

ENGINE IMMOBILIZER

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شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



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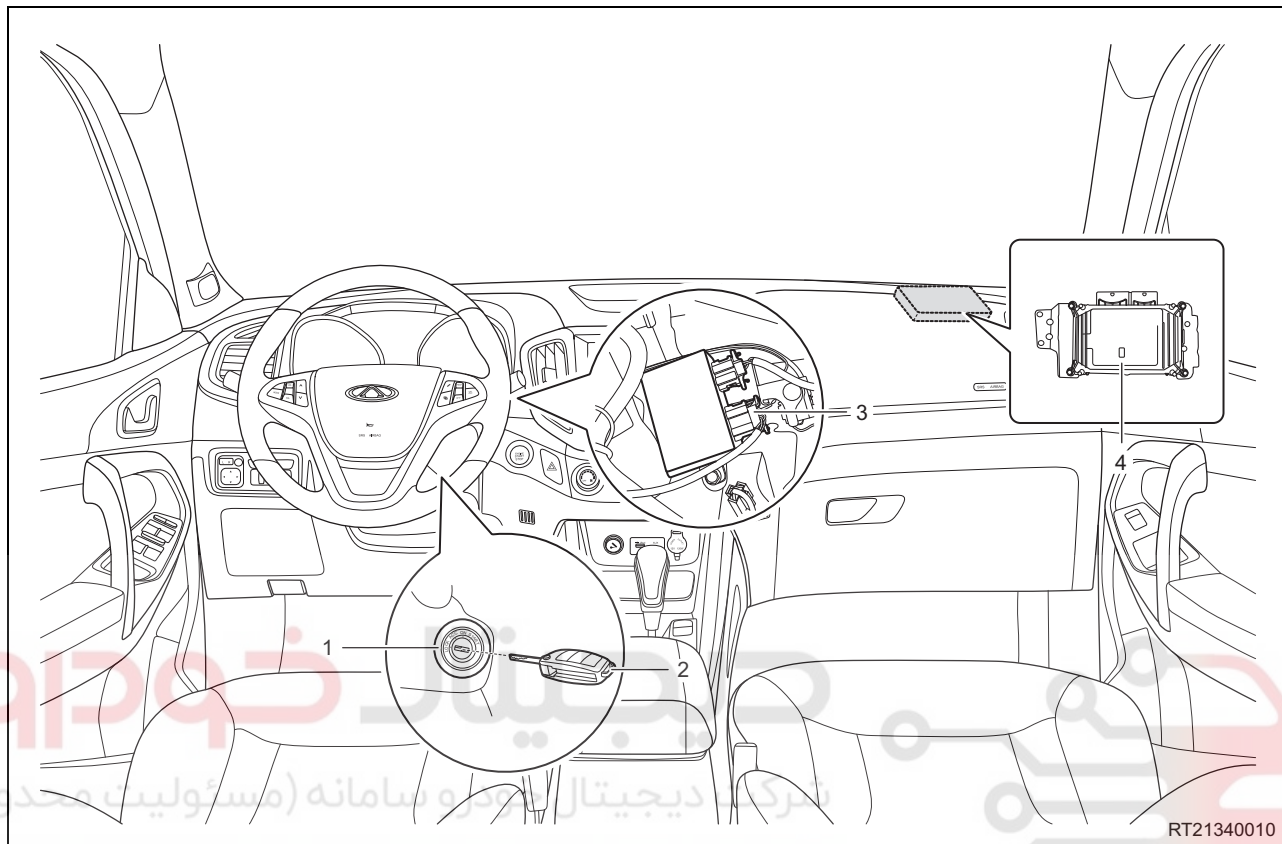
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GENERAL INFORMATION

Description



1 - Ignition Switch (Built-in Immobilizer Coil)	2 - Ignition Key (Built-in Transponder)
3 - Engine Control Module (ECM)	4 - Immobilizer Control Module

The vehicle is equipped with engine immobilizer system. The anti-theft features of the vehicle have improved due to the integration technology of ignition key identification and engine start-up. When the engine is started with unprogrammed ignition key, the engine immobilizer sends the detected signal to the engine control module and the engine control module outputs the prohibit starting command, thus effectively reduces the possibility of being stolen.

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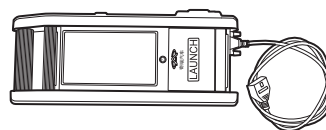
Operation

When the ignition key is inserted into the ignition switch, the immobilizer coil can detect the data information of the ignition key, and sends the data information to the immobilizer control module. The immobilizer control module communicates with the engine control module (ECM) via CAN - Line, realizing codes verification and mutual certification. The ignition switch supply power to the immobilizer control module continuously, allowing the immobilizer to save the trigger memory that has been generated and the malfunctioning content.

