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FCAR F3 Series Product Operation Manual Instruction

- Before using FCAR F3 series product, please read this manual carefully.
- This manual is based on the current product features and configurations. If adding new features and configuration, this manual will subsequently be amended. The new specification can be download at FCAR website (http: //www. fcar.com).
- Please carefully read the "Note" “Remark” of the user manual to ensure that users can use the products properly and safely.

FCAR F3 Series Main Unit Maintenance and Use Attentions

- Do not allow unauthorized demolition.
- Avoid strong impact.
- Avoid closing to magnetic field.
- Do not put the machine in a high-temperature environment for a long time.
- Do not put the machine in a low-temperature environment for a long time.
- Do not click on the screen violently or by using weapon.
- Do not use water and chemical solvents to clean the machine, using a soft clean cloth and neutral detergent to clean.

Automobile Inspection Notes

- Shall operate by adhering to auto repair industry safety rules. Special attention to the impact or damage caused by the environmental factors such as the surrounding pH, poisonous gas and high pressure.
- Vehicle battery fluid contains sulfuric acid, which is corrosive to skin. Users should avoid skin having direct contact with battery fluid in operation. Please be particularly careful not to splash into eyes and avoid closing to the fire.
- Engine exhaust emission contains a variety of toxic compounds and inhalation should be avoided. During

the operation, vehicles should be parked in a well-ventilated place.

- When the temperature of working engine is high, users should avoid touching with high temperature components such as water tank and exhaust pipes.
- Before starting the engine, users should hold the handbrake in order to avoid the vehicle rushing out and cause accident when starting the engine. Gear lever is placed in neutral (manual transmission) or【P】 gear position (automatic transmission).
- Before repairing the vehicles, users should hold the parking brake well, shifting transmission gear into the neutral position or 【P】 gear, and lowering the driver's seat side doors and windows.
- If the engine cannot start, firstly warm up to normal temperature (water temperature at about 80 ℃), and close the auxiliary electrical appliances (such as air conditioning, lighting, sound, etc.).
- Find the diagnostic socket of the car, check, ensure the intact of the diagnostic socket line, and connect the main unit for diagnosis. Otherwise, do not test to avoid damage to the main unit or use a multimeter to measure the voltage of diagnostic socket if necessary.

Instrument Use Notes

- When testing FCAR series products, users must handle with care and be away from heat and electromagnetic field, to avoid interference with the main unit.
- The matched touch pen, rather than any other sharp tool, is recommended to click the touch screen.
- When electrical components energized, you cannot disconnect the circuit to prevent the self-inductance, mutual inductance attacking sensors and automotive ECU.
- When electrical equipment works, avoid putting magnetic objects close to the vehicle control unit, otherwise the vehicle control unit may be damaged.
- When dismounting vehicle control unit or electrical components, it must be carried out 1 minute after turning off the ignition switch.

Contents

1. Product Introduction

1.1 Introduction

As professional multi-functional intelligentized automotive diagnostic computer equipment, FCAR Series products follow the international standard design. With large color touch screen, high resolution display integrated structural design, single-track working and touch operation, these special designs make you feel faster and more convenient in use and during diagnosis. In addition, FCAR F3 series product adopt flexible drive technology, with good extensibility, which fully satisfies the test of all kinds of communication BUS of vehicle electronic control system.

1.2 Features

The hardcore of FCAR auto diagnostic computer follows the international advanced modularized design technology, with excellent performance of high speed, stability and data collection accurate.

Openning structure design and independent operating system makes the future upgrade of system software and diagnostic software more conveniently.

Its working power supply is from vehicle storage battery which can meet the voltage change between 9~27V. Internal power supply adopts separating power supply design which can avoid products to be damaged when vehicle voltage is abnormal.

Good extensibility. Its communication interface adopts flexible drive circuit which not only satisfies the current auto BUS type test,but also meets the auto bus type test in the future. Built-in high and low speed CAN-BUS supports CAN-BUS electronic control system vehicles and just only one diagnostic interface can test all of vehicles with CAN-BUS. The products support all OBD-II protocols.

Build-in high speed thermal printer for the convenience of maintenance personnel to record data and save DTC.

Screen follows international standard LED true-color industry touch screen. It can show clear words even in strong light. Sensitive touch, broad interface and high compressive strength are also available. Therefore, it can work well even in bad environment.

Multi-language operation edition has been applicable to different countries and areas.

1.3 Care and Maintenance

1.3.1 Storage Environment

1) Store FCAR in a flat and dry place with suitable temperature.
2) Do not put FCAR under direct sunlight or near heating source.
3) Do not put FCAR in the magnetic field.
4) Avoid smoke erosion, water and oil splashing into FCAR.
5) Avoid shock, dust, moisture and extremely high temperature.
6) Power off the machine and make sure the power cable is removed, then clean the outside surface and touch screen with soft cloth that is dipped with a little water if main unit is dirty.
7) Periodically turn on the FCAR main unit to avoid moisture if it has not been used during a long time.

1.3.2 Main Unit Protection

1) Handle it with care and avoid hitting.
2) Be careful to plug and unplug the main cable and diagnostic connector. Tighten the screw before operation to avoid unexpected disconnecting and/or damage to the diagnostic port.
3) Put back the machine, cables, connectors and accessories to assembly case to avoid loss.

1.3.3 Touch Screen Care

1) Dust may be accumulated on the LCD screen due to electrostatic. Users are suggested to buy the special LCD screen wiper to clean the screen gently.
2) Do not wipe the screen with bare finger to avoid fingerprint attached. Never use chemicals to clear the screen.
3) Never put FCAR close to the electromagnetic wave products to avoid any effect on the screen.
4) Never put FCAR under direct sunlight or ultraviolet radiation for a long time to shorten the service life of screen.

1.3.4 Precaution on Operation

1) Forbidden to switch main unit frequently and cut off the power suddenly, power supply instability and abnormal power supply etc.
2) Unplug the power after usage in case of the aging of the products.
3) Never insert or pull out SD card when machine is turned on to avoid SD card damage or SD card data loss.

4) Don't expose product under the chemical volatility environment to avoid any corrosion of hardware.
5) Never clear product with chemical solubility reagents like banana water, engine cleaning agents,gasoline etc..
6) Don't put anything on the screen to avoid any damage.
7) Srarting up FCAR main unit periodically, if it is not operated for long time to avoid moisture.

1.3.5 SD Card Maintenance

1) Do not switch on/off FCAR main unit frequently.
2) Adopting antistatic precautions to avoid static electricity to contact SD card.
3) Do not operate SD card during upgrade or connection to main unit until data transmission is completed.
4) Do not plug or unplug SD card with electricity or brutal force.
5) Please remember the password if encrypt the content of card, or not to encrypt data.
6) Please use high-quality data transmission device during connection.
7) Randomly plug and unplug SD card from main unit are strictly prohibited during the operation of main unit.
8) Do not use cleaning liquid or water to clean SD card.
9) When insert SD card, the insert direction must be correct (Error insertion may lead to damage of SD card or SD card slot).
10) Do not twist and bend SD card.

1.4 Help

FCAR series product, provided with supporting service, is easy and simple to maintain. From purchase, use, upgrade to maintenance, the marketing network spreads over various regions that will provides users with the most convenient and efficient service.

FCAR Company provides users with online help. If users want to know the latest products, or automotive diagnostic information, please login FCAR website via internet: http://www.fcar.com and contact us.

2. Product Configuration

Figure 2.1.1 Main unit (Front side)

1. ON/OFF Button 2. Paper Out Button
3. Printing Paper Outlet

2.1 FCAR Hardware Introduction

2.1.1 FCAR Main Unit Front Side Configuration

Figure 2.1.1 is the front side structure diagram of FCAR main unit.

No.	Name
1	Main unit ON/OFF button
2	Printing Paper Out Button
3	Printing Paper Outlet

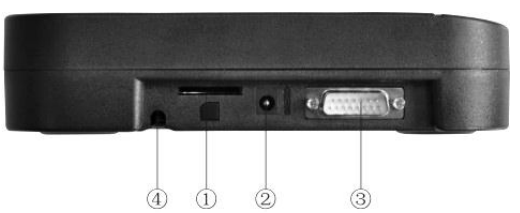


Figure 2.1.2 Main Unit Top Structure Diagram

2.1.2 FCAR Main Unit Side Configuration

Figure 2.1.2 is the top structure diagram of FCAR main unit.

No.	Name
1	SD Card Slot
2	Power Interface
3	Diagnose Interface
4	Touch Pen

Figure 2.1.3

Item	Unit/Method	Parameter
Print Method	Thermal dot-matrix Printing	
Number of Rows	(dot-matrix/row)	384
Resolution	(dot-matrix/mm)	8
Paper Width	（mm）	58＋0-1
Print Width	（mm）	48
Print Speed	（mm/s）	62.5
Paper Feed Method	Direct in	Bend out
Detection Mode	Thermal-Printing head temperature / Heat inductor	----

Table 2.1.4

Figure 2.1.4

2.1.3 Main Unit Parameters Introduction

Hardware	Parameters	Type
CPU	200MHZ	SAMSUNG ARM 2410A
RAM	64M	SMD
Flash Memory	SD Card	Plug Type
Power	12V/3A	DC Direct Voltage
Diagnose Interface	---	DB15
SD Card Interface	---	National Standard
Display	8-inch LED	TFT LCD Color Touch Screen
Resolution	600×800	Dot-matrix
External Dimension	290.7×207.3×45	mm
Net weight	1390	Gram

2.2 Printer Parameters Introduction and Printing Paper Installation

2.2.1 Printer Parameters Introduction

FCAR F3 main unit with built-in mini thermal printer, adopting the way of direct in and bent out, reduces the risk of printing stuck. See table 2.1.4.

2.2.2 Printing Paper Installation

1. Put main unit flat on desk or other flat surface, pull outward printer and take out cover plate on the lower part of main unit, as shown in Figure 2.1.4.

Figure 2.1.5

2. Take the printing paper navigation bar down from the printer as shown in Figure 2.1.5.

Note: When taking out the printing paper navigation bar, left side (navigation bar left side has no gear) should be firstly taken down and then the right side. The wrong order can lead to abnormal wear on the navigation bar gear or damage to navigation bar.

Figure 2.1.6

3. Unpack the printing paper provided by FCAR, pull out printing paper from the roll of paper for about 5cm, put the printing paper into the installation slot, and hold the printing paper beginning end, as shown in Figure 2.1.6.

Note: The exit of printing paper must be installed downward. The wrong installation direction can result in that the printer cannot print.

Figure 2.1.7

4. Install the printing paper navigation bar on the navigation bar bracket, as shown in Figure 2.1.7.

Note: When installing the printing paper navigation bar, firstly install the right side of navigation bar (the right side with gear), then place printing paper in the most middle (if printing paper is not in the most middle of the navigation bar, it will cause printer jams or misalign during printing), and then install the left side.

Figure 2.1.8

5. Using thermal printing paper, error installation direction will cause printing failure. Installation direction of printing paper is shown in Figure 2.1.8.

Figure 2.1.9

6. Passing the printing paper out from the paper exit in the back of printer paper cover as shown in Figure 2.1.9, according to the reverse order of dismantling printer cover to install the printer cover and ensure that the printer cover board is engaged and the main unit cover is locked.

7. Tear down the extra printing paper, as shown in figure 2.1.10 (normally tearing the printing paper off rightward).

Figure 2.1.10

8. Power on main unit, select 【Print】on the main unit menu, and check the printed results to ensure that the printing contents is normal, without stagnation and abnormal noise phenomenon.

Remark: In the case of main unit working, press 【LF】button on the left side of printer, and printing paper will automatically deliver paper. Please make sure the integrity of printing results.

3. Operation Guide

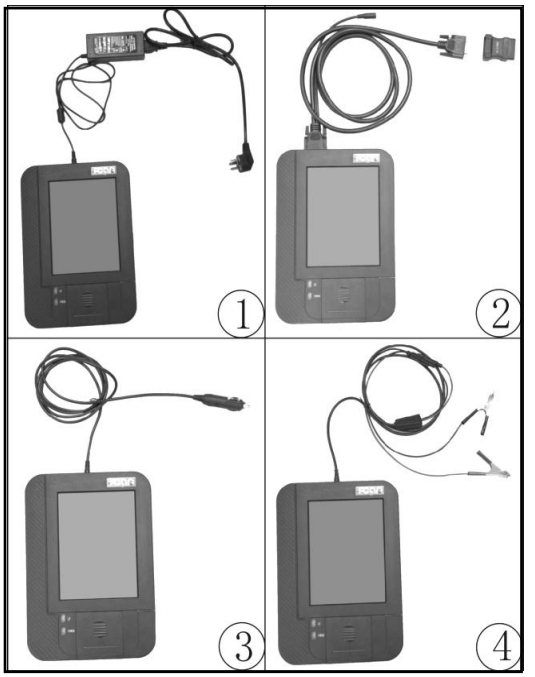


Figure 3.1.1

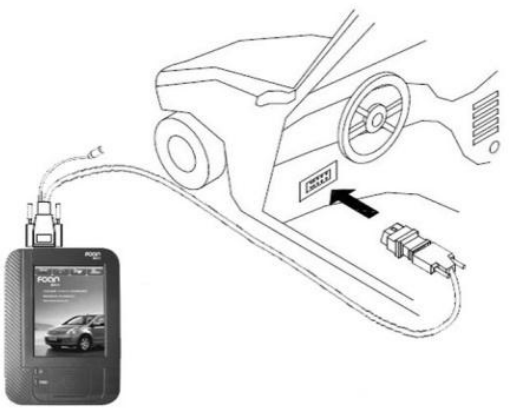


Figure 3.1.2

3.1 Power and Testing Cable Connection

3.1.1 Main Unit Power Supply

Four methods of FCAR F3 main unit power supply are available, as shown in Figure 3.1.1

- Power supply by power adapter.
- Power supply by main testing cable, connector and vehicle diagnostic socket.
- Power supply by connection of cigarette lighter with vehicle.
- Power supply by connection of battery terminal line with vehicle battery.

3.1.2 Cable Connection Method

Option of power:

If the diagnostic socket is not equipped with power supply, methods ① ③ ④ can be chose in 3.1.1 as one of these three power connection methods to provide power for the main unit.

If the diagnostic socket is equipped with power, users do not need to connect another power cord.

The connection of testing cable is shown in Figure 3.1.2.

The prerequisites for vehicle:

1. Confirm the diagnostic socket location, shape, and whether there is a need for external power supply.
2. Select the appropriate connector base on vehicle model and shape of diagnostic socket.
3. Connect one end of the main testing line to the other end of main unit diagnostic connector.
4. Plug diagnostic connector that connected with the main testing line into the vehicle diagnostic socket.
5. Confirm that main unit with power and start it up.

Remark: Diagnostic interface in Figure 3.1.2 is standard OBD-II interface. During connection, two ends of main testing cable are required to separately connect with OBD-II connector and FCAR main unit, plugging OBD-II connector into vehicle diagnostic socket to finish connection. Not

all cars are equipped with BOD-II connectors, thus, the connections shall be subject to the actual connectors.

Figure 3.1.3

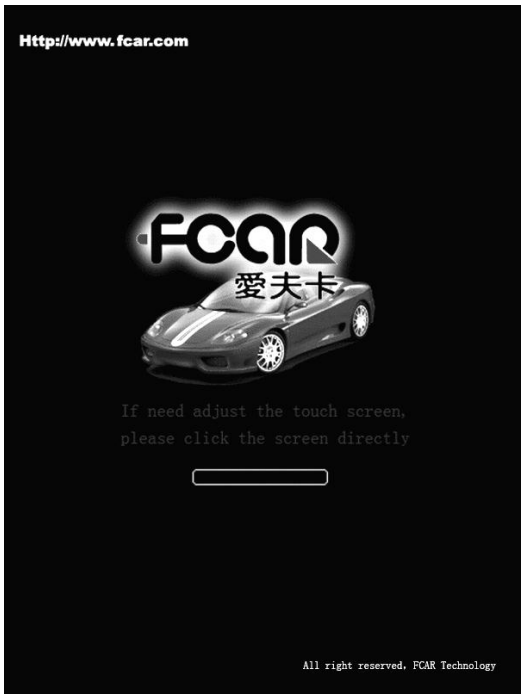


Figure 3.2.1

3.1.3 Start Up

Through any one of the four power supply ways introduced in 3.1.1, press the button 【POWER】 in the bottom left of the main unit screen. The main unit will start, and then enter into the running state. As shown in Figure 3.1.3.

3.1.4 Shut Down

After usage of this equipment, click touch screen to back to desktop, press the 【POWER】 key in the bottom left of the main unit screen to shut down. As shown in Figure 3.1.3.

