MOTOBATT

SAFETY INSTRUCTIONS

FOR MODELS TECH1 ONLY
Suitable for lead acid battery and lithium battery

THIS MANUAL CONTAINS IMPORTANT SAFETY AND OPERATING INSTRUCTIONS. PLEASE SAVE THESE INSTRUCTIONS.

WARNING – RISK OF EXPLOSIVE GASES. Working in a vicinity of a lead-acid battery is dangerous. Batteries generate explosive gases during normal battery operation. For this reason it is of the utmost importance that each time before using your charger, you read and follow the instructions provided exactly:

The appliance is not intended for use by young children or infirm persons without supervision. Young Children should be supervised to ensure that they do not play with the appliance.

1. To reduce risk of a battery explosion, follow these instructions and those marked on the battery.
2. **NEVER** smoke or allow an open spark or flame in the vicinity of the battery or engine.
3. Do not expose the charger to rain or snow. For indoors use only.
4. Use of an attachment not recommended or sold by the battery charger manufacturer may result in a risk of fire, electric shock, or injury to persons.
5. To reduce risk of damage to electric plug and cord, pull by plug rather than cord when disconnecting the charger.
6. Make sure cord is located so that it cannot be stepped on, tripped over, or otherwise subjected to damage or stress.
7. Study all the battery manufacturers specific precautions such as removing or not removing cell caps while charging and recommended rates of charge.
8. Do not use the battery charger unless the battery voltage matches the output voltage rating of the charger.
9. Do not operate the charger in a closed-in area or restrict ventilation in any way.
10. An extension cord should not be used unless absolutely necessary. Use of improper extension cord could result in a risk of fire and electric shock. If extension cord must be used, make sure:
    a. That pins on the plug of extension cord are the same number, size and shape as those of plug on charger;
    b. That extension cord is properly wired and is in good electrical condition;
    c. That wire size is as specified in Table 1 below. Do not operate the charger with damaged cord or plug and;
    d. The supply cord cannot be replaced. If the cord is damaged the appliance should be scrapped.

Length of Cord, Feet	**25**	**50**	**100**	**150**	
AWG Size of Cord	**18**	**18**	**18**	**18**	**Table 1**

11. To reduce risk of electric shock, unplug the charger from an outlet before attempting any maintenance or cleaning.
12. Keep electrical appliances out of reach from Children or infirm persons. Do not let them use the appliances without supervision.

PERSONAL PRECAUTIONS:

1. Someone should be within range of your voice or close enough to come to your aid when you work near a lead-acid battery.
2. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing or eyes.
3. Wear complete eye protection and clothing protection. Avoid touching eyes while working near battery.
4. If battery acid contacts skin or clothing wash immediately with soap and water, if acid enters an eye, immediately flood eye with running cold water for at least 10 minutes and get medical attention immediately.
5. **NEVER** smoke or allow a spark or flame in vicinity of battery or engine.
6. Be extra cautions to reduce risk of dropping a metal tool onto battery. It might spark or short-circuit battery or other electrical part that may cause an explosion.
7. Remove personal metal items such as rings, bracelets, necklaces and watches when working with a lead-acid battery. A lead-acid battery can produce a short-circuited current high enough to weld a ring or the like to metal causing a severe burn.
8. Use the charger for charging a rechargeable lead-acid battery **ONLY**. It is not intended to supply power to an extra low-voltage electrical system or to charge dry-cell batteries. Charging dry-cell batteries may cause them to burst and cause injury to persons and damage to property.
9. **NEVER** charge a frozen battery.

PREPARING TO CHARGE:

1. If it is necessary to remove battery from vehicle to charge it, always remove grounded terminal from battery first. Make sure all accessories in the vehicle are off in order to prevent an arc.
2. Be sure area around battery is well ventilated while battery is being charged. Using a piece of cardboard or other nonmetallic material as a fan can forcefully blow gas away
3. Clean battery terminals. Be careful to keep corrosion from coming in contact with eyes.
4. Add distilled water in each cell until battery acid reaches level specified by battery manufacturer. This helps purge excessive gas from cells. Do not overfill. For a battery without cell caps, carefully follow manufacturers recharging instructions.
5. Study all battery manufacturers specific precautions such as removing or not removing cell caps while charging and recommended rates of charge.
6. Determine voltage of battery by referring to car owner manual and make sure it matches output rating of the battery charger.

LOCATE CHARGER:

1. Locate the charger as far away from battery as the DC cables permit.
2. Never place the charger directly above or below the battery being charged. Gases or fluids from the battery will corrode and damage the charger.
3. Never allow battery acid to drip on the charger when reading gravity or filling battery.
4. Do not operate the charger in a closed-in area or restrict ventilation in any way.
5. Do not set a battery on top of the charger.

