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Tornado®

Operations & Maintenance Manual

MODEL NO.
99695 BR 22/14

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Long-term buyer protection warranties

Tornado Standard Warranty Program*

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.

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.

10 Years:
All plastic tanks and rotationally-molded bodies

2 Year:
On all Tornado components
except as shown below

1 Year:
Labor on all Tornado cleaning equipment
except as shown below

1 Year:
Warranty on batteries and chargers, one year, pro-rated
All battery warranties are handled by the battery manufacturer, please call customer service for more information.

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, 2007. 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, PV 6 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, charger, parts, accessories)
3)Warranties on all riding sweepers including the ICC1, KM 100/100 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 inluding the 75/140 & 90/140 are 24 months parts/12 months labor OR 1,000 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 6 months after dealer purchased the unit from Tornado, whichever comes first.

Note: Tornado, The Latest Dirt, Floorkeeper, 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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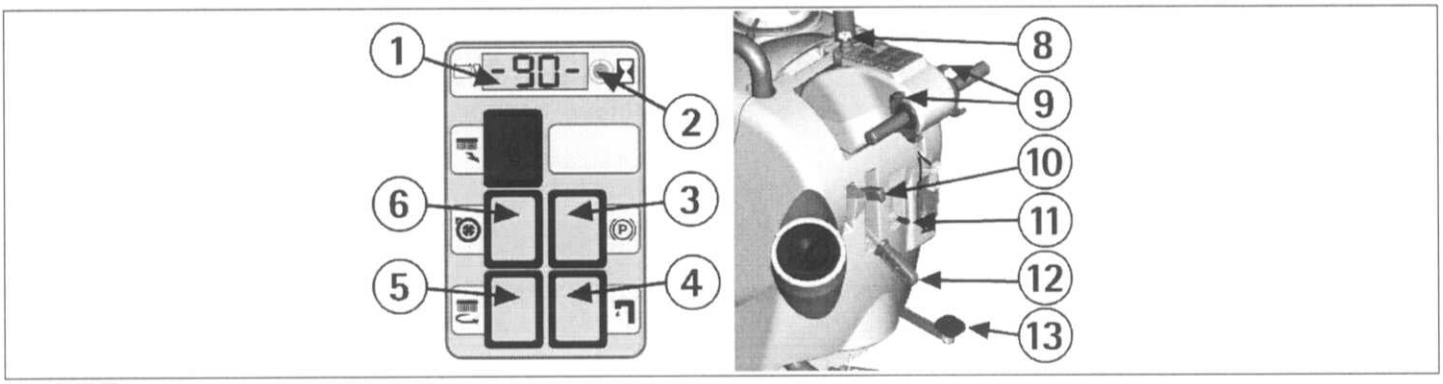
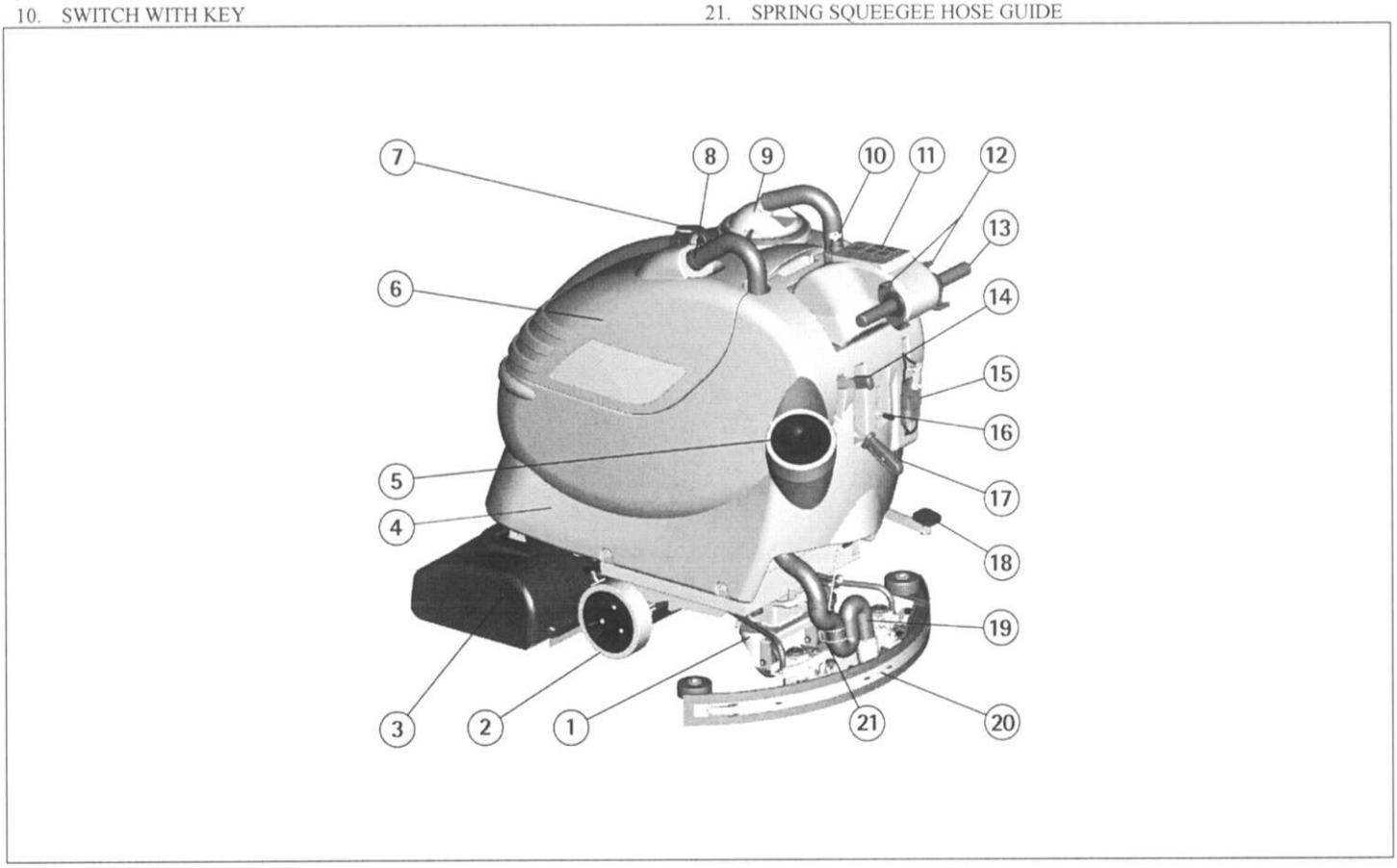
INSTRUMENT BOARD AND CONTROLS

