

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

The throttle motor is operated by the ECM. 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 motor and monitor the throttle opening angle as the ECM responds to driver inputs.

HINT:

This Electrical 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: (1 trip detection logic) (a) Throttle control motor output duty 80 % or more (b) Throttle control motor current less than 0.5 A or less	<ul style="list-style-type: none"> • Open in throttle control motor and sensor circuit • Throttle control motor and sensor • ECM
P2103	Either of the following condition is met. (1 trip detection logic) (a) Hybrid IC diagnosis signal fail (b) Hybrid IC current limiter port fail	<ul style="list-style-type: none"> • Short in throttle control motor and sensor circuit • Throttle control motor and sensor • Throttle valve • Throttle body • ECM

MONITOR DESCRIPTION

The ECM monitors the current through the electronic throttle motor and detects malfunctions or open circuit in the throttle motor based on the voltage of the 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, turns on the MIL and sets a DTC is set.

Example:

When the current is more than 10 A. Or the current is less than 0.5 A when the motor driving duty ratio is exceeding 80%. The ECM concludes that the current is out of range, turns on the MIL and a DTC is set.

FAIL SAFE

If the ETCS (Electronic Throttle Control System) has a malfunction, the ECM cuts off current to the throttle control motor. 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 minimum 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 control motor current (Low current)
	P2103	Throttle actuator control motor current (High current)
Required sensors/components	Throttle actuator motor	
Frequency of operation	Continuous	
Duration	2 sec.	
MIL operation	Immediate	
Sequence of operation	None	

TYPICAL ENABLING CONDITIONS

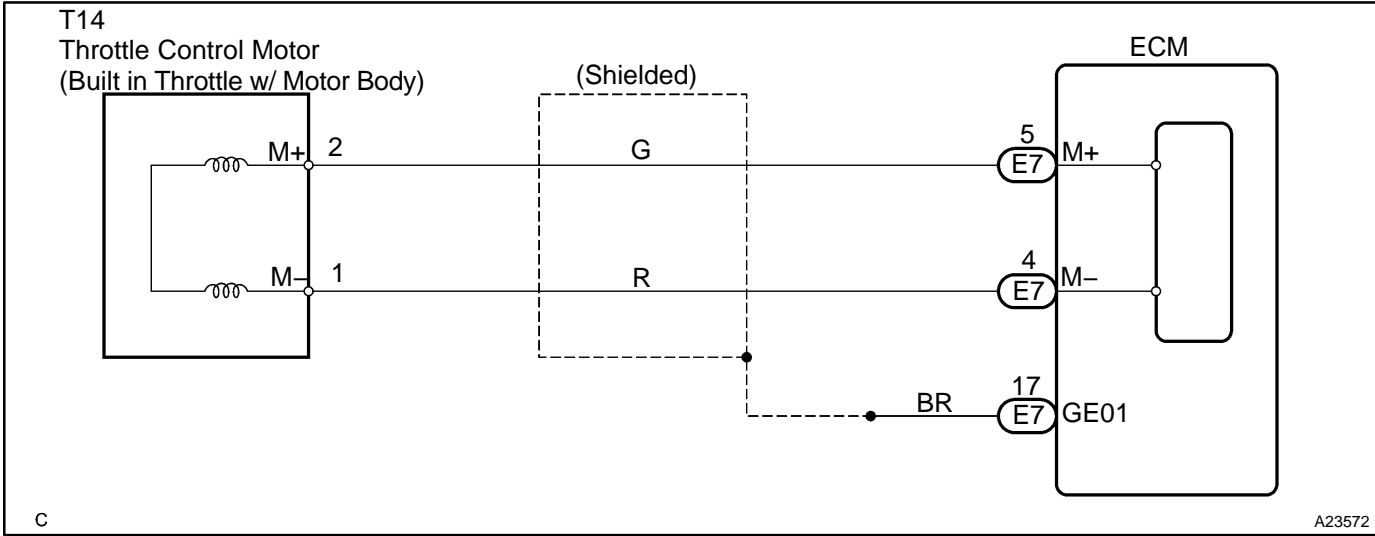
Item	Specification	
	Minimum	Maximum
The monitor will run whenever these DTCs are not present	See page DI-18	
P2102:		
Throttle motor	ON	
Duty-cycle ratio to open throttle actuator	80%	–
Throttle actuator power supply	8 V	–
Current motor current – Motor current at 0.016 sec. before	–	0.2 A
P2103:		
Throttle motor	ON	
Either of the following conditions is met:	Condition 1 or 2	
1. Throttle actuator power supply	8 V	–
2. Throttle actuator power	ON	
Battery voltage	8 V	–
Starter	OFF	