Notes: When startup or shutdown, the button operation time is generally 1 ~ 2mins, long press the 【On】 and 【Off】 button maybe cause key failure.

3.2 Starting Up Interface Menu Introduction

3.2.1 Starting Up Interface

Connect the power supply, press the power switch key, FCAR product identification firstly appears on the screen, then【if you want to adjust the touch screen please, click screen directly】 appears at the top of the starting up progress bar, as shown in Figure 3.2.1.

Notes: If you need to adjust touch screen, please at this time click on anywhere of the screen with the touch pen to enter adjustment mode. During adjustment, you must use touch pen to adjust.
If don't need touch screen adjustment, the system will automatically enter desktop in 2s.

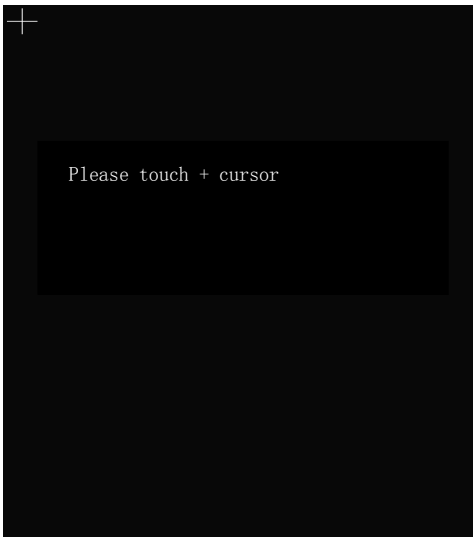


Figure 3.2.2

Figure 3.2.3A

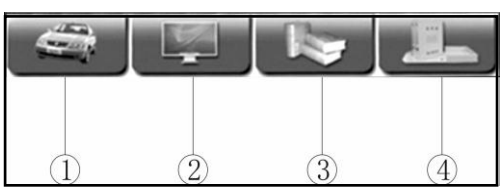


Figure 3.2.3B

3.2.2 Starting Up Screen Adjustment

In Figure 3.2.1, if you use touch pen to click on anywhere of screen, the main unit menu enter into the touch screen adjusting mode.

The main unit screen prompts 【Please touch + cursor】, click on the cross cursor appears on the 4 corners of screen in turn clockwise with a touch pen from top left corner of the screen. Figure 3.2.2 is the display of menu after entering adjusting mode.

After adjustment, and the main unit shows correct information, then log onto the desktop menu.

3.2.3 Desktop Menu Description

When the main unit starts normally, the main unit will enter the desktop menu, as shown in Figure 3.2.3A. The top of desktop is the menu bar. Desktop background displays product models, service hotline update website and service network.

Desktop top from left to right are

1: 【Trouble Diagnostic Program】

2: 【System Settings】

3: 【Professional Dictionary】

4: 【Maintenance information】

Note: The bottom right position of the menu shows ****date ** month ** year, representing the last update time of the software program.

1	Trouble diagnostic program
2	System setting
3	English-Chinese Dictionary
4	Maintenance Information

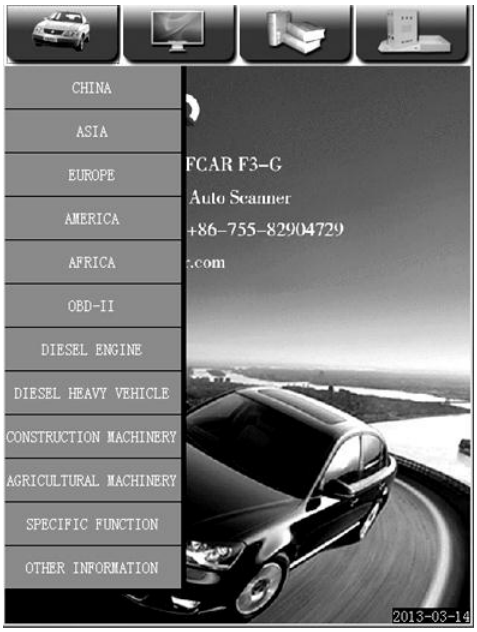


Figure 3.3

3.3 Use of Diagnostic Program

Take F3-G as an example, as shown in Figure 3.3, the actual interface should be subject to the one displayed on the decoder.

Notes: Since the car type, software system and menu included in F3 series products differs for different models of cars, all these should be subject to actual configurations displayed in the product, and this manual only takes a few types of F3 series products for example.

Figure 3.4

3.4 System Settings

Select the menu 【System settings】 with the touch pen at the top of desktop, then the sub-menu of system setting menu appears. Sub-menu as shown in left Figure3.4.

【System info】
【Touch adjust】
【User info】
【System theme】
【Language】
【System active】
【Data Manager】
【Self-test】
【SD card test】

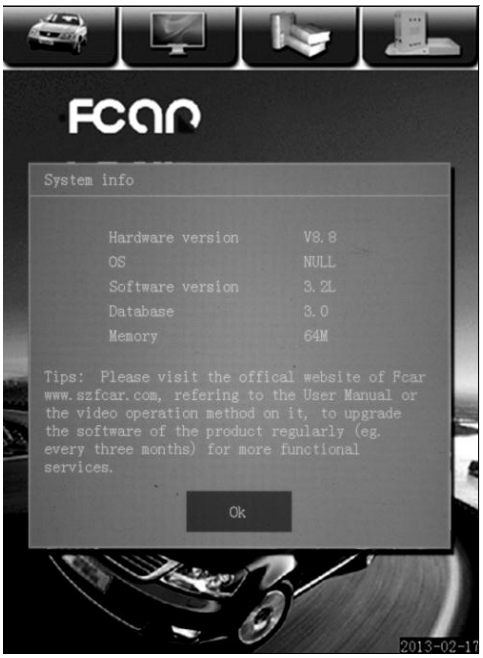


Figure 3.4.1

3.4.1 System Information

Select 【System info】and enter, the main menu pops up a dialog box of hardware information, operating system version, software version, database version and memory information of product. Operate the button【OK】 to return to previous menu. As shown in Figure 3.4.1.

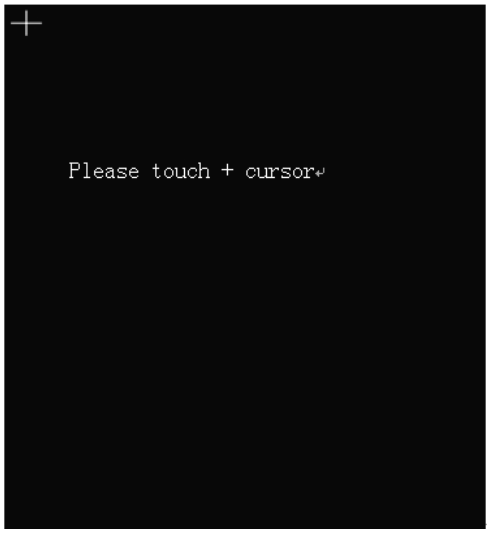


Figure 3.4.2

3.4.2 Touch Screen Adjustment

This feature is for screen deviation adjustment during operation of main unit functions. When using touch pen to select main menu, the entered menu is not the actual one selected. Operation method is the same to that of starting up screen adjustment. See 3.2.2 for detailed operation method.

Note: If it cannot be adjusted through the touch screen adjustment menu, users can adjust it when startup.

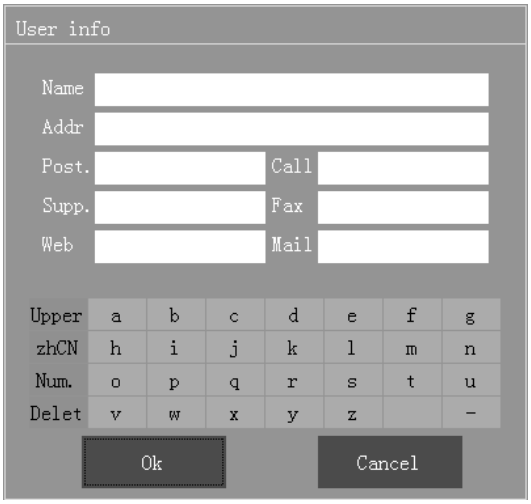


Figure 3.4.3

3.4.3 User Information

After purchasing, users fill in information by themselves: company name (either company name or individual name is ok), address (the detailed address which is easy to be found by customers who need repairs), post code, call number, fax, support, website, email. Relevant information about the user is shown as in Figure 3.4.3. After finishing inputting, press 【OK】 button to save and 【Cancel】to drop it.

Note: At entry time, users must firstly select the right input location. 【Upper】 in keyboard area of the bottom of the screen is for change case. 【zhCN】 is for conversion between Chinese and English.【Num.】 is used for conversion between the letters and numbers. 【Delet】 is for user to delete the inputted error character or letter. This function is used when there is need to print the user's information.

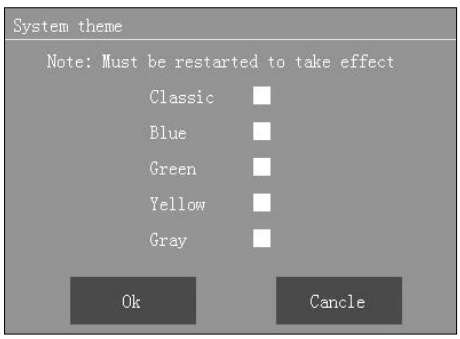


Figure 3.4.4

3.4.4 System Theme

Used for setting programs menu background. There are 5 themes in total available: Classic, Blue, Green, Yellow and Grey, as shown in Figure 3.4.4. The Setting theme is based on working environment to avoid the visual gap between different environments. When setting, select the appropriate theme in the system setting dialog, and click on the small box behind the theme to select, then click【OK】button to save. Press 【Cancel】 button to cancel this operation.

Note: After changing the theme, the main unit is required to be restarted to make the new theme taken effect.

Figure 3.4.5

3.4.5 Language

The menu is used for setting languages of main unit. Mainly eleven languages are available for option: Simplified Chinese, English, Russian, Traditional Chinese, Japanese, Spanish and Polish, as shown in Figure 3.4.5. When setting select the appropriate language in the Language dialog, you can select by clicking on the small box behind the language, then click【OK】button to save. Press【Cancel】button to cancel this operation.

Note: After changing the language type, users need to restart the main unit to have the new language patterns taken effect. If the change has no authorization for other languages, there would be no response after click on diagnostic menu.

Figure 3.4.6A

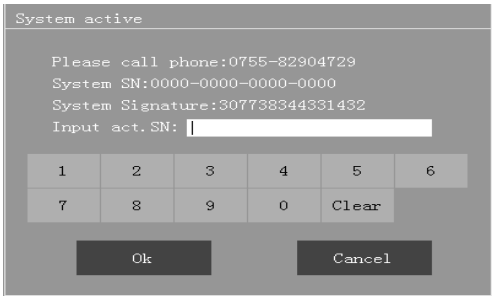


Figure 3.4.6B

3.4.6 System Active

After FCAR main unit leaving the factory, it has not been permanently activated and can only operates 50 times use (as shown in Figure 3.4.6A, only after the user purchased it, the user can activate the device through FCAR website after registration and login the member center in FCAR website. (Some customers request FCAR to activate it when shipping).

System active detail methods please refer to 6.2.

Figure 3.4.7

3.4.7 Data Manager

Image View is used to see the pictures saved by screenshot function.

Data manage is used to clear data stream saved before. If it is necessary, please click 【OK】to clear data, and if it is not, click 【Cancel】, as shown in Figure 3.4.7

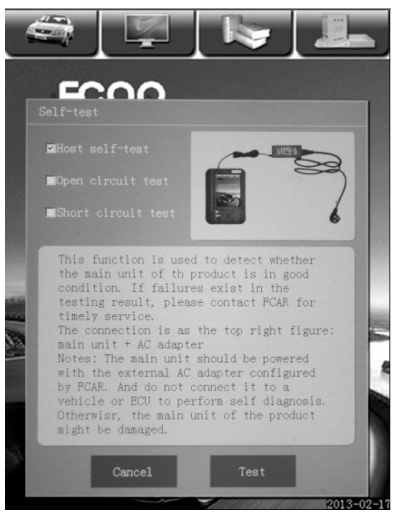


Figure 3.4.8A

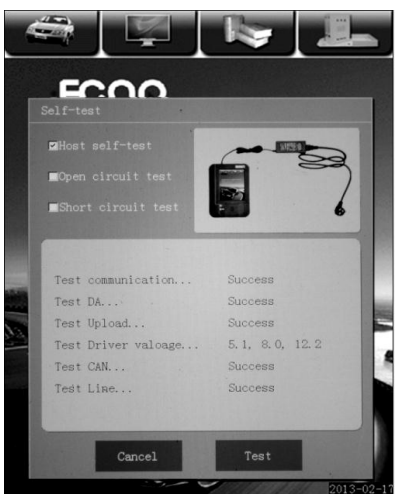


Figure 3.4.8B

3.4.8 Self-test

This function includes host self-test, open circuit test and short circuit test. Please select the function based on your need and operate in accordance with the requirements and precautions.

3.4.8.1 Host Self-test

This function is used to detect the performance of hardware of main unit. Please use the product configured power adapter to supply power and diagnose.

As shown in Figure 3.4.8B. If the test is successful, it means the main unit with good performance.

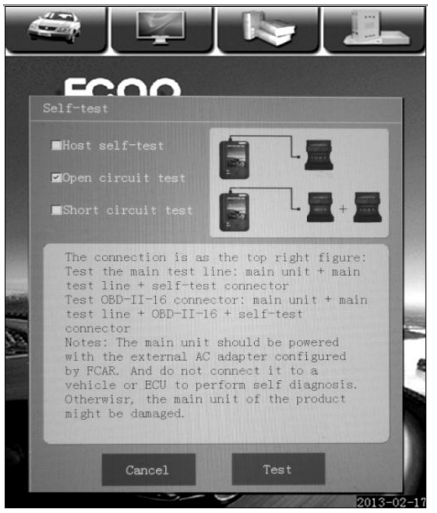


Figure 3.4.8C

3.4.8.2 Open Circuit Test

The function is used to detect whether there is open circuit in main testing cable and OBDII-16 connector.

We need to test the performance of main testing cable and OBD-II-16 connector when some vehicles cannot be tested.

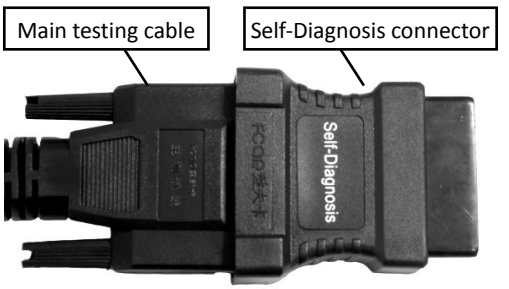
Please use the product configured power adapter to supply power and diagnose.

The connection method is as below:

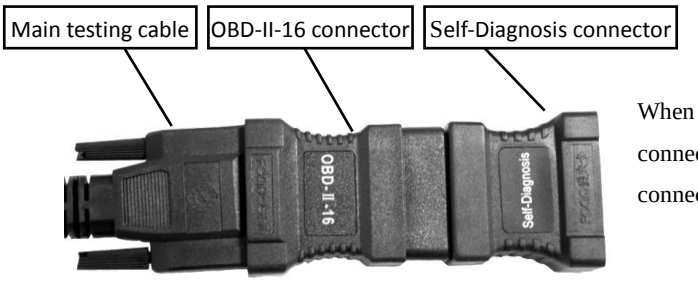
Self-diagnosis connector

Note：

Use this connector only when users do open circuit test.



When main testing cable is being tested, please connect it to self-diagnosis connector.



When users test OBD-II-16 connector, please connect main testing cable and standard OBD-II-16 connector and then connect self-diagnosis connector.

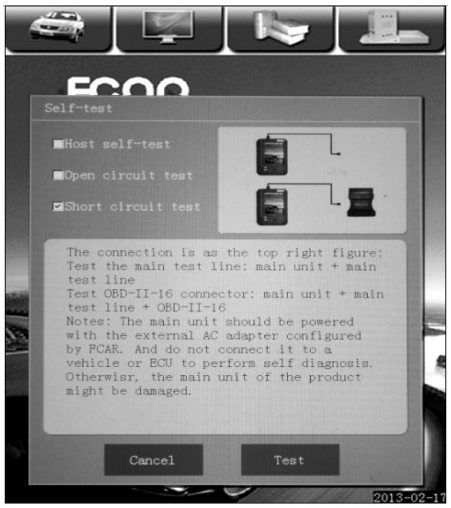


Figure 3.4.8D

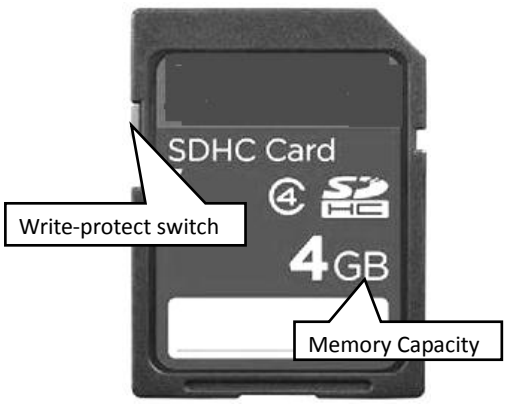
3.4.8.3 Short Circuit Test

(It is prohibited to use self-diagnosis connector to do short circuit test)

This is used to do short circuit test of main testing cable and OBD-II-16 connector.

