KEEP FOR FUTURE REFERENCE

OPERATING INSTRUCTIONS

INTENDED FOR USE BY SKILLED PROFESSIONALS • READ AND UNDERSTAND BEFORE OPERATING



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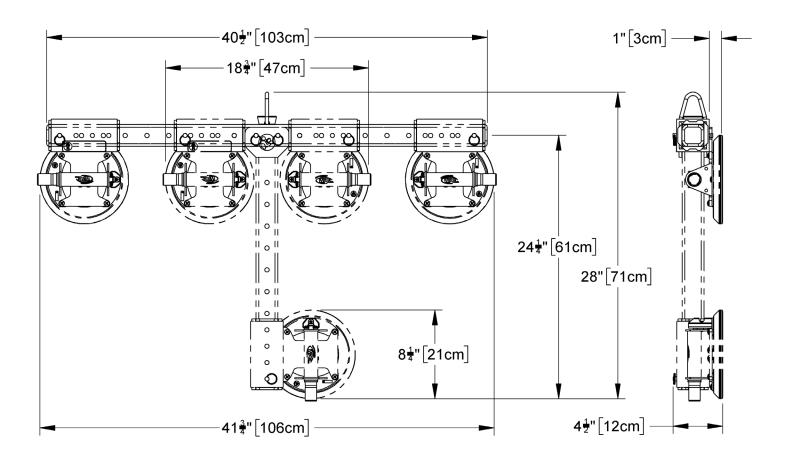
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SPECIFICATIONS

	Product ription	Designed for use with hoisting equipment, the VL2MAN lifter supports loads using vacuum for lifting in the upright orientation.		
	Model lumber	VL2MAN	VL2MAN with Center Arm	
	pread¹ er edges)			
Height-	-Maximum	8¼" [21 cm]	24¼" [61 cm]	
ı	Minimum	8¼" [21 cm]	10¾" [27 cm]	
Width-	Maximum	41¾" [106 cm]	41¾" [106 cm]	
ı	Minimum	16¾" [42 cm]	18¾" [47 cm]	
Maximur Ca _l	m Load pacity ²			
	Per-Pad ³	93 lbs [42.5 kg]		
	Total	185 lbs [85 kg]		
LBS [KG]	Lifter Weight			
without Ha	and Cups	15 lbs [7 kg]	25 lbs [12 kg]	
with H	land Cups	25 lbs [12 kg]	40 lbs [19 kg]	
	roduct Options	Available with Adjustable Center Arm. See separate instructions about other options.		
Ope FT [m] 1 Ele	erating evation	Up to 5,000' [1,524 m]		
Ope Temper	erating ratures	10° — 120° F [-12° — 49° C]		
9	Service Life	20,000 lifting cycles, when used and maintained as intended ⁴		
ASME Sta	andard BTH-1	Design Category "B", Service Class "0"		

- 1...... Specifications apply to lifters using WPG 8" [20 cm] hand cups (models N4950 and N4000). If another hand cup is used, consult the manufacturer for specifications. The maximum structural capacity of this lifter is 185 lbs [85 kg], regardless of capacity ratings for any hand cups that may be installed.
- 2..... The Maximum Load Capacity is rated at a vacuum of 16" Hg [-54 kPa] on clean, smooth, nonporous flat surfaces with a friction coefficient of 1. Pad compound, load rigidity, strength, surface conditions, overhang, angle, center of gravity and temperature can also affect the lifting capacity. A "qualified person" should evaluate the effective lifting capacity for each use (see definition under "Rated Load Test").
- 3..... The Per-Pad Load Capacity does not apply to the vacuum pad on the Adjustable Center Arm, because it does not contribute to the lifter's Maximum Load Capacity. In addition, capacities calculated from the Per-Pad Load Capacity may not exceed the Maximum Load Capacities listed above.
- 4..... Vacuum pads and other wear-out items are excluded.

SPECIFICATIONS



Note: A standard VL2MAN with Adjustable Center Arm and 8" [20 cm] hand cups is shown.

