### **KEEP FOR FUTURE REFERENCE**



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# INSTRUCTIONS

International Version

MODEL NUMBERS: MRTA8HV11AC, MRTA811LAC

SERIAL NUMBER:

(please see serial label and record number here)





READ ALL INSTRUCTIONS AND WARNINGS BEFORE OPERATING THIS LIFTER



**DESIGNED FOR THE MATERIALS HANDLING PROFESSIONAL** 

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# SPECIFICATIONS

Description:	Designed for use with a crane or other hoisting equipment, the MRTA8-AC lifters employ vacuum to hold a load for lifting, and they provide manual 360° rotation and mechanically assisted, manual 90° tilt movements for load manipulation.		
Model Number:	MRTA8HV11AC	MRTA811LAC	
Vacuum Pads:	10" [25 cm] nom. diameter, lipped (Model HV11) (Eight, standard rubber, spring-mounted for	11" [28 cm] nom. diameter, lipped (Model G3370) 1 <sup>1</sup> /4" [7 mm] travel, with #60 filter screen)	
Pad Spread: <sup>1</sup> (to outer ed	qes)		
Length - Maximum: - Minimum: Width - Maximum: - Minimum:	122 1/4" [3105 mm] 50" [1270 mm] 73 1/2" [1867 mm] 12 3/4" [327 mm]	123 1/4" [3130 mm] 51" [1295 mm] 74 1/2" [1892 mm] 13 3/4" [352 mm]	
Lifter Weight:	293 lbs [133 kg]	290 lbs [132 kg]	
Maximum Load Capacity Per-Pad: Maximum:	: (rated at 16" Hg [-54 kPa] on clean, 150 lbs [68.5 kg] 1200 lbs [545 kg]	smooth, nonporous flat surfaces <sup>2</sup> ) 175 lbs [79.5 kg] 1400 lbs [635 kg]	
Power Source:	120 volts AC, 50/60 hertz, 5 amps		
Tilt Capability:	Manual, 90°, with four-bar tilt linkage that minimizes operator effort and automatically holds a correctly attached load in the upright or flat position.		
<b>Rotation Capability:</b>	Manual, 360°, with automatic latching (when desired).		
Vacuum Pump:	Rotary vane type, 4 SCFM [113 liters/minute] nominal airflow <b>or</b> Wobble piston, 4 SCFM [113 liters/minute] nominal airflow		
Vacuum Reserve Tank:	Vacuum reservoir helps prevent immediate vacuum loss in case of power failure.		
Vacuum Gauge:	Dial gauge indicates current vacuum level in positive inches of Hg and negative kPa.		
Vacuum Lift Light:	Green light is energized whenever vacuum level is sufficient for lifting maximum load weight (higher than 16" [-54 kPa]).		
Options:	<i>Available</i> with Tilt Lock. When engaged, this op orientation of the load is not compromised by ac instructions about other options.		
<b>Operating Elevation:</b>	Maximum = 10,000' [3,048 m]		
<b>Operating Temperatures</b>	: 32° to 100° F [0° to 38° C]		
Service Life:	This lifter is designed to have a service life of 20 as intended. Vacuum pads, filter elements and MAINTENANCE and REPLACEMENT PARTS LIST LIFTER after its service life, see INTENDED USE.	other wear-out items are excluded; see	
ASME Standard BTH-1:	Design Category "B", Service Class "0" (see www		
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**!!–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.

<sup>&</sup>lt;sup>1</sup> To identify the Pad Spread for any specific pad frame configuration, see the illustrations in ASSEMBLY: To CHANGE THE PAD FRAME CONFIGURATION.

<sup>&</sup>lt;sup>2</sup> 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 Maximum 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 attaching the pads (see MAINTENANCE: VACUUM PAD MAINTENANCE).
- *Never* exceed the Maximum Load Capacity or attempt to lift loads that 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 ATTACH 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 could compromise its safety. Wood's Powr-Grip cannot be responsible for the safety of a lifter that has been modified by others. For consultation, contact Wood's Powr-Grip (see LIMITED WARRANTY).
- *Always* employ a ground fault circuit interrupter when connecting the power cable to the power source.

# **OPERATING FEATURES**

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



Standard MRTA811LAC shown.

- 1 LIFT SPOOL
- 2 LIFT BAR
- 3 Enclosure with ... VACUUM SWITCH
- 4 POWER SWITCH
- 5 VACUUM PUMP
- 6 EXTENSION ARM

- 7 TILT LOCK (OPTION)
- 8 VACUUM GAUGE
- 9 AIR FILTER
- 10 VACUUM CONTROL VALVE
- 11 CONTROL HANDLE
- 12 ROTATION RELEASE LEVER
- 13 MOVABLE PAD MOUNT

- 14 VACUUM PAD
- 15 QUICK CONNECTOR
- 16 PAD FRAME
- 17 HOIST PENDANT BASKET
- 18 CONTROL HANDLE
- 19 VACUUM LIFT LIGHT
- 20 VACUUM RESERVE TANK

# ASSEMBLY

- 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) 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 spool from slipping off under any circumstances.

