

Component Procedures: Electronic Throttle Actuator

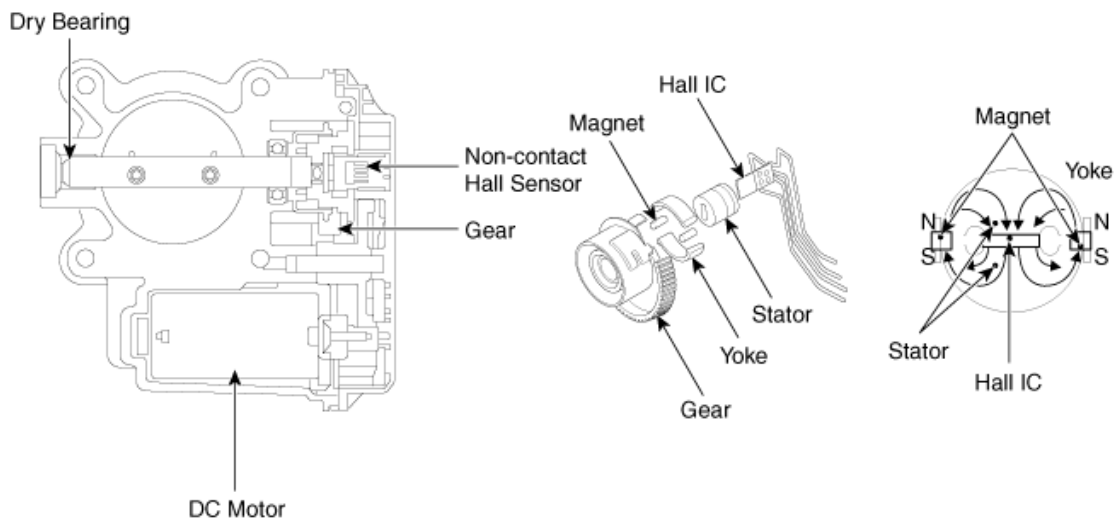
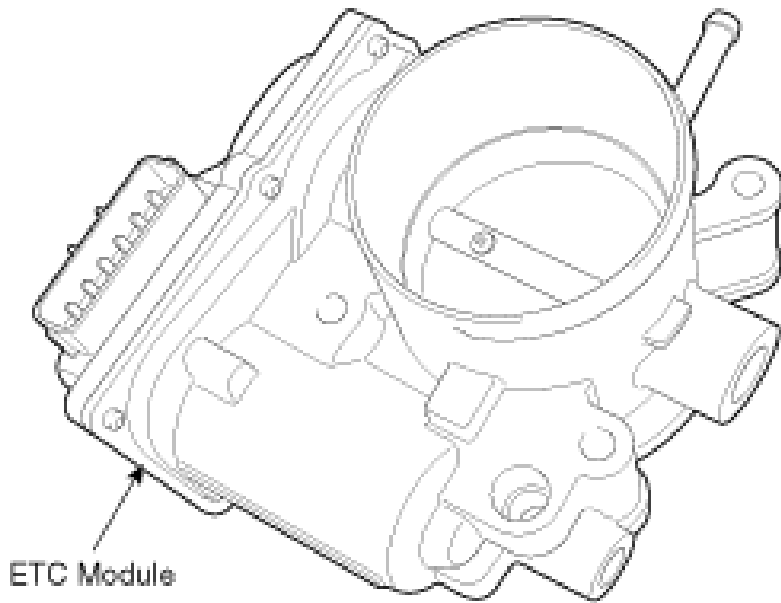
Table of Contents

1. ETC (Electronic Throttle Control) System - Description and Operation (Article 44193)
2. ETC (Electronic Throttle Control) System - Schematic Diagrams (Article 44196)
3. ETC (Electronic Throttle Control) System - Repair Procedures (Article 44198)
4. ETC (Electronic Throttle Control) System - Specifications (Article 44194)
5. ETC (Electronic Throttle Control) System - Troubleshooting (Article 44195)

