

2004 4T65-E transmission
Transmission Diagnostic Parameters

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SENSED PARAMETERS	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Vehicle Speed Sensor (VSS) Low Voltage	P0502	0 RPM to 6000 RPM This DTC detects a very low vehicle speed signal when the vehicle has a large engine speed in a drive gear range.	Transmission OSS \leq 150 RPM for 5 seconds	No MAP Sensor DTCs No TP Sensor DTCs No Transmission ISS DTCs No Engine Torque Malfunction Engine Speed > 500 RPM for 5 seconds and Not in Fuel Cut Off TFT \geq 0°C TP \geq 12% 0 kPa \leq MAP \leq 105 kPa 50 lb ft < Engine Torque < 300 lb ft Transmission ISS \geq 1500 RPM TCC Slip Speed \geq 0 RPM	5 seconds Continuous	Type B MIL Illuminated – 2 nd consecutive trip with fail reported No DIC Message
Vehicle Speed Sensor (VSS) Intermittent	P0503	0 RPM to 6000 RPM This DTC detects a large drop in the vehicle speed signal in a very short period of time (unrealistic change).	Drop in Transmission OSS \geq 1500 RPM for 2 seconds	Time Since Last Gear Selector Range Change \geq 6 seconds Rise in Transmission OSS < 250 RPM for 2 seconds	2 seconds Continuous	Type B MIL Illuminated – 2 nd consecutive trip with fail reported No DIC Message
Transmission Fluid Temperature (TFT) Sensor Performance	P0711	-40° C to 151° C This DTC detects a TFT that remains constant for a period of time in which a measurable amount of change is expected or a TFT in which large rapid changes occur in a very short period of time (unrealistic change).	<u>Fail Case 1</u> TFT has not changed \geq 1.5° C since startup for 409 seconds <u>Fail Case 2</u> TFT changes \geq 20° C, 14 times within 7 seconds DTC will set if either Fail Case is True	No ECT Sensor DTCs No VSS DTCs No Transmission ISS DTCs 8V \leq System Voltage \leq 18V Engine Running \geq 300 seconds 10 \leq Trans Temp AD Counts \leq 251 (0.2 volts \leq TFT Sensor \leq 4.92 volts) -40° C \leq TFT at startup \leq 21° C ECT \geq 84° C and has changed \geq 55° C since startup Vehicle Speed \geq 5 mph for \geq 409 seconds cumulatively this ignition TCC Slip Speed \geq 80 RPM for \geq 409 seconds cumulatively this ignition	Case 1: 409 seconds Continuous Case 2: 7 seconds Continuous	Type C No MIL Illumination No DIC Message
Transmission Fluid Temperature (TFT) Sensor Circuit Low Voltage	P0712	0.20V to 4.92V The DTC detects a continuous short to ground in the TFT Sensor signal circuit or the TFT Sensor.	Trans Temp AD Counts \leq 10 (TFT Sensor \leq 0.20 volts) for 10 seconds	8V \leq System Voltage \leq 18V The Ignition Switch is in the ON position	10 seconds Continuous	Type C No MIL Illumination No DIC Message
Transmission Fluid Temperature (TFT) Sensor Circuit High Voltage	P0713	0.20V to 4.92V The DTC detects a continuous open or short to voltage in the TFT Sensor circuit or the TFT Sensor.	Trans Temp AD Counts \geq 251 (TFT Sensor \geq 4.92 volts) for 400 seconds	8V \leq System Voltage \leq 18V The Ignition Switch is in the ON position	400 seconds Continuous	Type C No MIL Illumination No DIC Message

