

# User Manual

## X Ride 28 Riding Extractor

## Introduction

### Preface

Dear customer, Thank you for purchasing the Minuteman® X Ride 28. The outstanding operational characteristics of the X Ride 28 should justify the confidence you demonstrated in making this purchase.

The X Ride 28 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 X Ride 28 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 X Ride 28, **THINK SAFETY FIRST!**

This manual provides vital information concerning the safe operation, use,

maintenance, and service of the X Ride 28. 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 X Ride 28 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 X Ride 28 or information contained in this manual. If repair or maintenance work is performed on the X Ride 28, Minuteman recommends that only genuine replacement parts be used and that such work be performed by qualified individuals.

### Proper use

The X Ride 28 is a carpet extraction machine. Its intended scope of application is for wet cleaning of level, carpeted-surfaced floors in accordance with the provisions of this instruction manual, applicable governmental regulations, manufacturer specifications, and machine labels (collectively, "proper use"). Using the X Ride 28 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 X Ride 28, or uses beyond or inconsistent with the X Ride's intended scope of application. This disclaimer of liability also extends to modifications to the X Ride 28 made without Minuteman's prior written consent.

The X Ride 28 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 X Ride 28.

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event that technical or typographical errors exist in this manual, Minuteman reserves the right to make changes to subsequent editions of this manual without prior notice to the recipients of this edition. The reader should notify Minuteman if any errors in this manual are suspected. Minuteman does not undertake to guarantee the performance of any individual manufacturer or seller's products or services by virtue of this instruction manual.

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 advise of a competent professional in determining the exercise of reasonable care in any given circumstances.

Valid as of: June 2009

**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 X Ride 28 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 X Ride 28 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.

**Minuteman International Inc.**  
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**U.S.A.**

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## Safety Information

### 1 Safety Information

#### 1.1 Safety and Warning Symbols

All paragraphs in this manual referring to your personal safety, the safety of your machine and the environment protection are attributed one of the following warning symbols:

Safety Symbols	Description
WARNING 	Indicates a hazardous situation which could result in death or serious injury.
NOTICE 	Indicates a potentially hazardous situation which may result in equipment or property damage.

Additional Symbols	Description
Ecological hazard 	Indicates the use of substances representing an inherent danger to the health of the environment
Note 	Indicates important or additional information.

## Safety Information

### 1.2 General Provisions

- Please read this user manual and instruction plates / labels on the X Ride 28 unit in their entirety before operation. These materials contain valuable information regarding the safe operation of the machine. Minuteman recommends that operators receive training by qualified Minuteman technicians before start-up, operation, use, servicing, or repair of the machine.
- This user manual is not intended as a substitute for applicable government regulations; nor does it include or address same. Users, and employers of users, should familiarize themselves with applicable government regulations that may impact use and operation of the X Ride 28, including, but not limited to, regulations promulgated pursuant to the federal Occupational Safety and Health Act.
- The precautions and important safety information contained in this user manual must be made available current users and downstream users of the machine. When re-selling or renting out X Ride 28 machines, it is recommended that copies of this user manual be provided and that any illegible machine labels or instruction plates be replaced.
- The X Ride 28 is designed for indoor use only. Store machine indoors. Keep the electrical components of the machine dry.
- Make sure that all warning labels and instruction plate on the machine are maintained, legible, and properly attached.

## Safety Information

### 1.3 Operational Precautions

The X Ride 28 is a battery-operated carpeted floor cleaning system that utilizes a water / cleaning solution that is applied to the floor and then vacuumed back into the machine by way of an integrated vacuum shoes for later disposal.



Liquid residue remaining on the floor during operation can represent a slip and fall hazard to the operator and others in the vicinity of machine use. When working with the machine, operators should use firm and skid-proof shoes. Areas where floor cleaning will occur should be appropriately marked with suitable slip and fall hazard signs / markers / pop-up cones.

- It is indispensable for the operator or user of the machine to become thoroughly acquainted with attached implements and controls - as well as their various functions - before operation commences.
- Before commencing operation of the machine, check for obvious signs of loose parts, potential conditions in-

dicative of malfunctions, etc. Any signs of potential problems must be remedied before actual operation commences.



The electrical system in the machine is not designed to suppress sparks. Accordingly, use of the X Ride 28 where fire or explosion hazards may exist due to flammable gases or vapors, flammable liquids, combustible dust, or ignitable fibers or flyings, must be avoided. The machine can cause an explosion when operated near such areas.



Use caution when operating the machine on a ramp or incline. Do not turn the machine on an incline, as it may become unstable and flip over. Do not leave the machine unattended on a ramp or incline, as it could roll freely and result in personal injury. The X Ride 28 is not designed for use on surfaces with a greater than 2% incline or slope. Adopt operation habits to local conditions to

ensure machine is always under operator's control.



The X Ride 28 is not designed for decontamination purposes and should not be used in areas where hazardous wastes or materials are stored or have been spilled. Use of the X Ride 28 in these areas could result in the spread of hazardous wastes or materials and operator exposure to same.

- Remove the key to avoid unauthorized use of the machine.



## Safety Information

### 1.4 Maintenance Precautions

- Maintenance and repairs must be performed by qualified personnel only. Maintain adjustments on machine pursuant to specifications noted in the service manual.
- Maintenance and repair work must be performed by using appropriate, undamaged tools.
- Spare and replacement parts must conform with factory machine specifications. Failure to do so may result in machine malfunctions. Genuine spare and replacement parts are highly recommended.



Switch off and remove the machine's key before inspecting the machine or performing any maintenance or repair work. Failure to do so may result in accidental machine activation and personal injury.



When performing maintenance or repair work on the machine's electrical system, be sure to disconnect the machine's battery plug first. Failure to do so could result in accidental machine activation and personal injury.

- Before commencing operation of the machine, check for obvious signs of loose parts, potential conditions indicative of malfunctions, etc. Any signs of potential problems must be remedied before actual operation commences.



Before commencing operation of the machine following maintenance or repair activities, check to ensure that all protective devices have been properly refitted and positioned, or other potential problems before actual operation commences, otherwise personal injury may occur.

## Safety Information

### 1.5 Battery and Electrical System Precautions



The X Ride 28 operates on either lead acid or AGM batteries. Batteries can generate gases which can ignite or cause an explosion. Keep sparks and flames away from the batteries. Charge the batteries only in well ventilated areas.



Wear eye protection when working near batteries. Do not put any type of metal objects or tools across the battery terminals or on top of batteries. Do not clean the machine's electrical parts or system, including batteries, by means of high-pressure cleaning equipment. Such activities could cause short-circuit or battery explosion hazards, resulting in personal injury.

- Only use a charger designed for your specific battery type.
- Only qualified individuals should attempt to undertake maintenance and repair activities associated with the machine's electrical system in accor-

dance with appropriate industry standards and government regulations, if any.

