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VEC1095A
US Patent No. 6,822,425

SMART AUTOMATIC BATTERY CHARGER

OWNER'S MANUAL & WARRANTY INFORMATION

12 VOLT 2/10/25 AMP WITH 75 AMP ENGINE START
ALTERNATOR VOLTAGE CHECK AND BATTERY RECONDITION FUNCTIONS

• IMPORTANT SAFETY INSTRUCTIONS •

WARNING - RISK OF EXPLOSIVE GASES

1. WORKING IN VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. FOR THIS REASON, IT IS OF UTMOST IMPORTANCE THAT EACH TIME BEFORE USING YOUR CHARGER, YOU READ THIS MANUAL AND FOLLOW THE INSTRUCTIONS EXACTLY.
2. To reduce risk of battery explosion, follow these instructions and those published by the battery manufacturer and manufacturer of any equipment you intend to use in vicinity of battery. Review cautionary markings on these products and on engine.

GENERAL SAFETY

1. Use this charger for charging a LEAD-ACID battery only. It is not intended to supply power to a low voltage electrical system other than in a starter-motor application. DO not use this battery charger for dry-cell batteries that are commonly used with home appliances. These batteries may burst and cause injury to persons and damage to property.
2. 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.
3. To reduce risk of damage to electric plug and cord, pull by plug rather than cord when disconnecting charger.
4. An extension cord should not be used unless absolutely necessary. Use of an improper extension cord could result in a risk of fire and electric shock.
   <u>If extension cord must be used, make sure:</u>
   a. Pins on plug of extension cord are the same number, size, and shape as those of plug on charger.
   b. Extension cord is properly wired and in good electrical condition; and
   c. Wire size is AWG#14 (14 gauge) to 100 feet and AWG#12 for distances over 100 feet.
5. Do not operate charger with damaged cord or plug - take to a qualified service technician for replacement of the cord or plug immediately.
6. Do not operate charger if it has received a sharp blow, been dropped, or otherwise damaged in anyway; take it to a qualified service technician.
7. Do not disassemble charger; contact a qualified service technician when service or repair is required. Incorrect reassembly may result in risk of electric shock or fire.
8. To reduce risk of electric shock, unplug charger from outlet before attempting any maintenance or cleaning. Turning off charger controls will not reduce this risk.
9. Do not operate charger in rain or snow or use when wet.
10. Never charge a frozen battery.

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

SAVE THESE INSTRUCTIONS:

This manual contains important safety and operating instructions for battery charger Model VEC1095A

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PERSONAL PRECAUTIONS AND SAFETY

1. Another person should be close enough to come to your aid when you work near a lead-acid battery.
2. Fresh water and soap should be nearby in case battery acid contacts skin, clothing, or eyes.
3. Wear eye protection and protective clothing. Avoid touching eyes or skin while working with a battery. If acid particles or corrosion gets into eyes immediately flood eye with cold water (Eye Wash Station) for at least 10 minutes and get medical attention immediately.
4. If battery acid contacts skin or clothing, wash immediately with soap and water.
5. NEVER smoke or allow a spark or flame in vicinity of battery or engine.
6. CAUTION: Dropping metal tool or other object onto battery may cause spark, short-circuit battery or other electrical components and may cause explosion.
7. Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a lead-acid battery. Lead-acid batteries can produce a short-circuit current high enough to cause a severe burn.

POWER CORD CONNECTION

Charger should be grounded to reduce risk of electric shock. Charger is equipped with an AC cord having grounding conductor and a grounding plug. The plug must be plugged into a properly installed and grounded 110/120VAC outlet in accordance with all local codes and ordinances. (See Figure 1.)

