Valve Body Identification Guide

**U760E**
Upper Valve Body Casting

- Small Exhaust Groove
- No Transmission Designation
- Solenoid Casting
- Smaller Solenoid Casting Boss
- No Casting Number
- No Pressure Switch Plate
- Casting Cutouts

**U660E, U660F**
Upper Valve Body Casting

- Extended Exhaust Groove
- U660 Casting Number (may be seen here)
- Solenoid Casting
- Larger Solenoid Casting Boss
- Flat Casting
- Pressure Switch Plate

**NOTE:** Large canister solenoid connectors are brown and white.

**NOTE:** Large canister solenoid connectors are brown and black.
Parts are labeled here in order of installation. See other side of sheet for details on kit contents.

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 OE B1 Apply Boost Assembly
Packaging Pocket 1
• Sleeve    • Valve

Step 2 Replace OE Reverse Boost Assembly
Packaging Pocket 2
• Sleeve    • Valve

Step 3 Replace OE Small End Plugs
CAUTION: O-rings go on Inboard spool! Inboard retaining port edge on casting should be chamfered prior to installation to prevent O-ring shear. See page 8 of installation and testing booklet for details.
Packaging Pocket 3
• End Plugs, Small (6)    • O-Rings, Small (9) 3 extra

Step 4 Replace OE Solenoid Modulator Valve Lineup
CAUTION! Many units use tri-lobed end plug. Note location of OE retainer on tri-lobed OE end plug. See page 8 of installation and testing booklet for assembly details.
Packaging Pocket 4
• Valve    • Sleeve    • Spring    • End Plug    • Shims (2)

Step 5 Replace OE Lockup Control Boost Assembly
Packaging Pocket 5
• Sleeve    • Valve

Step 6 Replace OE Large End Plug
CAUTION: O-ring for this large end plug goes on outboard spool!
Packaging Pocket 6
• End Plug, Large    • O-Rings, Large (2) 1 extra

Step 7 Replace OE (Short) C1 Accumulator Piston
Packaging Pocket 7
• Accumulator Piston    • O-Rings (2) 1 extra

Step 8 Replace OE (Long) B1, B2, B3 & C2 Accumulator Pistons
Packaging Pocket 8
• Accumulator Pistons (4)    • O-Rings (6) 2 extra

Step 9 Replace OE Checkballs
NOTE: See pages 6 & 7 in installation and testing booklet for locations.
Packaging Pocket 9
• Checkballs (3)

Step 10 Replace OE O-Rings on Case Connector & Fluid Temperature Sensor
NOTE: See page 8 in installation and testing booklet for locations.
Packaging Pocket 10
• Fluid Temperature Sensor O-Ring, Small
• Case Connector O-Ring, Large

Step 11 Drill & Plug Separator Plate Balance Orifice at Solenoid Modulator Valve
To prevent solenoid modulator leakage, drill indicated orifice to .062”. Plug with aluminum plug and peen in place.
Packaging Pocket 11
• Orifice Plugs, .062” dia. (2) 1 extra
• Drill Bit, .062” dia.
TCM Initialized/Memory Reset

The U660E TCM learns the performance of the vehicle and adapts the transmission accordingly. When significant transmission or engine repairs are made, the TCM needs to be initialized and/or have the memory reset in accordance with the chart in Figure 2. These procedures require use of Toyota's Techstream scan tool or their PC-based version of the scan tool, Techstream lite.

Input Transaxle Compensation Code

The transaxle compensation code is a unique, 60-digit alphanumeric value found on the QR label at the top of the transmission (Figure 1). Inputting an incorrect code into the TCM may cause shift shock.

1. Shift the shift lever to Neutral or Park.
2. Connect Techstream to the DLC3 (diagnostic link connector).
3. Turn ignition switch on (do not start the engine).
4. Turn tester on.
5. Enter the menu items in the following order:
   Powertrain / ECT / Utility / A/T Code Registration.
7. Register the compensation code:
   a. Press “Input”
   b. Type in code. Press “OK.”
8. Verify the displayed value is the same as that on the QR label.
9. Press “Next” to set the code to the TCM.

Initialize Transaxle Compensation Code

This procedure resets the code and, combined with a road test, allows the TCM to relearn.

1. Shift the shift lever to Neutral or Park.
2. Turn the ignition switch off.
3. Connect Techstream to the DLC3.
4. Turn ignition switch on and push Techstream main switch on.
5. Enter the menu items in the following order:
   Powertrain / ECT / Utility / A/T Code Reset
6. Press “Next” again to proceed.
7. Press “Exit.”