We need to test the performance of main testing cable and OBDII-16 connector when some vehicles cannot be tested.

Please use the product configured power adapter to supply power and diagnose.



3.4.9 SD card Test

SD card has C2 and C4 two types, please distinguish them.

Write-protect switch should be on the side without 【LOCK】 mark and if the switch is on the side with 【 LOCK 】 mark, the SD card will be in write-protected state in which users can read data but cannot write in data, format SD card and update. When users choose format, there will be a prompt 【This SD card is in write-protected state】.

Figure 3.4.9

As shown in Figure 3.4.9. After SD card testing, it shows【Speed:1.666MB/s means the read and write speed is 1.666MB/s, this SD card's performance is good!】

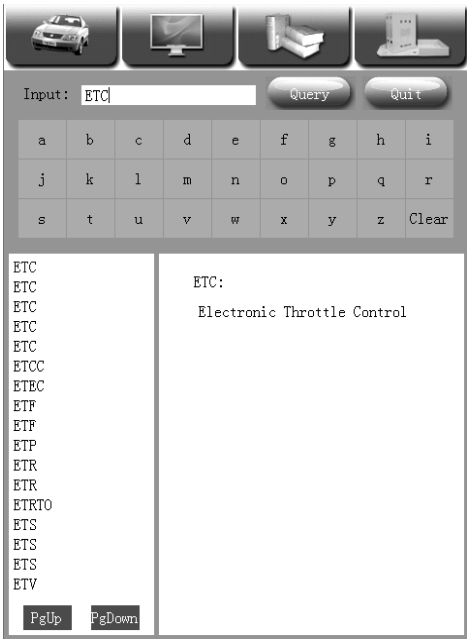


Figure 3.5

3.5 Professional Dictionary

When users fail to understand the professional vocabulary encountered in the routine maintenance and learning, users can enhance personal skills via professional dictionaries.

For example: after inputting "ETC" in the input box click 【Query】 to search the word, system will display words related with ETC in the left column, select and click the appropriate search word, the word in Chinese can be automatically translated and displayed in the right column as shown in Figure 3.5. If it is finished, please press 【Quit】 to log out.

Note: The dictionary supports full-writing and abbreviation.

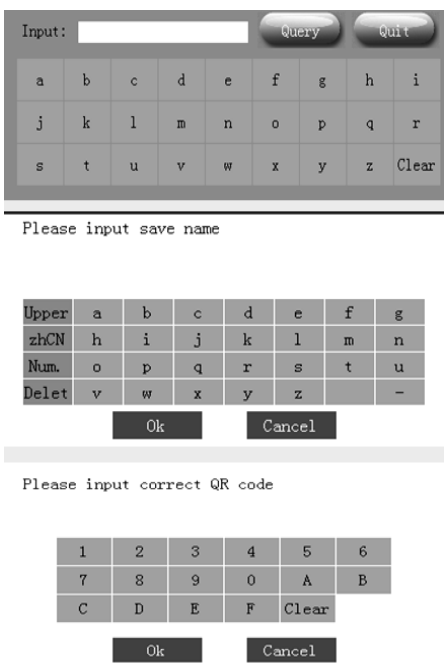


Figure 3.6.1

3.6 Screen Keyboard & Maintenance Help System

【Maintenance Help System】 and 【Screen Keyboard】display differently in different versions and specific version is subject to real object.

3.6.1 Screen Keyboard

Different menus of FCAR main unit contain different input methods, as shown in Figure 3.6.1. Three kinds of keyboard: letters input, uppercase and lowercase letters input and English and Chinese input and digital input.

Figure 3.6.2A

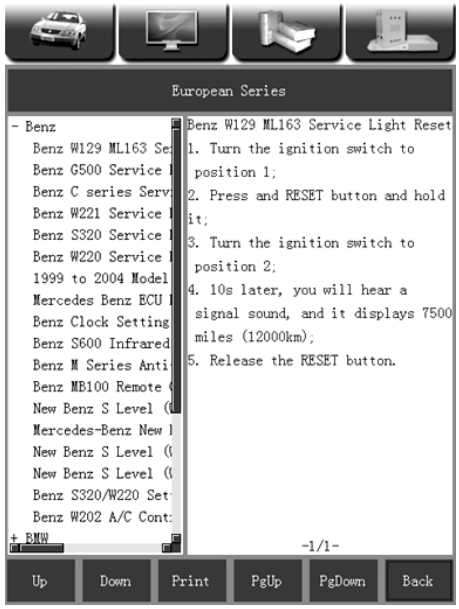


Figure 3.6.2B

3.6.2 Maintenance Information

Maintenance information is provided by FCAR for customers in relation to the car maintenance technologies and is subject to the one displayed on decoder.

Select the needed information. After users enter the menu, there will be two sections: title section and content section. After selecting the titles, see on the left and the respective content will appear immediately on the right, as shown in Figure 3.6.2B.

Note: Users can click the buttons under the menu, including 【Up】, 【Down】, 【Back】, 【Next】 and 【Print】 for your other operations.

4. Vehicle Diagnosis

Figure 4.1A

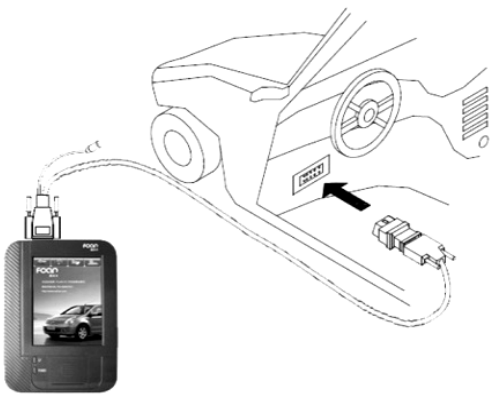


Figure 4.1B

4.1 The Technical Requirements for Diagnosis

4 .1.1 Equipment Requirements

FCAR main unit and a variety of test connectors are needed. Select the corresponding test connector according to the type of vehicle diagnostic socket.

4.1.2 Vehicle Requirements

1. Ignition switch ON.
2. Car battery voltage should be between the 11-14V or 24-27V (subject to the power supply of vehicles).
3. Accelerator pedal in Off state, namely idle bonding point.
4. Ignition timing and idle speed should be in standard range, transmission temperature and oil temperature reach to normal operating temperature (water temperature: 90-110 ℃, transmission oil temperature: 50-80 ℃)
5. Diagnostic circuit is normally connected.

Different models have different diagnostic socket positions. See 【9. Common Car Diagnosis Socket Position】about diagnostic socket position of vehicle model.

4.1.3 The Requirements for Maintenance Technician

1) Basic knowledge of automotive electronics
2) Basic operations of equipment and familiarity with operating instructions
3) Ability to tell the tested vehicle trouble from mechanical failure or electronic control related fault
4) Understanding of the origin, manufacturing year, and engine model of vehicle

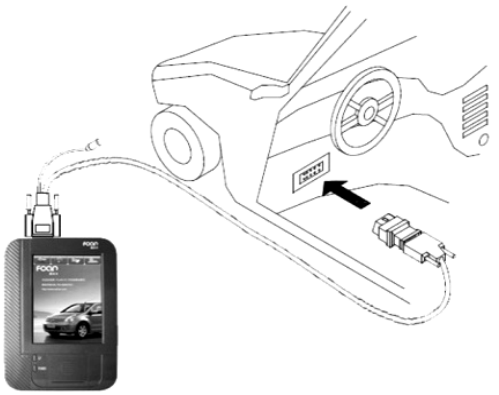


Figure 4.2.1

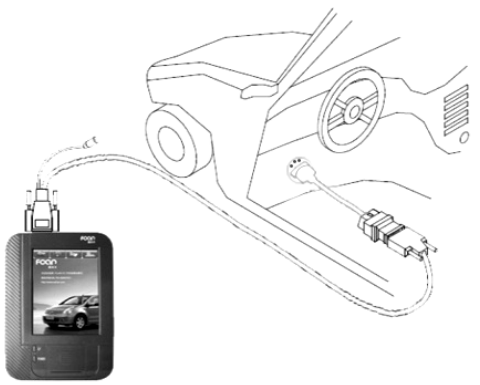


Figure 4.2.2

Figure 4.2.3.1

4.2 FCAR F3 and Diagnostic Socket Connection

4.2.1 Connection of OBD-II connector

Choose the proper connectors according to the diagnostic connectors of the to-be-detected vehicles. If the connector of the to-be-detected vehicles is standard OBD-II, users need to separately connect two ends of the main test cable with the main unit and OBD-II connector, fasten them with bolts and put diagnostic connector into the diagnostic sockets on one side of the vehicle, as shown in Figure 4.2.1.

4.2.2 Connection of Non-OBD-II Connector

At first, users should confirm whether the connector of to-be-detected vehicle has the F3 decoder. When connecting, users should first connect the connector that is exclusive to F3 decoder to standard OBD-II connector, and then connect standard OBD-II connector with the main testing cable and the main unit of the decoder.

4.2.3 Connection between Jumper Holder and Vehicle Diagnostic Connector

In the course of vehicle diagnosis, users often meet the problems that the connection still fails even proper diagnostic connectors are used because of human damages, modification or wrong connection to vehicle diagnostic socket. In such case, users can use jumper holder to do the connection with jumpers.

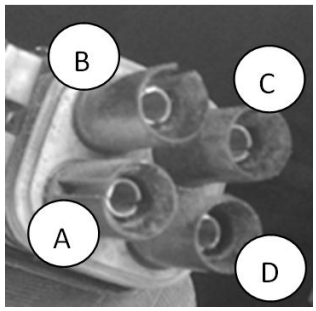
Notes: Jumper holder is only installed in F3-D and F3-G.

Jumper Holder and Jumper Introduction

<table>
<tr>
<td> 
</td>
<td>Introduction to a jumper holder
There are 15 holes on jumper holder, specially: 1, 2, 3, GND, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, VCC.
Respective definition of each hole are as follows:
1#: K Line 2#: K Line
3#: K Line GND: Ground（Negative）
6#: CAN-H
7#: RSR232+, J1708+, K Line 8#: K Line
9#: K Line 10#: K Line
11#: K Line 12#: K Line
13#: K Line 14#: CAN-L
15#: RSR232-, J1708-, L line
VCC: Power Line（positive）
POWER: Power indicator</td>
</tr>
<tr>
<td>  </td>
<td>Introduction to jumper
There are 16 jumpers in three colors (red, black and yellow) in an assembly box. For sake of identification, red jumper is often used to connect the positive pole of power, black jumper is used to connect the negative pole of power and the yellow one is used to connect signal line. There are four kinds of jumper pin: sheet pin, cylindrical, square hole, round hole. They can be applied to any shape of diagnostic port pin. The actual usage of it should be subject to the shape of diagnostic connector pin of the vehicles.</td>
</tr>
</table>

Variable Communication Protocols

Protocol Name	Name of Communication Line	Reference Range of Voltage	Hole Number of Jumper to Be Connected
K Line Communication	K	1V lower than battery voltage	7
CAN Communication	CAN-H	2.5V＋0.25V	6
	CAN-L	2.5V－0.25V	14
J1708 Communication	J1708-A	3V~5V	7

	J1708-B	0V~2V	15
RS232 Communication	RS232-TD	（-9V）~（-5V）	7
	RS232-RD	0V~0.7V	15
Yuchai Natural Gas		A Terminal（5.5V）	7
		B Terminal（4.5V）	15
		C Terminal（GND）	GND

There is no power supply through diagnostic socket. Please use battery clip to connect anode (No need to connect battery clip Cathode) when providing main unit with power. Please do not use cigarette lighter or else that will lead to ECU test failure.

The detailed connection steps are given as follows based on the most common example of K line communication and CAN communication.

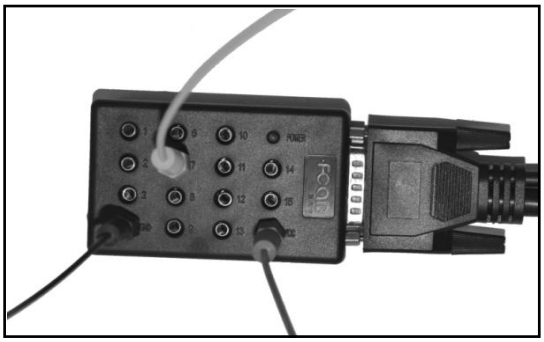


Figure 4.2.3.2

K Line Communication Diagnostic Socket Connection Method

Signal voltage of K line is 1V lower than that of battery voltage. For example, the voltage of storage battery is 12V, so the voltage of signal line is about 11V and the signal voltage is 23V if the voltage of storage battery is 24V. In actual measurement of pin voltage of diagnostic socket, there might be an error that is about ±0.25V.

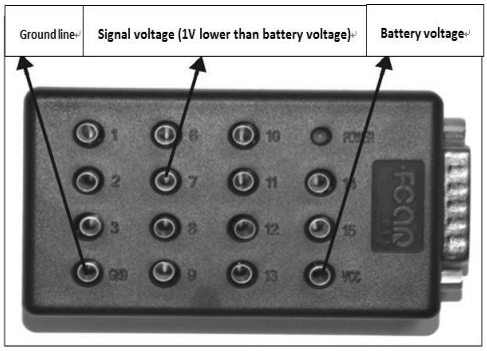


Figure 4.2.3.3

Methods of connecting K line communication to diagnostic socket and FCAR jumper holder are as described as in the Figure 4.2.3.3. Connect the signal line to No. 7 hole, power line (battery voltage) to VCC and ground line to GND.

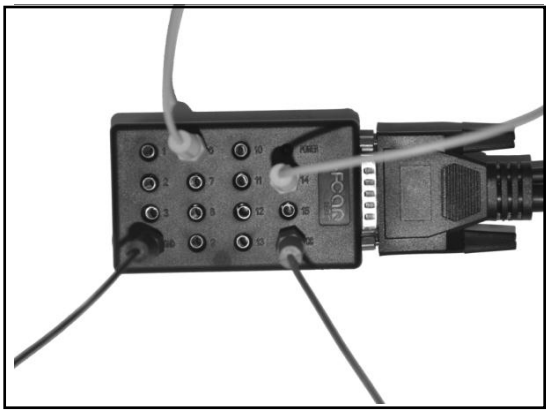


Figure 4.2.3.4

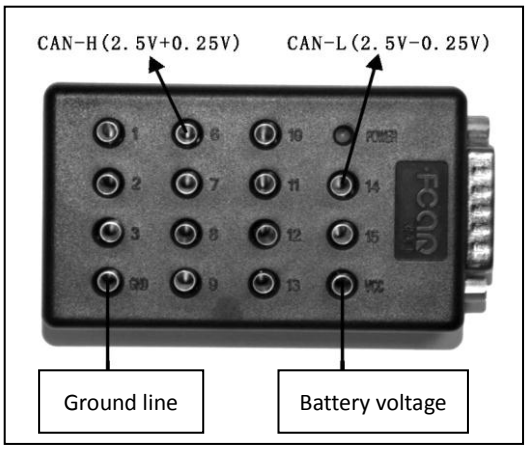


Figure 4.2.3.5

CAN Line Communication Diagnostic Socket Connection Method

Double signal line should be adopted in CAN line communication. Two diagnostic signal lines are used when users measure the voltage of ground line via multimeter under the circumstance that the ignition switch is turned on. The total voltage of the two is 5V, the voltage of CAN-H line is 2.5＋0.25V, and the voltage of CAN-L line is 2.5－0.25V. There might be an error in comparison with the actual values, and the error is 0.25V or so.

Methods of connecting CAN line communication diagnostic socket and FCAR jumper holder is as described as the Figure 4.2.3.5. Connect CAN-H to No. 7 hole, CAN-L to No. 14 hole, power line (battery voltage) to VCC and ground line to GND.

Note: In actual measurement of pin voltage of diagnostic socket, there might be an error which is about ±0.25V.

