KEEP FOR FUTURE REFERENCE

OPERATING INSTRUCTIONS

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

WOOD'S POWR-GRIP WPG™ .COM

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DOUBLE-CHANNEL LIFTER, DC-VOLTAGE

Model numbers: P2110435DC; P2110445DC (shown); P211047DC

Record serial number in blank space above (to locate, see serial label on the product).

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SPECIFICATIONS

Product Description	Designed for use with hoisting equipment, P2-DC lifters support loads using vacuum and manipulate loads using manual 180° rotation and manual 90° tilt motions.		
Model Number	P2110435DC	P2110445DC	P211047DC
Lifter Weight	180 lbs [82 kg]	190 lbs [87 kg][1]	205 lbs [93 kg][2]
Pad Spread (to outer edges)	51" x 40½" [130 cm x 103 cm]	51" x 54¼" [130 cm x 138 cm]	51" x 84¼" [130 cm x 214 cm]
Vacuum Pads[3] (standard rubber)	Eight 11" [28 cm] nominal diameter, lipped (Model G3370)		
Maximum Load Capacity[4]	Per Pad: 175 lbs [79.5 kg] Total: 1400 lbs [635 kg]		
Power Source	12 volts DC, 3.5 amps for each pad channel		
Battery Capacity	7 amp-hours		
Product Options	*Available* with Individual Pad Shutoffs. See separate instructions about other options.		
Rotation Capability	Manual, 180°, with latching at each ¼ turn (when required)		
Tilt Capability	Manual, 90°, with automatic latching in vertical position		
Operating Elevation	Up to 6,000' [1,828 m]		
Operating Temperatures	32° — 104° F [0° — 40° C]		
Service Life	20,000 lifting cycles, when used and maintained as intended.[5]		
ASME Standard BTH-1	Design Category "B", Service Class "0"		
Troubleshooting Guide[6]	TST-008_DC-CHANNEL-SVS_rev2013-048		

1..... Asian Model P2110445DC Lifter Weight: 210 lbs [96 kg]

2..... Asian Model P211047DC Lifter Weight: 225 lbs [103 kg]

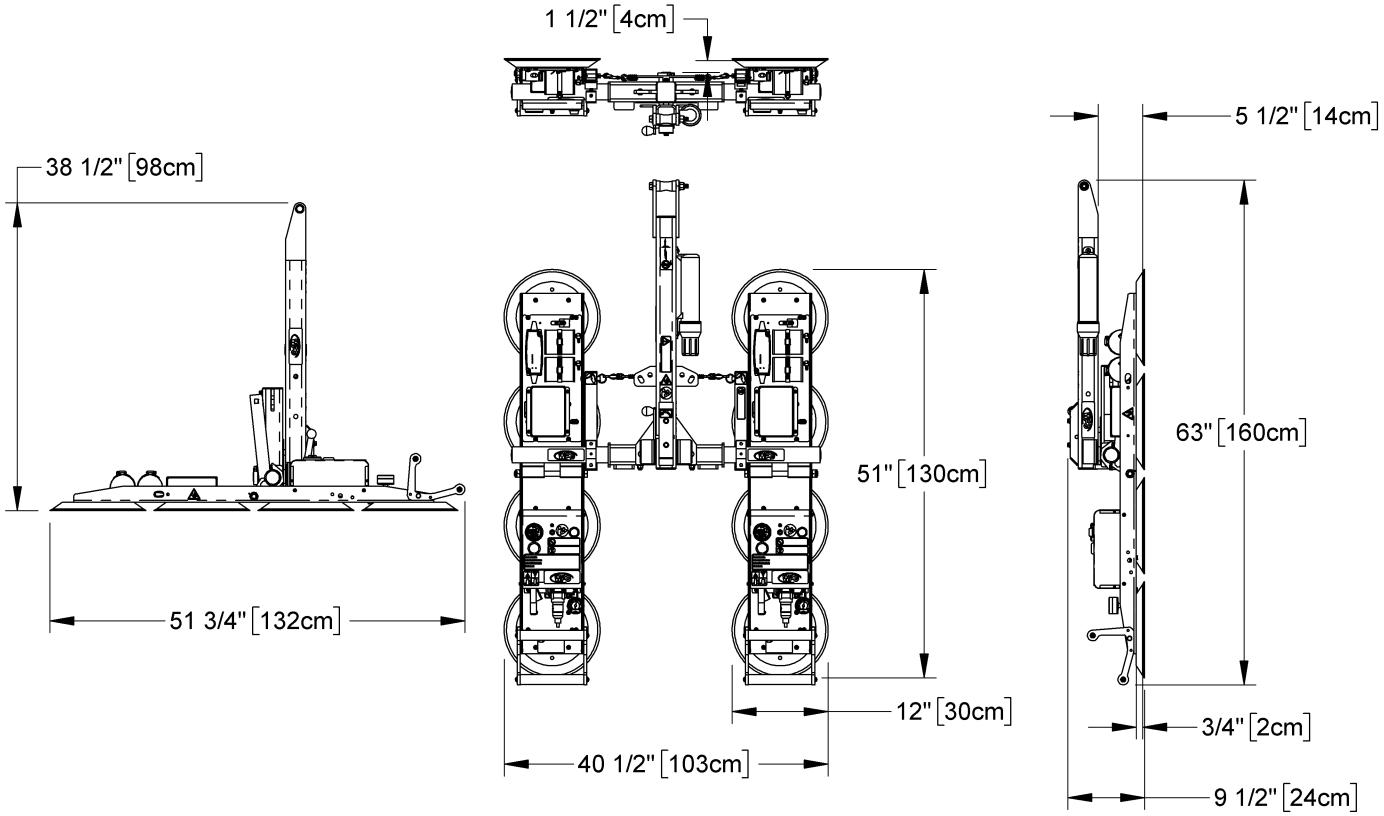
3..... Available with other rubber compounds for special purposes (see www.wpg.com).

4..... 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").

5..... Vacuum pads, filter elements and other wear-out items are excluded.

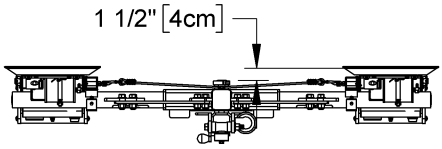
6..... To view this guide, click the link at right. Additionally, you can search for your lifter's Model Number at www.wpg.com and select the "Troubleshooting" link on the product page.

