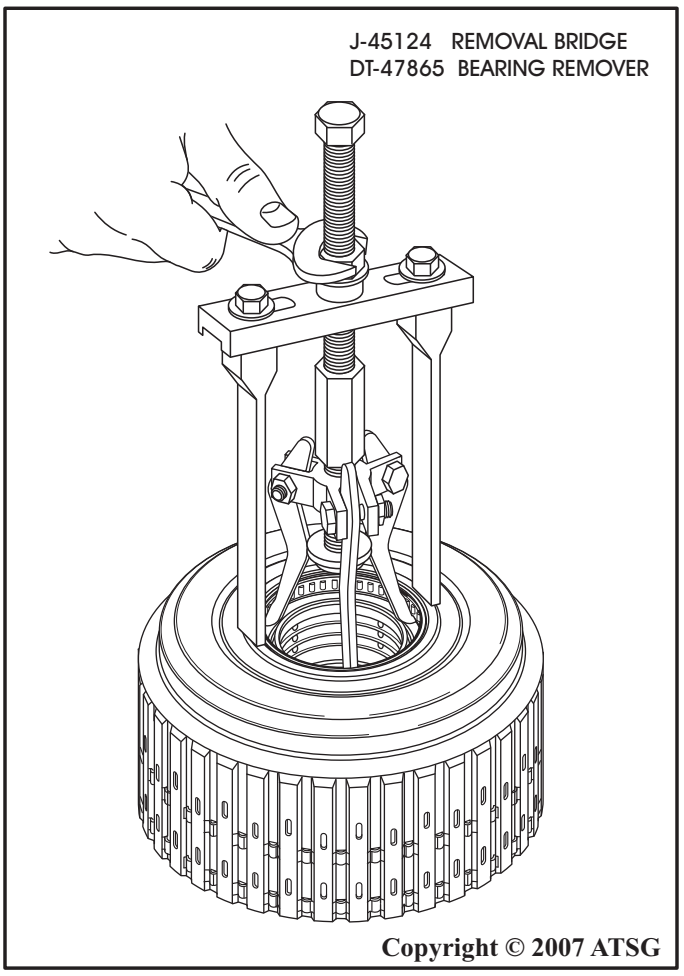


Figure 89

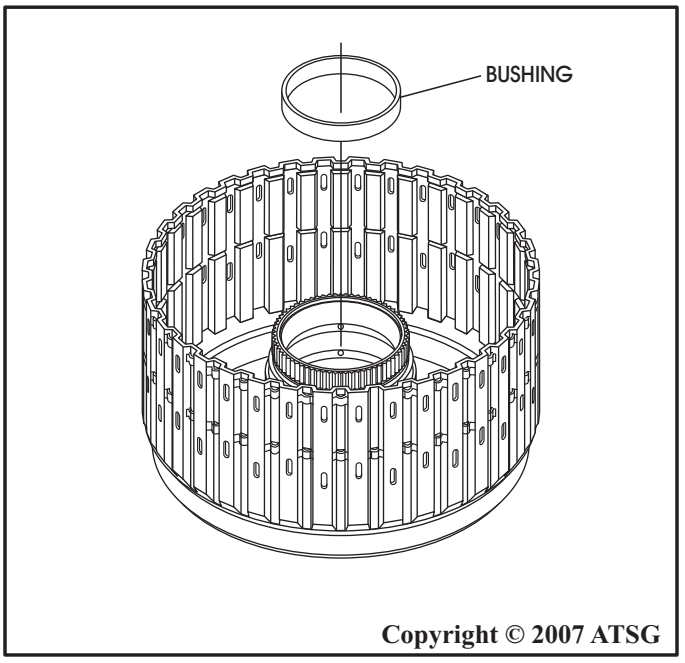
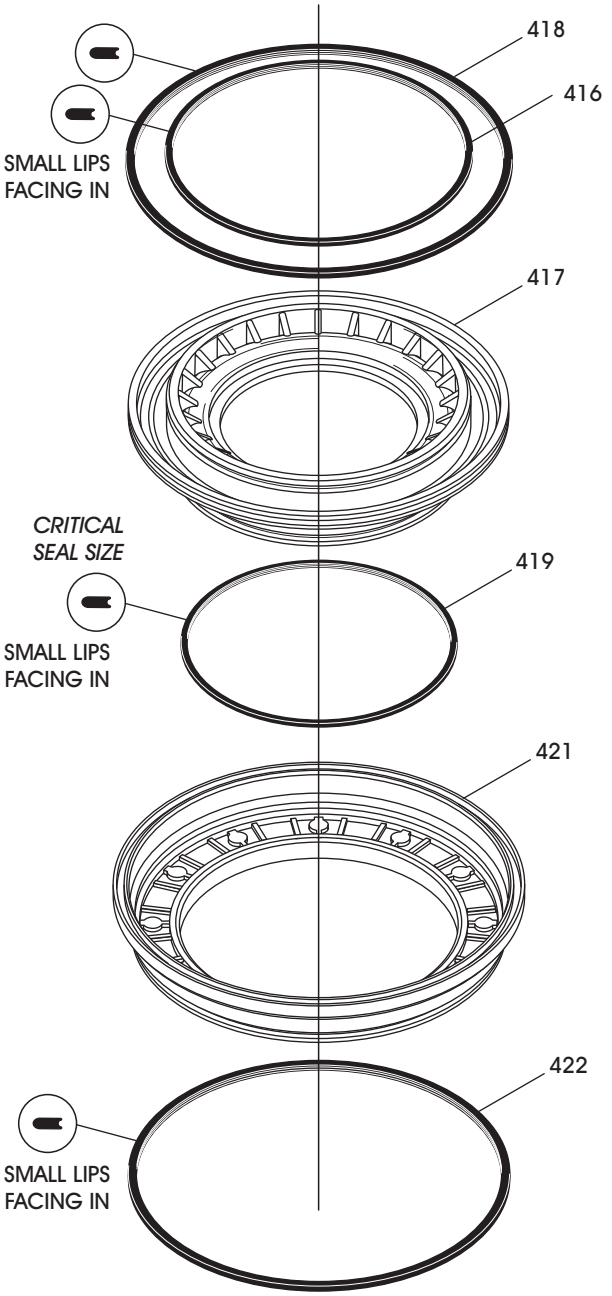


Figure 91

1-2-3-4 AND 3-5 REVERSE HOUSING (CONT'D)

8. Install the seals into the grooves of 3-5 reverse clutch apply piston and 1-2-3-4 clutch apply piston, with the small lips facing towards the groove, as shown in Figure 92.

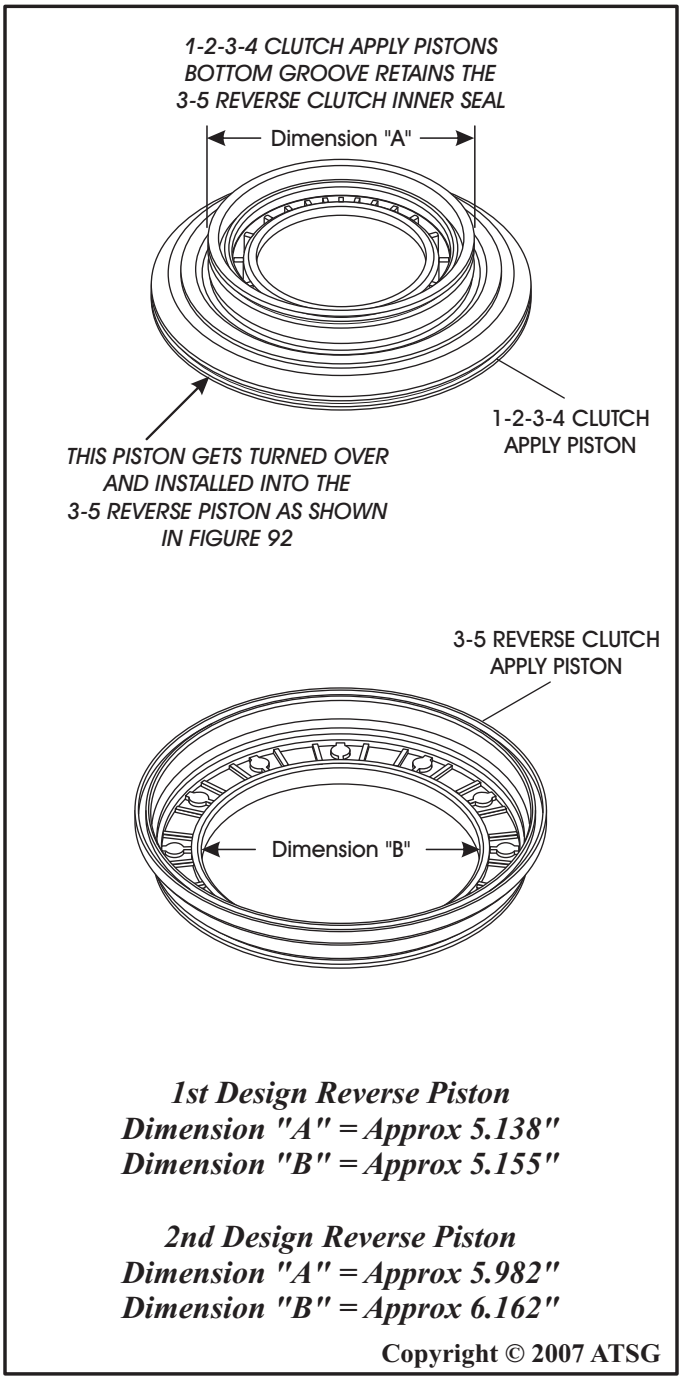


416 1-2-3-4 CLUTCH APPLY PISTON SEAL
417 1-2-3-4 CLUITCH APPLY PISTON HOUSING
418 3-5 REVERSE CLUTCH PISTON DAM SEAL
419 3-5 REVERSE CLUTCH PISTON INNER SEAL (1ST DESIGN)
421 3-5 REVERSE CLUTCH APPLY PISTON
422 3-5 REVERSE CLUTCH PISTON OUTER SEAL

Figure 92

CAUTION -- CAUTION -- CAUTION

For 2006 & 2007 "Transmission" Model Years, 6L80 units will be built with a 1st Design 3-5 Reverse Piston, and its corresponding 1st Design Inner Seal.
For the 2008 "Transmission" Model Year, 6l80 units will be built with a 2nd Design (Smaller) 3-5 Reverse Piston, and its corresponding 2nd Design Inner Seal.
Dimensional differences between 1st and 2nd Design pistons and seals, make them non-interchangeable. Each Design Level 3-5 Reverse Piston Inner Seal "MUST" be installed only with its corresponding Design Level 3-5 Reverse Piston. Refer to Figure 93 for the dimensions of the critical matching parts.



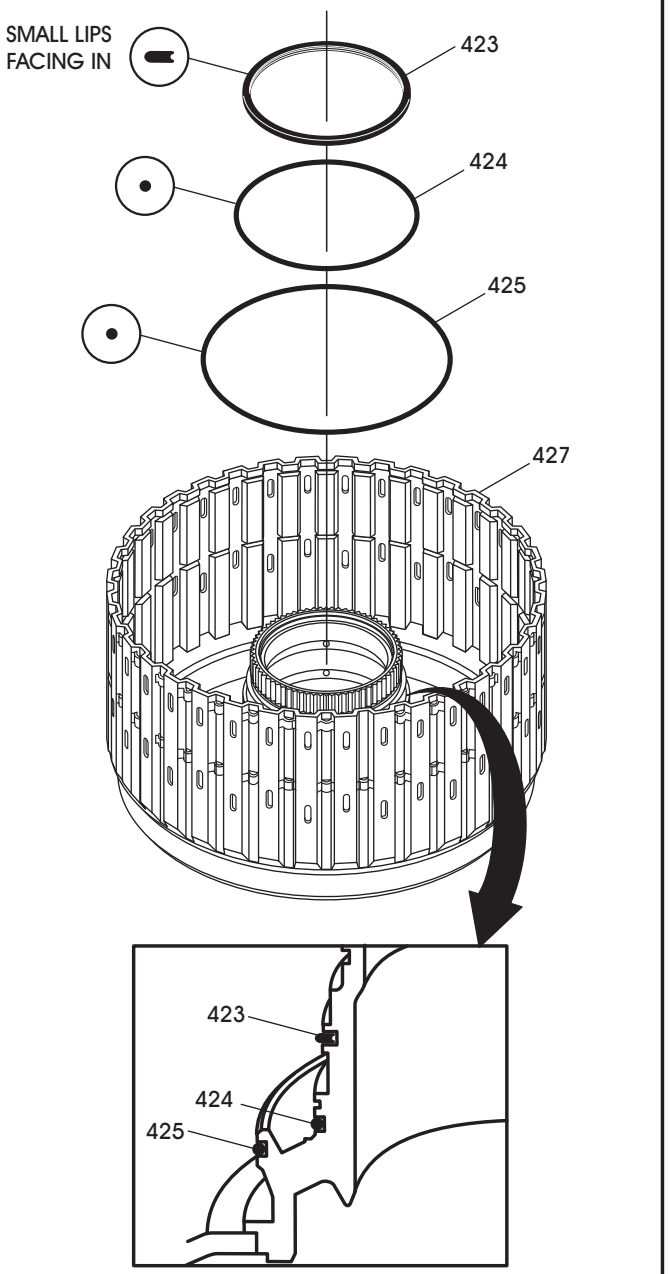
1st Design Reverse Piston
Dimension "A" = Approx 5.138"
Dimension "B" = Approx 5.155"

2nd Design Reverse Piston
Dimension "A" = Approx 5.982"
Dimension "B" = Approx 6.162"

Figure 93

1-2-3-4 AND 3-5 REVERSE HOUSING (CONT'D)

9. Install only the two "O" ring seals into their grooves in the 1-2-3-4 and 3-5 reverse housing hub, as shown in Figure 94.
Note: "Do Not" install the 1-2-3-4 clutch inner seal in the top groove at this time. We will install this seal "After" we have installed the snap ring for the 3-5 reverse piston.

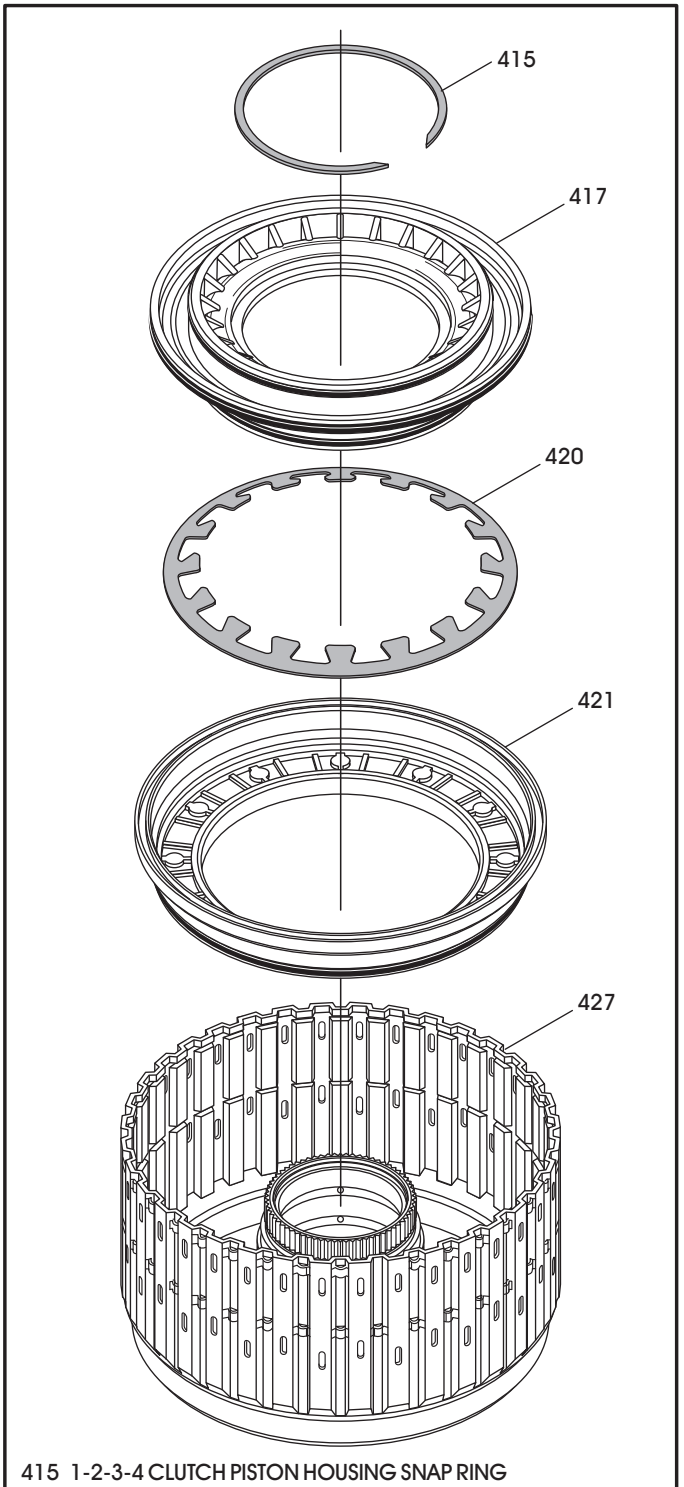


423 1-2-3-4 CLUTCH PISTON INNER SEAL
424 1-2-3-4 CLUTCH PISTON HOUSING SEAL
425 1-2-3-4 CLUTCH PISTON HOUSING SEAL

Figure 94

10. Lubricate the outer seal and both inner seal surfaces of the 3-5 reverse piston assembly, as shown in Figure 95.

Continued on Page 59



415 1-2-3-4 CLUTCH PISTON HOUSING SNAP RING
417 1-2-3-4 CLUITCH APPLY PISTON HOUSING AND SEALS
420 3-5 REVERSE CLUTCH APPLY PISTON "BELLVILLE" SPRING
421 3-5 REVERSE CLUTCH APPLY PISTON AND SEALS
427 3-5 REVERSE CLUTCH HOUSING ASSEMBLY

Figure 95

1-2-3-4 AND 3-5 REVERSE HOUSING (CONT'D)

11. Install the 3-5 reverse clutch apply piston into the 3-5 reverse clutch housing, as shown in Figure 95.
12. Install the 3-5 reverse clutch "bellville" return spring, as shown in Figure 95.
13. Lubricate all three seals on the 1-2-3-4 clutch piston housing, as shown in Figure 95.
14. Install the 1-2-3-4 clutch piston housing, as shown in Figure 95.
15. Before using the snap ring installer, push the snap ring over the cone by hand, so that the snap ring is positioned below the tapered area, as shown in Figure 96.
16. Push the snap ring down over the cone until it seats firmly in the snap ring groove. The snap ring will make a distinctive "click" sound when it seats.
17. Remove the snap ring installer and cone.
18. ***Now,*** install the 1-2-3-4 clutch piston inner seal with the lips facing the groove, as shown in Figure 97.
19. Install the 1-2-3-4 clutch apply piston into the housing, as shown in Figure 97.
20. Install the 1-2-3-4 clutch "bellville" return spring in direction shown in Figure 97.

Continued on Page 60

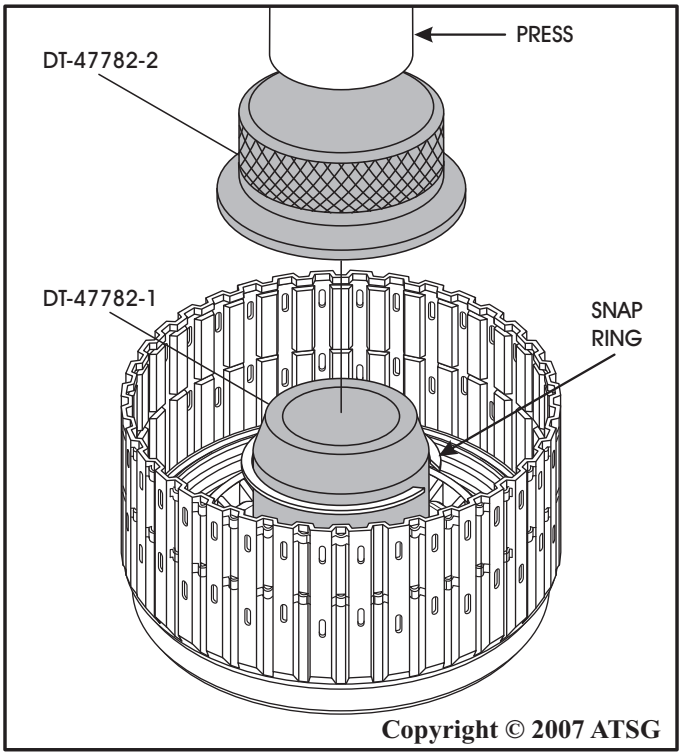
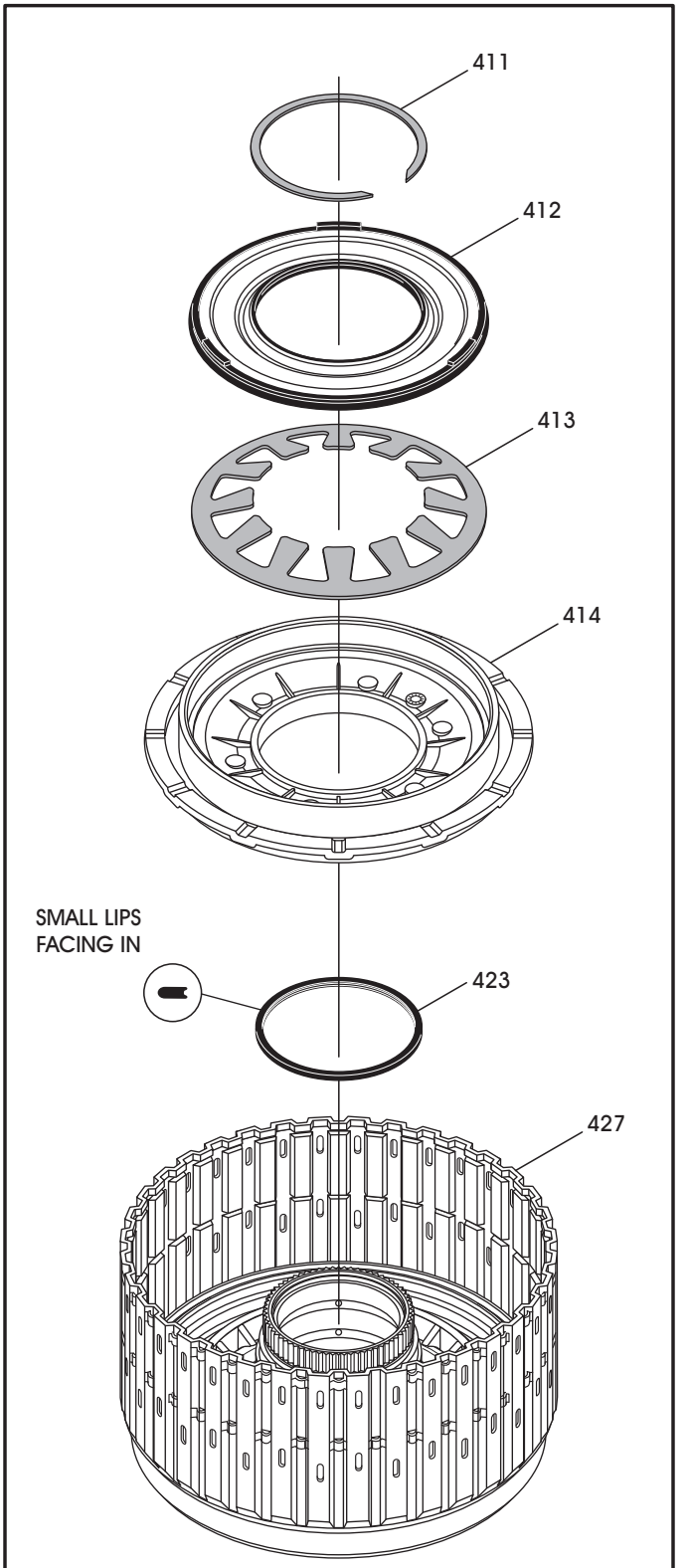
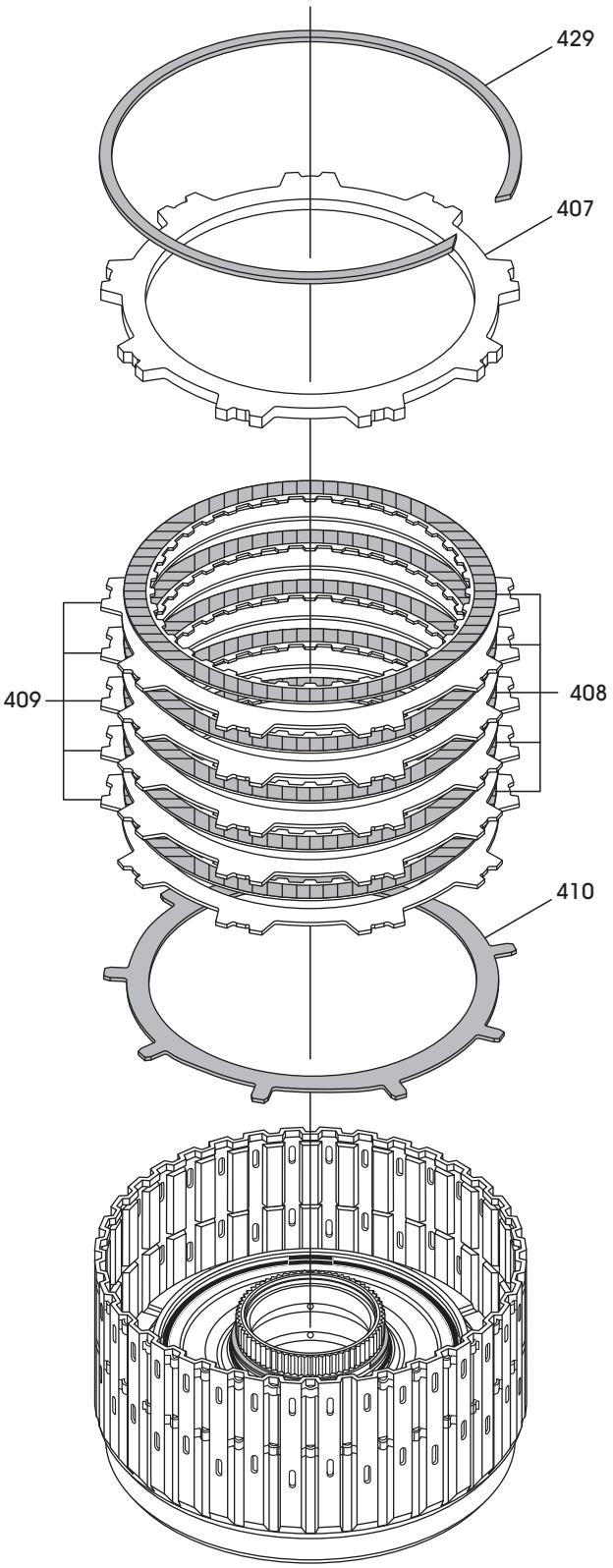


Figure 96



411 1-2-3-4 CLUTCH BALANCE PISTON SNAP RING
412 1-2-3-4 CLUTCH BALANCE PISTON
413 1-2-3-4 CLUTCH APPLY PISTON "BELLVILLE" RETURN SPRING
414 1-2-3-4 CLUTCH APPLY PISTON
423 1-2-3-4 CLUTCH PISTON INNER SEAL
427 3-5 REVERSE CLUTCH HOUSING ASSEMBLY

Figure 97



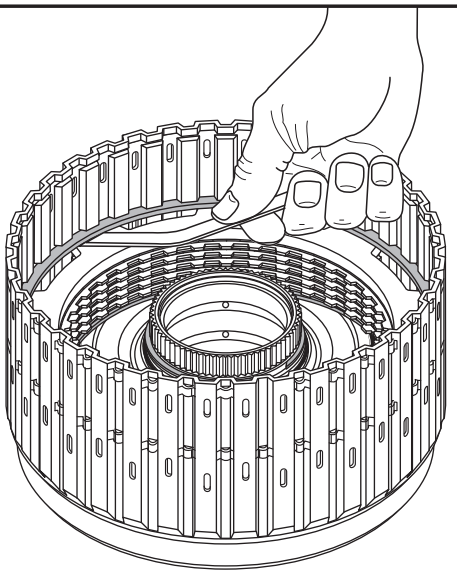
407 1-2-3-4 CLUTCH BACKING PLATE
408 1-2-3-4 CLUTCH FRICTION PLATES
409 1-2-3-4 CLUTCH STEEL PLATES
410 1-2-3-4 CLUTCH "WAVED" PLATE
429 1-2-3-4 CLUTCH BACKING PLATE *SELECTIVE* SNAP RING

Figure 98

1-2-3-4 AND 3-5 REVERSE HOUSING (CONT'D)

21. Lubricate the seal area and install the 1-2-3-4 clutch balance piston, as shown in Figure 97.
22. Compress the assembly and install the snap ring, as shown in Figure 97.
    Note: Compressing the balance piston too far may damage the piston, so use care.
23. Install the 1-2-3-4 clutch "wave" plate into the housing, as shown in Figure 98.
24. Install the 1-2-3-4 clutch plates beginning with a steel plate and alternating with a friction until you have installed five of each, as shown in Figure 98.
25. Install the 1-2-3-4 clutch backing plate, as shown in Figure 98.
26. Install the 1-2-3-4 clutch backing plate snap ring, as shown in Figure 98.
27. Check 1-2-3-4 clutch clearance using a feeler gage between the snap ring and backing plate, as shown in Figure 99.
28. Change the selective snap ring to achieve the proper clutch clearance using thickness chart and both are found in Figure 99.

