PRO-LOGIX

Operator's Manual

Battery Charger Model No. PL2545

(Part No. 141-252-000)

⚠WARNING	
	Failure to follow instructions may cause damage or explosion, always shield eyes. **Read entire instruction manual before use.**

WARNING: This product can expose you to chemicals, including Vinyl-Chloride, Styrene and Acrylonitrile, which are known to the State of California to cause cancer.

A IMPORTANT SAFETY INSTRUCTIONS - READ THESE FIRST

⚠WARNING	
	Read these instructions completely before using the Battery Charger and save them for future reference. Before using the Battery Charger to charge a battery, read these instructions and the instruction manual/safety information provided by the car, truck, boat or equipment manufacturer. Following all manufacturers' instructions and safety procedures will reduce the risk of accident.
	Working around lead-acid batteries may be dangerous. Lead-acid batteries release explosive gases during normal operation, charging and jump starting. Carefully read and follow these instructions for safe use. Always follow the specific instructions in this manual and on the Battery Charger each time you use the Battery Charger. All lead-acid batteries (car, truck and boat) produce hydrogen gas which may violently explode in the presence of fire or sparks. **Do not smoke, use matches or a cigarette lighter while near batteries.** Do not handle the battery while wearing vinyl clothing because static electricity sparks are generated when vinyl clothing is rubbed. Review all cautionary material on the Battery Charger and in the engine compartment.
	Always wear eye protection, appropriate protective clothing and other safety equipment when working near lead-acid batteries. Do not touch eyes while working on or around lead-acid batteries.
	Always store clamps away from each other or common conductors. Improper storage of clamps may cause the clamps to come in contact with each other, or a common conductor, which would be hazardous if the Battery Charger was plugged into an AC outlet.
	Use extreme care while working within the engine compartment, because moving parts may cause severe injury. Read and follow all safety instructions published in the vehicle's Owner's Manual.
	Batteries being charged with the Battery Charger unit likely contain liquid acids which are hazardous if spilled.

WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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 receiver antenna
- Increase the separation between equipment and receiver.
- Connect the equipment into 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.

This Class B digital apparatus complies with Canadian ICES-003.

INPUT/OUPUT Specifications:

INPUT: 120VAC 60Hz 4.5A (6A start)
OUTPUT: 12VDC 20A (28A start, 4 min max)

1. SAVE THESE INSTRUCTIONS – This manual contains important safety and operating instructions for Model No. PL2545.
2. Do not expose charger to rain or snow.
3. Use of an attachment not recommended or sold by the manufacturer may result in a risk of fire, electric shock, or injury to persons.
4. To reduce risk of damage to electric plug and cord, pull by plug rather than cord when disconnecting charger.
5. 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. If extension cord must be used, make sure:
   a. That pins on 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 in good electrical condition; and
   c. That the wire size is large enough for the length of cord as specified below.

Cord Length: ft.(m)	25(8)	50(16)	100(31)	150(46)
AWG size of cord:	18	16	14	12

6. To prevent electric shock - Dispose of battery charger if cord becomes defective.
7. Do not operate charger if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified service center.
8. Do not disassemble charger; take it to a qualified service center when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.
9. To reduce risk of electric shock, unplug the charger from outlet before attempting any maintenance or cleaning. Turning off controls will not reduce this risk.
10. Monitor battery charger daily when using it to maintain battery for extended periods.
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 each time before using your charger, you read this manual and follow the instructions exactly.
    b. To reduce risk of battery explosion, follow these instructions and those published by the battery manufacturer and the manufacturer of any equipment you intend to use in the vicinity of the battery. Review cautionary markings on these products and in the engine compartment.

B 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 eye, immediately flood eye with cold running 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 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.
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 other jewelry to metal, causing a severe burn.
8. Use charger for charging LEAD-ACID batteries only. 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.
9. NEVER charge a frozen battery.

C PREPARATION

PREPARING TO CHARGE BATTERY:

1. If it is 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.
2. Be sure area around battery is well ventilated while battery is being charged. Gas can be forcefully blown away by using a piece of cardboard or other non-metallic material as a fan.
3. Clean battery terminals with a mixture of baking soda and hot water. 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 Maintenance Free Batteries - carefully follow manufacturer's recharging instructions.
5. Study all battery manufacturer's 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 vehicle owner's manual and make sure that charger output voltage matches vehicle voltage.

