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Notes on the Maintenance and Use of the FCAR Products

- No disassembling without permission or professional help.
- Avoid fierce impact of any kind.
- Do not take the product near the magnetic field.
- Do not keep this product exposed to high temperature for a long time.
- Do not keep this product exposed to low temperature for a long time.
- Do not click on the screen violently or using sharp objects.
- Do not use water and chemical solvents to clean the machine. Always use a soft clean cloth and neutral detergent.

Notes on Motorcycle Inspection

- The repair of a motorcycle should best be done after the motor is switched off.
Should such maintenance takes place when the motor is running, it must be done at a place well-ventilated to avoid the toxic effects of the CO contained in the exhaust fumes.
- Gasoline is highly explosive and combustible. Therefore smoking, igniting, kindling or sparking of any sort is to be avoided when the maintenance takes place.
- The electrolyte in the accumulator contains sulfuric acid which can cause severe chemical burns. Upon contact with the electrolyte, be it on the skin, clothes or in the eyes or other places, it should be immediately be dealt with through irrigation

with large quantities of water. Washing is continued for at least ten to fifteen minutes to cool the tissue surrounding the acid burn and to prevent secondary damage. Contaminated clothing is removed immediately and the underlying skin washed thoroughly. Persons with severe injury should be taken to the hospital immediately. The hydrogen released from the accumulator is explosive and combustible therefore smoking, igniting, kindling or sparking of any sort is to be avoided, especially when the battery is being charged, while the maintenance takes place.

- To disassemble or assemble the motorcycle, one must use specialized maintenance tools. When assembling the motorcycle after the disassembly is done, the gasket, seal and split pin etc. should be replaced.
- Do not use flammable detergents when cleaning the accessories. Apply lubricants to the surface of these accessories before assembly.
- After the assembly, inspect the accessories to make sure that they are installed correctly.

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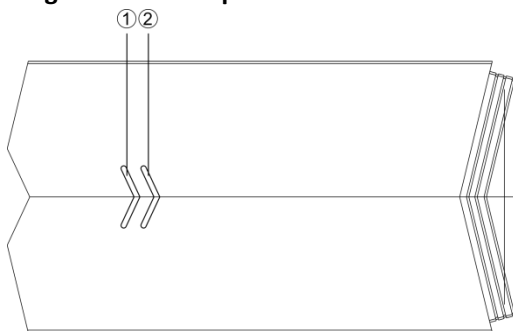
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1. Product Overview

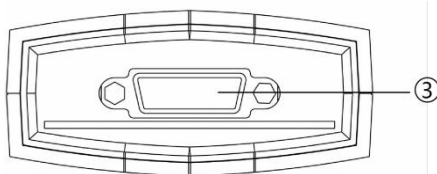
1.1 Product Overview

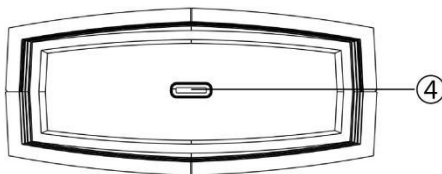
The FCAR FMM is the latest integrated diagnostic tool developed by FCAR to detect malfunctions in the motorcycle electronic control system, currently available to diagnose more than 90% models of the motorcycle brands such as YAMAHA, SUZUKI, HONDA, KAWASAKI etc. The FMM software will be updated continuously for future needs in which sense one machine would suffice. Our products are made with friendly UI design and provide ultra-practical maintenance help manuals to help our users handle problems rather quickly. It is easy to operate and up to the needs of all-sized maintenance enterprises, training institutions, manufacturers and so on.

1.2 FV100 Configuration Description



Serial No.	Name	Description
①	Power light	Red light is on when the power is on.
②	Diagnostic light	Green light flashes when the connection to the vehicle is set and they start communicating.















Serial No.	Name	Description
③	DB15 interface	Connects to the vehicle's diagnostic connector via the main test cable.
④	USB Type-C interface	Applied to connecting to or updating the FV100.




