



POWERED BY SCHUMACHER

PROSERIES™

MODEL

DSR118

Battery Charger & Engine Starter

OWNERS MANUAL



PLEASE SAVE THIS OWNERS MANUAL AND READ BEFORE EACH USE. This manual will explain how to use the battery charger safely and effectively. Please read and follow these instructions and precautions carefully. et precautions.

1. IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS.

- 1.1 **SAVE THESE INSTRUCTIONS –**
This manual contains important safety and operating instructions.
- 1.2 Keep out of reach of children.
- 1.3 Do not expose the charger to rain or snow.
- 1.4 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.
- 1.5 To reduce the risk of damage to electric plug and cord, pull by the plug rather than the cord when disconnecting charger.
- 1.6 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 an extension cord must be used, make sure:
 - The pins on plug of extension cord are the same number, size and shape as those of plug on charger.
 - The extension cord is properly wired and in good electrical condition
 - The wire size is large enough for AC ampere rating of charger as specified in section 8.
- 1.7 Do not operate charger with damaged cord or plug – replace the cord or plug immediately.
- 1.8 Do not operate charger if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified serviceman.
- 1.9 Do not disassemble charger; take it to a qualified serviceman when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.
- 1.10 To reduce risk of electric shock, unplug charger from outlet before attempting any maintenance or cleaning. Turning off controls will not reduce this risk.
- 1.11 **WARNING:**
RISK OF EXPLOSIVE GASES.
 - a. 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 YOU FOLLOW THE INSTRUCTIONS EACH TIME YOU USE THE CHARGER.
 - b. To reduce risk of battery explosion, follow these instructions and those published by battery manufacturer and manufacturer of any equipment you intend to use in vicinity of battery. Review cautionary markings on these products and on engine.

2. PERSONAL SAFETY PRECAUTIONS

- 2.1 Consider having someone close enough by to come to your aid when you work near a lead-acid battery.
- 2.2 Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
- 2.3 Wear complete eye protection and clothing protection. Avoid touching eyes while working near battery.
- 2.4 If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flood eye with running cold water for at least 10 minutes and get medical attention immediately.
- 2.5 NEVER smoke or allow a spark or flame in vicinity of battery or engine.
- 2.6 Be extra cautious to reduce risk of dropping a metal tool onto battery. It might spark or short-circuit battery or other electrical part that may cause explosion.
- 2.7 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-circuit current high enough to weld a ring or the like to metal, causing a severe burn.
- 2.8 Use charger for charging only LEAD-ACID (STD or AGM) rechargeable batteries with rated capacities of 24Ah (6V) and 44-75Ah (12V). It is not intended to supply power to a low voltage electrical system other than in a starter-motor application. Do not use battery charger for charging dry-cell batteries that are commonly used with home appliances. These batteries may burst and cause injury to persons and damage to property.
- 2.9 NEVER charge a frozen battery.
- 2.10 **WARNING:** This product contains one or more chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

3. PREPARING TO CHARGE

- 3.1 If necessary to remove battery from vehicle to charge, always remove grounded terminal from battery first. Make sure all accessories in the vehicle are off, so as not to cause an arc.
- 3.2 Be sure area around battery is well ventilated while battery is being charged.
- 3.3 Clean battery terminals. Be careful to keep corrosion from coming in contact with eyes.
- 3.4 Add distilled water in each cell until battery acid reaches level specified by battery manufacturer. Do not overfill. For a battery without removable cell caps, such as valve regulated lead acid batteries, carefully follow manufacturer's recharging instructions.
- 3.5 Study all battery manufacturer's specific precautions while charging and recommended rates of charge.
- 3.6 Determine voltage of battery by referring to car owner's manual and make sure that output voltage selector switch is set at correct voltage. If charger has adjustable charge rate, charge battery initially at lowest rate.

4. CHARGER LOCATION

- 4.1 Locate charger as far away from battery as DC cables permit.
- 4.2 Never place charger directly above battery being charged; gases from battery will corrode and damage charger.
- 4.3 Never allow battery acid to drip on charger when reading electrolyte specific gravity or filling battery.
- 4.4 Do not operate charger in a closed-in area or restrict ventilation in any way.
- 4.5 Do not set a battery on top of charger.