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Input Speed Sensor (ISS) Performance	P0716	0 RPM to 6000 RPM This DTC detects a large change in the input speed signal in a very short period of time (unrealistic change).	Change in Input Speed \geq 1300 RPM for 0.8 second	No TP Sensor DTCs No VSS DTCs No Transmission ISS DTCs No 1-2 SS Electrical/Performance DTCs DTC P0717 Passed This Ignition Engine Speed > 500 RPM for 5 seconds and Not in Fuel Cut Off TP \geq 14% Vehicle Speed \geq 5 mph	0.8 second Continuous	Type B MIL Illuminated – 2 nd consecutive trip with fail reported No DIC Message
Input Speed Sensor (ISS) Low Voltage	P0717	0 RPM to 6000 RPM This DTC detects a very low input speed signal when vehicle speed is greater than a calibrated value.	Transmission ISS < 100 RPM for 5 seconds	No VSS DTCs No Engine Torque Malfunction Engine Speed > 500 RPM for 5 seconds and Not in Fuel Cut Off 50 lb ft < Engine Torque < 500 lb ft Vehicle Speed \geq 5 mph	5 seconds Continuous	Type B MIL Illuminated – 2 nd consecutive trip with fail reported No DIC Message
Torque Converter Clutch (TCC) System – Stuck Off	P0741	This DTC detects a high TCC Slip Speed when the TCC is Commanded On.	If TCC Slip Speed \geq 180 RPM for 7 seconds, then increment Fail Counter. DTC will set when Fail Counter = 2	No TP Sensor DTCs No VSS DTCs No Transmission ISS DTCs No TCC System Stuck On DTC No TCC Solenoid Electrical DTC No TCC Release Switch DTC No Engine Torque Malfunction Engine Speed > 500 RPM for 5 seconds and Not in Fuel Cut Off 20° C \leq TFT \leq 130° C Transmission Gear Selector in D2, D3 or D4 Range 4% < TP < 99% 21 lb ft < Engine Torque < 500 lb ft TCC Locked Capacity > 50% or Max Allowed Pressure If Commanded Gear is 2nd, then 1.5 < Gear Ratio < 1.6 If Commanded Gear is 3rd, then 0.95 < Gear Ratio < 1.05 If Commanded Gear is 4 th , then 0.7 < Gear Ratio < 0.8	7 seconds Continuous	Type B MIL Illuminated – 2 nd consecutive trip with fail reported No DIC Message
Torque Converter Clutch (TCC) System – Stuck On	P0742	This DTC detects a closed TCC Release Switch, indicating TCC applied, when the TCC is Commanded Off.	If the TCC Release Switch is Closed (indicating TCC applied) for 4 seconds, then increment Fail Counter. DTC will set when Fail Counter = 6	No TP Sensor DTCs No TCC Solenoid Electrical DTC No TCC Release Switch DTCs No Engine Torque Malfunction Engine Speed > 500 RPM for 5 seconds and Not in Fuel Cut Off 20° C \leq TFT \leq 130° C 5% \leq TP \leq 45% 70 lb ft < Engine Torque < 200 lb ft TCC is Commanded Off	4 second Continuous	MIL Illuminated – 2 nd consecutive trip with fail reported No DIC Message
1-2 Shift Solenoid (SS) Valve Performance – No First or Fourth Gear	P0751	This DTC detects a 2-2-3-3 shift pattern.	<u>SS Fail Case 1</u> Time Since Last Gear Selector Range Change \geq 1 second TP \geq 5% 20 lb ft \leq Engine Torque \leq 200 lb ft	No TP Sensor DTCs No VSS DTCs No Transmission ISS DTCs No TCC System Stuck On DTC	Case 1: 1 second Continuous Case 2: 1 second Continuous	Type B MIL Illuminated – 2 nd consecutive trip with fail reported

