

# 28TD



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## RHINO 28" TRACTION DRIVE BATTERY FLOOR SCRUBBER

OPERATOR'S MANUAL (EN)



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Rev. 01 (16-2024)

## Introduction


This manual is furnished with each new model. It provides necessary operation and maintenance instructions.

Read this manual completely and understand the machine before operating or servicing it.

**This machine will provide excellent service. However, the best results will be obtained at minimum costs if:**

- The machine is operated with reasonable care.
- The machine is maintained regularly - per the machine maintenance instructions provided.
- The machine is maintained with manufacturer supplied or equivalent parts.

### PROTECT THE ENVIRONMENT

 Please dispose of the pack materials, old machine parts, used battery cells, and toxic liquids like freezing agents and oil following local waste disposal regulations.



Always remember to recycle.

### MACHINE DATA

Please fill out at time of installation  
for future reference.

Model No.- \_\_\_\_\_

Serial No.- \_\_\_\_\_

Machine Options - \_\_\_\_\_

Sales Rep. - \_\_\_\_\_

Sales Rep. phone no. - \_\_\_\_\_

Customer Number - \_\_\_\_\_

Installation Date - \_\_\_\_\_


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## Safety Precautions


The machine is a commercial product. It is designed for cleaning indoors hard floor, cannot use for other purpose. Be sure to use the recommended pads, brushes and commercially available floor cleaners suitable for the machine.

The following safety warning and "FOR SAFETY" symbols are used throughout this manual as indicated in the descriptions:

 **WARNING:** To warn of hazards or unsafe practices that could result in severe personal injury or death.

**FOR SAFETY:** To identify actions that must be followed for safe operation of equipment.

The following safety precautions signals will point out the potentially dangerous conditions to the operator or equipment. All operators must read, understand and practice the following safety precautions.

 **WARNING:** Fire or Explosion Hazard

-Do not use flammable liquids; Do not operate the machine in or near flammable liquids, gases or combustible dust workplace.

This machine do not equipped with an explosion proof motor. During start-up and operation, the electric motor produces sparks, if operate it in the place with flammable gases, liquids or combustible dust, it may result in flash fire or explosion.


-Do not pick up the flammable materials or reactive metals.

 **WARNING:**Electric Shock Hazard

-Remove the battery connect and charger plug before servicing machine.

-DO NOT use damaged power connect for battery charging. Do not refit the plug.

If the charger connect is damaged or broken, it must be replaced by the manufacturer or its service agent or similar qualified personnel, to avoid danger.

 **WARNING:** The rotary brush is running. Do not put your hands near the brush. Turn off the power before servicing the machine.

**FOR SAFETY:****1. DO NOT operate the machine:**

- In or near the place with flammable liquids or gases, otherwise it could cause an explosion or flash fire.
- Unless trained or authorized.
- Unless operation manual is read and understood.
- Do not in the normal operating conditions.

**2. Before operating the machine:**

- Make sure all safety devices are in place and operate properly.

**3. When using machine:**

- Go slowly on inclines and slippery surfaces.
- Wear non-slip shoes.
- Slow down before turning.
- Report machine damage or malfunctioning immediately.
- No children playing on or near the machine is allowed.
- Follow mixing, handling and scrapping instruction on chemical containers.
- DO NOT operate on a inclines more than 5% (3°).

**4. Before leaving or servicing machine:**

- Stop on level surface.
- Turn off machine.
- Remove the key.
- Use Rhino supplied or equivalent parts

**5. When servicing machine:**

- Avoid moving parts. DO NOT wear loose jackets, shirts or sleeves.
- Disconnect battery connections before working on machine.
- Wear protective gloves and eye protection equipment when handling battery or battery connect.
- DO NOT spray or high pressure hose down the machine. This may cause an electrical system failure.
- Use GAOMEI supplied or equivalent replacement parts.
- All servicing must be operated by trained technician.
- DO NOT make any change on original design for machine.

**6. When loading/unloading machine onto/off truck or trailer:**

- Drain the tanks before loading machine.
- Remove the battery before loading machine.
- Loading machine with assistance.
- Turn off machine.
- Lift down the brush into the down position.
- Tie machine down to truck or trailer.

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## Safety Labels

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Security label will follow the position instructions marked on the machine. If the label is lost, destroyed or illegible, replace the label.

Warning label - on the recovery tank cap cover.



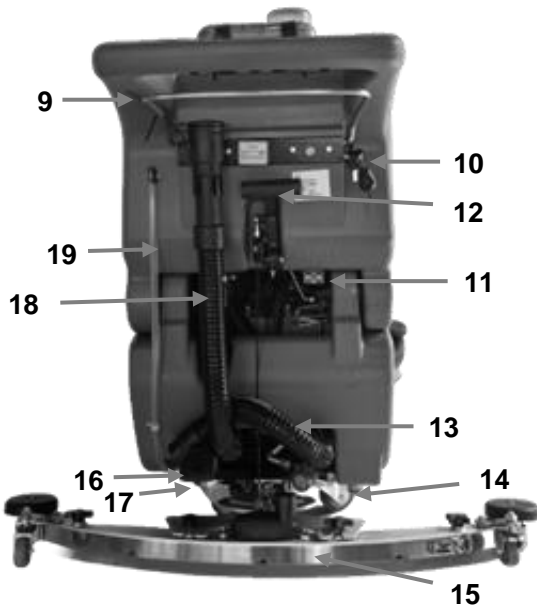
Rotating brush label - marked on scrub head



