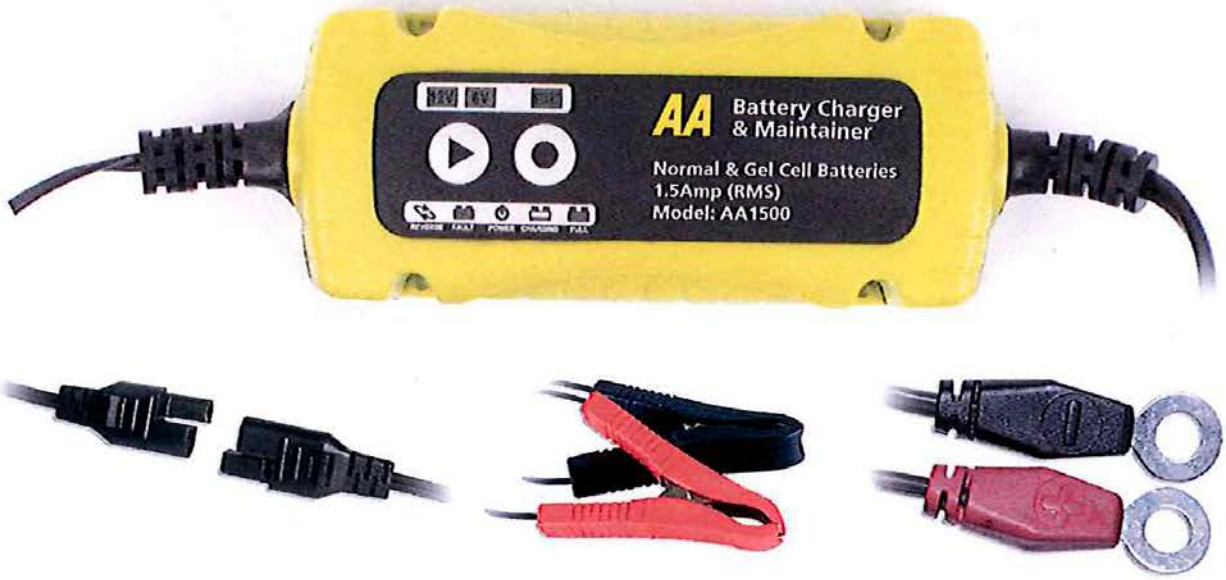
AA BATTERY CHARGER & MAINTAINER



Thank you for purchasing the AA Battery Charger & Maintainer. Please read the instructions carefully before using this product and retain this leaflet for future reference.

INTRODUCTION

This AA Charger & Maintainer is designed to keep a vehicle battery in a good state of charge. Its primary function is to maintain a good battery in a vehicle that is used infrequently, only gets used for short journeys or is in storage. The unit will charge a discharged battery but due to its output it may take some time especially on larger batteries.

It is also worth being aware that if an automotive battery is not kept in a good state of charge a chemical process takes place inside the battery called sulphation. Sulphation is the number one cause for premature battery failure and is not covered by the manufacturers warranty as it is regarded as 'neglect' and not a manufacturing defect.

The maintainer is suitable for all 6V and 12V lead acid automotive batteries which include enhanced flooded, sealed, leisure, calcium, silver calcium AGM and GEL batteries. It should not be used to recharge NICAD or any other type of battery.

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IMPORTANT SAFETY INSTRUCTIONS

GASES
During charging, a battery can emit explosive gases. For this reason ensure there are no naked flames or sparks around the battery, i.e only connect and disconnect the maintainer when the mains supply is disconnected.

POINTS OF NOTE
When not in use store the maintainer in a dry area to avoid moisture damage. This Battery Maintainer is not designed to be used as a power supply.

REPAIR
The AA Battery Charger & Maintainer has no serviceable items inside so should not be dismantled. The mains supply cord of this appliance cannot be replaced; if the cord is damaged, the unit should be discarded.

DANGER
Never charge a frozen battery. If the battery fluid (electrolyte) becomes frozen, bring the battery into a warm area to allow it to thaw before you begin charging.

