



Portable Watering Cart - Operation & Maintenance Manual

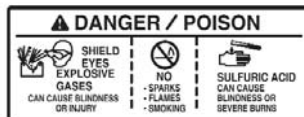
For Model:
BA-MS-105
BA-MS-106
BA-MS-205



BL-032
8/18/2008

General Information & Precautions

This publication provides detailed instructions for installing the single point watering system kit and/or related water supply. Thoroughly review this document before any installation procedures are performed.



The following safety statements relate to specific safety issues and must be read, understood, and heeded before a kit is installed. Failure to do so could result in personal injury and/or property damage.

DANGER

- Battery – Explosive gases! Do not smoke. Keep sparks and flames away from the vehicle and service area. Ventilate when charging or operating vehicle in an enclosed space. Wear a full face shield and rubber gloves when working on or near batteries.
- Battery – Poison! Contains acid! Causes severe burns. Avoid contact with skin, eyes, or clothing. Antidotes:
 - External: Flush with water. Call a physician immediately.
 - Internal: Drink large quantities of milk or water. Follow with milk of magnesia or vegetable oil. Call a physician immediately.
 - Eyes: Flush with water for 15 minutes. Call a physician immediately.

WARNING

- Follow the procedures exactly as stated in this instruction, and heed all DANGER, WARNING, and CAUTION statements in this instruction as well as those on the vehicle and battery charger.
- Only trained technicians should service or repair the single point watering system. Anyone doing even simple repairs or service should have knowledge and experience in plumbing, electrical and mechanical repair. The appropriate instructions must be used when performing maintenance, service, or accessory installation.
- Prior to servicing the vehicle or leaving the vehicle unattended, turn the key switch OFF, remove the key, and chock the wheels when servicing the vehicle.
- Wear safety glasses or approved eye protection when servicing any part of the watering system. Wear a full face shield and rubber gloves when working on or near batteries.
- Do not wear loose clothing or jewelry such as rings, watches, chains, etc., when servicing the vehicle or battery charger.
- Moving parts! Do not attempt to service the vehicle while it is running.
- Hot! Do not attempt to service hot engine, exhaust system, or motor. Failure to heed this warning could result in severe burns.
- Use insulated tools when working near batteries or electrical connections. Use extreme caution to avoid shorting of components or wiring.
- If wires are removed or replaced, make sure wiring and wire harness are properly routed and secured. Failure to properly route and secure wiring could result in vehicle malfunction, property damage, personal injury, or death.

Watering Procedures

1. Water After Charge

- Electrolyte levels drop during discharge and rise during charge. In addition, charging generates heat, fluid expansion and explosive gases. Watering a battery before charge (or with a low charge level) can lead to boil over resulting in potential damage of the watering system, battery and vehicle.

Water, when needed, must be added to fully charged battery. Prior to charging, there must be sufficient water to cover the plates. If the battery has been discharged (partially or fully), the water level should still be above the plates.

2. Watering Intervals

- Watering intervals are dependent on the local climate, charging methods, application, and age of batteries. Flow-Rite recommends that new batteries be checked once a month and older batteries be checked weekly until you get a feel for your water consumption rate.

Typically for a heavy use application, we recommend watering a maximum of once per week, and for light use applications once per month. Generally it is best to water on Wednesdays for most applications. Specifically you should not water a battery that has been sitting for an extended period of time with no activity (non use or not on charge) such as a battery that has sat idle over the weekend. It is best to water a warm battery that has just been fully charged.

Important: Water quality is important to maintain the life of your battery and watering system. Always use water that meets the quality requirements of your batteries' manufacturer.

Power Requirements

Model Number	Power Requirement	Battery Requirements
BA-MS-105	100-115 VAC	12 VDC (sealed) Included
BA-MS-106	100-240 VAC	12 VDC (sealed) Included
BA-MS-205	115 VAC	Not Applicable

Operation

For continued successful operation of your Single Point Watering system always:

1. Only use Flow-Rite approved equipment
Warning! Use of unapproved equipment or modification of approved equipment can lead to system failure and will void your warranty
2. Always follow Flow-Rite's required watering procedures.
3. Perform regular scheduled maintenance!
4. For indoor use only!

Warning! Only fill batteries after they have been fully charged, and require water.

Step 1 - Fill Tank

- Ensure the water supply has ample water to fill battery. If necessary, remove lid and fill cart with water. All carts are compatible with deionized water.

Step 2 - Power Up Cart

- For AC powered, first plug into a GFCI outlet. See power requirements of your specific models on page 3. Turn on rocker switch.

