



INDUSTRIAL SERIES™ **900**

JUMPSTART SYSTEM & POWER SUPPLY

PORTABLE, CORDLESS, RECHARGEABLE 12-VOLT DC* POWER SUPPLY

COMPLETELY PORTABLE, SAFE & CONVENIENT



***INCLUDES INSTRUCTIONS FOR 110-VOLT AC POWER OPTION
(MODEL VEC023 INVERTER: INCLUDED WITH MODEL VEC021AC; NOT INCLUDED WITH MODEL VEC021)**

THIS MANUAL CONTAINS IMPORTANT INFORMATION REGARDING SAFETY, OPERATION, MAINTENANCE AND STORAGE OF THIS PRODUCT. BEFORE USE, READ AND UNDERSTAND ALL CAUTIONS, WARNINGS, INSTRUCTIONS AND PRODUCT LABELS, PLUS YOUR VEHICLE'S BATTERY MANUFACTURER GUIDELINES. FAILURE TO DO SO COULD RESULT IN POSSIBLE INJURY OR PROPERTY DAMAGE.

OWNER'S MANUAL

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WARNINGS

WARNING STATEMENTS IDENTIFY CONDITIONS OR PRACTICES THAT MAY RESULT IN PERSONAL INJURY OR LOSS OF LIFE.

- WHEN WORKING WITH LEAD ACID BATTERIES, ALWAYS MAKE SURE IMMEDIATE ASSISTANCE IS AVAILABLE IN CASE OF ACCIDENT OR EMERGENCY.
- ALWAYS USE PROTECTIVE EYEWEAR WHEN USING THIS PRODUCT: CONTACT WITH BATTERY ACID MAY CAUSE BLINDNESS AND/OR SEVERE BURNS, BE AWARE OF FIRST AID PROCEDURES IN CASE OF ACCIDENTAL CONTACT WITH BATTERY ACID.
- THERE IS A RISK OF EXPLOSIVE GASES BEING RELEASED WHEN LEAD ACID BATTERIES ARE BEING CHARGED OR DISCHARGED. FAILURE TO FOLLOW INSTRUCTIONS MAY CAUSE PROPERTY DAMAGE, EXPLOSIVE HAZARD, AND/OR PERSONAL INJURY.
- WHEN CHARGING UNIT FROM A 110-VOLT AC ELECTRICAL OUTLET IN ANY WET OR DAMP AREA, MAKE SURE THAT THE OUTLET USED IS PROTECTED BY A GROUND FAULT INTERRUPT (GFI) SWITCH.
- WHEN CHARGING THE UNIT NEAR WATER, DO NOT ALLOW THE ELECTRICAL CORDS AND OUTLETS TO GET WET OR COME NEAR WATER—ELECTRICAL SHOCK COULD RESULT!
- JUMPSTART PROCEDURES SHOULD ONLY BE PERFORMED IN A SAFE, DRY, WELL VENTILATED AREA.
- ALWAYS STORE BATTERY CLAMPS IN BUILT-IN HOLSTERS WHEN NOT IN USE. NEVER TOUCH BATTERY CLAMPS TOGETHER—THIS CAN CAUSE DANGEROUS SPARKS, POWER ARCING, AND/OR EXPLOSION.
- WHEN USING THIS UNIT IN PROXIMITY TO THE VEHICLE'S BATTERY AND ENGINE, STAND THE UNIT ON A FLAT, STABLE SURFACE, AND BE SURE TO KEEP ALL CLAMPS, CORDS, CLOTHING AND BODY PARTS AWAY FROM MOVING VEHICLE COMPONENTS.
- DO NOT WEAR VINYL CLOTHING WHEN JUMPSTARTING A VEHICLE—FRICTION CAN CAUSE DANGEROUS STATIC ELECTRICITY SPARKS. REMOVE ALL JEWELRY OR METAL OBJECTS THAT COULD CAUSE SHORT CIRCUITS OR REACT WITH BATTERY ACID.
- ALWAYS DISCONNECT THE NEGATIVE (**BLACK**) JUMPER CABLE FIRST: FOLLOWED BY THE POSITIVE (**RED**) JUMPER CABLE.
- NEVER ALLOW RED AND BLACK CLAMPS TO TOUCH EACH OTHER OR ANOTHER COMMON METAL CONDUCTOR—THIS COULD CAUSE DAMAGE TO THE UNIT AND/OR CREATE SPARKING/EXPLOSION HAZARD. ALWAYS STORE BATTERY CLAMPS IN BUILT-IN HOLSTERS WHEN NOT IN USE.
- DO NOT EXPOSE BATTERY TO FIRE OR INTENSE HEAT AS IT MAY EXPLODE. BEFORE DISPOSING OF THE BATTERY, PROTECT EXPOSED TERMINALS WITH HEAVY-DUTY ELECTRICAL TAPE TO PREVENT SHORTING (SHORTING CAN RESULT IN INJURY OR FIRE).
- DO NOT SMOKE OR USE INFLAMMABLE ITEMS (MATCHES, CIGARETTE LIGHTERS, ETC.) WHILE WORKING ON A VEHICLE'S BATTERY SYSTEM.
- KEEP UNIT OUT OF REACH OF CHILDREN (WHETHER STORED, OR IN USE).

FIRST AID:

- **SKIN:** IF BATTERY ACID COMES IN CONTACT WITH SKIN, RINSE IMMEDIATELY WITH WATER, THEN WASH THOROUGHLY WITH SOAP AND WATER. IF REDNESS, PAIN, OR IRRITATION OCCURS, SEEK IMMEDIATE MEDICAL ATTENTION.
- **EYES:** IF BATTERY ACID COMES IN CONTACT WITH EYES, FLUSH EYES IMMEDIATELY—FOR MINIMUM OF 15 MINUTES—SEEK IMMEDIATE MEDICAL ATTENTION.

CAUTIONS

CAUTION STATEMENTS ADVISE AGAINST CERTAIN CONDITIONS AND PRACTICES THAT MAY RESULT IN DAMAGE TO VEHICLES, APPLIANCES, THE INDUSTRIAL SERIES 900™ JUMPSTART SYSTEM AND/OR THE POWER FORCE™ INVERTER.

- **IMPORTANT:** ALTHOUGH THIS UNIT IS DELIVERED IN A PARTIALLY-CHARGED STATE - YOU MUST FULLY CHARGE IT WITH THE SUPPLIED 110-VOLT AC CHARGER FOR A FULL 24 HOURS, BEFORE USING IT FOR THE FIRST TIME.
- **IMPORTANT:** DO NOT OVERCHARGE UNIT, THIS WILL REDUCE BATTERY LIFE.
- USE ONLY THE SUPPLIED CORDS FOR RECHARGING/OPERATING THIS UNIT. DO NOT RECHARGE FOR MORE THAN 3-4 HOURS MAXIMUM USING 12-VOLT DC METHOD. RECHARGE UNIT AFTER EACH USE.
- ALL ON/OFF SWITCHES SHOULD BE IN THE OFF POSITION WHEN THE UNIT IS CHARGING OR NOT IN USE. MAKE SURE ALL SWITCHES ARE IN THE OFF POSITION BEFORE CONNECTION TO A POWER SOURCE OR LOAD.
- NEVER INSERT ANYTHING OTHER THAN THE SUPPLIED POWER/RECHARGING CORDS OR RECOMMENDED APPLIANCE POWER/RECHARGING CORDS INTO THE 12-VOLT DC CHARGING/POWER SOCKET ON THIS UNIT. DO NOT USE ANY ACCESSORY THAT IS NOT RECOMMENDED OR PROVIDED BY THE MANUFACTURER.
- DO NOT USE THIS UNIT TO OPERATE APPLIANCES THAT DRAW MORE THAN 10 AMPS.
- THIS SYSTEM IS DESIGNED TO BE USED ONLY ON VEHICLES WITH 12-VOLT DC BATTERY SYSTEMS. DO NOT CONNECT TO A 6-VOLT OR 24-VOLT BATTERY SYSTEM.
- THIS SYSTEM IS NOT DESIGNED TO BE USED AS A REPLACEMENT FOR A VEHICULAR BATTERY. DO NOT ATTEMPT TO JUMPSTART A VEHICLE THAT DOES NOT HAVE A BATTERY INSTALLED.
- VEHICLES THAT HAVE ON-BOARD COMPUTERIZED SYSTEMS MAY BE DAMAGED IF VEHICLE BATTERY IS JUMPSTARTED. BEFORE JUMPSTARTING, READ THE VEHICLE'S OWNER'S MANUAL TO CONFIRM THAT EXTERNAL-STARTING ASSISTANCE IS ADVISED.
- EXCESSIVE ENGINE CRANKING CAN DAMAGE A VEHICLE'S STARTER MOTOR. IF THE ENGINE FAILS TO START AFTER THE RECOMMENDED NUMBER OF ATTEMPTS. DISCONTINUE JUMPSTART PROCEDURE AND LOOK FOR OTHER PROBLEMS THAT MAY NEED TO BE CORRECTED.
- ALTHOUGH THIS UNIT CONTAINS A NON-SPILLABLE BATTERY, IT IS RECOMMENDED THAT UNIT BE KEPT UPRIGHT DURING STORAGE, USE AND RECHARGING. TO AVOID POSSIBLE DAMAGE THAT MAY SHORTEN THE UNIT'S WORKING LIFE, PROTECT IT FROM DIRECT SUNLIGHT, DIRECT HEAT, AND/OR MOISTURE.
- CHECK UNIT PERIODICALLY FOR WEAR AND TEAR. REPLACE WORN OR DEFECTIVE PARTS IMMEDIATELY - CONTACT VECTOR™ CUSTOMER SERVICE DEPARTMENT AT (954) 923-1155.
- DO NOT ATTEMPT TO JUMPSTART A FROZEN BATTERY.
- NEVER SUBMERGE THIS UNIT IN WATER.
- DO NOT USE INVERTER WITH POSITIVE GROUND ELECTRICAL SYSTEMS (THE MAJORITY OF MODERN AUTOMOBILES, RVs, AND TRUCKS ARE NEGATIVE GROUND). NOTE: REVERSE POLARITY CONNECTION WILL RESULT IN DAMAGE TO THE JUMPSTART SYSTEM.
- THIS UNIT WILL NOT OPERATE APPLIANCES AND EQUIPMENT THAT PRODUCE HEAT, SUCH AS HAIR DRYERS, MICROWAVE OVENS, AND TOASTERS.