Tools

Special Tool

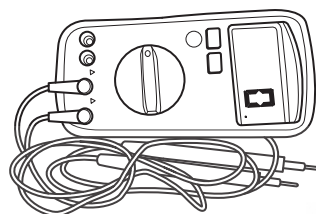
X-431 3G Diagnostic Tester



RCH0000001

General Tool

Digital Multimeter

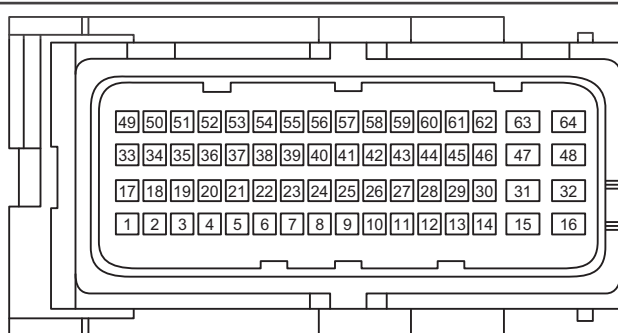
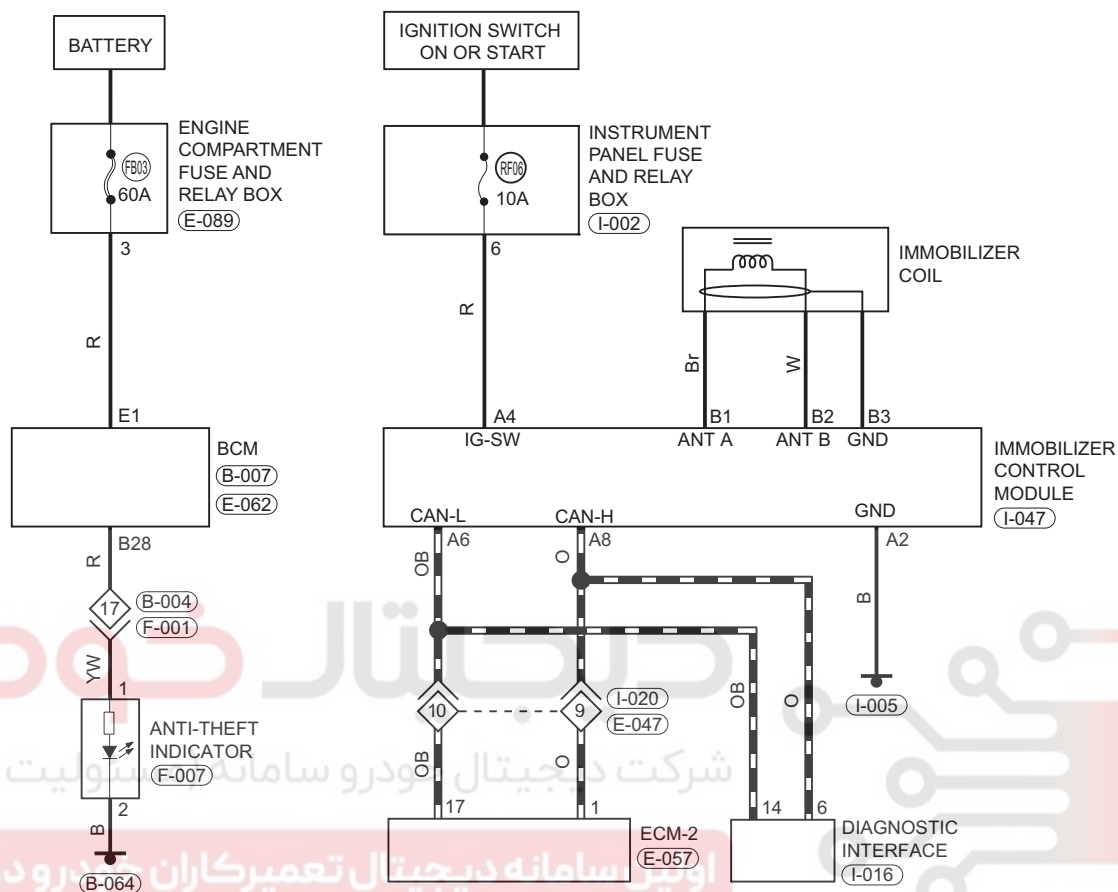
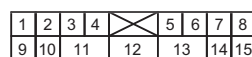
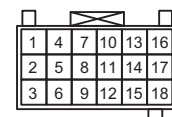
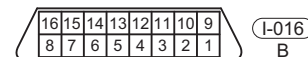
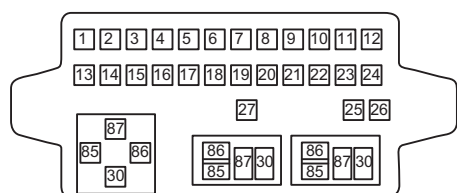


RCH0000002

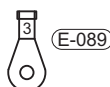
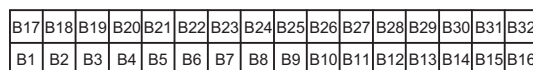
Circuit Diagram

Engine Immobilizer System

w/o PEPS

(E-057)
BI-020
WI-047
BB-004
WI-016
B

I-002

E-062
WB-007
L

ET21450010

Immobilizer Control Module Terminal List

No.	Definition	Description
1	-	-
2	GND	Ground
3	-	-
4	IG-SW	Ignition Switch Power Supply
5	-	-
6	CAN-L	CAN Low (Diagnosis)
7	-	-
8	CAN-H	CAN High (Diagnosis)
B1	ANT A	Coil (ANT A)
B2	ANT B	Coil (ANT B)
B3	GND	Coil (GND)

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DIAGNOSIS & TESTING

Problem Symptoms Table

HINT:

Use the table below to help determine the cause of the problem. Check each suspected area in sequence. Repair or replace the faulty components, or adjust as necessary.

