Tornado®
TECH TALK

Information and Advice from Tornado’s Technical Service Experts
Here you will find our collection of Tech Talk articles, filled with information from our Technical Service experts about a variety topics including equipment maintenance, battery maintenance, workplace safety issues, and much more. If you are a service or maintenance professional, we hope these articles make your job working with Tornado equipment just a little bit easier.
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CARPET CARE

Vacuum Clogged?
Two Easy Steps for a Quick Fix

If your CV 30/38 Vacuum shuts off and will not turn on again for 20-40 minutes, the unit is most likely clogged and the motor’s thermal protection switch has activated. The thermal activation light can be found on the top right of the body of the unit.

The normal operating temperature of the CV 30 is around 150°F. The unit’s motor thermal protection switch is activated at 170-180°F.

Two Simple Steps to Removing a Clog:

1) **Check the filter bag.** If the filter bag is full, it will restrict airflow causing the motor to overheat.

2) **Check all of the hoses.** What often happens is the hose and wand assembly is removed and checked/cleared, but the bottom hose that goes to the brush head is not checked and the unit may still have the same problem. The bottom hose must be removed from the back housing and straightened out. If you can not see the brush roller through the hose, it is clogged. It is best to align the turn locks on the bottom of the unit so you can remove the glide sole. This will allow access to both ends of the hose. In most cases you will find a paper clip or some object that started the blockage. Once all hoses are cleared the unit should be fine and returned to normal service.
**Carpet Care: Defoamer 101**

Defoamer is a concentrated, water-based emulsion formulated to eliminate foam in liquid recovery systems in carpet extractors, as well as foam created from soapy residue in the carpets themselves. Defoamers are usually used in situations where a large amount of detergent residue has built up in the carpet.

When you are extracting carpets and the instruction manual calls for defoamer or you find the carpet is loaded with chemicals from other carpet cleaning methods, it is important to follow the chemical supplier’s recommendation. Be sure to place the correct amount of defoamer into the recovery tank or suck it up through the vacuum hose, whichever they direct. Why? If defoamer is not used in the recovery tank to eliminate foam, the foam from the solution will NOT lift the float up to close off the vacuum system. Instead, it will ride over the float and go straight up to close off the vacuum motor and out the exhaust. If your unit appears to be leaking from the vacuum exhaust, it may not be leaking but actually sucking foam through the vacuum motor due to lack of defoamer.

**Benefits of Defoamer:**

Defoamer can enhance the interim carpet cleaning and restorative extraction process by:

- Protecting the vacuum motor from becoming flooded
- Minimizing dump and refills through the reduction of foam in the recovery tank:
- Enabling interim carpet maintenance such as bonnet cleaning, encapsulation or dry cleaning by reducing soapy residue on carpets.
Is Your Self-contained Extractor Leaving Embarrassing Streaks Behind?

If your self-contained carpet extractor is leaving streaks behind, the problem is likely a clog. To prevent this issue, once per month you need to flush the machine out with a mixture of 8 to 1 water and white vinegar solution. Pour about 2 gallons into the solution tank and run it through the whole system.

If your spray jets do become clogged, use the same water-vinegar solution to rinse them out. NEVER use wires or pins to clean the jets, as this will destroy the spray pattern causing the unit to leave streaks.

If you have problems with the vacuum shoe being plugged up, the back of an old hacksaw blade is a great tool for cleaning the shoe.
When to Change HEPA Filter Cartridges on Your Vacuum?

We are often asked, how often should I change the HEPA filter on my vacuum? The real answer is, it all depends. There are a number of factors that can contribute to how long the HEPA filters last. Items effecting the filter include:

- Frequency of use (daily, weekly, monthly);
- What is being vacuumed up (hair, large items, etc.)

As a general rule of thumb, you should change the HEPA filter on your vacuum every 6 months. You can use Day light saving time as a reminder, as it is the perfect time to change your HEPA cartridge. A clogged HEPA filter cartridge can negatively impact vacuum performance, not to mention indoor air quality. Other than that, you can simply change it when it appears dirty or clogged. Most vacuum dealers sell filters, and some manufacturers sell accessories at list price online on their web site. This helps to ensure consumers have quick and easy access to these important machine accessories, eliminating long wait periods or machine down-time.
Wet Entryways to Clean?

Throughout the summer and fall, entry mats are vacuumed and cleaned efficiently with the use of upright carpet vacuums, which are designed for dry applications. However, as winter arrives, snow and moisture can accumulate on entry mats to create a slushy, damp mess that is hard to clean and vacuum. Vacuuming wet mats with an upright carpet vacuum can create cleaning challenges, not to mention potentially serious equipment maintenance and repair issues that will cost you valuable time and money.

