



Technical Service Information

FORD 6R140W PRELIMINARY INFORMATION

At the start of production for the 2011 model year Ford Motor Company introduced a newly designed full time six speed 6R140W transmission also known as the Torqshift® 6, (Figure 1), for the F250 to F550 Super Duty truck models equipped with the 6.2L Gas Flex Fuel engine or the 6.7 Turbo Diesel engine. It is available in both 2WD and 4WD configurations and can be Power Take-Off capable.

The 6R140W assembled weight is 350 Lbs. and is of the Lepelletier geartrain design consisting of a ***Simpson planetary gearset, a Ravigneaux gear set, two holding clutches, three drive clutches, a one-way clutch and a torque converter clutch***. TCC can be commanded on from first to sixth gear. The 6R140W is electronically controlled by ***seven pwm solenoids*** and uses a Transmission Control Module (TCM) in diesel powered applications or a Powertrain Control Module (PCM) for gasoline powered applications.

When the TCM/PCM detects a fault, Failure Mode Effect Management (FMEM) will be initiated and the transmission will enter fifth and reverse gear limp mode.

The transmission system is also capable of Tow Haul Mode which will provide all six speeds at higher shift points and also has manual shift capability.

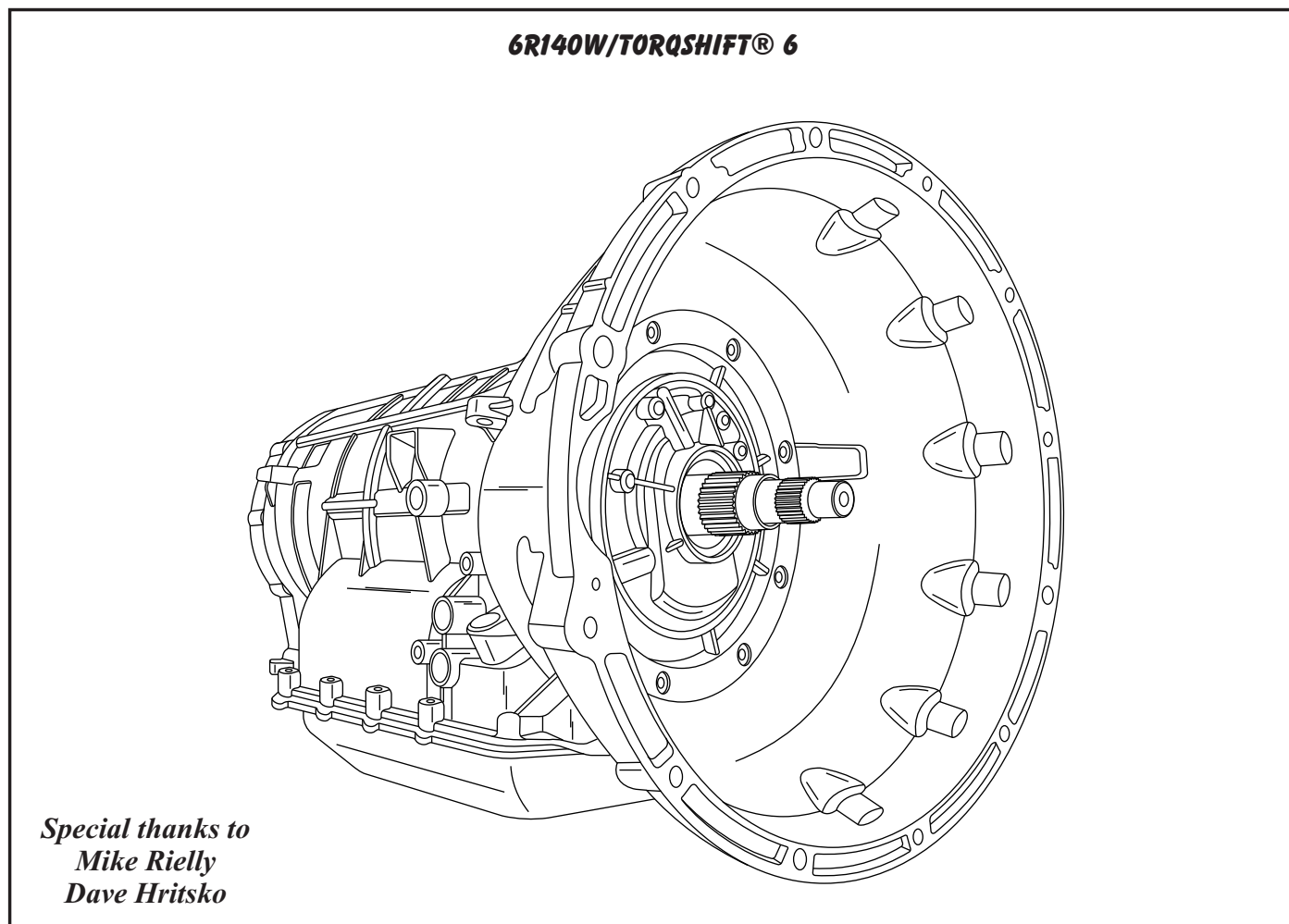
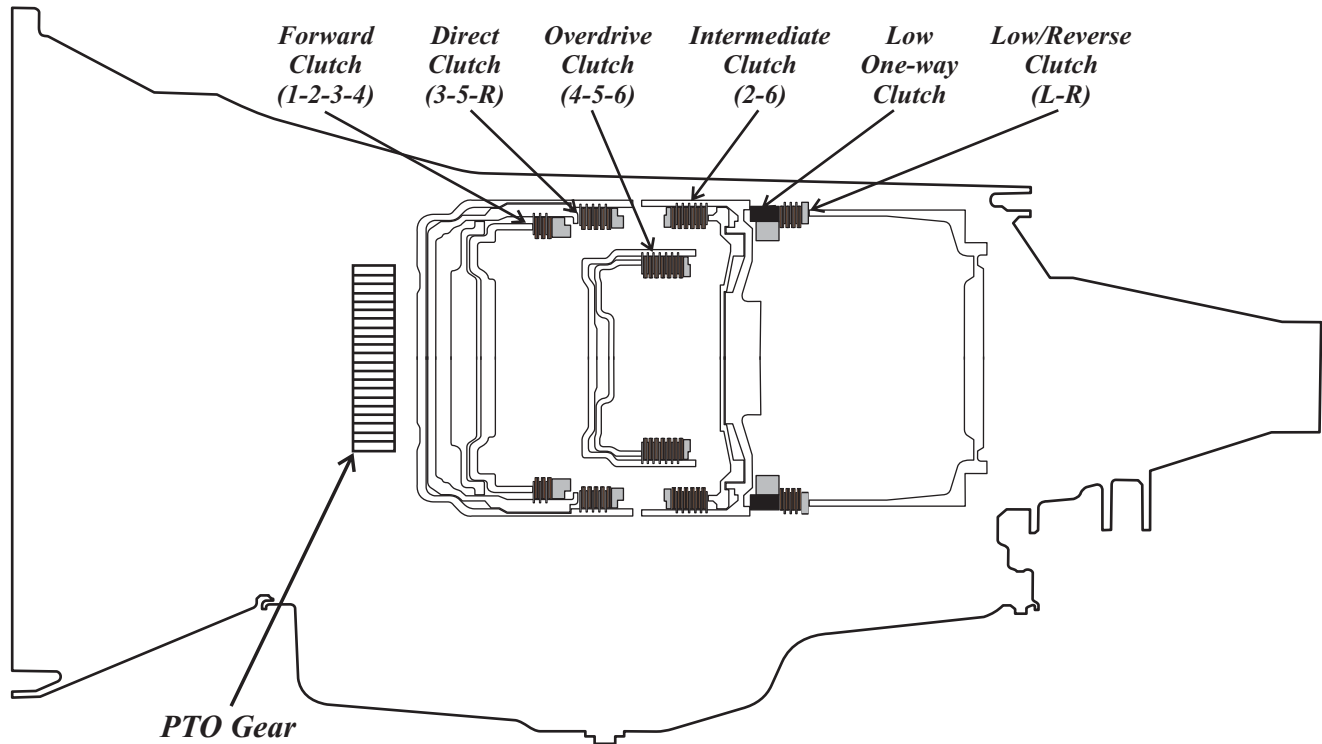


Figure 1

6R140W INTERNAL COMPONENT IDENTIFICATION AND LOCATION



COMPONENT APPLICATION CHART

RANGE	1-2-3-4 Clutch (Fwd)	3-5-Rev Clutch (Direct)	2-6 Clutch (Int)	Low/ Reverse Clutch	4-5-6 Clutch (OD)	Low One-Way Clutch	Torque Converter Clutch		Gear Ratio
Park				On					
Reverse		On		On					3.13
Neutral				On					
"D"-1st	On			^On		Hold	Applied*		3.97
"D"-2nd	On		On				Applied*		2.32
"D"-3rd	On	On					Applied*		1.52
"D"-4th	On				On		Applied*		1.15
"D"-5th		On			On		Applied*		0.86
"D"-6th			On		On		Applied*		0.67

* TCC is available in 1st thru 6th gear, based on throttle position, fluid temp and vehicle speed.

^ Low/Reverse Clutch is holding until vehicle speed reaches 5 mph.

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Figure 2

6R140W SHIFT QUADRANT

P When the Park position is selected, there is no powerflow through the transaxle. The parking pawl is engaged which locks the output shaft to the case. The engine can be started and the ignition key can be removed.

R When the Reverse position is selected, the vehicle can be operated in a rearward direction at a reduced gear ratio.

N When the Neutral position is selected, there is no powerflow through the transmission. The output shaft is free to rotate and the engine can be started.

D Six forward gears are available dependant on sensor input.

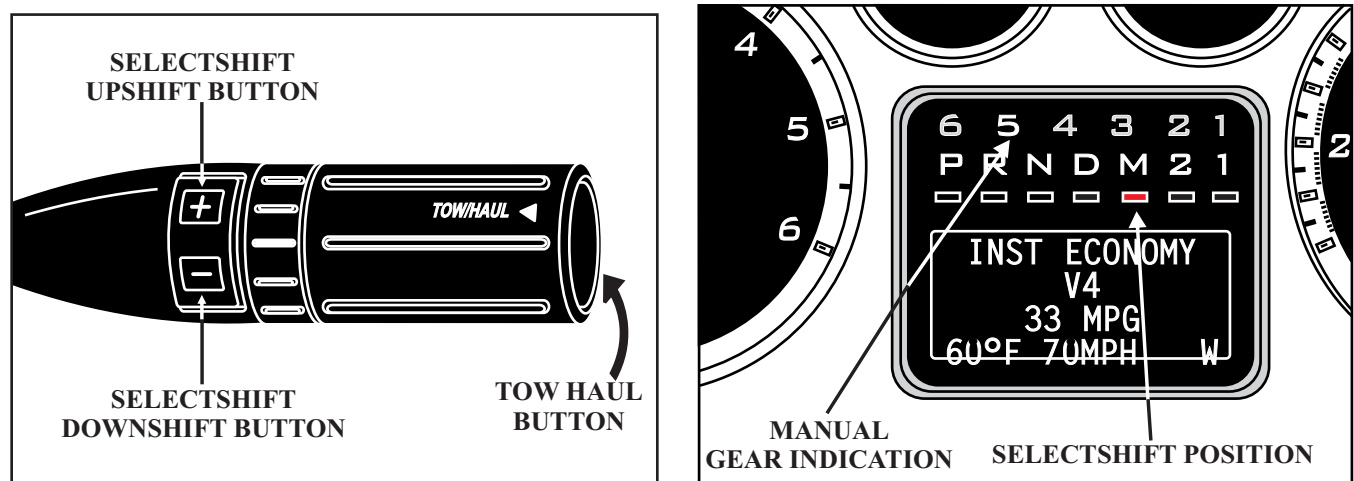
D - TOW HAUL First through sixth gears are available. The shift schedule is altered for higher shift speeds, engine braking is also available.

D - RANGE SELECT All six gears are available. The driver has the option to lockout higher gears by pressing the “minus” button or enable those locked out gears by pressing the “plus” button both of which are located on the selector lever. The transmission automatically shifts through lower gears that have not been locked out.

M - SELECT SHIFT All six gears are available upon driver request. The driver has the ability to shift the transmission manually by pressing the “plus” and “minus” buttons located on the shift lever.

2 This gear shift position provides second gear “hold”, without any upshift. When driving in higher gears, a downshift to second will occur when this position is selected when the calibrated speed is reached.

1 This gear shift position provides first gear “hold” with engine braking, no upshift will occur. When driving in higher gears, a downshift to first will occur when this position is selected when the calibrated speed is reached.

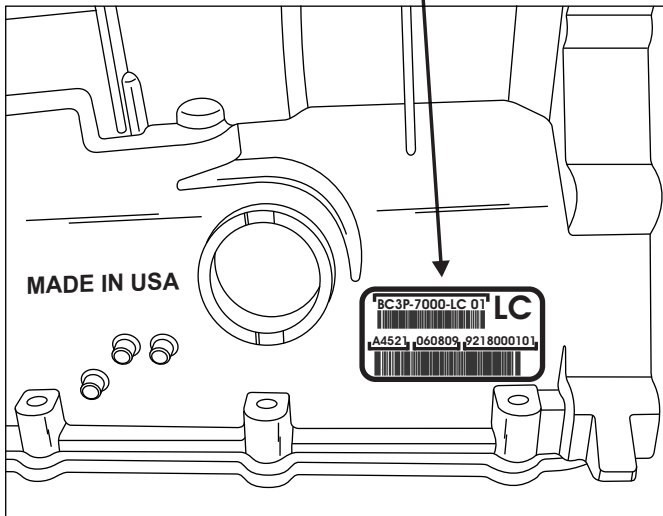
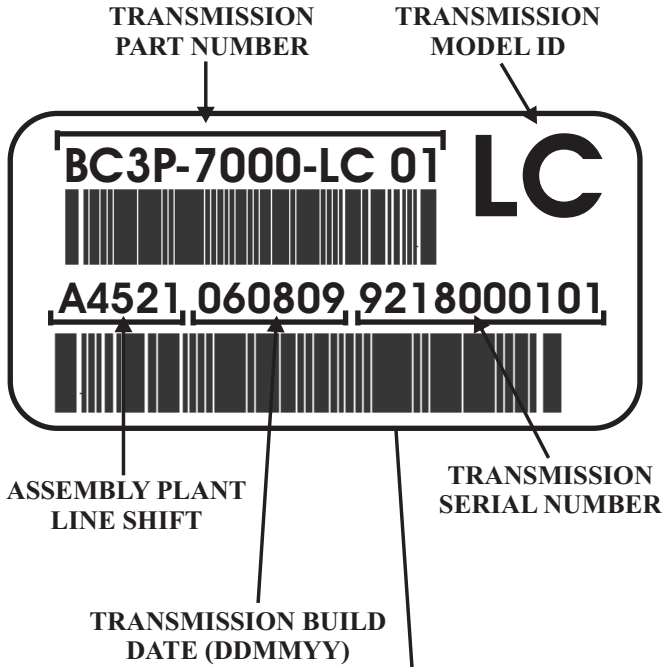


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Figure 3

TRANSMISSION IDENTIFICATION TAG

The Transmission Identification Tag is located on the left side of the transmission.