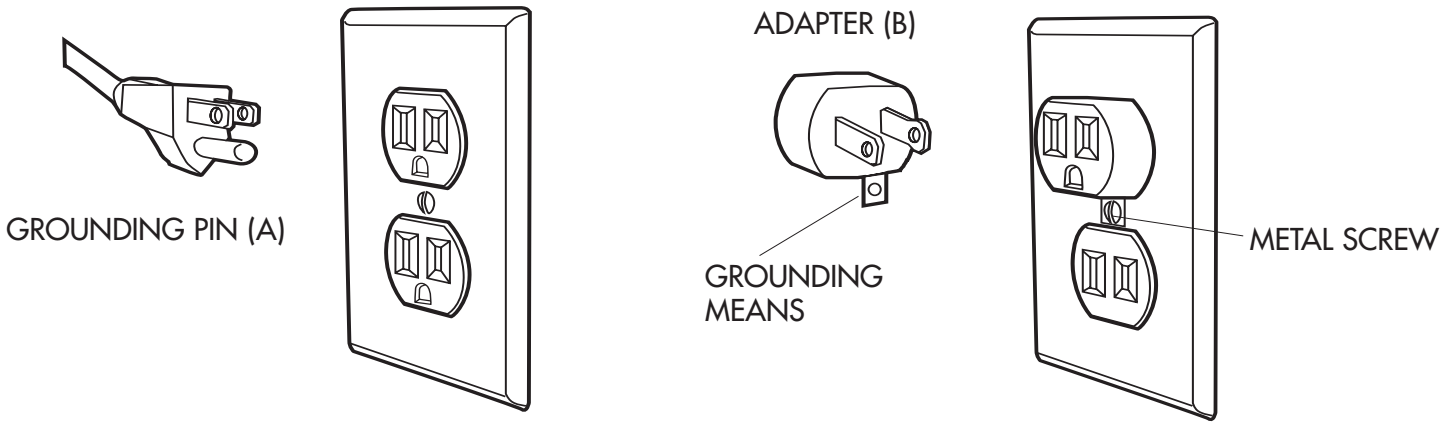
DANGER! NEVER alter AC cord or plug – if it will not fit outlet, have proper outlet installed by a qualified electrician. Improper connection may result in an electric shock.

This battery charger is for use on a 110/120VAC circuit, and has a grounding plug that looks like the plug shown in FIGURE 1A. If a properly grounded outlet is not available, a temporary adapter (like the adapter shown in FIGURE 1B), may be used to connect this plug to a two-pole receptacle as shown in FIGURE 1B. The temporary adapter should be used ONLY until a properly grounded outlet can be installed by a qualified electrician.

The green-colored rigid ear or tab extending from adapter must be connected to a properly grounded outlet. Make certain it is grounded. If necessary, replace original outlet cover plate screw with a longer screw that will secure adapter ground tab to outlet cover plate and connect to grounded outlet.

DANGER! Before using adapter as shown (FIGURE 1B), be sure the center screw of outlet plate is grounded.

FIGURE 1



USE OF AN ADAPTER IS NOT ALLOWED IN CANADA. IF A GROUNDING TYPE RECEPTACLE IS NOT AVAILABLE, DO NOT USE THIS APPLIANCE UNTIL THE PROPER OUTLET IS INSTALLED BY A QUALIFIED ELECTRICIAN.

PREPARING TO CHARGE

1. Determine voltage of battery by referring to car owner's manual.
2. If necessary, remove battery from vehicle to charge, or to clean terminals, always remove grounded terminal from battery first. Make sure all accessories in the vehicle are off, so as not to cause an arc.
3. Clean battery terminals. Be careful to keep corrosion from coming in contact with eyes or skin.
4. Add distilled water in each cell until battery acid reaches manufacturer's specified level. This helps purge excessive gas from cells. Do not overfill. For a battery without cell caps, carefully follow manufacturer's recharging instructions.
5. Study all battery manufacturers' precautions such as removing or not removing cell caps while charging and recommended charging rates.
6. Area around battery should be well ventilated while battery is being charged. Gas can be forcefully blown away by using a piece of cardboard or other non-metallic material such as a fan.
7. Make sure the initial charging rate does not exceed manufacturer's recommendation.

CHARGER LOCATION

1. Locate charger as far away from battery as cables permit.
2. **NEVER** place charger directly above battery being charged; gases from battery will corrode and damage charger.
3. **NEVER** allow battery acid to drip on charger when reading specific gravity or filling battery cells with battery acid.
4. **NEVER** operate charger in a restricted or non-ventilated area.
5. Marine batteries must be removed and charged on shore.
6. Do not set a battery on top of charger.

DC CONNECTION PRECAUTIONS

1. Connect and disconnect DC output clamps only after unplugging AC cord from outlet.
2. Never allow clamps to touch each other.
3. Attach clamps to battery posts and check for secure connection. This will hold clamps securely on terminals and helps to reduce risk of sparking.

