INTRODUCTION

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GENERAL MOTORS
6T70/75 Transmission

The new Hydra-matic 6T70/75 (6 Speed) is a fully automatic, six speed, front wheel drive, electronically controlled transmission that features clutch to clutch shifting. It is also all-wheel drive capable. It was first introduced in the 2007 model year in several different models, as shown in Figure 1. It consists primarily of a four element torque converter, three planetary gear sets, five clutch packs, one mechanical one-way clutch and a hydraulic pressurization and control system. Three 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 the procedures necessary to diagnose, overhaul and/or repair the new 6T70/75 (6 Speed) transmission from General Motors.

Special thanks to the Worldwide Transmission Group in Illinois for donating a 6T70 transmission to ATSG making this manual possible.

THIS MANUAL IS DEDICATED IN MEMORY OF DALE ENGLAND

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GENERAL DESCRIPTION

The Hydra-matic 6T70/75 is a fully automatic, six speed, front-wheel drive, electronic-controlled transmission, and was first introduced in the 2007 model year as shown in Figure 1. It consists primarily of a four element torque converter, compound planetary gear set, friction and mechanical clutch assemblies, and a hydraulic pressurization system. There are two variants of the transmission (6T70 and 6T75), based on the torque carrying capacity. Structure is common between the variants, and component differences are primarily related to size.

The 4-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 input shaft of the transmission.

The three compound 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 inside the transmission and bolted to the valve body. The TCM receives and monitors various electronic sensor inputs and uses this information to shift the transmission at the optimum time.

The TCM commands 2 On/Off shift solenoids and six variable bleed (PWM) solenoids to control shift timing and shift feel. 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. All of the solenoids and the TCM are packaged into a self-contained assembly and are not serviced separately.

The hydraulic system primarily consists of an off-axis chain driven vane-type pump, upper and lower valve body assemblies, transfer drive gear support assembly and the transmission case. The pump maintains the working pressures needed to stroke the clutch pistons that apply or release the friction components. These friction components, when applied or released, support the automatic shifting qualities of the transmission.

The friction components used in this transmission consist of 5 multiple disc clutches. The multiple disc clutches combine with a one-way clutch to deliver the seven different ratios, six forward and one reverse, through the compound planetary gear sets. The gear sets then transfer torque through the transfer drive, transfer driven gear and differential assembly.

Component location chart is found in the cut-away view in Figure 2.

VEHICLE APPLICATION CHART

VEHICLE	YEAR	ENGINE	COUNTRY	TRANS-AXLE
BUICK, ENCLAVE	*2007-12*	*3.6L (V6)*	*USA,*	*6T75*
CHEVROLET & GMC, ACADIA	*2007-12*	*3.6L (V6)*	*USA, CAN,*	*6T75*
CHEVROLET, EQUINOX	*2007-12*	*3.0L,3.6L (V6)*	*USA,*	*6T70*
CHEVROLET, MALIBU	*2007-12*	*3.6L (V6)*	*USA, CAN,*	*6T70*
PONTIAC, G6	*2007-09*	*3.6L (V6)*	*USA, CAN,*	*6T70*
PONTIAC, TORRENT	*2007-09*	*3.6L (V6)*	*USA, CAN,*	*6T70*
CHEVROLET, CAPTIVA SPORT	*2008-12*	*3.6L (V6)*	*USA, CAN,*	*6T70*
BUICK, LACROSSE	*2009-12*	*3.6L (V6)*	*USA, CAN,*	*6T70*
CHEVROLET, TERRAIN	*2009-12*	*3.6L (V6)*	*USA, CAN,*	*6T70*
CHEVROLET, TRAVERSE	*2009-12*	*3.6L (V6)*	*USA, CAN,*	*6T75*
CADILLAC, SRX	*2009-12*	*3.0L (V6)*	*USA, CAN,*	*6T70*
CHEVROLET, IMPALA	*2011-12*	*3.0L,3.6L (V6)*	*USA, CAN,*	*6T70*
SATURN, AURA "XR"	*2007-11*	*3.6L (V6)*	*USA,*	*6T70*
SATURN, OUTLOOK	*2007-09*	*3.6L (V6)*	*USA,*	*6T75*

Figure 1

COMPONENT LOCATION AND IDENTIFICATION

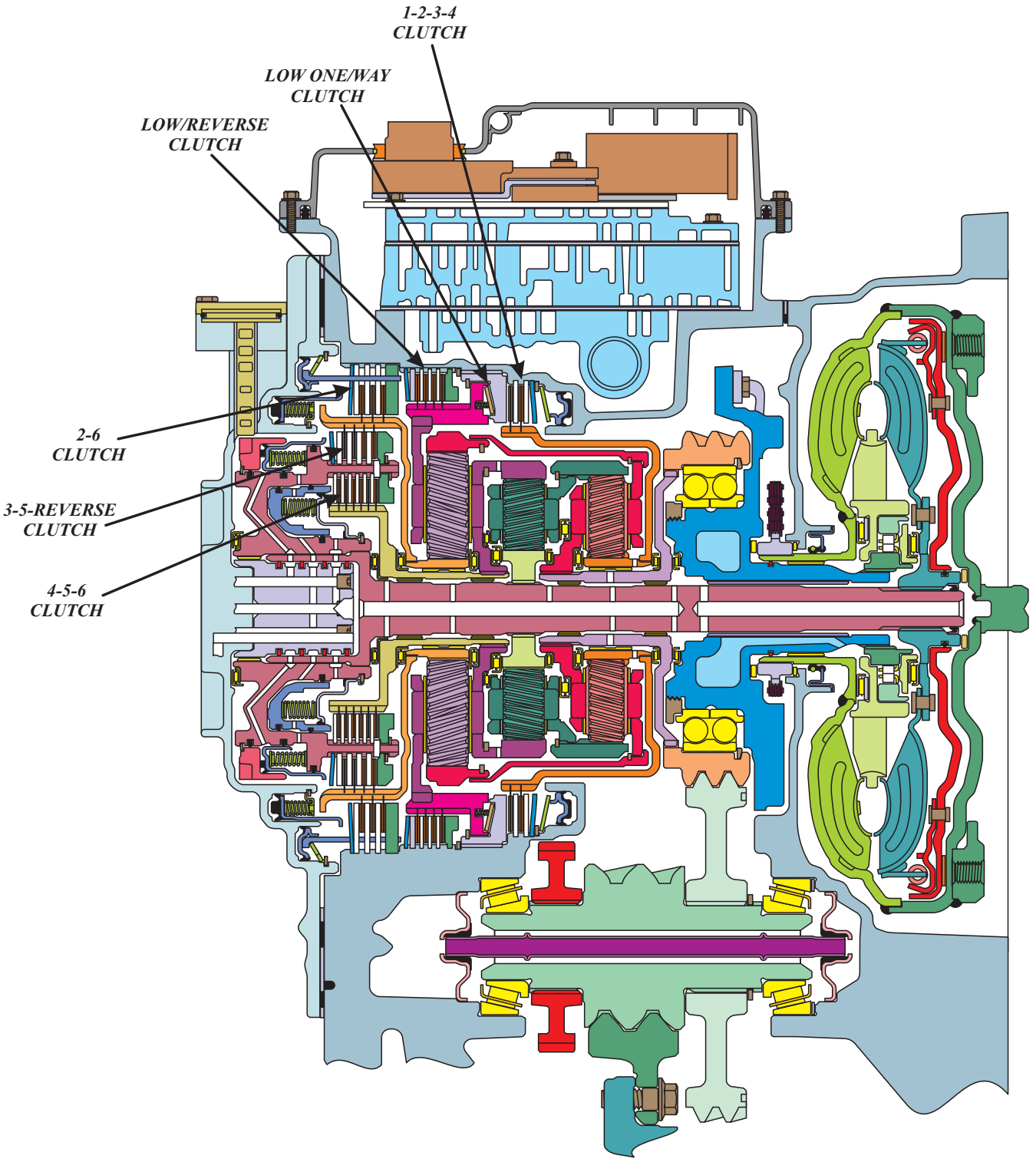


Figure 2

DESCRIPTION OF OPERATION AND POWERFLOW

The new Hydra-matic 6T70/75 (6 Speed) is a fully automatic, six speed, rear wheel drive, electronically controlled transmission (See Figure 3), that features clutch to clutch shifting. It consists primarily of a four element torque converter, three planetary gear sets, five clutch packs, one mechanical one-way clutch and a hydraulic pressurization and control system.

The three 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.

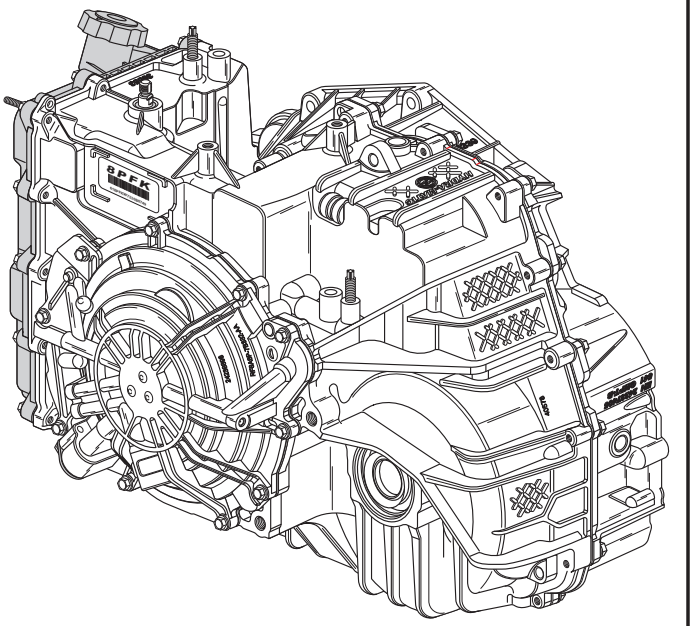


Figure 3

COMPONENT APPLICATION CHART

RANGE	GEAR	RATIO	SHIFT SOL 1 (On/Off)	SHIFT SOL 2 (On/Off)	1-2-3-4CL PC SOL 5 N.L.	2-6 CL PC SOL 4 N.L.	3-5 REV CL PC SOL 2 N.H.	LO/REV 4-5-6 CL PC SOL 3 N.H.	4-5-6 CLUTCH	3-5 REV CLUTCH	2-6 CLUTCH	LO/REV CLUTCH	1-2-3-4 CLUTCH	LOW ONE-WAY CLUTCH
PARK	P		ON	ON	OFF	OFF	ON	OFF				APPLIED*		
REV	R	2.880	ON	OFF	OFF	OFF	OFF	OFF		APPLIED		APPLIED		
NEUT	N		ON	ON	OFF	OFF	OFF	ON				APPLIED*		
DRIVE	1ST BRAKING	4.484	ON	ON	ON	OFF	ON	OFF				APPLIED	APPLIED	
	1ST	4.484	OFF	ON	ON	OFF	ON	ON					APPLIED	HOLD
	2ND	2.872	OFF	ON	ON	ON	ON	ON			APPLIED		APPLIED	
	3RD	1.842	OFF	ON	ON	OFF	OFF	ON		APPLIED			APPLIED	
	4TH	1.414	OFF	ON	ON	OFF	ON	OFF	APPLIED				APPLIED	
	5TH	1.000	OFF	ON	OFF	OFF	OFF	OFF	APPLIED	APPLIED				
	6TH	0.742	OFF	ON	OFF	ON	ON	OFF	APPLIED		APPLIED			

* APPLIED WITH NO LOAD

Figure 4

SHIFT QUADRANTS

There are two different styles of shift quadrants for this transmission; Standard Shift Quadrant and Driver Shift Control (DSC) Quadrant.

The transmission shift quadrants vary by model. There may be four to seven different positions shown on the shift quadrant. Refer to Figure 5, 6, and 7. The following are a couple of examples.

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 upshift and downshift in each of the six forward gear ratios automatically, according to the normal shift pattern that is programmed into the TCM.

Driver Shift Control (DSC) Quadrant

Some vehicles are equipped with Driver Shift Control (DSC) version of the selector system, as shown in Figure 5. This configuration allows the driver to manually shift between forward gears.

M - In the M (Manual) 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 5. The transmission will shift up or down depending on the request that is made by tapping the selector lever. Refer to the appropriate owners manual for specific instructions.

DRIVER SHIFT CONTROL (DSC) QUADRANT

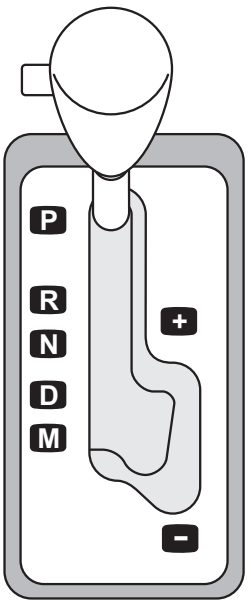


Figure 5

Continued on Page 7

SHIFT QUADRANTS (CONT'D)

Standard Shift Quadrant (Cont'd)

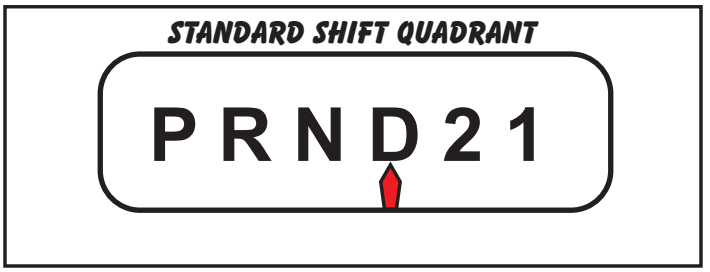


Figure 6

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 upshift and downshift in each of the six forward gear ratios automatically, according to the normal shift pattern that is programmed into the TCM.

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.

Driver Shift Control (DSC) Quadrant

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 7 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 on the steering wheel, as shown in Figure 7, may be used to select the desired range of gears for the current driving conditions. Refer to the appropriate owners manual for specific instructions.

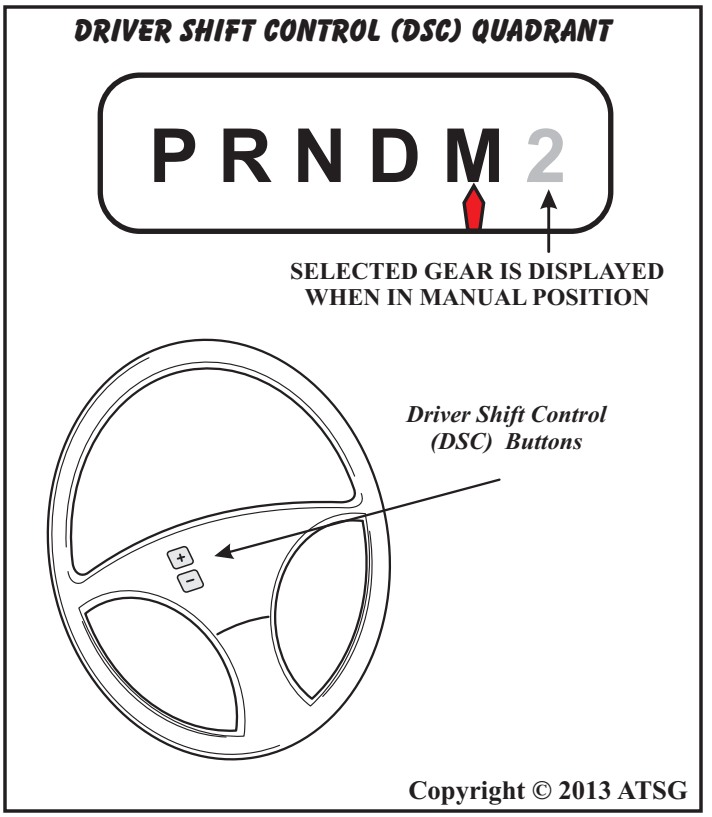
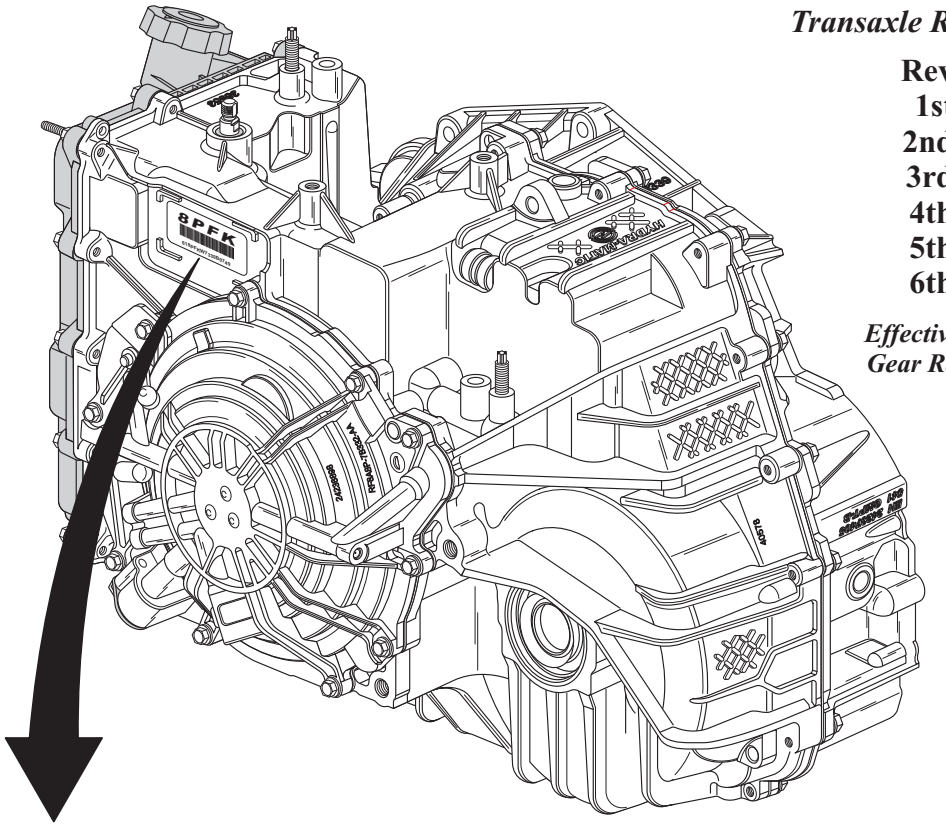


Figure 7

IDENTIFICATION TAG INFORMATION



Transaxle Ratio Information

Rev = 2.88
1st = 4.48
2nd = 2.87
3rd = 1.84
4th = 1.41
5th = 1.00
6th = 0.74

Effective Final Drive Gear Ratio 2.77/3.16

Fluid Requirement
Dexron VI Only
Dry Fill = 9.0 Ltrs/9.5 Qts.

Identification Tag Information Chart	
Callout	*Description*
1	*Code for Automatic Transmission*
2	*Model Year*
3	*Model for Transmission*
4	*Transmission Family (K = 6T70/75)*
5	*Source Code for Plant*
6	*Calendar Year*
7	*Julian Date*
8	*Shift/Build Line (A/B)*
9	*Sequence No. starting at 0001 @ 12:01 AM each day*

Source Code for Plant:
H = Ypsilanti, Michigan
J = Windsor, Ontario
S = Strasbourg, France
W = Warren, Michigan
Y = Toledo, Ohio
(Also built in Mexico, Korea and China)

Figure 8

TORQUE CONVERTER CLUTCH OPERATION

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.

When the torque converter clutch is released fluid is directed into the torque converter through the turbine shaft, as shown in Figure 9, and enters the release side of the clutch pressure plate. The pressure plate is forced away from the converter cover and allows the torque converter turbine to rotate at speeds other than engine speed. The TCC release fluid then flows between the friction element on the pressure plate and the converter cover to enter the apply side of the torque converter. The release fluid then exits the torque converter through the TCC apply passage located in the stator shaft and transfer drive gear support and enters the upper valve body assembly. The fluid is now directed to the fluid cooler.

When the TCM determines that the vehicle is at the proper speed for the torque converter clutch to apply, it sends a signal to the TCC Pressure Control solenoid. The solenoid then regulates Drive 1-6 fluid into the regulated apply passage. The regulated apply fluid is then directed into the converter apply passage located in the transfer drive gear support and stator shaft, as shown in Figure 9, and applies the torque converter clutch. At the same time TCC release fluid is exhausted at the TCC control valve in the upper valve body and flows back through the turbine shaft.

TCC apply fluid pressure forces the pressure plate against the torque converter cover to provide a mechanical link between the engine and turbine. In vehicles equipped with Electronically Controlled Capacity Clutch (ECCC) system, the TCM will maintain a small amount of slippage to reduce torsional disturbances.

The TCC may apply in Drive 1st (without engine braking), 2nd, 3rd, 4th, 5th or 6th gears, but should not apply until the transmission fluid and engine temperatures have reached a minimum value which is calibrated into the TCM.

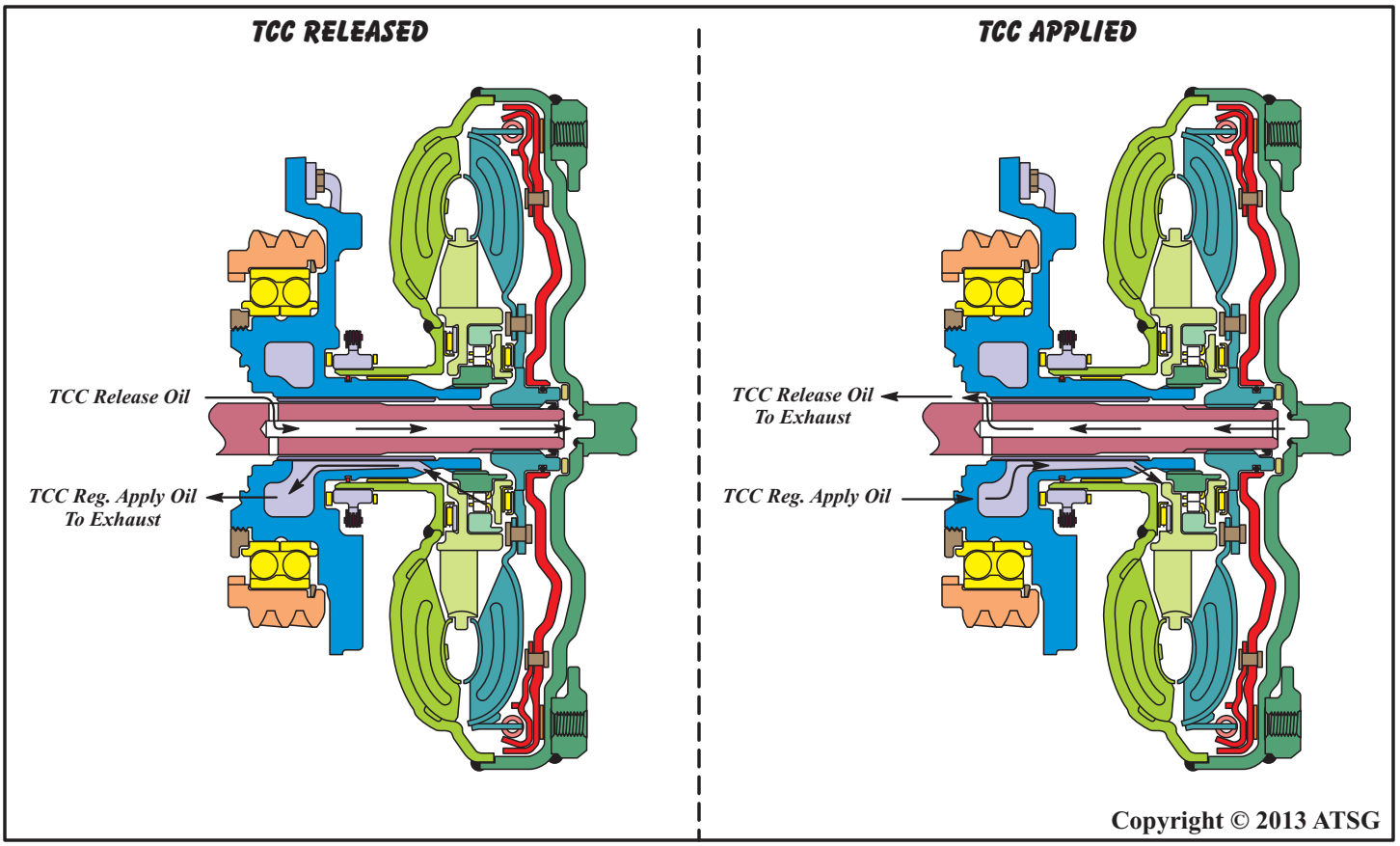


Figure 9

ELECTRONIC COMPONENTS

In the 6T70/75 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 behind the side cover pan, and bolted to the valve body, as shown in Figure 10.

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 converter clutch, 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.

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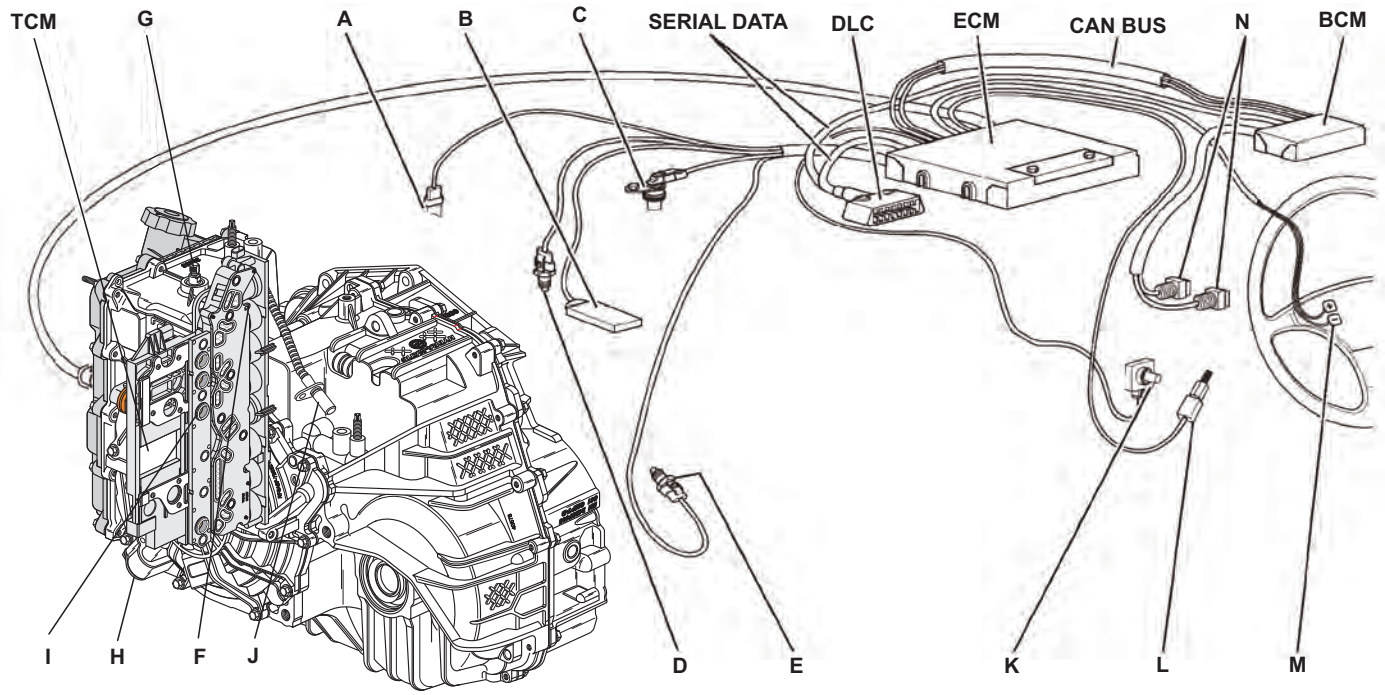


INFORMATION SENSORS

A THROTTLE POSITION SENSOR
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 INTERNAL MODE SWITCH (IMS) 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)

ELECTRONIC BRAKE & TRACTION CONTROL MODULE (NOT SHOWN)

DIAGNOSTIC LINK CONNECTOR (DLC)

ELECTRONICALLY CONTROLLED TRANSMISSION COMPONENTS

LINE PRRESSURE 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 10

ELECTRONIC COMPONENTS (CONT'D)

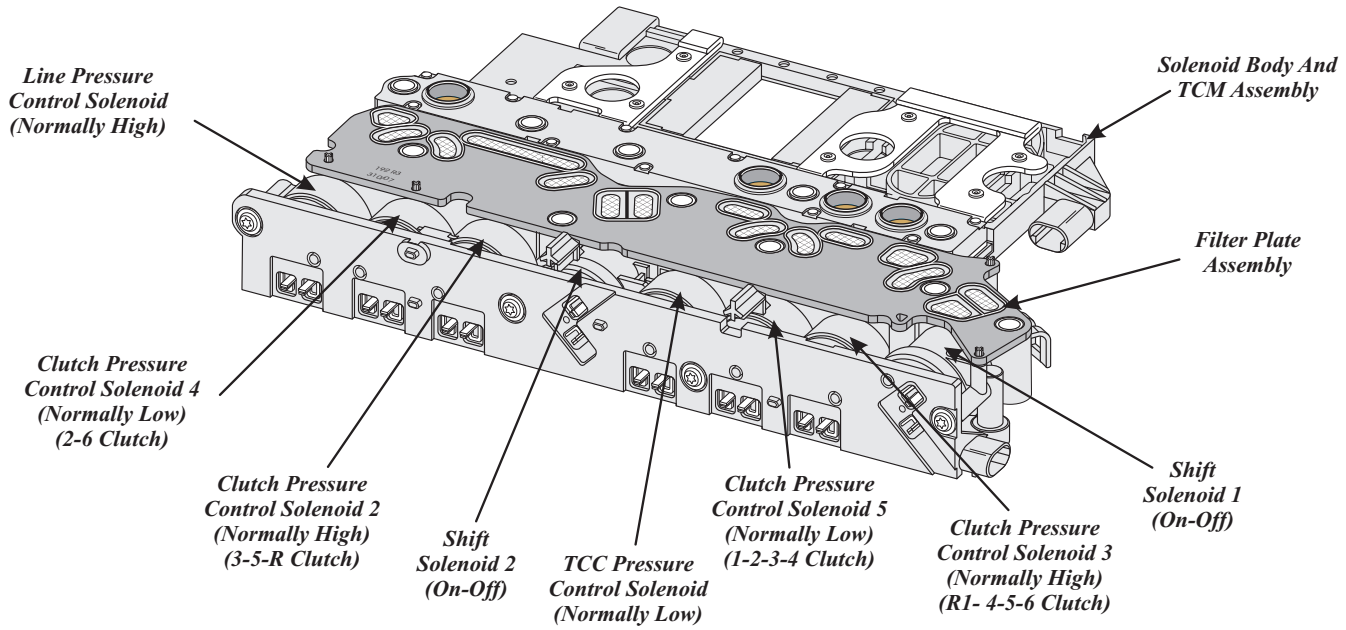
Control Solenoid Body And TCM Assembly

The Solenoid Body & TCM Assembly utilizes a lead frame system to connect the components to the TCM, as shown in Figure 11. There are no wires used for these components. The Control Solenoid Body and TCM Assembly connect to the external harness 20 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 11.

Continued on Page 12

SOLENOID LOCATIONS AND IDENTIFICATION



SOLENOID APPLICATION CHART

RANGE	Shift Sol. 1	Shift Sol. 2	N.L. CPC Sol. 5 1-2-3-4 CL.	N.L. CPC Sol. 4 2-6 CL.	N.H. CPC Sol. 2 3-5 Rev CL.	N.H. CPC Sol. 3 4-5-6, Low/Rev CL.	TCC PC Sol. Torq Conv CL.	LINE PC Sol. Line Pres Cont	GEAR RATIO
Park	ON	ON	OFF	OFF	ON	OFF	OFF	ON**	——
Reverse	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON**	2.880
Neutral	ON	ON	OFF	OFF	ON	OFF	OFF	ON**	——
"D"-1st Braking	ON	ON	ON	OFF	ON	OFF	OFF		4.484
"D"-1st	OFF	ON	ON	OFF	ON	ON	OFF	ON**	4.484
"D"-2nd	OFF	ON	ON	ON	ON	ON	ON*	ON**	2.872
"D"-3rd	OFF	ON	ON	OFF	OFF	ON	ON*	ON**	1.842
"D"-4th	OFF	ON	ON	OFF	ON	OFF	ON*	ON**	1.414
"D"-5th	OFF	ON	OFF	OFF	OFF	OFF	ON*	ON**	1.000
"D"-6th	OFF	ON	OFF	ON	ON	OFF	ON*	ON**	0.742

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 11

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 12, 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 12, 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 separately.

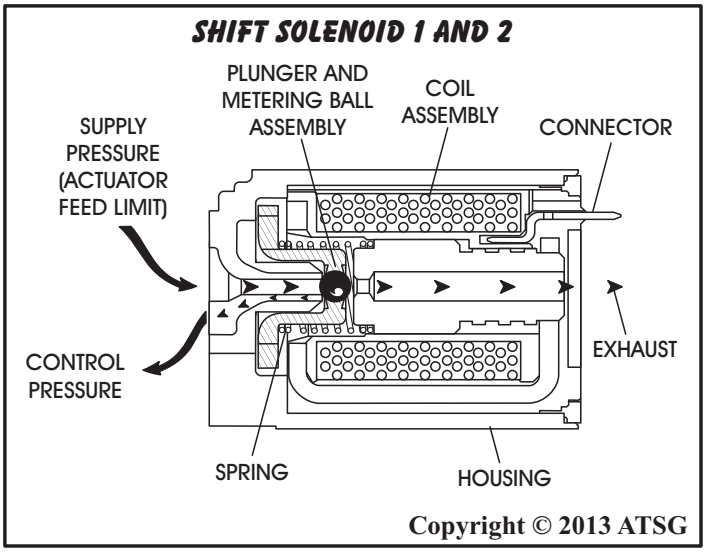


Figure 12

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 12. 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 12.

Shift Solenoid 2

Actuator feed limit fluid feeds the shift solenoid 2 fluid circuit to control clutch select valve 3. When shift solenoid 2 is energized (ON), actuator feed limit fluid is allowed to pass through the solenoid, thereby creating solenoid 2 control pressure, as shown in Figure 12. 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 12.

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. The transmission will remain in 5th gear default range until the ignition has been turned off or the transmission has been shifted to Reverse. When the vehicle is restarted and shifted back into Drive, the transmission will then operate in the 3rd gear default range.

Continued on Page 13

ELECTRONIC COMPONENTS (CONT'D)

PRESSURE CONTROL SOLENOIDS

Line Pressure Control Solenoid

The Line Pressure 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"*** amperage line pressure control 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 13. Opening the exhaust port decreases control pressure, which is routed to the isolator (boost) valve, as shown in Figure 13, 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 13, 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 solenoid. If the TCM detects a line pressure control solenoid electrical malfunction, a DTC will be activated.

The Line Pressure Control Solenoid is part of the Control Solenoid Body And TCM Assembly and is not serviced separately.

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 and/or failsafe operation.

If the transmission is in 1st, 2nd or 3rd during an electrical failure, the transmission will default to 3rd gear. All solenoids will default to their normal state. If the torque converter clutch was applied, it will release.

If the transmission is in 4th, 5th or 6th during an electrical failure, the transmission will default to 5th gear. All solenoids will default to their normal state. If the torque converter clutch was applied, it will release.

The transmission will remain in 5th gear default range until the ignition has been turned off or the transmission has been shifted to Reverse. When the vehicle is restarted and shifted back into Drive, the transmission will then operate in the 3rd gear default range.

Continued on Page 14

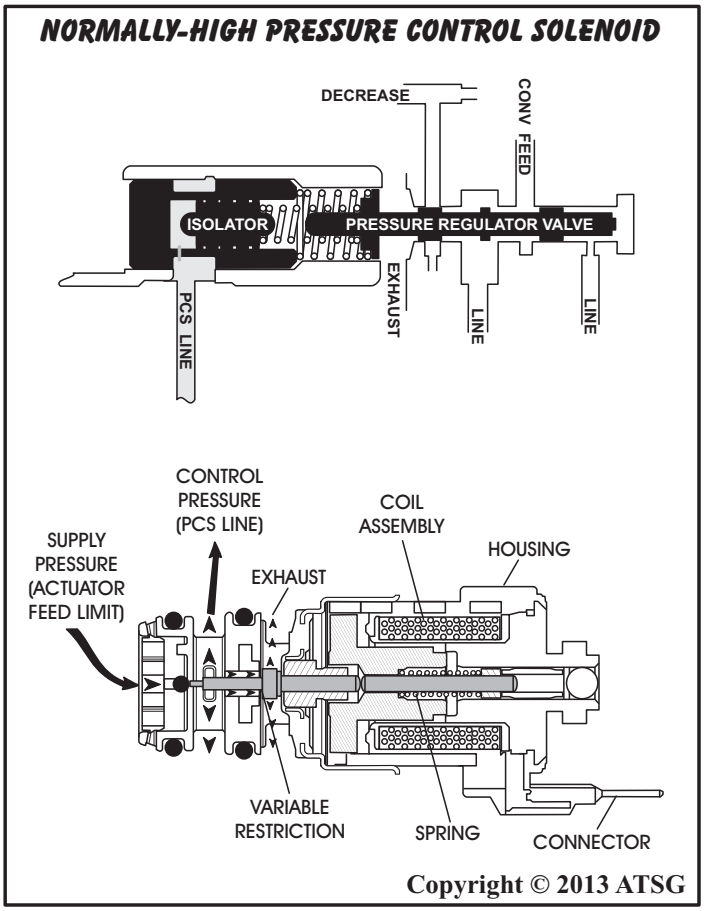


Figure 13

ELECTRONIC COMPONENTS (CONT'D)

Torque Converter Clutch (TCC) Solenoid

The Torque Converter Clutch (TCC) Solenoid is a ***"normally-low"amperage***, 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 solenoid regulates actuator feed limit fluid pressure to the TCC regulator valve, located in the upper valve body, and provides a signal pressure to shift the TCC control valve, located in the upper valve body, to the apply position, as shown in Figure 14. When the TCM determines to apply the TCC, the TCC 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 results in a smoother TCC operation.

When vehicle operating conditions are appropriate to apply the TCC, the TCM increases current flow to allow the TCC solenoid to increase PCS TCC fluid pressure, to move the TCC control valve to the apply position, as shown in Figure 14, and move the TCC regulator valve to the regulating position to regulate fluid pressure proportional to solenoid pressure. Release pressure is directed to exhaust, and regulated apply pressure is directed to the apply side of the converter clutch plate and 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 for 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 Solenoid is part of the Control Solenoid Body And TCM Assembly and is not serviced separately.

Continued on Page 15

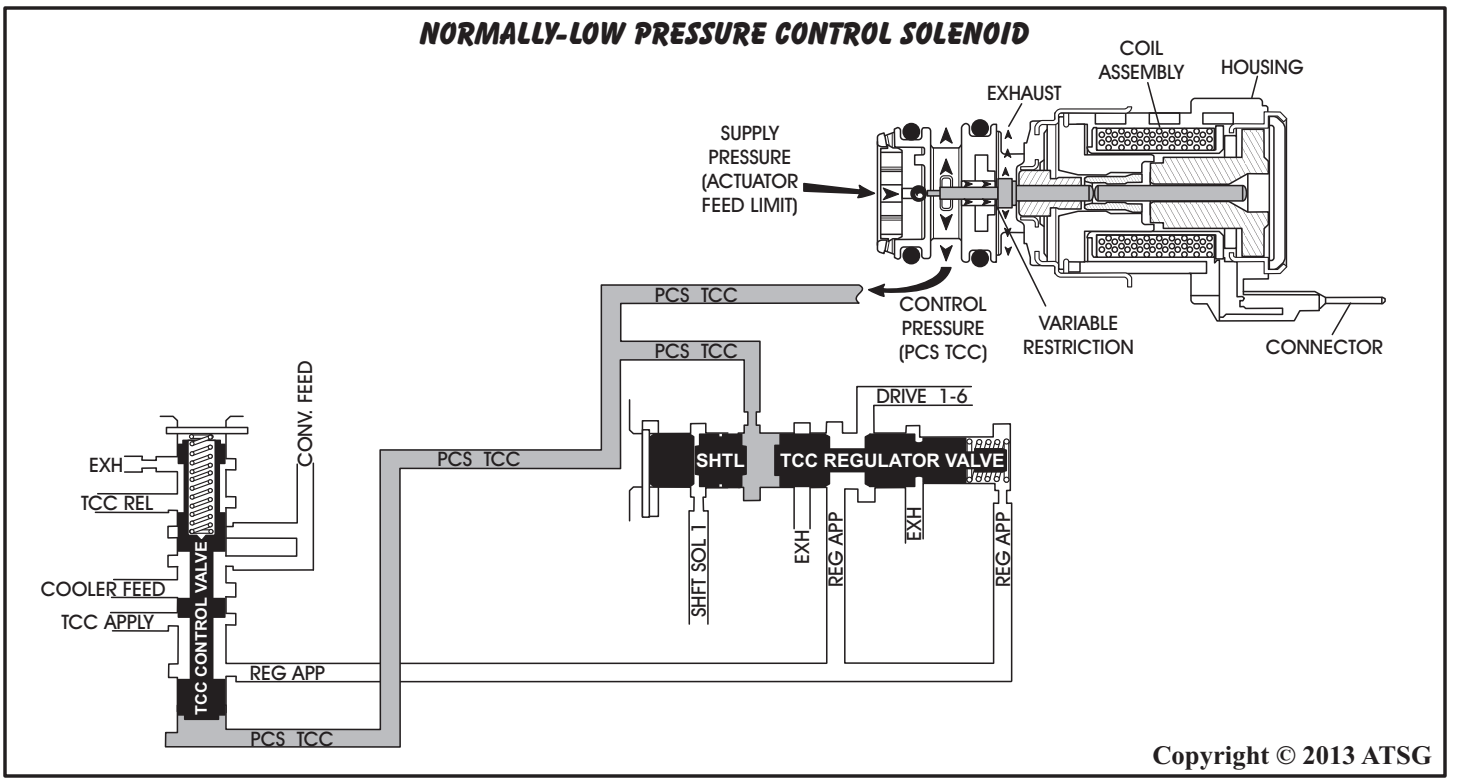


Figure 14

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 solenoids 2 and 3 are ***"normally-high"*** amperage pressure control solenoids, as shown in Figure 16, and are identical to the line pressure control solenoid.

Clutch Pressure Control solenoids 4 and 5 are ***"normally-low"*** amperage pressure control solenoids, as shown in Figure 15, and are identical to the TCC PC solenoid.

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

Clutch Pressure Control Solenoid 2

Clutch Pressure Control 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 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 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 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.

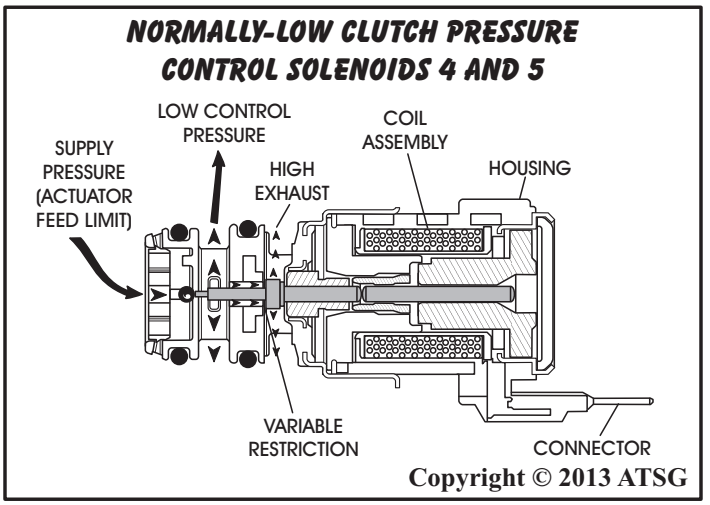


Figure 15

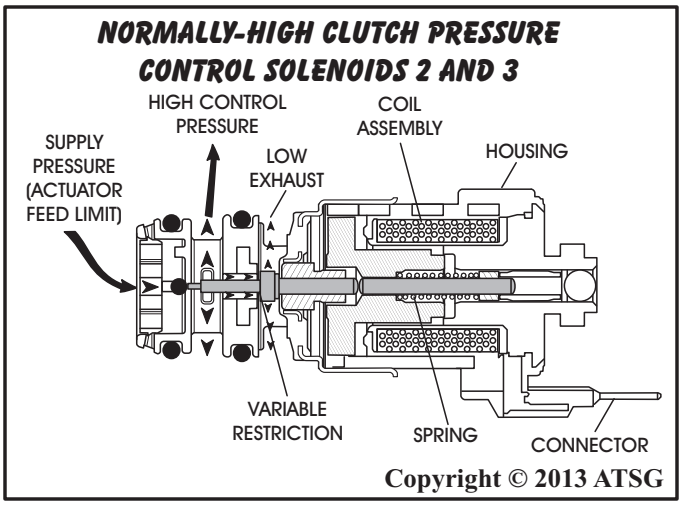


Figure 16

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.

Continued on Page 16

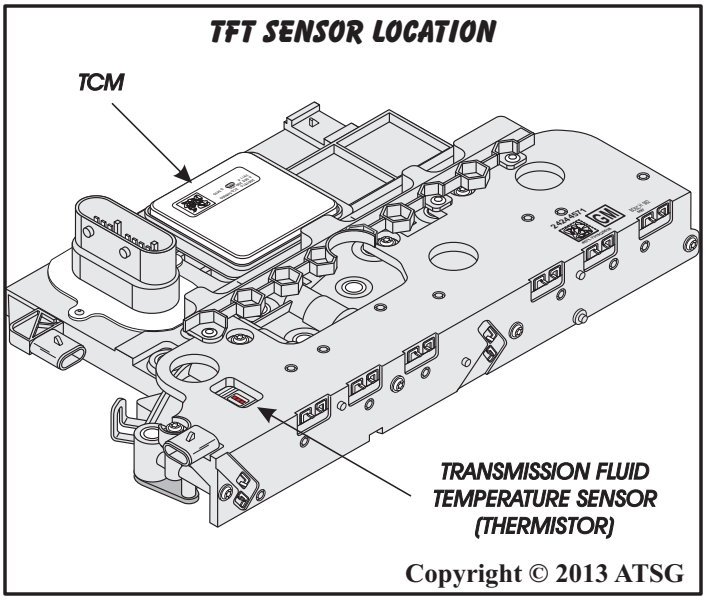


Figure 17

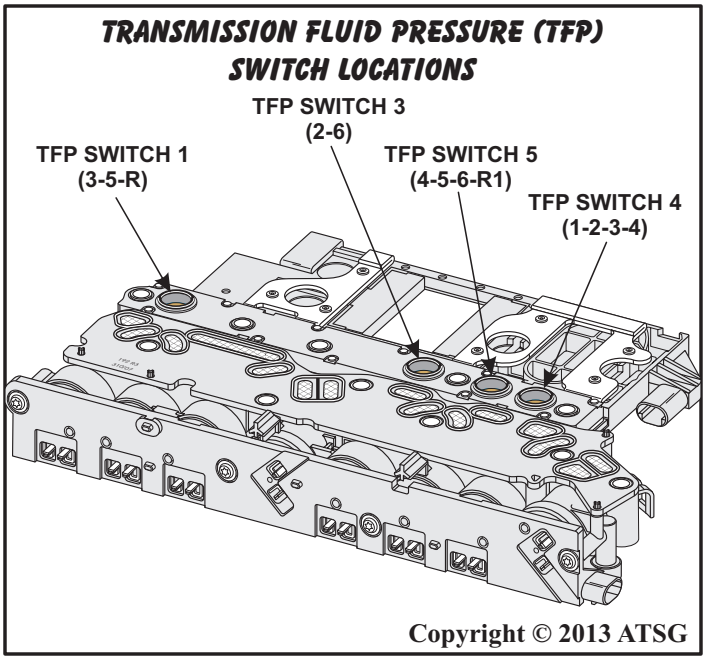


Figure 18

ELECTRONIC COMPONENTS (CONT'D)

Transmission Fluid Temperature (TFT) Sensor

The Transmission Fluid Temperature (TFT) sensor is an integral part of the solenoid body and TCM and located in the position shown in Figure 17, and is not serviced separately.

The TFT sensor is a thermistor, 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.

NOTE: GM appears to have re-assigned three of the four TFP switch identifications, locations and function. The information in this manual that follows is based on the current re-assignments.

Most preliminary information in GM's manuals and Technician's Guides will refer to the previous original information.

GM has re-assigned:

TFP switch 1 to what is now 4
TFP switch 2 to what is now 1
TFP switch 4 to what is now 5
TFP switch 3 remains the same

Fluid Pressure Switches

The transmission fluid pressure switches are located in the control solenoid body and TCM assembly, as shown in Figure 18, and 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 so that the circuit opens and there is no current flow. See Figure 19 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-Rev clutch regulator valve.

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

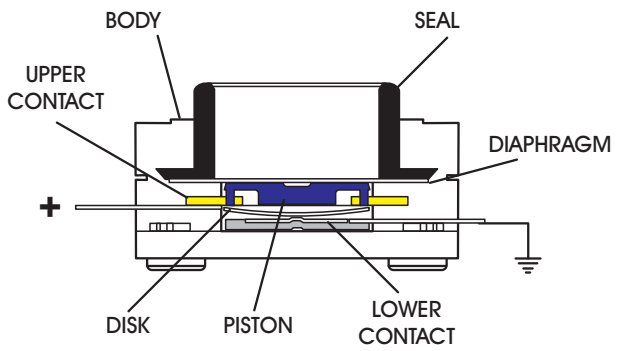
TFP switch 4 sends a signal to the TCM to indicate the state of 1-2-3-4 clutch regulator valve.

TFP switch 5sends a signal to the TCM to indicate the state of 4-5-6-R1 clutch regulator valve.
(R1 = Clutch Braking 1st)

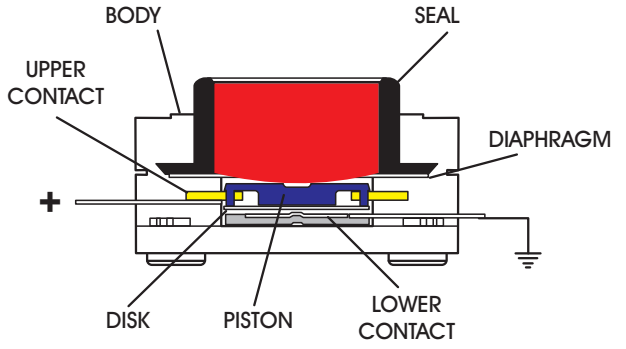
The transmission fluid pressure switches are part of the Control Solenoid Body and TCM Assembly, and are not serviced separately.

Continued on Page 17

PRESSURE SWITCH



NO PRESSURE



PRESSURIZED

Pressure Switch Logic

Selector Position	*Switch 1 (Was 2)*	*Switch 3 (Same)*	*Switch 4 (Was 1)*	*Switch 5 (Was 4)*
Park	*1*	*0*	*0*	*0*
Reverse	*0*	*0*	*0*	*0*
Neutral	*1*	*0*	*0*	*0*
1st Engine Braking	*1*	*1*	*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*

1 = Pressurized (High) 0 = Exhausted (Low)

** Depending on computer strategy may show 1 (High)*

Figure 19

ELECTRONIC COMPONENTS (CONT'D)

Internal Mode Switch & Detent Lever 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 an electrical connector that plugs into the control solenoid body and TCM assembly, and is shown in Figure 20.

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 presented are Signal A, Signal B, Signal C, and Signal P (Parity).

Continued on Page 18

INTERNAL MODE SWITCH

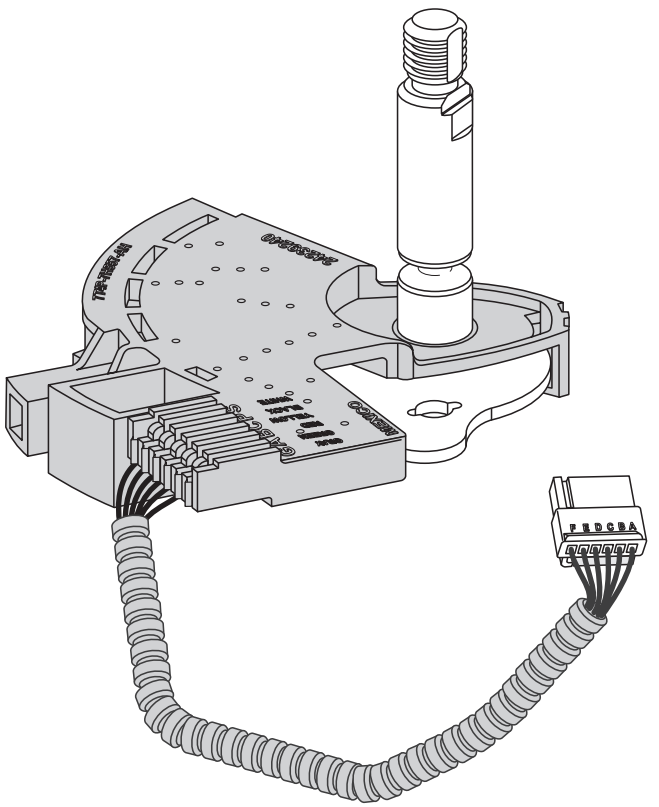


Figure 20

ELECTRONIC COMPONENTS (CONT'D)

Internal Mode Switch Assembly (Cont'd)

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. It uses the TCM as a pass-thru connector only. A switch logic chart is provided for you in Figure 21 and Figure 22 gives you connector terminal identification.

The Transmission Internal Mode Switch (IMS) assembly is serviced separately.

If the TCM detects an improper signal from the Internal Mode Switch (IMS) assembly, a DTC will be activated.

Electronic Components
Continued on Page 19

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*	*HI*	*HI*	*HI*

HI = 12 Volts
LOW = 0 Volts

Internal Mode Switch (IMS) Terminal Identification	
Terminal	*Function*
A	*Ground (Gray)*
B	*Mode Switch Signal "P" (Black)*
C	*Mode Switch Signal "C" (Yellow)*
D	*Mode Switch Signal "B" (Red)*
E	*Mode Switch Signal "A" (Green)*
F	*P/N Start Signal "N" To ECM (White)*
Note: Wire Colors May Vary	

Figure 21

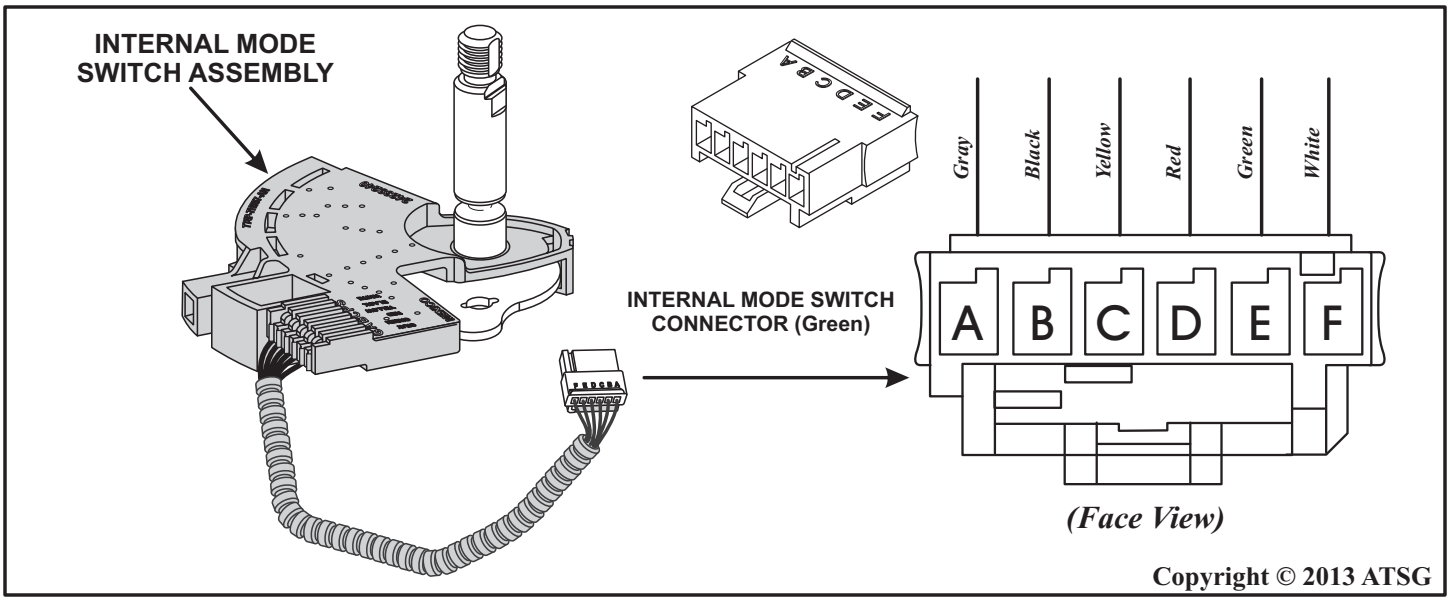
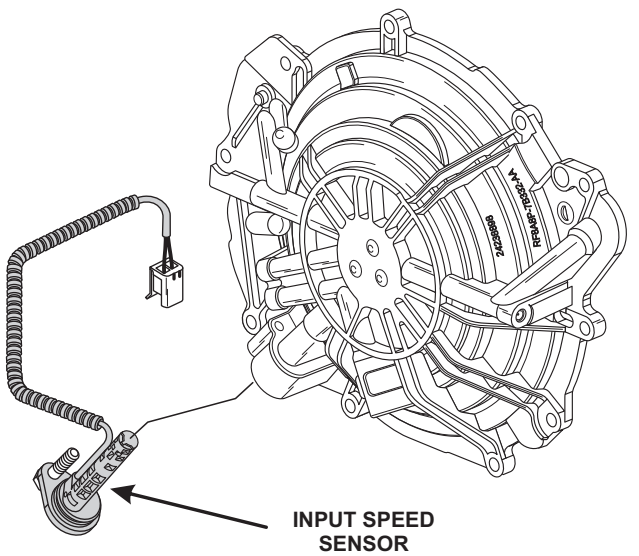
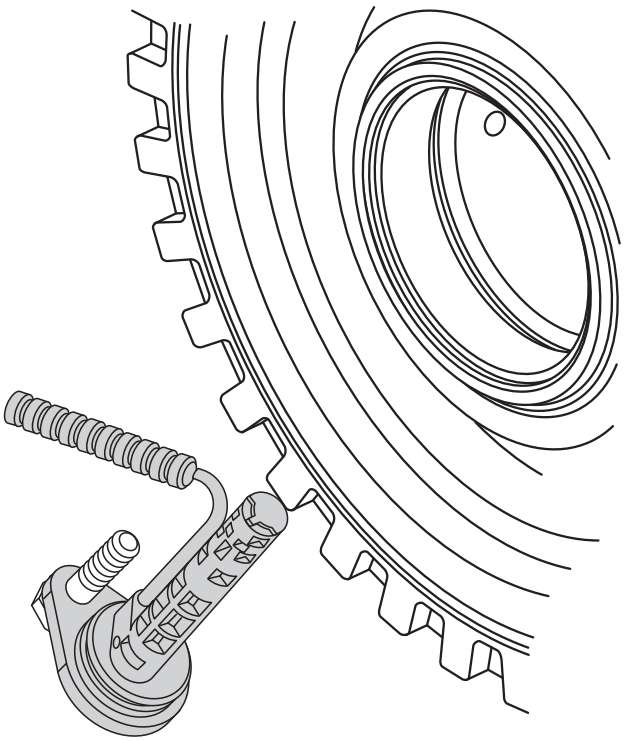


Figure 22

INPUT SPEED SENSOR





The Input Speed Sensor Is Triggered By The Reluctor Wheel Teeth On The 3-5/Reverse & 4-5-6 Clutch Housing Assembly

Figure 23

ELECTRONIC COMPONENTS (CONT'D)

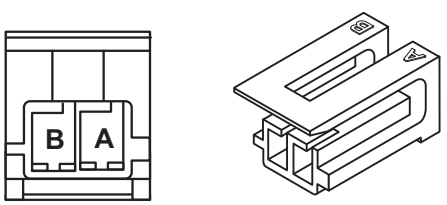
Input Speed Sensor Assembly

The Input Speed Sensor (ISS) is a 2 wire Hall-Effect type speed sensor. The ISS is mounted inside the rear case cover and connected to the control solenoid body and TCM assembly through a wire harness and gray connector, as shown in Figure 23. The ISS faces the transmission input shaft speed sensor reluctor wheel that is attached to the 3-5-Reverse and 4-5-6 clutch housing assembly and is triggered by the teeth on the reluctor wheel outside diameter, as shown in Figure 23.

The sensor receives 8.3 to 9.3 volts on the ISS/OSS supply voltage circuit from the TCM thru terminal B on the connector (See Figure 24). As the reluctor wheel rotates, the sensor produces a signal frequency based on the tooth profile and speed of the reluctor wheel. This signal is transmitted through the ISS signal circuit to the TCM thru terminal A on the connector (See Figure 24). The TCM uses the ISS signal to determine line pressure, transmission shift timing, torque converter clutch (TCC) slip speed and gear ratio.

Electronic Components
Continued on Page 20

INPUT SPEED SENSOR CONNECTOR (GRAY)



TERMINAL "A" = ISS RETURN SIGNAL (White)
TERMINAL "B" = TCM VOLT SIGNAL (Black)

Figure 24

ELECTRONIC COMPONENTS (CONT'D)

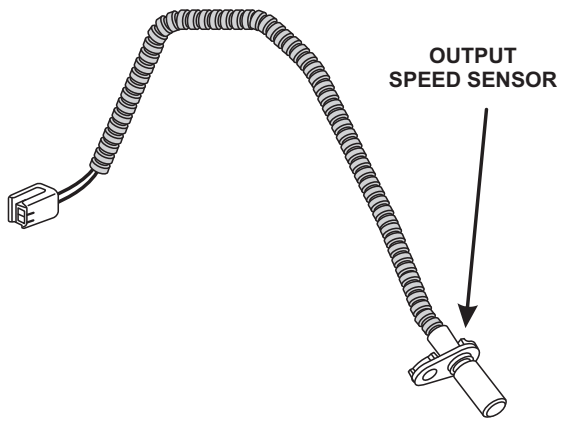
Output Speed Sensor Assembly

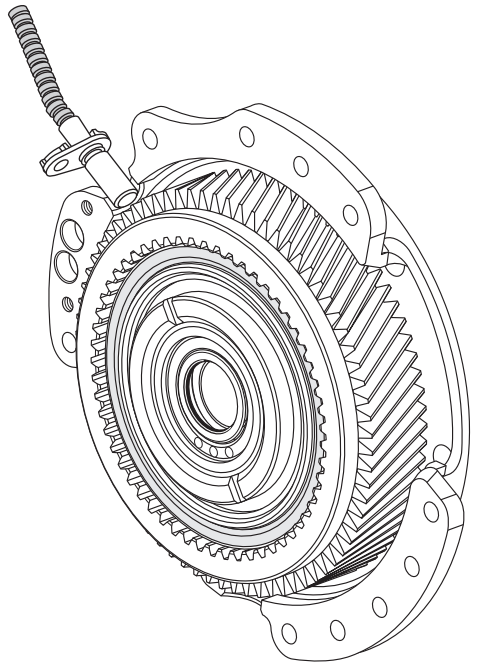
The Output Speed Sensor (OSS) is a 2 wire Hall-Effect type speed sensor. The OSS is mounted in the transmission case underneath the valve body and connected to the control solenoid body and TCM assembly through a wire harness and green connector, as shown in Figure 25. The OSS faces the transmission front differential transfer drive gear support assembly and is triggered by the gear teeth of the transfer drive gear, as shown in Figure 25.

The sensor receives 8.3 to 9.3 volts on the ISS/OSS supply voltage circuit from the TCM thru terminal B on the green connector (See Figure 26). As the transfer drive gear rotates, the sensor produces a signal frequency based on the gear teeth of the transfer drive gear. This signal is transmitted through the OSS signal circuit to the TCM thru terminal A on the green connector (See Figure 26). The TCM uses the OSS signal to determine line pressure, transmission shift timing, vehicle speed and gear ratio.

Electronic Components
Continued on Page 21

OUTPUT SPEED SENSOR

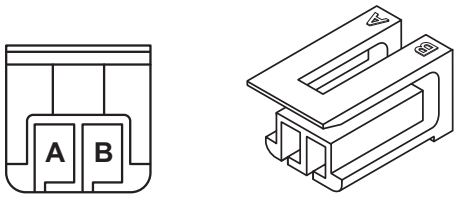




The Output Speed Sensor Is Excited By The Front Differential Transfer Gear Assembly

Figure 25

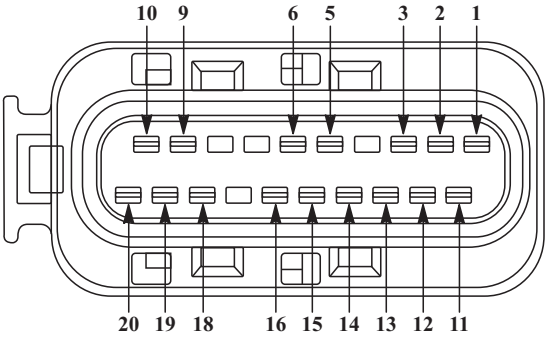
OUTPUT SPEED SENSOR CONNECTOR (GREEN)



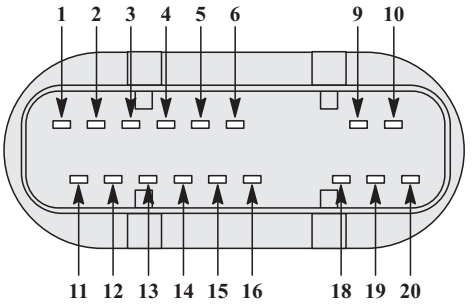
TERMINAL "A" = OSS RETURN SIGNAL (White)
TERMINAL "B" = TCM VOLT SIGNAL (Black)

Figure 26

20-WAY CASE CONNECTOR TERMINAL IDENTIFICATION



View Looking Into
20-Way Harness Connector



View Looking Into
20-Way Solenoid Body Connector

Pin No.	Function (Model Sensitive)
1	PS Ground
2	CAN HI
3	I CAN HI - Termination
4	Not Used
5	CAN HI
6	Tap Up/Tap Down Shift Switch
7, 8, 9	Not Used
10	Battery Positive Power
11	I CAN LO - Termination
12	CAN LO
13	Ignition 1 Voltage Power
14	CAN LO
15	Accessory Voltage
16	Stop Lamp Switch Signal
17	Not Used
18	Ground
19	Battery Positive Voltage (Optional)
20	Park/Neutral Signal

Figure 27

ELECTRONIC COMPONENTS (CONT'D)

20-Way Case Connector

The 20-way transmission case connector is also part of the solenoid body and TCM assembly, as shown in Figure 28, and ***is not*** serviced separately. The case connector and the terminal identification chart are both illustrated in Figure 27, for diagnostic purposes. We have provided a partial wiring schematic in Figure 29.

Since the case connector is part of the TCM and is located internally, there is an oval rubber seal required to seal the control unit 20-way connector to the plastic valve body cover which it passes through, as shown in Figure 28.

SOLENOID BODY CONNECTOR & SEAL

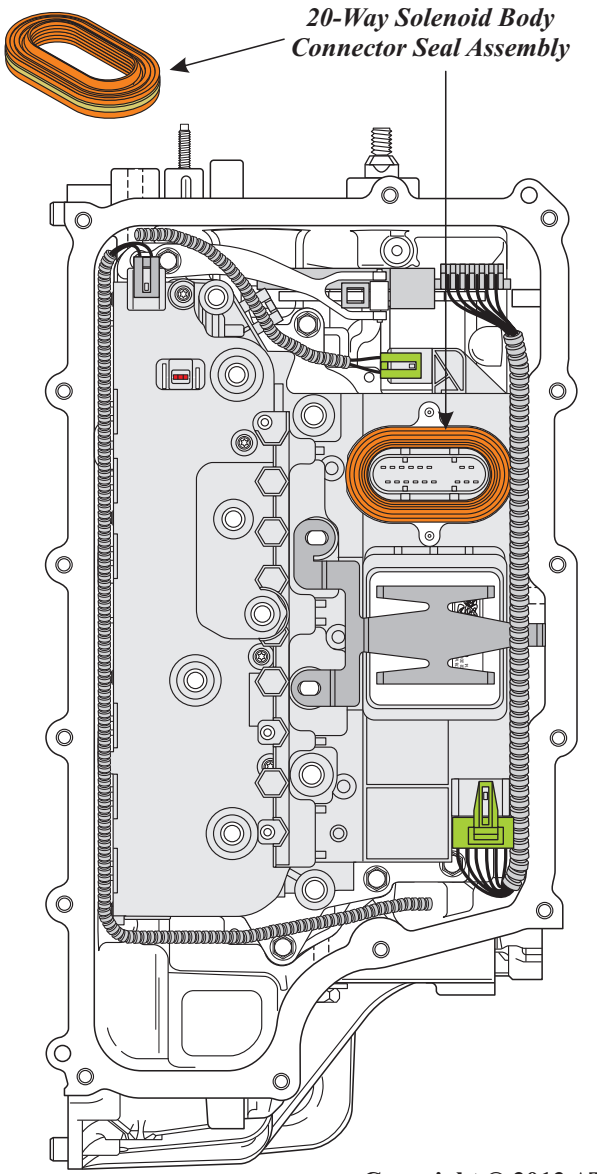


Figure 28

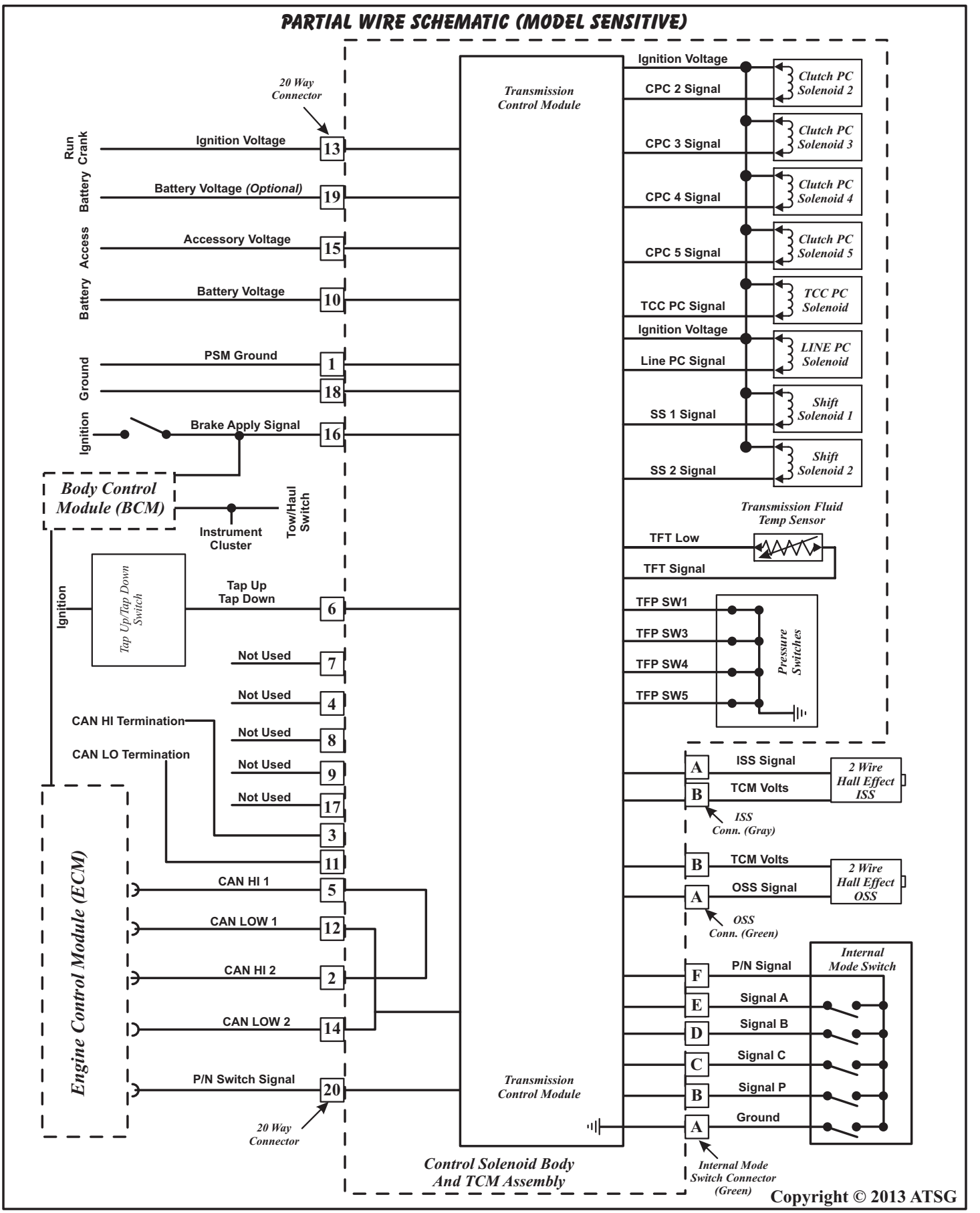

PARTIAL WIRE SCHEMATIC (MODEL SENSITIVE)
20 Way Connector
Transmission Control Module
Ignition Voltage
CPC 2 Signal
CPC 3 Signal
CPC 4 Signal
CPC 5 Signal
TCC PC Signal
Ignition Voltage
Line PC Signal
SS 1 Signal
SS 2 Signal
Clutch PC Solenoid 2
Clutch PC Solenoid 3
Clutch PC Solenoid 4
Clutch PC Solenoid 5
TCC PC Solenoid
LINE PC Solenoid
Shift Solenoid 1
Shift Solenoid 2
Run Crank
Ignition Voltage
13
Battery
Battery Voltage (Optional)
19
Access
Accessory Voltage
15
Battery
Battery Voltage
10
Ground
PSM Ground
1
18
Ignition
Brake Apply Signal
16
Body Control Module (BCM)
Instrument Cluster
Tow/Haul Switch
Transmission Fluid Temp Sensor
TFT Low
TFT Signal
Ignition
Tap Up/Tap Down Switch
Tap Up
Tap Down
6
TFP SW1
TFP SW3
TFP SW4
TFP SW5
Pressure Switches
Not Used
7
Not Used
4
CAN HI Termination
Not Used
8
CAN LO Termination
Not Used
9
Not Used
17
3
11
A
ISS Signal
B
TCM Volts
2 Wire Hall Effect ISS
ISS Conn. (Gray)
B
TCM Volts
OSS Signal
A
2 Wire Hall Effect OSS
OSS Conn. (Green)
Internal Mode Switch
F
P/N Signal
E
Signal A
D
Signal B
C
Signal C
B
Signal P
A
Ground
Internal Mode Switch Connector (Green)
Engine Control Module (ECM)
CAN HI 1
5
CAN LOW 1
12
CAN HI 2
2
CAN LOW 2
14
P/N Switch Signal
20
20 Way Connector
Transmission Control Module
Control Solenoid Body And TCM Assembly
Copyright © 2013 ATSG

Figure 29

DIAGNOSTIC TROUBLE CODE (DTC) IDENTIFICATION		
DTC	**DESCRIPTION**	**DTC TYPE***
P0218	*Transmission Fluid Over temperature, Over 270°F for 10 minutes.*	C
P0562	*System Voltage Low, 11 volts or less for 10 seconds.*	C
P0563	*System Voltage High, Greater than 18 volts for 12 seconds.*	C
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), Over temperature.*	A
P0667	*TCM (Internal), Temperature Sensor Performance.*	C
P0668	*TCM (Internal), Temperature Sensor circuit voltage low.*	C
P0669	*TCM (Internal), Temperature Sensor circuit voltage high.*	C
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.*	C
P0713	*Transmission Fluid Temperature (TFT), Sensor circuit voltage high.*	C
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.*	A
P0723	*Output Speed Sensor (OSS), Sensor intermittent.*	A
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.*	B
P0742	*Torque Converter Clutch (TCC), System Stuck ON.*	B
P0751	*Shift Solenoid (SS) 1 Valve Performance, Stuck OFF.*	C
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 30

DIAGNOSTIC TROUBLE CODE (DTC) IDENTIFICATION		
DTC	**DESCRIPTION**	**DTC TYPE***
P0756	*Shift Solenoid (SS) 2 Valve Performance, Stuck OFF.*	A
P0776	*Clutch Pressure Control (PC) Solenoid 2, Stuck OFF.*	A
P0777	*Clutch Pressure Control (PC) Solenoid 2, Stuck ON.*	A
P0796	*Clutch Pressure Control (PC) Solenoid 3, Stuck OFF.*	A
P0797	*Clutch Pressure Control (PC) 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	*P/N Position (PNP) Switch, Circuit Voltage Low (Internal Mode Switch).*	C
P0852	*P/N Position (PNP) Switch, Circuit Voltage High (Internal Mode Switch).*	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 (PC) Solenoid 2, System Performance.*	A
P0966	*Clutch Pressure Control (PC) Solenoid 2, Circuit Voltage Low.*	A
P0967	*Clutch Pressure Control (PC) Solenoid 2, Circuit Voltage High.*	A
P0969	*Clutch Pressure Control (PC) Solenoid 3, System Performance.*	A
P0970	*Clutch Pressure Control (PC) Solenoid 3, Circuit Voltage Low.*	A
P0971	*Clutch Pressure Control (PC) 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 31

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.*	B
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 (PC) Solenoid 4, Stuck OFF.*	A
P2715	*Clutch Pressure Control (PC) Solenoid 4, Stuck ON.*	A
P2719	*Clutch Pressure Control (PC) Solenoid 4, System Performance.*	A
P2720	*Clutch Pressure Control (PC) Solenoid 4, Circuit Voltage Low.*	A
P2721	*Clutch Pressure Control (PC) Solenoid 4, Circuit Voltage High.*	A
P2723	*Clutch Pressure Control (PC) Solenoid 5, Stuck OFF.*	A
P2724	*Clutch Pressure Control (PC) Solenoid 5, Stuck ON.*	A
P2728	*Clutch Pressure Control (PC) Solenoid 5, System Performance.*	A
P2729	*Clutch Pressure Control (PC) Solenoid 5, Circuit Voltage Low.*	A
P2730	*Clutch Pressure Control (PC) 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.

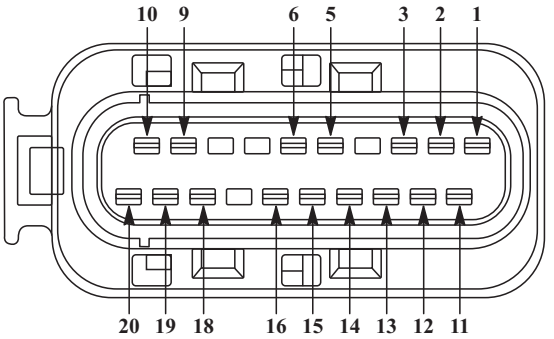
Figure 32

FAIL-SAFE OR PROTECTION MODE

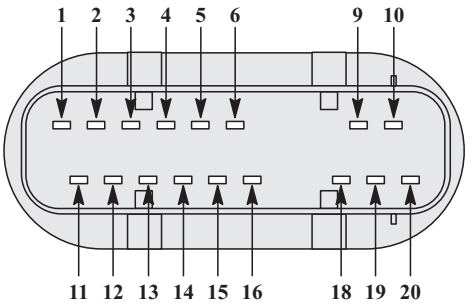
If for any reason, the entire electronic control system of the transmission, or any one of the electrical components within the Control Solenoid Body and TCM Assembly becomes disabled, the transmission will default to fail-safe mode. If the transmission is in 1st, 2nd or 3rd gear during an electrical 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. The transmission will remain in 5th gear default range until the ignition has been turned off or the transmission has been shifted to Reverse. When the vehicle is restarted and shifted back into Drive, the transmission will then operate in the 3rd gear default range.

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 and garage shifts. The TCC PC solenoid would also be OFF, resulting in no torque converter clutch apply.

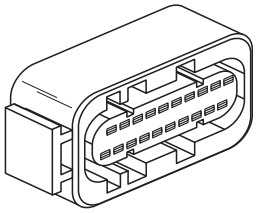
CONNECTOR AND TERMINAL IDENTIFICATION

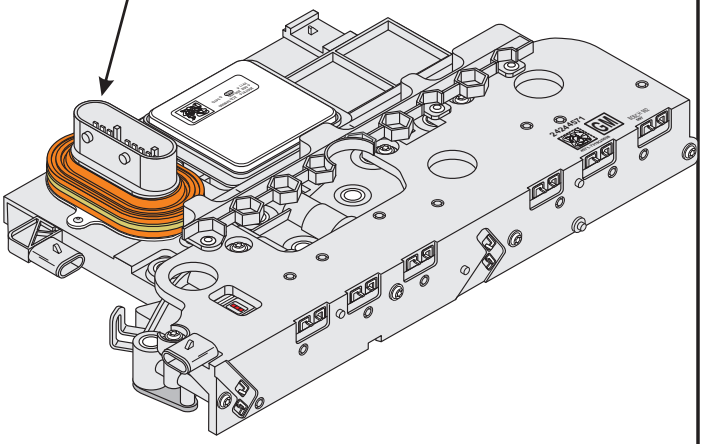


20-Way Harness Connector
"Face View" (Black)



20-Way Connector On
Solenoid Body & TCM
"Face View" (Dk Brown)





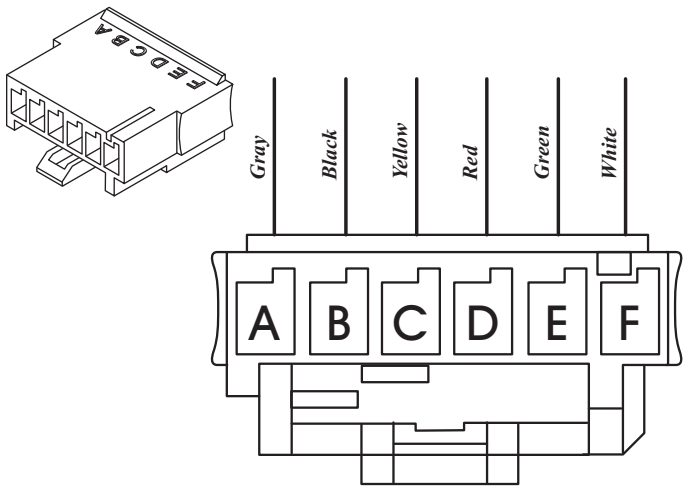
20-Way Connector Terminal ID	
Pin No.	*Function (Model Sensitive)*
1	*PS Ground*
2	*CAN HI*
3	*I CAN HI - Termination*
4	*Not Used*
5	*CAN HI*
6	*Tap Up/Tap Down Shift Switch*
7, 8, 9	*Not Used*
10	*Battery Positive Power*
11	*I CAN LO - Termination*
12	*CAN LO*
13	*Ignition 1 Voltage Power*
14	*CAN LO*
15	*Accessory Voltage*
16	*Stop Lamp Switch Signal*
17	*Not Used*
18	*Ground*
19	*Battery Positive Voltage (Optional)*
20	*Park/Neutral Signal*

Connector Views
Continued on Page 27

Figure 33

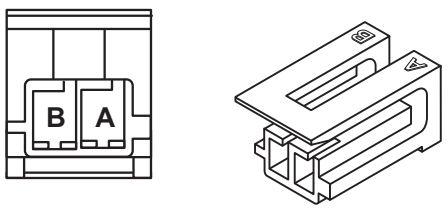
CONNECTOR AND TERMINAL IDENTIFICATION

Internal Mode Switch (IMS) Terminal Identification	
Terminal	Function
A	Ground (Gray)
B	Mode Switch Signal "P" (Black)
C	Mode Switch Signal "C" (Yellow)
D	Mode Switch Signal "B" (Red)
E	Mode Switch Signal "A" (Green)
F	P/N Start Signal "N" To ECM (White)
Note: Wire Colors May Vary	



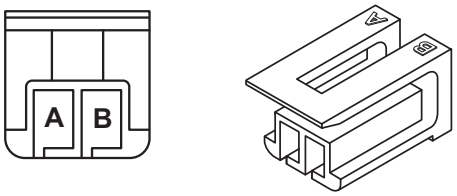
Internal Mode Switch Harness Connector "Face View" (Green)

Input Speed Sensor Harness Connector "Face View" (Gray)



TERMINAL "A" = ISS RETURN SIGNAL (White)
TERMINAL "B" = TCM VOLT SIGNAL (Black)

Output Speed Sensor Harness Connector "Face View" (Green)



TERMINAL "A" = OSS RETURN SIGNAL (White)
TERMINAL "B" = TCM VOLT SIGNAL (Black)

Figure 34

MECHANICAL COMPONENTS

Low One-Way Clutch

The 6T70/75 is equipped from the factory with a unique "diode style" low one-way clutch assembly. It is located in the case between the low/reverse clutch and the 1-2-3-4 clutch, as shown in Figure 2. The outer race of the low one-way clutch assembly is splined to the case, and the inner race is splined to the internal teeth of the low/reverse clutch friction plates.

When holding in first gear, the individual springs on each of the 12 diodes force the diodes toward and "lock" against, the 34 ramps provided on the low one-way clutch outer race, as shown in Figure 35. The inner ace will only rotate approximately one degree before locking.

When overrunning in 2nd, 3rd, 4th, 5th, and 6th gear, the diodes ratchet in and out of the ramps on the outer race allowing the inner race to overrun the diodes, as shown in Figure 35. Freewheel direction is shown in Figure 36.

The "diode style" low one-way clutch is serviced only as a complete assembly.