CONNECTING CHARGER:

Connect and disconnect DC output clips only after setting any charger switches to the off position and removing AC cord from the electric outlet. Never allow clips to touch each other.

1. **Follow these steps when battery is installed in a vehicle.** A spark near battery may cause a battery explosion. To reduce risk of a spark near battery:
   a. Position AC and DC cords to reduce risk of damage by hood, door or moving engine part.
   b. Stay clear of fan blades, belts, pulleys, and other parts that can cause injury to persons.
   c. Check polarity of battery posts. A positive (pos, p+) battery post usually has a larger diameter than a negative (neg, n-) post.
   d. Determine which post of battery is, grounded (connected) to the chassis. If negative post is, grounded to the chassis (as in most vehicles), see item (e). If positive post is grounded to the chassis, see item (f).
   e. For a negative-grounded vehicle, connect the positive (red) clip from the battery charger to the positive (pos, p, +) ungrounded post of battery first. Connect the negative (black) clip to the vehicle chassis of engine block remote from the battery and fuel line. Do not connect the clip to carburetor, fuel lines, or sheet-metal body parts. Connect to a heavy gauge metal part of the frame or engine block;
   f. For a positive-grounded vehicle, connect the negative (black) clip from battery charger to negative (neg, n, -) ungrounded post of battery first. Connect the positive (red) clip to the vehicle chassis or engine block remote from the battery and fuel line. Do not connect clip to carburetor, fuel lines, or sheet-metal body parts. Connect to a heavy gauge metal part of the frame or engine block.
   g. Connect charger as supply cord to an electric outlet.
   h. When disconnecting the charger, disconnect AC cord, remove clip from vehicle chassis, and then remove clip from battery terminal.

2. **Follow these steps when battery is outside the vehicle.** A spark near the battery may cause a battery explosion. To reduce risk of a spark near battery:
   a. Check polarity of battery posts. A positive (pos, p. +) battery post usually has a larger diameter than a negative (neg, n. -) post.
   b. Attach at least a 1.8m long 0.50mm sq. insulated battery output cable of charger to the negative (neg, n -) battery post.
   c. Connect the positive (red) charger clip to the positive (pos, p. +) post of battery.
   d. Position yourself and the free end of cable as far away from battery as possible, then connect negative (black) charger clip to free end of cable.
   e. Do not face battery when making final connection.
   f. Connect charger as supply cord to an electric outlet.
   g. When disconnecting the charger, always do so in reverse sequence of connecting procedure and break first connection while standing as far away from battery as practical.

USER INSTRUCTIONS:

AUTOMATIC MONITORING – Your new **TECH 1** battery charger is completely automatic and may be left on whenever input power is made available to the charger. The charger output depends on the condition of the battery it is charging. When the battery is fully charged, the indicating light will turn green and the charger will switch itself to a storage charge mode and will automatically monitor and maintain the battery at full charge.

CABLE CONNECTIONS – The **TECH 1** battery charger is equipped with two output leads, a red positive lead, and a black negative lead. Only connect or disconnect the output leads before plugging into AC power

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For all battery types: Connect the red positive (+) lead to the positive terminal of the battery. Connect the black negative (-) lead to the negative terminal of the battery.

If the charger is left connected to a battery for long periods of time, check water levels as directed by the battery manufacturer to ensure they remain at the proper level.

ATTENTION: YOUR TECH 1 HAS SPARK FREE CIRCUITRY! The clips will not spark when touched together.

The **TECH 1** will not produce voltage (turn on) until it senses at least three volts from the battery **(EXCEPT LITHIUM MODE)**. It must be connected to a battery to start working.

The clips terminals must be clipped to a battery in the correct polarity to initiate output voltage. In other words, if you plug the A.C. cord into a 230V power source, the output clips will not spark when touched together.

REMEMBER – THE OUTPUT CLIPS MUST BE CONNECTED TO A BATTERY TO PRODUCE AN OUTPUT VOLTAGE.

If the charger is hooked up backwards, the red light will turn on which indicating that a charge has not been imitated. The clips must be connected in the proper polarity to start the charger, Red to Positive (+ TO +) and Black to Negative (- TO -).

OPERATION :

Step 1 – Connect to AC Power

Step 2 – Battery Clip connect to Battery (Red connect to positive (+) terminal / Black connect to negative (-) terminal of the battery.

Step 3 – Press Mode select charging lead acid battery mode or lithium battery mode.

REMEMBER – NEVER TURN ON AND OFF YOUR TECH 1 REPETITIONARY IN SECONDS. IF THIS HAPPENS, PLEASE UNPLUG TECH 1 FROM AC POWER, WAIT FOR ONE MINUTE AND THEN CONNECT THE CHARGER AGAIN TO RESTART AND SETTING CHARGING MODE.

