CHRYSLER 45RFE
PRELIMINARY INFORMATION

Beginning at the start of production for the 1999 model year Chrysler Corporation has introduced a brand new rear wheel drive transmission for the 99 Jeep Grand Cherokee with the 4.7L engine, and scheduled for the Ram Pick-up for the 2000 model year. This is the first completely new rear wheel drive automatic transmission from Chrysler in more than thirty years. The 45RFE designation tells us that this new unit has **4** forward speeds, a relative torque rating of **5**, is for **R**ear drive vehicles and is **F**ully **E**lectronic controlled. Refer to Figure 1.

MECHANICAL OPERATION

The operation of the 45RFE is very similar to the Chrysler 41TE (A604) and 42LE (A606) transaxles that you are already familar with. The 45RFE has no internal bands, but uses several different clutch assemblies instead. The Input Clutch Housing retains the underdrive clutch, overdrive clutch and the reverse clutch and is set up almost identical to the 41TE transaxle, except much larger. The 45RFE also contains seperate holding clutches, such as the 2nd clutch, 4th clutch and the low/reverse clutch. This unit also uses one overrunning or freewheel device called the low overrun clutch.

To achieve its different gear ratios, the 45RFE applies different combinations of two clutch packs at a time, as shown in Figure 2. In Park and Neutral, only the low/reverse clutch is applied. Notice also that a unique characteristic of the 45RFE is its alternate 2nd gear ratio, or "2nd prime" as it is known. The 2nd prime is enabled only during kickdown shifts above certain speeds, that enhances vehicle performance by allowing for a higher gear ratio passing gear at highway speeds. Refer to the chart in Figure 2 for the clutches that are applied for each shift lever position.

Another feature of this unit is the three planetary gear sets, as shown in Figure 2, which is one more than you are used to seeing in a Chrysler unit. These planetary gear sets provide a deeper 1st and reverse ratio and does not need a seperate overdrive unit. All gear ratios are also shown in the chart in Figure 2.

ELECTRICAL OPERATION

The Transmission Control Module (TCM) controls ***all*** of the transmission functions and is located in the engine compartment, as shown in Figure 5. The Powertrain Control Module (PCM) ***does not*** control the transmission. The electronic components of the 45RFE transmission consist of various sensors and switches as input information to the TCM, that the TCM uses to determine the appropriate gear ratio and shift schedule points. There is also the associated wiring, fuses, relays, connectors, splices and grounds for the transmission to function as designed. A complete transmission wiring schematic has been provided for you in Figure 9.

The final output from the TCM is to the six shift solenoids and the line pressure control solenoid located in the Solenoid Pack/Transmission Range Sensor assembly and bolted on the valve body as shown in Figure 4. The solenoids in this transmission are unique in that some are normally vented and some are normally applied and is illustrated in Figure 4. The TCM also communicates with other control modules, such as the PCM, currently using the two wire CCD Bus for communication. The TCM recieves power from two sources, fused battery power to pin 56 and fused ignition switch input to pin 11, both at the 60-way connector on the TCM. The TCM also has a ground to complete its electrical circuit. (See Figure 8).

Continued on next Page.

INPUTS TO THE TCM

Input and Output Shaft Speed Sensors - are located on the left side of the transmission and are illustrated in Figure 11. The input shaft speed sensor reads input shaft speed off of a tone wheel. The TCM compares this reading with that of the output shaft speed sensor, which is also read off of a tone wheel. This comparison provides the TCM with gear ratio information. The crankshaft position sensor supplies the TCM with engine RPM data that is also critical to scheduling shift points.

Line Pressure Sensor - is located on the right rear of the transmission, as illustrated in Figure 11, and supplies the TCM with line pressure information. The line pressure sensor operates much like a throttle position sensor.

Transmission Fluid Temperature Sensor - is located in the Solenoid Pack/Transmission Range Sensor and is a thermister that the TCM uses to moniter transmission fluid temperature.

Overdrive Cancel Switch - located on the shift lever and cancels overdrive operation.

Solenoid Pack/Transmission Range Sensor - contains several different inputs to the TCM. The TRS contains five switches that tell the TCM, through different combinations of switch states, what position the manual gear selector has been placed. There is also a back-up lamp switch incorporated in the TRS.
In addition to the switches above, there are five pressure switches to moniter pressure in the Low/Rev, Second Clutch, Fourth Clutch, Underdrive Clutch and Overdrive Clutch hydraulic circuits. The primary function of these switches is to help the TCM detect when clutch circuit hydraulic failures occur. The TCM continuously monitors the switches for the correct states (Open or Closed) in each gear as shown in the chart in Figure 5.

OUTPUTS FROM THE TCM

Transmission Control Relay - located in the Power Distribution Center (PDC), as shown in Figure 10, and recieves a ground signal from terminal 15 at the TCM to close the relay. Refer to the wiring schematic in Figure 9.

Underdrive Solenoid with Pressure Switch - This solenoid is ***normally applied*** and controls oil to the UD clutch in all 1st, 2nd, 2nd Prime and 3rd gears of the transmission.

Overdrive Solenoid with Pressure Switch - This solenoid is ***normally vented*** and controls oil to the OD clutch in 3rd and 4th gears in the transmission.

Fourth Clutch Solenoid with Pressure Switch - This solenoid is ***normally vented*** and controls oil to the 4th clutch in all 4th and 2nd Prime gears in the transmission.

Second Clutch Solenoid with Pressure Switch - This solenoid is ***normally vented*** and controls oil to the 2nd clutch in all 2nd gears in the transmission.

Low/Reverse Solenoid with Pressure Switch - This solenoid is ***normally vented*** and is used to apply the L/R clutch in 1st from neutral, or coast down to 1st, and to control oil for converter clutch engagement.

Multi-Select Solenoid - The Multi-Select Solenoid is ***normally applied*** and controls the OD clutch in 3rd gear Limp-in, 2nd clutch in Manual 2, 2nd Limp-in and the Low/Reverse clutch in reverse.

Line Pressure Control Solenoid - This solenoid is ***Pulse Width Modulated*** and is used to control pressure to the boost valve, and thus control line pressure. Most of the time, line pressure is torque based (increases with torque), however, it is also set to a predetermined value just prior to a shift and then reverts back to torque based value after the shift. Zero percent duty cycle (No Voltage) provides maximum line pressure. A shift solenoid application chart has been provided for you in Figure 3.

Continued on next Page.

ADAPTIVE LEARNING

The 45RFE transmission uses an "Adaptive Learning" feature which allows the TCM to modify the clutch apply rate to maintain consistant shift quality. This is done based on the amount of wear on the friction elements. The TCM then adjusts the duty cycle of the shift solenoids to achieve the smoothest possible upshifts and downshifts. The TCM adjusts the "Clutch Volume Index" when a shift change takes place to optimize clutch to clutch timing. Clutch Volume Index is described in Figure 6, along with proper clutch volumes and clutch clearances for the 45RFE transmission.

LIMP-IN MODE OPERATION

The TCM has the ability to monitor all transmission related electrical components and if it detects a problem, takes appropriate action, and most of the time results in the TCM setting a Diagnostic Trouble Code (DTC). Whether this results in MIL illumination, or Limp-in Mode operation, depends on the type of DTC that was set. We have provided you with a OBD II DTC chart in Figures 18 and 19.

If the TCM determines that transmission damage may result from the DTC type that was set, the TCM will shut off the ground signal to the transmission control relay which will shut off all power to the transmission and the vehicle will be in Limp-in Mode Operation.

When in Limp-in Mode Operation, with the shift lever in the "Drive" position the transmission will be in 3rd gear, and if the shift lever is moved to "2" or "L" position the transmission will be in 2nd gear. This will allow the driver to manually shift the transmission to Limp home.

DIAGNOSIS AND SERVICE INFORMATION

You have been provided with the 23-way case connector pin cavity identification and pin function in Figure 7, and 60-way TCM connector pin cavity identification and pin function in Figure 8. A complete transmission wiring schematic is provided in Figure 9, and transmission control relay location in the power distribution center is shown in Figure 10.

Special tools that might be needed are illustrated in Figure 12, along with the identification of the pressure taps that are available on the main valve body. Air pressure test passage identification is provided for you in Figure 13.

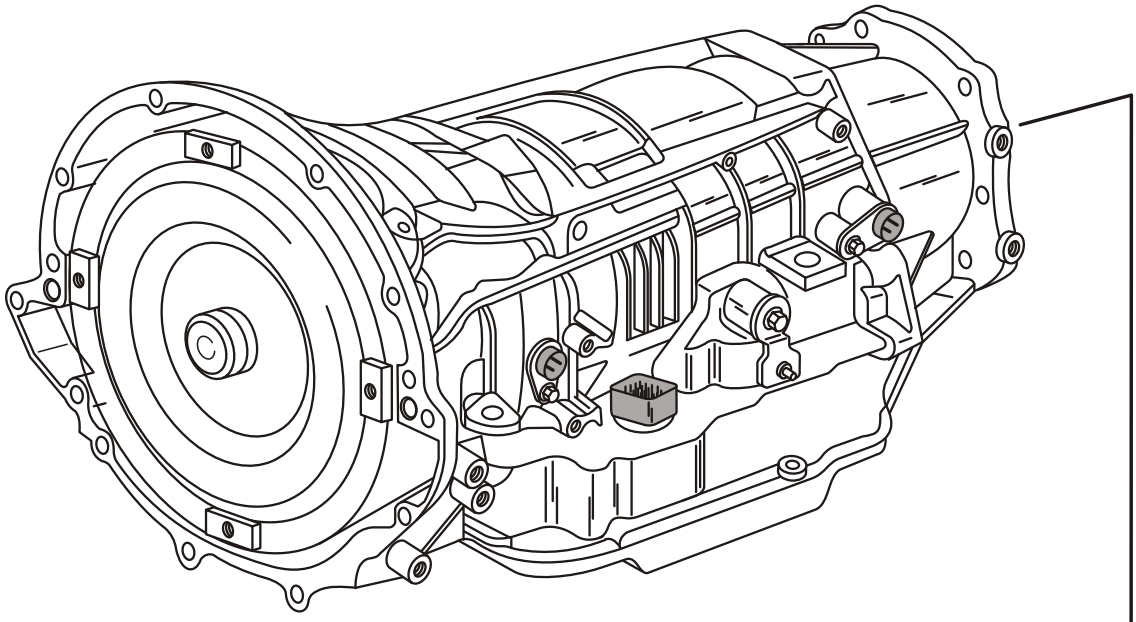
Accumulator piston and accumulator spring configurations, located in the valve body, are illustrated in Figure 14, along with the seven checkball locations. The valves that are located in the valve body and their locations are illustrated in Figure 15.

