

# GM 6T70/75 (Gen. 1) ZIP KIT®

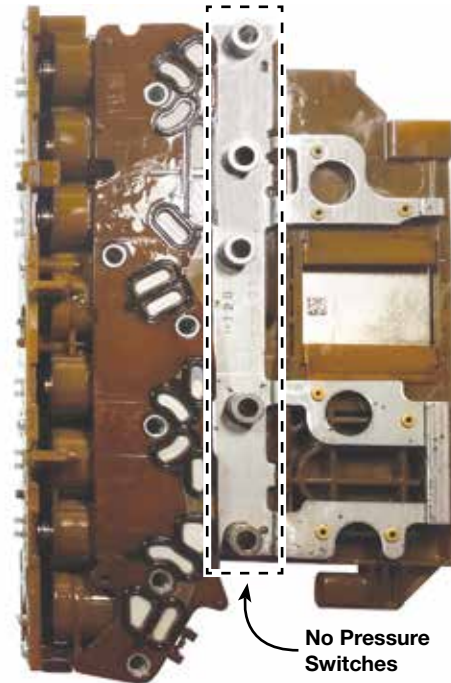
PART NUMBER 6T70-ZIP

IDENTIFICATION GUIDE

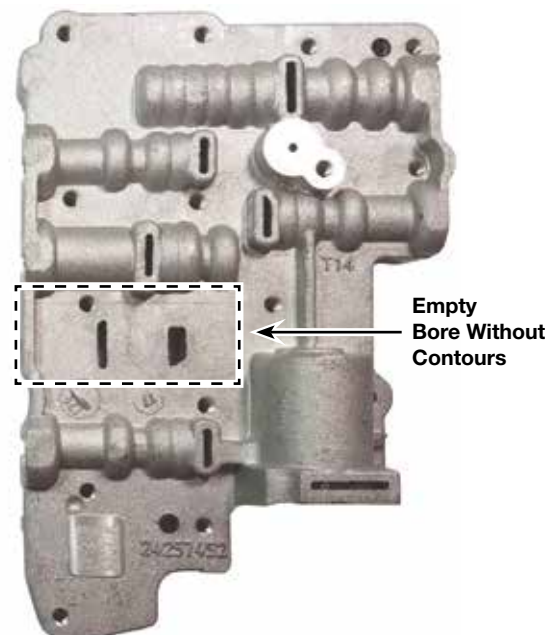
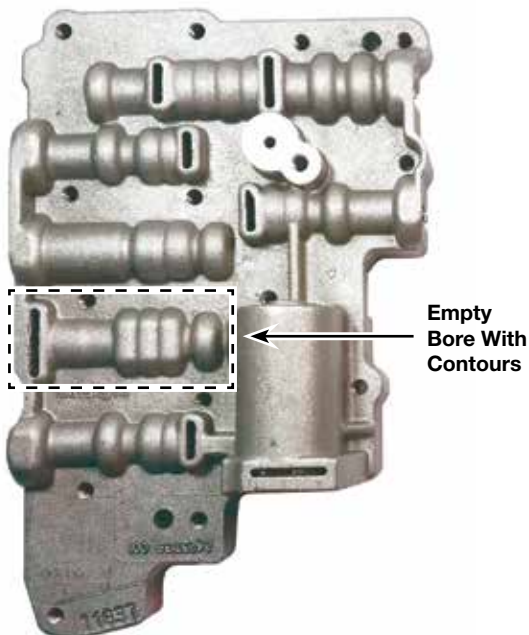
## GM Gen. 1 6T70/75

