



4T65-E

P1887 TCC RELEASE SWITCH MALFUNCTION

COMPLAINT: A GM vehicle equipped with a 4T65-E transaxle comes to the shop with complaints of harsh shifting, no TCC operation or loses 4th gear when hot. The Service Engine Soon light (MIL) may or may not be illuminated at this time.

When the vehicle is scanned, a P1887 fault code defined as a TCC release switch malfunction is stored in memory. While this code is current, the PCM will inhibit TCC operation, freeze shift adapts and not allow 4th gear if the transmission is in Hot Mode.

CAUSE: The PCM supplies 12 volts on CKT 657 to the TCC release switch with the ignition switch on or in the run position. (See figure 1) The TCC release switch is located inside the transaxle as part of the fluid pressure switch assembly. (See figure 2) This code is typically set when voltage on CKT 657 remains high for 6 seconds or longer when TCC is commanded on and TCC slip speed is -20 to +60 RPM.

There are several possible causes for this problem such as follows;

A possible electrical issue could be an open in the signal circuit (CKT 657) between the PCM and the TCC release switch.

A faulty TCC release switch.

A damaged turbine shaft, teflon seal rings, O-ring or front stator support bushing.

A worn or damaged drive sprocket and/or bearing or channel plate sleeve.

A sticking or worn TCC control valve or bore in the valve body.

The #1 checkball in the channel plate is leaking or not seating properly.

A faulty PCM.

CORRECTION: *External electrical checks:*

Scan tool data may not display TCC release switch status.

To test CKT 657, unplug the harness connector at the transmission and identify terminal U. (See figure 3) With a DVOM set to DC volts, place the negative lead to a known good ground and the positive meter lead to terminal U in the harness connector. Turn the **key on** with the **engine off**. Battery voltage should be seen.

If battery voltage **is** seen at this time, proceed with **Scenario 1**.

If battery voltage **is not** seen at this time, proceed with **Scenario 2**.

(Scenario 1) If battery voltage IS seen:

Turn the key off. Plug in trans harness connector and then turn key on again. Recheck voltage on wire at terminal U from wire entry side of connector. No voltage should be seen. If battery voltage remains, then either the internal harness is open or the TCC release switch is defective as this switch is normally closed to ground without oil pressure present. Repair internal harness or replace fluid pressure switch assembly as necessary



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CORRECTION: *External electrical checks continued:*

(Scenario 2) If battery voltage IS NOT seen:

For 98 and newer models, check voltage on wire at terminal 63 in the PCM C2 connector. For 97 vehicles use terminal 75. (See figure 4) If battery voltage is present then repair break in wire or run a new wire to the trans harness connector terminal U. This is usually a yellow wire from the PCM to the trans harness connector. If no voltage is present on the wire at PCM connector then turn **key off**, disconnect battery and unplug PCM connector. Remove terminal end and wire from connector to inspect for damaged crimp or broken wire. Test terminal end for loose fit on PCM pin. Repair as necessary. Plug connector in to PCM. Reconnect battery. Turn key on and recheck voltage on wire at PCM connector. If battery voltage is now seen then verify voltage is present at unplugged trans connector terminal U and your repair is complete. If there is still no battery voltage with key on/engine off and the trans connector unplugged, then the PCM will require replacement.

NOTE: *Electrically, this code can only be set by an open or break in CKT 657. An intermittent or constant short to ground on this circuit will not set a code P1887.*

Internal mechanical concerns:

Check for damaged turbine shaft or loose inner steel sleeve. Replace turbine shaft as necessary. Inspect for worn or damaged turbine shaft O-ring or seal rings and replace as necessary. Check for worn or loose drive sprocket support bushing and replace bushing or support as needed. (Stator Support) A worn or damaged drive sprocket where it rides the bearing or a damaged bearing will require replacement of both pieces. (See figure 5) If the channel plate sleeve has been damaged at the turbine shaft seal ring area from turbine shaft misalignment due to drive sprocket bushing or bearing failure, then replacement of the sleeve or entire channel plate assembly may be required. Valve body concerns such as a sticking or worn TCC control valve or bore will require repair or replacement of the control valve assembly. (See figure 6) Look for metal particles or debris that would not allow the # 1 checkball to seat properly. Clean or remove debris from the channel plate area as needed. (See figure 7)