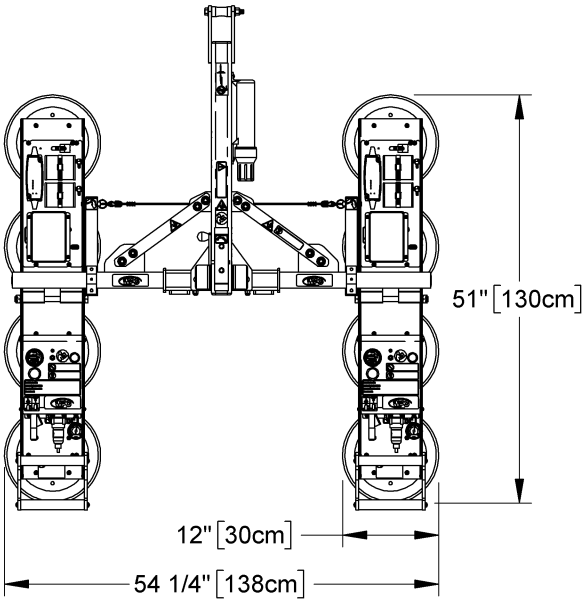
SPECIFICATIONS

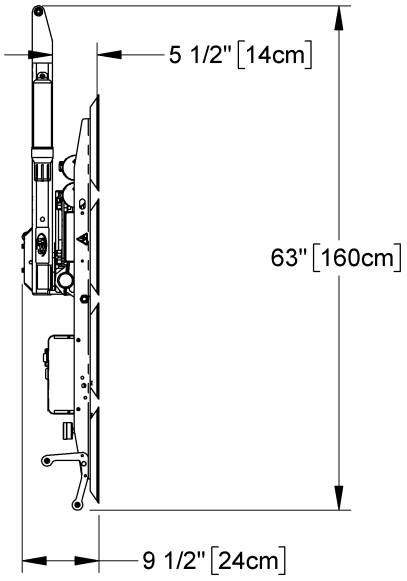


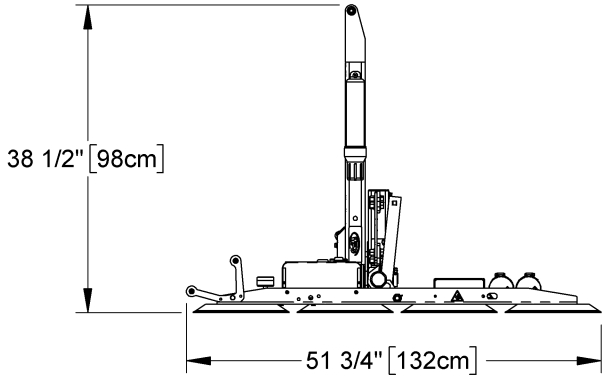
Note: A standard P2110435DC is shown.

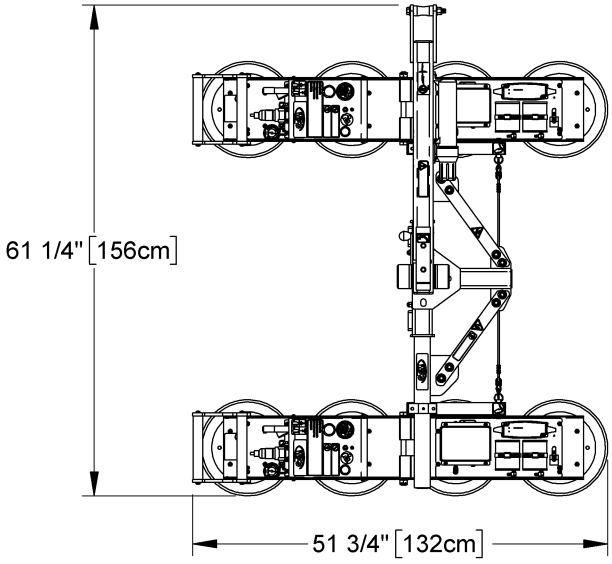
SPECIFICATIONS





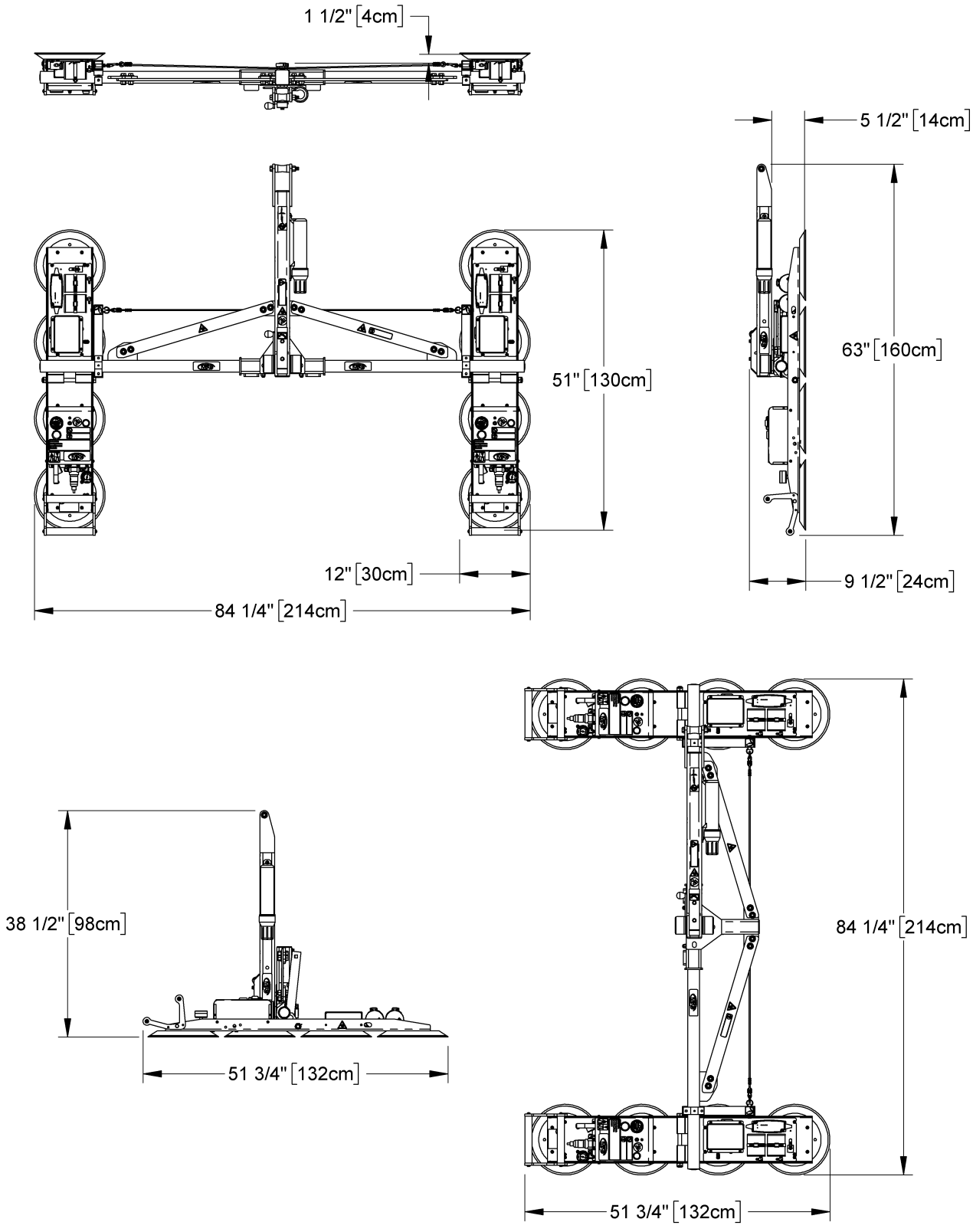






Note: A standard P2110445DC is shown.

SPECIFICATIONS



Note: A standard P211047DC is shown.

SAFETY

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

Do not remove or obscure safety labels.

Do not make any modifications to the lifter (see “LIMITED WARRANTY”).

Use the lifter only in an approved “OPERATING ENVIRONMENT” (see “INTENDED USE”).

Do not use a lifter that is damaged, malfunctioning, or missing parts.

Do not use a lifter if the sealing edge of any vacuum pad is cut or otherwise damaged.