## GM Gen. 2 6T70/75/80

### TEHCMs



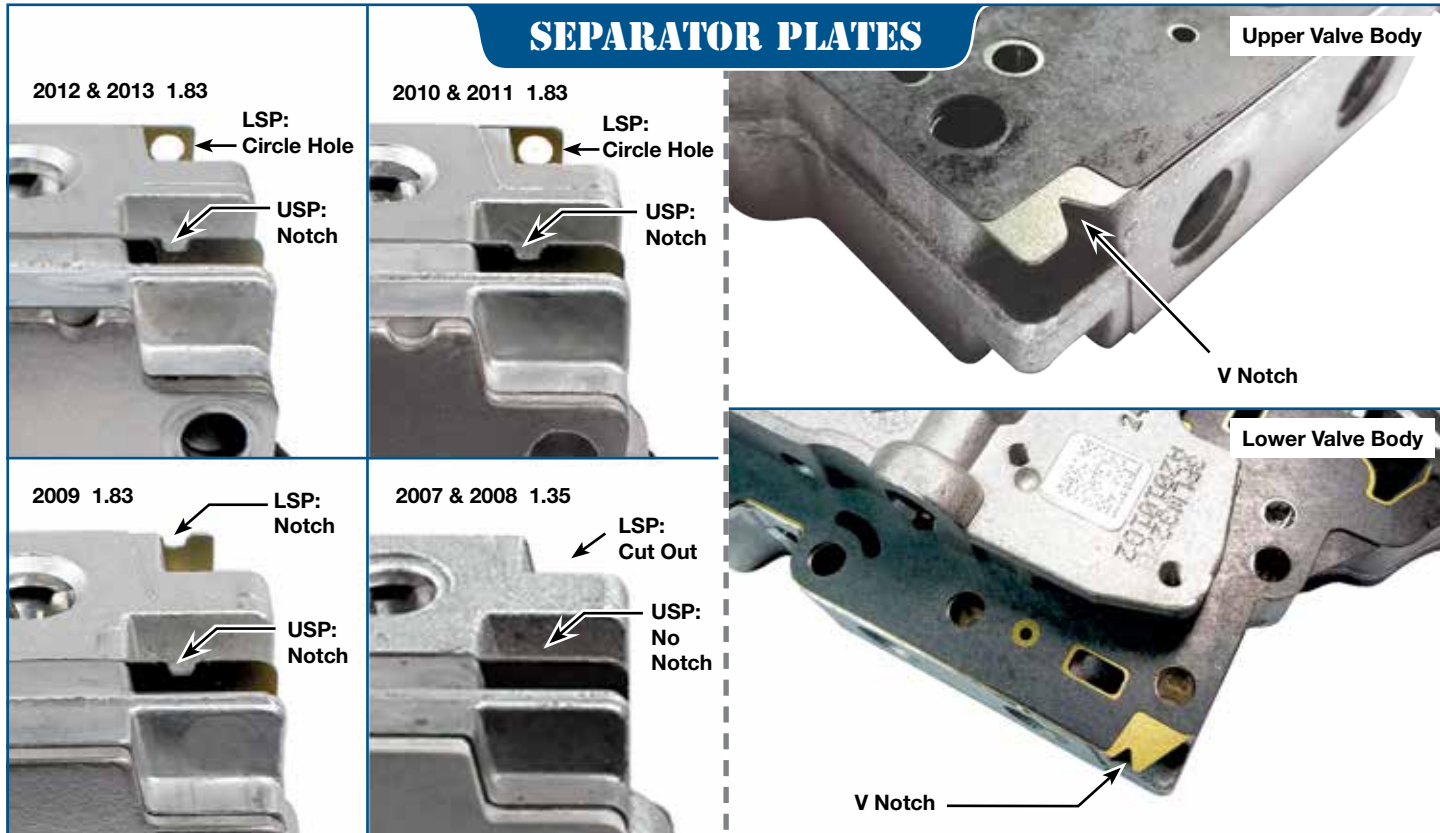
### LOWER VALVE BODIES



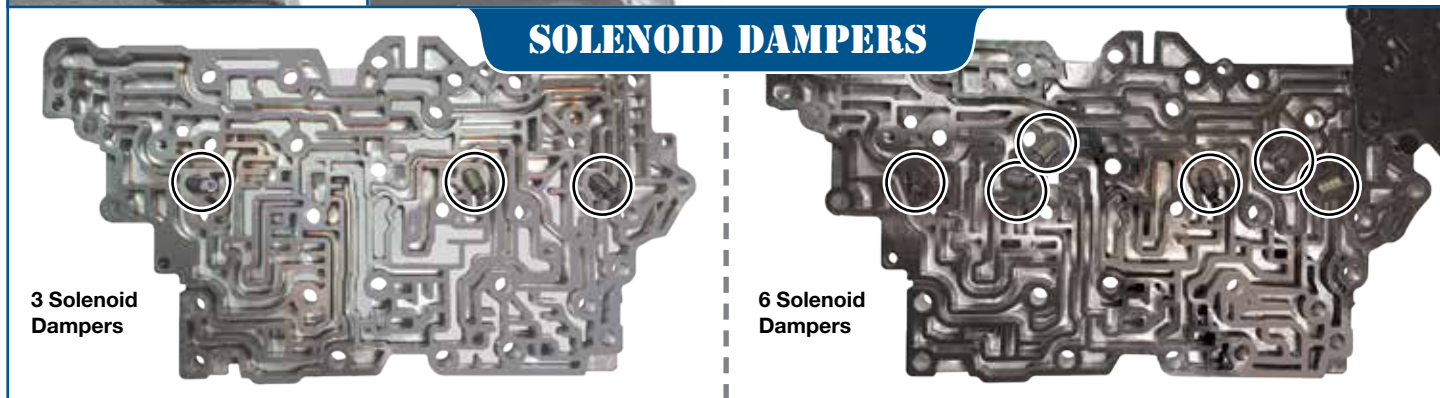
## GM Gen. 1 6T70/75

## GM Gen. 2 6T70/75/80

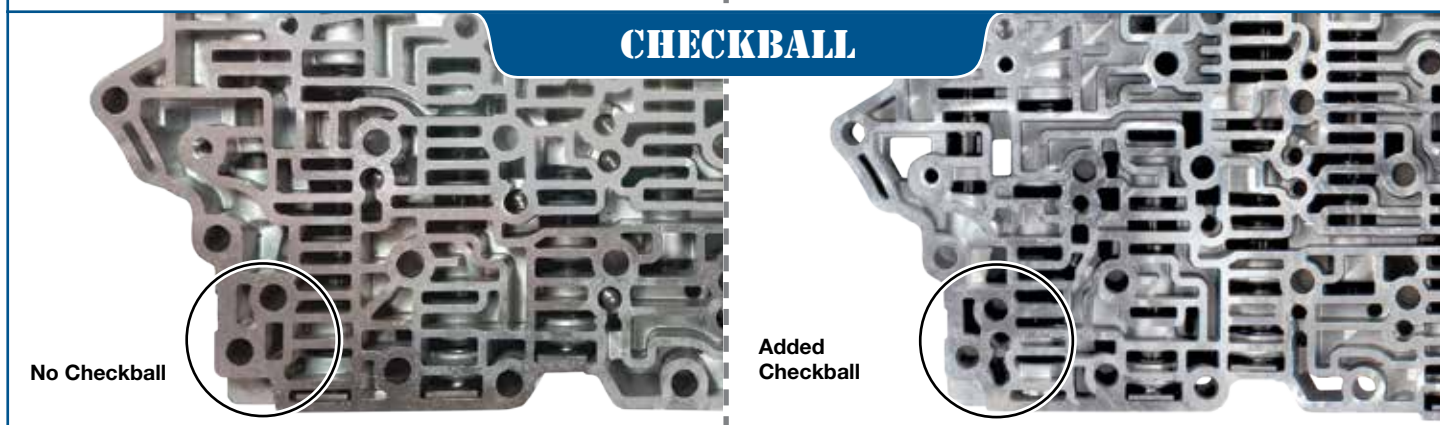
### SEPARATOR PLATES



### SOLENOID DAMPERS



### CHECKBALL







# GM 6T70/75 (Gen. 1) ZIP KIT®

PART NUMBER 6T70-ZIP

QUICK GUIDE

Parts are labeled here in order of installation. See other side of sheet for details on kit contents.

## INSTALLATION DIAGRAM

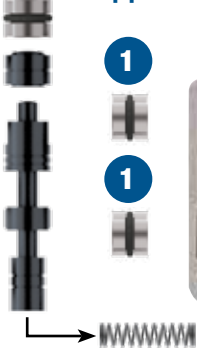


**CAUTION!!** Ensure shuttle valve is installed with blind bore facing inboard and rounded, closed end facing the end plug.



**NOTE:** Reference pages 2, 3 and 4 in the technical booklet for installation details.

### 3 6T70 (Gen. 1) Upper Valve Body



1



2

5



### 6T70 (Gen. 1) Lower Valve Body



1

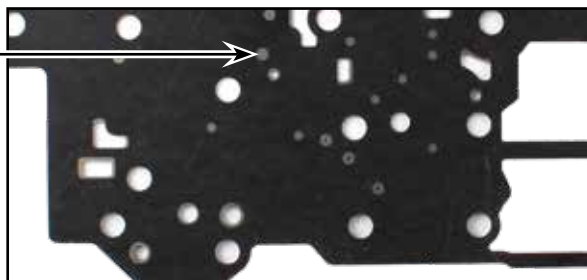
7 Replace nine OE checkballs.



