

# **Volkswagen Anti-theft Operation Guide**

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# 1、 Introduction to Volkswagen Anti-theft System

Volkswagen anti-theft system can be divided into second and third generation anti-theft systems, third and half generation systems, 4<sup>th</sup> generation anti-theft systems, 5<sup>th</sup> generation anti-theft systems, 5<sup>th</sup> generation and half or 6<sup>th</sup> generation systems according to different starting principles and anti-theft components.

Note: If you don't know which anti-theft system the vehicle belongs to, please refer to appendix 1 for selection according to the year and model.

## 1.1、 2<sup>nd</sup> and 3<sup>rd</sup> Generation Anti-theft Systems

The anti-theft system only has one PIN (password), which stored in the engine and the instrument. When the engine is started, the engine ECU will verify the PIN code with the instrument. And the instrument obtains the ID of the key through the coil to determine whether the key is legal. If the key is legal, the instrument then gives the engine ECU a start command, otherwise, the engine cannot start.

## 1.2、 4<sup>th</sup> Generation Anti-theft Systems

The anti-theft components of the 4<sup>th</sup> generation anti-theft system can be divided into:

- instruments and engines
- comfort control ECU and engines (Magotan, CC)
- Kessy and engines (A8, Touareg)
- EZS and engines (A6, Q7)

Refer to appendix 1 for the detailed correspondence.

The Volkswagen 4<sup>th</sup> generation anti-theft system has added the CS code (component security code). When the key is used to start the engine, the key will be authenticated by the coil or antenna with the instrument. If the key authentication data is the same as the instrument data, the key is legal. At the same time, the engine ECU will send the anti-theft data, such as CS, MAC (synchronization code), power level and other data to the instrument through the CAN communication bus after algorithm calculation. also the instrument calculates its own anti-theft data, if the results obtained are the same, and the key number is also legal, the instrument ECU will authorize the engine ECU to start the engine through the bus.

## 1.3、 5<sup>th</sup> Generation Anti-theft Systems

The main anti-theft component of the 5<sup>th</sup> generation anti-theft system is BCM2 (comfort control ECU 2, 46 system). The anti-theft components include engine, gearbox and steering column lock. Some vehicles include less components. Mainly it can be divided into A6/A7/A8/Touareg and A4/A5/Q5.

The anti-theft system only has a 16-byte CS code and no PIN code.

### **1.3.1、 A6/A7/A8/Touareg**

Four anti-theft system CSs are stored in their car keys. When vehicle start the engine, BCM2 will use the coil or antenna to authenticate with the key and read the CSs anti-theft data of other three components from the key, also BCM2 will decrypted other three component CSs from its own CS. after relevant authentication data is obtained through algorithm, BCM2 with authenticate anti-theft data with engine and gearbox through CAN bus network, steering column lock through the LIN line. If all three components and BCM2 are verified, BCM2 will send an authorization command to the engine ECU to start the engine.

### **1.3.1、 A4/A5/Q5**

Only the CS of BCM is stored in these car keys. When the vehicle starts the engine, BCM2 will use the coil or antenna to authenticate with the key. After the key authentication is passed, BCM2 will obtain anti-theft data through its own stored CSs data of the other three components by algorithm, then authenticate with engine and gear through the CAN bus network, the steering column lock through the LIN line. If all three components and BCM2 are verified, BCM2 will send an authorization command to the engine ECU to start the engine.

## **1.4、 5<sup>th</sup> Generation and Half or 6<sup>th</sup> Generation Systems**

The main anti-theft systems include MQB platform, MLB platform and MSB platform, which are similar to the 5<sup>th</sup> generation anti-theft principle.

### **1.4.1、 MQB Platform**

The main anti-theft component of the MQB platform is the instrument; the anti-theft components include the engine, gearbox and steering column lock. Some vehicles will include more or less components. Similar to the 5<sup>th</sup> generation anti-theft system, the anti-theft system only has a 16-byte CS code and no PIN code.

### **1.4.2、 MLB Platform**

Omit.

### **1.4.3、 MSB Platform**

Omit.

## 2、 Key Learning

If you don't know which generation is your car anti-theft system, please refer to appendix table.

### 2.1、 2<sup>nd</sup> and 3<sup>rd</sup> Generation Anti-theft System

Omit. (Can be done without X-PRO G)

### 2.2、 4<sup>th</sup> Generation Anti-theft System

#### 2.2.1、 4<sup>th</sup> Generation Instrument

Support backup and restore EEPROM data, read and write anti-theft data, key learning and other functions. At present, most instruments support the automatic diagnosis type. The 4<sup>th</sup> generation anti-theft instruments use the Megamos 48 chip as the keys anti-theft chip. The CS code of the CDC type instrument is 7 bytes, and the other instrument CS is 12 bytes. Following is a detailed introduction to the key learning process of the 4<sup>th</sup> generation instrument.

When we know that the main anti-theft component is a 4<sup>th</sup> generation instrument, and know the instrument type of the vehicle, we can directly select the instrument type to enter this function.



图 Figure-1

If you are not sure about the instrument type, please select the [Automatic diagnosis type] function, as shown in Figure 1, if there is an error in [Automatic diagnosis type], please contact our dealer or after-sales. After recognizing the instrument, click "Yes" to confirm the function of entering the instrument, as shown in Figure 2.

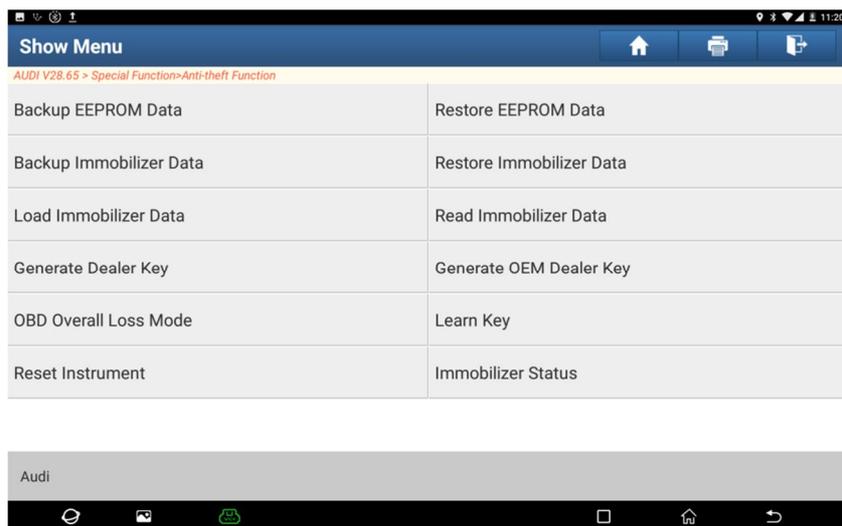


Figure-2

### Function introduction of Figure 2.

**Backup EEPROM Data:** better do this steps first before other steps, to avoid data loss, and need to backup data, it include many important instrument data: anti-theft data, mileage data, coded data and etc.

**Restore EEPROM Data:** Generally, it is not necessary to perform this function. When the vehicle has an unresolvable fault code or other unresolvable phenomenon, you can use this function to select the backup data to restore the vehicle to original state. The data of each car is different, so the restoration needs to be careful to prevent the irreparable loss caused by the restoration of data errors.

**Backup immobilizer data:** This function only backs up anti-theft data. After backing up the anti-theft data for the first time, if the relevant functions of the vehicle are executed later, you can use the [Load Anti-theft Data] function; don't need repeat [Read Anti-Theft Data].

**Restore immobilizer data:** Generally, it is not necessary to perform this function, it will write backup anti-theft data into the instrument. Note that the data of each car is different, so the restoration needs to be careful to prevent the irreparable loss caused by the restoration of data errors.

**Load immobilizer data:** If the vehicle has backed up anti-theft data, we can directly load anti-theft data by executing this function. No need to read anti-theft data repeatedly.

**Read immobilizer data:** By function we can display the data out, as shown in Figure 3. You can take photos or screenshots to save anti-theft data to prevent data loss.

