

## TECHNICAL MANUAL

### OPERATION AND MAINTENANCE INSTRUCTIONS FOR THE WARTHOG™ HEPA VACUUM SYSTEMS

Models WH-105-0, WH-105-4, WH-115-0, and WH-115-4



This manual is intended as a complete operations manual for owners and users of the Clayton Warthog™ Series HEPA Vacuums and equipment packages which incorporate the Clayton Warthog™ Series HEPA Vacuums. Although this manual details maintenance and operation of Clayton pneumatic tools in conjunction with the vacuum, these tools may be sold separately or as part of a kit. Pneumatic tools, hoses, or accessories are available directly from Clayton Associates, Inc.

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## OPERATION AND MAINTENANCE

### CLAYTON WARTHOG HEPA VACUUM SYSTEMS MODELS WH-105-0, WH-105-4, WH-115-0, WH-115-4

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## Reference Material

Abbreviations for Use on Drawings, and in Specification, Standards, and Technical Documents  
see MIL-STD-12

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## WARNINGS APPLICABLE TO HAZARDOUS MATERIALS CLAYTON VACUUM SYSTEMS







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1. Warnings for hazardous materials listed in this manual are designed to warn personnel of hazards associated with such items when they come in contact with them by actual use. Additional information related to hazardous materials is provided in OPNA VINST 5100.23, Navy Occupational Safety and Health (NAVOSH) Program Manual, NAVSUPINTST 5100.27, Navy Hazardous Material Control Program, and the DOD 6050.5 Hazardous Materials Information System (HMIS) series publications. For each hazardous material used within the Navy, a material safety data sheet (MSDS) is required to be provided and available for review by users. Consult your local safety and health staff concerning any questions on hazardous chemicals, MSDS, personal protective equipment requirements and appropriate handling and emergency procedures and disposal guidance.

2. Complete warnings for hazardous materials referenced in this manual are identified by use of an icon, nomenclature and specification and a numeric identifier. The numeric identifiers have been assigned to the hazardous materials in the order of their appearance in the manual. Each hazardous material is assigned only one numeric identifier. Repeated use of a specific hazardous material references the numeric identifier assigned at its initial appearance. The approved icons and their application are in Figure 1, Icons for Hazardous Materials.




3. In the text of the manual, the caption "WARNING" will not be used for hazardous materials. Such warnings will be identified by an icon and numeric identifier. The material nomenclature will also be provided. The user is directed to refer to the corresponding numeric identifier listed below for the complete warning applicable to the hazardous materials. Refer to Hazardous Materials Warning System (HMWS-3) for information on hazardous materials which are used throughout this manual.

## Explanation of Hazard Symbols

	The symbol of a person wearing goggles shows that flying debris or dust may injure the eyes.
	The symbol of a person wearing breathing protection shows that airborne dust may be present.
	The rapidly expanding symbol indicates that there is a danger of explosion if equipment is misused or safety precautions are not followed.
	The caution symbol indicates that caution should be used to avoid damage to equipment.
	The lifting strain symbol indicates that lifting certain equipment unassisted could cause back injury or strain.
	The shock symbol indicates that danger of electrical shock is present. Take precautions to avoid potential risks.

## HAZARDOUS MATERIALS WARNINGS

There are no inherently hazardous materials in the Clayton Warthog™ Vacuum Systems. However, use of the system can generate hazardous materials, depending on the media being sanded. When removing coatings such as lead paint, chromated primers, or other hazardous paints and primers, the resultant dust is hazardous and can cause serious health problems. Check with environmental or safety officers to determine the level of protection required when performing surface coatings removal.

	Proper breathing protection should be worn whenever sanding surfaces with potentially harmful surface coatings. Paints and primers may contain lead, chromium, or other hazardous substances which can cause respiratory damage when inhaled as an airborne particle. Sanding fiberglass and other composite materials can generate a fine dust which has the ability to cause harm to the lungs. When in doubt, always take proper precautions.
	Proper eye protection should always be worn when using any Vacuum Sanding System or pneumatic tool. The mechanical interaction between the tool and the work surface can generate flying particles which can cause severe damage to the eyes.
	Vacuum equipment should always be grounded. The friction caused by dust and air moving through the vacuum system causes a remarkable amount of static electricity. If the vacuum is not grounded at all times, the static charge will build rapidly, and may arc to the nearest ground. In environments where flammable fumes are present, this sudden spark can cause an explosion.