Do not use a lifter to lift cracked or broken glass.

Do not exceed the Maximum Load Capacity or lift loads the lifter is not designed for (see “INTENDED USE”).

Do not use a lifter if the Maximum Load Capacity or any safety label appears to be missing or obscured.

Make sure the contact surfaces of the load and vacuum pads are clean before attaching the lifter (see “MAINTENANCE”).

Position the vacuum pads 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 touch the vacuum release controls during a lift.

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

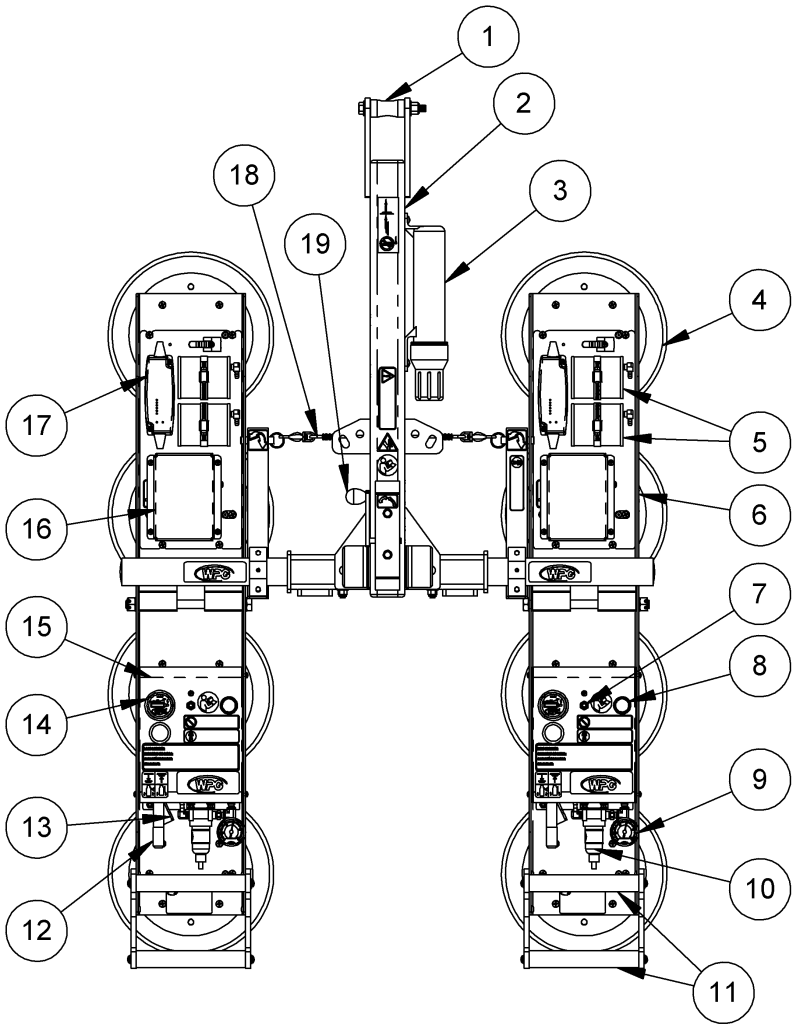
Do not lift a load higher than necessary or leave suspended loads unattended.

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 underlined on their first appearance in each section following.
If a feature is identified on one channel, an identical feature exists in the same location on the other channel.



1 LIFT POINT	2 LIFT FRAME	3 INSTRUCTIONS CANISTER
4 VACUUM PAD	5 VACUUM RESERVE TANK	6 PAD FRAME
7 BATTERY TEST BUTTON	8 LOW VACUUM WARNING LIGHT	9 VACUUM GAUGE
10 AIR FILTER	11 CONTROL HANDLES	12 VALVE HANDLE
13 VALVE RELEASE LEVER	14 BATTERY GAUGE	15 Cover for VACUUM PUMP and VACUUM SWITCH (available with LOW VACUUM WARNING BUZZER)
16 BATTERY	17 BATTERY CHARGER	18 TILT RELEASE CABLE
19 ROTATION RELEASE LEVER		

Note: A standard P2110435DC is shown. Although some of the following photos do not show this specific lifter, they all illustrate how this kind of lifter functions.

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 containers (3) for future use.

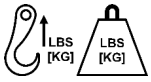
2) Disengage the rotation latch and raise the lift frame bar to a vertical orientation (figs 2A-B).

2A

2B

3) Suspend the lift frame from appropriate hoisting equipment:

3.1) Select a crane and/or hoist rated for the Maximum Load Capacity plus the Lifter Weight.



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

3.2) Attach the hoisting hook to the lift point (fig. 3A).

> ***Make sure hook has restraining latch (see arrow in fig. 3A).***

Use rigging (fig. 3B) as needed to make sure the hook does not interfere with the load.

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

3A

3B

4) Remove the channels from the shipping containers, being careful to avoid damage to any vacuum pads.

   Note: Both channels must have identical Model Numbers. If not, they are not compatible for use on the same lifter.

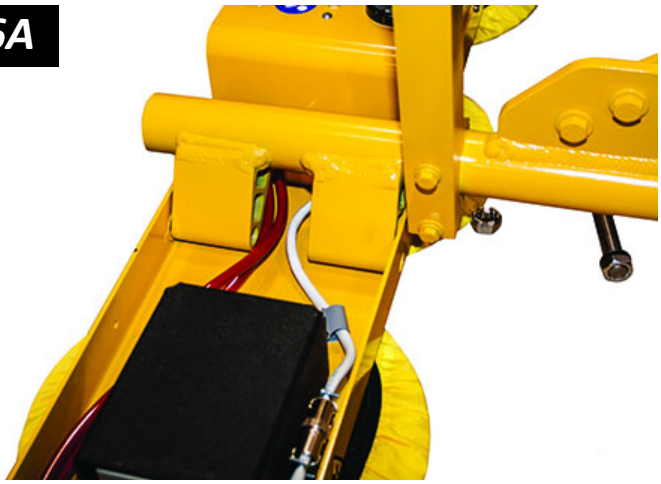
   Position the channels on a clean, flat surface (fig. 4A).

4A

5) Use the hoisting equipment to position the lift frame between the rails of each channel's pad frame, making sure the lift frame is oriented correctly (fig. 5A).

5A

6A



6B

6) Attach the lift frame to the two channels:

6.1) Align the mounting holes on the lift frame with those in one pad frame (fig. 6A).

6.2) Insert a tilt pin through the holes in one pad frame, underneath the vacuum hoses and wiring (fig. 6B).

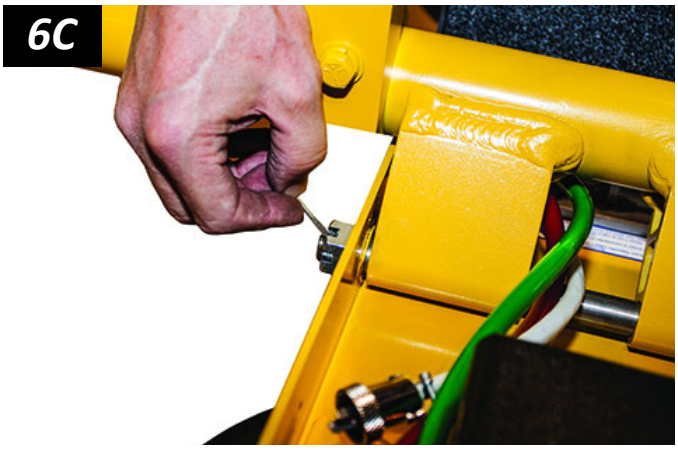
Caution: *To avoid damage, do not place tilt pin on top of vacuum hoses or wiring.*

6.3) Secure the tilt pin using the hardware supplied (fig. 6C).

