

<b>DTC</b>	<b>P2102</b>	<b>THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT LOW</b>
------------	--------------	--

<b>DTC</b>	<b>P2103</b>	<b>THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT HIGH</b>
------------	--------------	---

## 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 sensor which is mounted on the throttle body. The throttle position sensor provides feedback to the ECM. This feedback allows the ECM to control the throttle actuator and monitor the throttle opening angle in response 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 (a) and (b) continue for 2.0 seconds: (a) Throttle actuator output duty 80 % or more (b) Throttle actuator current 0.5 A or less (1 trip detection logic)	<ul style="list-style-type: none"> <li>• Open in throttle actuator circuit</li> <li>• Throttle actuator</li> <li>• ECM</li> </ul>
P2103	Either of following conditions is met: • Throttle actuator current 10 A or more (0.1 seconds) • Throttle actuator current 7 A or more (0.6 seconds) (1 trip detection logic)	<ul style="list-style-type: none"> <li>• Short in throttle actuator circuit</li> <li>• Throttle actuator</li> <li>• Throttle valve</li> <li>• Throttle body assy</li> <li>• ECM</li> </ul>

## 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, the ECM concludes that there is a fault in the throttle motor. 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 a DTC is set.

### Example:

When the current is more than 10 A, or the current is less than 0.5 A when the actuator driving duty ratio is more than 80 %, the ECM concludes that the current is deviated from the standard, turns on the MIL and a DTC is set.

## 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.

## MONITOR STRATEGY

Related DTCs	P2102: Throttle actuator current (low current) P2103: Throttle actuator current (high current)
Required sensors / components (Main)	Throttle actuator
Required sensors / components (Related)	-
Frequency of operation	Continuous
Duration	2 sec.
MIL operation	Immediate
Sequence of operation	None

## TYPICAL ENABLING CONDITIONS

The monitor will run whenever these DTCs are not present	See page <a href="#">05-16</a>
--	--------------------------------

### P2102:

Throttle actuator duty ratio	80 % or more
Throttle actuator power supply	8 V or more

### P2103:

Throttle actuator power supply	8 V or more
Battery voltage	8 V or more
Starter	OFF

## TYPICAL MALFUNCTION THRESHOLDS

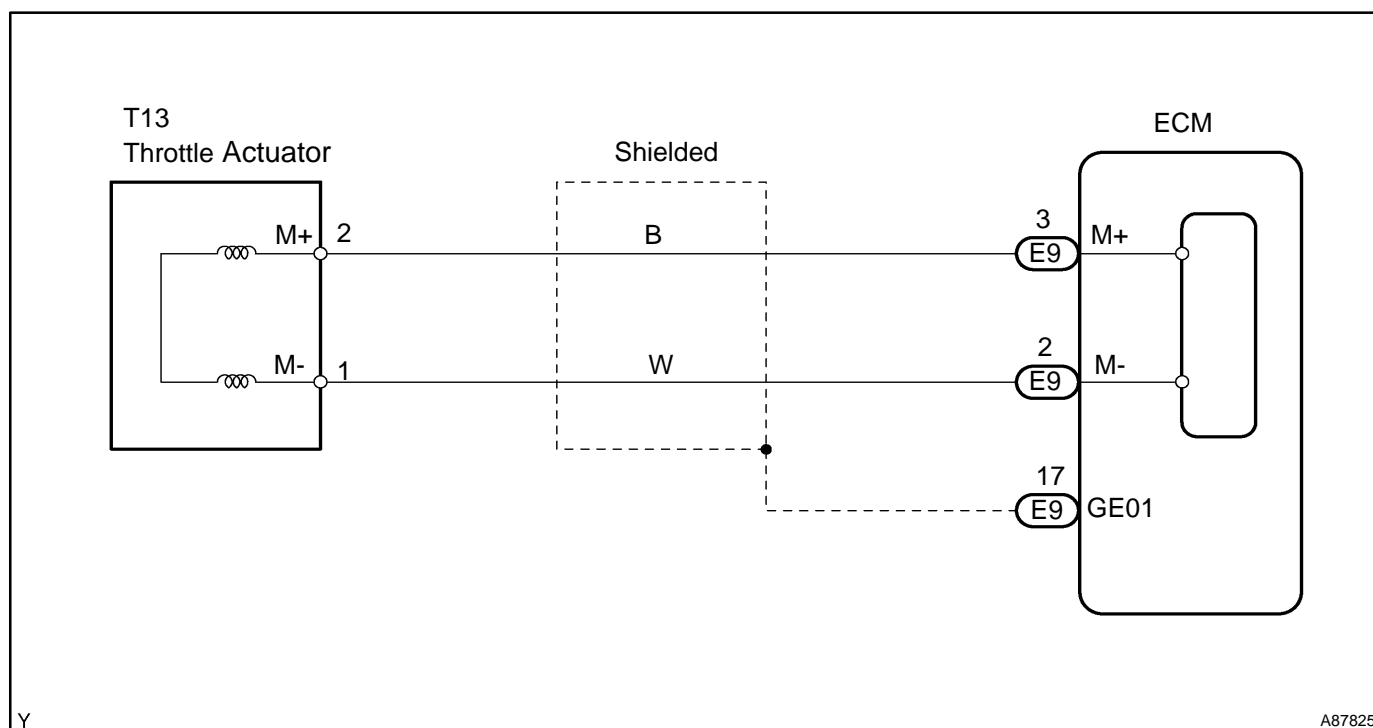
### P2102:

Throttle actuator current	Less than 0.5 A
---------------------------	-----------------

### P2103:

Either of the following conditions is met:	Condition 1 or 2
1. Hybrid IC diagnosis signal	Fail ( for 0.1 sec.)
2. Hybrid IC current limiter port	Fail (for 0.6 sec.)

## WIRING DIAGRAM

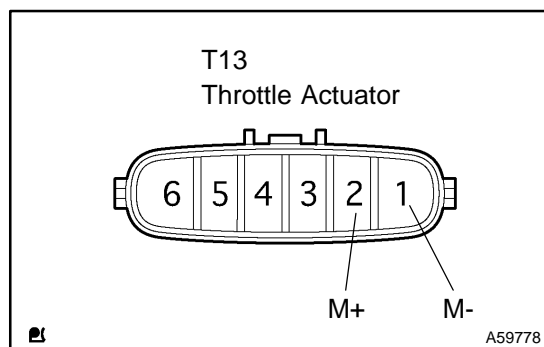


## INSPECTION PROCEDURE

### HINT:

Read freeze frame data using the hand-held tester or the OBD II scan tool. 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.

### 1 INSPECT THROTTLE BODY ASSY (THROTTLE ACTUATOR)



- Disconnect the T13 throttle actuator connector.
  - Measure the resistance of the throttle actuator terminals.
- Standard:**

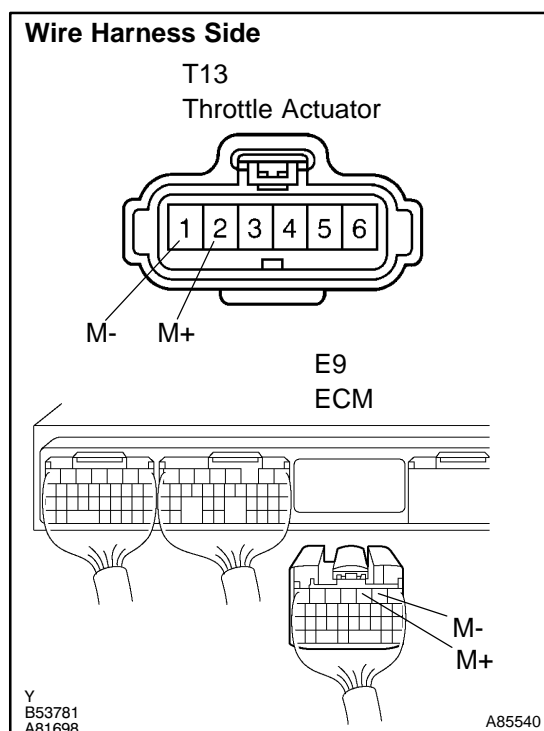
Tester Connection	Specified Condition
T13-2 (M+) - T13-1 (M-)	0.3 to 100 $\Omega$ (20 °C (68°F))

NG

REPLACE THROTTLE BODY ASSY

OK

### 2 CHECK WIRE HARNESS (THROTTLE ACTUATOR - ECM)



- Disconnect the T13 throttle actuator connector.
  - Disconnect the E9 ECM connector.
  - Measure the resistance of the wire harness side connectors.
- Standard:**

Tester Connection	Specified Condition
T13-2 (M+) - E9-3 (M+) T13-1 (M-) - E9-2 (M-)	Below 1 $\Omega$
T13-2 (M+) or E9-3 (M+) - Body ground T13-1 (M-) or E9-2 (M-) - Body ground	10 k $\Omega$ or higher

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

**3 INSPECT THROTTLE BODY ASSY**

- (a) Visually check for foreign objects between the throttle valve and the housing.  
Also, check if the valve can open and close smoothly.

**OK: The throttle valve is not contaminated with foreign objects and can move smoothly.**

**NG****REMOVE FOREIGN OBJECT AND CLEAN  
THROTTLE BODY****OK****REPLACE ECM (See page 10-9 )**