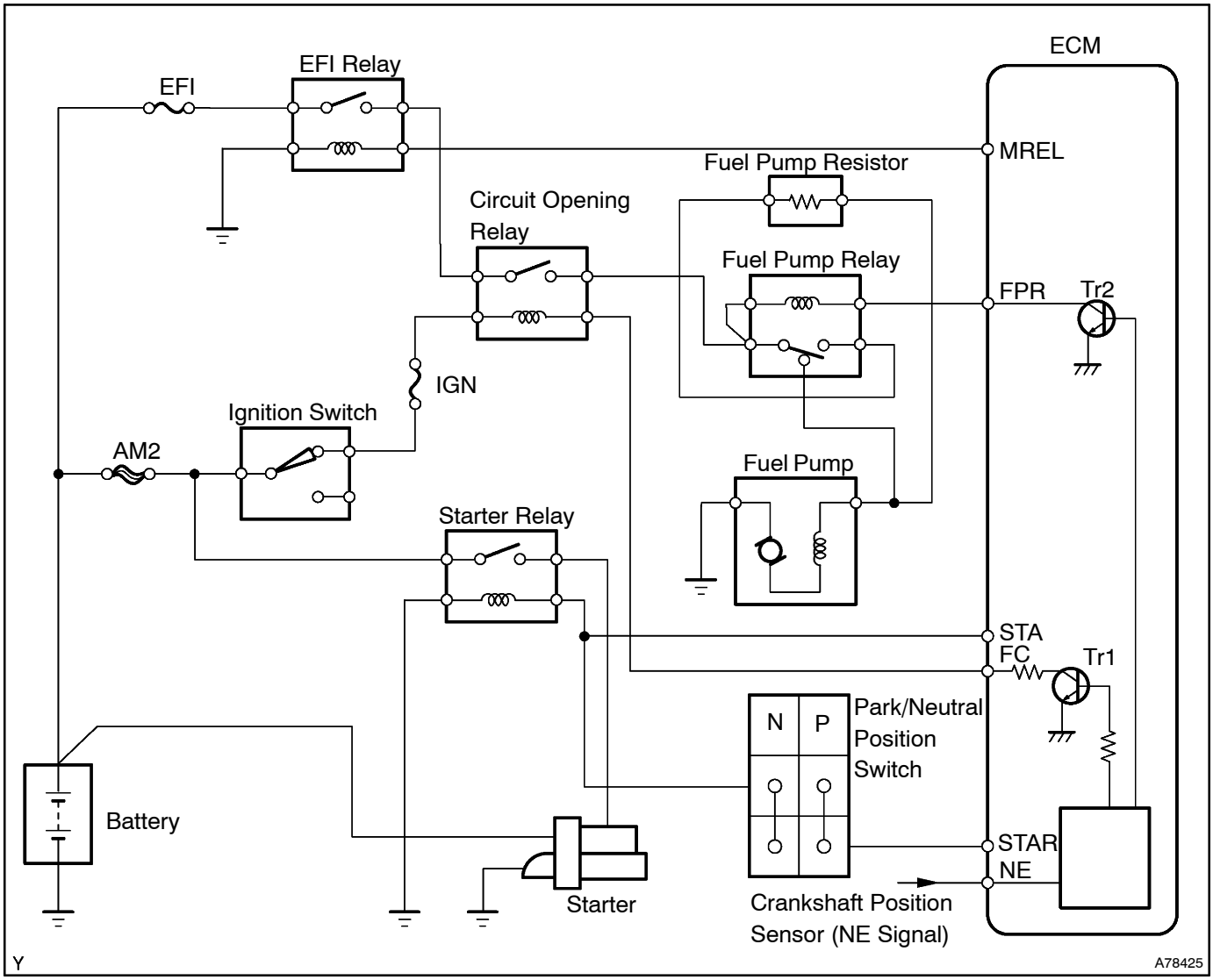
DTC P0230/78 FUEL PUMP PRIMARY CIRCUIT

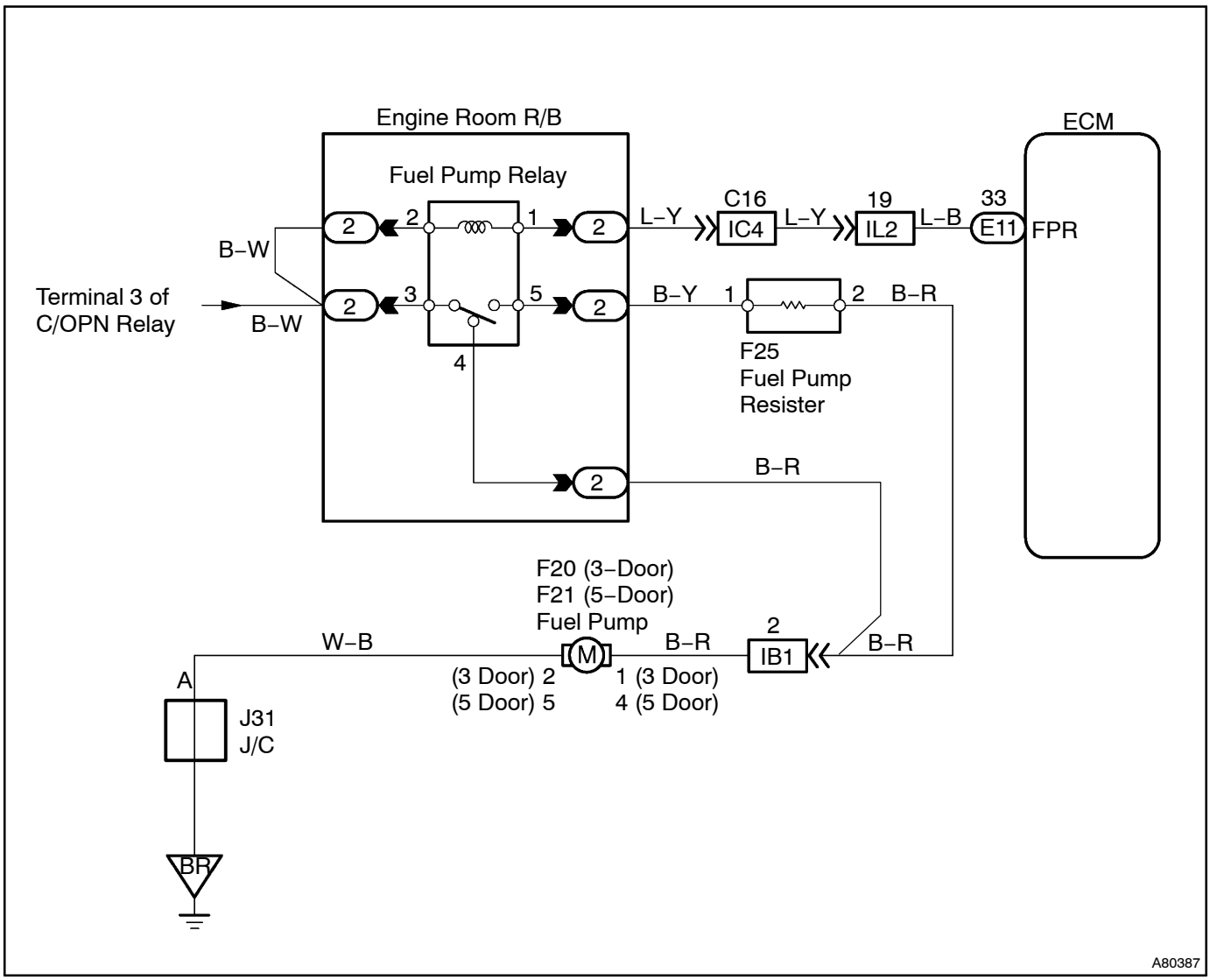
CIRCUIT DESCRIPTION

In the diagram below, when the engine is cranked, current flows from terminal STAR of the ECM 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, Tr1 is turned ON, current flows to the coil of the circuit opening relay, 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 the 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). When the engine starts (STA ON), Tr2 in the ECM is OFF, so the fuel pump relay closes and battery positive voltage is applied directly to the fuel pump. The fuel pump operates at high speed.
After the engine starts during idling or light loads, Tr2 goes ON, power is supplied to the fuel pump via the fuel pump resistor. The fuel pump operates at low speed.