Immobilizer Data	Value
VIN (Vehicle Identification Number):	LFV2A2BSXE4519338
CS:	C85024C79659A1E657AAF2BF
PIN:	44806
Power Level:	84
ECU Software Version	31G920850A
Number Of Keys:	02
Key ID1:	00E9950A

Confirm

图 Figure-3

**Generate Dealer key:** The anti-theft data of each car is different. After reading the data, the CS code is obtained, by this function, the CS code is written into the Megamos 48 key chip, so that the key data matches the vehicle data.

**Generate OEM Dealer Key:** Equivalent to the function of key copying, without changing the data of the instrument, a key that can directly start the vehicle is obtained. The premise of this function is that the key chip ID is editable.

**Learn Key:** After executing the [Generate Dealer Key] function, by this function, we can write new key ID and quantity of keys into the instrument.

**Reset Instrument:** When reading and writing data, the vehicle will enter the service mode. If the function is interrupted during the execution process, and caused the instrument screen black, you can exit the service mode by executing this function and light the instrument.

**Immobilizer status:** by function we can obtain current key status which is close to the ignition coil. If we don't know whether the key learning process failed or not, you can use this function to judge the key. If after [Generate dealer key] function executed, the new key closed to ignition coil shown as Figure 4, this key can be learned by the instrument.

Immobilizer Data	Value
Number Of Existing Keys:	2
Is The Currently Inserted Key (Or Sensing Key) The Dealer Key	Yes
Is The Currently Inserted Key (Or Sensing Key) The Locked Key	Yes
Is The Currently Inserted Key (Or Sensing Key) The Learned Key	No

图 Figure-4

#### Function introduction of Figure 4:

**Number of Existing Keys:** the quantity of keys stored in the vehicle anti-theft device;

**Is the current inserted Key (or Sensing key) the dealer key:** you can test whether the anti-theft data of the key matches the anti-theft data of the anti-theft device;

**Is the currently inserted (or Sensing key) the locked key:** the fourth-generation key needs to be locked in order to be learned by the immobilizer. If the key is not locked, it is easy be edited by high-frequency signals;

**Is the currently inserted (or sensing key) the learned key:** test whether the current key ID is stored in anti-theft box.

#### CDC Instrument Key Learning

##### Method 1 steps:

1. [Backup EEPROM Data], if not succeed, please try method 2.
2. [Read anti-theft data]
3. [Generate Dealer key]
4. [Learn Key], if step 3 is [Generate OEM Dealer Key], then skip step 4.

##### Method 2 steps:

1. [Read anti-theft data], if not succeed, please manually choose engine type in pervious menus.
2. [Search 7<sup>th</sup> byte], Put available car key in the X-PRO G hole, and find the seventh byte value of the key through the key authentication method;
3. [Generate Dealer key]
4. [Learn Key]

### UDS Instrument Key Adding

1. [Backup EEPROM Data]
2. [Read anti-theft data]
3. [Generate Dealer key]
4. [Learn Key], if step 3 is [Generate OEM Dealer Key], then skip step 4.

Note: if the reading of UDS instrument data fails or there is a problem with the reading of 873B and other component types, we can do key matching through [Online Anti-theft] - [Fourth-Generation Instruments] - [Key Learning]. The ID of the key may be checked. Some deputy factory key IDs do not meet the rules. In this case, use [Generate OEM Dealer Key] to solve.

### 2.2.2、 4<sup>th</sup> generation comfort control ECU (Magotan, CC)

The 4<sup>th</sup> generation comfort control ECU has 2 kind of anti-theft chips, one is Megamos48 key chip, and the other is Hitag2 (46 chip). Before adding the key, first select the key type is 48 or 46, general smart key is 46 chip, semi-smart 48 chips.

46 Chip key: Whether execute key learn or key overall lost, just need to change the 7th byte to FF;

48 Chip key: After reading six bytes from the engine, get the whole CS code by [Find the 7th byte].

Steps of adding 48 chip keys:

1. Obtain six bytes CS code and PIN code from the engine (If the OBD reading fails, you need to skip the gateway and enter [Engine]-> [MED17]-> [Directly read anti-theft data], connection diagram (Figure 5).
2. [Find the seventh byte], Get the whole vehicle CS code.
3. [Generate dealer key], Write the obtained vehicle CS code to the key.
4. [Learning Key], Write the new key ID to the comfort control ECU.

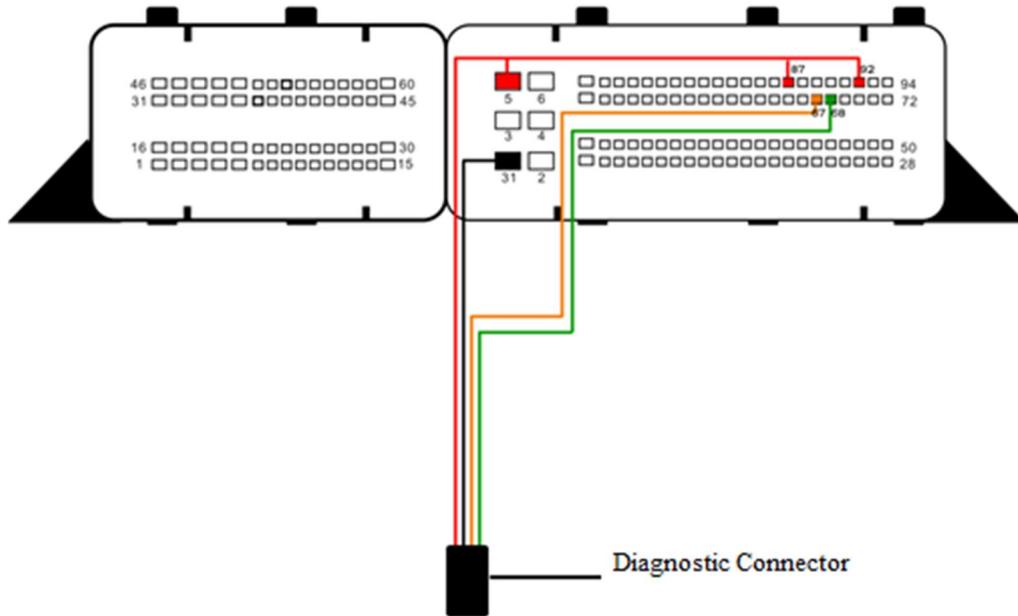


图 Figure-5

Steps of adding 46 chip keys:

1. Obtain six bytes CS code and PIN code from the engine (If the OBD reading fails, you need to skip the gateway and enter [Engine]-> [MED17]-> [Directly read anti-theft data], connection diagram (Figure 5).
2. [Generate dealer key], Fill the last byte of the CS code obtained by the engine with FF, as shown in Figure 6.
3. [Learn Key], Write the new key ID to the comfort control ECU.

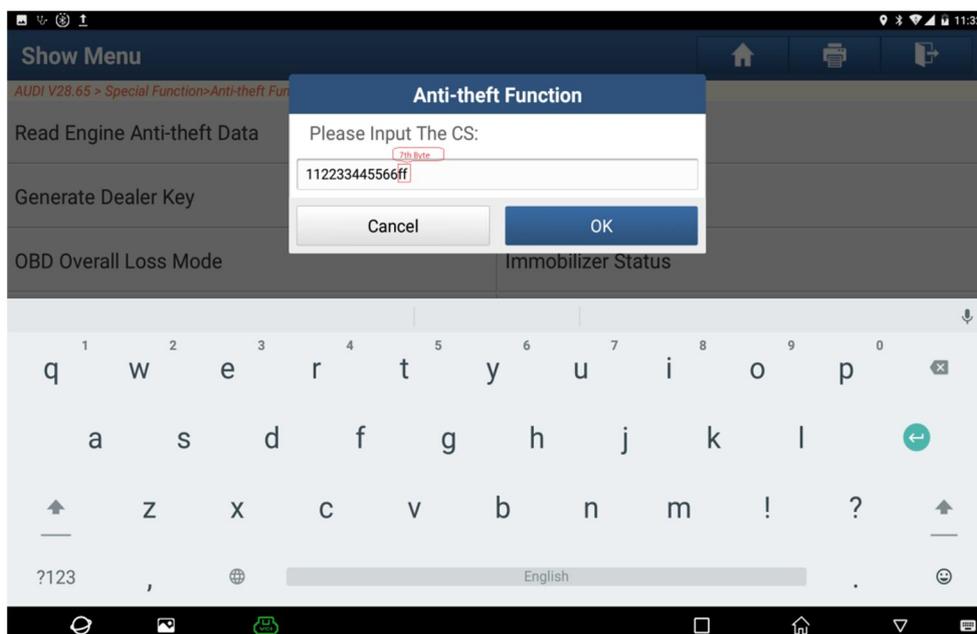


图 Figure-6

### 2.2.3、4th generation Kessy (A8, Touareg)

The 4<sup>th</sup> generation Kessy key learning function is the same as 4<sup>th</sup> generation comfort control ECU 46-key learning. For the detailed process, please refer to the 4<sup>th</sup> generation comfort control ECU 46 keys learning steps.