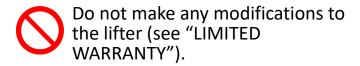
SAFETY

Wear personal protective equipment that is appropriate for the load material. Follow trade association guidelines.

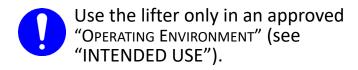
Make sure the contact surfaces of the load and vacuum pad are clean before attaching the lifter (see "MAINTENANCE").

Do not remove or obscure safety labels.

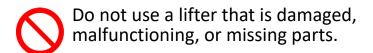
Position the vacuum pad correctly on the load before lifting (see "OPERATION: Positioning the Lifter on the Load").

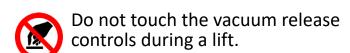


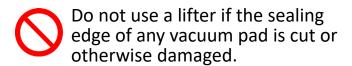
Do not lift a load if any vacuum indicator shows inadequate vacuum.



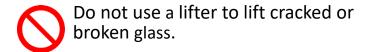
Keep unauthorized personnel away from the lifter, to avoid injury in case of an unintended load release.



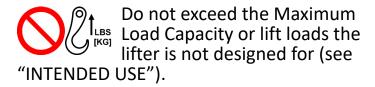




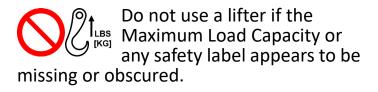
Do not allow people to ride on the lifter or the load.



Do not lift a load higher than necessary or leave suspended loads unattended.



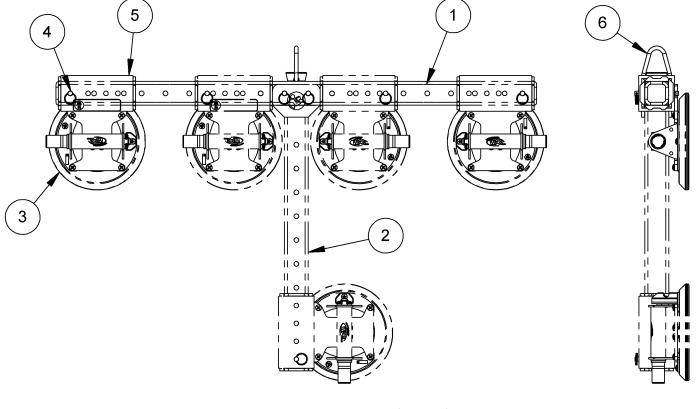
Do not position a loaded or unloaded lifter over people.



Before servicing a powered lifter, place the power control in the inactive position and, when possible, disconnect the power source.

OPERATING FEATURES

Features shown here are <u>underlined</u> on their first appearance in each section following.



1 PAD FRAME

COTTERLESS HITCH PIN

- 2 ADJUSTABLE CENTER ARM (optional)
- SLIDING HAND CUP MOUNT
- 3 HAND CUP with VACUUM PAD
- 6 LIFT POINT

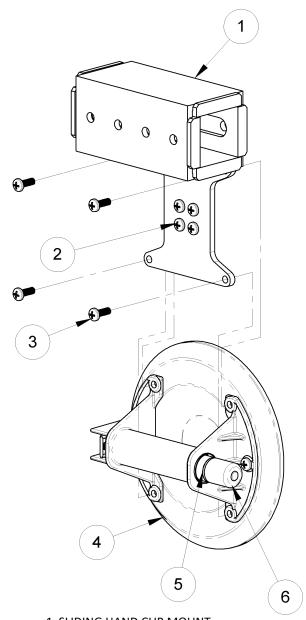
Note: A standard VL2MAN with Adjustable Center Arm and 8" [20 cm] hand cups is shown.

For information about specific parts, see "REPLACEMENT PARTS" and/or any separate instructions for Product Options.

