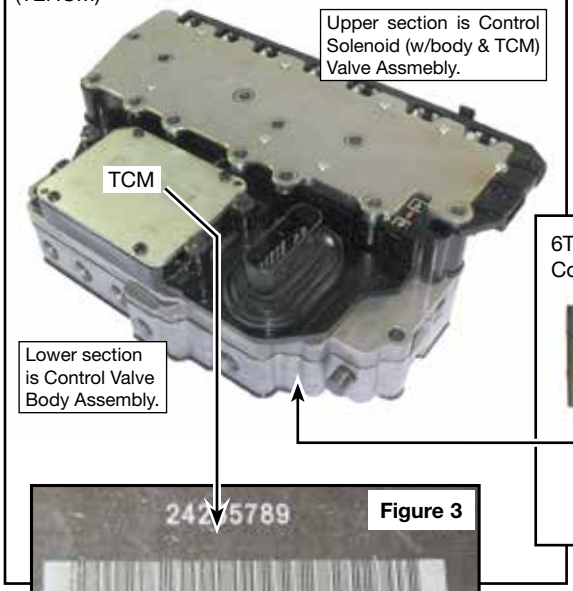
GM 6T40 (GEN. 2), 6T45 (GEN. 2), 6T50 (GEN. 2) ZIP KIT®

PART NUMBER 6T40-GEN2-ZIP **INSTALLATION & TESTING BOOKLET**

6T40 Generation 1, Transmission Electro-Hydraulic Control Module (TEHCM) **Figure 1**



Valve Body Identification

Confirm Generation

This Zip Kit works in Generation 2 6T40 series valve bodies. To identify core as Generation 1 versus Generation 2, check for presence of 4-5-6 clutch boost valve in control valve body assembly (**Figures 1 & 2**).

Also check the Transmission Control Module (TCM) identifier (**Figures 3 & 4**). The control valve body assembly and TCM must be of the same generation.

6T40 Generation 2 Control Valve Body Assembly **Figure 2**

Generation 1 - No 4-5-6 clutch boost valve
Generation 2 - Has 4-5-6 clutch boost valve

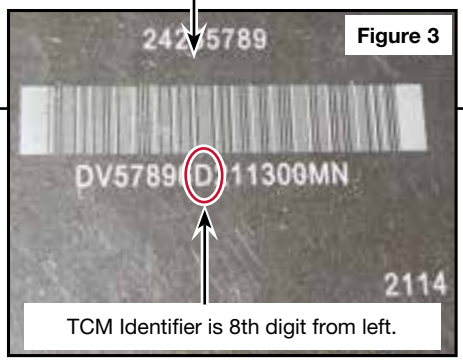


Figure 3

TCM Identifier is 8th digit from left.

TCM Identifier **Figure 4**

Generation 1	1 or 2 or 3
Generation 2	B or C or D

Adaptive Learning

The 6T40, 6T45 and 6T50 are equipped with several adaptive learning strategies. After valve body service the existing adaptive values will need to be erased. Then, a "Fast Learn" process should be performed. Reference GM material for proper "Fast Learn" process.

Solenoids

The Generation 2 6T40, 6T45 and 6T50 solenoids are a mix of normaly-high and normaly-low type. These are calibrated at the factory and switching solenoids between locations in the control solenoid (w/body and TCM) valve assembly should be avoided.