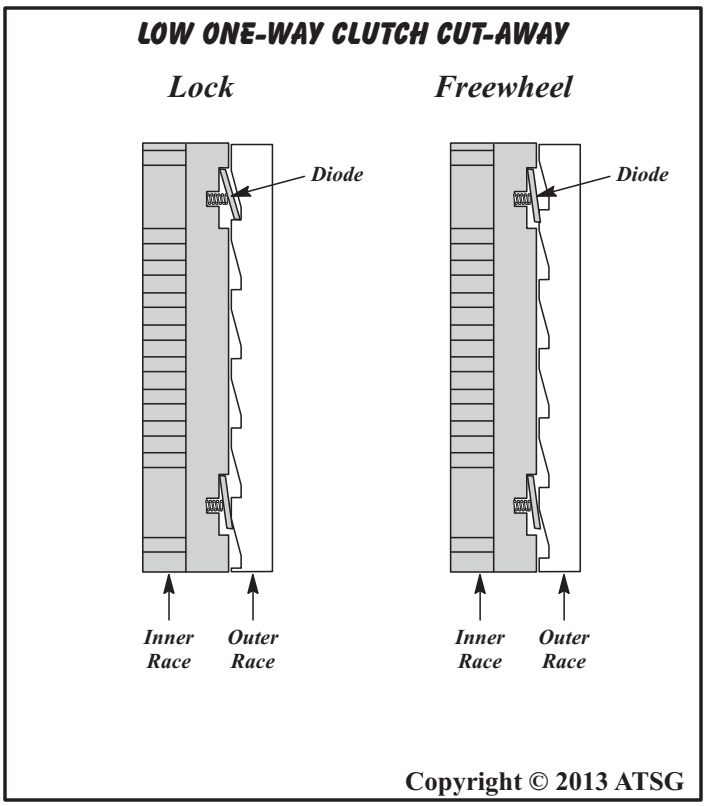


Figure 35

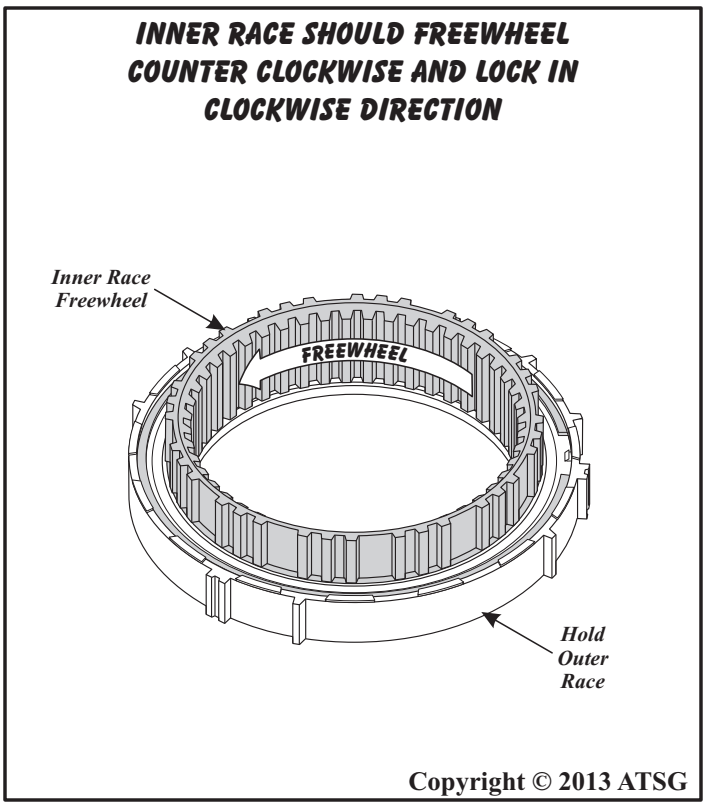
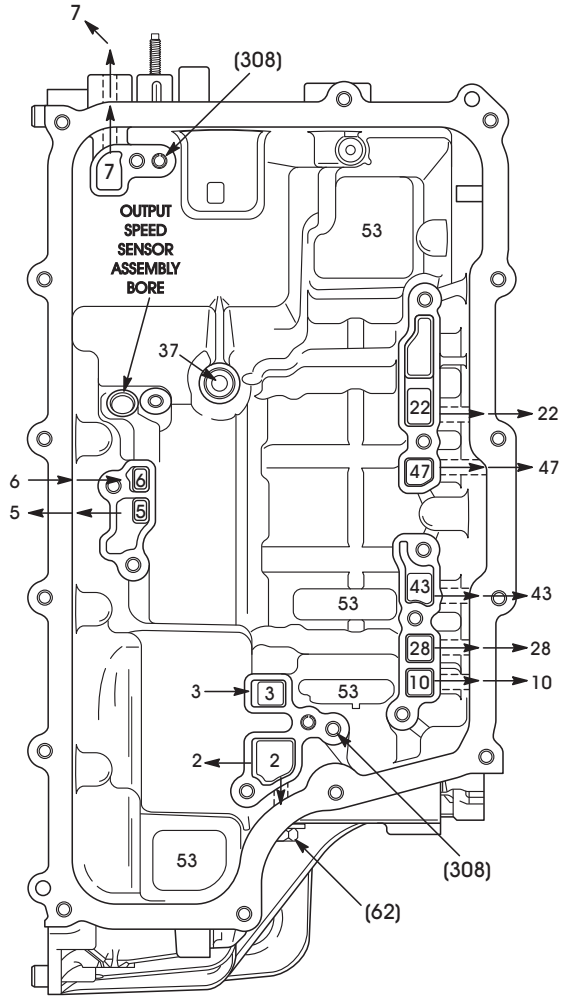


Figure 36

PASSAGE IDENTIFICATION



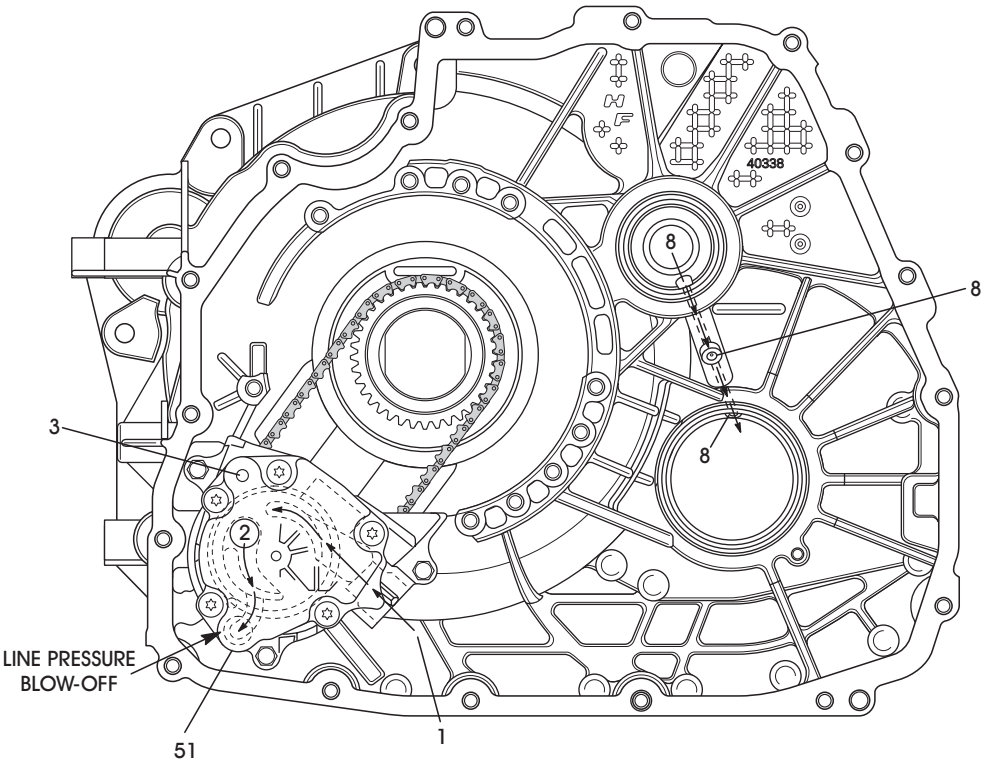
Transmission Case Assembly (Valve Body Side)

1 SUCTION.
2 LINE.
3 DECREASE.
4 CONVERTER FEED.
5 TCC RELEASE.
6 TCC APPLY.
7 COOLER FEED.
8 LUBE.
9 REGULATED APPLY.
10 COMPENSATOR FEED.
11 ACTUATOR FEED LIMIT.
12 PRESSURE SWITCH 1.
13 PC SOLENOID (LINE).
14 PC SOLENOID 3 (R1/4-5-6 CLUTCH).
15 SHIFT SOLENOID 1.
16 SHIFT SOLENOID 2.
17 CSV2 ENABLE.
18 CSV3 ENABLE.
19 R1/4-5-6 CLUTCH FEED.
20 R1 FEEDBACK.
21 R1 SUPPLY.
22 R1.
23 PC SOLENOID 2 (3-5-REV CLUTCH).
24 REVERSE.
25 3-5-REV CLUTCH FEED.
26 3-5-REV SUPPLY.
27 3-5-REV FEED.
28 3-5-REV CLUTCH.
29 3-5-REV CLUTCH FEEDBACK.
30 PC SOLENOID 5 (1-2-3-4 CLUTCH).
31 DRIVE.
32 DRIVE BRAKE.
33 DRIVE B.
34 2-6 CLUTCH/1-2-3-4 CLUTCH FEED.
35 PRESSURE SWITCH 3.
36 1-2-3-4 CLUTCH FEED.
37 1-2-3-4 CLUTCH.
38 1-2-3-4 CLUTCH FEEDBACK.
39 DRIVE 1-6.
40 PRESSURE SWITCH 4.
41 CSV2 LATCH.
42 PC SOLENOID 4 (2-6 CLUTCH).
43 2-6 CLUTCH.
44 1-2-3-4 CLUTCH DEFAULT FEED.
45 1-2-3-4 CLUTCH DEFAULT.
46 4-5-6 CLUTCH FEED.
47 4-5-6 CLUTCH.
48 PC SOLENOID (TCC).
49 PRESSURE SWITCH 1.
50 EXHAUST BACKFILL.
51 EXHAUST.
52 TORQUE CONVERTER SEAL DRAIN-BACK.
53 VOID.

(62) FLUID PRESSURE TEST PLUG.
(63) DRAIN PLUG (FACTORY FILL ONLY)
(308) VALVE BODY LOCATOR PIN.

Figure 37

PASSAGE IDENTIFICATION



Torque Converter Housing With Oil Pump Assembly (Case Side)

See Figure 37 For Legend

Transmission Case Assembly (Converter Housing Side)

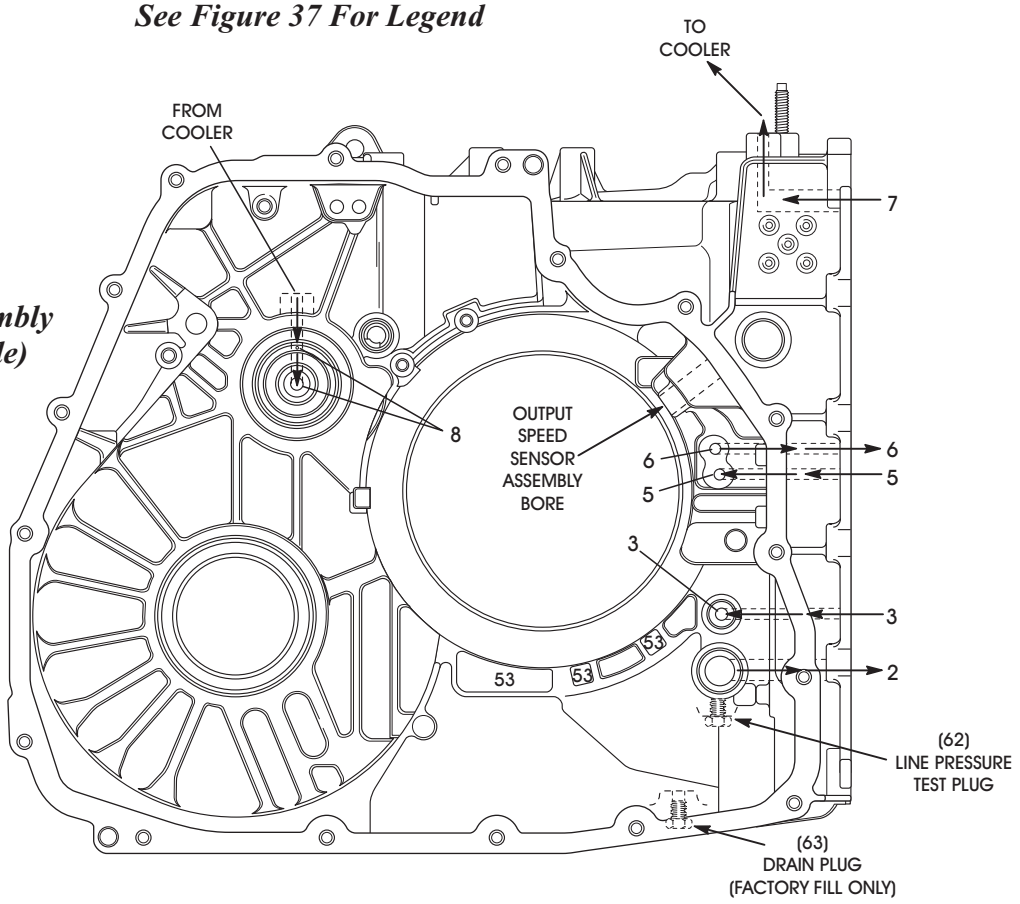
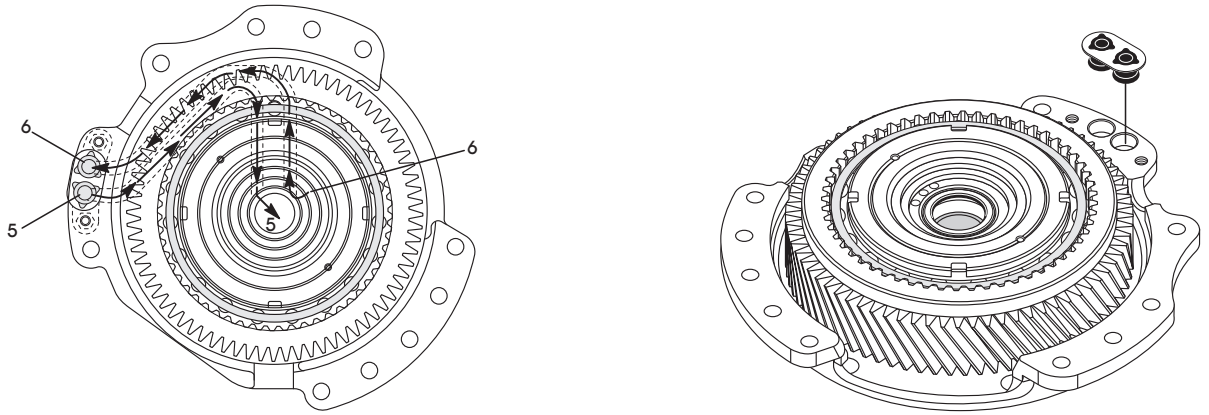


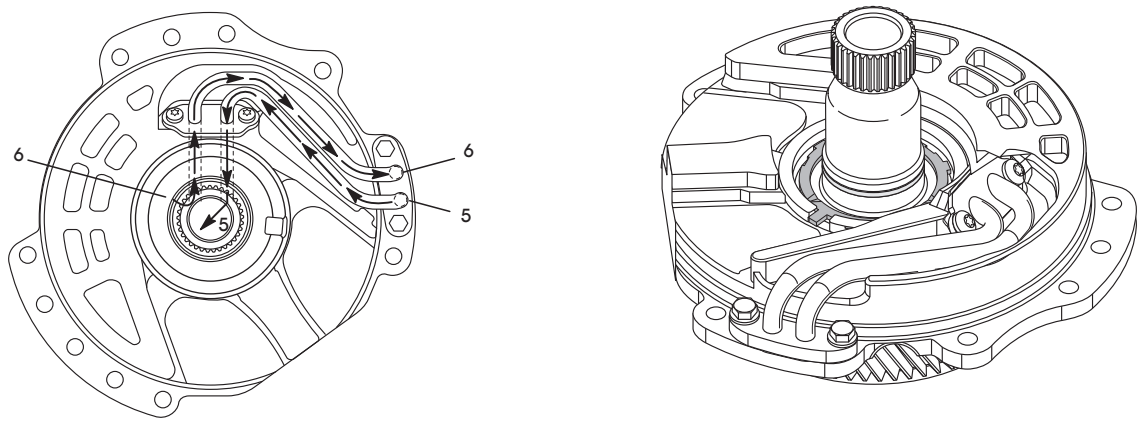
Figure 38

PASSAGE IDENTIFICATION



Transfer Drive Gear Support Assembly
(Transmission Case Side)

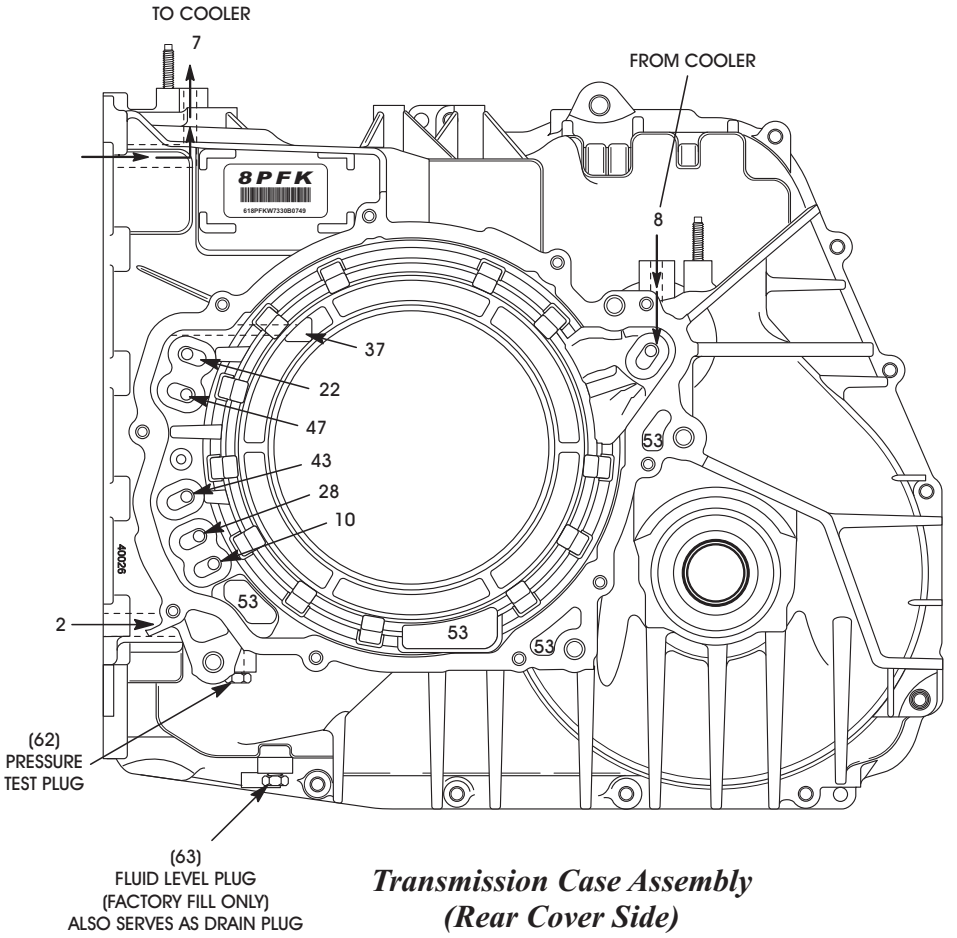
See Figure 37 For Legend



Transfer Drive Gear Support Assembly
(Torque Converter Side)

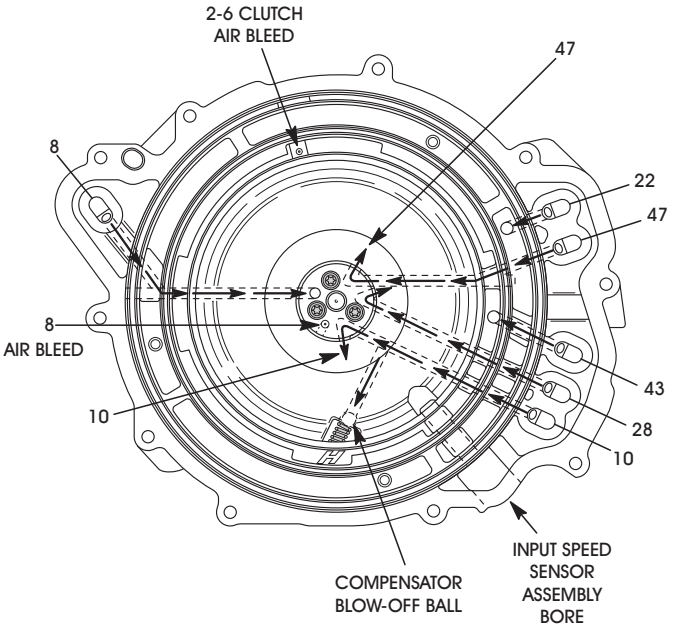
Figure 39

PASSAGE IDENTIFICATION



Transmission Case Assembly (Rear Cover Side)

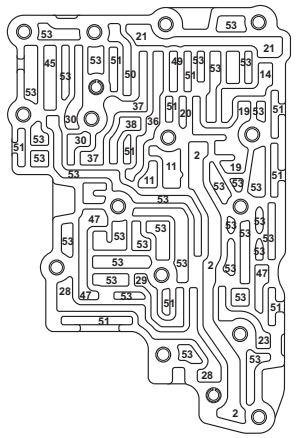
See Figure 37 For Legend



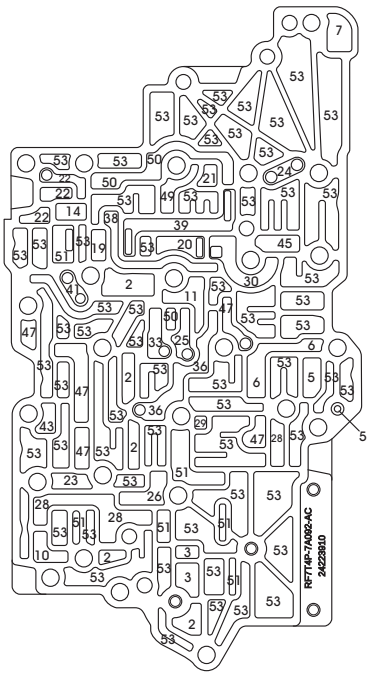
Transmission Rear Cover Assembly (Case Side)

Figure 40

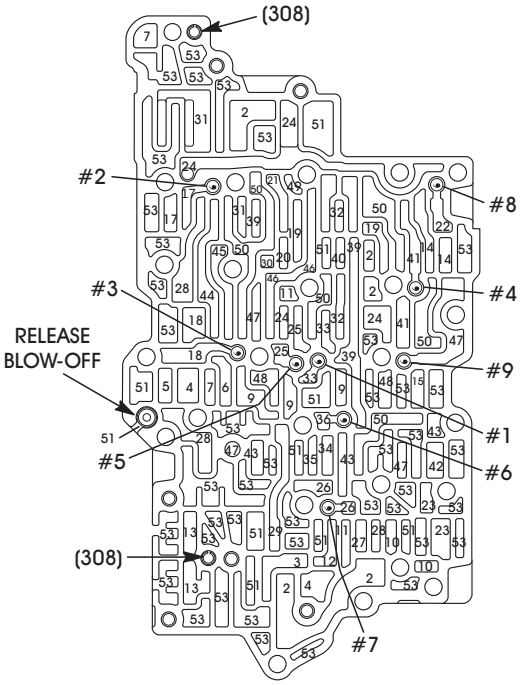
PASSAGE IDENTIFICATION



Lower Valve Body
(Lower Spacer Plate Side)

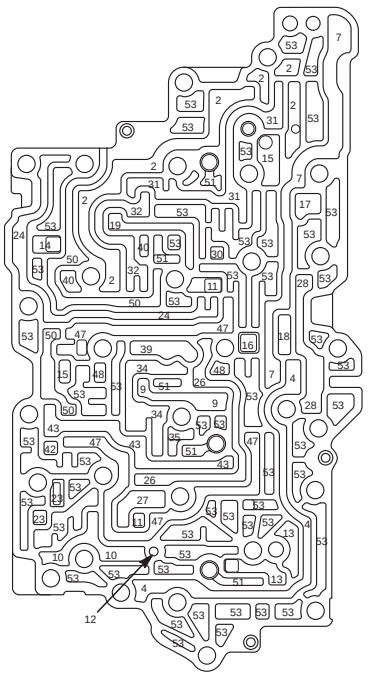


Upper Valve Body
(Lower Spacer Plate Side)

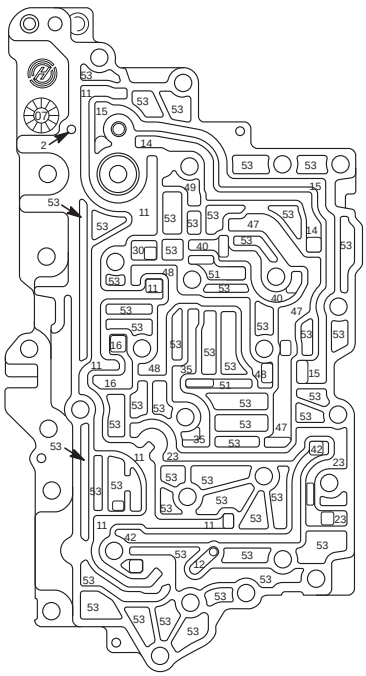


Upper Valve Body
(Upper Spacer Plate Side)

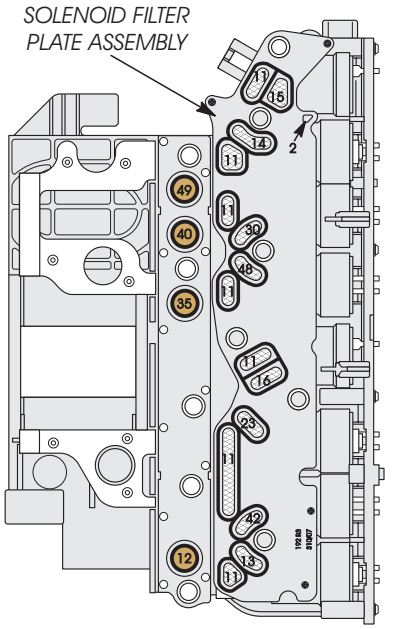
See Figure 37 For Legend



Channel Plate
(Upper Spacer Plate Side)



Channel Plate
(Upper Support Plate Side)



Solenoid Body and TCM
With Filter Plate Assembly
(Upper Support Plate Side)

Figure 41

6T70/75 CHECK BALL LOCATION AND FUNCTION

Number 1 Check Ball

The number one check ball is located in the upper valve body, as shown in Figure 42. When the transmission is operating in Drive 1st, 2nd, 3rd, 4th, 5th or 6th gear, drive 1-6 fluid seats the check ball 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 Check Ball

The number two check ball is located in the upper valve body, as shown in Figure 42. This shuttle type check ball is seated against the reverse passage while the transmission is operating in Park, Neutral and Drive 1st. With the check ball 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 check ball 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 Check Ball

The number three check ball is located in the upper valve body, as shown in Figure 42. This shuttle type check ball 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 check ball 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 check ball 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 Check Ball

The number four check ball is located in the upper valve body, as shown in Figure 42. This shuttle type check ball is seated against the 4-5-6 clutch passage by Pressure Solenoid 4 fluid, while the transmission is operating in Park, Reverse, Neutral, Drive 1st, 2nd and 3rd gear. With the check ball in this position, PS 4 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 check ball against the PS 4 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 Check Ball

The number five check ball is located in the upper valve body, as shown in Figure 42. This shuttle type check ball is seated against the Drive 1-6 passage by 3-5/Reverse Feed fluid while the transmission is operating in Reverse. With the check ball in this position, 3-5/Reverse Feed fluid enters the 3-5/Reverse Supply circuit and is routed to the number 7 check ball. 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 Check Ball

The number six check ball is located in the upper valve body, as shown in Figure 42. This "one way orifice control" type check ball 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 check ball, 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 check ball, and forces exhausting fluid through orifice number 32, which allows for a controlled exhaust of the 1-2-3-4 clutch.

Number 7 Check Ball

The number seven check ball is located in the upper valve body, as shown in Figure 42. This "one way orifice control" type check ball 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 check ball 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 check ball in this position, the 3-5/Reverse Supply fluid is forced through orifice number 16 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 check ball. This allows for a faster exhaust of 3-5/Reverse Feed fluid and a quick release of the 3-5/Reverse clutch.

Number 8 Check Ball

The number eight check ball is located in the upper valve body, as shown in Figure 42. This "one way orifice control" type check ball is used to differentiate the flow rate of fluid between applying and releasing the Low/Reverse clutch. When the transmission is operating in Park, Reverse, Neutral and Drive Range 1st gear-Engine Braking, the number eight check ball allows for a quick apply of the Low/Reverse clutch. When the transmission is operating in Drive Range First Gear, R1 fluid exhausts, seating the ball forcing R1 fluid past orifice #18. The orifice helps control the release of the Low/Reverse clutch.

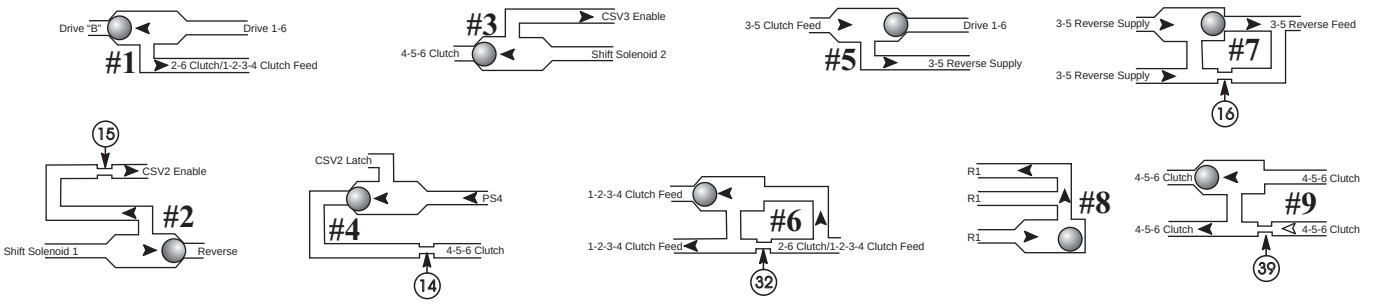
Number 9 Check Ball

The number nine check ball is located in the upper valve body, as shown in Figure 42. This "one way orifice control" type check ball is used to control the flow rate of fluid when applying and releasing the 4-5-6 clutch. When the transmission is operating in Drive Range Fourth ,Fifth and Sixth gears, this clutch pressure seats the ball. At this time 4-5-6 fluid id forced through orifice #39 before going to the 4-5-6 clutch. The orifice helps control the rate of apply and release of the 4-5-6 clutch.

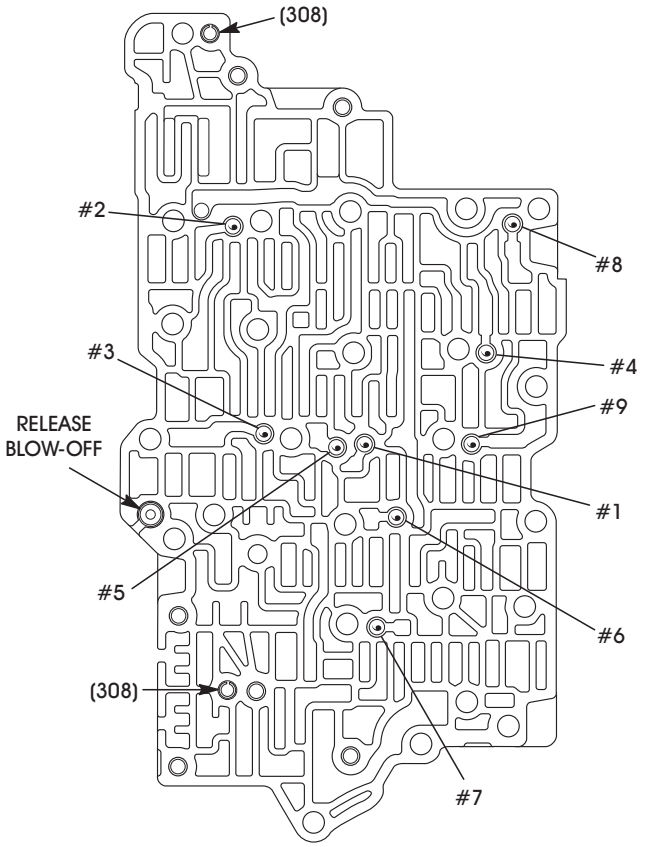
Actuator Feed Accumulator (AFL) Pistons

The Actuator Feed Accumulator Piston is located in the control valve channel plate, as shown in Figure 42. Three actuator feed accumulators are used to dampen any pressure irregularities that may occur in the actuator feed (AFL) limit fluid circuit.

6T70/75 CHECK BALL LOCATION AND FUNCTION

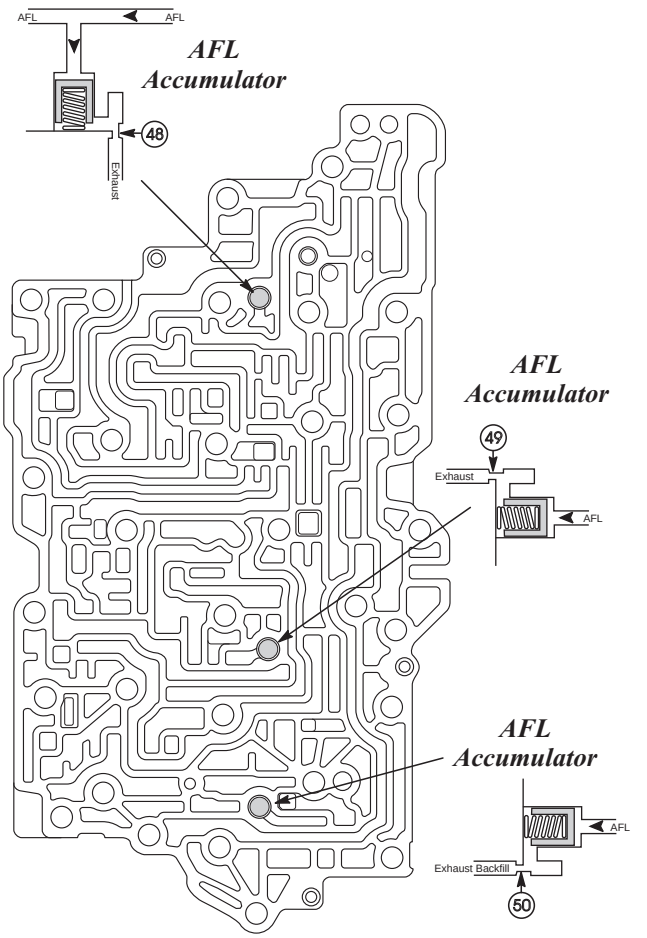


UPPER VALVE BODY



Upper Valve Body
(Upper Spacer Plate Side)

VALVE BODY CHANNEL PLATE



Channel Plate
(Upper Spacer Plate Side)

(308) VALVE BODY LOCATING DOWELS.
ALL CHECK BALLS ARE .250" DIAMETER STEEL (9 REQUIRED)

Figure 42

SAFETY PRECAUTIONS

Service information provided in this manual by ATSG is intended for use by professional, qualified technicians. Attempting repairs or service without the appropriate training, tools and equipment could cause injury to you or others.

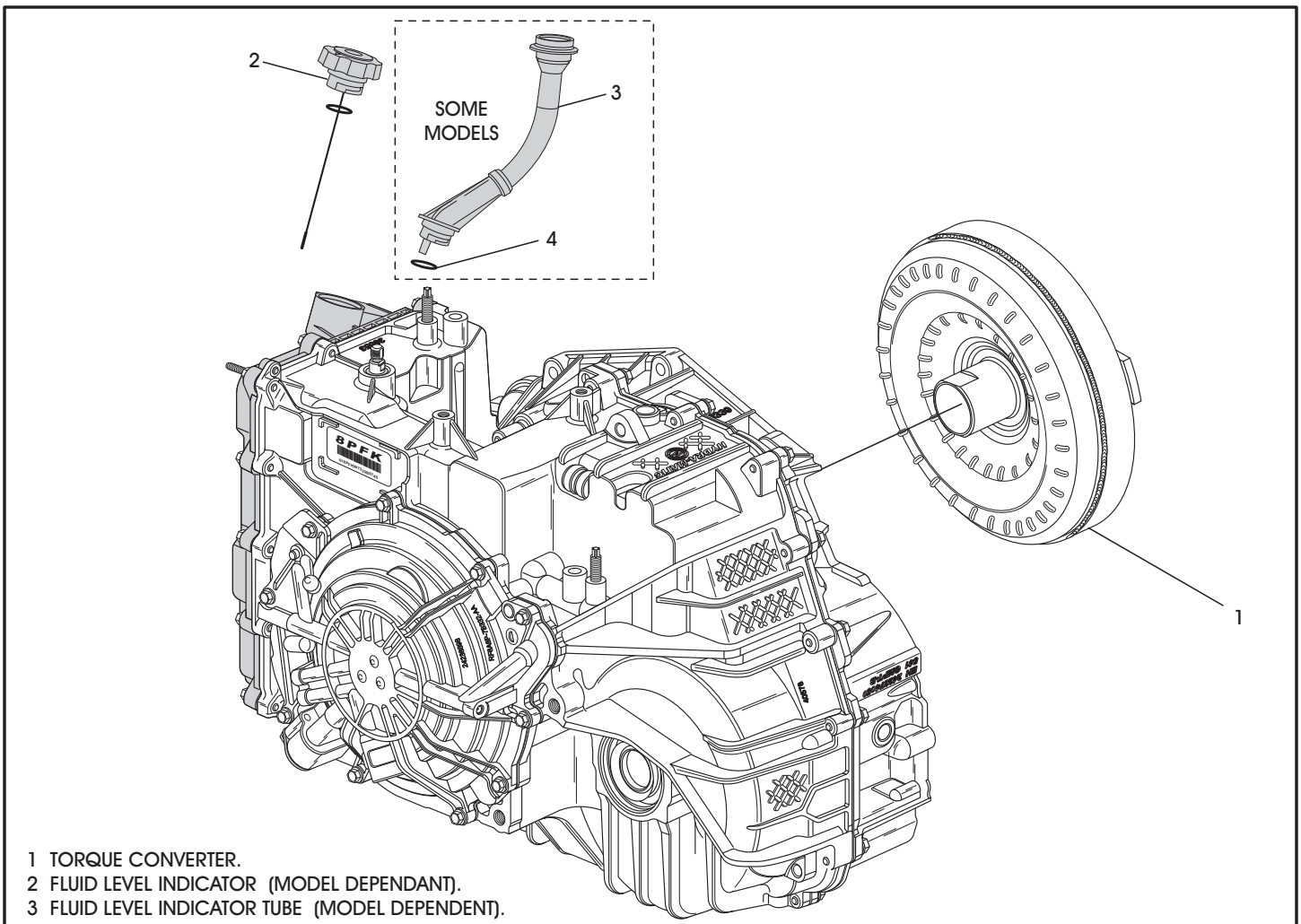
The service procedures we recommend and describe in this manual are effective methods of performing service and repair on this unit. Some of the procedures require the use of special tools that are designed for specific purposes.

This manual contains CAUTIONS that you must observe carefully in order to reduce the risk of injury to yourself or others. This manual also contains NOTES that must be carefully followed.

TRANSMISSION DISASSEMBLY

1. The transmission should be steam cleaned on the outside, to remove any dirt and grease before the disassembly process begins.
2. This transmission can be disassembled very easily on a work bench without the benefit of a holding fixture for rotation, however there is one available from Kent-Moore under J-46625.
3. Remove the torque converter assembly from the transmission, as shown in Figure 43.
   Caution: Use care when removing the torque converter, to avoid personal injury and/or damage to converter, as it is heavy.
4. Record the converter code letters just in case replacement becomes necessary.
5. Remove the dip-stick, as shown in Figure 43.
   Note: Dip-sticks will vary in length but all models are equipped with dip-stick.

Continued on Page 37



1 TORQUE CONVERTER.
2 FLUID LEVEL INDICATOR (MODEL DEPENDANT).
3 FLUID LEVEL INDICATOR TUBE (MODEL DEPENDENT).
4 FLUID LEVEL INDICATOR TUBE SEAL (MODEL DEPENDENT.

Figure 43

TRANSMISSION DISASSEMBLY (CONT'D)

6. Install dial indicator onto the transmission, as shown in Figure 44.
   Caution: This is a mandatory step. There are no selective thrust washers to set the end-play in this transmission. The units checked before disassembly had "zero" end-play but would turn free.
7. Remove the 12 valve body cover bolts and the 2 valve body cover studs, as shown in Figure 45.
   Note: Amount and location of the valve body cover studs may vary by model.

Continued on Page 38

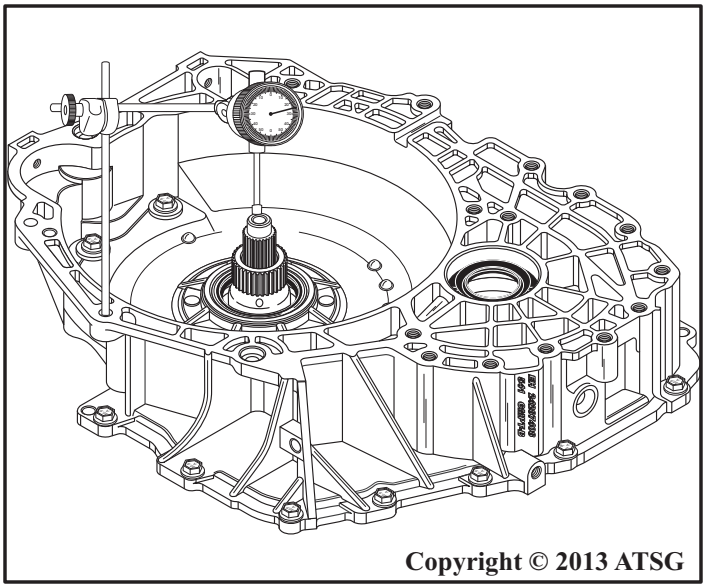


Figure 44

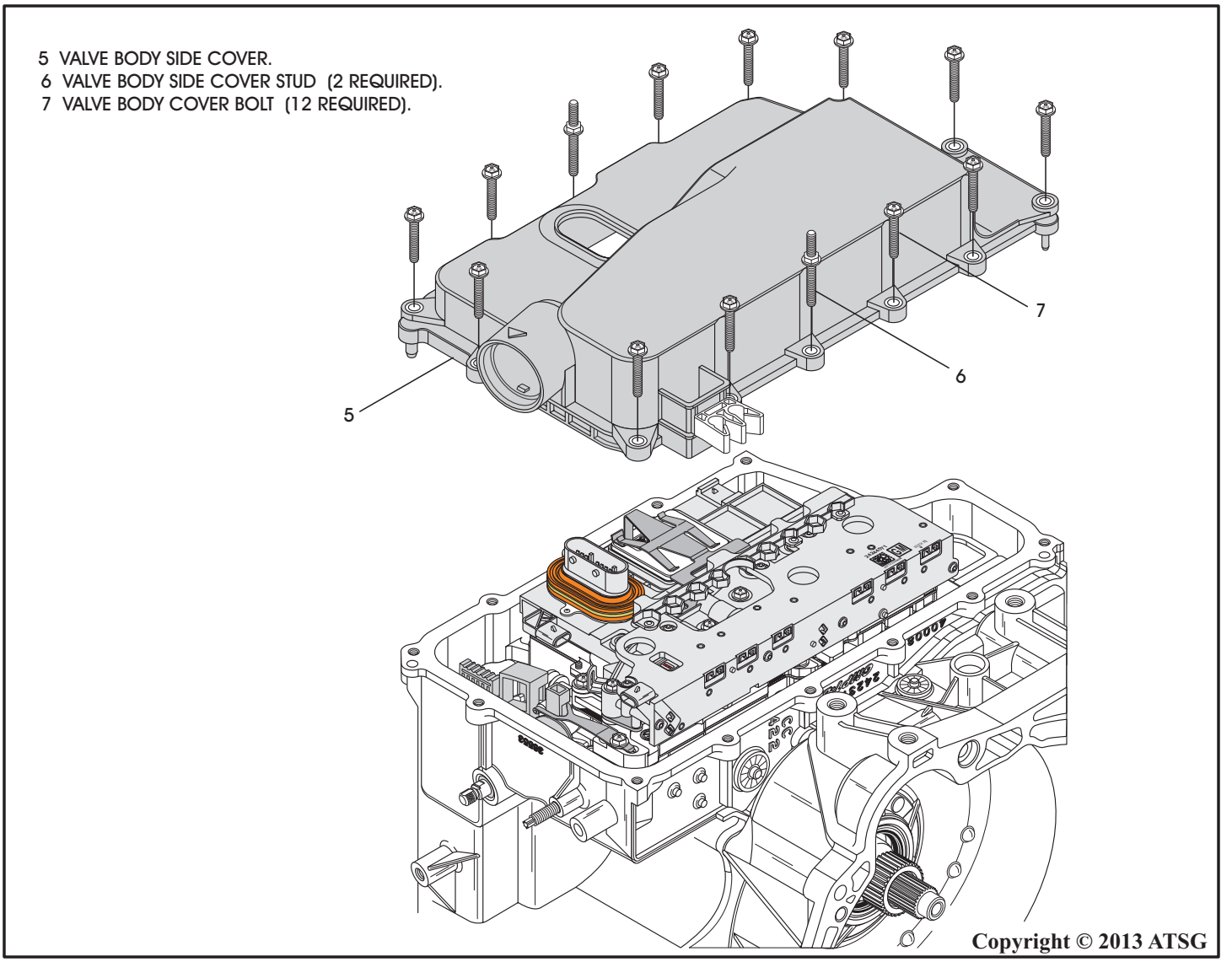
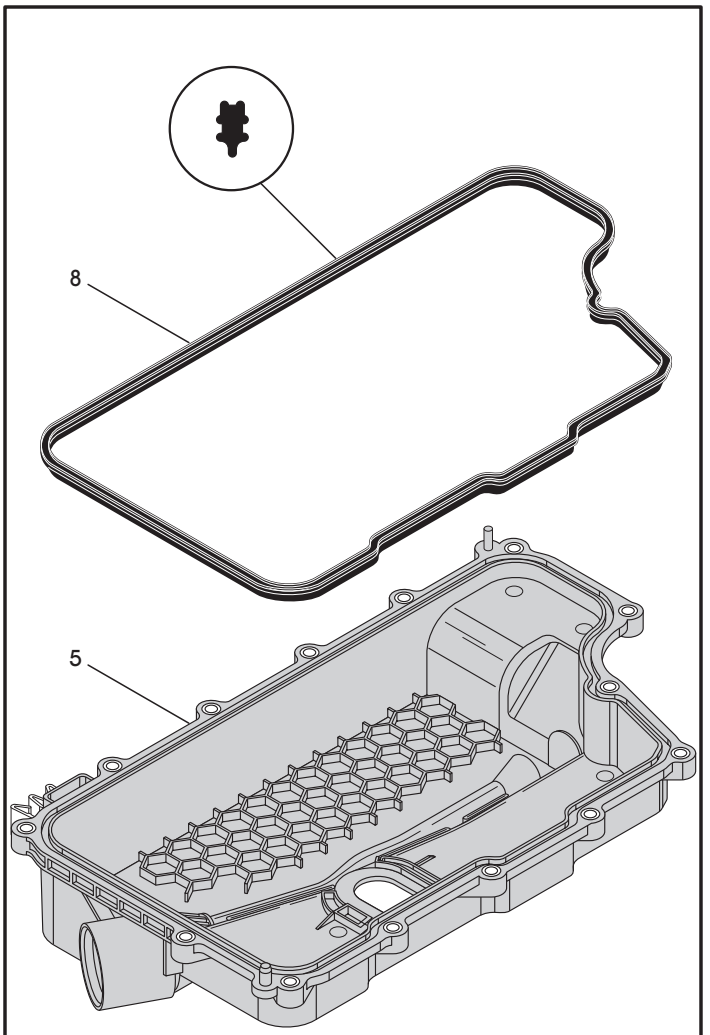


Figure 45

TRANSMISSION DISASSEMBLY (CONT'D)

8. Remove and discard the valve body cover gasket as shown in Figure 46.
9. Disconnect Internal Mode Switch (IMS) connector from Solenoid Body/TCN assembly, as shown in Figure 47, and lay harness over the pan rail.
10. Disconnect the Output Speed Sensor connector from Solenoid Body/TCM assembly, as shown in Figure 47, and lay harness over pan rail.
11. Disconnect the Input Speed Sensor connector from Solenoid Body/TCM assembly, as shown in Figure 47 and lay harness over pan rail.

Continued on Page 39



5 VALVE BODY SIDE COVER.
8 VALVE BODY SIDE COVER GASKET.

Figure 46

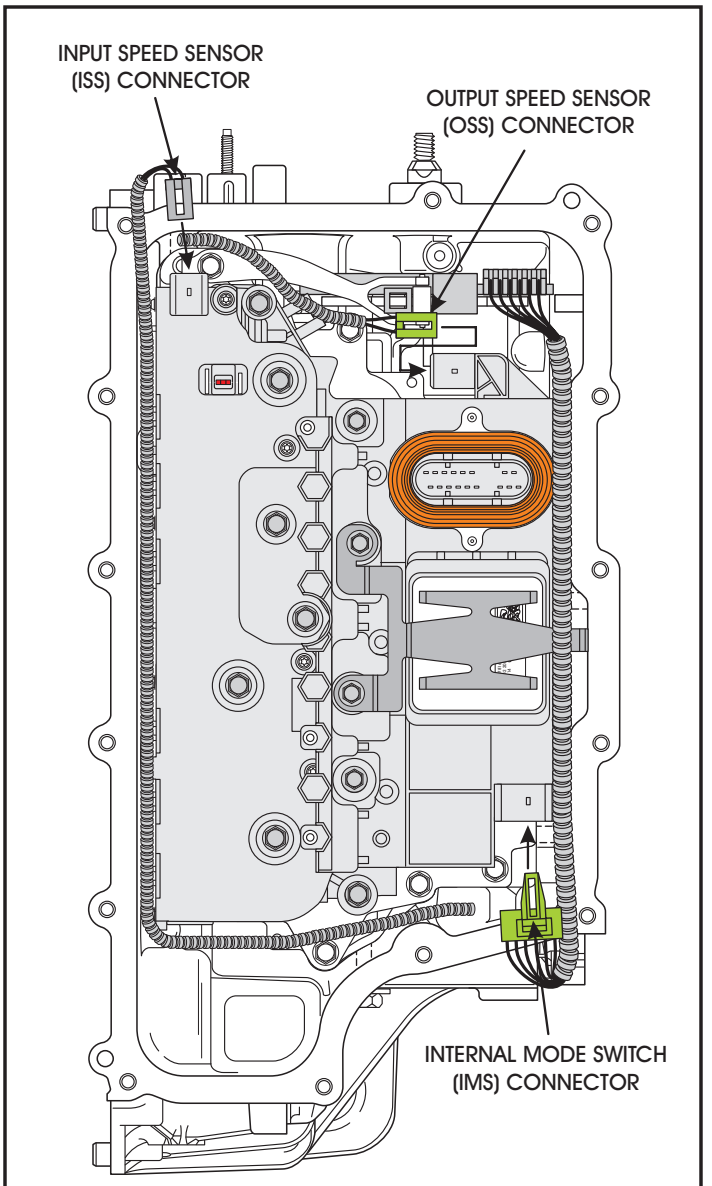


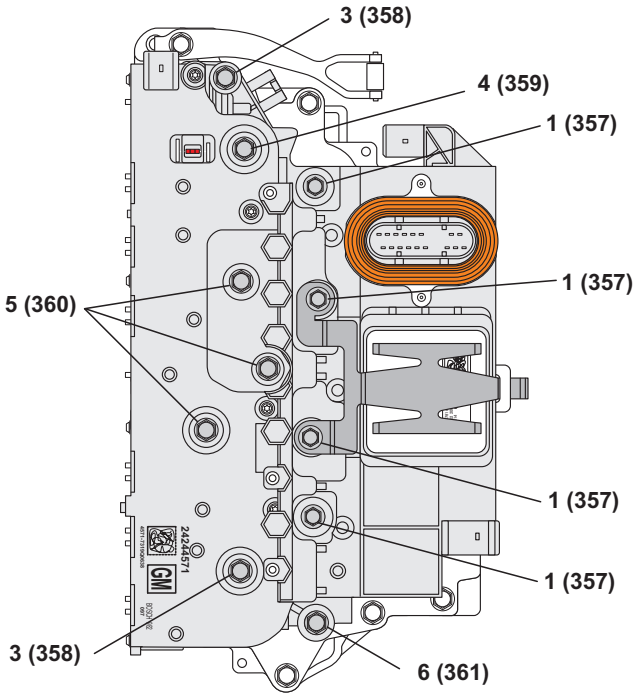
Figure 47

TRANSMISSION DISASSEMBLY (CONT'D)

12. Remove only the Solenoid Body/TCM retaining bolts that are shown in Figure 48 and 49.
13. Remove the Solenoid Body retaining spring, as shown in Figure 49.
14. Remove the Solenoid Body/TCM assembly, as shown in Figure 49.
15. Remove and discard solenoid body to side cover seal assembly, as shown in Figure 49.
16. Set the Solenoid Body/TCM assembly aside for component rebuild section.

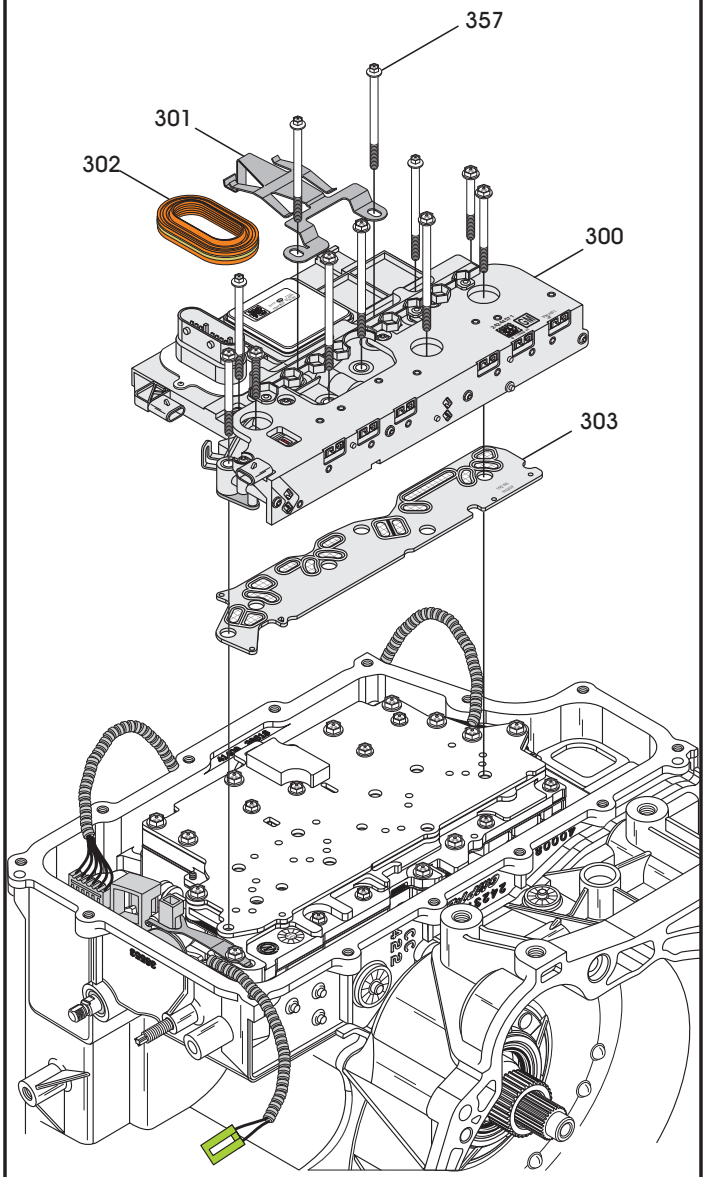
Continued on Page 40

Solenoid Body/TCM Retaining Bolt Identification And Locations



1 SOLENOID BODY BOLT (357), M6 X 80 (4 REQUIRED).
3 SOLENOID BODY BOLT (358), M6 X 65 (2 REQUIRED).
4 SOLENOID BODY BOLT (359), M6 X 42 (1 REQUIRED).
5 SOLENOID BODY BOLT (360), M6 X 95 (3 REQUIRED).
6 SOLENOID BODY BOLT (361), M6 X 55 (1 REQUIRED).

Figure 48



300 SOLENOID BODY AND TCM ASSEMBLY.
301 SOLENOID BODY RETAINING SPRING.
302 SOLENOID BODY TO SIDE COVER SEAL ASSEMBLY.
303 SOLENOID BODY FILTER PLATE ASSEMBLY.
357 SOLENOID BODY/TCM BOLTS (SEE FIGURE 48).

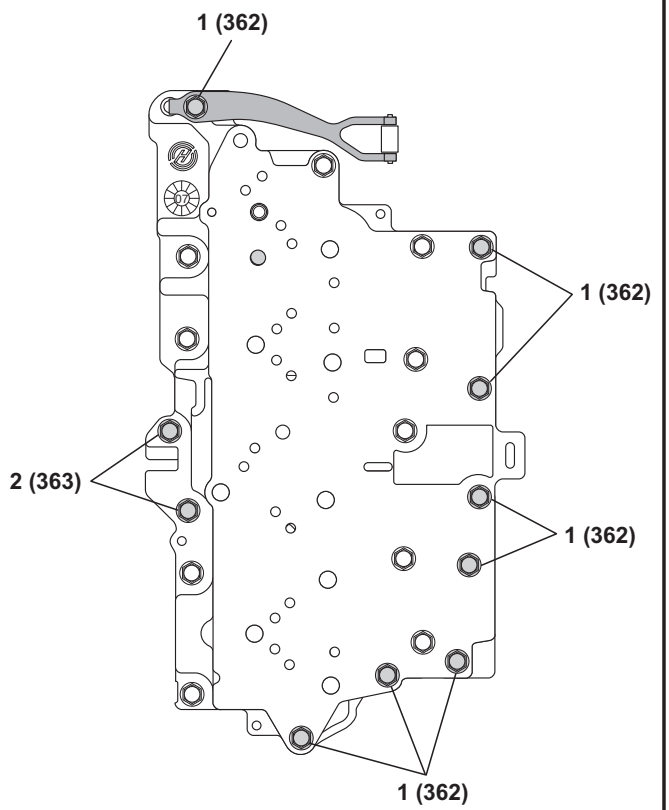
Figure 49

TRANSMISSION DISASSEMBLY (CONT'D)

17. Remove only the valve body retaining bolts that are shown in Figure 50 and 51.
18. Remove the detent spring and roller assembly, as shown in Figure 51.
19. Remove the valve body assembly, as shown in Figure 51.
20. Set the complete valve body assembly aside for the component rebuild section.

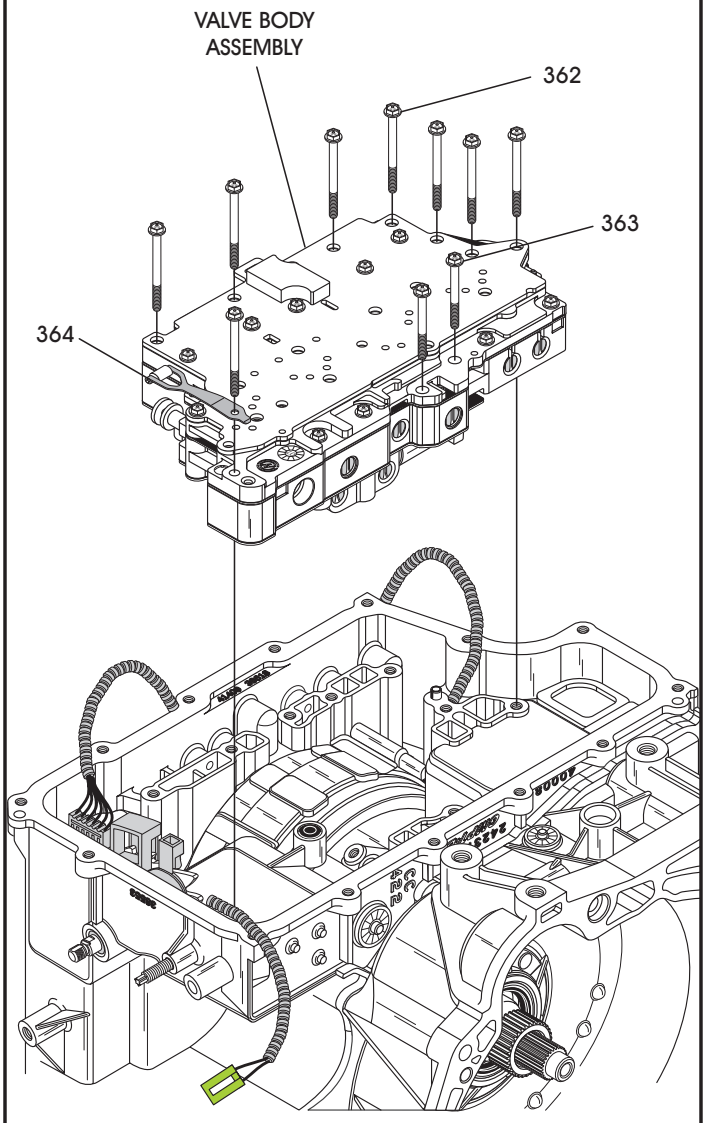
Continued on Page 41

Valve Body Retaining Bolt Identification And Locations



1 VALVE BODY BOLT (362), M6 X 65 (8 REQUIRED).
2 VALVE BODY BOLT (363), M6 X 55 (2 REQUIRED).

Figure 50



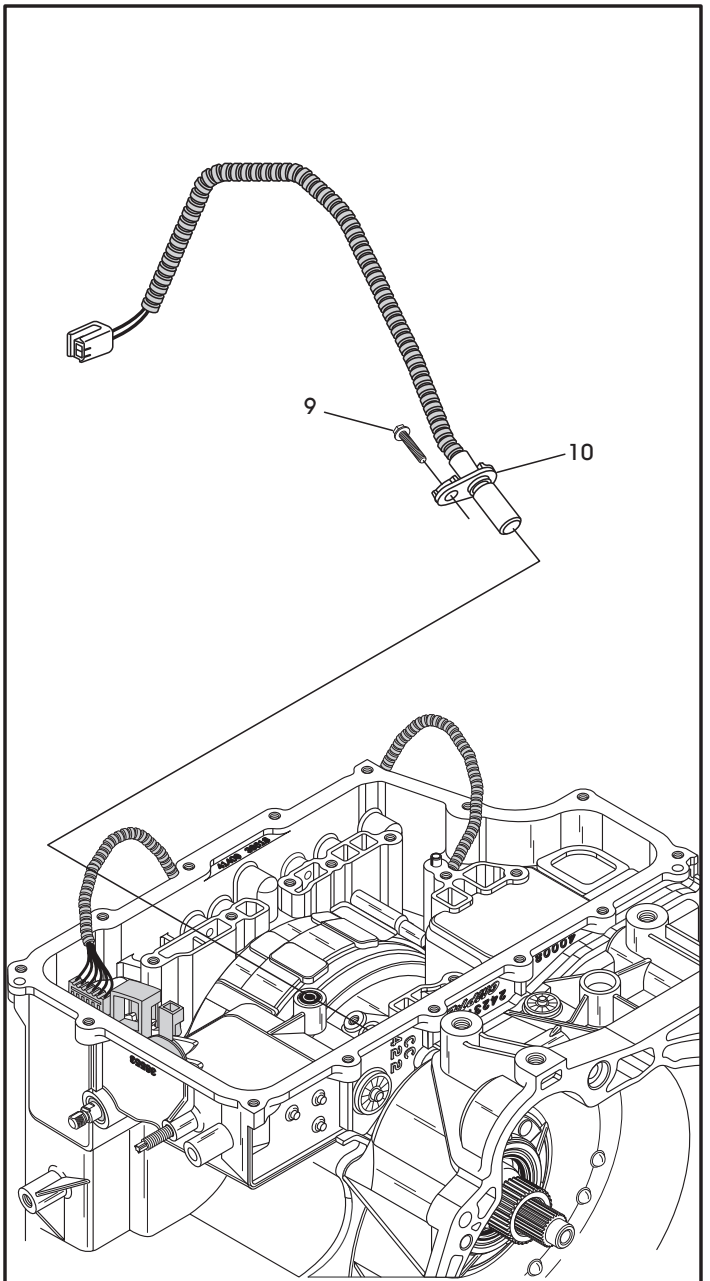
362 VALVE BODY BOLT), M6 X 65 (8 REQUIRED).
363 VALVE BODY BOLT), M6 X 55 (2 REQUIRED).
364 DETENT SPRING AND ROLLER ASSEMBLY.

Figure 51

TRANSMISSION DISASSEMBLY (CONT'D)

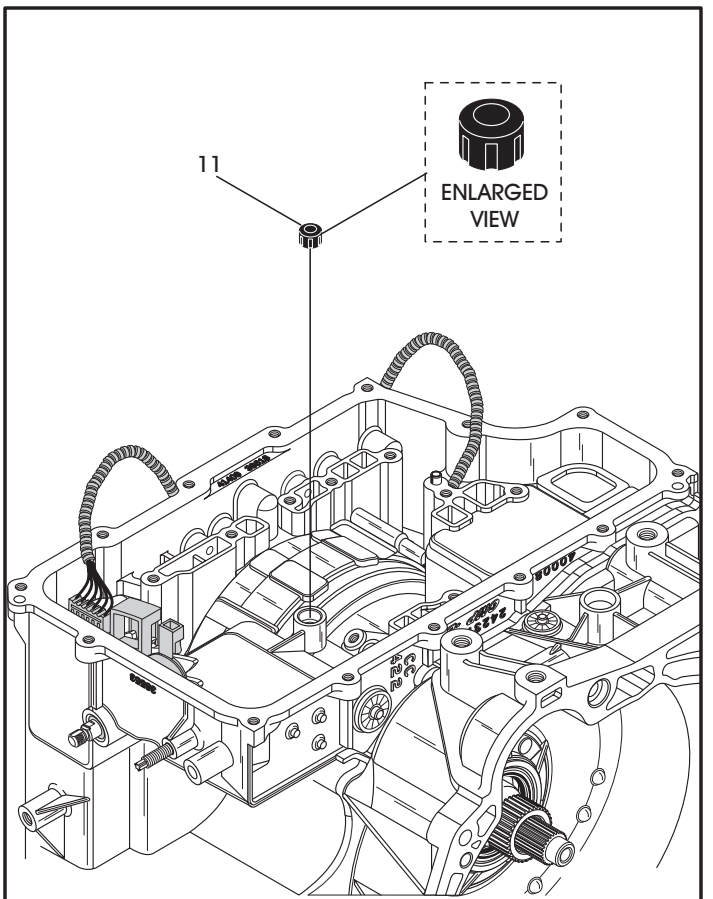
21. Remove the output speed sensor retaining bolt, as shown in Figure 52.
22. Remove the output speed sensor assembly, as shown in Figure 52.
23. Remove and discard the 1-2-3-4 clutch passage seal from the case, as shown in Figure 53.

Continued on Page 42



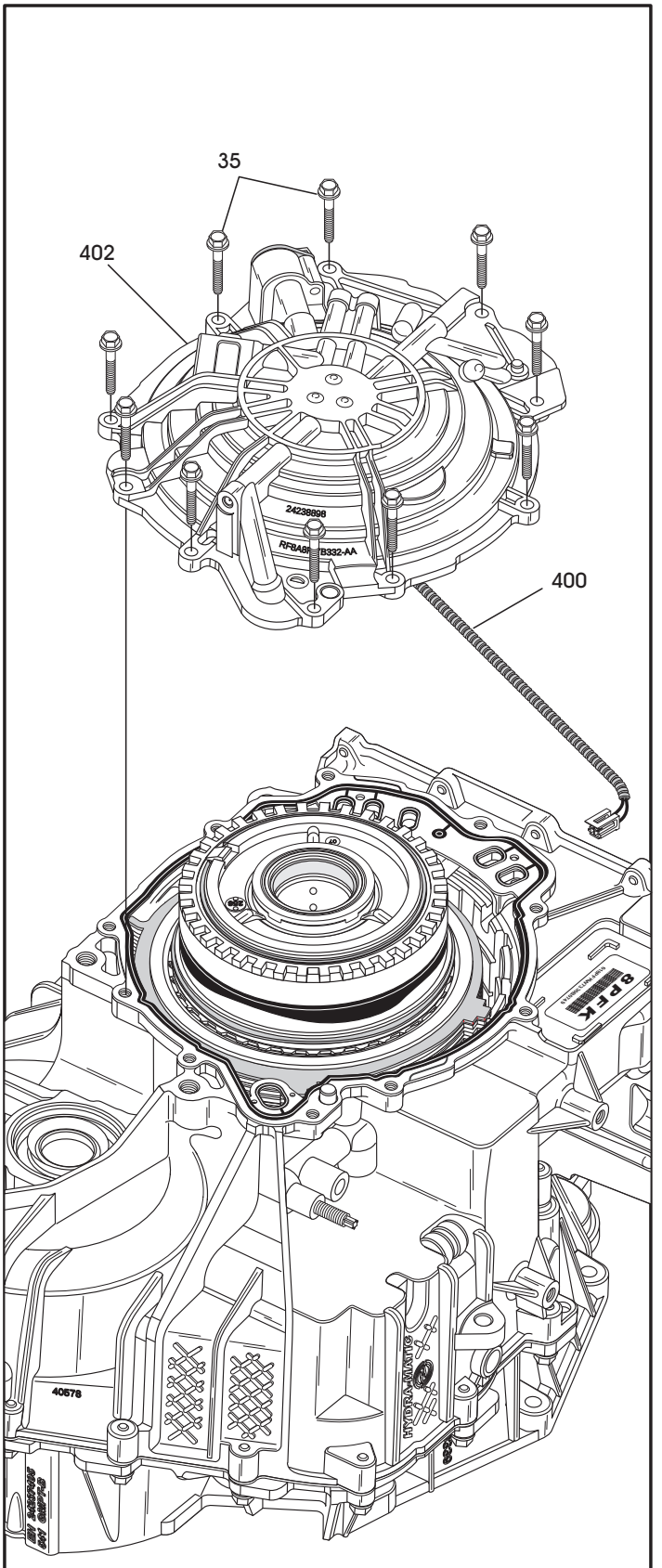
9 OUTPUT SPEED SENSOR RETAINING BOLT, M6 X 25 (1 REQ.).
10 OUTPUT SPEED SENSOR ASSEMBLY.

Figure 52



11 1-2-3-4 CLUTCH PASSAGE SEAL.

Figure 53



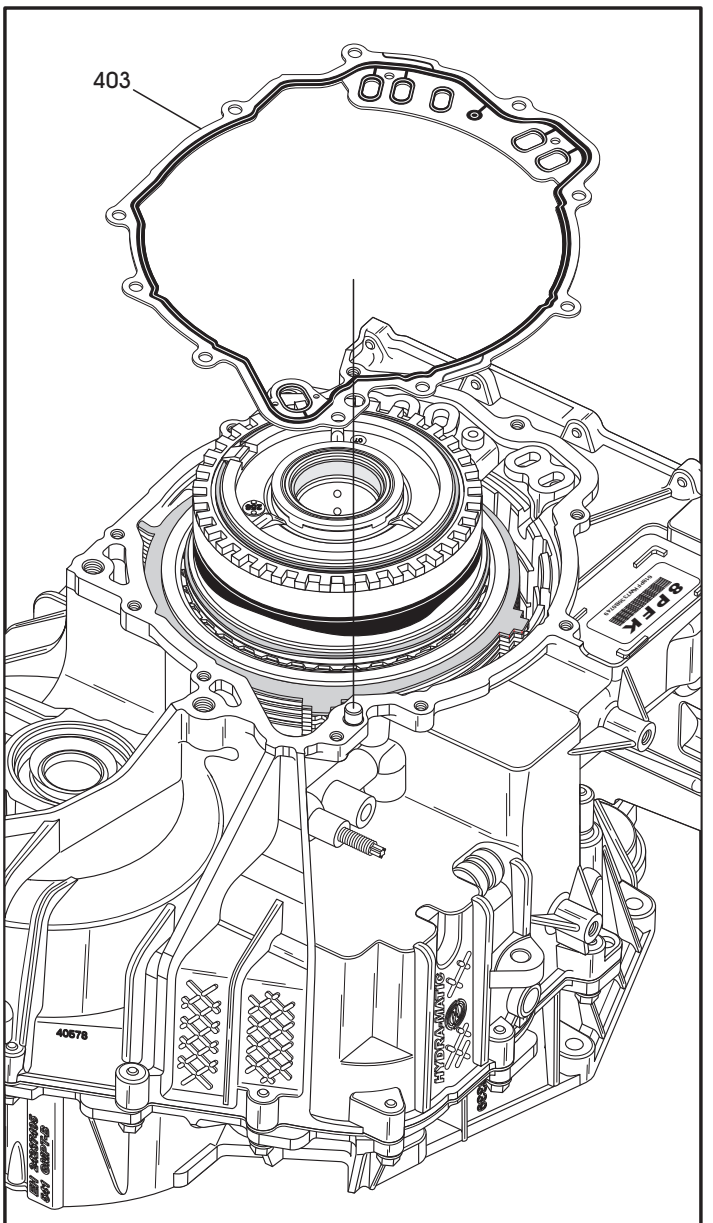
35 REAR CASE COVER RETAINING BOLTS (10 REQUIRED).
400 INPUT SPEED SENSOR ASSEMBLY.
402 REAR CASE COVER ASSEMBLY.

Figure 54

TRANSMISSION DISASSEMBLY (CONT'D)

24. Remove the 10 rear case cover bolts and remove rear case cover with input speed sensor still in the cover, as shown in Figure 54.
Note: "Do Not" try to remove the input speed sensor with rear cover in place, as the harness must carefully be removed through a tight passage.
25. Remove and discard the rear case cover to case gasket, as shown in Figure 55.

Continued on Page 43



403 REAR CASE COVER TO CASE GASKET.

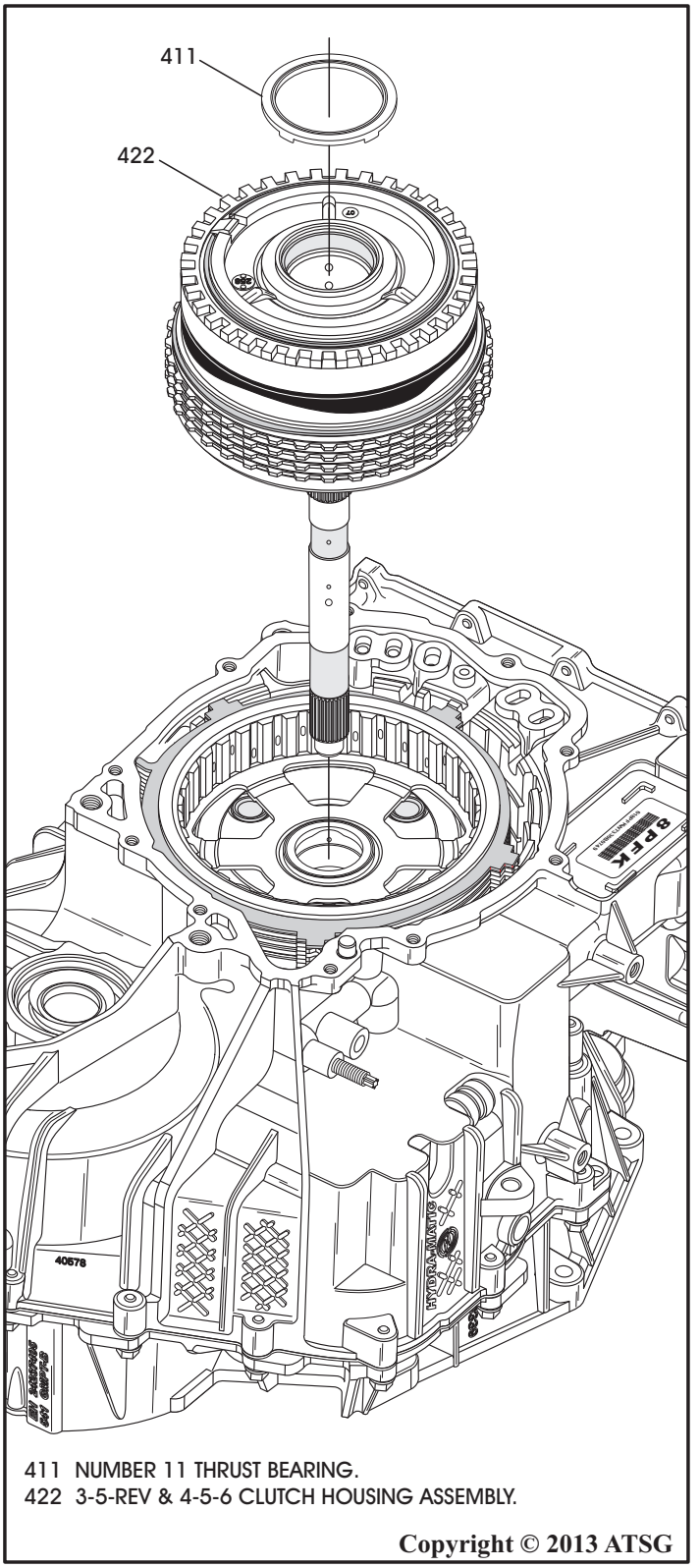
Figure 55

TRANSMISSION DISASSEMBLY (CONT'D)

26. Remove the number 11 thrust bearing and the 3-5-R & 4-5-6 clutch housing assembly, as shown in Figure 56.
Note: Bearing may be stuck to the rear cover.

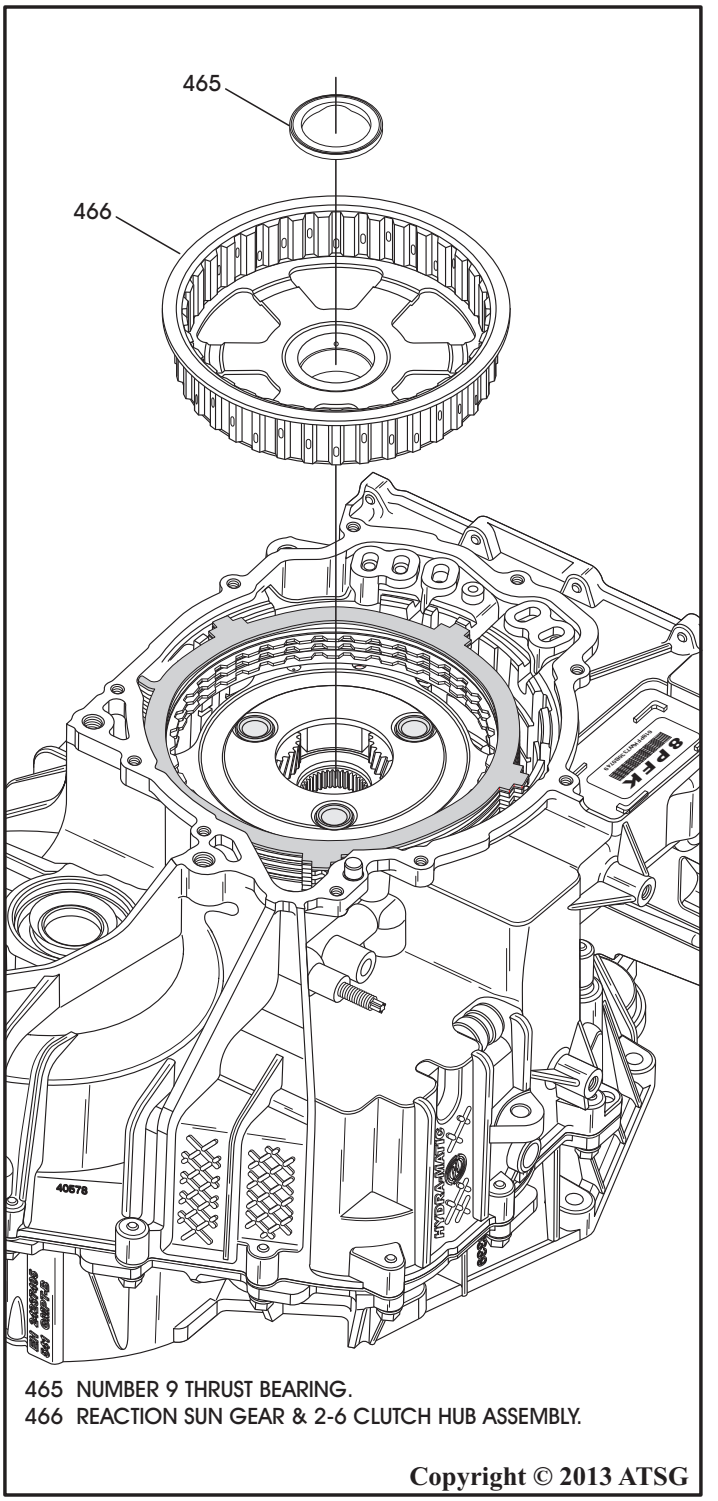
27. Remove the number 9 thrust bearing and the reaction sun gear, as shown in Figure 57.
Note: Bearing may be stuck to the 3-5-R/4-5-6 clutch housing.

Continued on Page 44



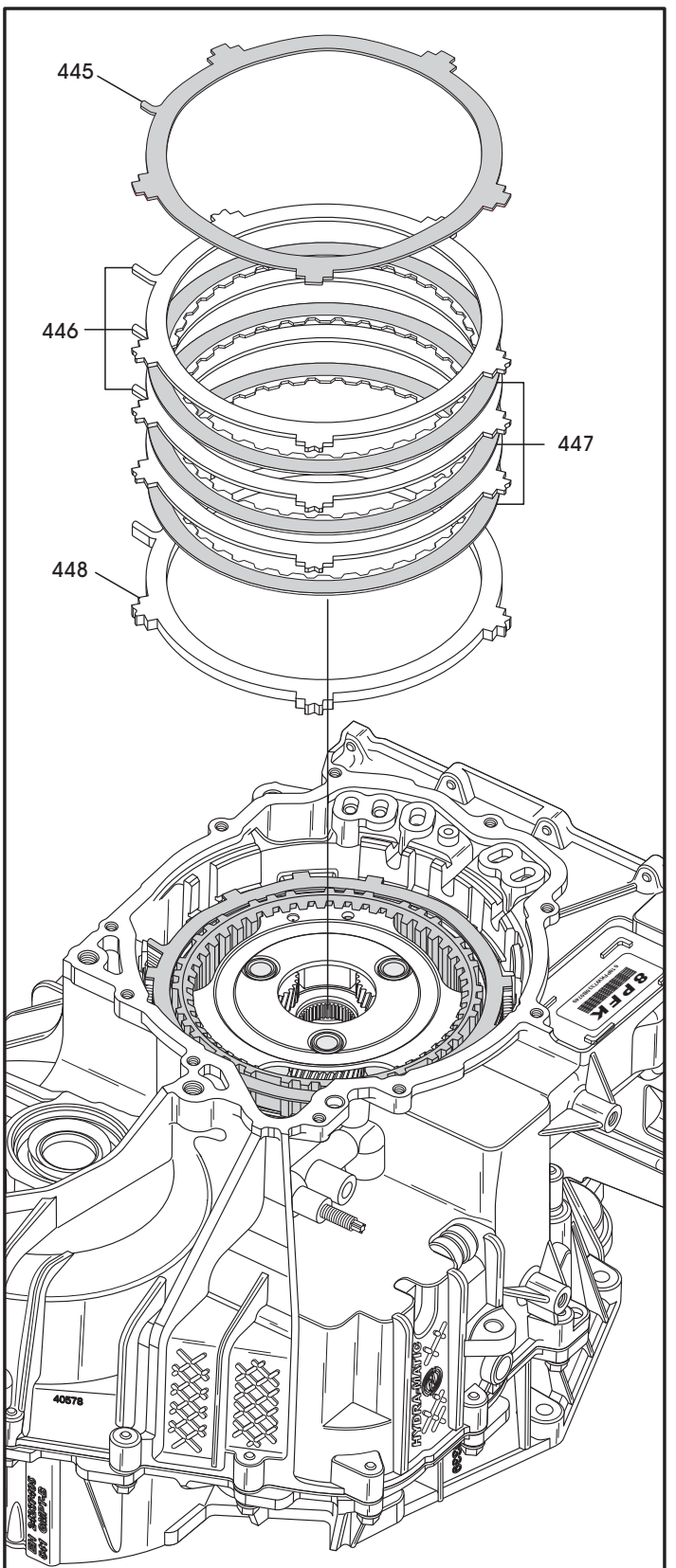
411 NUMBER 11 THRUST BEARING.
422 3-5-REV & 4-5-6 CLUTCH HOUSING ASSEMBLY.

Figure 56



465 NUMBER 9 THRUST BEARING.
466 REACTION SUN GEAR & 2-6 CLUTCH HUB ASSEMBLY.

Figure 57



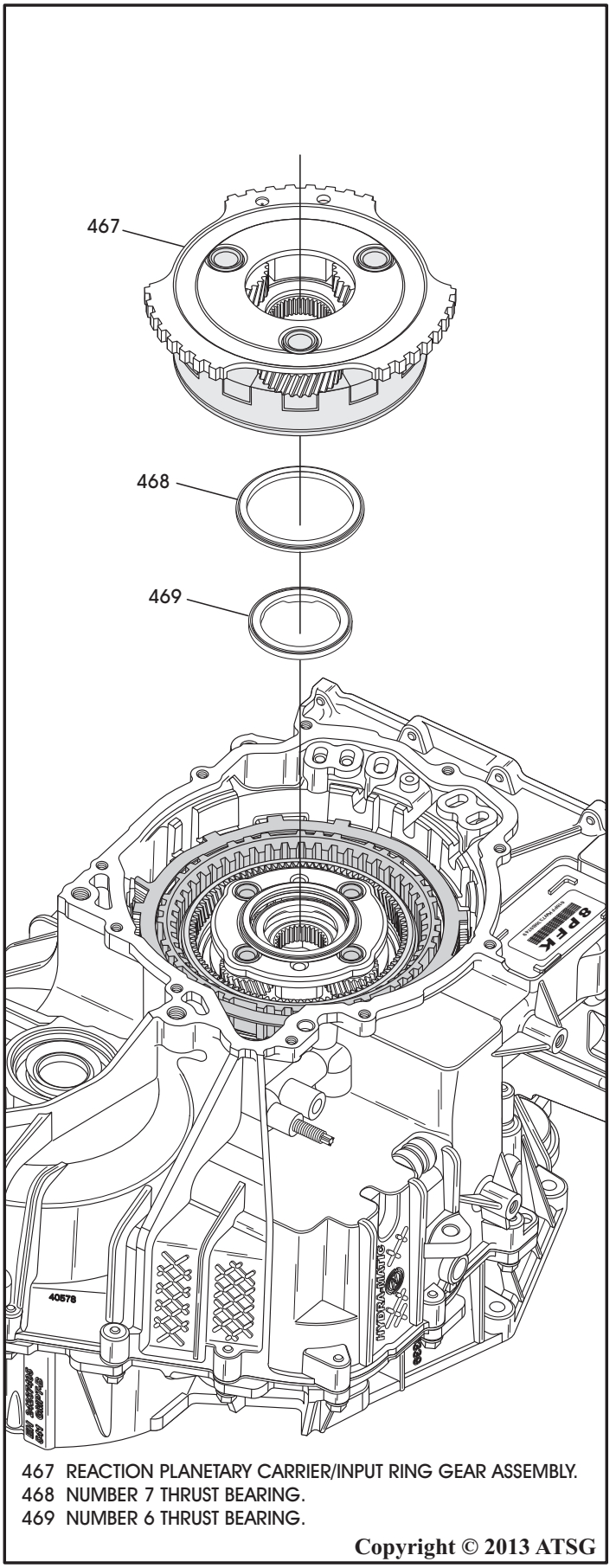
445 2-6 CLUTCH "WAVE" SPRING.
446 2-6 CLUTCH STEEL PLATES, .115" THICK (3 REQUIRED).
447 2-6 CLUTCH FRICTION PLATES (3 REQUIRED).
448 2-6 CLUTCH BACKING PLATE, .260" THICK.

