



# Technical Service Information

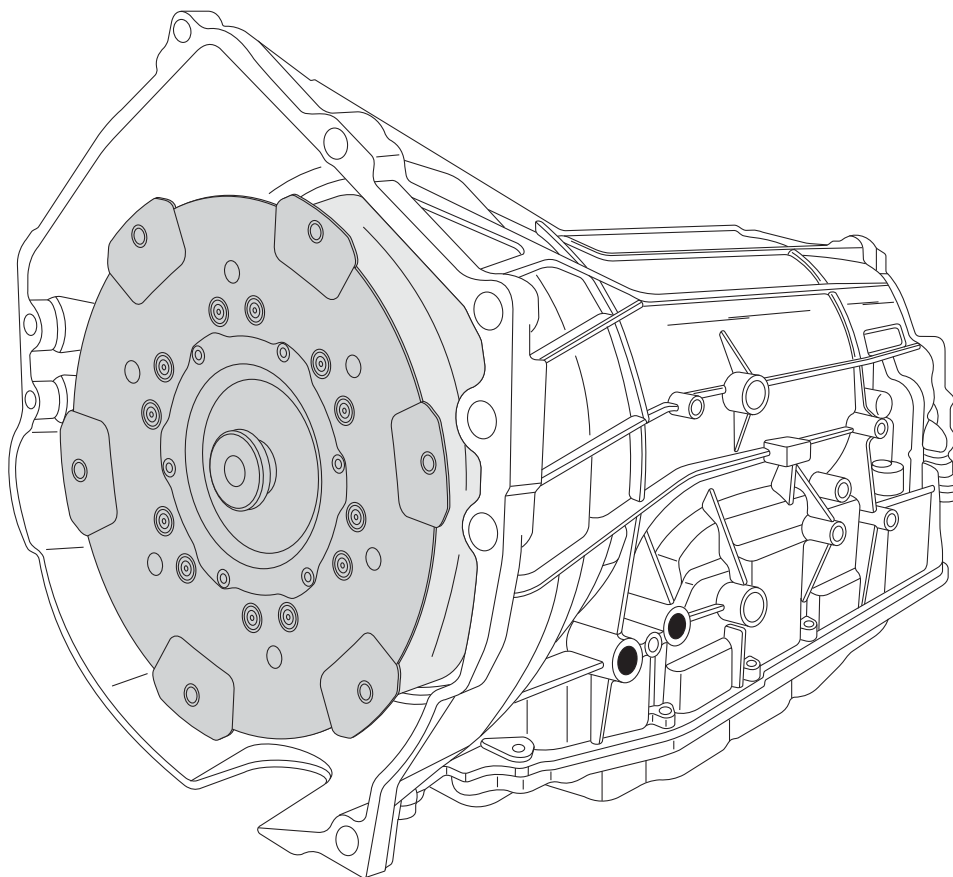
## GM 8L45 - 8L90 PRELIMINARY INFORMATION

The General Motors 8 Speed Rear Wheel Drive Transmission is currently manufactured in two configurations, the 8L45 and the 8L90. The 8L45 has an RPO code of M5N and the 8L90 RPO is M5U. The difference being much the same as the 6L80 compared to the 6L50 as the 8L45 will be used behind less powerful engines than the 8L90. Vehicles equipped with the 8L90 have all wheel drive and stop-start options, GM's Driver Shift Control as well as Performance Algorithm Shifting (PAS). PAS is a computer program that will learn how the car is driven and will automatically adjust for optimum efficiency.

The 8L family of transmissions is an electronically controlled transmission that utilizes clutch to clutch shifting. It consists of a four element torque converter, four planetary gears sets, five friction elements and nine solenoids to provide eight forward speeds and one reverse. The Transmission Control Module is located outside of the transmission and will control shifting, converter clutch and line pressure control. A minimum of eleven sensors will provide input to the TCM as well as other modules in the vehicle.

This transmission uses an Off-Axis fluid pump located in the valve body and is chain driven by the engine through the torque converter.

**8L90**



*Many thanks to the good folks at Transtec for the use of this transmission.*

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Figure 1

## GM 8L45 - 8L90

### GM 8L45 - 8L90 IDENTIFICATION

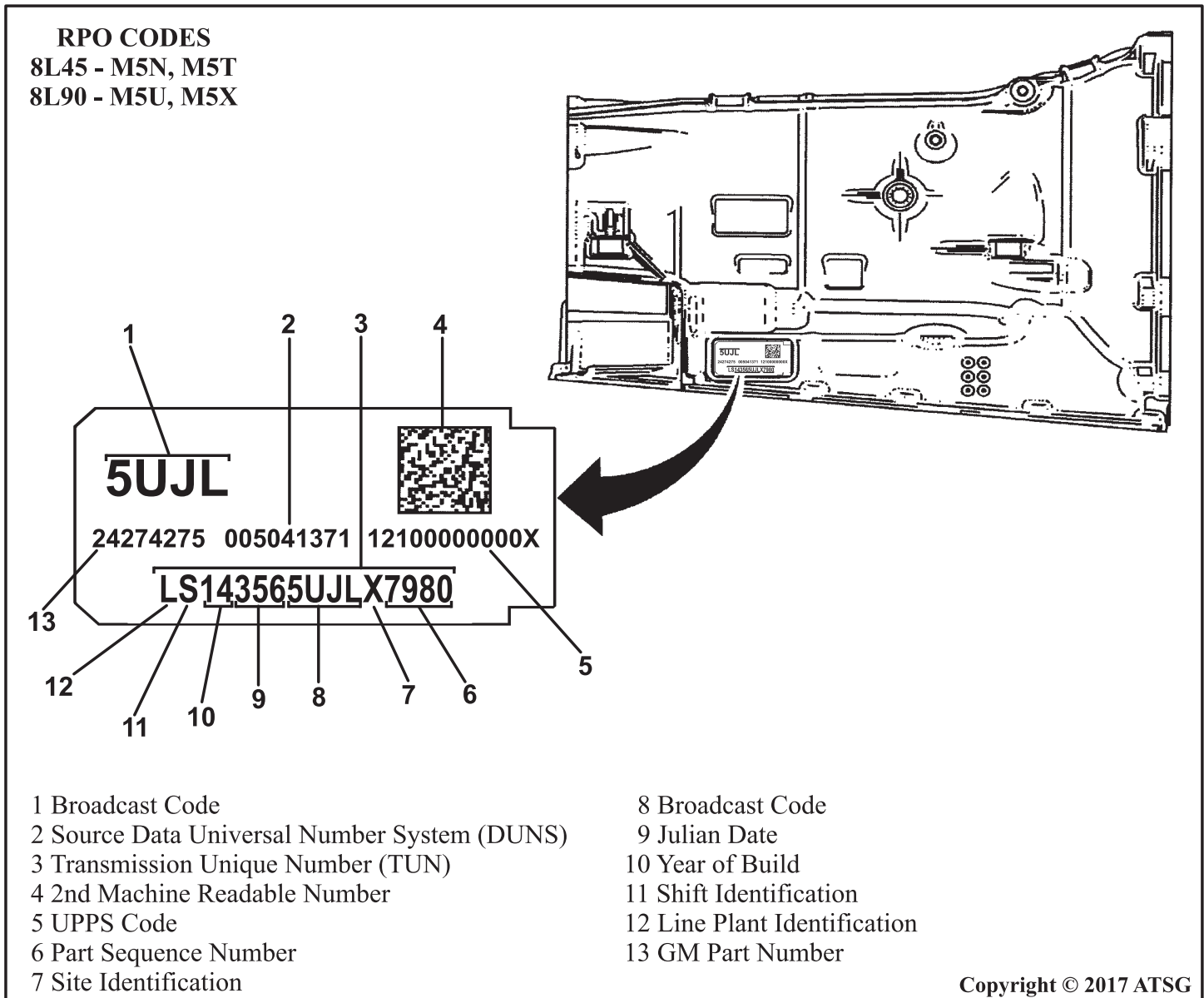


Figure 2

8L45/8L90 SPECIFICATIONS		
NAME	8L45	8L90
Torque Converter Turbine Size	238 MM	258 MM
Pressure Taps	Line Pressure/1-2-3-4-5-R	Line Pressure/1-2-3-4-5-R
Transmission Fluid Type	DEXRON® HP	DEXRON® HP
Typical Quadrant Positions	P-R-N-D-M	P-R-N-D-M
Transmission Net Weight w/ Converter (Wet)	196 lbs (89 kg)	229 lbs (104 kg)

Figure 3

## GM 8L45 - 8L90 SHIFT QUADRANTS

The transmission shift quadrants vary by model. There may be as low as four and as high as seven different shift quadrant positions. Figures 3 and 4 show five positions.

### Standard Shift Quadrant

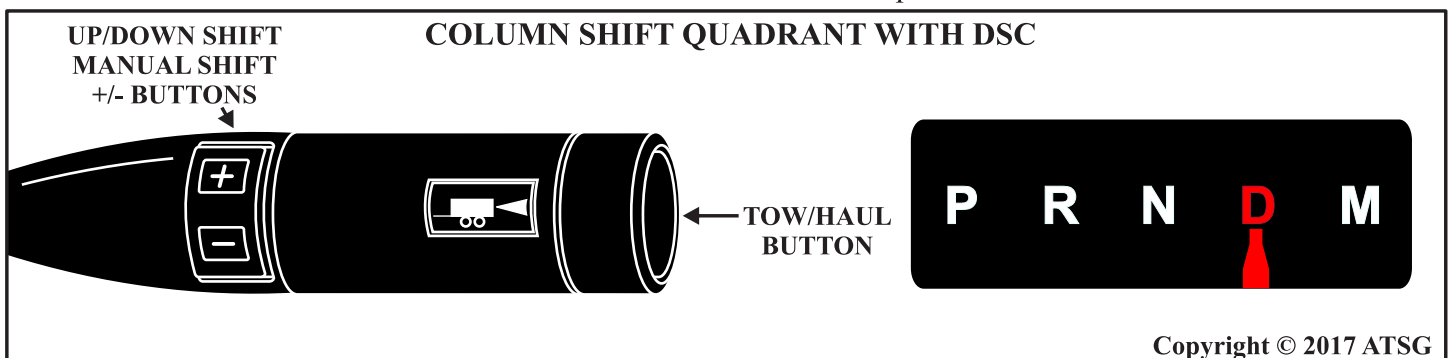
- P** - Park position enables the engine to be started while preventing the vehicle from moving. For safety reasons, the vehicle's parking brake should always be used in addition to the "Park" position. Park position should not be selected until the vehicle has come to a complete stop.
- R** - Reverse enables the vehicle to be operated in a rearward direction.
- N** - Neutral position enables the engine to start and operate without driving the vehicle. If necessary, this position should be selected to restart the engine while the vehicle is moving.
- D** - Drive range should be used for all normal driving conditions for maximum efficiency and fuel economy. Drive range allows the transmission to operate in each of the eight forward gear ratios.  
Downshifts to a lower gear are available for safe passing, by depressing the accelerator, or by manually selecting a lower gear with the shift lever.

**TOW/HAUL** - Tow/Haul Mode maintains lower gears longer and increases shift pressure. It is best used when combined vehicle & trailer weight is at least 75% of the vehicles GCW rating. It improves initial take-off performance as well as reducing shift busyness and assists in engine braking performance.

### Manual Shift Ranges

**Some** vehicles are equipped with a shift quadrant that allow manual range selection. For example, "M" manual range and/or manual range "2" or "1", as shown in figure 3. 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 is also helpful for engine braking when descending slight grades.

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



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Figure 4

## GM 8L45 - 8L90 SHIFT QUADRANTS (Continued)

### *Driver Shift Control (DSC) Quadrant*

Some vehicles are equipped with a Driver Shift Control (DSC) version of the selector system, as shown in figure 4. This configuration allows the driver to manually shift between forward gears.

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

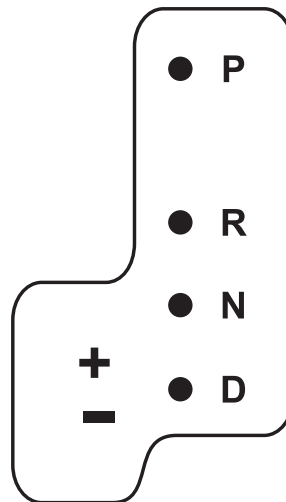
**R** - Reverse enables the vehicle to be operated in a rearward direction.

**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 eight forward gear ratios, according to the normal shift pattern that is programmed in the TCM.

**M/S** - In the M/S (Manual or Sport) position, the driver may manually select the range of gears by tapping the selector lever towards "+" or "-" to cause an up-shift or downshift, as shown in figure 4. The transmission will shift up or down depending on the request that is made by tapping the selector lever.

### FLOOR SHIFT QUADRANT WITH DSC



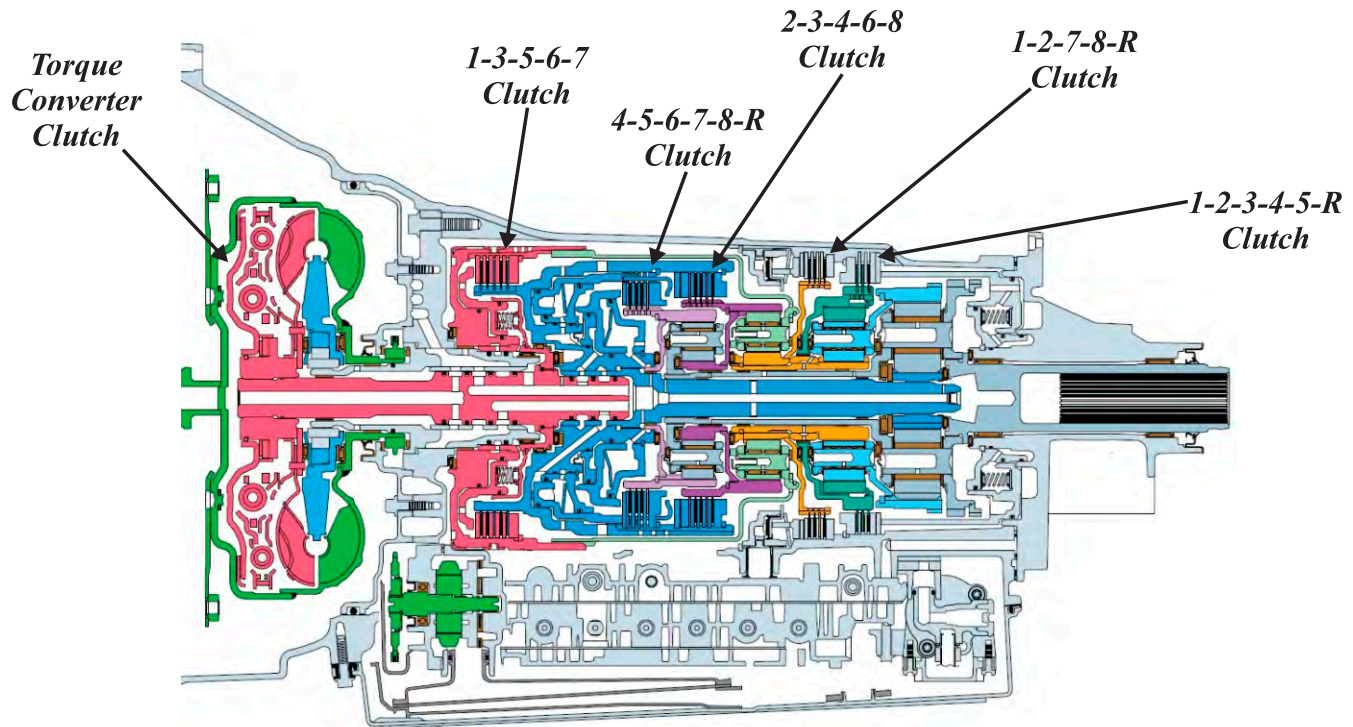
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Figure 5



## GM 8L45 - 8L90

### CLUTCH APPLICATION & LOCATION



**COMPONENT APPLICATION CHART**

RANGE	GEAR	1-3-5-6-7 Clutch	4-5-6-7-8 -Reverse Clutch	2-3-4-6-8 Clutch	1-2-7-8-Reverse Clutch	1-2-3-4-5 -Reverse Clutch	Torque Converter Clutch	8L45 GEAR RATIO	8L90 GEAR RATIO
Park	P				Applied*	Applied*			
Reverse	R		Applied		Applied	Applied		3.93	3.82
Neutral	N				Applied*	Applied*			
D	1st	Applied			Applied	Applied	Applied**	4.62	4.56
	2nd			Applied	Applied	Applied	Applied**	3.04	2.97
	3rd	Applied		Applied		Applied	Applied**	2.07	2.08
	4th		Applied	Applied		Applied	Applied**	1.66	1.69
	5th	Applied	Applied			Applied	Applied**	1.26	1.27
	6th	Applied	Applied	Applied			Applied**	1.00	1.00
	7th	Applied	Applied		Applied		Applied**	0.85	0.84
	8th		Applied	Applied	Applied		Applied**	0.66	0.65