D LOCATING THE CHARGER

1. Locate the charger as far away from the battery as DC cables permit.
2. Never place the charger directly above the battery being charged; gases from the battery will corrode and damage the charger.
3. Never allow battery acid to drip on the charger when reading specific gravity or filling the battery.
4. Do not operate the charger in a closed area or restrict ventilation in any way.
5. Do not set a battery on top of the charger.
6. Locate the charger at least 18" above the floor.
7. Do not place the charger where rain, snow, or other moisture could drip on it.

E BATTERY CHARGER CONNECTION PRECAUTIONS

1. CAUTION: Connect and disconnect DC output clips only after setting any switches with an OFF position to OFF and removing AC power cord from electric outlet. Never allow clips to touch each other.
2. When hooking up charger, attach one clip to battery and the other to a point away from battery (see sections G & H). Do not hook up charger until reading sections A–J.
3. Always make battery connections prior to plugging charger into AC outlet.

To reduce explosion risk, never connect both clips directly to the battery. When making each connection, twist or rock clip back and forth several times to make a good connection and to reduce the risk of a clip slipping off and creating a spark. Do not twist or rock clip on the battery after the second clip connection is made.

F CHARGING A BATTERY THAT IS INSTALLED IN A VEHICLE

CAUTION: A MARINE (BOAT) BATTERY MUST BE REMOVED AND CHARGED ON SHORE. TO CHARGE IT ON BOARD REQUIRES EQUIPMENT SPECIALLY DESIGNED FOR MARINE USE.

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

1. Position AC and DC cords to reduce risk of damage by hood, door, or moving engine part.
2. Stay clear of fan blades, belts, pulleys, and other parts that can cause injury to persons.
3. Check polarity of battery posts. POSITIVE

(POS, P, +) battery post usually has larger diameter than NEGATIVE (NEG, N, –) post.

4. Determine which post of battery is grounded (connected) to the chassis. If the negative post is grounded to the chassis (as in most vehicles), see Figure 1 and instruction 5a. If the positive post is grounded to the chassis, see instruction 5b.

5. a) For NEGATIVE GROUNDED vehicle, connect POSITIVE (Red) clip from the battery charger to the POSITIVE (POS, P, +) ungrounded post of the battery.

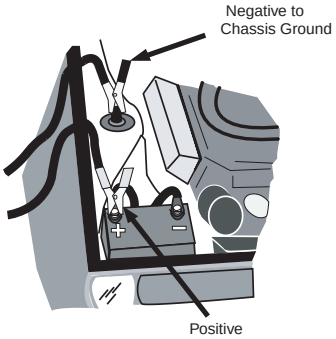
   b) For POSITIVE GROUNDED vehicle, connect the NEGATIVE (Black) clip from the battery charger to the NEGATIVE (NEG, N, –) ungrounded post of the battery. (This arrangement is usually found in pre-1970 foreign vehicles or pre-1970 farm tractors. This is a rare occurrence.)

6. Connect the remaining battery charger clip to the vehicle chassis or engine block, as far away from the battery as possible. 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.

7. When disconnecting charger, turn charging sequence OFF by depressing the START/ STOP button, disconnect AC cord, remove clip from vehicle chassis, and then remove clip from battery terminal.

8. Refer to the Operating Instructions for information on setting selector switches.

Figure 1



G CHARGING A BATTERY OUTSIDE OF A VEHICLE

CAUTION: A MARINE (BOAT) BATTERY MUST BE REMOVED AND CHARGED ON SHORE. TO CHARGE IT ON BOARD REQUIRES EQUIPMENT SPECIALLY DESIGNED FOR MARINE USE.

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

1. Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has a larger diameter than NEGATIVE (NEG, N, –) post.

2. Attach at least a 24” long, #6 gauge (AWG) insulated battery cable to NEGATIVE (Neg, N, –) battery post.

3. Connect POSITIVE (RED) charger clip to POSITIVE (POS, P, +) post of battery.

4. Position yourself and the free end of the cable (installed in step #2) as FAR away from the battery as possible. FACING AWAY FROM THE BATTERY, connect the NEGATIVE (Black) charger clip to the free end of the cable.

5. When charging is complete, turn charging sequence off by depressing the START/ STOP button. Then disconnect charger, always in reverse sequence of connecting procedure and break first connection while as far away from battery as practical.

