

# User Manual

**E Ride 28/32 Rider Scrubber**

## Technical Specifications

This manual is furnished with each new **MINUTEMAN ERide 28/32**. This provides the necessary operating and preventive maintenance instructions. Operators must read and understand this manual before operating or servicing this machine.

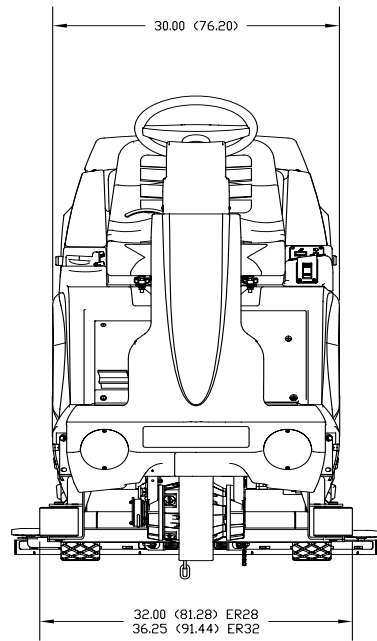
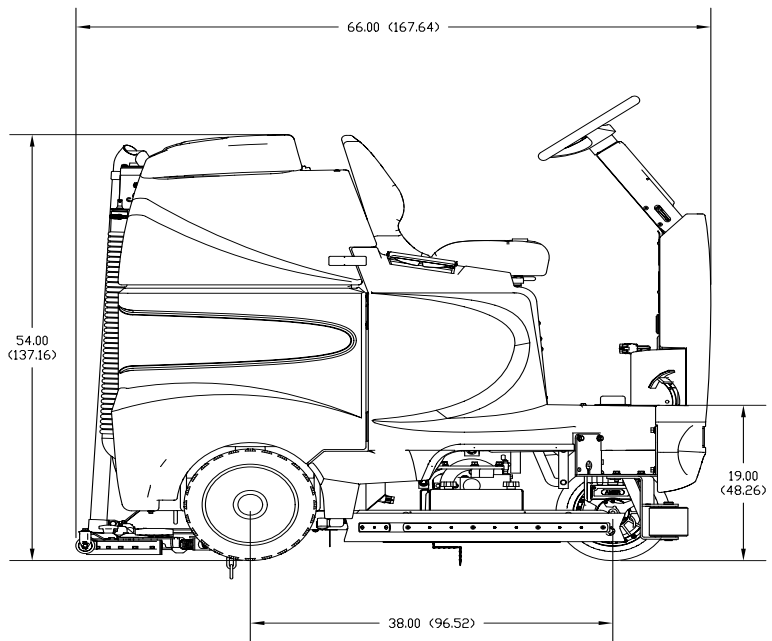
This machine was designed to give you excellent performance and efficiency. For best results and minimal cost, please follow the general guidelines below:

- Operate the machine with reasonable care.
- Follow the manufacturers suggested maintenance instructions as provided in this manual.
- Use original Minuteman supplied parts.

### **Model**      *E Ride 28/32*

Model No. ER28C, ER28CPLUS, ER28CQP, ER28CQPG, ER28CQPT, ER28D, ER28DPLUS, ER28DQP, ER28DQPG, ER28DQPT, ER32C, ER32CPLUS, ER32CQP, ER32CQPG, ER32CQPT, ER32D, ER32DPLUS, ER32DQP, ER32DQPG, ER32DQPT

|                         |   |
|-------------------------|---|
| Current                 | 60 Amps   |
| Voltage, Batteries      | 36 volts, 6-6volt   |
| Battery Capacity        | 235 Ah (Optional 395 Ah batteries available)                            |
| Sound Level             | 75 dB   |
| Dimensions (LxWxH)      | 66" x 31" x 54" (167.64cm x 78.74cm x 137cm)                            |
| Gross Weight            | 1,243 lbs (564 kg) with batteries<br>847 lbs (384 kg) without batteries |
| Working Grade Transport | 10% (7°)  |
| Wheel to Floor Pressure | 64 PSI Front, 69 PSI Rear   |



## Introduction

### Preface

Dear customer, Thank you for purchasing the Minuteman® E Ride. The outstanding operational characteristics of the E Ride should justify the confidence you demonstrated in making this purchase.

The E Ride is a commercial grade Rider Scrubber machine. It is battery operated and is intended by Minuteman to be used in accordance with this manual, the labels on the machine itself, as well as applicable federal, state, and local safety and environmental statutes, regulations, and ordinances (collectively the "governmental regulations"), applicable commercial standards, and common sense. .

The user's own safety, as well as the safety of others, depends to a great extent on how the E Ride is operated, handled, and maintained. Therefore, as a starting point, this manual must be read and understood thoroughly prior to the machine being switched on for the first time. When operating or maintaining the E Ride, **THINK SAFETY FIRST!**

This manual provides vital information concerning the safe operation, use, maintenance, and service of the E Ride.

The various safety alert symbols, signal words, and safety messages contained herein are intended to be read in conjunction with each other, as well as with E Ride labels, instruction plates, and applicable governmental regulations. To the extent that any governmental regulations conflict with the provisions of this instruction manual, such governmental regulations would govern. Your authorized Minuteman dealer would be happy to answer any questions you may have concerning the operation or maintenance of the E Ride or information contained in this manual. If repair or maintenance work is performed on the E Ride, Minuteman recommends that only genuine replacement parts be used and that such work be performed by qualified individuals.

### Proper use

The E Ride is a floor scrubbing machine. Its intended scope of application is for wet cleaning of level, hard-surfaced floors in accordance with the provisions of this instruction manual, applicable governmental regulations, manufacturer specifications, and machine labels (collectively, "proper use"). Using the E Ride beyond its proper use will be deemed improper use by Minuteman. Minuteman disclaims any liability for any personal injury, property, or other damages of any nature whatsoever, whether special, indirect, consequential, or compensatory, directly or indirectly resulting from the improper use of the E Ride, or uses beyond or inconsistent with the E Ride's intended scope of application. This disclaimer of liability also extends to modifications to the E Ride made without Minuteman's prior written consent.

The E Ride should only be operated, handled, and maintained by persons who are familiar with the machine and who have been instructed of the potential hazards associated with such operation, handling, and maintenance.

### **Disclaimer:**

Minuteman disclaims liability for any personal injury, property, or other damages of any nature whatsoever, whether special, indirect, consequential, or compensatory, directly or indirectly resulting from the publication, use of, application, or reliance on this document or, except as expressly set forth in the sales contract for the machine, the operation or maintenance of the E Ride. EXCEPT AS EXPRESSLY SET FORTH IN SUCH SALES CONTRACT, MINUTEMAN MAKES NO WARRANTIES, EXPRESS OR IMPLIED, AND SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Minuteman disclaims and makes no guaranty or warranty, express or implied, as to the accuracy or completeness of any information published herein, and disclaims and makes no warranty that the information in this instruction manual will fulfill any parties' particular purposes or needs. While Minuteman believes that the information in this manual is accurate, in the event that technical or typographical er-

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In publishing and making this manual available, Minuteman is not undertaking to render professional or other services for or on behalf of any person or entity, nor is Minuteman undertaking to perform any duty owed by any person or entity to someone else. Anyone using this manual should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances.

Valid as of: August 2010

**Minuteman International Inc.  
14N845 U.S. ROUTE 20  
PINGREE GROVE, IL. 60140  
U.S.A.**

### **Notes on warranty**

The terms of the sales contract apply in regard to any product warranties. Minuteman expressly disclaims all other warranties, either express or implied, of any kind. It should be noted, however, that failure to maintain and service your E Ride in accordance with its proper use may void the warranty. In this regard, any maintenance work must be performed by an authorized Minuteman service representative and confirmed in the "Maintenance Certificate" - the warranty document. By way of example, the following items are excluded from the E Ride warranty: fuses; normal wear and tear; improper machine handling; damages caused by overloads; unauthorized machine modifications; non-compliance with maintenance instructions or specifications; or improperly fitting parts or accessories.

### **Acceptance of the machine**

Upon arrival, check machine for possible damages in transit. Follow unpacking instructions on shipping pallet. Each unit has been tested and thoroughly inspected before shipment. Any damage is the responsibility of the delivery carrier who should be notified immediately.

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## The E Ride 28/32

This machine was designed with total operator comfort and ease of use in mind. All machine components have been designed as a total system to efficiently clean dirty floors. The E Ride has four available scrub head types and sizes to fit specific applications. *Please contact your Minteman representative for specific recommendations for the correct scrub head type, size, and brush type and chemical applications.*

Before using the machine, always perform the following steps to ensure proper machine operation.

- Check under the machine for leaks.
- Check the rear and side squeegees for wear and damage.
- Check the steering for proper operation.
- Check the solution and recovery tanks.

After using the machine, always perform the following steps:

- Check the battery charge level. Charge batteries if necessary. When charging batteries, extra precaution is required:

- Battery acid can cause burns.
- When working on or around batteries, always wear protective clothing and safety glasses.
- Remove metal jewelry. Do not lay tools or metal objects on top of the batteries.
- Charging batteries generate explosive gasses.

**DO NOT CHARGE BATTERIES WHEN OPEN FLAMES OR SPARKS ARE PRESENT. DO NOT SMOKE.**

- Make sure the charger is turned off before disconnecting it from the batteries.
- Charge the batteries in a well-ventilated area.
- Fluid levels should be checked before and after charging and maintained at the proper levels. If low, add water until the metal plates are covered.
- If the machine is not used for an extended period of time, batteries should be kept fully charged with a boost charge once a week.
- Check for wire, string, or twine wrapped around the scrub brushes.
- Check the squeegees for wear and damage.
- Check the rear squeegee suction hose and off-aisle wand hose for obstructions.
- Empty and clean the debris box (cylindrical systems only).
- Drain and clean the recovery tank.
- Check under the machine for leaks.
- Check the service records to determine maintenance requirements.

**WARNING!**

- **Be sure you understand the machine controls and their functions.**
- **While on ramps or inclines, avoid sudden stops when tanks are filled.**
- **Avoid abrupt sharp turns. Slow down driving speed when going downhill.**
- Always drive up when cleaning ramps.





