KEEP FOR FUTURE REFERENCE

Wood's Powr-Grip CO., INC.

INSTRUCTIONS

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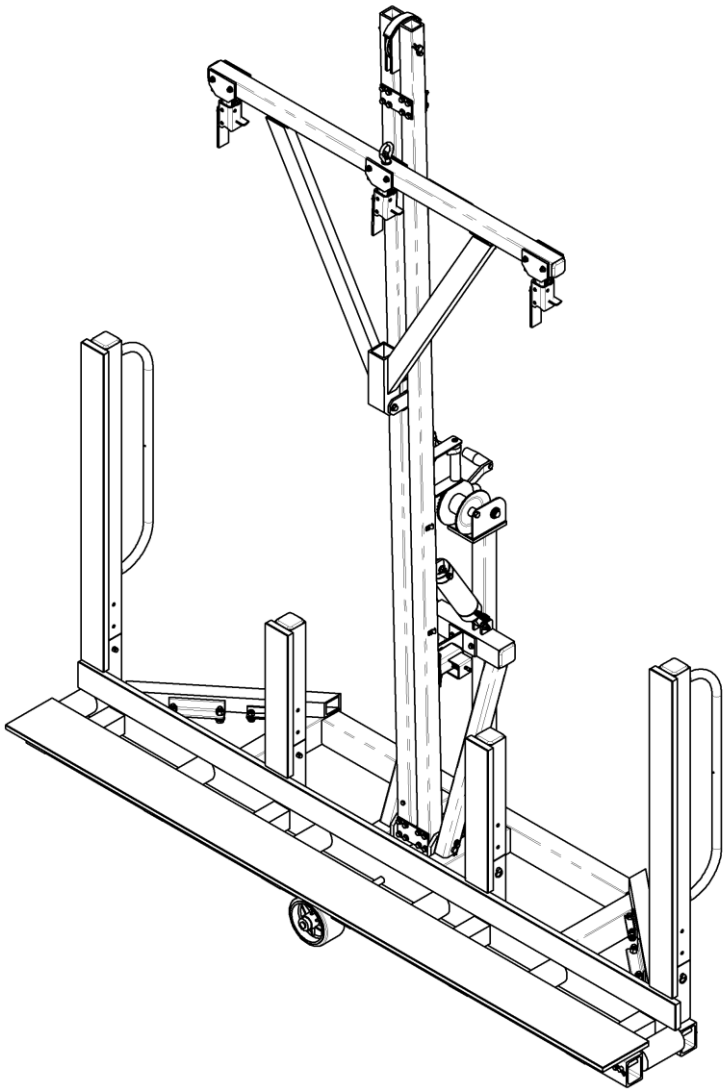
MODEL NUMBER: AD3N6292

SERIAL NUMBER: _____



ACE DOLLY

READ ALL INSTRUCTIONS AND WARNINGS BEFORE OPERATING THIS UNIT

DESIGNED FOR THE MATERIALS HANDLING PROFESSIONAL

SPECIFICATIONS

Model Number:	AD3N6292
Description:	Designed for use as an independent dolly with limited hoisting ability, the AD3N6292 Ace Dolly employs manual vacuum cups (hereafter, "hand cups") to hold a load for lifting, and it provides manual tilt and support rollers for load manipulation.
Vacuum Pads:	Three 11" [28 cm] diameter, lipped (Model G3370), 55 durometer natural-polybutadiene rubber, with #60 filter screen
Pad Spread:[1]	12" x 61¼" [305 mm x 1556 mm] to outer edges
Maximum Load Capacity:[1]	450 lbs [205 kg] based on **Per-Pad Load Capacity** of 150 lbs [68.5 kg], rated at 16" Hg [-54 kPa] on clean, smooth, nonporous flat surfaces[2] Note: Must use WPG Model N6292 Hand Cups.
Unit Weight:[1]	395 lbs [180 kg] Note: Does not include ballast.
Unit Dimensions: (with mast in vertical position)	Height = 119½" [3037 mm] Length = 95½" [2426 mm] Width = 35" [888 mm]
Mast Tilt:	Manual, up to 27" [686 mm] out from vertical position
Operating Elevation:	Red-line vacuum indicator on hand cups may not perform reliably at elevations above 5000 ft [1524 m]; contact Wood's Powr-Grip or an authorized dealer for assistance before using the unit at such elevations.
Operating Temperatures:	10° to 120° F [-12° to 49° C]
Service Life:	This unit is designed to have a service life of at least 20,000 lifting cycles, when used and maintained as intended. Wear-out items are excluded; see MAINTENANCE and REPLACEMENT PARTS LIST for more information..
Attachment:	Winch instructions

[1] Specifications apply to the Ace Dolly when equipped with Wood's Powr-Grip model N6292 (11" [28 cm] diameter) hand cups (supplied). If another size hand cup is used, consult the manufacturer for specifications.

[2] Load Capacity is based on a friction coefficient of 1; see MAINTENANCE: VACUUM PAD MAINTENANCE: Friction Coefficient for additional information.

WARNINGS

Powr-Grip is pleased to offer the most reliable materials handling products available. Despite the high degree of security provided by the Ace Dolly, certain precautions must be observed to protect the operator and others.

Always wear personal protective equipment that is appropriate for the material being handled. Follow trade association guidelines.

Always operate the unit under conditions approved for its design (see INTENDED USE: OPERATING ENVIRONMENT).

