



## BAT 110

<b>cs</b>	Tester pro 12voltové startovací akumulátory
<b>pl</b>	Tester 12-woltowych akumulatorów rozruchowych
<b>tr</b>	12 Volt marş akümülatörleri için test cihazı
<b>en</b>	For testing 12-volt automotive starting batteries
<b>ja</b>	12 V スターター バッテリー用テスター
<b>zh</b>	用于 12 V 启动蓄电池的测试仪
<b>ko</b>	12볼트 스타터 배터리용 테스터




# BOSCH






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## Quick Reference


### Battery Test


 Make sure all vehicle accessory loads are off and the ignition is in the OFF position.

1. Connect the tester clamps to the battery:  
red to the positive (+) terminal,  
black to the negative (-) terminal.
2. Select battery technology.
3. Select battery temperature.
4. Select battery standard.
5. Select cold start current.

Symbol	LED	Indication
	Green	Ok
	Green	Load battery
	Yellow	
	Yellow	Load battery and test again
	Red	Replace battery


### Starter System Test

 The battery must be good and fully charged for this test.

1. Connect the tester clamps to the battery: red to the positive (+) terminal, black to the negative (-) terminal.
2. Press the Button **V**
3. Start the engine.
4. Press and hold the arrow button .

Cranking voltage	Indication
Greater than 9,6 V	OK
Less than 9,6 V	Check the connections, wiring and starter

### Charging System Test

1. Connect the tester clamps to the battery:  
red to the positive (+), black to the negative (-).
2. Press the button **V**.
3. Rev the engine at 2000 rpm for 15 seconds.
4. Press and hold the arrow button .

Charging voltage	Indication
Greater than 13,3 V or less than 15,0 V	OK.
Less than 13,3 V	Check the connections, wiring, and alternator.
Greater than 15,0 V	Check the regulator.

## 1. Important information

Before starting, connecting and using products from Robert Bosch GmbH Test Equipment (referred to henceforth as Bosch), it is absolutely necessary to read through the accompanying product documentation carefully, with particular reference to the security information. Being familiar with this information from the offset, helps avoid damage to the products, uncertainties in how to use the Bosch products, as well as avoid security risks this could lead to. Anyone passing on a Bosch product to another person, must also pass on the accompanying product documents with it.

### 1.1 User group

This product may only be used by trained specialist personnel from the automobile industry.

### 2.2 Agreement

Your use of the product means that you accept the following conditions:

#### Copyright:

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## 2. Safety instructions

### 2.1 Mains voltages, High voltage



Hazardous voltages occur in both the lighting system and the electrical system of a motor vehicle. If contact is made with live parts (e.g. with the ignition coil), there is a risk of electric shock from flashover voltages caused by damaged insulation (e.g. ignition cables which have been attacked by martens). This applies to both the primary side and the secondary side of the ignition system, to the cable harness and the plug connections, to the lighting systems (Litronic) and to the Bosch-tester connections.

#### Safety precautions:

- Any cables with damaged insulation must be replaced.
- Always switch off the ignition before performing any work on the electrical system of the vehicle. The term "work" includes connecting Bosch-testers, replacing parts of the ignition system, removing assemblies (e.g. generators), connecting assemblies to a test bench, etc.
- Never open the housing of the Bosch-tester.

### 2.2 Danger of acid burning



**Acids and alkalis** can cause severe burning on unprotected skin.

#### Rules of conduct:

- Rinse any affected parts of the skin immediately in water, then consult a doctor!



If liquid crystal escapes from a damaged **liquid crystal display**, avoid direct skin contact, inhalation and swallowing.

#### Rules of conduct:

- If you have inhaled or swallowed liquid crystal, consult a doctor immediately!

### 2.3 Danger of fire, Danger of explosion



There is a risk of fire and explosion.

#### Safety precautions:

- Avoid naked flames and potential sources of sparks.
- Do not smoke.
- Always ensure effective ventilation and suction when working in closed areas.
- Care required when using tools that these do not cause any short circuits. Always disconnect the negative connection first from the battery.

## 3. What you should be aware of and observe when testing a starter battery

### 3.1 General notes

The portable and mains-independent battery tester BAT 110, developed for mobile applications, is used for **load-free testing 12-V start batteries**. You can check the battery both in the vehicle as well as when this is not installed in the vehicle. The applications foreseen for the BAT 110 range from the car workshop, MOT testing stations, petrol stations to the retail battery trade. The BAT 110 can also be used for outdoor testing. Additional tests are starter system test and charger system test.

### 3.2 Important tips on testing batteries

- The battery tester requires the cold start current in amps and the test standard (IEC, DIN, SAE, EN, JIS) as a reference value for the purpose of assessing a battery. The **correct entry** of this reference value is a **prerequisite for a battery test**. The start performance of a battery is dependent on temperature. In order to arrive at a reliable test statement it **is absolutely essential to enter the temperature range of the battery** (< 0 °C or > 0 °C). Select the battery temperature, not the ambient temperature
- **New, ready-for-installation, charged starter batteries**, which have been in storage for a long time, will generally achieve their **full starting power after usage for a few weeks**.
- The battery test delivers **the best results** if **no charging or current consumption has taken place on the battery for at least one hour prior** to the test.
- Battery testers provide a snapshot of the battery's condition. Each charging or discharging procedure influence the battery condition. If a battery condition is located within the good/unserviceable border, then **two successive tests on the same battery, which, in the meantime has been charged or discharged, may see the test fluctuate between an "i.O." and "unserviceable" result**.
- If the test result indicates "Replace battery" for batteries, which are not older than 3 years, then we recommend testing the cold-start current or charge circuit as well as the charge balance (for e.g. the deficient battery charge through short-distance driving).
- As long as the **sulfate layer of a battery** has not set, reduction of the sulfate layer causes the battery condition to change during charging. Even if the **result of a battery test is "Battery unserviceable" prior to charging, the battery may be assessed as "Good" after charging**.



