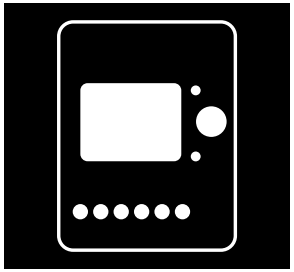

DTC Summaries

ZF 4 HP 24 E9 / AJ16 Transmission Control System – OBD II

OBD II MONITORING

DTCs can be accessed only through the DLC (diagnostic link connector).
Using PDU, select ToolBox, Engine / Transmission DTC, and Bosch / ZF 4 HP 24 E9.

MIL Activation

CHECK ENGINE MIL: A number in the CHECK ENG. MIL column indicates the consecutive trips required to activate the MIL. The CHECK ENGINE MIL activates for OBD II related transmission faults. Activation will store engine management DTC P1775 in the ECM memory.

TRANSMISSION MIL: A check mark in the TRANS. MIL column indicates MIL activation. The number of trips required to activate the TRANSMISSION MIL may vary depending on other fault parameters.

DTC	FAULT DESCRIPTION	OBD II MONITORING CONDITIONS	CHECK ENG. MIL	TRANS. MIL	LIMP HOME	POSSIBLE CAUSES
P0603	TCM internal memory error	Start engine.	2	—	—	TCM failure
P0605	TCM data corrupted	Start engine.	2	√	√	TCM failure
P0702	TCM internal shift solenoid control relay malfunction	Switch ignition ON.	2	√	√	TCM failure
P0705	Rotary switch position signal invalid	Start engine. Operate gear selector through all ranges.	2	√	√	Rotary switch to TCM "position code XYZ" circuit: open circuit or short circuit to ground Rotary switch failure
P0706	Rotary switch "not in P or N" signal during starting	Start engine.	2	√	√	Rotary switch incorrect adjustment Gear selector / rotary switch not in P or N Rotary switch to TCM "position code Z" circuit: short circuit to ground Rotary switch failure
P0712	Fluid temperature sensor circuit low voltage or fluid temperature < -58º F (-50º C)	Run engine from cold to normal operating temperature.	—	—	—	Transmission internal harness temp. sensor signal circuit: short circuit to ground Transmission to TCM harness temp. sensor signal circuit: short circuit to ground Temperature sensor failure
P0713	Fluid temperature sensor circuit high voltage or fluid temperature > 365º F (185º C)	Run engine from cold to normal operating temperature.	—	—	—	High transmission operating temperature. (Look for burned transmission fluid) Transmission internal harness temp. sensor signal circuit: open circuit or short circuit to B+ voltage Transmission to TCM harness temp. sensor signal circuit: open circuit or short circuit to B+ voltage Temperature sensor failure

DTC	FAULT DESCRIPTION	OBD II MONITORING CONDITIONS	CHECK ENG. MIL	TRANS. MIL	LIMP HOME	POSSIBLE CAUSES
P0721	Output speed sensor signal out of range (high)	Drive vehicle and accelerate to force downshifting.	2	√	√	Transmission internal harness output speed sensor circuit: intermittent open circuit or short circuit to ground or B+ voltage Transmission to TCM harness output speed sensor circuit: intermittent open circuit or short circuit to ground or B+ voltage Intermittent speed sensor failure
P0722	Output speed sensor, no signal	Drive vehicle in a forward gear at an engine speed greater than 2000 rpm.	2	√	√	Transmission internal harness speed sensor circuit: open circuit or short circuit to ground or B+ voltage Transmission to TCM harness speed sensor circuit: open circuit or short circuit to ground or B+ voltage Output speed sensor failure Transmission mechanical failure (no drive)
P0726	Engine speed signal high, out of range	Start engine.	2	√	√	ECM to TCM engine speed signal circuit intermittent open circuit, intermittent short circuit to ground or B+ voltage ECM engine speed signal error
P0727	Engine speed, no signal	Drive vehicle above 10 mph (16 km/h).	2	√	√	Engine stalled at a road speed above 10 mph (16 km/h) ECM to TCM engine speed signal circuit open circuit or short circuit to ground ECM engine speed signal error (TCM failure)
P0731	Slip detected – First gear	Drive vehicle; accelerate rapidly	2	√	√	Transmission oil level low Output speed sensor problem (Refer to P0721 and P0722 Possible Causes) Engine speed signal circuit between ECM and TCM: open circuit, short circuit, or high resistance Transmission mechanical failure

DTC	FAULT DESCRIPTION	OBD II MONITORING CONDITIONS	CHECK ENG. MIL	TRANS. MIL	LIMP HOME	POSSIBLE CAUSES
P0732	Slip detected – Second gear	Drive vehicle so that transmission shifts through all forward gears; repeat several times	2	√	√	Transmission oil level low Output speed sensor problem (Refer to P0721 and P0722 Possible Causes) Engine speed signal circuit between ECM and TCM: open circuit, short circuit, or high resistance Transmission mechanical failure
P0733	Slip detected – Third gear	Drive vehicle so that transmission shifts through all forward gears; repeat several times	2	√	√	Transmission oil level low Output speed sensor problem (Refer to P0721 and P0722 Possible Causes) Engine speed signal circuit between ECM and TCM: open circuit, short circuit, or high resistance Transmission mechanical failure
P0734	Slip detected – Fourth gear	Drive vehicle so that transmission shifts through all forward gears; repeat several times	2	√	√	Transmission oil level low Output speed sensor problem (Refer to P0721 and P0722 Possible Causes) Engine speed signal circuit between ECM and TCM: open circuit, short circuit, or high resistance Transmission mechanical failure
P0741	Torque converter clutch stuck OFF	Drive vehicle on level road at highway cruising speed; accelerate slowly; decelerate to highway cruising speed	2	√	√	TCM to transmission shift solenoid MV3 (TCM pin 42 – YU wire) circuit: open circuit, short circuit or high resistance Transmission shift solenoid MV3 circuit open circuit, short circuit or high resistance Engine torque signal circuit between ECM and TCM: open circuit, short circuit, or high resistance Shift solenoid MV3 failure Control valve (valve block) failure Torque converter failure