Never operate a unit until the counterweight enclosures have been filled with ballast (see ASSEMBLY).

Never operate a unit that is damaged, malfunctioning, or missing parts.

Never operate a unit if the sealing edge of any vacuum pad is cut or otherwise damaged.

Never remove or obscure warning labels.

Never operate a unit if the load capacity or any warning appears to be missing or obscured.

Always make certain the contact surfaces of the load and all vacuum pads are clean prior to applying the pads (see MAINTENANCE: VACUUM PAD MAINTENANCE).

Never exceed the load capacity or attempt to handle loads the unit was not designed for (see INTENDED USE: LOAD CHARACTERISTICS).

Never attempt to handle cracked or broken glass with this unit.

Always engage both floor locks before loading or unloading the unit.

Always center the load from end to end on the unit and position the vacuum pads on the upper half of the load.

Never release or tilt the unit's mast unless the floor locks are set.

Never force the hand cups to reach beyond their intended limit (i.e., position they occupy automatically when yoke is supported by winch cable only).

Never attempt to handle a load if the red-line vacuum indicator is showing on any hand cup.

Never touch the valve release lever of any hand cup while under a load. This may result in loss of attaching vacuum and release of the load.

Never hold in or otherwise interfere with the plunger of any hand cup while under a load

Always break the vacuum adhesion between glass to be transferred and any other glass it rests against.

Always use correct lifting technique to raise or lower the unit's mast under a load.

Never lift a load higher than necessary or leave suspended loads unattended.

Never lift a load over people.

Always keep other personnel far enough away from the unit to avoid injury in the event of an unexpected load release.

Never move the unit unless the mast latch is engaged.

Always make certain the unit's path is level and free from debris or obstructions.

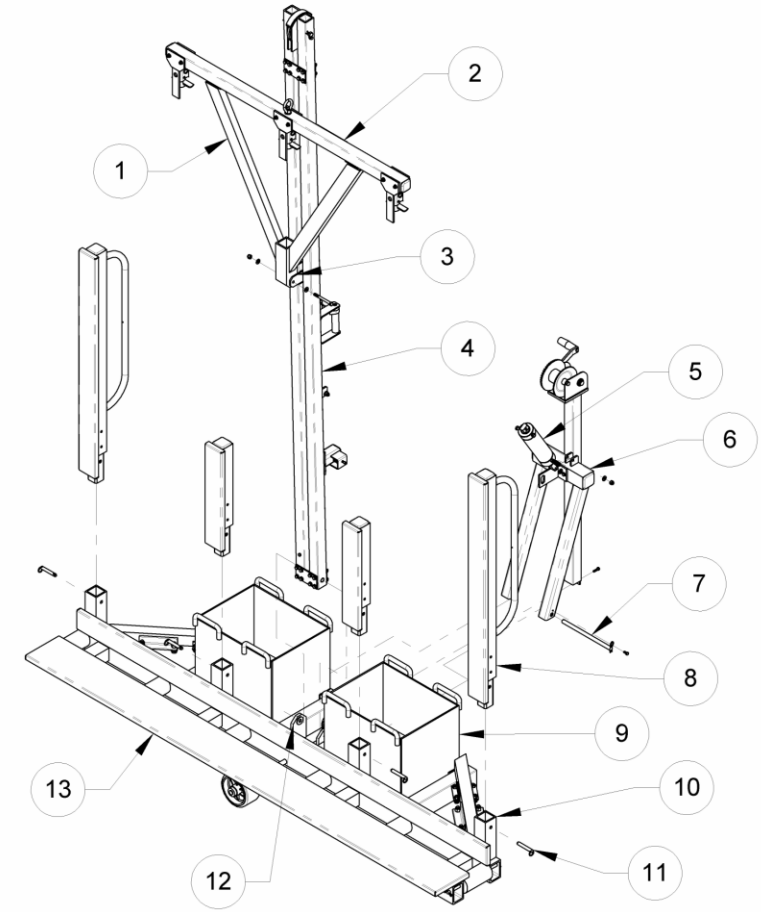
Always leave sufficient space for any load overhang when rolling, turning, or pivoting the unit.

Never allow people to ride on the unit or the load being handled

Always remember that modifications to the unit may compromise its safety. Wood's Powr-Grip cannot be responsible for the safety of a unit that has been modified by the customer. For consultation, contact Wood's Powr-Grip.

ASSEMBLY

Note: Components featured in the following instructions for assembling the unit are underlined on their first appearance in this section.



1 YOKE
2 LIFT BAR
3 YOKE MOUNT
4 MAST
5 TILT CYLINDER
6 WINCH ASSEMBLY
7 TILT SHAFT
8 UPRIGHT
9 COUNTERWEIGHT ENCLOSURE
10 UPRIGHT SUPPORT
11 COTTERLESS HITCH PIN
12 TILT EARS
13 BASE ASSEMBLY

1) Open the shipping container and remove all materials for restraining or protecting the unit. Then lift the unit subassemblies out of the container. Save the container for use whenever unit is transported.

2) Install the winch assembly and mast as follows:

   Remove the base assembly and place it in an open area. Remove the counterweight enclosures for easier access. Then remove the tilt shaft from the tilt ears. While slackening the winch cable as necessary, set the winch assembly on top of the base assembly and fasten the bolt at the back to secure it in place. Align the holes in the winch assembly with the tilt ears and slide the tilt shaft in one side, to hold the winch assembly in place.