Note: Flat washers should be installed outside of the pad frames.

Caution: *Replace cotter pins each time they are used.*

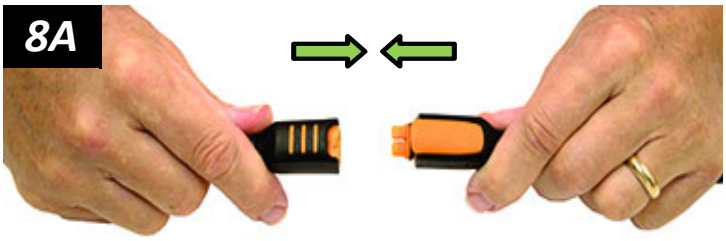
6C



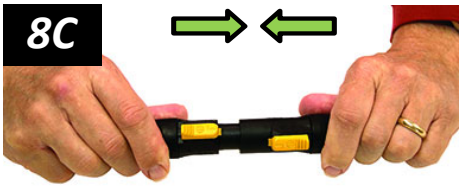
6.4) Repeat steps 6.1–6.3 to attach the second channel securely to the lift frame.

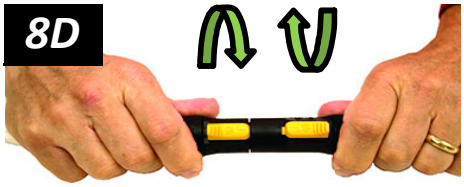
7) Use the hoisting equipment to raise the lifter. Remove the pad covers (fig. 7A) and save them for future use.

7A



8) Connect the electrical connectors on each channel (figs. 8A-B and figs. 8C-D).





9) Perform tests as required under "TESTING".

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 relatively nonporous material with a flat and relatively smooth 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]

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 pads 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.

OPERATING ENVIRONMENT

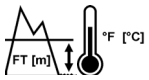
Make sure the vacuum lifter is intended for use in each work environment, given the following restrictions:

- This lifter is not intended for any environment that is dangerous to the operator or damaging to the lifter. Avoid environments containing explosives, caustic chemicals and other dangerous substances.

Never use lifter in dangerous environments.

Metal particles and similar environmental contaminants could result in <u>vacuum pump</u> failure.

- The work environment is limited by the Operating Elevation and Operating Temperatures.[1, 2]



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

Moisture can result in reduced lifting capacity.

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.

Note: Special disposal regulations may apply to the <u>battery</u>.

1..... Although lifter use may be possible at higher elevation, lifting capacity is reduced whenever the lifter is unable to attain vacuum in the green range on the vacuum gauges. Contact WPG for more information.

2..... Special provisions may allow the lifter to operate outside the specified temperature range. 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.
- Follow trade association guidelines about precautions needed for each load material.

Read all directions and safety rules before using lifter.

Always wear appropriate personal protective equipment.

Performing Inspections and Tests

- Follow the "INSPECTION SCHEDULE" and "TESTING".
- Examine the air filters and service whenever their bowls contain liquid or other contaminates, or their elements appear dirty (see "AIR FILTER MAINTENANCE" in *SERVICE MANUAL*).

Examine air filters regularly and service when needed.

- If the lifter has a low vacuum warning buzzer (fig. 1A), make sure it is clearly audible at the maximum distance between the operator and the lifter, despite any barriers or obstacles.[1, 2, 3]

Make sure warning buzzers can be heard over noise at operator position.

1..... Maximum alarm volume is 103 dBA at 2' [60 cm]. If CE or UKCA Standards apply, consult EN 7731 to make sure the warning buzzer is compliant.

2..... The "Vacuum Test" provides a convenient opportunity to check this.

3..... Lifters in the P2 Series will have a buzzer serving each of the lifter's two independent vacuum systems, if so equipped.

Checking the Battery

> ***Always check battery energy before every lift.***

Use the battery gauge on each channel to determine whether the corresponding battery needs to be charged (see "BATTERY RECHARGE").[1] Never use the lifter unless battery energy appears in the green range.

- While the valve handle is in the "attach" position (|⇠ / power on), the battery gauge automatically shows battery energy.[2]
- While the valve handle is in the "release" position (|⇢ / power off), use the battery test button (circled) to check the battery energy.[3]

1..... If the vacuum pump is running or the battery charger is connected to an AC power source, the reading on the battery gauge will not be accurate.

2..... After the pump stops running, the battery gauge requires a few moments to stabilize before it shows an accurate energy level.

3..... If the lifter has not been used since the battery was charged, the battery gauge may falsely show a high energy level. This "surface charge" dissipates after the pump runs for about 1 minute, allowing the gauge to show accurate energy.

To Use the Optional Pad Shutoffs

Each pad shutoff on the pad frame controls the vacuum line to the adjacent vacuum pad. Activating or deactivating the airflow at specific pads enables the lifter to handle loads with different weights and dimensions (see "SPECIFICATIONS") or to avoid holes in the load surface.

To support the maximum load weight and larger load dimensions, all pads must be activated; for smaller weights and dimensions, some pads may be deactivated, ***provided that the lifter still has sufficient capacity to support the load*** (see "Load Characteristics").

> ⚠ ***Closing any pad shutoff reduces lifting capacity.***

To activate a pad, place the valve lever *parallel* with the vacuum line (ie, valve open — fig. 1A).

To deactivate a pad, place the valve lever *perpendicular* to vacuum line (ie, valve closed — fig. 1B).

1A

1B

To calculate the lifting capacity when some pads are deactivated, consult the Per-Pad Load Capacity and multiply by the number of pads currently activated. Always activate pads in a symmetrical configuration and use as many pads as possible for each load being lifted, to maximize lifting capacity and to minimize load overhang.

To Attach the Pads to a Load

Make sure the contact surfaces of the load and vacuum pads are clean (see "Pad Cleaning".

Positioning the Lifter on the Load

1) Center the lifter on the load (fig. 1A).[1]
2) Make sure all vacuum pads will fit on the load and will be loaded evenly.

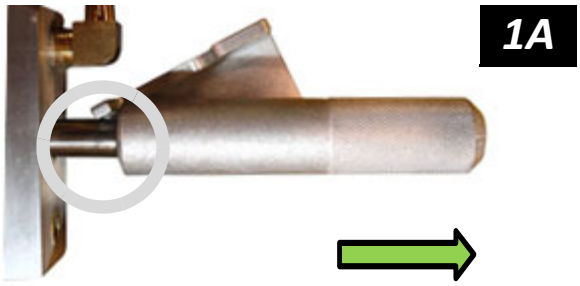
   Consult the Per-Pad Load Capacity.

   Then place the vacuum pads in contact with the load surface (fig. 2A).

1..... The lifter is designed to handle the maximum load weight when the load's center of gravity is positioned within 2" [5 cm] of the lifter's rotation axis. Uncentered loads may rotate or tilt unexpectedly.