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			<p>1st Gear is Commanded</p> <p>$1.52 \leq \text{Gear Ratio} \leq 1.6$ (2nd Gear Ratio)</p> <p>The above conditions are true for 1 second</p> <p><u>SS Fail Case 2</u></p> <p>Time Since Last Gear Selector Range Change \geq 1 second</p> <p>TP \geq 10%</p> <p>30 lb ft \leq Engine Torque \leq 200 lb ft</p> <p>4th Gear is Commanded</p> <p>$0.95 \leq \text{Gear Ratio} \leq 1.05$ (3rd Gear Ratio)</p> <p>The above conditions are true for 1 second</p> <p>If both SS Fail Case 1 and SS Fail Case 2 are true, then increment Fail Counter.</p> <p>DTC will set when Fail Counter = 2</p>	<p>No Shift Solenoid Electrical DTCs</p> <p>No TCC Solenoid Electrical DTCs</p> <p>No Engine Torque Malfunction</p> <p>8V \leq System Voltage \leq 18V</p> <p>Engine Speed > 500 RPM for 5 seconds and Not in Fuel Cut Off</p> <p>20° C \leq TFT \leq 130° C</p> <p>150 RPM \leq Transmission ISS \leq 8000 RPM</p> <p>Transmission OSS \geq 300 RPM</p>		No DIC Message
1-2 Shift Solenoid (SS) Valve Performance – No Second or Third Gear	P0752	This DTC detects a 1-1-4-4 shift pattern.	<p><u>SS Fail Case 3</u></p> <p>Time Since Last Gear Selector Range Change \geq 1 second</p> <p>TP \geq 10%</p> <p>20 lb ft \leq Engine Torque \leq 200 lb ft</p> <p>2nd Gear is Commanded</p> <p>$2.87 \leq \text{Gear Ratio} \leq 2.97$ (1st Gear Ratio)</p> <p>The above conditions are true for 1 second</p> <p><u>SS Fail Case 4</u></p> <p>Time Since Last Gear Selector Range Change \geq 1 second</p> <p>TP \geq 10%</p> <p>20 lb ft \leq Engine Torque \leq 200 lb ft</p> <p>3rd Gear is Commanded</p> <p>$0.65 \leq \text{Gear Ratio} \leq 0.75$ (4th Gear Ratio)</p> <p>The above conditions are true for 1 second</p> <p>If both SS Fail Case 3 and SS Fail Case 4 are true, then increment Fail Counter.</p> <p>DTC will set when Fail Counter = 2</p>	<p>No TP Sensor DTCs</p> <p>No VSS DTCs</p> <p>No Transmission ISS DTCs</p> <p>No TCC System Stuck On DTC</p> <p>No Shift Solenoid Electrical DTCs</p> <p>No TCC Solenoid Electrical DTCs</p> <p>No Engine Torque Malfunction</p> <p>8V \leq System Voltage \leq 18V</p> <p>Engine Speed > 500 RPM for 5 seconds and Not in Fuel Cut Off</p> <p>20° C \leq TFT \leq 130° C</p> <p>150 RPM \leq Transmission ISS \leq 8000 RPM</p> <p>Transmission OSS \geq 300 RPM</p>	<p>Case 3: 1 second Continuous</p> <p>Case 4: 1 second Continuous</p>	<p>Type B</p> <p>MIL Illuminated – 2nd consecutive trip with fail reported</p> <p>No DIC Message</p>
1-2 Shift Solenoid (SS) Control Circuit	P0753	0V to 12V This DTC detects a continuous open, short to ground or short to voltage in the SS circuit or the SS.	<p>Every 100 milliseconds the circuit is tested and if an open or short condition is detected a Fail Counter is incremented.</p> <p>If the Fail Counter \geq 43 Counts out of 50 Counts, then the DTC will set.</p>	<p>8V \leq System Voltage \leq 18V</p> <p>The Ignition Switch is in the ON position</p>	<p>Every 100 milliseconds Continuous</p>	<p>Type B</p> <p>No DIC Message</p>
2-3 Shift Solenoid (SS) Valve Performance – No First or Second Gear	P0756	This DTC detects a 4-3-3-4 shift pattern.	<p><u>SS Fail Case 5</u></p> <p>Time Since Last Gear Selector Range Change \geq 1 second</p> <p>TP \geq 10%</p> <p>60 lb ft \leq Engine Torque \leq 200 lb ft</p> <p>Transmission OSS \geq 100 RPM</p>	<p>No TP Sensor DTCs</p> <p>No VSS DTCs</p> <p>No Transmission ISS DTCs</p> <p>No TCC System Stuck On DTC</p> <p>No Shift Solenoid Electrical DTCs</p>	<p>Case 5: 1 second Continuous</p> <p>Case 6: 1 second Continuous</p>	<p>Type A</p> <p>MIL Illuminated – 1st trip with fail reported</p> <p>No DIC Message</p>

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			<p>-8191 RPM ≤ TCC Slip Speed ≤ 8191 RPM (cal'd out)</p> <p>1st Gear is Commanded</p> <p>0.65 ≤ Gear Ratio ≤ 0.75 (4th Gear Ratio)</p> <p>The above conditions are true for 1 second</p> <p><u>SS Fail Case 6</u></p> <p>Time Since Last Gear Selector Range Change ≥ 1 second</p> <p>TP ≥ 10%</p> <p>60 lb ft ≤ Engine Torque ≤ 200 lb ft</p> <p>2nd Gear is Commanded</p> <p>0.95 ≤ Gear Ratio ≤ 1.05 (3rd Gear Ratio)</p> <p>The above conditions are true for 1 second</p> <p>If both SS Fail Case 5 and SS Fail Case 6 are true, then increment Fail Counter.</p> <p>DTC will set when Fail Counter = 2</p>	<p>No TCC Solenoid Electrical DTCs</p> <p>No Engine Torque Malfunction</p> <p>8V ≤ System Voltage ≤ 18V</p> <p>Engine Speed > 500 RPM for 5 seconds and Not in Fuel Cut Off</p> <p>20° C ≤ TFT ≤ 130° C</p> <p>150 RPM ≤ Transmission ISS ≤ 8000 RPM</p> <p>Transmission OSS ≥ 300 RPM</p>		