VCI Parameters

The processor	Cortex®-M3
Frequency	72MHZ
Bluetooth	V2.1+EDR, BT3.0, BT4.1
RAM	128KB

1.3 Diagnostic Cables and Accessories

	Main test cable.
	<p>Battery clips and cables.</p> <p>For some models, the FV100 is charged by using battery clips and cables to connect the motorcycle's accumulator and the FV100. (Do not misconnect the anode and cathode)</p>

	<p>Cigar lighter.</p> <p>To power up the FV100, please connect the battery clip to the power interface on the main test cable.</p>
	<p>USB data lines.</p> <p>Applied to connecting Android phones and FV100 for the sake of data communication. Also available to connect the PC and Android phones to transmit data.</p>
	<p>KAWASAKI-1</p> <p>Kawasaki -1 8P diagnostic cable</p>
	<p>KAWASAKI-2</p> <p>Kawasaki -2 4P diagnostic cable</p>
	<p>KAWASAKI-3</p> <p>Kawasaki -3 4P diagnostic cable</p>
	<p>KAWASAKI-4</p> <p>Kawasaki -4 6P diagnostic cable</p>
	<p>KAWASAKI-5</p> <p>Kawasaki -5 (6P+4P) diagnostic cable</p>
	<p>YAMAHA-1</p> <p>Yamaha-1 4P diagnostic cable</p>
	<p>YAMAHA-2</p> <p>Yamaha-2 (3P+3P) diagnostic cable</p>

	<p>HONDA-1</p> <p>Honda-1 4P diagnostic cable</p>
	<p>HONDA-2</p> <p>Honda-2 2P diagnostic cable</p>
	<p>SUZUKI</p> <p>Suzuki 6P diagnostic cable</p>

Note: The hardware and software are updated regularly. To get the information of the actual configuration of the products, please check out the checklist in the product.

2. Motorcycle Diagnosis

The diagnostic program can be used to read the vehicle's diagnostic information, data stream and perform actuation test once it has been connected to the electronic control system of the motorcycle that's already connected to FV100.

- To maintain the communication between the diagnostic program and the motorcycle, make sure to follow the steps down below:
 - 1) Connect the FV100 and the motorcycle diagnostic connector and turn the ignition switch on.
 - 2) Establish the communication between FV100 and the diagnostic program through Bluetooth pairing.
 - 3) Check out the connection status of the VCI. Once successfully connected, the motorcycle diagnosis is ready to start.
- How to start the motorcycle diagnosis:
 - 1) For more information on how to establish the communication between the diagnostic program and vehicle, please go to 2.2.
 - 2) On how to choose the vehicle model, please go to 2.3.
 - 3) On how to select a certain control unit to begin the diagnosis, please go to 2.4.

See more detailed instructions down below.

2.1 Pre-diagnostic Requirements

- 1) The FCAR motorcycle diagnostic tool is equipped with main test cable and multiple

testing connectors. Choose the corresponding testing connector that matches the vehicle's diagnostic connector before the diagnosis.



- 1) The mechanic must have basic knowledge of motorcycle electronics, and information such as the origin of vehicle, the production year, model, etc.
- 2) The mechanic should roughly be able to categorize the vehicle's malfunction as mechanical failure or failure in the electronic control unit.
- 3) The mechanic should be familiar with the basic operating skills of this product and read the manual thoroughly.
- 4) Turn the ignition switch to ON.
- 5) Make sure that the diagnostic cables are correctly connected.

2.2 Connect the Vehicle

2.2.1 Connect the FV100 and the Vehicle



Figure 2.2.1-1 Connection between FV100 and vehicle

Operation instructions:

- 1) Check out the location of the diagnostic pedestal, the diagnostic connector and whether it needs extra power supply.
- 2) Connect one end of the main test cable to the DB15 connector of FV100 and fasten the connecting bolt.
- 3) Connect the other end of the main test cable to the specialized diagnostic connector on the vehicle.
- 4) Connect the specialized connector to the motorcycle's diagnostic pedestal as is shown in figure 2.2.1-2.
- 5) With that done, the FV100 will get the power supply through the vehicle's diagnostic pedestal and the power light will be on. (If the light doesn't turn on, it could be that the vehicle's diagnostic pedestal is not electrified. This can be tackled by providing power to the FV100 using the accumulator clips as is shown in figure 2.2.1-3.)

Note: After the diagnosis is done, turn the connecting bolt loose first before pulling out the main test cable in case of any damage to the diagnostic connector.



Figure 2.2.1-2 Connection to the motorcycle's diagnostic pedestal




Figure 2.2.1-3 Power Supply through the Battery Clips

2.2.2 Connect the Diagnostic Program and FV100

Once the FV100 is connected with the motorcycle, the diagnostic program needs to be paired with the FV100. After all that is done, the vehicle will be ready to be diagnosed.