FOLLOW THESE STEPS WHEN BATTERY IS INSTALLED IN VEHICLE. A SPARK NEAR BATTERY MAY CAUSE BATTERY EXPLOSION. TO REDUCE RISK OF A SPARK NEAR BATTERY:

1. Position AC and DC cords/cables to reduce risk of damage by hood, door, or other moving engine parts.
2. Stay clear of fan blades, belts, pulleys, and other parts that can cause injury.
3. Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has larger diameter than NEGATIVE (NEG, N,-) post.
4. Determine which battery post is grounded (connected) to the chassis. If negative post is grounded to chassis (as in most vehicles), see (5). If positive post is grounded to the chassis, see (6).
5. For negative-grounded vehicle, connect POSITIVE (RED) clamp from battery charger to POSITIVE (POS,P, +) post of battery. Connect NEGATIVE (BLACK) clamp to vehicle chassis or engine block away from battery. Do not connect clamp to carburetor, fuel lines, or sheet-metal body parts. Connect to heavy gauge metal part of the frame or engine block.
6. For positive-grounded vehicle, connect NEGATIVE (BLACK) clip from battery charger to NEGATIVE (NEG, N, -) post of battery. Connect POSITIVE (RED) clamp to vehicle chassis or engine block away from battery. Do not connect clamp to carburetor, fuel lines, or sheet-metal body parts. Connect to a heavy gauge metal part of the frame or engine block.
7. When disconnecting charger, disconnect AC cord first. Then remove clamps from vehicle chassis from battery terminal.
8. Refer to operating instructions for length of charge information.
9. Do not charge the battery while the engine is operating.

FOLLOW THESE STEPS WHEN BATTERY IS INSTALLED OUTSIDE VEHICLE. A SPARK NEAR BATTERY MAY CAUSE BATTERY EXPLOSION. TO REDUCE RISK OF A SPARK NEAR BATTERY:

1. Check polarity of battery posts for top-mounted battery connectors, the Positive posts (marked POS,P, +) usually has a larger diameter than the Negative battery post (marked NEG, N,-). For side-mounted battery connections, the Positive terminal is red, the Negative terminal is black.
2. Attach a 24-inch (minimum length) 6 AWG insulated battery cable to the Negative battery post (marked NEG, N,-).
3. Connect the Positive (RED) battery clamp to the Positive battery connector (marked POS,P, + or red).
4. Stand as far back from the battery as possible, and do not face battery when making final connection.
5. Carefully connect the NEGATIVE (BLACK) charger clamp to the free end of the battery cable connected to the negative terminal.
6. Set the charge rate to appropriate setting according to battery size.
7. When disconnecting charger, always do so in reverse sequence of connecting procedure and break first connection while as far away from battery as practical.
8. A marine (boat) battery must be removed and charged on shore. To charge it on board requires equipment specially designed for marine use.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

INTRODUCTION AND FEATURES

Thank you for selecting the Vector Model VEC1095A 2/10/25 AMP 12 Volt Smart Battery Charger, with Alternator Voltage Check and Battery Voltage Check functions. With proper care and use, it will give you years of dependable service. This battery charger has a high charge rate of up to 25 amps, and low charge rate of up to 2 amps. It is designed for charging only 12 volt lead-acid batteries - conventional automotive, maintenance free, marine deep cycle and Gel - used in cars, trucks, farm equipment, boats, RVs and SUVs, lawn mowers/garden tractors, motorcycles, personal watercraft, snowmobilers, ATVs, trucks and various commercial applications.

Vector Smart Battery Chargers feature 3-Stage High Efficiency Charging Technology Built-in Microprocessor Control that ensures Fast, Safe and complete Charge on serviceable batteries (See FIGURE 2).

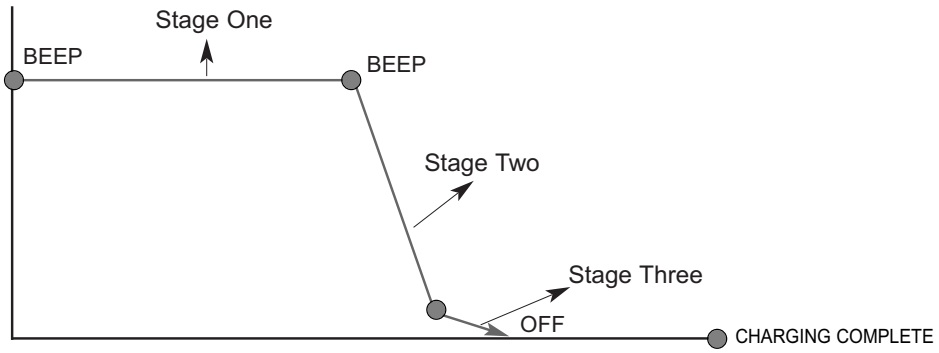
Stage One - Rapid Start Charge delivers maximum charging amperage to “wake up” any serviceable 12 Volt battery and allows for quick engine starting in just 5 minutes (based on midsize vehicle battery at 50% charge level). When battery reaches a maximum safe predetermined voltage, the charger will automatically signal a "BEEP" and move into Stage 2 of the charging process. At the end of Stage 2, the charger will signal a "BEEP" and move into Stage 3 charge mode.

