



# TOYOTA/LEXUS U660E, U660F ZIP KIT®

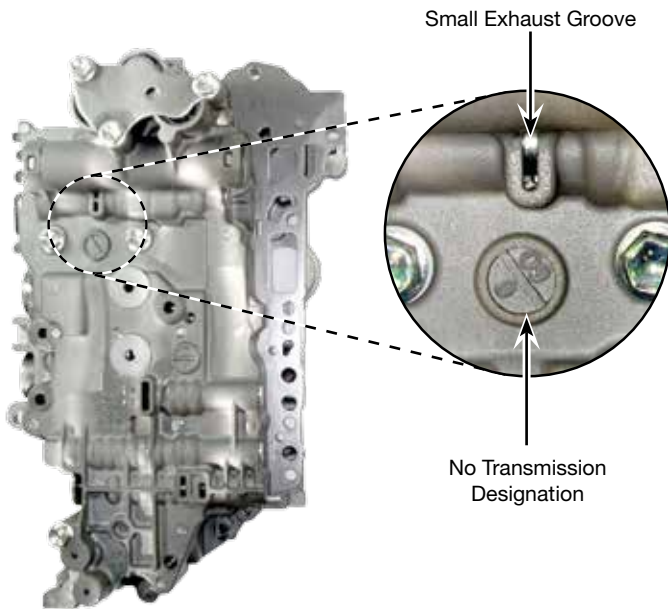
PART NUMBER U660E-ZIP

IDENTIFICATION GUIDE

## Valve Body Identification Guide

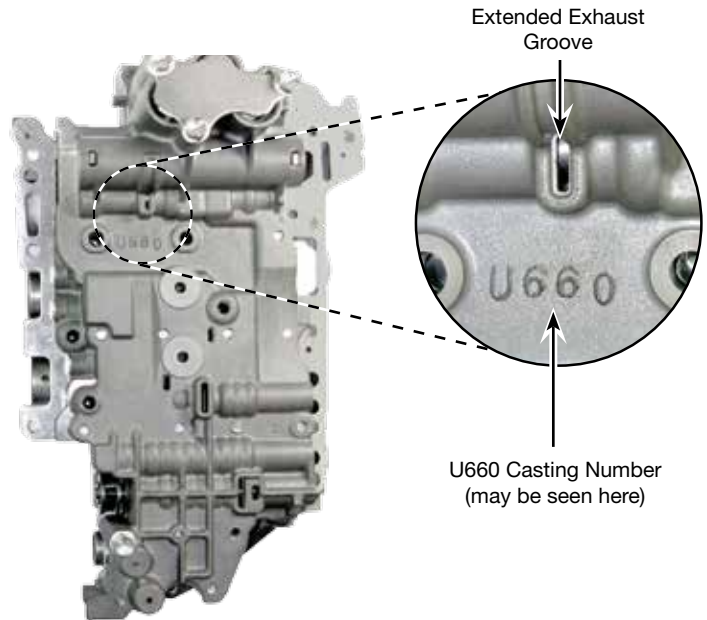
### U760E

Upper Valve Body Casting

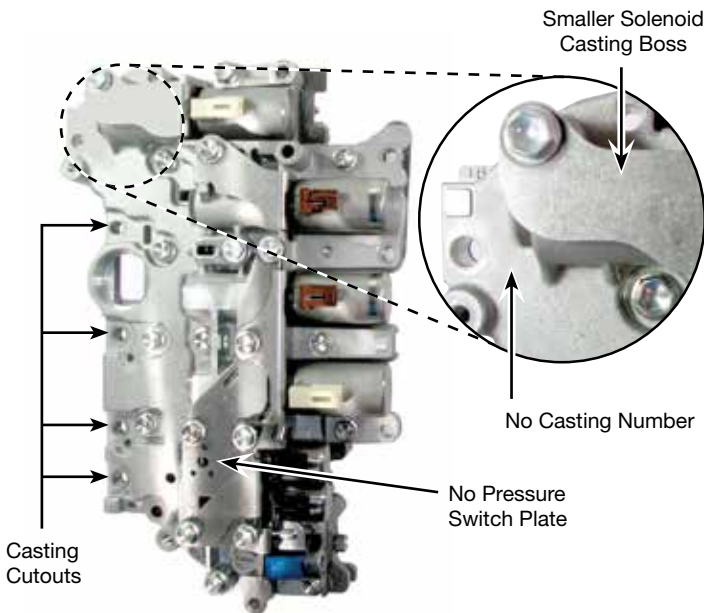


### U660E, U660F

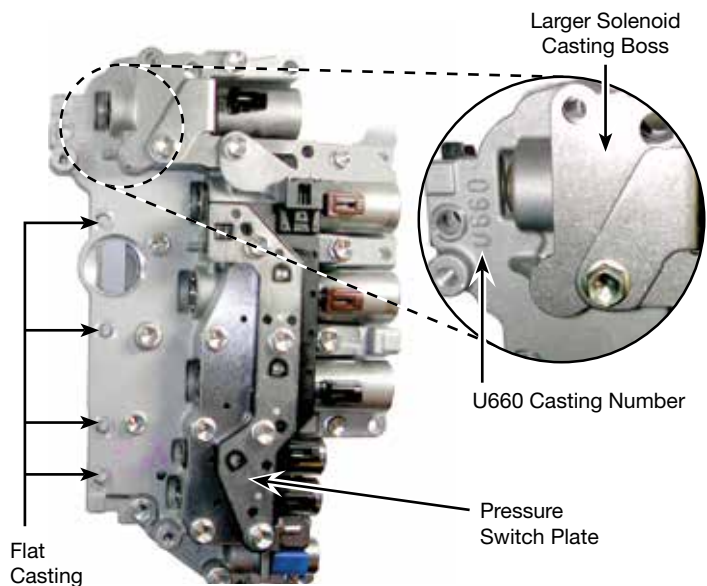
Upper Valve Body Casting



Solenoid Casting



Solenoid Casting



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



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



# TOYOTA/LEXUS U660E, U660F ZIP KIT®

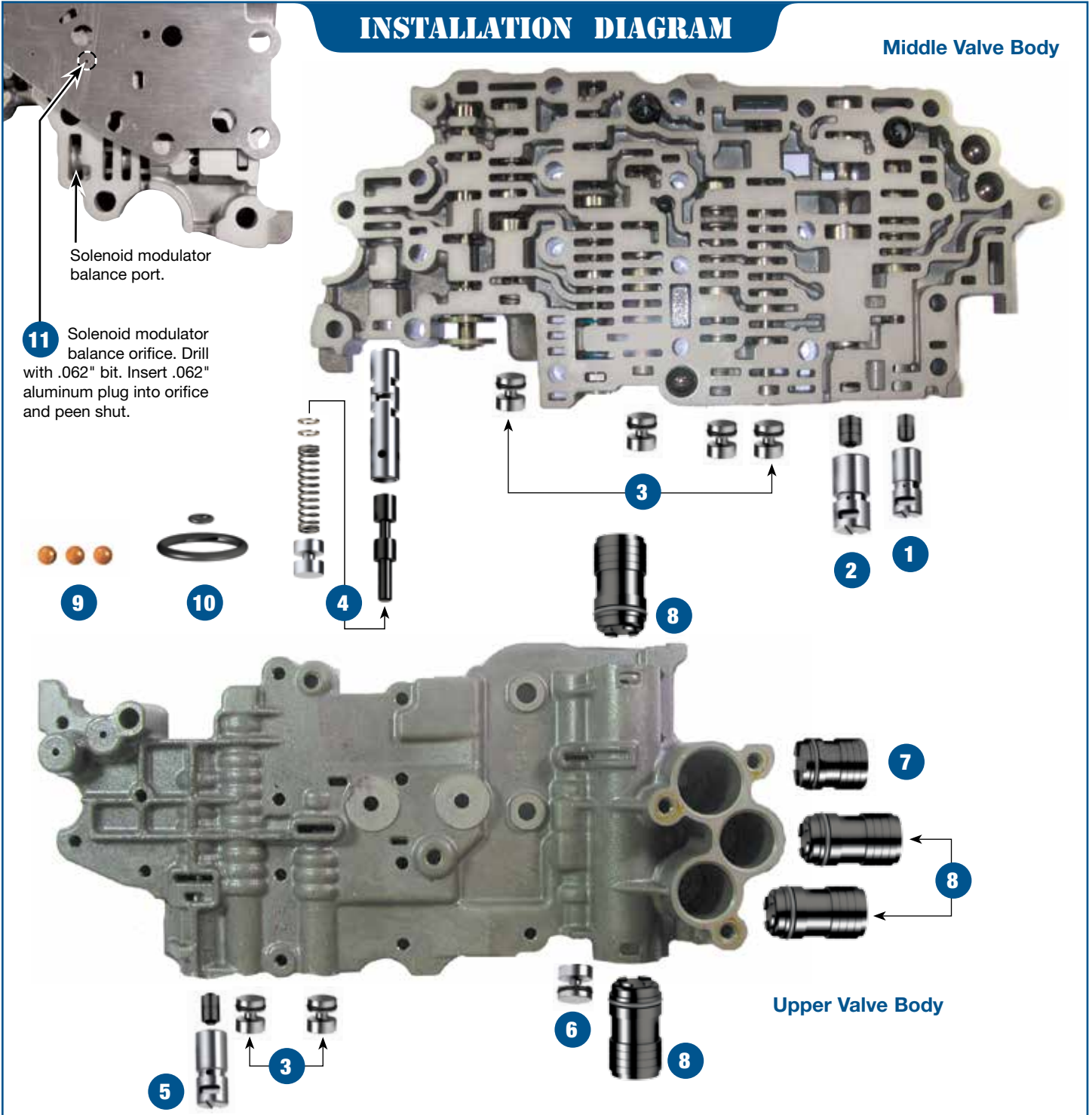
PART NUMBER U660E-ZIP

QUICK GUIDE

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

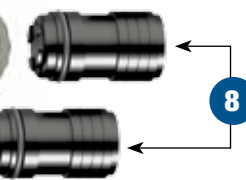
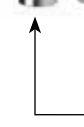
## INSTALLATION DIAGRAM

Middle Valve Body



Solenoid modulator balance port.

**11** Solenoid modulator balance orifice. Drill with .062" bit. Insert .062" aluminum plug into orifice and peen shut.



Upper Valve Body

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.

## Zip 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 andpeen in place.

#### Packaging Pocket 11

- Orifice Plugs, .062" dia. (2) 1 extra
- Drill Bit, .062" dia.