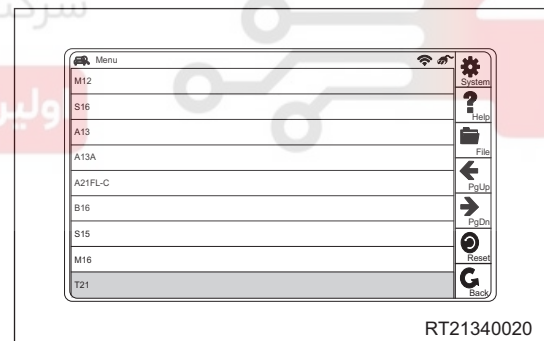
Symptom	Suspected Area	See page
Immobilizer system causes the engine cannot start or immobilizer system has failed	Ignition key (transponder)	50-58
	Immobilizer coil	59-13
	Wire harness or connector	-
	Immobilizer control module	45-17
	Electronic fuel injection system	-
	ECM	06-257

Engine Immobilizer System Match

If the transponder, ECM or immobilizer control module is replaced, match the system again using diagnostic tester. When matching the engine immobilizer system, please send the VIN of the vehicle to After-Sales Service Department of Chery International to get the safety code.

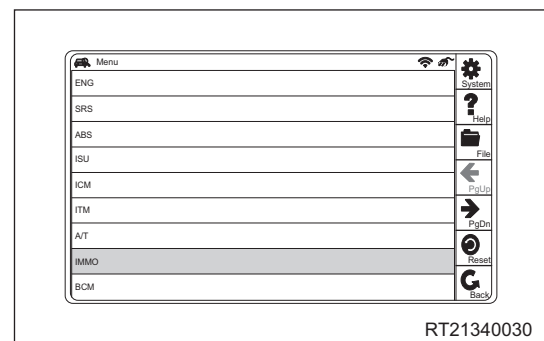
The operation procedures are as follows:

1. Connect the X-431 3G diagnostic tester to the Data Link Connector (DLC).
2. Turn ignition switch to ON.
3. Turn the X-431 3G diagnostic tester on, then select "T21".



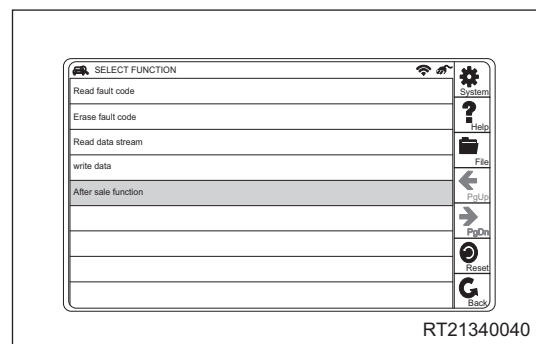
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4. Select "IMMO".

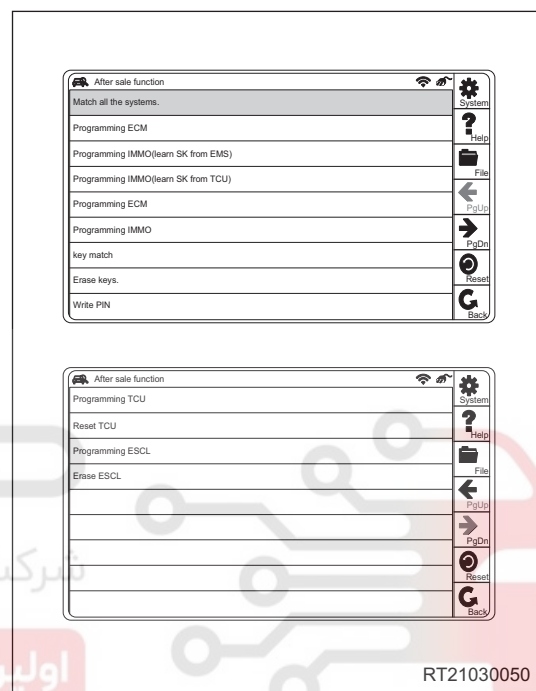


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5. Select "After sale function".

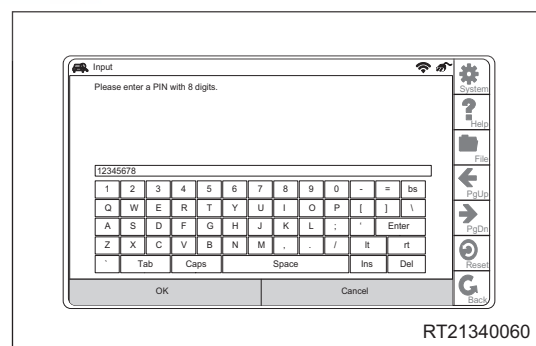


6. Select the required match item.



7. Input the Security Code or PIN Code (from Chery), and then click "OK".

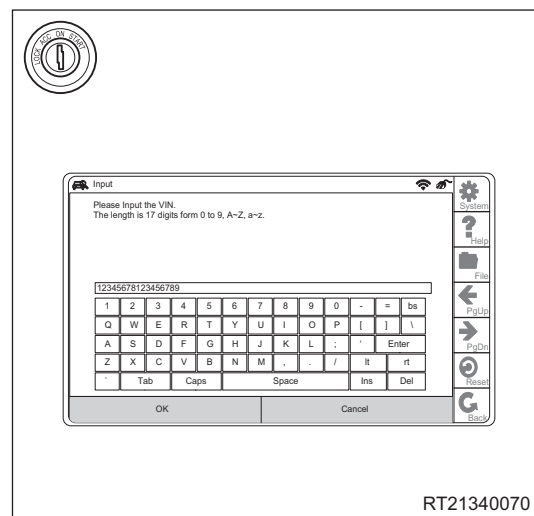
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CAUTION

- The code in the illustration is only an example.

8. Input the VIN code, and then click "OK".



9. Match all the systems.

If the transponder, immobilizer control module and ECM have been all replaced, select "Match all the systems" and finish the procedures according the following steps.

- Input the VIN code to the diagnostic tester;
- Input the SC (Security Code) code to the diagnostic tester;
- Match the immobilizer control module with diagnostic tester;
- Match the ECM with diagnostic tester;
- Add the key;
- Clear the code.