The valves that are located in the pump cover and their locations are illustrated in Figure 16, and the unique three gear, two stage oil pump is described in Figure 17.

The OBD II Diagnostic Trouble Code list is found in Figures 18 and 19.

JEEP GRAND CHEROKEE 45RFE TRANSMISSION

FOUND BEHIND 4.7L ENGINE FOR 1999



4 = *Four Forward Speeds*

5 = *Relative Torque Capacity*

R = *Rear Wheel Drive*

FE = *Fully Electronic*

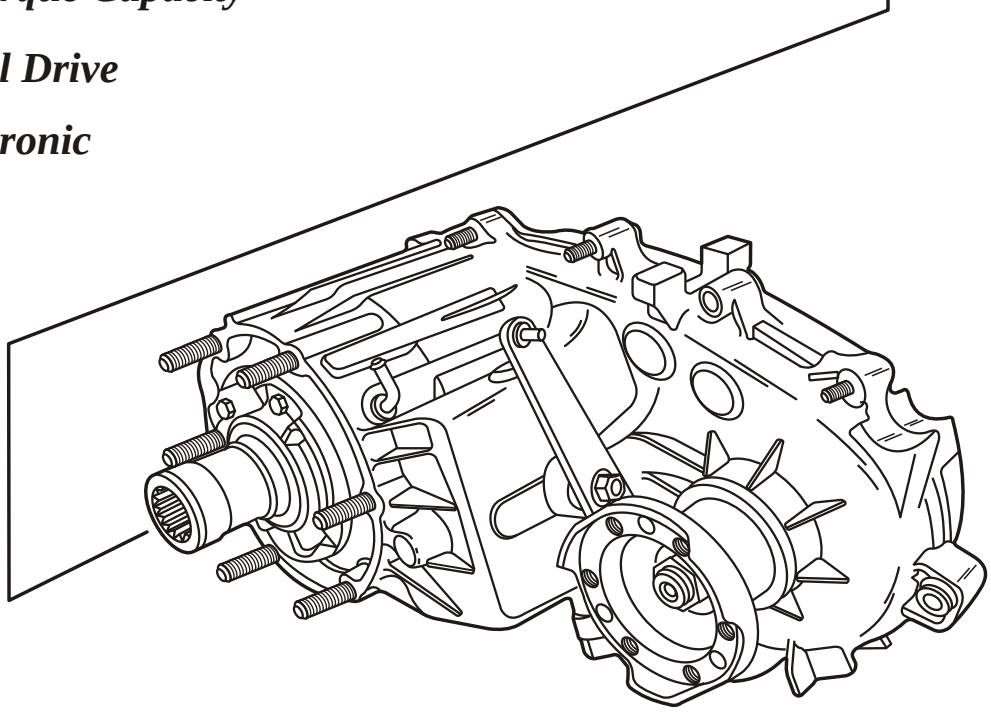


Figure 1

CLUTCH APPLICATION CHART

SELECTOR POSITION	LO/REV CLUTCH	UD CLUTCH	SECOND CLUTCH	OD CLUTCH	FOURTH CLUTCH	REVERSE CLUTCH	LOW OVERRUN CLUTCH	GEAR RATIO
PARK	ON							
REVERSE	ON					ON		3.00:1
NEUTRAL	ON							
OD-1ST	ON*	ON					HOLD	3.00:1
OD-2ND		ON	ON					1.67:1
2ND PRIME		ON			ON			1.50:1
OD-3RD		ON		ON				1.00:1
OD-4TH				ON	ON			0.75:1
OD-*LIMP*		ON		ON				1.00:1
(2)-1ST	ON*	ON					HOLD	3.00:1
(2)-2ND		ON	ON					1.67:1
(2)-LIMP		ON	ON					1.67:1
(1)-1ST	ON*	ON					HOLD	3.00:1

** L/R Clutch is on only with the output shaft speed below 150 RPM.*

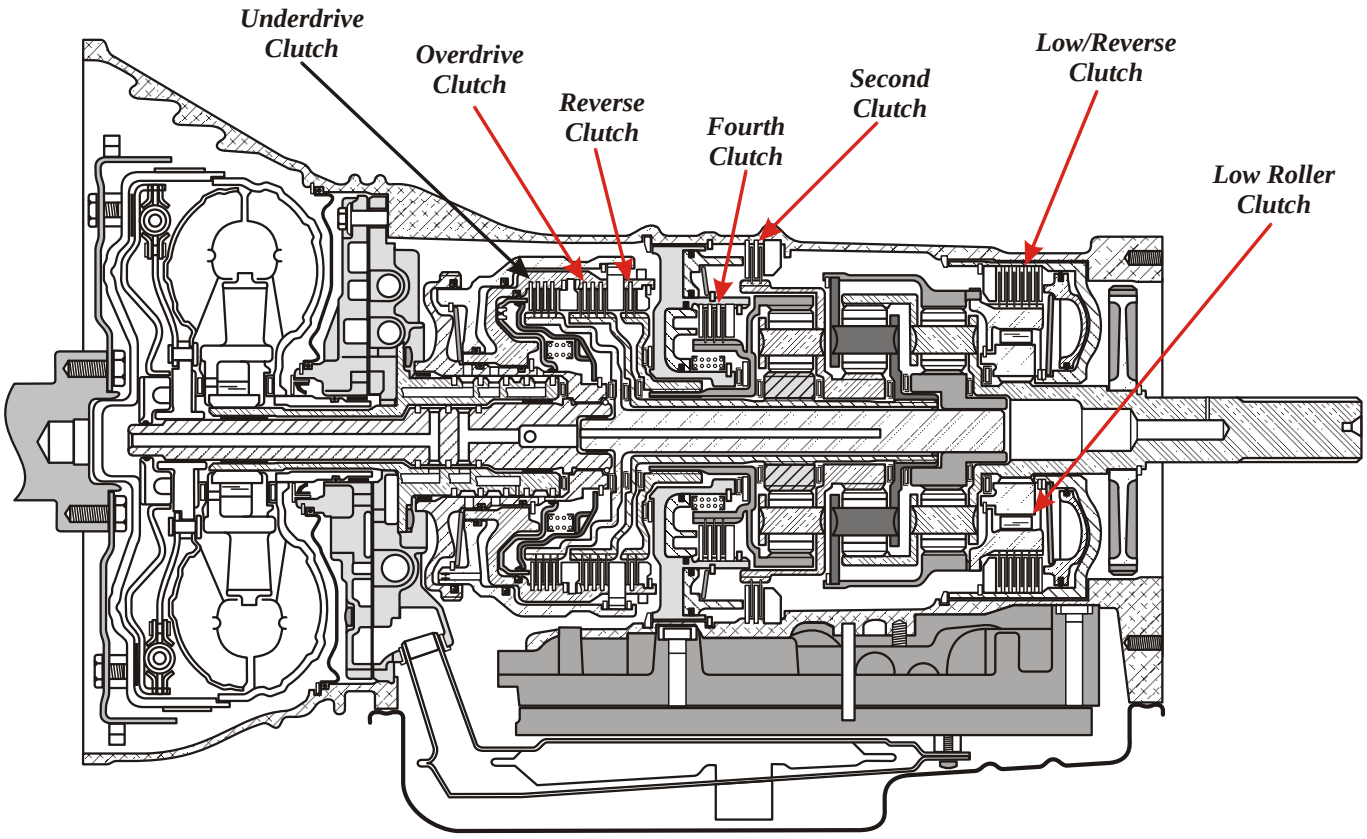


Figure 2

CLUTCH APPLICATION CHART

SELECTOR POSITION	LO/REV CLUTCH	UD CLUTCH	SECOND CLUTCH	OD CLUTCH	FOURTH CLUTCH	REVERSE CLUTCH	LOW OVERRUN CLUTCH	GEAR RATIO
PARK	ON							
REVERSE	ON					ON		3.00:1
NEUTRAL	ON							
OD-1ST	ON*	ON					HOLD	3.00:1
OD-2ND		ON	ON					1.67:1
2ND PRIME		ON			ON			1.50:1
OD-3RD		ON		ON				1.00:1
OD-4TH				ON	ON			0.75:1
OD-*LIMP*		ON		ON				1.00:1
(2)-1ST	ON*	ON					HOLD	3.00:1
(2)-2ND		ON	ON					1.67:1
(2)-LIMP		ON	ON					1.67:1
(1)-1ST	ON*	ON					HOLD	3.00:1

