



## **Operation & Instruction Manual**

**PowerLift 4560 Ultrasonic Cleaning System  
500 Lbs. Lift-Table  
3 phase/240 VAC/ 30 Amp**



**Read all instructions thoroughly before operating this equipment**

## **INTRODUCTION**

Congratulations! You have purchased an Omegasonics Ultrasonic Parts Washer. The Omegasonics Parts Washer provides increased cleaning power and reliability versus competitive brands. The units are skirted with a powder coated steel frame for greater durability and chemical resistance.

## **CONFIGURATION AND TANK VOLUME**

The Power Lift 4560, Model OMG4560PL tank dimensions are 38+length x 32+width x 21+working depth to the top of the weir. The tank has a 4.75+weir width. This tank has an overall 125 gallon volume with a working volume of approximately 112 gallons. Use this volume for calculating the amount of detergent you will use.

## **ULTRASONIC CLEANING PROCESS**

When ultrasonic energy is introduced into a cleaning solution, cavitation, the foundation of ultrasonic cleaning occurs. Ultrasonic energy causes alternating patterns of low and high pressure phases, which form microscopic vacuum bubbles. During the subsequent high pressure phases, the bubbles implode violently. This is called cavitation.

Cavitation provides an intense scrubbing action that leads to unsurpassed cleaning speed and consistency when compared with simple soaking or immersion with agitation. Additionally, the bubbles are small enough to penetrate even microscopic crevices, cleaning them thoroughly and consistently. As a result, ultrasonic cleaning is one of the most highly effective and efficient methods you can use for cleaning a wide array of parts.

Omegasonics provides a complete line of quality ultrasonic cleaning washers developed for industries that have historically used obsolete technology and environmentally unsafe cleaning solvents. We provide state-of-the-art, labor saving, fast, efficient and environmentally safe cleaning alternative.

## **UNDERSTANDING THE ULTRASONIC CLEANING PROCESS**

To establish an ultrasonic cleaning process or improve your ultrasonic cleaning, consider the following:

There are several aspects of ultrasonic cleaning that should be reviewed in order to get the most efficient and cost effective ultrasonic cleaning. Understanding all of these aspects together will make your ultrasonic cleaning system operate at maximum efficiency.

### **Chemistry**

The most overlooked and an important thing to remember is the need for a surfactant or wetting agents to be part of the chemistry. Surfactants lower the surface tension of the water and allow for improved acoustical coupling.

## **Frequency**

The output frequency of the ultrasonic cleaning system has to be correct for the application. The most common frequency today for the majority of applications is 40 kHz. More than 98% of ultrasonic cleaning application should be done with a 40 kHz ultrasonic cleaning system. There are a few occasions where higher frequencies should be used because of the sensitivity of the items to be cleaned. This system also incorporates sweep technology. The sweep ensures a more uniform cleaning throughout the liquid volume.

## **Power**

Most ultrasonic cleaning applications require a minimum of about 40 watts per gallon (peak power). If you use anything less than this, you may not achieve the desired results.

## **Time**

You can just do a quick dip for most ultrasonic cleaning applications. A place to start your cleaning time test is usually about five (5) minutes. You can add additional time or decrease the time after a few experiments to understand how tenacious the contamination is on your items to be cleaned.

## **Temperature**

The temperature for ultrasonic cleaning applications will vary. Optimal ultrasonic cleaning temperature for most applications is between 120°F and 160° F.

## **Tank loading**

Be careful not to overload the system and or the baskets. Many times you can achieve better cleaning by cleaning two smaller loads rather than cleaning one large load. Don't use a basket any heavier than is required to support the items to be cleaned. Baskets should be made from round stock (rod) whenever possible, rather than flat stock that would reflect the ultrasonic energy.

## **Flow**

In many applications the use of a pump and filter system will extend the useful life of the cleaning chemistry. The pump / filter system helps flow away the contamination that is loosened by the ultrasonic cleaning action. The overflow weir provides for the removal of contamination that floats and this will minimize the re-depositing of contamination on the items being cleaned.

Rinsing may be necessary to remove the detergent and or residual contamination that is loosened by the ultrasonic cleaning action.

