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**Tornado® Operations & Maintenance Manual**

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MODEL NO.  
99410 BR 13/1MW

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Long-term buyer protection warranties\*

<b>Tornado Standard Warranty Program</b>	
<p style="text-align: center;">Warranties do not cover components subject to normal wear or abuse and misuse, and have other limitations not specified here. For full details, contact your Authorized Tornado Distributor, Service Center, or the Tornado Service Department.</p> <p>Tornado sales and services representatives are not authorized to waive or alter the terms of this warranty, or to increase the obligations of Tornado under the warranty.</p>	<p><b>10 Years:</b> All plastic tanks and rotationally-molded bodies</p>
	<p><b>2 Year:</b> <b>On all Tornado components</b> <i>*except as shown below</i></p>
	<p><b>1 Year:</b> <b>Labor on all tornado cleaning equipment</b> <i>*except as shown below</i></p>
	<p><b>1 Year:</b> <b>Warranty on batteries and chargers, one year, pro-rated</b> All battery warranties are handled by the battery manufacturer, please call customer service for more information.</p>

Thank you for choosing Tornado products. We are proud to offer the most complete line of commercial and industrial cleaning equipment in the industry. Our reputation for quality, innovation and durability is unsurpassed.

\*Effective January 1st, 2008. Terms subject to change without notice.

- 1) Windshear™ Blower-Dryers, Insulation Blowers, CK LW 13/1, CK 14/1, CV 30, CV 38, Pro PAC Vacs, PV6 Back Pack Duo-Upright Carpetkeepers™, and all chargers are warranted for 1 (one) year for both parts and labor.
- 2) Warranties on the EB30 are 90 days (batteries, chargers, parts, accessories).
- 3) Warranties on all riding sweepers including the ICC1, KM100/100 R, KMR 1250, and KMR 1700 are 24 months parts/6 months labor OR 1000 hours of operation, whichever comes first. Warranties on all riding scrubbers including the 75/140 & 90/140 are 24 months parts/12 months labor OR 1000 hours of operation whichever comes first.
- 4) All non-wear item parts purchased after warranty expiration are warranted for 90 days.
- 5) Warranty starts from the date of sale to the consumer or 6 months after the dealer purchased the unit from Tornado, whichever comes first.

Note: Tornado, The Latest Dirt, Carpetkeeper, Carpetrinser, Carpetrinser/Dryer, Headmaster, Taskforce, PAC-VAC, T-Lite, Glazer, Windshear, Max-Vac, CV 30, CV 38, and Trot Mop are trademarks of Tornado Industries

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## Introduction

This Tornado floor cleaning machine is designed to be used on smooth, even floors indoors. They can be used on most floor surfaces including carpet, wood, PVC, rubber and stone.

We are confident the machines will give years of trouble free service, coupled with ease of use and minimum maintenance.

The following instructions contain important information about the machine and safety advice for the operator.

To save space and to protect the machine during transit, it is supplied with its handle disassembled. Follow the simple assembly instructions.

**Warning:** The machine must be fully assembled in accordance with these instructions before connecting to the electric supply.

### Important Safety Advice

When using electrical equipment, basic safety precautions should be followed:

- Read all instructions carefully before use.
- The machine must be unpacked and assembled in accordance to the instructions given.
- Keep children and unauthorized persons away from the machine when in use.
- Unplug the machine when not in use.
- Switch off the machine before removing the plug.
- When unplugging the cord, pull the plug and not the cord.
- Keep the power supply cord away from moving parts. Do not run the machine over the cord.
- Do not operate the machine with a damaged supply cord or plug, or after the machine malfunctions or is damaged in any way. Contact an authorized Service Center for repair or adjustment.
- When cleaning or performing maintenance to the machine, make sure that it is unplugged.
- Regularly inspect the power supply cord. If it is damaged, it needs to be replaced.
- Be careful when using the machine near the top of stairs.

