

# INSTRUCTION MANUAL

DVS-20 / DVD-40

## IMPORTANT SAFETY INSTRUCTIONS. SAVE THESE INSTRUCTIONS.

### Safety Instructions-

**BEFORE** using the battery charger, read all instructions and cautionary markings on (1) battery, (2) battery charger and (3) the product using battery. **CAUTION**, use charger only for lead acid type batteries. Not for gel-cell or dry cell or any other types that may burst and cause personal injury. **WARNING**, lead acid batteries generate explosive gases during normal operation. Read and follow instructions published by battery manufacturer. **NEVER SMOKE** or allow a spark or flame in vicinity of battery. **DO NOT** expose charger to rain or snow. **NEVER** charge a frozen battery. **DO NOT** operate charger with damaged cord or plug - replace them immediately. **DO NOT** operate charger if it has been dropped or damaged in any way; return it to dealer for service. Any attempt to disassemble, repair or clean charger may cause severe electric shock or injury and will void any warranty. **DO NOT** use any attachments not recommended or sold by battery manufacturer. They may result in risk of fire, electric shock or injury to persons. **NEVER** remove electric cord from an outlet by pulling on cord: always remove by pulling on the plug. **AVOID** using an extension cord unless absolutely necessary. Use of an improper extension cord could result in risk of fire and electric shock.

If an extension cord must be used make sure: (A) that pins on the plug are the same in number, size and shape as those on battery charger; (B) that extension cord is properly wired and in good electrical condition and that the wire is as specified as below:

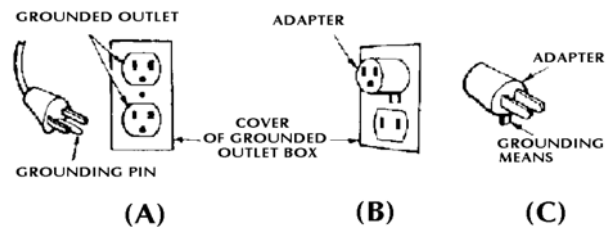
Length of cord in feet	25	50	100
AWG size of wire (DVS-20)	18	16	14
(DVD-40)	16	14	10

### Personal Precautions-

Have someone nearby in the event aid is necessary. To avoid contamination or injury when charging batteries, always wear complete eye, skin and clothing protection. Have soap and water available in case acid contacts skin, eyes or clothing. If acid enters an eye, immediately flood eyes with running water for at least 10 minutes and get medical attention immediately. Make sure any metal parts are clear of the battery, and remove jewelry and rings that may accidentally

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cause a short circuit resulting in injury.

Be extra cautious to reduce risk of dropping a tool or any metal object on battery. It may spark or short circuit the

## Grounding and AC Power Cord Safety Precautions-

Your SUPERSMART® battery charger is for use on a nominal 120-volt circuit and has a grounding plug that looks like the one illustrated in Figure 1A. A temporary adaptor (Figure 1C), may be used to connect this plug to a two-pole receptacle as shown in Figure 1B if a properly grounded outlet is not available. The temporary adapter should be used only until a properly grounded outlet can be installed by a qualified electrician.

### **DANGER!**

Before using the adapter as illustrated, be certain that center screw of outlet plate is grounded. The green-colored rigid ear or lug extending from the adapter must be connected to a properly grounded outlet - make certain that it is grounded. If necessary, replace original outlet cover plate with a longer screw that will secure adapter ear or lug to outlet cover plate and make ground connection to a grounded outlet.

## Connecting Charger to AC Power-

Make sure power switch is in “off” position and AC cord is disconnected. To reduce risk of electric shock, charger should be grounded. Charger is equipped with an electric cord having an equipment grounding conductor and a grounding plug. The plug must be plugged into an outlet that is properly installed and grounded according to all local codes and ordinances. **DANGER!** Never alter AC cord or plug provided. If it will not fit the outlet, have a proper outlet installed by qualified electrician. Improper connection may risk an electric shock.

