

U660E: Diagnosing the Toyota 6-Speed



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Toyota's transmission computer has a learning function to adapt transmission performance to vehicle operation.

The U660E first appeared in the Lexus ES350 and the Toyota Camry in 2007. Then it showed up in the 2008 Avalon, followed by the Venza in 2009.

To diagnose and repair these transmissions, you'll need some special tools. One tool you'll want to have is the techstream: Toyota's dedicated scan tool. But you don't have to buy the actual techstream: Techstream lite is a PC-based version of the scan tool, providing you with the same access to the Toyota/Scion/Lexus computer system for a fraction of the cost.

Toyota's transmission computer has a learning function to adapt transmission performance to vehicle operation. So whether you're just replacing a solenoid or the entire valve body, part of your repair procedure should include *initializing* the TCM and then road testing the vehicle to give the TCM a chance to relearn.

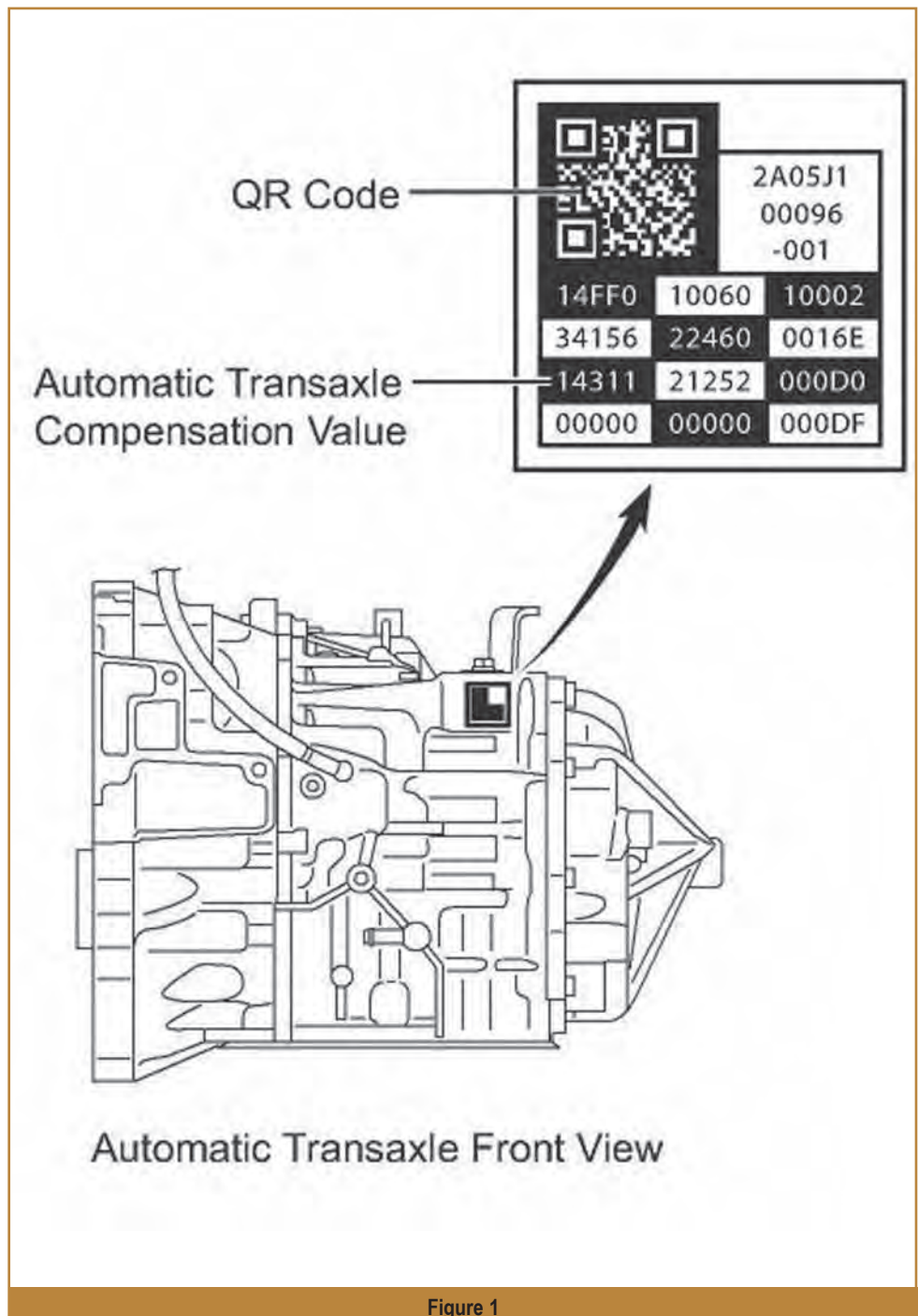


Figure 1

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 (If possible, read the transaxle compensation code from the previous TCM)	Possible	Input (Into the new TCM)	-	-
	Impossible	-	Necessary	-