Pair via Bluetooth:

1. Turn on the Android phone and get the FCAR FMM motorcycle diagnostic system running.
2. Enter "Setting"  and select "VCI". Pair with the FCAR-VCI after it pops up in the discovery page.
3. Once the pairing is completed, the vehicle diagnosis will be ready to start.

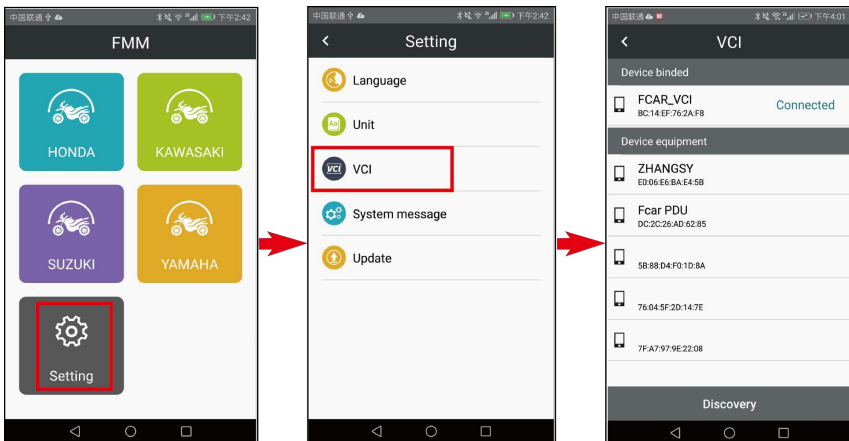


Figure 2.2.2-1 Bluetooth Pairing

Note: If the Bluetooth couldn't be found, it could be that the signal from the transmitter is too weak. To tackle this problem, try to stand to the VCI Bluetooth as near as possible.

2.3 Select Vehicle Model

Once all of the connections above are completed, you can now select the motorcycle model to start the diagnosis. Follow the instructions shown on the screen and make a few choices to finish selecting the vehicle model. Certain choices will vary for different vehicle models.



Figure 2.3-1 Model Selection

Before the vehicle diagnosis, a “help manual” will pop up. The manual contains information such as the vehicle model, the location of the diagnostic pedestal/connector and the specialized diagnostic connector and cautions. Before the vehicle diagnosis, please read this file carefully to conduct the diagnosis better-prepared.

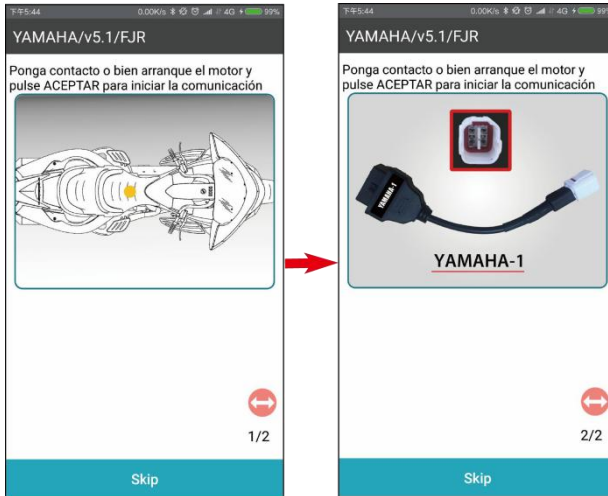


Figure 2.3-2 Help Manual

2.4 Vehicle Model Diagnosis

Once the diagnostic program identified the vehicle model, by selecting a control unit, you'll be able to enter the diagnostic interface of the control unit as is shown in figure 2.4-1. (If the vehicle is not equipped with a certain control unit, it'll be impossible to connect it to the vehicle's ECU)

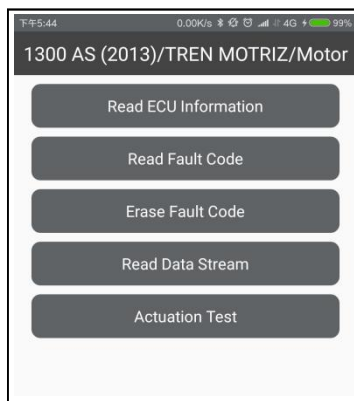



Figure 2.4-1 The main page of the Diagnosis

Read ECU Info	Read and display the ECU information.
Read Fault Code	Read and display the fault code detected from the vehicle system.
Clear Fault Code	Clear the fault code and frozen data detected in the vehicle's system.
Read Data Stream	Read and display the live data of the system module when it's running.
Actuation Test	Perform tests on the components of certain systems.

