



# FORD 6F50, 6F55 ZIP KIT®

PART NUMBER 6F50-ZIP

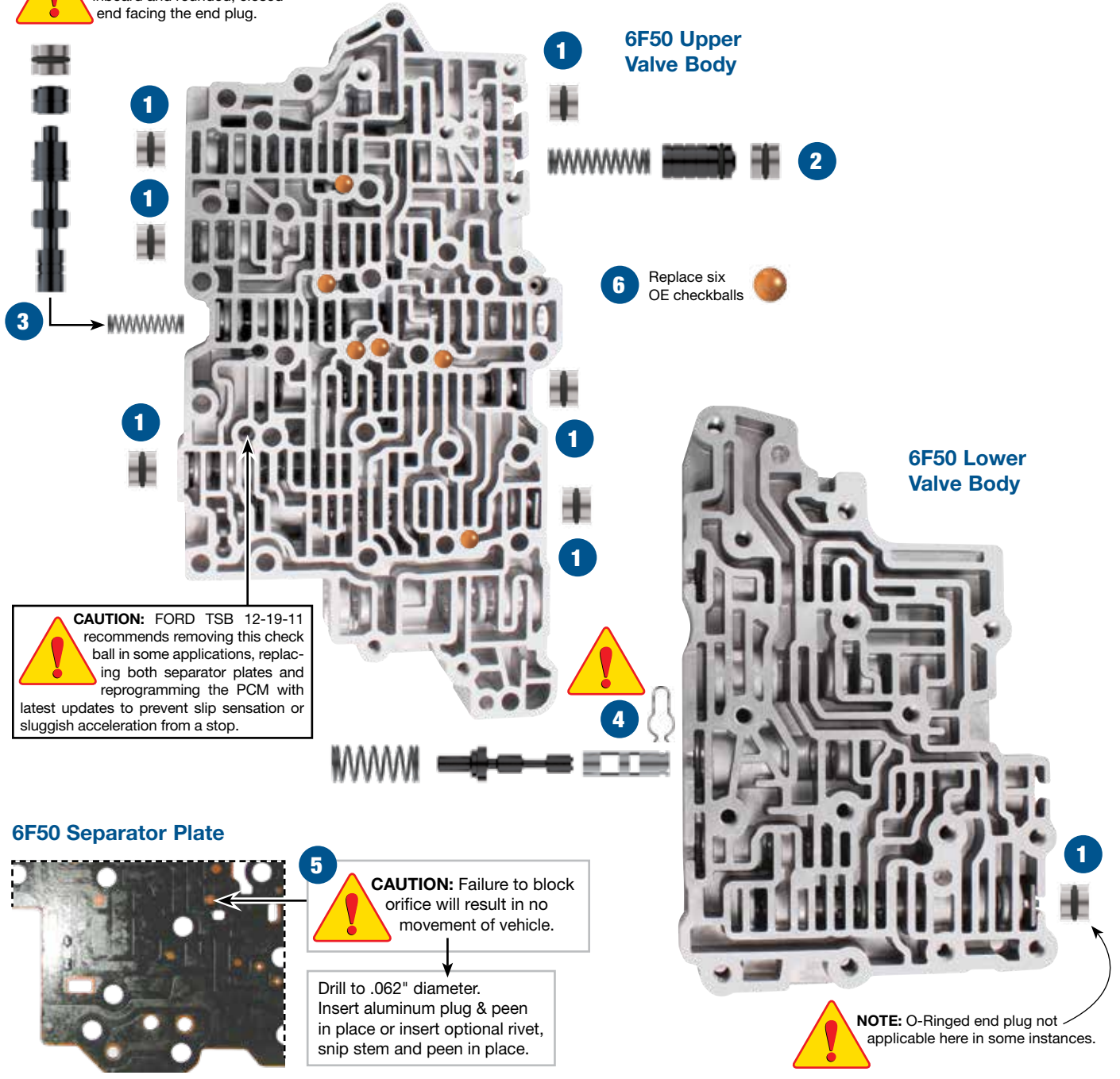
QUICK GUIDE

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.



**CAUTION:** FORD TSB 12-19-11 recommends removing this check ball in some applications, replacing both separator plates and reprogramming the PCM with latest updates to prevent slip sensation or sluggish acceleration from a stop.



**4**



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

Drill to .062" diameter. Insert aluminum plug &peen in place or insert optional rivet, snip stem and peen in place.



