



TOYOTA U140E-U241E ZIP KIT

PART NUMBER U140E-U241E-ZIP

INSTALLATION & TESTING BOOKLET

Torque Specifications

| | |
|---|---|
| Pan Filter to Valve Body 96 in-lb | Oil Pan to Transaxle 72 in-lb |
|---|---|

Component Pack Clearance

| | |
|--|---|
| Forward (C1) Clutch U140E/F: 4-Cyl .069-.082" U140E/F: V6 .082-.095" U240/241E: .056-.069" | Low & Reverse (B2) Brake U140E/F: 4-Cyl .040-.048" U140E/F: V6 .043-.051" U240/241E: .043-.049" |
| 2nd (B1) Brake U140E/F: .024-.036" U240E: .024-.029" U241E: .024-.036" | Direct (C2) Input U140E/F: .024-.033" U240/241E: .024-.029" |
| Underdrive (C3) Clutch U140E/F: .059-.075" U240E/241E: .058-.067" | Underdrive (B3) Brake U140E/F: .071-.087" U240/241E: .074-.082" |

End Play

| | |
|--|---|
| Input Shaft U140E/F: .010-.049" U240E/241E: .011-.049" | Underdrive Unit U140E/F: .020-.039" U240E/241E: .008-.027" |
| Direct Clutch Assembly U140E/F: .008-.037" U240E/241E: .008-.035" | |

Fluid

Toyota Type T-IV

Electronic Cautions

Resetting Shift Adapts

The ECM (engine control module) has memorized values which must be relearned after transmission repair. Use a scan tool (OE factory tool recommended) to reset the ECM.

Post-Adapt Road Test

After resetting the ECM, a road test is required. Start the engine and warm it to normal operating temperature. Perform a thorough road test with multiple accelerations from a stop until proper shifting is obtained.

TSB TC002-06

Toyota published a Technical Service Bulletin regarding computer hardware problems in 2001-2003 RAV4 vehicles. Resetting the ECM will not eliminate shifting complaints for this unit. A new ECM will be required.

Solenoids

Solenoids should be cleaned to remove debris that results in sticking and malfunction.

**Toyota/Lexus U140E/F, U240E, U241E
Clutch Application Chart**

| Gear Range | C1 | C2 | C3 | B1 | B2 | B3 | F1 | F2 |
|--------------|----|----|----|----|----|----|----|----|
| Park | | | | | | ON | | |
| Reverse | | ON | | | ON | ON | | |
| Neutral | | | | | | ON | | |
| D-1st Gear | ON | | | | | ON | ON | ON |
| D-2nd Gear | ON | | | ON | | ON | | ON |
| D-3rd Gear | ON | ON | | | | ON | | ON |
| D-Overdrive | ON | ON | ON | | | | | |
| 2-1st Gear | ON | | | | | ON | ON | ON |
| 2-2nd Gear | ON | | | ON | ON | ON | | ON |
| Low-1st Gear | ON | | | | ON | ON | ON | ON |

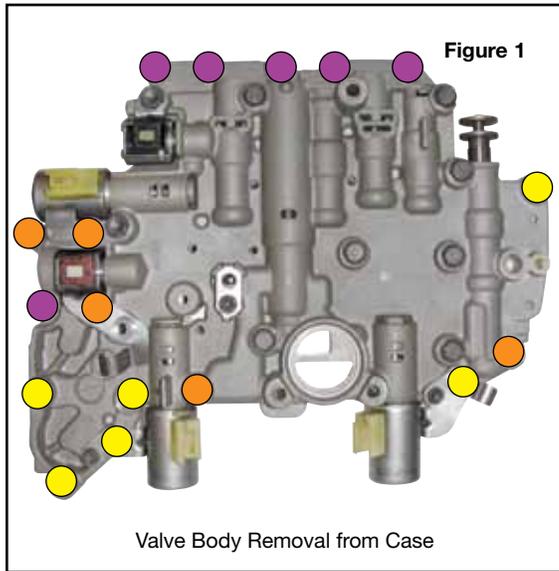
**Toyota/Lexus U140E/F, U240E, U241E
Solenoid Function & Apply Chart**

| Gear | SL1 Controls B1 Brake | SL2 Controls C2 Clutch | S4 Controls 3-4 Shift |
|------|--------------------------|---------------------------|--------------------------|
| 1st | ON | ON | Off |
| 2nd | Off | ON | Off |
| 3rd | | Off | Off |
| 4th | | Off | ON |

SLT: Controls line pressure.

