



Operation and Maintenance Manual

ACE^{20T}

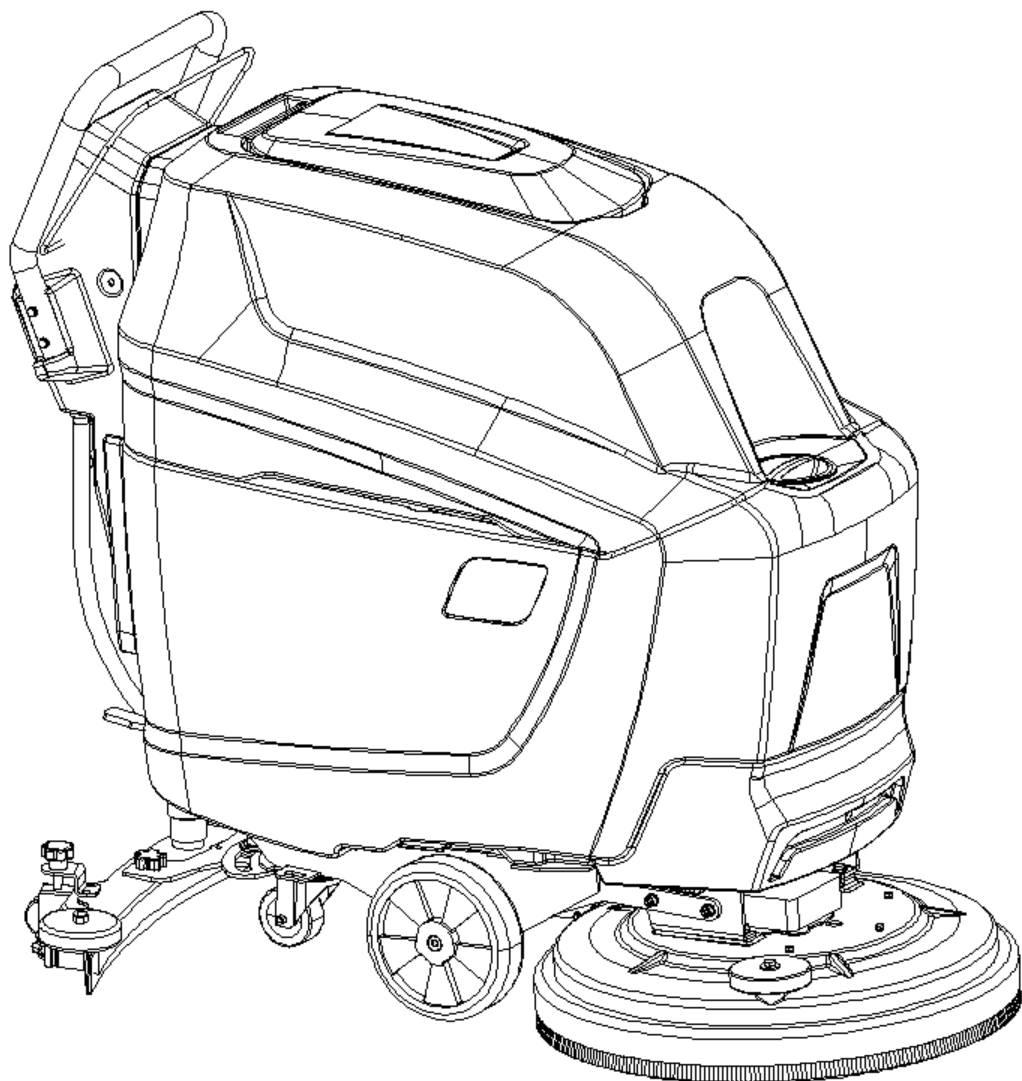


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CRATE CONTENTS

order	name	unit	quantity
1	ACE ^{20T} Machine	set	1
2	Charging cable	set	1
3	Battery cable	piece	1
4	Squeegee assembly	set	1
5	Suction hose	piece	1
6	Manual	piece	1
7	QC certificate	piece	1



Additional parts

Pad holder 20 inch
 Front squeegee blade
 Rear squeegee blade

INTRODUCING THE ACE^{20T}

A walk-behind floor scrubber and dryer. Combining the use of scrubbing brushes and water/ detergent solution, the ACE^{20T} is capable of cleaning any type of hard flooring. As the machine cleans, dirt and water are suctioned off the floor surface. Maintaining your machine ensures optimal performance and longevity. Please read this manual thoroughly before operation. Please refer to the troubleshooting section should any problems arise. If the problem persists our company is always available for assistance and service.

