

Precaution on Operation

- The appliance is a sophisticated electronic device, never have it clashed when in use.
- Main unit screen may flash at the moment of engine ignition, which is normal.
- You may unplug the main unit if the program can not be actuated or confused screen occurs. Plug again to continue the operation.
- Make sure the appliance is properly connected to the DLC to avoid communication interruptions.
- During operation, keep the screen upward and leveled.
- Be careful when plugging and unplugging the main cable and diagnostic connector. Tighten the screw before operation to avoid unexpected disconnecting and/or damage to the port.
- Handle with care. Avoid collision. Unplug the power after operation.
- Unplug the power cable by holding the connector, not the cable itself.



Contents

1. Foreword	1
1.1 Product summary	1
1.2 Scope.....	1
1.3 Capability standard for vehicle battery test	2
2. Test environment and structure.....	3
2.1 Test environment.....	3
2.2 Battery status and description	3
2.3 Batterybox structure and test accessories	4
3. Connections & Operations.....	6
3.1 Connection	6
3.2 Inside the vehicle test.....	6
3.2.1 Battery test.....	6
3.2.2 Charging system and starting system test.....	11
3.4 Outside the vehicle test.....	14
3.5 Review version info.....	16
4. Precaution items on battery test.....	18

1. Foreword

1.1 Product summary

X-431 GDS is a new generation of sophisticated and integrated automotive diagnostic product with colorful screen and powerful functions developed by LAUNCH.

It provides an optional function of automotive battery test, which adopts the latest state-of-the-art conductance testing technology in the world and can test vehicle's battery status. Two testing environments (Inside the Vehicle and Outside the Vehicle) are available and applicable to battery test. In addition to battery test, charging system and actuation system test can be done while Inside the Vehicle is selected.

It supports various battery standards and specifications, including CCA, DIN, IEC, EN, JIS, SAE and GB etc. It is specifically designed to help car owner, repair workshop, battery factory use battery test instrument properly and determine whether the battery is normal or not.

1.2 Scope

Battery test aims to check starting plumbic acid storage batteries for vehicles, ship, boats and aviations, etc. It can test all kinds of batteries complying with CCA, DIN, JIS, EN, GB and SA standards. For detailed test standards, please refer to Table 1-1.

Table 1-1 Test standard

Standards	Standard (Full name)	Test capacity range
CCA	Battery Council international	100~1700
DIN	Deutsche industry normen	100~1200
JIS	Japanese industry standard	26A17~245H52
EN	Europe norm	100~1700
IEC	National electrical commission	100~1200
GB	Chinese national standard	100~1200
SAE	Society of Automotive engineers	100~1700

1.3 Capability standard for vehicle battery test

The rated capacity range for vehicle battery varies with different test standards. See Table 1 for details. If not specified, the rated capacity value is defaulted as 100~1700.

CCA: 100~1700

DIN: 100~1200

EN: 100~1700

IEC: 100~1200

GB: 100~1200

SAE: 100~1700

JIS: 26A17~245H52

2. Test environment and structure

2.1 Test environment

Inside the vehicle test indicates that the battery connects to loading devices, such as engine, etc. After doing battery test, it can perform charging system and actuation system test, which is proceeded as a whole simultaneously. Charging system and actuation system test is not required but must not be performed before battery test. Because it is difficult for vehicle technicians to judge where is faulty exactly if they have the faintest idea of battery's status itself.

Outside the vehicle test indicates that the battery is disconnected from all loading devices on vehicles. Therefore, only battery test is supported in this condition.