Continued on Page 61



1-2-3-4 Clutch Clearance Should Be 1.53-1.99mm (.060" - .078")

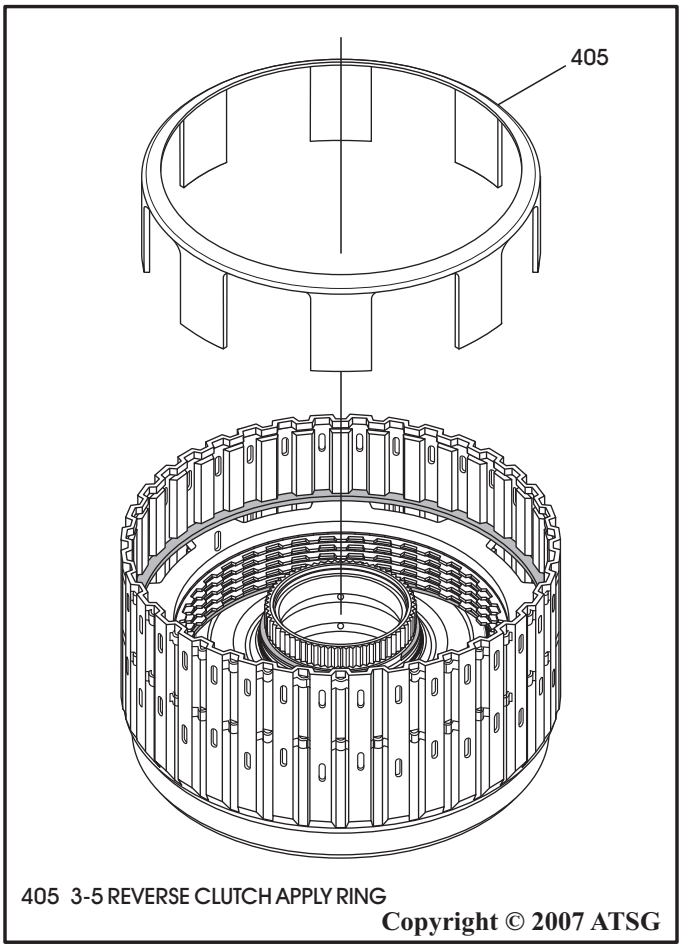
THICKNESS		O.D. COLOR
2.15-2.25mm	(.085" - .089")	YELLOW
2.42-2.52mm	(.095" - .099")	NONE
2.69-2.79mm	(.106" - .110")	PURPLE
2.96-3.06mm	(.117" - .120")	LIGHT BLUE
3.23-3.33mm	(.127" - .131")	ORANGE

Figure 99

1-2-3-4 AND 3-5 REVERSE HOUSING (CONT'D)

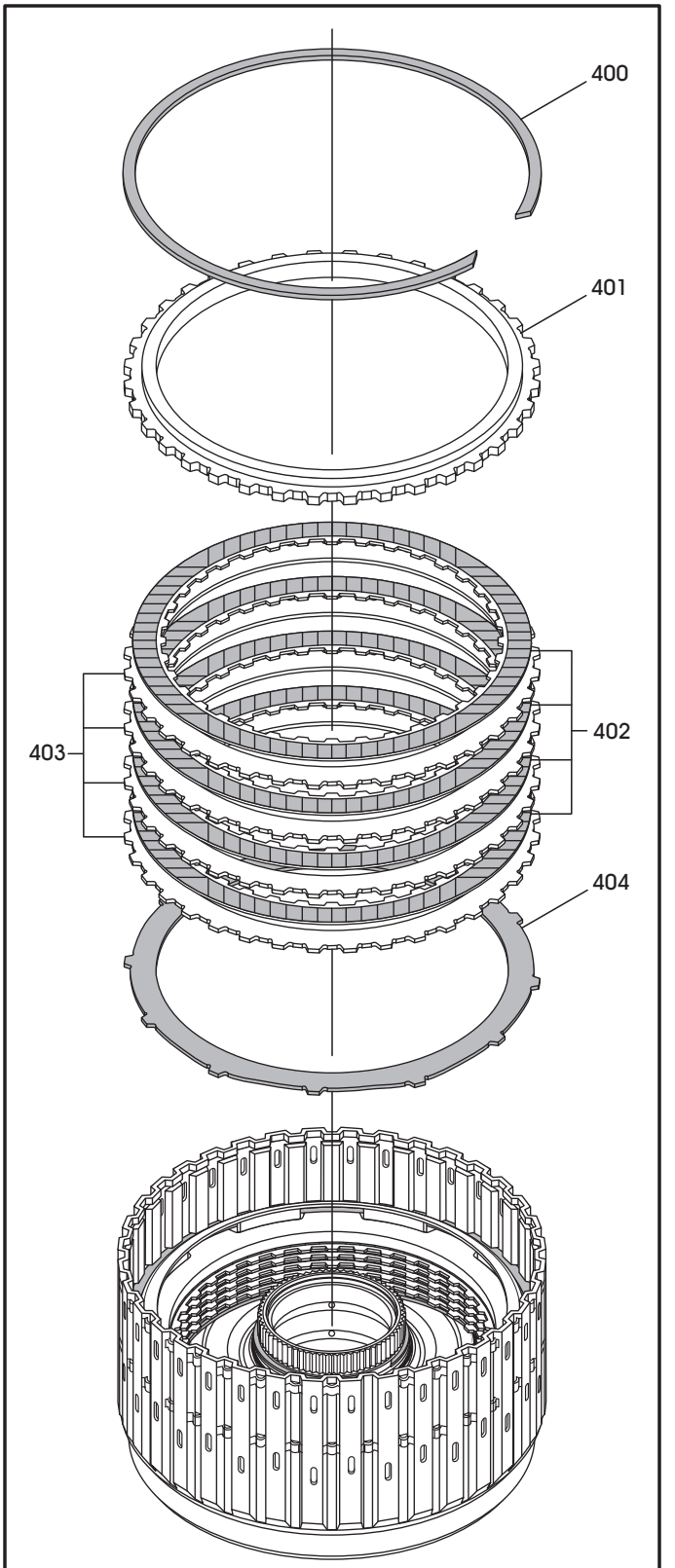
29. Install the 3-5 reverse clutch apply ring with legs going down between the 1-2-3-4 backing plate and the housing, as shown in Figure 100.
30. Install the 3-5 reverse clutch "wave" plate on top of the apply ring, as shown in Figure 101.
31. Install the 3-5 reverse clutch plates beginning with a steel plate and alternating with a friction plate until you have installed four of each, as shown in Figure 101.
32. Install the 3-5 reverse clutch backing plate, as shown in Figure 101.
33. Install the 3-5 reverse clutch backing plate selective snap ring, as shown in Figure 101. ***Note: The snap ring opening must be aligned with the missing snap ring groove punch in the housing, as shown in Figure 102.***

Continued on Page 62



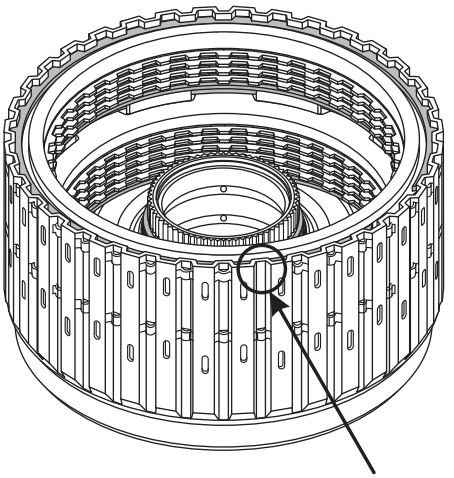
405 3-5 REVERSE CLUTCH APPLY RING

Figure 100



400 3-5 REVERSE CLUTCH BACKING PLATE SNAP RING
401 3-5 REVERSE CLUTCH BACKING PLATE
402 3-5 REVERSE CLUTCH FRICTION PLATES
403 3-5 REVERSE CLUTCH STEEL PLATES
404 3-5 REVERSE CLUTCH "WAVED" PLATE

Figure 101



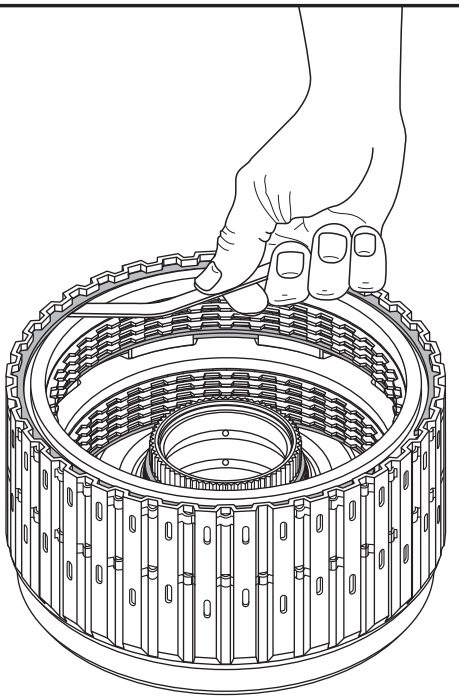
Align the snap ring opening with the missing snap ring groove punch as shown above.

Figure 102

1-2-3-4 AND 3-5 REVERSE HOUSING (CONT'D)

34. Check the 3-5 reverse clutch clearance using a feeler gage between the snap ring and backing plate, as shown in Figure 103.
35. The 3-5 reverse clutch clearance should be 1.21-1.79mm (.048" - .070").
36. Change the selective snap ring as necessary using the chart in Figure 103 to obtain correct clutch clearance.
37. Set the completed 1-2-3-4 and 3-5 reverse clutch housing aside for final assembly. (See Figure 104).

Component Rebuild
Continued on Page 64



3-5 Reverse Clutch Clearance Should Be 1.21-1.79mm (.048" - .070")

THICKNESS	O.D. COLOR
1.61-1.71mm (.063" - .067")	GRAY
1.88-1.98mm (.074" - .078")	LIGHT GREEN
2.15-2.25mm (.085" - .089")	YELLOW
2.42-2.52mm (.095" - .099")	NONE
2.69-2.79mm (.106" - .110")	PURPLE

Figure 103

COMPLETED 1-2-3-4 AND 3-5 REVERSE CLUTCH HOUSING

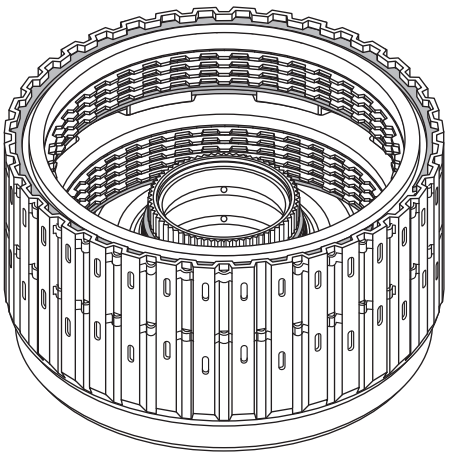
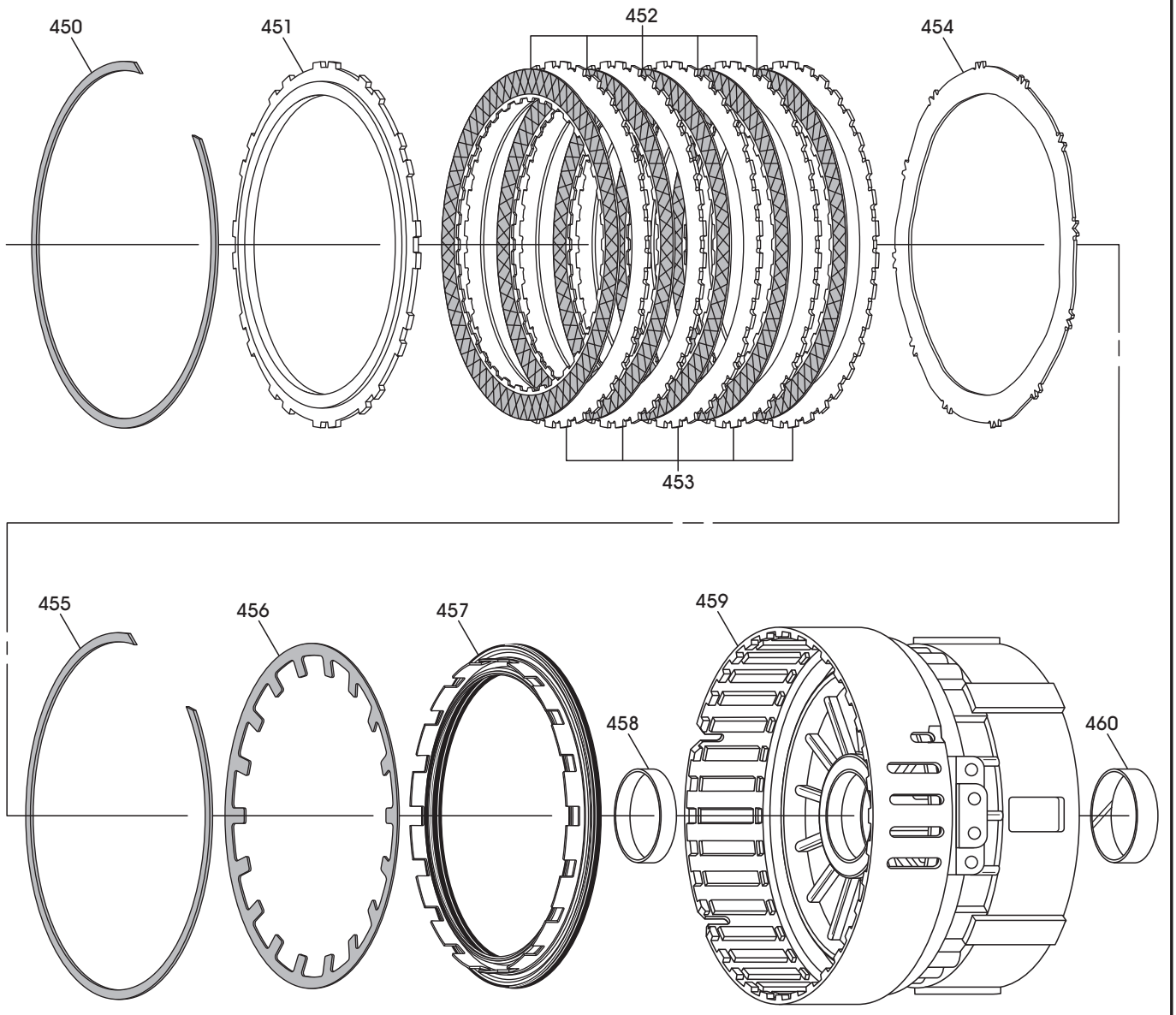


Figure 104

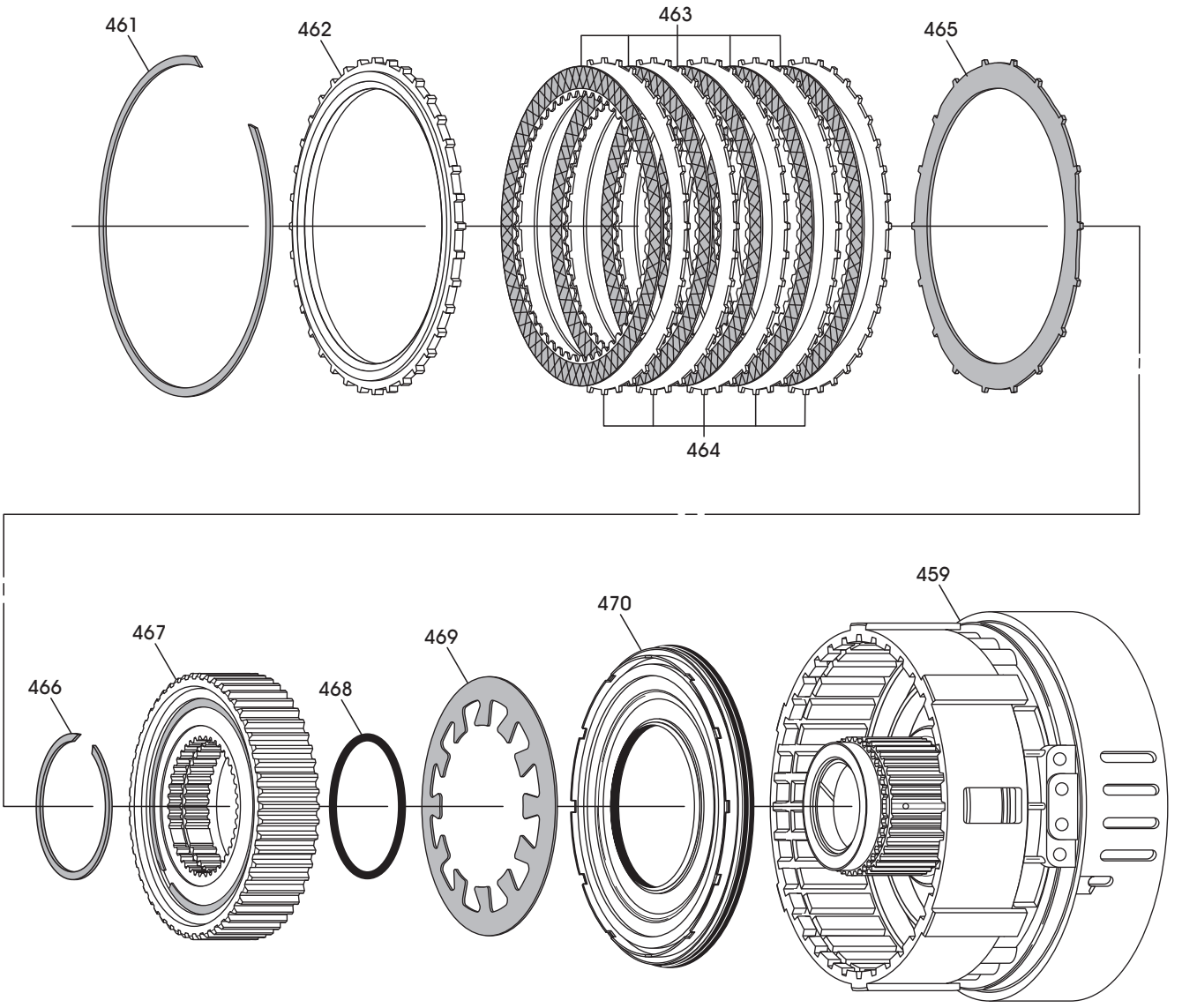
CENTER SUPPORT, FRONT SIDE, EXPLODED VIEW



450 2-6 CLUTCH BACKING PLATE SNAP RING
451 2-6 CLUTCH BACKING PLATE
452 2-6 CLUTCH FRICTION PLATES (5 REQUIRED)
453 2-6 CLUTCH STEEL PLATES (5 REQUIRED)
454 2-6 CLUTCH "WAVE" PLATE
455 2-6 CLUTCH "BELLVILLE" RETURN SPRING SNAP RING
456 2-6 CLUTCH "BELLVILLE" RETURN SPRING
457 2-6 CLUTCH APPLY PISTON ASSEMBLY
458 CENTER SUPPORT FRONT BUSHING
459 CENTER SUPPORT ASSEMBLY
460 CENTER SUPPORT REAR BUSHING

Figure 105

CENTER SUPPORT, REAR SIDE, EXPLODED VIEW



459 CENTER SUPPORT ASSEMBLY
461 LOW AND REVERSE CLUTCH BACKING PLATE SNAP RING
462 LOW AND REVERSE CLUTCH BACKING PLATE
463 LOW AND REVERSE CLUTCH FRICTION PLATES
464 LOW AND REVERSE CLUTCH STEEL PLATES
465 LOW AND REVERSE CLUTCH "WAVE" PLATE
466 LOW AND REVERSE CLUTCH RETURN SPRING SNAP RING
467 LOW CLUTCH SPRAG ASEMBLY
468 LOW CLUTCH SPRAG SEAL (FAT "O" RING)
469 LOW AND REVERSE CLUTCH "BELLVILLE" RETURN SPRING
470 LOW AND REVERSE CLUTCH APPLY PISTON

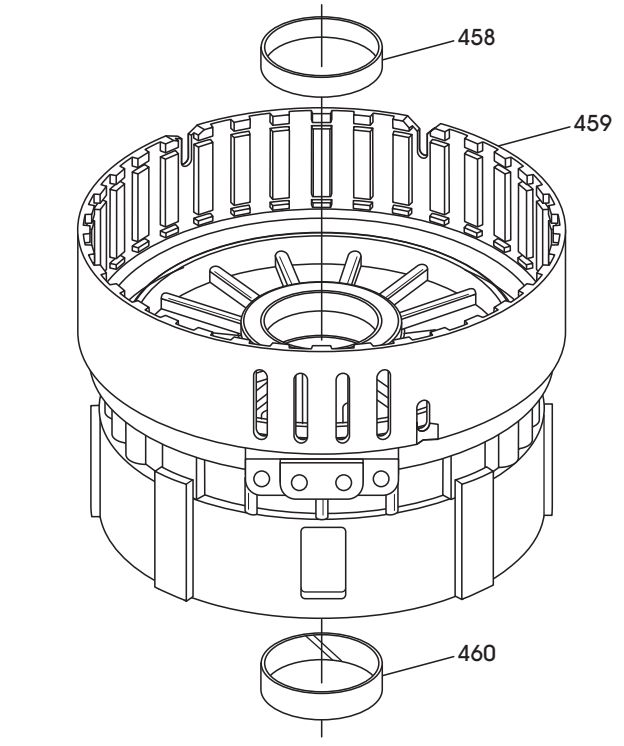
Figure 106

COMPONENT REBUILD

CENTER SUPPORT ASSEMBLY

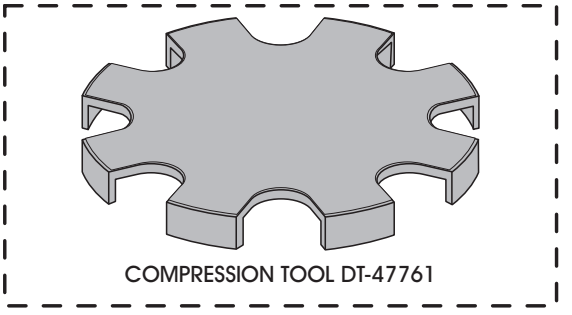
1. Disassemble the center support assembly using Figure 105 and 106 as a guide.
2. Clean all center support parts thoroughly and dry with compressed air.
3. Inspect all center support parts thoroughly for any wear and/or damage.
4. Replace center support bushings as necessary, as shown in Figure 107, using the proper size bushing drivers.
5. Place the center support on a flat work surface with the front side facing up (See Figure 108).
6. Lubricate the seal surfaces of a new 2-6 clutch piston and install piston into the center support, as shown in Figure 108.
7. Install the 2-6 clutch piston "bellville" return spring onto the piston with the tabs facing down, as shown in Figure 108, and that the tabs fit between the stands on the piston.
8. Using the compression tool DT-47761 shown in Figure 108, compress the return spring and install the snap ring.

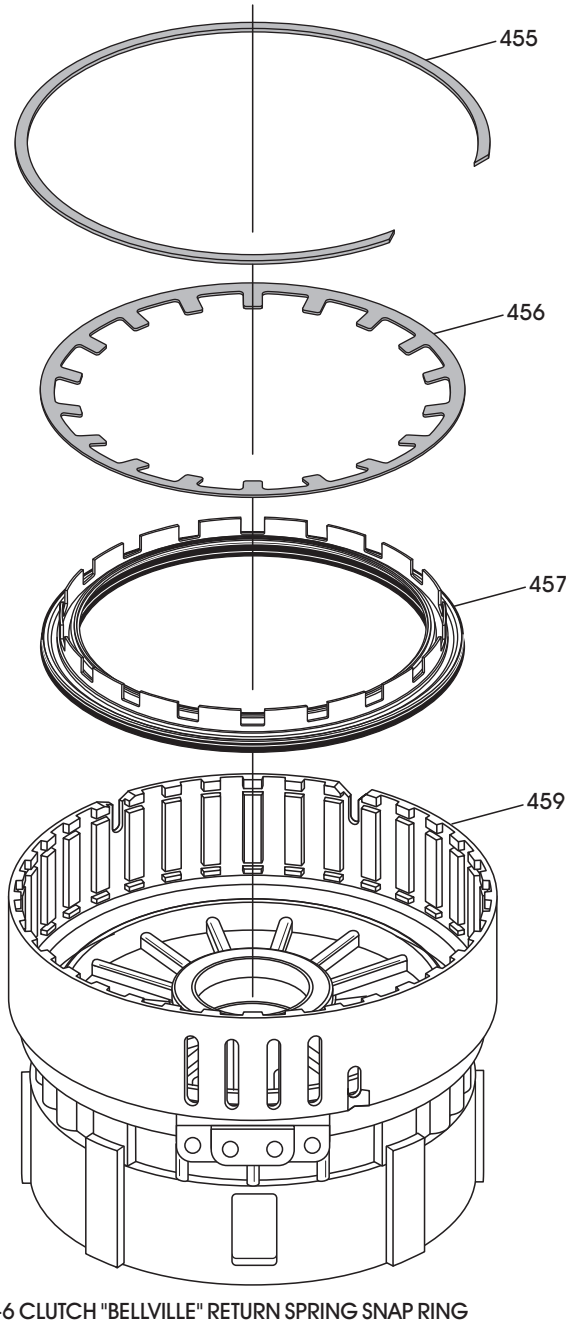
Continued on Page 67



458 CENTER SUPPORT FRONT BUSHING
459 CENTER SUPPORT ASSEMBLY
460 CENTER SUPPORT REAR BUSHING

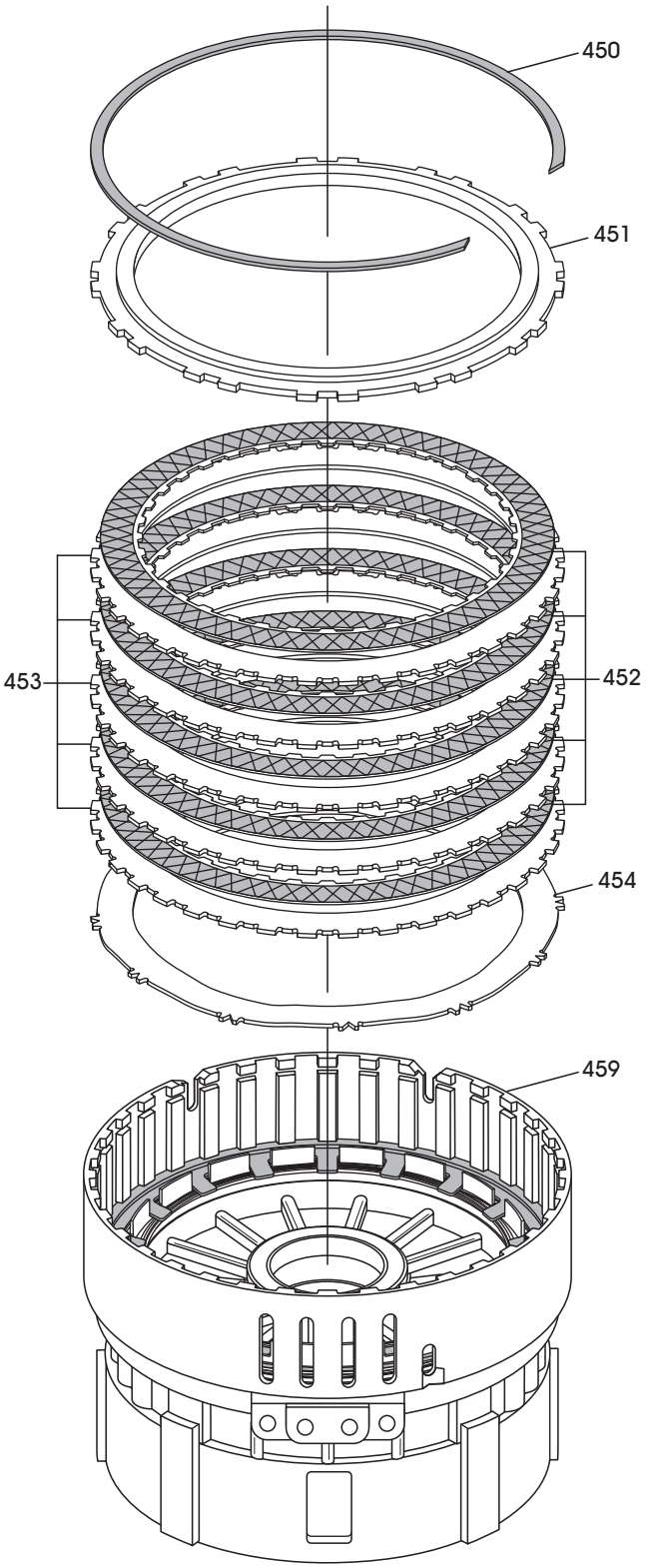
Figure 107





455 2-6 CLUTCH "BELLVILLE" RETURN SPRING SNAP RING
456 2-6 CLUTCH "BELLVILLE" RETURN SPRING
457 2-6 CLUTCH APPLY PISTON ASSEMBLY

Figure 108



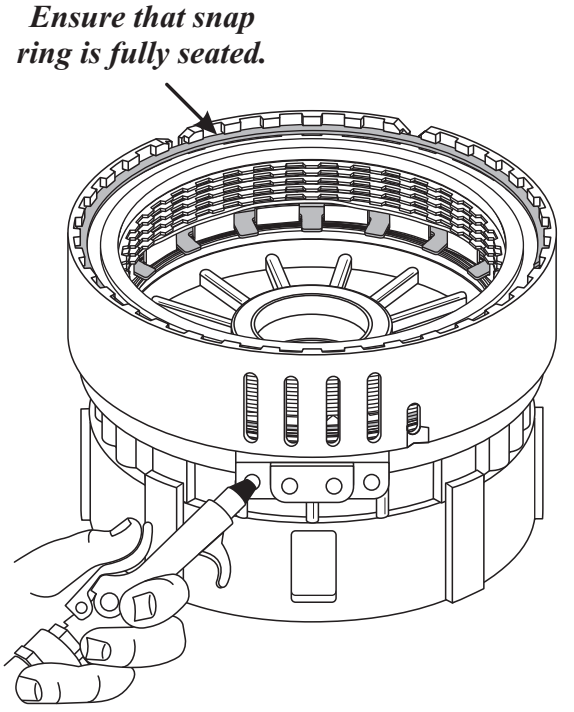
450 2-6 CLUTCH BACKING PLATE SNAP RING
451 2-6 CLUTCH BACKING PLATE
452 2-6 CLUTCH FRICTION PLATES (5 REQUIRED)
453 2-6 CLUTCH STEEL PLATES (5 REQUIRED)
454 2-6 CLUTCH "WAVE" PLATE
459 CENTER SUPPORT ASSEMBLY

Figure 109

CENTER SUPPORT ASSEMBLY (CONT'D)

9. Install the 2-6 clutch "wave" plate into center support, as shown in Figure 109.
10. Install the 2-6 clutch plates beginning with a steel plate and alternating with a friction plate until you have installed five of each, as shown in Figure 109.
11. Install the 2-6 clutch backing plate, as shown in Figure 109.
12. Install the 2-6 clutch backing plate snap ring, as shown in Figure 109.
13. There are ***no*** selectives for the 2-6 clutch pack. You should have approximately .050" clutch clearance. If you do not, you have mis-built the 2-6 clutch and you must do again.
14. Ensure that the snap ring is fully seated and air check the 2-6 clutch to verify integrity, as shown in Figure 110.

Continued on Page 68



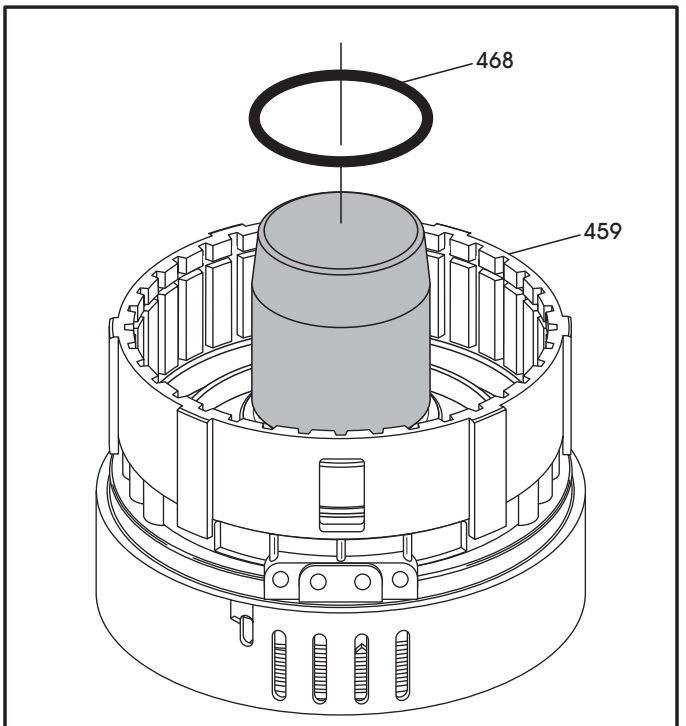
Apply air pressure regulated to 60 psi, to verify proper installation of all 2-6 clutch components, as there are NO selectives.

Figure 110

CENTER SUPPORT ASSEMBLY (CONT'D)

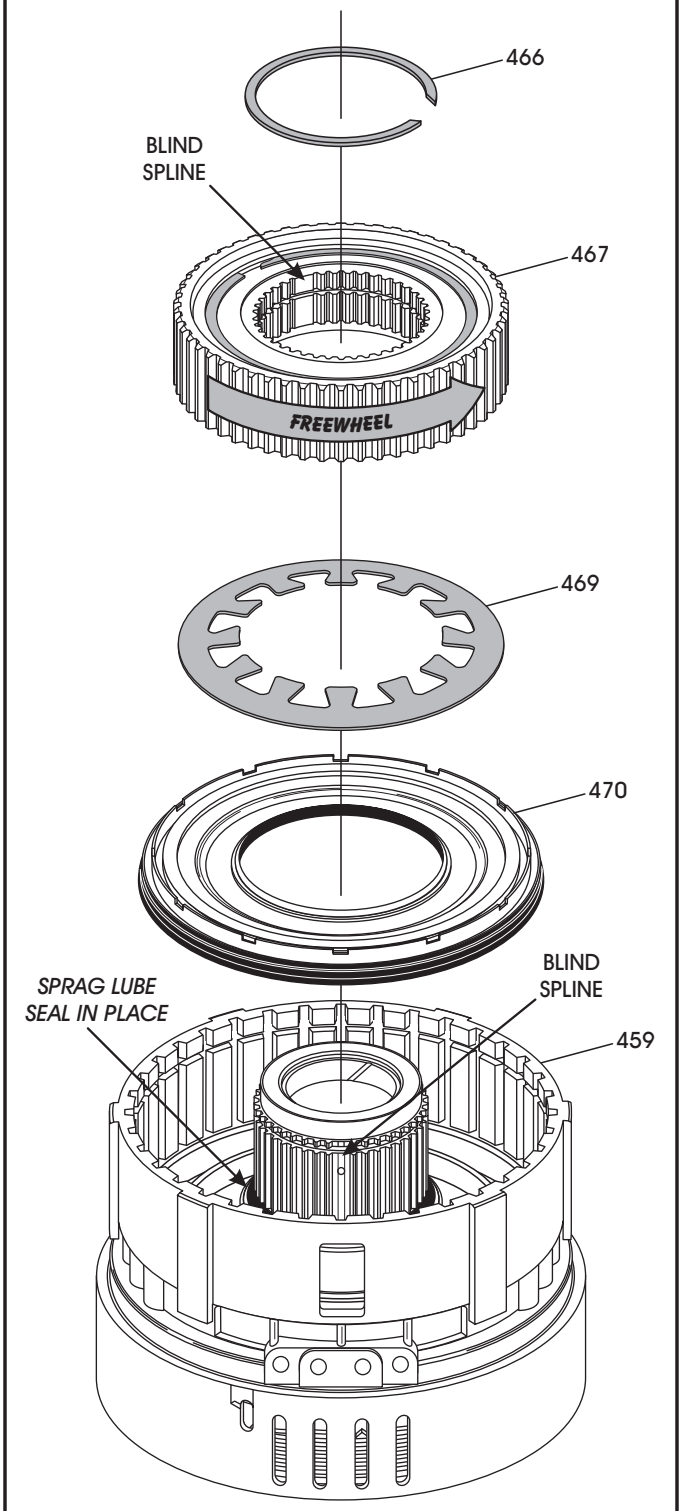
15. Turn the center support over on flat surface, as shown in Figure 111.
16. Install the sprag lube seal (Fat "O" Ring), as shown in Figure 111.
    Note: There is an installation cone available as shown in Figure 111, but is not really a mandatory tool.
17. Lubricate the seals on a new low/reverse clutch molded piston and install into center support, as shown in Figure 112.
18. Check for proper sprag rotation, as shown in Figure 112. Low sprag should freewheel in counter-clockwise direction while holding the inner race and lock in clockwise direction.
19. Install the low sprag assembly onto the hub of the center support, as shown in Figure 112.
    Note: Ensure the blind spline on the sprag inner race is aligned with the corresponding blind spline on center support hub. Some of the low sprags come apart with the removal of snap ring, as shown. Some low sprags come as a complete assembly and are only serviced as an assembly.