If the lifter is equipped with the optional <u>tilt lock</u>, make sure it is either disengaged or locked out (see OPERATION: TO LIFT AND MOVE THE LOAD: Using or Locking out the Optional Tilt Lock). Then raise the <u>lift bar</u> to a vertical orientation and attach the hoisting equipment hook to the <u>lift spool</u>.

Note: Some hoisting equipment hooks could interfere with an upright load that extends beyond the lifter's <u>pad frame</u>. 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 spool.

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

Use the hoisting equipment to raise the lifter out of the shipping container, being careful to avoid damaging any <u>vacuum pads</u>. The control pendant for the hoisting equipment can be attached to the lifter by inserting it into the <u>hoist pendant basket</u> provided. Remove the pad covers and save them for use whenever the lifter is stored.

3) Connect the power cable from the lifter to the power source as follows: Wire the female connector provided to an appropriate current-protected power source (see serial number plate for power requirements).

# Marching Wiring must be done by qualified personnel, taking all appropriate safety precautions.

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.

Make certain the power cable is routed so that it does not become tangled while operating the lifter or hoisting equipment. Then push the power cable's male connector into the female connector and twist to secure them together. Now the lifter is operational.

- 4) Arrange the <u>pad frame</u> in the configuration that will provide optimal support of the load while lifting (see To CHANGE THE PAD FRAME CONFIGURATION to follow).
- 5) Perform Operational and Load Tests for the lifter as directed in MAINTENANCE: TESTING SCHEDULE.

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# TO CHANGE THE PAD FRAME CONFIGURATION

The lifter offers a variety of <u>pad frame</u> configurations to accommodate different load dimensions and weights (see SPECIFICATIONS: Pad Spread and Load Capacity). The following illustrations show several possible configurations. Select a configuration to provide optimal support across the load surface and to minimize load overhang (see OPERATION: BEFORE USING THE LIFTER).



Note: Smaller dimensions indicate Pad Spread when <u>extension arms</u> are removed (see To Install/Remove Extension Arms to follow). Shaded circles indicate alternative locations of <u>vacuum pads</u> (see to Reposition Movable Pad Mounts to follow).

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Configurations are created by installing or removing the pad frame's extension arms, by repositioning or removing the <u>movable pad mounts</u>, and by connecting or disconnecting the vacuum hoses to certain <u>vacuum pads</u>. Always assemble the pad frame in a symmetrical arrangement, to keep the lifter balanced (see illustrations).

For supporting the maximum load weight, all vacuum pads must be installed and all vacuum hoses must be connected to the vacuum pads. For larger load dimensions, all vacuum pads and extension arms must be installed on the pad frame. For smaller weights and dimensions, some extension arms or vacuum pads may be removed, and the corresponding vacuum hoses may be disconnected, *provided that the lifter still has sufficient capacity to support the load in question*.

# MARNING: Removing or disconnecting any vacuum pad reduces lifter's load capacity.

To calculate the load capacity when some vacuum pads are disconnected, consult the Per-Pad Load Capacity rating (see SPECIFICATIONS) and multiply by the number of pads currently in use. Make sure all vacuum hoses are secure and routed to avoid being pinched, snagged, abraded or otherwise damaged while the lifter is in operation.

# WARNING: Make sure all vacuum hoses are coiled or routed so they cannot become entangled, kinked or punctured during rotation or tilt.

## To Connect/Disconnect Vacuum Hoses

The vacuum hose for each <u>vacuum pad</u> is connected to or disconnected from the vacuum system by means of a <u>quick</u> <u>connector</u>. 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 away from the male end until the connector separates. Then clip the free end of the connector to the spring clip on the <u>extension arm</u>.



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 <u>pad frame</u>.

## To Reposition (or Remove) Movable Pad Mounts

- 1) Remove the cotterless hitch pin from one movable pad mount.
- 2) Move the pad mount to the desired position on the <u>pad frame</u> and align the holes for the cotterless hitch pin in the pad mount with the corresponding holes in the pad frame.
- 3) Secure the pad mount by pushing the cotterless hitch pin through the holes until the retaining ball emerges on the far side of the pad mount.
- 4) Make sure that the vacuum hose connecting the <u>vacuum pad</u> to the vacuum system is not pinched, kinked, cut or abraded and that it will not interfere with lifter operations.
- 5) Repeat steps #1-4 to position other pad mounts as needed. Always position vacuum pads in a symmetrical arrangement, and make sure that all vacuum hoses are functioning correctly.

To remove a vacuum pad from the pad frame all together, disconnect the corresponding vacuum hose and remove the pad mount as directed above. Make sure to store the pad and its mount in a clean, dry location to protect them from prolonged environmental exposure.

Note: When you are assembling a linear configuration (see illustration), a third vacuum pad may be mounted in line on each of two pad arms. Although these additional pads do help prevent load breakage, *they must not be included in calculations of load capacity*, because each arm of the pad frame has a maximum structural capacity of 350 lbs [159 kg].