2.2 Battery status and description

There are mainly 5 states as follows:

No.	States	Descriptions
1	Good battery	Indicates battery is normal.
2	Replace battery	Indicates that battery is aged or becomes rejected, or battery life cycle approaches to be exhausted. In this case, battery voltage appears to be normal, but battery itself is not well, i.e. battery polarity board has been completely vulcanized or aged. Please replace battery immediately.
3	Good-recharge	Stands for low battery. The battery is good itself.
4	Charge-retest	It is better for a few batteries to be fully charged before

		testing in order to avoid judging in error under special conditions.
5	Bad cell	Indicates one of the battery cells is bad and can not work normally, but for which one is bad, it can't be verified. In this case, battery voltage is generally lower than 11V, mainly resulting from internal circuitry damage, such as short circuit, open circuit, dummy weld etc.

2.3 Batterybox structure and test accessories

2.3.1 Batterybox structure

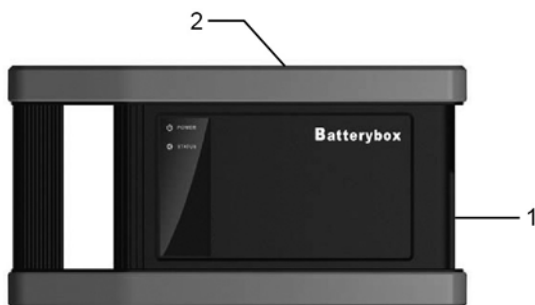


Fig.2-1 Batterybox structure diagram

1. **Battery connector:** Connect to battery for battery test.
2. **B type USB terminal:** Connect to the GDS main unit with a USB cable.

2.3.2 Test accessories



Fig. 2-2 Kelvin clip



Fig. 2-3 A/B cable

3. Connections & Operations

3.1 Connection

Connect one end of the A/B cable to the B type USB terminal of the batterybox, and then connect the other end to the USB port of GDS main unit. This connection applies to outside the vehicle test and inside the vehicle.

Notes:

- 1. Wait about 10s and begin to communicate since the batterybox needs to initialize after connection is complete, otherwise, communication may fail.*
- 2. Red lamp on the batterybox means it has been successfully powered up; if the green light is always on, it indicates the clip is well connected; while the green light blinks, it indicates that the clip has poor contact. Do not perform any test until the clip and A/B cable are properly connected.*

3.2 Inside the vehicle test

Battery test and charging system & actuation system test can be done in this mode.

3.2.1 Battery test

1. Enter battery test main menu, and select a desired test environment as shown in Fig. 3-1.

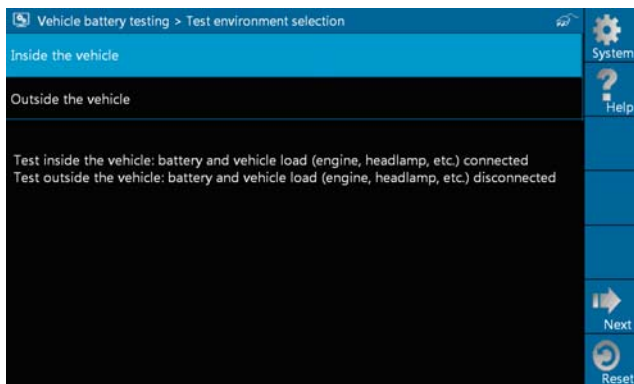


Fig. 3-1

Button Descriptions:

[System]: 3 submenus are available: Show desktop (return to desktop), Version (view the current version info) and Exit program (exit the current program).

[Help]: views introduction and operation guideline for battery test.

[Next]: proceed to the next operation.

[Reset]: stop all current operation and enter initializing interface.

Note: The sequences of inside the vehicle and outside the vehicle test are almost the same, but under inside the vehicle condition, all loads in vehicles must be powered off for getting an exact test value.

2. Firstly, detect whether floating electricity exists or not before testing. If yes, turn on the headlamp to remove it. Otherwise, the system starts test program directly.

Select [Battery testing] > [Inside the vehicle], then click [Next], the system starts detecting floating electricity automatically. A screen similar to Fig. 3-2 appears if floating electricity is detected.