   Hold the mast vertically with the tilt cylinder on the side facing the winch assembly. Align the holes at the base of the mast with the tilt ears and slide the tilt shaft the rest of the way through the mast, winch assembly and tilt ears. Continue supporting the mast and secure the tilt cylinder to the winch assembly with the bolt included.

3) Install the yoke and lift bar as follows:

   Make sure the winch cable is centered on the pulley at the top of the mast. Use the shackle to connect the eye bolt on the lift bar to the winch cable, and suspend the assembly using the winch. With the yoke and lift bar supported, slide the yoke mount up the mast, align the holes with the yoke and install the bolt, making sure the side of the lift bar with labels faces the winch.

4) Insert the uprights in their corresponding supports and secure the uprights with the cotterless hitch pins.

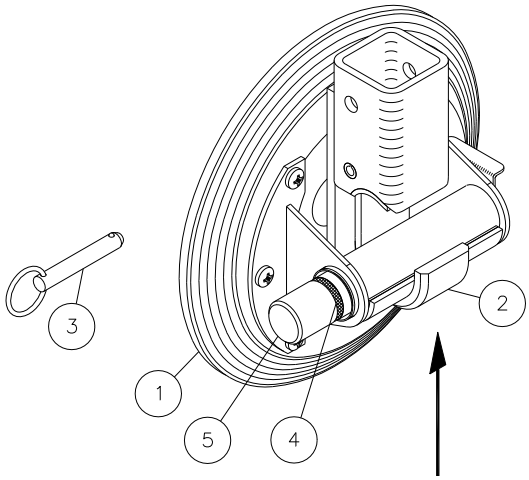
5) Attach each Powr-Grip model N6292 Hand Cup to the lift bar, as follows (see illustration at right):[3]

   Remove the cotterless hitch pin from the saddle mount, allowing the saddle to slide out from the mount.

   With the vacuum pad facing toward you, position the handle of the hand cup in the saddle. Then rotate the hand cup 180° around the handle's axis, to the orientation shown.

   Slide the saddle into the mount until the hand cup's handle fits snugly in the saddle mount.

   Insert the cotterless hitch pin in the saddle mount to secure the hand cup. Push the pin through the holes until the retaining ball emerges on the far side of the saddle mount.



1 VACUUM PAD
2 SADDLE MOUNT
3 COTTERLESS HITCH PIN
4 RED-LINE VACUUM INDICATOR
5 PLUNGER

6) Fill the counterweight enclosures as follows:

   Place the enclosures in their mounting locations on the unit. Secure them with the bolts included. Fill each one with dry sand (not included) to within 2" [5 cm] of the top. Approximately 450 lbs [204 kg] or 3.6 cu ft [102 L] of sand are required.

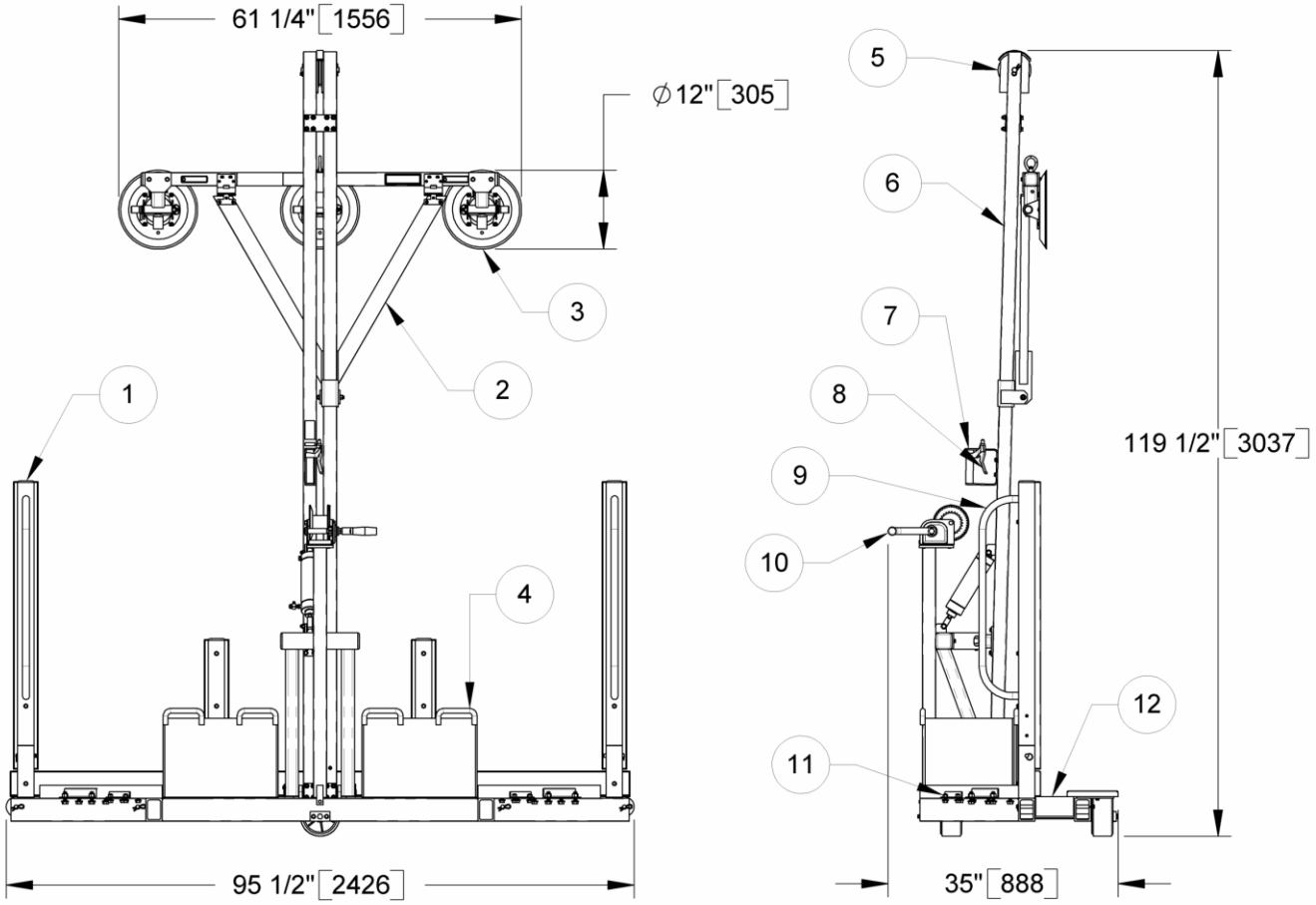
   If desired, concrete can be substituted for sand as ballast, but it will be impossible to remove from the enclosures, and they will be very difficult to manage separately from the Ace Dolly because they will weigh approximately 250 lbs [114 kg] each.

