

KEEP FOR FUTURE REFERENCE



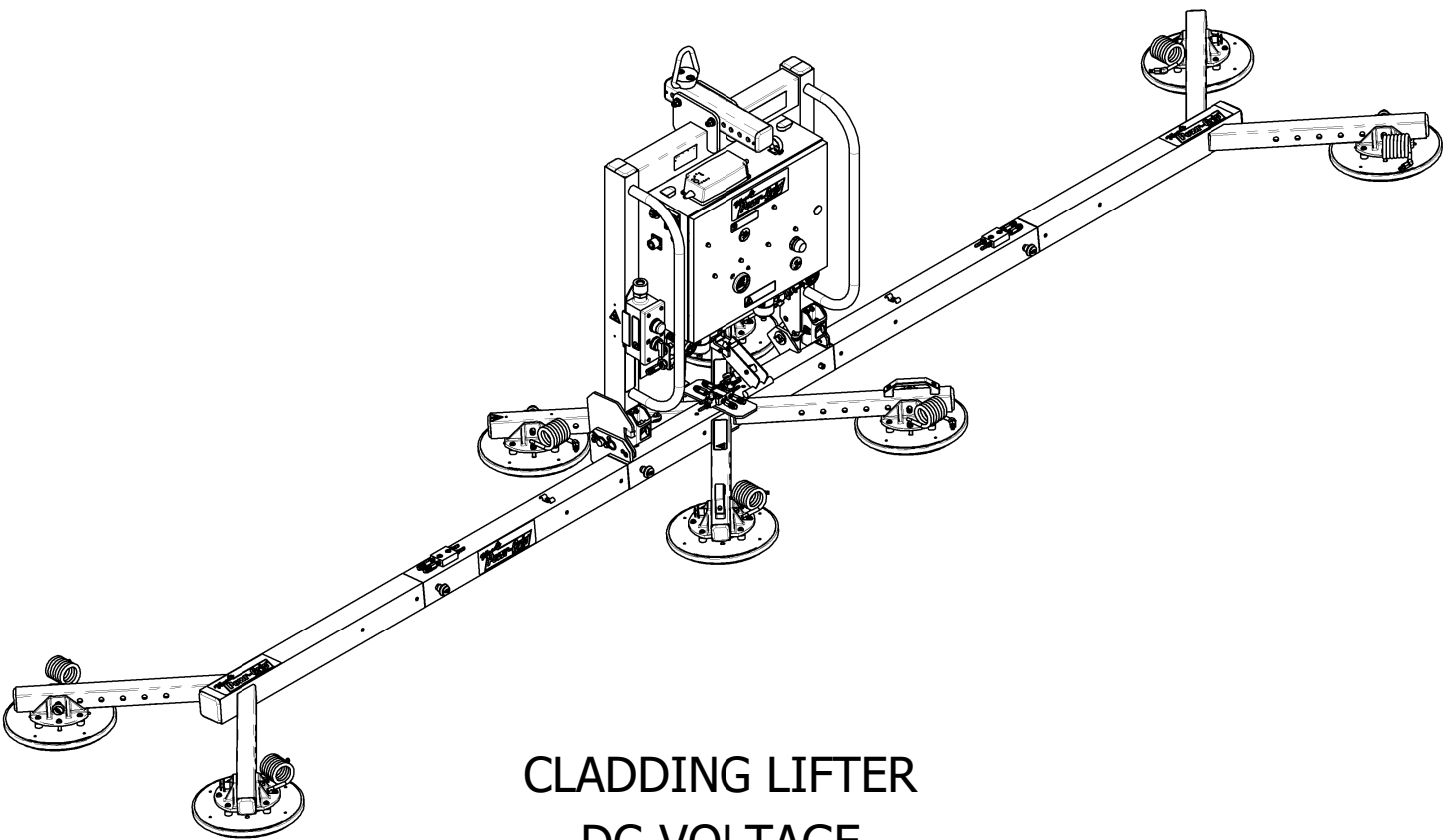
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INSTRUCTIONS

International Version

MODEL NUMBER: MTCL8FS10TDC

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



**CLADDING LIFTER
DC-VOLTAGE
WITH DUAL VACUUM SYSTEM
AND VPFS10T PADS**



***READ ALL INSTRUCTIONS AND WARNINGS
BEFORE OPERATING THIS LIFTER***



DESIGNED FOR THE MATERIALS HANDLING PROFESSIONAL



[View Quick Start Guide.](#)

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SPECIFICATIONS

Model Number:	MTCL8FS10TDC		
Description:	Designed for use with a crane or other hoisting equipment, the MTCL8FS10TDC lifter employs vacuum to hold a load for lifting, and it provides manual 90° tilt movements for load manipulation.		
Power Source:	12 volts DC, 8 amps		
Battery Capacity:	35 amp-hours		
Vacuum Pads:	Eight 10" [25 cm] nominal diameter (Model VPFS10T), standard rubber, spring-mounted (¾" [20 mm] travel), with #60 filter screen and replaceable sealing rings for applications on rough or textured surfaces		
Pad Spread: ¹ (to outer edges)	Minimum	Maximum w/o Extensions	Maximum w/Extensions
Length:	23¾" [60 cm]	39½" [101 cm]	179½" [456 cm]
Width:	23¾" [60 cm]	39¾" [101 cm]	39¾" [101 cm]
Load Capacity: ¹	(rated at 16" Hg [-54 kPa] on clean, smooth, nonporous flat surfaces ²)		
Per-Pad:	150 lbs [68 kg]		
Maximum:	700 lbs [320 kg] with 6 vacuum pads in use		
Lifter Weight:	253 lbs [115 kg]		
With Extensions:	368 lbs [167 kg]		
Tilt Capability:	Manual, 90°; Latch engages automatically when pad frame reaches vertical or horizontal position (if desired)		
Dual Vacuum System:	2 vacuum system circuits allow the lifter to maintain the vacuum level in one circuit even if an unexpected vacuum loss occurs in the other one (eg, due to load breakage).		
Vacuum Pumps:	2 diaphragm type, 1 SCFM [28 liters/minute] nominal airflow		
Vacuum Reserve Tanks:	2 vacuum reservoirs help prevent immediate vacuum loss in case of power failure and extend battery life by reducing pump cycles required to maintain vacuum.		
Vacuum Gauges:	2 dial gauges indicate current vacuum level in positive inches of Hg and negative kPa.		
Vacuum Lift Lights:	2 green lights are energized whenever vacuum level is sufficient for lifting maximum load weight (higher than 16" Hg [-54 kPa]).		
Low Vacuum Warning Buzzer:	Maximum Alarm Volume = 103 dBA at 2 ft [60 cm]. While the lifter is powered up, an audible alarm warns the operator whenever vacuum is not sufficient for lifting the maximum load weight.		
Options:	<i>Available</i> with Model EO8RC - Remote Control System. This option features a radio transmitter and receiver that can activate apply and release functions at distances up to 250 ft [76 m]. The system uses a 310-320 MHz signal.		
Operating Elevation:	Maximum = 6000 ft [1828 m]		
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 inserts, filter elements and other wear-out items are excluded; see MAINTENANCE and REPLACEMENT PARTS LIST for more information. For the DISPOSAL OF THE LIFTER after its service life, see INTENDED USE.		
ASME Standard BTH-1:	Design Category "B", Service Class "0" (see www.wpg.com for more information)		

!!-CE-!! Note: This symbol appears in the *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 For a listing of Pad Spread and Maximum Load Capacity for all pad frame configurations, see the illustration under ASSEMBLY: TO CHANGE THE PAD FRAME CONFIGURATION.

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

WARNINGS



Powr-Grip is pleased to offer the most reliable vacuum lifters available. Despite the high degree of security provided by this product, certain precautions must be observed to protect the operator and others.



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

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

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

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

Never remove or obscure warning labels.

Never operate a lifter if the Load Capacity or any warning appears to be missing or obscured.

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

Never exceed the Load Capacity or attempt to lift loads the lifter is not designed for (see INTENDED USE: LOAD CHARACTERISTICS).

Never attempt to lift cracked or broken glass with this lifter.

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

Never lift a load when any vacuum indicator shows inadequate vacuum.

Never touch the vacuum release controls during a lift. This may result in loss of vacuum and release of the load.

Never allow people to ride on the lifter or the load being lifted.

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

Never lift a load over people.

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

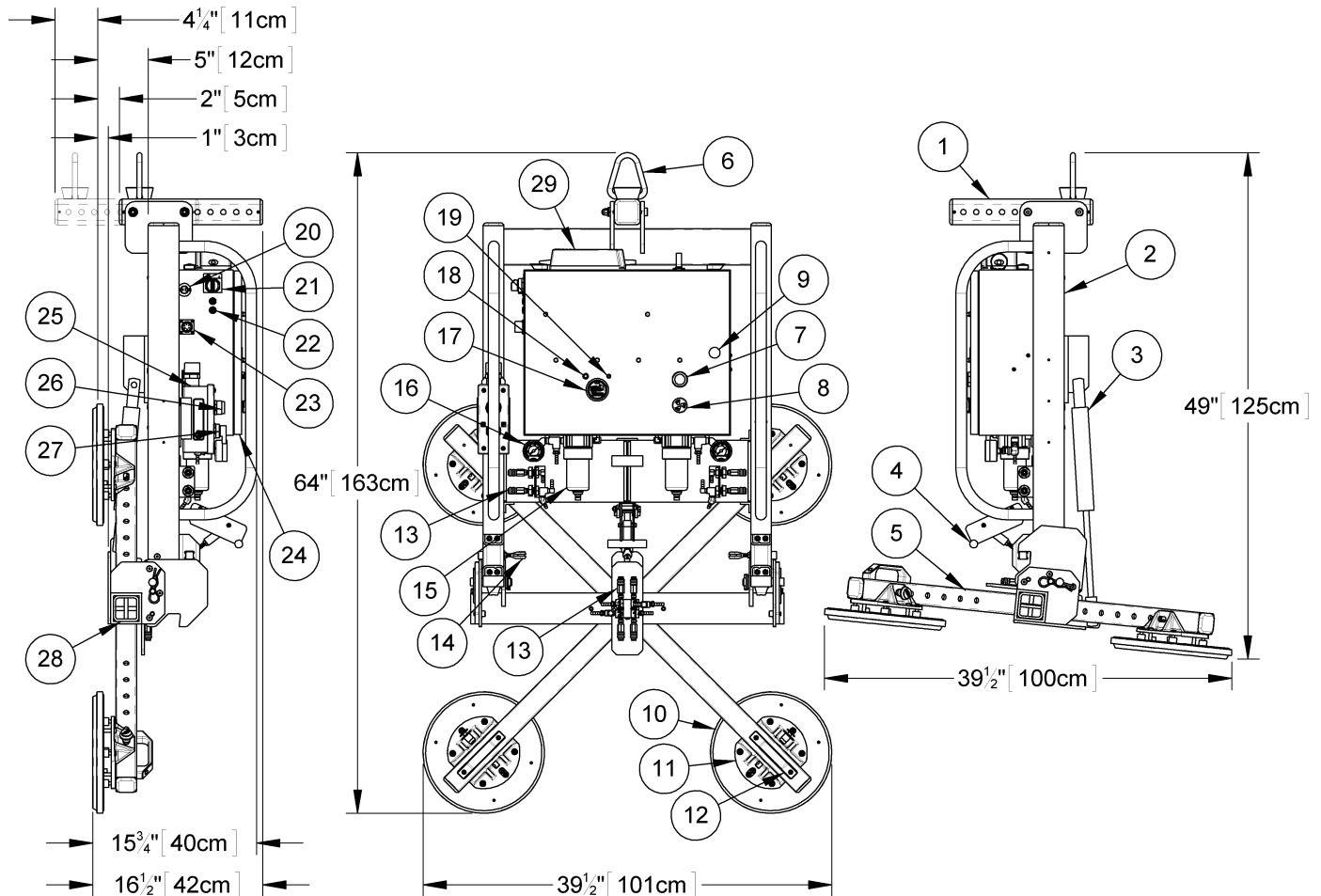
Always place the power control in the inactive position and, when possible, disconnect the power source before opening any enclosure on the lifter. (Only applicable to powered lifters)

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

If the lifter is equipped with a Remote Control System, **never** operate the lifter remotely unless there is clear communication about intended actions (eg, releasing load) with all personnel near the lift. In addition, the operator must visually verify the status of the lifter and load prior to remote operations.