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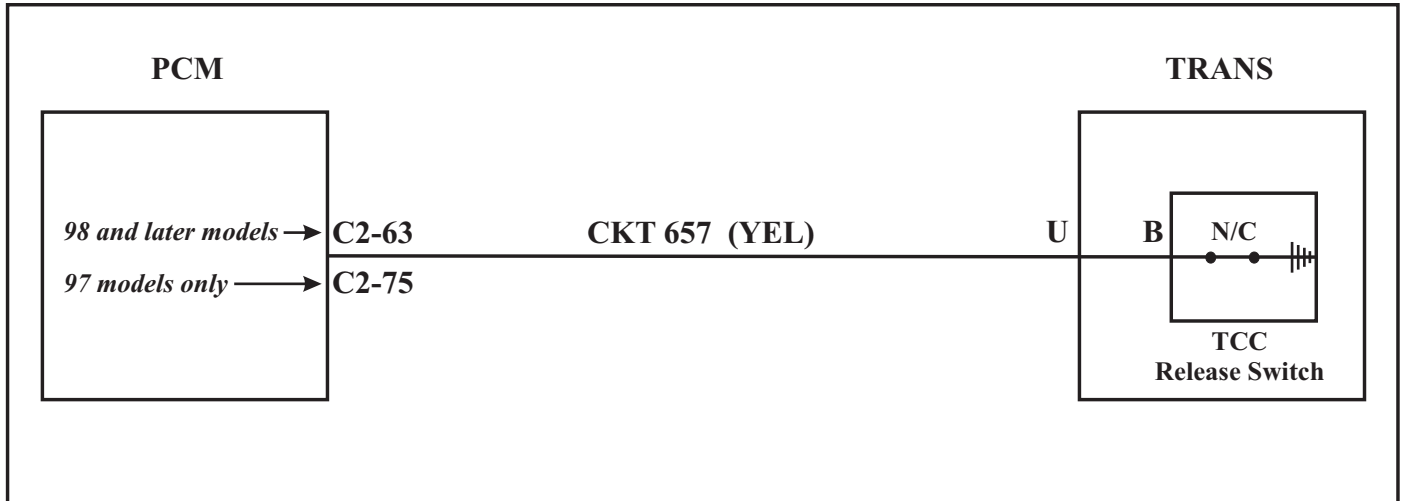


Figure 1

SERVICE INFORMATION: (See Figure 2)

At the time of this printing, the current OEM part numbers are as follows:

24223197 = 1st Design Fluid Pressure Switch Assembly

24216426 = 2nd Design Fluid Pressure Switch Assembly

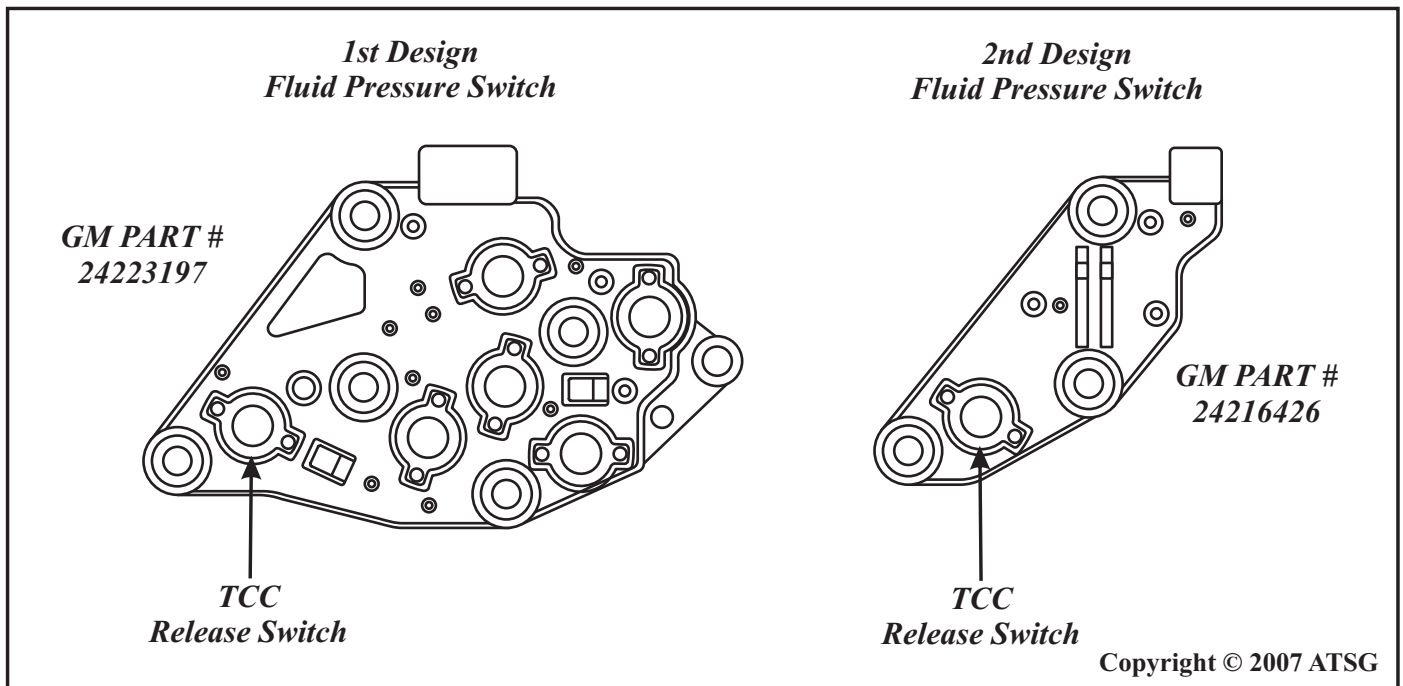


Figure 2

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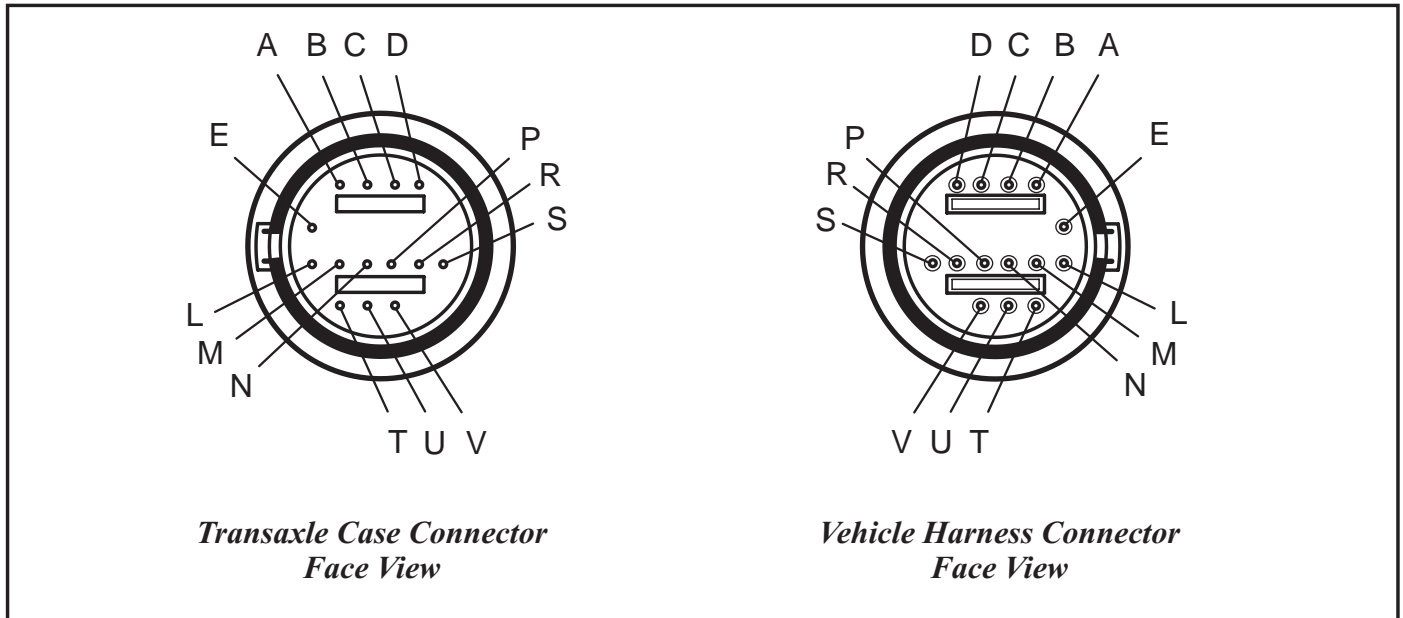