DSL: Controls lockup clutch.

N-D ENGAGEMENT: 3rd gear is commanded during the engagement, then 1st after the engagement is complete.



Zip Kit Instructions

1. Valve Body Removal from Case

NOTE: See color chart for bolt lengths.

Remove the 17 bolts indicated (**Figure 1**).

2. Valve Body Disassembly: Step 1

NOTE: See **Figure 2** and **3** for bolt locations.

The solenoids have differing resistance amounts (**Figure 2**). Ensure each of the solenoids are put back in their correct location.

a. Remove the five solenoids and bolts shown in **Figure 2**.

NOTE: Reference **Figure 3** for steps b through e.

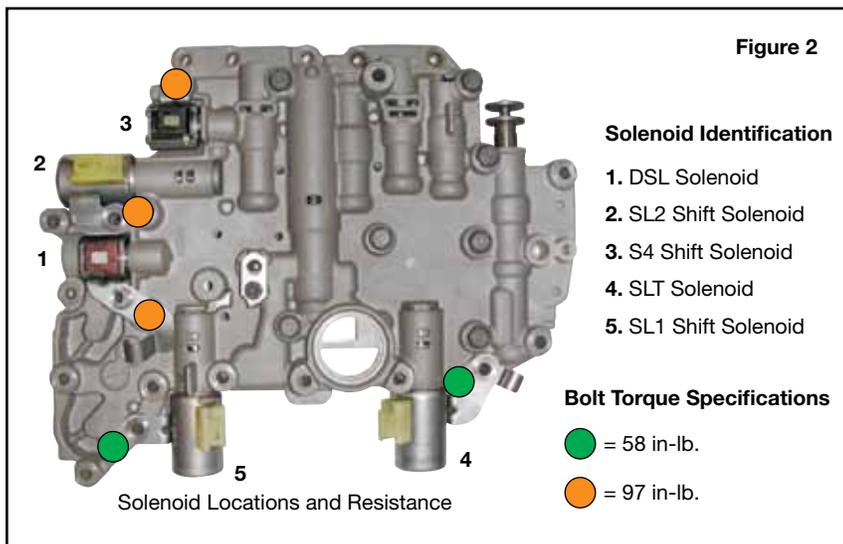
b. Remove the eight upper valve body bolts, #1 and #2.

c. Remove the seven upper valve body cover bolts, #3 and #4.

d. Remove bolt #5, bracket and checkball.

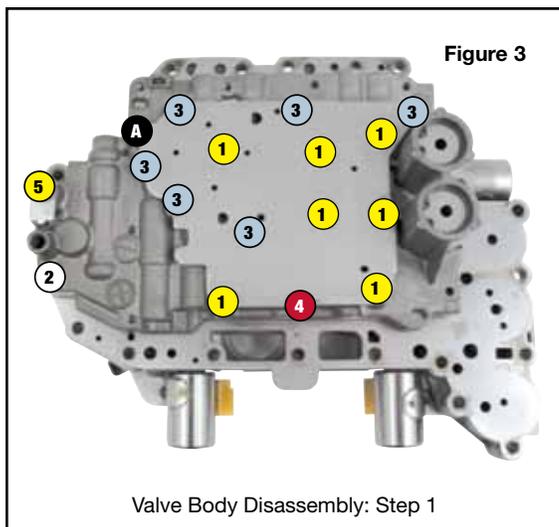
e. Remove checkball, location **A**.

| Bolt Color Code | Bolt Length |
|-----------------|-------------|
| Red | 10mm |
| Green | 12mm |
| Blue | 14mm |
| Purple | 25mm |
| White | 30mm |
| Yellow | 41mm |
| Orange | 45mm |



Solenoid Resistance Chart

| Solenoid | U140E | U140F | U240E | U241F |
|----------|--------------|--------------|--------------|--------------|
| SL1 | 5.1–5.5 ohms | 5.0–5.6 ohms | 5.0–5.6 ohms | 5.0–5.6 ohms |
| SL2 | 5.1–5.5 ohms | 5.1–5.5 ohms | 5.1–5.5 ohms | 5.1–5.5 ohms |
| S4 | 5.1–5.5 ohms | 11–15 ohms | 11–15 ohms | 11–15 ohms |
| DSL | 11–15 ohms | 11–13 ohms | 11–13 ohms | 11–13 ohms |
| SLT | 5.0–5.6 ohms | 5.1–5.5 ohms | 5.1–5.5 ohms | 5.1–5.5 ohms |



3. Valve Body Disassembly: Step 2

NOTE: See **Figure 4** for bolt locations.

