MASHIN®

MASHIN ELECTRIC CORP.

VAT-650

USER GUIDE

Company Profile

Established in 1996 in Madou District, Tainan City, Mashin Electric Corp. begins as a manufacturer of car chargers. Over the years, Mashin becomes a professional battery charger manufacturer for Automotive, Motorcycle, Industry, Jump Starter and functional battery chargers. Especially the car chargers stand the first selling position in domestic market.
Recently, we have committed into more and more product lines for battery chargers.

We specialized in Battery Charger, Adaptor, Transformer, Switching Power, DC to AC Inverter, LiFePO4 Lithium Battery Pack, Battery Analyzer, Booster Cable, Jump Starter and related electronic products. With more than 20 years' factory experiences, we received customers' reliance for automotive market around the world. Mashin can do OEM services and also has the capability for ODM. Our products are followed by high SOP standards throughout the whole production process. Besides, we put into the newest equipment and focus on employees training in order to provide the best service and products to our customers.

Creativity and experiences are our advantages to receive customers' trust.
Besides, our engineers have decades of experiences and contributed in developing our own battery chargers. Every year, we will have more than 5% R&D developing fees for our new products. What we want is to provide our customers a more convenient life.

We take the four policies, "Total Quality Assurance, Quality First, Service First, Customer Satisfy" as our company goals. From R&D, purchasing, production to the sales and delivery, we all have completely Quality Management System. In addition, most of our products obtained UL, CE, CB, FCC, PSE, SAA, RoHs, and CEC certifications and safety regulations. Strict company policy and management obtain the certification of French (ANFOR) ISO-9001 and be the Japan PSE and U.S. UL certified factory.

Since the factory established, Mashin has actively built up our own brand and strives to develop the best products on a daily basis. It wasn't easy to keep the faith after several decades, but we did. In the future, we will maintain our creativity, keep developing new types of chargers and extend the international market. It's our responsibility to feed back to the world.

Notes

- Please read the user manual carefully before using.
- There will be no further notice for the product upgrade or changes. Please take the device as standard.
- Declaration : Any product names mentioned in this manual are used for explaining the using methods. The trademarks still belong to the original company.
- Only available for 12V lead-acid batteries.

Mashin will have no responsibility for the followings:

- This manual is designed forMashin's Analyzer only. Any consequence caused by using this manual to other products.
- Any damages or problems that casued by using other accessories or consumables instead of Mashin's original products.
- Any fees or expenses from the damages or losses of the analyzer caused by private accidents or misused and unused without following Mashin's standard.

Contents

Chapter 1 Product Summary

■ Product Profile

VAT-650 Lead-acid Battery Analyzer adopts the world's most advanced conductance testing technology which can easily, quickly and accurately measure the actual cold cranking amps capability of the vehicle starting battery, state of battery health, and common faults of the vehicle starting and charging system. This Battery Analyzer helps maintenance personnel to find out the problem quickly and accurately to increase the efficiency for repairing the vehicle.

1、Available for all automotive lead-acid batteries, eg. Ordinery Battery, AGM Flat Plate, AGM Spiral, GEL and EFB...etc.
2、Battery condition detection.
3、Reverse polarity protection which will not cause the damage when connecting reversely either for analyzer or battery.
4、Low battery testing.
5、Multiple rating system selection, eg. CCA, DIN, JIS, EN, IEC, GB, SAE, MCA, BCI and CA.
6、Multi-language support which includes Traditional Chinese, English, Japanese...etc, other language is available according to customer's requirement.

■ Function

VAT-650 Lead-acid Battery Analyzer includes Battery Test, Cranking Test, Charging Test and other additional functions.

Battery Test : Analyze the battery status to calculate the actual cold cranking capability and aging.
Cranking Test : Test and analyze the condition of starting motor.
Charging Test : Check and analyze the condition of charging system.