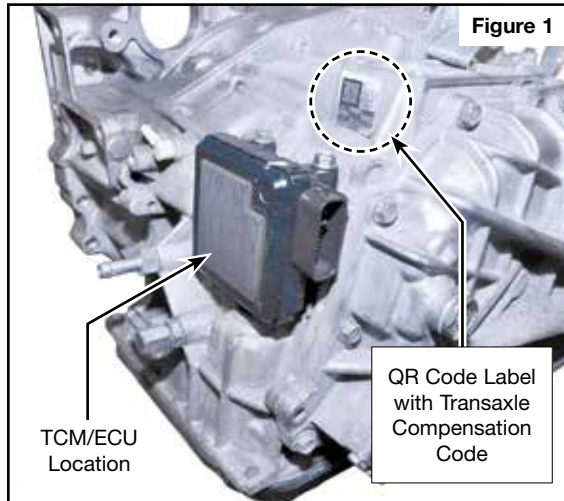
# Toyota/Lexus U660E, U660F ZIP KIT®

PART NUMBER U660E-ZIP

INSTALLATION & TESTING BOOKLET

## 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.



### Automatic Transaxle Parts Replacement Chart

Figure 2

| Replaced Parts                      | Transaxle Compensation Code | Road Test | Memory (Learned Values) |
|-------------------------------------|-----------------------------|-----------|-------------------------|
| Automatic Transaxle Assembly        | Input                       |           | Reset                   |
| Valve Body Assembly                 | Initialize                  | Necessary | Reset                   |
| Shift Solenoid Valve SL1 and/or SL2 |                             | Necessary |                         |
| Shift Solenoid Valve SL3 and/or SL4 | Initialize                  | Necessary | Reset                   |
| TCM* - Possible                     | Input (into the new TCM)    |           |                         |
| TCM* - Impossible                   |                             | Necessary |                         |

\* **Note:** If possible, read the transaxle compensation code from the previous TCM.

### 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.

- Shift the shift lever to Neutral or Park.
- Connect Techstream to the DLC3 (diagnostic link connector).
- Turn ignition switch on (do not start the engine).
- Turn tester on.
- Enter the menu items in the following order:  
Powertrain / ECT / Utility / A/T Code Registration.
- Select "Set Compensation Code."
- Register the compensation code:
  - Press "Input"
  - Type in code. Press "OK."
- Verify the displayed value is the same as that on the QR label.
- Press "Next" to set the code to the TCM.

- Enter the menu items in the following order:  
Powertrain / ECT / Utility / A/T Code Reset
- Press "Next" again to proceed.
- Press "Exit."

### Road Test

- Warm up the engine.
- 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.
- Repeat the previous step until shift shock no longer occurs.
- 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.
- 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.

- Turn the ignition switch off.
- Connect the Techstream to the DLC3.
- Turn the ignition switch on.
- Turn Techstream main switch on.
- Enter the menu items in the following order:  
Powertrain / ECT / Utility / Reset Memory.
- Press "Next" to confirm reset.

### Initialize Transaxle Compensation Code

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

- Shift the shift lever to Neutral or Park.
- Turn the ignition switch off.
- Connect Techstream to the DLC3.
- Turn ignition switch on and push Techstream main switch on.



Figure 3

| Clutch & Brake Application |    |    |    |    |    |    | Solenoid Energized<br>When selector position in manually operated. |     |     |     |     |     |    |
|----------------------------|----|----|----|----|----|----|--|-----|-----|-----|-----|-----|----|
| Selector Position          | C1 | C2 | B1 | B2 | B3 | F1 | SL1  | SL2 | SL3 | SL4 | SLU | SLT | SL |
| P-Park                     |    |    |    |    |    |    | X  |     |     |     |     | X   |    |
| R-Reverse                  |    |    |    | X  | X  |    |  |     |     | X   |     | X   |    |
| N-Neutral                  |    |    |    |    |    |    | X  |     |     |     | X   |     |    |
| D, S6-1st                  | X  |    |    |    |    | X  | X  |     |     |     |     | X   |    |
| D, S6-2nd                  | X  |    | X  |    |    |    | X  |     | X   |     |     | X   |    |
| D, S6-3rd                  | X  |    |    |    | X  |    | X  |     |     | X   |     | X   |    |
| D, S6-4th                  | X  | X  |    |    |    |    | X  | X   |     |     |     | X   |    |
| D, S6-5th                  |    | X  |    |    | X  |    |  | X   |     | X   |     | X   |    |
| D, S6-6th                  |    | X  | X  |    |    |    |  | X   | X   |     |     | X   |    |
| S1-1st/Manual              | X  |    | X  |    |    | X  |  |     |     |     |     |     |    |

## Zip Kit Instructions

### 1. Valve Body Removal

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

### 2. Valve Body Disassembly

- Disconnect and remove counter gear/turbine speed sensor and valve body bolts (Figure 5).
- Disconnect case connector from all seven solenoids. Remove case connector assembly retaining bolt, bracket and connector/harness assembly (Figure 6).
- Remove four indicated bolts (Figure 7) and pressure switch and TFT sensor assembly.
- Remove eight indicated bolts (Figure 8), solenoid brackets, solenoids, small and large cover plate.
- 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.

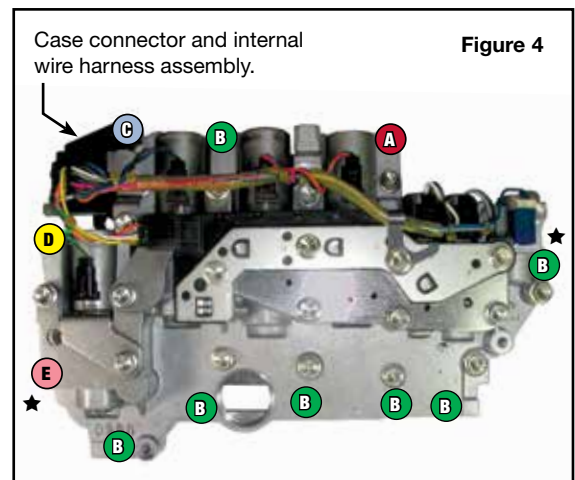
Sonnax recommends vacuum testing critical wear areas not covered by this kit to determine whether additional Sonnax parts are required (see pages 4–5).

### 4. Valve Body Reassembly

- Reinstall the eight bolts (Figure 9) and line pressure relief spring and ball.
- Reinstall the solenoid brackets, solenoids, small and large cover plate and eight bolts (Figure 8).
- Reinstall pressure switch and TFT sensor assembly and four bolts (Figure 7).
- Reinstall case connector assembly retaining bracket, bolt and connector/harness assembly (Figure 6). Attach wire harness from bracket and connect to all seven solenoids.

