Transmission Type... 6R140W

Rebuilder's Kwik Reference Guide

Clutch Clearances — Adjusted By:

Gas		
Forward (1,2,3,4)	0.006"-0.017"	Snap Rings
Direct (3,5,R)	0.011"-0.022"	Snap Rings
Intermediate (2,6)	0.009"-0.021"	Snap Rings
Overdrive (4,5,6)	0.039"-0.054"	Snap Rings
Diesel		
Forward (1,2,3,4)	0.010"-0.021"	Snap Rings
Direct (3,5,R)	0.008"-0.020"	Snap Rings
Intermediate (2,6)	0.009"-0.021"	Snap Rings
Overdrive (4,5,6)	0.039"-0.054"	Snap Rings
Low/Reverse (1,R)*	1.68"-1.72"	Snap Rings

*The low/reverse specification is a measurement of the height of the low/reverse clutch not the clearance.

Unit Endplays — Location — Selective

Front (0.006"-0.018")	Shims
Rear (0.031"-0.043")	Shims

Torque Specifications

Driveshaft Flange Bolts	76 Lb.-Ft.
Extension Housing Bolts	30 Lb.-Ft.
Inspection Cover Bolts	26 Lb.-Ft.
Line Pressure Tap Plug	97 Lb.-In.
Low/Reverse Piston Assembly Bolt	97 Lb.-In.
Main Control to Transmission Case Bolts	97 Lb. In.
Manual Control Lever Nut	18 Lb. Ft.
Output Shaft Flange Bolt	98 Lb. Ft.
Output Shaft Nut	148 Lb. Ft.
Output Shaft Speed (OSS) Sensor Bolt	97 Lb. In.
Park Pawl Abutment Plate	97 Lb. In.
Park Pawl Pin Plug	26 Lb. Ft.
Selector Lever Cable Bracket Bolts	35 Lb. Ft.
Separator Plate Bolts	97 Lb. In.
Solenoid Retainer Bracket Bolts	97 Lb. In.
Stator Support-to-Pump Housing Bolts	18 Lb. Ft.
Torque Converter Nuts	35 Lb. Ft.
Transfer Case Linkage Bolts	85 Lb. Ft.
Transmission Control Module (TCM)	168 Lb. In.
Transmission Feed Tube-To-Transmission Case Bolts	97 Lb. In.
Transmission Filler Tube Bolt	18 Lb. Ft.
Transmission Fluid Cooler Tube Bolt	18 Lb. Ft.
Transmission Fluid Filter Bolts	97 Lb. In.
Transmission Fluid Pan Drain Plug	159 Lb. In.
Transmission Range (TR) Sensor Detent Spring Bolt	106 Lb. In.
Transmission Support Insulator Studs	55 Lb. Ft.
Transmission-to-Engine Bolts	35 Lb. Ft.
Turbine Shaft Speed (TSS) Sensor Bolts	97 Lb. Ft.

Transmission Type... 6R140W

Clutch Application Chart

Gear	Forward (1,2,3,4)	Direct (3,5,R)	Intermediate (2,6)	Low/Reverse (1,R)	Overdrive (4,5,6)	Low-OWC
Park				H		
Reverse		D		H		
Neutral				H		
1st Gear D	D			H*		H
2nd Gear D	D		H			O/R
3rd Gear D	D	D				O/R
4th Gear D	D				D	O/R
5th Gear D		D			D	O/R
6th Gear D			H		D	O/R
1st Gear Manual	D			H		H
Planetary Components	Front planetary carrier-to-No. 3 sun gear	Front Carrier-to-No. 2 sun gear	No. 2 sun gear	Rear planetary carrier	Input shaft-to-rear planetary carrier	Rear plantary carrier

*Low/Reverse clutch is holding until vehicle reaches 5 mph.

- D=Drive Clutch
- H=Hold Clutch
- O/R = Overrunning

Transmission Type... 6R140W

Solenoid Application

Selector Lever Position	Commanded Gear	Shift Solenoid					TCC NL
		SSA NL (1,2,3,4)	SSB NH (3,5,R)	SSC NL (2,6)	SSD NL (1,R)	SSE NH (4,5,6)	
P	P	OFF	ON	OFF	ON	ON	OFF
R	R	OFF	OFF	OFF	ON	ON	OFF
N	N	OFF	ON	OFF	ON	ON	OFF
D	1	ON	ON	OFF	OFF*	ON	ON/OFF(**)
	2	ON	ON	ON	OFF	ON	ON/OFF(**)
	3	ON	OFF	OFF	OFF	ON	ON/OFF(**)
	4	ON	ON	OFF	OFF	OFF	ON/OFF
	5	OFF	OFF	OFF	OFF	OFF	ON/OFF
	6	OFF	ON	ON	OFF	OFF	ON/OFF
L	L	ON	ON	OFF	ON	ON	OFF

**** Solenoid will change state when vehicle speed is greater than 5 mph.***
***** TCC may be commanded ON early in 1st, 2nd and 3rd gears depending on transmission fluid temperature.***

NH = Normally High
NL = Normally Low

Transmission Type... 6R140W

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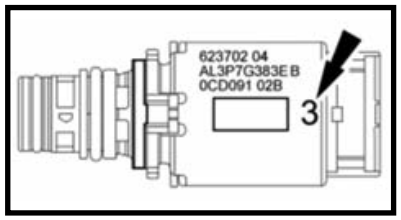
Solenoid ID

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



Solenoid/Clutch	Type
Shift Solenoid A (SSA)/Forward (1,2,3,4)	Normally Low
Shift Solenoid B (SSB)/Direct (3,5,R)	Normally High
Shift Solenoid C (SSC)/Intermediate (2,6)	Normally Low
Shift Solenoid D (SSD)/Low/Reverse (1,R)	Normally Low
Shift Solenoid E (SSE)/Overdrive (4,5,6)	Normally High
Line Pressure Control (LPC) Solenoid	Normally High
Torque Converter Clutch (TCC) Solenoid	Normally Low

