

A T T E N T I O N

YOUR WARRANTY DEPENDS ON YOUR ADHERENCE TO THESE GUIDELINES

U660E - U760E FAMILIES

INSTALLATION GUIDE

Tech Backed by  **ATSG**
AUTOMATIC TRANSMISSION SERVICE GROUP

PURPOSE: This document supplies a general overview of installing a U660E or U760E transmission. It is not intended to be a step by step manual. Consult the service manual for complete information and safety precautions.

VEHICLE PREP:

- Scan original vehicle computer, record any codes for later review and resolve all codes.
- Inspect flex plate carefully and entirely for cracks or any damage.
- Inspect crankshaft for excessive lateral movement.
- Inspect all engine and transmission mounts for wear and damage.
- Inspect driveshafts, C/V joints, and u-joints for wear, binding, and damage. Repair or replace as needed.

PRE-INSTALLATION CHECK LIST :

- Verify that the replacement transmission matches the original. Pay close attention to the bell housing pattern, torque converter bolt pattern, output shaft style, selector shaft, and mounting bosses.
- Retain the cooler line fittings for reuse. (If necessary).
- It is suggested that you take a photo of the QR label prior to installation of the transmission. It may not be clearly visible once installed. **Caution: Always record the transaxle compensation code before installing the transaxle. After you've installed the transaxle, the QR code label will be out of position, where you can't read it.**
- Make sure the 6-digit serial number on the transmission bell housing matches the number on the included paperwork and shipping pod.
- Verify the torque converter is properly and completely installed.
- Transmission cooler and lines must be hot flushed or replaced.
- Ensure all dowel pins are clean, installed properly, and are in good condition.
- Seat the torque converter completely in the transmission before installation in the vehicle.
- Verify that the engine block and bell housing surfaces are clean and free of paint, grease, oil, and corrosion.



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PRE-INSTALLATION CHECK LIST (cont.):

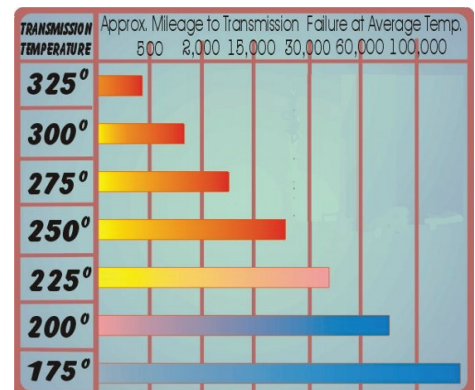
- Verify the proper function of the entire electrical system, including the battery, alternator, vehicle grounds, MAF Sensor, and throttle position sensor. Failure to do so may damage your new transmission and cause performance problems.
- Test all sensors and switches that may have been transferred from the original transmission for correct operation.
- Clean the driveshaft yoke or transfer case input shaft before installation to prevent transmission output seal damage.
- It is recommended that during removal, connectors are marked with number tape to aid in correct re-assembly. Many transmissions have connectors that can be crossed during re-assembly.



COOLER FLUSHING & REPLACEMENT

A restricted and/or contaminated transmission cooling system is the #1 cause of transmission failure after a replacement. Failure to follow these directions will void your warranty.

- Flush the entire transmission cooling system using a hot flush machine.
- Hot flush or replace transmission cooler lines.
- Cooler flow must be at least 1.5-quarts per 15-seconds.
- Replace plugged coolers.



INSTALLATION STEPS

- Install any supplied gaskets, seals, and or bushings.
- Apply thread sealant to the threads of the cooler fittings that were removed from the core transmission (if necessary).
- Install the cooler line fittings from the core into the replacement transmission (if necessary).
- Transfer external sensors and switches from the original transmission or replace them if necessary.
- Verify the torque converter is fully installed into the transmission.
- Do NOT use air tools to force the transmission against the engine block; this may damage or break the transmission case.
- Tighten all bell housing bolts evenly in a crisscross pattern.
- Confirm that the torque converter bolts up and rotates before continuing the installation.
- Pull the torque converter into position evenly a few turns of the bolts/nuts at a time. Failure to draw the converter evenly can cause front seal leakage.

INSTALLATION STEPS (cont.):

- Confirm that the transmission has a good ground connection; reattach all ground straps to the correct location free of paint, grease, oil, and corrosion.
- Adjust gearshift linkage after installation.
- Flush the transmission cooler and lines with a hot flush machine. Flush until the fluid is clean and free of debris.
- Check that the cooler flow rate meets service manual specifications for the vehicle being serviced.