Figure 3

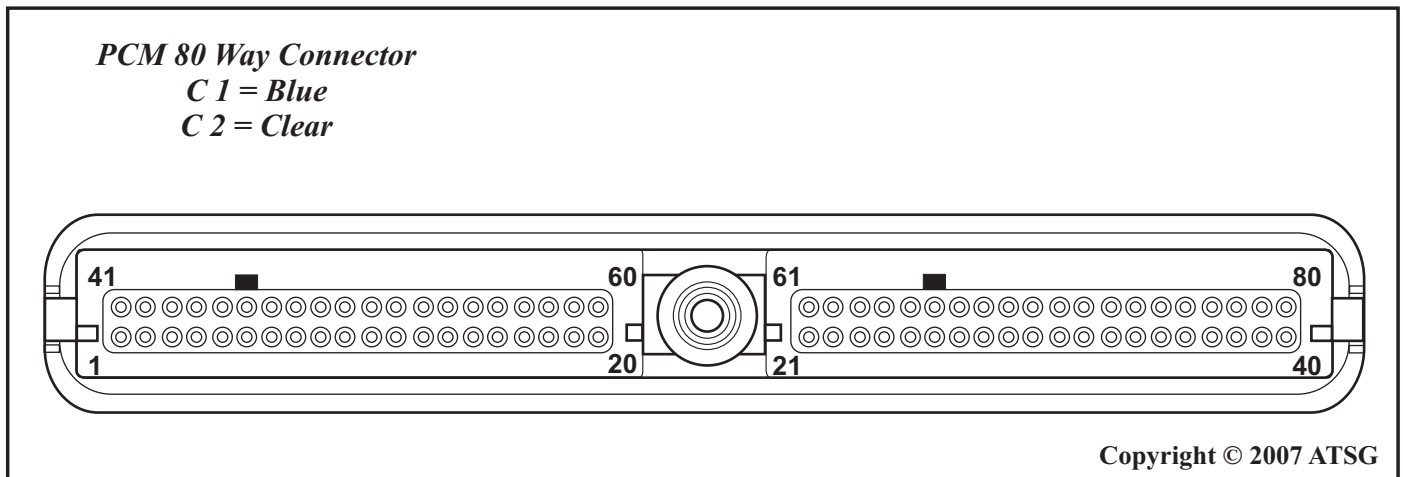
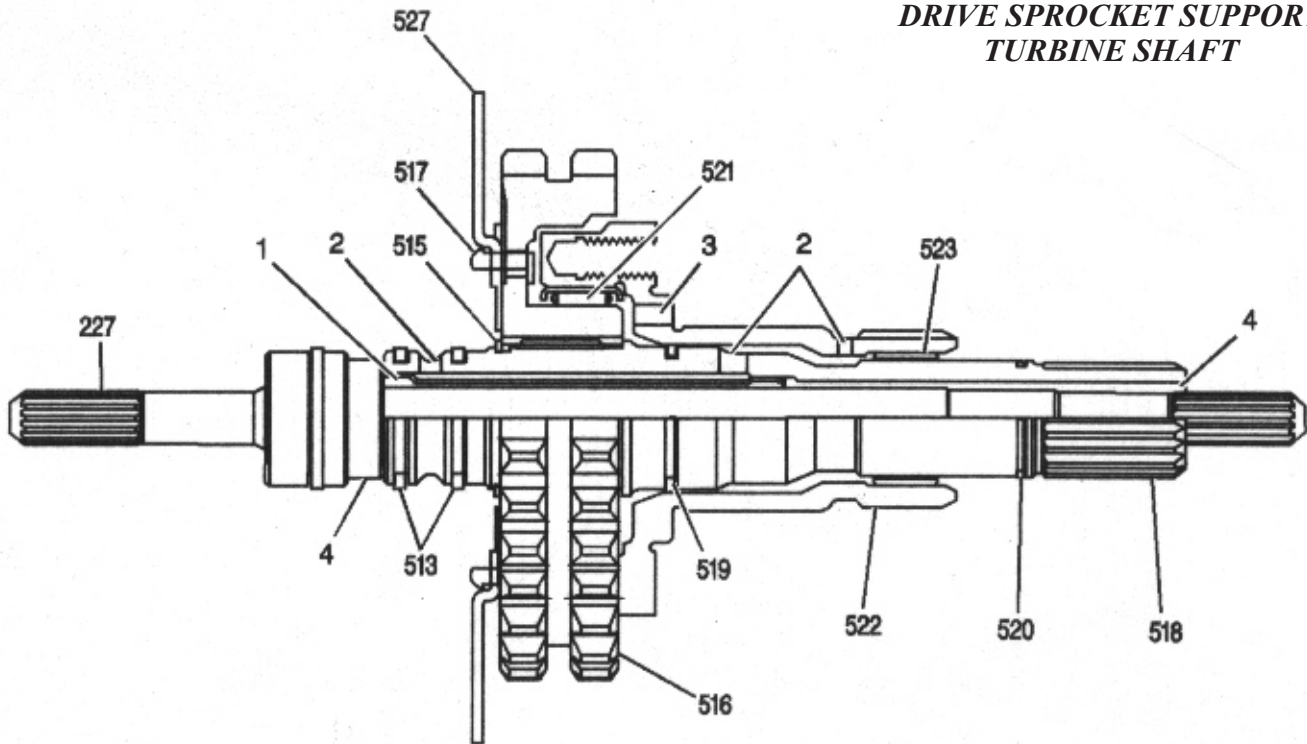