Figure 58

TRANSMISSION DISASSEMBLY (CONT'D)

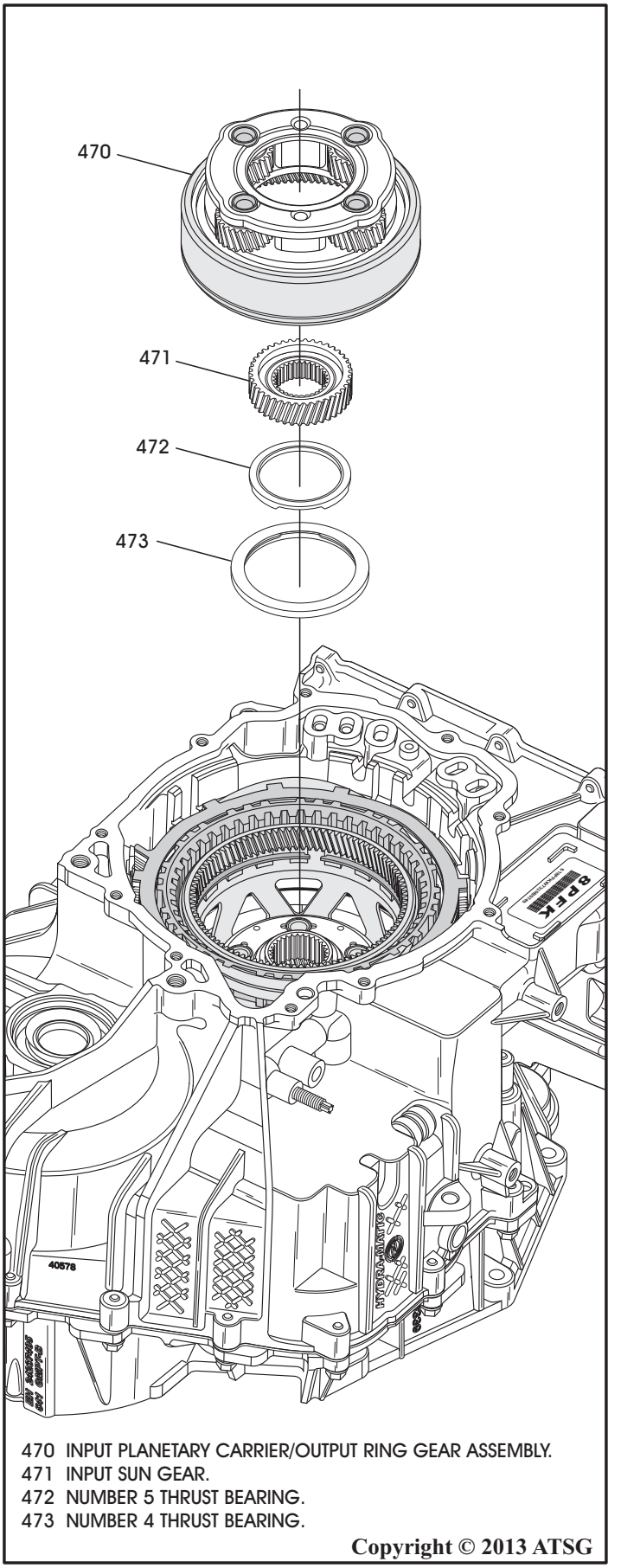
28. Remove the 2-6 clutch "wave" cushion plate, as shown in Figure 58.
29. Remove the 2-6 clutch steel and friction plates, three of each, as shown in Figure 58.
30. Remove the 2-6 backing plate, as shown in Figure 58.
    Note: Note the location of the long tabs on the wave, steel and backing plates towards the bottom of the case (See Figure 58).
31. Remove the reaction planetary carrier assembly, as shown in Figure 59.
32. Remove the number 7 thrust bearing, as shown in Figure 59.
33. Remove the number 6 thrust bearing, as shown in Figure 59.
    Note: Number 6 thrust bearing may be stuck to the reaction carrier assembly.
34. Remove the input planetary carrier assembly and the input sun gear, as shown in Figure 60.
35. Remove the number 5 thrust bearing, as shown in Figure 60.
36. Remove the number 4 thrust bearing, as shown in Figure 60.

Continued on Page 46



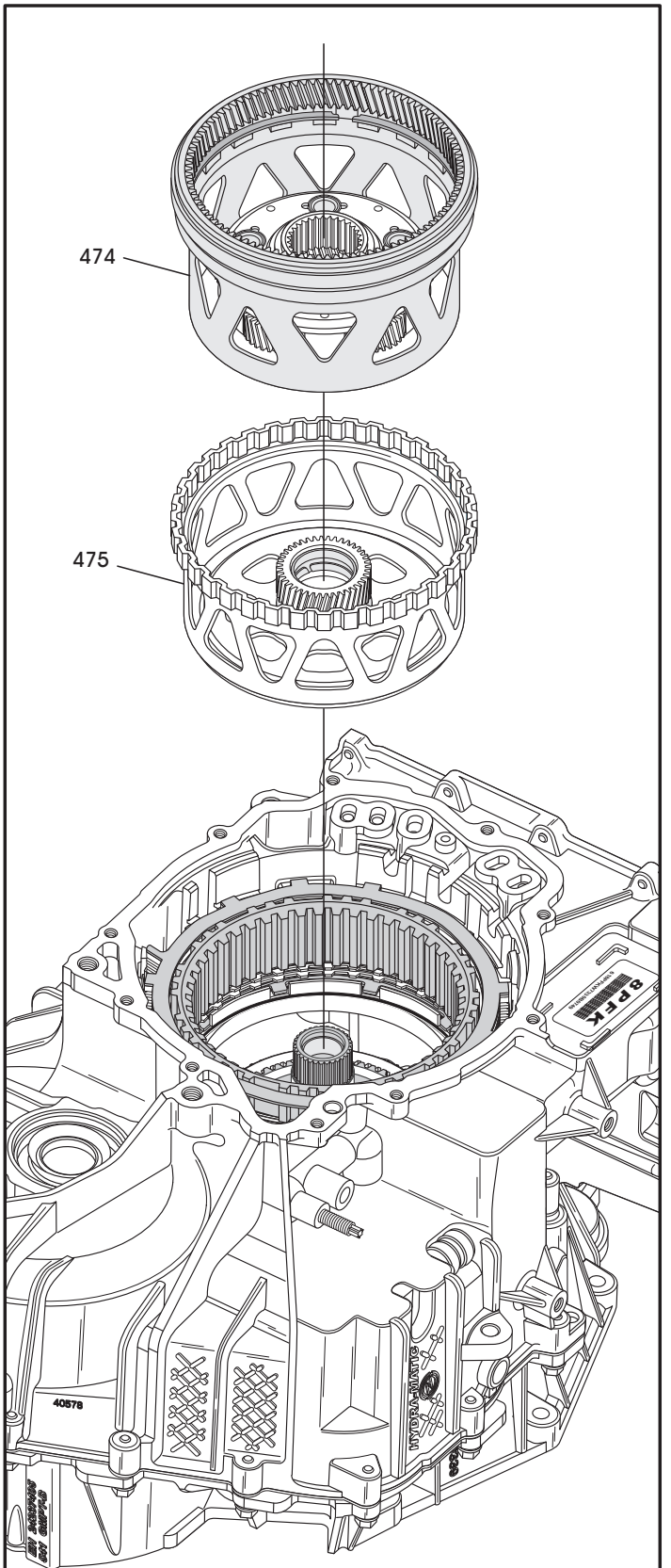
467 REACTION PLANETARY CARRIER/INPUT RING GEAR ASSEMBLY.
468 NUMBER 7 THRUST BEARING.
469 NUMBER 6 THRUST BEARING.

Figure 59



470 INPUT PLANETARY CARRIER/OUTPUT RING GEAR ASSEMBLY.
471 INPUT SUN GEAR.
472 NUMBER 5 THRUST BEARING.
473 NUMBER 4 THRUST BEARING.

Figure 60



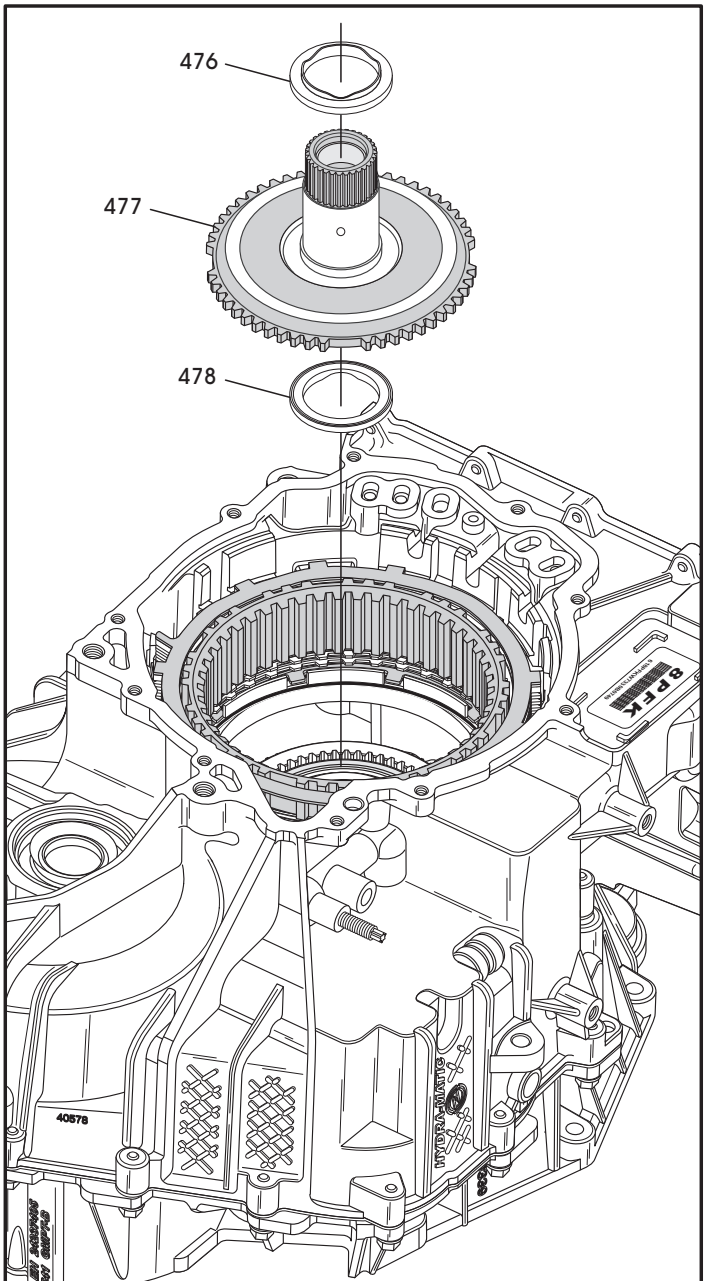
474 OUTPUT PLANETARY CARRIER/REACTION RING GEAR ASSEMBLY.
475 OUTPUT SUN GEAR/1-2-3-4 CLUTCH HUB ASSEMBLY.

Figure 61

TRANSMISSION DISASSEMBLY (CONT'D)

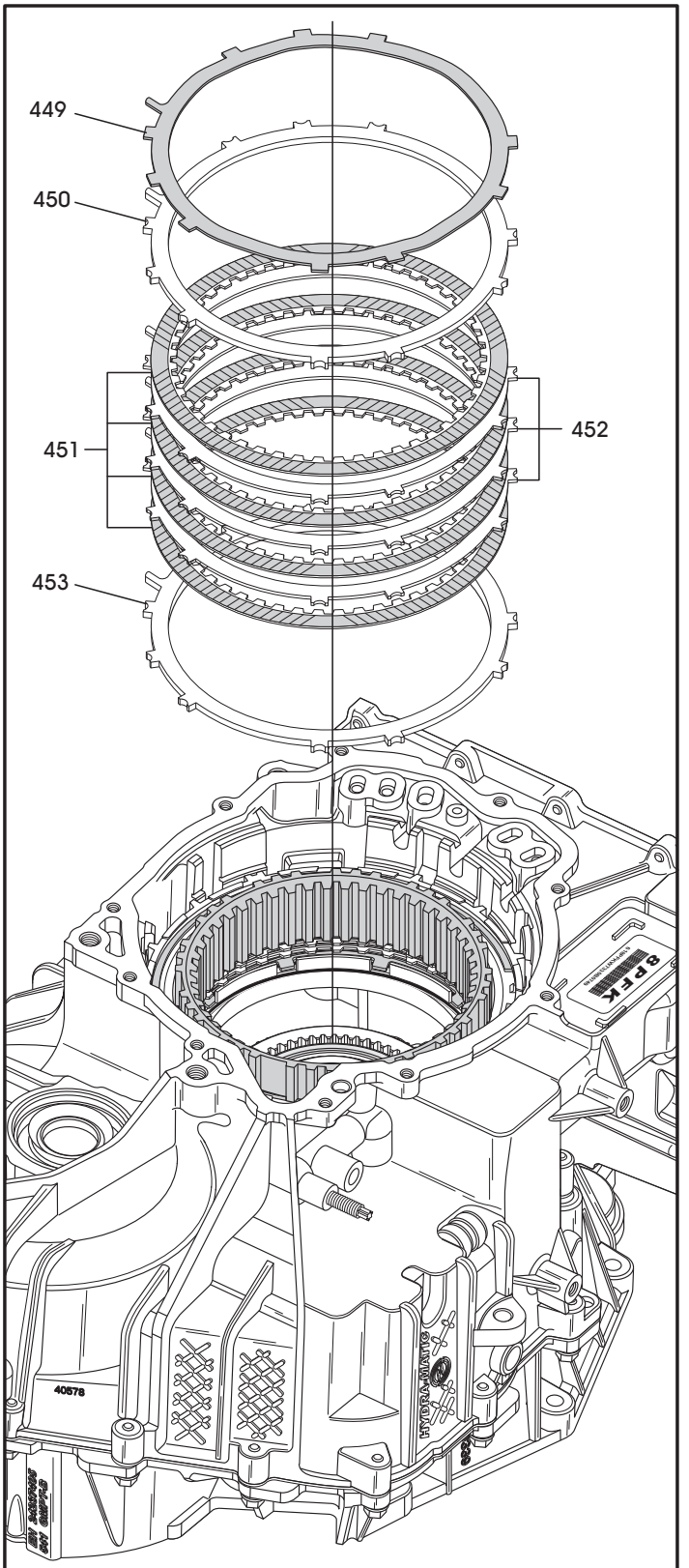
37. Remove the output planetary carrier assembly, as shown in Figure 61.
38. Remove the output sun gear/1-2-3-4 clutch hub assembly, as shown in Figure 61.
39. Remove the number 2 thrust bearing, the output transfer drive gear hub and the number 1 thrust bearing, as shown in Figure 62.

Continued on Page 47



476 NUMBER 2 THRUST BEARING.
477 OUTPUT TRANSFER DRIVE GEAR HUB ASSEMBLY.
478 NUMBER 1 THRUST BEARING.

Figure 62



449 LOW/REVERSE CLUTCH "WAVE" PLATE.
450 LOW/REVRESE CLUTCH APPLY PLATE, .115" THICK.
451 LOW/REVERSE CLUTCH FRICTION PLATES (4 REQUIRED).
452 LOW/REVERSE CLUTCH STEEL PLATES, .070" THICK (3 REQ.)
453 LOW/REVERSE CLUTCH BACKING PLATE, .255" THICK.

Figure 63

TRANSMISSION DISASSEMBLY (CONT'D)

40. Remove the low/reverse clutch "wave" cushion plate, as shown in Figure 63.
41. Remove the low/reverse clutch apply plate, as shown in Figure 63.
    Note: The apply plate is .115" thick.
42. Remove the low/reverse clutch friction and steel plates, as shown in Figure 63.
    Note: The steel plates are .070" thick.
43. Remove the low/reverse clutch backing plate, as shown in Figure 63.
    Note: The backing plate is .255" thick and has a step on one side as shown in Figure 64.

    Note: Note the location of the long tabs on the wave, steel and backing plates towards the bottom of the case (See Figure 63).

Continued on Page 48

Low/Reverse Clutch Backing Plate Is Stepped And Step Faces Down

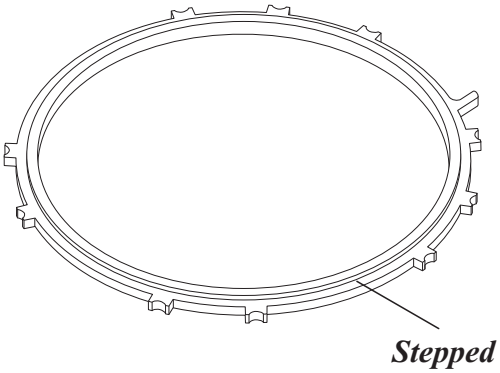
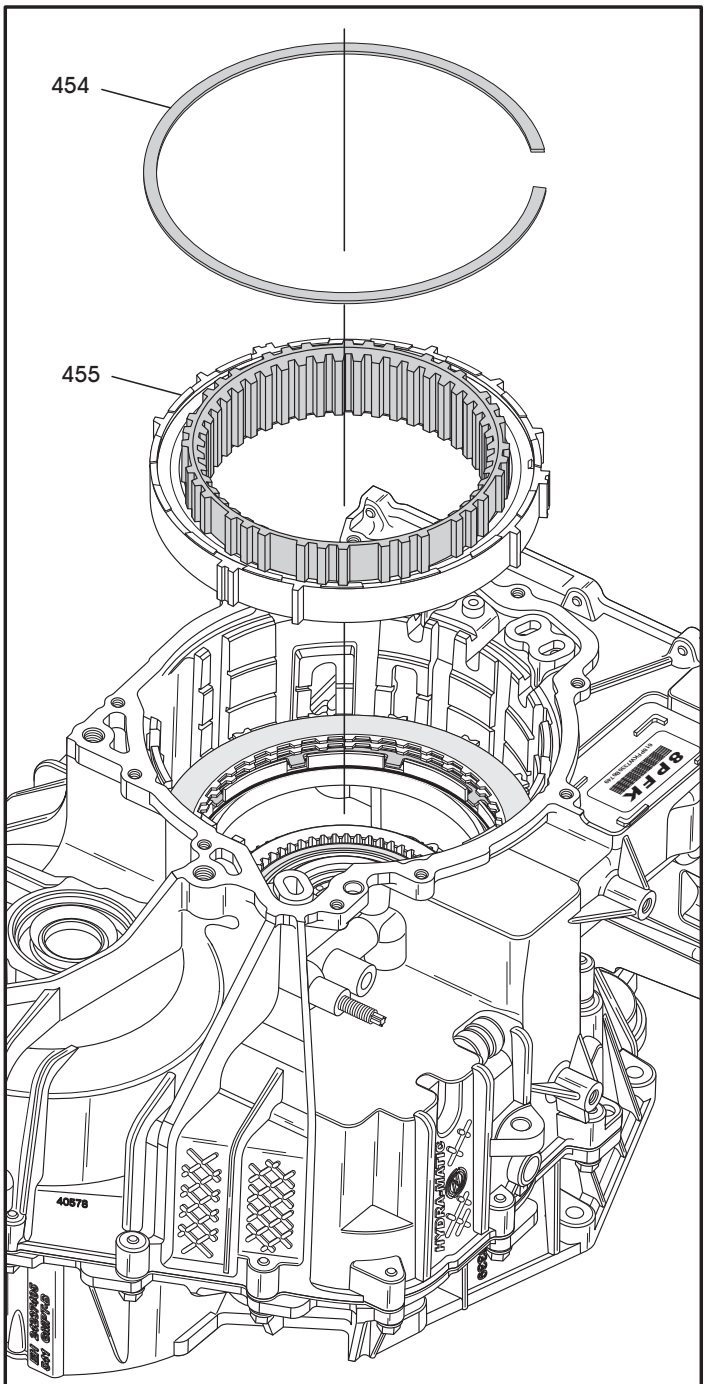


Figure 64

TRANSMISSION DISASSEMBLY (CONT'D)

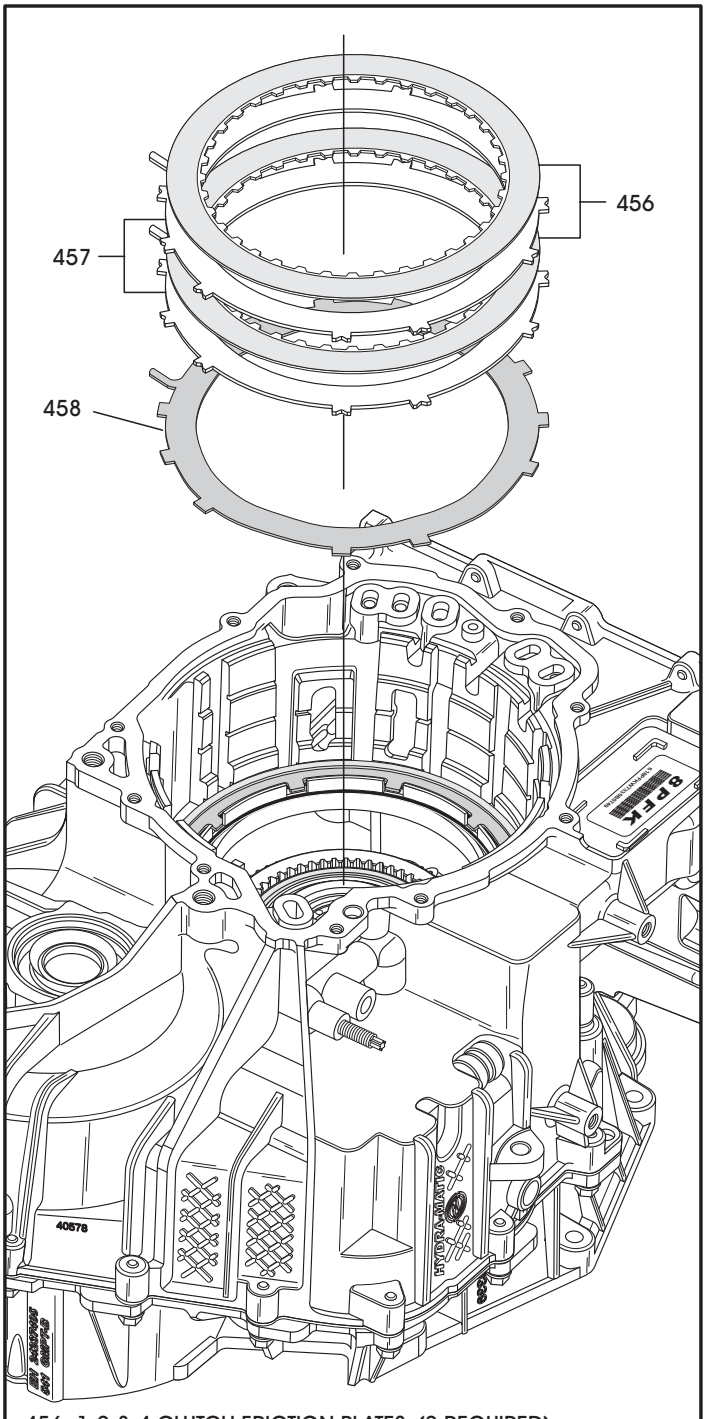
44. Remove the snap ring from the case groove that retains the one-way clutch assembly, as shown in Figure 65.
45. Remove one-way "diode style" clutch assembly from the case, as shown in Figure 65.
46. Remove the 1-2-3-4 clutch pack, 2 frictions and 2 steel plates, as shown in Figure 66.
47. Remove the 1-2-3-4 clutch "wave" cushion plate as shown in Figure 66
    Note: Note the location of the long tabs on the wave, steel and backing plates towards the bottom of the case (See Figure 66).

Continued on Page 49



454 LOW ONE-WAY CLUTCH RETAINING SNAP RING.
455 LOW ONE-WAY "DIODE STYLE" CLUTCH.

Figure 65



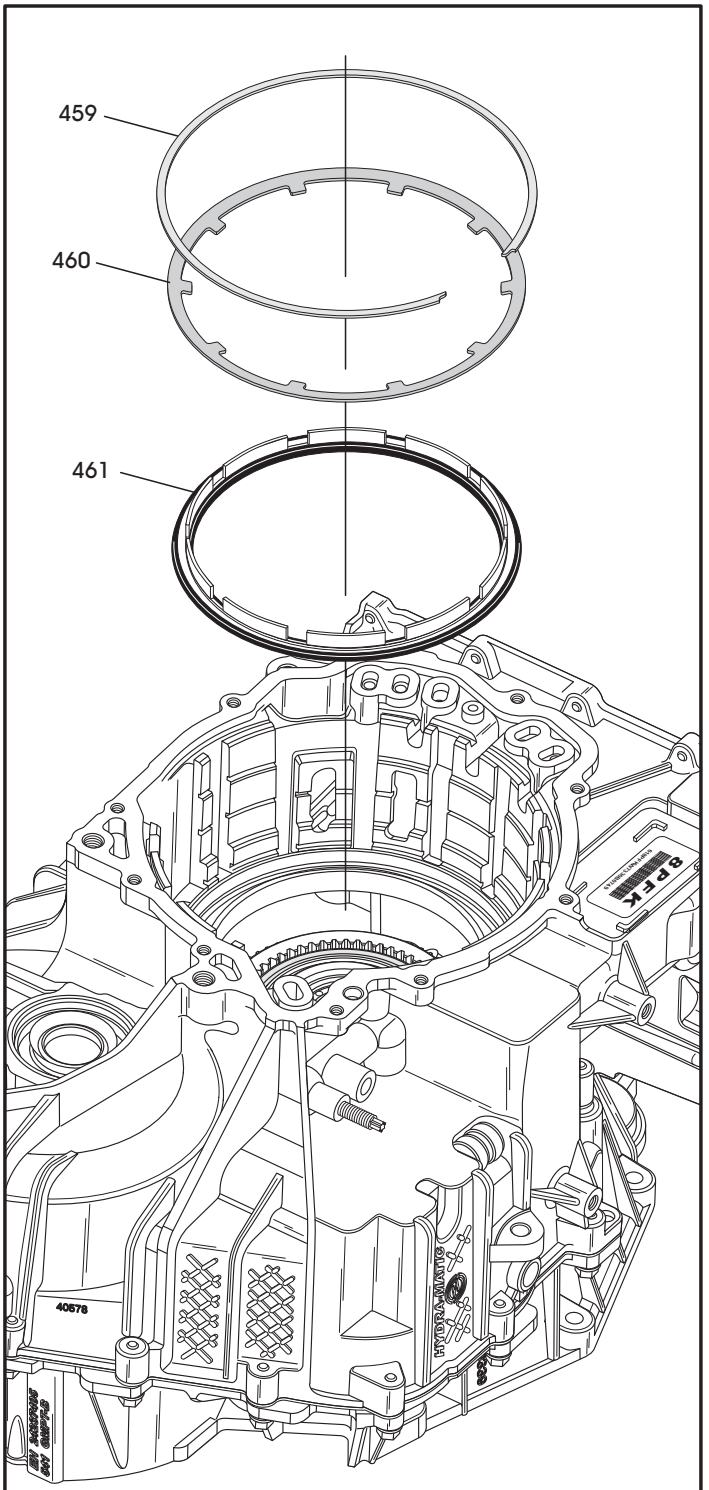
456 1-2-3-4 CLUTCH FRICTION PLATES (2 REQUIRED).
457 1-2-3-4 CLUTCH STEEL PLATES, .085" THICK (2 REQUIRED).
458 1-2-3-4 CLUTCH "WAVE" PLATE.

Figure 66

TRANSMISSION DISASSEMBLY (CONT'D)

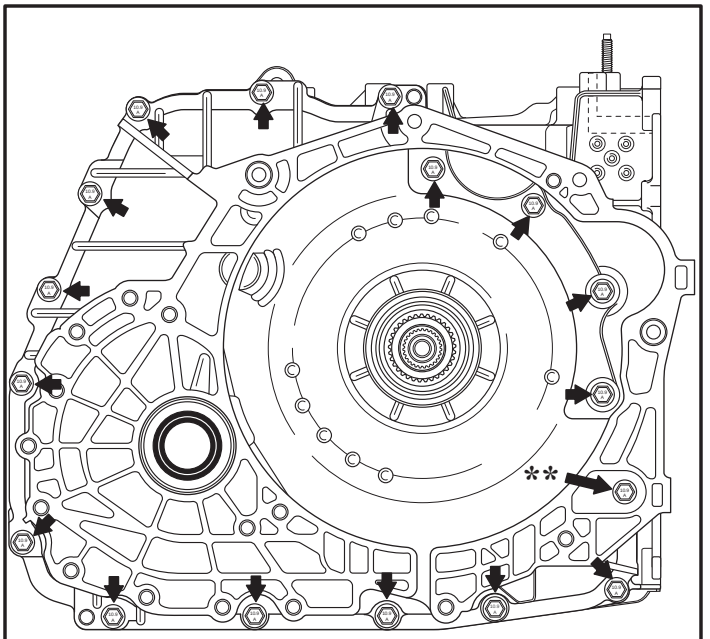
48. Remove the snap ring from the case groove that retains the 1-2-3-4 piston return spring, as shown in Figure 67.
49. Remove the 1-2-3-4 clutch piston return spring, as shown in Figure 67.
50. Remove the 1-2-3-4 clutch piston, as shown in Figure 67, using a pair of pliers.
51. Rotate transmission so that converter housing is facing up, as shown in Figure 68.
52. Remove the seventeen (17) converter housing to case retaining bolts and their locations are shown in Figure 68.
    Note: There is one retaining bolt that is easily overlooked because it is 3-1/2 inches below the machined surface of the converter housing. Refer to Figure 68 and 69.

Continued on Page 50



459 1-2-3-4 CLUTCH PISTON RETURN SPRING SNAP RING.
460 1-2-3-4 CLUTCH PISTON RETURN SPRING.
461 1-2-3-4 CLUTCH APPLY PISTON.

Figure 67



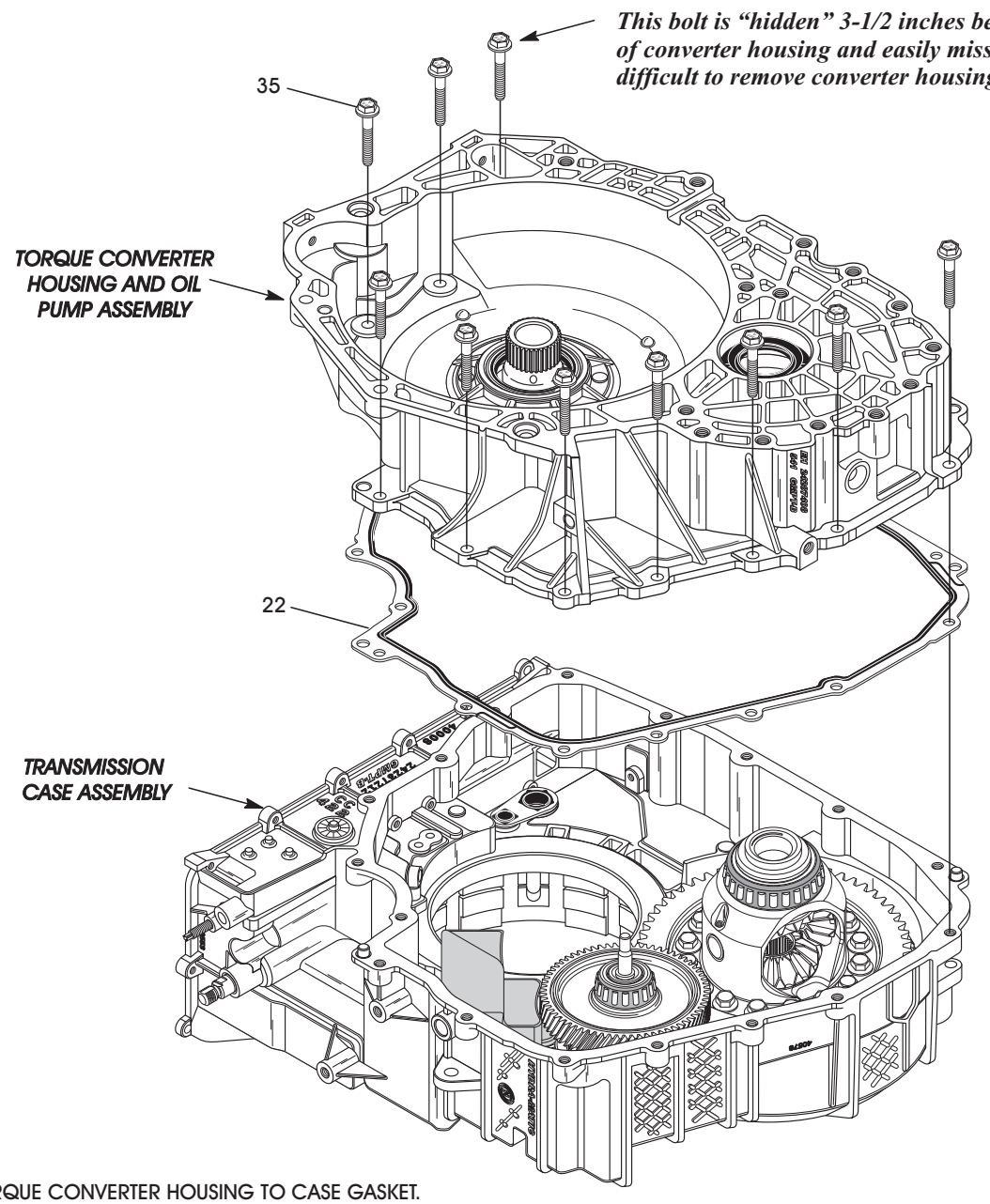
***** This bolt is "hidden" 3-1/2 inches below the surface of converter housing and easily missed. Makes it difficult to remove converter housing if missed.***

Figure 68

TRANSMISSION DISASSEMBLY (CONT'D)

53. After removing the 17 retaining bolts, remove the torque converter housing, oil pump and the drive sprocket support assembly, as shown in Figure 69.
    Note: Sometimes a slide hammer is needed to break loose the converter housing from the locating dowels.
54. Set the torque converter housing, oil pump and drive sprocket support assembly aside for the component rebuild section.

Continued on Page 51



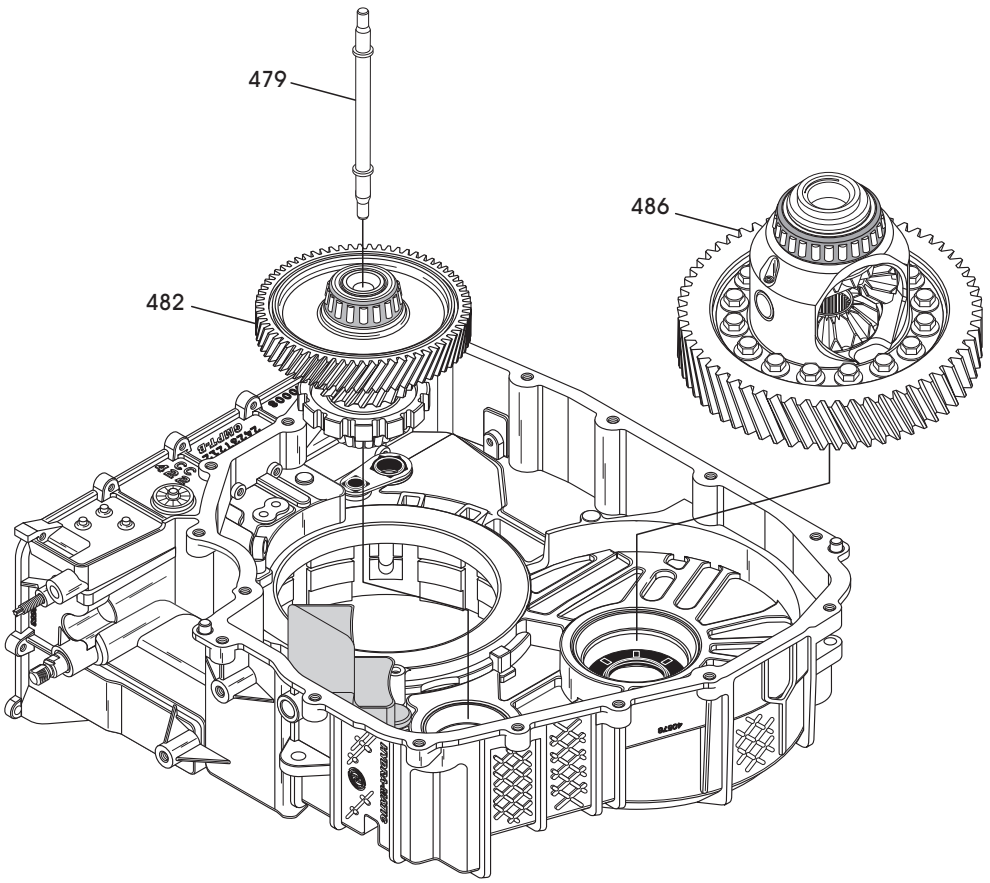
22 TORQUE CONVERTER HOUSING TO CASE GASKET.
35 TORQUE CONVERTER HOUSING TO CASE BOLTS (17 REQ.).

Figure 69

TRANSMISSION DISASSEMBLY (CONT'D)

55. Remove the differential pinion gear lube tube, as shown in Figure 70.
56. Remove differential pinion and transfer driven gear assembly, along with the differential carrier assembly, as shown in Figure 70.
    Note: Remove differential carrier assembly and pinion gear assembly together to avoid any interference with the gears during removal.
57. Set the differential pinion and transfer driven gear assembly, along with the differential carrier assembly aside for component rebuild section.

Continued on Page 52



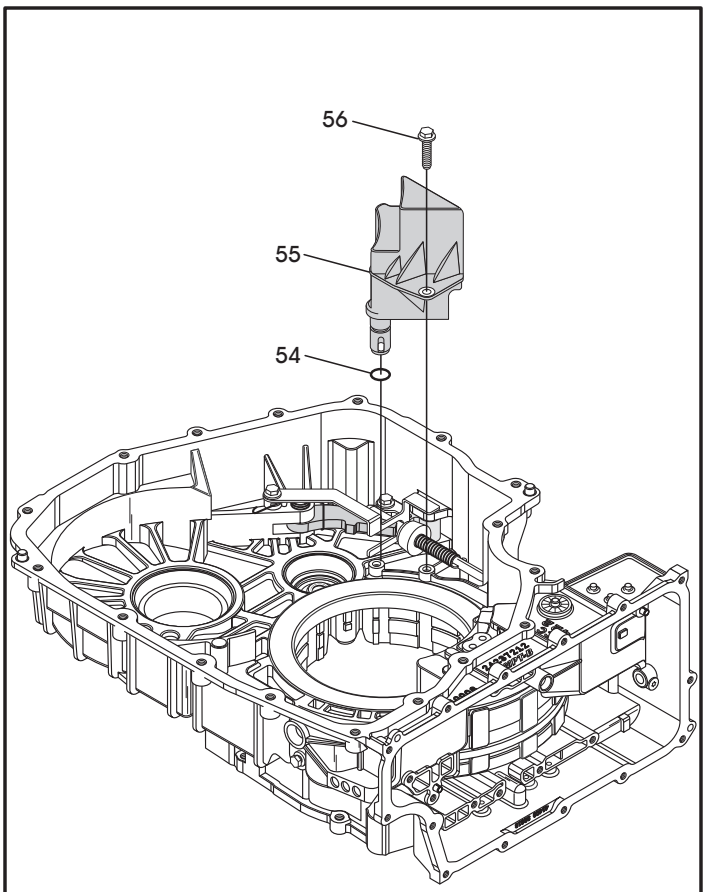
479 DIFFERENTIAL PINION GEAR LUBE TUBE.
482 DIFFERENTIAL PINION GEAR & TRANSFER DRIVEN GEAR ASM.
486 DIFFERENTIAL CARRIER ASSEMBLY.

Figure 70

TRANSMISSION DISASSEMBLY (CONT'D)

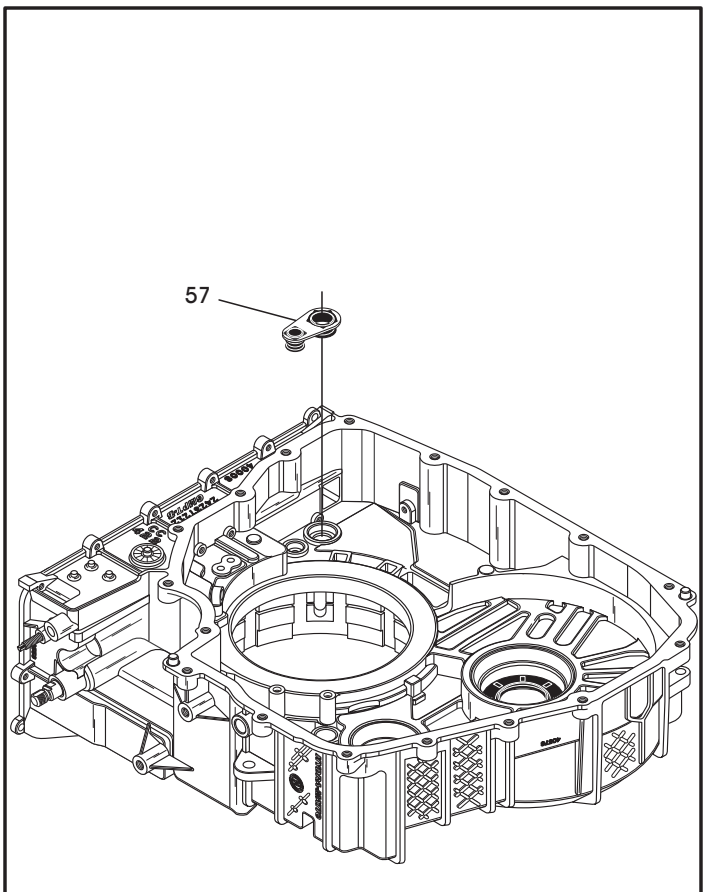
58. Remove the fluid trough retaining bolt, as shown in Figure 71.
59. Remove the fluid trough assembly, as shown in Figure 71.
60. Remove and discard the fluid trough "O" ring seal, as shown in Figure 71.
    Note: Fluid trough has a captured check ball located in the tube and should "rattle".
61. Remove and discard the oil pump outlet seal from the case, as shown in Figure 72.

Continued on Page 53



54 FLUID TROUGH "O" RING SEAL.
55 FLUID TROUGH ASSEMBLY.
56 FLUID TROUGH RETAINING BOLT.

Figure 71



57 OIL PUMP OUTLET SEAL ASSEMBLY.

Figure 72

TRANSMISSION DISASSEMBLY (CONT'D)

62. Use a small nail puller to reach down between internal mode switch and the case, to loosen and and remove the manual shaft retaining pin, as shown in Figure 73.
63. Remove the internal mode switch and park rod from the case.
    Note: Rotate the assembly counterclockwise so the park rod will fit through the case opening.
64. Remove the park linkage from the case using Figure 74 as a guide.

Continued on Page 55

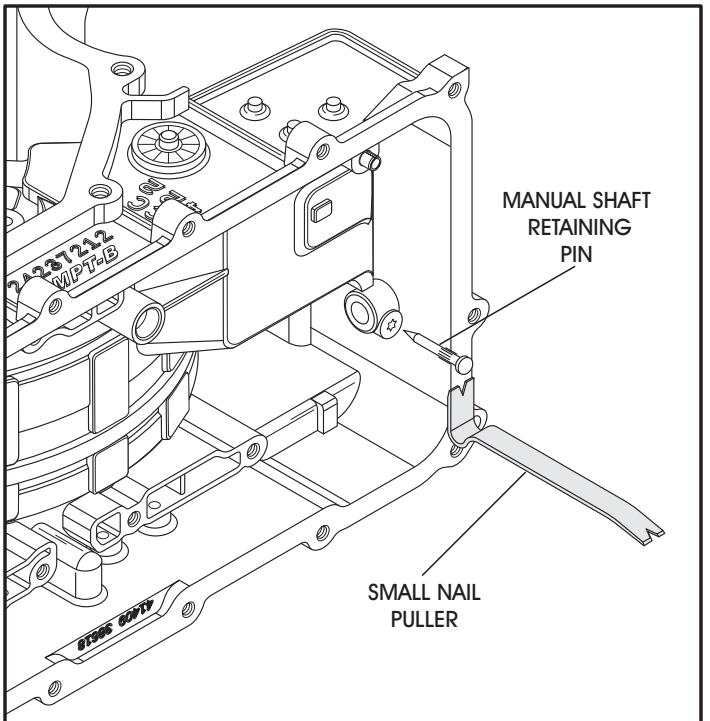
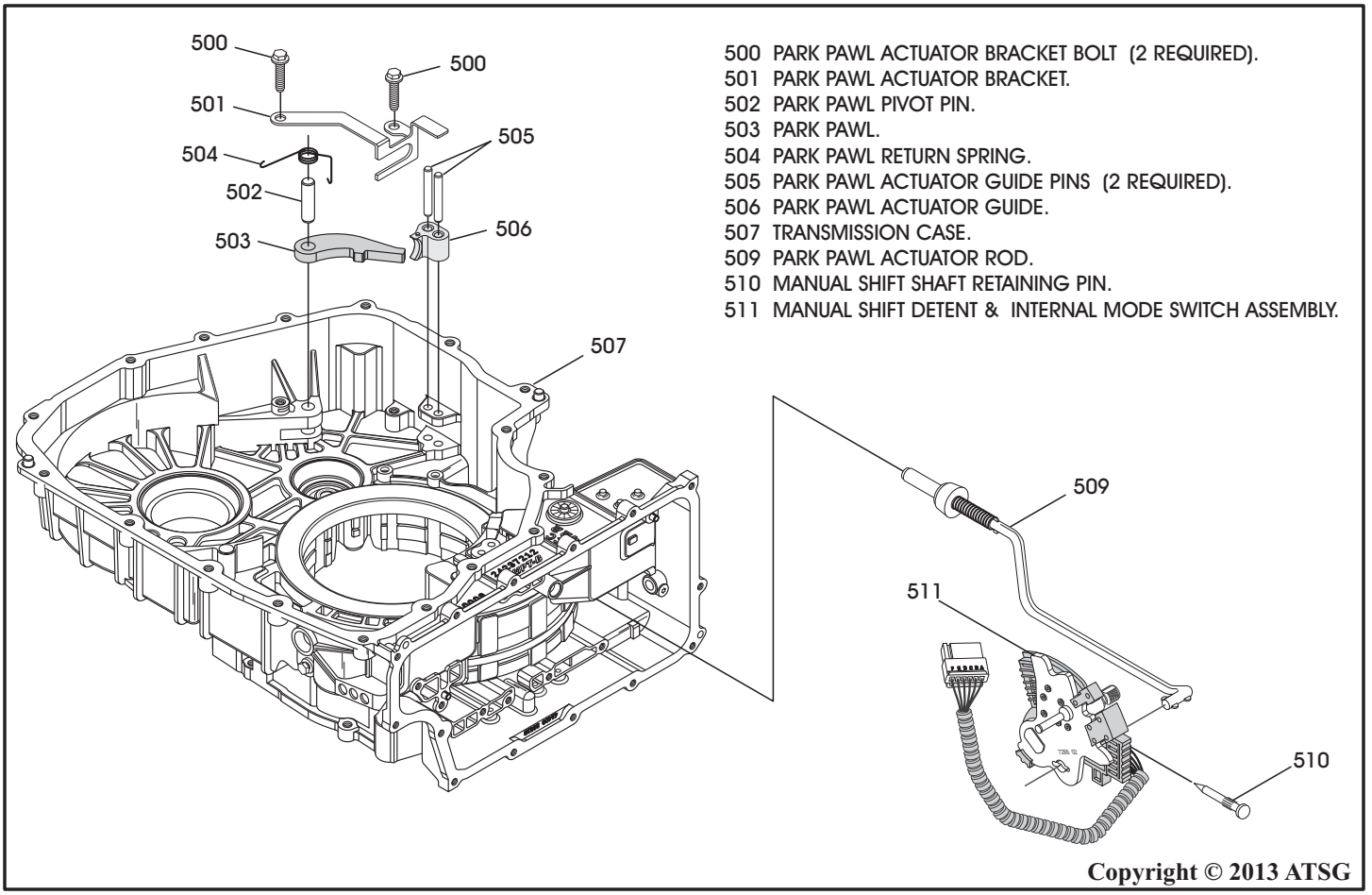


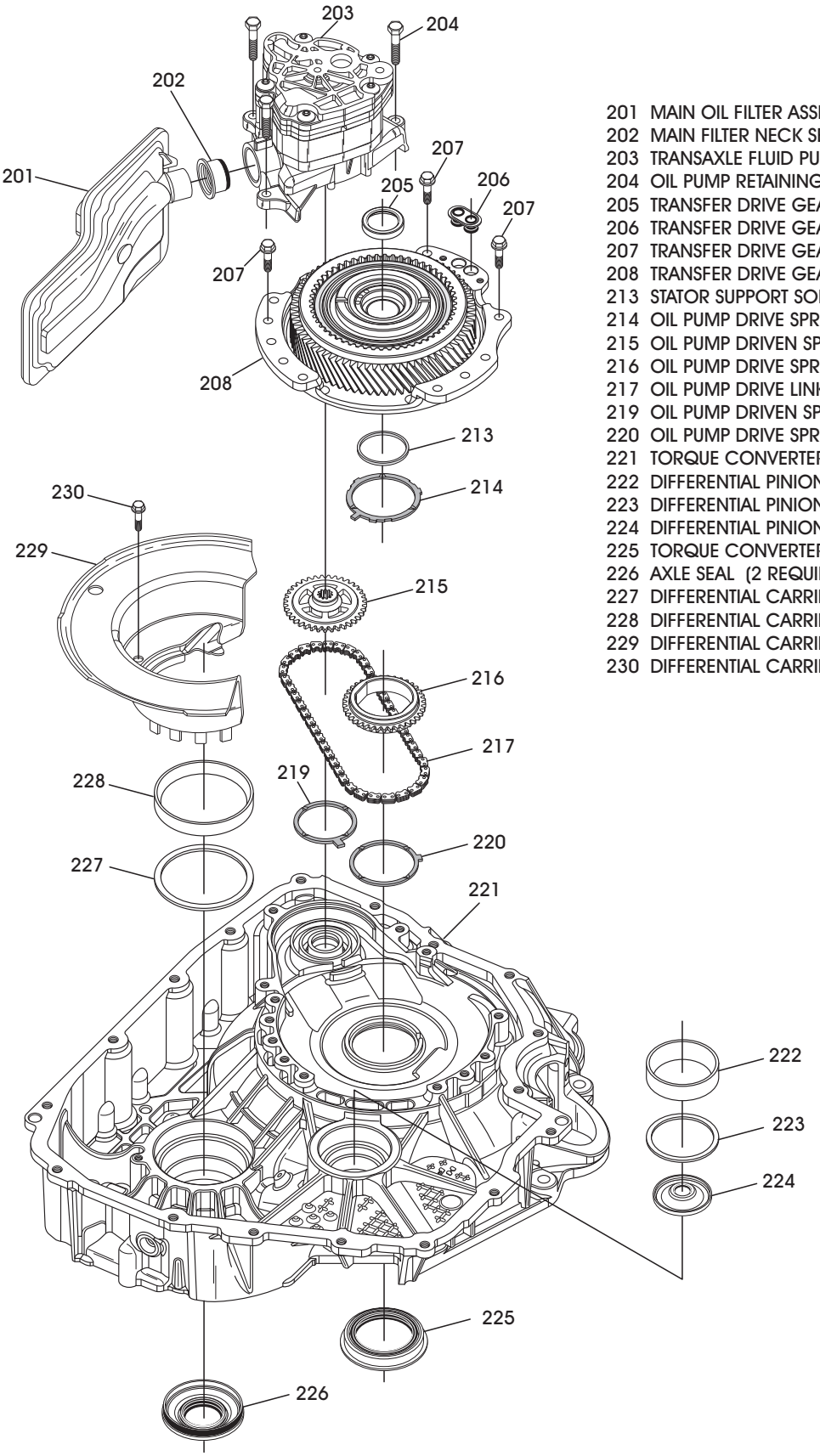
Figure 73



500 PARK PAWL ACTUATOR BRACKET BOLT (2 REQUIRED).
501 PARK PAWL ACTUATOR BRACKET.
502 PARK PAWL PIVOT PIN.
503 PARK PAWL.
504 PARK PAWL RETURN SPRING.
505 PARK PAWL ACTUATOR GUIDE PINS (2 REQUIRED).
506 PARK PAWL ACTUATOR GUIDE.
507 TRANSMISSION CASE.
509 PARK PAWL ACTUATOR ROD.
510 MANUAL SHIFT SHAFT RETAINING PIN.
511 MANUAL SHIFT DETENT & INTERNAL MODE SWITCH ASSEMBLY.

Figure 74

TORQUE CONVERTER AND DIFFERENTIAL HOUSING, EXPLODED VIEW



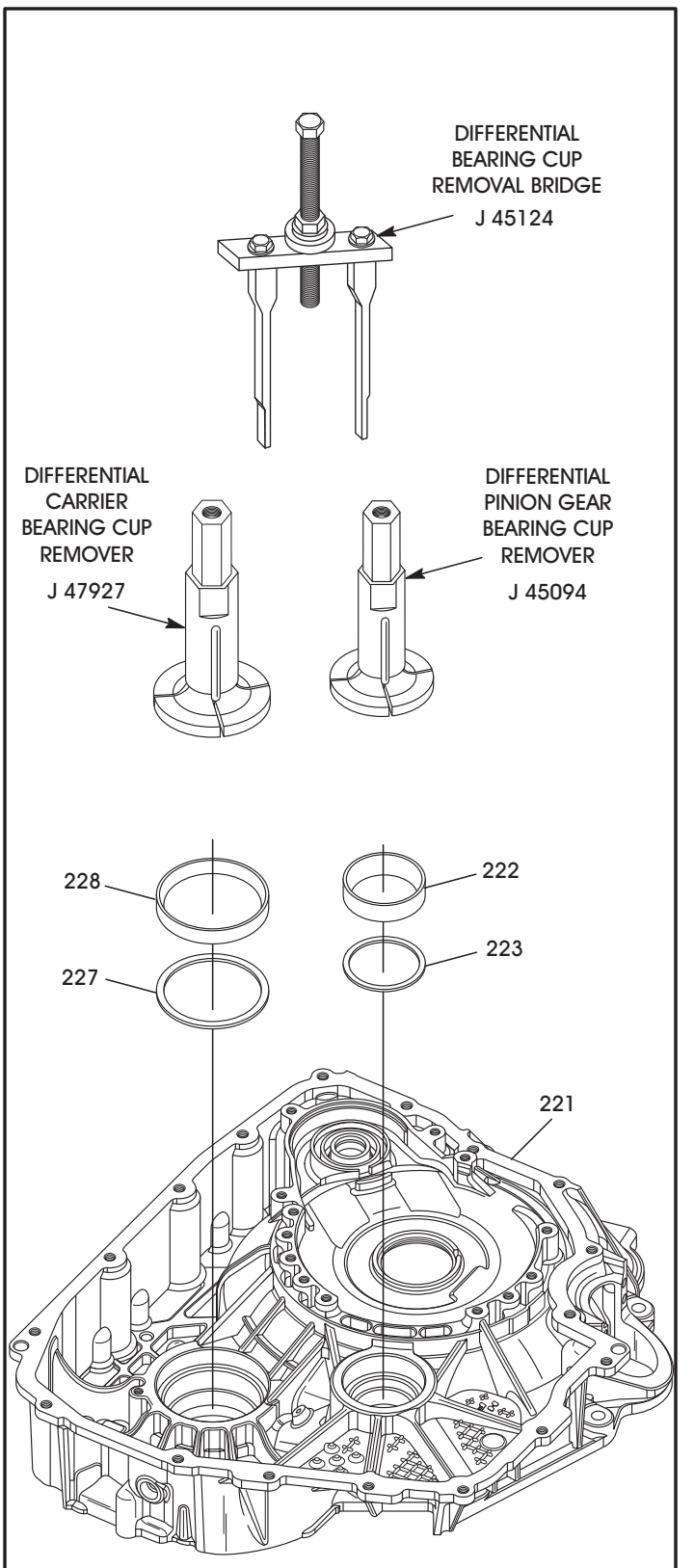
201 MAIN OIL FILTER ASSEMBLY.
202 MAIN FILTER NECK SEAL.
203 TRANSAXLE FLUID PUMP ASSEMBLY.
204 OIL PUMP RETAINING BOLTS, M6 X 25 (3 REQUIRED).
205 TRANSFER DRIVE GEAR SUPPORT ASSEMBLY SEAL.
206 TRANSFER DRIVE GEAR SUPPORT TO MAIN CASE SEAL.
207 TRANSFER DRIVE GEAR SUPPORT BOLTS, M8 X 25 (10 REQ.).
208 TRANSFER DRIVE GEAR SUPPORT ASSEMBLY.
213 STATOR SUPPORT SOLID TEFLON SEAL.
214 OIL PUMP DRIVE SPROCKET TO SUPPORT THRUST WASHER.
215 OIL PUMP DRIVEN SPROCKET.
216 OIL PUMP DRIVE SPROCKET.
217 OIL PUMP DRIVE LINK CHAIN.
219 OIL PUMP DRIVEN SPROCKET TO CASE THRUST WASHER.
220 OIL PUMP DRIVE SPROCKET TO CASE THRUST WASHER.
221 TORQUE CONVERTER AND DIFFERENTIAL HOUSING ASSEMBLY.
222 DIFFERENTIAL PINION GEAR BEARING CUP.
223 DIFFERENTIAL PINION GEAR BEARING *SELECTIVE* SHIM.
224 DIFFERENTIAL PINION GEAR LUBE DAM.
225 TORQUE CONVERTER HUB SEAL.
226 AXLE SEAL (2 REQUIRED).
227 DIFFERENTIAL CARRIER BEARING *SELECTIVE* SHIM.
228 DIFFERENTIAL CARRIER BEARING CUP.
229 DIFFERENTIAL CARRIER OIL BAFFLE.
230 DIFFERENTIAL CARRIER OIL BAFFLE RETAINING BOLT.

Figure 75

TRANSMISSION DISASSEMBLY (CONT'D)

65. Disassemble the torque converter housing using Figure 75 as a guide.
66. Remove the differential oil baffle bolt M6 X 25, as shown in Figure 75.
67. Remove the differential "plastic" oil baffle, as shown in Figure 75.
68. Remove the 10 transfer drive gear support bolts, as shown in Figure 75, and remove the transfer drive gear support.
69. Set the transfer drive gear support aside for the component rebuild section.
70. Remove the 3 oil pump assembly retaining bolts, as shown in Figure 75, and remove the oil pump and main filter as an assembly.
71. Set oil pump assembly aside for the component rebuild section.
72. Remove the oil pump drive link chain and both sprockets as an assembly and separate them after removal.
73. If bearing service is not required, leave the two bearing cups and the 2 selective shims in place.
74. If bearing service is required, remove the bearing cups and the two selective shims from the torque converter housing using the removal tools that are shown in Figure 76.
    Note: Setting the differential pre-load will be covered in the Component Rebuild section under "Differential Pre-load Shim Selection" on Page 63.
75. Set the disassembled torque converter housing aside for the component rebuild section.

Component Rebuild Section
Begins on Page 56



221 TORQUE CONVERTER AND DIFFERENTIAL HOUSING ASSEMBLY.
222 DIFFERENTIAL PINION GEAR BEARING CUP.
223 DIFFERENTIAL PINION GEAR BEARING *SELECTIVE* SHIM.
227 DIFFERENTIAL CARRIER BEARING *SELECTIVE* SHIM.
228 DIFFERENTIAL CARRIER BEARING CUP.

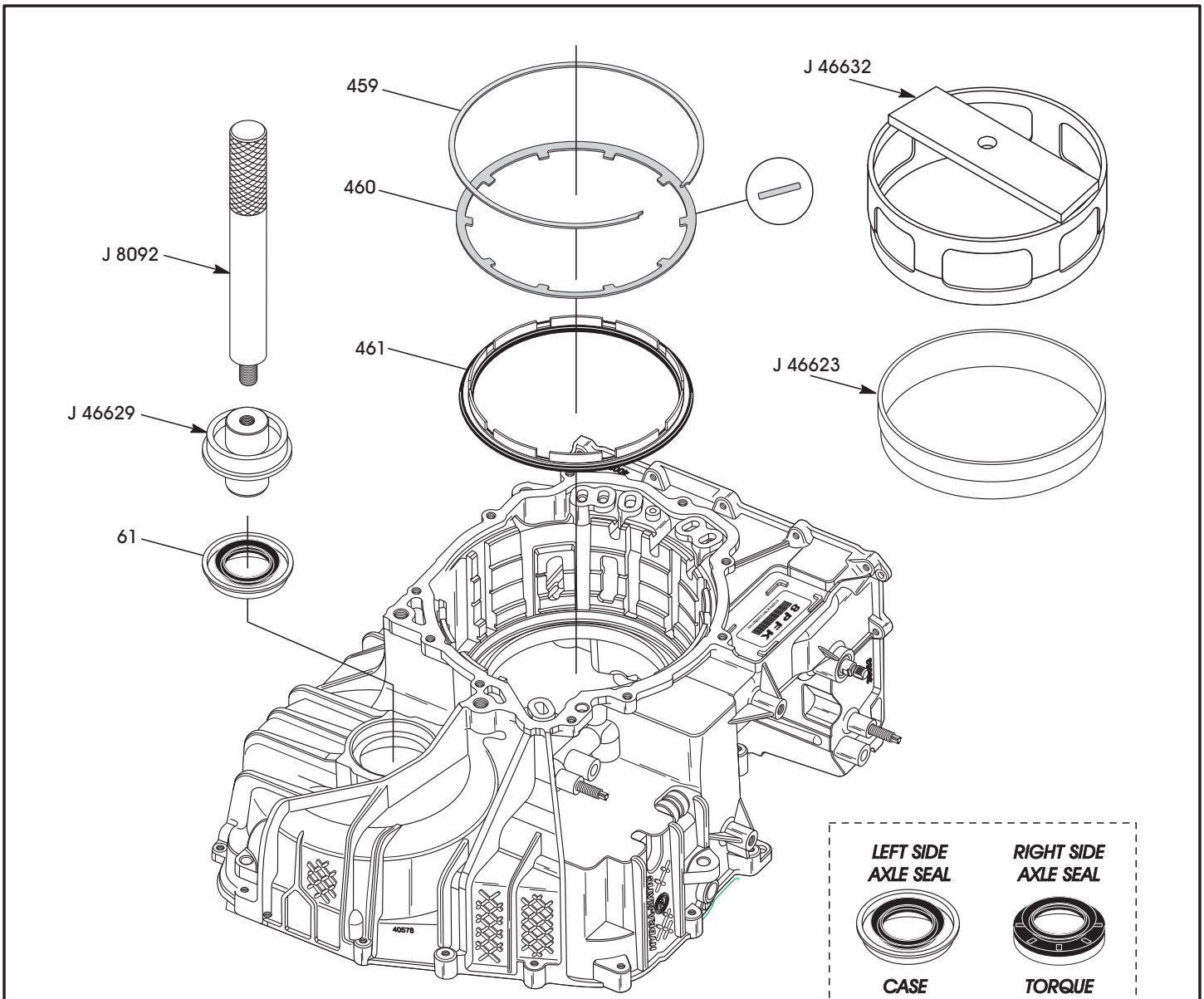
Figure 76

COMPONENT REBUILD

Transmission Case Assembly

1. Clean ***all*** transmission parts thoroughly and dry with compressed air.
2. Inspect ***all*** transmission parts thoroughly for any wear and/or damage and replace as necessary.
3. Install new left hand axle seal using the adapters shown in Figure 77.
   Note: The left and right side axle seals are different design (See Figure 77).
4. Lubricate ***new*** 1-2-3-4 clutch piston and the case bore with a small amount of Trans-Jel®.
5. Install the 1-2-3-4 clutch piston into the case, as shown in Figure 77.
   Note: There's a seal protector available, J 46623, as shown in Figure 77.
6. Install the 1-2-3-4 clutch piston return spring, as shown in Figure 77.
7. Compress the return spring using J 46632 and install the snap ring, as shown in Figure 77, with the snap ring opening positioned so that it is supported by a splined tooth in the case.

Continued on Page 57



61 LEFT SIDE AXLE SEAL.
459 1-2-3-4 CLUTCH PISTON RETURN SPRING SNAP RING.
460 1-2-3-4 CLUTCH PISTON RETURN SPRING.
461 1-2-3-4 CLUTCH PISTON.

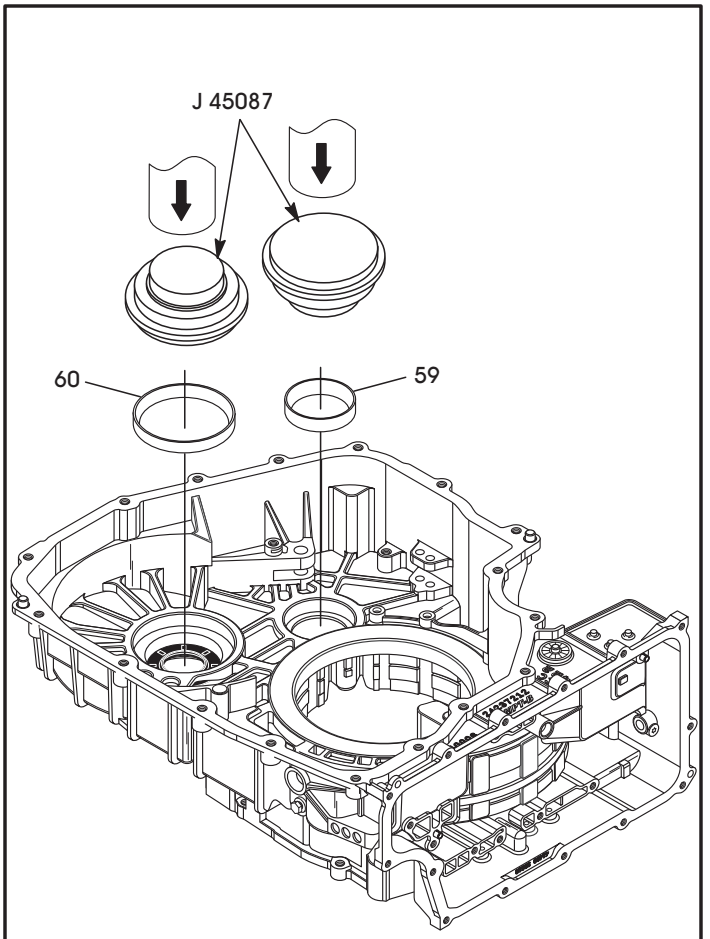
Figure 77

COMPONENT REBUILD

Transmission Case Assembly (Cont'd)

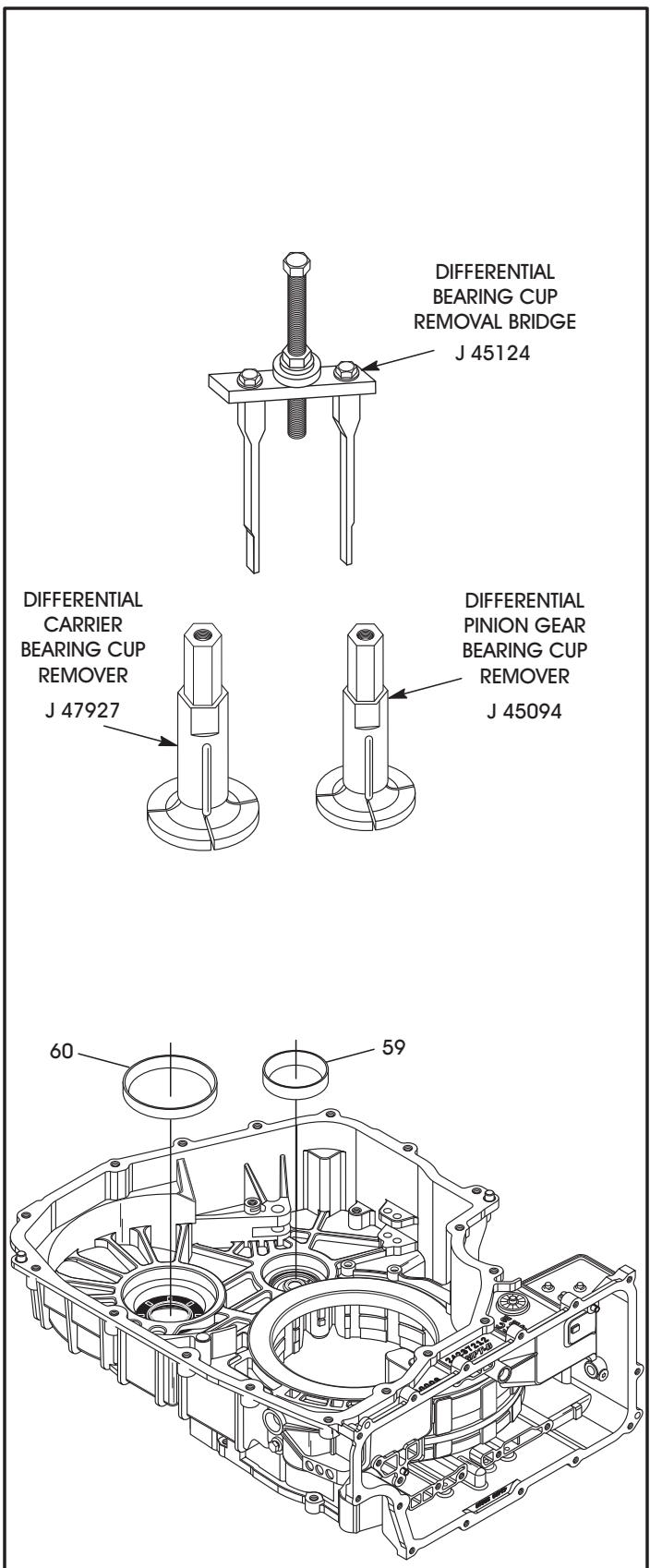
8. If bearing service is not required, leave the two bearing cups in place.
9. If bearing service is required, remove the bearing cups from the case using the removal tools that are shown in Figure 79.
10. There are not any selective shims under bearing cups on the case side.
    Note: Setting the differential pre-load will be covered in the Component Rebuild section under "Differential Pre-load Shim Selection" on Page 63.
11. Install new bearing cups into the case using the adapter shown in Figure 78 and a hydraulic shop press. One side of the J-45087 is used for pinion cup and the other side for differential carrier cup.

Continued on Page 58



59 DIFFERENTIAL PINION GEAR BEARING CUP.
60 DIFFERENTIAL CARRIER BEARING CUP.

Figure 78



59 DIFFERENTIAL PINION GEAR BEARING CUP.
60 DIFFERENTIAL CARRIER BEARING CUP.

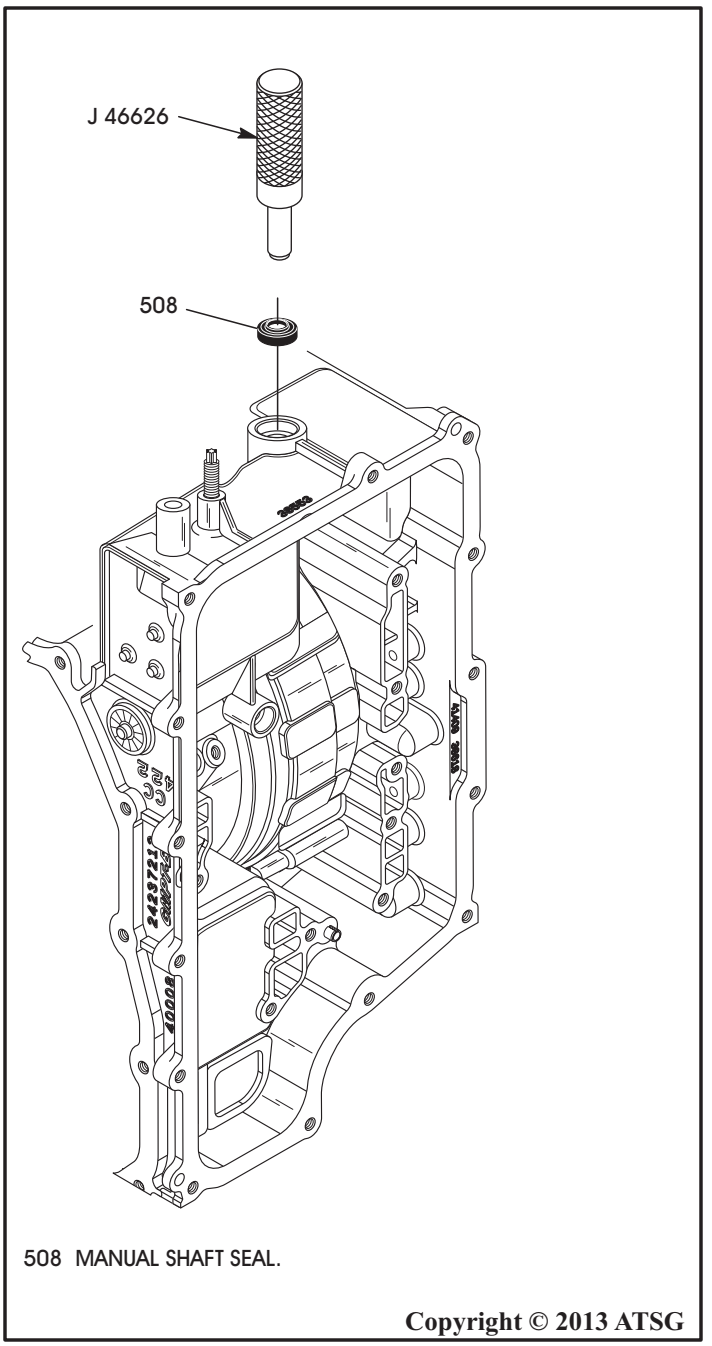
Figure 79

COMPONENT REBUILD

Transmission Case Assembly (Cont'd)

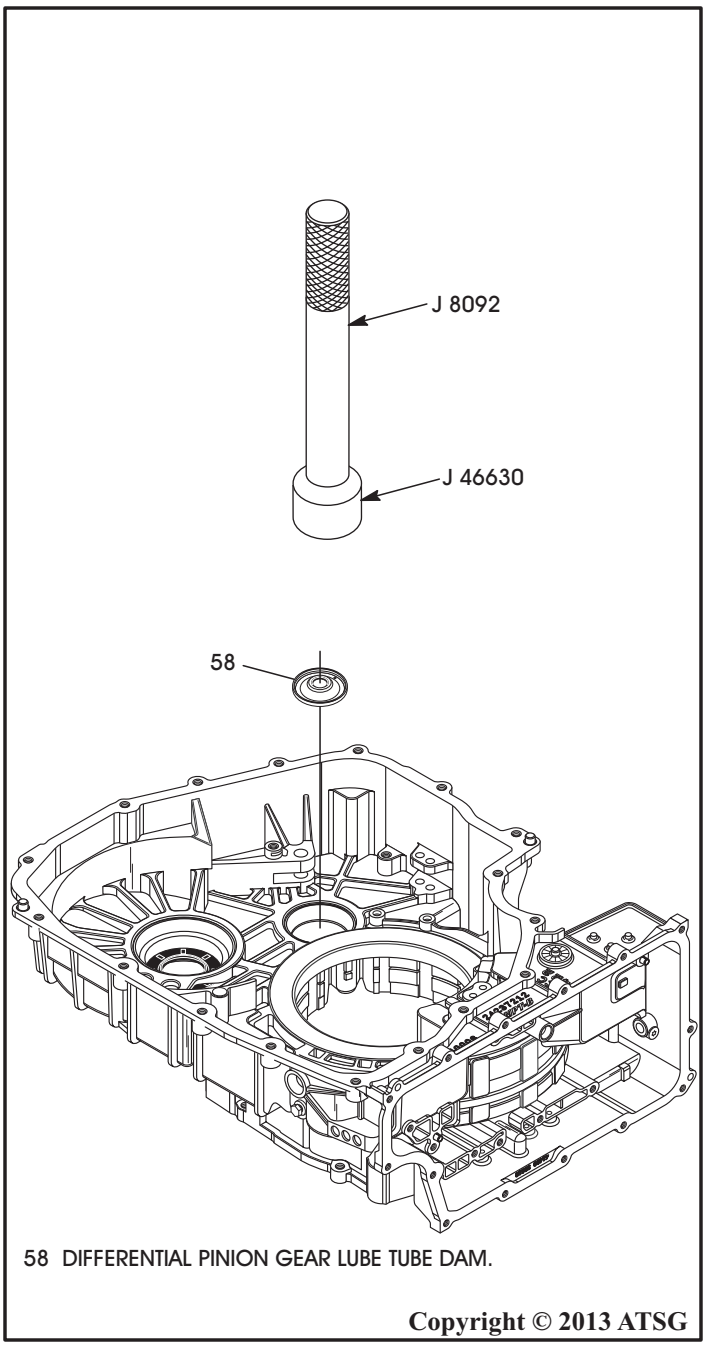
12. Install a new manual shaft seal into the case bore, as shown in Figure 80 using proper driver.
13. Install a new differential pinion gear lube tube dam using the tools shown in Figure 81.

Continued on Page 59



508 MANUAL SHAFT SEAL.

Figure 80



58 DIFFERENTIAL PINION GEAR LUBE TUBE DAM.

Figure 81

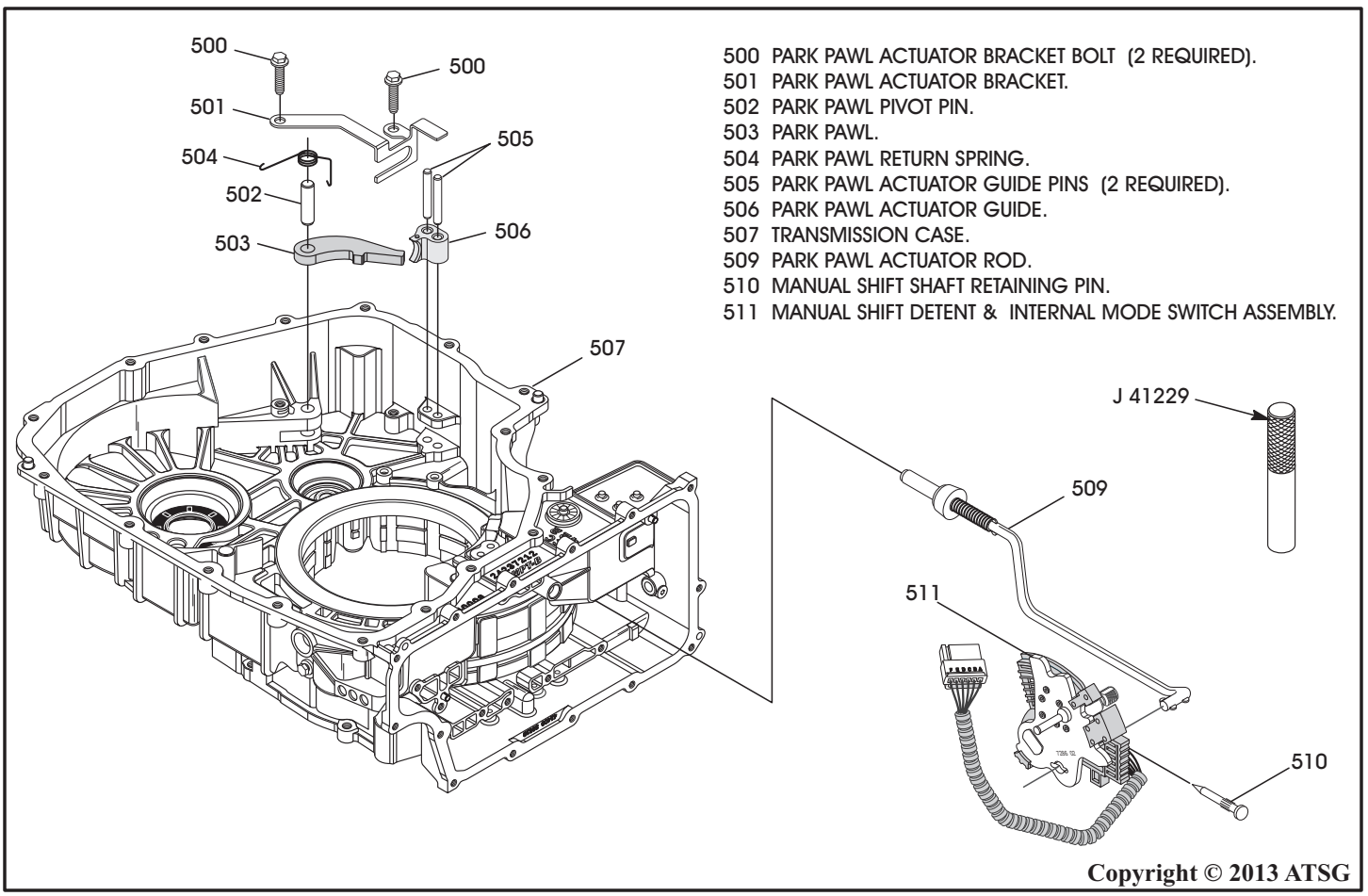


Figure 82

COMPONENT REBUILD

Transmission Case Assembly (Cont'd)

14. Install the park pawl & linkage in the case using Figure 82 as a guide.
    Note: Ensure that return spring is hooked on park pawl properly and engaged into the case groove, as shown in Figure 83.
15. Install the bracket and bolts and torque the two bolts to 12 N·m (106 in.lb.).
16. Install the park rod into the IMS detent lever and install the assembly into the case, as shown in Figure 82, rotating the assembly clockwise so the park rod will fit through the case opening.
    Note: Ensure that park rod is engaged properly with park pawl, as shown in Figure 83.
17. Install the manual shaft retaining pin using tool number J-41229, to ensure it is set to the proper depth. Retaining pin height installed should be 6.5-7.5 mm (.250" to .300").

Component Rebuild
Continued on Page 60

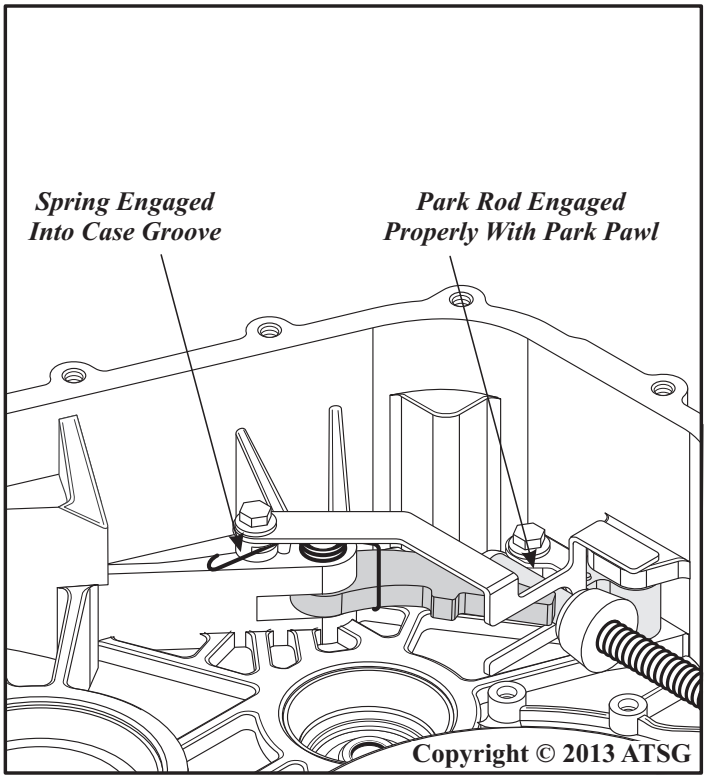


Figure 83

COMPONENT REBUILD

Differential Carrier Assembly

1. Special tools needed for differential and pinion bearing service are shown in Figure 84.
   Note: Bearings on the differential carrier are different between left and right sides.
2. Disassemble the differential carrier assembly using Figure 85 as a guide.
   Note: Keep the conical thrust washer with the gear it is mated to. The conical thrust washers are all selective sizes and it is difficult to identify the proper washer thickness. Recommend marking them when disassembled. If improperly assembled it may cause premature failure of the differential assembly.
3. Inspect the differential assembly, pinion gears and thrust washers for scoring, wear or damage.
   Note: Bearings are the only item serviced. The differential carrier is only serviced as an assembly.

Continued on Page 61

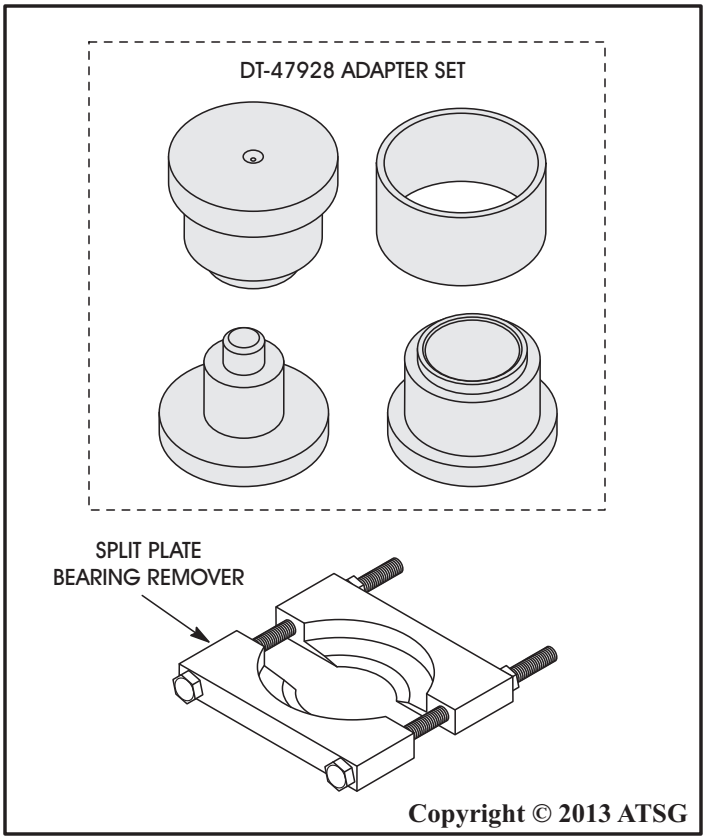
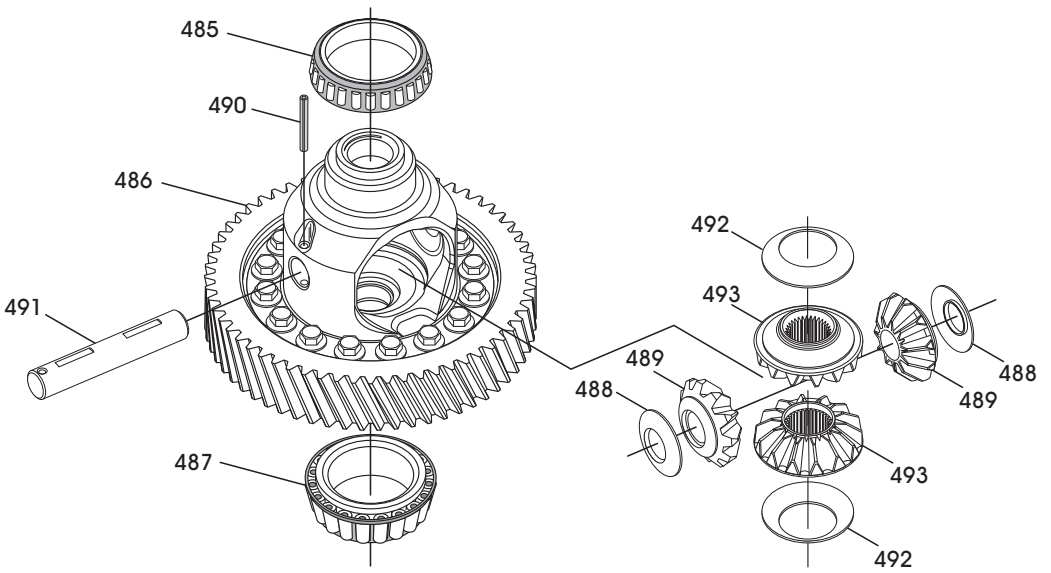


Figure 84

DIFFERENTIAL CARRIER ASSEMBLY, EXPLODED VIEW



485 DIFFERENTIAL CARRIER BEARING (SHORT ROLLERS).
486 DIFFERENTIAL CARRIER ASSEMBLY.
487 DIFFERENTIAL CARRIER BEARING (LONG ROLLERS).
488 DIFFERENTIAL CARRIER PINION GEAR CONICAL THRUST WASHER.
489 DIFFERENTIAL CARRIER PINION GEAR.
490 DIFFERENTIAL CARRIER PINION GEAR SHAFT RETAINER.
491 DIFFERENTIAL CARRIER PINION GEAR SHAFT.
492 DIFFERENTIAL CARRIER SIDE GEAR CONICAL THRUST WASHER.
493 DIFFERENTIAL CARRIER SIDE GEAR.

