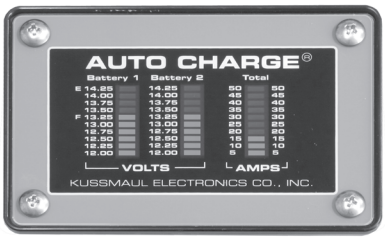
IM_091-171-12
REV A, 06-26-2008
EMS

INSTRUCTION MANUAL

ADD-A-BAT

AUTOMATIC BATTERY CHARGER & AUTOMATIC LOSSLESS BATTERY ISOLATOR FOR DUAL BATTERY SYSTEMS



MODEL #091-171

INPUT: 115 Volt, 60 hz, 4.7 Amps

OUTPUT: 12 Volt, 20 Amps
battery system.

3 YEAR WARRANTY

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INTRODUCTION

Many vehicles come from the factory with only a single battery. Often, especially in emergency or police vehicles, a considerable number of electrical accessories are installed. This creates an extreme burden on the battery and results in an unreliable system. In addition to a larger alternator, it is often desirable to install a second battery. This additional battery can then be dedicated to the accessory loads and the original battery is then used only for vehicle operation.

The Model 091-171-12 Add-A-Bat is designed to simplify the installation of a auxiliary battery. The Add-A-Bat consists of an automatic battery charger, a high current solenoid switch and a Bar Graph display. The automatic battery charger recharges and maintains the batteries whenever the vehicle is connected to a 115 volt AC source. The high current solenoid connects the two batteries so that the alternator charges both when the engine is running while the display indicates the voltage of each battery and the charger output current.

The accessory loads may be wired to auxiliary battery and thus are completely isolated from the main vehicle battery. Whenever the vehicle is plugged into “shore power” the battery charger recharges and maintains the two batteries separately. When the engine is running the solenoid is energized connecting the two batteries to charge them simultaneously from the alternator. Thus, a vehicle parked with the engine not running or with insufficient alternator output, will have its solenoid de-energized and the accessories will only drain the auxiliary battery. The main vehicle battery is protected and will always be available for engine starting.

Construction of the Add-A-Bat is extremely rugged to withstand the shock and vibration normally encountered by vehicle mounted equipment. The unit operates completely automatically and stops charging the batteries when they are fully charged.

There is no trickle charge and therefore no danger of overcharging and water boil-off. Any parasitic loads on the battery such as radio, lights etc. are automatically supplied with current from the charger.