**CAUTION:** Failure to block orifice will result in NO movement of vehicle.

6

Block AFL balance port by drilling and plugging separator plate where indicated using drill bit and aluminum plug provided (not shown).



Lower Valve Body Separator Plate

In addition to general rebuilding tips and technical information, the technical booklet included in this kit contains vacuum testing and additional repair options for higher mileage units or for repairing specific complaints which are beyond the scope of this kit.

## Kit Contents & Installation Steps

### Step 1 Replace Seven OE End Plugs

Place O-ring into end plug groove. Lubricate with Sonnax Slippery Stick **O-LUBE** and roll on bench to size.

#### Packaging Pocket 1

- End Plug (7)
- O-Rings (11) 4 Extra

### Step 2 Replace OE Isolator Valve & Spring

Place one O-ring into plug groove and one O-ring into isolator valve groove. Lubricate with Sonnax Slippery Stick **O-LUBE** and roll on bench to size.

#### Packaging Pocket 2

- End Plug
- Valve
- Spring
- O-Rings (3) 1 Extra

### Step 3 Replace OE TCC Regulator Apply Valve Bore Lineup

Remove and discard all OE components except the end clip. Save OE end clip for reuse.



**CAUTION:** Ensure shuttle valve is installed with blind bore facing inboard and rounded, closed end facing the end plug.

#### Packaging Pocket 3

- TCC Regulator Apply Valve
- Spring
- Shuttle Valve
- End Plug
- O-Rings (2) 1 Extra

### Step 4 Replace OE Actuator Feed Limit (AFL) Valve Lineup

Remove and discard OE valve and spring. Keep outboard OE retainer for reuse. Install Sonnax sleeve and valve as illustrated. Secure sleeve into bore by installing Sonnax clip into sleeve groove at inboard port. Install Sonnax spring and secure all components into the bore with OE retainer.

#### Packaging Pocket 4

- Sleeve
- Valve
- Spring
- Clip

### Step 5 Replace OE 4-5-6 Accumulator Piston & Springs

Remove and discard OE piston and springs. Keep OE retainer for reuse. Place O-ring into piston groove. Lubricate with Sonnax Slippery Stick **O-LUBE** and roll on bench to size.

#### Packaging Pocket 5

- Accumulator Piston
- Large Spring
- Small Spring
- O-Rings (2) 1 Extra

### Step 6 Block AFL Balance Port

Drill indicated separator plate orifice with included .062" dia. drill bit. Remove any burrs. Insert .062" dia. aluminum plug into drilled hole and peen in place on both sides of plate. Ensure plate will sit flush on both castings. Replace OE checkballs.



**CAUTION:** Ensure supplied retainer clip is fully seated in AFL sleeve groove after installation.

#### Packaging Pocket 6

- Drill Bit (.062" dia.)
- Aluminum Plugs (2) 1 Extra

### Step 7 Replace OE Checkballs

#### Packaging Pocket 7

- Checkballs, .250" dia. (9)

### Step 8 Replace OE Pressure Switch Laminate Discs & Seals

Reference pages 2, 3 and 4 in the technical booklet for installation details.

#### Packaging Pockets 8-10

- Seals (5) 1 Extra
- Laminate Discs (5) 1 Extra
- Seal Installer
- Piston
- Plunger
- Laminate Installation Tool

**NOTE:** Some parts listed here may be protected by patent number D784,101.



# GM 6T70/75 (Gen. 1) ZIP KIT®

PART NUMBER 6T70-ZIP

INSTALLATION & TESTING BOOKLET

## Valve Body ID & Tech Tips

### Adaptive Learning

The 6T70 and 6T75 is 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.

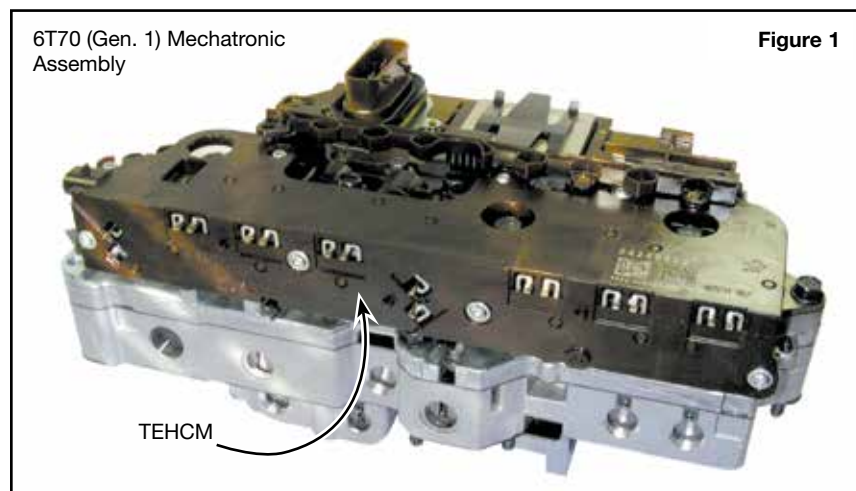


Figure 1

### Clutch Apply Chart

Figure 2

Gear	1-2-3-4 Clutch	3-5 Clutch	4-5-6 Clutch	2-6 Clutch	Low & Reverse Clutch	Low & Reverse One-Way Clutch
Park					X	
Reverse		X			X	
Neutral					X	
1st Breaking	X				X	Holding
Drive	1st	X				Holding
	2nd	X		X		
	3rd	X	X			
	4th	X		X		
	5th		X	X		
	6th		X	X		

### Solenoid Apply Chart

Figure 3

Gear	Solenoid					
	Shift Solenoid 1	Shift Solenoid 2	1-2-3-4 PC Solenoid 5 NL	2-6 PC Solenoid 4 NL	3-5 Rev. PC Solenoid 2 NH	Low Reverse 4-5-6 PC Solenoid 3 NH
Park	X	X				X
Reverse	X				X	X
Neutral	X	X				X
1st Breaking	X	X	X			X
Drive	1st		X			
	2nd		X	X		
	3rd		X		X	
	4th		X			X
	5th		X		X	X
	6th		X	X		X

KEY: X = On/Applied

## Zip Kit Instructions

### 1. Valve Body Removal from Case

- Disconnect shift position switch.
- Disconnect input speed sensor (ISS).
- Disconnect output speed sensor (OSS).
- Remove four control valve body 80mm bolts (yellow). Position TCU spring retainer to the side.
- Remove the remaining seven control valve bolts (Figure 4).
- Remove TEHCM assembly.
- Remove solenoid filter plate (Figure 6) from the back of the TEHCM assembly. Discard and replace, as the seals take a set and will leak if reused.
- Remove the ten control valve body bolts (Figure 7).
- Remove manual shaft detent assembly.
- Remove control valve body from transmission.

