Speed Bumps in TCC Diagnosis: 4T65-E, 46/47RH/RE

By Bob Warnke

There are speed bumps for traffic control and speed bumps in transmission work. The small bumps entering an intersection are unavoidable, similar to those of transmission diagnosis and inspection. We have posted the following check lists, which are like the SLOW, 5 MPH speed limit bumps, so you can avoid the impact of a BIG transmission problem.

KEY:	VEHICLE = In the Vehicle, preliminary testing (scanner or DVOM)
	BENCH = Inspection of related parts on the bench

4T65-E

VEHICLE:

- Monitor release psi., P1, P2
- Cross leaks of 20 psi. + trip P2
- P2 indicates control valve position
- Movie of input/turbine RPM
- Variation of 8-10 RPM is ok. (Highway)
- Movie of MAF, TPS
- TCC duty % must rise w/load
- High slip w/low 30-40 % duty, a concern;
- Verify duty % rise to at least 70%
- Low TCC duty %? Brain dead PCM, 1st
- Low TCC duty %? reflash or new PCM
- Slip in 4th, no slip in 3rd, is not TCC
- Slip RPM over 10% of engine RPM ?
- High slip RPM, with code 730 = ratio
- Perform TCC command stall test, at 180°F min.
- Install SonnaFlow®, verify TCC control, valve strokes: Premature stroke = bad solenoid; Valve cycling = bad bore
- TCC PWM ohms test 10.8 at 68°F

BENCH:

- Refer to 4T65-E repairs ***(pages 56-57)***
- ISS retainer location/retention ***(see Figure 1)***
- ISS reluctor end-play, pin wear ***(see Figure 2)***
- Case cover sleeve index/wear ***(see Figure 3)***
- Converter blow-off dirty (Case cover) ***(see Figure 3)***
- Inspect #1 check ball seat ***(see Figure 3)***
- Converter hub bushing wear
- Internal converter leakage
- Sprocket or differential ratio
- Test TCC PWM solenoid for cross-leakage
- OSS reluctor application
- Pump bearing and seal
- Drive sprocket bearing wear
- Air test converter apply circuit

Figure 1

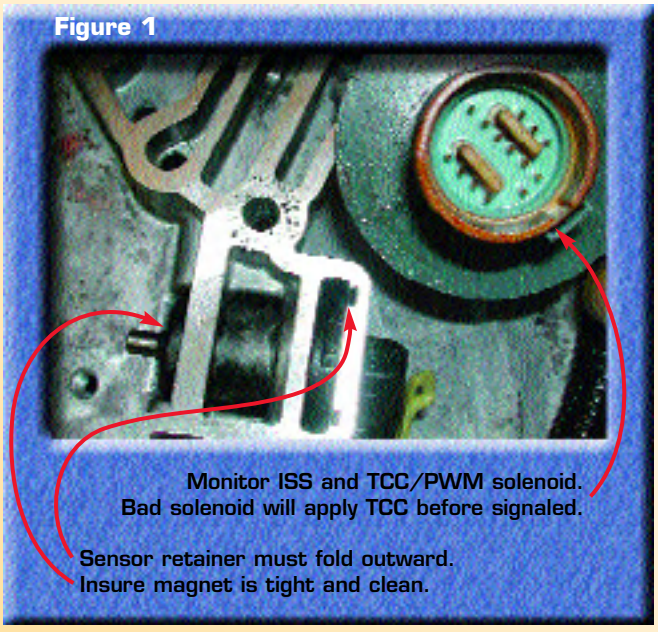


Figure 2

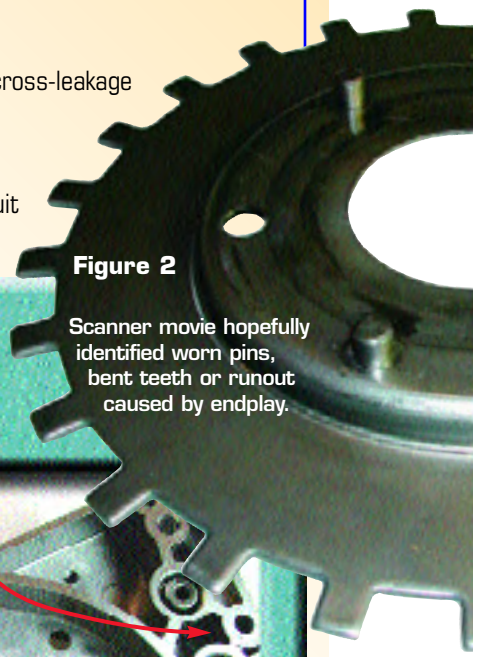
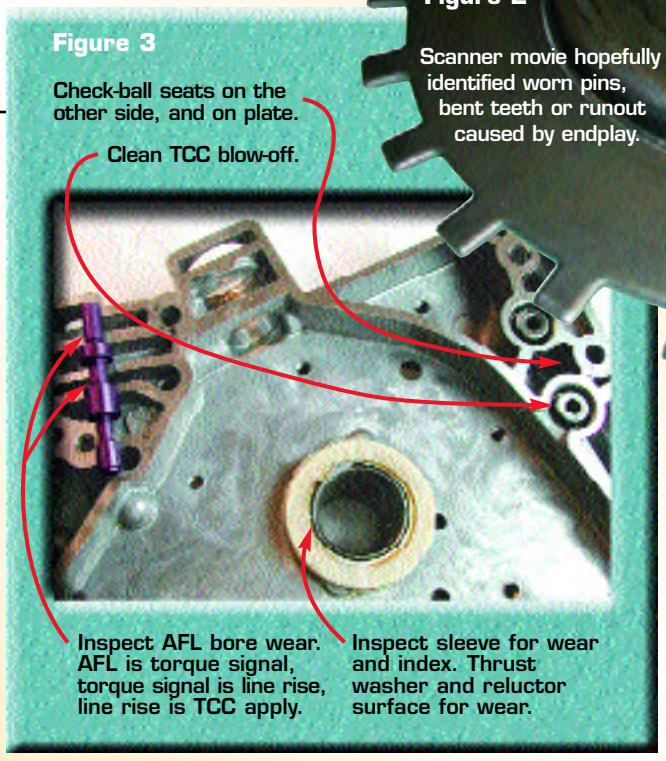