If the red LED lights (Replace battery) when you test in-vehicle, there can be a poor connection between the battery cables and the vehicle. Disconnect the battery cables and retest at the battery posts before replacing the battery.

## 4. Operating

### 4.1 Battery Test



Make sure all vehicle accessory loads are off and the ignition is in the OFF position.

1. Connect the tester clamps to the battery: red to the positive (+) terminal, black to the negative (-) terminal. Rock each clamp back and forth to make a good connection.
  2. When the display shows "1", select the battery technology. Press the
    - ↑ FLOODED (wet cell) battery or
    - ↓ the AGM battery (GEL or Vlies battery).
    - ⇒ The LED shows the selected battery technology.
  3. Press the TEST button to confirm
  4. When the display shows "2", select the battery temperature: Press the
    - ↑ for Battery temperature > 0 °C (SUN) or
    - ↓ for Battery temperature < 0 °C (SNOW).
    - ⇒ The LED shows the selected battery temperature.
  5. Press the TEST button to confirm.
  6. Select battery standard with arrow button ↑ or ↓.
    - ⇒ The battery standard is shown in the display.
  7. Press the TEST button to confirm
  8. Select cold start current with arrow button ↑ or ↓.
    - ⇒ The cold start current is shown in the display.
  9. Press the TEST button to confirm.
- ➔ One or more LEDs will light to indicate the battery's condition. The BAT 110 will also display the battery's available power.



To display the battery's live voltage measurement, press the **V** button. To start a new battery Test, disconnect the tester clamps for a short time.

#### Results of the battery test:

Symbol	LED	Indication
	Green	The battery is good and can be returned to service.
	Green	The battery is good, but discharged. Charge the battery fully and return it to service.
	Yellow	Charge the battery fully and retest. If you get the same result after charging, replace the battery.
	Yellow	Charge the battery fully and retest. If you get the same result after charging, replace the battery.
	Red	The battery has failed or is weak and may fail soon. Replace the battery. A message that alternates between <b>bAd</b> and <b>CELL</b> means one or more battery cells are bad. Replace the battery (also see section 3.2).

## 4.2 Starter System Test



The battery must be good and fully charged for this test.

1. Connect the tester clamps to the battery: red to the positive (+) terminal, black to the negative (-) terminal. Rock each clamp back and forth to make a good connection.
  2. Press the button **V**
    - ⇒ The voltage of the battery is shown in the display.
  3. Start the engine.
  4. Press and hold the arrow button ↓.
- ➔ The cranking voltage is shown in the display.

#### Results of the Cranking Voltage Test:

Cranking voltage	Indication
Greater than 9,6 V	The starting system is OK
Less than 9,6 V	There is a problem with the starting system. Check the connections, wiring, and starter

### 4.3 Charging System Test

1. When the engine is running, connect the tester clamps to the battery: red to the positive (+) terminal, black to the negative (-) terminal. Rock each clamp back and forth to make a good connection.
  2. Press the button **V**.
    - ⇒ The voltage of the battery is shown in the display..
  3. Rev the engine at 2000 rpm for 15 seconds.
  4. Press and hold the arrow button ↑.
- ➔ The highest charging voltage is shown in the display.

#### Results of the Charging System Test:

Charging voltage	Indication
Greater than 13,3 V or less than 15,0 V	The charging system is OK.
Less than 13,3 V	There is a problem with the charging system. Check the connections, wiring, and alternator.
Greater than 15,0 V	There is a problem with the charging system. Check the regulator.

## 5. Notes concerning faults

Note	What can you do
The display flashes or shows one flashing letter	The battery that is tested is too low (< 8 volts) to test. Charge the battery fully and retest.
"conn"	A <b>conn</b> message means there is a bad connection. Disconnect the clamps and reconnect. Make sure to rock the clamps back and forth to make a good connection.

## 6. Maintenance

### 6.1 Cleaning

The housing and the display are only to be cleaned using a soft cloth and a neutral cleaning agent. Do not use any abrasive cleaning agent or rough cleaning cloths.

### 6.2 Spare and wearing parts

Description	Order number
BAT 110	1 986 AT5 110

## 7. Disposal



**This product is subject to European guidelines 2002/96/EG (WEEE).**

Old electrical and electronic devices, including cables and accessories or batteries must be disposed of separate to household waste.

- Please use the return and collection systems in place for disposal in your area.
- Damage to the environment and hazards to personal health are prevented by properly disposing of old equipment.

## 8. Technical data

Function/Range	Value
Operating temperature	-18 °C – 50 °C
Accuracy range	0 °C – 40 °C
Operating voltage	5,5 V – 19,99 V
Weight	295 g
Dimensions	197 mm x 98 mm x 40 mm
Entry range of Cold start Current	EN, SAE 200 – 900 CCA 200 – 850 DIN, IEC 120 – 550
Battery standards	EN, SAE, CCA, DIN, IEC, JIS