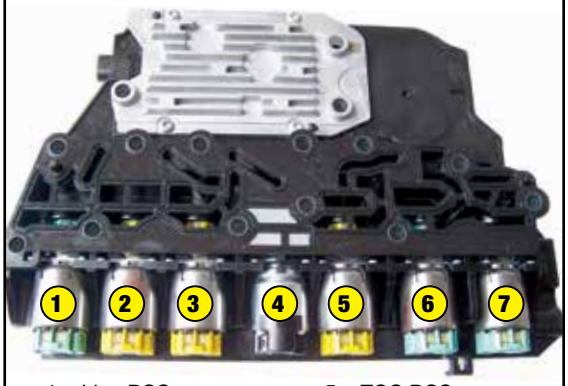
Solenoid & Clutch Apply Chart

Figure 5

Range/Gear		Shift Solenoid	1-2-3-4 CL PC Sol N.H.	2-6 CL PC Sol N.L.	3-5 Rev. CL PC Sol N.L.	Low Rev. 4-5-6 CL PC Sol N.H.	4-5-6 Clutch	3-5 Reverse Clutch	2-6 Clutch	Low & Rev. CL (OWC)	Low & Rev. Clutch	1-2-3-4 Clutch
Park		On	On	Off	Off	Off					Applied*	
Reverse		On	On	Off	On	Off		Applied			Applied	
Neutral		On	On	Off	Off	Off					Applied*	
Drive	**1st Braking**	On	Off	Off	Off	Off				Holding†	Applied	Applied
	1st	Off	Off	Off	Off	On				Holding		Applied
	2nd	Off	Off	On	Off	On			Applied			Applied
	3rd	Off	Off	Off	On	On		Applied				Applied
	4th	Off	Off	Off	Off	Off	Applied					Applied
	5th	Off	On	Off	On	Off	Applied	Applied				
	6th	Off	On	On	Off	Off	Applied		Applied			

NOTE: For shift solenoids, "ON" = solenoid energized (pressurized), "OFF" = solenoid de-energized (no pressure). For pressure control (PC) solenoids, "ON" = pressurized, "OFF" = no pressure. *Applied with no load. †Holding but ineffective.

6T40 Generation 2 Solenoid Locations **Figure 6**



1. Line PCS
2. 2-6 PCS
3. 3-5 Reverse PCS
4. Shift Solenoid
5. TCC PCS
6. 1-2-3-4 PCS
7. L/R 4-5-6 PCS

- Pressure Control Solenoid (PCS) 3-5 ohms at 70ºF
- Shift Solenoid 16-20 ohms at 70ºF

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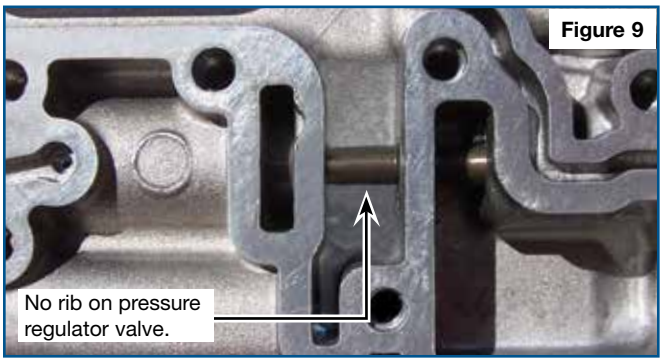
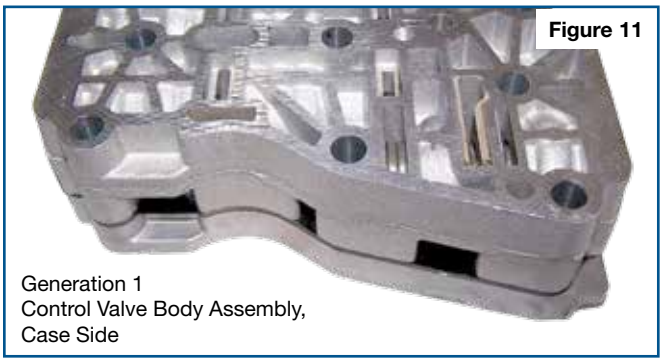
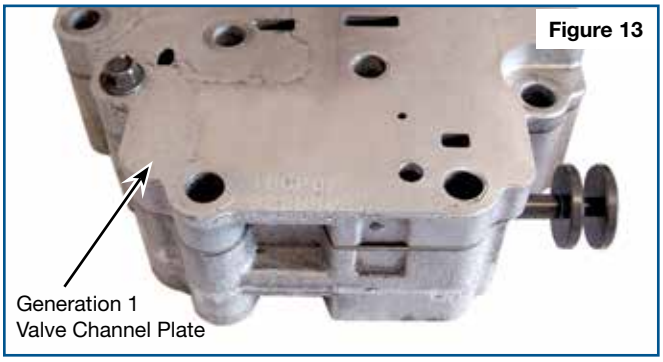
Additional Identification Information