## Preparing to Charge Battery-

battery and cause an explosion

### **USE FOR LEAD-ACID TYPE BATTERIES ONLY!** **NOT FOR GEL-CELL OR DRY CELL BATTERIES.**

**NOTE: DELCO® Batteries ARE NOT GEL-CELL batteries.**

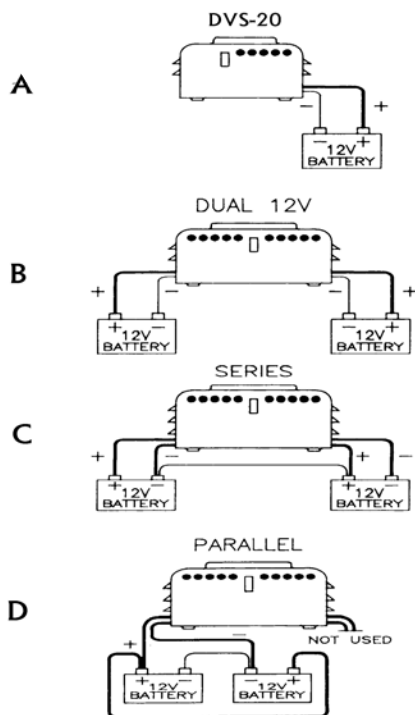
1. **CAUTION!** Select proper switch setting for type of battery to be charged. “DELCO” or “OTHER”. Power switch must be in “off” position when setting “DELCO/OTHER” switch. **Incorrect setting will damage battery.**
2. Place battery in well ventilated area and forcefully blow away any acid fumes that may have accumulated.
3. Follow all instructions placed on battery by manufacturer.
4. Make sure battery terminals are clean.
5. Follow battery manufacturer’s precautions for removing (or not removing) cell caps while charging. Add distilled water in each cell until battery acid reaches level specified by manufacturer. Do not over fill. For battery without cell caps carefully follow battery manufacturer’s instructions. It is very important to follow battery manufacturer’s instructions to remove or not remove cell caps when charging.
6. Keep charger as far away from battery being charged as DC cables permit and never place charger directly above battery. Battery gases will corrode and damage charger.
7. When reading gravity or filling battery, avoid dripping battery acid on charger.
8. Avoid exposure to elements.

## DC Connection Safety Precautions-

1. Connect and disconnect DC output clamps only after setting charger switch to “off” position and removing AC cord from electric outlet.
2. When attaching clamps to battery post twist or rock them back and forth several times to make a good connection. This tends to keep clamps from slipping off terminals and helps reduce risk of sparking. **NOTE!** Charger has a built-in safety factor and clamps will not spark when touching.

## Cable Connections-

1. **SINGLE 12 VOLT BATTERY (DVS-20/DVD-40)**  
- Use plus side (+ red clamp) cable to plus side (+ red) of battery. Connect negative (- black clamp)



3. **TWO 12 VOLT BATTERIES CONNECTED IN SERIES (24 VOLTS), (DVD-40)** - Batteries are connected together, plus (+) to negative (-), with a jumper cable of adequate size. Connect charger to batteries as described in step 2 above. Fig. 2C.
4. **TWO 12 VOLT BATTERIES IN PARALLEL, (DVS-20 AND DVD-40)** - Batteries are connected together, plus (+) to plus (+) and negative (-) to negative (-), with jumper cables of adequate size. Connect plus (+ red clamp) cable to plus (+ red) side of battery No. 1. Connect negative (- black clamp) cable to negative (-black) side of battery No. 2. Fig. 2D.

## Automatic Monitoring-

Your SUPERSMART® battery charger is completely automatic and may be left "on" whenever input power is made available. The charger output depends upon the condition of the battery it is charging. If the battery or batteries are discharged, the charger

2. **TWO 12 VOLT BATTERIES AT SAME TIME (DVD-40)** - Connect plus (+ red clamp) cable to plus (+ red) side of battery No. 1. Connect negative (- black clamp) cable to negative (- black) side of battery No.1. Connect battery No. 2 in same manner. Fig. 2B

will deliver its full output. After the battery reaches its gas point (about 14.4 volts) the charger will gradually reduce the current level. When the battery or batteries are fully charged, the charger will automatically monitor and maintain the charge of the batteries. If charger is connected to battery for long periods, check water levels every two weeks to make sure they are at proper levels. If a battery being charged is still drawing 10 amps or more after 12 or more hours, the battery may be defective, or there is excessive load on the battery during the charge cycle.

**GREEN LIGHT:** A steady green light indicates that battery is connected properly and charge cycle is to begin. A blinking green light indicates that the charge cycle is complete and the battery is being floated at a voltage of approximately 13.10 volts.

**STEADY RED LIGHTS:** Red lights indicate charging current much like that of a typical meter. The amount of current is indicated numerically below each individual light.

**FLASHING RED LIGHTS:** Flashing red lights indicate an abnormal condition has occurred during charging. This can be caused by the charger sensing a high output voltage that can be caused by a bad connection to the battery. Also it can be caused when the battery charger senses the battery is not accepting a charge.

## Troubleshooting-

1. **CHARGER DOES NOT TURN ON:**
  - A. Check to make sure AC input line is supplying power by plugging a lamp, appliance or voltage meter.
  - B. Turn off power switch and remove AC input line plug. Check fuse in holder on rear panel of charger. If fuse is blown, replace with one of proper size and value. Use of fuse other than one specified may cause serious damage to charger and will void the warranty.
5. **GREEN LIGHT ON STEADY BUT RED LIGHTS DO NOT LIGHT:**
  - A. Turn off power switch and remove AC input line plug. Recheck the battery charger clamps for clean tight connections.
  - B. Battery may be deeply discharged. Disconnect battery from the vehicle. Leave battery charger

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connected to battery. The charger will slowly charge the battery until the battery is able to take full charging current. After a period the battery charger will proceed with a normal battery charge. If this does not occur then the battery is probably defective.

6. RED LIGHTS ARE FLASHING:
  - A. Battery may be defective. Try again to charge battery by cycling power off and on. If red lights start flashing again, turn off power switch and remove AC input line plug and remove battery from charger and have battery tested by your battery dealer.
  - B. Connections to battery may be dirty or loose. Turn off power switch and remove AC input line plug. Recheck the battery charger clamps for clean tight connection