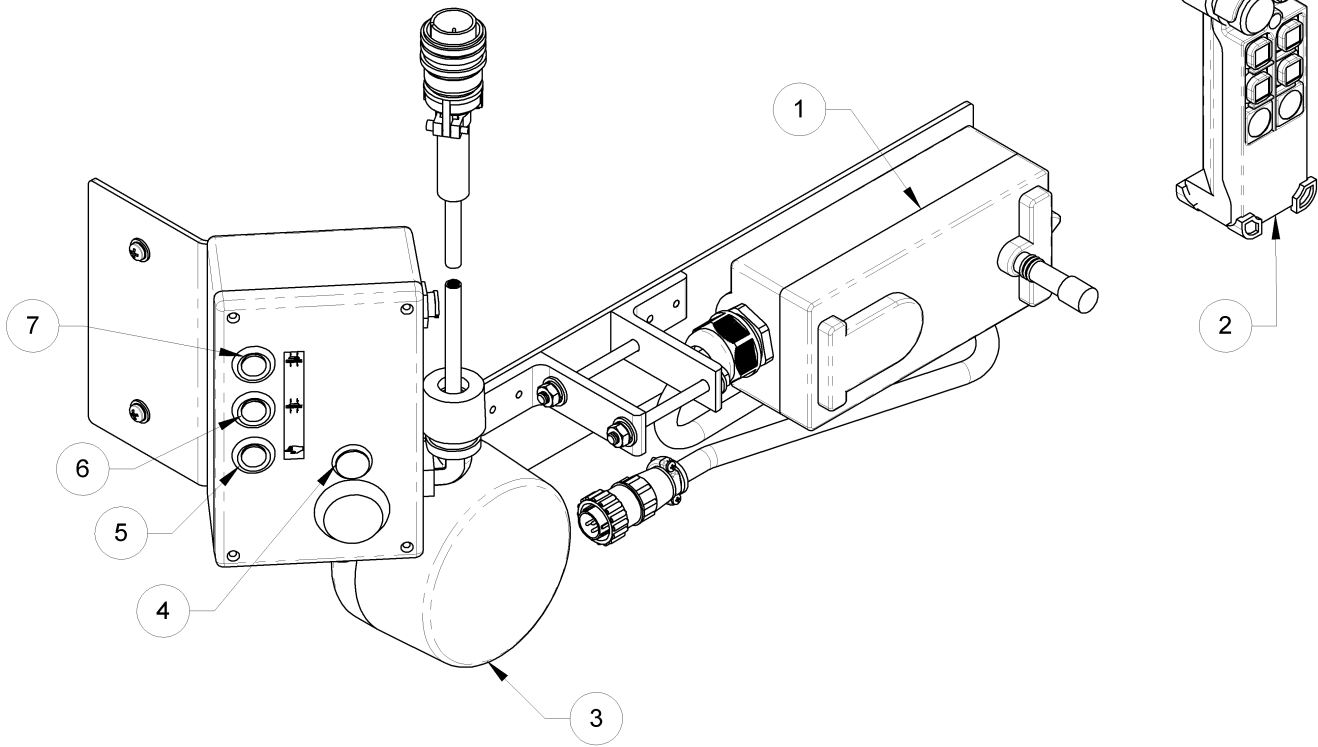
OPERATING FEATURES

Note: Components featured in the following instructions for assembling, operating or maintaining the vacuum lifter are underlined> on their first appearance in each section.



Standard MTCL8FS10TDC shown without pad frame extensions.

- | | | | |
|------------------------------|---------------------|----------------------------|-----------------------------------|
| 1 ADJUSTABLE LIFT POINT TUBE | 9 ENCLOSURE LATCH | 17 BATTERY GAUGE | 24 POWER SYSTEM ENCLOSURE, with: |
| 2 LIFT BAR | 10 VACUUM PAD | 18 BATTERY TEST BUTTON | VACUUM PUMPS |
| 3 TILT DAMPER | 11 PAD MOUNT | 19 POWER LIGHT | VACUUM SWITCHES |
| 4 TILT CONTROL LEVER | 12 CONTROL HANDLE | 20 CHARGER CORD RECEPTACLE | BATTERY |
| 5 PAD FRAME | 13 QUICK CONNECTORS | 21 POWER SWITCH | BATTERY CHARGER |
| 6 LIFT BAIL | 14 TILT LATCH | 22 CIRCUIT BREAKER | 25 MOVABLE CONTROL PENDANT, with: |
| 7 VACUUM LIFT LIGHT | 15 AIR FILTER | 23 CONTROLS RECEPTACLE | 26 ENABLE RELEASE BUTTON |
| 8 LOW VACUUM WARNING BUZZER | 16 VACUUM GAUGE | | 27 APPLY/RELEASE SWITCH |
| | | | 28 Socket for PAD FRAME EXTENSION |

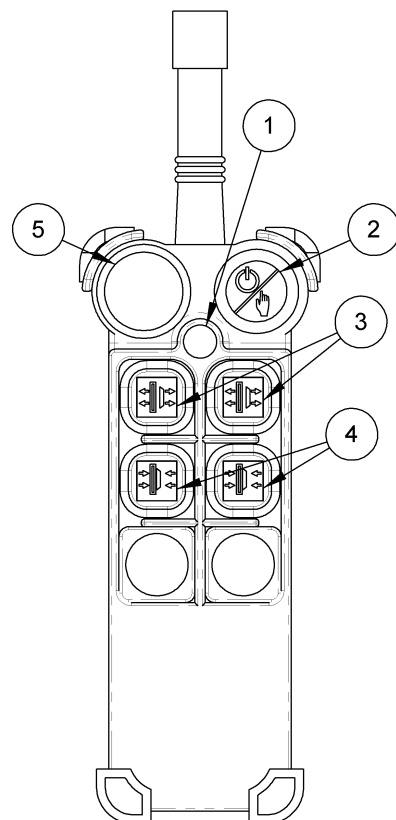


OPTIONAL REMOTE CONTROL SYSTEM

- 1 RADIO RECEIVER
- 2 RADIO TRANSMITTER
- 3 STROBE LIGHT
- 4 VACUUM LIFT LIGHT
- 5 ENABLE BUTTON
- 6 APPLY BUTTON
- 7 RELEASE BUTTON

OPTIONAL RADIO TRANSMITTER

- 1 TRANSMISSION INDICATOR LIGHT
- 2 TRANSMITTER POWER/ENABLE BUTTON
- 3 RELEASE BUTTONS
- 4 APPLY BUTTONS
- 5 EMERGENCY TRANSMITTER DISCONNECT



ASSEMBLY

TO SET UP THE LIFTER

- 1) Open the shipping container and remove all materials for restraining or protecting the vacuum lifter during shipping. Save the container for use whenever the lifter is transported.
- 2) Position the adjustable lift point tube as follows: The location of the lift point can be adjusted to obtain the optimal hang angle of the lifter and load. A different hang angle may be desirable, depending on the angle needed to attach the lifter to the load, release the load or manipulate the load during a lift.

First disengage the lifter's tilt latches (see OPERATION: TO TILT THE LOAD: Operating the Tilt Latches) and raise the lift bar to a vertical orientation. ***Make sure the lift bar latches in the vertical orientation before releasing the lift bar.***

To adjust the lift point location, remove both retaining bolts and associated hardware, and reposition the adjustable lift point tube as desired. Reinstall the retaining bolts and hardware, making sure to secure them tightly in position as originally installed.



WARNING: Lift point must be adjusted so as to prevent interference between adjustable lift point tube and load.

Note: If the load would extend higher than the lift point when lifted or tilted upright (see OPERATION: TO TILT THE LOAD), the lift point must be adjusted to prevent interference between the adjustable lift point tube and the load. Failure to do so may damage the lifter or load, and may result in the release of the load.

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

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 (eg, relevant OSHA standards in the USA).



WARNING: Hoisting equipment hook must be fitted with restraining latch to prevent lift bail from slipping off under any circumstances.

Attach the hoisting equipment hook to the lift bail, and use the hoisting equipment to raise the lifter out of the shipping container. Be careful to avoid damaging any vacuum pads.

Note: Some hoisting equipment hooks could interfere with an upright load that extends beyond the lifter's pad frame. If the load would contact the hook during lifter operation, the operator must prevent this by attaching a sling (or other rigging that does not interfere with the load) between the hook and the lift bail.



WARNING: Any sling used must be rated to carry maximum load weight plus lifter weight.

- 4) To use the movable control pendant (instead of the optional Remote Control System), insert the plug of its coiled cord into the controls receptacle on the power system enclosure. Then secure the connector by tightening its threaded collar.
- 5) Assemble the pad frame in the configuration that will provide optimal support of the load while lifting (see TO CHANGE THE PAD FRAME CONFIGURATION to follow).
- 6) Open the power system enclosure and connect the electrical connectors uniting the battery to the battery charger and the vacuum generating system. Now the lifter is operational.
- 7) Perform Operational and Load Tests for the lifter as directed in MAINTENANCE: TESTING SCHEDULE. If the lifter is equipped with a Remote Control System, also perform the REMOTE CONTROL SYSTEM TEST (see MAINTENANCE).

TO CHANGE THE PAD FRAME CONFIGURATION

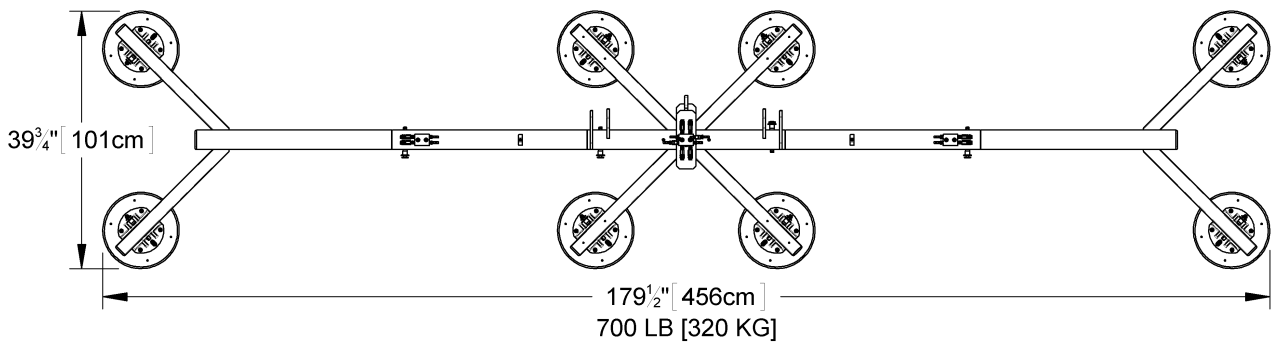
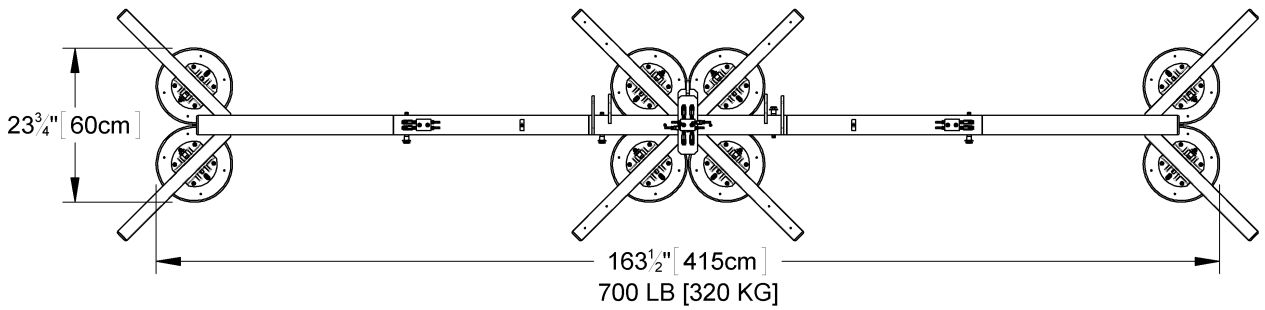
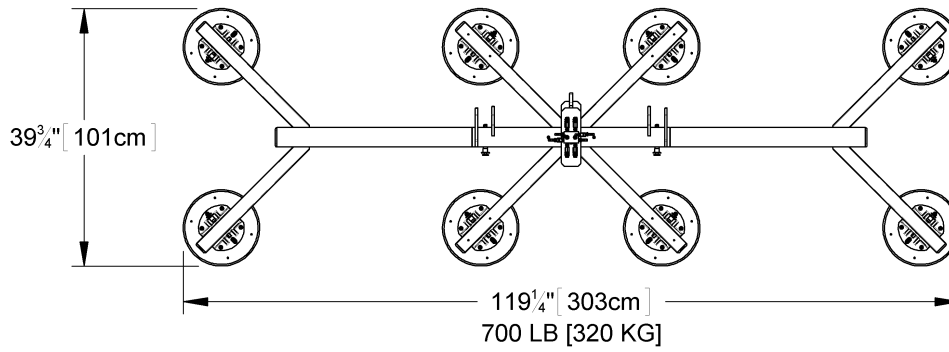
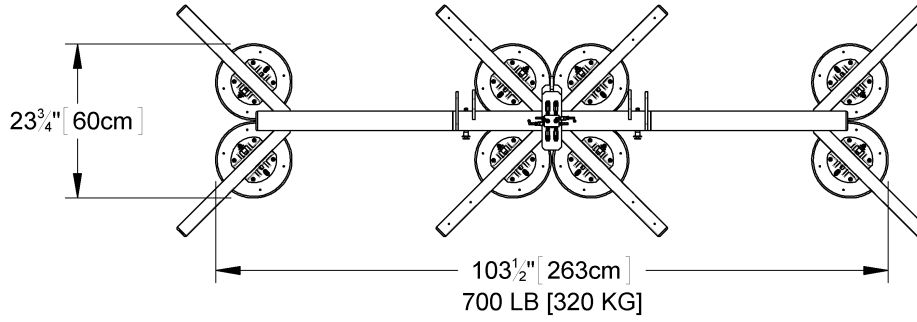
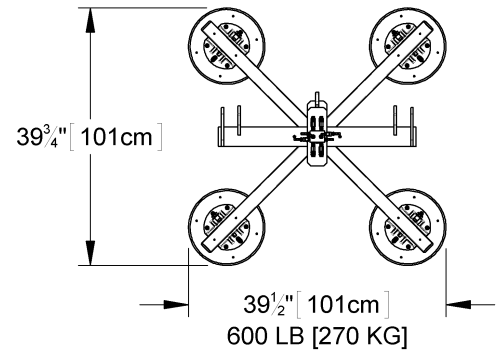
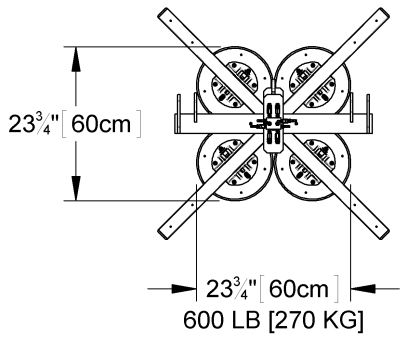
This lifter offers a variety of pad frame configurations to accommodate different load dimensions and weights (see illustrations on following page). Configurations are created by positioning or removing the pad mounts, and/or by installing or removing pad frame extensions. Always arrange the vacuum pads in a symmetrical configuration, in both width and length dimensions.

