

SERVICE MANUAL

Minuteman[®]
Excellence Meets Clean



Generation 1



Generation 2

For:
Training
Troubleshooting
Adjustments

For Max Ride Models:

Generation 1

MR20ECO, MR20S,

MR26ECO, MR26S,

Generation 2

A-MR20ECO, A-MR20S,
A-MR26ECO and A-MR26S

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1. Safety



- 1. Stop the machine only on level surfaces.**
- 2. Avoid moving parts. Do not wear loose jackets, shirts, or sleeves when working on machine.**
- 3. Avoid contact with battery acid. Battery acid can cause burns. When working on or around batteries, wear protective clothing and safety glasses. Remove metal jewelry. Do not lay tools or metal objects on top of the batteries.**
- 4. Do not clean machine with a pressure washer.**
- 5. Only authorized personnel should perform repairs and maintenance.**
- 6. Use only Minuteman genuine replacement parts.**
- 8. Do not use machine around flammable substances.**
- 9. The batteries should be charged only in well ventilated areas.**
- 10. Always disconnect the battery pack from the machine and the A.C cord the from outlet, when servicing the machine.**

3. Maintenance Intervals

•**Maintenance Intervals:**

In a modular structure, the Minuteman System Maintenance determines the specific technical procedures to be performed and sets the time interval between the two maintenance cycles.

For each of the maintenance cycle, the replaceable parts are determined as well. Further details described in the specific chapters.

•**Minuteman System Maintenance K:**

To be performed by the customer (in daily or weekly intervals) according to the maintenance and care instructions as specified in the operating instructions.

The operator must be professionally instructed after delivery of the machine by selling dealer.

•**Minuteman System Maintenance I:** (after every 125 hours of operation)

To be performed an authorized Minuteman Service Center in accordance with the machine-specific system maintenance.

•**Minuteman System Maintenance II:** (after every 250 hours of operation)

To be performed an authorized Minuteman Service Center in accordance with the machine-specific system maintenance.

•**Minuteman System Maintenance S:** (after every 500 hours of operation, safety check) To be performed by an authorized Minuteman Service Center in accordance with the machine-specific system maintenance.

3.1 Minuteman System Maintenance K



| To be performed by the customer/user | Interval | |
|--|----------|--------|
| | Daily | Weekly |
| Fill the clean water tank and mix the proper amount and type of cleaning solution. | O | |
| Charger the batteries. | O | |
| Check the brush head, Clean if needed with a damp cloth. Do not get water inside the motor. | O | |
| Check the squeegee, clean if needed | O | |
| Check the lid gasket on the recovery tank. | O | |
| Empty and flush the recovery tank with clean water. | O | |
| Clean the filter/float inside the recovery tank. | O | |
| Check the water levels of all the batteries. Add distilled water, if needed. Do not over fill. | O | |
| Check the pads and brushes for wear. Replace if needed. | | O |
| Check the squeegee hose for clogs, damage and wear. Replace if needed | | O |
| Check the squeegee rubbers for cuts and wear. Flip the blade(s) over or replace. | | O |
| Check the solution filter. Clean if needed. | | O |
| Flush the clean water solution tank with warm water. | | O |
| Test all the functions of the machine. | | O |

3.2 Minuteman System Maintenance I



| To Be Performed By An Authorized Service Center | Interval |
|---|------------------------------|
| | Every 125 hours of operation |
| | |
| Perform the Minuteman System Maintenance I | 0 |
| Check the battery charger. Make sure it is functioning correctly. | 0 |
| Check the recovery lid gasket. Replace if needed. | 0 |
| Lubricate the brush lift linkages with grease. Use a small brush. | 0 |
| Check for loose hardware, tighten if needed. | 0 |
| Check the tire pressure on pneumatic wheels at 65 psi, if equipped. | 0 |
| Lubricate the squeegee linkages with grease. Use a small brush. | 0 |
| Inspect the entire machine for damage, wear and proper operation. | 0 |