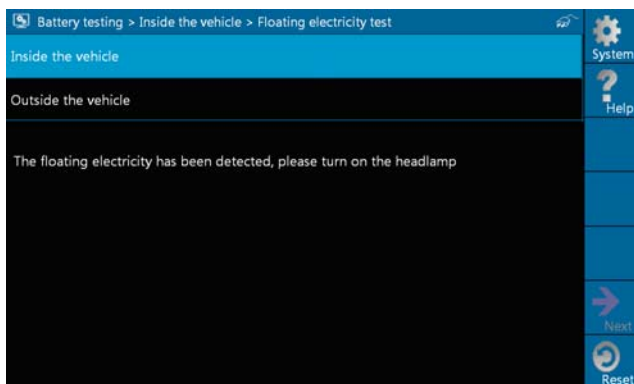


Fig. 3-2

3. Follow the on-screen instructions to turn on headlamp, then the interface will be shown as below.

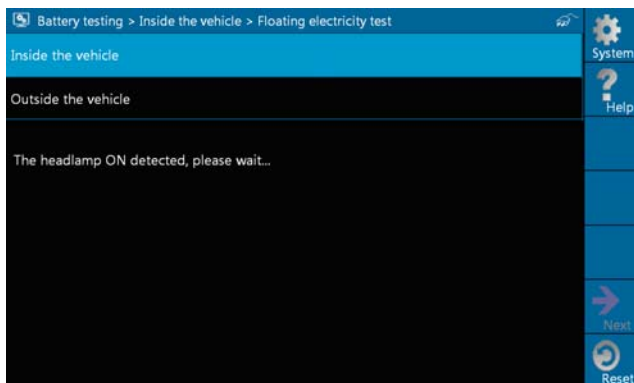


Fig. 3-3

- Once the floating electricity is removed, a prompt message box will appear on the screen.

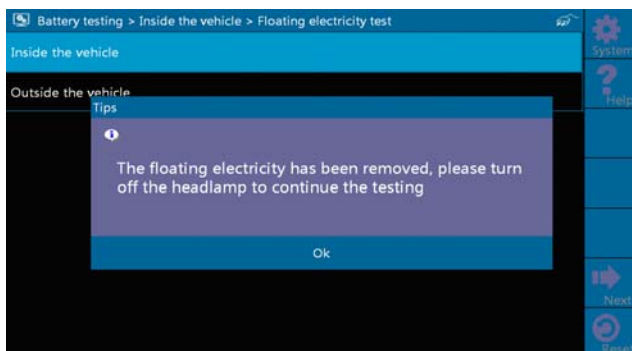


Fig.3-4

- Follow the on-screen instructions to turn off the headlamp and click [OK], the system will continue the testing. Click [Next], it will go into Selecting testing standard screen. See Fig. 3-5

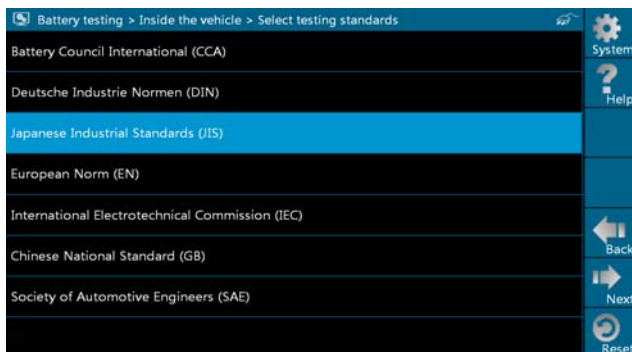


Fig. 3-5

6. Select a testing standard except for JIS and click [Next], a screen similar to Fig. 3-6 will appear. Users can adjust capacity size by tapping on << or >> or by dragging the slider on the bar.



Fig. 3-6

If JIS is selected, click [Next], the system will enter Select testing capacity screen. Users can select corresponding standard capacity value according to battery model marked on battery.