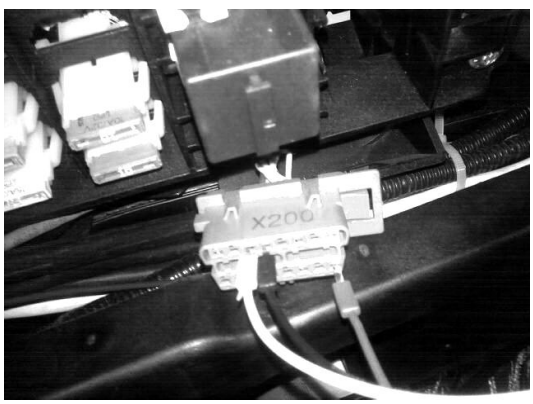


Figure 4.3.2.6

Connect the jumper holder and the main testing cable and fasten them with bolts. After connecting the jumpers according to the right steps, users can connect them to cars for diagnosis.

Turn on the ignition switch after connection, power indicator light on jumper holder will be lightened. After users press the switch of main unit of F3 series products, the main unit will work normally and the proper system for diagnosis can be selected.

Note: Anyone who is lack of knowledge about electric device of cars or is not sure about the power supplier of the electric device is not allowed to do jumper test, because the wrong jumper test may lead to electric failures of cars or the faults of FCAR main unit and wires.

Relevant information confirmation and tool of car diagnostic socket:

1. Digital high impedance multimeter (high impedance meter is a must, otherwise, there might be damages to the computer board)
2. Turn ignition switch to ON, and there should be voltage supplied to car on the diagnostic socket. The voltage difference between the voltage of diagnostic socket and battery of car should not be more than 2.5V.
3. During diagnosis, if the signal line is single-wire communication (K line), voltage of signal line is lower than 1V, (if the supply voltage of car is 12V, voltage of signal line is 11V±0.25V and if it is 24V, voltage of signal line is 23V±0.25V)
4. If CAN communication is adopted in the communication of duel signal lines, and two diagnostic signal lines are used when users measure the voltage of ground wire via universal meter under the circumstance that the ignition switch is turned on. The total voltage of the two is 5V, the voltage of CAN-H line is 2.5＋0.25V, and the voltage of CAN-L line is 2.5－0.25V. There might be an error in comparison with the actual values and the error is 0.25V or so.

5. F3 Program Usage Introduction

Note: Since F3 has different configurations for different types of car software, it should be subject to the specific software list.

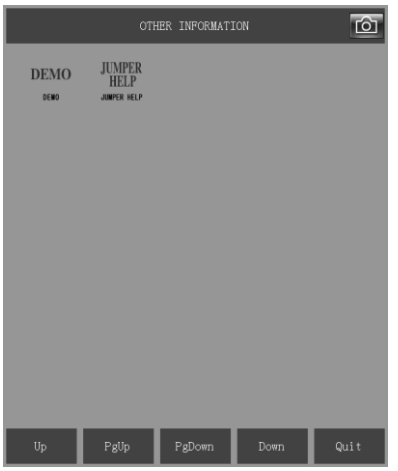


Figure 5.1.1

Figure 5.1.2

5.1 DEMO

In order to help users to know about car diagnosis, training program is installed in the software of FCAR series products, which can make users to get familiar with the car diagnosis program quickly.

The users who know little about cars can fully understand the relevant steps of car diagnosis after they bought it.

1. At first, electrify the main unit, press the switch of FCAR main unit to start the main unit, and then choose the car diagnosis.
2. Choose 【Other Information】, users can see DEMO, as shown in Figure 5.1.1.

3. Choose 【DEMO】to enter a submenu, and 【V5.3】displayed in this menu is the current version of current training mode, as shown in Figure 5.1.2.

Figure 5.1.3

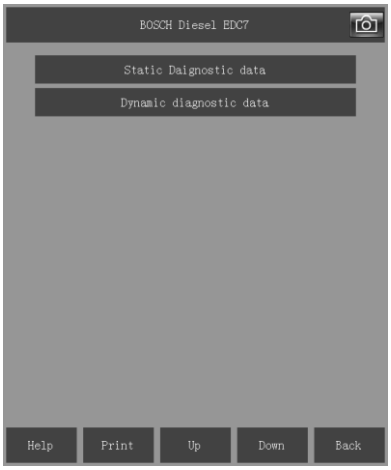


Figure 5.1.4

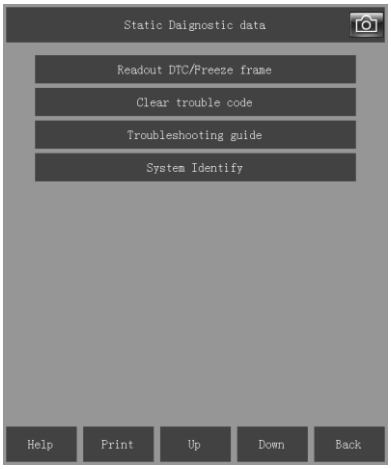


Figure 5.1.5

4. Choose 【Version Information】 to enter a submenu.

The menu displays systems currently available for training, namely, BOSCH, DENSO and DELPHI, as shown in Figure 5.1.3.

According to individual needs, choose the system that users need to know. If users need to know the system, users can choose corresponding system and enter it for learning.

Choose 【BOSCH】 and enter it, static diagnostic data and dynamic diagnostic data show. See Figure 5.1.4.

Note: Static diagnostic data suggests the functions that can be operated when the electronic control system is static (the ignition switch points to ON but the engine is not started).

Choose 【Static Diagnostic Data】 to enter a submenu.

This menu covers relevant functions in ECU under the condition of static diagnostic data. As shown in Figure 5.1.5.

Choose 【Readout DTC/Freeze Frame】 to enter a submenu.

Choose 【Clear Trouble Code】 and then users can execute the operation of clearing current trouble code stored in ECU.

Choose 【Troubleshooting Guide】 and users can do troubleshooting and analysis of current trouble code stored in ECU.

Choose 【System Identify】 and users can browse current relevant parameters inside the ECU. Parameters include mode of the engine, software version number of ECU, hardware version number, factory number, etc.

Figure 5.1.6

Exit the menu as shown in Figure 5.1.5 and choose dynamic diagnostic data, and then users can view the dynamic diagnostic data (date for the engine that is at idle speed or non-idle speed) inside the ECU. The contents that can be seen are given in Figure 5.1.6.

5.2 Screenshot Function

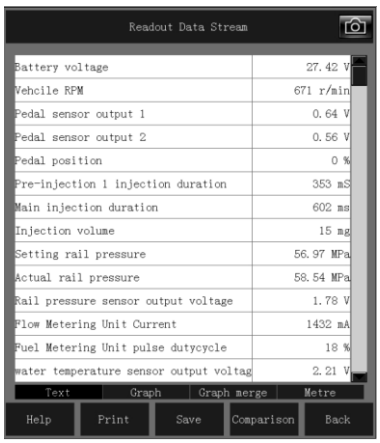


Figure 5.2A

After entering the main menu, there is a small button like a camera on the top right of the screen. Click the button to do screenshot. As shown in Figure 5.2A.

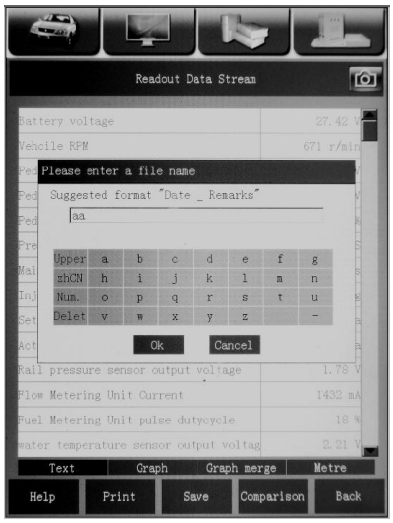
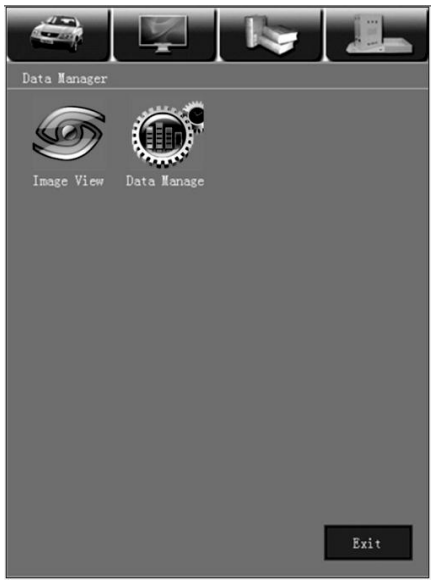


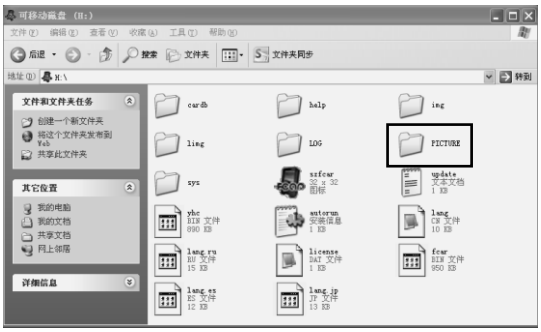
Figure 5.2B

Click the camera button, the screen will pop out a box, enter the file name and the screenshot picture will be saved. As shown in Figure 5.2B.

The saved pictures can be checked through the scanner second icon. Please enter 【Data Manager】.



Choose 【Image View】 to check the pictures saved by screenshot.



Users can also connect the SD card with PC computer and choose the file folder named 【PICTURE】 to check the screenshot pictures.

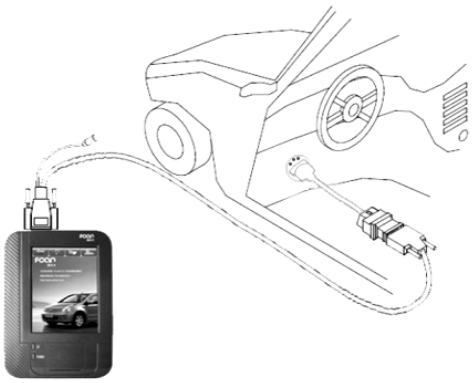


Figure 5.3A

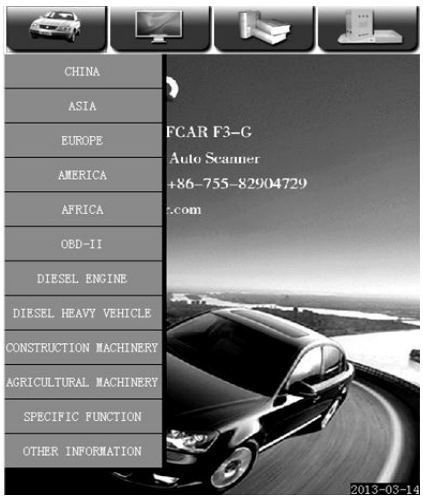


Figure 5.3B

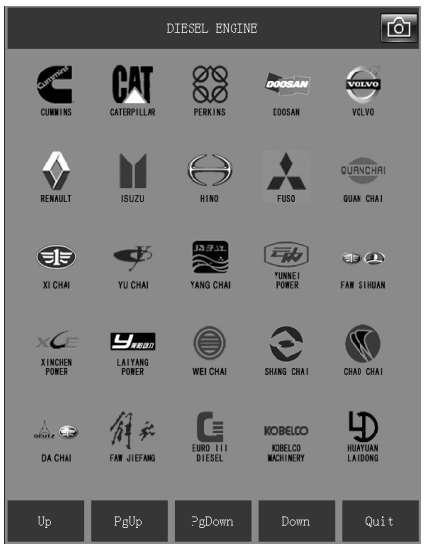


Figure 5.3C

■ 5.3 Steps of Vehicle Diagnosis

1. Find the location of vehicle diagnostic socket.

2. Select the connector according to the vehicle diagnostic socket model.

3. Connect the main unit to the wire or connector of the to-be-detected vehicle.

4. Connect the testing connector to the vehicle diagnostic socket as shown in Figure 5.3A.

Note: If the power supply of diagnostic socket of diagnostic vehicle is insufficient or its power supply pin is damaged. Users can make the decoder obtain power supply by any of the following ways:

- Through the cigarette lighter cord: insert one end of cigarette lighter cord to automobile cigarette lighter hole, the other end of the FCAR main testing line connect to power plug.
- Through the double-clamp power cord: connect power clamp of double-clamp power cord to the battery positive and negative, insert the other end into the FCAR main testing line power plug.

5. Turn on the ignition switch or start the engine.

6. Turn on【POWER】 the FCAR F3 main unit.

7. Select the area of the vehicle that is in current diagnosis in diagnostic program (as shown in Figure 5.3B).

8. As shown in Figure 5.3C (different decoder type suggest different vehicle model. There are five function menus: 【Up】, 【Pg Up】, 【Pg Down】, 【Down】 and 【Quit】. 【Up】 and 【Down】 can make a row of the vehicle types scroll upward or downward, and 【Pg Up】, 【Pg Down】 are buttons to turn a page of vehicle types upward or downward.

Note: For limited displaying of auto makers on per page, so users need to find the software of the vehicle to be detected through the 【PgUp】, 【PgDown】 and the scroll bar on the right side.

Figure 5.4.1

5.4 Diagnosis Function Option

5.4.1 Readout Information about Computer Version

In the menu, choose【Version Information】, read the product number of ECU. As shown in Figure 5.4.1

Note: This information is from vehicle ECU. The content that the auto computer fault diagnostic tool displayed is ECU version information, which is the only number for ECU specified by manufacturer.

5.4.2 Readout Trouble Code

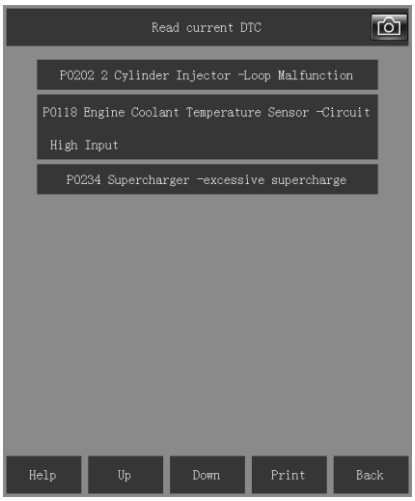


Figure 5.4.2A

Some vehicle manufacturers have different settings on readout data stream, so they are divided into current trouble code and history trouble code.

Read current trouble code

Choose 【Read Current DTC】 in the menu for reading the trouble code recorded by auto ECU self-diagnosis, and make explanation about the trouble content. As shown in Figure 5.4.2A.

Five function keys under the operation menu are for relevant operation.

Note: Obtaining the trouble code digital information from vehicle from random access memory RAM of auto computer control unit (ECU) through auto fault diagnostic computer.

Trouble code Analysis:

About trouble code, people who have some knowledge of vehicle maintenance will tell you that trouble code refers to when the vehicle electronic control system such as engine or gearbox malfunction, the system control unit ECU or self-diagnostic module of ABS module detects system component fault to meet specific program conditions, and have the fault information in form of digital code stored in a special area within the module such as RAM, ROM, or to keep current in the memory KAM. When the vehicle maintenance technician is in the diagnosis of vehicle breakdowns, these trouble codes can be obtained from memory through the external auto fault diagnostic computer. By interpreting and analyzing the fault information corresponding to these codes, the maintenance technicians can quickly find faults, to avoid the diagnostic work going astray.

Trouble Code Setting Conditions:

The whole control system is composed of many subsystems (sensors, actuator elements, power supply, and computer) circuit. Therefore, the content of trouble code contains not only the sensor or actuator elements failures, but rather shows that the signal of the sub-system is abnormal, which may be caused by any part (components, connectors, circuit, or computer) of the sub-system, so trouble code only provide the general direction of further testing for maintenance personnel, but does not tell us exactly what the failure is and where it is. Therefore, trouble codes mainly play the role of the maintenance guidelines.

When engine is working normally, trouble self-diagnosis system will monitor the components of electronic control system and ECU own work, both the level for all sensor input signal to ECU and the control signal output from ECU are in the prescribed range. Once the input or output signal of ECU is not in the prescribed range, self-diagnosis system will judge the signal is faulty, meanwhile the light on the dashboard will be immediately lit and store relevant trouble code into ECU's memory. When conducting fault diagnosis, you can get out the trouble code through the auto fault diagnostic instrument and find out the trouble location according to trouble codes, which brings great convenience for the clearance of trouble codes. However, if you use it incorrectly or rely on the trouble code too much, or blindly repair or replace some components without any analysis. It cannot solve the problem and even it will result in new trouble and more problems.

The significance of checking diagnostic trouble code setting conditions carefully lies in: as vehicle maintenance personnel, he must know when did the vehicle's fault happen? Trouble code is triggered because of what conditions? How to simulate conditions that the fault occurred?

