Abs error codes

From gt4dc_wiki

NOTE: This is only relevant for GT4's fitted with Antilock Braking Systems

To find out what ABS errors have been detected in the brake system, you need to switch it into diagnostic mode. To do this:-

- Switch off the ignition.
- Locate the diagnostic box, under the bonnet behind the passenger suspension turret.
- The lid of the box hinges open and on the back of the lid there is a pinout of the connector.
- Locate the E1 and TC terminals and using a paperclip, piece of wire etc connect these two terminals together.
- Go back into the car and switch the ignition to on (but do not start the car) and observe the ABS light.
- It will do one of two things:-
- A steady flashing indicates that there are no stored codes (as shown in the image above)
- Otherwise, count the number of flashes and write down the number. There is a pause between each number, so if you count 5, then observe a pause, then count 1, that makes error code 51.

Code Diagnosis

11	Open shorted relay circuit. Check modulator wiring harness, solenoid relay, solenoid relay wiring harness and solenoid relay connector
12	Short in solenoid relay circuit. Check modulator wiring harness, solenoid relay, solenoid relay wiring harness and solenoid relay connector
13	Open pump motor relay circuit. Check modulator wiring harness, pump motor wiring harness, pump motor relay circuit and pump motor connector.
14	Short in pump motor relay circuit. Check modulator wiring harness, pump motor wiring harness, pump motor relay circuit and pump motor connector.
21	Open or short in ABS solenoid for right front wheel.
22	Open or short in ABS solenoid for left front wheel.
23	Open or short in ABS solenoid for right rear wheel.
24	Open or short in ABS solenoid for left rear wheel.
31	Problem in right front wheel speed sensor circuit
32	Problem in left front wheel speed sensor circuit.

33	Problem in right rear wheel speed sensor circuit.
34	Problem in left rear wheel speed sensor circuit.
35	Open in left front or right rear wheel speed sensor (WSS) circuit.
36	Open in right front or left rear WSS circuit
37	Faulty rear speed sensor rotor.
41	Battery voltage too low or high (under 9.5 volts or over 16.2 volts). Check battery and charging system.
51	Pump motor is locked or pump motor circuit is open. Check pump motor, motor relay, wiring harness and modulator ground connections
Always on	Malfunction of ABS module.

SPECIAL WSS TEST MODE

If you've found a fault code for a wheel speed sensor, it may be due to an open or short in the sensor's wiring harness, physical damage to the sensor or sensor ring, a buildup of metallic debris on the sensor tip or corrosion.

Toyota provides a special wheel speed sensor diagnostic procedure that can generate additional codes to help you diagnose the underlying fault. Though this test is really redundant, it may help you isolate a troublesome wheel speed sensor.

To enter the special WSS test mode, turn off the ignition. Leave the short pin in the ABS check connector and use a jumper wire to connect terminals Ts and E1. Engage the parking brake and start the engine. If the system is in the special diagnostic mode, the ABS light will flash at a rate of four times per second.

Drive the vehicle straight ahead at a speed above 50 mph. The ABS light will stop blinking as soon as you exceed 28 mph, then blink once when you hit 50 mph. As soon as you've seen the blinks, the test is complete and you can stop the vehicle.

To retrieve the wheel speed sensor codes, use the same diagnostic procedure that you would use to read the normal ABS codes. Remove the short pin from the ABS check connector and jump Tc to E1. If a problem was detected in any of the wheel speed sensor circuits, you'll find one or more of the following codes:

71 — Low voltage in right front WSS circuit.

72 — Low voltage in left front WSS circuit.

73 — Low voltage in right rear WSS circuit.

74 — Low voltage in left rear WSS circuit.

75 — Abnormal signal from right front speed sensor. Check the sensor ring on the right front brake rotor for damage or debris.

76 — Abnormal signal from the left front speed sensor. Check the sensor ring on the left front brake rotor for damage or debris.

77 — Abnormal signal from the right rear speed sensor. Check the sensor ring on the right rear brake.

78 — Abnormal signal from the left rear speed sensor. Check the sensor ring on the left rear brake.

Light blinks four times a second — No problem found. All speed sensors are reading normal.

WSS CHECKS

To measure a wheel speed sensor's output voltage and circuit continuity at the same time, plug a breakout box into the ABS module's wiring harness and attach the test leads from a DVOM to the appropriate sensor circuit pins on the breakout box. (Note: The DVOM test leads can also be connected directly to the wheel speed sensor, but testing the sensor this way won't show if the signal is getting through to the ABS control module or not.) Spin the wheel by hand and note the sensor's voltage reading during that time.

A good wheel speed sensor will generally produce an alternating current (AC) voltage reading of 50 to 700 MV when the wheel is spun at a speed of about one revolution per second.

If the voltage reading is low or nonexistent, check the sensor's resistance (with the key off). This can be done through the breakout box with the DVOM. Checking resistance through the breakout box will tell you if the sensor's wiring harness is OK. If the wheel speed sensor doesn't read between 990 to 1210 ohms, disconnect the sensor from its wiring harness and check the sensor's resistance by attaching the DVOM test probes to the sensor leads. A resistance reading that's now within range tells you the problem is in the wiring, not the sensor. If the sensor has too much internal resistance (opens) or too little resistance (shorts), the sensor is defective and needs to be replaced.

Grounds or shorts in the wheel speed sensor cables can be found by checking continuity between the wiring connectors. (See Fig. 3). If a defect is found in the wires that run between the sensor and the chassis, replacing the wires with new ones is a better repair choice than trying to fix or splice them. These wires undergo a great deal of flexing every time the suspension encounters a bump, so new wires will hold up better than ones that have been soldered, spliced or taped.

Another way to check wheel speed sensors is with an oscilloscope. By displaying the sensor's output pattern graphically on the scope screen, you can often see problems that are difficult to find otherwise. A missing or damaged tooth on a sensor ring, for example, may not produce a noticeable change in the sensor's output voltage. Yet, the fluctuation that occurs in the signal every time the missing tooth passes under the tip of the sensor may be enough to affect the operation of the ABS module.

The scope connection can either be made through the breakout box or it can be hooked up directly to the wheel speed sensor. A scope pattern for a wheel speed sensor should show a classic sine wave alternating current pattern that changes both in frequency and amplitude with wheel speed. As the wheel is turned faster, both signal frequency and amplitude should increase. Damaged or missing teeth on the sensor ring will show up as flat spots or gaps in the sine wave pattern. A bent axle or hub will produce an undulating pattern that changes as the strength of the sensor signal changes with every revolution.

If the scope pattern produced by the sensor is flattened (diminished amplitude) or erratic, it usually indicates a weak signal caused by an excessively wide air gap between the tip of the sensor and its ring, or a build up of metallic debris on the end of the sensor. A weak signal can also be caused by internal

resistance in the sensor or its wiring circuit, or loose or corroded wiring connectors.

Category: Brake system maintenance