## WARNINGS

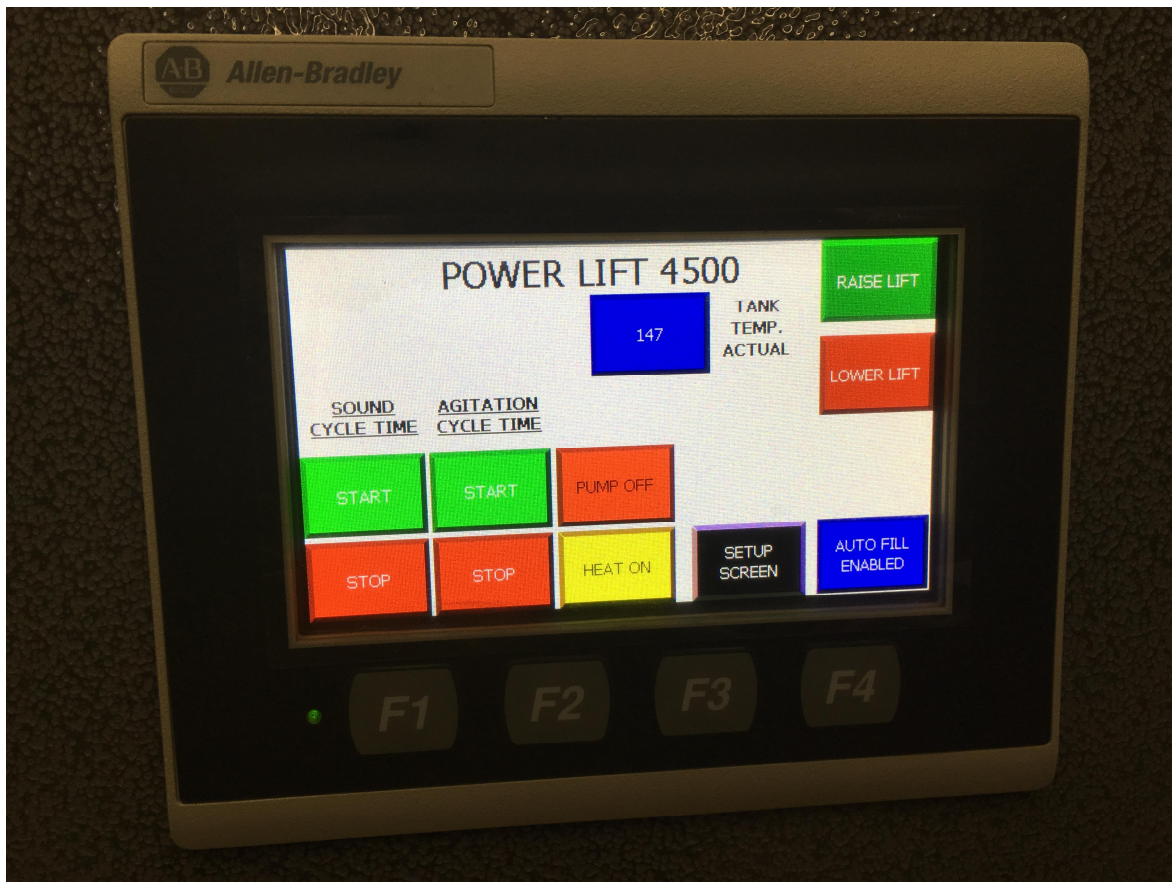
Failure to read these warnings may cause the unit to fail.

Failure to read these warnings may cause personal injury or property damage.

- **Equipment should only be operated on a three phase, 208 - 240VAC, 30 Amp grounded electrical system.**
- **Facility engineering will be required to hard wire the equipment electrical wiring to the proper power source.**
- Never operate the unit (heat, ultrasound or pump) without the appropriate liquid level in the tank.
- Never energize the machine power until the unit has been filled with the appropriate level of water.
- **Keep all hands, fingers and other body parts away from the lip of the lid near any of the noted lid pinch points to avoid accidental personal injury.**
- Never use flammable liquids or solvents in the unit.
- Maintain a minimum liquid level in the main tank to the height of the weir.
- Maintain at least a 2/3 volume of water in the weir for proper operation of the pump.
- Minimum water level in the tank must be to the height of the low liquid level sensor for the SONICS, HEAT or PUMP circuits to be operational.
- Keep lid closed to maximize heating insulation efficiency.
- Due to the heated liquid in the tank, use racks, baskets, tongs or wires to insert or remove parts from the tank.
- Do not operate the unit with wet hands.
- Use only biodegradable cleaning agents. Never use solvents or flammable cleaning solvents.
- Do not rest parts to be cleaned directly on the immersible transducer pack. Severe transducer erosion will occur.
- Do not open the internal circuitry of the equipment, disassemble any part or parts, or move or remove any components or electrical devices.
- Never attempt to perform maintenance on the equipment when the unit is energized.
- Never attempt to perform maintenance on the unit when the cleaning solution is hot.
- Disconnect the power source when moving the unit to a new location.
- Avoid splashing water outside the tank.