Road Test

1. Warm up the engine.
2. From a standstill, achieve highest possible speed with the accelerator pedal opened no more than 15%. Keep the accelerator pedal angle steady while driving the vehicle.
3. Repeat the previous step until shift shock no longer occurs.
4. From a standstill, achieve highest possible speed with the accelerator pedal opened 25% or more. Keep the accelerator pedal angle steady while driving the vehicle.
5. Repeat the previous step until shift shock no longer occurs.

Memory Reset

This procedure resets the TCM memory so it can memorize new performance information.

1. Turn the ignition switch off.
2. Connect the Techstream to the DLC3.
3. Turn the ignition switch on.
4. Turn Techstream main switch on.
5. Enter the menu items in the following order:
   Powertrain / ECT / Utility / Reset Memory.
6. Press “Next” to confirm reset.
Zip Kit Instructions

1. Valve Body Removal
   a. With the valve body still in the transmission, remove the 11 bolts (Figure 4).
   b. Remove the case connector and internal wire harness assembly from the transmission as part of the valve body.

2. Valve Body Disassembly
   a. Disconnect and remove counter gear/turbine speed sensor and valve body bolts (Figure 5).
   b. Disconnect case connector from all seven solenoids. Remove case connector assembly retaining bolt, bracket and connector/harness assembly (Figure 6).
   c. Remove four indicated bolts (Figure 7) and pressure switch and TFT sensor assembly.
   d. Remove eight indicated bolts (Figure 8), solenoid brackets, solenoids, small and large cover plate.
   e. Remove remaining eight bolts (Figure 9) and line pressure relief spring and ball.

3. Installation
   Install Zip Kit parts as shown on diagram of separate quick guide sheet included in this Zip Kit.

   **NOTE:** Special rebuilding tips for steps 3, 4 and 10 are on page 8 of this booklet.

   Sonnax recommends vacuum testing critical wear areas not covered by this kit to determine whether additional Sonnax parts are required (see pages 4–5).

4. Valve Body Reassembly
   a. Reinstall the eight bolts (Figure 9) and line pressure relief spring and ball.
   b. Reinstall the solenoid brackets, solenoids, small and large cover plate and eight bolts (Figure 8).
   c. Reinstall pressure switch and TFT sensor assembly and four bolts (Figure 7).
   d. Reinstall case connector assembly retaining bracket, bolt and connector/harness assembly (Figure 6). Attach wire harness from bracket and connect to all seven solenoids.
   e. Connect and reinstall counter gear/turbine speed sensor and valve body bolts (Figure 5).
   f. When reinstalling the valve body, first temporarily tighten the two bolts marked (★) in Figure 4 as they are positioning bolts.

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**Clutch & Brake Application**

<table>
<thead>
<tr>
<th>Selector Position</th>
<th>C1</th>
<th>C2</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>F1</th>
<th>SL1</th>
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**Solenoid Energized**

When selector position in manually operated.

**Removal Bolts**

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<tr>
<th>Bolt Color Code</th>
<th>Bolt Color</th>
<th>Bolt Length</th>
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<tr>
<td>A</td>
<td>Red</td>
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<td>30mm</td>
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<tr>
<td>C</td>
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<td>D</td>
<td>Yellow</td>
<td>45mm</td>
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<tr>
<td>E</td>
<td>Pink</td>
<td>55mm</td>
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Torque all to 8 ft-lbs

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**Figure 4**

Case connector and internal wire harness assembly.

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**Figure 5**

Case connector and internal wire harness assembly.
## Disassembly & Reassembly Bolts

<table>
<thead>
<tr>
<th>Bolt Color Code</th>
<th>Bolt Length</th>
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<tbody>
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<td>A</td>
<td>Red</td>
</tr>
<tr>
<td>B</td>
<td>Green</td>
</tr>
<tr>
<td>C</td>
<td>Lt Blue</td>
</tr>
<tr>
<td>D</td>
<td>Yellow</td>
</tr>
<tr>
<td>E</td>
<td>Pink</td>
</tr>
<tr>
<td>F</td>
<td>Dk Blue</td>
</tr>
<tr>
<td>G</td>
<td>Orange</td>
</tr>
<tr>
<td>H</td>
<td>Teal</td>
</tr>
<tr>
<td>I</td>
<td>Brown</td>
</tr>
<tr>
<td>J</td>
<td>Purple</td>
</tr>
</tbody>
</table>

Torque all to 8 ft-lbs.