## Table of Contents

|   |           |          |   |           |
|---|-----------|----------|---|-----------|
| <b>Technical Specifications</b> . . . . . | 2         | <b>2</b> | <b>First Operation</b> . . . . .        | <b>32</b> |
| Introduction . . . . .                    | 4         | 2.1      | Instruction . . . . .                   | 32        |
| Notes on Warranty . . . . .               | 6         | 2.2      | Initial charging procedure . . . . .    | 32        |
| Acceptance of the machine . . . . .       | 6         | 2.3      | Before Putting into Operation . . . . . | 32        |
| <b>The E Ride 28/32</b> . . . . .         | <b>7</b>  | 2.4      | Start Machine . . . . .                 | 32        |
| Important Safety Instructions . . . . .   | 10        | 2.5      | Operation . . . . .                     | 33        |
| Unpacking Instructions . . . . .          | 11        | 2.6      | Stop Machine . . . . .                  | 34        |
| <b>1 Machine Overview</b> . . . . .       | <b>12</b> | 2.7      | After Work . . . . .                    | 34        |
| 1.1 Machine Overview - Front . . . . .    | 12        | 2.8      | Transporting the machine . . . . .      | 35        |
| 1.2 Machine Overview - Rear . . . . .     | 13        | 2.9      | Tie-down points . . . . .               | 35        |
| 1.3 Operator Compartment . . . . .        | 14        | <b>3</b> | <b>Maintenance and Care</b> . . . . .   | <b>36</b> |
| 1.4 Control Console . . . . .             | 16        | 3.1      | Minuteman System                        |           |
| 1.5 Operation Modes . . . . .             | 18        |          | Maintenance . . . . .                   | 36        |
| 1.6 Fault/Diagnostic Codes . . . . .      | 20        | 3.2      | Maintenance Document . . . . .          | 37        |
| 1.7 Steering Wheel . . . . .              | 21        | 3.3      | Maintenance Schedule . . . . .          | 38        |
| 1.8 Accelerator Pedal . . . . .           | 21        | <b>4</b> | <b>Troubleshooting</b> . . . . .        | <b>44</b> |
| 1.9 Seat . . . . .                        | 21        | <b>5</b> | <b>Warranty</b> . . . . .               | <b>50</b> |
| 1.10 Directional Switch . . . . .         | 21        |          |   |           |
| 1.11 Parking Brake . . . . .              | 21        |          |   |           |
| 1.12 Circuit Breakers . . . . .           | 22        |          |   |           |
| 1.13 Battery Compartment . . . . .        | 22        |          |   |           |
| Battery Connection Diagram . . . . .      | 23        |          |   |           |
| 1.14 Scrub Decks . . . . .                | 24        |          |   |           |
| 1.15 Scrub Deck Installation . . . . .    | 26        |          |   |           |
| 1.16 Side Squeegees . . . . .             | 28        |          |   |           |
| 1.17 Rear Squeegee . . . . .              | 30        |          |   |           |

## IMPORTANT SAFETY INSTRUCTIONS

**Operators must read and understand this manual before operating or maintaining this machine.**

**Do not operate this machine in flammable or explosive areas.**

This machine is designed solely for scrubbing dirt and dust in an indoor environment. Minuteman does not recommend using this machine in any other capacity.

The following information below may cause a potential hazard to the operator and equipment. Read this manual carefully and be aware when these conditions can exist. Take necessary steps to locate all safety devices on the machine and train the personnel operating the machine. Report any machine damage or faulty operation immediately. **Do not use machine if it is not in proper operating condition.**

### FOR SAFETY DURING OPERATION

Keep hands and feet clear of moving parts while machine is in operation.

Make sure all safety devices are in place and operate properly. All covers, doors and latches must be closed and fastened before use.

During operation, attention should be paid to other persons in the

work area and especially if small children are present.

Electric motors and components can cause an explosion when operated near explosive materials or vapor. Do not operate this machine near flammable materials such as solvents, thinners, fuels, grain dust, etc.

Store or park this machine on a level surface only, with the key switch in the off position. To prevent unauthorized use, machine should be stored or parked with the key removed.

This machine is designed for level operation only. **Do not operate on ramps or inclines.**

This machine is not suitable for picking up hazardous dusts.

Use caution when moving this machine into areas that are below freezing temperatures. Any water in the tanks or hoses can cause damage to the machine.

### FOR SAFETY WHEN SERVICING OR MAINTAINING MACHINE

Stop on level surface and turn off machine.

Disconnect the power to the machine by pressing the Red Emergency Disconnect Button when charging batteries or during installation or removal of brushes.

Avoid moving parts. Do not wear loose jackets, shirts, or sleeves when working on machine.

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 batteries.

Charging batteries generates explosive gasses. **Do not charge batteries when open flames or sparks are present. Do not smoke.**

Make sure the charger is turned off before disconnecting it from the machine. Charge the batteries in a well-ventilated area with the battery cover removed completely.

Do not clean machine with a pressure washer.

Authorized personnel must perform repairs and maintenance. Use Minuteman supplied replacement parts.

## UNPACKING INSTRUCTIONS

Carefully unpack and inspect your E Ride Scrubber for shipping damage. Follow unpacking instructions on shipping pallet. Each unit has been tested and thoroughly inspected before shipment. Any damage is the responsibility of the delivery carrier who should be notified immediately.

This machine is battery operated and designed to operate on 36 Volts DC (6) 6-volt batteries.

The recommended batteries are rated 235Ah (Minuteman P.N. 956740).

*We do not recommend mixing Amp Hour capacities. Any alternate battery sets can be used if they are of equal physical size and capacity.*

Read this manual carefully before operating this machine.

The operator is responsible for taking care of the daily maintenance and check ups of the machine to keep it in good working condition. The operator must inform the service mechanic or supervisor when scheduled maintenance is required as stated in the *MAINTENANCE* section of this manual.

Before starting, familiarize yourself with the machine and its controls (see "Machine Overview, Front", "Machine Overview, Rear", "Operator Compartment", & "Control Console" diagrams).

## SAVE THESE INSTRUCTIONS

## 1 Machine Overview

### 1.1 Machine Overview - Front

- 1 Front Drive Wheel
- 2 Side Squeegee
- 3 Accelerator Pedal
- 4 Steering Tilt Lever
- 5 Steering Wheel
- 6 Operator's Seat
- 7 Recovery Tank Lid
- 8 Recovery Tank
- 9 Control Console
- 10 Directional Switch
- 11 Recovery Tank Safety Latch
- 12 Battery Compartment
- 13 Solution Tank
- 14 Electrical Panel
- 15 Rear Squeegee
- 16 Rear Wheel
- 17 Scrubdeck
- 18 Roller Bumper

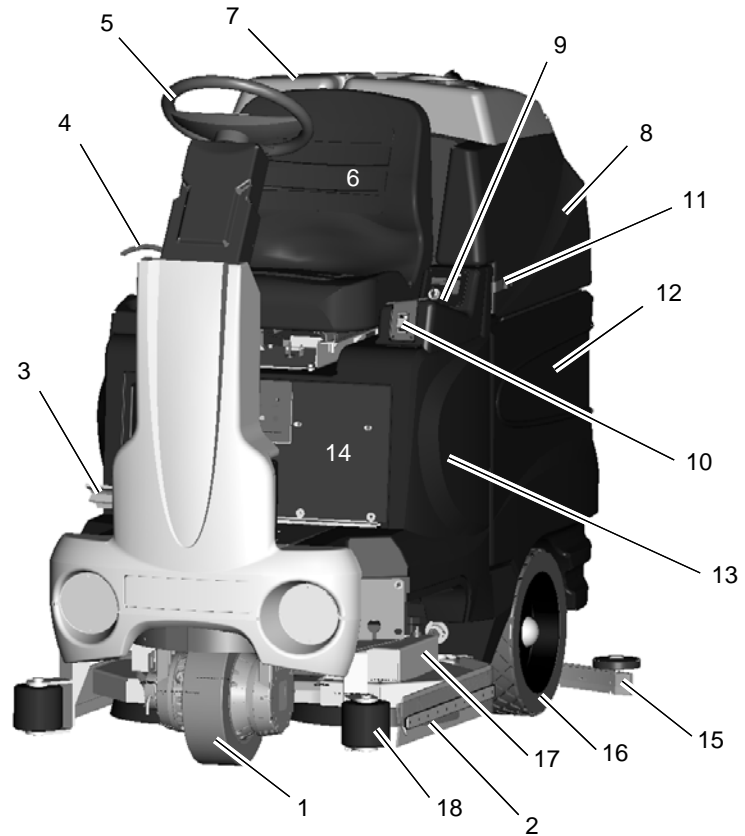


Fig.1

## Machine Overview

### 1.2 Machine Overview - Rear

- 19 Rear Squeegee
- 20 Rear Wheel
- 21 Side Squeegee
- 22 Accelerator Pedal
- 23 Solution Tank
- 24 Steering Tilt Lever
- 25 Steering Wheel
- 26 Recovery Tank Lid
- 27 Vacuum Filter Access
- 28 Vacuum Inlet Assembly
- 29 Recovery Tank
- 30 Battery Compartment
- 31 Clean-Out Cap
- 32 Recovery Drain Hose
- 33 Recovery Vacuum Hose
- 34 Scrubdeck

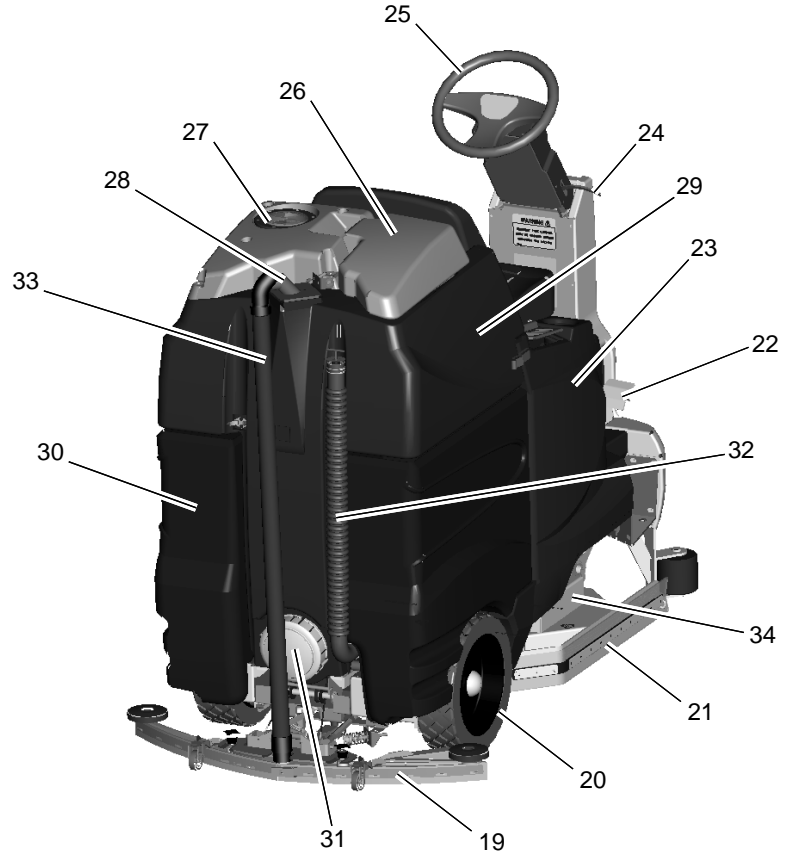
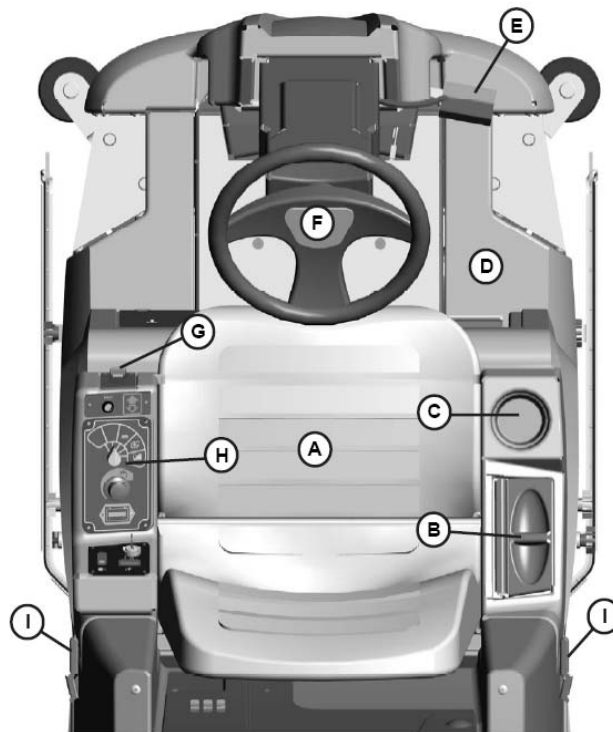


