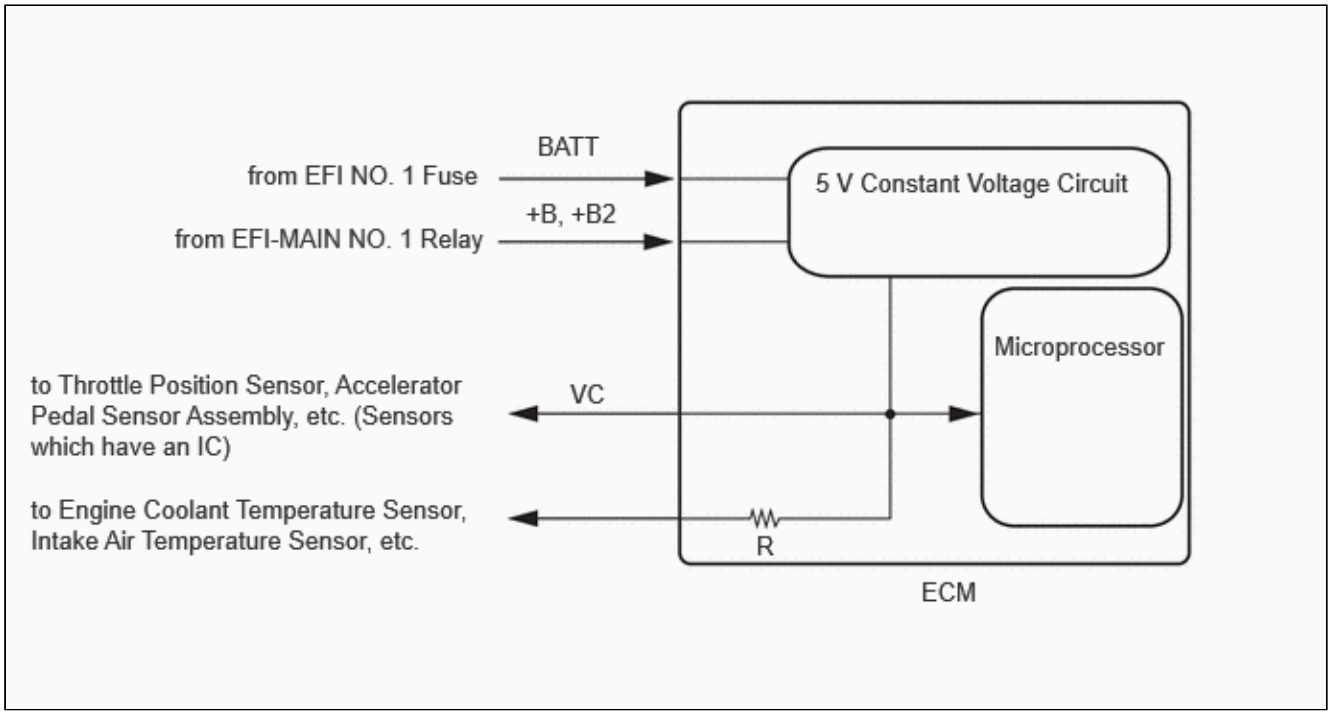
Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM100000002C41Q
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: M20A-FXS (ENGINE CONTROL): SFI SYSTEM: VC Output Circuit; 2023 - 2024 MY Prius Prius Prime [03/2023 -]		

VC Output Circuit

DESCRIPTION

The ECM constantly generates a 5 V power source voltage from the auxiliary battery voltage supplied to the +B, +B2 (BATT) terminals to operate the microprocessor. The ECM also provides this power to the sensors through the VC output circuit.