BATTERY REPLACEMENT:

IT IS RECOMMENDED TO RETURN UNIT TO VECTOR™ CUSTOMER SERVICE FOR BATTERY REPLACEMENT: CONTACT (954) 923-1155

BATTERY DISPOSAL:

THIS UNIT CONTAINS A MAINTENANCE-FREE, SEALED, NON-SPILLABLE, LEAD ACID BATTERY WHICH MUST BE DISPOSED OF PROPERLY. SOME STATES REQUIRE RECYCLING. DISPOSAL QUESTION? IN USA, CALL 1-800-RE-USE-PB (783-7372), OR VECTOR CUSTOMER SERVICE DEPARTMENT (954)923-1155.

Congratulations on selecting the Vector™ INDUSTRIAL SERIES™ 900 JUMPSTART SYSTEM & POWER SUPPLY.

Please read this guide carefully before use to ensure optimum performance and avoid damage to the unit or items that you are using it with.

In addition to a built-in 12-volt power supply, the **INDUSTRIAL 900™ JUMPSTART SYSTEM** has several exclusive features that set it apart from other similar devices. Primarily, it includes a special, built-in mounting (Patent Pending) that allows for the simple, slide-in addition of a 110-volt AC power inverter (sold separately for Model VEC021; included with Model VEC021AC). This will allow you to upgrade the basic unit to run 110-volt AC devices, while still maintaining the unit's one-piece, compact styling.

The **INDUSTRIAL 900™ JUMPSTART SYSTEM** is a convenient, easy-to-carry, completely portable system that is perfect for emergency situations and remote locations - when jumpstarting assistance or permanent utility power sources are not available. It is also ideal for use with Vector™ 12-volt DC cordless, portable, rechargeable products.

For easy reference, this manual includes all information and specifications pertaining to the following Vector™ Model Numbers:

VEC021 INDUSTRIAL SERIES™ 900 JUMPSTART SYSTEM & POWER SUPPLY—Jumpstart System and 12-volt DC power supply.

Note: You can purchase a Vector™ **Power Force 150™** inverter (sold separately) to upgrade this model to the same capabilities and specifications as the VEC021AC. (Contact Vector™ customer service for your newest retailer). Use the VEC021 to:

-Jumpstart

Any vehicle with a standard 12-volt DC battery system: boat, truck, car, airplane, RV, personal watercraft, snowmobile, tractor, etc.

-Operate: 12-volt DC

Fans, inflators, fluorescent work lights, cellular phones*, air compressors, inflators, spotlights, TVs, portable radios, cassette or CD players, and more. *Can quick-charge a cellular phone by using the phone's 12-volt DC adapter cord.

VEC021AC INDUSTRIAL SERIES™ 900 JUMPSTART SYSTEM & POWER SUPPLY—Jumpstart System and 12-volt DC/110-volt AC power supply (this model includes the detachable VEC023 **Power Force 150™** inverter). Use the VEC021AC as jumpstarter and 12-volt power supply (as above), PLUS:

Operate: 110-volt AC

Laptop computers and printers, fax machines, reading lamps, fans, small appliances and power hand tools (up to 1.5-amp), and more. Note: You can also **Recharge: 110-volt AC**: Small 110-volt AC devices (laptop computers, cellular phones, camcorders, power tool batteries) that have an appropriate recharging adapter with a 110-volt AC standard-type plug.

VEC023 Power Force 150™ inverter—included with Model VEC021 AC; sold separately for Model VEC021. This 150/300 watt power inverter is one in a series of the most advanced DC to AC inverters available today, providing a convenient, portable source of electricity for running 110-volt AC appliances or accessories in areas where permanent utility power is not available. Can be added to Model VEC021 for the additional convenience of a 110-volt AC power supply. Important information and specifications regarding the inverter are included in the back of this manual.

VEC021/VEC021AC INDUSTRIAL SERIES™ 900 JUMPSTART SYSTEM & POWER SUPPLY

Figure 1.

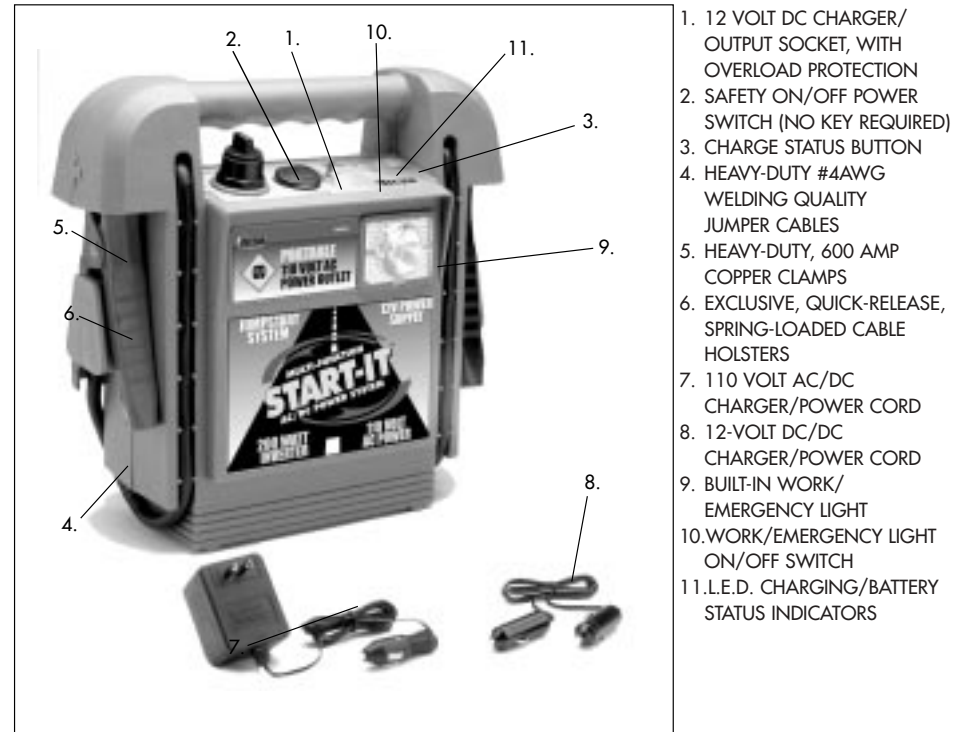
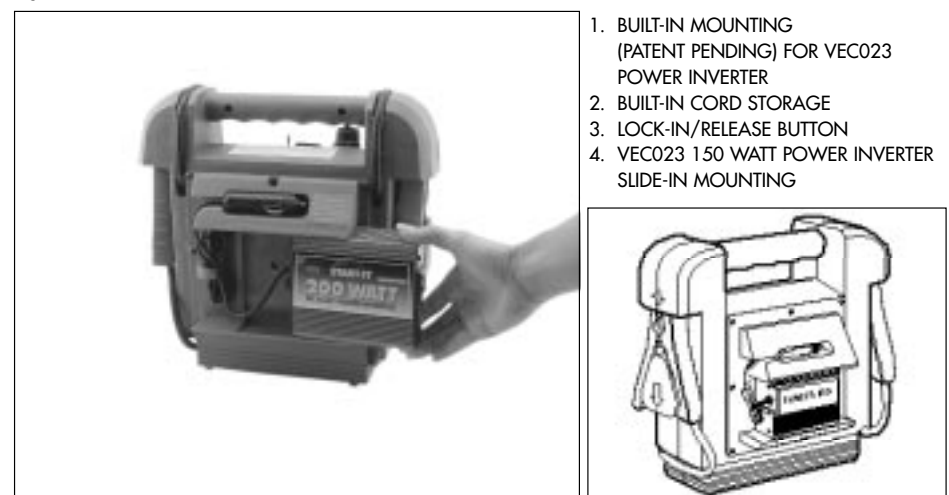
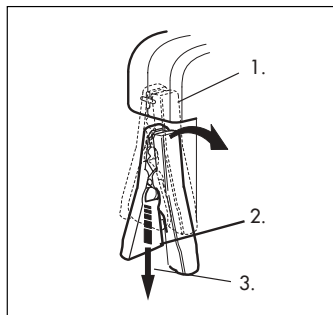