- a. Remove the seven lower valve body bolts shown.
- b. Hold separator plate against lower valve body. Lift off of upper valve body and lay on bench with separator plate side up.
- c. Remove separator plate from lower valve body. Note the location of all the checkballs and retainers. Verification on page 8 in booklet.

4. Installation

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

- When installing the lockup control plunger valve and sleeve kit in Step 2, reuse the OE spring in between the new valve and sleeve if applicable.
- The Sonnax O-ringed end plugs in Step 3 must be installed with the O-ring outboard.

5. Valve Body Assembly: Step 1

NOTE: See **Figure 4** for bolt locations.

- a. Loosely install the seven bolts.
- b. Torque all bolts to 97 in-lb.

6. Valve Body Assembly: Step 2

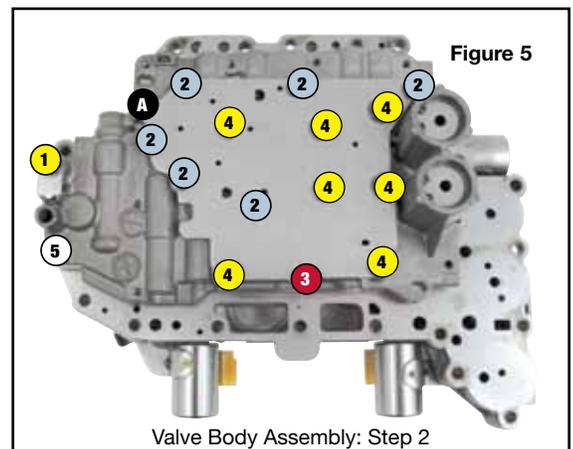
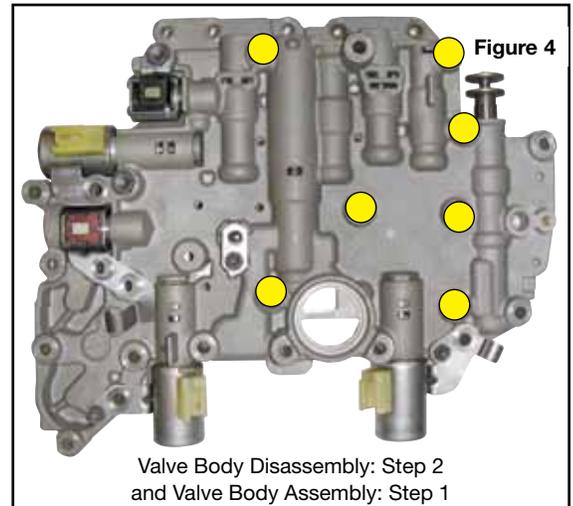
NOTE: See **Figure 5** for bolt locations and torque specifications.

- a. Reinstall checkball, location **A**.
- b. Install checkball and bracket, then loosely install bolt #1.
- c. Loosely install the seven upper valve body cover bolts, #2 and #3.
- d. Loosely install the eight upper valve body bolts #4 and #5.
- e. Torque all bolts in previous steps according to specs in **Figure 5**.
- f. Install the five solenoids and bolts shown in **Figure 2** and torque per spec indicated.

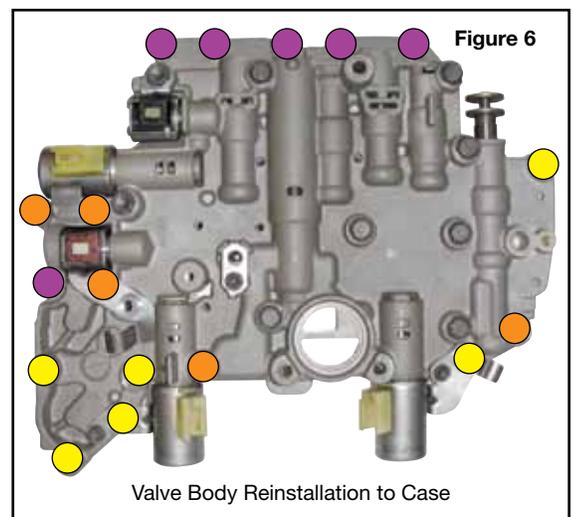
7. Valve Body Reinstallation to Case

NOTE: See **Figure 6** for bolt locations.