10. Programming ECM.

If the ECM has been replaced, select "Programming ECM" and finish the procedures according the following steps.

- Input the VIN code to the diagnostic tester;
- Input the SC code to the diagnostic tester;
- Match the ECM with diagnostic tester;
- Input the service station code;
- Input program date.

11. Programming IMMO.

If the immobilizer control module has been replaced, select "Programming IMMO" and finish the procedures according the following steps.

- Input the VIN code to the diagnostic tester;
- Input the SC code to the diagnostic tester;
- Match the immobilizer control module with diagnostic tester;
- Input the service station code;
- Input program date.

 CAUTION

- Add the old key (See page 45-10) after programming immobilizer control module.
- If both ECM and immobilizer control module are replaced at the same time, there are two cases, one, if the immobilizer control module has no communication problem, replace the ECM first, and then perform the ECM programming and match with immobilizer control module that need to be replaced, after that, replace the immobilizer control module and programming the IMMO, and finally, immobilizer control module matches the old key, there is no need to replace a new key. Two, if the immobilizer control module has communication problem, replace the ECM, immobilizer control module and key with now one and perform match all the systems.

12. Programming TCU.

If the TCU has been replaced, select "Programming TCU" and finish the procedures according the following steps.

- Input the VIN code to the diagnostic tester;
- Input the SC code to the diagnostic tester;
- Match the TCU with diagnostic tester;
- Input the service station code;
- Input program date.

13. Key match

- Add new key.
 - Input the SC code to the diagnostic tester;
 - Perform add new key procedure.
- Add old key.
 - Input the SC code to the diagnostic tester;
 - Perform add old key procedure.
- Erase key
 - Erase all key
 - Input the SC code to the diagnostic tester;
 - Perform erase all key procedure.
 - Erase key X
 - Input the SC code to the diagnostic tester;
 - Perform erase key X (X = 1, 2, 3, 4, 5) procedure.

Diagnostic Help

1. Connect X-431 3G diagnostic tester (the latest version) to the Data Link Connector (DLC), and make it communicate with the vehicle electronic module by the data network.
2. Confirm that malfunction is current, and carry out the diagnostic test and repair procedures.
3. If DTC cannot be deleted, the malfunction is current.
4. Only use a digital multimeter to measure the voltage of the electrical system.
5. Refer to any Technical Bulletin that may apply to the malfunction.
6. Visually check related wire harness.
7. Check and clean all the immobilizer control module ground related to the current DTC.
8. If multiple trouble codes were set, use the circuit diagrams and look for any common ground circuit or power supply circuit applied to the DTC.

Intermittent DTC Troubleshooting

If the malfunction is intermittent, perform the following:

- Check if connectors are loose.
- Check if wire harnesses are worn, pierced, pinched or partially broken.
- Monitor the X-431 3G diagnostic tester (the latest version) data that is related to this circuit.
- Wiggle related wire harness and connector and observe if the signal is interrupt in the related circuit.
- If possible, try to duplicate the conditions under which the DTC was set.
- Look for data that has changed or the DTC to reset during the wiggle test.
- Look for broken, bent, protruded or corroded terminals.
- Inspect sensor and mounting areas for damage, foreign matter, etc. that will cause incorrect signals.
- A data recorder and/or oscilloscope can be helpful in diagnosing the intermittent malfunction.

Ground Inspection

Groundings are very important to the proper operation of the electrical equipment and circuits. Groundings are often exposed to moisture, dirt and corrosive elements. Corrosion (rust) may form additional resistance. This additional resistance will change the way in which a circuit works.

Electronically controlled circuits are very sensitive to proper grounding. A loose or corroded ground can affect the electronically controlled circuit. Perform the following operations when checking the groundings:

1. Remove the ground bolt or nut.
2. Check all the contact surfaces for tarnish, dirt, rust, etc.
3. Clean as necessary to ensure that the contacting is in a good condition.
4. Reinstall the bolt or nut securely.
5. Check for the accessories which may interfere with the ground circuit.
6. If several wires are crimped into one ground terminal, check for proper crimps. Make sure that all the wire harnesses are clean, securely fastened and good contacted without crimping any excessive insulation coat.

Diagnostic Trouble Code (DTC) Chart

DTC Code	DTC Definition
B1300	Internal Control Module EEPROM Error
B1301	Immobilizer and ECM authentication failed
B1302	VIN Not Programmed
B1303	The antenna communication is disturbed
B1304	None transponder was detected
B1305	Immobilizer has none key was storage
B1306	Security code was not programmed
U0100	Lost communication With ECM authentication frame
U0073	Control Module communication Bus Off
U0101	Lost Communication with TCM
B1307	Immobilizer and Transponder authentication failed

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DTC	B1300	Internal Control Module EEPROM Error
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DTC Code	DTC Definition	DTC Detection Conditions	Possible Causes
B1300	Internal Control Module EEPROM Error	Ignition switch ON	Immobilizer Control Module

DTC Confirmation Procedure

Confirm that battery voltage is between 11 and 14 V before performing the following procedures.

- Turn ignition switch to LOCK.
- Connect X-431 3G diagnostic tester (the latest software) to Data Link Connector (DLC), and make it communicate with vehicle electronic module by the data network.
- Turn ignition switch to ON.
- Using X-431 3G diagnostic tester to record and clear the DTCs stored in the TCU.
- Turn ignition switch to LOCK and wait for a few seconds.
- Turn ignition switch to ON, and then select "Read Code".
- If DTC is detected, the malfunction indicated by the DTC is current. Go to the diagnosis procedure - Step 1.
- If DTC is not detected, the malfunction indicated by the DTC is intermittent. Please refer to Intermittent DTC Troubleshooting.