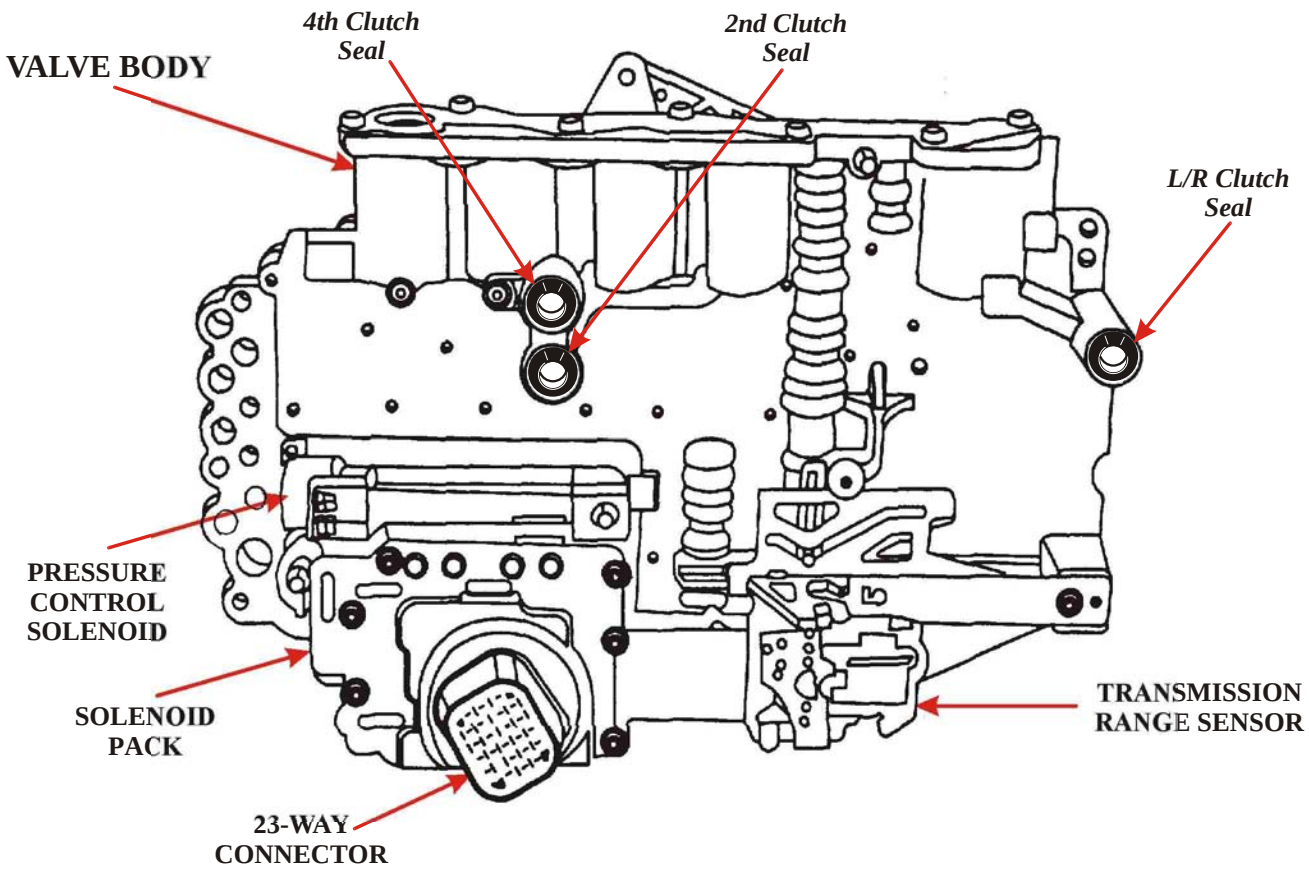
** L/R Clutch is on only with the output shaft speed below 150 RPM.*

SOLENOID CHART

	N.O.	N.C.	N.O.	N.O.	N.O.	N.C.	
SELECTOR POSITION	LR/CC SOLENOID	UD SOLENOID	OD SOLENOID	2nd CLUT SOLENOID	4th CLUT SOLENOID	Multi-Select SOLENOID	Variable Force SOLENOID
P/N Under 8	ON					OFF	Modulating
P/N Over 8						ON	Modulating
REVERSE							Modulating
REV-Block						ON	Modulating
OD-1ST	ON					ON	Modulating
OD-2ND	*			ON		ON	Modulating
2ND PRIME	*		ON		ON	ON	Modulating
OD-3RD	*		ON				Modulating
OD-4TH	*	ON	ON		ON		Modulating
(1)-1ST Or Autostick	ON					ON	Modulating
FAILSAFE	OFF	OFF	OFF	OFF	OFF	OFF	OFF

** Modulating (EMCC) if the Converter Clutch has been signaled.*

Figure 3



TWO DIFFERENT TYPES OF SHIFT SOLENOIDS

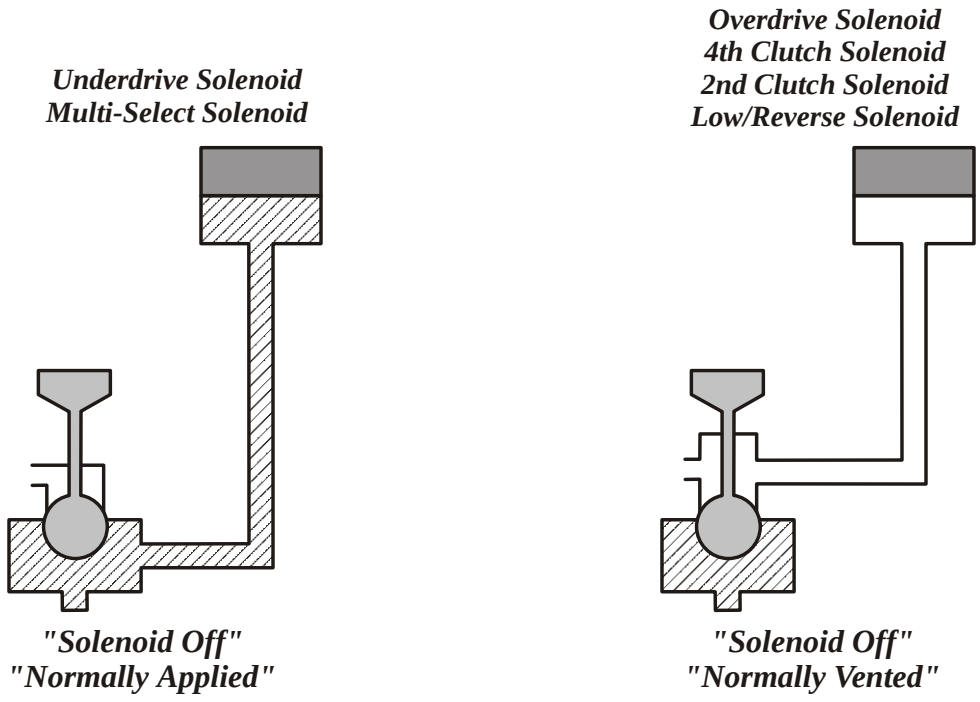


Figure 4

PRESSURE SWITCHES

The pressure switches are located inside the solenoid and pressure switch assembly and are only serviced by replacing the complete assembly.

The Transmission Control Module (TCM) is located as shown below and relies on five pressure switches to monitor pressure in the Low/Rev, 2nd Clutch, 4th Clutch, Underdrive, and Overdrive hydraulic circuits. The primary function of these switches is to help the TCM detect when the clutch circuit hydraulic failures occur. The switches close at 23 psi and open at 11 psi, and indicate whether or not pressure exists. The switches are continuously monitored by the TCM for the correct states (Open or Closed) in each gear as shown in the chart below.

SWITCH CHART

	Low/Rev	*2nd Clut*	*4th Clut*	*Underdrive*	*Overdrive*
Park/Neut	***Closed***	***Open***	***Open***	***Open***	***Open***
Reverse	***Open***	***Open***	***Open***	***Open***	***Open***
First	***Closed****	***Open***	***Open***	***Closed***	***Open***
Second	***Open***	***Closed***	***Open***	***Closed***	***Open***
2nd Prime	***Open***	***Open***	***Closed***	***Closed***	***Open***
Third	***Open***	***Open***	***Open***	***Closed***	***Closed***
Fourth	***Open***	***Open***	***Closed***	***Open***	***Closed***

**** L/R is closed if output speed is below 150 RPM in Drive and Manual 2. L/R is open in Manual 1.***

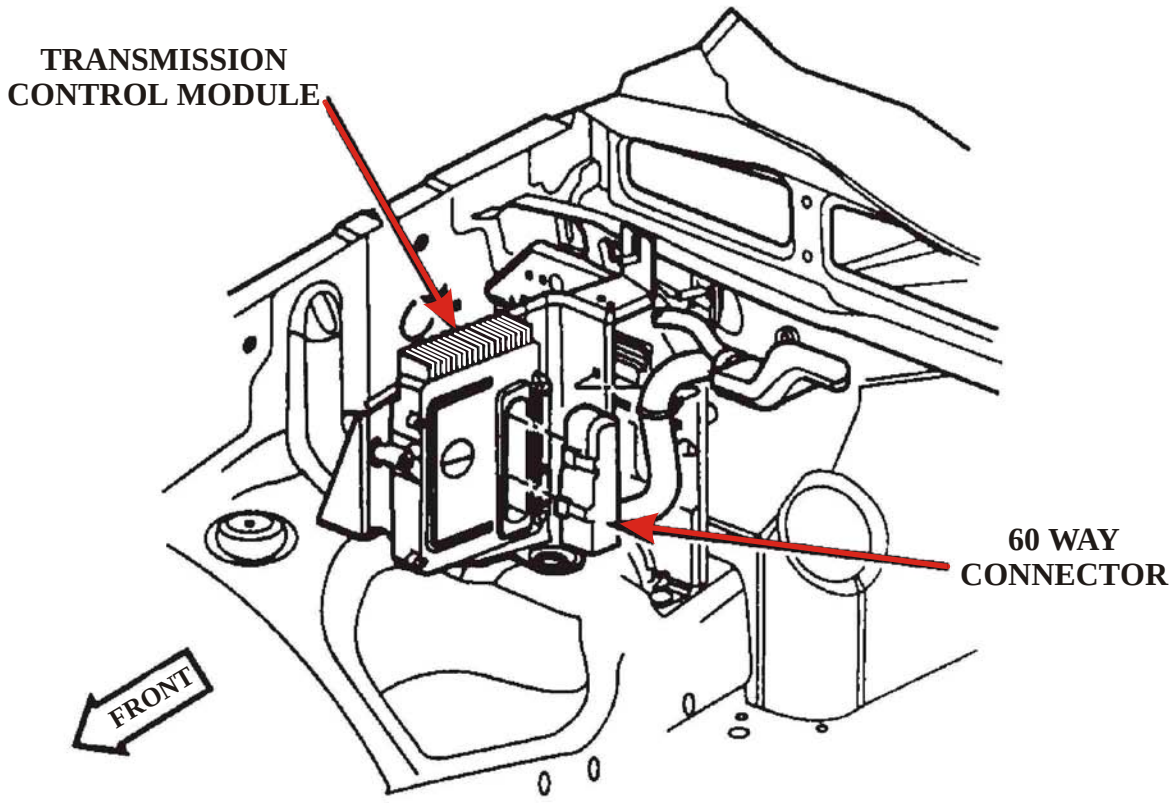


Figure 5

CLUTCH VOLUME INDEXES

An important function of the TCM is to monitor Clutch Volume Indexes (CVI). CVIs represent the volume of fluid needed to compress a clutch pack properly.

The TCM monitors gear ratio changes by monitoring the Input and Output Speed Sensors. The Input Speed Sensor sends an AC voltage signal to the TCM that represents input shaft rpm. The Output Speed Sensor provides the TCM with output shaft speed information.

By comparing these two inputs, the TCM can determine actual gear ratio. This is important to the CVI calculation because the TCM determines CVIs by monitoring how long it takes for a gear change to occur.

