

DTC P0615

Diagnostic Instructions

- Perform the Diagnostic System Check – Vehicle prior to using this diagnostic procedure.
- Review Strategy Based Diagnosis for an overview of the diagnostic approach.
- Diagnostic Procedure Instructions provides an overview of each diagnostic category.

DTC Descriptor

DTC P0615: Starter Relay Control Circuit

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
CRNK Relay Control	P0615	P0615	P0615	—
Ground	—	P0615	—	—

Typical Scan Tool Data

Starter Relay Ckt Short Gnd Test Status – ECM

Circuit	Short to Ground	Open	Short to Voltage
Operating Conditions: Cranking Parameter Normal Value: OK			
CRNK Relay Control	Fault	OK	OK
Ground	—	OK	—

Starter Relay Ckt Open Test Status – ECM

Circuit	Short to Ground	Open	Short to Voltage
Operating Conditions: Ignition ON, engine OFF Parameter Normal Value: OK			
CRNK Relay Control	OK	Fault	Fault
Ground	—	Fault	—

Starter Relay Ckt Short Volts Test Status – ECM

Circuit	Short to Ground	Open	Short to Voltage
Operating Conditions: Ignition ON, engine OFF Parameter Normal Value: OK			
CRNK Relay Control	OK	Fault	Fault
Ground	—	Fault	—

Circuit/System Description

When the ignition switch is placed in the START position, a discrete signal is supplied to the body control module (BCM) notifying it that the ignition is in the START position. The BCM then sends a serial data message to the engine control module (ECM) that crank has been requested. The ECM then verifies that the transmission is in Park or Neutral. If it is, the ECM then supplies 12 V to the control circuit of the CRNK relay. When this occurs, battery voltage is supplied through the switch of the CRNK relay to terminal A X2 of the starter solenoid. The ECM monitors the voltage on the CRNK relay control circuit.

Conditions for Running the DTC

- a) The battery voltage is between 9.5–18 V.
- b) The ignition is ON.

Conditions for Setting the DTC

The ECM detects that the control circuit of the CRNK relay is open, shorted to ground, or shorted to voltage for 2 seconds.

Action Taken When the DTC Sets

DTC P0615 is a type C DTC.

Conditions for Clearing the DTC

The condition for setting the DTC no longer exists for 2 seconds.

Circuit/System Verification

- 1) Ignition ON, observe the following scan tool ECM parameters. The scan tool should display the status is OK.
 - a) Starter Relay Ckt Open Test Status
 - b) Starter Relay Ckt Short Volts Test Status
- 2) Turn the ignition switch to the START position. Observe the scan tool ECM Starter Relay Ckt Short Gnd Test Status parameter. The engine should crank, and the scan tool should display the status is OK while the engine is cranking.

Circuit/System Testing

- 1) Ignition OFF, disconnect the CRNK relay.
- 2) Ignition OFF and scan tool disconnected, open and close the driver door, and wait 1 minute. Test for less than 5 Ω between the ground circuit terminal 85 and ground.

If greater than the specified range, test the ground circuit for an open/high resistance.

- 3) Ignition OFF, connect a test lamp between the control circuit terminal 86 and the ground circuit terminal 85.
- 4) With the transmission range selector in park, cycle the ignition switch between the OFF and START positions. The test lamp should turn ON and OFF when changing between the commanded states.

If the test lamp is always ON, test the control circuit for short to voltage. If the circuit tests normal, replace the ECM.

If the test lamp is always OFF, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the ECM.

- 5) If all circuits test normal, test or replace the CRNK relay.

Component Testing

Relay Test

- 1) Ignition OFF, disconnect the CRNK relay.
- 2) Test for 60–250 Ω between terminals 85 and 86.
If not within the specified range, replace the relay.
- 3) Test for infinite resistance between the following terminals:
 - a) 30 and 86
 - b) 30 and 87
 - c) 30 and 85
 - d) 85 and 87

If not the specified value, replace the relay.

- 4) Install a 20 A fused jumper wire between relay terminal 85 and 12 V. Install a jumper wire between relay terminal 86 and ground. Test for
- 5) less than 2 Ω between terminals 30 and 87.
If greater than specified range, replace the relay.

LAUNCH