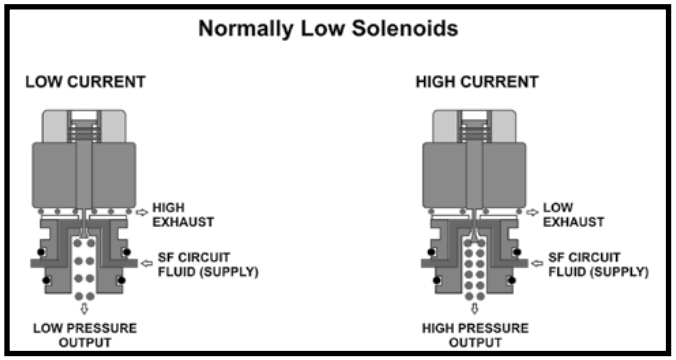


Image Courtesy of ATRA

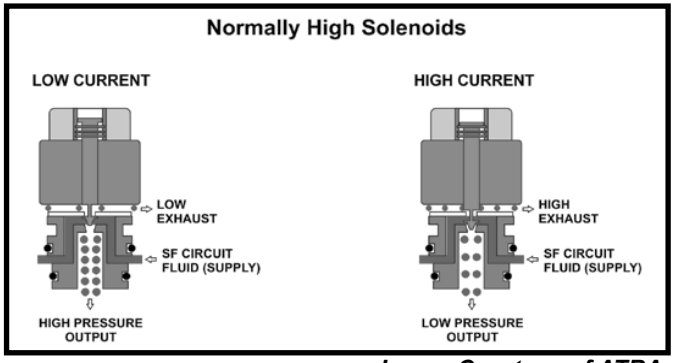


Image Courtesy of ATRA

Transmission Type... 6R140W

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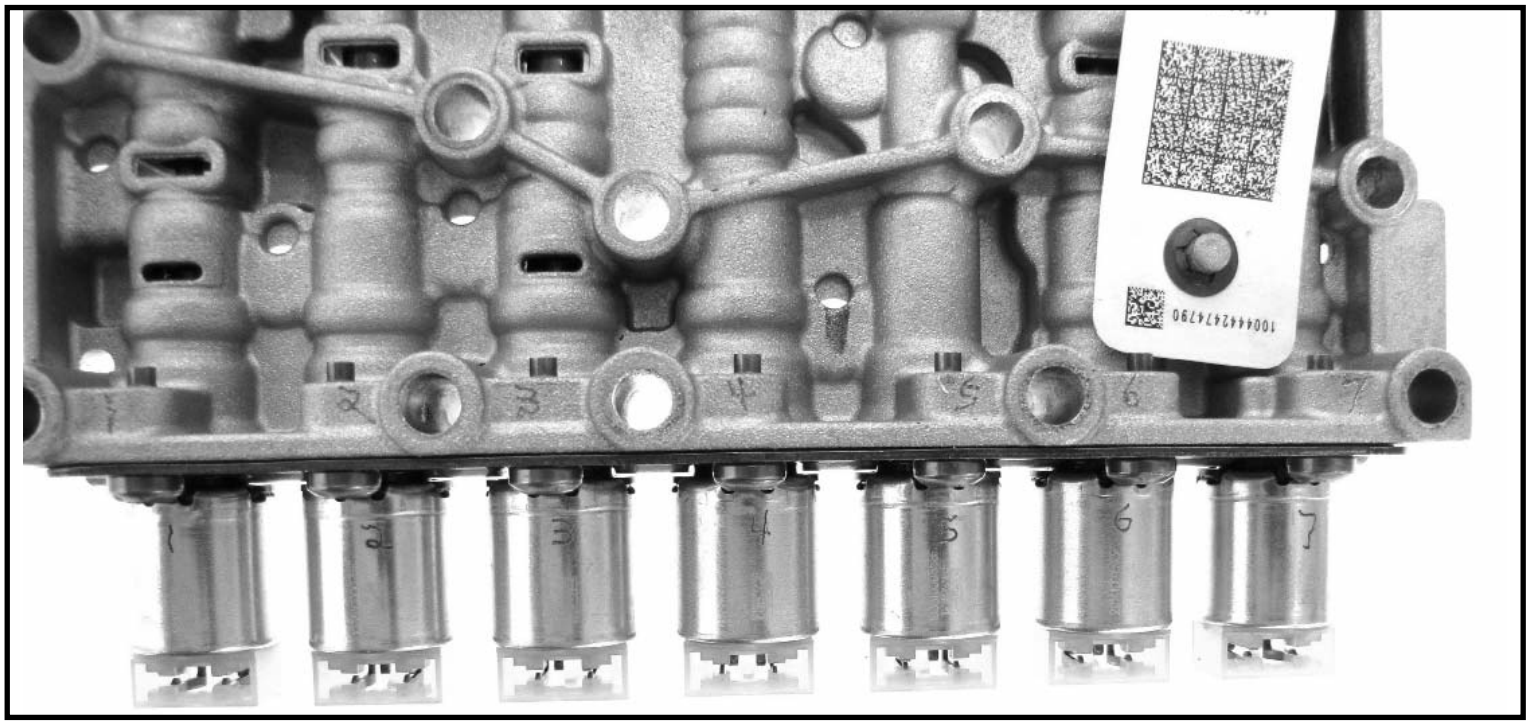
Solenoid ID