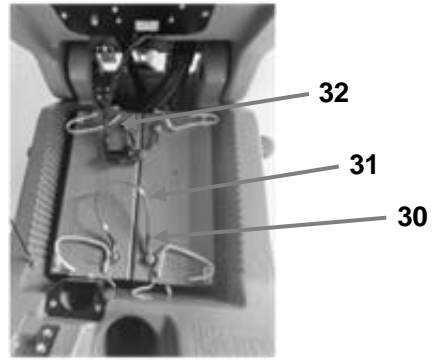
**WARNING:** The rotary brush is running. Do not put your hands near the brush. Turn off the power before servicing the machine.



1. Recovery Tank Cap
2. Body Main Handle
3. Clean Water Filling Port
4. Brush Motor
5. Brush
6. Scrubber Head Skirt
7. Drive Wheel
8. Universal Wheel
9. Motor Switch Handle
10. Water Valve Handle
11. Charging Coupler
12. Squeegee Lift Handle
13. Vacuum Hose
14. Clean Water Filter
15. Squeegee Assembly
16. Brush up/down Pedal
17. Solution Tank Drain Port (below the footboard)
18. Discharge Hose
19. Water Level Tube







- 20. Main power switch
- 21. Battery electric meter
- 22. Overload reset switch
- 23. Speed control switch
- 24. Directional switch
- 25. Brush motor button
- 26. Vacuum motor
- 27. Control panel
- 28. Battery
- 29. Water filters
- 30. Charging connect
- 31. Battery positive (red)
- 32. Battery negative (black)

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## Symbols on Control panel

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Main power switch



Brush motor switch



Slow, Fast



Forward, backward

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## Install the Machine

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### *Unpack the machine*

1. Check the damage situation in outside carton. If any damage, contact with your carrier immediately.
2. Check the packing list, if any miss items, contact with you dealer.

### **Content:**

- 2-12V batteries
- 120V, 15A charger
- $\phi$  8 connecting cable, 37 cm
- 4 rubber covers for battery connection
- 1 set of squeegee assembly
- 2 brushes or 2 pad holders
- cleaning pad need purchased additionally

3. Remove the metal holder on the big caster before disassemble the machine.  
Unloading the machine with assistance.

NOTE: If no loading device, do not push the machine directly to avoid damage to the machine.

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## Install the Batteries

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**FOR SAFETY:** When servicing the machine, wear protective gloves and eye protection equipment when handling battery or battery connect.

**Recommended battery specification:**

150 ah Battery

Battery max volume: 332mmx176mmx214mm.

1. Stop the machine on level surface, turn off the power and remove the key.
2. Lift up the recovery tank. (Figure 1).

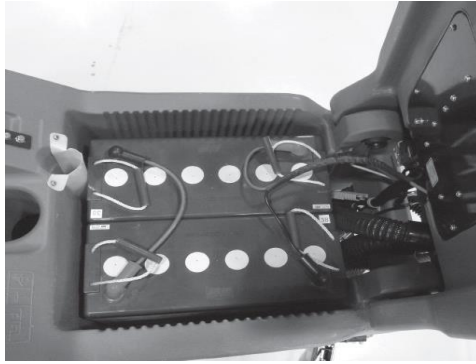


Figure 1

3. Carefully install the batteries into compartment room, and connect the terminals as following figure show. (Fig. 2)

4. Connect the battery cable to the battery terminals, as shown in (Fig. 2).  
Red for the anode post (+), black for cathode post (-).

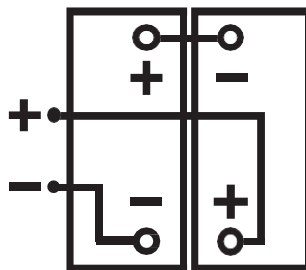


Figure 2

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## **Scrubbing Principle**

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### *Cleaning method:*

Water and detergent from solution tank flow to brush and floor through a water valve and a solenoid valve. The brushes use the detergent and water solution to scrub the floor clean. As the machine propels forward, the suction created by the vacuum fan then draws the dirty solution from the squeegee into the recovery tank.

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## **Brush and Pad Information**

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For best results, use the correct brush type for the cleaning application.

Rhino 28TD recommended brush and pad are as following

Brush : 13 inch, 330.2mm

Pad holder: 14 inch, 355.6mm

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Polishing pad(White) - this pad is for maintenance the high gloss or bright slippery surface. Turn on the water valve before cleaning, to prevent scratch the surface.

Buffing pad(Red) - this pad is for scrubbing the slight dirt surface with out any scuff.

Scrubbing pad(Blue) - this pad is for scrubbing medium and severe dirt surface. Scrub the dirty, stain and scratch to make the surface clean for re-coating.

Stripping pad(Brown) - this pad is for stripping floors for re-coating.

Heavy duty stripping pad(Black) - this pad is for stripping floors by cut through old heavy finishes, bases to prepare for re-coating. Also can be used for heavy duty scrubbing.

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## **Machine Set Up**

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### *Connect Squeegee Assembly*

1. Stop machine on a level surface, turn the machine ON/OFF key switch off and remove the key.
2. Lift the squeegee handle into upwards(Figure 3).