BLOCK DIAGRAM

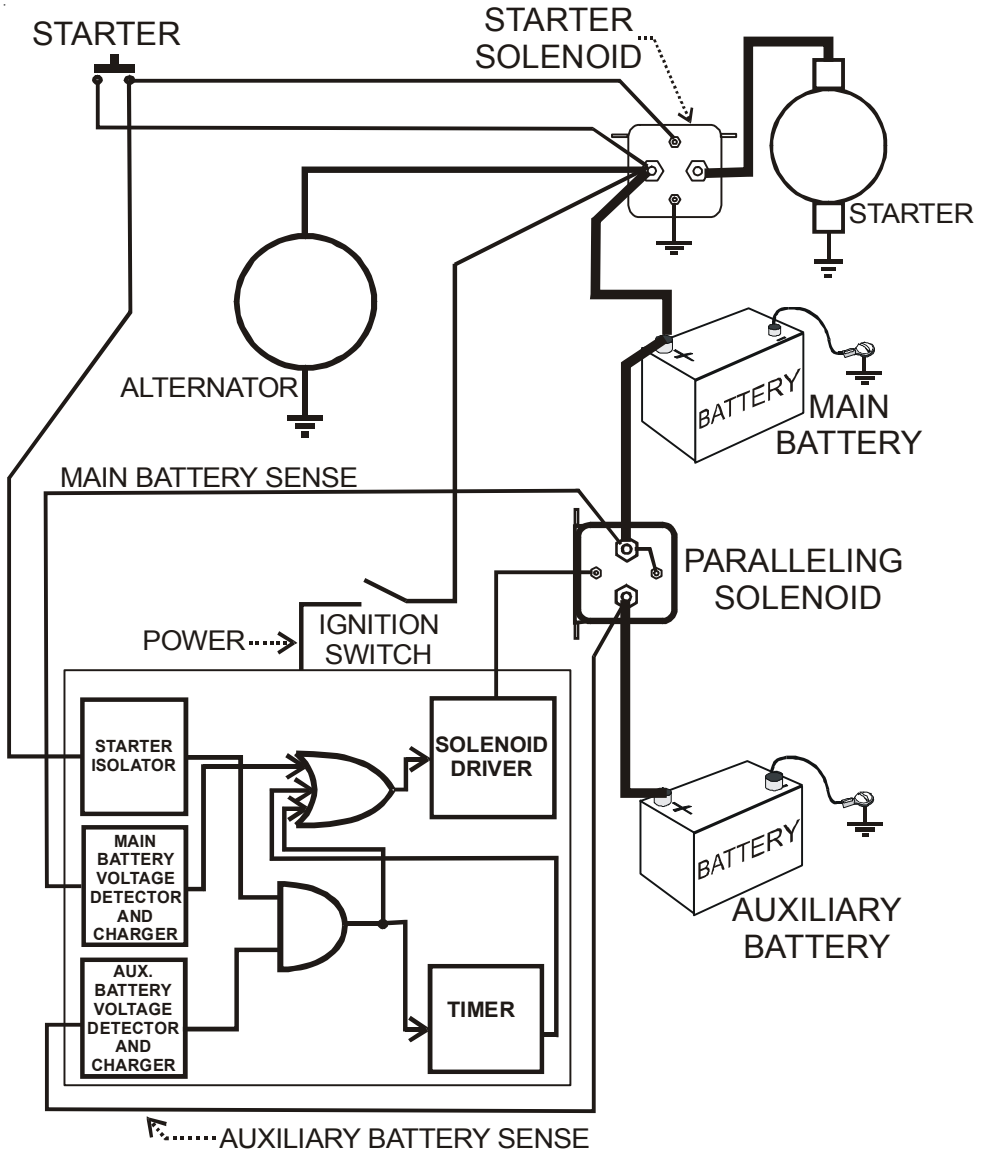

Figure 1
ADD-A-BAT Block Diagram

SYSTEM OPERATION

The Add-A-Bat in addition to the dual independent automatic battery charger contains a solenoid controller. The solenoid controller receives its power from the ignition switch. With the switch "OFF" all the power is removed from the system and the solenoid is de-energized.

As soon as the operator turns the ignition switch "ON" the system is powered and detects the voltage of the main and auxiliary batteries. If the auxiliary battery is 12.4 volts or greater, (indicating sufficient charge) cranking the engine will cause the paralleling solenoid to be energized. The engine is cranked with the two batteries in parallel yielding a faster start. A 10 second timer will maintain the solenoid if the engine doesn't start immediately and must be cranked a second time. When the engine starts, the alternator output raises the battery voltage so that the solenoid remains energized and both batteries are charged.

If when the engine is started the auxiliary battery is below 12.0 volts the paralleling solenoid is not energized while cranking. As soon as the engine starts the alternator raises the main battery voltage and the solenoid is energized charging both batteries.

Upon engine shut down the ignition switch is placed in the "OFF" position. Power is removed from the solenoid controller and the solenoid is de-energized. The batteries are thus isolated.

INSTALLATION

The Add-A-Bat should be installed in an area with adequate ventilation. The solenoid must be installed as close as possible to the two batteries in order to limit the voltage drop in the high current cables. The bar graph display should be located in a convenient place for the operator.

1. Mount the charger and solenoid using the holes shown in the outline drawing.

2. Connect the wiring from the batteries to the output terminal strip. Ferrule lugs that have been securely crimped or soldered should be used.

3. Wire the indicator per the diagram.

4. Double check all wiring.

5. Turn on 115 volt AC power and note that power indicator is illuminated.

6. Note that charger output is 13.25 volts for each battery when batteries are fully charged. Output volts may be lower while charging.

