

Warehouse Floor Sweeper Scrubber Battery Maintenance Procedure

1.0 Maintenance Objective & Frequency

The objective of this procedure is to perform routine maintenance on the lead-acid or AGM battery pack of a warehouse floor sweeper scrubber. Proper battery maintenance ensures maximum runtime, extends battery service life (typically 5-7 years), prevents sulfation, and reduces the risk of thermal runaway or acid leaks. This procedure covers weekly watering, monthly equalization charging, and quarterly terminal cleaning.

Frequency: Weekly (watering check), Monthly (equalization charge), Quarterly (terminal cleaning and full inspection).

2.0 Lockout/Tagout (LOTO) & Safety

- **Electrical Isolation:** Turn the key switch to OFF and remove the key. Disconnect the battery connector from the machine harness.
- **Battery Isolation:** If the battery has a disconnect switch, open it. For flooded lead-acid batteries, ensure the vent caps are tight and the battery is cool before handling.
- **Personal Protective Equipment (PPE):** Wear acid-resistant gloves, safety goggles, a rubber apron, and steel-toed boots. Have a neutralizing agent (baking soda solution) available for acid spills.
- **Ventilation:** Perform all battery work in a well-ventilated area. Hydrogen gas can accumulate and is explosive. No smoking or open flames within 10 feet.

3.0 Required Tools, Parts & Lubricants

- Distilled water (only for flooded lead-acid batteries)
- Battery watering gun or syringe with graduated markings
- Baking soda (sodium bicarbonate) and water for neutralization
- Wire brush or battery terminal cleaning tool
- Dielectric grease or anti-corrosion spray
- Digital multimeter (DC voltage, 0-20V range)
- Hydrometer (for flooded batteries) or temperature-compensated refractometer
- Torque wrench (Nm range for terminal bolts)
- Clean rags and a bucket of water
- Battery charger (compatible with battery type and voltage)

4.0 Step-by-Step Maintenance Procedure

1. Perform LOTO as per Section 2.0. Ensure the machine is parked on a level surface, the parking brake is engaged, and the battery is disconnected from the machine.
2. Visually inspect the battery case for cracks, bulges, or leaks. Check the cable insulation for fraying or corrosion. If any damage is found, tag the machine out of service and report to supervision.

3. For flooded lead-acid batteries: Remove the vent caps and check the electrolyte level in each cell. The level should be 1/4 to 1/2 inch above the plates. If low, add distilled water only. Do not overfill. Replace caps securely.
4. Clean the battery top and terminals. Mix a paste of baking soda and water (1 cup baking soda to 1 gallon water). Apply with a rag to neutralize any acid residue. Scrub gently with a brush. Rinse with clean water and dry with a rag.
5. Inspect and clean the battery terminals and cable connectors. Use a wire brush or terminal cleaning tool to remove corrosion. Apply a thin layer of dielectric grease to the terminals to prevent future corrosion.
6. Torque the terminal bolts to the manufacturer's specification (typically 8-12 Nm for small terminals, 15-20 Nm for larger posts). Do not overtighten. Reconnect the battery connector to the machine harness.
7. Measure the open-circuit voltage of the battery pack using a digital multimeter. For a 24V system, a fully charged battery should read 25.2-25.6V. For a 36V system, 37.8-38.4V. Record the voltage in the PM log.
8. If performing a monthly equalization charge: Connect the battery to the charger. Select the equalization mode (if available) or set the charger to a constant voltage of 2.5-2.7V per cell (e.g., 15.0-16.2V for a 24V pack). Charge for 2-4 hours after the normal charge cycle completes. Monitor electrolyte temperature; do not exceed 50°C.
9. After equalization, allow the battery to cool for 1 hour. Check electrolyte levels again and top up with distilled water if needed. Reinstall vent caps.
10. Perform a specific gravity test on flooded batteries using a hydrometer. The corrected specific gravity should be 1.265-1.285 at 25°C. If any cell reads more than 0.030 below the others, the battery may be failing. Record readings.
11. Reconnect the battery to the machine. Turn the key switch ON and verify that the battery gauge shows a full charge (or appropriate state of charge). Run the scrubber in a test cycle for 2 minutes to ensure proper operation.

5.0 Verification & Return to Service

1. Confirm that the machine operates normally: drive forward and reverse, activate the scrub deck and squeegee, and check that the vacuum motor runs. No error codes should appear on the display.
2. Verify that the battery charger accepts the battery and begins a normal charge cycle when plugged in. The charger should not show fault codes.
3. Remove all tools, rags, and debris from the machine. Close any access panels. Return the machine to the designated storage area.
4. Complete the PM work order in ServiceGrid. Record the date, technician name, battery voltage, specific gravity readings (if applicable), and any observations (e.g., corrosion level, water usage). Sign off on the task.

Regulatory Disclaimer: This document is a generic maintenance template provided for educational and informational purposes only. It does not constitute professional engineering or reliability advice. The end-user assumes all liability for validating all step sequences, torque specs, and LOTO protocols against specific machinery OEM manuals before deployment to a live production floor.