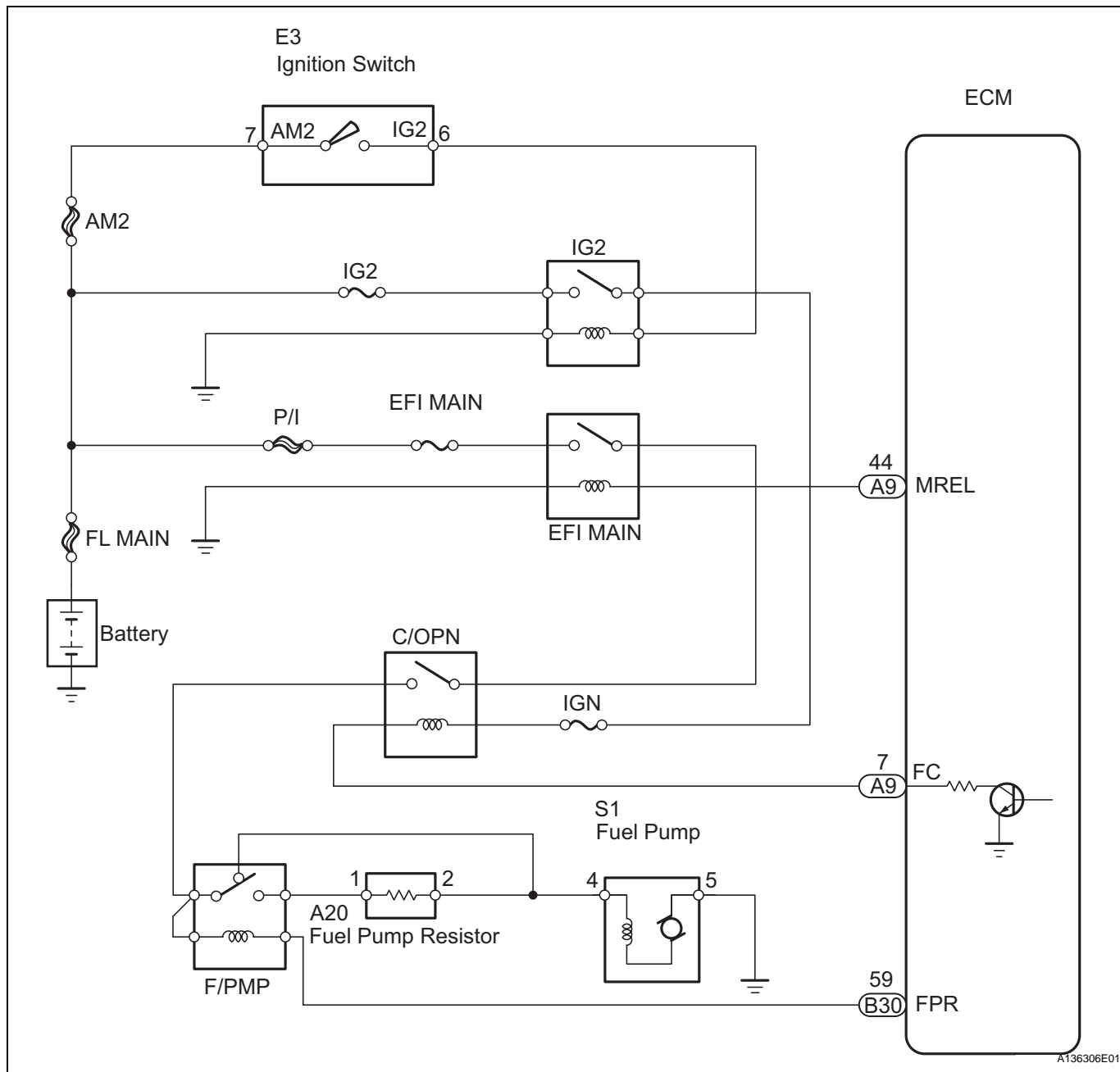


## Fuel Pump Control Circuit

### DESCRIPTION

The F/PMP relay switches the fuel pump speed according to the engine conditions. The fuel pump operates when the ECM receives the starter-operating signal (STA) and crankshaft-rotating signal (NE). The F/PMP relay is turned ON while the engine is idling or operating at low load. This causes current to flow through the fuel pump resistor to the fuel pump. The fuel pump then operates at low speed. The F/PMP relay is turned OFF while the engine is cranking or operating at high load. The fuel pump then operates at normal speed.