Stage Two - Absorption Charge maintains the maximum possible charge at a constant safe predetermined voltage. During the phase, voltage absorption regulation charge, the charging voltage remains constant, while the actual charging current is reduced to allow for the maximum proper internal chemical energy transfer.

Stage Three - Top-Off Charge voltage is automatically maintained and reduced to a predetermined level while current is adjusted for a safe, effective battery charge level (step-down regulation mode); Ideal for topping off batteries that have been in storage. At the conclusion of Stage 3, the unit will BEEP signaling the completion of the charging cycle.

The Automatic Float Charge feature is ideal for maintaining a battery. It automatically tops off battery as needed to keep battery fully charged all the time.

FIGURE 2 - CHARGE CURVE



FEATURES

- This unit has three charge rate settings, with a 2/10/25 AMP push button charge rate switch:
  a) 2 amps: smaller batteries as in lawn mowers, snowmobiles, motorcycles, etc.
  b) 10 amps: middle sized batteries such as in small cars.
  c) 25 amps: automobile batteries and light trucks.
- Automatic Temperature Compensation
- Battery type selection
- Digital Diagnostics
- Alternator voltage and battery check
- Digital display shows charge rate, operating mode, fault codes and FUL when charged
- 1 minute engine start
- 3 stage high frequency switch mode automatic rapid charging
- Spark resistant reverse polarity and short circuit protection for user
- Built-in battery reconditioning (Desulfate)
- Lightweight, high efficiency design
- Internal short circuit protection
- Cables and clamps self stored
- Reverse polarity indicator
- Microprocessor control (Digital Smart Control)/High frequency power
- Compensates for low AC from extension cord use
- Equilization function

FIGURE 3A (FRONT VIEW)

WARNINGS: THERE ARE NO USER-SERVICEABLE PARTS IN THIS CHARGER. DO NOT OPEN THE UNIT! IT MUST BE RETURNED TO POWER ON BOARD FOR PROFESSIONAL TESTING AND REPAIR. OPENING THE UNIT WILL VOID THE MANUFACTURER'S WARRANTY.

Contact the Vector Technical Support Department at (954) 584-4446 or toll free: (866) 584-5504 for further information.

FIGURE 4A: Control Panel

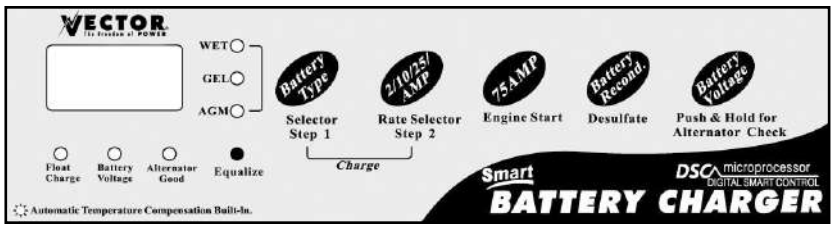


FIGURE 4B: Digital Readout Circulating Pattern

CONTROLS AND INDICATORS

From left to right the function buttons are:

Battery Type Selector (Step 1) - Allows the user to select Wet, Gel or AGM type of battery for efficient and safe charge. Most automotive batteries are Wet batteries. Refer to the battery manufacturer's specifications for battery type.

Charge Rate Selector (Step 2) - Allows the user to select the charger rate based on battery size. This selection and the actual battery charge rate are monitored by the microprocessor and the charger will stop charging if the rate is too fast or too slow for the battery size or condition.

Engine Start - Places the charger in an engine start sequence, this button will not be activated unless the charger is in the 25 amp charge mode, set the 2/10/25 amps button to 25 amps first to activate this button.

Desulfate- Is an automatic mode that once started continues for 24 hours and then stops. A series of electrical pulses breaks the crystalline form of lead sulfate to return these chemicals into useful battery electrolyte. More than 24 hours may be needed to restore. If 5 cycles does not improve battery performance, discontinue and re-cycle the battery.