■ Technical Parameters

◎ Cold Cranking Amps Measure Range:

Measure Standard	Measure Rate
CCA	100 - 2000
DIN	100 - 1400
JIS	26A17 - 245H52
EN	100 - 2000
IEC	100 - 1400
GB	30 - 220
SAE	100 - 2000
MCA	100 - 2000
BCI	100 - 2000
CA	100 - 2000

■ Environmental Requirement

◎ Temperature：-20°C ~ 60°C（Non-waterproof）

◎ Storage：-30°C ~ 70°C

Chapter 2 Parts Indicator

VAT-650 Lead-acid Battery Analyzer consists of a main device, testing wire sets and the printer.

Chapter 3 Operation

■ Pre-Test

- Please clean battery poles before using.
- Please make sure clamps and battery are well-connected.
- Before testing, please make sure the engine stopped and the door closed.

■ Connect Analyzer

- Please connect the clamps with the battery pole, positive to positive and negative to negative.

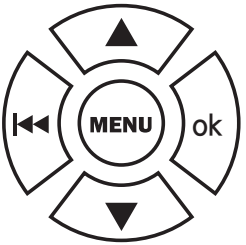
  Please make sure clamps are well-connected. If they are not connected well, the test will be unavailable. If screen shows "CHECK CONNECTION ", before getting into the testing program, please clean the poles and re-connect.

- This Analyzer has reverse polarity protection. If the clamps are connecting reversely, the screen will not light on. But it will not cause any damages either on analyzer or car load.

※ For parallel batteries, must break off the cathode connection first, then do the individual test to each battery. If you do not break off the cathode connection, there might come out with an error testing result.

※ For series batteries, if it is 24V, please test by each battery.

■ Button Indicator

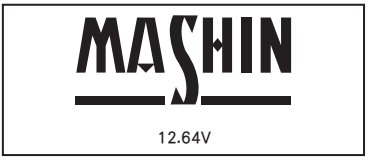


-  (UP & DOWN)
-  (BACK)
-  (OK)
-  (MENU)

Press MENU for additional functions.

■ Analyzer Startup

The Battery Tester will startup automatically when the clamps are well-connected.



The battery voltage will show at the bottom of screen which can be used as DC Voltmeter. The measureing range is 6 - 30VDC, out of this range will cause the damage of the analyzer.

Press  to get into the MAIN MENU or press  to SYSTEM SETUP.

■ Battery System Standard and Rating

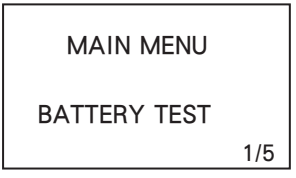
Please select the SYSTEM STANDARD and RATING according to the information showed on the battery, as the arrow indicated below:

CCA : Cold Cranking Amps, specified by SAE & BCI
DIN : German Institute for Standardisation
JIS : Japanese Industrial Standard, displayed on the battery as combination of the numbers and letters, e.g. 55D23, 80D26
EN : European Standard
IEC : International Electrotechnical Commission
GB : Chinese National Standard
SAE : Society of Automotive Engineers (USA)
MCA : Marine Cranking Amps standard, effective starting current value at 0°C
BCI : Battery Council International (Publishes Automotive Battery Standards)
CA : Cranking Amps standard, effective starting current value at 0°C