Note: After this type of key is successfully learned, the car sometimes will not start immediately. Insert the new key into the ignition switch and wait a few minutes to start.

### 2.2.4、4th-generation EZS (A6, Q7)

This type uses the MEGAMOS 8E chip, and the anti-theft component is a steering column lock. These two vehicles can be divided into type 1 and type 2; we select type 1 or type 2 according to the year. As showed Figure 7

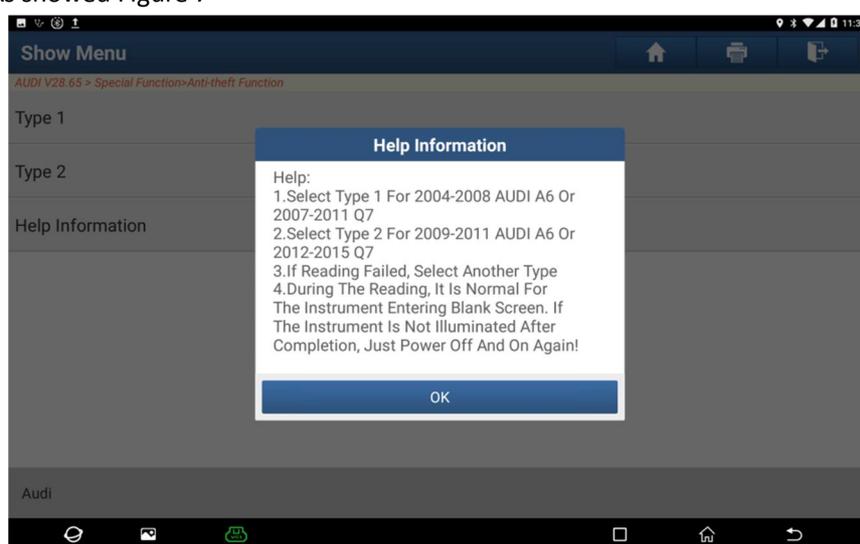


图 Figure-7

Key learning steps:

1. [Read EZS anti-theft data]: Read the 12bytes CS code and PIN code from EZS
2. [Generate dealer key]: Put the key into hole of X-PRO G, and the device will write the 12 bytes CS code into the key
3. [Learning Key]: Write the new key ID to EZS

Note: If vehicle data reading process is interrupted or the screen of instrument does not automatically light up after reading the data, please manually power off the battery for a few seconds and then power on to restore.

## **2.3、 5<sup>th</sup> Generation Anti-theft System**

### **2.3.1、 A4/A5/Q5**

5th-generation Audi A4 / A5 / Q5 models can be divided into two types, one is non-encrypted BCM2, and the other is encrypted BCM2. Generally 2008-2014 year vehicles is non-encrypted BCM2, which can be read directly, 2015-2016 year vehicles are all encrypted BCM2, following are details of key learning steps:

The steps of non-encrypted BCM2 key learning are as follows:

1. [Read anti-theft data]: Read the 16 bytes CS code from BCM2. (If the keys are all lost, you need to open the vehicle emergency light to activate OBD. During the reading process, you need to reset the power supply of BCM2 according to the software prompt (unplug the ECU plug)
2. [Generate dealer key]: Put the key to be added into the anti-theft hole of X-PRO G, and the device writes the 16 bytes CS code into the key
3. [Learn key]: Follow the prompt to operate the key and write the new key ID to BCM2.

### **2.3.2、 A6 / A7 / A8 / Touareg**

For 5th-generation Audi A6 / A7 / A8 and Volkswagen Touareg, due to all anti-theft data of the engine, gearbox and steering column lock are in the key, so it is different from the Audi A4 / A5 / Q5. If the key is lost, you need to know the anti-theft data of engine, gearbox and steering column lock, X-PRO G only supports key learning.

Key learning steps are as follows:

1. [Read anti-theft data]: Read the 16 bytes CS code from BCM2;
2. [Generate dealer key]: Put the new key and the car key into the X-PRO G anti-theft hole as prompted, and the device writes the anti-theft data of the vehicle to the new key;
3. [Learn key]: Follow the prompt to operate the key and write the new key ID to BCM2.

## **2.4、 MQB Anti-theft System**

MQB instrument uses Megamos 48 AES key chip. There are two main types of instruments on this platform, one is the NEC 35XXMQB, and the other is the Johnson MQB instrument. The two types of key learning methods are introduced below. Keys overall lost is temporarily not supported.

The steps to add NEC 35XX MQB instrument key are as follows:

1. Enter MQB anti-theft, enter key learning, and first back up and save the EEPROM data of the instrument;
2. [Key Learning]: Follow the prompts. The detailed process is shown in Figure 8.

Note: The remote control function of the MQB platform is matched together with the anti-theft keys. There is no need to match the remote separately, and you need to follow the instructions strictly. If there is an interruption during the reading of the data and the instrument cannot light up normally, please execute [Reset instrument] to exit the service mode.

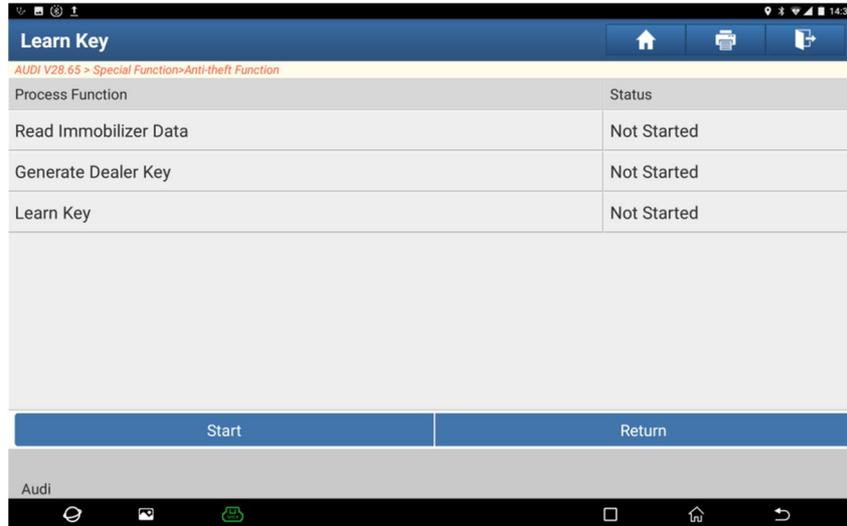


Figure-8

## 3、Keys Overall Lost

### 3.1、4<sup>th</sup> Generation Keys Overall Lost

For keys overall lost function, some vehicle instrument data need to be changed. After executing this function, the current vehicle will not be able to use the key customized by the original manufacturer, so you need to carefully follow the instructions.

#### 3.1.1、4<sup>th</sup> generation instrument

For Marelli NEC+95320, Motorola 9S12 anti-theft, 2013 Johnson anti-theft, some NEC+24C32 instruments, Audi A4-encrypted version RB4, Audi A4-encrypted version RB8 and some other instruments, keys overall lost function executing process are same as key learning , other instruments are required use the following method.

Method 1: If you can read the six-byte CS code and PIN code from the engine, select [OBD overall Loss Mode] directly from the type of instrument, and the detailed steps are shown in the figure 9.

