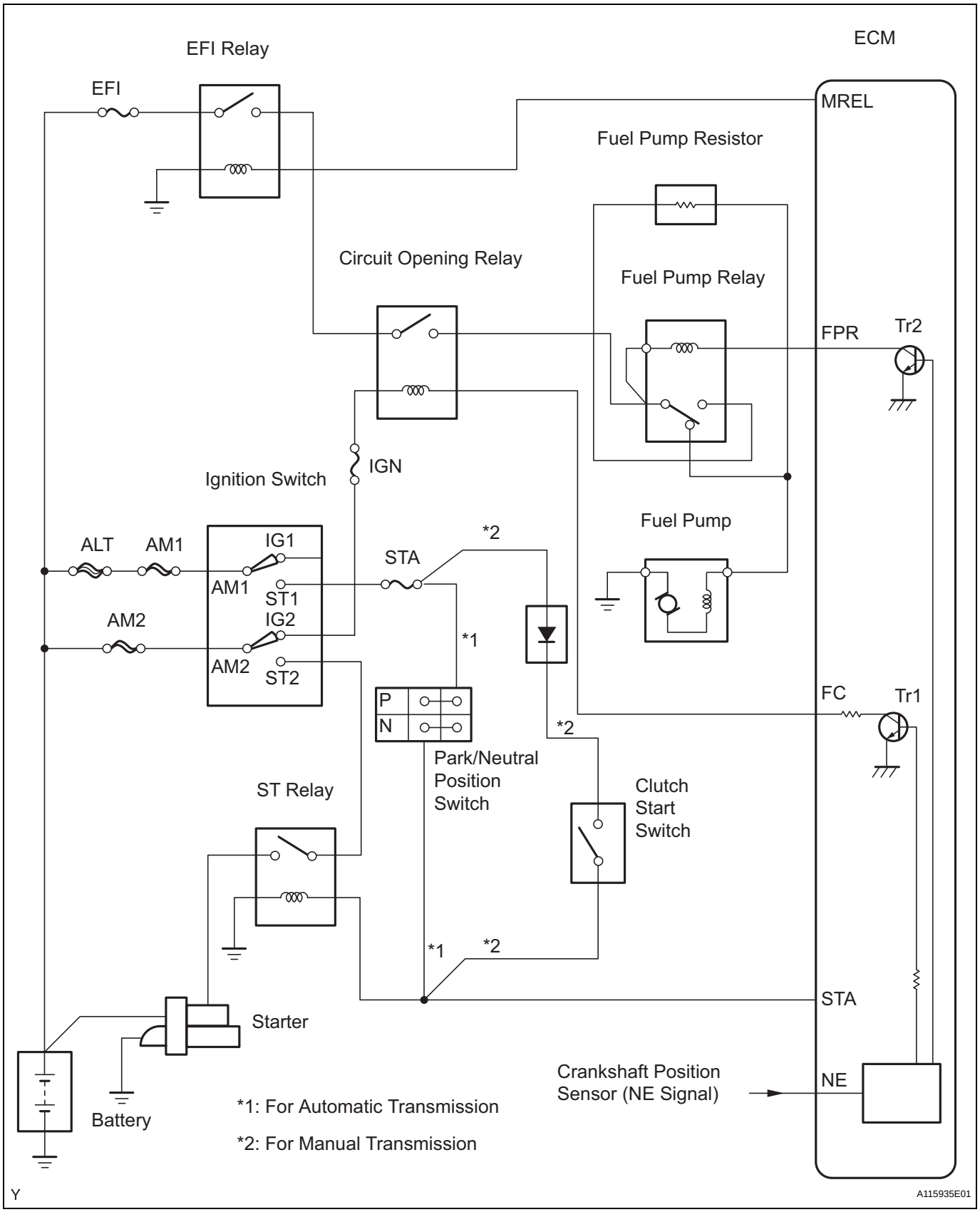
DTC	P0230	Fuel Pump Primary Circuit

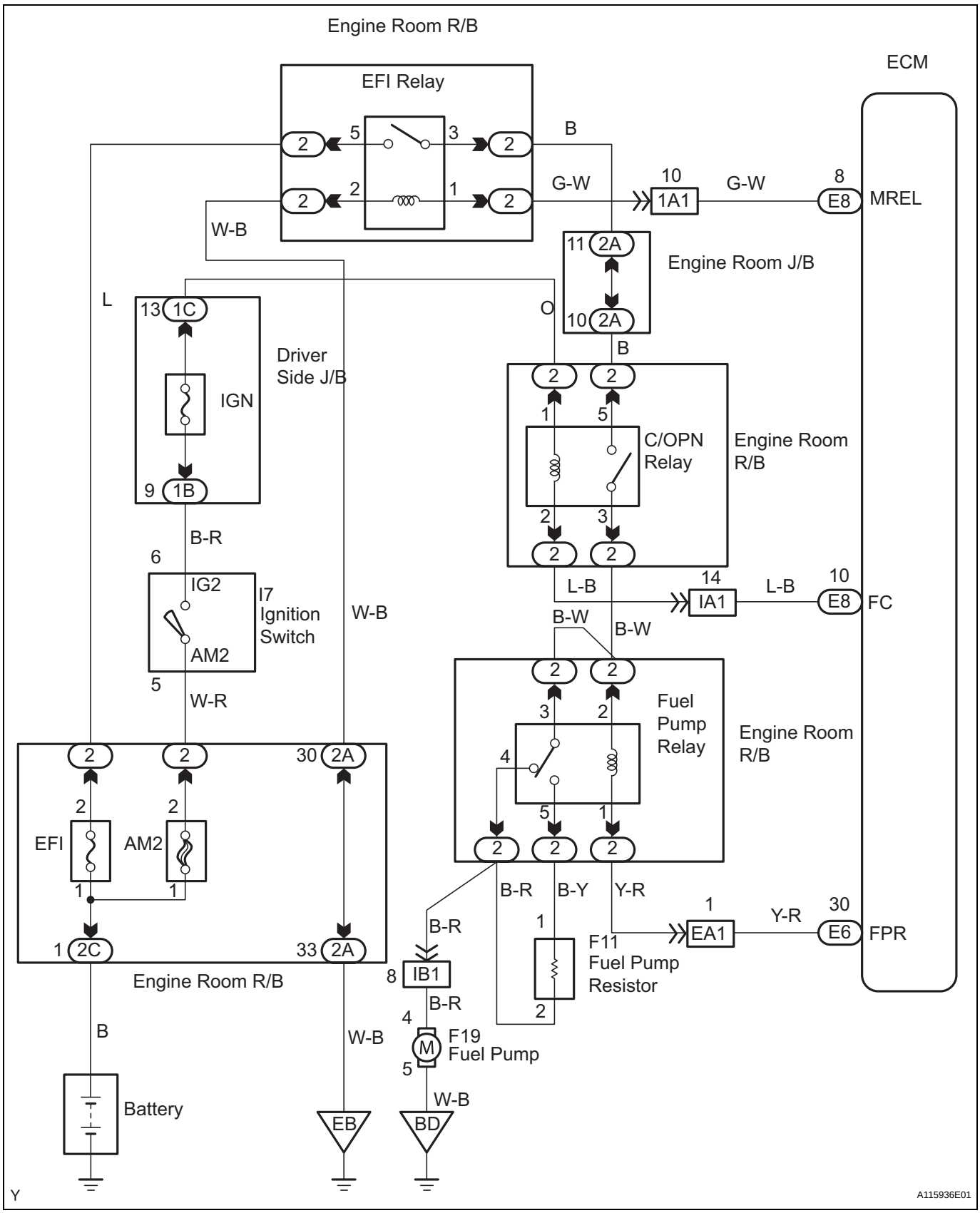
DESCRIPTION

As shown in the illustration, when the engine is cranked, current flows from terminal ST1 of the ignition switch into the ECM and the ST (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 (power transistor 1) 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 engine condition (starting, light load, heavy load). When the engine starts (STA ON), Tr2 (power transistor 2) in the ECM is OFF, so the fuel pump relay closes and positive