It is important to remember that upright carpet vacuums and backpack vacuums are not designed for wet applications. If you follow these easy tips below, you’ll improve entry-way cleaning during the winter months and ensure the safety of building occupants:

- Be sure to educate your staff on the appropriate use of dry vacuums versus wet-dry vacuums;
- If entry mats are wet and slushy, use a wet-dry vacuum such as the Tornado® Taskforce 10, 15, 17 or 20 Trot-Mop when cleaning;
- Position an air-mover/dryer such as the Windshear™ 3000 or Windshear™ Storm next to building entrances or exits to dry surfaces quickly and prevent slips and falls.
HARD FLOOR CARE

Spring Cleaning: Eliminate Ground-in Dirt or Salt Build-Up on Hard Floors with Double Scrubbing

Springtime is the perfect time to restore hard floors in any school or facility that has gone through tough winter weather conditions.

When removing ground in dirt or salt build-up left over from the winter months with Tornado’s World-Class family of Ride-on cylindrical (BR) and disc (BD) scrubbers, double scrubbing your floors can be a great aid. Double scrubbing is defined as simply applying solution through the machine, scrubbing as you go, but making the first pass without recovering the solution, allowing the chemical more dwell time on the floor. You then make a second pass, scrubbing again as you go, but this time recovering the solution.

To use any Tornado Ride-On Scrubber for this deep, restorative cleaning method, follow these quick and easy steps:

1. Switch to Manual (MAN) mode (versus “Auto” mode which engages both the brushes and vacuum simultaneously);
2. Lower and activate the brushes, but do not lower the squeegee;
3. Make the first pass over the floor with the brushes activated and the squeegee blade raised. This allows the chemical to sit on the floor longer for that extra boost of cleaning power needed to remove salt and ground-in dirt;
4. After completing the first pass, lower the squeegee blade and follow the same path you took initially, using the squeegee to recover the solution, chemical and dirt.
5. The double-scrub method restores heavily soiled commercial floors quickly and efficiently!
To Burnish or Buff?

How are you treating your floors this winter season? With the winter season comes the challenge of keeping your floors looking their best. The chemicals used to keep entryways safe can really do a number on your floors. This becomes even harder if you are using the wrong machine for the job.

High-Speed vs. Low-Speed?

High speed burnishers are used for spray buffing, dry buffing, and burnishing hard floors. These units range from 17 to 28 inches and from 1000 to 2500 RPM. These are the machines that are used to maintain the glossy look on many floors.

Slower speed buffers are normally used for daily polishing, stripping, scrubbing, and sanding wood floors. They can also be used with a bonnet on carpeting, although check to make sure this does not void your carpet warranty first. These units are available in 17 or 20-inch models and run at 175 RPM.
HARD FLOOR CARE

SALT: A Winter Cleaning Challenge

With the help of Tornado’s EZ Floorkeeper, you can clean up winter messes such as salt and snow, and dry floors at the same time to increase building safety and cleanliness. To properly maintain the scrubbing and drying functionality of the EZ Floorkeeper during the winter months, try these quick and easy maintenance tips below:

**Vacuum motor:**
If the vacuum isn’t picking up water, it can mean:

1. That there is a clog or leak in a hose; be sure to check the hose carefully for clogs or tears;
2. The vacuum motor isn’t functioning properly and may need repair or replacement. In this case, contact your Tornado Technical Service Department for additional assistance.

**Hoses:**
To prevent leaks, make sure the hoses are clog-free and in good condition with no rips or tears.

**Squeegee blades:**
Make sure the blades have no nicks or tears and are clean and adjusted correctly. Squeegee blades should bend back between 3/16” and ¼” against the floor, allowing dirty water/solution to pass underneath the front blade, while providing a seal between the two blades before being suctioned back into the recovery tanks.
HARD FLOOR CARE

Spraying Floor Care Problems Away

One goal of a Green Floor Care Program is to minimize the number of floor refinishing cycles. This reduces the amount of chemical, water, and waste necessary for the task. And, one way to do this is to ensure interim maintenance is done on a frequency that allows the floor to maintain the desired appearance, while also preventing damage to the finish.

The first line of defense should always be proper matting at all entrance doors to ensure that dirt, soils, and grit entering the building is kept to a minimum. It is always more costly to deal with it once inside a building, than it is to stop it at the door.