Gear ratios can be determined by using the DRB Scan Tool and reading the Input/Output Speed Sensor values in the "Monitors" display. Gear ratio can be obtained by dividing the Input Speed Sensor value by the Output Speed Sensor value.

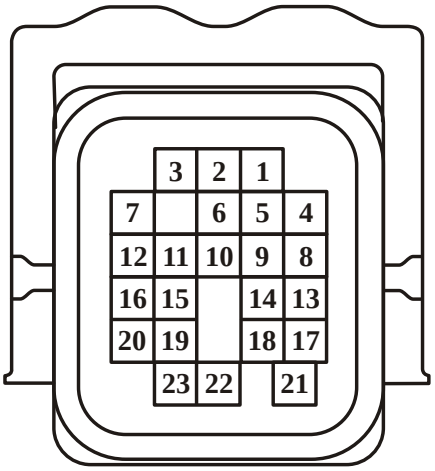
For example, if the input shaft is turning at 1000 rpm and the output shaft is turning at 500 rpm, the TCM can determine that the gear ratio is 2:1. In 3rd gear the gear ratio changes to 1:1. The gear ratio changes as clutches are applied and released. By monitoring the length of time it takes for a gear ratio to change following a shift request, the TCM can determine the volume of fluid used to apply or release a friction element.

The volume of transmission fluid needed to apply the friction elements are continuously updated for the adaptive controls. As friction material wears, the volume of fluid needed to apply the friction element increases. Certain mechanical problems within the transmission assembly such as broken return springs, out of position snap rings, excessive clutch pack clearance, or improper assembly can cause inadequate or out-of-range CVI readings. Also defective Input/Output Speed Sensors, wiring and poor connections may cause these same conditions. The following chart identifies the proper CVIs, when they are monitored and updated and the proper clutch pack clearances.

CLUTCH VOLUMES AND CLEARANCES			
CLUTCH	***WHEN UPDATED***	***PROPER VOLUME***	***CLUTCH CLEARANCE***
Low/Reverse	***2-1 or 3-1 Downshift***	***82 to 134***	***1.14-1.91mm (.045"-.075")***
2nd Clutch	***3-2 Kickdown shift***	***25 to 64***	***0.53-1.27mm (.021"-.050")***
Overdrive	***2-3 Upshift***	***30 to 64***	***1.01-1.65mm (.040"-.065")***
4th Clutch	***3-4 Upshift***	***30 to 64***	***0.81-1.35mm (.032"-.053")***
Underdrive	***4-3 Kickdown shift***	***44 to 92***	***0.76-1.60mm (.030"-.063")***
Reverse	***Not Monitored***	***Not Monitored***	***0.81-1.24mm (.032"-.049")***

Figure 6

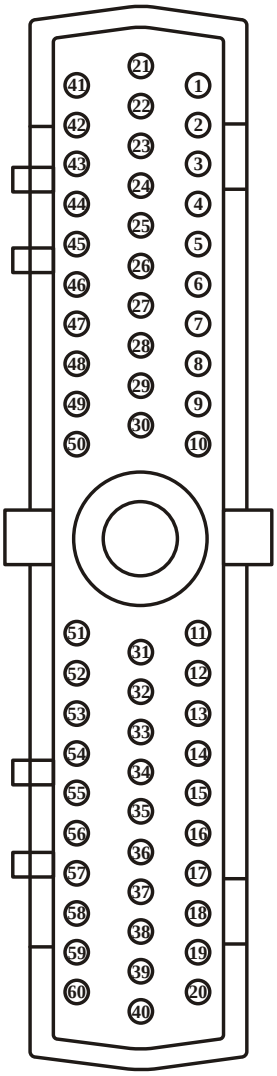
23-WAY CASE CONNECTOR PIN CAVITY IDENTIFICATION AND FUNCTION



PIN CAVITY	WIRE COLOR	FUNCTION
1	*White/Tan*	*Fused Ignition Switch Battery Voltage*
2	*Lt. Green*	*LR/TC Clutch Solenoid Control*
3	*Brown/Yellow*	*Park/Neutral Position Switch Signal*
4	*White*	*Transmission Range Sensor (T41) Signal*
5	*Violet/White*	*Transmission Range Sensor (T42) Signal*
6	*Violet/Black*	*Back-Up Lamp Feed*
7	*Brown*	*Overdrive Clutch Solenoid Control*
8	*Violet*	*Transmission Range Sensor (T3) Signal*
9	*Lt. Green/Black*	*Transmission Range Sensor (T1) Signal*
10	*Red*	*Transmission Control Relay Output*
11	*Dk. Blue*	*4th Clutch Pressure Switch Signal*
12	*Yellow/Dk. Blue*	*Line Pressure Control Solenoid Control*
13	*Tan/Black*	*Transmission Range Sensor (T2) Signal*
14	*Brown/Lt. Blue*	*Low/Reverse Clutch Pressure Switch Signal*
15	*Lt. Blue*	*2nd Clutch Pressure Switch Signal*
16	*Orange/Black*	*Overdrive Clutch Pressure Switch Signal*
17	*Pink*	*Underdrive Clutch Solenoid Control*
18	*Gray*	*Underdrive Clutch Pressure Switch Signal*
19	*Dk. Green/White*	*4th Clutch Solenoid Control*
20	*White/Dk. Blue*	*2nd Clutch Solenoid Control*
21	*Violet/Lt. Green*	*Multi-Select Solenoid Control*
22	*Dk. Blue/Black*	*Speed Sensor Ground*
23	*Violet*	*Transmission Oil Temperature Sensor Signal*

Figure 7

60-WAY CONNECTOR PIN CAVITY IDENTIFICATION AND FUNCTION



PIN CAVITY	WIRE COLOR	FUNCTION
1	Lt. Green/Black	Transmission Range Sensor T1 Signal
2	Tan/Black	Back-up Lamp Relay Control
3	Violet	Transmission Range Sensor T3 Signal
6	Gray/Black	Crankshaft Position Sensor Signal
7	Pink	SCI Transmit
8	Red	Fused Ignition Switch Output (Start)
9	Orange/Black	Overdrive Clutch Pressure Switch Signal
10	Yellow/Dk.Green	Torque Management Request
11	Orange/Dk. Blue	Fused Ignition Switch Output (Start-Run)
12	Brown	Overdrive Clutch Solenoid Control
13	Dk. Blue/Black	Speed Sensor Ground
14	Lt. Green/White	Output Speed Sensor Signal
15	Pink/Yellow	Transmission Control Relay Control
16	Red	Transmission Control Relay Output
17	Red	Transmission Control Relay Output
18	Yellow/Dk. Blue	Line Pressure Control Solenoid Control
19	White/Dk. Blue	2nd Clutch Solenoid Control
20	Lt. Green	L/R-TCC Clutch Solenoid Control
28	White/Orange	Vehide Speed Sensor Signal
29	Gray	Underdrive Clutch Pressure Switch Signal
30	Violet/Tan	Line Pressure Sensor Signal
36	Red	Transmission Control Relay Output
37	Black/Yellow	Ground
38	Gray/Lt. Blue	5 Volt Supply
39	Black/Yellow	Ground
40	Violet/Lt. Green	Multi-Select Solenoid Control
41	White	Transmission Range Sensor (T41) Signal
42	Violet/White	Transmission Range Sensor (T42) Signal
43	Yellow/Violet	PCI Bus
46	Lt. Green	SCI Recieve
47	Lt. Blue	2nd Clutch Pressure Switch Signal
48	Dk. Blue	4th Clutch Pressure Switch Signal
49	Violet/White	Overdrive Off Switch Signal
50	Brown/Lt. Blue	Low/Reverse Clutch Pressure Switch Signal
51	Black/Lt. Blue	Sensor Ground
52	Red/Black	Input Speed Sensor Signal
53	Black/Red	Ground
54	Violet	Transmission Oil Temperature Sensor Signal
55	Pink	Underdrive Clutch Solenoid Control
56	Red/White	Fused Battery Voltage
57	Black/Yellow	Ground
59	Dk. Green/White	4th Clutch Solenoid Control
60	Brown	Overdrive Clutch Solenoid Control