Battery testing > Inside the vehicle > Select testing capacity								System
26A17	26A19	30A19	34A19	26B17	28B17	28B19	34B17	?
34B19	36B20	38B19	38B20	40B19	42B19	44B19	44B20	Help
46B24	50B24	55B24	60B24	65B24	32C24	48D26	50D20	←
55D23	55D26	65D23	65D26	65D31	70D23	75D23	75D26	PgUp
75D31	80D23	80D26	85D23	85D26	90D26	95D31	105D31	→
110D26	115D31	95E41	100E41	105E41	110E41	115E41	120E41	PgDn
130E41	115F51	130F51	145F51	150F51	170F51	145G51	155G51	←
165G51	180G51	195G51	190H52	210H52	225H52	245H52	NS40	Back
NS0	NS60	N70	N100	N120	N150	N200	54801	→
55415	55530	55566	56093	56318	56618	56620	57069	Next
26A17	26A19	30A19	34A19					

Fig. 3-7

- Click [Next] and the testing result will appear on the following screen.

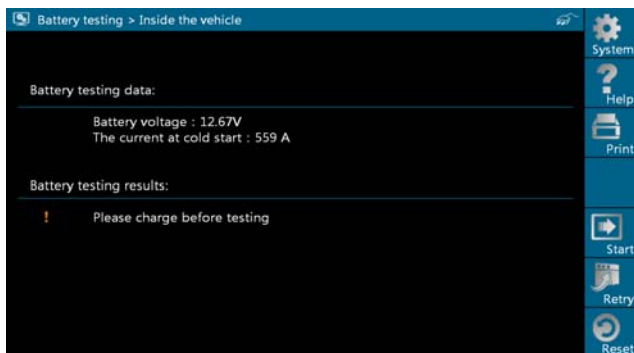


Fig. 3-8

3.2.2 Charging system and starting system test

While performing this test, the battery's charging voltage value and starting voltage can be obtained in case of engine starting and accelerating. Based on the data, the system will judge whether battery's charging and actuation status is normal or not.

- The interface will display as Fig. 3-9 after the engine starts.



