

PROBLEM SYMPTOMS TABLE

HINT:

- Inspect the fuses and relays before confirming the suspected areas in the table below.
- Inspect each malfunction circuit in numerical order for the corresponding symptom.

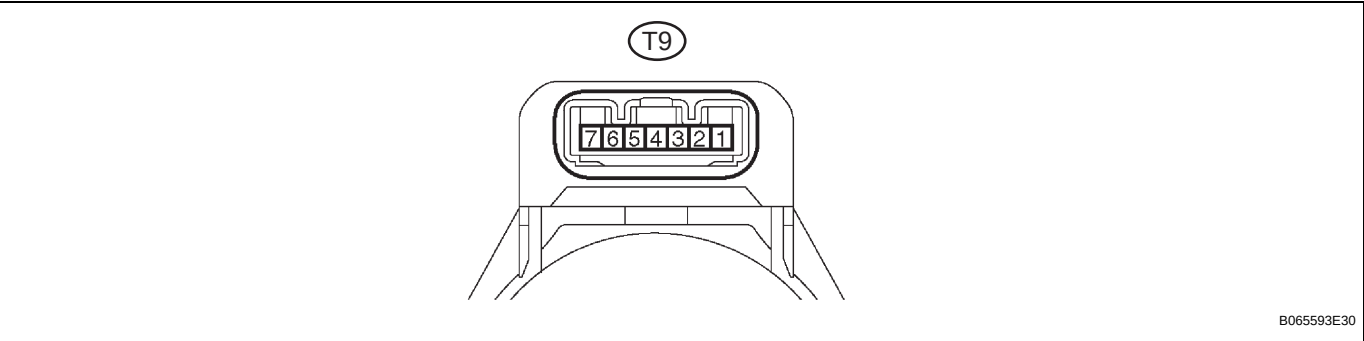
If any malfunction still exists even after checking and confirming that all the circuits are normal, replace the ECU.

ENGINE IMMOBILISER SYSTEM

Symptom	Suspected Area	See page
Immobiliser is not set.	1. Door courtesy switch circuit	EI-39
	2. Transponder key ECU assembly	-
Engine does not start.	1. Key	EI-17
	2. Key unlock warning switch circuit	EI-20
	3. Transponder key amplifier circuit	EI-23
	4. Transponder key ECU assembly	-
	5. ECM	ES-406
Security indicator is always ON.	1. Security indicator light	EI-36
	2. Transponder key ECU assembly	-
Security indicator is always ON. (Although code has been registered in the automatic registration mode, indicator does not go off.)	1. Transponder key amplifier circuit	EI-23
	2. Transponder key ECU assembly	-
Security indicator is OFF.	1. Security indicator light circuit	EI-36
	2. Transponder key ECU assembly	-
Security indicator is abnormally blinking.	Transponder key ECU assembly	-
No code is output.	1. ECU power source circuit	EI-41
	2. Diagnosis circuit	EI-43
	3. Transponder key ECU assembly	-

TERMINALS OF ECU

1. CHECK TRANSPONDER KEY AMPLIFIER



- (a) Disconnect the T9 amplifier connector.
- (b) Measure the resistance according to the value(s) in the table below.

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
GND (T9-7) - Body ground	Y - Body ground	Ground	Always	Below 1 Ω

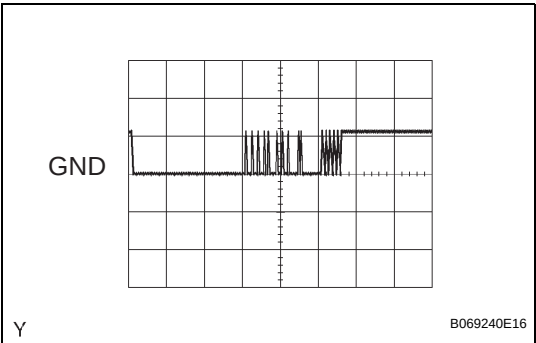
If the result is not as specified, there may be a malfunction on the wire harness side.