**NOTE:** O-Ringed end plug not applicable here in some instances.

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



**NOTE:** O-Ringed end plug should not be used on later 6F50 applications without short shuttle valve, and that have long (approximately .940") end plugs. Reference page 6 for exploded view.

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

#### Packaging Pocket 1

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

### Step 2 Replace OE Isolator Valve & Spring

Remove and discard all OE components except the end clip. Save OE end clip for reuse. 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 Valve
- Spring
- Shuttle Valve
- End Plug
- O-Rings (2) 1 Extra

### Step 4 Replace OE Solenoid Pressure Regulator 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.



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

#### Packaging Pocket 4

- Sleeve
- Valve
- Spring
- Clip

### Step 5 Block Solenoid Pressure Regulator Balance Port

Drill indicated separator plate orifice with included .062" diameter drill bit. Remove any burrs. If using straight plug, insert into orifice and peen on both sides of plate. If using optional small rivet, insert into orifice and using wire cutters, snip the stem end of the rivet if/as necessary to provide for a small head once peened in place. Peen the rivet in place on head side of plate also. After peening on both sides of the plate, ensure plate will still fit flush on mating surfaces.



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

#### Packaging Pocket 5

- Drill Bit, .062" dia.
- Aluminum Plugs (3) 1 Extra
- Rivets (3) 2 Extra

### Step 6 Replace OE Checkballs

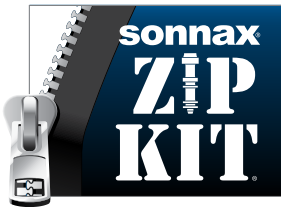


**CAUTION:** OE valve body may contain 7 checkballs. Reference Ford TSB 12-19-11 for recommended removal of one check ball and replacement of separator plates for some vehicles.

#### Packaging Pocket 6

- Checkballs (7) 1 Extra

The parts listed here may be protected by patent number 8,919,381.



# FORD 6F50, 6F55 ZIP KIT®

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INSTALLATION & TESTING BOOKLET

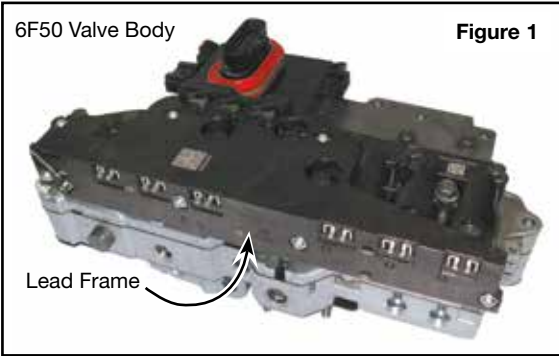


Figure 1

## 6F50 Valve Body ID & Tech Tips

### Reprogramming

Many transmission performance concerns both prior to and after an overhaul can be addressed by reflashing or reprogramming the PCM. Refer to OE reflashing procedures.

### Part Updates

Ford has made numerous part updates to deal with drivability complaints, including changes to the range sensor, TSS and OSS. Ensure the latest updates are made.

### Solenoid Body Identification & Strategy

The solenoid body strategy is a file programmed into the PCM to control the various solenoids to prevent shift concerns. The original solenoid body tag on the transmission case indicates the solenoid strategy and solenoid body I.D. (Figure 2). These must match the numbers on the lead frame attached to the valve body (Figure 3).

Anytime a new solenoid body is installed, a new strategy file is downloaded into the PCM with a scan tool. A replacement tag (Figure 4) must be placed on the case as well.

**NOTE:** The solenoid strategy is always 13 numeric digit. The solenoid body ID is a combination of numeric digits and any letters A–F.

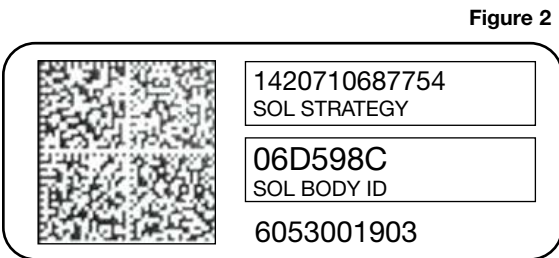


Figure 2

Identification: The original solenoid body tag on transmission case will look like this.