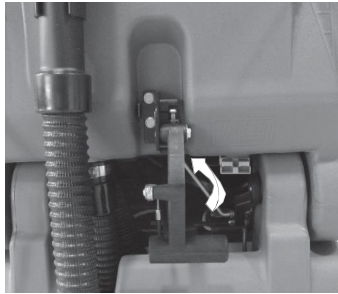


Figure 3

3. Place the squeegee assembly under the squeegee mount bracket (figure 4). Tighten the knobs after putting them into the slot completely.

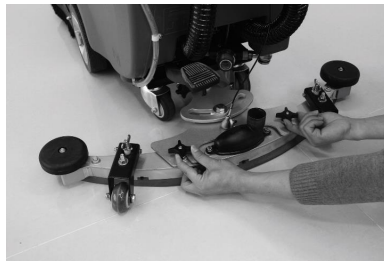


Figure 4

4. Connect the vacuum hose onto the squeegee assembly. Shown in figure 5.



Figure 5

5. Check the squeegee blade and make proper adjustment if necessary. (Follow "Adjust the squeegee blade" in page 32.)

### *Installing Brushes/pads*

FOR SAFETY: Before installing the brush or pad, stop machine on a level surface, turn off machine and remove the key.

1. Stop machine on a level surface, turn off machine and remove the key.
2. Press the brush up/down switch down and move it to right(as the arrows show), lift the brush up(figure 6).



Figure 6

3. Installation: Place the scrub brush or pad holder downwards to the drive hub in the left of brush motor, rotate in clockwise to install it; then place the scrub brush or pad holder downwards to the drive hub in the right side of brush motor, rotate in counterclockwise to install it. Do conversely when remove the brush or pad holder.

***Filling the Solution Tank***

The machine is equipped with a fill port in the front, fill the water into the solution tank.(figure 8)



figure 8

For scrubbing: use warm water(not to exceed 60°C/140°F). Pour the required amount of detergent into the solution tank according to mixing instructions on the bottle.

NOTE: When filling the solution tank with a bucket, make sure that bucket is clean. Do not use the same bucket for filling and draining the machine.

**ATTENTION:** For scrubbing, only use recommended cleaning detergents. Machine damage due to improper detergent usage(do not use granular detergents like washing powder particularly) will void the manufacturer's warranty.

**⚠ WARNING:** Flammable liquids can cause explosion or fire. Do not use flammable liquids in tank(s).

**FOR SAFETY:** When use machine, follow mixing and handling instructions on chemical containers.

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## Machine Operation

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**FOR SAFETY:** DO NOT operate machine before read and fully understand this manual.

**Warning:** Flammable materials can cause explosion or fire. Do not operate machine in or near the flammable liquids, gases or flammable dusts.

### Pre-operation Checklist

- Clean the dust in floor.
- Check the battery scale on battery charge scale.( Follow "Battery Discharge Indicator" on page 19).
- Check the brush/pad holder for the damage and wear.
- Check the squeegee for damage, wear and for deflection adjustment.
- Drain and clean the recovery tank. Check the waste water filter is installed.

### Before Operating

1. Turn on the main power, put the directional switch to the forward position.
2. Press the brush motor button, adjust to the preferred speed.





4. Put down the squeegee handle to move the squeegee assembly connect the surface (figure 10), and vacuum motor works.

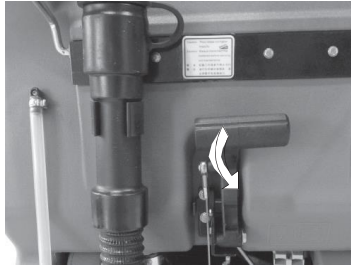


Figure 10

5. Step on the brush motor pedal and move left (as arrow show), remove the brush (figure 11).



Figure 11

6. Lift the water valve handle up, hold the brush motor switch to begin the cleaning (figure 12).

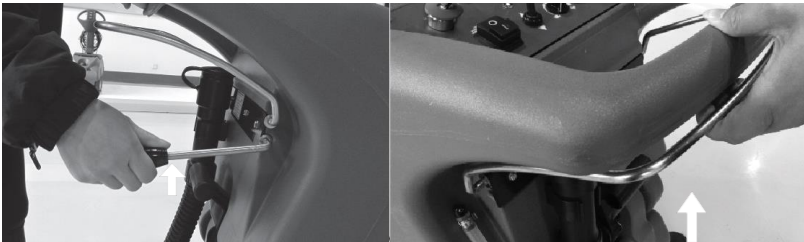


Figure 12

7. Adjust the solution flow through water valve for different surface cleaning use (figure 13).

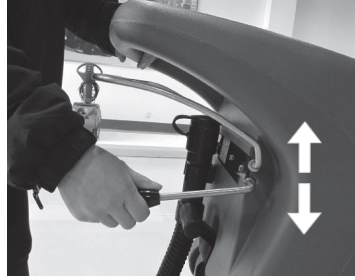


Figure 13

8. To stop cleaning, turn off the brush, squeegee motor switch and main power, raised the brush and squeegee.

#### *While Operating the Machine*

**WARNING:** Flammable materials or reactive metals can cause explosion and fire. Do not pick up.

**FOR SAFETY:** While using machine, go slow on inclines and slippery surface, wearing non-slip shoes.

1. Overlap the scrub paths by 2-3 inches.
2. Keep the machine moving to prevent damaging floor finishes.
3. Clean the scrubbing area in advance to avoid drag marks. If squeegee leave any drag marks, use cloth to remove the debris.
4. Do not operate the machine on inclines exceeding 5% (3°).
5. Pour a recommended foam control solution into the recovery tank if excessive foam appears.