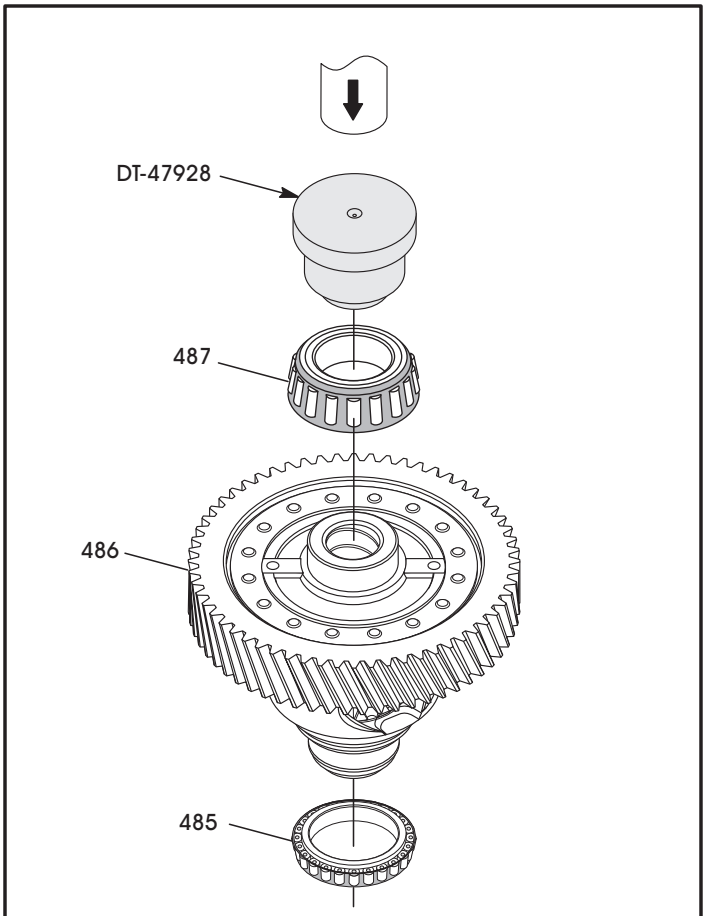
Figure 85

COMPONENT REBUILD

Differential Carrier Assembly (Cont'd)

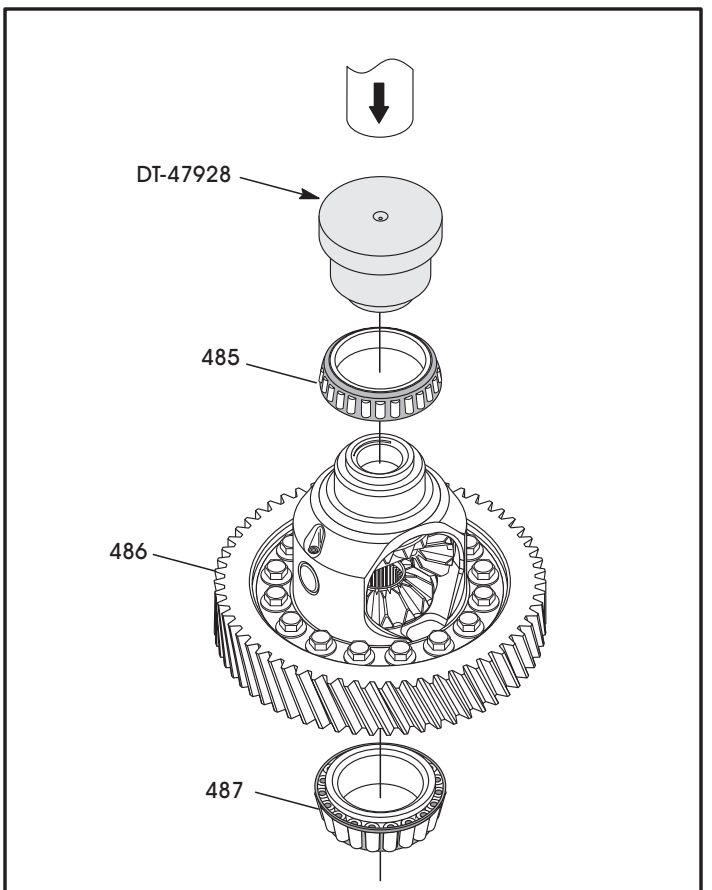
4. Assemble the differential carrier assembly using Figure 85 as a guide.
5. Install the left side differential carrier bearing (Long Rollers) using DT-47928 and hydraulic shop press, as shown in Figure 86.
6. Install the right side differential carrier bearing (Short Rollers) using DT-47928 and hydraulic shop press, as shown in Figure 87.
7. Set the completed differential carrier assembly aside for now (See Figure 88).

Continued on Page 62



485 DIFFERENTIAL CARRIER BEARING (SHORT ROLLERS).
486 DIFFERENTIAL CARRIER ASSEMBLY.
487 DIFFERENTIAL CARRIER BEARING (LONG ROLLERS).

Figure 86



485 DIFFERENTIAL CARRIER BEARING (SHORT ROLLERS).
486 DIFFERENTIAL CARRIER ASSEMBLY.
487 DIFFERENTIAL CARRIER BEARING (LONG ROLLERS).

Figure 87

COMPLETED DIFFERENTIAL CARRIER ASSEMBLY

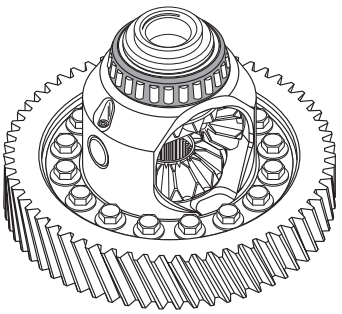


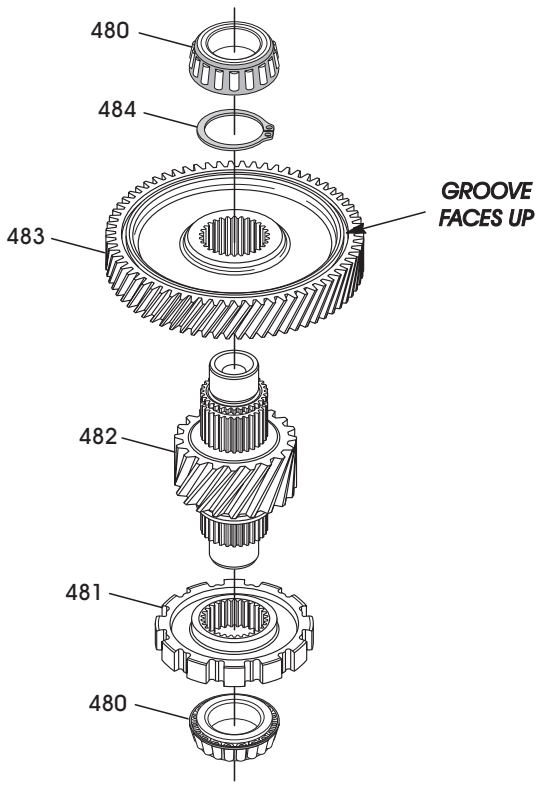
Figure 88

COMPONENT REBUILD

Differential Pinion Gear Assembly

1. Disassemble the differential pinion gear assembly using Figure 89 as a guide.
2. Remove the bearings using the split plate and hydraulic shop press.
3. Inspect all differential pinion gear and transfer driven gear parts thoroughly for any wear and/or damage.
4. Assemble the differential pinion gear assembly using Figure 89 as a guide.
   Note: Notice that transfer driven gear goes on the pinion gear shaft with the groove facing up, as shown in Figure 89.
5. Install both bearings on differential pinion gear assembly using DT-47928 and hydraulic shop press, as shown in Figure 90.
   Note: Notice the support used under the pinion shaft so you are not pressing against bearing.
6. Set the completed differential pinion gear and transfer driven gear assembly aside for now, as shown in Figure 91.

Continued on Page 63



480 DIFFERENTIAL PINION GEAR BEARINGS (2 REQUIRED).
481 PARKING GEAR.
482 DIFFERENTIAL PINION GEAR AND SHAFT ASSEMBLY.
483 TRANSFER DRIVEN GEAR.
484 TRANSFER DRIVEN GEAR SNAP RING.

Figure 89

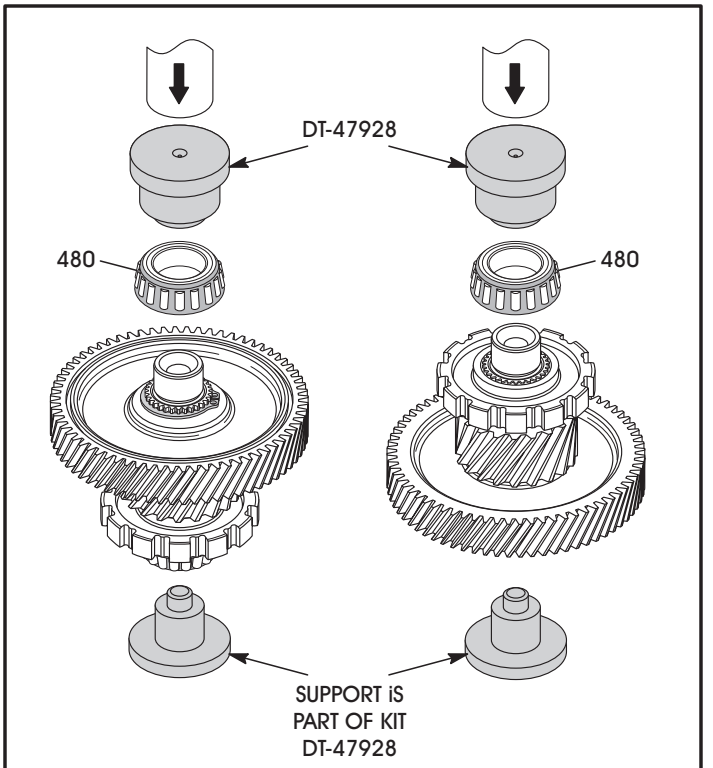


Figure 90

COMPLETED DIFFERENTIAL PINION GEAR AND TRANSFER DRIVEN GEAR ASSEMBLY

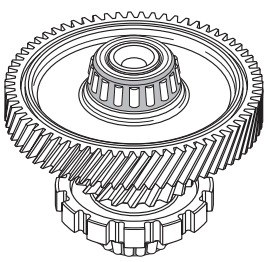


Figure 91

COMPONENT REBUILD

Differential Pre-load Shim Selection

1. There is a differential shim selection gauge kit available from your local dealer under part number DT-47800 and is ***mandatory*** if bearing service is required. Contents of the gauge kit are illustrated in Figure 92.
2. Install the pre-assembled differential carrier and pre-assembled differential pinion gear assembly into the case, as shown in Figure 93.
   Note: Install the differential carrier assembly and the differential pinion gear as an assembly to avoid interference with the gears during installation.
3. Install the new bearing cup onto the differential pinion gear and place DT-47800-1 onto the bearing cup, as shown in Figure 93.
4. Install the new bearing cup onto the differential carrier assembly and place DT-47800-2 onto the bearing cup, as shown in Figure 93.
5. Install the two guide pins from the DT-47800 kit into a case threaded hole at approximately 180 degrees apart, as shown in Figure 93.
6. Install the converter housing to case gasket over the guide pins and onto the case surface, as shown in Figure 93.
7. Install two of the spacers included in DT-47-800 kit over the guide pins and onto the case gasket, as shown in Figure 93.

Continued on Page 64

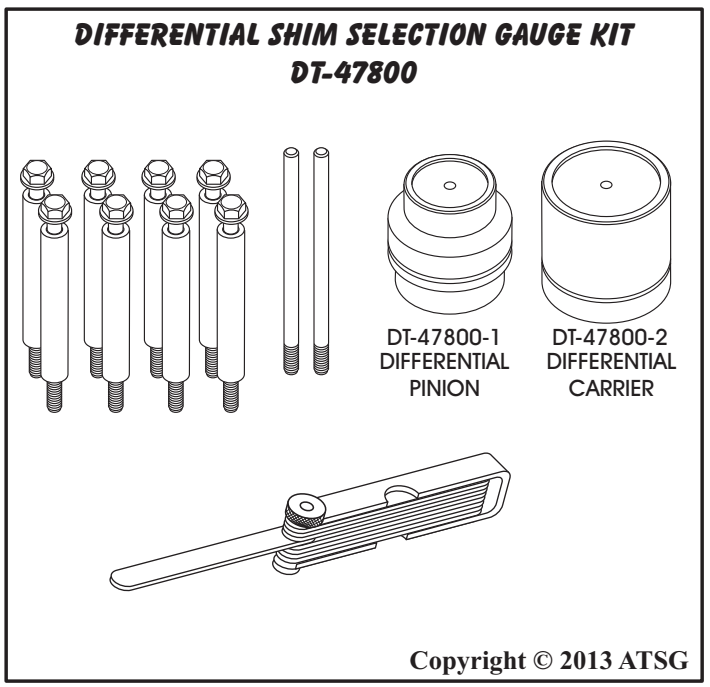


Figure 92

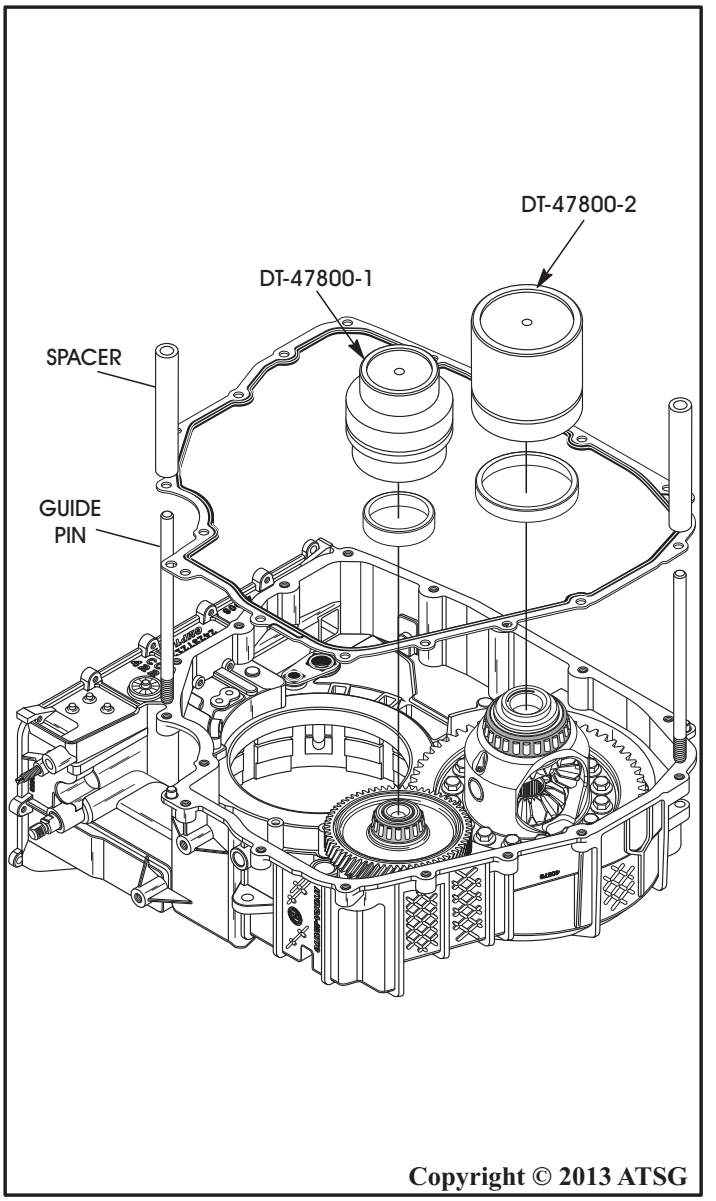


Figure 93

COMPONENT REBUILD

Differential Pre-load Shim Selection (Cont'd)

8. Install the empty converter housing down onto the spacers and onto the installed gauges, as shown in Figure 94.
   Note: Some alignment of the gauges may be required while lowering the converter housing onto the case.
9. Install the remaining spacers with bolts evenly at every other bolt hole, as shown in Figure 95.
10. Remove the two guide pins and replace them with spacer bolts.
11. Torque the eight bolts in sequence, as shown in Figure 95, to 30 N•m (22 ft. lb.).

Continued on Page 65

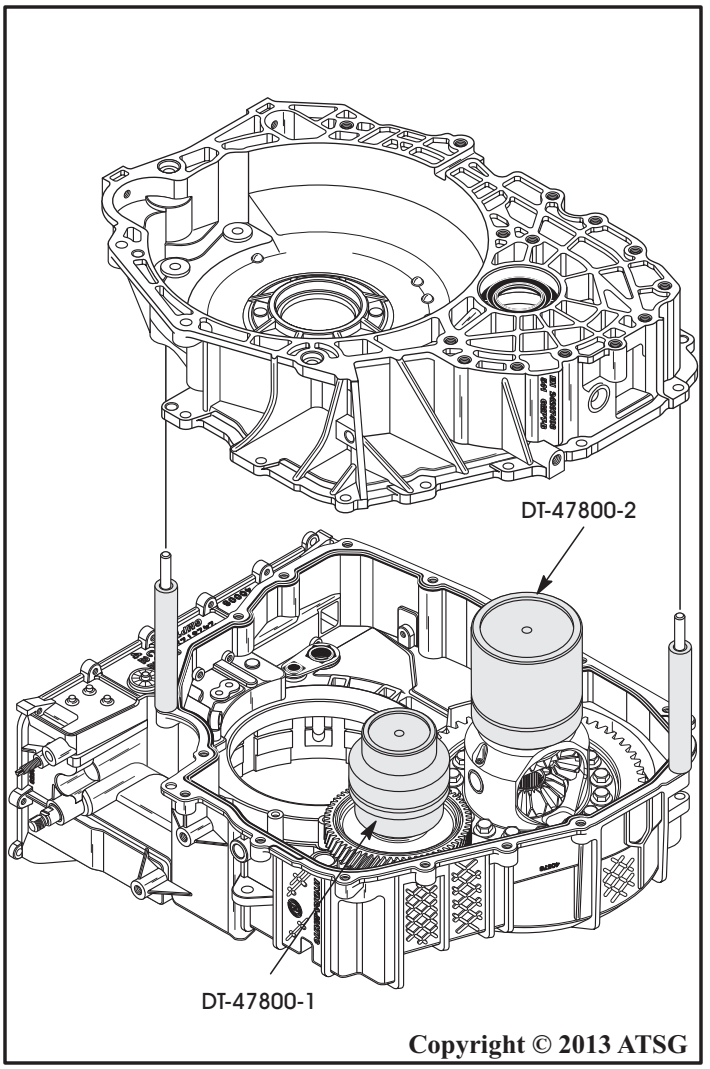


Figure 94

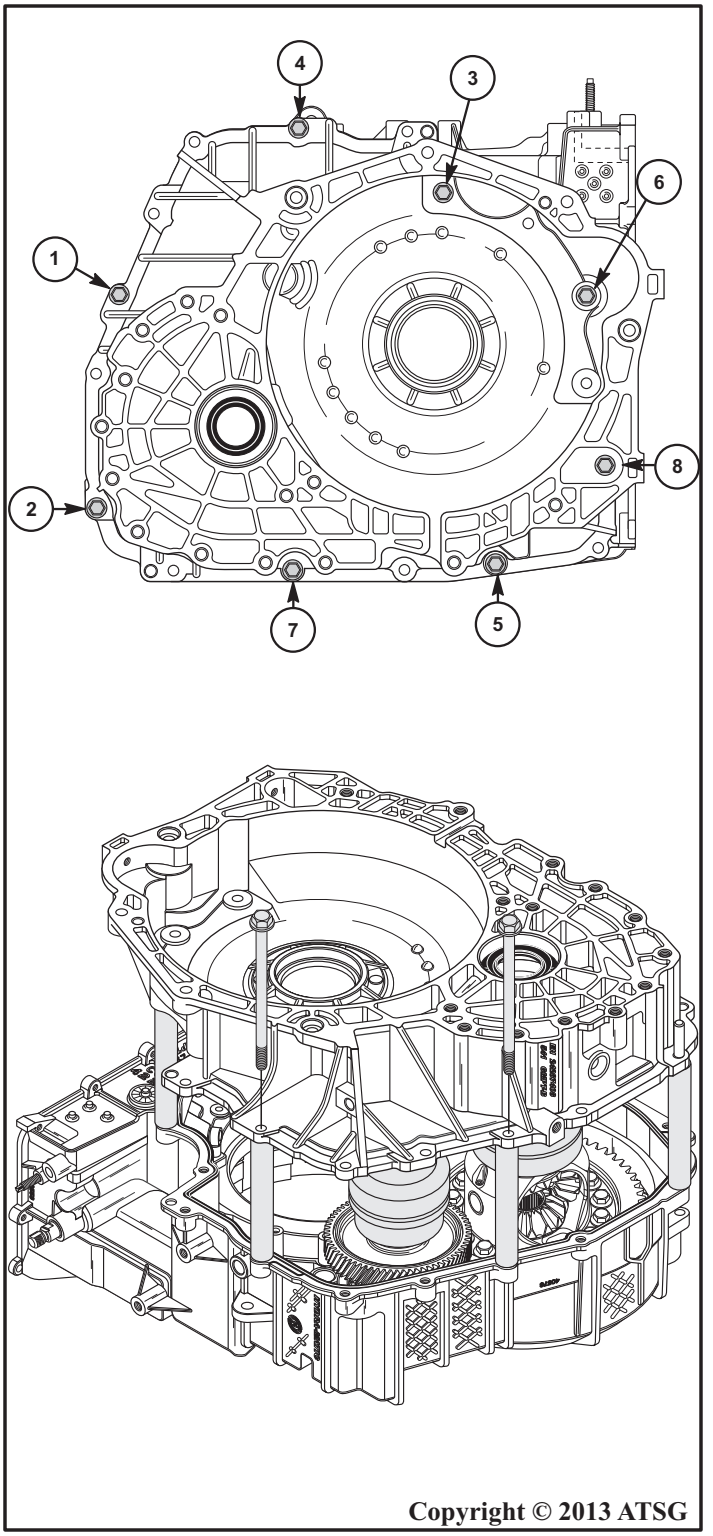


Figure 95

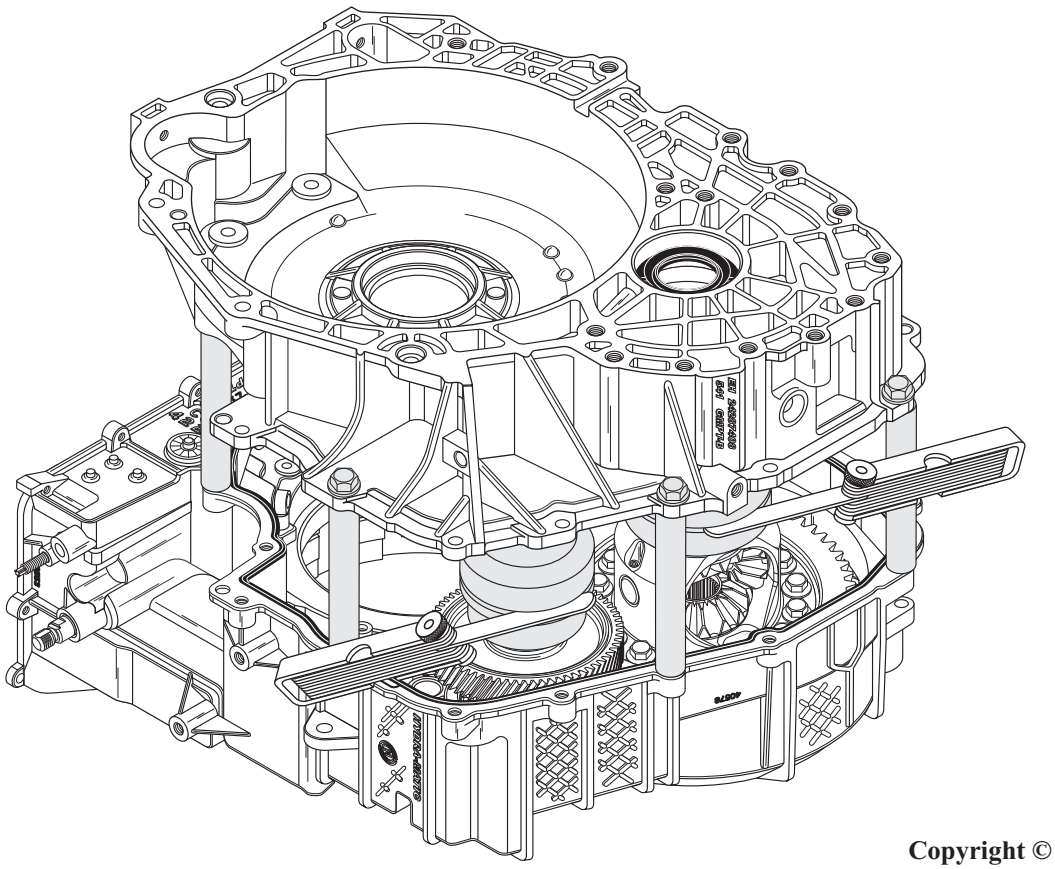


Figure 96

COMPONENT REBUILD

Differential Pre-load Shim Selection (Cont'd)

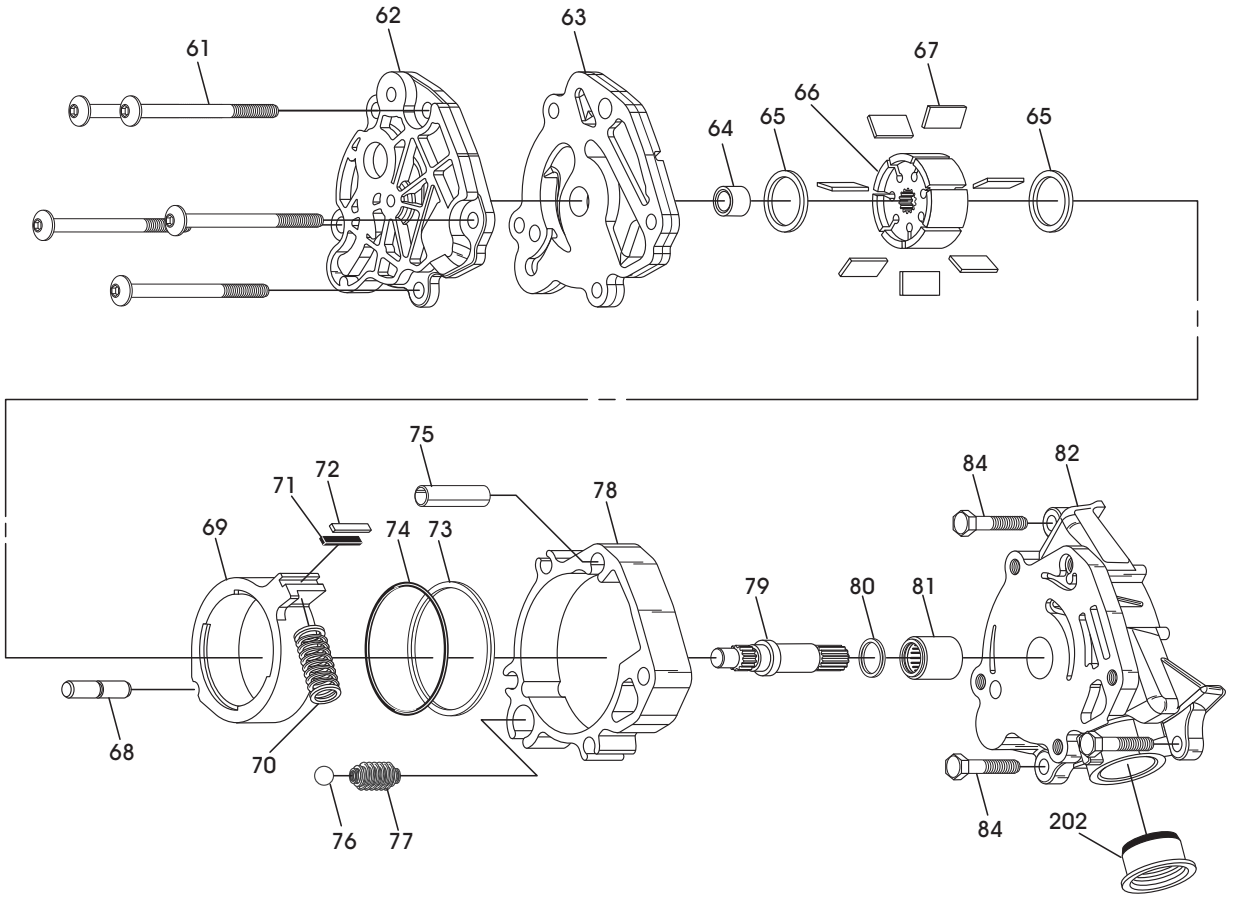
12. Rotate the differential assembly 10 revolutions to allow the bearings to seat into the cups.
    Note: If the bearings are not seated properly into the bearing cups, the washer selection will be inaccurate.
13. The differential rotating tool DT-47793 can be used to rotate the differential from the case side.
14. Using the feeler gauge supplied, continue trying different sizes in the gap of DT-47800-1 and in the gap of DT-47800-2, as shown in Figure 96, until the gauge will no longer fit into the gap.
15. The correct shim size is equal to the largest size blade that fits into the gap. Choose the correct shim using the chart in Figure 97.
    Note: The gap may not be even. Hold the top of the gauge and rotate the bottom to even the gap. Take two gap measurements 180 degrees apart. Average the two and select the shim that is closest to the average. Record the shim dimensions from both gauges as you will need them later.
16. Remove the converter housing, DT-47800 gauge kit and case gasket.

Component Rebuild
Continued on Page 66

Differential Pinion Gear and Differential Carrier Selective Washer Thickness Chart	
Outside Diameter Color Code	***Shim Thickness mm (in)***
Brown	***0.494mm (.020")***
Purple	***0.545mm (.022")***
Black	***0.596mm (.024")***
Pink	***0.647mm (.026")***
Dark Blue	***0.698mm (.028")***
Light Green	***0.749mm (.030")***
Plain (None)	***0.800mm (.032")***
White	***0.851mm (.034")***
Light Blue	***0.902mm (.036")***
Orange	***0.953mm (.038")***
White/Black	***1.004mm (.040")***
White/Orange	***1.055mm (.042")***
White/Light Green	***1.106mm (.044")***

Figure 97

OIL PUMP EXPLODED VIEW



61 OIL PUMP ASSEMBLY RETAINING BOLTS (5 REQUIRED).
62 OIL PUMP CHANNEL PLATE.
63 OIL PUMP BASE PLATE.
64 OIL PUMP DRIVE SHAFT BUSHING.
65 OIL PUMP VANE RINGS (2 REQUIRED).
66 OIL PUMP ROTOR.
67 OIL PUMP VANES (7 REQUIRED).
68 OIL PUMP SLIDE PIVOT PIN.
69 OIL PUMP SLIDE.
70 OIL PUMP SLIDE SPRING.
71 OIL PUMP SLIDE SEAL SUPPORT.
72 OIL PUMP SLIDE SEAL.
73 OIL PUMP SLIDE RING.
74 OIL PUMP SLIDE RING "O" RING SEAL.
75 OIL PUMP BODY HOLLOW LOCATING DOWEL.
76 LINE PRESSURE BLOW-OFF BALL.
77 LINE PRESSURE BLOW-OFF SPRING.
78 OIL PUMP BODY.
79 OIL PUMP DRIVE SHAFT.
80 OIL PUMP DRIVE SHAFT THRUST WASHER.
81 OIL PUMP DRIVE SHAFT CAGED NEEDLE BEARING.
82 OIL PUMP COVER.
84 OIL PUMP ASM. RETAINING BOLTS,(25MM (.984") (3 REQ).
202 MAIN OIL FILTER NECK SEAL.

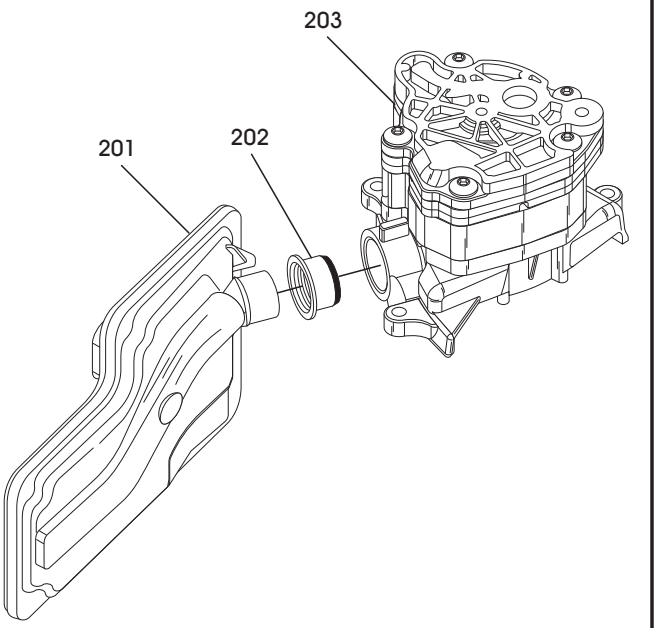
Figure 98

COMPONENT REBUILD

Oil Pump Assembly

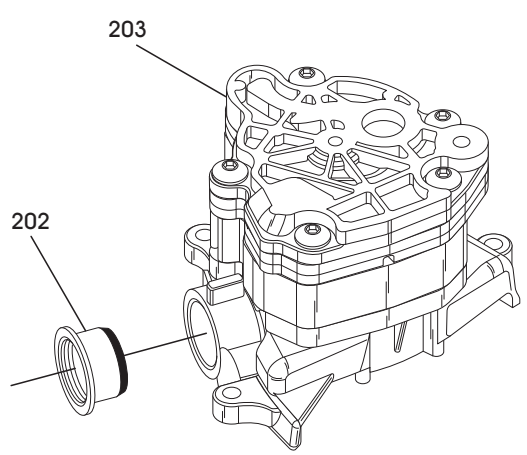
1. Remove and discard the main oil filter assembly as shown in Figure 99.
2. Remove and discard the main oil filter neck seal as shown in Figure 99.
3. Disassemble oil pump assembly using Figure 98 as a guide.
   Note: Nothing inside the oil pump is serviced except the slide seal, slide support and the "O" ring for slide, but must be disassembled for these three items.
4. Install new oil pump slide seal (72) and the slide seal support (71), as shown in Figure 98, and install new "O" ring seal (74).
5. Assemble the oil pump ***exactly*** as shown in Figure 98.
6. Torque oil pump cover bolts using a side to side pattern to 12 N•m (106 in. lb.).
7. Squirt some oil into the filter neck seal bore and ensure that oil pimp drive shaft turns freely.
8. Install a new main oil filter neck seal, as shown in Figure 100, using the proper driver.
9. Set the completed oil pump assembly aside for the converter housing assembly process.

Component Rebuild
Continued on Page 68



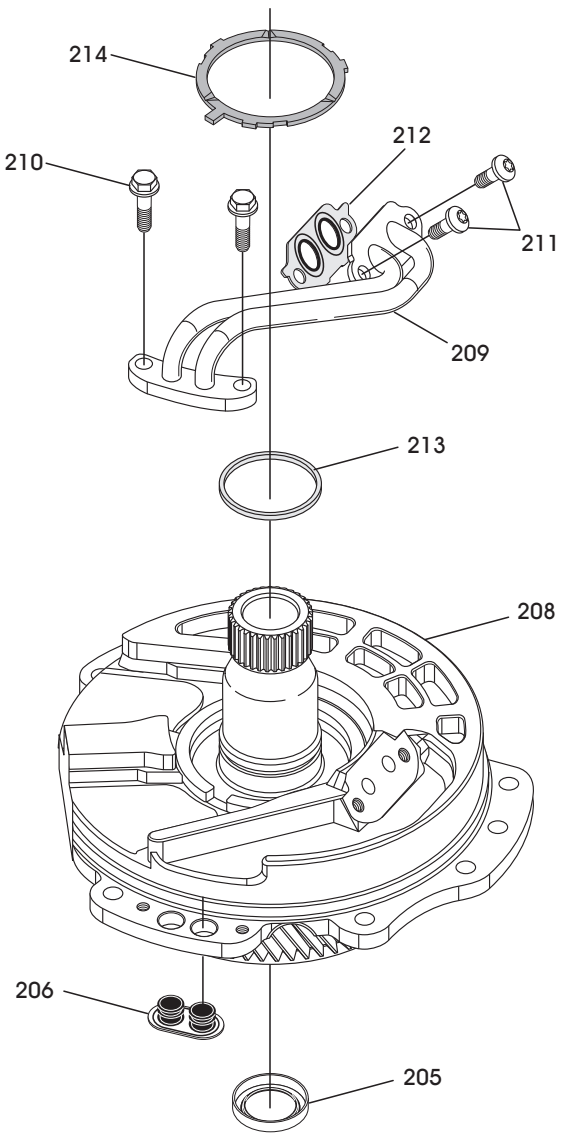
201 MAIN OIL FILTER ASSEMBLY.
202 MAIN OIL FILTER NECK SEAL.
203 COMPLETE OIL PUMP ASSEMBLY.

Figure 99



202 MAIN OIL FILTER NECK SEAL.
203 COMPLETE OIL PUMP ASSEMBLY.

Figure 100



205 TRANSFER DRIVE GEAR SUPPORT SEAL.
206 TRANSFER DRIVE GEAR SUPPORT TO CASE FLUID SEAL.
208 TRANSFER DRIVE GEAR SUPPORT ASSEMBLY.
209 TRANSFER DRIVE GEAR SUPPORT TUBE ASSEMBLY.
210 TUBE ASSEMBLY HEX BOLTS (2 REQUIRED).
211 TUBE ASSEMBLY TORX BOLTS (2 REQUIRED).
212 TUBE ASSEMBLY TO SUPPORT GASKET.
213 TRANSFER DRIVE GEAR SUPPORT SOLID TEFLON SEAL.
214 TRANSFER DRIVE GEAR SUPPORT THRUST WASHER.

Figure 101

COMPONENT REBUILD

Transfer Drive Gear Sprocket Support

1. Disassemble transfer drive gear support using Figure 101 as a guide.
   Note: Do Not attempt to remove the transfer gear bearing retaining nut as it is locked in place with two hardened pins that are pressed into place in the threads (See Figure 102). Removing the retaining nut will damage the support. The transfer drive gear and bearing are not serviceable.
2. Remove the tube assembly, remove and discard the tube gasket, as shown in Figure 101.
3. Remove and discard the solid Teflon seal that is on the stator support, as shown in Figure 101.
4. Remove and discard the transfer drive gear support metal clad seal, as shown in Figure 101.
5. Inspect the transfer drive gear support bearing. It should roll smoothly and quietly.
   Note: If transfer drive gear or bearing need replacement, it will require complete assembly.

Continued on Page 69

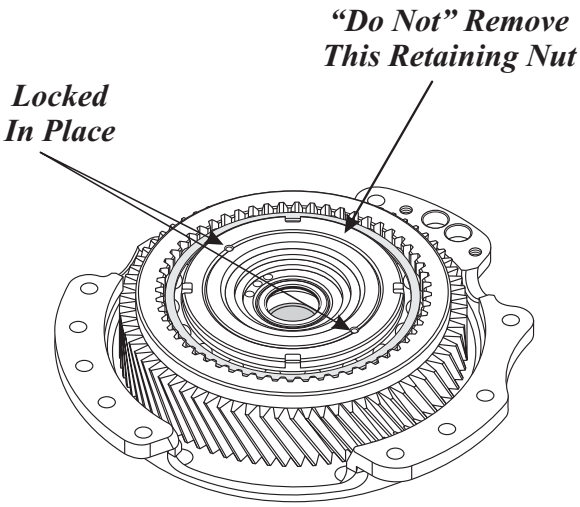


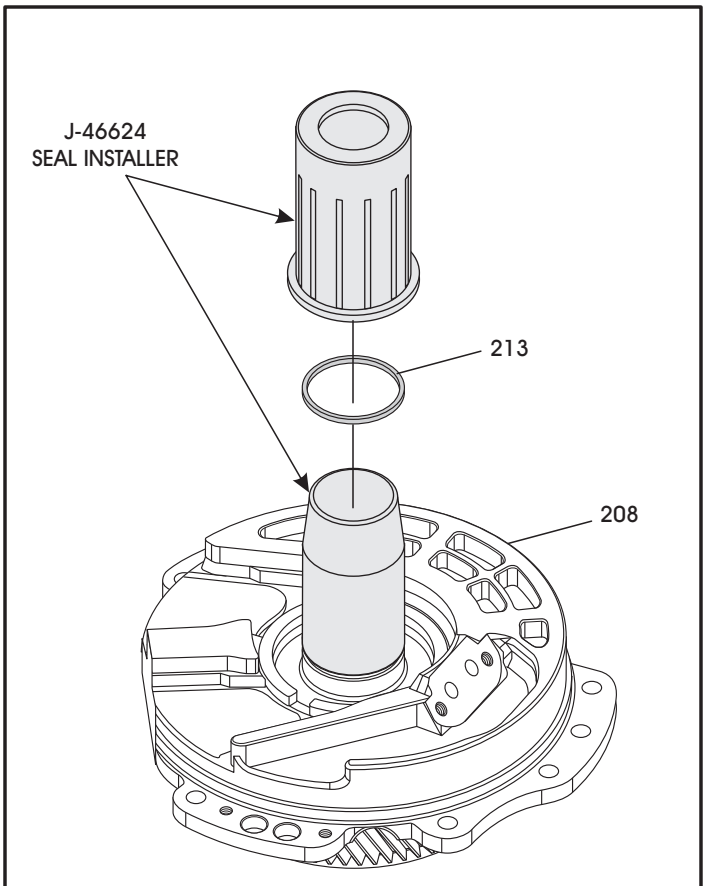
Figure 102

COMPONENT REBUILD

Transfer Drive Gear Sprocket Support (Cont'd)

6. Install a new transfer drive gear support solid Teflon seal, as shown in Figure 103.
   Note: This seal is identified by its Black color with White speckles.
7. Install the J-46624-1 resizing tool with the small chamfer end facing up, as shown in Figure 104, and leave in place for at least 60 seconds.
8. Turn the J-46624-1 resizing tool over with the large chamfer end facing up for 60 seconds to ensure that the seal has been properly sized.
9. Install a new tube assembly gasket onto the support, as shown in Figure 105.

Continued on Page 70



208 TRANSFER DRIVE GEAR SUPPORT ASSEMBLY.
213 TRANSFER DRIVE GEAR SUPPORT SOLID TEFLON SEAL.

Figure 103

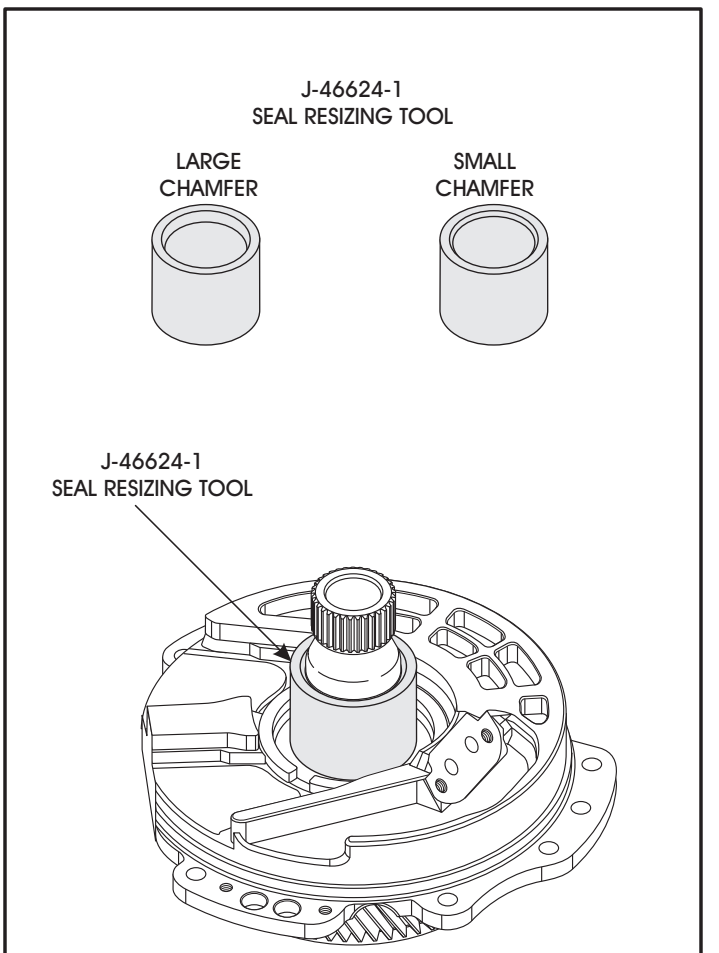
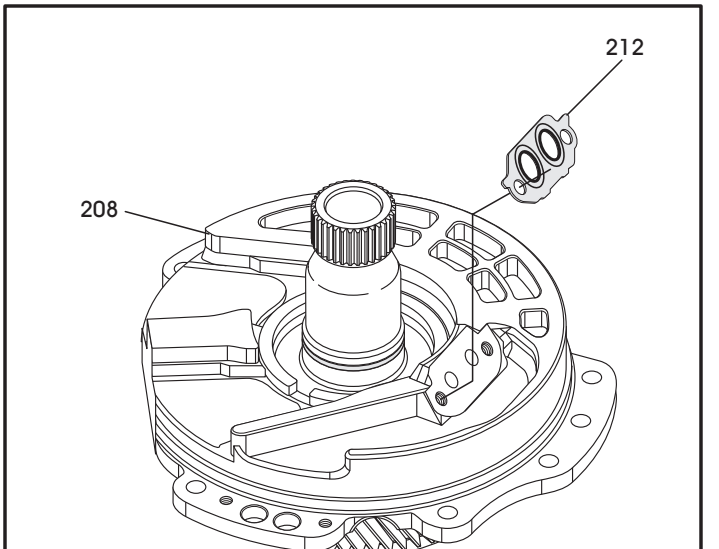


Figure 104



208 TRANSFER DRIVE GEAR SUPPORT ASSEMBLY.
212 TUBE ASSEMBLY TO SUPPORT GASKET.

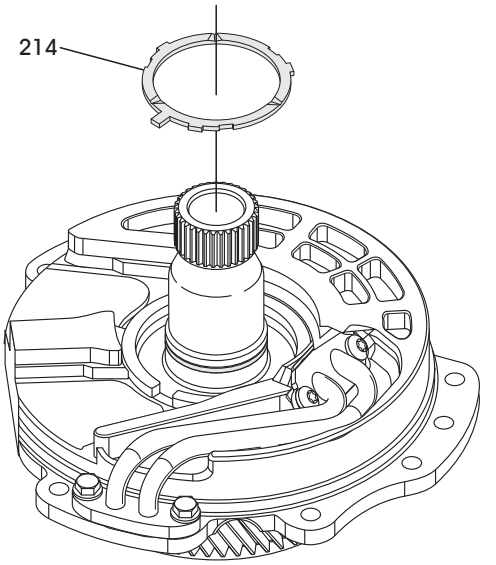
Figure 105

COMPONENT REBUILD

Transfer Drive Gear Sprocket Support (Cont'd)

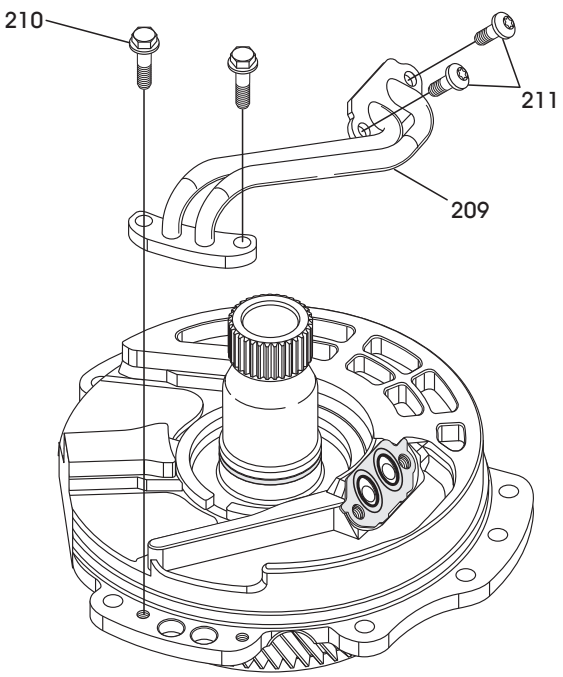
10. Install transfer drive gear support tube assembly, as shown in Figure 106.
11. Install the two Torx bolts ensuring that gasket is still in place, as shown in Figure 106, hand tight.
12. Install the two Hex head bolts hand tight, as shown in Figure 106.
13. Tighten Torx bolts to 12 N•m (106 in. lb.).
14. Tighten Hex bolts to 7 N•m (62 in. lb.).
15. Install the number 2 thrust washer onto transfer drive gear support, as shown in Figure 107, and retain with small amount of Trans-Jel®.
16. Turn transfer drive gear support over and set on blocks, as shown in Figure 108.
17. Install transfer drive gear support seal, as shown in Figure 108, using driver J-46627.

Continued on Page 71



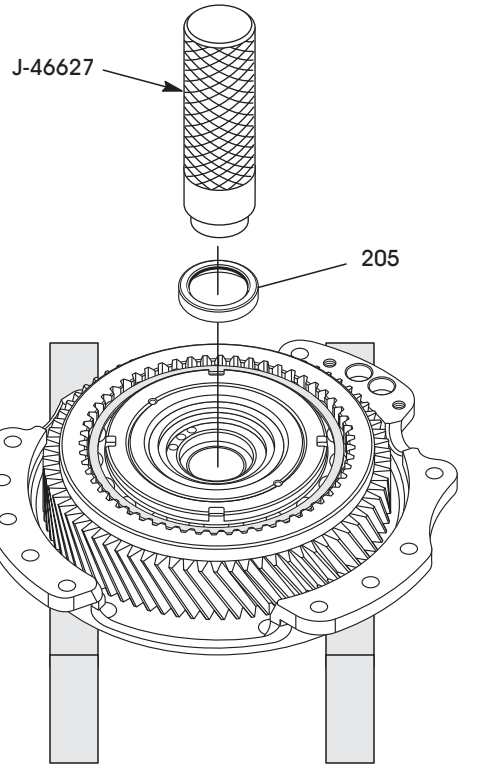
214 TRANSFER DRIVE GEAR SUPPORT THRUST WASHER (NO. 2).

Figure 107



209 TRANSFER DRIVE GEAR SUPPORT TUBE ASSEMBLY.
210 TUBE ASSEMBLY HEX BOLTS (2 REQUIRED).
211 TUBE ASSEMBLY TORX BOLTS (2 REQUIRED).

Figure 106



205 TRANSFER DRIVE GEAR SUPPORT SEAL.

Figure 108

COMPONENT REBUILD

Transfer Drive Gear Sprocket Support (Cont'd)

18. There is a staking tool available DT-49131 to properly stake the seal, as shown in Figure 109.
19. Install a new transfer drive gear support to case seal, as shown in Figure 110.
20. Set the completed transfer drive gear support aside for converter housing assembly, as shown in Figure 111.

Component Rebuild
Continued on Page 72

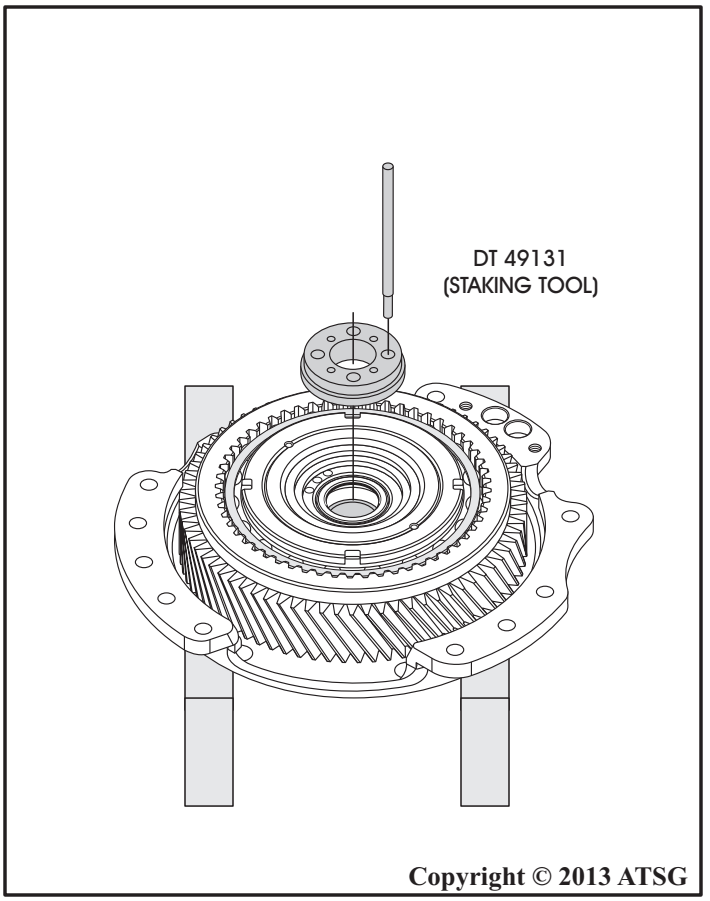
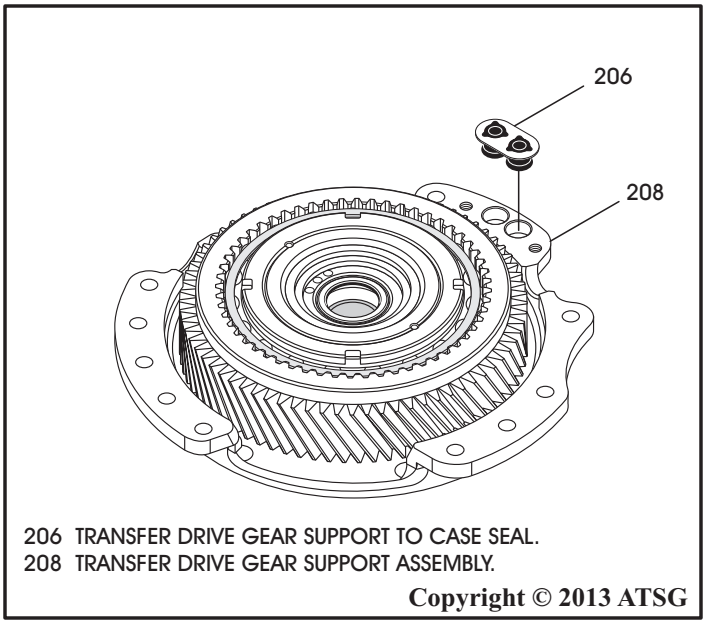


Figure 109



206 TRANSFER DRIVE GEAR SUPPORT TO CASE SEAL.
208 TRANSFER DRIVE GEAR SUPPORT ASSEMBLY.

Figure 110

COMPLETED TRANSFER DRIVE GEAR SUPPORT ASSEMBLY

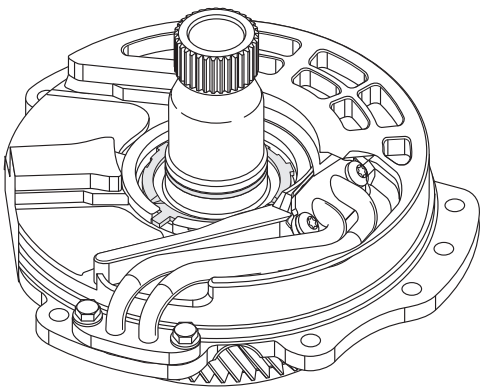
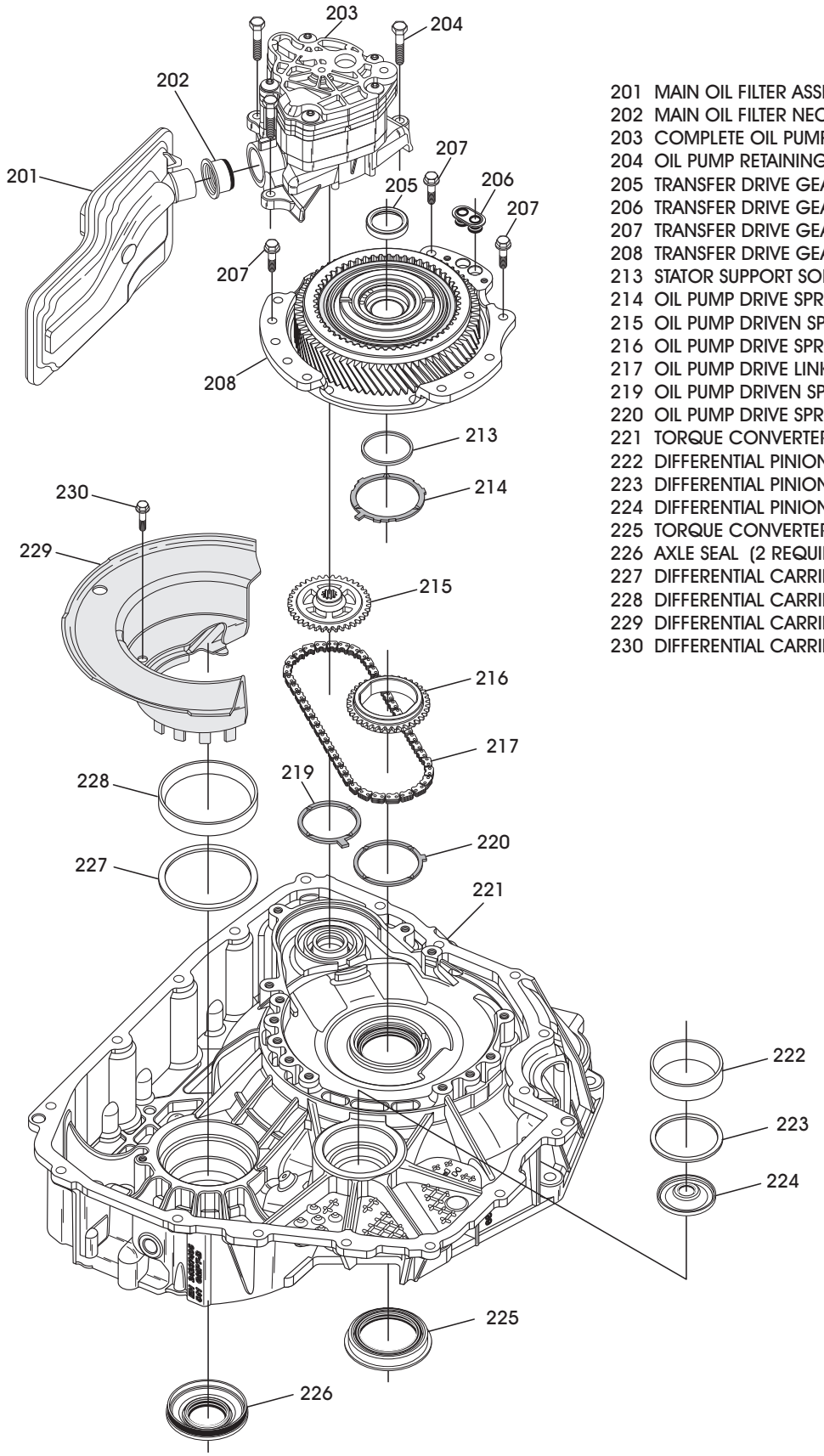


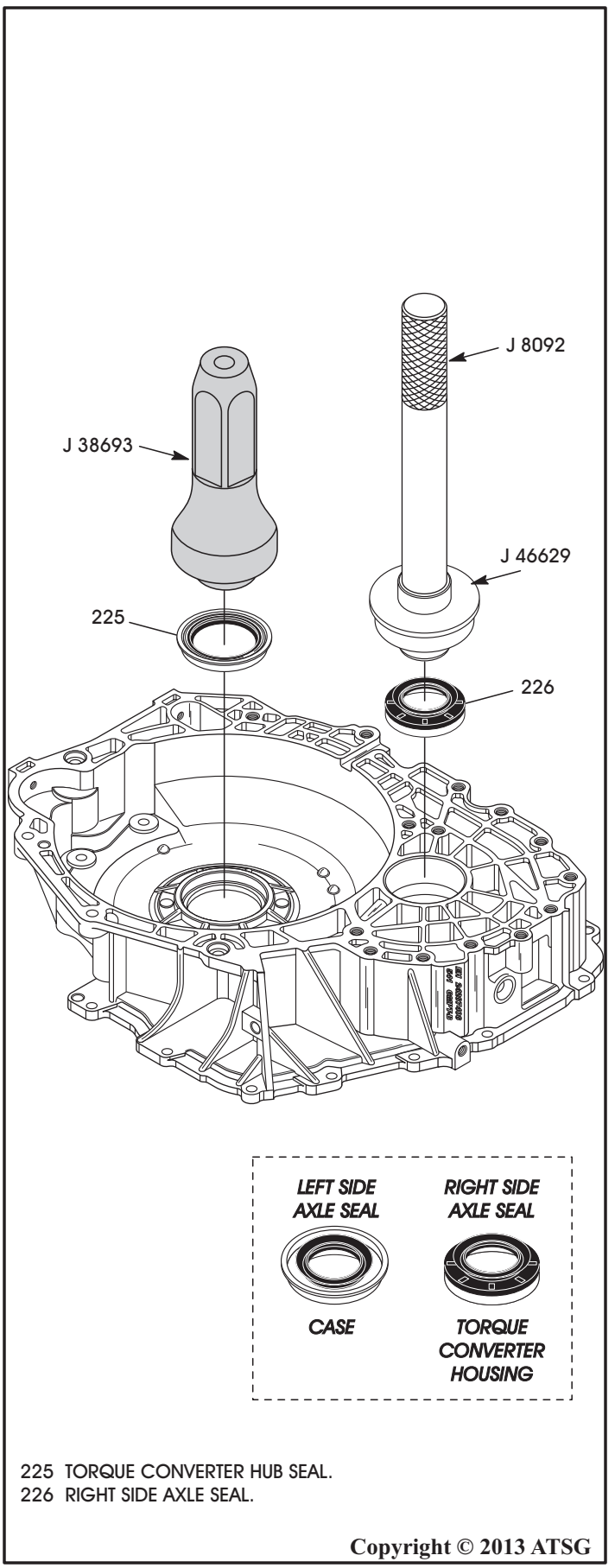
Figure 111

TORQUE CONVERTER AND DIFFERENTIAL HOUSING, EXPLODED VIEW



201 MAIN OIL FILTER ASSEMBLY.
202 MAIN OIL FILTER NECK SEAL.
203 COMPLETE OIL PUMP ASSEMBLY.
204 OIL PUMP RETAINING BOLTS, M6 X 25 (3 REQUIRED).
205 TRANSFER DRIVE GEAR SUPPORT ASSEMBLY SEAL.
206 TRANSFER DRIVE GEAR SUPPORT TO MAIN CASE SEAL.
207 TRANSFER DRIVE GEAR SUPPORT BOLTS, M8 X 25 (10 REQ.).
208 TRANSFER DRIVE GEAR SUPPORT ASSEMBLY.
213 STATOR SUPPORT SOLID TEFLON SEAL (WHITE SPECKLED).
214 OIL PUMP DRIVE SPROCKET TO SUPPORT THRUST WASHER.
215 OIL PUMP DRIVEN SPROCKET.
216 OIL PUMP DRIVE SPROCKET.
217 OIL PUMP DRIVE LINK CHAIN.
219 OIL PUMP DRIVEN SPROCKET TO CASE THRUST WASHER.
220 OIL PUMP DRIVE SPROCKET TO CASE THRUST WASHER.
221 TORQUE CONVERTER AND DIFFERENTIAL HOUSING ASSEMBLY.
222 DIFFERENTIAL PINION GEAR BEARING CUP.
223 DIFFERENTIAL PINION GEAR BEARING *SELECTIVE* SHIM.
224 DIFFERENTIAL PINION GEAR LUBE DAM.
225 TORQUE CONVERTER HUB SEAL.
226 AXLE SEAL (2 REQUIRED).
227 DIFFERENTIAL CARRIER BEARING *SELECTIVE* SHIM.
228 DIFFERENTIAL CARRIER BEARING CUP.
229 DIFFERENTIAL CARRIER OIL BAFFLE.
230 DIFFERENTIAL CARRIER OIL BAFFLE RETAINING BOLT.

Figure 112



225 TORQUE CONVERTER HUB SEAL.
226 RIGHT SIDE AXLE SEAL.

Figure 113

COMPONENT REBUILD

Torque Converter Housing Assembly

1. Install new converter hub seal into the converter housing, as shown in Figure 113, using J-38693 seal driver.
2. Install the right side axle seal using J-46629 seal driver, as shown in Figure 113.
   Note: The right and left side axle seals are different design (See Figure 113).
3. Use the open side of J-46629 installer to avoid seal lip damage and to install the axle seal to the proper depth.
   Note: There is not a seal stop provided in this bore and the depth is critical, so the J-46629 seal installer is highly recommended.
4. If the J-46629 seal installer is not available to you, the installed depth can be measured with small scale ruler, as shown in Figure 114.
   Note: Installed depth to seal base should be; 15.9 -17.5mm (.625" - .687") (5/8" to 11/16").

Continued on Page 74

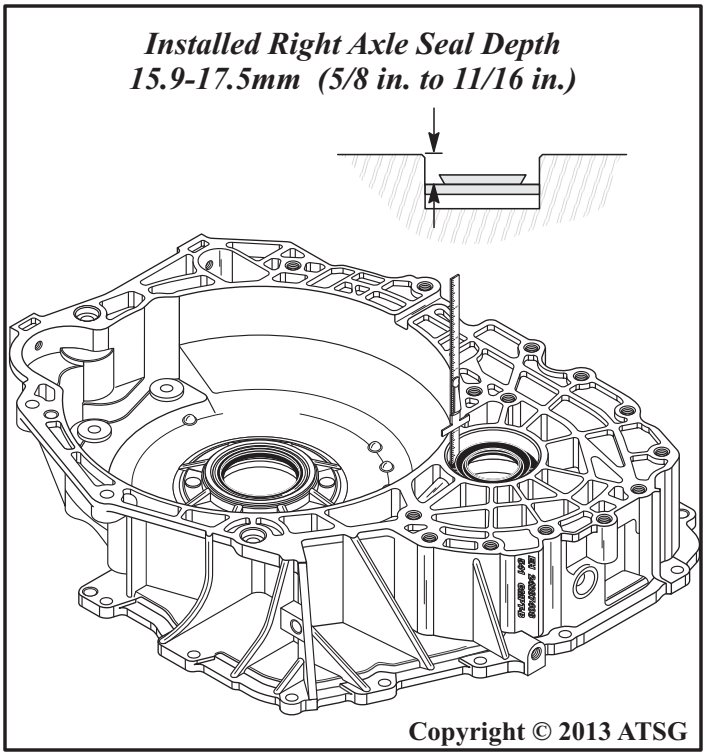


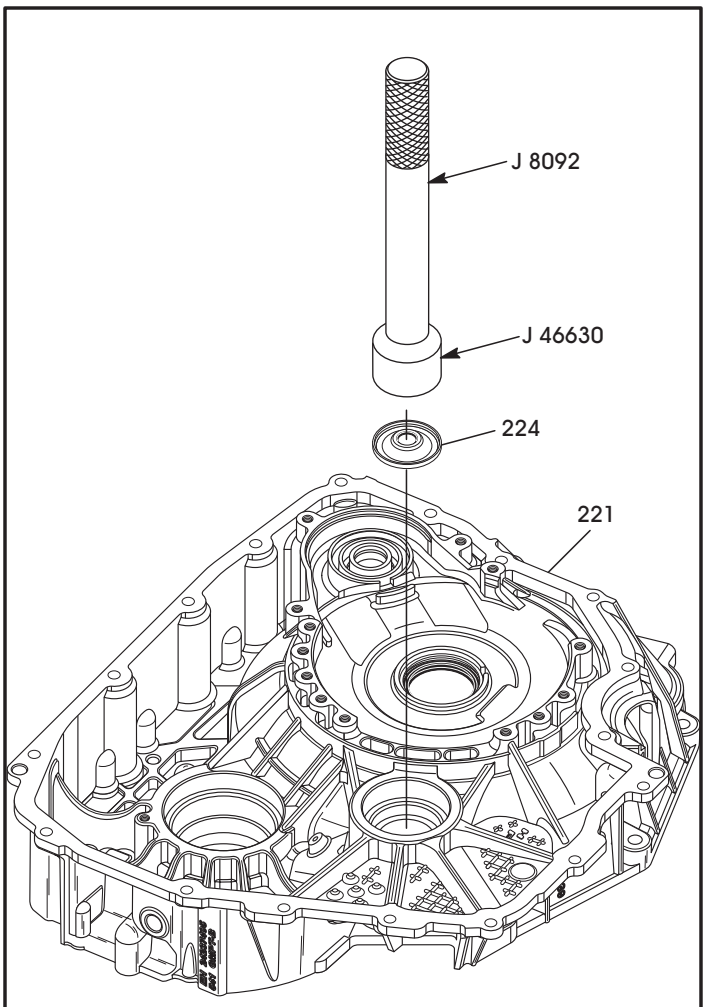
Figure 114

COMPONENT REBUILD

Torque Converter Housing Assembly (Cont'd)

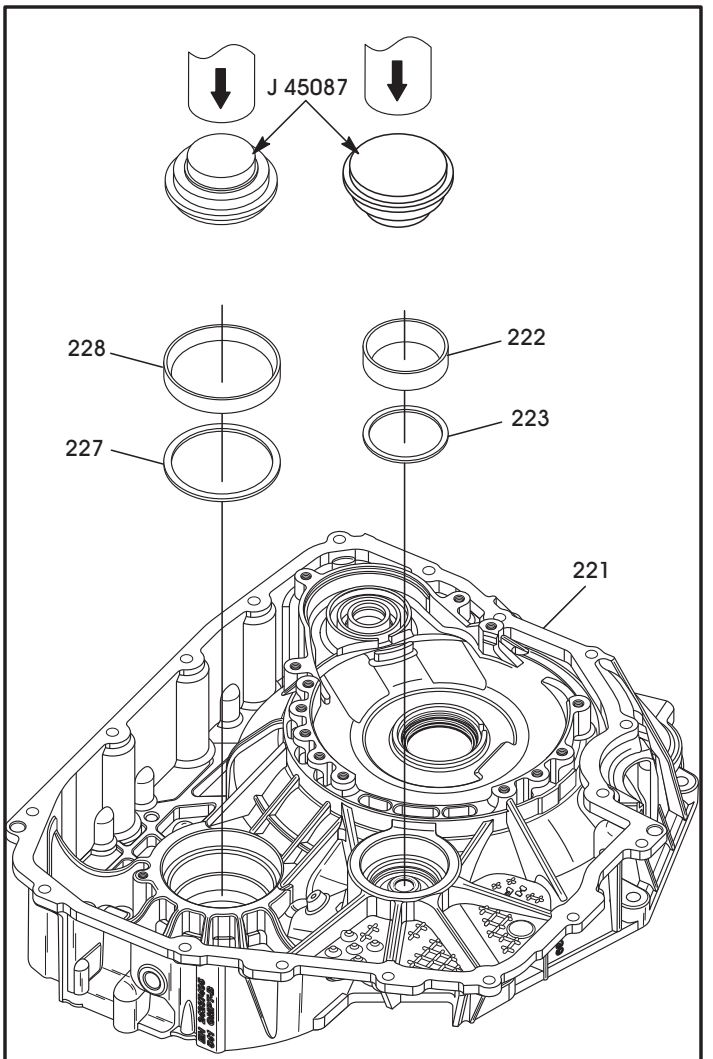
5. Install new differential pinion gear lube dam, as shown in Figure 115, using J-46630 installer and J-8059 handle.
6. Install selective shim you selected from pre-load chart on Page 65, as shown in Figure 116, into differential pinion gear bearing cup bore.
7. Install new differential pinion gear bearing cup on top of installed shim, as shown in Figure 116, using J-45087 installer and hydraulic shop press. ***Note: One side of J-45087 is used for pinion bearing cup and the other side for differential carrier bearing cup.***
8. Install selective shim you selected from pre-load chart on Page 65, as shown in Figure 116, into differential carrier bearing cup bore.
9. Install new differential carrier bearing cup on top of installed shim, as shown in Figure 116, using J-45087 installer and hydraulic shop press. ***Note: One side of J-45087 is used for pinion bearing cup and the other side for differential carrier bearing cup.***

Continued on Page 75



221 TORQUE CONVERTER AND DIFFERENTIAL HOUSING ASSEMBLY.
224 DIFFERENTIAL PINION GEAR LUBE DAM.

Figure 115



221 TORQUE CONVERTER AND DIFFERENTIAL HOUSING ASSEMBLY.
222 DIFFERENTIAL PINION GEAR BEARING CUP.
223 DIFFERENTIAL PINION GEAR BEARING *SELECTIVE* SHIM.
227 DIFFERENTIAL CARRIER BEARING *SELECTIVE* SHIM.
228 DIFFERENTIAL CARRIER BEARING CUP.

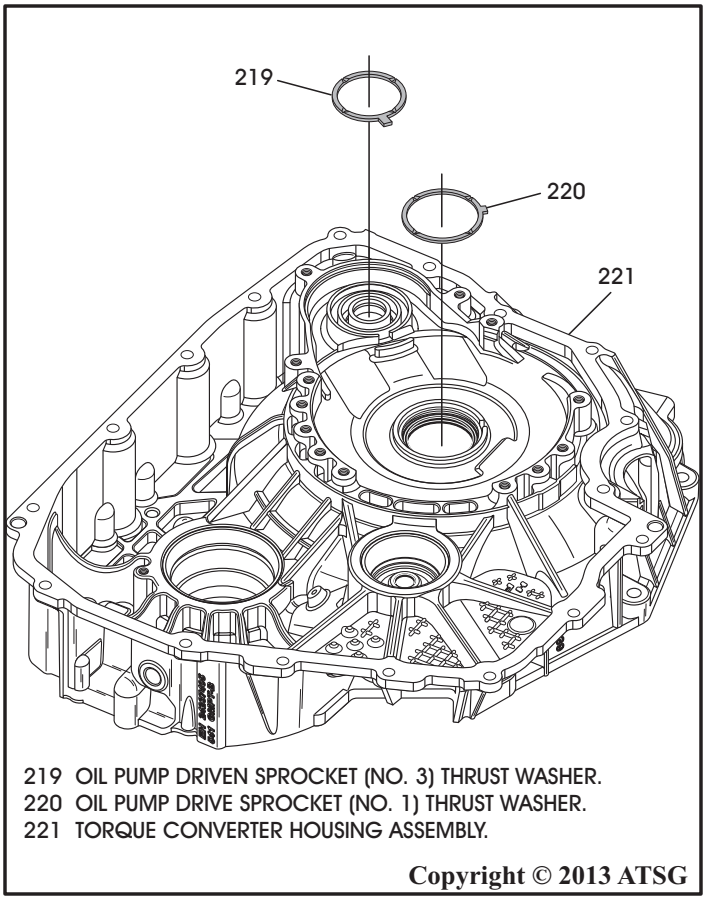
Figure 116

COMPONENT REBUILD

Torque Converter Housing Assembly (Cont'd)

10. Install oil pump driven sprocket number 3 thrust thrust washer (219) into converter housing, as shown in Figure 117 and retain with a small amount of Trans-Jel®.
11. Install oil pump drive sprocket number 1 thrust washer (220) into converter housing, as shown in Figure 117 and retain with a small amount of Trans-Jel®.
12. Assemble drive and driven oil pump sprockets into the drive chain, as shown in Figure 118.
13. Install the oil pump sprockets and drive chain as an assembly, as shown in Figure 119, and lube with a small amount of ATF.

Continued on Page 76



219 OIL PUMP DRIVEN SPROCKET (NO. 3) THRUST WASHER.
220 OIL PUMP DRIVE SPROCKET (NO. 1) THRUST WASHER.
221 TORQUE CONVERTER HOUSING ASSEMBLY.

Figure 117

OIL PUMP SPROCKETS AND DRIVE CHAIN ASSEMBLY

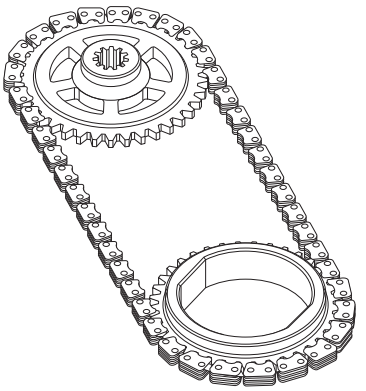


Figure 118

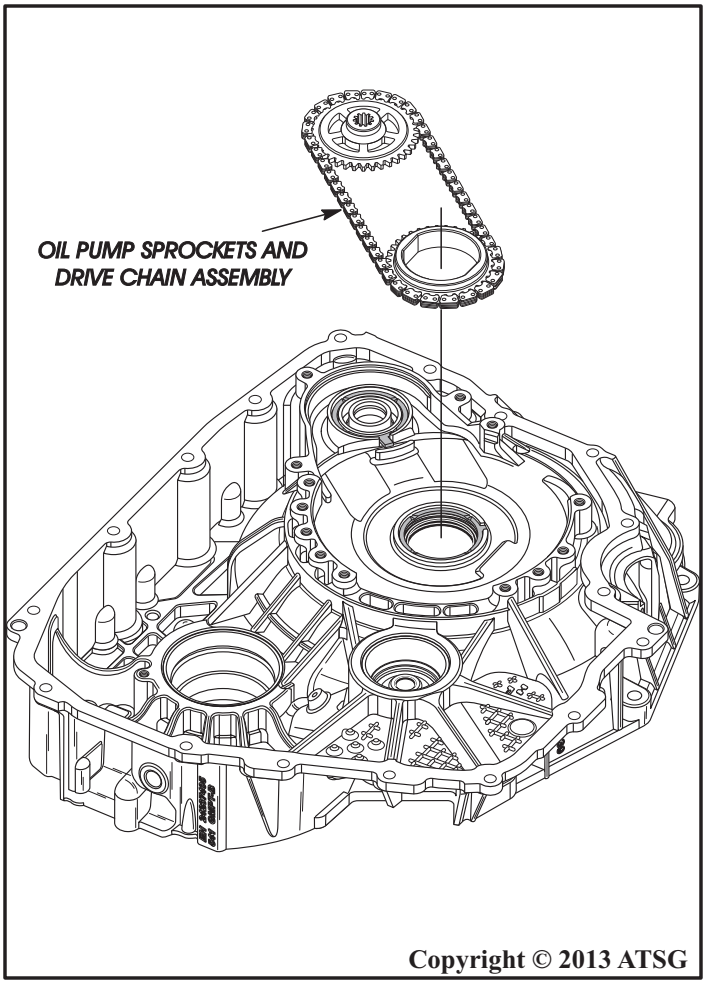


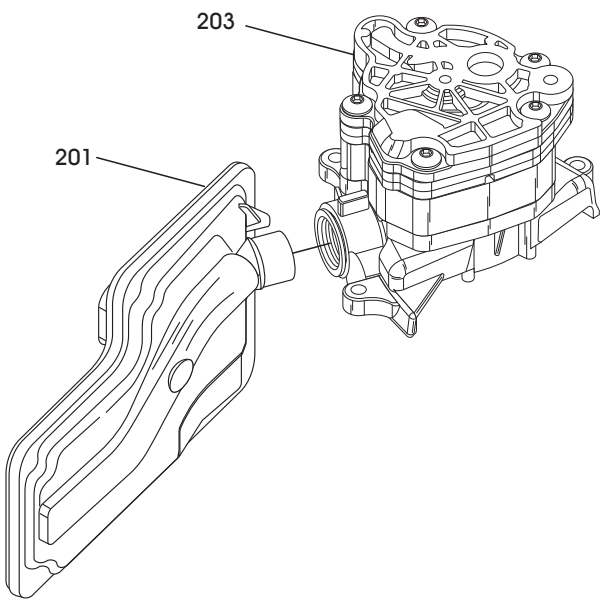
Figure 119

COMPONENT REBUILD

Torque Converter Housing Assembly (Cont'd)

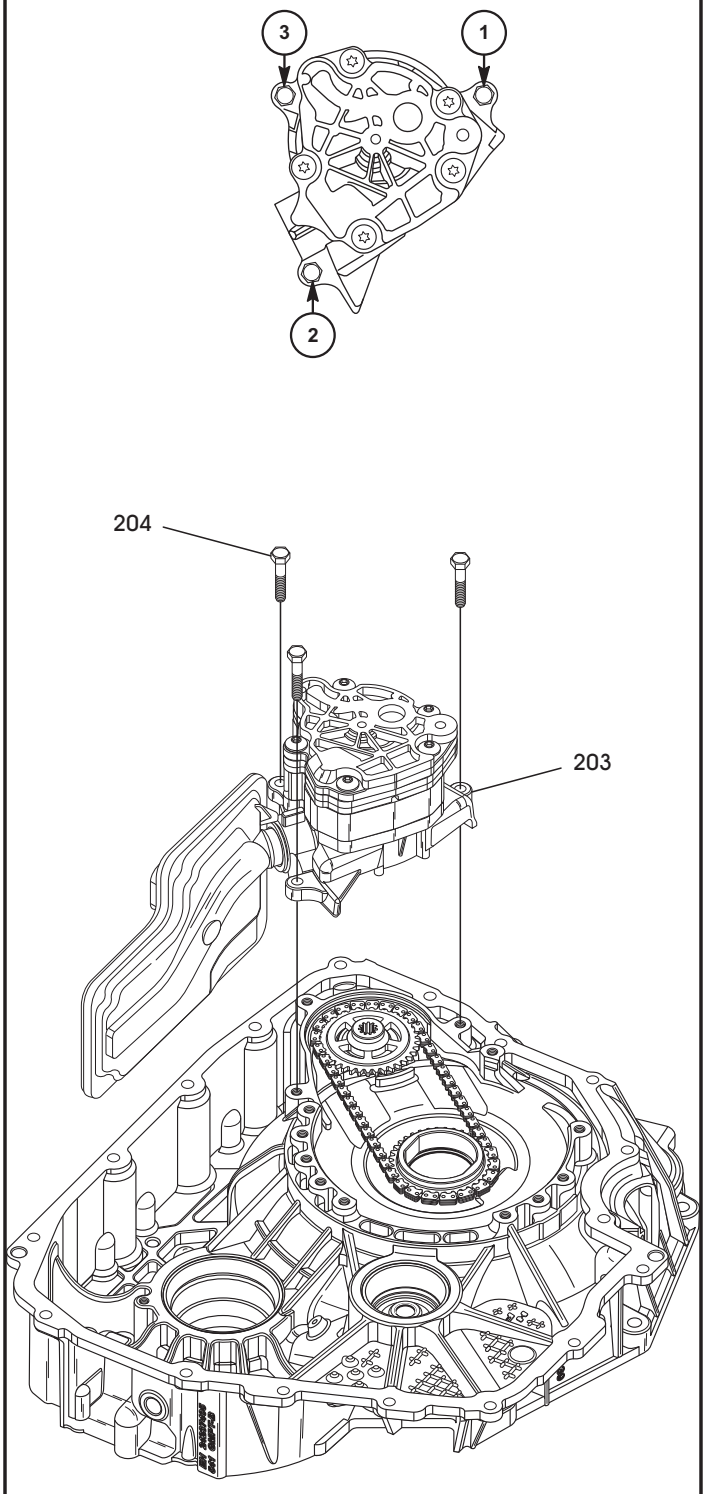
14. Install a new main oil filter into the oil pump, as shown in Figure 120.
15. Install the oil pump and filter as an assembly, as shown in Figure 121.
    Note: Rotate drive sprocket and chain assembly to engage the splines of oil pump drive shaft into splines of the driven sprocket.
16. Tighten the three oil pump retaining bolts in sequence to 12 N•m (106 in. lb.).

Continued on Page 77



201 MAIN OIL FILTER ASSEMBLY.
203 COMPLETED OIL PUMP ASSEMBLY.

Figure 120



203 COMPLETED OIL PUMP & FILTER ASSEMBLY.
204 OIL PUMP RETAINING BOLTS, M6 X 25 (3 REQUIRED).

Figure 121

COMPONENT REBUILD

Torque Converter Housing Assembly (Cont'd)

17. Install the differential carrier oil baffle and the retaining bolt, as shown in Figure 122.
18. Torque bolt to 12 N•m (106 in. lb.).
19. Install the completed transfer drive gear support, as shown in Figure 124.
    Note: Ensure that number 2 thrust washer is still in place before installation, as shown in Figure 123.
20. Ensure that the transfer drive gear support seal is still in place, as shown in Figure 124.
21. Install the ten transfer drive gear support bolts, as shown in Figure 124.