Fig. 3-9

2. After detecting engine starting, follow the instructions on the screen to increase the speed.

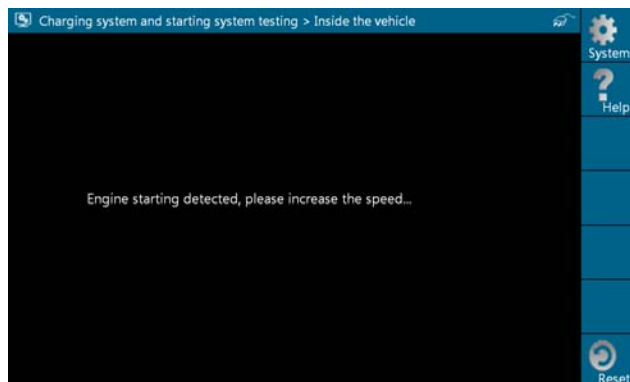


Fig. 3-10

3. The system begins to receive test data information after acceleration was detected, as shown in Fig. 3-11.

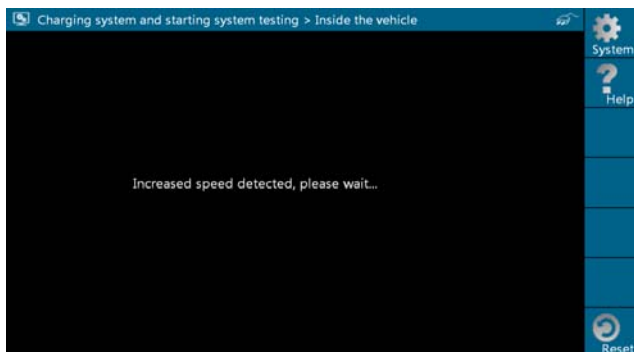


Fig. 3-11

4. Tested data will be shown on the screen, similar to Fig. 3-12.

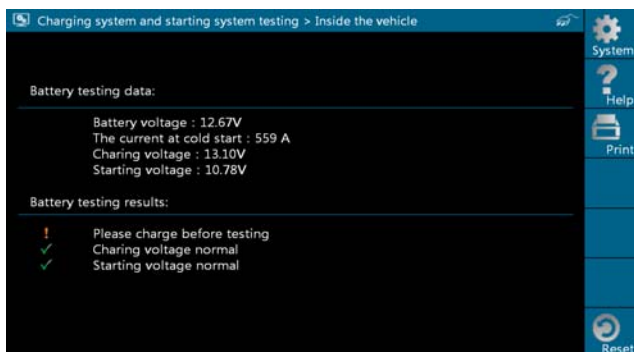


Fig. 3-12

Note: It is unnecessary to perform charging system and start system test after finishing battery test, but battery test must be done before undergoing charging system and starting system test.

3.4 Outside the vehicle test

It only applies to battery test and detecting floating electricity will be ignored while performing battery test.

1. On Fig. 3-1, select [Outside the vehicle], and click [Next] to enter.

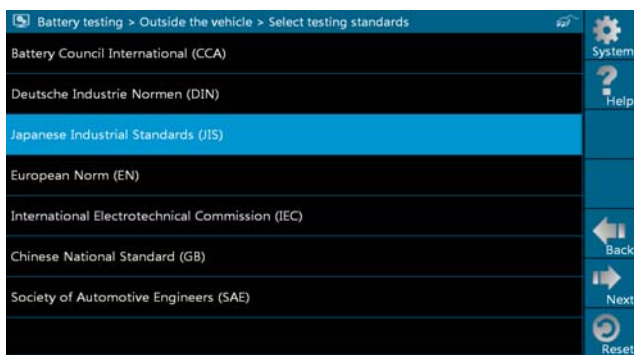


Fig.3-13

2. Select a testing standard except for JIS and click [Next], the system will enter a screen shown as Fig. 3-14. The capacity value can be adjusted by touching << or >> or by dragging the slider on the bar.



Fig. 3-14

If JIS is selected, click [Next], it will enter Select testing capacity screen. Users can select corresponding standard capacity value according to battery model marked on the battery.



Fig. 3-15

- Click [Next] and the testing results will appear on the following screen.

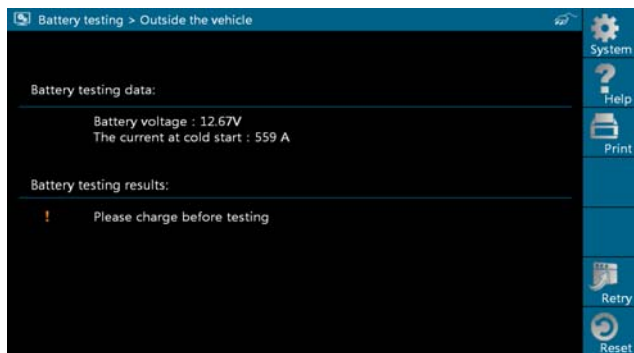


Fig. 3-16

Button Descriptions:

[System]: 3 submenus are available: Show desktop (return to desktop), Version (View the current version info) and Exit program (exit the current program).

[Help]: views introduction and operation guideline for battery test.

[Print]: print test results.

[Retry]: display test results again.

[Reset]: stop all current operation and enter initializing interface.

Note: All buttons are invalid unless the print was completed.