5. DC CONNECTION PRECAUTIONS

- 5.1 Connect and disconnect DC output clips only after setting any charger switches to "off" position and removing AC cord from electric outlet. Never allow clips to touch each other.
- 5.2 Attach clips to battery and chassis, as indicated in sections 6 and 7.

6. FOLLOW THESE STEPS WHEN BATTERY IS INSTALLED IN VEHICLE

WARNING: A SPARK NEAR THE BATTERY MAY CAUSE A BATTERY EXPLOSION. TO REDUCE THE RISK OF A SPARK NEAR THE BATTERY:

- 6.1 Position AC and DC cords to reduce risk of damage by hood, door, or moving engine part.
- 6.2 Stay clear of fan blades, belts, pulleys, and other parts that can cause injury to persons.
- 6.3 Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has larger diameter than NEGATIVE (NEG, N, -) post.
- 6.4 Determine which post of battery is grounded (connected) to the chassis. If negative post is grounded to chassis (as in most vehicles), see (6.5). If positive post is grounded to the chassis, see (6.6).
- 6.5 For negative-grounded vehicle, connect POSITIVE (RED) clip from battery charger to POSITIVE (POS, P, +) ungrounded post of battery. Connect NEGATIVE (BLACK) clip to vehicle chassis or engine block away from battery. 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.
- 6.6 For positive-grounded vehicle, connect NEGATIVE (BLACK) clip from battery charger to NEGATIVE (NEG, N, -) ungrounded post of battery. Connect POSITIVE (RED) clip to vehicle chassis or engine block away from battery. 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.
- 6.7 When disconnecting charger, turn switches to off, disconnect AC cord, remove clip from vehicle chassis, and then remove clip from battery terminal.
- 6.8 See *Operating Instructions* for length of charge information.

7. FOLLOW THESE STEPS WHEN BATTERY IS OUTSIDE VEHICLE

WARNING: A SPARK NEAR THE BATTERY MAY CAUSE A BATTERY EXPLOSION. TO REDUCE THE RISK OF A SPARK NEAR THE BATTERY:

- 7.1 Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has a larger diameter than NEGATIVE (NEG, N, -) post.
- 7.2 Attach at least a 24-inch-long 6-gauge (AWG) insulated battery cable to NEGATIVE (NEG, N, -) battery post.
- 7.3 Connect POSITIVE (RED) charger clip to POSITIVE (POS, P, +) post of battery.
- 7.4 Position yourself and free end of cable as far away from battery as possible – then

connect NEGATIVE (BLACK) charger clip to free end of cable.

- 7.5 Do not face battery when making final connection.
- 7.6 When disconnecting charger, always do so in reverse sequence of connecting procedure and break first connection while as far away from battery as practical.
- 7.7 A marine (boat) battery must be removed and charged on shore. To charge it on board requires equipment specially designed for marine use.

8. GROUNDING AND AC POWER CORD CONNECTIONS

- 8.1 This battery charger is for use on a nominal 120 volt circuit. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances. The plug pins must fit the receptacle (outlet). Do not use with an ungrounded system.
- 8.2 **DANGER:** Never alter the AC cord or plug provided – if it does not fit the outlet, have a proper grounded outlet installed by a qualified electrician. An improper connection can result in a risk of an electric shock or electrocution.

NOTE: Pursuant to Canadian Regulations, use of an adapter plug is not allowed in Canada. Use of an adapter plug in the United States is not recommended and should not be used.

8.3 USING AN EXTENSION CORD

The use of an extension cord is not recommended. If you must use an extension cord, follow these guidelines:

- Pins on plug of extension cord must be the same number, size, and shape as those of plug on charger.
- Ensure that the extension cord is properly wired and in good electrical condition.
- Wire size must be large enough for the AC ampere rating of charger, as specified:

Length of cord (feet)	25	50	100	150
AWG* size of cord	18	16	14	14

*AWG-American Wire Gauge

9. ASSEMBLY INSTRUCTIONS

- 9.1 Remove all cord wraps and uncoil the cables prior to using the battery charger.

10. CONTROL PANEL

DIGITAL DISPLAY

The digital display indicates the status of the battery and charger. See the *Display Messages* section for a complete list of messages.

NOTE: During charging, the display will go into sleep mode and will not show the percentage of charge or voltage of the battery. To turn the display back on, press the Display button.