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2-3 Shift Solenoid (SS) Valve Performance – No Third or Fourth Gear	P0757	This DTC detects a 1-2-2-1 shift pattern.	<p><u>SS Fail Case 7</u></p> <p>Time Since Last Gear Selector Range Change \geq 1 second</p> <p>TP \geq 10%</p> <p>20 lb ft \leq Engine Torque \leq 200 lb ft</p> <p>3rd Gear is Commanded</p> <p>1.52 \leq Gear Ratio \leq 1.62 (2nd Gear Ratio)</p> <p>The above conditions are true for 1 second</p> <p><u>SS Fail Case 8</u></p> <p>Time Since Last Gear Selector Range Change \geq 1 second</p> <p>TP \geq 5%</p> <p>0 lb ft \leq Engine Torque \leq 1300 lb ft</p> <p>4th Gear is Commanded</p> <p>1.80 \leq Gear Ratio \leq 2.97 (1st Gear Ratio with extended lower limit)</p> <p>The above conditions are true for 1 second</p> <p>If both SS Fail Case 7 and SS Fail Case 8 are true, then increment Fail Counter.</p> <p>DTC will set when Fail Counter = 1</p>	<p>No TP Sensor DTCs</p> <p>No VSS DTCs</p> <p>No Transmission ISS DTCs</p> <p>No TCC System Stuck On DTC</p> <p>No Shift Solenoid Electrical DTCs</p> <p>No TCC Solenoid Electrical DTCs</p> <p>No Engine Torque Malfunction</p> <p>8V \leq System Voltage \leq 18V</p> <p>Engine Speed > 500 RPM for 5 seconds and Not in Fuel Cut Off</p> <p>20° C \leq TFT \leq 130° C</p> <p>150 RPM \leq Transmission ISS \leq 8000 RPM</p> <p>Transmission OSS \geq 300 RPM</p>	<p>Case 7: 1 second Continuous</p> <p>Case 8: 1 second Continuous</p>	<p>Type A</p> <p>MIL Illuminated – 1st trip with fail reported</p> <p>No DIC Message</p>
2-3 Shift Solenoid (SS) Control Circuit	P0758	This DTC detects a continuous open, short to ground or short to voltage in the SS circuit or the SS.	<p>0V to 12V</p> <p>Every 100 milliseconds the circuit is tested and if an open or short condition is detected a Fail Counter is incremented.</p> <p>If the Fail Counter \geq 43 Counts out of 50 Counts, then the DTC will set.</p>	<p>8V \leq System Voltage \leq 18V</p> <p>The Ignition Switch is in the ON position</p>	<p>Every 100 millisecond Continuous</p>	<p>Type A</p> <p>MIL Illuminated – 1st trip with fail reported</p> <p>No DIC Message</p>
Torque Converter Clutch (TCC) Pulse Width Modulation (PWM) Solenoid Control Circuit	P1860	This DTC detects a continuous open, short to ground or short to voltage in the TCC PWM Solenoid circuit or the TCC PWM Solenoid.	<p>0V to 12V</p> <p>Every 100 milliseconds the circuit is tested and if an open or short condition is detected a Fail Counter is incremented.</p> <p>If the Fail Counter \geq 43 Counts out of 50 Counts, then the DTC will set.</p>	<p>8V \leq System Voltage \leq 18V</p> <p>70% \leq TCC Duty Cycle \leq 10%</p>	<p>Every 100 millisecond Continuous</p>	<p>Type B</p> <p>MIL Illuminated – 2nd consecutive trip with fail reported</p> <p>No DIC Message</p>
Torque Converter Clutch (TCC) Release Switch Circuit	P1887	This DTC detects an open TCC Release Switch (indicating TCC is not applied) when the TCC is commanded On and TCC Slip Speed is low.	<p>If the TCC Release Switch is Open (indicating TCC is not applied) for 6 seconds, then increment Fail Counter.</p> <p>DTC will set when Fail Counter = 2</p>	<p>No Transmission ISS DTCs</p> <p>No TCC Solenoid Electrical DTCs</p> <p>Engine Speed > 500 RPM for 5 seconds and Not in Fuel Cut Off</p> <p>30 lb ft \leq Engine Torque \leq 300 lb ft</p> <p>TCC is commanded On</p> <p>-20 RPM \leq TCC Slip Speed \leq 60 RPM</p> <p>15 psi \leq TCC Pressure \leq 120 psi</p>	<p>6 seconds Continuous</p>	<p>Type B</p> <p>MIL Illuminated – 2nd consecutive trip with fail reported</p> <p>No DIC Message</p>