Note: Keep the foam away from waste water filter to avoid damage the vacuum motor.

6. For heavy soiled areas, double cleaning method is recommended. Lift the squeegee first for scrubbing first, wait 3 - 5 minutes for solution flow dissolve, then put down the squeegee for cleaning again.

7. Raise the squeegee and brush, turn off main power and remove the key before leaving machine.

***Battery Discharge Indicator***

The battery discharge indicator shows the charge level of the battery. When the batteries are fully charged, all lights are lit. As the batteries discharge, the lights go out from right to left.

NOTE: To extend the life of the batteries, be sure to charge the battery after use in time.

When turn to the first yellow light in left, stop scrubbing and charge the battery. If keep scrubbing, the scrubbing function will stop automatically when the light turn to last yellow light. This prevents the battery power completely depleted. Charge the battery as soon as possible (figure 14-1).



Figure 14-1

***Brush Pressure Indicator***

Brush pressure indicates the brush pressure on floor. Adjust the pressure through brush up/down switch. Check the reader on the brush pressure indicator during operation (figure 14-2).

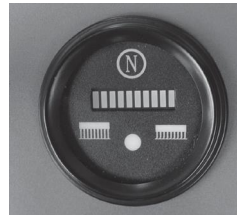


Figure 14-2



When the lights on the red, stop the machine.

***Timer***

Timer records the total amount of the working hours of brush motor. Use timer to determine when to perform recommended maintenance procedures and to record service history (Figure 15).



Figure 15

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## Drain the Tanks

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Drain and clean the recovery tank after use.

FOR SAFETY: Before leaving or servicing machine, stop machine in a level surface, turn off machine and remove the key.

### *Drain the Recovery Tank*

1. Drive the machine to a solution disposal drain, turn off machine and remove the key.
2. Holding the hose up, remove the plug and drain the water out (figure 16).



Figure 16

NOTE: When drain the recovery tank water into barrel, do not use the same barrel for filling and draining the machine.

3. Remove and rinse the waste water tank filter (figure. 17).



Figure 17

4. Do not rinse the waste water filter when cleaning the recovery tank (figure 18).



Figure 18

### *Drain the Solution Tank*

Screw off the solution tank drain cap to drain out the remaining water (figure 19).



Figure 19

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## **Battery Charge**

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The following description applies to the charger with this machine.

**NOTE:** To extend the service life of batteries, be sure to charge the battery after use in time, otherwise long time power loss will make battery damage.

### *Use of Battery Charger*

Please refer to the charger operation manual attached to the machine for detail information of charger operation.

The operation instructions of battery charger, follow the battery charger manual with the charger.

1. Drive machine to a ventilated place.

**WARNING:** Watch for the fire or explosion hazard. For safety use, stay away from sparks or open fire.

2. Stop machine on a level dry surface, raise the squeegee and brush, turn off machine and remove the key.

3. Open recovery tank cover for ventilation when charging.
4. Connect the AC((alternating current) power cord into a properly grounded electrical outlet.
5. Connect the DC(direct current) power cord into battery charging port on the rear of the machine(figure 20).



Figure 20

NOTE: DO NOT pull the DC power cord out from the machine during battery charging, to avoid arc strike. If must stop the charging, unplug the AC power cord.

#### ***Battery Installation and Use***

1. Check every battery for damage, clean, clear mark before operating. Clean the surface of batteries by dry cloth; Check for the open-circuit voltages, including the terminals and cable clamps.
2. Install the battery upright as the drawing shows on machine. Do not invert the direction. Spacing between each battery at least bigger than 5mm. After installation, check the terminals post and connect the cables per the drawings.
3. After installation, check the connecting parts, screw the connector tightly. Avoid excessive force to damaged pole, generally the screwing force is better no higher than 15N • M.
4. When installed the vehicle battery, adjust the clog on battery, make battery upright and fastened to avoid any shaking or collision.
5. Keep objects like electric door lock, fuse holder which easy to make sparks off the battery.
6. Battery is full of charging for direct use in the machine when delivery. Follow the charging method for supplementary charge if the battery holds for long time before use(more than 2months).

7. Do not close to fire, heat, strictly prohibited direct exposure to sunlight in hot summer; Severe vibration, collision and negative short-circuit should be avoided.

8. Battery capacity is based on the environment temperature 25°C Tcapacity will decreased 1% if temperature come down 1 °C Considering the environment temperature during operation. Avoid operate the machine lower than -10°C .

9. Do not dismantle the battery to avoid danger.

10. Waste batteries must be recycling use, do not thrown away for environment protection.

11. Pay attention on the battery temperature during charging, to prevent overheat damage the battery and make danger.

12. Avoid battery use in the situation prolonged loss of electricity, and make sure charge sufficient power before use.

13. DO NOT overcharge or work the machine in electricity loss situation, this will damage the battery. The manufacturer will not responsible for any battery damage due to such wrong operation.