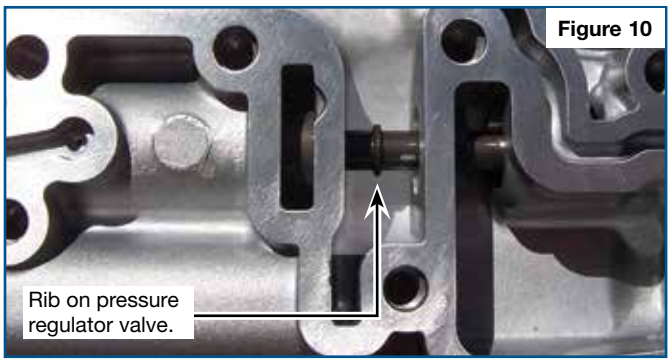
Generation 1

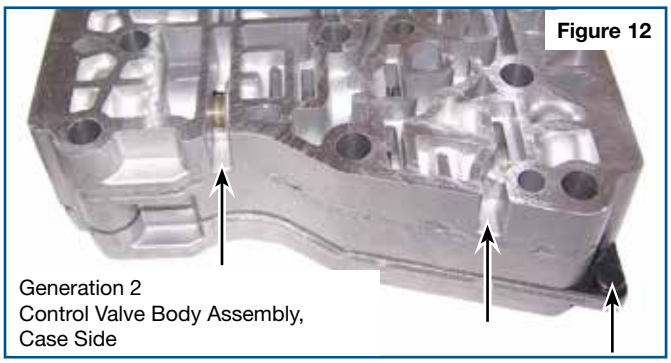


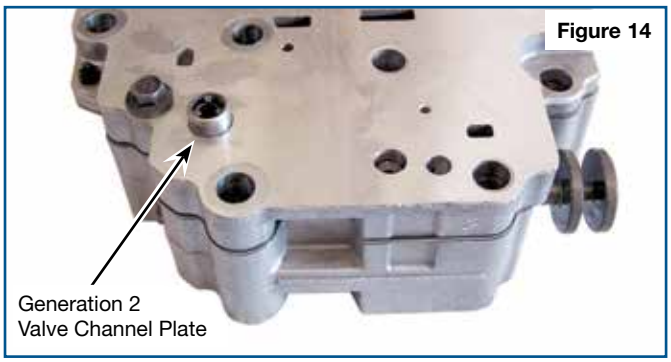




Generation 2







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Additional Identification Information

Generation 1

Figure 15

Generation 1, Control Solenoid (w/body and TCM) Valve Assembly

Figure 17

Generation 1, Control Solenoid (w/body and TCM) Valve Assembly: 4 Pressure Switches

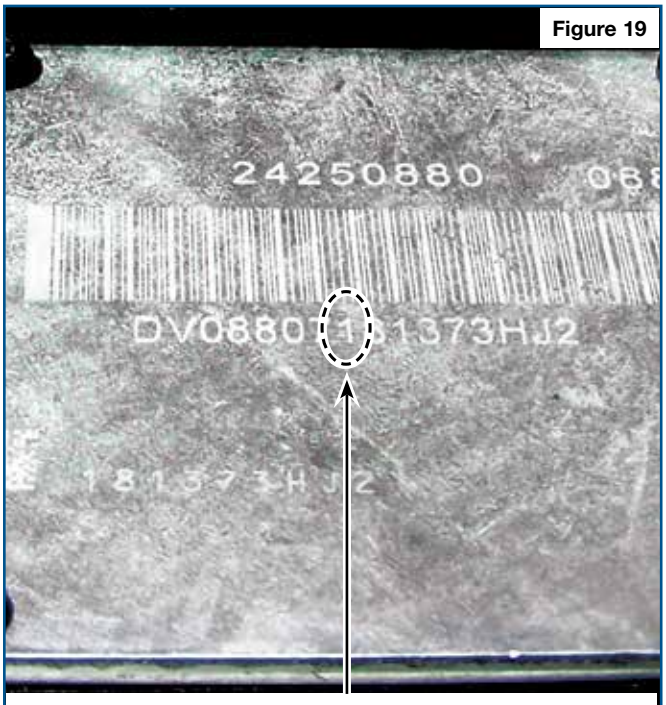


Figure 19

Generation 1, TCM Identification Number:
Middle number under bar code starts with 1, 2 or 3.

Generation 2

Figure 16

Generation 2, Control Solenoid (w/body and TCM) Valve Assembly, Beaded gasket and screen changed. Solenoid caps changed color.

Figure 18

Generation 2 Control Solenoid (w/body and TCM) Valve Assembly : No Pressure Switches

Figure 20

Generation 2, TCM Identification Number:
Middle number under bar code starts with B, C or D.

