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OPERATING INSTRUCTIONS



MODEL NUMBERS: P11004DC,
P1HV1104DC, P11104DC

SERIAL NUMBER: _____
(please see serial label and record number here)



SINGLE-CHANNEL LIFTER DC-VOLTAGE



***READ ALL INSTRUCTIONS AND SAFETY RULES
BEFORE OPERATING THIS LIFTER***



DESIGNED FOR THE MATERIALS HANDLING PROFESSIONAL

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


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SPECIFICATIONS

Description: 	Designed for use with a crane or other hoisting equipment, P1-04DC lifters employ vacuum to hold a load for lifting, and they provide manual 180° rotation and manual 90° tilt movements for load manipulation.		
Model Number:	P11004DC	P1HV1104DC	P11104DC
Vacuum Pads: ¹ (4 each, standard rubber)	10" [25 cm] nom. diameter, concave (Model G0750)	10" [25 cm] nom. diameter, lipped (Model HV11)	11" [28 cm] nom. diameter, lipped (Model G3370)
Maximum Pad Spread: (to outer edges)	49" x 10" [1245 mm x 254 mm]	50" x 11" [1270 mm x 280 mm]	51" x 12" [1295 mm x 305 mm]
Maximum Load Capacity: ² Per-Pad: Overall:	150 lbs [68 kg] 600 lbs [270 kg]	150 lbs [68 kg] 600 lbs [270 kg]	175 lbs [80 kg] 700 lbs [320 kg]
Lifter Weight: 	90 lbs [41 kg]		
Power Source:	12 volts DC, 3 amps		
Battery Capacity:	7 amp-hours		
Rotation Capability: 	Manual, 180°, with automatic locking at each ¼ revolution (when desired)		
Tilt Capability: 	Manual, 90°, with automatic locking in vertical position		
Operating Elevation: 	Maximum = 6000 feet [1828 meters]		
Operating Temperatures: 	32° to 104° F [0° to 40° C]		
Service Life:	This lifter is designed to have a service life of at least 20,000 lifting cycles, when used and maintained as intended (vacuum pads, filter elements and other wear-out items are excluded).		
ASME Standard BTH-1:	Design Category "B", Service Class "0" (see www.wpg.com for more information)		

!!-CE-!! Note: This symbol appears in the *OPERATING INSTRUCTIONS* manual only when requirements of a CE Standard are *different* from requirements of other standards that also apply to this vacuum lifter. CE requirements are mandatory in geographical areas where CE Standards apply, but may be optional in other locations.

¹ Available with alternative rubber compounds for special applications (see REPLACEMENT PARTS LIST).

² The Maximum Load Capacity is rated at 16" Hg [-54 kPa] on clean, smooth, nonporous flat surfaces, with a friction coefficient of 1 (see MAINTENANCE: VACUUM PAD MAINTENANCE: Pad to Load Friction Coefficient). A qualified person should evaluate the effective lifting capacity for the actual application. In addition to the effect of friction between the vacuum pads and load, the lifting capacity may be affected by the following load characteristics: rigidity, strength, surface conditions, overhang, angle, center of gravity and temperature.

SAFETY



The following safety rules must be observed to protect the operator and others from potential dangers.



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



Operate the lifter under conditions approved for its design (see INTENDED USE: OPERATING ENVIRONMENT).



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



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



Do not remove or obscure safety labels.



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



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



Do not exceed the Maximum Load Capacity or attempt to lift loads the lifter is not designed for (see INTENDED USE: LOAD CHARACTERISTICS).



Do not attempt to lift cracked or broken glass with this lifter.



Position the vacuum pads correctly on the load prior to lifting (see OPERATION: TO ATTACH THE PADS TO A LOAD).



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



Do not touch the vacuum release controls during a lift. This may result in loss of vacuum and release of the load.



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



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



Do not lift a load over people.



Keep other personnel far enough away from the lifter to avoid injury in the event of an unexpected load release.



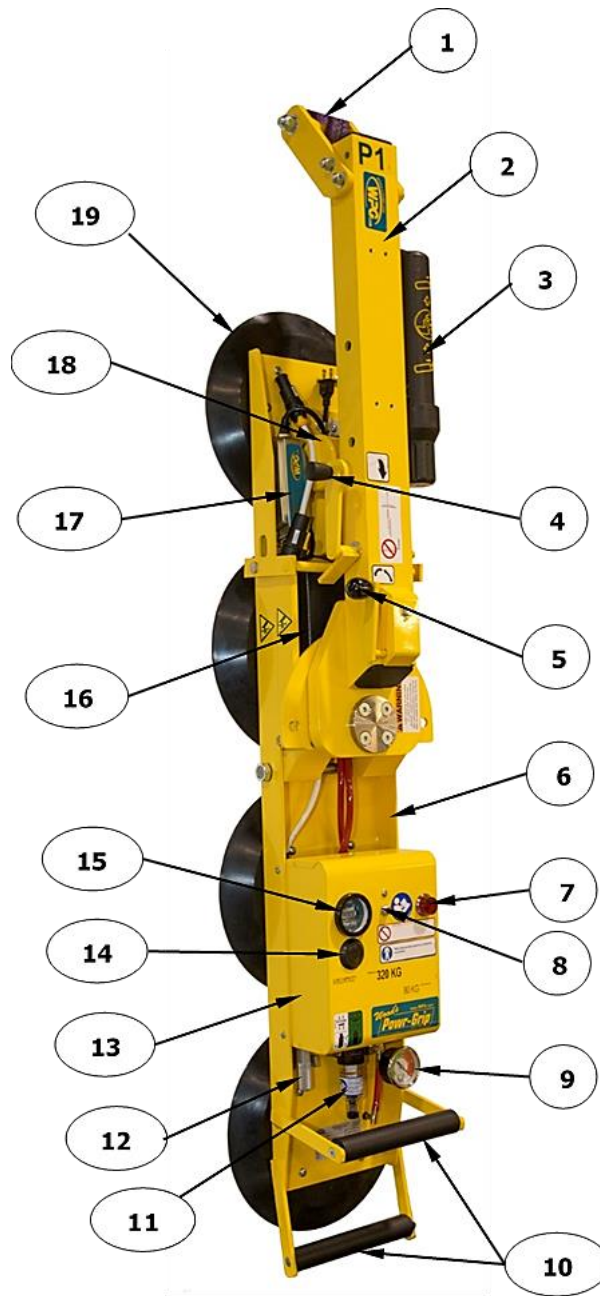
Place the power control in the inactive position and, when possible, disconnect the power source before opening any enclosure on the lifter. (Only applicable to powered lifters)



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

OPERATING FEATURES

Note: Components shown here are underlined> on their first appearance in each section to follow.



