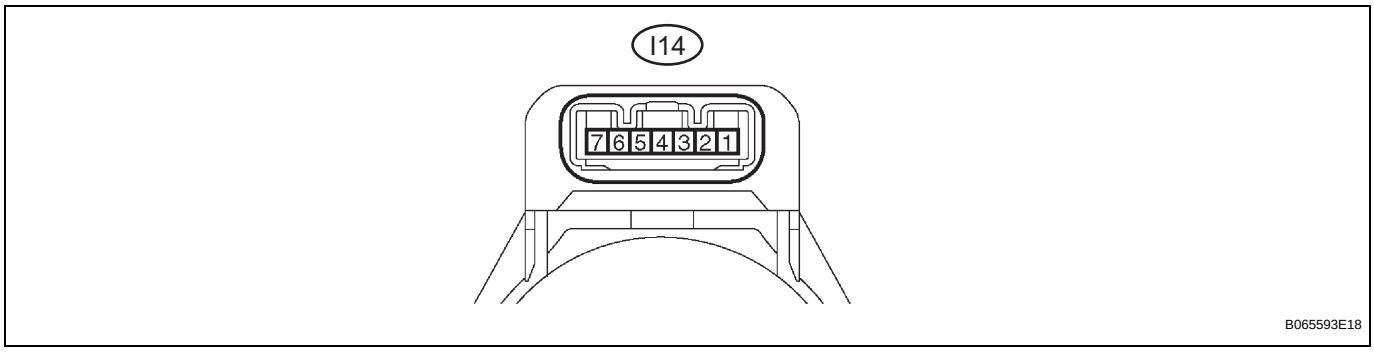
PROBLEM SYMPTOMS TABLE

ENGINE IMMOBILISER SYSTEM

Symptom	Suspected Area	See page
Engine does not start	1. Key (Transponder chip malfunction)	EI-24
	2. Key (Unmatched encryption code)	EI-25
	3. Key (Unmatched key code)	EI-26
	4. Key (No communication in immobiliser system)	EI-27
	5. Key (Communication malfunction)	EI-31
	6. Transponder key amplifier (Antenna coil open / short)	EI-21
	7. Transponder key amplifier (No communication in immobiliser system)	EI-25
	8. Transponder key amplifier (Communication malfunction)	EI-31
	9. Transponder key ECU assembly (Key unlock warning switch malfunction)	EI-18
	10. Transponder key ECU assembly (Antenna coil open / short)	EI-21
	11. Transponder key ECU assembly (No communication in immobiliser system)	EI-27
	12. Transponder key ECU assembly (Communication malfunction)	EI-31
	13. Transponder key ECU assembly (Engine immobiliser system malfunction)	EI-34

TERMINALS OF ECU

1. CHECK TRANSPONDER KEY AMPLIFIER



(a) Disconnect the I14 amplifier connector and measure the resistance between the terminal of the wire harness side connector and body ground.

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
GND (I14-7) - Body ground	BR-R - Body ground	Ground	Always	Below 1 Ω

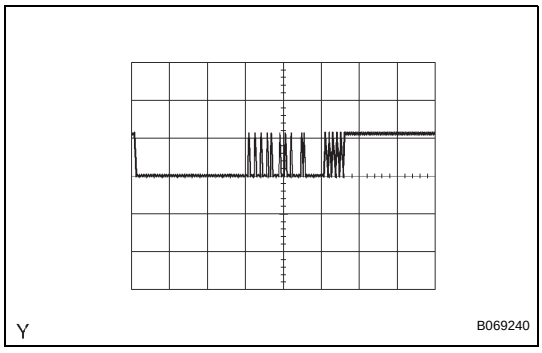
If the result is not as specified, there may be a malfunction on the wire harness side.

(b) Reconnect the I14 amplifier connector and measure the resistance and voltage of each terminal of the connector.