Trouble code can tell you a certain failure of a certain system of the vehicle occurring at present or in the past. Therefore only after being repaired, the trouble code will not appear any longer and this shows fault information has been cleared. But remember, trouble code may disappear because of inexistence of the fault. Similarly, if the fault monitoring system program was suspended because of the restriction of certain conditions, trouble code will not appear either.

Analysis Steps of Trouble code:

A: Read and record all trouble codes.

B: Clear all trouble codes

C: Confirm that trouble code has been cleared

D: Simulate the conditions that fault arise and make the road test

E: Re-read and record the trouble code at this time

F: Distinguish between sporadic trouble code (soft trouble codes or irrelevant trouble codes or historical trouble codes) and continuous trouble code (the current trouble code or related trouble code, or hard trouble code)

G: Distinguish between the main fault and minor trouble code that are relevant to fault symptoms

H: distinguish between various trouble codes or the main trouble codes among related trouble codes (which might be the cause of other trouble codes)

I: Based on the above analysis, further detect accurately the sensor, the actuator elements or control computer and relevant circuit state represented by trouble codes so as to ascertain the exact location of trouble spots.

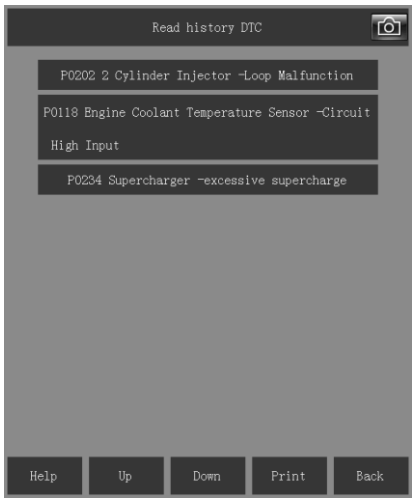


Figure 5.4.2B

Figure 5.4.3

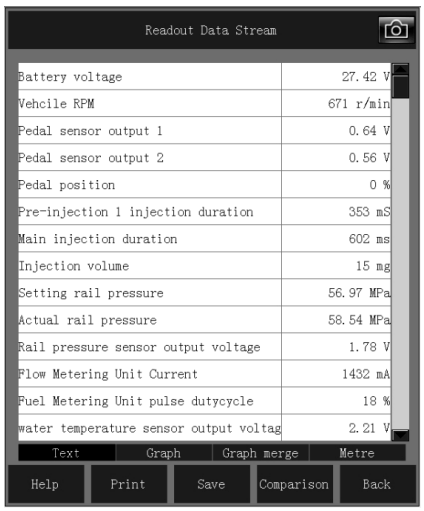


Figure 5.4.4

Read History DTC

Choose 【Read History DTC】 in the menu for reading the historical trouble code recorded by auto ECU self-diagnosis, and make explanation about the fault content. As shown in Figure 5.4.2B.

Note: Five function keys under the operation menu allow you to do functional operation

5.4.3 Clearing Trouble Code

For the clearance of trouble code that recorded by automotive electronic control system self-diagnosis. After troubleshooting, use automobile fault diagnostic computer to clear fault information in random access memory ROM of vehicle computer. As shown in Figure 5.4.3.

Note: During fault diagnosis, first record or print out the trouble codes for the reference of maintenance and then clear. Trouble code that cannot be cleared is the existing actual fault, users should find vehicle fault and repair it at first, then re-clear the trouble code.

5.4.4 Readout Data Stream

Select 【Readout Data Stream】in the menu to check the controller, sensor and executor of vehicle control system and data that meet the operation requirements of the engine. As shown in Figure 5.4.4.

Users can browse the next item or data on the next page by dragging the upward and downward progress bar on the right of the menu. Users also can prioritize the data that need to check. For instance, click the item 【Vehicle RPM】 with the touch pen, and 【Vehicle RPM】will become green and move to the first row and the data of this item will stay on the first row all the time. Users need to click it again until the green color has gone if it is wanted to be canceled.

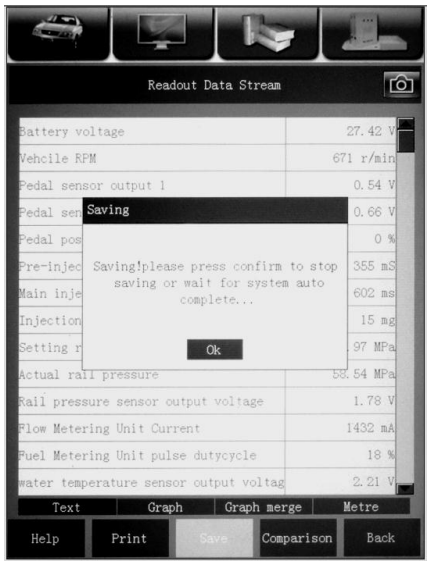


Figure 5.4.5A

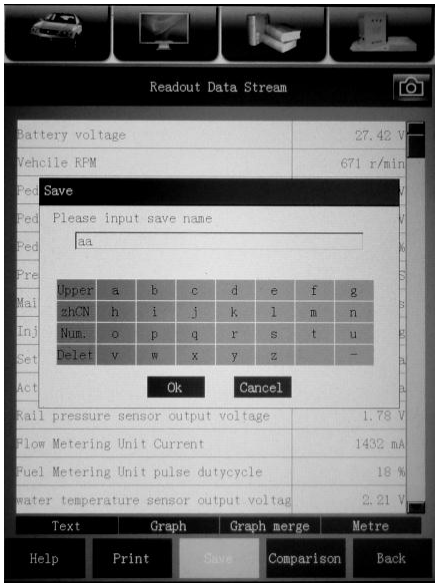


Figure 5.4.5B

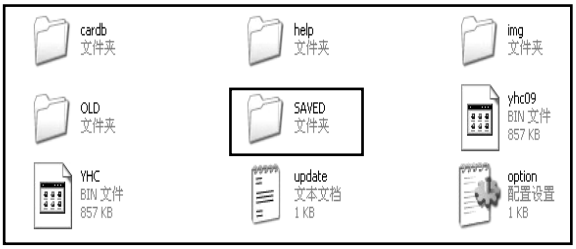


Figure 5.4.6

5.4.5 Data Stream Save

Select【Save】below in the menu shown in Figure 5.3.5, and the system will automatically save the current data stream, as shown in Figure 5.4.5A.

Select【OK】 in the menu to save it.

Type the name of the file to be saved in the popup window according to users' personal work habits. As shown in Figure 5.4.5B.

Note: The name of the file can consist of numbers, letters or characteristics. It is better to name it after current diagnostic vehicle's model or year for the convenience of reference.

5.4.6 Data Stream File Save

User self-study data stream will automatically save in【SAVED】folder of SD card. As shown in Figure 5.4.6. Before formatting, please save this folder to the physical HD of PC to avoid data stream missing. After finishing the upgrade, put back the folder to SD card to recover normal data stream. If no need to save the data stream, users can format SD card directly.

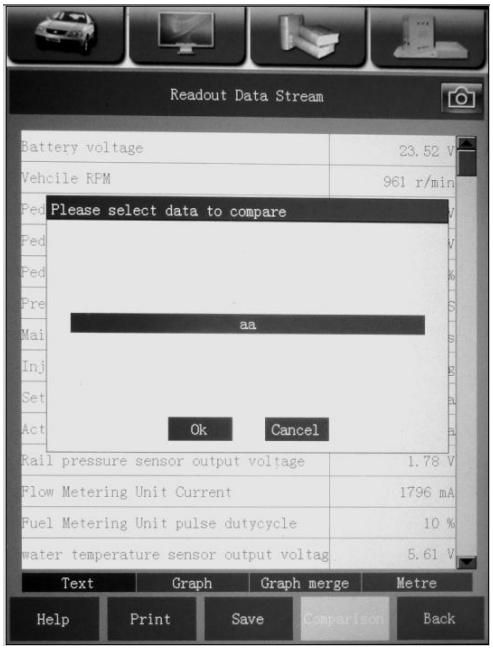


Figure 5.4.7A

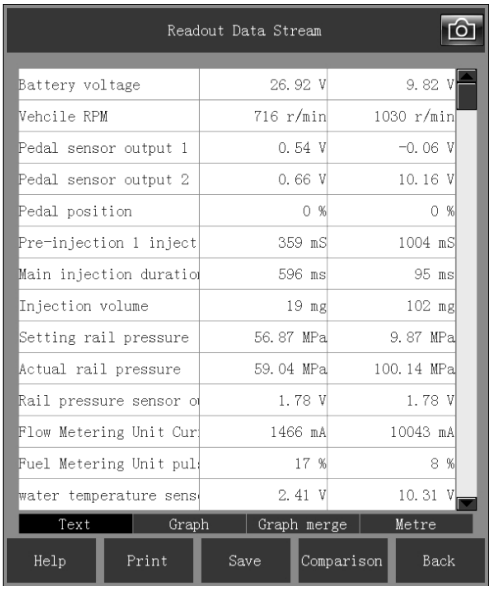


Figure 5.4.7B

5.4.7 Stream Comparison

Data stream study function can realize the automatic learn for the data parameters during the normal operation of vehicles, save and compare to other vehicles whether their relevant data is abnormal. It helps the users to have a scientific management and accurate judgment for these operating parameters of various vehicle models, so that it can improve the user's vehicle repair and maintenance skills effectively and quickly.

All data of the engine will vary under different conditions. In order to ensure the logicality of the variations, users can compare the data saved before with the current data so as to find where the fault is in a fast and vivid way.

Choose the button【Comparison】below the menu, then the file to be compared will be displayed on the menu. If it has been saved for once, there will be a comparable file, as shown in Figure 5.4.7A and if several data have been saved, there will be several files for comparison.

Note: If users do not choose the file to be compared in the popped-up dialog box, the operation becomes invalid. If the file was chosen, the name of file turns grey, which suggests that the operation succeeds.

After choosing the compared file, click 【OK】, and there will be a current data and a saved data on the menu. Users can compare the two kinds of data and give an analysis.

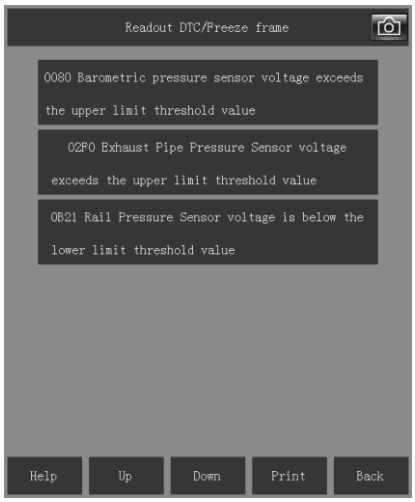


Figure 5.4.8A

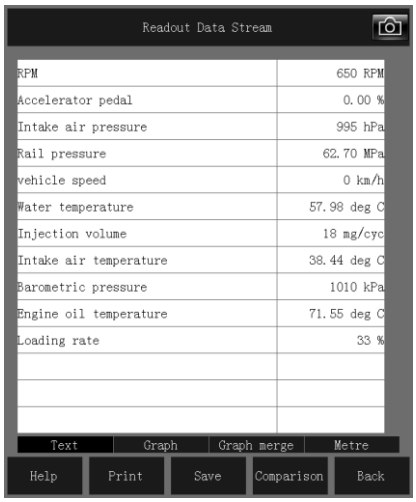


Figure 5.4.8B

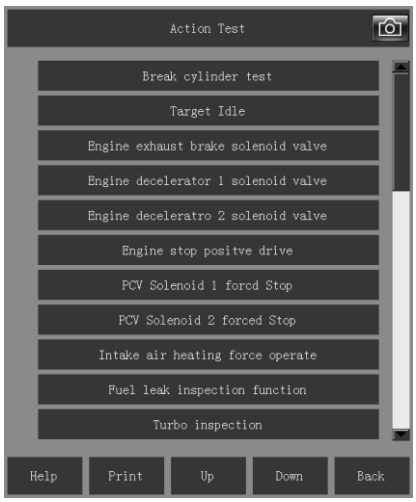


Figure 5.4.9A

5.4.8 Data Frame Freeze

When the trouble code related to automobile engine exhaust emissions appears, ECU control system not only set one trouble code, as shown in Figure 5.4.8A, but also record the relevant system operating parameters while the trouble code appears. The series data are called freeze frame data.

If users choose trouble code 【0080 Barometric pressure sensor voltage exceeds the upper limit threshold value】 to enter a submenu, the following content will be displayed in the menu as shown in Figure 5.4.8B.

【RPM】,【Accelerator pedal】,【Intake air pressure,【Rail pressure】,【Vehicle speed】,【Water temperature】,【Injection volume】,【Intake air temperature】,【Barometric pressure】,【Engine oil temperature】and【Loading rate】are displayed separately.

These data shows relevant data changes detected by ECU when the trouble code 0080 appears and it is convenient for users to make analysis and comparison according to the current conditions so as to know about the fundamental causes of the system fault and solve the fault quickly.

Note: Not all systems have the function of data frame freeze. When checking the system with this function, data stream item detected vary according to different trouble codes.

5.4.9 Action Test

This is used to check whether the executive components of electric system and wires work normally or not. Actuator items are set according to ECU. The components of the current electric system that can be executed are as follows, as shown in Figure 5.4.9A. They are: 【Break Cylinder Test】,

Figure 5.4.9B

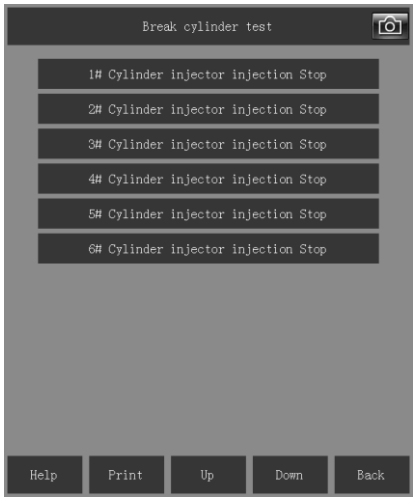


Figure 5.4.9C

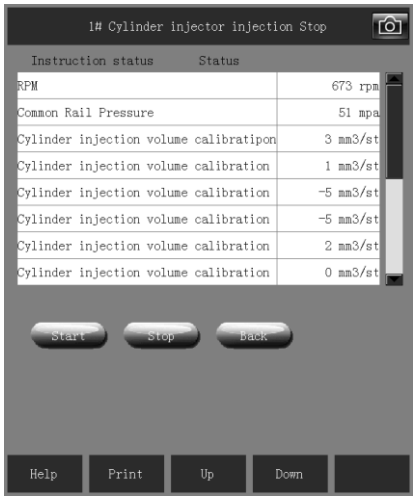


Figure 5.4.9D

【Target Idle】,【Engine Exhaust Brake Solenoid Valve】, 【Engine Decelerator 1 Solenoid Valve】, 【Engine Decelerator 2 Solenoid Valve】, 【Engine Stop Positive Drive】, 【PCV Solenoid 1 Forced Stop】,【PCV Solenoid 2 Forced Stop】,【Intake Air Heating Force Operate】,【Fuel Leak Inspection Function】, 【Turbo Inspection】, 【Accelerator Inductor Adjustment】and【Adjust PTO Accelerator Inductor】.

Note: If the executive components exceed the range that the screen can display, users can operate the progress bar on the right of the meun or the 【Down】below the menu to choose.

Take【Break Cylinder Test】as an example.

Choose 【Break Cylinder Test】 to enter a submenu, the submenu will display the conditions of break cylinder test, as shown in Figure 5.4.9B. If all conditions are met, break cylinder test can be done, or else, it will not succeed or abnormal phenomenon of the engine will occur. After users ensure the current conditions are suitable for test, please choose 【OK】below the menu to enter a submenu.

Note: Content of the actuation test for the system differs for different models of cars, it should be subject to the one displayed on the decoder. The test components are also different, users should know the features of the components before test.

The menu displays the available cylinders of break cylinder test. As shown in Figure 5.4.9C, there are 6 cylinders available for break cylinder test. According to the working conditions of engine, click the cylinder that needs to be stopped and enter cylinder stop operation menu.

Take 1 # Cylinder for example.

Clicking【Start】on the menu, users can stop the work of 1 # Cylinder. After 1 # Cylinder stop working, the engine will shake or increase its noise, suggesting that 1 # Cylinder is stopped or users can see the obvious data change of 1 # Cylinder in the data stream of the menu. If after the stop of 1 # Cylinder, there is not any change to the data or the engine's work, users can judge where the fault is according to the failure of the vehicle.

Users can restore the work of 1 # Cylinder by clicking 【Stop】on the menu. After the restoration, data stream should return to the original state and the engine also work as before.

By clicking 【Back】on the menu, users can return to the previous page.

Note: Users must make sure that all conditions for to-be-executed function and wires of injector work well, otherwise, function operations will become useless.