2.4.1 Read ECU Information

Read and display the vehicle's ECU information as is shown in figure 2.4.1-1.

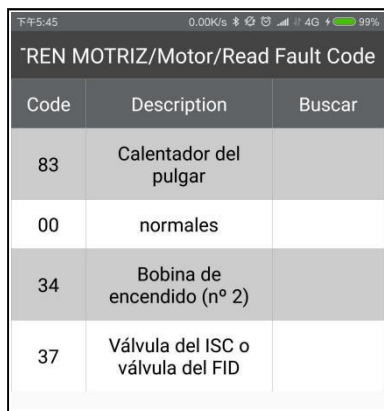


Referencia	012
Número de serie	30313233
Bastidor	0123456789A456789
Número de hardware	30313233
Número de software	30313233
Versión de software	30
Código de modelo	01

Figure 2.4.1-1 Read ECU Information

2.4.2 Read Fault Code

Read and display the fault code detected in the vehicle's system along with its description as is shown in figure 2.4.2-1.



Code	Description	Buscar
83	Calentador del pulgar	
00	normales	
34	Bobina de encendido (nº 2)	
37	Válvula del ISC o válvula del FID	

Figure 2.4.2-1 Read Fault Code

2.4.3 Clear Fault Code

Record and save the detected fault code before clearing them in case you need to check them out or make comparison afterwards. After the fault code is cleared, read the fault

code again to make sure that the clearance is completed.



DTC clearing command has been sent. Please read DTC again in order to verify that the code has been completely cleared



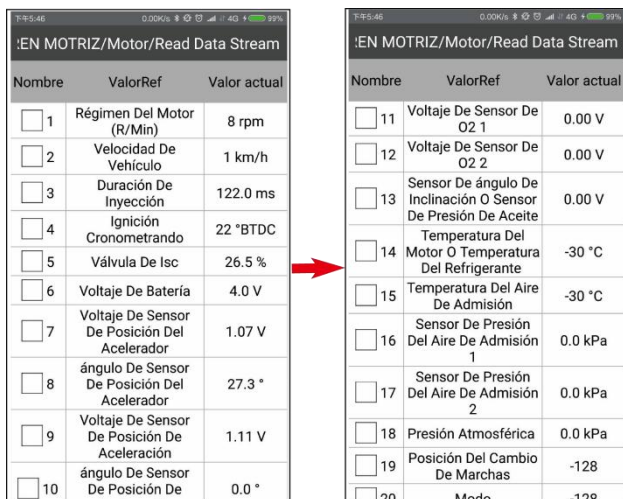
Figure 2.4.3-1 Clear the Fault Code

Analysis of the Fault Codes:

- 1) Read and record all fault codes.
- 2) Clear all of the fault codes.
- 3) Reenact such situation in which the same malfunction happens and execute a road test.
- 4) Read and record the fault code again.
- 5) Assort them into two categories such as occasional fault codes or sporadic fault code, relevant fault codes or irrelevant fault codes, history fault codes or current fault codes.
- 6) Assessing the “relevant fault codes” category and classify them as primary fault codes and secondary fault codes.
- 7) Find out the sensor, actuator or control system that has caused such fault codes to appear and analyze the status of their circuits. Locate the exact spot where the malfunction happens.

2.4.4 Read Data Stream

Choose “read data stream” and the diagnostic program will display the live data of the system module. Data may vary according to vehicle models and control modules as is shown in figure 2.4.4-1.



Nombre	ValorRef	Valor actual
<input type="checkbox"/> 1 Régimen Del Motor (R/Min)		8 rpm
<input type="checkbox"/> 2 Velocidad De Vehículo		1 km/h
<input type="checkbox"/> 3 Duración De Inyección		122.0 ms
<input type="checkbox"/> 4 Ignición Cronometrando		22 °BTDC
<input type="checkbox"/> 5 Válvula De Isc		26.5 %
<input type="checkbox"/> 6 Voltaje De Batería		4.0 V
<input type="checkbox"/> 7 Voltaje De Sensor De Posición Del Acelerador		1.07 V
<input type="checkbox"/> 8 ángulo De Sensor De Posición Del Acelerador		27.3 °
<input type="checkbox"/> 9 Voltaje De Sensor De Posición De Aceleración		1.11 V
<input type="checkbox"/> 10 ángulo De Sensor De Posición De Aceleración		0.0 °