### 2. Disassembly (Figure 8)

Remove the eight control valve body assembly bolts.

### 3. 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 5 & 6).

### 4. Reassembly

Reassemble valve body and reinstall the eight control valve body assembly bolts (Figure 8). Tighten to 106 in-lb (Figure 5).

### 5. Valve Body Reinstall to Case

- When reinstalling the manual shaft detent assembly, ensure proper alignment with the lever. Contact with the valve body can cause improper engagement with the lever (Figure 7).
- Reinstall the control valve body and manual shaft detent assembly into the transmission using 10 bolts (Figure 7). Hand tighten, then tighten in the indicated sequence to 106 lb-in (Figure 5).
- Install new solenoid filter plate (Figure 6).
- Reinstall TEHCM assembly and TCU spring retainer.

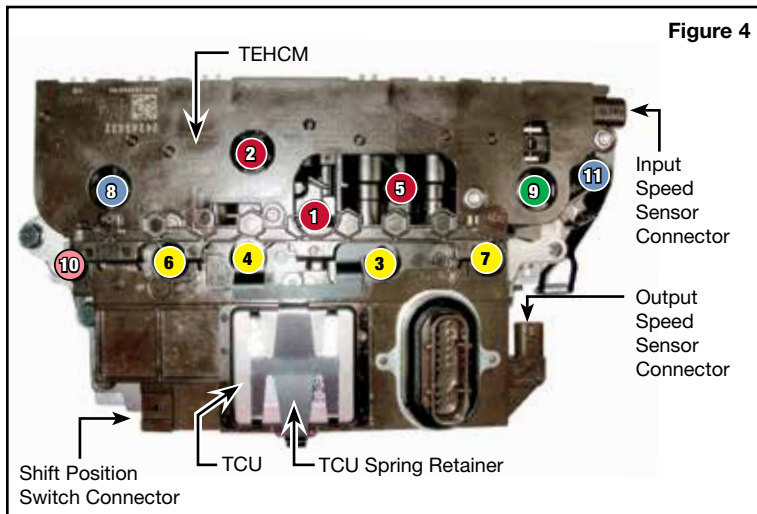


Figure 4

## 6T70 Disassembly & Reassembly Bolts

Bolt Color Code	Bolt Length	Torque
Orange	35mm	106 in-lb
Green	42mm	
Pink	55mm	
Blue	64mm	
Red	95mm	
Yellow	80mm	

Figure 5

## 5. Valve Body Reinstall to Case, continued

- Reinstall and hand tighten the 11 bolts, then tighten in the indicated sequence to 106 in-lb (**Figure 4**).
- Reconnect shift position switch.
- Reconnect input speed sensor (ISS).
- Reconnect output speed sensor (OSS).



Figure 6

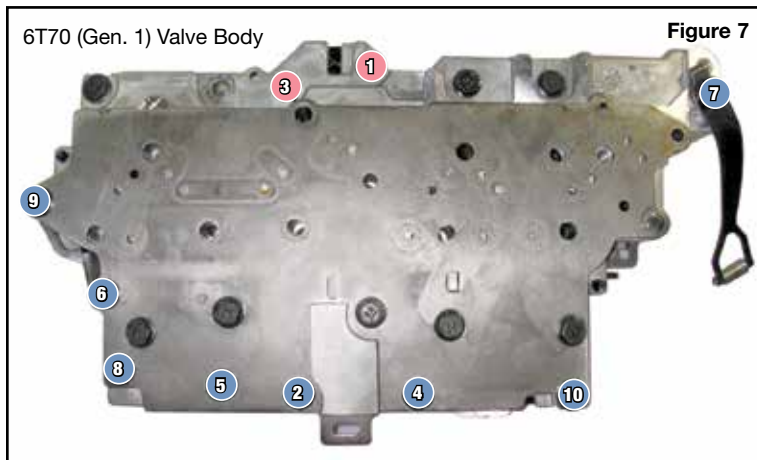


Figure 7

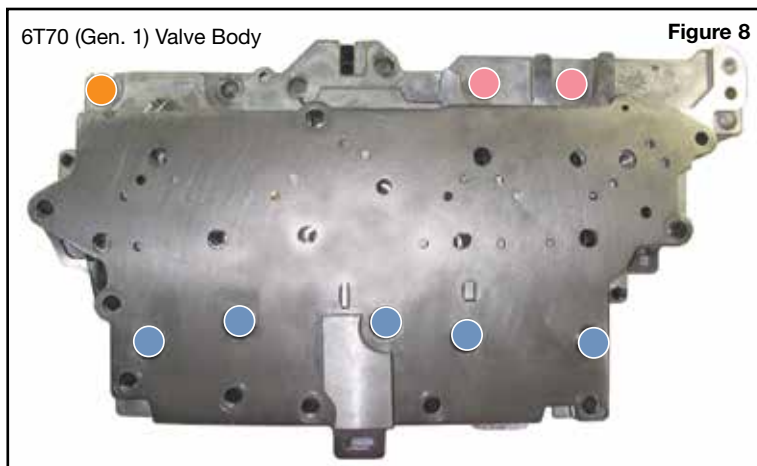


Figure 8

## Installing Sonnax Pressure Switch Rebuild Kit



**NOTE:** Before installing kit, test switches to verify proper electrical operation. Kit repairs laminate disc and seal failures only; it will not rectify electrical breakdown.

### 1. Testing Switches

- Locate 5-pin pressure switch terminals (**Figure 9**). Ground pin is all the way to the left; moving to the right, each pin is power supply for an individual switch (**Figure 10**). Place negative ohmmeter lead on ground pin and positive lead on a power supply pin. At rest, each switch should read between .5 and 10 ohms. Depressing switch with pencil eraser should result in O.L. reading.
- If testing is successful, proceed with kit installation.



## 2. Remove OE Seals & Discs

- Using small screwdriver, remove OE switch seals and discard (**Figure 11**).
- Using small pick, gently remove OE laminate discs and discard (**Figure 12**).
- With laminate disc removed, OE plastic piston is exposed; piston is easily removed with pick for cleaning (**Figure 13**). Using low air pressure (30psi), blow any debris out of switch cavities. Clean and reinstall piston.

## 3. Installation & Assembly

- Gently form Sonnax laminate disc into inverted “U” shape and insert into bottom of switch cavity. Leading edge of laminate disc should slide into small groove at bottom of switch bore (**Figures 14, 15 & 16**).
- Insert Sonnax laminate installation tool over disc with “heel” toward top of switch bore and “toe” tucked under groove at bottom of bore (**Figures 17 & 18**).
- Gently press down on disc with tool ‘foot’ and rotate tool 360° until all of laminate disc edge is secure under bore groove (**Figure 19**).