3.3 Minuteman System Maintenance II



| To Be Performed By An Authorized Service Center | Interval |
|--|------------------------------|
| | Every 250 hours of operation |
| | |
| Perform the Minuteman System Maintenance II | 0 |
| Inspect the caster wheels for wear and damage. Repair, if needed. | 0 |
| Inspect the carbon brushes for wear in the transaxle. Replace, if needed. | 0 |
| Inspect the recovery drain hose for wear or damage. Replace, if needed. | 0 |
| Inspect the brush bumper rollers for wear or damage. Replace, if needed. | 0 |
| Inspect the carbon brushes in the brush motors for wear. Blow out with compressed air. | 0 |
| Inspect the recovery hose for damage or wear. Replace, if needed. | 0 |
| Inspect the squeegee assembly for proper adjustment. Repair, if needed. | 0 |
| Test the machine for proper operation. | 0 |

3.4 Minuteman System Maintenance S



| To Be Performed By An Authorized Service Center | Interval |
|---|------------------------------|
| | Every 500 hours of operation |
| Perform the Minuteman System Maintenance check | 0 |
| Replace the carbon brushes in the transaxle. | 0 |
| Replace the carbon brushes in the brush motors. | 0 |
| Test the machine for proper operation. | 0 |

4. Lubrication

Regularly scheduled lubrication of certain machine parts should be performed to insure trouble-free operation of the machine. *Apply a generous amount of grease into the fittings on the machine until grease seeps out around the bearings. Wipe excessive grease off with a towel.*

The grease points are listed below:

1. *Rear squeegee caster wheel axle (2)*
2. *Rear squeegee caster swivel (2)*

Apply lubricant to:

1. *The rear squeegee pivot points*
2. *The scrub deck linkages.*

5. Setting the Charger Battery Type

(957760 & 957761 Charger only)



Instructions

- Remove the rear metal panel on the machine.
- 2. Remove the 957761 charger completely from the machine.
- 3. Locate the rubber plug on the bottom right side of the charger.
- 4. Remove the rubber plug.
- 5. Locate the selector switch.
- 6. Use a small flat tip screw driver to turn the red indicator to the desired setting. See the chart below.
- 7. Replace the rubber plug and install charger into the machine.

| Switch Position | Battery Type |
|-----------------|--|
| 1 | All Wet Flooded Lead Acid 95 to 115 AH (Group 27) |
| 2 | All Wet Flooded Lead Acid 130 to 140 AH (Group 31) |
| 3 | GEL/AGM (NON OEM) 135 amp Hr |
| 4 | GEL/AGM (NON OEM) 95 to 100 AH and Trojan AGM 102 (AH) hr. Minuteman Part # 956157 |

Note: These are the only settings available. For non OEM batteries, please contact supplier for the charging requirements. Select from the list above.

The remaining settings do not have any additional functions.

5. Setting the Charger Battery Type Cont.

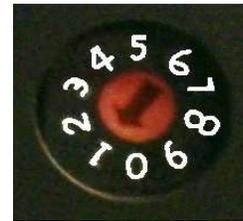
Remove the rubber plug on the end of the charger.
Turn the red selector with small flat tip screw driver to the desired setting.



Bottom view with plug



Bottom with plug removed



Selector Switch close up

6. Battery Charger Error Codes

Faults are displayed red LED on the battery charge indicator.

RED LED BLINKS ONCE AND REPEATS: OUTPUT CONNECTION ERROR.

1. Check for loose or corroded connections between the charger and the batteries.
2. The output may be shorted due to improper connection to the batteries or pinched wires.
3. The output may be connected in reverse polarity to the batteries.
4. The battery voltage may be too high (higher than a 24V battery pack).

This condition can also occur, if the charger is restarted immediately after charging.

Allow batteries to cool down before restarting the charger.

Note: The charger is not damaged by any of these problems except when connected to Batteries totaling 48 volts or more.

RED LED BLINKS TWICE: CHARGER HAS TIMED-OUT

The charging progress timer has elapsed before charging was complete and charger has stopped charging. Possible causes:

1. The batteries are extremely discharged – Unplug the AC cord connection for 30 seconds minimum. Let batteries cool down if hot. Reconnect the AC cord to start a new charge cycle.
2. The electrolyte is low in one or more cells – Correct by adding distilled water.
3. Batteries are weak, old, or have one or more bad cells. Batteries will still charge but capacity will be reduced. Replace the batteries, if needed.
4. If batteries are new, the batteries may need to be conditioned by charging and discharging them. Some batteries may need to be cycled several times in order to condition them to their full potential.