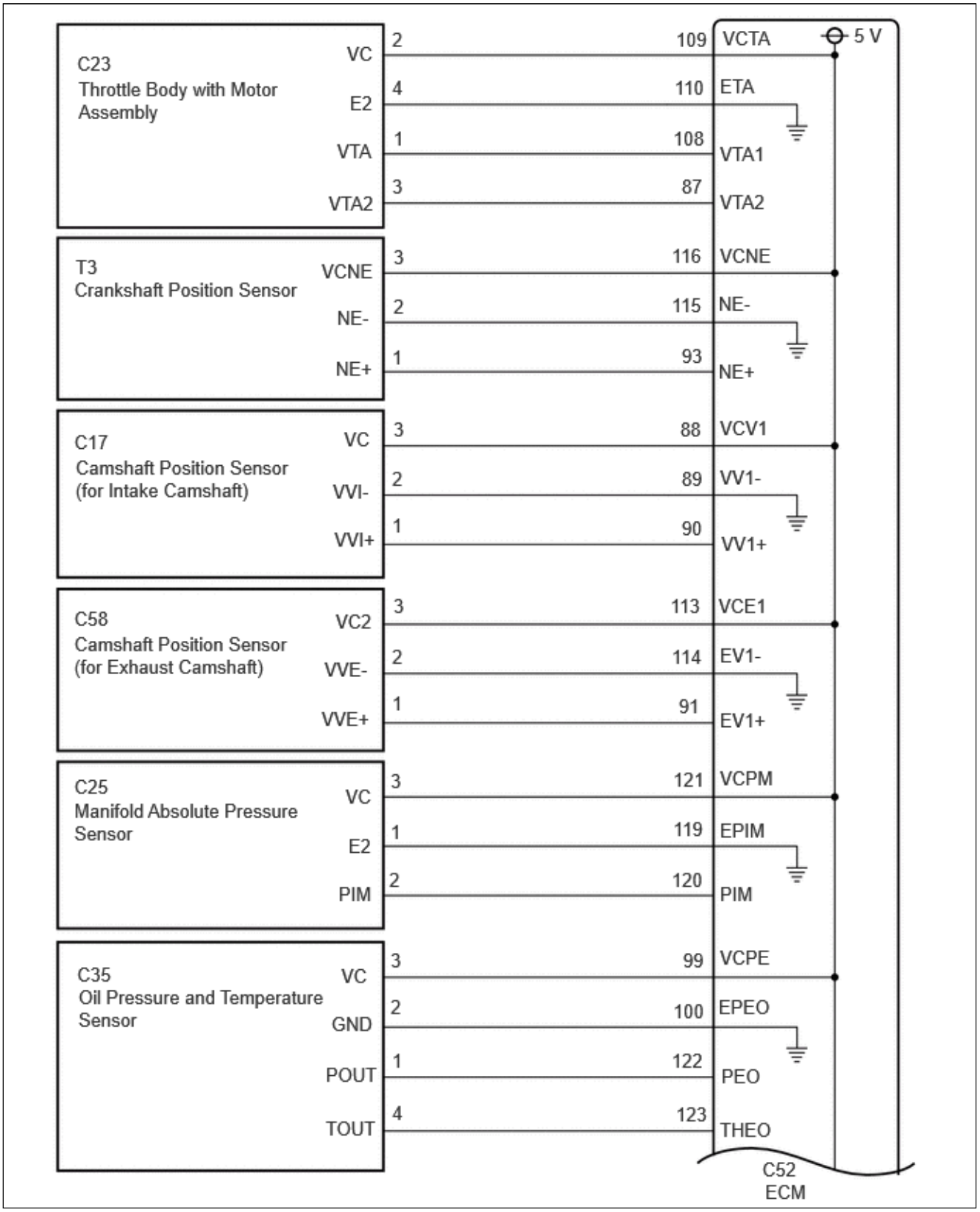
When the VC circuit has a short circuit, the microprocessor in the ECM and sensors that are supplied power through the VC circuit are deactivated because power is not supplied from the VC circuit. When the system is in this condition, it will not start.