### Removal Bolts

| Bolt Color Code        |        | Bolt Length |
|------------------------|--------|-------------|
| A                      | Red    | 25mm        |
| B                      | Green  | 30mm        |
| C                      | Blue   | 35mm        |
| D                      | Yellow | 45mm        |
| E                      | Pink   | 55mm        |
| Torque all to 8 ft-lbs |        |             |



Case connector and internal wire harness assembly.

Figure 4

- Connect and reinstall counter gear/turbine speed sensor and valve body bolts (Figure 5).
- When reinstalling the valve body, first temporarily tighten the two bolts marked (★) in Figure 4 as they are positioning bolts.

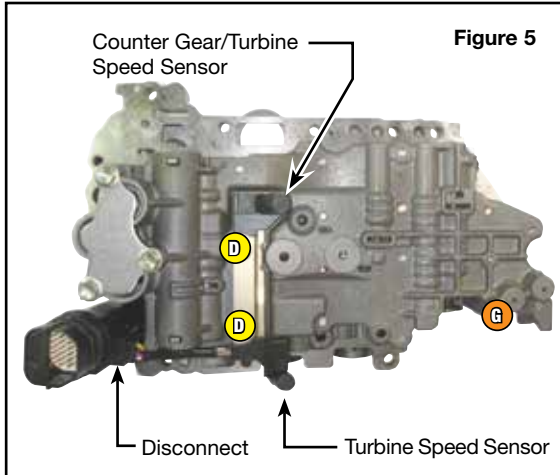


Figure 5

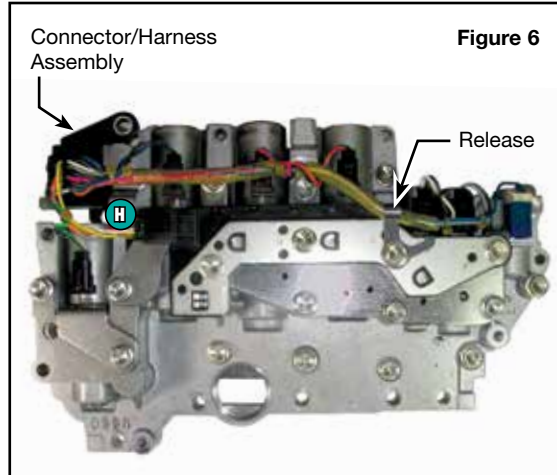


Figure 6

**Disassembly & Reassembly Bolts**

| Bolt Color Code |         | Bolt Length |
|-----------------|---------|-------------|
| A               | Red     | 15.5mm      |
| B               | Green   | 16mm        |
| C               | Lt Blue | 25mm        |
| D               | Yellow  | 50mm        |
| E               | Pink    | 55mm        |
| F               | Dk Blue | 60mm        |
| G               | Orange  | 70mm        |
| H               | Teal    | 75mm        |
| I               | Brown   | 80mm        |
| J               | Purple  | 85mm        |

Torque all to 8 ft-lbs

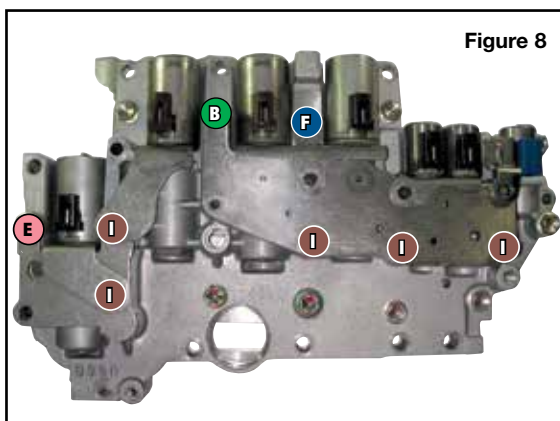
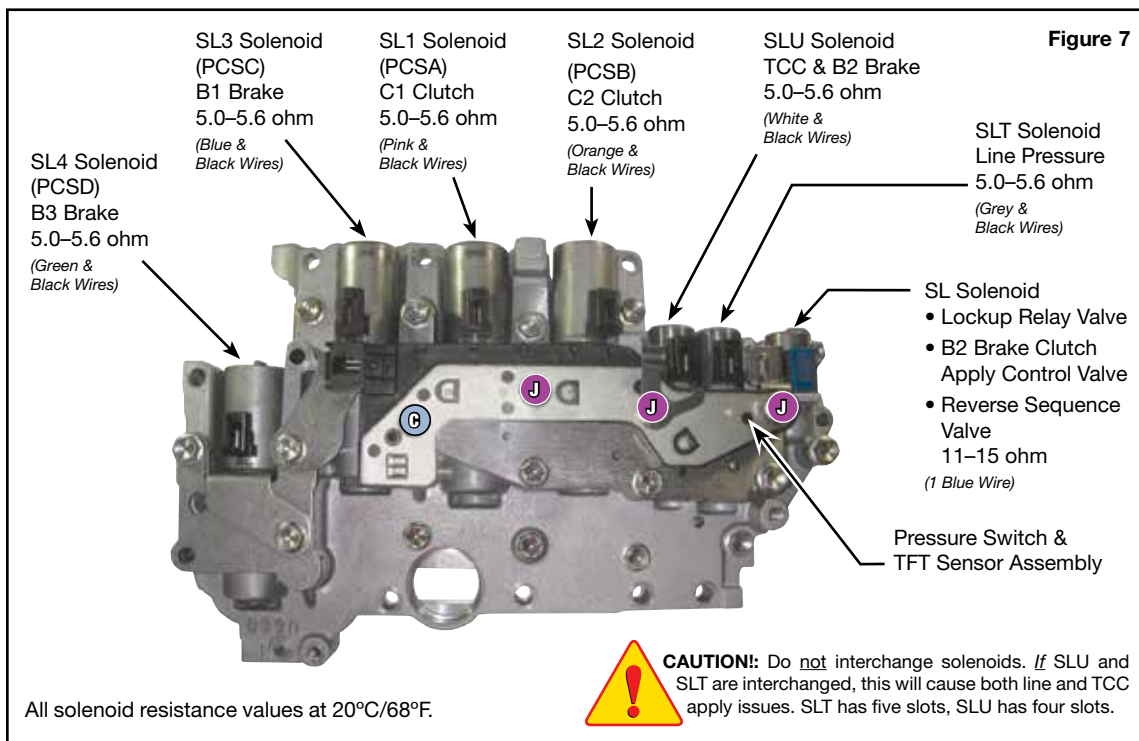