### LED Light Indicator

LED Indicator	Indication Status	Working Status
LED1, LED2	Flash, fan does not run	Pre-charge status [charging time: 3h ]
LED1, LED2	Red light on, fan runs	Constant current status [charging time: 7-8h ]
LED1, LED2	Red light on, fan runs	Constant voltage status [charging time: 4.5 h ]
LED1, LED2	LED1 red light on, LED green light flash, fan does not run.	Float charging status [charging time: 4.5h ]
LED1, LED2	LED1 red light off, LED green light on, fan does not run.	Charge finished.
Note		
The situation of LED2 red light on	1. Load short	
	2. Wire reversed	
	3. Battery short-circuit	
	4. over-temperature - LED2 Orange light on	

### *Machine Maintenance*

To keep the machine in best condition, follow the daily, weekly and monthly maintenance procedures.

**WARNING:** Watch for the electric shock hazard. Disconnect the battery cable before servicing machine.

#### *Daily Maintenance(After use)*

1. Drain and clean recovery tank (figure 21).



Figure 21

2. Remove and rinse the waste water filter in the recovery tank (figure 22).



Figure 22

3. Drain the solution tank, remove the clean water filter, clean and replace it (figure 23).



Figure 23



4. Make sure that the brush motor is able to rotate when it is lifted and brush motor button is pressed. Remove the pads and brush for cleaning. Rotate the direction or replace for a new one if the pad is worn (Figure 24).

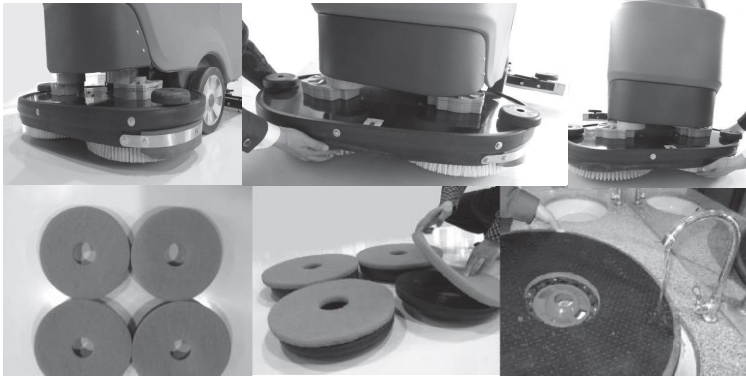


Figure 24

8. Clean the squeegee blade (figure 28). Raised the squeegee assembly up to avoid any damage.

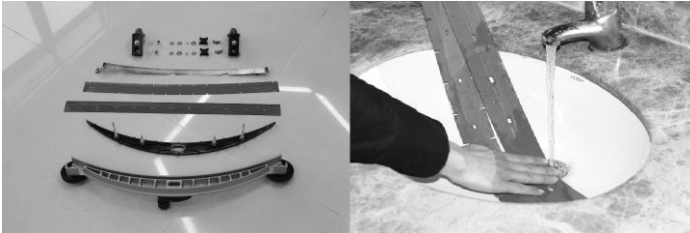


Figure 28

9. Check the wear condition of squeegee blade (figure 29). If worn, rotate the blade in other direction. (Follow “Replace the squeegee blade” on page 31).



Figure 29

10. Use multipurpose detergents and damp cloth to clean the machine (figure 30). **FOR SAFETY:** Do not spray or high pressure on the machine when cleaning. The electrical system damage may be caused.



Figure 30

11. To extend the service life of batteries, make sure to charge the battery in time after use to prevent the loss of electricity damage to the battery.

### *Weekly Maintenance*

1. Remove the clean water filter and clean (figure 32). Make sure drain the solution tank before remove the clean water filter.

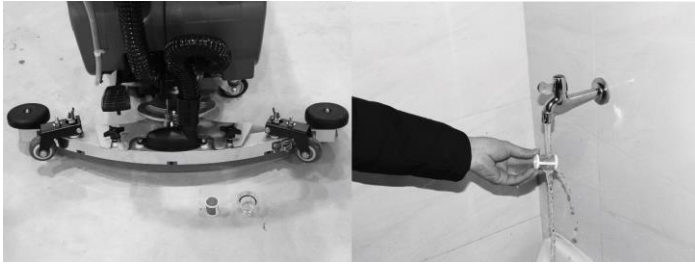


Figure 32

2. Clean the battery top to prevent the electrode corrosion, and check for the battery connection (figure 33).

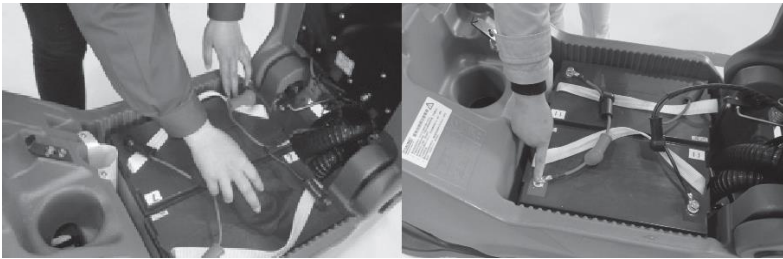


Figure 32

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**OPERATOR MANUAL****Maintenance Chart – Rhino 28TD**

The following table identifies the person responsible for each program

O = Operator

T = Trained Personnel

<b>Intervals</b>	<b>Person in charge</b>	<b>Descriptions</b>	<b>Procedures</b>
Daily	O	Brush/Pad	Check for brush/pad height
	O	Recovery Tank	Check for damage, wear or debris
200 h	T	battery terminals and cables	check and clean
500h	T	Vacuum fan motor(s)	Check motor carbon brush (check after 500hours for first operation, then check every 100hours)
	T	Scrub brush motors	Check motor carbon brush (check after 500hours for first operation, then check every 100hours)
	T	Propelling motor	Check motor carbon brush (check after 500hours for first operation, then check every 100hours)
	T	Big caster	Check for damage and wear

### *Replace the squeegee blade*

Each squeegee blade has 4 sides. If blade worn, rotate its side to use the good ones. If all sides are worn, replace new blades.