DTC No	DTC Detection Condition	Trouble Area
P0230/78	Open or short in fuel pump relay circuit	• Open or short in fuel pump relay circuit • Fuel pump relay • ECM

WIRING DIAGRAM

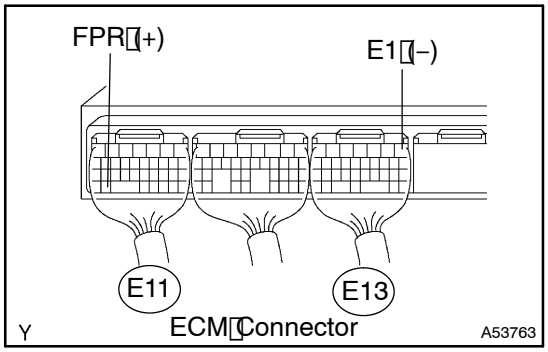


HINT:
This DTC chart is on the premise that the engine is started. If the engine is not started, proceed to the problem symptoms table on 05–33.

INSPECTION PROCEDURE

HINT:
Read freeze frame data using the hand–held tester, as freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1 INSPECT ECM (FPR VOLTAGE)



(a) Measure the voltage between the terminals of the E11 and E13 ECM connectors.

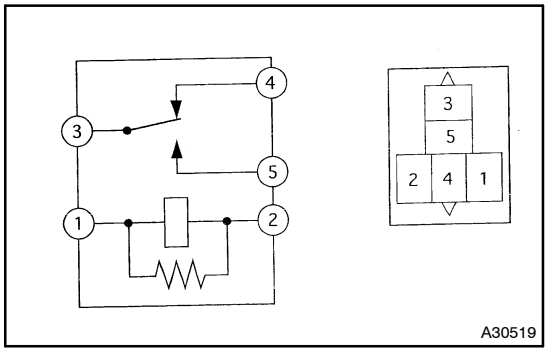
Standard:

Symbols (Terminal No.)	Condition	Specified condition
FPR (E11-33) – E1 (E13-1)	STA signal ON	9 to 14 V
	STA signal OFF	0 to 3 V

OK → **CHECK AND REPLACE ECM** (See page 01–35)

NG

2 INSPECT FUEL PUMP RELAY ASSY



(a) Remove the fuel pump relay from the engine room R/B.
(b) Inspect the fuel pump relay.

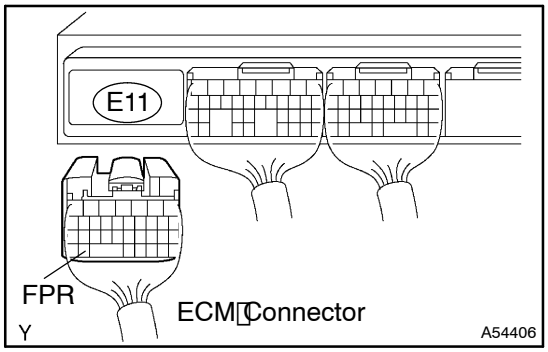
Standard:

Terminal No.	Specified condition
1 – 2 3 – 4	Continuity
3 – 5	No Continuity
	Continuity (Apply battery voltage terminals 1 and 2)

NG → **REPLACE FUEL PUMP RELAY ASSY**

OK

3 CHECK HARNESS AND CONNECTOR (FUEL PUMP RELAY – ECM)



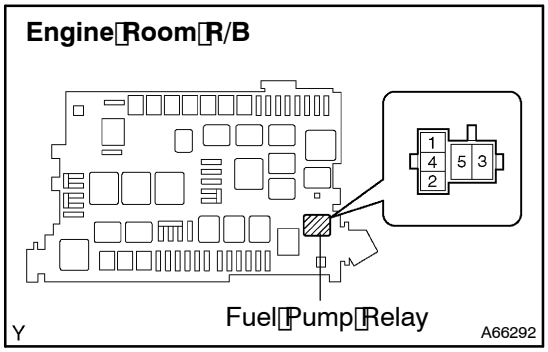
(a) Remove the fuel pump relay from the engine room R/B.
(b) Check for continuity between the wire harness side connectors.

Standard (Check for open):

Symbols (Terminal No.)	Specified condition
Fuel pump relay (1) – FPR (E11–33)	Continuity

Standard (Check for short):

Symbols (Terminal No.)	Specified condition
Fuel pump relay (1) or FPR (E11–33) – Body ground	No continuity



NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE ECM (See page 01–35)