Sealing the Pads on the Load

Pull the valve handle outward ***until it latches*** (circled in fig. 1A) in the "attach" position (|←) on each channel.



> ***Keep valve handle in "attach" position throughout lift.***

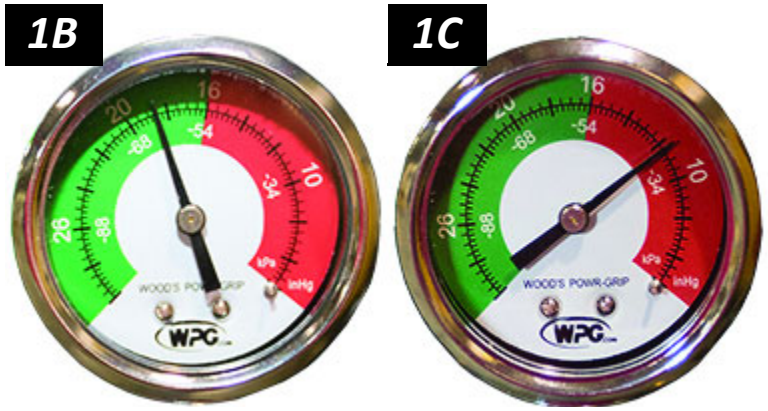
The vacuum pumps will turn on, the low vacuum warning lights will remain lit and the low vacuum warning buzzers, if present, will sound until the vacuum pads seal. This is normal.

Press the lifter firmly against the load to help the pads begin to seal.[1]

Reading the Vacuum Gauge

A vacuum gauge on each channel shows the current vacuum level in positive inches of Hg and negative kPa:

- *Green* range (≥16" Hg [-54 kPa]): Vacuum level is sufficient to lift the maximum load weight (fig. 1B).
- *Red* range (<16" Hg [-54 kPa]): Vacuum level is ***not*** sufficient to lift the maximum load weight (fig. 1C).



If it takes more than 5 seconds for the vacuum level to reach 5" Hg [-17 kPa], press on any vacuum pad that has not yet sealed.

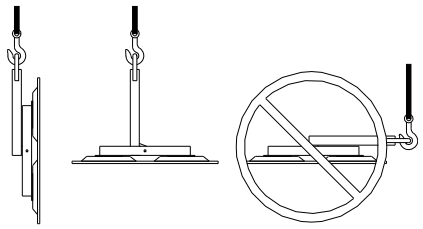
Once the pads have sealed, the lifter should be able to maintain sufficient vacuum for lifting, except when used above the maximum Operating Elevation.[2] If it does not:

- Make sure the vacuum switch is adjusted correctly (see *SERVICE MANUAL*).
- When necessary, perform the "Vacuum Test".

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

2..... If the lifter is used above the maximum Operating Elevation (see "SPECIFICATIONS"), it may not be able to maintain sufficient vacuum for lifting. Contact WPG for more information.

To Lift and Move the Load



> ***Lift frame bar must be vertical to lift load.***

Interpreting the Warning Light and Optional Warning Buzzer

> ***Never lift load unless warning devices turn off, because this could result in load release and personal injury.***

When vacuum is sufficient to lift the Maximum Load Capacity, the vacuum pumps and the low vacuum warning lights turn off temporarily, to conserve battery energy.

When air leaks into the vacuum system of a channel, the vacuum pump turns on and off (along with the warning light) as necessary to maintain sufficient vacuum for lifting. *Note: The low vacuum warning buzzer, if present, turns on and off together with the warning light.*

Watching Vacuum Indicators

Watch the low vacuum warning lights and the vacuum gauges (fig. 1A) throughout the entire lift.


1A

> ***Make sure vacuum indicators remain completely visible.***

If the warning light turns on and the ***vacuum gauge shows a level less than 16" Hg [-54 kPa]*** on either channel:

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

> ***Stay clear of any suspended load while indicators warn of low vacuum.***

2) Stop using the lifter until the cause of the vacuum loss can be identified: Conduct the "Pad Inspection" and perform the "Vacuum Test".
3) Correct any faults before resuming normal operation of the lifter.

Controlling the Lifter and Load

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

Use the control handle (circled in fig. 1A) to keep the lifter and load in the required position.

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

Never allow any pad shutoff to be opened or closed while lifting, because this could result in a load release and personal injury.

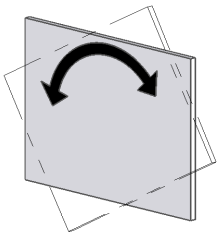
In Case of a Power Failure

A vacuum reserve tank helpsVacuum reserve tanks help maintain vacuum temporarily in the event of a battery failure or electrical system failure. Although the lifter is designed to support the load for at least 5 minutes without power, this depends on many factors, including the "LOAD CHARACTERISTICS" and the condition of the vacuum pads (see "VACUUM PAD MAINTENANCE").

If a power failure occurs, keep everyone away from a suspended load until it can be safely lowered to a stable support. Correct any faults before resuming normal operation of the lifter.

Stay clear of any suspended load during power failure.

TO ROTATE THE LOAD



Make sure load is positioned correctly on lifter (as previously directed).

Never disengage rotation and tilt latches at the same time, because this could result in load damage or personal injury.

1) Make sure the load has enough clearance to rotate without contacting anyone or anything.
2) Use a control handle (circled in fig. 2A) to keep the load under control at all times.

Unbalanced loads may rotate unexpectedly when latch is disengaged.

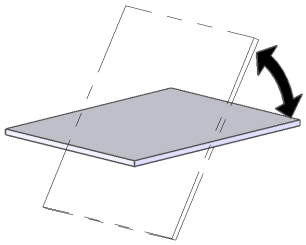
3) Pull the rotation release lever (fig. 3A) to disengage the rotation latch, and rotate the load as required.
4) To stop rotation, let go of the lever and guide the load to the next stop.

Note: Whenever rotation is not required, keep the rotation latch engaged, to prevent load damage or personal injury.

2A

3A

TO TILT THE LOAD



Make sure load is positioned correctly on lifter (as previously directed).

Never disengage rotation and tilt latches at the same time, because this could result in load damage or personal injury.

1) Make sure the load has enough clearance to tilt without contacting anyone or anything.
2) Use a control handle (circled in fig. 2A) to keep the load under control.

Unbalanced loads may tilt unexpectedly when latch is disengaged.

3) If the pad frames are latched, pull the tilt release cable (fig. 3A) to disengage the tilt latch. Then tilt the load as required.

Note: See "LOAD CHARACTERISTICS" for information about allowable overhang.

2A

3A

A load with overhang may force you to release the control handle as the load approaches the flat position. In this case, use hand cups (fig. 4A) or other appropriate means to control the load.

Note: The pad frames automatically latch when tilted to the vertical position.

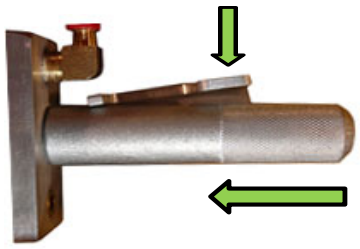
4A

To Release the Pads from the Load

> ***Make sure load is at rest and fully supported before releasing vacuum pads.***

1) Press the lever to release the latch and push the valve handle inward (fig. 1A) to the "release" position (|⇥) on each channel.