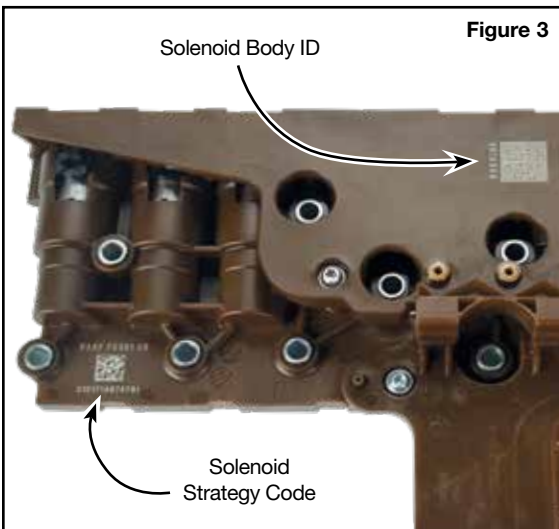


Figure 3

### Clutch Apply Chart

Figure 5

Gear	Direct Clutch	Overdrive Clutch	Forward Clutch (Brakes)	Low/Reverse Clutch (Brake)	Intermediate Clutch (Brake)	One-Way
Drive	1st		X	X		X
	2nd		X		X	Overrunning
	3rd	X		X		Overrunning
	4th		X	X		Overrunning
	5th	X	X			Overrunning
	6th		X			X
Reverse	X			X		

### Solenoid Apply Chart

Figure 6

PCM Commanded Gear	Shift Solenoid					TCC (VFS) NL	
	SSA (VFS) NL	SSB (VFS) NH	SSC (VFS) NL	SSD (VFS) NH	SSE (on/off) NC		
Park		X			X		
Reverse					X		
Neutral		X		*	X*		
Drive	1st	X	X		X*		
	2nd	X	X	X	X		
	3rd	X			X		
	4th	X	X				on/off
	5th						on/off
	6th		X	X			on/off
Low	X	X		*	X*		

KEY: X = On/Applied \* = Modulating

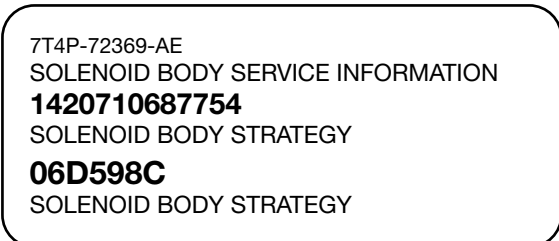


Figure 4

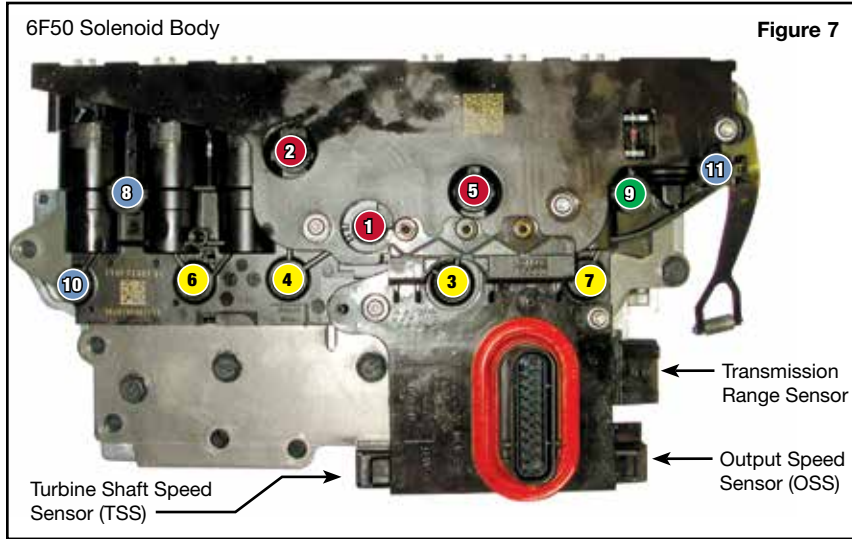


Figure 7

**1. Valve Body Removal from Case (Figure 7)**

- a. Disconnect transmission range sensor.
- b. Disconnect output speed sensor (OSS).
- c. Disconnect turbine shaft speed sensor (TSS).
- d. Remove 11 bolts and solenoid body. Handle solenoid body with care to prevent damage.

