



长安汽车  
CHANGAN

# EADO Workshop Manual

## Engine Immobilizer System

EADORM2H/2/1

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## Engine-1.6L

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### 3.1.12 Engine Immobilizer System

Specifications .....	3.1.12-1
Torque Specifications .....	3.1.12-1
Description and Operation.....	3.1.12-2
System Overview .....	3.1.12-2
System Schematic .....	3.1.12-3
General Procedures .....	3.1.12-4
General Procedures.....	3.1.12-4
Symptom Diagnosis and Testing .....	3.1.12-5
Inspection and Verification .....	3.1.12-5
Symptom Chart.....	3.1.12-6
The Function of the Remote Controller is Normal, but the Engine cannot Start Diagnose Procedures 3.1.12-7	
ECM Always Detect that Immobilizer Function Activated Diagnose Procedures.....	3.1.12-10

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**Specifications****Torque Specifications**

<b>Name</b>	<b>Nm</b>	<b>lb-ft</b>	<b>lb-in</b>
ECM retaining bolt	10		89
BCM retaining bolt	10		89

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## Description and Operation

### System Overview

After active the engine immobilizer function, turn the ignition switch to the "ST" position and disable the engine start. The engine control module receives the immobilizer signal via the network from the vehicle body control module and lock the fuel pump relay. Only after the immobilizer is realised by the remote controller, the engine can be started.

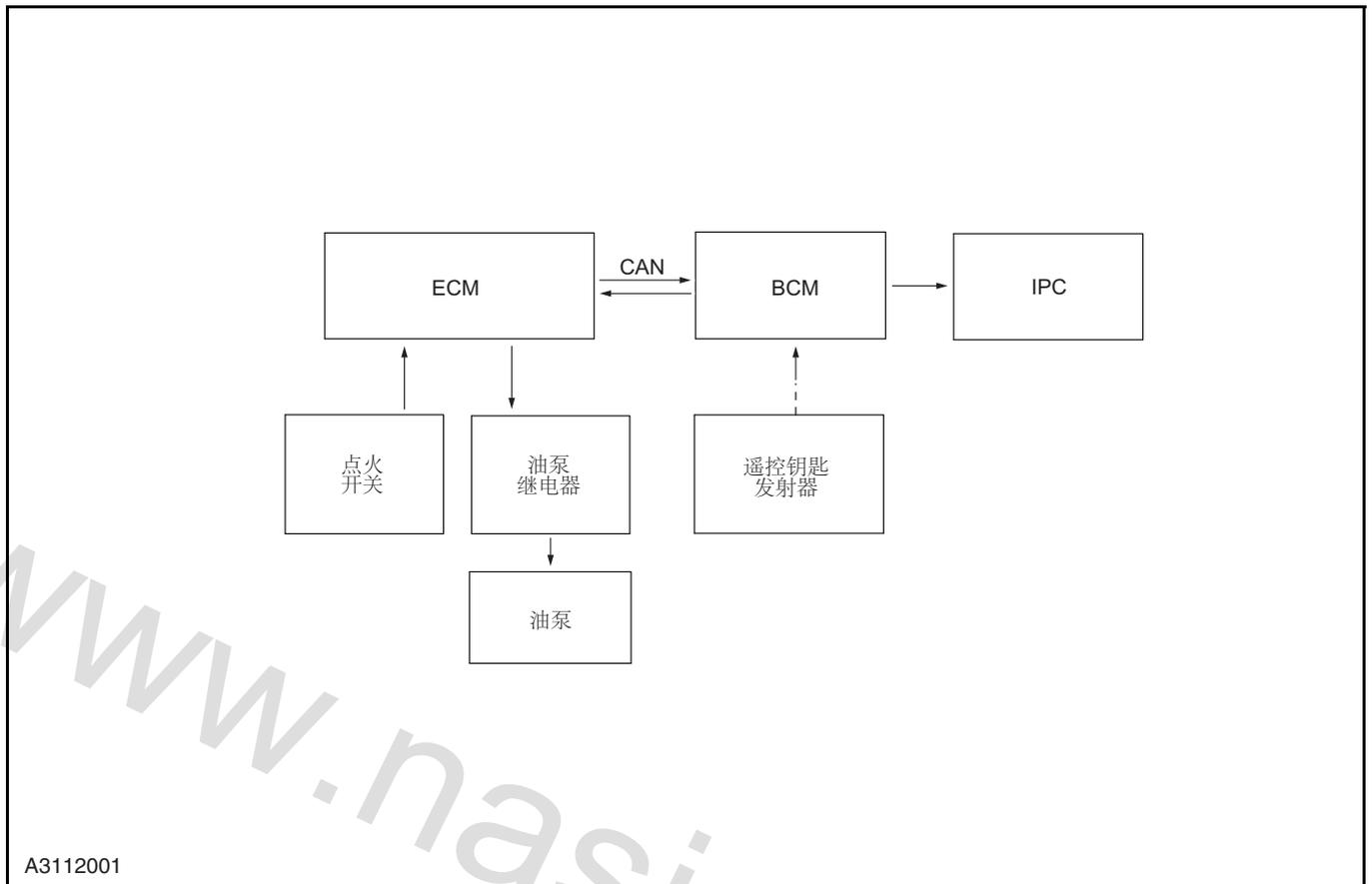
The engine immobilizer system is a engine immobilizer device that works together with the remote control immobilizer systems. The remote control radio frequency interference or battery power used-up may affect the engine immobilizer system.

