AARDWOLF INDUSTRIES LLC

MECHANICAL VACUUM LIFTERS

SERIES 250, 600, 1000

OWNER'S MANUAL

Get The AArdwolf AAdvantage

EN

Welcome onboard!

Thank you so much for your selection of Aardwolf Vacuum Lifter! You and your new Aardwolf Mechanical Vacuum Lifter are now companions. Please read this manual to understand your companion.

This Manual of Mechanical Vacuum Lifter is designed to provide the important information regarding the purposes, uses and maintenances of all mechanical vacuum lifters. It is compulsory for
the operator to carefully read over the manual before operating the lifter and keep it available for reference at any time in the workplace.

In the manual, you will find operating instructions, safety precautions, product specifications, drawing and spare parts list as well as maintenance and inspections.

Aardwolf Industries LLC

2. CONTENTS

1. DESCRIPTION OF LIFTER

The Aardwolf Mechanical Vacuum Lifters are designed to horizontally handle non-porous sheet and plate materials such as diamond sawn or polished granite, polished engineered stone, all types of metals, plastics and fiberglass.

By means of an automatic self-cycling valve, the vacuum grip and release cycle is assuredly safe and secure.

2. SPECIFICATIONS

Mechanical Vacuum Lifter AMVL250-2

PRODUCT CODE	AMVL250-2
VACUUM PAD FRAME CONFIGURATION	TWO VACUUM PADS
PADS DIAMETER	SEAL TO SEAL 300MM (11 4/5”) OVERALL 365MM (1’ 2 3/8”)
LOAD CAPACITY	250 KGS (551 LBS)
NET WEIGHT	46 KGS (101 LBS)

Mechanical Vacuum Lifter AMVL250-4 (In Line)

PRODUCT CODE	AMVL250-4 IN LINE
VACUUM PAD FRAME CONFIGURATION	FOUR VACUUM PADS
PADS DIAMETER	SEAL TO SEAL 190MM (7 ½”)
LOAD CAPACITY	250 KGS (551 LBS)
NET WEIGHT	47 KGS (103.6 LBS)

Mechanical Vacuum Lifter AMVL250-4

PRODUCT CODE	AMVL250-4
VACUUM PAD FRAME CONFIGURATION	FOUR VACUUM PADS
PADS DIAMETER	SEAL TO SEAL 190MM (7 ½")
LOAD CAPACITY	250 KGS (551 LBS)
NET WEIGHT	47 KGS (103.6 LBS)

Mechanical Vacuum Lifter AMVL250-8

PRODUCT CODE	AMVL250-8
VACUUM PAD FRAME CONFIGURATION	EIGHT VACUUM PADS
PADS DIAMETER	SEAL TO SEAL 120MM (4 2/3")
LOAD CAPACITY	250 KGS (551 LBS)
NET WEIGHT	63 KGS (139 LBS)

For Mechanical Vacuum Lifter of Series 600

Mono Mechanical Vacuum Lifter AMMVL650

PRODUCT CODE	AMMVL650
VACUUM PAD FRAME CONFIGURATION	ONE VACUUM PAD
PADS DIAMETER	SEAL TO SEAL 450MM (1' 5 2/3")
LOAD CAPACITY	650 KGS (1433 LBS)

Mechanical Vacuum Lifter AMVL600-2

PRODUCT CODE	AMVL600-2
VACUUM PAD FRAME CONFIGURATION	TWO VACUUM PADS
PADS DIAMETER	SEAL TO SEAL 300MM (11 4/5”) OVERALL 365MM (1’ 2 3/8”)
LOAD CAPACITY	600 KGS (1323 LBS)
NET WEIGHT	62 KGS (136.7 LBS)

Mechanical Vacuum Lifter AMVL600-4 (In Line)

PRODUCT CODE	AMVL600-4 IN LINE
VACUUM PAD FRAME CONFIGURATION	FOUR VACUUM PADS
PADS DIAMETER	SEAL TO SEAL 300MM (11 2/5”)
LOAD CAPACITY	600 KGS (1323 LBS)
NET WEIGHT	128 KGS (282 LBS)

Mechanical Vacuum Lifter AMVL600-4

PRODUCT CODE	AMVL600-4
VACUUM PAD FRAME CONFIGURATION	FOUR VACUUM PADS
PADS DIAMETER	SEAL TO SEAL 225 MM (8 5/6")
LOAD CAPACITY	600 KGS (1323 LBS)
	128 KGS (282 LBS)

Mechanical Vacuum Lifter AMVL600-8

PRODUCT CODE	AMVL600-8
VACUUM PAD FRAME CONFIGURATION	EIGHT VACUUM PADS
PADS DIAMETER	SEAL TO SEAL 190MM (7 1/2")
LOAD CAPACITY	600 KGS (1323 LBS)
NET WEIGHT	47 KGS (163 LBS)

For Mechanical Vacuum Lifter of Series 1000

Mono Mechanical Vacuum Lifter AMMVL1000

PRODUCT CODE	AMMVL1000
VACUUM PAD FRAME CONFIGURATION	ONE VACUUM PAD
PADS DIAMETER	SEAL TO SEAL 530MM (1' 8 5/6")
LOAD CAPACITY	1000 KGS (2205 LBS)
NET WEIGHT	55 KGS (121.3 LBS)