TECHNICAL SPECIFICATIONS ACE^{20t}

Scrub Path	20 in
Squeegee Width	32 in
Working Time	Up to 5 hours
Brush Pressure	88 lbs
Brush Speed	155 RPM
Vacuum Motor	500 W
Brush Motor	550 W
Suction Motor	24V/500W
Drive Motor	300 W
Solution Tank	16 gal
Recovery Tank	17 gal
Dimensions	15.5" L x 24.4"W x 41"H
Batteries	(2) 12V 100Ah AGM
Total Battery Weight	77 lbs

Battery Charger	External 24V 15A
Traction Drive	Standard
Net machine weight	209.5 lbs
Productivity (Theoretical Max)	24,606 sq. ft.

SYMBOL LEGEND



Attention



Manual



Watch Your Hand



Warning: hand injuries



No open flames



Caution: Danger of exhalation of gas



Recycle



Information



Warning: corrosion



Caution: shock



Dangerous waste



Lifting means

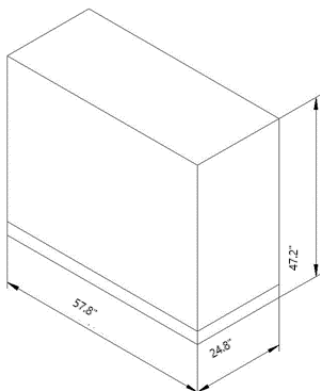
GENERAL SAFETY GUIDELINES

The regulations below must be carefully followed in order to avoid harm to the operator and damage to the machine.

- ◆ Read machine labels carefully, replace if damaged
- ◆ Use machine only by authorized, trained personnel.
- ◆ Pay attention to others while using.
- ◆ Avoid mixing different detergents.
- ◆ Don't store the machine with residual liquid.
- ◆ The storage temperature must be between -13°f and 131°f.
- ◆ Conditions of use: room temperature between 32 °f and 104 °f with relative humidity between 30 and 95%.
- ◆ Do not use the machine in an explosive atmosphere.
- ◆ Do not use the machine as a means of transport.
- ◆ Avoid acid solutions.
- ◆ Avoid using brushes when machine is stationary.
- ◆ Do not vacuum flammable liquids
- ◆ Do not use the device to collect dangerous powders.
- ◆ In the event of a fire, use a powder extinguisher. Do not use water.
- ◆ Avoid knocking against objects.
- ◆ Select operating speed as per traction.
- ◆ Avoid using on steep surfaces.
- ◆ Store properly when not in use.
- ◆ Use machine only in authorized areas.
- ◆ Perform routine maintenance.
- ◆ Use original spare parts for replacements.
- ◆ Use specified brushes.
- ◆ Use emergency brake in risky situations.
- ◆ Switch off before maintenance.
- ◆ Ensure full electrical connection after maintenance.
- ◆ Do not remove protection devices.
- ◆ Avoid corrosive substances and high-pressure water.
- ◆ Service after 200 hours of use.
- ◆ Prevent scale formation in solution tank.
- ◆ Check hatches and covers before use.
- ◆ Empty recovery tank before moving.
- ◆ Observe disposal laws for consumables.
- ◆ Dispose materials properly.

I. MACHINE PREPARATION HANDLING THE PACKED MACHINE

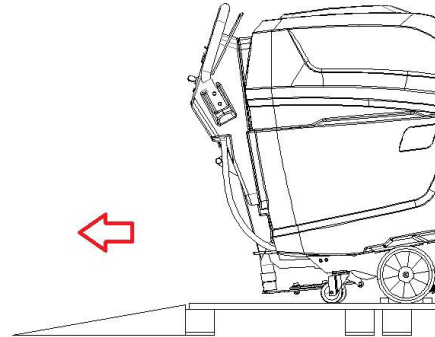
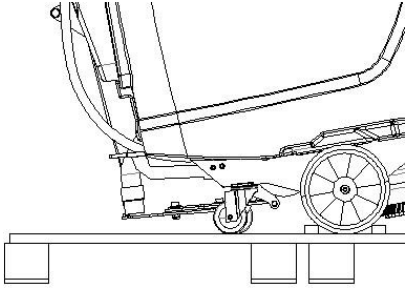
The machine is fixed to a pallet designed for forklift handling.