FLUID FILL PROCEDURE

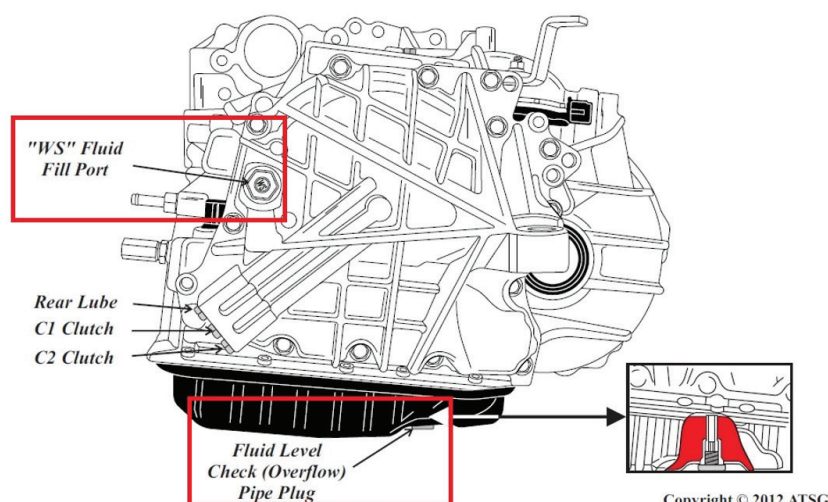
Fill the transmission with purchased Toyota ATF WS or 100% compatible transmission fluid.

The average dry fill capacity of a U660E or U760E is 11.5 quarts. The actual amount of fluid needed may vary depending on the size of the internal cooler, length, and diameter of cooler lines, presence of an auxiliary cooler, and residual fluid from the dyno testing process.

ATF FILLING PROCEDURES:

The ATF filling procedure is changed to improve the accuracy of the ATF level when the transaxle is being repaired or replaced. As a result, the oil filler tube and the oil level gauge used for a conventional automatic transaxle are discontinued, eliminating the need to inspect the fluid level as a part of routine maintenance.

This filling procedure employs a refill plug, overflow plug, ATF temperature sensor, and scan tool (to report transmission fluid temperature). After the transaxle is refilled with ATF, remove the overflow plug and drain the extra ATF at the proper ATF temperature. Thus, the appropriate ATF level can be obtained.



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The recommended fluid check temperature is 104°F to 113°F (Observed with a scan tool).

- 1) Raise the vehicle while keeping it level.
- 2) Remove the refill plug and overflow plug.
- 3) Place a drain pan under the overflow hole.
- 4) Reinstall the overflow plug.
- 5) Add 3.5 US quarts of Toyota ATF WS or 100% compatible transmission fluid.
- 6) Make sure the vehicle is sitting level.
- 7) Use a scan tool to monitor transmission fluid temperature.
- 8) Start the engine and allow it to idle. A/C switch must be turned off.
- 9) Move the shift lever from the P position to the S mode position and slowly selects each gear S1 - S6. Then move the shift lever back to the P position.
- 10) Move the shift lever to the D position, and then quickly move it back and forth between N and D (at least once every 1.5 seconds) for at least 6 seconds. This will activate the oil temperature detection mode.
- 11) Return the shift lever to the P position.
- 12) Idle the engine to raise the ATF temperature.
- 13) Wait for the transmission to reach 104°F as seen on the scan tool. (Alternatively, you can view the gear shift indicator. If the "D" position is unlit, the fluid is too cold for level checking. If the "D" position is lit, the fluid temperature is right for level checking. If the "D" position is blinking, the fluid is too hot for level checking.)
- 14) Remove the overflow plug and adjust the oil quantity. If the ATF overflows, go to step 17, and if the ATF does not overflow, go to step 15.
- 15) Remove the refill plug.
- 16) Add ATF through the refill plug hole until it flows out from the overflow plug hole.
- 17) When the ATF flow slows to a trickle, install the overflow plug and a new gasket.
- 18) Reinstall the refill plug (if the refill plug was removed).
- 19) Lower the vehicle.
- 20) Turn the ignition switch (engine switch) OFF to stop the engine.

PROGRAMMING/ADAPTS

The TCM memorizes the condition that the ECT controls the automatic transaxle assembly and engine assembly according to those characteristics. Therefore, when the automatic transaxle assembly, engine assembly, or TCM has been replaced, it is necessary to reset the memory so that the TCM can memorize the new information. The reset procedure is as follows:

Shift the shift lever to the N or P position.

Turn the ignition switch off.

Connect the Techstream scan tool to the DLC3.

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Turn the ignition switch on (IG) and push the Techstream main switch on.

Enter the menu items in this order: Powertrain / ECT / Utility / A/T Code Reset.

Press “Next” again to proceed.

Press “Exit”.

