# TRANSMISSION DIAGNOSTIC PARAMETERS

| Component / System | Fault Code | Monitor Strategy Description | Malfunction Criteria | Threshold Value | Secondary Parameters / Enable Conditions | Time Required | MIL Illumin. | Extra Prep |
|---|---|---|---|---|---|---|---|---|
| **TCM, Internal Fault** | P0605 | ROM checksum or RAM error | Calculated checksum differs from stored. | | Ignition ON<br><br>Number of failed calculations: 2 | Immediately<br><br>Continuous | Immediately | |
| **Lost communication with ECM (Engine)** | U0100 | Frame missing from ECM | Detect no Status CAN frame from ECM | | Engine rpm > 500 rpm once within the driving cycle<br><br>Ignition ON + 3 sec<br><br>Battery voltage >10,2 V<br><br>Limp home mode = Off | 4 sec<br><br>Continuous | Immediately | |
| **Invalid data from ECM** | P1895 | Engine Torque signal is indicated invalid | Invalid Torque data from ECM | | Engine rpm > 400 rpm<br><br>Not lost communication with ECM<br><br>Ignition ON > 3 sec<br><br>Battery voltage > 10,2 V<br><br>Limp home mode = Off | 4 sec<br><br>Continuous | Immediately | |
| **Solenoid S1** | | Circuit continuity check | | | Engine rpm > 400 rpm<br><br>Limp home mode = Off<br><br>Time after ctrl status change > 25 ms<br><br>Battery voltage > 10,2 V | 500 msec<br><br>Continuous | Immediately | |
| | P0985 | ← → | Short-cut ground | | | | | |
| | P0986 | ← → | Not connected or short-cut Ubatt | | | | | |
| | | | | | | | | |
| **Solenoid S2** | | Circuit continuity check | | | Engine rpm > 400 rpm<br><br>Limp home mode = Off<br><br>Time after ctrl status change > 25 ms<br><br>Battery voltage > 10,2 V | 500 msec<br><br>Continuous | Immediately | |
| | P0973 | ← → | Short-cut ground | | | | | |
| | P0974 | ← → | Not connected or short-cut Ubatt | | | | | |
| | | | | | | | | |
| **Solenoid S3** | | Circuit continuity check | | | Engine rpm > 400 rpm<br><br>Limp home mode = Off<br><br>Time after ctrl status change > 25 ms<br><br>Battery voltage > 10,2 V | 500 msec<br><br>Continuous | Immediately | |
| | P0976 | ← → | Short-cut ground | | | | | |
| | P0977 | ← → | Not connected or short-cut Ubatt | | | | | |
| | | | | | | | | |

# TRANSMISSION DIAGNOSTIC PARAMETERS

| Component / System | Fault Code | Monitor Strategy Description | Malfunction Criteria | Threshold Value | Secondary Parameters / Enable Conditions | Time Required | MIL Illumin. | Extra Prep |
|---|---|---|---|---|---|---|---|---|
| **Solenoid S4** | | Circuit continuity check | | | Engine rpm > 400 rpm | 500 msec | Immediately | |
| | P0979 | ← → | Short-cut ground | | Limp home mode = Off | Continuous | | |
| | P0980 | ← → | Not connected or short-cut Ubatt | | Time after ctrl status change > 25 ms | | | |
| | | | | | Battery voltage > 10,2 V | | | |
| **Solenoid S5** | | Circuit continuity check | | | Engine rpm > 400 rpm | 500 msec | Immediately | |
| | P0982 | ← → | Short-cut ground | | Limp home mode = Off | Continuous | | |
| | P0983 | ← → | Not connected or short-cut Ubatt | | Time after ctrl status change > 25 ms | | | |
| | | | | | Battery voltage > 10,2 V | | | |
| **Torque Converter Clutch Slips** | P0741 | Comparison of engine speed and transmission input speed | Slipping: (Eng. Rpm - Trans. Input rpm) > 100 Converter is slipping with active lock-up. | | Engine rpm > 400 rpm<br>Throttle > 20%<br>Trans. Input rpm signal OK<br>CAN BUS signals OK ( validity )<br>Engine rpm < 4000 rpm<br>SLU target current >= 1000mA<br>Time after shifting > 0,5 sec<br>Limp home mode = Off<br>Battery voltage > 10,2 V<br>Lock-up activated | 12 sec<br>Continuous | Immediately | |
| **Torque Converter Clutch Stuck On** | P0742 | Comparison of engine speed and transmission input speed | (Eng. Rpm - Trans. Input rpm) < 50  Converter clutch is locked when it should be slipping | | Active gear: 3, 4, or 5<br>Lock-up status: OFF<br>Trans. Input rpm signal < 3000 rpm<br>Engine torque in defined range<br>Oil temperature > 20 deg C<br>Battery voltage > 10,2 V<br>Engine speed > 400 rpm<br>Time after shifter status change > 8 sec<br>Time after shifting > 0,5 sec<br>Time after ignition ON > 3 sec | Continuous | | |