### Guidelines for the Operator

- Operators must be fully trained in the use of the machine in accordance with these instructions.
- Operators should be physically able to maneuver, transport and operate the machine.
- Operators should be able to recognize abnormalities in the machine.
- This machine should always be connected to a fully earthed power supply of the right voltage and frequency.
- Let the machine do the work. Grip the handle as lightly as possible.
- Wear suitable footwear to avoid slipping.
- Wear suitable clothing to keep dry and warm.
- Do not smoke when using the machine.
- Do not run the machine dry, as this could damage the floor surface or the machine.
- Do not use excessively foaming or highly corrosive cleaning solutions. If operating on a flooded floor, ensure that water depth does not exceed 6mm (1/4 inch).
- Do not operate the machine on rough surfaces, explosive atmospheres, slopes, near flammable liquids and where hazardous dusts are present.
- Only use brushes and accessories per the instruction manual. The use of other brushes and accessories may cause safety problems.

### Electrical Connection

Before connecting the machine to the power supply, check that your supply voltage corresponds with the rating label on the body of the machine.

**Important:** If the supply cord is damaged, it must only be replaced by a cord from the manufacturer or an authorized service agent.

## Transporting the Machine

**Caution:** This machine is heavy. Do not attempt to lift the machine without assistance. Incorrect lifting techniques may cause injury.

## Machine Parts

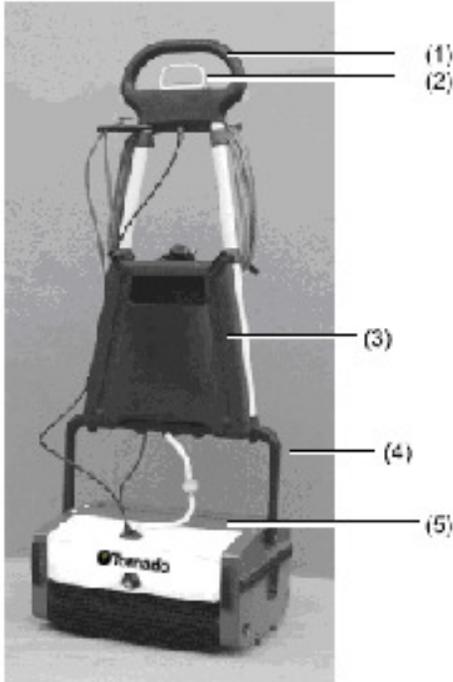


Fig. A

1. Top Handle
2. Liquid Discharge Control Handle
3. Solution Tank
4. Bottom Handle
5. Recovery Tank
6. Filter

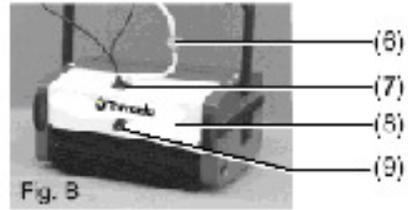


Fig. B

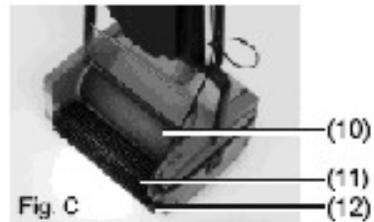
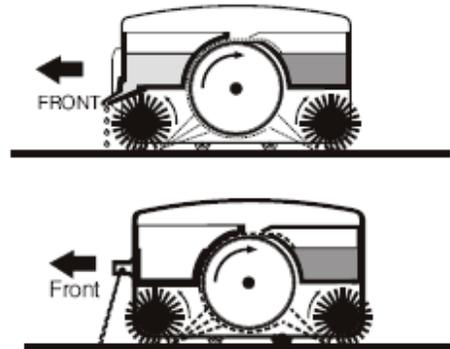