Figure 8

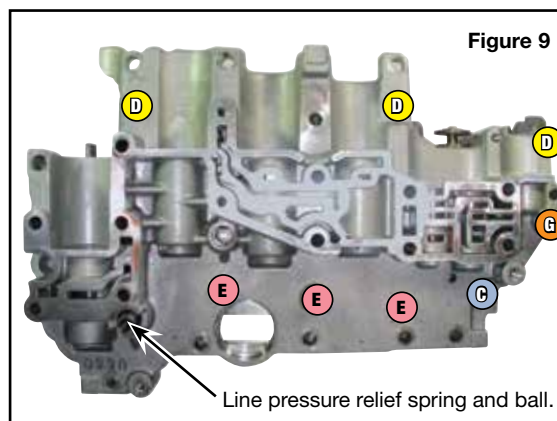
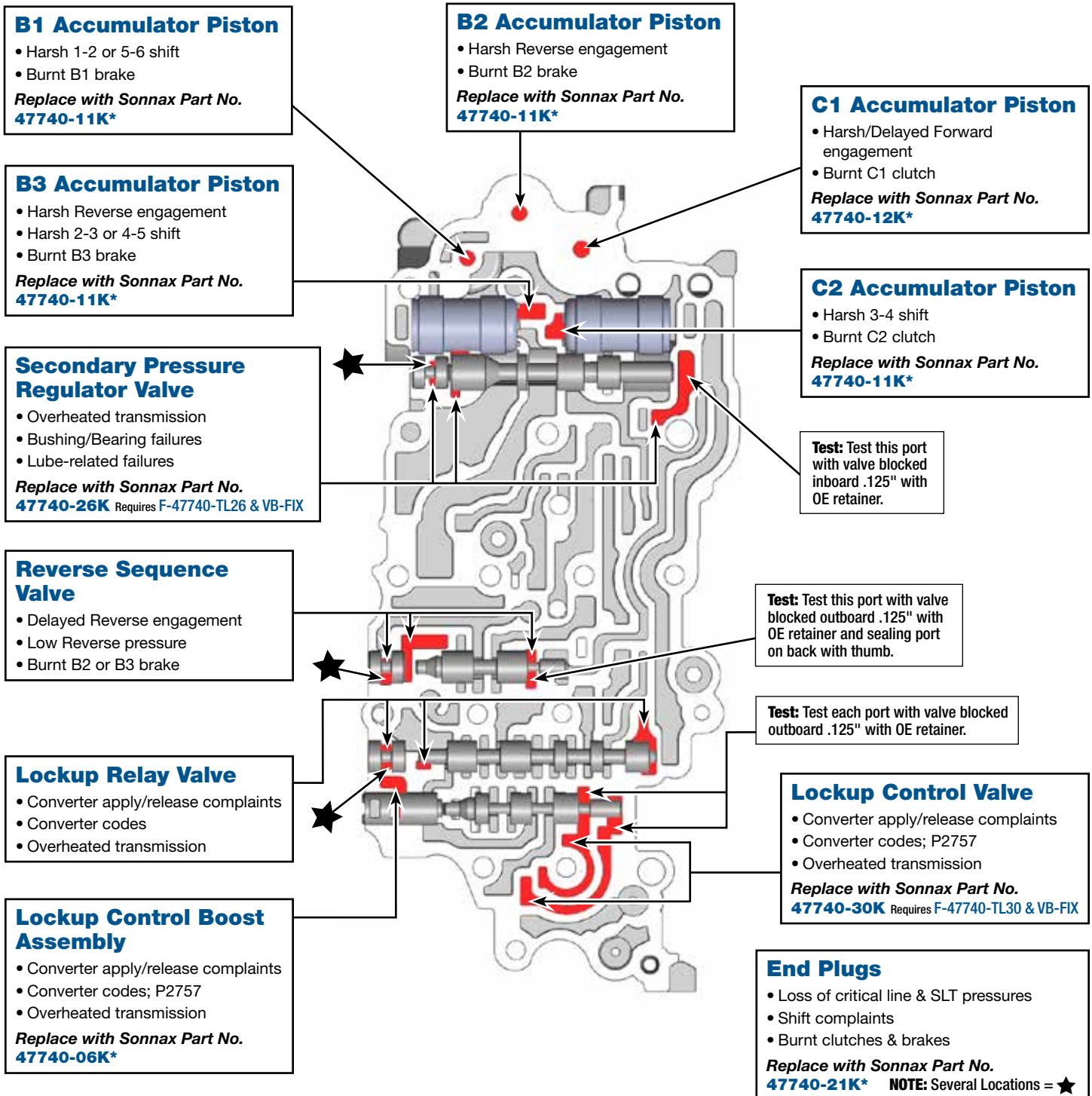