Method 2: If the meter is not a 35XX or 24C64 14+ instrument, you can make the instrument enter the service mode by jump wire, and then read the anti-theft data according to the method of key learning. (Connect additional accessories to instrument by jump wires)

Supplementary note: if by smart key vehicle cannot light up the instrument; you need to turn on the emergency flashers, step on the brake to activate the OBD, and if the communication is not normal, you need to skip insurance to power on the engine ECU.

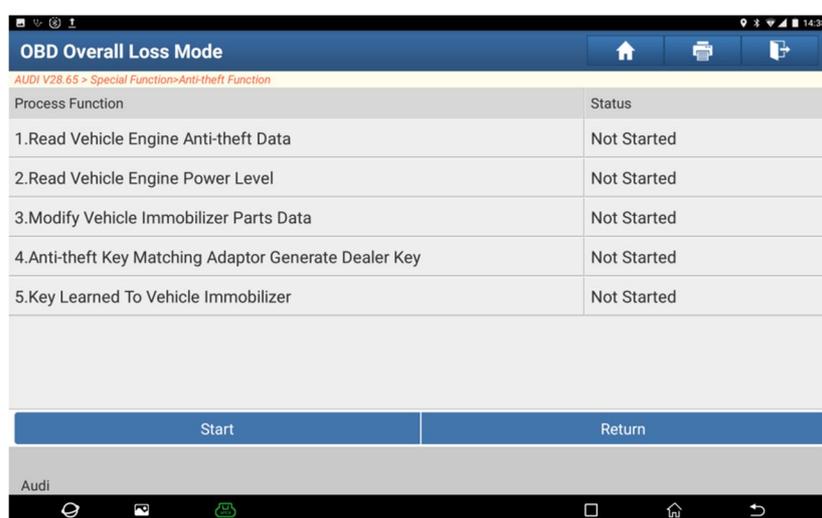


Figure-9

### 3.1.2、4<sup>th</sup> generation Comfort Control ECU

If it is a 46-chip vehicle, just follow the key learning method. For a 48-chip vehicle, you can execute key overall lost by following 2 methods.

#### Method 1:

- 1) Obtain the six bytes CS code and PIN code from the engine, (if OBD reading fails, you need to skip the gateway and enter [Engine] -> [MED17] -> [Direct connection to read anti-theft data], Connect ECU as shown in Figure 4);
- 2) Enter the menu of [4<sup>th</sup> Generation Comfort ECU (Magotan, CC)], click [OBD All Lost Mode], and manually input the CS code and PIN code read out by direct connection;
- 3) Follow the prompts to generate dealer keys and learn keys;

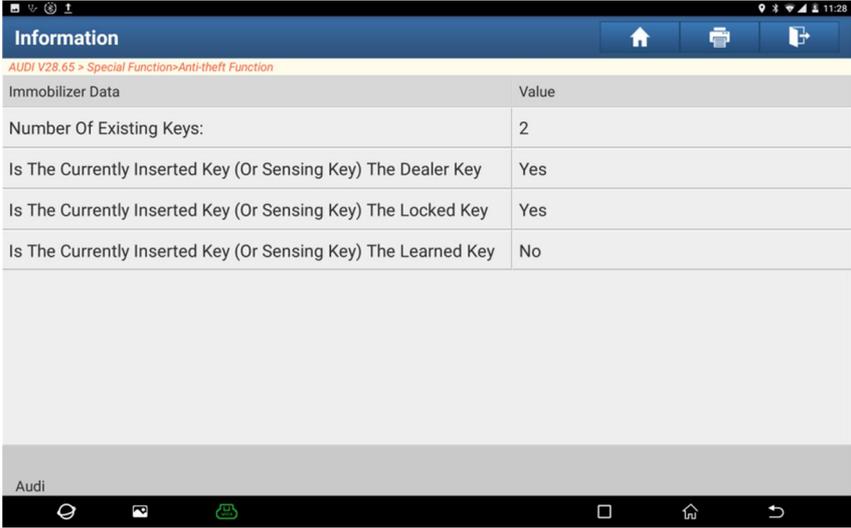
#### Method 2:

- 1) Obtain the six-byte CS code and PIN code from the engine, (if OBD reading fails, you need to skip the gateway and enter [Engine] -> [MED17] -> [Direct connection to read anti-theft data], Connect ECU as shown in Figure 4);
- 2) Enter the menu of [4th Generation Comfort ECU (Magotan, CC)], manually enter the CS code to generate the dealer key, the last byte is from 0x00-0xff; try 256 times at most, the generated key is close to the ignition coil, click [ Anti-theft status] If the page shown in Figure 10, then the

last byte you input before is correct.

3) Get the seven-byte CS code and PIN code, and learn the key directly according to the key learning method.

PS: by method 1, after the function is completed, because the process will change the data of the comfort control ECU, the car will not accept the key customized by the original factory. by method 2 it is slightly complicated, but it will not change any data of the comfort control ECU.



Immobilizer Data	Value
Number Of Existing Keys:	2
Is The Currently Inserted Key (Or Sensing Key) The Dealer Key	Yes
Is The Currently Inserted Key (Or Sensing Key) The Locked Key	Yes
Is The Currently Inserted Key (Or Sensing Key) The Learned Key	No

Figure-10

### 3.1.3、4<sup>th</sup> Generation Kessy Control ECU

The 4<sup>th</sup> generation Kessy Control ECU can execute keys overall lost by following two methods.

Method 1:

- 1) Get the 6-byte CS code and PIN code from the engine;
- 2) Enter the menu of [4th Generation Kessy (A8, Touareg)], click [OBD All Lost Mode], and manually input the CS code and PIN code read by the engine;
- 3) Follow the prompts to generate dealer keys and learn keys;

Method 2:

- 1) Get the six-byte CS code and PIN code from the engine;
- 2) Enter the menu of [5th Generation Kessy (A8, Touareg)], manually input CS code to generate the dealer key, the last byte is from 0x00-0xff; try 256 times at most, put generated key close to the ignition coil, click [Anti-theft Status], If the page as shown in the figure, the last byte you input is correct.
- 3) Get the seven-byte CS code and PIN code, and learn the key directly according to the key learning method.

PS: by method 1, after the function is completed, because the process will change the data of the comfort control ECU, the car will not accept the key customized by the original factory. by method 2 it is slightly complicated, but it will not change any data of the comfort control ECU.

### **3.1.4、 4<sup>th</sup> Generation EZS ECU**

The 4<sup>th</sup> generation EZS ECU can execute keys overall lost by following steps.

- 1) Get the six-byte CS code and PIN code from the engine;
- 2) Enter the menu of [4th generation EZS (A6, Q7)], click [OBD all lost mode], and manually input the CS code and PIN code read from the engine;
- 3) Follow the prompts to generate dealer keys and learn keys;

PS: Only 6 bytes of CS code and PIN can be read in the engine. Therefore, the EZS anti-theft data will be changed during execute keys overall lost function. After the function is completed, the vehicle will not accept the key customized by the original manufacturer.

### **3.2、 5<sup>th</sup> Generation A4/A5/Q5**

Omit, please refer to key learning 5<sup>th</sup> generation anti-theft systems 2.3.1, A4/A5/Q5

## **4、 Anti-theft Component Replacement**

This function can replace new anti-theft components or second-hand anti-theft components, and supports the following types

- 1) Second and third generation instruments and engines
- 2) Fourth-generation instrument ECU (for non-smart key vehicles, smart vehicles may not be able to start after the replacement is completed)
- 3) Fourth-generation engine ECU (ME7/EDC16/EDC17/MED9/MED17/Simos)
- 4) Four generations of comfort control ECU (Maotan, CC)
- 5) Fourth-generation Kessy ECU
- 6) Fourth-generation EZS-Keesy ECU (A6, Q7)
- 7) Fifth generation BCM2 ECU (components protection required)
- 8) Five-generation engine ECU
- 9) Five-generation gearbox ECU
- 10) The fifth generation steering column lock ECU

## 4.1、 2<sup>nd</sup> and 3<sup>rd</sup> Generation Replacement

Omit (2<sup>nd</sup> and 3<sup>rd</sup> generation replacement doesn't need X-PRO G)

## 4.2、 4<sup>th</sup> Generation Replacement

### 4.2.1、 4<sup>th</sup> Generation Instrument Replacement

Instrument replacement process needs to get original instrument data and the replacement instrument data. We need to get the complete 12-byte CS, PIN code, and power level of the original instrument. For the instrument used for replacement, we only need to get its 6-byte CS code to enter and write new anti-theft data inside.