Component Procedures: Electronic Throttle Actuator

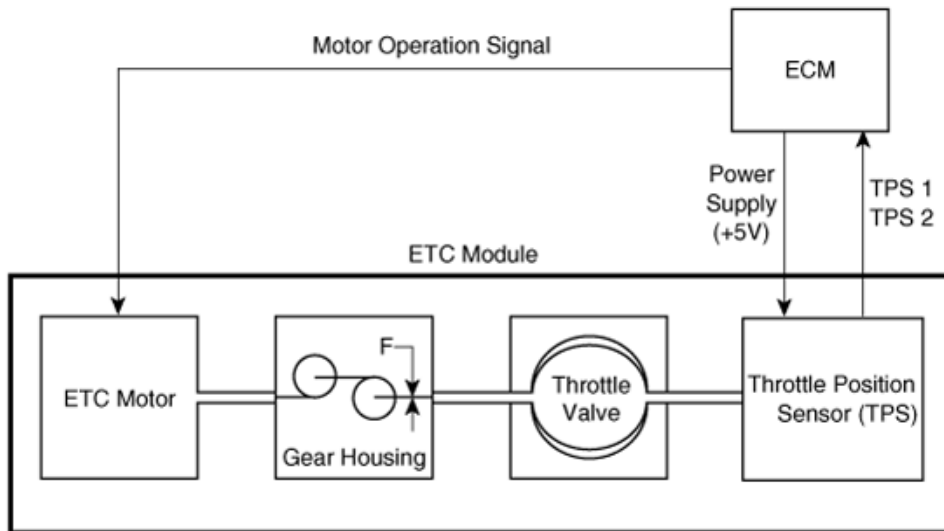
ETC (Electronic Throttle Control) System - Description and Operation (Article 44193)

- Description

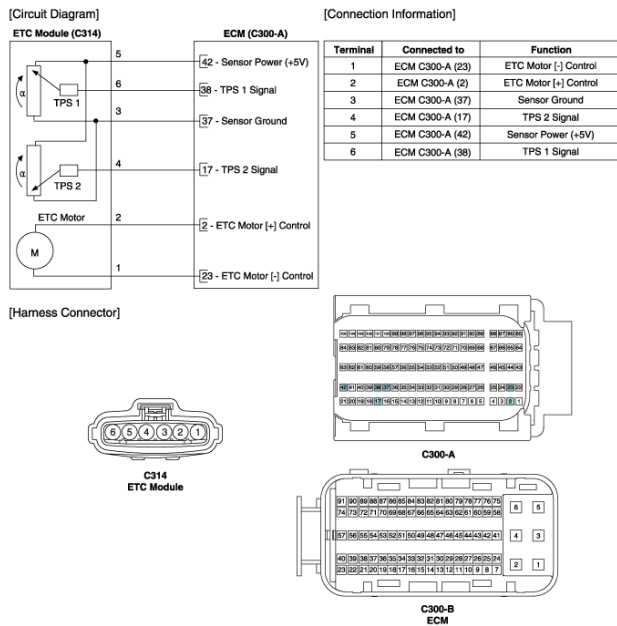


ETC (Electronic Throttle Control) System - Schematic Diagrams (Article 44196)

- Schematic Diagram



- Circuit Diagram



ETC (Electronic Throttle Control) System - Repair Procedures (Article 44198)

- Inspection

Throttle Position Sensor (TPS)

- Connect the GDS on the Data Link Connector (DLC).

- Start the engine and measure the output voltage of TPS 1 and 2 at C.T. and W.O.T. Throttle Angle Output Voltage (V) TPS 1 TPS 2 C.T 0.5 4.5 W.O.T 4.41 0.59

Throttle Angle Output Voltage (V)

TPS 1 TPS 2

C.T 0.5 4.5

W.O.T 4.41 0.59

ETC Motor

- Turn the ignition switch OFF.