Periodic reconditioning of a battery is recommended to maintain a battery's optimum performance

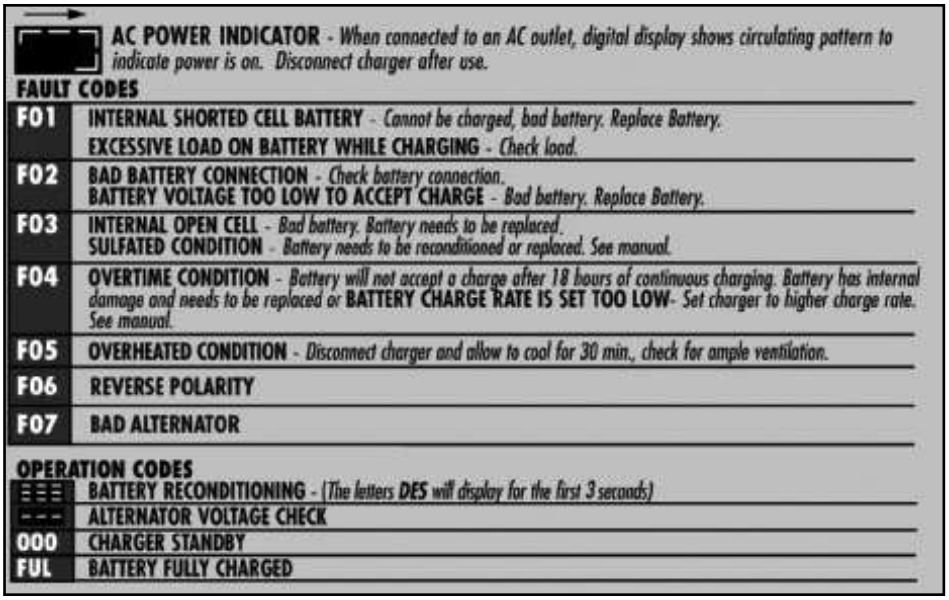
Alternator Voltage Check- Can only check alternator voltage in standby mode. In any other mode the battery voltage is checked to check alternator voltage press and hold down button for 5 seconds and release and the voltage will be displayed.To check battery voltage press and release the button and the voltage will be displayed This check is repeated at various electrical load levels and the tests allow the user to determine if the alternator can keep up with the loads.

It can indicate alternator service may be required.

INDICATORS

Large (.375") 3-character Digital Display in the upper left of the control panel indicates many conditions and/or status codes:

When AC power is applied to the charger, actual charge rate in amps, when the battery is fully charged , battery voltage, fault codes, operating modes and when the charger is ready for the next mode selection. "Status Codes" are described below (FIGURE 5) and on the back of charger.



Below the Digital Display are series of six LEDS that light on the following conditions:

WET - Lights when battery type selector is on WET battery type

GEL - Lights when battery type selector is on GEL battery type

AGM - Lights when battery type selector is on AGM battery type.

Float Charge - Lights when automatic charge monitoring is active. This feature allows a battery to maintain its's charge over long periods of non use. If there is any loss of power to the charger once power is restored charger will automatically return to the default settings. Battery selector type would be "gel"

Battery Voltage- Lights when battery voltage is displayed

Alternator Good - Lights when load or not load checks show the alternator is keeping up with the electrical load.

Equalize - A recessed button used to start the equalize process.

CHARGE RATE SELECTION

After charger clamps are correctly connected, plug in the charger to an AC outlet and the charger will show a circulating pattern on the Digital Display. This pattern indicates power is applied. Select proper charge current rate based on battery size. Press the 2/10/25 AMP push button and the charger will begin charging at 2 amps. Pressing the 2/10/25 AMP push button again will advance the charge rate to 10A, then 25A. Pressing the switch again will turn OFF the charger output and the display will show "000"

NOTE: The only time the selected charge rate does not display at the full selected rate is when the battery is nearly full and charging at either step two or three.The display will be showing a slowing charge rate. To return to 2A, press the 2/10/25 AMP button. When the battery is fully charged, the charging Complete LED is lit and "FUL" is displayed on the Digital Display.

CHARGING THE BATTERY

1. Charger displays circulating pattern when battery and AC power are connected properly. Select battery type and press 2/10/25 AMP button to begin charging at 2 amps rate; the charger sounds a beep and displays charging current.

WARNING: If Charger displays F02, and lights FAULT indicator, the connection to battery terminals is bad. Clean battery terminals then reconnect clamps .

If the Charger displays an F06, or the charger displays an F06, The Red (Positive) and Black (Negative) clamps are incorrectly connected to battery terminals. Reverse the clamps

NOTE: The charger starts charging at 2 amps rate automatically if 2/10/25 AMP button is not pressed within 3 minutes after applying AC power. The Battery Type Selector will automatically default to “gel”.

NOTE: If the display on the charger varies between F03 and amp rate the battery is sulfated and the charger is trying to give it some charge. Please run the desulfation process.

- Charger occasionally sounds a beep and displays 0.0 during self-test or charging stage changes.