### To Install/Remove Extension Arms

- 1) Remove the cotterless hitch pin (see illustration above) from one extension arm.
- 2) Insert the end of the extension arm in its socket on the <u>pad frame</u>, so that the holes align for the cotterless hitch pin.
- 3) Secure the extension arm in the pad frame by pushing the cotterless hitch pin through the holes until the retaining ball emerges on the far side of the pad frame socket.
- 4) Remove the end of the <u>quick connector</u> from the spring clip on the extension arm, and connect the vacuum hose as directed above.
- 5) Repeat steps #1-4 to install other extension arms as needed for the pad frame configuration desired.
- 6) To remove extension arms, reverse this procedure. Store removed extension arms in a clean, dry location to protect them from prolonged environmental exposure.

## **About Secondary Rotation Stops**

The lifter features two sets of holes in the rotation wear plate, which function as stops for the rotation latch. Rotation stops allow the operator to secure the load at each quarter turn of the rotation, keeping the long dimensions of an upright load either parallel or perpendicular to the ground. The secondary stops are rotated approximately 30° from the primary stops, to provide the same load positioning when the <u>pad frame</u> is in a linear configuration (see illustration).

Note: When you are assembling a linear configuration, be sure to install <u>extension arms</u> in the two sockets as shown in the illustration, since the secondary rotation stops do not align correctly when the arms are placed in the other two sockets.

# **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 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.<sup>3</sup> 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 <u>vacuum pads</u> (see MAINTENANCE: VACUUM PAD MAINTENANCE: Friction Coefficient), as verified by a friction test, or capacity should be derated appropriately. If necessary, contact Wood's Powr-Grip for help.
- 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 that 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.

 In order to maintain load stability in the upright position, the maximum allowable thickness of loads is 1<sup>1</sup>/<sub>2</sub>" [3.8 cm] at the maximum weight (see SPECIFICATIONS: Maximum Load Capacity).<sup>4</sup> This allowance assumes that the load is centered correctly on the lifter's <u>pad</u> <u>frame</u> (see OPERATION: TO ATTACH THE PADS TO A LOAD: Positioning the Lifter on the Load) and that no other forces, such as wind pressure, are affecting the load. Either of these circumstances could reduce the allowable load thickness.

<sup>&</sup>lt;sup>3</sup> Lifters that feature concave vacuum pads can also attach to some curved loads. Since curvature affects the lifting capacity, contact Wood's Powr-Grip for help in determining the Load Capacity for a particular curved load.

<sup>&</sup>lt;sup>4</sup> This allowance does **not** account for the use of Pad Spacers. *Pad Spacers can reduce load stability in the upright position and, in some cases, the allowable thickness of loads.* 

Conversely, allowable thickness increases as load weight decreases. In addition, an operator may be able to manually counteract the tendency of unstable loads to tilt out of the upright position, provided that the operator maintains control of the load at all times (see OPERATION: TO LIFT AND MOVE THE LOAD: About the Tilt Linkage and TO TILT THE LOAD). 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 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.
- The lifter's work environment must be free of metal particles or any other contaminates that could damage lifter components through airborne contact or any other means of transmission in the environment. If such contaminates cause a vacuum pump failure, they could result in a load release and injury to the operator or others nearby.

M WARNING: Environmental contaminates 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: Friction Coefficient).

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

• **!!-CE-!!** If the lifter is employed in a construction area, CE Standard EN 13155 requires the use of a secondary positive holding device, such as a sling system, designed to support the load in case of a vacuum system failure.

#### WARNING: Where CE Standards apply, secondary positive holding device is required for lifting loads in construction zones.

## **DISPOSAL OF THE LIFTER**

After the 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.

# **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**

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).

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

The lifter is equipped with one or more <u>air filters</u> to help protect the vacuum system from contaminates.<sup>5</sup> 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 can vary, depending on pad frame configuration.*

Make sure the <u>pad frame</u> 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 in question.

<sup>&</sup>lt;sup>5</sup> In order for the operator to use the lifter on wet load surfaces, it must be equipped with 2 or more filters that are connected *in series*. However, see MAINTENANCE: VACUUM PAD MAINTENANCE: Friction Coefficient before using the lifter on wet load surfaces.

# TO APPLY THE PADS TO A LOAD

Make sure the lever on the <u>vacuum control valve</u> is in the "release" ( $|\rightarrow\rangle$ ) position (see To Release THE PADS FROM THE LOAD).

### CAUTION: Never place valve lever in center position; this can result in pump damage.

Place the <u>power switch</u> in the "on" position (||), to engage the <u>vacuum pump</u>. The lifter is designed for the vacuum pump to run continuously.

# M WARNING: Never turn power off while operating lifter; keep pump running throughout lift.

The power switch must remain in the "on" position while operating the lifter. Placing the power switch in the "off" position ( $\bigcirc$ ) during lifter operation could result in the release of the load and possible injury to the operator (see TO LIFT AND MOVE THE LOAD: In Case of Power Failure to follow).