7. With both batteries fully charged, crank engine and note that the solenoid is energized during cranking cycle.

INSTALLATION WIRING DIAGRAM

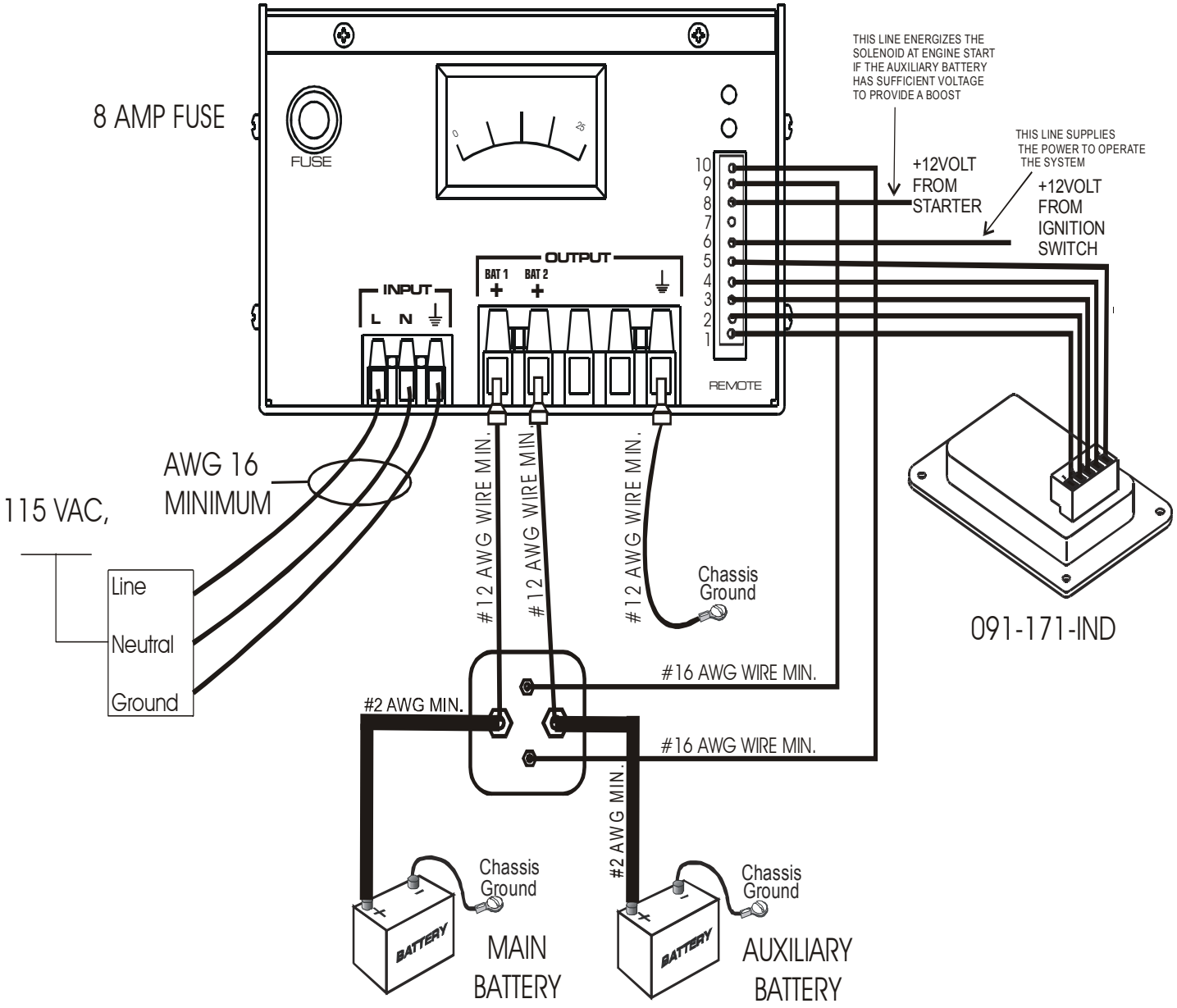

FIGURE 2

IMPORTANT:
NOTE: Wire size is for a maximum length of 20 feet. If wiring is to be longer, larger wiring is required. Additional information is available on request.