5.4.10 Specific Function

FCAR developed many specific functions for gasoline vehicles, clients can better use the scanner by one-key operation based on different need. (There are different types of machines with different functions. Please check the configured software based on purchased machine type.)

- Service Reset
- Throttle Reset
- ECU Reset
- Key programmer
- EPB
- TPMS
- SRS Reset
- ABS Exhaust
- CKP Learning

Take 【Service Reset】 for example. After entering the 【Service Reset】 menu, there are vehicle types for choice, one-key operation can do the service reset, other specific function operations are same.

6. Register, Activation, Download and Upgrade of Diagnostic Software and Hardware

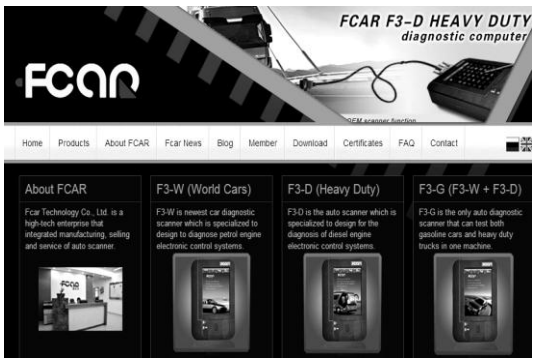


Figure 6.1.1

6.1 User Account Register, Activation and Upgrade

Open website homepage http://www.fcar.com, users will see FCAR English homepage as shown in Figure 6.1.1.

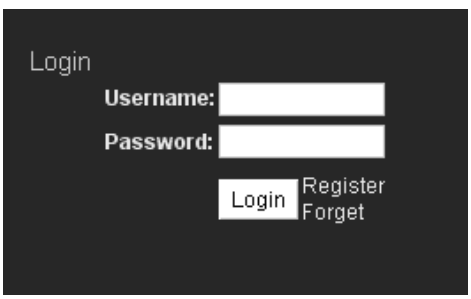


Figure 6.1.2

If users have registered the product, users can login directly by inputting the user name and password. See Figure 6.1.2.

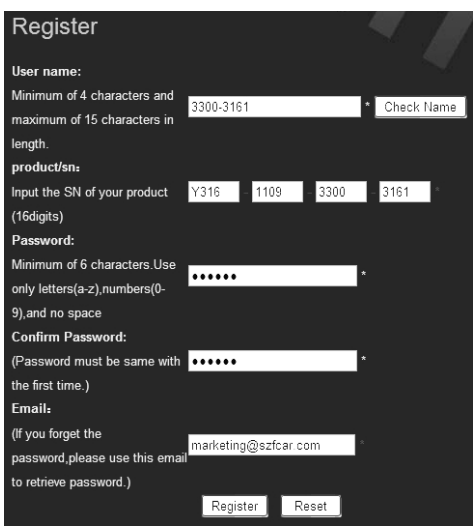


Figure 6.1.3

If users have not registered to be our member, please click 【Register】and a new page will shows, as shown in Figure 6.1.3, to apply new user registration. Then input relevant information and FCAR product SN (The SN is attached in the back of main unit or on the Warranty Card, Certificate of Approval). After input, please click【Register】 to submit and there will prompt 【Successful Registration】.

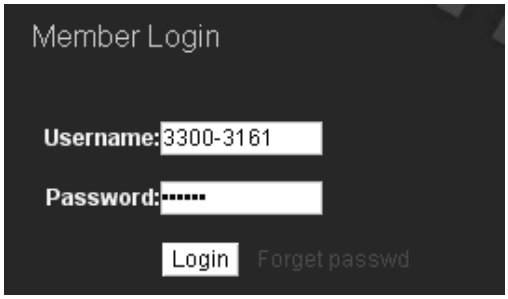


Figure 6.1.4

Back to FCAR member page, login directly with user name and password, as shown in Figure 6.1.4.

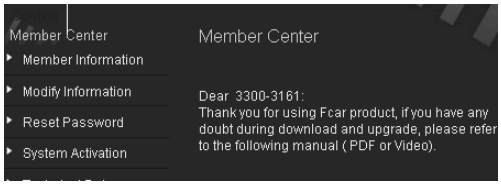


Figure 6.1.5

Click 【Login】, the page will show as Figure 6.1.5.

Figure 6.2

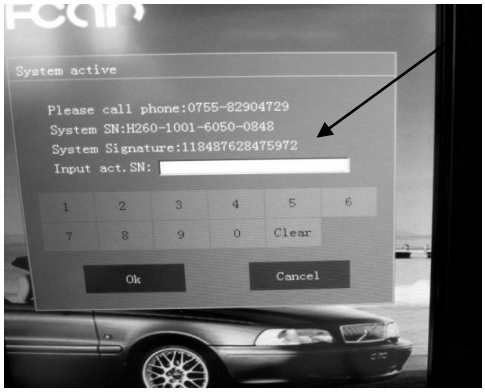


Figure 6.2.1

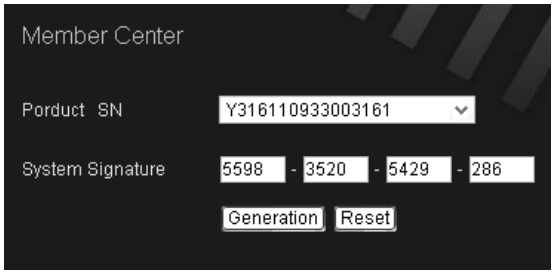


Figure 6.2.2

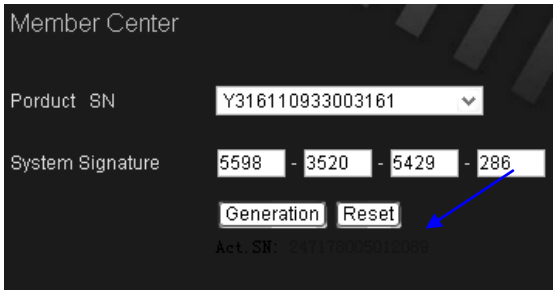


Figure 6.2.3

6.2 System activation

Normally when customer received the product, the screen will pop up 【You have ** times use】. See Figure 6.2. Customers need do the system activation to use without any times limitation.

Method 1 – From FCAR Website to active by yourself.

Method 2 – Send to FCAR Company to active by the email.

Method 1:

- Turn on main unit, open【System active】menu, system signature as shown Figure 6.2.1
- Open the FCAR website and login【Member Center】. Click【System Activation】in the left side of page, and input【System Signature】of main unit. As shown in Figure 6.2.2
- Click【Generation】, the page will pop up the ACT. SN in below with BLUE color. As shown in Figure 6.2.3
- Input the ACT. SN in the Main Unit as shown in Figure 6.2.4.
- Clicking the button 【OK】 , it will pop up active 50 success as shown in Figure 6.2.5.
- After successful activation, it can be used again. If it is not necessary to use the product, please turn off the main unit.

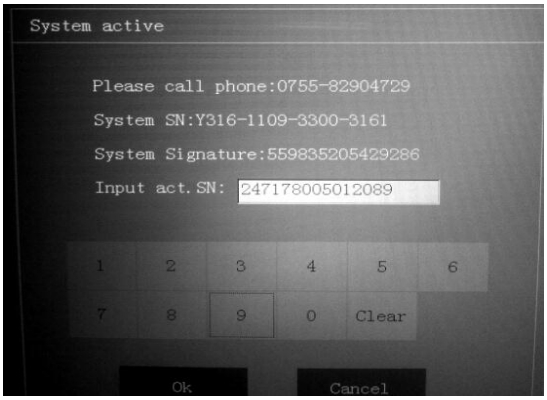


Figure 6.2.4

Figure 6.2.5

Method 2 – Send to FCAR to active by the email.

- Turn on main unit, and open the 【System Activation】 Menu. System signature shows as Figure 6.2.1. Please send this number to FCAR Company by email/Call, and then FCAR technicians will inform an ACT. SN number, such as the ACT SN is: 247176005012089. After receiving the number, please put it in the main unit (Figure 6.2.4).

- Then click button 【OK】 to active. It will pop up the activation success. Then turn off the main unit.

Note: All operations will be finished in one time. During the activation, if users turn off the main unit, it will get a new system signature in the activation menu. Then the ACT SN that FCAR supply is not consistent with the system signature, which will lead to activation failure. In addition, do not keep the main unit always on powering for a long time.

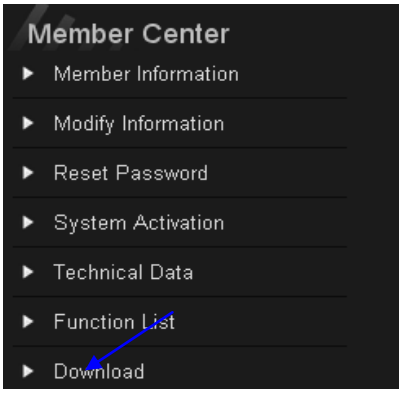


Figure 6.3.1

6.3 Download of Diagnostic Software

Click 【Download】in the left of the website after login in. See Figure 6.3.1.

FCAR Trouble Diagnostic program download have 【Full Data Package】 and 【Individual Vehicle Database Download】(the download method of them are the same), but FCAR advice select the full data package to download every time to avoid any problem in the process of upgrade. Of course, users can select the single one and program version to download.

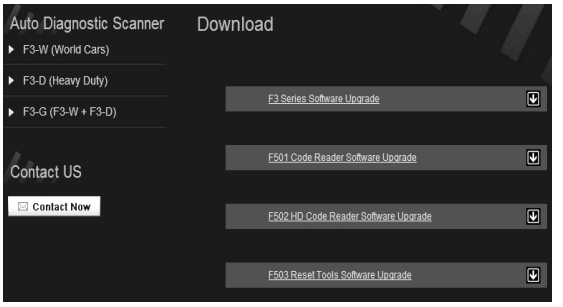


Figure 6.3.2

Click【F3 Series Software Upgrade】, as shown in Figure 6.3.2.

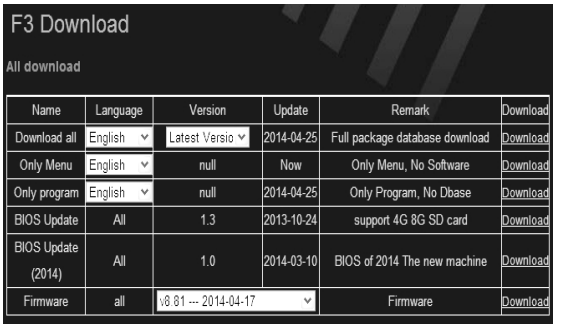


Figure 6.3.3

ON LINE 1, select needed language and click 【Download】 directly for the full data package download. See Figure 6.3.3

Figure 6.3.4

After clicking download upgrade procedure, the download window will pop up and click 【Save】as shown in Figure 6.3.4.

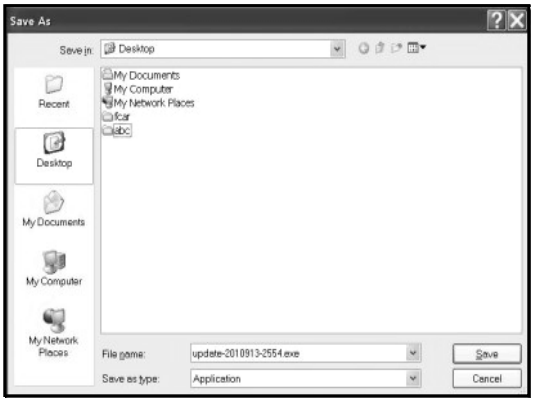


Figure 6.3.5

Select the disc where for saving, (remember the saved location) normally keep it on the desktop.
Click【Save】button. See Figure 6.3.5

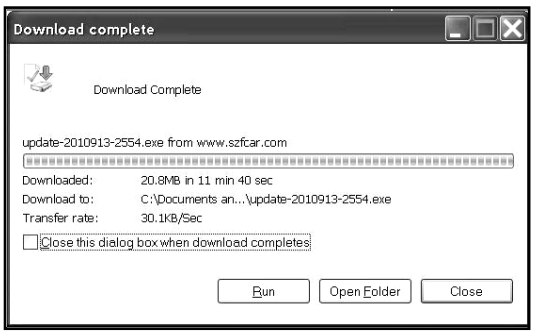


Figure 6.3.6

Click【Close】button when download finished, See Figure 6.3.6.

Figure 6.4.1

6.4 The Connection of SD card

Take out the SD card from FCAR Main Unit. See Figure 6.4.1.

Figure 6.4.2

Take out the SD card reader/writer from FCAR instrument container (subject to the real object).
See Figure 6.4.2.

Figure 6.4.3

Insert SD card into the SD card reader/writer (take note the direction）as shown in Figure 6.4.3.

Note: The wrong direction can lead to SD card and reader damage.

Figure 6.4.4

Then insert the SD card reader/writer with SD card attached into USB port of PC. See Figure 6.4.4.

Figure 6.4.5

Select 【My computer】in the desktop of Windows and double-click. See Figure 6.4.5.

After opening 【My computer】, it will show a removable disk, as shown in Figure 6.4.6.

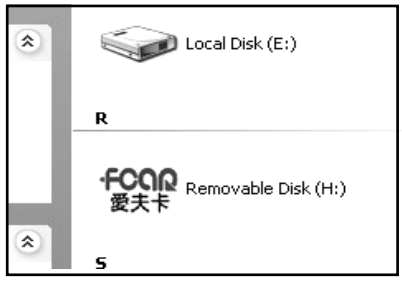


Figure 6.4.6

Precaution on operation of the SD card

1) Do not pull out SD card when SD reader/writer card is being used. 2) Do not insert or pull out SD card when FCAR main unit is turned on to avoid SD card damage or SD card data loss. 3) Do not format SD card frequently to avoid the damage of SD card data storage chip. 4) Do not put SD card in a strong magnetic field to avoid SD card data loss. 5) Do not touch any mordant chemical product to avoid the damage of SD card meta pin.

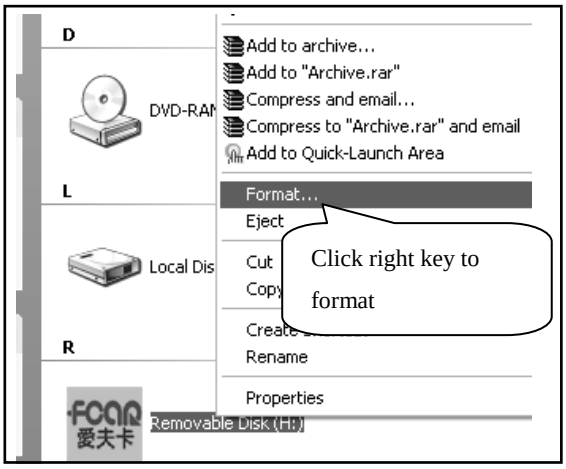


Figure 6.5.1

6.5 Diagnostic Software Upgrade

Following the step of Figure 6.5.1, insert SD card into the computer and one removable disk of FCAR SD card shows, click right key of mouse, select【Format】. If download interface have not popped the hint of the format, it is available to upgrade directly without format. See Figure 6.5.1,

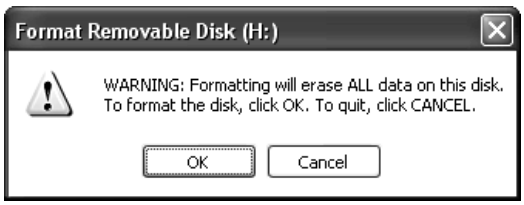


Figure 6.5.2

Select Quick Format, then Select【Start】, it will pop up a warning window, Click【OK】to format SD card. See Figure 6.5.2.

Figure6.5.3

After finished format, Click【OK】. See Figure 6.5.3.

Figure 6.5.4

Select the upgrade program just now you downloaded on the desktop and click it as shown in Figure 6.5.4

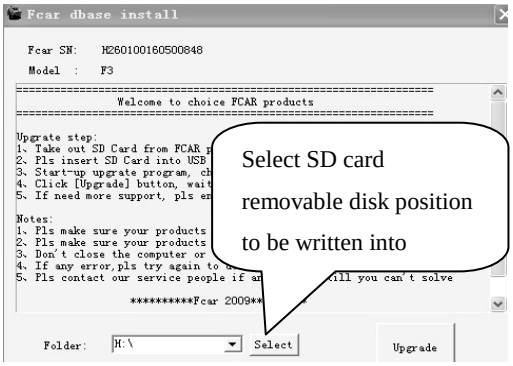


Figure 6.5.5

FCAR F3 series product upgrade tool will be shown on the desktop. Click【Upgrade】, the program will be written into SD card, as shown in Figure 6.5.5.

Figure 6.5.6

It will take several minutes, please be patient. See Figure 6.5.6.