## Positioning the Lifter on the Load

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

Center the lifter's <u>pad frame</u> to within 2" [5 cm] of the load center, since off-center loading can cause the load to tilt unexpectedly (see TO TILT THE LOAD to follow), and it may also damage the lifter.<sup>6</sup> Make sure that all vacuum pads will fit entirely on the load's contact surface (see SPECIFICATIONS: Maximum Pad Spread) and that they will be loaded evenly while lifting (see SPECIFICATIONS: Per-Pad Load Capacity). Then position the lifter on the load so that all pads are touching the contact surface.

## Sealing the Pads against the Load

Move the lever on the <u>vacuum control valve</u> to the "apply" ( $\downarrow \leftarrow$ ) position, as shown. This causes air to be drawn immediately at the <u>vacuum pads</u>.<sup>7</sup> Apply the lifter to the load until all pads seal against it.

# MARNING: Keep valve lever in "apply" position throughout lift.

Any interruption of airflow during lifter operation could result in the release of the load and possible injury to the operator.

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.

<sup>&</sup>lt;sup>6</sup> 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.

<sup>&</sup>lt;sup>7</sup> To minimize the time it takes for the lifter to attach and obtain full vacuum, do not place the control valve in the "apply" position until the vacuum pads are contacting the load.

## Reading the Vacuum Gauge

The <u>vacuum gauge</u> indicates the current vacuum level in the lifter's vacuum system. The *green* range indicates vacuum levels sufficient for lifting the maximum load weight (with all pads installed and connected to the vacuum system), whereas the *red* range indicates vacuum levels that are *not* sufficient for lifting the maximum load weight. The gauge needle should show a sudden surge in vacuum as the <u>vacuum pads</u> seal against the load. If it takes more than 5 seconds for the vacuum level to reach 5" Hg [-17 kPa], 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 the <u>vacuum gauge</u>, except when used at high elevations (see SPECIFICATIONS: Operating Elevation). If not, 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 <u>vacuum gauge</u>, due to leakage in the seal between the <u>vacuum pads</u> and the load surface. 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) When the vacuum level registers above 16" Hg [-54 kPa] on the vacuum gauge (see To LIFT AND MOVE THE LOAD: Load Capacity and the Vacuum Gauge to follow), place the <u>power switch</u> in the "off" (〇) position.
- 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.<sup>8</sup>

<sup>&</sup>lt;sup>8</sup> 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

### About the Tilt Linkage



#### WARNING: Make sure load is positioned correctly on lifter; unbalanced loads may tilt unexpectedly.

The lifter's tilt linkage is designed to automatically hold a balanced load in either the upright or the flat position. However, an unbalanced load may tilt unexpectedly from the flat position to the upright position or vice versa, when lifted. This could result in load damage or injury to anyone positioned in the tilt path of the load. To minimize the potential for these problems, make certain prior to lifting any load that it has allowable characteristics (see INTENDED USE: LOAD CHARACTERISTICS) and is attached correctly to the lifter (see To Apply THE PADS TO A LOAD preceding).

### Using or Locking out the Optional Tilt Lock

When a lifter is equipped with the <u>tilt lock</u>, it can be used to prevent unexpected tilting motion. Since the lifter is designed to maintain either the vertical or the horizontal pad frame orientation when correctly loaded, the tilt lock should only be needed if the operator is not able to maintain control of the load using the control handles or other appropriate means. For example, if the lifter is being used to install glass in a multi-story building, engaging the tilt lock would prevent the load from accidentally tilting due to wind loads or other causes of incidental loading. The tilt lock is intended as a secondary safety device and does not eliminate the need to center the load correctly on the pad frame (see TO APPLY THE PADS TO A LOAD: Positioning the Lifter on the Load preceding). Failure to center the load may damage the lifter and would make it difficult to operate the lock.

The tilt lock can be set to engage automatically when the pad frame reaches the vertical or horizontal position, or it can be locked out, depending on the application. To allow automatic locking, make sure the lock plate/handle (1) is set to engage the lock catches (2). If not, pull outward on the round knobs of the spring plungers (3) and turn them 90° to release the lock plate/handle. Make sure that the lock plate/handle slides freely along the tilt linkage (4) before you attempt to tilt the pad frame. If the lock plate/handle does not engage the catches or if the pad frame exhibits excessive play in either the vertical or the horizontal orientation, the stop cams (5) for the tilt linkage may require adjustment. Once the tilt lock is set to the automatic mode, simply pull on the lock plate/handle to disengage the lock.

To lock out the tilt lock, make sure the lock plate/handle is secured so that it *cannot* engage the catches. If otherwise, turn the round knobs of the spring plungers 90° and then slide the lock plate/handle upward until the spring plungers engage. Make sure that the lock plate/handle does not slide along the tilt linkage.



- 1 LOCK PLATE/HANDLE **2 LOCK CATCHES**
- **3 SPRING PLUNGER**
- **4 TILT LINKAGE**
- 5 STOP CAM

## Load Capacity and the 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 green <u>vacuum lift light</u> turns on to indicate that the lifter is ready to lift the maximum load weight.

### M 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 and the lever on the <u>vacuum</u> <u>control valve</u> is in the "apply" ( $\downarrow \leftarrow$ ) position; such an attempt could result in a load release and possible injury to the operator.

