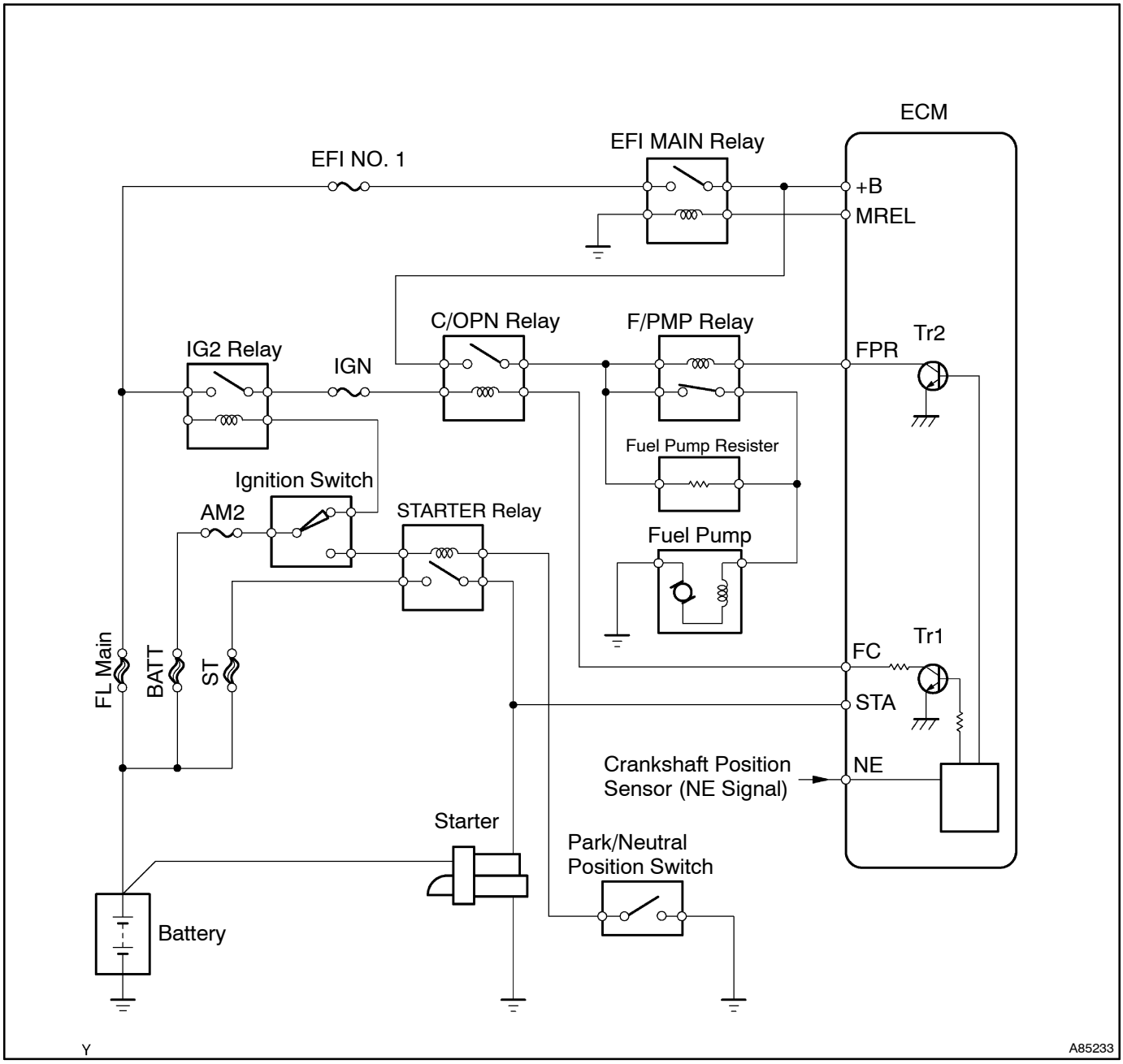
DTC	P0230	FUEL PUMP PRIMARY CIRCUIT

CIRCUIT DESCRIPTION

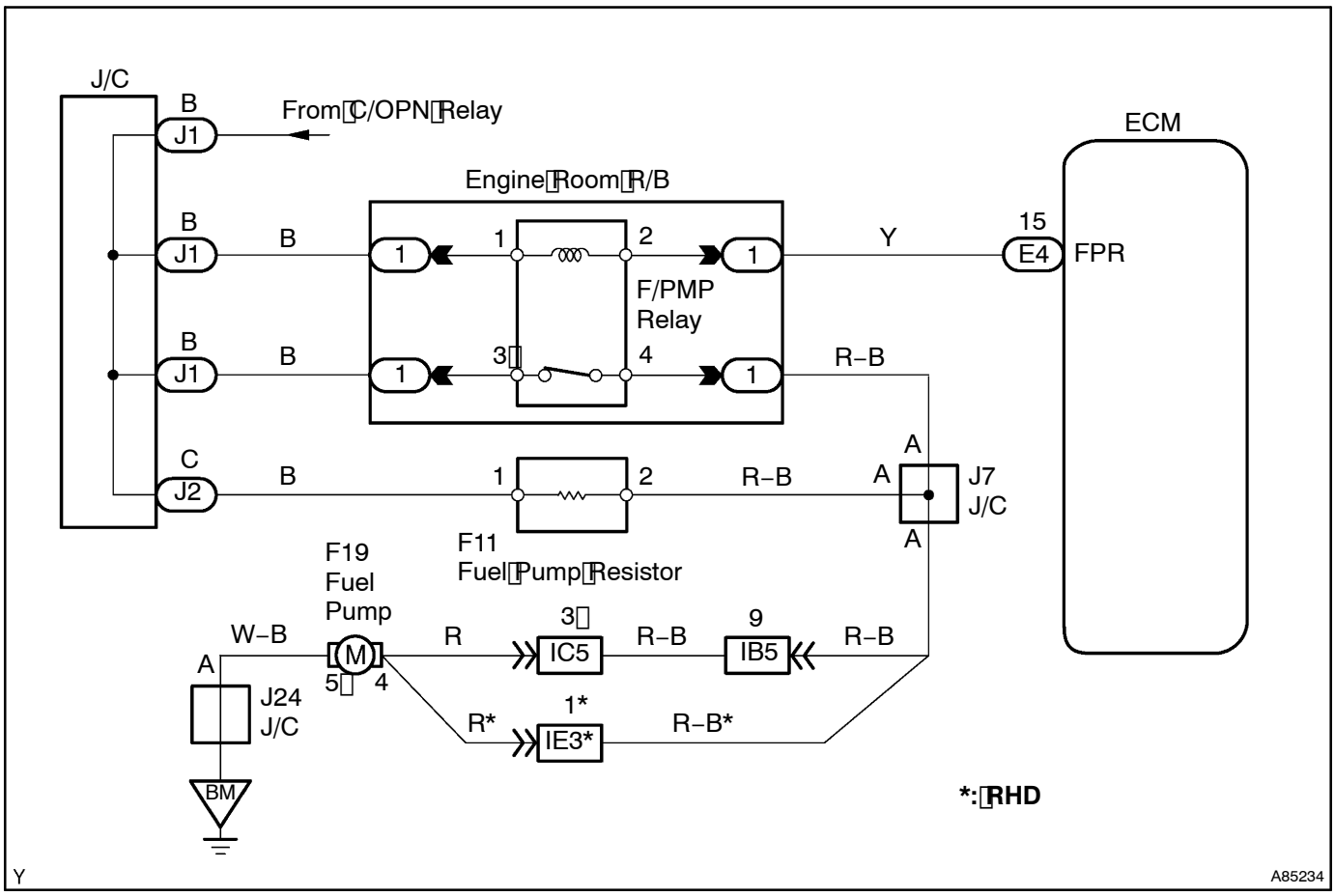
When the engine is cranked, current flows from terminal ST of the ignition switch to the starter relay coil and also current flows to terminal STA of the ECM (STA signal). When the STA signal and NE signal are input to the ECM, Transistor 1 (Tr1) of the ECM is turned ON, current flows to the coil of the circuit opening relay (marking: C/OPN), the relay switches on, power is supplied to the fuel pump, and the fuel pump operates. While the NE signal is generated (engine running), the ECM keeps Tr1 ON (circuit opening relay ON) and the fuel pump also keeps operating. The fuel pump speed is controlled at two levels (high speed or low speed) by the condition of the engine (starting, light load, heavy load).