2. Pressing the 2/10/25 AMP button again advances charging rate to 10 amps and pressing once more advances charging rate to 25 amps.

NOTE:
- If the battery is near full it will fall back to lower charge rate.
- Pressing the 2/10/25 AMP 4 times advances to standby mode; sounds a beep, displays 000 and stops charging.

3. The battery charger displays the charge current. To view the battery voltage, press BATTERY VOLTAGE button. The charger will sound a beep and display the battery voltage for 5 seconds then returns to display charge current
4. The display shows FUL when the battery is fully charged.
5. Disconnect the AC power cord first then the NEGATIVE clamp and finally the POSITIVE clamp.

AUTOMATIC FLOAT CHARGING - Ideal for maintaining a fully charged battery.

1. Keep the AC power and battery connected after battery is fully charged.
2. The charger monitors the battery and tops it off as needed.
3. The display shows the current in amps and turns on the Float Charge indicator and displays FUL when completed.
4. To view battery voltage press BATTERY VOLTAGE button.

NOTE: • After AC power interruption, charging restarts at 2 amps rate automatically. The Battery Type Selector will automatically default to “gel”.

EQUALIZING : the process by which the fluid in each of a battery’s cells is equalized. This process occurrs after charging is complete.

WARNING - NEVER TRY TO EQUALIZE A GEL CELL,THE RESULTING EXPLOSION COULD CAUSE SERIOUS INJURY, DEATH AND PROPERTY DAMAGE.

WARNING - TURN OFF ALL VOLTAGE SENSITIVE DEVICES DURING THE EQUALIZATION PROCESS.

The frequency which the equalization process needs to be run depends on the use of the battery. The more use the battery receives the more undercharged it is . The more times the battery should be equalized.

1. Do not use this mode on sealed or valve regulated batteries. This mode is only meant for wet (unsealed/vented)batteries.
2. Make sure there are no flammable sources near the recharging sight.
3. Wear safety glasses,gloves and protective clothing.
4. Remove battery from vehicle. Make sure that the battery has good ventilation. The process will cause the electrolytes to gas and release hydrogen and oxygen. Because of the accumulation of these gases the chance of explosion is realistic.
5. Open the battery cap
6. Fill the battery with distilled water according to the manufacturers instructions. Since the batteries may rapidly bubble while being charged refill only with distilled water after the equalization process is complete and the voltage is back to nor mal.
7. The battery should have no charge on it during the equalization process.
8. Plug in the charger, the display will show “000” and the battery type LED will default to “gel”.
9. Push the Battery Type Selector Switch till “wet” is displayed (this mode will only work if the Battery Type selected is “wet”).
10. Choose the correct charge rate and start charge. You can check the battery voltage by pushing the Battery Voltage but ton. This will trigger the Battery Voltage indicator button.

11. Push the Equalize button anytime and the battery will automatically begin to equalize but in 2 Amp limited current. In order to push the recessed button you will need a small pin or ballpoint pen .
12. Every hour the temperature should be checked by touching the battery .If the battery is to hot to touch stop the charg ing and let the battery cool.
13. The voltage rises but does not go over 15.3v to 16.2v (2.55 - 2.7v per cell) depending on ambient temperature ,it will automatically adjust.
14. The “wet” LED flashes while the charger is in the equalize mode.
15. The digital readout will show “FUL” when the equalization process is complete.
16. The equalization process may take anywhere from 2 to 6 hours to complete.

ALTERNATOR VOLTAGE CHECK: will not work in normal charge mode it will only work in the stand-by mode when the LED display is showing “000” or a circulating pattern.

PART 1: No Load (Turn OFF all vehicle’s accessories): The battery must be fully charged before testing the alternator. Run the engine long enough to achieve normal idle speed and verify there is a no-load voltage.

1. PRESS and hold down Alternator Check for 5 seconds to start the check.
2. ALTERNATOR GOOD LED will light to indicate the alternator is good, or the FAULT CODE F07 will be displayed to indicate the alternator is not good.
3. Press Alternator Check button again to stop the test.

PART 2: Under Load (Accessories ON): Next, load the alternator by turning on as many accessories as possible (except for A/C and DEFROST)

1. PRESS and hold down Alternator Check for 5 seconds to start the check.
2. ALTERNATOR GOOD LED will light to indicate the alternator is good, or the FAULT CODE F07 will be displayed to indicate the alternator is not good.
3. Press Alternator Check button again to stop the test.

If the first alternator check indicates a good alternator and the second indicates the alternator is bad, the problem could stem from: loose fan belts, an intermittent diode failure or possibly bad connections between the battery and alternator and/or ground.