Figure 21

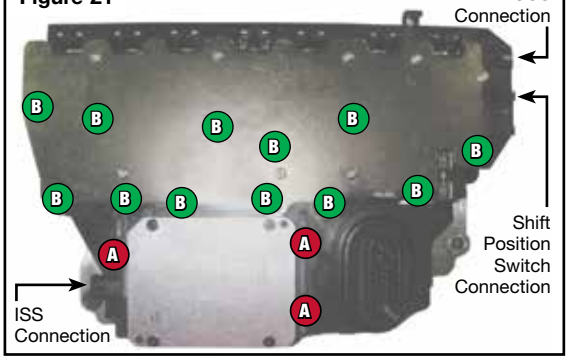
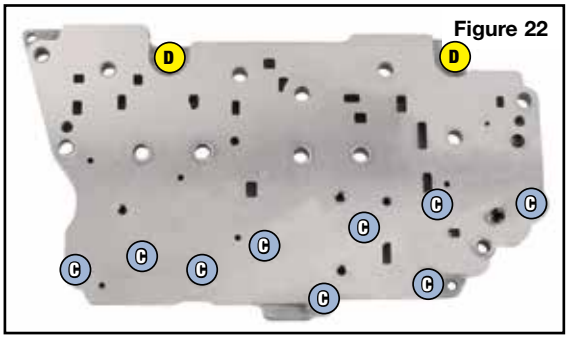


Figure 22



Removal Bolts

Figure 23

Bolt Color Code		Bolt Length	Quantity	Torque Specification
A	Red	40.5mm	3	71 in-lb
B	Green	30mm	12	106 in-lb
C	Blue	60mm	9	97 in-lb
D	Yellow	53mm	2	97 in-lb

Figure 24

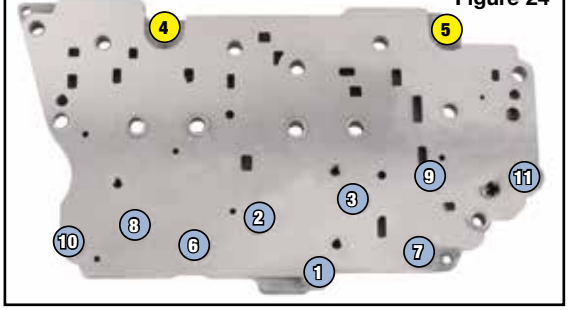


Figure 25

Zip Kit Instructions

1. TEHCM Removal from Case

a. Disconnect the input speed sensor, output speed sensor and shift position switch connectors from valve body.

b. Remove the three control solenoid (w/body and TCM) valve assembly bolts, 40.5mm long (**Figure 21 & 23**).

c. Remove the 12 control solenoid (w/body and TCM) valve assembly bolts, 30mm long (**Figure 21 & 23**).

d. Remove the control solenoid (w/body and TCM) valve assembly from valve body.

e. Remove the nine control valve body assembly bolts, 60mm long (**Figure 22 & 23**).

f. Remove the two control valve body assembly bolts, 53mm long (**Figure 22 & 23**).

g. Remove the control valve body assembly from the case.

2. Installation

Install Zip Kit parts as shown on diagram of separate quick guide sheet included in this Zip Kit. Sonnax recommends vacuum testing critical wear areas not covered by this kit to determine whether additional Sonnax parts are required (see page 3).

3. TEHCM Reinstall into Case

a. Install control valve body assembly into case and secure with (2x) 53mm and (9x) 60mm bolts until finger-tight (**Figure 22**).

b. Tighten to 97 in-lbs of torque in the indicated sequence (**Figure 24**).

c. Install control solenoid (w/body and TCM) valve assembly to control valve body assembly with (12x) 30mm and (3x) 40.5mm bolts until finger-tight (**Figure 21**).

d. Tighten (12x) 30mm bolts to 106 in-lb of torque in the indicated sequence (**Figure 25**).

e. Tighten the (3x) 40.5mm bolts to 71 in-lb torque in the indicated sequence.

f. Reconnect the input speed sensor, output speed sensor and shift position switch connectors (**Figure 21**).

Figure 26

NOTE: Control solenoid (w/body and TCM) valve assembly shown is a Gen. 2 (TCM identifier barcode, **Figure 4**).