TYPICAL MALFUNCTION THRESHOLDS

Detection Criteria	Threshold
P2102:	
Throttle motor current	Less than 0.5 A (when motor drive duty 80% or more)
P2103:	
Either of the following conditions is met:	Condition 1 or 2
1. Hybrid IC diagnosis signal	Fail
2. Hybrid IC current limiter port	Fail

WIRING DIAGRAM

Refer to DTC P0120 on page [DI-123](#).

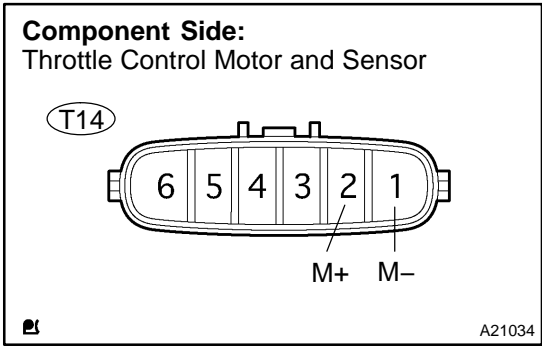


INSPECTION PROCEDURE

HINT:

Read freeze frame data using the hand-held tester. 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, as well as other data from the time when a malfunction occurred.

1	Check throttle control motor.
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PREPARATION:

Disconnect the throttle control motor and sensor connector.

CHECK:

Measure the resistance between terminals of the throttle control motor.

OK:

Standard:

Tester Connection	Specified Condition
M+ (T14-2) - M- (T14-1)	0.3 to 100 Ω (20°C (68°F))

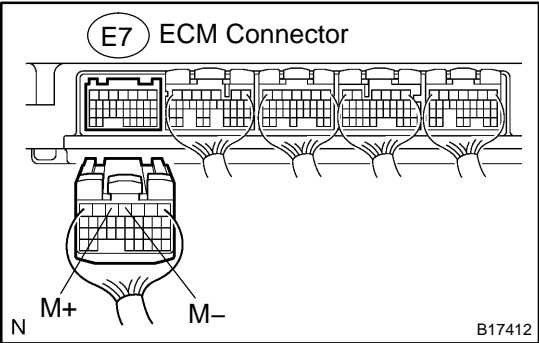
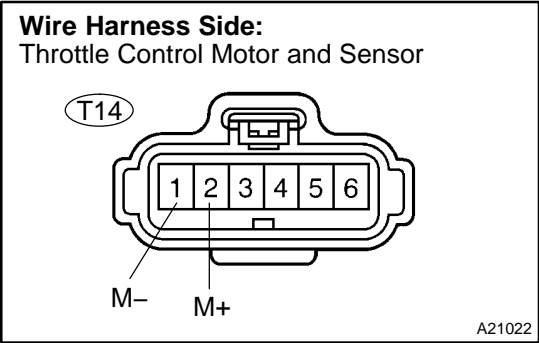
NG

Replace throttle body (See page [SF-40](#)).

OK

2

Check for open and short in harness and connector between throttle control motor and ECM.



PREPARATION:

- (a) Disconnect the T14 throttle control motor and sensor connector.
- (b) Disconnect the E7 ECM connector.

CHECK:

Measure the resistance between the wire harness side connectors.

OK:

Standard:

Tester Connection	Specified Condition
M+ (T14-2) – M+ (E7-5)	Below 1 Ω
M– (T14-1) – M– (E7-4)	Below 1 Ω
M+ (T14-2) or M+ (E7-5) – Body ground	10 kΩ or higher
M– (T14-1) or M– (E7-4) – Body ground	10 kΩ or higher

NG

Repair or replace harness or connector.

OK

3

Visually check throttle valve.

CHECK:

Check the area between the throttle valve and the housing for foreign objects.
Also, check if the valve can open and close smoothly.

OK:

The throttle valve is not contaminated by foreign objects and can move smoothly.

NG

Remove foreign object and clean throttle body.

OK

Replace ECM (See page [SF-66](#)).