DTC	FAULT DESCRIPTION	OBD II MONITORING CONDITIONS	CHECK ENG. MIL	TRANS. MIL	LIMP HOME	POSSIBLE CAUSES
P0742	Torque converter clutch stuck ON	Drive vehicle so that transmission shifts through all forward gears; repeat several times	2	√	√	TCM to transmission shift solenoid MV3 (TCM pin 42 – YU wire) circuit: open circuit, short circuit or high resistance Transmission shift solenoid MV3 circuit open circuit, short circuit or high resistance Engine torque signal circuit between ECM and TCM: open circuit, short circuit, or high resistance Shift solenoid MV3 failure Control valve (valve block) failure Torque converter failure
P0743	Shift solenoid 3 (MV3) (TCC) voltage incorrect	Drive vehicle at a steady speed of 55 mph (88.5 km/h) or above.	2	√	√	Transmission internal harness torque converter clutch solenoid circuit: open circuit, short circuit to ground or B+ voltage Transmission to TCM harness torque converter clutch solenoid circuit: open circuit, short circuit to ground or B+ voltage Torque converter clutch solenoid failure
P0748	Pressure control regulator solenoid voltage incorrect	Drive vehicle through all gear ranges.	2	√	√	Transmission internal harness pressure control solenoid circuit: open circuit, short circuit to ground or B+ voltage Transmission to TCM harness pressure control solenoid circuit: open circuit, short circuit to ground or B+ voltage Pressure control solenoid failure
P0753	Shift solenoid 1 (MV1) voltage incorrect	Drive vehicle through all gear ranges.	2	√	√	Transmission internal harness shift solenoid circuit: open circuit, short circuit to ground or B+ voltage Transmission to TCM harness shift solenoid circuit: open circuit, short circuit to ground or B+ voltage Shift solenoid failure

DTC	FAULT DESCRIPTION	OBD II MONITORING CONDITIONS	CHECK ENG. MIL	TRANS. MIL	LIMP HOME	POSSIBLE CAUSES
P0758	Shift solenoid 2 (MV2) voltage incorrect	Drive vehicle through all gear ranges.	2	√	√	Transmission internal harness shift solenoid circuit: open circuit, short circuit to ground or B+ voltage Transmission to TCM harness shift solenoid circuit: open circuit, short circuit to ground or B+ voltage Shift solenoid failure
P1608	TCM internal timing error	Switch ignition ON.	2	√	√	TCM failure
P1780	Torque reduction signal out of range	Run engine for more than 12 seconds.	2*	√	—	TCM to ECM torque reduction signal circuit: open circuit, short circuit to ground or B+ voltage ECM torque reduction signal error
P1781	Torque signal out of range (frequency or pulse width)	Run engine above 500 rpm.	2*	√	—	ECM to TCM torque signal circuit: open circuit, short circuit to ground or B+ voltage ECM torque signal error
P1782	Traction control signal voltage low	Switch ignition ON. Operate traction control switch.	—	—	—	ABS / TC CM to TCM signal circuit: short circuit to ground ABS / TC CM failure
P1785	TRANSMISSION MIL	Switch ignition ON.	—	—	—	TCM to instrument pack TRANSMISSION MIL circuit: open circuit, short circuit to ground or B+ voltage Instrument pack failure
P1790	TPS signal out of range	Run engine above 580 rpm.	2	√	—	ECM to TCM TPS signal circuit: open circuit, short circuit to ground or B+ voltage ECM TPS signal output error
P1791	TPS, no signal	Run engine above 580 rpm.	2	√	—	ECM to TCM TPS signal circuit: open circuit, short circuit to ground or B+ voltage ECM TPS signal output error

* Depending on other fault parameters, CHECK ENGINE MIL may not activate

DTC	FAULT DESCRIPTION	OBD II MONITORING CONDITIONS	CHECK ENG. MIL	TRANS. MIL	LIMP HOME	POSSIBLE CAUSES
P1792	Sport mode indicator circuit failure	Switch ignition ON. Operate mode switch.	—	—	—	Sport mode indicator bulb failure TCM to instrument pack sport mode indicator circuit: open circuit, short circuit to ground or B+ voltage Instrument pack failure
P1794	TCM voltage supply less than 10.5V (Ignition supply must be 8V for TCM to store DTC)	Start engine. Run above 1600 rpm.	2	√	√	Ignition switched TCM power fuse defective LH heelboard fuse box to TCM ignition switched power circuit: high resistance
P1796	Kickdown switch signal error	Drive vehicle, depress accelerator pedal fully	—	—	—	Kickdown switch adjustment Kickdown switch to TCM circuit: short circuit to ground Kickdown switch failure