Fig. C

7. Lid Cap
8. Boot
9. Nozzle
10. Conveyor Drum
11. Brush
12. Pedal

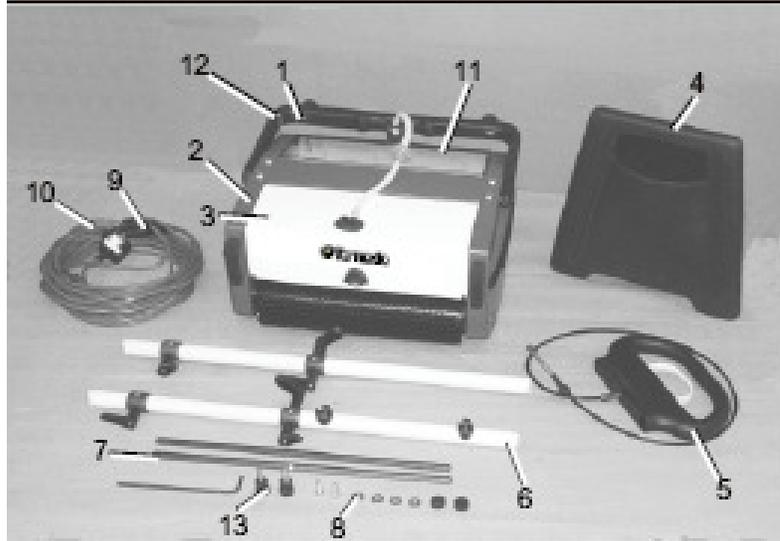
## How it Works

1. Cleaning liquid in the solution tank is applied to the floor by either gravity or spray.
2. The counter rotating brushes scrub the floor and also throw the dirty water on the conveyor drum. The front brush does most of the scrubbing and drying. The rear brush completes the scrubbing and collects the remaining water off the floor.
3. A blade fitted to the recovery tank wipes the drum and collects the dirty water.



## Preparing for Use

### Unpack



1. Bottom Handle
2. Machine Body
3. Pump Housing
4. Solution Tank
5. Top handle & Cable Pull
6. Handle LH & RH
7. Brush Shafts (2)
8. Screws & Washers
9. Cable Retainer
10. Power Cord
11. Recovery Tank
12. Hook
13. Knob

### Assembly

1. Insert the two tubular handles into the bottom handle and secure them using the knob by tightening lightly. Make sure that the handles are assembled according to their marked position and the cable holding hooks are pointed towards the rear.
2. Slide the electric cable retainer into the top portion of RH handle.
3. Fit the top handle over the tubular handles and secure them with washer and screw (2 sets). Make sure that the label on the top handle is facing the front of the machine. Now firmly tighten both knobs and screws. Insert the plastic caps provided to cover the screws in the top handle.
4. Pass the free end of the pull cable through the plastic guide in the RH Handle. Press and twist clockwise to firmly secure the cable end to the lid pump housing.
5. Fix the solution tank firmly into the bottom handle by holding the top handle.
6. Rotate the knob to hold the solution tank.
7. The brushes are loosely packed in the machine for transit; therefore the brush shafts must be fitted before operating the machine. Push the shafts through the brushes from the side of the machine. To remove brushes, push the brush shaft out from the side of the machine using your fingers and pull it from the other side.

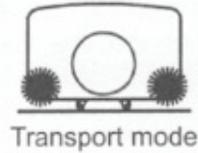


## Controls

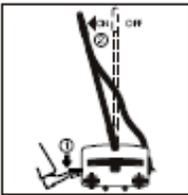
### Transport/Working Mode Control

Slide the knob to the TOP position (Working Mode) to operate the machine. Slide the knob to the BOTTOM position (Transport Mode) to move the machine and/or park the machine. The machine will not turn on in this mode.

**Warning:** Keeping the knob in the top position and moving the machine will damage the brushes.



### On/Off Control



Press the pedal lightly with your foot, then pull back the handle a little to start the motor. Pulling the handle further without pressing the pedal lowers the machine and engages the rotating brushes onto the floor. To turn the machine off, return the handle back to the vertical position.

### Brush Pressure Controls

The control is located on the left side of the machine and has 4 positions: MINIMUM pressure when the knob is all the way down and MAXIMUM pressure when the knob is all the way up. This allows you to compensate for brush wear and to control the brush pressure.

### Liquid Discharge Control

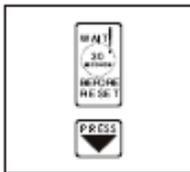


By pulling the liquid discharge handle up, the cleaning liquid is released onto the floor in front of the machine. The flow ceases when the handle is released.

