DIC2O–03

DTC	P2 102/41 *1	Throttle Actuator Control Motor Circuit Low

DTC	P2 103/41 *2	Throttle Actuator Control Motor Circuit High

*1: ETCS trouble code No. is 2 1.
*2: ETCS trouble code No. is 24.

CIRCUIT DESCRIPTION

The throttle motor is operated by the engine control ECU 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 engine control ECU. This feedback allows the engine control ECU to control the throttle motor and monitor the throttle opening angle as the engine control ECU responds to driver inputs.
HINT:
This Electrical Throttle Control System (ETCS) does not use a throttle cable.

DTC No.	DTC Detection Condition	Trouble Area
P2102/41	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 0.5 A or less	• Open in throttle control motor and sensor circuit • Throttle control motor and sensor • Engine control ECU
P2103/41	Either of following conditions is met (1 trip detection logic). (a) Throttle control motor current 10 A or more (0. 1 sec) (b) Throttle control motor current 7 A or more (0.6 sec.)	• Short in throttle control motor and sensor circuit • Throttle control motor and sensor • Throttle valve • Throttle body • Engine control ECU

MONITOR DESCRIPTION

The engine control ECU monitors the current through the electronic throttle motor and detects malfunctions or open circuit in the throttle motor based on the value of the current. When the current deviates from the standard, the engine control ECU concludes that there is a fault in the throttle motor.
Or, if the throttle valve is not functioning properly (for example, stuck ON) the engine control ECU 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 motor driving duty ratio is exceeding 80%. The engine control ECU 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 engine control ECU 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 engine control ECU then adjusts the engine output by controlling the fuel infection (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.

WIRING DIAGRAM

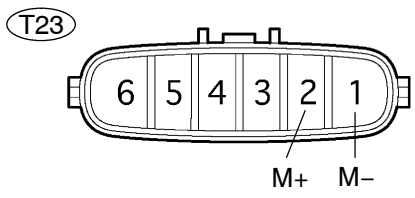
Refer to DTC P0120 on page DI–63.

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.**

Component Side:
Throttle Control Motor and Sensor



PREPARATION:
Disconnect the throttle control motor and sensor connector.
CHECK:
Measure the resistance between terminals of the throttle control motor.
OK:

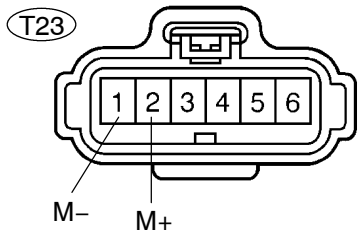
Tester Connection	Specified Condition
M+ (T23 –2) – M– (T23–1)	0.3 to 100 Ω (20°C (68°F))

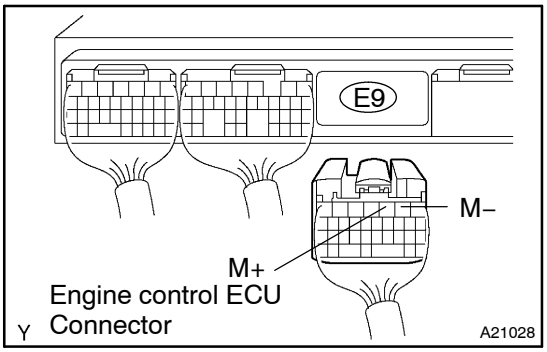
NG → **Replace throttle body (See Pub. No. RM630E, page FI –42).**

OK

2	Check for open and short in harness and connector between throttle control motor and engine control ECU.

Wire Harness Side:
Throttle Control Motor and Sensor





PREPARATION:

(a) Disconnect the T23 throttle control motor and sensor connector.
(b) Disconnect the E9 engine control ECU connector.

CHECK:

Measure the resistance between the wire harness side connectors.

OK:

Tester Connection	Specified Condition
M+ (T23 –2) – M+ (E9 –3)	Below 1 Ω
M– (T23–1) – M– (E9–2)	Below 1 Ω
M+ (T23 –2) or M+ (E9 –3) – Body ground	10 kΩ or higher
M– (T23–1) or M– (E9–2) – Body ground	10 kΩ or higher

NG → **Repair or replace harness or connector.**

OK

3	Visually check throttle valve.

CHECK:

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

NG → **Remove foreign object and clean throttle body.**

OK

Replace engine control ECU (See Pub. No. RM630E, page FI –74).