Figure 4

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CROSS SECTION VIEW DRIVE SPROCKET SUPPORT TURBINE SHAFT



Legend:

- | | |
|--------------------------------------|---|
| (1) Steel Sleeve | (517) Drive Sprocket Thrust Washer |
| (2) TCC Apply Passage | (518) Turbine Shaft |
| (3) Converter Seal Drainback Passage | (519) Turbine Shaft Oil Seal Ring |
| (4) TCC Release Passage | (520) Turbine Shaft O-Ring Seal |
| (227) Oil Pump Drive Shaft | (521) Drive Sprocket Bearing |
| (513) Turbine Shaft Oil Seal Ring | (522) Drive Sprocket Support |
| (515) Drive Sprocket Retaining Ring | (523) Drive Sprocket Support Bushing |
| (516) Drive Sprocket | (527) Turbine Speed Sensor Reluctor Wheel |

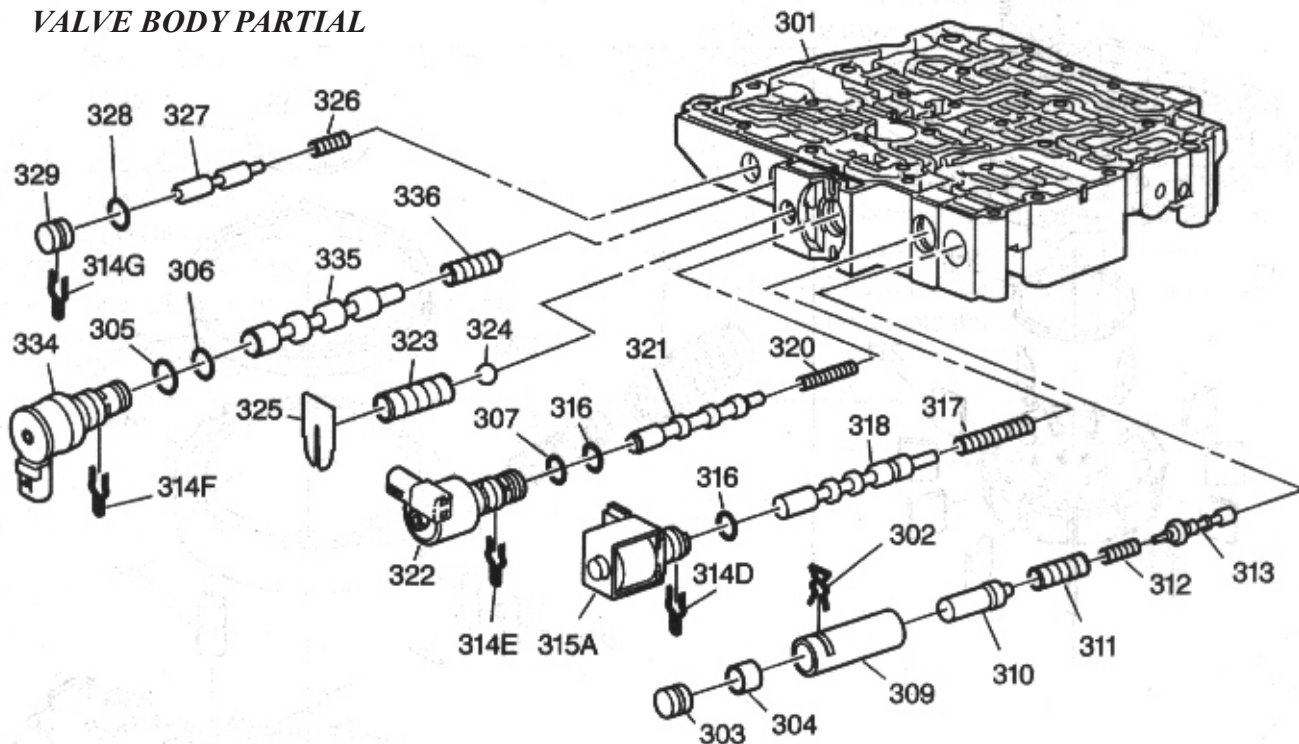
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Figure 5

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EXPLODED VIEW VALVE BODY PARTIAL



Legend:

(301) Control Valve Body
 (302) Line Boost Valve/Bushing Retainer
 (303) Line Boost Valve Bore Plug
 (304) Line Boost Valve
 (305) TCC PWM Solenoid O-Ring Seal
 (306) TCC PWM Solenoid O-Ring Seal
 (307) EPC Solenoid O-Ring Seal
 (309) Reverse Boost Valve Bushing
 (310) Reverse Boost Valve
 (311) Outer P.R. Valve Spring
 (312) Inner P.R. Valve Spring
 (313) Pressure Regulator (P.R.) Valve
 (314 D) Shift Solenoid Retainer
 (314 E) EPC Solenoid Retainer
 (314 F) TCC PWM Solenoid Retainer
 (314 G) Bore Plug Retainer
 (315 A) 1-2/3-4 Shift Solenoid

(316 A) 1-2/3-4 Shift Solenoid O-Ring Seal
 (316 B) EPC Solenoid O-Ring Seal
 (317) 1-2 Shift Valve Spring
 (318) 1-2 Shift Valve
 (320) Torque Signal Regulator Valve Spring
 (321) Torque Signal Regulator Valve
 (322) Pressure Control Solenoid (EPC)
 (323) Line Pressure Relief Valve Spring
 (324) Line Pressure Relief Valve
 (325) Line Pressure Relief Valve Spring Retainer
 (326) TCC Regulator Apply Valve Spring
 (327) TCC Regulator Apply Valve
 (328) TCC Regulator Apply Valve Bore Plug O-Ring Seal
 (329) TCC regulator Apply Valve Bore Plug
 (334) TCC PWM Solenoid
 (335) TCC Control Valve
 (336) TCC Control Valve Spring