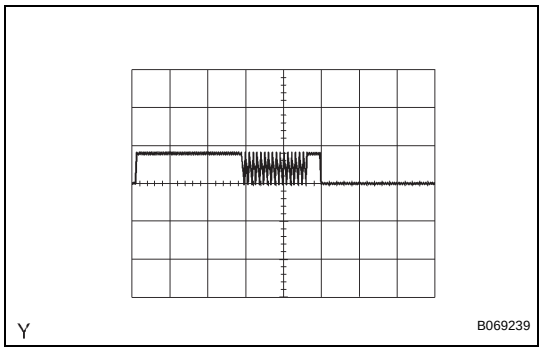
Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
VC5 (I14-1) - GND (I14-7)	Y-B - BR-R	Power source	No key is in ignition key cylinder	Below 1 V
			Key is in ignition key cylinder	4.6 to 5.4 V
CODE (I14-4) - GND (I14-7)	Y - BR-R	Demodulated signal of key code date	No key is in ignition key cylinder	Below 1 V
			Key is in ignition key cylinder	Waveform 1
TXCT (I14-5) - GND (I14-7)	Y-R - BR-R	Key code output signal	No key is in ignition key cylinder	Below 1 V
			Key is in ignition key cylinder	Waveform 2
GND (I14-7) - Body ground	BR-R - Body ground	Ground	Always	Below 1 Ω

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

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



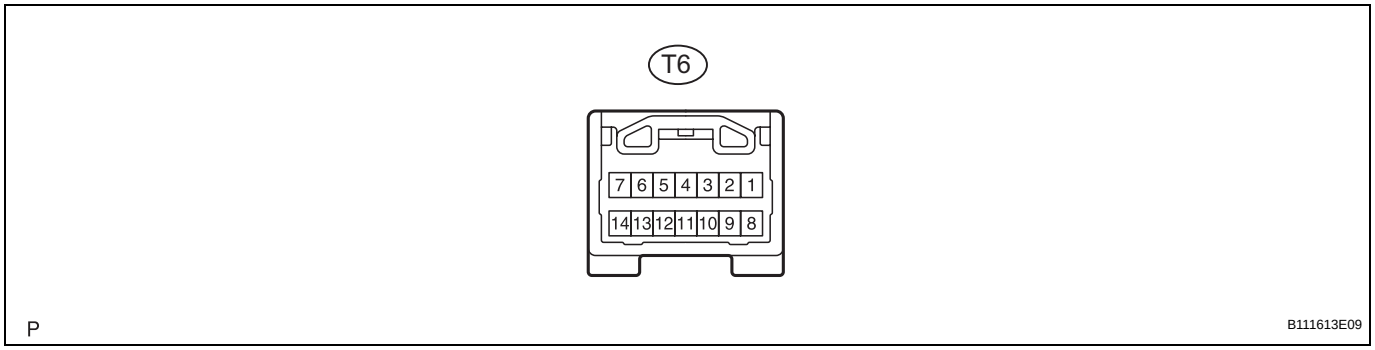
Terminal	CODE - GND
Tool Setting	5 V/DIV., 20 ms/DIV.
Condition	Key is in ignition key cylinder



(2) Waveform 2 (Reference):

Terminal	TXCT - GND
Tool Setting	5 V/DIV., 20 ms/DIV.
Condition	Key is in ignition key cylinder

2. CHECK TRANSPONDER KEY ECU ASSEMBLY



(a) Disconnect the T6 ECU connector and measure the resistance and voltage between each terminal of the wire harness side connector.

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
+B (T6-1) - GND (T6-14)	W-L - W-B	Battery	Always	10 to 14 V
IG (T6-2) - GND (T6-14)	B-O - W-B	Ignition switch	Ignition switch off	Below 1 V
			Ignition switch on	10 to 14 V
KSW (T6-10) - GND (T6-14)	L-W - W-B	Unlock warning switch	No key is in ignition key cylinder	10 kΩ or higher
			Key is in ignition key cylinder	Below 1 Ω

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

(b) Reconnect the T9 ECU connector and measure the voltage of each terminal of the connector.