Nombre	ValorRef	Valor actual
<input type="checkbox"/> 11 Voltaje De Sensor De O2 1		0.00 V
<input type="checkbox"/> 12 Voltaje De Sensor De O2 2		0.00 V
<input type="checkbox"/> 13 Sensor De ángulo De Inclinación O Sensor De Presión De Aceite		0.00 V
<input type="checkbox"/> 14 Temperatura Del Motor O Temperatura Del Refrigerante		-30 °C
<input type="checkbox"/> 15 Temperatura Del Aire De Admisión		-30 °C
<input type="checkbox"/> 16 Sensor De Presión Del Aire De Admisión 1		0.0 kPa
<input type="checkbox"/> 17 Sensor De Presión Del Aire De Admisión 2		0.0 kPa
<input type="checkbox"/> 18 Presión Atmosférica		0.0 kPa
<input type="checkbox"/> 19 Posición Del Cambio De Marchas		-128
<input type="checkbox"/> 20 Modo		-128

Figure 2.4.4.1 Read Data Stream

Oscillogram of the Data

With the FCAR motorcycle diagnostic system, mechanics are able to see the oscillogram of the live data. It helps mechanics to see the changes in the data stream more vividly and find out the problem in a faster manner.

Tick the box before any data that you'd like to see in the graphic form and the oscillogram shall be displayed as is shown in figure 2.4.4-2. You can choose up to three items at a time. Select "up" to stick the items to the top of the page as is shown in figure 2.4.4-3.

7:54:47 0.00Ks 4G 99%

!EN MOTRIZ/Motor/Read Data Stream

Cancelar Arriba **Grafico**

<input type="checkbox"/>	1	Régimen Del Motor (R/Min)	8 rpm
<input type="checkbox"/>	2	Velocidad De Vehículo	1 km/h
<input checked="" type="checkbox"/>	3	Duración De Inyección	122.0 ms
<input type="checkbox"/>	4	Ignición Cronometrando	22 °BTDC
<input type="checkbox"/>	5	Válvula De Isc	26.5 %
<input type="checkbox"/>	6	Voltaje De Batería	4.0 V
<input type="checkbox"/>	7	Voltaje De Sensor De Posición Del Acelerador	1.07 V
<input type="checkbox"/>	8	ángulo De Sensor De Posición Del Acelerador	27.3 °
<input type="checkbox"/>	9	Voltaje De Sensor De Posición De Aceleración	1.11 V
<input type="checkbox"/>	10	ángulo De Sensor De Posición De	0.0 °

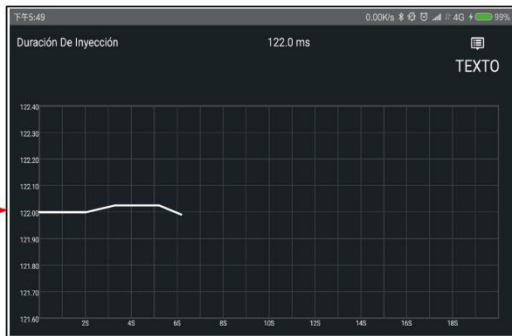


Figure 2.4.4-2 Oscillogram of the Data

7:54:47 0.00Ks 4G 99%

!EN MOTRIZ/Motor/Read Data Stream

Cancelar **Arriba** Grafico

<input type="checkbox"/>	1	Régimen Del Motor (R/Min)	8 rpm
<input type="checkbox"/>	2	Velocidad De Vehículo	1 km/h
<input checked="" type="checkbox"/>	3	Duración De Inyección	122.0 ms
<input checked="" type="checkbox"/>	4	Ignición Cronometrando	22 °BTDC
<input type="checkbox"/>	5	Válvula De Isc	26.5 %
<input type="checkbox"/>	6	Voltaje De Batería	4.0 V
<input checked="" type="checkbox"/>	7	Voltaje De Sensor De Posición Del Acelerador	1.07 V
<input checked="" type="checkbox"/>	8	ángulo De Sensor De Posición Del Acelerador	27.3 °
<input type="checkbox"/>	9	Voltaje De Sensor De Posición De Aceleración	1.11 V
<input type="checkbox"/>	10	ángulo De Sensor De Posición De	0.0 °