1. Remove the squeegee assembly (figure 34).



Figure 34

2. Loosen the squeegee blade clamping strip, remove the blade (figure 35).

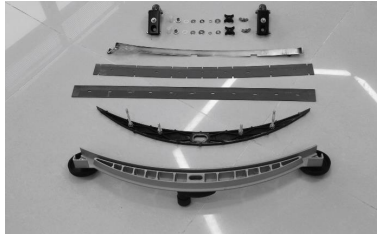


Figure 35

3. Change the rear blade into the other side, then re-install the blade. Make sure the clamping strip with notch is in the downwards (figure 36).



Figure 36

### *Adjust the squeegee blade*

Squeegee blade has been tuned before delivery. Adjust only when its position deviates.

For best performance, adjust the squeegee assembly caster to a certain height and inclination by following below instructions:

1. Check if the squeegee blade fully contact with the surface, measure the distance between wheel and surface. The best distance should be around 2mm, and squeegee blade is in the status as the arrow show in below during operation(figure 37).

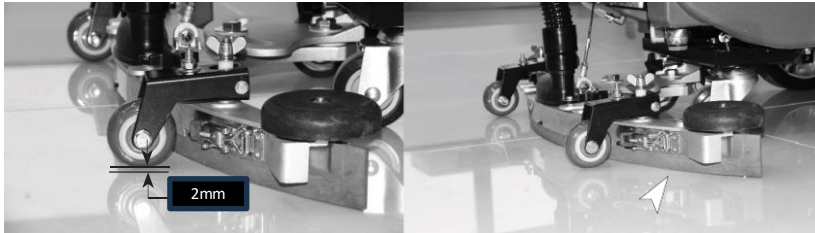


Figure 37

2. If the squeegee blade does not contact the surface well or has a little gap, adjust the nut as shown in arrow 2 in clockwise to raise up the squeegee blade. If adjust the nut in counter clockwise, the squeegee blade downwards and contact with surface. Adjust to the best condition according to the actual need(figure 38).

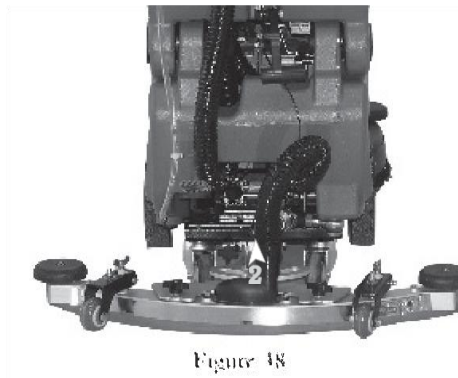


Figure 38

3. If the squeegee blade contact with surface well in middle but left side has gaps, adjust the nut as arrow 1 show in clockwise, the left side will be raised up. Adjust the nut in counter clockwise, the squeegee blade downwards and contact with surface. Adjust to the best condition according to the actual need (figure 39).

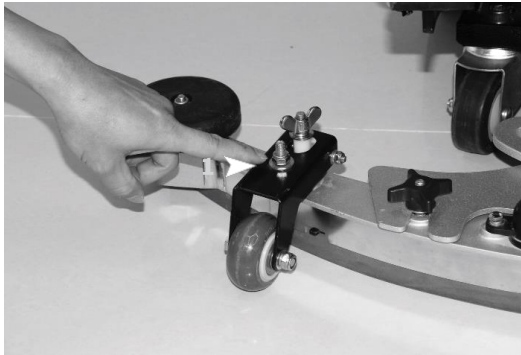


Figure 39

4. If the squeegee blade contact with surface well in middle but right side has gaps, adjust the nut as arrow 3 shown in clockwise, the right side blade will be raised up. Adjust the nut in counterclockwise, the squeegee blade downwards and contact with surface. Adjust to the best condition according to the actual need (figure 40).



Figure 40

5. If the squeegee blade left and right side contact with surface well but the middle has gaps, adjust the nut as arrow 2 show in counterclockwise( figure 41), make the squeegee blade contact the surface well. If the 2 sides has gaps, follow the above step 3 and 4 for adjustment again.