## Introduction

Fabrication and surface preparation of sheet metal, composites, fiberglass, wood, and other materials frequently requires a technician to use pneumatic tools. These tools, whether sanders, drills, needle scalers, or trimmers, all generate dust and debris, which can be hazardous to the technician and to the environment. Use of a HEPA (High Efficiency Particulate Air) filtered vacuum along with vacuum capable tools can practically eliminate all exposure to airborne dust. The procedures herein provide a method for performing surface preparation operations while minimizing the particulate contamination of hazardous dust into the air, ground, and water.

Vacuums called out in this manual are designed for use in collection of dry dust and debris. These vacuums are not intended for wet pickup.

## Purpose

This technical manual presented in work package (WP) format, describes the Clayton Vacuum System, and how it shall be used to perform surface preparation operations and general cleanup.

## Description

Clayton Vacuum Systems integrate a high efficiency filter vacuum cleaner with powerful air or electric motors for eliminating airborne toxins including lead, chromium, and dust during sanding/grinding operations from metallic and nonmetallic aircraft structures, marine vessels, ground support equipment, and other surfaces requiring maintenance.

The Clayton Warthog™ HEPA Filtered Vacuums consist of an impact resistant poly enclosure powered by either an electric or pneumatic motor. The vacuums are mounted on durable casters for maximum mobility.

The vacuum utilizes a two-stage replaceable filter system, and provides exceptional HEPA filtration of 99.97% of airborne particles 0.3 micron in size or larger. The first stage is a disposable filter bag, which captures the larger particles. After the filter bag, air passes through a HEPA filter, which captures any remaining particles.

## Warnings and Cautions

When operating electric or air-powered appliances, or while working nearby one, safety precautions should be exercised to avoid personal injury and property damage. The following safety precautions should be followed by and communicated to all personnel working with or around Clayton Vacuums and pneumatic tools:

Before using this cleaning equipment, please check to see that a disposable filter bag is positioned properly in the vacuum, and that a Clayton HEPA Filter is threaded into place. Follow approved safety procedures to open filter compartment after initial use, and use proper PPE to prevent personal exposure to hazardous dust.



This vacuum collection system is intended to collect dry or damp, not wet matter, free flowing liquids may damage the HEPA filter, and will void the warranty.

This equipment should always be stored in a dry area.

Use caution when connecting and disconnecting compressed air lines. When static air pressure is suddenly released, it can cause the airline to whip.

**Preparation for Use**

System is shipped complete. Remove packaging material from around system.

15-gallon tanks (WH-115 series) require handle assembly. Attach the handle to tank using four included bolts.

Before using this cleaning equipment, please check to see that a disposable filter bag is positioned properly in the vacuum, and that a Clayton HEPA Filter is threaded into place.

**Preparation for Storage**

The Clayton Warthog™ systems require no special preparation for short term storage.

When long term storage is required, Clayton recommends that the operator perform a filter change to remove any dust or residue from the system.

Pneumatic tools should be oiled and operated briefly prior to long-term storage.

**Preparation for Shipping**

Place the vacuum into an appropriately sized container, and liberally pack protective cushioning around the vacuum.

## Electric Vacuum Operational Procedures



Ensure that all electrical supplies are grounded. If you are unsure, check with a supervisor or building engineer. **WARNING: FAILURE TO USE GROUNDED ELECTRICAL SUPPLY CAN RESULT IN ELECTRICAL SHOCK, INJURY, OR DEATH.** If you do not have access to a grounded electrical supply, do not use the vacuum. Consult with a supervisor or electrician.

Warthog™ Vacuums are equipped with a 30' power cord. Do not use extension cords with these vacuums. Use of extension cords will decrease vacuum performance. Reduced performance will result in higher levels of exposure to hazardous dust. If an extension cord must be used, ensure that it is a UL Approved 12AWG or larger extension cord.

WartHog vacs are designed for use with a 1.5" Clayton vacuum hose (sold separately). One end of the hose has a metal sleeve – insert this end into the vacuum port.

On the side of the vacuum head is a power switch, with two positions. Turn this switch to the upward position to activate the vacuum motor. Turn this switch down to deactivate the vacuum.

The vacuum will now be operational, and the hose can be connected to either vacuum-shrouded grinders or tools, or to cleaning tools for general cleanup.

## Pneumatic Vacuum Operational Procedures

Connect one end of a 1/2" supply hose to shop air supply. Use the shortest airline possible to ensure maximum performance. Using air supply hoses smaller than 1/2" ID may decrease performance. Connect the other end to the vacuum.