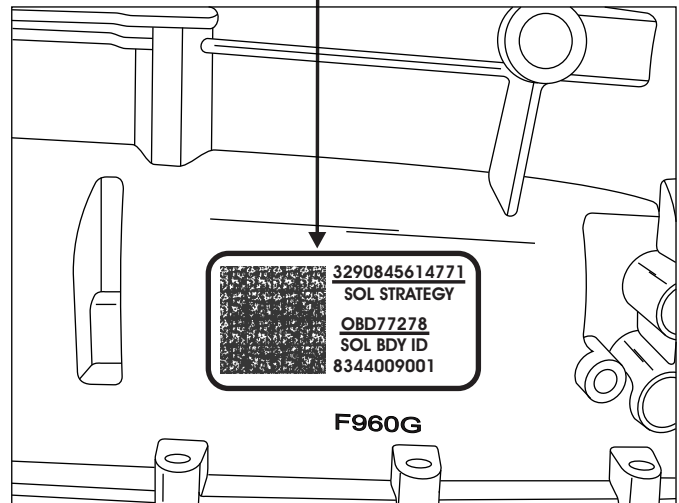
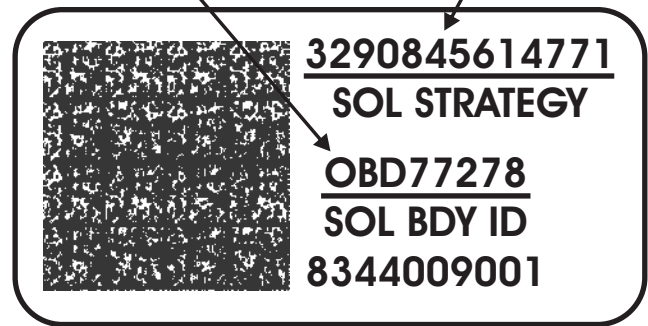
SOLENOID BODY TAG

The Solenoid Body Tag is located on the right side of the transmission.

The solenoid strategy is a file programmed into the PCM or TCM to control the shifts, line pressure and TCC operation. The Solenoid Body Tag contains a 13 digit solenoid body strategy number and an 8 digit solenoid body identification. Anytime the solenoid body is changed, a new solenoid body strategy file should be downloaded into the PCM or TCM using a capable scan tool. The solenoid body strategy on this tag has to match the solenoid body strategy on the valve body tag, See Figure 5.

8 DIGIT SOLENOID BODY IDENTIFICATION

13 DIGIT SOLENOID BODY STRATEGY IDENTIFICATION



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Figure 4

SOLENOID BODY ID & STRATEGY TAG

The Solenoid Body Identification and Strategy Tag is located on the valve body next to the solenoids closest to the manual valve.

If the solenoid body strategy printed on the tag does not match the solenoid body tag on the right side of the transmission case, the solenoid strategy will have to be programmed into the TCM or PCM or harsh shifts may result.

NOTE: Ford recommends the solenoid body be replaced anytime the tags don't match.

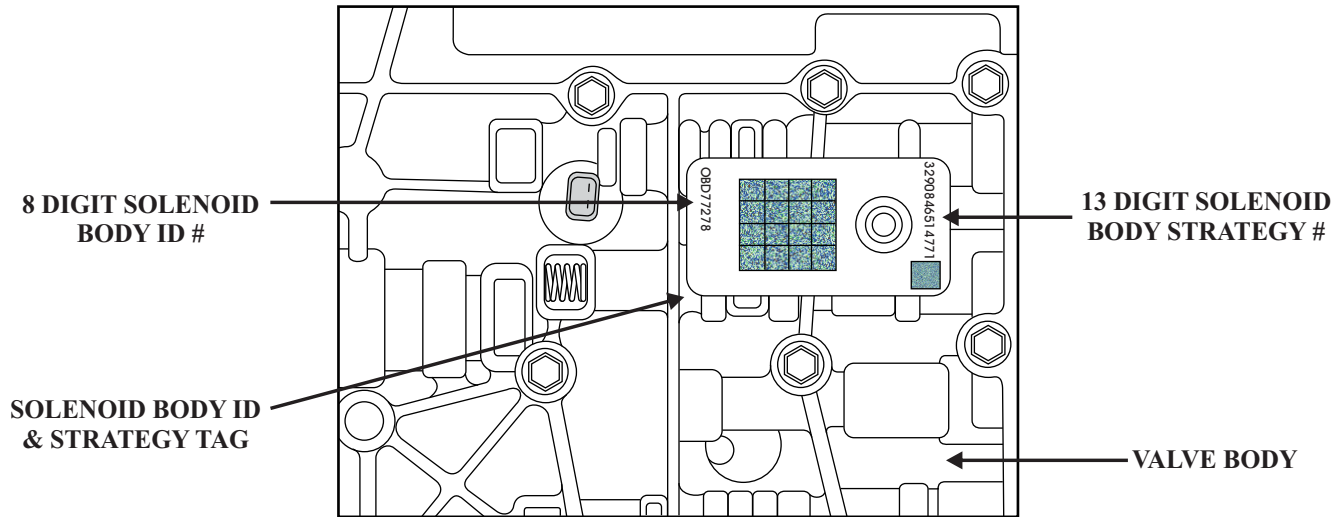
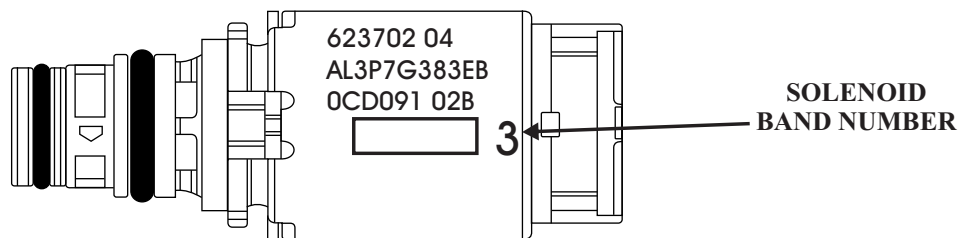


Figure 5

SOLENOID BAND NUMBER

The solenoids are calibrated from the factory and are **NOT** all the same. There are two types of solenoids, normally high and normally low. The solenoids can be replaced separately, but only with the same type. The replacement solenoid band number must match the band number of the solenoid being replaced. The band number printed on the solenoid body will be 2, 3, 4 or 5.



Solenoid Band Number	Normally High Solenoid Part #	Normally Low Solenoid Part #
2	BC3Z-7G383-K	BC3Z-7G383-S
3	BC3Z-7G383-L	BC3Z-7G383-T
4	BC3Z-7G383-M	BC3Z-7G383-U
5	BC3Z-7G383-N	BC3Z-7G383-V

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Figure 6

SOLENOID APPLICATION CHART

<i>Selector Lever Position</i>	<i>Commanded Gear</i>	<i>1-2-3-4 (SSA) NL</i>	<i>3-5-Rev (SSB) NH</i>	<i>2-6 (SSC) NL</i>	<i>1-Rev (SSD) NL</i>	<i>4-5-6 (SSE) NH</i>	<i>Torque Converter Clutch NL</i>
<i>P</i>	<i>P</i>	<i>Off</i>	<i>On</i>	<i>Off</i>	<i>On</i>	<i>On</i>	<i>Off</i>
<i>R</i>	<i>R</i>	<i>Off</i>	<i>Off</i>	<i>Off</i>	<i>On</i>	<i>On</i>	<i>Off</i>
<i>N</i>	<i>N</i>	<i>Off</i>	<i>On</i>	<i>Off</i>	<i>On</i>	<i>On</i>	<i>Off</i>
<i>D</i>	<i>1</i>	<i>On</i>	<i>On</i>	<i>Off</i>	<i>Off</i> [^]	<i>On</i>	<i>On/Off</i> *
	<i>2</i>	<i>On</i>	<i>On</i>	<i>On</i>	<i>Off</i>	<i>On</i>	<i>On/Off</i> *
	<i>3</i>	<i>On</i>	<i>Off</i>	<i>Off</i>	<i>Off</i>	<i>On</i>	<i>On/Off</i> *
	<i>4</i>	<i>On</i>	<i>On</i>	<i>Off</i>	<i>Off</i>	<i>Off</i>	<i>On/Off</i>
	<i>5</i>	<i>Off</i>	<i>Off</i>	<i>Off</i>	<i>Off</i>	<i>Off</i>	<i>On/Off</i>
	<i>6</i>	<i>Off</i>	<i>On</i>	<i>On</i>	<i>Off</i>	<i>Off</i>	<i>On/Off</i>
<i>L</i>	<i>L</i>	<i>On</i>	<i>On</i>	<i>Off</i>	<i>On</i>	<i>On</i>	<i>Off</i>

* TCC may be commanded ON early in 1st, 2nd and 3rd gears depending on transmission fluid temperature.

[^] Solenoid will change state when vehicle speed is greater than 5 mph.

NH = Normally High NL = Normally Low

Failsafe - If an electronic, hydraulic or mechanical transmission malfunction occurs, the PCM or TCM will turn off any current to the transmission. This leaves reverse and fifth gear as the only available gears and TCC will be unlocked. With SSB, SSE and the LPC Solenoids being normally high, fifth gear with maximum line pressure is achieved hydraulically when current is removed from the transmission.

Whenever solenoid strategy is changed due to relevant parts replacement the following Adaptive Drive cycle must be performed:

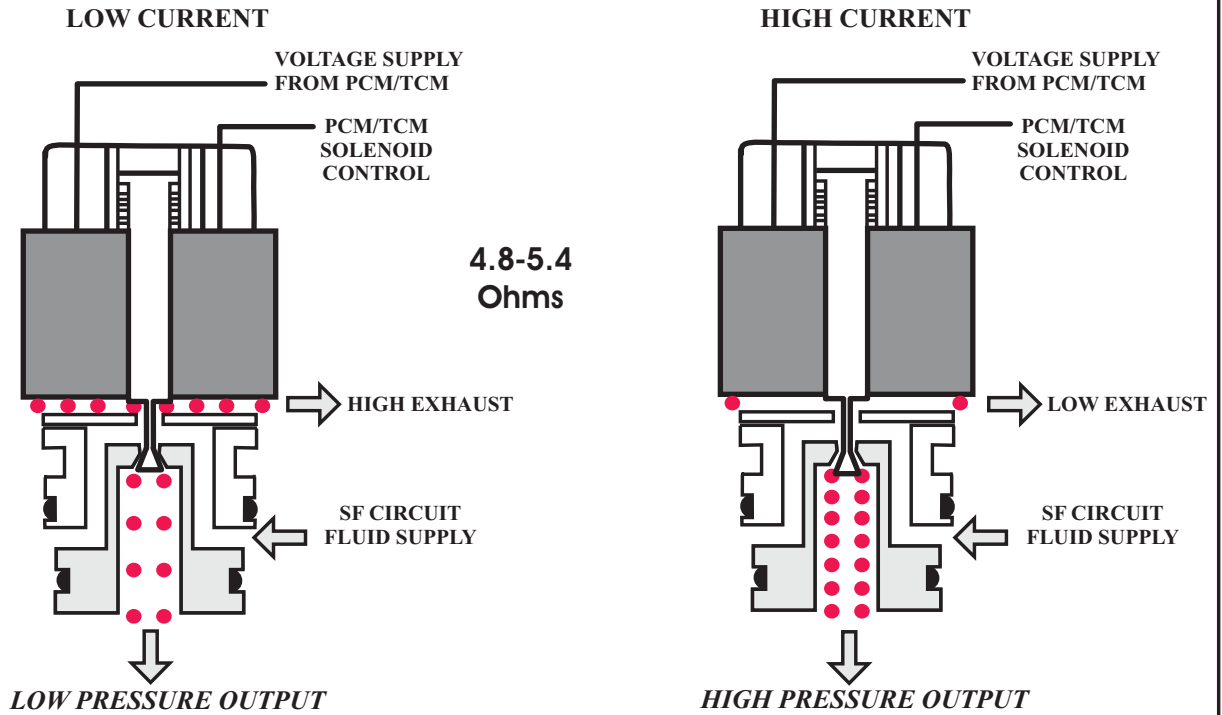
The 6R140W utilizes an adaptive drive cycle to insure continuous shift quality and therefor must have the shift adapts reset when repairs are completed. The Adaptive Drive Cycle is as follows:

- Using a scan tool, clear the TCM KAM, Do NOT clear the PCM KAM.
- Make certain transmission temperature is between 180°F and 200°F (82°C to 93°C).
- With the engine running and the brakes applied, move the selector lever in the following sequence pausing between each position for 4 seconds beginning in neutral as follows: N-R-N-D-R-D-N. Repeat this sequence two more times.
- Accelerate at moderate throttle so each shift occurs around 2000 rpm for gas engines and 1500 rpm for diesel engines up to 65 mph (105 k/mh). Brake moderately to a stop, repeat this sequence two more times.
- Accelerate at moderate throttle so each shift occurs around 3000 rpm for gas engines and 2250 rpm for diesel engines up to 65 mph (105 k/mh). Repeat this sequence two more times.
- Come to a complete stop.
- With the engine running and the brakes applied, move the selector lever in the following sequence pausing between each position for 4 seconds beginning in neutral as follows: N-R-N-D-R-D-N. Repeat this sequence two more times.