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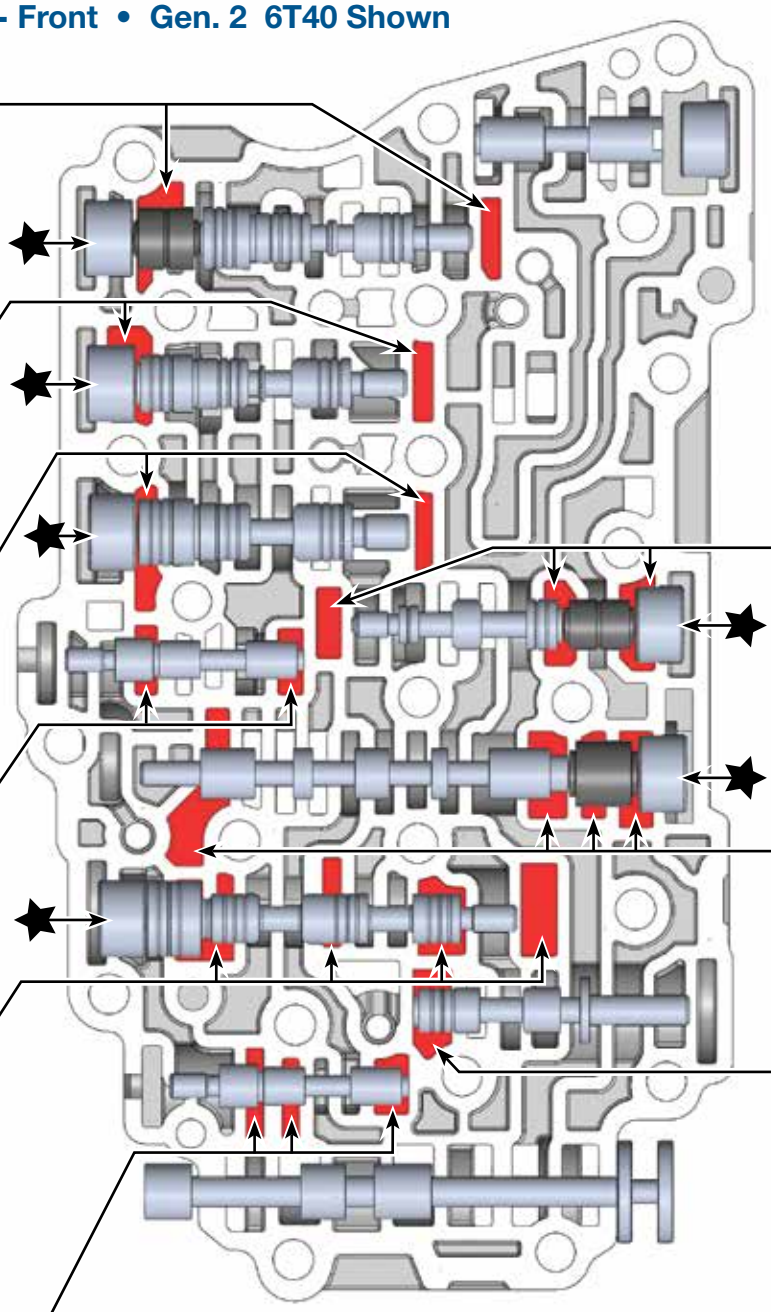
Critical Wear Areas & Vacuum Test Locations

NOTE: OE valves are shown in rest position and should be tested in rest position unless otherwise indicated. Test locations are pointed to with an arrow. Springs are not shown for visual clarity. Low vacuum reading indicates wear and Sonnax parts noted for replacement.

Control Valve Body – Front • Gen. 2 6T40 Shown



3-5 Reverse Clutch Regulator Valve
- Burnt 3-5 Reverse clutch
- Delayed Reverse
- 3rd & 5th Shift complaints
- 2-3 & 4-5 Shift flare

2-6 Clutch Regulator Valve
- Burnt 2-6 clutch
- 2nd & 6th Shift complaints
- 1-2 & 5-6 Shift flare

1-2-3-4 Clutch Regulator Valve
- Burnt 1-2-3-4 clutch
- Delayed Forward
- 1-2-3-4 Shift complaints

1-2-3-4 Clutch Boost Valve
- Burnt 1-2-3-4 clutch
- Delayed Forward
- 1-2-3-4 Shift complaints

Low Reverse 4-5-6 Clutch Regulator Valve
- Burnt L/R & 4-5-6 clutch
- Delayed Reverse
- 4-5-6 Shift complaints
- 3-4 Shift flare

Low Reverse 4-5-6 Boost Valve
- Burnt Low/Reverse & 4-5-6 clutch
- Delayed Reverse
- 4-5-6 Shift complaints
- 3-4 Shift flare

Default Override Valve
- Engagement concerns in Reverse when in fail-safe or default.

TCC Regulator Apply Valve
- No TCC/slip, soft apply
- Harsh TCC apply

Replace with Sonnax Part No.
144740-16K
Requires F-144740-TL16 & VB-FIX

Clutch Select Valve
- Various shift complaints
- Shift related trouble codes

Actuator Feed Limit Valve
- Harsh shifts
- No/Slipping shifts
- Low clutch pressure

Replace with Sonnax Part No.
144740-01 Requires 144740-TL

O-Ringed End Plugs
- Burnt clutches/brakes
- Various shift complaints

NOTE: Vacuum test end plugs at outboard port while sealing bore opening with thumb.