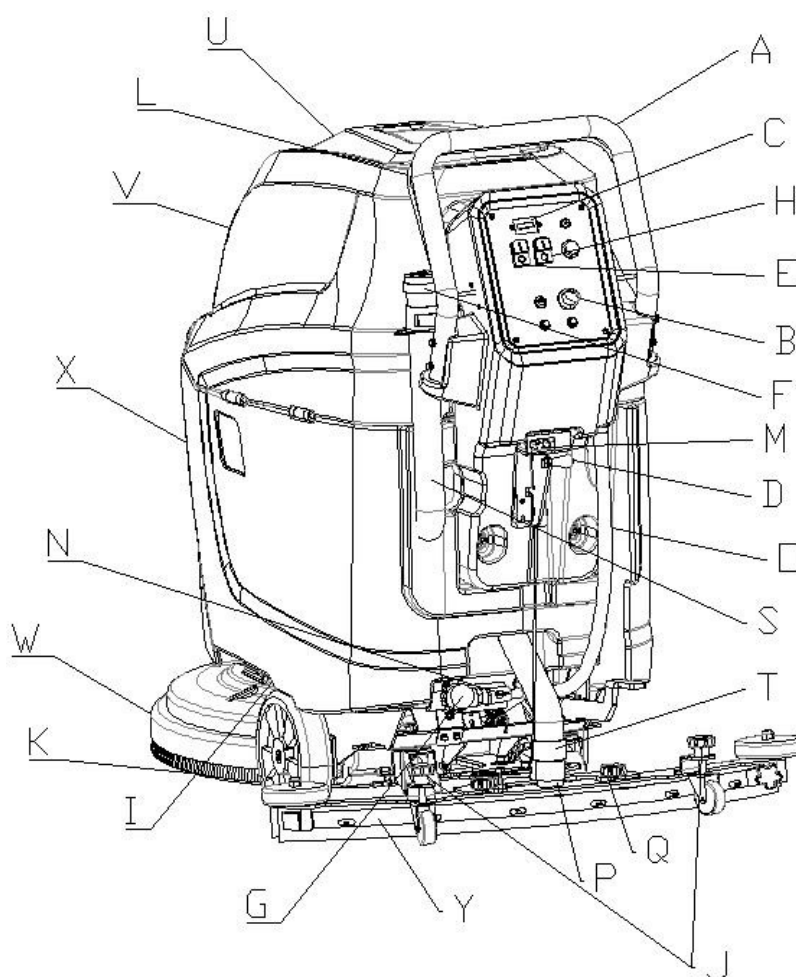
Overall dimensions of the package
L: 57.8 in W: 24.8 in H: 47.2 in

HOW TO UNPACK THE MACHINE

1. Remove the outer packaging
2. Machine fixed to pallet with wedges and belts.
Remove belts.
3. Get machine down from pallet. Keep pallet for transport.



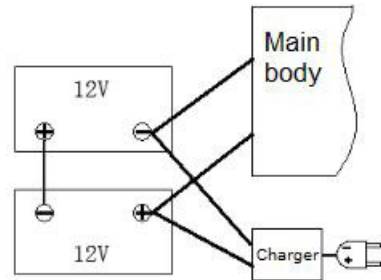
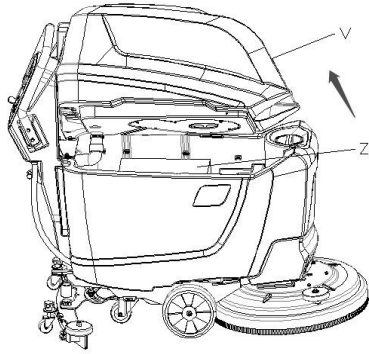
PARTS OF THE MACHINE



- | | | | |
|----------------------------------|-------------------|------------------------|----------------------------|
| A: handle | B: Key switch | C: Voltmeter | D: Squeegee lifting rod |
| E: brush switch | F: Drain cap | G: Filter | H: Squeegee switch |
| I: magnetic valve | J: Angle adjuster | K: Brush | L: Battery cables |
| M: Battery connector
(female) | N: Water tap | O: Water level
tube | P: Squeegee handle
tube |
| Q: Squeegee | R: Filter sponge | S: Drain hose | T: Suction hose |
| U: Cover | V: Recovery tank | W: Skirt | X: Solution tank |
| Y: Rear rubber | Z: Batteries | | |

INSERTING THE BATTERIES

Place batteries in the compartment with poles "+" and "-" opposite each other.