CAUTION

- If the ECM or immobilizer control module is replaced, match the system with the X-431 3G diagnostic tester (See page 45-9).

Diagnosis Procedure

1	Replace immobilizer control module
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45

OK

System is operating normally

DTC	B1301	Immobilizer and ECM authentication failed
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DTC Code	DTC Definition	DTC Detection Conditions	Possible Causes
B1301	Immobilizer and ECM authentication failed	Ignition switch ON	- Wire harness or connector - Immobilizer control module - ECM

DTC Confirmation Procedure

Confirm that battery voltage is between 11 and 14 V before performing the following procedures.

- Turn ignition switch to LOCK.
- Connect X-431 3G diagnostic tester (the latest software) to Data Link Connector (DLC), and make it communicate with vehicle electronic module by the data network.
- Turn ignition switch to ON.
- Using X-431 3G diagnostic tester to record and clear the DTCs stored in the TCU.
- Turn ignition switch to LOCK and wait for a few seconds.
- Turn ignition switch to ON, and then select "Read Code".
- If DTC is detected, the malfunction indicated by the DTC is current. Go to the diagnosis procedure - Step 1.
- If DTC is not detected, the malfunction indicated by the DTC is intermittent. Please refer to Intermittent DTC Troubleshooting.

CAUTION

- If the ECM or immobilizer control module is replaced, match the system with the X-431 3G diagnostic tester (See page 45-9).

Diagnosis Procedure

1	Check ground connection
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- Turn ignition switch to LOCK.
- Loosen and retighten the ground bolt or nut.
- Check the installation position of the ground connection.

NG

Repair or replace ground connection

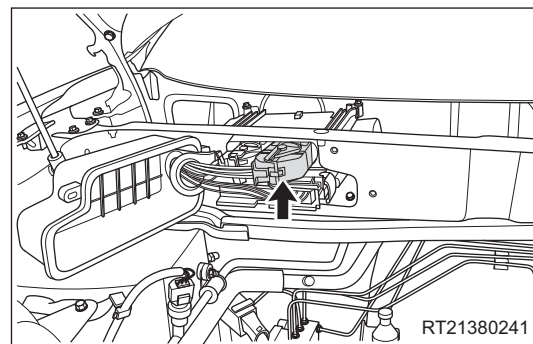
OK

2	Check engine control module (ECM) connector
---	---

- Turn ignition switch to LOCK.

45 - ENGINE IMMOBILIZER

- b. Disconnect the ECM connector E-057.



- c. Check if connector is damaged.

NG

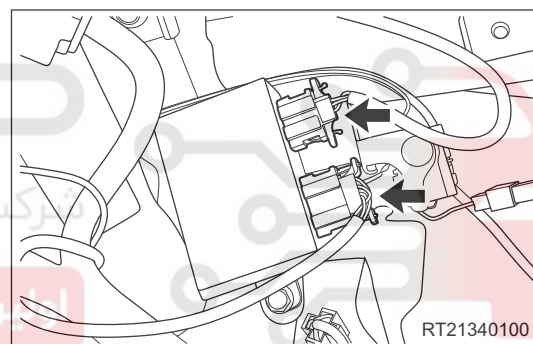
Repair or replace connector if necessary

OK

3

Check immobilizer control module connector and immobilizer coil connector

- a. Turn ignition switch to LOCK.
b. Disconnect the immobilizer control module connector I-047 and immobilizer coil connector.



- c. Check if connectors are damaged.

NG

Repair or replace connectors if necessary

OK

4

Replace immobilizer control module

- a. Replace the immobilizer control module and match it with X-431 3G diagnostic tester (See page 45-9).
b. Reconnect all the wire harness connectors that are disconnected.
c. Check if DTC still exists.

NG

Replace ECM

OK

System is operating normally

DTC	B1302	VIN Not Programmed
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DTC Code	DTC Definition	DTC Detection Conditions	Possible Causes
B1302	VIN Not Programmed	Ignition switch ON	Immobilizer control module

DTC Confirmation Procedure

Confirm that battery voltage is between 11 and 14 V before performing the following procedures.

- Turn ignition switch to LOCK.
- Connect X-431 3G diagnostic tester (the latest software) to Data Link Connector (DLC), and make it communicate with vehicle electronic module by the data network.
- Turn ignition switch to ON.
- Using X-431 3G diagnostic tester to record and clear the DTCs stored in the TCU.
- Turn ignition switch to LOCK and wait for a few seconds.
- Turn ignition switch to ON, and then select "Read Code".
- If DTC is detected, the malfunction indicated by the DTC is current. Go to the diagnosis procedure - Step 1.
- If DTC is not detected, the malfunction indicated by the DTC is intermittent. Please refer to Intermittent DTC Troubleshooting.

CAUTION

- If the ECM or immobilizer control module is replaced, match the system with the X-431 3G diagnostic tester (See page 45-9).

Diagnosis Procedure

1	Write VIN data
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- a. Using X-431 3G diagnostic tester, write the VIN data (See page 45-7).

NG

Replace immobilizer control module

OK

45

System is operating normally

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DTC	B1303	The antenna communication is disturbed
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DTC Code	DTC Definition	DTC Detection Conditions	Possible Causes
B1303	The antenna communication is disturbed	Ignition switch ON	- Wire harness or connector - Immobilizer control module - ECM

DTC Confirmation Procedure

Confirm that battery voltage is between 11 and 14 V before performing the following procedures.