1. DISPLAY CHARGE LEVEL BATTERY/HOUR METER
2. PUSH BUTTON VISUALIZATION HOUR METER (DISPLAY)
3. SIGNAL LAMP BRAKE ON
4. SIGNAL LAMP SOLUTION VALVE OPEN
5. BRUSH MOTOR SWITCH
6. VACUUM MOTOR SWITCH
8. SWITCH WITH KEY
9. BRUSH OPERATION LEVERS
7. PARKING / EMERGENCY BRAKE LEVER
8. SOLUTION VALVE LEVER
9. SQUEEGEE LIFTING LEVER
10. BRUSH BASE GROUP LIFTING PEDAL



MACHINE

1. CASTER WHEELS
2. WHEELS
3. BRUSH BASE GROUP
4. SOLUTION TANK
5. SCREW CAP FOR INLET DETERGENT SOLUTION
6. RECOVERY TANK
7. PLUG EXHAUST HOSE RECOVERY TANK
8. INLET OPENING SQUEEGEE HOSE
9. SUCTION COVER
10. SWITCH WITH KEY
11. INSTRUMENT BOARD
12. BRUSH OPERATION LEVERS
13. HANDLE BARS
14. PARKING / EMERGENCY BRAKE LEVER
15. BATTERY CONNECTOR
16. SOLUTION VALVE LEVER
17. SQUEEGEE LIFTING LEVER
18. BRUSH BASE GROUP LIFTING PEDAL
19. SQUEEGEE HOSE
20. SQUEEGEE ASSEMBLY
21. SPRING SQUEEGEE HOSE GUIDE