#### **Introduction to the way to obtain original instrument data:**

Case 1: If the instrument of the target vehicle can still work normally and there is a key that matches normally, go directly to [4th Generation Instrument]-[Read Anti-theft Data], and save it as replacement data after reading.

Case 2: If the instrument of the target car has been damaged and the anti-theft data cannot be read normally, the 6-byte CS code and PIN code can be obtained by reading the engine. In this case, changing the next 6 bytes will cause the target car key to fail Normal learning (the original factory key cannot be unlocked), you need to relearn with a new key.

#### **Introduction of ways to obtain replacement instruments data:**

Case 1: Marelli NEC+95320, Motorola 9S12, 2013 Johnson, and some NEC+24C32 instrument directly read by [4th Generation instrument]>>[Read Anti-theft Data], and save them as replacement data after reading.

Case 2: If the instrument is not a 35XX or 24C64 14+ instrument, you can make the instrument enter the service mode by jump wires, and then read the anti-theft data according to the method of key learning.

- 1) Obtain the instrument anti-theft data of the target vehicle (refer to the introduction to the method of acquiring instrument data of the target vehicle)
- 2) Obtain the anti-theft data of instruments used for replacement (refer to the introduction of obtaining replacement instruments data)
- 3) Install replacement instruments on the target vehicle
- 4) Enter [4th Generation Anti-theft System]>> [4th Generation Parts Replacement]>>[Instrument], enter the interface in Figure 11, and then select "Edit 1" and input the anti-theft data obtained in step 1, and select "Edit 2" and input the anti-theft data obtained

in step 2, If the target car data is the 6-byte CS and PIN obtained through the engine, the target car instrument CS can fill the last 6 bytes, the input byte is shown in Figure 12, 112233445566 is the filled byte, after “editing 1” and “edit 2” are completed, Select [Start replacement] to replace the instrument;

5) After the replacement is completed, enter the 4th-generation instrument and manually input the CS code and PIN code to learn the target car key to the new instrument.

P.S: External Instrument=instrument used as replacement=replacement instrument in these paragraph.

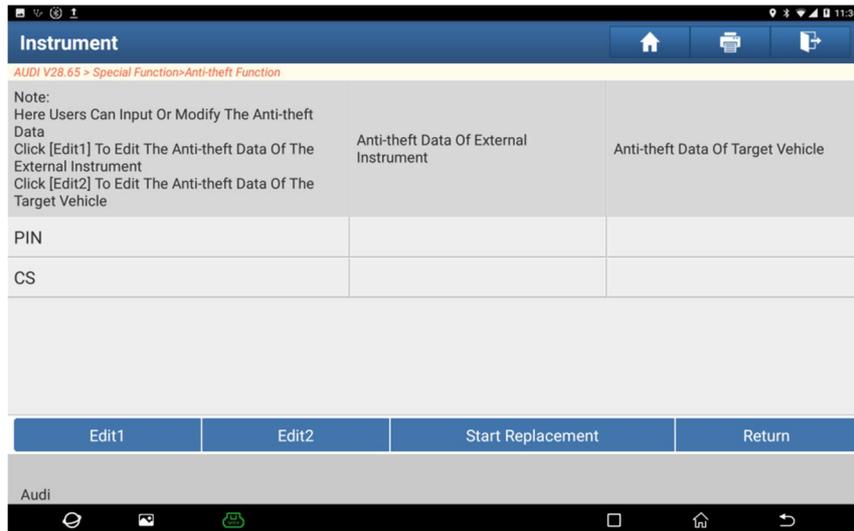


图 Figure-11

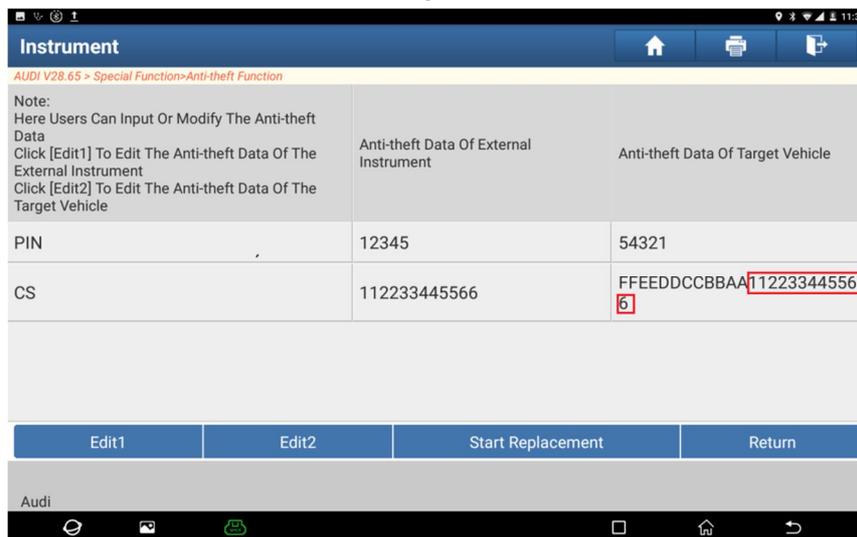


图 Figure-12

## 4.2.2、4<sup>th</sup> Generation Engine Replacement

The 4<sup>th</sup> generation engine replacement requires the anti-theft data of the two engines. Before replacing the engine, you need to ensure that the power levels of the two engine ECUs are the same. The engine power level cannot be changed during the replacement process. Generally, the

engine power level of ECUs with the same part number is the same. If the power level is not the same, you need to operate the instrument replacement function (only need to operate the function, do not need to change the instrument) to start the engine.

How to obtain the engine data of the target vehicle:

- 1) The engine data of the target vehicle is not damaged. The anti-theft data can be read normally, and the anti-theft data can be read directly from the [Engine].
- 2) If it is a 4<sup>th</sup> generation instrument type vehicle, the 12-byte CS code and PIN can be obtained by reading the anti-theft data of the instrument through the [fourth-generation instrument] function. The engine stores the first six-byte CS code of the instrument. If it is the EZS type, the 12-byte CS code and PIN can also be directly read. The engine stores the first six-byte CS code of the instrument. Comfort ECUs and Kessy need to be disassembled and read the EEPROM data to obtain the anti-theft data of the target vehicle engine.

How to obtain external engines:

- 1) Read the anti-theft data directly from [engine] by selecting the specific type
- 2) If the engine ECU is still on the original vehicle, the anti-theft data of the engine can be obtained by reading the instrument of the target vehicle or anti-theft components such as EZS
- 3) If the replacement part is a second-hand engine ECU, and it is a vehicle which main anti-theft system is an instrument, we can be read anti-theft data through [Online Anti-theft] >> [Fourth Generation Instrument] >> [Key Learning], and then contact our aftersales to obtain the complete 6-byte CS and PIN.

Detailed steps of engine replacement process

- 1) Obtain the engine anti-theft data of the target car
- 2) Obtain anti-theft data of external engines
- 3) Install the external engine on the target vehicle
- 4) Enter [Fourth Generation Anti-theft System] >> [Fourth Generation Parts Replacement] >> [Engine], input the anti-theft data obtained in step 1 and step 2, if it is read through the instrument, it can be directly saved and loaded, or manually input the CS code of the first six bytes of the instrument as shown in Figure 13
- 5) After the replacement is completed, you can try to start the engine. If the engine does not start normally, you need to perform the operation of the target vehicle instrument replacement function to synchronize the MAC data of the engine and the instrument.
- 6) After the instrument replacement function is operated, you need to enter the [fourth generation instrument] and manually input the 12-byte CS code and PIN code of the instrument to learn the target car key to the target car instrument.