- Turn ignition switch to LOCK.
- Connect X-431 3G diagnostic tester (the latest software) to Data Link Connector (DLC), and make it communicate with vehicle electronic module by the data network.
- Turn ignition switch to ON.
- Using X-431 3G diagnostic tester to record and clear the DTCs stored in the TCU.
- Turn ignition switch to LOCK and wait for a few seconds.
- Turn ignition switch to ON, and then select "Read Code".
- If DTC is detected, the malfunction indicated by the DTC is current. Go to the diagnosis procedure - Step 1.
- If DTC is not detected, the malfunction indicated by the DTC is intermittent. Please refer to Intermittent DTC Troubleshooting.

CAUTION

- If the ECM or immobilizer control module is replaced, match the system with the X-431 3G diagnostic tester (See page 45-7).

Diagnosis Procedure

1	Check ground connection
----------	--------------------------------

45

- Turn ignition switch to LOCK.
- Loosen and retighten the ground bolt or nut.
- Check the installation position of the ground connection.

NG

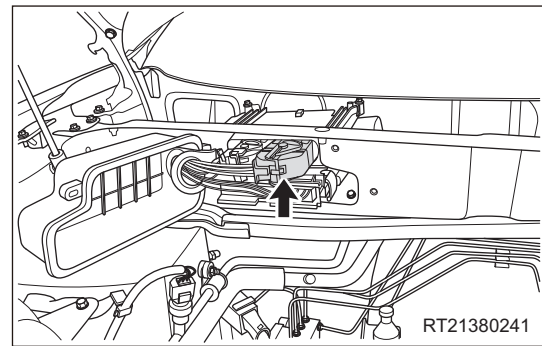
Repair or replace ground connection

OK

2	Check engine control module (ECM) connector
----------	--

- Turn ignition switch to LOCK.

- b. Disconnect the ECM connector E-057.



- c. Check if connector is damaged.

NG

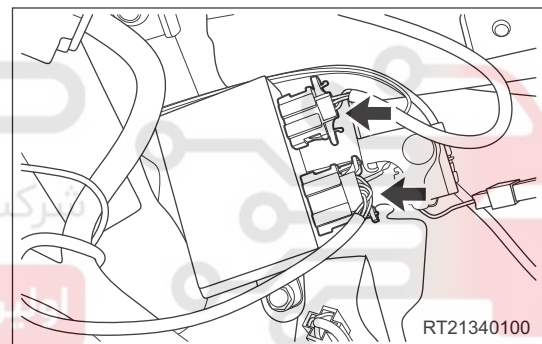
Repair or replace connector if necessary

OK

3

Check immobilizer control module connector and immobilizer coil connector

- a. Turn ignition switch to LOCK.
b. Disconnect the immobilizer control module connector I-047 and immobilizer coil connector.



- c. Check if connectors are damaged.

NG

Repair or replace connectors if necessary

OK

45

4

Check immobilizer control module and ECM communication circuit

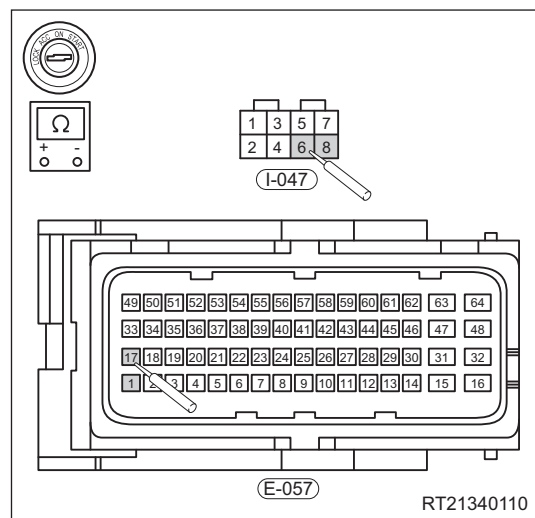
- a. Turn the ignition switch to LOCK.

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- b. Disconnect the immobilizer control module connector I-047 and ECM connector E-057.
- c. Check the wire harness between terminals of immobilizer control module and ECM.

Check for open

Multimeter Connection	Condition	Specified Condition
I-047 (6) - E-057 (17)	Always	Continuity
I-047 (8) - E-057 (1)	Always	Continuity

NG**Repair or replace harness if necessary****OK****System is operating normally**

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DTC	B1304	None transponder was detected
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DTC Code	DTC Definition	DTC Detection Conditions	Possible Causes
B1304	None transponder was detected	Ignition switch ON	• Transponder • Wire harness or connector • Immobilizer coil • Immobilizer control module

DTC Confirmation Procedure

Confirm that battery voltage is between 11 and 14 V before performing the following procedures.

- Turn ignition switch to LOCK.
- Connect X-431 3G diagnostic tester (the latest software) to Data Link Connector (DLC), and make it communicate with vehicle electronic module by the data network.
- Turn ignition switch to ON.
- Using X-431 3G diagnostic tester to record and clear the DTCs stored in the TCU.
- Turn ignition switch to LOCK and wait for a few seconds.
- Turn ignition switch to ON, and then select "Read Code".
- If DTC is detected, the malfunction indicated by the DTC is current. Go to the diagnosis procedure - Step 1.
- If DTC is not detected, the malfunction indicated by the DTC is intermittent. Please refer to Intermittent DTC Troubleshooting.

CAUTION

- If the ECM or immobilizer control module is replaced, match the system with the X-431 3G diagnostic tester (See page 45-7).

Diagnosis Procedure

1	Start the engine with another ignition key
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- Try to restart the engine with another ignition key.
- Check if the engine can be started.