Figure 2.



1. BUILT-IN MOUNTING (PATENT PENDING) FOR VEC023 POWER INVERTER
2. BUILT-IN CORD STORAGE
3. LOCK-IN/RELEASE BUTTON
4. VEC023 150 WATT POWER INVERTER SLIDE-IN MOUNTING

Figure 3.

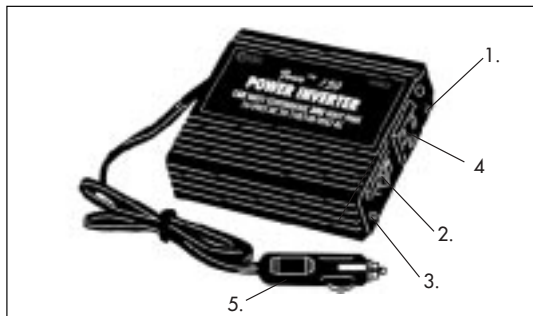


1. FIXED CLAMP COVER
2. CLAMP HOLSTER SHOULDER
3. **SLIDE DOWN & ROTATE CLAMP OUTWARD FROM BACK OF UNIT TO REMOVE**

FEATURES:

- Heavy duty, **INDUSTRIAL SERIES™**, professional quality
- Provides **INSTANT POWER**—whenever, and wherever it's needed.
- Easy-to-use: emergency jumpstarter for cars, trucks, jet skis, snowmobiles, trucks, farm equipment, airplanes, boats, RVs (any 12-volt DC battery system).
- Ideal for garage, marina, service station, towing service, airport, farm/ranch, home, tailgate parties, beach, picnics, campsite, wilderness, utility power outages, emergency repairs.
- Sturdy and compact unit provides up to 50 hours of completely portable 12-volt DC power
- Built-in cigarette lighter-type socket for use with 12-volt DC accessories.
- Includes exclusive, built-in mounting (Patent Pending) for 110-volt AC power option—simply slide in the VEC023 150/300 watt inverter (sold separately for VEC021, included in VEC021AC) for safe, portable 110-volt AC power supply in any remote location or emergency situation.
- **Portable, safe & convenient**—goes where extension cords can't reach and utility power is not available.
- ON/OFF safety power switch (**no key required, no key to get lost!**)
- **Cordless/rechargeable**—includes charging cords for standard 110-volt AC wall socket, and vehicle's 12-volt DC accessory outlet.
- **Powerful**—400 instantaneous cranking amps; 900 peak amps.
- Solid-state, automatic operation and built-in circuit protection.
- **Safe** to use, transport, store.
- Includes non-spillable, maintenance-free, heavy duty, 17 amp hour sealed battery.
- Requires no maintenance (other than recharging) for optimum operation.
- Molded high-impact case is tough and durable.
- **Heavy duty, industrial grade copper clamps and #4AWG jumper cables—with exclusive spring-loaded, quick-release storage holsters.**
- 110-volt AC charger is Underwriter Laboratories safety tested and listed.
- Easy-to-read L.E.D. battery charging/status indicators.
- Built-in work/emergency light for roadside repairs and remote locations without utility power.

Figure 4.



1. INVERTER POWER INDICATOR
2. INVERTER ON/OFF SWITCH
3. INVERTER OVERLOAD/LOW BATTERY INDICATOR
4. STANDARD HOUSEHOLD-TYPE 110-VOLT AC POWER SOCKET
5. 12-VOLT DC CIGARETTE LIGHTER TYPE PLUG

IMPORTANT INFORMATION:

CAUTION: READ INSTRUCTION MANUAL AND PRODUCT LABELING CAREFULLY, FOR COMPLETE INSTRUCTIONS, BEFORE USING THIS PRODUCT. FOLLOW RECOMMENDED WARNINGS, CAUTIONS, AND SAFETY PROCEDURES, AND MANUFACTURER GUIDELINES FOR YOUR VEHICLE BATTERY.

- **IMPORTANT:** ALTHOUGH THIS UNIT IS DELIVERED IN A PARTIALLY-CHARGED STATE—YOU MUST FULLY CHARGE IT WITH THE SUPPLIED 110-VOLT AC CHARGER FOR A FULL 24 HOURS, BEFORE USING IT FOR THE FIRST TIME.
- **IMPORTANT:** DO NOT OVERCHARGE UNIT, THIS WILL REDUCE BATTERY LIFE. CHARGE ONLY UNTIL “CHARGED” INDICATOR IS LIT. AFTER INITIAL CHARGE, LIMIT RECHARGE TIMES TO:
12-VOLT DC—3-4 HOURS MAX.
110-VOLT AC—16-20 HOURS MAX.
- **NOTE:** AFTER GREEN “CHARGED” INDICATOR LIGHT COMES ON, UNIT CAN BE TOP-OFF CHARGED FOR AN ADDITIONAL 2-4 HOURS.
- FULLY RECHARGE UNIT AFTER EACH USE, OR WHEN CHARGE STATUS INDICATOR SHOWS LOWER THAN “FULL”, AND EVERY 2 MONTHS WHEN NOT IN USE.
- ALWAYS RECHARGE IN A DRY, WELL-VENTILATED AREA, AWAY FROM WATER.
- **WHEN CHARGING IN ANY WET OR DAMP AREA FROM A 110-VOLT ELECTRICAL OUTLET, MAKE SURE THAT THE OUTLET USED IS PROTECTED BY A GROUND FAULT INTERRUPT SWITCH.**
- WHEN CHARGING THE UNIT NEAR WATER (POOL, DOCKSIDE, BEACH, ETC.) **DO NOT ALLOW THE ELECTRICAL CORDS AND OUTLETS TO GET WET OR COME NEAR WATER—ELECTRICAL SHOCK COULD RESULT!**
- USE ONLY THE SUPPLIED CORDS FOR RECHARGING/OPERATING THIS UNIT.
- IT IS RECOMMENDED THAT UNIT BE KEPT UPRIGHT DURING USE AND WHEN RECHARGING.
- WHEN NOT IN USE, STORE UNIT WITH ON/OFF SWITCH TURNED OFF.

SAFETY WARNINGS:

- THERE IS A RISK OF EXPLOSIVE GASES BEING RELEASED WHEN BATTERIES ARE IMPROPERLY CHARGED OR DISCHARGED. FAILURE TO FOLLOW INSTRUCTIONS MAY CAUSE PROPERTY DAMAGE, EXPLOSIVE HAZARD, AND/OR PERSONAL INJURY.
- ALWAYS USE PROTECTIVE EYEWEAR WHEN USING THIS PRODUCT: CONTACT WITH BATTERY ACID MAY CAUSE BLINDNESS AND/OR SEVERE BURNS.
- KEEP OUT OF REACH OF CHILDREN.
- ALWAYS STORE BATTERY CLAMPS IN BUILT-IN HOLSTERS WHEN NOT IN USE. NEVER TOUCH BATTERY CLAMPS TOGETHER - THIS CAN CAUSE DANGEROUS SPARKS, POWER ARCING, AND/OR EXPLOSION.