Solenoid	Description
1	Shift Solenoid E (SSE) Overdrive Clutch (4,5,6) Clutch, Normally Open
2	Shift Solenoid C (SSC) Intermediate (2,6) Clutch, Normally Closed
3	Shift Solenoid A (SSA) Forward (1,2,3,4) Clutch, Normally Closed
4	Shift Solenoid B (SSB) Direct (3.5,R) Clutch, Normally Open
5	Torque Converter Clutch (TCC) Solenoid, Normally Closed
6	Line Pressure Control (LPC) Solenoid, Normally Open
7	Shift Solenoid D (SSD) Low/Reverse (L,R) Clutch, Normally Closed

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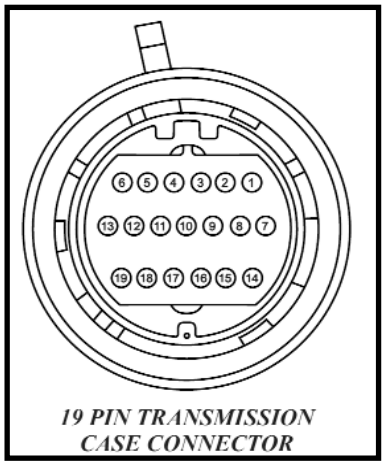
Solenoid Connector Resistance and Gear Ratios



19 PIN TRANSMISSION CASE CONNECTOR

Case Connector Terminal	Circuit Function
1	Transmission Solenoid Power Control 1
2	Transmission Solenoid Power Control 2
3	Shift Control Solenoid "A"
4	Shift Control Solenoid "B"
5	Shift Control Solenoid "C"
6	Shift Control Solenoid "D"
7	Shift Control Solenoid "E"
8	Line Pressure Solenoid Control
9	TCC Solenoid Control
10	Transmission Range Sensor Ground
11	Turbine Speed Sensor Signal
12	TSS, OSS TRS VPWR
13	Transmission Range Sensor Signal
14	Not Used
15	Not Used
16	Not Used
17	Output Shaft Speed Sensor Signal
18	Transmission Temperature Sensor Signal
19	Transmission Temperature Sensor Signal Ground

Gear Ratio	
1st	3.974 to 1
2nd	2.318 to 1
3rd	1.516 to 1
4th	1.149 to 1
5th	0.858 to 1
6th	0.674 to 1
Reverse	3.128 to 1

Pin Number	Solenoid	Resistance
3 and 2	SSA	4.8-5.4 Ω
5 and 2	SSC	4.8-5.4 Ω
7 and 2	SSE	4.8-5.4 Ω
8 and 1	PCA	4.8-5.4 Ω
9 and 1	TCC	4.8-5.4 Ω
4 and 1	SSB	4.8-5.4 Ω
6 and 1	SSD	4.8-5.4 Ω

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Line Pressure

NOTE *ACTUAL AND COMMANDED PRESSURES WILL VARY BASED ON CALIBRATION AND TRANSMISSION ADAPTIVE STRATEGIES. ALL PRESSURES LISTED ARE APPROXIMATE.*

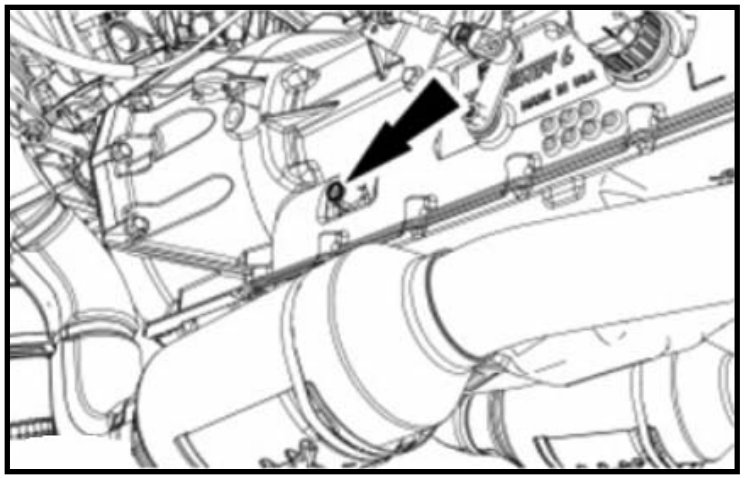
GAS

Gear	Line Pressure - kPa (psi)		Commanded - LPC pressure kPa (psi)*	
	Idle	WOT Stall	Idle	WOT Stall
P, N	619 (90)	-	94 (14)	-
R	619 (90)	1,675 (240)	94 (14)	410 (60)
(D)	619 (90)	1,600 (230)	94 (14)	375 (55)
3	619 (90)	1,230 (180)	94 (14)	275 (40)
2	619 (90)	1,675 (240)	94 (14)	410 (610)
1	619 (90)	1,600 (230)	94 (14)	375 (55)