- a. Loosely install all 17 bolts. Reference bolt color and length chart on previous page.
- b. Torque all bolts to 8 ft-lb.



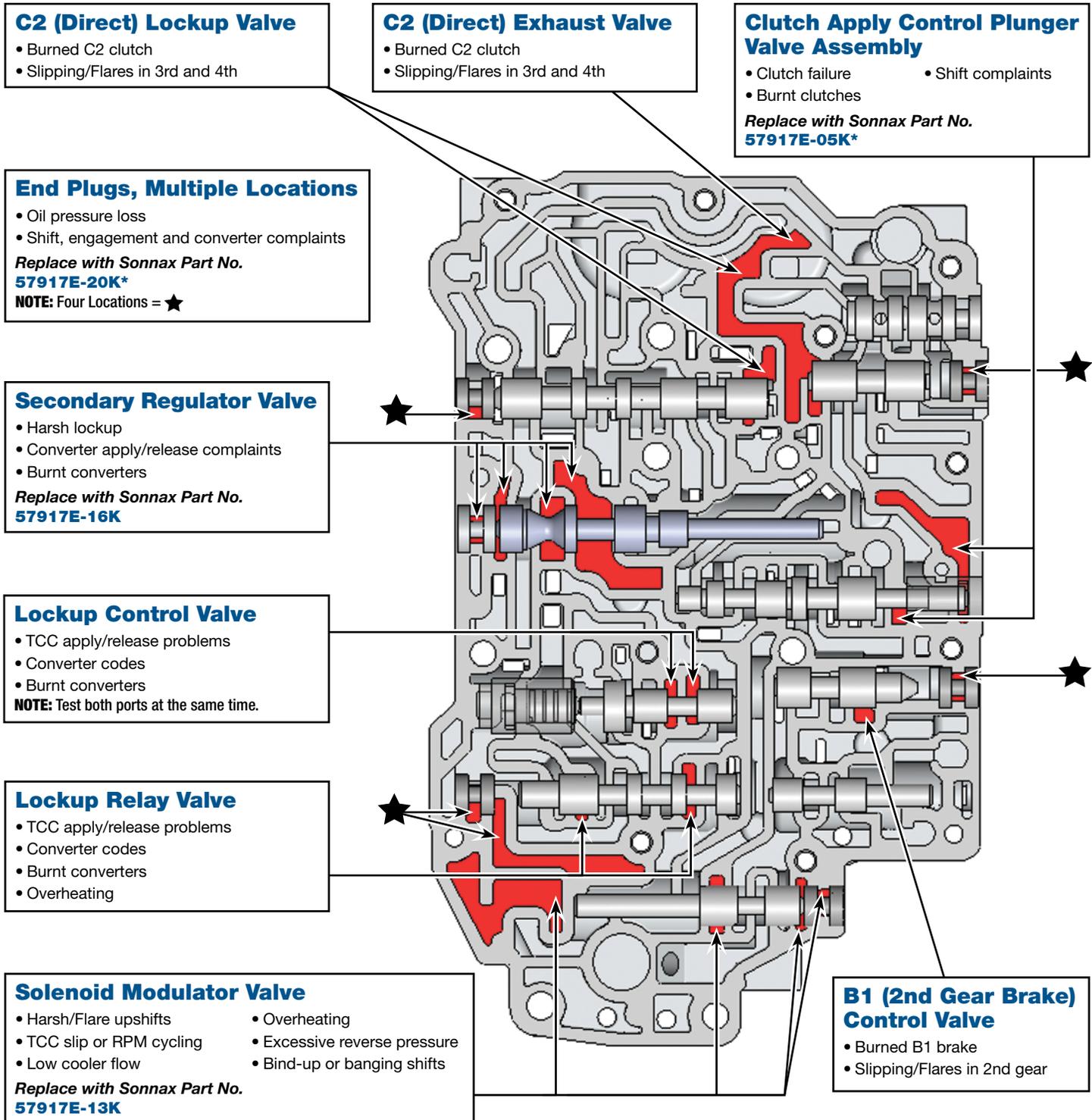
| Bolt ID & Color Code | Installation Torque Specs |
|---|---------------------------|
| Bolt #1 ■ | 58 in-lb |
| Bolt #2 ■ | 58 in-lb |
| Bolt #3 ■ | 58 in-lb |
| Bolt #4 ■ | 97 ft-lb |
| Bolt #5 ■ | 97 ft-lb |