CONNECTING THE BATTERIES

Connect charger to battery connector cable. Seek professional help for connections to prevent harm and damage.



BATTERY TYPE

3 types of battery can be used in this machine:

- Lead-acid battery composed of liquid plumbic acid, called WET Battery.
- Liquid electrolyte lead traction batteries, called AGM Battery.
- Sealed traction batteries with gas recombination or gel technology, called GEL Battery.

OTHER TYPES MUST NOT BE USED

Max size of the battery: Length=31 in Width=7 in Height=8.5 in Max weight of the battery: 79 lbs.

BATTERY MAINTENANCE

Follow battery manufacturer's maintenance instructions. Choose suitable charger. Dispose of worn-out batteries properly.

BATTERY DISPOSAL

Disconnect and remove worn-out batteries by trained personnel. Dispose according to laws and regulations.



RECHARGING THE BATTERIES

Recharge batteries before complete discharge to prevent damage. Follow charging indicator. Keep recovery tank raised during recharging.

NOTE: never leave the batteries completely discharged, even if the machine is not being used



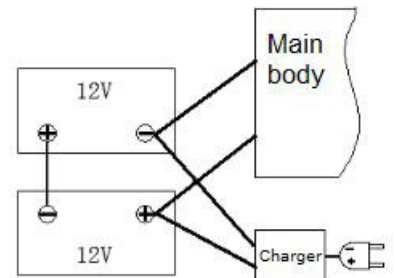
Caution: shock



Caution: Danger of exhalation of gas and corrosion.

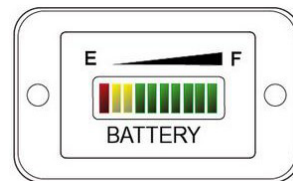
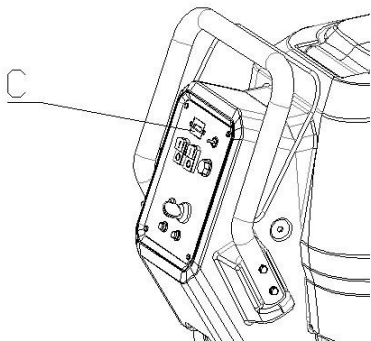


Danger of fire: do not go near with free flames



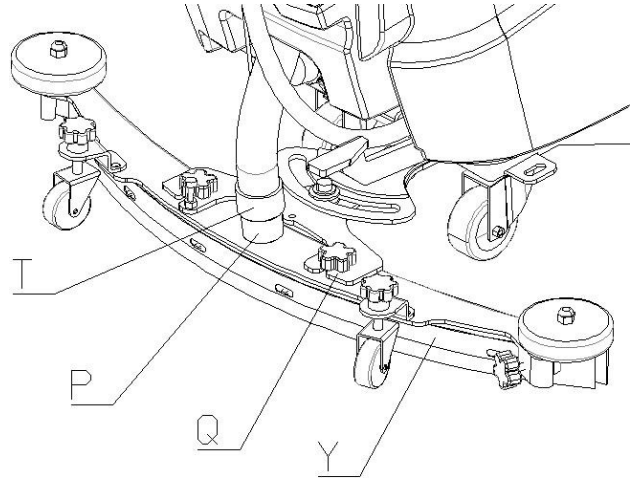
READING THE VOLTMETER

The voltmeter shows battery charging status. Green (full), Yellow (30% remaining), Red (low power). AGM battery users should use recommended charger.



ASSEMBLING THE SQUEEGEE

Attach the squeegee to the support frame assembly (Q). Connect the suction pipe (T) to the squeegee.