Figure 9

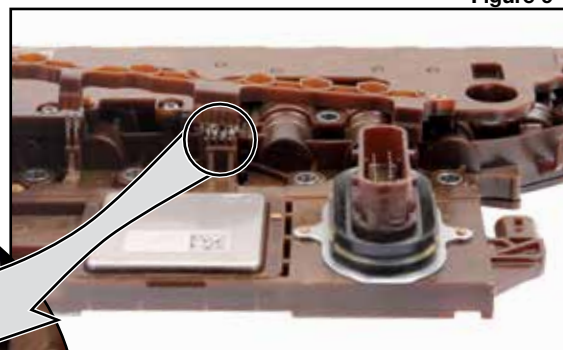


Figure 10

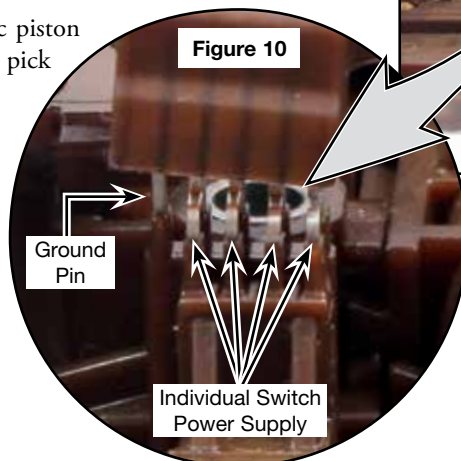
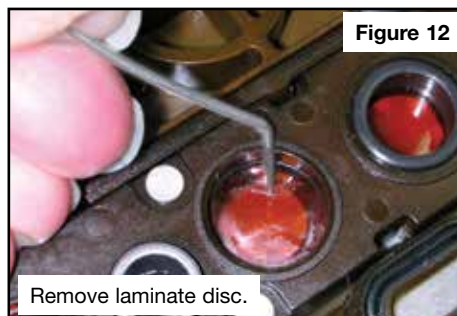


Figure 11



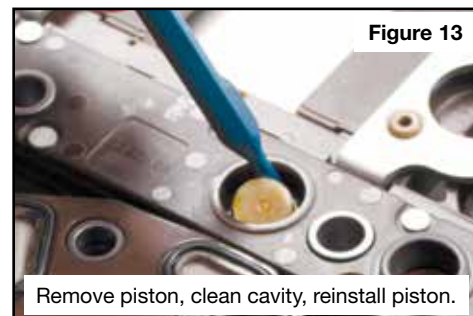
Remove seal.

Figure 12



Remove laminate disc.

Figure 13

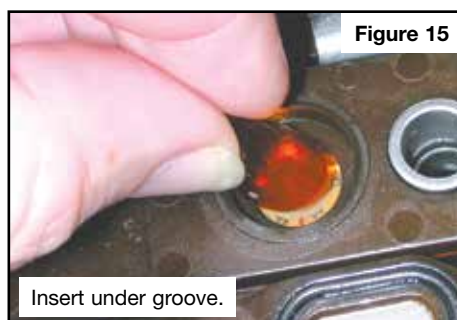


Remove piston, clean cavity, reinstall piston.

Figure 14



Figure 15



Insert under groove.

Figure 16

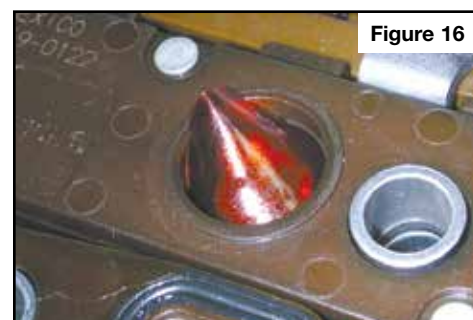


Figure 17

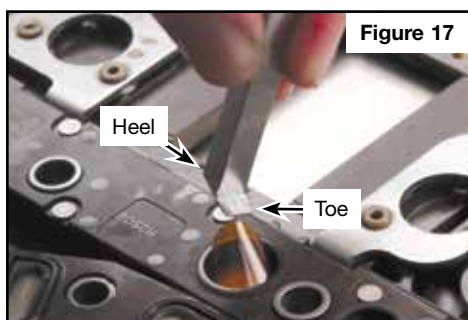
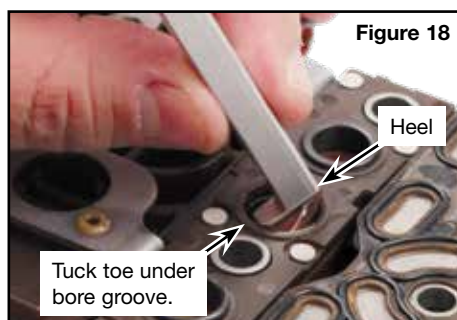
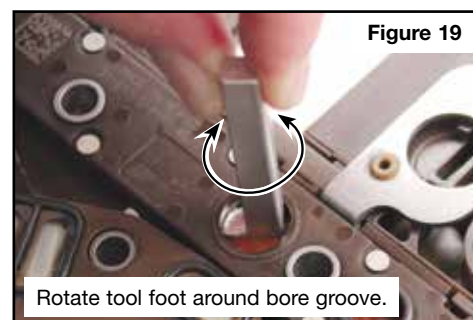


Figure 18



Tuck toe under bore groove.