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Figure 7

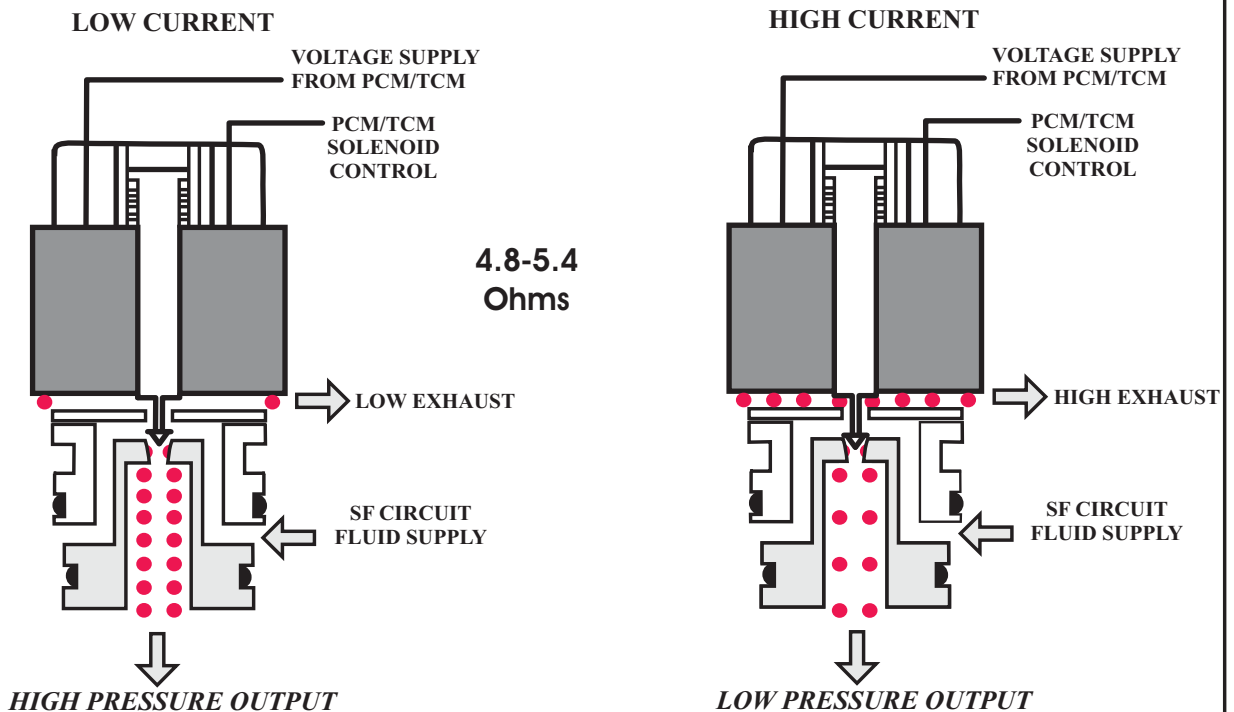
NORMALLY LOW SOLENOIDS



The normally low solenoids provide solenoid feed pressure from it's respective clutch latch valve proportional to supplied current. A normally low solenoid will output low pressure with low (50 mA) or no current, while it will supply high pressure with high current (850 mA)

NORMALLY HIGH SOLENOIDS

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The normally high solenoids provide hydraulic pressure inversely proportional to supplied current. Normally high solenoids provide full output of pressure with low (50 mA) or no current and low pressure with high current (850 mA).



Technical Service Information

FORD DIAGNOSTIC TROUBLE CODES	
DTC	DESCRIPTION
P0562	System Voltage Low
P0563	System Voltage High
P0602	PCM Programming Error
P0604	Transmission Control Module (TCM) RAM Error
P0605	Transmission Control Module (TCM) ROM Error
P0607	Transmission Control Module (TCM) CPU Error
P0657	Actuator Supply Voltage "A" Circuit Low
P06b8	Internal Control Module Non-Volatile RAM Error
P0701	Transmission Control System Range/Performance
P0702	Transmission Control Electrical System, Voltage Too High or Low
P0706	Transmission Range Sensor (TRS) "A" Circuit Range/Performance
P0707	Transmission Range Sensor (TRS) "A" Circuit Low
P0708	Transmission Range Sensor (TRS) "A" Circuit High
P0710	Transmission Fluid Temperature (TFT) Sensor "A" Circuit Excessive Voltage Drop
P0711	Transmission Fluid Temperature (TFT) Sensor "A" Circuit Range/Performance
P0712	Transmission Fluid Temperature (TFT) Sensor "A" Circuit Low
P0713	Transmission Fluid Temperature (TFT) Sensor "A" Circuit High
P0715	Turbine Speed Sensor (TSS) "A" Circuit Loss of Signal
P0717	Turbine Speed Sensor (TSS) "A" Circuit No Signal
P0718	Turbine Speed Sensor (TSS) "A" Circuit Intermittent Noise Detected
P0720	Output Shaft Speed Sensor (OSS) Loss of Signal
P0721	Output Shaft Speed Sensor (OSS) Range/Performance
P0722	Output Shaft Speed Sensor (OSS) "A" Circuit No Signal
P0729	Incorrect 6th Gear Ratio
P0731	Incorrect 1st Gear Ratio
P0732	Incorrect 2nd Gear Ratio
P0733	Incorrect 3rd Gear Ratio
P0734	Incorrect 4th Gear Ratio
P0735	Incorrect 5th Gear Ratio
P0740	Torque Converter Clutch (TCC) Solenoid Circuit Open
P0741	Torque Converter Clutch (TCC) Performance/Stuck Off
P0742	Torque Converter Clutch (TCC) Performance/Stuck On
P0743	Torque Converter Clutch (TCC) Solenoid Circuit Open or Shorted
P0744	Torque Converter Clutch (TCC) Solenoid Circuit Intermittent Shorted to Power
P0748	Pressure Control Solenoid "A" Electrical Circuit Fault
P0750	Shift Solenoid "A" (SSA) Circuit Open or Shorted
P0751	Shift Solenoid "A" (SSA) Performance/Stuck Off
P0752	Shift Solenoid "A" (SSA) Performance/Stuck On
P0753	Shift Solenoid "A" (SSA) Electrical Circuit Fault
P0754	Shift Solenoid "A" (SSA) Intermittent Electrical Circuit Fault
P0755	Shift Solenoid "B" (SSB) Circuit Open or Shorted
P0756	Shift Solenoid "B" (SSB) Performance/Stuck Off
P0757	Shift Solenoid "B" (SSB) Performance/Stuck On
P0758	Shift Solenoid "B" (SSB) Electrical Circuit Fault
P0759	Shift Solenoid "B" (SSB) Intermittent Electrical Circuit Fault
P0760	Shift Solenoid "C" (SSC) Circuit Open
P0761	Shift Solenoid "C" (SSC) Performance/Stuck Off

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Figure 9



Technical Service Information

FORD DIAGNOSTIC TROUBLE CODES	
DTC	DESCRIPTION
P0762	Shift Solenoid "C" (SSC) Stuck On
P0763	Shift Solenoid "C" (SSC) Electrical Circuit Fault
P0764	Shift Solenoid "C" (SSC) Intermittent Circuit Open or Shorted
P0765	Shift Solenoid "D" (SSD) Electrical Circuit Open
P0766	Shift Solenoid "D" (SSD) Performance/Stuck Off
P0767	Shift Solenoid "D" (SSD) Stuck On
P0768	Shift Solenoid "D" (SSD) Electrical Circuit Failure
P0769	Shift Solenoid "D" (SSD) Intermittent Circuit Open or Shorted
P0770	Shift Solenoid "E" (SSE) Electrical Circuit Open
P0771	Shift Solenoid "E" (SSE) Performance/Stuck Off
P0772	Shift Solenoid "E" (SSE) Stuck On
P0773	Shift Solenoid "E" (SSE) Electrical Circuit Fault
P0774	Shift Solenoid "E" (SSE) Intermittent Circuit Open or Shorted
P0815	Select Shift Switch Upshift Electrical Circuit Fault
P0816	Select Shift Switch Downshift Electrical Circuit Fault
P0882	PCM/TCM Power Input Signal Low
P0883	PCM/TCM Power Input Signal High
P0884	PCM/TCM Power Input Signal Intermittent Fault
P0885	PCM/TCM Power Relay Control Circuit Open
P0960	Pressure Control Solenoid "A" (PCA) Circuit Open
P0961	Pressure Control Solenoid "A" (PCA) Circuit Momentary Short to Ground
P0962	Pressure Control Solenoid "A" (PCA) Circuit Short to Ground
P0963	Pressure Control Solenoid "A" (PCA) Circuit Short to Power
P0973	Shift Solenoid "A" (SSA) Control Circuit Shorted to Ground
P0974	Shift Solenoid "A" (SSA) Control Circuit Shorted to Power
P0976	Shift Solenoid "B" (SSB) Control Circuit Shorted to Ground
P0977	Shift Solenoid "B" Control Circuit Shorted or Open
P0979	Shift Solenoid "C" (SSC) Control Circuit Shorted to Ground
P0980	Shift Solenoid "C" (SSC) Control Circuit High
P0982	Shift Solenoid "D" (SSD) Control Circuit Shorted to Ground
P0983	Shift Solenoid "D" (SSD) Control Circuit High
P0985	Shift Solenoid "E" (SSE) Control Circuit Shorted to Ground
P0986	Shift Solenoid "E" (SSE) Control Circuit High
P1001	KOER Self Test Aborted
P1397	System Voltage Out of Self Test Range
P1501	Vehicle Speed Sensor (VSS) Out of Self Test Range
P1635	Tires/Axle Out of Acceptable Range
P1636	Inductive Signature Chip Communication Error
P163E	PCM/TCM Programming Error
P163F	Transmission ID Block Corrupted/Not Programmed
P1702	Transmission Range Sensor (TRS) Intermittent Circuit Signal
P1705	Transmission Range Sensor (TRS) Not In Park During Self Test
P1711	Transmission Fluid Temperature (TFT) Sensor Out of Self Test Range
P1744	Torque Converter Clutch (TCC) Range/Performance
P1780	Transmission Control Switch (TCS) Out of Self Test Range
P1783	Transmission Over Temperature Condition
P1910	Reverse Lamp Circuit Open

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Figure 10

AUTOMATIC TRANSMISSION SERVICE GROUP



Technical Service Information

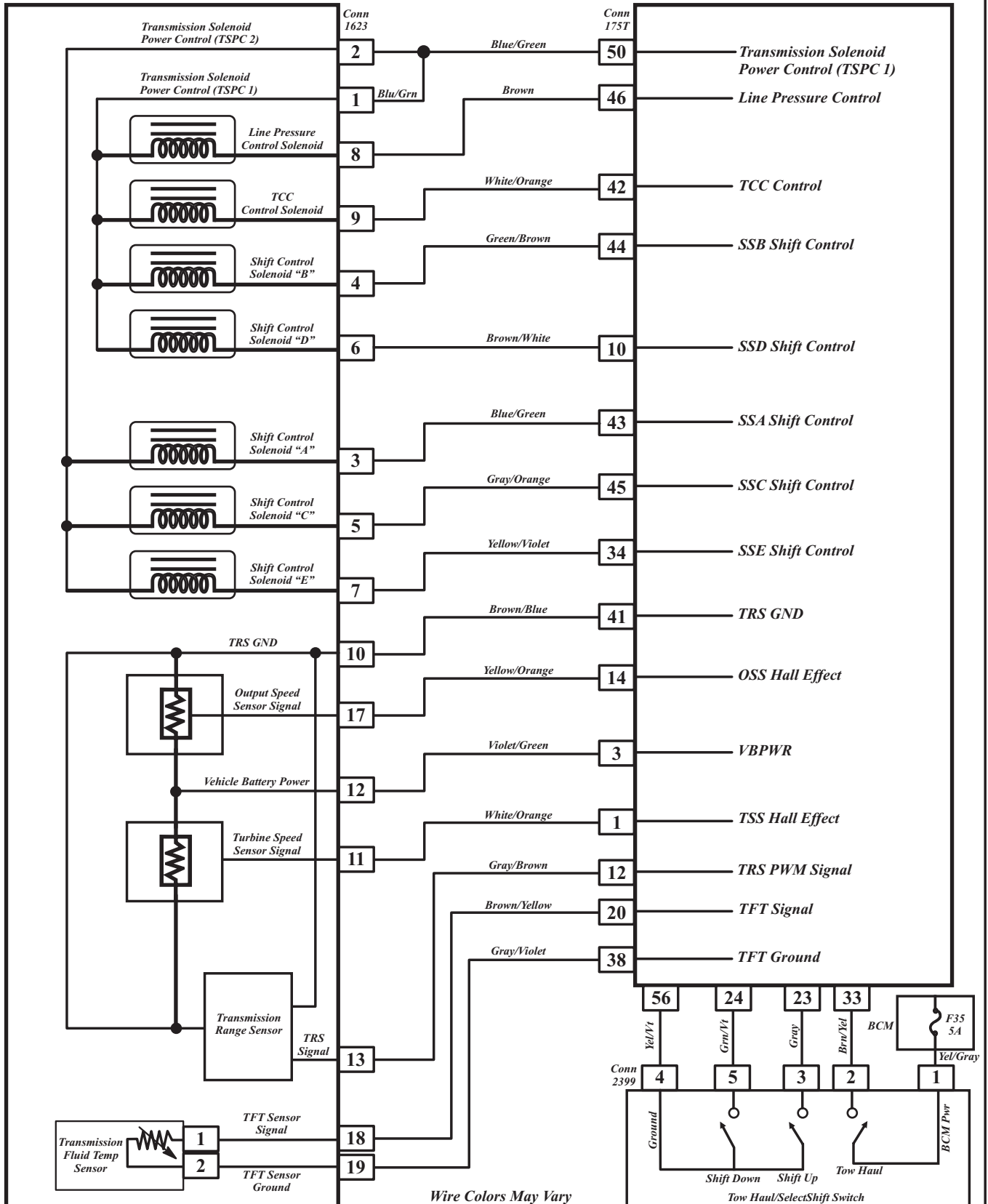
FORD DIAGNOSTIC TROUBLE CODES	
DTC	DESCRIPTION
<i>P1921</i>	<i>Transmission Range Sensor (TRS) Crank Signal Fault</i>
<i>P2669</i>	<i>Actuator Supply Voltage "B" Circuit Open</i>
<i>P2700</i>	<i>Transmission Friction Element "A" Apply Time Range/Performance</i>
<i>P2701</i>	<i>Transmission Friction Element "B" Apply Time Range/Performance</i>
<i>P2702</i>	<i>Transmission Friction Element "C" Apply Time Range/Performance</i>
<i>P2703</i>	<i>Transmission Friction Element "D" Apply Time Range/Performance</i>
<i>P2704</i>	<i>Transmission Friction Element "E" Apply Time Range/Performance</i>
<i>P2705</i>	<i>Transmission Friction Element "F" Apply Time Range/Performance</i>
<i>P2758</i>	<i>Torque Converter Clutch (TCC) Pressure Control Solenoid Stuck On</i>
<i>P2760</i>	<i>Torque Converter Clutch (TCC) Pressure Control Solenoid Short to Ground</i>
<i>U0028</i>	<i>TCM Lost CAN Communication To All Modules</i>
<i>U0073</i>	<i>PCM/TCM Lost CAN Communication To All Modules</i>
<i>U0100</i>	<i>PCM Lost Communication With TCM</i>
<i>U0102</i>	<i>PCM/TCM Lost Communication With The Transfer Case Control Module (TCCM)</i>
<i>U0115</i>	<i>Lost Communication Between PCM and TCM</i>
<i>U0121</i>	<i>The PCM/TCM Lost Communication With The ABS Module</i>
<i>U0129</i>	<i>The PCM/TCM Lost Communication With The Brake System Module</i>
<i>U0133</i>	<i>The PCM/TCM Lost Communication With The Active Roll Control Module (ARCM)</i>
<i>U0140</i>	<i>The PCM/TCM Lost Communication With the Body Control Module (BCM)</i>
<i>U0141</i>	<i>Lost Communication Between the PCM/TCM and The BCM</i>
<i>U0155</i>	<i>The PCM/TCM Lost Communication With Instrument Panel Cluster (IPC)</i>
<i>U0401</i>	<i>The TCM Has Received Invalid Data From The PCM</i>
<i>U0415</i>	<i>The PCM/TCM Has Received Invalid Data From the ABS Module</i>