Open the air valve on the intake of the vacuum head. Turning the valve handle parallel to the airline will allow air to flow to the vacuum motor. **NOTE:** Pneumatic vacuums consume large amounts of compressed air. Use of supply hoses and fittings smaller than 1/2" will result in reduced vacuum performance.

With the valve open, the vacuum motor will be activated, and the vacuum hose can be connected to either vacuum-shrouded grinders or tools, or to cleaning tools for general cleanup.

## Recommended Filter Change Procedure



**WARNING:** It is imperative that the operator use appropriate PPE when changing any filters contaminated with hazardous dust. If you are unsure of what precautions to take, check with a supervisor or your Industrial Hygienist/Safety Representative.

Filter bag should be changed when the bag is no more than half full (approx).

Unlatch the vacuum head from the tank. Lift the vacuum head approximately 1" above the tank and turn the motor on to prevent hazardous dust from escaping the tank and HEPA filter.



Place the vacuum head down gently to prevent damage to the HEPA filter.

Lightly spray mist the tank interior and bag with amended water (amended water can be made by adding a small amount of liquid Ivory soap or equivalent to a 1 quart spray bottle of water) to ensure that no dust will be disturbed.



Turn a large disposal bag inside out around your arms. Using the disposal bag like a large mitten, grasp the filter bag inside the tank and gently pull it free from the intake tube. The disposal bag should remain between the user and the filter bag.



Gently lift the filter bag, while drawing the disposal bag down and around the filter bag. Gather the neck of the bag, and seal the bag closed using tape or ties.

Wipe the tank interior with disposable towels, place used damp towels in a bag, and seal.



Place a new filter bag into the Warthog™ vacuum. Gently pull the bag all the way onto the filter intake tube. Place the vacuum motor head back onto the vacuum tank, re-secure all latches, and turn vacuum motor off.



Dispose of the used bag in accordance with all local, state, and federal regulations. Use ONLY Clayton DustMaster™ Filter Bags.



## HEPA Filter Change (for all Warthog HEPA Vacuum models)



Changing the HEPA Filter can expose the worker and the environment to hazardous dust. Be sure to wear appropriate PPE when performing filter changes. The Warthog™ should not be operating during the HEPA Filter Change – disconnect all electric or air lines before changing the filter.

Unlatch the vacuum head from the tank. Invert the vacuum head to gain access to the HEPA filter. Turn the filter counter clockwise to unscrew it from the filter adapter.

Place HEPA filter into disposal bag and seal the bag with tape or ties.

Replace this filter ONLY with a Clayton HEPA Filter. Place the new HEPA Filter onto the Warthog™ filter adapter, and screw it down onto the mount. Filter should thread all the way down on the filter adapter.

Replace primary filter bag.

## Vacuum Maintenance

Check the primary filter bag at regular intervals. The frequency with which this filter will need to be changed will depend upon the amount of sanding, grinding, and cleaning that you perform, and the type of material collected. Filter bag should be changed when the bag is no more than half full (approx).

Keep the unit away from moisture or harsh environments whenever possible. Store unit in a dry location.

Never use the Clayton Warthog Vacuum for wet vacuuming. The Clayton System is designed to extract dry dust, and is not equipped for fluid extraction. Vacuuming wet material can ruin the filter system, and void the warranty.

## Troubleshooting Guide for Electric Vacuums

Symptom	Probable Cause	Remedy
Vacuum will not start	Electrical connection has not been made.	Ensure that the power cord has been plugged into a properly grounded 120 Volt circuit.
Vacuum performance is low	Electrical source has low voltage.	Ensure that outlet is supplying proper voltage. Multiple appliances plugged into a single electrical outlet may cause a voltage drop.
	Extension cords are being used to extend the reach of the electric vacuum.	Discontinue use of extension cords. Find an electrical outlet closer to the work location.
	Filter bag is full or HEPA filter requires replacement.	Replace filter bag. If performance is still low, replace HEPA filter.
	Hose is clogged.	Check each hose for obstruction, and remove any debris.
Excessive dust is visible at work surface.	Filter bag is full.	Replace filter bag.
	Fine dust has coated surface of filter bag.	Disconnect air supply from Warthog™, and bump the vacuum gently to dislodge dust from the filter bag.
	HEPA filter is clogged.	Replace HEPA filter.
Motor makes excessive or harsh noise.	Motor brushes worn.	Replace motor brushes with Clayton PN 600-118B