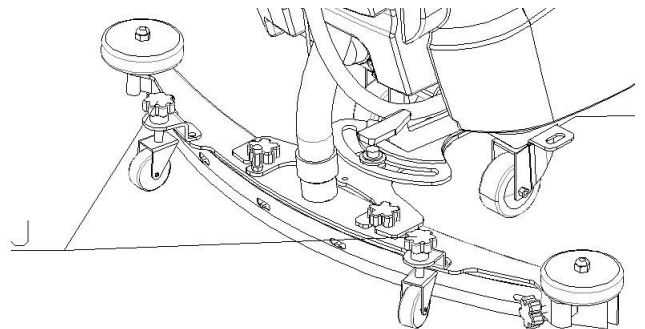


ADJUSTING SQUEEGEE HEIGHT

Adjust height to rubber. Rotate adjuster clockwise to raise, counter clockwise to lower. Keep squeegee parallel with ground.



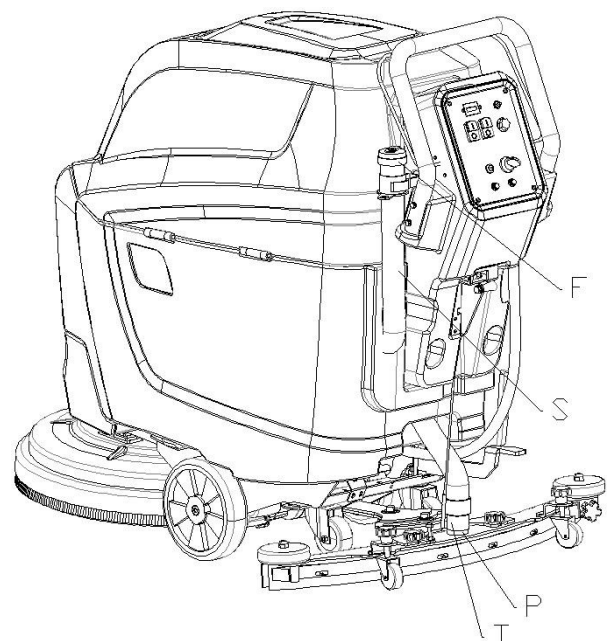
Rotate the adjuster of both sides simultaneously to keep the squeegee parallel with the ground.



RECOVERY TANK

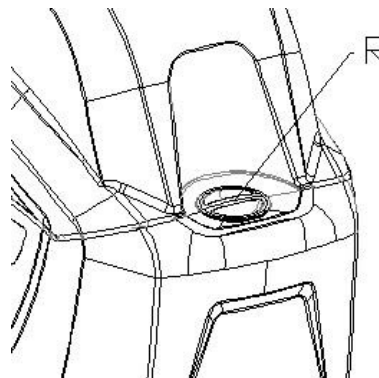
Rotate the recovery tank as far as it will go, using the side handle.

Connect hoses and tubes correctly. Fill solution tank with clean water and detergent.



SOLUTION TANK

Remove the front inlet cap (R), fill it with clean water.

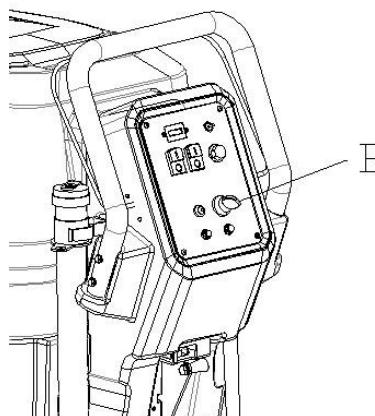


CLEAN WATER

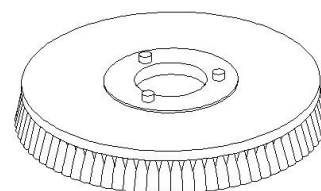
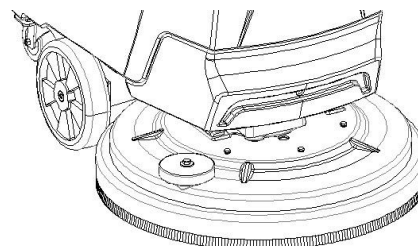
Fill the solution tank with clean water at a temperature not exceeding 122°F. Add the liquid detergent to the tank in the concentration and manner indicated on the detergent manufacturer's label. The formation of excess foam could damage the suction motor, so use only the minimum amount of detergent necessary. Cover the tank with cap(R).