DIESEL

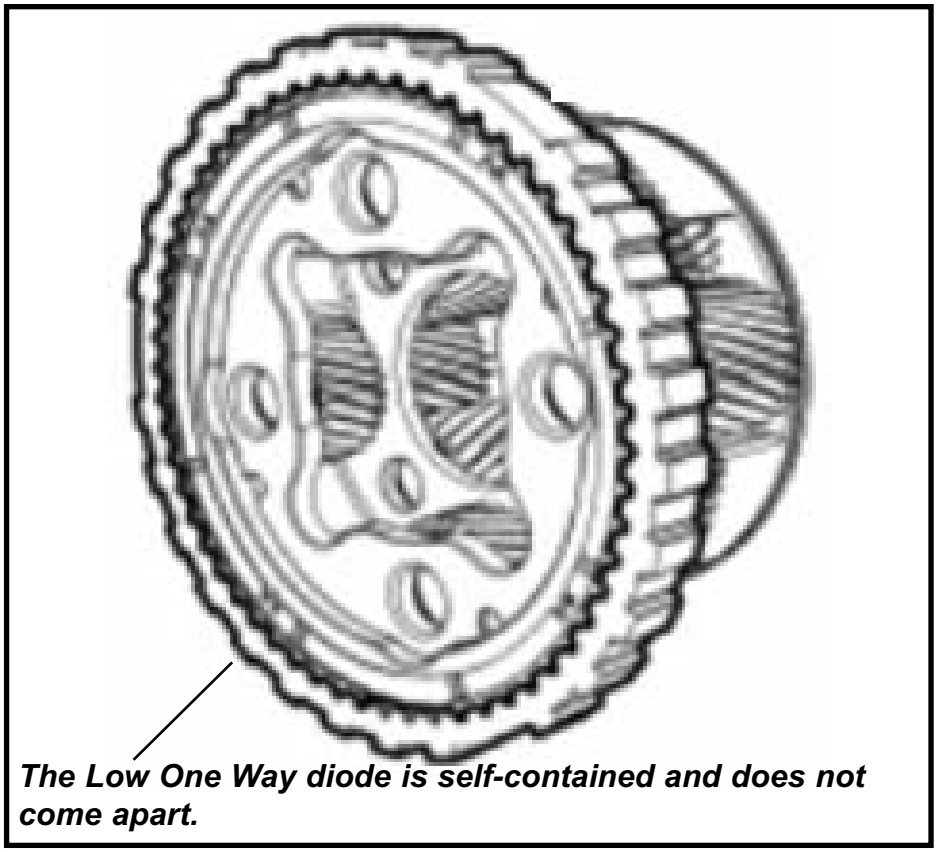
Gear	Line Pressure - kPa (psi)		Commanded - LPC pressure kPa (psi)*	
	Idle	WOT Stall	Idle	WOT Stall
P, N	619 (90)	-	94 (14)	-
R	619 (90)	1,790 (260)	94 (14)	480 (70)
(D)	619 (90)	1,550 (225)	94 (14)	375 (55)
3	619 (90)	1,100 (160)	94 (14)	240 (35)
2	619 (90)	1,650 (235)	94 (14)	410 (60)
1	619 (90)	1,550 (225)	94 (14)	375 (55)

**commanded pressure as viewed on diagnostic equipment*



Test Results	Possible Source
High at Idle - All Ranges	Wiring Harnesses Line Pressure Control (LPC) Solenoid LPC Valve
Low at Idle - All Ranges	Low Fluid Level Fluid Inlet Filter/Seal Main Control Cross Leaks Gaskets Pump Separator Plate
Low in Park ONLY	Main Control
Low in Reverse ONLY	Separator Plate Reverse Clutch Valve Body Forward Clutch
Low in Neutral ONLY	Main Control
Low in Drive ONLY	Low/Reverse (1,R) Clutch Forward (1,2,3,4) Clutch Main Control
Low in Manual 2nd ONLY	Forward (1,2,3,4) Clutch Intermediate (2,6) Cluch Main Control
Low in Manual 1st ONLY	Low/Reverse (1,R) Clutch Forward (1,2,3,4) Clutch Main Control

Sprag Rotation



The Low One Way diode is self-contained and does not come apart.

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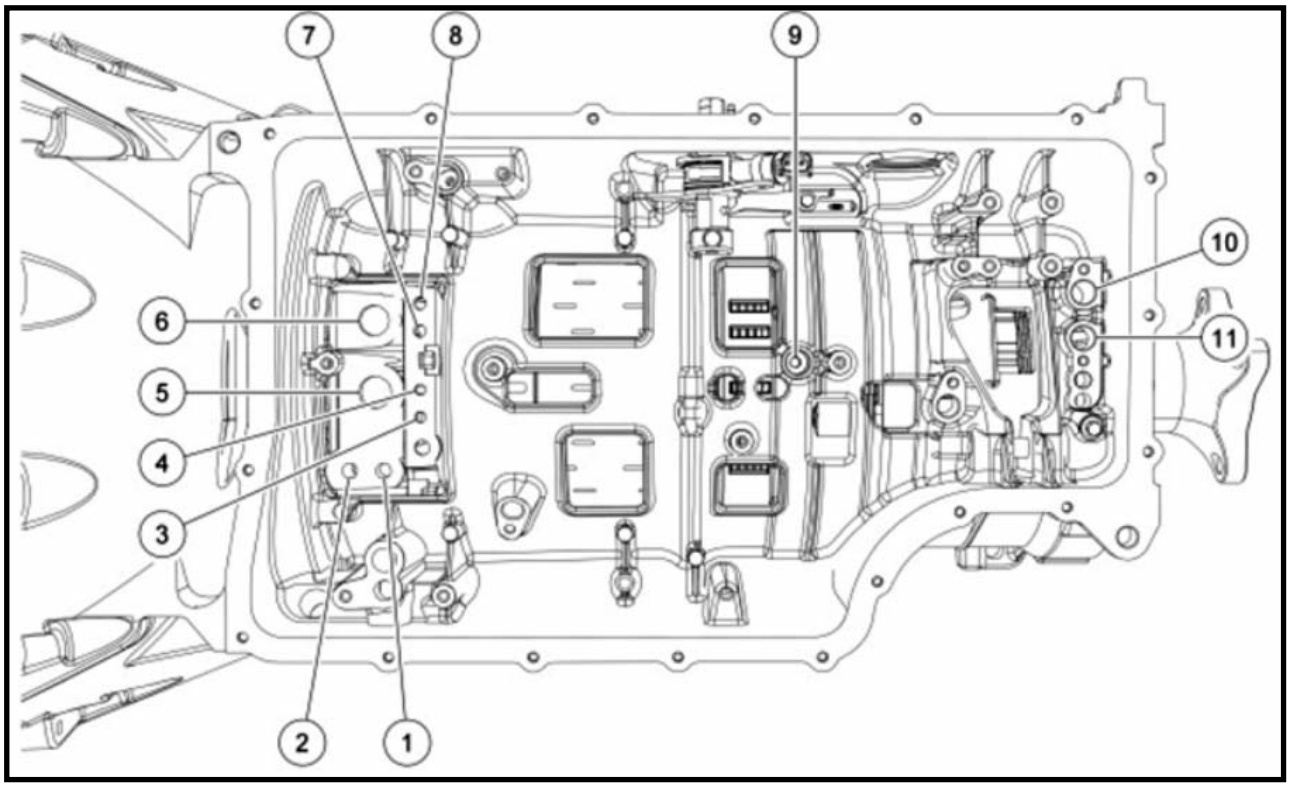
Air Pressure Test/Locations