Fig.2

## Machine Overview

### 1.3 Operator Compartment

- A Operator's Seat
- B Solution Tank Lid
- C Cup Holder
- D Solution tank
- E Accelerator Pedal
- F Steering Wheel
- G Directional Switch
- H Control Panel
- I Recovery Tank Safety Latch



## Machine Overview

## Machine Overview

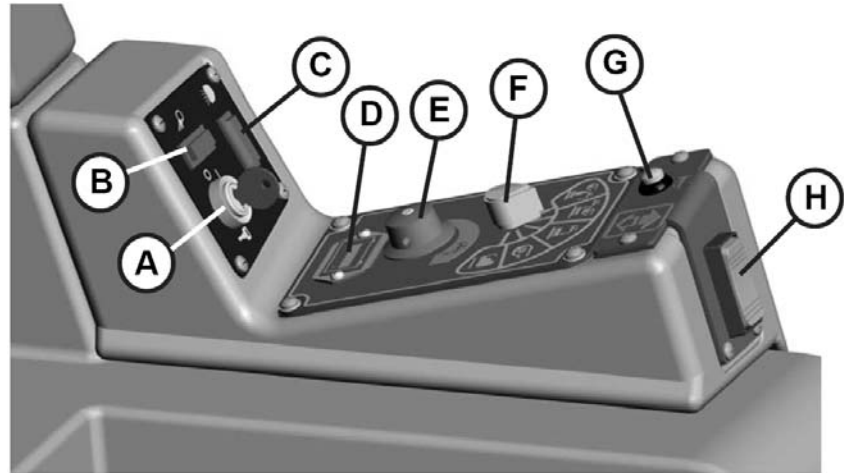
### 1.4 Control Console

For operator ergonomics, the control console houses all the primary function controls in a central area. The key switch and optional headlight and off-aisle wand switches are clustered in the back portion of the console. The directional switch (forward/reverse) is located at the front of the console for easy fingertip operation. The horn button, function selectors, and battery gauge are located in the central part of the console.

#### Key Switch (A) - S2

Controls the machine's power (ON/OFF) with a key for safety. All operational settings are retained even when the power is turned off and on. This also serves as a reset switch when errors or faults occur.

#### Off Aisle Wand Switch (OPTIONAL) (B) - S7 (281900 OPTIONAL)



ON/OFF control for the water supply to the wand and vacuum motor for the optional Off-Aisle Wand.

#### Headlight Switch (OPTIONAL) (C) - S10 (281990 OPTIONAL)

ON/OFF control for the optional headlights.

#### Battery Gauge (D) - BD1

Displays the level of charge remaining in the machine's batteries. The gauge consists of 10 LEDs. (3 Green, 4 Amber, 3 Red) If the battery life is low, the battery gauge bar icon will be flashing to inform the operator that the machine is almost out of power. Once



## Machine Overview

this signal is displayed, all functions will shut off, including transport mode. The operator must then *turn the key switch OFF and then ON* to reset the machine. The machine will then have only a few minutes left of reserve power to briefly use *Vacuum Only mode* to pick up any remaining solution on the floor and *Transport mode* to return to the charging station. This gauge will also display a fault code if the system has an error. This code is represented by a specific number of flashing LEDs. See *Fault/Diagnostic Codes for specific code information*.

### **Solution Control Knob (E) - R2**

Adjusts the amount of solution being dispensed to the floor while in one of the scrub modes. Turn the knob clockwise to increase the amount of solution being dispensed. The amount of solution applied is variable to a maximum of 1 GPM.

### **Mode Selector Knob (F) - S4**

This knob is used to select the desired operation mode of the machine. See *Operation Modes for information about each mode*.

### **Horn Button (G) - S3**

Depressing this button will activate the machine's horn.

### **Directional Switch (H) - S6**

Pressing switch to the down position will set the machine to move forward. Pressing it to the up position sets the machine to move in reverse.

# Machine Overview

## 1.5 Operation Modes

### 1. Regular Scrub Mode

When the machine is running in this mode, the machine will perform all operations. This mode can be used for day-to-day tasks under normal conditions. When the operator sets the *directional switch* to *forward* and activates the *accelerator pedal*, the solution pump will turn on, the brushes will turn on and be lowered to the floor, as well as the rear squeegee. While operating in this mode, the solution will be dispersed into the brushes, which will scrub the floor allowing the chemical in the solution to break down the dirt on the floor. As the machine continues to move forward, the rear squeegee and vacuum system will recover the dirt and dispensed solution. If the operator stops moving, the machine will automatically raise the scrub deck and turn off the brushes. If the *directional switch* is changed to reverse the machine will continue to operate normally, only the rear squeegee will raise up.

### 2. Heavy Scrub Mode

This mode is similar to *Regular Scrub*. The machine will continue to operate the same as if it was in *Regular Scrub Mode*, only this mode applies more solution and brush pressure is increased. This mode is used for high traffic areas and areas that have been heavily soiled, but do not require time for the solution to soak.

### 3. Double Scrub Mode

When the machine is running in this mode, the machine will perform all operations except dirty solution recovery. This mode can be used if the floor is heavily soiled and the chemical will need additional time to emulsify grease and oils that are on the floor. When the operator sets the *directional switch* to either the *forward* or *reverse* position and activates the *accelerator pedal*, the solution pump will turn on, the brushes will turn on and be lowered to the floor. While operating in this mode, the solution will be dispersed into the brushes, which will scrub the floor allowing the chemical in the solution to break down the dirt on the floor. As the machine continues to move forward or back, the rear squeegee and vacuum system are not on, which allows the

solution to stay on the floor emulsifying the grease and oil. If the operator stops moving in either direction, the machine will automatically raise the scrub deck and turn off the brushes. After double scrubbing, the operator should use *the vacuum only mode* to recover the dirty solution water from the floor.

### 4. Vacuum Only Mode

When the machine is running in this mode, the machine will only lower the rear squeegee and turn on the vacuum system to recover the dirty solution from the floor. This mode is usually chosen after double scrubbing to recover the dirty solution but it can also be used to pick up spills. When the operator sets the *directional switch* to *forward*, the rear squeegee will be lowered to the floor as the vacuum turns on, pulling the dirty solution water from the rear squeegee into the recovery tank. If the operator stops moving forward and sets the *directional switch* to *reverse*, the rear squeegee will retract (protecting it from damage) and the vacuum motor will turn off after a few seconds. If the operator quits moving in either direction, the machine will automatically raise the squeegee and turn off the vacuum motor after a few seconds.

### 5. Transport Mode

When the machine is set in this mode, none of the cleaning functions of the machine will operate. This mode is only used to transport the machine from one location to another.

### 6. Solution Control Knob

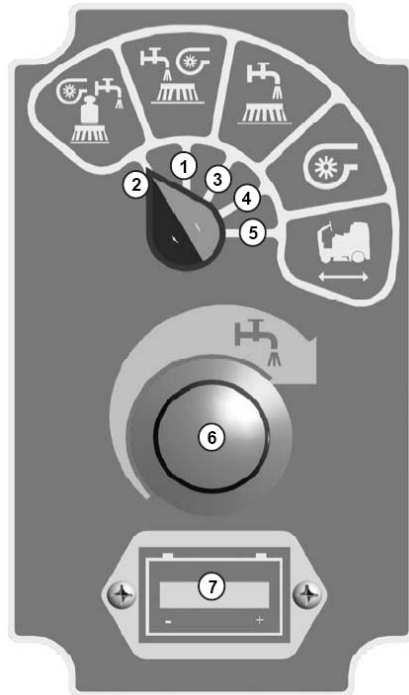
This control will adjust the amount of solution that is being dispersed to the floor while in one of the scrub modes. Adjust the control clockwise to increase the amount of solution being dispersed. The amount of solution applied is variable to a maximum of 1 GPM.

### 7. Battery Gauge

This gauge displays the level of charge remaining in the machine's batteries. The gauge consists of 10 LEDs. (3 Green, 4 Amber, 3 Red) If the battery life is low, the battery gauge bar icon will be flashing to inform the operator that the machine is almost out of power. Once this

## Machine Overview

signal is displayed, all functions will shut off, including transport mode. The operator must then *turn the key switch OFF and then ON* to reset the machine. The machine will then have only a few minutes left of reserve power to briefly use *Vacuum Only mode* to pick up any remaining solution on the floor and *Transport mode* to return to the charging station. This gauge will also display a fault code if the system has an error. This code is represented by a specific number of flashing LEDs. See *Fault/Diagnostic Codes for specific code information*.