SPECIFICATION

BATTERY CHARGER when connected to shore line, Model 091-171

Input: 115 volt, 60Hz, 4.7 Amps
Input breaker: 8 Amp fuse breaker
Output: 12 V supplies 20 Amps max
Weight: 18 lbs

BATTERY CHARGER when connected to battery, Model 091-171

Volts to parallel: 13.3 volts, field adjustable
Battery load: .000125 Amps
Output current: 3 Amps

SOLENOID, Model 091-139-SOL-12HO

Volts: 12 volts D.C.
Coil Current: .65 Amps
Contact Rating: 200 Amps

OUTLINE

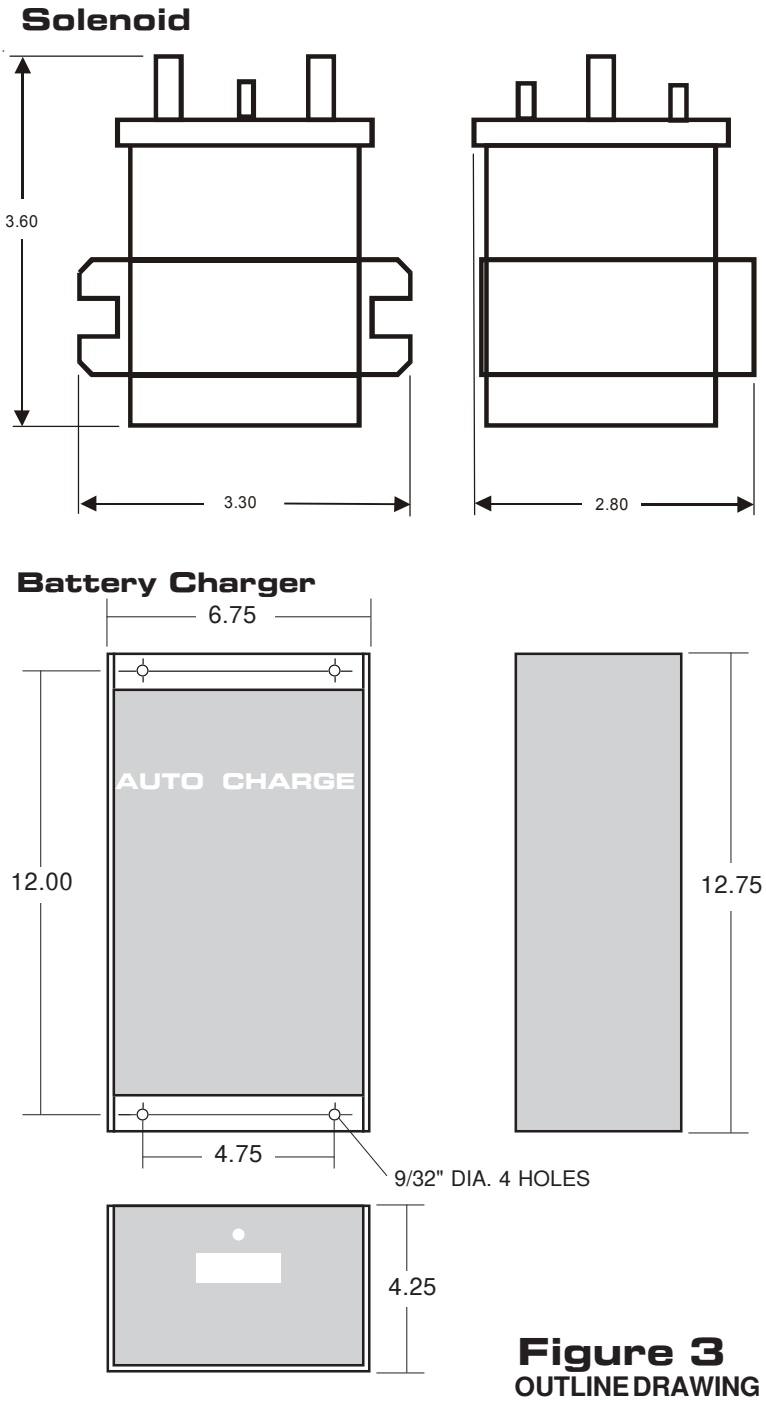

Figure 3
OUTLINE DRAWING

INSTALLATION RECORD & WARRANTY

Date Installed _____

Installed By _____

Vehicle Identification _____

Vehicle Owner _____

WARRANTY

All products of Kussmaul Electronics Company Inc. are warranted to be free of defects of material or workmanship. Liability is limited to repairing or replacing at our factory, without charge, any material or defects which become apparent in normal use within 3 years from the date the equipment was shipped.

Kussmaul Electronics Company, Inc. shall have no liability for damages of any kind to associated equipment arising from the installation and /or use of the Kussmaul Electronics Company, Inc. products. The purchaser, by the acceptance of the equipment, assumes all liability for any damages which may result from its installation, use or misuse, by the purchaser, his or its employees or others.