## EQUIPMENT SET-UP

- Locate the machine on a level surface.
- Be sure the drain valves are completely closed before filling the machine.
- Connect facility air pressure to the lift-table. 50 psi is the minimum requirement.
- Energize the machine.
- The Custom Power Lift 4560 tank utilizes 4,500 Watts of heat, three heat blankets at 900 Watts each and three heat blankets at 600 Watts each. The time required to heat the machine initially will vary between four (4) and five (5) hours. The unit heats water at approximately 20°F per hour. After the initial heating period, the temperature will remain constant with moderate electrical draw. It is important that the lid remain closed when not in use to minimize heat loss and evaporation.



**Power Lift 4560 Touchscreen Control Panel – START SCREEN**



## SET-UP

- Pull and turn the **E-STOP** clockwise-CW to energize the machine.
- The AUTO-FILL button is Enabled (shown as a blue button) on the START SCREEN and will fill until the main tank is completely full to the level of the overflow weir and the weir tank level sensor is activated. The AUTO-FILL level sensor is located 18+ from the bottom of the weir tank.
- Manually lift the lid open. The lid comes equipped with gas assist hinges.
- Manually fill the tank with the proper ratio of soap.
- Using hot water will shorten the amount of time required to heat the water. Check drain assembly to insure there is no leakage.
- To set Temperature Set Point, Sonic Cycle Time and Agitation Cycle Time, Press **SETUP SCREEN**



- Setting **Temperature Set Point**
  - Press the Blue box - **TANK TEMP. SETPOINT**
  - A numeric screen will display
  - Input the desired set point by pressing the appropriate numbers.
  - Press ← to enter the selected set point into memory. The maximum temperature that can be set is 165°F.

- Setting **Sonic Cycle Time**
  - Press the Blue box . **SOUND CYCLE TIME.**
  - A numeric screen will display to the right.
  - Input the desired time cycle (increments in minutes only) by pressing the appropriate numbers.
  - Press ← to enter the selected set point into memory. The maximum time that can be entered is 600 minutes.
- Setting **Agitation Cycle Time**
  - Press Blue box - **AGITATION CYCLE TIME.**
  - A numeric screen will display to the right.
  - Input the desired time cycle (increments in minutes only) by pressing the appropriate numbers.
  - Press ← to enter the selected set point into memory. The maximum time that can be entered is 600 minutes.
- If **SOUND** is turned OFF (Green . displayed as SOUND ON), Ultrasound cannot be started in the **START SCREEN**. This button must be Red and the display must read SOUND OFF.
- The same condition exists for the **AGITATION** command.

- Setting **Time Clock**
- Press **HEAT TIME CLOCK**
- The days of the week will display as follows:  
**MONDAY TUESDAY WEDNESDAY THURSDAY FRIDAY SATURDAY SUNDAY**  
**OFF OFF OFF OFF OFF OFF OFF**
- Red day button indicates that day is inactive and is displayed as OFF.
- Green day button indicates that day is active. And is displayed as ON.
- **NOTE: Upon initial power up of the unit, any time after a power outage or any time after the E-STOP is depressed, the days of the week will automatically cycle to the OFF position and must be reset to the ON position.**
- Press **HEAT START TIME**
  - A numeric screen will display to the right.
  - Input the desired start time (increments in hours and minutes) by pressing the appropriate numbers 1 - 24.
  - Time Clock is based on a 24 hour military time clock.



- Press **HEAT OFF TIME**
  - A numeric screen will display to the right.
  - Input the desired start time (increments in hours and minutes) by pressing the appropriate numbers 1 - 24.
- Factory Preset Start time is 05:00. Stop time 19:00
- **TANK TEMP. CALIBRATION** is factory set at 8 and should not be changed.