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### SL4 Solenoid (PCSD)
- **B1 Brake**: 5.0–5.6 ohm (Blue & Black Wires)
- **B3 Brake**: 5.0–5.6 ohm (Green & Black Wires)

### SL1 Solenoid (PCSA)
- **C1 Clutch**: 5.0–5.6 ohm (Pink & Black Wires)

### SL2 Solenoid (PCSB)
- **C2 Clutch**: 5.0–5.6 ohm (Orange & Black Wires)

### SLU Solenoid (PCSA)
- **TCC & B2 Brake**: 5.0–5.6 ohm (White & Black Wires)

### SLT Solenoid
- **Line Pressure**: 5.0–5.6 ohm (Grey & Black Wires)

### SL Solenoid
- **Lockup Relay Valve**: 11–15 ohm (1 Blue Wire)
- **B2 Brake Clutch Apply Control Valve**
- **Reverse Sequence Valve**

---

**CAUTION!**: Do not interchange solenoids. If SLU and SLT are interchanged, this will cause both line and TCC apply issues. SLT has five slots, SLU has four slots.

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All solenoid resistance values at 20°C/68°F.
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.

Upper Valve Body

B1 Accumulator Piston
- Burnt B1 brake clutches
- Forward Slip
- Flare/Harsh shifts
- Burnt clutches
Replace with Sonnax Part No. 47740-11K*

B2 Accumulator Piston
- Burnt B2 brake clutches
- Flare/Harsh shifts
- Delayed Reverse with harsh engagement
- Burnt clutches
Replace with Sonnax Part No. 47740-11K*

B3 Accumulator Piston
- Burnt B3 brake clutches
- Flare/Harsh shifts
- Burnt clutches
- Delayed Reverse with harsh engagement
Replace with Sonnax Part No. 47740-11K*

Secondary Pressure Regulator Valve
- TCC codes
- TCC shudder
- Lube failures
- TCC apply & release concerns
- Bearing/Bushing failure
Replace with Sonnax Part No. 47740-26K
Requires F-47740-TL26 & VB-FIX

C1 Accumulator Piston
- Delayed Forward
- Forward slip
- C1 Clutch burned
- Harsh Forward
- Flare shifts
Replace with Sonnax Part No. 47740-12K*

Test: Test this port with valve blocked inboard .125" with OE retainer.

Test: Test this port with valve blocked outboard .125" with OE retainer and sealing port on back with thumb.

Test: Test each port with valve blocked outboard .125" with OE retainer.

C2 Accumulator Piston
- Burnt C2 brake clutches
- Forward Slip
- Flare/Harsh shifts
- Burnt clutches
Replace with Sonnax Part No. 47740-11K*

Reverse Sequence Valve
- Delayed Reverse
- Low Reverse pressure
- Burnt B2 or B3 brake

Lockup Relay Valve
- TCC apply & release concerns
- TCC slip codes
- Overheated transmission

Lockup Control Valve
- TCC slip codes
- RPM fluctuation
- TCC apply & release concerns
- Harsh downshifts
Replace with Sonnax Part No. 47740-30K
Requires F-47740-TL30 & VB-FIX

Lockup Control Boost Assembly
- TCC apply & release concerns
- TCC slip codes
- Burnt converter
- Overheated Fluid
Replace with Sonnax Part No. 47740-06K*

End Plugs
- Burnt brake clutches
- Shift concerns
- Lockup concerns
- Burnt clutches
Replace with Sonnax Part No. 47740-21K*

*Items with an asterisk (*) are included in this Zip Kit.
NOTE: For specific vacuum test information, refer to individual part instructions included in kits and available at www.sonnax.com.

**Middle Valve Body • Lower Side**

**B1 Apply Control Valve**
- 2nd and 6th Gear shift concerns
- B1 brake clutches burned

**Primary Pressure Regulator Valve**
- Erratic/Soft/Harsh shifts
- Low line pressure/riase
- Clutch slippage
- High line pressure in Reverse
- Burnt brake clutches
- High line pressure
- Low converter pressure
- Burnt clutches