# TRANSMISSION DIAGNOSTIC PARAMETERS

| Component / System | Fault Code | Monitor Strategy Description | Malfunction Criteria | Threshold Value | Secondary Parameters / Enable Conditions | Time Required | MIL Illumin. | Extra Prep |
|---|---|---|---|---|---|---|---|---|
| | P2764 | Circuit continuity check | Short-cut ground or open | Low current, <92 mA, AD < 68 | Limp home mode = Off<br><br>Engine speed > 400 rpm<br><br>Battery voltage > 10,2 V | 12,5 sec<br><br>Continuous | Immediately | |
| **Pressure solenoid SLU** | P2762 | | Terminal short | Error current > 80 mA | Limp home mode = Off<br><br>Engine speed > 400 rpm<br><br>Oil temp > 20 deg C<br><br>System voltage change < 0,2V<br><br>System voltage 11 -16 V<br><br>Output current target > 835mA and not changed during detection. | 2,75 sec<br><br>Continuous | Immediately | |
| | P2763 | | Short-cut Ubatt | Measured Current > 1,356 mA, AD > 1000 | Limp home mode = Off<br><br>Engine speed > 400 rpm<br><br>Battery voltage > 10,2 V | 2 sec<br><br>Continuous | Immediately | |
| | P0962 | Circuit continuity check | Short-cut ground or open | Low current, <92 mA, AD < 68 | Limp home mode = Off<br><br>Engine rpm > 400<br><br>Battery voltage > 10,2 V | 12.5 sec<br><br>Continuous | Immediately | |
| **Pressure solenoid SLT** | P0961 | | Terminal short | Error current > 80 mA | Limp home mode = Off<br><br>Engine speed > 400 rpm<br><br>Oil temp > 20 deg C<br><br>System voltage change < 0,2V<br><br>System voltage 11 -16 V<br><br>Output current target > 835mA and not changed during detection. | 2.75 sec<br><br>Continuous | Immediately | |
| | P0963 | | Short-cut Ubatt | Measured Current > 1,356 mA, AD > 1000 | Limp home mode = Off<br><br>Engine speed > 400 rpm<br><br>Battery voltage > 10,2 V | 2 sec<br><br>Continuous | Immediately | |

## TRANSMISSION DIAGNOSTIC PARAMETERS

| Component / System | Fault Code | Monitor Strategy Description | Malfunction Criteria | Threshold Value | Secondary Parameters / Enable Conditions | Time Required | MIL Illumin. | Extra Prep |
|---|---|---|---|---|---|---|---|---|
| | P0787 | Circuit continuity check | Short-cut ground or open | Low current, <92 mA, AD < 68 | Limp home mode = Off<br><br>Engine rpm > 400<br><br>Battery voltage > 10,2 V | 12.5 sec<br><br>Continuous | Immediately | |
| **Timing solenoid SLS** | P0786 | | Terminal short | Error current > 80 mA | Limp home mode = Off<br><br>Engine speed > 400 rpm<br><br>Oil temp > 20 deg C<br><br>System voltage change < 0,2V<br><br>System voltage 11 -16 V<br><br>Output current target > 835mA and not changed during detection. | 2.75 sec<br><br>Continuous | Immediately | |
| | P0788 | | Short-cut Ubatt | Measured Current > 1,356 mA, AD > 1000 | Limp home mode = Off<br><br>Engine rpm > 400<br><br>Battery voltage > 10,2 V | 2 sec<br><br>Continuous | Immediately | |
| **Shift Malfunction** | P0780 | Shift time check | Shift time is too long, too short or "tie up" occurs | | Oil temp > 60 deg C<br><br>No other failure is detected<br><br>Limp home mode = Off<br><br>Shifter position: D, 4, 3, L, or M | 5 times detection during DCY<br><br>Continuous | Immediately | |
| **CAN Bus Off Counter Overrun** | U0001 | CAN controller continuity check | CAN controller Bus Off is detected | Counter reaches 64 | Limp home mode = Off<br><br>3 sec after Ignition ON or reset of CAN controller.<br><br>Battery voltage > 10,2 V | 12,7 - 28 sec<br><br>Continuous | Immediately | |