Replace with Sonnax Part No.
144510-14K*

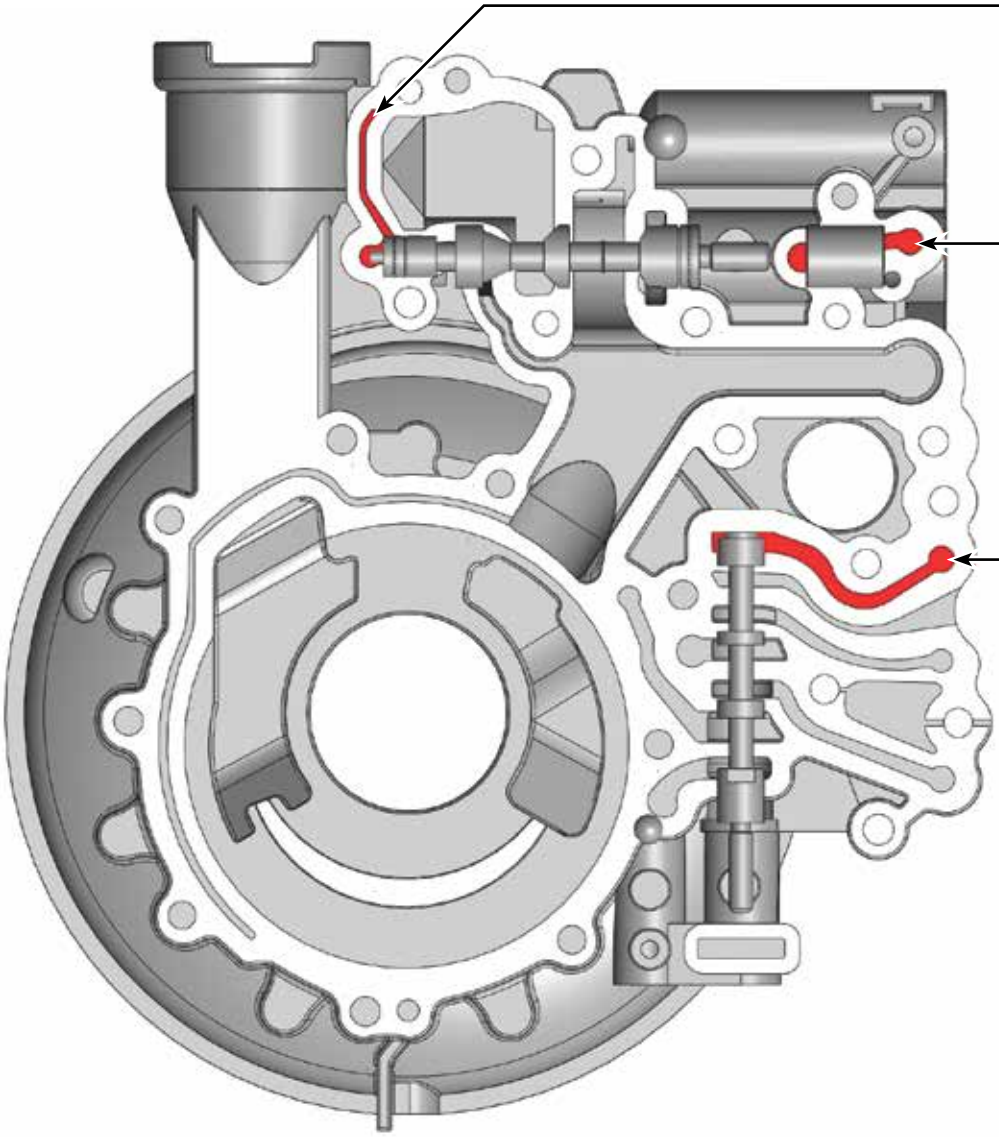
NOTE: Several Locations = ★

*Part numbers with an asterisk (*) are included in this Zip Kit.

Critical Wear Areas & Vacuum Test Locations

NOTE: OE valves are shown in rest position and should be tested in rest position unless otherwise indicated. Test locations are pointed to with an arrow. Springs are not shown for visual clarity. Low vacuum reading indicates wear and Sonnax parts noted for replacement.