PRODUCT SPECIFICATIONS

Model	BR 22/14
Machine Dimensions	
L x W x H	50" x 24" x 42"
Net Weight	223
Solution / Recovery Tank	14/15 gal.
Squeegee Width	33"
Design Characteristics	
Tank Construction	Polythylene
Cleaning System	
Brush Type	Cylindrical
Brush Width	22"
Brush RPM	1300
Brush Pressure	79 lbs.
Cleaning Path	22"
Productivity	
Cleaning Rate (Sq. Ft per Hour)	9740
Motors	
Vacuum Motor	.6 hp
Brush Motor	.6 hp
Traction Motor	N/A
Sound Level	67 dB
Battery	
Voltage	24
Amps	180

INTRODUCTORY COMMENT

Thank you for choosing our machine. This floor cleaning machine is used for industrial and commercial cleaning and is able to clean any type of floor. During its forward movement, the action of the brush and the detergent solution removes the dirt, which is picked up by the suction system, resultin in a dry surface.
The machine must be used only for this purpose. It gives the best performance when it is used correctly and maintained properly.
Therefore, we ask that you read this instruction booklet carefully whenever difficulties arise in the course of the machine's use. If needed, please contact our service department for advice and/or service.

GENERAL RULES

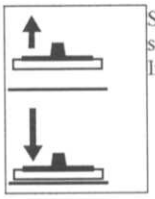
The rules below have to be followed carefully in order to avoid damage to the machine and injuries to the operator.
- Read the labels carefully on the machine. Do not cover them for any reason and replace them immediately if damaged.
- The machine must be used exclusively by authorized staff that has been instructed for its use.
- When using the machine, pay attention to other people, especially children.
- In case of danger, immediately use the emergency brake.
- To park the machine, take off the key and put on the parking brake.
- Do not mix different detergents to avoid harmful odors.
- Do not place any liquid containers onto the machine.
- The storage temperature has to be between -13°F and +131°F.
- The operating temperature should be between 32°F and 104°F.
- The humidity should be between 30 and 95%.
- Do not use the machine in an explosive atmosphere.
- Do not use the machine as a means of transportation.
- Do not use acidic solutions, which could damage the machine and/or injure people.
- Do not use the machine on surfaces covered with inflammable liquids or dusts (for example hydrocarbons, ashes or soot).
- In case of fire, use a powder fire-extinguisher. Do not use water.
- Watch out for shelves and/or scaffoldings, when operating the machine.
- Use the appropriate speed based on floor conditions (type of floor, dirtiness, etc).
- Do not use the machine on areas that have a higher gradient than the one stated on the number plate.
- The machine has to carry out simultaneously the operations of washing and drying. Different operations must be carried out in restricted areas prohibited to non-authorized personnel.
- Signal the areas of moist floors with suitable signs.
- If the machine does not work properly, check by conducting simple maintenance procedures. Otherwise, contact an authorized technical assistant for advice.
- Where parts are required, ask for ORIGINAL spare parts to the distributor or an authorized dealer.
- Use only ORIGINAL brushes.
- When cleaning and performing maintenance operations, disconnect the power supply plug from the machine.
- Do not wash the machine with corrosive material, direct water jets or high water pressure.
- Every 200 working hours, have the machine checked by an authorized service center.
- In order to avoid scales on the solution tank filter, do not fill the detergent solution hours before it is used.
- Before using the machine, check that all panels and coverings are in position as indicated in this use and maintenance catalog.
- Be sure the recovery tank is empty before lifting it.
- Restore all electrical connections after any maintenance operation.
- When your machine has to stop activity, provide the appropriate waste disposal for its materials, especially oils, battery and electronic components. Consider that the machine itself has been constructed by recyclable materials.

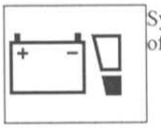
SYMBOLS

Symbol denoting the solution valve.
Indicates the solution valve lever.
Indicates the signal lamp of the solenoid valve functioning.

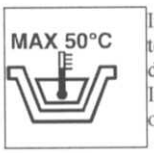
Symbol denoting the brush.
Indicates the switch of the brush motor.

Symbol denoting the vacuum motor.
Indicates the switch of the vacuum motor.


Symbol denoting up – down of the squeegee.
Indicates the squeegee lever.


Symbol denoting the charge level of the batteries.

Symbol denoting the hour meter.

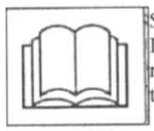


Indication of the maximum temperature of the solution detergent.
It is placed near the charging hole of the solution tank.