- | | | |
|----------------------------|--|--|
| 1 LIFT SPOOL | 8 BATTERY TEST BUTTON | 14 LOW VACUUM WARNING BUZZER
(optional) |
| 2 LIFT BAR | 9 VACUUM GAUGE | 15 BATTERY GAUGE |
| 3 INSTRUCTIONS CANISTER | 10 CONTROL HANDLES | 16 BATTERY |
| 4 TILT RELEASE LEVER | 11 AIR FILTER | 17 BATTERY CHARGER |
| 5 ROTATION RELEASE LEVER | 12 VALVE HANDLE | 18 VACUUM RESERVE TANK |
| 6 PAD CHANNEL | 13 Enclosure with VACUUM PUMP
and VACUUM SWITCH | 19 VACUUM PAD |
| 7 LOW VACUUM WARNING LIGHT | | |

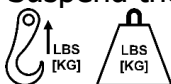
ASSEMBLY

1) Open the shipping container and remove all devices for restraining or protecting the vacuum lifter. Save the container and devices for use whenever the lifter is transported.

2) Position the lift spool to optimize the lifter's hang angle for the intended use, as shown. When a different spool position is desired, remove and loosen the bolts as needed to move the lift spool. Then reinstall all hardware, and tighten bolts securely.



3) Suspend the lifter from a crane as follows: Select hoisting equipment (crane and hoist, when applicable) rated to carry the Maximum Load Capacity plus the Lifter Weight (see SPECIFICATIONS).



Note: Any application of the lifter must conform to all statutory or regulatory standards that relate to the hoisting equipment when used in its geographical location.

Disengage the tilt latch and raise the lift bar to a vertical orientation, as shown.



Then attach the hoisting equipment hook to the lift spool as shown.



! Make sure hoisting equipment hook is fitted with restraining latch to prevent lift spool from slipping off under any circumstances.

Note: Make sure the hook does not interfere with the load, using a sling or other rigging as necessary.

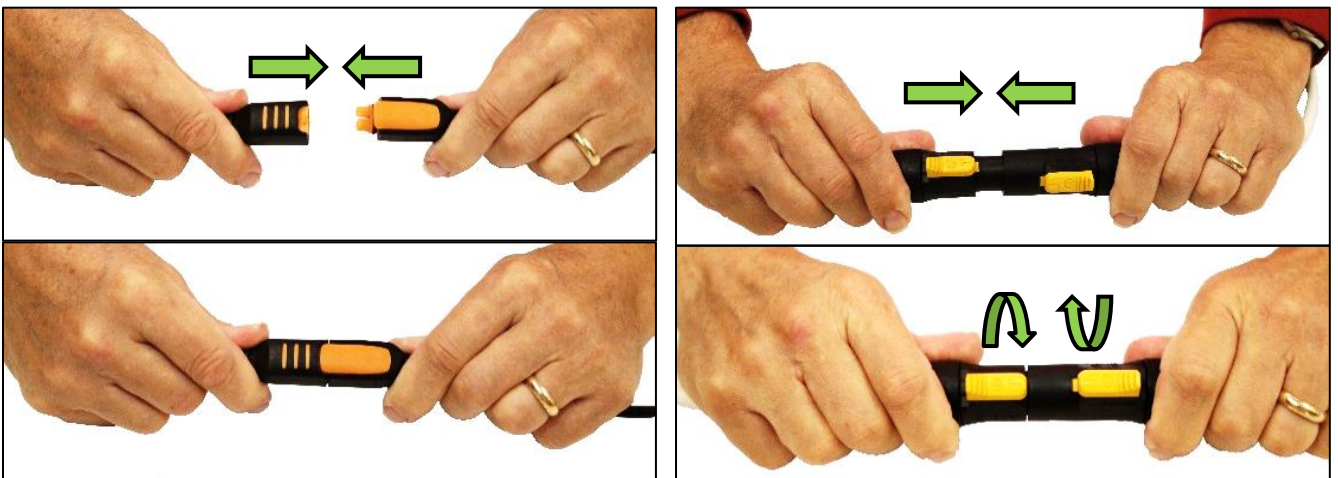
! Only use slings rated to carry Maximum Load Capacity plus Lifter Weight.



Use the hoisting equipment to raise the lifter out of the shipping container. Be careful to avoid damaging any vacuum pads. Remove the pad covers as shown, and save them for use whenever the lifter is stored.



4) Connect the electrical connectors, as shown.



5) Before you put the lifter into service, perform Operational and Load Tests (see MAINTENANCE: TESTING SCHEDULE).




INTENDED USE

LOAD CHARACTERISTICS



This lifter is NOT intended for lifting hazardous materials, such as explosives or radioactive substances.

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

- The load weight must not exceed the Maximum Load Capacity (see SPECIFICATIONS). 
- The load must be a single piece of nonporous or semiporous material with a flat and relatively smooth contact surface.³ To determine whether the load is too porous or rough, perform the test under Vacuum Level on Other Surfaces (see OPERATION: TO ATTACH THE PADS TO A LOAD).
- The load's contact surface must be suitable for obtaining a friction coefficient of 1 with the lifter's vacuum pads (see MAINTENANCE: VACUUM PAD MAINTENANCE: Pad to Load Friction Coefficient) or capacity should be derated appropriately.
- In order to avoid damaging the vacuum pads, the load's surface temperature must not exceed the Operating Temperatures (see SPECIFICATIONS).⁴ 
- The load's *minimum* length and width are determined by the Pad Spread (see SPECIFICATIONS).
- The load's *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.⁵
- 1" [2.5 cm] is the maximum allowable thickness of loads at the Maximum Load Capacity (see SPECIFICATIONS).⁶ 

Note: Standard vacuum pads can stain or deform load surfaces with light colors or soft coatings. Test such surfaces for detrimental effects before using the lifter on them. Alternative rubber compounds are available for these applications; contact Wood's Powr-Grip or an authorized dealer for more information.

³ Lifters that feature concave vacuum pads can also attach to some kinds of curved loads. Since curvature affects the lifting capacity, contact Wood's Powr-Grip for help in determining the effective lifting capacity for a particular curved load.

⁴ If such an application cannot be avoided, Wood's Powr-Grip does offer a heat-resistant rubber compound and other solutions which may enable you to lift loads with higher surface temperatures. Contact Wood's Powr-Grip or an authorized dealer for more information.



⁵ 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, stone or sheet metal 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.

⁶ Note that 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.