**\*\*The converter clutch can be applied from 1st thru 8th gears depending on shift conditions.**

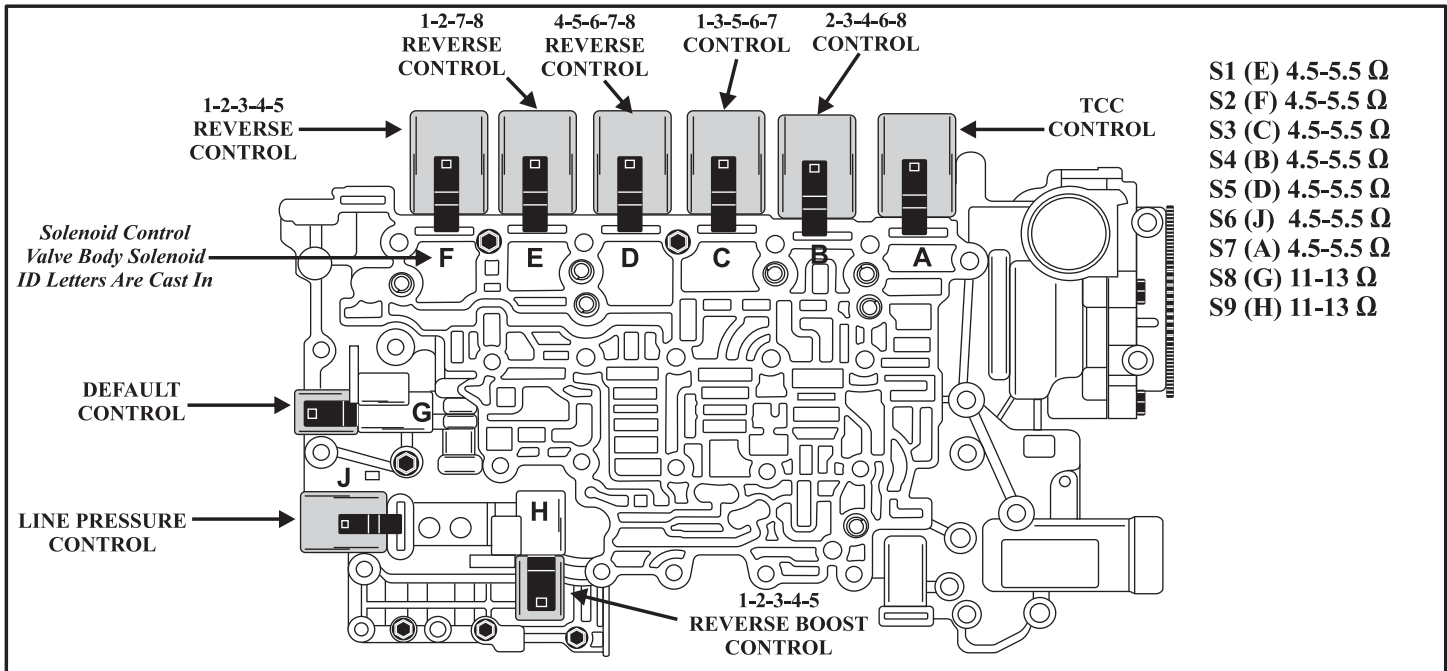
**\*Applied with no output load.**

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Figure 6

## GM 8L45 - 8L90

### SOLENOID IDENTIFICATION & FUNCTION



#### SOLENOID APPLICATION CHART

RANGE	GEAR	1-2-7-8-Reverse Clutch Sol. S1 or E N.H.	1-2-3-4-5-Reverse Clutch Sol. S2 or F N.L.	1-3-5-6-7 Clutch Sol. S3 or C N.L.	2-3-4-6-8 Clutch Sol. S4 or B N.H.	4-5-6-7-8-Reverse Clutch Sol. S5 or D N.H.	Line Press. Control Sol. S6 or J N.H.	Torque Converter Clutch Sol. S7 or A N.L.	Default Control Sol. S8 or G ON/OFF	1-2-3-4-5 Reverse Boost Sol. S9 or H ON/OFF
Park	P	ON	ON	OFF	OFF	OFF	◇	OFF	OFF	OFF
Reverse	R	ON	ON	OFF	OFF	ON	◇	OFF	OFF	OFF
Neutral	N	ON	ON	OFF	OFF	OFF	◇	OFF	OFF	OFF
D	1st	ON	ON	ON	OFF	OFF	◇	ON**	OFF/ON	OFF
	2nd	ON	ON	OFF	ON	OFF	◇	ON**	ON/OFF	OFF
	3rd	OFF	ON	ON	ON	OFF	◇	ON**	OFF*	OFF
	4th	OFF	ON	OFF	ON	ON	◇	ON**	OFF*	OFF
	5th	OFF	ON	ON	OFF	ON	◇	ON**	OFF*	OFF
	6th	OFF	OFF	ON	ON	ON	◇	ON**	OFF*	ON
	7th	ON	OFF	ON	OFF	ON	◇	ON**	OFF*	ON
	8th	ON	OFF	OFF	ON	ON	◇	ON**	OFF*	ON

\*Default valve is hydraulically latched in stroked position in this state, Default solenoid can be commanded ON for lube override.

\*\*The converter clutch can be applied from 1st thru 8th gears depending on shift conditions.

◇ The TCM controls the Line Pressure Solenoid based in inputs from throttle position, transmission temperature & engine load.

Note: Failsafe is sixth gear.

OFF/ON = Solenoid control port is not pressurized at low speed in 1st gear, solenoid port is pressurized at high speed in 1st gear.

ON/OFF = Solenoid control port is not pressurized at low speed in 2nd gear, solenoid port is pressurized at high speed in 2nd gear.

Note: ON = Solenoid control port pressurized.

Note: OFF = Solenoid pressure port not pressurized.

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Figure 7

## GM 8L45 - 8L90

### SOLENOID CHARACTERIZATION REPROGRAMMING

#### *Shift Characterization Reprogramming:*

The solenoids in this transmission require unique performance characteristic data in order to function at maximum efficiency. This data is programmed and stored in the Transmission Control Module. When a transmission assembly, TCM or solenoids are replaced, the performance characteristic data for the solenoids must be retrieved from the GM Repository (TIS2 Website) and reprogrammed into the TCM. This is to ensure that the characteristic data is properly matched between the solenoids, valve body and transmission. Solenoid characterization may also be performed to refresh characterization data.

#### *To Perform Solenoid Characterization Component Replacement:*

- 1 - Document the new Transmission Unique Number (TUN) as required, Refer to figures 2 and 8.
- 2 - Log into TIS2Web/SPS, (after the chosen subscription rate is paid).
- 3 - Type in the vehicles VIN number.
- 4 - Perform the SPS Transmission Control Module programming event:
  - Select “Transmission Control Module - Programming” to update TCM calibrations and solenoid data.  
OR
  - Select “Transmission Control Module - MCVM Operations” to update Solenoid Characterization Data only.
- 5 - From the “MCVM (Mechanical Characterization and Virtual Matching) Operation Selection” screen, select the applicable service procedure to be performed. You will be prompted to provide the necessary Transmission Unique Number (TUN) or Part Unique Number (PUN). Refer to figures 2 and 8 when replacing a transmission part. At this time, the system will read the VIN from the Engine Control Module using the Multiple Diagnostic Interface (MDI) and then retrieve the applicable genealogy data tree from the “cloud”. This data tree accesses the original characterization data so that it may be updated with new component information.

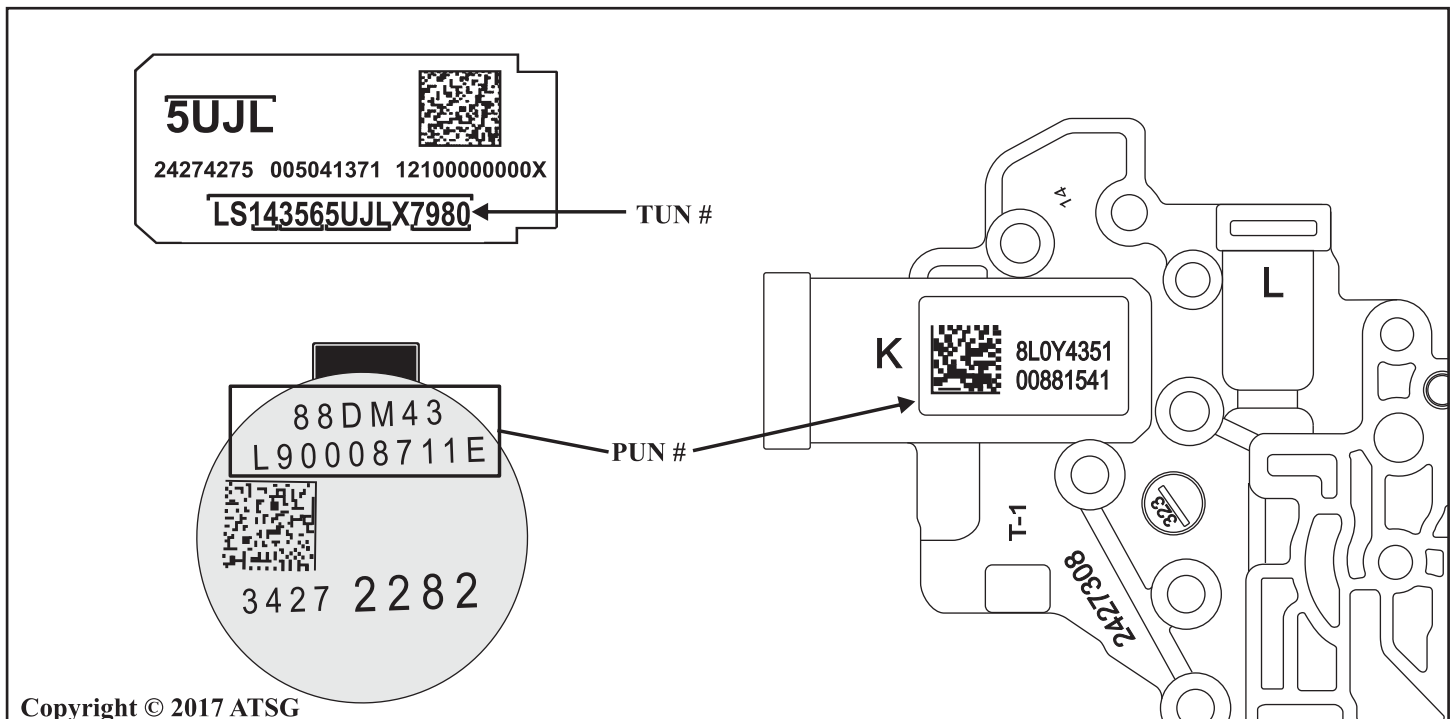


Figure 8



# Technical Service Information

## GM 8L45 - 8L90

### DIAGNOSTIC TROUBLE CODES

DTC	CODE DESCRIPTION	CODE TYPE
P0601	Control Module Read Only Memory (ROM) Performance	A
P0602	Control Module Not Programmed	A
P0603	Control Module Long Term Memory Reset	A
P0604	Control Module Random Access Memory (RAM) Performance	A
P0606	Control Module Processor Performance	A
P062F	Control Module Long Term Memory Performance	A
P16F3	Control Module Redundant Memory Performance	A
P16F4	Control Module Transmission Range Switch Input Circuitry Performance	A
P16FB	Control Module Speed Signal Analog To Digital Converter Performance	A
P0658	Actuator High Control Circuit Group 1 Voltage Low	C
P0659	Actuator High Control Circuit Group 1 Voltage High	C
P0711	Transmission Fluid Temperature Sensor Performance	B
P0712	Transmission Fluid Temperature Sensor Circuit Voltage Low	B
P0713	Transmission Fluid Temperature Sensor Circuit Voltage High	B
P0716	Input Speed Sensor Performance	A
P0717	Input Speed Sensor Circuit No Signal	A
P07BF	Input Speed Sensor Circuit Voltage Low	A
P07C0	Input Speed Sensor Circuit Voltage High	A
P071A	Transmission Tow Mode Switch Circuit Fault	C
P0722	Output Speed Sensor No Signal	A
P0723	Output Speed Sensor Intermittent Circuit Fault	A
P077C	Output Speed Sensor Intermittent Circuit Voltage Low	A
P077D	Output Speed Sensor Intermittent Circuit Voltage High	A
P0746	Transmission Control Solenoid 1 Stuck Off (1-2-7-8-R Clutch)	A
P0747	Transmission Control Solenoid 1 Stuck On (1-2-7-8-R Clutch)	A
P0776	Transmission Control Solenoid 2 Stuck Off (1-2-3-4-5-R Clutch)	A
P0777	Transmission Control Solenoid 2 Stuck On (1-2-3-4-5-R Clutch)	A
P0796	Transmission Control Solenoid 3 Stuck Off (1-3-5-6-7 Clutch)	A
P0797	Transmission Control Solenoid 3 Stuck On (1-3-5-6-7 Clutch)	A
P0815	Upshift Switch Circuit Fault	C
P0816	Downshift Switch Circuit Fault	C
P0826	Up & Down Shift Switch Circuit Fault	C
P0851	Park/Neutral Position Switch Circuit Voltage Low	C
P0960	Transmission Control Solenoid 1 Circuit Open	A
P0962	Transmission Control Solenoid 1 Circuit Voltage Low	A
P0963	Transmission Control Solenoid 1 Circuit Voltage High	A
P0964	Transmission Control Solenoid 2 Circuit Open	A
P0966	Transmission Control Solenoid 2 Circuit Voltage Low	A
P0967	Transmission Control Solenoid 2 Circuit Voltage High	A

Figure 9

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# Technical Service Information

## GM 8L45 - 8L90

### DIAGNOSTIC TROUBLE CODES

DTC	CODE DESCRIPTION	CODE TYPE
P0968	Transmission Control Solenoid 3 Circuit Open	A
P0970	Transmission Control Solenoid 3 Circuit Voltage Low	A
P0971	Transmission Control Solenoid 3 Circuit Voltage High	A
P175F	Acceleration Sensor Signal Message Counter Incorrect	C
P1761	Up & Down Shift Switch Message Counter Incorrect	C
P176B	Intermediate Speed Sensor Circuit Performance	B
P176C	Intermediate Speed Sensor Circuit Voltage Low	B
P176D	Intermediate Speed Sensor Circuit Voltage High	B
P1824	Internal Mode Switch "P" Circuit Voltage Low	B
P182D	Internal Mode Switch "P" Circuit Voltage High	B
P18B8	Internal Mode Switch "P" Circuit Shorted	B
P18BD	Internal Mode Switch "P" Circuit Stuck Off - Invalid Voltage Range	B
P18C2	Internal Mode Switch "P" Circuit Stuck On - Invalid Voltage Range	B
P182A	Internal Mode Switch "A" Circuit Voltage Low	B
P1838	Internal Mode Switch "A" Circuit Voltage High	B
P18B5	Internal Mode Switch "A" Circuit Shorted	B
P18BA	Internal Mode Switch "A" Circuit Stuck Off - Invalid Voltage Range	B
P18BF	Internal Mode Switch "A" Circuit Stuck On - Invalid Voltage Range	B
P182B	Internal Mode Switch "B" Circuit Voltage Low	B
P182C	Internal Mode Switch "B" Circuit Voltage High	B
P18B6	Internal Mode Switch "B" Circuit Shorted	B
P18BB	Internal Mode Switch "B" Circuit Stuck Off - Invalid Voltage Range	B
P18C0	Internal Mode Switch "B" Circuit Stuck On - Invalid Voltage Range	B
P182E	Internal Mode Switch Indicates Invalid Range	B
P1915	Internal Mode Switch Does Not Indicate Park/Neutral During Start	B
P182F	Internal Mode Switch "C" Circuit Voltage Low	B
P1839	Internal Mode Switch "C" Circuit Voltage High	B
P18B7	Internal Mode Switch "C" Circuit Shorted	B
P18BC	Internal Mode Switch "C" Circuit Stuck Off - Invalid Voltage Range	B
P18C1	Internal Mode Switch "C" Circuit Stuck On - Invalid Voltage Range	B
P1840	Internal Mode Switch "S" Circuit Voltage Low	B
P1841	Internal Mode Switch "S" Circuit Voltage High	B
P18B9	Internal Mode Switch "S" Circuit Shorted	B
P18BE	Internal Mode Switch "S" Circuit Stuck Off - Invalid Voltage Range	B
P18C3	Internal Mode Switch "S" Circuit Stuck On - Invalid Voltage Range	B
P2670	Actuator High Control Circuit Group 2 Voltage Low	A
P2671	Actuator High Control Circuit Group 2 Voltage High	C
P2714	Transmission Control Solenoid 4 Stuck Off (2-3-4-6-8 Clutch)	A
P2715	Transmission Control Solenoid 4 Stuck On (2-3-4-6-8 Clutch)	A

Figure 10

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# Technical Service Information