PRECAUTIONS WHEN WORKING WITH BATTERIES
If battery acid comes into contact with skin or clothing wash as soon as possible with soap and water. In cases of contact with eyes, rinse immediately with plenty of water and seek medical advice. Never smoke or allow a spark or naked flame in the vicinity of a battery.

Automotive batteries must be handled carefully. They contain sulphuric acid; they give off flammable gases (hydrogen) during charging and in a charged state they contain a high level of electrical energy sufficient to cause serious burns if the battery terminal were allowed to short-circuit (make contact with each other). It is important to understand when working on vehicles that the body/chassis will be connected directly to one of the battery terminals (vehicles from approx. 1970 will have a negative earth body). It is therefore very important that wiring connected to the battery positive terminal is not allowed to make contact with the vehicle body/chassis. This wiring will run throughout the vehicle so care must be taken where connectors are more exposed in places such as the fuse-box, the starter motor and at the alternator.

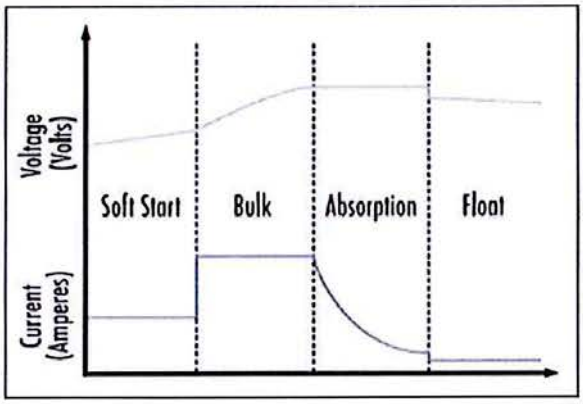
For the above reasons never rest tools on top of a battery, and when working in the engine bay and around the battery ensure that no metal objects such as spanners, jewellery, metal watch straps, bangles, rings etc. make contact with the battery live terminal, a live wiring terminal or the vehicle body, as this would cause a short-circuit which would result in serious burns or a vehicle fire.

FEATURES

AUTOMATIC AND INTELLIGENT 4-STAGE CHARGING CURVE
The AA Battery Charger & Maintainer is controlled by a 12-bit AD microprocessor with 4-stage charging characteristics designed for charging automotive batteries fitted in cars, bikes and light commercial vehicles.

The inbuilt microprocessor senses the condition of the battery and controls the regulator to provide the right current and voltage to suit the charging characteristics of the battery. This will provide the best type of charging and give the longest battery life.

CHARGING CHARACTERISTICS



Soft start: The unit will take an initial battery test to determine battery condition. If the battery is severely discharged the charger will begin the 'soft start' stage. Charging starts with reduced current until battery voltage reaches a normal condition for charge.

Bulk: This is the major charging stage where the battery receives the majority of its charge. During this stage the battery is brought to 75 - 80% of its charge. The maintainer will deliver maximum current until the terminal voltage has risen to the full charge level for a normal battery.

Absorption: Completes the charge up to almost 100%. The charge rate then falls to its minimum output while the voltage is maintained.

Float: This is maintenance charging at constant voltage. Float mode keeps the battery at 100% charge. Normal charging mode is time-limited (max 10 days) while float mode charging will maintain indefinitely without damaging the battery.

LED DISPLAY
The unit has a built in LED display for showing the maintainers status:

REVERSE - RED LED: Battery clamps are connected the wrong way round

FAULT - RED LED: Battery fault.

POWER - YELLOW LED: The charger is connected to mains power.

CHARGING - AMBER LED: The charger is charging the battery.

FULL- GREEN LED: The battery is fully charged and the charger is in maintenance mode.

TEMPERATURE COMPENSATION
A sensor will automatically adjust the charging voltage to compensate for extreme temperature. If the ambient temperature is very high the charger will lower the voltage and at very low temperatures the unit will raise the voltage.

VOLTAGE COMPENSATION
Due to volt drop in the cables, the actual voltage at the

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clamps of the battery can be lower that the charger output voltage. Special circuitry inside the unit will monitor the true input voltage to the battery and adjust the output voltage of the unit accordingly. This will maximise the charging efficiency.