Figure 9

# 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



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





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

**Middle Valve Body • Lower Side**

**B1 Apply Control Valve**

- 1-2 & 5-6 shift complaints
- Burnt B1 brake

**Note:** Seal port on back when testing.

**Primary Pressure Regulator Valve**

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

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

**Note:** Seal port on back when testing.

**Sequence Valve**

- Shift complaints
- Burnt clutches/brakes

**Note:** Seal port on back when testing.

**B2 Apply Control Valve**

- Delayed Reverse engagement
- Burnt B2 brake

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

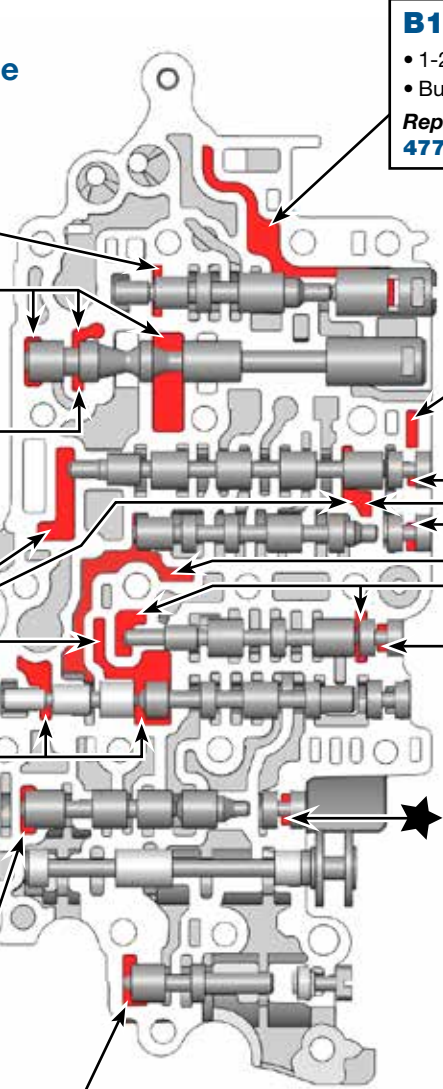
**B2 Control Valve**

- Delayed Reverse engagement
- Burnt B2 brake

**Solenoid Modulator Valve\***

- Shift complaints • Solenoid codes
- TCC clip • Loss of control pressures

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



**B1 Apply Boost Assembly**

- 1-2 & 5-6 shift complaints
- Burnt B1 brake

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

**Test:** Block this port and port on back when testing.

**Test:** Test this port with valve blocked inboard .218" dia. checkball.

**Clutch Control Valve**

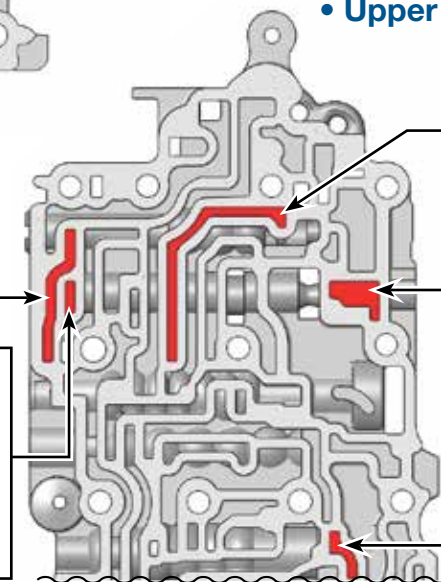
- 4-5 Flare/Harsh
- Delayed Reverse

**Replace with Sonnax Part No. 47740-22K** Requires F-47740-TL22 & VB-FIX

**C2 Clutch Apply Control Valve**

- Slipping 4th, 5th, 6th gear