## GM 8L45 - 8L90 DIAGNOSTIC TROUBLE CODES

DTC	CODE DESCRIPTION	CODE TYPE
<i>P2718</i>	<i>Transmission Control Solenoid 4 Circuit Open</i>	<i>A</i>
<i>P2720</i>	<i>Transmission Control Solenoid 4 Circuit Voltage Low</i>	<i>A</i>
<i>P2721</i>	<i>Transmission Control Solenoid 4 Circuit Voltage High</i>	<i>A</i>
<i>P2723</i>	<i>Transmission Control Solenoid 5 Stuck Off (4-5-6-7-8-R Clutch)</i>	<i>A</i>
<i>P2724</i>	<i>Transmission Control Solenoid 5 Stuck On (4-5-6-7-8-R Clutch)</i>	<i>A</i>
<i>P2727</i>	<i>Transmission Control Solenoid 5 Circuit Open</i>	<i>A</i>
<i>P2729</i>	<i>Transmission Control Solenoid 5 Circuit Voltage Low</i>	<i>A</i>
<i>P2730</i>	<i>Transmission Control Solenoid 5 Circuit Voltage High</i>	<i>A</i>
<i>P2736</i>	<i>Transmission Control Solenoid 6 Circuit Open</i>	<i>A</i>
<i>P2738</i>	<i>Transmission Control Solenoid 6 Circuit Voltage Low</i>	<i>A</i>
<i>P2739</i>	<i>Transmission Control Solenoid 6 Circuit Voltage High</i>	<i>A</i>
<i>P27A7</i>	<i>Transmission Control Solenoid 1 Calibration Incorrect</i>	<i>A</i>
<i>P27A8</i>	<i>Transmission Control Solenoid 2 Calibration Incorrect</i>	<i>A</i>
<i>P27A9</i>	<i>Transmission Control Solenoid 3 Calibration Incorrect</i>	<i>A</i>
<i>P27AA</i>	<i>Transmission Control Solenoid 4 Calibration Incorrect</i>	<i>A</i>
<i>P27AB</i>	<i>Transmission Control Solenoid 5 Calibration Incorrect</i>	<i>A</i>
<i>P27AC</i>	<i>Transmission Control Solenoid 6 Calibration Incorrect</i>	<i>A</i>
<i>P27AD</i>	<i>Transmission Control Solenoid 7 Calibration Incorrect</i>	<i>A</i>
<i>P2808</i>	<i>Torque Converter Clutch System Stuck Off</i>	<i>B</i>
<i>P2809</i>	<i>Torque Converter Clutch System Stuck On</i>	<i>A</i>
<i>P2812</i>	<i>Transmission Control Solenoid 7 Circuit Open</i>	<i>A</i>
<i>P2814</i>	<i>Transmission Control Solenoid 7 Circuit Voltage Low</i>	<i>A</i>
<i>P2815</i>	<i>Transmission Control Solenoid 7 Circuit Voltage High</i>	<i>A</i>
<i>P2817</i>	<i>Transmission Control Solenoid 8 Stuck Off (No 4th Gear)</i>	<i>A</i>
<i>P2818</i>	<i>Transmission Control Solenoid 8 Stuck On (TCC Slip RPM Too Low In Park)</i>	<i>B</i>
<i>P281D</i>	<i>Transmission Control Solenoid 8 Circuit Voltage Low</i>	<i>A</i>
<i>P281E</i>	<i>Transmission Control Solenoid 8 Circuit Voltage High</i>	<i>A</i>
<i>P2824</i>	<i>Transmission Control Solenoid 9 Circuit Open</i>	<i>A</i>
<i>P2826</i>	<i>Transmission Control Solenoid 9 Circuit Voltage Low</i>	<i>A</i>
<i>P2827</i>	<i>Transmission Control Solenoid 9 Circuit Voltage High</i>	<i>A</i>

Figure 11

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## GM 8L45 - 8L90 ELECTRICAL WIRING DIAGRAM

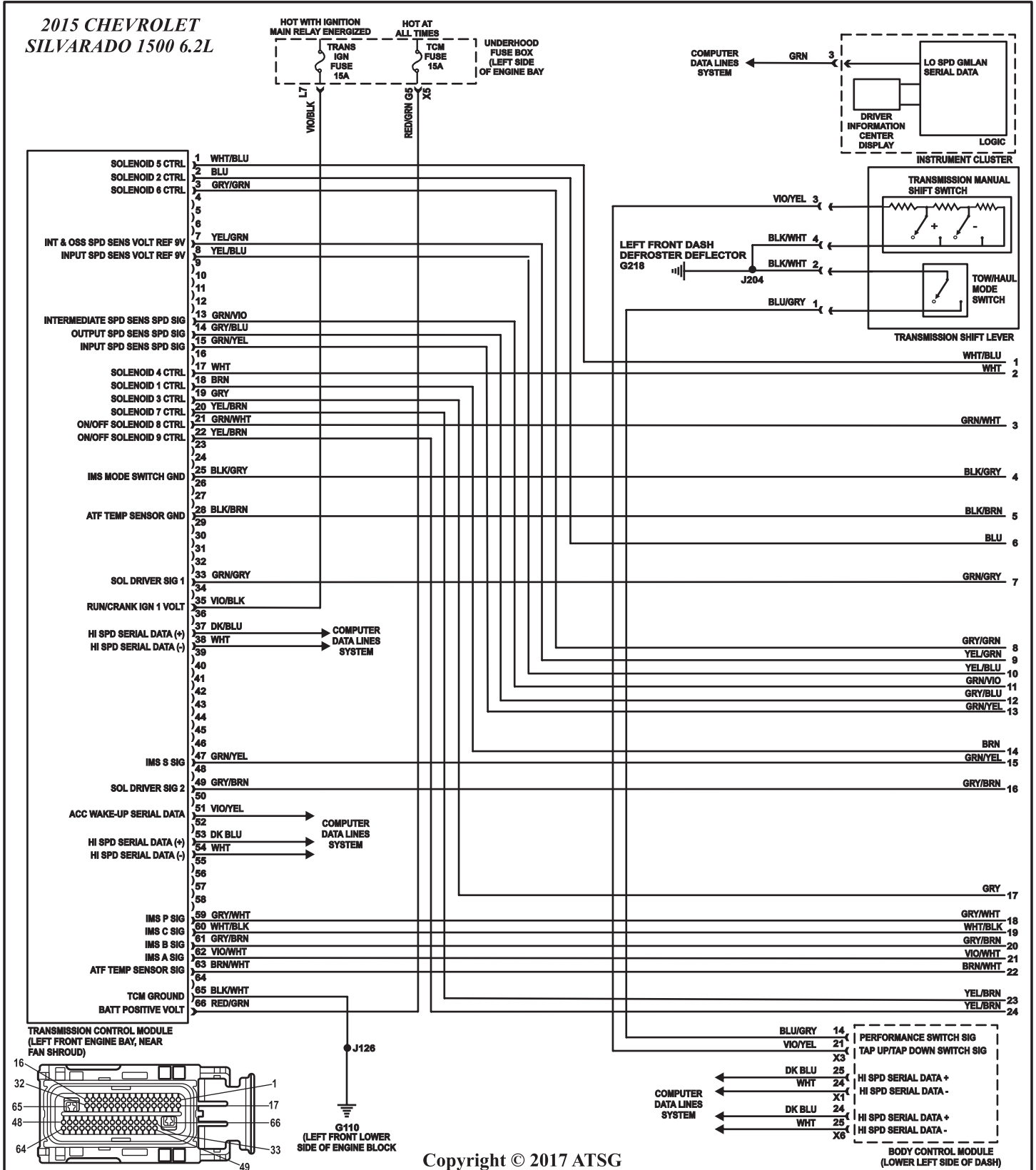


Figure 12



**INTERMEDIATE SHAFT SPEED SENSOR**  
WHITE 3  
BLACK 6  
RED 2  
YELLOW 1  
WHITE 4  
GREEN 5  
X177

**OUTPUT SHAFT SPEED SENSOR**  
WHITE 3  
BLACK 6  
RED 2  
YELLOW 1  
WHITE 4  
GREEN 5  
X177

**INPUT SHAFT SPEED SENSOR**  
WHITE 3  
BLACK 6  
RED 2  
YELLOW 1  
WHITE 4  
GREEN 5  
X177

**INTERNAL MODE SWITCH**

**TRANSMISSION CONTROL SOLENOID 5**  
WHT/BLU 1  
GRN/GRY 2

**TRANSMISSION CONTROL SOLENOID 4**  
WHT 1  
GRN/GRY 2

**TRANSMISSION CONTROL SOLENOID 8**  
GRN/WHT 1  
GRN/GRY 4

**TRANSMISSION FLUID TEMP SENSOR**  
BLACK  
BLACK

**TRANSMISSION CONTROL SOLENOID 2**  
GRY/BRN 1  
GRY/BRN 2

**TRANSMISSION CONTROL SOLENOID 6**  
GRY/GRN 1  
GRY/BRN 2

**TRANSMISSION CONTROL SOLENOID 1**  
GRY/BRN 1  
GRY/BRN 2

**TRANSMISSION CONTROL SOLENOID 3**  
GRY 1  
GRY/BRN 2

**TRANSMISSION CONTROL SOLENOID 7**  
GRY/BRN 1  
YEL/BRN 2

**TRANSMISSION CONTROL SOLENOID 9**  
GRY/BRN 1  
YEL/BRN 2

**ENGINE CONTROL MODULE (LEFT FRONT OF ENGINE BAY NEAR FAN SHROUD)**

**COMPUTER DATA LINES SYSTEM**

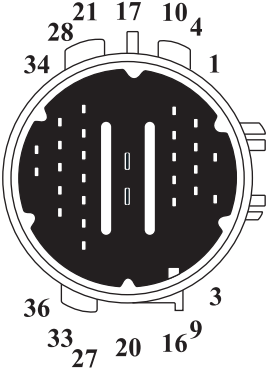
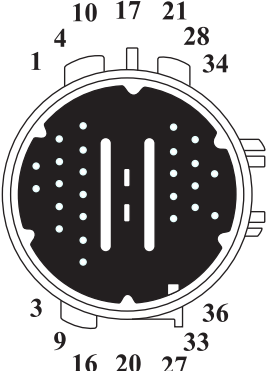
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**AUTOMATIC TRANSMISSION ASSEMBLY**

Figure 13

## GM 8L45 - 8L90

### TRANSMISSION CASE CONNECTOR

X175 CONNECTOR	TERMINAL NUMBER	CIRCUIT DESCRIPTION	WIRE COLOR	INTERNAL CONNECTOR COLOR
	1	Transmission Control Solenoid 9 (1-2-3-4-5-R Boost)	Green/Blue	White
	2	Not Used	_____	_____
	3	Transmission Control Solenoid 7 (TCC)	Yellow/Red	Gray
	4	Transmission Control Solenoid 6 (Line Pressure)	Gray/Green	Purple
	5	Transmission Control Solenoid 1 (1-2-7-8-R)	Brown	Purple
	6	Transmission Control Solenoid 2 (1-2-4-5-R)	Blue	Gray
	7	Transmission Control Solenoid 8 (Default Control)	Yellow/Red	White
	8	Not Used	_____	_____
	9	Not Used	_____	_____
	10	Transmission Control Solenoid 3 (1-3-5-6-7)	Gray	Gray
	11	Transmission Fluid Temperature Sensor Ground	Black/Brown	N/A
	12	Transmission Fluid Temperature Sensor Signal	Brown/White	N/A
	13	Transmission Control Solenoid 4 (2-3-4-6-8)	White	Clear
	14	Transmission Control Solenoid 5 (4-5-6-7-8-R)	Blue/White	Purple
	15	Not Used	_____	_____
	16	Not Used	_____	_____
	17	Not Used	_____	_____
	18	12V Power Supply To Sols 4, 5 & 9	Green/Gray	Purple, Clear, White
	19	12V Power Supply To Sols 1, 2, 3, TCC, LP & Default Control	Gray/Brown	Gray, Purple, Gray, Gray, Purple, White
	20	Not Used	_____	_____
	21	IMS Range "C" Signal	White/Black	Brown
	22	IMS Range "A" Signal	Purple/White	Brown
	23	IMS Range "P" Signal	Gray/White	Brown
	24	Output Speed Sensor Signal	Gray/Blue	White
	25	9 Volt Reference For Intermediate/Output Speed Sensor	Yellow/Green	White
	26	Input Speed Sensor Signal	Green/Yellow	White
	27	9 Volt Reference For Input Speed Sensor	Yellow/Blue	White
	28	IMS Range "B" Signal	Gray/Orange	Brown
	29	9 Volt Reference For Internal Mode Switch	Yellow/Blue	Brown
	30	Internal Mode Switch Ground	Black/Gray	Brown
	31	9 Volt Reference For Internal Mode Switch	Yellow/Green	Brown
	32	Intermediate Speed Sensor Signal	Green/Violet	White
	33	Not Used	_____	_____
	34	IMS Range "S" Signal	Gray/Yellow	Brown
	35	IMS Park/Neutral Signal To Engine Control Module	White/Gray	Brown
	36	Not Used	_____	_____
				

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Figure 14

## GM 8L45 - 8L90

### INTERNAL MODE SWITCH

The Park/Neutral switch which is an integral part of the Internal Mode Switch indicates to the Engine Control Module (ECM) if the vehicle is in park or neutral or in a drive range position. With ignition ON, the ECM provides 12 volts on the park/neutral signal wire to the park/neutral position switch. A separate ground circuit from the park/neutral position switch to the Transmission Control Module (TCM) completes the path to ground.

With the gear shift lever in park or neutral, the switch closes and drops the voltage on the signal circuit to zero volts. In this state the engine will start and run. In reverse or drive range the park/neutral switch opens, 12 volts is then present on the signal circuit which will inhibit engine starting.

The Internal Mode Switch indicates to the Transmission Control Module (TCM) which gear position the driver has selected. The Internal Mode Switch consists of five (5) separate Hall Effect Sensors. Each Hall Effect Sensor is supplied a nine (9) volt reference circuit and a signal circuit from the TCM. Each signal circuit for each gear selector position will have either a voltage reading of 0.70V indicating ON, or 1.68 - 2.38V indicating OFF. The voltage values on each circuit will change and are dependant on the position of the gear selector. The state of each Hall Effect Sensor circuit is displayed on the scan tool.