CAUTION: After the transaxle compensation code is reset, be sure to perform a road test to allow the TCM to learn.

PERFORM ROAD TEST TO ALLOW TCM TO LEARN

NOTICE: Perform the following procedures while strictly observing all traffic laws and speed limits.

Warm up the engine.

From a standstill, achieve the highest possible speed with the accelerator pedal opened 15% or less. Keep the accelerator pedal angle steady while driving the vehicle.

Repeat the previous step until shift shock no longer occurs.

From a standstill, achieve the 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.

RESET MEMORY

NOTICE: Perform the RESET MEMORY (Automatic Transmission initialization) when replacing the transmission assembly. The RESET MEMORY can be performed only with Techstream.

The ECM (TCM) memorizes the condition that the ECT controls the automatic transaxle assembly and engine assembly according to those characteristics. Therefore, when the automatic transaxle assembly, engine assembly, or ECM (TCM) has been replaced, it is necessary to reset the memory so that the ECM (TCM) can memorize the new information.

The reset procedure is as follows.

- Turn the ignition switch off.
- Connect Techstream to the DLC3.
- Turn the ignition switch on (IG).
- Turn Techstream main switch on.
- Select the following items: “Powertrain / ECT / Utility / Reset Memory”. Then, press “Next”.

NOTICE: After performing the RESET MEMORY, be sure to perform the ROAD TEST described.

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ROAD TEST

NOTICE: Perform the test at the ATF (Automatic Transmission Fluid) temperature of 122 to 176°F (50 to 80°C) in the normal operation.

D position test:

Shift into the D position and check the following:

Check the up-shift operation.

Check that 1 to 2, 2 to 3, 3 to 4, 4 to 5 and 5 to 6 up-shifts take place, and that the shift points conform to the automatic shift schedule.

HINT: 6th and 5th Gear Up-shift Prohibition Control

ATF temperature is 32°F (0°C) or less.

Lock-up Prohibition Control will not allow lock-up.

The brake pedal is depressed.

The accelerator pedal is released.

Engine coolant temperature is 140° (F60°C) or less.

Check for shift shock and slip.

Check for shock and slip at the 1 to 2, 2 to 3, 3 to 4, 4 to 5, and 5 to 6th up-shifts.

Check for abnormal noise and vibration.

Check for abnormal noise and vibration when up-shifting from 1 to 2, 2 to 3, 3 to 4, 4 to 5 and 5 to 6 while driving with the shift lever in the D position, and also while driving in the lock-up condition.

Check for abnormal shock and slip at kick-down.

Check the lock-up mechanism.

Drive the vehicle with the shift lever in the D position (6th gear) at a steady speed (lock-up ON).

Lightly depress the accelerator pedal and check that the engine speed does not change abruptly.

HINT: There is no lock-up in the 1st, 2nd, 3rd, 4th and 5th gear.

S position test:

Shift to the S position, depress the accelerator pedal and check the following:

Check shift operation.

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With the shift lever in the S position (while the vehicle is stopped), shift into the “+” position to check that the shift position on the combination meter changes as follows: 1 to 2, 2 to 3, 3 to 4, 4 to 5 and 5 to 6.

While driving in the 5 (S) position and 5th gear (at a vehicle speed of approximately 34 to 40 mph (55 to 65 km/h)), shift into the “-” position and check if the 4th gear down-shift occurs and proper engine braking occurs.

While driving in the 4 (S) position and 4th gear (at a vehicle speed of approximately 19 to 25 mph (30 to 40 km/h)), shift into the “-” position and check if the 3rd gear down-shift occurs and proper engine braking occurs.

While driving in the 3 (S) position and 3rd gear (at a vehicle speed of approximately 12 to 19 mph (20 to 30 km/h)), shift into the “-” position and check if the 2nd gear down-shift occurs and proper engine braking occurs.

While driving in the 2 (S) position and 2nd gear (at a vehicle speed of approximately 6 to 12 mph (10 to 20 km/h)), shift into the “-” position and check if the 1st gear down-shift occurs and proper engine braking occurs.

HINT: Manual shift (S position) is prohibited under either of the following conditions:

- 1) If down-shifting may cause engine overrun, the downshift is prohibited.
- 2) If the driver is continuously down-shifting, the downshift is prohibited. (Down-shifting to 1st gear may not be performed.)

R position test:

Shift into the R position, lightly depress the accelerator pedal and check that the vehicle moves backward without any abnormal noise or vibration.

CAUTION: Before conducting this test, ensure that the test area is free from people and obstruction.

P position test:

Stop the vehicle on a grade (more than 5°), and after shifting into the P position, release the parking brake. Then, check that the parking lock pawl holds the vehicle in place.