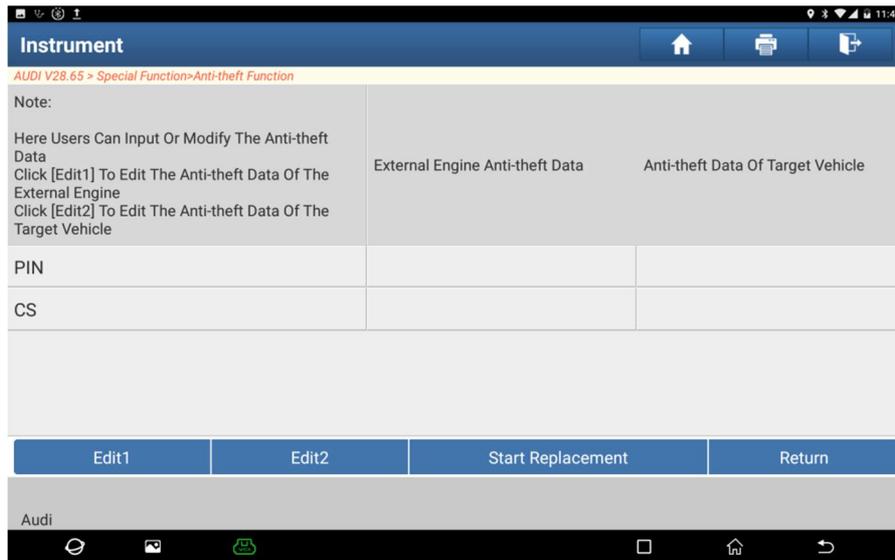


图 Figure-13

### 4.2.3、4<sup>th</sup> Generation Comfort ECU Replacement(Magotan,CC)

The replacement of the 4<sup>th</sup> generation comfort ECU needs to know the anti-theft data of two sets of comfort ECUs. The external comfort ECU can be obtained by disassembly and reading. The comfort ECU data of the target vehicle can be read from engine to obtain the six-byte CS code and PIN. Find the seventh byte through the key to get the complete seven bytes, the replacement steps are as follows

- 1) Obtain the EEPROM data of the external comfort ECU through other devices, and then decrypt it to get the CS code and PIN.
- 2) Read the engine anti-theft data to get the six bytes CS and PIN, and then look for the seventh byte to get the complete 7 bytes. Or obtain the EEPROM data of the comfort ECU of the target car through other equipment, and then decrypt the CS code and PIN.
- 3) Install the external comfortable ECU on the target vehicle
- 4) Enter [Fourth Generation Parts Replacement] -> [Fourth Generation Comfort ECU (Magotan, CC)], enter the anti-theft data of two groups of ECUs, and then follow the prompts to complete the operation
- 5) After the replacement is completed, you need to learn the key, and match the key in your hand to the comfortable external ECU.

### 4.2.4、4<sup>th</sup> Generation Kessy ECU Replacement(A8/Touareg)

The replacement of the 4<sup>th</sup> generation Kessy ECU needs to know the anti-theft data of two sets of comfortable ECUs. The external Kessy ECU can be obtained by disassembling and reading. The Kessy ECU data of the target vehicle can be obtained by reading the engine to obtain the six-byte

CS code and PIN. Find the seventh byte through the key to get the complete seven bytes, the replacement steps are as follows

- 1) Obtain the EEPROM data of the external Kessy ECU through other equipment, and then decrypt the CS code and PIN
- 2) Read the engine anti-theft data to get the six bytes CS and PIN, and then look for the seventh byte to get the complete 7 bytes. Or obtain the EEPROM data of the Kessy ECU of the target vehicle through other equipment, and then decrypt the CS code and PIN.
- 3) Install the external Kessy ECU on the target vehicle.
- 4) Enter [Fourth Generation Parts Replacement] -> [Fourth Generation Kessy (A8, Touareg)] and input the anti-theft data of two groups of ECUs, and then follow the prompts to complete the operation
- 5) After the replacement is completed, you need to learn the key and match the key in your hand to the external Kessy ECU.

#### **4.2.5、 4<sup>th</sup> generation EZS ECU(A6/Q7) Replacement**

The replacement of the fourth-generation EZS ECU needs to obtain the anti-theft data of two groups of ECUs. The external EZS ECU can obtain its MCU data through other equipment, and then decrypt the CS code and PIN. The target vehicle can be obtained in two ways.

Method 1: If the EZS ECU data of the target vehicle is not damaged, the complete 12-byte CS code and PIN code can be obtained through [4th generation EZS (A6, Q7)] -> [Read anti-theft data].

Method 2: Obtain the 6-byte CS code and PIN by reading the engine anti-theft data.

Replacement steps:

- 1) Input the 6-byte CS code and PIN code of the external EZS ECU
- 2) Input the 12-byte CS code and PIN of the EZS ECU of the target vehicle. (If the data is only 6-byte CS obtained by reading the engine, then the last 6 bytes can be filled randomly, and please remember the 12-byte CS)
- 3) Install the external EZS ECU on the target vehicle
- 4) Follow the prompt process to complete the replacement
- 5) After the replacement is completed, you need to enter the [fourth generation EZS (A6, Q7)] and manually input the 12-byte CS code and PIN code of the EZS to learn the target car key of the target car currently EZS ECU.

#### **4.3、 5<sup>th</sup> Generation Replacement**

The fifth-generation anti-theft components include BCM2 replacement, engine replacement,

gearbox replacement, and steering column lock replacement. The replacement process is to write the anti-theft data of the target car into the new anti-theft component. The anti-theft data mainly includes CS code (component protection code), VIN (frame number), power level and MAC (component synchronization code), etc. parameter. To perform the replacement, you need to obtain the CS codes of the target vehicle and the external anti-theft component separately. If it is an engine replacement, because the power level of the engine cannot be changed, it is necessary to ensure that the power level of the target vehicle is the same as the power level of the external engine in order to match normally.

### 4.3.1、5<sup>th</sup> Generation BCM2 Replacement

The fifth-generation BCM2 replacement now supports the replacement of Audi A6/A7/A8 vehicles, and only supports non-encrypted BCM2 replacement. The replacement needs to know the two sets of BCM2 anti-theft data. [Fifth Generation Anti-theft System] -> [Fifth Generation Replacement] -> [Fifth Generation BCM2], there are three ways to obtain BCM2 anti-theft data after select “Edit 1” and “Edit 2” buttons. As shown in Figure 14, the data is as shown in Figure 15



图 Figure-14



图 Figure-15

[OBD read IMMO data]: If the BCM2 of the target car can communicate normally, you can directly use this method to obtain the 16-byte CS code and power level.

[Manual input data]: If you obtain BCM2 anti-theft data through other methods, you can choose to directly input manually

[Obtained from dump data]: If the BCM2 cannot be communicated normally, you can import the PFLASH and DFLASH of this BCM2 chip to other devices to obtain complete IMMO data.



图 Figure-16

### 4.3.2、5<sup>th</sup> Generation Engine Replacement

The fifth-generation engine replacement has supported Bosch MED17 and EDC17 engines. The replacement of Bosch MED17 and EDC17 engines requires two sets of anti-theft data. The method of obtaining the two sets of anti-theft data and the replacement process are described in detail below.

Methods of obtaining external engines IMMO data:

- 1) To read the anti-theft data directly, first connect the engine and the diagnostic equipment as shown in Figure 17, and then click start. After the reading is completed, the data can be saved. Next time, if you need, you can load it directly, don't need repeat reading.
- 2) Manual input, if the engine data is obtained through other equipment, manual input can be selected.

How to obtain the engine of the target vehicle IMMO data:

- 1) If it is Audi A4/A5/Q5, directly obtain the engine anti-theft data through [OBD read anti-theft data], if it is Audi A6/A7/A8, the 16-byte CS code can be get from the engine by using the car key.
- 2) Manual input. If the engine data is obtained through other equipment, manual input can be selected

3) Directly connect to read the anti-theft data. First connect the engine and the diagnostic equipment as shown in Figure 16, and then click Start. After the reading is completed, the data can be saved. If you need, you can load it directly next time, you don't need Repeat reading.