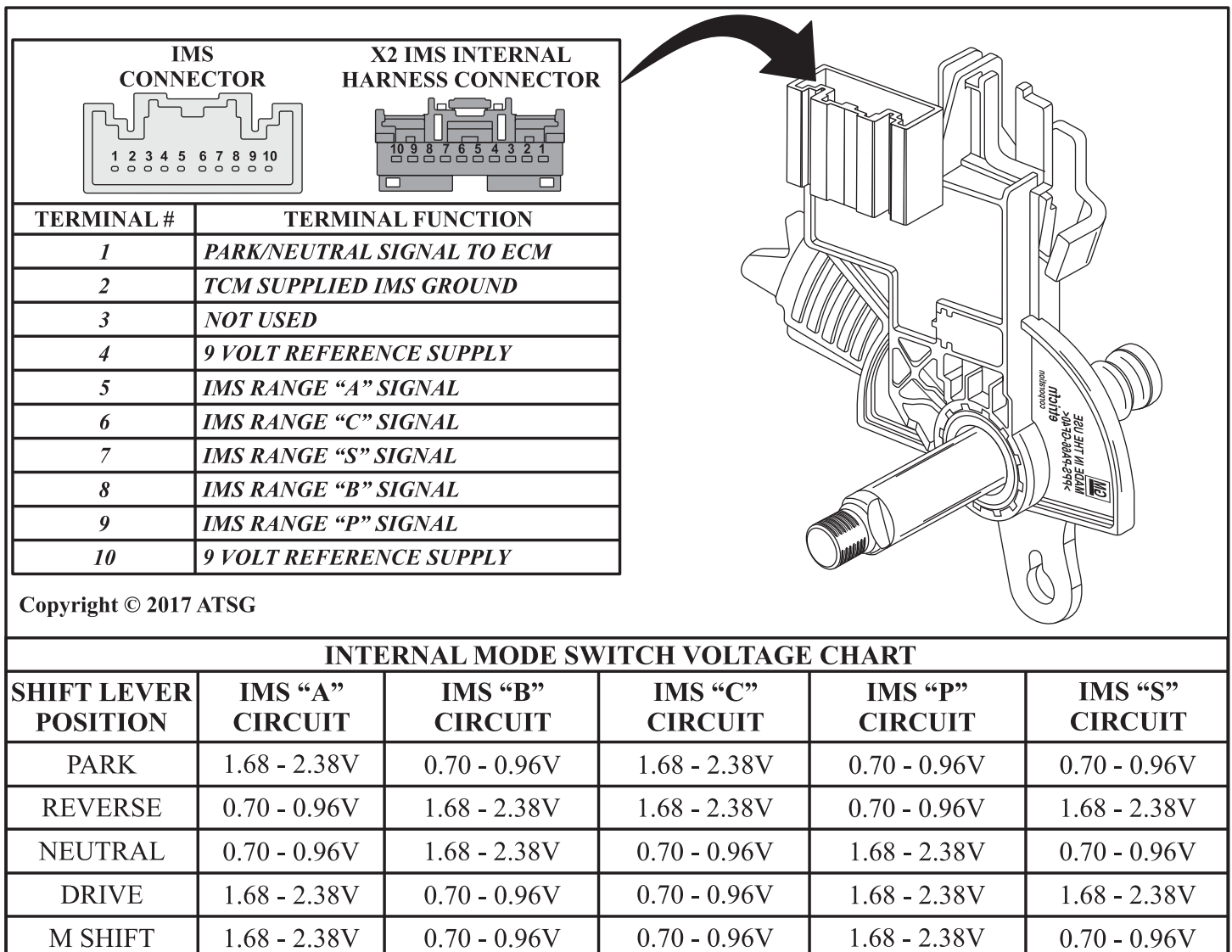


Figure 15

## GM 8L45 - 8L90

### INTERNAL WIRE HARNESS CONNECTOR

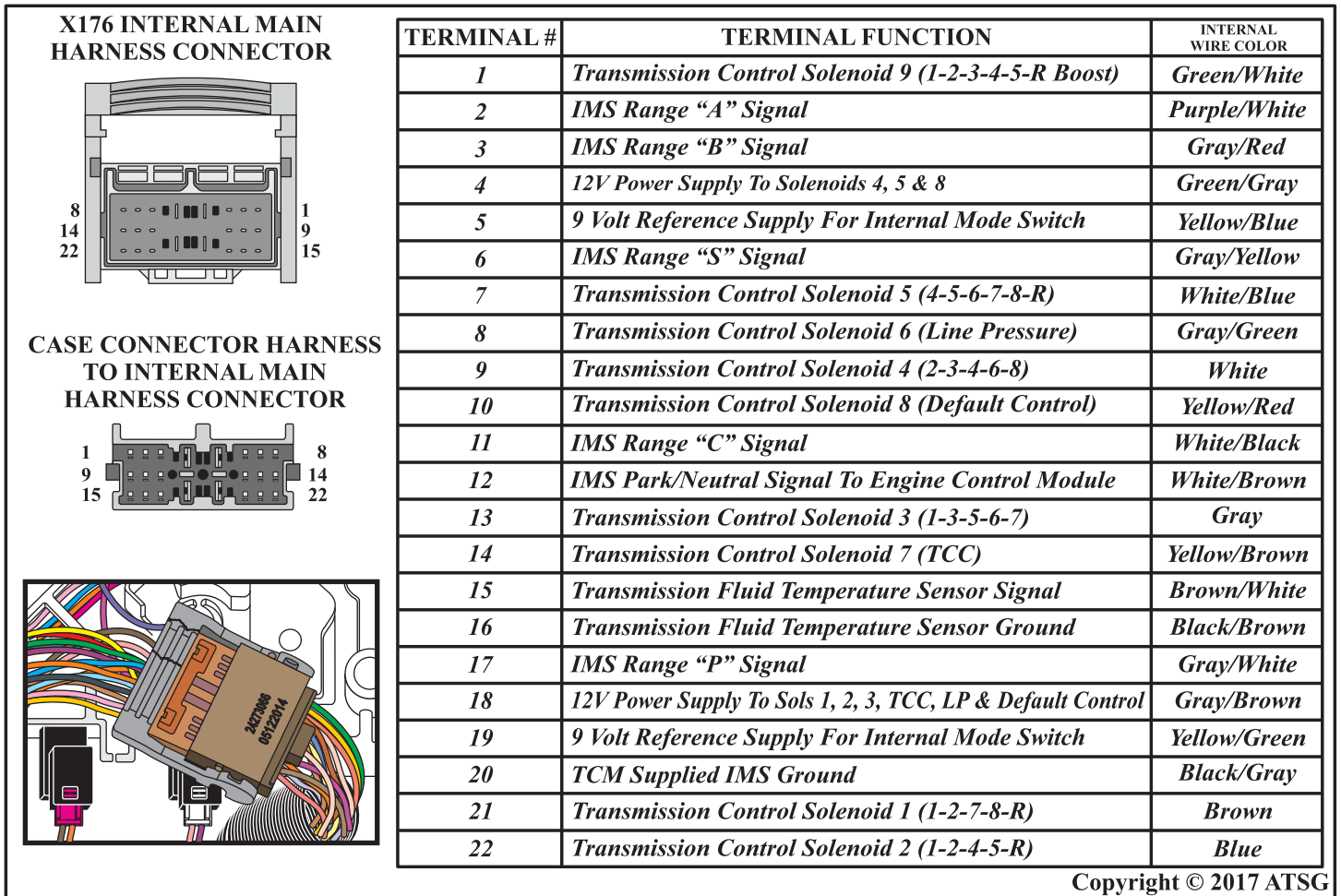


Figure 16

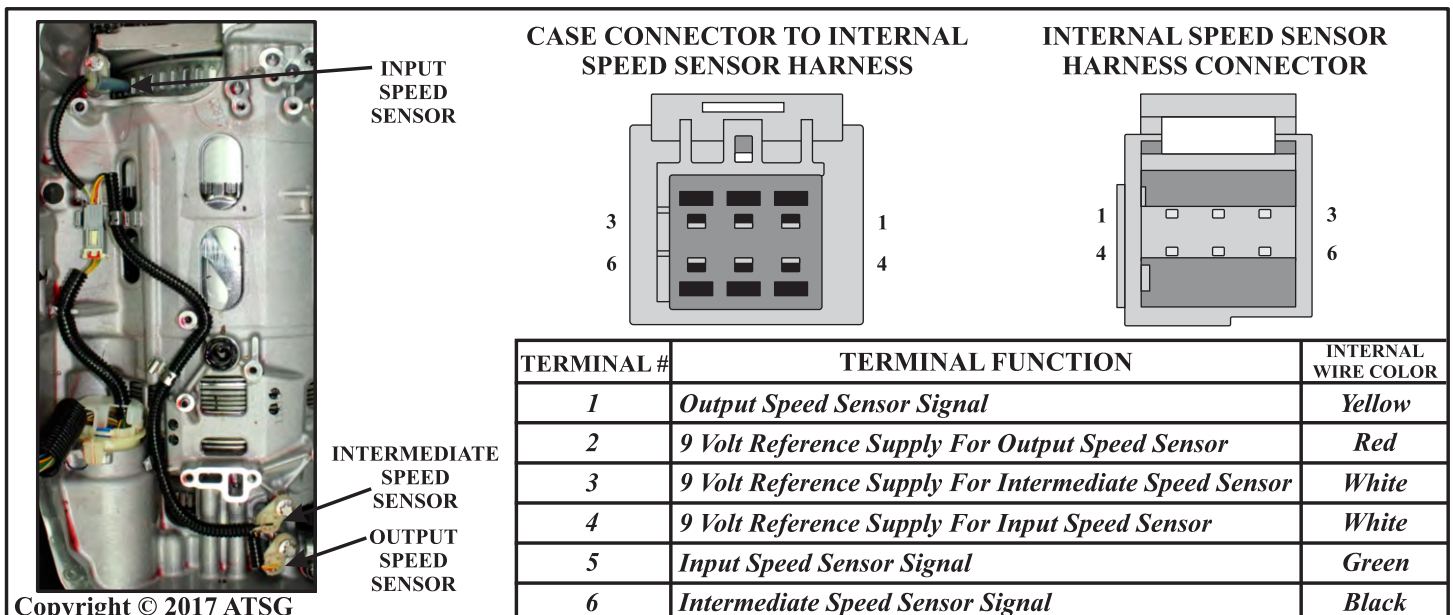


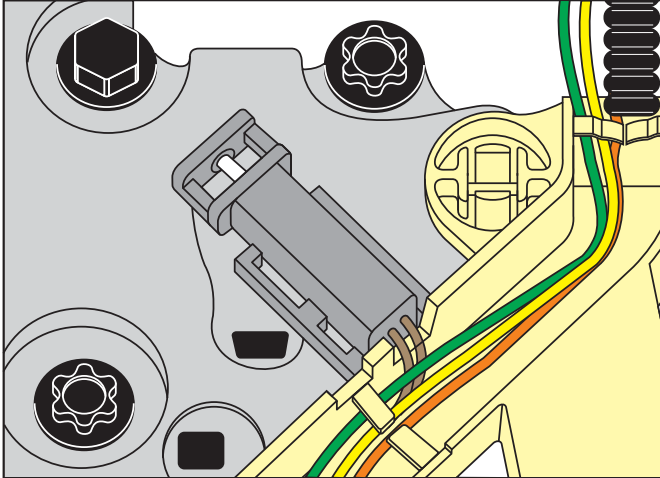
Figure 17



## GM 8L45 - 8L90

### TRANSMISSION FLUID TEMPERATURE SENSOR

The Transmission Fluid Temperature Sensor is an integral part of the internal wire harness. This sensor is a negative temperature coefficient type which means as temperature increases, resistance decreases. The TCM supplies a reference voltage to the sensor and measures the voltage drop in the circuit. As the temperature increases, signal voltage decreases. The TCM uses this information to maintain shift quality and converter clutch apply over the operating temperature range.



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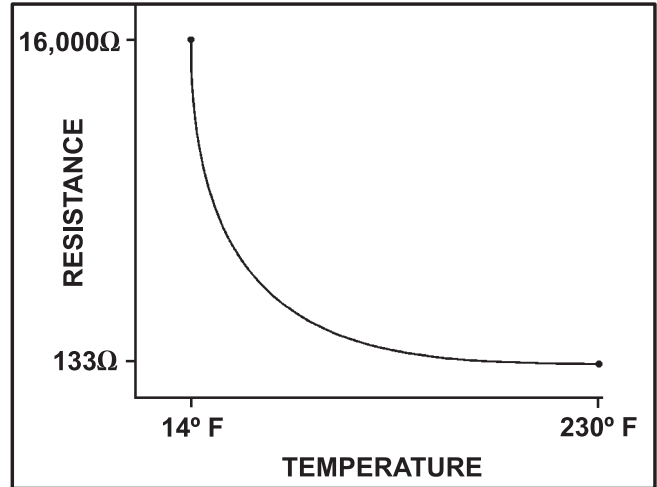
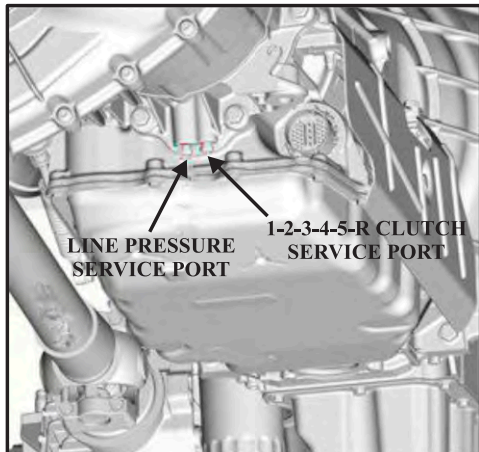


Figure 18

### LINE PRESSURE CHECK PROCEDURE

The 8L90 is equipped with two pressure ports located at the bottom of the extension housing as seen in Figure 19. Although there are pressure specifications for line pressure values, they are unrealistic when comparing scan tool commanded line pressure to the actual pressure shown on a gauge. As seen in the chart provided below, these two values do come close to each other.

Make certain all codes are cleared. Then control line pressure using the scan tools bidirectional control to see if a pressure range between 45 to 300 PSI can be obtained, this should be done with the transmission in the park position to protect internal components. Increase and decrease line pressure in increments allowing the pressure to stabilize between each increment. When the procedure is complete, torque the pressure port plug to 97 lb. in. (10.96 N·m).



Scan tool commanded line pressure (KPa)	Line pressure displayed on pressure gauge @ 1500 rpm	
	PSI	KPa
<i>Not Displayed</i>	<i>45 - 80</i>	<i>310 - 550</i>
200	95 - 130	655 - 900
400	160 - 190	1100 - 1310
600	220 - 250	1520 - 1725
800	270 - 300	1860 - 2070
1000	270 - 300	1860 - 2070
1200	270 - 300	1860 - 2070
1400	270 - 300	1860 - 2070
1600	270 - 300	1860 - 2070
1800	270 - 300	1860 - 2070
2000	270 - 300	1860 - 2070

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Figure 19



## GM 8L45 - 8L90

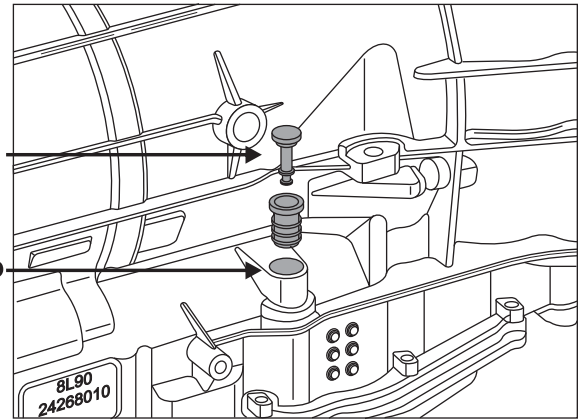
### TRANSMISSION FLUID LEVEL CHECK & FILL PROCEDURE

The 8L90 transmission does not have a filler tube or dipstick. Fluid level is checked through the check plug in the bottom of the oil pan. Using a scan tool to view temperature, the fluid level must be checked when the transmission fluid temperature is between 95 - 113°F (35 - 45°C). Make certain the vehicle is level when checking fluid level and that the transmission is in park with the engine running. *Carefully* remove the check plug to avoid coming in contact with hot fluid. If the fluid level is too high, the excess will flow out of the check plug. If it is too low, fluid will have to be added until it trickles out of the check plug which is determined by the height of the “stand pipe” inside the oil pan. To add fluid, remove the fill plug by pulling up on the top portion of it. Then pull the plug out of the fill opening. When enough fluid has been added, replace the fill plug and push the top of it down to lock it in place.

CHEVROLET & GMC TRUCKS - 8L90		
SERVICE PROVIDED	QUARTS	LITERS
<i>Pan &amp; Filter Service</i>	<b>6.0</b>	<b>5.7</b>
<i>Transmission Overhaul</i>	<b>10.5</b>	<b>9.9</b>
<i>Overhaul w/Cooling System</i>	<b>12.2</b>	<b>11.5</b>
<i>Overhaul w/ HD Cooling System</i>	<b>12.4</b>	<b>11.7</b>

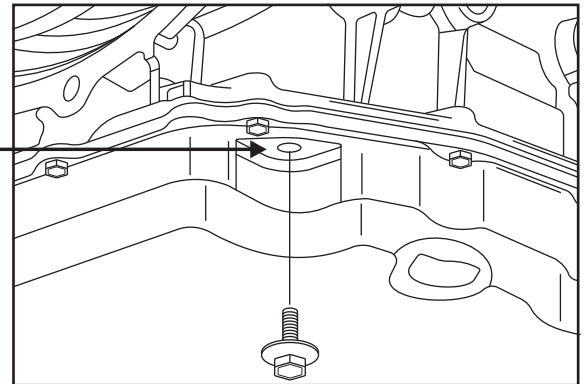
TOP  
PORTION  
OF PLUG

ADD FLUID  
HERE

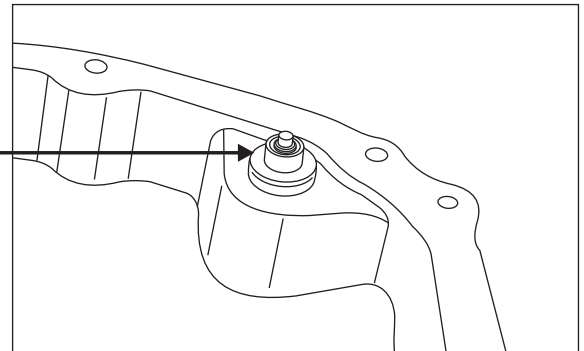


CHEVROLET CORVETTE - 8L90		
SERVICE PROVIDED	QUARTS	LITERS
<i>Pan &amp; Filter Service</i>	<b>7.4</b>	<b>7.0</b>
<i>Transmission Overhaul</i>	<b>11.30</b>	<b>10.7</b>
<i>Overhaul w/Cooling System</i>	<b>11.73</b>	<b>11.1</b>

CHECK  
FLUID  
LEVEL  
HERE



STANDPIPE WILL  
DETERMINE CORRECT  
FLUID LEVEL



CADILLAC - 8L45		
SERVICE PROVIDED	QUARTS	LITERS
<i>Pan &amp; Filter Service</i>	<b>6.4</b>	<b>6.0</b>
<i>Transmission Overhaul</i>	<b>10.1</b>	<b>9.5</b>
<i>Overhaul w/Cooling System</i>	<b>10.8</b>	<b>10.3</b>