NOTE: BATTERY VOLTAGE button is disabled in Alternator Check mode.

NOTE: If someone has added a number of accessory loads on the charging system, thereby increasing current demand from the alternator. MAKE SURE THAT THE ALTERNATOR IS RATED TO THE APPLICATION.

NOTE: This check may not be accurate for every make, manufacturer and model of vehicle. There is wide variation in user-controlled electrical loads, alternator output and wiring. Other factors include battery condition, temperature, and engine idle speed. It is recommended to check your alternator when it is known to be operating properly to verify that this check is valid for your particular vehicle.

Check only 12V systems. Checking 24 or 36V systems will damage charger.

ENGINE START

The Engine Start Function can supply 75Amps for engine starting.

Engine Start Procedure:

1. Set the charge rate to 25 amps.

2. When the digital display shows 25 amps, press the 75 amps engine start.

3. The Digital Display will begin a count down starting at 999 to 000

4. Once count down reaches 000, the display will begin flashing 000, meaning that the charger is ready to start

5. The charger will deliver 75 amps for 5 seconds. The charger will then go into a standby mode 000

6. During this time, the charger can manually be set to any charge rate, and after four minutes, the engine start procedure can be repeated if needed.

MAINTENANCE

With minimal maintenance, the VEC1095A 2/10/25 AMP Smart Battery Charger will provide years of dependable service. Follow these simple steps to maintain the charger in optimum condition:

- After each use, clean the battery charger clamps - be sure to remove any battery fluid that will cause corrosion of the copper clamps.
- Clean the outside case of the charger with a soft cloth and, if necessary, mild soap solution.
- Do not allow liquid to enter the charger. Do not operate when charger is wet.
- Keep the charger cords loosely coiled during storage to prevent damage to the cords.
- Do not use charger if cords or clamps have been damaged in any way - call Technical Support Department toll-free: (866) 584-5504 to replace cords and clamps.

TROUBLESHOOTING - FAULT LED LIT

The following conditions may cause the FAULT CODES to be displayed:

- Poor connection to battery (or frame).
- Charging too fast - Decrease Charge Rate - Press 2/10/25 AMP button to lower rate.
- Charging too slowly - Battery is large and did not complete charging in 24 hours - Press 2/10/25 AMP to charge at a faster rate.
- Shorted battery cell - Replace battery (F01).
- Open battery Cell - Replace battery (F03).
- Reverse Polarity (F06) - disconnect AC then reverse clamp locations on battery and frame.
- Internal overheat in charger- make sure fan is not blocked (F05).

Try charging another battery, if the FAULT CODE does not display, then one of the above problems exists with the initial battery. Charger will not charge and the fan will not operate if there is a fault. Call Technical Support toll-free: (866) 584-5504.

INTERNAL SHORT CELL BATTERY (F01)

- If the battery being charged has an internal shorted cell, then FAULT CODE F01 will be displayed.
- If FAULT CODE is displayed, Vector recommends you take your battery to a certified automotive service center for evaluation.

BATTERY NOT ACCEPTING A CHARGE

- Make sure that the charger is plugged into a "live" 120VAC outlet and Power LED is lit.
- Unplug charger and check battery connections - ensure that there is a good connection at the battery terminal and/or vehicle chassis.
- Check that the correct charge rate was selected for the battery being charged.
- Ensure that enough charging time was allowed for-check table in (page 11) for approximate charging times.

NOTE: Charger will NOT operate on batteries below 2.0 Volts. If a 12 Volt battery is below 2.0 volts it is probably shorted, open or sulfated and should be replaced.

VERY COLD BATTERY

If the battery to be charged is extremely cold (in temperatures less than freezing - 0º C/32º F) it cannot accept a high rate of charge, so the initial charge rate will be slow. The rate of charge will increase as the battery warms.

WARNING: DO NOT ATTEMPT TO CHARGE A FROZEN BATTERY

CHARGING TIMES

The VEC1095A, a fully automatic Smart Battery Charger will automatically adjust the charge rate as the battery becomes charged and stops charging when the battery is fully charged. For estimates of the time it takes to charge a battery refer to the following table for details. Deep cycle batteries may need longer charging time. It is recommended to repeat the charging cycle a second time beginning with the 2 AMP rate.

The following chart converts hydrometer readings into percent of charge values.

Refer to the chart below for approximate charging times.