- Burnt C2 clutch

**Middle Valve Body • Upper Side**



**Note:** Seal when testing B1 apply control valve.

**Note:** Seal when testing pressure regulator valve.

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

**Reverse Boost Assembly**

- Delayed Reverse
- Low line pressure in Reverse
- Burnt B2 & B3 brakes

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

**Note:** Seal when testing B1 apply boost assembly.

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



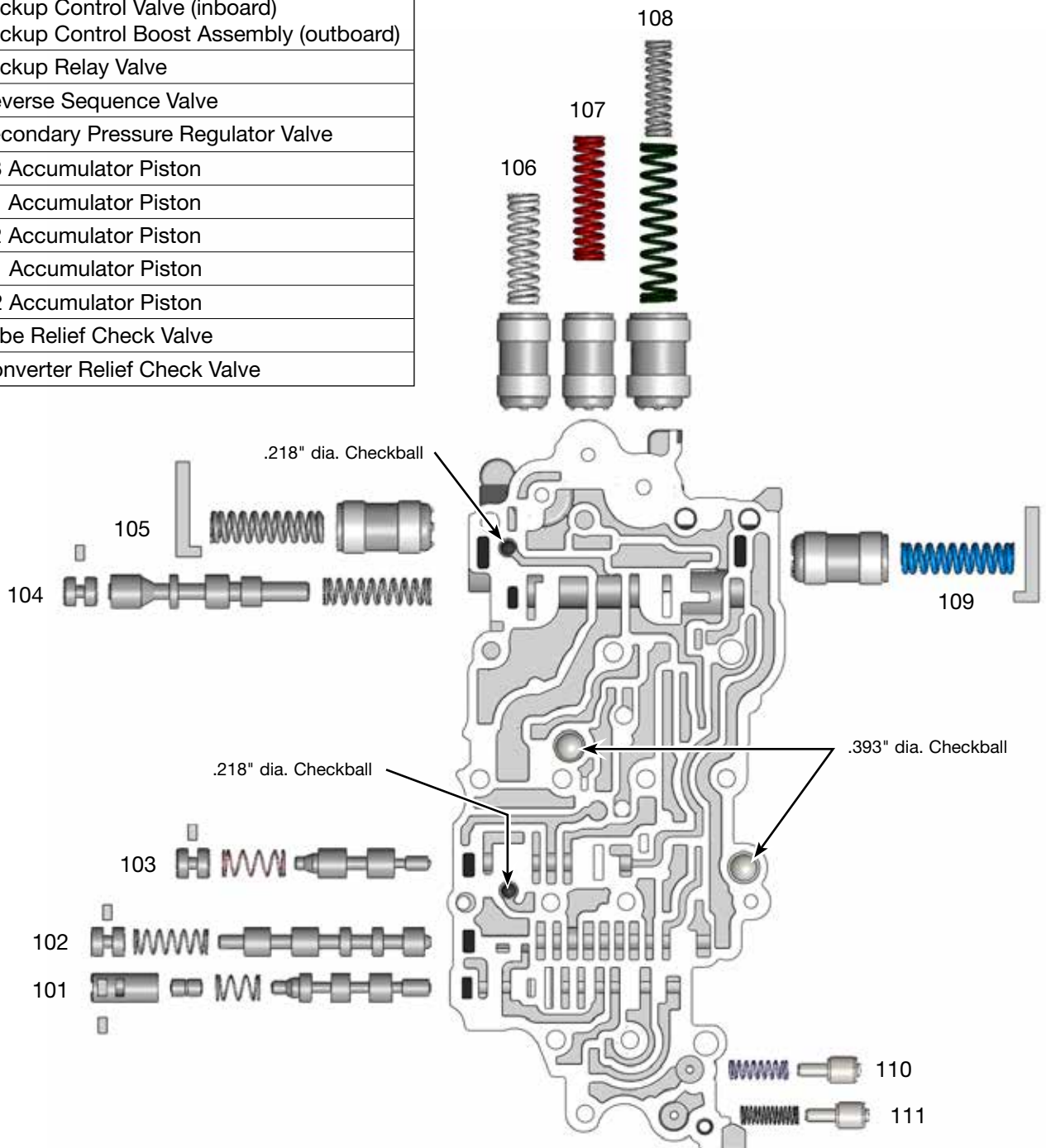
# OE Exploded View

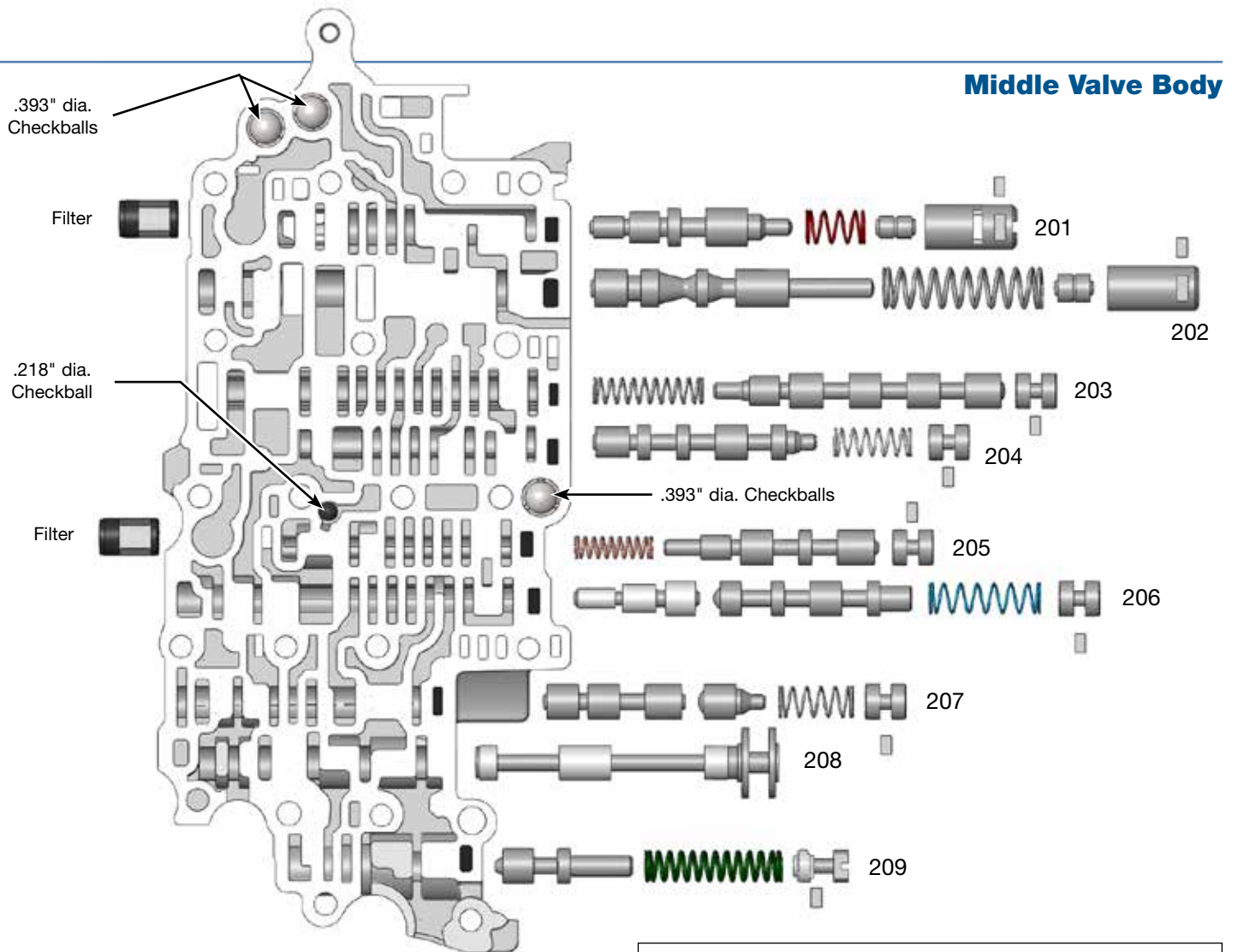
## Upper Valve Body

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

### Upper Valve Body Descriptions

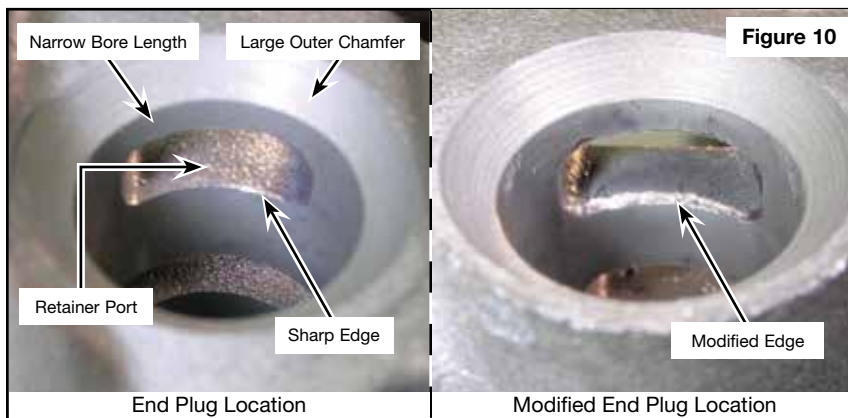
| I.D. No. | Description  |
|----------|--|
| 101      | Lockup Control Valve (inboard)<br>Lockup Control Boost Assembly (outboard) |
| 102      | Lockup Relay Valve   |
| 103      | Reverse Sequence Valve   |
| 104      | Secondary Pressure Regulator Valve   |
| 105      | B3 Accumulator Piston  |
| 106      | B1 Accumulator Piston  |
| 107      | B2 Accumulator Piston  |
| 108      | C1 Accumulator Piston  |
| 109      | C2 Accumulator Piston  |
| 110      | Lube Relief Check Valve  |
| 111      | Converter Relief Check Valve   |





| Upper Valve Body Descriptions |   |
|-------------------------------|---|
| I.D. No.                      | Description   |