2004 MY 4T65-E Transmission Diagnostic Matrix – Applications with P05 Controller

OBD II Group: 04OBDG04

Certification Standard: Cal Bin 5

Test Group: 4GMXV03.8042

NOTES:

Class 2 Device Control Overrides:

- Abort 2-1 Class 2 controlled downshift if Vehicle Speed > 32 mph
- Abort 3-2 Class 2 controlled downshift if Vehicle Speed > 65 mph
- Abort all Class 2 commanded shifts if Vehicle Speed > 65 mph
- Abort all Class 2 commanded shifts if Engine Speed > 4200 rpm
- Abort TCC Class 2 control if the TCC has been commanded off for > 5 minutes.
- Abort Class 2 Force Motor control if Engine Speed > 1500 rpm if the transmission is in P/N
- Disallow Class 2 Force Motor control of > 1.2 amps
- Disallow Class 2 Force Motor control of < 0.1 amps

**DTC Group
DTC Number**

Mass Air Flow (MAF)
P0101-P0102-P0103

Manifold Absolute Pressure (MAP)
P0105-P0106-P0107-P0108 - P1106-P1107

Engine Coolant Temperature (ECT)
P0115-P0116-P0117-P0118-P0125-P0126-P0128

Throttle Position (TP)
P0120-P0121-P0122-P0123-P0220-P0221-P0222-P0223
P0225-P0226-P0227-P0228-P1120-P1121-P1122-P1125

Accelerator Pedal Position (APP)
P1280-P1281-P1282-P1283-P1285-P1286-P1287-P1288

System Voltage
P0560-P0562-P0563

The above is an all-inclusive list of engine side P-codes that disable transmission side diagnostics.

* Transmission Temperature Default - the following is used to determine a Default Trans. Temp. for transmission operation and running the diagnostics.

- 1) If a Coolant Temp. DTC is set, Default Trans. Temp. is set to 131 C.
- 2) If Coolant Temp. is ≥ 115 C, Default Trans. Temp. is set to 131C.
- 3) If Engine Run Time is ≤ 180 seconds, Default Trans. Temp. is set to the value of Intake Air Temp. saved at startup.
(If a IAT DTC is set, Default Trans. Temp. is set to 0 C.)
- 4) If Engine Run Time ≥ 180 seconds and Coolant Temp. is between 45 C and 115 C, Default Trans. Temp. to one of the following:
 - Coolant Temp. minus 10 C, if startup IAT is ≤ 0 C
 - Coolant Temp. plus 10 C, if startup IAT is ≥ 28 C
 - Coolant Temp., if startup IAT is between 0 C and 28 C or a IAT DTC is set.
- 5) If Engine Run Time is ≥ 180 seconds and Coolant Temp. ≤ 45 C, Default Trans. Temp. is set to 12 C.

2004 MY 4T65-E Transmission Diagnostic Matrix – Applications with P05 Controller

OBD II Group: 04OBDG04

Certification Standard: Cal Bin 5

Test Group: 4GMXV03.8042

NOTES:

** Force Motor Diagnostic Retest Mode - an attempt to prevent transients from keeping the Force Motor off for the entire ignition cycle.

- 1) When a Force Motor Circuit fault is detected, the Force Motor is shut off and the P0748 Diagnostic code is set
- 2) After being shut off for 2 seconds, the Force Motor is turned on at 0.1 amps to retest the circuit
- 3) If during the retest period (5 seconds) a fault is detected, the circuit is turned off for another 2 seconds before reentering the retest mode. If a circuit fault is detected 5 times in the retest mode without returning to normal operation, the circuit is turned off for the remainder of that ignition cycle.
- 4) During the retest period (0.1 amp commanded), if no circuit faults are detected for the entire 5 seconds period, the Force Motor is returned to normal operation and the P0748 diagnostic is passed.
- 5) If 3 circuit faults are detected in normal operation, the Force Motor is turned off for the remainder of that ignition cycle and the P0748 diagnostic remains active.