6. Battery Charger Error Codes Continued



Faults are displayed red LED on the battery charge indicator cont.

All Three lights blink at the same time

1. Charger is restarting
2. Charger is unable to put full output to the batteries
3. Possible loose or poor connections. Check all connections.
4. Batteries may need to be conditioned by charging and discharging them. Some batteries may need to be cycled several times in order to condition them to their full potential.

7. Battery Trouble Shooting

(Excessive Gassing or Water Consumption in Batteries)

1. If the charger appears to be charging and excessive gassing or water consumption had been or is occurring in the batteries.
 2. Check the following:
 3. **A.** Have the batteries been maintained on a consistent basis? Failure to maintain batteries will shorten their life and reduce their performance.
B. Test the batteries with a hydrometer. The batteries should be fully charged and cooled for 2 hours after charging, before testing. Top the batteries off with distilled water prior to charging, if needed. Do not over fill.
C. Compare the cell readings of all the cells in each battery.
- The greater the variation between cells in any one battery, the greater loss of running time. A battery with variations of .040 or greater should be replaced.
 - The variation of .020 is considered normal.
 - Specific Gravity Readings are as follows:
 - 1.280 and above = 100% charged cell
 - 1.235 to 1.240 = 75% charged cell
 - 1.190 to 1.195 = 50% charged cell
 - 1.150 to 1.175 = 25% charged cell
 - 1.140 or less = 0% charged cell
 - Load test the batteries with a battery load tester.
 - The voltage difference should be less than 1 volt, when testing under load. Any battery that has 1 or more volt(s) less than the other should be replaced.

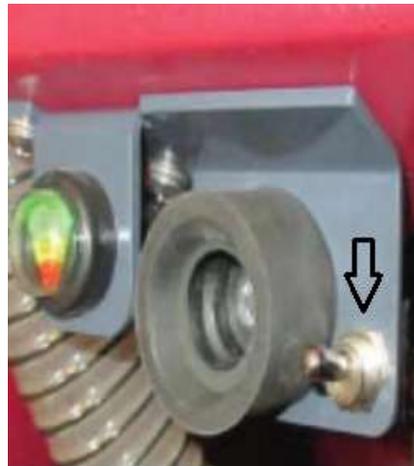
8. Electric Brake By-pass Switch (Gen 1)

Applies to Gen 1 versions only, Models MR20ECO, MR20S, MR26ECO and MR26S.

The by-pass switch allows you to release electric brake, the machine can be manually moved if drive circuit is non functional. Battery power is required.

If the machine is powered up in the manual released position, the code 9 (9 bar flash) will appear on the battery status LED indicator. The drive system will be disabled.

Turn the brake by-pass switch off and restart the machine.



9. Squeegee Blade Replacement on Gen 1

Changing the Squeegee Blades

Check the inner and outer squeegee blades on the squeegee (A) weekly for signs of wear. The squeegee blades can be reused by removing them and flipping over them (can be turned for 2 total uses). It is generally easier to remove the squeegee with the brush deck in the raised position.

1. Pull off the suction hose, loosen the two 3-sided knobs (B) and remove the squeegee.
2. Unlock the fastening devices on the inside and outside squeegees as shown.



10. Squeegee Height Adjustment

Adjusting the Squeegee Blades Height Adjustment

- If streaks are present, the clearance between the caster wheels and floor must be adjusted by tightening, or loosening the nut above the bracket that holds the caster as shown in Figure A. Figure B shows optimal flare of the squeegee for best results.



Figure A



Figure B

11. Maintaining the Recovery Float (all Versions)

- **Screened Float** If the recovery tank is overfilled or a large amount of foaming is present, the screened float blocks the vacuum intake inside the tank protecting the vacuum motor and internal electronics from water damage. It is essential to keep the float in working order through regular maintenance. The float should be cleaned daily by thoroughly rinsing with a hose.
- **Screened Float Removal** The screened float is positioned inside the recovery tank