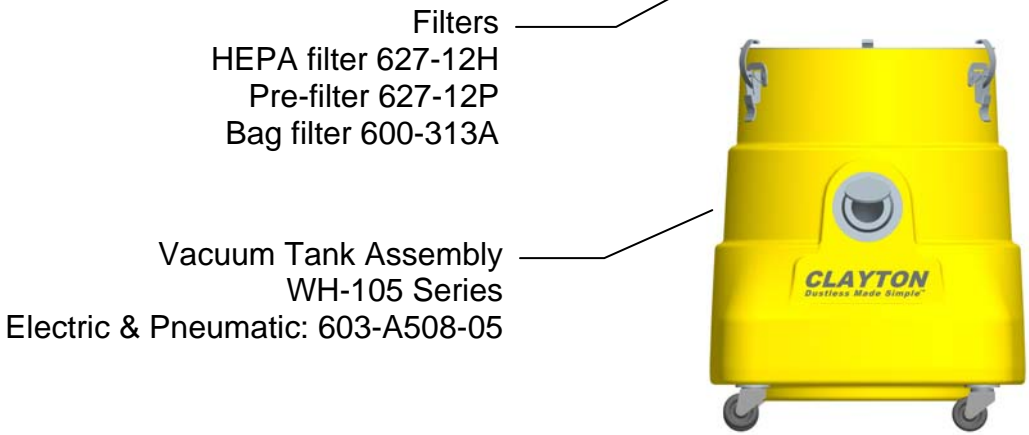
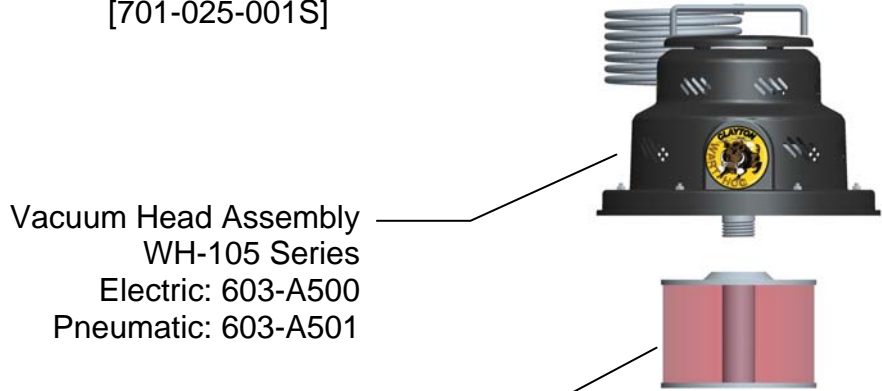
## Troubleshooting Guide for Pneumatic Vacuums

Symptom	Probable Cause	Remedy
Vacuum will not start.	Air connection has not been made.	Ensure that main air supply is connected to a compressed air source.
Vacuum performance is low.	Shop air pressure is set too low	Ensure that shop air pressure is at least 90-120 PSI
	Filter bag is full or HEPA filter requires replacement.	Replace filter bag. If performance is still low, replace HEPA filter.
	Hose is clogged.	Check each hose for obstruction, and remove any debris.
	Supply air line is not delivering enough air.	Be sure to use a 1/2" or larger air line. Use a gauge to check the pressure of the main supply line. If the pressure on the main line is not adequate, you may need to increase shop capacity.
Excessive dust is visible at work surface.	Filter bag is full	Replace filter bag.
	Fine dust has coated surface of filter bag.	Disconnect air supply from Warthog™, and bump the vacuum gently to dislodge dust from the filter bag.
	HEPA filter is clogged.	Replace HEPA filter.