# Machine Overview

## 1.6 Fault/Diagnostic Codes

When an error or fault occurs within the machine, a fault code will appear on the battery gauge represented by a specific number of flashing LEDs. The figure below shows a listing of the different codes.

| <b>Diagnostic Codes</b>  |           |
|--|-----------|
| <i>The number of flashing bars on the battery gauge represent fault codes as indicated below:</i>          |           |
| <b>Low battery voltage</b><br><i>Check condition of battery and connections</i>                            | <b>1</b>  |
| <b>Traction Motor fault</b><br><i>Check all connections between the motor and control system</i>           | <b>2</b>  |
| <b>Brush Motor fault</b><br><i>Check all connections between the motor and control system</i>              | <b>3</b>  |
| <b>Actuator Fault</b><br><i>Reset Key</i>  | <b>4</b>  |
| <b>Vacuum Motor fault</b><br><i>Check all connections between the motor and the control system</i>         | <b>5</b>  |
| <b>Off-Aisle Wand Activated</b><br><i>Check Off-aisle wand switch position</i>                             | <b>6</b>  |
| <b>Throttle fault</b><br><i>May indicate incorrectly wired or faulty potentiometer</i>                     | <b>7</b>  |
| <b>Control system fault</b><br><i>Check all connections are secure</i>                                     | <b>8</b>  |
| <b>Solution Tank Empty</b><br><i>Tank Needs To Be Filled</i>   | <b>9</b>  |
| <b>High battery voltage</b><br><i>Check condition of battery and connections</i>                           | <b>10</b> |
| <b>Throttle Displaced on start up</b><br><i>Restart keyswitch-throttle was activated prior to ignition</i> | Ripple    |
| <b>Please refer to manual for detailed trouble shooting information</b>                                    |           |
| 715908   |           |

### Low Battery Indicator

If the battery life is low, the battery gauge bar icon will be flashing to inform the operator that the machine is almost out of power. Once this signal is displayed, all functions will shut off, including transport mode. The operator must then *turn the key switch OFF and then ON* to reset the machine. The machine will then have only a few minutes left of reserve power to briefly use *Vacuum Only mode* to pick up any

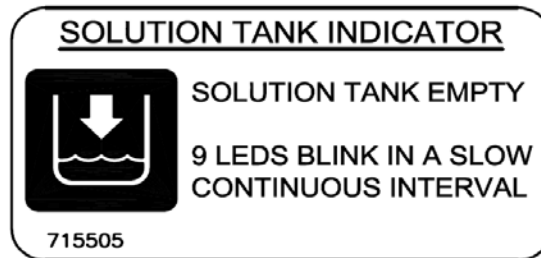
remaining solution on the floor and *Transport mode* to return to the charging station.

### Power Save Mode

The E Ride is equipped with a power save feature to conserve battery power. If the key switch power is left ON and none of the controls are activated for a period of fifteen minutes, the E Ride automatically goes into "power down mode" and turns OFF the power to conserve your batteries in case the operator forgets to turn the key switch off or leaves the machine unattended.

### Empty Solution Tank Indicator

Once the solution tank has become empty, the battery gauge will blink a solid 9 LEDs at a constant interval to alert the operator that the solution tank needs to be filled.



## Machine Overview

### 1.7 Steering Wheel

The steering wheel is adjustable for operator comfort by pulling the *tilt-steering lever* up and positioning the steering wheel up or down (there are three possible positions). Pulling on the *tilt-steering lever* and positioning the steering column in an upright position provides the operator with more room when climbing up and down the machine.



### 1.8 Accelerator Pedal - R1

Located on the right side of the operator compartment on the floor is the accelerator pedal. This pedal controls the propelling speed of the machine. The farther the pedal is pushed down the faster the machine will travel. As discussed earlier, the directional

switch governs the direction of travel the machine will take. Switching the directional switch with the pedal depressed will make your machine change directions (a very slight delay may occur before the direction of travel changes when switching directions on the fly). The accelerator pedal is interlocked with the seat switch, making machine propulsion not possible without the operator sitting on the seat. The accelerator pedal is also linked to the machine's *dynamic braking system*. During operation, when the accelerator pedal is released, the dynamic braking system will automatically halt the movement of the machine without need for an additional brake pedal.

### 1.9 Seat - S8

The ergonomically designed seat is located on top of the solution tank. There is a lever under the seat that allows the operator to adjust the seat forward or backward for operator comfort. There is an interlock switch located inside the seat. This makes it impossible to engage the traction drive circuitry without the operator on the seat. If the operator were to fall off the machine, the traction drive circuitry would turn off.

### 1.10 Directional Switch - S6

Located on the lower front of the control console, this switch controls the direction in which the E Ride will move when the *accelerator pedal* is activated. Flipping this switch to the down position will set the machine to move forward. Flipping it to the up position

sets the machine to move in reverse.

### 1.11 Parking Brake

This machine is equipped with an *Electromagnetic brake* built-in on the traction drive motor. When the machine's power is turned off (using either the key or the emergency button), the *E-mag* brake is activated and the traction motor is prevented from moving.

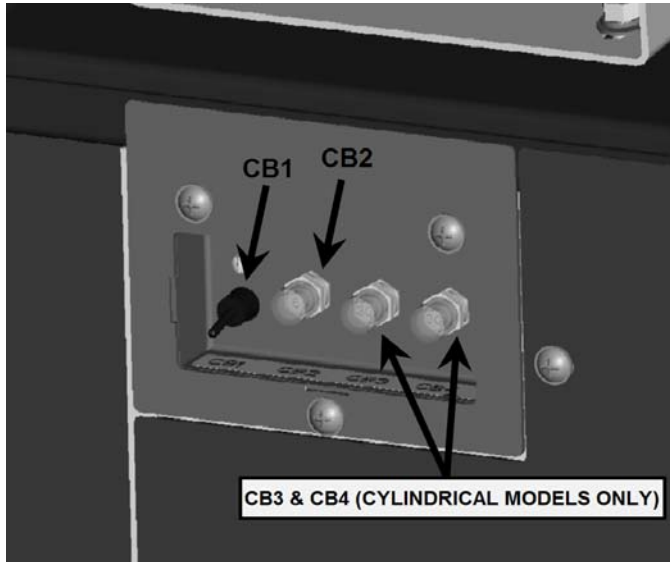
## Machine Overview

### 1.12 Circuit Breakers

The circuit breakers are located on the front panel under the seat. The **6-amp breaker** (CB2) protects all auxiliary circuits on the machine. The **100-amp breaker** (CB1) protects the main system circuit (TRIO controller). On the cylindrical models only - the **two 30-amp breakers** (CB3 & CB4) protect the cylindrical brush deck motors. Each main component is individually protected with an

internal breaker built-in the

controller. (See fault code table) and can be reset by turning the key switch off a few seconds and then on again. The 100 amp circuit breaker can also be used as a main power disconnect, this should be used only in case of emergency. When tripped the breaker removes power from the main controller and all auxiliary power circuits.

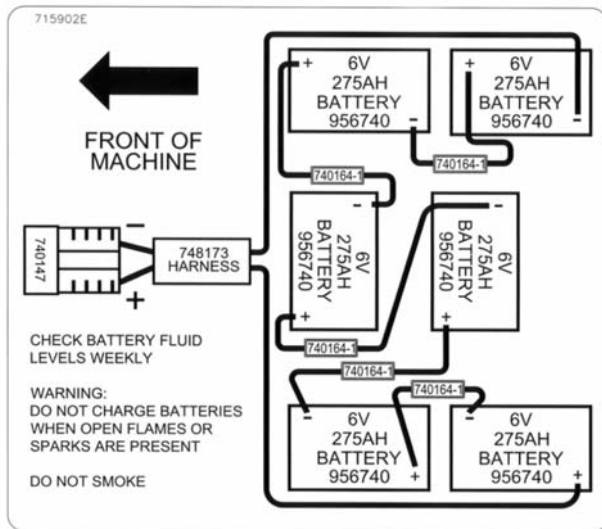


### 1.13 Battery Compartment

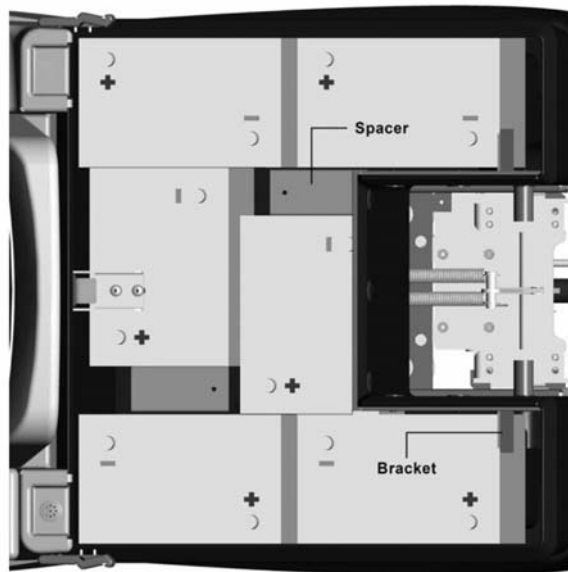
The battery compartment is located on the rear of the machine under the recovery tank. Unlatching the two safety latches on the side of the machine enables the operator to tilt the recovery tank and access the batteries for servicing and maintenance (make sure recovery tank has been drained before tilting). The battery compartment contains six, 6-volt batteries connected in series. Connect the batteries according to the battery connection diagram (see diagram). The recommended batteries are 235Ah (Minuteman P.N. 956740). The two batteries positioned in the center are offset and held in position by two steel spacers. These spacers keep the batteries from sliding inside the battery compartment during machine use and prevent undesired stresses in the battery cables. Be sure to replace these spacers whenever re-installing batteries.

## Machine Overview

### Battery Connection Diagram



### Batteries Installed with Spacers

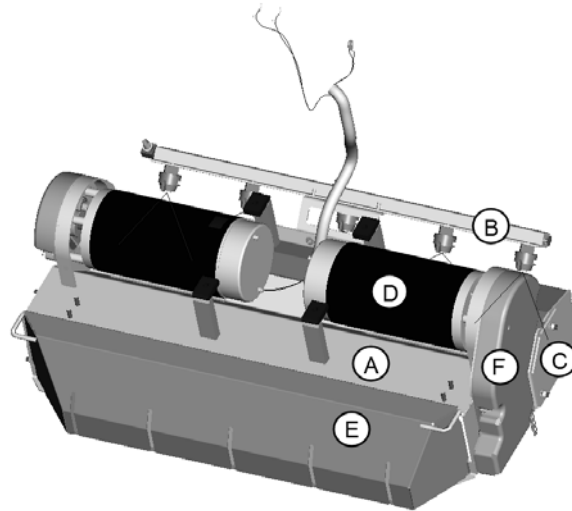


## Machine Overview

### 1.14 Scrub Decks

Minuteman offers two deck types (*Cylindrical and Disc*) to fit your specific needs. The E Ride design is very dynamic wherein the decks are interchangeable in a matter of minutes whenever necessary (removal of four bolts, one hose, and one electrical connection). The *cylindrical brush deck* has five built-in spray jets to uniformly dispense cleaning solution on the floor and a wet sweeping debris tray to collect loose objects on the floor. The *disc brush deck* dispenses cleaning solution through the two center hubs and the solution is contained within the bristle area for efficient agitation of cleaning solution to the floor and channeled to the rear of the machine. The disc brushes are also easily removed and installed by easily removing the side deck covers and releasing the scrub brush quick release clamp. Another nice feature that these scrub decks have is the ability to have uniform brush pressure applied to the floor at all times. Since the scrub deck brush pressure is computer controlled, it will automatically adjust and compensate to uneven contours on the floor while maintaining brush pressure.