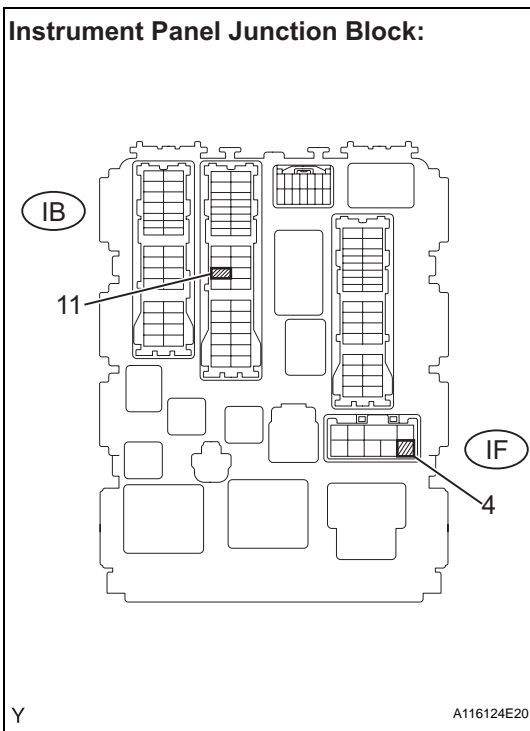
### WIRING DIAGRAM



## INSPECTION PROCEDURE

**1 PERFORM ACTIVE TEST USING INTELLIGENT TESTER (FUEL PUMP/SPD)**

- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the ignition switch ON and turn the tester ON.
- (c) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST / FUEL PUMP / SPD.
- (d) Check whether the fuel pump operating sound occurs when performing the Active Test on the tester.

**OK:****Fuel pump operating sound occurs.****OK****Go to step 12****NG****2 INSPECT INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY (C/OPN RELAY INPUT VOLTAGE)****Instrument Panel Junction Block:**

- (a) Measure the voltage between the terminal of the instrument panel junction block and the body ground when the ignition switch is turned ON and OFF.

**Standard voltage**

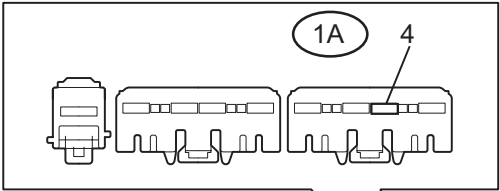
Tester Connection	Ignition Switch Condition	Specified Condition
IB-11 - Body ground	OFF	Below 1 V
IF-4 - Body ground		
IB-11 - Body ground	ON	9 to 14 V
IF-4 - Body ground		

**OK****Go to step 4****NG****ES**

3

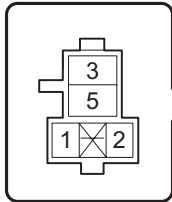
CHECK WIRE HARNESS (INSTRUMENT PANEL JUNCTION BLOCK - INTEGRATION RELAY AND IG2 RELAY)

Wire Harness Side:



Engine Room No. 1  
Relay Block

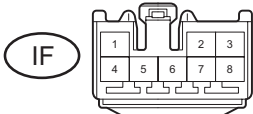
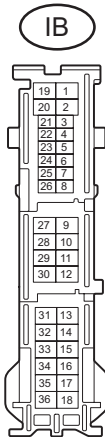
Integration Relay



IG2 Relay Holder

Main Body ECU

(Instrument Panel Junction  
Block)



A133157E01

- (a) Remove the integration relay and IG2 relay from the engine room No. 1 relay block.
- (b) Disconnect the instrument panel junction block connector.
- (c) Measure the resistance.

Standard resistance

Tester Connection	Specified Condition
IG2 relay 5 - IF-4	Below 1 $\Omega$
1A-4 - IB-11	Below 1 $\Omega$
IF-4 - Body ground	10 k $\Omega$ or higher
IB-11 - Body ground	10 k $\Omega$ or higher

- (d) Reinstall the integration relay and IG2 relay.
- (e) Reconnect the instrument panel junction block connector.