The float/screen cage can be removed for cleaning, without removing the screws

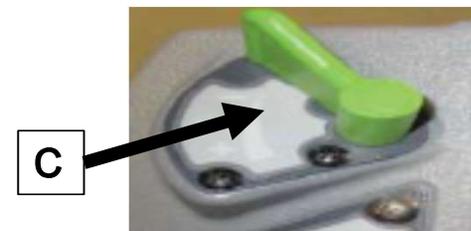
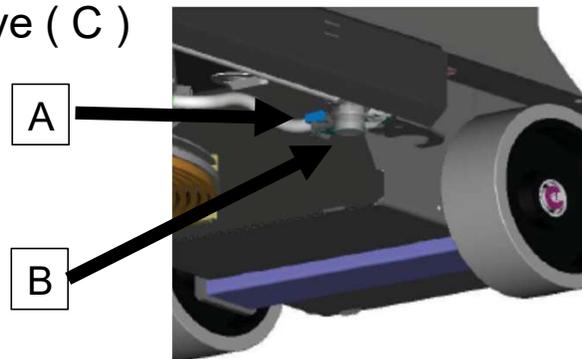
- **WARNING:** Damage to the machine may occur if operated without the screened float properly in place. Removal of the screened float is not necessary for daily maintenance.

12. In-line Solution Screen and Valve (Generation 1)

The solution solenoid, which shuts off solution flow is protected from debris by the in-line filter assembly. The filter assembly is located on the under-carriage of the machine on the left hand side, just under the solution tank. It is important to check and clean the screened washer inside the assembly regularly to ensure proper solution flow. Before cleaning, lift the scrub deck lift lever to the fully raised position. To open, pull the blue shut off handle to the closed position (A), then unscrew the screen assembly (B). Remove the screen and rinse, reinsert and screw assembly together, tightening by hand. Overtightening with tools may damage the plastic threads.

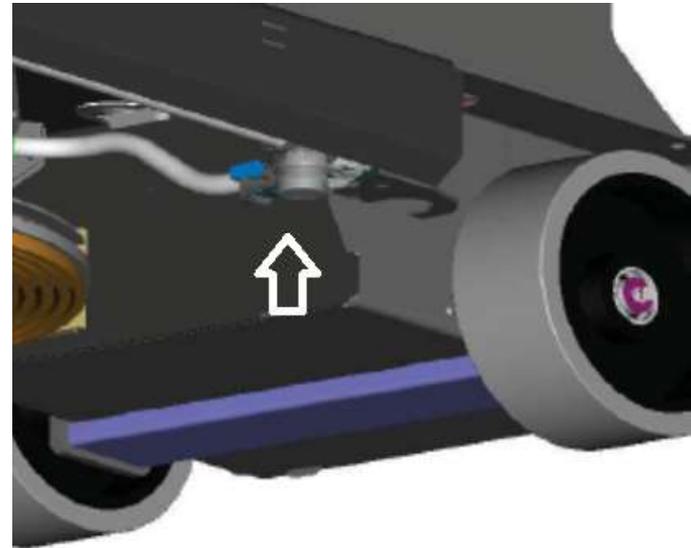
Note: The valve (A) can also be used to control water volume.

Manual control valve (C)



13. Solution Filter and water control valve (Gen 2)

- This applies to the Generation two A-MR20 and A-MR26 only.
- The solution filter and solution control valve is located under the frame on the operators left side in front of the left rear wheel.
- The solution valve should be turned off before cleaning the filter.
- The solution valve can also be adjusted to control the solution flow rate. The Gen 2 version machines do not have a manual water control on the top of the machine.



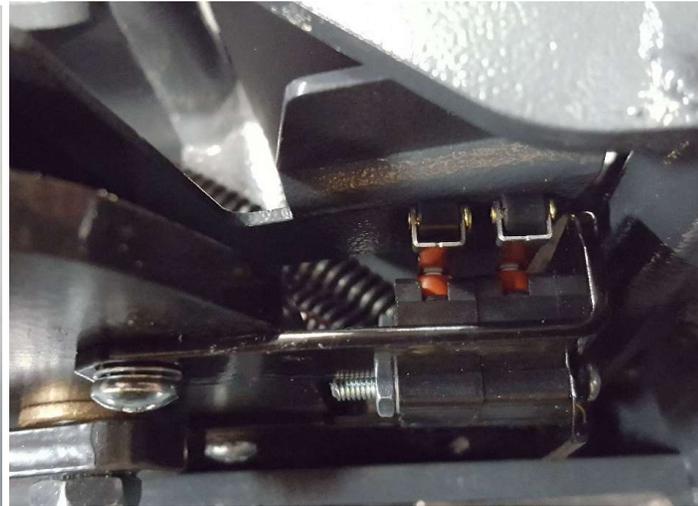
14. Switches (Gen 1 Only)

(Water Solenoid and Brush Unload Brake Switches)

These are located under the frame below the throttle pedal area.