*Replace with Sonnax Part No. 47740-02K. Requires F-47740-TL2 & VB-FIX*

**Sequence Valve**
- Shift concerns
- Burnt clutches/brakes

*Note: Seal port on back when testing.*

**B2 Apply Control Valve**
- B2 Clutch burned • No Reverse
- Delayed Reverse • Reverse slip

*Replace with Sonnax Part No. 47740-27K. Requires F-47740-TL27 & VB-FIX*

**B2 Control Valve**
- B2 Clutch burned • Delayed Reverse

**Solenoid Modulator Valve**
- Shift concerns
- Solenoid performance codes
- TCC apply & release concerns

*Replace with Sonnax Part No. 47740-24K. Requires F-47740-TL24 & VB-FIX*

**Reverse Boost Assembly**
- Delayed Reverse
- Low line rise in Reverse
- B2 Brake clutches burned

*Replace with Sonnax Part No. 47740-17K*

**B1 Apply Boost Assembly**
- 2nd and 6th Gear shift concerns
- B1 brake clutches burned

*Replace with Sonnax Part No. 47740-19K*

**Clutch Control Valve**
- 4-5 Flare/Harsh
- Delayed Neutral to Drive
- Delayed Reverse

*Replace with Sonnax Part No. 47740-22K*

*Requires F-47740-TL22 & VB-FIX*

**C2 Clutch Apply Control Valve**
- Slipping 4th, 5th, 6th
- Burnt C2 clutch

**Middle Valve Body • Upper Side**

**B2 Control Valve**
- B2 Clutch burned • Delayed Reverse

*Note: Seal when testing B2 apply control valve.*

**Sequence Valve**
- Shift concerns
- Burnt clutches/brakes

*Note: Seal port on back when testing.*

**Reverse Boost Assembly**
- Delayed Reverse
- Low line rise in Reverse
- B2 Brake clutches burned

*Replace with Sonnax Part No. 47740-17K*

*Note: Seal when testing reverse boost assembly.*

*Note: Seal when testing pressure regulator valve.*

*Items with an asterisk (*) are included in this Zip Kit.*
OE Exploded View

Upper Valve Body

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

<table>
<thead>
<tr>
<th>I.D. No.</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>101</td>
<td>Lockup Control Valve (inboard)</td>
</tr>
<tr>
<td></td>
<td>Lockup Control Boost Assembly (outboard)</td>
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<tr>
<td>102</td>
<td>Lockup Relay Valve</td>
</tr>
<tr>
<td>103</td>
<td>Reverse Sequence Valve</td>
</tr>
<tr>
<td>104</td>
<td>Secondary Pressure Regulator Valve</td>
</tr>
<tr>
<td>105</td>
<td>B3 Accumulator Piston</td>
</tr>
<tr>
<td>106</td>
<td>B1 Accumulator Piston</td>
</tr>
<tr>
<td>107</td>
<td>B2 Accumulator Piston</td>
</tr>
<tr>
<td>108</td>
<td>C1 Accumulator Piston</td>
</tr>
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<td>109</td>
<td>C2 Accumulator Piston</td>
</tr>
<tr>
<td>110</td>
<td>Lube Relief Check Valve</td>
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<tr>
<td>111</td>
<td>Converter Relief Check Valve</td>
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### Middle Valve Body Descriptions

<table>
<thead>
<tr>
<th>I.D. No.</th>
<th>Description</th>
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</thead>
</table>
| 201     | B1 Apply Control Valve (inboard)  
          | B1 Apply Boost Assembly (outboard) |
| 202     | Primary Pressure Regulator Valve (inboard)  
          | Reverse Boost Assembly (outboard) |
| 203     | Sequence Valve |
| 204     | Clutch Control Valve |
| 205     | C2 Clutch Apply Control Valve |
| 206     | B2 Apply Control Relay Valve (inboard)  
          | B2 Apply Control Valve (outboard) |
| 207     | B2 Control Valve (inboard)  
          | B2 Control Relay Valve (outboard) |
| 208     | Manual Valve |
| 209     | Solenoid Modulator Valve |
Additional Technical Tips for Installation Steps 3, 4 & 10 from the Quick Guide

**Step 3 Replace OE Small End Plugs**

The large outer chamfer on the small end plug bores makes the outer bore too narrow for an O-ring to seal properly. The Sonnax O-ringed end plugs require the O-ring to seal at the bore inboard of the retainer port. To prevent O-ring shear during assembly, the sharp edge must be broken. This can be done by inserting a narrow file or small screwdriver through the retainer port and reworking the edge (Figure 10).

To install the O-ringed end plug after the edge has been modified, place the O-ring in the narrow plug groove. Lubricate the plug and O-ring with O-Lube and roll on bench to size. Carefully push the plug into the bore. As the O-ring contacts the modified edge, gently compress the exposed portion with a small screwdriver blade inserted through the retainer port.

**Step 4 Replace OE Solenoid Modulator Valve Lineup**

During disassembly of OE solenoid modulator lineup, note location of the tri-lobed end plug (if applicable) retainer (Figure 11). This adjusts solenoid modulator pressure. Follow options A–D if a tri-lobed end plug is used.

If a standard two-spooled end plug is used, proceed to option E.

- **Option A:** If OE retainer is installed at the most narrow location, no Sonnax shims are required.
- **Option B:** If OE retainer is installed at the middle spool location, one Sonnax shim is required.
- **Option C:** If OE retainer is installed at the widest spool location, two Sonnax shims are required.
- **Option D:** Shims should be placed over valve spring stem, between valve spool face and spring (Figure 12).
- **Option E:** For standard two-spooled OE plug, do not use any shims. Install as pictured (Figure 12), omitting the shims.

**Step 10 Replace OE O-Rings on Case Connector & Fluid Temperature Sensor**

Replace the O-rings in the case connector and internal wire harness assembly, as well as in the pressure switch and TFT sensor assembly as shown in these locations (Figure 13).