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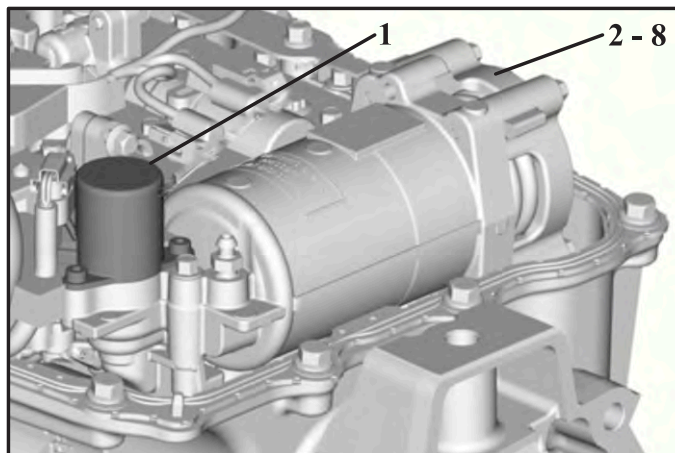
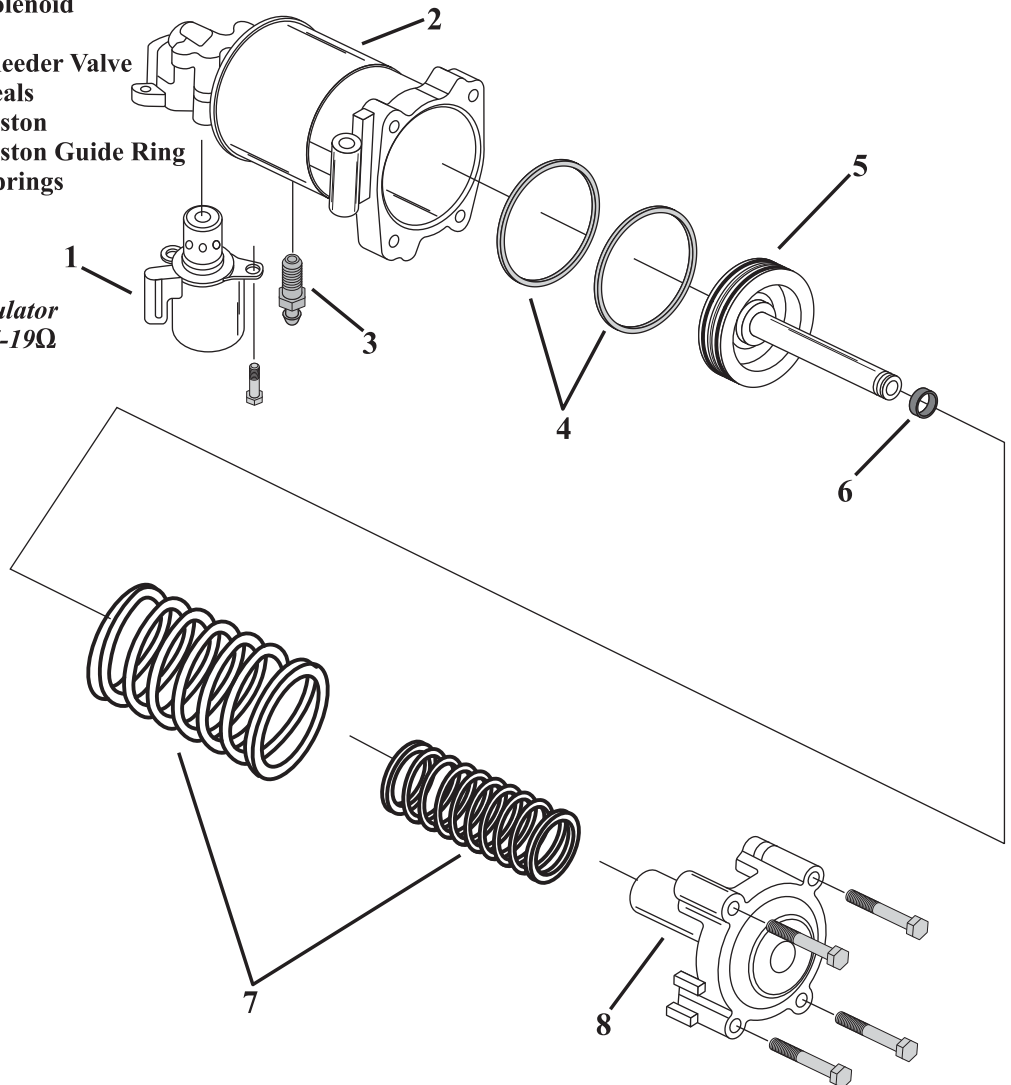
Figure 20

## GM 8L45 - 8L90

### TRANSMISSION STOP/START SURGE ACCUMULATOR

- 1 Auxiliary Fluid Accumulator Solenoid
- 2 Auxiliary Fluid Housing
- 3 Auxiliary Fluid Accumulator Bleeder Valve
- 4 Auxiliary Fluid Accumulator Seals
- 5 Auxiliary Fluid Accumulator Piston
- 6 Auxiliary Fluid Accumulator Piston Guide Ring
- 7 Auxiliary Fluid Accumulator Springs
- 8 Auxiliary Fluid Cover

*Auxiliary Fluid Accumulator  
Solenoid Resistance: 17-19Ω*

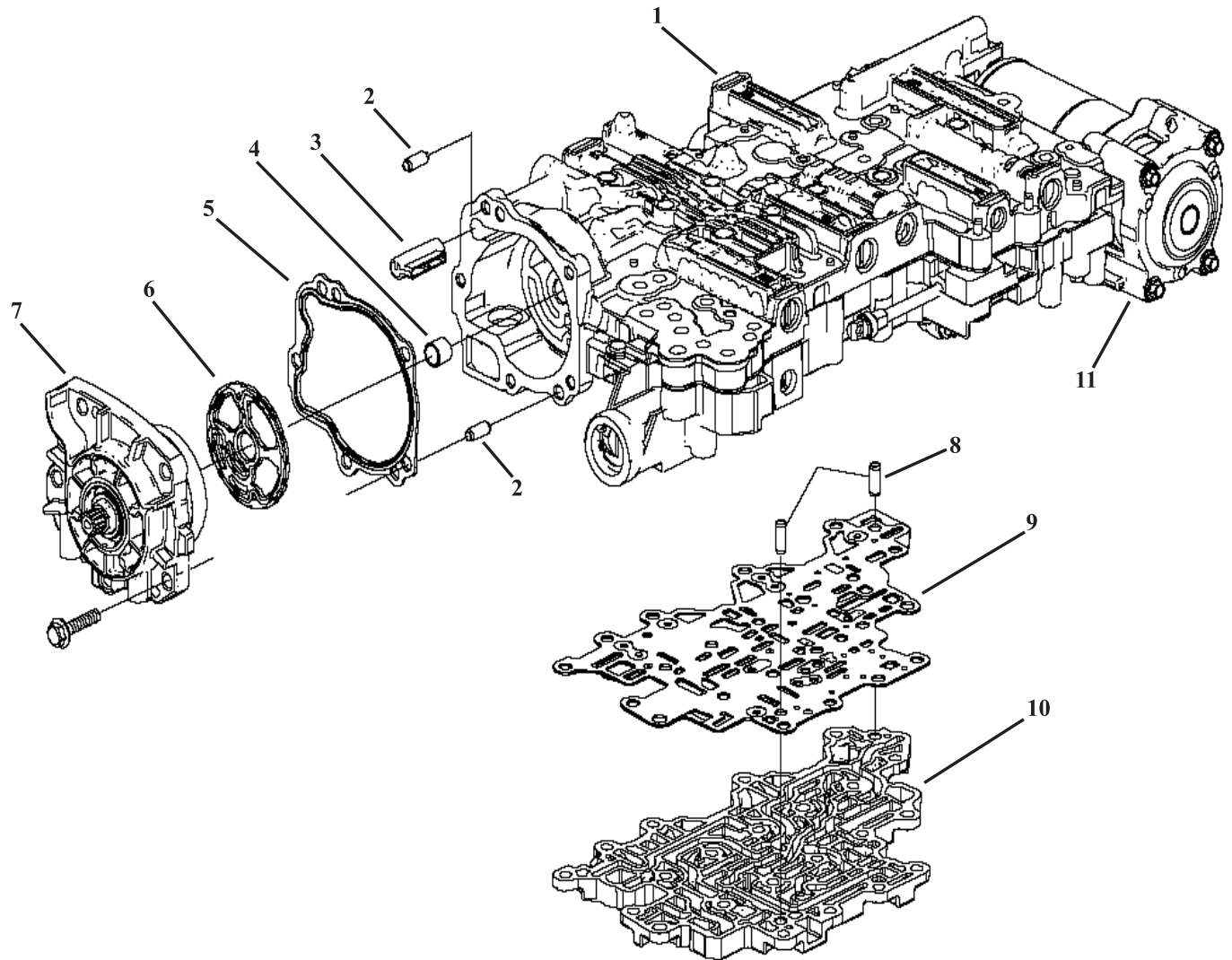


The Surge Accumulator assembly is bolted to the Control Valve Upper Body and is only used when the vehicle is equipped with the Auto-Stop/Start System. During engine OFF conditions the surge accumulator stores line pressure. When the driver lets off the brake and steps on the throttle pedal, the surge accumulator solenoid opens, sending stored pressure in two directions. First, it unseats checkball #20 and seats checkball #9 to prevent surge oil from going to the pump. This oil goes through the 1-3-5-6-7 Regulator Valve to apply the 1-3-5-6-7 clutch and through the 1-2-7-8-R Regulator Valve to apply the 1-2-7-8-R clutch. Secondly, the surge oil goes directly to the 1-2-3-4-5-R clutch. These clutches provide 1st gear in preparation for engine restart.

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Figure 21

## GM 8L45 - 8L90 CONTROL VALVE ASSEMBLY

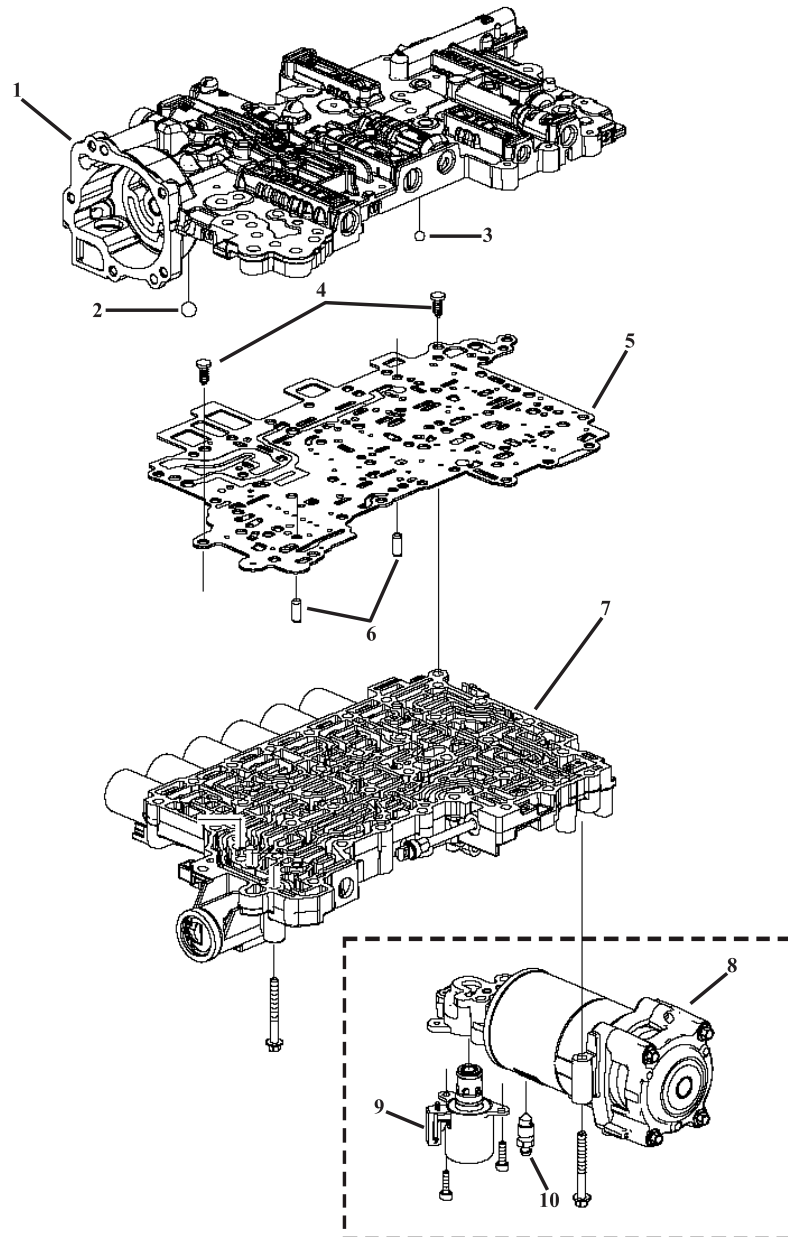


- 1 Control Valve Body Assembly**
- 2 Transmission Fluid Pump Locator Pin (2)**
- 3 Transmission Fluid Passage Sleeve**
- 4 Transmission Fluid Pump Drive Shaft Bushing**
- 5 Transmission Fluid Pump Gasket**
- 6 Transmission Fluid Pump Seal**
- 7 Transmission Fluid Pump Assembly**
- 8 Control Valve Body Locator Pin (2)**
- 9 Control Valve Body Channel Plate Spacer Plate (bonded)**
- 10 Control Valve Channel Plate**

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Figure 22

## GM 8L45 - 8L90 CONTROL VALVE ASSEMBLY



- 1** Control Valve Upper Valve Body
- 2** Control Valve Body Ball Check Valve (3)
- 3** Cooler Flow Blow-off Ball Valve
- 4** Control Valve Body Spacer Plate Retainer (2)
- 5** Control Valve Body Spacer Plate (bonded)
- 6** Control Valve Body Locator Pin (2)
- 7** Control Valve Body Solenoid Assembly
- 8** Transmission Auxiliary Surge Accumulator Assembly (auto-stop Only)
- 9** Transmission Auxiliary Surge Accumulator Solenoid (auto-stop Only)
- 10** Transmission Auxiliary Surge Accumulator Bleeder Valve (auto-stop Only)

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Figure 23



## GM 8L45 - 8L90

### UPPER CONTROL VALVE BODY ASSEMBLY

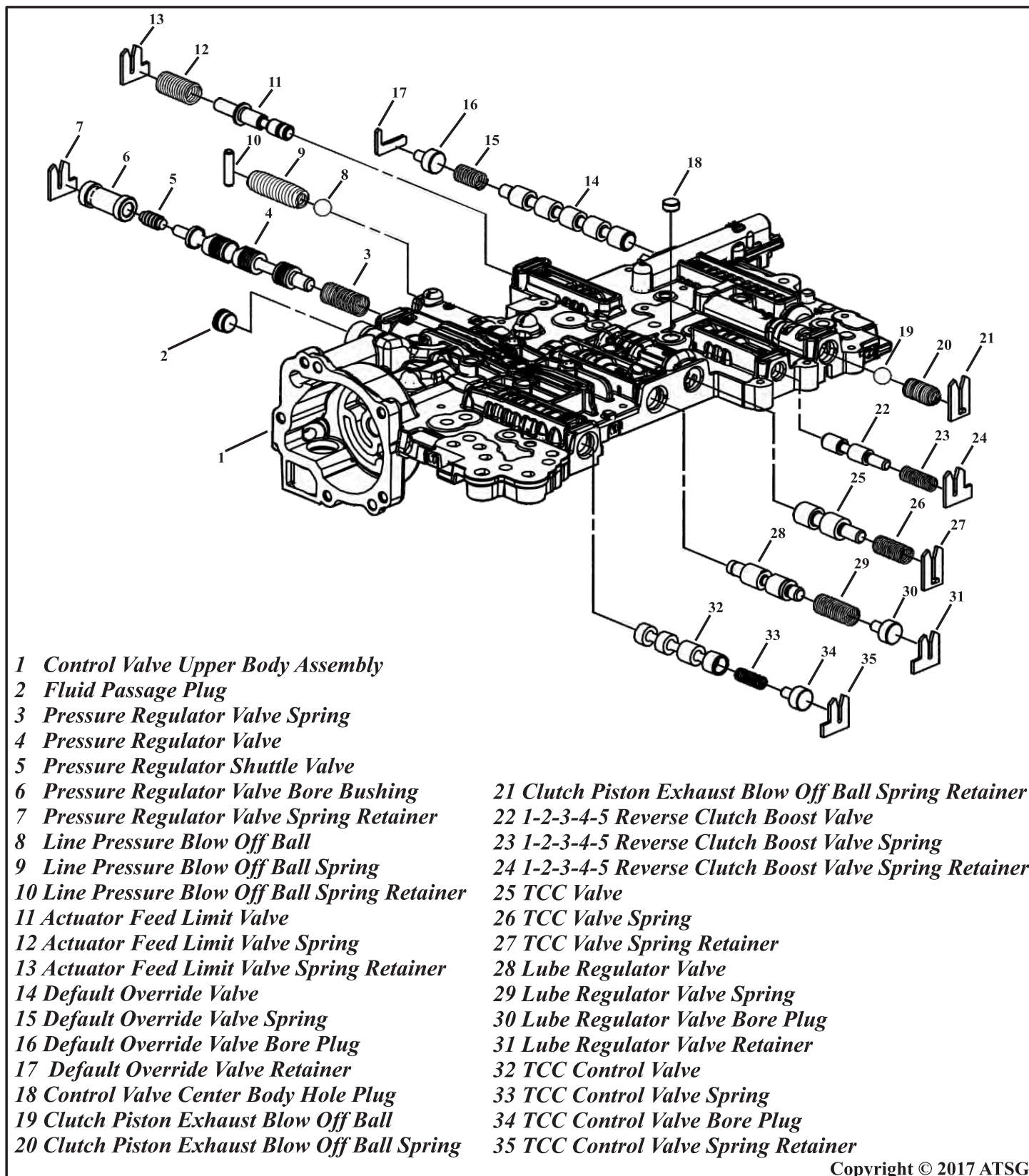
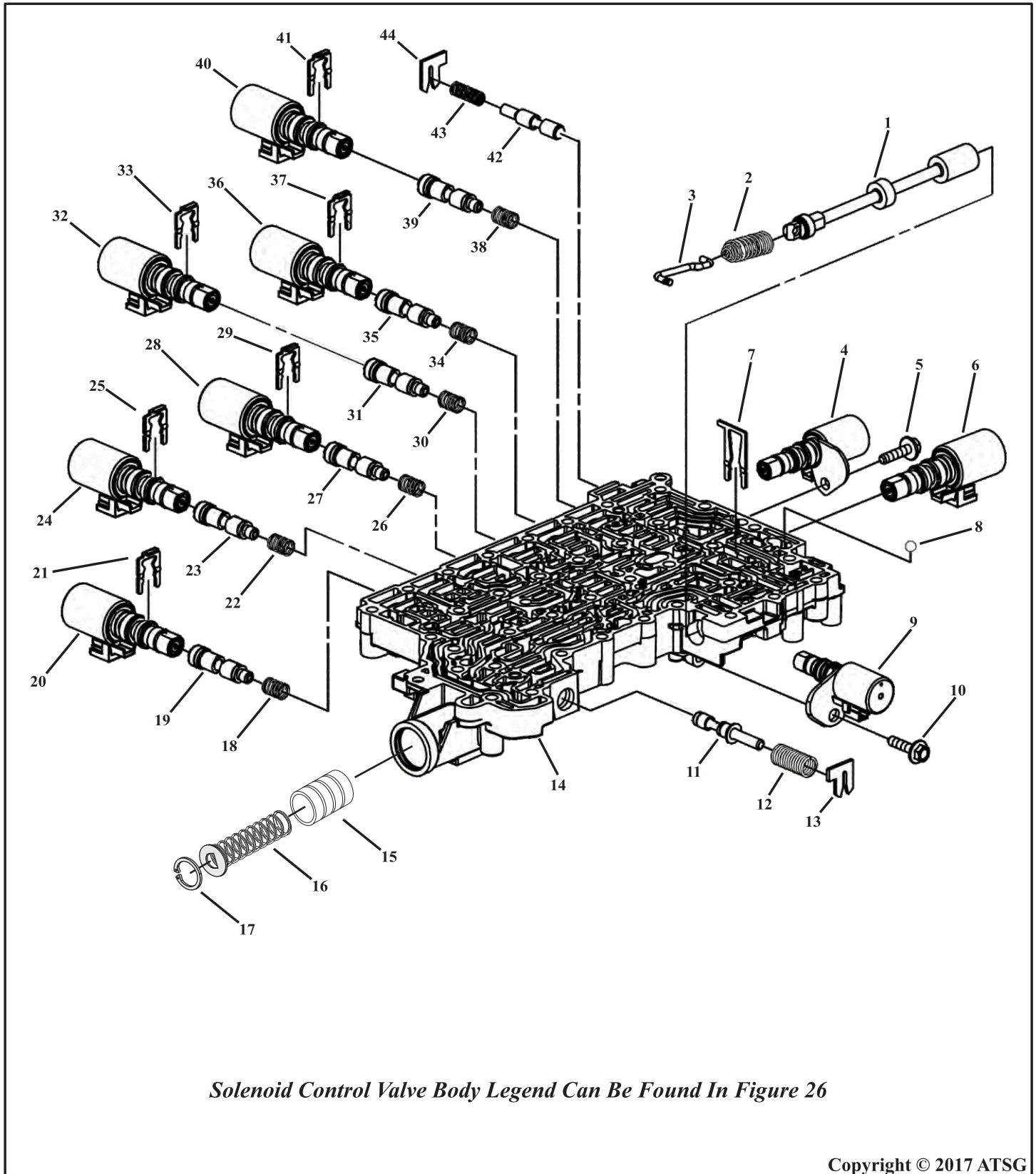