NG

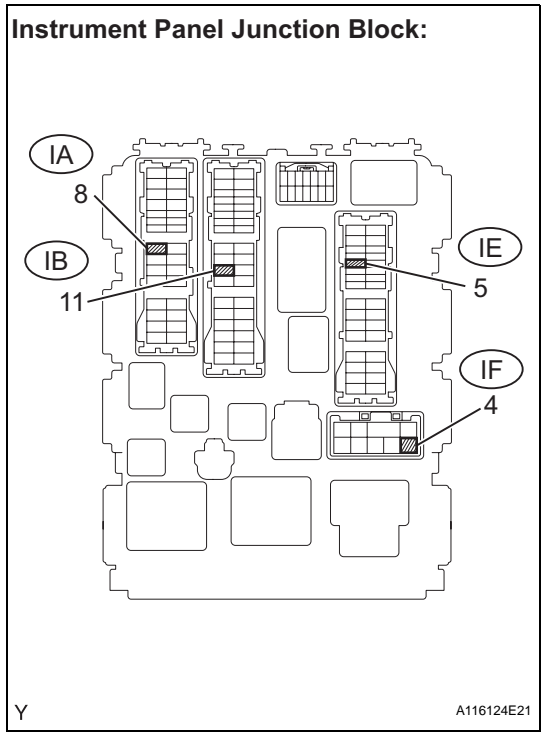
REPAIR OR REPLACE HARNESS AND  
CONNECTOR

OK

GO TO ECM POWER SOURCE CIRCUIT

ES

4INSPECT INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY (C/OPN RELAY)



- (a) Remove the instrument panel junction block.
- (b) Measure the C/OPN relay resistance.

Standard resistance

Tester Connection	Specified Condition
IB-11 - IA-8	10 kΩ or higher
	Below 1 Ω (when battery voltage is applied to terminals IF-4 and IE-5)

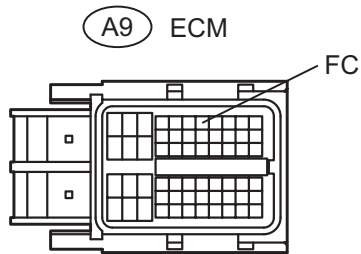
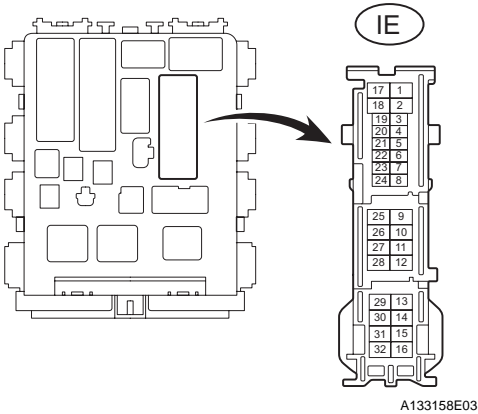
HINT:  
Relay coil circuit between IF-4 and IE-5 is through IGN fuse.

- (c) Reinstall the instrument panel junction block.

NG

REPLACE INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY

OK

**5****CHECK WIRE HARNESS (INSTRUMENT PANEL JUNCTION BLOCK - ECM)****Wire Harness Side:****Main Body ECU****(Instrument Panel Junction Block)**

- (a) Disconnect the A9 ECM connector.
- (b) Disconnect the IE connector from the instrument panel junction block.
- (c) Measure the resistance.

**Standard resistance**

Tester Connection	Specified Condition
IE-5 - A9-7 (FC)	Below 1Ω
IE-5 or A9-7 (FC) - Body ground	10 kΩ or higher

- (d) Reconnect the instrument panel junction block and the ECM connectors.