OPERATING ENVIRONMENT

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

 **Never use lifter in dangerous environments.**

- This lifter is not intended for use in any environment that is inherently dangerous to the operator or likely to compromise the lifter's ability to function. Environments containing explosives, caustic chemicals and other dangerous substances must be avoided.
- The lifter's work environment is limited by the Operating Elevation and Operating Temperatures indicated in SPECIFICATIONS.  °F [°C]  FT [m]
- The lifter's work environment must be free of metal particles or any other contaminants that could cause a vacuum pump failure. Such contaminants could result in a load release and possible injury to the operator or others nearby.

 **Environmental contaminants could result in vacuum pump failure.**

- Using the lifter in wet environments may require the operator to take special precautions: Moisture on contact surfaces of the load or vacuum pads diminishes the lifter's slip resistance, thereby reducing the lifting capacity (see MAINTENANCE: VACUUM PAD MAINTENANCE: Pad to Load Friction Coefficient).

 **Moisture reduces slip resistance of vacuum pads.**

The lifter is not designed to be water-tight. Submerging the lifter or using it in rain may damage lifter components; these and similar conditions must be avoided.

-
- **!!-CE-!!** For CE compliance, a secondary positive holding device (eg, sling) is required to lift loads on construction sites.
-

DISPOSAL OF THE LIFTER

After the vacuum lifter has reached the end of its Service Life (see SPECIFICATIONS), dispose of it in compliance with all local codes and relevant regulatory standards.

Note: This lifter is equipped with a battery, which may be subject to special disposal regulations.

OPERATION

BEFORE USING THE LIFTER

The operator must determine whether the lifter is capable of performing each intended task (see SPECIFICATIONS and INTENDED USE). In addition, all of the following preparations must be completed prior to lifting any load.

Taking Safety Precautions



Read all directions and safety rules before using lifter.

- Be trained in all relevant industry and regulatory standards required to operate the lifter in your location.



Always wear appropriate personal protective equipment.

- Take any personal 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



Always check battery energy before using lifter, as shown. (See MAINTENANCE: BATTERY TEST)

- Perform all inspections and tests required by the INSPECTION and TESTING SCHEDULES (see MAINTENANCE).
- Always conduct a VACUUM TEST before placing a lifter in service (see MAINTENANCE).
- ***Caution: Examine air filter regularly, and empty when necessary.***



An air filter helps protect the vacuum generating system from contaminants. Examine the filter regularly, to determine whether service is needed (see AIR FILTER SERVICE in *SERVICE MANUAL* for details).



Make sure alarm is clearly audible over ambient noise at operator position.

If the lifter is equipped with a low vacuum warning buzzer, make sure the alarm can be heard over ambient noise in the work area. The alarm must be clearly audible at the maximum distance between the operator and the lifter, despite any intervening barriers or obstructions.⁷



⁷ Maximum Alarm Volume is 103 dBA at 2 ft [60 cm]. To determine whether the alarm is clearly audible in compliance with CE Standards, consult EN 7731.

To ATTACH THE PADS TO A LOAD

Positioning the Lifter on the Load

- 1) Make sure that the contact surfaces of the load and all vacuum pads are clean (see MAINTENANCE: VACUUM PAD MAINTENANCE).



- 2) Center the lifter's pad channel on the load as shown, to avoid unexpected rotation or tilt (see TO ROTATE THE LOAD EDGEWISE or TO TILT THE LOAD to follow).⁸
- 3) Make sure that all vacuum pads will fit on the load (see SPECIFICATIONS: Maximum Pad Spread) and that the pads will be loaded evenly (see SPECIFICATIONS: Per-Pad Load Capacity).
- 4) Place the lifter on the load so that all vacuum pads are touching the contact surface.



⁸ The lifter is designed to handle the maximum load weight (see SPECIFICATIONS: Maximum Load Capacity) when the load's center of gravity is positioned within 2" [5 cm] of the lifter's rotation axis. Occasional loading deviations are permissible, provided that the operator can maintain control of the load at all times and that the load weight is low enough to avoid damaging the lifter.

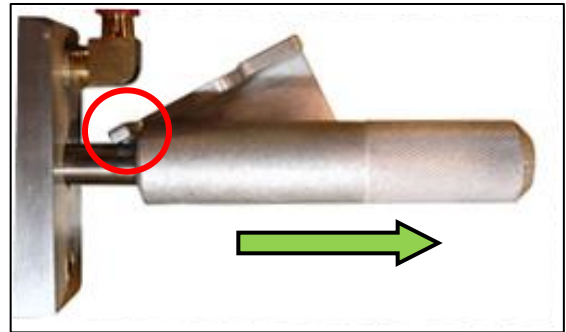
Sealing the Pads against the Load

Pull the valve handle outward ***until it latches*** in the "attach" (⇄) position, as shown.



Keep valve handle in "attach" position throughout lift.

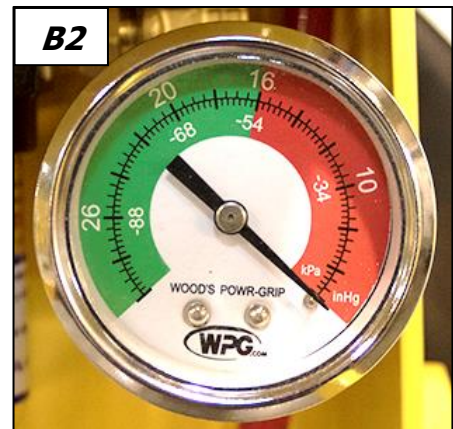
The vacuum pump will immediately begin to draw air through the vacuum pads, the low vacuum warning light will remain illuminated, and (if applicable) the low vacuum warning buzzer will sound an alarm, until the lifter attains sufficient vacuum for lifting. Firm pressure on the lifter helps the pads to seal against the load.⁹



Reading the Vacuum Gauge

A vacuum gauge displays the current vacuum level for the lifter's vacuum system in positive inches of Hg and negative kPa:

- The *green* range indicates vacuum levels sufficient for lifting the maximum load weight (see figure B1).
- The *red* range indicates vacuum levels that are ***not*** sufficient for lifting the maximum load weight (see figure B2).



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.

⁹ Although a vacuum pad may become distorted during shipping or storage, this condition should correct itself with continued use.