DISPLAY BUTTON

Use this button to set the function of the digital display to one of the following:

 **Voltage** – The digital display shows the voltage at the charger's battery clamps.

 **Battery percentage** – The digital display shows an estimated charge percentage of the battery connected to the charger's battery clamps.

 **Current** – The digital display shows the charging current, in amps.

NOTE: To save energy, press the display button until the display shuts off.

MODE SELECTION BUTTON

Use this button to select one of the following modes:

- **6<>2A CHARGE/MAINTAIN –**
For charging small and large batteries. Not recommended for industrial applications.
- **15<>40A BOOST –** Increases the voltage and sends a quick burst of energy into the battery, to quickly bring deeply discharged batteries back to life.
- **15<>40A SERVICE –** Maintains stable voltage at 13.6V, to prevent battery discharge during service or when idle in a showroom. Always use in combination with a battery.
- **125A ENGINE START –** Provides additional amps for cranking an engine with a weak or run-down battery. Always use in combination with a battery.

LED INDICATORS

 **REVERSED (red) LED flashing:**
The connections are reversed.

 **CHARGING (yellow/orange) LED Solid:** The charger is charging the battery.

 **CHARGED/MAINTAINING (green) LED solid:** The battery is fully charged and the charger is in Maintain mode.

NOTE: See *Operating Instructions* for a complete description of the charger modes.

BATTERY TYPE BUTTON

Use this button to select the battery type.

 **STO –** Used in cars, trucks and motorcycles, these batteries have vent caps and are often marked “low maintenance” or “maintenance-free”. This type of battery is designed to deliver quick bursts of energy (such as starting engines) and has a greater plate count. The plates are thinner and have somewhat different material composition. Standard batteries should not be used for deep-cycle applications.

 **AGM –** The Absorbed Glass Mat construction allows the electrolyte to be suspended in close proximity with the plate’s active material. In theory, this enhances both the discharge and recharge efficiency. The AGM batteries are a variant of Sealed VRLA (valve regulated lead-acid) batteries. Popular uses include high-performance engine starting, power sports, deep-cycle, solar and storage batteries.

11. OPERATING INSTRUCTIONS

WARNING: A spark near the battery may cause an explosion.

IMPORTANT: Do not start the vehicle with the charger connected to the AC outlet (except during Engine Start), or it could damage the charger.

NOTE: This charger is equipped with an auto-start feature. Current will not be supplied to the battery clamps until a battery is properly connected. The clamps will not spark if touched together.

BATTERY CONNECTION INDICATOR

If the charger does not detect a properly connected battery, charging will not start and the digital display will show one of two messages. If the display shows **CONNECT CLAMPS**, make sure the charger is connected to the battery and the connection points are clean and making a good connection. If the display shows **WARNING - CLAMPS REVERSED**, unplug the charger from the AC outlet and reverse the connections at the battery.

CHARGING A BATTERY IN THE VEHICLE

1. Turn off all the vehicle’s accessories.
2. Keep the hood open.
3. Clean the battery terminals.
4. Place the charger on a dry, non-flammable surface.
5. Lay the AC/DC cables away from any fan blades, belts, pulleys and other moving parts.
6. Connect the battery, following the precautions listed in sections 6 and 7.
7. Connect the charger to an electrical outlet.
8. Select the battery type and charge mode. See Section 12 for display message details.
9. The  **CHARGING (yellow/orange) LED** will light, and the display will show **ANALYZING BATTERY** while the charger determines that the battery is properly connected and the condition of the battery.
10. When charging is complete, disconnect the charger from the AC power, remove the clamps from the vehicle’s chassis, and then remove the clamp from the battery terminal.

CHARGING A BATTERY OUTSIDE OF THE VEHICLE

1. Place battery in a well-ventilated area.
2. Clean the battery terminals.
3. Connect the battery, following the precautions listed in sections 6 and 7.
4. Connect the charger to the electrical outlet.
5. Select the battery type and charge mode. See Section 12 for display message details.
6. The  CHARGING (yellow/orange) LED will light, and the display will show **ANALYZING BATTERY** while the charger determines that the battery is properly connected and the condition of the battery.
7. When charging is complete, disconnect the charger from the AC power, disconnect the negative clamp, and finally the positive clamp.
8. A marine (boat) battery must be removed and charged on shore.