CAUTION: Vacuum pads must be mounted on main pad frame at all times.

To prevent lifter damage and to provide adequate load support, 4 activated vacuum pads must be mounted on the main pad frame, regardless of the configuration selected (see illustrations on following page). It is especially important to observe this rule when pad frame extensions are employed: The vacuum pads may not be located solely on the extensions, as such a configuration would not provide adequate load support.

The lifter is equipped with a dual vacuum system, as indicated by color-coded vacuum hoses. For maximum effectiveness, adjacent vacuum pads must be connected to separate circuits of the vacuum system in an even distribution. Make sure that an equal number of pads is connected to the green circuit and to the red circuit.

After changing the pad frame configuration, make sure all vacuum hoses are secure and routed to avoid being pinched, snagged, abraded or otherwise damaged while the lifter is in operation. Also be sure to verify that all pads are connected and functioning correctly.



Pad Spread and Maximum Load Capacity
(larger configurations shown with pad frame extensions)

To Install/Remove Pad Frame Extensions

- 1) Insert the end of a pad frame extension in one socket on the main pad frame, so that the holes align for the cotterless hitch pin.
- 2) Secure the pad frame extension in the pad frame by pushing a cotterless hitch pin through the holes until the retaining ball emerges on the far side of the pad frame socket.
- 3) Use the quick connectors to connect the vacuum hoses from the pad frame extensions to the main pad frame as directed in the discussion to follow.
- 3) Repeat steps 1-3 to install the other pad frame extensions as required for the pad frame configuration desired.
- 4) To remove the pad frame extensions, reverse this procedure. Store pad frame extensions in a clean, dry location to protect them from environmental exposure.

To Install/Remove, Rotate and Position Pad Mounts

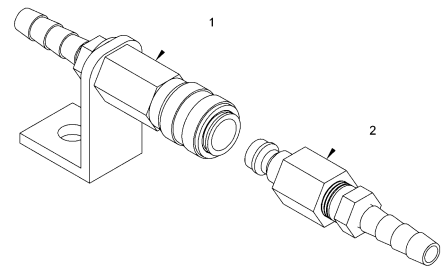
- 1) Position a pad mount on one arm of the pad frame. Note that each pad mount can also be rotated 180° to allow for the best hose routing.
- 2) Align the holes for the cotterless hitch pin in the pad mount with the corresponding holes in the pad frame.
- 3) Use the quick connector to connect the vacuum hose from the vacuum pad to the appropriate circuit of the vacuum system as directed in the discussion to follow.
- 4) Repeat steps 1-3 to install and position each vacuum pad as required for the pad frame configuration desired.
- 5) To remove the pad mounts, reverse this procedure. Store pad mounts in a clean, dry location to protect them from environmental exposure.

To Connect/Disconnect Vacuum Hoses

The vacuum hose for each vacuum pad is connected to or disconnected from the vacuum system by means of a quick connector. To connect the vacuum hose, push the male and female ends of the connector together until they lock. To disconnect the vacuum hose, move the release ring on the female end until the connector separates.

Note: For proper function of the dual vacuum system, make sure that vacuum pads are connected to alternating circuits of the vacuum system (red or green).

Note: Whenever a quick connector is disconnected, the corresponding vacuum pad does not contribute to the load capacity, whether or not the pad is mounted on the pad frame.



QUICK CONNECTOR

- 1) FEMALE END
- 2) MALE END

INTENDED USE

LOAD CHARACTERISTICS

 **WARNING: 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 must not exceed the maximum allowable weight specified under Load Capacity (see SPECIFICATIONS).
- The load must be a single piece of nonporous or semiporous material with a flat and relatively smooth contact surface. Flexible sealing rings are able to accommodate some surface relief, provided contour changes are not too abrupt. To determine whether the load is too porous, rough or contoured to seal adequately, perform the test under Vacuum Level on Other Surfaces (see OPERATION: TO APPLY 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: Friction Coefficient), as verified by a friction test. If necessary, contact Wood's Powr-Grip for help in conducting a friction test.
- In order to avoid damaging the vacuum pads, the load's surface temperature must not exceed the allowable Operating Temperatures (see SPECIFICATIONS). However, 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.
- While the *minimum* length and width of the load are determined by the Pad Spread (see SPECIFICATIONS), the *maximum* length and width are determined by the allowable overhang, or the amount of load material that can extend sideways beyond the vacuum pads without breaking or otherwise being damaged.

The allowable overhang depends on the kind of load material being lifted, the thickness of the material, and the angle at which it is handled (if any). Since materials such as glass, 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.

- 8" [20 cm] is the maximum allowable thickness of loads at the maximum weight (see SPECIFICATIONS: Load Capacity). However, allowable thickness increases as load weight decreases. If necessary, contact Wood's Powr-Grip for help in determining the maximum thickness permitted when handling any specific load.

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

OPERATING ENVIRONMENT

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

 **WARNING: 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 when using the lifter.
- The lifter's work environment is limited by the Operating Elevation and Operating Temperatures indicated in SPECIFICATIONS.
- 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: Friction Coefficient).

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

Although the lifter's exterior surfaces can tolerate some exposure to water vapor, they are 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.

- If the lifter is equipped with a Remote Control System, the work environment must be suitable for using it, as verified by the REMOTE CONTROL SYSTEM TEST (see MAINTENANCE).

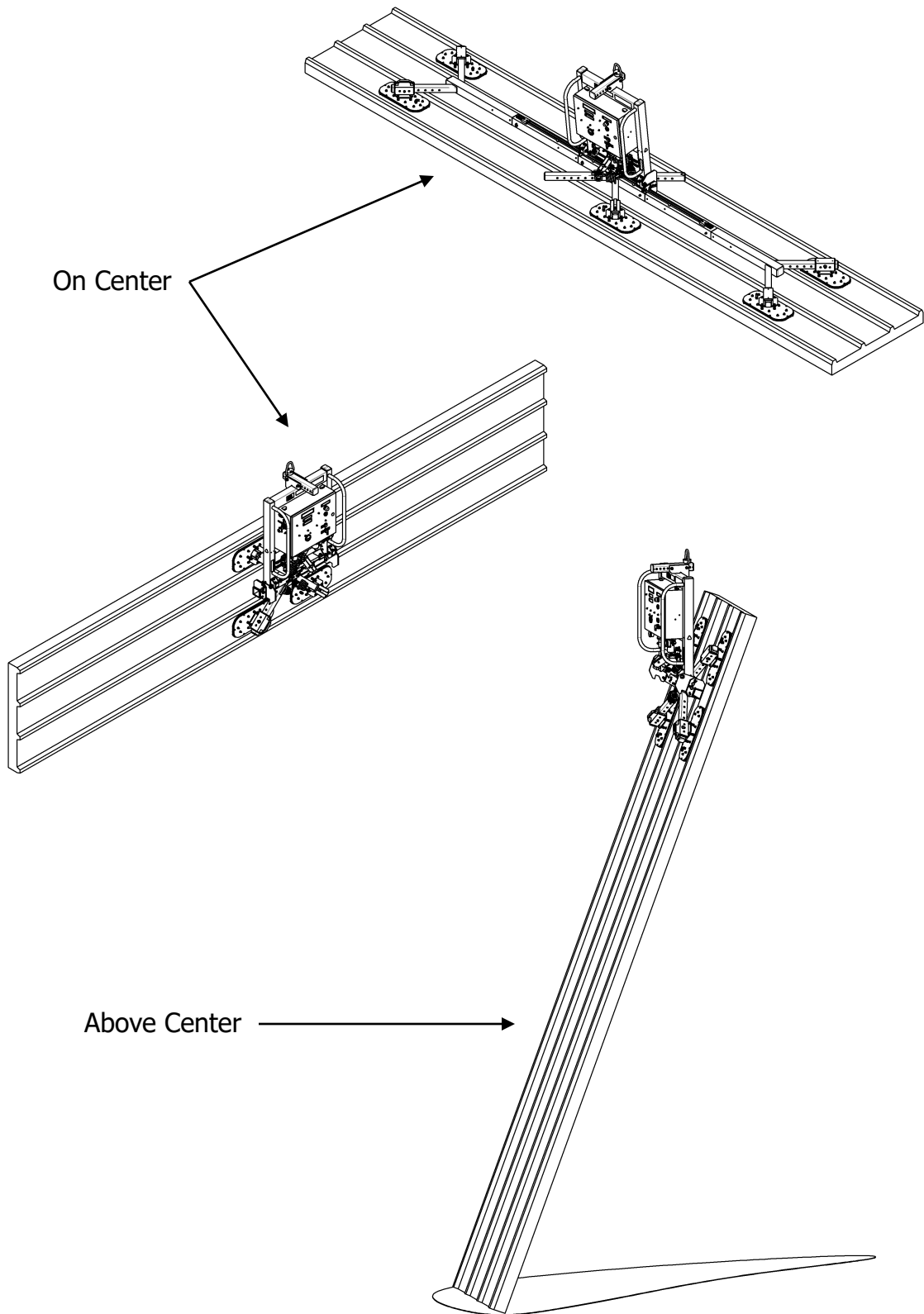
DISPOSAL OF THE LIFTER

After the vacuum lifter has reached the end of its service life, you must dispose of the lifter in compliance with all local codes and regulatory standards that are relevant for the geographical region.