Figure 11

TYPICAL 6R140W SOLENOID WIRE SCHEMATIC GASOLINE

TRANSMISSION

PCM

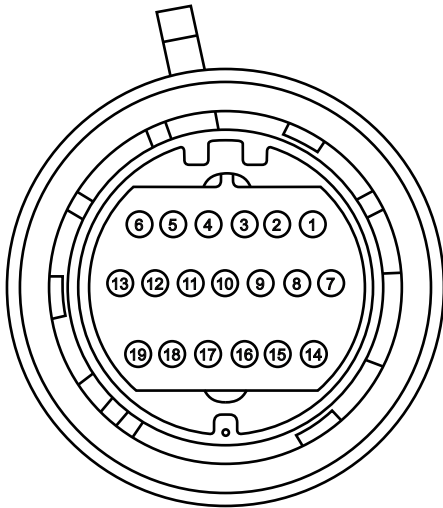


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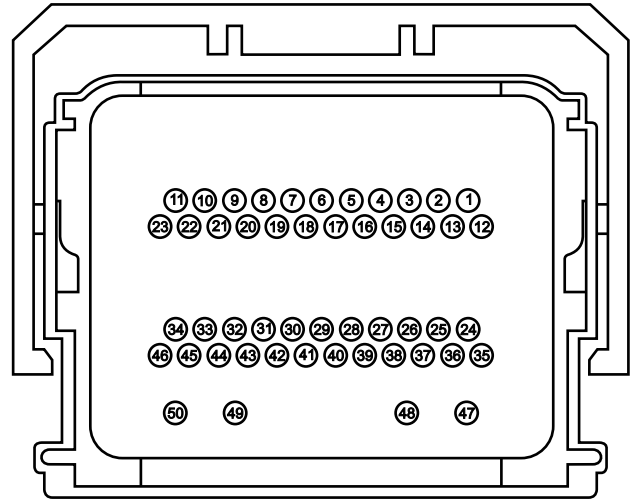
Figure 12

CONNECTOR TERMINAL ID & FUNCTION

GASOLINE



**19 PIN TRANSMISSION
CASE CONNECTOR**



**50 PIN C175T
PCM CONNECTOR**

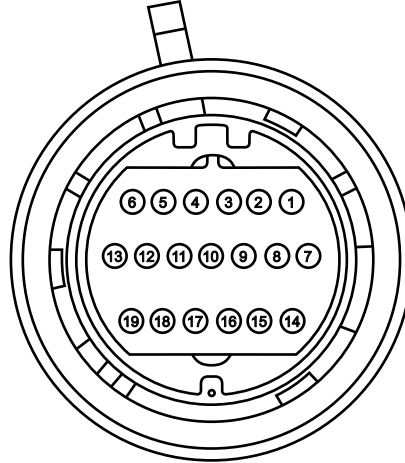
<i>Case Conn. Terminal</i>	<i>Circuit Function</i>	<i>PCM Conn. Number</i>	<i>Outside Wire Color</i>
1	Transmission Solenoid Power Control 1	50	Blue/Green
2	Transmission Solenoid Power Control 2	50	Blue/Green
3	Shift Control Solenoid "A"	43	Blue/Green
4	Shift Control Solenoid "B"	44	Green/Brown
5	Shift Control Solenoid "C"	45	Gray/Orange
6	Shift Control Solenoid "D"	10	Brown/White
7	Shift Control Solenoid "E"	34	Yellow/Violet
8	Line Pressure Solenoid Control	46	Brown
9	TCC Solenoid Control	42	White/Orange
10	Transmission Range Sensor Ground	41	Brown/Blue
11	Turbine Speed Sensor Signal	1	White/Orange
12	TSS, OSS, TRS VPWR	3	Violet/Green
13	Transmission Range Sensor Signal	12	Gray/Brown
14	Not Used	—	—
15	Not Used	—	—
16	Not Used	—	—
17	Output Shaft Speed Sensor Signal	14	Yellow/Orange
18	Transmission Temperature Sensor Signal	20	Brown/Yellow
19	Transmission Temperature Sensor Signal Ground	38	Gray/Violet
<i>Tow Haul SelectShift Switch Terminal</i>	<i>Circuit Function</i>	<i>PCM Conn. Number</i>	<i>Outside Wire Color</i>
2	Tow Haul Signal	33	Brown/Yellow
3	Selectshift Switch Upshift Signal	23	Gray
4	Selectshift Switch Ground	56	Yellow/Violet
5	Selectshift Switch Downshift Signal	24	Green/Violet

Figure 13

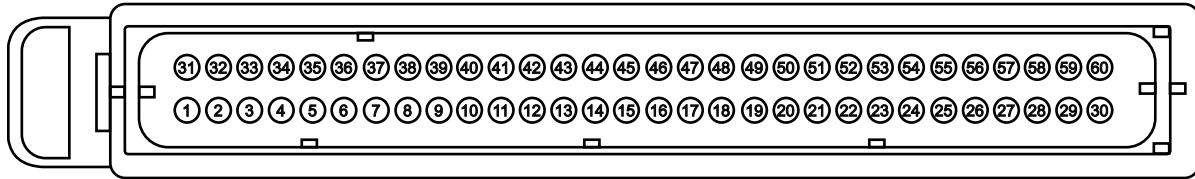
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DIESEL 19 PIN TRANSMISSION CASE CONNECTOR



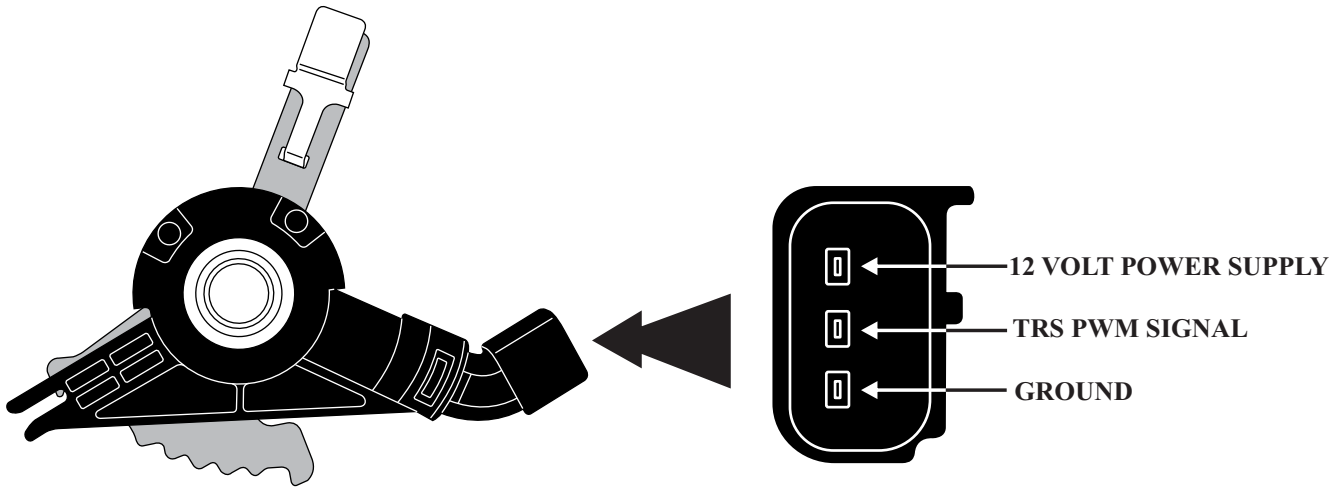
60 PIN C1750 TCM CONNECTOR



Case Conn. Terminal	Circuit Function	TCM Conn. Number	Outside Wire Color
1	Transmission Solenoid Power Control 1	2	Blue/Green
2	Transmission Solenoid Power Control 2	32	Brown
3	Shift Control Solenoid "A"	42	Blue/Green
4	Shift Control Solenoid "B"	7	Green/Brown
5	Shift Control Solenoid "C"	6	Gray/Orange
6	Shift Control Solenoid "D"	43	Brown/White
7	Shift Control Solenoid "E"	4	Yellow/Violet
8	Line Pressure Solenoid Control	3	Brown
9	TCC Solenoid Control	44	White/Orange
10	Transmission Range Sensor Ground	46	Brown/Blue
11	Turbine Speed Sensor Signal	50	White/Orange
12	TSS, OSS, TRS VPWR	20	Violet/Green
13	Transmission Range Sensor Signal	45	Gray/Brown
14	Not Used	—	—
15	Not Used	—	—
16	Not Used	—	—
17	Output Shaft Speed Sensor Signal	51	Yellow/Orange
18	Transmission Temperature Sensor Signal	54	Brown/Yellow
19	Transmission Temperature Sensor Signal Ground	46	Gray/Violet
Tow Haul SelectShift Switch Terminal	Circuit Function	PCM Conn. Number	Outside Wire Color
2	Tow Haul Signal	53	Brown/Yellow
3	Selectshift Switch Upshift Signal	58	Gray
4	Selectshift Switch Ground	46	Gray/Violet
5	Selectshift Switch Downshift Signal	59	Green/Violet

Figure 15

TRANSMISSION RANGE SENSOR

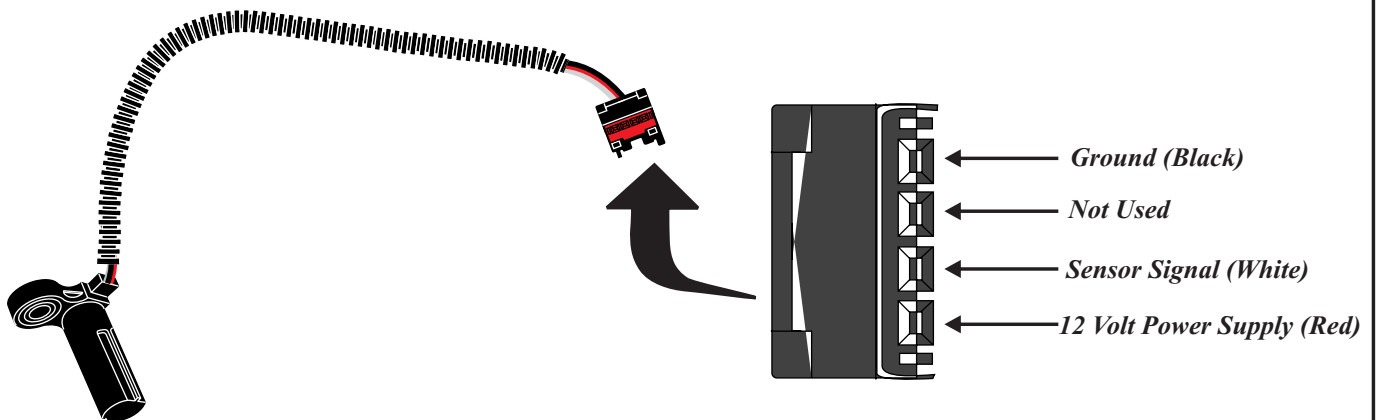


TRANSMISSION RANGE SENSOR LOGIC	
<i>Selector Lever Position</i>	<i>TRS Range (% Duty Cycle)</i>
P	13.3 - 15.5
R	33.2 - 34.5
N	40.0 - 46.6
D	58 - 60.5
M	69.0 - 70.5
2	80.0 - 90.5
1	85.5 - 95.0

Figure 16

OUTPUT & TURBINE SPEED SENSORS

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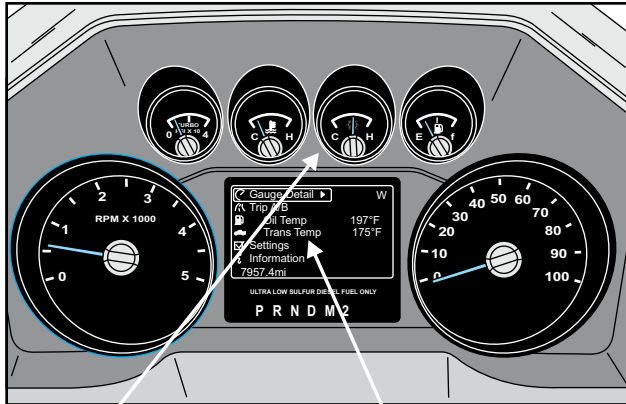


The Turbine & Output Speed Sensors Are Hall Effect Types And Will Produce A Zero To Five Volt DC Square Wave Signal

Figure 17

TRANSMISSION FLUID TEMPERATURE SENSOR

The transmission fluid temperature sensor is a two wire thermistor containing a ground circuit and a 5 volt supply circuit. The 5 volt supply circuit will vary according to actual transmission temperature. The warmer the transmission temperature, the lower the voltage and resistance will be making this a negative coefficient type sensor. Refer to the chart for transmission fluid temperature specifications.