**2. Disassembly (Figures 9 & 10)**

- a. Remove the solenoid filter plate (Figure 9) from the back of the solenoid body. Discard and replace as the seals will leak if reused.
- b. Remove the 10 (blue) 62mm bolts, transmission range sensor detent spring and main control valve body (Figure 10).
- c. Remove the three (orange) 35mm bolts and eight (purple) 62mm bolts to disassemble the valve body (Figure 10).

**NOTE:** The eighth 62mm bolt is located under the separator plate and not shown.

**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 3 and 4).

**4. Separator Plate Update**

Reference Ford TSB 12-19-11. Some vehicles 2009–2011 using MERCON LV (indicated on dipstick) require a separator plate and checkball update to eliminate drivability issues.

**5. Reassembly**

Install the three (orange) 35mm bolts and seven (purple) 62mm bolts (Figures 8 and 10). Torque to 106 in-lb.

**6. Valve Body Reinstall to Case**

- a. Install valve body into transmission using 10 (blue) 62mm bolts. Hand tighten first, then tighten in indicated sequence to 106 lb-in (Figure 10).
- b. Install a new solenoid filter plate (Figure 9).
- c. Install solenoid body and secure with 11 bolts (Figure 7). Hand tighten, then tighten in the sequence shown to 106 lb-in.
- d. Reconnect transmission range sensor.
- e. Reconnect output speed sensor (OSS).
- f. Reconnect turbine shaft speed sensor (TSS).

**6F50 Disassembly & Reassembly Bolts**

Figure 8

Bolt Color Code	Bolt Length	Torque
Purple	62mm	106 in-lb
Orange	35mm	
Green	42mm	
Blue	62mm	
Red	95mm	
Yellow	80mm	



Figure 9

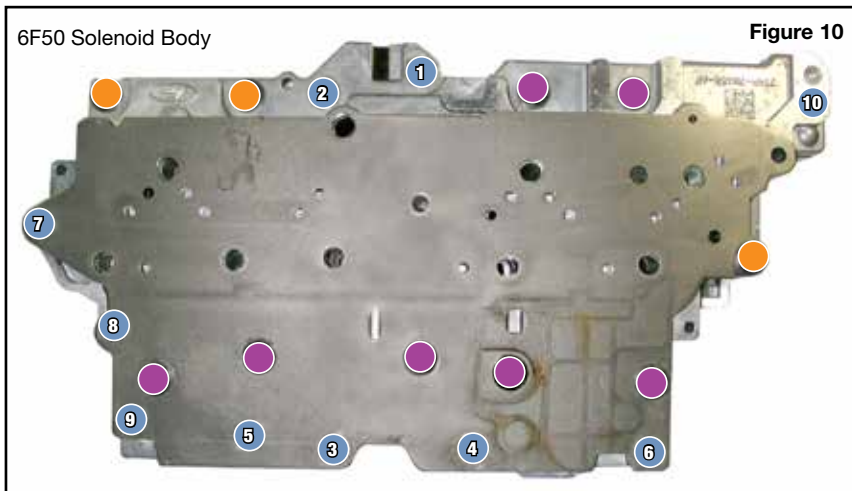


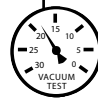
Figure 10

# 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 are noted for replacement.

## Upper Valve Body • 6F50 Shown Here



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

### Direct 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 Nos.**  
**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
- Poor shift quality
- Burnt clutches
- Low converter & lube flow
- Overheating
- TCC apply & release concerns

**Replace with Sonnax Part No.**  
**124740-12K** Requires F-124740-TL12 & VB-FIX

### Isolator Valve

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

**Replace with Sonnax Part Nos.**  
**124740-16** Spring Only or  
**124740-03K\*** Isolator Valve Kit

### Intermediate Clutch Regulator & Gain Valve

- 1-2 & 5-6 Flare
- 2nd & 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

### TCC Regulator Apply Valve

- Code P0741, P0742
- TCC slip
- Harsh TCC apply
- 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
- Overheating
- Low cooler flow
- TCC apply & release concerns
- Low converter & lube flow
- 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 Overdrive clutch
- 4-5-6 Shift concerns
- Delayed Reverse
- 3-4 Flare

### O-Ringed End Plug Kit

- Pressure loss
  - Shift concerns
  - Burnt clutches
  - TCC apply concerns
- NOTE:** Vacuum test end plugs at outboard port while sealing bore opening with thumb.