7:54:47 0.00Ks 4G 99%

!EN MOTRIZ/Motor/Read Data Stream

Nombre	ValorRef	Valor actual
<input checked="" type="checkbox"/> 3	Duración De Inyección	122.0 ms
<input checked="" type="checkbox"/> 7	Voltaje De Sensor De Posición Del Acelerador	1.07 V
<input checked="" type="checkbox"/> 8	ángulo De Sensor De Posición Del Acelerador	27.3 °
<input checked="" type="checkbox"/> 4	Ignición Cronometrando	22 °BTDC
<input type="checkbox"/> 1	Régimen Del Motor (R/Min)	8 rpm
<input type="checkbox"/> 2	Velocidad De Vehículo	1 km/h
<input type="checkbox"/> 5	Válvula De Isc	26.5 %
<input type="checkbox"/> 6	Voltaje De Batería	4.0 V
<input type="checkbox"/> 9	Voltaje De Sensor De Posición De Aceleración	1.11 V
<input type="checkbox"/> 10	ángulo De Sensor De Posición De	0.0 °

Figure 2.4.4-3 Stick the data to the top

2.4.5 Actuation Test

An actuation test is to give access to certain subsystems of the vehicle and start diagnosing the components. When an actuation test takes place, the diagnostic program sends instructions to the ECU to activate the actuators, and by doing so it can check out whether the actuators of the vehicle electronic control system and their circuits are functioning properly. The options of the test vary from model to model and control system to control system.

How to:

- 1) Enter the actuation test page of the vehicle to be tested. See figure 2.4.5-1.
- 2) Select the test that you'd like to perform and follow the instructions to make sure everything is ready for the test to take place. When a test completes, the system will inform you so with a “operation succeeded” pop-up window.
- 3) Analyze whether the component is functioning properly according to the test results.

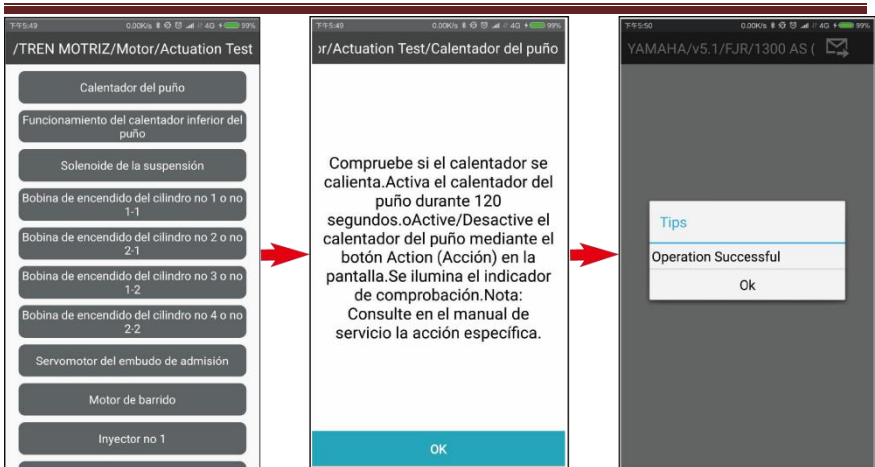
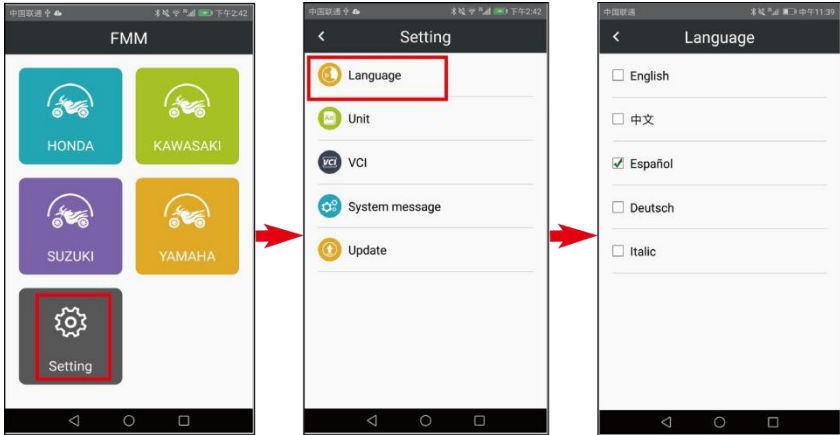