battery voltage is applied directly to the fuel pump. The fuel pump operates at high speed.
During idling or under light loads, Tr2 goes ON, and then 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 Areas
P0230	Open or short in fuel pump relay circuit (1 trip detection logic)	• Open or short in fuel pump relay circuit • Fuel pump relay • ECM

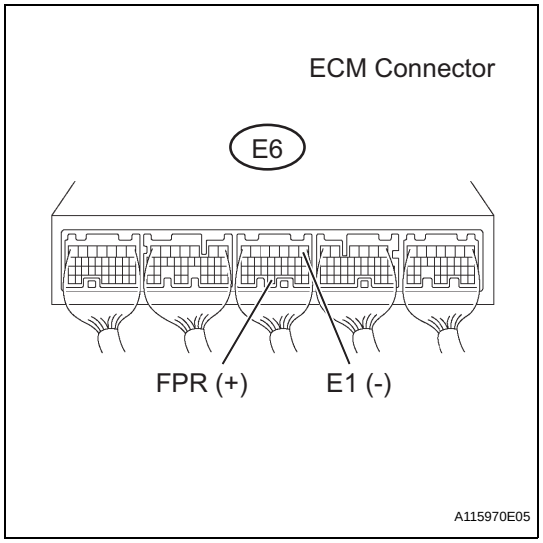
WIRING DIAGRAM



HINT:
This DTC chart is on the premise that the engine is started normally. If the engine is difficult to start, proceed to the problem symptoms table (See page ES-28).