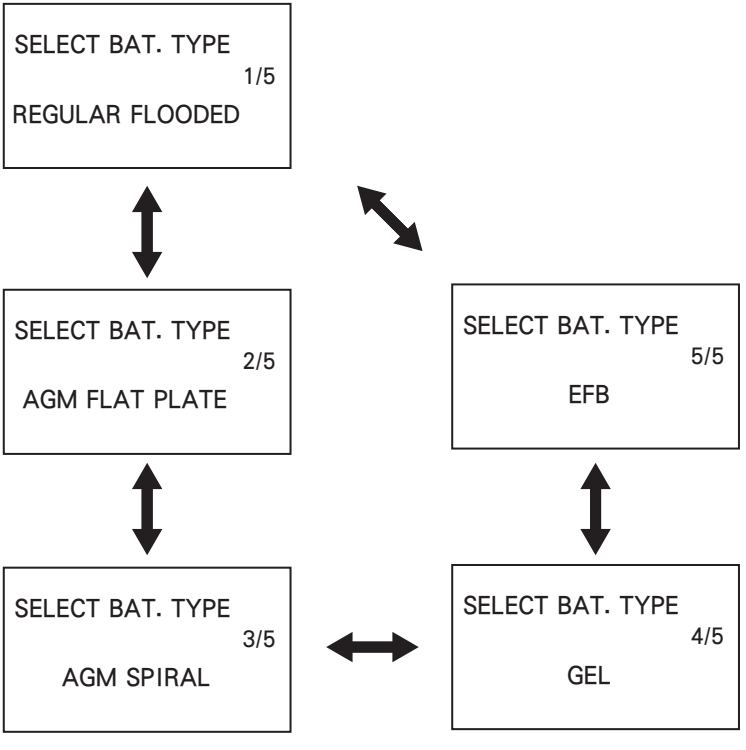
SELECT STANDARD
CCA

■ Battery Test

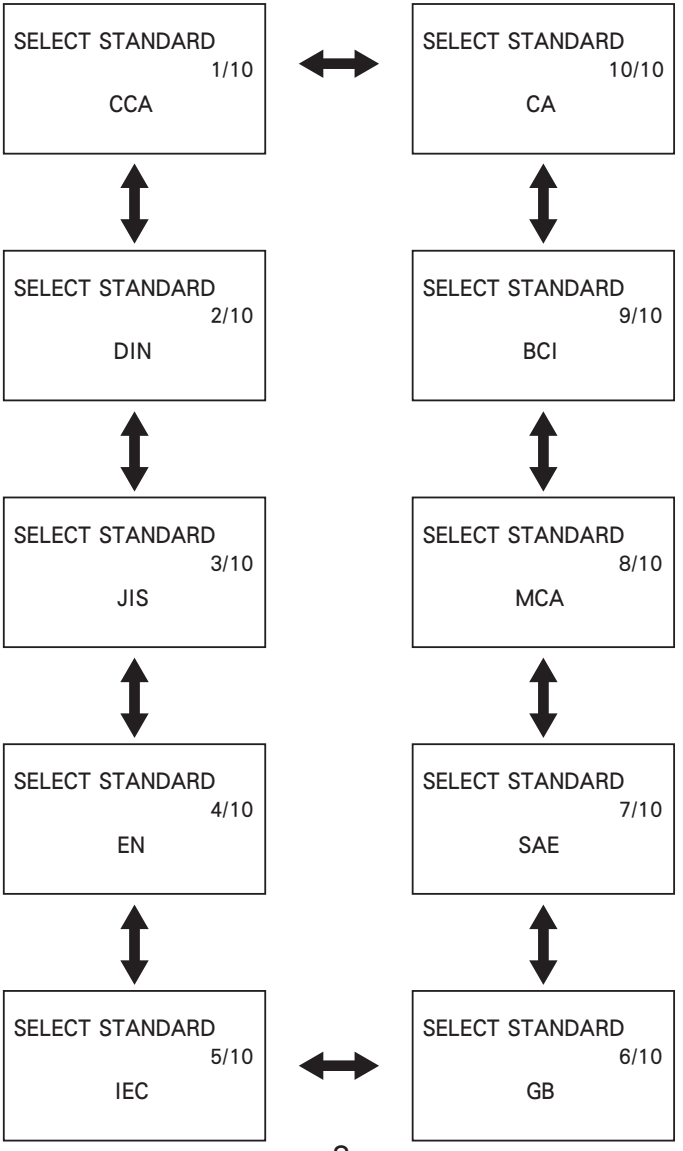
Press ok to get into the MAIN MENU and select BATTERY TEST (1/5) then press ok.



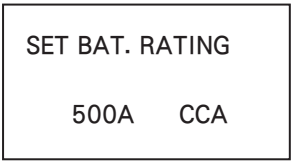
Press ▲ ▼ to select your BATTERY TYPE then press ok.