BATTERY CHARGING TIMES

APPLICATION	BATTERY SIZE	CHARGING TIME (Hours)			
		2A	6A	8A	10A
POWERSPORTS ↓	6Ah	6	2	1.75	1.5
	32Ah	↓ 15	↓ 5	↓ 4.5	↓ 4
AUTOMOTIVE ↓	300 CCA	12	4	3.5	3
	1000 CCA	↓ 30	↓ 10	↓ 8.5	↓ 7
MARINE	50Ah	15	5	4.25	3.5
	↓ 105Ah	↓ 33	↓ 11	↓ 9.5	↓ 8

Times are based on a 50% discharged battery and may change, depending on age and condition of battery.

AUTOMATIC CHARGING

When an Automatic Charge is performed, the charger switches to the maintain mode automatically after the battery is charged.

SERVICE MODE

Supplies 15A<>40A at 13.6V. The yellow/orange  CHARGING LED is lit. During Service Mode, battery percentage is invalid. If the display button is pressed, the display will show battery voltage and estimated current. Always use in combination with a battery.

DESULFATION

If the battery is left discharged for an extended period of time, it could become sulfated and not accept a normal charge. If the charger detects a sulfated battery, the charger will switch to a special mode of operation designed for such batteries, and the display will show **BAD BATTERY**. If successful, normal charging will resume

after the battery is desulfated. Desulfation could take up to 10 hours. If desulfation fails, charging will abort and the display will show **CHARGE ABORTED - BAD BATTERY**.

ABORTED CHARGE

If charging cannot be completed normally, charging will abort. When charging aborts, the charger's output is shut off, and the display will show **CHARGE ABORTED -BAD BATTERY**. Do not continue attempting to charge this battery. Check the battery and replace, if necessary.

CHARGE COMPLETION AND MAINTAIN MODE (FLOAT MODE MONITORING)

Charge completion is indicated by the solid green  CHARGED/MAINTAINING LED and the digital display showing **FULLY CHARGED - AUTO MAINTAINING**.

This means that the charger has stopped charging and has switched to the Maintain Mode of operation. **NOTE:** If the charger has to provide its maximum maintain current for a continuous 12 hour period, it will go into Abort Mode (see Aborted Charge section). This is usually caused by a drain on the battery, or the battery could be bad. Make sure there are no loads on the battery. If there are, remove them. If there are none, have the battery checked or replaced.

MAINTAINING A BATTERY

The DSR118 maintains 6 and 12 volt batteries, keeping them at full charge. **It is not recommended for industrial applications.**

NOTE: The maintain mode technology allows you to safely charge and maintain a healthy battery for extended periods of time. However, problems with the battery, electrical problems in the vehicle, improper connections or other unanticipated conditions could cause excessive current draws. As such, occasionally monitoring your battery and the charging process is required.

USING ENGINE START MODE

Your battery charger can be used to jump start your car if the battery is low. Follow all safety instructions and precautions for charging your battery. Wear complete eye protection and protective clothing.

WARNING: Using Engine Start mode WITHOUT a battery installed in the vehicle could cause damage to the vehicle's electrical system.

NOTE: If you have charged the battery and it still will not start your car, do not use Engine Start mode, or it could damage the vehicle's electrical system. Have the battery checked.

1. With the charger unplugged from the AC outlet, connect the charger to the battery, following the instructions given in sections 6 and 7.
2. With the charger plugged in and connected to the battery and chassis, press the  MODE SELECTION button until the display shows **ENGINE START - PRESS FOR BATTERY TEST**. Wait for message to change to **ENGINE START ON**. Wait two more minutes.
3. When the display shows **READY**, crank the engine until it starts or 5 seconds pass. If the engine does not start, wait 3 minutes (until the display shows **READY**) before cranking again. This allows the charger and battery to cool down.

NOTE: During extremely cold weather, or if the battery is under 2 volts, charge the battery for 5 minutes before cranking the engine.

4. If the engine fails to start, charge the battery for 5 more minutes before attempting to crank the engine again.
5. After the engine starts, unplug the AC power cord before disconnecting the battery clamps from the vehicle.

NOTE: If the engine does not turn over but never starts, there is not a problem with the starting system; there is a problem somewhere else with the vehicle. STOP cranking the engine until the other problem has been diagnosed and corrected.