ASSEMBLING THE BRUSH

1. At first, turn the key (B) to position "0" to turn off the power.



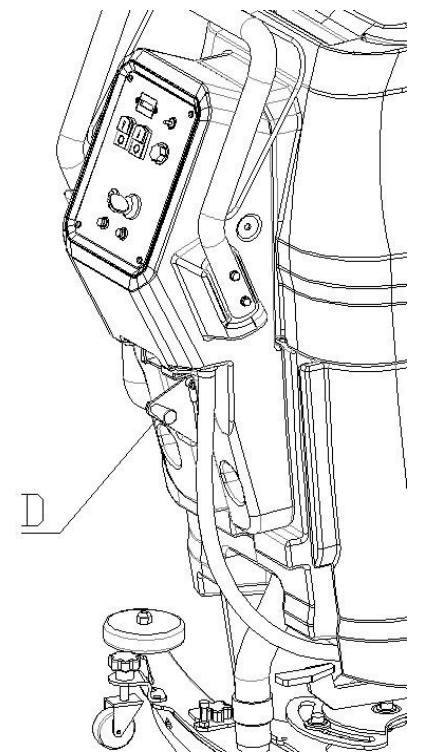
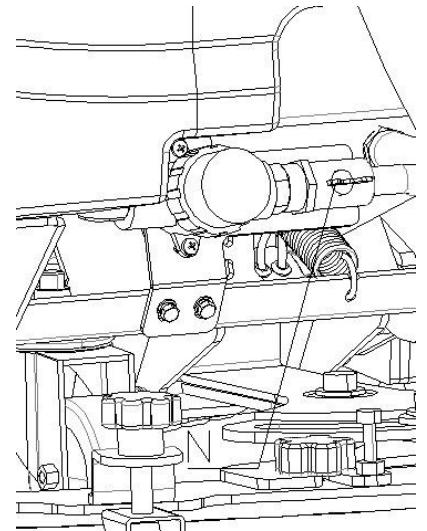
2. With the base up, place the brushes into the plate housing beneath the base, turning the brushes until the three pins enter the niches in the plate itself; turn until the pin is pushed towards the coupling spring and is locked into place. The figure shows the rotation direction for coupling the brush



II. MACHINE OPERATION

PREPARING TO USE THE ACE^{20T}

1. Connect the connector (M) to the batteries;
2. Turn the key (B) of the main switch to position "1" .The monitor (H) on the instrument panel will immediately come on;
3. Rotate the water tap (N) to adjust the flow. Select an appropriate level. The water falls automatically while the brushes are turning. You are advised to adjust the level according to the movement speed and the type of floor and dust;
4. Lean the head of the machine toward the front and lower the base;
5. Lower the squeegee, rotating the squeegee lifting lever (D).



OPERATION

Walk forward: Press the brush switch and Squeegee switch.

Then hold the handle with the machine working



Raise squeegee when making reverse movements.

If there is an operation risk, turn off the machine using the key switch. Restart the machine after trouble shooting.

OVERFLOW DEVICE

The machine has a float that will turn off suction when recovery tank is full. Empty tank to resume function.



Wear gloves for safety while emptying recovery tank.

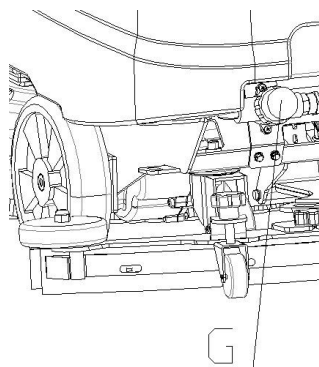
AFTER USING THE MACHINE

- Press the brush pedal to lift the brush.
- Raise the squeegee by lifting lever (D).
- Turn the key switch (B) to "OFF" to switch off the machine.
- Remove the drainage tube (S) from its compartment and drain tank.
- Clean brushes

III. DAILY MAINTENANCE

CLEANING THE RECOVERY TANK

1. Remove the drain pipe(S)
2. Remove the cap (F) and empty the tank.
3. Rinse the inside of the tank with water
4. Rinse all the elements with water
5. Reassemble all the elements

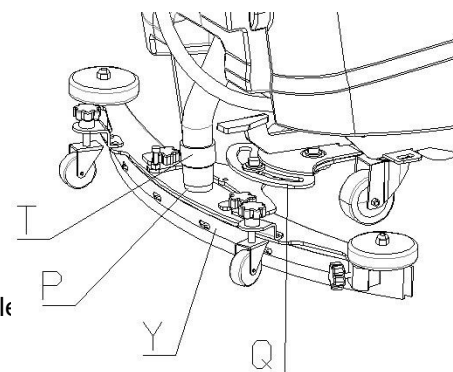


CLEANING THE SUCTION FILTER

1. Remove the suction filter (G) from its seat.

Use a jet of water to clean the walls and base of the filter.