Item	*Description*
1	*Converter Inlet*
2	*Converter Outlet*
3	*Overdrive Clutch*
4	*Forward Clutch*
5	*Pump Inlet*
6	*Pump Outlet*
7	*Direct Clutch*
8	*Torque Converter Clutch*
9	*Intermediate Clutch*
10	*Low/Reverse Dynamic*
11	*Low/Reverse Static*

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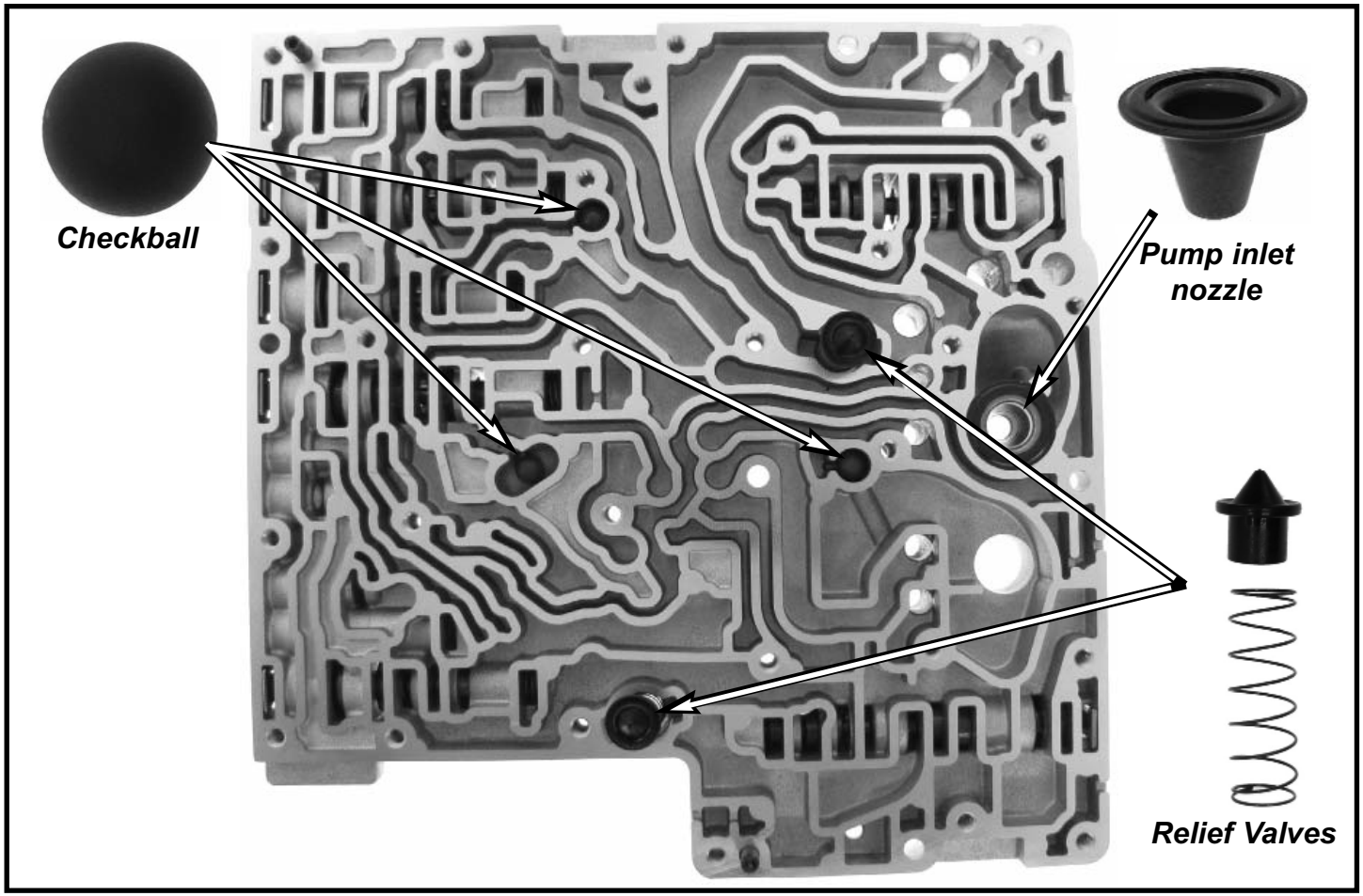
Checkball Locations