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 – Bottom Side • U241E Shown Here



Part numbers with an asterisk () are included in this Zip Kit. Other part numbers are available separately.



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

Upper Valve Body – Top Side • U241E Shown Here

C2 (Direct) Accumulator Piston

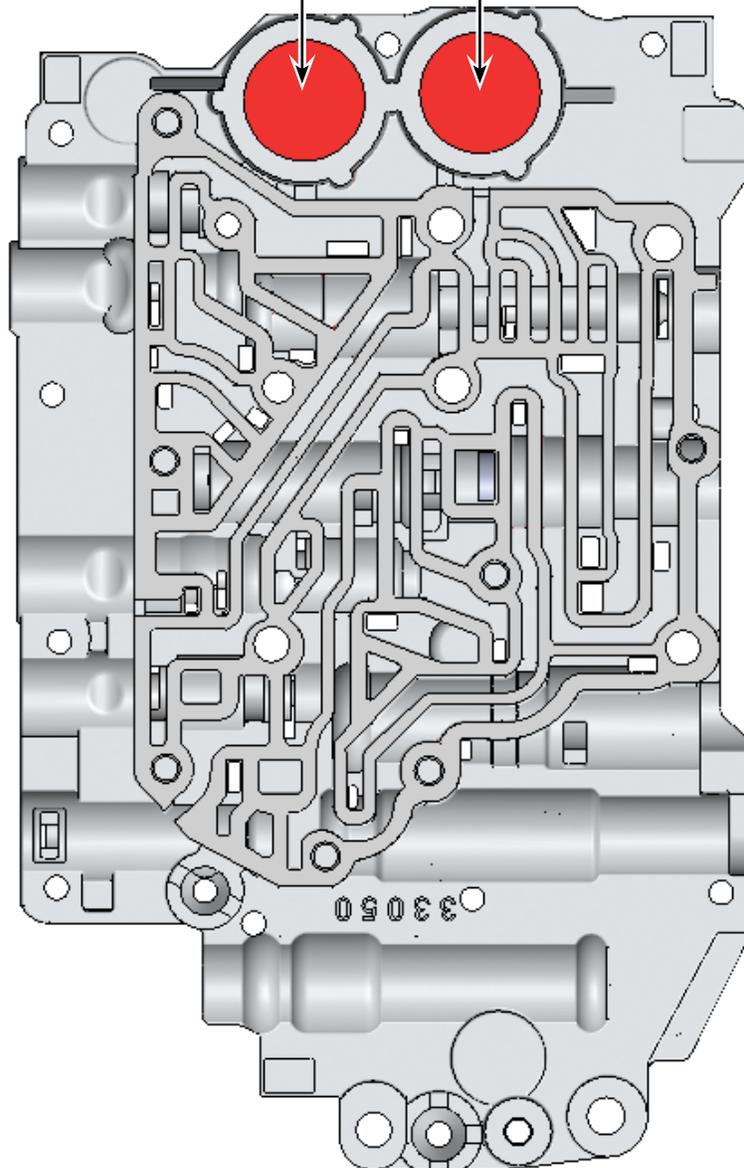
- Burned C2 clutch
- Slipping/Flares in 3rd and 4th