Transmission
Temperature
Gauge

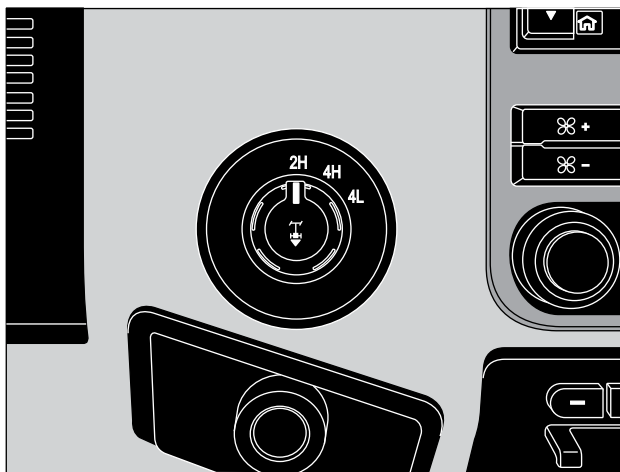
Transmission Temperature
Can Also Be
Displayed In The
Driver Information Center

TFT RESISTANCE CHART

DEGREES (F)	DEGREES (C)	RESISTANCE (K)
-40 to -4	-40 to -20	967 - 284
-3 to 31	-19 to -1	284 - 100
32 to 68	0 to 20	100 - 37
69 to 104	21 to 40	37 - 16
105 to 158	41 to 70	16 - 5
159 to 194	71 to 91	5 - 2.7
195 to 230	91 to 110	2.7 - 1.5
231 to 266	111 to 130	1.5 - 0.8
267 to 302	131 to 150	0.8 - 0.54

Figure 18

FOUR WHEEL DRIVE APPLICATION



Motorcraft Transfer Case Fluid
4.0 Pints (1.9 Liters)

NP271/273 Transfer Case

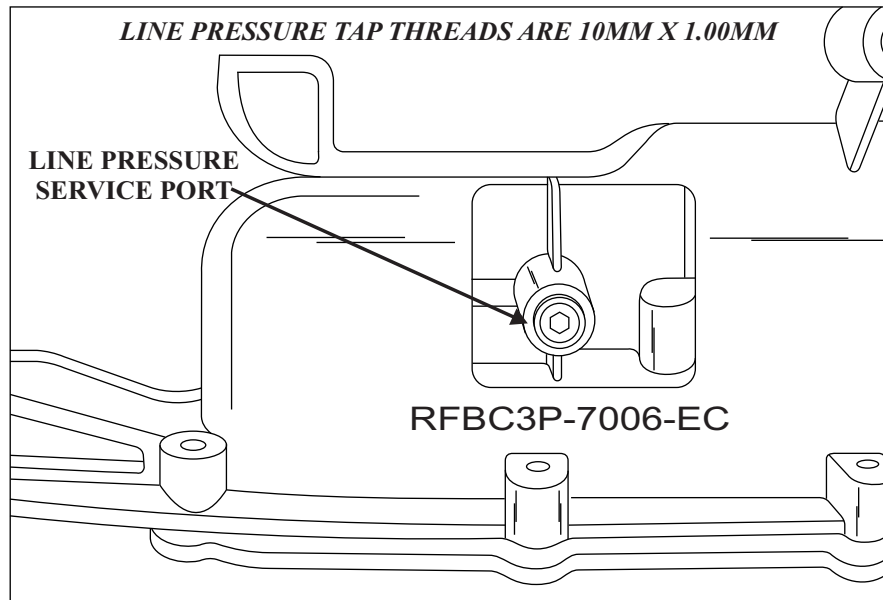
The NP271/273 Transfer Case is a part time 4WD type. There are two versions, one is Manual Shift On Stop (MSOS), the other is Electronic Shift On The Fly (ESOF).

The main components on the MSOS unit are the Transfer Case Shift Lever, Manual Locking Hubs, Shift Linkage and 4WD Indicator Lamps.

The main components on the ESOFF unit are the Transfer Case Control Module, Mode Select Switch, Motor Encoder Assembly, 4WD Indicator Lamps, Constant Vacuum Hublock, CVH Solenoid and Vacuum Lines and a Vacuum Pump on diesel applications only. Transfer Case inputs and outputs to and from the TCCM will be carried across the CAN Bus Communication System. Copyright © 2013 ATSG

Figure 19

LINE PRESSURE TEST



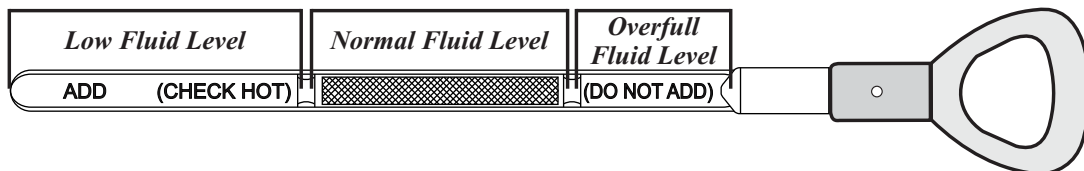
Gear Position	Actual Line Pressure - PSI (KpA)			Line Pressure Control (L/EPC) - PSI (KpA)		
	Idle Gas & Diesel	WOT Gas Only	WOT Diesel Only	Idle Gas & Diesel	WOT Gas Only	WOT Diesel Only
P/N	90 (619)	—	—	14 (94)	—	—
R	90 (619)	240 (1675)	260 (1790)	14 (94)	60 (410)	70 (480)
D	90 (619)	230 (1600)	225 (1550)	14 (94)	55 (375)	55 (375)
3	90 (619)	180 (1230)	160 (1100)	14 (94)	40 (275)	35 (240)
2	90 (619)	240 (1675)	235 (1650)	14 (94)	60 (410)	60 (410)
1	90 (619)	230 (1600)	225 (1550)	14 (94)	55 (375)	55 (375)

Actual and commanded pressures can vary based on calibrations and adaptive strategies.

Figure 20

TRANSMISSION FLUID LEVEL CHECK

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Fluid level should be checked at normal operating temperature: 180°F - 200°F (82°C - 93°C)

Factory Recommended Fluid - Mercon® LV

Early Build - Diesel - 18 Qts (17 Liters)... Gas - 19 Qts. (18 Liters)

Late Build - Diesel - 16.2 Qts. (15.3 Liters)... Gas - 17.2 Qts. (16.3 Liters)