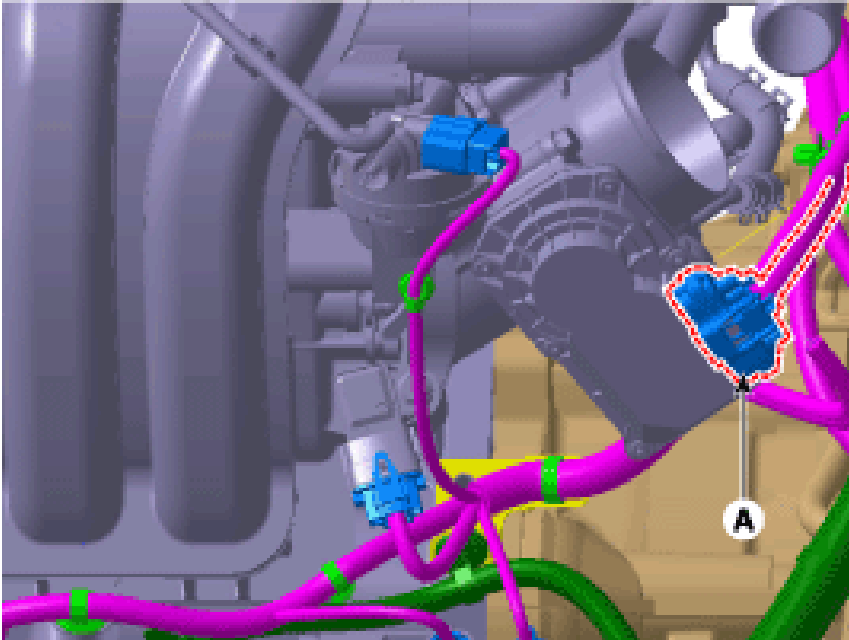
- Disconnect the ETC module connector.

- Measure resistance between the ETC module terminals 1 and 2.

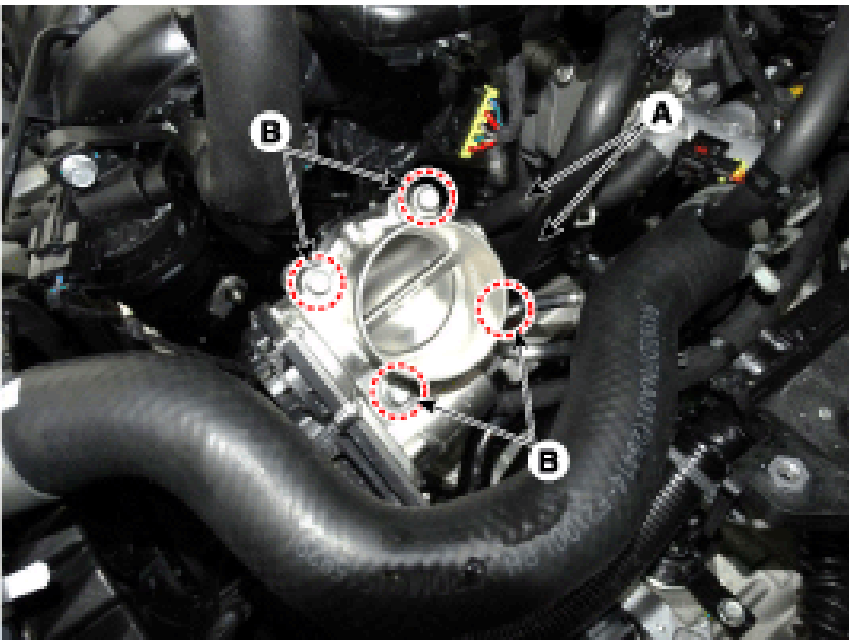
- Check that the resistance is within the specification. Specification : Refer to "Specification"

- Removal

- Turn the ignition switch OFF and disconnect the battery negative (-) cable.
- Remove the resonator and the air intake hose. (Refer to Engine Mechanical System - "Air Cleaner")
- Disconnect the ETC module connector (A).