Replace with Sonnax Part No. 57917E-19K*

B1 (2nd Gear) Accumulator Piston

- Burned B1 brake
- Slipping/Flares in 2nd

Replace with Sonnax Part No. 57917E-19K*

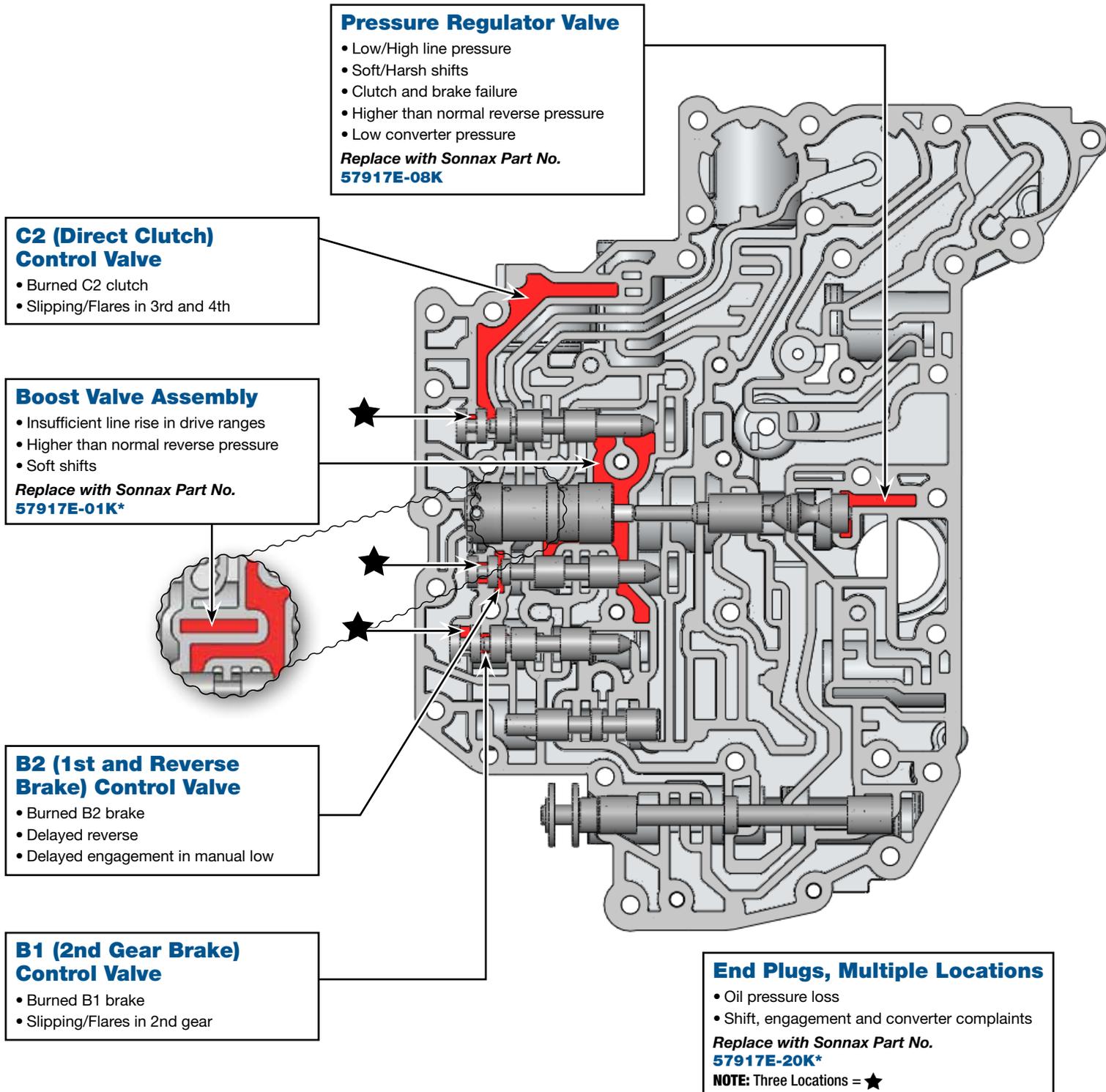


Items without part numbers are valid vacuum test locations for indicated drivability complaints, but do not have corresponding Sonnax parts due to low percentage of bore wear.

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.