Continued on Page 69



459 CENTER SUPPORT ASSEMBLY
468 LOW CLUTCH SPRAG SEAL (FAT "O" RING)

Figure 111



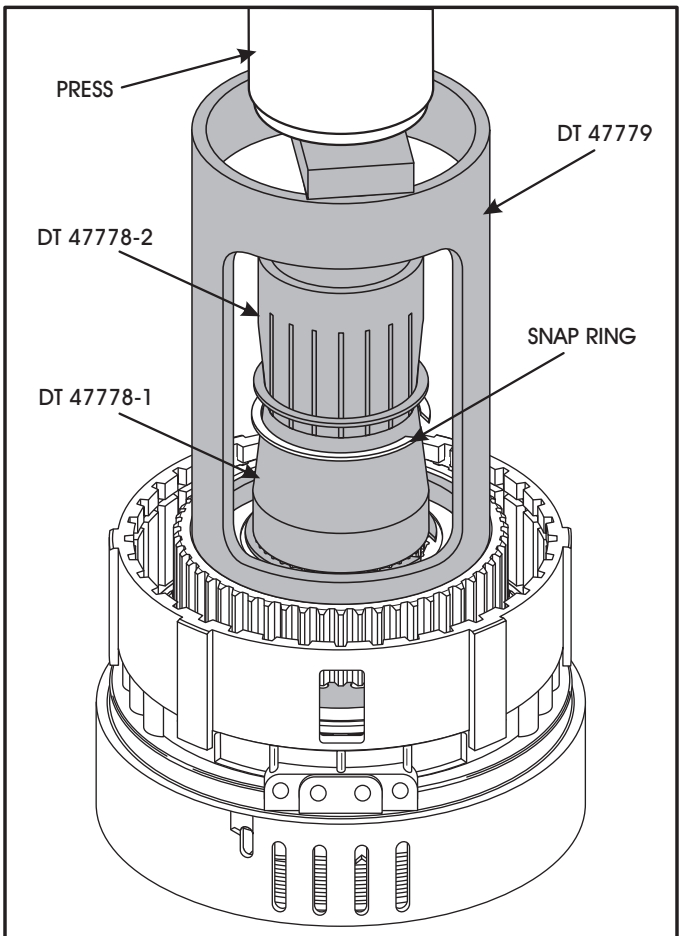
466 LOW AND REVERSE CLUTCH RETURN SPRING SNAP RING
467 LOW CLUTCH SPRAG ASSEMBLY
469 LOW AND REVERSE "BELLVILLE' RETURN SPRING
470 LOW AND REVERSE CLUTCH APPLY PISTON
459 CENTER SUPPORT ASSEMBLY

Figure 112

CENTER SUPPORT ASSEMBLY (CONT'D)

20. Compress the low sprag assembly using the compression tool DT-47779, as shown in Figure 113.
    Note: Ensure the compression tool contacts the sprag "outer" race and not the sprag snap ring.
21. Install ***new*** low sprag retaining snap ring using the installation tool, as shown in Figure 113.
    Note: Snap ring opening must be aligned with the blind spline on the inner race, as shown in Figure 114.
22. After installation, once again verify proper low sprag rotation, as shown in Figure 115.

Continued on Page 70



DT 47778-1 LOW CLUTCH SPRAG SNAP RING CONE
DT 47778-2 LOW CLUTCH SPRAG SNAP RING PUSHER
DT 47779 LOW CLUTCH RETURN SPRING COMPRESSOR

Figure 113

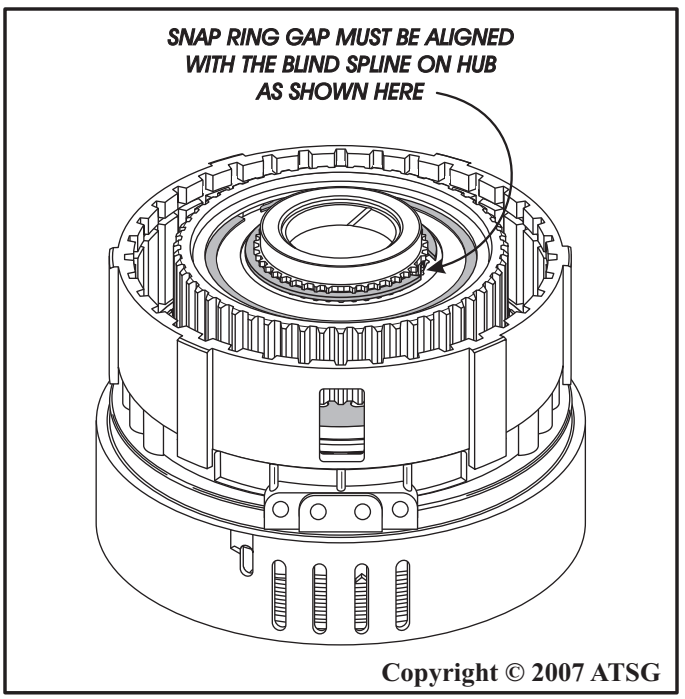


Figure 114

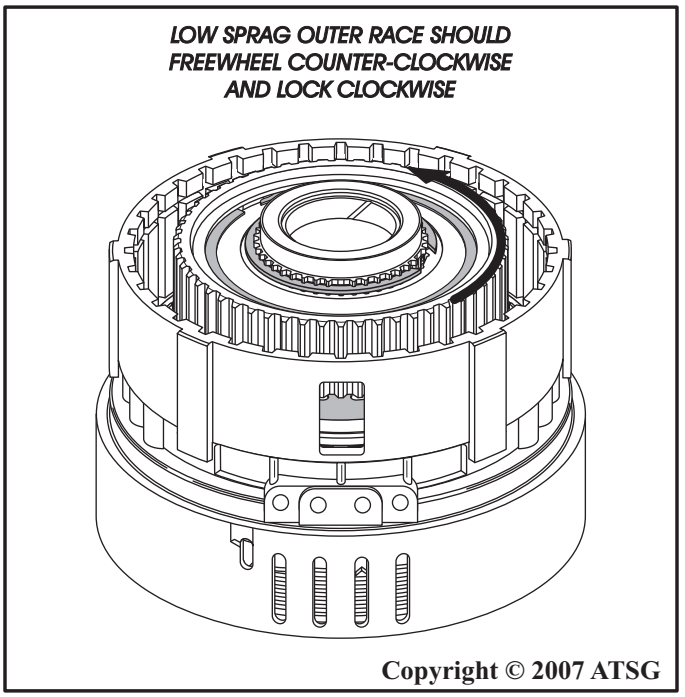
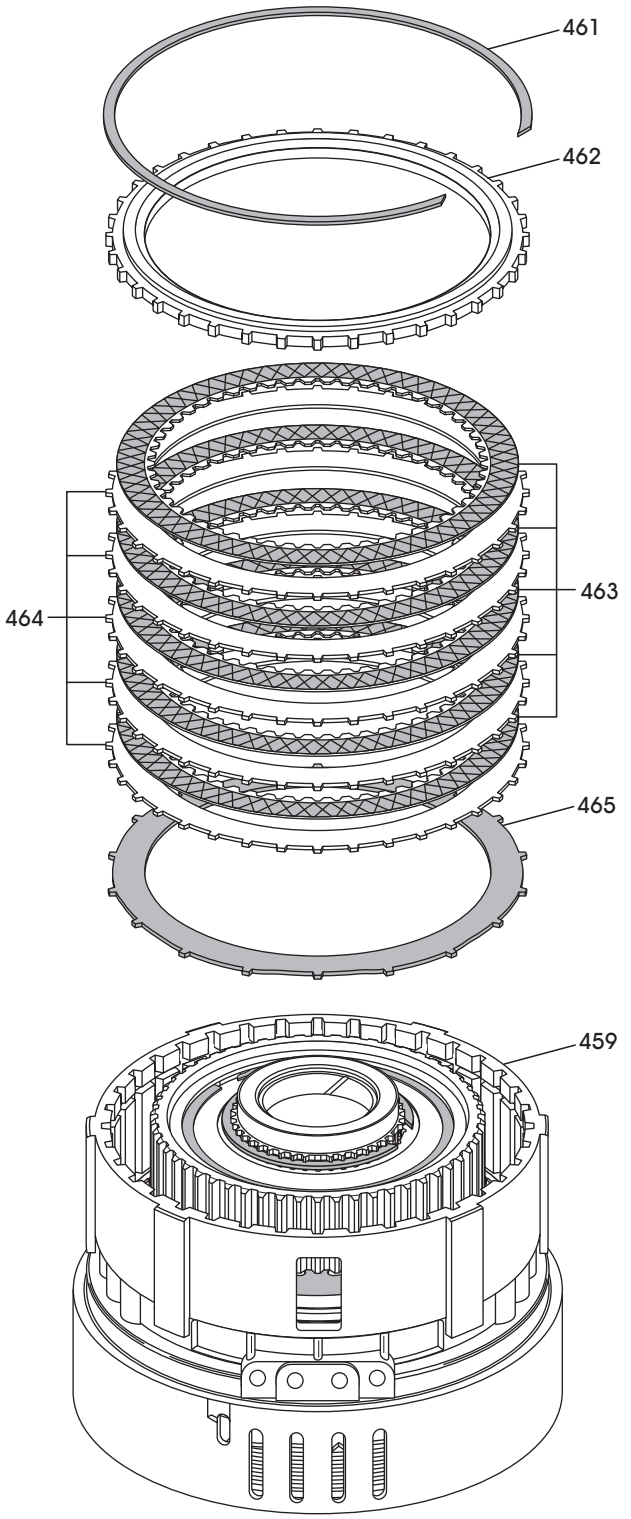


Figure 115



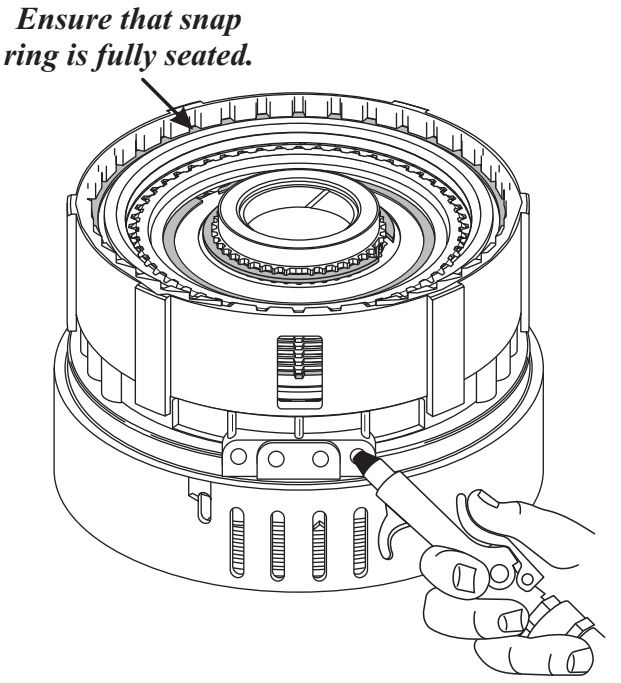
461 LOW AND REVERSE CLUTCH BACKING PLATE SNAP RING
462 LOW AND REVERSE CLUTCH BACKING PLATE
463 LOW AND REVERSE FRICTION PLATES (5 REQUIRED)
464 LOW AND REVERSE STEEL PLATES (5 REQUIRED)
465 LOW AND REVERSE "WAVE" PLATE
459 CENTER SUPPORT ASSEMBLY

Figure 116

CENTER SUPPORT ASSEMBLY (CONT'D)

23. Install the low/reverse clutch "wave" plate, as shown in Figure 116.
24. Install the low/reverse clutch plates beginning with a steel plate and alternating with a friction plate until you have installed five of each, as shown in Figure 116.
25. Install the low/reverse clutch backing plate, as shown in Figure 116.
26. Install the low/reverse clutch backing plate snap ring, as shown in Figure 116.
27. There are ***no*** selectives for the low/reverse clutch pack. You should have approximately .050" clearance. If you do not, you have mis-built the low/reverse clutch and you must do it again.
28. Ensure that the snap ring is fully seated and air check the low/reverse clutch to verify integrity, as shown in Figure 117.

Continued on Page 71

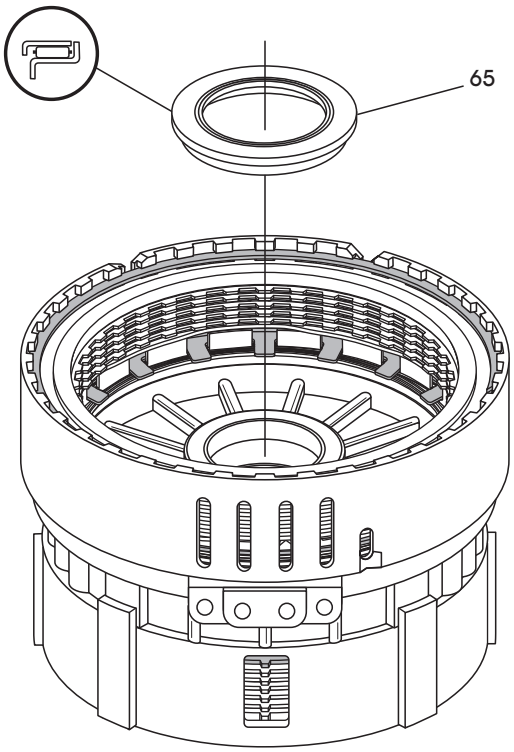


Apply air pressure, regulated to 60 psi, to verify proper installation of all Low/Reverse clutch components, as there are NO selectives.

Figure 117

CENTER SUPPORT ASSEMBLY (CONT'D)

29. Install the 2-6 and 3-5 reverse clutch hub thrust bearing in the direction shown in Figure 118, and retain with a small amount of Trans-Jel®.
30. Set the completed center support and large case snap ring aside for final assembly.



65 2-6 AND 3-5 REVERSE CLUTCH HUB THRUST BEARING

Figure 118

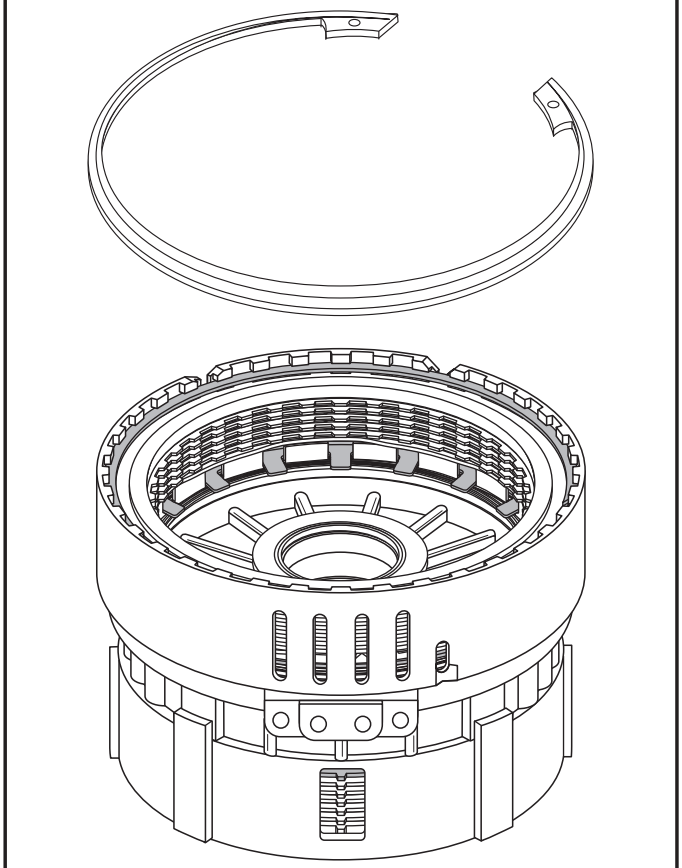


Figure 119

Component Rebuild
Continued on Page 72

COMPONENT REBUILD

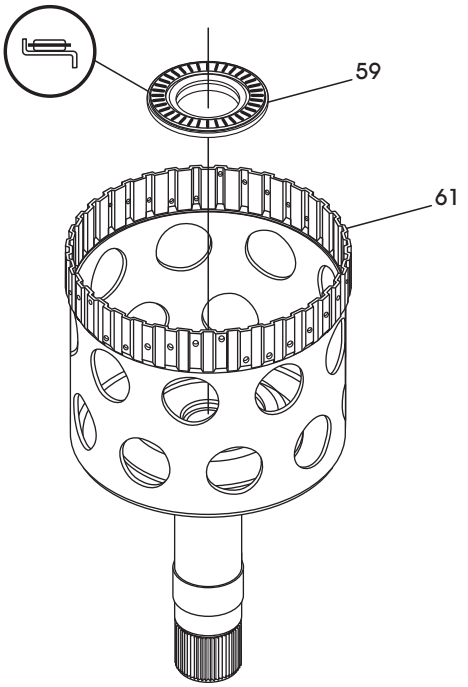
1-2-3-4 CLUTCH HUB AND SHAFT

1. Clean all 1-2-3-4 clutch hub and sun gear shaft parts thoroughly and dry with compressed air.
2. Inspect all 1-2-3-4 clutch hub and sun gear shaft parts thoroughly for any wear and/or damage.
3. Install the 4-5-6 clutch hub thrust bearing, as shown in Figure 120, and retain with a small amount of Trans-Jel®.
4. Set the 1-2-3-4 clutch hub and sun gear shaft assembly aside for final assembly.

2-6 AND 3-5 REVERSE CLUTCH HUB AND SHAFT

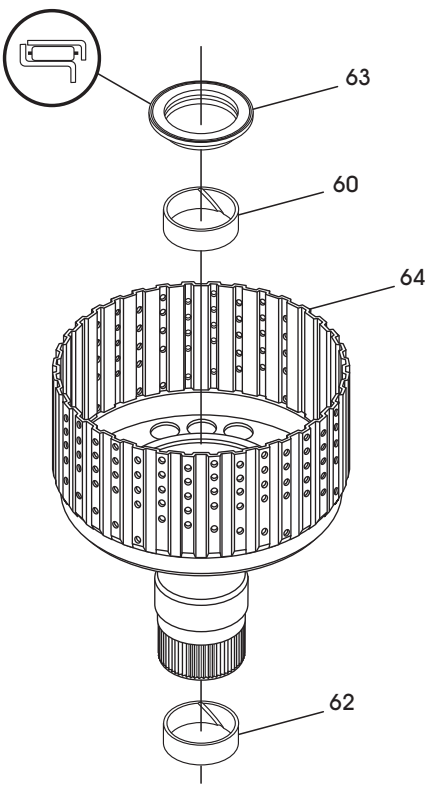
1. Clean all 2-6 and 3-5 reverse clutch hub and shaft parts thoroughly and dry with compressed air.
2. Inspect all 2-6 and 3-5 reverse clutch hub and shaft parts thoroughly for any wear and/or damage.
3. Install new bushings as necessary, as shown in Figure 121, using proper size bushing drivers.
4. Install the 1-2-3-4 clutch hub thrust bearing, as shown in Figure 121, and retain with a small amount of Trans-Jel®.
5. Set the 2-6 and 3-5 reverse clutch hub and sun gear shaft assembly aside for final assembly.

Component Rebuild
Continued on Page 73



59 4-5-6 CLUTCH HUB THRUST BEARING ASSEMBLY
61 1-2-3-4 CLUTCH HUB AND SUN GEAR SHAFT ASSEMBLY

Figure 120



60 2-6 AND 3-5 REVERSE HUB AND SHAFT FRONT BUSHING
62 2-6 AND 3-5 REVERSE HUB AND SHAFT REAR BUSHING
63 1-2-3-4 CLUTCH HUB THRUST BEARING ASSEMBLY

Figure 121

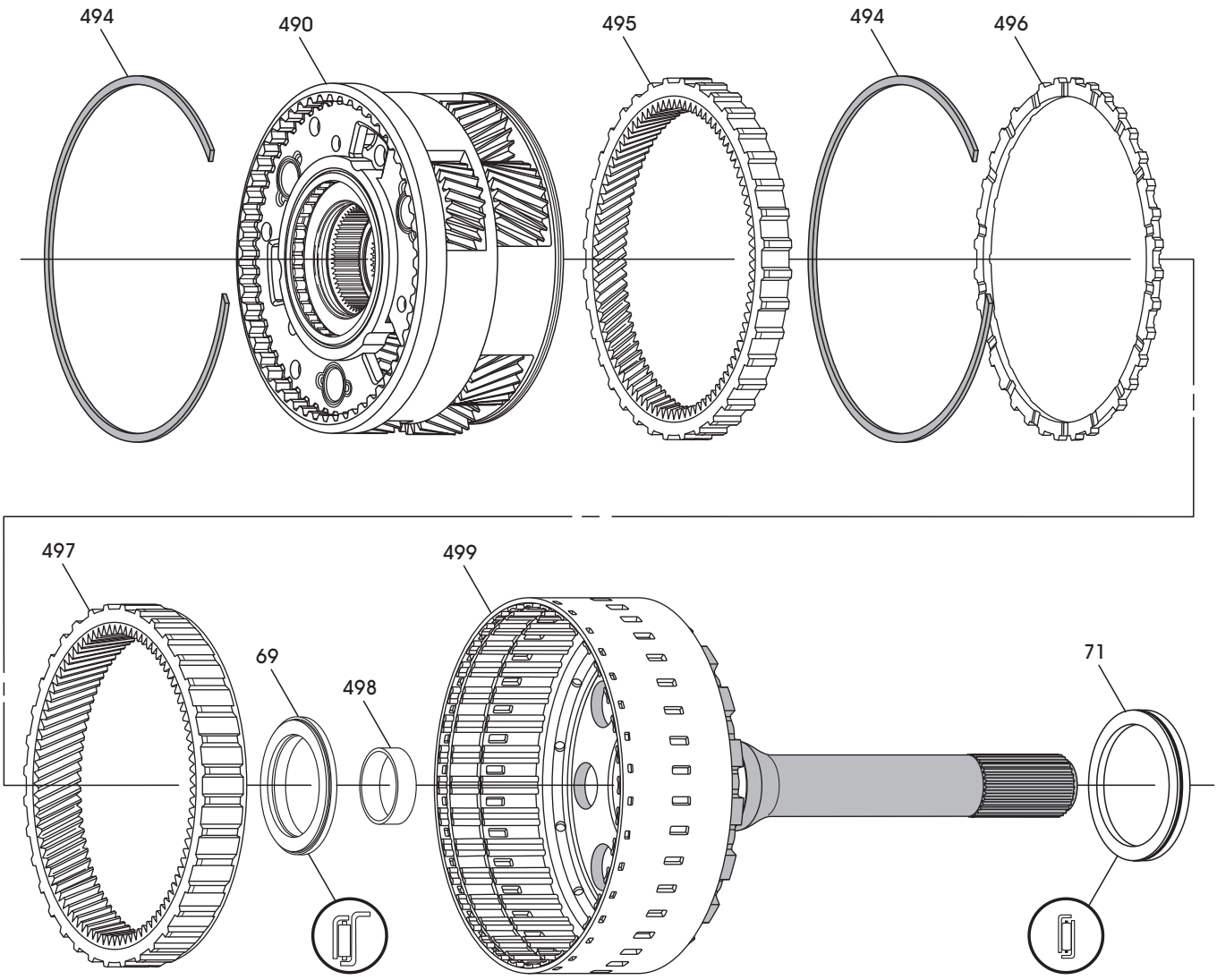
COMPONENT REBUILD

REAR CARRIER AND OUTPUT SHAFT

1. Disassemble the output shaft assembly using Figure 122 as a guide.
2. Clean all output shaft parts thoroughly and dry with compressed air.
3. Inspect all output shaft parts thoroughly for any wear and/or damage. Replace as necessary.
4. There are currently three different versions of the output shaft depending on model and all 3 are illustrated and identified in Figure 123.

Continued on Page 75

REAR PLANETARY CARRIER AND OUTPUT SHAFT EXPLODED VIEW



69 REAR CARRIER TO OUTPUT SHAFT THRUST BEARING
71 OUTPUT SHAFT TO CASE THRUST BEARING
490 OUTPUT CARRIER ASSEMBLY
494 RETAINING SNAP RING (2 REQUIRED)
495 OUTPUT CARRIER FRONT INTERNAL RING GEAR
496 OUTPUT CARRIER INTERNAL RING GEAR SPACER
497 OUTPUT CARRIER REAR INTERNAL RING GEAR
498 OUTPUT SHAFT BUSHING
499 OUTPUT SHAFT ASSEMBLY *(MODEL SENSITIVE)*

Figure 122

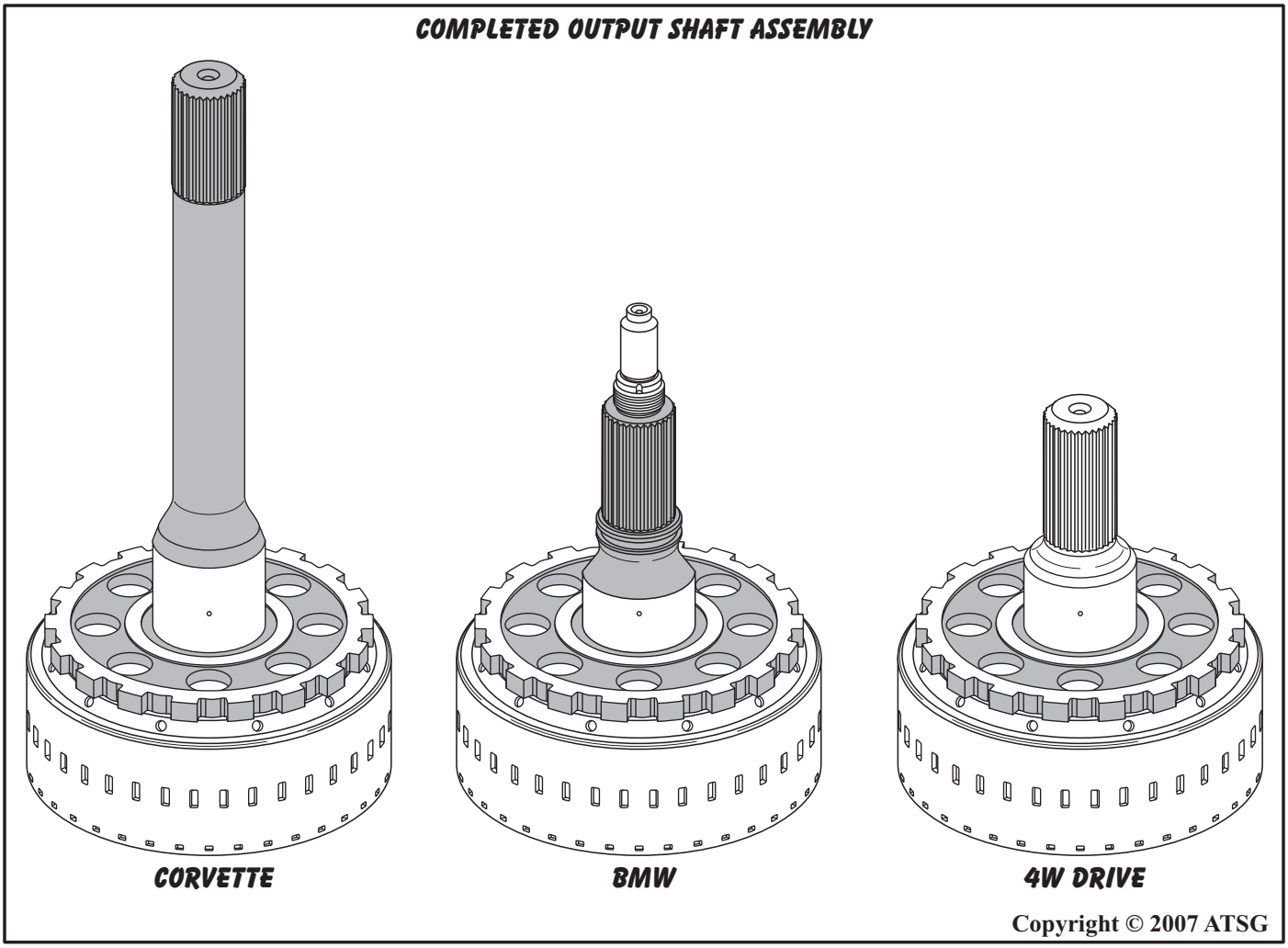
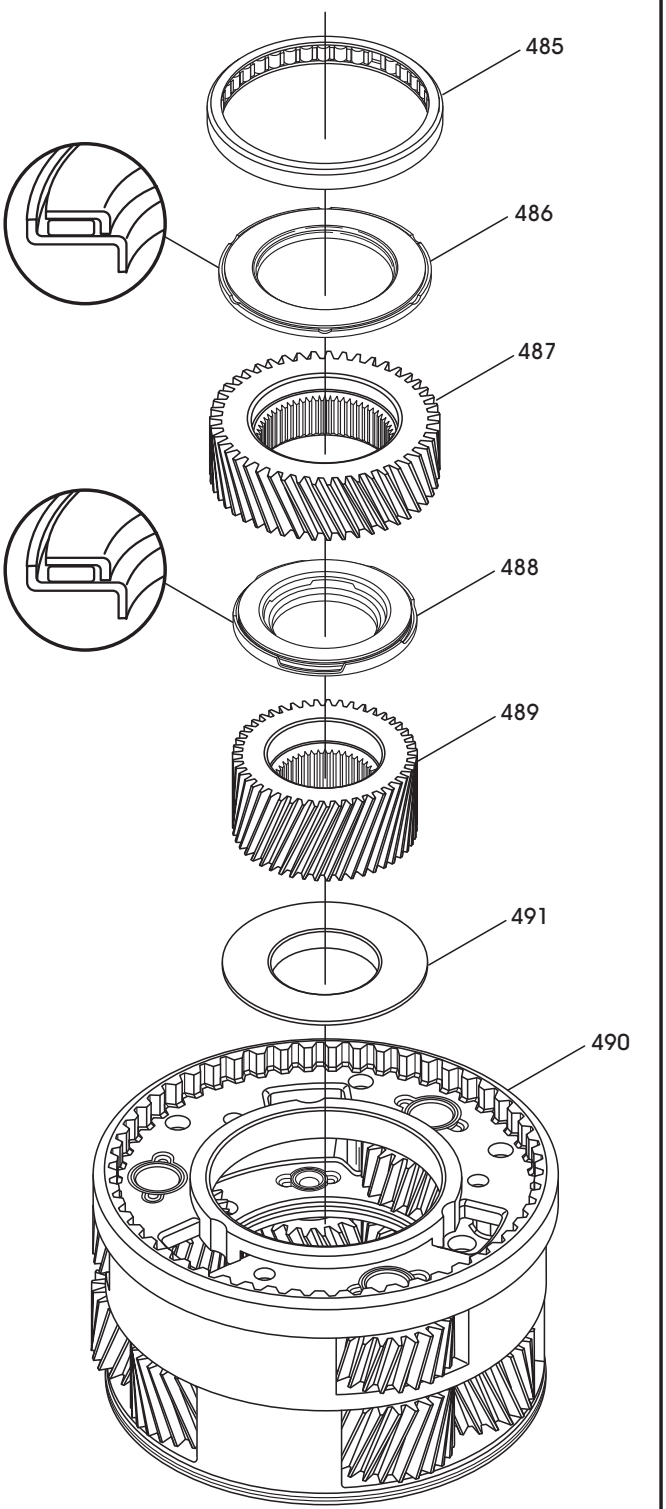

COMPLETED OUTPUT SHAFT ASSEMBLY
CORVETTE
BMW
4W DRIVE
Copyright © 2007 ATSG

Figure 123



485 CAGED ROLLER BEARING ASSEMBLY
486 OUTPUT CARRIER FRONT SUN GEAR THRUST BEARING
487 OUTPUT CARRIER FRONT SUN GEAR
488 OUTPUT CARRIER FRONT SUN GEAR REAR THRUST BEARING
489 OUTPUT CARRIER REAR SUN GEAR
490 OUTPUT CARRIER ASSEMBLY
491 OUTPUT CARRIER REAR SUN GEAR THRUST BEARING
(THIS IS A "CAPTURED" BEARING AND NOT SERVICED)

Figure 124

REAR CARRIER AND OUTPUT SHAFT (CONT'D)

5. Disassemble the rear planetary carrier using Figure 124 as a guide.
6. Remove and discard the center support roller bearing using a slide hammer, as shown in Figure 125.
   Note: Always install new roller bearing (485).
7. After bearing removal, remove parts, as shown in Figure 124.
   Note: The last bearing is a captured bearing and is not serviced. If this bearing (491) is damaged, it will require a carrier.