- (c) Reconnect the T9 amplifier connector.
- (d) Measure the voltage and resistance according to the value(s) in the table below.

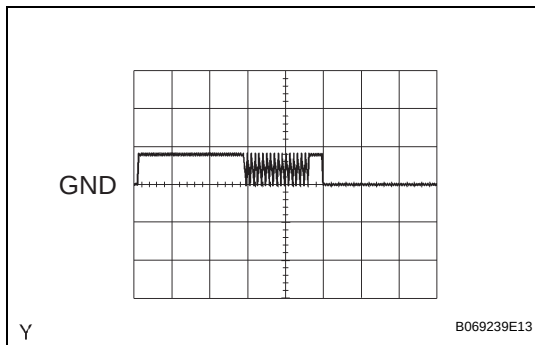
Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
VC5 (T9-1) - GND (T9-7)	G-R - Y	Power source	No key in ignition key cylinder → Key inserted	0 V → 4.6 to 5.4 V
CODE (T9-4) - GND (T9-7)	L - Y	Demodulated signal of key code data	No key in ignition key cylinder → Key inserted	Pulse generation (see waveform 1)
TXCT (T9-5) - GND (T9-7)	G - Y	Key code output signal	No key in ignition key cylinder → Key inserted	Pulse generation (see waveform 2)

If the result is not as specified, the amplifier may have a malfunction.

- (e) Inspect using an oscilloscope.
(1) Waveform 1 (Reference):



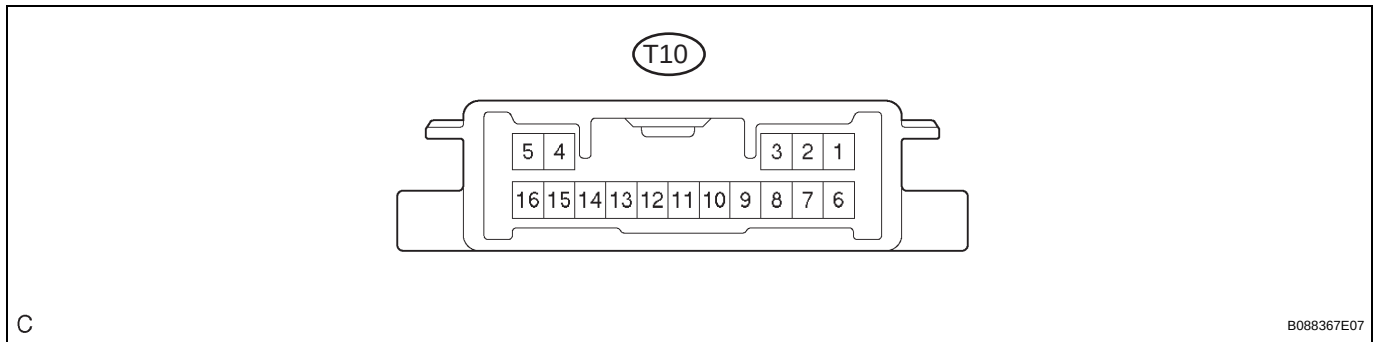
Terminal	CODE - AGND
Tool Setting	10 V/DIV., 20 ms/DIV.
Condition	No key in ignition key cylinder → Key inserted



(2) Waveform 2 (Reference):

Terminal	CODE - AGND
Tool Setting	5 V/DIV., 20 ms/DIV.
Condition	No key in ignition key cylinder → Key inserted

2. CHECK TRANSPONDER KEY ECU ASSEMBLY



- (a) Disconnect the T10 ECU connector, and measure the voltage and resistance according to the value(s) in the table below.