Figure 3



46/47RH/RE

VEHICLE:

- No restrictions allowed in cooler circuit!
- Sonnaflow®, diagnostics ***(see pages 180 & 181)***
- Re-test with auxillary cooler, by-pass OEM
- Remove anti-drainback ball, re-retest
- Monitor TCC signal, Trans temp. TPS, VSS's
- Tap into TCC release circuit (special fittings)
- Set line pressure 65 psi. drive, idle
- Retorque all valve body bolts
- Install 727 screen filter
- Use synthetic ATF

BENCH:

- Use, 22771A-01, -02K, 22771-09 instructions and refer to pages 184, 185, 187 & 191
- No wear allowed in pressure regulator bore ***(see Figure 4)***
- WAT TCC apply circuit with pump, turbine shaft into converter
- TCC piston can be applied through pump
- WAT turbine shaft sealing rings ***(see Figure 5)***
- Install 2 stiff-plastic turbine shaft seals (Torlon or Peak Material).
- Resurface the pump, seal surfaces with Loctite® #518
- Converter cover alignment affects TCC, due to shaft alignment ***(see Figure 6)***
- Inspect dowel pins, crank wear and flex-plate
- Clean TCC solenoid feed orifice. .030" pin gauge must fit into solenoid feed hole in valve body casting.
- Test/replace TCC solenoid assembly

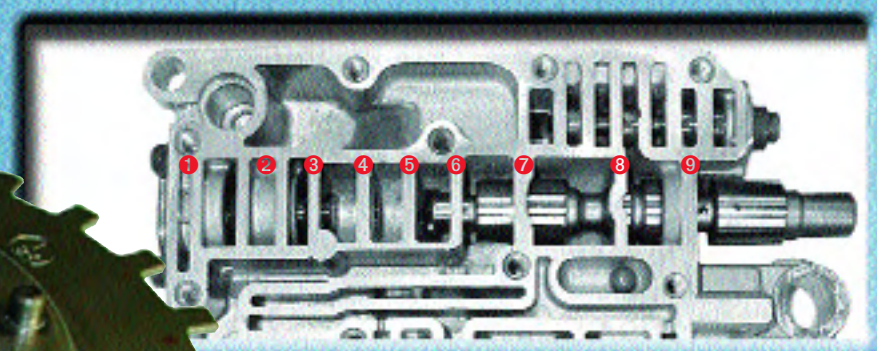


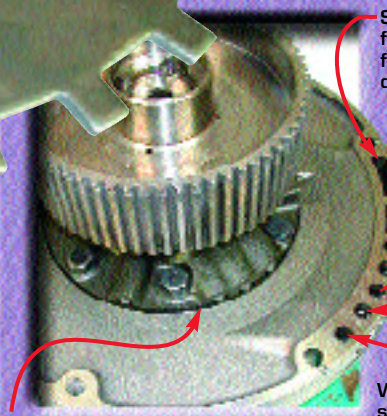
Figure 4

Wear/Cross Leakage Causes:

1. Reverse high line psi. or buzz from instability
2. High line psi.
3. Low line psi., late upshifts
4. & 5. High line psi, valve instability
6. & 7. Low line psi
8. Elevated converter psi
9. Low converter pressure, delayed engagement

Figure 5

Note: The direct drum & forward clutches have been removed for this photo. They must be fully assembled with thrust washers to get the proper WAT test results!



Should never be air or fluid bubbles coming from suction or line, during any WAT.

Pump suction

Pump line psi.

Direct/front clutch

Forward clutch

Converter release

Converter apply

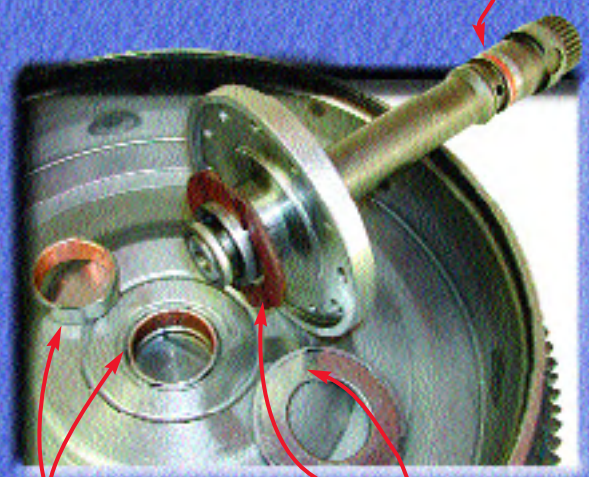
Should never be oil/air leakage between halves. If so, resurface both, chamfer the thread pockets & seal w/Locktite® #518.

Air into release, plug apply. Cross leaks from release to forward? Inspect turbine shaft sealing rings & stator bore.

With converter full of ATF, supply 30-50 psi. into apply port. Minimal to no leakage from release. No leaks into forward. Remove your air supply slowly as the converter will push the fluid back out!

Figure 6

Use improved plasticsealing rings here, separating TCC apply from release oil.



Release oil must flow across bushing or engine stumble, TCC apply during engagement to D-R.

Washer or bearing must flow oil.