FIRST AID:

- **SKIN:** IF BATTERY ACID COMES IN CONTACT WITH SKIN, RINSE IMMEDIATELY WITH WATER, THEN WASH THOROUGHLY WITH SOAP AND WATER. IF REDNESS, PAIN, OR IRRITATION OCCURS, SEEK IMMEDIATE MEDICAL ATTENTION.
- **EYES:** IF BATTERY ACID COMES IN CONTACT WITH EYES, FLUSH EYES IMMEDIATELY—FOR MINIMUM OF 15 MINUTES—SEEK IMMEDIATE MEDICAL ATTENTION.

1. INTRODUCTION

The Vector™ **INDUSTRIAL SERIES™ 900 JUMPSTART SYSTEM & POWER SUPPLY** is a compact, durable and portable jump start system for vehicles and boats that have a standard 12-volt DC battery system. This self-contained, rechargeable system will start most vehicles and boats without the need for a host vehicle or 110-volt AC power supply. It can also be used as a safe, portable source of 12-volt DC electric power in remote locations and/or emergency situations. When used together with a Vector™ **Power Force 150™-watt power inverter** (sold separately for Model VEC021; included with model VEC021AC) the **INDUSTRIAL 900™** will also provide a completely portable source of 110-volt AC electric power.

The **INDUSTRIAL 900™** has an easy-to-read, L.E.D. (Light Emitting Diode) indicator that shows when the unit is fully charged, or the level of charge in the battery. A 12-volt DC cigarette lighter-type socket is provided for use with appliances that can operate from a vehicle cigarette lighter. This allows maximum portability and utility when the **INDUSTRIAL 900™** is used in remote locations.

For maximum convenience, the Vector™ **INDUSTRIAL 900™** can be recharged from any standard 110-volt AC or 12-volt DC power source using the built-in 12-volt socket and the appropriate charging/adaptor cord. When depressed, the PUSH FOR STATUS switch will show the battery 's power level status (from Low to Full). The green L.E.D. CHARGED indicator illuminates when the unit is fully recharged. An ON/OFF switch operates the built-in work/emergency light.

WARNING:

Lead-acid batteries generate hydrogen gas during normal operation. More gas is generated when the battery is charging. Hydrogen gas is:

1. Explosive
2. Poisonous to breathe
3. Highly flammable

To avoid an explosion and/or the possibility of being splashed with battery acid:

- NEVER allow the red and black clamps to touch each other or a common metal object.
- ONLY attempt to jumpstart a vehicle or boat in a WELL ventilated area.
- ALWAYS CONNECT THE RED (+) CLAMP TO THE POSITIVE (+) BATTERY TERMINAL FIRST.
- DO NOT CONNECT THE BLACK (-) CLAMP TO THE NEGATIVE (-) BATTERY TERMINAL.
- DO CONNECT THE BLACK (-) CLAMP TO A NON-MOVING METAL PART ON THE ENGINE.

CAUTIONS:

1. To avoid possible damage that may shorten the unit's working life, protect this unit from direct sunlight, direct heat, and/or moisture.
2. This system is designed to be used ONLY on vehicles or boats with 12-volt DC battery systems.
3. This system is NOT designed to be used as a replacement for a vehicular battery.

RECOMMENDATIONS FOR OPTIMUM PERFORMANCE OF THE INDUSTRIAL 900™ JUMPSTART SYSTEM:

WARNING: NEVER insert anything other than the supplied power/recharging cords or recommended appliance power/recharging cords into the charging/power sockets on this unit.

IMPORTANT: The safety ON/OFF switch should be in the OFF position when the unit is charging, or not in use.

2. USING THE INDUSTRIAL 900™ AS A JUMPSTART SYSTEM

CAUTIONS:

- Before using this system to jump start any vehicle or boat, read and understand all instructions, safety tips, warnings and cautions, and first aid information provided in this manual and on the product labeling. Additional important information may also be provided by the vehicle 's battery system manufacturer.
- BE AWARE OF FIRST AID PROCEDURES BEFORE ATTEMPTING JUMPSTART PROCEDURE.
- ALWAYS wear protective eyewear when working with a lead acid-type battery.
- DO NOT smoke or use inflammable items (matches, cigarette lighters, etc.) while working on a vehicle 's battery system.
- When using this vehicle in proximity to the vehicle 's battery and engine, stand the unit on a flat, stable surface, and be sure to keep all cords and cables well away from any moving parts.
- Check unit periodically for wear and tear. Replace worn or defective parts immediately - contact Vector™ Customer Service Department at (954) 923-1155.
- Do not attempt to jumpstart a frozen battery.
- NEVER submerge this unit in water.
- Do not wear vinyl clothing when jumpstarting a vehicle—friction can cause dangerous static electricity sparks. Remove all jewelry or metal objects—they can cause short circuits or react with battery acid to cause severe burns. Remove or secure any loose clothing items, and restrain long hair, before attempting jumpstart procedure.

WARNINGS:

- Vehicles that have on-board computerized systems may be damaged if vehicle battery is jumpstarted. Before jumpstarting this type of vehicle, read the vehicle's owner's manual to confirm that external-starting assistance is advised.
- Excessive engine cranking can damage the vehicle 's starter motor. If the engine fails to start after the recommended number of attempts, discontinue jumpstart procedure and look for other problems that may need to be corrected.

2.1 EASY, STEP-BY-STEP JUMPSTARTING INSTRUCTIONS

1. Turn OFF vehicle ignition and all accessories (radio, a/c, lights, cell phone, etc.). Place vehicle in "park" and set the emergency brake.
2. Make sure jumpstart system power switch is turned OFF.
3. Follow procedure for negative or positive grounded system, as follows:
NEGATIVE GROUNDED SYSTEM (NEGATIVE BATTERY TERMINAL IS CONNECTED TO CHASSIS—MOST COMMON METHOD):
 - TO REMOVE BOOSTER CLAMPS FROM PROTECTIVE HOLSTER (FIG. 3): SIMPLY PULL DOWN ON CLAMP, (SHOULDER REST IS SPRING LOADED)—ROTATE TOP OF CLAMP OUTWARD WHILE YOU PULL DOWN—WHEN CLEAR OF CLAMP COVER REMOVE CLAMP. TO REPLACE BOOSTER CLAMP INTO PROTECTIVE HOLSTER—RETURN CLAMP TO SHOULDER REST, ROTATE OUT AND PUSH DOWN THEN SLIDE CLAMP UP INTO PROTECTIVE COVER.
 - CONNECT POSITIVE (+) RED CLAMP TO VEHICLE BATTERY 'S POSITIVE TERMINAL.
 - CONNECT NEGATIVE (-) BLACK CLAMP TO CHASSIS OR A SOLID, NON-MOVING, METAL VEHICLE COMPONENT OR BODY PART. NEVER CLAMP DIRECTLY TO NEGATIVE BATTERY TERMINAL OR MOVING PART.
4. Turn jumpstart system 's power switch to ON position.
5. Start vehicle (do not turn key for longer than 5-6 seconds).
6. After vehicle starts, turn jumpstart system 's power switch to OFF position. Remove clamps (disconnect the negative (Black) jumper cable first; followed by the positive (Red) jumper cable) and replace them in the built-in storage holsters.

NOTE: In the rare event that the vehicle to be started has a Positive Grounded System (positive battery terminal is connected to chassis): Replace steps 1 and 2 above with the following steps, and then proceed to steps 4-6 above.

1. Connect negative (-) black clamp to vehicle battery 's negative terminal.
2. Connect positive (+) red clamp to vehicle chassis or a solid, non-moving, metal vehicle component or body part. **DO NOT** clamp directly to positive battery terminal or moving part.

CAUTIONS:

- If vehicle fails to start, leave vehicle ignition key turned OFF, turn **INDUSTRIAL 900™** power switch to off, disconnect the negative (-) clamp first, then the positive (+) clamp, and discontinue jumpstarting procedure.
- Recharge jumpstart system after each use.