Pump Body • Gen. 2 6T40 Shown



Pressure Regulator Valve

- Harsh/Soft shifts
- High/Low line pressure
- Burnt clutches

Replace with Sonnax Part No.
144510-01K
Requires F-144510-TLC & VB-FIX

TCC Control Valve

- Incorrect TCC apply/release
- Inadequate lube & cooling
- Transmission overheat
- Converter codes

Replace with Sonnax Part No.
144510-05K
Requires F-144510-TL5C & VB-FIX

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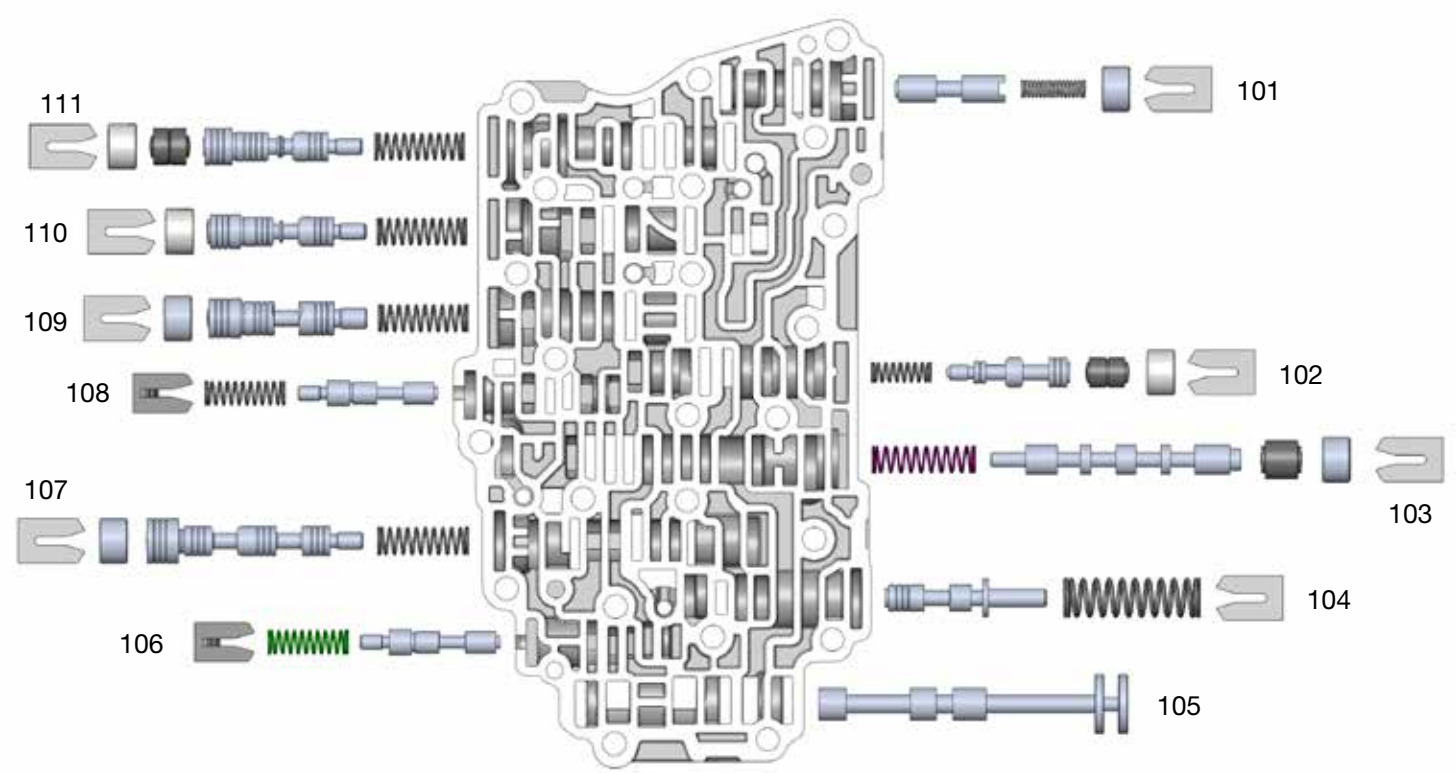
OE Exploded View

Control Valve Body Assembly • Gen. 2 6T40 Shown

NOTE: Depending upon vehicle application, the OE springs shown may not be present.



