DTC	P2102	THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT LOW

DTC	P2103	THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT HIGH

CIRCUIT DESCRIPTION

The throttle actuator is operated by the ECM and it opens and closes the throttle valve.
The opening angle of the throttle valve is detected by the Throttle Position (TP) sensor which is mounted on the throttle body. The TP sensor provides feedback to the ECM. This feedback allows the ECM to control the throttle actuator and monitor the throttle opening angle as the ECM responds to driver inputs.
HINT:
This Electronic Throttle Control System (ETCS) does not use a throttle cable.

DTC No.	DTC Detection Condition	Trouble Area
P2102	Conditions below are met for 2 seconds (1 trip detection logic): • Throttle control motor output duty 80 % or more • Throttle control motor current below 0.5 A	• Open in throttle actuator circuit • Throttle actuator • ECM
P2103	Either of following conditions is met (1 trip detection logic): • Throttle actuator current is more than 10 A for 0.1 seconds • Throttle actuator current is more than 7 A for 0.6 seconds	• Short in throttle actuator circuit • Throttle actuator • Throttle valve • Throttle body • ECM

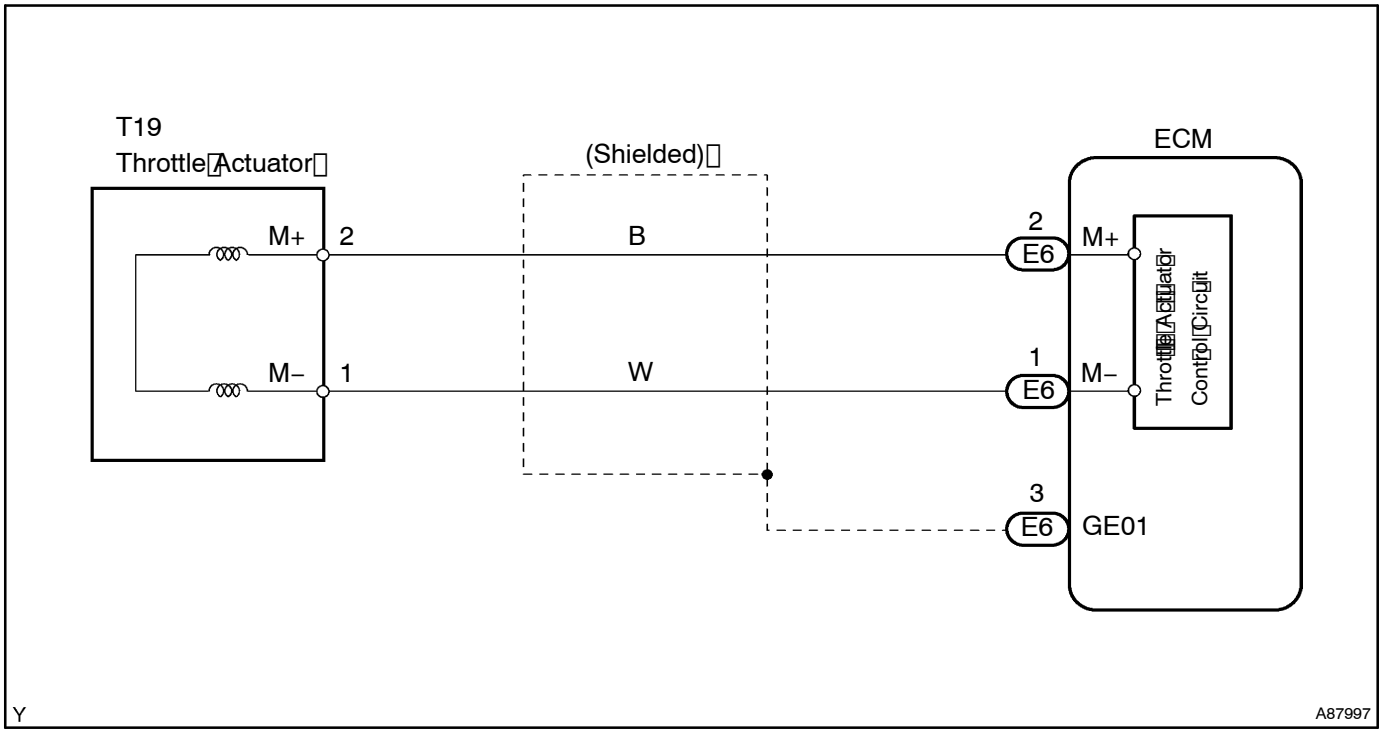
MONITOR DESCRIPTION

The ECM monitors the flow of electrical current through the electronic throttle actuator, and detects malfunctions or open circuits in the throttle motor based on the value of the electrical current. When the current deviates from the standard values, the ECM concludes that there is a fault in the throttle actuator. Or, if the throttle valve is not functioning properly (for example, stuck ON) the ECM concludes that there is a fault and turns on the MIL and set a DTC.
Example:
When the current is more than 10 A. Or, the current is less than 0.5A when the motor driving duty ratio is exceeding 80%. The ECM concludes that the current is deviated from the standard values, turns on the MIL and a DTC is set.
This monitor runs after the engine is started, idled for 5 seconds, and then quickly revved at a high rpm several times.