## MACHINE OPERATION

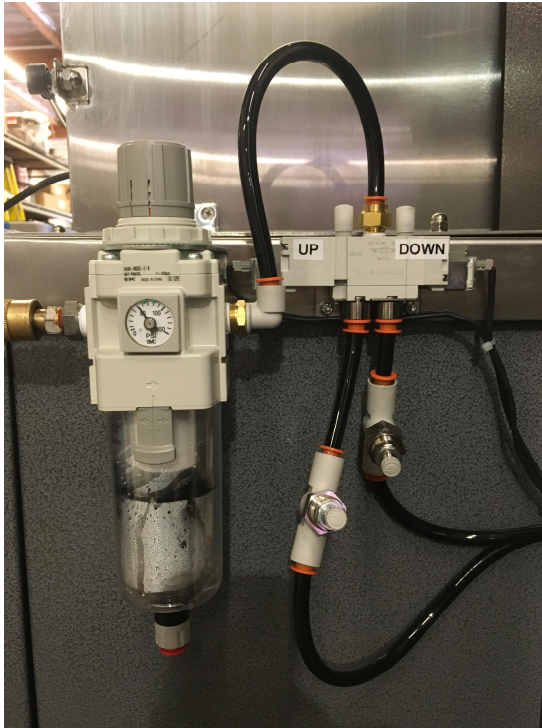
- Press **START SCREEN** if not currently in that mode.
- Display will be as shown on page 5.
- The color shown indicates to the operator which action will be taken by pushing the selected button.

**Pressing Green or Yellow function buttons indicates that this function is currently disengaged and will be engaged when pressed.**

- Pressing Red function button indicates that this function is currently active and will be deactivated when pressed.
- To activate the heat, press the Yellow **HEAT ON** button. This button will change states to Red and will display **HEAT OFF**.
- The temperature controller is factory preset for 150° F. To change the preset, follow the instructions found on page 6.
- Actual bath temperature will display in the blue box - **TANK TEMP. ACTUAL**.
- To activate the ultrasound, press the Lime Green **SOUND CYCLE TIME** button. The button color will change to a darker Forest Green color and the cycle will begin based on the programmed cycle time.
- Operate the ultrasound for fifteen (15) minutes after the tank has been initially filled and heated. This process is called degassing and helps eliminate any air from the water in the tank.
- To deactivate the ultrasound before the timer has completed its cycle, press the Red **SOUND CYCLE TIME - STOP** button. The Red button will illuminate brighter and the cycle will cease.
- The Sound Cycle Time is factory preset for 15:00 minutes.
- To activate the agitation, press the Lime Green **AGITATION CYCLE TIME** button. The button color will change to a darker Forest Green color and the cycle will begin based on the programmed cycle time.
- To deactivate the agitation before the timer has completed its cycle, press the Red **AGITATION CYCLE TIME - STOP** button. The Red button will illuminate brighter and the cycle will cease.
- If the Agitation Cycle is stopped before the cycle time has expired and in any position but the complete lower position, the lift will lower to the complete lower position.
- The Agitation Cycle Time is factory preset for 05:00 minutes.
- To activate the filtration system, press the Green **PUMP ON** button. This button will change states to Red and will display **PUMP OFF**.
- You are now ready to begin the cleaning process.
- Manually open the lid to the full open upright position.
- Press and hold the Green **RAISE LIFT** button until the lift reaches the height of the tank lip. The lift will not rise above this lip elevation.
- Load parts onto the lift platform.
- Press and hold the Red **LOWER LIFT** button until the lift reaches the bottom of the tank. The lift platform will lower to the tank bottom just above the immersible transducer packs.
- Manually close the lid. Lid should not be closed until the lift has been lowered to the bottom of the tank to ensure the parts being cleaned do not hit the inside of the lid.

- The heat circuit, agitation circuit and ultrasound can all be operated simultaneously.
- The heat circuit and pump filtration circuit can be operated simultaneously.
- The ultrasound and pump filtration circuits are electrically interlocked and the filtration system will not operate during the ultrasonic cleaning process.
- If a low liquid level condition arises, a Red LOW TANK LEVEL flag will appear on the main START Screen to the left of the Tank Temperature indicator. The low level sensor protects the ultrasound, heat and pump agitation circuits.