7) Perform Operational and Load Tests for the unit as directed in MAINTENANCE: TESTING SCHEDULE.

[3] Other hand cups may reduce load capacity or be incompatible.

OPERATING FEATURES

Note: Components featured in the following instructions for operating or maintaining the unit are underlined on their first appearance in each section.



Standard AD3N6292 shown.

1 UPRIGHT
2 YOKE
3 N6292 HAND CUP with VACUUM PAD
4 COUNTERWEIGHT ENCLOSURE
5 PULLEY
6 MAST
7 TILT HANDLE
8 MAST LATCH
9 CONTROL HANDLE
10 WINCH
11 FLOOR LOCK
12 LOAD SUPPORT ROLLER

INTENDED USE

LOAD CHARACTERISTICS

⚠ ***WARNING: This unit is NOT intended for lifting hazardous materials, such as explosives or radioactive substances.***

The operator must verify that the unit is intended to handle each load, in accordance with the following requirements:

- This unit is designed to lift glass lites or similar loads.
- The load must not exceed the allowable weight specified under Maximum Load Capacity (see SPECIFICATIONS).

⚠ ***WARNING: Do not attempt to lift rough or porous materials.***

- The load must be a single piece of nonporous material with a flat and relatively smooth contact surface. Do not attempt to lift rough or porous materials, such as unfinished wood or rough-cut stone. To determine whether a load is porous or too rough, first perform the VACUUM TEST as directed under MAINTENANCE. Once you have determined that the hand cups are capable of maintaining vacuum on smooth, nonporous materials, perform the same test on the load in question. If the hand cups' red-line vacuum indicators do not remain hidden, the load does not possess the characteristics required for using this unit.
- The load's contact surface must be suitable for obtaining a friction coefficient of 1 with the unit's vacuum pads (see MAINTENANCE: VACUUM PAD MAINTENANCE: Friction Coefficient), as verified by a friction test. If necessary, contact Wood's Powr-Grip for help in conducting a friction test.
- While the *minimum* length and width of the load are determined by the Pad Spread (see SPECIFICATIONS), the *maximum* length and width are determined by the allowable overhang, or the amount of load material that can extend sideways beyond the vacuum pads without breaking or otherwise being damaged.

  The allowable overhang depends on the kind of load material being lifted, the thickness of the material, and the angle at which it is handled (if any). Since materials such as glass or plastics each have different physical properties, the allowable overhang must be evaluated separately for each type of load. If necessary, contact Wood's Powr-Grip or an authorized dealer for help in determining the recommended overhang in a specific situation.
- 1" [2.5 cm] is the maximum allowable thickness of loads at the maximum weight (see SPECIFICATIONS: Load Capacity). However, allowable thickness increases as load weight decreases. If necessary, contact Wood's Powr-Grip for help in determining the maximum thickness permitted when handling any specific load.

Note: Vacuum pads can stain or deform load surfaces with light colors or soft coatings. The operator should test such surfaces for detrimental effects before using the unit on them.

OPERATING ENVIRONMENT

The operator must determine whether the unit is intended to be used in each work environment, in accordance with the following restrictions:

⚠ ***WARNING: Never use unit in dangerous environments.***

- This unit is not intended for use in any environment that is inherently dangerous to the operator or likely to compromise the unit's ability to function. Environments containing explosives, caustic chemicals and other dangerous substances must be avoided when using the unit.
- The unit's work environment is limited by the Operating Elevation and Operating Temperatures indicated in SPECIFICATIONS.
- Using the unit in wet environments may require the operator to take special precautions:

  Moisture on contact surfaces of the load or vacuum pads diminishes the unit's slip resistance, thereby reducing the lifting capacity (see MAINTENANCE: VACUUM PAD MAINTENANCE: Friction Coefficient).