Figure 6.5.7

Click【OK】to finish all upgrade steps. See Figure 6.5.7.

6.6 The Exit Step of SD card

Figure 6.6.1

Figure 6.6.2

After software upgrade to the SD card successfully, SD card needs to be exited from the computer and specific operation methods are as follows:

1. In the activity icon bar of the button right corner of computer screen, select removable hardware icon, as shown in Figure 6.6.1.

2. Click the right key of the mouse, select the【Safely Remove Hardware】in the pop-up dialog box, as shown in Figure 6.6.2.

Figure 6.6.3

3. In the pop-up dialog box, click【Stop】 button to stop the computer attaching removable storage device (FCAR SD card), as shown in Figure 6.6.3.

Figure 6.6.4

4. In the upper left side of the pop-up dialog box, select the USB device currently needed to stop, click on 【OK】, as shown in Figure 6.6.4. The computer system will conduct data separation on the USB device that wanted to stop.

Figure 6.6.5

5. After computer finished data separation on removable devices (FCAR SD card), activity icon bar in the lower right corner of the computer display screen will pop up 【Safely Remove Hardware】 dialog box. As shown in Figure 6.6.5.

Figure 6.6.6

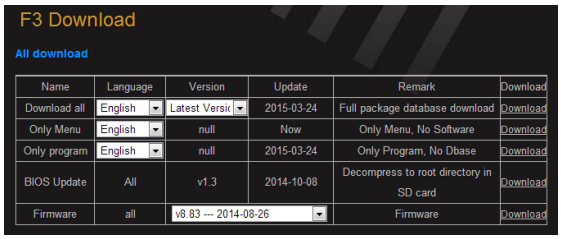
6. Unplug the FCAR reader that inserted with SD card from the computer USB interface, as shown in Figure 6.6.6, to remove the SD card from the reader.

7. Insert upgraded SD card to FCAR F3-W main unit, the upgrade has finished.

Note: If users do not follow this operation method, it will cause loss of SD card data. When the upgraded SD card is installed to FCAR main unit, system may unable to work.

Operation method in this chapter, please directly click the link below to check.

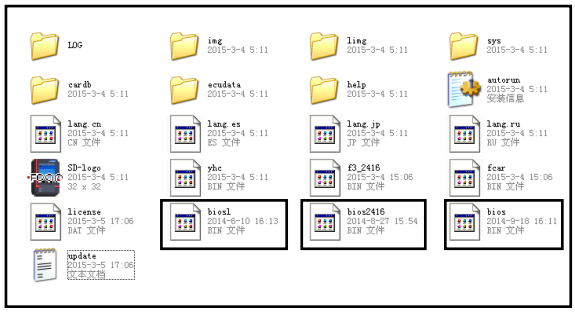
http://www.fcar.com/res/en/Register-Activate-Download-Upgrade-Manual.pdf



6.7 Main Unit Hardware Upgrade

Back to download center, choose download 【BIOS Update】.

Users can download a file : 【bios.exe】.



Insert SD card to computer, after clicking download in above step, choose save to a removable disk.

Note: Please do not change the file name when download and save.

After download the procedure, SD card will have three files【bios.bin】, 【bios2416.bin】 and 【biosl.bin】.

Figure 6.7A

Note: Please exit SD card based on the instructions, as shown in Figure 6.6.5.

Put the upgraded SD card into FCAR F3 series main unit in right direction and open the scanner, as shown in Figure 6.7A, then click 【Update】and wait for several seconds.

After update finished, it will pop up【System bit machine Update ok!】. Click【OK】and restart the machine.

Figure 6.7B

After restarting the scanner, it will pop up a dialog box【Find update bios. Update it now? 】, as show in Figure 6.7B. Please use the same method to choose update.

After updating, the scanner will show【Bios Update ok!】and click【OK】.

Note: Please restart the scanner again before diagnosing vehicles, or else it will lead to ECU connection interruption.

7. FAQ

7.1 Questions Related to Main Unit Operation

7.1.1 Power cannot be Turned On after Connecting Vehicle Diagnostic Socket?

Possible Cause: Check whether the diagnostic port have 12V power supply voltage, whether the connection between diagnostic main cable and connector of main unit is ok, check whether vehicle battery voltage is higher than 10V, whether main cable diagnostic connector have any damage or breakdown, etc.

Solution: Check vehicle system voltage and main cable diagnostic connector.

7.1.2 Screen does not Display except Backlight after Startup

Possible Cause: The power connection does not touch well.

Solution: Shut down and repeat pluging/unpluging the power supplier. Start up again after 1 second.

7.1.3 Screen Displayed Abnormally After Startup

Possible Cause: SD card does not insert well. SD card program has damaged. Supply voltage is too low.

Solution: Take out SD card and insert again; Download SD card upgrade program: Checking the supply voltage

7.1.4 Screen Displayed 【SD card Cannot Be Detected】after Startup

Possible Cause: SD Card is dirty with oil, or oxidation, also damage because of incorrect upgrade.

Solution: Wipe SD card in a little alcohol with cotton tipped applicator. Change new SD card.

7.1.5 Screen Flickers or Not Enough Bright after Startup

Possible Cause: Vehicle power voltage is not stable or the voltage is too low. The supply is not enough for the main unit.

Solution: Check the battery power and circuit.

7.1.6 Cannot Input Data after Opening Soft Keyboard

Possible Cause: Touch screen is not accurate to adjust. The cursor is not in editing location.

Solution: Adjust the touch screen again. Use the touch pen to click the editing part if the cursor is flickering, means it is editing.

7.1.7 Screen does not Respond or Responds Wrongly When Touch Stylus Click

Possible Cause: The touch screen need adjustment again（Note: you need to adjust the screen after SD card upgrade every time）.

Solution: The detail information Ref: "3.4.2 Touch Screen Adjustment"

7.1.8 The Tested Result cannot be Printed Out or Printed Unclearly

Possible Cause: Lack of print paper. Installed paper is incorrect or reverse.

Solution: Update the high quality heat sensitive paper and take out the paper and install it again.

7.1.9 Displayed 【Authorization Doc.Error, please Contact Dealer】 When Diagnose

Possible Cause: The SN in SD card and Main Unit are not matched.

Solution: Download the relevant main unit diagnostic program, and make sure the correct software upgrade following the operation instruction.

7.1.10 No Hardware Version shown in 【System info】, No SN shown in 【System active】

Possible Cause: Power off suddenly when downloading firmware and lead to lack of program or version.

Solution: Upgrade the program or firmware again.

7.1.11 Test Line Failed when Doing Host Self-Test

Possible Cause: Connect to vehicles or other device through main testing cable. Firmware version is too low.

Solution: Use configured power adapter to supply power (The self-test result is inaccurate when using main testing cable to connect vehicle). If test line still failed when using power adapter, users can download program and firmware again.

7.2 Questions Related to Vehicle Diagnosis

7.2.1 Split Second Screen Flickers during Engine Starting

Possible Cause: Effected by electromagnetism, or the battery voltage fluctuation is serious when startup vehicles.

Solution: It is the normal phenomena（just try to avoid power on when start the engine）.

7.2.2 Operation Interrupted During Diagnosis

Possible Cause: Effected by electromagnetism, or the connector to the socket is not tight.

Solution: Depart from engine compartment with strong electromagnetism environment, turn off the high-power acoustics, and check main unit connector.

7.2.3 There Is No Response from Vehicle ECU at Communication

Possible Cause: Supply power voltage is out of the normal range. The Throttle Valve is not closed, transmission in 【D】, turned on by electrical appliances and water temperature is out of the normal range.
Solution: Inspect the supply power voltage, close the throttle valve and put transmission in【P】. Turn off the electrical appliance and make sure the water temperature is in normal range.

7.2.4 Some Systems Cannot Be Diagnosed

Possible Cause: Few system diagnostic sockets in the forepart vehicles are separated.

Solution: Please Ref. the vehicle user manual.

7.2.5 No Trouble Code Is Found

Possible Cause: Usually for the third part trouble code of common circuit.

Solution: Search the most similar trouble code and the circuit to analyze.

7.3 Questions Related to Website Login, Doc., Upgrade, Download

7.3.1 Cannot Open FCAR Website

Possible Cause: System maintenance, Internet connection problem, IE browser fault or firewall reject, etc.

Solution: Try to open after several hours. Change the internet, restore computer system and close the firewall.

7.3.2 User Account Cannot Login

Possible Cause: User name or password is wrong. Local internet problem. IE browser fault.

Solution: Call FCAR to get back password. Change other internet. Restore computer system.

7.3.3 Diagnostic Program Cannot Be Downloaded Successfully

Possible Cause: System IE browser fault. Download software do not support. Virus Fault.

Solution: Restore computer system, install or download others software.

7.3.4 FCAR Website Is Slow When Open and Login

Possible Cause: System IE browser fault. Download software do not support. Virus Fault.

Solution: Change others internet. Restore computer system.

7.3.5 【Individually Vehicle Data Base】Update Whether Need Format SD card

There is no need to format SD card. Just check whether upgrade software is right or not.

7.3.6 Screen Popped 【Separation/Extracting Module Failed】 While Opening Update Program,

Update Unsuccessfully.

Possible Cause: Users cut off the operation in the process of main unit upgrade, then it will pop up the hint when upgrade again.

Solution: Restart the computer.

7.3.7 Screen Indicated 【Please Install msxml 4.0 SP2 program】While Upgrading SD card

Possible Cause: The first time to run the upgrade program.

Solution: Users can download from the internet【msxml 4.0 SP2 program】to the computer, then upgrade it.

7.3.8 Screen Displayed 【Cannot Find Application Program, Error Code 0!】

Possible Cause: There is no program in SD card.

Solution: Download the program to upgrade.

7.4 How to Select Diagnostic System of Domestic Vehicles

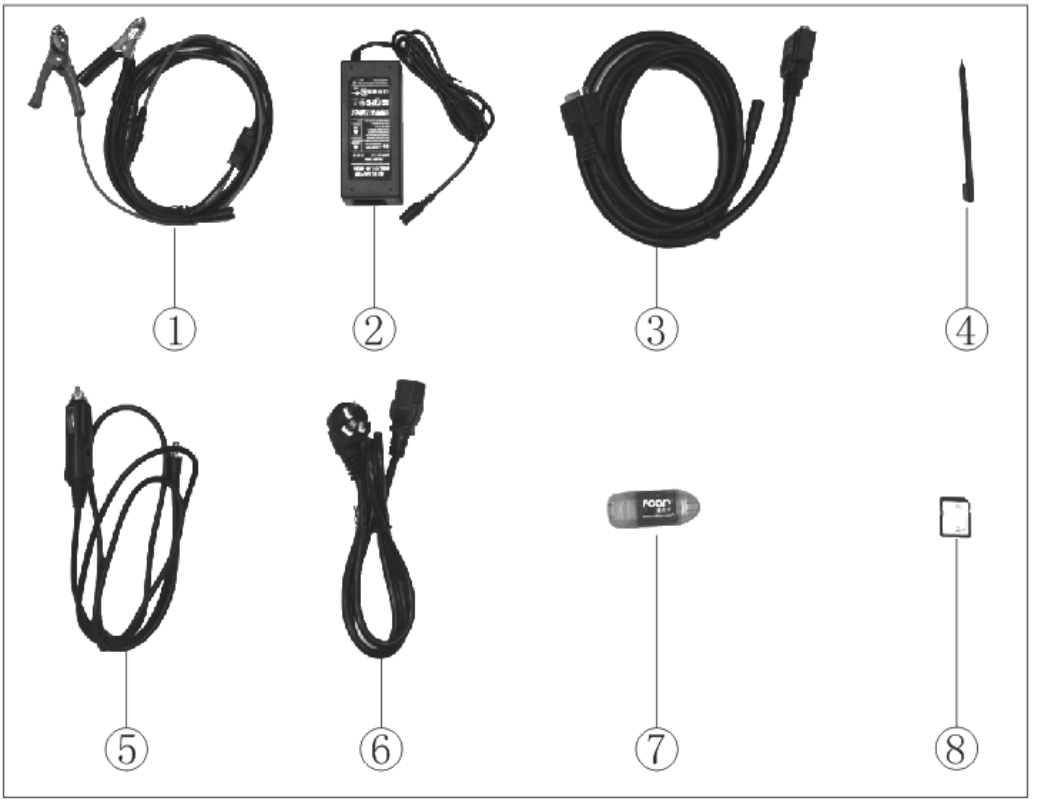
Solution: As there are various models and brands in China, engine electronic control systems can be domestic independently developed, or from joint ventures, import. Because the difference of the brands and the technology capabilities of each vehicle manufacturers, domestic vehicle engine management system can be divided into combined electronic control system, DELPHI electronic control system, MARELI electronic control system, SIMENS electronic control system, MOTOROLA, BOSCH etc. Just Delphi's electronic control system has not less than 10 species. The wrong choice of the system will cause auto fault diagnostic computer unable to communicate with the control unit, false fault, inaccurate trouble code inaccurate data stream and misplaced data stream display. Diagnosing the vehicle assembled with such electronic control system should pay attention to the following questions:

1) Vehicle model match with auto fault diagnostic software.
2) Control unit type match with auto fault diagnostic software.
3) Control unit model match with auto fault diagnostic software.
4) Diagnostic seat match with auto fault diagnostic connector.

Note: When the diagnosed vehicle models of the above conditions is not sure, users can test only by entering into the system successively and observing the accuracy of data streams to judge whether choose the right electronic control system or pull out the corresponding sensor actuator, or checking whether the trouble code of the vehicle fault decoder associated with the pulled-out components to judge whether the system is the right choice or not.

8. Instrument Connector Configuration Table

8.1 Common Accessories Introduction



Picture 8.1 common accessories

No.	Name	No.	Name
1	Double Clamp Power Cord	**5**	Cigarette Lighter Power Cord
2	220V Power Adapter	**6**	Adapter Power Cord
3	Main Testing Cable	**7**	SD Card Reader
4	Touch Pen	**8**	High Speed SD Card

8.2 Diagnostic Connector Introduction

8.2.1 F3-W Gasoline Vehicle Diagnostic Connector Introduction

No.	Photos	Name	Description
1		[OBD-Ⅱ-16]	Applicable to vehicles with CAN BUS or Non-CAN BUS system
2		[Marelli-3]	Connect to magnetic Marelli electronic controlled injection engine
3		[NISSAN-14]	Connect to Nissan 14pin diagnostic socket
4		[HONDA-3]	Connect to Honda 3Pin diagnostic socket (Note: ABS needs adjusting code by hand)
5		[KIA-20]	Connect to Kia 20Pin diagnostic socket

No.	Photos	Name	Description
6		[GM-DAEWOO-12]	Connect to GM, DAEWOO 12Pin diagnostic socket
7		[BENZ-14]	Connect to Ssangyong 14-pin diagnostic socket
8		[MITSUBISHI -12+16]	Connect to MITSUBISHI 12-pin and 16-pin diagnostic socket
9		[BENZ-38] （Subject to packing list）	Connect to Benz 38-Pin diagnostic socket
10		[BMW-20] （Subject to packing list）	Connect to BMW 20-Pin diagnostic socket
11		[SELF-DIAGNOSIS]	Use to diagnose main testing cable and OBD-II-16 connector performance

8.2.2 F3-D Diesel Vehicle Diagnostic Connector Introduction

No.	Photos	Name	Description
1		[OBD-Ⅱ-16]	Applicable to vehicles with CAN BUS or Non-CAN BUS system
2		[OBD-16]	Applicable to assembly vehicles with round 16 pin engine and cars with 16 pin diagnostic socket
3		[HY-DIESEL]	Connect to Hyundai 16 pin diagnostic socket
4		[CUMMINS-9]	Applicable to vehicles with Cummins engine or Cummins company configures 9 pin diagnostic socket
5		[CUMMINS-6]	Applicable to vehicles with Cummins engine or Cummins company configures 6 pin diagnostic socket

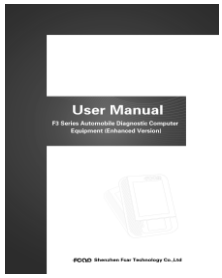
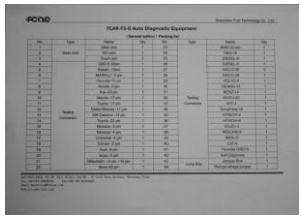
No.	Photos	Name	Description
6		[IVECO- 30] (without deck)	Applicable to vehicles with Iveco engine or Iveco company configures 30 pin diagnostic socket
7		[IVECO- 30] (with deck)	Applicable to vehicles with Iveco engine or Iveco company configures 30 pin diagnostic socket
8		[VOLVO-8]	Applicable to vehicles with Volvo engine or Volvo company configures 8 pin diagnostic socket
9		[BENZ-14]	Connect to Ssangyong and Benz vehicles configured with 14 pin diagnostic socket
10		[ISUZU-20]	Applicable to vehicles with Isuzu engine or Isuzu company configures 20 pin diagnostic socket
11		[HITACHI-4]	Applicable to Hitachi machines

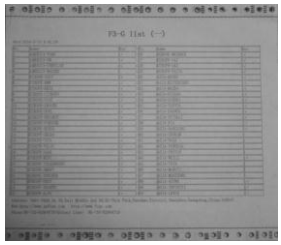
No.	Photos	Name	Description
12		[HITACHI-6]	Applicable to Hitachi machines configured with Isuzu engine
13		[ISUZU-3]	Applicable to old Euro II or Euro III Isuzu vehicles
14		[MAN-37]	Applicable to Man bus and Heavy duty with 37 pin diagnostic socket
15		[CAT-machinery]	Applicable to all Cat vehicles with 9 pin diagnostic socket
16		[SELF-DIAGNOSIS]	Use to diagnose main testing cable and OBD-II-16 connector performance
17		[Jumper Box]	Applicable to the irregular diagnostic communication vehicles or engines jumper test connection (only F3-D and F3-G model are with this connector)

No.	Photos	Name	Description
18		[Jumper Wires]	Applicable to the irregular diagnostic communication vehicles or engines jumper test connection

Note: F3-G model is configured with F3-W and F3-D vehicle diagnostic connectors listed above.