Engine immobilizer system consists of the following main components:

1. Emitter (key)
2. RF Receiver (BCM)
3. Engine control module (ECM)
4. Fuel pump relay
5. Fuel pump
6. Combined instrument (IPC)

When pressing the unlock button on the remote controller, it will send the signal to the BCM, and BCM then passes immobilizer defenses removed signals to ECM; ECM controls the engine based on the ignition key working state signals.

## System Schematic



A3112001

## General Procedures

### General Procedures

#### General Equipment

Digital multimeter
Diagnosis tester

1. Inspect the aftersales rectified devices, which may affect the engine immobilizer system.
2. Inspect the easy-to-access or visible system components, in order to identify whether there is significant damage or other problems that may cause failure.
3. If the system displays the engine is locked, inspect to see whether the ignition key is learnt or perform the learning process of the ignition key.

## Symptom Diagnosis and Testing

### General Equipment

Digital multimeter
Changan Auto special diagnostic tester

## Inspection and Verification

1. Verify the customer concern.
2. Visually inspect for obvious signs of mechanical damage or electric damage.
3. If an obvious cause for an observed or reported concern is found, correct the cause before proceeding to the next step.
4. If no obvious problem been found, confirm the failure and refer to the Symptoms Chart.

### Visual Inspection Chart

Mechanical	Electric
<ul style="list-style-type: none"> <li>•Fuel pump</li> <li>•Remote controller (key)</li> </ul>	<ul style="list-style-type: none"> <li>•Return circuit</li> <li>•Fuel pump relay</li> <li>•ECM circuit</li> <li>•BCM circuit</li> <li>•IPC circuit</li> </ul>

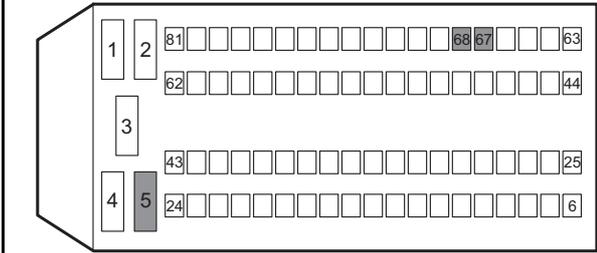
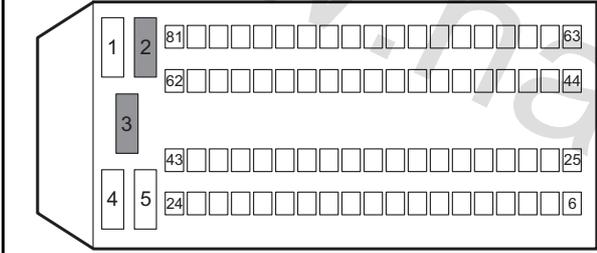
## Symptom Chart