SPECIFIC GRAVITY (HYDROMETER READING)	PERCENT OF CHARGE IN BATTERY	PERCENT OF CHARGE NEEDED BY BATTERY
1.265	100%	0%
1.225	75%	25%
1.190	50%	50%
1.155	25%	75%
1.120	0%	100%

The times shown in the chart above are approximate and refer to an average automotive battery. For smaller batteries, the charge time should be adjusted using the formula shown below and adding 1 hour to the time calculated.

To estimate charging time for a discharged battery, divide the amp hour (aH) rating of the battery by the charge rate selected. This is the number of hours required to recharge the battery. For example, a 50 AH (12 volt) battery is discharged (10 volts). How long should it be charged at the 10 Amp rate? Divide the 50 AH by 10.

Answer: 5.5 hours. Always round up the charge time by 10% to ensure full charge. In most cases, battery charging times will vary depending on the age and condition of the battery. Smaller batteries should be charged at a lower rate (2 Amps) and add an extra hour to charge time.

Refer to Chart below for approximate Charging Time

PERCENT OF CHARGE	75%	50%	25%	0%
2 AMPS	6.5	12	NR	NR
10 AMPS	1.8	3.0	4.5	6
25 AMPS	0.8	1.4	2	2.7

* Not recommended

WARRANTY

This limited warranty program is the only one that applies to this product, and it sets forth all the responsibilities of Vector Manufacturing, Ltd., regarding this product. There is no other warranty, other than described herein.

This Vector Manufacturing, Ltd. product is warranted, to the original purchaser only, to be free of defects in materials and workmanship for five years from the date of purchase without additional charge. The warranty does not extend to subsequent purchasers or users. Vector Manufacturing, Ltd. will not be responsible for any amount of damage in excess of the retail purchase price of the product under any circumstances. Incidental and consequential damages are specifically excluded from coverage under this warranty.

This product is not intended for commercial use. This warranty does not apply to accessories or damage to units from misuse or incorrect installation. Misuse includes wiring or connecting to improper polarity power sources.

RETURN/REPAIR POLICY: Defective products, other than accessories, may be returned postage prepaid to Vector Manufacturing. Any defective product, other than accessories, that is returned to Vector Manufacturing within 30 days of the date of purchase will be replaced free of charge. If such a product is returned more than 30 days but less than five year from the purchase date, Vector Manufacturing will repair the unit or, at its option, replace it free of charge. If the unit is repaired, new or reconditioned replacement parts may be used, at Vector Manufacturing's option. A unit may be replaced with a new or reconditioned unit of the same or comparable design. The repaired or replaced unit will then be warranted under the terms of the remainder of the warranty period. The customer is responsible for the shipping charges on all returned items after 30 days. During the warranty period, Vector Manufacturing, Ltd. will be responsible for the return shipping charges.

LIMITATIONS: This warranty does not cover accessories, bulbs, fuses and batteries, defects resulting from normal wear and tear (including chips, scratches, abrasions, discoloration or fading due to usage or exposure to sunlight), accidents, damage during shipping to our service facility, alterations, unauthorized use or repair, neglect, misuse, abuse, failure to follow instructions for care and maintenance, fire, flood and Acts of God.

If your problem is not covered by this warranty, call our Technical Support Department toll free: (866) 584-5504 for general repair information and charges if applicable. You may also contact us through our website at www.vectormfg.com.

STATE LAW RIGHTS: This warranty gives you specific legal rights. Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the exclusions or limitations stated herein may not apply. This warranty gives the purchaser specific legal rights; other rights, which vary from state to state, may apply.

TO REQUEST WARRANTY SERVICE FOR THIS PRODUCT: Contact Vector Manufacturing Technical Support by telephone, fax or mail. We suggest that you keep the original packaging in case you need to ship the unit. When returning a product, include your name, address, phone number, dated sales receipt (or copy) and a description of the reason for return and product serial number. After repairing or replacing the unit, we will make every effort to return it to you within four weeks.

WARRANTY ACTIVATION: Please complete Warranty Activation Card and mail to Vector Manufacturing. Enter "VEC1095A" as Model and "12V 2/10/25 Amp Battery Charger" as Product Type. All Vector Manufacturing, Ltd. products must be registered within 10 days of purchase to activate this warranty. Mail the completed registration form, along with a copy of the original sales receipt to:

ATTN.: CUSTOMER SERVICE / VECTOR MANUFACTURING, Ltd.
4140 SW 28th Way, Ft. Lauderdale, FL 33312
PH: 954-584-4446 • TOLL FREE: 866-584-5504 • Fax: 954-584-5556.
You may also contact us at our web site www.vectormfg.com.

WARRANTY IS NON-TRANSFERABLE AND NON-REFUNDABLE.
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