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

TYPICAL APPLICATIONS

Though the lifter is designed with the flexibility to be used in many different ways, these illustrations represent some typical applications.



OPERATION

BEFORE USING THE LIFTER

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

Taking Safety Precautions

The operator must be trained in all relevant industry and regulatory standards for the operation of the vacuum lifter in its geographical location (eg, ASME B30.20 in the USA).

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

⚠ WARNING: Always wear appropriate personal protective equipment.

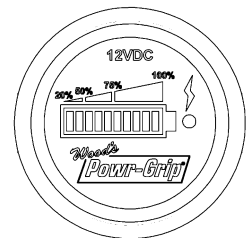
The operator must wear any personal protective equipment and take any other precautions required to handle the load safely. Consult appropriate trade association guidelines to determine what precautions are necessary for each type of load material.

Performing Inspections and Tests

⚠ WARNING: Always check battery energy before using lifter.

(See MAINTENANCE: BATTERY TEST)

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



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

The volume of the alarm may be adjusted by rotating the shutter of the low vacuum warning buzzer. Make sure the alarm is loud enough to be heard over any other noise that may be present while the lifter is in use. In addition, the alarm must be clearly audible at the maximum distance the operator may be from the lifter, as well as through any barriers or obstructions between the operator and the lifter. In order to be considered clearly audible, **the alarm volume must exceed ambient noise by at least 15 dBA at the operator position.**³ Since the Maximum Alarm Volume is 103 dBA, ambient noise must not exceed 88 dBA under any circumstances. Furthermore, if ambient noise measures 88 dBA, the alarm volume must be set to maximum and the operator must remain within 2 ft [60 cm] of the warning buzzer, in order for it to be effective.

³ Consult CE Standard EN 457 for alternative ways to determine whether the alarm is clearly audible to operators.

CAUTION: Examine each air filter regularly, and empty when necessary.

Two air filters help protect the vacuum generating system from contaminants. However, the lifter is not intended for use on wet load surfaces because the filters would not necessarily prevent liquid from entering the vacuum system. In order for a filter to function, the operator must empty the filter bowl before enough liquid accumulates to contact any portion of the filter element (see MAINTENANCE: AIR FILTER MAINTENANCE).

Confirming the Pad Frame Configuration

 ***WARNING: Load Capacity of lifter varies, depending on pad frame configuration.***

Make sure the pad frame has been assembled in the configuration that will provide optimal support of the load while lifting (see ASSEMBLY: TO CHANGE THE PAD FRAME CONFIGURATION). The pad frame configuration selected must be appropriate both for the weight and for the dimensions of the load to be lifted.


Preparing to Use the Optional Remote Control System

If the lifter is equipped with a Remote Control System, the operator can engage the lifter's apply and release functions at distances up to 250 ft [76 m], provided there is a direct and clear view of the lifter and its status indicators from the operator location (see MAINTENANCE: REMOTE CONTROL SYSTEM TEST). When lifting a load from a remote location, the operator must monitor the lifter at all times to make sure that it is functioning as intended.⁴ In addition, the operator must exercise special care to ensure that the load is landed and supported correctly before releasing the load (see TO RELEASE THE PADS FROM THE LOAD to follow).

The radio transmitter is also equipped with an emergency transmitter disconnect that prevents the transmitter from sending any transmission. This button should not need to be used, but may have to be reset if accidentally engaged. To reset, twist the button clockwise while allowing it to spring outward to its normal position.

TO APPLY THE PADS TO A LOAD

Powering up the Lifter

Place the lifter's power switch in the "on" () position.⁵ The blue power light remains illuminated while the lifter is powered up. Keep the power switch in the "on" position while lifting a load. Any power interruption during a lift could result in the release of a load and possible injury to the operator or others (see TO LIFT AND MOVE THE LOAD: In Case of Power Failure to follow).

 ***WARNING: Never turn power off while lifting.***

⁴ The Remote Control System is designed with safeguards to prevent multiple lifters from responding until a clear transmission is received. Nevertheless, radio controlled lifters should be tested to ensure that each transmitter controls only one lifter. The buttons located on the lifter function regardless of any radio transmissions in the vicinity.

⁵ When the operator powers up the lifter, either the stand-by function or the apply function is automatically activated, depending on which was used last. If a vacuum pump or any other powered component fails to function while the lifter's power switch is in the "on" position, examine each circuit breaker (adjacent to power switch) to determine whether it has interrupted the electrical circuit to the component. Although the operator can reset the circuit breaker, the power interruption may indicate an electrical problem that requires attention. Correct any deficiency before resuming normal operation of the lifter (see wiring diagram provided).

If the lifter is equipped with a Remote Control System, press the transmitter power/enable button and hold it briefly to activate the radio transmitter.⁶ This button is also used to activate the enable function (see TO RELEASE THE PADS FROM THE LOAD to follow).


Note: If the transmitter is activated, the transmission indicator light flashes green when any button on the transmitter is pressed and held; if the transmitter is not activated, the indicator light flashes red (see BEFORE USING THE LIFTER: Preparing to Use the Optional Remote Control System preceding).

Positioning the Lifter on the Load

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

To lift loads in the *flat* orientation (see INTENDED USE: TYPICAL APPLICATIONS), center the pad frame to within 2" [5 cm] of the load center (hereafter, "on center"), since off-center loading can cause the load to hang at an angle or to tilt unexpectedly (see TO TILT THE LOAD to follow), and it may also damage the lifter.⁷

To lift loads in the *upright* orientation (see INTENDED USE: TYPICAL APPLICATIONS), center the pad frame from left to right on the load and determine which will be the top edge of the load while lifting. Then position the vacuum pads near that edge (hereafter, "above center"). This position will maximize stability while lifting the load.

 **WARNING: When lifter is positioned above center, tilt latches must be locked out before lifting load.**

If the lifter is positioned above center on a load encountered in the flat orientation, the load automatically tilts to the upright position when lifted (see TO TILT THE LOAD: Tilting Loads Positioned Above Center to follow). In this case, failure to lock out the tilt latches could result in an unexpected load release or damage to the lifter.

Make sure that all vacuum pads will fit entirely on the load's contact surface (see SPECIFICATIONS: Pad Spread) and that they will be loaded evenly while lifting (see SPECIFICATIONS: Per-Pad Load Capacity). Then apply the lifter to the load so that all pads are touching the contact surface.

 **WARNING: Lift point must be adjusted so as to prevent interference between adjustable lift point tube and load.**

Note: If the load would extend higher than the lift point when lifted or tilted upright, the lift point must be adjusted to prevent interference between the adjustable lift point tube and the load (see ASSEMBLY: TO SET UP THE LIFTER). Failure to do so could damage the lifter or load, and may result in an unexpected load release.

⁶ The radio transmitter turns off automatically, after a period of inactivity. The operator can also operate the lifter without using the transmitter, if desired.

⁷ 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 pad frame's center point. 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

The apply/release switch is located on the movable control pendant. The movable control pendant allows the vacuum controls to be moved away from the lifter, so that the operator can control airflow at a distance equal to the length of the pendant cord.

 **WARNING: Do not disconnect control pendant during lifter operation.**

The movable control pendant is not intended to be disconnected during lifter operation. Disconnecting the control pendant is likely to result in a load release and injury to the operator or others nearby.

Turn the apply/release switch to the "apply" (↻) position (clockwise) to make sure the apply function is activated.

 **WARNING: Keep apply/release switch in "APPLY" position throughout lift.**

Alternatively, if the lifter is equipped with a Remote Control System, press an apply button on either the radio transmitter or the lifter, to make sure the apply function is activated.

This energizes the vacuum pumps, causing air to be drawn immediately at the vacuum pads. The low vacuum warning buzzer also sounds an alarm until the lifter attains sufficient vacuum to lift the maximum load weight (see TO LIFT AND MOVE THE LOAD: Load Capacity and Lift Light to follow). Press the lifter onto the load until all the pads seal against it. The apply/release switch must remain in the "apply" (↻) position throughout the entire lift.

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

Reading the Vacuum Gauges

The lifter is equipped with 2 vacuum gauges, which indicate the current vacuum level in each circuit of the lifter's vacuum system. The *green* range indicates vacuum levels sufficient for lifting the maximum load weight, whereas the *red* range indicates vacuum levels that are **not** sufficient for lifting the maximum load weight. The gauge needles should show a sudden surge in vacuum as the vacuum pads seal against the load. If it takes more than 5 seconds for the vacuum level to reach 5" Hg [-17 kPa] on a vacuum gauge, press on any pad that has not yet sealed.

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 both vacuum gauges, except when used at high elevations (see SPECIFICATIONS: Operating Elevation). If not, make sure the vacuum switches are adjusted correctly (see MAINTENANCE: VACUUM SWITCH ADJUSTMENT). If the vacuum switches 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 both vacuum gauges, due to leakage in the seal between the vacuum pads and the load surface.⁸ In the case of contamination, thoroughly clean the contact surfaces of the load and the vacuum pads (see MAINTENANCE: VACUUM PAD MAINTENANCE: Cleaning), and reapply the lifter to the load. If the load has rough or porous surfaces, ***the operator must conduct a test to determine whether the lifter is designed to lift the load***, as follows:

- 1) Make sure the lifter's vacuum generating system is functioning correctly (see MAINTENANCE: VACUUM TEST).
- 2) Apply the vacuum pads to the load as previously directed.
- 3) After the vacuum pumps stop running, place the power switch in the "off" (⊖) position.
- 4) Raise the load a minimal distance, to assure that it is supported by the lifter.
- 5) Monitor both vacuum gauges 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.⁹

⁸ Contaminated loads can also cause the vacuum pumps to run frequently or continuously. Since excessive pumping quickly reduces battery energy, the operator should clean the load when possible, to minimize pumping.

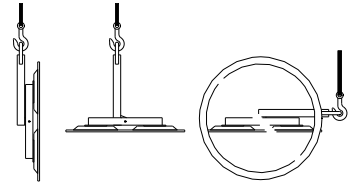
⁹ Certain load materials are too rough or porous to allow the lifter to form a seal which can be maintained for 5 minutes without power. However, in geographical locations where CE Standards do not apply, it may be possible to use the lifter to lift such loads. Contact Wood's Powr-Grip for more information.

TO LIFT AND MOVE THE LOAD

Positioning the Lift Bar

⚠ WARNING: Lift bar must be oriented vertically to lift load.

Never lift the load from a flat position with the lift bar latched parallel to the load. Always disengage the tilt latches (see TO TILT THE LOAD to follow) and raise the lift bar to a vertical orientation before attempting to lift.



Interpreting the Warning Buzzer and Lift Light

A lifter's Load Capacity is rated at a vacuum level of 16" Hg [-54 kPa] (see SPECIFICATIONS). After the lifter has attained this level, the low vacuum warning buzzer turns *off* automatically and the green vacuum lift light turns *on* automatically, to signal that the lifter is ready to lift the maximum load weight. As vacuum continues to increase, the vacuum pumps turn off to conserve battery energy.

⚠ WARNING: Never attempt to lift load unless green lift light is illuminated.

Do not attempt to lift the load unless the lift light is illuminated; such an attempt could result in a load release and possible injury to the operator.

Monitoring Vacuum Indicators

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

⚠ WARNING: Vacuum indicators must be visible to operator throughout entire lift.

If the vacuum system experiences leakage while the lifter is attached to the load, the vacuum pumps turn on and off automatically, as required to maintain sufficient vacuum for lifting the maximum load weight. Under normal conditions, such intermittent cycling of the pump is no cause for alarm.

However, if vacuum decreases significantly, the lift light turns *off* and the low vacuum warning buzzer turns *on*, to signal the reduction in vacuum to the operator. If this occurs while you are lifting a load, make sure both vacuum gauges show a vacuum level of 16" Hg [-54 kPa] or higher. If not, move away and stay clear of the load until it can be lowered to the ground or a stable support.

⚠ WARNING: Stay clear of any suspended load while vacuum level is lower than 16" Hg [-54 kPa].

Discontinue lifter use until the cause of the vacuum loss can be determined. If the pumps run at intervals of five minutes or less while the lifter is attached to clean, smooth, nonporous materials, a leak in the vacuum system is likely to be the cause. In this event, perform the VACUUM TEST (see MAINTENANCE) and inspect the vacuum pads for damage (see MAINTENANCE: VACUUM PAD MAINTENANCE: 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 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 the control handles or other appropriate means to keep the lifter and load in the desired orientation while they are suspended from the crane.