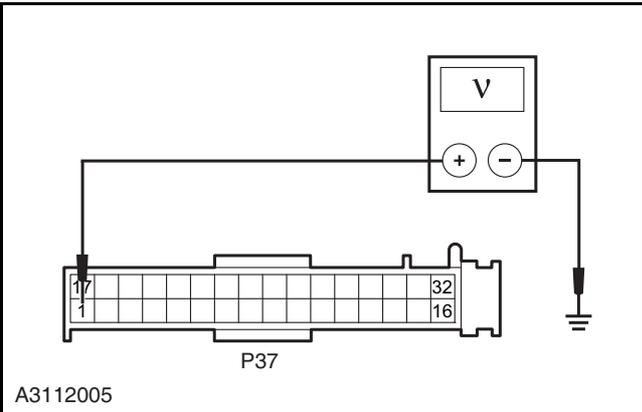
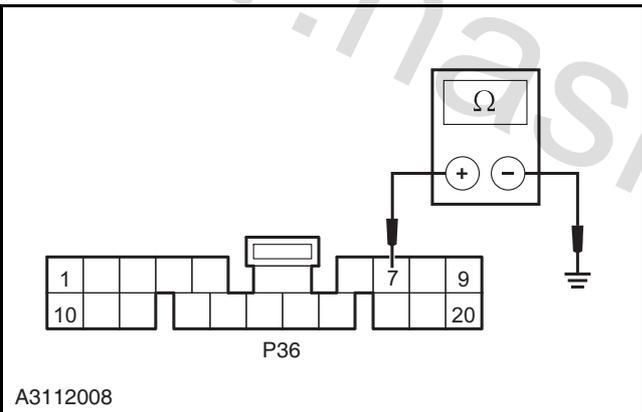
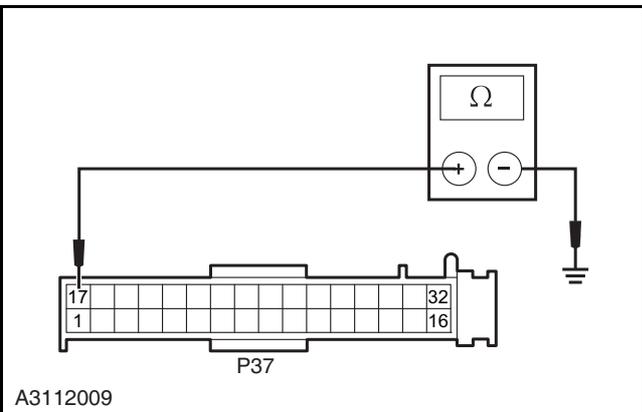
If a symptom occurs, while its DTC is not stored in the Control module and the cause can't be verified in basic inspection, diagnose and eliminate in order of the following table.

Symptom	Possible Sources	Action
Electronic immobilizer indicator always on	<ul style="list-style-type: none"> <li>• Combined instrument</li> <li>• BCM</li> </ul>	<ul style="list-style-type: none"> <li>• Inspect the circuit.</li> <li>• Inspect and replace BCM.</li> <li>• Inspect and replace the combined instrument.</li> </ul>
The remote control function of the remote controller is normal, but the engine cannot start	<ul style="list-style-type: none"> <li>• wiring harness connector</li> <li>• ECM</li> <li>• BCM</li> </ul>	<p><b>Refer to: The Functions of the Remote Controller is Normal, but the Engine cannot Start Diagnosis Procedures (3.1.12 Engine Immobilizer System, Symptom Diagnosis and Testing).</b></p>
The key cannot match	<ul style="list-style-type: none"> <li>• Key</li> <li>• BCM</li> </ul>	<ul style="list-style-type: none"> <li>• Inspect and replace the emitter battery.</li> <li>• Match the emitter.</li> <li>• Inspect the circuit.</li> <li>• Inspect and replace BCM.</li> </ul>
ECM always detect that the immobilizer is enabled	<ul style="list-style-type: none"> <li>• Wiring harness connector</li> <li>• ECM</li> <li>• BCM</li> </ul>	<p><b>Refer to: ECM always Detect that the Immobilizer is Enabled Fault Diagnosis Procedures (3.1.12 Engine Immobilizer System, Symptom Diagnosis and Testing).</b></p>

## The Function of the Remote Controller is Normal, but the Engine cannot Start Diagnose Procedures

Test Conditions	Details/Results/Actions
1. Inspect the data communication state between ECM and BCM.	<p>A. Use special diagnose tool for Changan to inspect the DTC between ECM and BCM.</p> <p>B. Inspect the CAN network cable between ECM and BCM.</p> <p>Is the data communication state between ECM and BCM is normal?</p> <p><b>Y</b></p> <p>Go to step 2.</p> <p><b>N</b></p> <p>Repair the related failures that indicated by DTC, repair the CAN network circuit.</p> <p><b>Refer to: Diagnose Tool cannot Communicate with BCM (4.3.16 Vehicle Network System, Symptom Chart).</b></p>
2. Inspect the starter motor	<p>A. Turn the ignition key to "ST" position and inspect the starter.</p> <p>Is the starter normal?</p> <p><b>Y</b></p> <p>Go to step 3.</p> <p><b>N</b></p> <p>Repair the startor and related circuit.</p>
3. Inspect the engine	<p>A. Inspect the engine mechanical related systems.</p> <p><b>Refer to: Engine cannot Start in Normal Speed (3.1.13 Engine Electronic Control System - MT22.1, Symptom Diagnosis and Testing).</b></p> <p>Is the engine mechanical related systems normal?</p> <p><b>Y</b></p> <p>Go to step 4.</p> <p><b>N</b></p> <p>Repair the engine mechanical system.</p>

