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

CAUTION: FORD TSB 11-12-10 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.

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

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

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. Insert .062" diameter aluminum plug into drilled hole and peen in place on both sides of plate. Ensure plate will sit flush on both castings.

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

Packaging Pocket 5
- Drill Bit (.062" dia.)
- Aluminum Plugs (2) 1 extra

**Step 6 Replace OE Checkballs**

CAUTION: OE valve body may contain 7 checkballs. Reference Ford TSB 11-12-10 for recommended removal of one check ball and replacement of separator plates for some vehicles.

Packaging Pocket 6
- Checkballs (7) 1 extra
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.

Clutch Apply Chart

<table>
<thead>
<tr>
<th>Gear</th>
<th>Direct Clutch</th>
<th>Overdrive Clutch</th>
<th>Forward Clutch (Brakes)</th>
<th>Low/Reverse Clutch (Brake)</th>
<th>Intermediate Clutch (Brake)</th>
<th>One-Way</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>2nd</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>Overrunning</td>
</tr>
<tr>
<td>3rd</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>Overrunning</td>
</tr>
<tr>
<td>4th</td>
<td></td>
<td>X</td>
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<td></td>
<td>Overrunning</td>
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<tr>
<td>Reverse</td>
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<td></td>
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<td>X</td>
</tr>
</tbody>
</table>

Solenoid Apply Chart

<table>
<thead>
<tr>
<th>PCM Commanded Gear</th>
<th>Shift Solenoid</th>
<th>TCC (VFS) NL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SSA (VFS) NL</td>
<td>SSB (VFS) NH</td>
</tr>
<tr>
<td>Park</td>
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</tr>
<tr>
<td>Reverse</td>
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<td>Neutral</td>
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<td>2nd</td>
<td>X</td>
<td>X</td>
</tr>
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<td>3rd</td>
<td>X</td>
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<td>4th</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>5th</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6th</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Low</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

KEY: X = On/Applied    * = Modulating
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 seven (purple) 62mm bolts to disassemble the valve body (Figure 10).

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**

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).
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.

For specific vacuum test information, refer to individual part instructions included in kits and available at www.sonnax.com.

Upper Valve Body • 6F50 Shown

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 No.
124740-26K (1.35 Ratio) Requires F-124740-TL26 & VB-FIX
124740-21K (1.83 Ratio) Requires F-124740-TL21 & VB-FIX

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, 742   • TCC slip
• Harsh TCC apply
• Loss of fuel economy
• Low TCC apply pressure
• Overheated fluid & TCC lining
Replace with Sonnax Part No.
124740-24K Requires F-124740-TL24 & 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 = ★

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)
124740-03K* (Isolator Valve Kit)

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

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

**Lower Valve Body • 6F50 Shown**

**AFL (Actuator Feed Limit) Valve**
- Solenoid performance codes
- Wrong gear starts
- Clutch failure
*Replace with Sonnax Part No. 124740-01*
Requires F-104740-TL12 & 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

**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

**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

**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

Upper Valve Body Descriptions

<table>
<thead>
<tr>
<th>I.D. No.</th>
<th>6F50 Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Pressure Regulator Valve</td>
</tr>
<tr>
<td>102</td>
<td>Isolator Valve</td>
</tr>
<tr>
<td>103</td>
<td>TCC Control Valve</td>
</tr>
<tr>
<td>104</td>
<td>Multiplex Manual Valve</td>
</tr>
<tr>
<td>105</td>
<td>Multiplex Shift Valve</td>
</tr>
<tr>
<td>106</td>
<td>Manual Valve</td>
</tr>
<tr>
<td>107</td>
<td>L/R Overdrive Clutch Regulator Valve</td>
</tr>
<tr>
<td>108</td>
<td>TCC Regulator Apply Valve</td>
</tr>
<tr>
<td>109</td>
<td>Intermediate Clutch Regulator &amp; Gain Valve</td>
</tr>
<tr>
<td>110</td>
<td>Direct Clutch Regulator Valve</td>
</tr>
</tbody>
</table>
OE Exploded View
Lower Valve Body • 6F50 Shown

<table>
<thead>
<tr>
<th>I.D. No.</th>
<th>6F50 Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>201</td>
<td>Forward Clutch Latch Valve</td>
</tr>
<tr>
<td>202</td>
<td>Forward Clutch Regulator Valve</td>
</tr>
<tr>
<td>203</td>
<td>L/R Overdrive Clutch Latch Valve</td>
</tr>
<tr>
<td>204</td>
<td>Solenoid Pressure Regulator Valve</td>
</tr>
<tr>
<td>205</td>
<td>Direct Clutch Latch Valve</td>
</tr>
</tbody>
</table>
Vacuum Test Stand Kit Part No. VACTEST-01K

- Quick & Easy Setup
- Accurate, Repeatable Tests
- Guaranteed Sonnax Quality

Good equipment is essential for quality valve body repair and the Sonnax vacuum test stand kit is an easy, affordable alternative to building your own rig.

Vacuum Test Plates

Find Valve Body Problems 2X FASTER
Each plate seals over the entire valve body, leaving ports open at key test areas. Easy-to-follow instruction guides identify valves, symptoms of wear and the right Sonnax parts for repair.

- GM 4L60-E, 4L65-E, 4L70-E Part No. 77754-VTP
- ZF6HP19/24/26 (Gen.1), Ford 6R60/80 Part No. 95740-VTP1
- Ford 5R55N/S/W Part No. 56947J-VTP

ZF6 Solenoid Manifold Test Kit Part No. 95430-VTK

Identify Problem Solenoids Quickly & Cost-Effectively
For use with the Sonnax vacuum test stand, this test kit is a quick, easy and affordable way to verify the internal sealing integrity of ZF6 Gen. 1 and Gen. 2 solenoids.

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60-41SN (AF-17)

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6F35
6F50, 6F55
New! 6R140

GM
6L45, 6L50, 6L80, 6L90
First Gen. 6T40/45/50
First Gen. 6T70/75

Toyota/Lexus
A340E/F ’00-Later V6 & V8
A750E/F, A760E/F/H, A761E, A960E/F
U140E/F, U240E, U241E
U151E/F, U250E
U660E/F
U760E/F

ZF
ZF6HP19/26/32 (Gen. 1), Ford 6R60/80
ZF6HP21/28/34 (Gen. 2)

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