Figure 2

When performing a major repair, such as replacing the engine or transaxle, or even the TCM, you'll need to *reset the transaxle compensation code*. This is Toyota's term for reprogramming the TCM. Naturally you'll need to road test the vehicle to allow the TCM to relearn and adapt after resetting the compensation code.

To reset the transaxle compensation code using techstream lite:

1. Move the shift lever to neutral

or park.

2. Key off.
3. Connect your techstream lite connector to the diagnostic link connector (DLC3).
4. Key on, engine off.
5. Turn your computer on, and enter the techstream lite program.
6. Enter the menu items in this order:
 - Powertrain

- ECT
 - Utility
7. A/T Code Reset.
 8. Select Next to proceed.
 9. Select Exit.
 10. Perform road test to allow the TCM to adapt to the transaxle and conditions.

Transaxle Compensation Code (figure 1).

Transaxle compensation codes are

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...most diagnostic procedures only involve inspecting one circuit at a time. With a basic understanding of the system and a firm grasp on the principles of electricity, you should have no trouble performing accurate diagnoses and repairs.

unique, 60-digit alphanumeric values printed on the QR label on the transaxle. The code provides the computer system with the initialization information for that transaxle configuration.

Entering the wrong transaxle compensation code into the TCM will cause shift shock.

After you've installed the transaxle, the QR code label will be out of position, where you can't read it. So always record the transaxle compensation code before installing the transaxle.

The chart (figure 2) shows you which procedure will be necessary, depending on which repairs you performed.

Diagnostic Procedures

Toyota and Lexus use a large number of ECU-controlled systems. These systems are often very intricate, requiring a high level of technical knowledge to troubleshoot.

But most diagnostic procedures only involve inspecting one circuit at a time. With a basic understanding of the system and a firm grasp on the principles of electricity, you should have no trouble performing accurate diagnoses and repairs.

Shift Solenoid Operation

The TCM commands shifts by turning the shift solenoids on or off in a specific sequence.

When there's an open or short circuit in any shift solenoid circuit, the TCM detects the problem, lights the MIL, and stores a code. It also stops