Test Conditions	Details/Results/Actions
<p>4. Inspect the ECM power supply circuit</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center;">E01</p>  <p style="font-size: small;">A3112003</p> </div>	<p>A. Turn the ignition switch to "LOCK" position.</p> <p>B. Measure from the back of ECM wiring harness connector E01.</p> <p>C. Turn the ignition switch to "ON" position and use a multimeter to measure the voltage between the terminal 5, 67 and 68 of the ECM wiring harness connector E01 and the power supply.</p> <p><b>Standard Voltage Value: 11~14 V</b></p> <p>Is the voltage normal?</p> <p><b>Y</b></p> <p>Go to step 5.</p> <p><b>N</b></p> <p>Repair the ECM power supply circuit.</p>
<p>5. Inspect the ECM ground circuit</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center;">E01</p>  <p style="font-size: small;">A3112004</p> </div>	<p>A. Turn the ignition switch to "LOCK" position.</p> <p>B. Measure from the back of ECM wiring harness connector E01.</p> <p>C. Measure the resistance between terminal 2 and 3 of the ECM wiring harness connector E01 and the reliable ground.</p> <p><b>Standard Resistance Value: less than 5Ω</b></p> <p>Is the resistance value normal?</p> <p><b>Y</b></p> <p>Go to step 6.</p> <p><b>N</b></p> <p>Inspect and repair the ECM ground circuit.</p>
<p>6. Replace ECM</p>	<p>A. Replace ECM.</p> <p style="color: blue;"><b>Refer to: Engine Control Module (3.1.13 Engine Electronic Control System-MT22.1, Removal and installation).</b></p> <p>Is the system normal?</p> <p><b>Y</b></p> <p>Verify the system is normal.</p> <p><b>N</b></p> <p>Go to step 7.</p>

Test Conditions	Details/Results/Actions
<p>7. Inspect the BCM power supply circuit</p>  <p>A3112005</p>	<p>A. Turn the ignition switch to "LOCK" position.            B. Disconnect the battery negative cable.            C. Disconnect the vehicle body control module wiring harness connector P37.            D. Connect the battery negative cable.            E. Turn the ignition switch to "ON" position.            F. Measure the voltage between terminal 1 of the vehicle body control module wiring harness connector P37 and the power supply.</p> <p><b>Standard Voltage Value: 11~14 V</b></p> <p>Is the voltage normal?  <b>Y</b>            Go to step 8.  <b>N</b>            Inspect and repair the BCM power supply circuit.</p>
<p>8. Inspect the BCM ground circuit</p>  <p>A3112008</p>  <p>A3112009</p>	<p>A. Turn the ignition switch to "LOCK" position.            B. Disconnect the battery negative cable.            C. Disconnect the vehicle body control module wiring harness connector P36 and P37.            D. Measure the resistance of the terminal 7 of the BCM wiring harness connector P36 and the value between the terminal 17 and the reliable ground.</p> <p><b>Standard Resistance Value: less than 5Ω</b></p> <p>Is the resistance value normal?  <b>Y</b>            Go to step 9.  <b>N</b>            Inspect and repair the BCM ground circuit.</p>

Test Conditions	Details/Results/Actions
9. Replace BCM	
	<p>A. Replace BCM.</p> <p><b>Refer to: Body Control Module (4.3.14 Body Electronic Control System, Removal and Installation).</b></p> <p>Confirm the maintenance is finished.</p>

## ECM Always Detect that Immobilizer Function Activated Diagnose Procedures

Test Conditions	Details/Results/Actions
1. Inspect the data communication state between the ECM and the BCM	
	<p>A. Use special diagnose tool for Changan to inspect the DTC between ECM and BCM.</p> <p>B. Inspect the CAN network cable between ECM and BCM.</p> <p>Is the data communication state between ECM and BCM is normal?</p> <p><b>Y</b></p> <p>Go to step 2.</p> <p><b>N</b></p> <p>Repair the related failures that indicated by DTC and repair the CAN network circuit.</p> <p><b>Refer to: Diagnose Tool cannot Communicate with BCM (4.3.16 Vehicle Network System, Symptom Chart).</b></p>
2. Inspect the remote controller	
<p> <b>CAUTION: Make sure that the distance between the remote controller and the vehicle is within the effective range; When using the remote controller, ensure that no other RF devices is used at the same time in the surrounding area. Ensure that no shielding or interfere device is used within the range.</b></p>	
	<p>A. Inspect the remote controller performance status.</p> <p>B. Replace the failed battery.</p> <p>C. Re-match the remote controller.</p> <p>Is the system normal?</p> <p><b>Y</b></p> <p>Confirm the maintenance is finished.</p> <p><b>N</b></p> <p><b>Refer to: The Functions of the Remote Controller is Normal, but the Engine cannot Start (3.1.12 Engine Immobilizer System, Symptom Diagnosis and Testing).</b></p>