WARNINGS:

- **ALWAYS** disconnect the negative (Black) jumper cable first; followed by the positive (Red) jumper cable.
- **NEVER ALLOW RED AND BLACK CLAMPS TO TOUCH EACH OTHER OR ANOTHER COMMON METAL CONDUCTOR—THIS COULD CAUSE DAMAGE TO THE UNIT AND/OR CREATE A SPARK AND EXPLOSION.**
- There is a risk of explosive gases being released when batteries are improperly charged or discharged. Failure to follow instructions may cause property damage, explosive hazard, and/or personal injury.
- **ALWAYS USE PROTECTIVE EYEWEAR WHEN USING THIS PRODUCT: CONTACT WITH BATTERY ACID MAY CAUSE BLINDNESS AND/OR SEVERE BURNS.**
- Keep out of reach of children.
- **ALWAYS** store battery clamps in built-in holsters when not in use. Never touch battery clamps together—this can cause dangerous sparks, power arcing, and/or explosion.

FIRST AID:


- **Skin:** If battery acid comes in contact with skin, rinse immediately with water, then wash thoroughly with soap and water. If redness, pain, or irritation occurs, SEEK IMMEDIATE MEDICAL ATTENTION.
- **Eyes:** If battery acid comes in contact with eyes, flush eyes immediately—for minimum of 15 minutes—SEEK IMMEDIATE MEDICAL ATTENTION.

2.2 BATTERY REPLACEMENT

IT IS RECOMMENDED TO RETURN UNIT TO VECTOR™ CUSTOMER SERVICE FOR BATTERY REPLACEMENT: CONTACT (954) 923-1155

2.3 BATTERY DISPOSAL

Contains a maintenance-free, sealed, non-spillable, lead acid battery which must be disposed of properly. Most states require recycling—contact your local authority for information.

 SEALED LEAD BATTERY, MUST BE RECYCLED OR DISPOSED OF PROPERLY, DISPOSAL QUESTION? FOR USA CALL 1-800-RE-USE-PB (738-7372) OR VECTOR™ CUSTOMER SERVICE.

WARNINGS:

- **DO NOT DISPOSE OF THE BATTERY IN FIRE AS THIS MAY RESULT IN AN EXPLOSION.**
- **BEFORE DISPOSING OF THE BATTERY, PROTECT EXPOSED TERMINALS WITH HEAVY-DUTY ELECTRICAL TAPE TO PREVENT SHORTING (SHORTING CAN RESULT IN INJURY OR FIRE).**
- **DO NOT EXPOSE BATTERY TO FIRE OR INTENSE HEAT AS IT MAY EXPLODE.**

3. EMERGENCY/WORK LIGHT

Bulb Replacement

To turn work light on or off, simply toggle the switch on the front control panel.

1. Replacement bulbs are available from Vector™ Customer Service Department; call (954) 923-1155.
2. Remove the lens cover, two phillips type screws—snap out cover.
3. Remove the burned-out bulb.
4. Replace with a new bulb (12-volt 0.7 amp Krypton bulb).
5. Snap the lens cover back into place and replace the two screws—**DO NOT OVER-TIGHTEN.**

4. CHARGING/RECHARGING

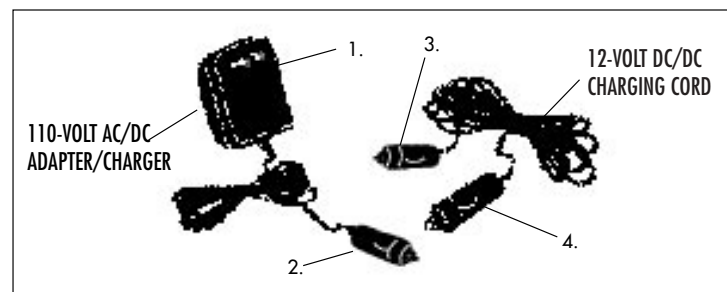
4.1 110-Volt AC Charging

IMPORTANT:

- **MAKE SURE SAFETY ON/OFF SWITCH IS IN OFF POSITION DURING RECHARGING.**
- Charge unit for full 24 hours, prior to first use.
- Recharge unit fully after each use.
- Recharge unit every two months, when it has not been used.

1. Simply plug the 110-volt AC plug (Fig. 5 #1) of the AC/DC adapter/charger cord into any standard 110/120-volt AC wall outlet.
2. Plug the 12-volt DC cigarette type plug (Fig. 5 #2) into the 12-volt DC receptacle on the unit.
3. Charge this device for at least 14-16 hours or until the FULL indicator is lit.
4. **NOTE:** The unit can be overcharged (which will shorten the life of the battery)—**DO NOT** charge with AC charging procedure for more than 24 hours maximum.
5. Remove the power cord and store in a safe place.
6. When the 110-volt power inverter option is installed on the unit, the inverter 's ON/OFF switch must be in the OFF position during recharging.

Figure 5.



4.2 12-Volt DC Charging

The **INDUSTRIAL 900™** system also comes with a DC/DC charging cord, for recharging the unit from the 12-volt DC cigarette lighter socket in a vehicle or boat. Note: This recharging method will **NOT** recharge the unit as effectively as recharging from a 110-volt AC outlet. The 12-volt DC recharging procedure is recommended only when it is necessary, as continued use of the 12-volt DC recharging procedure may shorten the battery system's life.

WARNING: DO NOT RECHARGE FOR MORE THAN 3-4 HOURS MAXIMUM USING 12-VOLT DC METHOD.

- NOTE: If unit is fully discharged, it is recommended that the vehicle being used for recharging be left running while the unit is being charged via the 12-volt DC method.
- Insert one end of the DC/DC charging cord into the 12-volt DC cigarette lighter receptacle on the vehicle or boat. See Fig. 5 #3.
- Insert the plug at the other end of this power cord (Fig. 5 #4) into the 12-volt DC receptacle on the front panel of the unit.
- Charge the unit until the green CHARGED indicator is lit—DO NOT EXCEED 3-4 HOURS MAXIMUM.
- Remove the power cord and store in a safe place.

4.3 Recharging

1. For maximum battery life, we recommend that the **INDUSTRIAL 900™** system be kept fully charged at all times. If the battery is allowed to remain in a discharged state, battery life may be shortened.

Note: Recharging battery after each use will prolong battery life; frequent discharges between recharges will reduce battery life. Table I shows the relationship of the frequency of use between recharging and the expected number of discharge/recharge cycles.

TABLE I. - ESTIMATED BATTERY LIFE

AVERAGE NUMBER OF USES (JUMPSTART OR DISCHARGES) BETWEEN RECHARGES	POTENTIAL TOTAL NUMBER OF JUMPSTART OR DISCHARGE CYCLES (LIFETIME OF UNIT BATTERY)
1	1000+
5	700+
10	500+

2. The time required to fully

recharge the **INDUSTRIAL 900™** system after jumpstarting an engine depends on how many jumpstarts are performed between recharging sessions. Table II shows the approximate recharging times to be expected.

TABLE II. - ESTIMATED RECHARGING TIMES BASED ON NUMBER OF JUMPSTARTS (OR DISCHARGES) PERFORMED SINCE LAST FULL CHARGING

NUMBER OF JUMPSTARTS	RECHARGING TIME (IN MINUTES)	NUMBER OF JUMPSTARTS.....	RECHARGING TIME (IN MINUTES)
1	8	4.....	32
2	16	5.....	40
3	24	6.....	48

3. Note: Check the battery charge level by depressing the PUSH FOR STATUS switch. The L.E.D. display will show the level of the battery 's charge.

5.1 To Use The Industrial 900™ System As A 12-Volt DC Portable Power Supply

- NOTE: Make sure that the unit 's safety ON/OFF switch is ALWAYS in the OFF position when using the 12-volt DC accessory outlet.
- Lift up the cover of the unit 's 12-volt DC cigarette lighter-type receptacle.
- Insert the 12-volt DC plug from the appliance into the receptacle on the unit.
- Switch on the appliance, as usual.

CAUTION: DO NOT USE THIS UNIT TO OPERATE APPLIANCES THAT DRAW MORE THAN 15 AMPS.

Table III shows the estimated 12-volt DC operation times when using a fully-charged system.