- The electrical system of the machine should be inspected at regular intervals. Any obvious defects, such as loose connections, damaged or frayed electrical cables, corrosion, should be repaired before the machine is put back into use. Failure to do so could cause machine malfunctions or electrical hazards.
- In case of a malfunction of the machine's electrical system, including, but not limited to, unexpected loss of power or individual system shutdowns, the machine should be shut down immediately for inspection and required maintenance and repair.



Batteries must be selected and seated appropriately in accordance with factory machine specifications. Failure to do so could result in inappropriate changes to the machine's center of gravity which, in turn, could result in machine operation and control hazards (especially on inclined surfaces) and related personal injury.

- Observe all operating, use, and safety instructions provided by the appropriate battery manufacturer.



Used batteries must be handled, disposed, or recycled properly in accordance with government regulations. Used batteries should never be disposed of as non-hazardous waste (e.g. domestic or household waste). Used batteries should be disposed or recycled by appropriately trained and permitted entities and /or disposal facilities.

## Safety Information

### 1.6 Cleaning Solution Use and Disposal Precautions

- Only cleaning agents / detergents suitable for automatic machines (low foaming) should be used in the X Ride 28. Cleaning agents / detergents should be mixed with water in ratios established by product labels and or manufacturer recommendations. All safety precautions established by the cleaning agent / detergent's manufacturer (including, but not limited to, use of gloves and safety glasses) must be followed. These safety precautions can typically be found on the cleaning agent / detergent's product labels, accompanying collateral materials, and related Material Safety Data Sheets
- Used or spent mixtures of water and cleaning agents / detergents collected in the machine's recovery tank must be disposed of in accordance with applicable government regulations and or local permits obtained by the facility in which floor cleaning activities occur, if any. Violations of such government regulations and local permits can result in significant penalties.



Never dispose of the contents of the machine's recovery tank outdoors or into stormwater systems or basins!

# Safety Information

## 1.7 Machine Labels

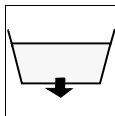
The following safety and information labels are legibly attached to the machine. Replace missing or illegible labels immediately.

Minuteman nameplate (Fig. 1/1)

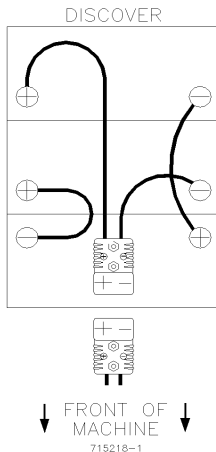
Machine identification number (Fig. 1/2)



Recovery tank drain hose (Fig. 2/1)



Battery cable routing (Fig. 1/3)



Water temp warning (Fig. 1/5)



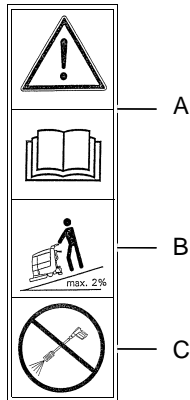
122°F

Battery caution (Fig. 1/6)

<b>ACHTUNG:</b>	Explosive Gase – Flammen und Funken vermeiden – Während des Ladens für ausreichende Belüftung sorgen.
<b>Caution:</b>	Explosive gases – Avoid fires and sparks – Provide for sufficient ventilation during loading!
<b>Précaution:</b>	Gaz explosifs – Eviter des flammes et étincelles – Pourvoir suffisante ventilation pendant chargement!

## Safety Information

General information (Fig. 1/4)



A = Read and observe the instruction manual  
B = Maximum incline is 2 %  
C = Do not clean the machine by means of high-pressure cleaning equipment

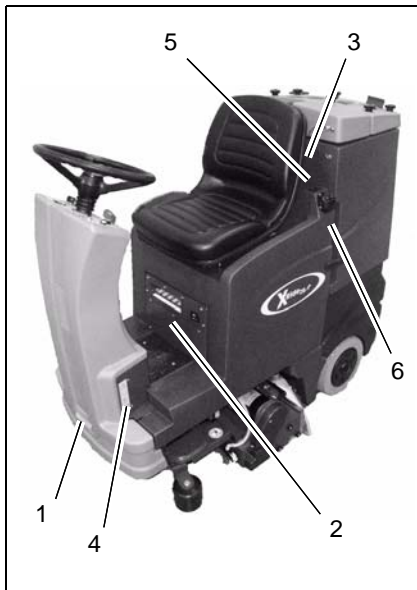


Fig.1



Fig.2

## 2 Machine Overview

### 2.1 Machine Overview - Front

- 1 Recovery tank lid
- 2 Steering wheel
- 3 Drive wheel
- 4 Roller bumper
- 5 Foot step
- 6 Cylindrical deck
- 7 Solution level sight gauge
- 8 Seat adjustment lever
- 9 Solution tank
- 10 Solution tank fill port
- 11 Hourmeter
- 12 Circuit breakers

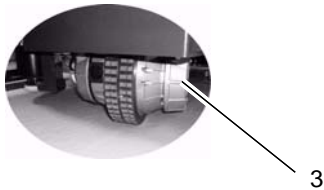


Fig.3

## Machine Overview

### 2.2 Machine Overview - Rear

- 13 Recovery tank dump hose
- 14 Off Aisle Wand
- 15 Recovery tank
- 16 Safety latch
- 17 Accelerator pedal
- 18 Control panel
- 19 Rear Wheel
- 20 Vacuum Shoe

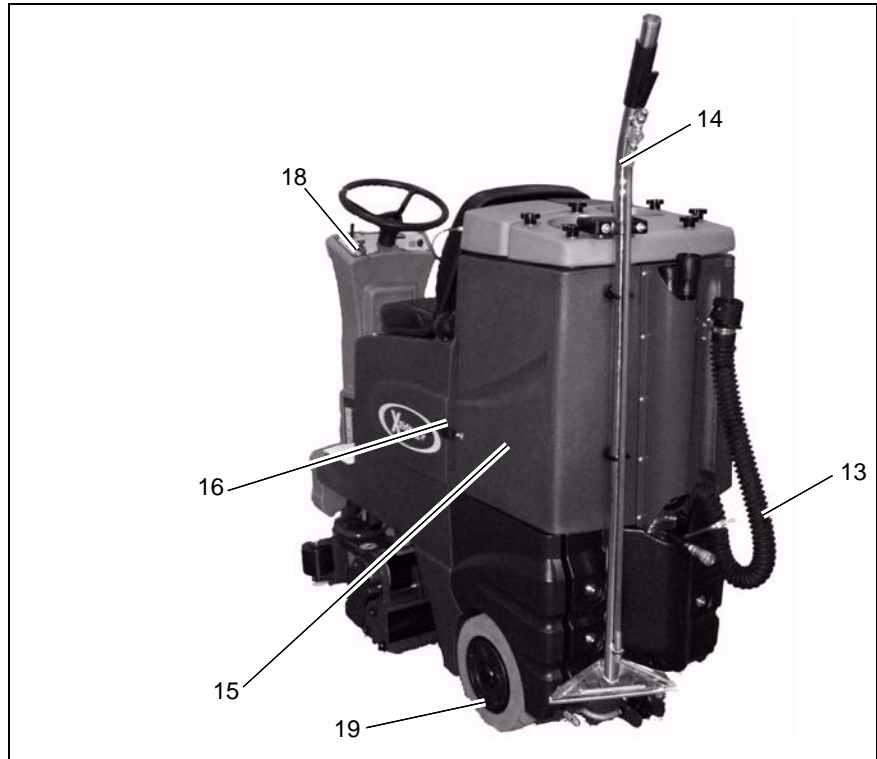
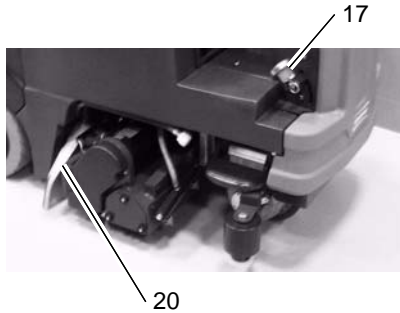