Vacuum Level on Optimal Surfaces

When the lifter is attached to clean, smooth, nonporous load surfaces, it should be able to maintain a vacuum level in the green range on the vacuum gauge, except when used at high elevations (see SPECIFICATIONS: Operating Elevation). If not, make sure the vacuum switch is adjusted correctly (see VACUUM SWITCH ADJUSTMENT in *SERVICE MANUAL* for details). If the vacuum switch cannot be adjusted to maintain a vacuum of 16" Hg [-54 kPa], perform the VACUUM TEST (see MAINTENANCE) to determine whether there is a deficiency in the vacuum generating system.



Vacuum Level on Other Surfaces

When the lifter is attached to contaminated, rough or porous load surfaces, it may not be able to maintain a vacuum level in the green range on the vacuum gauge, due to leakage in the seal between the vacuum pads and the load surface.¹⁰ In the case of contamination, thoroughly clean the contact surfaces of the load and the vacuum pads (see MAINTENANCE: VACUUM PAD MAINTENANCE: Pad Cleaning), and reattach the lifter to the load. If the load has rough or porous surfaces, ***the operator must conduct a load suitability test***, as follows:

- 1) Make sure the lifter's vacuum generating system is functioning correctly (see MAINTENANCE: VACUUM TEST).
- 2) Attach the vacuum pads to the load as previously directed.
- 3) After the vacuum pump stops running, disconnect the battery connector (see AFTER USING THE LIFTER to follow).¹¹
- 4) Raise the load a minimal distance, to assure that it is supported by the lifter.
- 5) Monitor the vacuum gauge while the load is suspended for 5 minutes: ***The lifter must maintain a minimum vacuum level of 10" Hg [-34 kPa] during this time.*** If not, the load does not possess the characteristics required for using this lifter.¹²

¹⁰ Contaminated loads can also cause the vacuum pump to run frequently or continuously. Since excessive pumping quickly reduces battery energy, the operator should clean the load when possible, to minimize pumping.

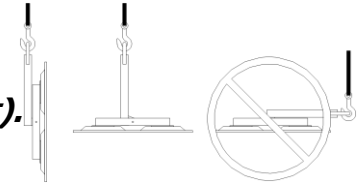
¹¹ Move the valve handle to the "release" position (power *off*) before reconnecting the battery.

¹² Certain load materials are too rough or porous to allow the lifter to form a seal which can be maintained for 5 minutes without power. However, in geographical locations where CE Standards do not apply, it may be possible to use the lifter to lift such loads. Contact Wood's Powr-Grip for more information.

To LIFT AND MOVE THE LOAD



Lift bar must be oriented vertically to lift load (see To TILT).



Interpreting Warning Light and Optional Warning Buzzer



A lifter's Maximum Load Capacity is rated at a vacuum level of 16" Hg [-54 kPa] (see SPECIFICATIONS). After the lifter has attained this level, the vacuum pump turns off automatically, to conserve battery energy. At the same time, the low vacuum warning light turns off and (if applicable) the low vacuum warning buzzer turns off, to signal that the lifter is ready to lift the maximum load weight.



Never attempt to lift load while red warning light is illuminated.



Never attempt to lift load while warning buzzer is sounding alarm.

If you attempt to lift the load while warning devices are activated, this could result in a load release or injury.

Monitoring Vacuum Indicators

The low vacuum warning light and the vacuum gauge must remain completely visible to the operator, so that they can be monitored throughout the entire lift.



Keep vacuum indicators visible throughout entire lift.

If the vacuum system experiences leakage while the lifter is attached to the load, the vacuum pump turns on and off automatically, as required to maintain sufficient vacuum. Normally, such intermittent cycling of the pump is no cause for alarm.

However, if vacuum decreases significantly, the warning light turns on and (if applicable) the low vacuum warning buzzer turns on, to warn the operator. If this occurs while you are lifting a load, move away and stay clear of the load until it can be lowered to the ground or a stable support.



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

Discontinue lifter use until the cause of the vacuum loss can be determined. If the pump runs at intervals of ten minutes or less while the lifter is attached to clean, smooth, nonporous materials, the leakage is likely to be in the vacuum system. In this event, perform the VACUUM TEST (see MAINTENANCE) and inspect the vacuum pads for damage (see MAINTENANCE: VACUUM PAD MAINTENANCE: Pad Inspection). If the vacuum loss cannot be remedied immediately, perform inspection and maintenance as needed to identify and correct any deficiency before resuming normal operation of the lifter.



Controlling the Lifter and Load

When the vacuum indicators show that the lifter is ready, use the hoisting equipment to raise the lifter and load as needed to clear any obstacles in their path. Use a control handle to keep the lifter and load in the desired orientation while they are suspended from the crane, as shown. Once sufficient clearance is established, the load can be rotated or tilted as desired (see TO ROTATE THE LOAD EDGEWISE or TO TILT THE LOAD to follow).



In Case of Power Failure

In the case of a power failure (ie, in battery), a vacuum reserve tank is designed to maintain vacuum temporarily.



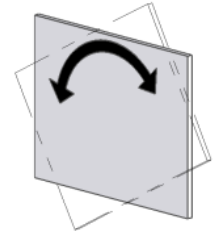
Stay clear of any suspended load in the event of a power failure.

Although the lifter is designed to support the load for at least 5 minutes without power, this depends on many factors (see INTENDED USE: LOAD CHARACTERISTICS and MAINTENANCE: VACUUM PAD MAINTENANCE, VACUUM TEST). If a power failure occurs, keep all personnel clear of the suspended load until it can safely be placed on the ground or a stable support. Correct any deficiency before resuming normal operation of the lifter.

TO ROTATE THE LOAD EDGEWISE

 **Never disengage both the rotation latch and the tilt latch at the same time.**

This lifter is not designed for rotation and tilt functions to be used at the same time. Disengaging the rotation and tilt latches simultaneously could cause uncontrolled and unpredictable load movement, potentially resulting in load damage or injury to the operator.



 **Make sure load is positioned correctly on lifter (see To ATTACH).**

- 1) Make sure there is sufficient clearance for the load to rotate without contacting the operator or any nearby objects.
- 2) Maintain a firm grip on one control handle to keep the load under control at all times (see figure B3).

 **Unbalanced loads may rotate unexpectedly when latch is disengaged.**

- 3) Pull the rotation release lever to disengage the rotation latch, and rotate the load to the desired position, as shown.



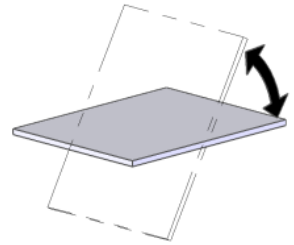
- 4) To stop the load's motion automatically at each quarter turn, simply let go of the rotation release lever so that the rotation latch engages at the next stop.