- Disconnect the coolant hoses (A).
- Remove the installation bolts (B), and then remove the ETC module from the engine.



- Installation
- Install the component with the specified torques. Note that internal damage may occur when the component is dropped. In this case, use it after inspecting.



- Install the component with the specified torques.
- Note that internal damage may occur when the component is dropped. In this case, use it after inspecting.
- Installation is reverse of removal. Electronic throttle body Installation bolt : 7.8 - 11.8 N.m (0.8 - 1.2 kgf.m, 5.8 - 8.7 lb-ft)

ETC (Electronic Throttle Control) System - Specifications (Article 44194)

- Specification

Throttle angle (°) Output voltage (V) [Vref = 5.0V]

TPS1 TPS2

0 0.5 4.5

10 0.96 4.05

20 1.41 3.59

30 1.87 3.14

40 2.32 2.68

50 2.78 2.23

60 3.23 1.77

70 3.69 1.32

80 4.14 0.86

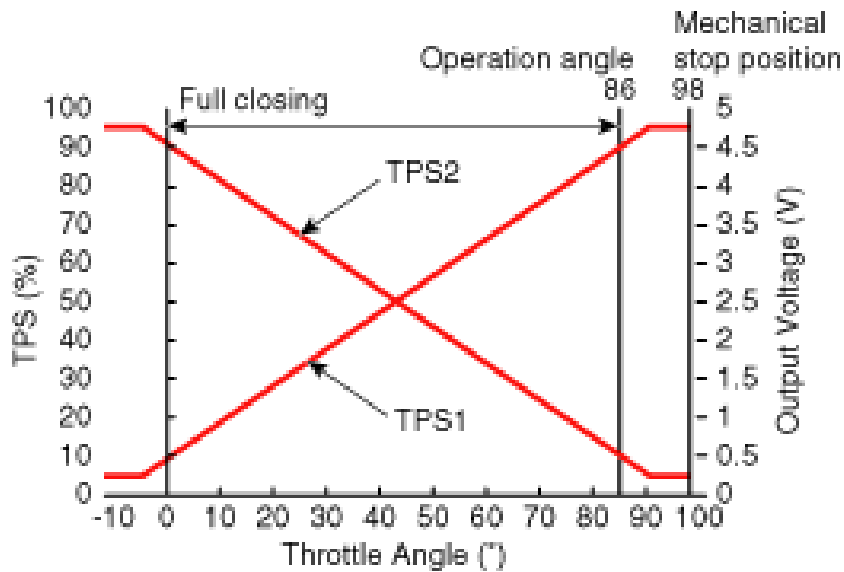
90 4.6 0.41

98 4.65 0.35

C.T (0) 0.5 4.5

W.O.T (86) 4.41 0.59

[TPS Characteristic Graph]



[ETC Motor]

Item Specification

Coil Resistance (Ω) 0.3 - 100 [20°C (68°F)]

ETC (Electronic Throttle Control) System - Troubleshooting (Article 44195)

- Fail-Safe Mode

Item Fail-Safe

ETC Motor Throttle valve stuck at 7°

TPS TPS 1 fault Replace it with TPS 2

TPS 2 fault Replace it with TPS 1

TPS 1, 2 fault Throttle valve stuck at 7°

APS APS 1 fault Replace it with APS 2

APS 2 fault Replace it with APS 1

APS 1, 2 fault Engine idle state

When throttle value is stuck at 7°, engine speed is limited at below 1,500rpm and vehicle speed at maximum 40

- 50 km/h (25 - 31 mph).

NOTICE

- When throttle value is stuck at 7°, engine speed is limited at below 1,500rpm and vehicle speed at maximum 40 - 50 km/h (25 - 31 mph).