



**OWNERS MANUAL
VANNER INVERTER
MODELS 20-1000UL AND 20-1000TUL**

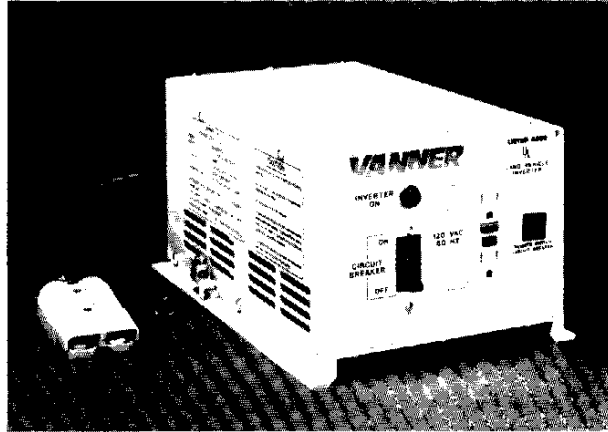


TABLE OF CONTENTS

I.	GENERAL INFORMATION	
	DESCRIPTION	2
	AGENCY APPROVAL	2
	GENERAL SPECIFICATIONS	2
II.	INSTALLATION	
	CAUTION AND SAFETY	3
	MOUNTING	3
	DC INPUT WIRING	4
	CHASSIS BONDING LUG	5
	AC OUTPUT WIRING	6
	AC INPUT WIRING	6
	REMOTE ON/OFF SWITCH	7
III.	OPERATION	8
IV.	TROUBLE SHOOTING GUIDE	9
V.	GENERAL MAINTENANCE	10
VI.	WARRANTY INFORMATION	11
VII.	GFCI TEST RECORD	12

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I. GENERAL INFORMATION

DESCRIPTION

Vanner inverters are electronic devices which convert 12 Vdc into 120 Vac, 60 Hz power. They employ patented and patent pending control circuitry and proven MOSFET technology to deliver True RMS regulated, quasi-sinewave AC power to all types of electrical loads.

There are two basic models; the 20-1000UL which is an Inverter unit only, and the 20-1000TUL which is an inverter with an internal automatic transfer relay. This relay allows an external 120 Vac power source to power the vehicle outlets. Standard equipment supplied with both models include a remote control On/Off switch assembly, ground fault current protected output, DC quick connectors and panel light which indicates output power available.

The model 20-1000UL and 20-1000TUL inverters are internally protected against low and high input voltage, output overload, output short circuit, and high temperature. When installed and operated in accordance with this manual, your Vanner inverter will give years of outstanding service.

AGENCY APPROVAL

Vanner inverter models 20-1000UL and 20-1000TUL are listed by Underwriters Laboratories for use in recreation, emergency, and other land vehicles. These inverters comply with Article 551 of the National Electric Code and Federal KKK specifications for use in ambulances.

GENERAL SPECIFICATIONS

AC OUTPUT RATING	120 Vac +/- 3% True RMS, 60 Hz. Quasi-Sinewave, 1000 Watts Continuous @ 12.8 Vdc.
DC INPUT RATINGS	10.5 to 16.0 Vdc, 100 amps max.
DIMENSIONS	8.5 W X 6.5 H X 12.5 L (inches)
WEIGHT	26.25 LBS (max.)

Model 20-1000TUL Only

TRANSFER SWITCH	Rated at 125 Vac, 15 Amps
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II. INSTALLATION

CAUTION AND SAFETY

All wiring must conform to the National Electric Code, state, local, or other codes in effect at the time of installation.

CAUTION

To prevent fire, do not cover or obstruct ventilating openings.

Do not mount in zero-clearance compartment. Overheating may result.

Do not expose to rain or moisture.

This equipment employs components that tend to produce arcs and sparks. To prevent fire or explosion, do not install in compartments containing batteries or flammable materials.