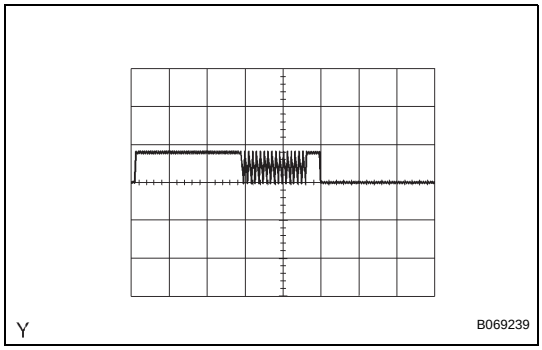
Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
AGND (T6-13) - Body ground	BR-R - Body ground	Ground	Always	Below 1 Ω
KSW (T6-10) - GND (T6-14)	L-W - W-B	Unlock warning switch	No key is in ignition key cylinder	10 to 14 V
			Key is in ignition key cylinder	Below 1 V
VC5 (T6-8) - AGND (T6-13)	Y-B - BR-R	Power source	Ignition switch off	Below 1 V
			Ignition switch on	4.6 to 5.4 V
TXCT (T6-12) - AGND (T6-13)	Y-R - BR-R	Transponder key amplifier communication signal	No key is in ignition key cylinder	Below 1 V
			Key is in ignition key cylinder	Waveform 1
CODE (T6-11) - AGND (T6-13)	Y - BR-R	Transponder key amplifier ground	No key is in ignition key cylinder	Below 1 V
			Key is in ignition key cylinder	Waveform 2

EI

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
EFIO (T6-6) - GND (T6-14)	BR-R - W-B	ECM output signal	Ignition switch off	Below 1 V
			Ignition switch on	Waveform 3
EFII (T6-7) - GND (T6-14)	BR-W - W-B	ECM input signal	Ignition switch off	Below 1 V
			Ignition switch on	Waveform 4

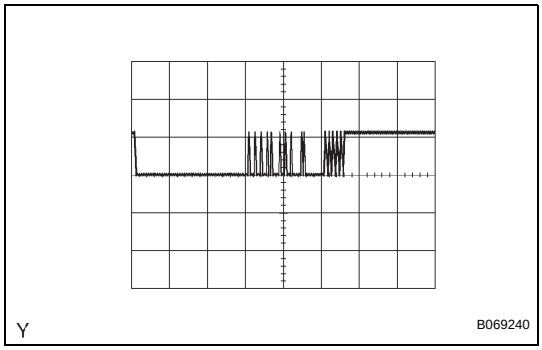
If the result is not as specified, the ECU may have a malfunction.

(c) Inspect using an oscilloscope.
(1) Wave form 1 (Reference):



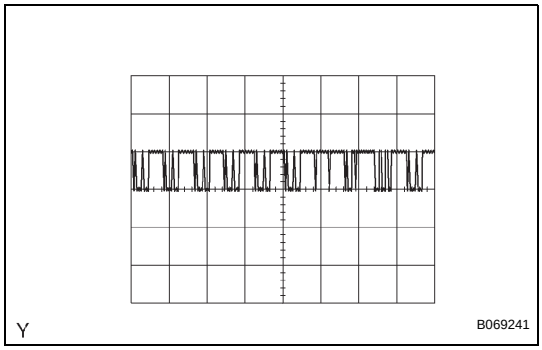
Terminal	TXCT - AGND
Tool Setting	5 V/DIV., 20 ms/DIV.
Condition	Key is in ignition key cylinder

(2) Wave form 2 (Reference):



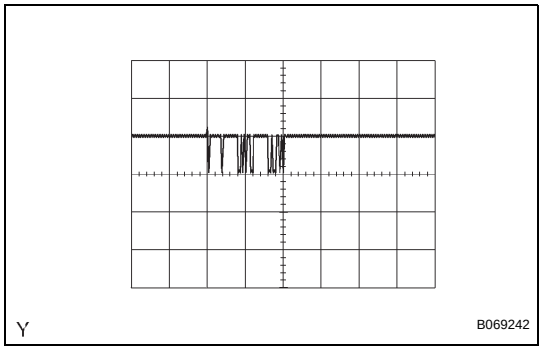
Terminal	CODE - AGND
Tool Setting	10 V/DIV., 20 ms/DIV.
Condition	Key is in ignition key cylinder

(3) Wave form 3 (Reference):