TABLE III. - INDUSTRIAL 900™ AS A 12-VOLT DC POWER SUPPLY

APPLIANCE TYPE	ESTIMATED POWER CONSUMPTION (IN WATTS)	ESTIMATED USAGE TIME (IN HOURS)
CELL PHONE	3	35
FLUORESCENT LIGHT	4	30
RADIO, FAN, DEPTH FINDER	9	21
CAMCORDER, VCR, SPOTLIGHT	15	12
POWER TOOLS, BILGE PUMP	24	7
ELECTRIC COOLER	48	3
AIR COMPRESSOR, CAR VACUUM	80	1.5

NOTE: ALL TIMES ARE APPROXIMATE, AND BASED UPON FULLY CHARGED UNIT.

5.2 To Use The Industrial 900™ System As A 110-Volt AC Power Supply

- IMPORTANT: Before using the unit as a 110-volt power supply, read the complete instructions, information and troubleshooting tips, pertaining to the inverter, in the back of this manual.
- Make sure that the inverter 's power switch is in the OFF position before recharging or making any connection to power source or load.
- Line up the body housing on the Vector™ **Power Force 150™** inverter (sold separately for Model VEC021; included with Model VEC021AC) with the mounting walls on the back of the **INDUSTRIAL 900™**. Slide the inverter into place, from right to left. See Fig. (2) #4.
- Note the convenient built-in cord storage above the inverter mounting.
- NOTE: Once inverter is properly in place, lock-in tab button will pop up, see Fig. (2) #3 (depress tab button to release and remove inverter).
- Remove the inverter's adapter cord from its storage compartment, and plug the cigarette lighter-type tip into the 12-volt DC receptacle on the front of the unit.
- Plug the appliance's 110-volt plug into the corresponding socket on the inverter.
- Turn the inverter power switch to ON.
- Turn the appliance on, and operate as normal.
- After use, unplug the inverter's adapter cord from the front of the unit and replace in the storage compartment.

CAUTION: RECHARGEABLE APPLIANCES

Certain rechargeable devices are designed to be recharged by plugging them directly into an AC receptacle. These devices may damage the **Power Force 150™**. When first using a rechargeable device, monitor its temperature for the initial ten minutes of use to determine whether it emits excessive heat. If excessive heat is detected, it is a good indication that the device should not be used with this inverter. This problem does not occur with the majority of battery-operated equipment. Most of these devices use a separate charger or transformer that is plugged into an AC receptacle. The **Power Force 150™** is easily capable of running most chargers and transformers.

Table IV shows the estimated 110-volt AC operation times when using a fully-charged system.

TABLE IV. Using the **INDUSTRIAL 900™** AS A 110-VOLT AC POWER SUPPLY

APPLIANCE TYPE CONSUMPTION (IN WATTS)	ESTIMATED POWER TIME (IN WATTS)	ESTIMATED USAGE
CELLULAR PHONE/CAMCORDER/ POWER TOOL CHARGERS	50 WATTS	4.0-6.0 HOURS
LAPTOP COMPUTER, PRINTER, LAMP, FAN, VCR, WORKLIGHT, RADIO/CASSETTE/CD PLAYER, SUMP PUMP	90 WATTS	3.0 HOURS
FAX, TV, SMALL POWER TOOL	100 WATTS 140 WATTS	1.5 HOURS 1 HOUR

NOTE: ALL TIMES ARE APPROXIMATE, AND BASED UPON FULLY CHARGED UNIT.

6. SPECIFICATIONS

Model	VEC021	VEC021AC
Voltage	12 VDC	12 VDC/110 VAC
Boost Power	400 Instantaneous	400 Instantaneous
	Cranking Amps	Cranking Amps
Peak Ampere Power	900 Amps	900 Amps
Battery Type	Sealed, lead- acid, rechargeable, maintenance-free, 12-volt DC, 17.5-Ampere-hours	
Bulb	12-volt 0.7 amp Krypton	
Booster Cables	#4AWG welding	
Booster Clamps	600 AMP copper clamps	
HEIGHT	11-3/4" (29.85CM)	
DEPTH	6-1/4" (15.88CM)	
WIDTH	11-5/8" (29.53CM)	
WEIGHT	18LBS. (8.16KG)	
VEC023/150 Watt Power Inverter	Optional	Included

7. REPLACEMENT PARTS

For replacement parts (bulbs, batteries, fuses, etc.), contact Vector™ Customer Service: (954) 923-1155.

8. OPTIONAL VEC023 POWER FORCE 150™ WATT INVERTER FOR USE WITH THE INDUSTRIAL SERIES™ 900 JUMPSTART SYSTEM & POWER SUPPLY:

VEC023 Power Force 150™ Inverter—Included with Model VEC021AC; and sold separately as an optional accessory for use with Model VEC021.

NOTE: The following information applies only to the inverter as it is used in conjunction with the **INDUSTRIAL 900™**.

If the inverter is purchased together with the VEC021AC or separately, a full manual (detailing the independent use of the inverter) is supplied.

Features:

- The **Power Force 150™** inverter provides a portable power source to run a variety of 110-volt devices equipped with standard household-type plugs.
- The **Power Force 150™** inverter is easily attached to (or removed from) the rear of the **INDUSTRIAL 900™**. The exclusive mounting (Patent Pending) is neat and convenient, maintaining the original single-unit integrity of the product.
- Using the **Power Force 150™** inverter with the **INDUSTRIAL 900™** does not reduce the efficiency of either device, or their portability. This combined unit provides the convenience of a 12-volt DC / 110-volt AC Power Supply and a completely portable, rechargeable emergency Jumpstart System, in one compact unit.
- The **Power Force 150™** inverter can be stored permanently in place on the **INDUSTRIAL 900™**, or stored separately and quickly connected as needed.
- The **Power Force 150™** inverter can also be used independently of the **INDUSTRIAL 900™** as a 110-volt AC power supply (use in conjunction with your vehicle). For instructions, refer to the inverter 's full manual (supplied, when the inverter is purchased separately) or call Vector™ Customer Service Department at (954) 923-1155 to obtain a copy.

The Vector **Power Force 150™** inverter is one in a series of the most advanced DC to AC inverters available today. With proper care and appropriate usage, it will provide years of dependable service in your car, truck, RV, boat or even airplane.

For easy reference, see the following sections titled:

- 8.1 Introduction
- 8.2 How the **Power Force 150™** Inverter Works
- 8.3 Installation
- 8.4 Operating Tips
- 8.5 Troubleshooting

8.1 INTRODUCTION:

The **Power Force 150™** supplies 150 watts of continuous power, with a 300 watt peak, in the form of a household-type outlet that is ready to deliver 110-volt AC power whenever and wherever you need it! Simply plug the inverter directly into the **INDUSTRIAL 900™** 12-volt DC socket to provide 110-volt AC power for almost any small household or electronic appliance including: color TVs (up to 10"); VCRs; portable radios/boom boxes/CD players; laptop computers, printers, fax machines; camcorder, cellular phone and power tool chargers; lamps (up to 100 watts); light duty power tools (up to 1.5amps); and much more. The inverter 's AC receptacle is fully marinated, weatherproof and fused. Added safety features include automatic shutdown and a low battery alarm to prevent damage to the unit 's main battery.

To ensure years of reliable service, the power inverter must be installed and used properly. Please read the installation and operating instructions thoroughly prior to installation and use. Pay particular attention to the CAUTION and WARNING statements in this manual. The CAUTION statements advise against certain conditions and practices that may result in damage to the **INDUSTRIAL 900™** and/or the inverter. The WARNING statements identify conditions or practices that may result in personal injury or loss of life.

8.2 HOW THE VECTOR™ Power Force 150™ INVERTER WORKS

The **Power Force 150™** inverter is an electronic device that converts low voltage DC (direct current) electricity from a 12-volt DC vehicle battery or other 12-volt DC power source (like the **INDUSTRIAL 900™** system) to standard 110-volt AC (alternating current) household power. In designing the **Power Force 150™**, Vector™ has incorporated design techniques previously employed in computer power supplies. The result of these design innovations is a smaller, lighter and easier-to-use power inverter.

8.2.1 Vector™ Power Force 150™ Inverter—Principle Of Operation

The **Power Force 150™** inverter converts power in two stages. The first stage is a DC-to-DC conversion process that raises the low voltage DC at the inverter input to 14.5-volts DC. The second stage is the actual inverter stage that converts the high voltage DC into 110-volts, 60 Hz AC.

The DC-to-DC converter stage uses modern high frequency power conversion techniques that have replaced the bulky transformers found in less technologically-advanced models. The inverter stage uses advanced power MOSFET transistors in a full bridge configuration. This ensures excellent overload capability and the ability to operate reactive loads like lamp ballasts and small induction motors.