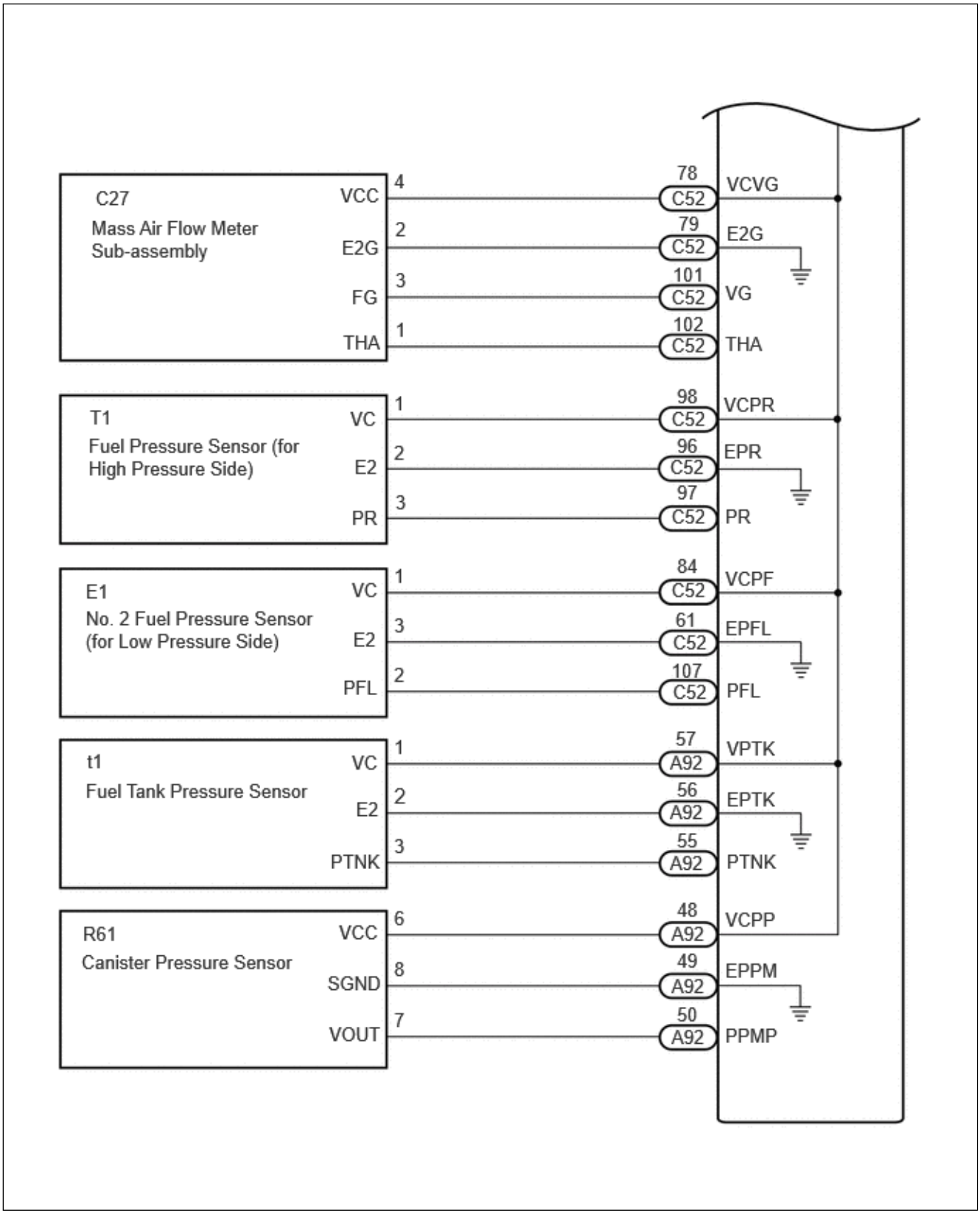
WIRING DIAGRAM

- For the circuit diagram of the ECM power source refer to the ECM power source circuit.

  Click here INFO

- VC Output Circuit





CAUTION / NOTICE / HINT

NOTICE:

Check the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

1.	**CHECK CONNECTION BETWEEN GTS AND ECM**

(a) Check the communication between the GTS and ECM.

HINT:

It can be checked using the "Engine" item of the Data List.

RESULT	PROCEED TO
Communication is not possible	A
Communication is possible	B

B ▶ **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE**

A

2.	**CHECK EFI NO. 3 FUSE VOLTAGE**

(a) Turn the ignition switch to ON.