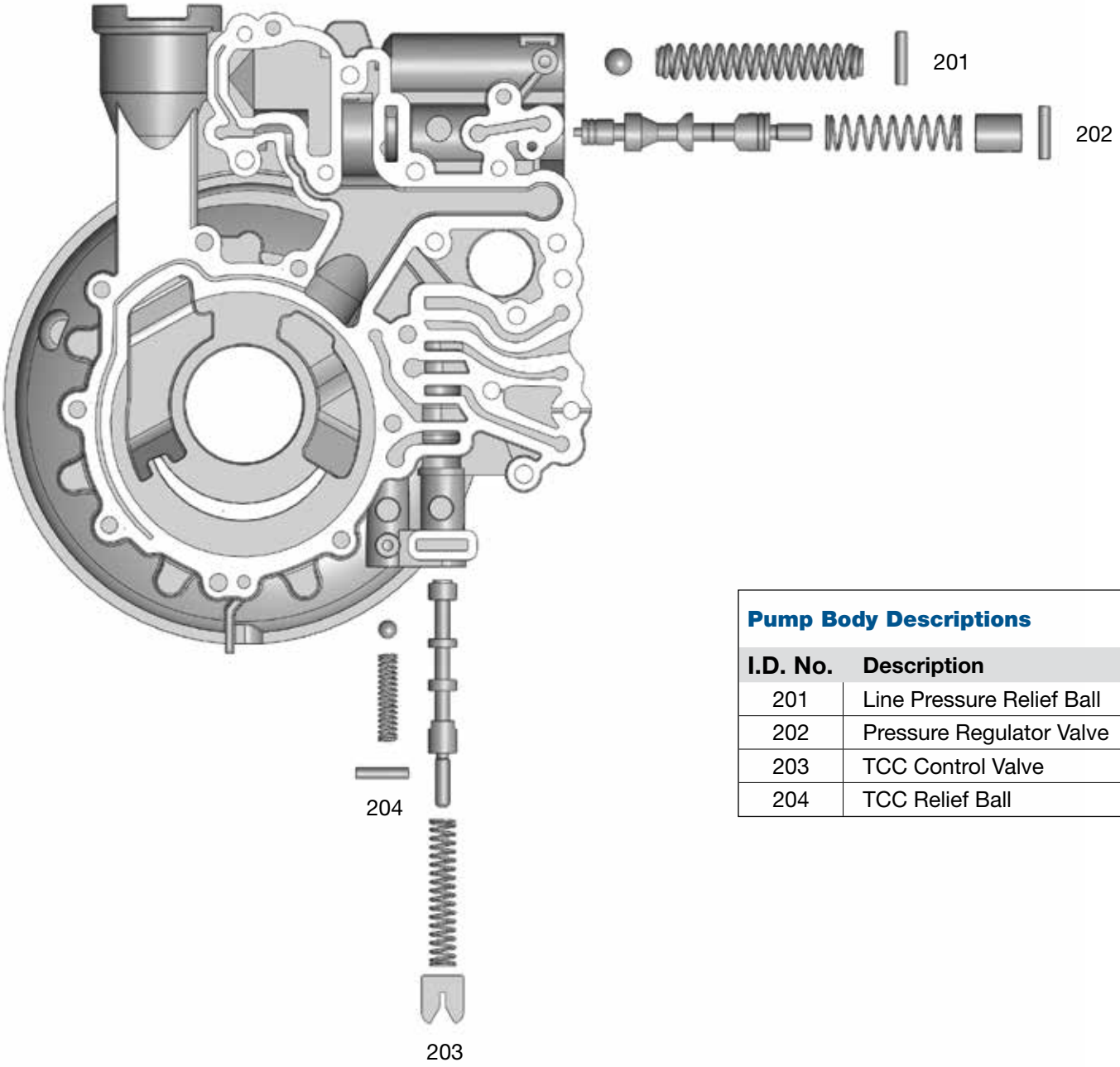
Control Valve Body Assembly Descriptions

I.D. No.	Description
101	Default Override Valve
102	TCC Regulator Apply Valve
103	Clutch Select Valve (inboard) Shuttle Valve (outboard)
104	Actuator Feed Limit Valve
105	Manual Valve
106	Low/Reverse 4-5-6 Boost Valve
107	Reverse & 4-5-6 Clutch Regulator Valve
108	1-2-3-4 Clutch Boost Valve
109	1-2-3-4 Clutch Regulator Valve
110	2-6 Clutch Regulator Valve
111	3-5 Reverse Clutch Regulator Valve

OE Exploded View

Pump Body • Gen. 2 6T40 Shown

NOTE: Depending upon vehicle application, the OE springs shown may not be present.



Pump Body Descriptions

I.D. No.	Description
201	Line Pressure Relief Ball
202	Pressure Regulator Valve
203	TCC Control Valve
204	TCC Relief Ball