HINT:
Read freeze frame data using an intelligent tester. Freeze frame data record the engine condition when malfunctions are detected. When troubleshooting, freeze frame data can help determine if the vehicle was moving or stationary, if the engine was warmed up or not, if the air-fuel ratio was lean or rich, and other data, from the time the malfunction occurred.

1 CHECK ECM (FPR VOLTAGE)



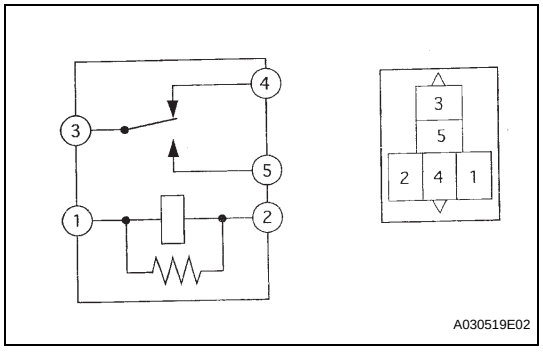
(a) Measure the voltage between the terminals of the E6 ECM connector.
Standard Voltage

Tester Connections	Conditions	Specified Conditions
FPR (E6-30) - E1 (E6-1)	STA signal ON	9 to 14 V
FPR (E6-30) - E1 (E6-1)	STA signal OFF	0 to 3 V

NG → **REPLACE ECM**

OK

2 INSPECT FUEL PUMP RELAY ASSEMBLY



(a) Remove the fuel pump relay from the engine room R/B.
(b) Check the fuel pump relay resistance.
Standard Resistance

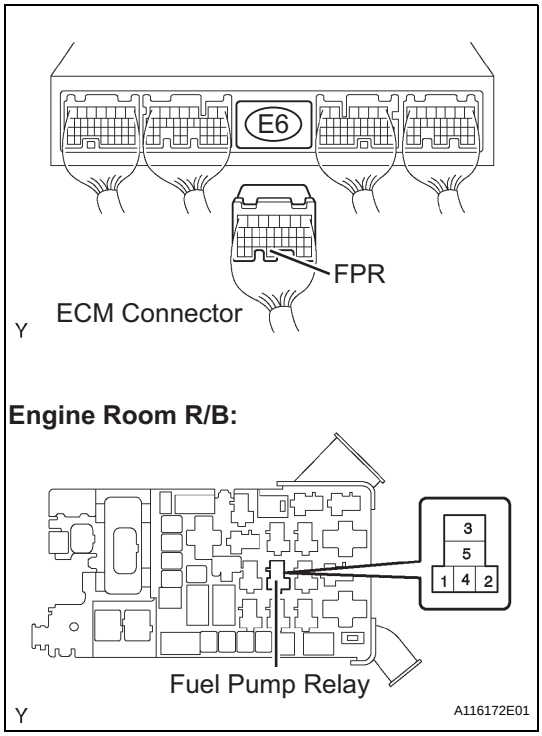
Tester Connections	Specified Conditions
3 - 4	Below 1 Ω
3 - 5	10 kΩ or higher
3 - 4	10 kΩ or higher (when battery voltage applied to terminals 1 and 2)
3 - 5	Below 1 Ω (when battery voltage applied to terminals 1 and 2)

(c) Reinstall the fuel pump relay.

NG → **REPLACE FUEL PUMP RELAY ASSEMBLY**

OK

3	CHECK HARNESS AND CONNECTOR (F/PMP RELAY - ECM)



(a) Remove the fuel pump relay from the engine room R/B.
(b) Disconnect the E6 ECM connector.
(c) Check the resistance.

Standard Resistance (Check for open)

Tester Connections	Specified Conditions
Fuel pump relay (1) - FPR (E6-30)	Below 1 Ω

Standard Resistance (Check for short)

Tester Connections	Specified Conditions
Fuel pump relay (1) or FPR (E6-30) - Body ground	10 kΩ or higher

(d) Reinstall the fuel pump relay.
(e) Reconnect the ECM connector.

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

OK

REPLACE ECM