### Cylindrical Scrub Deck



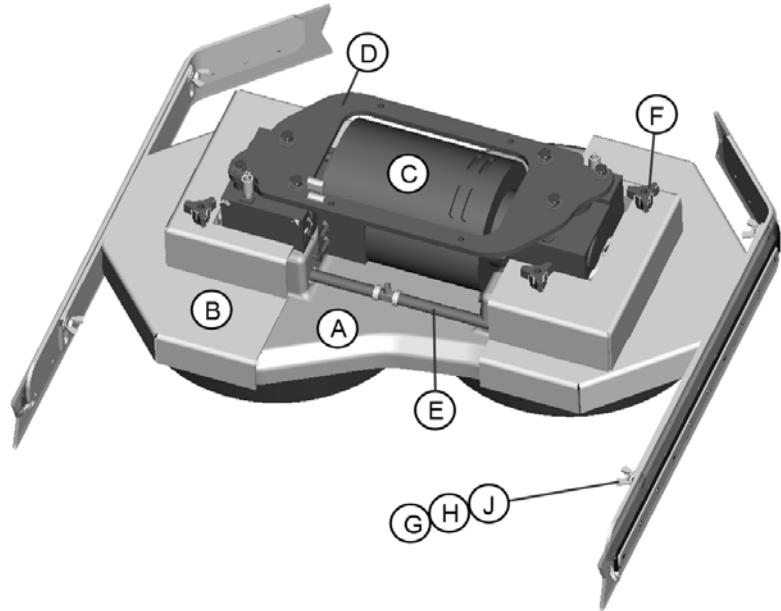
- A Main Housing
- B Spray Bar w/ Sprayjets
- C Access Door (2)
- D Brush Motor (2)
- E Debris Box
- F Pulley Cover (2)



## Machine Overview

### Disc Scrub Deck

- A Center Deck Cover
- B Side Deck Cover (2)
- C Brush Motor
- D Mounting Plate
- E Solution Feed Hose
- F Three Sided Knob (4)
- G Wing Nut for Squeegee Adj. (4)
- H Helical Lock Washer for Squeegee Adj. (4)
- J Flat Washer for Squeegee Adj. (4)



# Machine Overview

## 1.15 Scrub Deck installation

When installing a cylindrical deck to a machine:

1. Install brushes **after** the deck has been mounted to avoid flat spots on the brushes.
2. Use a piece of cardboard underneath the deck to prevent scratches to the painted surface when sliding the deck under the machine.
3. Make sure the scrub deck is oriented correctly with the spray jets towards the front of the machine.

When installing a disc scrub deck to a machine:

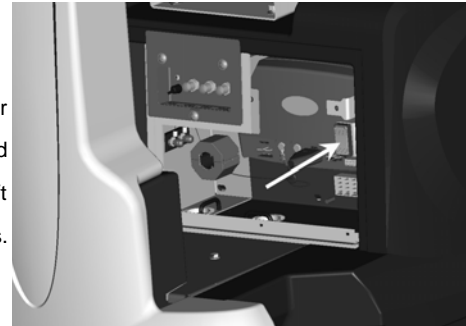
1. Install brushes on the scrub deck; this aids the installer in sliding the deck assembly into position.
2. Make sure the scrub deck is oriented correctly with the solution hose tee fitting towards the front of the machine.

### Installation Instructions

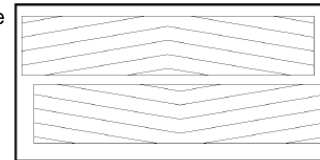
1. Park the machine on a flat or level surface.
2. Turn the key switch to the ON position and select the transport mode with mode selector knob.
3. Slide the scrub deck assembly underneath the machine (follow instructions as described above)
4. Position the scrub deck to align the mounting brackets with the mounting lugs on the lift linkage.
5. Lower the lift linkage to the floor by pressing the manual override switch for five seconds. (see figure)
6. Lower the lift linkage mounting lugs until they barely touch the scrub deck mounting brackets.
7. Fasten with (4) 711242 bolts, 711515 flat washers and 711546 lock washers.

### 8. For cylindrical scrub deck only:

- a. Remove the yellow 3 sided knob on the side squeegee assembly and swing out the side squeegee to reveal the access door.
  - b. Remove the two access doors (one on each end) by removing the three wing nuts on each door.
  - c. Install the brushes by sliding them through the access opening. (see figure for correct orientation.)
  - d. Align the notches on the brush with the drive pins on the hub.
  - e. Push the brush all the way in until it bottoms out.
  - f. Insert the access door hub into the other end of the brush.
- g. Reinstall the wing nuts and yellow 3 sided knobs and tighten.



**Manual Override Switch, located behind electrical panel.**



Cylindrical scrub brushes must be installed with the chevron pattern pointing away from each other for best water and debris pick up.

## Machine Overview

### **Cylindrical scrub brushes must be installed with the chevron pattern pointing away from each other for best water and debris pick up** **Important Note when Interchanging Scrub Decks**

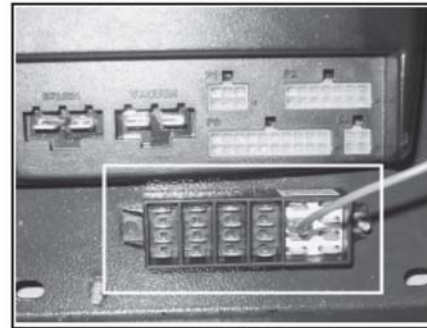
As previously mentioned, the scrub deck brush pressure is computer controlled. However, when interchanging the two types of decks, an additional step must be taken to ensure that the controller correctly compensates the pressure for the type of deck that is currently installed.

Inside the main electrical box, beneath the seat there is an Orange/Violet jumper wire (shown disconnected in Figure 1) that may or may not be connected to the terminal block, depending on the type of scrub deck that was originally ordered with the machine. When using the **Disk Scrub Deck**, the wire is **disconnected**. When using the **Cylindrical Scrub Deck**, the wire is connected to the terminal block located in the electrical box, beneath the TRIO Controller. This terminal block is divided into five sections, each separated by a divider. The four leftmost sections contain one column each of spade terminals. The section on the right contains two columns of spade terminals (**this section also contains four Red/Black wires, not shown in Figure 2 for clarity**). The Orange/Violet wire must be connected to a spade terminal in the section with two columns when using the Cylindrical Scrub Deck **ONLY!**

When switching from the Cylindrical Scrub Deck to the Disk Scrub Deck, be sure to **disconnect** the Orange/Violet wire. When switching from the Disk Scrub Deck to the Cylindrical Scrub Deck, **connect** the Orange/Violet wire to any available spade terminal in the section that contains two columns (shown in Figure 2) and the Red/Black wires.



**Figure 1**  
**Jumper wire disconnected**



**Figure 2**  
**Jumper wire connected to terminal block**

## Machine Overview

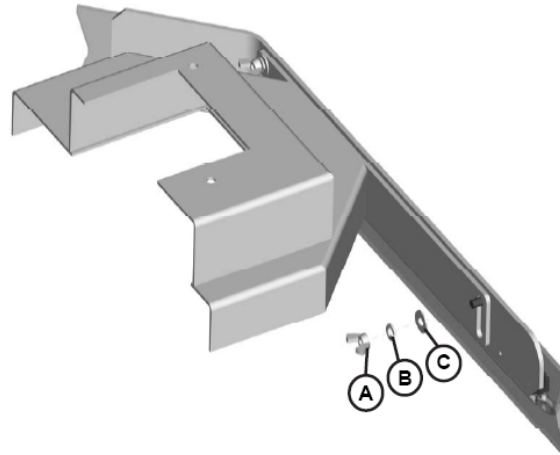
### 1.16 Side Squeegees

The side squeegees (left and right) are attached to the scrub decks. These items channel the dirty solution to the rear squeegee, helping contain the water within the machine's cleaning path. These squeegees are raised when the scrub deck is in the raised position.

The side squeegees are pre-adjusted at the factory. Adjustments may be required when replacing worn blades or to achieve optimum performance for different floors and conditions.

To adjust the side squeegees, simply loosen the mounting hardware (two wing nuts for Disk Scrub Deck, two black three-sided knobs for Cylindrical Scrub Deck). Lower the scrub deck by switching to a scrubbing mode and when the brushes start up, turn off the key switch. At this point the side squeegees should be resting vertically (no deflection) on the floor. Press down on the side squeegee bracket assembly from each end while making sure that the blade is uniformly deflected in a 45 degree angle along its whole length. Tighten the wing nuts (item A). Turn the steering wheel all the way to the left or right and start pushing the machine to the side to inspect the blade deflection and wiping action. Repeat the steps above until a satisfactory result is obtained.

Disc Deck Side Squeegee Components



|   |   |
|---|---|
| A | Wing Nut for Squeegee Adjustment (2)            |
| B | Helical Lock Washer for Squeegee Adjustment (2) |
| C | Flat Washer for Squeegee Adjustment (2)         |

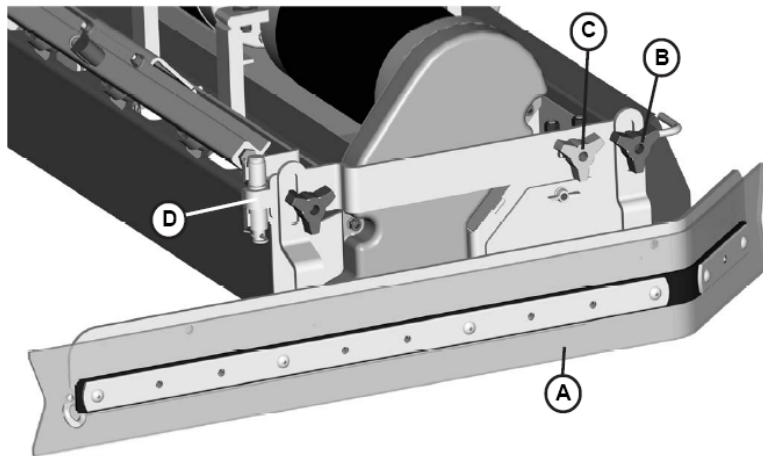
## Machine Overview

### Brush Changes On the Cylindrical Deck

In order to change the brushes on the cylindrical deck the side squeegee must be moved in order to access the brush doors. The cylindrical deck was designed so one can change the brushes without having to realign the side squeegees. This is accomplished by removing the yellow three-sided knob (Item C) and swinging the squeegee along the hinge bracket (Item D) located at the front of the deck, gaining access to the brushes. Once completed inserting new brushes, replace the brush doors and swing the squeegee back into place, tightening down the knob (Item C).