Figure 8

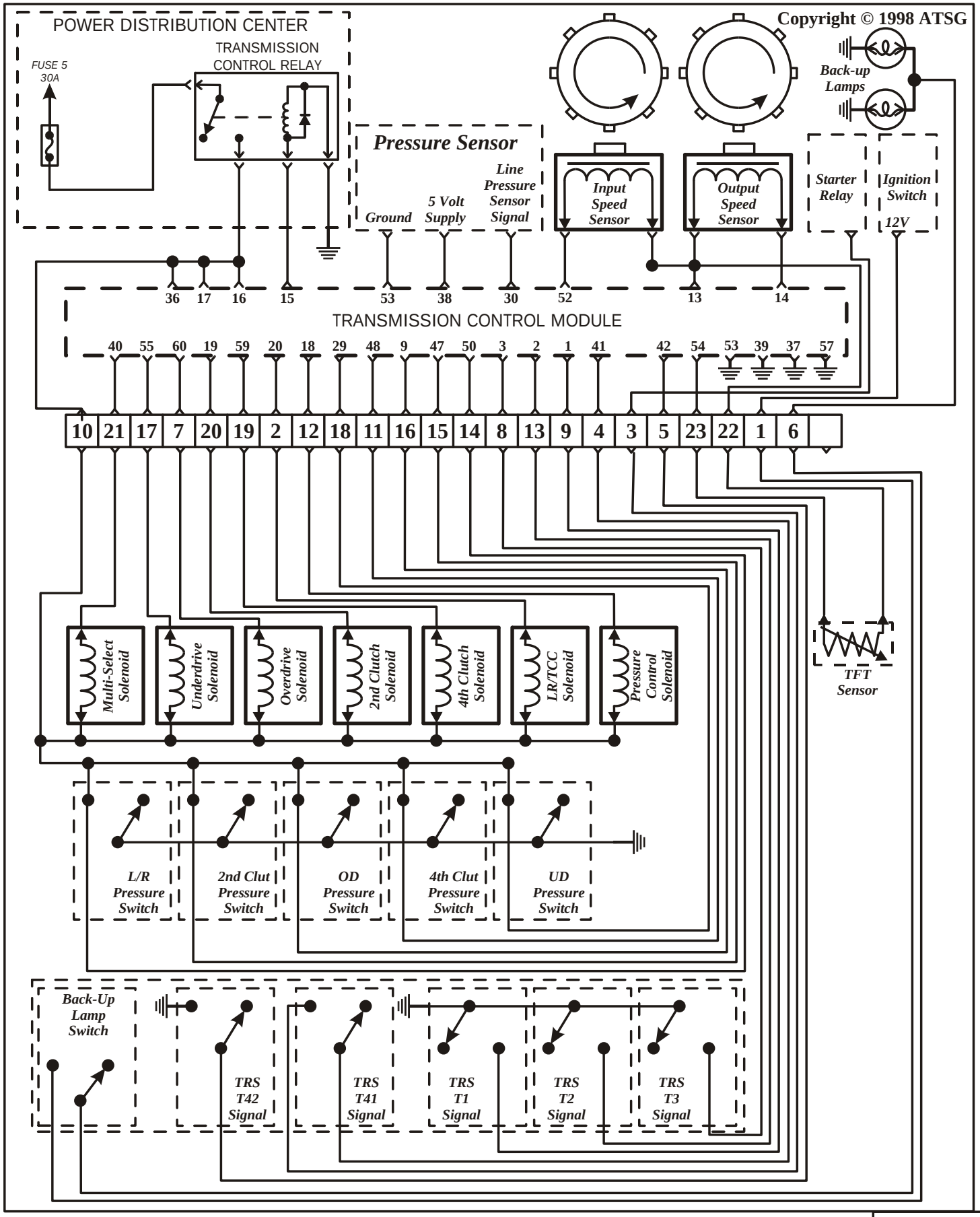

Copyright © 1998 ATSG
POWER DISTRIBUTION CENTER
TRANSMISSION CONTROL RELAY
FUSE 5 30A
Pressure Sensor
Ground
5 Volt Supply
Line Pressure Sensor Signal
Input Speed Sensor
Output Speed Sensor
Back-up Lamps
Starter Relay
Ignition Switch
12V
36 17 16 15 53 38 30 52 13 14
TRANSMISSION CONTROL MODULE
40 55 60 19 59 20 18 29 48 9 47 50 3 2 1 41 42 54 53 39 37 57
10 21 17 7 20 19 2 12 18 11 16 15 14 8 13 9 4 3 5 23 22 1 6
Multi-Select Solenoid
Underdrive Solenoid
Overdrive Solenoid
2nd Clutch Solenoid
4th Clutch Solenoid
LR/TCC Solenoid
Pressure Control Solenoid
TFT Sensor
L/R Pressure Switch
2nd Clut Pressure Switch
OD Pressure Switch
4th Clut Pressure Switch
UD Pressure Switch
Back-Up Lamp Switch
TRS T42 Signal
TRS T41 Signal
TRS T1 Signal
TRS T2 Signal
TRS T3 Signal

Figure 9

TRANSMISSION CONTROL RELAY AND FUSE LOCATIONS

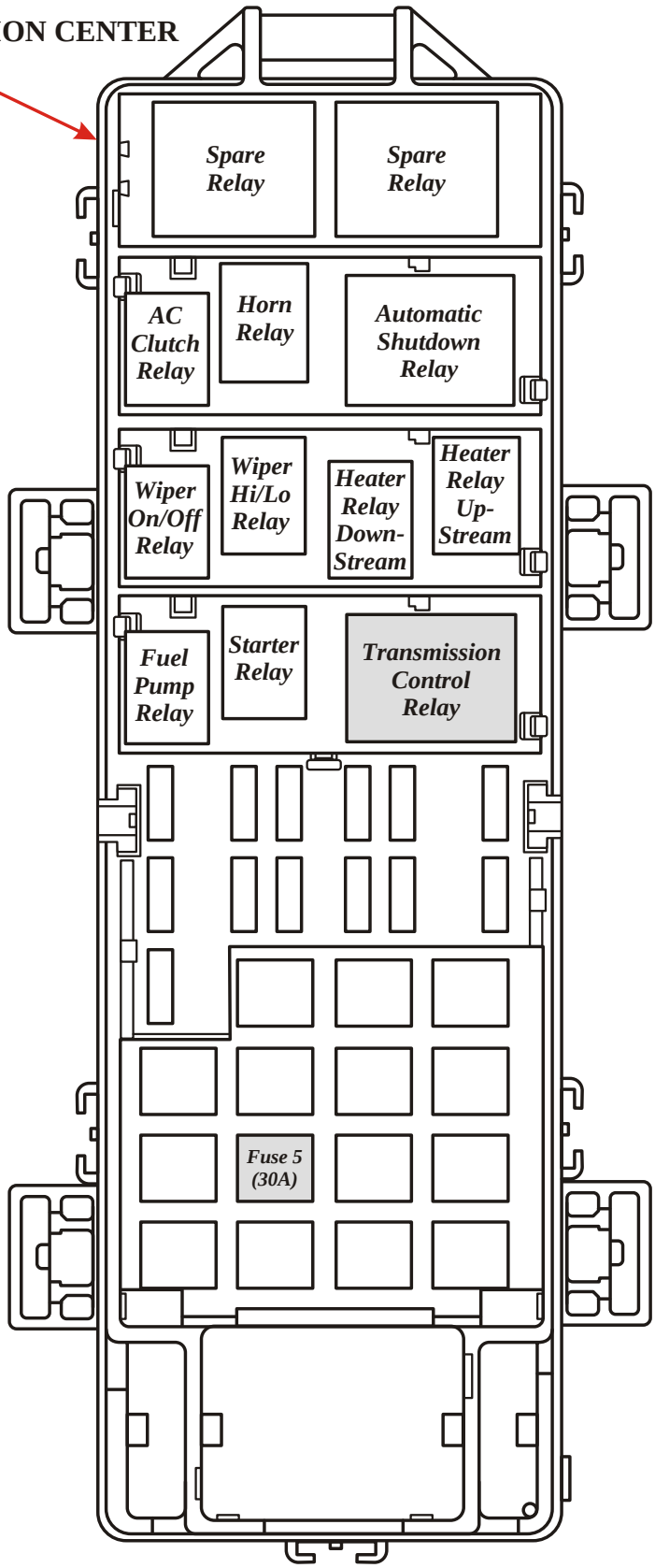
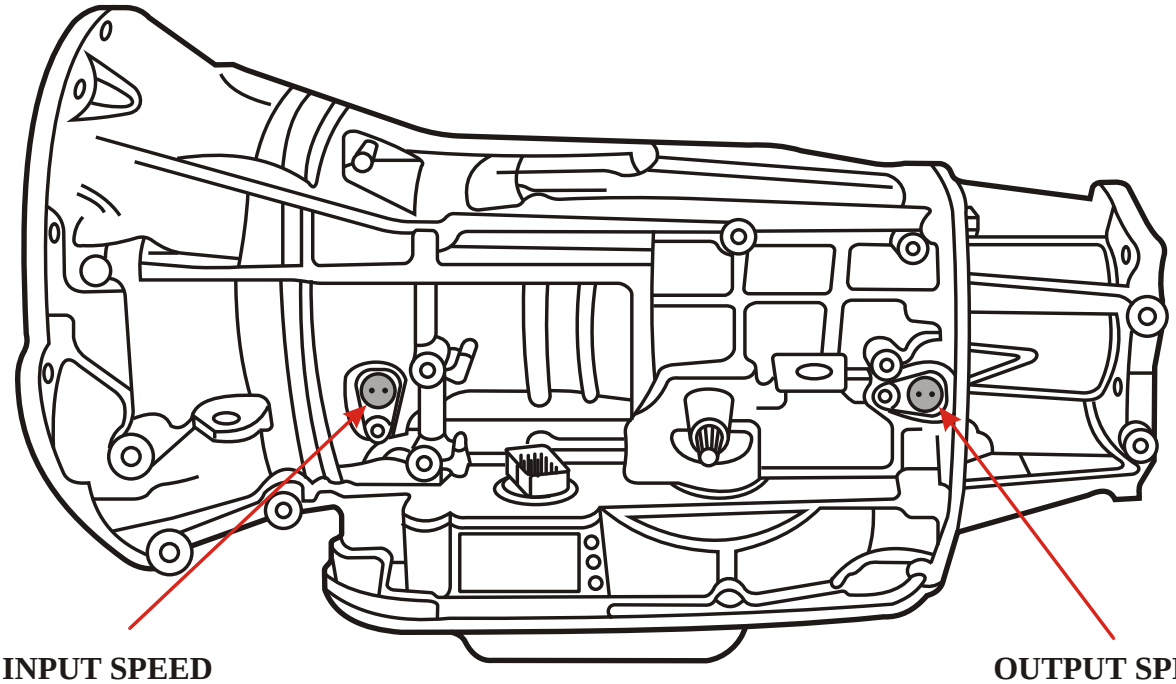