### Pull Cable Connect/Disconnect Control

Insert the free end of pull cable into the valve body fitted in the cap base switch. Press and twist clockwise to secure the cable end. Similarly, press and twist counter-clockwise to disconnect the cable end.

### Motor Overload Cut-Out



In the event of the motor getting overloaded due to improper power supply or unexpected obstruction to the brush or drum rotation, the overload protector trips and protects the motor from damage. If this happens, identify the cause, correct it and reset the protector button after a minimum of 30 seconds from the tripping. After this, you may continue working.

**Important:** Should the machine fail to operate, contact your dealer.

## Operating the Machine

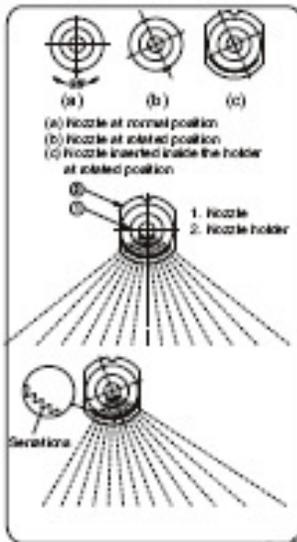
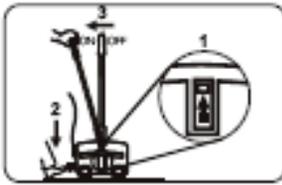
### Before the Washing Operation Starts

**Warning:** Pre-sweep the floor to remove debris before using the machine.

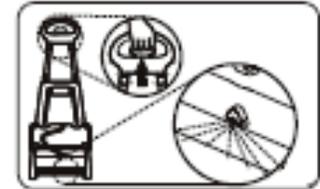
1. Ensure that the brushes are fitted properly.
2. Fill the solution tank with cleaning liquid.
3. Insert the plug into the electrical outlet.



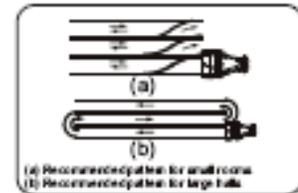
### Recommended Washing Sequence



1. Start the machine by pressing the pedal and pull the handle back.
2. Move forward, while sparingly pulling the liquid discharge control handle. This handle should not be kept pulled all the time. The duration and frequency of pulling and releasing have to be adjusted to match with the type of floor and extent of dirt. For tile or stone floors, apply very little water. The spray pattern of the machine can be adjusted by the user. Adjust the spray to prevent solution being dispensed onto areas that already have been cleaned.



- The spray pattern is adjusted by using the serration in the spray nozzle and holder. Each serration allows a 4-degree change.
3. Stop the liquid discharge approximately 12 inches before the end of the forward motion. Continue to move forward up to the wall without pulling the handle.
  4. Pull the machine backwards in the same track, but without discharging any liquid. When you reach the starting point, change the track and repeat steps 2 to 4. When you are changing the track, allow some overlap with the cleaned area. In case of large halls take a U-turn and move forward. If quick drying is required, move on the same track without discharging the liquid.
  5. Clean the blades.

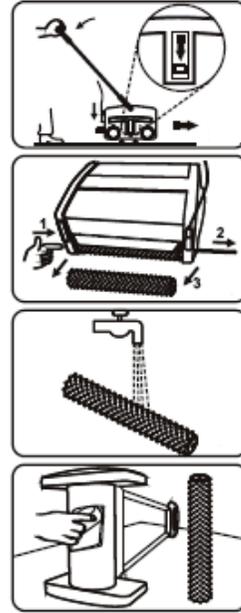


**Warning:** Avoid touching the sharp edges of the recovery tank.

## Cleaning the Machine

**Warning:** Switch off the machine and unplug the electric supply before performing any cleaning operations.

1. Move the Transport/Working Mode control to the BOTTOM (Transport) position to raise the brushes.
2. Unplug the machine and wrap the supply cord around the hooks on the handle.
3. Remove the recovery tank, wash thoroughly and refill.
4. To prevent possible clogging of the liquid drip holes in the solution tank, empty any unused solution from the tank.
5. Remove the brushes by pushing out the brush shafts. Wash the brushes thoroughly in clean water.
6. Lay the machine on its side and wipe clean the rubberized drum and machine body with a damp cloth.
7. Reinstall the brushes after washing. It is easier to push the brush shaft from the right hand side (identified by the electrical cable).
8. Store the machine in a dry indoor area only.