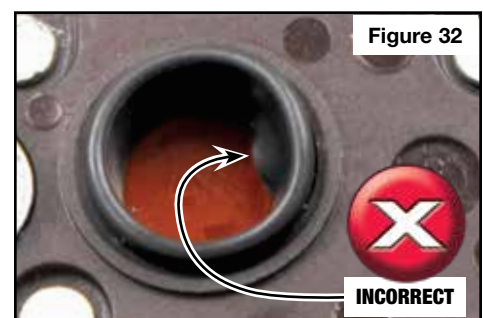
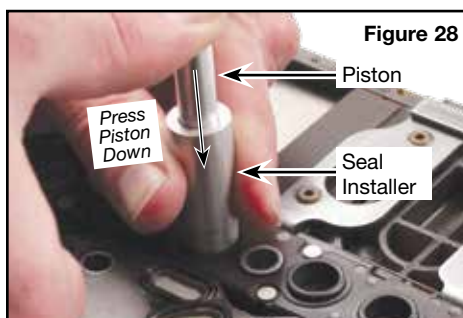
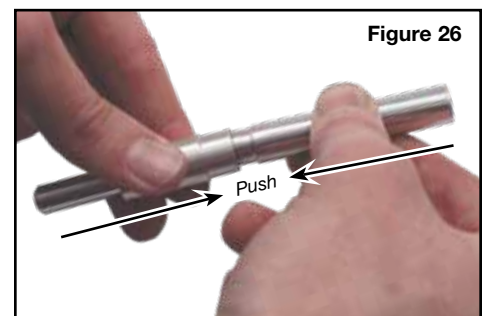
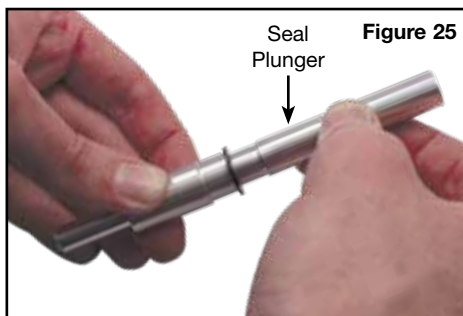
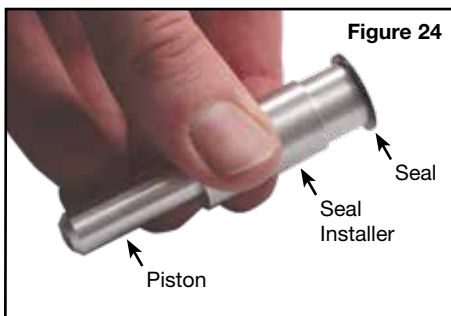
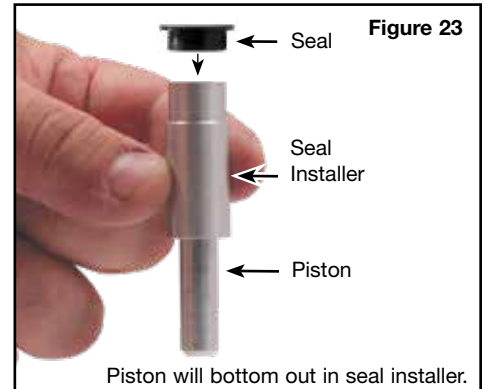
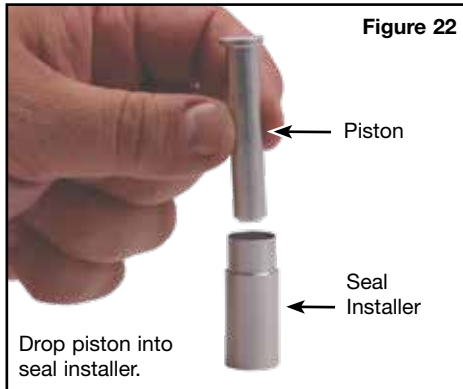
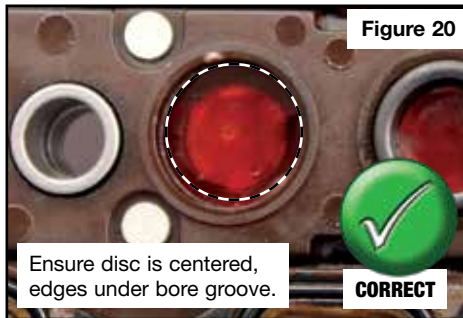
Figure 19



Rotate tool foot around bore groove.

### 3. Installation & Assembly, continued

- d. Ensure laminate disc is centered, covering entire bore opening without gaps (**Figures 20 & 21**).
- e. Install Sonnax piston into Sonnax seal installer as indicated (**Figures 22 & 23**).
- f. Lubricate all sides of Sonnax seal. Insert seal flush into seal installer (**Figure 24**).
- g. Push seal into seal installer assembly using Sonnax seal plunger until plunger bottoms seal in tool (**Figures 25 & 26**).
- h. Insert piston/seal installer assembly into switch bore (**Figure 27**).
- i. While holding seal installer in place, push piston downward (**Figures 28, 29 & 30**). The seal installer will rise out of bore as seal sets into place.
- j. Inspect installed seal to ensure flush fit (**Figures 31 & 32**).





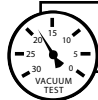
## Critical Wear Areas & Vacuum Test Locations



Drop-In Zip Valve™  
Parts Available

**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 are noted for replacement.

### Upper Valve Body • 6T70 (Gen. 1)



For specific vacuum test information, refer to individual part instructions included in kits and available at [www.sonnax.com](http://www.sonnax.com).

#### 3-5 Reverse Clutch Regulator Valve

- 2-3 & 4-5 Flare • Delayed Reverse • Reverse slip
- 3-5 Reverse clutch burned • Ratio codes • Bind-up

Replace with Sonnax Part No.

**124740-26K** (1.35 Ratio) Requires F-124740-TL26 & VB-FIX or

**124740-21K** (1.83 Ratio) Requires F-124740-TL21 & VB-FIX

#### Pressure Regulator Valve

- Erratic line pressure
- Low converter & lube flow
- TCC apply & release concerns
- Poor shift quality
- Burnt clutches
- Overheating

Replace with Sonnax Part No.

**124740-12K** Requires F-124740-TL12 & VB-FIX

#### 2-6 Clutch Regulator & Gain Valve

- 1-2 or 5-6 Flare • 2nd or 6th Slip
- No 2nd or 6th • Ratio codes
- 2-6 Clutch burned
- Erratic shift timing

Replace with Sonnax Part No.

**124740-17K** Requires F-124740-TL17 & VB-FIX

#### Isolator Valve

- Low line pressure
- Line pressure instability
- No line rise
- Harsh shifts
- Burnt clutches
- Shift concerns

Replace with Sonnax Part Nos.

**124740-16** Spring Only or **124740-03K\*** Isolator Valve Kit

#### TCC Regulator Apply Valve

- Code P0741, 742 • Harsh TCC apply
- TCC slip • Loss of fuel economy
- Low TCC apply pressure
- Overheated fluid & TCC lining

Replace with Sonnax Part Nos.

**124740-31K** or **124740-24K** Requires F-124740-TL24 & VB-FIX

#### TCC Control Valve

- Excess TCC slip
- Low cooler flow
- Overheating
- Low convert & lube flow
- TCC apply & release concerns
- TCC apply codes
- TCC lining failure

Replace with Sonnax

Part No. **124740-14K** Requires F-124740-TL14 & VB-FIX

#### L/R Overdrive Clutch Regulator Valve

- Burnt L/R and/or 4-5-6 clutch
- 4-5-6 Shift concerns
- Delayed Reverse
- 3-4 Flare

#### Clutch Select Solenoid Valve #3

- Various shift concerns
- Shift codes

#### Clutch Select Solenoid Valve #2

- Various shift concerns
- Shift codes

#### O-Ringed End Plugs

- Pressure loss
- Shift concerns
- Burnt clutches
- TCC apply concerns

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

Replace with Sonnax Part No.