Figure 10



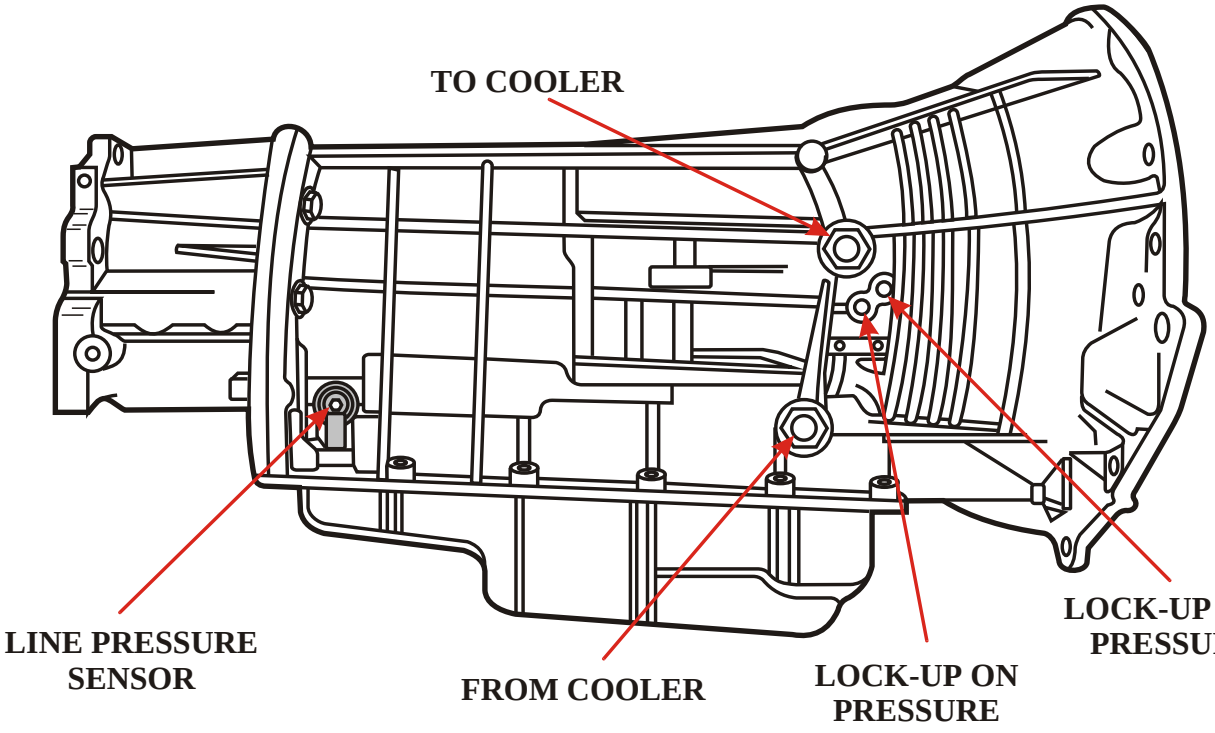
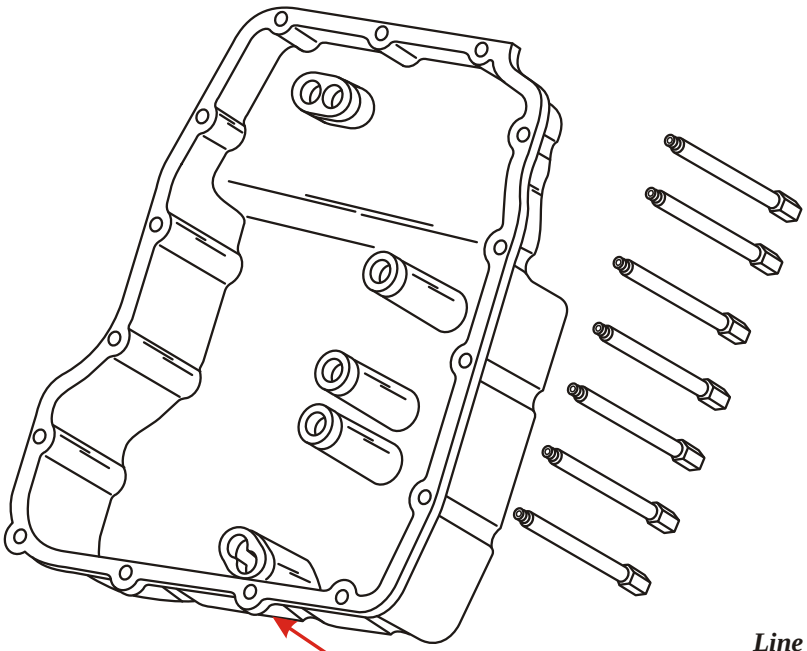
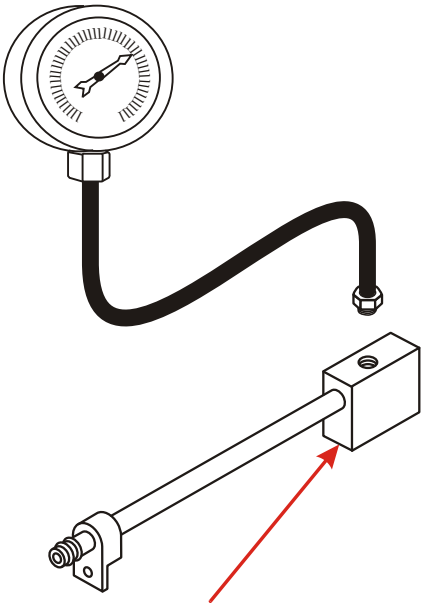


Figure 11

MANDATORY TOOLS NEEDED FOR CHECKING PRESSURES ON 45RFE



Pressure Tap Adapter Tool No. 8258, to check oil pressures through the valve body taps.



Line Pressure Adapter Tool No. 8259, to install into the line pressure sensor circuit, and then reinstall the sensor and pressure gage.