Symbol denoting the brake.
Indicates the signal lamp of the brake on.

Symbol denoting the brake.
Indicates the lever of the emergency and parking brake.

Symbol denoting the brush release.
This is not available on this model.


Symbol denoting the open book.
Indicates that the operator has to read the manual before the use of the machine.

Warning symbol.
Read carefully the sections marked with this symbol, for the security of both the operator and the machine.

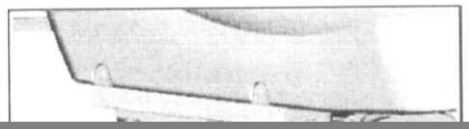
BEFORE USE

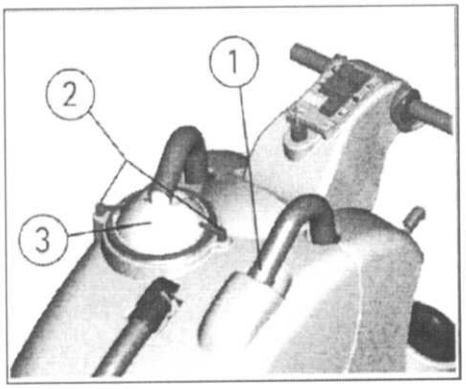
The machine is supplied with suitable packing for forklift truck handling.
The total weight is 269 lbs.
Packing dimensions:
Base: 54 in x 26 in
Height: 47 in

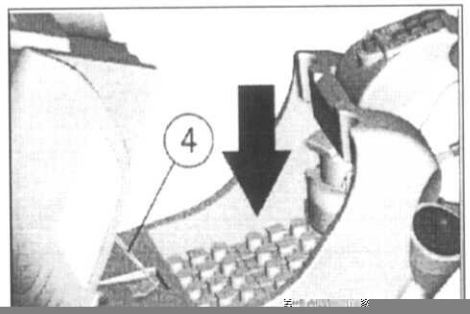
⚠**ATTENTION:**
Do not place more than 2 packings on top of each other.

UNPACKING THE MACHINE

1. Remove the external packing.
2. Unscrew the brackets (1+2) that secure the machine to the pallet.
3. Move the machine backwards, as indicated in the figure, avoiding heavy contacts to mechanical parts.
4. Keep the pallet and the brackets for future transport.

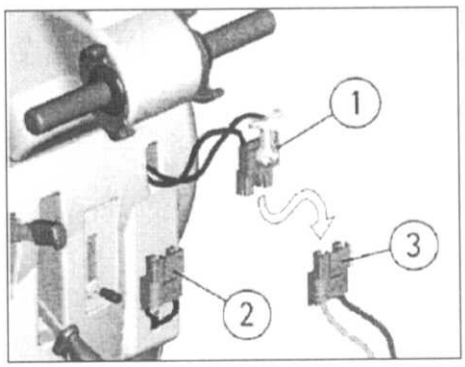




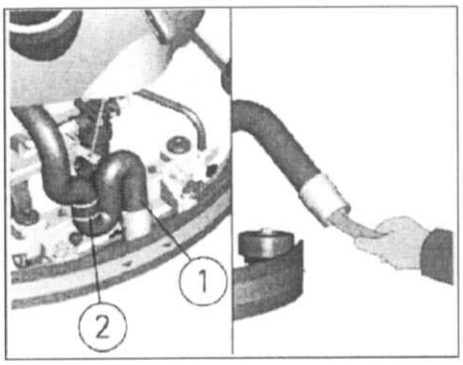


BATTERY RECHARGING

Bring the machine on a levelled surface.
Plug in the battery connector (1), placed in the rear part of the machine, to the connector (3) of the battery charger.