In order to remove or adjust the alignment of the side squeegees on the cylindrical deck, remove the black three-sided knobs (Item B) and follow the instructions on the previous page.

Cylindrical Deck Side Squeegee Components



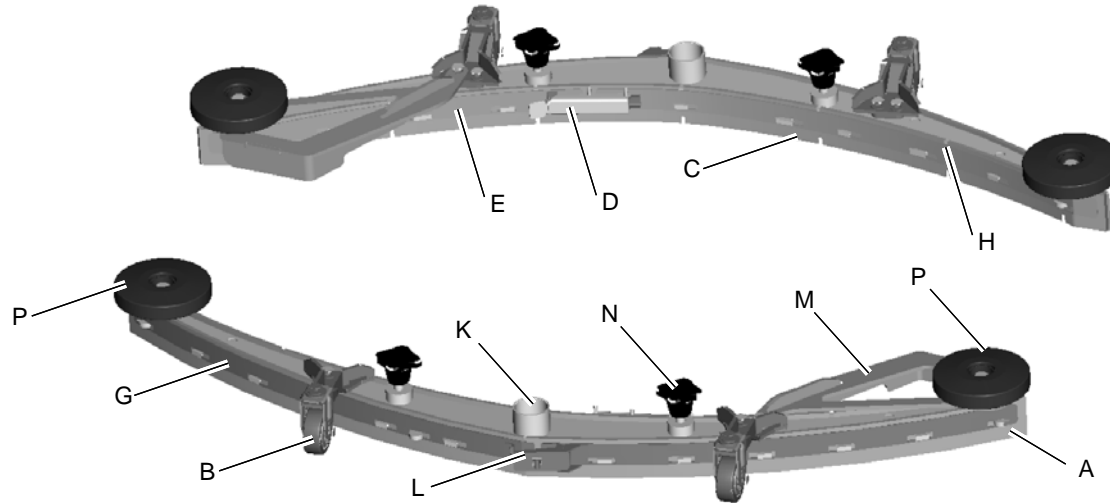
- |   |                                    |
|---|------------------------------------|
| A | Side Squeegee Blade                |
| B | Black Squeegee Adjustment Knob (2) |
| C | Yellow Brush Access Knob           |
| D | Side Squeegee Hinge                |

## Machine Overview

### 1.17 Rear Squeegee

The rear squeegee is the main element that acts as the conduit that transfers the spent solution into the recovery tank. A daily maintenance check of this component is essential to have optimum machine performance. The rear squeegee assembly is equipped with a universal front blade that allows the operator the option to use a slotted and a non-slotted side for specific applications. Each blade configuration has two usable edges. The rear blade however has four usable edges.

**The squeegee is pre-adjusted at the factory. Adjustments may be required to get optimum performance for different floors and conditions.**



A. Rear squeegee blade  
B. Swivel Caster (2)  
C. Front Squeegee Blade  
D. Latch - Front

E. Front Strap (Short)  
F. Rear Strap (Latch Side)  
G. Rear Strap (Catch Side)  
L. Latch - Rear

J. Guide Wheels (2)  
K. Recovery Hose Intake  
M. Deflector Arm  
P. Wheels

## Machine Overview

### Rear Squeegee Adjustment

1. Ensure that the scrubber is on a relatively flat surface. Turn on the key switch and select the **Vacuum only** mode. This lowers the squeegee to the floor and turns the vacuum motor on.
2. Move the scrubber one or two feet forward slowly while someone behind the machine checks the rear squeegee blade (item **A**) for uniform deflection to the floor.
3. If uneven deflection or lay is evident, minor adjustments may be necessary to avoid streaking and uneven wear on the blade.
4. To correct this, loosen the wing jam nut (item **B**) in order to adjust the caster height. If the squeegee blade is deflecting too much, the casters (item **C**) need to be lowered to control the down pressure. Lower the caster by turning the exposed threaded stem (item **P**) on the caster clockwise. Make the adjustment a few turns at a time. **Repeat step 2.**
5. If the blades are not deflecting enough, raise the caster by turning the stem counter-clockwise to adjust the caster height to allow more down pressure on the squeegee. **Repeat step 2.**
6. Make sure there is even deflection on the entire length of the rear blade. Adjust the casters and retighten the wing jam nuts to lock the caster setting in place.
7. Pitch adjustment is necessary if the outer ends on the squeegee blade do not contact the floor and there is too much deflection in the middle area or if the outer ends are over deflected and there is no contact in the middle.
8. To adjust the pitch, repeat step 2.
9. Loosen the two wing jam nuts (item **D**) that lock the pitch angle. Turning the knob (item **E**) clockwise or counter-clockwise controls the forward and backward pitch of the squeegee. Having the rear blades deflected uniformly along its entire length is the desired set-up.
10. Repeat step 2 until desired set-up is achieved.
11. In certain applications where a non-slotted front wiper blade (item **F**) is needed, detach the rear squeegee assembly by loosening the two wing bolts (item **G**). Unlock the toggle clamp (item **H**) on the front squeegee to release the front long strap (item **I**) and slide the front short strap (item **J**). Flip the blade over to the non-slotted side. Reattach the straps and lock the clamp back in place.
12. You can also easily replace the rear blade by unlatching the latch (item **M**) and removing the two rear straps (items **K** & **L**) by sliding them off the assembly. You can then flip the blade over in order to use a new edge for better wiping action.

## First Operation

### 2 First Operation

#### 2.1 Instruction

Only persons trained by qualified Minuteman technicians are authorized to operate, service and repair the machine. Operators must read and understand this manual before operating or maintaining this machine.

#### 2.2 Initial charging procedure

**NOTICE** Be sure to use proper charger per battery type.

**NOTICE** Before first operation of the machine, fully charge the battery with an initial charging procedure and comply with the operating instructions of the charger as well as with those of the battery manufacturer. Minuteman will not be held liable for damages resulting from an insufficient initial charge.

#### 2.3 Before Putting into Operation

Complete the following inspections before taking the machine into operation:

1. Check the area around the machine for signs of leakage. Hoses, lines

and tanks must be free from any leakage or damage.

2. Install brushes - see maintenance chapter.
3. Check battery charge and recharge if required. An initial charge is required before first operation of the machine. (see Maintenance section)
4. Empty recovery tank and clean it if required, see maintenance chapter.
5. Refill solution tank and add cleaning agent according to the manufacturer's recommendations.

**NOTICE** Use only cleaning agents suitable for automatic machines (low-foaming) and comply with the instructions for use, disposal and with the warning information specified by the cleaning agent's manufacturer.

**NOTICE** DO NOT LEAVE CLEANING SOLUTIONS IN THE MACHINE WHEN NOT IN USE

#### 2.4 Start Machine

Proceed with the following to set the machine to operating mode:

- Disconnect the charger and connect the battery connector
- Switch on machine by actuation of key switch from position (0) to position (1). The battery gauge will display the remaining battery life.



## First Operation

### 2.5 Operation

1. Switch on the machine.
2. Select one of the five available modes using the mode selector .
3. Set the direction the machine will travel by selecting forward or reverse on the direction selector.
4. Activating the accelerator pedal turns on the transport, brushes, water flow, vacuum accordingly to the mode selected.



If the accelerator pedal is activated before, or the key is switched “ON” at the same time, the machine will not move as a safety precaution. Remove your foot from the pedal, turn the machine OFF and ON, then activate the pedal to drive the machine.



When the direction switch is set to reverse and the accelerator is activated, the back up alarm will sound and the brush deck will automatically raise.

5. Start scrubbing by driving the machine forward in a straight line over-

lapping each path by 2 to 3 inches.

**NOTICE** Start moving machine immediately after switching on the brush deck, otherwise the brushes leave traces on the floor. Lift brush deck before passing over steps and other obstacles.

6. When scrubbing, check behind the machine occasionally to see that all of the dirty water is being picked up.



If streaking occurs, the recovery tank may be full, the suction hose may be clogged, debris may need to be removed from the vacuum shoes.



The recovery tank has a safeguard for overflow protection to guard against water entering the vacuum motor when the recovery tank is full. The Vacuum will stay ON for 15 seconds and then shut-off automatically. When this happens, immediately empty the recovery

tank.

7. Drive the machine to a designated dirty water disposal area and empty the recovery tank. (Refer to “Maintenance” section for instructions.)
8. Refill the solution tank and continue cleaning until the job is done or the machine runs out of charge.

## First Operation



The battery/ fault gauge will flash to signal that the machine is almost out of power. When this signal is displayed, all functions will shut off (brushes will turn off, the scrub deck and vacuum shoe will raise. The key switch must be turned OFF then ON to reset the machine. The machine will then only have a few minutes left of reserve power for a short vacuum only mode to pick up remaining solution on the floor and transport power to drive to the battery recharging station. If the machine is operated for an excessive period of time after cleaning functions have stopped, it will eventually turn itself off. The machine will have to be pushed back to the recharging station.

### 2.6 Stop Machine

To stop cleaning, select the transport mode. This will automatically stop the solution flow, raise the scrubdeck, and turn off the vacuum motor (20-second delay).

### 2.7 After Work

Refer to the “Maintenance” section for specific maintenance instructions described below.

1. When finished cleaning, select the transport mode, all cleaning functions will shut off. Move the machine to a suitable site for maintenance.
2. Empty and clean the solution tank
3. Empty and clean the recovery tank



Observe the legal directives and local regulations for disposal of detergents.

4. Remove and clean the vac shoes.
5. Check operating fluid levels, function and setting.
6. Clean the machine.

**NOTICE** Do not clean the electrical parts by means of high-pressure cleaning equipment.

7. Check the maintenance schedule and perform any required maintenance before storing the machine.
8. Charge batteries.
9. Store the machine indoors in a clean dry place.

**NOTICE** Keep from freezing

**NOTICE** Leave the solution and recovery tank lids open for ventilation to prevent odor build-up.

10. Turn key switch OFF and remove key.



Remove the key to avoid unauthorized use of the machine.