⚠ ***WARNING: Moisture reduces slip resistance of vacuum pads.***

Although the unit's exterior surfaces can tolerate some exposure to water vapor, they are not designed to be water-tight. Submerging the unit or using it in rain may damage unit components; these and similar conditions must be avoided.

OPERATION

BEFORE USING THE UNIT

The operator must determine whether the unit is capable of performing each intended task, in accordance with the SPECIFICATIONS and INTENDED USE sections of this *INSTRUCTIONS* manual. In addition, all of the following preparations must be completed prior to handling any load.

Taking Safety Precautions

The operator must read and understand this *INSTRUCTIONS* manual, including all ***WARNINGS***, before using the unit. If necessary, contact Wood's Powr-Grip or an authorized dealer for assistance.

⚠ ***WARNING: Always wear appropriate personal protective equipment.***

The operator must wear any personal protective equipment and take any other precautions required to handle the load safely. Consult appropriate trade association guidelines to determine what precautions are necessary for each type of load material.

Performing Inspections and Tests

Perform all inspections and tests required by the INSPECTION and TESTING SCHEDULES (see MAINTENANCE). In addition, if the unit has been in storage, always conduct a VACUUM TEST before placing it in service (see MAINTENANCE).

TO USE THE FLOOR LOCKS

Always engage both floor locks before loading or unloading the unit. To engage a floor lock, press the flat, wide foot pedal downward. Engaging the floor lock extends the release levers on both sides of the locking pedal. To disengage a floor lock, press either extended release lever down.

TO APPLY THE PADS TO A LOAD

Inspecting the Contact Surfaces

Make certain that the contact surfaces of the load and all vacuum pads are free of any contaminates that could prevent the pads from sealing against the load (see MAINTENANCE: VACUUM PAD MAINTENANCE).

Securing the Load on the Unit

Center the load from end to end on the unit, and use the winch to set the height of the hand cups so that the vacuum pads will contact the upper half of the load. This position will maximize stability while lifting or transporting the load. Make sure that all pads will fit entirely on the load's contact surface (see SPECIFICATIONS: Pad Spread) and that they will support the load evenly (see SPECIFICATIONS: Per-Pad Load Capacity).

When the sealing edge of each pad is fully contacting the load surface, pump the plunger of the hand cup until the red-line vacuum indicator stays hidden (see illustration in ASSEMBLY). When all pads are attached completely, the unit is ready to lift or transport the load.

Note: If a hard object has been resting against a vacuum pad, it may be slightly distorted. Although initially it may be difficult to apply the pad to a load, this condition should correct itself with continued use.

⚠ ***WARNING: Never leave unattended any load supported by hand cups.***

Each hand cup is equipped with a red-line vacuum indicator. When the red line stays hidden, vacuum is sufficient for handling loads. Check each red line frequently to make sure all hand cups are attached completely. If a red line appears while the unit is in use, immediately set down any suspended load and repump the plunger until the red line stays hidden again.

⚠ ***WARNING: Always monitor hand cups during use, and never handle a load when any red line is showing.***

Do not attempt to lift or transport a load while any red line is showing; such an attempt could result in a load release and possible injury to the operator. If the hand cup does not maintain a vacuum hold, discontinue use until the fault is corrected.

TO RELEASE THE PADS FROM THE LOAD

⚠ ***WARNING: Load must be fully supported before releasing vacuum pads.***

When the load is at rest and fully supported, press the valve release lever (located opposite the plunger) on each hand cup until the vacuum pad disengages completely from the load.

SPECIFIC APPLICATIONS OF UNIT FOR GLASS HANDLING

To Load Upright Glass from the End

(for vertical racks or vertical cases with end open)

1) Position the unit so that the load support rollers line up on the end of the lite to be loaded. If the lite is over 95½" [242 cm] long, leave enough space between the unit and the end of the lite to accommodate glass overhang. For example, to load a 144" [366 cm] long lite, position the unit 2' to 2½' [61 cm to 76 cm] out from the end of the lite.
2) Engage both floor locks (see TO USE THE FLOOR LOCKS preceding).
3) Pull the lite onto the rollers using additional hand cups or glass tongs. Make certain the lite is centered from end to end on the unit, so that any overhang is equal on both ends.
4) Apply the vacuum pads to the lite (see TO APPLY THE PADS TO A LOAD preceding).
5) Apply some tension to the winch cable to help support the lite. This will cause the top of the lite to lean slightly away from the operator.
6) Disengage both floor locks (see TO USE THE FLOOR LOCKS preceding) and roll the unit away.

Note: Reverse this procedure to unload a lite from the end of the unit.

To Load Upright Glass from the Side

(for A-frame or L-frame racks, leaning cases with side open, tilted cutting tables, edgers, bevelers or truck racks)

1) Position the unit parallel to, centered on, and as close as possible to the lite.
2) Engage both floor locks (see TO USE THE FLOOR LOCKS preceding).
3) Position the vacuum pads on the lite: Grasp the tilt handle with your left hand and the winch handle with your right hand (to adjust hand cup height, if necessary). Then release the mast latch and tilt the mast forward until the pads gently contact the lite.
4) Apply the vacuum pads to the lite (see TO APPLY THE PADS TO A LOAD preceding).
5) Use the winch to raise the lite while it is still in contact with the rack or other support system. Make certain the lower edge of the lite is high enough to clear any object between the support system and the unit's load support rollers during transfer--but ***do not*** transfer the lite yet.
6) Make certain to break the vacuum adhesion between the lite to be transferred and any other lite it rests against: Use another hand cup to carefully pull out one lower corner of the outermost lite, just enough for air to pass between it and the next lite. This will prevent any other lites from adhering to the one being transferred.
7) Transfer the lite onto the unit: Grasp the tilt handle with your left hand and the winch handle with your right hand (to adjust lite elevation, if necessary). Then *firmly* but *slowly* pull the mast back until the mast latch engages. The bottom of the lite will contact the uprights first, and the top will follow.
8) Lower the lite onto the load support rollers with the winch, leaving some tension on the cable for support.
9) Disengage both floor locks (see TO USE THE FLOOR LOCKS preceding) and roll the unit away.

