

1.0 PURPOSE

The purpose of this procedure is to provide a uniform procedure for re-filling and consistent charging of the motorized equipment batteries. This process will help prolong the life of the batteries and prevent over-filling and over-charging.

2.0 SCOPE

These procedures are used by all authorized employees who may have to re-fill battery cells and/or charge motorized equipment batteries.

3.0 METHODS

3.1 Charging Batteries (without removing the battery).

- 3.1.1 Batteries are not to be recharged unless the battery charge indicator on the motorized equipment shows a remaining charge of between 20-25% (Battery discharge meter will be flashing). The exception to this is at the end of the workday. The motorized equipment will be charged as described regardless of the amount of the remaining charge.
- 3.1.2 Batteries should be allowed to recharge for at least 8 hours and cool down for 8 hours before being used again.
- 3.1.3 Do not plug the battery in during breaks or lunch. This does not improve the charge and only adds additional heat, which results in damage to the battery.
- 3.1.4 Each battery charger has a number on it that corresponds to the number on the motorized equipment or may have a color-coded connector that matches the connector on the motorized equipment. Do not mix a charger with motorized equipment that has either the wrong number or different color connector.
- 3.1.5 Inspect connectors and report to the supervisor if they are loose or damaged.
- 3.1.6 Always wear appropriate safety equipment when charging batteries.

3.1.7 Appropriate safety equipment includes:

- Gloves
- Face shield
- Safety glasses

3.1.8 Specific procedures for charging a battery without removing it from the equipment.

3.1.8.1 Find the battery charger that matches the number on the equipment that is to be charged or the correct color-coded connector.

3.1.8.2 Obtain and wear the following personal protective equipment:

- Gloves
- Face shield
- Safety glasses

3.1.8.3 Turn off the motorized equipment.

3.1.8.4 Open the cover of the battery.

3.1.8.5 Unplug the connector that connects the battery to the equipment.

3.1.8.6 Turn off the charger before connecting to the battery.

3.1.8.7 Connect the battery connector to the battery charger connector.

3.1.8.8 Ensure that connections are tight.

3.1.8.9 Turn the charger on.

3.1.8.10 Press start to begin charging.

3.1.8.11 Double check that the connections are tight.

3.1.8.12 Remove and replace personal protective equipment.

3.1.9 Procedures for Disconnecting the Battery Charger.

3.1.9.1 Turn off the charger.

3.1.9.2 Disconnect the charger connector from the battery.

- 3.1.9.3 Reconnect the battery connector to the battery.
- 3.1.9.4 Close the battery cover.
- 3.1.9.5 Look for evidence of spills or leaks in and around the equipment. Clean up as needed.
- 3.1.9.6 Place the battery charge cable back in a position that prevents damage from contact with the floor or sharp objects.

3.2 Water Refill of Battery Cells

- 3.2.1 Only add water after the battery charge is complete. If you fill the cells then charge, you will cause an overflow of battery acid.
- 3.2.2 Do not overflow battery cells.
 - 3.2.2.1 Most of the battery cells have a white plastic insert. This insert is a guide to ensure that the battery is not over-filled. Fill the battery cell with enough water to the point where the water just covers the bottom of the plastic insert. **DO NOT OVER FILL THE CELL.**
 - 3.2.2.2 For those units that do not have the insert, the water hose has a water pressure attachment on it. This water pressure attachment automatically stops the water flow from the hose when the water reaches the shut off switch inside the water pressure attachment.
 - 3.2.2.3 Some units have a small plug-in adapter that connects directly to the fill hose and performs refilling without physical contact with battery or battery cell covers. Just connect the fill hose to the adapter on the unit, open the valve, and turn on the water. When water stops flowing, close the valve and disconnect the fill hose.
- 3.2.3 Batteries are to be watered only once a week. Radial has determined that the day of watering is Monday morning only. There is to be no further watering until the following Monday morning.
- 3.2.4 Always wear appropriate personal protective equipment when filling the battery cells. These include:

- Rubber Gloves
- Safety Glasses
- Face Shield
- Rubber Apron

3.2.5 Specific Procedures for Filling Battery Cells with Water.

3.2.5.1 Wear personal protective equipment. These include:

- Rubber Gloves
- Safety Glasses
- Face Shield
- Rubber Apron

3.2.5.2 Open the covers of each battery cell.

3.2.5.3 Ensure that each cell needs water before adding more water.

3.2.5.4 Using the water hose place the water pressure insert into the cell and rest flush against the base of the cell.

3.2.5.5 Activate the water trigger and allow the cell to fill.

3.2.5.6 When the water shuts off automatically, remove the filler attachment from the cell and insert into the next cell. Do not try to over fill the cell.

3.2.5.7 Repeat as necessary.

3.2.5.8 Upon completion of the water filling, replace the water hose on the holder.

3.2.5.9 Replace all caps on the cells.

3.2.5.10 Ensure they are secure.

3.2.5.11 Wipe down the top of the battery to remove any water or moisture that may have built up.

3.2.5.12 Close the cover.

3.2.5.13 Remove and replace the personal protective equipment.

3.3 Equalizing Charge

3.3.1 Every Friday afternoon, motorized equipment is set up for charging as described in section 3.1. The one exception is instead of pushing START, the operator presses EQUALIZE.

3.3.2 Equalizing every week allows the battery to charge and to spread the charge equally to all the cells. This also ensures a proper cool down period for the battery.

3.4 Battery Cleaning

3.4.1 All batteries should be free of corrosion and grime.

3.4.1.1 To accomplish this, the operator neutralizes and wipes off the top of the batteries after every water refilling.

3.4.1.2 Some facilities use an outside cleaning service for this procedure.

3.4.2 Failure to do this will result in a build-up of corrosion and will damage the battery case.

3.5 Spills of Battery Acid or Electrolytes.

3.5.1 In the event that battery acid or electrolytes are spilled or an over-flow occurs during refilling or re-charging, please follow the guidelines in Radial's Hazardous Communication Program to contain and clean up the spill.

3.6 Training

3.6.1 Every authorized motorized equipment operator, supervisor and manager is trained in these procedures. Training includes hands on practice and lecture.

4.0 RECORDS

The Attendance Information Log is utilized to document the Employees training. This training record is maintained in hard copy format and is placed in the Employees' personnel file. Human Resources maintain the training records permanently.