Note: Whenever rotation is not required, keep the rotation latch engaged, to prevent accidental damage to the load and possible injury to the operator.

TO TILT THE LOAD

 **Never disengage both the rotation latch and the tilt latch at the same time.**

This lifter is not designed for rotation and tilt functions to be used at the same time. Disengaging the rotation and tilt latches simultaneously could cause uncontrolled and unpredictable load movement, potentially resulting in load damage or injury to the operator.



 **Make sure load is positioned correctly on lifter (see To ATTACH).**

- 1) Make sure there is sufficient clearance for the load to tilt without contacting the operator or any nearby objects.
- 2) Maintain a firm grip on one control handle to keep the load under control at all times (see figure B4).

 **Unbalanced loads may tilt unexpectedly when latch is disengaged.**

- 3) If the pad channel is latched in the vertical position, pull the tilt release lever to disengage the tilt latch, as shown.



- 4) If load size permits, maintain control with the control handle throughout the tilt. For loads with overhang, it may be necessary to release the handle as the load approaches the flat position. If so, keep the load under control using hand cups or other appropriate means, as shown.



Note: The pad channel automatically latches in place when it returns to the vertical position.

TO RELEASE THE PADS FROM THE LOAD



Make sure load is fully supported before releasing vacuum pads.

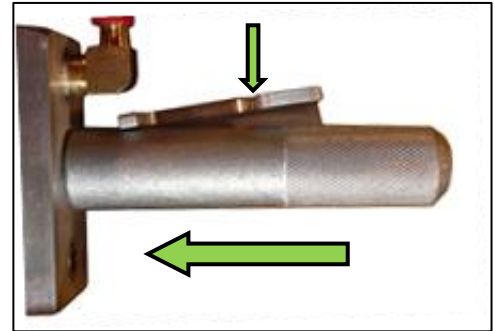
- 1) Make sure the load is at rest and fully supported.
- 2) Press the lever to release the latch, and push the valve handle inward to the “release” (∴|∴) position, as shown.



Do not attempt to move lifter until vacuum pads disengage completely from load.

Attempting to move the lifter before the vacuum pads are completely disengaged could result in load damage or injury.

- 3) Prior to lifting another load, perform the Every-Lift Inspection (see MAINTENANCE: INSPECTION SCHEDULE).



AFTER USING THE LIFTER

Leave the valve handle in the “release” (∴|∴) position (power *off*).



Caution: Do not set lifter against any surfaces which could soil or damage vacuum pads.

A control handle can be used to support an unloaded lifter when not suspended from a crane, as shown: Use the hoisting equipment to gently lower the lifter onto the control handle. Make sure the lifter leans securely against an appropriate support; then detach the hoisting equipment hook from the lift spool.

If the lifter is transported to another location, use the original shipping container and secure the lifter so as to protect the vacuum pads and all other components from damage.

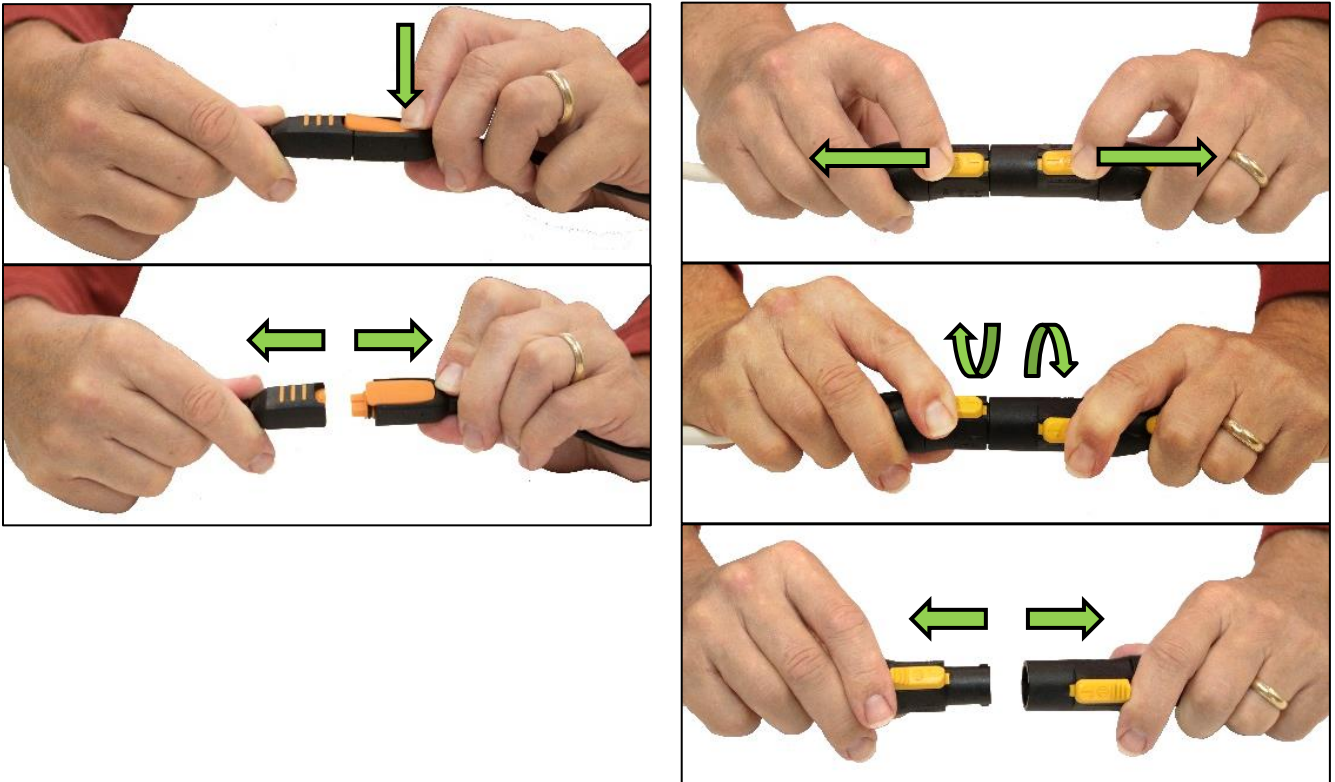


Storing the Lifter

- 1) Use the covers supplied to keep the vacuum pads clean, as shown.

!!-CE-!! The lifter is designed to rest on relatively horizontal surfaces without tipping over. To store the lifter in this way, set the lifter with the pads facing downward on a clean, smooth, flat surface. Then lower the lift bar to a horizontal orientation and place a support under the lift spool.