REVERSE-POLARITY PROTECTION
The unit offers reverse-polarity protection, the RED "REVERSE" LED will illuminate and the charging process will not start. If this happens, unplug immediately from the mains, connect the red crocodile clip to the positive (+) battery post and the black crocodile clip to the negative (-) post, plug into the mains power and the charging process will start.

SHORT-CIRCUIT PROTECTION
If you accidentally touch the crocodile clips together whilst the mains power is on, the unit will stop charging. To reset unplug from the mains, disconnect then start the process again, being careful not to touch the clips together.

CHARGER MEMORY
In the event of a loss of mains power, the charger will automatically memorise the charging state. When mains power is restored the charger will continue in the previous charging state

ATTENTION: Once the maintainer is disconnected from the battery, this memory is erased and the recharging process will restart from the first charging state.

OTHER FEATURES

- Fully automatic with built in circuitry to protect against short circuit or over-charge.
- The AA Battery Charger & Maintainer can be left connected for months at a time, as long as connections are checked periodically.
- 'Anti spark protection'.
- Battery and 'charger overheating protection'.
- Waterproof durable ABS plastic housing.
- IP65 rating (international protection rating).

OPERATION - PLEASE READ CAREFULLY BEFORE USE

1. **PREPARING THE BATTERY**
   Ensure everything in the vehicle is turned off and the keys have been removed from the vehicle.

   If charging an old style battery with removable filler caps, firstly remove the filler caps from the top of each cell and check that the level of the electrolyte is sufficient. If the electrolyte is low top up with de-ionized or distilled water.

   When charging a battery not fitted with removable filler caps (this will be the 99% of modern day batteries) check to see if it has a 'State of Charge' (SOC) indicator fitted in the top of the battery. These are not fitted by all battery manufacturers but when fitted they give a good indication of the battery charge and electrolyte level. Please see **Fig. 1** for an example of an SOC indicator.

   The SOC indicator (sometimes referred to as a 'magic eye') needs to be looked at from directly above to be viewed correctly. The battery will usually have a sticker next to the indicator to explain what each colour means. Please see **Fig. 2** for an example.


Fig 1

Fig. 2 (colours will differ between different battery manufacturers).

Green: Battery is charged (typically 60% plus). It should provide a reliable vehicle start.

Black/Dark Red: The battery's state of charge is not in its optimum state. The battery should be recharged.

Clear/Light Yellow: This indicates the battery is low on electrolyte. This can only occur on a sealed battery if it has been over-charged due to a vehicle fault or the battery has been physically damaged (cracked/holed etc.). In these cases the battery should not be recharged as the battery is in a dangerous state (potentially full of hydrogen). Great care needs to be used when handling batteries in this state to avoid any chance of a spark from the vehicle or from a static charge.

PLEASE NOTE: Some manufacturers may use an alternative colour to green to indicate a fully charged electrolyte solution (i.e. Yuasa use red).

2. **CONNECTION**
   PLEASE NOTE: The maintainer can be connected directly to the vehicle battery terminals without having to disconnect the battery.

   Connect the positive charging lead (red) to the positive terminal post of the battery (marked 'P' or '+').

   Connect the negative charging lead (black) to the negative terminal post of the battery (marked 'N' or '–').

   WARNING: Always disconnect the mains plug from the AC mains socket before disconnecting the appliance to or from the battery.

   CABLE CONNECTOR
   The AA Battery Charger & Maintainer has a fused main cable with two options of battery connection. Either:
   1. Crocodile clamps for easy and flexible connection direct to the battery.
   2. 'O-ring' connectors for permanent attachment to the battery terminals. This lead comes with a plastic end cap and connector cover for when the plug is not in use.
   3. It is important to ensure that both crocodile clamps are making good contact with their respective battery posts.

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3. TURNING THE MAINTAINER ON

1. Now the maintainer is connected to the vehicle battery it is safe to connect the plug into the 240V mains socket and switch the socket on.
2. A beep will sound to indicate the unit is switched 'on', all of the lights on the charging unit will briefly illuminate, the amber POWER light will be on and either 12V or 6V will be lit, depending on the battery type being charged.
3. Use the arrow button to toggle between 12V and 6V if required (unit automatically defaults to the 12V option.
4. To start the battery charge/ maintain cycle press the round START button.