⚠️ *WARNING: When lifter is positioned above center, tilt latches must be locked out before lifting load.*

If the lifter is positioned *above center* on a load encountered in the flat orientation, the load automatically tilts to the upright position when lifted (see TO TILT THE LOAD: Tilting Loads Positioned Above Center to follow). In this case, failure to lock out the tilt latches could result in an unexpected load release or damage to the lifter. If the load is positioned *on center*, the load can be tilted as desired once sufficient clearance is established (see TO TILT THE LOAD: Tilting Loads Positioned On Center to follow).

In Case of Power Failure

The lifter is equipped with 2 vacuum reserve tanks, designed to maintain vacuum temporarily in case of a power failure (ie, in battery).

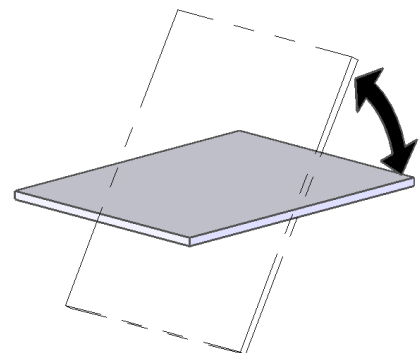
⚠️ *WARNING: Stay clear of any suspended load in the event of a power failure.*

Although the lifter is designed to support the load for at least 5 minutes without power, this depends on many factors, including the condition of the load and the lifter's vacuum system (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 TILT THE LOAD

⚠️ *WARNING: Make sure load is positioned correctly on lifter (see To APPLY); unbalanced loads may tilt unexpectedly when latches are disengaged.*

The tilt feature allows the operator to transfer a load from the flat position to the upright position, and vice versa (see INTENDED USE: TYPICAL APPLICATIONS). Remember that the load requires more vertical space when tilting to the upright position, as well as more horizontal space when tilting to the flat position. Make sure there is sufficient clearance for the load to tilt without contacting the operator or any nearby objects. Keep the load under control throughout the tilt using control handles, control lines or other appropriate means.



The appropriate way to tilt the load differs, depending on whether the lifter is attached to the load "above center" or "on center" (see To Apply the Pads to the Load: Positioning the Lifter on the Load preceding), as follows:

Tilting Loads When Lifter is Positioned *Above Center*



WARNING: *When lifter is positioned above center, tilt latches must be locked out before lifting load.*

The tilt latches must always be locked out when the lifter is positioned above center (see Operating the Tilt Latches to follow). Failure to lock out the tilt latches could result in an unexpected load release or damage to the lifter and load.

If the lifter is positioned above center on the load, the load automatically tilts from the flat position to the upright position when lifted. To tilt the load from the upright position to the flat position, use the hoisting equipment to lower the load until its lower edge is adequately supported. Then move the lifter forward and downward, allowing the load to tilt to the flat orientation as you continue to lower it.

Tilting Loads When Lifter is Positioned *On Center*

If the lifter is positioned on center, disengage the tilt latches (see Operating the Tilt Latches to follow) and prepare for a slight surge of motion as the load begins to tilt. Lift upward or press downward on the control handles to tilt the load as desired, and continue to apply pressure as necessary to maintain the desired load orientation.



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



Operating the Tilt Latches

To disengage the tilt latches, push the tilt control lever *part of the way* upward. The pad frame automatically latches in place when the load reaches either the upright or the flat position, provided that you release the control lever after the tilt motion has been initiated. However, automatic latching can be defeated by continuing to hold the control lever so that the tilt latches do not engage. Alternatively, you can lock out the tilt latches, so that they will not engage at any time during the tilt: To lock out the tilt latches, push the tilt control lever *all the way* upward until it locks in the disengaged position. Whenever tilt is not required, keep the tilt latches engaged, to prevent accidental damage to the load and possible injury to the operator.

TO RELEASE THE PADS FROM THE LOAD

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

The lifter is designed to prevent an accidental load release, which could result from unintentionally interrupting the apply mode: When the load is at rest and fully supported, press the enable release button () on the movable control pendant and, at the same time, turn the apply/release switch to the "release" () position (counter-clockwise) to force air into the vacuum pads, quickly breaking the vacuum seal. Continue to hold the enable release button and the apply/release switch until the pads disengage completely from the load.

When the apply/release switch is no longer held in the "release" () position, it automatically returns to the neutral position (stand-by mode). Do not turn the apply/release switch to the "apply" () position until the pads are contacting the next load to be lifted. This conserves battery energy and reduces the time required to apply the pads to the load, by preventing the vacuum reserve tanks from losing their vacuum.

Alternatively, if the lifter is equipped with a Remote Control System, press and hold the enable button on either the radio transmitter or the lifter. While holding the enable button, press a release button (on the transmitter or on the lifter) to force air into the vacuum pads, quickly breaking the vacuum seal. Continue to hold both buttons until the vacuum pads disengage completely from the load.

If the lifter is equipped with a Remote Control System, a strobe light flashes as long as the operator is pressing the enable or release buttons. This serves to show the operator when signals are being transmitted successfully from a remote location and also to warn other personnel that the operator is suspending the apply function.

 **WARNING: If vacuum pads do not disengage completely, do not attempt to move the lifter or load.**

The operator must never attempt to move the lifter or load until the vacuum pads are completely disengaged, as this could cause an unexpected load release and potential injury to the operator or others. If the vacuum pads do not disengage completely on the first attempt, repeat the release process. If the load cannot be successfully released for any reason, reapply the vacuum pads to the load as previously directed (see TO APPLY THE PADS TO A LOAD preceding) prior to moving the lifter or load.

After the load is successfully released, the lifter will automatically activate the stand-by mode to conserve the battery energy until the lifter is ready to lift another load. Once the stand-by mode is activated, only the blue power light remains illuminated.

Prior to lifting another load, perform the Every-Lift Inspection as directed in MAINTENANCE: INSPECTION SCHEDULE.

AFTER USING THE LIFTER

Leave the apply/release switch in the neutral position and place the power switch in the "off" (○) position (power light shuts off when power is disengaged).

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

To remove the lifter from the hoisting equipment, place stable supports under the center of the pad frame. Additional supports may be placed under the pad frame extensions for stability. Use the hoisting equipment to gently lower the lifter until the supports are holding its entire weight. Make sure the lifter is stable; then detach the hoisting equipment hook from the lift bail.

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 while in transit.

Storing the Lifter

Charge the battery completely when placing it in storage and at six-month intervals thereafter (see MAINTENANCE: BATTERY RECHARGE). After charging the battery, open the power system enclosure and disconnect the electrical connector uniting the battery charger and the battery, in order to prevent power drainage. Disconnecting the battery from the vacuum generating system is also recommended.¹⁰ Preferred temperatures for storing the battery are 32° to 70° Fahrenheit [0° to 21° Celsius]. Higher temperatures require the battery to be charged more frequently. Storage at temperatures above 100° Fahrenheit [38° Celsius] should be avoided.

TO REPLACE SEALING RING INSERT IN VACUUM PAD

- 1) Remove the old sealing ring insert: Hold the vacuum pad firmly and pull the ring insert out from the mounting groove. Discard any damaged ring insert.
- 2) Install a new sealing ring insert (see REPLACEMENT PARTS LIST): Make sure the entire vacuum pad is clean, including the mounting groove (see Vacuum Pad Maintenance: Pad Cleaning preceding). Push the ring insert into the mounting groove so that the insert's base (flat side) fits flush against the bottom of the groove. Begin by placing the inside edge of the ring insert against the inside edge of the mounting groove. Then push gently and firmly on the outside edge of the ring insert until it seats completely into the mounting groove. A pad ring installation tool is available to facilitate this process (see REPLACEMENT PARTS LIST). Work your way around the entire ring insert, repeating this process until the entire ring is seated in the mounting groove.
- 3) Make sure that the sealing ring is secure and fully inserted into the mounting groove around the entire perimeter of the vacuum pad.

Note: If the ring insert ever comes partially or entirely out of the mounting groove, inspect the ring insert for damage and reinstall an undamaged ring insert according to preceding directions.

¹⁰ Place the power switch in the "off" position before disconnecting the battery leads.

MAINTENANCE

 **WARNING:** Always make sure battery is disconnected before servicing lifter.

Note: One or more wiring/hose routing diagrams are provided in the final section of this *INSTRUCTIONS* manual for reference when servicing the lifter or trouble-shooting a deficiency.

INSPECTION SCHEDULE

Perform inspections routinely, according to the following frequency schedule:

Every-Lift Inspection

- Examine the vacuum pads and load surface for contamination or debris (see VACUUM PAD MAINTENANCE to follow).
- Examine the vacuum pads, controls and indicators for visual damage (see VACUUM PAD MAINTENANCE to follow).
- Test the battery for adequate charge (see BATTERY TEST to follow).

If a battery's charge appears to be inadequate, charge and retest the battery (see BATTERY RECHARGE to follow). If any other deficiency is detected during the inspection, correct it before using the lifter and perform the Frequent Inspection to follow.

Frequent Inspection

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

- Examine the lifter's structure for visual damage.
- Examine the vacuum system (including vacuum pads, fittings and hoses) for visual damage.
- Examine the air filters for conditions requiring service (see AIR FILTER MAINTENANCE to follow).
- Perform the VACUUM TEST to follow.
- Check for unusual vibrations or noises while operating the lifter.

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

Periodic Inspection

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

- 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.

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

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 or modification*. Correct any deficiency and retest before using the lifter.

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.¹¹ Employ the following method to test with an actual load:

- 1) Place a test load with appropriate LOAD CHARACTERISTICS (see INTENDED USE) on a stable support. Make sure the load is oriented in the upright position.
- 2) Apply the vacuum pads to the load as previously directed.
- 3) After the vacuum pumps stop running, place the power switch in the "off" () position.
- 4) Raise the load a minimal distance, to assure 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: Inspection (see sections to follow). Correct any deficiency that is found and retest the lifter.

Note: See MAINTENANCE topics to follow for additional directions about inspecting and testing specific lifter components. Since the low vacuum warning buzzer is controlled by a vacuum switch, consult the VACUUM SWITCH ADJUSTMENT discussion for inspection, testing and adjustment procedures.

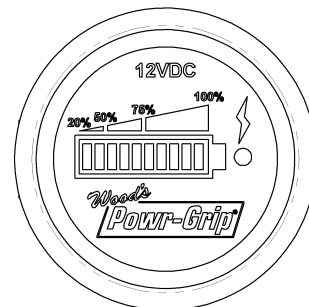
¹¹ ASME Standard B30.20 requires the lifter to be tested to 125% of its Load Capacity.

MAINTENANCE SCHEDULE

Unless specified elsewhere in this *INSTRUCTIONS* manual, the lifter does not require maintenance on a routine basis. Instead, maintenance must be performed whenever a deficiency is indicated by routine inspections or tests. Any maintenance warranted must be performed before resuming normal operation of the lifter.

BATTERY TEST

The lifter is equipped with a battery gauge to help the operator evaluate whether the battery has adequate energy for lifting. Factors such as the condition of the battery, the time required to execute a lift, and the porosity of the load combine to determine how much battery energy is needed. ***It is the operator's responsibility to evaluate these conditions and to make sure the battery has sufficient energy to complete a lift safely.*** 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).¹² Never use the lifter when battery energy registers lower than 50% (that is, when only red lights are illuminated), regardless of the estimated energy requirement.



⚠ WARNING: Never use lifter if battery energy is lower than 50% of capacity.

While the lifter's power switch is in the "on" (⏻) position, the battery gauge automatically monitors battery energy (provided that the lifter is not in stand-by mode). However, the battery gauge shuts off temporarily while the vacuum pumps are 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.

While the lifter's power switch is in the "off" (⏻) position (or the lifter is in stand-by mode), the battery energy can be checked manually using the battery test button. 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 pumps runs for approximately one minute, the surface charge dissipates, allowing the operator to take an accurate energy reading.

¹² 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.

BATTERY RECHARGE

CAUTION: Charge battery only while lifter's power switch is in "off" (⏻) position.

Operating the lifter when the battery charger is connected to an AC power source could result in permanent damage to the charger.