Fig.4

### 3 Operating and Indicating Elements

#### 3.1 Operating Panel

- 1 Direction selector
- 2 LED indicator - Forward
- 3 Battery / Fault gauge
- 4 Horn - push button
- 5 Key switch
- 6 LED indicator - Reverse
- 7 Interim Clean mode
- 8 Restorative Cleanmode
- 9 Off Aisle Wand mode
- 10 Mode selector
- 11 Vacuum only mode
- 12 Transport mode

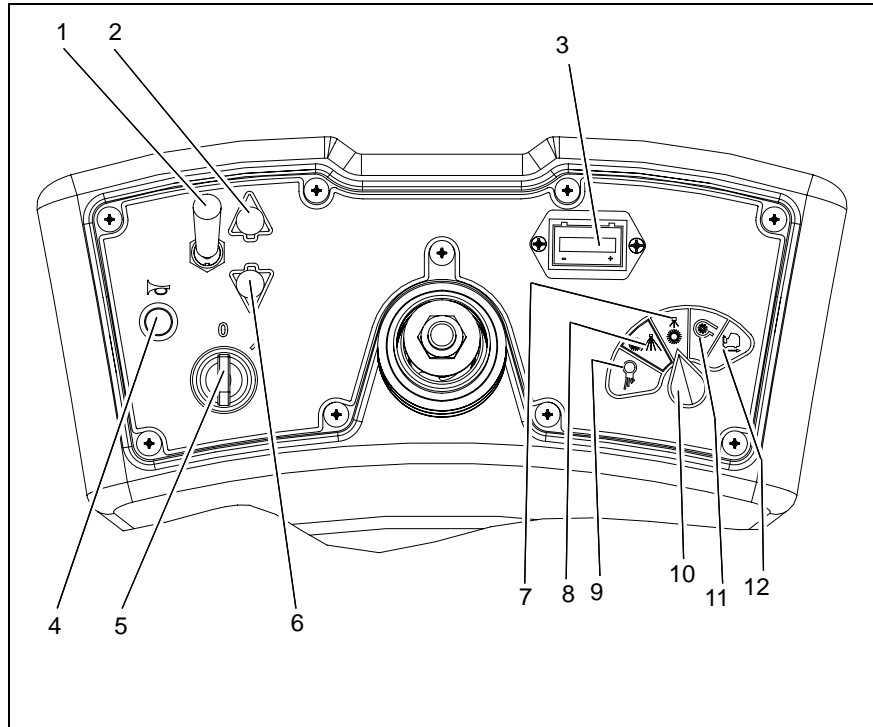


Fig.5



## Operating and Indicating Elements

### Direction selector (Fig. 5/1)

Controls the direction in which the X Ride 28 will move when the accelerator pedal is activated. The arrow pointing forward the amber LED (Fig. 5/2) indicates the machine is in forward mode. The arrow pointing backward with the red LED (Fig. 5/6) indicates the machine is in reverse mode.



### Battery / Fault gauge(Fig. 5/3)

This gauge displays the remaining battery charge. This gauge also displays any fault codes that might occur with the machine controller (see "Troubleshooting" for fault codes).



### Horn (Fig. 5/4)

Activates the electric horn.



### Key Switch(Fig. 5/5)

The key switch turns the electrical system on and off.



Remove the key to avoid unauthorized use of the machine.

### Mode selector(Fig. 5/10)

Selects the operating mode of the machine.

## Operating and Indicating Elements



### Off Aisle Wand mode(Fig. 5/9)

This mode is for cleaning areas that can not be reached with the machine. When selected, the vacuum motors will turn on and the solution pump will run when the trigger of the off aisle wand is activated. The machine will not move.



### Restorative Clean mode(Fig. 5/8)

When this mode is selected the solution will pump to the four spray jets in front of the scrub deck. When the operator selects **forward** and presses the accelerator the scrub deck will automatically come down, the brush motors will turn on, the vacuum motors will turn on, the solution pump and interim solenoid will turn on. If the operator selects **reverse** the scrub deck will raise, the brush motor, solution pump and interim solenoid will turn off. The vacuum motors will continue to run for 20 seconds to clear the vacuum hoses.



### Interim Clean mode(Fig. 5/7)

When this mode is selected the solution will pump to the single spray jet aimed on to the front scrub brush. When the operator selects **forward** and presses the accelerator the scrub deck will automatically come down, the brush motors will turn on, the vacuum motors will turn on, the solution pump and interim solenoid will turn on. If the operator selects **reverse** the scrub deck will raise, the brush motor, solution pump and interim solenoid will turn off. The vacuum motors will continue to run for 20 seconds to clear the vacuum hoses.



### Vacuum only mode(Fig. 5/11)

This mode is recommended for solution removal after double scrubbing, but can also be used to pick up spills. When the accelerator pedal is activated with the direction selector in the forward position, the rear brush deck will lower to the

floor as the vacuum motor turns on pulling the dirty solution water from the vacuum shoes into the recovery tank. If the machine stops moving and the direction selector is switched to reverse, the brush deck will raise (protecting it from damage) and the vacuum motor will turn off after a delay. If the machine stops moving in either direction, the brush deck will automatically raise and the vacuum motor will shut off after a delay.