Continued on Page 76

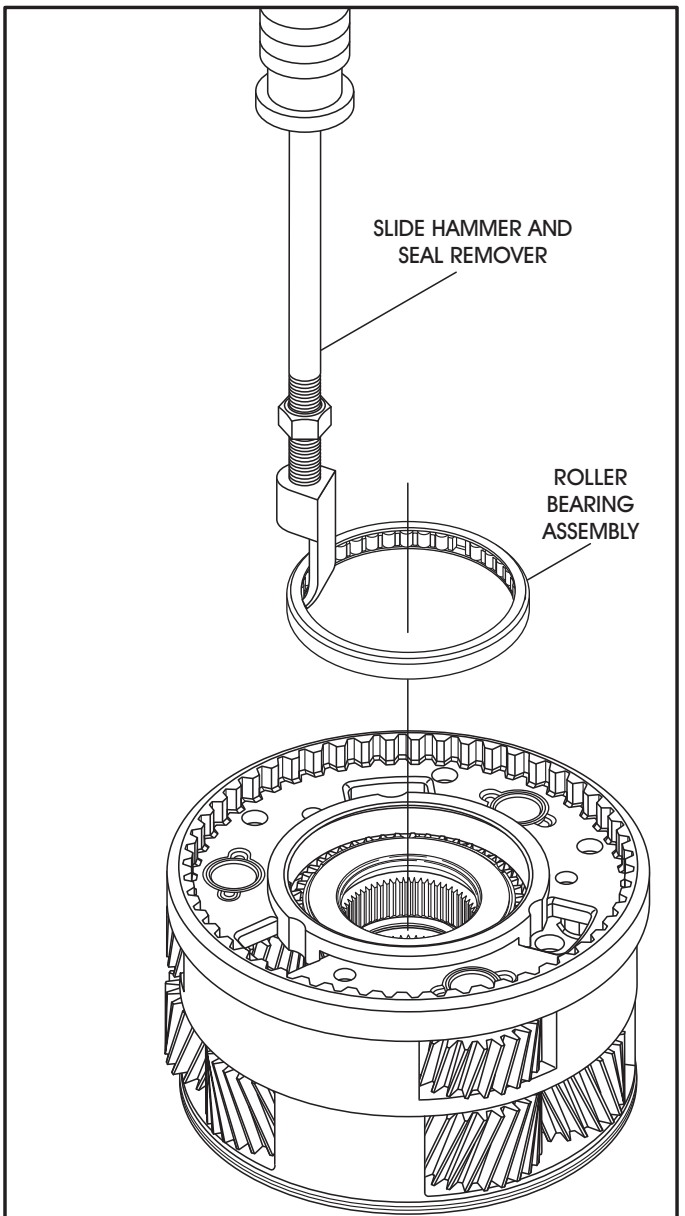
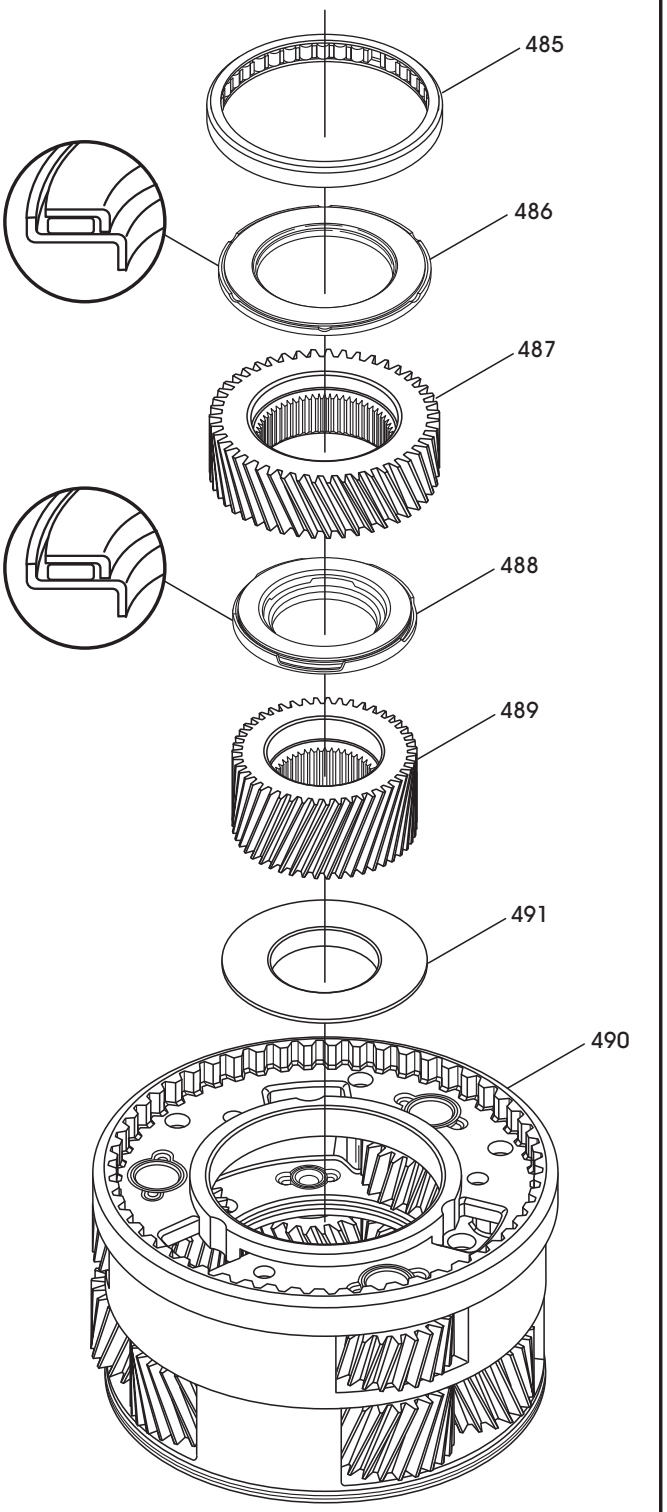


Figure 125



485 CAGED ROLLER BEARING ASSEMBLY
486 OUTPUT CARRIER FRONT SUN GEAR THRUST BEARING
487 OUTPUT CARRIER FRONT SUN GEAR
488 OUTPUT CARRIER FRONT SUN GEAR REAR THRUST BEARING
489 OUTPUT CARRIER REAR SUN GEAR
490 OUTPUT CARRIER ASSEMBLY
491 OUTPUT CARRIER REAR SUN GEAR THRUST BEARING
(THIS IS A "CAPTURED" BEARING AND NOT SERVICED)

Figure 126

REAR CARRIER AND OUTPUT SHAFT (CONT'D)

8. Install output carrier rear sun gear, as shown in Figure 126.
9. Install rear sun gear rear thrust bearing in the direction shown in Figure 126.
10. Install the front sun gear in carrier, as shown in Figure 126.
11. Install front sun gear front thrust bearing in the direction shown in Figure 126.
12. Install a new caged roller bearing using proper driver, as shown in Figure 127, and ensure the thick side of bearing is facing up.

Continued on Page 77

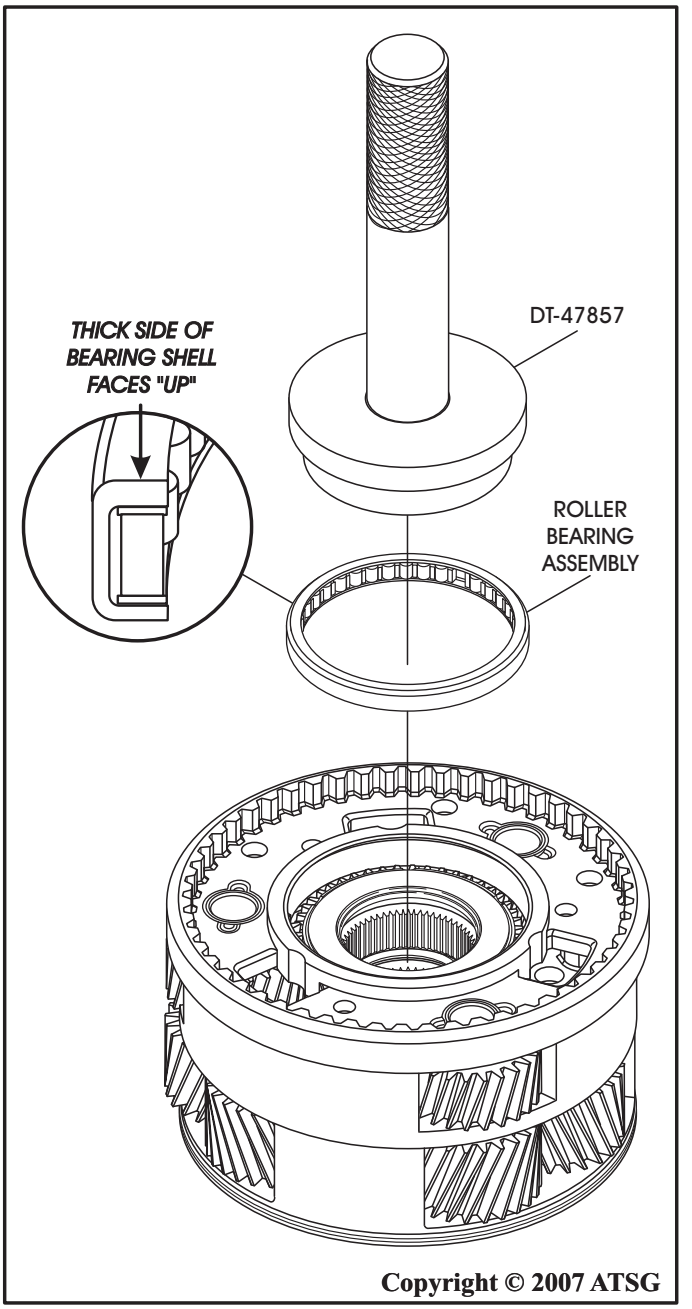


Figure 127

REAR CARRIER AND OUTPUT SHAFT (CONT'D)

13. Set completed rear planetary carrier assemby aside for now (See Figure 128).
14. Install a new bushing into the output shaft, as necessary using the proper bushing driver, as shown in Figure 129.
15. Install the output carrier rear internal ring gear with the step side facing down, as shown in Figure 129.
    Note: This is the thickest of the two internal ring gears.
16. Install the output carrier internal ring gear spacer, as shown in Figure 129.
17. Install the output carrier internal ring gear snap ring, as shown in Figure 129, and ensure that it is fully seated.

Continued on Page 78

COMPLETED REAR PLANETARY CARRIER

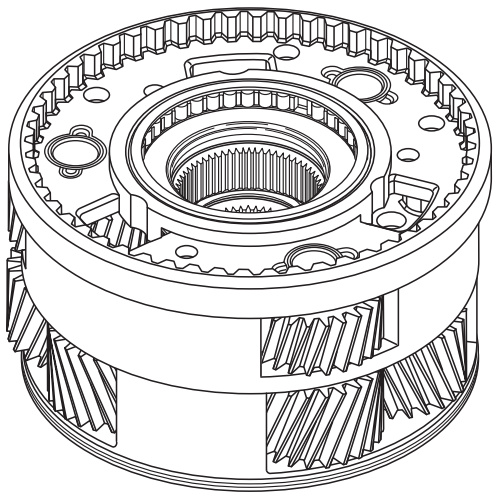
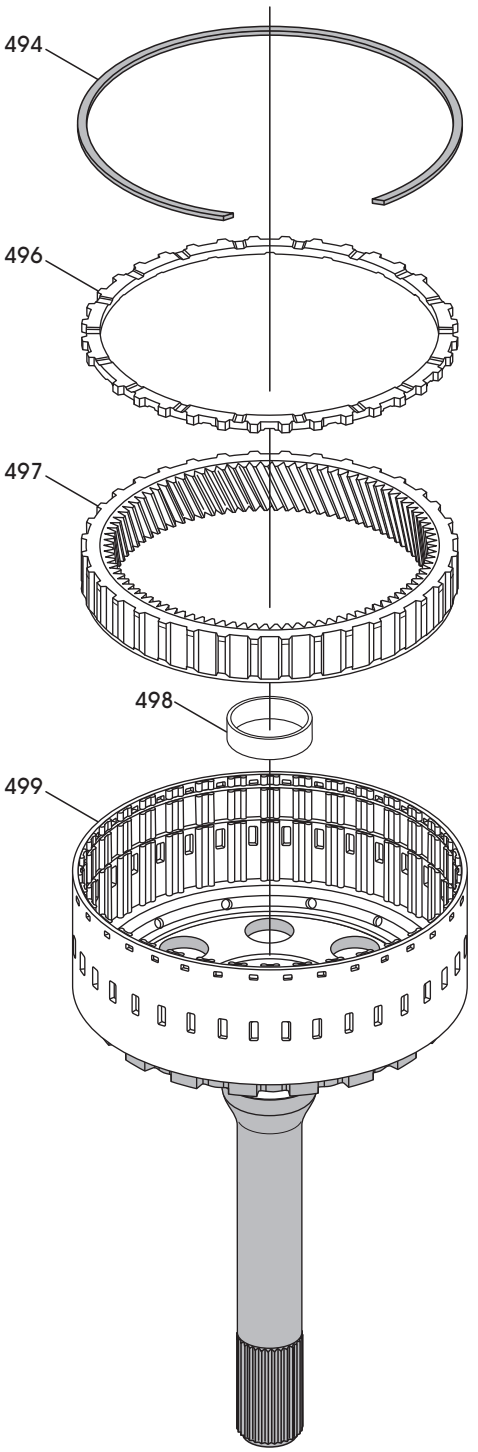


Figure 128



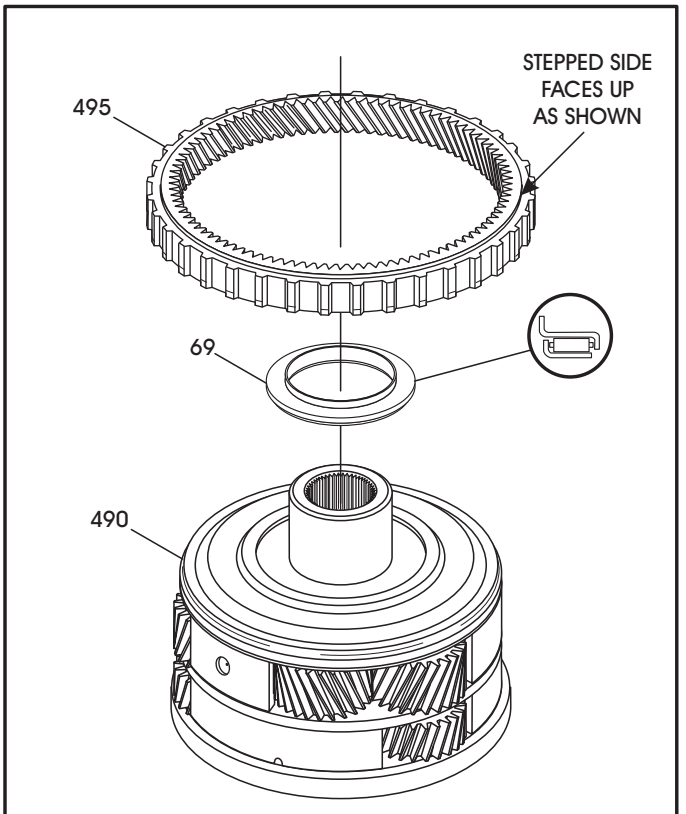
494 RETAINING SNAP RING (2 REQUIRED)
496 OUTPUT CARRIER INTERNAL RING GEAR SPACER
497 OUTPUT CARRIER REAR INTERNAL RING GEAR
498 OUTPUT SHAFT BUSHING
499 OUTPUT SHAFT ASSEMBLY *(MODEL SENSITIVE)*

Figure 129

REAR CARRIER AND OUTPUT SHAFT (CONT'D)

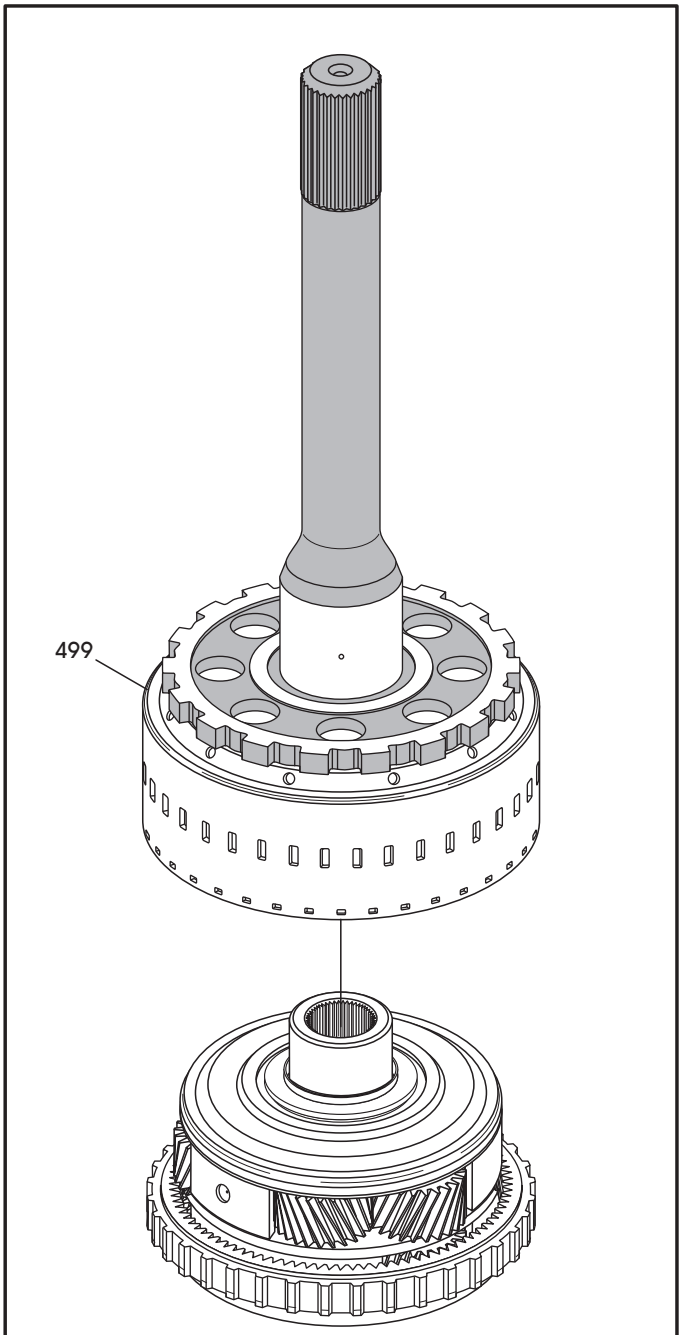
18. Place the pre-assembled rear planetary carrier assembly on flat work surface with the snap ring side facing down, as shown in Figure 130.
19. Install the output carrier to output shaft thrust bearing onto carrier in the direction shown in Figure 130.
20. Install the output carrier front internal ring gear onto the carrier with the stepped side facing up, as shown in Figure 130, and engage it with the bottom set of carrier pinion gears.
    Note: Should look like the illustration shown in Figure 131.
21. Install output shaft assembly over the output carrier, as shown in Figure 131.

Continued on Page 79



69 REAR CARRIER TO OUTPUT SHAFT THRUST BEARING
490 OUTPUT CARRIER ASSEMBLY
495 OUTPUT CARRIER FRONT INTERNAL RING GEAR

Figure 130



499 OUTPUT SHAFT ASSEMBLY *(MODEL SENSITIVE)*

Figure 131

REAR CARRIER AND OUTPUT SHAFT (CONT'D)

22. Turn the entire output carrier and output shaft assembly over and install the last retaining snap ring, as shown in Figure 132.
23. Install the DT-47786 lifting tool into the completed output shaft assembly, as shown in Figure 133, and set aside for final assembly.

Component Rebuild
Continued on Page 80

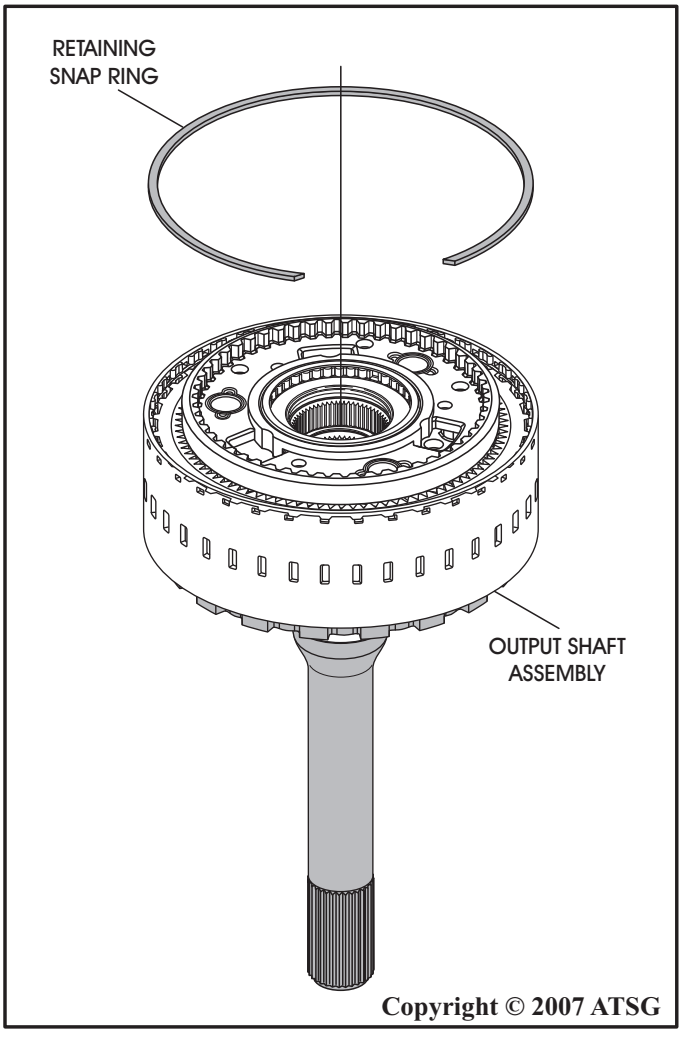


Figure 132

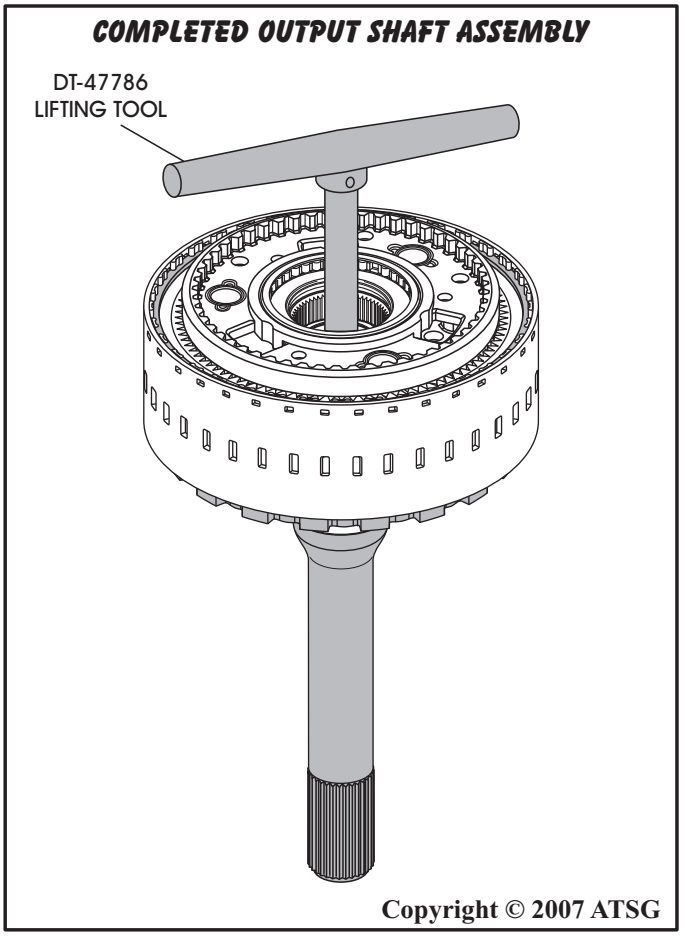


Figure 133

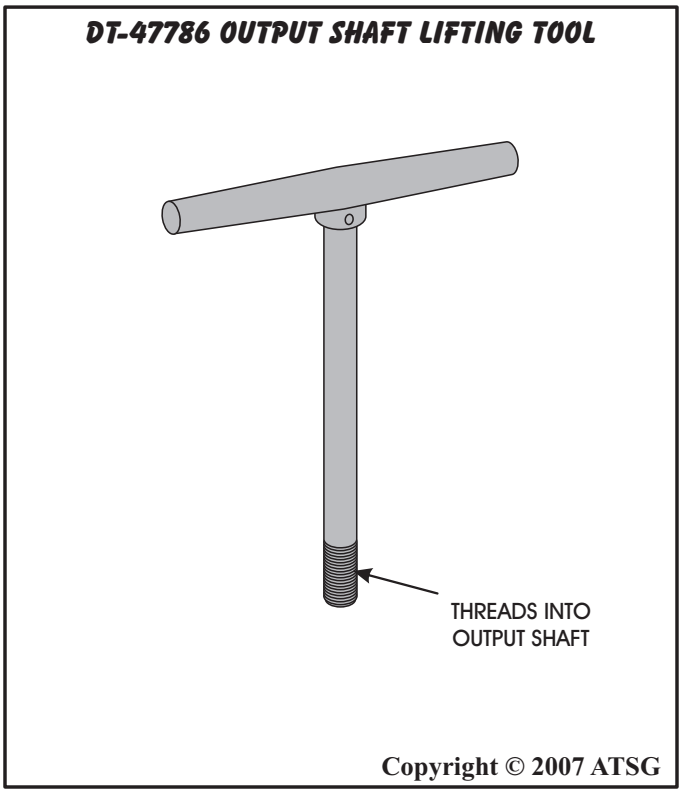
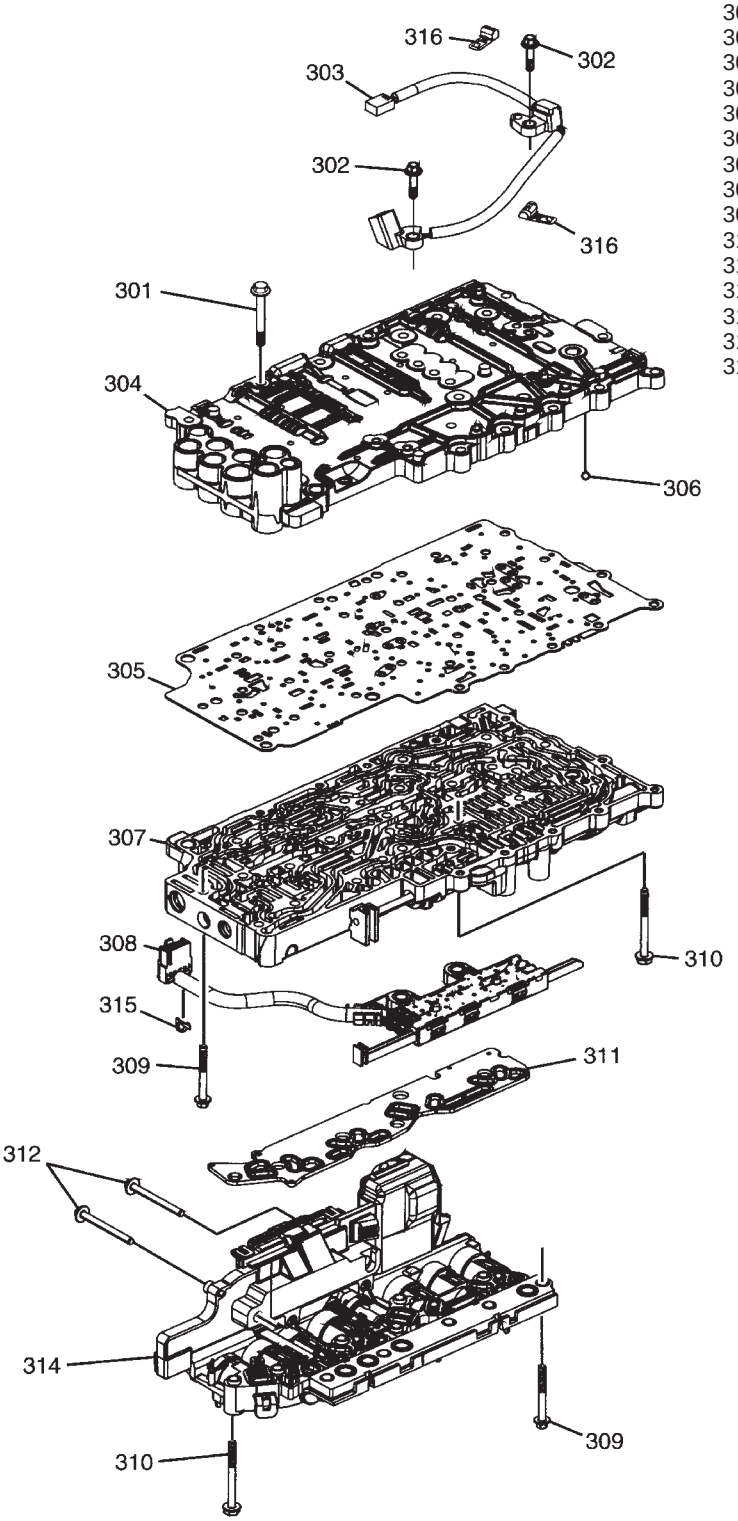


Figure 134

SOLENOID BODY AND VALVE BODY ASSEMBLY EXPLODED VIEW



301 Bolt, M5 X 36mm.
302 Bolt, M6 X 20mm.
303 Input and Output Speed Sensor Assembly.
304 Upper Valve Body Assembly.
305 Valve Body Spacer Plate Assembly (With Gasket).
306 Valve Body Check Balls (7 Required).
307 Lower Valve Body Assembly.
308 Internal Mode Switch Assembly.
309 Bolt, M5 X 45mm.
310 Bolt, M5 X 55mm.
311 Filter Plate Assembly.
312 Bolt, M5 X 53mm.
314 Control Solenoid Body And TCM Assembly.
315 Internal Mode Switch Wire Harness Clip.
316 Speed Sensor Wire Harness Clip (2 Required).

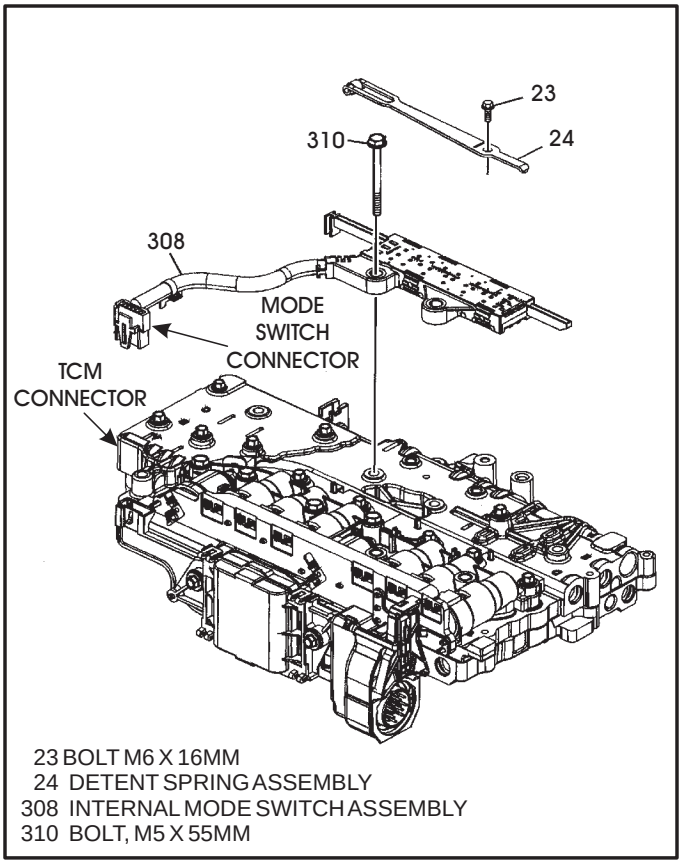
Figure 135

COMPONENT REBUILD

VALVE/SOLENOID BODY ASSEMBLY

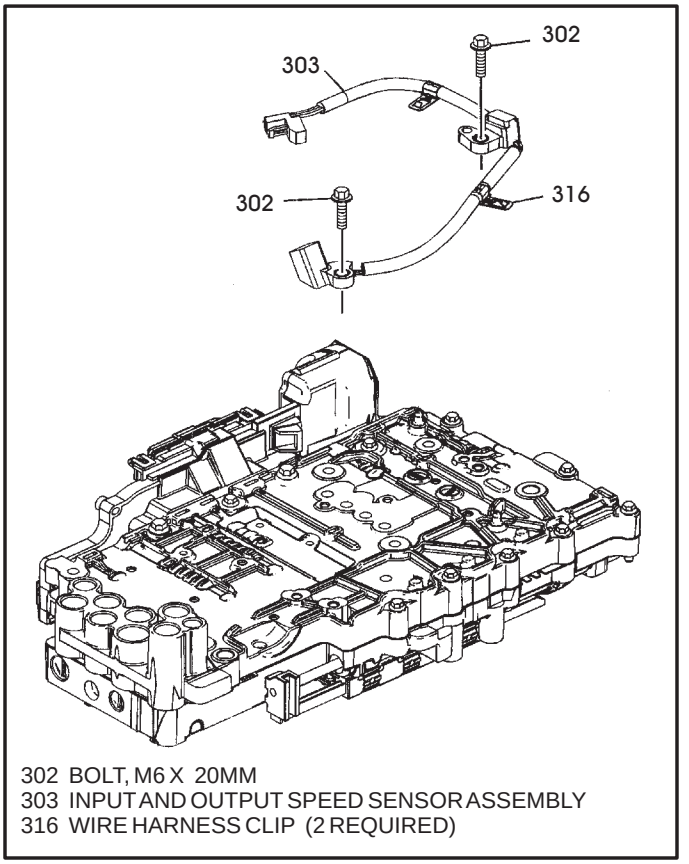
1. Remove the input and output speed sensor assembly by removing the retaining bolts on each sensor, as shown in Figure 136.
2. Disconnect Mode Switch electrical connector from the solenoid body/TCM, as shown in Figure 137.
3. Remove the internal mode switch assembly, as shown in Figure 137.
4. Remove the remaining bolts that retain the Solenoid Body/TCM assembly to the valve body, as shown in Figure 138, and remove the Solenoid Body/TCM assembly.
5. Remove and discard the gasket and screen assembly, as shown in Figure 138.