Continued on Page 78

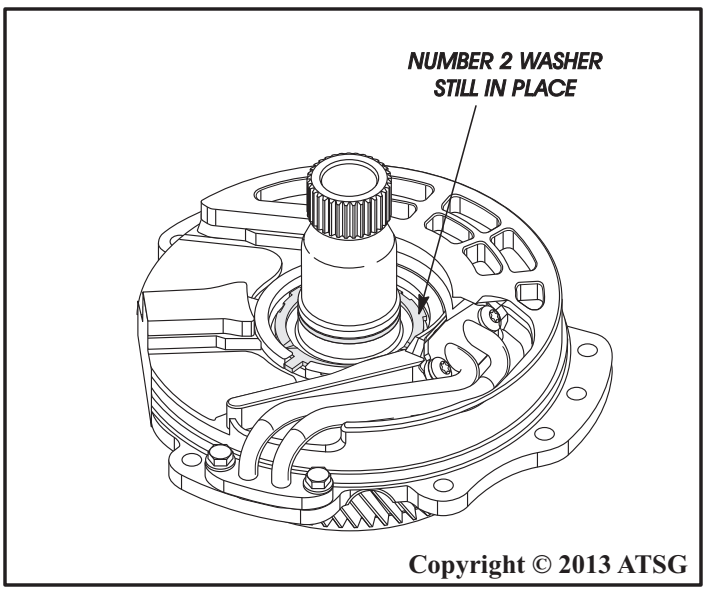
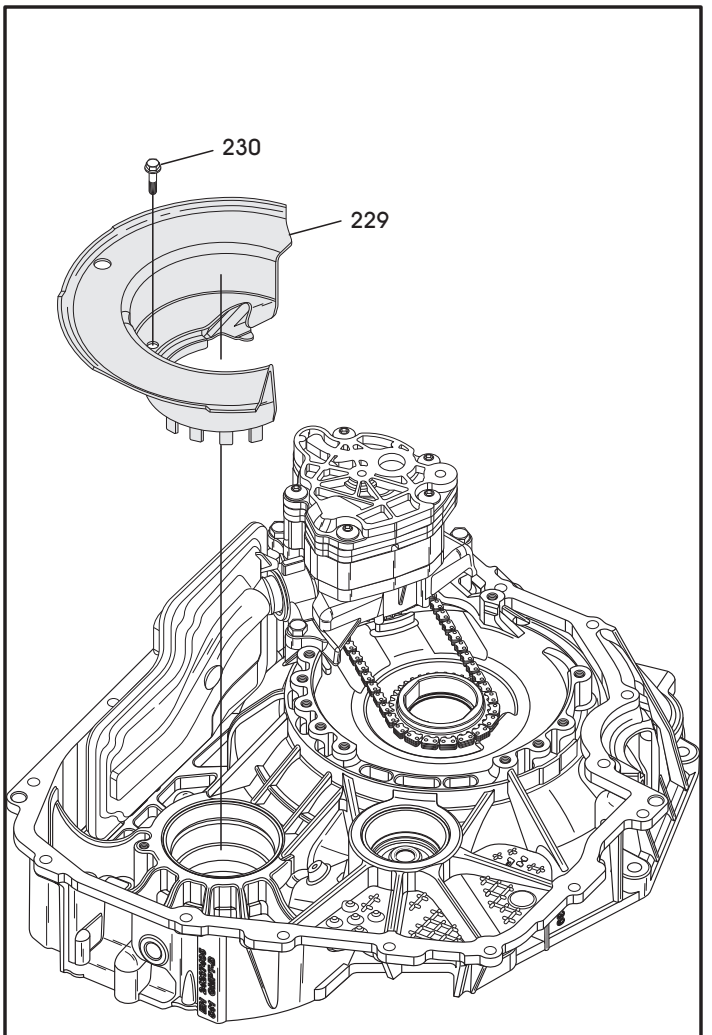
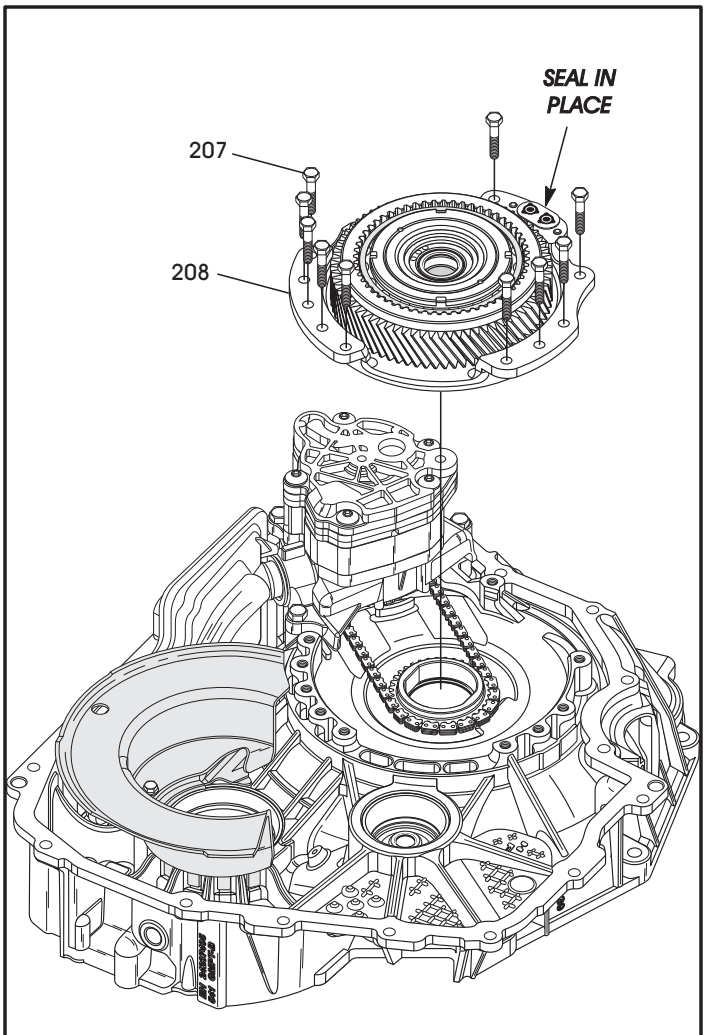


Figure 123



229 DIFFERENTIAL CARRIER OIL BAFFLE.
230 DIFFERENTIAL CARRIER OIL BAFFLE RETAINING BOLT.

Figure 122



207 TRANSFER DRIVE GEAR SUPPORT BOLTS, M8 X 25 (10 REQ.).
208 TRANSFER DRIVE GEAR SUPPORT ASSEMBLY.

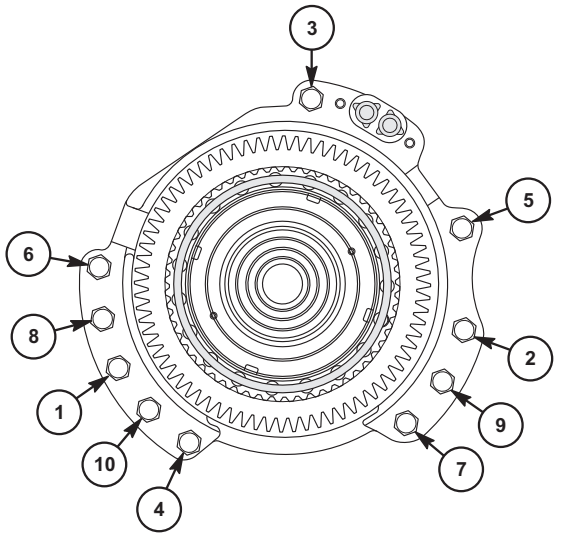
Figure 124

COMPONENT REBUILD

Torque Converter Housing Assembly (Cont'd)

22. Torque the ten transfer drive gear support bolts to 41 N•m (30 ft. lb.), as shown in Figure 125, using the sequence shown in Figure 125.
23. Set the completed torque converter housing aside for the final assembly process (See Figure 126).

Component Rebuild
Continued on Page 79



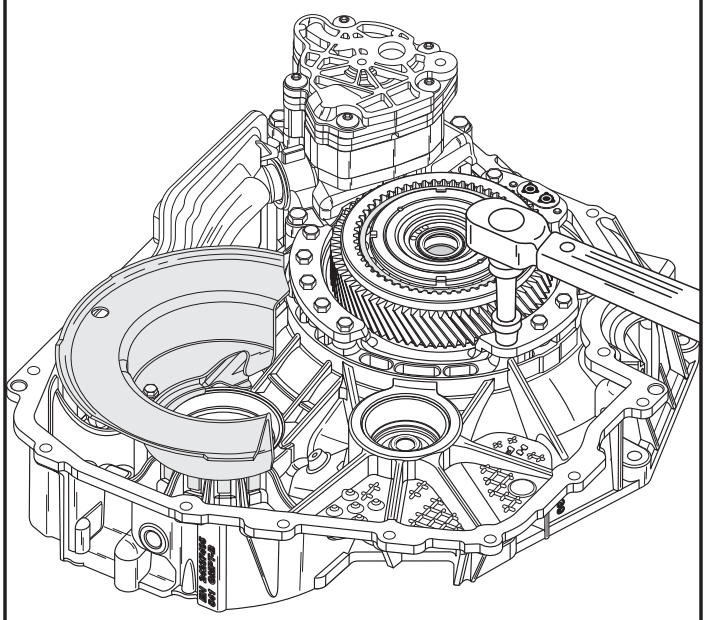


Figure 125

COMPLETED TORQUE CONVERTER HOUSING ASSEMBLY

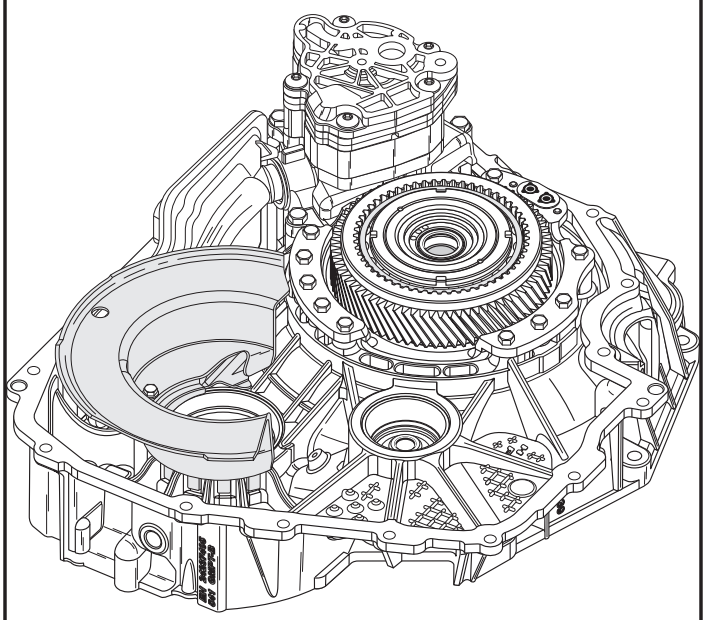


Figure 126

COMPONENT REBUILD

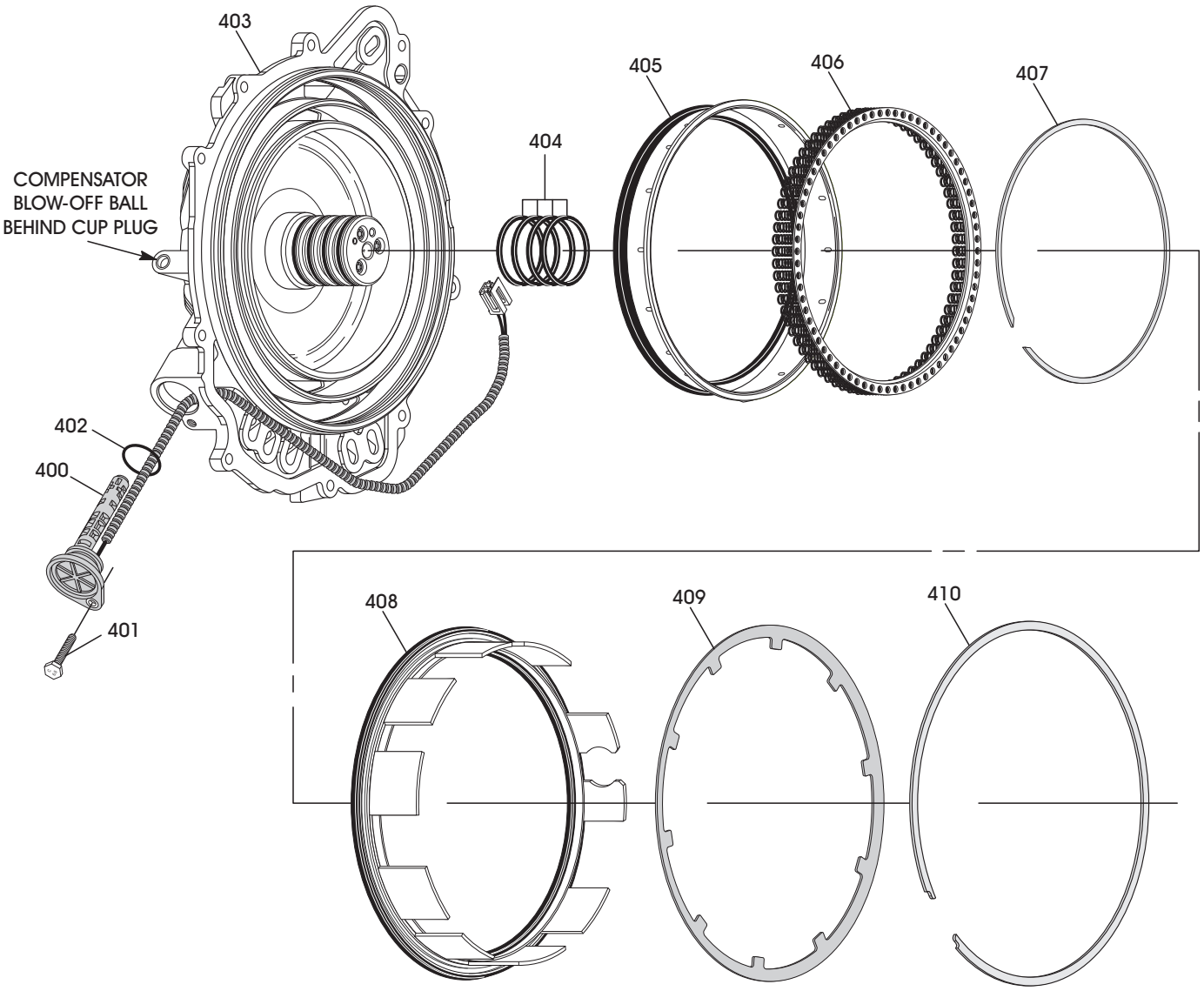
Transmission Rear Case Cover Assembly

1. Disassemble the rear case cover assembly using Figure 127 as a guide.
2. Inspect all rear case cover parts thoroughly for any wear and/or damage, replace as necessary.

Note: If the compensator blow-off ball needs to be removed, it is located behind the cup plug that is shown in Figure 127.

Continued on Page 80

TRANSMISSION REAR CASE COVER, EXPLODED VIEW



400 INPUT SPEED SENSOR ASSEMBLY.
401 INPUT SPEED SENSOR RETAINING BOLT, M6 X 25.
402 INPUT SPEED SENSOR "O" RING SEAL.
403 TRANSMISSION REAR CASE COVER ASSEMBLY.
404 3-5-REV & 4-5-6 CLUTCH SOLID TEFLON SEAL RINGS.
405 2-6 CLUTCH APPLY PISTON.
406 2-6 CLUTCH APPLY PISTON RETURN SPRING ASSEMBLY.
407 2-6 CLUTCH APPLY PISTON RETURN SPRING SNAP RING.
408 LOW/REVERSE CLUTCH APPLY PISTON.
409 LOW/REVERSE CLUTCH APPLY PISTON RETURN SPRING.
410 LOW/REVERSE CLUTCH RETURN SPRING SNAP RING.

Figure 127

COMPONENT REBUILD

Transmission Rear Case Cover Assembly (Cont'd)

3. If the rear cover hub was removed for cleaning purposes, torque the three rear cover hub bolts to 12 N•m (106 in. lb.), as shown in Figure 128.
4. Install new 3-5-Rev & 4-5-6 clutch sealing rings using J-46620 seal installer kit, as shown in Figure 129.
5. Place J-46620-3 over the case cover hub and adjust it so that only the bottom seal groove is exposed, as shown in Figure 129.
6. Use J-46620-2 to push a new seal ring down and into the hub groove.
7. Repeat step 6 to install all 4 seal rings, adjusting J-46620-3 to the appropriate ring groove.
8. Install the J-46620-1 resizing tool with the small chamfer end facing up, as shown in Figure 130, and leave in place for at least 60 seconds.
9. Turn the J-46620-1 resizing tool over with the large chamfer end facing up for 60 seconds to ensure that the seals have been properly sized.
   Note: Leaving the seal resizing tool J-46620-1 on the sealing rings for an extended period of time could cause a fluid leak until the seal has time to warm up and expand to the proper dimension.

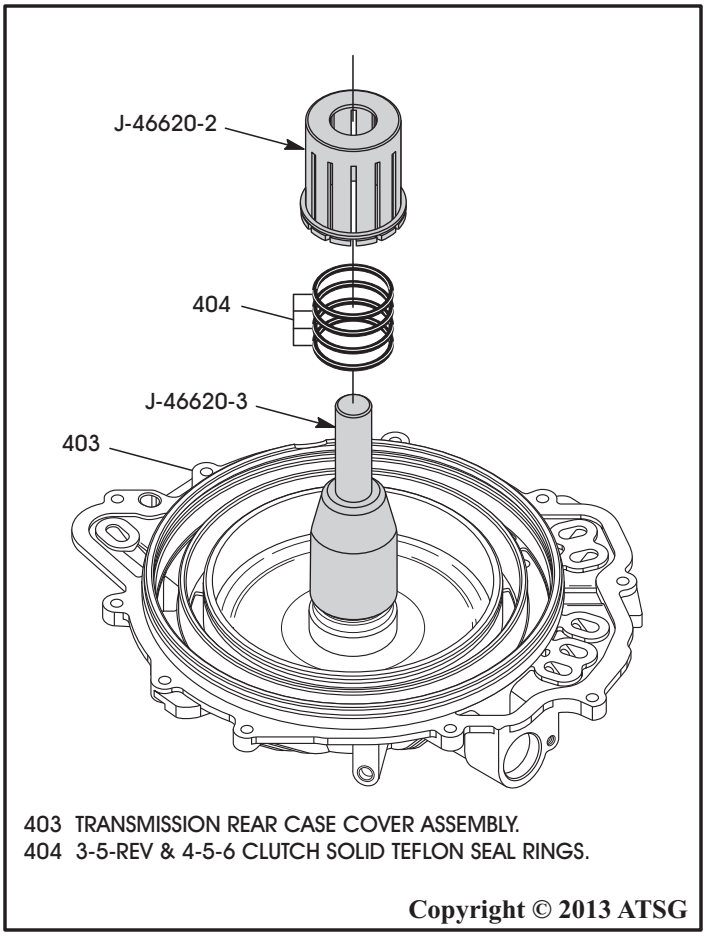


Figure 129

Continued on Page 81

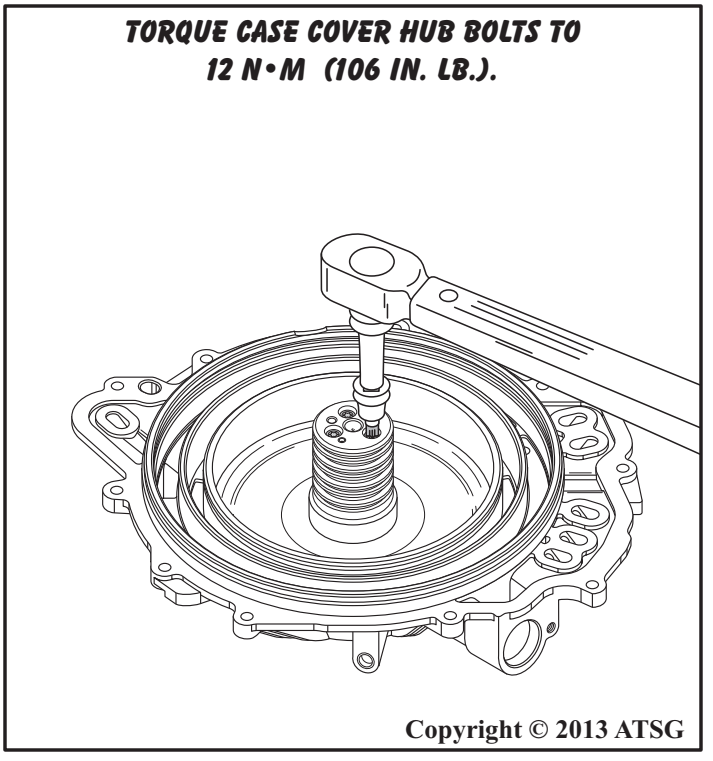


Figure 128

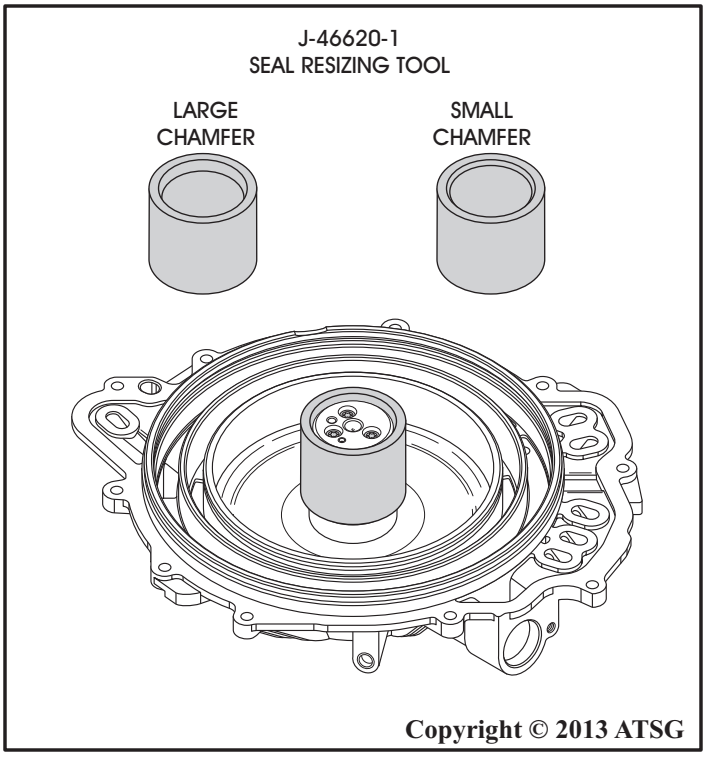
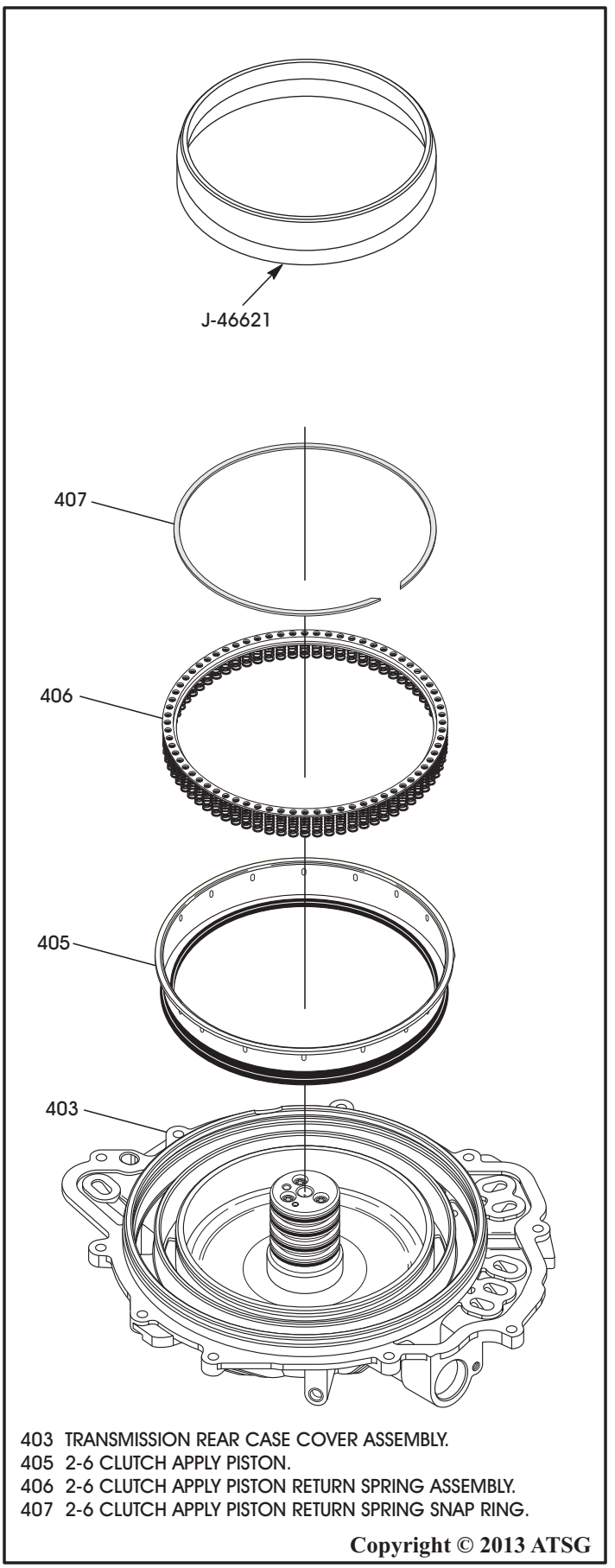


Figure 130



403 TRANSMISSION REAR CASE COVER ASSEMBLY.
405 2-6 CLUTCH APPLY PISTON.
406 2-6 CLUTCH APPLY PISTON RETURN SPRING ASSEMBLY.
407 2-6 CLUTCH APPLY PISTON RETURN SPRING SNAP RING.

Figure 131

COMPONENT REBUILD

Transmission Rear Case Cover Assembly (Cont'd)

10. Install new 2-6 clutch apply piston, as shown in Figure 131, using seal protector J-46621.
11. Install the 2-6 clutch apply piston return spring assembly, as shown in Figure 131.
12. Compress the return spring using the J-46632 compressor tool, as shown in Figure 132, and install the snap ring.
    Note: Place the snap ring inside the J-46632 compressor tool prior to placing the tool onto the return spring. Install the snap ring with opening positioned at the top of the case cover.
13. Ensure that snap ring is fully seated.

Continued on Page 82

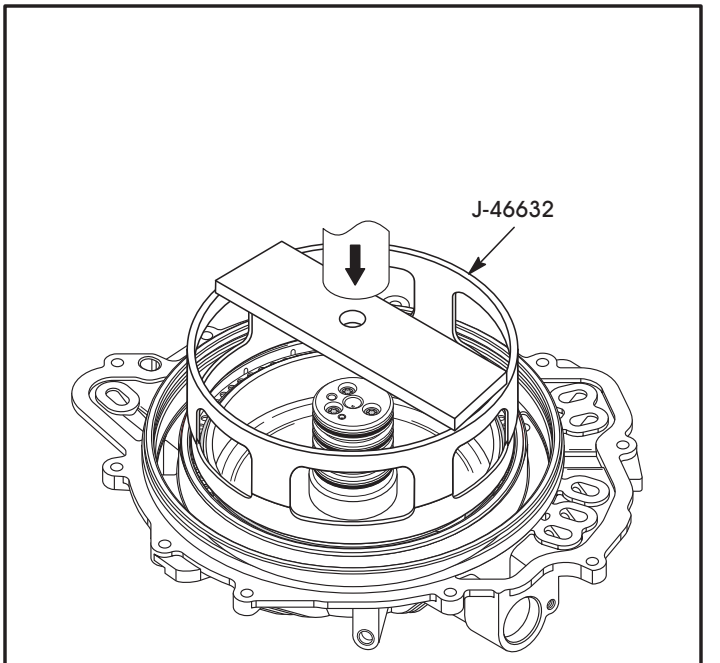
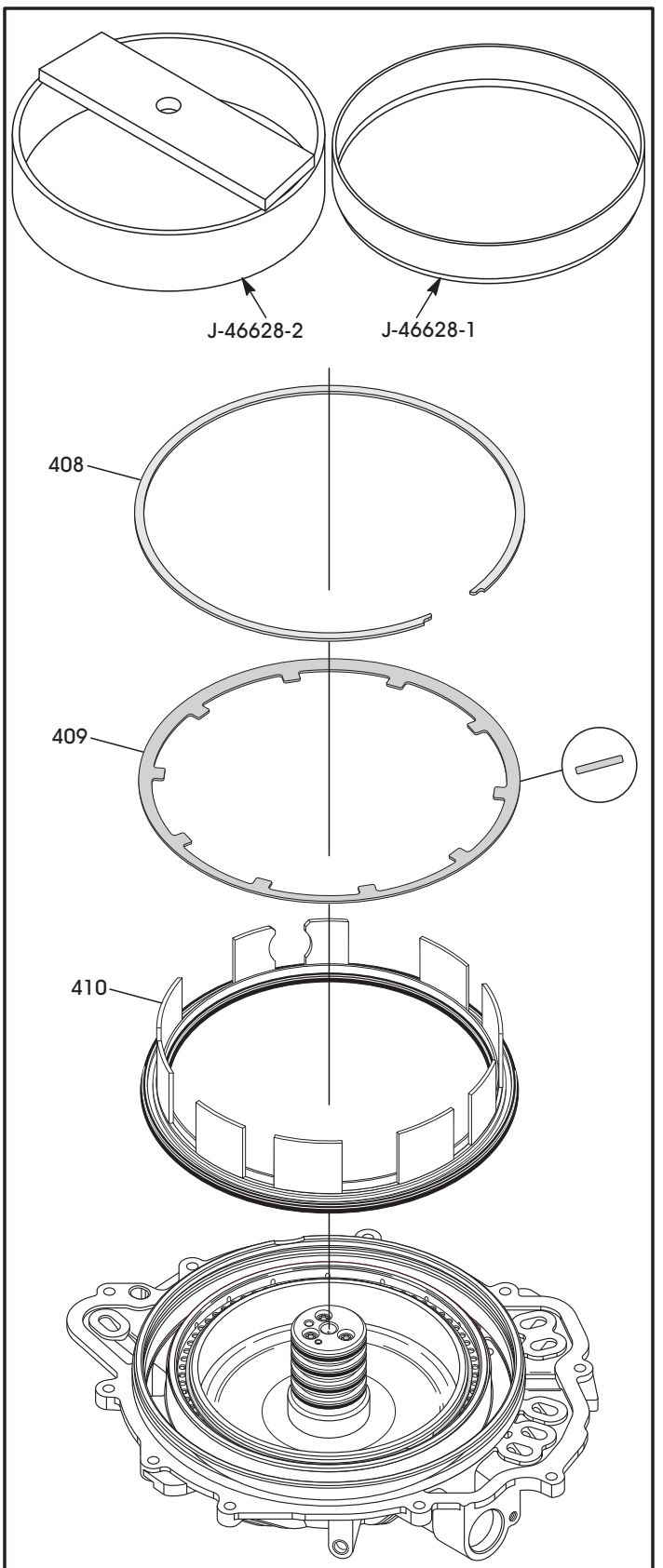


Figure 132



408 LOW/REVERSE CLUTCH APPLY PISTON.
409 LOW/REVERSE CLUTCH APPLY PISTON RETURN SPRING.
410 LOW/REVERSE CLUTCH RETURN SPRING SNAP RING.

Figure 133

COMPONENT REBUILD

Transmission Rear Case Cover Assembly (Cont'd)

14. Install low/reverse clutch apply piston assembly, as shown in Figure 133, using seal protector J-46628-1.
    Note: The 2-6 piston air bleed located between the "half-circle" notched fingers must be positioned at the alignment feature in the case cover, as shown in Figure 134. This will orient the piston fingers with the openings in the 2-6 clutch steel plates.
15. Install the 2-6 clutch apply piston return spring, as shown in Figure 133.
16. Compress the return spring using the J-46628-2 compressor tool, as shown in Figure 133, and install the snap ring.
17. Ensure that the snap ring is fully seated.

Continued on Page 83

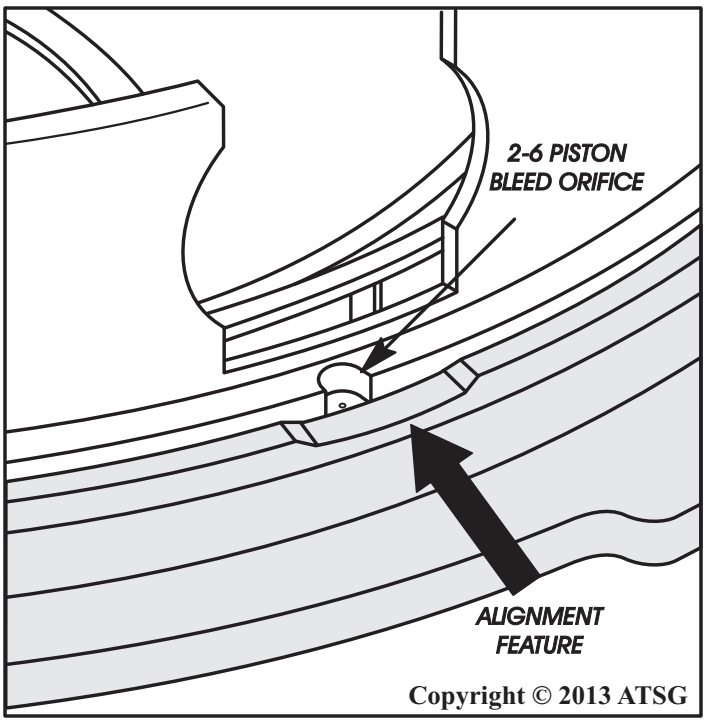
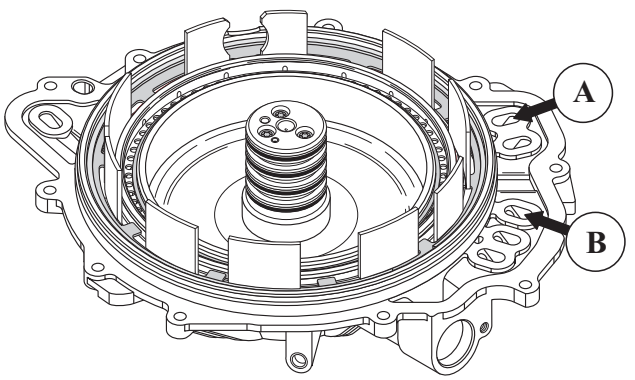


Figure 134



A = Low/Reverse Clutch
B = 2-6 Clutch

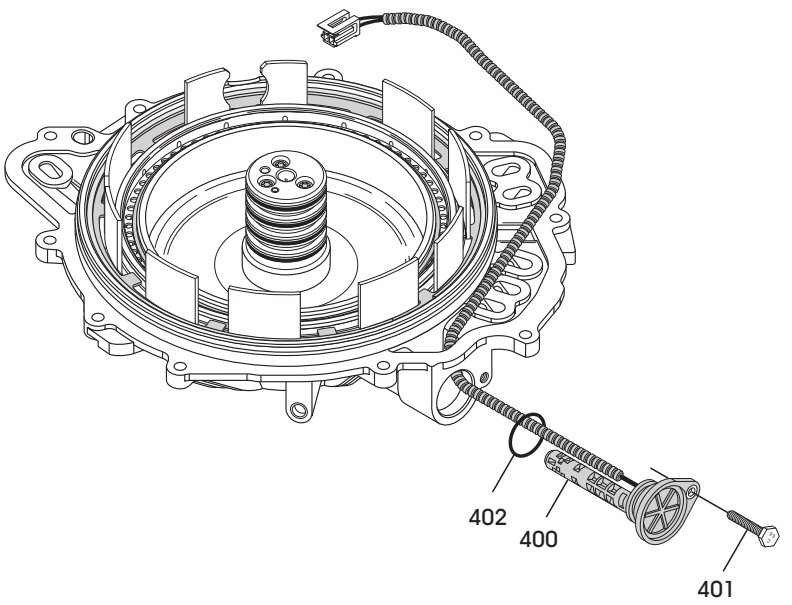
Figure 135

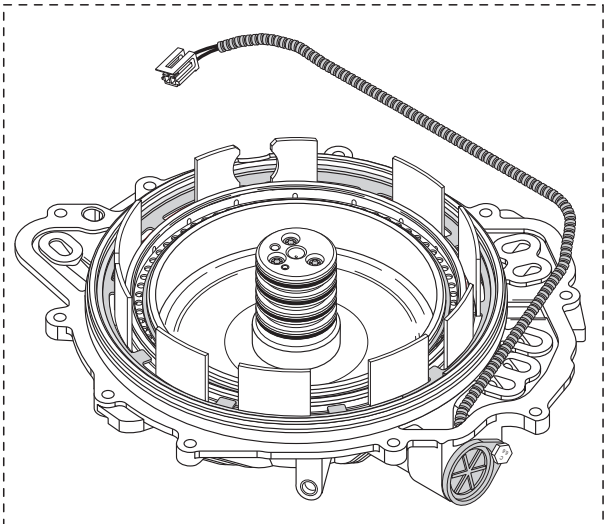
COMPONENT REBUILD

Transmission Rear Case Cover Assembly (Cont'd)

18. Apply shop air, regulated to 40 psi, as shown in Figure 135, and observe the movement of the 2-6 clutch piston and low/reverse clutch piston. ***Note: Pressure higher than 40 psi could cause the piston to over travel and damage the piston seals.***
19. Install new "O" ring seal onto the input speed sensor, as shown in Figure 136, and lube with a small amount of Trans-Jel®.
20. Install the input speed sensor assembly into the rear case cover, as shown in Figure 136.
21. Install the retaining bolt and torque the bolt to 9 N•m (80 in. lb.). ***Note: Use Red Loc-tite®, type 275, on the threads of the input speed sensor bolt.***
22. Set the completed rear case cover aside for the final assembly process (See Figure 136).

Component Rebuild
Continued on Page 84





COMPLETED REAR CASE COVER

400 INPUT SPEED SENSOR ASSEMBLY.
401 INPUT SPEED SENSOR RETAINING BOLT, M6 X 25.
402 INPUT SPEED SENSOR "O" RING SEAL.

Figure 136

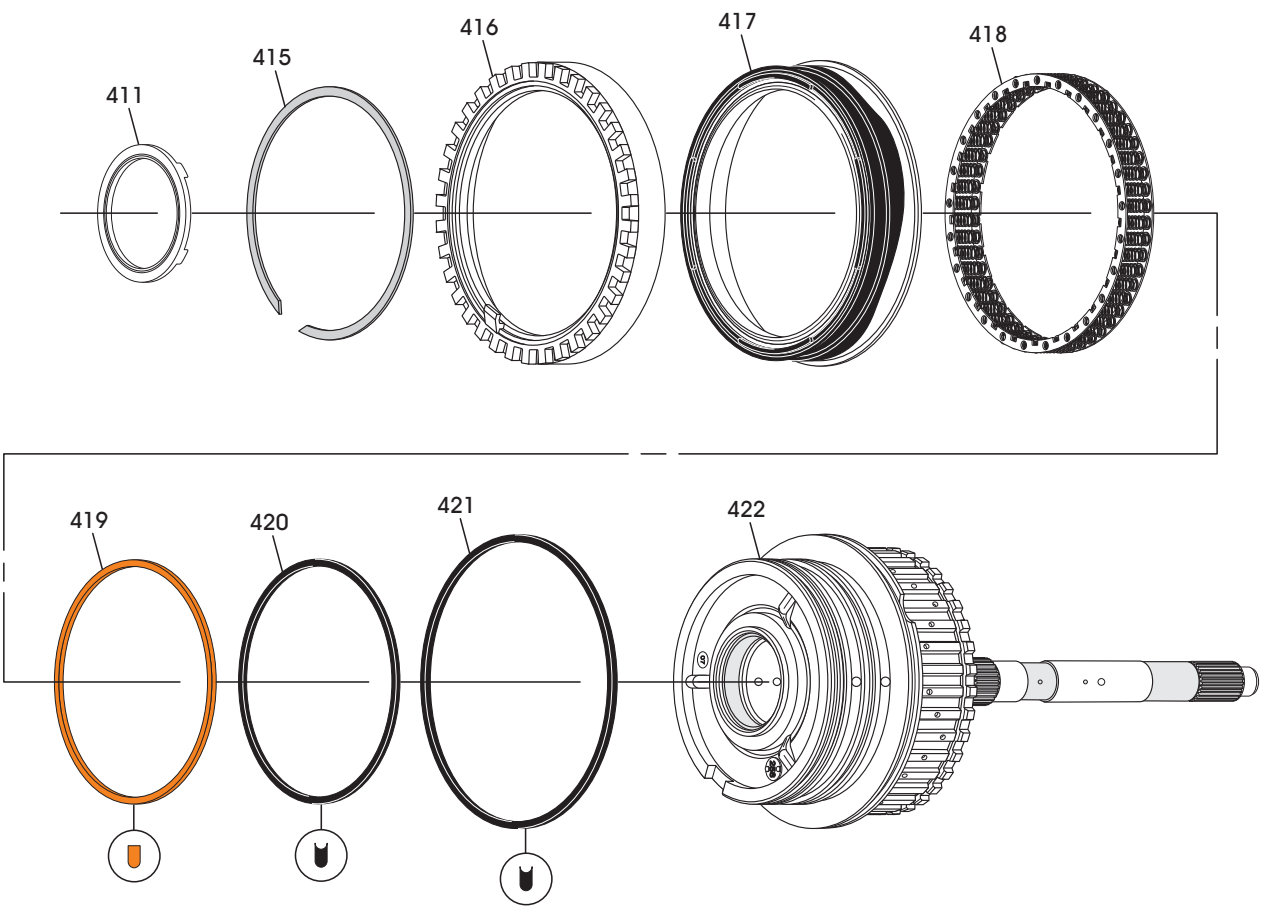
COMPONENT REBUILD

3-5-Rev & 4-5-6 Clutch Housing

1. The 3-5-Rev & 4-5-6 clutch housing must be disassembled from both sides. Exploded view of the rear side of the 3-5-R & 4-5-6 clutch housing is shown in Figure 137 and the front side is shown in Figure 138.
2. This clutch housing requires several special seals and will need your undivided attention when the assembly process begins.
3. There are also several special tools required that we will show you during the disassembly and assembly process.
4. Disassembly begins on Page 86.

Continued on Page 86

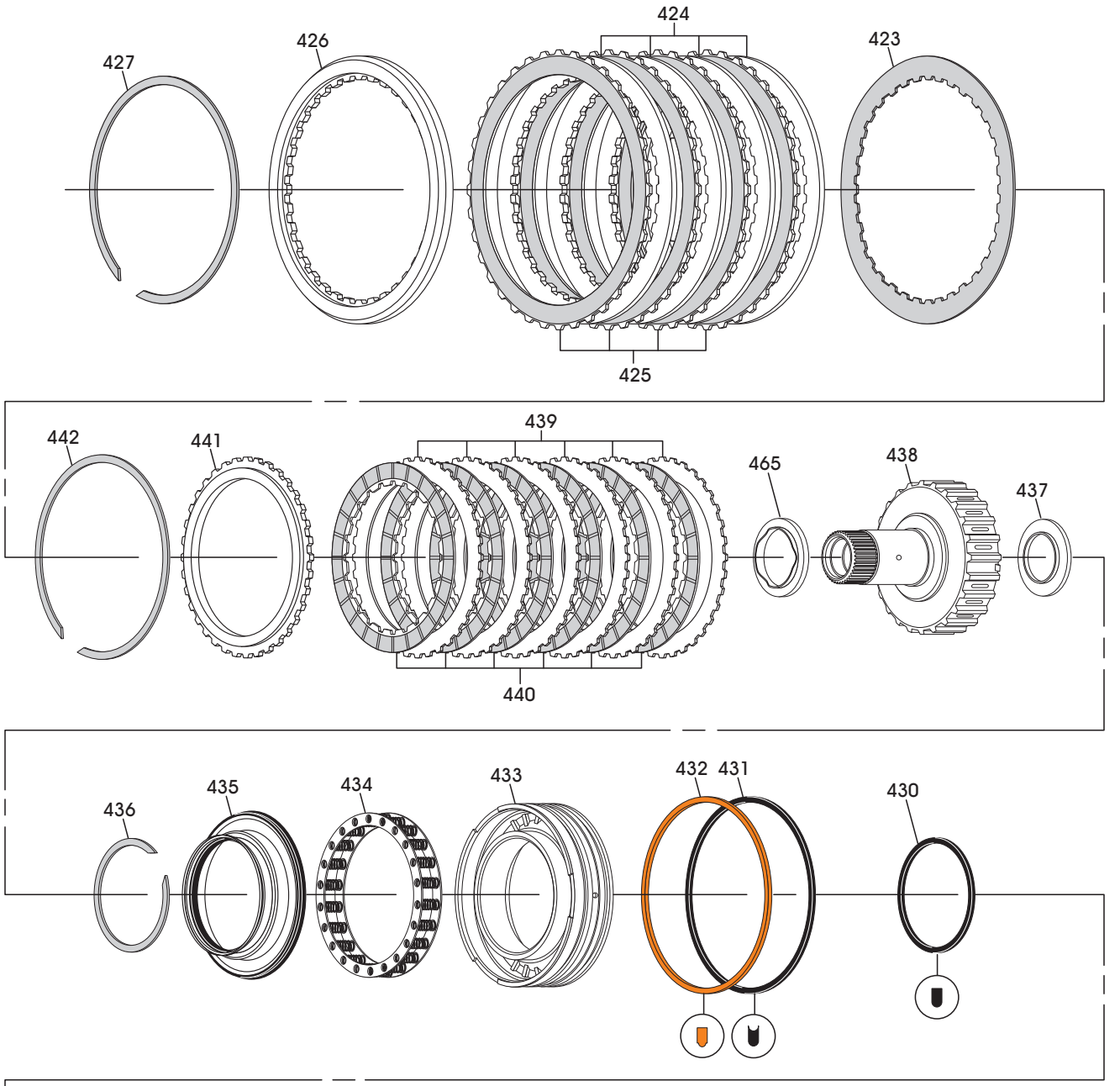
3-5-REVERSE AND 4-5-6 CLUTCH HOUSING EXPLODED VIEW "REAR SIDE"



411 NUMBER 11 THRUST BEARING.
415 INPUT SHAFT SPEED SENSOR RELUCTOR RING SNAP RING.
416 INPUT SHAFT SPEED SENSOR RELUCTOR RING.
417 3-5-REVERSE CLUTCH PISTON.
418 3-5-REVERSE CLUTCH PISTON RETURN SPRING.
419 3-5-REVERSE CLUTCH PISTON INNER SEAL (ORANGE).
420 3-5-REVERSE CLUTCH PISTON INNER SEAL (BLACK).
421 3-5-REVERSE CLUTCH PISTON DAM SEAL.
422 3-5-REV & 4-5-6 CLUTCH HOUSING ASSEMBLY.

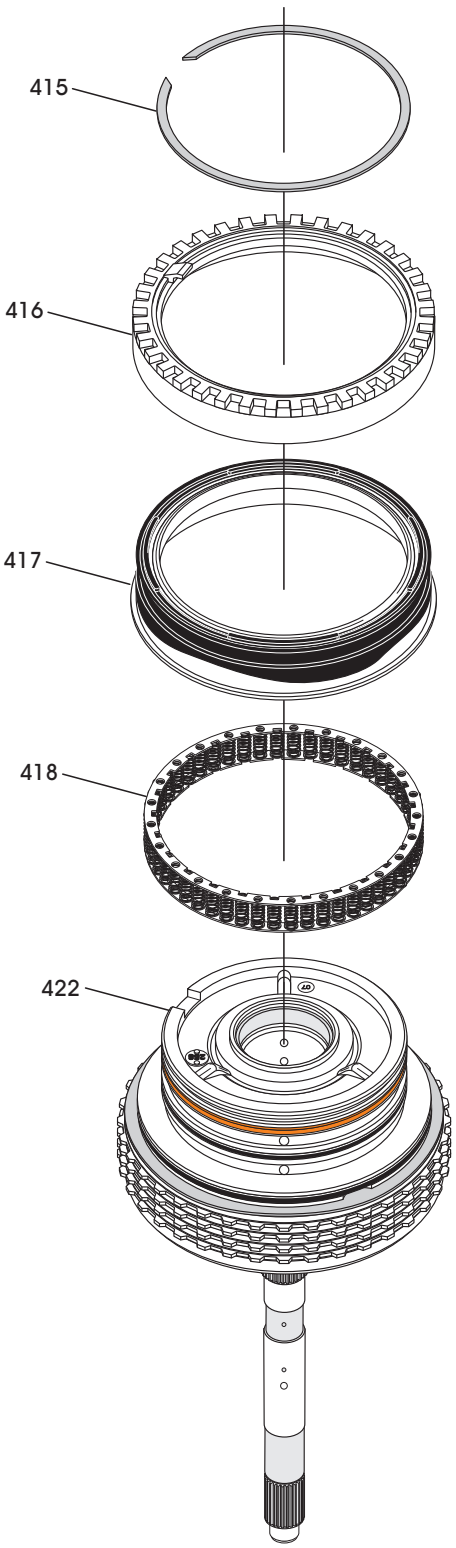
Figure 137

3-5-REVERSE AND 4-5-6 CLUTCH HOUSING EXPLODED VIEW "FRONT SIDE"



422 3-5-REV & 4-5-6 CLUTCH HOUSING ASSEMBLY.
423 3-5-REVERSE CLUTCH "WAVED" PLATE.
424 3-5-REVERSE CLUTCH STEEL PLATE (4 REQUIRED).
425 3-5-REVERSE CLUTCH FRICTION PLATES (4 REQUIRED).
426 3-5-REVERSE CLUTCH BACKING PLATE.
427 3-5-REVERSE CLUTCH BACKING PLATE SNAP RING.
430 4-5-6 CLUTCH PISTON INNER SEAL.
431 4-5-6 CLUTCH PISTON OUTER SEAL (ROUNDED & BLACK).
432 4-5-6 CLUTCH PISTON OUTER SEAL (STEPPED & ORANGE).
433 4-5-6 CLUTCH PISTON.
434 4-5-6 CLUTCH PISTON RETURN SPRING.
435 4-5-6 CLUTCH BALANCE PISTON.
436 4-5-6 CLUTCH BALANCE PISTON SNAP RING.
437 NUMBER 10 THRUST BEARING.
438 4-5-6 CLUTCH HUB ASSEMBLY.
439 4-5-6 CLUTCH STEEL PLATES (6 REQUIRED).
440 4-5-6 CLUTCH FRICTION PLATES (6 REQUIRED).
441 4-5-6 CLUTCH BACKING PLATE.
442 4-5-6 CLUTCH BACKING PLATE SNAP RING.
465 NUMBER 9 THRUST BEARING.

Figure 138



415 INPUT SHAFT SPEED SENSOR RELUCTOR RING SNAP RING.
416 INPUT SHAFT SPEED SENSOR RELUCTOR RING.
417 3-5-REVERSE CLUTCH PISTON.
418 3-5-REVERSE CLUTCH PISTON RETURN SPRING.
422 3-5-REV & 4-5-6 CLUTCH HOUSING ASSEMBLY.

Figure 139

COMPONENT REBUILD

3-5-Rev & 4-5-6 Clutch Housing (Cont'd)

5. Compress the input speed sensor reluctor ring just enough to remove the snap ring using spring compressor tool, as shown in Figure 140.
   Note: Over compressing the reluctor wheel will break the alignment tab and clutch housing.
6. Remove the input speed sensor reluctor wheel, as shown in Figure 139.
7. Remove 3-5-Rev clutch apply piston, as shown in Figure 139.
8. Remove the 3-5-Rev clutch piston return spring, as shown in Figure 139.

Continued on Page 87

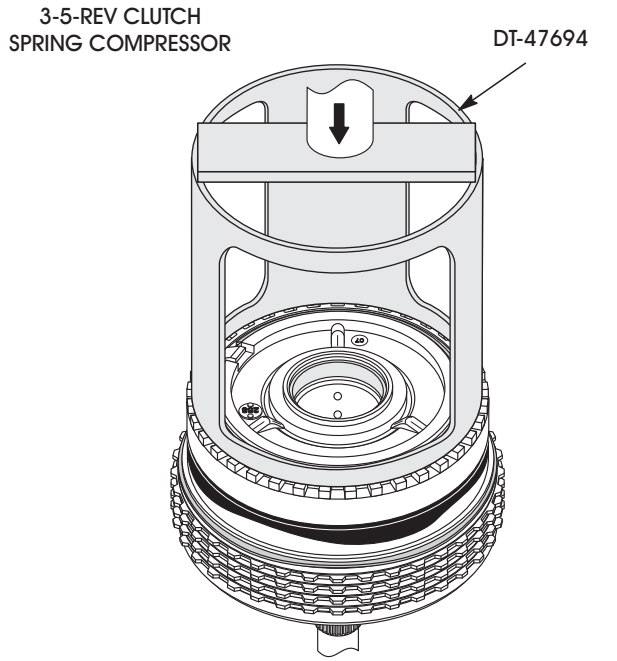


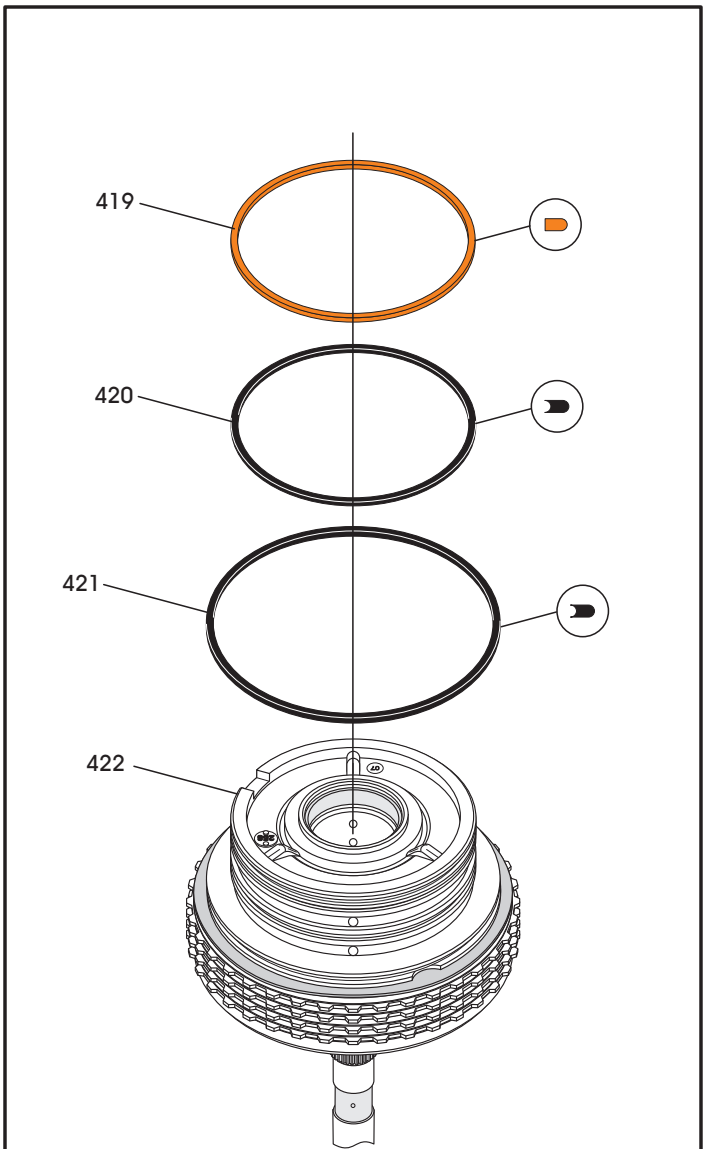
Figure 140

COMPONENT REBUILD

3-5-Rev & 4-5-6 Clutch Housing (Cont'd)

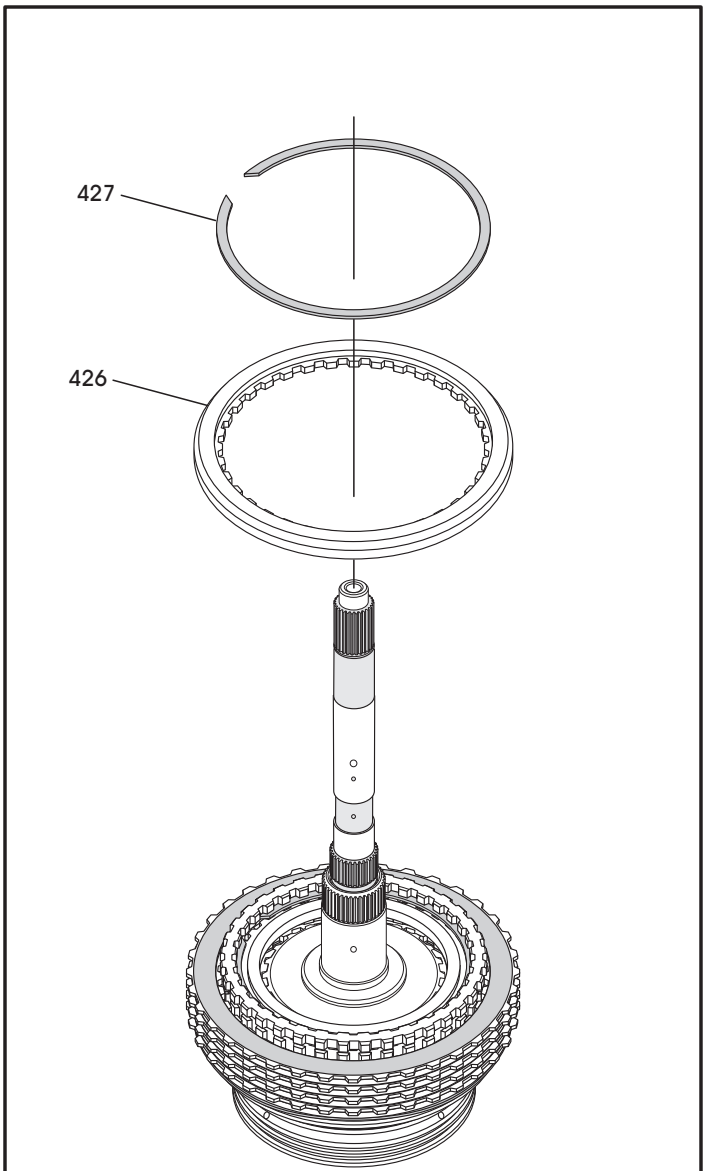
9. Remove and discard the orange 3-5 Rev clutch piston inner seal, as shown in Figure 141.
10. Remove and discard the black 3-5-Rev clutch piston inner seal, as shown in Figure 141.
11. Remove and discard the 3-5-Rev clutch piston dam seal (largest), as shown in Figure 141.
12. Turn the assembly over with input shaft facing up, as shown in Figure 142.
13. Remove the 3-5-Rev clutch backing plate snap ring, as shown in Figure 142.
14. Remove the 3-5-Rev clutch backing plate, as shown in Figure 142.

Continued on Page 88



419 3-5-REVERSE CLUTCH PISTON INNER SEAL (ORANGE).
420 3-5-REVERSE CLUTCH PISTON INNER SEAL (BLACK).
421 3-5-REVERSE CLUTCH PISTON DAM SEAL.
422 3-5-REV & 4-5-6 CLUTCH HOUSING ASSEMBLY.

Figure 141



426 3-5-REVERSE CLUTCH BACKING PLATE.
427 3-5-REVERSE CLUTCH BACKING PLATE SNAP RING.

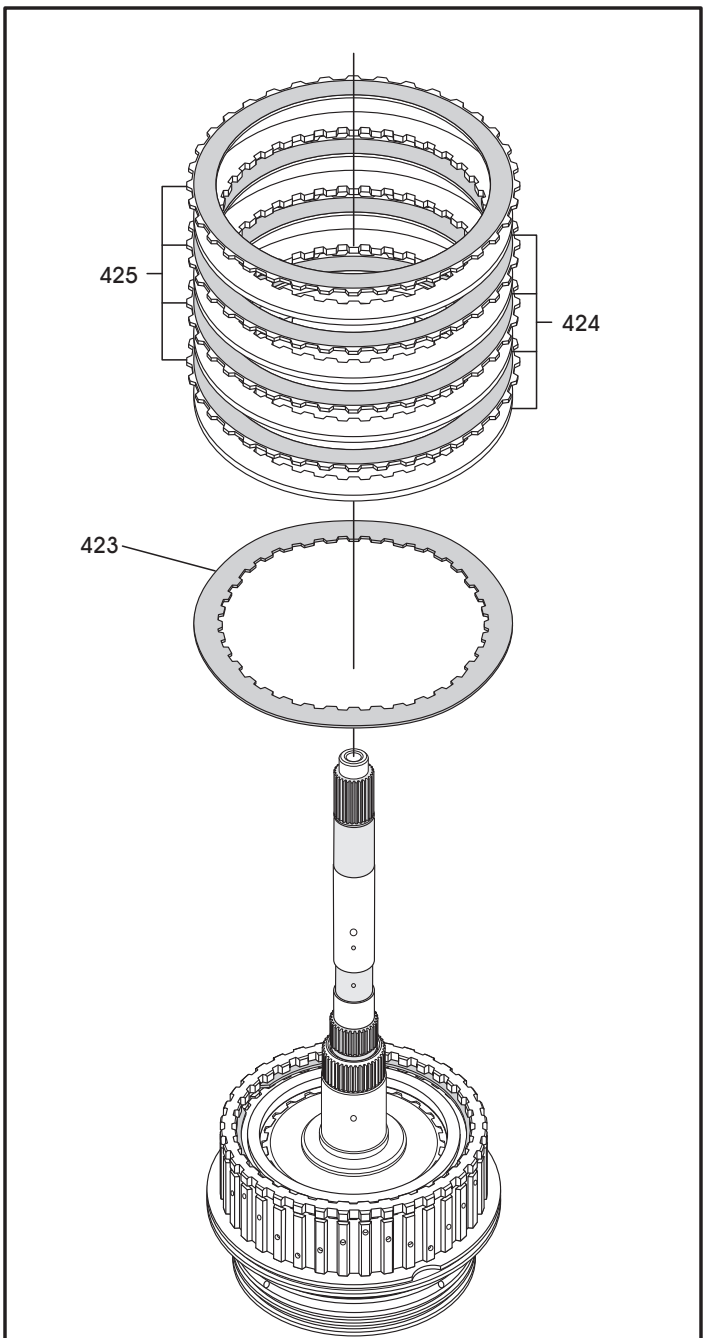
Figure 142

COMPONENT REBUILD

3-5-Rev & 4-5-6 Clutch Housing (Cont'd)

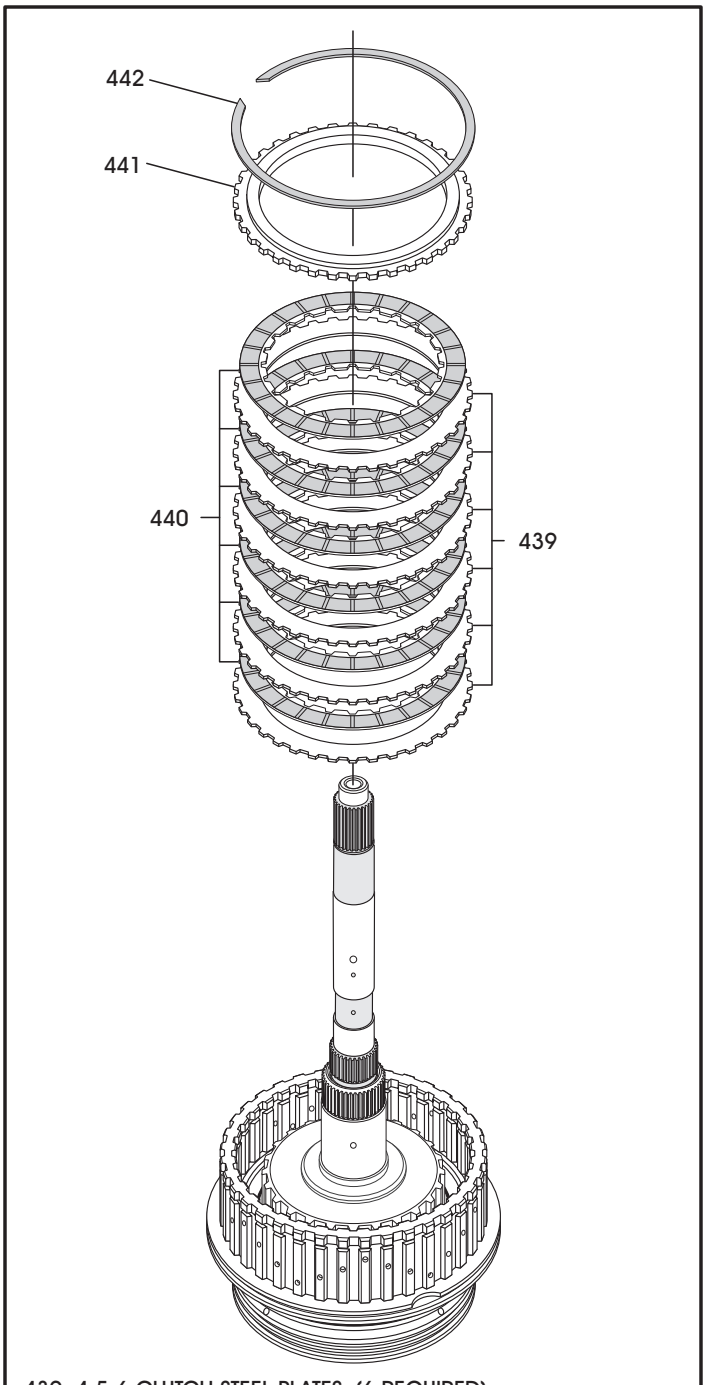
15. Remove the 3-5-Rev clutch friction and steel plates, as shown in Figure 143.
16. Remove the 3-5-Rev clutch wave plate, as shown in Figure 143.
    Note: The 3-5-Rev clutch wave plate is prone to breakage.
17. Remove the 4-5-6 clutch backing plate snap ring, as shown in Figure 144.
18. Remove the 4-5-6 clutch backing plate and the friction and steel plates, as shown in Figure 144.

Continued on Page 89



423 3-5-REVERSE CLUTCH "WAVED" PLATE.
424 3-5-REVERSE CLUTCH STEEL PLATE (4 REQUIRED).
425 3-5-REVERSE CLUTCH FRICTION PLATES (4 REQUIRED).

Figure 143



439 4-5-6 CLUTCH STEEL PLATES (6 REQUIRED).
440 4-5-6 CLUTCH FRICTION PLATES (6 REQUIRED).
441 4-5-6 CLUTCH BACKING PLATE.
442 4-5-6 CLUTCH BACKING PLATE SNAP RING.

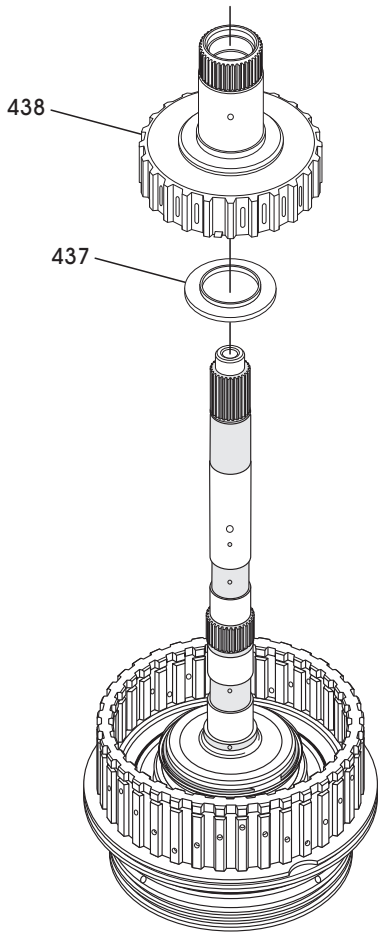
Figure 144

COMPONENT REBUILD

3-5-Rev & 4-5-6 Clutch Housing (Cont'd)

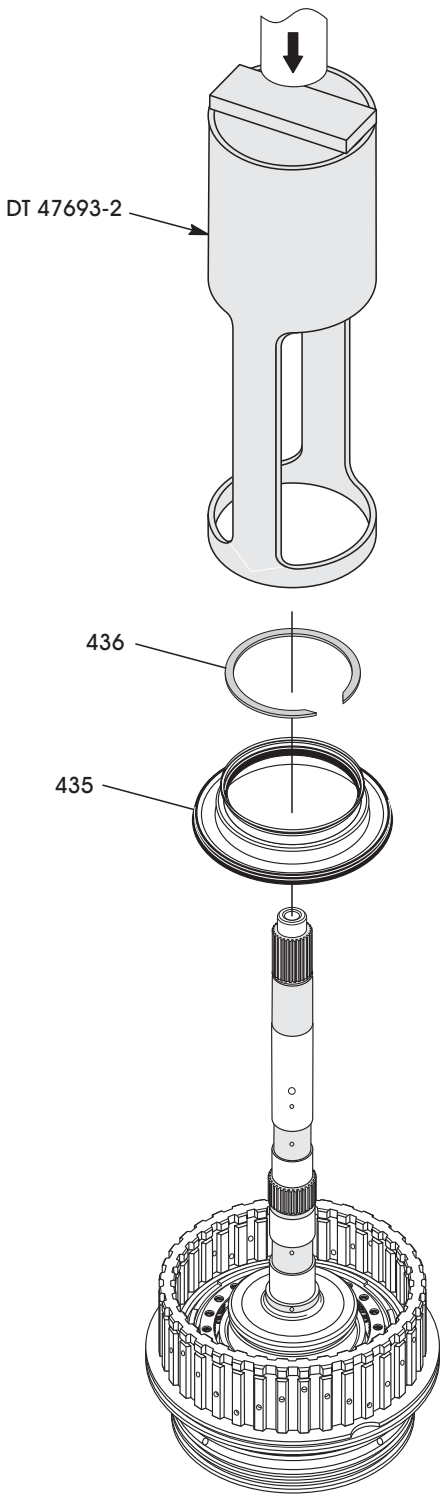
19. Remove the 4-5-6 clutch hub and the number 10 thrust bearing, as shown in Figure 145.
20. Compress the 4-5-6 clutch piston return spring using compressor tool DT-47693-2, as shown in Figure 146, and remove the snap ring.
21. Remove 4-5-6 clutch balance piston, as shown in Figure 146.

Continued on Page 90



437 NUMBER 10 THRUST BEARING.
438 4-5-6 CLUTCH HUB ASSEMBLY.

Figure 145



435 4-5-6 CLUTCH BALANCE PISTON.
436 4-5-6 CLUTCH BALANCE PISTON SNAP RING.

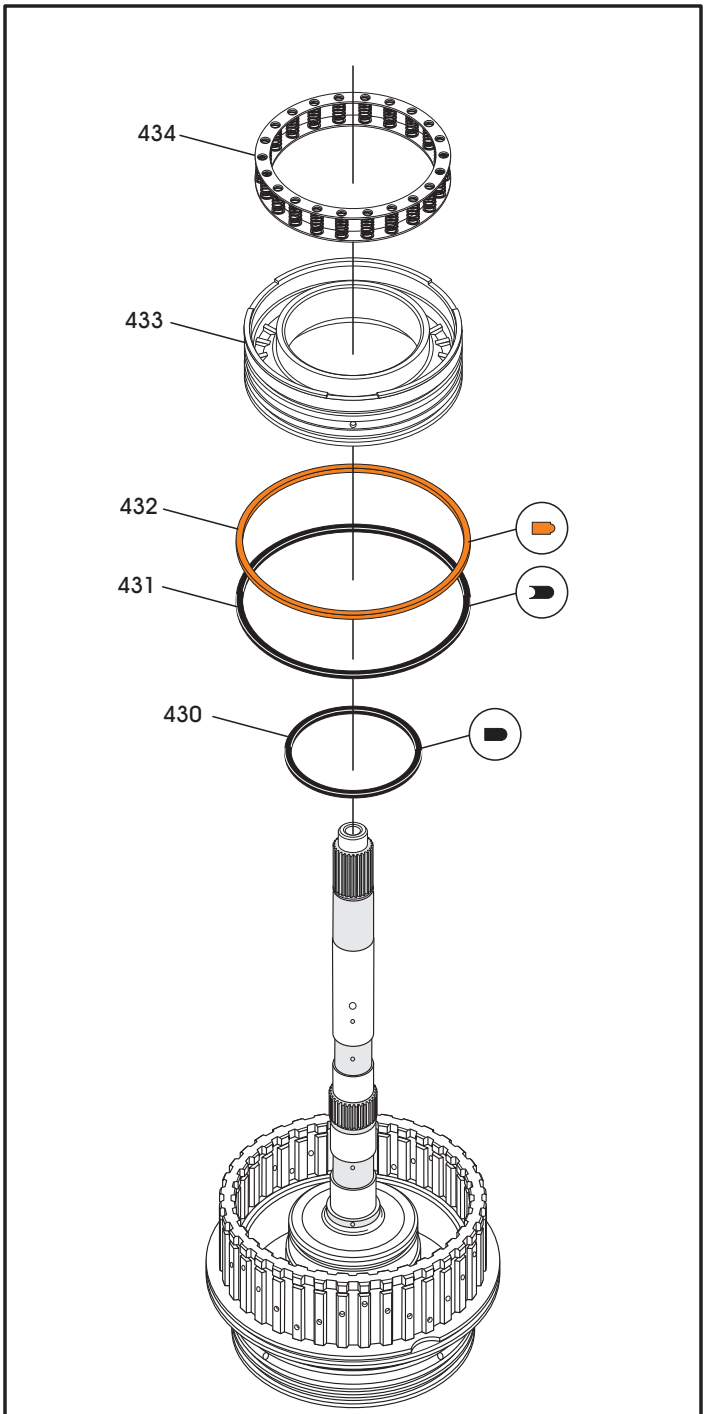
Figure 146

COMPONENT REBUILD

3-5-Rev & 4-5-6 Clutch Housing (Cont'd)

22. Remove the 4-5-6 clutch piston return spring, as shown in Figure 147.
23. Remove the 4-5-6 clutch piston, as shown in Figure 147.
    Note: You can install the housing into the completed rear cover with the number 11 thrust bearing in place, as shown in Figure 148, and carefully apply shop air to the 4-5-6 clutch feed hole to dislodge the piston.
24. Remove and discard the 4-5-6 clutch piston outer seal (Stepped & Orange), as shown in Figure 147.
25. Remove and discard the 4-5-6 clutch piston outer seal (Rounded & Black), as shown in Figure 147.
26. Remove and discard the 4-5-6 clutch piston inner seal from the housing, as shown in Figure 147.

Continued on Page 91



430 4-5-6 CLUTCH PISTON INNER SEAL.
431 4-5-6 CLUTCH PISTON OUTER SEAL (ROUNDED & BLACK).
432 4-5-6 CLUTCH PISTON OUTER SEAL (STEPPED & ORANGE).
433 4-5-6 CLUTCH PISTON.
434 4-5-6 CLUTCH PISTON RETURN SPRING.

Figure 147

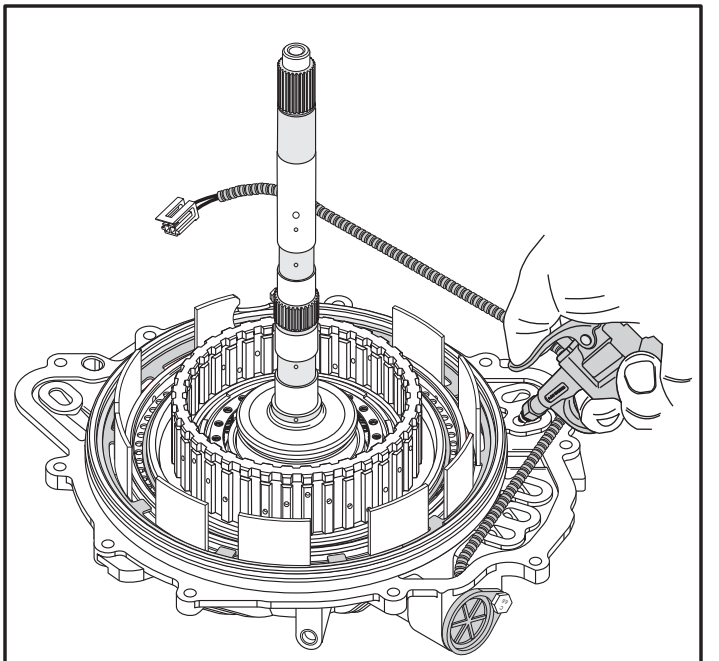


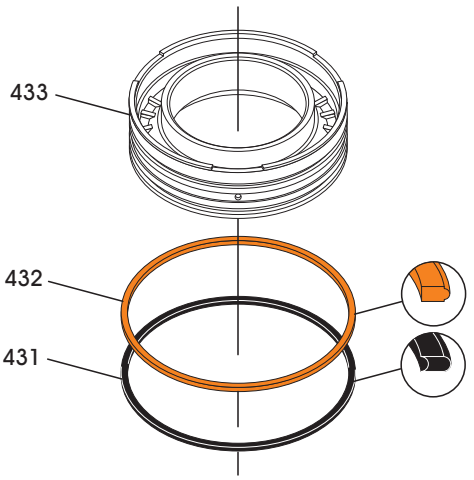
Figure 148

COMPONENT REBUILD

3-5-Rev & 4-5-6 Clutch Housing (Cont'd)

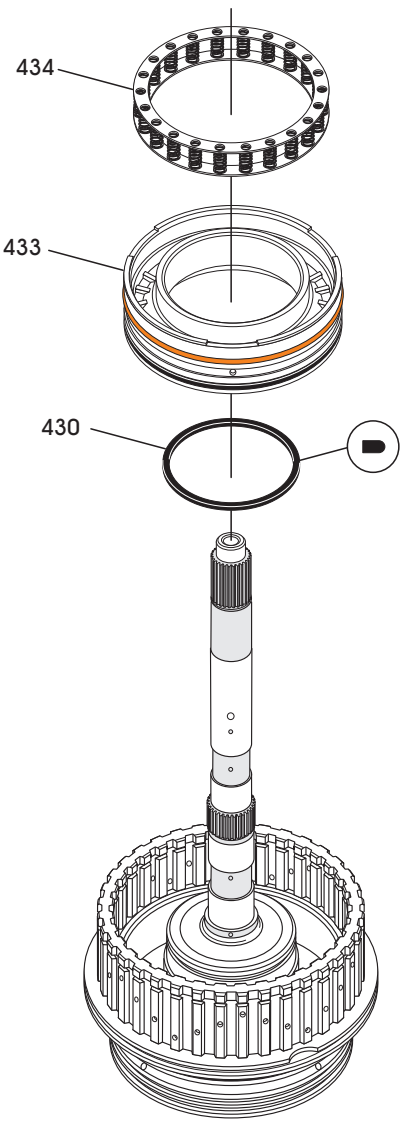
27. Clean all 3-5-Rev & 4-5-6 clutch housing parts thoroughly and dry with compressed air.
28. Inspect all 3-5-Rev & 4-5-6 clutch housing parts thoroughly for any wear or damage and replace as necessary.
29. Install new 4-5-6 clutch piston outer seal into the upper groove, as shown in Figure 149.
    Note: This seal is "Stepped" and orange in color for identification, as shown in Figure 149.
30. Install new 4-5-6 clutch piston outer seal into the lower groove, as shown in Figure 149.
    Note: This seal is "Rounded" and black in color for identification, as shown in Figure 149.
31. Install new 4-5-6 clutch piston inner seal into the clutch housing, as shown in Figure 150, and lube with small amount of Trans-Jel®.
32. Lube the 4-5-6 clutch piston outer seals and the inside diameter of piston with s small amount of Trans-Jel® (See Figure 150).
33. Install 4-5-6 clutch piston assembly into housing, as shown in Figure 150, until fully seated.
34. Install the 4-5-6 clutch piston return spring on top of the piston, as shown in Figure 150.

Continued on Page 92



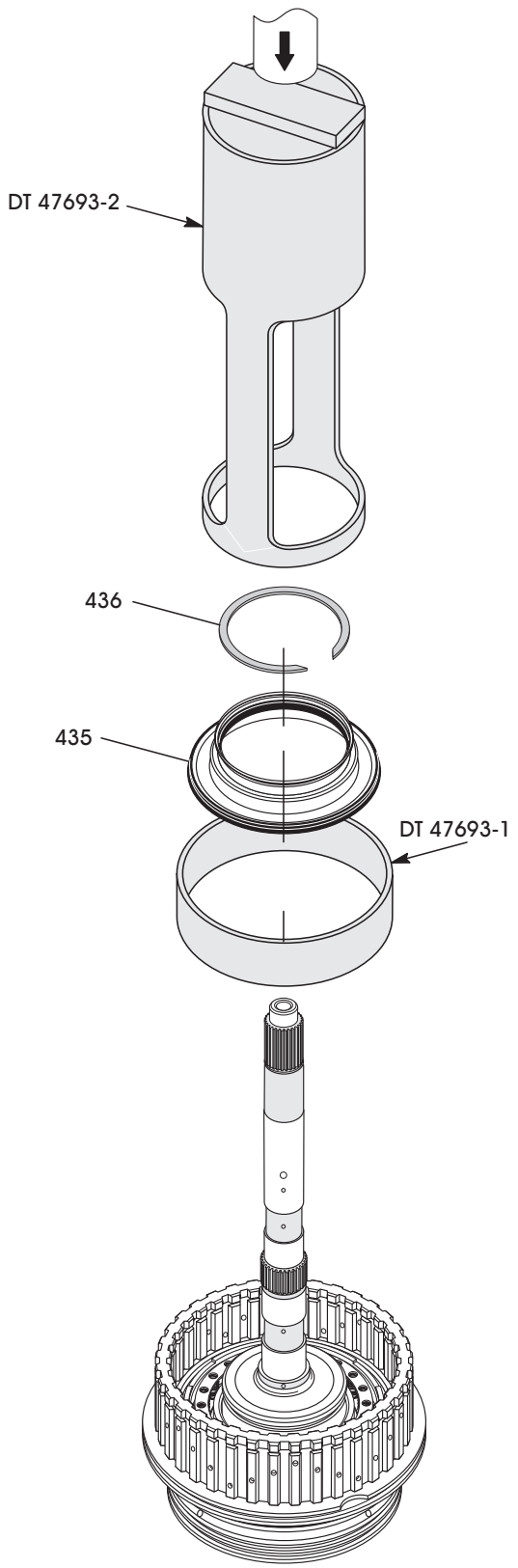
431 4-5-6 CLUTCH PISTON OUTER SEAL (ROUNDED & BLACK).
432 4-5-6 CLUTCH PISTON OUTER SEAL (STEPPED & ORANGE).
433 4-5-6 CLUTCH PISTON.

Figure 149



430 4-5-6 CLUTCH PISTON INNER SEAL.
433 4-5-6 CLUTCH PISTON WITH SEALS.
434 4-5-6 CLUTCH PISTON RETURN SPRING.

Figure 150



435 4-5-6 CLUTCH BALANCE PISTON.
436 4-5-6 CLUTCH BALANCE PISTON SNAP RING.

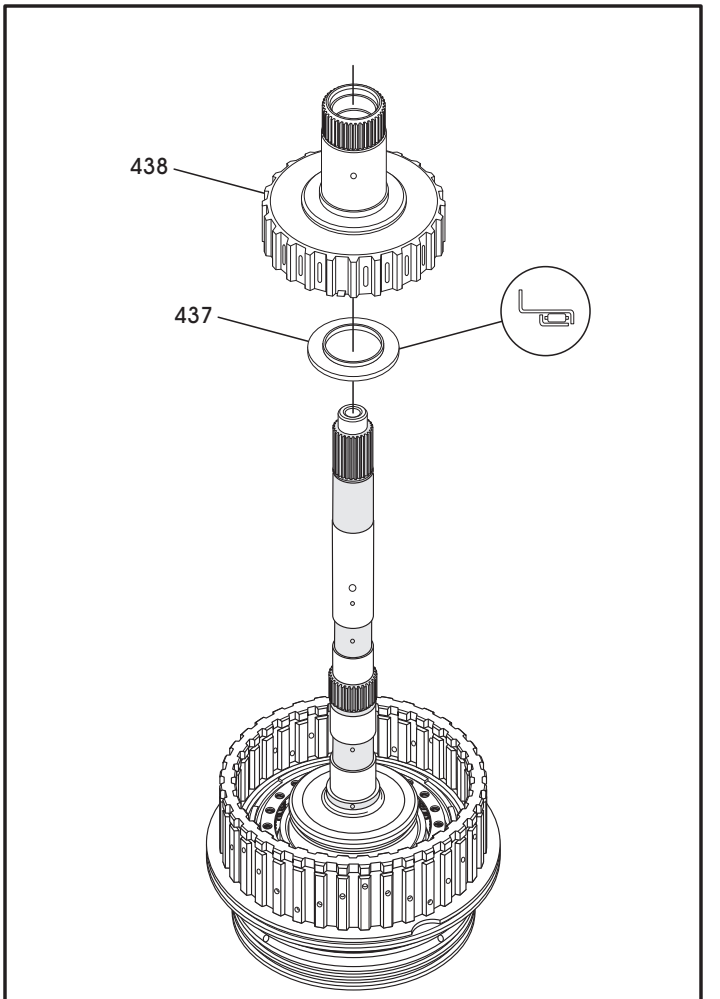
Figure 151

COMPONENT REBUILD

3-5-Rev & 4-5-6 Clutch Housing (Cont'd)

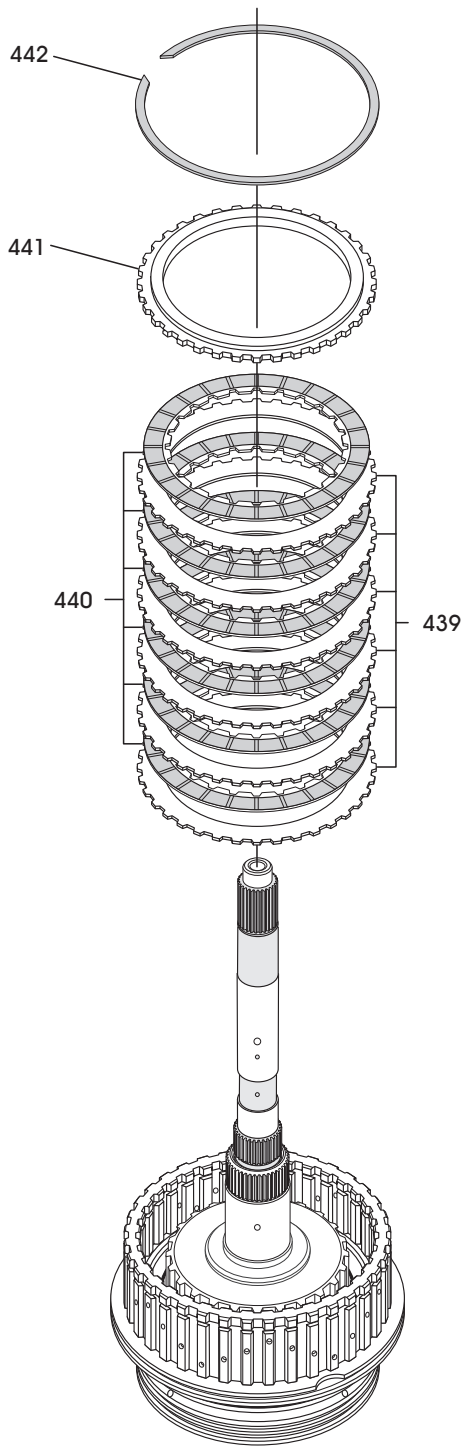
35. Lubricate the seals on the 4-5-6 balance piston and install into housing, as shown in Figure 151, using the seal protector DT-47963-1.
36. Use spring compressor DT-47693-2, as shown in Figure 151, to compress the return spring and install the snap ring.
37. Install the number 10 thrust bearing in direction shown in Figure 152 and retain with a small amount of Trans-Jel®.
38. Install the 4-5-6 clutch hub assembly, as shown in Figure 152, using care not to damage the hub bushings as you pass the splined area on input shaft.

Continued on Page 93



437 NUMBER 10 THRUST BEARING.
438 4-5-6 CLUTCH HUB ASSEMBLY.

Figure 152



439 4-5-6 CLUTCH STEEL PLATES (6 REQUIRED).
440 4-5-6 CLUTCH FRICTION PLATES (6 REQUIRED).
441 4-5-6 CLUTCH BACKING PLATE.
442 4-5-6 CLUTCH BACKING PLATE SNAP RING.

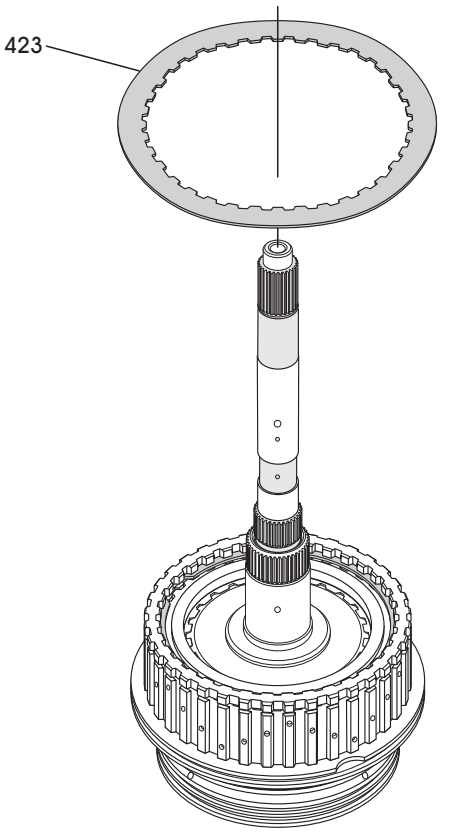
Figure 153

COMPONENT REBUILD

3-5-Rev & 4-5-6 Clutch Housing (Cont'd)

39. Install the 4-5-6 clutch plates, as shown in Figure 153, beginning with a steel plate and alternating with friction plates until you have installed six of each.
    Note: All friction plates should be soaked in proper fluid for 30 minutes before installing.
40. Install the 4-5-6 backing plate, as shown in Figure 153.
41. Install the 4-5-6 clutch backing plate snap ring, as shown in Figure 153, and ensure that it is fully seated.
42. Install ***new*** 3-5-Rev clutch wave plate, as shown in Figure 154.
    Note: The 3-5-Rev clutch wave plate should always be replaced with OEM part number 24254103 (At time of this printing).
    "DO NOT" use the Ford wave plate for a replacement as the thickness is different.
    GM 3-5-Rev clutch wave plate = .051" thick.
    Ford 3-5-Rev clutch wave plate = .030" thick.