NG	Go to next step 3
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OK

2	Replace first ignition key or transponder
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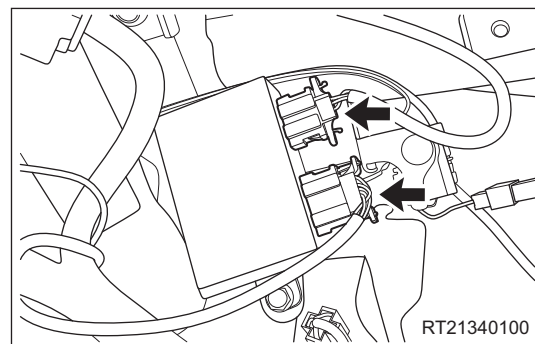
- Replace the first ignition key or transponder in it, and match it (See page 45-7).

OK

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3**Check immobilizer control module connector and immobilizer coil connector**

- a. Turn ignition switch to LOCK.
- b. Disconnect the immobilizer control module connector I-047 and immobilizer coil connector.

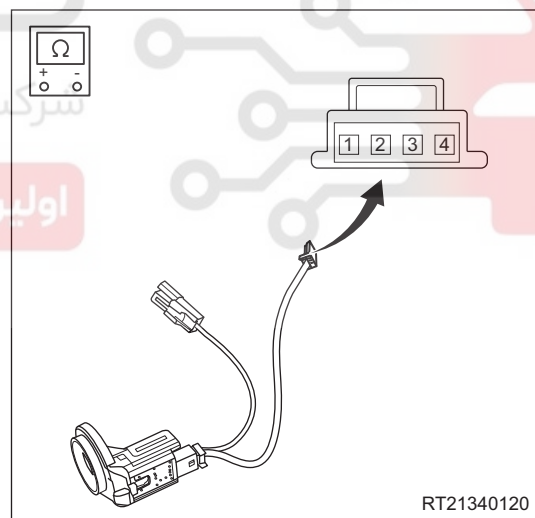


- c. Check if connectors are damaged.

NG**Repair or replace connectors if necessary****OK****4****Check immobilizer coil**

- a. Measure the immobilizer coil resistance.

Multimeter Connection	Condition	Specified Condition
B1 - B2	Always	15 - 20 Ω

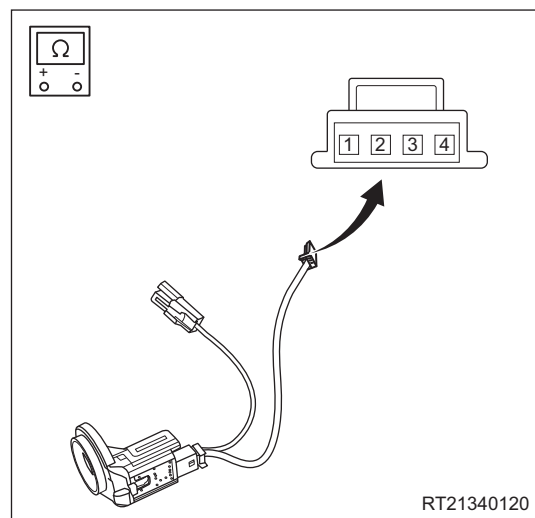


b. Check for the continuity of immobilizer coil connector.

Multimeter Connection	Condition	Specified Condition
B1 - B3	Always	No continuity
B2 - B3	Always	No continuity

NG

Replace immobilizer coil



RT21340120

OK

Replace immobilizer control module

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DTC	B1305	Immobilizer has none key was storage
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DTC Code	DTC Definition	DTC Detection Conditions	Possible Causes
B1305	Immobilizer has none key was storage	Ignition switch ON	- Wire harness or connector - Immobilizer control module

DTC Confirmation Procedure

Confirm that battery voltage is between 11 and 14 V before performing the following procedures.

- Turn ignition switch to LOCK.
- Connect X-431 3G diagnostic tester (the latest software) to Data Link Connector (DLC), and make it communicate with vehicle electronic module by the data network.
- Turn ignition switch to ON.
- Using X-431 3G diagnostic tester to record and clear the DTCs stored in the TCU.
- Turn ignition switch to LOCK and wait for a few seconds.
- Turn ignition switch to ON, and then select "Read Code".
- If DTC is detected, the malfunction indicated by the DTC is current. Go to the diagnosis procedure - Step 1.
- If DTC is not detected, the malfunction indicated by the DTC is intermittent. Please refer to Intermittent DTC Troubleshooting.

CAUTION

- If the ECM or immobilizer control module is replaced, match the system with the X-431 3G diagnostic tester (See page 45-9).

Diagnosis Procedure

1	Match ignition key
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- a. Using the X-431 3G diagnostic tester, match the ignition key (See page 45-10).

45

NG

Replace immobilizer control module

OK

System is operating normally

DTC	B1306	Security code was not programmed
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DTC Code	DTC Definition	DTC Detection Conditions	Possible Causes
B1306	Security code was not programmed	Ignition switch ON	- Wire harness or connector - Immobilizer control module

DTC Confirmation Procedure

Confirm that battery voltage is between 11 and 14 V before performing the following procedures.

- Turn ignition switch to LOCK.
- Connect X-431 3G diagnostic tester (the latest software) to Data Link Connector (DLC), and make it communicate with vehicle electronic module by the data network.
- Turn ignition switch to ON.
- Using X-431 3G diagnostic tester to record and clear the DTCs stored in the TCU.
- Turn ignition switch to LOCK and wait for a few seconds.
- Turn ignition switch to ON, and then select "Read Code".
- If DTC is detected, the malfunction indicated by the DTC is current. Go to the diagnosis procedure - Step 1.
- If DTC is not detected, the malfunction indicated by the DTC is intermittent. Please refer to Intermittent DTC Troubleshooting.