Fifth generation engine replacement process

- 1) Obtain the target's engine ECU anti-theft data.
- 2) Obtain external engine ECU anti-theft data.
- 3) Change the external engine ECU to the target vehicle
- 4) Click [Start Replacement], after the replacement is completed, write the code of the target vehicle engine ECU to the external engine ECU.

Supplementary Note: Before replacing the engine, it is necessary to ensure that the power levels of the two engine ECUs are the same. If the part numbers are different, some engines can be solved through online programming. PADIII or PADV supports online programming functions



图 Figure-17

### 4.3.3、5<sup>th</sup> Generation Gearbox Replacement

The fifth-generation gearbox replacement has supported the gearboxes starting with 0AW. The replacement of the 0AW gearbox requires two sets of anti-theft data. The method of obtaining the two sets of anti-theft data and the replacement process are described in detail below.

How to obtain external gearboxes:

- 1) Read anti-theft data directly, first connect the gearbox and the diagnostic equipment as shown in Figure 18, and then click start. After the reading is completed, the data can be saved. Next time, if you need just load it directly, no Need to read repeatedly.
- 2) Manual input, if the gearbox data is obtained through other equipment, select manual input.

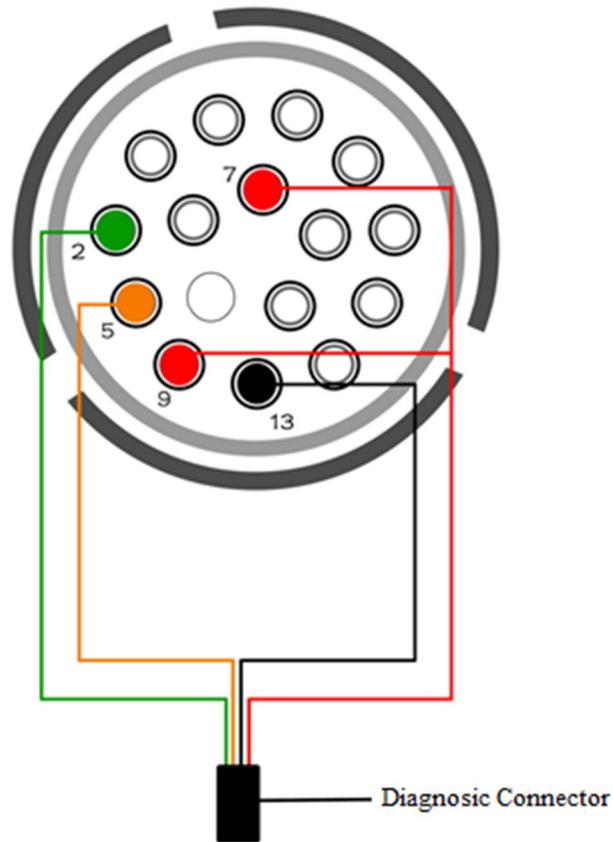


图 Figure-18

How to obtain the gearbox of the target vehicle:

- 1) In the case of Audi A4/A5/Q5, the gearbox anti-theft data can be obtained directly through [OBD read anti-theft data]. In the case of Audi A6/A7/A8, the 16-byte CS code of the target gearbox can be read out by the help of car key.
- 2) Manual input, if the gearbox data is obtained through other equipment, select manual input.
- 3) read the anti-theft data directly, first connect the gearbox and the diagnostic equipment as shown in Figure 15, and then click Start. After the reading is completed, the data can be saved. If you need just load it directly next time, no need to read repeatedly.

Fifth generation engine replacement process

- 1) Obtain the target's gearbox ECU anti-theft data
- 2) Obtain foreign gearbox ECU anti-theft data
- 3) Change the external gearbox ECU to the target vehicle
- 4) Click [Start Replacement], after the replacement is completed, write the data of the gearbox ECU of the target vehicle to the external gearbox ECU.

The replacement of the fifth-generation steering column lock requires two sets of anti-theft data.

The method of obtaining the two sets of anti-theft data and the replacement process are described in detail below.

How to obtain the external steering column anti-theft data:

- 1) Manual input, if the steering column data is obtained through other equipment, select manual input.
- 2) obtained from dump data: Import the data of the steering column lock chip into the device through other devices to obtain complete anti-theft data

How to obtain the steering column of the target vehicle:

- 1) If it is Audi A4/A5/Q5, directly obtain the steering column anti-theft data through [OBD read anti-theft data], if it is Audi A6/A7/A8, the 16-byte CS code to the steering column of the target car key needs to be used.
- 2) Manual input: If the steering column data is obtained through other equipment, select manual input.
- 3) obtained from dump data: Import the data of the steering column lock chip into the device through other devices to obtain complete anti-theft data

Fifth generation steering column lock replacement process

- 1) Obtain the target's steering column ECU anti-theft data.
- 2) Obtain external ECU anti-theft data on steering column.
- 3) Change the external steering column ECU to the target vehicle.

## Appendix 1 Correspondence Table of Anti-theft Types

Brand	Model	Year	Key Learn	Key Overall Lost	IMMO Components Replacement	IMMO Generation
Audi	A1(8X/FT)	2011-2018	support	~2014, support; 2014~, to be support.	~2014, engine/instrument, support	4 <sup>th</sup> instrument
Audi	A3/S3/RS3(8L)	1997-2003	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup>
Audi	A3/S3/RS3(8P/FM)	2004-2013.05	support	support	support	4 <sup>th</sup> instrument
Audi	A3/S3/RS3(8V/FF)	2013.06-2018	support	Don't support	Don't support	MQB
Audi	A4/RS4(8K/FL)	2008-2014.08	support	support	support	5 <sup>th</sup>
Audi	A4/RS4(8K/FL)	2015.08-2016.08	support	support	support	
Audi	A5/RS5(8F/8T/FH/FR)	2008-2014	support	support	support	5 <sup>th</sup>
Audi	A6/AllRoad/RS6(4B)	1998-2004	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup> (VDO66)
Audi	A6/AllRoad/RS6(4F/FB)	2004-2011	support	support	support	4 <sup>th</sup> EZS
Audi	A6/AllRoad/RS6(4G/FC)	2011-2018	support	To be support	support	5 <sup>th</sup>
Audi	A7/RS7(4G/FC)	2010-2018	support	To be support	support	5 <sup>th</sup>
Audi	A8/S8(4D)	1997-2003	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup>
Audi	A8/S8(4E)	2003-2010	support	support	support	4 <sup>th</sup> KESSY
Audi	A8/S8(4H/FD)	2010-2017	support	To be support	support	5 <sup>th</sup>
Audi	Q2(GA)	2017-2018	support	Don't support	Don't support	MQB
Audi	Q3/RSQ3(8U/FS)	2012-2018	support	support	support	4 <sup>th</sup> instrument
Audi	Q5(8R/FP)	2009-2018	support	support	support	5 <sup>th</sup>
Audi	Q7(4L)	2007-2015	support	support	support	4 <sup>th</sup> EZS
Audi	R8(42/FG)	2006-2015	support	support	support	4 <sup>th</sup> instrument
Audi	R8(42/FG)	2015-2018	support	support	support	
Audi	TT(8J/FK)	2007-2015	support	support	support	4 <sup>th</sup> instrument
Audi	TT(8N)	1999-2006	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup>
VW(EU)	Amarok(2H/SD)	2010-2018	support	support	support	4 <sup>th</sup> instrument
VW(EU)	Arteon(3H)	2017-2018	To be support			4 <sup>th</sup> instrument
VW(EU)	Atlas	2018	To be support			4 <sup>th</sup> instrument
VW(EU)	Beetle(1C/9C/1Y)	1998-2011	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup>