(b) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
1 (EFI NO. 3 fuse) - Body ground	Ignition switch ON	11 to 14 V

HINT:

- Check the fuse with it installed to the No. 1 engine room relay block and No. 1 junction block assembly.
- If the result is not as specified, since current is not flowing to the +B and +B2 terminals of the ECM, the system may not be started.

NG ▶ **GO TO ECM POWER SOURCE CIRCUIT**

OK

3.	**CHECK CONNECTION BETWEEN GTS AND ECM (THROTTLE POSITION SENSOR)**

(a) Disconnect the throttle body with motor assembly connector.

(b) Check the communication between the GTS and ECM.

HINT:

It can be checked using the "Engine" item of the Data List.

RESULT	PROCEED TO
Communication is not possible	A
Communication is possible	B

B ▶ **REPLACE THROTTLE BODY WITH MOTOR ASSEMBLY**

A ▼

4.	**CHECK CONNECTION BETWEEN GTS AND ECM (CRANKSHAFT POSITION SENSOR)**

(a) Disconnect the crankshaft position sensor connector.

(b) Check the communication between the GTS and ECM.

HINT:

It can be checked using the "Engine" item of the Data List.

RESULT	PROCEED TO
Communication is not possible	A
Communication is possible	B

B ▶ **REPLACE CRANKSHAFT POSITION SENSOR**

A ▼

5.	**CHECK CONNECTION BETWEEN GTS AND ECM (CAMSHAFT POSITION SENSOR (FOR INTAKE CAMSHAFT))**

(a) Disconnect the camshaft position sensor (for intake camshaft) connector.

(b) Check the communication between the GTS and ECM.

HINT:

It can be checked using the "Engine" item of the Data List.

RESULT	PROCEED TO
Communication is not possible	A
Communication is possible	B

B ▶ **REPLACE CAMSHAFT POSITION SENSOR (FOR INTAKE CAMSHAFT)**

A ▼

6.	**CHECK CONNECTION BETWEEN GTS AND ECM (MANIFOLD ABSOLUTE PRESSURE SENSOR)**

(a) Disconnect the manifold absolute pressure sensor connector.

(b) Check the communication between the GTS and ECM.

HINT:

It can be checked using the "Engine" item of the Data List.

RESULT	PROCEED TO
Communication is not possible	A
Communication is possible	B

B ▶ **REPLACE MANIFOLD ABSOLUTE PRESSURE SENSOR**

A ▼

7.	**CHECK CONNECTION BETWEEN GTS AND ECM (CAMSHAFT POSITION SENSOR (FOR EXHAUST CAMSHAFT))**

(a) Disconnect the camshaft position sensor (for exhaust camshaft) connector.

(b) Check the communication between the GTS and ECM.

HINT:

It can be checked using the "Engine" item of the Data List.

RESULT	PROCEED TO
Communication is not possible	A
Communication is possible	B

B ▶ **REPLACE CAMSHAFT POSITION SENSOR (FOR EXHAUST CAMSHAFT)**

A

8.	**CHECK CONNECTION BETWEEN GTS AND ECM (OIL PRESSURE AND TEMPERATURE SENSOR)**

(a) Disconnect the oil pressure and temperature sensor connector.

(b) Check the communication between the GTS and ECM.

HINT:

It can be checked using the "Engine" item of the Data List.

RESULT	PROCEED TO
Communication is not possible	A
Communication is possible	B

B ▶ **REPLACE OIL PRESSURE AND TEMPERATURE SENSOR**

A

9.	**CHECK CONNECTION BETWEEN GTS AND ECM (FUEL PRESSURE SENSOR (FOR HIGH PRESSURE SIDE))**

(a) Disconnect the fuel pressure sensor (for high pressure side) connector.

(b) Check the communication between the GTS and ECM.

HINT:

It can be checked using the "Engine" item of the Data List.

RESULT	PROCEED TO
Communication is not possible	A
Communication is possible	B

B ▶ **REPLACE FUEL PRESSURE SENSOR (FOR HIGH PRESSURE SIDE)**

A ▼

10.	**CHECK CONNECTION BETWEEN GTS AND ECM (NO. 2 FUEL PRESSURE SENSOR (FOR LOW PRESSURE SIDE))**

(a) Disconnect the No. 2 fuel pressure sensor (for low pressure side) connector.