To Unload Glass onto a Leaning Support System

(for A-frame or L-frame racks, tilted cutting tables, edgers, bevelers or truck racks)

1) Position the unit parallel and as close as possible to the rack or other support system. Roll the unit forward or backward to align the lite with the desired position on the support system.
2) Engage both floor locks (see TO USE THE FLOOR LOCKS preceding).
3) Use the winch to raise the lower edge of the lite 2" to 4" [5 cm to 10 cm] higher than the bottom ledge of the support system.
4) Transfer the lite onto the support system: Grasp the tilt handle with your left hand and the winch handle with your right hand (to adjust lite elevation, if necessary). Release the mast latch and *firmly* but *slowly* tilt the mast forward until the face of the lite gently contacts the support system.
5) Use the winch to lower the lite until its weight is resting entirely on the support system.
6) Release all vacuum pads from the lite (see TO RELEASE THE PADS FROM THE LOAD preceding).
7) Return the mast to the vertical position: Pull the mast back until the mast latch engages.
8) Disengage both floor locks (see TO USE THE FLOOR LOCKS preceding) and roll the unit away.

TRANSPORTING THE LOAD

Whether the unit is loaded or unloaded, it's important to watch for overhead obstructions that may be encountered by either the load or the top of the mast when the unit is moving. The casters and wheels on the unit are designed only to be used on smooth, level surfaces, so make sure to keep the floor where the unit is operated clean and clear of obstructions.

WHEN THE UNIT IS NOT IN USE

Park the unit on a level surface and engage both floor locks (see TO USE THE FLOOR LOCKS preceding.). Use the covers supplied to keep the vacuum pads clean.

MAINTENANCE

HAND CUP MAINTENANCE

Refer to the instructions accompanying individual hand cups for information about Inspection, Cleaning, Service and Replacement Parts.

INSPECTION SCHEDULE

Perform inspections routinely, according to the following frequency schedule:

Every-Lift Inspection

- Examine the pulley, winch and winch cable for damage, rust or debris (see WINCH CABLE MAINTENANCE to follow). Also make certain that the hardware used to connect the winch cable to the lift bar remains securely attached and undamaged.
- Check for unusual vibrations, noises or winch resistance while operating the unit.
- Examine the vacuum pads and load surface for contamination or debris (see VACUUM PAD MAINTENANCE to follow).
- Examine the vacuum pads, controls and indicators for visual damage (see VACUUM PAD MAINTENANCE to follow).

If any deficiency is detected during the inspection, correct it before using the unit and perform the Frequent Inspection to follow.

Frequent Inspection

(*following every 20-40 hours' use; or whenever unit is out of service for 1 month or more*)

- Examine the unit's structure and all moving parts for visual damage.
- Examine the full length of the winch cable (including lifting shackle, thimble and wire clamp) for visual damage (see WINCH CABLE MAINTENANCE to follow).
- Examine the winch for conditions requiring service (see WINCH MAINTENANCE to follow).
- Perform the VACUUM TEST to follow.

If any deficiency is detected during the inspection, correct it before using the unit and perform the Periodic Inspection to follow.

Periodic Inspection

(*following every 250-500 hours' use; or whenever unit is out of service for 1 year or more*)

- Examine the entire unit for external evidence of looseness, excessive wear, deformation, cracks, excessive corrosion, dents to structural or functional components, cuts, or any deficiency which might constitute a hazard.
- Keep a written record of all Periodic Inspections.

If any deficiency is detected during the inspection, return the unit to Wood's Powr-Grip or an authorized dealer for repair (see LIMITED WARRANTY).

Infrequent Use

If a unit is used less than 1 day in a 2-week period, perform the Periodic Inspection *each time before using the unit*.

TESTING SCHEDULE

Perform these tests when placing the unit in service *initially* and *each time following a repair or modification*. Correct any deficiency and retest before using the unit.

Operational Tests

- Perform the VACUUM TEST to follow.
- Test all features and functions of the unit (see OPERATING FEATURES, OPERATION and MAINTENANCE).

Load Test

Prove that the unit can lift 100% of its Maximum Load Capacity (see SPECIFICATIONS), using an actual load or an equivalent simulation. Employ the following method to test with an actual load:

1) Place a test load with appropriate LOAD CHARACTERISTICS (see INTENDED USE) on a stable support. Make sure the load is oriented in the upright position.
2) Attach the vacuum pads to the test load as previously directed.
3) Raise the load a minimum distance and release the winch handle, to assure that the load is supported by the unit.
4) Lower the load a minimum distance and again release the winch handle to make sure that the load is supported by the unit.
5) Allow the unit to support the load for 5 minutes. The load must not slip or fall during this time period, whether from a failure of the winch, winch cable or the vacuum pads. If it does, inspect the winch as directed under WINCH MAINTENANCE to follow; inspect the winch cable as directed under WINCH CABLE MAINTENANCE to follow; and/or conduct a VACUUM TEST and inspect each vacuum pad as directed under VACUUM PAD MAINTENANCE: Inspection (see sections to follow). Correct any deficiency that is found and retest the unit.