### **Monitoring Vacuum Indicators**

The <u>vacuum lift light</u> and the <u>vacuum gauge</u> must remain completely visible to the operator, so that they can be monitored throughout the entire lift.

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

The lifter's <u>vacuum pump</u> runs continuously to maintain sufficient vacuum for lifting the maximum load weight. If the vacuum system experiences leakage while the lifter is attached to the load, the lift light turns off automatically, to signal the reduction in vacuum to the operator.

If the lift light turns off while you are lifting a load, make sure the vacuum gauge shows 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.

# MARNING: Stay clear of any suspended load while vacuum level is less than 16" Hg [-54 kPa].

Discontinue lifter use until the cause of the vacuum loss can be determined. If the lift light does not turn on when 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 <u>vacuum pads</u> 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 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 the <u>control handles</u> to keep the lifter and load in the desired orientation while they are suspended from the crane. Once sufficient clearance is established, the load can be tilted or rotated as desired (see TO TILT THE LOAD and TO ROTATE THE LOAD EDGEWISE to follow).

## In Case of Power Failure

The lifter is equipped with a <u>vacuum reserve tank</u>, designed to maintain vacuum temporarily in case of a power failure.

### M 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 ROTATE THE LOAD EDGEWISE

#### M WARNING: Make sure load is positioned correctly on lifter (see To Apply); unbalanced loads may rotate unexpectedly when latch is disengaged.

Remember that the load is longer in its diagonal dimensions than in its side dimensions. Make sure there is sufficient clearance for the load to rotate without contacting the operator or any nearby objects. Maintain a firm grip on the <u>pad frame</u> or use other appropriate means to keep the load under control at all times. Squeeze the <u>rotation release lever</u> to disengage the rotation latch, and rotate the load to the desired position.<sup>9</sup> To stop the load's motion automatically at each quarter turn, simply let go of the rotation release lever immediately before the end of the turn, so that the rotation latch engages at the next stop. Whenever rotation is not required, keep the rotation latch engaged, to prevent accidental damage to the load and possible injury to the operator.



<sup>&</sup>lt;sup>9</sup> If the load's center of gravity is not centered on the pad frame, it may be necessary to relieve pressure on the rotation latch by applying force to the pad frame in the appropriate direction of rotation.

# TO TILT THE LOAD

#### M WARNING: Always keep hands and fingers away from bars of tilt linkage.

Remember that the load requires more vertical space when tilted to the upright position, as well as more horizontal space when tilted to the flat position. Make sure there is sufficient clearance for the load to tilt without contacting the operator or any nearby objects. If the lifter is equipped with the optional <u>tilt lock</u>, also make sure it is either disengaged or locked out (see OPERATION: TO LIFT AND MOVE THE LOAD: Using or Locking out the Optional Tilt Lock). Then lift upward or press downward on the lower <u>control</u> <u>handles</u> to tilt the load as desired. Since the tilt linkage is designed to automatically maintain the load in either the upright



or the flat position, the load force on the control handles changes direction during the tilt. 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 the load approaches the flat position. If so, keep the load under control using hand cups or other appropriate means.

# TO RELEASE THE PADS FROM THE LOAD

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

When the load is at rest and fully supported, move the lever on the <u>vacuum control valve</u> to the "release" ( $|\rightarrow\rangle$ ) position, as shown. This forces air into the <u>vacuum pads</u>, quickly breaking the vacuum seal. After the pads have disengaged completely from the load, move the lifter away. Leave the control valve in the release position until ready to attach to the next load.



# **AFTER USING THE LIFTER**

Turn the <u>power switch</u> to the "off" ( $\bigcirc$ ) position.

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

Use the hoisting equipment to gently lower the lifter onto a stable support; then detach the hoisting equipment hook from the <u>lift spool</u>.

If the lifter is transported to another location, use the original shipping container and secure the lifter so as to protect the <u>vacuum pads</u> and all other components from damage while in transit.

## **Storing the Lifter**

Use the covers supplied to keep the <u>vacuum pads</u> clean.

**!!-CE-!!** In accordance with CE Standard EN 13155, 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 <u>lift bar</u> to a horizontal orientation and place a support under the <u>lift spool</u>.

.....

# MAINTENANCE

# MARNING: Make sure power cable is disconnected from power source before servicing lifter.

Note: One or more wiring diagrams may be 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 <u>vacuum pads</u> and load surface for contamination or debris (see VACUUM PAD MAINTENANCE to follow).
- Examine the vacuum pads, controls and indicators for visual damage (see VACUUM PAD MAINTENANCE to follow).

If any deficiency is detected during the inspection, correct it before using the 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 <u>vacuum pads</u>, fittings and hoses) for visual damage.
- Examine the <u>air filter</u> 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 that 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

Confirm that the lifter can lift 100% of its Maximum Load Capacity (see SPECIFICATIONS), using an actual load or an equivalent simulation.<sup>10</sup> 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.<sup>11</sup>
- 2) Attach the <u>vacuum pad</u>s to the load as previously directed.
- 3) When the vacuum level registers above 16" Hg [-54 kPa] on the <u>vacuum gauge</u>, place the <u>power switch</u> in the "off" position (○).
- 4) Raise the load a minimal distance, to make sure 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.