### Transport mode(Fig. 5/12)

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

## Operating and Indicating Elements

### 3.2 At the Machine

- 1 Seat adjustment lever
- 2 Solution tank fill port
- 3 Solution Filter
- 4 Solution drain hose
- 5 Solution level sight gauge
- 6 Recovery drain hose
- 7 Recovery tank lid
- 8 Float Shut off

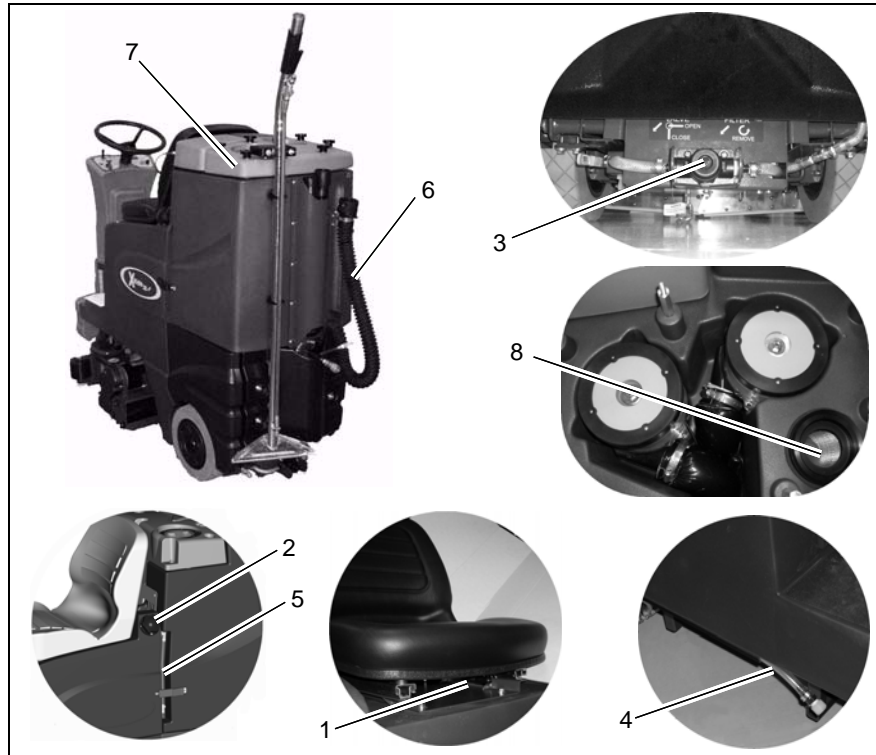


Fig.6

## Operating and Indicating Elements

### Seat adjustment lever (Fig. 6/1)

Use this lever to adjust the seat forward or backward.

### Solution tank fill port (Fig. 6/2)

The solution tank is filled through this port.

### Solution filter (Fig. 6/3)

While solution flows from tank to brush deck, it is cleaned by the filter element.

### Solution tank drain hose (Fig. 6/4)

This hose allows draining of the solution tank.

### Solution level sight gauge (Fig. 6/5)

The amount of solution in the tank can be checked visually using this gauge.

### Recovery tank drain hose (Fig. 6/6)

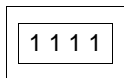
This hose allows draining of the collected soiled water from the tank.

### Recovery tank lid (Fig. 6/7)

Removing this lid allows access to the recovery tank and suction filter.

### Suction filter (Fig. 6/8)

This filter protects the vacuum motor from water and debris.



### Hourmeter (Fig. 3/11)

The hourmeter displays the current operating hour level.



### Main Fuse Fig. 3/12)

The main fuse interrupts the entire power supply to the vehicle. In the event of faults in the electrical system, the vehicle must be shut down by means of the main fuse. The Main Battery cut off switch positions (CB1) are:

- up = on
- down = off

Further fuses:

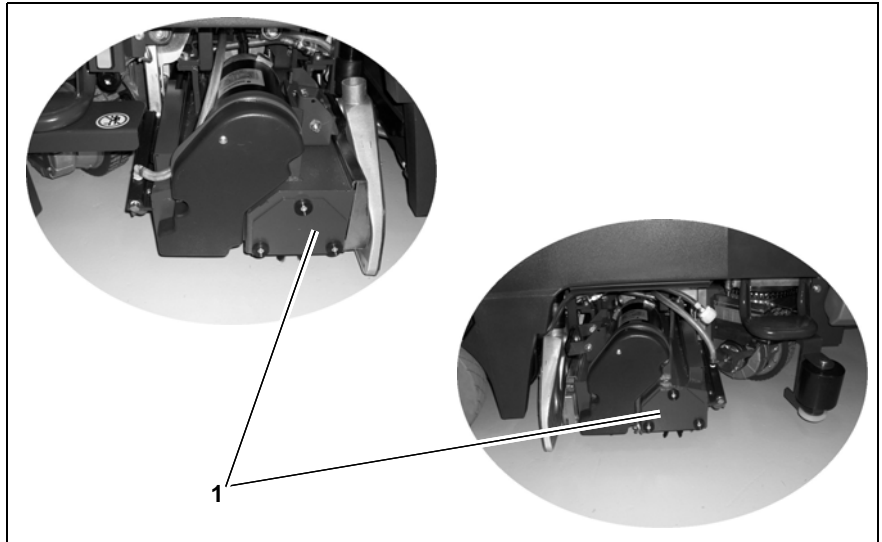
- CB2 Control Circuit
- CB3 Brush Motor (M3) Right
- CB4 Brush Motor (M4) Left
- CB5 Vacuum Motor (M1) Right
- CB6 Vacuum Motor (M2) Left



## Operating and Indicating Elements

### **Cylindrical brush hub (Fig. 7/1)**

This hub (both sides) can be removed to access the cylindrical brushes. The cylindrical brushes may be easily removed without tools.



**Fig.7**

## Operating and Indicating Elements

### Off aisle wand tool

The X Ride 28 is equipped with a ready-to-use built-in off-aisle wand system for use in hard to reach areas. Switch to the off-aisle wand mode (Fig. 5/9), then connect the wand as shown and it is ready to use.

### Solution trigger (Fig. 8/1)

The trigger controls the solution flow to the spray jet. Squeezing the trigger opens an internal valve to dispense cleaning solution.

### Vacuum Hose (Fig. 8/2)

Vacuum hose must be connected to recovery tank to pull solution into the wand.

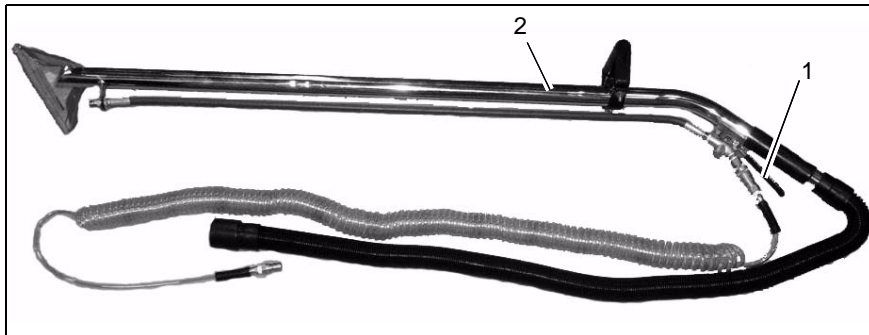


Fig.8

- 1 Solution trigger
- 2 Wand



## Operating and Indicating Elements

## First Operation

### 4 First Operation

#### 4.1 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.

#### 4.2 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 cannot be held liable for damages resulting from an insufficient initial charge.