Continued on Page 94



423 3-5-REVERSE CLUTCH "WAVED" PLATE.

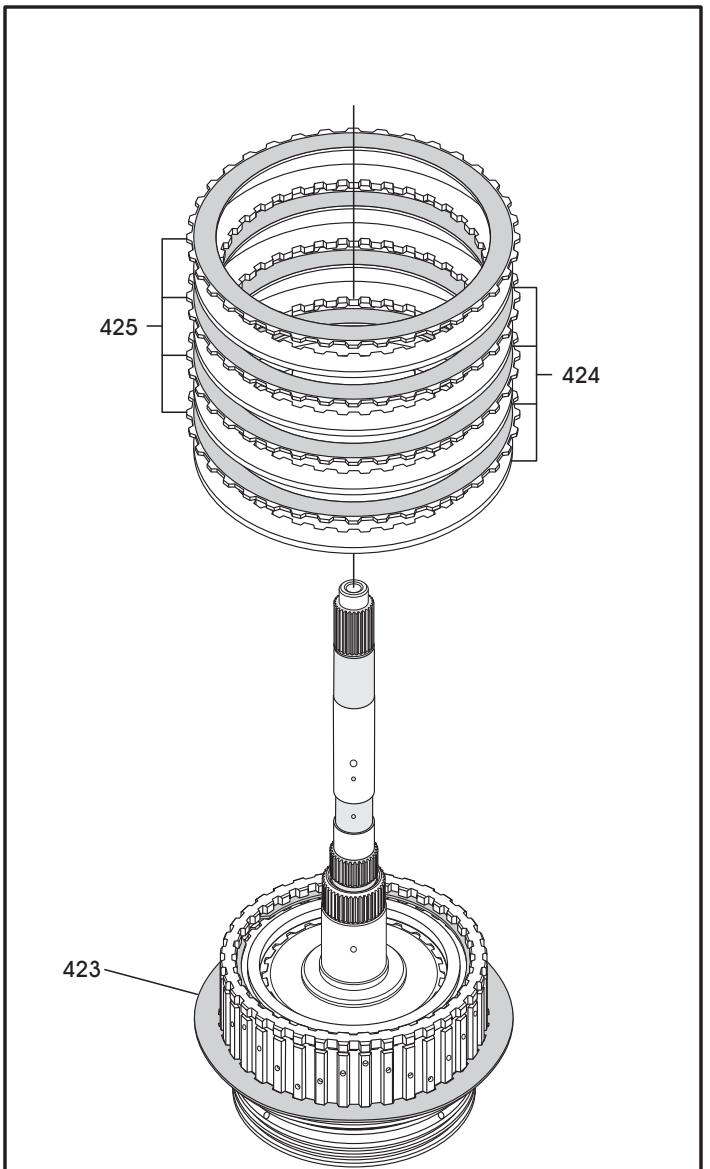
Figure 154

COMPONENT REBUILD

3-5-Rev & 4-5-6 Clutch Housing (Cont'd)

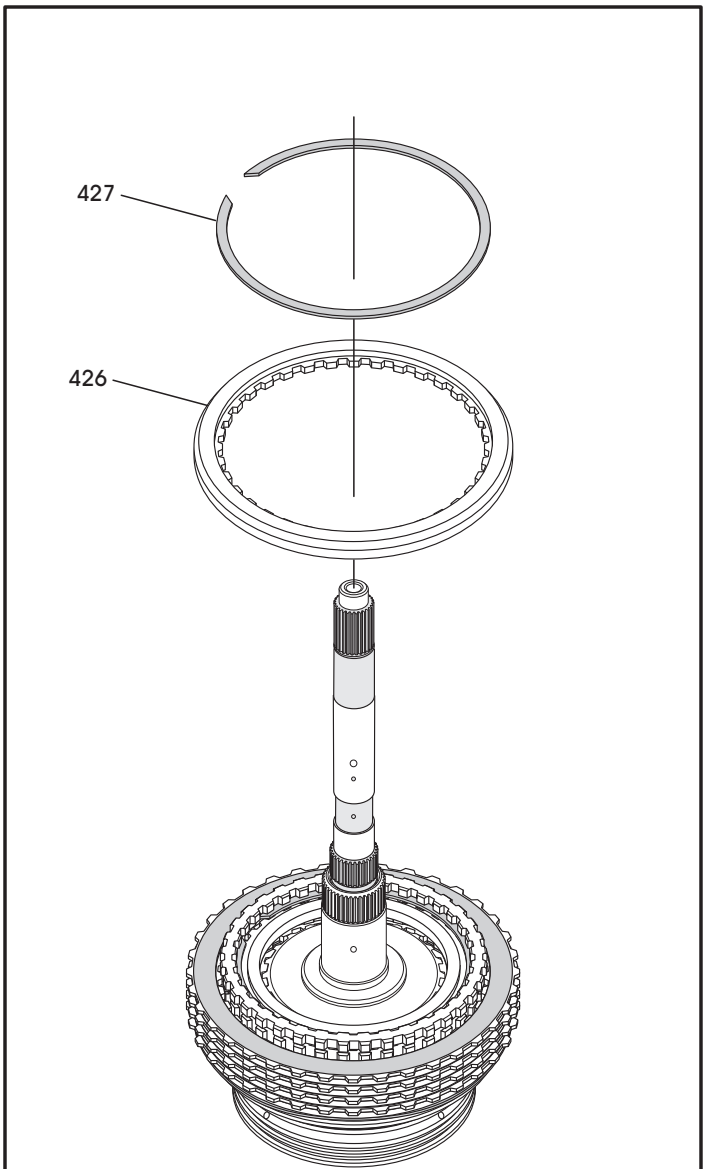
43. Install the 3-5-Rev clutch plates beginning with a steel plate and alternating with friction plates until you have installed four of each, as shown in Figure 155.
    Note: All friction plates should be soaked in proper fluid for 30 minutes before installing.
44. Install the 3-5-Rev clutch backing plate with the flat side facing down, as shown in Figure 156.
45. Install the3-5-Rev clutch backing plate snap ring, as shown in Figure 156, and ensure fully seated.

Continued on Page 95



423 3-5-REVERSE CLUTCH "WAVED" PLATE ***(NEW)***.
424 3-5-REVERSE CLUTCH STEEL PLATE, .115" (4 REQUIRED).
425 3-5-REVERSE CLUTCH FRICTION PLATES (4 REQUIRED).

Figure 155



426 3-5-REVERSE CLUTCH BACKING PLATE.
427 3-5-REVERSE CLUTCH BACKING PLATE SNAP RING.

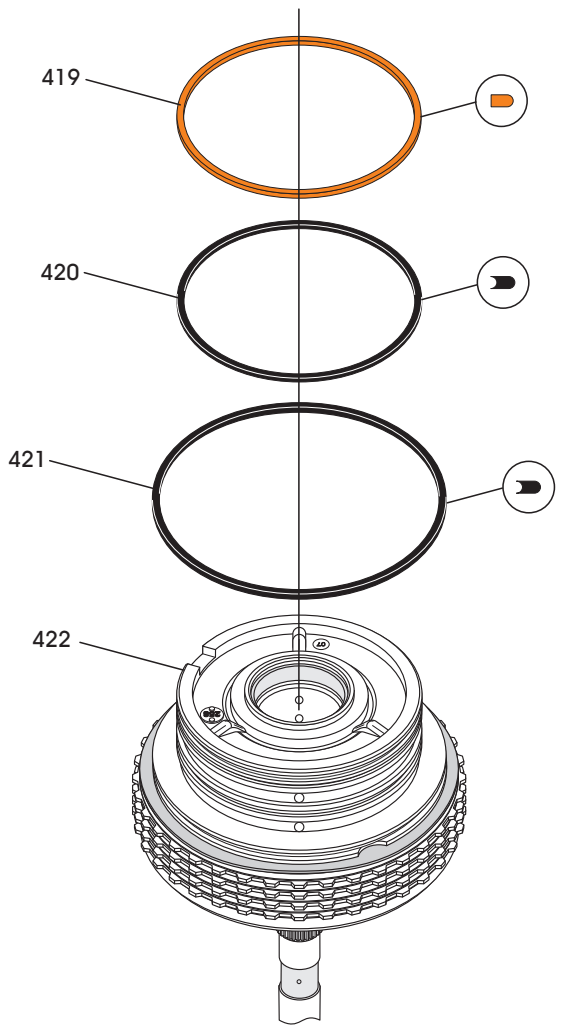
Figure 156

COMPONENT REBUILD

3-5-Rev & 4-5-6 Clutch Housing (Cont'd)

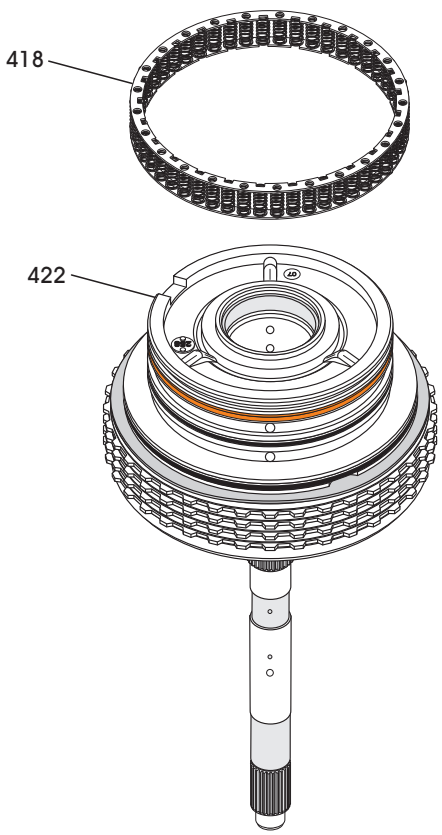
46. Install new 3-5-Rev clutch piston dam seal into the lower groove (largest diameter), as shown in Figure 157, and ensure that it is not twisted.
47. Install new 3-5-Rev clutch piston inner seal that is black in color into next groove up, as shown in Figure 157, and ensure that it is not twisted.
48. Install new 3-5-Rev clutch piston inner seal that is orange in color into the top seal groove, as shown in Figure 157, and ensure that it is not twisted.
49. Lubricate all three inner piston seals with a small amount of Trans-Jel®.
50. Install the 3-5-Rev clutch piston return spring, as shown in Figure 158.

Continued on Page 96



419 3-5-REVERSE CLUTCH PISTON INNER SEAL (ORANGE).
420 3-5-REVERSE CLUTCH PISTON INNER SEAL (BLACK).
421 3-5-REVERSE CLUTCH PISTON DAM SEAL.
422 3-5-REV & 4-5-6 CLUTCH HOUSING ASSEMBLY.

Figure 157



418 3-5-REVERSE CLUTCH PISTON RETURN SPRING.
422 3-5-REV & 4-5-6 CLUTCH HOUSING ASSEMBLY.

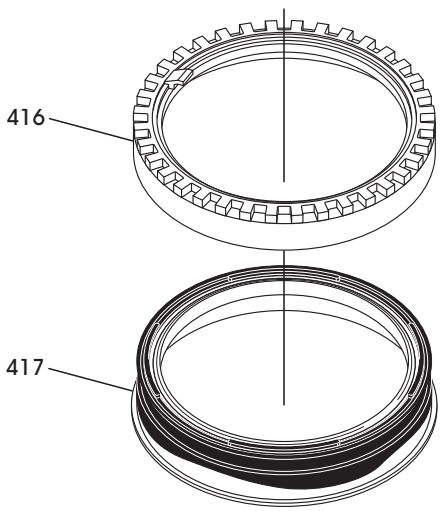
Figure 158

COMPONENT REBUILD

3-5-Rev & 4-5-6 Clutch Housing (Cont'd)

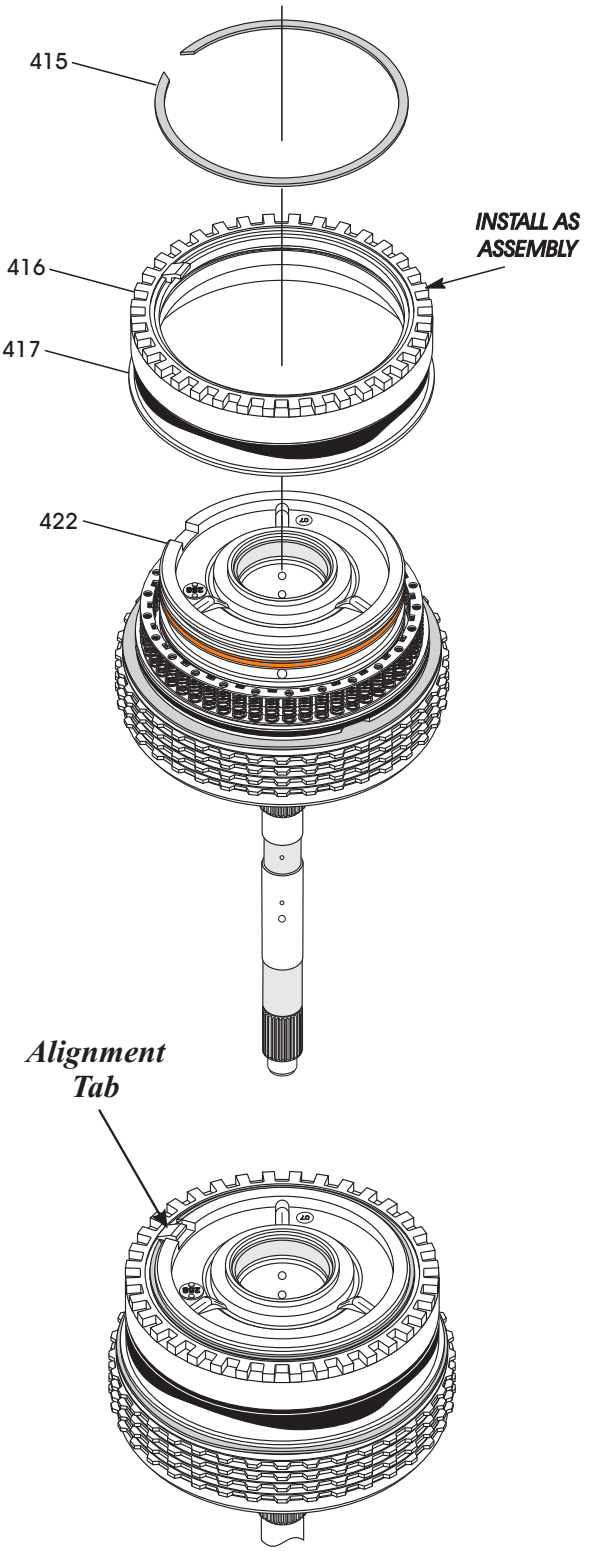
51. Lubricate the lip seals of 3-5-Rev clutch piston and install into the speed sensor reluctor ring, as shown in Figure 159.
52. Lubricate both inside diameters of the piston and the inside diameter of reluctor ring with a small amount of Trans-Jel®.
53. Install the reluctor wheel and 3-5-Rev piston as an assembly, as shown in Figure 160.
    Note: The reluctor ring must be rotated so that alignment tab fits into the slot in the housing, as shown in Figure 160.

Continued on Page 97



416 INPUT SHAFT SPEED SENSOR RELUCTOR RING.
417 3-5-REVERSE CLUTCH PISTON.

Figure 159



415 INPUT SHAFT SPEED SENSOR RELUCTOR RING SNAP RING.
416 INPUT SHAFT SPEED SENSOR RELUCTOR RING.
417 3-5-REVERSE CLUTCH PISTON.
422 3-5-REV & 4-5-6 CLUTCH HOUSING ASSEMBLY.

Figure 160

COMPONENT REBUILD

3-5-Rev & 4-5-6 Clutch Housing (Cont'd)

54. Compress the input speed sensor reluctor ring just enough to install the snap ring using spring compressor tool, as shown in Figure 161.
    Note: Over compressing the reluctor ring will break the alignment tab and clutch housing.
55. Install the snap ring with alignment tab centered in the snap ring opening (See Figure 160).
56. Install the number 11 thrust bearing in direction shown in Figure 162 and retain with a small amount of Trans-Jel®.
57. Install the completed 3-5-Rev & 4-5-6 clutch housing into the completed rear cover assembly, as shown in Figure 163.
58. Carefully apply shop air, regulated to 40 psi, as shown in Figure 163, and observe the movement of the 4-5-6 clutch piston and the 3-5-Rev clutch piston.
    Note: Pressure higher than 40 psi could cause the piston to over travel and damage the piston seals.
59. Set completed 3-5-Rev & 4-5-6 clutch housing aside for the final assembly process.

Component Rebuild
Continued on Page 98

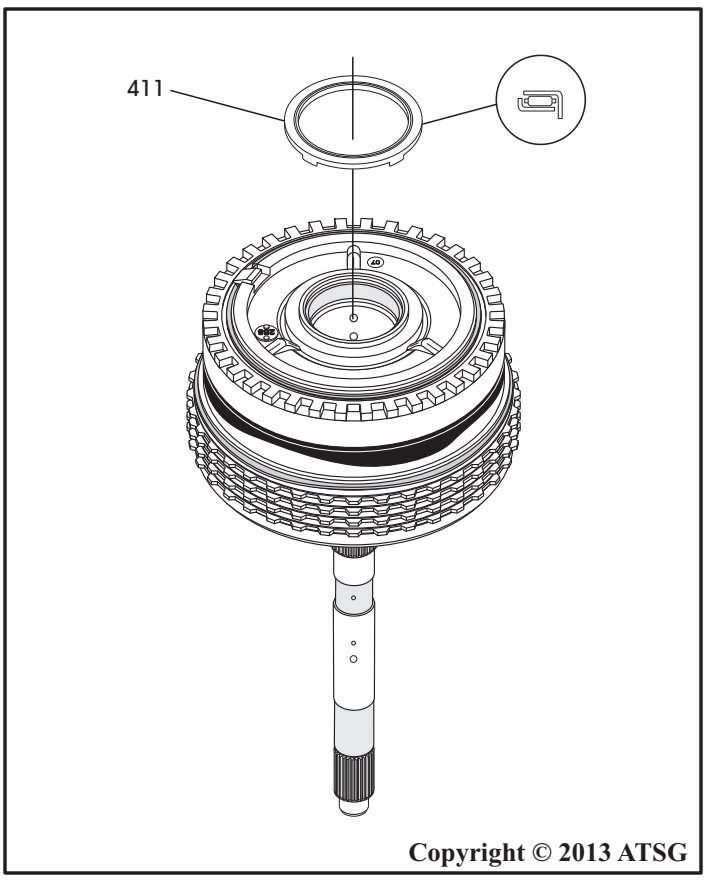


Figure 162

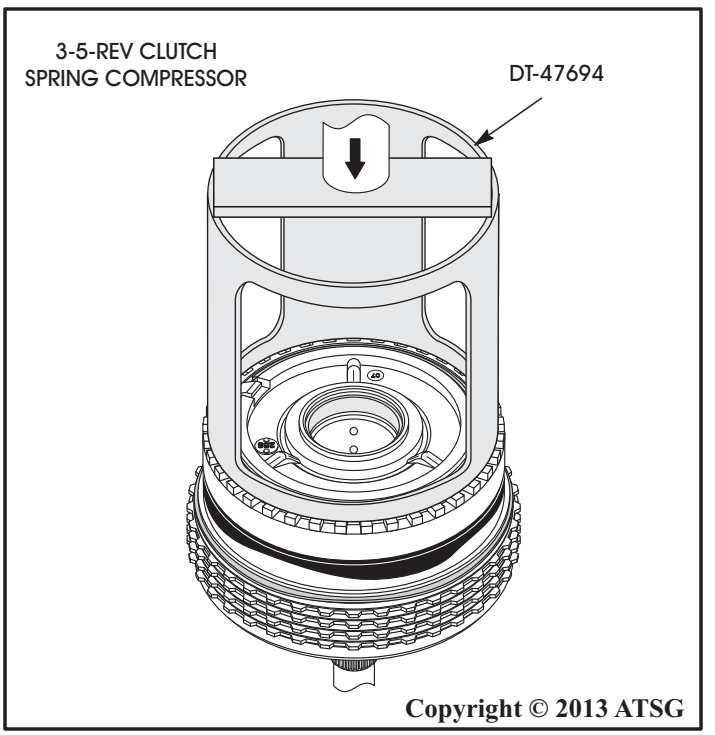
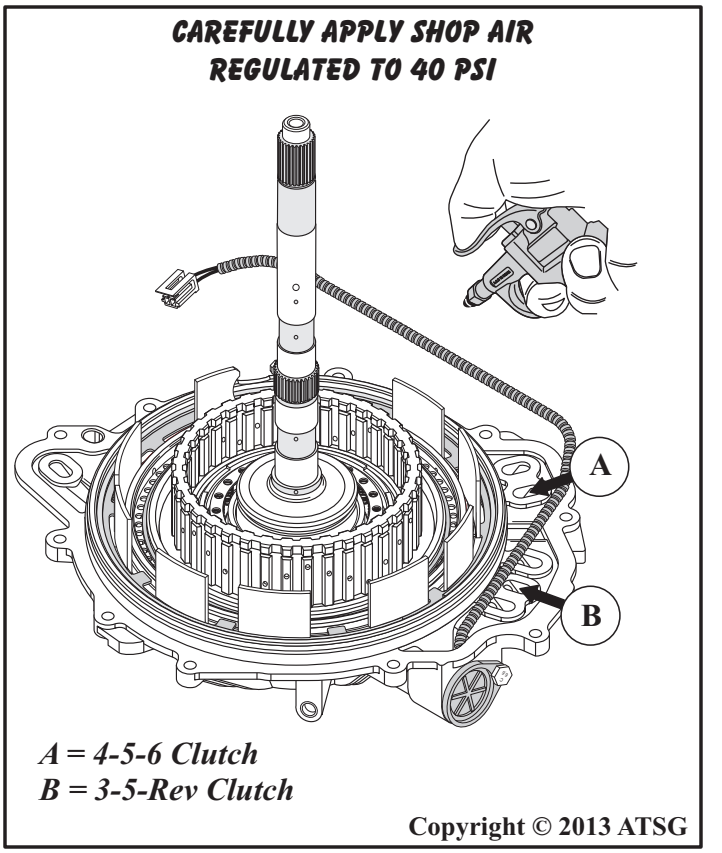


Figure 161



A = 4-5-6 Clutch
B = 3-5-Rev Clutch

Figure 163

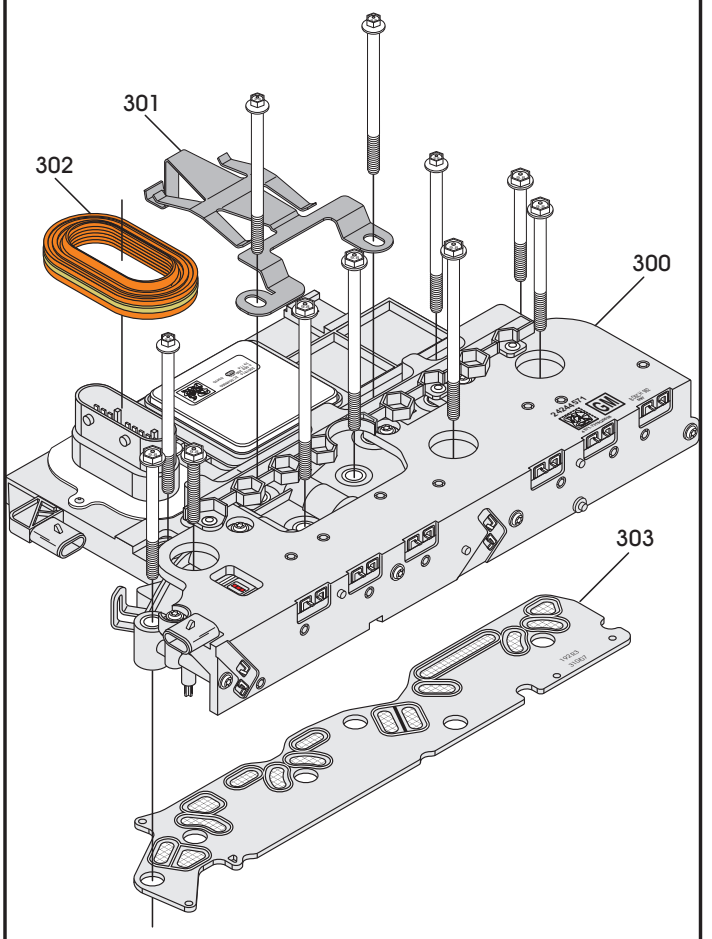
COMPONENT REBUILD

Solenoid Body & TCM Assembly

1. Remove the solenoid body filter plate assembly, as shown in Figure 164.
   Note: Use care when removing the filter plate assembly as the locating pins are fragile and easily broken.
2. Remove and discard the solenoid body to side cover seal assembly, as shown in Figure 164.
3. Inspect the diaphragm in each of the pressure switches for tearing and/or damage. This has been a common concern for the 6T70/75.
   Note: If there is damage to any of the switches the Solenoid Body and TCM assembly must be replaced as the switches are not serviced.
4. We have provided you with a chart of "actual" solenoid resistance readings in Figure 165, from a known good working unit.
5. Check the solenoids across the terminals shown in Figure 165 for the proper resistance.
   Note: If any of the resistance readings are off, the Solenoid Body and TCM assembly must be replaced as the solenoids are not serviced.
   Note: There is also a Solenoid Test Plate Kit available from your local dealer that will allow you to pressure test the solenoids under OEM part number DT 47825 (See Page 142).

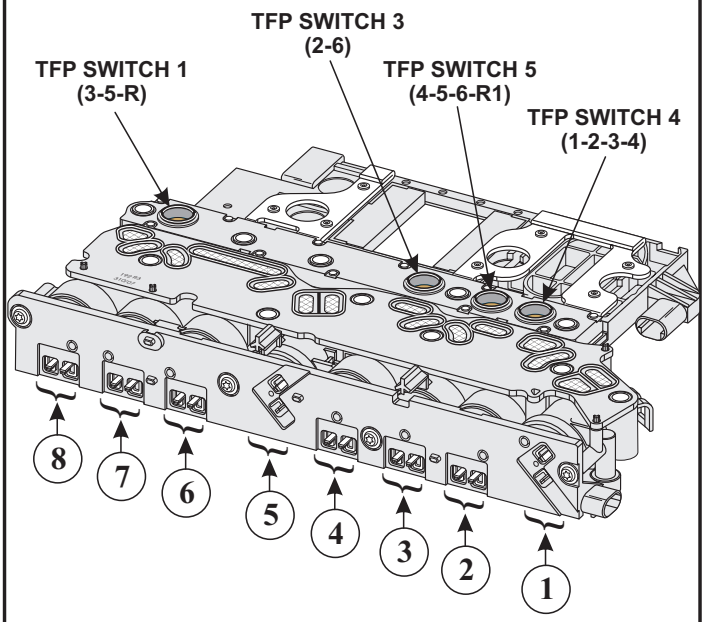
Continued on Page 99

SOLENOID BODY AND TCM ASSEMBLY EXPLODED VIEW



300 SOLENOID BODY AND TCM ASSEMBLY.
301 SOLENOID BODY RETAINING SPRING.
302 SOLENOID BODY TO SIDE COVER SEAL ASSEMBLY.
303 SOLENOID BODY FILTER PLATE ASSEMBLY.

Figure 164

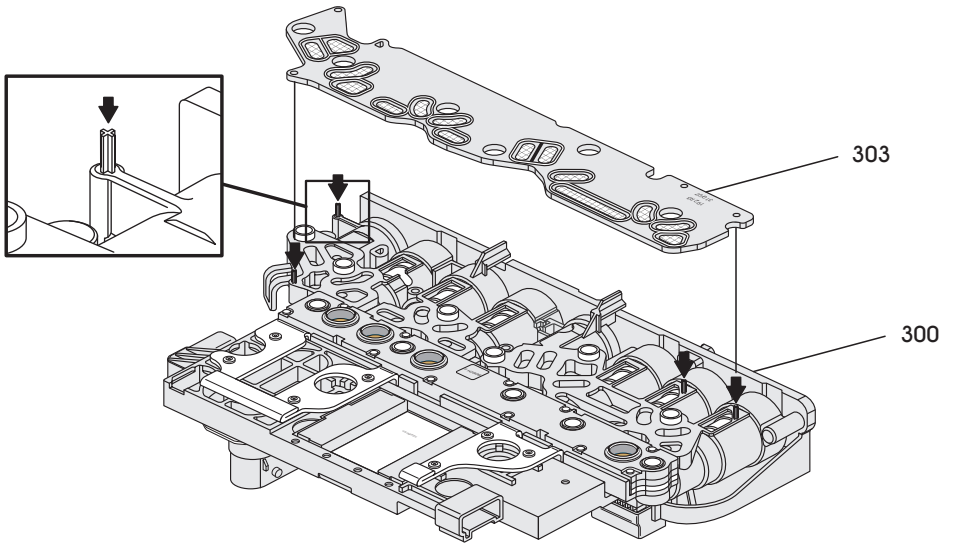


"Actual" Solenoid Resistance Chart

Number	*Description*	** Ohms Resistance*
1	*Shift Solenoid 1 (On/Off)*	*23.9 Ohms*
2	*CPC Solenoid 3, PWM (NH)*	*5.3 Ohms*
3	*CPC Solenoid 5, PWM (NL)*	*5.3 Ohms*
4	*TCC Solenoid, PWM (NL)*	*5.3 Ohms*
5	*Shift Solenoid 2 (On/Off)*	*23.9 Ohms*
6	*CPC Solenoid 2, PWM (NH)*	*5.3 Ohms*
7	*CPC Solenoid 4, PWM (NL)*	*5.3 Ohms*
8	*Line Pressure Solenoid, PWM (NH)*	*5.3 Ohms*

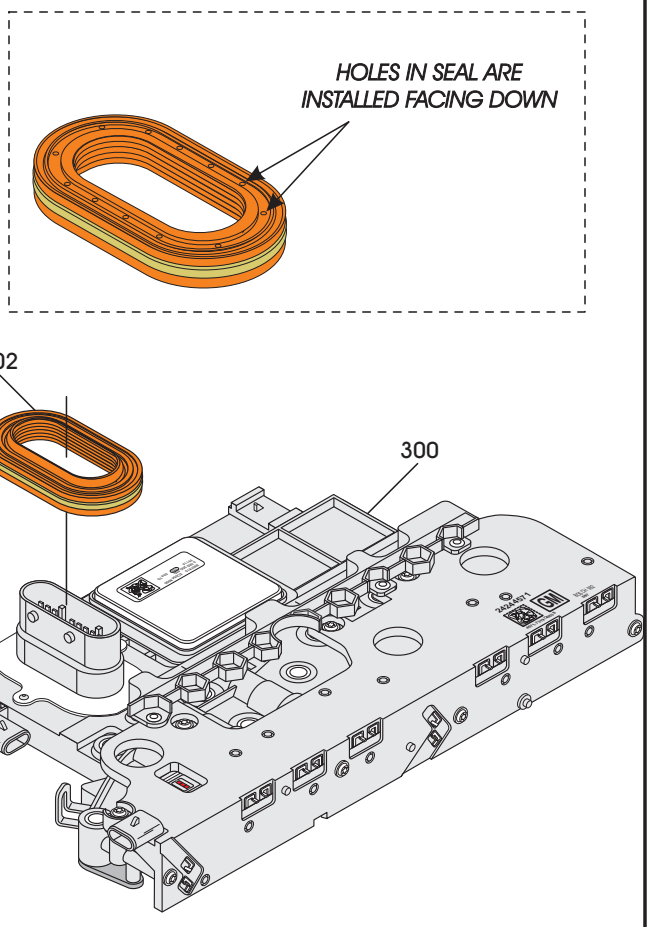
**Actual Ohms Resistance @ Room Temperature*

Figure 165



300 SOLENOID BODY AND TCM ASSEMBLY.
303 SOLENOID BODY FILTER PLATE ASSEMBLY.

Figure 166



300 SOLENOID BODY AND TCM ASSEMBLY.
302 SOLENOID BODY TO SIDE COVER SEAL ASSEMBLY.

Figure 167

COMPONENT REBUILD

Solenoid Body & TCM Assembly

6. Install a new filter plate assembly, as shown in Figure 166, over the four locating pins and fully seated against the solenoid body.
   Note: Use care when installing the filter plate assembly as the locating pins are fragile and easily broken.
7. Install a new solenoid body to side cover seal assembly, as shown in Figure 167.
   Note: Holes in seal must face down.
8. Set the completed Solenoid Body & TCM assembly aside for the final assembly process.

Component Rebuild
Continued on Page 100

COMPLETED SOLENOID BODY & TCM ASSEMBLY

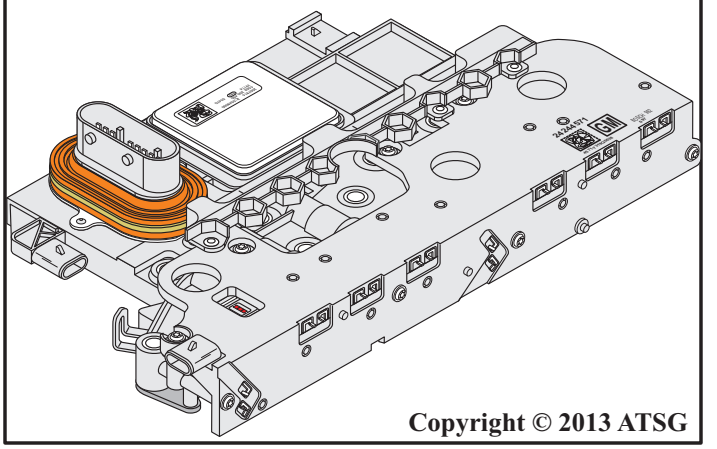


Figure 168

VALVE BODY ASSEMBLY, EXPLODED VIEW

305 CHANNEL PLATE UPPER SUPPORT PLATE (BONDED GASKET).
306 UPPER VALVE BODY ASSEMBLY.
319 STEEL CHECK BALLS, .250" DIAMETER (9 REQUIRED).
336 LOWER VALVE BODY SPACER PLATE (BONDED GASKETS).
337 LOWER VALVE BODY ASSEMBLY.
352 VALVE BODY CHANNEL PLATE ASSEMBLY.
353 ACTUATOR FEED ACCUMULATOR PISTON (3 REQ.).
354 ACTUATOR FEED ACCUMULATOR PISTON SPRING (3 REQ.).
355 CHANNEL PLATE TO UPPER VALVE BODY SPACER PLATE.
356 SPACER PLATE PLASTIC RETAINERS.

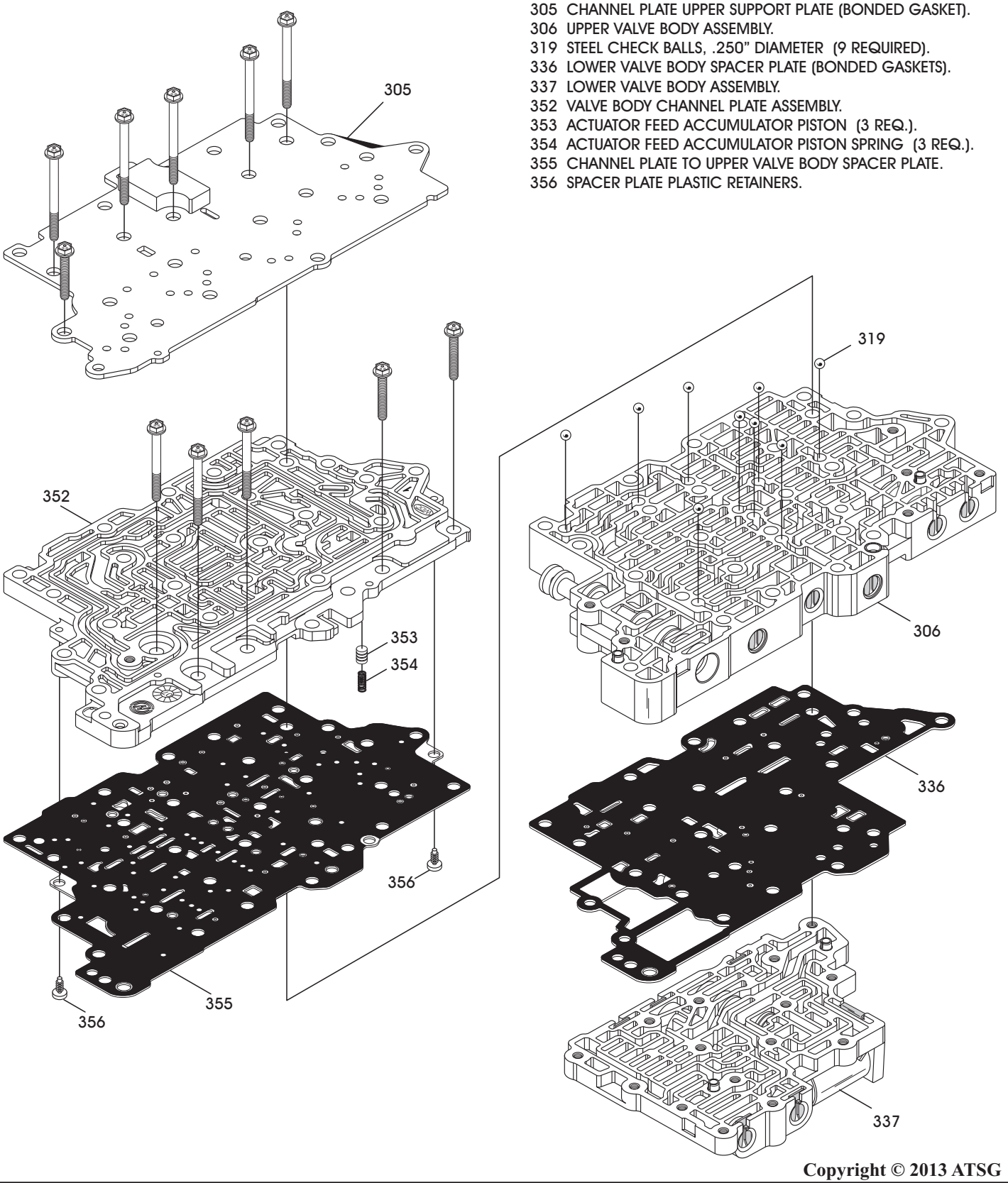


Figure 169

COMPONENT REBUILD

Valve Body Assembly

1. We have provided you with an exploded view of the valve body assembly in Figure 169.
2. Place the valve body assembly on a flat work surface, as shown in Figure 170.
   Note: There is an aluminum block permanently attached to the steel upper support plate, as shown in Figure 170, that acts as a heat-sink for the TCM which is part of the solenoid body.
3. Remove the five 65 mm bolts (357) and the one 35 mm bolt (358) that retains the upper channel plate support plate (305), as shown in Figure 171 and remove the upper support plate.
4. Remove the two 55 mm bolts (359) and the two 35 mm bolts (358), as shown in Figure 171.

Continued on Page 102

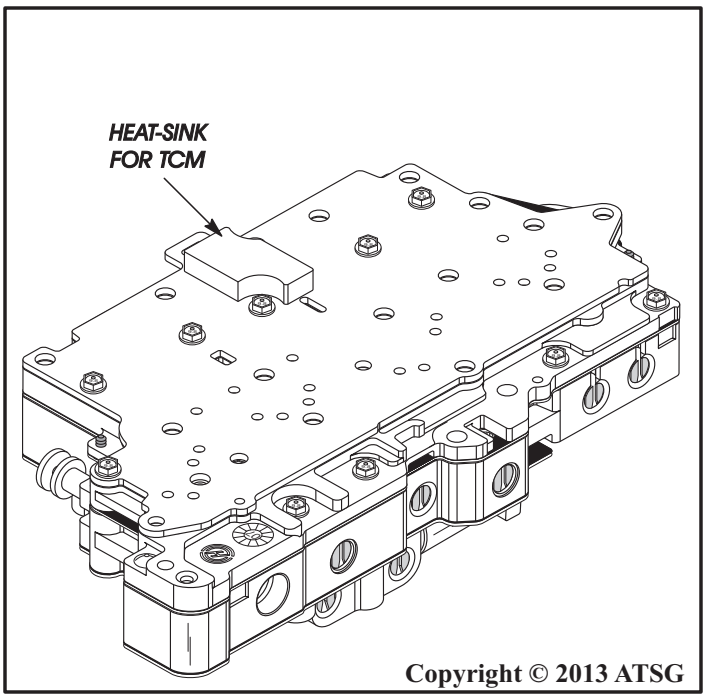
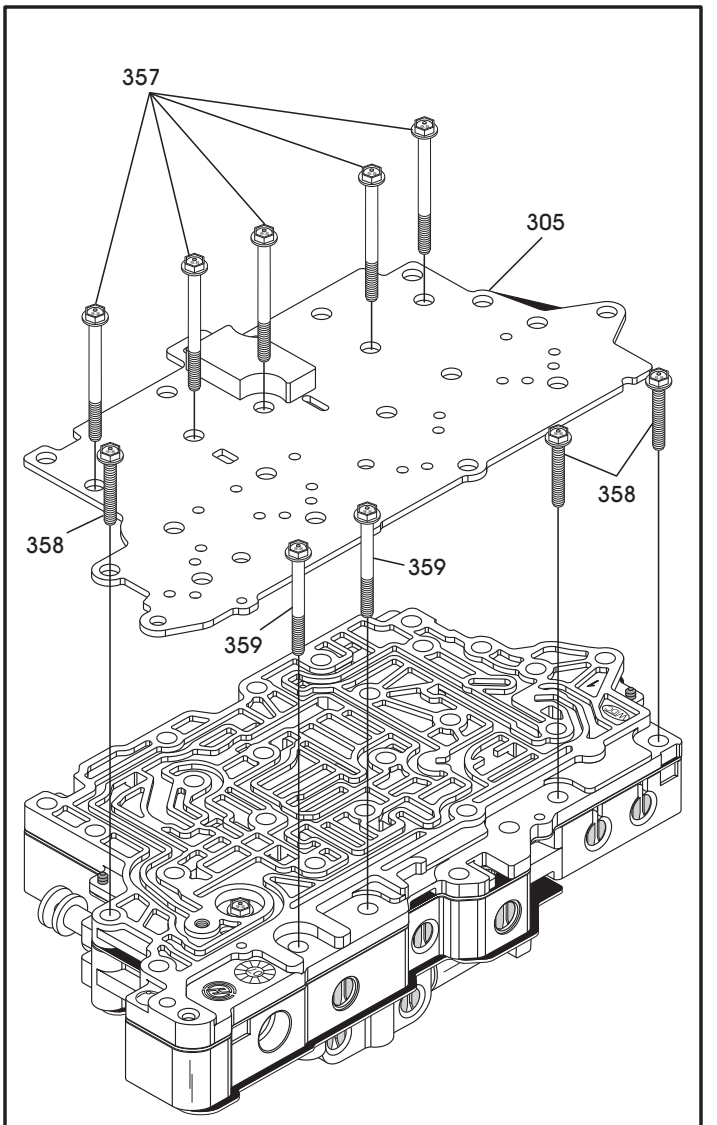


Figure 170



305 CHANNEL PLATE UPPER SUPPORT PLATE.
357 VALVE BODY BOLT, 65MM (5 REQUIRED).
358 VALVE BODY BOLT, 35MM (3 REQUIRED).
359 VALVE BODY BOLT, 55MM (2 REQUIRED)

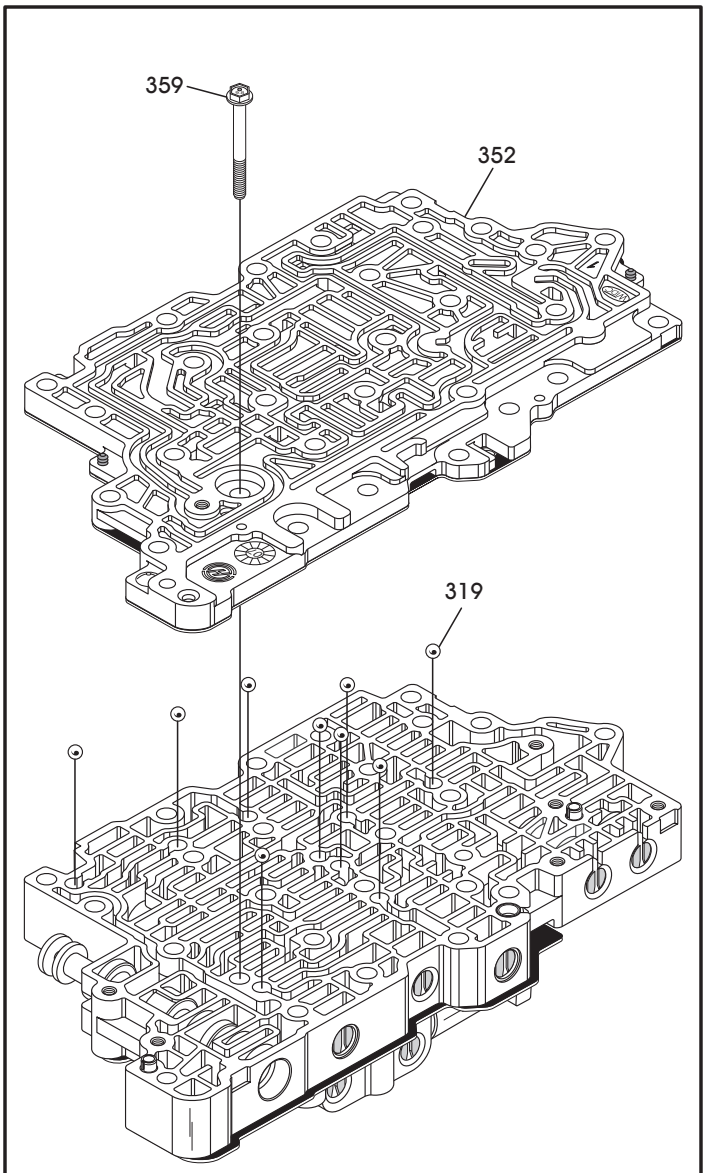
Figure 171

COMPONENT REBUILD

Valve Body Assembly (Cont'd)

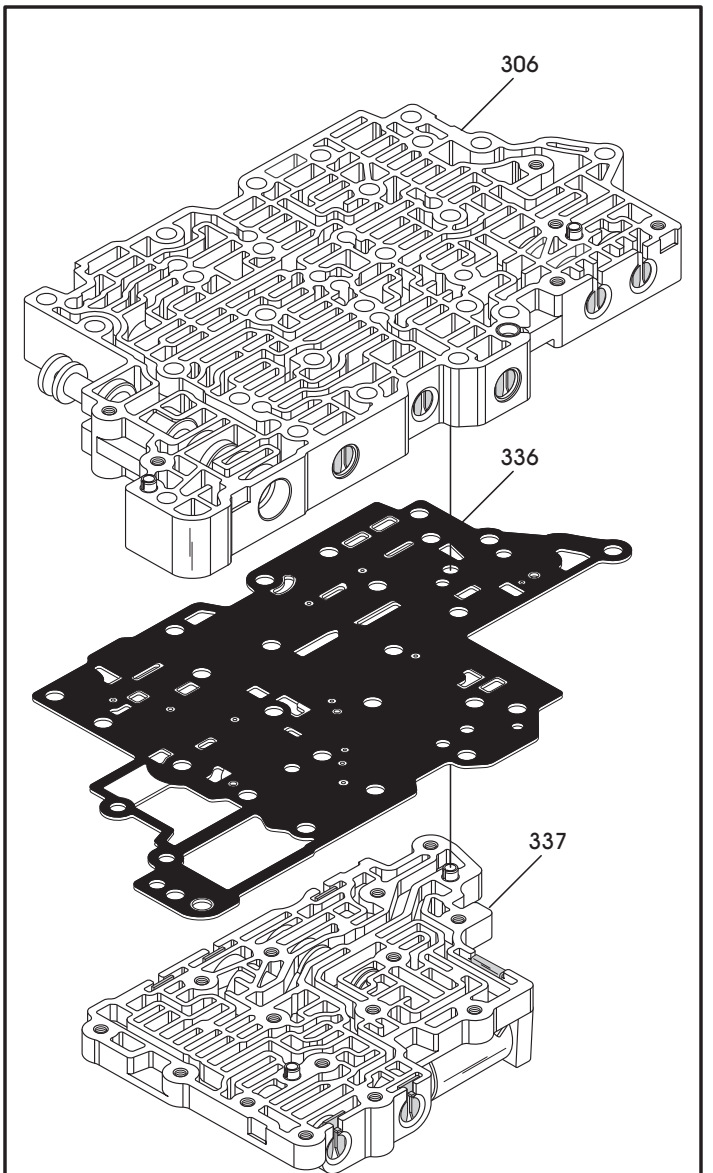
5. Remove one 55 mm bolt that is left, as shown in Figure 172, and remove the valve body channel plate and upper spacer plate assembly.
   Note: Upper spacer plate is held in place on the channel plate with two plastic retainers.
6. Remove the nine 1/4" steel check balls from the upper valve body, as shown in Figure 172.
7. Remove upper valve body assembly, as shown in Figure 173.
8. Remove the lower valve body spacer plate, as shown in Figure 173.

Continued on Page 103



319 STEEL CHECK BALLS, .250" DIAMETER (9 REQUIRED).
352 VALVE BODY CHANNEL PLATE ASSEMBLY.
359 VALVE BODY BOLT, 55MM (1 REQUIRED).

Figure 172



306 UPPER VALVE BODY ASSEMBLY.
336 LOWER VALVE BODY SPACER PLATE (BONDED GASKETS).
337 LOWER VALVE BODY ASSEMBLY.

Figure 173

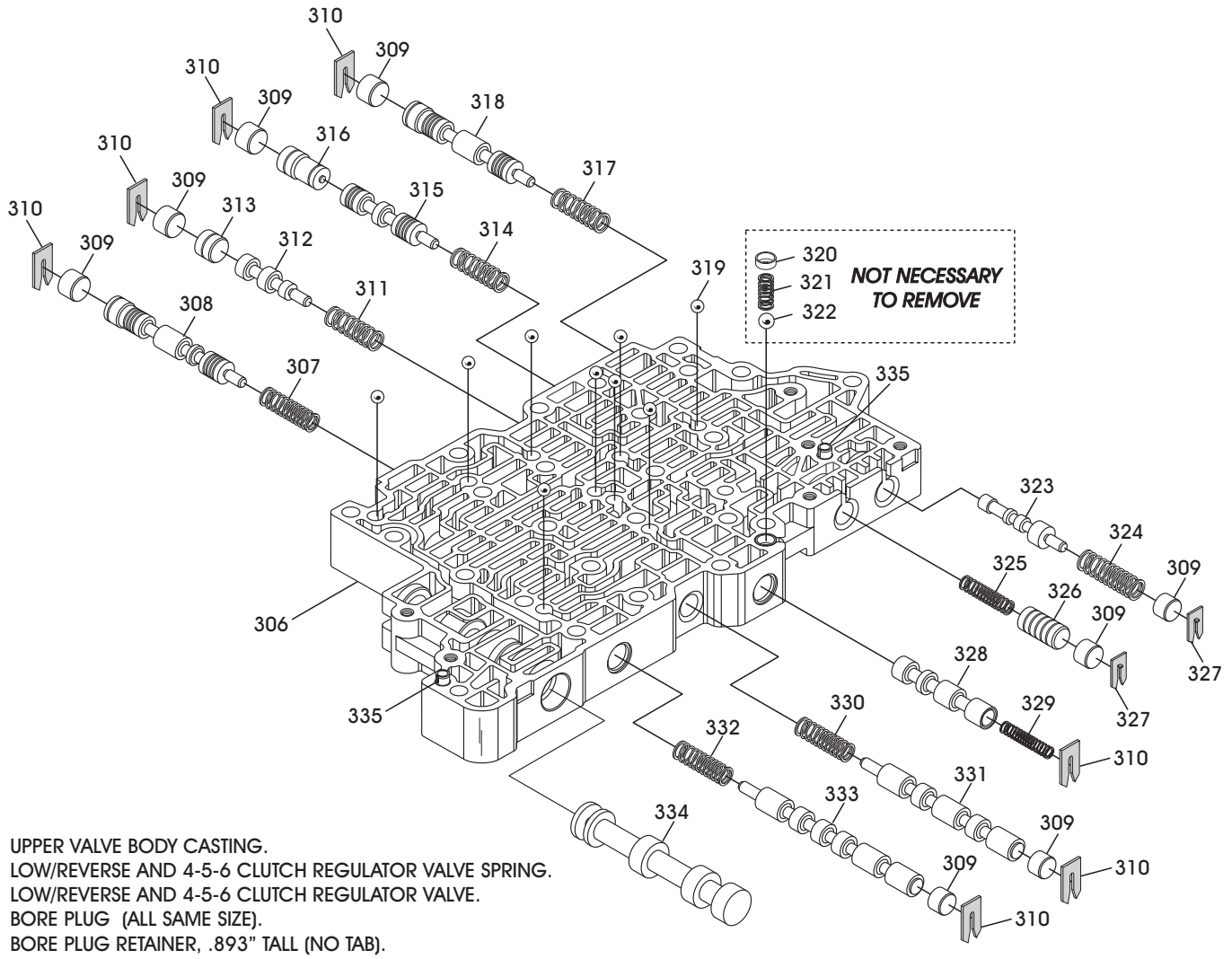
COMPONENT REBUILD

Valve Body Assembly (Cont'd)

9. Disassemble upper valve body and place valves, springs, bore plugs and retainers on appropriate trays exactly as they are removed, as shown in Figure 174.
10. It is not necessary to remove TCC blow-off ball unless damaged.
11. Clean all upper valve body parts thoroughly and dry with compressed air.

Continued on Page 104

UPPER VALVE BODY, EXPLODED VIEW



306 UPPER VALVE BODY CASTING.
307 LOW/REVERSE AND 4-5-6 CLUTCH REGULATOR VALVE SPRING.
308 LOW/REVERSE AND 4-5-6 CLUTCH REGULATOR VALVE.
309 BORE PLUG (ALL SAME SIZE).
310 BORE PLUG RETAINER, .893" TALL (NO TAB).
311 TCC REGULATOR APPLY VALVE SPRING.
312 TCC REGULATOR APPLY VALVE.
313 TCC REGULATOR VALVE SHUTTLE VALVE.
314 2-6 CLUTCH REGULATOR VALVE SPRING.
315 2-6 CLUTCH REGULATOR VALVE.
316 2-6 CLUTCH REGULATOR VALVE GAIN VALVE.
317 3-5-REVERSE CLUTCH REGULATOR VALVE SPRING.
318 3-5-REVERSE CLUTCH REGULATOR VALVE.
319 STEEL CHECK BALLS, .250" DIAMETER (9 REQUIRED).
320 TCC RELEASE BLOW-OFF CUP PLUG.
321 TCC RELEASE BLOW-OFF SPRING.
322 TCC RELEASE BLOW-OFF BALL.
323 PRESSURE REGULATOR VALVE.
324 PRESSURE REGULATOR VALVE SPRING.
325 ISOLATOR VALVE SPRING.
326 ISOLATOR VALVE.
327 BORE PLUG RETAINER, .730" TALL (WITH TAB & FACES OUT).
328 TORQUE CONVERTER CLUTCH CONTROL VALVE
329 TORQUE CONVERTER CLUTCH CONTROL VALVE SPRING.
330 CLUTCH SELECT SOLENOID VALVE NO. 3 SPRING.
331 CLUTCH SELECT SOLENOID VALVE NO. 3 VALVE.
332 CLUTCH SELECT SOLENOID VALVE NO. 2 SPRING
333 CLUTCH SELECT SOLENOID VALVE NO. 2 VALVE.
334 MANUAL VALVE.
335 HOLLOW LOCATOR DOWEL.

Figure 174

COMPONENT REBUILD

Valve Body Assembly (Cont'd)

12. Inspect all upper valve body parts thoroughly for any wear and/or damage.
13. Assemble the upper valve body parts ***exactly***, as shown in Figure 174, and lube with the proper fluid as they are installed.
    Note: There are 3 different size retainers used in upper and lower valve bodies. Dimensions and illustration numbers are in Figure 175.
14. Disassemble lower valve body and place valves, springs, bore plugs and retainers on appropriate trays exactly as they are removed, as shown in Figure 176.
15. Clean all lower valve body parts thoroughly and dry with compressed air.
16. Inspect all lower valve body parts thoroughly for any wear and/or damage.
    Note: The valve body is serviced only as a complete assembly.
17. Assemble the lower valve body parts ***exactly***, as shown in Figure 176, and lube with the proper fluid as they are installed.

Continued on Page 105

Upper And Lower Valve Body Retainers

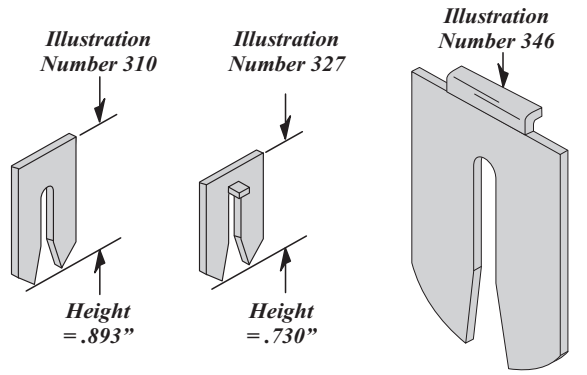
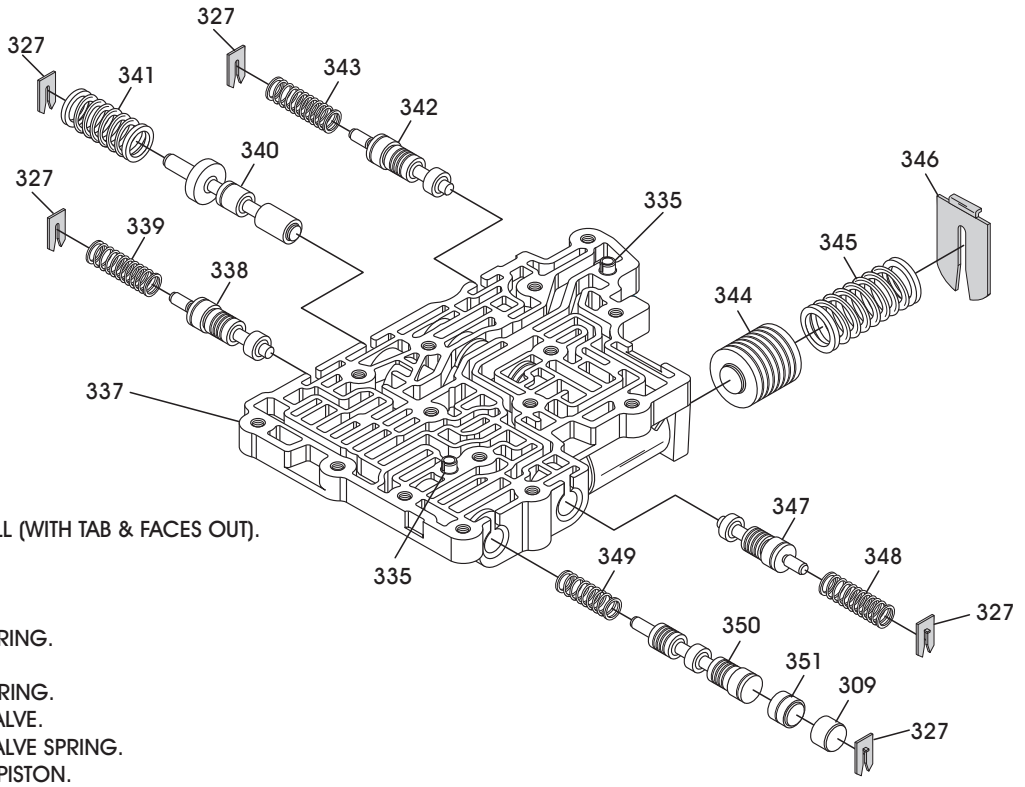


Figure 175

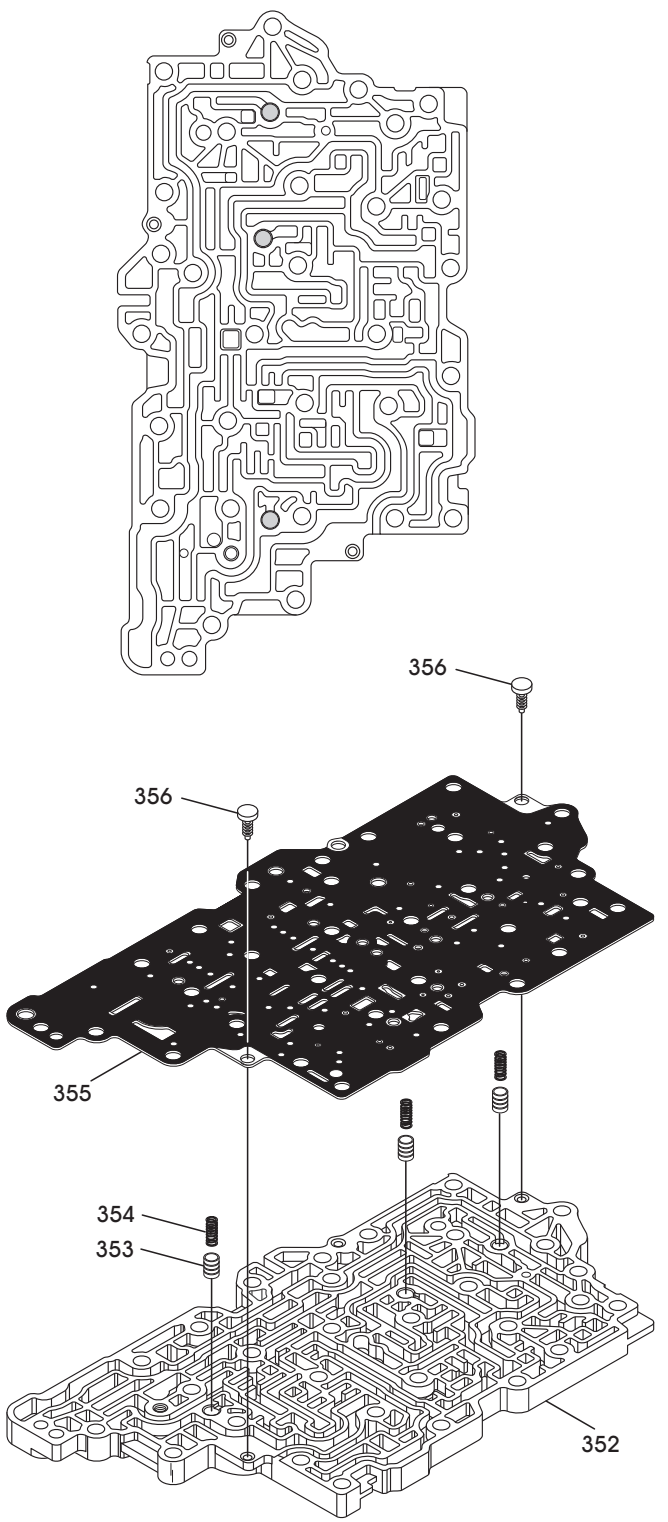
LOWER VALVE BODY, EXPLODED VIEW



309 BORE PLUG (ALL SAME SIZE).
327 BORE PLUG RETAINER, .730" TALL (WITH TAB & FACES OUT).
335 HOLLOW LOCATING DOWEL.
337 LOWER VALVE BODY CASTING.
338 4-5-6 CLUTCH BOOST VALVE.
339 4-5-6 CLUTCH BOOST VALVE SPRING.
340 ACTUATOR FEED LIMIT VALVE.
341 ACTUATOR FEED LIMIT VALVE SPRING.
342 3-5-REVERSE CLUTCH BOOST VALVE.
343 3-5-REVERSE CLUTCH BOOST VALVE SPRING.
344 4-5-6 CLUTCH ACCUMULATOR PISTON.
345 4-5-6 CLUTCH ACCUMULATOR PISTON SPRING.
346 4-5-6 CLUTCH ACCUMULATOR PISTON RETAINER.
347 1-2-3-4 CLUTCH BOOST VALVE.
348 1-2-3-4 CLUTCH BOOST VALVE SPRING.
349 1-2-3-4 CLUTCH REGULATOR VALVE SPRING.
350 1-2-3-4 CLUTCH REGULATOR VALVE.
351 DEFAULT OVERRIDE 1-2-3-4 CLUTCH VALVE.

Figure 176

VALVE BODY CHANNEL PLATE, EXPLODED VIEW



352 VALVE BODY CHANNEL PLATE CASTING.
353 ACTUATOR FEED ACCUMULATOR PISTON (3 REQ.).
354 ACTUATOR FEED ACCUMULATOR PISTON SPRING (3 REQ.).
355 UPPER VALVE BODY TO CHANNEL PLATE SPACER PLATE.
356 CHANNEL PLATE SPACER PLATE RETAINERS (2 REQ.).

Figure 177

COMPONENT REBUILD

Valve Body Assembly (Cont'd)

18. Remove the 2 plastic spacer plate retainers from the channel plate and remove the spacer plate, as shown in Figure 177.
    Note: New retainers are included in most gasket sets.
19. Remove the three accumulator feed pistons and springs, as shown in Figure 177.
20. Clean all channel plate parts thoroughly and dry with compressed air.
21. Inspect all channel plate parts thoroughly for any wear and/or damage.
22. Assemble the three accumulator feed pistons and springs ***exactly***, as shown in Figure 177.
    Note: All 3 accumulator pistons and springs are identical.
23. Install upper spacer plate and gasket assembly onto channel plate, as shown in Figure 177.
24. Install 2 ***new*** upper spacer plate plastic retainers, as shown in Figure 177.

Continued on Page 106

COMPONENT REBUILD

Valve Body Assembly (Cont'd)

25. Check the height of all hollow locating dowels, as shown in Figure 178.
26. All hollow locating dowels should protrude as follows; 3.3 - 4.3mm (.130" - .170").
27. Place the completed lower valve body on a flat work surface, as shown in Figure 179.
28. Install the lower spacer plate onto lower valve body and over the locating dowels, as shown in Figure 179.
29. Place the completed upper valve body onto the lower spacer plate and over the locating dowels, as shown in Figure 179.
    Note: There is a valve body guide pin kit (3) available under Kent-Moore part number J-39068 (See Page 142).

Continued on Page 107

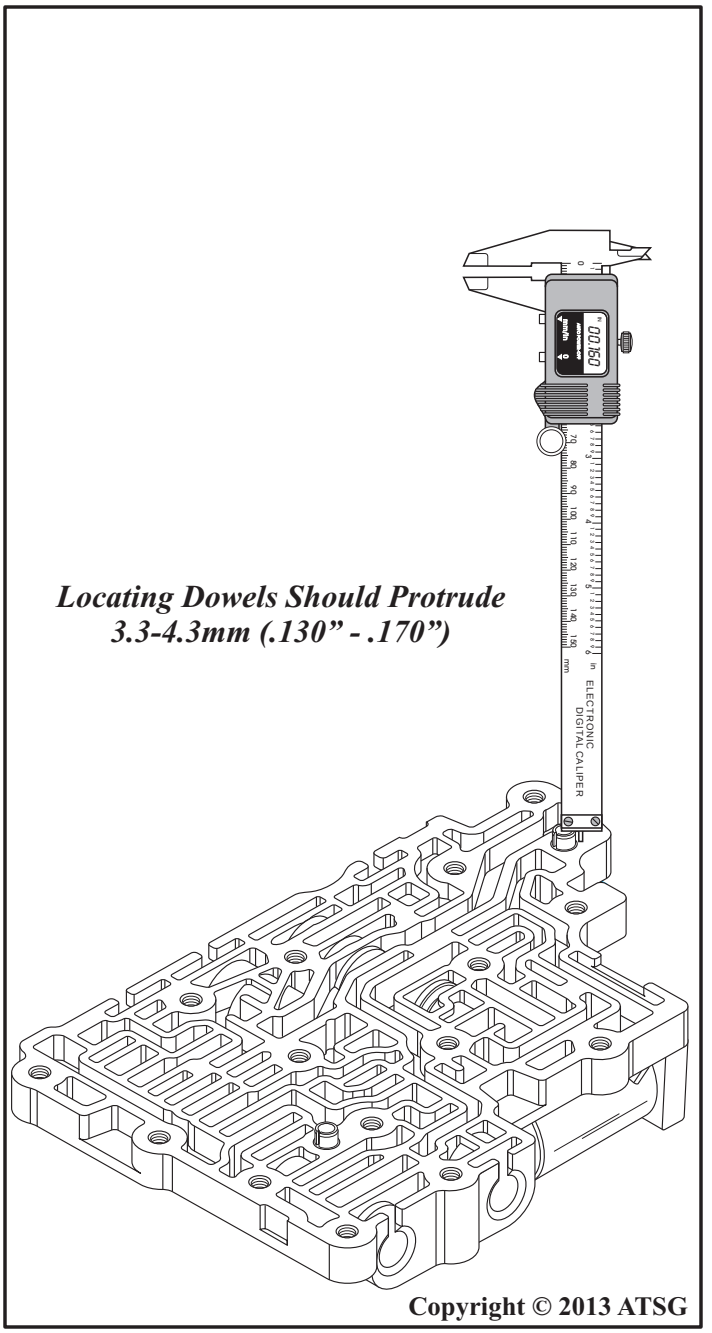
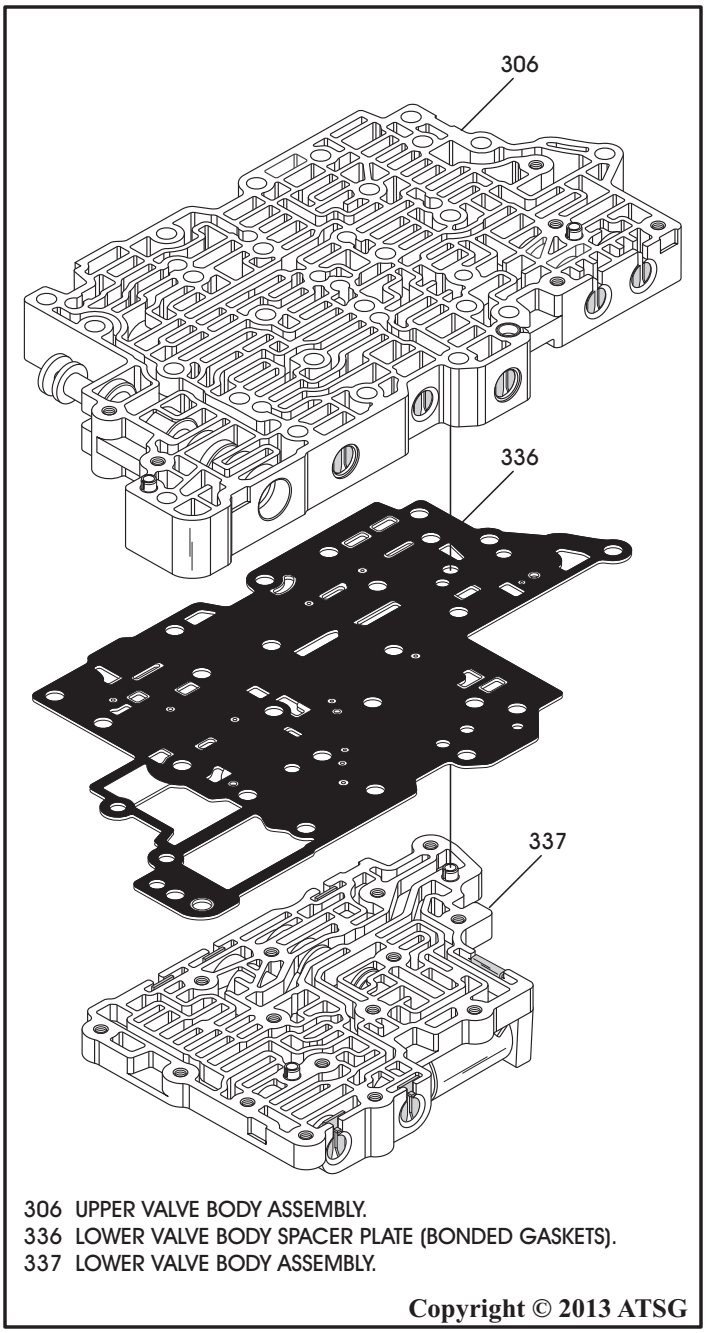
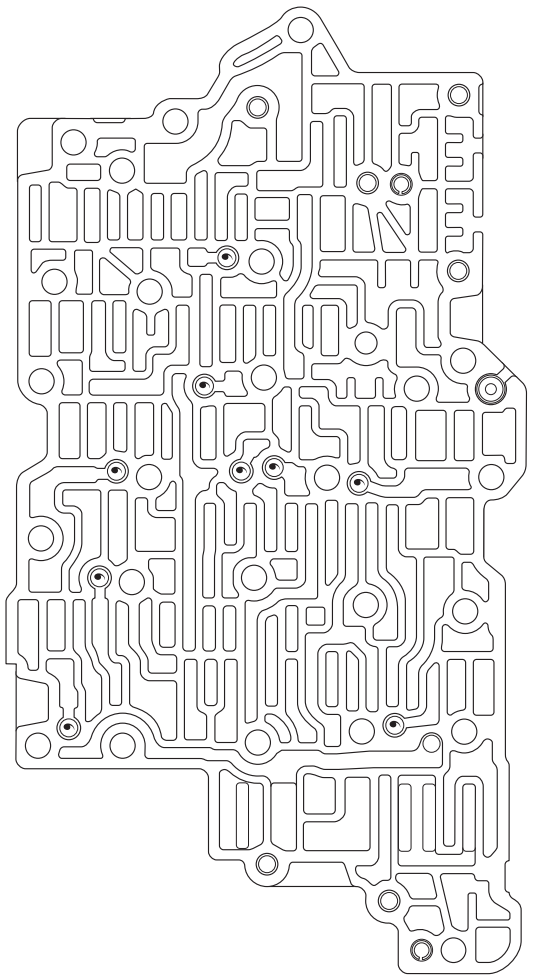


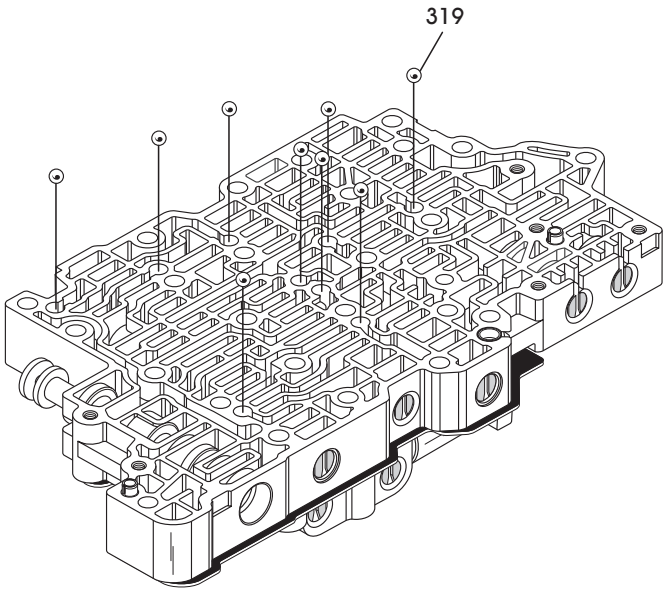
Figure 178



306 UPPER VALVE BODY ASSEMBLY.
336 LOWER VALVE BODY SPACER PLATE (BONDED GASKETS).
337 LOWER VALVE BODY ASSEMBLY.

Figure 179





319 STEEL CHECK BALLS, .250" DIAMETER (9 REQUIRED).

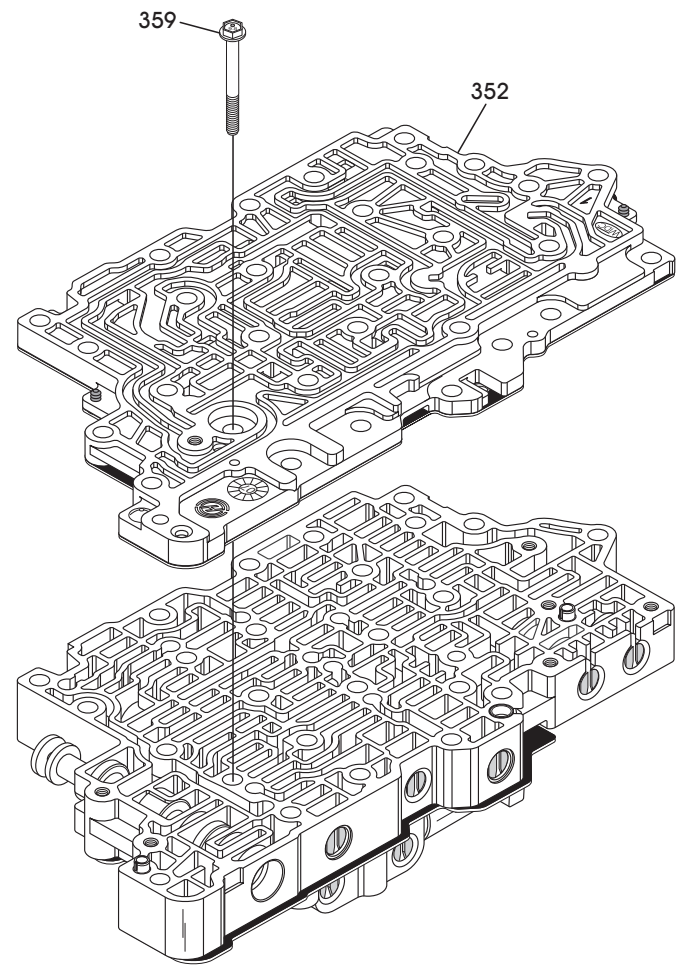
Figure 180

COMPONENT REBUILD

Valve Body Assembly (Cont'd)

30. Place the nine check balls into the upper valve body in their proper locations, as shown in Figure 180.
31. Install the completed channel plate and upper spacer plate assembly onto the upper valve body, and over the dowels, as shown in Figure 181.
32. Install one 55mm bolt into the location shown in Figure 181.

Continued on Page 108



352 VALVE BODY CHANNEL PLATE ASSEMBLY.
359 VALVE BODY BOLT, 55MM (1 REQUIRED).

Figure 181

COMPONENT REBUILD

Valve Body Assembly (Cont'd)

33. Torque the one 55mm bolt just installed to 12 N•m (106 in. lb.), as shown in Figure 182.
34. Install the channel plate upper support plate, as shown in Figure 183.
35. Install the five 65mm bolts and one 35 mm bolt into the upper support plate, in positions shown in Figure 183, finger tight only.
36. Install two 55 mm bolts into valve body in the positions shown in Figure 183.
37. Install two 35 mm bolts into valve body in the positions shown in Figure 183.

Continued on Page 109

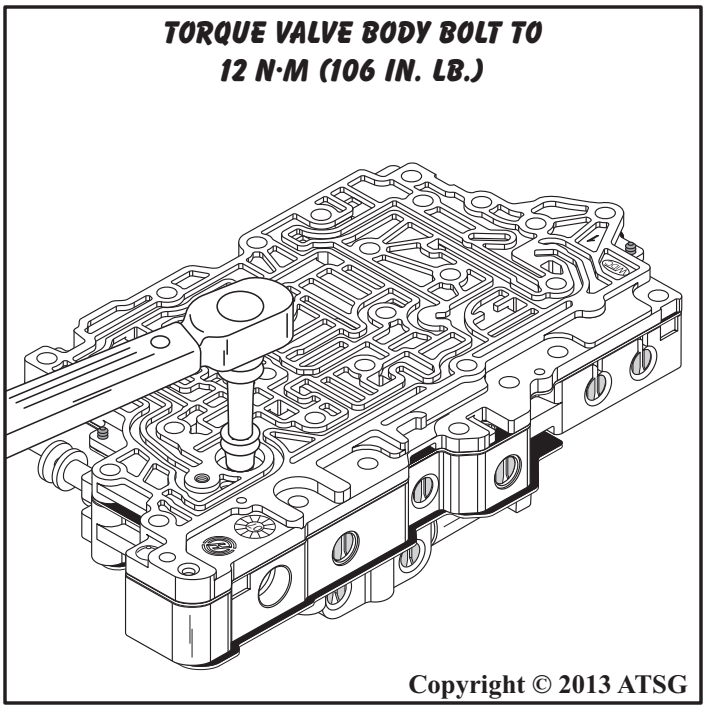


Figure 182

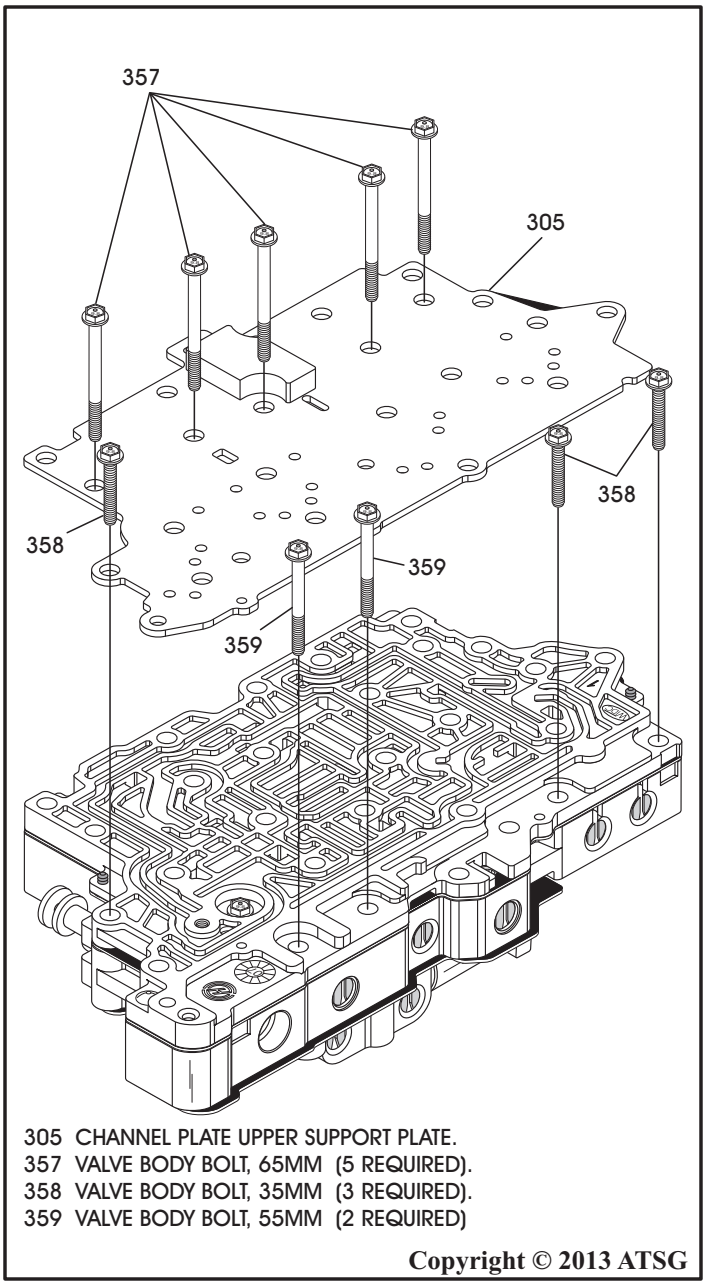


Figure 183

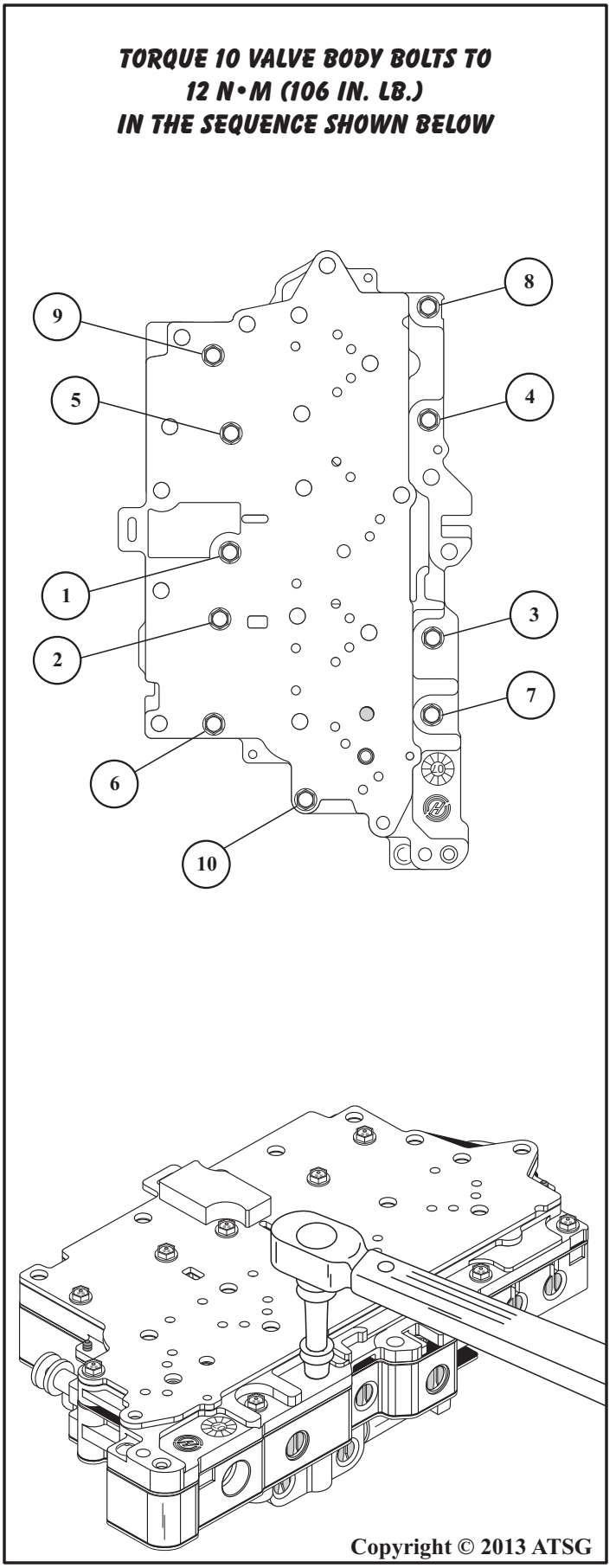


Figure 184

COMPONENT REBUILD

Valve Body Assembly (Cont'd)

38. Now torque all 10 valve body bolts in sequence to 12 N•m (106 in. lb.), as shown in Figure 184.
39. Set the completed valve body assembly aside for the final assembly process, as shown in Figure 185.

