Beyond the 1870:

by Gregg Nader

General Motors' infamous trouble code P1870 has been around since 1995 and is very familiar to transmission shops. P1870 is a "manufacturer specific" OBD-II trouble code used by GM. The official description is "transmission component slipping," indicating problems with TCC performance on 4L60-E, 4L80-E, 4L30-E and 4T60-E transmissions.

GM models 4T40-E, 4T65-E, 4T80-E, and Saturn transmissions, do not use the P1870 code. These models use "Generic OBD-II transmission systems" code P0741 "TCC Stuck Off" to indicate TCC performance problems. Some transmissions use both the P0741 and P1870. The 4L80-E transmission uses the P0741 for 3rd gear TCC slip, and P1870 for 4th gear TCC slip. Some late model 4L60-E transmissions can set a P1870 or P0741 depending on how the computer is programmed.

GM uses code "P0742 TCC Stuck On" when the computer detects the TCC has not released. P0742 is most often encountered on 4T40-E and 4T65-E transmissions units that have a TCC Release Pressure Switch. This switch is located in the TFP (Transmission Fluid Pressure switch assembly) mounted to the valve body. The TCC release pressure switch is used to verify TCC applies and releases when commanded by the PCM by indicating if TCC release pressure is present (the oil pressure that keeps the TCC piston in the released position).

The TCC Release Pressure Switch is normally closed and opens when there is approximately 20 psi of oil pressure in the TCC release circuit (see *Figure 1*). The switch is closed when the engine is off or when the TCC is locked up. The switch is open whenever the engine is running and the TCC is NOT engaged. Units with a TCC release pressure switch also have a diagnostic code P1887 for pressure switch performance.

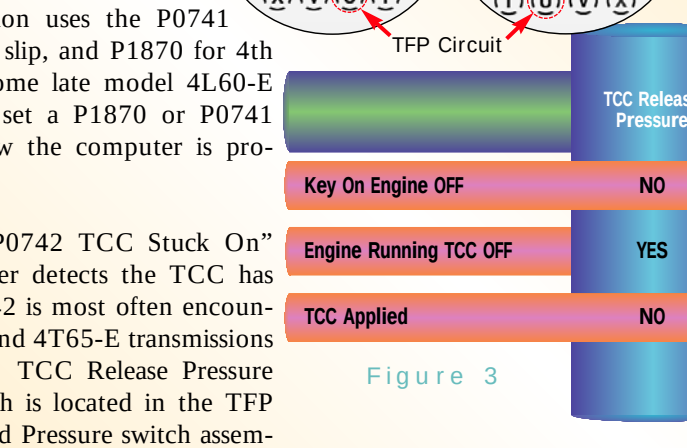
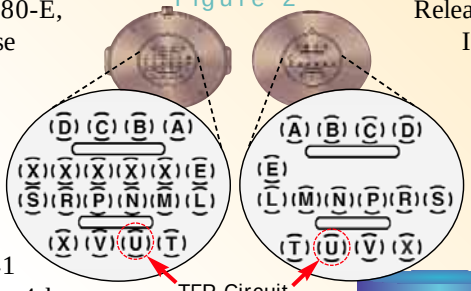


Figure 1

When diagnosing code P0742 on a 4T40-E or 4T65-E transmission, look at the scan tool data to see if Release Pressure "Yes" or "No" is present. It may be helpful to monitor voltage on the signal wire between the switch and the computer (Refer to *Figure 2* for connecter wire location). Compare scan data or circuit voltage to the chart in *Figure 3* and verify correct operation. On units with a TCC release pressure switch, codes P0742 & P1887 are just as likely to be caused by a defective TFP, electrical or connecter problems as by internal transmission problems.

Figure 2



	TCC Release Pressure	Release Switch Position	Release Switch Wire Voltage
Key On Engine OFF	NO	Closed	0 Volts
Engine Running TCC OFF	YES	Open	12 Volts
TCC Applied	NO	Closed	0 Volts

Figure 3

Figure 4

GM Calibration Website
http://calid.gm.com/vci

2002 Chevy Malibu VIN: 1G1NE52J72MXXXXXX

Part No.	Cal. ID #	Bulletin #	Description
12227254	12227240	220730021	new calibration to address false setting of dtc po741

In late model vehicles, it is becoming mandatory to check for computer program updates when diagnosing codes. Figure 4 is an example of a TCC code that GM addresses with a reprogram. To check for updated programs all you need is the vehicle identification number for the vehicle that you are working on. The GM website is free and does not require a password.

800/843-2600 • 802/463-9722 • fax: 802/463-4059 • www.sonnax.com • info@sonnax.com

GM CONVERTER CODES P0741, P0742 & 1887

P0741 TCC STUCK OFF

If the PCM detects high converter slip when the TCC is commanded on, then a DTC P0741 will set. The following conditions must exist for two times during the same ignition cycle.
This code will set for all the same reasons that a P1870 will set:

- The TCC duty cycle is greater than 50%
- The TCC slip speed is greater than 180 RPM for 7 seconds
- TCC slip in 3rd gear on 4L80-E transmissions

Known causes for P0741:

- Worn TCC valve bores in the valve body
- Damaged or worn pump bearing seal
- Defective TCC PWM or TCC apply solenoids
- Restricted separator plate solenoid feed orifice
- Defective converter
- Computer reprogram
- Channel plate sleeve & turbine shaft sealing ring damage

P0742 TCC STUCK ON 4T40-E & 4T65-E

When the computer releases the TCC, yet the TCC release switch indicates no release pressure (switch is closed or grounded) then P0742 sets.
This code can be caused by electrical or hydraulic problems.

Known causes for P0742:

- Defective TFP (fluid pressure switch)
- Defective TCC PWM solenoid
- Intermittent short to ground in TCC release switch signal circuit.
- Rapid fluctuation in line pressure. If line pressure drops very low, converter charge oil will be restricted and the release pressure switch will close.

P0742 TCC STUCK ON ALL GM UNITS

When the PCM detects low slip speed with TCC commanded off.

Known causes for P0742:

- Sticking TCC apply valve
- Defective TCC PWM or TCC apply solenoid

P1887 TCC RELEASE SWITCH MALFUNCTION

When TCC is commanded on, and slip speed indicates that the converter clutch IS applied and the TCC release switch indicates the converter clutch is NOT applied, then the P1887 will set.

This code can be caused by electrical or hydraulic problems. It is possible to have a normally working TCC with no excess slip, and due to internal cross leaks, have enough residual pressure in the TCC release circuit to open the TCC release pressure switch, causing a code P1887.

Known causes for P1887:

- Intermittent open in TCC release switch signal circuit caused by:
  - Fatigued wires or poor terminal connections
  - Defective TFP (fluid pressure switch)
- Residual TCC release pressure due to cross leaks at the:
  - Pump bearing seal
  - Turbine shaft
  - Inside the torque converter