Continued on Page 82



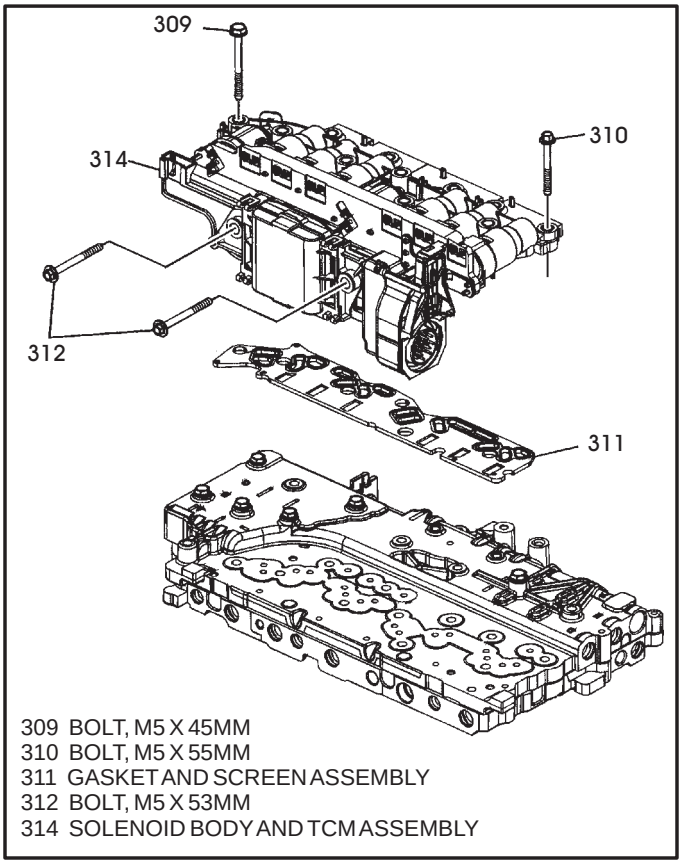
23 BOLT M6 X 16MM
24 DETENT SPRING ASSEMBLY
308 INTERNAL MODE SWITCH ASSEMBLY
310 BOLT, M5 X 55MM

Figure 137



302 BOLT, M6 X 20MM
303 INPUT AND OUTPUT SPEED SENSOR ASSEMBLY
316 WIRE HARNESS CLIP (2 REQUIRED)

Figure 136



309 BOLT, M5 X 45MM
310 BOLT, M5 X 55MM
311 GASKET AND SCREEN ASSEMBLY
312 BOLT, M5 X 53MM
314 SOLENOID BODY AND TCM ASSEMBLY

Figure 138

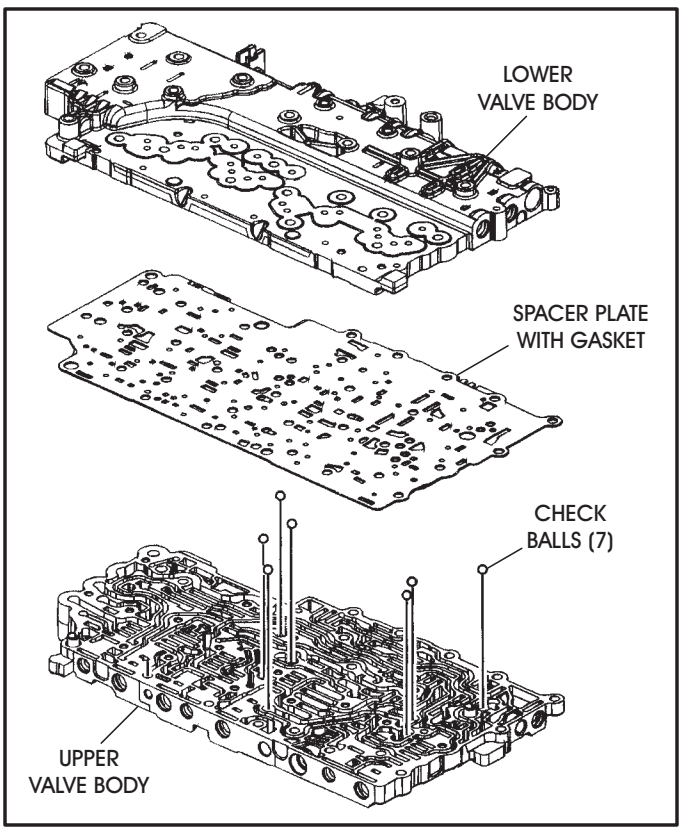


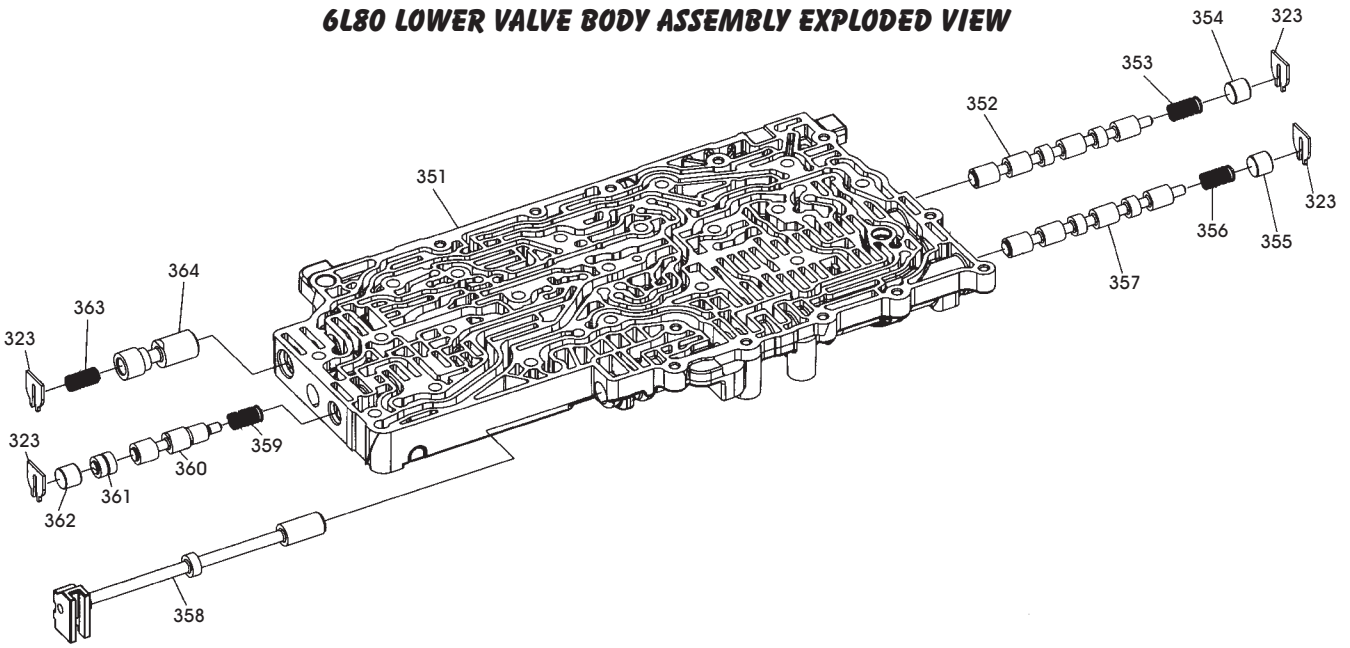
Figure 139

VALVE/SOLENOID BODY ASSEMBLY (CONT'D)

6. Remove the remaining bolts retaining lower and upper valve bodies and seperate the two, as shown in Figure 139.
7. Remove and discard the spacer plate/gasket assembly. Gasket is bonded to the plate. ***Note: GM recommends replacement of spacer plate on all rebuilds.***
8. Disassemble the lower valve body assembly using Figure 140 as a guide.
9. Lay each valve line-up out in order as you remove them from the valve body casting.
10. Inspect each valve, valve spring, bore plugs and retainers for any wear and/or damage.
11. Clean all lower valve body parts thoroughly and dry with compressed air.
12. Install each valve train back into their bores ***exactly***, as shown in Figure 140, lubricating them with Dexron VI® as they are installed.

Continued on Page 83

6L80 LOWER VALVE BODY ASSEMBLY EXPLODED VIEW



323 VALVE LINE-UP RETAINER (4 REQUIRED).
351 LOWER VALVE BODY CASTING.
352 CLUTCH SELECT VALVE 3.
353 CLUTCH SELECT VALVE 3 SPRING.
354 CLUTCH SELECT VALVE 3 BORE PLUG.
355 CLUTCH SELECT VALVE 2 BORE PLUG.
356 CLUTCH SELECT VALVE 2 SPRING.
358 MANUAL VALVE.
359 TCC REGULATOR VALVE SPRING.
360 TCC REGULATOR VALVE.
361 TCC REGULATOR SHUTTLE VALVE.
362 TCC REGULATOR VALVE BORE PLUG.
363 COMPENSATOR FEED REGULATOR VALVE SPRING.
364 COMPENSATOR FEED REGULATOR VALVE.

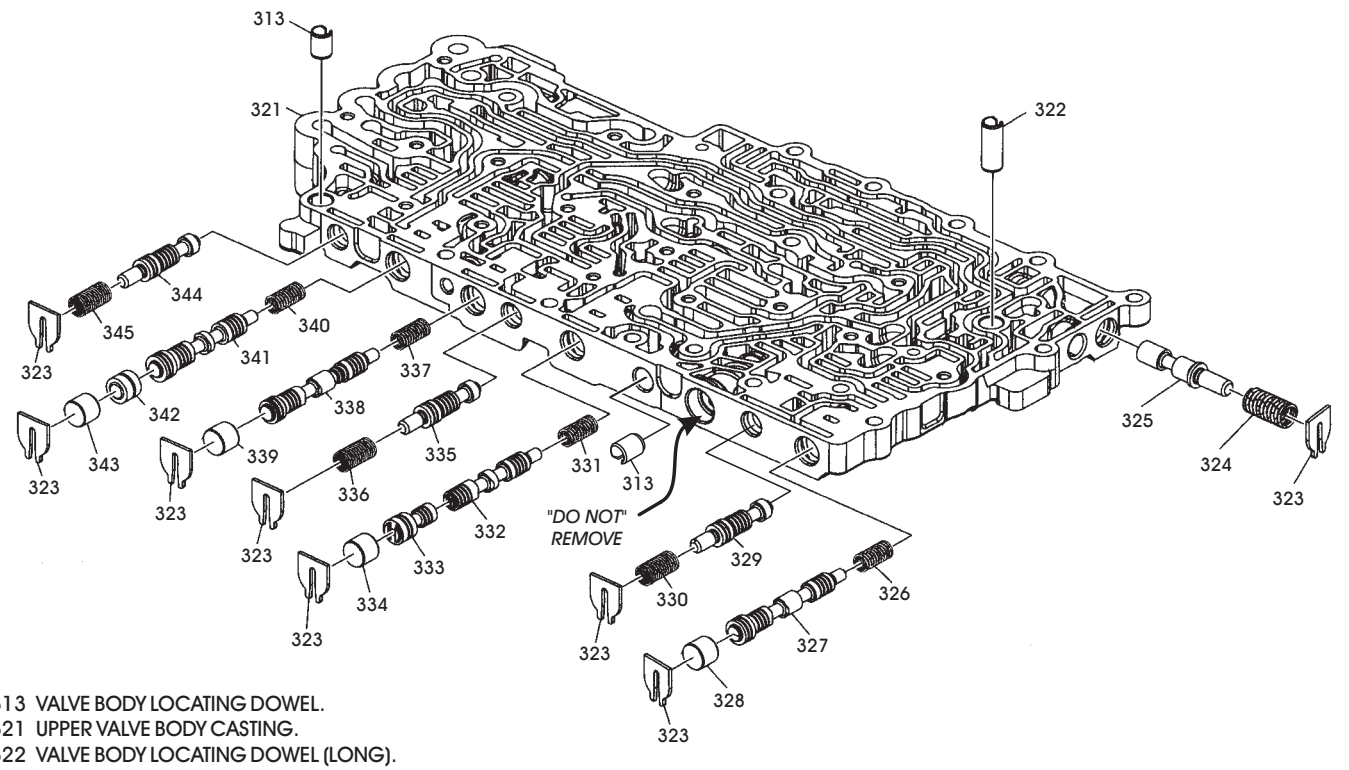
Figure 140

VALVE/SOLENOID BODY ASSEMBLY (CONT'D)

13. Disassemble the upper valve body assembly using Figure 141 as a guide.
    Special Note: "Do Not" remove the clutch piston backfill blow-off plug, spring, or ball. The bore plug is pressed in to a precise depth. Refer to Figure 141 for location in the upper valve body assembly.
14. Lay each valve line-up out in order as you remove them from the valve body casting.
15. Inspect each valve, valve spring, bore plugs and retainers for any wear and/or damage.
16. Clean all upper valve body parts thoroughly and dry with compressed air.
17. Install each valve train back into their bores ***exactly***, as shown in Figure 141, lubricating them with Dexron VI® as they are installed.

Continued on Page 84

6L80 UPPER VALVE BODY ASSEMBLY EXPLODED VIEW



313 VALVE BODY LOCATING DOWEL.
321 UPPER VALVE BODY CASTING.
322 VALVE BODY LOCATING DOWEL (LONG).
323 VALVE LINE-UP RETAINER (8 REQUIRED).
324 ACTUATOR FEED LIMIT VALVE SPRING.
325 ACTUATOR FEED LIMIT VALVE.
326 1ST/REV AND 4-5-6 CLUTCH REGULATOR VALVE SPRING.
327 1ST/REV AND 4-5-6 CLUTCH REGULATOR VALVE.
328 1ST/REV AND 4-5-6 CLUTCH REGULATOR VALVE BORE PLUG.
329 1ST/REV AND 4-5-6 CLUTCH BOOST VALVE.
330 1ST/REV AND 4-5-6 CLUTCH BOOST VALVE SPRING.
331 2-6 CLUTCH REGULATOR VALVE SPRING.
332 2-6 CLUTCH REGULATOR VALVE.
333 2-6 CLUTCH REGULATOR VALVE GAIN VALVE.
334 2-6 CLUTCH REGULATOR VALVE BORE PLUG.
335 3-5/REVERSE CLUTCH BOOST VALVE.
336 3-5/REVERSE CLUTCH BOOST VALVE SPRING.
337 3-5/REVERSE CLUTCH REGULATOR VALVE SPRING.
338 3-5/REVERSE CLUTCH REGULATOR VALVE.
339 3-5/REVERSE CLUTCH REGULATOR VALVE BORE PLUG.
340 1-2-3-4 CLUTCH REGULATOR VALVE SPRING.
341 1-2-3-4 CLUTCH REGULATOR VALVE.
342 1-2-3-4 CLUTCH SHUTTLE VALVE.
343 1-2-3-4 CLUTCH REGULATOR VALVE BORE PLUG.
344 1-2-3-4 CLUTCH BOOST VALVE.
345 1-2-3-4 CLUTCH BOOST VALVE SPRING.

Figure 141

VALVE/SOLENOID BODY ASSEMBLY (CONT'D)

18. Install the seven (7) checkballs in their proper locations in the upper valve body, as shown in Figure 142.
19. Install the valve body locating dowels in the upper valve body, as shown in Figure 141.
20. Install a ***new*** spacer plate and gasket assembly over locating dowels, as shown in Figure 143. ***Note: GM recommends the spacer plate be replaced on all rebuilds because of gaskets being bonded to spacer plate.***
21. Install the lower valve body over the locating dowels and on top of the spacer plate, as shown in Figure 143.
22. Turn the complete assembly over and install 12 valve body bolts, 36mm in length, in locations shown in Figure 144.

Continued on Page 85

VALVE BODY CHECKBALL LOCATIONS

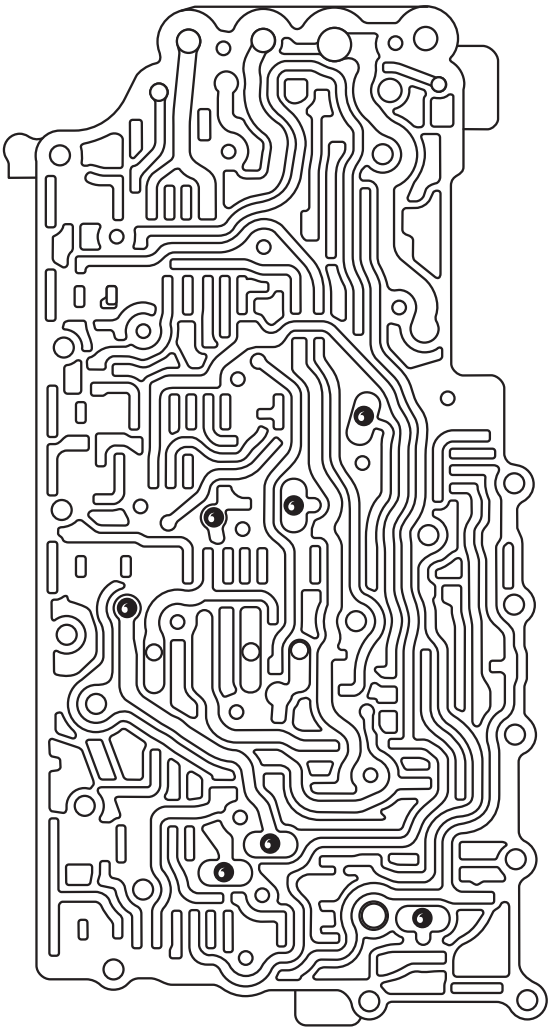
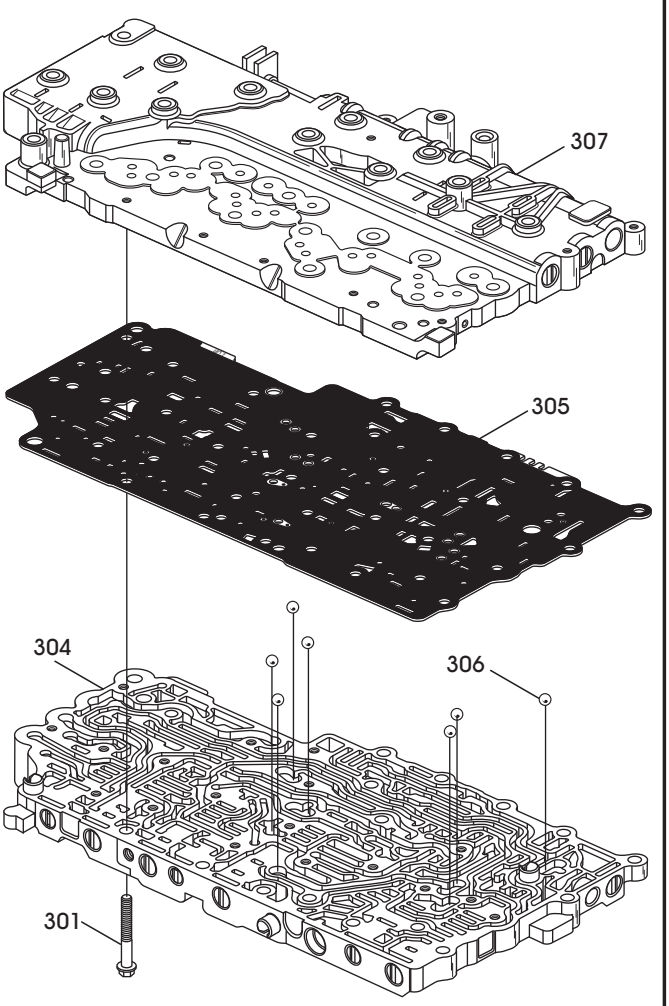


Figure 142



301 VALVE BODY BOLT M5 X 36MM (12 REQUIRED)
304 UPPER VALVE BODY ASSEMBLY
305 VALVE BODY SPACER PLATE ASSEMBLY (WITH GASKETS)
306 VALVE BODY CHECKBALLS (7 REQUIRED)
307 LOWER VALVE BODY ASSEMBLY

Figure 143

VALVE/SOLENOID BODY ASSEMBLY (CONT'D)

23. Torque the 12 upper valve body to lower valve body bolts to 8 N·m (71 in.lb.), using the sequence shown in Figure 144.
24. Install a ***new*** filter plate and gasket (311) on Solenoid Body/TCM assembly, as shown in Figure 145, ensuring that it goes over locating dowels and snaps into place.
25. Install the Solenoid Body/TCM onto the valve body and start the two attaching bolts through the side, as shown in Figure 146, and hand tighten only at this time.
    Note: Solenoid Body/TCM assembly must be aligned with the locating dowel, as shown in Figure 146.

Continued on Page 86

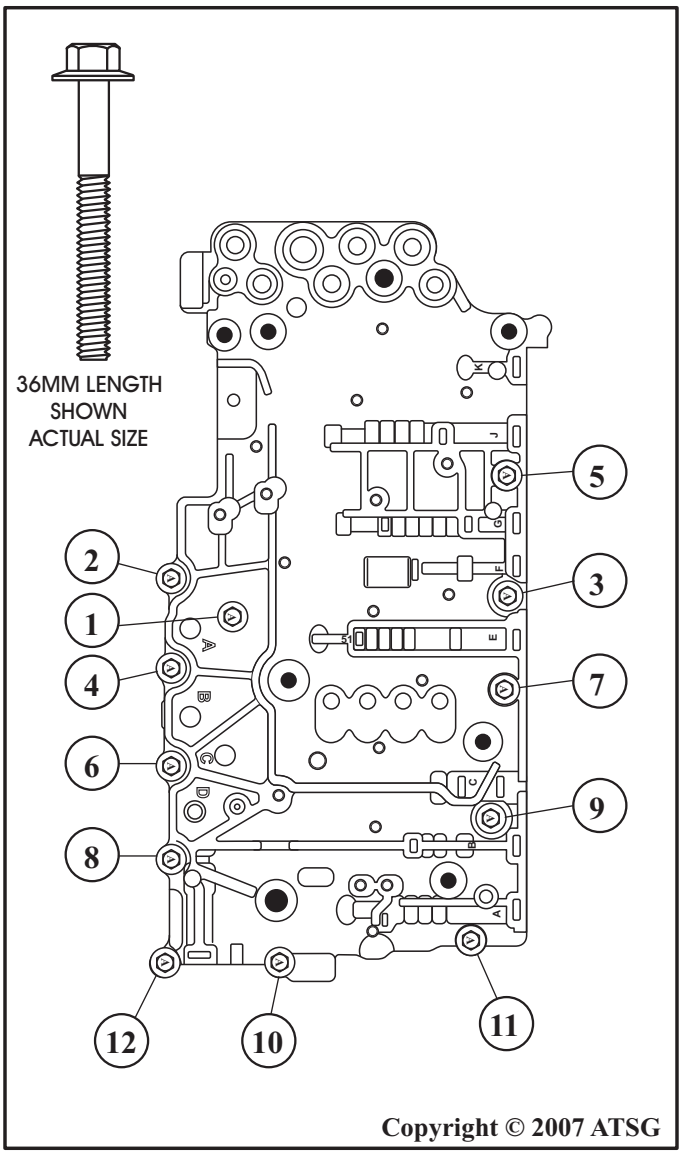


Figure 144

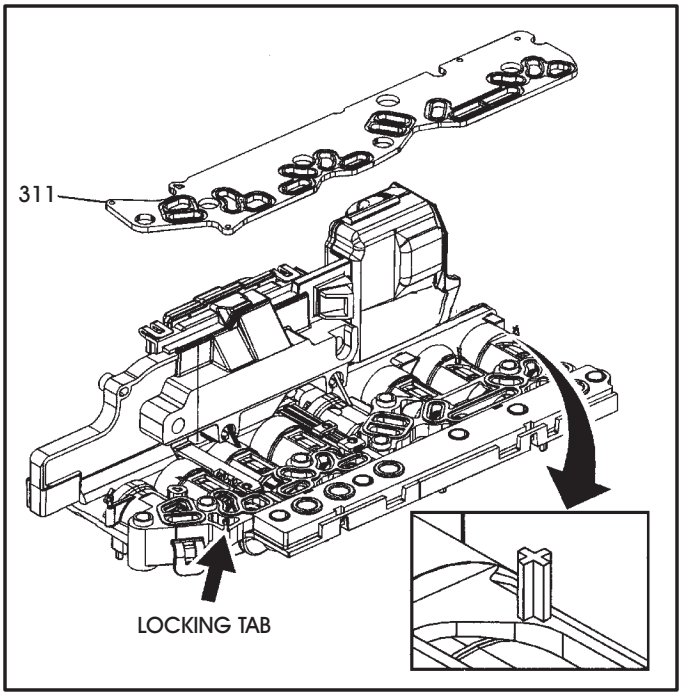
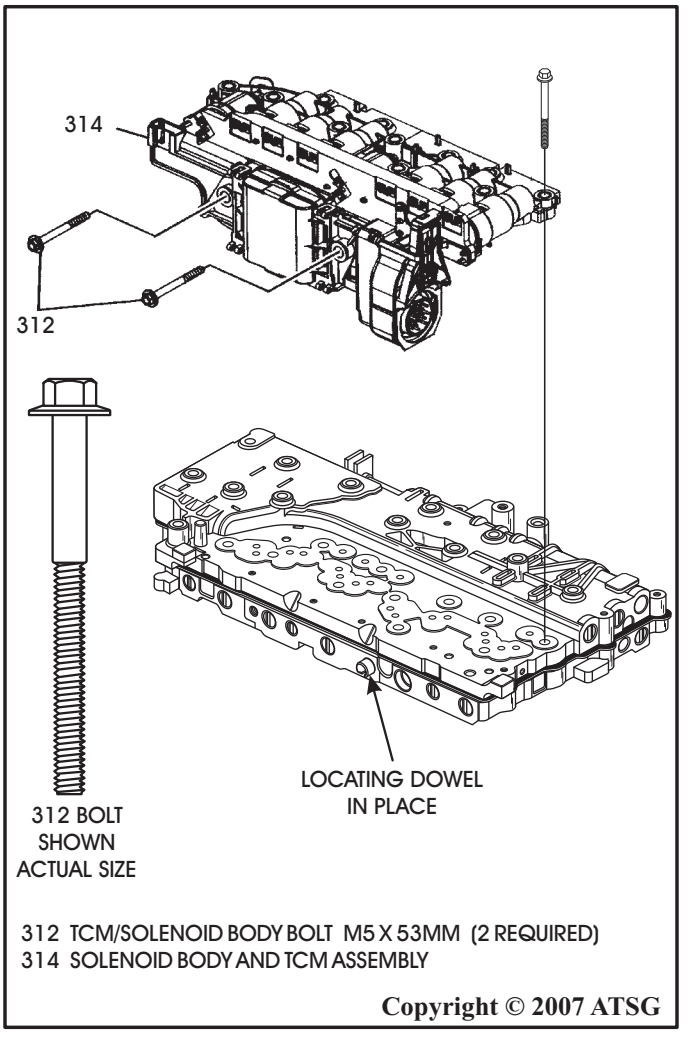


Figure 145



312 TCM/SOLENOID BODY BOLT M5 X 53MM (2 REQUIRED)
314 SOLENOID BODY AND TCM ASSEMBLY

Figure 146

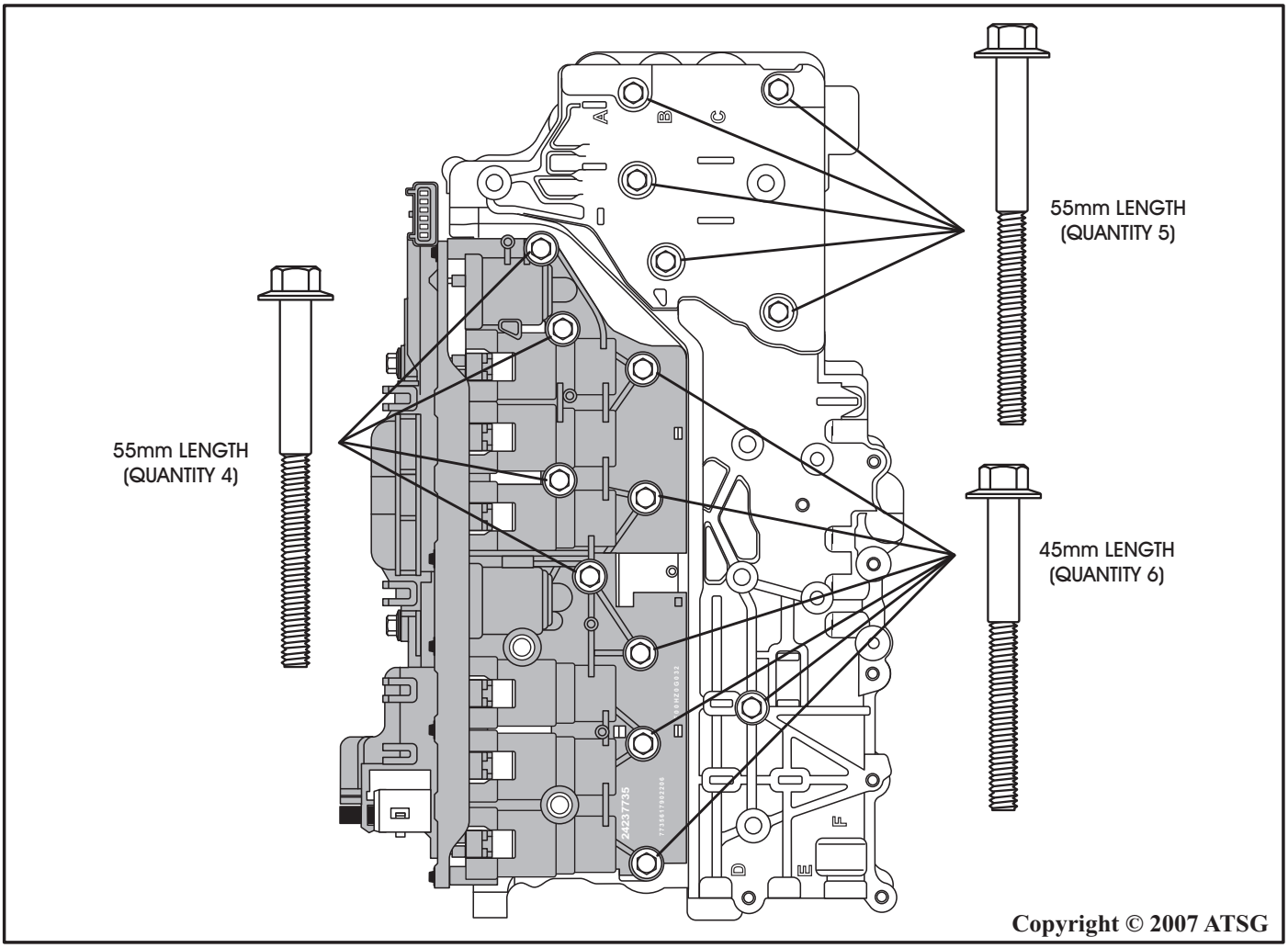


Figure 147

VALVE/SOLENOID BODY ASSEMBLY (CONT'D)

26. Install the nine (9) 55mm length valve body bolts in the locations shown in Figure 147, and hand tighten only at this time.
27. Install the six (6) 45mm length valve body bolts in the locations shown in Figure 147, and hand tighten only at this time.
28. Install the manual shift Internal Mode Switch, as shown in Figure 148, using only one 55mm long valve body bolt in the location shown and hand tighten only at this time.
    Note: Align the switch activator slide with the manual valve, as shown in Figure 148.
29. Connect and lock the internal mode switch electrical connector to Solenoid Body/TCM.

Continued on Page 87

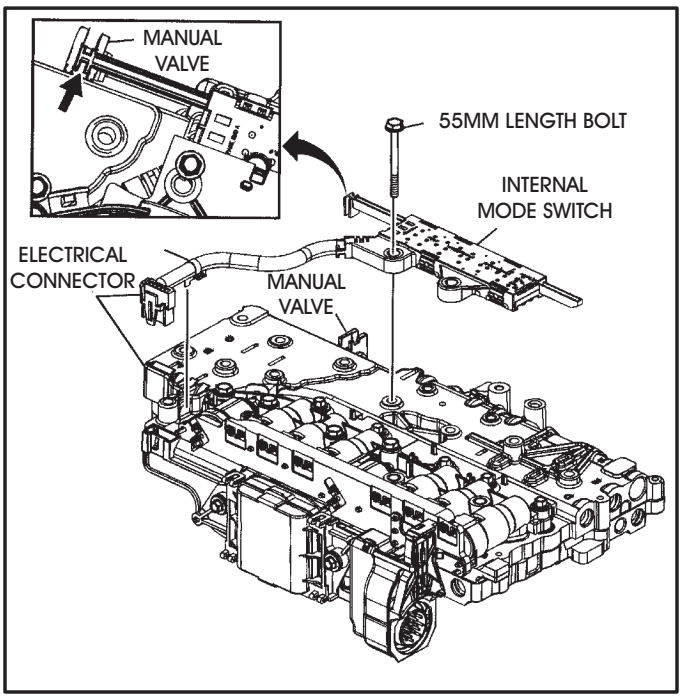


Figure 148

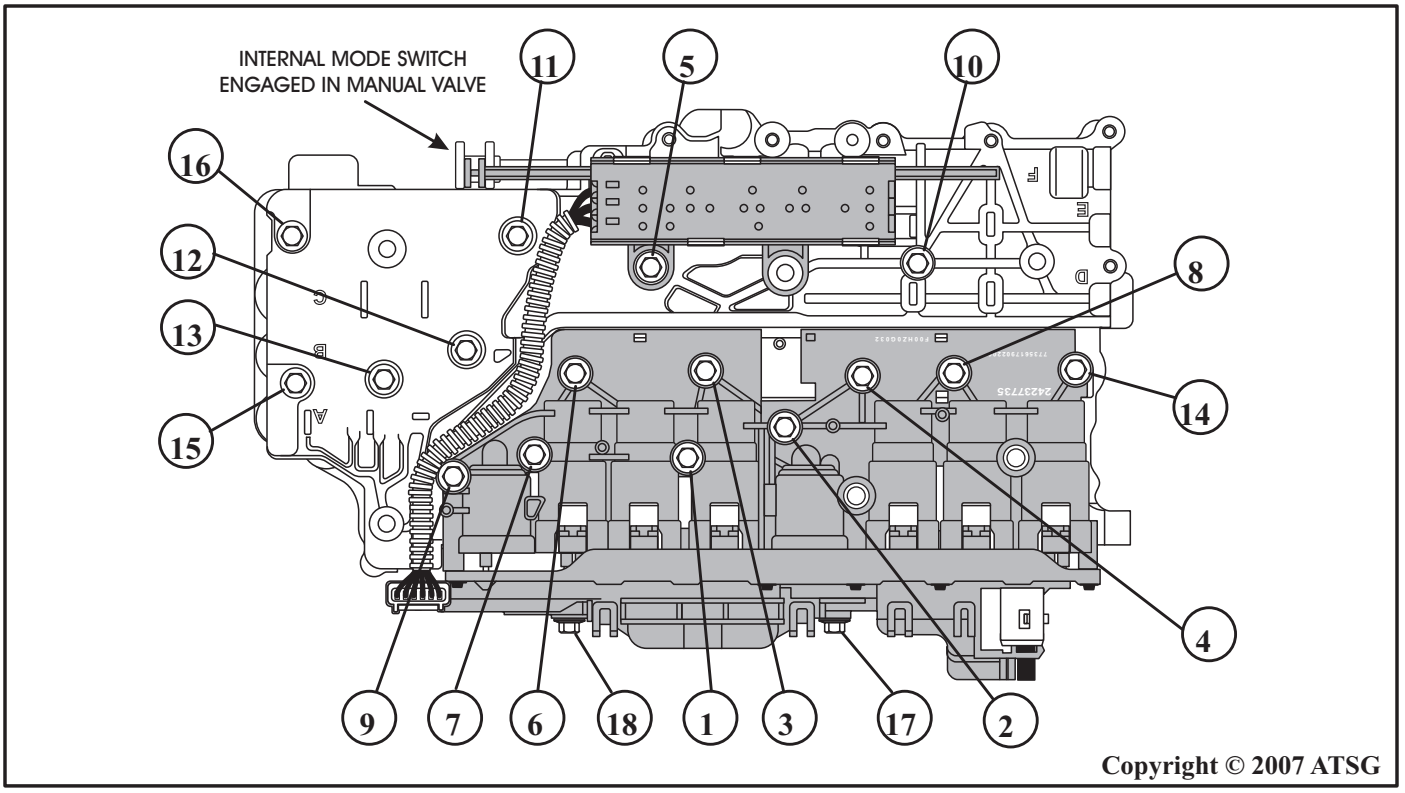


Figure 149

VALVE/SOLENOID BODY ASSEMBLY (CONT'D)

30. Now you can torque all 18 valve body bolts to 8 N·m (71 in.lb.), in the sequence shown in Figure 149.
    Note: Bolt torque sequencing is critical to the proper function on this unit.
31. The two 53mm bolts going in the side of the Solenoid Body/TCM (17 and 18) in Figure 149 ***must*** be tightened last.
32. Inspect the contact area between the "heat sink" area of the Solenoid Body/TCM assembly and valve body assembly, as shown in Figure 150.
33. There should be no visible gap. If a gap exists, loosen all 18 bolts and retighten in the required sequence, as shown in Figure 149.
    Note: The six empty holes left in the assembly are for the 70mm long bolts that retain the valve body assembly to the case.