ASSEMBLY

- 1) Remove all lifter restraints and save them with the shipping container for future use.
- 2) If the lifter has the <u>adjustable center arm</u>, install or remove this option as needed to support anticipated load dimensions (see "To Install or Remove the Adjustable Center ARM").
- 3) When necessary, attach a Powr-Grip® hand cup to each sliding hand cup mount:¹
 - 3.1) Remove the 4 screws from the corners of the hand cup's handle base.
 - 3.2) Remove the 4 longer screws from the center of the cup mount. Insert the 4 hand cup screws into the center of the cup mount. Then tighten the screws securely.
 - 3.3) Position the hand cup onto the cup mount and align the screw holes.
 - 3.4) Insert the longer screws through the cup mount and into the hand cup. Then tighten the screws securely.
 - 3.5) Repeat these steps for all cup mounts in use.

Note: Make sure all <u>vacuum pads</u> are facing the same direction.



- 1 SLIDING HAND CUP MOUNT
- 2 HAND CUP SCREWS
- 3 LONGER SCREWS
- 4 VACUUM PAD
- **5 RED-LINE VACUUM INDICATOR**
- 6 PLUNGER

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^{1.....} Other manufacturers' hand cups may reduce load capacity or be incompatible. Use the same model of hand cups in all cup mounts.

ASSEMBLY

4) Suspend the lifter from appropriate hoisting equipment:

4.1) Select a crane and/or hoist rated for the Maximum Load Capacity.



Note: Any lifter use must comply with all statutory or regulatory standards for hoisting equipment in your region.

4.2) Attach the hoisting hook to the <u>lift</u> point (fig. 4A).

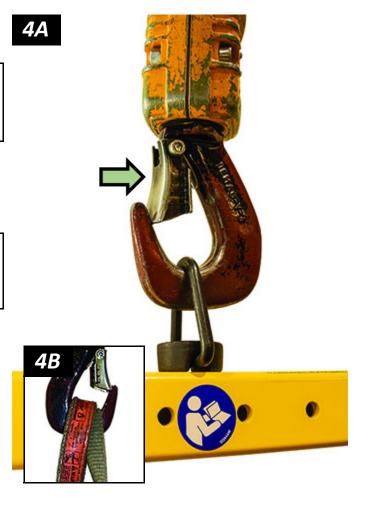


Make sure hook has restraining latch (see arrow in fig. 4A).

Use rigging (fig. 4B) as needed to make sure the hook does not interfere with the load.



Only use rigging rated for Maximum Load Capacity plus Lifter Weight.



- 4.3) Use the hoisting equipment to suspend the lifter.
- 5) Perform tests as required under "TESTING".

ASSEMBLY

TO INSTALL OR REMOVE THE ADJUSTABLE CENTER ARM



Center arm does NOT increase lifting capacity.

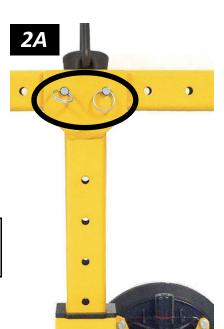
If the lifter has an <u>adjustable center arm</u>, install this option as needed to support the load's dimensions before attaching the lifter to a load (see "To ATTACH THE PADS TO A LOAD"):^{1, 2}

- 1) Remove the <u>cotterless hitch pins</u> (circled in fig. 2A) from the mount of the center arm.
- 2) Slide the <u>pad frame</u> into the mount, so that the holes below the lift point align for the hitch pins.



Use BOTH hitch pins to secure center arm on the pad frame.

3) Reinstall the hitch pins through the holes, to secure the center arm on the pad frame.

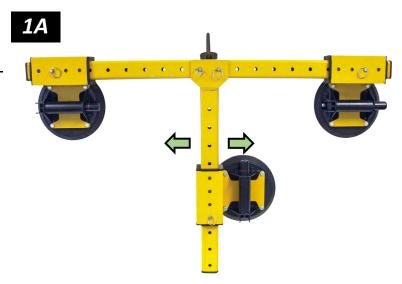


To remove the center arm, reverse these steps. Store the center arm in a clean, dry location.

About Asymmetrical Loads

If the load has an asymmetrical shape (eg, L-shaped loads), you can move the adjustable center arm along the lifter's <u>pad</u> <u>frame</u> to provide better support (fig. 1A):

- 1) Remove the <u>cotterless hitch pins</u> from the center arm's mount.
- 2) Slide the center arm to the desired location on the pad frame and align the holes for the hitch pins.
- 3) Reinstall the hitch pins, to secure the center arm.