**124740-02K\***

**NOTE:** Several Locations = ★

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

## Critical Wear Areas & Vacuum Test Locations



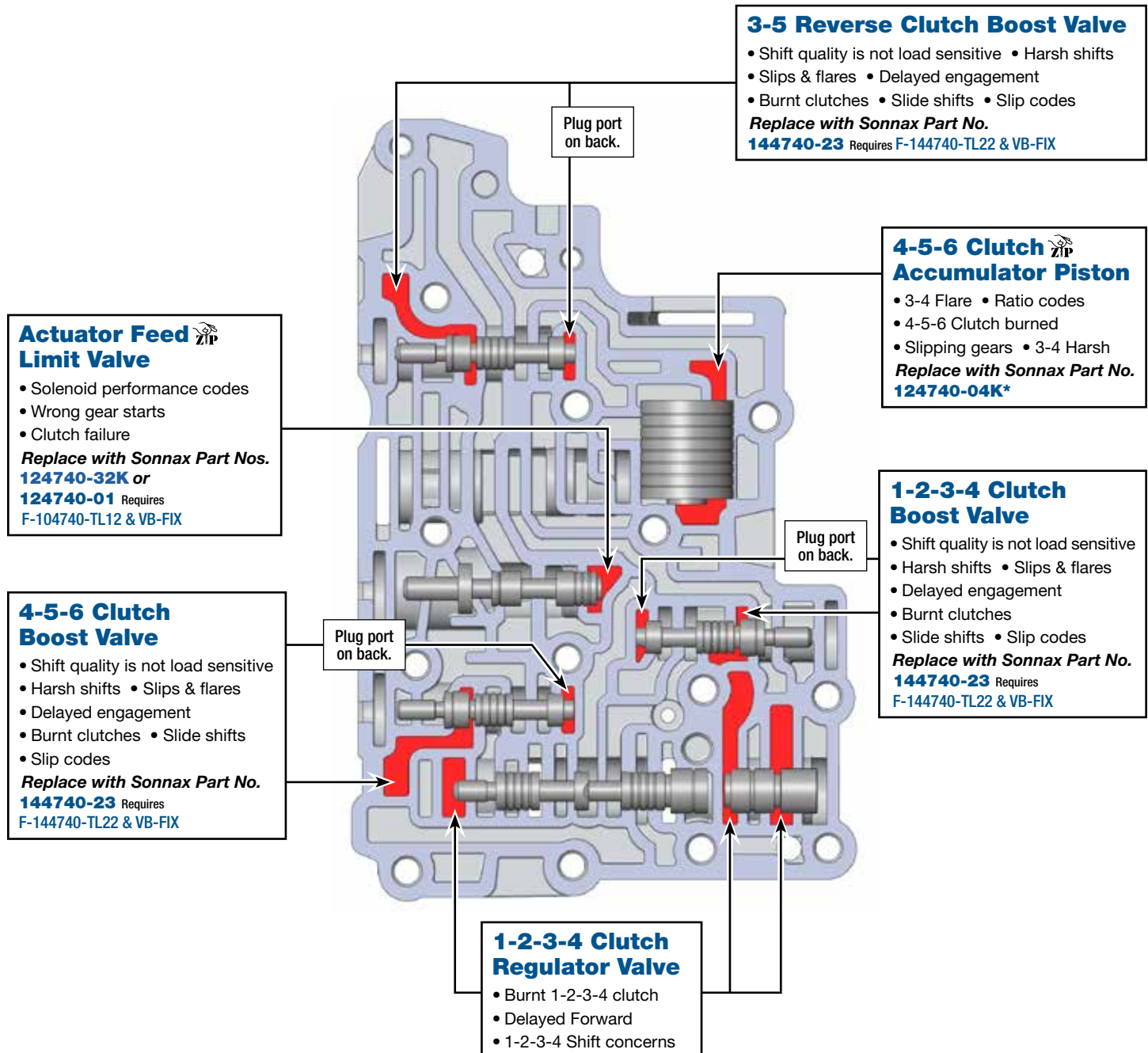
Drop-In Zip Valve™  
Parts Available

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### Lower Valve Body • 6T70 (Gen. 1)



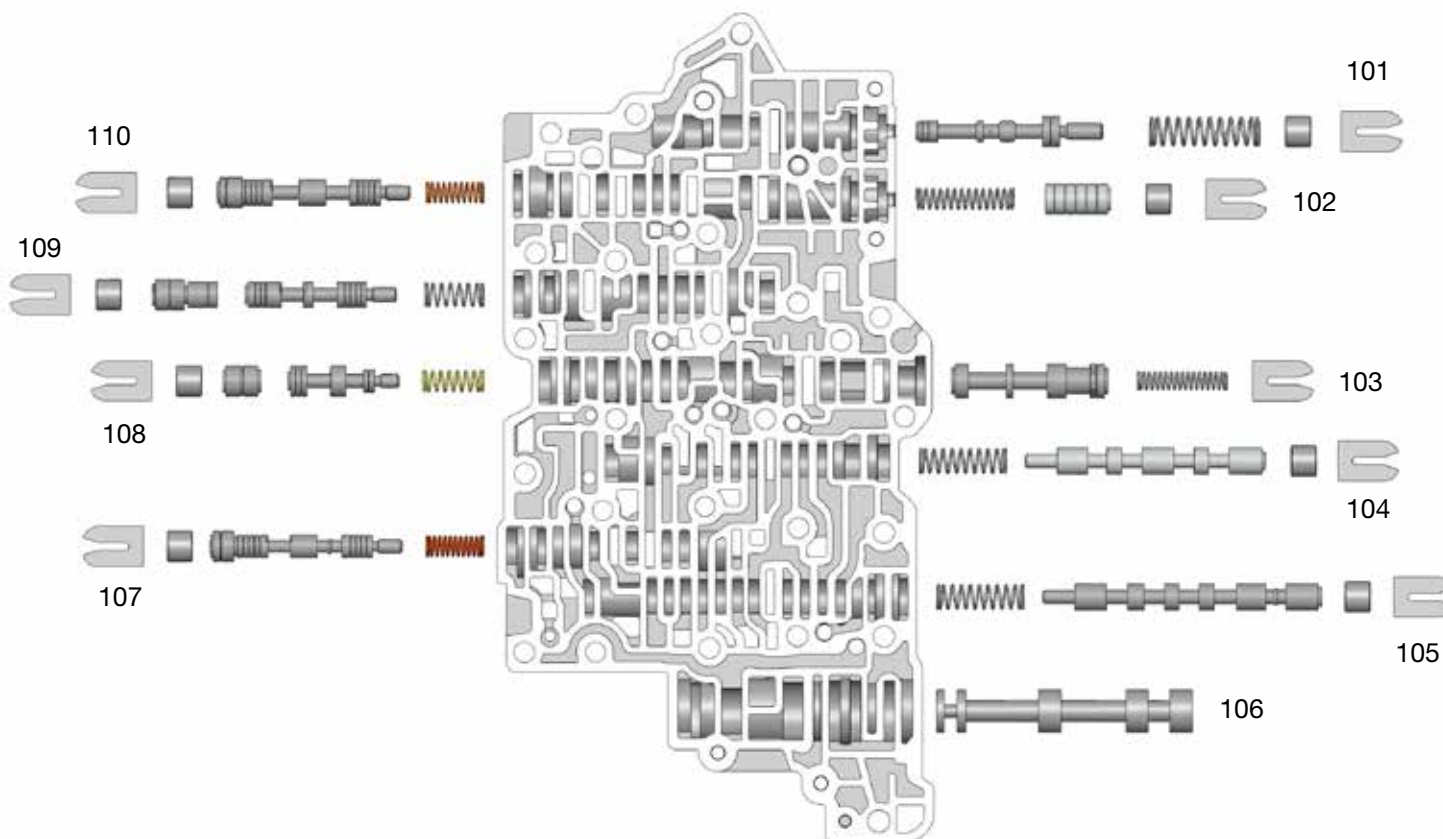
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## Upper Valve Body • 6T70 (Gen. 1)