SAFETY

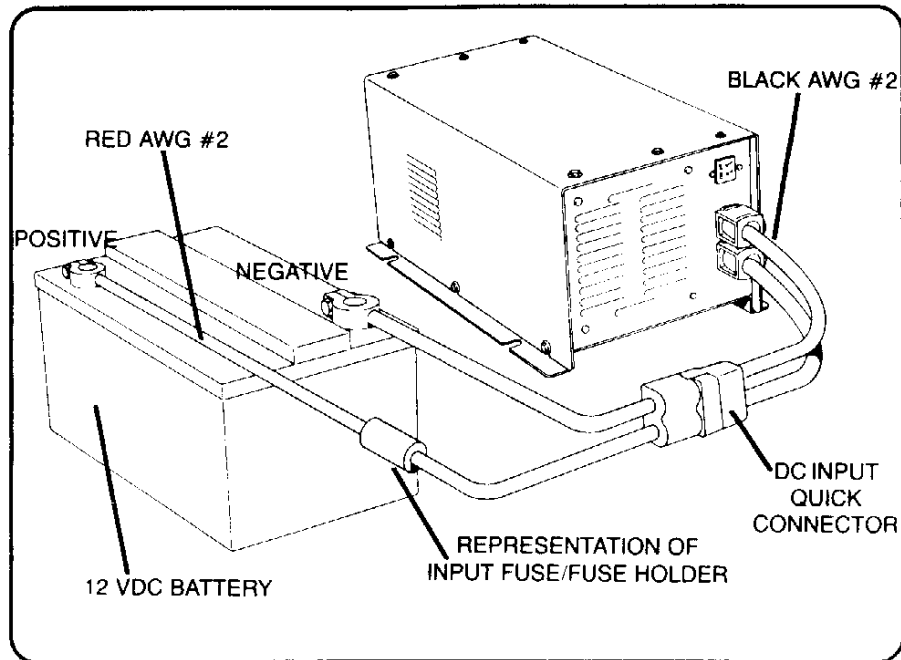
Safety goggles should always be worn when working near batteries.

Make sure that the inverter is off during installation.

MOUNTING

Locate a secure, flat, horizontal surface as close to the battery as possible without being in the same compartment. The location should provide adequate ventilation and clearance to maintain room temperature while the unit is operating. At least 4 inches of clearance should be maintained on all sides. The unit should be secured to the mounting surface with four (4) # 10 screws (not supplied) through the slots in the bottom flange of the inverter.

NOTE: Electrical equipment utilizing 120VAC receptacles are not intended to be operated in an enclosed or concealed compartment.



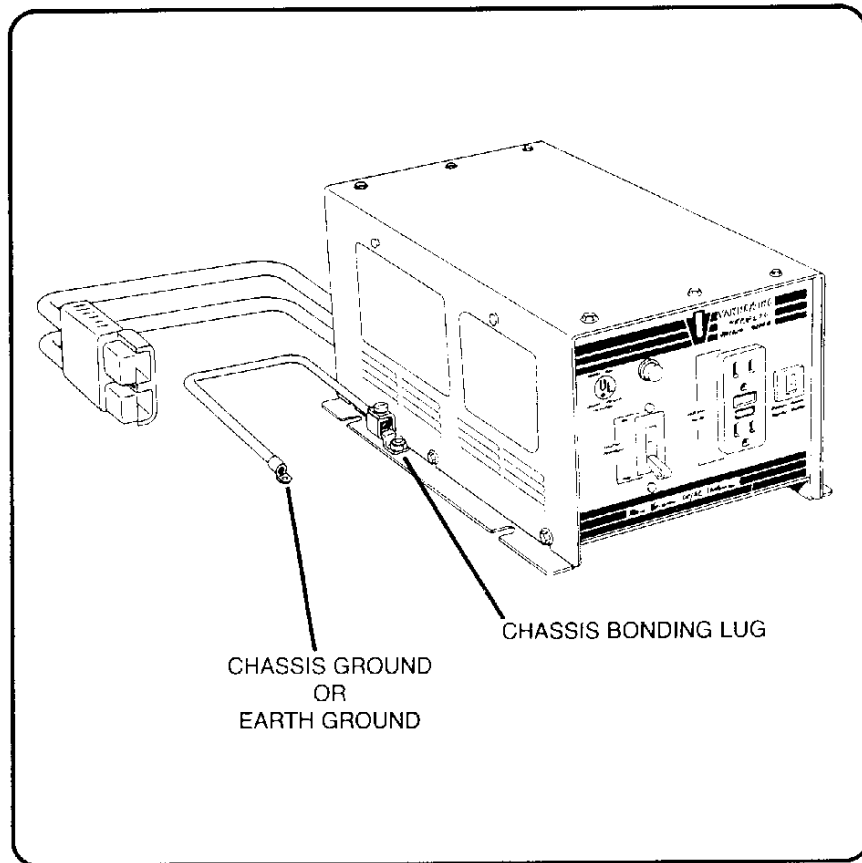
DC INPUT WIRING

To protect the positive input power cable between the battery or power source and the inverter, N.E.C. code requires that a fuse be installed within 18 inches of the battery or power source. The fuse and fuse holder should comply with N.E.C. Article 551 and be U.L. listed. A 125 amp fuse, such as a Bussman ANN-125 with fuse holder 3576, is recommended.