Figure 2.4.5-1 Actuation Test

3. Setting

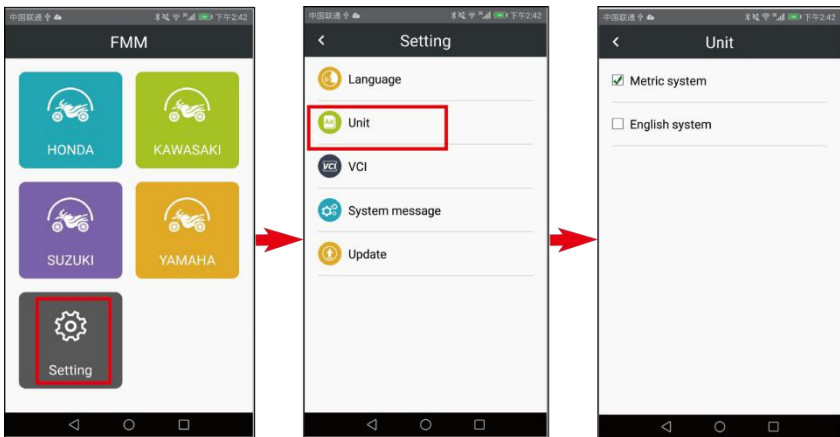
3.1 Language Setting

There are various languages to choose from for the system language setting in the FCAR FMM motorcycle diagnostic tool. Select “setting” and “language” to set the system’s language.



3.2 Unit

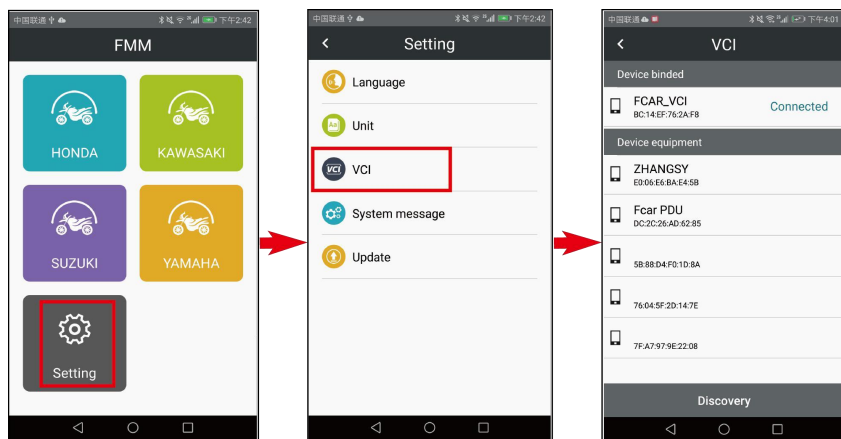
Select “Unit” to set the data flow’s unit in the diagnostic program. There are two options, “metric system” and “English system”, for you to choose from.



3.3 VCI Bluetooth Pairing

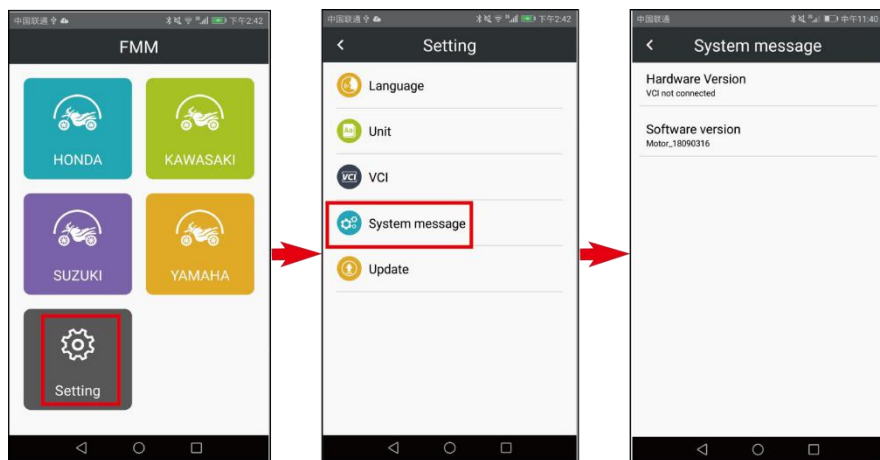
Before the diagnosis, make sure to match the Bluetooth. Select “discovery” to search for available Bluetooth and pair with the FCAR VCI. The diagnosis shall be ready to start once the

pairing has completed.