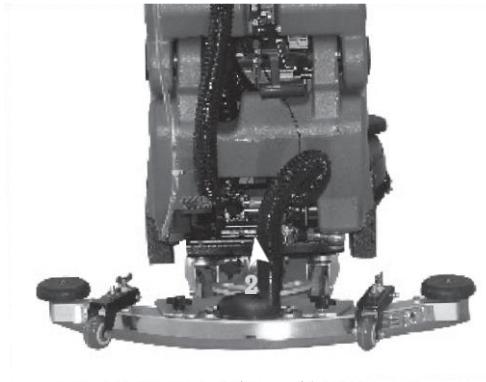


Figure 41

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## Transporting the Machine

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When transporting the machine by trailer or truck, be certain to follow the tie-down procedure below:

1. Raise the squeegee and scrub head.
2. Use a recommend devices when loading/unloading machine.
3. Position the front of machine against the front of the trailer or truck. Lower the brush head and squeegee after machine is fixed.
4. Place a block behind each wheel to prevent the machine from rolling.
5. Tie-down the machine top to prevent tripping. Be sure the brackets must be installed on the truck or trailers floor.

FOR SATETY: When transporting machine, use a recommend devices for loading/unloading machines on/off the truck or trailer; use tie-down straps to secure machine to truck or trailer.



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## Storage Information

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1. Charge the battery into full before storage. Do not storage when battery run out of power. If the storage period is long, make sure charge the battery every 2-3 months to prevent loss of electricity damage.

2. Drain and clean the solution and recovery tanks.

3. Park the machine in a cool and dry area. Raise the squeegee assembly and scrub up.

4. Open the recovery tank cover to promote air circulation.

**Notes:** Do not expose the machine to rain. Store indoors.

5. If store the machine in freezing temperatures, follow the instructions below freezing.

### *Freeze Protection*

1. Pour 1 gallons(4 liters) antifreeze into the solution tank at full strength. Do not dilute.

FOR SAFETY: Prevent the antifreeze contact with eyes, wear eye protection glasses.

ATTENTION: Before operating machine, clean the antifreeze in solution tank.

## Trouble Shooting

Problem	Cause	Remedy
Machine cannot operate	Switch do not open or damage	Open or replace the switch
	Brush motor do not open or damage	Open or replace the switch
	Vacuum motor do not open or damage	Open or replace the switch
	Motor handle damage	Replace the motor switch
	Battery lack of power or damage	Charge or replace the battery
	Overload protector activated	Solve short circuit, press overload protection
Charger does not work	Plug does not connect with power	Check plug connect
	Positive and negative cable connect wrong	Connect the positive and negative cable correct
	Charger breakdown	Refer to charger trouble code
Brush motor does not work	Scrub brush lifted away from surface or brush motor button damage	Replace brush motor button
	Motor switch damage	Replace the motor micro-switch
	Overload protector activated	Solve short circuit, press overload protection
	Brush motor joint loose	Tighten the joint
	Brush motor damage	Replace the motor
Machine does not move advance	Directional wheel damage	Replace the directional wheel
	Big caster damage	Replace the big caster
	Brush adjusting nut loose	Readjust the brush adjusting nut
Vacuum motor does not work	Micro-switch under the squeegee assembly damage	Replace the micro-switch
	Micro Switch line off	Re connect the line
	Motor micro-switch damage	Replace the micro-switch
	Vacuum motor damage	Replace the vacuum motor
	Recovery tank full	Empty recovery tank
Little or no solution flow to the flow	Solution tank filter	Clean solution tank filter
	Water valve switch damage	Replace the water valve switch
	Solenoid valve damage	Replace solenoid valve
Water flow does not stop when close the water valve	Solenoid valve has impurities	Full the solution tank, open water valve into max, operate machine, use water pressure to clean the impurities(repeated several times)
	Solenoid valve damage	Replace the solenoid valve

**Troubleshooting--Continued**

Suction power inadequate	Recovery tank is full or vacuum hose worn	Drain the recovery tank or replace the vacuum hose
	Discharge hose cap does not sealed	Cover the discharge hose cap
	Waste water filter in recovery tank clogged	Clean the waste water filter
	Waste water hose cap sealed parts has debris	Clean the debris and cover the waste water hose cap
	Squeegee blade worn	Rotate or replace the blade
	Squeegee blade cannot bend	Adjust the blade height
	Vacuum motor damage	Replace the vacuum motor
	Sewage guide cover has debris	Clean the debris on the sewage guide cover
Running time shortened	Battery lack of electrical power	Charge the battery
	Battery breakdown	Replace the battery
	Battery need maintenance	Refer to “battery maintenance”
	Battery charger breakdown	Maintenance or replace battery charger

### Battery Charger fault code

Code	Fault	Solution
LED2 turns GREEN and blink	Charger breakdown	Replace the charger
[ Slow flash ]	Charger temperature is overheat	Check if the charger Cooling vents clogged
LED2 turns ORANGE	Battery voltage<12V	Check if battery terminals connected well; or the battery lines problem; or use other 24V, 15-25Ah charger.
LED2 turns RED	<p>1. Do not use the charger for liquid-adding batteries to charge the maintenance-free batteries. The charger will be burnt-out.</p> <p>2.Charger for maintenance-free batteries adapts to liquid-adding batteries,but battery cannot be fully charged.</p> <p>3. If battery voltage is lower than 12V, the intelligent charger cannot work.</p> <p>4. Faults above are only for new batteries. Replace or maintenance if old batteries.</p> <p>5. In general, the operation panel will alarm if in insufficient voltage. Charge the battery in time, otherwise faults above will occur.</p>	