VW(EU)	Beetle(16/AT)	2012-2016	support	support	support	4 <sup>th</sup> instrument
VW(EU)	Beetle(16/AT)	2016-2018	To be support			4 <sup>th</sup> instrument
VW(EU)	Bora(1J)	1999-2005	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup>
VW(EU)	Caddy(2K)	2004-2010	support	support	support	4 <sup>th</sup> instrument
VW(EU)	Caddy(2K/SE)	2010-2018	support	support	support	4 <sup>th</sup> instrument
VW(EU)	Caddy(9K)	-2004	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup>
VW(EU)	Crafter	2017-2018	support	Don't support	Don't support	MQB
VW(EU)	EOS(1F/AH)	2006-2018	support	support	support	4 <sup>th</sup> instrument
VW(EU)	Fox Africa(5Z) Fox	2004-2010	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup> (VDO66)
VW(EU)	Fox EU(5Z) Fox	2005-2012	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup> (VDO66)
VW(EU)	Golf PLUS(1K)	2004-2014	support	support	support	4 <sup>th</sup> instrument
VW(EU)	Golf Sportsvan(AU)	2013.06-2018	support			Johnson MQB
VW(EU)	Golf(1J)	1998-2007	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup>
VW(EU)	Golf(AU)	2013.06-2018	support			Johnson MQB
VW(EU)	Golf-e(AU)	2013.06-2018	support			Johnson MQB
VW(EU)	Golf6 ESTATE(AJ)	2010-2012	support	support	support	4 <sup>th</sup> instrument
VW(EU)	Jetta(16/AJ)	2011-2018	support	support	support	4 <sup>th</sup> instrument
VW(EU)	Jetta(1K)	2006-2011	support	support	support	4 <sup>th</sup> instrument
VW(EU)	Passat CC(3C/AN) CC	2008-2017	support	support	support	4 <sup>th</sup> Comfort ECU
VW(EU)	Passat ESTATE(3C/AN) ESTATE	2011-2012	support	support	support	4 <sup>th</sup> Comfort ECU
VW(EU)	Passat R36(3C/AN) R36		support	support	support	4 <sup>th</sup> Comfort ECU
VW(EU)	Passat(3B)	2001-2005	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup> (VDO66)
VW(EU)	Passat(3C/AN)	2005-2010	support	support	support	4 <sup>th</sup> Comfort ECU

VW(EU)	Passat(A3)	2010-2018	support	support	support	4 <sup>th</sup> instrument
VW(EU)	Passat(3C/AN)	2015.06-2018	support	Don't support	Don't support	MQB
VW(EU)	Phaeton(3D)	2002-2016	support	support	support	4 <sup>th</sup> KESSY
VW(EU)	Phaeton(3E)	2016-2018	support	To be support	support	5 <sup>th</sup>
VW(EU)	Polo China(9N)	2004-2009	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup> (VDO66)
VW(EU)	Polo RUS/IND(60/61)	2015-2018	support	support	To be support	4 <sup>th</sup> instrument
VW(EU)	Polo(60/61/6R/A7)	2010-2011	support	support	support	4 <sup>th</sup> instrument
VW(EU)	Polo(60/61/6R/A7)	2012-2014	support	support	support	4 <sup>th</sup> instrument
VW(EU)	Polo(6R)	2015-2018	support	Don't support	Don't support	MQB
VW(EU)	Polo(9N)	2001-2009	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup> (VDO66)
VW(EU)	PoloLim(9N)	2004-2006	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup> (VDO66)
VW(EU)	Scirocco(13/AB)	2009-2018	support	support	support	4 <sup>th</sup> instrument
VW(EU)	Sharan(7M)	2001-2010	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup> (VDO66)
VW(EU)	Sharan(7N)	2010-2018	support	support	~2016 support, 2016~ don't support	4 <sup>th</sup> instrument
VW(EU)	T-Roc	2018	To be support			4 <sup>th</sup> instrument
VW(EU)	Tiguan(5N/AX)	2008-2018	support	support	~2016 support, 2016~ don't support	4 <sup>th</sup> instrument
VW(EU)	Tiguan(5N)	2016-2018	support	Don't support	Don't support	MQB
VW(EU)	Touareg(7L)	2003-2010	support	support	support	4 <sup>th</sup> KESSY
VW(EU)	Touareg(7P/A9/BP)	2010-2018	support	To be support	MED17/EDC17 engine, OAW gearbox, steering column lock, support	5 <sup>th</sup>
VW(EU)	Touran(1T)	2003-2018	support	support	~2015 support, 2015~ don't support	4 <sup>th</sup> instrument
VW(EU)	Transporter5/Multivan(7H/7J) T5	2003-2018	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup> (VDO66)
VW(EU)	UP(AA)	2012-2018	support	support	support	4 <sup>th</sup> instrument

Skoda	Citigo(AA)	2012-2018	support	support	support	4 <sup>th</sup> instrument
Skoda	Fabia India(5J)	2009-2015	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup> (VDO66)
Skoda	Fabia (6Y)	1999-2008	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup> (VDO66)
Skoda	Fabia (5J)	2007-2015	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup> (VDO66)
Skoda	Fabia (NJ)	2015-2018	support	support	To be support	4 <sup>th</sup> instrument
Skoda	Kamiq	2018	support	Don't support	Don't support	MQB
Skoda	Karoq	2018	support	Don't support	Don't support	MQB
Skoda	Kodiahq(NS)	2017-2018	support	Don't support	Don't support	MQB
Skoda	Octavia(1U)	1997-2011	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup> (VDO66)
Skoda	Octavia(1Z)	2004-2013	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup> (VDO66)
Skoda	Octavia(NE)	2013-2018	support	Don't support	Don't support	MQB
Skoda	Rapid India(NA)	2012-2015.08	support	support	~2014 support, 2014~ to be support	4 <sup>th</sup> instrument
Skoda	Rapid (NH)	2012-2018	support	support	~2014 support, 2014~2015 to be support	4 <sup>th</sup> instrument
Skoda	Roomster(5J)	2006-2015	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup>
Skoda	Roomster(SE)	2016-2018	support	Don't support	Don't support	MQB
Skoda	Superb(3T)	2008-2015.05	support	support	support	4 <sup>th</sup> instrument
Skoda	Superb(3U)	2001-2008	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup> (VDO66)
Skoda	Superb(NP)	2015.06-2018	support	Don't support	Don't support	MQB
Skoda	Yeti(5L)	2010-2018	support	support	~2014 support, 2014~ to be support	4 <sup>th</sup> instrument
Seat	Alhambra(7M)	2001-2010	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup>
Seat	Alhambra(7M)	2010-2018	support	~2014 support, 2014~ to be support	~2014 support, 2014~ to be support	4 <sup>th</sup> instrument
Seat	Altea(5P)	-2015	support	support	support	4 <sup>th</sup> instrument
Seat	Arona(KJ)	2018	support	Don't support	support	MQB
Seat	Arosa(6H)	-2004	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup>

Seat	Ateca(5F)	2017-2018	support	Don't support	Don't support	MQB
Seat	Cordoba(6K)	1999-2002	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup>
Seat	Cordoba(6L)	2003-2009	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup> (VDO66)
Seat	Cupraleon S.A(1P)0	2005-2010	support	support	support	4 <sup>th</sup> instrument
Seat	Exeo(3R)	2009-2014	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup>
Seat	Ibiza(6J)	2008-2018	support	~2015 support, 2015~ don't support	~2015 support, 2015~ don't support	4 <sup>th</sup> instrument
Seat	Ibiza(6L)	2002-2009	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup>
Seat	Ibiza(KJ)	2018	support	Don't support	Don't support	MQB
Seat	leon(1M)	2000-2006	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup>
Seat	leon(1P)	2006-2013	support	support	support	4 <sup>th</sup> instrument
Seat	leon(5F)	2013-2018	support	Don't support	Don't support	MQB
Seat	Mii(AA)	2012-2018	support	support	support	4 <sup>th</sup> instrument
Seat	Toledo(1M)	1999-2004	support	support	support	2 <sup>nd</sup> /3 <sup>rd</sup>
Seat	Toledo(5P)	2005-2009	support	support	support	4 <sup>th</sup> instrument
Seat	Toledo(NH)	2013.05-2018	support	support	~2014 support, 2014~2015 to be support	4 <sup>th</sup> instrument