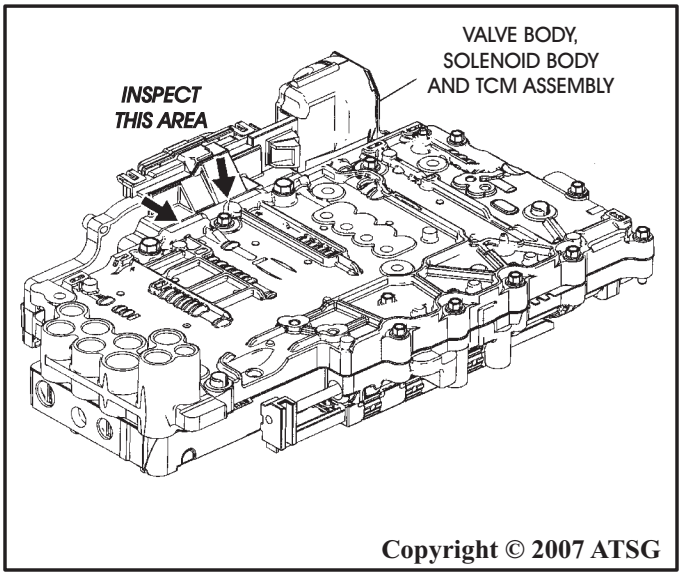


Figure 150

Continued on Page 88

VALVE/SOLENOID BODY ASSEMBLY (CONT'D)

34. Install input and output speed sensor assembly, as shown in Figure 151, and torque retaining bolts to 12 N·m (106 in.lb.).
35. Plug the speed sensor wire harness into TCM, as shown in Figure 151.
36. Set the completed Valve Body and Solenoid Body/TCM assembly aside for final assembly.

COMPONENT REBUILD

EXTENSION HOUSING

1. Install a new metal clad seal into the extension housing, as shown in Figure 152, using proper seal driver.
2. Notice that seal is driven in on the side that goes against the case.
   Note: Corvette version is illustrated, 2WD version is also shown in Figure 152.
3. Set completed extension housing aside for the final assembly process.

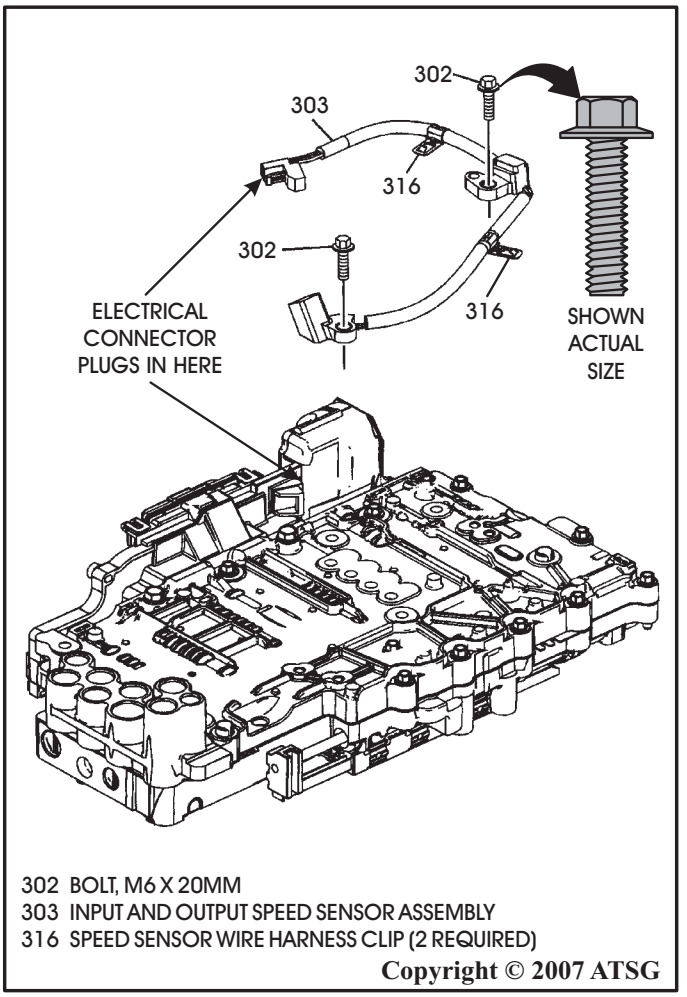


Figure 151

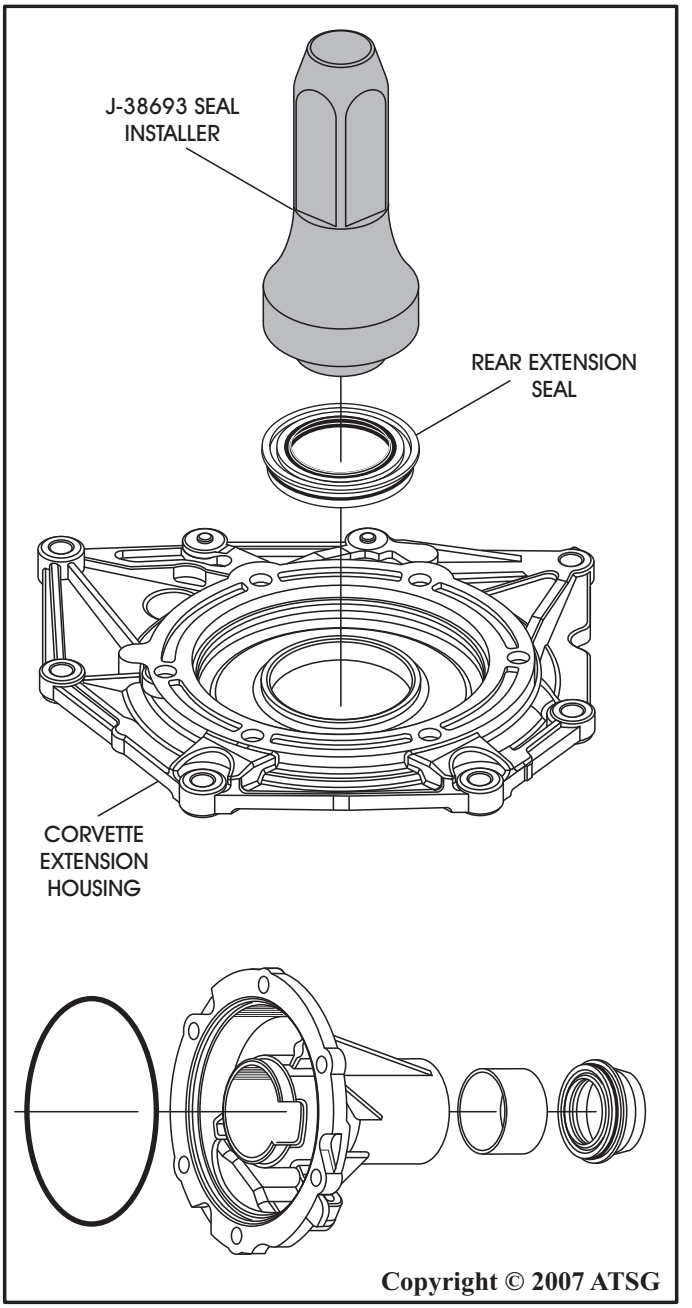


Figure 152

FINAL ASSEMBLY

INTERNAL COMPONENTS

1. Rotate transmission case in fixture so that rear of preassembled case is facing up, as shown in Figure 153.
2. Lubricate rear case bushing and rear seal inside diameters witha small amount of Trans-Jel®, as shown Figure 153.
3. Install the output shaft to case thrust bearing into case, in the direction shown in Figure 154.
4. Ensure the DT-47786 lifting tool is completely threaded into the output shaft assembly, as shown in Figure 154. Due to the weight of the assembly, incomplete threading may let the assembly break free, causing damage/injury.
5. Install the pre-assembled output shaft assembly into the case, as shown in Figure 154, using the DT-47786 lifting tool.

Continued on Page 90

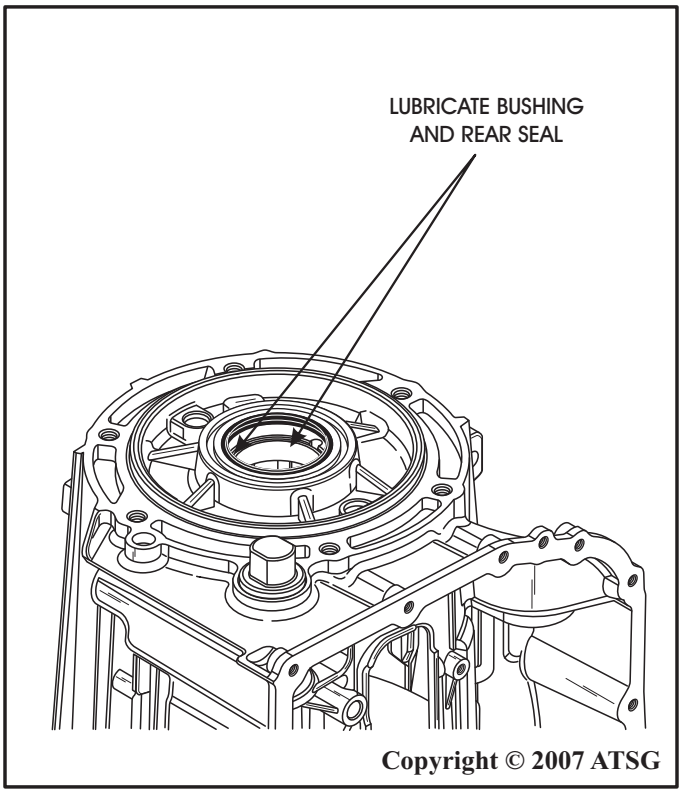


Figure 153

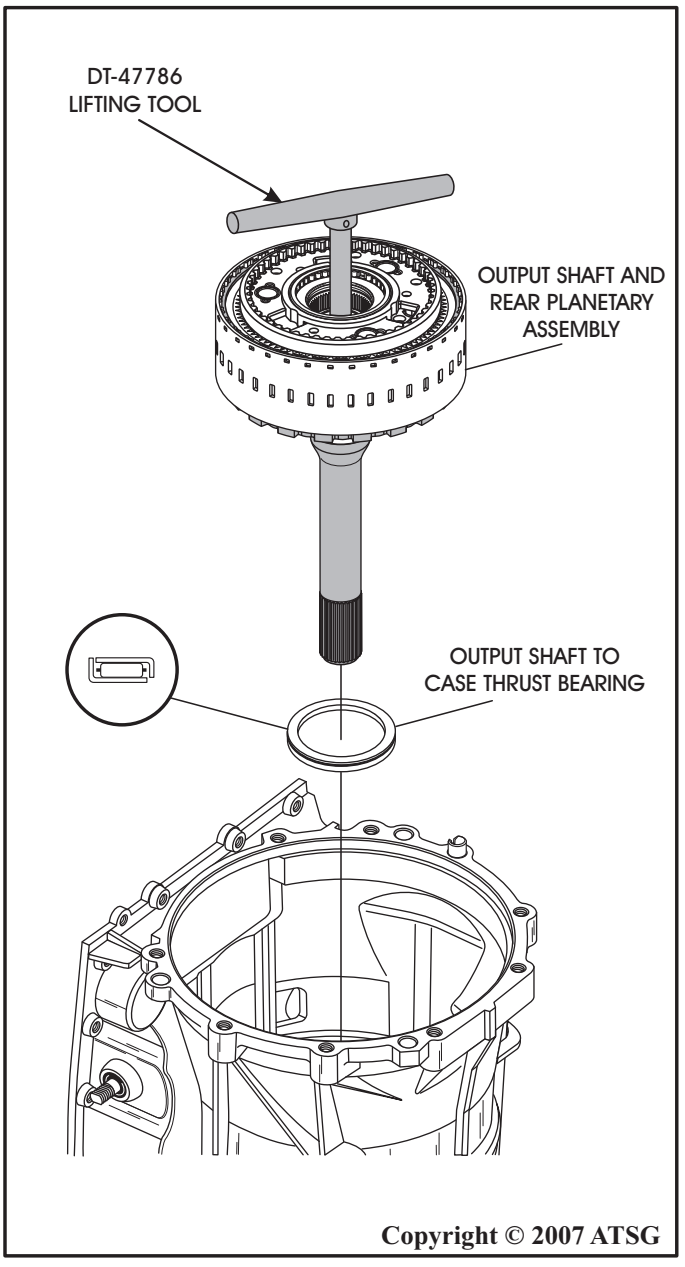


Figure 154

FINAL ASSEMBLY
INTERNAL COMPONENTS (CONT'D)

6. Install the pre-assembled center support assembly, as shown in Figure 155.
7. When the center support assembly is properly installed, the fluid passages should align with the fluid passage seal bores in the case.
   Note: It may be necessary to rotate the output shaft by hand in order to fully seat the center support in the case.
8. Install center support retaining ring with the tapered side facing up, as shown in Figure 155, and snap ring opening at the 9 o'clock position, using the J-45126 snap ring pliers along with DT-47773 adapter set, shown in Figure 156.
   Note: This is a mandatory tool for snap ring installation to prevent bodily injury.
9. Install the thrust bearing on top of the center support in direction shown in Figure 157.
10. Install the 2-6 and 3-5 reverse clutch hub and shaft assembly, as shown in Figure 157.

Continued on Page 91

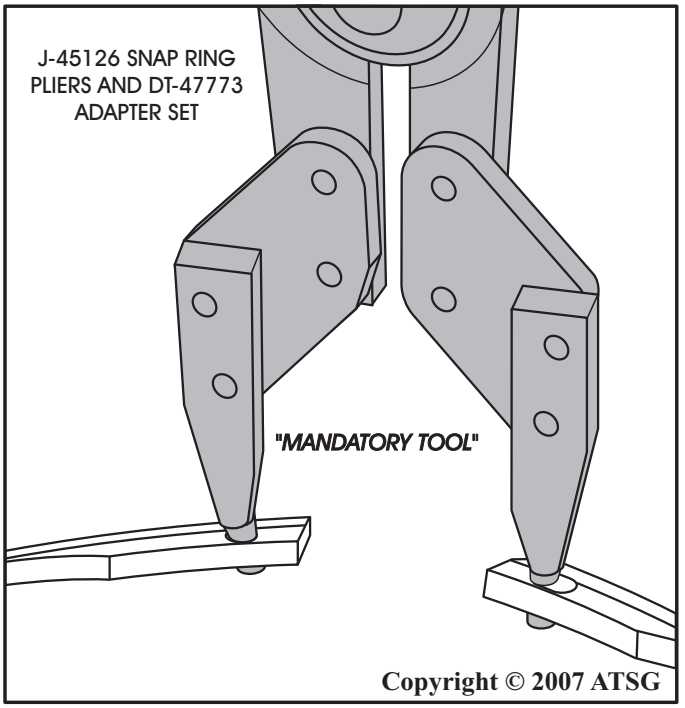
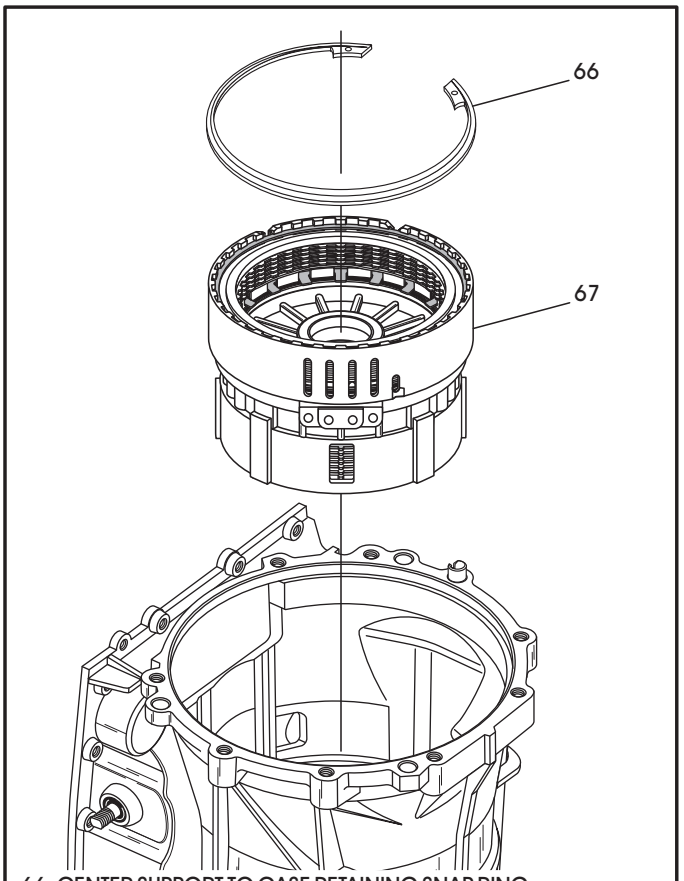
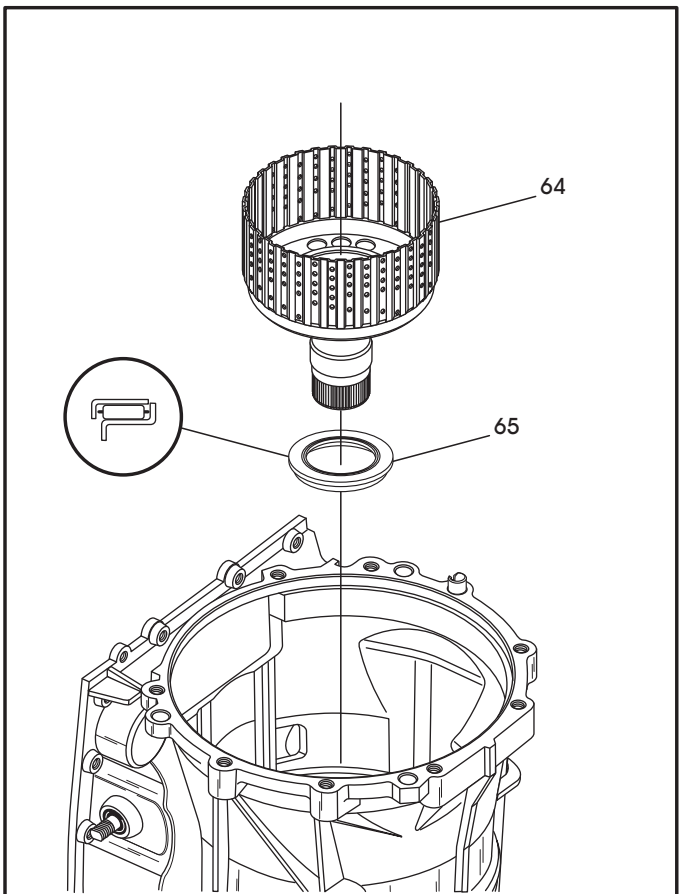


Figure 156



66 CENTER SUPPORT TO CASE RETAINING SNAP RING
67 CENTER SUPPORT ASSEMBLY

Figure 155



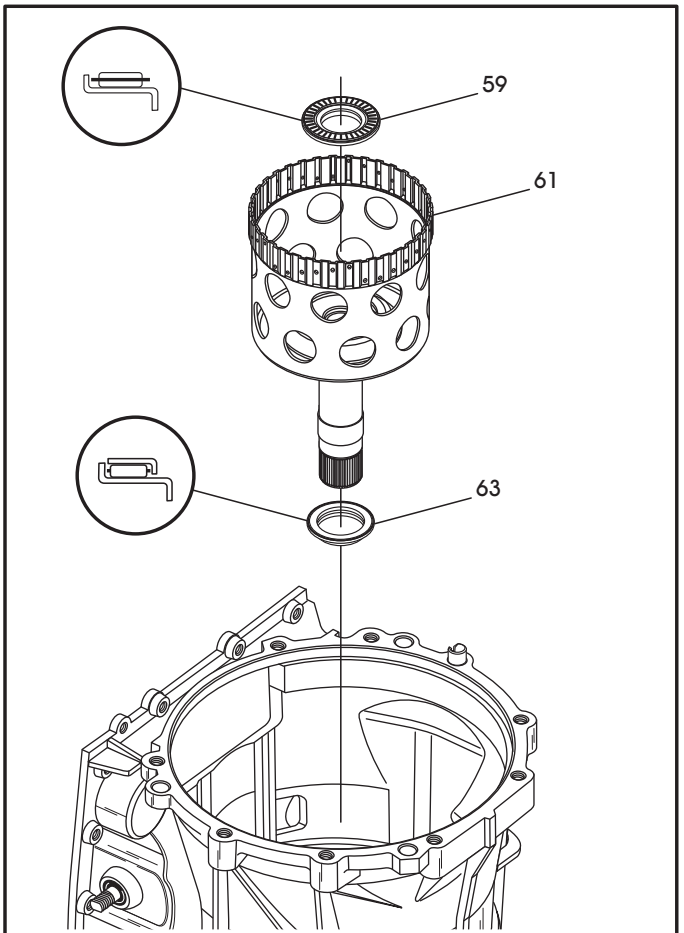
64 2-6 AND 3-5 REVERSE CLUTCH HUB AND SHAFT ASSEMBLY
65 2-6 AND 3-5 REVERSE CLUTCH HUB THRUST BEARING

Figure 157

FINAL ASSEMBLY
INTERNAL COMPONENTS (CONT'D)

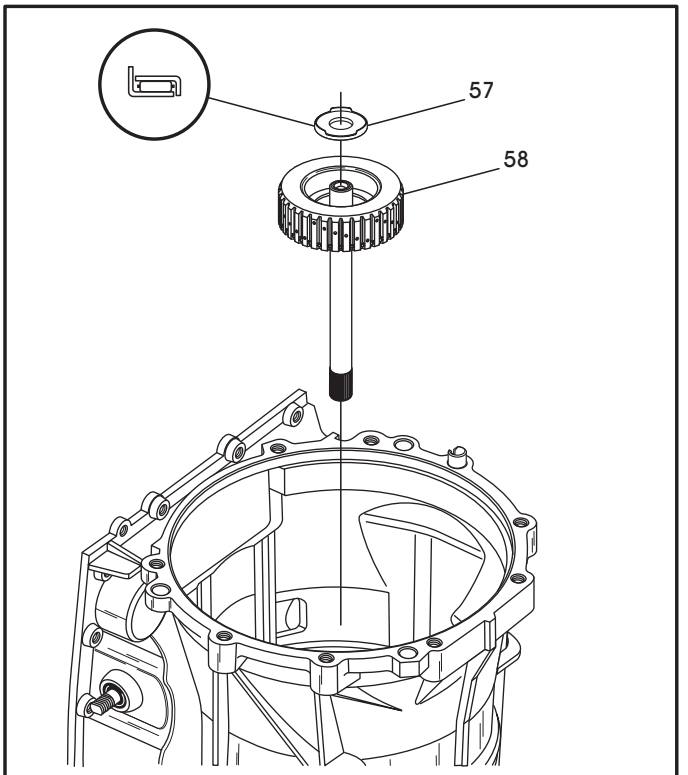
11. Install the 1-2-3-4 clutch hub thrust bearing in direction shown in Figure 158.
12. Install 1-2-3-4 clutch hub and shaft assembly, as shown in Figure 158.
13. Install 4-5-6 clutch hub to shell thrust bearing in direction shown in Figure 158.
14. Install 4-5-6 clutch hub and the dampener assembly, as shown in Figure 159.
15. Install the 4-5-6 clutch hub to turbine shaft thrust bearing in direction shown in Figure 159.

Continued on Page 92



59 4-5-6 CLUTCH HUB TO SHELL THRUST BEARING
61 1-2-3-4 CLUTCH HUB AND SHAFT ASSEMBLY
63 1-2-3-4 CLUTCH HUB THRUST BEARING

Figure 158



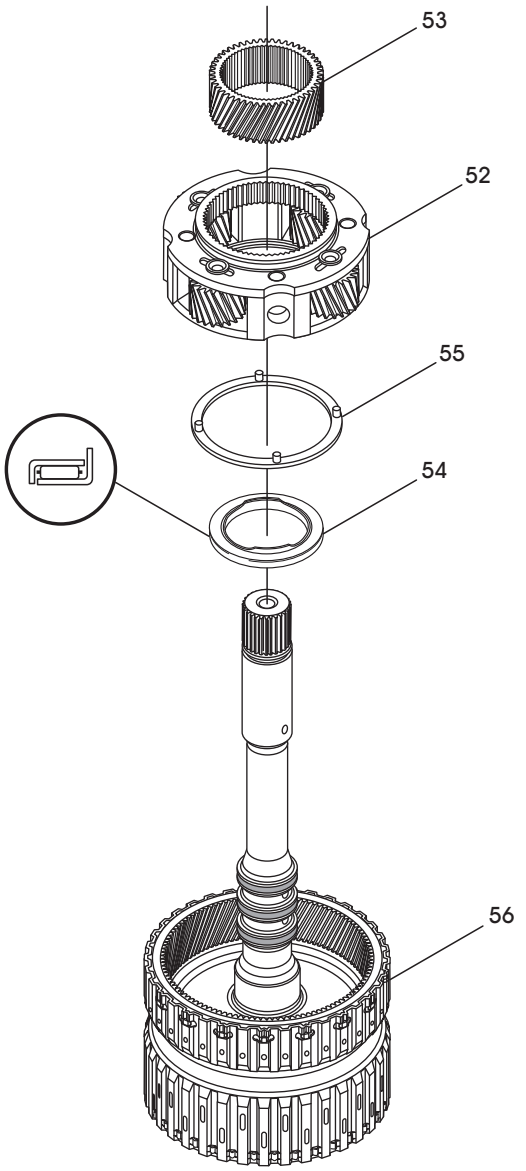
57 4-5-6 CLUTCH HUB TO TURBINE SHAFT THRUST BEARING
58 4-5-6 CLUTCH HUB AND DAMPENER ASSEMBLY

Figure 159

FINAL ASSEMBLY
INTERNAL COMPONENTS (CONT'D)

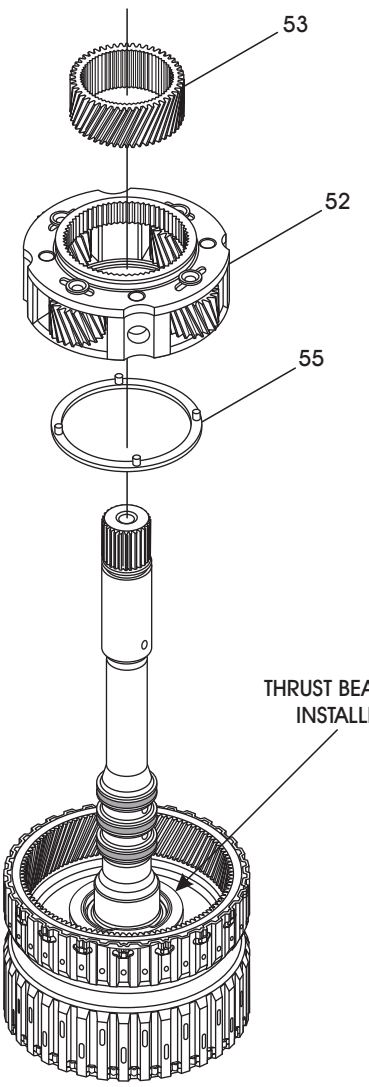
16. Install the input sun gear thrust bearing into the 4-5-6 clutch housing in the direction shown in Figure 160.
17. Install the input carrier thrust washer onto back side of carrier, as shown in Figure 161, and retain with a small amount of Trans-Jel®.
18. Install the input planetary carrier and thrust washer assembly into the ring gear, as shown in Figure 161, with a rotating motion.

Continued on Page 93



52 INPUT PLANETARY CARRIER ASSEMBLY
53 INPUT SUN GEAR
54 INPUT SUN GEAR THRUST BEARING
55 INPUT PLANETARY CARRIER THRUST WASHER
56 COMPLETED 4-5-6 CLUTCH HOUSING ASSEMBLY

Figure 160



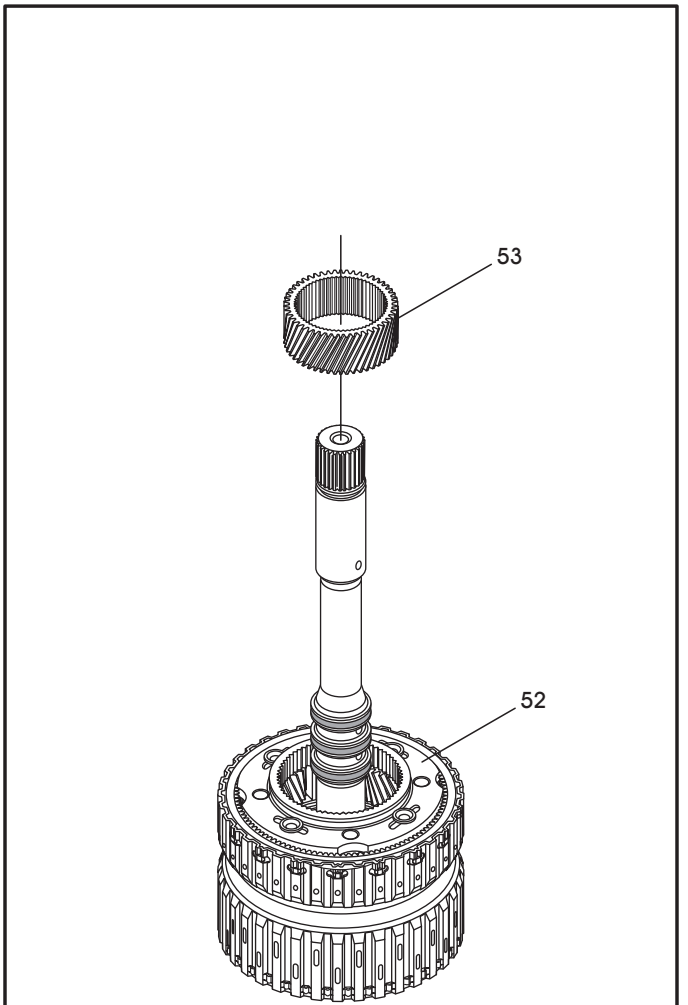
52 INPUT PLANETARY CARRIER ASSEMBLY
53 INPUT SUN GEAR
55 INPUT PLANETARY CARRIER THRUST WASHER

Figure 161

FINAL ASSEMBLY
INTERNAL COMPONENTS (CONT'D)

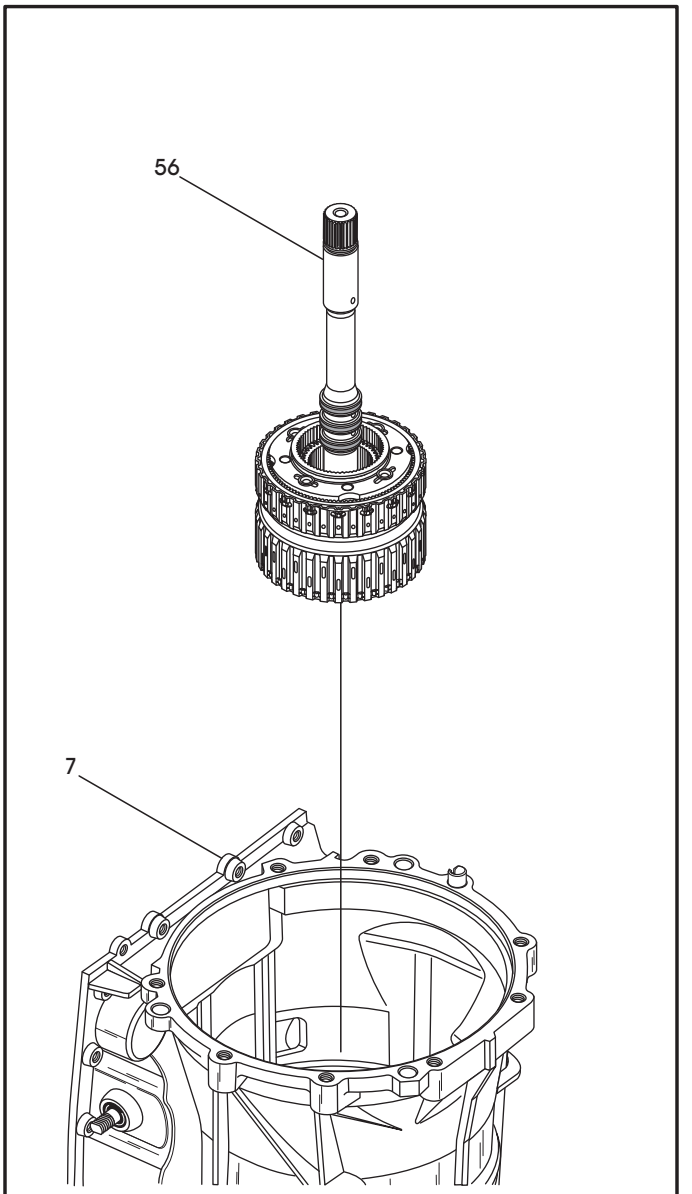
19. Install input sun gear, as shown in Figure 162, with a rotating motion until fully seated.
20. Install the 4-5-6 clutch housing assembly with carrier and sun gear into the case, as shown in Figure 163.
21. Rotate the turbine shaft back and forth until all 4-5-6 clutch plates have engaged on the 4-5-6 clutch hub and dampner assembly.