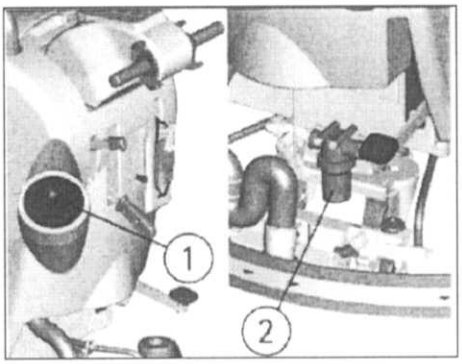
⚠**ATTENTION:**
Never charge a GEL battery with a nonsuitable charger. Strictly follow the instructions supplied by the battery and charger manufacturer.
In order not to cause permanent damage to



CLEANING OF SOLUTION TANK AND FILTER

1. Bring the machine to an appropriate place for draining tanks.
2. Unscrew the solution tank cap (1).
3. Unscrew the exhaust plug (2).
4. Rinse with a water jet the solution tank.
5. Rinse the solution tank filter placed inside the exhaust plug (2).
6. Reassemble all parts.

⚠ **ATTENTION:**
This operation must be carried out using gloves to protect from contact with dangerous solutions.

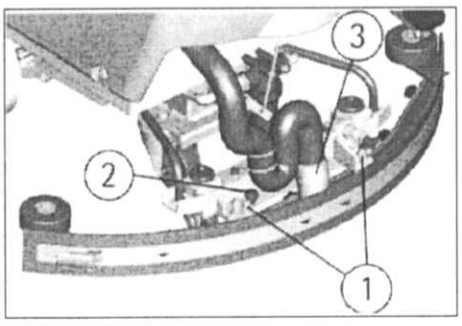


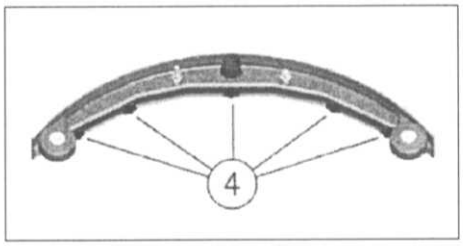
TWO-MONTHLY MAINTENANCE

FRONT SQUEEGEE RUBBER REPLACEMENT

Check the wear of the squeegee rubber.
For replacement, see below:

1. Take off the squeegee hose (3).
2. Disassemble the squeegee from the support by rotating the levers (2) counter-clockwise and by sliding the stud bolts (1) in their slots.
3. Unscrew the wing nuts (4) in the front part of the squeegee.
4. Take off the rubber holder blade.
5. Replace the front rubber.
6. Reassemble all parts.

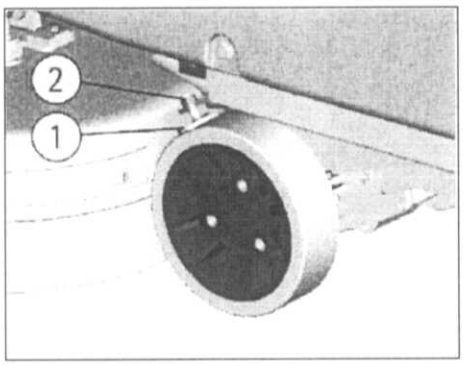




SIX-MONTHLY MAINTENANCE

CHECKING THE BRAKE

Make sure that both pads (1) are no more than .12 in from the wheels. If necessary, adjust them through the fixing nuts (2).

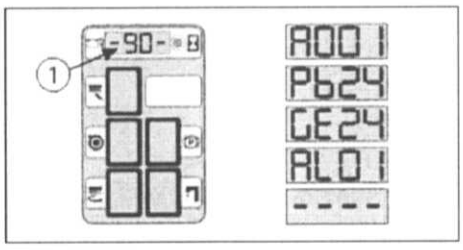


TROUBLESHOOTING GUIDE

All other machine operations are to be checked by an authorized technical assistant.

SIGNALS ON THE DISPLAY

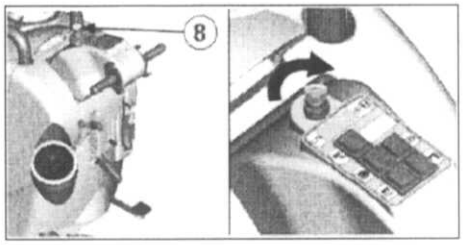
A001: Indication of the version of the electronic check card (the last number indicates the revision of the check card).
Pb24: Indication battery check card set for lead batteries.
GE24: Indication battery check card set for WET batteries.
AL01: Signal indicating absorption of excessive current of the brush motor.
---- (blinking): signal indicating the discharged batteries and intervention of the brushes stop device.