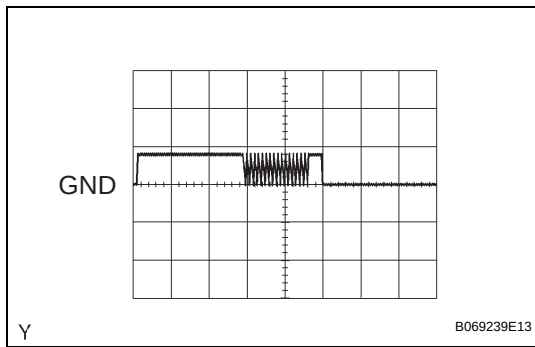
Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
+B (T10-1) - GND (T10-16)	R-B - W-B	Battery	Always	10 to 14 V
IG (T10-2) - GND (T10-16)	B-W - W-B	Ignition switch	Ignition switch OFF → ON	Below 1 V → 10 to 14 V
GND (T10-16) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω

If the result is not as specified, there may be a malfunction on the wire harness side.

- (b) Reconnect the T10 ECU connector, and measure the voltage according to the value(s) in the table below.

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
KSW (T10-3) - GND (T10-16)	L-B - W-B	Unlock warning switch	No key in ignition key cylinder → Key inserted	10 to 14 V → Below 1 V
TXCT (T10-4) - AGND (T10-5)	G - Y	Transponder key amplifier communication signal	Ignition switch ON	Waveform 1
CTY (T10-7) - GND (T10-16)	R-W - W-B	Courtesy signal	Driver side door is open → closed	10 to 14 V → Below 1 V
IND (T10-8) - GND (T10-16)	R-W - W-B	Security indicator signal	Engine immobiliser system SET → UNSET	3 to 5 V → Below 1 V
D (T10-9) - GND (T10-16)	L-R - W-B	Diagnosis tester communication	Ignition switch ON	Pulse generation
EFII (T10-12) - GND (T10-16)	B - W-B	ECM input signal	Ignition switch ON	Waveform 4
EFIO (T10-13) - GND (T10-16)	W - W-B	ECM output signal	Ignition switch ON	Waveform 3
VC5 (T10-14) - AGND (T10-5)	GR - Y	Power source	Ignition switch OFF → ON	Below 1 V → 4.6 to 5.4 V
CODE (T10-15) - AGND (T10-5)	L - Y	Transponder key amplifier ground	Ignition switch ON	Waveform 2

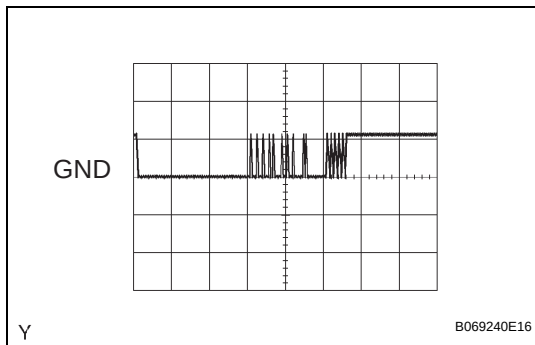
If the result is not as specified, the ECU may have a malfunction.



(c) Inspect using an oscilloscope.

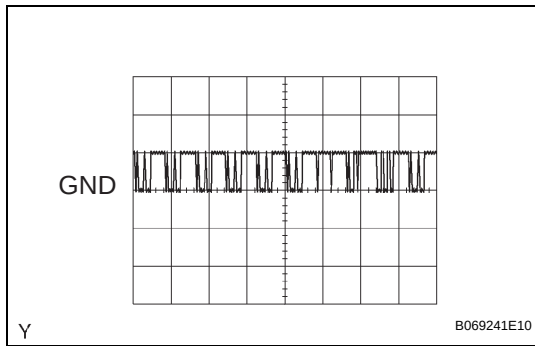
(1) Waveform 1 (Reference):

Terminal	TXCT - AGND
Tool Setting	5 V/DIV., 20 ms/DIV.
Condition	Ignition switch ON