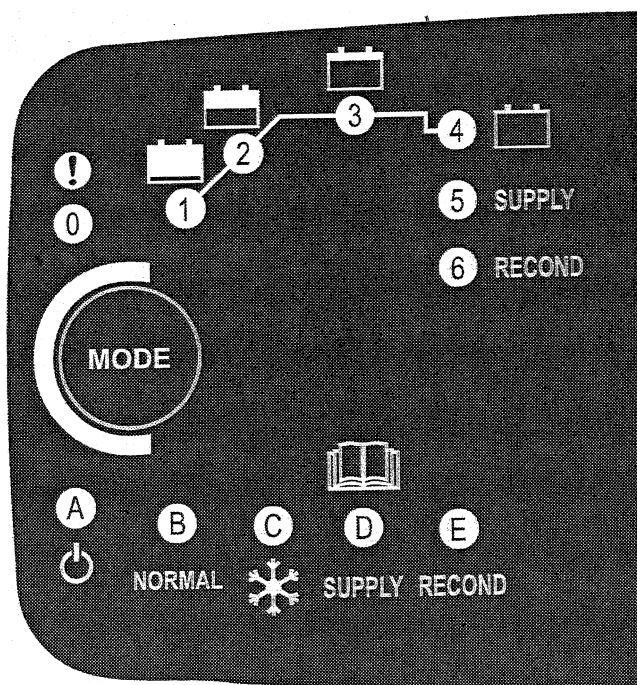
Only use a battery charger supplied by or approved by Wood's Powr-Grip; other chargers may reduce battery life. Charge the battery as soon as possible after any extended use of the lifter, or whenever the battery gauge indicates diminished energy (see BATTERY TEST preceding). Temperatures higher than 70° Fahrenheit [21° Celsius] require the battery to be charged more frequently.

Identify the input voltage marked on the power system enclosure, plug the charger cord supplied into the charger cord receptacle and plug the other end into an appropriate power source.¹³ The power source must be equipped with a ground fault circuit interrupter, in order to reduce the risk of electrical shocks.

⚠ WARNING: Power source must be equipped with ground fault circuit interrupter.

Open the power system enclosure (see enclosure latch in OPERATING FEATURES) and press the charger's "MODE" button to select "NORMAL" mode. After the mode has been selected, the charger should begin to charge the battery automatically. Lights #1-4 in the illustration indicate the level of charging that has been attained.¹⁴ When the battery is fully charged, the charger switches to a maintenance mode and charging level light #4 (green) turns on. The blue light on the battery gauge also turns on, to indicate that the battery is fully charged. Be sure to unplug the charger and check the battery energy again before operating the lifter (see BATTERY TEST preceding).

When the lifter and its charger are used as directed, the battery should take no more than 8 hours to charge completely.¹⁵ However, following long-term use, a battery gradually loses the capacity to hold a charge. After reaching charging level #3, the charger analyzes the battery voltage, to determine whether or not the battery is holding a charge. If the battery does not hold a charge adequately, the charger's red error light (!) turns on, indicating that the battery needs to be replaced (see REPLACEMENT PARTS LIST).



¹³ Any external power supply must conform to all applicable local codes.

¹⁴ If none of the charging level lights turns on, the battery connection or the battery itself may be faulty. If the red error light (!) turns on immediately, the battery leads may be reversed or the charger terminals may be short-circuited; once the problem has been corrected, the charger should function normally. The red error light can indicate other problems, depending on the mode selected and level of charging; if necessary, contact Wood's Powr-Grip for assistance.

¹⁵ 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.

VACUUM PAD MAINTENANCE

Friction Coefficient

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

The Load Capacity of most Powr-Grip lifters is based on a friction coefficient of 1 (only Flat Lifters are exempt from this requirement). However, a vacuum pad's ability to maintain this friction coefficient is reduced by factors such as contamination, wear, age and exposure to sunlight, as well as the condition of the load's contact surface (see INTENDED USE: LOAD CHARACTERISTICS). Pads that have surface contamination must be thoroughly cleaned (see Cleaning discussion to follow). Over time, the rubber in a pad may experience hardening or leaching of chemicals, resulting in stiffness or surface glaze. Pads that exhibit wear, stiffness or glaze must be replaced. In addition, all pads should be replaced on a regular basis, preferably after no more than 2 years, to ensure that the friction coefficient is not compromised. If necessary, contact your dealer or Wood's Powr-Grip for more information.

Inspection

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

- Contaminates on the pad face or sealing ring: Soil build-up can prevent pads from sealing adequately or reduce the friction coefficient (see discussion preceding). Follow the directions to clean pads as necessary (see discussion to follow).
- Filter screen missing from pad face: This screen helps prevent debris from plugging the vacuum hose and the air filter. Replace any missing screen immediately (see REPLACEMENT PARTS LIST).

 **WARNING: Replace any sealing ring that has any nicks, cuts, abrasions or other deterioration.**

- Nicks, cuts, abrasions other deterioration in sealing rings: Pad damage can reduce the lifting capacity. Replace any damaged sealing ring immediately (see discussion to follow).

Cleaning

Regularly clean each vacuum pad to remove oil, dust and any other contaminants. Acceptable cleaning agents include soapy water and other mild cleansers. Do *not* use solvents, petroleum-based products (including kerosene, gasoline and diesel fuel) or any harsh chemicals for cleaning. Do *not* use unauthorized rubber cleaners or conditioners, such as those intended for cleaning tires or vinyl surfaces, because those products can leave a hazardous film on vacuum pads which significantly reduces their lifting capacity (see Friction Coefficient preceding). The use of any unauthorized cleaning agent is prohibited because it could damage the pad and/or create a hazard to the operator or others.

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

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

To prevent liquid from contaminating the vacuum system during cleaning, cover the suction hole in the recess for the filter screen or make sure the pad faces downward. Use a clean sponge or lint-free cloth to apply an authorized cleanser and wipe the pad clean. A toothbrush (or similar brush with bristles *that do not harm rubber*) may be used to remove contaminants clinging to sealing edges.¹⁶ Wipe all residue from the pad, and allow the pad to dry completely before using the lifter.

Sealing Ring Replacement

- 1) Remove the old sealing ring insert: Hold the vacuum pad firmly and pull the sealing ring out from the mounting groove. Discard any damaged sealing ring.
- 2) Install a new sealing ring insert (see REPLACEMENT PARTS LIST): Make sure the entire vacuum pad is clean, including the mounting groove (see discussion preceding). Then push the sealing ring into the mounting groove so that the insert's base (flat side) fits flush against the bottom of the groove. Begin by placing the inside edge of the sealing ring against the inside edge of the mounting groove. A pad ring installation tool is available to facilitate this process (see REPLACEMENT PARTS LIST). Then push gently and firmly on the outside edge of the sealing ring until it seats completely into the mounting groove. Work your way around the sealing ring, repeating this process until the entire ring is seated in the mounting groove.
- 3) Make sure that the sealing ring is secure and fully inserted into the mounting groove around the entire perimeter of the vacuum pad.

Note: If the sealing ring ever comes partially or entirely out of the mounting groove, inspect the sealing ring for damage and reinstall an undamaged sealing ring according to preceding directions.

VACUUM TEST

Test the vacuum system for leakage routinely, as directed in the preceding INSPECTION and TESTING SCHEDULES.

- 1) Clean each vacuum pad as previously directed (see VACUUM PAD MAINTENANCE: Cleaning).
- 2) Apply the lifter to a clean, smooth, nonporous surface. The surface should be flat or possess no more curvature than the lifter is designed for (if any).¹⁷ When the pumping cycle is completed, the vacuum level should register above 16" Hg [-54 kPa] on the vacuum gauges (if not, see VACUUM SWITCH ADJUSTMENT to follow).
- 3) After the vacuum pumps stop running, leave the pads attached to the surface and place the power switch in the "off" (⊖) position, to interrupt the energy flow from the battery.
- 4) Monitor the vacuum gauges: *The vacuum level should not decrease by more than 4" Hg [-14 kPa] in 10 minutes.*

 **WARNING: If lifter fails vacuum test, discontinue use immediately.**

Correct any deficiency in the vacuum system before using the lifter. Contact Wood's Powr-Grip or an authorized dealer for assistance.

¹⁶ If these cleaning methods are not successful, contact Wood's Powr-Grip or an authorized dealer for assistance.

¹⁷ Any test material used must be fully and independently supported, and capable of bearing the lifter's weight. Do not use the lifter to lift the test material during the vacuum test.

Dual Vacuum Circuit Test

Two vacuum system circuits allow the lifter to maintain the vacuum level in one circuit even if an unexpected vacuum loss occurs in the other one. Verify the function of the circuits each time the preceding VACUUM TEST is performed and whenever a deficiency is suspected, as follows:

- 1) Clean the vacuum pads and apply the lifter to the test material as previously directed.
- 2) After the vacuum pumps stop running, monitor the vacuum gauges as a leak is introduced in one circuit. To introduce a leak, partially disconnect or connect one of the quick connectors until the vacuum circuit begins to leak. The corresponding vacuum gauge should indicate a loss of vacuum in that circuit.
- 3) As the vacuum level decreases in one circuit, continue to monitor the vacuum gauge for the other circuit, to make sure that it maintains its original vacuum level.
- 4) Repeat steps 1-3 as needed to verify the function of the second circuit of the vacuum system. Be sure to introduce the leak at a vacuum pad belonging to the second circuit.

Correct any deficiency in the vacuum system before using the lifter. Contact Wood's Powr-Grip or an authorized dealer for assistance.

REMOTE CONTROL SYSTEM TEST

If the lifter is equipped with a Remote Control System, perform this test in the environment where the lifter is normally employed. Use the radio transmitter to activate each of the remote functions.¹⁸ Vary the location and distance of the transmitter in relation to the lifter, to ensure that transmissions are effective in a variety of circumstances. This may require assistance from someone near the lifter, to verify that functions are being performed as intended.

If the Remote Control System does not function correctly, review the following potential causes of malfunction and correct them as directed:

- The battery for the radio transmitter may be worn out. Replace any expended battery (see REPLACEMENT PARTS LIST).
- Metal or other electrically conductive surfaces may be causing interference between the radio transmitter and radio receiver. Although the transmission signals often can bounce around interfering surfaces, the signals do not travel through conductive walls. Reposition the transmitter as necessary to transmit signals effectively.

If the preceding directions do not resolve a performance problem, repeat the test under different conditions, to determine whether there is transmission interference in the work environment or the Remote Control System is not functioning as intended. Correct any deficiency before resuming normal use of the Remote Control System. If necessary, contact Wood's Powr-Grip or an authorized dealer for assistance.

¹⁸ Use a test material with appropriate surface characteristics (see INTENDED USE: LOAD CHARACTERISTICS) to test the apply and release functions.

TILT DAMPER ADJUSTMENT

The lifter is equipped with a tilt damper, to slow the motion of the pad frame as it tilts from the vertical orientation to the horizontal orientation. This feature minimizes unexpected or rapid motions, for which the operator may not be prepared. The damper is set at the factory and should not need adjustment. If readjustment is necessary, disconnect the damper from the pad frame by pulling the pin from the clevis of the damper. Then pull the piston rod out to its fully extended position. While continuing to pull on the rod, turn it clockwise or counter-clockwise in small increments until the desired damping is achieved. The adjustment may require some trial and error to achieve the correct damping.

CAUTION: Do not turn damper rod in completely.

Turning the rod all the way in causes the damper to become very stiff. It will therefore be difficult to fully extend the damper in order to change the adjustment. Trying to use the damper in this condition may damage the damper or other lifter components.

TILT LATCHES ADJUSTMENT

If it becomes difficult to disengage or lock out the tilt latches (see OPERATION: TO TILT THE LOAD: Operating the Tilt Latches), the tilt latch mechanism requires adjustment, as follows:

When the tilt latches are engaged, the cable should remain taut but should not retract the latch pins at all. To change this adjustment, remove the flat head socket screw from the adjustment clevis in one of the tilt latches and remove the cable from the clevis. Loosen the clevis' lock nut and turn the clevis in or out as needed to adjust cable tension. Next, tighten the lock nut, making sure the slot in the clevis is oriented vertically, to minimize wear on the cable. Reattach the cable, reinsert the screw and tighten it securely. Then check the cable tension. The adjustment may require some trial and error to achieve the correct tension.