8.3 Other Accessories

No.	Photos	Name	Description
1		User Manual	Introduction of product usage
2		Certificate of approval	Certificate for product warranty and qualified certification
3		Product Packing List	For checking the packaged goods

No.	Photos	Name	Description
4		Software Inventory	For checking the current software configuration information
5		Outer Package Box	Overall package of product
6		Product Box	Assembling product
7		Printing Paper	Print for the detection result and data reference report
8		Fuse	Used to prevent the anomaly of main unit due to excessive current of main unit (used on cigar lighter and battery folder)

Remarks: The actual configuration subject to the packing list in purchased product due to continuous update of hardware, software and configuration.

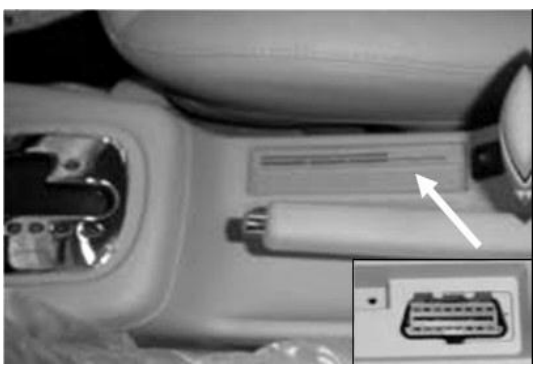
9. Common Diagnostic Socket Position

GM

- GM BUICK GL8, the diagnostic socket is located in the lower left of dashboard, 16PIN with [OBD- II-16] testing connector.

- GM BUICK, under the dashboard, near the steering column, 16PIN with [OBDII-16] testing connector.

- GM Sail, in the fuse box on the lower left of driving cab dashboard, it can be seen after removing the fuse box cover, 16 PIN, with [OBD-II-16] testing connector.



Volkswagen

- VW Passat B5, behind gear lever, beside brake lever. 16PIN with [OBD-II-16] testing connector.

- VW Polo, under the dashboard, 16PIN with [OBD- II-16] testing connector.

- VW Santana, under gear lever dustcover, 16PIN with [OBD II-16] testing connector.

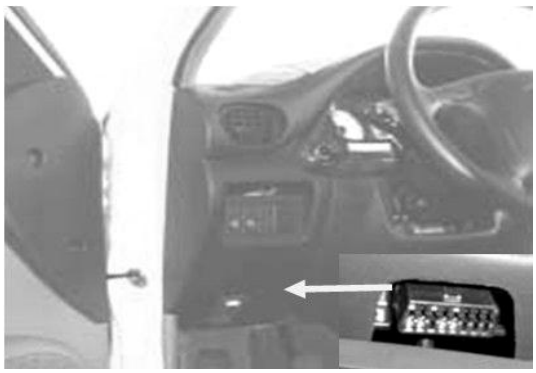
- AUDI A6, on the lower left of instrument, 16PIN with [OBD II-16] testing connector.

- VW New Bora, 1.8, under the center console, 16PIN with [OBD- II-16] connector.

- VW Jetta (5 valve) behind fuse box of instrument, 16PIN with [OBD II-16] connector.

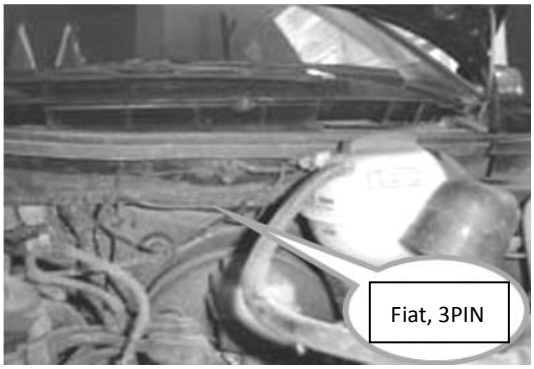
- TianJin Vios, TianJin Vios, under the dashboard, 16PIN, with [OBD- II-16] testing connector.

- Citroen Fukang 988, AT system diagnostic socket in fuse box under instrument, 16PIN [OBD- II-16] testing connector



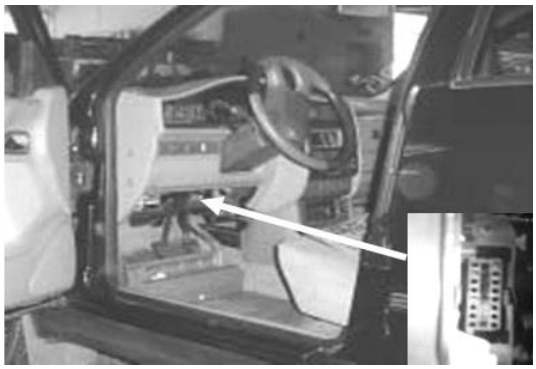
KIA

- KIA Qianlima, under the instrument, 16PIN with [OBD- II-16] connector.

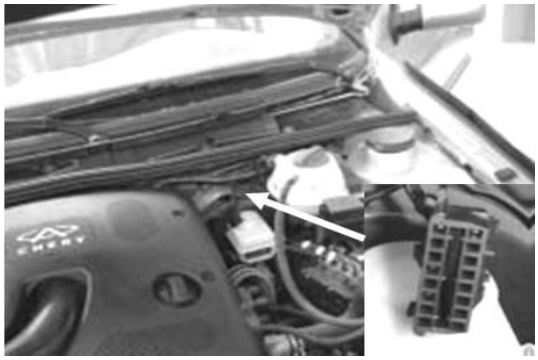


CHERY Automobile

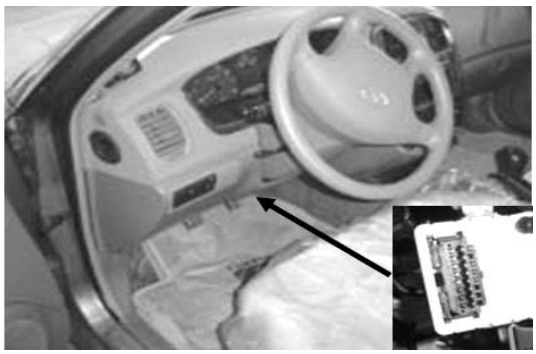
- SAIC CHERY, MM electronic control system diagnostic socket close to firewall in engine compartment, 3PIN, with [Marelli-3] testing connector.



- SAIC CHERY, ABS diagnostic socket under instrument, 16PIN with [OBD II-16] connector.

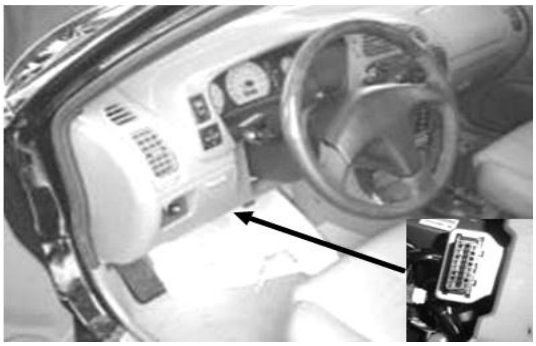


- SAIC, Motorola K2, electronic control system diagnostic socket close to firewall in engine compartment, 16PIN with [OBD- II-16] testing connector.



Hyundai

- Hyundai Sonata, under the instrument, 16PIN with [OBD- II-16] testing connector.



Southeast Automobile

- LIONCEL, close to steering post under the instrument, 16PIN with [OBD-II-16] testing connector.

- Southeast minibus, under the instrument, 16 PIN, select [OBD-II-16] testing connector.

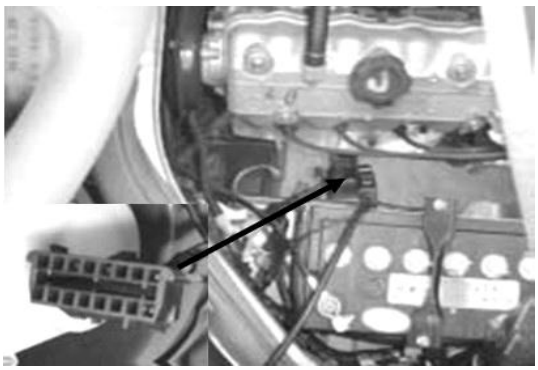
Brilliance China Auto

- Brilliance Auto, close to steering post under the instrument, 16PIN select [OBD- II-16] connector.

Changan Auto

- Linyang, under the instrument, 16PIN, select [OBD- II-16] testing connector.

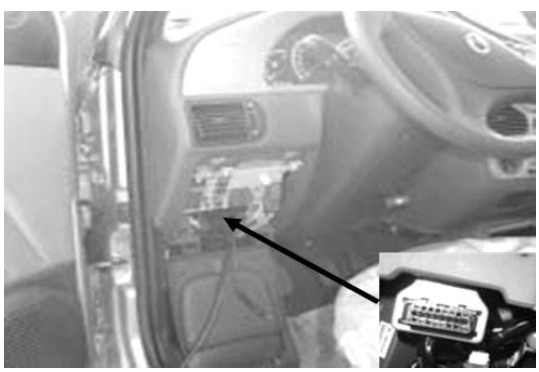
- Changan star, under the center console, 16PIN, select [OBD- II-16] testing connector.



- Changan Star, minibus, close to battery under engine cover, 16PIN, [OBD- II-16] connector.

FIAT

- Fiat Siena, in the fuse box under the instrument, 16PIN, select [OBD-II-16] connector.

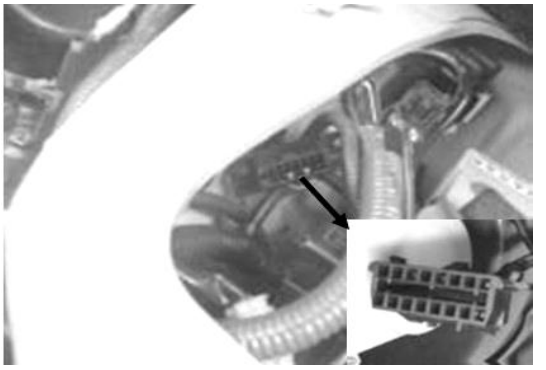


GEELY Auto

- GEELY MEIRI, under the left of instrument, 16PIN, select [OBD- II-16] connector.

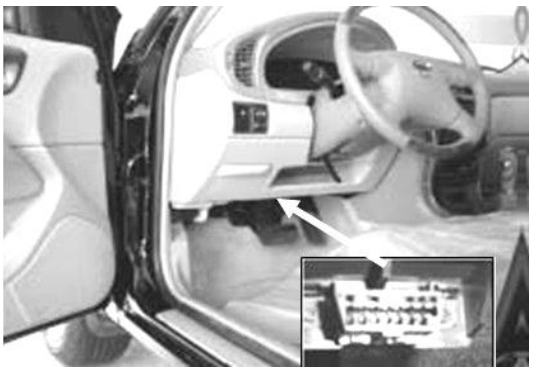
CF LIEBAO

- CF LIEBAO, on the lower left of the instrument, 16PIN, select [MITSUBISHI-12+16] connector.



JINBEI

- JINBEI minibus, close to battery under engine cover, 16PIN, with [OBD- II-16] connector.



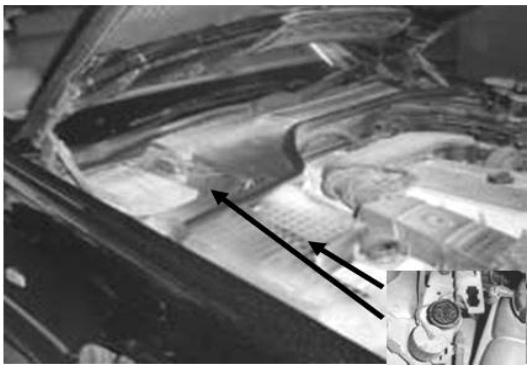
NISSAN Auto

- NISSAN Sunny, 2.0LS, 16PIN diagnostic socket close to steering post under instrument, select [OBD-II-16] connector.

- CEFIRO, 14PIN diagnostic socket in fuse box at the lower left of instrument [NISSAN-14] connector.

OPEL Auto

OPEL Vectra, under the glove compartment cover of Cab, 16PIN, select [OBD-II-16] connector



Benz

- Benz S320 140, under engine cover in the right side of engine compartment.
  Benz 560SEL 129, the right side of engine compartment, 38PIN.
  Benz 300SEL 140 Chassis, the right side of engine compartment, 38PIN, select [BENZ-38] testing connector.

- The diagnostic socket of all Benz series model manufactured after the year of 2001are located on the lower left of dashboard.

BMW Auto

- BMW 735i the left side of engine compartment, 20PIN, select [BMW-20] connector.

10. Warranty Clause

Warranty Clause

Dear FCAR users, welcome to choose FCAR F3 Series products. In order to better use the product, we recommend that you should take care of your product well, and operate in accordance with user manual's instructions whenever you use it. If your use meets this requirement, your product will be able to provide you longer-term services.

1. In line with the following terms and conditions and under the premise that you have bought our products and registered in the website of Shenzhen FCAR Technology Co., Ltd. (hereinafter referred to as "FCAR Technology"), FCAR Technology will provide free product warranty services by our distributor, if there are defects in materials or workmanship of hardware.

2. Confirm that you have carefully read the product warranty clause. Otherwise as FCAR Technology registered your mailed warranty card stub, you will be considered as agreeing to and accepting the terms of this warranty clause.

3. Your product must be purchased from product dealer that authorized by FCAR Technology. If purchase products through the illegal channels, buyers have to bear the cost of product maintenance services and cannot get the warranty by FCAR Technology.

4. The following items of products: Items that are easy to wear and tear, such as product instructions, inner and outer package box, attached power supply, promotional presents, SD card, card reader, touch pen and printing supplies are not under warranty range.

5. Products from the date of purchase (subject to valid purchase proof and effective warranty card of the product), if the products suffer performance failure caused by non-human factors, you can choose our maintenance services or replace the product with the same model within a month. You can enjoy one year warranty service for main unit, excluding human damage and incorrect operation.

6. You will not be able to enjoy free warranty service if the products are in any of the following case:

1) Failure, defect or flaw that do not belong to the quality of FCAR Technology products: including your use of the product not according to the product instruction, improper operation of the product, crash, fall, disassembly by yourself, connection of improper accessories, damage owing to crash because of improper transport or storage of the product, the erosion and corrosion, etc. that caused by infiltration of liquid or food.

2) The natural wear and tear of product: including but not limited to cover, keypad, LCD touch screens, accessories, etc.

3) Product main unit serial number and warranty card product serial number do not match, and product quality inspection tag or bar code is removed, altered or damaged.

4) Maintenance and modification without the approval of FCAR Technology or FCAR distributor.

7. The product quality problem or failure occurring within the warranty period, you can take the following measures:

1) You can inspect product by yourself based on products help information. If there are no hardware quality problems, try to upgrade the product program.

2) You can dial FCAR Technology local distributor to obtain the correct service information.

8. In the process of product warranty, you can contact with local FCAR Technology designated distributor and take responsibility of delivering or shipping to the location.

9. If you enjoy your free warranty service under this warrant clause is the only measure for the losses due to product defect within the product warranty period. FCAR technology shall not be liable for your direct or indirect loss.

10. All product warranty information, product features and specification changes will be posted on FCAR Technology latest promotional materials and website without further notice.

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