## Specifications

### *General Machine Dimensions / Capacities – Rhino 28TD*

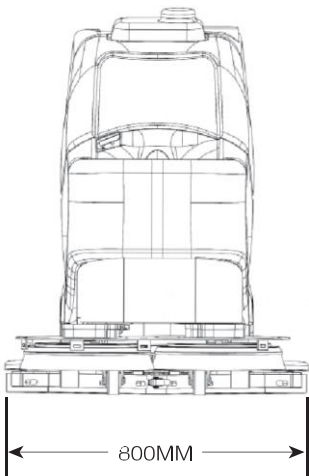
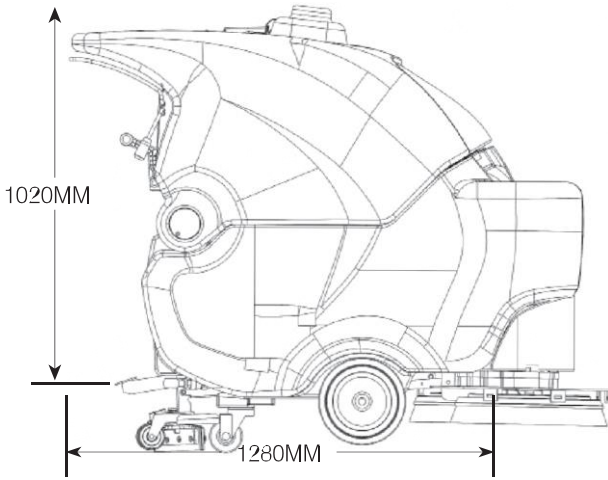
Item	Dimensions/Capacities
Length	1280mm
Height	1020mm
Width/Frame(roller-roller)	800mm
Width/Squeegee assembly(roller-roller)	960mm
Brush diameter	13"x2
Cleaning path	700mm
Solution tank capacity	70L
Recovery tank capacity	75L
Weight(battery included)	186kg

### *General Parts Information*

Type	Quantity	Voltage	Rated Current	Weight (each)
Battery	2	24V	150 Ah	36.7 kg

Type	Use	VDC	KW(hp)
Electric motor	Brush motor	24	0.4x2
	Vacuum motor	24	0.4
	Drive motor	24	0.4

Type	VDC	Amperage	HZ	VAC
Charger (intelligent)	24	15A	50/60	110/220



# United States Commercial Limited Warranty



<u>Model</u>	<u>Rotationally-Molded Components</u>	<u>Parts</u>	<u>Battery</u>	<u>Labor</u>	<u>Travel</u>	<u>Hour Meter Limit</u>
Backpack Vac 4 qt	5 Years	1 Year	N/A	6 Months	30 Days	N/A
19" Pad Drive	5 Years	1 Year	1 Year Pro-Rated	6 Months	30 Days	1000 Hours
28" Traction Drive	5 Years	1 Year	1 Year Pro-Rated	6 Months	30 Days	1000 Hours

## New Machine Warranty

Rhino Cleaning Machines (Rhino) warrants to the original purchaser, for the above-stated periods (whichever occurs first), that machines will be free from defects in workmanship and material, provided that machines are installed, operated, and maintained in accordance with Rhino written manuals and other instructions. This warranty does not apply to damage or failure caused by accident, freight damage, misuse, negligence, abuse, improper repair, or maintenance of the machines. Please refer to the Operator Manual for proper machine operation and maintenance instructions. The warranty period begins on the date the unit is delivered to the end-user site. A Warranty Registration Checklist must be filled out electronically via the Shipping notification email. Rhino will require credit card information for all warranty service dispatch requests unless there is an open account in good standing on file with Rhino or an authorized distributor. In the event that a warranty claim is denied due to the aforementioned reason, Rhino reserves the right to charge your credit card or account for the full amount of any labor, travel and parts costs incurred due to the equipment repair. Rhino will not reimburse or compensate any customer expense for parts or service. While under warranty, all parts supplied and services rendered must be transacted through Rhino or an authorized distributor; any parts or service determined to be covered under warranty will be provided on behalf of the customer. Warranty does not cover items considered wear parts unless determined to be defective in parts or workmanship.

## Labor and Travel Warranty

Rhino will, at its option, provide labor and travel or pay for outside repair for the above stated periods.

## Parts Warranty

Parts replaced or repaired under this warranty are guaranteed for the remainder of the warranty period. Consumable parts, expected to wear from normal use, are not covered under the parts warranty.

## Service Labor Warranty

Labor performed by Rhino or an authorized service representative is warranted for thirty (30) days from the date the repairs are completed. This policy does not cover work performed by any service company other than Rhino or an authorized Rhino distributor or service center and is restricted to the specific repair operation, component or concern for which the claim is made.

## Disclaimer

Rhino will not be liable for any indirect, special, consequential, or punitive damages (including lost profits) arising out of or relating to this agreement or the transactions it contemplates (whether for breach of contract, tort, negligence, or other form of action) and irrespective of whether it has been advised of the possibility of any such damage. In no event will Rhino's liability exceed the price the Buyer paid for the specific Goods giving rise to the claim or cause of action. All Sales Are Final. However, if we decide to waive any part of our policy, by our sole determination, there will be a 25% restocking fee plus all freight costs incurred. If we have shipped the wrong item or there was shipping damage, please contact us. Rhino hereby disclaims any and all other warranties express or implied, including, but not limited to, any implied warranty of merchantability and/or fitness for a particular purpose.

Rhino Cleaning Machines reserves the right to change its warranty policy without notice.

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