- 2) Charge the battery completely when placing it in storage and at six-month intervals thereafter (see MAINTENANCE: BATTERY RECHARGE).
- 3) Disconnect the electrical connectors, as shown, in order to minimize battery drainage.



- 4) Store the battery at temperatures between 32° and 70° Fahrenheit [between 0° and 21° Celsius].
Note: Storage at temperatures above 100° Fahrenheit [38° Celsius] should be avoided.

MAINTENANCE



Make sure battery is disconnected before servicing lifter.

Note: Refer to ***SERVICE MANUAL #36110*** when applicable.
See final section for wiring diagrams.

INSPECTION SCHEDULE

Perform inspections routinely, according to the following frequency schedule. If any deficiency is detected, correct it before using the lifter (see *SERVICE MANUAL* when necessary) and perform the next most frequent inspection.

Action	Every Lift	Frequent¹³ (20-40 hours)	Periodic¹⁴ (250-400 hours)
Examine the <u>vacuum pads</u> for contamination or debris, and clean them as necessary (see VACUUM PAD MAINTENANCE: Pad Cleaning).	✓	✓	✓
Examine the vacuum pads for visual damage.	✓	✓	✓
Examine the load surface for contamination or debris, and clean it as necessary.	✓	✓	✓
Examine the controls and indicators for visual damage.	✓	✓	✓
Test the <u>battery</u> for adequate charge. If necessary, charge and retest the battery (see BATTERY RECHARGE to follow).	✓	✓	✓
Examine the lifter's structure for visual damage.		✓	✓
Examine the vacuum system (including <u>vacuum pads</u> , fittings and hoses) for visual damage.		✓	✓
Examine the <u>air filter</u> for conditions requiring service.		✓	✓
Perform the VACUUM TEST.		✓	✓
Check for unusual vibrations or noises while operating the lifter.		✓	✓

¹³ The Frequent Inspection is also required whenever the lifter is out of service for 1 month or more.

¹⁴ The Periodic Inspection is also required whenever the lifter is out of service for 1 year or more. If necessary, return the lifter to Wood's Powr-Grip or an authorized dealer for repair (see LIMITED WARRANTY).

Action	Every Lift	Frequent ¹³ (20-40 hours)	Periodic ¹⁴ (250-400 hours)
Examine the entire lifter 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.			✓
Inspect all parts of the electrical system for damage, wear or contamination that could constitute a hazard, in compliance with all local codes and regulatory standards that are relevant for the geographical region. Caution: Be sure to use appropriate cleaning methods for each type of electrical component, as specified by codes and standards. Improper cleaning can damage components.			✓
Keep a written record of all Periodic Inspections.			✓

Note: See following sections (VACUUM PAD MAINTENANCE, BATTERY TEST, VACUUM TEST) for details about these inspections.

Infrequent Use

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

TESTING SCHEDULE

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

Note: See following sections (BATTERY TEST, VACUUM TEST, etc) for details about these tests.

Operational Tests

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

Load Test



Prove that the lifter can lift 100% of its Maximum Load Capacity (see SPECIFICATIONS), using an actual load or an equivalent simulation.¹⁵ 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.¹⁶
- 2) Attach the vacuum pads to the load as previously directed.
- 3) After the vacuum pump stops running, disconnect the battery connector (see OPERATION: AFTER USING THE LIFTER).¹⁷
- 4) Raise the load a minimal distance, to ensure that it is supported by the lifter.
- 5) Hold the load for 5 minutes. The load must not slip or fall during this time period. If it does, conduct a VACUUM TEST and inspect each vacuum pad as indicated under VACUUM PAD MAINTENANCE: Pad Inspection (see sections to follow). Correct any deficiency that is found and retest the lifter.

BATTERY TEST

A battery gauge enables you to evaluate whether the battery has adequate energy for lifting. Check the battery energy before every lift and also at the end of each day's use, to decide whether a charge is needed (see BATTERY RECHARGE to follow).¹⁸



Never use lifter unless battery energy registers in green range.



While the valve handle is in the "attach" (⌚) position (power on), the battery gauge automatically monitors battery energy.¹⁹

While the valve handle is in the "release" (⌚) position (power off), the battery energy can be checked manually using the battery test button, as shown.²⁰

¹⁵ ASME Standard B30.20 requires the lifter to be tested to 125% of its Maximum Load Capacity.

¹⁶ Flat Lifters are exempt from this requirement.

¹⁷ Move the valve handle to the "release" position (power *off*) before reconnecting the battery.

¹⁸ The battery charger must be disconnected from its AC power source in order to test the battery energy; otherwise, the energy reading on the battery gauge would not be accurate.

¹⁹ However, the battery gauge shuts off temporarily while the vacuum pump is running, to prevent an inaccurate reading. When the pumping cycle is completed, the battery gauge requires a few moments to stabilize before it displays an accurate energy reading again.

²⁰ If the lifter has not been used since the battery was charged, the battery gauge may falsely indicate an energy level that is higher than actual, due to a "surface charge" on the battery. After the pump runs for approximately one minute, the surface charge dissipates, allowing the operator to take an accurate energy reading.

BATTERY RECHARGE

Charge the battery whenever the battery gauge indicates diminished energy (see BATTERY TEST preceding). **Caution: Make sure valve handle is in "release" position (power OFF).**

Identify the input voltage marked on the battery charger, and plug it in to an appropriate power source.²¹ A ground fault circuit interrupter is necessary to reduce the risk of electrical shocks.

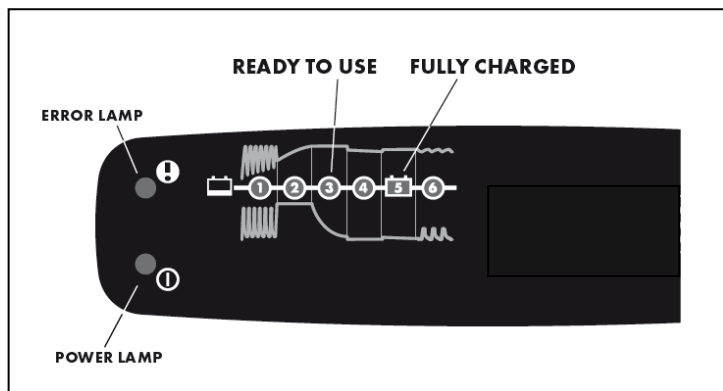
 **Make sure power source is equipped with ground fault circuit interrupter.**

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

Normally, the battery should take no more than 8 hours to charge completely.²² If not, check for the following conditions and correct any deficiencies as directed:


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

Before you return the lifter to service, be sure to unplug the charger and power up the lifter, to ensure that the battery gauge reflects the current energy reading (see BATTERY TEST preceding).