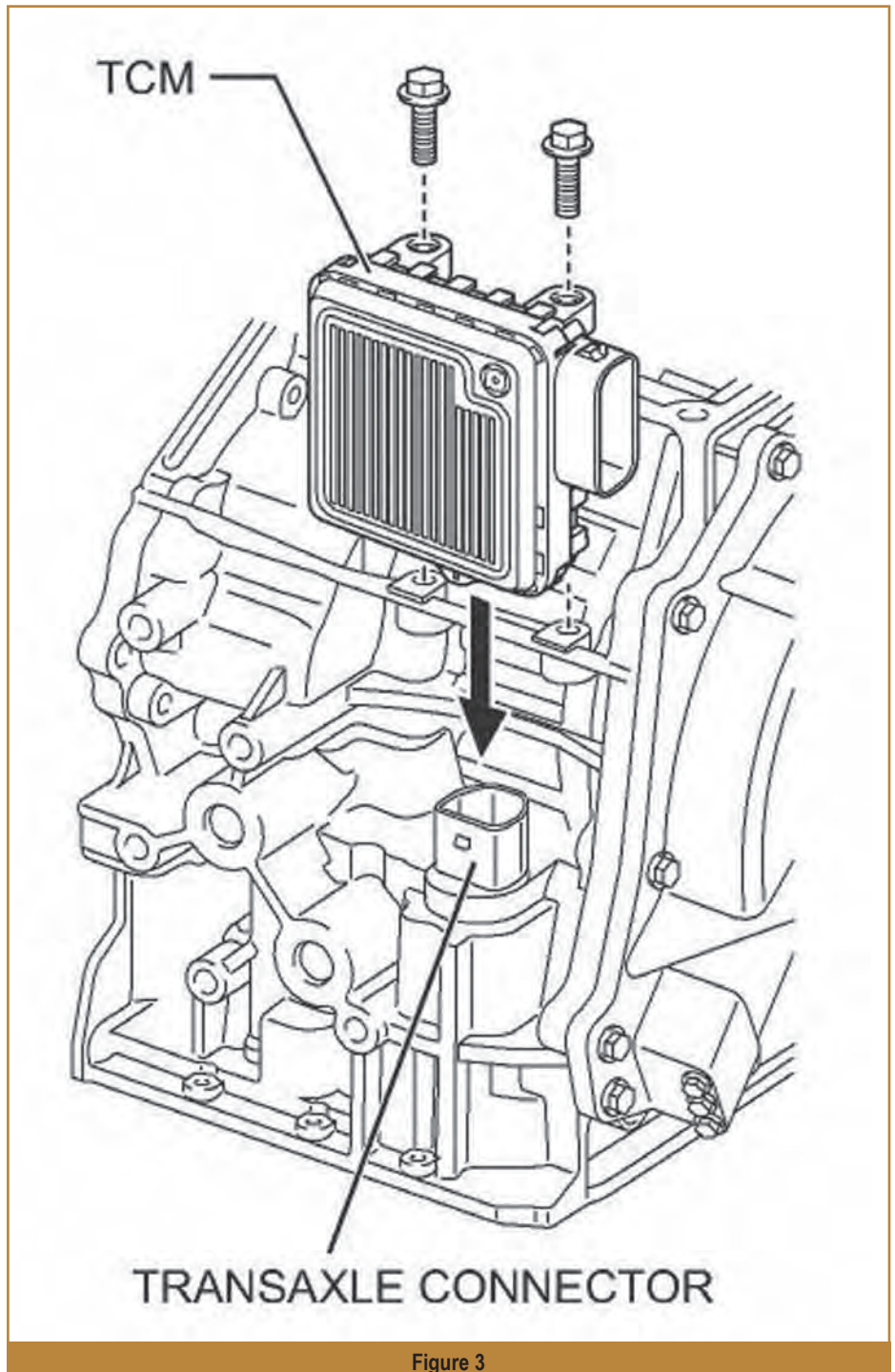


Figure 3

sending current to the faulty circuit.

At the same time, the TCM goes into failsafe operation, controlling the remaining shift solenoids to provide basic transmission operation.

Inspection Procedure

Remove the TCM from the transaxle and measure the solenoid resistances. (figure 3)

SLT, SLU, SL1, SL2, SL3, and SL4.....	5.0–5.6Ω
SL.....	11–15Ω

Check the solenoids for a short to ground; connect your meter between the each solenoid wire and the chassis ground. Resistance should be 10kΩ or higher. Below 10kΩ indicates a short to ground.

- If the solenoid resistance is okay and there's no indication of a short to ground, you're probably dealing with a faulty TCM.
- If the solenoid resistance is out of spec, or the resistance between the solenoid and ground is below 10kΩ, you'll need to replace the solenoid.

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This valve body kit deals with soft sloppy 1-2 shifts, inadequate lube, overdrive band failure, 3rd clutch failure, 2nd roller clutch failure, soft sloppy 3-4 shifts, and converter shudder.

Part # KAOD-E



The 4R75W/4R70W/AODE Super Servo

This Super Servo offers greater holding capacity, a more positive 4th gear, helps eliminate premature overdrive band failure and is built of 6061-T6 billet aluminum and offers an additional Teflon sealing ring for better centering and sealing.

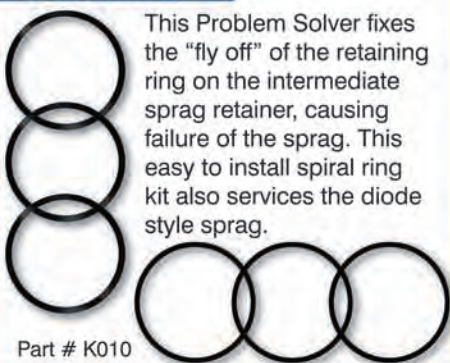
Part # K085



The 4R75W/4R70W/AODE Spiral Ring Kit

This Problem Solver fixes the "fly off" of the retaining ring on the intermediate sprag retainer, causing failure of the sprag. This easy to install spiral ring kit also services the diode style sprag.