1A



> ***Do not move lifter until pads release completely, because such movement could result in load damage or personal injury.***

2) Before you lift another load, perform the Every-Lift Inspection (see "Inspection Schedule").

After Using the Lifter

1) Leave the valve handle on each channel in the "release" position (|⇥ / power *off*).
2) Charge the battery on each channel after each workday as needed (see "Battery Recharge").[1]
3) Use the hoisting equipment to lower the vacuum lifter gently onto a stable support. Then detach the hoisting hook from the lift point.

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

   Note: Control handles can be used to support an unloaded lifter when not suspended (fig. 3A). Make sure the lifter leans securely against an appropriate support that does not contact the vacuum pads.

3A

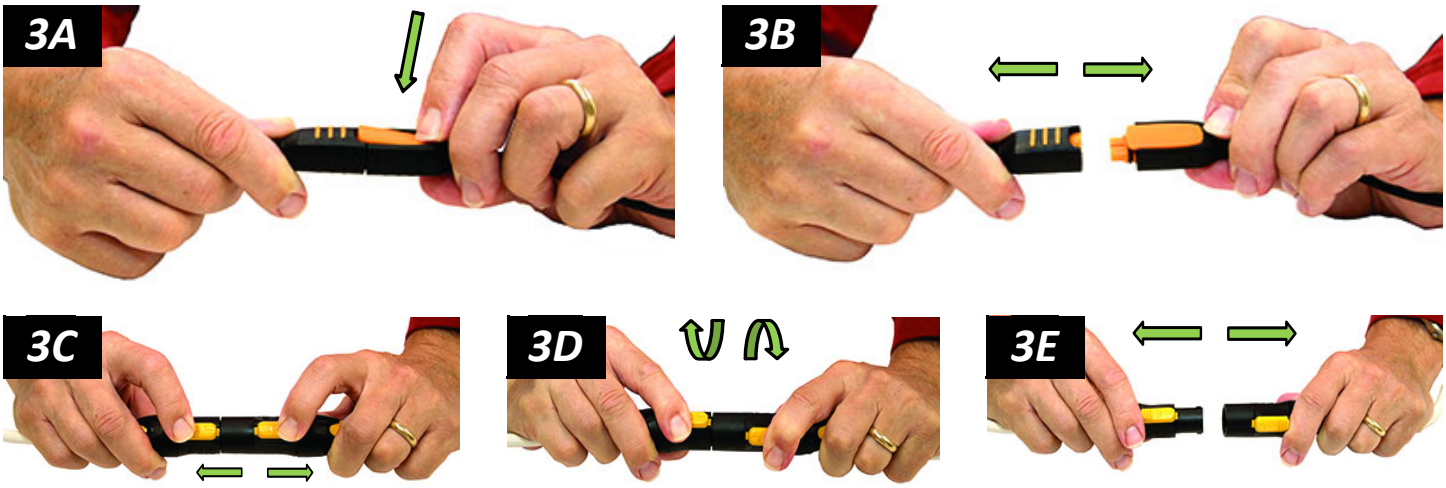
1..... To maximize battery life, charge it promptly after each use.

Storing the Lifter

1) Use the pad covers supplied (fig. 1B) to keep the vacuum pads clean.

CE/UKCA – *To prevent the lifter from tipping over on relatively horizontal surfaces, place the vacuum pads facedown on a clean, smooth, flat surface. Then lower the lift frame bar and place a support under the lift point.*

2) Charge the battery on each channel completely and repeat every 6 months (see "BATTERY RECHARGE").



3) Disconnect the electrical connectors (figs. 3A-B and figs. 3C-E) on each channel, to prevent battery discharge.

4) Store the lifter in a clean, dry location. Store the battery between 32° and 70° F [0-21° C]. Avoid storage above 100° F [38° C].

Transporting the Lifter

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

INSPECTION SCHEDULE

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 vacuum pads for contaminates or damage (see "Pad Inspection").	✓	✓	✓
Examine load surface for contaminates or debris.	✓	✓	✓
Examine controls and indicators for damage.	✓	✓	✓
Check each channel's battery for adequate charge (see "Checking the Battery").	✓	✓	✓
Examine lifter's structure for damage.		✓	✓
Examine vacuum systems for damage (including vacuum pads, fittings and hoses).		✓	✓
Examine air filters for conditions requiring service (see "AIR FILTER MAINTENANCE" in *SERVICE MANUAL*).		✓	✓
Perform "Vacuum Test".		✓	✓
Check for unusual vibrations or noises while operating lifter.		✓	✓
Examine entire lifter for evidence of: • looseness, excessive wear or excessive corrosion • deformation, cracks, dents to structural or functional components • cuts in vacuum pads or hoses • any other hazardous conditions			✓
Inspect entire electrical system for damage, wear or contamination that could be hazardous, in compliance with all local codes and regulatory standards. *Caution: Use appropriate cleaning methods for each electrical part, as specified by codes and standards. Improper cleaning can damage parts.*			✓

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

Perform the following test to determine whether or not a load surface is too porous or rough:

Lifter/Load Compatibility Test

1) Make sure the vacuum generating system on each channel is functioning correctly (see "Vacuum Test").
2) Thoroughly clean the load surface and the vacuum pads (see "Pad Cleaning").[1]
3) Place the load in the position on a stable support.
4) Attach the vacuum pads to the load as previously directed.
5) After the vacuum pump on each channel stops running, disconnect the corresponding battery connector.[2]
6) Raise the load a minimal distance, to make sure it is supported by the lifter.

Take precautions in case load should fall during test.

7) Watch eachthe vacuum gauge: ***Starting from a vacuum level of 16" Hg [-54 kPa], the lifter must maintain a vacuum level greater than 12" Hg [-41 kPa] for 5 minutes.***[3] If not, lifting this load requires additional precautions (eg, a load sling). Contact WPG for more information.
8) Lower the load *after* 5 minutes or *before* the vacuum level diminishes to 12" Hg [-41 kPa].

1..... Contaminated loads can cause the vacuum pump to run frequently or continuously. Since excessive pumping quickly reduces battery energy, clean the load whenever possible.

2..... Move the valve handle to the "release" position (power *off*) before reconnecting the battery.

3..... Under CE requirements, the lifter must maintain a vacuum level ***greater than 8" [-27 kPa]***.

INSPECTIONS AND TESTS

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) Use a test load with weight equal to the Maximum Load Capacity, a clean, smooth, nonporous surface and other appropriate "LOAD CHARACTERISTICS".[1]

3) Attach the lifter to the test load as previously directed. After the vacuum pump on each channel stops running, the vacuum level should appear in the green range on each of the vacuum gauges (if not, see "VACUUM SWITCH ADJUSTMENT" in *SERVICE MANUAL*).
4) Raise the load a minimal distance and disconnect the battery connector on each channel.

Take precautions in case load should fall during test.

5) Watch the vacuum gauges: *The vacuum level should not decrease by more than 4" Hg [-14 kPa] in 5 minutes.*
6) Lower the load after 5 minutes or whenever a lifter fails the test, and release the load as previously directed.

Never use lifter that has failed test.

7) Qualified service personnel must correct any fault in the vacuum systems before the lifter can be returned to service.[2]

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

2..... For more information, search for your lifter's Model Number at www.wpg.com and select the "Troubleshooting" link on the product page.

Rated Load Test[1]

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 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.

Take precautions in case load should fall during test.