- For DC powered carts turn on rocker switch, and check voltage meter to ensure battery is charged. The cart should not be operated once the voltage falls below 12 volts.

Recharging Battery: Plug in battery charger (to a GFCI outlet) when cart is not in use to ensure the battery is fully charged. The on-board charger will maintain charge levels as necessary. See page 3 for charger power requirements.

NOTE: Once the water supply has been powered on, the pump will turn on briefly to develop pressure in the supply hose and then will turn off. The power switch can be left on in between refilling batteries. The pumps will turn on occasionally to maintain pressure in supply hose. This occasional cycling will not damage the water supply. **The water supply should be powered down if it will be inactive for 15 minutes or more to prevent overheating.**

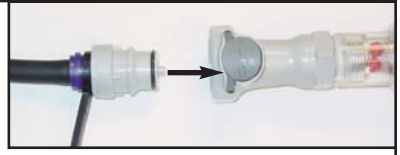
Operation Continued

Step 3 - Remove Dust Cover



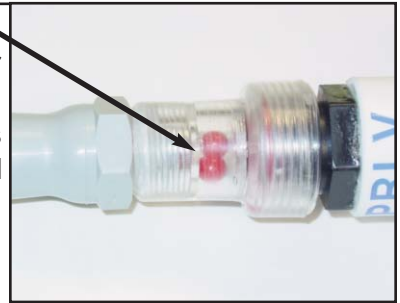
Step 4 - Mate Couplers

- Insert the male coupler on the spw system into the female coupler on the end of the water supply.



Step 5 - Observe Flow Indicator

- The red balls inside the flow indicator will begin to spin indicating that water is flowing into the battery. As the cells fill and the valves shut off, the balls will begin to spin slower until they come to a stop. This indicates that all valves have shut off and filling is complete.



Step 6 - Disconnect

- When the balls stop spinning, and not before, immediately disconnect the couplers by depressing the push button on the female coupler. If the water supply is left connected after the filling process is finished it could lead to an overfill. Disconnecting before the balls come to a complete stop will lead to underfilled cells.



CAUTION: If at any time during the filling process you have a valve failure disconnect immediately

Step 7 - Replace Dust Cover

- Place dust cover back over the male coupler. Do not push cover past the large barb on the coupler.

Tip: If you slightly squeeze the dust cover when sliding it over the coupler it will create a vacuum allowing it to hold tightly.



Regular Maintenance

Your single point watering system requires regular preventative maintenance on at least a quarterly basis.

1. Check all screens

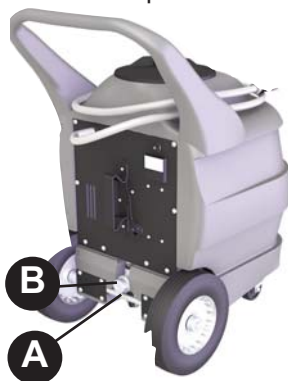
Clean or replace all strainers as necessary. Failure to do so can cause a reduction in the water pressure and flow rates needed to operate the system properly.



Regulator Filter Screen (A)



Line Strainer (B)



Note: Pictures may differ slightly from your specific application.

2.

Inspect the condition of all tubing connections, red end caps, swivel T's, and couplers.

Make sure that all parts are in good working condition and are secure, leak free, and properly connected. The coupler must have an O-ring and dust cover properly attached.

3. Electrolyte Levels

Flow-Rite recommends checking the electrolyte level in each cell for accuracy after the system has been installed and operational for three months.

Seasonal Maintenance

Water Supplies

Water supplies must be drained and stored in an empty state if they will be exposed to freezing temperatures. Failure to do so can cause permanent damage.

Watering Systems

If you have vehicles that are taken out of service or put into storage for a period of 6 weeks or longer, your single point watering system will require seasonal maintenance. Check you system instructions for details.

Operating Specifications

Operating Requirements of SPW system

Flow-Rate:	2-5 gallons per minute*
Pressure Range:	3-35 PSI (no flow, static)
Temp. Range:	Freezing - 150° F
	Freezing- 65.5° C

Water supply Operating Requirements

Temp. Range	33 - 150° F
	1 - 65.5° C

All product specifications should be met for proper operation of your Flow-Rite SPW system. Contact battery supplier or Flow-Rite Controls if you have any questions regarding product specifications or how to verify a water supply.

*Flow rate should be measured at the end of a purger (female / male coupler combination).



Visit www.flow-rite.com for details



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