Lower Valve Body – Bottom Side • U241E Shown Here



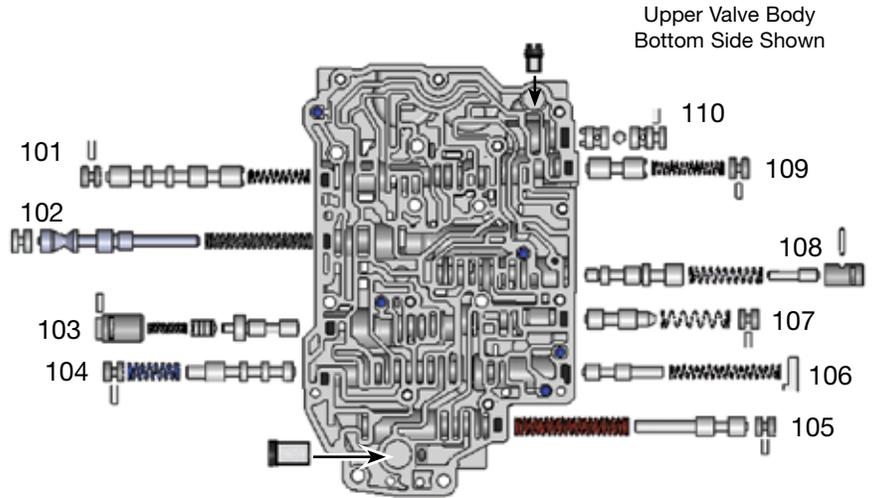
Part numbers with an asterisk () are included in this Zip Kit. Other part numbers are available separately.

OE Exploded View

Upper & Lower Valve Body • U241E Shown Here

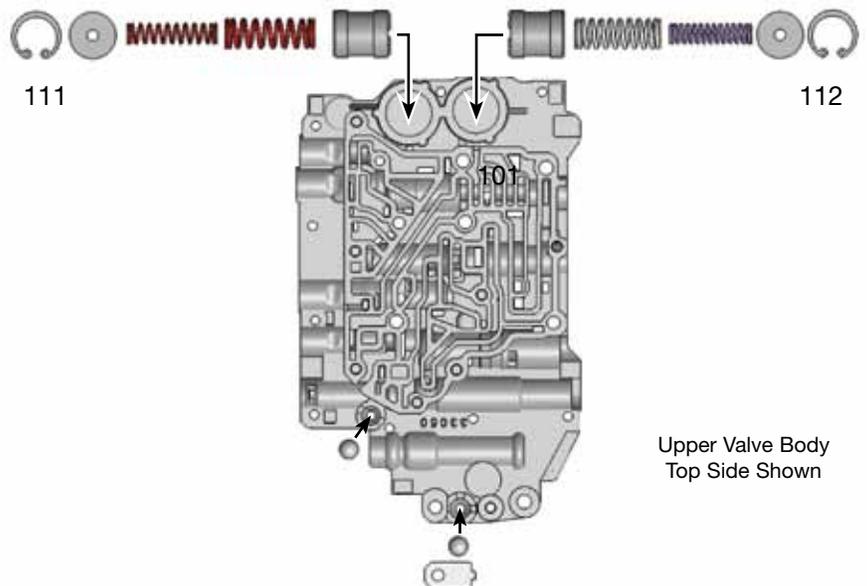
Upper Valve Body Descriptions

| I.D No. | Description |
|---------|----------------------------|
| 101 | C2 Lock Valve |
| 102 | Secondary Regulator Valve |
| 103 | Lockup Control Valve |
| 104 | Lockup Relay Valve |
| 105 | Solenoid Modulator Valve |
| 106 | B3 Orifice Control Valve |
| 107 | B1 Lock Valve |
| 108 | Clutch Apply Control Valve |
| 109 | C2 Exhaust Valve |
| 110 | Three-Way Check Valve |



Upper Valve Body Descriptions

| I.D. No. | Description |
|----------|-----------------------|
| 111 | C2 Accumulator Piston |
| 112 | B1 Accumulator Piston |