Never use lifter that has failed test.

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.

*Note: Refer to **SERVICE MANUAL #36110** when applicable.*

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 damage vacuum pads. Replace pads every 2 years or more often when necessary.

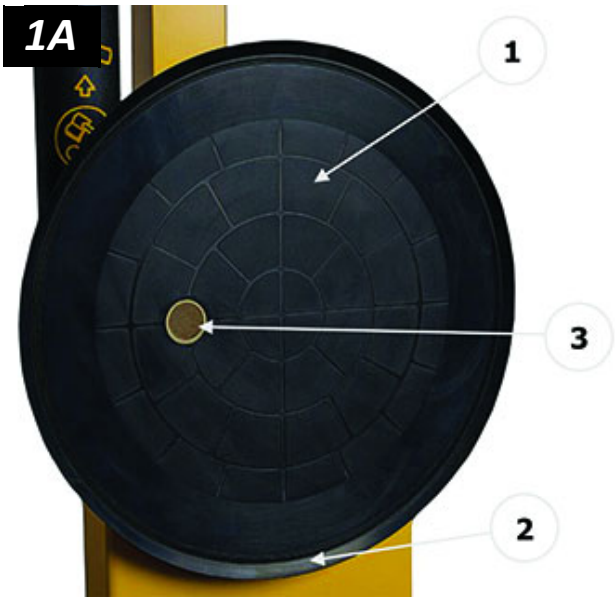
Pad Inspection

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

- Contaminates on the face (item 1 in fig. 1A) or sealing edges (item 2 in fig. 1A).
- Filter screen (item 3 in fig. 1A) missing from face.

> ***Replace any pad that has damaged sealing edges.***

- Nicks, cuts, deformation or abrasions in sealing edges.
- Wear, stiffness or glaze.



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.

Pad Cleaning

1) Regularly clean the face of each vacuum pad (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 system through the suction hole on the pad face.

3) Wipe each pad face clean, using a clean sponge or lint-free cloth to apply the cleanser.[1]

4) Allow each pad to dry completely before using the lifter.

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.

BATTERY RECHARGE

Charge the battery on each channel whenever the corresponding battery gauge shows reduced energy.[1] ***Caution:*** *Make sure each channel's valve handle is in "release" position (|→▯ / power off).*

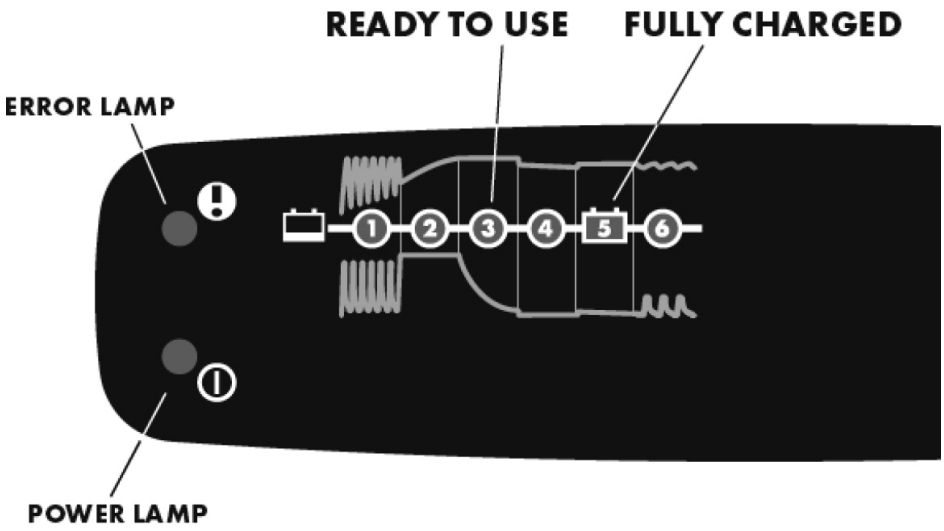
Identify the input voltage marked on the battery charger of each channel, and plug it in to an appropriate power source.[2]

> ***Make sure power source has ground fault circuit interrupter.***

The power lamp (Φ) turns on when the charger is functioning. Consult the six-stage display to determine the charging status. The battery can be used after stage 3 and is fully charged at stage 5.

Normally, the battery on each channel should take no more than 8 hours to charge completely.[3] If not, check for the following faults:

- Power lamp (Φ) flashes: Charger is not connected to battery; reconnect charger (see "ASSEMBLY").
- Error lamp (!) turns on immediately: Battery leads connected to wrong poles; reverse battery leads.
- Charging stops at stage 1 or 4, and error lamp (!) turns on: Battery is no longer functioning; replace battery (see "REPLACEMENT PARTS").



Before you return the lifter to service, recheck the battery as previously directed.

1..... To maximize the battery's lifespan, charge it promptly after each use.

2..... Any external power supply must conform to all applicable local codes. This lifter is not intended for use while the charger is connected to AC power.

3..... The charger automatically reduces the charging rate when the battery is fully charged.

REPLACEMENT PARTS

Stock No.	Description	Qty.
93012	Pad Shutoff Valve Assembly	8
65440	Vacuum Hose – 0.245" ID x 3/8" OD – Red	*
65301	Handle Grip Foam	*
64715	Battery Charger – 0.8 Amp – 240 V AC	2
64714	Battery Charger – 0.8 Amp – 100 / 120 V AC	2
64664	Battery – 12 V DC – 7 Amp-Hours	2
59086NC	Battery Connector – Twin Lead	2
57012	Pad Channel Tilt Pin	2
54390NC	Power Lead	1
53132	Hose Fitting – Tee – 5/32" ID	4
53126	Pad Fitting – Tee – 3/64" ID	4
53120	Pad Fitting – Elbow – 3/64" ID	4
49646T	Vacuum Pad – Model G3370 / 11" [28 cm] Diameter – Lipped	8
49605T	Vacuum Pad – Model HV11 / 10" [25 cm] Diameter – Lipped (option)	8
49144	End Plug – 2-1/2" x 2-1/2" x 3/16" Tubing Size	2
49122	End Plug – 2" x 2" x 1/4" Tubing Size	2
36110	Service Manual — 12 V DC — Single Vacuum System w/ Manual Valve	1
29353	Pad Cover	8
15792	Rotation Release Lever Knob	1
15630	Pad Filter Screen – Large	8
10005	Machine Screw – 1/4-20 x 1" (for HV11 pad mounting)	**
10003	Machine Screw – 1/4-20 x 3/4" (for pad mounting)	**
10002	Machine Screw – 1/4-20 x 1/2" (for pad mounting)	**

* Length as required; sold by the foot (approx 30.5 cm).

*See **SERVICE MANUAL #36110** for additional parts.*

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)

KEEP FOR FUTURE REFERENCE

ENGINEERING DRAWINGS

908 W. Main • P.O. Box 368
Laurel, MT USA 59044
800-548-7341 (phone) • 406-628-8231 (phone)
406-628-8354 (fax) • www.WPG.com

INTENDED FOR USE BY SKILLED TECHNICAL PROFESSIONALS • READ AND UNDERSTAND BEFORE ROUTING, WIRING AND/OR ASSEMBLING

DOUBLE-CHANNEL LIFTER, DC-VOLTAGE

Model numbers: P2110435DC, P2110445DC, P211047DC

NOTES:
1) 16AWG OR 20AWG WIRE, BASED ON VACUUM PUMP USED.