Final Assembly
Begins on Page 110

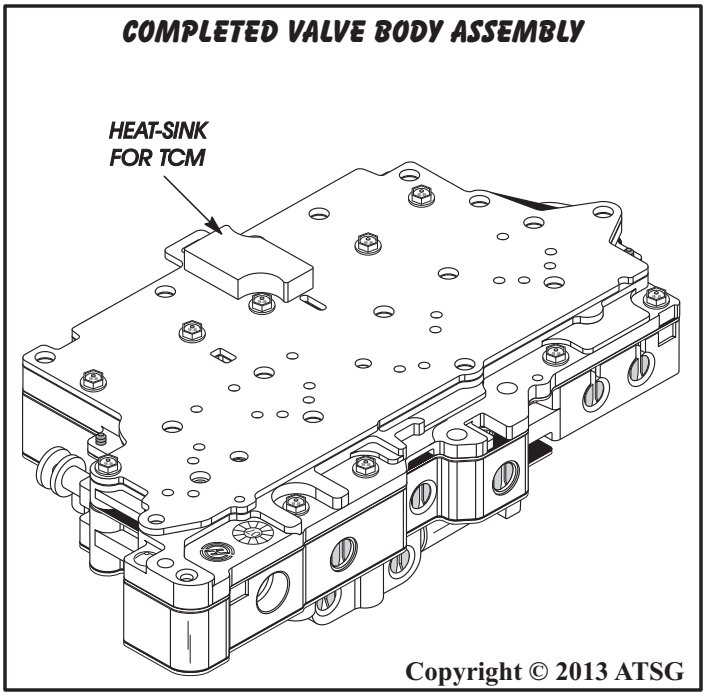
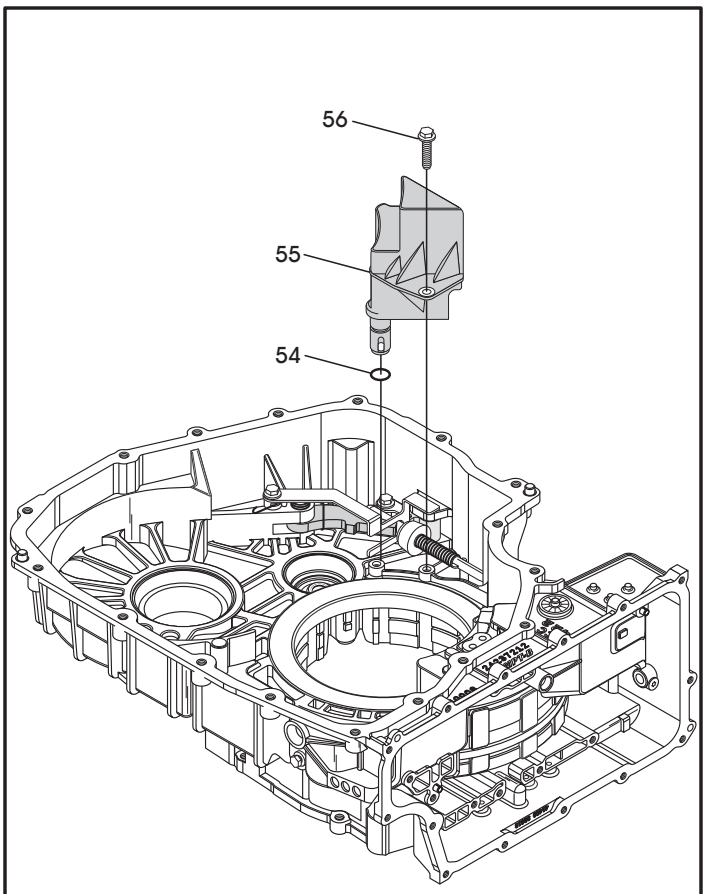


Figure 185

TRANSMISSION ASSEMBLY

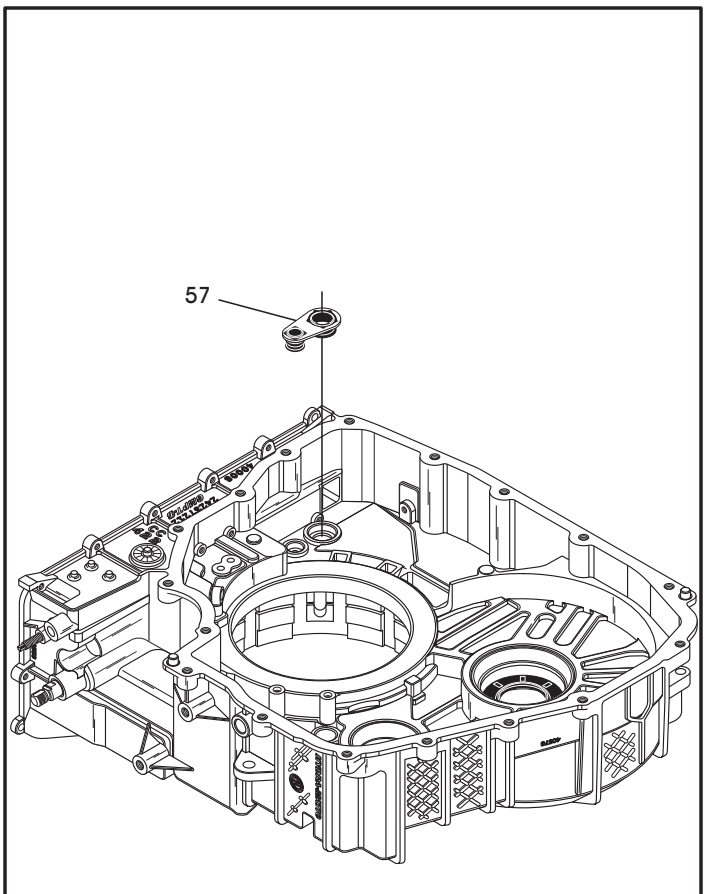
1. Place the completed transmission case assembly on a flat work surface, as shown in Figure 186, or into the bench fixture with converter cover surface facing up.
2. Install new “O” ring seal onto the fluid trough, as shown in Figure 186, and lube with a small amount of Trans-Jel®.
   Note: Fluid trough has a captured check ball located in the tube and should “rattle”.
3. Install the fluid trough assembly into the case bore, as shown in Figure 186.
4. Install the fluid trough retaining bolt, as shown in Figure 186, and torque to 12 N•m (106 in. lb.).
5. Install new oil pump outlet seal into the case, as shown in Figure 187.

Continued on Page 111



54 FLUID TROUGH “O” RING SEAL.
55 FLUID TROUGH ASSEMBLY.
56 FLUID TROUGH RETAINING BOLT.

Figure 186



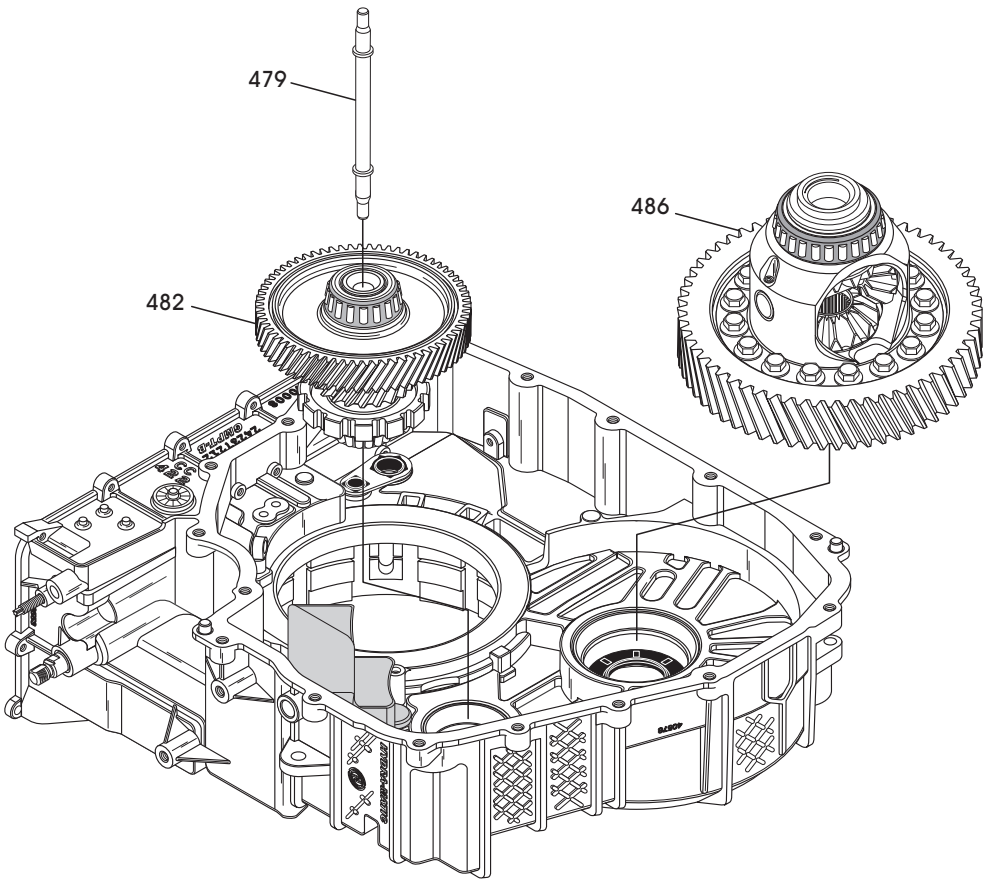
57 OIL PUMP OUTLET SEAL ASSEMBLY.

Figure 187

TRANSMISSION ASSEMBLY (CONT'D)

6. Install the differential pinion & transfer driven gear assembly, along with the differential carrier assembly, as shown in Figure 188.
   Note: Install differential carrier assembly and pinion gear assembly together to avoid any interference with the gears during installation.
7. Install the differential pinion gear lube tube, as shown in Figure 188.

Continued on Page 112



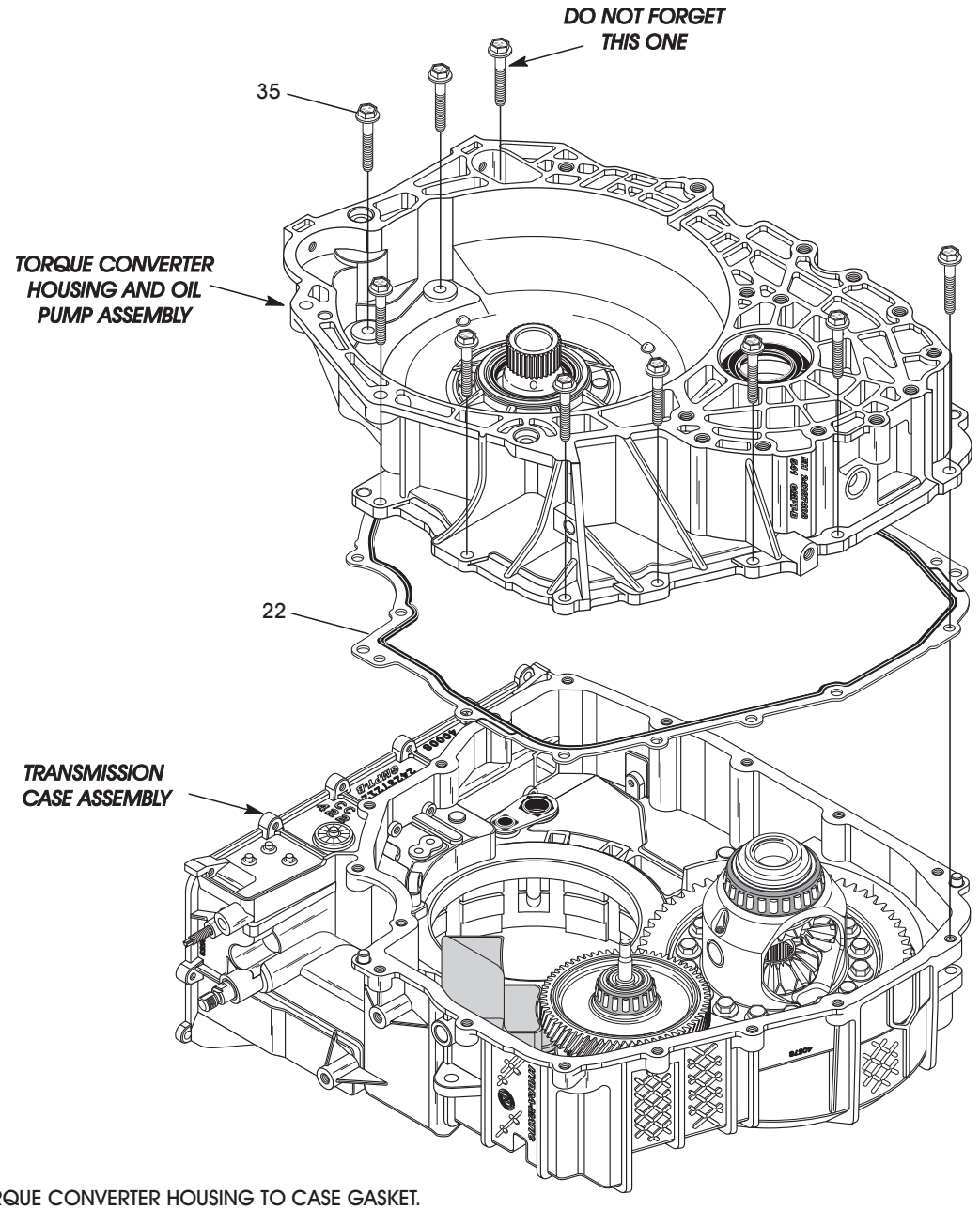
479 DIFFERENTIAL PINION GEAR LUBE TUBE.
482 DIFFERENTIAL PINION GEAR & TRANSFER DRIVEN GEAR ASSEMBLY.
486 DIFFERENTIAL CARRIER ASSEMBLY.

Figure 188

TRANSMISSION ASSEMBLY (CONT'D)

8. Install new converter housing to case gasket onto the case, as shown in Figure 189, and over the locating dowels.
9. Install previously completed converter housing onto case, as shown in Figure 189, and ensure that it is fully engaged on locating dowels.
10. Install the 17 converter housing to case retaining bolts, as shown in Figure 189.
    Note: Don't forget the semi-hidden bolt.

Continued on Page113



22 TORQUE CONVERTER HOUSING TO CASE GASKET.
35 TORQUE CONVERTER HOUSING TO CASE BOLTS (17 REQ.).

Figure 189

TRANSMISSION ASSEMBLY (CONT'D)

11. Torque all 17 converter housing to case bolts in the sequence shown in Figure 190.
Note: Some bolt torque specifications are different. Over tightening the bolts at the 12, 15 and 17 positions in the sequence could cause damage to the case threads.
Tighten in sequence to 36 N•m (27 ft. lb.).
Tighten the 3 bolts at 12, 15 and 17 in the torque sequence to 30 N•m (22 ft. lb.).

Continued on Page 114

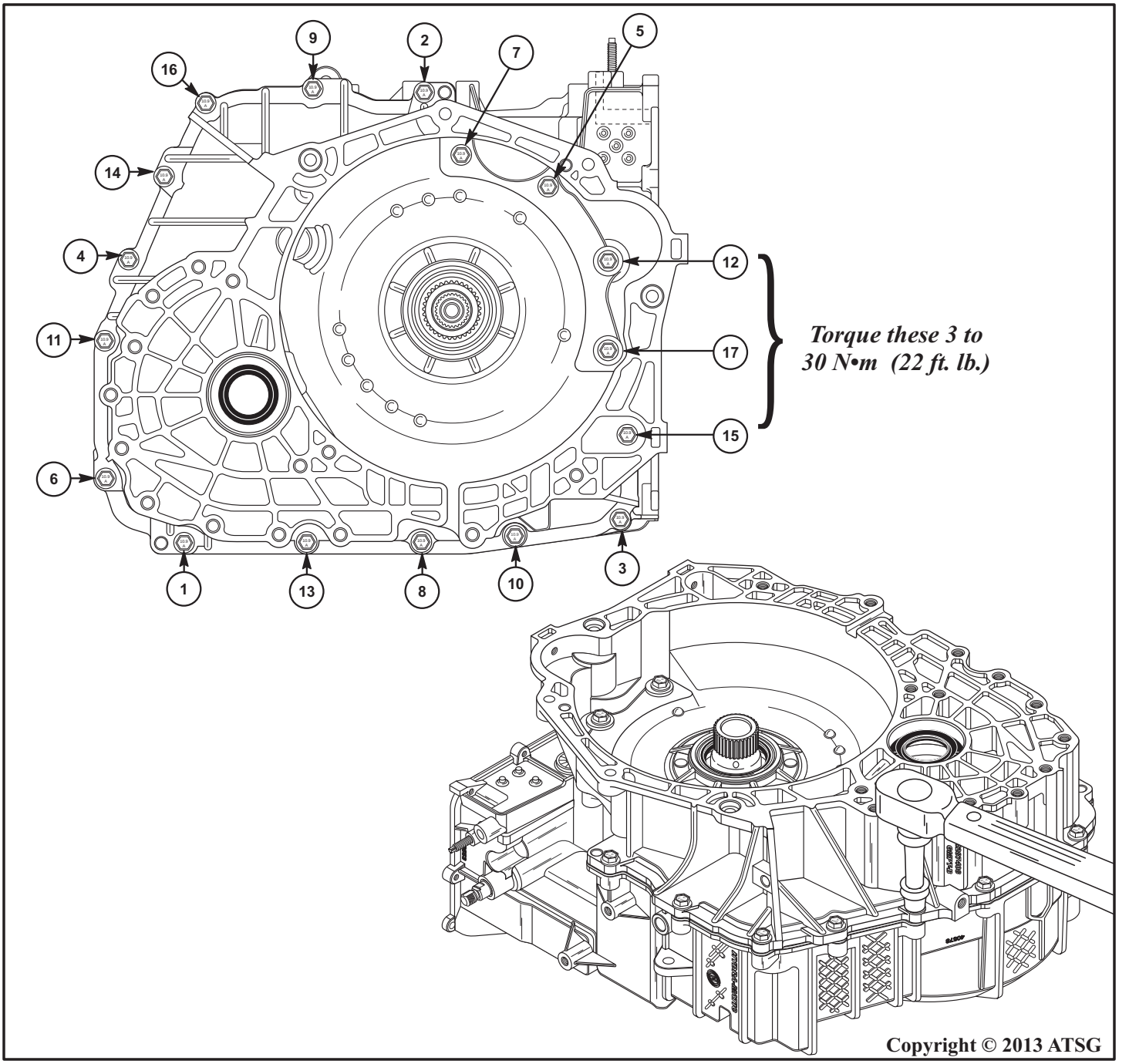


Figure 190

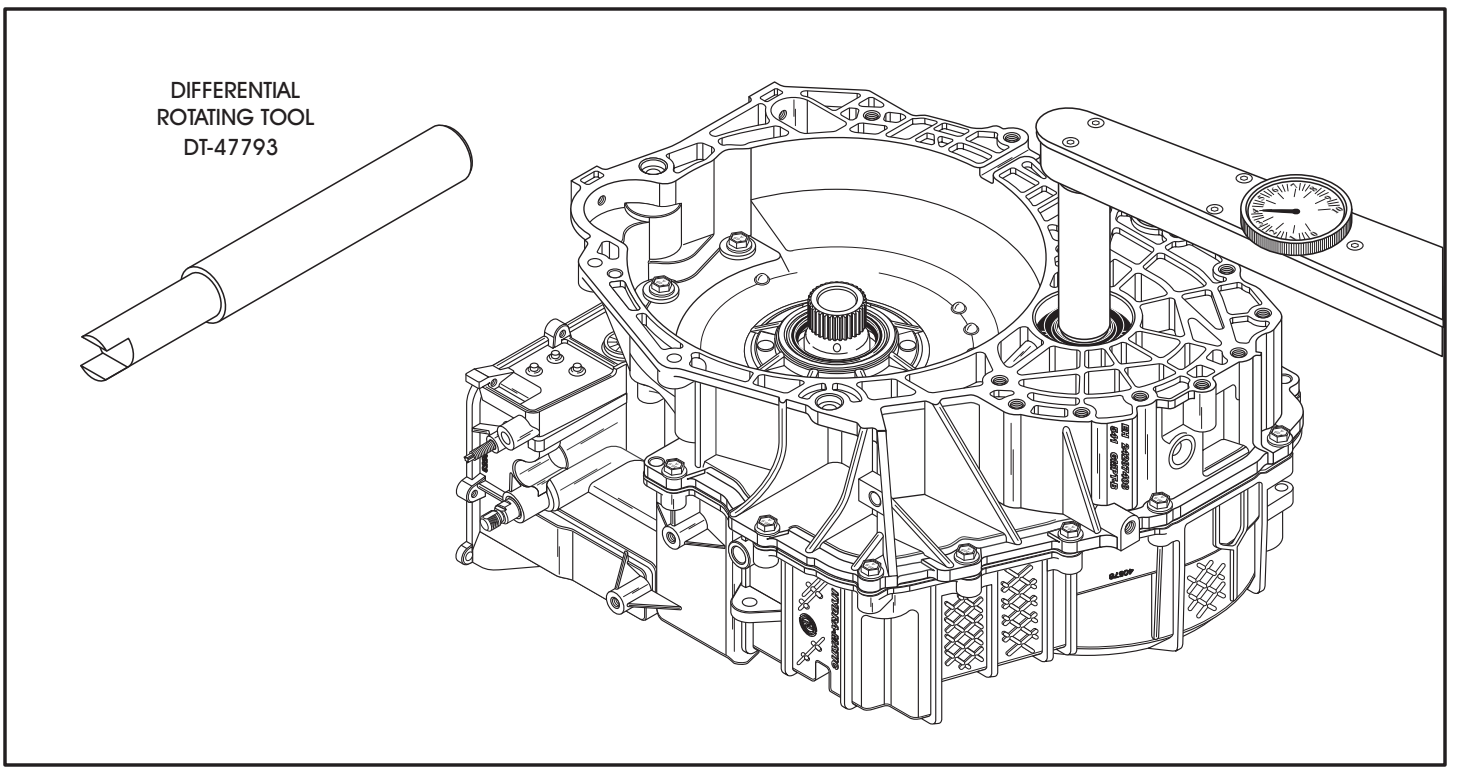


Figure 191

TRANSMISSION ASSEMBLY (CONT'D)

12. Check rotating torque of the differential carrier assembly using the differential rotating tool DT-47793, as shown in Figure 191, and a beam or dial type inch pound torque wrench.
    Note: This is a preliminary check and must be performed again after rear cover is installed as the readings will be different.
13. Rotating torque should be between the following; 4 - 12 N•m (35 - 106 in. lb.).
    Caution: If the rotating torque is not within specifications, the pinion gear assembly and differential bearing pre-load shim selection is incorrect and must be corrected. Refer to "Differential Pre-load Shim Selection" on Page 63.
14. Rotate the transmission assembly so that the rear cover surface is facing up, as shown in Figure 192.
15. The 1-2-3-4 clutch piston, return spring and the snap ring should already be in place, as shown in Figure 192.

Continued on Page 115

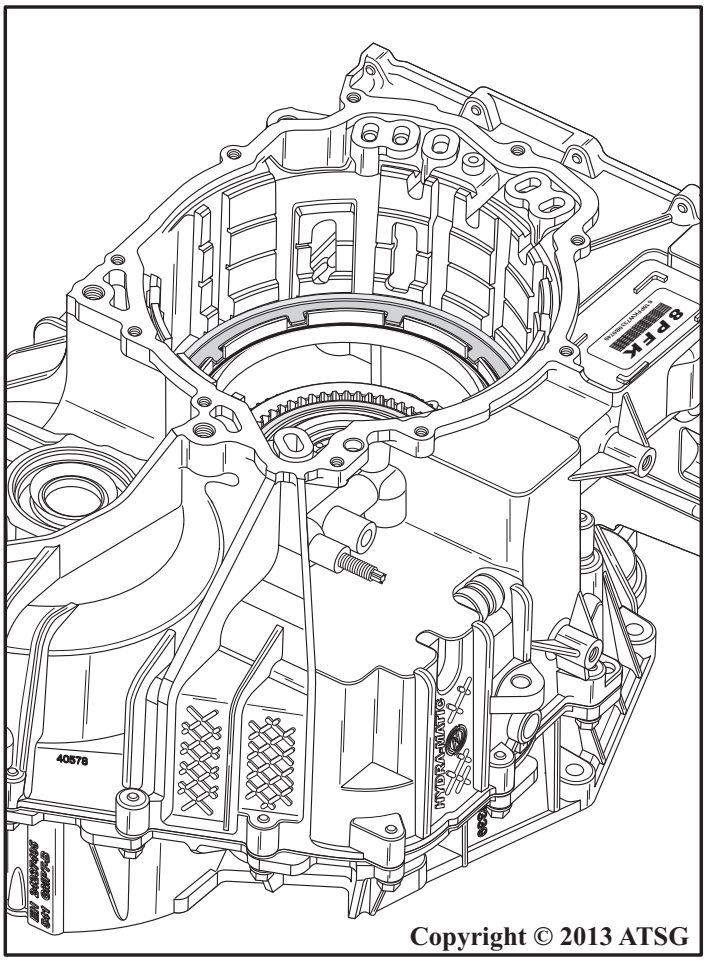
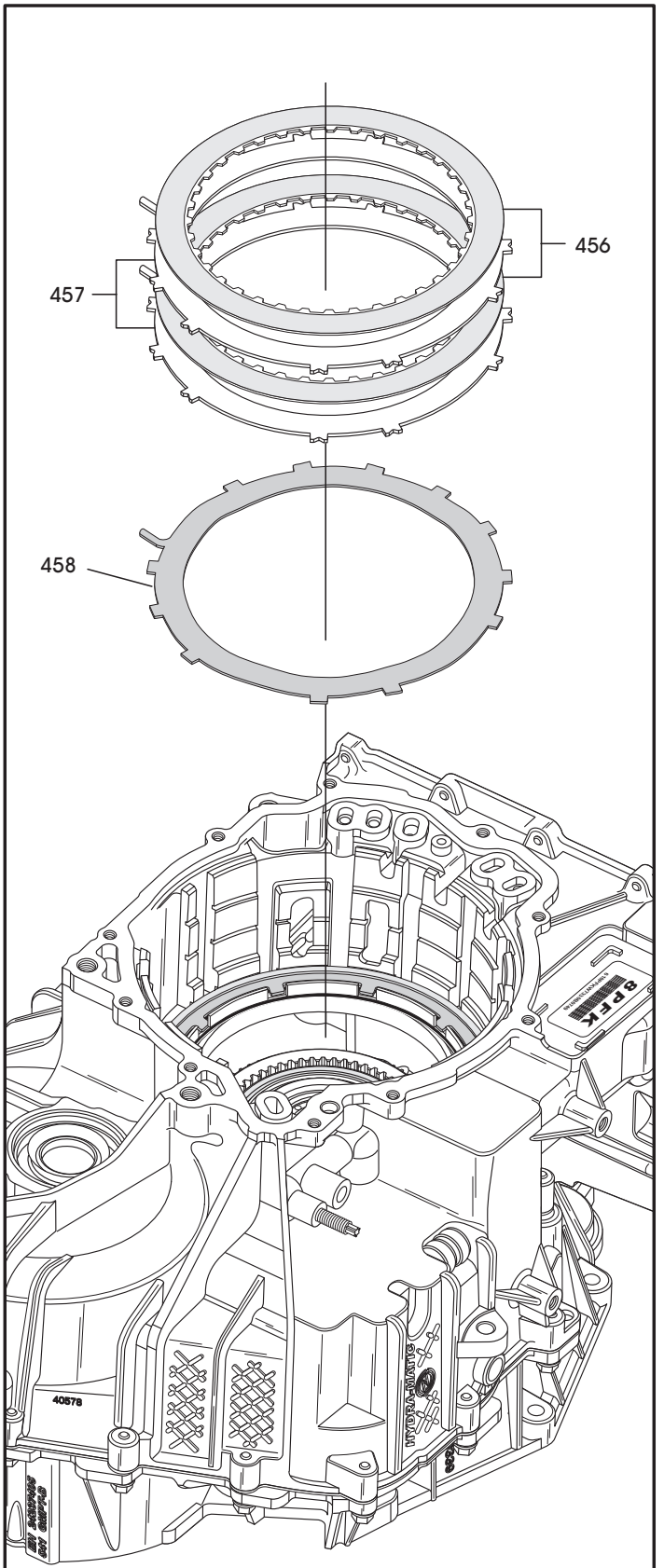


Figure 192



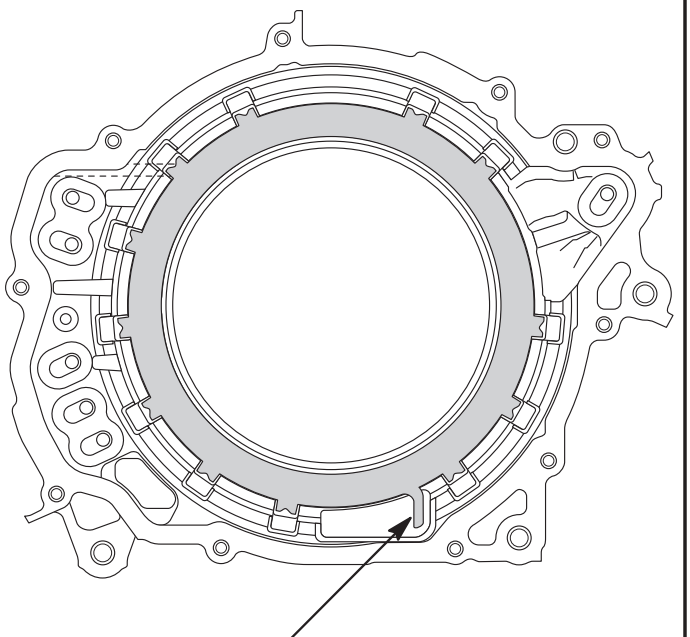
456 1-2-3-4 CLUTCH FRICTION PLATES (2 REQUIRED).
457 1-2-3-4 CLUTCH STEEL PLATES, .085" THICK (2 REQUIRED).
458 1-2-3-4 CLUTCH "WAVE" PLATE.

Figure 193

TRANSMISSION ASSEMBLY (CONT'D)

16. Install the 1-2-3-4 clutch wave plate in the case, as shown in Figure 193, with the long tab facing the bottom of the case (See Figure 194)..
    Note: If replacement is necessary, OEM part number (at time of printing) is 24259063.
17. Install the 1-2-3-4 clutch plates beginning with a steel plate and alternating with friction plates until you have installed 2 of each, as shown in Figure 193.
    Note: All friction plates should be soaked in proper fluid for 30 minutes before installation.
    Note: All wave plates, steel plates and backing plates that are installed in case will install with the long tab positioned as shown in Figure 194.

Continued on Page 116



All wave plates, steel plates and backing plates that are installed in case, will install with the long tab positioned as shown above.

Figure 194

TRANSMISSION ASSEMBLY (CONT'D)

18. Check one-way "diode style" clutch assembly to ensure proper operation, as shown in Figure 195.
19. Install one-way "diode style" clutch assembly into the case, as shown in Figure 196.
    Note: Install one-way clutch assembly so that the three wide lugs are positioned as shown in Figure 195 for installation.
20. Install the snap ring into case groove, as shown in Figure 196, with the opening facing the valve body side of the case and ensure that it is fully seated.

Continued on Page 117

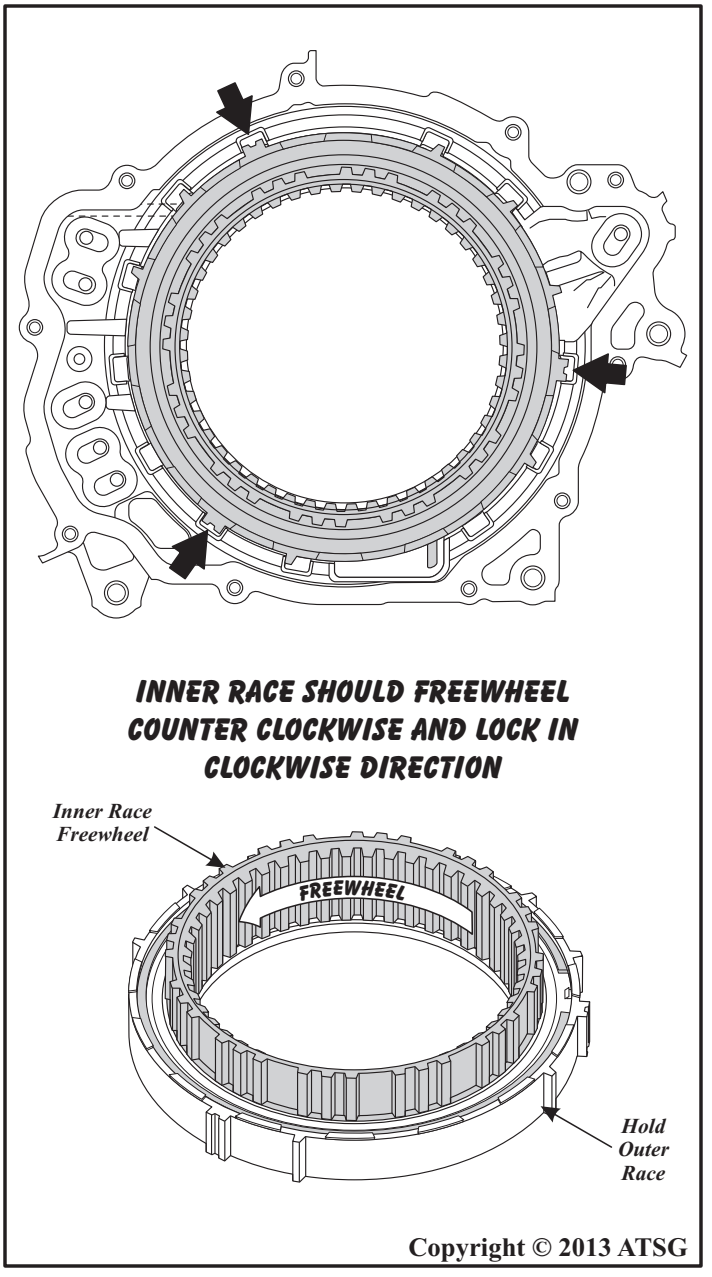
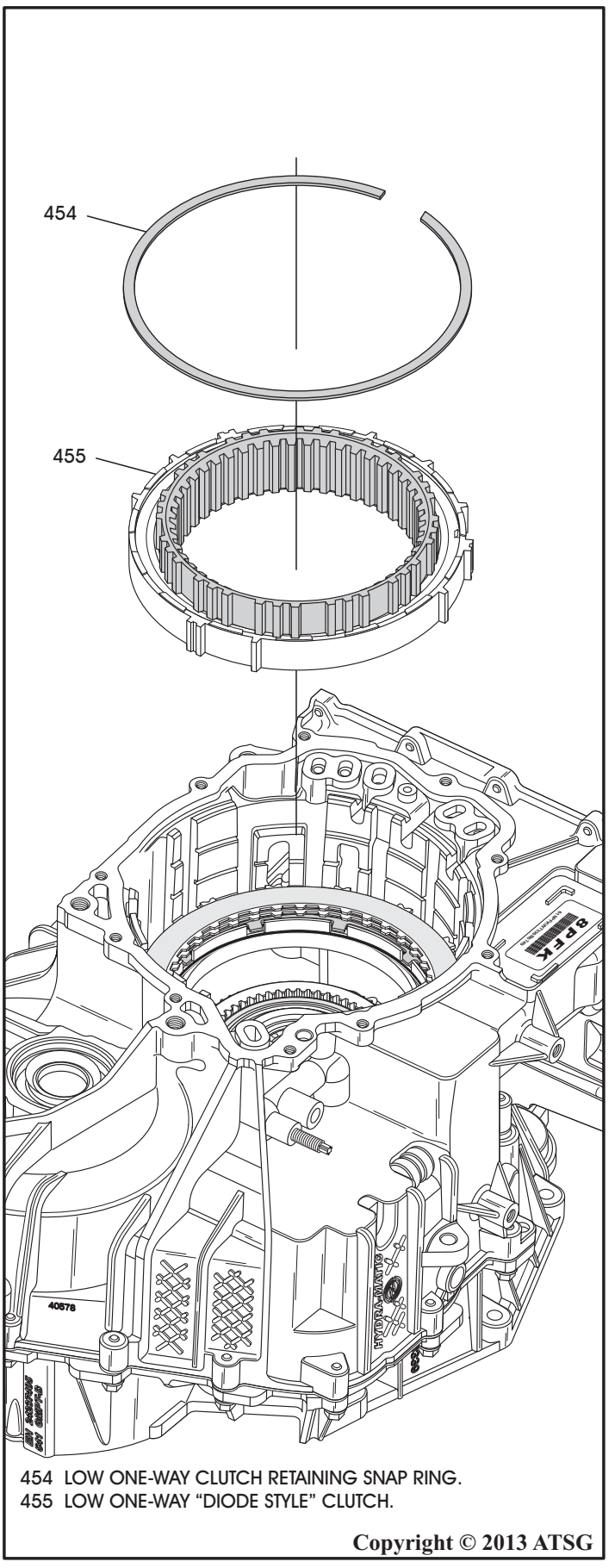
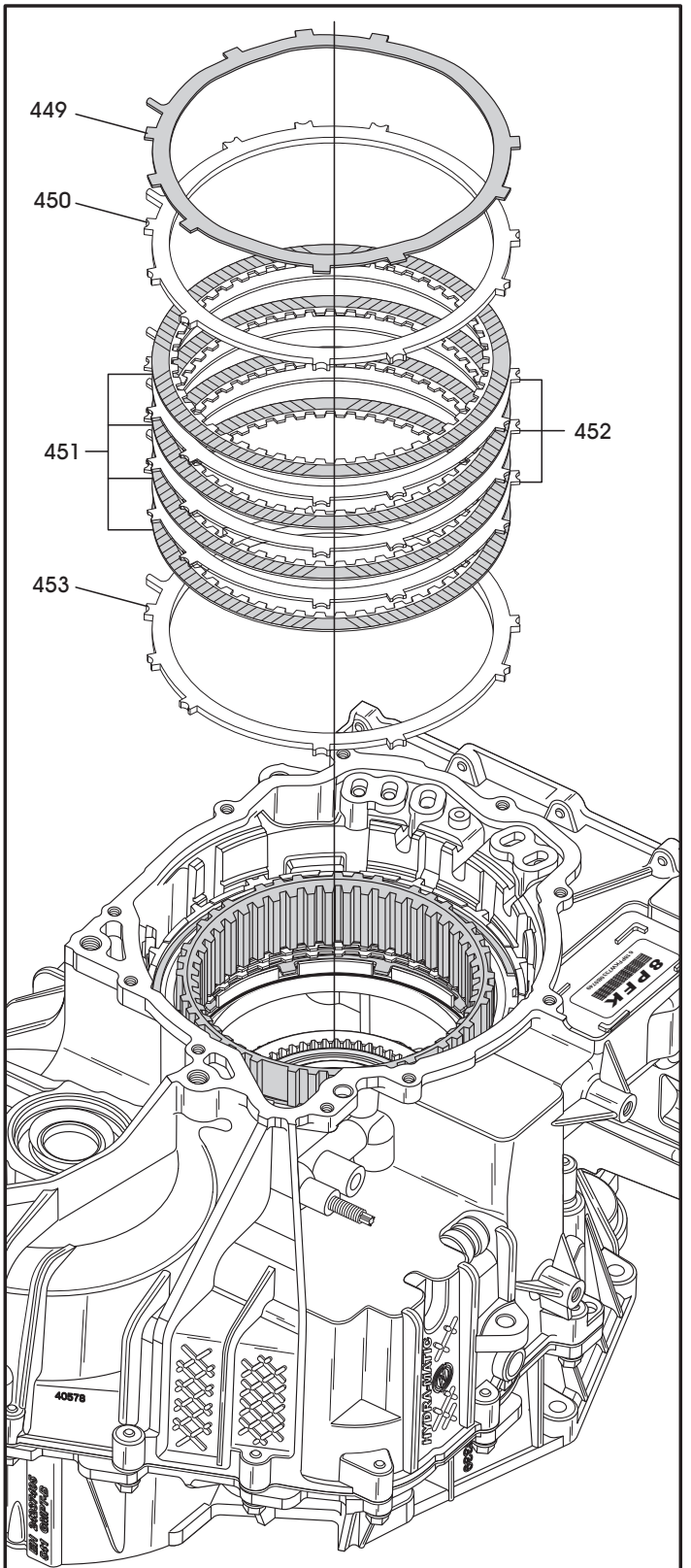


Figure 195



454 LOW ONE-WAY CLUTCH RETAINING SNAP RING.
455 LOW ONE-WAY "DIODE STYLE" CLUTCH.

Figure 196



449 LOW/REVERSE CLUTCH "WAVE" PLATE.
450 LOW/REVRESE CLUTCH APPLY PLATE, .115" THICK.
451 LOW/REVERSE CLUTCH FRICTION PLATES (4 REQUIRED).
452 LOW/REVERSE CLUTCH STEEL PLATES, .070" THICK (3 REQ.)
453 LOW/REVERSE CLUTCH BACKING PLATE, .255" THICK.

Figure 197

TRANSMISSION ASSEMBLY (CONT'D)

21. Install the low/reverse clutch backing plate, as shown in Figure 197, with the stepped side facing down (See Figure 198).
Note: All friction plates should be soaked in proper fluid for 30 minutes before installation.
22. Install the low/reverse clutches beginning with a friction plate and alternating with steel plates, as shown in Figure 197, until you have installed 4 friction plates and 3 steel plates.
Note: The steel plates are .070" thick and the apply plate is .115" thick. Refer to Figure 194 for positioning of the long tabs.
23. Install the low/reverse clutch apply plate (.115"), as shown in Figure 197.
24. Install the low/reverse clutch wave plate, as shown in Figure 197.
Note: If replacement is necessary, OEM part number (at time of printing) is 24259817.

Continued on Page 118

Low/Reverse Clutch Backing Plate Is Stepped And The Step Faces Down

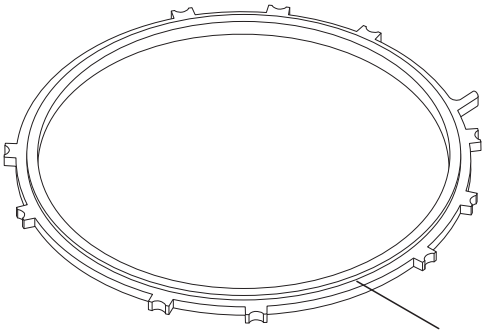
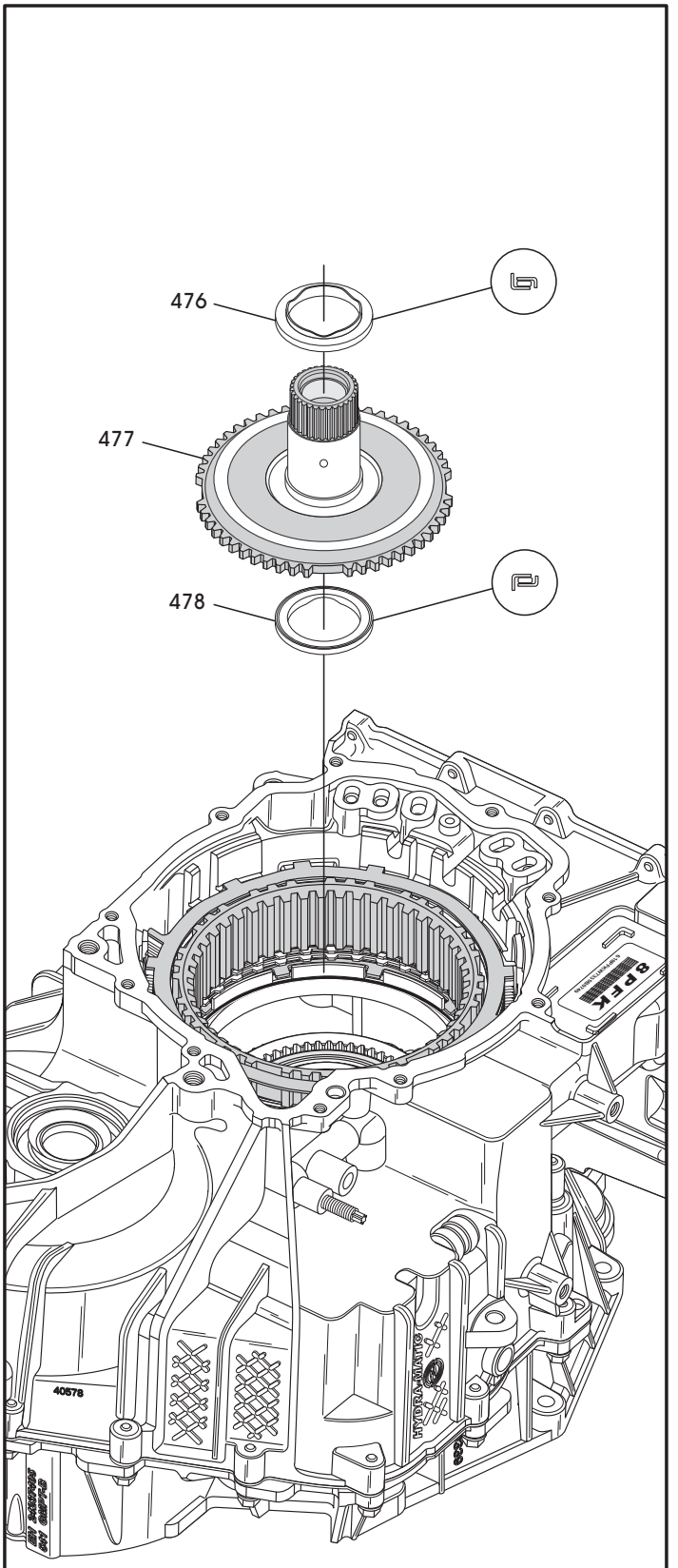


Figure 198



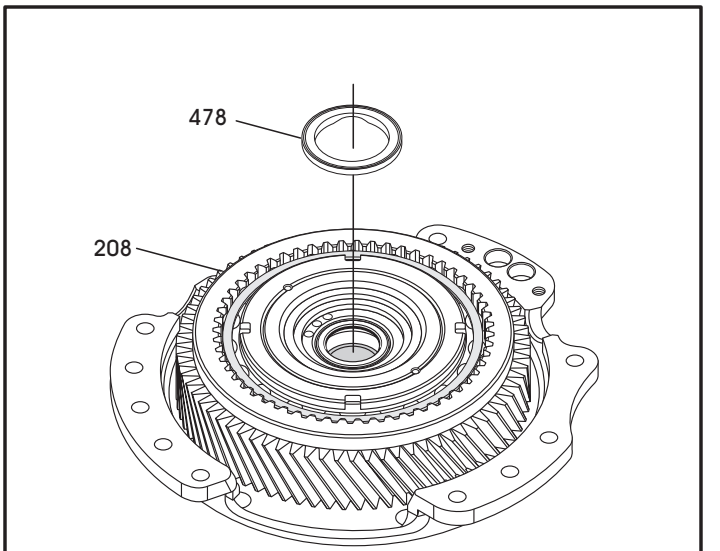
476 NUMBER 2 THRUST BEARING.
477 OUTPUT TRANSFER DRIVE GEAR HUB ASSEMBLY.
478 NUMBER 1 THRUST BEARING.

Figure 199

TRANSMISSION ASSEMBLY (CONT'D)

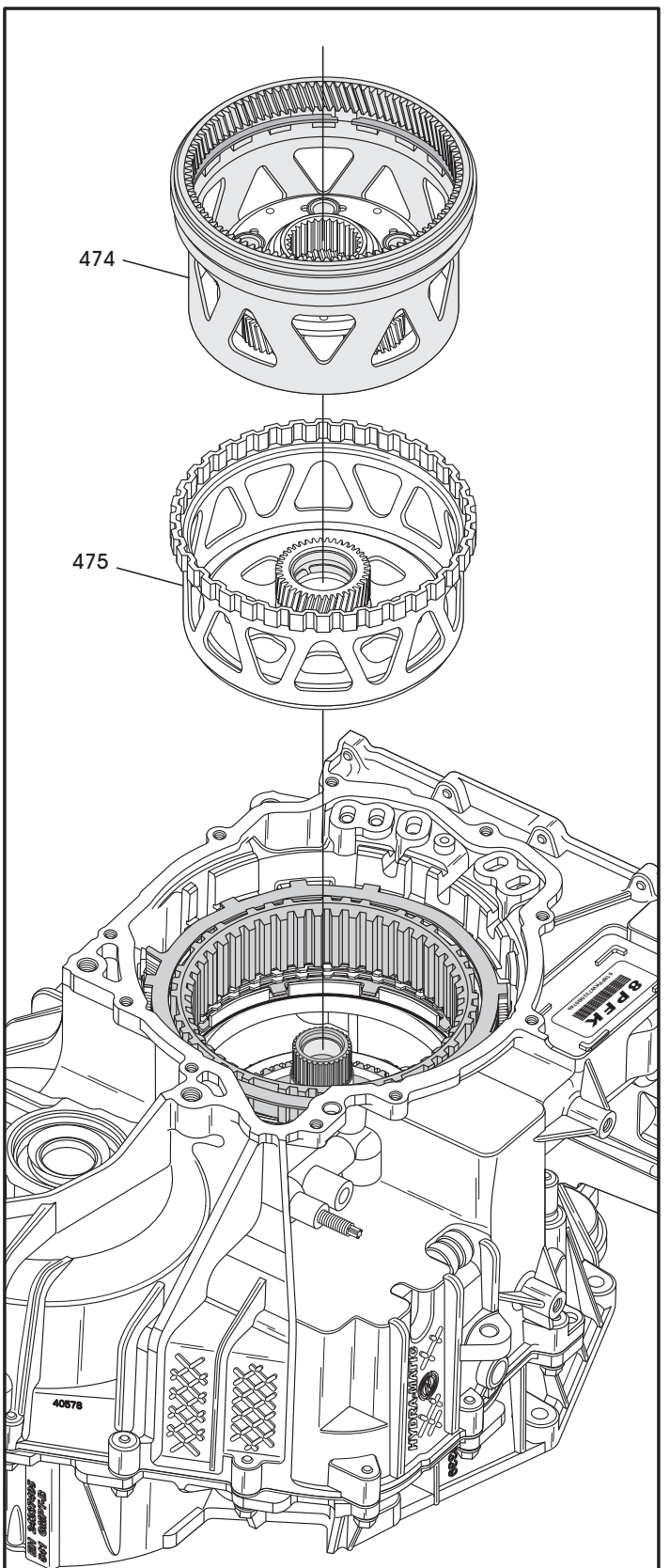
25. Install number 1 thrust bearing in the direction shown in Figure 199, onto the drive sprocket support assembly.
    Note: The drive sprocket support assembly was previously installed with the converter housing assembly (See Figure 200).
26. Install output transfer drive gear hub assembly, as shown in Figure 199, and engage it into the teeth on the drive gear assembly.
27. Install the number 2 thrust bearing in direction shown in Figure 199, onto the output transfer drive gear hub assembly.
28. Install the output sun gear/1-2-3-4 clutch hub assembly, as shown in Figure 201, by rotating back and forth to engage the friction plates until fully seated.
29. Install output planetary carrier/reaction ring gear assembly, as shown in Figure 201.
30. Install number 4 thrust bearing in the direction shown in Figure 202.
31. Install number 5 thrust bearing in the direction shown in Figure 202.
32. Install input sun gear, as shown in Figure 202.
33. Install input planetary carrier/output planetary ring gear, as shown in Figure 202, by rotating into position until fully seated.

Continued on Page 120



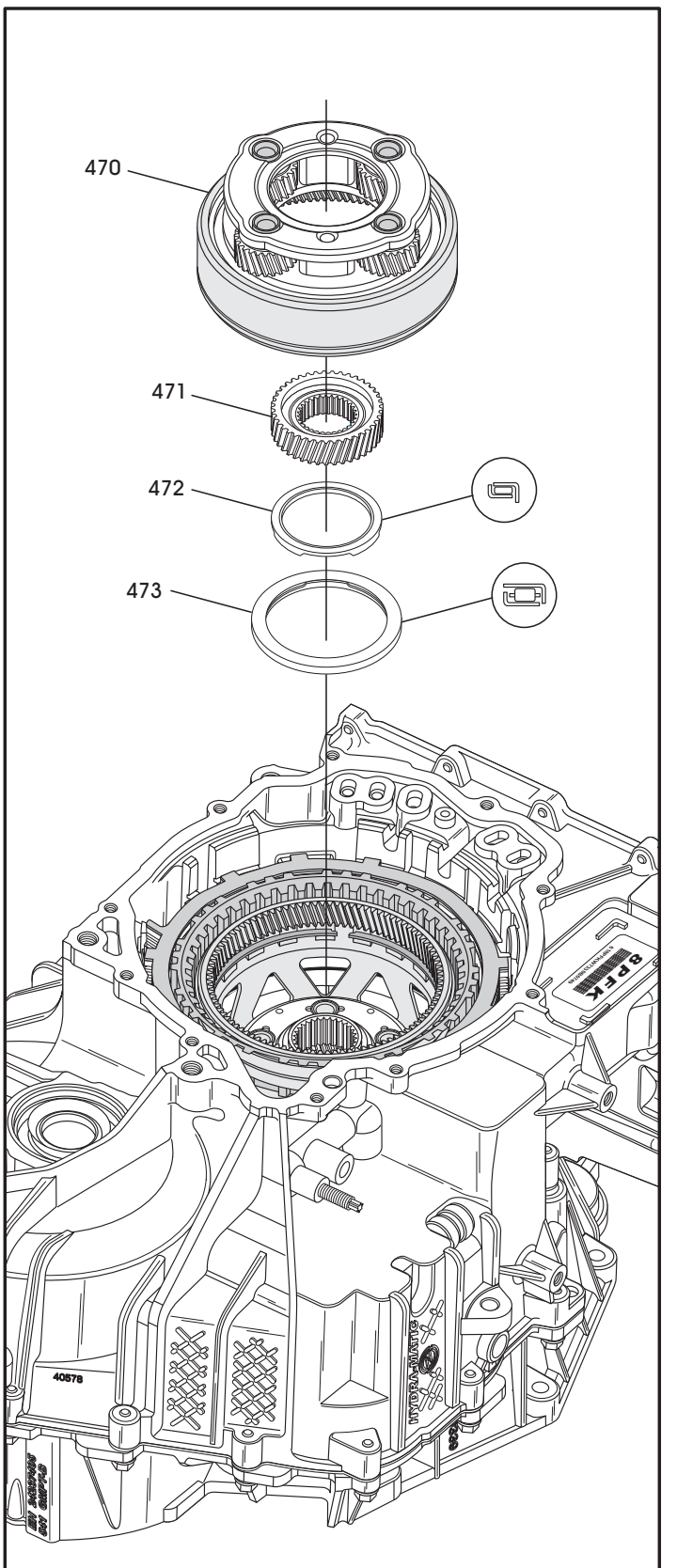
208 TRANSFER DRIVE GEAR SUPPORT ASSEMBLY.
478 NUMBER 1 THRUST BEARING.

Figure 200



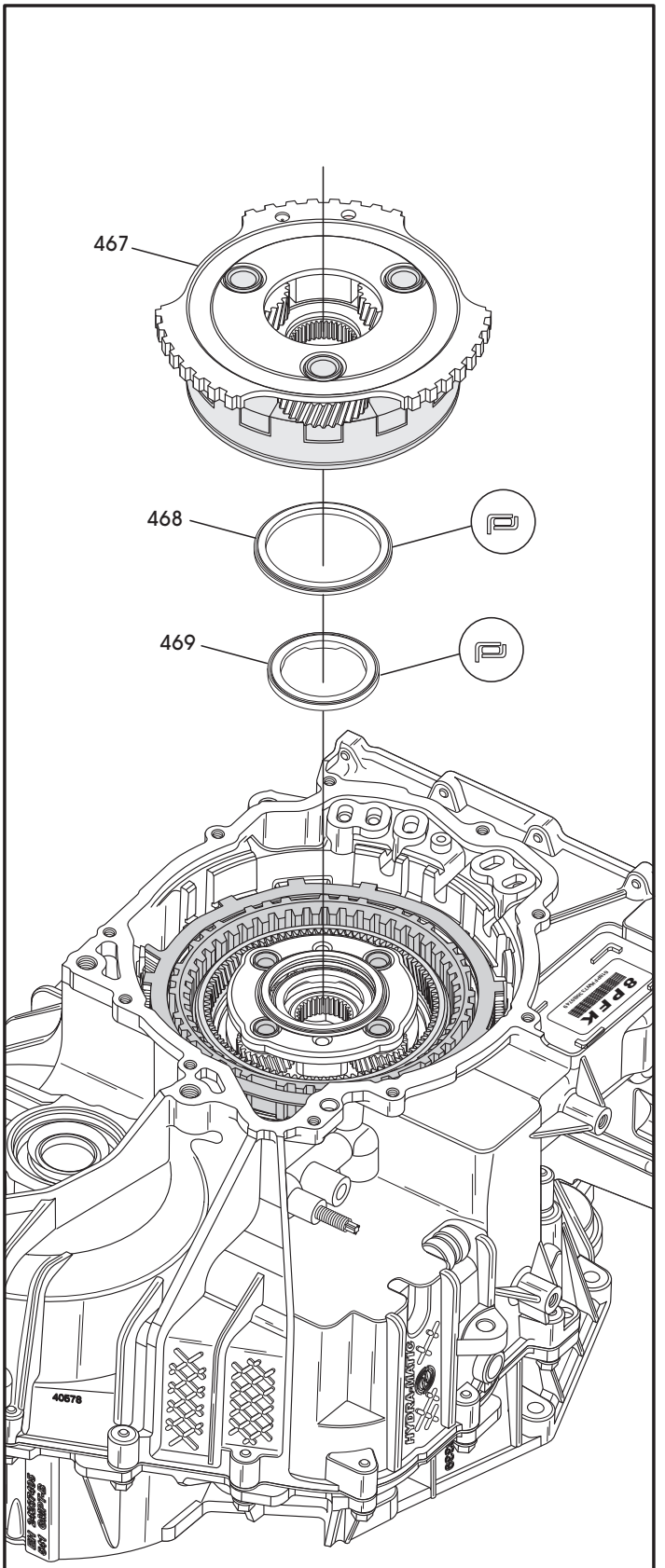
474 OUTPUT PLANETARY CARRIER/REACTION RING GEAR ASSEMBLY.
475 OUTPUT SUN GEAR/1-2-3-4 CLUTCH HUB ASSEMBLY.

Figure 201



470 INPUT PLANETARY CARRIER/OUTPUT RING GEAR ASSEMBLY.
471 INPUT SUN GEAR.
472 NUMBER 5 THRUST BEARING.
473 NUMBER 4 THRUST BEARING.

Figure 202



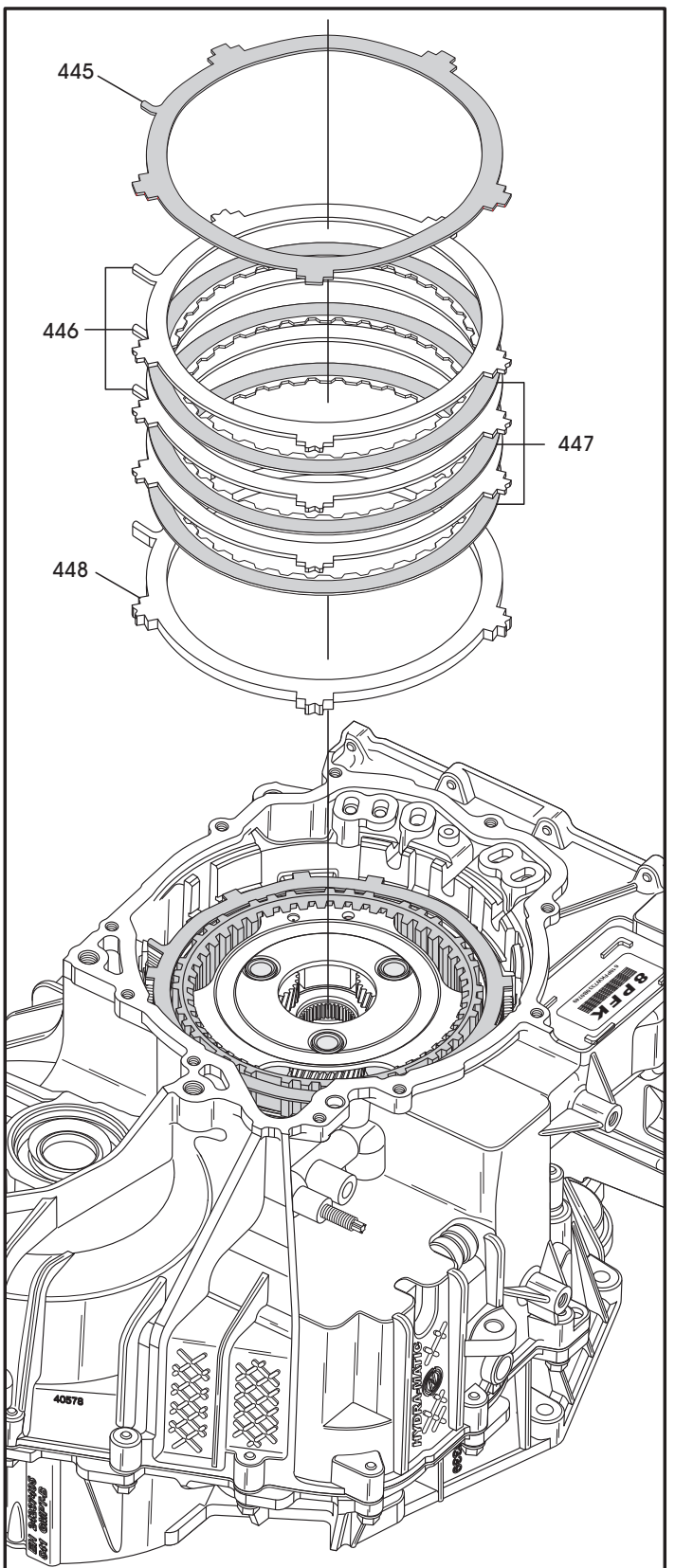
467 REACTION PLANETARY CARRIER/INPUT RING GEAR ASSEMBLY.
468 NUMBER 7 THRUST BEARING.
469 NUMBER 6 THRUST BEARING.

Figure 203

TRANSMISSION ASSEMBLY (CONT'D)

34. Install number 6 thrust bearing in the direction shown in Figure 203, onto the input sun gear.
35. Install number 7 thrust bearing in the direction shown in Figure 203, onto the input planetary carrier.
36. Install the reaction planetary carrier/input ring gear assembly, as shown in Figure 203, by rotating into position until fully seated.

Continued on Page 121



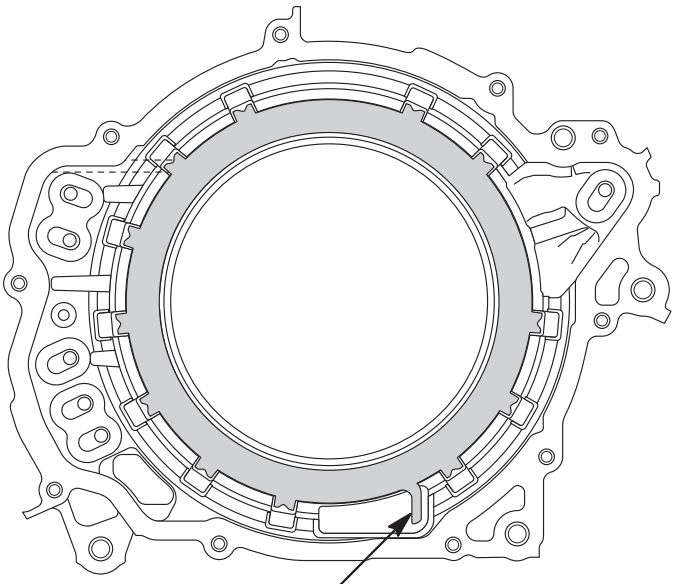
445 2-6 CLUTCH "WAVE" SPRING.
446 2-6 CLUTCH STEEL PLATES, .115" THICK (3 REQUIRED).
447 2-6 CLUTCH FRICTION PLATES (3 REQUIRED).
448 2-6 CLUTCH BACKING PLATE, .260" THICK.

Figure 204

TRANSMISSION ASSEMBLY (CONT'D)

37. Install the 2-6 clutch backing plate into the case, as shown in Figure 204.
38. Install the 2-6 clutches beginning with a friction plate and alternating with steel plates, as shown in Figure 204, until you have installed 3 of each. ***Note: All friction plates should be soaked in proper fluid for 30 minutes before installation.***
39. Install the 2-6 clutch wave plate, as shown in Figure 204, on top of the last steel plate. ***Note: If replacement is necessary, OEM part number (at time of printing) is 24259816. Note: All wave plates, steel plates and backing plates that are installed in case, will install with the long tab positioned in the case, as shown in Figure 205.***

Continued on Page 122



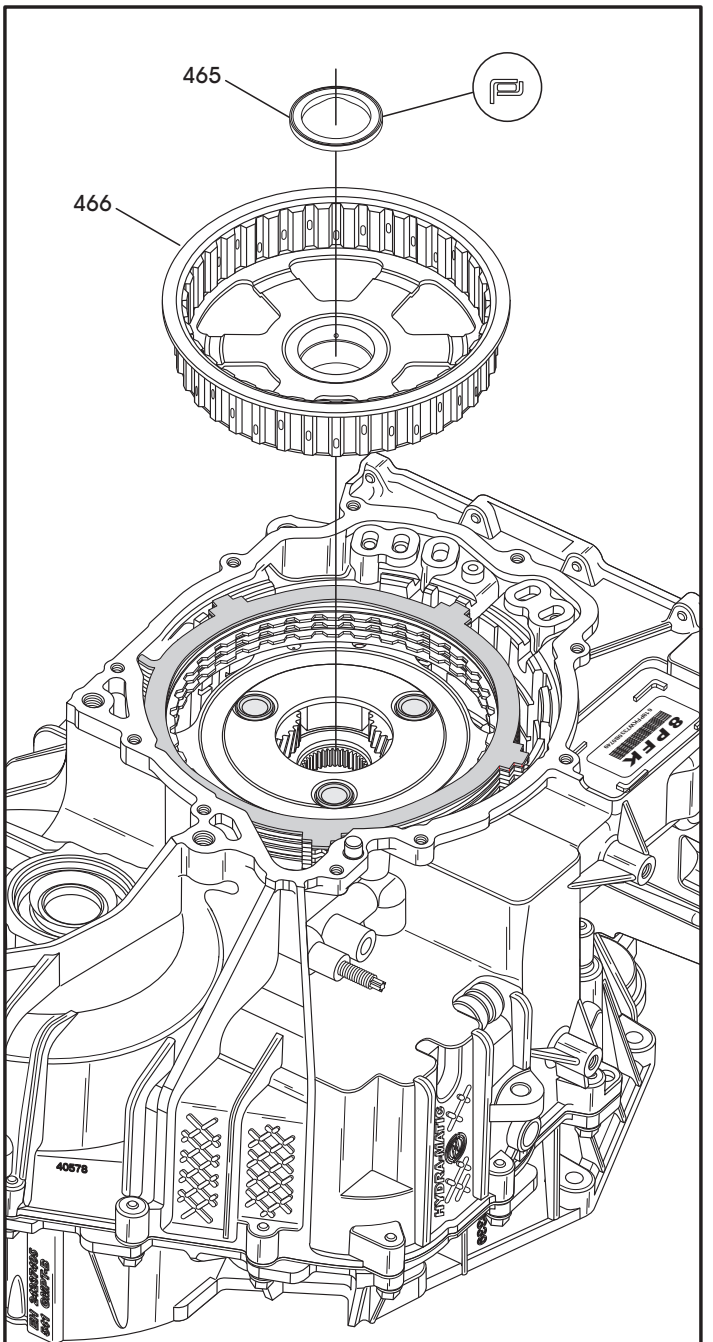
All wave plates, steel plates and backing plates that are installed in case, will install with the long tab positioned as shown above.

Figure 205

TRANSMISSION ASSEMBLY (CONT'D)

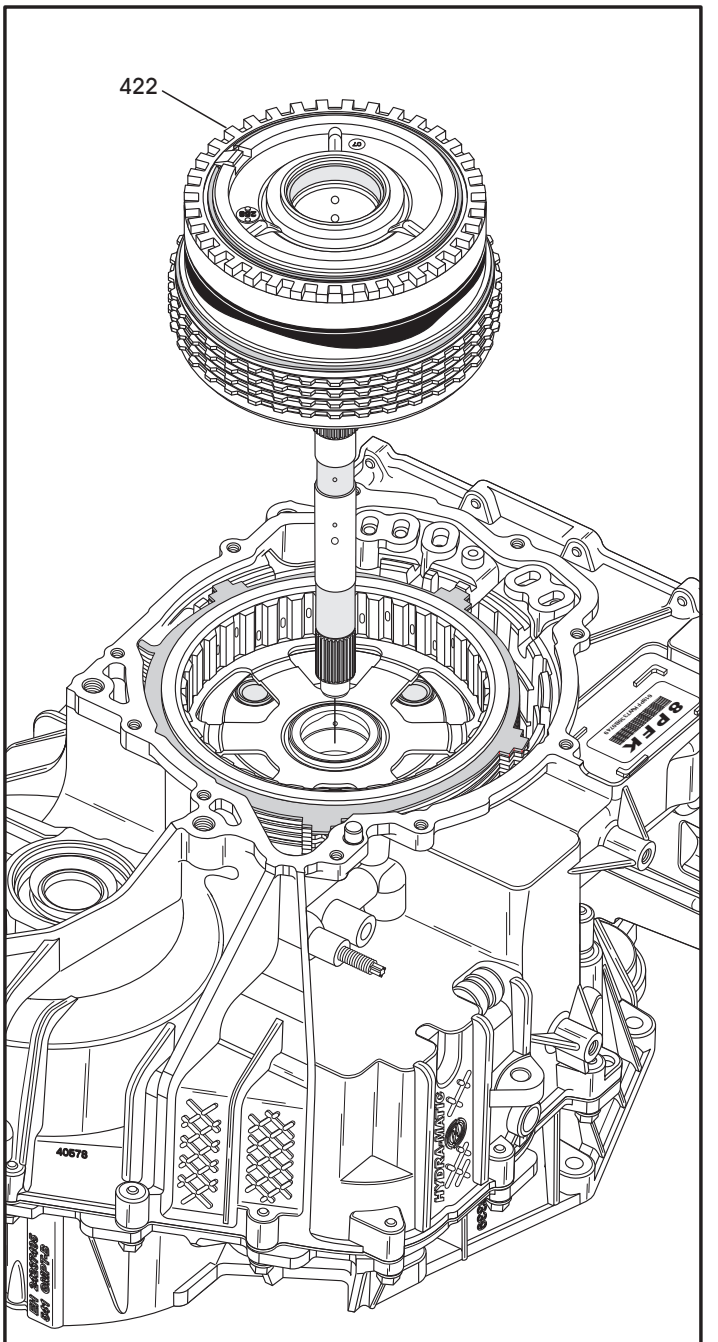
40. Install the reaction sun gear & 2-6 clutch hub assembly, as shown in Figure 206, by rotating back and forth to engage the friction plates until fully seated.
41. Install the number 9 thrust bearing onto the 2-6 clutch hub in direction shown in Figure 206.
42. Install the completed 3-5-Rev & 4-5-6 clutch housing, as shown in Figure 207, by rotating back and forth to engage input sun gear with the input shaft and the 3-5-Rev clutches into the 2-6 clutch hub and ensure it is fully seated.

Continued on Page123



465 NUMBER 9 THRUST BEARING.
466 REACTION SUN GEAR & 2-6 CLUTCH HUB ASSEMBLY.

Figure 206



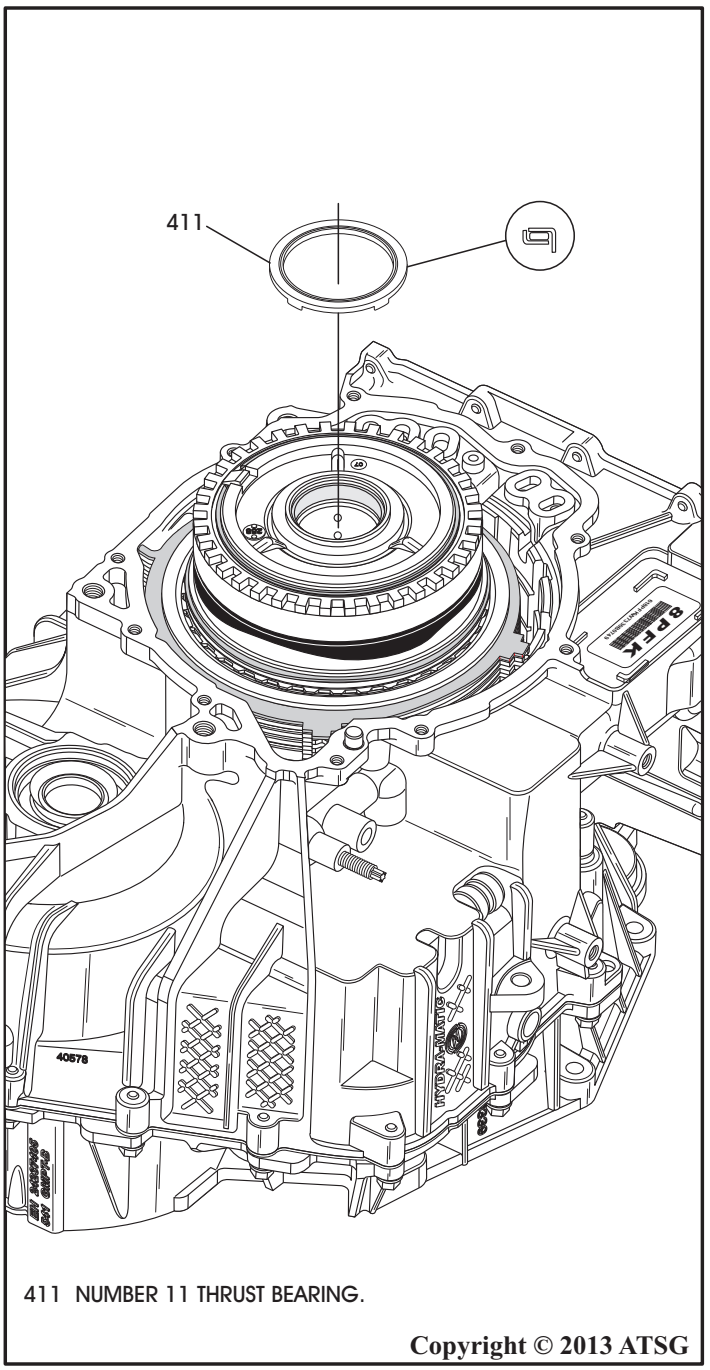
422 3-5-REV & 4-5-6 CLUTCH HOUSING ASSEMBLY.

Figure 207

TRANSMISSION ASSEMBLY (CONT'D)

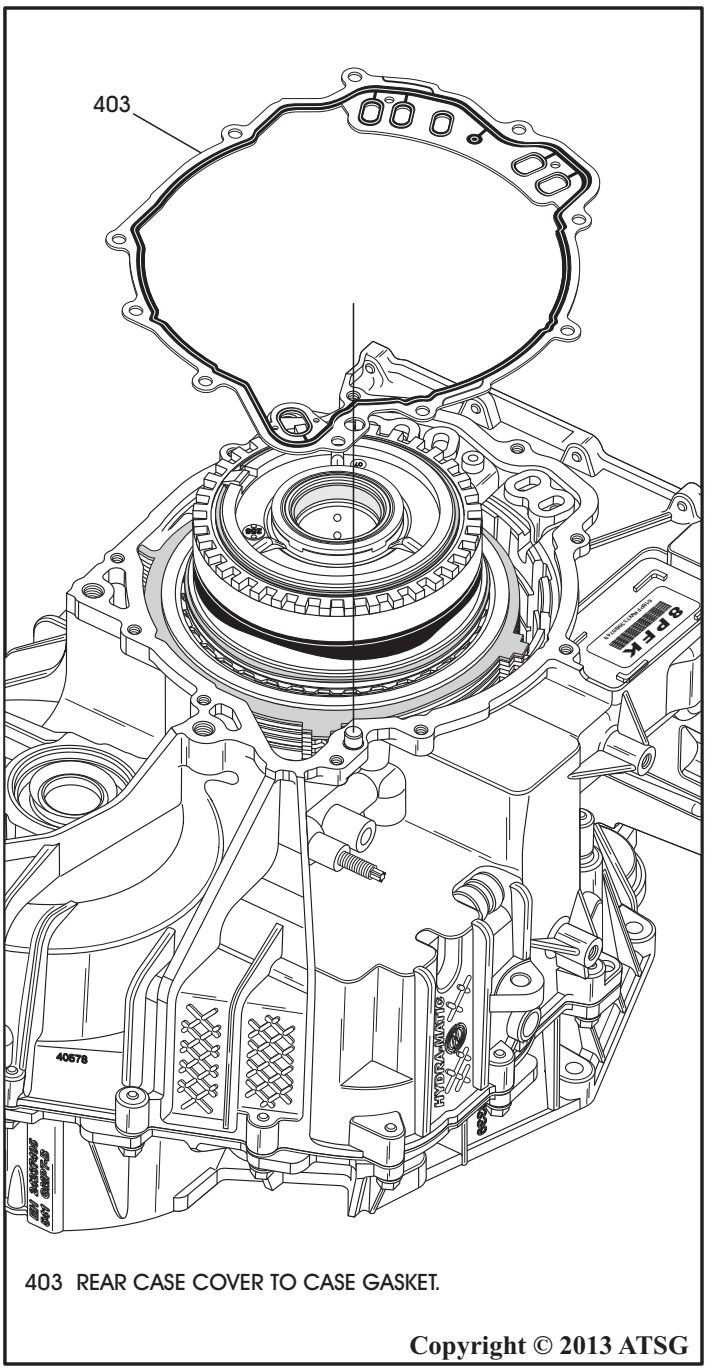
43. Install the number 11 thrust bearing onto the 3-5-Rev & 4-5-6 clutch housing in the direction shown in Figure 208.
44. Install new rear cover to case gasket onto the case, as shown in Figure 209, and over the alignment dowel.

Continued on Page 124



411 NUMBER 11 THRUST BEARING.

Figure 208



403 REAR CASE COVER TO CASE GASKET.

Figure 209

TRANSMISSION ASSEMBLY (CONT'D)

45. Route the input speed sensor harness connector thru the case passage, as shown in Figure 210. ***Note: The input speed sensor must be installed in rear cover before the rear cover is installed.***
46. Install the completed rear cover, as shown in Figure 211, pulling the speed sensor harness thru the case passage while lowering the cover onto the case and over the alignment dowel.
47. Install the 10 rear cover retaining bolts, as shown in Figure 211.

Continued on Page 125

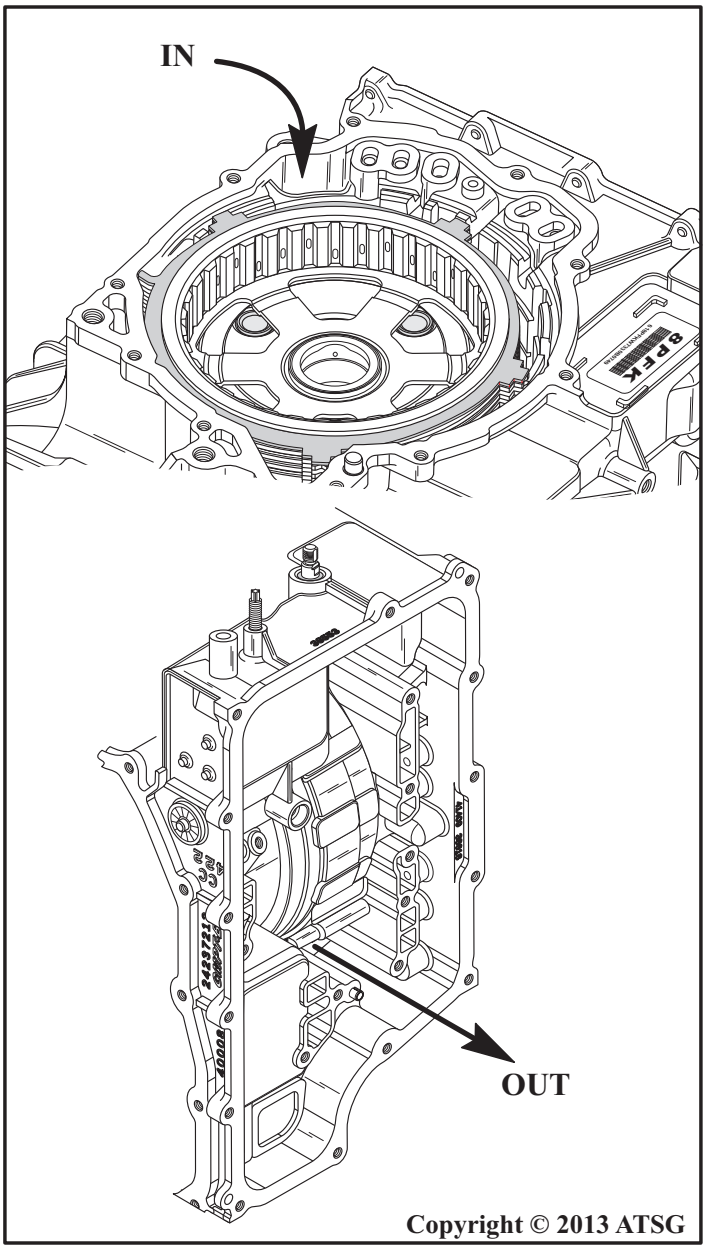
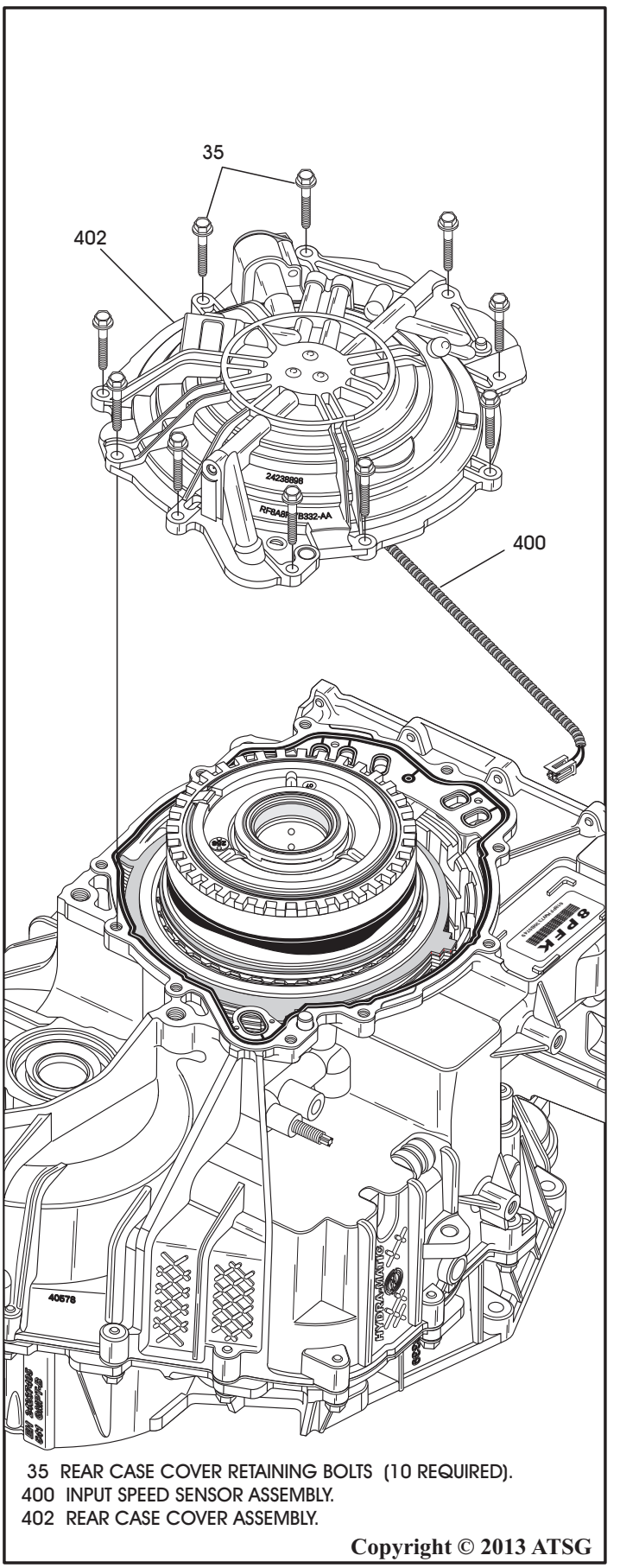
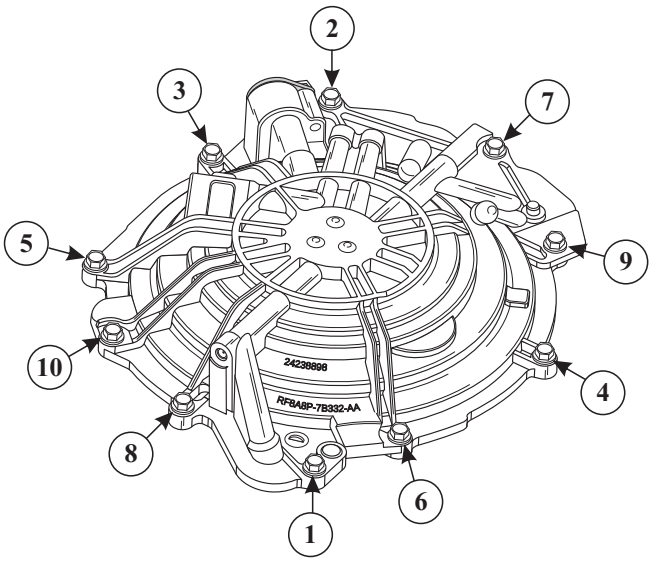


Figure 210



35 REAR CASE COVER RETAINING BOLTS (10 REQUIRED).
400 INPUT SPEED SENSOR ASSEMBLY.
402 REAR CASE COVER ASSEMBLY.

Figure 211



TORQUE IN SEQUENCE TO 12 N•M (106 IN. LB.)

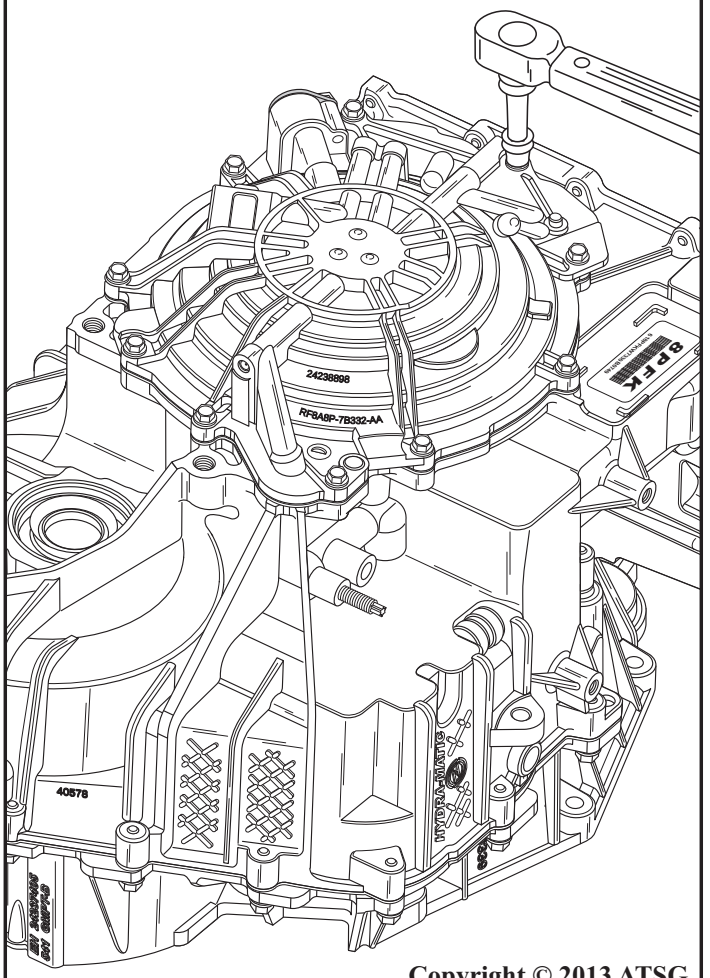


Figure 212

TRANSMISSION ASSEMBLY (CONT'D)

48. Torque the 10 rear case cover bolts in sequence to 12 N•m (106 in. lb.), as shown in Figure 212.
49. Perform the ***Final*** rotating torque measurement as shown in Figure 213, using a dial or beam style foot pound torque wrench and DT-47793.
50. The final rotating torque measurement should be 14 - 22 N•m (10-16 ft. lb.).
    Caution: If the rotating torque is not within specifications, the pinion gear assembly and differential bearing pre-load shim selection is incorrect and must be corrected. Refer to "Differential Pre-load Shim Selection" on Page 63.