#### 4.3 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

#### 4.4 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

### 4.5 Operation

1. Switch on the machine.
2. Select one of the five available modes using the mode selector (Fig. 5/10).
3. Set the direction the machine will travel by selecting forward or reverse on the direction selector (Fig. 5/1).
4. Activating the accelerator pedal (Fig. 4/17) 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 ma-

chine forward in a straight line overlapping 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, imme-

diately 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 (Fig. 5/3) 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.

### 4.6 Stop Machine

To stop cleaning, select the transport mode (Fig. 5/13). This will automatically stop the solution flow, raise the scrub deck, and turn off the vacuum motor (20-second delay).

### 4.7 After Work

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

1. When finished cleaning, select the transport mode (Fig. 5/12), 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.

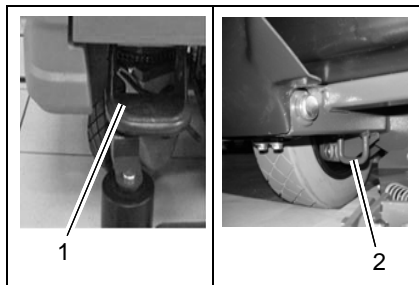
## First Operation

### 4.8 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.

### 4.9 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. 9/1) and the rear tie hooks (Fig. 9/2) as tie-down points.



**Fig.9**

## 5 Operation

### 5.1 Method of Operation General

#### 5.1.1 Brush Deck

Brush deck (Fig. 10/1) automatically lowers when traveling with a cleaning mode selected. The brushes rotate and solution supply switches on automatically. When the machine stops, brushes and solution supply switch off automatically.

#### 5.1.2 Solution Tank

Fill the solution tank (Fig. 10/2) through solution fill port (Fig. 10/4). The solution tank holds 27 gallons and the filling level can be checked visually through the solution level sight gauge (Fig. 10/5).

**NOTICE** The solution temperature is not to exceed 122°F (50°C).

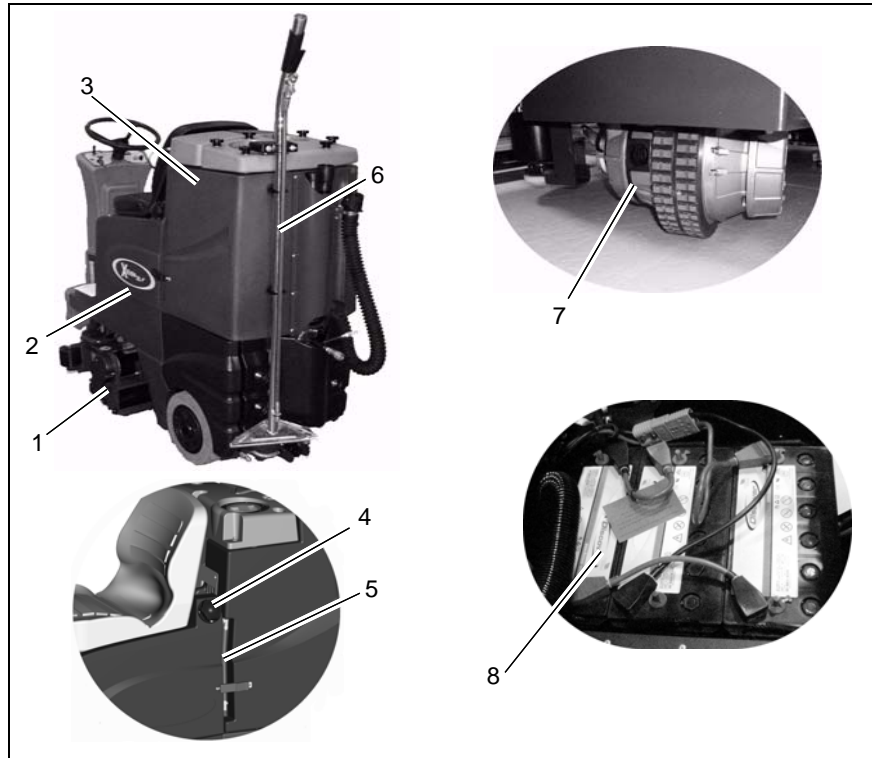


Fig.10

## Operation

### 5.1.3 Recovery Tank

The soiled water is taken from vacuum shoes to the recovery tank (Fig. 10/3) by vacuum motors and suction hose.



Accessories such as brushes, and rollers are available. Contact your Minuteman Dealer for more information.

### 5.1.4 Batteries

The battery compartment contains three 12-volt batteries connected in series (Fig. 10/8). The recommended battery is:

AGM 234 Ah (Minuteman P/N 956748)

### 5.1.5 Drive motor

The drive motor (Fig. 10/7) features dynamic braking as well as an electromagnetic parking brake. When the machine's power is turned off, the e-mag brake is activated and the traction motor is prevented from moving.



To manually disengage the parking brake pull the lever on the drive wheel.

## 6 Technical Data

	Cylindrical brush deck			
Machine length	61	in	155	cm
Machine height	54	in	137	cm
Working width	28	in	71	cm
Surface performance theoretical	9060	ft <sup>2</sup> /h	842	m <sup>2</sup> /h
Service voltage	36	V	36	V
Nominal power drive motor	600	W	600	W
Nominal power vacuum motor	650x2	W	650x2	W
Nominal power brush motor	2x600	W	2x600	W
Number of brushes	2	Qty.	2	Qty.
Diameter of brushes	5.9	in	15	cm
Working speed	65	fpm	19.8	m/min
Solution tank	27	gal	122	L
Recovery tank	25	gal	113	L
Weight without batteries and solution	475	lb	215	kg
Weight with solution and batteries	1315	lb	596.5	kg

## Technical Data

<b>Noise emission</b> The sound pressure level measured under maximum conditions of use (LwA) according to DIN EN 60335-2-72 amounts to: The sound pressure level measured (at the ear of the driver) under normal conditions of use (LpA) according to DIN EN 60335-2-72 amounts to: Measurement inaccuracy (KpA):	83dB (A) 72dB (A) 2dB (A)	83dB 72dB 2dB
<b>Vibration</b> The frequency weighted acceleration measured according to DIN EN ISO 5349 which have an effect upon the upper limbs (hand-arm-system) amounts under normal working conditions:	<0.8 m/s <sup>2</sup>	<0.8 m/s <sup>2</sup>

### 7 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.

#### 7.1 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

## 7.2 Maintenance Document

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

## Maintenance and Care

### 7.3 Maintenance Schedule System Maintenance Customer

Maintenance intervals must be performed by the customer/operator.