Continued on Page 94



52 INPUT PLANETARY CARRIER ASSEMBLY *(INSTALLED)*
53 INPUT SUN GEAR

Figure 162



7 TRANSMISSION CASE ASSEMBLY
56 4-5-6 CLUTCH HOUSING ASSEMBLY, W/TURBINE SHAFT

Figure 163

FINAL ASSEMBLY
INTERNAL COMPONENTS (CONT'D)

22. Place the completed 1-2-3-4 and 3-5 reverse clutch housing on a flat surface, as shown in Figure 164.
23. Install the DT-47781 clutch assembly installer over 1-2-3-4 and 3-5 reverse clutch housing, as shown in Figure 164, and close the vise grip type clamp.
    Note: This tool is also a suggested purchase as there are three different things to align by rotating back and forth to install this housing.
24. Grab the entire assembly by the "handles" of the DT-47781 and install the 1-2-3-4 and 3-5 reverse clutch housing, as shown in Figure 165.
25. Wiggle the DT-47781 back and forth in order to align the 1-2-3-4 clutch plates, and the 3-5 reverse clutch plates with the external splines of the two shells. (See Figure 165).
26. There are also splines on the 3-5 reverse clutch housing that must be engaged into the splines of the input carrier.
27. To verify that 1-2-3-4 and 3-5 reverse clutch housing is fully seated, lift up on the turbine shaft. There should not be any noticeable end-play..

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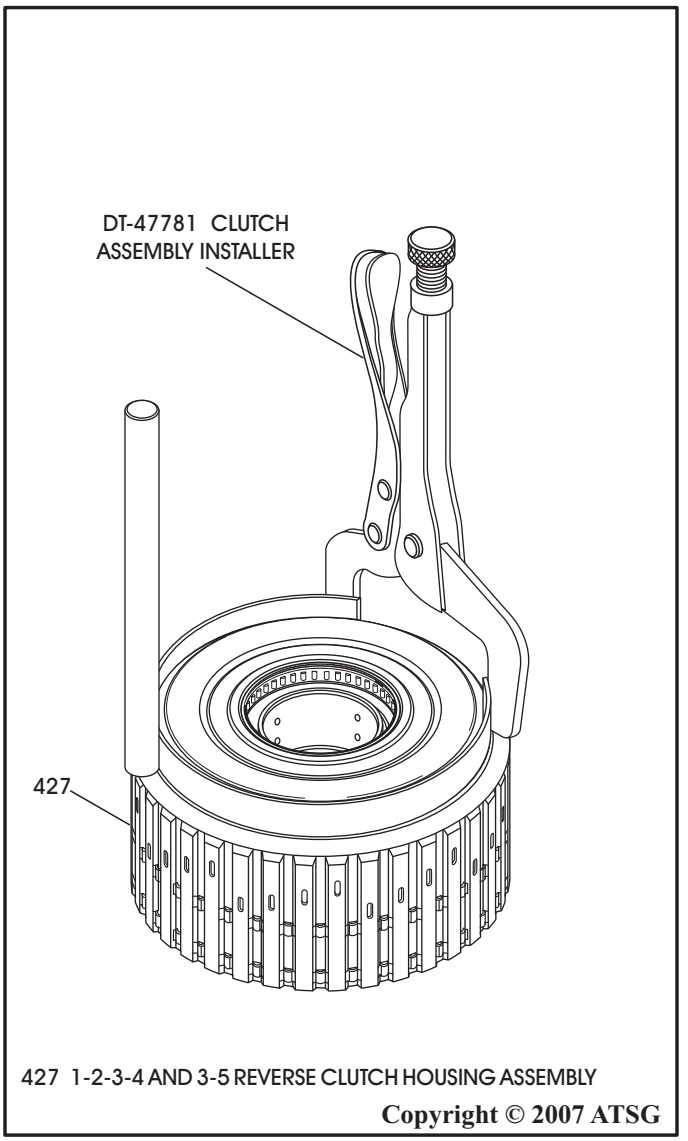
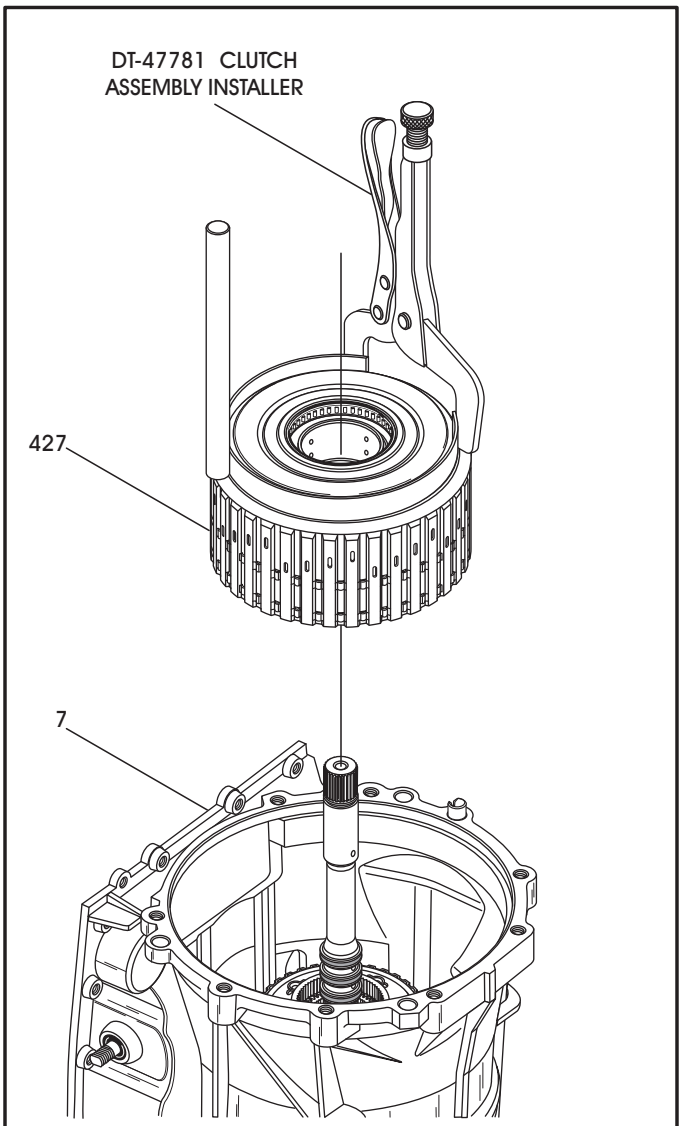


427 1-2-3-4 AND 3-5 REVERSE CLUTCH HOUSING ASSEMBLY

Figure 164



7 TRANSMISSION CASE ASSEMBLY
427 1-2-3-4 AND 3-5 REVERSE CLUTCH HOUSING ASSEMBLY

Figure 165

FINAL ASSEMBLY
INTERNAL COMPONENTS (CONT'D)

28. Lay the completed converter housing and oil pump assembly on flat work surface, as shown in Figure 166.
29. Install new converter housing to case "O" ring seal, as shown in Figure 166, and lube with a small amount of Trans-Jel®.
30. Install the converter housing and oil pump assembly, as shown in Figure 167.
    Note: You may have to turn the turbine shaft to get the assembly to fully seat, as the stator shaft must spline into the input sun gear.
31. Ensure that converter housing is fully seated against case surface and over locating dowel
32. Install the nine (9) converter housing to case retaining bolts, as shown in Figure 167, finger tight only at this time.

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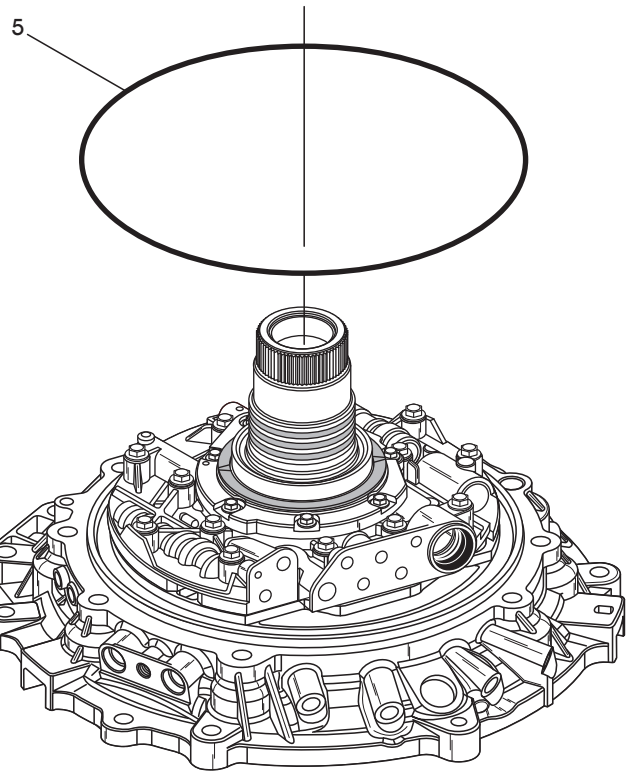
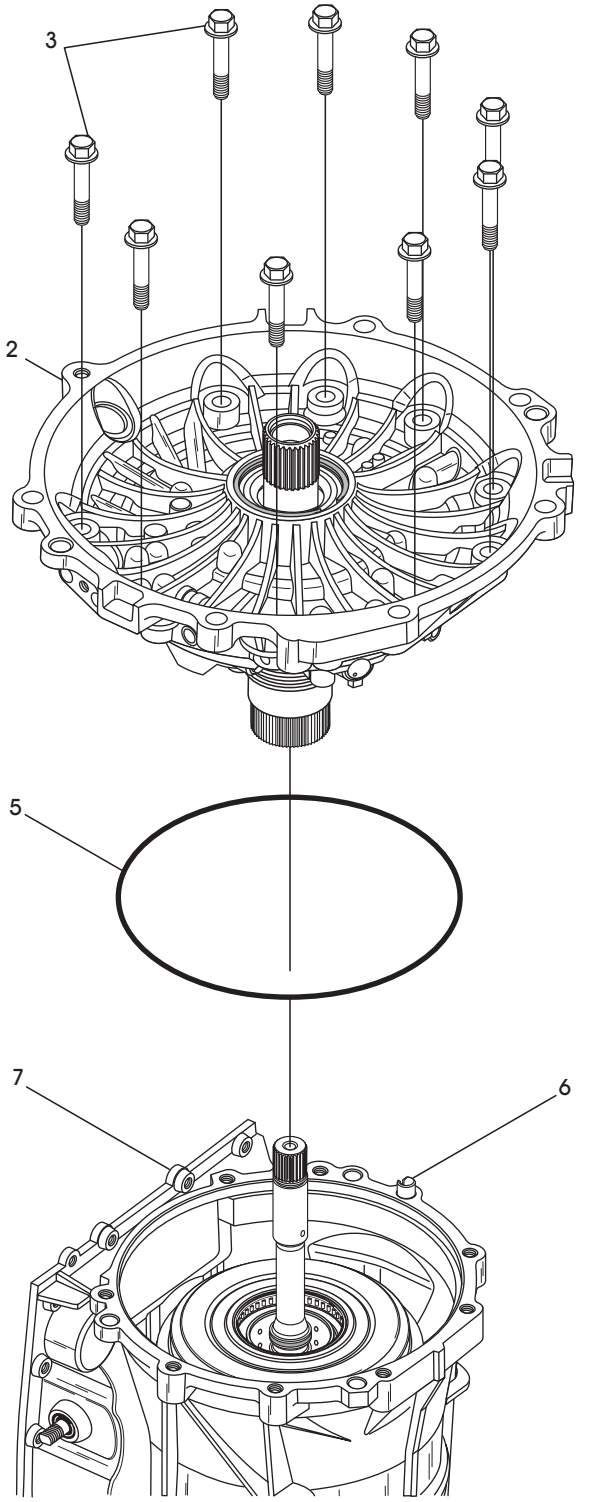


5 CONVERTER HOUSING TO CASE "O" RING SEAL

Figure 166



2 CONVERTER HOUSING AND OIL PUMP ASSEMBLY
3 CONVERTER HOUSING TO CASE BOLTS (9 REQUIRED)
5 CONVERTER HOUSING TO CASE "O" RING SEAL
6 CONVERTER HOUSING LOCATING DOWEL
7 TRANSMISSION CASE ASSEMBLY

Figure 167

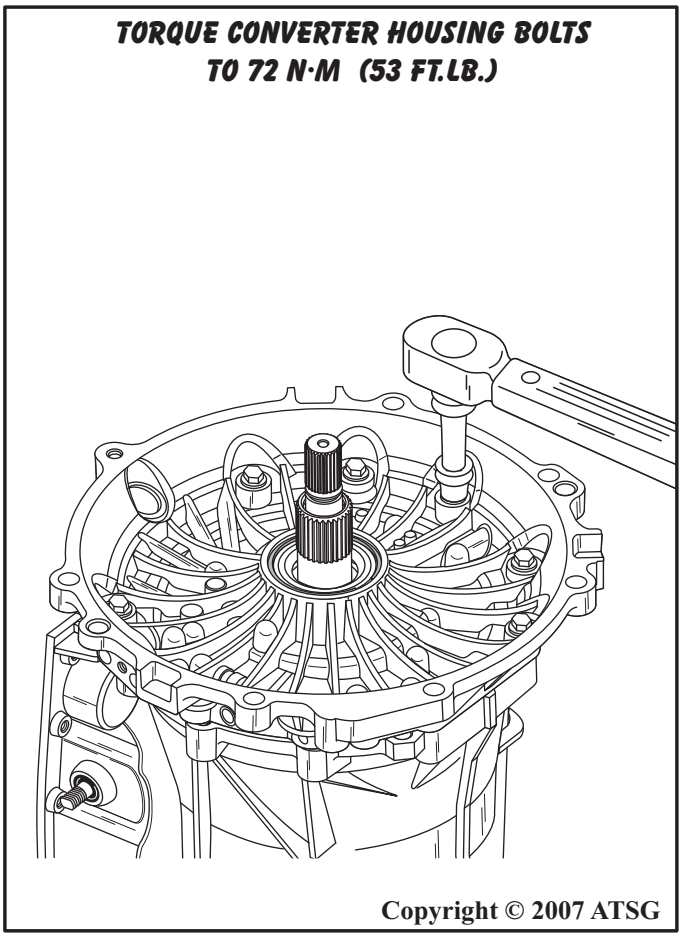


Figure 168

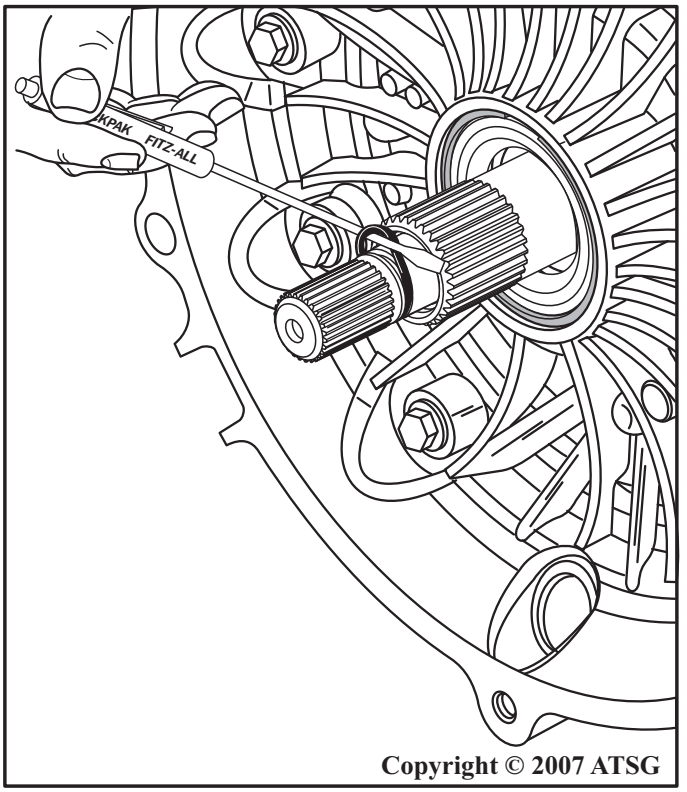


Figure 169

FINAL ASSEMBLY

INTERNAL COMPONENTS (CONT'D)

33. Torque all nine converter housing bolts down to 72 N·m (53 ft.lb.), as shown in Figure 168, using a criss-cross pattern from side to side.
34. Install a new turbine shaft "O" ring seal in the groove, as shown in Figure 169, using a small screwdriver.
35. Rotate the transmission in fixture so that pan surface is facing up, as shown in Figure 170.
36. Lubricate with small amount of Trans-Jel® and install the three valve body seals into the bores in the bottom of valve body (See Figure 170).
37. Install the pre-assembled valve body onto the case, as shown in Figure 170, ensuring the manual valve is engaged on the detent lever pin, as shown in Figure 171.
38. Install the six 70mm valve body to case bolts in the locations shown in Figure 171.

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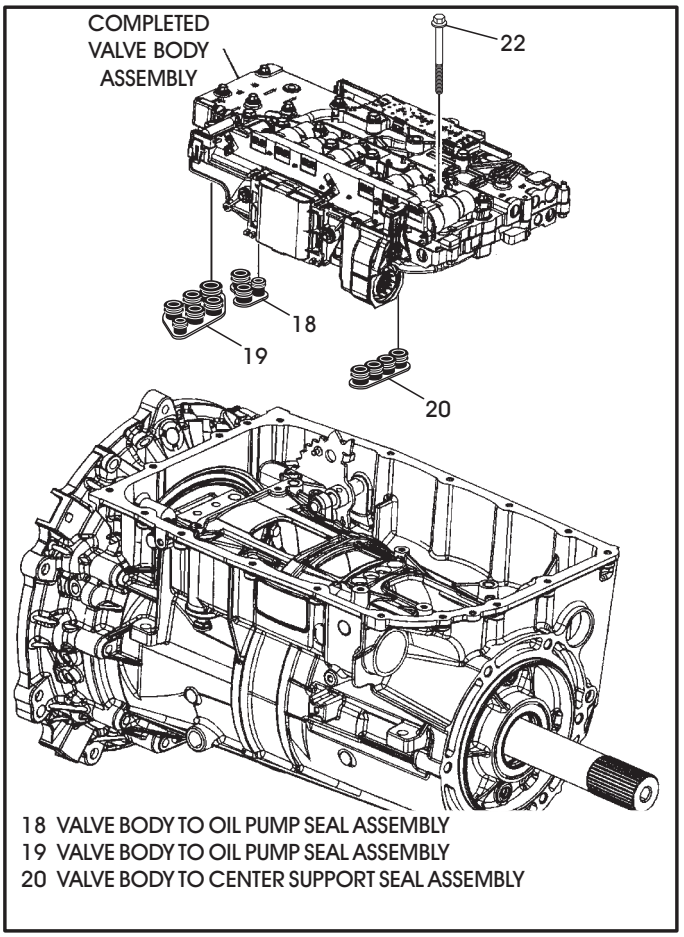

Figure 170

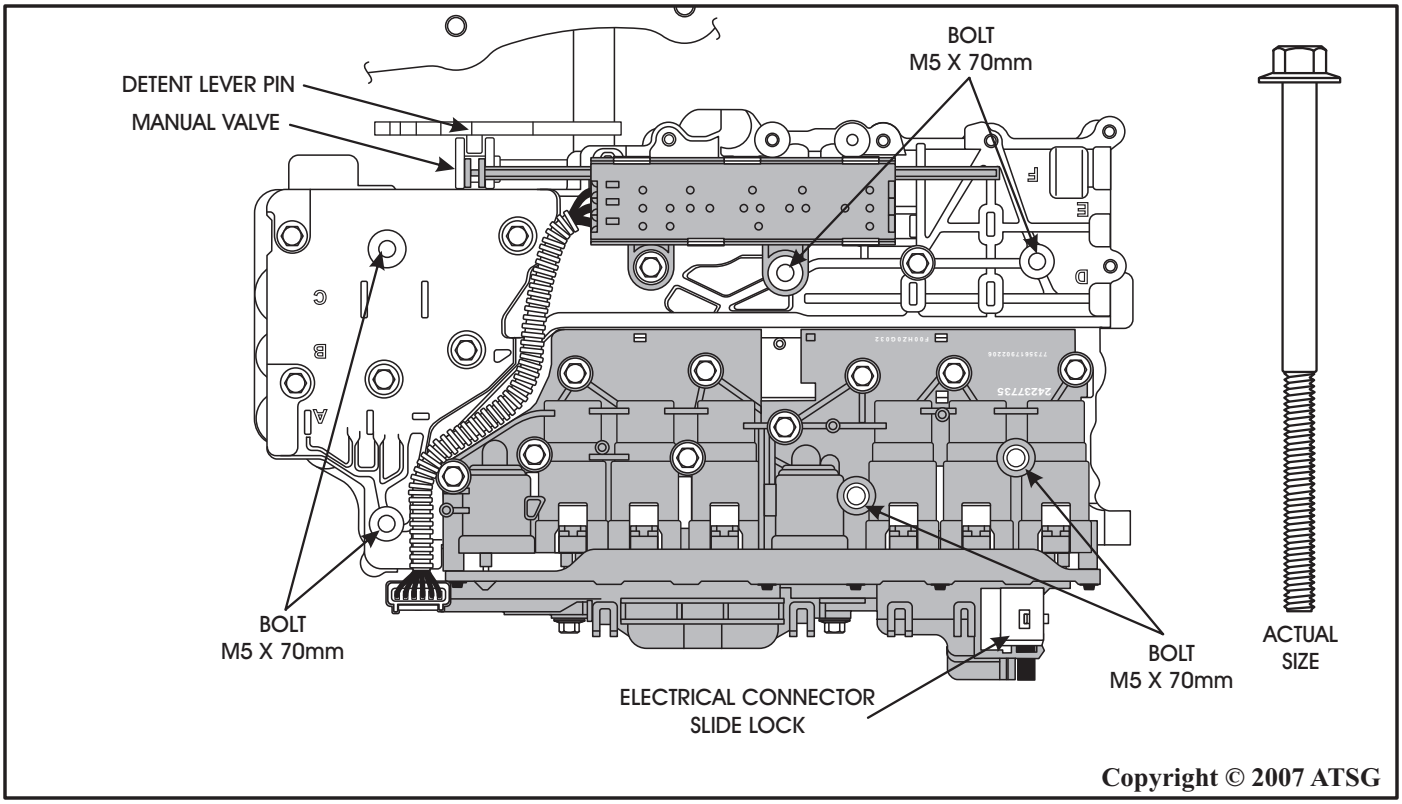

Figure 171

FINAL ASSEMBLY

INTERNAL COMPONENTS (CONT'D)

39. If not already done, install new filter seal into oil pump bore, as shown in Figure 172, using the proper seal driver.
40. Install a new oil filter assembly, as shown in Figure 172.
41. Install the detent spring and roller, as shown in Figure 172, torque bolt to 12 N·m (106 in.lb.). ***Note: Ensure roller is centered over inside detent lever.***

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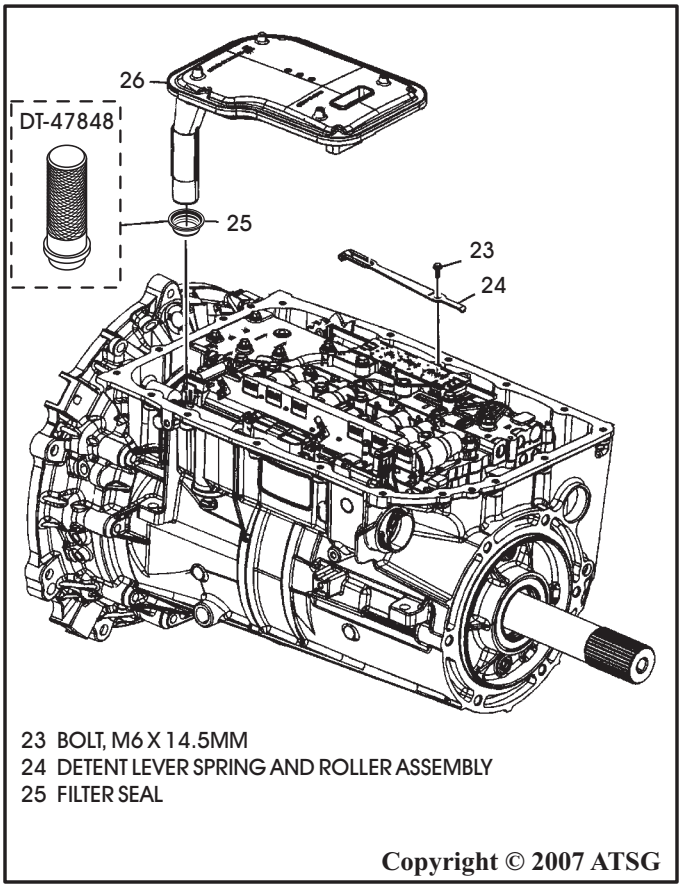

Figure 172

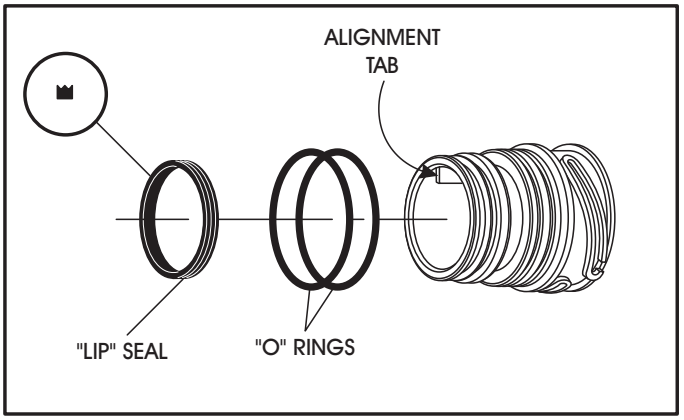

Figure 173

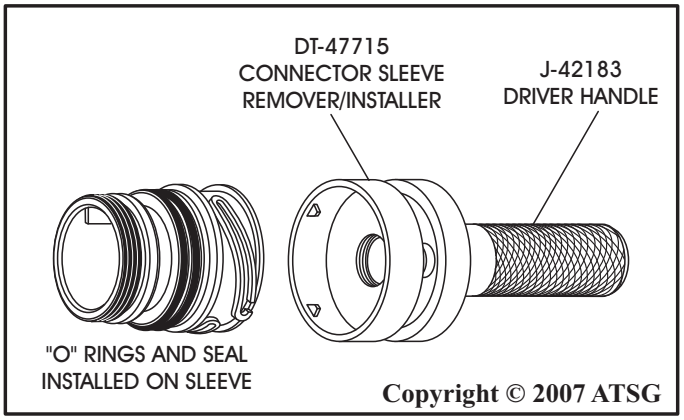

Figure 174

INTERNAL COMPONENTS (CONT'D)

42. Install two new "O" rings into the grooves in the connector sleeve, as shown in Figure 173, and lubricate with small amount of Trans-Jel®.
43. Install a new "lip" seal into the groove in the connector sleeve, as shown in Figure 173, and lubricate with small amount of Trans-Jel®.
44. Orientate the alignment tab inside the passage sleeve, with coresponding slot of the Solenoid Body/TCM assembly, and lift up the connector slide lock to allow the sleeve to be installed.
45. Push the sleeve straight into the case bore and TCM connector. ***Do Not,*** rotate the sleeve at any time (See Figure 175).
46. When the sleeve is properly installed, the distance from the case surface to the end of the sleeve should be 14-16mm (.551" - .630"), as shown in Figure 175.
47. Ensure the sleeve is fully seated and push down on the electrical connector slide lock, as shown in Figure 175, to lock the connector sleeve in place.
48. There is a special tool available to remove and install the electrical connector sleeve, as shown in Figure 174.

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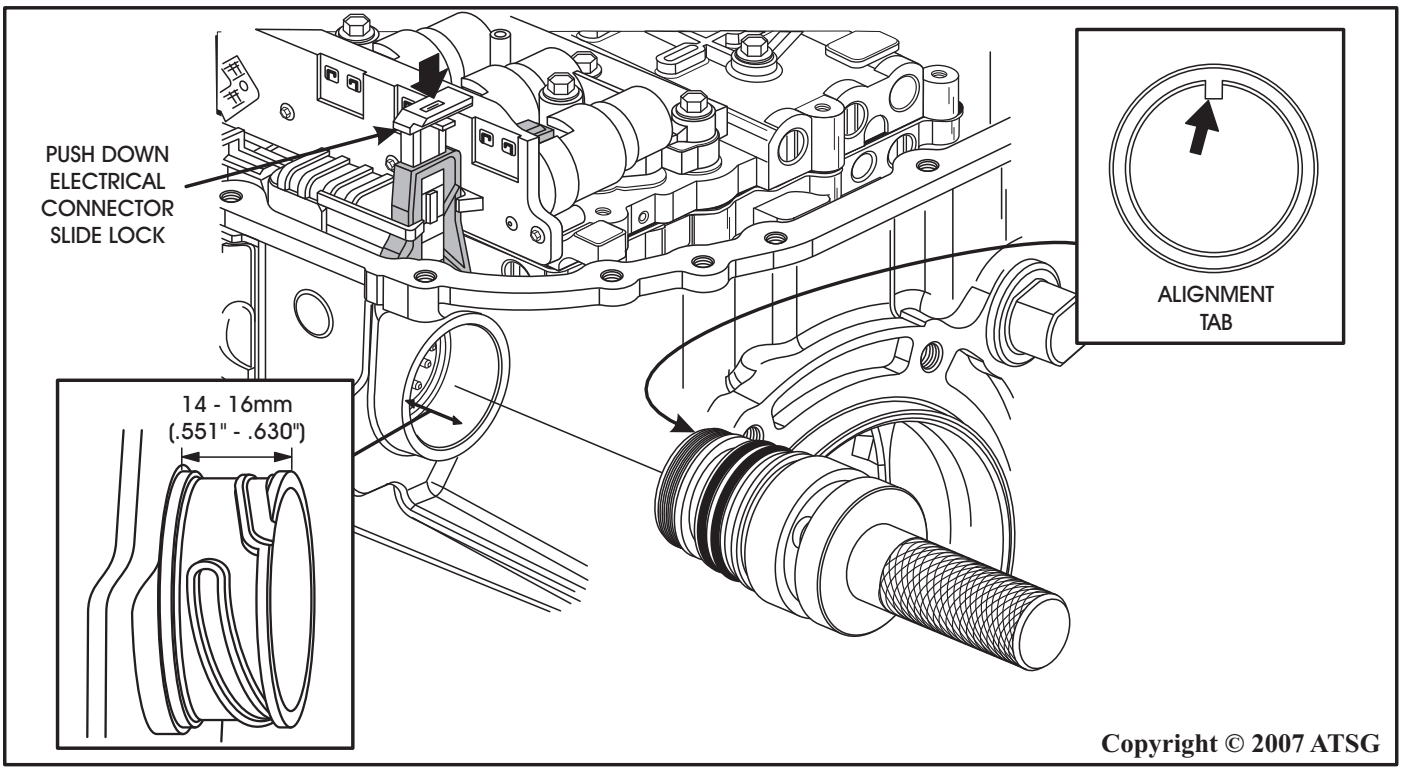

Figure 175

INTERNAL COMPONENTS (CONT'D)

49. Install a new bottom oil pan gasket, as shown in Figure 176.
    Note: Oil pan gasket is reuseable as long as none of the beads are broken. Experience shows it should get a new one.
50. Install the bottom oil pan assembly, as shown in Figure 176, and install the 18 pan bolts.
51. Torque all of the bottom oil pan bolts down to 9 N·m (80 in.lb.), using a criss-cross pattern.
52. Install the extension housing studs, if they were removed, as shown in Figure 177.
53. Install the case extension housing, as shown in Figure 177, and the six retaining bolts.
54. Torque bolts to 50 N·m (37 ft.lb.).