Figure 21

OUTPUT SHAFT LOCK NUT

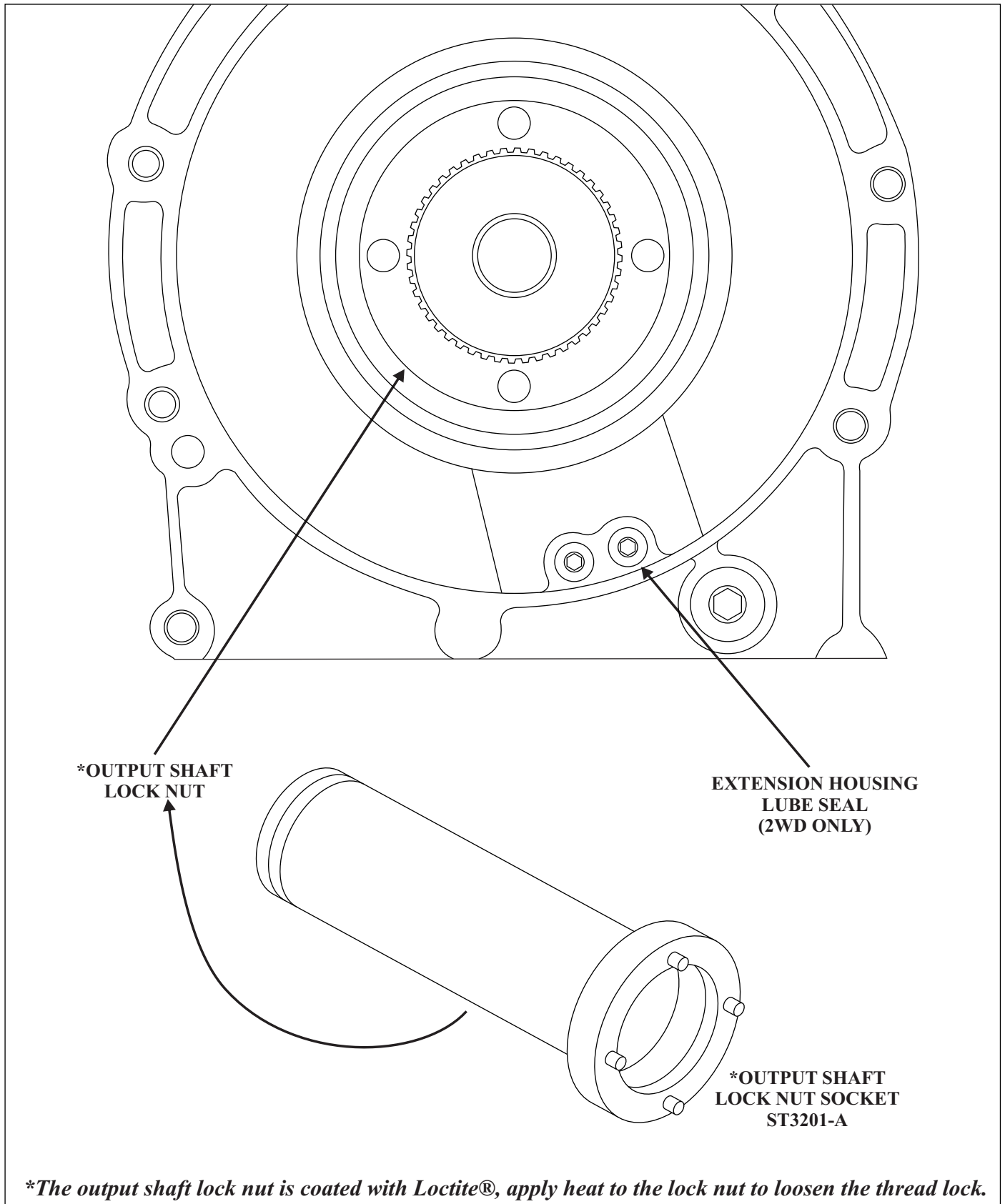


Figure 22

TRANSMISSION ASSEMBLY TIPS

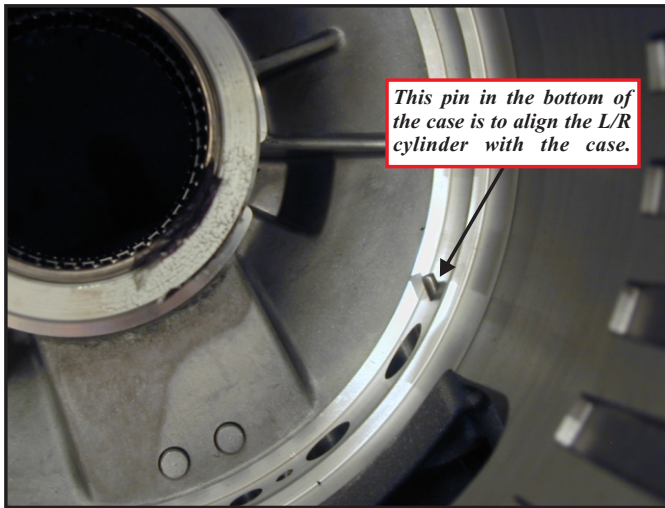


Figure 23

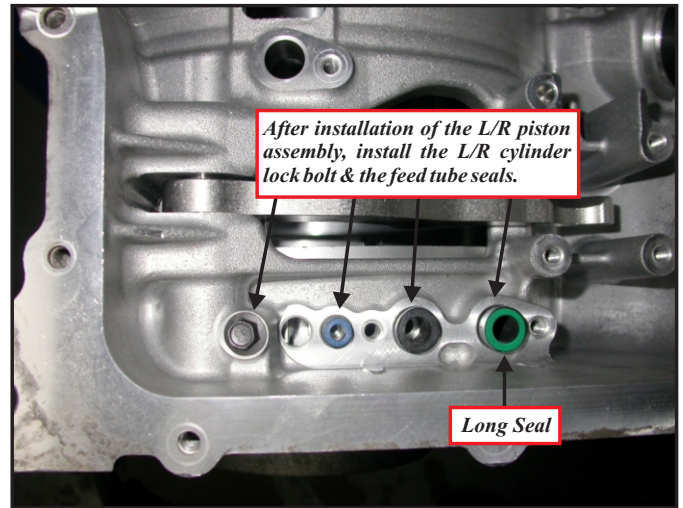


Figure 26

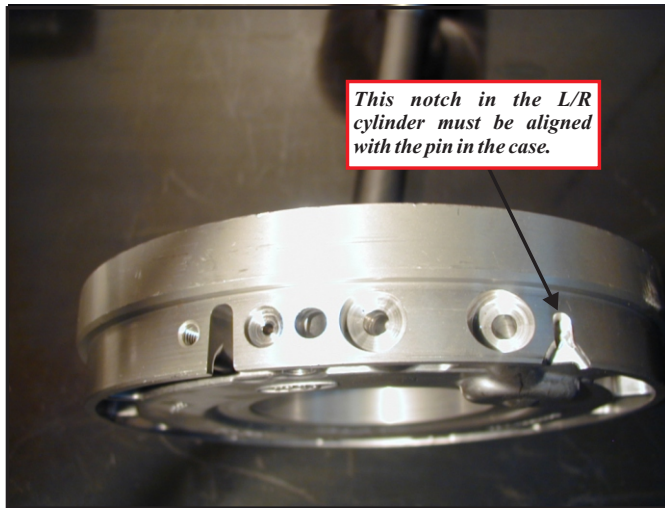


Figure 24



Figure 27

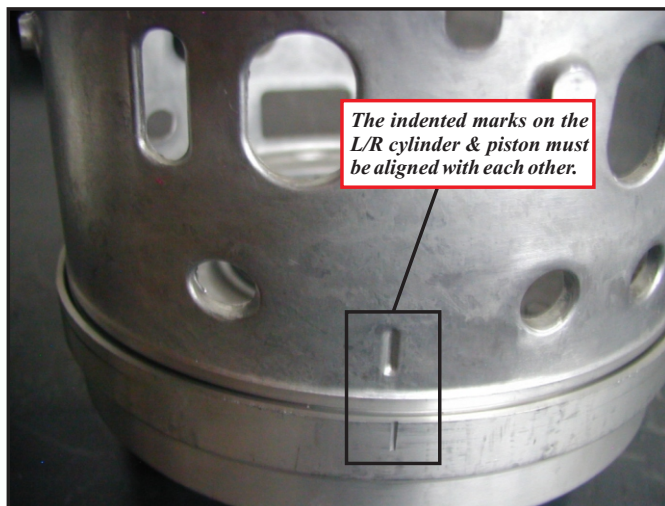


Figure 25

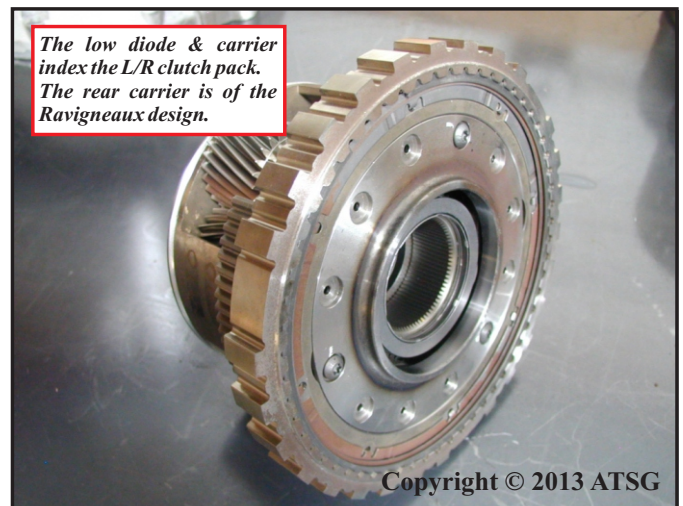


Figure 28

TRANSMISSION ASSEMBLY TIPS



Figure 29



Figure 32

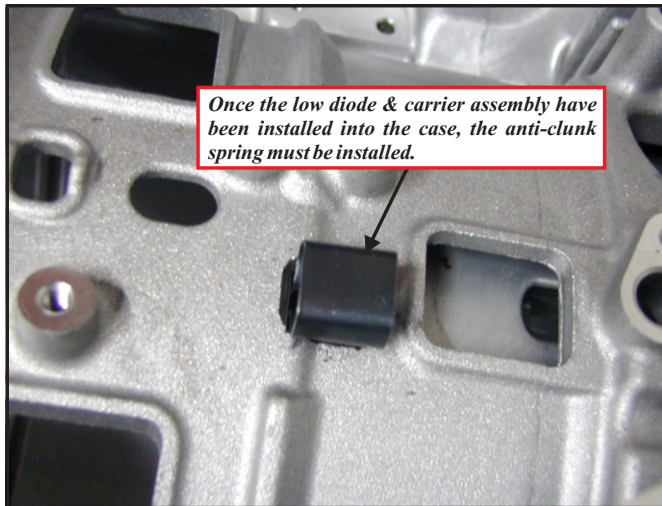


Figure 30

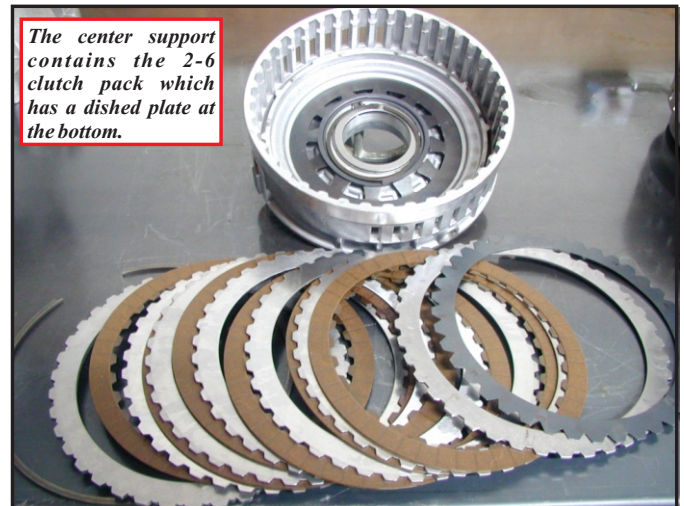


Figure 33

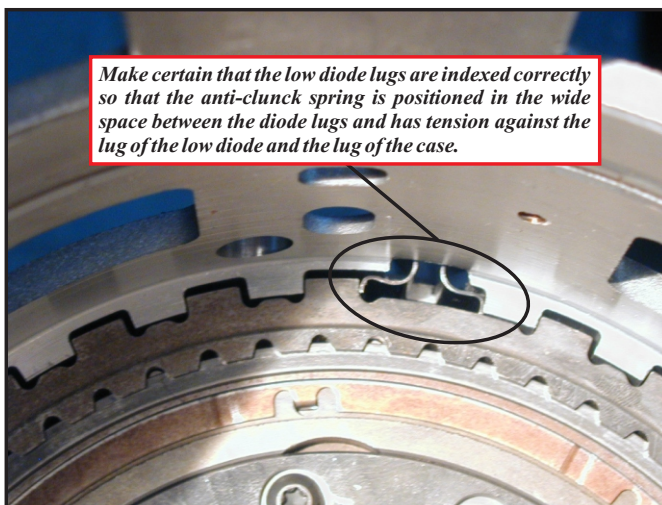


Figure 31



Figure 34

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TRANSMISSION ASSEMBLY TIPS

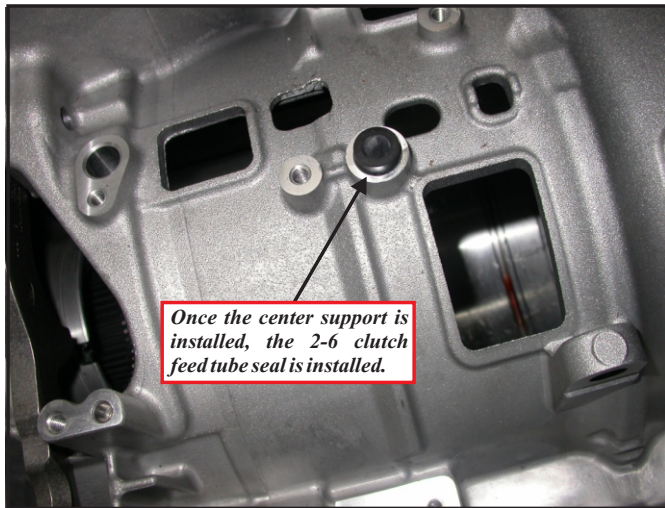


Figure 35

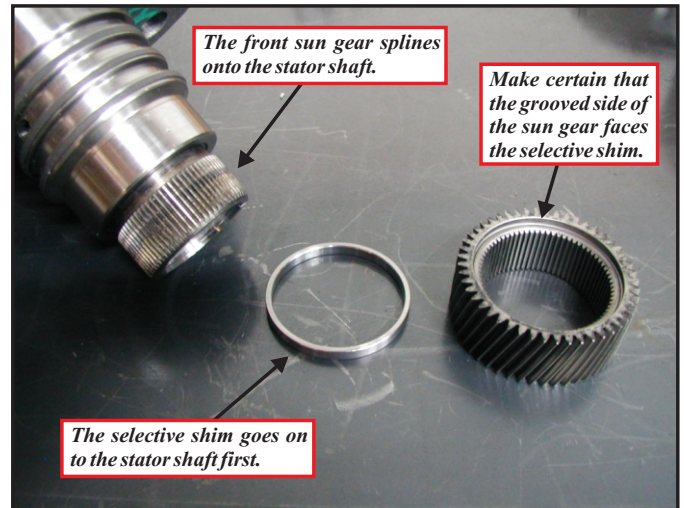


Figure 38

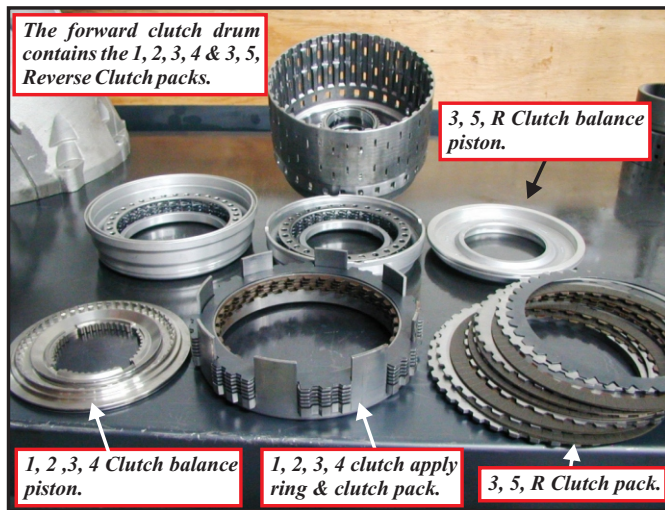


Figure 36



Figure 39



Figure 37