Figure 24

## GM 8L45 - 8L90

### SOLENOID CONTROL VALVE BODY ASSEMBLY



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Figure 25





## GM 8L45 - 8L90

### SOLENOID CONTROL VALVE BODY ASSEMBLY...continued

#### SOLENOID CONTROL VALVE BODY LEGEND FROM FIGURE 25

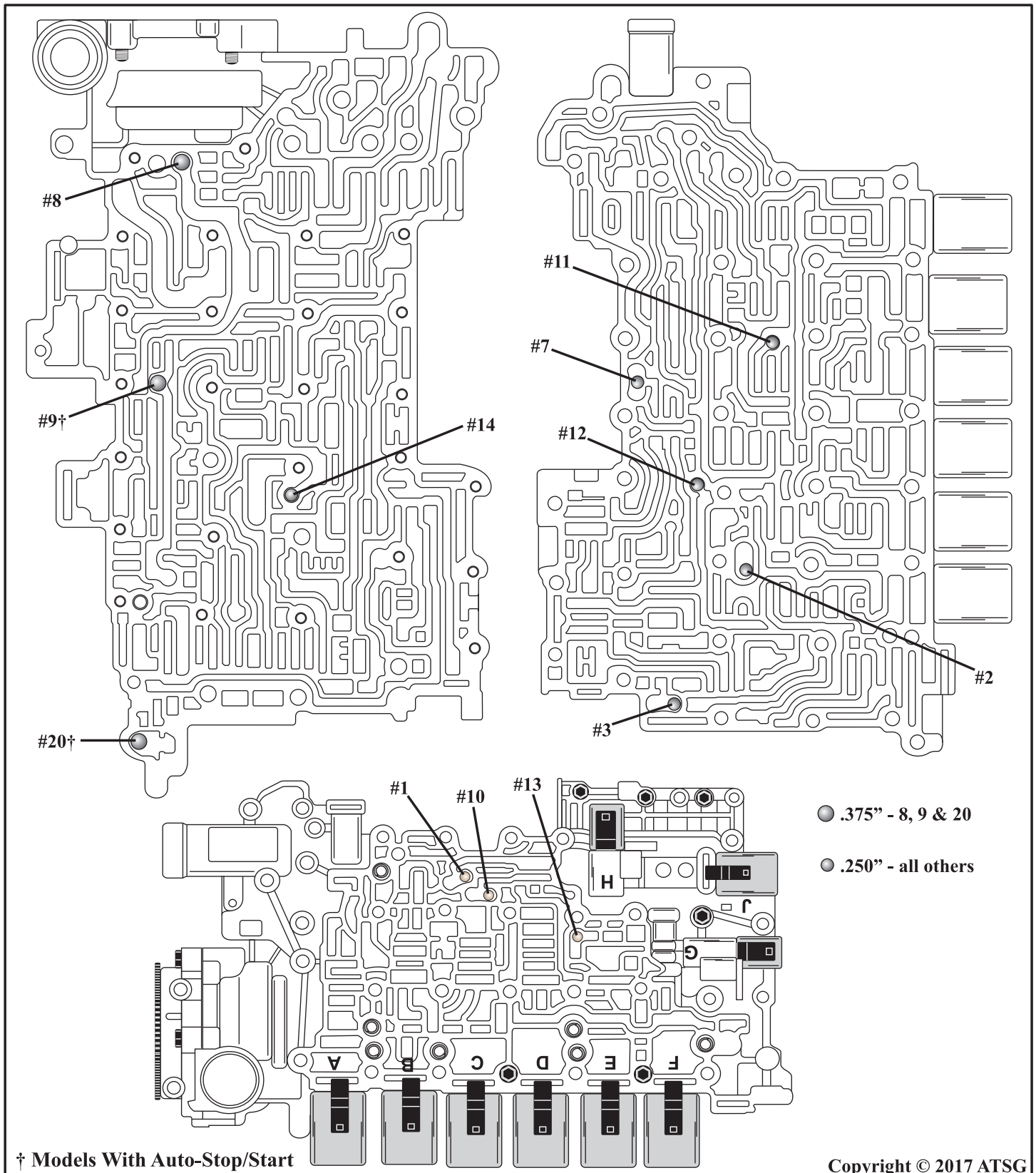
- 1 Manual Valve*
- 2 Manual Valve Spring*
- 3 Manual Valve Link*
- 4 Default Control Solenoid*
- 5 Default Control Solenoid Retaining Bolt*
- 6 Line Pressure Control Solenoid*
- 7 Line Pressure Control Solenoid Retainer*
- 8 Cooler Flow Blow Off Ball*
- 9 1-2-3-4-5 Reverse Boost Control Solenoid*
- 10 1-2-3-4-5 Reverse Boost Control Solenoid Retaining Bolt*
- 11 Converter Feed Limit Valve*
- 12 Converter Feed Limit Valve Spring*
- 13 Converter Feed Limit Valve Spring Retainer*
- 14 Solenoid Control Valve Body*
- 15 1-3-5-6-7 Clutch Accumulator Piston*
- 16 1-3-5-6-7 Clutch Accumulator Piston Spring*
- 17 1-3-5-6-7 Clutch Accumulator Piston Retaining Ring*
- 18 TCC Control Valve Spring*
- 19 TCC Control Valve*
- 20 TCC Control Solenoid*
- 21 TCC Control Solenoid Retainer*
- 22 2-3-4-6-8 Control Valve Spring*
- 23 2-3-4-6-8 Control Valve*
- 24 2-3-4-6-8 Control Solenoid*
- 25 2-3-4-6-8 Control Solenoid Retainer*
- 26 1-3-5-6-7 Control Valve Spring*
- 27 1-3-5-6-7 Control Valve*
- 28 1-3-5-6-7 Control Solenoid*
- 29 1-3-5-6-7 Control Solenoid Retainer*
- 30 4-5-6-7-8 Reverse Control Valve Spring*
- 31 4-5-6-7-8 Reverse Control Valve*
- 32 4-5-6-7-8 Reverse Control Solenoid*
- 33 4-5-6-7-8 Reverse Control Solenoid Retainer*
- 34 1-2-7-8 Reverse Control Valve Spring*
- 35 1-2-7-8 Reverse Control Valve*
- 36 1-2-7-8 Reverse Control Valve Solenoid*
- 37 1-2-7-8 Reverse Control Valve Solenoid Retainer*
- 38 1-2-3-4-5 Reverse Control Valve Spring*
- 39 1-2-3-4-5 Reverse Control Valve*
- 40 1-2-3-4-5 Reverse Control Solenoid*
- 41 1-2-3-4-5 Reverse Control Solenoid Retainer*
- 42 Lube Regulator Valve*
- 43 Lube Regulator Valve Spring*
- 44 Lube Regulator Valve Spring Retainer*

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Figure 26

## GM 8L45 - 8L90

### CHECKBALL LOCATIONS & FUNCTION





# Technical Service Information

## GM 8L45 - 8L90

### CHECKBALL LOCATIONS & FUNCTION

#### **#1 2-3-4-6-8 Clutch/Reverse**

Located in the upper control solenoid body, this “Shuttle Ball Valve” is seated against the reverse fluid passage while the transmission is operating in Park, Neutral and Drive, 1st through 8th gears. With the ball in this position, 2-3-4-5-8 Clutch fluid enters the 2-3-4-5-8 Clutch/Reverse fluid circuit and then is routed to the Default Override Valve. When the transmission is operating in Reverse, the ball seats against the 2-3-4-6-8 Clutch fluid passage to allow reverse fluid to enter the 2-3-4-6-8 Clutch/Reverse fluid circuit and is then routed to the Default Override Valve.

#### **#2 4-5-6-7-8-R Clutch Drive Feed/Reverse**

Located in the upper control solenoid body, this “Shuttle Ball Valve” is seated against the reverse fluid passage while the transmission is operating in Park, Neutral and Drive, 1st through 8th gears. With the ball in this position, DRIVE fluid enters the 4-5-6-7-8-R CLUTCH FEED fluid circuit to the 4-5-6-7-8 Control Valve. When the transmission is operating in Reverse, the ball seats against the DRIVE fluid passage to allow REVERSE fluid to enter the 4-5-6-7-8-R CLUTCH FEED fluid circuit to the 4-5-6-7-8 Control Valve.

#### **#3 Default Latch/S9 On/Off Sig**

Located in the upper control solenoid body, this “Shuttle Ball Valve” is seated against the DEFAULT LATCH passage while the transmission is operating in Drive first gear. With the ball in this position, S8 ON/OFF SIG fluid enters the DFLT LATCH/S8 ON/OFF SIG fluid circuit to apply the default Override Valve. When the transmission is operating in Drive 2nd through 8th gears, the ball seats against the S8 ON/OFF SIG fluid passage to allow DEFAULT LATCH fluid to enter the DFLT LATCH/S8 ON/OFF SIG fluid circuit and hold the Default Override Valve in the applied position.

#### **#7 Regulated Lube/Lube Override**

Located in the upper control valve body, this “Shuttle Ball Valve” is seated against the LUBE OVERRIDE passage while the transmission is operating in Park, Reverse, Neutral, Drive 1st, 2nd and 3rd gear ranges. With the ball in this position, regulated lube fluid enters the REG LUBE/LUBE OVERRIDE fluid circuit to hold the Lube Flow Regulator Valve in the regulating position. When the transmission is operating in Drive 4th through 8th gears, LUBE OVERRIDE fluid pressure unseats the ball against the regulated lube fluid pressure to allow LUBE OVERRIDE fluid and regulated lube fluid to enter the REG LUBE/LUBE OVERRIDE fluid circuit to hold the Lube Flow Regulator Valve in the regulating position.

#### **#8 Line/Secondary Line**

Located in the upper control valve body, this “Shuttle Ball Valve” is seated against the SECONDARY LINE fluid passage by LINE fluid while the transmission is operating in ALL ranges. With the ball in this position, LINE fluid pressure is greater than SECONDARY LINE pressure and is routed to the line pressure Blow-Off Ball Valve. When SECONDARY LINE pressure is greater than LINE fluid pressure, the ball unseats to allow SECONDARY LINE fluid to enter the LINE fluid circuit.

#### **#9 Line/Line†**

Located in the upper control valve body, this “One Way” ball is used in Start/Stop conditions to keep line pressure coming from the Surge Accumulator back feeding into the pump.

#### **#10 2-3-4-6-8 Clutch/4-5-6-7-8-R Clutch**

Located in the upper control solenoid body, this “Shuttle Ball” is seated against the 2-3-4-6-8 CLUTCH fluid passage while the transmission is operating in Reverse, 5th and 7th gears. With the ball in this position, 4-5-6-7-8-R CL fluid enters the 4-5-6-7-8-R CL/2-3-4-6-8 CL fluid circuit, this applies the Lube Override Enable Valve. When the transmission is operating in 2nd and 3rd gears, the ball seats against the 4-5-6-7-8-R CLU fluid passage to allow 2-3-4-6-8 CLU fluid to enter the 4-5-6-7-8-R CLU/2-3-4-6-8 CL fluid circuit and is then routed to the Lube Override Enable Valve.



## GM 8L45 - 8L90

### CHECKBALL LOCATIONS & FUNCTION

#### **#11 1-3-5-6-7 Clutch Feed**

Located in the upper control solenoid body, this “One Way Orifice Control Ball” is used to differentiate the flow rate of fluid between applying and releasing the 1-3-5-6-7 Control Valve. 1-3-5-6-7 CL FEED fluid pressure opens the ball while the transmission is operating in Drive 1st, 3rd, 5th, 6th and 7th gears. With the ball in this position, 1-3-5-6-7 CL FEED fluid flows freely into the 1-3-5-6-7 CL FEED fluid passage. Exhausting 1-3-5-6-7 CL FEED fluid seats the ball and fluid is forced through Orifice #32. This allows for a controlled exhaust of 1-3-5-6-7 CL FEED fluid.

#### **#12 Actuator Feed/4-5-6-7-8-R Clutch Feedback**

Located in the upper control solenoid body, this “One Way Ball” is one of two boost balls. When feedback pressure on the end of the 4-5-6-7-8-R Control Valve is higher than actuator feed limit pressure, it opens and lowers the valve feedback pressure (raising or boosting clutch apply pressure). When 4-5-6-7-8-R regulator valve feedback pressure is at or below actuator feed limit pressure the ball is seated.

#### **#13 4-5-6-7-8-R Clutch Feed**

Located in the upper control solenoid body, this “One Way Orifice Control Ball” is used to differentiate the flow rate of fluid between applying and releasing the 4-5-6-7-8 Control Valve. 4-5-6-7-8 CLUTCH FEED fluid pressure opens the ball while the transmission is operating in Reverse and Drive 4th through 8th gears. With the ball in this position, 4-5-6-7-8 CLUTCH FEED fluid flow freely through the 4-5-6-7-8-R Control Valve into the 4-5-6-7-8-R CLU feed passage. When in Drive 1st, 2nd and 3rd gears, 4-5-6-7-8 CLUTCH FEED fluid flow is stopped at the 4-5-6-7-8-R Control Valve. Exhausting 4-5-6-7-8 CLUTCH FEED fluid is forced through Orifice #35. This allows for a controlled exhaust of 4-5-6-7-8 CLUTCH FEED fluid.