^{1.....} To support the maximum load dimensions, the center arm must be installed on the lifter.

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^{2.....} To support smaller dimensions, the center arm may be removed, provided that load overhang can be minimized sufficiently (see "LOAD CHARACTERISTICS").

INTENDED USE

LOAD CHARACTERISTICS

Make sure the vacuum lifter is intended to handle each load according to these requirements:



Do NOT lift explosives, radioactive substances or other hazardous materials.

The load weight must not exceed the Maximum Load Capacity.



 The load must be a single piece of nonporous material with a flat and relatively smooth



Do NOT lift rough or porous materials, such as unfinished wood or rough-cut stone.

contact surface.^{1, 2} To determine whether the load is too porous or rough, perform the "Lifter/Load Compatibility Test".

- The load's contact surface must be able to obtain a friction coefficient of 1 with the lifter's vacuum pads (see "Pad-to-Load Friction Coefficient"). Otherwise, the capacity should be derated appropriately.
- The load's surface temperature must not exceed the Operating Temperatures.³



- The load's minimum length and width are determined by the current Pad Spread (see "SPECIFICATIONS").
- The load's maximum length and width are determined by its allowable overhang.⁴
- 1" [2.5 cm] is the allowable thickness at Maximum Load Capacity.⁵



Note: Standard vacuum pads can stain or deform load surfaces with light colors or soft coatings. Test such surfaces for damaging effects before using the lifter on them.⁶

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^{1.....} Although concave vacuum pads can also attach to some curved loads, curvature can reduce lifting capacity. Contact WPG for more information.

^{2.....} A "single piece" of material includes curtainwall assemblies, unitized glazing systems and similar construction units.

^{3.....} Vacuum pads made from a heat-resistant rubber compound can enable you to lift loads with higher surface temperatures. Contact WPG or an authorized dealer for more information.

^{4.....} The allowable overhang is the amount of load material that can extend sideways beyond the vacuum pad without breaking or otherwise being damaged. This depends on the load material, its thickness, and the angle of handling (if any). Since every material has different physical properties, the allowable overhang must be evaluated separately for each load type. Contact WPG or an authorized dealer for more information.

^{5.....} However, the allowable thickness increases as load weight decreases. Contact WPG for more information.

^{6.....} Alternative rubber compounds are available for these purposes. Contact WPG or an authorized dealer for more information.

INTENDED USE

OPERATING ENVIRONMENT

Make sure the vacuum lifter is intended for use in each work environment, given the following restrictions:

 This lifter is not intended for any environment that is dangerous to the operator or damaging to the lifter. Avoid environments containing



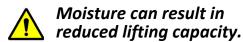
Never use lifter in dangerous environments.

explosives, caustic chemicals and other dangerous substances.

The work environment is limited by the Operating Elevation and Operating Temperatures.¹



• The lifter is not designed to be watertight. Do not use it in rain or other unsuitable conditions.



CE/UKCA — A secondary positive holding device is required to lift loads on construction sites.

DISPOSAL OF THE LIFTER

After the Service Life of the vacuum lifter has ended (see "SPECIFICATIONS"), dispose of it in compliance with all local codes and applicable regulatory standards.

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^{1.....} Lifting capacity is reduced whenever the red-line indicators are visible. Contact WPG for more information.



BEFORE USING THE LIFTER

Determine whether the vacuum lifter is capable of each intended task (see "SPECIFICATIONS" and "INTENDED USE"). Then complete the following preparations:

Taking Safety Precautions

 Be trained in all industry and regulatory standards for lifter operation in your region.



Read all directions and safety rules before using lifter.



Always wear appropriate personal protective equipment.

 Follow trade association guidelines about precautions needed for each load material.

Performing Inspections and Tests

• Follow the "Inspection Schedule" and "Testing".