To be performed	Interval	
	daily	weekly
Fill solution tank and proceed to chemical agent dosage	o	
Charge batteries	o	
Check brush deck and clean if required	o	
Check vacuum shoe and clean if required	o	
Clean tank lid seal of the recovery tank	o	
Empty recovery tank. Clean recovery tank and suction filter	o	
Check brushes and replace if required	o	
Clean suction hose of recovery tank		o
Clean drain hose of solution tank		o
Check solution supply to brushes and clean if required		o
Check solution filter and clean if required		o
Check roller bumpers		o
Test drive and function test		o

## Maintenance and Care

### System Maintenance I

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

To be performed	Interval
	every 125 hours of operation
Check battery charger	o
Check tank lid seal of the recovery tank and replace if required	o
Check drain hose of the recovery tank and replace if required	o
Grease joints at the brush lift mechanism	o
Check wheel fixing screws and tighten (24 lb ft) if required	o
Check condition of tires	o
Test drive and function test	o

## Maintenance and Care

### System Maintenance II

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

To be performed	Interval
	every 250 hours of operation
Perform maintenance works according to System Maintenance I	o
Inspect steering damages and bearing slackness and replace if required	o
Check drain hose of the recovery tank 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
Test drive and function test	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

## 7.4 Battery Systems

- 1 Battery gauge
- 2 Recovery tank
- 3 Battery connector
- 4 Batteries
- 5 Safety latch
- 6 Support strap
- 7 Battery layout/connection



Handling and changing the batteries may be performed only by maintenance staff.

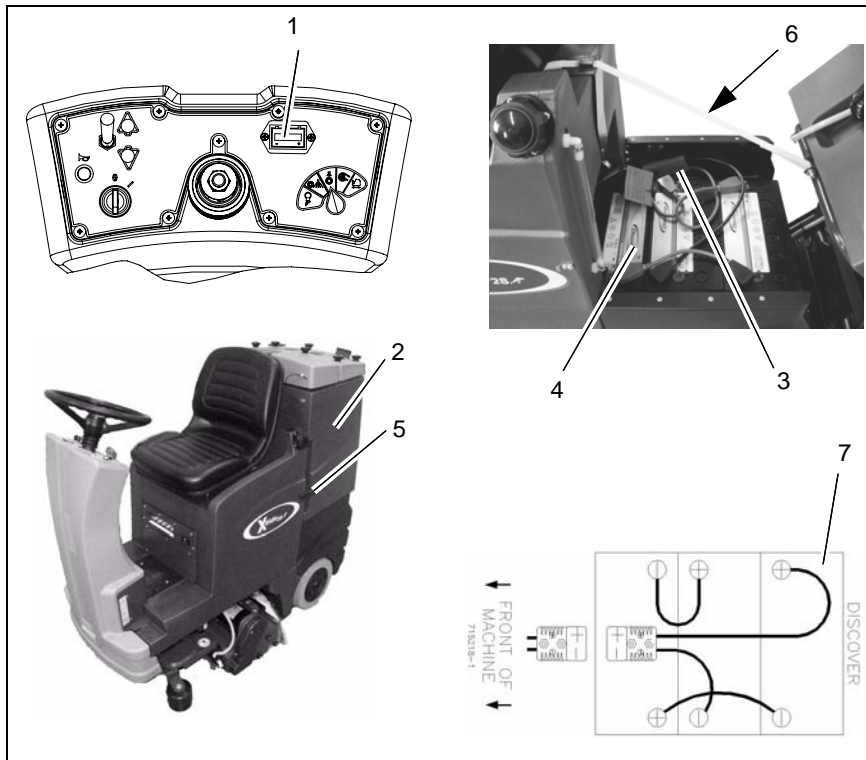


Fig.11

### 7.4.1 Charge Batteries

Connect the charger to the battery connector (Fig. 11/3) Charging batteries is recommended if at least one bar of the battery gauge has extinguished after operation of the machine. Observe the operating instructions of the charger as well as the operating instructions of the battery manufacturer. In case it is intended to change the type of battery the charger has to be adjusted only by Minuteman contract workshops.

**NOTICE** Be sure to use the correct battery charger per battery type.

### 7.4.2 Charger Specifications

P/N: 957746-2  
(36VDC, 25A, 120VAC Input, Hi-frequency)

**NOTICE** Charge the batteries properly before starting the machine for the first time. Minuteman cannot be held liable for battery damage resulting from failure to initially charge batteries.



Provide for sufficient ventilation of areas where batteries are charged. – Explosion hazard! See section 1.5 of this manual for battery and electrical precautions.

### 7.4.3 Maintenance of Batteries

Refer to battery manufacturers instructions for information on care of batteries.

### 7.4.4 Remove Batteries

1. Park machine on level ground.
2. Switch off machine by key switch.
3. Open empty recovery tank (Fig. 11/2) and secure by strap (Fig. 11/6).
4. Disconnect battery connector (Fig. 11/3).
5. Disconnect battery connection cables.
6. Remove batteries.

### 7.4.5 Install Batteries



Batteries must be selected and seated appropriately in accordance with factory machine specifications. Failure to do so could result in inappropriate changes to the machine's center of gravity which, in turn, could result in machine operation and control hazards (especially on inclined surfaces) and related personal injury.

1. Switch off machine by key switch.
2. Open empty recovery tank (Fig. 11/2) and secure by strap (Fig. 11/6).
3. Place batteries into tray according to figure.
4. Connect battery poles and enclosed connecting cables according to battery connection/layout (Fig. 11/7). Tighten and grease poles.

### 7.4.6 Disposal of Batteries

Used batteries labelled by the recycling sign contain re-usable substances. Such batteries must not be added to normal household waste. Obtain local information for the proper disposal of used batteries.

## 7.5 Solution tank

- 1 Solution tank
- 2 Fill level sight gauge
- 3 Fill port
- 4 Solution tank drain hose
- 5 Pump Box