## LIFT-TABLE PNEUMATIC ADJUSTMENTS



- To adjust air pressure to the machine you will pull the grey knob on the left hand side up and turning it clockwise-CW will increase the air pressure, it should be set to no less than 50PSI. Once set you will push the knob down to lock in place.
- To adjust the lift speed in the raising operation, turning the white valve adjustment on the UP valve counter clockwise . CCW will increase the flow of air through the valve and make the lifting action faster. Clockwise-CW will inversely cause the lift to raise more slowly.
- To adjust the lift speed in the lowering operation, turning the white valve adjustment on the DOWN valve counter clockwise . CCW will increase the flow of air through the valve and make the lowering action faster. Clockwise-CW will inversely cause the lift to lower more slowly.
- **NOTE: The valves are factory adjusted and should not be altered.**

## **CLEANING PROCEDURES - GENERAL**

- Arrange parts to be cleaned so they are not touching the bottom of the tank. Use racks, baskets or tongs to insert and remove parts from the tank. The volume of parts to be cleaned should not exceed thirty percent (30%) of the total tank volume.
- Parts should be arranged so as not to stack the parts too densely and operate the ultrasound for the necessary period of time. The amount of time required is dependent upon the density of the parts being cleaned, the type and amount of thickness of the oil, grease, dirt or carbon being removed. Customer experimentation is necessary for most applications, though it is best to use three (3) minute testing increments.
- Lower the parts to be cleaned into the tank.
- Activate the ultrasound.
- Cleaning times will vary depending on the temperature of the solution, the number of parts to be cleaned, the amount of contamination and the amount and type of cleaning agent used. Generally, small parts should be cleaned with the ultrasound operating for three (3) to five (5) minutes.
- Parts being cleaned do not require continuous supervision or labor intensive cleaning. Parts should however be inspected during the cleaning process.
- Visually inspect each part for desired decontamination after the parts have dried completely. If parts must be handled, wear gloves when touching surfaces to protect against heated parts.

## **CLEANING TIMES**

- Most parts can be cleaned within minutes. Cleaning times will vary depending on the condition of the parts being cleaned, the level of heat in the tank and the cleaning agent used. Aluminum parts will clean faster than other metal parts. Never leave aluminum parts in the ultrasonic bath longer than five (5) minutes without inspection.
- It is not necessary to move the parts by hand or in the basket when cleaning.
- Keep the bath free of oils, grease and any foreign materials.
- Skim off oil and grease residue periodically if necessary.
- Cleaning agents should be changed periodically depending on usage.
- When discharging bath and waste, follow all environmental and regulatory requirements. A reputable and licensed waste transportation firm should perform removal of all waste materials.
- Omegasonics is not liable for improper handling of waste materials.

## **WATER QUALITY**

The quality of the customer's water source can have an important effect on the performance of the ultrasonic equipment. This can be due to high levels of calcium, magnesium, sulfur and other contaminants in the water source that can have a negative effect on the type of cleaning soap used. High levels of calcium and/or magnesium (constitutes hard water) can cause the soap to work less efficiently and less effectively as intended.

## CLEANING AGENTS

Omegasonics carries a full line of cleaning agents. Each cleaning agent has a unique cleaning specialty and use. Some of the products are as follows.

- **OmegaClean** . General to heavy-duty degreaser which will remove carbon, oil, grease and dirt from a variety of metals and will not harm aluminum finishes. Especially formulated for the aerospace industry as well as for automotive applications. Has built in conditioners for hard water (high calcium and magnesium content) sources and good quality rust inhibitors.
- **OmegaBrite** . Heavy-duty degreaser removes carbon, oil, dirt, grease and dirt from a variety of metals. It is excellent for cleaning and brightening ferrous and nonferrous metals. Product may cause aluminum to scar if left in contact with aluminum part for an extended period of time. Should not be used with copper or copper alloy substrates. Product contains a short-term flash rust inhibitor.
- **OmegaZyme** . Ideal for industrial applications cleaning oil and grease from aluminum, stainless steel and titanium parts. Does not remove carbon. Will cause cast iron and cold rolled steel parts to rust if not used in conjunction with silicate, nitrate or trisodium phosphate rust inhibitors or with another cleaning agent containing rust inhibitors.
- **OmegaCitriSurf 2250**. Designed for industrial and aerospace applications where stainless steel passivation (the removing of free iron from the surface) is required. Also useful in removing calcium deposits from a variety of metals including brass and steel.
- **Omega DeScaler** - A unique product formulated to remove rust, corrosion, heat scale and mineral deposits from a variety of metals. Excellent when used in an ultrasonic tank to remove rust from metal components exposed to extreme moisture and water. Effectively used to remove mineral deposits from heat exchangers
- **Omega Mold Release** - A high pH concentrated cleaning agent used successfully to remove burnt-on crystalline rubber, plastic and food from molds, dies and other metal surfaces
- **OmegaBlue** - Designed to remove ink and ink residue from metal and rubber components including Anilox rollers.