Note: See MAINTENANCE topics to follow for additional directions about inspecting and testing specific unit components.

MAINTENANCE SCHEDULE

Although the unit does not require maintenance on a routine basis, maintenance must be performed whenever a deficiency is indicated by routine inspections or tests. Any maintenance warranted must be performed before resuming normal operation of the unit.

WINCH CABLE MAINTENANCE

For inspection purposes, the winch cable is categorized as a kind of wire rope. All wire ropes wear out eventually, gradually losing work capability throughout their service life. That's why regular inspections and maintenance are critical, especially as the cable approaches the end of its useful life. Referring to ASME B30.6, the following maintenance guidelines apply to the winch cable:

Frequent Inspection of Winch Cable

The winch cable in service should be visually inspected once each day it is in use. A visual inspection includes examining the full length of all cable that can be expected to be used during the day's operations. The cable should be replaced immediately upon finding any of the following forms of obvious visual damage:

- Kinking, crushing, unstranding, birdcaging, main strand displacement or core protrusion.
- Rust or other corrosion.
- Any broken or cut strands.

If there is any concern that the winch cable could be too worn or unsafe for any reason, a more thorough Periodic Inspection should be performed.

Periodic Inspection of Winch Cable

Periodic Inspections of the winch cable must be performed by an appointed, competent person. Each inspection must consider the entire length of cable, and individual wires in the strands must be visible to the inspector. Special care should be taken especially to inspect the cable near the end connections or at typical wear points. The inspector must keep a written record of all Periodic Inspections. Any wear indicating a loss in strength should be noted, and the inspector must judge whether further use of the cable constitutes a hazard. Such wear may include, but is not limited to, the following:

- Damage outlined in the Frequent Inspection.
- Reduction of cable diameter below nominal (1/8" [3.2 mm]) due to loss of core support, internal or external corrosion or wear of the outside wires.
- Severely corroded or broken wires at the end connections.
- Severely corroded, cracked, bent, worn or improperly applied end connections.

Winch Cable Replacement

Numerous factors are involved in determining when the winch cable should be replaced. Once a cable exhibits any of the following criteria, it should be removed from service and replaced with a suitably rated cable:

- Broken or cut strands/wires.
- Wear amounting to one-third the original diameter of the individual outside wires.
- Kinking, crushing, birdcaging, main strand displacement or core protrusion.
- Evidence of heat damage from any cause.
- Reduction from nominal diameter 1/8" [3.2 mm] of more than 1/64" [0.4 mm].

Winch Cable Service

The winch cable may look like a simple, single part, but it is really a machine with many moving parts, requiring as much care and maintenance as gears and chains. The cable should be stored so as to prevent damage, deterioration and corrosion. Store the unit in a dry location, and cover the cable to prevent dirt, water or other contaminants from damaging the cable. It is also important to apply lubricant on a regular basis, to reduce internal friction and prevent corrosion.

When the winch cable is in use, care should be taken to prevent scraping, nicking, crushing or inducing sharp bends in the cable.

WINCH MAINTENANCE

Refer to the winch manufacturer's instructions (provided) for information about winch inspection, testing and maintenance.

PULLEY MAINTENANCE

The pulley of the unit must be kept lubricated and must be inspected periodically for damage (see MAINTENANCE: INSPECTION SCHEDULE: Every-Lift Inspection), but otherwise requires very little maintenance. If at any time the pulley becomes cracked, chipped, dented or otherwise damaged, replace it immediately. Operating with a damaged pulley can cause it to fail or possibly create a jam that cannot be cleared. A damaged pulley can also damage the winch cable, reducing its service life or requiring it to be replaced.

VACUUM PAD MAINTENANCE

Pad Friction Coefficient

The friction coefficient represents the unit's ability to resist load slippage when the load is oriented in any position except horizontal. If the contact surfaces of either the load or the vacuum pads are not clean, dry and in good condition, slippage is more likely to occur.

The Load Capacity of most Powr-Grip units is based on a friction coefficient of 1. However, a vacuum pad's ability to maintain this friction coefficient is reduced by factors such as contamination, wear, age and exposure to sunlight, as well as the condition of the load's contact surface (see INTENDED USE: LOAD CHARACTERISTICS). Pads that have surface contamination must be thoroughly cleaned (see Cleaning discussion to follow). Over time, the rubber in a pad may experience hardening or leaching of chemicals, resulting in stiffness or surface glaze. Pads that exhibit wear, stiffness or glaze must be replaced.

In addition, all pads should be replaced on a regular basis, preferably after no more than 2 years, to ensure that the friction coefficient is not compromised. If necessary, contact your dealer or Wood's Powr-Grip for more information.

Pad Inspection

Inspect each vacuum pad for the following deficiencies routinely, as directed in the preceding INSPECTION and TESTING SCHEDULES. Correct any deficiency before using the unit.