8.2.2 Power Force 150™ Output Waveform—Modified Sine Wave

The AC output waveform of the **Power Force 150™** is known as a “quasi-sine wave” or a “modified sine wave”. It is a stepped waveform that is designed to have characteristics similar to the sine wave shape of utility power. This type of waveform is suitable for most AC loads, including linear and switching power supplies used in electronic equipment, transformers, and motors.

The modified sine wave produced by the **Power Force 150™** inverter is designed to have an RMS (root mean square) voltage of 115-volts, which is the same as standard household power. Most AC voltmeters (both digital and analog) are sensitive to the average value of the waveform rather than the RMS value. They are calibrated for RMS voltage under the assumption that the waveform measured will be a pure sine wave. These meters will not read the RMS voltage of a modified sine wave correctly. They will read about 20 to 30 volts low when measuring the output of the **Power Force 150™**. For accurate measurement of the output voltage of this unit, use a true RMS reading voltmeter such as a Fluke 87, Fluke 8060A, Beckman 4410, or a Triplett 4200.

8.3 INSTALLATION

1. See Fig. (2) #4 on page 1 of this manual (Using the **INDUSTRIAL 900™** as a 110-volt Power Supply).
2. Make sure that the inverter’s power switch is in the OFF position before making any connection to power source or load.
3. Line up the housing on the Vector™ **Power Force 150™** inverter (sold separately for Model VEC021; included with Model VEC021AC) with the mounting walls on the back of the **INDUSTRIAL 900™**. Slide the inverter into place, from right to left. See Fig.(2) #4.
4. Note the convenient built-in cord storage above the inverter mounting.
5. NOTE: Once inverter is properly in place, lock-in tab button, then on the right will pop up (depress tab button to release and remove inverter).

8.3.1 Power Source Requirements

The power source must provide between 11 and 14.5-volts DC and must be able to supply the necessary current to operate the load. The **INDUSTRIAL 900™** contains a 12-volt DC 17 amp hour maintenance-free sealed lead acid battery. To obtain a rough estimate of the current (in amperes) required to operate a particular device (load), simply divide the power consumption of the load (in watts) by 10.

Example: If a load is rated at 100 watts, the power source must be able to deliver:
 $100 \div 10 = 10$ amperes

CAUTION: The **Power Force 150™** must only be connected to batteries with a nominal output voltage of 12-volts DC. The unit will not operate from a 6-volt battery and will sustain permanent damage if connected to a 24-volt battery.

8.3.2 Connecting To Power Source

The **Power Force 150™** is equipped with a cigarette lighter-type plug for connecting it to the **INDUSTRIAL 900™**. The tip of the plug is positive and the side contact is negative. Simply insert the plug firmly into the 12-volt DC socket on the front of the **INDUSTRIAL 900™**.

CAUTION—REVERSE POLARITY CONNECTION WILL RESULT IN DAMAGE TO THE INVERTER.

If the inverter is connected to the incorrect polarity, the fuse will be blown. If the unit does not function after replacement of the fuse, the unit must be returned to Vector for repair. Repair expenses for this type of damage are not covered by your warranty.

CAUTION: DO NOT USE WITH POSITIVE GROUND ELECTRICAL SYSTEMS.

(THE MAJORITY OF MODERN AUTOMOBILES, RVs, AND TRUCKS ARE NEGATIVE GROUND)

8.3.3 Connection To Load

Make sure that the ON/OFF switch on the inverter is in the OFF position. Remove the inverter’s power cord from its storage compartment and connect the **Power Force 150™** to the 12-volt DC socket on the front of the **INDUSTRIAL 900™**. Leave the ON/OFF switch on the **INDUSTRIAL 900™** in the OFF position, and then turn the inverter’s ON/OFF switch to the ON position. The inverter’s green LED indicator will illuminate to indicate that the unit is functioning. Make sure the load requirements of your equipment are within the parameters of the **Power Force 150™** output. If so, plug the appliance into the standard household-type AC outlet on the inverter and turn ON your equipment. If an audible alarm sounds, refer to the Troubleshooting section of this manual for probable causes and recommendations.

DO NOT CONNECT TO AC DISTRIBUTION WIRING: The **Power Force 150™** is engineered to be connected directly to standard electrical and electronic equipment in the manner described above. Do not connect the Power Inverter to household or RV AC distribution wiring. Do not connect the Power Inverter to any AC load circuit in which the neutral conductor is connected to ground (earth) or to the negative of the DC (battery) source.

CAUTION: RECHARGEABLE APPLIANCES

Certain rechargeable devices are designed to be recharged by plugging them directly into an AC receptacle. These devices may damage the **Power Force 150™**. When first using a rechargeable device, monitor its temperature for the initial ten minutes of use to determine whether it emits excessive heat. If excessive heat is detected, it is a good indication that the device should not be used with this inverter. This problem does not occur with the majority of battery-operated equipment. Most of these devices use a separate charger or transformer that is plugged into an AC receptacle. The **Power Force 150™** is easily capable of running most chargers and transformers.

8.3.4 Fuse Replacement

If the **Power Force 150™** is overloaded and the spade type fuse (30A) is blown, flip up the fuse replacement cover on the back of the **Power Force 150™** and replace the blown fuse with a new spade type, 30 Amp fuse, available from Vector™ Customer Service Department (954) 923-1155. Determine the cause of the short before restarting the **Power Force 150™** again. Fuse Replacement in automobile (only applies when using inverter direct from vehicle): Most automobile cigarette lighter circuits use fuses at 15 Amps or less. In order to maximize the output of your **Power Force 150™** and minimize the possibility of shutdown due to a blown fuse in your vehicle, it may be necessary to replace the existing fuse in your automobile cigarette lighter circuit with a minimum 15 amp fuse. This fuse amperage change will not affect performance or any other aspect of this circuit.

8.3.5 Placement Of The Power Force 150™

For best operating results, the inverter should be properly installed (as directed in this manual) in the **INDUSTRIAL 900™**. The combined unit should only be used in locations that meet the following criteria:

DRY—Do not allow water or other liquids to come into contact with unit.

COOL—Ambient air temperature should be between -20° C and 40° C—ideally between 15° C and 25° C (60 - 80° F). Do not place the unit on or near a heating vent or any piece of equipment which is generating heat above room temperature. Keep the unit away from direct sunlight, if at all possible.

VENTILATED—Keep the area surrounding the **Power Force 150™** clear to ensure free air circulation around the unit.

Do not place items on or over the inverter during operation. A fan is helpful if the inverter is operating at maximum power outputs for extended periods of time. The unit will shut down if the internal temperature exceeds 90° C. Restart the unit once it cools down sufficiently.

SAFE—Do not use the unit near flammable materials or in any locations that may accumulate flammable fumes or gases.

8.4 OPERATING TIPS

8.4.1 Rated versus Actual Current Draw of Equipment

Most electrical tools, appliances and audio/video equipment have labels that indicate the power consumption in amps or watts. Be sure that the power consumption of the item you wish to operate is rated at 200 watts or less. (If the power consumption is rated in amps, simply multiply by the AC volts (110) to determine the wattage).

Example: AMPS (1) X VOLTS (110) = 110 WATTS

The inverter has overload protection, so it is safe to try to operate equipment rated at 200 watts or less. The inverter will shut down if is overloaded, and will restart once the overload is rectified.

Resistive loads are the easiest for the **Power Force 150™** to run; however, larger resistive loads, such as electric stoves or heaters, usually require more wattage than the **Power Force 150™** can deliver on a continuous basis. Inductive loads, such as TVs and stereos, require more current to operate than do resistive loads of the same wattage rating. Induction motors, as well as some televisions, may require 2 to 6 times their wattage rating to start up. The most demanding in this category are those that start under load, such as compressors and pumps. Testing is the only definitive way to determine whether a specific load can be started and how long it can run. The unit will simply shut down if it is overloaded. To restart the unit after a shutdown due to overloading, momentarily turn off the power to the unit.

THIS UNIT WILL NOT OPERATE APPLIANCES AND EQUIPMENT THAT PRODUCE HEAT, SUCH AS HAIR DRYERS, MICROWAVE OVENS, AND TOASTERS.

8.4.2 Battery Operating Time

SEE TABLE IV ON PAGE 10

8.5 TROUBLESHOOTING

8.5.1 Protective Features of the Power Force 150™

The **Power Force 150™** monitors the following potentially hazardous conditions:

Low Battery Voltage - This condition is not harmful to the inverter but could damage the **INDUSTRIAL 900™**. An audible alarm will sound when input voltage drops to 10.6. The **Power Force 150™** automatically shuts down when input voltage drops to 10.0-volts. The **INDUSTRIAL 900™** must be fully recharged. Then the unit may be restarted.