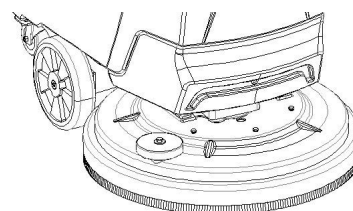
2. Reassemble all the elements.



CLEANING THE SQUEEGEE

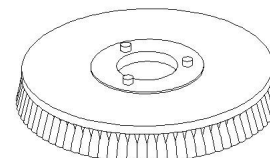
Check the squeegee is always clean, for better drying results, to clean

1. Remove the tube (T) from the squeegee.
2. Release the Squeegee fixed nut, then take down the squeegee (Y)
3. Carefully clean the inside of the squeegee (Q) and rubbers.



DISASSEMBLING THE BRUSH

1. Lift the brush base.
2. Turn the brush to the direction shown
3. If you will not use the machine for a long time, remove brushes to keep them dry.

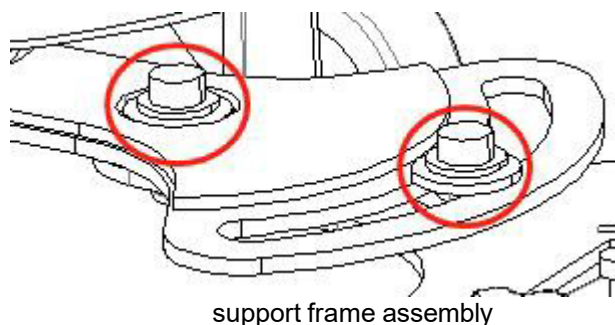


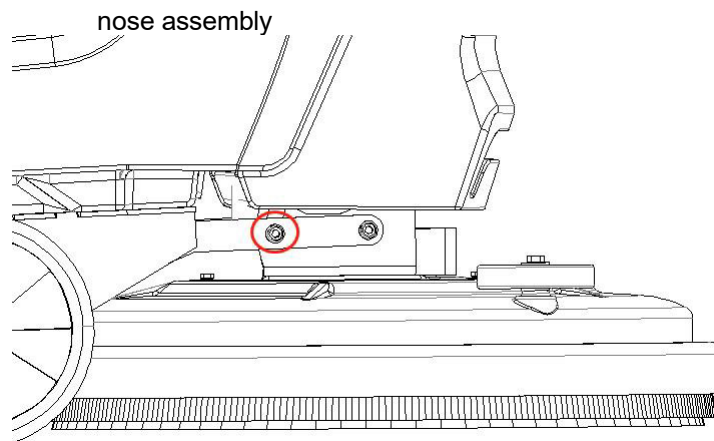
CLEANING THE BATTERY BOX

Keep battery box clean. Check cables and connectors.