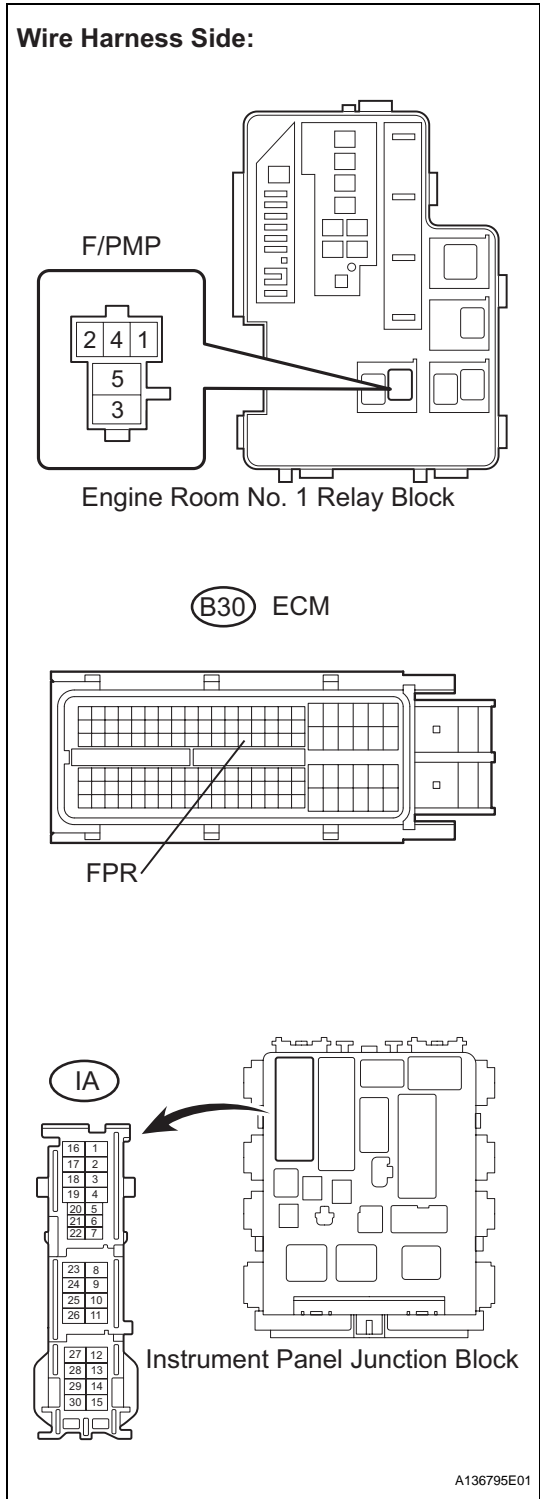
**NG****REPAIR OR REPLACE HARNESS AND CONNECTOR****ES****OK****6****PERFORM ACTIVE TEST USING INTELLIGENT TESTER (FUEL PMP SP CTL)**

- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the ignition switch ON and turn the tester ON.
- (c) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST / FUEL PMP SP CTL.
- (d) Check the operation of the relay while operating it using the intelligent tester.

**OK:****Operating noise can be heard from the relay.****OK****Go to step 9****NG****7****INSPECT F/PMP RELAY (See page ES-194)****NG****REPLACE F/PMP RELAY**

OK

8 CHECK WIRE HARNESS (F/PMP RELAY - ECM AND INSTRUMENT PANEL JUNCTION BLOCK)



- (a) Remove the F/PMP relay from the engine room No. 1 relay block.
- (b) Disconnect the B30 ECM connector.
- (c) Disconnect the IA instrument panel junction block connector.
- (d) Measure the resistance.

Standard resistance

Tester Connection	Specified Condition
F/PMP relay terminal 1 - B30-59 (FPR)	Below 1 $\Omega$
F/PMP relay terminal 2 - IA-8	Below 1 $\Omega$
F/PMP relay terminal 3 - IA-8	Below 1 $\Omega$
F/PMP relay terminal 1 or B30-59 (FPR) - Body ground	10 k $\Omega$ or higher
F/PMP relay terminal 2 or IA-8 - Body ground	10 k $\Omega$ or higher
F/PMP relay terminal 3 or IA-8 - Body ground	10 k $\Omega$ or higher

- (e) Reconnect the ECM connector
- (f) Reconnect the instrument panel junction block connector.
- (g) Reinstall the F/PMP relay.