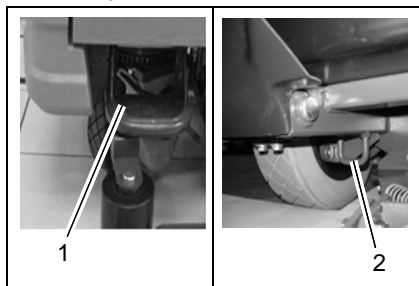
## First Operation

### 2.8 Transporting the machine

To transport the machine, turn the key switch ON, select the transport mode, select forward or reverse, activate the accelerator pedal to start movement.

### 2.9 Tie-down points

When transporting on a vehicle or trailer, the machine has to be secured. Tie the machine down firmly by using the front foot steps (Fig. 3/1) and the rear tie hooks (Fig. 3/2) as tie-down points.



**Fig.3**

### 3 Maintenance and Care

#### General



Before proceeding to maintenance and care work you are advised to read and comply with the Safety Information section 1.4 and 1.5.

Compliance with the recommended maintenance work will ensure that you always have a reliable machine available.

Daily or weekly maintenance and repair work may be executed by the driver/operator having been trained accordingly. Further Minuteman system maintenance work must be completed by qualified personnel only. Please contact your local Minuteman Service Center or Minuteman contract dealer. We cannot be held liable for damages resulting from non-compliance with these instructions.

Please indicate the machine's serial number with any enquiry or spare part order, see section 1.7 - Nameplate.

#### 3.1 Minuteman System Maintenance

The Minuteman System Maintenance:

- guarantees reliable operability of the Minuteman machines (preventive maintenance)
- minimizes operating costs, repair costs and maintenance costs
- ensures long service life and operability of the machine

The Minuteman System Maintenance is structured in separate modules and determines specific technical works to be executed as well as the intervals for such maintenance works. For any specific maintenance type, the replacement parts are determined and listed in spare part kits.

##### **System Maintenance K:**

To be performed by the customer in accordance to the maintenance and care instructions contained in the operating instructions (daily or weekly). The operator will be instructed upon delivery of the machine.

##### **System Maintenance I :**

(every 125 hours of operation)  
To be performed by qualified personnel of authorized Minuteman Service Center in accordance with the machine-specific system maintenance including spare part kit.

##### **System Maintenance II:**

(every 250 hours of operation)  
To be performed by qualified personnel of authorized Minuteman Service Center in accordance with the machine-specific system maintenance including spare part kit.

##### **System Maintenance S:**

(every 500 hours of operation safety check)  
To be performed by qualified personnel of authorized Minuteman Service Center in accordance with the machine-specific system maintenance including spare part kit.

# Maintenance and Care

## 3.2 Maintenance Document

|  |  |   |  |
|--|--|---|--|
| <p>Handing over</p> <p>Upgrade<br/>Test drive<br/>Handing over to the customer<br/>Instruction<br/>carried out on:</p> <p>at _____ operating hours</p> | <p>System Maintenance I<br/>125 operating hours<br/>Workshop stamp</p> <p>carried out on:</p> <p>at _____ operating hours</p>  | <p>System Maintenance II<br/>250 operating hours<br/>Workshop stamp</p> <p>carried out on:</p> <p>at _____ operating hours</p>  | <p>System Maintenance I<br/>375 operating hours<br/>Workshop stamp</p> <p>carried out on:</p> <p>at _____ operating hours</p>  |
| <p>System Maintenance S<br/>500 operating hours<br/>Workshop stamp</p> <p>carried out on:</p> <p>at _____ operating hours</p>                          | <p>System Maintenance I<br/>625 operating hours<br/>Workshop stamp</p> <p>carried out on:</p> <p>at _____ operating hours</p>  | <p>System Maintenance II<br/>750 operating hours<br/>Workshop stamp</p> <p>carried out on:</p> <p>at _____ operating hours</p>  | <p>System Maintenance I<br/>875 operating hours<br/>Workshop stamp</p> <p>carried out on:</p> <p>at _____ operating hours</p>  |
| <p>System Maintenance S<br/>1000 operating hours<br/>Workshop stamp</p> <p>carried out on:</p> <p>at _____ operating hours</p>                         | <p>System Maintenance I<br/>1125 operating hours<br/>Workshop stamp</p> <p>carried out on:</p> <p>at _____ operating hours</p> | <p>System Maintenance II<br/>1250 operating hours<br/>Workshop stamp</p> <p>carried out on:</p> <p>at _____ operating hours</p> | <p>System Maintenance I<br/>1375 operating hours<br/>Workshop stamp</p> <p>carried out on:</p> <p>at _____ operating hours</p> |

## Maintenance and Care

### 3.3 Maintenance Schedule System Maintenance Customer

Maintenance intervals must be performed by the customer/operator.

| To be performed                                | Interval |        |
|--|----------|--------|
|  | daily    | weekly |
| Check/Clean Tanks and Hoses                    | o        |        |
| Charge batteries                               | o        |        |
| Check/Clean/Rotate the Brushes/Pads            | o        |        |
| Check/Clean the Squeegee                       | o        |        |
| Check/Clean Vacuum Shut-Off Float              | o        |        |
| Check/Clean the Vacuum Motor Foam Filter       | o        |        |
| Clean Hopper on Cylindrical System             | o        |        |
| Check Each Battery Cell(s) Water Level         |          | o      |
| Inspect Scrub Housing Skirts                   |          | o      |
| Inspect and Clean Solution Filter              |          | o      |
| Check Foot/Parking Brake for Wear & Adjustment |          | o      |
| Clean Spray Jets on Cylindrical System         |          | o      |

## Maintenance and Care

### 3.4 Maintenance Schedule cont'd

#### System Maintenance Customer

Maintenance intervals must be performed by the customer/operator.

| To be performed                                       | Interval |        |
|---|----------|--------|
|   | monthly  | yearly |
| Flush the solution system to remove chemical build-up | o        |        |
| Lubrication - Frease Fittings, chains, etc.           | o        |        |
| Check Carbon Brushes*                                 |          | o      |

**NOTE: REFER TO THE SERVICE MANUAL FOR MORE DETAIL ON MAINTENANCE AND SERVICE REPAIRS.**

#### Flushing the Solution System

The system should be flushed once with the spray jets removed and once with them installed. To flush system, use a mixture of 1 quart of white vinegar to 2 gallons of clean warm water, followed by a warm water rinse.

The spray jets may also be removed and soaked in same vinegar mixture for cleaning. The spray tips are released by turning 1/4 turn clockwise.

Do not clean the spray jet/tips with needles or wire. Doing so could damage, resulting in an uneven spray pattern or streaking.

#### Lubricating the Machine

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.*

The grease points are listed below:

- Rear squeegee caster wheel axle (2)
- Rear squeegee caster wheel stem (2)
- Side squeegee caster wheel axle (2)
- Side squeegee caster wheel stem (2)
- Steering wheel chain sprockets and idlers

Apply lubricant or light machine oil to lubricate the:

- Rear squeegee general pivot points
- Side squeegee general pivot points
- Scrub deck linkages
- Drive wheel assembly seals.

\* Have Minuteman check the vacuum motor carbon motor brushes after 300 operating hours or once a year. The brush motor carbon brushes should be checked every 500 hours or once a year.

## Maintenance and Care

### System Maintenance I & II

The following maintenance work must be performed by an authorized Minuteman Service workshop.

| To be performed  | Interval                         |                                   |
|--|----------------------------------|-----------------------------------|
|  | every 125 hours of operation (I) | every 250 hours of operation (II) |
| Check battery charger  | o                                | o                                 |
| Check tank lid seal of the recovery tank and replace if required       | o                                | o                                 |
| Check drain hose of the recovery tank and replace if required          | o                                | o                                 |
| Grease joints at the brush lift mechanism                              | o                                | o                                 |
| Check wheel fixing screws and tighten (24 lb ft) if required           | o                                | o                                 |
| Check condition of tires   | o                                | o                                 |
| Test drive and function test   | o                                | o                                 |
| Inspect steering damages and bearing slackness and replace if required |                                  | o                                 |
| Check roller bumper of the brush deck and replace if required          |                                  | o                                 |
| Check suction hose for tight fit and damages and replace if required   |                                  | o                                 |



## Maintenance and Care

### System Maintenance S (Safety check)

The following maintenance work must be performed by an authorized Minuteman Service workshop at least once a year.

| To be performed   | Interval                     |
|---|------------------------------|
|   | every 500 hours of operation |
| Perform maintenance works according to System Maintenance II  | o                            |
| Clean traction drive motor from carbon dust and check carbon brushes for smooth operation and wear and replace carbon brushes if required | o                            |
| Clean brush motors from carbon dust and check carbon brushes for smooth operation and wearing and replace carbon brushes if required      | o                            |
| Test drive and function test  | o                            |

## Maintenance and Care

### Notes

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## Maintenance and Care

### Notes

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## 4 Troubleshooting

| <b>Problem</b>  | <b>Possible Cause</b>  | <b>Remedy</b>   |
|---|--|---|
| <b>Poor water pick-up</b>                                   | Worn or torn squeegee blades   | Rotate or replace blades                                |
|   | Squeegee out of adjustment   | Adjust so blades touch floor evenly across entire width |
|   | Recovery tank full   | Empty recovery tank                                     |
|   | Recovery tank lid gasket leak  | Replace gasket lid cover properly                       |
|   | Debris caught in squeegee  | Clean squeegee  |
|   | Vacuum hose clogged  | Remove debris and flush hose                            |
|   | Using too much solution  | Adjust solution control valves                          |
|   | Vacuum hose to squeegee or recovery tank disconnected to squeegee or damaged | Reconnect or replace squeegee hose                      |
| <b>Poor scrubbing performance</b>                           | Worn brushes   | Rotate or replace brushes                               |
|   | Wrong brush or cleaning chemical   | Consult Manufacturer                                    |
|   | Debris caught on scrub brushes   | Remove debris   |
|   | Moving machine too fast  | Slow down   |
|   | Low battery charge   | Recharge batteries                                      |
| <b>Inadequate solution flow or no solution to the floor</b> | Solution tank empty  | Fill solution tank                                      |
|   | Recovery tank full   | Empty recovery tank                                     |
|   | Solution lines, valves, filter or spray jets clogged                         | Flush lines, and clean solution filter and spray jets.  |
|   | Solution solenoid valve  | Clean or replace valve                                  |