VACUUM PAD MAINTENANCE

Pad to Load Friction Coefficient

 The friction coefficient represents the lifter's ability to resist load slippage (Note: Flat lifters are exempt). The Maximum Load Capacity assumes a friction coefficient of 1.0 (see SPECIFICATIONS). This rating is based on testing of clean, new, standard rubber vacuum pads on clean, dry, regular glass. If the lifter is used under other conditions, a qualified person must first determine the effective lifting capacity.

Exposure to heat, UV light or chemicals can cause vacuum pads to deteriorate. Standard rubber pads should be replaced on a regular basis (at least every 2 years), to prevent deterioration of the friction coefficient.

²¹ Any external power supply must conform to all applicable local codes. **CAUTION: Do not operate the lifter while the charger is connected to an AC power source**, since this could result in permanent damage to the charger.

²² The charger is designed to automatically sense the energy level of the battery and reduce the charging rate when the battery is fully charged. Accordingly, the charger does not need to be unplugged until the lifter is going to be used again.

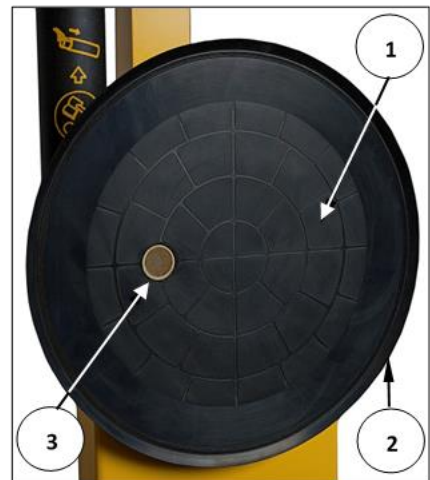
Pad Inspection

Inspect each vacuum pad for the following deficiencies routinely (see preceding INSPECTION and TESTING SCHEDULES), and correct them before using the lifter.

- Contaminates on the pad face (1) or sealing edges (2) (see Pad Cleaning discussion to follow).
- Filter screen (3) missing from pad face (see REPLACEMENT PARTS LIST).
- Nicks, cuts or abrasions in sealing edges of vacuum pad (see REPLACEMENT PARTS LIST).

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

- Wear, stiffness or glaze of vacuum pad (see REPLACEMENT PARTS LIST).



Pad Cleaning

- 1) Regularly clean the face of each vacuum pad as shown, to remove oil, dust and any other contaminants. Acceptable cleaning agents include soapy water and other mild cleansers.

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

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

 **Never use unauthorized rubber conditioners on vacuum pad.**

Most rubber conditioners, such as ArmorAll[®], can leave a hazardous film on vacuum pads, which could compromise lifting capacity and/or create a hazard to the operator or others.

- 2) Make sure to prevent liquid from contaminating the vacuum system through the suction hole on the pad face.
- 3) Use a clean sponge or lint-free cloth to apply an authorized cleanser and wipe the pad face clean.²³
- 4) Allow the pad to dry completely before using the lifter.



²³ A toothbrush (or similar brush with bristles *that do not harm rubber*) may be used to remove contaminants clinging to sealing edges. If these cleaning methods are not successful, contact Wood's Powr-Grip or an authorized dealer for assistance.

VACUUM TEST

Test the vacuum system for leakage routinely (see preceding INSPECTION and TESTING SCHEDULES).

- 1) Clean the face of each vacuum pad (see VACUUM PAD MAINTENANCE: Pad Cleaning).
- 2) Use a test load with a weight equal to the Maximum Load Capacity (see SPECIFICATIONS) and a clean, smooth, nonporous surface, as well as other appropriate LOAD CHARACTERISTICS (see INTENDED USE).²⁴
- 3) Attach the lifter to the test load as previously directed (see OPERATION: TO ATTACH THE PADS TO A LOAD). After the vacuum pump stops running, the vacuum level should register above 16" Hg [-54 kPa] on the vacuum gauge (if not, see VACUUM SWITCH ADJUSTMENT in *SERVICE MANUAL* for details).
- 4) Raise the load a minimal distance, to make sure that the vacuum pads are loaded to capacity, and disconnect the battery connector (see OPERATION: AFTER USING THE LIFTER).²⁵
- 5) Monitor the vacuum gauge: *The vacuum level should not decrease by more than 4" Hg [-14 kPa] in 5 minutes.*



Never use a lifter that has failed the VACUUM TEST.

Correct any deficiency in the vacuum system before using the lifter.

²⁴ The load surface should be flat or possess no more curvature than the lifter is designed for (if any).

²⁵ Move the valve handle to the "release" position (power *off*) before reconnecting the battery.

REPLACEMENT PARTS LIST

Stock No.	Description	Qty.
64664	Battery – 12 V DC – 7 Amp-Hours	1
59086NC	Battery Connector – Twin Lead	1
57012	Pad Channel Tilt Pin	1
54390NC	Power Lead	1
49646T	Vacuum Pad – Model G3370 / 11" [28 cm] Diameter – Lipped	4
49643T	Vacuum Pad – Model G3370 / 11" [28 cm] Diameter – Lipped – Low-Marking (option)	4
49605T	Vacuum Pad – Model HV11 / 10" [25 cm] Diameter – Lipped	4
49586TA	Vacuum Pad – Model G0750 / 10" [25 cm] Diameter – Concave	4
49122	End Plug – 2" x 2" x 1/4" [50.8 mm x 50.8 mm x 6.4 mm] Tubing Size	3
36110	Service Manual – 12 V DC – 1 SCFM – Single Vacuum System – Manual Valve	1
29353	Pad Cover	4
16134	Filter Element Kit (for 1 oz [30 ml] bowl size air filter)	1
15632	Pad Filter Screen – Small (for G0750 pad)	4
15630	Pad Filter Screen – Large (for G3370 & HV11 pads)	4

***SERVICE ONLY WITH IDENTICAL REPLACEMENT PARTS,
AVAILABLE AT WPG.COM OR THROUGH AN AUTHORIZED WPG DEALER***

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.