3.5 Review version info

1. In Fig. 3-1, click [system], a pull-down menu will pop up.

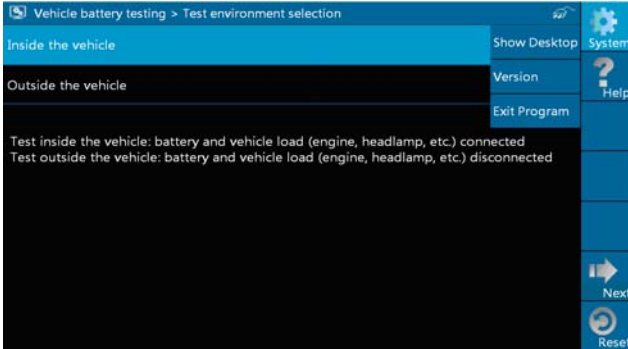


Fig. 3-17

2. Click [version], a message box will be shown on the following screen.

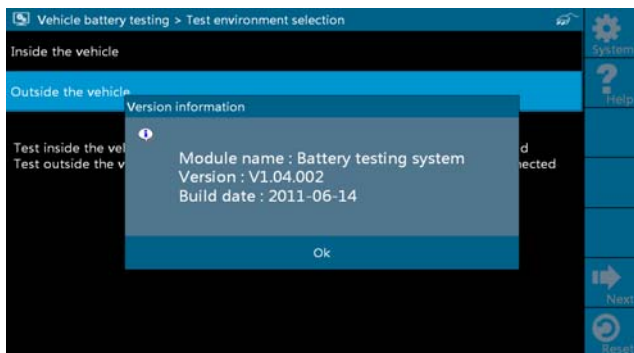


Fig. 3-18

4. Precaution items on battery test

1. For the purpose of getting accurate test results, unless otherwise special required, all loads need to be power off such as headlamp, engine etc. before testing battery.
2. The operating time required for charging system and actuation system test varies from person to person. If the engine does not start or accelerate within 30 seconds, the system will prompt you "receiving timeout" and return to the initial status.
3. Whether Engine is off or not has no influence on charging and actuation test result after increased speed is detected, but other loads need to be powered off.
4. The accuracy of battery voltage, charging voltage, start voltage is 0.01V in test results; CCA (Cold Cranking Amps) precision is 5CCA.
5. Generally, charging voltage value is greater than starting voltage.

Charging voltage range is as follows: 13.8--14.5V for domestic vehicle; 13.3--15.5V for imported vehicles. The voltage varies with different car models, so you have to judge based on related vehicle models. In general, the DC voltage is stable, but it also varies with different revolution speed.

Starting voltage range: the value higher than 9.6V is regular, otherwise it is too low. Due to different situations, whether the starting voltage is higher or not does not mean the vehicles or batteries are faulty. For detailed faults, other special equipments are needed. To validate the accuracy of the value, the best method is to collect the signals of starting and charging voltage and observe it on an oscilloscope.

6. Generally, the voltage is lower than 11V for the bad cell battery, but it is possible that the battery is completely exhausted or has a serious low

capacity. In this case, just recharge your battery. Bad cell always happens when the loads on a stopping vehicle are turned on for a long time.

7. Please note that it is normal for quick detecting of "Increase speed" because it follows the theory of detecting "Increase speed": if the detected voltage is higher than the previous battery test voltage, the system will prompt you a message of "Engine has been speeded"
8. It has no influence on test result in the event that engine's output voltage or engine revolution is not very stable. No matter whether the vehicle is accelerated or not, the output voltage only differs within 0.2V.
9. While doing inside the vehicle test, Kelvin clip is always found to be in poor contact. To remain it in good contact, please shake it several times before testing. Take down the battery connector, and test it again, the value probably varies. The deviation may arise from battery connector.
10. Pay more attention to connect the clip. The battery poles connect with conductor, which makes the clip has a poor connection when testing battery. A tolerance of dozens of CCA occurs if the clip is out of position, or oil, dust attaches on the pole. The gear and main body of clip should be fully matched with battery poles.

Notes:

1. *Battery poles inside the vehicle are enveloped by connectors, which may produce some errors for test results. The tolerance results from the resistance of connectors. The greater the resistance value is, the greater the tolerance becomes. But generally, the tolerance does not affect the test conclusion.*
2. *Testing the battery separately generates an exact test result. The battery box is a very useful auxiliary tool for quick test. If any problems were found, test it separately for getting an exact test result.*