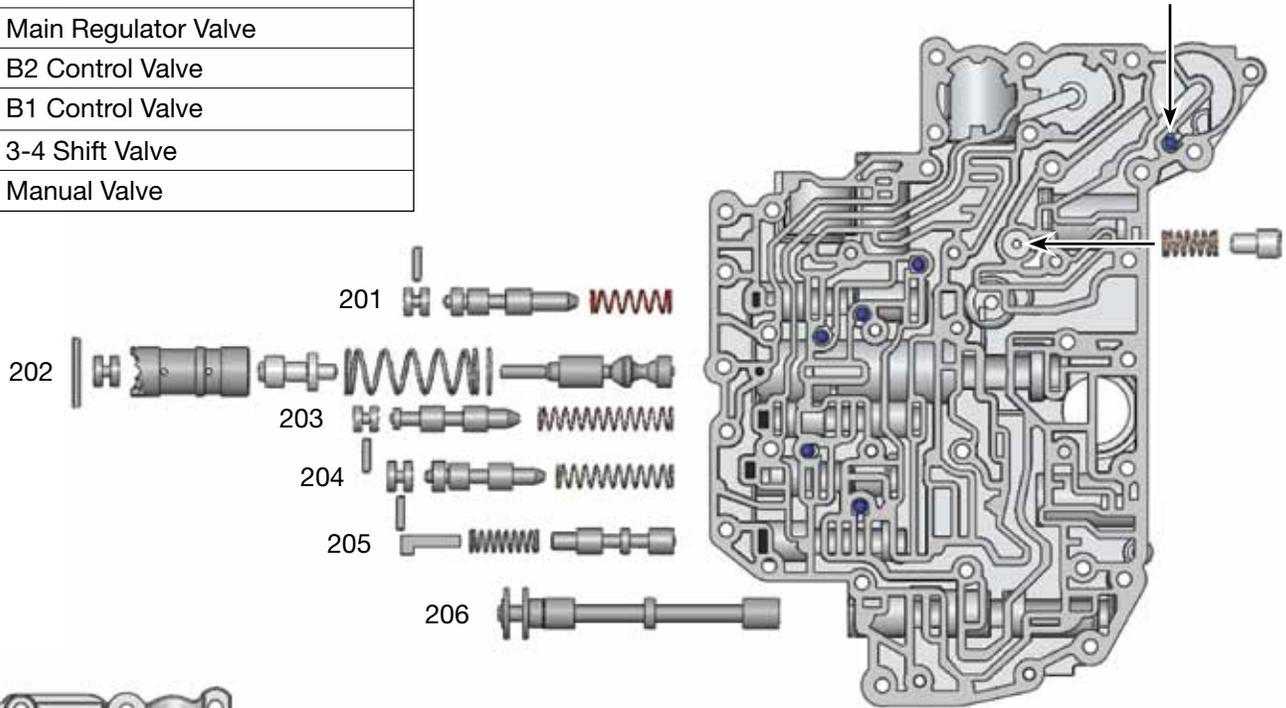
OE Exploded View

Upper & Lower Valve Body • U241E Shown Here

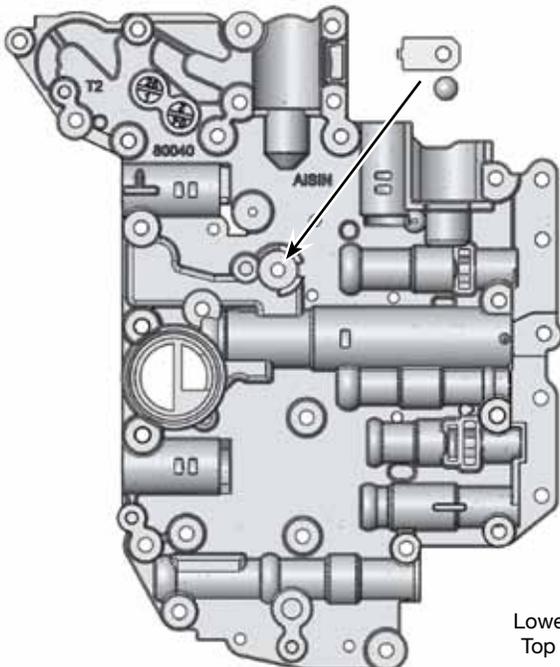
Lower Valve Body Descriptions

| I.D No. | Description |
|---------|----------------------|
| 201 | C2 Control Valve |
| 202 | Main Regulator Valve |
| 203 | B2 Control Valve |
| 204 | B1 Control Valve |
| 205 | 3-4 Shift Valve |
| 206 | Manual Valve |

Checkball is not used in all units. Only use in models that have a corresponding hole in the separator plate at this location.



Lower Valve Body
Bottom Side Shown



Lower Valve Body
Top Side Shown