 $<sup>^{10}</sup>$  ASME Standard B30.20 requires the lifter to be tested to 125% of its Load Capacity.

<sup>&</sup>lt;sup>11</sup> Flat Lifters are exempt from this requirement.

# **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.

# 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 <u>vacuum pads</u> 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 every 2 years, to make sure that the friction coefficient is not compromised. If necessary, contact your dealer or Wood's Powr-Grip for more information.

## Inspection

Inspect each <u>vacuum pad</u> 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 edges: Soil build-up can prevent pads from sealing adequately or reduce the friction coefficient (see discussion preceding). Follow the directions to clean pads as necessary (see discussion to follow).
- Filter screen missing from pad face: This screen helps prevent debris from plugging the vacuum hose and the <u>air filter</u>. Replace any missing screen immediately (see REPLACEMENT PARTS LIST).
- Nicks, cuts or abrasions in sealing edges: Pad damage can reduce the lifting capacity of the lifter. Replace any damaged pad immediately (see REPLACEMENT PARTS LIST).<sup>12</sup>

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

• Wear, stiffness or glaze: See Friction Coefficient preceding. Replace any pad that exhibits wear, stiffness or glaze (see REPLACEMENT PARTS LIST).

<sup>&</sup>lt;sup>12</sup> If the lifter is equipped with VPFS10T or VPFS625 pads, the sealing edge is the replaceable sealing ring/insert. When it is damaged, install a new one. In such cases, see To REPLACE SEALING RING/INSERT IN VACUUM PAD to follow.

## Cleaning

Regularly clean the face of each <u>vacuum pad</u> to remove oil, dust and any other contaminates. 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 that significantly reduces 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.

# MARNING: Never use solvents, gasoline or other harsh chemicals to clean vacuum pad.

# M 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 face clean. A toothbrush (or similar brush with bristles *that do not harm rubber*) may be used to remove contaminates clinging to sealing edges.<sup>13</sup> Wipe all residue from the pad face, and allow the pad to dry completely before using the lifter.

# VACUUM TEST

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

- 1) Clean the face of each <u>vacuum pad</u> as previously directed (see VACUUM PAD MAINTENANCE: Cleaning).
- 2) Attach 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).<sup>14</sup>
- 3) When the vacuum level registers above 16" Hg [-54 kPa] on the <u>vacuum gauge</u>, place the <u>power switch</u> in the "off" position (<sup>O</sup>) and leave the pads attached to the surface.
- 4) Monitor the vacuum gauge: *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.

<sup>&</sup>lt;sup>13</sup> If these cleaning methods are not successful, contact Wood's Powr-Grip or an authorized dealer for assistance.

<sup>&</sup>lt;sup>14</sup> 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.

# AIR FILTER MAINTENANCE – LARGE

(For 4.4 oz bowl size filters)

### **Filter Function and Conditions Requiring Service**

An <u>air filter</u> 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**

- 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).
- 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 contaminates 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 Ncm] torque).
- 10) Test the vacuum system to make sure 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 – GAST 0523-101Q-SG588DX



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

#### **Disassembly/Reassembly Procedure**

(includes replacing the air filters, vanes and gasket-see REPLACEMENT PARTS LIST)

- 1) Remove the end caps (10), O-rings (9) and air filters (8) from the sound chamber (6) of the vacuum pump.
- 2) Remove the five bolts (7) and remove the sound chamber (6).

Note: If any liquid is discovered in the sound chamber, thoroughly dry all interior surfaces of the pump prior to reassembly.

- 3) Remove the six bolts (4) from the endplate (3), and separate the endplate from the rotor housing. The shroud (1) surrounding the rotor housing will loosen as well.
- 4) Note the orientation of the bevel on the vanes (2) for step 5. Then remove the vanes by sliding them out the end of the rotor. If needed, rotate the rotor by hand to position the vanes for easier access.
- 5) Make sure that the rotor and housing are clean and free of debris. Orient the new vanes (2) like the old ones by matching the bevel. Then insert the new vanes by sliding them into the empty slots in the rotor.
- 6) Reinstall the endplate (3) and secure it with the six bolts (4) previously removed.
- 7) Remove the gasket (5), and make sure that the contact surfaces between the endplate and sound chamber are clean. Install a new gasket and reinstall the sound chamber (6). Then secure the sound chamber with the five bolts (7) previously removed.
- 8) Replace the air filters (8). Then reinstall the O-rings (9) and end caps (10).

1 2 3 4 6

1 SHROUD	6 SOUND CHAMBER
2 VANES (4x)	7 BOLTS FOR SOUND CHAMBER (5x)
3 ENDPLATE	8 AIR FILTER (2x)
4 BOLTS FOR ENDPLATE (6x)	9 O-RING (2x)
5 GASKET	10 END CAP (2x)

# VACUUM PUMP MAINTENANCE – GAST N70

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

If the <u>vacuum pump</u> takes too long to attain full vacuum, it may require maintenance. Replace worn parts as necessary to obtain acceptable pump performance (see REPLACEMENT PARTS LIST).