ENGINE STARTING NOTES

During the starting sequence, the charger is set to one of three states:

- **Wait for cranking** – The charger waits until the engine is actually being cranked before delivering the amps for engine start.
- **Cranking** – When cranking is detected, the charger will automatically deliver up to its maximum output as required by the starting system for up to 5 seconds or until the engine cranking stops.
- **Cool Down** – After cranking, the charger enters a mandatory 3 minute (180 second) cool down state. The digital display will show **COOL DOWN xxx SECONDS REMAINING**. It starts at 180 and counts down to 0. After 3 minutes, the digital display will change to **READY**.

USING THE BATTERY VOLTAGE TESTER

1. With the charger unplugged from the AC outlet, connect the charger to the battery following the instructions given in previous sections.
2. Plug the charger AC power cord into the AC outlet.
3. If necessary, press the  BATTERY TYPE button until the correct type is indicated.
4. Read the voltage on the digital display. Keep in mind that this reading is only a battery voltage reading; a false surface charge may mislead you. Compare the reading to the following chart.

6V Battery Voltage Reading	12V Battery Voltage Reading	Battery Condition
6.4 or more	12.8 or more	Charged
6.1 to 6.3	12.2 to 12.7	Needs charging
Less than 6.1	Less than 12.2	Discharged

TESTER AND CHARGER

When first turned on, the unit operates only as a tester, not as a charger. Selecting a mode activates the battery charger and deactivates the tester. Pressing the  MODE SELECTION button when the Engine Start mode is active (except during the 180 second cool down) will shut off the charger and activate the tester.

POWER-UP IDLE TIME LIMIT

If no button is pressed within 10 minutes after the battery charger is first powered up, the charger will automatically switch from tester to charger if a battery is connected. In that case, the charger will be set to the 6<>2A CHARGE/MAINTAIN mode and AGM battery type.

TESTING AFTER CHARGING

After the unit has been changed from tester to charger (by selecting a mode), it remains a charger. To change the battery charger back to a tester, press the MODE SELECTION button until the display shows voltage.

NOTE: The battery tester is only designed to test batteries. Testing a device with a rapidly changing voltage could yield unexpected or inaccurate results.

FAN OPERATION

It is normal for the fan to start and stop when maintaining a fully charged battery. The fan does not run in Tester Mode. Keep the area near the charger clear of obstructions, to allow the fan to operate efficiently.

RESTART

If the Mode is changed after charging has started (by pressing the  MODE SELECTION button), the charging process will restart.

12. DISPLAY MESSAGES

0.0V – No battery is detected.

CONNECT CLAMPS – Plugged into the AC outlet without the clamps connected to a 6 or 12V battery.

xx.xV – Battery voltage is displayed.

---- – Battery percentage is not yet available (starting voltage is below 8.0V).

xx.xA – Charging current is displayed.

xxo/o – Percentage of battery charge is displayed.

WARNING - CLAMPS REVERSED (Red REVERSED LED flashing) – Plugged into the AC outlet and the clamps are connected backwards to a battery. Scrolls until condition is corrected.

CHARGE/MAINTAIN - PRESS FOR BOOST – If the Charge/Maintain mode is selected and the battery starting voltage is below 12.8V, the charger will automatically switch to Boost mode. If you press the mode selection button again, the charger will go back to Charge/Maintain mode and stay in Charge/Maintain mode.

BOOST - PRESS FOR SERVICE – Mode selection button was pressed once.

SERVICE - PRESS FOR ENGINE START – Mode selection button was pressed again.

ENGINE START - PRESS FOR BATTERY TEST – Mode selection button pressed once more.

ANALYZING BATTERY (Yellow/orange Charging LED lit) – The charger is checking the battery. This may take up to five minutes.

BAD BATTERY – A sulfated battery is detected.

CHARGE ABORTED - BAD BATTERY Circumstances that could cause an Abort situation during charging:

- The battery is severely sulfated or has a shorted cell and can't reach a full charge.

- The battery is too large or there is a bank of batteries and it doesn't reach full charge within a set time period.

Circumstances that could cause an Abort situation during maintaining:

- The battery is severely sulfated or has a weak cell and will not hold a charge.
- There is a large draw on the battery and the charger has to supply its maximum maintain current for a 12 hour period to keep the battery at full charge.

CHARGING 6V – **xxo/o** (Yellow/orange Charging LED lit) – Plugged into the AC outlet and correctly connected to a discharged 6V battery.