(b) Check the communication between the GTS and ECM.

HINT:

It can be checked using the "Engine" item of the Data List.

RESULT	PROCEED TO
Communication is not possible	A
Communication is possible	B

B ▶ **REPLACE NO. 2 FUEL PRESSURE SENSOR (FOR LOW PRESSURE SIDE)**

A ▼

11.	**CHECK CONNECTION BETWEEN GTS AND ECM (MASS AIR FLOW METER SUB-ASSEMBLY)**

(a) Disconnect the mass air flow meter sub-assembly connector.

(b) Check the communication between the GTS and ECM.

HINT:

It can be checked using the "Engine" item of the Data List.

RESULT	PROCEED TO
Communication is not possible	A
Communication is possible	B

B ▶ **REPLACE MASS AIR FLOW METER SUB-ASSEMBLY**

A

12.	**CHECK CONNECTION BETWEEN GTS AND ECM (CANISTER PUMP MODULE)**

(a) Disconnect the canister pump module connector.

(b) Check the communication between the GTS and ECM.

HINT:

It can be checked using the "Engine" item of the Data List.

RESULT	PROCEED TO
Communication is not possible	A
Communication is possible	B

B ▶ **REPLACE CANISTER PUMP MODULE**

for HEV Model: Click here INFO

for PHEV Model: Click here INFO

A

13.	**CHECK CONNECTION BETWEEN GTS AND ECM (FUEL TANK PRESSURE SENSOR)**

(a) Disconnect the fuel tank pressure sensor connector.

(b) Check the communication between the GTS and ECM.

HINT:

It can be checked using the "Engine" item of the Data List.

RESULT	PROCEED TO
Communication is not possible	A
Communication is possible	B

B **REPLACE FUEL TANK PRESSURE SENSOR**

for HEV Model: Click here INFO

for PHEV Model: Click here INFO

A

14.	CHECK HARNESS AND CONNECTOR

(a) Disconnect the throttle body with motor assembly connector.

(b) Disconnect the crankshaft position sensor connector.

(c) Disconnect the camshaft position sensor (for intake camshaft) connector.

(d) Disconnect the manifold absolute pressure sensor connector.

(e) Disconnect the camshaft position sensor (for exhaust camshaft) connector.

(f) Disconnect the oil pressure and temperature sensor connector.

(g) Disconnect the fuel pressure sensor (for high pressure side) connector.

(h) Disconnect the No. 2 fuel pressure sensor (for low pressure side) connector.

(i) Disconnect the mass air flow meter sub-assembly connector.

(j) Disconnect the canister pump module connector.

(k) Disconnect the fuel tank pressure sensor connector.

(l) Disconnect the ECM connectors.

(m) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

EWD INFO

Click Location & Routing(C52,A92)
Click Connector(C52)
Click Connector(A92)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
C52-109 (VCTA) - Body ground	Always	10 kΩ or higher

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
C52-116 (VCNE) - Body ground	Always	10 kΩ or higher
C52-88 (VCV1) - Body ground	Always	10 kΩ or higher
C52-113 (VCE1) - Body ground	Always	10 kΩ or higher
C52-121 (VCPM) - Body ground	Always	10 kΩ or higher
C52-99 (VCPE) - Body ground	Always	10 kΩ or higher
C52-78 (VCVG) - Body ground	Always	10 kΩ or higher
C52-98 (VCPR) - Body ground	Always	10 kΩ or higher
C52-84 (VCPF) - Body ground	Always	10 kΩ or higher
A92-48 (VCPP) - Body ground	Always	10 kΩ or higher
A92-57 (VPTK) - Body ground	Always	10 kΩ or higher
A92-9 (+B) - 1 (EFI NO. 3 fuse)	Always	Below 1 Ω
A92-35 (+B2) - 1 (EFI NO. 3 fuse)	Always	Below 1 Ω

OK ▶ **REPLACE ECM**

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**