## A) Dissembling the Head Assembly

- 1) Note or mark the orientation of the pump heads (2) and valve plate (3) for reassembly.
- 2) Remove the eight head screws (1), and then remove the two heads (2) and valve plate (3).
- Remove the four head O-rings (8) and the two cylinder O-rings (9) from the valve plate (3). The O-rings will be replaced later.

## **B)** Replacing the Head-Side Leaf Valves

- 1) Note the orientation of the valve limiters (11) for reassembly.
- Remove the two long valve screws (10) from the head side of the valve plate (3), and then remove the two valve limiters (11) and (exhaust) leaf valves (12).
- Install new leaf valves (12) and reinstall the valve limiters (11) and long valve screws (10).

## C) Replacing the Cylinder-Side Leaf Valves

- 1) Note the orientation of the valve retainer plates (14) for reassembly.
- 2) Remove the two short valve screws (13) from the cylinder side of the valve plate (3) and then remove the two retainer plates (14) and (intake) leaf valves (15).
- Install new leaf valves (15) and reinstall the retainer plates (14) and short valve screws (13).

## D) Dissembling the Cylinder Assembly

- 1) Note the orientation of the cylinders (7) and cups (6) for reassembly.
- Remove the four retainer screws (4) from the two retainer plates (5). Remove the cylinders (7), leaving the retainer plates and cups (6) inside.
- 3) Invert the cylinders (7) and push the retainer plates (5) out through the top. The cylinders and cups (6) will be replaced next.



## E) Replacing the Cylinders and Cups

- 1) Push one push rod (16) all the way down, and then position a new cylinder (7) over the push rod.
- Place a retainer plate (5) into a new cup (6) and insert these parts together into the top of the cylinder (7). Then push both parts down until the retainer plate contacts the push rod (16).
- 3) Install two new retainer screws (4) to secure the retainer plate (5) to the push rod (16). Tighten the screws securely.
- 4) Press down on the cylinder (7) just installed to hold it in place, and then push the other push rod (16) all the way down.
- 5) Repeat steps 1–5 to install the second cylinder, cup and retainer plate.

## F) Replacing O-Rings and Reassembling the Head Assembly

- 1) Install two new cylinder O-rings (9) into the valve plate (3), and position the valve plate on the top of the cylinders (7).
- 2) Install four new head O-rings (8) into the valve plate (3), and position the two heads (2) on top of the valve plate.
- 3) Make sure that the valve plate (3) and heads (2) are oriented in their original positions, and secure the heads to the pump using the eight head screws (1).

Reference Number	Availability	Quantity	Description
1	*	8	Head Screws (T25 Torx)
2	*	2	Head
3	*	1	Valve Plate
4	$\bigtriangleup$	4	Retainer Screw (T20 Torx)
5	*	2	Retainer Plate
6	$\bigtriangleup$	2	Cup
7	$\bigtriangleup$	2	Cylinder
8	$\bigtriangleup$	4	Head O-ring
9	$\bigtriangleup$	2	Cylinder O-ring
10	*	2	Long Valve Screw (T15 Torx)
11	*	2	Valve Limiter
12	$\bigtriangleup$	2	Leaf Valve (Exhaust)
13	*	2	Short Valve Screw (T15 Torx)
14	*	2	Retainer Plate
15	Δ	2	Leaf Valve (Intake)

\* Special Order – Non-Stocked Item

 $\triangle$  Included in service kit #66178

# VACUUM SWITCH ADJUSTMENT

## Vacuum Switch Function

A <u>vacuum switch</u> controls the <u>vacuum lift light</u> for an AC lifter (see OPERATING FEATURES for location of vacuum switch). After the lifter attains a vacuum level sufficient for lifting the maximum load weight (hereafter, "minimum lifting level"), the vacuum switch automatically turns on the lift light. When vacuum decreases to a level that is lower than the minimum lifting level (as when releasing a load), the vacuum switch automatically turns off the lift light again, until the minimum lifting level is regained.

## **Conditions Requiring Readjustment**

At the factory, the <u>vacuum switch</u> is set to the minimum vacuum level specified for Load Capacity (see SPECIFICATIONS). However, shipping vibrations or shocks, normal wear, or other conditions may adversely affect this adjustment. Periodically verify the switch adjustment by comparing how the <u>vacuum</u> <u>lift light</u> functions in relation to the vacuum level registered on the <u>vacuum gauge</u>, as follows:

- If the lift light *turns on before* vacuum attains the minimum lifting level, it is likely that the <u>air filter</u>'s element is dirty. *Any filter element that obstructs airflow must be replaced* (refer to AIR FILTER MAINTENANCE preceding). Otherwise, the lift light would turn on at vacuum levels that are not sufficient to lift the maximum load weight.
- If the lift light *does not turn on after* vacuum increases to a level much *higher* than the minimum lifting level, the light bulb may be burned out. If this condition persists after the bulb has been replaced, the vacuum switch may need to be adjusted to turn on the lift light at a lower vacuum level. Otherwise, the operator might wait unnecessarily for the lift light to turn on, after the lifter has already attained sufficient vacuum to lift the maximum load weight.
- If the lift light *does not turn off before* vacuum decreases to a level *lower* than the minimum lifting level, the vacuum switch *must be adjusted to turn off the lift light at a higher vacuum level*.<sup>15</sup> Otherwise, the lift light would remain on at vacuum levels that are not sufficient to lift the maximum load weight.