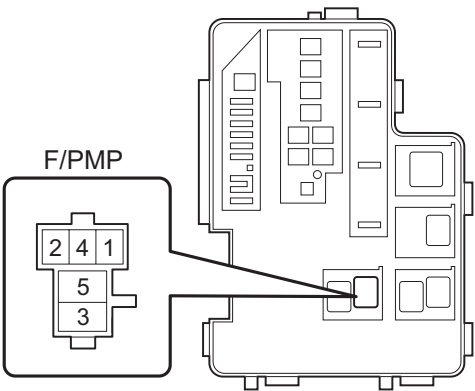
NG REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

9 CHECK WIRE HARNESS (F/PMP - FUEL PUMP AND PUMP RESISTOR)

Wire Harness Side:

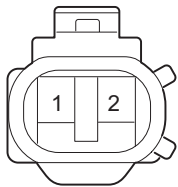
Engine Room No. 1 Relay Block



S1 Fuel Pump



A20 Fuel Pump Resistor



A136796E02

- (a) Remove the F/PMP relay from the engine room No. 1 relay block.
- (b) Disconnect the S1 fuel pump connector.
- (c) Disconnect the A20 fuel pump resistor connector.
- (d) Measure the resistance.

Standard resistance

Tester Connection	Specified Condition
F/PMP relay terminal 4 - S1-4	Below 1 $\Omega$
F/PMP relay terminal 5 - A20-1	Below 1 $\Omega$
A20-2 - S1-4	Below 1 $\Omega$
S1-5 - Body ground	Below 1 $\Omega$
F/PMP relay terminal 4 or S1-4 - Body ground	10 k $\Omega$ or higher
F/PMP relay terminal 5 or A20-1 - Body ground	10 k $\Omega$ or higher
A20-2 or S1-4 - Body ground	10 k $\Omega$ or higher

- (e) Reconnect the fuel pump resistor connector.
- (f) Reconnect the fuel pump connector.
- (g) Reinstall the F/PMP relay.

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

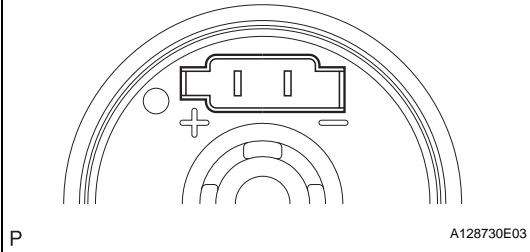
OK

ES

**10 INSPECT FUEL PUMP**

Component Side:

Fuel Pump



- (a) Inspect fuel pump resistance.  
 (1) Measure the resistance between the terminals.

**Standard resistance:****0.2 to 3.0  $\Omega$  at 20°C(68°F)**

- (b) Inspect fuel pump operation.  
 (1) Apply the battery voltage to both the terminals.  
 Check that the pump operates.

**NOTICE:**

- These tests must be done quickly (within 10 seconds) to prevent the coil from burning out.
- Keep the fuel pump as far away from the battery as possible.
- Always turn the voltage on and off on the battery side, not the fuel pump side.

**NG****REPLACE FUEL PUMP****OK****11 INSPECT FUEL PUMP RESISTOR**

- (a) Measure the resistance of the fuel pump resistor.

**Standard resistance:****0.30 to 0.34  $\Omega$  at 20°C (68°F)****NG****REPLACE FUEL PUMP RESISTOR****OK****REPLACE ECM****12 READ VALUE USING INTELLIGENT TESTER (STARTER SIG)**

- (a) Connect the intelligent tester to the DLC3.  
 (b) Turn the ignition switch ON and turn the tester ON.  
 (c) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DATA LIST / PRIMARY / STARTER SIG.  
 (d) Check the result when the ignition switch is turned ON and START.

**OK**

Ignition Switch Position	STARTER SIG
ON	OFF
START	ON

**NG****REPAIR OR REPLACE STARTING SYSTEM****ES**



OK**13** READ VALUE USING INTELLIGENT TESTER (ENGINE SPD)

- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the ignition switch ON and turn the tester ON.
- (c) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DATA LIST / PRIMARY / ENGINE SPD.
- (d) Read the values displayed on the tester while cranking.

**Standard:**

Values are displayed continuously.

NG**REPAIR OR REPLACE CRANKSHAFT  
POSITION SENSOR CIRCUIT****ES**OK**REPLACE ECM**