When the tilt control lever is placed in the locked out position, the latch pins should remain fully retracted but cable tension should not be excessive (ie, making it difficult to engage or disengage the control lever). To change this adjustment, remove the flat head socket screw from the adjustment clevis for the control lever and remove the cable from the clevis. Loosen the clevis' lock nut and turn the clevis in or out as needed to adjust cable tension. Then tighten the lock nut, making sure the slot in the clevis is aligned with the cable so as to allow reassembly. Reattach the cable, reinsert the screw and tighten it securely. Then check the adjustment.

AIR FILTER MAINTENANCE – LARGE

(for 4.4 oz [130 ml] bowl size filters)

Filter Function and Conditions Requiring Service

An air filter prevents solid particles and liquid from contaminating components in the vacuum system.

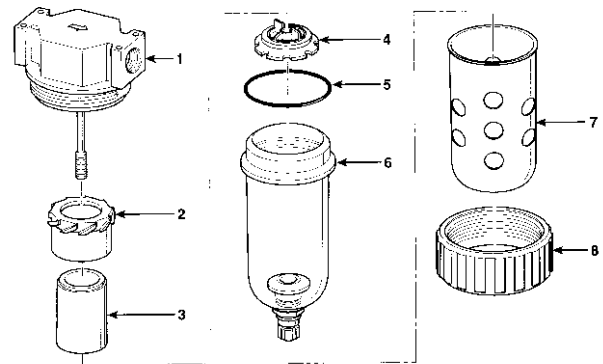
CAUTION: *Examine air filter regularly and empty when necessary.*

Liquid must not contact any portion of the filter element; remove trapped liquid regularly. Replace the element if it has an overall dirty appearance, or if there is a noticeable increase in the time required to attain full vacuum. (Refer to REPLACEMENT PARTS LIST for filter element kit.)

Filter Service Procedures

- 1) Unscrew the threaded collar (8) from the body (1). Support the body while twisting the collar, to protect the vacuum line fittings from being damaged. Then remove the bowl guard (7) and the bowl (6).
- 2) Determine whether the filter element (3) needs to be replaced (see Conditions Requiring Service preceding). *If so*, proceed to step 3.

If not, remove any liquid or contaminants from the bowl; clean the old bowl seal (5) with mild soap and water; and skip to step 7.



- 3) Unscrew the baffle (4), and remove the element and deflector (2).
- 4) Discard the element and the bowl seal (5).
- 5) Clean all internal parts and the bowl, using mild soap and water only. Do *not* use any other cleaners.
- 6) Install the deflector and a new filter element; then screw the baffle back on (tighten gently, finger tight) to hold the element in place.
- 7) Lubricate the new or cleaned bowl seal, using a mineral base oil or grease (such as the lubricant furnished in the filter element kit). Do *not* use synthetic oils, such as esters, or silicones.
- 8) Place the bowl seal around the rim of the bowl. Then install the bowl on the body, taking care to avoid contaminating the filter element with lubricant.
- 9) Install the bowl guard and the collar, tightening it only hand-tight (28-32 in-lbs [316-362 N-cm] torque).
- 10) Test the vacuum system to be certain the air filter does not leak (see VACUUM TEST preceding, if applicable).

⚠ WARNING: When the air filter is being used on a *vacuum* system, rather than with pressure, using the twist drain to remove liquid from the bowl is *not* recommended. **Never** disturb the twist drain, as contaminants could lodge in the drain seal and cause a vacuum leak

VACUUM PUMP MAINTENANCE – DYNAFLO DV1032102

⚠ WARNING: Before proceeding with any maintenance, disconnect power source.

If the vacuum pump takes too long to attain full vacuum, it may require maintenance. Replace the diaphragm, gasket/flap valves or (when preferable) the entire head assembly¹⁹ (see REPLACEMENT PARTS LIST), as necessary to obtain acceptable pump performance.

CAUTION: Do not over-tighten the head screws, because this may damage the threads in the pump body.

Replacing the Diaphragm

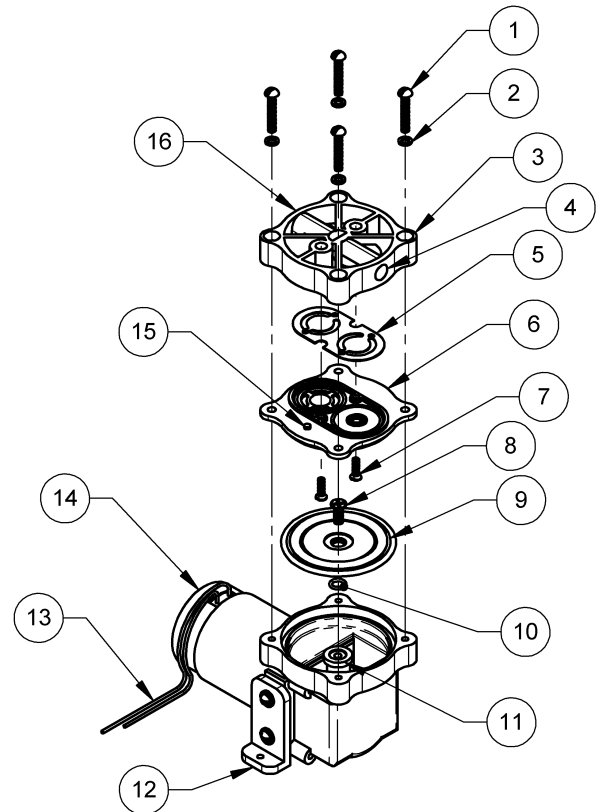
- 1) Remove the four head screws (1) and lock washers (2), and remove the head assembly (3–7).
- 2) Remove the diaphragm retaining screw (8), diaphragm (9) and rubber O-ring (10).
Note: Be sure to save the flat washer located between the O-ring and the connecting rod (11). Also take note of the diaphragm orientation for reassembly.
- 3) Replace the diaphragm, rubber O-ring and diaphragm retaining screw. Reinstall the flat washer in its original position.
- 4) Reverse the steps above for reassembly, as shown in the illustration.

Replacing the Gasket/Flap Valves

- 1) Remove the four head screws (1) and lock washers (2), and remove the head assembly (3–7).
- 2) Invert the head and remove the two valve plate screws (7). Remove the valve plate (6) to access the gasket/flap valves.
- 3) Replace the gasket/flap valves (5) and reverse the steps above for reassembly, as shown in the illustration. Use the alignment pin (15) to ensure proper fit between the head and valve plate.

Replacing the Head Assembly

- 1) Remove the four head screws (1), lock washers (2) and head assembly (3–7).
- 2) Replace the head assembly, and reverse the steps above for reassembly, as shown in the illustration.



1 HEAD SCREW	5 GASKET/FLAP VALVES	9 DIAPHRAGM	13 WIRES
2 LOCK WASHER	6 VALVE PLATE	10 RUBBER O-RING	14 MOTOR
3 HEAD	7 VALVE PLATE SCREW	11 CONNECTING ROD	15 ALIGNMENT PIN
4 INTAKE PORT	8 DIAPHRAGM RETAINING SCREW	12 MOUNTING FOOT	16 EXHAUST PORT

¹⁹ **CAUTION:** Depending on the product, the head assembly (3–7) may be rotated to an orientation different from the one shown. When removing the head assembly, always take note of its orientation and install it the same way during reassembly. Make sure that the intake and exhaust ports remain in their original positions.

VACUUM SWITCH ADJUSTMENT

Vacuum Switch Function

Two vacuum switches control various functions of the vacuum lifter (see OPERATING FEATURES for location of vacuum switches). While the lifter is powered up, each vacuum switch senses the vacuum level in one of the two vacuum circuits of the vacuum system. If either circuit loses significant vacuum while the lifter is in the apply mode, the system responds automatically. Each vacuum switch controls two functions: Settings n_1 and n_2 control the vacuum pump(s) and the battery gauge. Settings n_3 and n_4 control a vacuum lift light and low vacuum warning buzzer, light and/or strobe light.

Both vacuum switches should have the same settings to ensure the two circuits are functioning together. Although the vacuum switches are set at the factory and should not require adjustment, the following section lists the factory settings, in case adjustment is necessary.

Adjustment Procedure

⚠ WARNING: Lifting capacity decreases whenever vacuum switch is adjusted to maintain lower vacuum level.

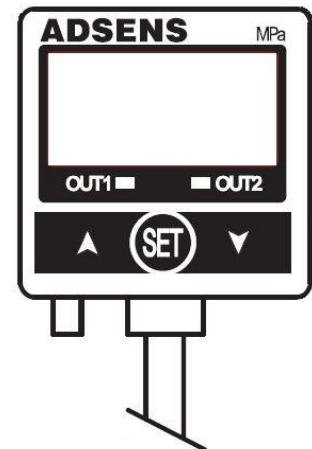
1) To unlock the vacuum switch settings, press and hold the "SET" button for at least five seconds. Note that a different menu may appear if the button is released too soon.²⁰ Use the arrow keys to access the unlocked mode ("UnL") and press the "SET" button again.

2) Press and release the "SET" button to access the different settings (n_1, n_2, n_3, n_4). Use the arrow keys to adjust each setting and then press the "SET" button to continue to the next setting. The following values should appear on the digital display:

- n_1 = -458. This setting turns off power to the vacuum pump(s) when the vacuum system reaches the maximum vacuum level. Setting n_1 must always be set above n_2.

Note: Lowering this value allows the pump(s) to shut off at higher elevations, but it also requires the pump(s) to run more frequently.

- n_2 = -432. After a vacuum switch has turned off the vacuum pump(s) (see n_1) and the vacuum system begins to lose vacuum, setting n_2 turns on power again to the vacuum pump(s). The vacuum pump(s) should turn on before the needle on either vacuum gauge moves from the green range to the red range. Setting n_2 must always be set above n_4.



²⁰ The vacuum switch has additional settings that should **not** be adjusted. These settings are accessed if the "SET" button is held for 3 seconds. For reference, the correct settings are provided below.

- Setting 1 should display "nnH"
- Setting 2 should display "1nC"
- Setting 3 should display "2nC"
- Setting 4 should display "192"
- Setting 5 should display "nAn"

- n_3 = -430. This setting turns off the low vacuum warning buzzer, light and/or strobe light and turns on the vacuum lift light, indicating that the lifter has already reached the minimum vacuum level (see n_4). Setting n_3 must always be set above n_4.
- n_4 = -428. After the vacuum switch has turned off the vacuum pump(s) (see n_1) and the vacuum system has lost significant vacuum, setting n_4 turns on the low vacuum warning buzzer, light and/or strobe light and turns off the vacuum lift light. This signals a loss of adequate vacuum to the lifter operator.

Note: Setting n_4 corresponds with the minimum vacuum level for lifting loads. ***This setting must not be lowered without first consulting Wood's Powr-Grip, because it may reduce the maximum lifting capacity.***

- 3) Each vacuum switch must be locked after all adjustments have been made. Use the arrow keys to access the locked mode ("LoC") and press the "SET" button again.
- 4) Repeat steps 1-4 for the other vacuum switch, to ensure the settings are the same.