TO ATTACH THE PADS TO A LOAD

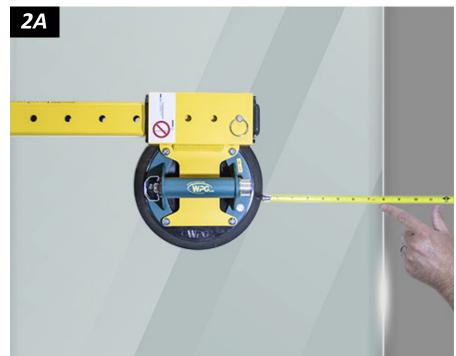
Caution: Attach this lifter only to vertically oriented loads.

1) Make sure the contact surfaces of the load and <u>vacuum</u> <u>pads</u> (fig. 1A) are clean (see "Pad Cleaning").



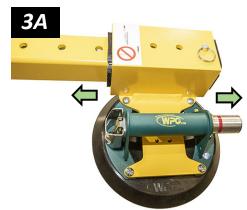
2) Center the <u>pad frame</u> from left to right on the load and position the (uppermost) pads near the top edge, to maximize stability. Make sure all pads will fit on the load and will be loaded evenly (fig. 2A).

Consult the Per-Pad Load Capacity.

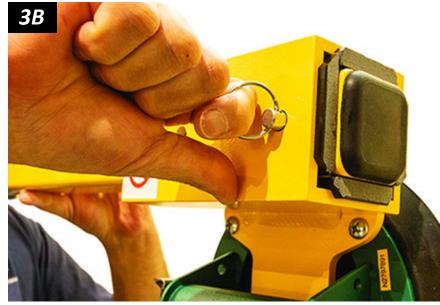


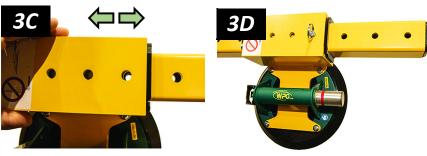
3) Position the <u>sliding hand cup mounts</u> to optimize load support and minimize load overhang (fig. 3A):

Note: Adjacent vacuum pads must not contact one another.



- 3.1) Remove the cotterless hitch pin from one cup mount (fig. 3B).
- 3.2) Slide the cup mount to the desired position and align the holes for the hitch pin (fig. 3C).
- 3.3) Reinstall the hitch pin to secure the cup mount (fig. 3D).
- 3.4) Repeat these steps for each cup mount.

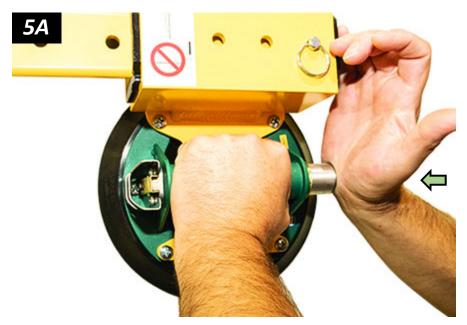




Note: If the lifter has an adjustable center arm, repeat these steps for the cup mount on it, too (fig. 3E).



- 4) Place the <u>vacuum pads</u> on the load surface. Make sure the entire sealing edge of each pad is in contact with the surface.¹
- 5) Pump the plunger of each hand cup (figs. 5A-B) until the red-line vacuum indicator stays hidden (see "Watching Red-Line Indicators"). Repeat this with all hand cups in use.





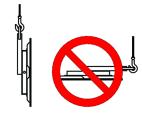
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^{1.....} Although a vacuum pad may become distorted during shipping or storage, this condition should correct itself with continued use.

TO LIFT AND MOVE THE LOAD



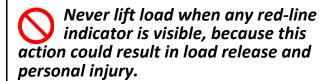
Never lift load when lifter is in horizontal orientation.

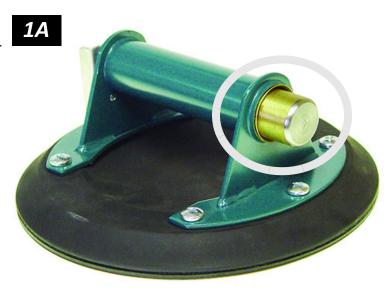


Interpreting Red-Line Indicators

A red line on the plunger of each <u>hand cup</u> serves as a vacuum indicator. When the redline vacuum indicator is hidden (circled in fig. 1A) on all hand cups in use, vacuum is sufficient for lifting.