Images Courtesy of ATRA

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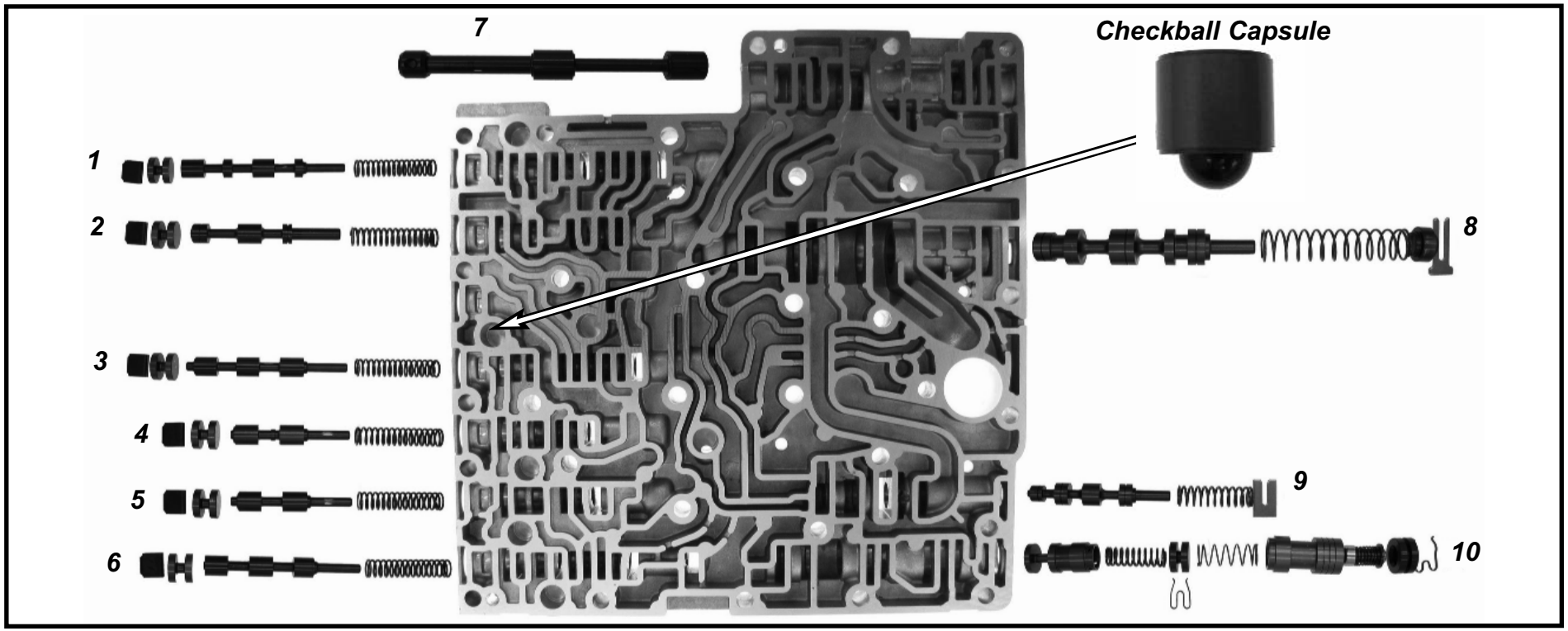
Lower Valve Body



Images Courtesy of ATRA

1	Low/Reverse 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
8	Line Pressure Regulator Valve
9	TCC Charge Limit Valve
10	Cooler Bypass Valve

Transmission Type... 6R140W

Upper Valve Body

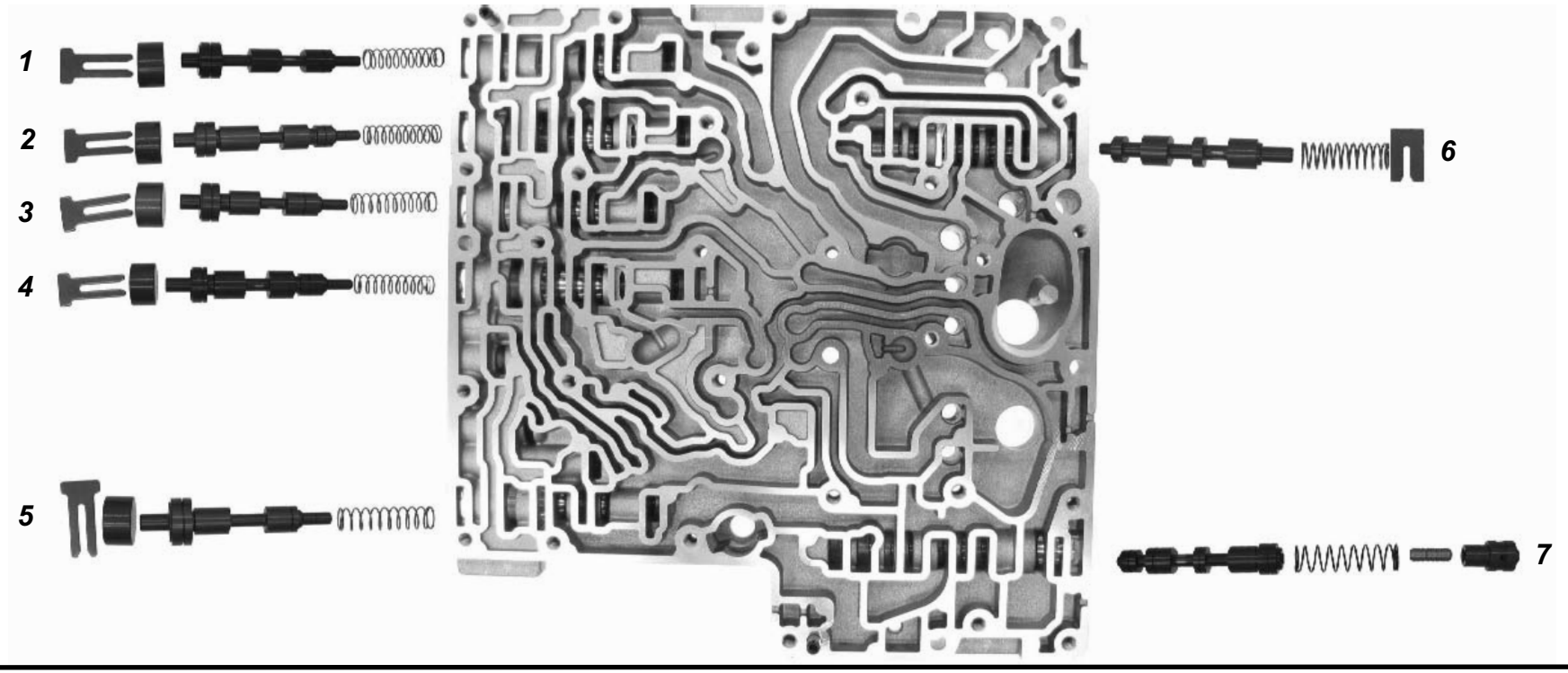


Image Courtesy of ATRA

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 (TCC) Regulator Valve
7	TCC Apply Regulator Valve