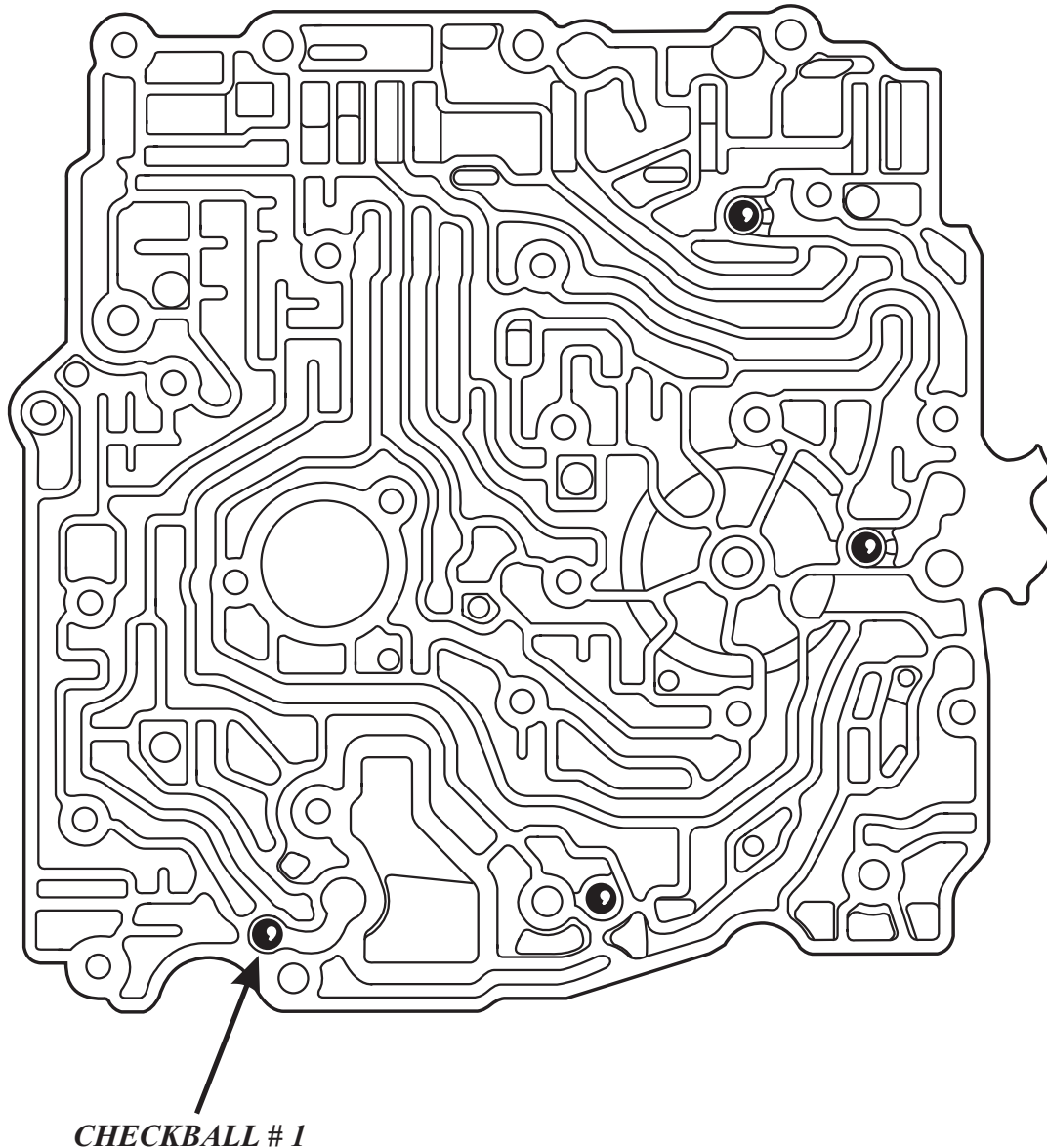
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Figure 6

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P1887 TCC RELEASE SWITCH MALFUNCTION

**CHANNEL PLATE / CASE COVER
CHECKBALL LOCATIONS**



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Figure 7