## Maintenance

**Warning:** Before undertaking any maintenance operations or adjustments, switch off the machine and unplug from the electrical supply.

To get the maximum life of the machine, do the following:

- **Supply Cord**  
Regularly inspect sheath, plug and cord anchorage for damage or loose connection.
- **Brushes**  
Wash the brushes regularly. Make sure that the machine is in Transport Mode when not in use. Store additional brushes in a vertical position to avoid bending the bristles. Check for permanent bending of bristles in a particular direction. This may occur if the machine is operated for several days without removing the brushes, which is not recommended. If this occurs, reverse the brush so that the bent bristles are straightened.
- **Wiper Blade**  
If the wiper blade wears out, the water collection performance will decrease. It should be replaced by an authorized service agent.
- **Solution Feed Filter (Pump)**  
The filter should be periodically cleaned. Use pressurized air/water for cleaning.
- **Nozzle Maintenance (Pump)**  
If the spray nozzle is blocked, slide the nozzle cover off and remove the nozzle. Clean it with clean water and use a pin to unclog, then reinstall.

## Accessories

### Transport Trolley

The simply fitted trolley provides ease in movement when transporting the machine.



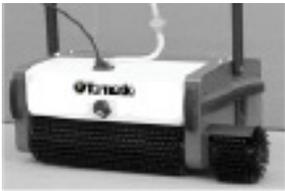
#### Using the Trolley

1. Empty all liquid from the machine.
2. With the machine handle in the upright position place the trolley in the middle alongside the machine.
3. Hold the machine firmly, strap the velcro with the machine to fix the transporter.
4. Make sure that the velcro strap is securely wrapped around the bottom handle.
5. The trolley is ready for use. The machine can be maneuvered easily while holding the top handle.

### Side Brush

The side brush can be used to clean corners near the walls. Switch off and unplug the machine before fitting the side brush.

**Warning:** Do not use side brush in a room with no wall skirting, otherwise, the wall may get dirty.



#### Fitting the Side Brush

1. Remove the front brush and brush shaft.
2. Fix the shield assembly on the side plate
3. Insert the side brush through the shield and main brush.

#### Using the Side Brush

1. Tilt the machine at an angle that will allow the rear brush to collect the dirty water.
2. Use side brush only for washing the edges.

## Technical Specification

<b>Cleaning Width</b>	13.5 Inches
<b>Body Height</b>	8.5 Inches
<b>Handle Height</b>	44 Inches
<b>Width</b>	17.5 Inches
<b>Length</b>	15 Inches
<b>Weight</b>	55 lbs.
<b>Motor Power</b>	1 HP
<b>Brush Speed @ 110V 60Hz</b>	820 RPM
<b>Solution Tank Capacity</b>	1 Gallon
<b>Noise Level</b>	69dB

## Accessories

<b>Item</b>	<b>Part Number</b>
<b>Standard Brush (1 Pair)</b>	33855
<b>Soft Brush (1 Pair)</b>	33856
<b>Hard Brush (1 Pair)</b>	33857
<b>Side Brush</b>	33858
<b>Escalator Brush</b>	33859
<b>Trolley</b>	05-3395-0000

## Brush Selection Guide

<b>Type of Floor</b>	<b>First Time Cleaning</b>	<b>Maintenance Cleaning</b>
Granite, Ceramic, Vinyl	Standard	Standard/Soft
Mosaic	Hard/Standard	Standard/Soft
Marble	Standard	Soft
Smooth Concrete	Hard	Standard
Wood, Rubber	Standard/Soft	Standard/Soft
Carpet	Soft	Soft
Others	To suit individual floor conditions	