Battery Basics

by

Minuteman®

Battery Testing

Batteries should be tested at regular equipment service intervals, as well as when equipment begins to operate less than its normal specified running time.

1). Fully charge batteries prior to beginning any test.

2). Check battery cells with a hydrometer if available. If variations of specific gravity range more than 30 points in a battery, the battery is defective.

3). Fully charge and load test the batteries (use the piece of equipment that contains the batteries as your load tester). Run the unit's components (i.e. vac motor and brushes, etc.) for 20 to 30 minutes. While batteries are still under a load, measure each battery's voltage.

Check for the following: 1). If there is 1 or more volt variance between batteries, the low battery must be replaced. 2). If there is less than a 1 volt variance between batteries under load the batteries are okay. 3). Test the low batteries specific gravity and replace if there is a 30 point variance between cells. Under normal conditions, batteries are serviceable with gravities between 1.250 to 1.280.

Battery Charging

1). New batteries should be given a full charge before first use.

2). Limit the use of the new batteries for the first six cycles.

3). **DO NOT** excessively discharge batteries. Excessive battery discharge can cause polarity reversal of individual cells, eventually resulting in complete battery failure.

   a). Your Minuteman charger will not turn on if batteries are excessively discharged. This is a built-in safety to protect your charger and batteries.

   b). All batteries should be brought to the charger when the battery power indicator on the unit being used has the needle just entering the red discharge area. this indicates the proper level of discharge to protect the batteries & charger.

4). Batteries should not be left in a state of discharge. They should be charged after each use.

5). Batteries should be charged between short intervals of non-use, of 1 hour or more.

6). Match the battery charger to the size of batteries being charged (i.e. DO NOT use a 10 amp charger to charge 185 amp hr batteries).

7). **DO NOT SMOKE** near batteries when they are charging, avoid flames and sparks, which may cause an explosion & serious injury.

8). Use of any battery additives is not recommended, because the use of such products will shorten battery life.

Minuteman Battery Chargers

Since January 1990, Minuteman International has been using fully automatic chargers. Listed below are instrucitons on how to properly use and diagnosis charger problems.

1). Make sure the charger is the correct charger for the job (i.e. 24 volt charger for a 24 volt battery pack).

2). **Always connect the AC power cord to the outlet before connecting the DC cord to the battery pack.**

3). After plugging in the charger, the relay should click and gauge should read a"charging current".

4). The charger will shut-off when battery voltage reaches a predetermined amount. The battery cell specific gravity should be 1.265 to 1.280 when checked with a hydrometer after the charging process is complete.

If the charger will not turn off:

1). Check to see that you have the proper charger for the battery pack size you are charging.(i.e. 24 volt charger for a 24 volt-battery back.)

2). Check battery specific gravity, if 1.265 or above. Have the charger tested. Also, have the charger tested if signs of over charging are present.

Note: This applies only, when batteries have been allowed to cool down. This normally takes one to two hours after the charger turns off.

Minuteman Battery Chargers (cont)

If charger fails to turn on:

1). Check A.C. power supply.

a). Is line voltage present?

b). Is the line voltage correct for the charger? (i.e. 115V/240V)

2). Make sure charger is plugged into batteries and not machine.

3). Test DC fuses. DO NOT visually inspect, but rather test with a continuity tester or OHM meter.

4). **The battery chargers require a minimum voltage remaining in the battery pack, before the charger will activate. 24 volt chargers require 18 volts or more to activate. 36 volt chargers require 28 volts or more to activate.**

5). When the battery pack is plugged into the charger the relay should click within 3 to 5 seconds. If click is not heard and the charger does not turn on, the battery pack, voltage must be tested as stated in step#3.

a). If battery voltage is lower than specified previously for the charger being used, it will have to be charged with an automotive style charger and then tested. Also, the reason for excessive discharge should be established and corrected to ensure proper charger and battery life. (i.e. batteries left in storage without maintaing the charge or the opeartor running machine with the operating gauge well into the discharged area.)

Minuteman Battery Chargers (cont)

If battery charger turns off early:

1). Batteries may have been allowed to sulfate. Battery testing will confirm this. Once sulfation occurs, it may be partially reduced by returing temporary, to daily charging.

2). A.C. circuit is not live, no power to charger.

a). Tripped breaker.

b). A.C. cord unplugged.

For further information see:
"Trouble Shooting Minuteman Battery Chargers"

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