Over Voltage Protection—The **Power Force 150™** will automatically shut down when the input voltage exceeds 15-volts DC.

Short Circuit Protection—Reverse polarity or a short circuit condition will usually result in the fuse being blown. Immediately disconnect the shorted load and replace the fuse of the **Power Force 150™** as described in the **VE023 Power Force 150™** operation manual.

Overload Protection—The inverter will automatically shut down when the continuous draw exceeds 150 watts.

Over Temperature Protection—When the temperature sensor inside the **Power Force 150™** reaches 150° F, the unit will automatically shut down. Allow the unit to cool for at least 15 minutes before restarting after a heat-related shutdown. Unplug unit while cooling.

CAUTION: LOW BATTERY ALARM

An alarm will sound when the voltage from the battery drops to 10.6-volts. This is an indication that the battery needs to be recharged. **STOP OPERATION OF THE ELECTRONIC DEVICE IMMEDIATELY** since the **Power Force 150™** will shut down automatically shortly thereafter, when the battery voltage drops to 10-volts. Recharge the **INDUSTRIAL 900™**, per the instructions in this manual.

8.5.2 Common Problems

"Buzzing" sound in audio systems

Some inexpensive stereo systems and "boom boxes" emit a buzzing sound from their speakers when operated from the **Power Force 150™** power inverter. This occurs because the power supply in the electronic device does not adequately filter the modified sine wave produced by the **Power Force 150™**. The only solution to this problem is to use a sound system that incorporates a higher quality power supply.

Television Interference

The **Power Force 150™** is shielded to minimize interference with TV signals. However, in some instances, some interference may still be visible, particularly with weak TV signals. Try the following corrective measures: Position the unit as far as possible from the television, the antennae and the antennae cables. Use an extension cable, if necessary. Adjust the orientation of the unit, the antennae cables and the TV power cord to minimize interference. Make sure that the antennae feeding the television provides an adequate ("snow free") signal and that high quality, shielded antennae cable is used.

8.5.3 Troubleshooting Guide:

TROUBLESHOOTING TIPS

PROBLEM	POSSIBLE CAUSES	RECOMMENDATIONS
LACK OF POWER OUTPUT	<ol style="list-style-type: none"> Inverter not adequately warmed up. Source battery voltage below 10-volts. Equipment being operated draws too much power. Inverter in thermal shutdown. Inverter/main fuse blown. Accessory receptacle in vehicle or INDUSTRIAL 900™ is dirty or not working. 	<p>Turn inverter switch OFF, then ON again. Repeat if necessary.</p> <p>Recharge/replace source battery.</p> <p>Reduce load to appropriate maximum for the inverter.</p> <p>Allow inverter to cool down for at least 15 mins. before turning ON again.</p> <p>Replace fuse (see section in this manual).</p> <p>Clean or replace, as necessary, for proper connection.</p>
LOW OUTPUT VOLTAGE	<ol style="list-style-type: none"> Using average quality voltmeter. Inverter is overloaded. Input voltage below 10.5-volts. 	<p>Use "true" reading RMS meter.</p> <p>Reduce load to appropriate maximum for the inverter.</p> <p>Keep input voltage above 10.5-volts to maintain regulation.</p>
TV, POWER TOOL WILL NOT START UP	<ol style="list-style-type: none"> High "surge" wattage required for start-up. Vehicle accessory receptacle not working. 	<p>Toggle inverter's ON/OFF switch ON and OFF rapidly several times to generate enough power to start the device. If device still does not start, the inverter and device are not compatible.</p> <p>Turn vehicle ignition to accessory ON position.</p>
OVERLOAD/ LOW BATTERY LIGHT IS LIT	<ol style="list-style-type: none"> Insufficient power, or excessive voltage reduction. Battery charge is low. Battery condition is poor/expired. Inverter is overloaded. Inverter voltage is below 10 amp 	<p>Check accessory receptacle (cigarette lighter socket) and socket connection – clean or replace, as necessary for proper connection.</p> <p>Recharge battery.</p> <p>Replace battery.</p> <p>Reduce load to appropriate maximum for the inverter.</p> <p>Recharge/replace battery.</p>
TV INTERFERENCE ("SNOW")	TV picture is poor, or breaks up.	<ol style="list-style-type: none"> Position the inverter further away from the TV, antennae, antennae cables. Use an extension cord, if necessary. Adjust the orientation of the inverter, antennae cables, and TV power cord to minimize interference. Make sure that antenna provides adequate signal, and that high quality, shielded antennae cable is used. TV station may be out of range.
STATIC, SOUND INTERFERENCE IN AUDIO SYSTEM	Power supply in some inexpensive audio systems does not adequately filter the inverter's modified sine wave.	<ol style="list-style-type: none"> Use audio system with higher quality internal power supply filtering. Do not use inverter with inexpensive audio systems.



VECTOR Power Force 150™ POWER INVERTER
PRODUCT SPECIFICATIONS

MAXIMUM CONTINUOUS POWER	150 WATTS
SURGE CAPACITY (PEAK POWER)	300 WATTS
MAXIMUM EFFICIENCY	± 90%
NO LOAD CURRENT DRAW	0.06A
INPUT VOLTAGE RANGE	10-15 VDC
LOW VOLTAGE SHUTDOWN ACTIVATION	10.0 VOLTS
WAVE FORM	MOD. SINE WAVE
# OF AC RECEPTACLES	ONE
FUSE	30 AMP
WEIGHT	1.46 LBS (0.66 KG)
LENGTH	5 3/8 IN. (137 MM)
WIDTH	4 1/2 IN. (114 MM)
HEIGHT	1 7/16 IN. (37 MM)



1 YEAR LIMITED WARRANTY REGISTRATION FORM

This Vector Manufacturing, Ltd. product is warranted to the original purchaser only, for one year from the date of purchase, to be free of defects in materials and workmanship. In no event will Vector Manufacturing, Ltd. be responsible for any amount of damages beyond the retail purchase price of the product. 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 the address shown below.

TERMS OF REPAIR OR REPLACEMENT: In the event of a defective unit, return the unit to us within 30 days of the date of purchase, and we will replace it, free of charge. If returned after 30 days but within one year of the purchase date we will repair the unit or, at our option, replace it free of charge. If we repair the unit, we may use new or reconditioned replacement parts, at our option. If we elect to replace the unit, we may replace it with a new or reconditioned one of the same or comparable design. Replacement unit will then be warranted under the terms of our standard one year warranty. The customer is responsible for shipping charges on all returned items. During the warranty period, Vector Manufacturing, Ltd. will be responsible for the repair or replacement cost plus the return shipping charges.

LIMITATIONS: Implied warranties, including those of fitness for a particular purpose and merchantability (an unwritten warranty that the product is fit for ordinary use), are limited to one year from the purchase date. Vector Manufacturing, Ltd. will not reimburse for loss of time, inconvenience, loss of use of a product or property damage caused by a product or its failure to work or any other incidental or consequential damages, including personal injury.

EXCLUSION: This warranty does not cover 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 customer service facility at (954) 584-4446 for general repair information and charges. This limited warranty is the only one that applies to this product and sets forth all the responsibilities of Vector Manufacturing, Ltd. regarding this product. There are no warranties which extend beyond those described herein.

STATE LAW 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, varying from state to state, may apply.

TO REQUEST WARRANTY SERVICE FOR THIS PRODUCT: Within 30 days of the purchase date, return the unit, along with the dated sales receipt, to the place of purchase for immediate replacement. After 30 days, but within the one year warranty period, you may return the product to the address shown below. We strongly suggest that you retain the original packaging in case you need to ship the unit. When returning a product, include your name, address, phone number, dated sales receipt and a description of the reason for return. After repairing or replacing the unit, we will return it to you within four weeks.

Please activate my Limited Warranty for Model VEC021, VEC021AC
I have enclosed a copy of the original sales receipt.

Name _____
Street Address _____
City _____ State _____ Zip code _____
Phone _____ Fax _____ E-mail _____
Item Purchased _____ Date of Purchase _____
Store Where Purchased _____
UPC Number from package (12 digits) _____

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 S.W. 28th WAY
FT. LAUDERDALE, FL 33312

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