FAIL–SAFE

If the ETCS, has a malfunction, the ECM cuts off current to the throttle actuator. The throttle control valve returns to a predetermined opening angle (approximately 16°) by the force of 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 enable the vehicle to continue at a minimal speed. If the accelerator pedal is depressed firmly and slowly, the vehicle can be driven slowly.
If a ”pass” condition is detected and then the ignition switch is turned OFF, the fail–safe operation will stop and the system will return to normal condition.

WIRING DIAGRAM

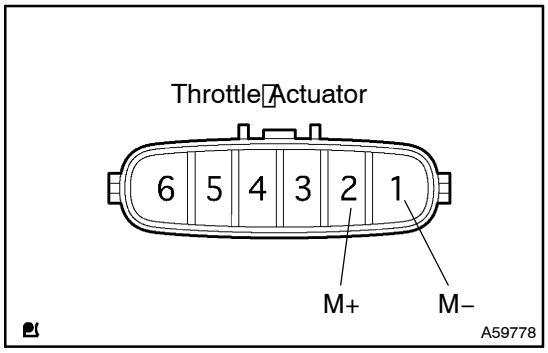


INSPECTION PROCEDURE

HINT:

- Read freeze frame data using the Intelligent tester II. Freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, freeze frame data can help determine if the vehicle was running or stopped, if the engine was warmed up or not, if the air–fuel ratio was lean or rich, and other data from the time the malfunction occurred.
- The throttle actuator current and the throttle actuator duty ratio can be read using Intelligent tester II. However, the ECM shuts off the throttle actuator current when the ETCS malfunctions.

1	INSPECT THROTTLE BODY ASSY (THROTTLE ACTUATOR RESISTANCE)



(a) Disconnect the T20 throttle actuator connector.

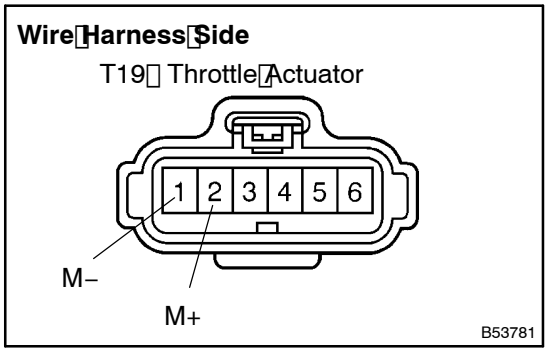
(b) Measure the resistance between terminals 1 and 2 of the throttle actuator.

Standard: 0.3 to 100 Ω at 20 °C (68 °F)

NG → **REPLACE THROTTLE BODY ASSY** (See page 10–9)

OK

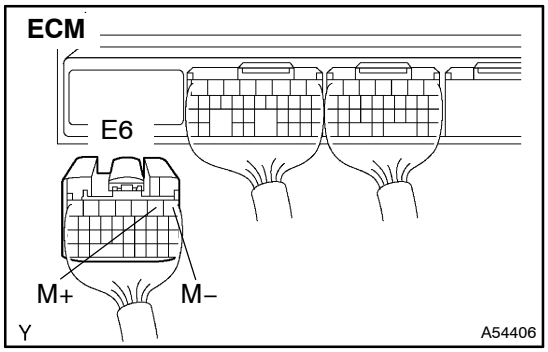
2 CHECK WIRE HARNESS (THROTTLE ACTUATOR – ECM)



(a) Disconnect the E6 ECM connector.
(b) Measure the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
T19–2 (M+) – E6–2 (M+)	Below 1 Ω
T19–1 (M–) – E6–1 (M–)	Below 1 Ω
T19–2 (M+) or E6–2 (M+) – Body ground	10 kΩ or higher
T19–1 (M–) or E6–1 (M–) – Body ground	10 kΩ or higher



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

3 INSPECT THROTTLE BODY

Check between the throttle valve and the housing for foreign objects.

NG → **REMOVE FOREIGN OBJECT AND CLEAN THROTTLE BODY**

OK

4 INSPECT THROTTLE VALVE

Check if the throttle valve can open and close smoothly.

NG → **REPLACE THROTTLE BODY ASSY (See page 10–9)**

OK

REPLACE ECM (See page 10–21)