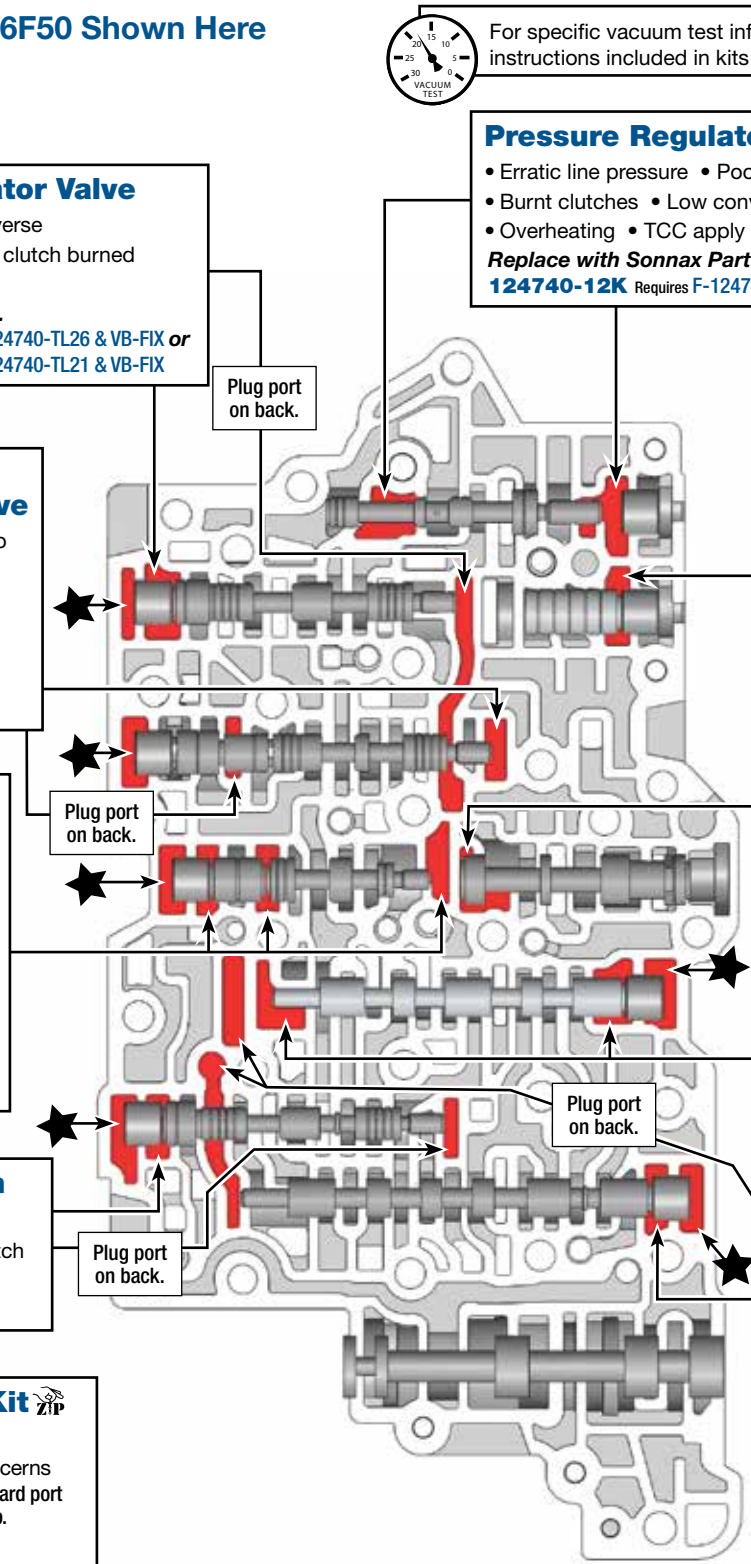
**Replace with Sonnax Part No.**  
**124740-02K\***  
**NOTE:** Several Locations = ★