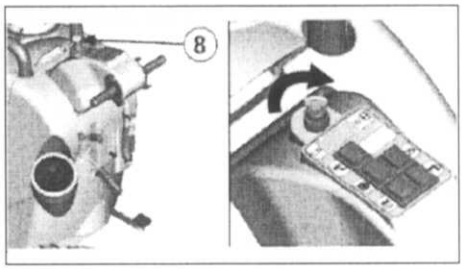


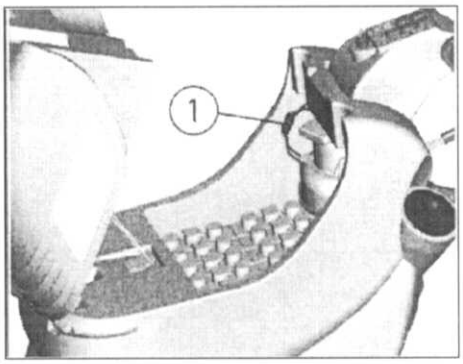
THE VACUUM MOTOR DOES NOT WORK

1. Verify the key switch (8) is in the correct position.
2. Check the charge level of the batteries.
3. Check that the battery connector is correctly plugged in.
4. Verify that the switch (6) is on.
5. Check that the red connector of the vacuum motor (1) is correctly plugged in.

If the problem persists, please contact an authorized technical assistant.



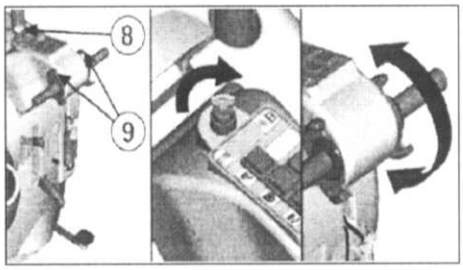


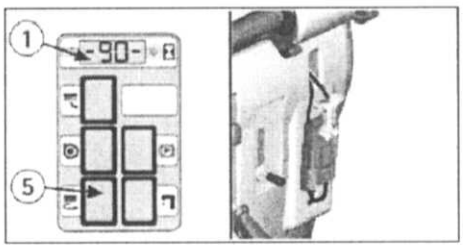


THE BRUSH MOTOR DOES NOT WORK

1. Verify the key switch (8) is in the correct position. Switch off and restart the machine.
2. Check the charge level of the batteries.
3. Check that the battery connector is correctly plugged in.
4. Verify that the switch (5) is on.
5. Rotate the drive control levers (9).
6. Check the display (1) to see that the alarm "AL01" (brushes motor overload alarm) does not appear.

If the problem persists, please contact an authorized technical assistant.

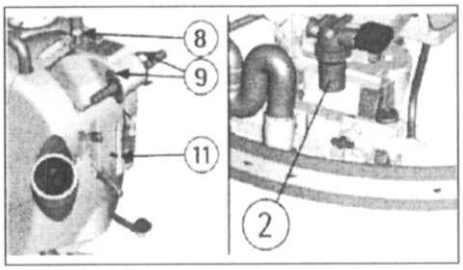




INSUFFICIENT WATER ON THE BRUSHES

1. Check that the solution valve lever (11) is open.

2. Check the level of the liquid in the solution tank.
3. Check that the solution filter (2) is clean.
4. The machine is equipped with solenoid valve, therefore rotate the drive control levers (9).
If the problem persists, please contact an authorized technical assistant.



MACHINE DOES NOT CLEAN PROPERLY
1. The brushes do not have the suitable bristle dimension: contact an authorized technical assistant.
2. The brushes have got worn bristles. Check the brush wear condition and replace them (the brushes have to be replaced when the bristles have reached a height of about .6 in).
To replace brushes, see instructions at paragraph "BRUSH DISASSEMBLY" and "BRUSH ASSEMBLY".
3. The solution detergent is insufficient: open the solution valve more.
4. Check that the liquid detergent is in the recommended percentage.
5. Increase the brush base pressure (see at paragraph "ADJUSTMENT OF BRUSH PRESSURE").
Contact an authorized technical assistant for advice.