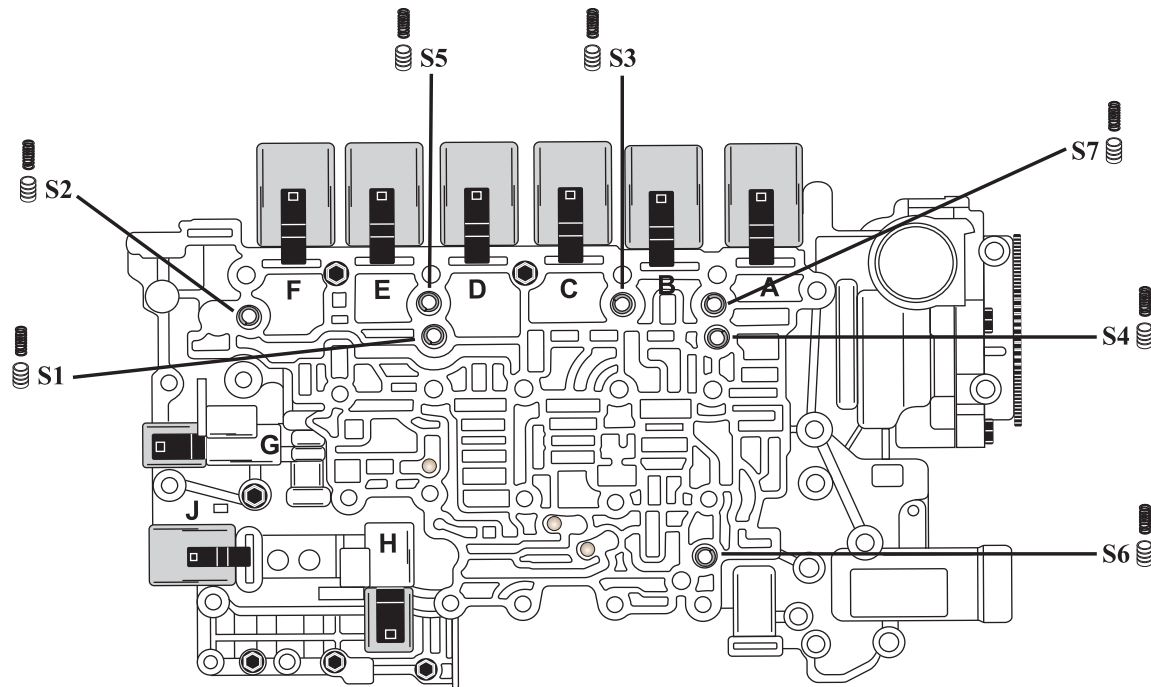
#### **#14 Actuator Feed/1-2-7-8-R Clutch Feedback**

Located in the upper control valve body, this “One Way Ball” is one of two boost balls. When feedback pressure on the end of the 1-2-7-8-R Control Valve is higher than actuator feed limit pressure, it opens and lowers the valve feedback pressure (raising or boosting clutch apply pressure). When 1-2-7-8-R regulator valve feedback pressure is at or below actuator feed limit pressure, the ball is seated. This allows for a controlled exhaust of 1-2-7-8-R CL FDBK fluid.

#### **#20 Line/Line†**

Located in the upper control valve body, this “One Way” ball is used to prevent line pressure from going to the 1-2-3-4-5-R Clutch during normal driving conditions. On a restart during Stop/Start conditions, it opens to allow Surge Accumulator oil to enter the line pressure circuit.

## GM 8L45 - 8L90 ACCUMULATOR LOCATIONS & FUNCTION



*All VFS Accumulator Springs are .682"-Long x .315"-Wide x .060"-Wire Diameter*

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Figure 28

### ***S1 VFS ACCUMULATOR***

The S1 VFS Accumulator is used to control shift feel of the 1-2-7-8-R Clutch while the transmission is operating in Park, Neutral and Drive 1st, 2nd, 7th and 8th gears.

### ***S2 VFS ACCUMULATOR***

The S2 VFS Accumulator is used to control shift feel of the 1-2-3-4-5-R Clutch while the transmission is operating in Park, Reverse, Neutral and Drive 1st through 5th gears.

### ***S3 VFS ACCUMULATOR***

The S3 VFS Accumulator is used to control shift feel of the 1-3-5-6-7 Clutch while the transmission is operating in Reverse and Drive 1st, 3rd, 5th, 6th and 7th gears.

### ***S4 VFS ACCUMULATOR***

The S4 VFS Accumulator is used to control shift feel of the 2-3-4-6-8 Clutch while the transmission is operating in Drive 2nd, 3rd, 4th, 6th and 8th gears.

### ***S5 VFS ACCUMULATOR***

The S5 VFS Accumulator is used to control shift feel of the 4-5-6-7-8-R Clutch while the transmission is operating in Reverse and Drive 4th through 8th gears.

### ***S6 VFS ACCUMULATOR***

The S6 VFS Accumulator is used to help regulate line fluid pressure while the transmission is operating in ALL ranges.

### ***S7 VFS ACCUMULATOR***

The S7 VFS Accumulator is used to control pressure of the Converter Control Valve and Converter Fault Valve engagement while the transmission is operating in 7th and 8th gears.



## 8L45/90 TECHNICIANS TIPS

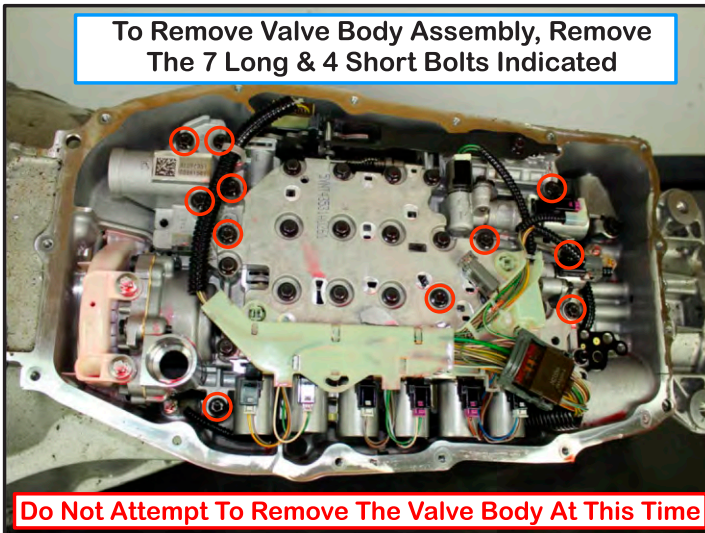


Figure 29

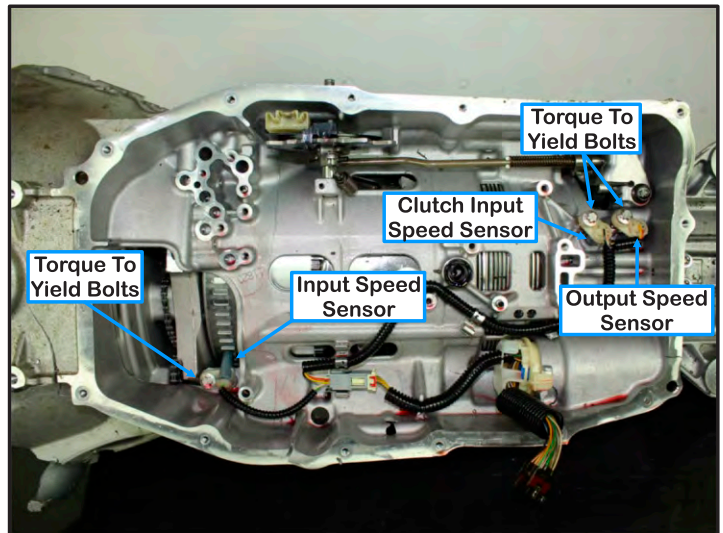


Figure 32

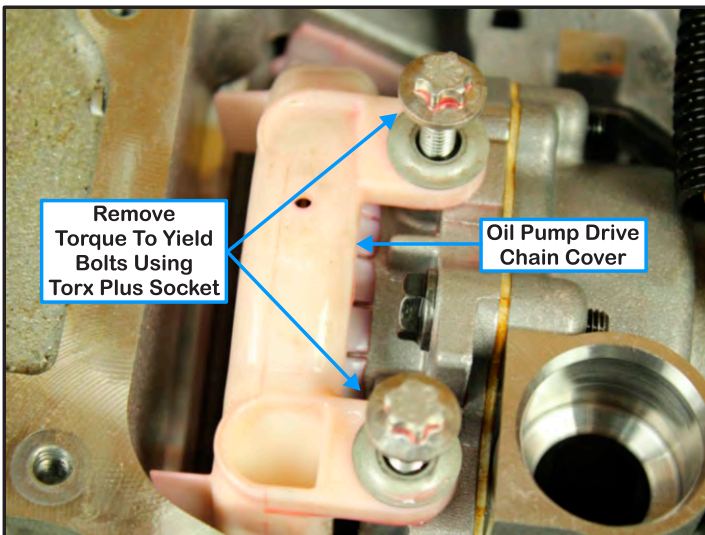


Figure 30

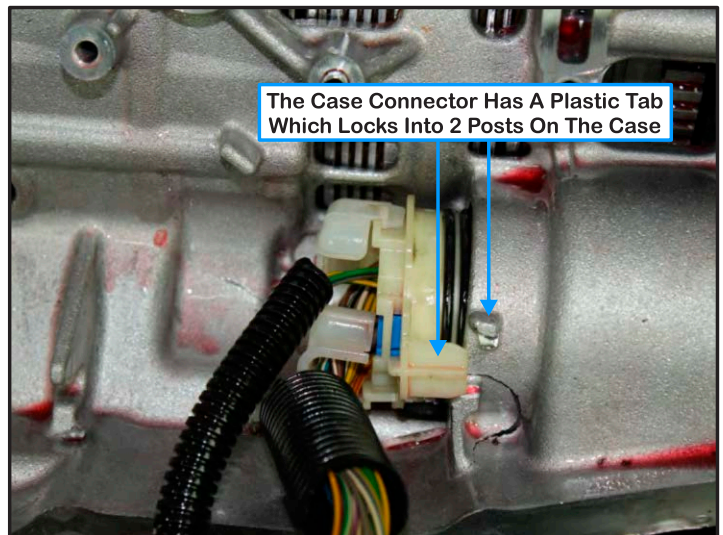


Figure 33

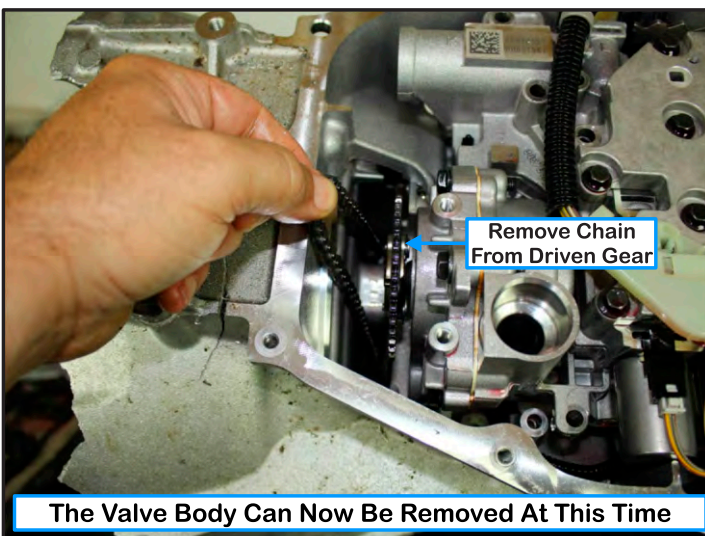


Figure 31

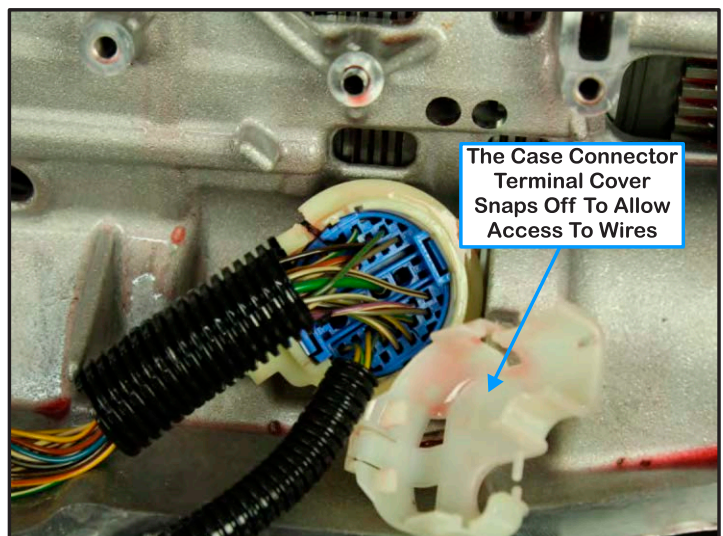
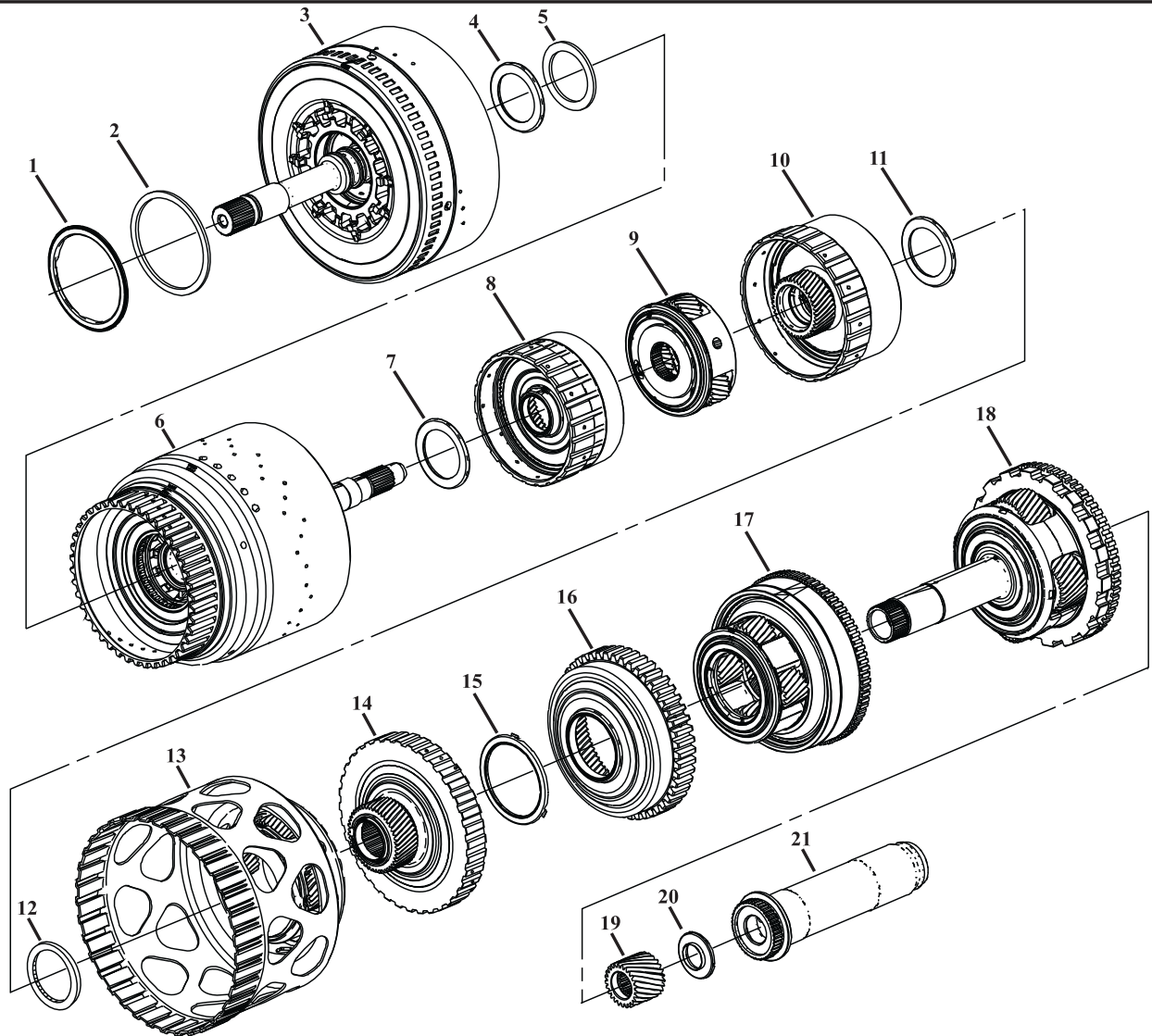


Figure 34

## GM 8L45 - 8L90 CLUTCH & GEARTRAIN COMPONENTS



- 1 1-3-5-6-7 Clutch Thrust Bearing
- 2 1-3-5-6-7 Clutch Thrust Bearing Washer
- 3 1-3-5-6-7 Clutch Assembly
- 4 2-3-4-5-8/4-5-6-7-8 Reverse Clutch Thrust Bearing
- 5 2-3-4-5-8/4-5-6-7-8 Reverse Clutch Thrust Bearing Washer
- 6 2-3-4-6-8 /4-5-6-7-8 Reverse Clutch Assembly
- 7 Input Sun Gear Thrust Bearing
- 8 Direct/Overdrive Internal Gear Assembly
- 9 Direct/Overdrive Carrier Assembly
- 10 Input Internal Gear Assembly
- 11 Input Sun Gear Thrust Bearing

- 12 Input Carrier Spacer
- 13 Input Carrier Assembly
- 14 Input Sun Gear Assembly
- 15 1-2-3-4-5 Reverse Clutch Hub Thrust Bearing
- 16 Reaction Internal Gear/1-2-3-4-5 Reverse Hub
- 17 Reaction Gear/Output Internal Gear Assembly
- 18 Output Carrier Assembly
- 19 Output Sun Gear
- 20 Output Sun Gear Thrust Bearing
- 21 Output Shaft (Model Dependant)