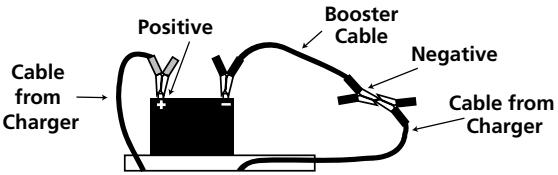


Figure 2

H OPERATING INSTRUCTIONS - CHARGING

BATTERY CHARGING SETTINGS

Upon making a proper battery connection (see Section F or G as applicable), plug AC power cord into an AC receptacle. The unit's display should power up per step 1 below. The charger is now in Standby Mode.

If, upon making the battery connection and powering up the charger, you see an error message on the display, disconnect from AC power supply immediately and determine the cause of the alarm. If you see ***Reverse Polarity Detected***, check all connections. If you see ***Charging Stopped – Voltage Error***, double check that you are connected to a 12V system, which is the only system voltage for which this charger is appropriate. If you ***See Battery Error – Suspect Bad Battery***, the charger has detected battery fault, such as a shorted cell.

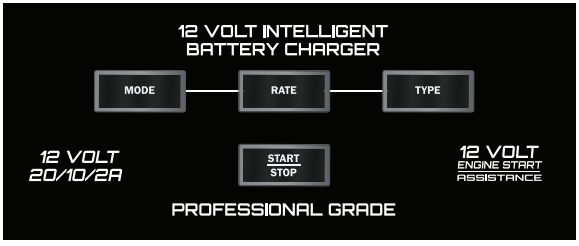
To charge a battery:

1. Upon making a proper connection and powering up the charger, the display will power up, you will see a logo splash screen and then the display will provide the battery status in terms of open circuit voltage and estimated battery percent of charge. The charger is in Standby Mode.
2. Press the MODE button once to enter Battery Charging Mode.
3. Next, choose a battery charging rate by pressing the RATE button. Small batteries found in lawn and garden, motorcycle or ATV applications should be charged in the lowest possible charge rate setting.
4. Next, choose your battery type by pressing the TYPE button until the correct battery type is shown. For more on managing this selection, please see *Section J, Choosing the Battery Type.*
5. Once all settings are correct, press the START/STOP button to commence the charging process. The charger will automatically run through and complete the charging process. During charging, the display will indicate the settings chosen (10A AGM) as well as the battery's voltage and percent of charge. If you press the START/STOP button at any point during the charging sequence, the charger will stop charging and return to Standby Mode.

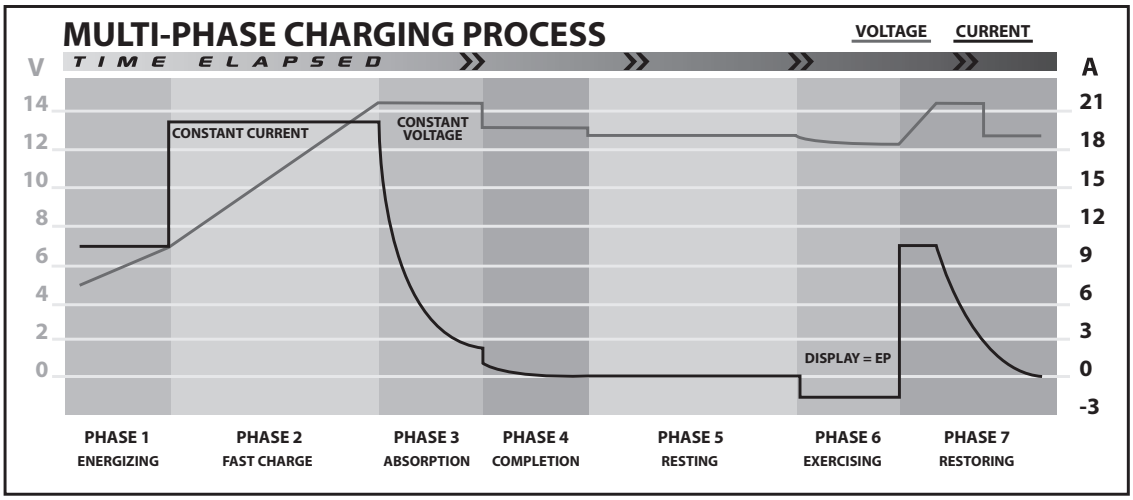
Note: If, at any time in the charging process, an ERROR message appears on the display, disconnect from AC power immediately and determine the cause of the alarm. See Additional Features for a list of conditions that might cause this warning.