Wood's Powr-Grip Co., Inc.
908 West Main St. / P.O. Box 368
Laurel, MT USA 59044

phone 800-548-7341

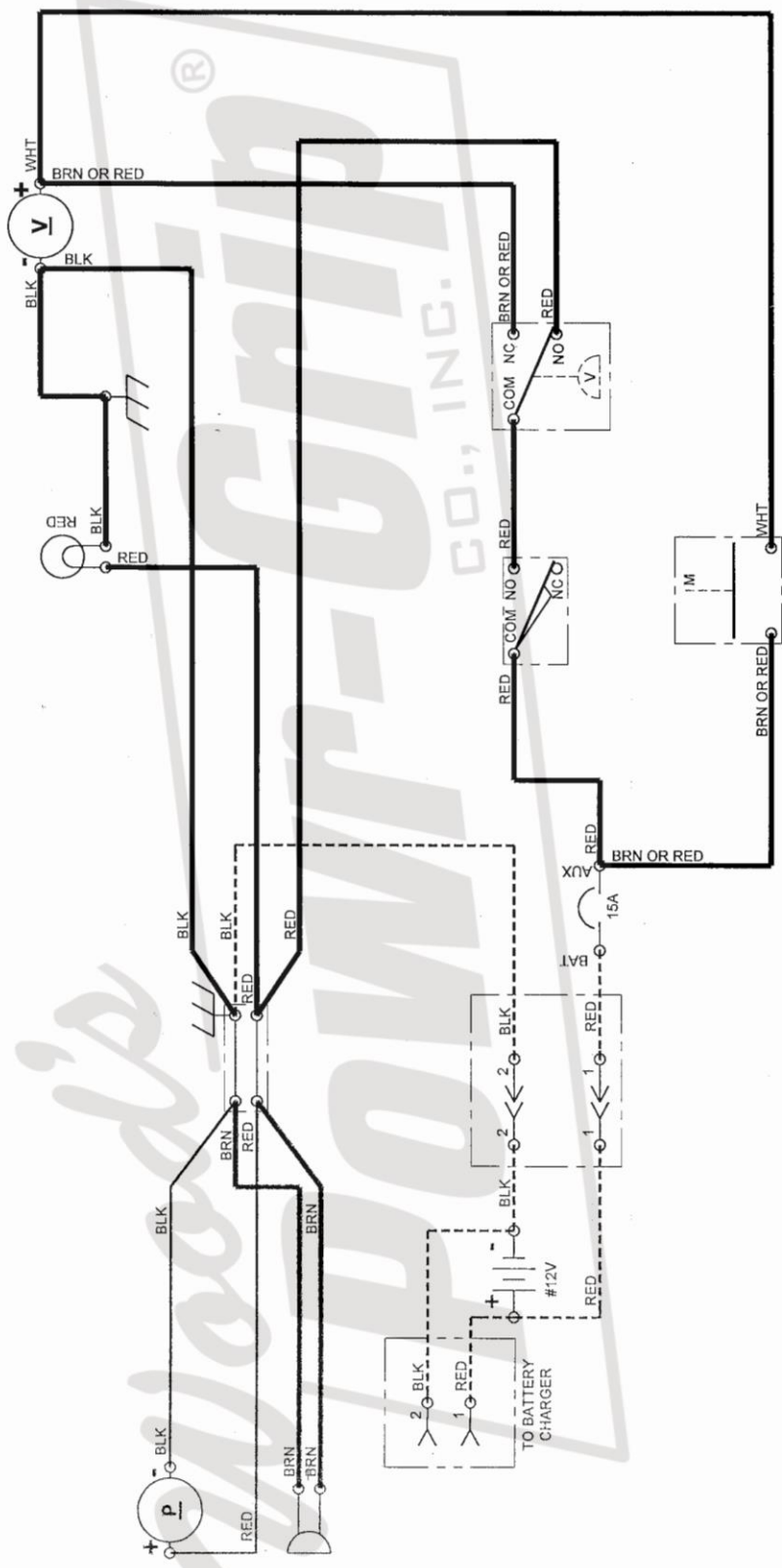
phone 406-628-8231

fax 406-628-8354

TYPE: STANDARD	DIRECTORY: FILE (SHEET):	H:\Working\IS\DV\705-DCP\UECN 3011 705-W01 [D-W01]
	THIS DRAWING IS THE PROPERTY OF WOOD'S POWR-GRIP CO., INC. . IT IS LOANED WITH THE UNDERSTANDING THAT NEITHER IT NOR ANY INFORMATION CONTAINED THEREIN WILL BE COPIED, PUBLISHED OR TRANSMITTED TO OTHERS WITHOUT EXPRESS WRITTEN PERMISSION. LAUREL, MONTANA U.S.A.	
1 SCFM DC VACUUM PACKAGE		
N/A		
PIEZOELECTRIC BUZZER WIRING DIAGRAM		
D705-W01 [D-W01]		
SIZE: A	SCALE: NONE	REV.: 4
ECN NUMBER: 3011	DATE: 11/14/2012	BY: RAS
EST. WEIGHT: N/A		

WIRE LEGEND: CONTROLLED BY WIRING SYMBOLS DRAWING EXCEPT AS NOTED AND BELOW.	DATE: 06/04/2003
LINE STYLES AND WIDTHS FOR WIRE UNLESS NOTED OTHERWISE.	CHECKED: <i>LR</i>
1-4AWG. --- N/A	APPROVED: <i>CLM</i>
NOTE #1: --- 16AWG	DATE: 12-11-12
	DATE: 12-12-12

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



TOLERANCES: CONTROLLED BY STANDARD DN05C001 EXCEPT AS NOTED AND LISTED BELOW.		FILE DIRECTORY: 705-W04 [W04]	
DECIMAL X.XX ± N/A	ANGULAR X ± N/A	TYPE: STANDARD	FILE [SHEET]:
FRACTIONAL X/XX ± N/A	Ø 1" ± N/A	THIS DRAWING IS THE PROPERTY OF WOOD'S POWR-GRIP CO., INC. IT IS LOANED WITH THE UNDERSTANDING THAT NEITHER IT NOR ANY INFORMATION CONTAINED THEREIN WILL BE COPIED, PUBLISHED OR TRANSMITTED TO OTHERS WITHOUT EXPRESS WRITTEN PERMISSION.	
Ø X.XXX ± N/A	Ø 1" > Ø X/XX ± N/A	WOOD'S POWR-GRIP CO., INC. LAUREL, MONTANA U.S.A.	
UNITS: INCHES (MILLIMETERS), DO NOT SCALE.	PRODUCT MANAGER: KEITH B.	1 SCFM DC VACUUM PACKAGE	
DATE: 10/10/2016	CHECKED: <i>ek</i>	CHARGER WIRING SCHEMATIC	
APPROVED: <i>Ann</i>	DATE: 10-18-16	REVISION: 01.A	ECN NUMBER: D705-W04 [W04]
		SIZE: A	SCALE: NONE
		ECN BY: JAC	EST. WEIGHT: N/A