LED MESSAGES AND WHAT THEY MEAN

CHARGING: This illuminates to indicate the battery is being charged. Once the battery is fully charged (can take up to 100 hours depending on the Amp Hour rating (AH) of the battery) the LED indicator will switch to FULL.

FLASHING CHARGING LIGHT: This illuminates if the maintainer is having a problem charging the battery. After approx. 30 seconds of trying the light will either stay on constant and charging will start or if the battery is in a state of deep discharge/sulphation the FAULT LED will illuminate and battery replacement will be necessary.

FULL: This illuminates when the battery is fully charged and the maintainer switches to the battery maintenance mode (FLOAT). This will then maintain the battery in a good state of charge using minimal mains power. Ideal for vehicles in storage.

REVERSE: This illuminates if the crocodile clamps have been connected to the wrong battery terminals, i.e. reversed polarity. If this occurs simply disconnect the battery charger for the mains power and reconnect the crocodie clamps to the correct battery terminals and then reconnect the maintainer to the mains power supply.

FAULT: This illuminates if the maintainer detects any of the following faults:

A. Low battery voltage - less than 3V
B. High battery voltage - (Above 15V on a 12V battery/ above 7.5V on a 6V battery)
C. Battery short circuit of battery cell short circuit
D. Wrong choice of voltage for the battery

Under theses conditions the battery charger will stop charging. In the event of A, B or C that battery may be defective and we advise you have the battery tested or please call the AA Technical Department (for number see bottom of page) for more advice. If the problem is attributable to D, simply select the appropriate voltage setting and proceed to charge the battery.

4. MAINTAINING BATTERIES

Always check the maintainer has switched from 'CHARGE' to 'FULL' before leaving unattended and connected for long periods. If the maintainer has not switched from CHARGE to FULL within 4 days this could indicate a more serious problem. Please call the AA Technical Department for further advice.

5. WHEN BATTERY MAINTAINING IS NO LONGER REQUIRED

Switch off the mains supply, unplug the charger and disconnect the crocodile clips, or if the unit has been hard wired direct to the battery, disconnect the two pin plug form the charging lead and replace the protective rubber end cap.

MAINTENANCE AND CARE

Battery sulphation is the number cause of battery failure. Sulphation occurs when battery voltage is allowed to drop below 12.4V. Typically this is caused by lack of use or an electrical fault draining the battery.

It is therefore essential for good battery life to keep your battery regularly charged and maintained throughout the year. This is especially important during the winter months when the demand on the battery is greater due to the charging system working harder to accommodate the additional use of the heaters, wipers, headlights etc.

Cold weather also has a chemical effect on a battery which causes a reduction in output and capacity. For this reason it is important a battery is maintained at peak power. If your battery is not regularly maintained and kept fully charged, it may let you down and will also considerably shorten battery life.

TECHNICAL SPECIFICATION	
Voltage/current input	220V - 240V 21W
Current output	1.0A - 1.2A DC (1.5A RMS)
Output voltage	6V or 12V
Type of battery	All types of lead acid batteries including wet acid, sealed, AGM, leisure type or gel batteries
Charge time (bulk charge up to 80%)	20 AH battery = time to charge 20 hours 50 AH battery = time to charge 50 hours 100 AH battery = time to charge 100 hours
Main cable length	2m
Charging cables length	1.5m
Accessories	1x pair of crocodile clamps with 1.0m lead 1x pair of eyelet connectors with 1.0m lead
Weight	725g
Insulation rating	IP65

For recycling information please visit www.theAA.com/shop/recycle

ADDITIONAL INFORMATION

For additional information or help when using your AA Battery Charger & Maintainer call our experienced Technical team on **0370 142 00 02**, and select Option 2 for technical help.

theAA.com

Part No. 240BATCHAR
Batch No: 1620SL
AA Media Ltd, RG21 4EA, UK
Pictures are for illustration purposes only.
Please retain packaging for future reference.
This is not a toy. Keep out of reach of children.
Store in a safe place when not in use.

IP65