Use SXL style stranded copper wire for connections between the battery, the fuse holder, and the inverter. For best performance, the vehicle frame should not be used as the battery negative conductor.

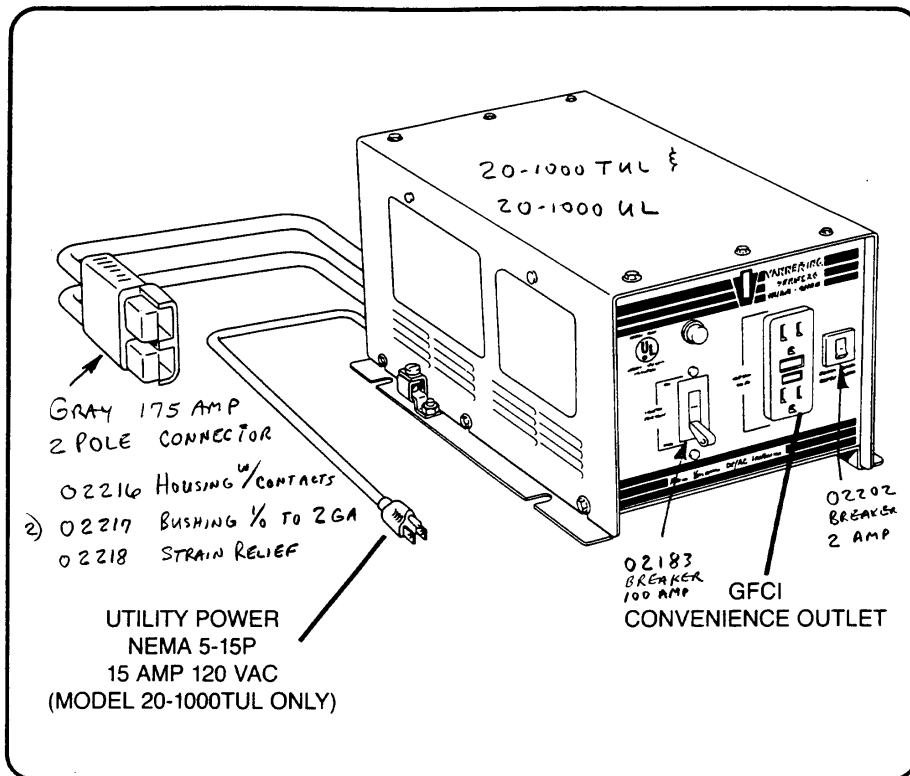
Vanner inverters are supplied with a DC input pigtail terminated with a high current capacity quick connector. A mating connector is supplied for termination of wires from the battery and are marked with "+" for battery positive, and "-" for battery negative. For run lengths up to 15 feet, AWG #2 is recommended. For run lengths between 15 feet and 30 feet, AWG #1/0 is recommended. Run lengths over 30 feet are not recommended.

The recommended tool for crimping the DC input connector terminals to the battery leads can be purchased from Anderson Power Products (telephone 617-787-5880), part number 1368. The strain relief clamp and connector kit supplied with the unit must be assembled in like manner to the connector assembly attached to the unit.



CHASSIS BONDING LUG

As with all electrical apparatus, shock is always a potential hazard. Since the DC positive and negative input power cables are isolated from the inverters' chassis, for safety, a separate inverter chassis bonding lug is provided to ground the inverters' case to the vehicle chassis and/or earth ground. Using a AWG #8 or greater SXL style copper conductor, connect the chassis bonding lug to the vehicle chassis and/or earth ground.