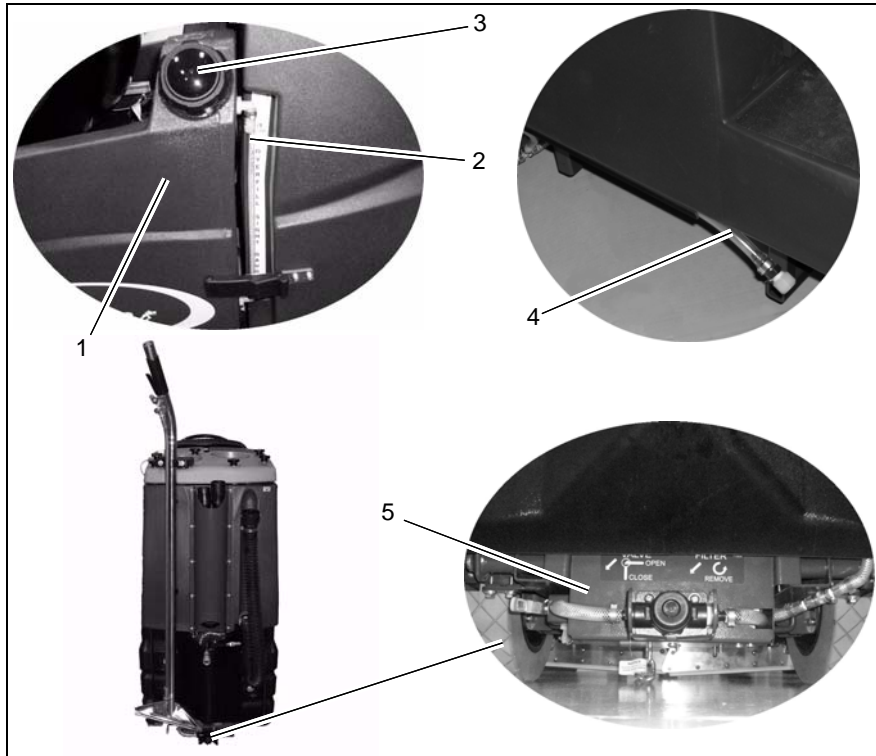


Fig.12



### 7.5.1 Fill solution tank

Fill solution tank (Fig. 12/1) before work or as required. Park machine on level ground. Open fill port (Fig. 12/4) and fill tank up to the maximum (1/1 marker) on the sight gauge (Fig. 12/2).

**NOTICE** The solution temperature is not to exceed 122°F (50°C).

### 7.5.2 Empty solution tank

Park machine such that the solution tank drain hose (Fig. 12/5) is located above the drain aperture in the floor. Take tank drain hose from holder and remove cap.

### 7.5.3 Solution Filter

Check solution filter at weekly intervals and clean or replace if required.

**NOTICE** Only clean solution filter when the solution tank is empty.

1. Empty solution tank (Fig. 12/1), see paragraph 7.5.2.
2. Unscrew filter cap.
3. Remove the filter element from the filter case for cleaning. Replace if required.
4. Re-install filter element and filter cap.

### 7.6 Recovery tank

- 1 Recovery tank
- 2 Drain hose
- 3 Float Shut off
- 4 Tank lid

#### 7.6.1 Empty recovery tank

Clean recovery tank (Fig. 13/1) at daily intervals, as required or upon acoustic signal (increased vacuum motor speed).

1. Take machine to appropriate area for draining.
2. Park machine such that drain hose reaches a drain aperture in the floor.
3. Switch off machine.



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

4. Take drain hose (Fig. 13/2) from holder and empty recovery tank completely.

#### 7.6.2 Clean recovery tank

Clean recovery tank at daily intervals or as required.

1. Empty recovery tank per 7.6.1

2. Open tank lid (Fig.13/4) of the recovery tank.
3. Take drain hose (Fig. 13/2) from holder and empty recovery tank completely.
4. Remove remaining dirt by rinsing tank and hose with clean water.

#### 7.6.3 Clean Suction Filter

Check suction filter (Fig. 13/3) at daily intervals and clean if required. The suction filter can be easily removed by pulling downward.

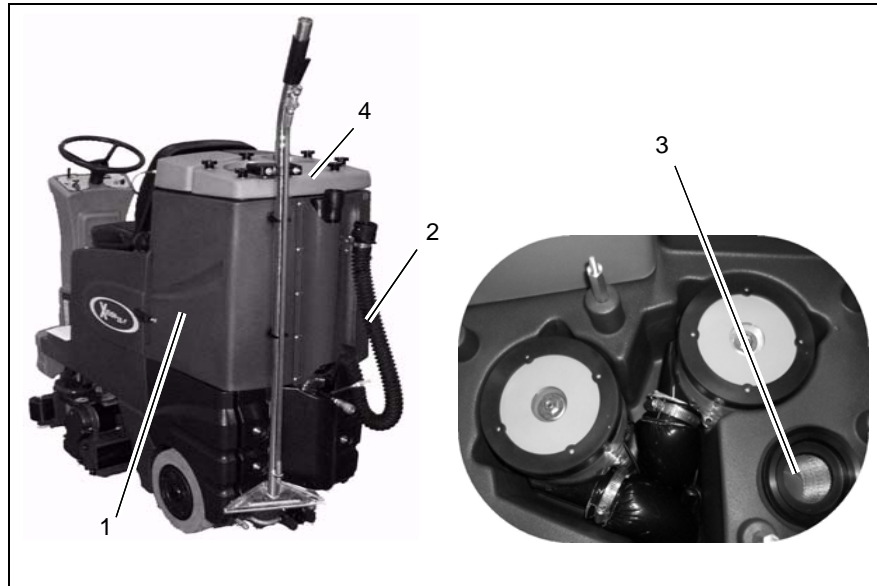


Fig.13

### 7.7 Cylindrical Brush Deck

- 1 Brush deck
- 2 Roller bumper
- 3 Debris Tray
- 4 Brush hub
- 5 Drive hub
- 6 Notched end of cylindrical brush

#### 7.7.1 Clean debris tray

Clean debris tray (Fig. 14/3) at daily intervals or as required.

Remove dirt hopper by **lowering the Brush deck**, lifting the debris tray and sliding sideways. Clean the tray and replace.

#### 7.7.2 Remove brushes

1. Release brush hub (Fig. 14/5) by removing the three thumbnuts.
2. Remove and check the brushes.

#### 7.7.3 Clean brushes

Clean brushes in the brush deck at daily intervals or as required.

#### 7.7.4 Replace brushes

Check brushes in the brush deck for wear at daily intervals and replace as required.

1. Insert brush into brush deck and rotate until it catches on the drive hub (notched end must face inward) (Fig. 14/6&7).
2. Place the brush hub and secure it with the three thumbnuts and lock washers.

#### 7.7.5 Change roller bumper

Check roller bumpers (Fig. 14/2) at weekly intervals and replace if required.