TIME OF CHARGE –

(BATTERY CAPACITY) / (CHARGER CURRENT) = HOURS or
(AMP HOURS) / AMPS = HOURS

Suppose I have a 15 Amp-Hour Battery, which is a fairly typical size for an automotive engine start type battery. Now let's say I have a 1.0 Amp Charger and if it is a good charger (like TECH 1), it will deliver close to 1.0 Amp for as long as it takes to get the battery voltage up to its recharge level. So, how long will it take to actually charge the battery?? We can make a pretty good guess by just dividing two numbers:

e.g. : (15 AMP HOURS) DIVIDED BY (1.0AMPS) = 15 HOURS

Some large capacity batteries may take up to 24 hours or even days to fully charge.

Battery Size Recommended: Max. 45Ah Lead Acid Battery and Max. 70Ah Lithium Battery. Only one battery to be charged each time. For Lead-acid and Lithium battery only.

DEAD BATTERY -

If your battery is totally dead below 3 volts, the TECH 1 circuitry will not start due to its internal safety circuit . The internal safety circuit of the TECH 1 must sense more than 3 volts in the battery before it will allow the charger to turn on (EXCEPT LITHIUM MODE). Otherwise, the charger is inoperable. In this case, the Power Indicator Lights are flashing, which means a charge has not been initiated. To charge a totally dead battery, you must fool the TECH 1 circuitry by momentarily jumping the dead battery to a known good battery. This will trick the charger and start the charging sequence.

Note: Most 6volts / 12 volts lead acid batteries are likely to be defective if their voltage is below 4.5 volts / 9 volts.

72-HOUR SAFETY TIMER -

A 72- hour Safety Timer will start working once the TECH 1 is turned on to protect marginal batteries from over charging. If the battery voltage does not reach the absorption level within 72 hours, the charger will automatically switch to the float mode. When this happens, the Poor Battery indicator lights will be flashing. Please check the battery condition as it may indicate that a very large, good battery is not fully charged yet.

However, if your battery is marginal or defective, the TECH 1 will stop all the charging process in order to protect the marginal battery from over charging. When this happens, the Power indicator will be flashing. Please have the battery checked in this case.

LIGHTS FOR INDICATING ERROR MESSAGE

- ☆ **Power light does not switch on, TECH 1 is not connected to the main power properly**
- ☆ **Wrong polarity light indicates the connection to battery is wrong.**
- ☆ **Poor Battery light indicates the battery is defected or below 3V**

In case either one of the above messages appear, the charge will not be commenced.

The following describes light operation:

	OPERATION	LED					
		Power	Charging	Completed	Li-PO4	6V 1A	12V 1A
TECH 1 Charger	AC Connected	●	X	X	X	X	X
	Disconnect Battery	●	X	X	X	X	X
Battery Type Selection	Li-PO4 Lithium Battery	●	X	X	●	X	X
	6V Lead Acid Battery	●	X	X	X	●	X
	12V Lead Acid Battery	●	●	●	X	X	●
Li-PO4 4S Lithium Battery	Low Voltage Battery (5 seconds flashing & turn on)	●	●	X	●	X	X
	Charging	●	●	X	●	X	X
	80% Fully Charged	●	●	F	●	X	X
	Fully Charged	●	X	●	●	X	X

TECH 1 Charger	OPERATION	LED					
		Power	Charging	Completed	Li-PO4	6V 1A	12V 1A
6V Lead Acid Battery	Low Voltage Battery (5 seconds flashing & turn on)	●	●	X	X	●	X
	Charging	●	●	X	X	●	X
	80% Fully Charged	●	●	F	X	●	X
	Fully Charged	●	X	●	X	●	X
12V Lead Acid Battery	Low Voltage Battery (5 seconds flashing & turn on)	●	●	X	X	X	●
	Charging	●	●	X	X	X	●
	80% Fully Charged	●	●	F	X	X	●
	Fully Charged	●	X	●	X	X	●
TECH 1 Error Indication	Wrong Polarity (Except Lithium Battery)	F	X	X	X	X	X
	Dead Battery (Except Lithium Battery)	F	X	X	X	X	X

● = LED turn on

X = LED off

F = LED Flashing

Specification :

Model No. : TECH 1

Input : 100-240VAC 50/60 Hz 18W

Output : 14.4V 1.0A Li-FePO4 (4S)

12V 1.0A Lead Acid Battery

6V 1.0A Lead Acid Battery

Recommended Battery Size (Charging) :

Lead Acid Battery 6V min. 3.0Ah Max. 45Ah

Lead Acid Battery 12V min. 3.0Ah max. 45Ah

Li-FePO4 (4S) min. 1Ah max. 70Ah