Torque Converter: Testing and Inspection

Torque Converter Diagnosis

Torque Converter Diagnosis

Prior to torque converter installation, all diagnostic procedures must be followed. This is to prevent the unnecessary installation of good torque converters. Only after a complete diagnostic evaluation can the decision be made to install a new torque converter.

Begin with the normal diagnostic procedures as follows:

1. Preliminary Inspection. See: Transmission Control Systems/Testing and Inspection/Initial Inspection and Diagnostic Overview/Preinspections/4R70W/4R75W Automatic Transmission/Preliminary Inspection
2. Know and understand the customer's concern.
3. Verify the condition - carry out the torque converter operation test.
4. Carry out diagnostic procedures.
   - ^ Carry out on-board diagnostics; refer to Diagnostics.
     - Repair all non-transmission related diagnostic trouble codes (DTCs) first.
     - Repair all transmission DTCs.
     - Rerun on-board diagnostic to verify repair.
   - ^ Carry out Line Pressure Test. See: Transmission Control Systems/Testing and Inspection/Component Tests and General Diagnostics/4R70W/4R75W Automatic Transmission/Line Pressure Test
   - ^ Carry out Stall Speed Test. See: Transmission Control Systems/Testing and Inspection/Component Tests and General Diagnostics/4R70W/4R75W Automatic Transmission/Stall Speed Test
   - ^ Carry out Diagnostic Routines. Refer to Diagnosis By Symptom. See: Transmission Control Systems/Testing and Inspection/Symptom Related Diagnostic Procedures/4R70W/4R75W Automatic Transmission/Diagnosis By Symptom
     - Use the Diagnosis by Symptom Index to locate the appropriate routine that best describes the symptom(s). The routine will list all possible components that may cause or contribute to the symptom. Check each component listed; diagnose and repair as required before changing the torque converter.

Torque Converter Operation Test

This test verifies that the torque converter clutch control system and the torque converter are operating correctly.

1. Carry out Quick Test with scan tool. Refer to Computers and Control Systems. Check for DTCs.
2. Connect a tachometer to the engine.
3. Bring the engine to normal operating temperature by driving the vehicle at highway speeds for **approximately 15 minutes in (D) position.**
4. After normal operating temperature is reached, maintain a constant vehicle speed of **about 80 km/h (50 mph)** and tap brake pedal with the left foot.
5. Engine rpm should increase when brake pedal is tapped, and decrease **about 5 seconds** after pedal is released. If this does not occur, refer to torque converter operation concerns. Refer to Diagnosis By Symptom. See: Transmission Control Systems/Testing and Inspection/Symptom Related Diagnostic Procedures/4R70W/4R75W Automatic Transmission/Diagnosis By Symptom
6. If the vehicle stalls in (D) or manual 2 at idle with vehicle at a stop, move the transmission range selector lever to manual 1 position. If the vehicle stalls, refer to torque converter operation concerns. Refer to Diagnosis By Symptom. If the vehicle does not stall in (D), refer to Diagnosis By Symptom. See: Transmission Control Systems/Testing and Inspection/Symptom Related Diagnostic Procedures/4R70W/4R75W Automatic Transmission/Diagnostic Routines/Torque Converter Clutch Operation Concerns 240/340-242/342 See: Transmission Control Systems/Testing and Inspection/Symptom Related Diagnostic Procedures/4R70W/4R75W Automatic Transmission/Diagnosis By Symptom
7. If the vehicle exhibits a vibration during the road test, complete the Road Test Evaluation Form. This form will aid the technician in determining the source of the vibration.

   NOTE: This is a list of common vehicle concerns that have been misdiagnosed as torque converter clutch shudder. For diagnosis of these items, refer to the appropriate information and Computers and Control Systems.

   - ^ Spark plugs - check for cracks, high resistance or broken insulators
   - ^ Plug wires
   - ^ Fuel injector - filter may be plugged
   - ^ Fuel contamination - engine driveability concerns
   - ^ Exhaust gas recirculation (EGR) valve - valve may let in too much exhaust gas and cause engine to run lean
   - ^ Vacuum leak - engine will not get correct air/fuel mixture
   - ^ Manifold absolute pressure (MAP)/mass air flow (MAF) sensor - incorrect air/fuel mixture
   - ^ Heated oxygen sensor (HO2S) - too rich/lean air/fuel mixture
   - ^ Fuel pressure - may be too low
   - ^ Engine mounts - loose/damaged mounts can cause vibration concerns
   - ^ Axle joints - check for vibration

Torque Converter Road Evaluation Form		
1) Does the torque converter engage/disengage?	Yes	• GO to Step 2.
	No	• REFER to Diagnosis By Symptom — Torque Converter No Apply Routine 240/340 and Always Applied Routine 241/341 for further diagnosis information. Repair as required, verify converter operation and then continue.
2) Does vibration occur during 3-4 or 4-3 shift at: light, medium or heavy throttle?	Light	• May be torque converter clutch shudder, GO to Step 3.
	Medium	• May be torque converter clutch shudder, GO to Step 3.
	Heavy	• Not torque converter clutch shudder — converter does not engage due to PCM strategy, REFER to Vehicle/Testing and Diagnosis By Symptom — Noise/Vibration Routine 254/354 for further diagnosis.
3) Is the problem vehicle speed dependent? (Operating at steady speed, for example 64 km/h [40 mph] regardless of transmission range. Verify by manually selecting 2nd, OD cancel and OD.)	Yes	• Not torque converter clutch shudder — REFER to Vehicle/Testing and Diagnosis By Symptom — Noise/Vibration Routine 254/354 for further diagnosis.
	No	• GO to Step 4.
4) Is the problem engine-rpm dependent? (Occurs at the same engine rpm independent of transmission gear. Verify by holding same rpm in each transmission gear.)	Yes	• Not torque converter clutch shudder — REFER to Vehicle/Testing and Diagnosis By Symptom — Noise/Vibration Routine 254/354 for further diagnosis.
	No	• GO to Step 5.
5) Does the problem occur in coast, steady speed or reverse range?	Yes	• Not torque converter clutch shudder — REFER to Vehicle/Testing and Diagnosis By Symptom — Noise/Vibration Routine 254/354 for further diagnosis.
	No	• GO to Step 6.
6) Does vibration occur during extended light brake application?	Yes	• Not torque converter clutch shudder — REFER to Vehicle/Testing, Brakes and Diagnosis By Symptom — Noise/Vibration Routine 254/354 for further diagnosis.

Torque Converter Road Evaluation Form (Part 1)

Torque Converter Road Evaluation Form		
	No	• GO to Step 7.
7) If one of the driving modes in Step 2 identifies a vibration which was not present in Steps 3-6, then there is a strong possibility that the vibration is caused by the torque converter clutch function.	—	• CARRY OUT the repair procedures as found under Disassembly/Assembly.

Torque Converter Road Evaluation Form (Part 2)