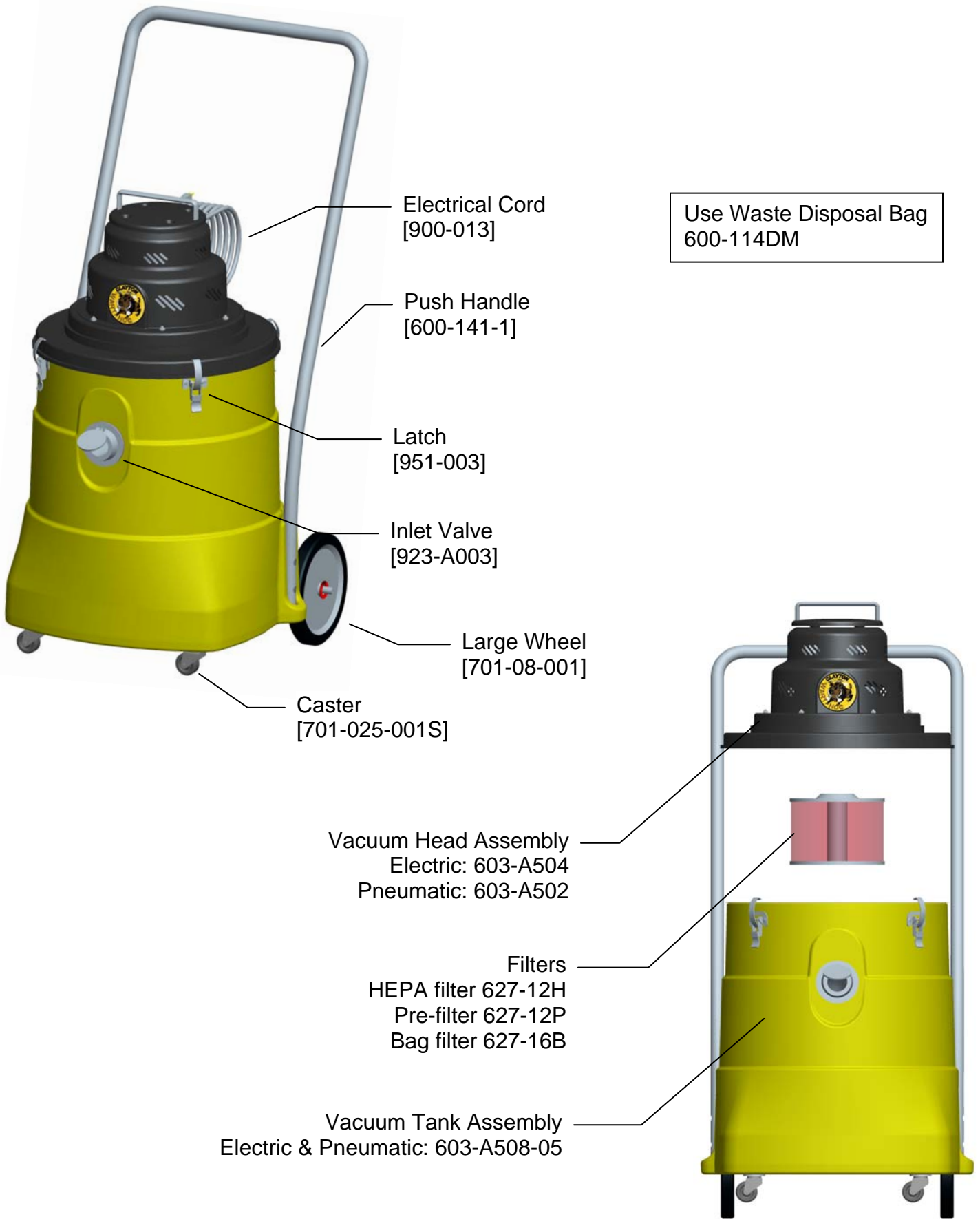
### Illustrated Parts Breakdown for WH-105 Series Vacuums



Use Waste Disposal Bag  
600-114DM



### Illustrated Parts Breakdown for WH-115 Series Vacuums



## Warranty

Clayton Associates, Inc. guarantees its products against defects in materials or workmanship and will either repair or replace all parts that prove defective under normal use for a period of one (1) year with the exception of Clayton Associates, Inc. vacuums, for which the period is two (2) years. The warranty period shall commence from the date of invoice.

This warranty does not cover repairs due to normal wear, accident, neglect, misuse, or use other than as indicated in the instruction booklet.

Within the continental U.S.: During the first 90 days of the warranty period, Clayton will at no charge to the customer, provide parts and labor at the customer's site. From day 91 onward, Clayton will provide parts to the customer's site at no charge and will perform labor at no charge for products returned to its factory at the customer's expense.

Outside the continental U.S.: Clayton will provide parts to the customer's site at no charge or for products returned to its factory at the customer's expense, Clayton will provide parts and perform labor at no charge.

Clayton shall not in any event be liable for any damages, loss of production time or profits, whether based on contract, warranty, negligence, strict liability or otherwise, including without limitation any consequential, incidental or special damages, arising with respect to the equipment or its failure to operate.

Clayton Associates, Inc. makes no other warranty or representation of any kind, except that of title, and all other warranties, express or implied, including warranties of merchantability and fitness for a particular purpose, are hereby expressly disclaimed.



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