The above products are concentrates. These products are formulated for use at a 10:1 ratio. Ten parts water versus one part cleaning detergent.

## OPERATING HINTS

- Starting with hot water will allow the unit to reach optimum operating temperature quicker.
- Do not use de-ionized water if possible in the unit. DI water will accelerate cavitation erosion in the tank.
- Never place items to be cleaned directly on the immersible transducers items to be cleaned should be suspended at least ½" above the tank bottom or on the supplied tank platform rack.
- Never allow the unit to operate without liquid. This will cause the unit to fail.
- Keep the cover closed to heat the liquid faster.
- After frequent use, the tank should be emptied, rinsed out and wiped with a non-abrasive cloth.
- If the lid chatters or squeaks during the lifting or lowering cycle, apply a light, penetrating oil (WD-40) to the hinges of the lid itself.

## EQUIPMENT MAINTENANCE

- Turn equipment off.
- Wait at least twenty (20) minutes after the heat circuit is turned off before emptying the tank.
- Drain the contaminated cleaning solution from the tank.
- Rinse the inside of the tank with clean water.
- Buff the inside of the tank with a clean, soft cloth. Do not use steel wool cleaning pads as they are too abrasive and will scratch the tank surface.
- Rinse the tank again.
- Wipe the inside and the outside of the tank dry with a dry, clean, soft cloth.
- The lid should remain closed when the equipment is not in use.
- This tank cleaning procedure should be performed every time the bath is changed. Thoroughly inspect drain areas for leaks.
- Keep the bath free of oils, grease and any foreign materials.
- Skim off oil and grease residue periodically if necessary.
- Cleaning agents should be changed periodically depending on usage.
- When discharging bath and waste, follow all environmental and regulatory requirements. A reputable and licensed waste transportation firm should perform removal of all waste materials.
- **Omegasonics is not liable for improper handling of waste materials.**

## **CHANGING FILTERS**

- Prior to changing the filters, the water level in the tank must be below the level of the filter. Follow the prescribed equipment maintenance procedures above.
- Filters should be changed periodically depending on the usage of the equipment and the contaminants being removed.
- Individually unscrew counterclockwise the two (2) large blue filter cartridge holders. The cartridges will be full of water.
- Pour the water out of the cartridges and remove the filters. Be careful not to lose the rubber O-ring gasket located on the inside of the filter cartridge. Absence of this gasket will cause the filter(s) to leak.
- Replace with new filter(s) and re-install the cartridges.
- The recommended 50 Micron Polycarbonate Filter is the primary filter and is located on the right side of the filtration unit.
- The Carbon Filter is the secondary oil filter and is located on the left side of the filtration system. The carbon filter removes oil and grease and will require changing more often than the recommended Micron Polycarbonate Filter.



## **REPAIRS**

If you experience problems with your equipment, please call Omegasonics at (800) 669-8227

## **LIMITED WARRANTY**

Omegasonics warrants the Custom Power Lift 4560 ultrasonic cleaner for a period of one (1) year from the date of purchase, when used in accordance with the manufacturer's instructions. During the warranty period, Omegasonics will repair or replace free of charge at an authorized repair service center all parts that are defective because of material or workmanship. Freight charges to an authorized service centers are the responsibility of the user.

This warranty does not include damage or product failure, which results from cavitation erosion, misuse, abuse, or transportation damage. This warranty is limited to the original purchaser and is not transferable. Total liability for any reason whatsoever, shall not in any case exceed the cost of repair or replacement of the defective part. In no case shall Omegasonics be responsible for any incidental or consequential damages.

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