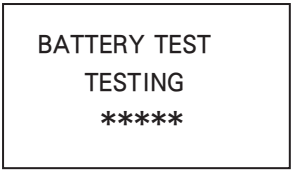
Then press ⏶ ⏷ to select SYSTEM STANDARD.



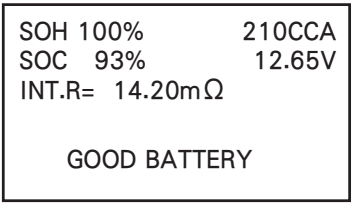
After selecting standard, press ok to confirm then press ▲ ▼ to set BATTERY RATING.



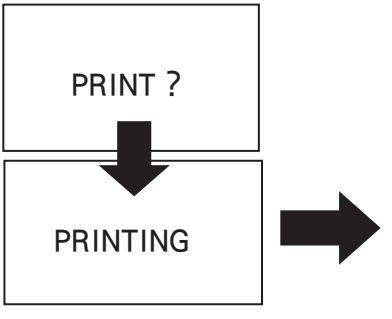
After setting, press ok to begine the test.

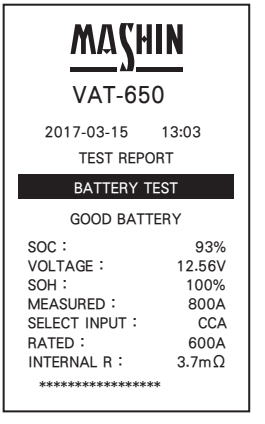


It takes around 3-5 seconds for testing and the result will come out.



Then press ok to print the result.

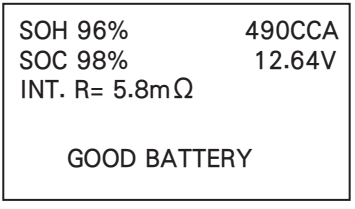




■ Battery Test Result

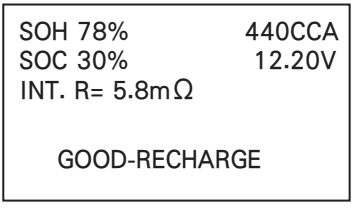
There will be 5 different situations as follows :

① Good Battery



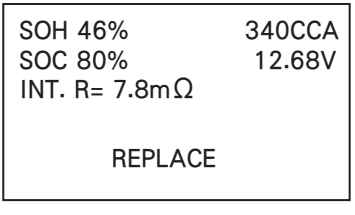
NOTE : SOH : State Of Healthy
SOC : State Of Charge

② Good, Recharge



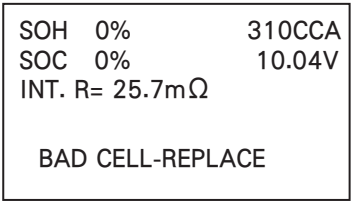
Battery is good but in low power, please charge before using.

③ Replace



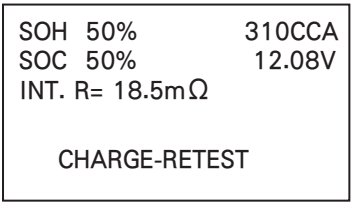
Might be battery deterioration, please charge it and re-test. If it comes out the same result, replace the battery.

④ Bad Cell, Replace



Replace the battery

⑤ Charge, Re-test



Unstable battery, please charge and re-test.
If it still comes out the same result, the battery is damaged, replace it.

※ Normally a good battery should be in low internal resistance unless it is short-circuit, this can be a determination when testing.