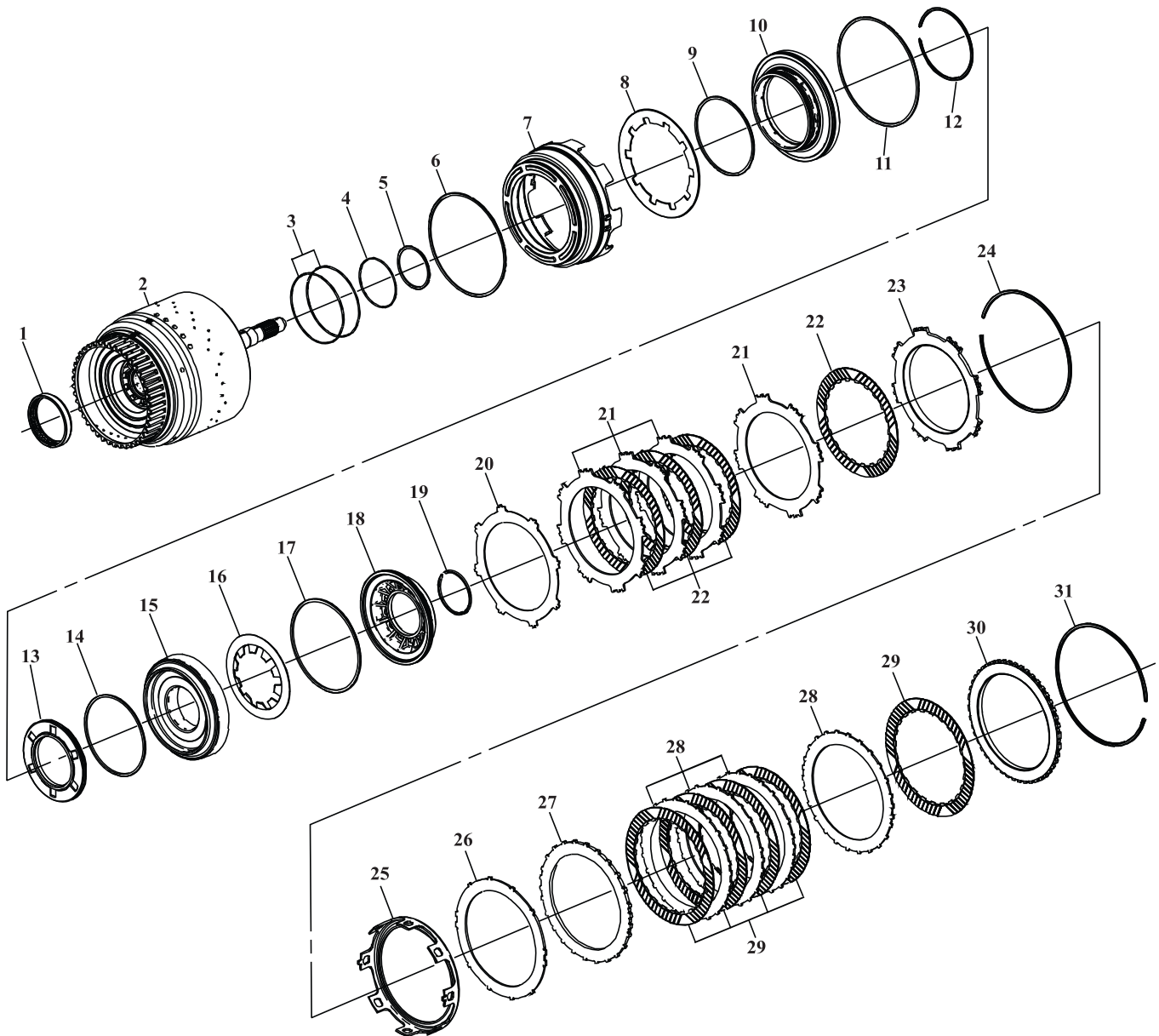
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Figure 35



## GM 8L45 - 8L90

### 2-3-4-6-8/4-5-6-7-8 REVERSE CLUTCH HOUSING ASSEMBLY



*Solenoid Control Valve Body Legend Can Be Found In Figure 37*

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Figure 36



## GM 8L45 - 8L90

### 2-3-4-6-8/4-5-6-7-8 REVERSE CLUTCH HOUSING ASSEMBLY

#### SOLENOID CONTROL VALVE BODY LEGEND FROM FIGURE 36

- 1 2-3-4-6-8/4-5-6-7-8 Reverse Clutch Housing Bearing*
- 2 2-3-4-6-8/4-5-6-7-8 Reverse Clutch Housing*
- 3 2-3-4-6-8 Clutch Piston Dam Seal*
- 4 4-5-6-7-8 Reverse Clutch Piston Stop O-Ring Seal*
- 5 4-5-6-7-8 Reverse Clutch Piston Seal*
- 6 2-3-4-6-8 Clutch Piston Seal*
- 7 2-3-4-6-8 Clutch Piston*
- 8 2-3-4-6-8 Clutch Piston Return Spring*
- 9 2-3-4-6-8 Clutch Piston Dam Inner Seal*
- 10 2-3-4-6-8 Clutch Piston Dam*
- 11 2-3-4-6-8 Clutch Piston Dam Outer Seal*
- 12 2-3-4-6-8 Clutch Piston Dam Retaining Ring*
- 13 4-5-6-7-8 Reverse Clutch Piston Stop*
- 14 4-5-6-7-8 Reverse Clutch Piston Seal*
- 15 4-5-6-7-8 Reverse Clutch Piston*
- 16 4-5-6-7-8 Reverse Clutch Piston Return Spring*
- 17 4-5-6-7-8 Reverse Clutch Piston Dam Seal*
- 18 4-5-6-7-8 Reverse Clutch Piston Dam*
- 19 4-5-6-7-8 Reverse Clutch Piston Dam Retaining Ring*
- 20 4-5-6-7-8 Reverse Clutch Waved Plate*
- 21 4-5-6-7-8 Reverse Clutch Steel Plates*
- 22 4-5-6-7-8 Reverse Clutch Friction Plates*
- 23 4-5-6-7-8 Reverse Clutch Backing Plate*
- 24 4-5-6-7-8 Reverse Clutch Backing Plate Retaining Ring (Selective)*
- 25 2-3-4-6-8 Clutch Apply Ring*
- 26 2-3-4-6-8 Clutch Waved Plate*
- 27 2-3-4-6-8 Clutch Apply Plate*
- 28 2-3-4-6-8 Clutch Steel Plates*
- 29 2-3-4-6-8 Clutch Friction Plates*
- 30 2-3-4-6-8 Clutch Backing Plate*
- 31 2-3-4-6-8 Clutch Backing Plate Retaining Ring*



## 8L45/90 TECHNICIANS TIPS

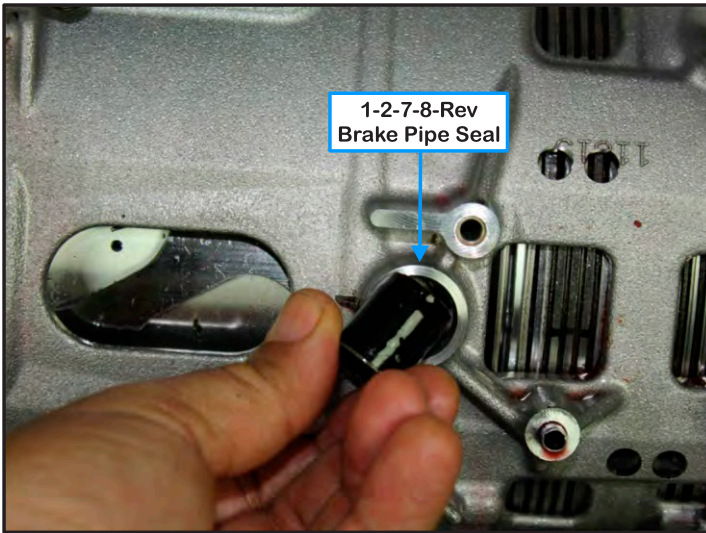


Figure 38

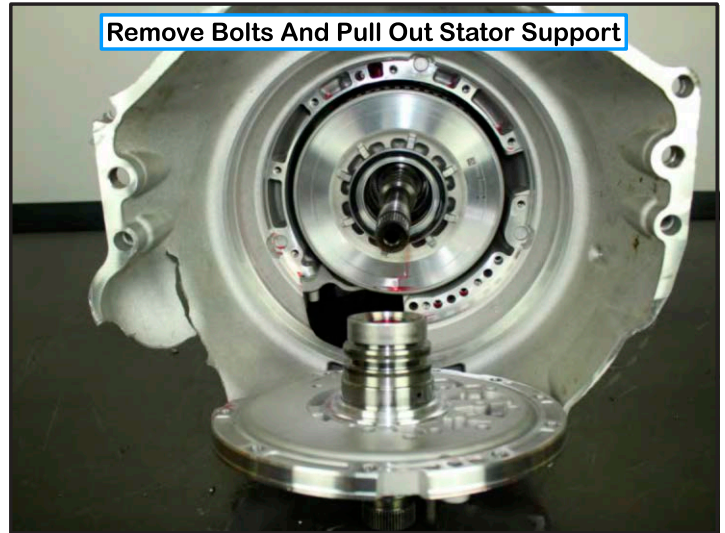


Figure 41



Figure 39



Figure 42



Figure 40

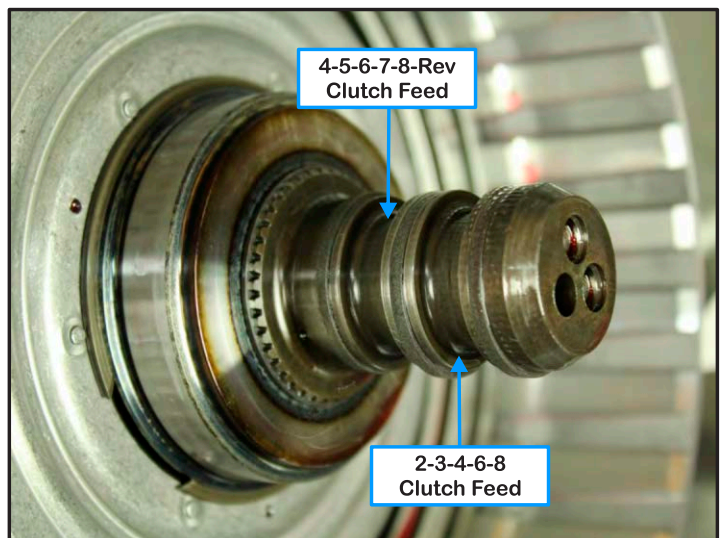


Figure 43



## 8L45/90 TECHNICIANS TIPS

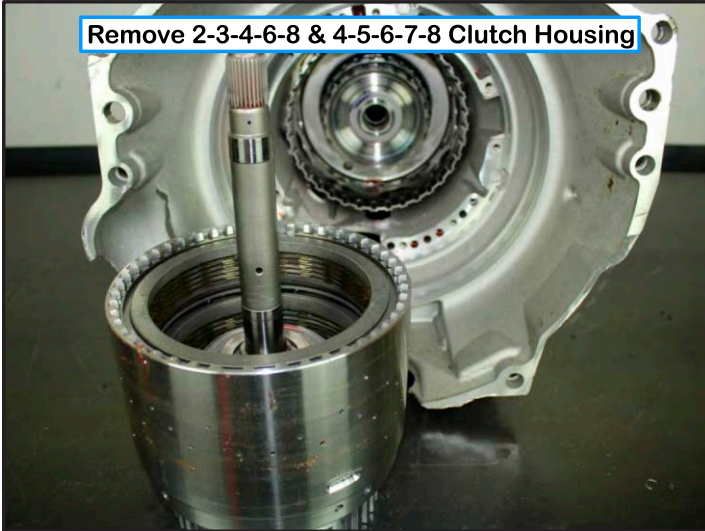


Figure 44



Figure 47



Figure 45

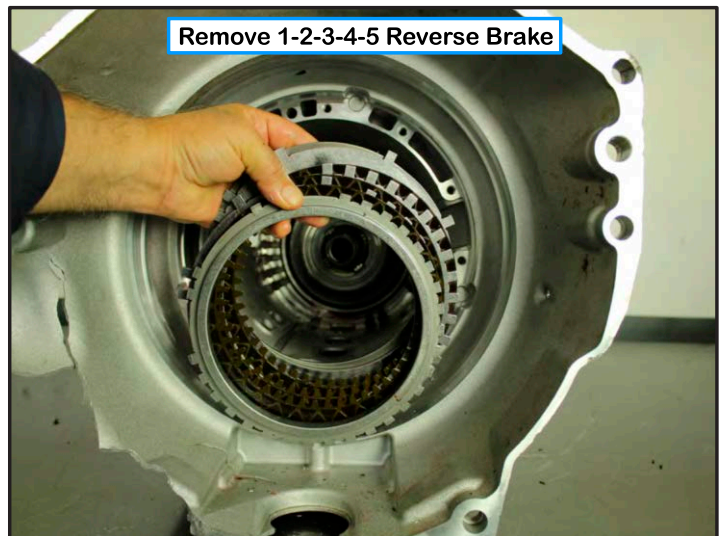


Figure 48

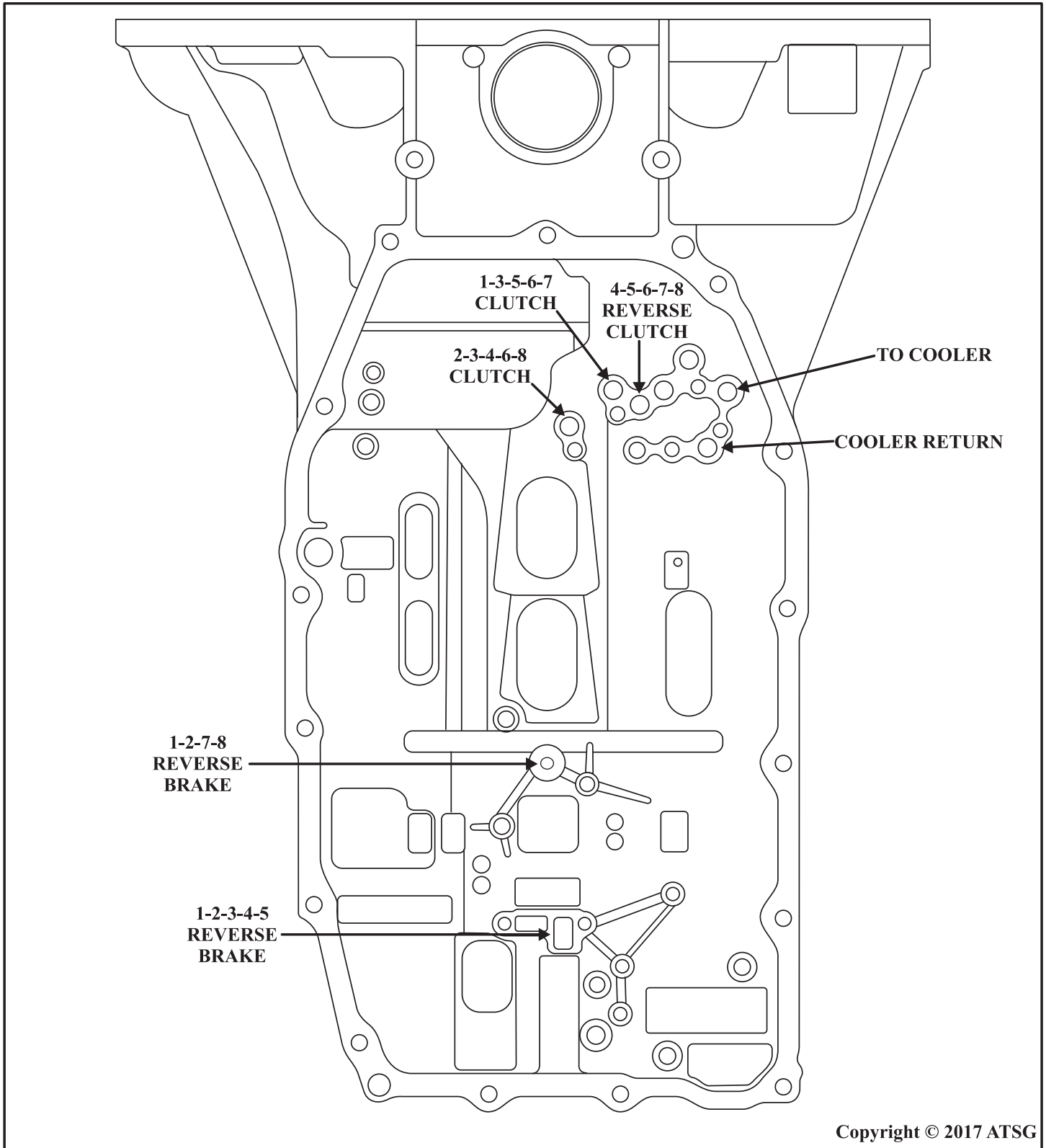


Figure 46



Figure 49

## GM 8L45 - 8L90 CASE PASSAGE IDENTIFICATION



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Figure 50  
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