Note: The charger is designed to protect against faults and shorts (see Battery Charger Features). If the battery to be charged has an open circuit voltage of less than 1V, the charger will indicate an error. If, after unplugging unit, checking connections and verifying all settings, you determine the problem causing the "fault" condition is battery voltage below 1V, you can override the charger's protection by holding down the START/STOP button for 3 seconds. The charger will commence the charging sequence and, assuming there are no other hindrances that caused the fault indication, will complete the charging process and automatically turn off when the battery has reached full charge.

6. When the battery reaches full charge and enters maintenance mode, the display will read ***Charge Complete – Maintenance Mode***. The charging phase is complete and, if you need to put your battery into service, you can do so now. If you wish to maintain a battery in long term storage, your charger is ideally suited to do so. Its enhanced maintenance mode will provide a beneficial maintenance routine, whether the battery is connected to the charger for days, weeks or months.
7. When you are finished with the charging process, disconnect AC power cord from AC outlet, then disconnect DC leads from vehicle ground (if charging with battery in vehicle) and battery in the reverse sequence of the connection procedure.



CHARGING PROGRESS AND DISPLAY FEEDBACK



The charger uses a proprietary Multi-Stage charging process designed to optimally charge and maintain batteries. An example is shown above. The representation above shows the charging routine when charging a deeply discharged AGM battery in the 20A setting.

ENERGIZING PHASE

The charging process includes an initial energizing mode in which the charger determines the best charging path for the connected battery. From there, the charger can enter the Fast Charge stage (most cases), Soft Start Mode, Battery Repair Mode or stop the charging routine because unsafe battery conditions (short, etc.) are detected.

SOFT START MODE

Soft Start Mode is activated when the charger is connected to a deeply discharged battery. This mode protects the battery during the initial charge period, as the battery's voltage rises to a more normal level, and is beneficial for the long-term health of the battery. If this mode is activated, the display will read ***Soft Start Mode Engaged***.

BATTERY REPAIR MODE

During the Energizing Phase, if the charger detects the presence of battery sulfation, it will activate If this mode is engaged, the display will read ***Battery Repair Mode Engaged***. This indicates the charge time will be extended while the charger attempts to recondition the battery.

PRO-LOGIX PHASES 5-7: IDEAL BATTERY MAINTENANCE

A key feature of this charger is how it manages a battery that remains on the charger after a complete charge has been achieved, such as during the storage of a seasonal use vehicle. Once the charger reaches the Resting Phase, its output is virtually turned off, except to occasionally monitor battery condition. This is beneficial for the connected battery, as it reduces chemical reaction within the battery compared to traditional charger maintenance modes. This greatly reduces the chance of damaging a battery in long-term storage.

In addition, in Phase 6 Exercising, we introduce a load on the battery, simulating active use, and then recharge the battery to full charge. This Exercising feature keeps the battery in optimal condition during periods of storage and non-use.

ADDITIONAL FEATURES

MULTIPLE BATTERY COMPATIBILITY
The charger will properly charge a wide variety of battery types, including Conventional, Maintenance Free, AGM, Spiral Wound, Gel Cell, Marine and Deep Cycle batteries.

SMART CLAMP TECHNOLOGY
The charger will send power to the output leads only when a proper battery connection is made.

REVERSE POLARITY PROTECTION
Guards against reverse connections. When this protection mode is engage, the display will read ***Reverse Polarity Detected*** and power will not be sent to the output cables/clamps until the reverse condition is corrected.

BATTERY FAULT PROTECTION
Guards against excessively charging compromised batteries. When this protection mode is engaged, the display will read ***Battery Error – Suspect Bad Battery*** and power will not be sent to the output cables/clamps. Conditions that cause this error include: if the battery voltage does not rise appropriately during the charging process (indicating a shorted cell) or if the maximum charge time has been exceeded.

SHORT CIRCUIT PROTECTION
Guards against shorted connections. When this protection mode is engage, the display will read ***Battery Error – Suspect Bad Battery*** and power will not be sent to the output cables/clamps.

OVER-VOLTAGE PROTECTION
Guards against charging errors where the charger is programmed to charge in a different voltage than the detected voltage of the battery. When this protection mode is engage, the display will read ***Charging Stopped – Voltage Error*** and power will not be sent to the output cables/clamps.