■ Cranking Test

Select CRANKING TEST (2/5) in the MAIN MENU and press 


```
MAIN MENU

CRANKING TEST
                2/5
```

Please follow the instruction and start your engine :

```
CRANKING TEST

START ENGINE
```

Once detecting the RPM, the testing will begin automatically and comes out the result.

```
CRANKING TEST

RPM DETECTED
```

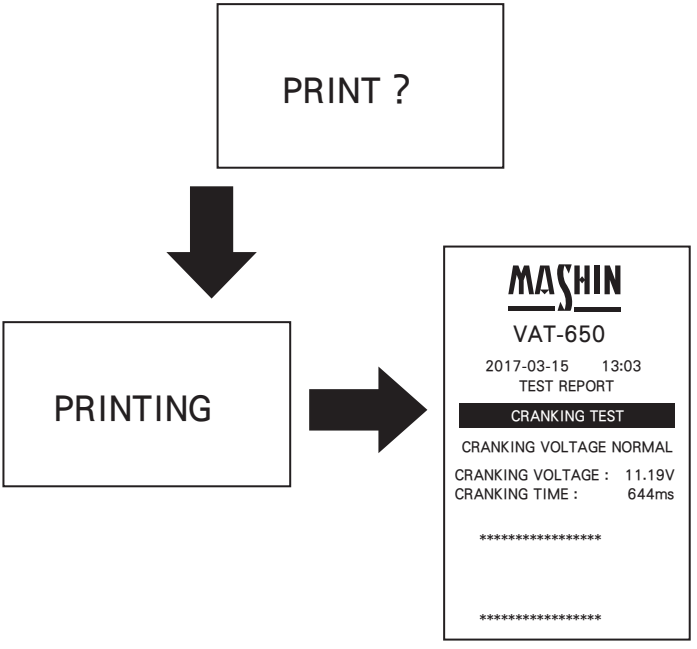
```
CRANKING TEST
    TESTING
    *****
```

```
 CRANKING TEST
TIME          644ms
CRANKING  NORMAL
      11.9V
```

The normal cranking voltage should higher then 9.6V, if it is lower, then the battery is faulty and will show as follows:

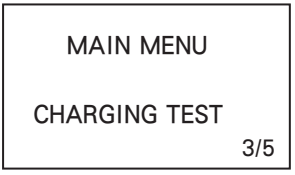
```
CRANKING  TEST
TIME          1020ms
CRANKING       LOW
      9.12V
```

After testing, press ok to print the result.



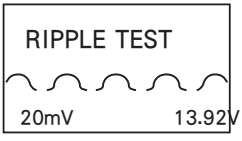
■ Charging Test

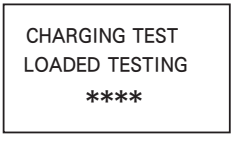
Select CHARGING TEST (3/5) in the MAIN MENU and press 



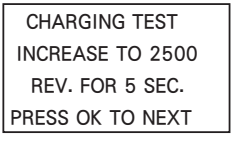
※ Please start the engine and make sure all the electronic devices are turned off. If there is any electronic device not in OFF position during the test which could affect the accuracy of the result.

It will begin with a RIPPLE TEST, the ripple and charging voltage will indicate at the bottom of the screen.
The ripple test will take around 6 seconds then get into LOADED TESTING.

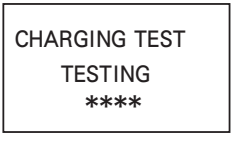




Loaded testing will take around 3 seconds then show as follows:



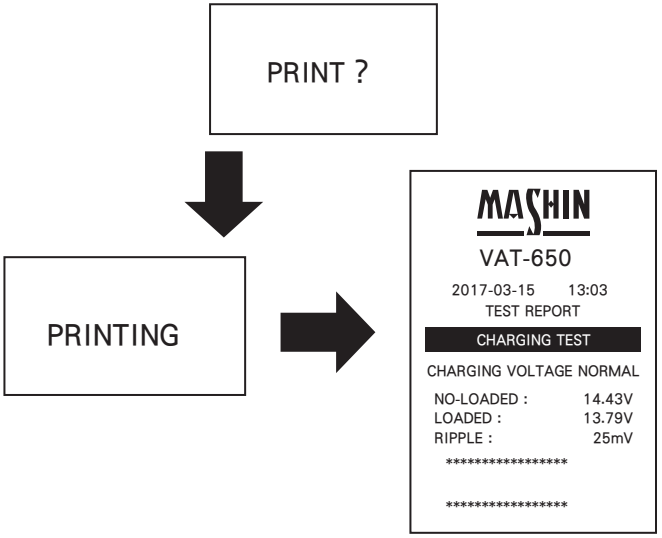
Then increase the rotating speed to 2500rpms or above for 5 seconds, then press for testing.