CAUTION

- If the ECM or immobilizer control module is replaced, match the system with the X-431 3G diagnostic tester (See page 45-9).

Diagnosis Procedure

1	Write security code
----------	----------------------------

- a. Using the X-431 3G diagnostic tester, write the security code (See page 45-10).

NG

Replace the immobilizer control module

45

OK

System is operating normally

45 - ENGINE IMMOBILIZER

DTC	U0100	Lost communication With ECM authentication frame
DTC	U0073	Control Module communication Bus Off
DTC	U0101	Lost Communication with TCM
DTC	B1307	Immobilizer and Transponder authentication failed

DTC Code	DTC Definition	DTC Detection Conditions	Possible Causes
U0100	Lost communication With ECM authentication frame	Ignition switch ON	- Wire harness or connector - ECM
U0073	Control Module communication Bus Off	Ignition switch ON	CAN Line
U0101	Lost Communication with TCM	Ignition switch ON	Wire harness or connector TCM
B1307	Immobilizer and Transponder authentication failed	Ignition switch ON	- Wire harness or connector - Immobilizer control module

DTC Confirmation Procedure

Confirm that battery voltage is between 11 and 14 V before performing the following procedures.

- Turn ignition switch to LOCK.
- Connect X-431 3G diagnostic tester (the latest software) to Data Link Connector (DLC), and make it communicate with vehicle electronic module by the data network.
- Turn ignition switch to ON.
- Using X-431 3G diagnostic tester to record and clear the DTCs stored in the TCU.
- Turn ignition switch to LOCK and wait for a few seconds.
- Turn ignition switch to ON, and then select "Read Code".
- If DTC is detected, the malfunction indicated by the DTC is current. Go to the diagnosis procedure - Step 1.
- If DTC is not detected, the malfunction indicated by the DTC is intermittent. Please refer to Intermittent DTC Troubleshooting.

CAUTION

- If the ECM or immobilizer control module is replaced, match the system with the X-431 3G diagnostic tester (See page 45-9).

Diagnosis Procedure

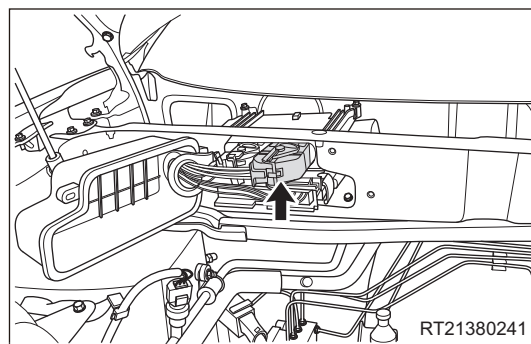
1	Check the ground connection
----------	------------------------------------

- Turn ignition switch to LOCK.
- Loosen and retighten the ground bolt or nut.

- c. Check the installation position of the ground connection.

NG**Repair or replace ground connection****OK****2****Check engine control module (ECM) connector**

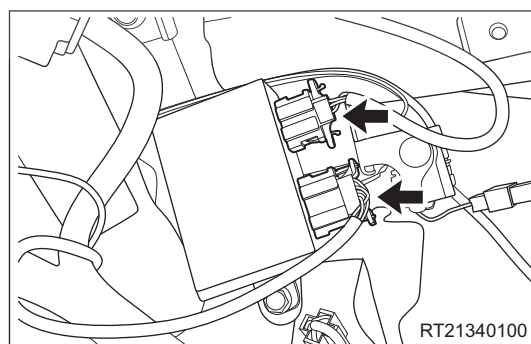
- a. Turn ignition switch to LOCK.
b. Disconnect the ECM connector E-057.



- c. Check if the connector is damaged.

NG**Repair or replace connector if necessary****OK****3****Check immobilizer control module connector and immobilizer coil connector**

- a. Turn ignition switch to LOCK.
b. Disconnect the immobilizer control module connector I-047 and immobilizer coil connector.



- c. Check if the connectors are damaged.

NG**Repair or replace connectors if necessary****OK**

45 - ENGINE IMMOBILIZER

4

Replace ECM

NG

Repair or replace CAN BUS line

OK

System is operating normally

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

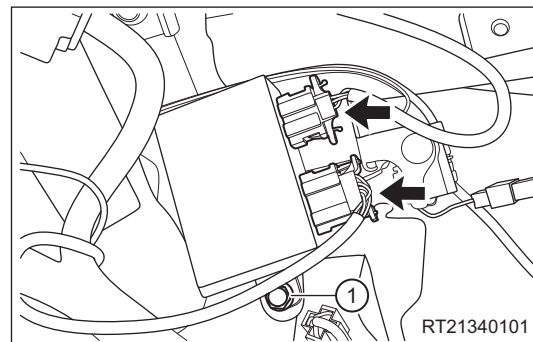


ON-VEHICLE SERVICE

Immobilizer Control Module

Removal & Installation

1. Turn off all the electrical devices and ignition switch.
2. Disconnect the negative battery cable.
3. Remove the right lower instrument panel protector ([See page 59-20](#)).
4. Disconnect the connectors (arrow) and remove the fixing bolt (1) of the immobilizer control module with a wrench.
(Tightening torque: $7 \pm 1 \text{ N}\cdot\text{m}$)



Installation is in the reverse order of removal.

CAUTION

- Install the connectors in place.
- Tighten the fixing bolt in place.

دیجیتال خودرو

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