Part # K010



The 4R75W/4R70W/AODE Pressure Regulator Valve

This Superior Steel Series Problem Solver extends the problem land area and moves the working area further into the non worn area of the valve body bore, providing more stability and helps prevent additional wear.

Part # K073



The 4R75W/4R70W/AODE Boost Valve and Sleeve

This Superior Steel Series Problem Solver replaces worn out O.E. aluminum valves. Made of hardened steel to resist wear. Proper tolerance assured at bore mating surfaces. Also included in the KAOD-E-V Total Package Kit.

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Replacing the ATF

The U660E has a special ATF filling procedure to improve the accuracy of the ATF level after repairs (figures 4&5).

Because of this, the oil filler tube and oil level gauge used in conventional automatic transmissions have been discontinued, eliminating the need to inspect the fluid level as part of routine maintenance.

That's going to wrap it up for now. Keep your eyes open for more about the U660E as we keep these transmissions *street smart*.

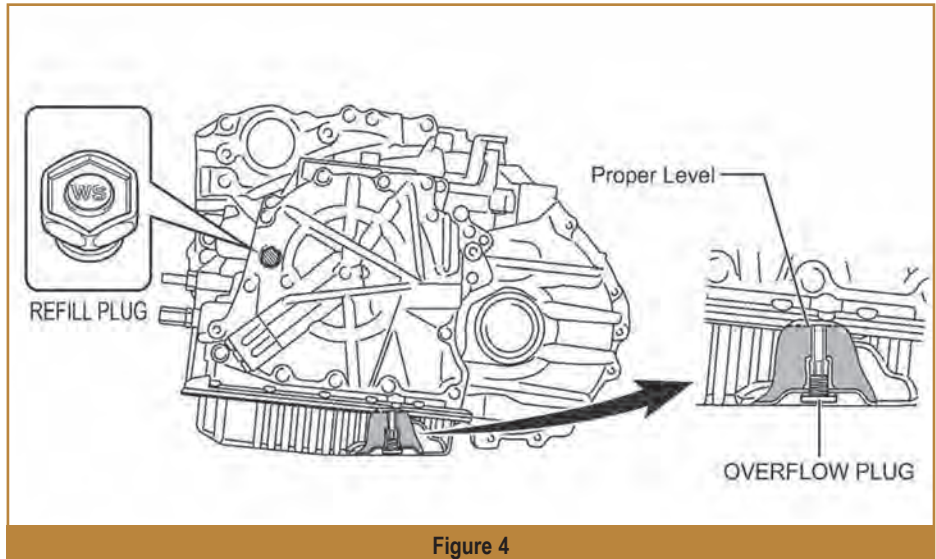
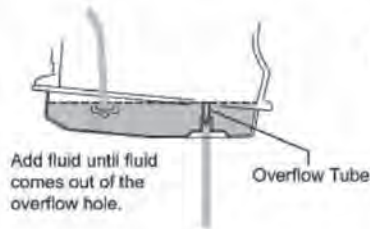


Figure 4

Fluid Filling Procedure:

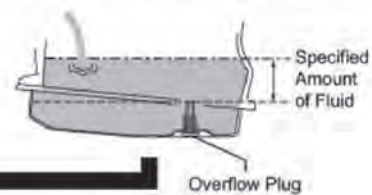
1. PERFORM INITIAL FILLING

Add fluid to the oil pan to the specified level.



2. ADD SPECIFIED AMOUNT

Add the correct amount of fluid specified for the operation that was performed.



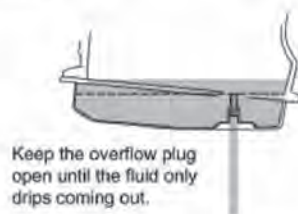
3. ADJUST FLUID TEMPERATURE

Start the engine to circulate the fluid. Activate the fluid temperature detection mode and engine idle speed control mode and adjust the fluid temperature to the specified value.

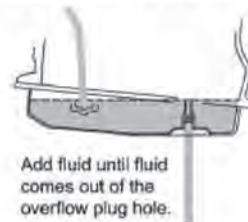


4. ADJUST FLUID LEVEL

Drain excess fluid at the specified fluid temperature.



If no fluid comes out, add fluid until fluid comes out of the overflow hole.



(c) The U660E automatic transaxle requires Toyota Genuine ATF WS.

(d) The adjustment should be performed according to the procedures and notes.

Figure 5

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