REPLACEMENT PARTS LIST

Stock No.	Description	Qty.
93220	Dynaflor Vacuum Pump - Diaphragm Type - 1-SCFM [28 liters/minute] - 12 V DC (Dynaflor)	2
66197BM	Dynaflor Pump Gasket & Flap Valves	2
66197AM	Dynaflor Pump Diaphragm Kit	2
66197	Dynaflor Pump Head Assembly	2
65442AM	Vacuum Hose - 1/4" [6.3 mm] ID x 48" [122 cm] Length - Coiled - Green	4
65441	Vacuum Hose - 1/4" [6.3 mm] ID x 48" [122 cm] Length - Coiled - Red	4
65440	Vacuum Hose - 1/4" [6.3 mm] ID - Red (approx. 100" [254 cm] in length)	1
65437	Vacuum Hose - 1/4" [6.3 mm] ID - Green (approx. 100" [254 cm] in length)	1
65429	Vacuum Hose - 0.16" [4.1 mm] ID - Blue (approx. 70" [178 cm] in length)	1
65253	Solenoid Valve - 12 V DC - 8 W	2
65244	Solenoid Valve - 12 V DC - 5 W (for vacuum reserve tanks)	2
65211	Check Valve - 1/8 NPT - 0.5 psi	2
65010	Pad Spring - Coil Type (for VPFS10T pads)	8
64752	Audio Alarm - 5-15 V DC - Panel Mount (for low vacuum warning buzzer)	1
64713AU	Battery Charger - 240 V AC - Australian Type	1
64712US	Battery Charger - 120 / 120 V AC	1
64711EU	Battery Charger - 240 V AC	1
64682	Battery - 1.5 V DC - AA Alkaline (for optional radio transmitter)	2
64670	Battery - 12 V DC - 35 Amp-Hours	1
64590	Battery Gauge	1
64461	Circuit Breaker - 10 A (for vacuum pumps)	1
64459	Circuit Breaker - 5 A (for vacuum controls and indicators)	1
64283	Bulb - 13 V - Bayonet (for vacuum lift lights)	2
64271	Strobe Light - 12 V DC - Amber (option)	1
64262	Green Lens (for vacuum lift light on power system enclosure)	1
64238AA	Vacuum Switch - 1/8 NPT - Digital w/Dual Set Point	2
64213	Push-Button Switch - Chrome (for apply, enable, and release buttons)	3
64200AM	Push-Button Switch w/Integrated Green Light (for movable control pendant)	1
64199	Push-Button Switch (for battery test button)	1
64191	Contact Block (for power switch)	1
58382	Remote Control System Retrofit Kit (option)	1
49724TT	Sealing Ring Insert - Model VIFS10T2 - Closed Cell Foam (for VPFS10T pads)	8
49672FT	Vacuum Pad - Model VPFS10T / 10" [25 cm] Diameter - w/Replaceable Sealing Ring	8
49150	End Plug - 2 1/2" x 2 1/2" x 1/4" [63.5 mm x 63.5 mm x 6.4 mm] Tubing Size	2
49122	End Plug - 2" x 2" x 1/4" [50.8 mm x 50.8 mm x 6.4 mm] Tubing Size	12
29353	Pad Cover	8
20050	Pad Ring Installation Tool	1
16132	Filter Element Kit (for 4.4 oz [130 ml] bowl size air filter)	2
16057	Quick Connector - 1/8 FNPS - Male End	12
16056	Quick Connector - 1/8 FNPS - Female End	12
15910	Vacuum Gauge - 2" [5.1 cm] Diameter - 1/8 NPT - CBM Type	2
15791	Control Handle	2
15632	Pad Filter Screen - Small (for VPFS10T pads)	8
13530	Cotterless Hitch Pin - 1/2" x 3-1/2" [12 mm x 89 mm]	12
10904	Shoulder Bolt - Socket Head - 5/16" X 1" X 1/4-20 Thread (for mounting pads)	48

***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.

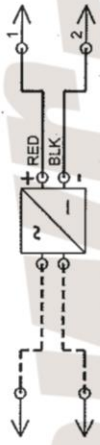
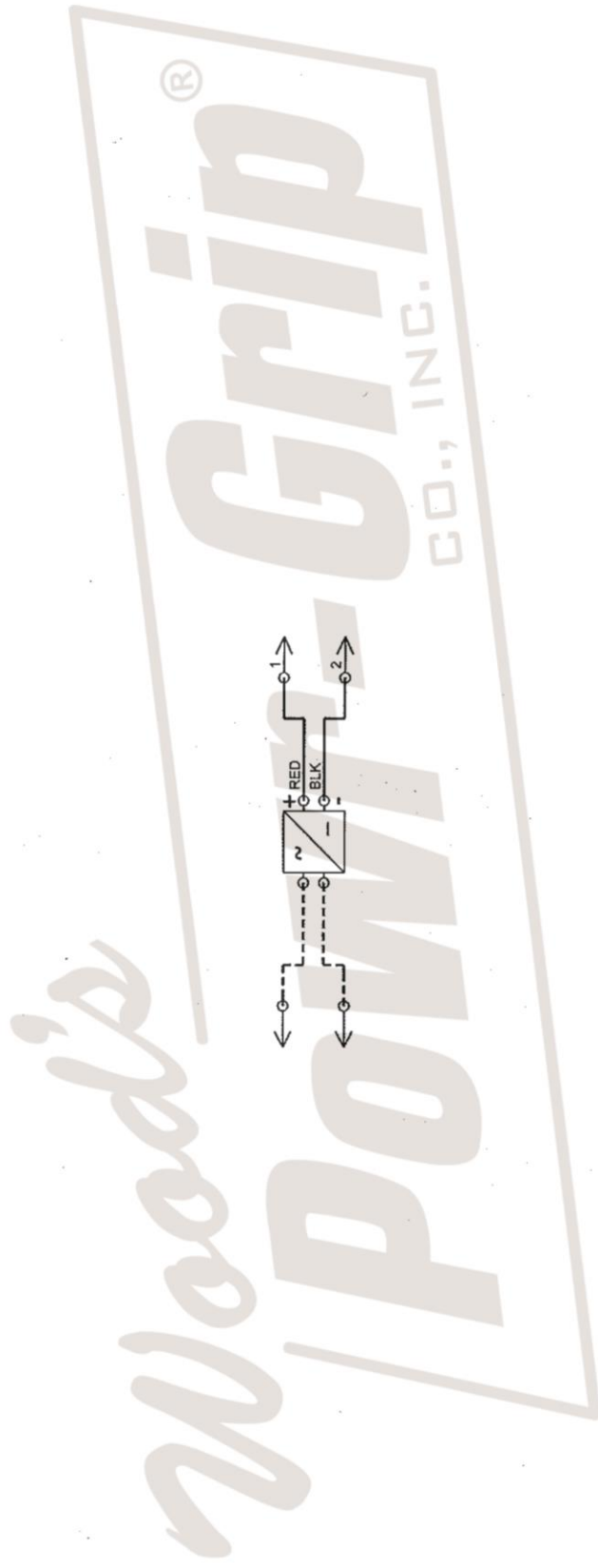
Wood's Powr-Grip Co., Inc.
908 West Main St. / P.O. Box 368
Laurel, MT USA 59044

phone 800-548-7341

phone 406-628-8231

fax 406-628-8

WIRE LEGEND: CONTROLLED BY WIRING SYMBOLS DRAWING EXCEPT AS NOTED AND BELOW.		TYPE: STANDARD		FILE DIRECTORY: 714	FILE (SHEET): 714
LINE STYLES AND WIDTHS FOR WIRE UNLESS NOTED OTHERWISE.		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.		714-W01 [W01]	
--- 18 AWG ---	N/A	WOOD'S POWR-GRIP CO., INC.		LAUREL, MONTANA U.S.A.	
--- 16 AWG ---	N/A	WPG			
PRODUCT MANAGER: NATHAN G.	DATE: 10/21/2009	3 SCFM DC POWER UNIT			
CHECKED: CR	01-19-15	N/A			
APPROVED: <i>Chen</i>	2-11-15	BATTERY CHARGER WIRING DIAGRAM			
		REVISION: 01.A	ECN NUMBER: 3623	ECN DATE: 01/07/2015	EST. WEIGHT: 0 LBS
		SCALE: A	NONE	LER	



12/11/17 HW:king/STDC/825-MTCL/ECN/3110

TYPE: **STANDARD** DIRECTORY: **825A-W01 [A-W01]**

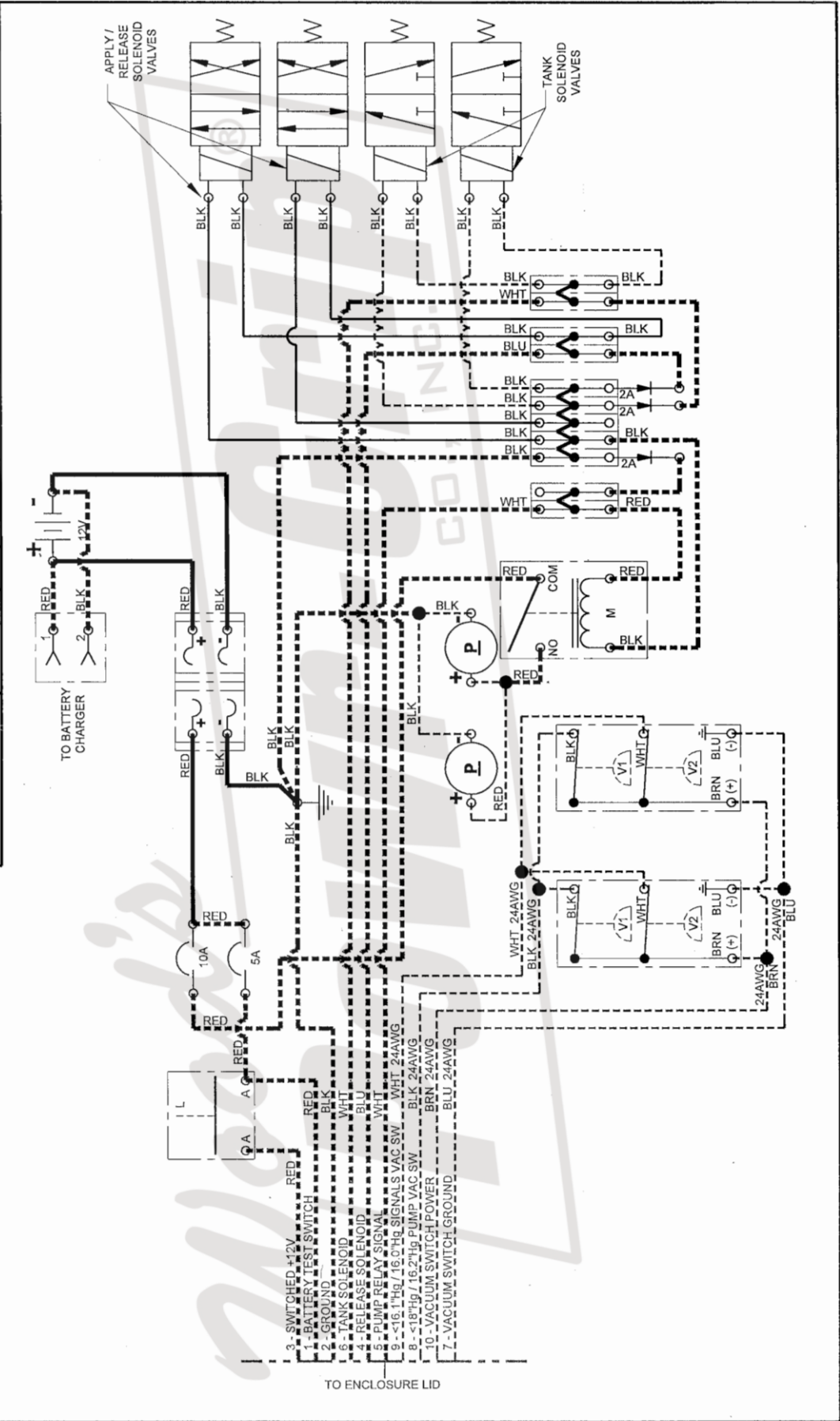
WIRE LEGEND: CONTROLLED BY WIRING SYMBOLS DRAWING EXCEPT AS NOTED AND BELOW.
 LINE STYLES AND WIDTHS FOR WIRE UNLESS NOTED OTHERWISE.
 --- 20AWG --- 18AWG --- 16AWG --- 10AWG

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700# MANUAL TILTER - CLADDING
 POWER ENCLOSURE MOUNTING PLATE WIRING SCHEMATIC
 D825A-W01 [A-W01]

PRODUCT MANAGER: **JOSH E.** DATE: **02/10/2011**
 CHECKED: *JK* DATE: **06-19-13**
 APPROVED: *OWN* DATE: **6-19-13**

SCALE: **A NONE** REV: **1** 3110 BY: **LER** EST. WEIGHT: **N/A**



FILE DIRECTORY:
STANDARD

825A-W02 [A-W02]

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

LINE STYLES AND WIDTHS FOR
WIRE UNLESS NOTED OTHERWISE.

--- 24AWG ---
--- 16AWG ---

PRODUCT MANAGER:
KELLY K.

CHECKED: *CR*

APPROVED: *man*

DATE:
04/03/2013

08-17-15

8-18-15

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WOOD'S POWER-GRIP CO., INC.
LAUREL, MONTANA
U.S.A.

700LB MANUAL FILTER-CLADDING

DC POWER ENCLOSURE

VACUUM SYSTEM ENCLOSURE LID WIRING SCHEMATIC

D825A-W02 [A-W02]

SIZE: SCALE: A NONE
REVISION: 01.A
ECON NUMBER: 3803
ECN DATE: 08/05/2015
ECN BY: CCH
EST. WEIGHT: N/A