WIRE LEGEND: CONTROLLED BY WIRING SYMBOLS DRAWING EXCEPT AS NOTED AND BELOW.

LINE STYLES AND WIDTHS FOR WIRE UNLESS NOTED OTHERWISE.

14AWG — NOTE #1

N/A — 16AWG

DRAWN: L. RENNER	DATE: 06/04/2003
CHECKED: CR	12-11-12
APPROVED: CMM	12-12-12

TYPE: STANDARD

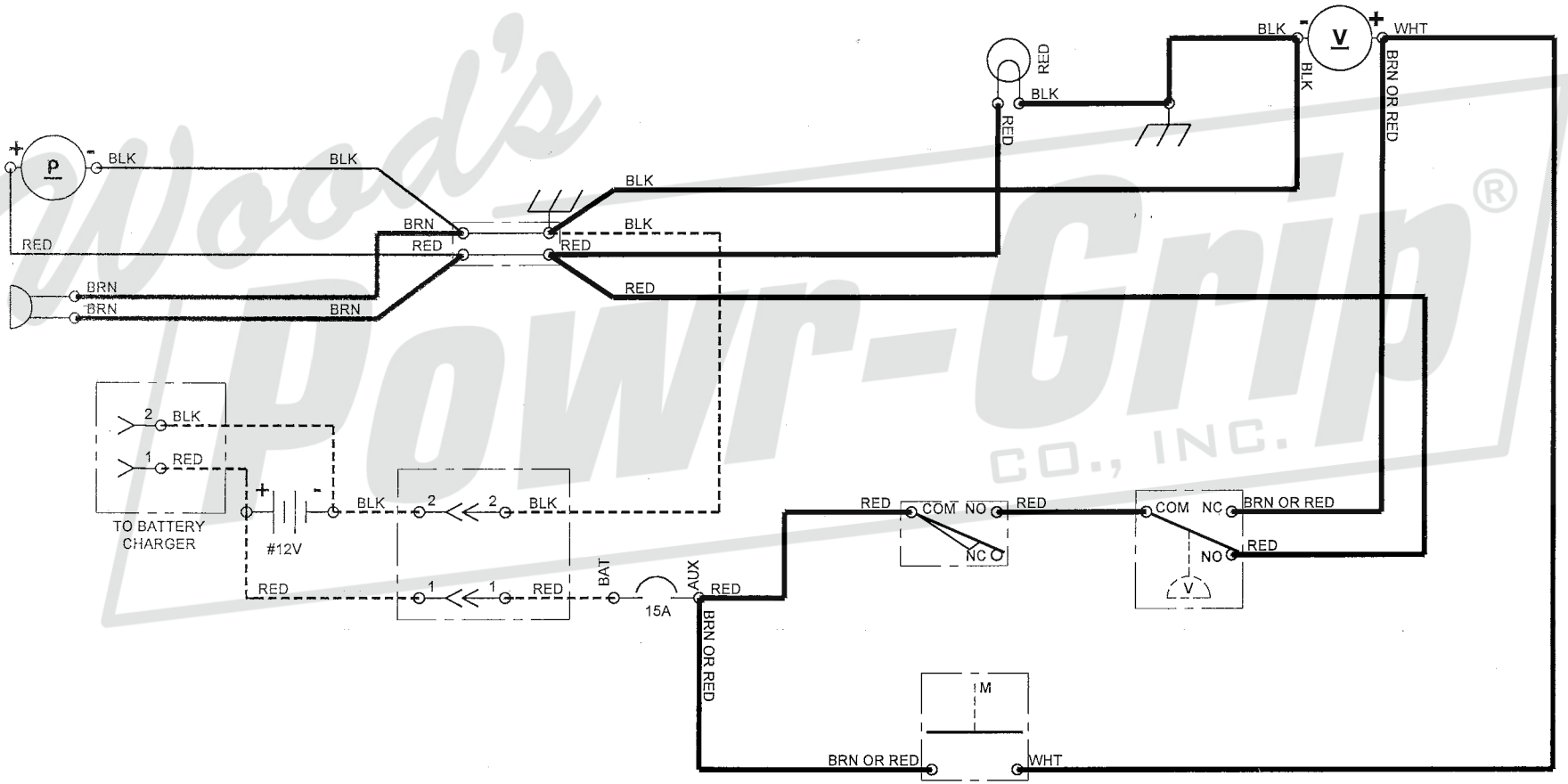
DIRECTORY: H:\Working\STD\7\705-DCPU\ECN 3011\

FILE [SHEET]: 705-W01 [D-W01]

LAUREL, MONTANA U.S.A.

1 SCFM DC VACUUM PACKAGE
N/A
PIEZOELECTRIC BUZZER WIRING DIAGRAM
D705-W01 [D-W01]

SIZE:	SCALE:	REV.:	ECN NUMBER:	DATE:	BY:	EST. WEIGHT:
A	NONE	4	3011	11/14/2012	RAS	N/A



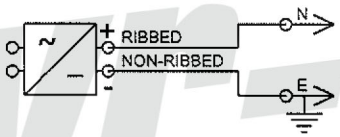
TOLERANCES: CONTROLLED BY STANDARD DN05C001 EXCEPT AS NOTED AND LISTED BELOW.		
DECIMAL	ANGULAR	FRACTIONAL
X.XX ±N/A	X° ±N/A	X/XX ±N/A
X.XXX ±N/A		∅1"≤∅X/XX ±N/A
∅X.XXX ±N/A		∅1">∅X/XX ±N/A
UNITS: INCHES [MILLIMETERS], DO NOT SCALE.		

TYPE:	FILE DIRECTORY: 705
STANDARD	FILE [SHEET]: 705-W04 [W04]

PRODUCT MANAGER:	DATE:
KEITH B.	10/10/2016
CHECKED: CR	10-18-16
APPROVED:	10-18-16

1 SCFM DC VACUUM PACKAGE
N/A
CHARGER WIRING SCHEMATIC
D705-W04 [W04]

SIZE:	SCALE:	REVISION:	ECN NUMBER:	ECN DATE:	ECN BY:	EST. WEIGHT:
A	NONE	01.A	4151	10/10/2016	JAC	N/A



WPG ASC

WIRE LEGEND: CONTROLLED BY WIRING SYMBOLS DRAWING EXCEPT AS NOTED AND BELOW.

LINE STYLES AND WIDTHS FOR WIRE UNLESS NOTED OTHERWISE.

N/A	N/A	N/A	NOTE #1
N/A	18AWG	N/A	16AWG

PRODUCT MANAGER:	DATE:
KEITH B.	10/27/2016
CHECKED: CR	11-30-16
APPROVED: Dmr	11-30-16

TYPE: STANDARD

FILE DIRECTORY: 705

FILE [SHEET]: 705-W06 [W06]

1 SCFM DC VACUUM PACKAGE
N/A
1 SCFM DC VACUUM SYSTEM WIRING SCHEMATIC, POWERCON
D705-W06 [W06]

SIZE:	SCALE:	REVISION:	ECN NUMBER:	ECN DATE:	ECN BY:	EST. WEIGHT:
A	NONE	02.A	4170	11/02/2016	JAC	N/A

NOTES:
(1) 16 AWG OR 20 AWG WIRE, BASED ON VACUUM PUMP USED.