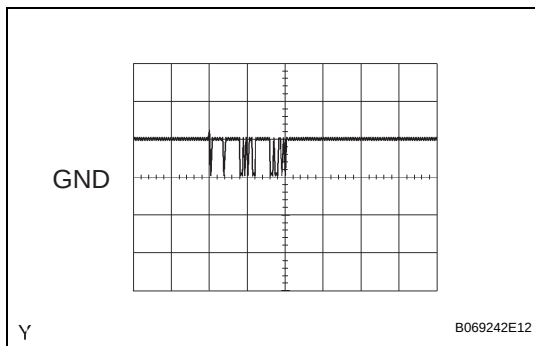
(2) Waveform 2 (Reference):

Terminal	CODE - AGND
Tool Setting	5 V/DIV., 20 ms/DIV.
Condition	Ignition switch ON



(3) Waveform 3 (Reference):

Terminal	EFIO - GND
Tool Setting	10 V/DIV., 500 ms/DIV.
Condition	Ignition switch ON



(4) Waveform 4 (Reference):

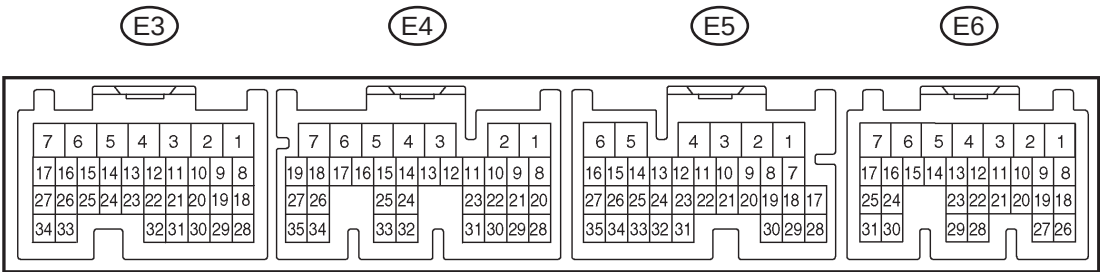
Terminal	EFII - GND
Tool Setting	10 V/DIV., 500 ms/DIV.
Condition	Ignition switch ON

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

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
AGND (T10-5) - GND (T10-16)	Y - W-B	Amplifier ground circuit	Always	Below 1 Ω

If the result is not as specified, the ECU may have a malfunction.

3. CHECK ECM



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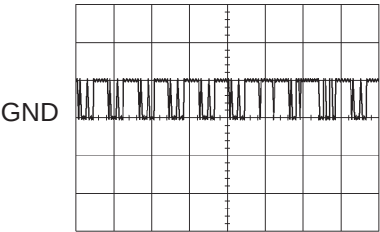
(a) Measure the voltage and resistance according to the value(s) in the table below.

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
IMI (E5-27) - EOM (E6-15)	W - W-B	Transponder key ECU output signal	No key in ignition key cylinder → Key inserted	Pulse generation (see waveform 1)
IMO (E5-26) - EOM (E6-15)	B - W-B	Transponder key ECU input signal	No key in ignition key cylinder → Key inserted	Pulse generation (see waveform 2)
EOM (E6-15) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω

If the result is not as specified, there may be a malfunction on the wire harness side.

(b) Inspect using an oscilloscope.
(1) Waveform 1 (Reference):

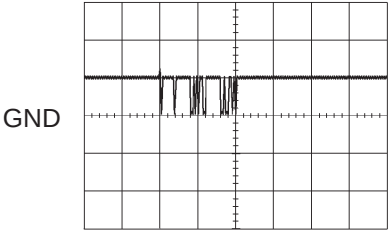
Terminal	IMI - EOM
Tool Setting	10 V/DIV., 500 ms/DIV.
Condition	No key in ignition key cylinder → Key inserted



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(2) Waveform 2 (Reference):

Terminal	IMO - EOM
Tool Setting	10 V/DIV., 500 ms/DIV.
Condition	No key in ignition key cylinder → Key inserted



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