### Multiplex Manual Valve

- Various shift concerns
- Shift codes

### Multiplex Shift Valve

- Various shift concerns
- Shift codes



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

**Critical Wear Areas & Vacuum Test Locations**



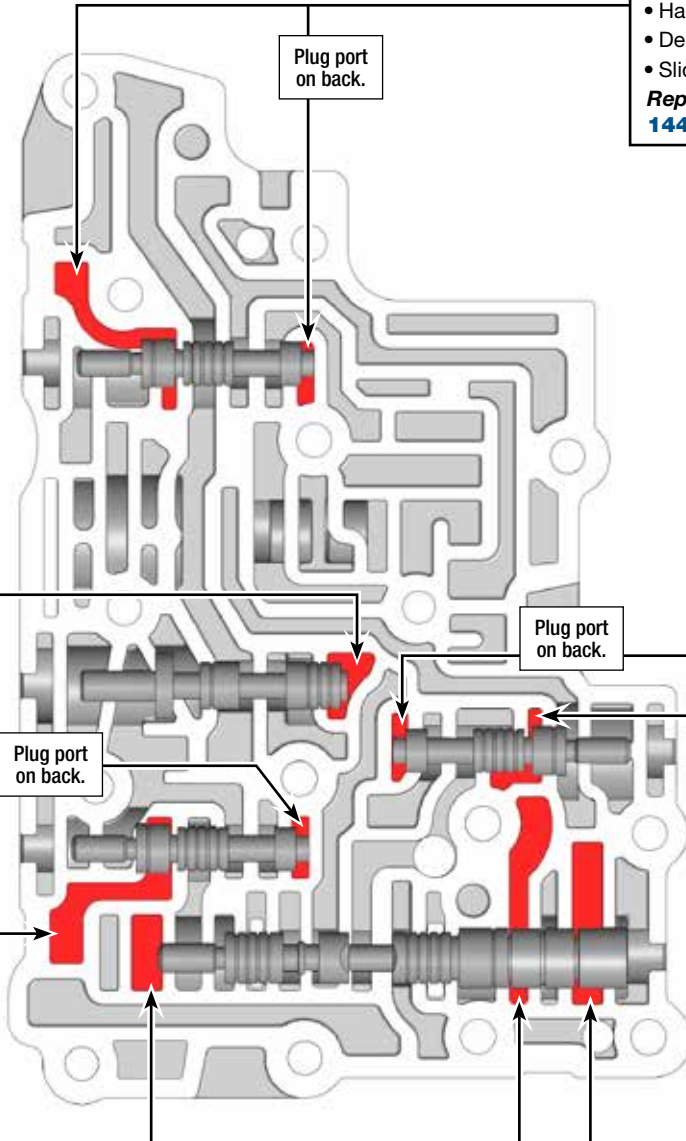
Drop-In Zip Valve™  
Parts Available

**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.

**Lower Valve Body • 6F50 Shown Here**



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



**Direct Clutch Latch Valve**

- Shift quality is not load sensitive
- Harsh shifts • Slips & flares
- Delayed engagement • Burnt clutches
- Slide shifts • Slip codes

**Replace with Sonnax Part No. 144740-23**  
Requires F-144740-TL22 & VB-FIX

**AFL (Actuator Feed Limit) Valve**

- Solenoid performance codes
- Wrong gear starts
- Clutch failure

**Replace with Sonnax Part Nos. 124740-32K or 124740-01**  
Requires F-104740-TL12 & VB-FIX

**Forward Clutch Latch Valve**

- Shift quality is not load sensitive
- Harsh shifts • Slips & flares
- Delayed engagement
- Burnt clutches
- Slide shifts • Slip codes

**Replace with Sonnax Part No. 144740-23**  
Requires F-144740-TL22 & VB-FIX

**L/R Overdrive Clutch Latch Valve**

- Shift quality is not load sensitive
- Harsh shifts • Slips & flares
- Delayed engagement
- Burnt clutches
- Slide shifts • Slip codes