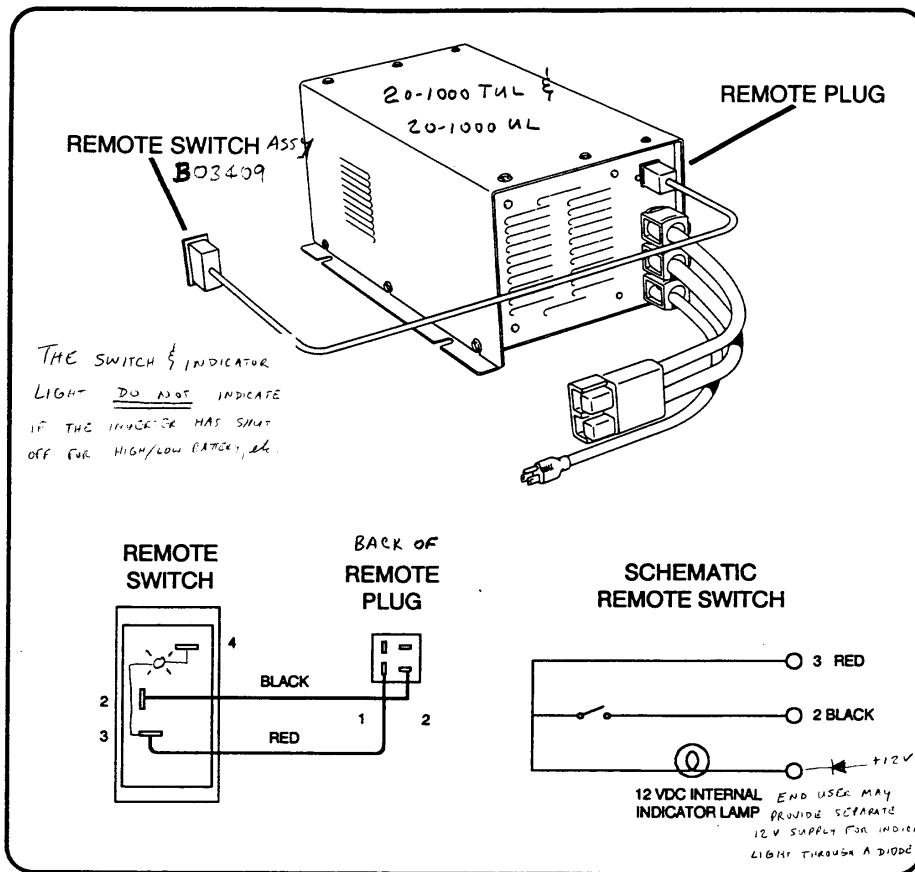


AC OUTPUT WIRING

To promote safety, Vanner models 20-1000UL and 20-1000TUL are equipped with ground fault current interrupt (GFCI) convenience outlets. Equipment provided with standard 120 Vac, 15 amp grounded line cords should be plugged directly into these outlets. Permanent wiring is not intended to be plugged into these outlets.

AC INPUT WIRING

The Vanner model 20-1000TUL inverters are equipped with a NEMA 5-15P line cord and an automatic utility power transfer switch. The line cord can be plugged into any standard 120 Vac, 15 amp grounded outlet. When 120 Vac utility power is applied to the line cord of the inverter, an internal relay transfers the utility power directly to the GFCI outlets and turns off the inverter.



REMOTE ON/OFF SWITCH WIRING

It is important to note that the inverter will not operate unless the Remote Switch is plugged in and turned on.

The Remote Switch is a standard feature on Vanner inverters and is supplied with an 8 foot long prewired cable assembly. The Remote Switch cable plugs into the back of the inverter just above the DC input cables. The remote cable plug is polarized and can be connected one way only.

The Remote Switch supplied with the unit should be mounted in a convenient location in a U.L. listed outlet box with an approved strain relief. The Remote Switch has color dots to match the connecting red and black wires of the cable assembly.

July 27, 1988

MEMO: To All Users of Vanner's 1000 watt U.L. Listed Inverters

803409 REMOTE SWITCH ASSEMBLY

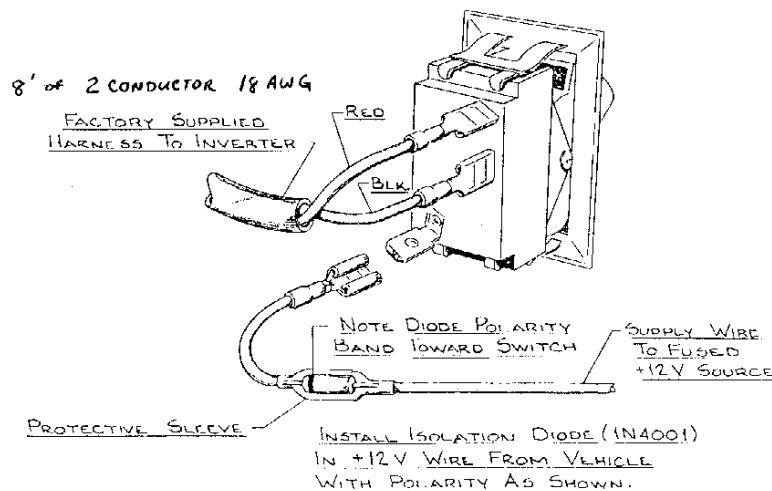
SUBJECT: Inquiry Response - Field Wiring of Remote Switch Indicator Lamp