One switch controls the electric water solenoid.

The other controls the brush motor braking during the brush unload (removal).



15. Drive Controller Error Codes



Single flash Low Batteries- Charge the batteries



Single flash Faulty connection to the traction drive motor or worn out carbon brushes in traction motor.



Single flash – Shorted traction drive motor or drive motor circuit.



Single flash – Battery charge level has fallen below lockout level. Charge the batteries.



Single flash – Not used

15. Drive Controller Error Codes



Single flash – Drive controller Inhibited –
Because of low battery voltage - charge the batteries



Single flash- Throttle fault (potentiometer) Not detected or
throttle may not be in neutral position during startup.



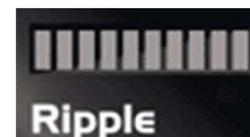
Single flash- Loose battery connection or
from repeatedly cycling key switch on and off to quickly.



Single Flash – Electric Brake disconnected from circuit or
the override switch is set in the manual transport position (gen 1 only).



Single flash- High battery voltage- Check all connections



Ripple-Throttle activated during start up.
(LEDS start on left and light up traveling to
right and repeating)

16. Seat Switch contact plates

Machine does not to drive (everything else works)

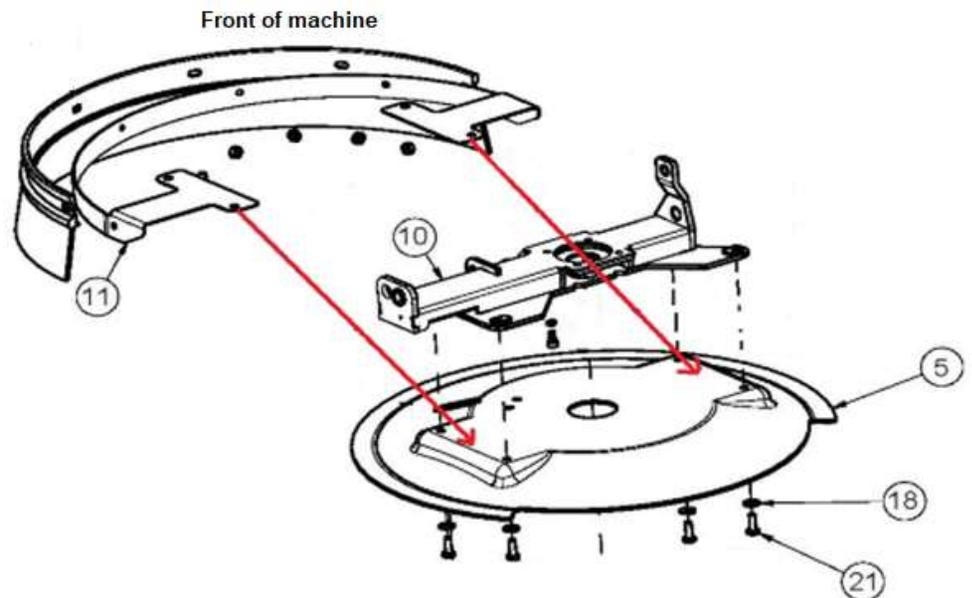
Check the contact plates on the rear edge on the seat/tank cover and the solution/recovery tank where the two meet. These are the contacts for the seat switch circuit. (applies to all versions)



21. Adding Brush Skirt to the MR20D Gen. 1

1. Remove the four screws #21 shown below.
2. Insert #11 between #10 and #5 from the front.
3. Install the four screws # 21

| Parts Needed | | |
|-------------------|-------------|----------------|
| Quantity Required | Part Number | Description |
| 6 | 3400232 | Screw |
| 6 | 711373 | Nylon Lock Nut |
| 1 | 246104 | Skirt |
| 1 | 246095 | Bracket, Skirt |



MR20ECO, MR20Sport, MR26ECO and MR26Sport

