

BATTERY TESTING INSTRUMENT OPERATION INSTRUCTIONS

1. Introduction

1.1 This product is a kind of portable instrument used to test batteries for determining their capacity state which is divided into three sections, namely, the "consumed", "recharge" and "normal". All these are directly and speedily shown through direct perception on the graduated disc to judge the quality of a battery. In addition this instrument can also check whether the charging system is in good or bad condition.

1.2 Structure and Characteristics. This product consists of D. C. Voltmeter, load resistance, instantaneous contact switch, housing and testing clamps. The capacity state of a battery is shown in 3 sections: red, yellow, and green to show the 3 states, namely, the "consumed", "recharge" and "normal" respectively.

1.3 The technical parameters

Range of measurement:

The rated voltage of the battery to be tested: 6V, 12V

Rated capacity of the battery to be tested: 200—1000 CCA

Type of indication: 3 sections, red, yellow and green to show the "consumed", "recharge" and "normal" state respectively.

Way of testing: manual instantaneous contact type. Each measurement should be done within 10 seconds.

Precisions: 2.0 level

Measuring limit: 0—16V

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ment to rain or snow.

6.2 No smoking or fire is allowed in the vicinity of the battery. Don't let any metal tool fall on the battery to prevent spark or short circuit of battery or other electric equipment causing possible explosion.

6.3 Never use a faulty battery. It should be replaced at once.

6.4 The time for each test should not exceed 10 seconds.

test again. If the needle falls, it is necessary to replace the battery. The values of 12-volt batteries are given in the following table, while those of 6-volt batteries can be obtained by halving these of the 12-volt ones.

Open -- circuit voltage (V)	≤11.7	12.0	12.2	12.4	≥12.6
Recharging percentage	0%	20%	50%	75%	100%

5. Testing the Recharge System :

5.1 Connect the testing instrument in the same way as that for testing the battery.

5.2 Start the motor to reach the normal operation temperature.

5.3 Start the motor at the speed of 1200—1500rpm.

Note: Keep the operating motor clean. Don't press the load switch.

5.4 Reading. The reading given in the red section indicates that there is some trouble in the recharge system, and the battery charge will not be able to reach its full extent. The readings within the OK section indicates the charge system is in good condition.

6. Precautions:

6.1 It is strictly forbidden to expose the testing instru-

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This product meets the enterprise standard.

2. Testing preparation:

2.1 During the test, its surrounding should be well ventilated.

2.2 Clean the measuring ends of the battery to be tested.

2.3 Check the battery for broken part or damage.

2.4 If it is necessary to remove the battery from the vehicle, first remove the earthing end of the battery, and other accessories are taken out carefully so as to avoid electric arc.

3. Test of the Battery:

3.1 First check if the needle of the instrument points to zero position on the left of the graduated disc; if not, turn the zero adjuster in the middle of the instrument until it points to zero.

3.2 Connect the red clamp to the positive terminal of the battery, while the black one is connected to the negative terminal.

Then instrument needle should move away from zero to the right side. If it turns in the other direction, this shows that the clamp connection is wrong, and if there is no reading at all (i.e. the needle stays at zero position) check if the testing clamp is properly connected with the terminals, (Fig. 3.2).

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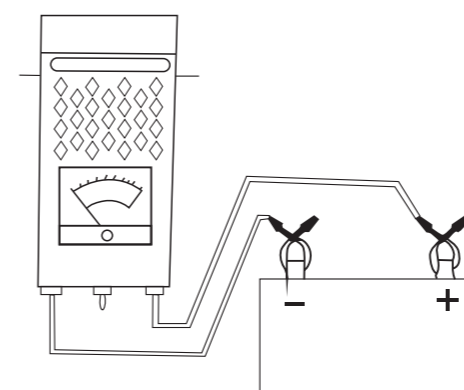


Fig. 3.2 The connection diagram of battery testing.

3.3 Turn the load switch to the 'on' position. Keep at that position until the needle is steady, but don't exceed 10 seconds.

3.4 Read the battery state on the graduated disc

4. Analysis of Battery :

On-load test	Battery state: The reaction after the instrument being loaded (i.e. the load switch is turned to "on" position).
OK or green section	Battery capacity is sufficient. Whether the battery is fully charged or not can be checked by measuring its specific gravity (spgr for short) and recharge it to its full extent (shown in 5).

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Weak or bad condition, but indication is steady.

Battery capacity is not sufficient. This may be due to the following two factors: (1) the damaged battery, (2) insufficient recharge. Which one of the two factors can be determined by checking the specific gravity. If the specific gravity is larger than 1.225, the battery is damaged; if it is less than 1.225, recharge it and test again. If the variation exceeds 0.025, this shows that the battery has been damaged; if the recharge cannot reach the fully charged specific gravity, this shows that the battery is aged or ineffective.

Weak or bad condition, and the value is falling.

The battery is perhaps disqualified. Make quick inspection, release the load switch and check the reaction on the voltmeter. If the voltmeter needle reaches or exceeds 12 volts within a few seconds, the battery may be damaged. If the needle gradually reaches 12 volts, the battery has been used up. Precision results can be obtained by checking the specific gravity.

4.2 If the battery capacity is found insufficient during on-load test, keep it steady for a few seconds. Then measure the open-circuit voltage. If the percentage value reaches or exceeds 75% (i.e. the voltage value $\geq 12.4V$), this indicates that the battery has been sufficiently charged. If the recharge percentage reaches 75%, but it is disqualified during the on-load test, it is necessary to replace the battery. If the battery doesn't reach 75%, it is necessary to recharge, make on-load

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