The second line of defense should be regular dust and wet mopping of the floors. Doing so prevents dirt and soils from damaging the finish. Automatic Scrubbers can go a long way in increasing the effectiveness and productivity associated with this element. Once only used for large areas, there are new, modern, compact scrubbers today that can be used in just about any area.

Finally, there are finish restorers, enhancers, and spray buff/restorers that can be used to ensure floors are kept at optimal appearance levels between stripping cycles. These products include solutions that can be added to mop water, the solution tanks of automatic scrubbers, or even in spray bottles for spot treatments.

Summarizing processes that are applicable to a variety of hard-surface floor coverings:

• Ensure proper and adequate matting is in place
• As with all floor care tasks, always place “wet floor” signs around the work area
• Dust mop/vacuum the entire floor area on a regular basis
• Damp mop or auto scrub the entire area and allow to dry
• Use spray buff – restorers or mop on – auto scrubber applied restorers / enhancers to maintain optimal appearance levels
How to Maintain Your Automatic Scrubbers

Spring cleaning means equipment cleaning time. As you go about your spring cleaning tasks don’t forget to take the time to maintain your cleaning equipment, especially your automatic scrubbers. Whether your equipment has been used all winter long or has been tucked away for the season, this is a great time to do preventive maintenance.

If your automatic scrubber has been in use through the winter months and exposed to all the harsh weather and chemicals that go along with the season, you’ll want to follow these simple steps below to keep your equipment in tip-top-shape:

• Clean your automatic scrubber, starting with a general overall cleaning with a mild detergent and plenty of clean water.

• Check your squeegee blades to see if they have been worn out or dry-rotted by the harsh elements that go along with the winter months. Replace squeegee blades if necessary. You can purchase these from your Tornado dealer, or online at www.tornadovac.com.

• Do your disc pads or cylindrical brushes need to be replaced with clean new ones? If your cylindrical brush scrubber was stored with the brushes down, there is a chance they will have flat spots and will not longer clean effectively. To purchase new cylindrical brushes, visit your Tornado dealer or buy them at www.tornadovac.com.

• Have your batteries been holding a good charge? If you have lead acid batteries, check them with a hydrometer. For sealed batteries, use a load test to check them. Replace batteries if necessary.

• Remember that preventive maintenance checks allow you to catch the little things before they turn into major problems and will ensure the longevity of your cleaning equipment.
How to Avoid Common Pitfalls When Stripping Floors

If you strip floors in your facility on a regular basis, you are probably familiar with common pitfalls that can occur during this process. The technical tips listed below are designed to help you avoid common equipment challenges when using a wet-dry vacuum:

**Technical Tips:**

1. When using a wet-dry vacuum to recover stripper from floors, be sure to clean stripper from the wet-dry solution tank thoroughly, making sure that no stripper remains;
2. Wash the float and float cage well after use, making sure the float moves freely before operating again;
3. Note that it is also important to make sure the float is installed correctly after changing a vacuum motor. Remember that the open end always goes down.

Warning: if you do not clean the float cage well, you run the risk burning up the vacuum motor due to the float being stuck to the bottom of the cage, allowing water to breach the vacuum motor.

**Stripping Floors 101:**

- Lay stripper with a mop;
- Agitate the floor stripper with a floor machine;
- Recover stripper with a wet-dry vacuum;
- Let the floor dry thoroughly;
- Apply wax;
- Buff the waxed floors with a high-speed or automatic scrubber.
HARD FLOOR CARE

Getting the Most Out of Your Manual Sweeper

There are cleaning tips that can apply to just about every type of cleaning tool and equipment as well as every type of cleaning task ... even using a manual sweeper such as Tornado’s new SWM 31/9 sweeper.

The SWM is designed to clean as much as 28,000 square feet in an hour. The machine eliminates the need for brooms and, in those locations such as industrial sites that used to be cleaned by hosing down floor surfaces, it can save literally thousands of gallons of water. But it has to be used properly. Here are some suggestions on getting the most out of a manual sweeper:

• Read the operator’s manual: Believe it or not, not all sweepers are the same; some will have functions or features not found on other machines. A few minutes reviewing the operator’s manual can make this cleaning task faster, safer, and more effective.

• Clear the area to be cleaned first: Instead of stopping to pick up chairs, tables, and other objects on the floor on an as-you-clean basis, pick everything up in the specific area to be cleaned before you start. This can reduce time and improve worker productivity significantly.

• Empty the collection container before it needs it: Although the performance of the machine will not necessarily decrease as the machine’s collection area fills, as can happen with some vacuum cleaners, it is still a good policy to empty it before it gets too full. This can help keep the machine light and easier to use and maneuver and makes emptying the container less physically taxing.