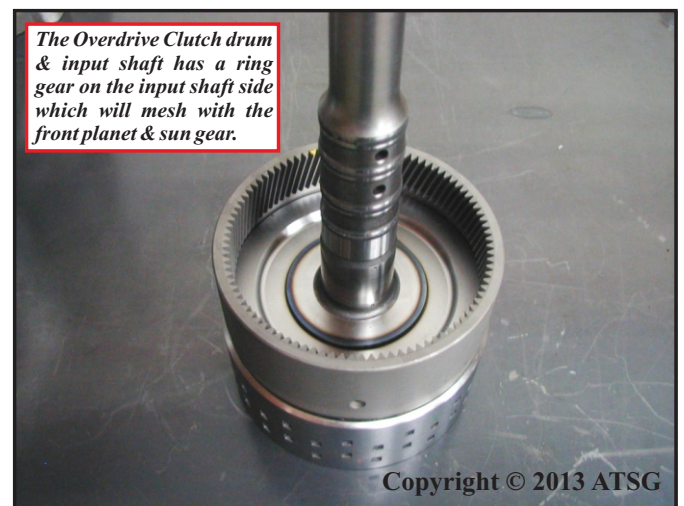


Figure 40

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TRANSMISSION ASSEMBLY TIPS

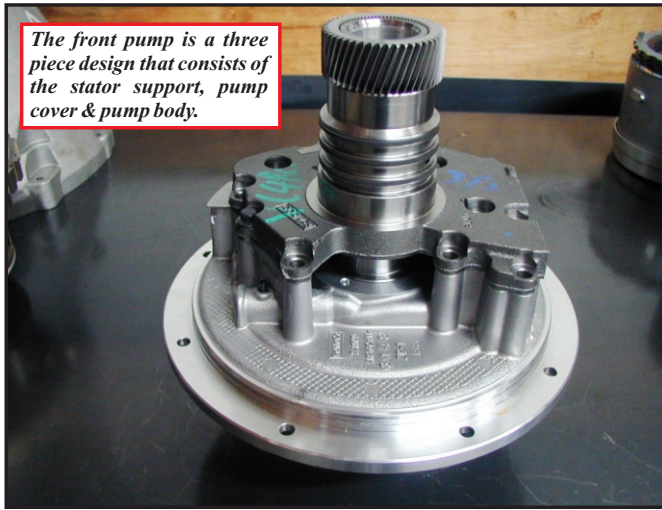


Figure 41



Figure 44

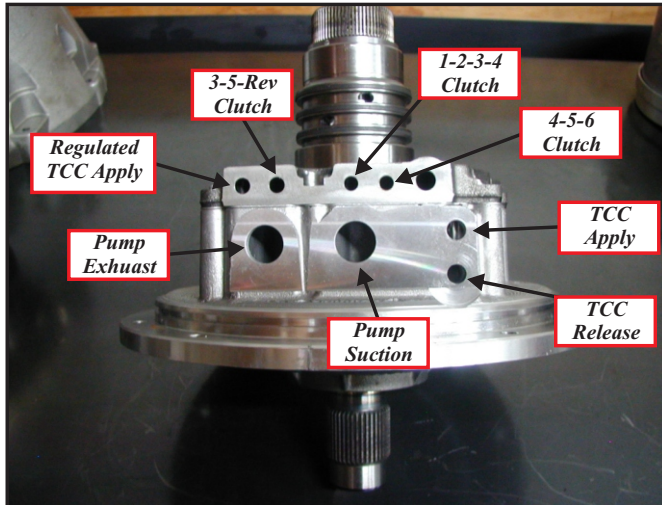


Figure 42

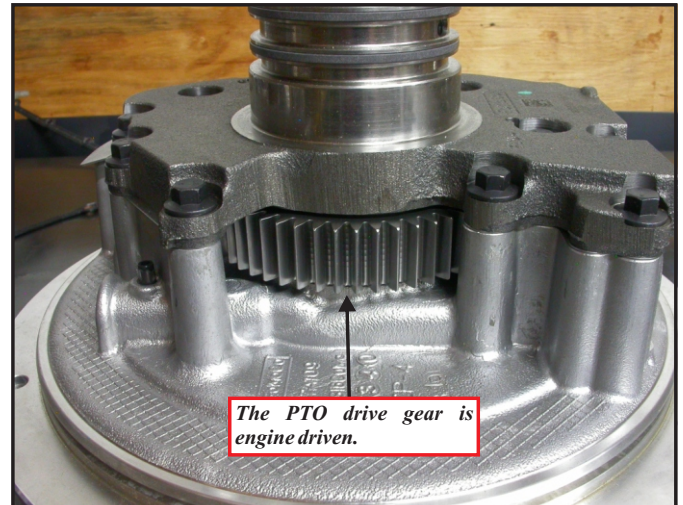


Figure 45

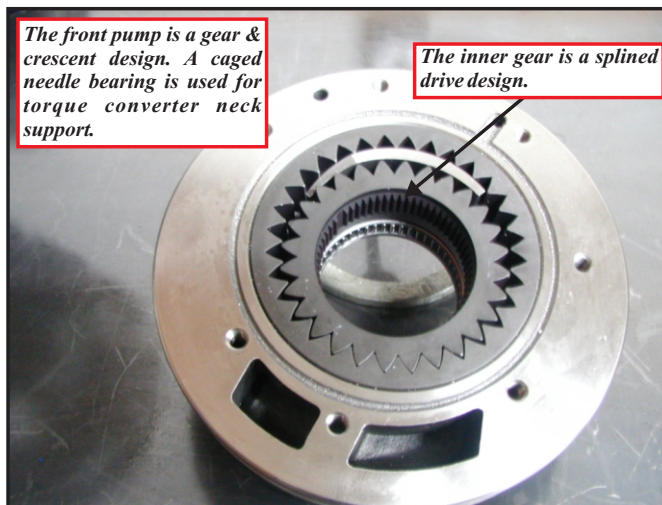


Figure 43

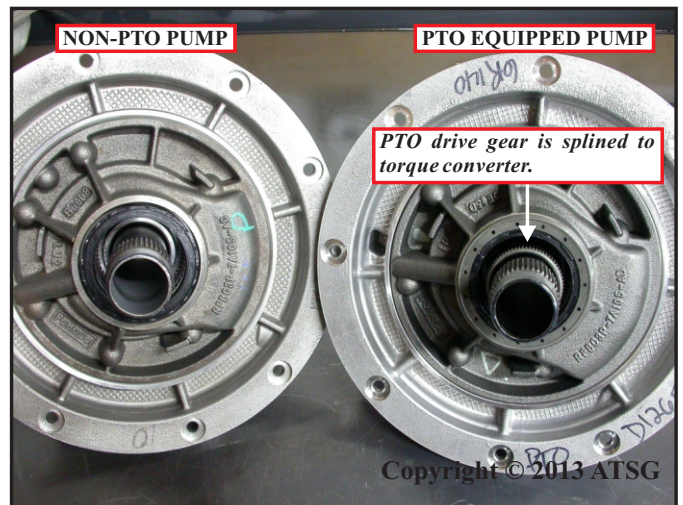


Figure 46

TRANSMISSION ASSEMBLY TIPS

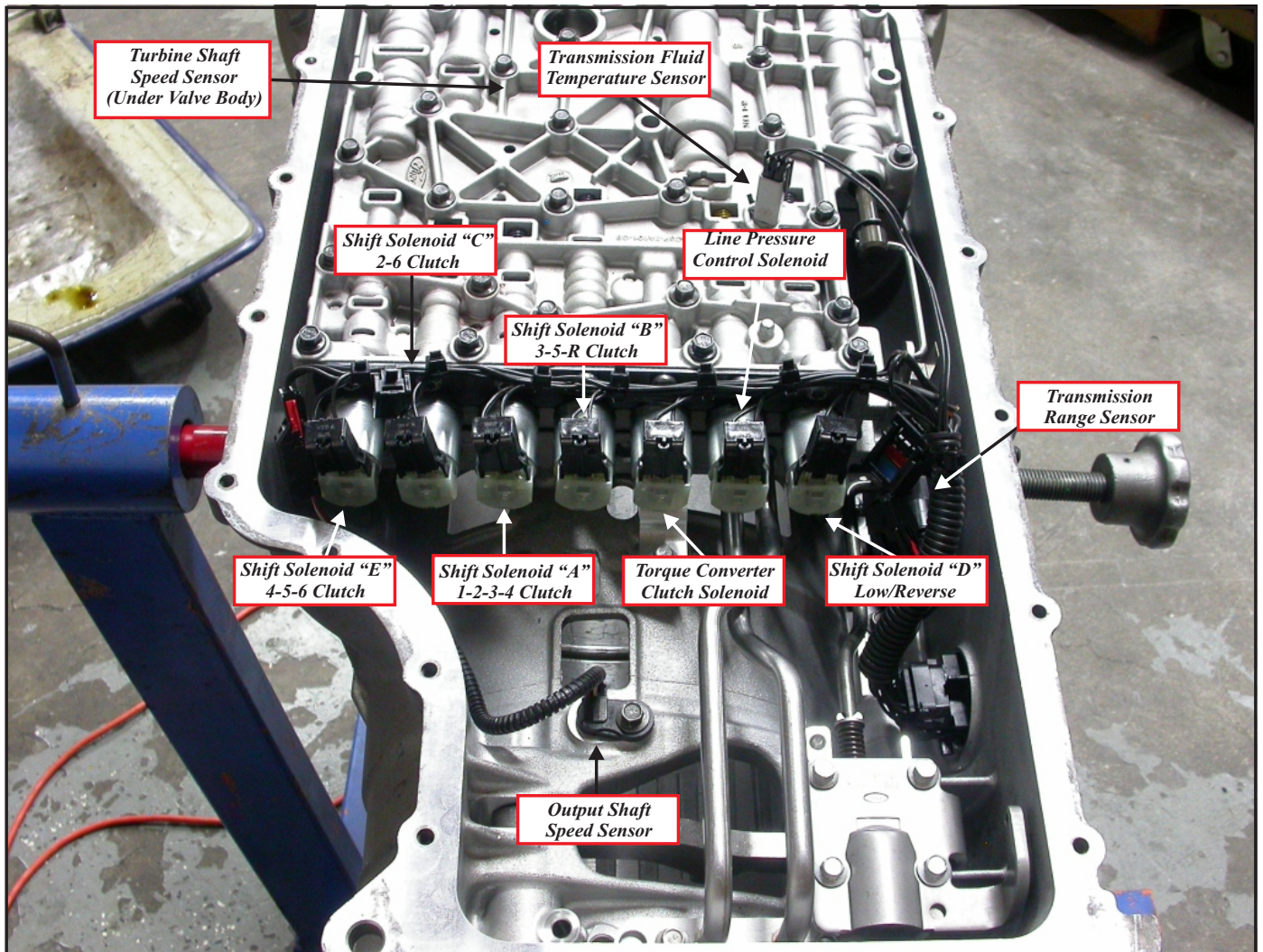


Figure 47

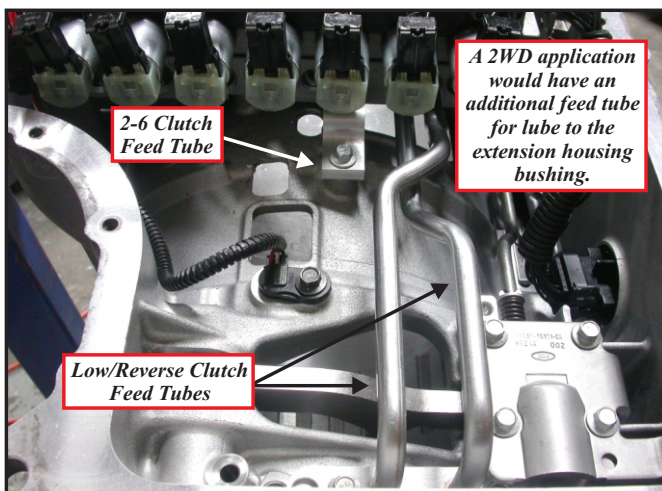


Figure 48

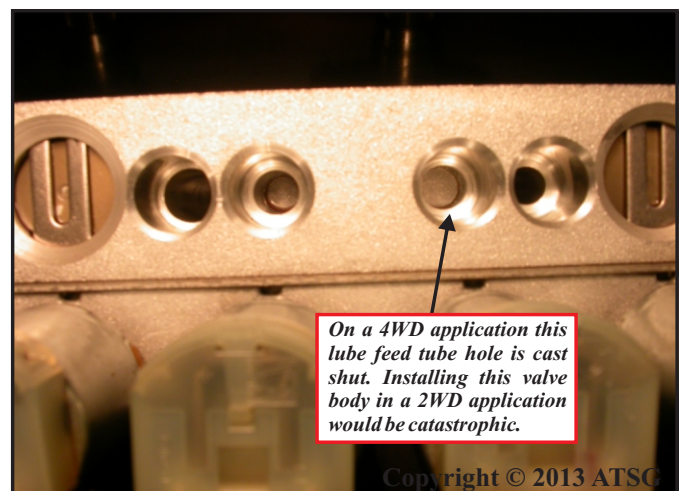


Figure 49

TRANSMISSION ASSEMBLY TIPS

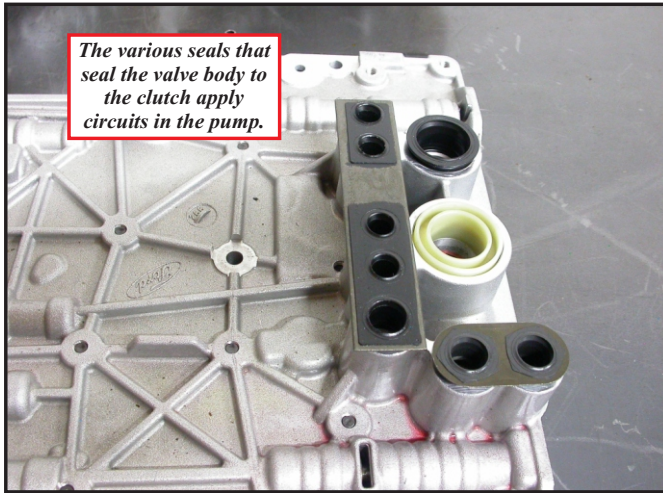


Figure 50

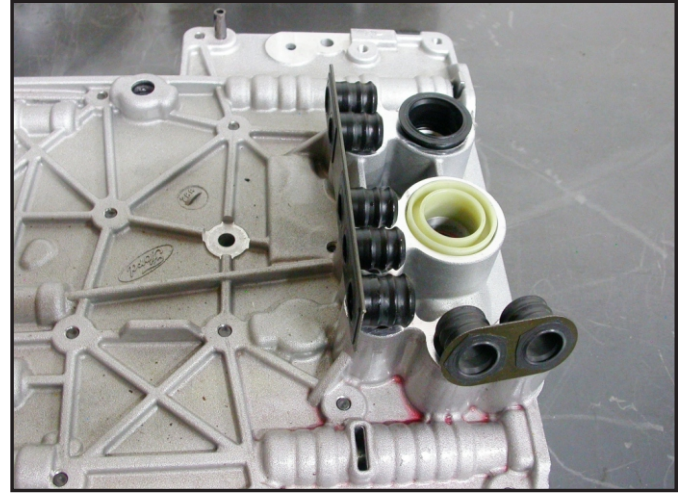


Figure 52

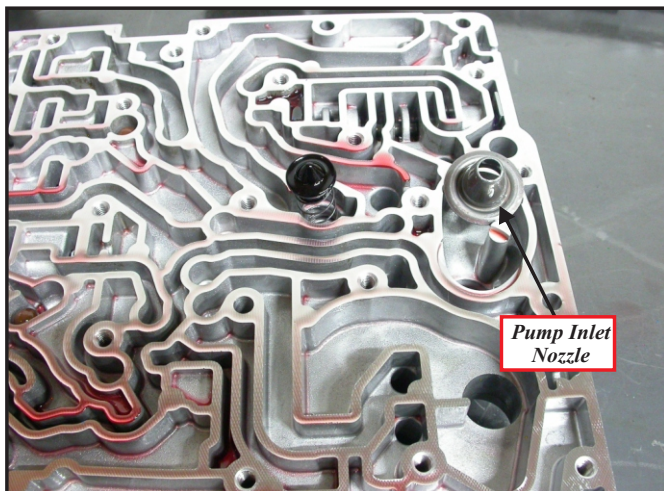


Figure 51

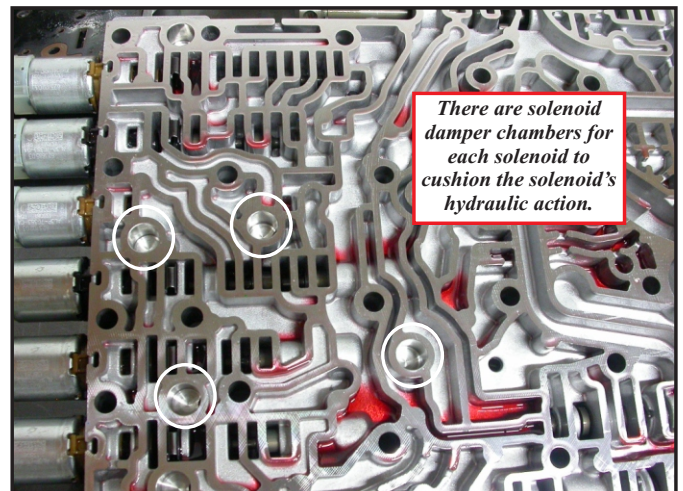


Figure 53

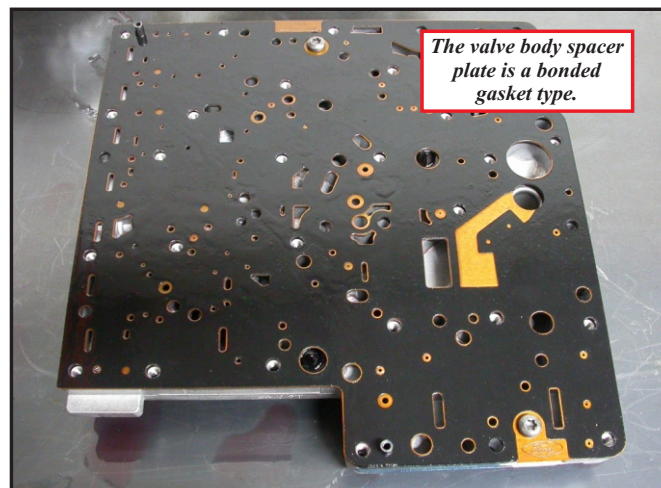
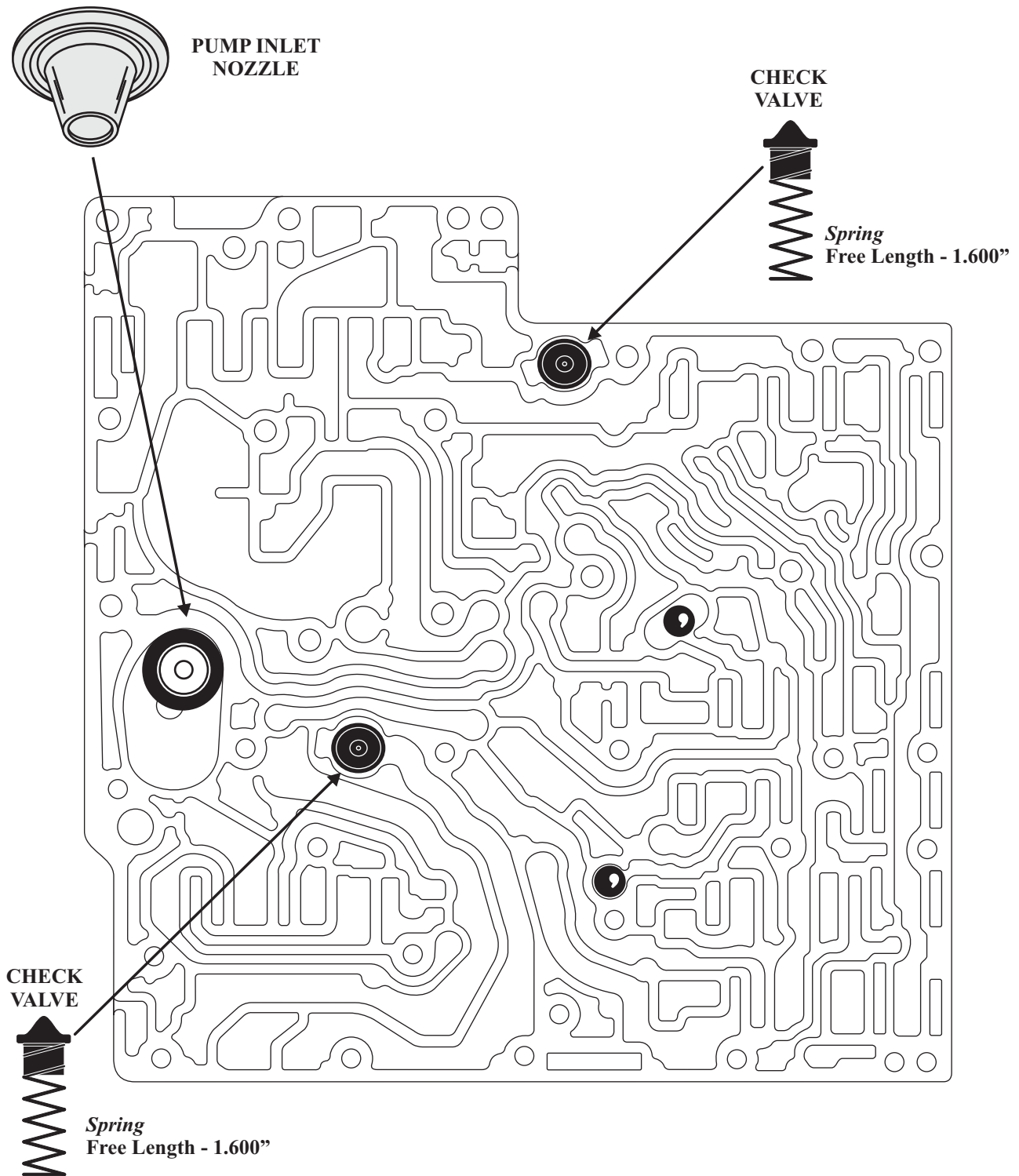