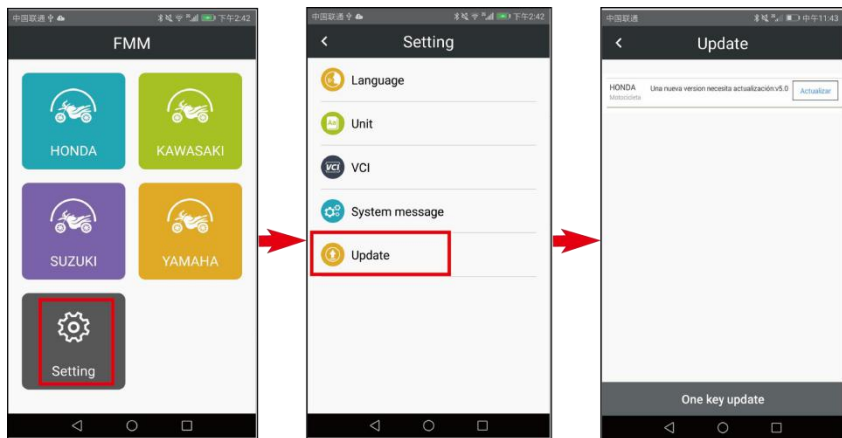
3.4 System Message

System message provides users with the information of system's hardware and software versions.



3.5 Update

When an update is available the system can be updated once it's connected to the internet. Select "Setting" and click "Update" the system will search for the latest update available. Click "update" to start the process.



Warranty Clause

Dear FCAR users, thank you for choosing FCAR products. It is best that you keep the product in good condition, and follow the user's guide every time you operate it so that it will last longer and function better.

1. Shenzhen FCAR Technology Co., Ltd. (hereinafter referred to as "FCAR Technology") will repair without charge any products which fail due to a defect in material or workmanship on condition that you've activated the tool, completed registering and filled out your personal information.
2. Read this warranty clause carefully. By registering on the official website of the FCAR Technology and filling out your personal information you've agreed to and accepted the terms of this warranty clause.
3. Make sure you buy our products through authorized franchisers. Otherwise you need to pay for the maintenance service of the product.
4. This warranty does not cover damage to accessories such as the product manual, the inner and outer wrapping box and promotional gifts etc.
5. The goods are guaranteed for 1 month, from date of sale, provided that they're not damaged by the user. Under such conditions, the defected product can be repaired or replaced with another one of the same type. FCAR Technology will repair without charge certain items such as the main body of the product, the main test cable, the connectors and the AC adapter within 12 months of the purchase.
6. The free maintenance service does not cover your products in any of the following cases:
 - 1) Failure and defect not caused by the manufacture of the FCAR Technology product. When you misuse the product, crash or drop the product, disassemble and reassemble the product without permission, connect improper accessories to it, transport and store the product inappropriately and damage it or if an erosion or corrosion is made to the product due to the infiltration of liquid or food, FCAR Technology is not responsible for such damages made to the product.
 - 2) The natural wear and tear of the product, including but not limited to the product's case,

keyboard, touchscreen, accessories and so on.

3) The serial number on the product's body and the warranty doesn't match. The quality inspection certificate or the bar code is removed or scratched.

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

7. Should the product be damaged under warranty, you can take the following measures:

1) You can inspect the product yourself following its help manual. If there are no hardware problems you could try updating the software.

2) For more information, don't hesitate to reach out to our customer service via telephone, the number to which is 0086-755-82904730.

3) On receiving a proper response to your request, you are to send the product to the designated address for repair or maintenance. The FCAR Technology is not responsible for the ramification of a lost product during the delivery.

8. When you send the product for maintenance and repair service, you are to pay for the relevant expenses incurred before the product reaches the address designated by FCAR Technology, including the wrapping, transportation, insurance etc..

9. The free maintenance and repair service only cover the under-warranty products when there are defects in the product itself and FCAR Technology is not responsible for your direct or consequential loss.

10. All changes made to the warranty clause or the product features and specification will be published in the latest FCAR promotional materials or on the FCAR official website. There will be no other notifications elsewhere.



Shenzhen Fcar Technology Co., Ltd.



Shenzhen Fcar Technology Co., Ltd.



Certification

This product has been strictly inspected as qualified products and met the company standards.

Product name	
Product serial number	
Date of production	
Inspector	



Warranty card

Product name	
Product serial number	
Purchase date	

Company name: _____

User address: _____

Contact person: _____

Contact number: _____