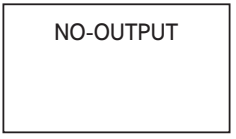
It will come out the result :

CHARGING	NORMAL
NO-LOADED	14.43V
LOADED	13.79V
RIPPLE	NORMAL

Then press ok to print the result.



※ If there is no engine rev detected, the connection between alternator regulator and battery might be faulty. If it fails detecting at least three times, it will come out a result and showed “NO-OUPUT” .



■ Charging Test Result

① Charging Voltage : Normal
No problems detected.

② Charging Voltage : Low
Please check if alternator system is well-connected. Otherwise, the alternator might be faulty.

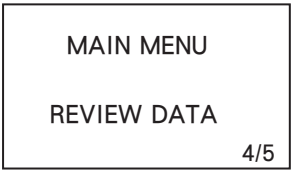
③ Charging Voltage : High
Normally the highest voltage for stabilizer will not over 14.7±0.5V, otherwise, please check if the alternator is faulty.

④ No Output :
Please check if alternator system is well-connected.

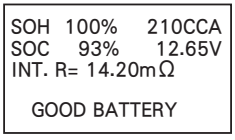
⑤ Ripple :
Through detecting the charging current wave to check if the ripple is in a normal condition. If the voltage is too high means the rectifier is damaged, please check and replace.

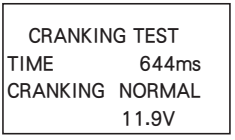
■ Review Data

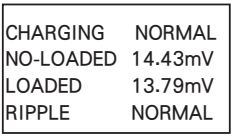
Select REVIEW DATA (4/5) in the MAIN MENU then press 



Press  to see the testing result for BATTERY TEST, CRANKING TEST and CHARGING TEST.





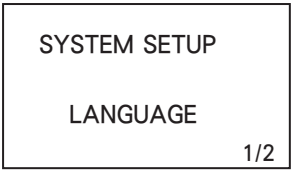


■ System Setup

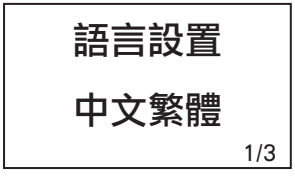
■ Language

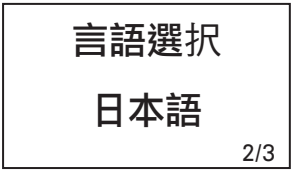
User can change language according to their requirement, such as Traditional Chinese, Japanese and English...etc.

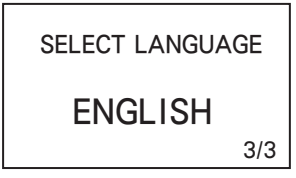
Press (MENU) to get into SYSTEM SETUP and select LANGUAGE (1/2) then press (ok) to confirm.



User can select different language through pressing ▲ ▼.

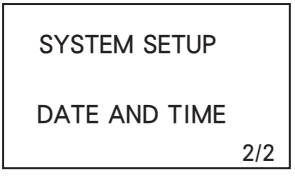




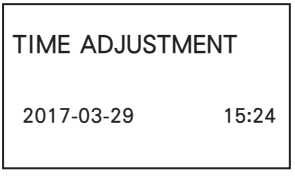


■ Date and Time

Press (MENU) to get into SYSTEM SETUP and select DATE AND TIME (2/2) then press (ok) to confirm.



Press ▲ ▼ and (ok) to adjust your date and time.



Chapter 4 Troubleshooting

■ The display does not turn on?

- Check if analyzer and battery are well-connected or revere polarity.
- Check if testing cables are dropped off or broken.

MASHIN ELECTRIC CORP.

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