Figure 54

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UPPER VALVE BODY SMALL PARTS LOCATIONS



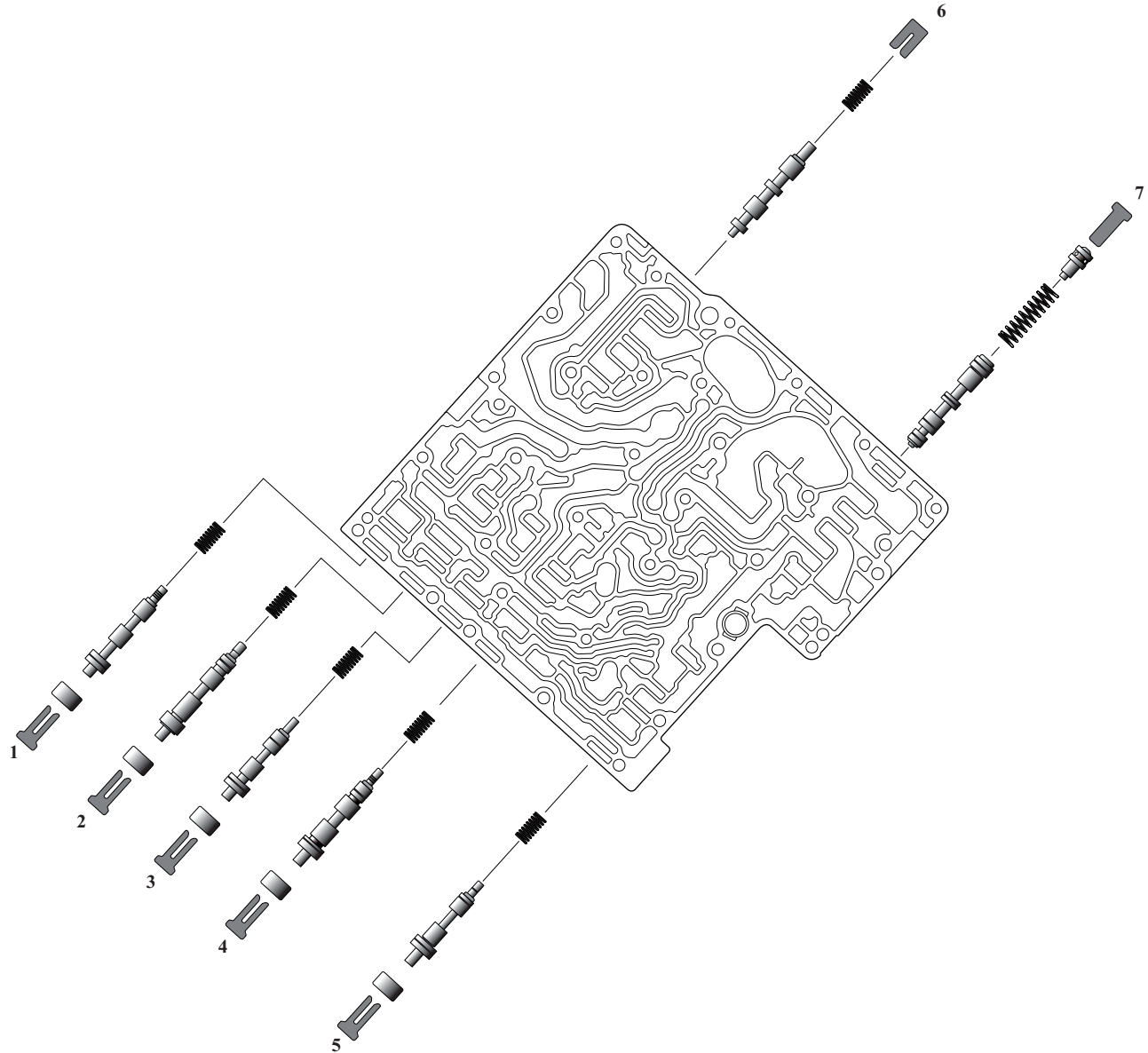
BOTH CHECKBALLS ARE .375\" DIAMETER - PLASTIC

Items With Springs Are Installed With The Spring In First

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Figure 55

UPPER VALVE BODY VALVE IDENTIFICATION

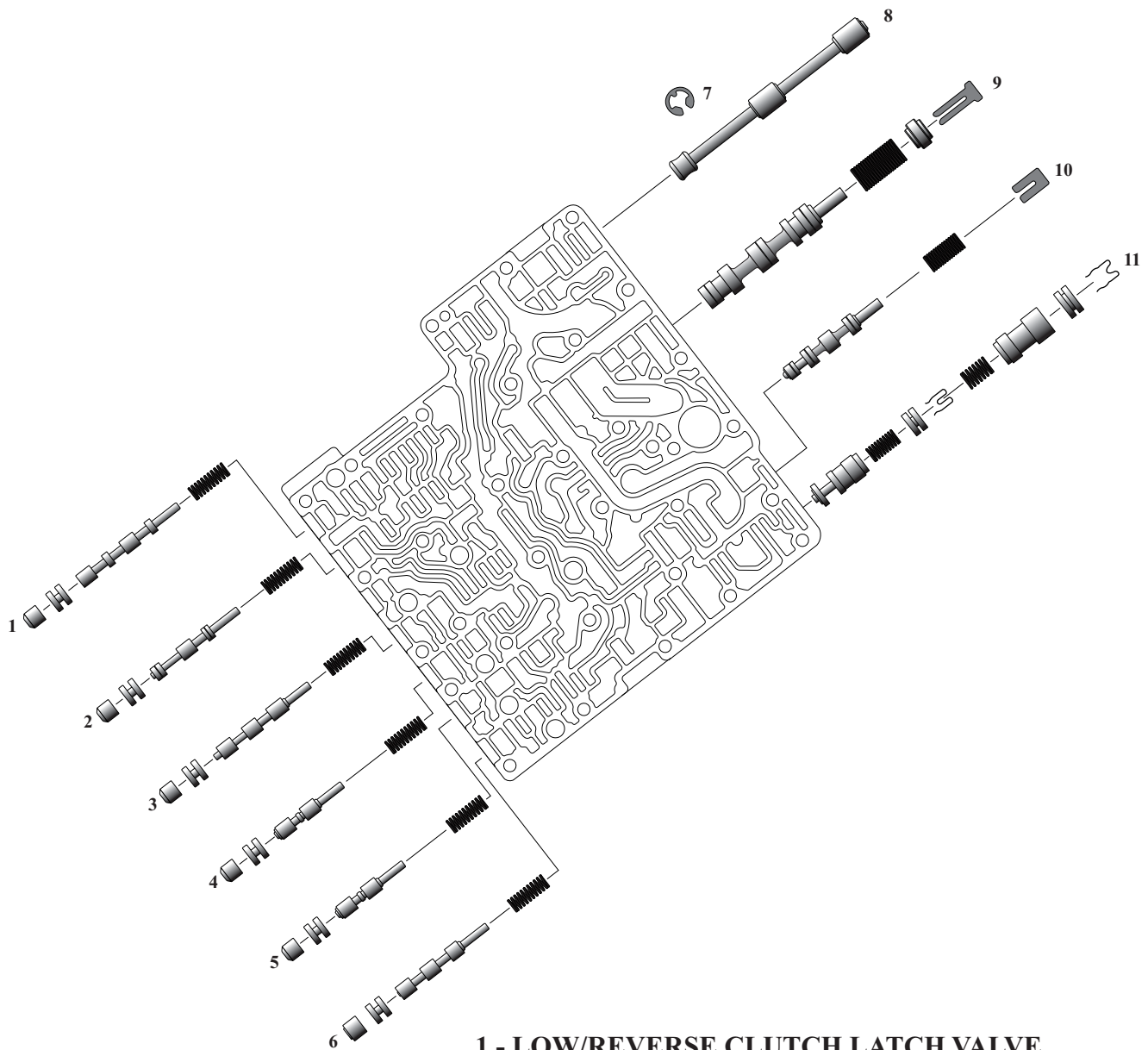


- 1 - OVERDRIVE 4-5-6 CLUTCH REGULATOR VALVE
- 2 - INTERMEDIATE 2-6 CLUTCH REGULATOR VALVE
- 3 - FORWARD 1-2-3-4 CLUTCH REGULATOR VALVE
- 4 - DIRECT 3-5-R CLUTCH REGULATOR VALVE
- 5 - LOW/REVERSE CLUTCH REGULATOR VALVE
- 6 - TORQUE CONVERTER CLUTCH CHARGE CONTROL VALVE
- 7 - TORQUE CONVERTER CLUTCH APPLY REGULATOR VALVE

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Figure 56

LOWER VALVE BODY VALVE IDENTIFICATION



- 1 - LOW/REVERSE CLUTCH LATCH VALVE
- 2 - SOLENOID FEED PRESSURE REGULATOR VALVE
- 3 - DIRECT 3-5-R CLUTCH LATCH VALVE
- 4 - FORWARD 1-2-3-4 CLUTCH LATCH VALVE
- 5 - INTERMEDIATE 2-6 CLUTCH LATCH VALVE
- 6 - OVERDRIVE 4-5-6 CLUTCH LATCH VALVE
- 7 - MANUAL VALVE RETAINING CLIP
- 8 - MANUAL VALVE
- 9 - LINE PRESSURE CONTROL (LPC) VALVE
- 10 - TCC CHARGE LIMIT VALVE
- 11 - COOLER BYPASS VALVE

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Figure 57

CASE PASSAGE IDENTIFICATION

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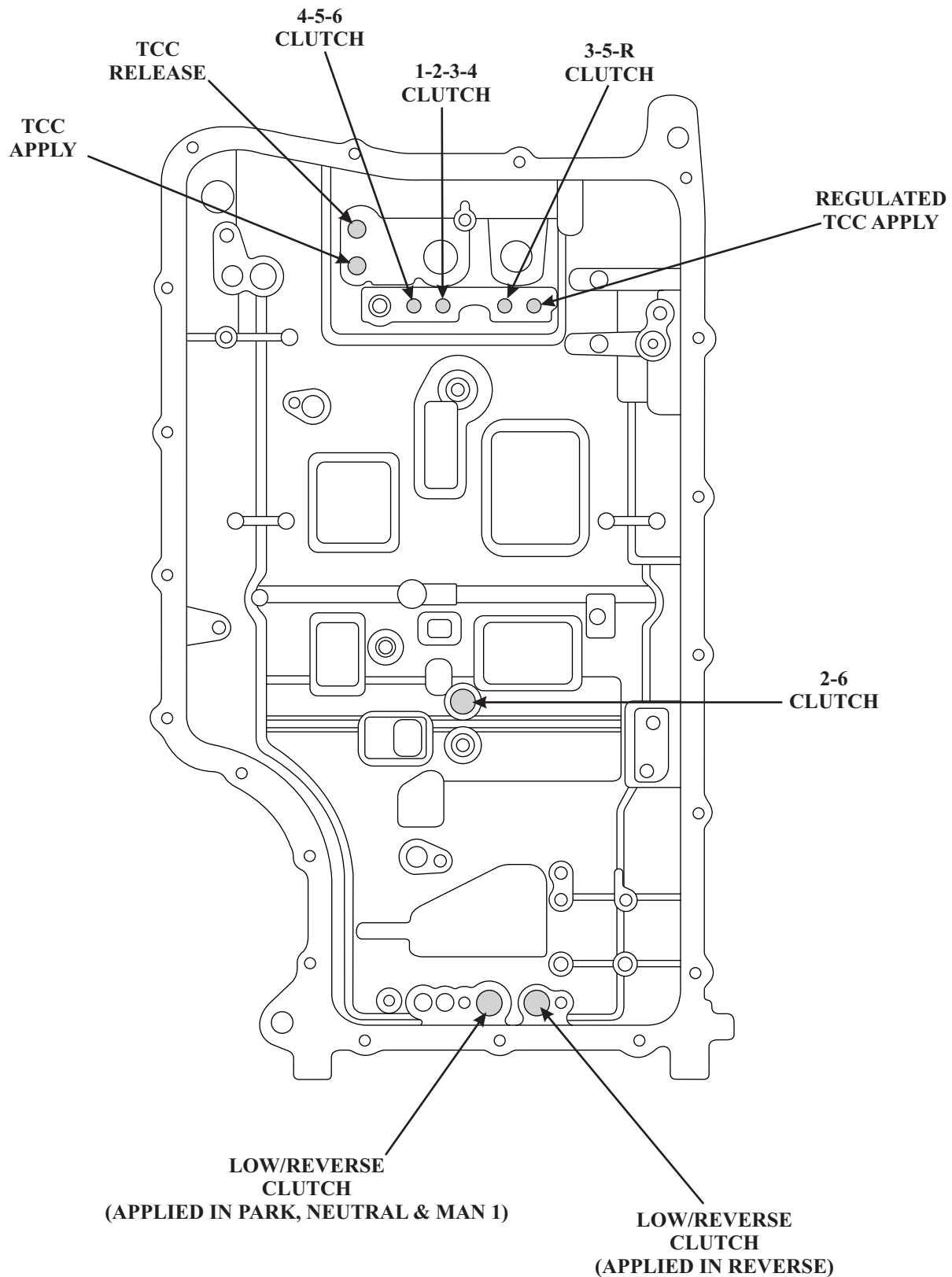


Figure 58