| 201                           | B1 Apply Control Valve (inboard)<br>B1 Apply Boost Assembly (outboard)          |
| 202                           | Primary Pressure Regulator Valve (inboard)<br>Reverse Boost Assembly (outboard) |
| 203                           | Sequence Valve  |
| 204                           | Clutch Control Valve  |
| 205                           | C2 Clutch Apply Control Valve   |
| 206                           | B2 Apply Control Relay Valve (inboard)<br>B2 Apply Control Valve (outboard)     |
| 207                           | B2 Control Valve (inboard)<br>B2 Control Relay Valve (outboard)                 |
| 208                           | Manual Valve  |
| 209                           | Solenoid Modulator Valve  |

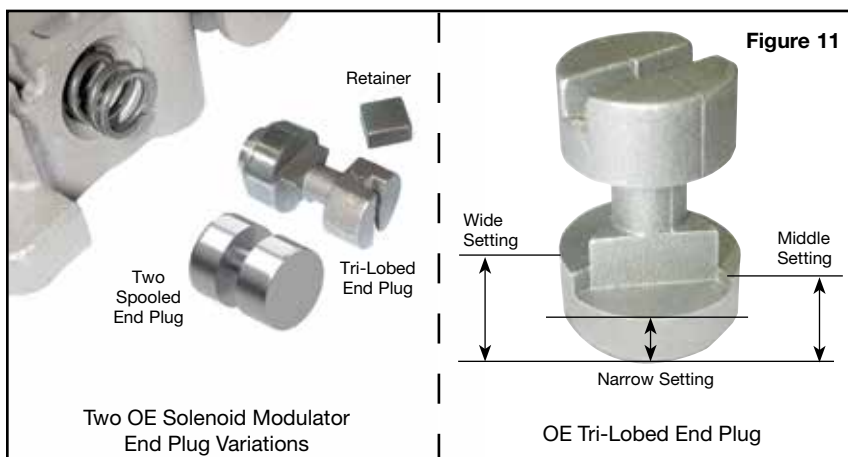
## Additional Technical Tips for Installation Steps 3, 4 & 10 from the Quick Guide




### 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**).

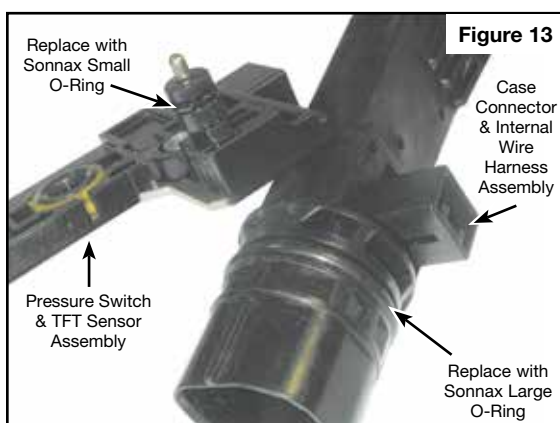
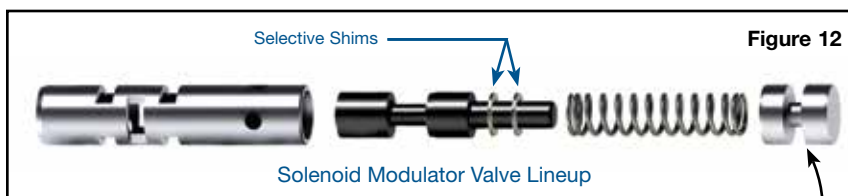
To install the O-ringed end plug after the edge has been modified, place the O-ring in the narrow plug groove. Lubricate the plug and O-ring with O-Lube and roll on bench to size. Carefully push the plug into the bore. As the O-ring contacts the modified edge, gently compress the exposed portion with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



**NOTE:** Sonnax end plug can be swapped end for end for best fit of sleeve in bore.

- 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**).