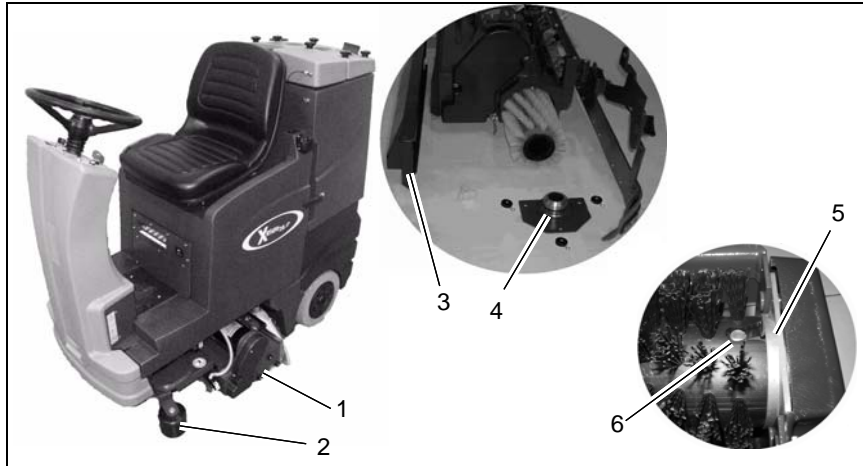
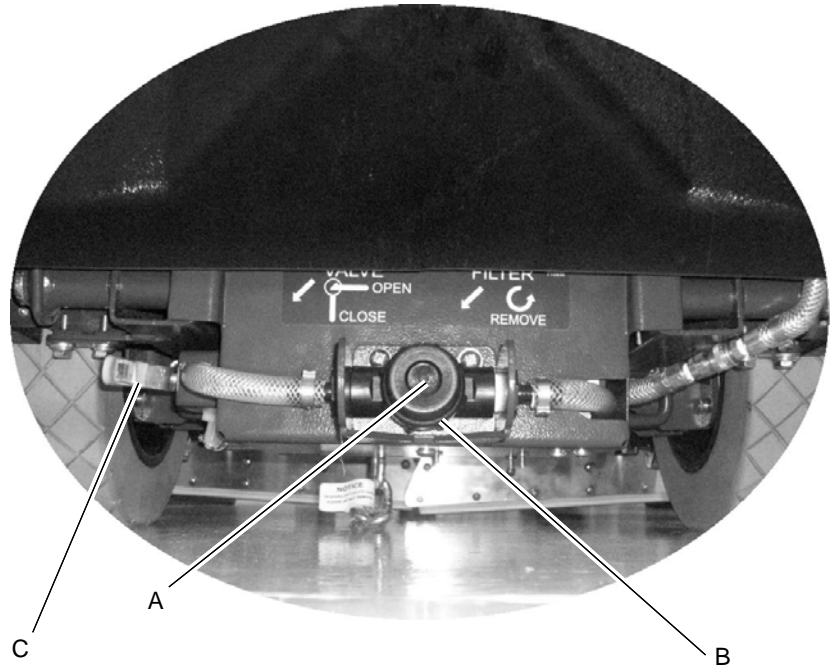


Fig.14

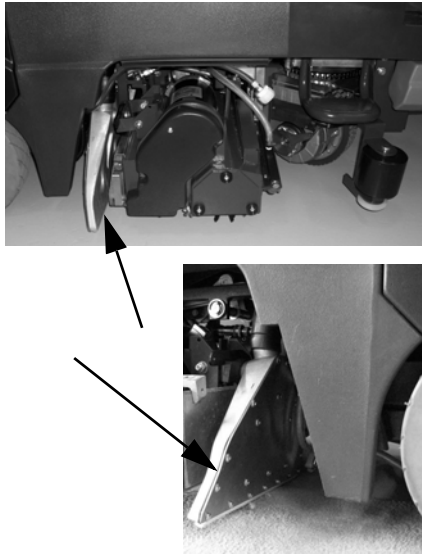
### 7.8 Pump Tank In-line Filter Maintenance

The **Solution Tank Filter (B)** should be cleaned regularly. To remove, turn the **Shut-off Valve (C)** closed by turning it 90° clockwise. Next, twist the **Filter Cap (A)** counter-clockwise and pull the filter out to clean.



### 7.9 Vacuum Shoes

The dual vacuum shoes are designed to extract soiled solution from the carpet. The plastic vacuum shoe lips minimize damage to carpet and flooring. The vacuum shoes should be removed and cleaned after each use to ensure maximum solution recovery.



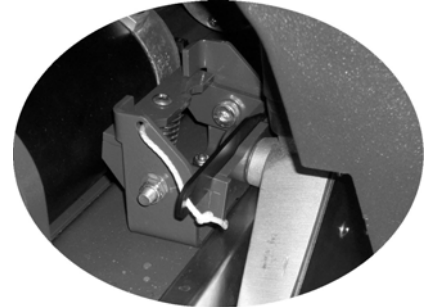
#### 7.9.1 Removal

1. With the vacuum shoes in the raised position, turn key switch "off".
2. Remove vacuum shoe locking bracket from left side of machine by rotating the vacuum shoe locking bracket and sliding the vacuum shoe out.
3. Pull vacuum shoe backward until it is free from vacuum shoe mount.
4. Repeat to remove the other vacuum shoe.
5. Inspect or repair as necessary and reinstall.



#### 7.9.2 Cleaning

1. Flush vacuum shoes from top with water. If necessary, clean blockage from narrow opening with knife, scraper or similar device.
2. Vacuum shoe glides may be removed for cleaning (or replaced) by removing the three pins that secure them to metal vacuum shoes.



# Maintenance and Care

## Notes


## Maintenance and Care

### Notes


## 8 Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Remedy</b>
Poor water pick-up / poor brush performance	Recovery tank full	Empty recovery tank
	Recovery tank drain hose leak	Secure drain hose cap or replace
	Recovery tank lid gasket leak	Replace gasket lid cover properly
	Debris caught in vacuum shoe	Clean vacuum shoe
	Vacuum hose clogged	Remove debris and flush hose
	Vacuum hose to vacuum shoe or recovery tank disconnected to vacuum shoe or damaged	Reconnect or replace vacuum shoe hose
	Worn brushes	Rotate or replace brushes
	Wrong brush or cleaning chemical	Consult Minuteman
	Debris caught on scrub brushes	Remove debris
	Moving machine too fast	Slow down
	Low battery charge	Recharge batteries
	Debris box full	Empty and clean debris box
	Brushes worn	Replace brushes
	Bristles have taken a set	Rotate brushes
No solution to off-aisle wand spray jet	Solution tank empty	Refill solution tank
No FWD/REV drive	Drive system speed controller.	Check error fault codes



## Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Remedy</b>
Inadequate solution flow or no solution to the floor	Solution tank empty	Fill solution 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
Machine does not run	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. Reset machine: Reset breaker and turn key switch off and restart.
	Batteries Low	Charge Batteries
Vacuum motor does not turn on	Recovery tank full	Empty recovery tank
	Excessive foaming in recovery tank.	Empty recovery tank. Use less or change chemical Use defoaming agent
	Five LEDs flashing on Battery Gauge	Check for motor overload Reset machine: Turn key switch off and restart.
Poor Vacuum Performance	Motor overload	Check individual circuit breakers CB5 and CB6
Brush Motors not running	Motor overload	Check individual circuit breakers CB3 and CB4

## 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
4	1	<i>EXCESSIVE CURRENT TRIP (Supported on LCD only)</i>	0x1310

## Troubleshooting

No. of Bars	No. of Flashes	Fault Description	Fault Code
	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 REF ERROR	0x0705
	2	HI SWITCH REF 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 OVER CURRENT ERROR	0x1507
10		HIGH BATTERY ERROR	0x1600

## Minuteman International Made Simple Commercial Limited Warranty

### REVISION O EFFECTIVE 4/1/2016

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.

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.

## Minuteman International Made Simple Commercial Limited Warranty

<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				

<i>Stand-alone Battery Chargers:</i>	One year
<i>Replacement Parts:</i>	Ninety days
<i>Batteries:</i>	0-3 months full replacement, 4-12 months pro-rate
<i>Polypropylene Plastic Tanks:</i>	12yr warranty, no additional labor



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