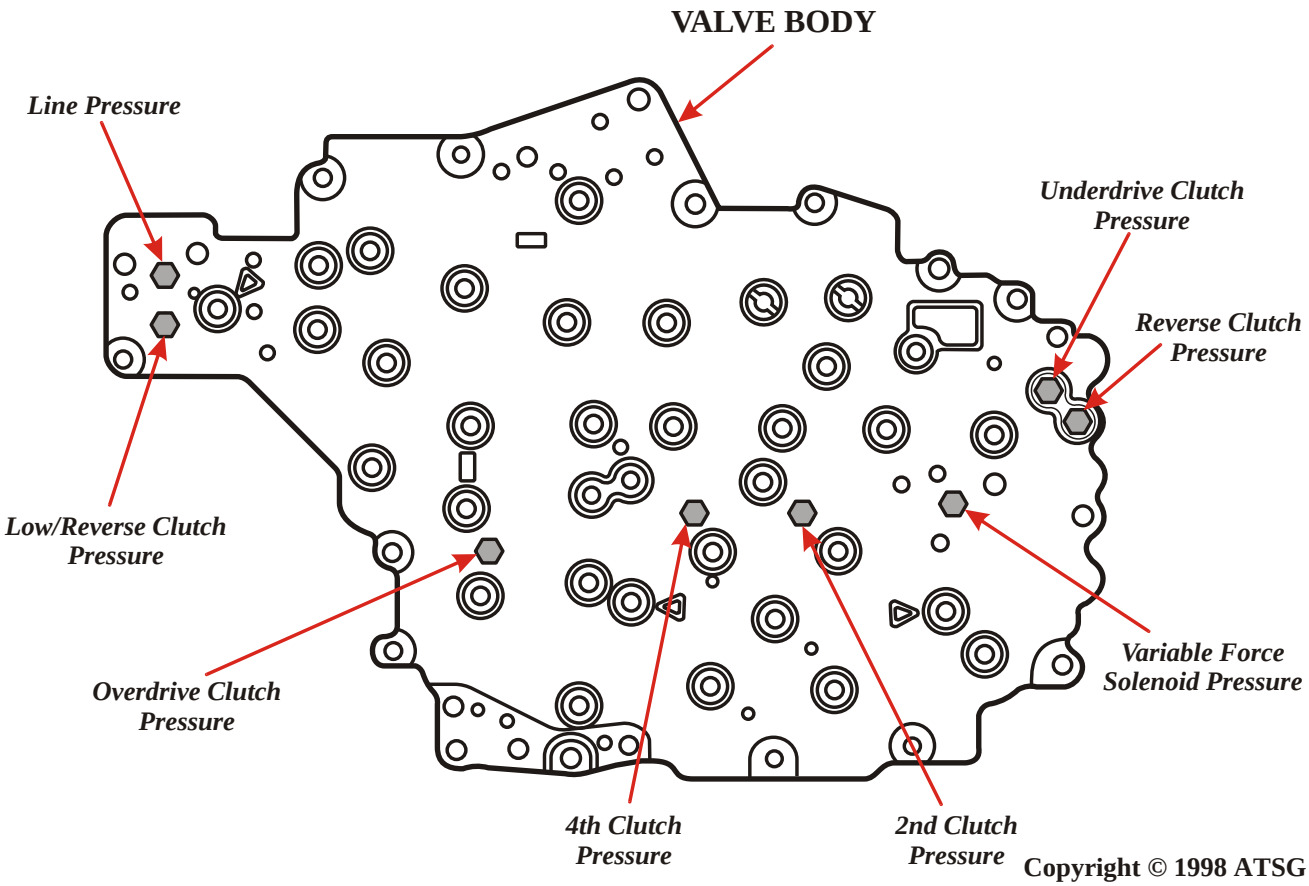


Figure 12

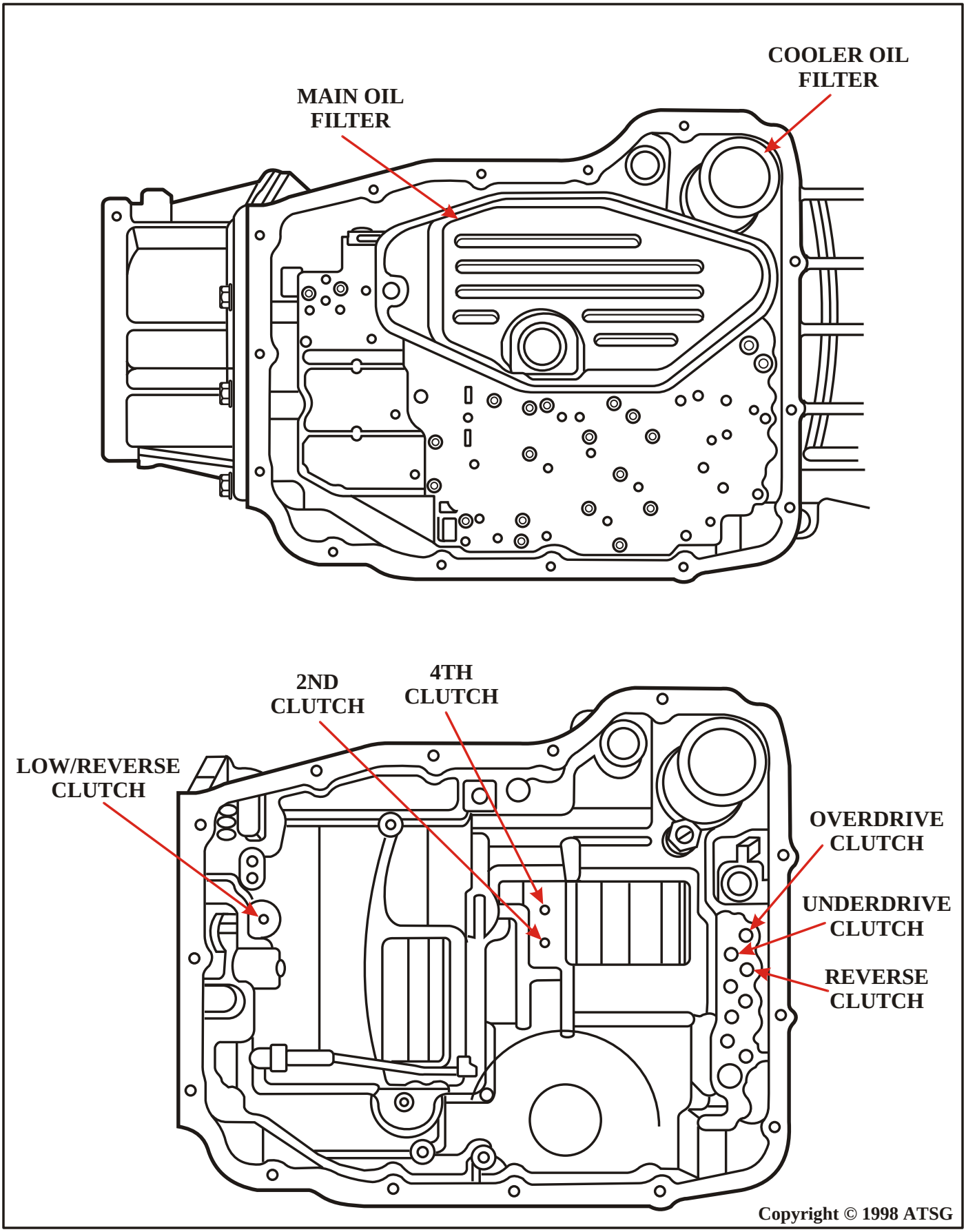


Figure 13

45RFE ACCUMULATOR LOCATIONS

SEVEN CHECKBALL LOCATIONS ARE SHOWN BELOW

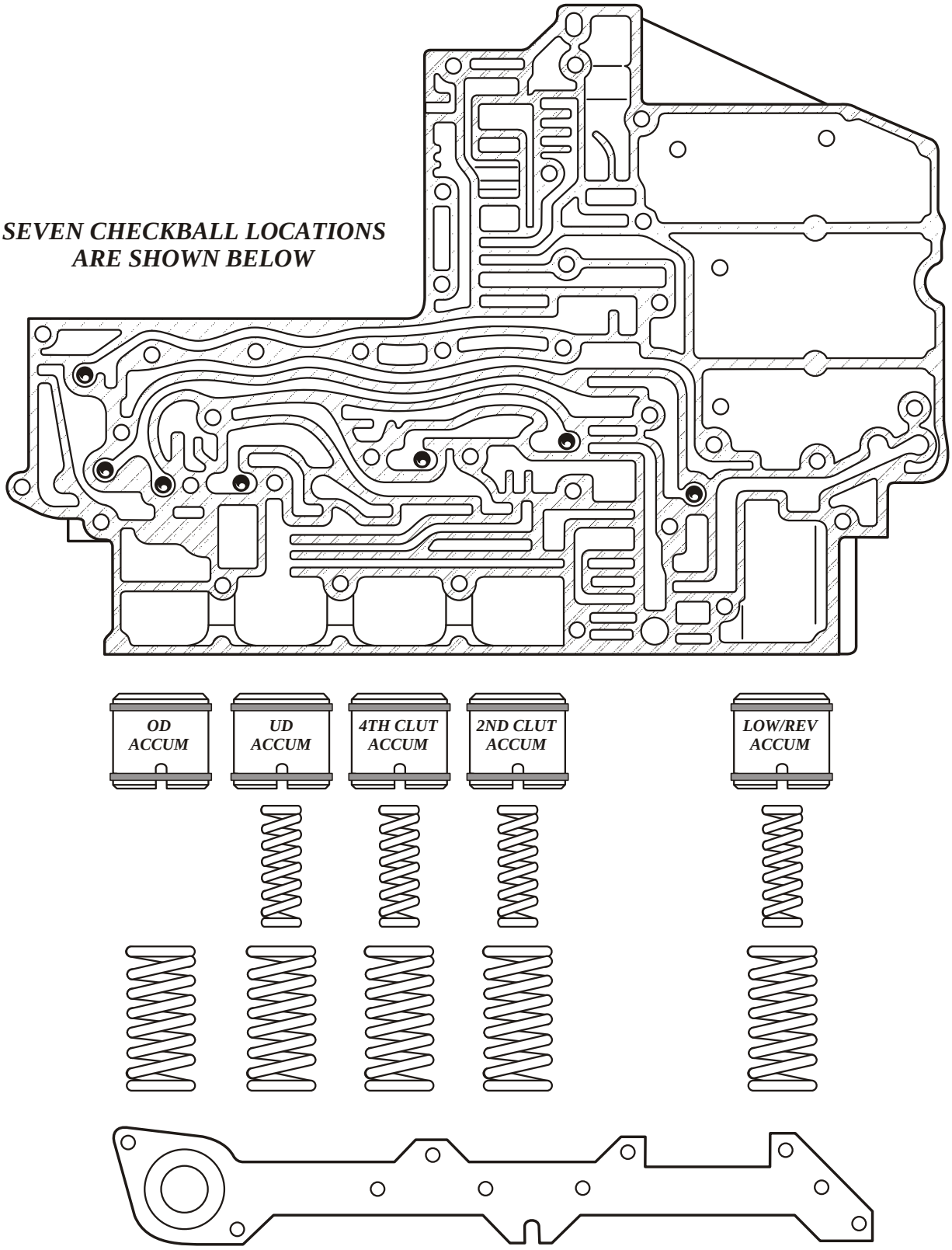


Figure 14

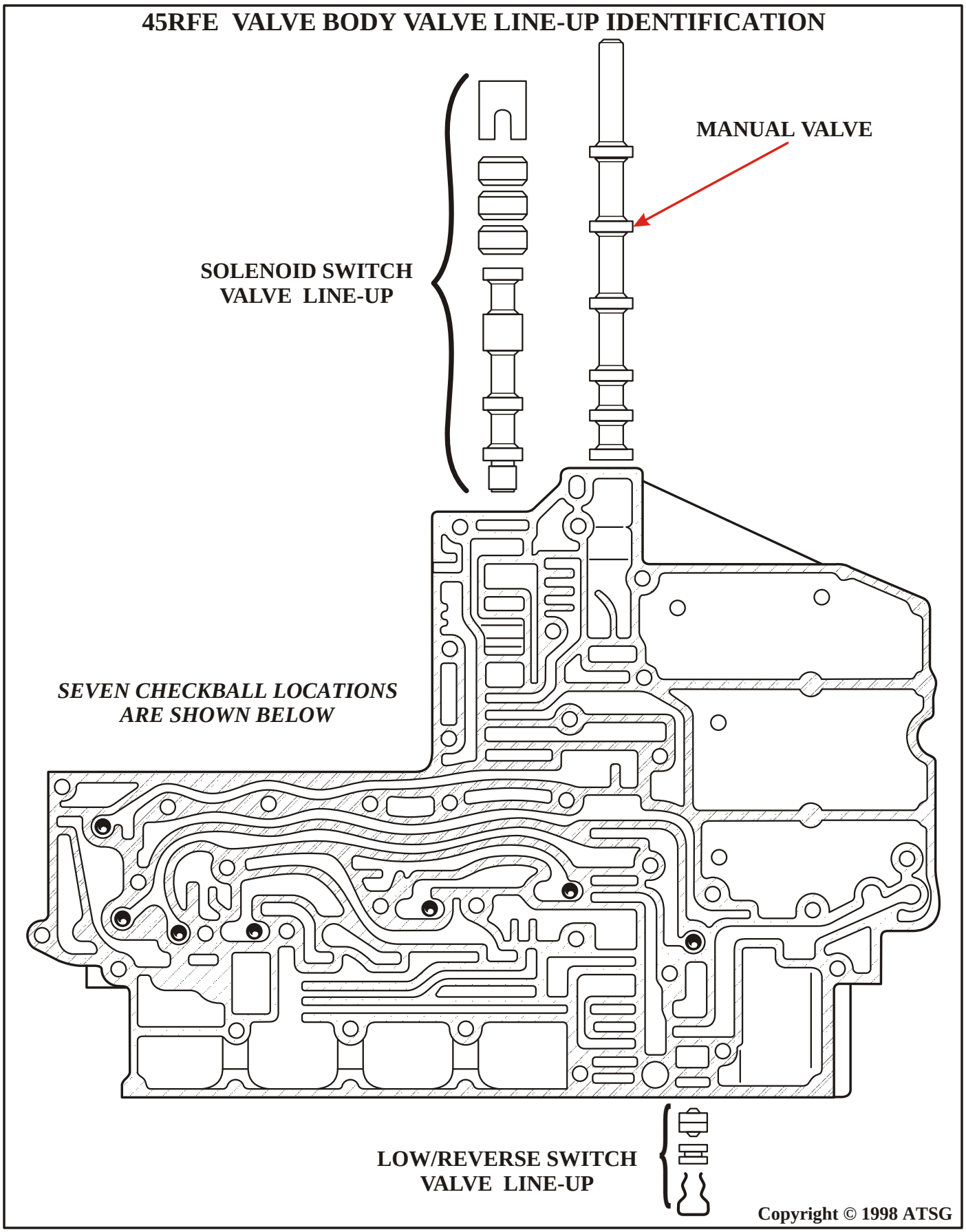

45RFE VALVE BODY VALVE LINE-UP IDENTIFICATION
MANUAL VALVE
SOLENOID SWITCH VALVE LINE-UP
SEVEN CHECKBALL LOCATIONS ARE SHOWN BELOW
LOW/REVERSE SWITCH VALVE LINE-UP
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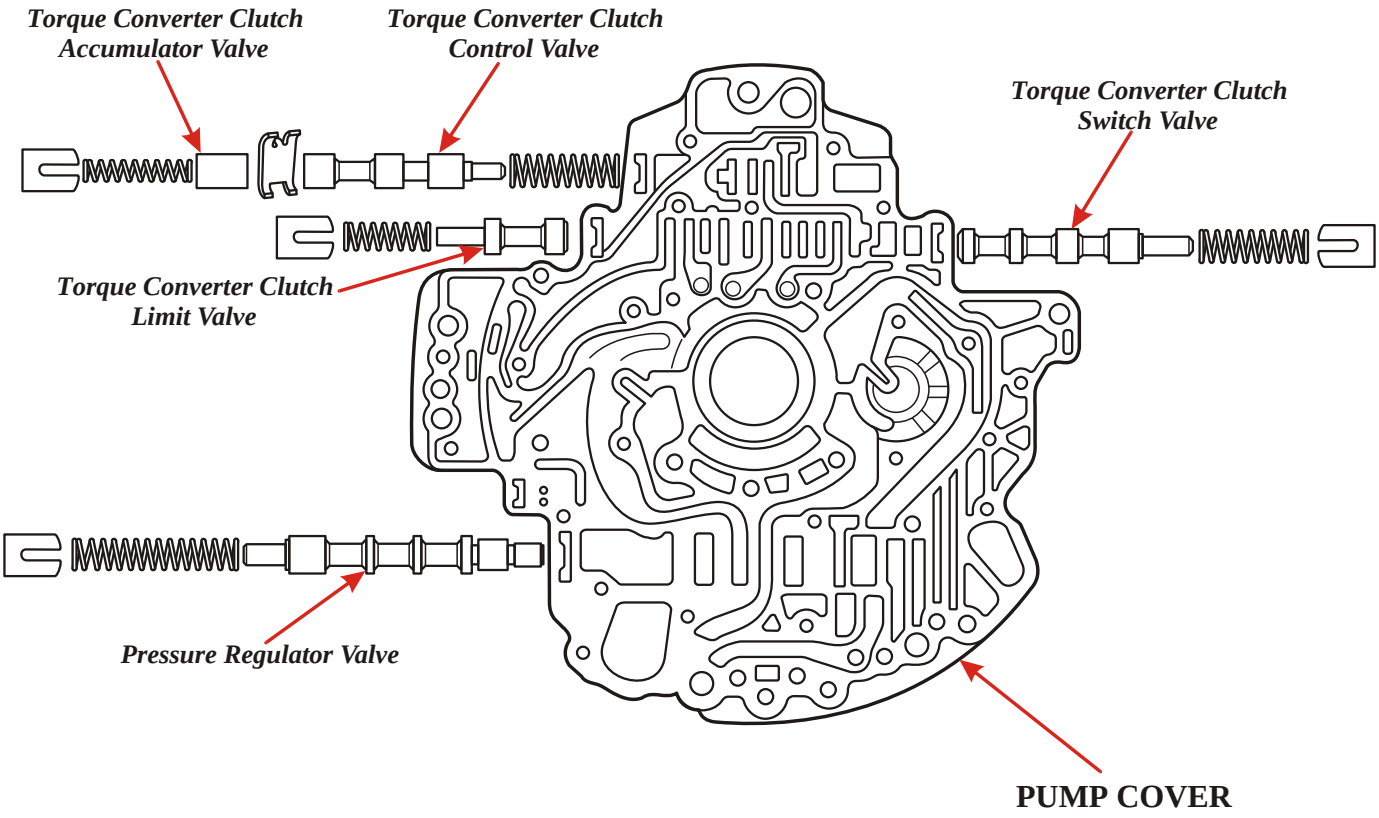
Figure 15

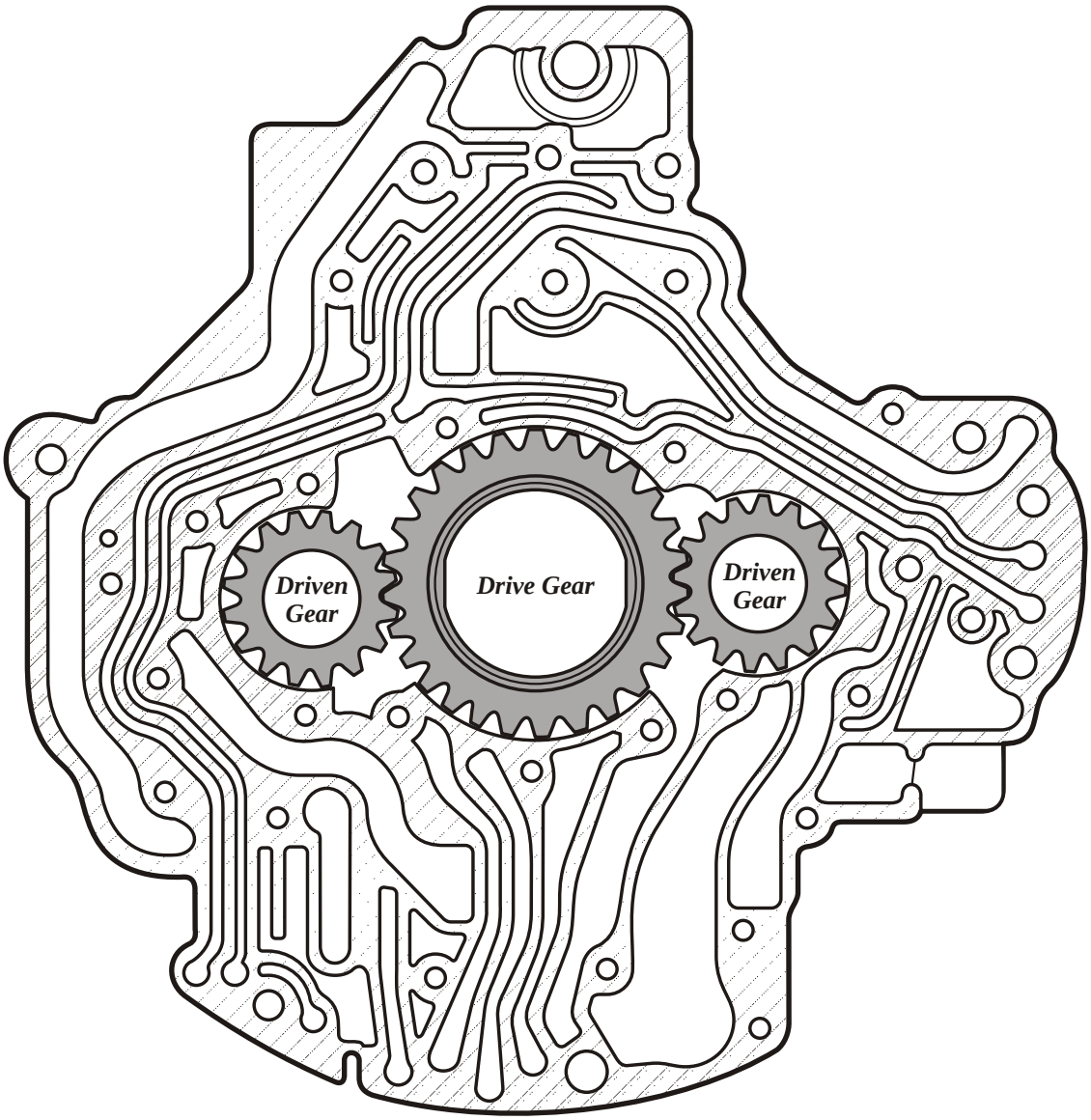
VALVE LINE-UP IDENTIFICATION AND LOCATIONS IN PUMP COVER



The Pump Cover Assembly now contains the valve line-ups that are shown above, which were previously found in the valve body. Placing these control valves closer to the pressure source improves line pressure control and also eliminates some of the hydraulic circuits to and from the valve body.

Figure 16

45RFE OIL PUMP BODY AND GEARS



A dual stage oil pump is also new for the 45RFE. The pump has three gears, one drive gear and two driven gears as shown above. Both stages of the pump supply fluid during idle and at low engine speeds. Under these conditions there is not enough pressure from the primary stage to close the shuttle valve. As engine speed increases, so does the output from the primary stage. Once the pressure from the primary stage builds up, the shuttle valve is forced closed and in this condition the secondary stage has no effect and the primary side supplies all of the pressure needed for proper transmission operation.

Figure 17

45RFE OBDII DIAGNOSTIC TROUBLE CODE LIST

OBDII Codes	Description	Limp-in	MIL Illumination
P0120	Throttle Position Signal Out Of Range	NO	NO
P0600	Bus Communication	NO	NO
P0705	Check Shifter Signal	NO	NO
P0715	Input Speed Sensor Error	YES	YES
P0720	Output Speed Sensor Error	YES	YES
P0725	Engine Speed Sensor Circuit Error	YES	YES