OVERHEAT PROTECTION
Guards against overheat conditions within the charger. When this protection mode is engaged, the display will read ***Overheat Condition Detected*** and power will not be sent to the output cables/clamps. Once the charger cools down, it will resume charging.

I CHOOSING THE CHARGING RATE

For the small batteries found in motorcycles, jet skis, snowmobiles and lawn tractors, always charge on the lowest possible charge rate setting. It is not recommended to charge these smaller batteries at a high charge rate – a low charge rate is most beneficial.

For large batteries found in cars, trucks, vans, SUVs, agricultural equipment and commercial vehicles, higher charging rates are appropriate. Please always remember to reference the charging instructions on the battery or the vehicle in which the battery is installed for specific charging requirements.

J CHOOSING THE BATTERY TYPE

For Conventional and Maintenance Free flooded (wet) batteries, the ideal Battery Type selection is “STD”.

⚠ **WARNING:** This battery charger is designed to charge lead acid batteries. Using it to charge a lithium battery will result in serious property damage and/or personal injury. Never charge a lithium battery with a charger that does not have a specific setting for the exact type of lithium battery to be charged.

For batteries identified as AGM construction, the ideal Battery Type selection is “AGM”.

For batteries identified as Gel Cell construction, the ideal Battery Type selection is “GEL”.

For most Spiral Wound batteries, the best Battery Type selection is “AGM”.

For batteries identified as Deep Cycle, determine the construction of the battery. Is it a wet cell battery or

another type of construction? This will determine the proper Battery Type selection.

For batteries identified as Marine, determine the construction of the battery. Is it a wet cell battery or another type of construction? This will determine the proper Battery Type selection.

K OPERATING INSTRUCTIONS - ENGINE STARTING

The battery charger can provide a increased-current output to help start a vehicle with a weak battery. However, the computer in some vehicles can be damaged when attempting to jump start.

⚠ ALWAYS READ THE VEHICLE OPERATOR'S MANUAL BEFORE BOOSTING to determine if jump starting can do damage to the vehicle. If not, read and follow these instructions.

CAUTION: Do not try to jump start a vehicle that does not contain a battery or you may damage electrical systems in the vehicle.

1. Upon making a proper battery connection (see Section F), plug AC power cord into an AC receptacle. The display will power up, you will see a logo splash screen and then the display will provide the battery status in terms of open circuit voltage and estimated battery percent of charge. The charger is now in Standby Mode.

2. Charge the battery for 10 minutes using the appropriate settings for the size and type of battery installed in the vehicle.

3. After 10 minutes, press the START/STOP button to stop charging and return the charger to Standby Mode.

4. Press the MODE button twice until the screen reads ***Engine Start Assist Mode***. Then, press START/STOP button. You have entered Start Mode.

5. The screen will read ***Start Mode Engaged*** and the charger will attempt to raise the battery's voltage to a level suitable to start the vehicle, which could take several minutes. One of three outcomes will occur:

   a. The charger will bring the battery to a suitable level. The display will read ***Start Mode Complete – Start Vehicle***. When this happens, attempt to start the vehicle.
   b. The start routine could time out before getting the battery to a suitable level. In this case, the display will read ***Start Mode Time Out – Resume Start Mode***. In this case, we suggest running the start mode a again.
   c. The charger can detect a problem battery, and, if it does, it will stop charging and the display will read ***Battery Error Detected – Run Full Charge Mode***. In this case, we suggest attempting to charge the battery to overcome the problem.

CAUTION: Excessive, continuous engine cranking can damage vehicle starter motors.

6. When you are finished with the boosting process, press the START/STOP button to return the charger to Standby Mode. Disconnect AC power cord from AC outlet, then disconnect DC leads from vehicle ground and battery in the reverse sequence of the connection procedure.

Note: If the engine spins but fails to start after several starting attempts, there is an engine problem not related to the starting system. Discontinue cranking the engine until the other problem is found and corrected.

L CHARGER CARE & MAINTENANCE

CAUTION – Make sure charger is unplugged from electrical outlet before performing any maintenance.

A minimum amount of care can keep your battery charger working and looking good for years.

1. Clean the clamps after each use. Wipe off any battery fluid that may have come in contact with the clamps to prevent corrosion. Battery fluid may be neutralized with a solution of water and baking soda
2. If needed, the case may be wiped clean with a soft cloth. There are no user-serviceable parts inside.