Transmission Type... 6R140W

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Valve Body Removal

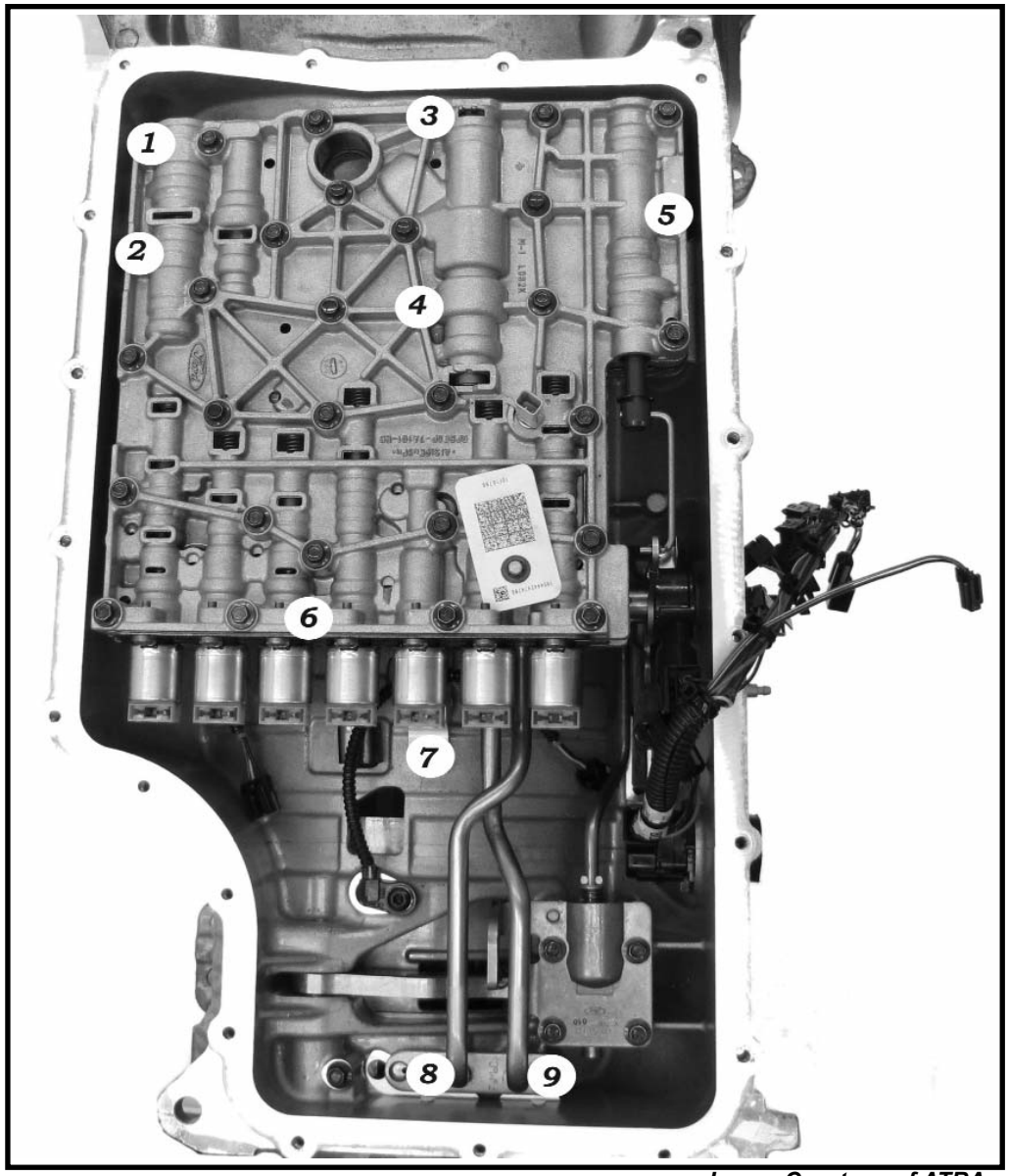

Image Courtesy of ATRA

NOTE

To Remove the Valve Body, you will need to remove the 9 bolts indicated on this picture.

New 06/14

Transmission Type... 6R140W

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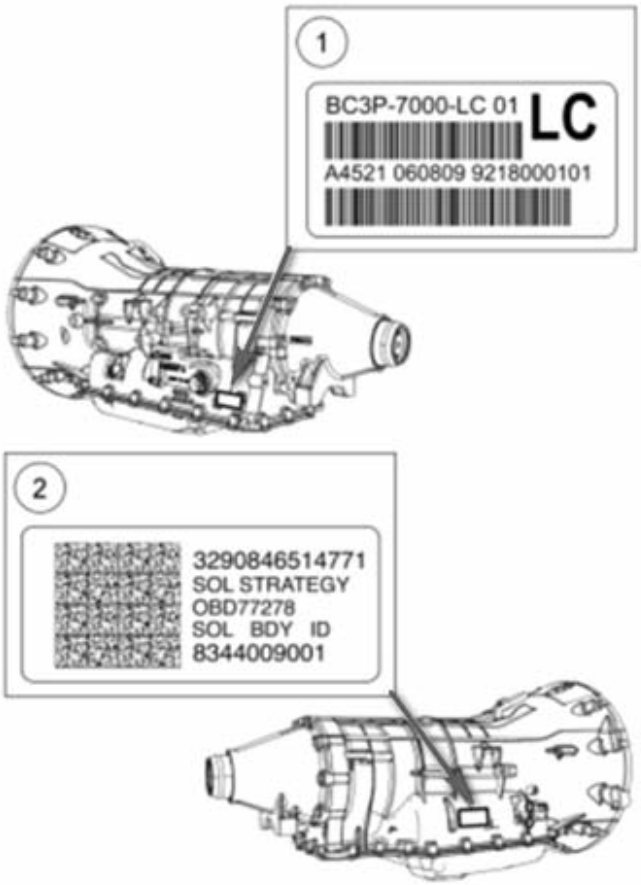
Technical Tips-Solenoid Strategy