SQUEEGEE DOES NOT DRY PROPERLY
1. Check that the squeegee rubbers are clean.
2. Check the height and the inclination of the squeegee. (see section "ADJUSTMENT OF THE SQUEEGEE" in "BEFORE USE").
3. Check that the suction hose is correctly inserted in the proper seat on the recovery tank.
4. Clean the suction filter.
5. Replace the rubbers if worn out.
4. Check that the vacuum motor switch is on.

EXCESSIVE FOAM PRODUCTION
Check that low foam detergent has been used.
Add small quantities of anti foam liquid into the recovery tank.
Please be aware that a bigger quantity of foam is produced when the floor is not dirty. In this case please dilute detergent solution.

PROGRAMMED MAINTENANCE

INTERVENTION	DAILY	20 HOURS *	200 HOURS *	1000 HOURS *
RECOVERY TANK CLEANING	•			
SUCTION FILTER CLEANING	•			
SOLUTION TANK FILTER CLEANING		•		
BRUSH CLEANING	•			
BRUSH DISASSEMBLY	•			
SQUEEGEE CLEANING	•			
FRONT SQUEEGEE RUBBER REPLACEMENT			•	
REAR SQUEEGEE RUBBER REPLACEMENT		•		
CHECK SQUEEGEE ADJUSTMENT		•		
SQUEEGEE HOSE CLEANING		•		
SOLUTION TANK CLEANING		•		
CHECK BATTERIES ELECTROLYTE		•		
CHECKING THE BRAKE				•
BRUSH MOTOR CHECK				•
VACUUM MOTOR CHECK				•
CHECK BRUSH BASE GROUP			•	
SCREW TIGHTENING				•

* The hours refer to the ones indicated on the display (see under paragraph "HOUR METER").

WARRANTY REGISTRATION FORM

Please provide additional information on Tornado equipment: *(Check choices below)*

- ☐ Automatic Scrubbers
- ☐ Propane Floor Machines
- ☐ High Speed Burnishers
- ☐ Carpet Extractors & Spotters
- ☐ Steam Cleaners
- ☐ Ride-on Equipment
- ☐ Sweepers
- ☐ Rotary Floor Machines
- ☐ Carpet Vacuums
- ☐ Wet/Dry Vacs
- ☐ Jumbo Vacs
- ☐ Pressure Washers

See complete product info at www.tornadovac.com

SELLING DEALER: (required)

_____

Please print clearly.

_____
COMPANY/INSTITUTION

_____ _____
CONTACT NAME TITLE

_____ _____
ADDRESS CITY/STATE/ZIP CODE

_____ _____
PHONE FAX

_____ _____
DATE OF PURCHASE EMAIL

See white metal plate or sticker on unit for this information.

MACHINE TYPE/MODEL NUMBER:	MACHINE SERIAL NUMBER:
1.	1.
	2.

Facility Description (please circle all that apply)

1. School
2. Retail Store
3. Restaurant
4. Office Building
5. Contract Cleaning
6. Light Manufacturing
7. Heavy Manufacturing
8. College/University
9. Hospital
10. Nursing Home
11. Religious Institution
12. Airport
13. Warehouse
14. Apartment/Condo
15. Warehouse
16. Supermarket
17. U.S. Govt.
18. Other Govt.
19. Auto Service
20. Shopping Ctr.
21. Non-Profit
22. Other (specify) _____ _____

How did you first learn about Tornado cleaning and maintenance equipment?	In square feet *(meters)*	
	Total Hard Floor Area	Total Carpeted Area Square feet (square meters)
☐ Contacted by local dealer ☐ Previous experience with Tornado products ☐ Reputation/Recommendation ☐ Advertising ☐ Direct mail ☐ Internet ☐ Other _____	☐ 0-10,000 *(0-930)* ☐ 10-50,000 *(930-4,650)* ☐ 50-250,000 *(4,650-23,250)* ☐ Over 250,000 *(over 23,250)*	☐ 0-10,000 *(0-930)* ☐ 10-50,000 *(930-4,650)* ☐ 50-250,000 *(4,650-23,250)* ☐ Over 250,000 *(over 23,250)*

Damage or defect arising from abuse, neglect, or other misuse is excluded from this warranty. Other items may or may not apply based on your specific machine. If any defect occurs, the warranty is voided if service is attempted by non-Authorized Tornado Service Centers.

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Tornado®

Today's Innovative Leader in Cleaning and Maintenance Equipment

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