Continued on Page 126

DIFFERENTIAL CARRIER ASSEMBLY FINAL ROTATING TORQUE MEASUREMENT 14 - 22 N•M (10-16 FT. LB.)

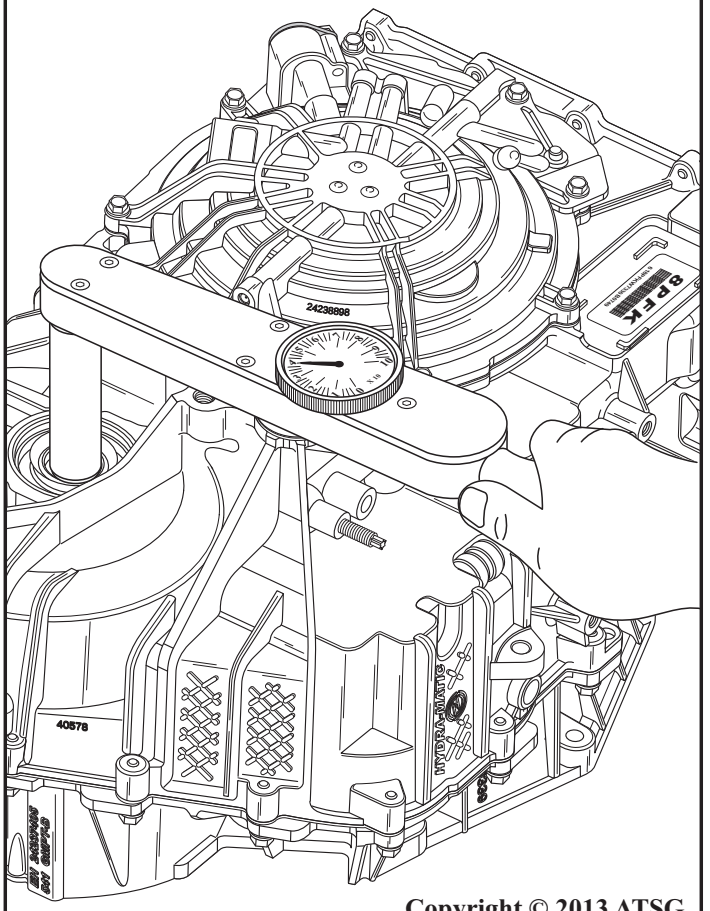


Figure 213

TRANSMISSION ASSEMBLY (CONT'D)

51. Install dial indicator on the input shaft, as shown in Figure 214, and zero the indicator.
52. There should be zero end-play but the input shaft should turn free with vice grips.
    Note: There are no selective washers for setting end-play. If you do have end-play, you have a mis-assembly.
53. Install a new 1-2-3-4 clutch passage seal in the direction shown in Figure 215.
54. Install the output speed sensor into the case bore, as shown in Figure 216.
55. Install the output speed sensor retaining bolt and torque to 12 N•m (106 in. lb.).

Continued on Page 127

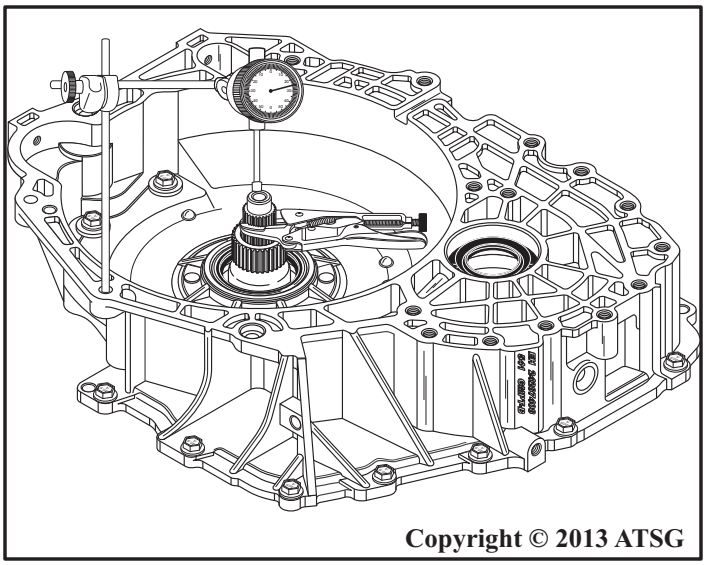
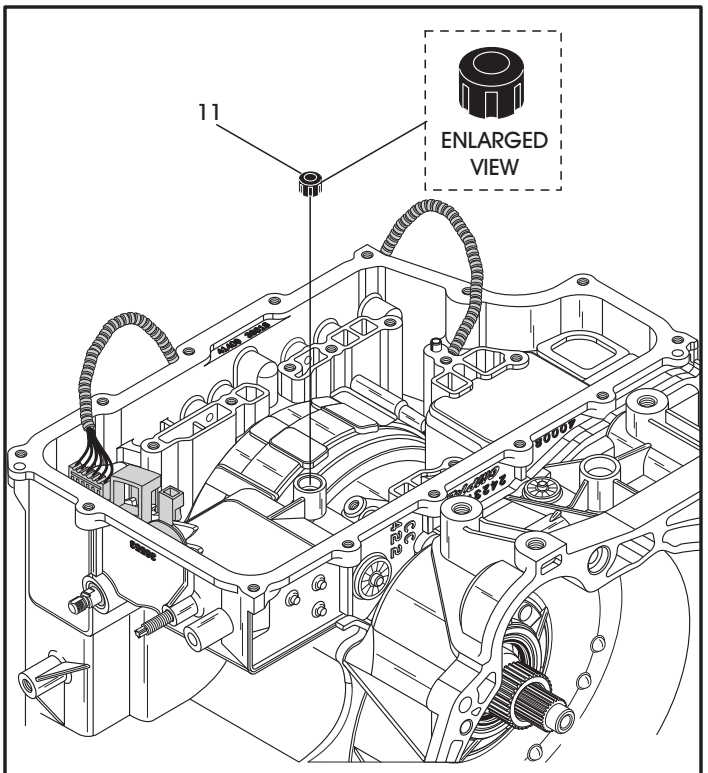
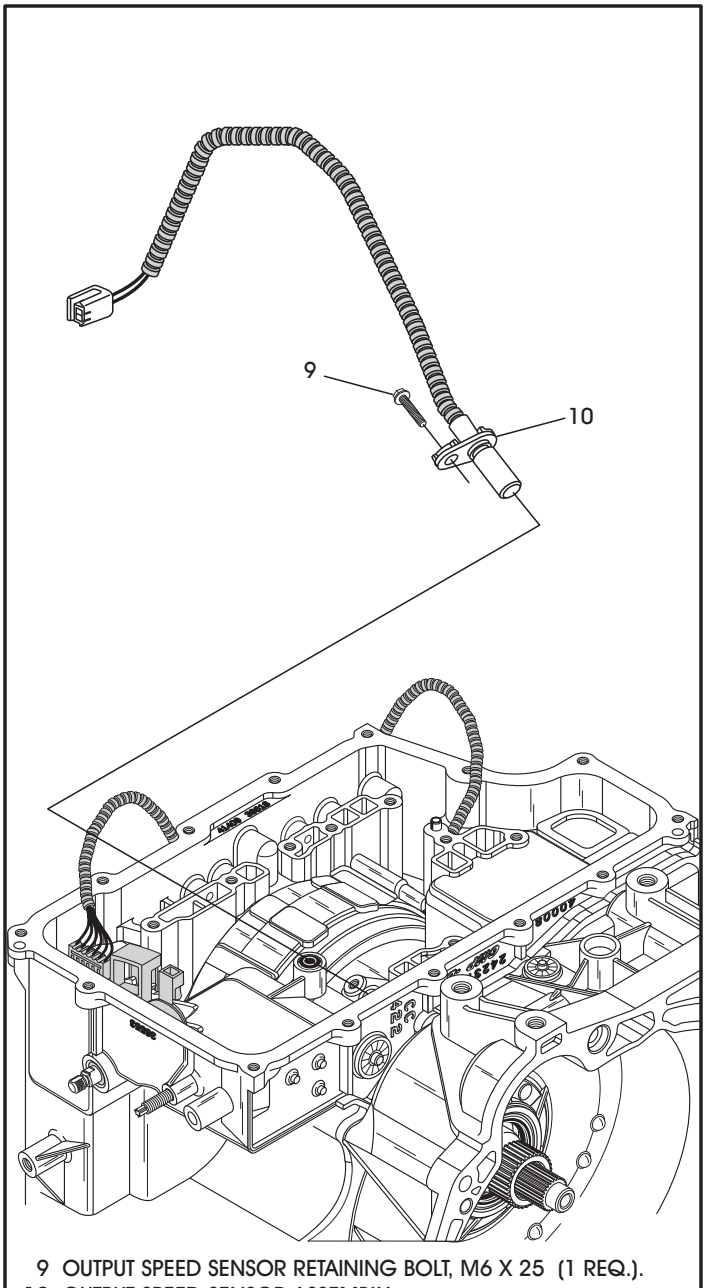


Figure 214



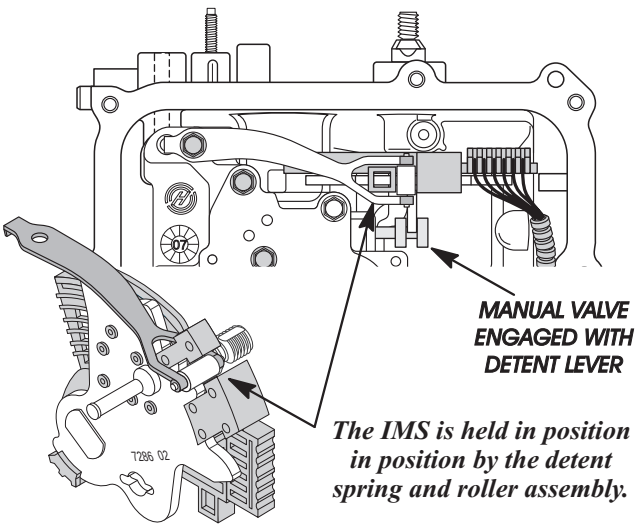
11 1-2-3-4 CLUTCH PASSAGE SEAL.

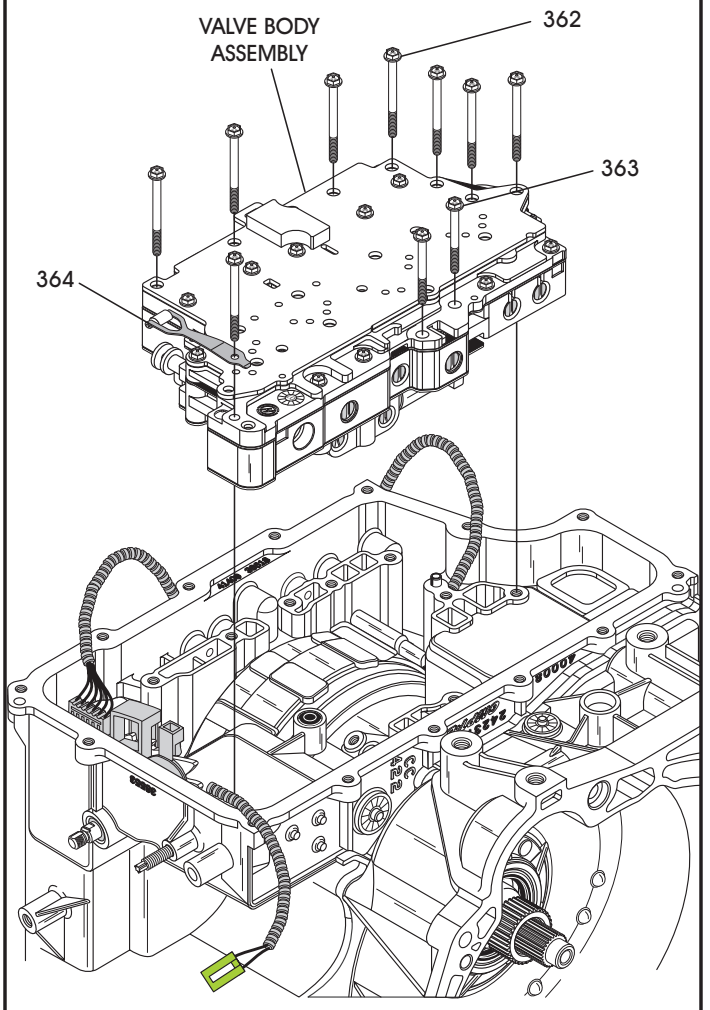
Figure 215



9 OUTPUT SPEED SENSOR RETAINING BOLT, M6 X 25 (1 REQ.).
10 OUTPUT SPEED SENSOR ASSEMBLY.

Figure 216





362 VALVE BODY BOLT), M6 X 65 (8 REQUIRED).
363 VALVE BODY BOLT), M6 X 55 (2 REQUIRED).
364 DETENT SPRING AND ROLLER ASSEMBLY.

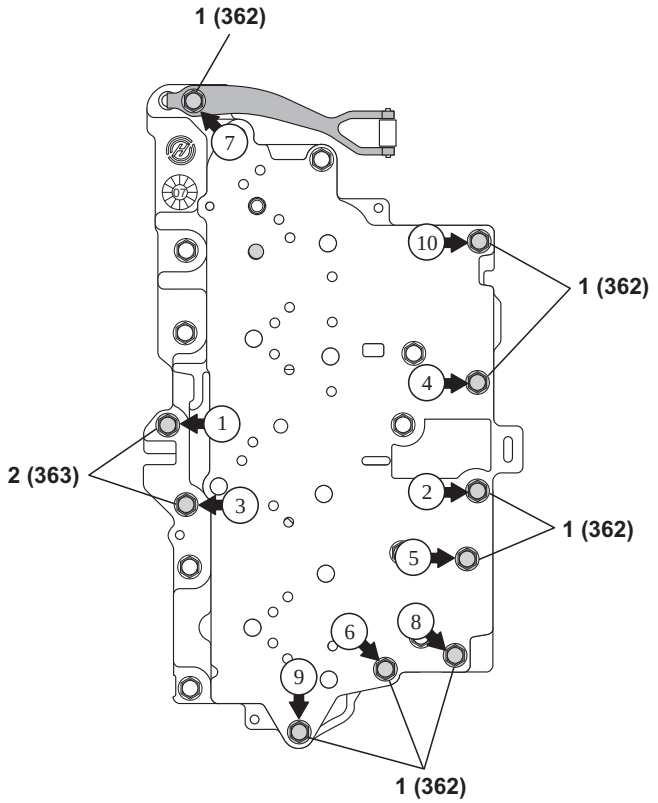
Figure 217

TRANSMISSION ASSEMBLY (CONT'D)

56. Install the completed valve body assembly, as shown in Figure 217.
Note: Ensure that manual valve is engaged with the detent lever, as shown in Figure 217.
57. Install the detent spring and roller assembly, as shown in Figure 217, and ensure it is in proper position over internal mode switch (IMS) and on the inside detent lever.
Note: Detent spring and roller assembly is used to hold the IMS in position (See Figure 217).
58. Install the remaining valve body retaining bolts, as shown in Figure 217, in their proper locations.
Note: All valve body bolt lengths and locations are shown in Figure 218.
59. Torque valve body bolts to 12 N•m (106 in. lb.), in the sequence shown in Figure 218.

Continued on Page 128

Valve Body Retaining Bolt Identification And Locations



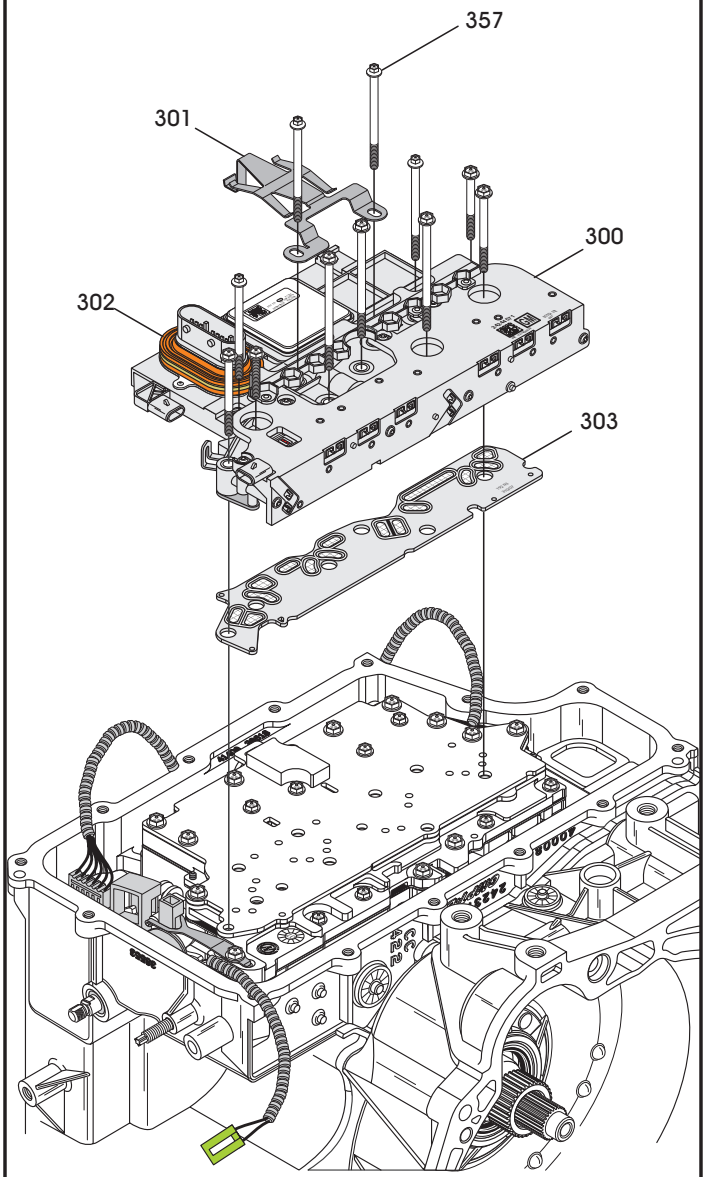
1 VALVE BODY BOLT (362), M6 X 65 (8 REQUIRED).
2 VALVE BODY BOLT (363), M6 X 55 (2 REQUIRED).

Figure 218

TRANSMISSION ASSEMBLY (CONT'D)

60. Install the completed solenoid body & TCM, with filter plate, as shown in Figure 219.
61. Install the solenoid body retaining spring, as shown in Figure 219. Insert tab of spring into the slot on spacer plate, then rotate into position. ***Note: This spring is used to hold the TCM down against the heat-sink that is permanently attached to spacer plate.***
62. Install all of the solenoid body & TCM assembly retaining bolts in their proper positions, as shown in Figure 219, finger tight. ***Note: All solenoid body & TCM assembly bolt lengths and locations are shown in Figure 220.***
63. Torque all of the solenoid body & TCM bolts to 12 N•m (106 in. lb.), in the sequence shown in Figure 220.

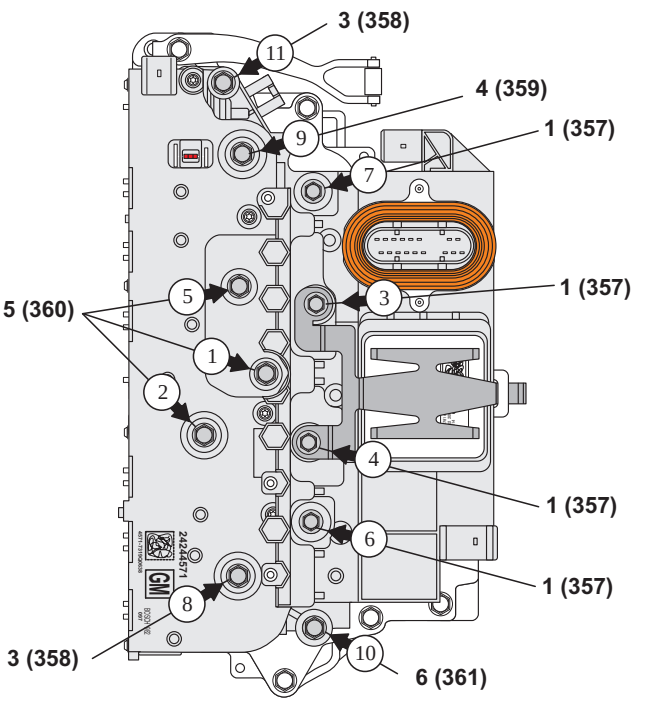
Continued on Page 129



300 SOLENOID BODY AND TCM ASSEMBLY.
301 SOLENOID BODY RETAINING SPRING.
302 SOLENOID BODY TO SIDE COVER SEAL ASSEMBLY.
303 SOLENOID BODY FILTER PLATE ASSEMBLY.
357 SOLENOID BODY/TCM BOLTS (SEE FIGURE 220).

Figure 219

Solenoid Body/TCM Retaining Bolt Identification And Locations



1 SOLENOID BODY BOLT (357), M6 X 80 (4 REQUIRED).
3 SOLENOID BODY BOLT (358), M6 X 65 (2 REQUIRED).
4 SOLENOID BODY BOLT (359), M6 X 42 (1 REQUIRED).
5 SOLENOID BODY BOLT (360), M6 X 95 (3 REQUIRED).
6 SOLENOID BODY BOLT (361), M6 X 55 (1 REQUIRED).

Figure 220

TRANSMISSION ASSEMBLY (CONT'D)

64. Connect output speed sensor green connector to the solenoid body & TCM assembly, as shown in Figure 221.
65. Connect input speed sensor gray connector to the solenoid body & TCM assembly, as shown in Figure 221.
66. Connect internal mode switch green connector to the solenoid body & TCM assembly, as shown in Figure 221.
    Note: Route all wire harness' as shown in Figure 221.
67. Install a new valve body side cover gasket into groove of valve body side cover in the direction shown in Figure 222.

Continued on Page 130

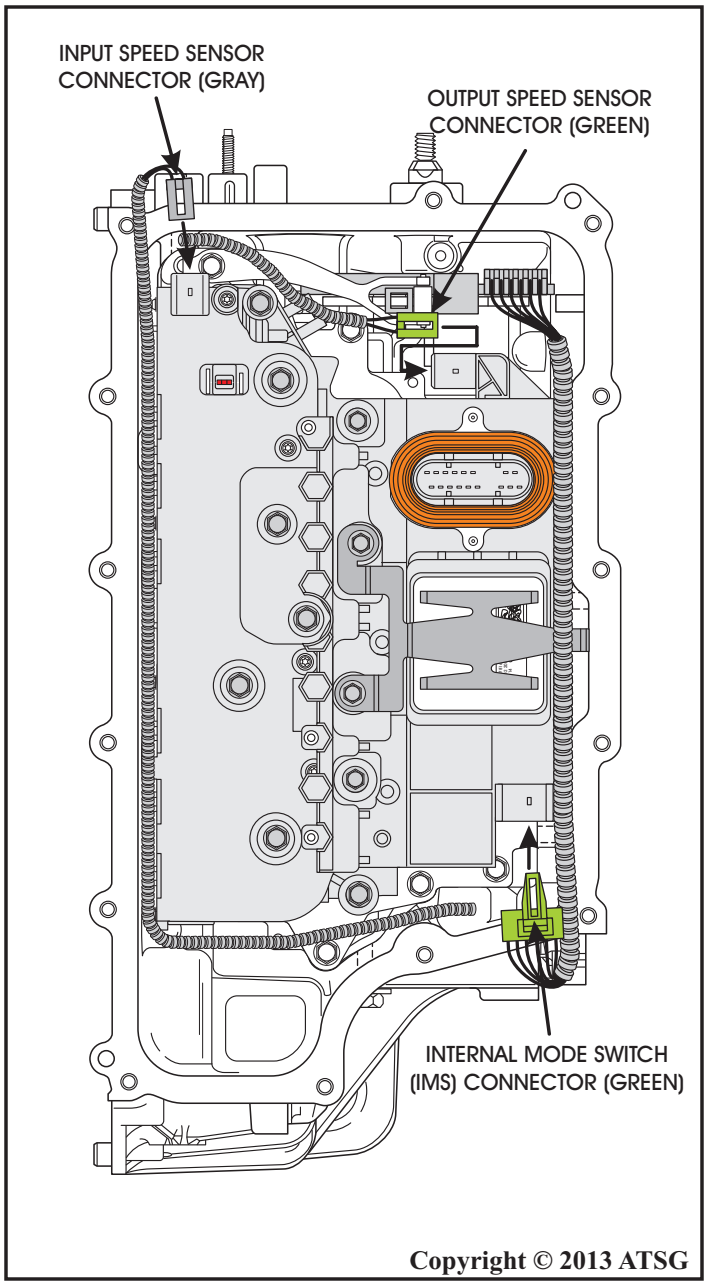


Figure 221

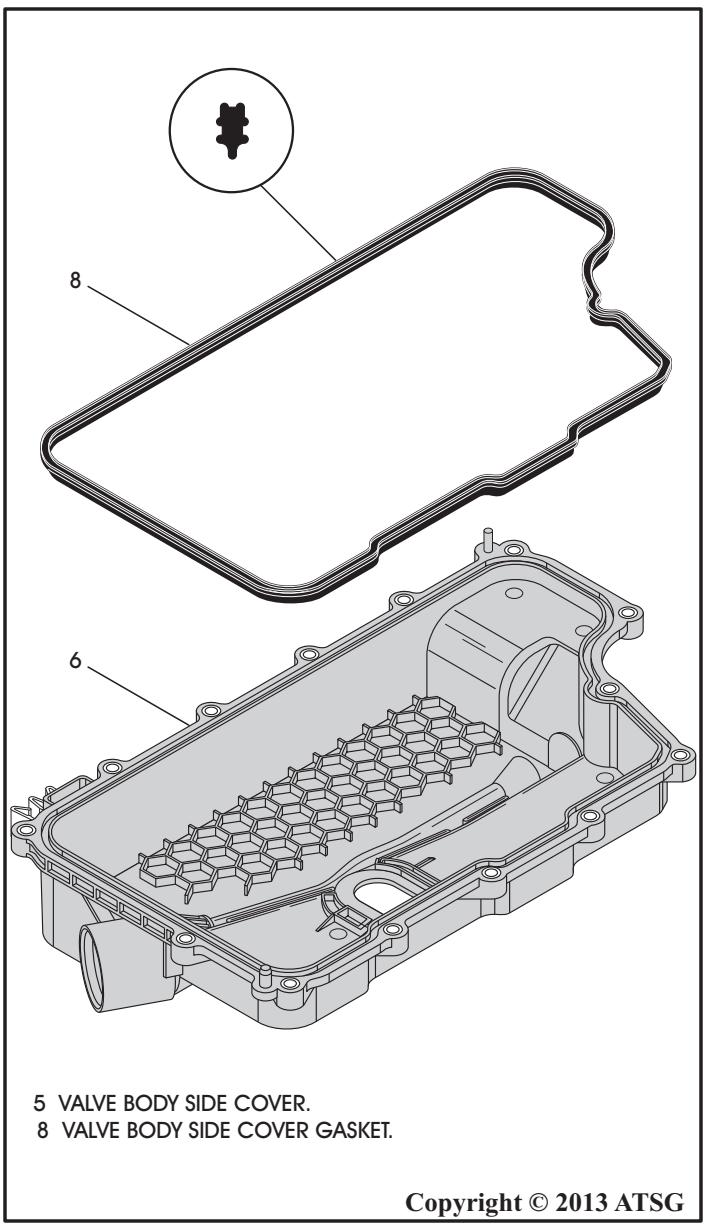
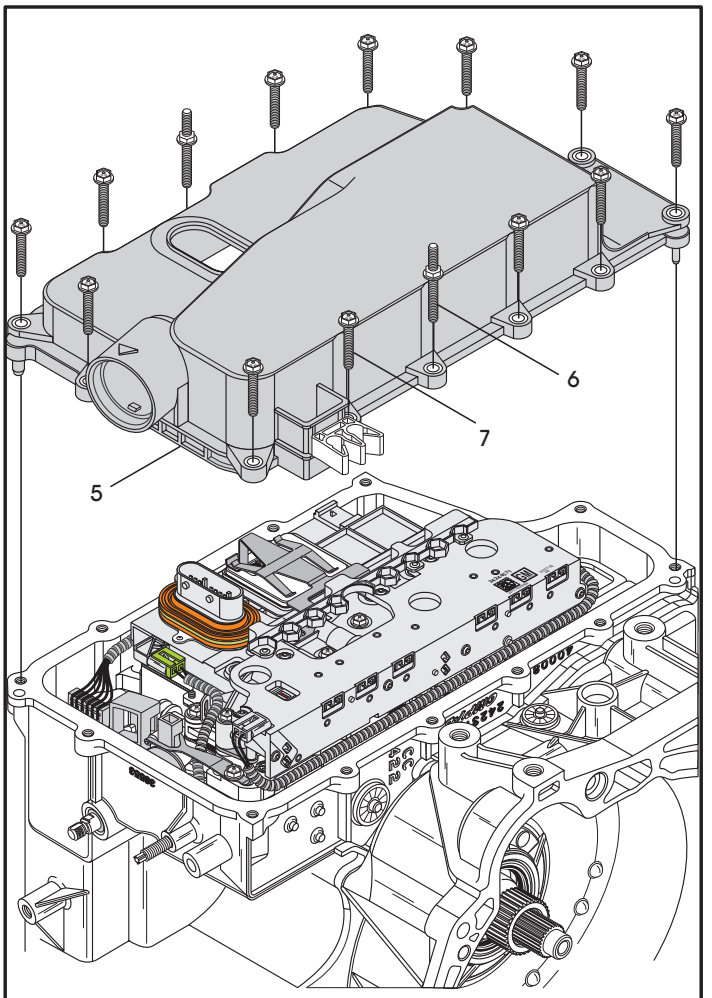


Figure 222

TRANSMISSION ASSEMBLY (CONT'D)

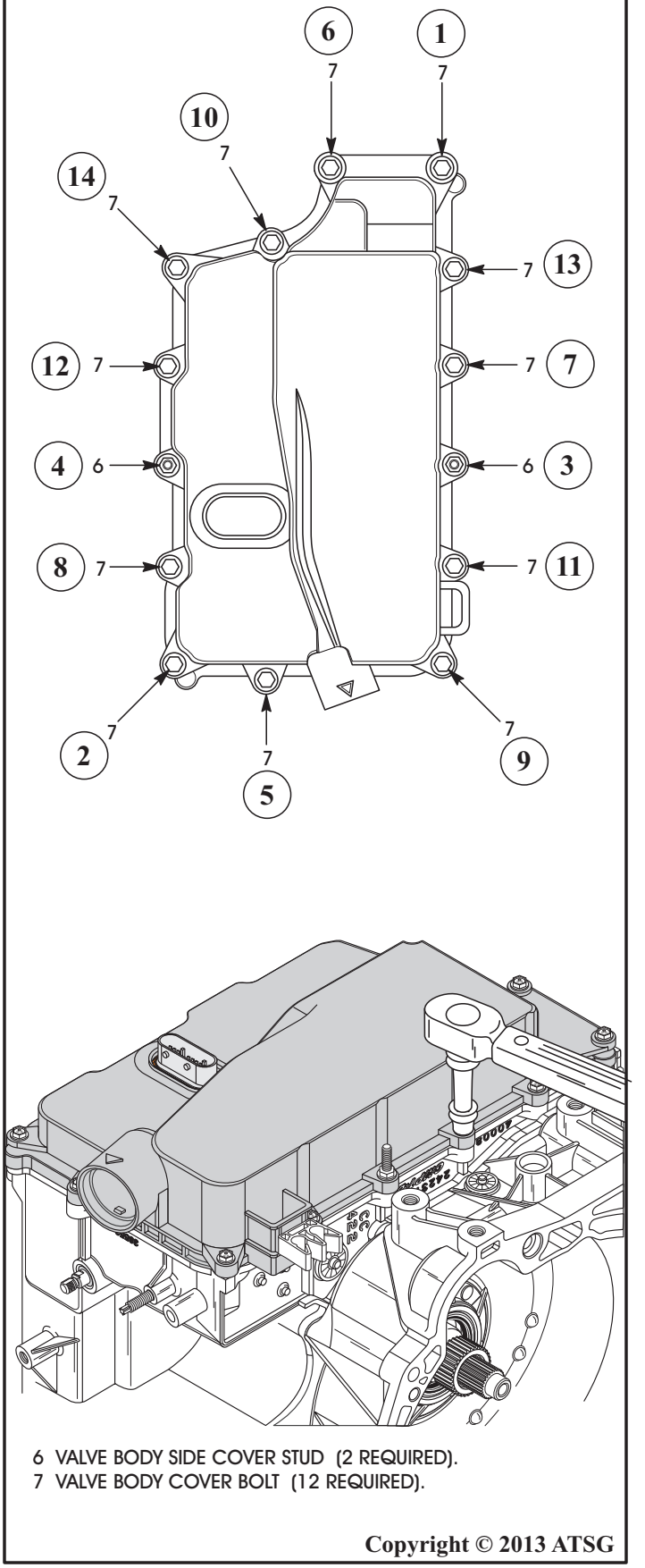
68. Install the valve body side cover with gasket onto the transmission, as shown in Figure 223.
69. Install the 12 valve body side cover bolts and the 2 valve body side cover studs, as shown in Figure 223.
    Note: Amount and location of the valve body side cover studs may vary by model.
70. Torque the valve body side cover bolts and studs to 12 N•m (106 in. lb.), as shown in Figure 224, in the sequence shown.

Continued on Page 131



5 VALVE BODY SIDE COVER.
6 VALVE BODY SIDE COVER STUD (2 REQUIRED).
7 VALVE BODY COVER BOLT (12 REQUIRED).

Figure 223



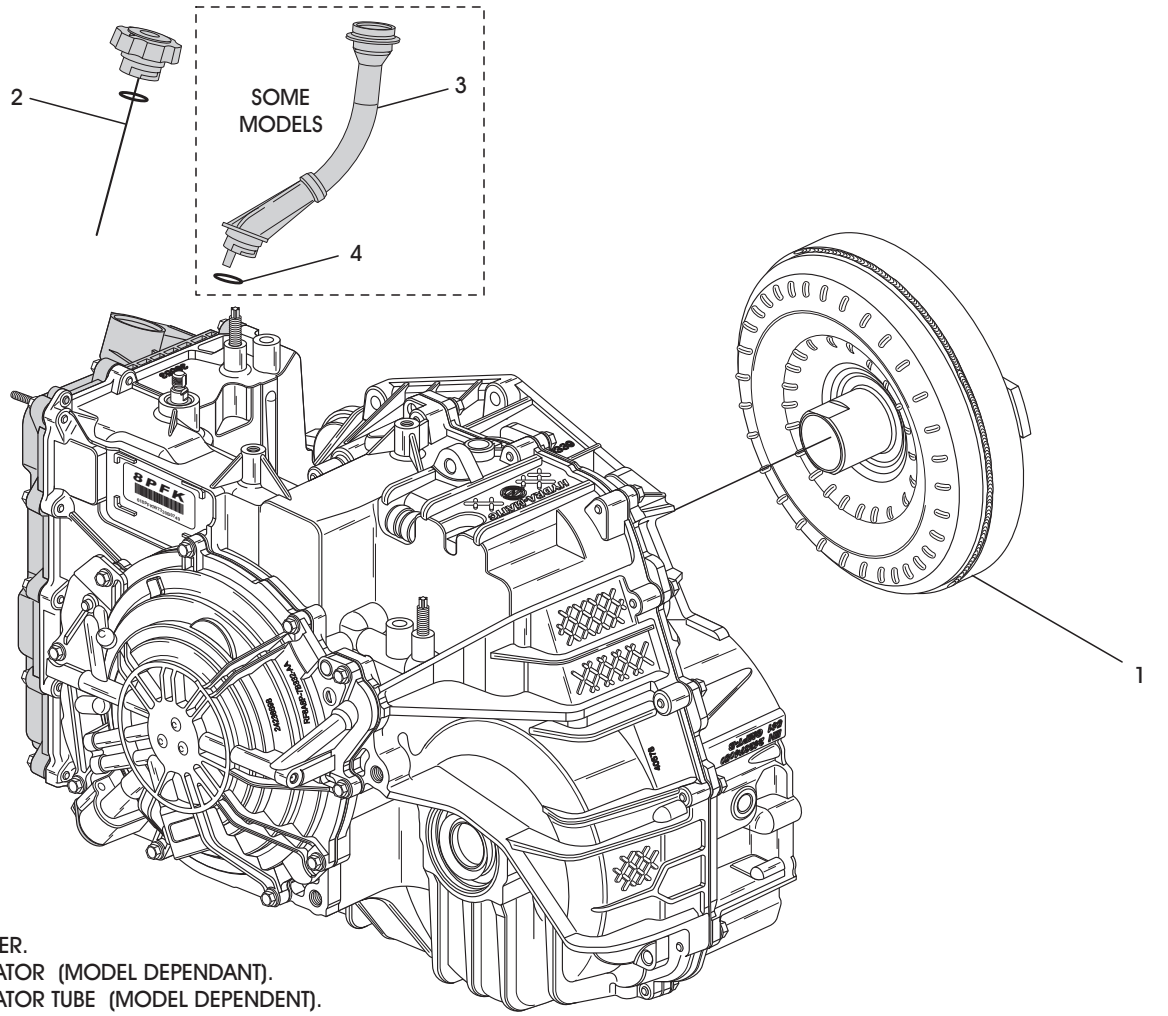
6 VALVE BODY SIDE COVER STUD (2 REQUIRED).
7 VALVE BODY COVER BOLT (12 REQUIRED).

Figure 224

TRANSMISSION ASSEMBLY (CONT'D)

71. Install new "O" ring seal and install the dip-stick as shown in Figure 225.
72. There will also be an "O" ring required on the dip-stick tube, if so equipped.
    Note: Dip-sticks will vary in length but all models are equipped with dip-stick.
73. Lubricate the torque converter hub with a small amount of Trans-Jel®, and install the torque converter assembly as shown in Figure 225.
    Note: It is best to pre-fill the converter with 2 quarts of the proper fluid before installation.

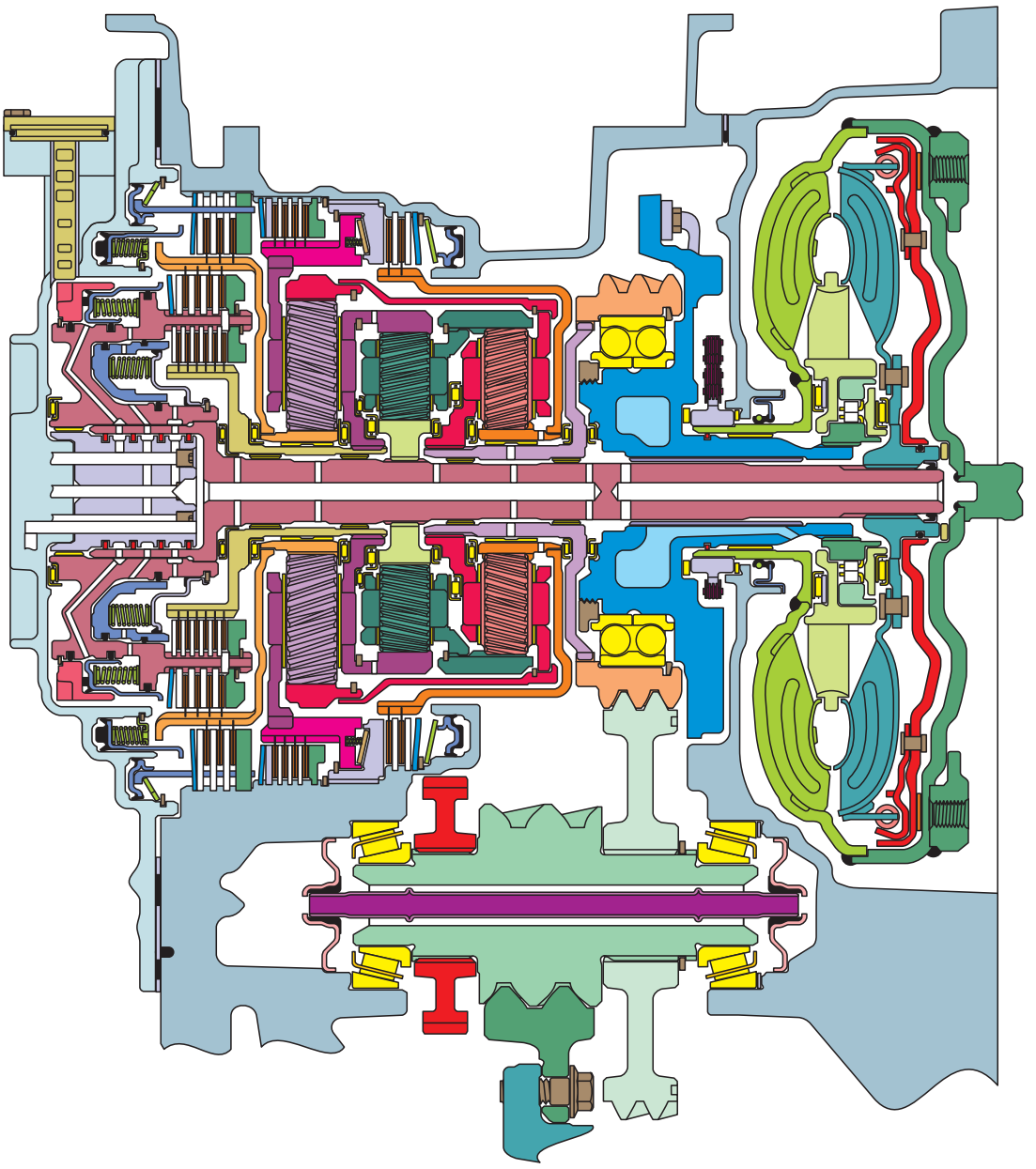
CONGRATULATIONS,
YOU ARE FINISHED!



1 TORQUE CONVERTER.
2 FLUID LEVEL INDICATOR (MODEL DEPENDANT).
3 FLUID LEVEL INDICATOR TUBE (MODEL DEPENDENT).
4 FLUID LEVEL INDICATOR TUBE SEAL (MODEL DEPENDENT).

Figure 225

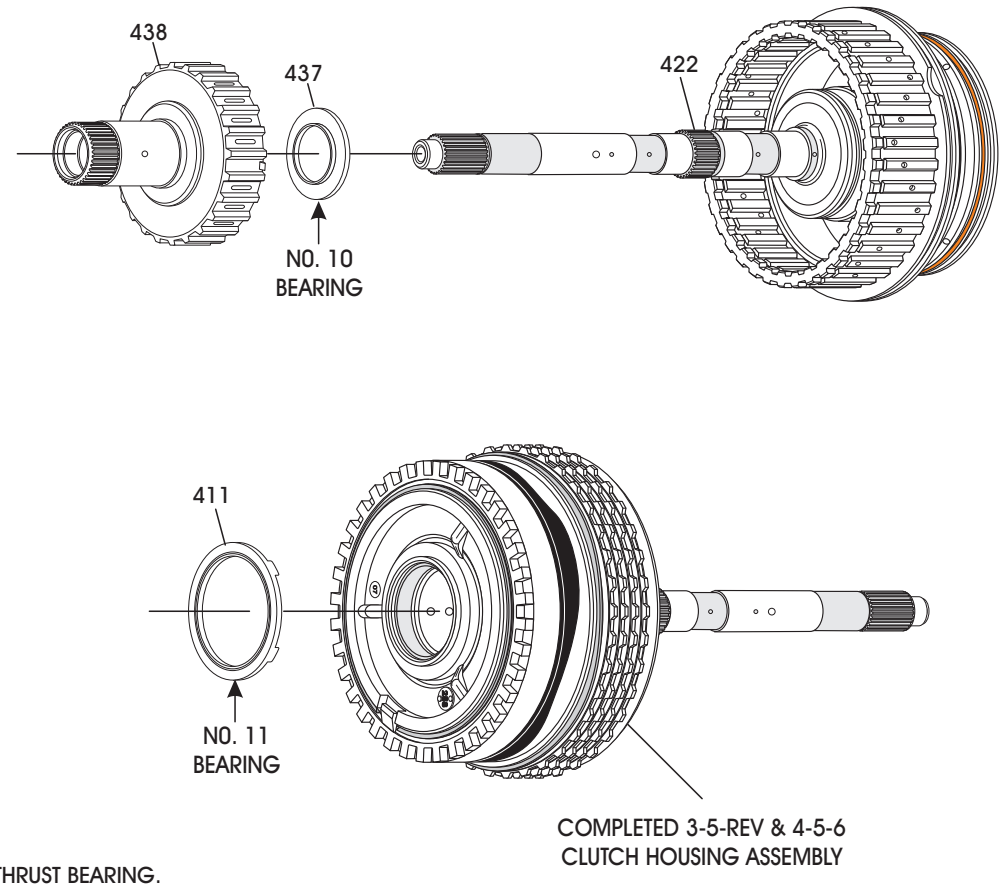
THRUST BEARING IDENTIFICATION AND LOCATION



Refer to Figure 227, 228 and 229 for 3 dimensional illustrations of all thrust bearings and thrust washers.

Figure 226

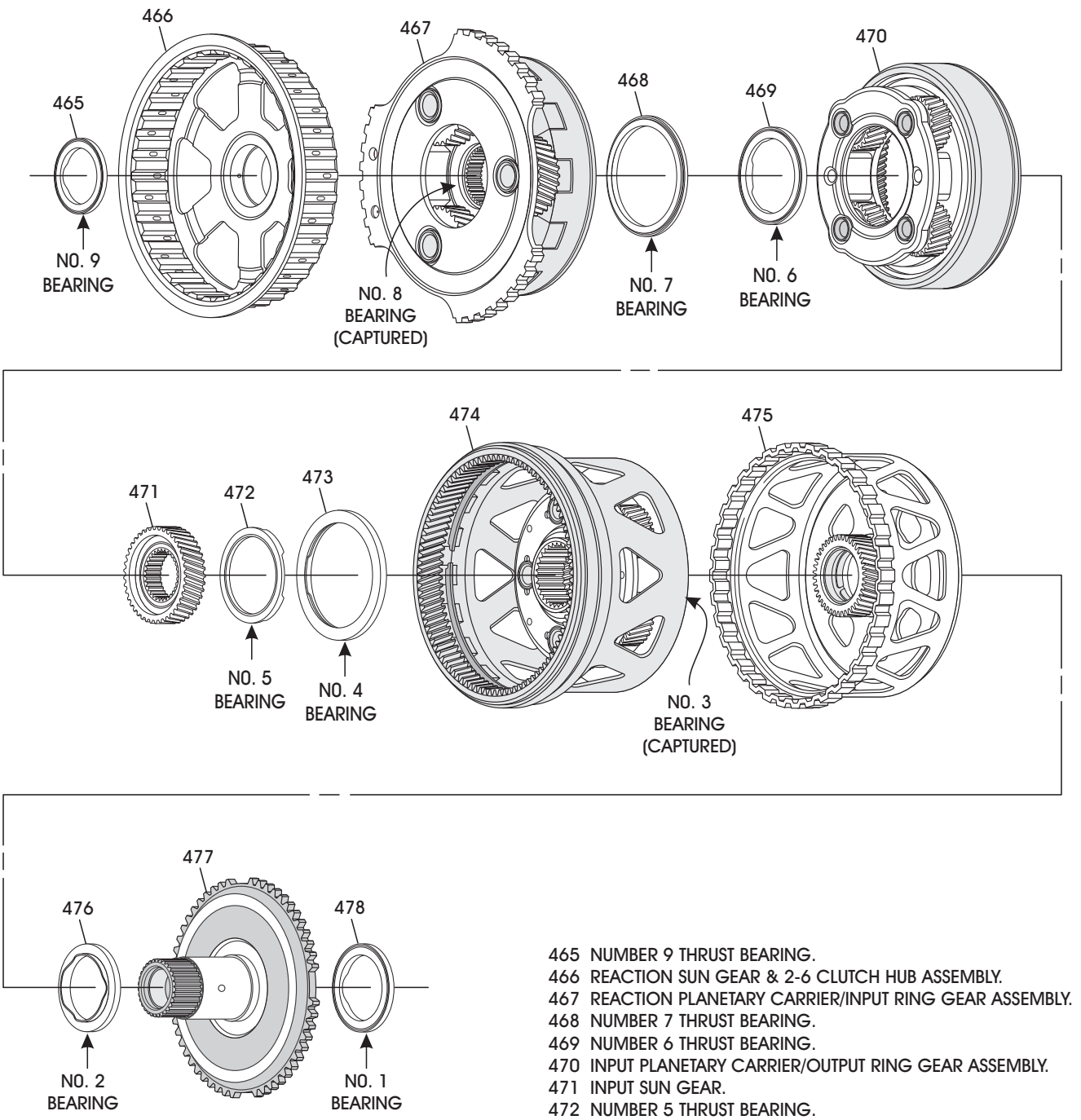
THRUST BEARING IDENTIFICATION AND LOCATION



411 NUMBER 11 THRUST BEARING.
437 NUMBER 10 THRUST BEARING.
438 4-5-6 CLUTCH HUB ASSEMBLY.
422 3-5-R & 4-5-6 CLUTCH HOUSING ASSEMBLY.

Figure 227

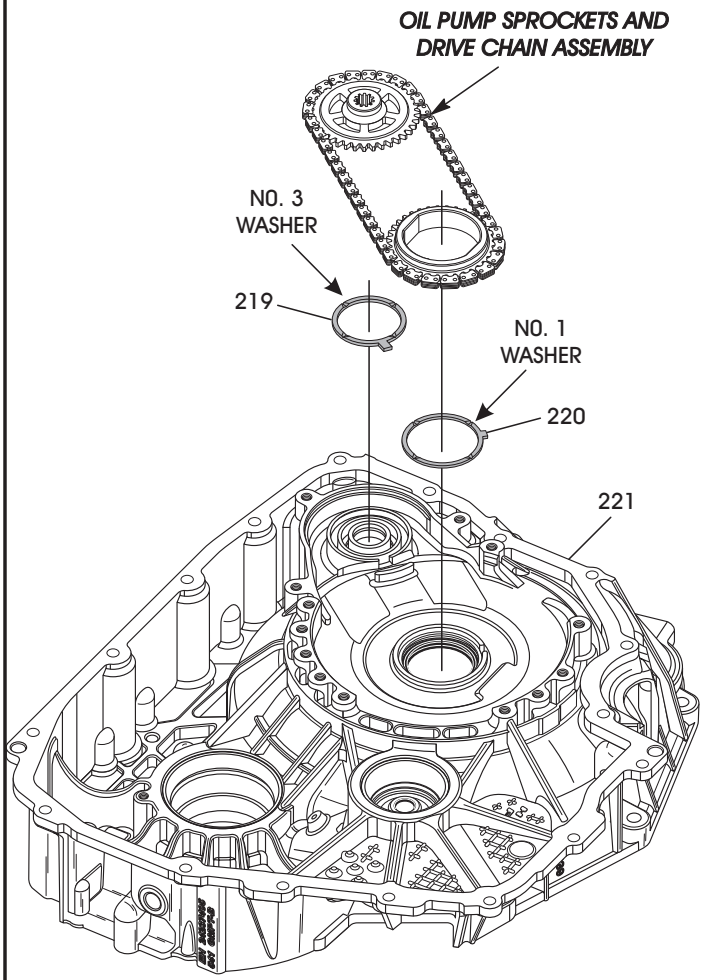
THRUST BEARING IDENTIFICATION AND LOCATION

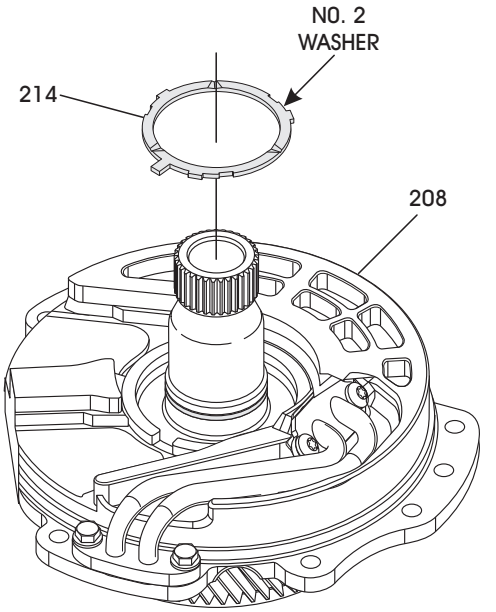


465 NUMBER 9 THRUST BEARING.
466 REACTION SUN GEAR & 2-6 CLUTCH HUB ASSEMBLY.
467 REACTION PLANETARY CARRIER/INPUT RING GEAR ASSEMBLY.
468 NUMBER 7 THRUST BEARING.
469 NUMBER 6 THRUST BEARING.
470 INPUT PLANETARY CARRIER/OUTPUT RING GEAR ASSEMBLY.
471 INPUT SUN GEAR.
472 NUMBER 5 THRUST BEARING.
473 NUMBER 4 THRUST BEARING.
474 OUTPUT PLANETARY CARRIER/REACTION RING GEAR ASSEMBLY.
475 OUTPUT SUN GEAR/1-2-3-4 CLUTCH HUB ASSEMBLY.
476 NUMBER 2 THRUST BEARING.
477 OUTPUT TRANSFER DRIVE GEAR HUB ASSEMBLY.
478 NUMBER 1 THRUST BEARING.

Figure 228

THRUST WASHER IDENTIFICATION AND LOCATION





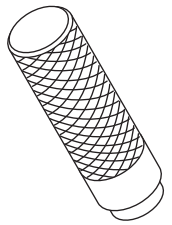
219 NUMBER 3 THRUST WASHER.
220 NUMBER 1 THRUST WASHER.
221 TORQUE CONVERTER HOUSING ASSEMBLY.

208 TRANSFER DRIVE GEAR SUPPORT ASSEMBLY.
214 NUMBER 2 THRUST WASHER.

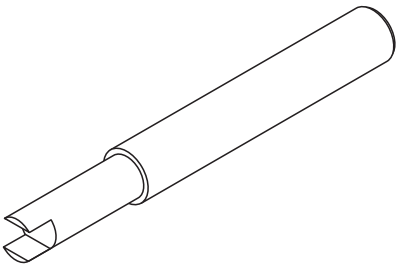
Figure 229

TORQUE SPECIFICATIONS			
Component	N•m	Ft. Lb.	In. Lb.
Oil Pump Cover to Oil Pump Body	12		106
Oil Pump Assembly to Converter Housing	12		106
Transfer Drive Gear Support Oil Tube (Torx) Bolts	12		106
Transfer Drive Gear Support Oil Tube (Hex) Bolts	7		62
Transfer Drive Gear Support Assembly to Converter Housing	41	30	
Differential Oil Baffle to Case Bolt	12		106
Transmission Rear Cover Hub Bolts	12		106
Input Speed Sensor to Rear Cover Bolt	9		80
Fluid Trough to Case Bolt	12		106
Torque Converter Housing to Case Bolts	--- See Page 113 ---		
Rear Case Cover to Case Bolts	12		106
Output Speed Sensor to Case Bolt	12		106
Upper Valve Body to Lower Valve Body Bolts	12		106
Valve Body Assembly to Case Bolts	12		106
Solenoid Body & TCM Assembly Bolts	12		106
Valve Body Side Cover To Case Bolts and Studs	12		106
Park Pawl Actuator Bracket Bolts	12		106
Line Pressure and Drain Plugs	12		106

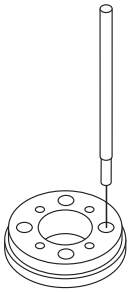
Figure 230



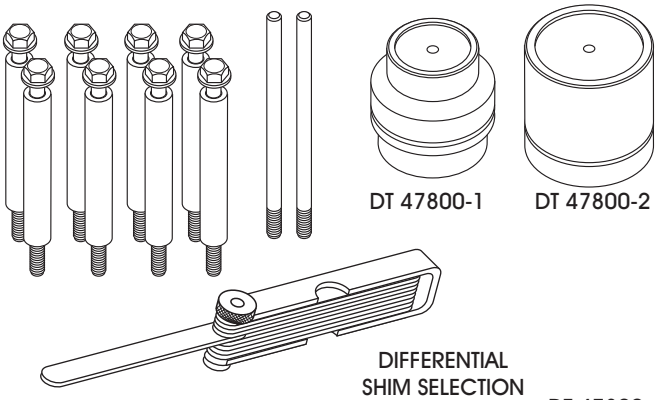
DRIVE SPROCKET SEAL INSTALLER DT 46627 J 46627



DIFFERENTIAL ROTATING TOOL DT 47793

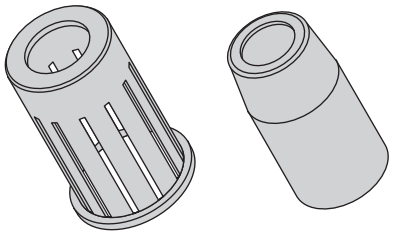


DRIVE SPROCKET SEAL STAKING TOOL DT 49131

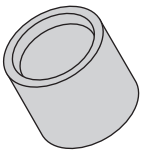


DT 47800-1 DT 47800-2

DIFFERENTIAL SHIM SELECTION GAUGE KIT DT-47800

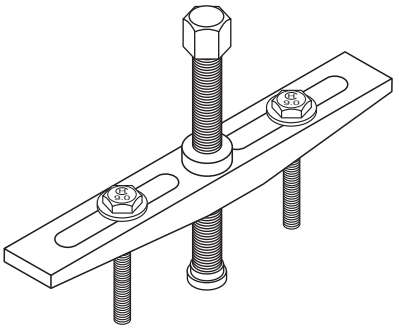


DT-46624 SEAL INSTALLER FOR STATOR SHAFT

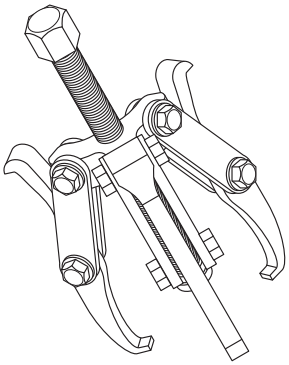


DT 46624-1 SEAL RESIZING TOOL

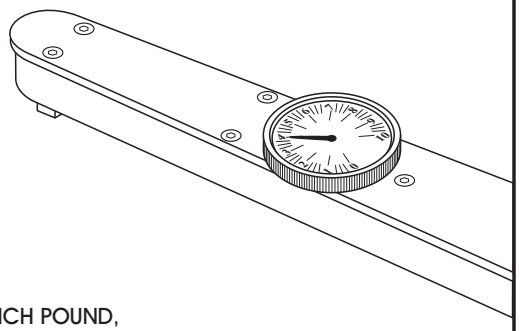
DT 46624 J 46624



UNIVERSAL DIFFERENTIAL LARGE BEARING REMOVER

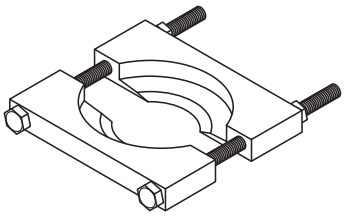


THREE LEGGED BEARING PULLER DT 41816 J 41816

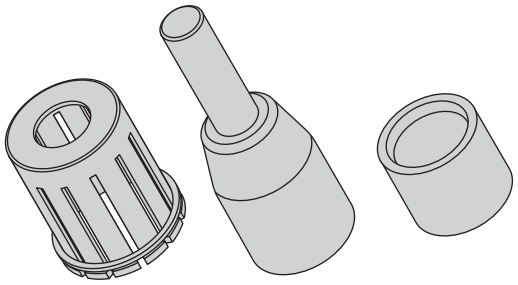


UNIVERSAL INCH POUND, DIAL TYPE TORQUE WRENCH

Figure 231

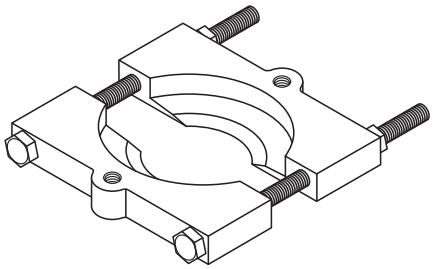


UNIVERSAL
SPLIT PLATE
BEARING REMOVER



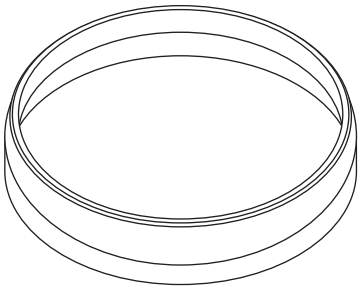
END COVER SEAL
RING INSTALLER
AND RE-SIZER KIT

DT 46620
J 46620



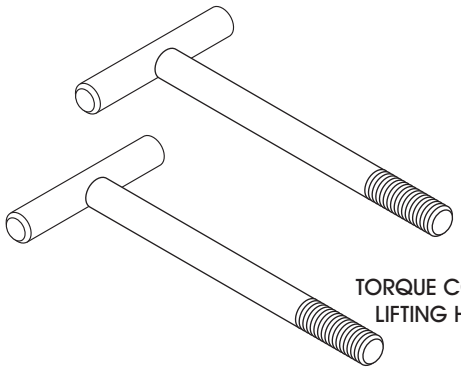
SPLIT PLATE
BEARING REMOVER

DT 22912-B
J 22912-B



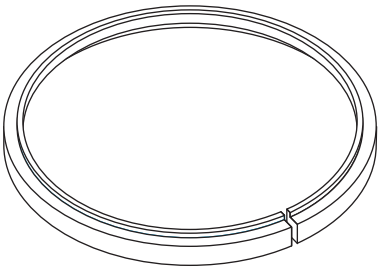
2-6 CLUTCH
PISTON LIP SEAL
PROTECTOR

DT 46621
J 46621



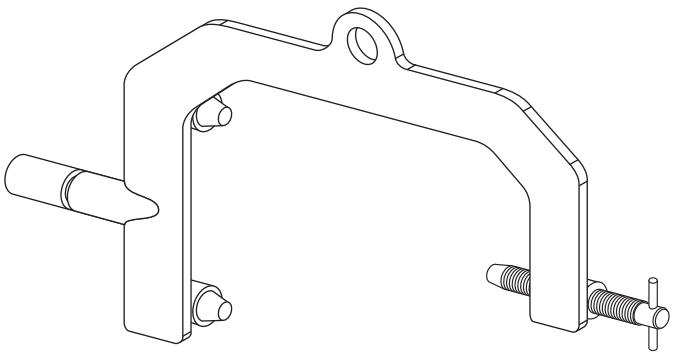
TORQUE CONVERTER
LIFTING HANDLES

DT 46409
J 46409



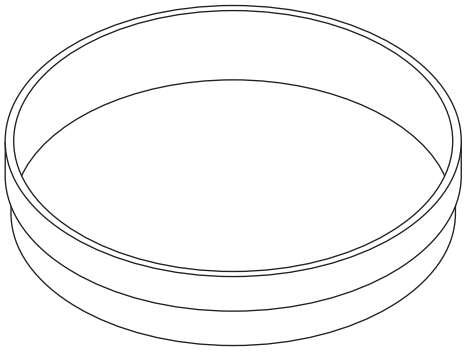
3-5 REVERSE
PISTON LIP SEAL
PROTECTOR

DT 46622
J 46622



TRANSMISSION
HOLDING FIXTURE

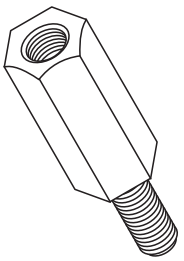
DT 46625
J 46625



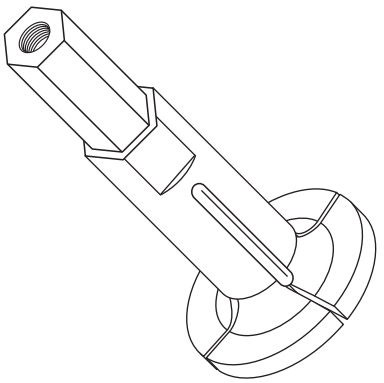
1-2-3-4 CLUTCH
PISTON LIP SEAL
PROTECTOR

DT 46623
J 46623

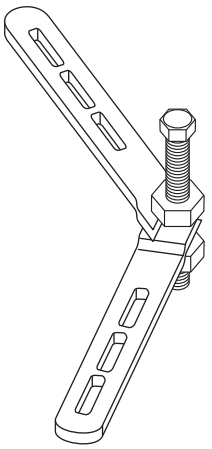
Figure 232



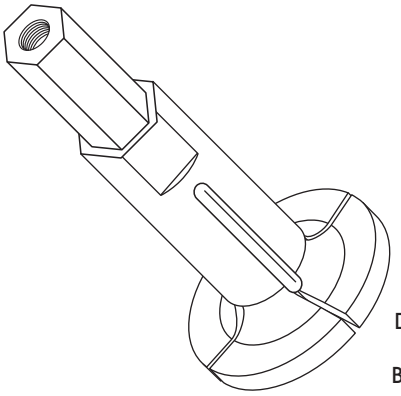
LUBE DAM REMOVER DT 48055



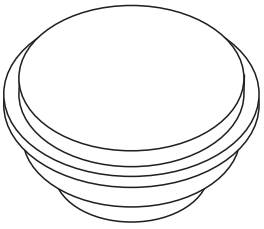
DIFFERENTIAL PINION GEAR BEARING CUP REMOVER DT 45094 J 45094



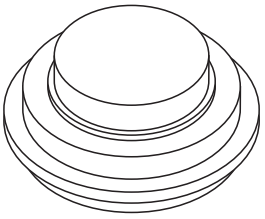
SPRING COMPRESSOR BRIDGE DT 48056



DIFFERENTIAL CARRIER BEARING CUP REMOVER DT 47927 J 47927

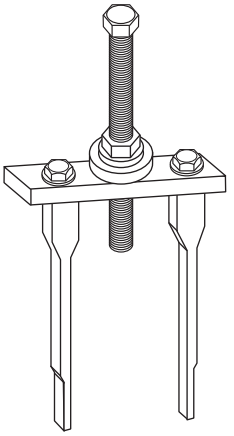


DIFFERENTIAL PINION BEARING SIDE

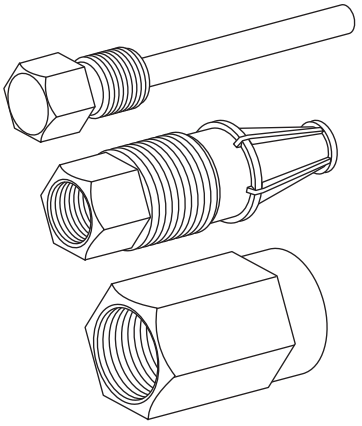


DIFFERENTIAL CARRIER BEARING SIDE

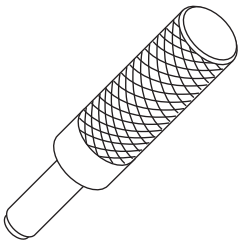
DIFFERENTIAL BEARING CUP INSTALLER DT 45087 J 45087



DIFFERENTIAL BEARING CUP REMOVAL BRIDGE DT 45124 J 45124

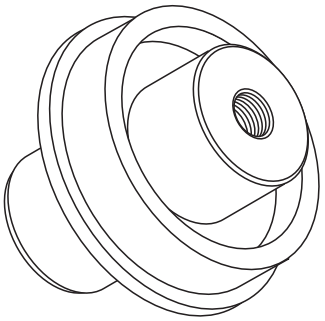


COOLER LINE SEAL REMOVER DT 45201 J 45201

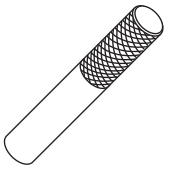


COOLER LINE AND MANUAL SHAFT SEAL INSTALLER DT 46626 J 46626

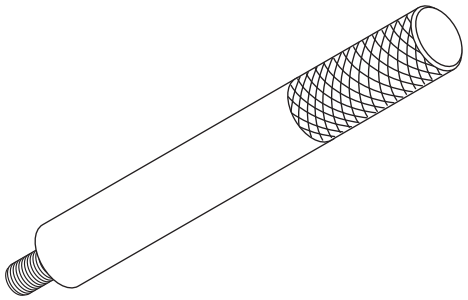
Figure 233



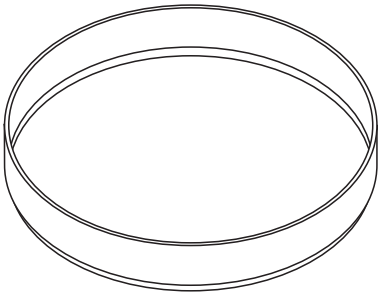
AXLE SEAL INSTALLER DRIVER — DT 46629, J 46629



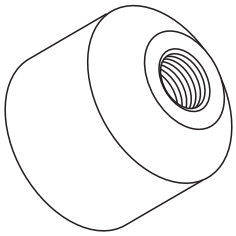
MANUAL SHAFT PIN INSTALLER DRIVER — DT 41229, J 41229



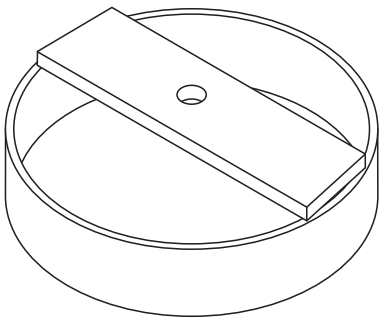
UNIVERSAL DRIVER HANDLE — J 8092



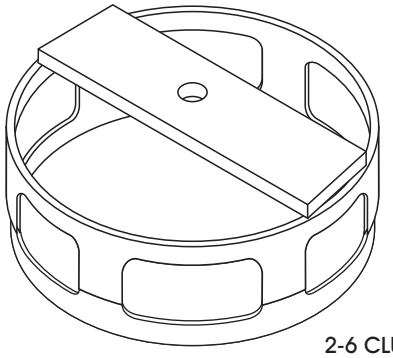
LOW/REVERSE CLUTCH LIP SEAL PROTECTOR — DT 46628-1, J 46628-1



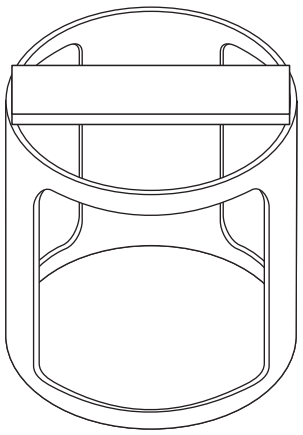
LUBE DAM INSTALLER DRIVER — DT 46630, J 46630



LOW/REVERSE CLUTCH SPRING COMPRESSOR — DT 46628-2, J 46628-2

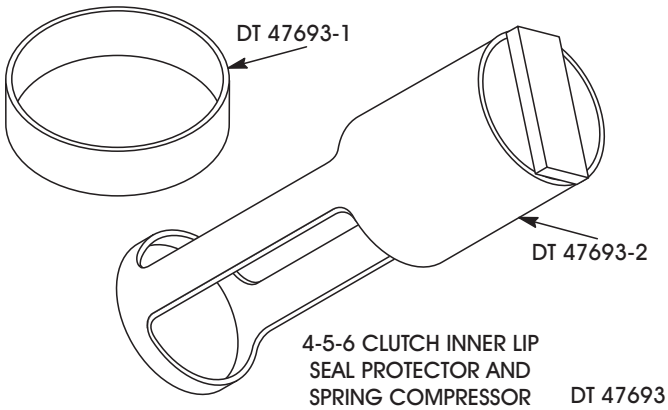


2-6 CLUTCH AND 1-2-3-4 CLUTCH SPRING COMPRESSOR — DT 46632, J 46632

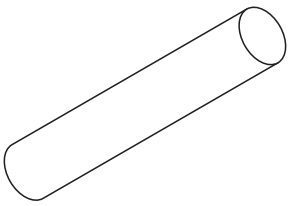


3-5-REV CLUTCH SPRING COMPRESSOR — DT 47694

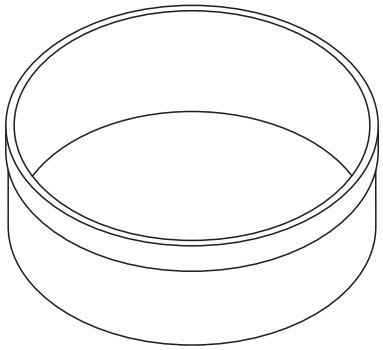
Figure 234



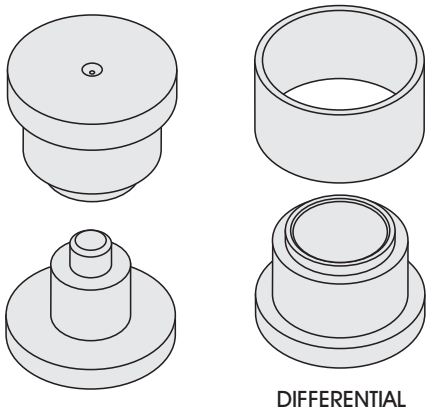
4-5-6 CLUTCH INNER LIP
SEAL PROTECTOR AND
SPRING COMPRESSOR DT 47693



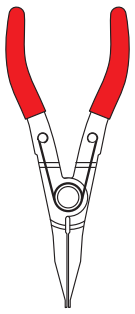
4-5-6 CLUTCH HUB
BUSHING PROTECTOR DT 48551



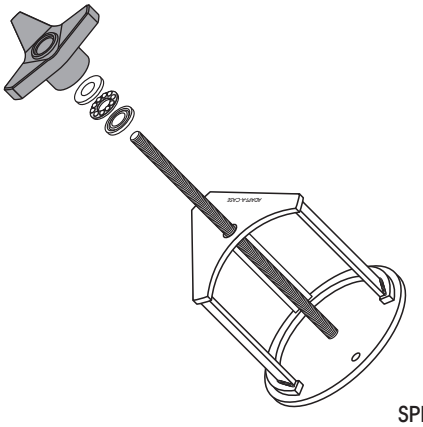
4-5-6 CLUTCH OUTER LIP
SEAL PROTECTOR AND
SPRING COMPRESSOR DT 47859



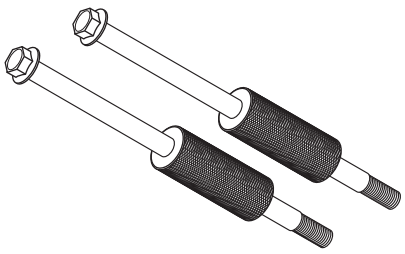
DIFFERENTIAL
BEARING INSTALLERS DT 47928



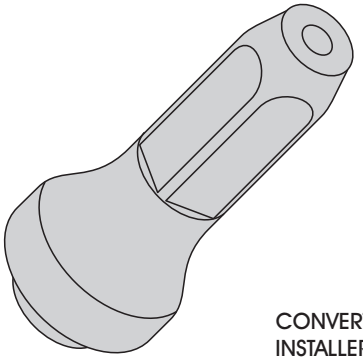
SNAP RING PLIERS
MAC TOOL TP 15P



UNIVERSAL
SPRING COMPRESSOR

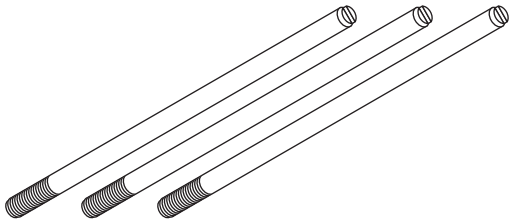


UNIVERSAL
SLIDE HAMMERS



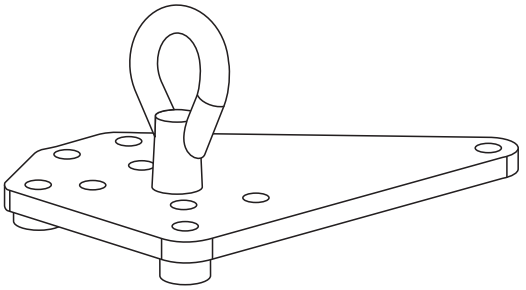
CONVERTER SEAL
INSTALLER/DRIVER DT 47861
J 38693

Figure 235



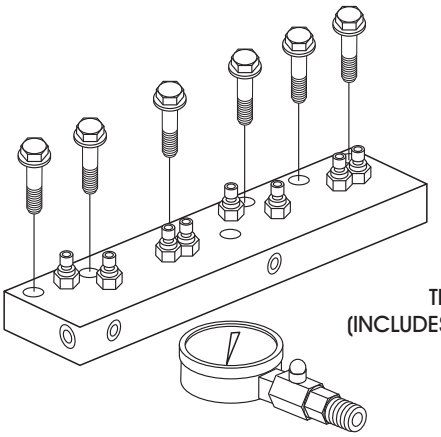
VALVE BODY
GUIDE PINS (3)

DT 39068
J 39068



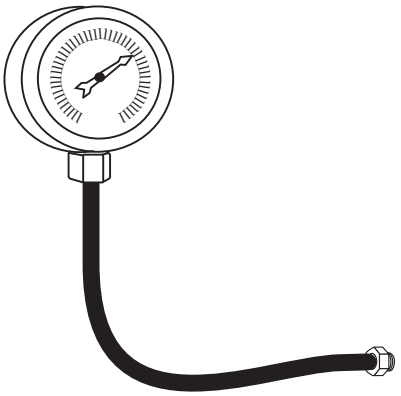
LIFTING
PLATE

DT 47811-A

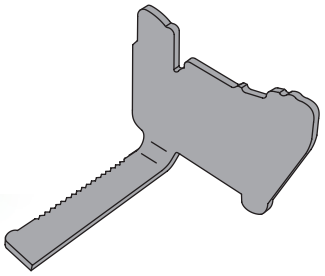


SOLENOID
TEST PLATE KIT
(INCLUDES ADAPTER HARNESS)

DT 47825

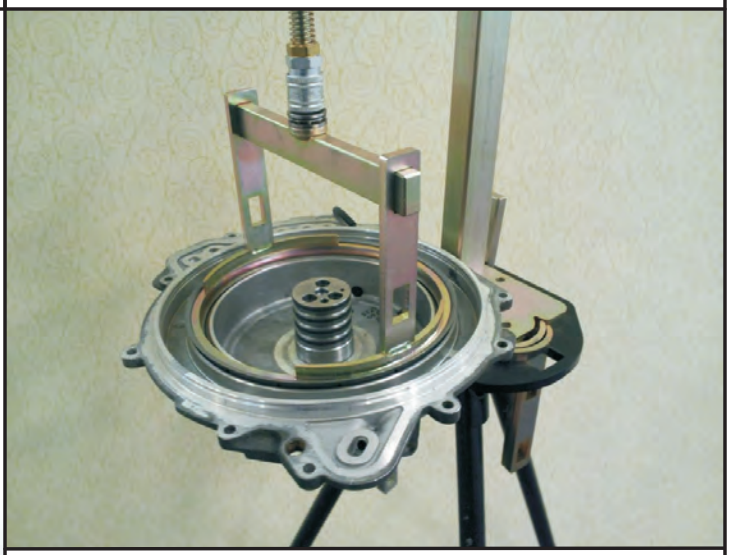


J 21867
PRESSURE GAUGE



The "6T70 Buddy"
Transmission Jack Support.
"T-3000-6TAC
From Adapt-A-Case
adapt-a-case.com

"Every Buddy Universal Press"
T-0158PSAC



"Large Diameter 6T70 Ring Set"
with Press Stand J-hook T-7464AC

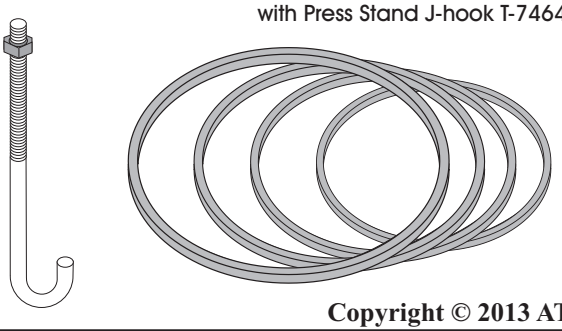


Figure 236

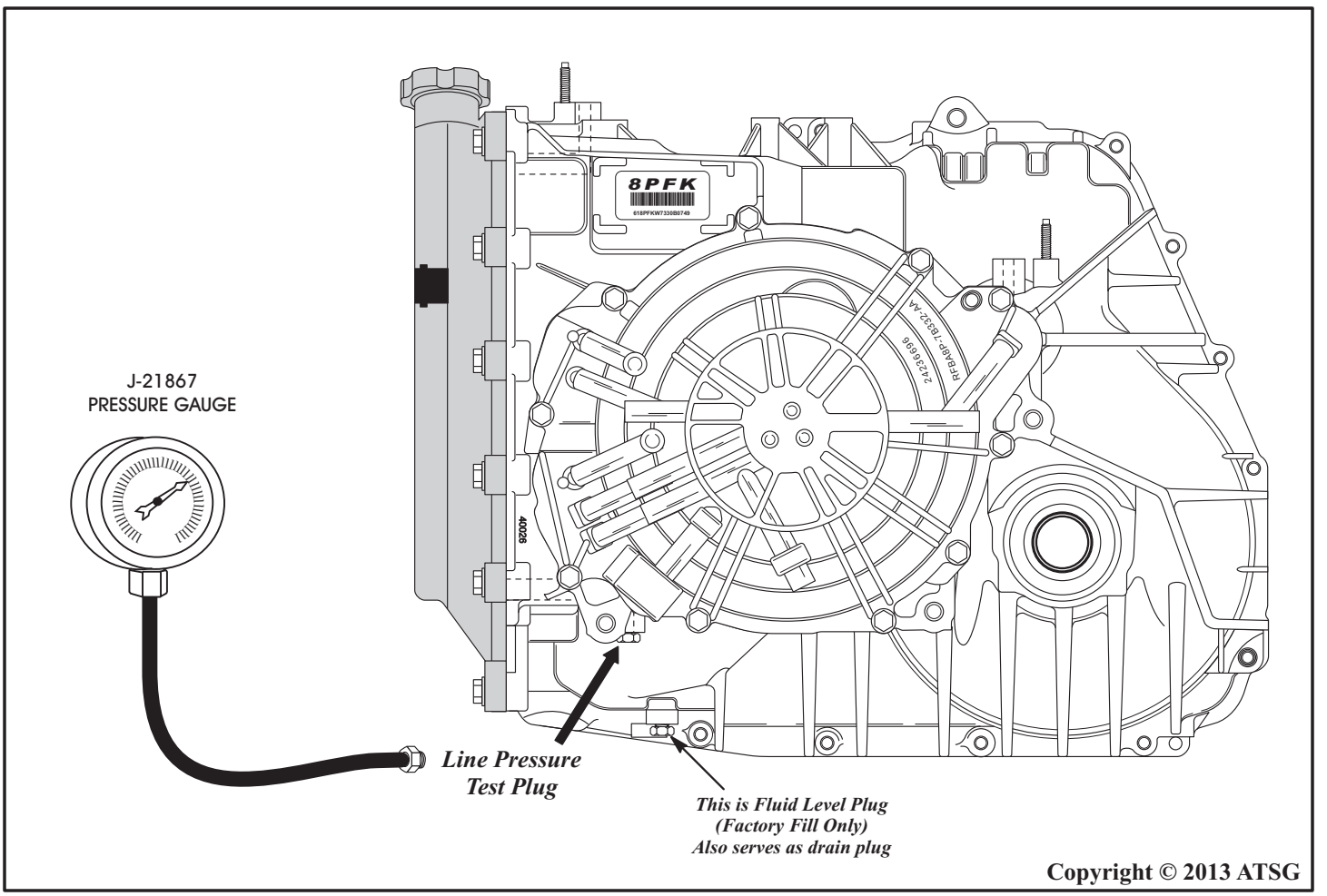


Figure 237

LINE PRESSURE TEST

Caution: Keep the brakes applied at all times in order to prevent unexpected vehicle motion and possible personal injury.

1. Install a scan tool.
2. Start the engine.
3. Inspect the transmission for the proper fluid level as shown on Page 144 (Dexron VI Only).
4. Use the scan tool to inspect for any active and/or stored diagnostic trouble codes.
5. Turn the engine Off.
6. Remove the line pressure test plug, as shown in Figure 237.
   Note: There are two plugs in close proximity to one another. The lower plug is a fluid level plug used for factory fill only and also serves as a drain plug. All 6T70/75 units are equipped with a dipstick for fluid level.
7. Install the J-21867 pressure gauge, as shown in Figure 237.
8. Access the Scan Tool Output Controls for the Line Pressure Control Solenoid.
9. Start the engine.
   Note: In order to achieve accurate and uniform line pressure readings, the following procedure must be performed at least 3 times. The scan tool is only able to control the line pressure solenoid in PARK and NEUTRAL with engine speeds below 1500 RPM.
10. Use the scan tool to increase and decrease the line pressure control solenoid in increments of approximately 200 KPa (29 psi). The scan tool commands the increment values automatically.
11. Allow the pressure to stabilize between the changing of increments.

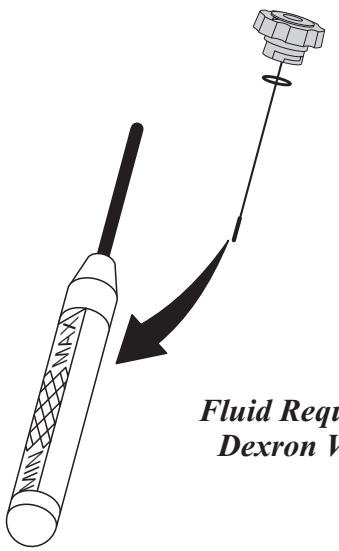
Continued on Page 144

LINE PRESSURE TEST (CONT'D)

12. Compare the line pressure readings on J-21867 pressure gauge, to the actual pressure values in the solenoid valve pressure chart in Figure 238.
13. Turn the engine Off.
14. Remove the J-21867 pressure gauge.
15. Install the line pressure test plug and torque to 12 N•m (106 in. lb.).

Requested Pressure	*Actual Pressure*
None	*50 - 130 psi*
200 kPa	*100 - 130 psi*
400 kPa	*160 - 190 psi*
600 kPa	*220 - 250 psi*
800 kPa	*270 - 300 psi*
Any Above 800 kPa	*270 - 300 psi*

Figure 238



Fluid Requirement
Dexron VI Only

Figure 239

FLUID LEVEL CHECKING PROCEDURE

1. Park the vehicle on a level surface and place the shift lever in the PARK (P) position.
   Caution: Apply the parking brake.
2. Start the engine.
3. Depress the brake pedal and move the shift lever through each gear range, pausing for about three seconds in each range, and then back to PARK.
4. Allow the engine to idle at 500-800 rpm for at least one minute and release the brake pedal.
   Note: Check the fluid level when the fluid temp is between 180°F and 200°F (82°C and 93°C).
5. Remove the dipstick and wipe it with a clean shop towel or paper towel.
   Note: Always check the fluid level at least twice.
6. Install the dipstick and tighten, wait 3 seconds and remove it again.
7. Check both sides of the dipstick and read the fluid level.
   Note: It is not necessary to get the fluid level all the way up to the MAX mark. Anywhere within the crosshatch area is acceptable.
8. Install and remove the dipstick again to verify the fluid level reading.
9. If the fluid level is not within the crosshatch area, as shown in Figure 239, and the transmission is up to operating temperature, add or drain fluid as necessary to bring the level into the crosshatch area on the dipstick.
   Note: Use only Dexron VI fluid and do not add more than 1 pint at a time.
10. Once the fluid level is in the acceptable range, install the dipstick and tighten.