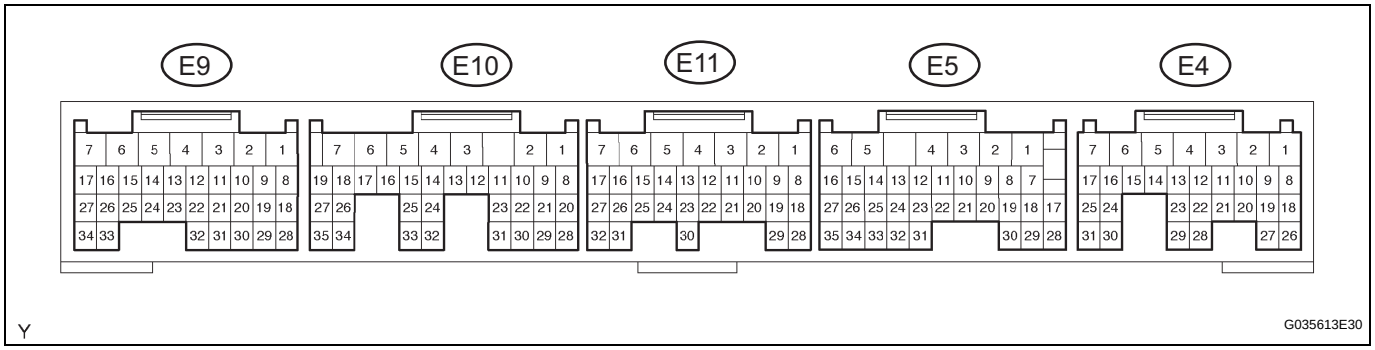
Terminal	EFIO - AGND
Tool Setting	5 V/DIV., 50 ms/DIV.
Condition	Ignition switch on

(4) Wave form 4 (Reference):



Terminal	EFII - AGND
Tool Setting	5 V/DIV., 50 ms/DIV.
Condition	Ignition switch on

3. CHECK ECM



(a) Disconnect the E11 ECM connector and measure the resistance between the terminal of the wire harness side connector and body ground.

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
E1 (E11-1) - Body ground	BR - Body ground	Ground	Always	Below 1 Ω

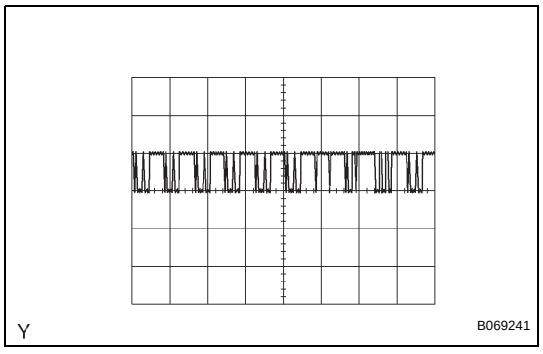
If the result is not as specified, there may be a malfunction on the wire harness side.

(b) Reconnect the E11 ECM. Measure the voltage between each terminal of the connector according to the value(s) in the table below.

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
IMI (E5-16) - E1 (E11-1)	BR-R - BR	Transponder key ECU input signal	Ignition switch off	Below 1 V
			Ignition switch on	Waveform 1
IMO (E5-15) - E1 (E11-1)	BR-W - BR	Transponder key ECU output signal	Ignition switch off	Below 1 V
			Ignition switch on	Waveform 2

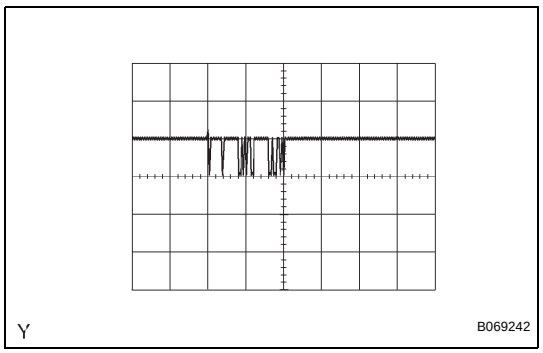
If the result is not as specified, there may be a malfunction on the wire harness side.

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



Terminal	IMI - E1
Tool Setting	5 V/DIV., 50 ms/DIV.
Condition	Ignition switch on

(2) Waveform 2 (Reference):



Terminal	IMO - E1
Tool Setting	5 V/DIV., 50 ms/DIV.
Condition	Ignition switch on