P0731	Gear Ratio Error In 1st Gear	YES	YES
P0732	Gear Ratio Error In 2nd Gear	YES	YES
P0733	Gear Ratio Error In 3rd Gear	YES	YES
P0734	Gear Ratio Error In 4th Gear	YES	YES
P0736	Gear Ratio Error In Reverse	YES	YES
P0740	Torque Converter Clutch Control Circuit	NO	YES
P0750	Underdrive Solenoid Circuit Error	YES	YES
P0755	Overdrive Solenoid Circuit Error	YES	YES
P0760	4th Clutch Solenoid Circuit Error	YES	YES
P0765	Low/Reverse Solenoid Circuit Error	YES	YES
P0770	2nd Clutch Solenoid Circuit Error	YES	YES
P1720	Line Pressure Out Of Range	NO	NO
P1721	Line Pressure Sensor Voltage Out Of Range	NO	NO
P1722	Line Pressure Low	NO	NO
P1724	Line Pressure High	NO	NO
P1726	Overdrive Switch Did Not Close	YES	YES
P1727	Underdrive Switch Did Not Close	YES	YES
P1728	2nd Clutch Switch Did Not Close	YES	YES
P1729	Low/Reverse Switch Did Not Close	YES	YES
P1732	Overdrive Switch Circuit Error	YES	YES
P1733	Underdrive Switch Circuit Error	YES	YES
P1734	2nd Clutch Switch Circuit Error	YES	YES
P1736	Multi-Select Solenoid Circuit Error	YES	YES
P1737	Multi-Select Solenoid Circuit Error	YES	YES
P1738	High Temperature Operation Activated (Info Only)	NO	NO
P1739	Power-Up At Speed		
P1765	Switched Battery	YES	YES
P1767	Transmission Control Relay Always ON	YES	YES

Figure 18

45RFE OBDII DIAGNOSTIC TROUBLE CODE LIST

OBDII Codes	Description	Limp-in	MIL Illumination
P1768	Transmission Control Relay Always OFF	YES	YES
P1775	Solenoid Switch Valve Stuck In TCC Position	NO	YES
P1776	Solenoid Switch Valve Stuck In L/R Position	YES	YES
P1781	4th Clutch Switch Circuit Error	YES	YES
P1784	Low/Reverse Clutch Switch Circuit Error	YES	YES
P1787	4th Clutch Switch Did Not Close	YES	YES
P1790	Fault Immediately After Shift	YES	YES
P1792	Battery Was Disconnected	NO	NO
P1793	Torque Management Request (TRD) Sense Circuit	NO	NO
P1794	Speed Sensor Ground Error	YES	YES
P1799	Calculated Oil Temperature In Use	NO	NO

Figure 19