If air leaks back into any hand cup, its redline indicator will become visible, to signal the reduction in vacuum.





Watching Red-Line Indicators

The plungers on all <u>hand cups</u> must remain completely visible to the operator throughout the entire lift.

Always monitor red-line indicators; never leave suspended loads unattended.

Check all red-line vacuum indicators frequently to make sure the <u>vacuum pads</u> remain securely attached. If a red-line indicator becomes visible on any hand cup:

 Keep everyone away from a suspended load until it can be safely lowered to a stable support.



Stay clear of suspended load while any red-line indicator is visible.

- 2) Stop using the lifter until the cause of the vacuum loss is identified: Conduct the "Pad Inspection" and perform a "Vacuum Test".
- 3) Correct any deficiency before resuming normal operation of the lifter. Consult the hand cups' *INSTRUCTIONS* for service information.

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Controlling the Lifter and Load

When the lifter is ready, use the hoisting equipment to raise the lifter and load as needed.

Use the <u>pad frame</u>, additional <u>hand cups</u> or other appropriate means to keep the lifter and load in the required position.

Once there is enough clearance, you may move the load as required.

TO RELEASE THE PADS FROM THE LOAD



Make sure load is at rest and fully supported before releasing <u>vacuum pads</u>.

- Press the valve release lever (circled in fig.
 on each <u>hand cup</u> until all the <u>vacuum</u> <u>pads</u> disengage completely from the load.
- 2) Before you lift another load, perform the Every-Lift Inspection (see "INSPECTION SCHEDULE").



AFTER USING THE LIFTER

Use the hoisting equipment to lower the vacuum lifter gently onto a stable support. Then detach the hoisting equipment hook from the <u>lift point</u>.

Caution: Do not set the lifter on surfaces that could soil or damage vacuum pads.

Storing the Lifter

1) Use the covers (when available) to keep the <u>vacuum</u> <u>pads</u> clean (fig. 1A).

CE/UKCA — To prevent the lifter from tipping over on relatively horizontal surfaces, place the vacuum pads facedown on a clean, smooth, flat surface.

2) Store the lifter in a clean, dry location.

Note: If hand cups are removed from the lifter, store them in their original cases (fig. 2A), if applicable.





Transporting the Lifter

Secure the lifter in the original shipping container with the original shipping materials or equivalent.

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INSPECTION SCHEDULE

Consult <u>hand cup</u> *INSTRUCTIONS* for additional inspection requirements.

Perform inspections according to the following frequency schedule. If any fault is found, correct it and perform the next most frequent inspection before using the vacuum lifter.

Note: If a lifter is used less than 1 day in a 2-week period, perform the Periodic Inspection before using it.

Action	Every Lift	Frequent ¹ (every 20-40 hrs)	Periodic ² (every 250-400 hrs)
Examine <u>vacuum pads</u> for contaminates or damage (see "Pad Inspection").	✓	✓	✓
Examine load surface for contaminates or debris.	✓	✓	✓
Examine lifter's structure for damage.		✓	✓
Examine hand cups for damage.		✓	✓
Perform "Vacuum Test".		✓	✓
 Examine entire lifter for evidence of: looseness, excessive wear or excessive corrosion deformation, cracks, dents to structural or functional components any other hazardous conditions 			✓

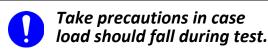
^{1......} The Frequent Inspection is also required whenever the lifter has been out of service for 1 month or more.

^{2.....} The Periodic Inspection is also required whenever the lifter has been out of service for 1 year or more. Keep a written record of all Periodic Inspections. If necessary, return the lifter to WPG or an authorized dealer for repair (see "LIMITED WARRANTY").