| Component / System | Fault Code | Monitor Strategy Description | Malfunction Criteria | Threshold Value | Secondary Parameters / Enable Conditions | Time Required | MIL Illumin. | Extra Prep |
|---|---|---|---|---|---|---|---|---|
| **Transmission input speed sensor** | **P0717** | Circuit continuity check | No pulse | No pulse of Input speed sensor during 3000 pulses of output speed sensor | Limp home mode = Off | Speed dependent (e.g 4 sec at 100 km/h) | Immediately | |
| | | | | | Shifter position: D, 4, 3, or L | Continuous | | |
| | **P0716** | | Pulses incorrect | In rpm = 0 AND Speed from ABS sensor > 20 km/h | Limp home mode = off | 2,30 sec | Immediately | |
| | | | | | 3 sec after Ignition ON or reset of CAN controller. | Continuous | | |
| | | | | Short to Ubatt or to ground | Limp home mode = off | 3,30 sec | Immediately | |
| | | | | | DS_active??? | Continuous | | |
| **Invalid signal from ECM** | **P1820** | Accelerator pedal position signal is invalid | Data from ECM indicated as invalid | | Limp home mode = off | 4 sec | Immediately | |
| | | | | | 3 sec after Ignition ON or reset of CAN controller. | Continuous | | |
| | | | | | Engine speed > 400 rpm | | | |
| | | | | | Battery voltage > 10,2 V | | | |

## TRANSMISSION DIAGNOSTIC PARAMETERS

| Component / System | Fault Code | Monitor Strategy Description | Malfunction Criteria | Threshold Value | Secondary Parameters / Enable Conditions | Time Required | MIL Illumin. | Extra Prep |
|---|---|---|---|---|---|---|---|---|
| **Trans. Output speed sensor** | **P0722** | Circuit continuity check | No pulse | No pulse of Output speed sensor during 6000 pulses of input speed sensor | Limp home mode = Off<br><br>Out Rpm calculated from ABS > 3000<br><br>Selected gear D, 4, 3, L<br><br>No temperature failure<br><br>No ABS failure | 6000 pulses<br><br>Continuous | Immediately | |
| | | | | Out Rpm = 0 AND Speed ABS > 20 km /h | Limp home mode = Off<br><br>Out Rpm calculated from ABS > 3000<br><br>Selected gear D, 4, 3, L<br><br>No temperature failure<br><br>No ABS failure | 2.30 sec<br><br>Continuous | Immediately | |
| | | | | Short to Ubatt or GND | Limp home mode = off | 3.30 sec<br><br>Continuous | Immediately | |
| | **P0721** | | Incorrect rpm | Difference > 15% compared to calculated from input speed | | 10 sec<br><br>Continuous | | |
| **Gear error, hydraulic fault** | **P0730** | Rationality | Calculation of actual gear ratio is not correct | Calculated ratio differs more than 10% from expected | Limp home mode = Off | 12 sec<br><br>Continuous | Immediately | |
| | | | | Driving on 5th gear - gear ratio equals ratio for 3rd gear | out Rpm > 500 | | | |
| | | | | Driving on 4th gear - gear ratio equals ratio for 3rd gear | throttle > 10 % | | | |
| **Transmission range switch** | **P0705** | Check of switch output pattern | Failure combination of signals from Gear Selector range switch | | Limp home mode = Off<br>Engine speed > 400 rpm<br>Battery voltage > 10,2 V | 5 sec<br><br>Continuous | Immediately | |