The Remote Switch Assembly furnished with our UL inverters is not interchangeable with the Remote Switch furnished with our non-UL inverters. This situation is due to a UL requirement limiting the potential current draw on the Remote Switch circuit in the event there is a short in the Switch wiring harness. This requirement precludes Vanner from making this feature available on the UL units. However, if you wish, you may utilize the Remote Switch indicator lamp by providing a separate +12 volt supply to the Switch. If you elect to do this, you must install an Isolation Diode in the +12 volt supply wire as shown in the attached drawing.

The above will provide you with a remote on/off switch that has a built in indicator light if your application requires this feature.

VANNER INC

RED IS BOTTOM LEFT PIN ON INVERTER.
BLACK IS BOTTOM RIGHT PIN ON INVERTER.





OPERATION

Before initial startup, check all electrical connections. To operate the inverter, the input breaker on the front panel must be On. The inverter is turned On and Off from the Remote Switch. An indicator light on the front panel indicates power is available at the convenience outlet, either from the inverter or from the utility power if the unit is equipped with a Transfer Switch. The inverter automatically turns off when utility power is applied and automatically restarts when utility power is removed.

IV. TROUBLE SHOOTING GUIDE

Vanner model 20-1000UL and 20-1000TUL inverters are electronically protected against potentially damaging operating conditions such as:

LOW INPUT VOLTAGE	(Less than 10.5 VDC)
HIGH INPUT VOLTAGE	(Greater than 16.0 VDC)
OUTPUT OVERLOAD	
OUTPUT SHORT CIRCUIT	
OVER-TEMPERATURE	

If one or more of these conditions exists, the unit will automatically shut off, or fail to start at all. The following list may be helpful in isolating a problem that could be keeping the inverter from functioning properly.

PROBLEM: Inverter will not turn on.

CHECK:

Inverter will not operate without Remote Switch plugged in and turned On.
Main input circuit breaker and remote circuit breaker must be in "On" position.
Battery voltage must be between 10.5 and 16.0 Vdc.
Utility power must be disconnected for inverter to turn on.

PROBLEM: Inverter runs for short period of time then turns off.

CHECK:

Inverter may be overloaded. Disconnect load and reset inverter by switching Off then On at either the Remote Switch or main input breaker.
Be sure air vents at sides and rear of unit are not obstructed. This may cause over heating and eventual shut down of the unit.
Battery voltage must remain between 10.5 and 16.0 Vdc at all times during inverter operation.

PROBLEM: Main input breaker trips immediately when switched on.

CHECK:

Battery connections may have reversed polarity. The inverter input connections are RED for battery positive, and BLACK for battery negative.
CAUTION: Unit may be severely damaged by reversed input polarity

PROBLEM: Inverter runs but there is no power at the output receptacle.

CHECK:

The GFCI may need to be reset. The GFCI is designed to trip if a ground fault is detected.

THERE ARE NO USER SERVICEABLE COMPONENTS INSIDE YOUR INVERTER.

If further assistance is required, call your dealer or Vanner Weldon Inc.

V. GENERAL MAINTENANCE

MAINTENANCE CHECKLIST

For continued reliability and safety, a monthly maintenance program should be implemented to include the following:

1. Check all wiring for secureness and corrosion.
2. Check air ventilation openings for dust and other obstructions.
3. Test GFCI (See GFCI Test Procedure)
4. Examine all connector housings, lamps and switches for cracks and breaks.

GFCI TEST PROCEDURE

The GFCI receptacle needs to be tested monthly for maximum protection against shock hazard. To test the GFCI:

1. Supply power to the outlet by turning On the inverter. A lighted front panel power indicator signals that the GFCI is reset.
2. Push the black TEST button. The RESET button should pop out and the front panel indicator light should go out. If the RESET button does not pop out and/or the front panel indicator light remains on, do not use the inverter. Have a qualified repair technician replace the defective GFCI.
3. If the GFCI tests O.K., restore power by pushing the RESET button back in. The RESET button must be pushed firmly and fully into place until it locks and remains depressed. If the GFCI fails to reset properly, do not use the inverter. Have a qualified repair technician replace the defective GFCI.
4. Record the test on the GFCI Test Record.