TESTING

Lifter/Load Compatibility Test¹

- 1) Make sure the <u>hand cups</u> are functioning correctly (see "Vacuum Test").
- 2) Thoroughly clean the load surface and the <u>vacuum pads</u> (see "Pad Cleaning").
- 3) Place the load in the upright position on a stable support.
- 4) Attach the vacuum pads to the load as previously directed.
- 5) Raise the load a minimal distance, to make sure it is supported by the lifter.



- 6) Watch the <u>red-line vacuum indicators</u>: **All of them must remain hidden for 5 minutes.** If not, the load is not compatible with this lifter.
 Contact WPG for more information.
- 7) Lower the load after 5 minutes or whenever any red-line indicator begins to appear.

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^{1.....} The "Pad-to-Load Friction Coefficient" can affect the outcome of this test.

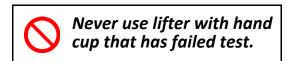
Perform the following tests before placing the lifter in service *initially, following any repair,* when directed in the *"INSPECTION SCHEDULE"*, or *whenever necessary*:

Operational Tests

Test all features and functions of the lifter (see "OPERATING FEATURES" and "OPERATION").

Vacuum Test

- 1) Clean the face of each vacuum pad (see "Pad Cleaning").
- 2) Attach the vacuum pads as previously directed to a clean, smooth, scratch-free piece of glass or metal. 1 **Do not lift the test material during the test.**
- 3) Monitor the <u>hand cups'</u> red-line vacuum indicators: **All red-line indicators must remain hidden for 2 hours.** If not, service the hand cup(s) as directed in their *INSTRUCTIONS* and repeat the test.



4) Correct any fault before resuming normal operation of the lifter.

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^{1.....} The material should have either a flat surface or no more curvature than the lifter is designed for, if any.

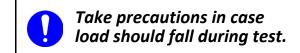
Rated Load Test¹

The following steps must be performed or supervised by a qualified person:²

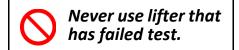
1) Use a test load that weighs 125% (±5%) of the Maximum Load Capacity and has the appropriate "LOAD CHARACTERISTICS".



- 2) Attach the vacuum pads to the load as previously directed.
- 3) Position the load to produce the greatest stress on the lifter consistent with "INTENDED USE".
- 4) Raise the load a minimal distance and leave it suspended for 2 minutes.



- 5) Once the test is completed, lower the load for release as previously directed.
- 6) Inspect the lifter and <u>hand cups</u> for any stress damage, and repair or replace components as necessary to successfully pass the test.



7) Prepare a written report of the test and keep it on file.

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^{1.....} An equivalent simulation may also be used. Contact WPG for more information.

^{2.....} A "qualified person" has successfully demonstrated the ability to solve problems relating to the subject matter and work, either by possessing a recognized degree in an applicable field or a certificate of professional standing, or by possessing extensive knowledge, training and experience.

MAINTENANCE

Notes: Maintenance must be performed whenever a deficiency is indicated by "INSPECTIONS" AND TESTS" and completed before resuming normal operation of the lifter. Consult the hand cup INSTRUCTIONS for additional maintenance information.

VACUUM PAD MAINTENANCE

Pad-to-Load Friction Coefficient

The friction coefficient represents the lifter's ability to resist load slippage. The Maximum Load Capacity is based on a friction coefficient of 1, as determined by testing of clean, new, standard rubber vacuum pads on clean, dry, regular glass. If the lifter is used under any other conditions, a qualified person must first determine the effective lifting capacity. 1

Long-term exposure to heat, chemicals or UV light can reduce the friction coefficient of vacuum pads. Replace pads every 2 years or more often, when necessary.

Pad Inspection

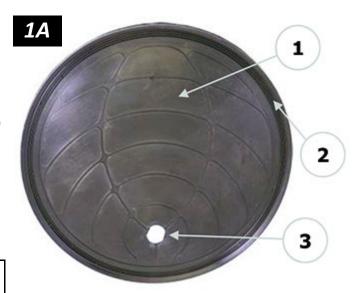
Inspect each vacuum pad (fig. 1A) according to the "INSPECTION SCHEDULE" and correct the following faults before using the lifter (see hand cup INSTRUCTIONS, when applicable):

- Contaminates on the face (item 1 in fig. 1A) or sealing edges (item 2 in fig. 1A).
- Air filter (item 3 in fig. 1A) missing from face.
- Nicks, cuts or abrasions in sealing edges.



