

DTC	P2102	Throttle Actuator Control Motor Circuit Low
DTC	P2103	Throttle Actuator Control Motor Circuit High

DESCRIPTION

The throttle actuator is operated by the ECM and opens and closes the throttle valve using gears. The opening angle of the throttle valve is detected by the Throttle Position (TP) sensor, which is mounted on the throttle body assembly. The TP sensor provides feedback to the ECM. This feedback allows the ECM to appropriately control the throttle actuator and monitor the throttle opening angle as the ECM responds to driver inputs.

HINT:

This ETCS (Electronic Throttle Control System) does not use a throttle cable.

DTC No.	DTC Detection Conditions	Trouble Areas
P2102	Conditions (a) and (b) continue for 2.0 seconds (1 trip detection logic): (a) Throttle actuator duty ratio 80 % or more (b) Throttle actuator current 0.5 A or less	- Open in throttle actuator circuit - Throttle actuator - ECM
P2103	Either of following conditions met: - Hybrid IC diagnosis signal fail - Hybrid IC current limiter port fail	- Short in throttle actuator circuit - Throttle actuator - Throttle valve - Throttle body assembly - ECM

MONITOR DESCRIPTION

The ECM monitors the electrical current through the electronic actuator, and detects malfunctions and open circuits in the throttle actuator based on this value. If the current is outside the standard range, the ECM determines that there is a malfunction in the throttle actuator. In addition, if the throttle valve does not function properly (for example, stuck on), the ECM determines that there is a malfunction. The ECM then illuminates the MIL and sets a DTC.

Example:

When the electrical current is more than 10 A, or less than 0.5 A and the throttle actuator duty ratio exceeds 80 %, the ECM interprets this as the current being outside the standard range, and illuminates the MIL and sets a DTC.

If the malfunction is not repaired successfully, a DTC is set when the engine is quickly revved to a high rpm several times after the engine has idled for 5 seconds after engine start.

MONITOR STRATEGY

Related DTCs	P2102: Throttle actuator current (low current) P2103: Throttle actuator current (high current)
Required Sensors/Components (Main)	Throttle actuator (throttle body)
Required Sensors/Components (Related)	None
Frequency of Operation	Continuous
Duration	P2102: 2 seconds P2103: 0.1 seconds or 0.6 seconds
MIL Operation	Immediate
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

All:

The monitor will run whenever the following DTCs are not present	None
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P2102:

Throttle motor	ON
Duty-cycle ratio to open throttle actuator	80 % or more
Throttle actuator power supply	8 V or more
Current motor current - Motor current at 0.016 seconds before	Less than 0.2 A

P2103:

Throttle motor	ON
Either of the following conditions met:	Condition 1 or 2
1. Throttle actuator power supply	8 V or more
2. Throttle actuator power	ON
Battery voltage	8 V or more
Starter	OFF

TYPICAL MALFUNCTION THRESHOLDS**P2102:**

Throttle actuator current	Less than 0.5 A
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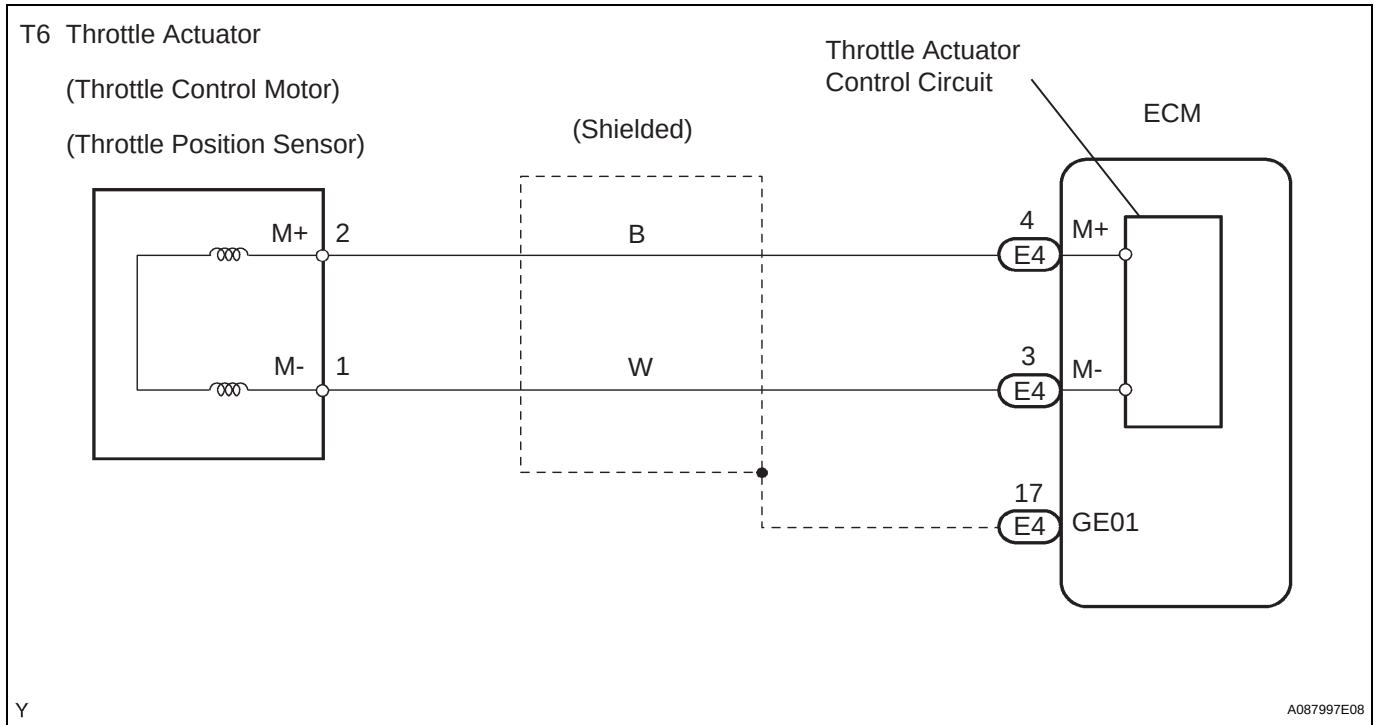
P2103:

Either of the following conditions met:	Condition A or B
A. Hybrid IC diagnosis signal	Fail
B. Hybrid IC current limiter port	Fail

FAIL-SAFE

When any of these DTCs, as well as other DTCs relating to ETCS (Electronic Throttle Control System) malfunctions, are set, the ECM enters fail-safe mode. During fail-safe mode, the ECM cuts the current to the throttle actuator off, and the throttle valve is returned to a 6.5° throttle angle by the return spring. The ECM then adjusts the engine output by controlling the fuel injection (intermittent fuel-cut) and ignition timing, in accordance with the accelerator pedal opening angle, to allow the vehicle to continue at a minimal speed. If the accelerator pedal is depressed firmly and gently, the vehicle can be driven slowly. Fail-safe mode continues until a pass condition is detected, and the ignition switch is then turned to OFF.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

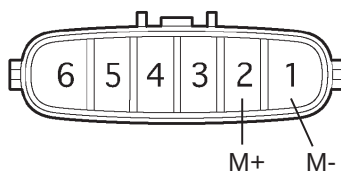
- Read freeze frame data using an intelligent tester or OBD II scan tool. The ECM records vehicle and driving condition information as freeze frame data the moment a DTC is stored. When troubleshooting, freeze frame data can be helpful in determining whether the vehicle was running or stopped, whether the engine was warmed up or not, whether the air-fuel ratio was lean or rich, as well as other data recorded at the time of a malfunction.
- The throttle actuator current (THROTTLE MOT) and the throttle actuator duty ratio (THROTTLE OPN / THROTTLE CLS) can be read using an intelligent tester. However, the ECM shuts off the throttle actuator current when the ETCS malfunctions.

1

INSPECT THROTTLE BODY ASSEMBLY (THROTTLE ACTUATOR RESISTANCE)

Component Side:

Throttle Body Assembly



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- Disconnect the T6 throttle body assembly connector.
- Measure the resistance between the terminals of the throttle body.

Standard resistance

Tester Connections	Specified Conditions
M+ (2) - M- (1)	Between 0.3 Ω and 100 Ω at 20°C (68°F)

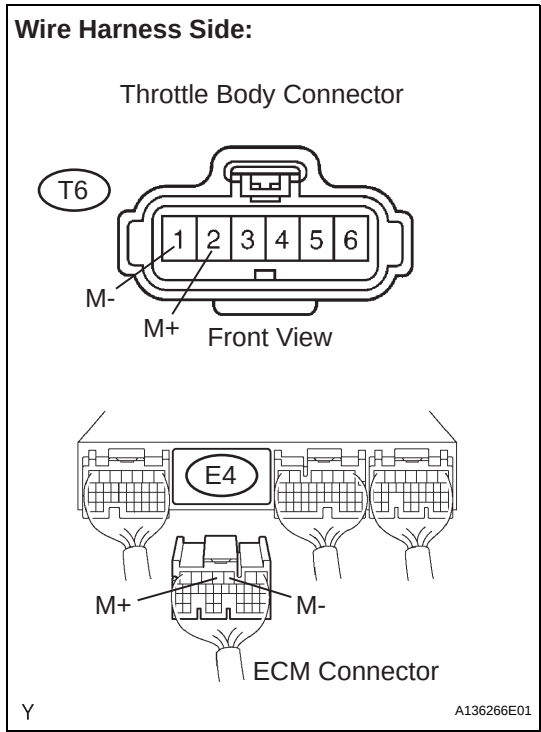
- Reconnect the throttle body connector.

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REPLACE THROTTLE BODY ASSEMBLY
OK
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CHECK HARNESS AND CONNECTOR (THROTTLE ACTUATOR - ECM)



- (a) Disconnect the T6 throttle body connector.
- (b) Disconnect the E4 ECM connector.
- (c) Check the resistance.

Standard resistance (Check for open)

Tester Connections	Specified Conditions
M+ (T6-2) - M+ (E4-4)	Below 1 Ω
M- (T6-1) - M- (E4-3)	Below 1 Ω

Standard resistance (Check for short)

Tester Connections	Specified Conditions
M+ (T6-2) or M+ (E4-4) - Body ground	10 kΩ or higher
M- (T6-1) or M- (E4-3) - Body ground	10 kΩ or higher

- (d) Reconnect the throttle body connector.
- (e) Reconnect the ECM connector.

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REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

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INSPECT THROTTLE BODY

- (a) Check for foreign objects between the throttle valve and the housing.

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CLEAN THROTTLE BODY

OK

4

INSPECT THROTTLE VALVE

- (a) Check if the throttle valve opens and closes smoothly.

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REPLACE THROTTLE BODY ASSEMBLY

OK

REPLACE ECM

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