**Replace with Sonnax Part No. 144740-23**  
Requires F-144740-TL22 & VB-FIX

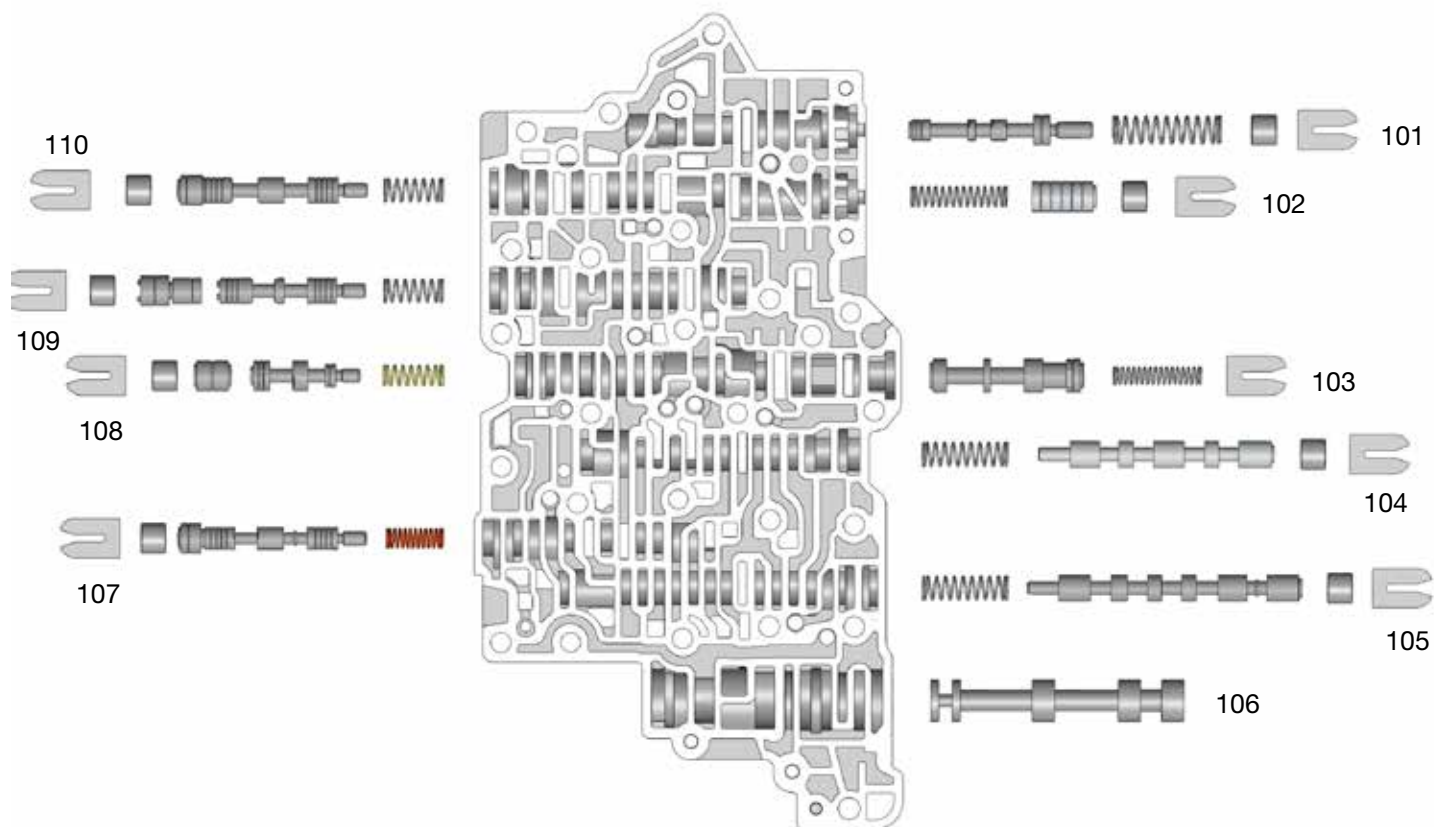
**Forward Clutch Regulator Valve**

- Burnt Forward clutch
- Delayed Forward
- 1-2-3-4 Shift concerns

**NOTE:** Vacuum locations are the same regardless of OE end plug design and inclusion of short shuttle valve.

# OE Exploded View

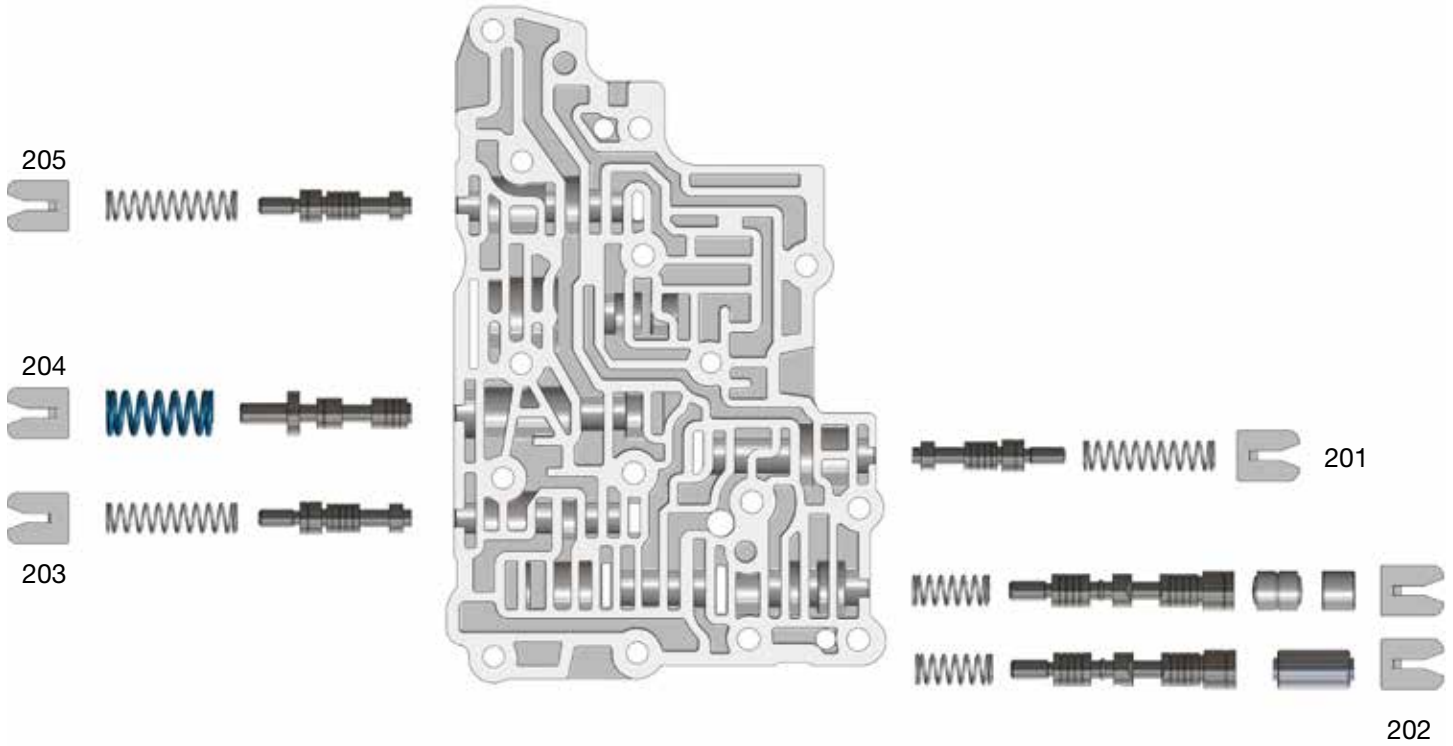
## Upper Valve Body • 6F50 Shown



<b>Upper Valve Body Descriptions</b>	
<b>I.D. No.</b>	<b>6F50 Description</b>
101	Pressure Regulator Valve
102	Isolator Valve
103	TCC Control Valve
104	Multiplex Manual Valve
105	Multiplex Shift Valve
106	Manual Valve
107	L/R Overdrive Clutch Regulator Valve
108	TCC Regulator Apply Valve