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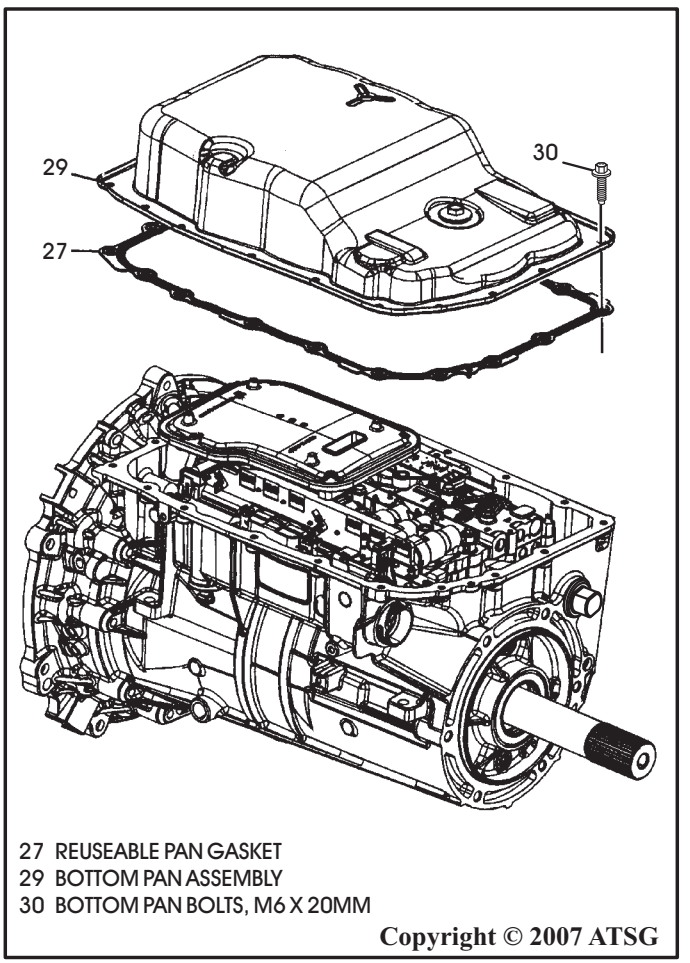
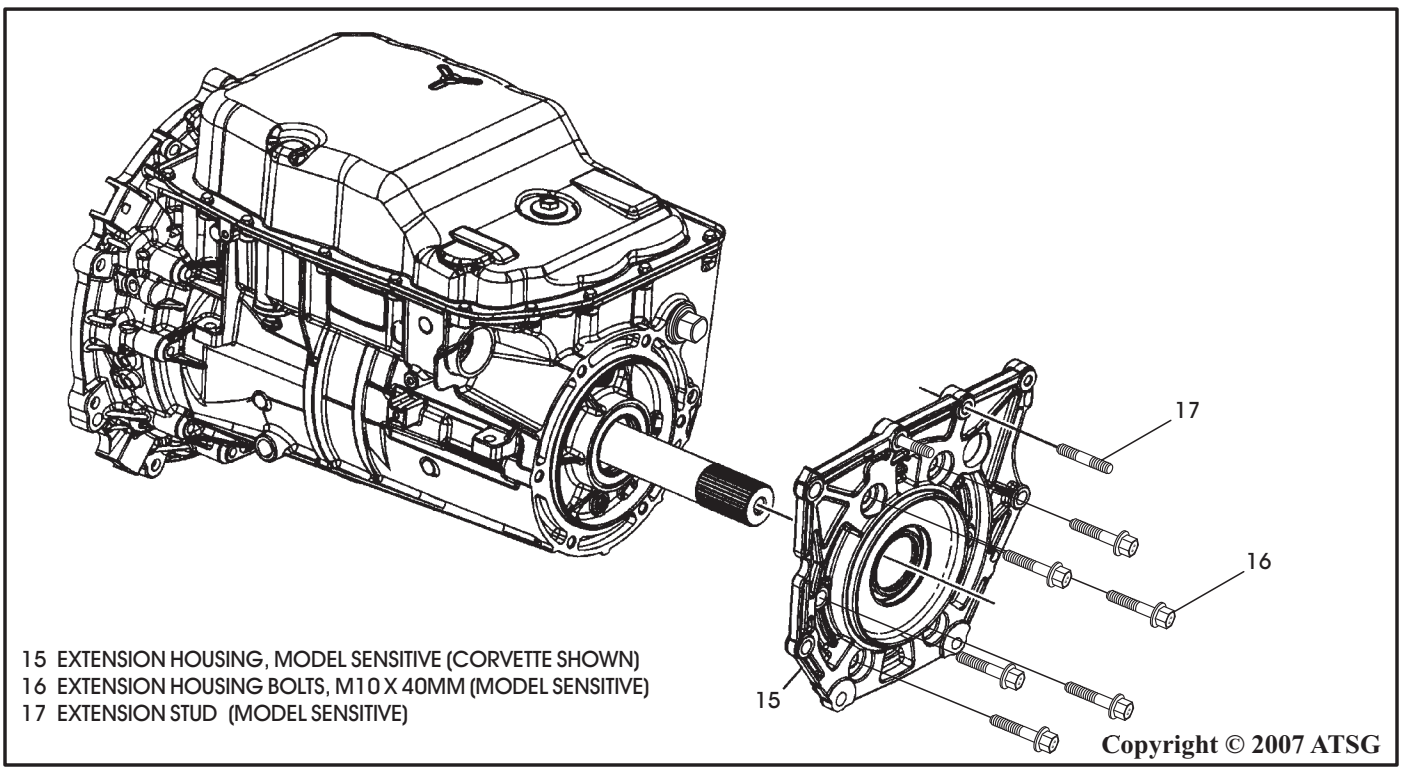


27 REUSEABLE PAN GASKET
29 BOTTOM PAN ASSEMBLY
30 BOTTOM PAN BOLTS, M6 X 20MM

Figure 176



15 EXTENSION HOUSING, MODEL SENSITIVE (CORVETTE SHOWN)
16 EXTENSION HOUSING BOLTS, M10 X 40MM (MODEL SENSITIVE)
17 EXTENSION STUD (MODEL SENSITIVE)

Figure 177

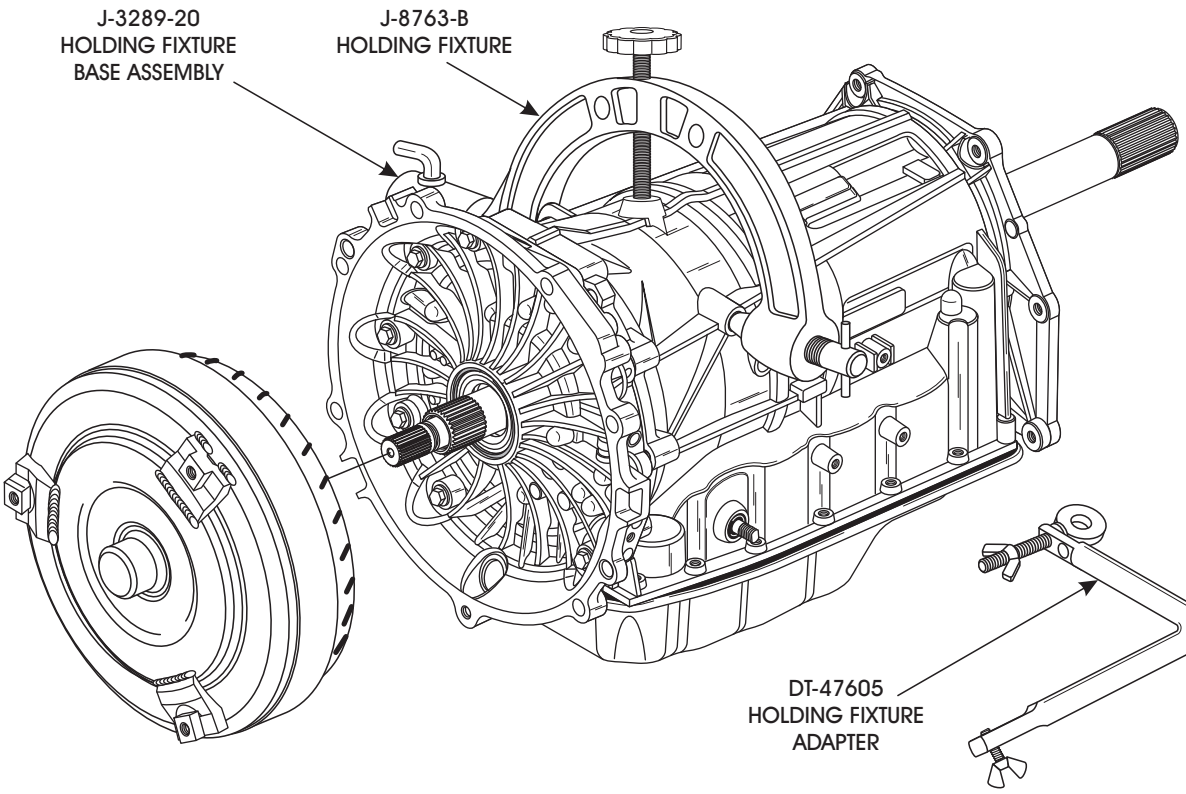


Figure 178

INTERNAL COMPONENTS (CONT'D)

55. Lubricate the torque converter hub with small amount of Trans-Jel®.
56. Install the torque converter onto transmission, with a rotating motion until fully engaged with the splines and the oil pump rotor, as shown in Figure 178.
57. Remove transmission from bench fixture and remove holding fixture and adapter, as shown in Figure 179.

CONGRATULATIONS
YOU ARE FINISHED!

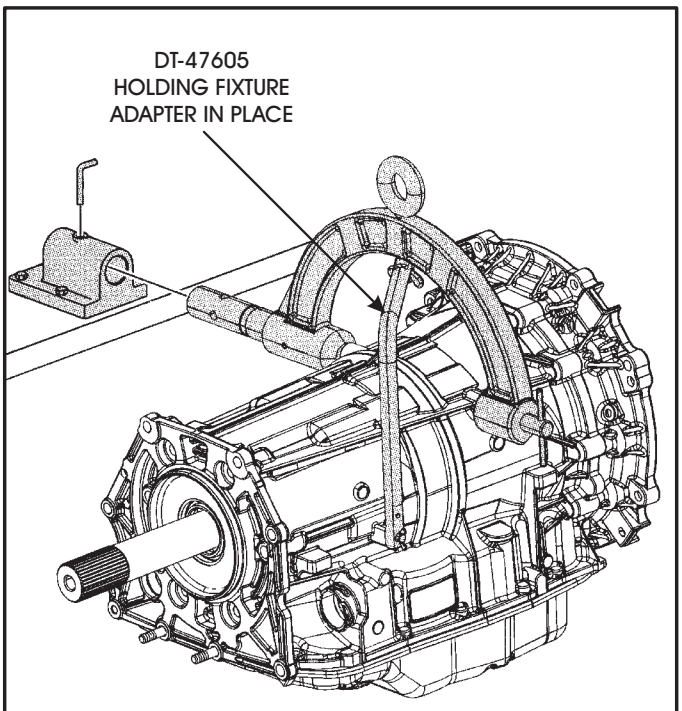
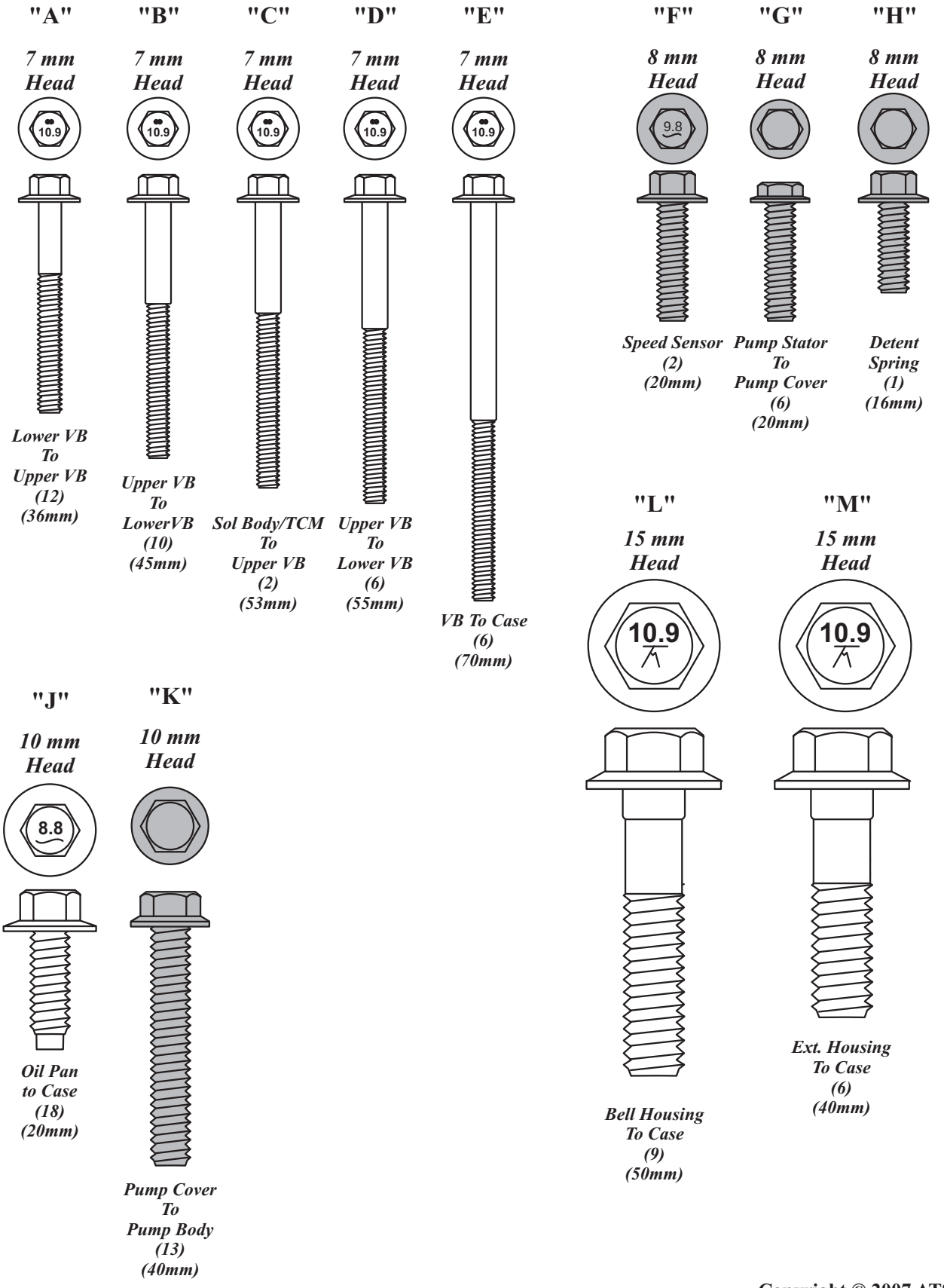


Figure 179

6L80 BOLT CHART FOR IDENTIFICATION



SPECIAL TOOLS AND EQUIPMENT

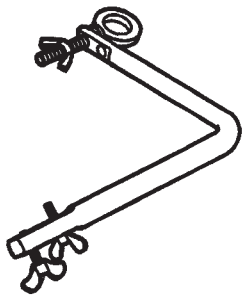
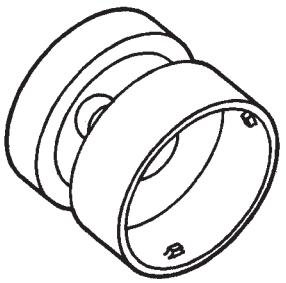
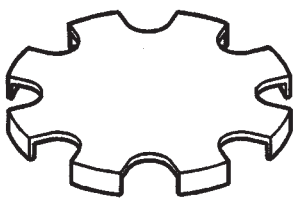
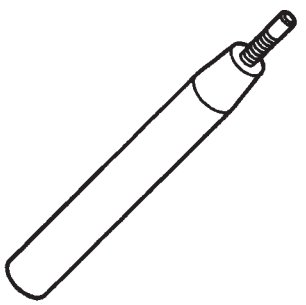
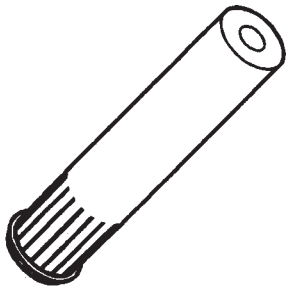
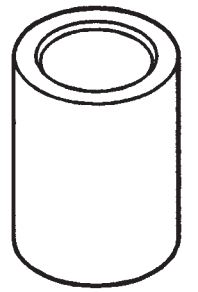
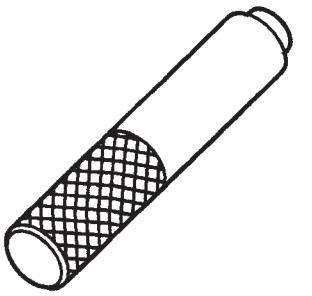
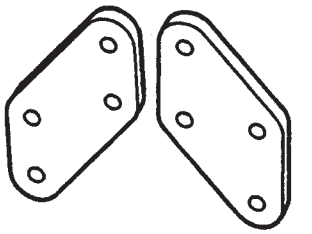
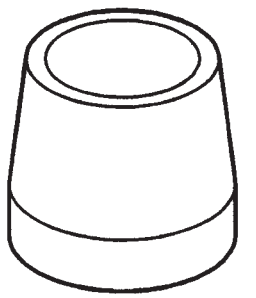
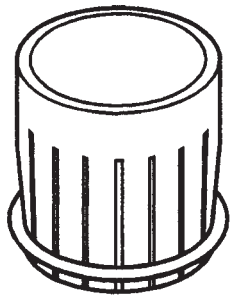
Illustration	Tool Number/Description
	DT 47605 Holding Fixture Adapter
	DT 47715 Electrical Connector Passage Sleeve Remover/Installer
	DT 47761 Clutch Spring Compressor
	DT 47768–1 Seal Protector
	DT 47768–2 Seal Pusher
	DT 47768–3 Seal Sizer
	DT 47770 Seal Installer
	DT 47773 Snap Ring Pliers Adapter Set
	DT 47778–1 Low Clutch Sprag Retaining Ring Cone
	DT 47778–2 Low Clutch Sprag Retaining Ring Pusher

Figure 181

SPECIAL TOOLS AND EQUIPMENT

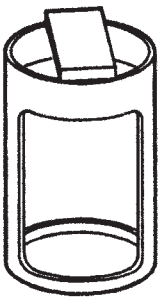
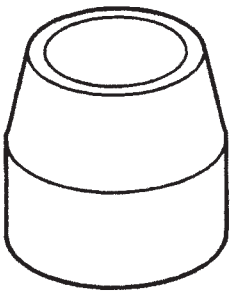
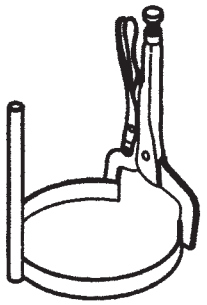
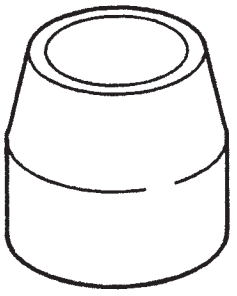
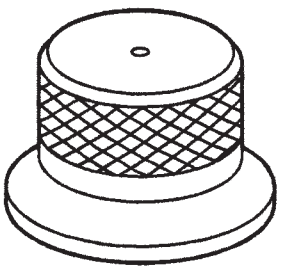
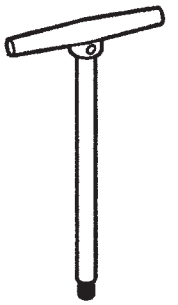
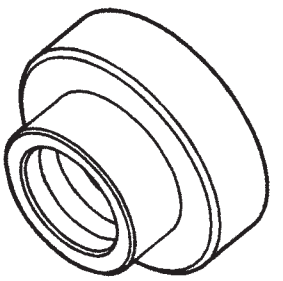
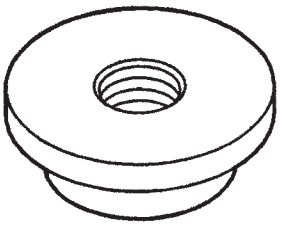
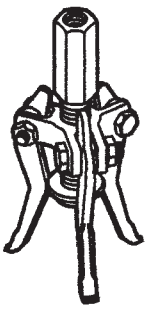
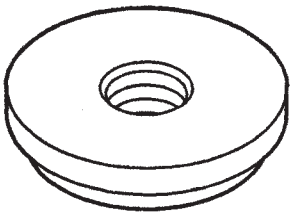
Illustration	Tool Number/Description
	DT 47779 Clutch Spring Compressor
	DT 47780 Low Clutch Sprag Seal Cone
	DT 47781 C1234 and 35R Clutch Assembly Installer
	DT 47782–1 Retaining Ring Cone
	DT 47782–2 Retaining Ring Installer
	DT 47786 Output Carrier/Shaft Lifting Tool
	DT 47848 Seal Installer
	DT 47857 Bearing Installer
	DT 47865 Bearing Remover
	DT 47866 Bearing Installer

Figure 182

SPECIAL TOOLS AND EQUIPMENT

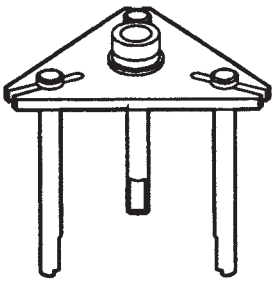
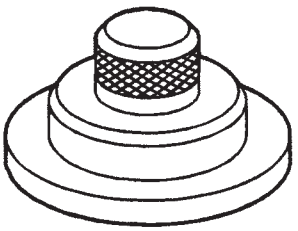
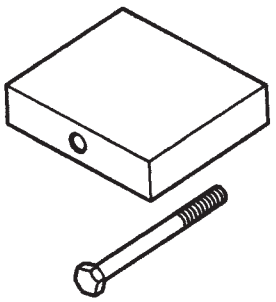
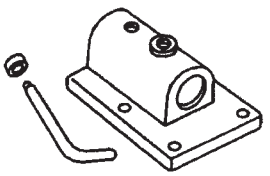
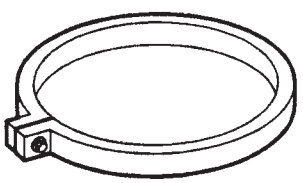
Illustration	Tool Number/Description
	DT 47867 Adjustable Clutch Spring Compressor
	DT 47868–1 Pack Travel Weight
	DT 47868–2 Magnetic Base Adapter
	J 3289–20 Holding Fixture Base Assembly
	J 46664 Pump Cover Alignment Tool

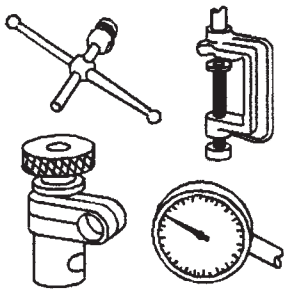
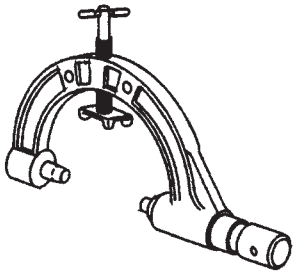
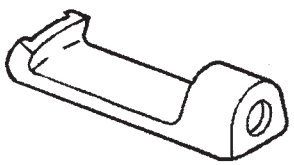
Illustration	Tool Number/Description
	J 6125–B Slide Hammer
	J 8001 Dial Indicator Set
	J 8092 Driver Handle
	J 8763–B Holding Fixture
	J 23129 Universal Seal Remover

Figure 183

SPECIAL TOOLS AND EQUIPMENT

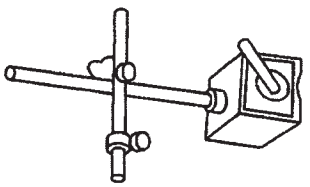
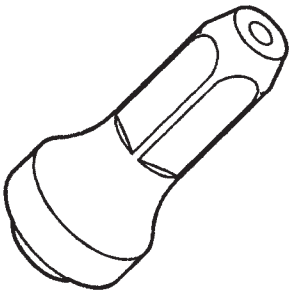
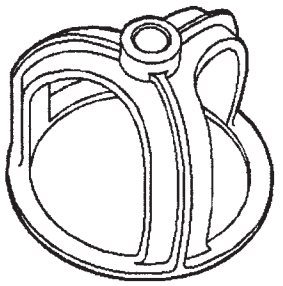
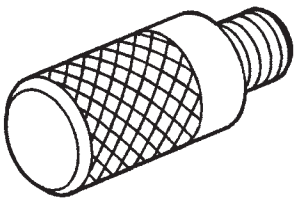
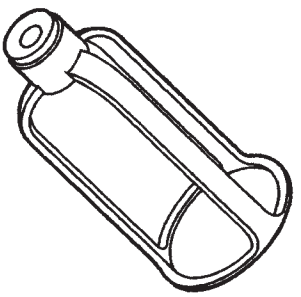
Illustration	Tool Number/Description
	J 26900–13 Magnetic Base
	J 38693 Seal Installer
	J 38734 Intermediate Spring Compressor Adapter
	J 42183 Driver Handle
	J 43074 Clutch Spring Compressor

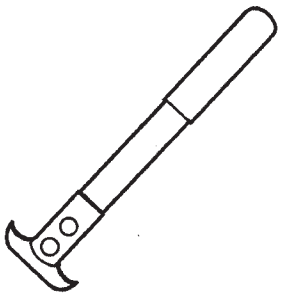
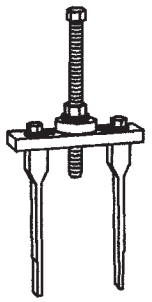
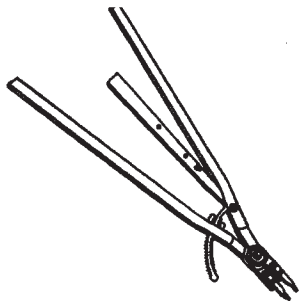
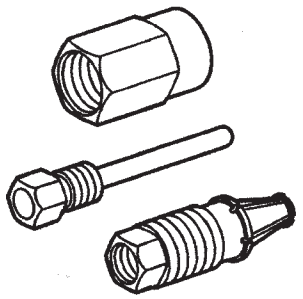
Illustration	Tool Number/Description
	J 45000 Seal Remover
	J 45124 Remover Bridge
	J 45126 Snap Ring Pliers
	J 45201 Cooler Line Seal Remover

Figure 184

6L80 Transmission General Specifications	
RPO Codes	MYC
Production Location	Ypsilanti MI (USA)
Transmission Drive	Rear Wheel Drive
1st Gear Ratio	4.027
2nd Gear Ratio	2.364
3rd Gear Ratio	1.532
4th Gear Ratio	1.152
5th Gear Ratio	0.852
6th Gear Ratio	0.667
Reverse Gear Ratio	3.064
Torque Converter Size	258/300 mm
Pressure Taps	Line Pressure
Fluid Type	Dexron VI®
Case Material	Cast Aluminum
6L80 Net Weight	100kg (220 lb.)

6L80 Pump Selective Specifications

Important

Rotor and slide must be chosen from the same size classification as the oil pump body.
Allowable rotor and slide to oil pump body end play

Slide to Pump Body Face
0.020-0.051 mm (0.0008-0.0020 in.)

Rotor to Pump Body Face
0.020-0.038mm (0.0008-0.0015 in.)

The oil pump assembly has "selective" rotor and slide components. These components are chosen based on pump body dimensions. Oil pump rotor and slide components are available in three size classifications (1, 2, 3) with the following tolerances.

PUMP POCKET DEPTH		
SIZE CLASSIFICATION	THICKNESS (MM)	THICKNESS (IN)
1	17.980-17.994	.7079" - .7084"
2	17.994-18.007	.7084" - .7089"
3	18.007-18.003	.7089" - .7100"
ROTOR SELECTION		
ROTOR SELECTION	THICKNESS (MM)	THICKNESS (IN)
1	17.948-17.961	.7066" - .7071"
2	17.961-17.974	.7071" - .7076"
3	17.974-17.987	.7076" - .7081"
SLIDE SELECTION		
SLIDE SELECTION	THICKNESS (MM)	THICKNESS (IN)
1	17.948-17.961	.7066" - .7071"
2	17.961-17.974	.7071" - .7076"
3	17.974-17.987	.7076" - .7081"

CLUTCH BACKING PLATE RETAINING RING SPECIFICATIONS

1-2-3-4 CLUTCH

THICKNESS	O.D. COLOR
2.15-2.25mm (.085" - .089")	YELLOW
2.42-2.52mm (.095" - .099")	NONE
2.69-2.79mm (.106" - .110")	PURPLE
2.96-3.06mm (.117" - .120")	LIGHT BLUE
3.23-3.33mm (.127" - .131")	ORANGE

4-5-6 CLUTCH

THICKNESS	O.D. COLOR
1.61-1.71mm (.063" - .067")	YELLOW
2.02-2.12mm (.080" - .083")	NONE
2.44-2.54mm (.096" - .100")	PURPLE

3-5 REVERSE CLUTCH

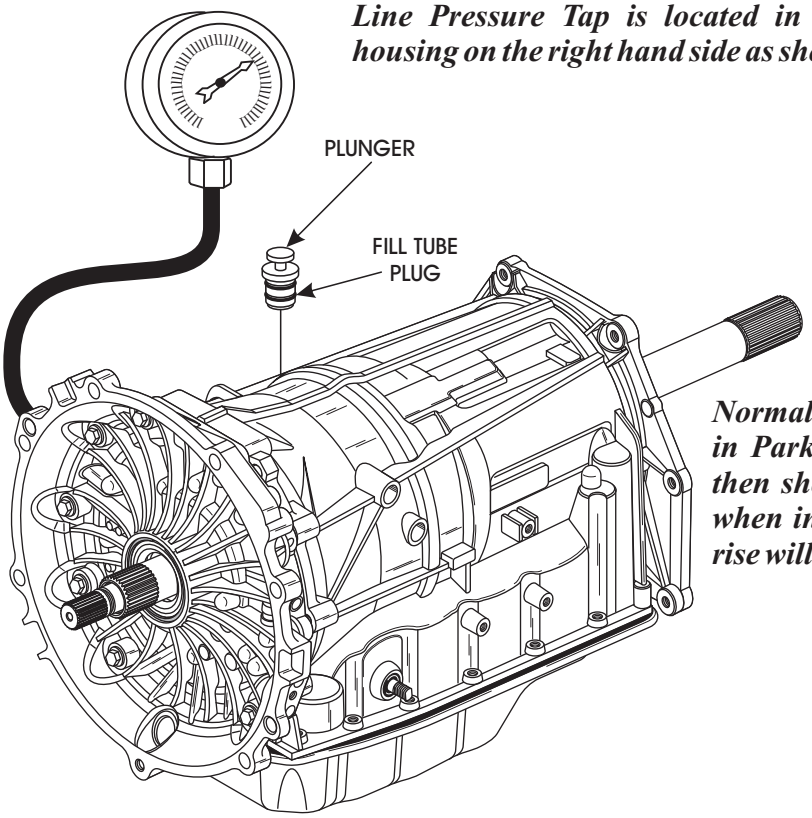
THICKNESS	O.D. COLOR
	GRAY
1.88-1.98mm (.074" - .078")	LIGHT GREEN
2.15-2.25mm (.085" - .089")	YELLOW
2.42-2.52mm (.095" - .099")	NONE
2.69-2.79mm (.106" - .110")	PURPLE

Important: After measuring clutch pack travel, determine if the measurement is within the specification. If the measurement is not within the specification, measure the thickness of the existing snap ring, and then choose a thicker or thinner snap ring that will bring the measurement within specification.

Figure 185

LINE PRESSURE SPECIFICATIONS

Line Pressure Tap is located in the converter housing on the right hand side as shown below.



Normal line pressure should be 50-53 PSI, when in Park or Neutral and RPM below 1500, and then should rise smoothly with throttle opening when in gear and road testing. Amount of line rise will depend on engine load and vehicle speed.

FLUID FILL PROCEDURE

Perform this procedure for vehicles that are not equipped with a fill tube and dipstick.

1. Unlock the fill tube plug by lifting up on the plunger. Once the plunger is lifted, remove the entire plug assembly, as shown above. ***Note: You may want to purchase an extra dipstick tube to assist in filling this unit.***
2. Fill unit only with the appropriate amount of Dexron VI® fluid needed to fill the unit based on the type of repair performed. See capacity chart below.
3. Since the Corvette unit is not equipped with a fill tube and dipstick, a tube in the bottom pan is used to set the fluid level, much like some Ford transmissions.
4. Raise the vehicle on a hoist. The vehicle must be level, with the engine running and the shift lever in the PARK position. Allow the engine to idle for at least a minute.
5. The engine ***must*** be running when the fluid level control plug in bottom pan is removed or excessive fluid loss will occur, resulting in an under-filled condition.
6. If the fluid is flowing as a steady stream, wait until the fluid begins to drip.
7. If no fluid comes out, add fluid until the fluid drips out and reinstall fluid level control plug in bottom pan.

DEXRON VI®	TRANSMISSION FLUID REQUIREMENTS	DEXRON VI®
Pan Removal - Approximate Capacity		6.5 Quarts
Overhaul - Approximate Capacity (Cadillac STSV/XLRV)		10 Quarts
Overhaul - Approximate Capacity (Corvette)		12.5 Quarts

Figure 186

TORQUE SPECIFICATIONS

Application	Ref No.	Quantity	Size	Specification	
				Metric	English
Case Extension Stud to Case Extension	17	2	M10x1.5	15 N·m	11 lb ft
Case Extension to Case Assembly	16	6	M10x1.5x40	50 N·m	37 lb ft
Control Solenoid Valve Assembly and Control Valve Lower Body Assembly to Control Valve Upper Body Assembly	310	6	M5x0.8x55	8 N·m	71 lb in
Control Solenoid Valve Assembly and Control Valve Lower Body Assembly to Control Valve Upper Body Assembly	309	10	M5x0.8x45	8 N·m	71 lb in
Control Solenoid Valve Heat Sink to Valve Body	312	2	M5x0.8x53	8 N·m	71 lb in
Control Valve Upper Body Assembly to Control Valve Lower Body Assembly	301	12	M5x0.8x36	8 N·m	71 lb in
Control (with Body and Valve) Valve Assembly to Case Assembly	22	6	M5x0.8x73	8 N·m	71 lb in
Fluid Pan Assembly to Case Assembly	30	18	M6x1.0x20	9 N·m	80 lb in
Trans Oil Level Check Plug to Fluid Pan Assembly	31	1	M12x1.75	25 N·m	18 lb ft
Fluid Pump Cover Assembly to Torque Converter Housing	231	13	M6 1.0x40	11 N·m	97 lb in
Input and Output Speed Sensor Assembly to Control Valve Upper Body Assembly	302	2	M6x1.0x20	12 N·m	106 lb in
Line Pressure Test Hole Plug to Torque Converter Housing	202	1	1/8–27 NPTF	11 N·m	97 lb in
Manual Shaft Detent Assembly to Valve Body	23	1	M6x1.0x14.5	12 N·m	106 lb in
Torque Converter Housing Assembly to Case Assembly	3	9	M10x1.5x50	72 N·m	53 lb ft

*Reference number refers to the component callout number in Disassembled Views

Figure 187