The fuel pump operates at high speed when: 1) the engine starts and the STA signal is ON; and 2) Transistor 2 (Tr2) of the ECM is OFF, causing the fuel pump relay (marking: F/PMP) to close and battery positive voltage to be applied directly to the fuel pump. The fuel pump operates at low speed when: 1)after the engine starts, the engine is idling or has a light load; and 2) since the ECM's Tr2 is ON, battery positive voltage is applied to the fuel pump via the fuel pump resistor.



DTC No	DTC Detection Condition	Trouble Area
P0230	Open or short in fuel pump relay circuit	• Open or short in F/PMP relay circuit • F/PMP relay • ECM

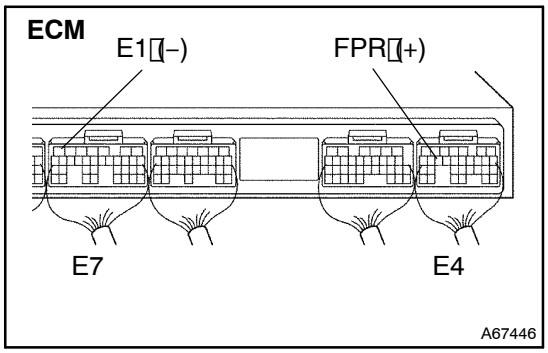
WIRING DIAGRAM



This inspection procedure is based on the premise that the engine is started. If the engine is not started, proceed to the problem symptoms table on page 05–14.

INSPECTION PROCEDURE

1 INSPECT ECM (FPR VOLTAGE)



(a) Measure the voltage between the terminals of the ECM connectors.

Standard:

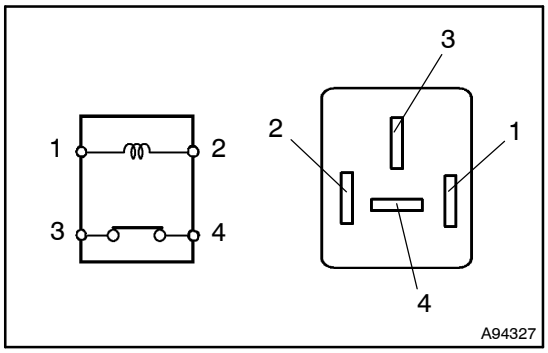
Tester Connection	Condition	Specified Condition
E4–15 (FPR) – E7–7 (E1)	STA signal ON	9 to 14 V
E4–15 (FPR) – E7–7 (E1)	STA signal OFF	0 to 3 V

(b) Reinstall the F/PMP relay

NG → **REPLACE ECM (See page 10–21)**

OK

2 INSPECT RELAY (F/PMP)



(a) Remove the F/PMP relay from the engine room Relay Block (R/B).

(b) Measure the resistance.

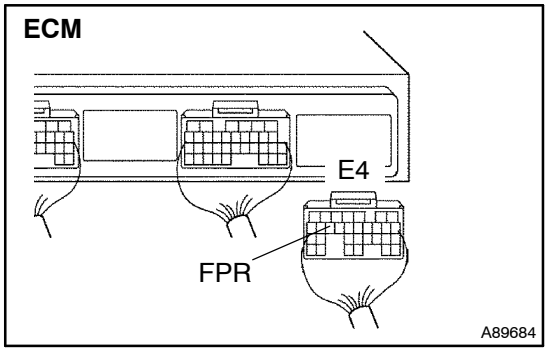
Standard:

Tester Connection	Specified Condition
3 – 4	Below 1 Ω
3 – 4	10 kΩ or higher (apply battery voltage to terminals 1 and 2)

NG → **REPLACE RELAY (F/PMP)**

OK

3 CHECK WIRE HARNESS (F/PMP RELAY – ECM)



(a) Remove the F/PMP relay from the engine room R/B.

(b) Disconnect the E4 ECM connector.

(c) Measure the resistance between the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
F/PMP relay terminal 1 of R/B – E4–15 (FPR)	Below 1 Ω
F/PMP relay terminal 1 of R/B or E4–15 (FPR) – Body ground	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE ECM (See page 10–21)