Replace any pad that has damaged sealing edges.

Wear, stiffness or glaze.



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^{1.....} A "qualified person" has successfully demonstrated the ability to solve problems relating to the subject matter and work, either by possessing a recognized degree in an applicable field or a certificate of professional standing, or by possessing extensive knowledge, training and experience.

MAINTENANCE

Pad Cleaning

 Regularly clean the face of each <u>vacuum</u> <u>pad</u> (fig. 1A), using soapy water or other mild cleansers to remove oil, dust and other contaminates.

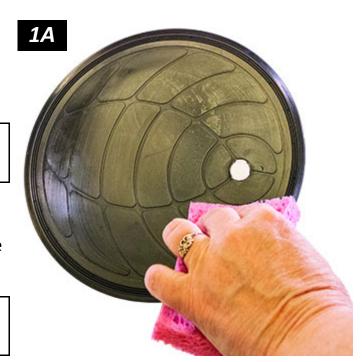


Never use harsh chemicals on vacuum pad.

Solvents, petroleum-based products (including kerosene, gasoline and diesel fuel) or other harsh chemicals can damage vacuum pads.



Never use rubber conditioners on vacuum pad.



Many rubber conditioners can leave a hazardous film on vacuum pads.

- 2) Prevent liquid from entering the vacuum pump through the suction hole on the pad face.
- 3) Remove the air filter and wipe the pad face clean, using a clean sponge or lint-free cloth to apply the cleanser.¹
- 4) Allow the pad to dry completely and reinstall the air filter.

Repeat steps 1-4 for all vacuum pads before using the lifter.

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^{1.....} A brush with bristles *that do not harm rubber* can help remove contaminates clinging to sealing edges. If these cleaning methods are not successful, contact WPG or an authorized dealer for assistance.

REPLACEMENT PARTS

Stock No.	Description	Qty.
91500CRL	Hand Cup – Model N4950 / 8" [20 cm] Diameter — CRL Version	2/3
91500	Hand Cup – Model N4950 / 8" [20 cm] Diameter	2/3
91400CRL	Hand Cup – Model N4000 / 8" [20 cm] Diameter — CRL Version	2/3
91400	Hand Cup – Model N4000 / 8" [20 cm] Diameter	2/3
65334	Hoist Ring – 180° Pivot	1
49110	End Plug – 2" x 2" x 3/16" Tubing Size	2
29353	Pad Cover (optional)	2/3
29353CRL	Pad Cover (optional)	2/3
13522	Cotterless Hitch Pin – 3/8" x 3-1/2"	2
13520	Cotterless Hitch Pin – 3/8" x 3" (for Center Arm option)	2
10003	Machine Screw – 1/4-20 x 3/4" (for Sliding Hand Cup Mounts)	8 / 12

Service only with identical replacement parts,

AVAILABLE AT WPG.COM OR THROUGH AN AUTHORIZED WPG DEALER

LIMITED WARRANTY

Wood's Powr-Grip[®] (WPG) 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 below to obtain warranty service. If inspection shows that the problem is due to defective workmanship or materials, WPG 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, and/or;
- the product has been damaged, misused or neglected.

If a problem is not covered under warranty, WPG 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, then WPG will proceed with repairs.

TO OBTAIN REPAIRS OR WARRANTY SERVICE

For purchases in North America:

Contact the WPG Technical Service Department. When factory service is required, ship the complete product – prepaid – along with your name, address and phone number to the street address listed at the bottom of this page. WPG may be reached by phone or fax numbers listed below.

For purchases in all other localities:

Contact your dealer or the WPG Technical Service Department for assistance. WPG may be reached by phone or fax numbers listed below.

Wood's Powr-Grip Co., Inc. 406-628-8231 (phone)
908 West Main St. 800-548-7341 (phone)
Laurel, MT 59044 USA 406-628-8354 (fax)

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