## Troubleshooting

| Problem   | Possible Cause                      | Remedy  |
|---|-------------------------------------|---|
| <b>Machine does not run</b>                               | Operator seat safety switch         | Operator has to be seated. Check for open circuit   |
|   | Main system controller              | Check error fault codes   |
|   | Tripped 100 amp circuit breaker     | Check for an electrical short circuit.<br>Reset machine: Reset breaker and turn key switch off and restart. |
|   | Batteries Low                       | Charge Batteries  |
| <b>Vacuum motor does not turn on</b>                      | Recovery tank full                  | Empty recovery tank   |
|   | Excessive foaming in recovery tank. | Empty recovery tank.<br>Use less or change chemical<br>Use defoaming agent                                  |
|   | Five LEDs flashing on Battery Gauge | Check for motor overload<br>Reset machine: Turn key switch off and restart.                                 |
| <b>Poor Sweeping Performance<br/>(Cylindrical System)</b> | Debris box full                     | Empty and clean debris box  |
|   | Brushes worn                        | Replace brushes   |
|   | Bristles have taken a set           | Rotate Brushes  |
| <b>Solution tank empty indicator light on</b>             | Solution tank empty                 | Refill solution tank  |
|   | Faulty float switch                 | Replace float switch  |

## 9) Fault Codes

| No. of Bars | No. of Flashes | Fault Description                         | Fault Code |
|-------------|----------------|---|------------|
| 1           |                | LOW BATTERY ERROR                         | 0x2C00     |
|             |                | LOW BATTERY ERROR2                        | 0x2C01     |
|             |                | SOFT BATTERY LOCKOUT OCCURRED             | 0x2C02     |
|             |                | SOFT BATTERY LOCKOUT 2 OCCURRED           | 0x2C03     |
|             |                |   |            |
| 2           | Traction       | MOTOR FAULT 1                             | 0x7800     |
|             |                | TRACTION OVER CURRENT ERROR               | 0x7801     |
|             |                | SOFT TRACTION MOTOR IN FOLDBACK STATE     | 0x7802     |
|             | Traction       | MOTOR LINE VOLTAGES INSTABILITY TIMEOUT   | 0x7803     |
|             |                | TRACTION SPEED INPUT OUT OF RANGE         | 0x7880     |
|             |                |   |            |
| 3           |                | SOFT BRUSH MOTOR DISCONNECTED ERROR       | 0x7600     |
|             |                | SOFT BRUSH CURRENT FOLDBACK               | 0x7601     |
|             |                | SOFT BRUSH CURRENT FOLDBACK2              | 0x7602     |
|             |                | SOFT BRUSH CURRENT FOLDBACK3              | 0x7603     |
|             |                | SOFT BRUSH INHIBIT                        | 0x7604     |
|             |                | BRUSH OVERCURRENT DETECTION STARTUP FAULT | 0x7605     |
|             |                |   |            |

## Troubleshooting

| No. of Bars | No. of Flashes | Fault Description  | Fault Code |
|-------------|----------------|--|------------|
| 4           | 1              | <b><i>EXCESSIVE CURRENT TRIP (Supported on LCD only)</i></b> | 0x1310     |
|             | 1              | SOFT BRUSH DECK ACTUATOR OVERCURRENT OCCURRED                | 0x1311     |
|             | 1              | BRUSH DECK ACTUATOR OVERCURRENT 2 OCCURRED                   | 0x1321     |
|             | 1              | ERROR BRUSH DECK ACTUATOR POSITIVE SHORTED LOW               | 0x1411     |
|             | 1              | ERROR BRUSH DECK ACTUATOR NEGATIVE SHORTED LOW               | 0x1412     |
|             |                |  |            |
| 4           | 2              | SOFT SOLENOID 2 OVERCURRENT OCCURRED                         | 0x1312     |
|             | 2              | SOLENOID 2 OVERCURRENT 2 OCCURRED                            | 0x1322     |
|             | 2              | ERROR SOLENOID 2 POSITIVE SHORTED LOW                        | 0x1413     |
|             | 2              | ERROR SOLENOID 2 NEGATIVE SHORTED LOW                        | 0x1414     |
|             |                |  |            |
| 5           |                | SOFT VACUUM MOTOR DISCONNECTED ERROR                         | 0x7700     |
|             |                | SOFT VACUUM CURRENT FOLDBACK                                 | 0x7701     |
|             |                | SOFT VACUUM CURRENT FOLDBACK2                                | 0x7702     |
|             |                | SOFT VACUUM CURRENT FOLDBACK3                                | 0x7703     |
|             |                |  |            |
| 6           |                | OFF AISLE WAND MODE  | 0x1E03     |
|             |                | OFF AISLE WAND MODE  | 0x1E04     |

## Troubleshooting

| No. of Bars | No. of Flashes | Fault Description                                  | Fault Code |
|-------------|----------------|--|------------|
| 7           | 1              | SPEED POTENTIOMETER FAULT 1                        | 0x0810     |
|             | 1              | SPEED POTENTIOMETER MAX WIPER DIFFERENCE ERROR     | 0x0811     |
|             | 1              | SPEED POTENTIOMETER MAX PULL DOWN DIFFERENCE ERROR | 0x0812     |
|             | 1              | SPEED POTENTIOMETER MAX PULL SAFE DIFFERENCE ERROR | 0x0813     |
|             | 1              | SPEED POTENTIOMETER REFERENCE ERROR                | 0x0814     |
|             | 1              | SPEED POTENTIOMETER LO REFERENCE ERROR             | 0x0815     |
|             | 1              | SPEED POTENTIOMETER HI REFERENCE ISO ERROR         | 0x0816     |
| 7           | 1              | SPEED POTENTIOMETER LO REFERENCE ISO ERROR         | 0x0817     |
|             | 1              | SPEED POTENTIOMETER ERROR BOTH HAVE READINGS       | 0x0818     |
|             | 1              | SOFT BELLY BUTTON ACTIVATED                        | 0x7901     |
|             |                |  |            |
| 7           | 2              | V2POINT5 VOLTAGE REFERENCE ERROR                   | 0x0705     |
|             | 2              | HI SWITCH REFERENCE ERROR                          | 0x0706     |
|             | 2              | EMERGENCY STOP ERROR                               | 0x7900     |
|             |                |  |            |
| 7           | 3              | STARTUP WITH PUSH SELECTED                         | 0x7000     |
|             | 3              | PUSH ACTIVATED IN DRIVE MODE                       | 0x7001     |
|             |                |  |            |



## Troubleshooting

| No. of Bars | No. of Flashes | Fault Description                       | Fault Code |
|-------------|----------------|---|------------|
| 8           |                | Any faults not covered elsewhere        |            |
|             |                |   |            |
| 9           | 1              | SOLUTION TANK EMPTY                     | 0x1318     |
|             |                |   |            |
| 9           | 2              | SOFT ALARM OVERCURRENT OCCURRED         | 0x131C     |
|             |                |   |            |
| 9           | 3              | SOFT SOLUTION PUMP OVERCURRENT OCCURRED | 0x1313     |
|             |                |   |            |
| 9           | 4              | SOFT SOLENOID 1 OVERCURRENT OCCURRED    | 0x1314     |
|             |                |   |            |
| 9           | 5              | BRAKE FAULT 1                           | 0x1500     |
|             | 5              | BRAKE FAULT 2                           | 0x1501     |
|             | 5              | BRAKE OVERCURRENT ERROR                 | 0x1507     |
|             |                |   |            |
| 10          |                | HIGH BATTERY ERROR                      | 0x1600     |
|             |                |   |            |
|             |                |   |            |
|             |                |   |            |

## Minuteman International Made Simple Commercial Limited Warranty - Revision O

Minuteman International, Inc. warrants to the original purchaser/user that the product is free from defects in workmanship and materials under normal use.

Minuteman will, at its option, repair or replace without charge, parts that fail under normal use and service when operated and maintained in accordance with the applicable operation and instruction manuals. All warranty claims must be submitted through and approved by factory authorized repair stations.

This warranty does not apply to normal wear, or to items whose life is dependent on their use and care, such as belts, cords, switches, hoses, rubber parts, electrical motor components or adjustments. Parts manufactured by Minuteman are covered by and subject to the warranties and/or guarantees of their manufacturers. Please contact Minuteman for procedures in warranty claims against these manufacturers.

**Special warning to purchaser** -- Use of replacement filters and/or pre-filters not manufactured by Minuteman or its designated licensees, will void all warranties expressed or implied. A potential health hazard exists without original equipment replacement.

All warranted items become the sole property of Minuteman or its original manufacturer, whichever the case may be.

Minuteman disclaims any implied warranty, including the warranty of merchantability and the warranty of fitness for a particular purpose. Minuteman assumes no responsibility for any special, incidental or consequential damages.

This limited warranty is applicable only in the U.S.A. and Canada, and is extended only to the original user/purchaser of this product. Customers outside the U.S.A. and Canada should contact their local distributor for export warranty policies. Minuteman is not responsible for costs or repairs performed by persons other than those specifically authorized by Minuteman. This warranty does not apply to damage from transportation, alterations by unauthorized persons, misuse or abuse of the equipment, use of non-compatible chemicals, or damage to property, or loss of income due to malfunctions of the product.

## Minuteman International Made Simple Commercial Limited Warranty

If a difficulty develops with this machine, you should contact the dealer from whom it was purchased.

This warranty gives you specific legal rights, and you may have other rights which vary from state to state. Some states do not allow the exclusion or limitation of special, incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions and limitations may not apply to you.

| <b>Model</b>           | <b>Parts</b> | <b>Labor</b> | <b>Poly</b> | <b>Travel**</b> |
|------------------------|--------------|--------------|-------------|-----------------|
| Cord Electric Group    | 5yrs         | 3yrs         | 12yrs       | 90 days         |
| Battery Operated Group | 5yrs         | 3yrs         | 12yrs       | 90 days         |

Exceptions.....

| <b>Model</b>                      | <b>Parts</b> | <b>Labor</b> | <b>Poly</b> | <b>Travel**</b> |
|-----------------------------------|--------------|--------------|-------------|-----------------|
| Port A Scrub, all models          | 1yr          | 6months      | 12yrs       | 90 days         |
| A3S Blower                        | 1yr          | 1yr          | 0           | 0               |
| Phenom Dual Motor Upright Vacuums | 2yrs         | 2yrs         | 0           | 0               |
| Explosion Proof Vacuum            | 1yr          | 1yr          | 0           | 0               |
| Propane Burnisher                 | 1yr          | 1yr          | 0           | 90 days         |

\*\*Travel, 2 hours max

*Stand-alone Battery*

One year

*Chargers:*

*Replacement Parts:*

Ninety days

*Batteries:*

0-3 months full replacement, 4-12 months pro-rate

*Polypropylene*

*Plastic Tanks:*

12yr warranty, no additional labor



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Minuteman International Inc. · 14N845 U.S. Route 20 · Pingree Grove, Illinois 60140 · U.S.A.  
Phone: 800-323-9420 · Fax 800-422-6933  
[www.minutemanintl.com](http://www.minutemanintl.com)

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