IV. WEEKLY MAINTENANCE

1. Add grease or lubricating oil to moving parts regularly.

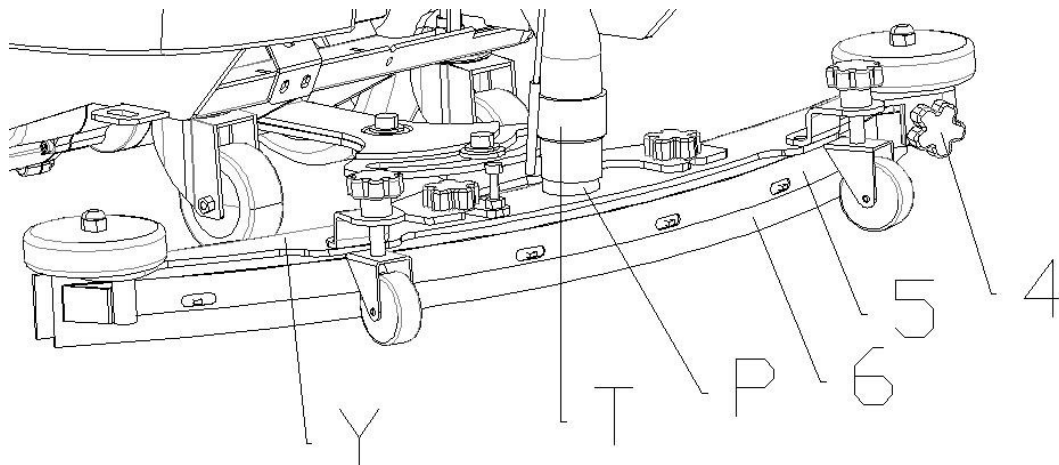




REPLACING THE SQUEEGEE BLADES

Check the state of wear and tear of the squeegee rubbers and, if necessary, replace them:

1. Remove the tube (T) from the sleeve (P) on the squeegee.
2. Rotate the nut on the squeegee.
3. Unthread the squeegee (Y).
4. Loosen the screw (4) that block the rubber-pressing blade and take down the plate (5) stainless steel.
5. Reassemble the rubber (6).
Reassemble squeegee.



V. TROUBLE SHOOTING

Check common problems before seeking assistance

Problem	Possible Cause	Solution
Brush motor will not work	<ol style="list-style-type: none"> 1. Electric not working 2. Low voltage 3. Motor not connected properly 	<ol style="list-style-type: none"> 1. Plug in the power and make sure the fuses are working 2. Make sure the batteries are fully charged 3. Check motor connections
Low solution/ no solution flow	<ol style="list-style-type: none"> 1. Filter or joint is clogged 2. The solenoid valve is clogged or needs replaced 3. Solution tank is empty 	<ol style="list-style-type: none"> 1. Clean out the filter or joint 2. Take out the solenoid valve, then wash it 3. Fill solution tank
Machine will not suction	<ol style="list-style-type: none"> 1. The cover of recovery tank is not sealed 2. Hose clamp loose 3. Suction Motor loose or defection 4. Suction hose is partially blocked 5. Battery low 6. Recovery tank is full 	<ol style="list-style-type: none"> 1. Check the seal 2. Check the hose clamp 3. Make sure the is motor install correctly 4. Clean the hose 5. Charge the batteries 6. Empty recovery tank
Battery terminal cable is hot	<ol style="list-style-type: none"> 1. Cable has bad connection 2. Cable has a short or break 	<ol style="list-style-type: none"> 1. Tighten the screw 2. Replace the battery cable
Water absorption is not even	<ol style="list-style-type: none"> 1. Suction motor does not work 2. Suction hose is blocked 3. The squeegee is blocked with something 4. The squeegee is total worn-out 5. The height of the squeegee is not suitable 	<ol style="list-style-type: none"> 1. Check the motor 2. Clean the suction hose 3. Clean the squeegee 4. Change squeegee blades 5. Adjust the height of the squeegee
The brush does not clean well	<ol style="list-style-type: none"> 1. The brush motor does not work 2. Dirt will not come off floor 3. Brush is scratching the floor 4. Something is tangled in the brush 	<ol style="list-style-type: none"> 1. Check the motor 2. Use appropriate cleaning fluid 3. Change the brush 4. Clean the brush

VI. CHOOSING THE RIGHT BRUSHES

POLYPROPYLENE BRUSH (PPL)

Used on all types of floors. Good resistance to wear and tear, and hot water (no greater than 140°F). Brush is non-hygroscopic and retains its characteristics even when working in wet conditions.

NYLON BRUSH

Used on all types of floors. Good resistance to wear and tear, and hot water (no greater than 140°F). Brush is hygroscopic and easy-extended will not retain characteristics when working in wet conditions.

ABRASIVE BRUSH

The bristles of this type of brush are extremely hard. It is used to clean very dirty floors. To avoid floor damage, work only with the pressure strictly necessary.

STEEL BRUSH

It is made up of steel wire and artificial fiber blends and used to clean rough roads, floors with big joints or dirt which is difficult to clean up.

THICKNESS OF THE BRISTLES

Thicker bristles are more rigid and are therefore used on smooth floors or floors with small joints.

On uneven floors or those with deep joints, it is advisable to use softer bristles which can enter the gaps more easily.

Remember that when the bristles are worn and therefore too short, they will become rigid and are no longer able to penetrate and clean deep down. In this case, like with over-large bristles, the brush tends to jump.