109	Intermediate Clutch Regulator & Gain Valve
110	Direct Clutch Regulator Valve

# OE Exploded View

## Lower Valve Body • 6F50 Shown



<b>Lower Valve Body Descriptions</b>	
<b>I.D. No.</b>	<b>6F50 Description</b>
201	Forward Clutch Latch Valve
202	Forward Clutch Regulator Valve
203	L/R Overdrive Clutch Latch Valve
204	Solenoid Pressure Regulator Valve
205	Direct Clutch Latch Valve



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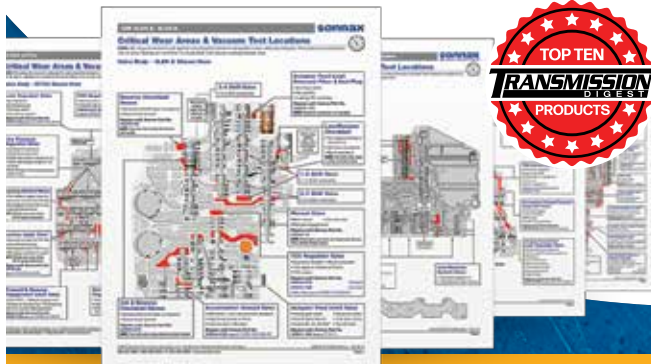
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- GM 4L80-E, 4L85-E
- GM 4T65-E
- GM 6L45/50/80/90
- Ford 4R70E/W, 4R75E/W, AODE
- Ford 5R55S/W
- Ford Gen. 1 & 2 6F35, Gen. 1 6T40/45/50
- Ford 6F50/55, Gen. 1 & 2 6T70/75
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