CHARGING 12V – **xxo/o** (Yellow/orange Charging LED lit) – Plugged into the AC outlet and correctly connected to a discharged 12V battery.

BATTERY DISCONNECTED – The charger's connection to the battery has been lost.

FULLY CHARGED - AUTO MAINTAINING (Green Charged/Maintaining LED solid) – Plugged into the AC outlet and correctly connected to a fully charged 6 or 12V battery.

BOOST ON (Yellow/orange Charging LED lit) – The charger is in Boost mode.

SERVICE ON (Yellow/orange Charging LED lit) – The charger is in Service mode.

ENGINE START ON – Shows during the first 2 minutes of Engine Start mode.

READY – Shows after 2 minutes in Engine Start mode. The charger is ready for Engine Start.

COOL DOWN xxx SECONDS REMAINING – The charger is in a mandatory 3 minute (180 second) cool down state.

13. MAINTENANCE AND CARE

A minimal amount of care can keep your battery charger working properly for years.

- Clean the clamps each time you are finished charging. Wipe off any battery fluid that may have come in contact with the clamps to prevent corrosion.
- Occasionally cleaning the case of the charger with a soft cloth will keep the finish shiny and help prevent corrosion.

- Coil the input and output cords neatly when storing the charger. This will help prevent accidental damage to the cords and charger.
- Store the charger unplugged from the AC power outlet in an upright position.
- Store inside, in a cool, dry place. Do not store the clamps on the handle, clipped together, on or around metal, or clipped to the cables.

14. TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
The charger will not turn on when properly connected.	AC outlet is dead.	Check for open fuse or circuit breaker supplying AC outlet.
	Poor electrical connection.	Check power cord and extension cord for loose fitting plug.
	Battery is defective.	Have battery checked.
Battery clamps do not spark when touched together.	The charger is equipped with an auto-start feature. It will not supply current to the battery clamps until a battery is properly connected. The clamps will not spark if touched together.	No problem; this is a normal condition.
The battery is connected and the charger is on, but is not charging.	The charger is in tester mode, not charge mode.	Press the MODE SELECTION button to activate a mode.
No reading on the digital display.	Charger is not plugged in.	Plug the charger into an AC outlet.
	No power at the receptacle.	Check for open fuse or circuit breaker supplying AC outlet.
	The display is in sleep mode, during charging.	Press the Display button to turn the display back on.
Yellow/orange CHARGING LED is solid and the display shows ANALYZING BATTERY .	The charger needs to check the condition of the battery.	The charger has not completed the checking process. This process can last for up to 5 minutes, if the starting voltage is below 8.0V.
The display shows BAD BATTERY .	The battery is sulfated.	Have the battery checked, and replace, if necessary.
The display shows CHARGE ABORTED - BAD BATTERY .	The battery is sulfated and desulfation has failed.	Have the battery checked, and replace, if necessary.
	The battery is too large for the charger.	You need a charger with a higher amp rate.
The display shows CONNECT CLAMPS .	The clamps are not making a good connection.	Check for poor connection at battery and frame.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Short or no start cycle when cranking engine.	No power at receptacle.	Check for open fuse or circuit breaker supplying AC outlet.
	AC cord and/or extension cord is loose.	Check power cord and extension cord for loose fitting plug.
	The clamps are not making a good connection.	Check for poor connection at battery and frame.
	Failure to wait 3 minutes between cranks.	Wait 3 minutes of rest time before the next crank.
	The battery may be severely discharged.	On a severely discharged battery, use the 15<->40A Boost mode for few minutes, to help assist in cranking.
	The battery is drawing more than the engine start rate.	Crank time varies with the amount of current drawn. If cranking draws more than the engine start rate, crank time may be less than 5 seconds.
The charger may be overheated.	The thermal protector may have tripped and needs a little longer to reset. Make sure the charger vents are not blocked. Wait and try again.	

15. SPECIFICATIONS

Input Voltage..... 120V AC @ 60Hz, 5.2A max. continuous, 25A intermittent
Output Voltage.....6V or 12V, with Auto Voltage Detection
Output Current Rating6V/12V DC: 2/6/15A cont.; 40A int. (40 sec. max. on/120 sec. min. off)
125A int. (5 sec. max. on/180 sec. min. off)