- Contaminates on the pad face or sealing edges: Soil build-up can prevent pads from sealing adequately or reduce the friction coefficient (see discussion preceding). Follow the directions to clean pads as necessary (see discussion to follow).
- Felt filter missing from pad face: This filter helps prevent debris from plugging the pump. Replace any missing filter immediately (see instructions accompanying individual hand cups).
- Nicks, cuts or abrasions in sealing edges: Pad damage can reduce the lifting capacity of the unit. Replace any damaged pad immediately (see instructions accompanying individual hand cups).

⚠ ***WARNING: Replace vacuum pad if sealing edge has any nicks, cuts or abrasions.***

- Wear, stiffness or glaze: See Friction Coefficient preceding. Replace any pad that exhibits wear, stiffness or glaze (see instructions accompanying individual hand cups).

Pad Cleaning

Regularly clean the face of each vacuum pad to remove oil, dust and any other contaminates. Wood's Powr-Grip strongly recommends using our Vacuum Cup Cleaner (see REPLACEMENT PARTS LIST), because it cleans vacuum pads effectively and even helps to restore their flexibility and grip in many cases. Soapy water or other mild cleansers are also acceptable. Do *not* use solvents, petroleum-based products (including kerosene, gasoline and diesel fuel) or any harsh chemicals for cleaning. Do *not* use unauthorized rubber cleaners or conditioners, such as those intended for cleaning tires or vinyl surfaces, because those products can leave a hazardous film on vacuum pads which significantly reduces their lifting capacity (see Friction Coefficient preceding). The use of any unauthorized cleaning agent is prohibited because it could damage the pad and/or create a hazard to the operator or others.

⚠ ***WARNING: Never use solvents, gasoline or other harsh chemicals to clean vacuum pad.***

⚠ ***WARNING: Never use unauthorized rubber cleaners or conditioners to clean vacuum pad.***

To prevent liquid from contaminating the vacuum pump during cleaning, cover the suction hole in the recess for the air filter or make sure the pad faces downward. Use a clean sponge or lint-free cloth to apply an authorized cleanser and wipe the pad face clean. A toothbrush (or similar brush with bristles *that do not harm rubber*) may be used to remove contaminates clinging to sealing edges.[4] Wipe all residue from the pad face, and allow the pad to dry completely before using the unit.

[4] If these cleaning methods are not successful, contact Wood's Powr-Grip or an authorized dealer for assistance.

VACUUM TEST

Test all of the hand cups for leakage routinely, as directed in the preceding INSPECTION and TESTING SCHEDULES.

1) Make sure the hand cups are functioning correctly (see hand cup instructions).
2) Apply the vacuum pads to a clean, smooth, scratch-free piece of glass or metal, as directed under OPERATION: TO APPLY THE PADS TO A LOAD. ***Do not attempt to lift the test material during the vacuum test.***
3) Monitor the hand cups' red-line vacuum indicators for approximately 2 hours: ***All of the red lines must remain hidden during this time.*** If not, perform general maintenance (see hand cup instructions) and repeat the test. If the problem persists, contact Wood's Powr-Grip or an authorized dealer for assistance.

⚠ ***WARNING: If hand cup fails vacuum test, discontinue use immediately.***

Correct any deficiency in the hand cups before resuming normal operation of the unit.

REPLACEMENT PARTS LIST

Stock No.	Description	Qty.
91820	Hand Cup - Model N6292 / 11" [28 cm] Diameter	3
66487	Wheel - 6" [15 cm] Diameter - 3" [8 cm] Tread Width	2
66485	Swivel Caster - 4" [10 cm] Diameter - 2" [5 cm] Tread Width	2
66472	Hand Winch - 600 lbs [272 kg] Capacity	1
66473	Handle for Hand Winch	1
66418	Pulley - 5" [13 cm] OD - 3/4" [19 mm] Bore	1
28675	Wood's Powr-Grip® Vacuum Cup Cleaner	1
15764	3/16" [5 mm] Galvanized Steel Wire Rope (22' [6.7 m] in length)	1
13528	1/2" x 3" [13 mm x 76 mm] Cotterless Hitch Pin	4

SERVICE ONLY WITH IDENTICAL REPLACEMENT PARTS
SUPPLIED BY OR APPROVED BY WOOD'S POWR-GRIP CO., INC.

LIMITED WARRANTY

Powr-Grip products are carefully constructed, thoroughly inspected at various stages of production, and individually tested. They are warranted to be free from defects in workmanship and materials for a period of one year from the date of purchase.

If a problem develops during the warranty period, follow the instructions hereafter to obtain warranty service. If inspection shows that the problem is due to defective workmanship or materials, Powr-Grip will repair the product without charge.

WARRANTY DOES NOT APPLY WHEN:

Modifications have been made to the product after leaving the factory.

Rubber portions have been cut or scratched during use.

Repairs are required due to abnormal wear and tear.

The product has been damaged, misused, or neglected.

If a problem is not covered under warranty, Powr-Grip will notify the customer of costs prior to repair. If the customer agrees to pay all repair costs and to receive the repaired product on a C.O.D. basis, Powr-Grip then will proceed with repairs.

TO OBTAIN REPAIRS OR WARRANTY SERVICE

For purchases in *North America*:

Contact the Technical Service Department at Wood's Powr-Grip Co.. When factory service is required, ship the complete product--prepaid--along with your name, address and phone number to the street address hereafter.

For purchases in *all other localities*:

Contact your dealer or the Technical Service Department at Wood's Powr-Grip Co. for assistance.

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