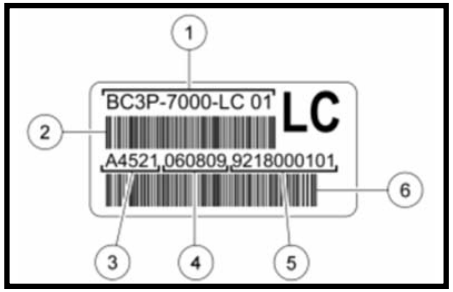
The solenoid body strategy is a file programmed into the PCM or TCM to control the shift, Line Pressure Control (LPC) and TCC solenoids to improve shift quality. The solenoid body tag on the transmission case contains the 13-digit solenoid body strategy and the 8-digit solenoid body identification.

Transmission Identificaton Tag

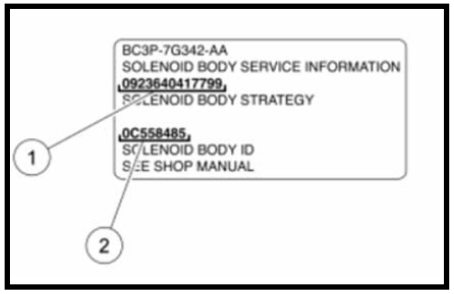


Solenoid Body Identification Tag

Anytime a new main control is installed, a new solenoid body strategy file is downloaded into the PCM or TCM using the scan tool. A replacement solenoid body tag is supplied with the new solenoid body which contains the 13-digit solenoid body strategy and the 8-digit solenoid body identification. The new tag is placed over the original solenoid body tag.



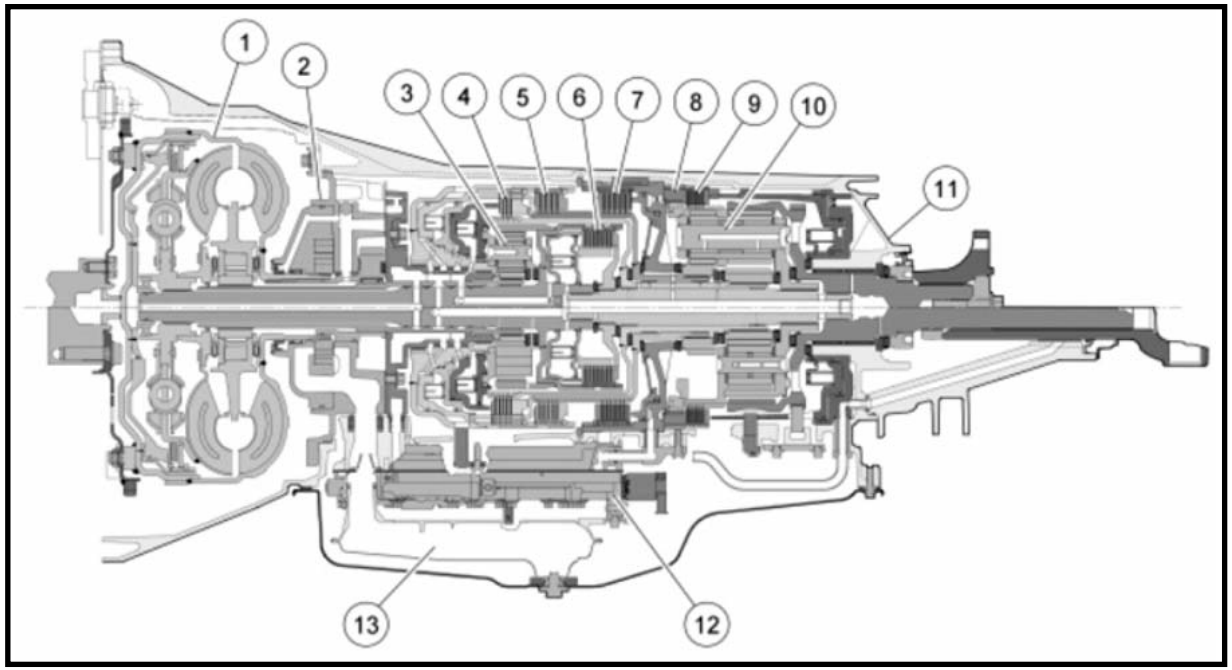
Item	Description
1	Transmission Part Number
2	Bar Code 1
3	Assembly Plant Line Shift
4	Transmission Build Date (DDMMYY)
5	Transmission Serial Number
6	Bar Code 2



If the solenoid body strategy printed on the tag on the solenoid body does not match the solenoid body tag on the side of the transmission case, a new main control must be installed and the solenoid body strategy must be downloaded into the PCM or TCM or harsh shifts will result.

Transmission Type... 6R140W

Technical Tips-Transmission Components



Item	Description
1	Torque Converter
2	Pump Assembly
3	Front Planetary Gearset
4	Forward (1,2,3,4) Clutch
5	Direct (3,5,R) Clutch
6	Overdrive (4,5,6) Clutch
7	Intermediate Clutch (2,6)
8	Low/One-Way Clutch (OWC) (part of 7G224)
9	Low/Reverse (1,R) Clutch
10	Rear Planetary Gearset
11	Transmission Case
12	Main Control Assembly
13	Transmission Fluid Filter