## **Adjustment Procedure**

1) Using a 1/4" open-end wrench (as provided), turn the adjustment screw about 1/6th turn at a time (approximately one flat of the screw head).

To make the <u>vacuum lift light</u> turn *on* at a *lower* vacuum level, turn the screw *clockwise* (when viewing <u>vacuum switch</u> from end with electrical connectors).

To make the lift light turn *off* at a *higher* vacuum level, turn the screw *counter-clockwise* (when viewing vacuum switch from end with electrical connectors).

2) Check the vacuum switch setting following each 1/6th turn of the adjustment screw. In order to test the adjustment accurately, release the vacuum pads completely before reattaching them to a test surface.



1 ELECTRICAL CONNECTORS 2 ADJUSTMENT SCREW 3 LIGHT OFF AT HIGHER VACUUM 4 LIGHT ON AT LOWER VACUUM

When the vacuum switch is adjusted correctly, the lift light turns on only *after* vacuum increases to a level higher than the minimum lifting level; and the lift light turns off again *before* vacuum decreases to a level lower than the minimum lifting level.

<sup>&</sup>lt;sup>15</sup> In order to observe lifter functions while vacuum is decreasing, it may be necessary to create a controlled leak in the vacuum system (eg, by breaking the seal between one or more vacuum pads and the test surface).

# **REPLACEMENT PARTS LIST**

Stock No.	Description	Qty.
95500AM	Vacuum Pump – Rotary Vane Type – 4 SCFM – 100/120/240 V AC	1
66464	Spring Plunger with Round Knob – 1/4-20 Thread (for optional tilt lock)	2
66178	Pump Service Kit (for wobble piston pump)	1
66175AB	Pump Gasket (for rotary vane pump)	1
66175	Pump Vanes/Filters Kit (for rotary vane pump)	1
66125	Vacuum Pump – Wobble Piston – 4 SCFM – 100/120/240 V AC	1
65443	Vacuum Hose – 3/8" ID (approx. 48" in length)	*
65441	Vacuum Hose – 1/4" ID x 48" Length – Coiled	4
65440	Vacuum Hose – 1/4" ID (approx. 120" in length)	*
65438	Vacuum Hose – $1/8"$ ID (approx. 6" in length)	*
65301	Handle Grip Foam (approx. 73" in length)	1
65277	Vacuum Control Valve with Lever	1
65234	Solenoid Valve – 240 V AC – 6 W	1
65226	Solenoid Valve – 120 V AC – 6 W	1
65300	Handle Grip Foam	2
65212	Check Valve – 1/4 NPT	1
65211AM	Check Valve – 1/8 NPT	1
65014	Pad Spring – Wave Type (for HV11 pad)	8
65010	Pad Spring – Coil Type (for G3370 pad)	8
64284	Bulb – 6.3 V – Bayonet (for vacuum lift light)	1
64262	Green Lens (for vacuum lift light)	1
64236	Vacuum Switch – 1/4 NPT	1
64191	Contact Block (for power switch)	1
59028	Movable Pad Mount – 2-1/2" Tubing Size	8
53132	Hose Fitting – Tee – 5/32" ID	2
53120	Pad Fitting – Elbow – 3/16" ID	8
49646T	Vacuum Pad – Model G3370 / 11" [28 cm] Diameter – Lipped (for MRTA811LAC)	8
49605T	Vacuum Pad – Model HV11 / 10" [25 cm] Diameter – Lipped (for MRTA8HV11AC)	8
49150	End Plug – 2-1/2" x 2-1/2" x 1/4" Tubing Size	4
49122	End Plug – 2" x 2" x $1/4$ " Tubing Size	6
29350	Pad Cover	8
20270	1/4" Open-End Wrench (for adjusting vacuum switch)	1
16132	Filter Element Kit (for 4.4 oz bowl size air filter)	1
16057	Quick Connector – 1/8 FNPS – Male End	8
16056	Quick Connector – 1/8 FNPS – Female End	8
15910	Vacuum Gauge – 1/8 NPT – CBM	1
15650AM	360° Rotating Union – 1/4 NPT	1
13532	Cotterless Hitch Pin – $1/2$ " Dia. x 5" Length	12
11726AM	Clamp Collar – 2.157-18 Thread – 1-Piece	1
10900	Shoulder Bolt – Socket Head – 5/16" x 1/2" x 1/4-20 Thread (for mounting pads)	48
	* Replacement vacuum hose is sold by the foot (approx. 30.5 cm).	

#### 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