• Avoid moisture: In most cases, manually powered sweepers are designed to be used in dry areas. It will likely not damage the sweeper should it collect moisture from the area being cleaned; however, it may impair its performance. The brushes are typically designed to help collect dry soils, dirt, and dust. If they get wet, these contaminants may collect on the brushes, impeding their ability to collect and remove them.

• Sweep often: Using a manual sweeper can be one of the quickest and most effective ways to clean hard surface areas, inside and out. However, the more often an area is cleaned, the faster the task can be completed and the better the performance of the machine. It’s like just about any other cleaning task: If it has not been performed recently or regularly, it can take considerably more time to clean the area effectively. Repetition and frequency in cleaning typically means the job gets easier and surfaces stay cleaner over time.
Preventative Maintenance vs. Corrective Maintenance

We have all heard the old adage that an ounce of prevention is worth a pound of cure and the same applies to the Tornado line up of maintenance equipment. A sound preventive maintenance program will catch the small items before they become major repair issues, saving your organization time and money.

Be sure to follow these easy steps to help ensure a long life-cycle for your floor machine, burnisher or automatic scrubber:

- Perform daily/weekly checks as specified in your User & Operations Manual;
- Execute monthly, quarterly, and even annual checks and schedule service for all of your units to keep them operating smoothly;
- Check all cables -- battery or power -- for good continuity;
- Check water-level and/or charge batteries following the manufacturer’s recommendations.
- Check all spinning parts—brushes, disc pads, wheels, gears, etc.—for lubrication, if required;
- Check all moving parts to ensure proper alignment.
SAFETY & MAINTENANCE

Benefits of Preventative Maintenance vs. Corrective Maintenance

If you are budget-conscious, like most facility managers today, it is easier and more cost-effective to keep up with a proactive, Preventative Maintenance (PM) program when it comes to maintaining your cleaning equipment. If you wait until your machine is no longer working and requires Corrective Maintenance (CM), you are not only increasing cleaning costs, you are reducing productivity due to equipment down-time. For example, it is far easier to replace a torn squeegee blade on an automatic scrubber than it is to continually add weight to the squeegee assembly to achieve effective solution-recovery. This “band-aid” approach can end up causing irreparable damage to your scrubber, costing thousands of dollars to repair.

Other common examples of PM include when using battery-powered equipment, you must perform daily, weekly and monthly maintenance to keep batteries running properly. When vacuuming, you must change your paper collection filter bags regularly depending upon usage, and the HEPA post-motor filter cartridges should be changed bi-annually.

If you follow this advice and execute proactive, preventative maintenance recommended in your Tornado® User & Operations Manual, you’ll find that a PM program beats the hassles of corrective maintenance every time! Benefits include:

- Cleaning machines will continue to run smoothly and boost cleaning productivity;
- In-house cleaning staff, once trained, can perform PM on machines independently;
- Minimize the need for expensive Service Center repair bills;
- Adhere to your cleaning budget, avoiding unexpected expenses.

Please note that if you encounter maintenance issues more severe in nature, always be sure to contact your nearest Tornado service center or Tornado authorized dealer. Failure to observe this voids the warranty on your equipment and any rights to claims under the terms of guarantee in respect of resulting damage or consequential damage.
Safety on the job is just good business. Employees that feel safe and secure at work, result in increased productivity and profitability for your organization. Facility Maintenance and Technical Service professionals encounter health and safety risks on-the-job each and every day, and should consider exercising these basic electrical, battery and wet-floor safety tips to minimize safety risks and reduce work-related injury:

**Electrical Safety:**
- Ensure all cords are equipped with Ground plugs
- Ensure Extension cords are properly rated for the application
- Use yellow extension cords and equipment for high visibility
- Never tape a damaged cord—always replace it
- Use separate circuits to prevent overloading
- Never use dry vacuums for wet applications

**Wet Battery Safety:**
- Always Wear approved safety glasses and gloves
- Store batteries in a well ventilated room
- Only add water after full charge, and if plates are exposed, add water to cover plates then charge
- Dispose of wet batteries properly and according to manufacturer/dealer recommendations

**Wet Floors:**
- Reduce slip and fall accidents by barricading and posting areas with wet floors
- Use extension cords only as needed
- Use blowers or air-movers to dry spaces quickly
Caring for Automatic Scrubber Batteries

Does it seem like your scrubber is not running as long as it used to? There is a high probability that the problem is the batteries. To get the maximum life out of your batteries, they need to be maintained properly. One of the worst things that can happen to a battery is for it to be discharged too far. To protect against this, almost all of Tornado’s battery powered units have an electronic low-battery cut-out that prevents this from happening. Basic and routine battery maintenance should include the following:

• Check the water level, if applicable.
• Check cables and connectors for cleanliness and to make sure they are tight.
• Sealed batteries are commonly called maintenance-free batteries, and as far as the battery is concerned, it is maintenance free. However, you still need to maintain the connections and cables.
• Never leave deep-cycle batteries in a unit that will not be used for extended periods of time, without placing them on charge occasionally. All batteries will self-discharge over time and it is important to keep them maintained.
• Keep your batteries and battery operated equipment away from heat sources while storing them. High heat kills batteries.
• And, remember to always wear safety glasses when servicing batteries.

When it comes to deep-cycle batteries, the best advice is to remember that keeping them in top condition will save you big dollars in the long run!
Batteries 101

Looking for a way to save energy and improve worker safety when using commercial floor care equipment? You may want to consider the benefits of using battery-powered equipment next time you clean your floors, and here’s why.

Using a battery as a power-source can:

- Eliminate the danger of trips and falls since a power cord is replaced by a battery
- Reduce battery maintenance and watering when you use Absorbed Glass Mat (AGM) batteries, or new lithium-iron batteries.
- Minimize the risk of exposure to exhaust fumes generated by propane powered floor machines
- Reduce indoor air pollution
- Decrease indoor noise pollution
- Reduce the hazard of worker exposure to lead-acid and sulfuric-acid
- Earn LEED points for the use of cleaning equipment that reduces environmental impact

Three Main Battery Types to consider for cleaning equipment:

- Traditional flooded lead acid batteries – oldest and cost the least
- Absorbed Glass Mat (AGM) batteries – fully-sealed so the acid doesn’t move around, creating the safest battery option available. Many federal and state municipalities require the use of AGM batteries today.
- Lithium-iron batteries - fully sealed and maintenance-free, newest and most expensive.

Understanding Battery Technology

Did you know that all of Tornado’s battery powered, automatic scrubbers have a sealed, low-maintenance battery option available to you? These advanced technology batteries not only meet LEED EB Standards, but will save your customer time and money in the long term. Educate yourself on the differences between batteries used in the cleaning industry today by clicking on the link below for information and training on Battery Technology and how eco-batteries can benefit your facility cleanliness and health, cleaning professionals, building occupants and reduce your facility maintenance budget long-term!
STARTING BATTERIES VS. DEEP CYCLE BATTERIES?

Today, every cleaning professional must get more done with a tight cleaning budget. In an attempt to save money, some cleaning professionals have experimented with batteries, substituting a starting battery as replacement for a deep-cycle battery which is traditionally used for floor care applications. Scrimping on batteries for your floor machines or automatic scrubbers can backfire, negatively affecting your cleaning budget as well as your cleaning productivity. To help you avoid this common pitfall, let's start with the basic definitions and identify the pros and cons below:

Starting Battery:
(SLI, starting, lighting, ignition) batteries are commonly used to start and run engines. Engine starters need a very large starting current for a very short time. Starting batteries have a large number of thin plates for maximum surface area. The plates are composed of a Lead “sponge”, similar in appearance to a very fine foam sponge. This gives a very large surface area, but if deep cycled, this sponge will quickly be consumed and fall to the bottom of the cells. Automotive batteries will generally fail after 30-150 deep cycles if deep cycled, while they may last for thousands of cycles in normal starting use (2-5% discharge) in automobiles, as an example. The battery information tag on these type of batteries will most often list the capacity as CCA, or Cold Cranking Amps.

Pros:
- Initial cost.

Cons:
- Shorter run time reducing cleaning productivity; Reduced battery life; Increased cost due to constant battery replacement.

Deep Cycle Battery:
Batteries are designed to be discharged down as much as 80% time after time, and have much thicker plates which deliver longer run-times and battery longevity. Deep cycle batteries are ideal for floor care applications, due to the long run time required to clean large rooms. The major difference between a true deep cycle battery and others is that the plates are SOLID Lead plates - not sponge. This gives less surface area, thus less “instant” power like starting batteries need. Although these can be cycled down to 20% charge, the best lifespan vs. cost method is to keep the average cycle at about 50% discharge. Deep cycle batteries are available as traditional wet, lead acid, AGM, or EV Traction type batteries. The battery information tags on these types of batteries will most often list capacity as Ah, or Amp hours.

Pros:
- Longer run times; Increased equipment productivity; Eco-friendly options available; AGM batteries are maintenance free.

Cons:
- Initial cost.