# TRANSMISSION  DIAGNOSTIC  PARAMETERS

| Component / System | Fault Code | Monitor Strategy Description | Malfunction Criteria | Threshold Value | Secondary Parameters / Enable Conditions | Time Required | MIL Illumin. | Extra Prep |
|---|---|---|---|---|---|---|---|---|
| **Transmission oil temperature sensor** | **P0711** | Rationality | Oil temp change less than | 5°C | Limp home mode = Off<br>Oil temp sensor  AD >10 & < 1000<br>Oil temp at initialization < 20 °C<br>Selected gear R, D, 4, 3, L<br>Eng. rpm > 400 rpm<br>15min driving time<br>Vehicle speed > 40 km/h once<br>Battery voltage > 10,2 V | 15 min<br>Once / DCY | Two DCY | |
| | **P0712** | Circuit continuity check | Short-cut ground | Voltage < 50 mV, AD < 10 | Limp home mode = off<br>Engine speed > 400 rpm<br>Battery voltage > 10,2 V | 5 min<br>Continuous | Two DCY | |
| | **P0713** | Circuit continuity check | Short-cut Ubat or open circuit | AD > 1000 | Limp home mode = off<br>Engine speed > 400 rpm<br>ECT > 50 deg C<br>ECT signal valid<br>15 min driving time<br>Battery voltage > 10,2 V | 12 sec + 15 min<br>Continuous | Two DCY | |

## TRANSMISSION DIAGNOSTIC PARAMETERS

| Component / System | Fault Code | Monitor Strategy Description | Malfunction Criteria | Threshold Value | Secondary Parameters / Enable Conditions | Time Required | MIL Illumin. | Extra Prep |
|---|---|---|---|---|---|---|---|---|
| Gear error, hydraulic fault | P0731 | Rationality | Calculation of actual gear ratio for 1st gear is not correct. | Calculated ratio for 1st gear differs more than 4% from expected | Limp home mode = Off<br>Selected gear D, 4, 3, L<br>500 < output shaft speed < 1260 (rpm)<br>No other failure detection<br>A/T oil temp. > 20 °C | 12 sec<br>Continuous | Immediately | |
| | P0732 | Rationality | Calculation of actual gear ratio for 2nd gear is not correct. | Calculated ratio for 2nd gear differs more than 20% from expected | Throttle > 10%<br>0,5 sec after shifting control done<br>Current gear = 2<br>out Rpm >= 500 | 12 sec<br>Continuous | Immediately | |
| | P0733 | Rationality | Calculation of actual gear ratio for 3rd gear is not correct. | Calculated ratio for 3rd gear differs more than 20% from expected | Throttle > 10%<br>Current gear = 3<br>out Rpm >= 500 | 12 sec<br>Continuous | Immediately | |
| | P0734 | Rationality | Calculation of actual gear ratio for 4th gear is not correct. | Calculated ratio for 4th gear differs more than 20% from expected, but not equals 3$^{rd}$ gears.ratio +- 4% | Throttle > 10%<br>Current gear = 4<br>out Rpm >= 500 | 12 sec<br>Continuous | Immediately | |
| | P0735 | Rationality | Calculation of actual gear ratio for 5th gear is not correct. | Calculated ratio for 5th gear differs more than 20% from expected | Throttle > 10%<br>Current gear = 5<br>out Rpm >= 500 | 12 sec<br>Continuous | Immediately | |
| | P0736 | Rationality | Calculation of actual gear ratio for Reverse gear is not correct | Calculated ratio for Reverse gear differs more than 20% from expected | Limp home mode = Off<br>Selected gear R<br>A/T oil temp. > 20 °C<br>Throttle > 10%<br>0,5 sec after shifting<br>Eng. Rpm > 400 rpm<br>8 sec after N-R-D shift<br>IG voltage > 10,5 V<br>out Rpm >= 500<br>out Rpm stable value | 12 sec<br>Continuous | Immediately | |

## TRANSMISSION  DIAGNOSTIC  PARAMETERS

| Component / System | Fault Code | Monitor Strategy Description | Malfunction Criteria | Threshold Value | Secondary Parameters / Enable Conditions | Time Required | MIL Illumin. | Extra Prep |
|---|---|---|---|---|---|---|---|---|
| **Battery voltage** | **P0562** | Voltage low | | < 8,68 V | Limp home mode = Off | 20 sec | Immediately | |
| | **P0563** | Voltage high | | > 18 V | Transmission input speed > 800 rpm | Continuous | | |
| | | | | | Ignition ON | | | |
| **Engine speed signal** | **P0725** | Signal from ECM stated as unreliable | | | Ignition on > 3 sec | 4 sec | Immediately | |
| | | | | | Engine speed > 500 rpm | Continuous | | |
| | | | | | Limp home mode = Off | | | |
| | | | | | Battery voltage > 10,2 V | | | |

**Note: All components/system (DTCs) have a test frequency of 30~60ms**