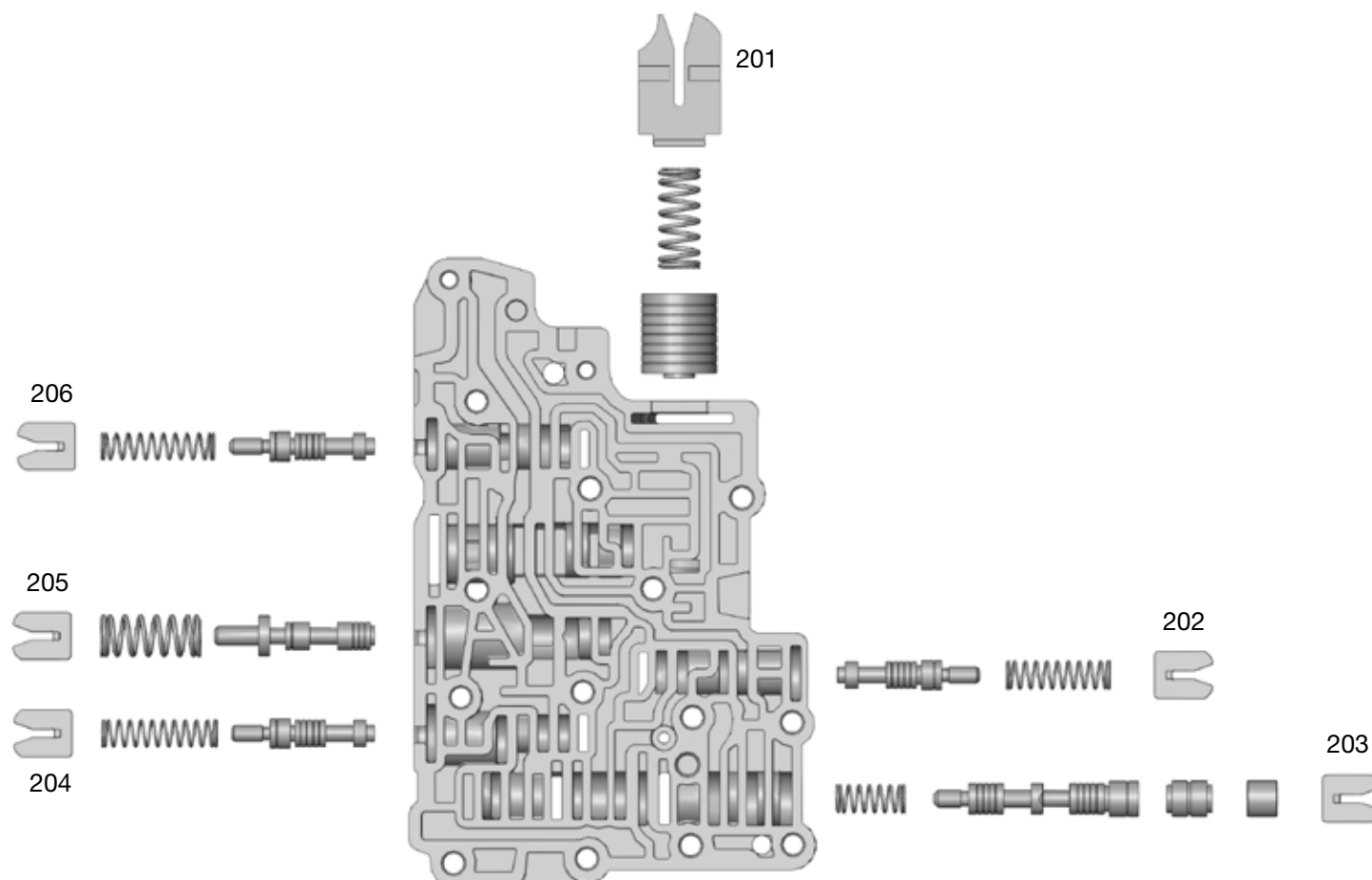


## Upper Valve Body Descriptions

I.D. No.	6T70 Description
101	Pressure Regulator Valve
102	Isolator Valve
103	TCC Control Valve
104	Clutch Select Solenoid Valve #3
105	Clutch Select Solenoid Valve #2
106	Manual Valve
107	L/R 4-5-6 Clutch Regulator Valve
108	TCC Regulator Apply Valve
109	2-6 Clutch Regulator & Gain Valve
110	3-5 Reverse Clutch Regulator Valve

## OE Exploded View

### Lower Valve Body • 6T70 (Gen. 1)



#### Lower Valve Body Descriptions

I.D. No.	6T70 Description
201	4-5-6 Clutch Accumulator Piston
202	1-2-3-4 Clutch Boost Valve
203	1-2-3-4 Clutch Regulator Valve
204	4-5-6 Clutch Boost Valve
205	Actuator Feed Limit Valve
206	3-5 Reverse Clutch Boost Valve