Mechanical Vacuum Lifter AMVL1000-2

PRODUCT CODE	AMVL1000-2
VACUUM PAD FRAME CONFIGURATION	TWO VACUUM PADS
PADS DIAMETER	SEAL TO SEAL 450MM (1' 5 2/3")
LOAD CAPACITY	1000 KGS (2205 LBS)
NET WEIGHT	245KG (529 LBS)

Mechanical Vacuum Lifter AMVL1000-4

PRODUCT CODE	AMVL1000-4
VACUUM PAD FRAME CONFIGURATION	FOUR VACUUM PADS
PADS DIAMETER	SEAL TO SEAL 300MM (11 4/5”)
LOAD CAPACITY	1000 KGS (2205 LBS)
NET WEIGHT	225 KGS (496 LBS)

Mechanical Vacuum Lifter AMVL1000-8

PRODUCT CODE	AMVL1000-8
VACUUM PAD FRAME CONFIGURATION	EIGHT VACUUM PADS
PADS DIAMETER	SEAL TO SEAL 300MM (11 4/5”)
LOAD CAPACITY	1000 KGS (2205 LBS)
NET WEIGHT	318 KGS (701 LBS)

Mechanical Vacuum Lifter AMVL1000-10

PRODUCT CODE	AMVL1000-10
VACUUM PAD FRAME CONFIGURATION	TEN VACUUM PADS
PADS DIAMETER	SEAL TO SEAL 190MM (7 ½”)
LOAD CAPACITY	1000 KGS 92205 LBS)
NET WEIGHT	340 KGS (750 LBS)

2.2 MARKINGS

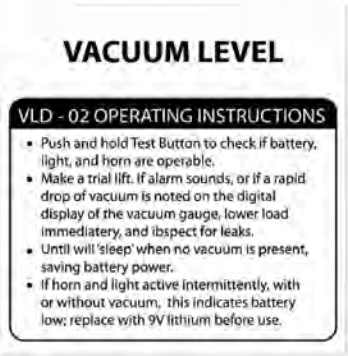

AARDWOLF
Mechanical Vacuum Lifter


AARDWOLF
VACUUM LEAKAGE SENSOR AND WARNING SYSTEM
VACUUM LEVEL
inHg / cmHg
WARNING HORN
PUSH TO TEST


WARNING
Read and understand operator's manual and all instructions before operating this lift! Failure to follow the operating instructions and all safety procedures could result in serious injury or death.


NOTICE
Do Not Lubricate with Oil
Lubricating the piston with oil will damage the rubber parts. Keep the piston rod clean, lifter dry and apply only baby talcum powder to the internal rubber diaphragm.


DANGER!
STAY CLEAR OF LOAD


VACUUM LEVEL
VLD - 02 OPERATING INSTRUCTIONS
• Push and hold Test Button to check if battery, light, and horn are operable.
• Make a trial lift. If alarm sounds, or if a rapid drop of vacuum is noted on the digital display of the vacuum gauge, lower load immediatery, and ibspect for leaks.
• Until will 'sleep' when no vacuum is present, saving battery power.
• If horn and light active intermittently, with or without vacuum, this indicates battery low; replace with 9V lithium before use.


W.L.L
75
Kgs


W.L.L
150
Kgs


W.L.L
270
Kgs


W.L.L
600
Kgs


W.L.L
650
Kgs


W.L.L
1100
Kgs


W.L.L
2200
Kgs

3.1 BEFORE OPERATING THE LIFTER

ÅAttaching the lifter to hoisting equipment

- Determine the capacity of hoisting equipment (crane and hoist, when applicable) that is fit with the maximum load weight plus the lifter weight.

- Determine the sling that is fit with the maximum load weight plus the lifter weight.

- Perform the load test for the lifter before handling the load.

- Inspect the lifter for damage that may have occurred during shipping.

- While unpacking, make sure the components are intact & their quantity is correct.

- Make sure there are no kinks in the flexible vacuum conduit.

- Re connect/assemble all items disconnected for shipping purposes before using.

- Check all fasteners for tightness. Vibration during shipping can loosen screws and bolts.

- Remove all packing material. Make sure the underside of sealing ring is clean and free of debris.

- Make sure that there are no kinks in the flexible vacuum conduit.

- All manual shut-off valves are in the open position.

- The shackle/master link is not twisted when hanging the unit on the crane hook.

- Lift this unit only by the chain master link.

- All position locking knobs or wing nuts are tight and pads and/or cross arms are correctly positioned.

- All hoses, handle bar, alarm battery etc. are disconnected for shipping purposes. Please reconnect/assemble all such items before using.

- Read the instruction and service manual.

- Make certain all operating personnel are familiar with the operating procedures and safe lifting practices, as well as understanding all the laws, rules and regulations applicable for below-the-hook lifting devices.

CAUTION
If the unit has been exposed to a cold environment (below 35ºF) the mechanical valve mechanism, sealing ring and rolling diaphragm may be cold and stiff. To prevent damage to the internal rolling diaphragm and to ensure proper sealing of the rubber sealing ring, allow the unit to remain in a heated area (above 35ºF) for a few hours prior to operation.

Place the lifter with the seals off the ground to allow the sealing rings to relax from their compressed condition on the shipping skid. Do not hang lifter from shackle for long periods of time with no load.

When starting up a new and/or cold unit, raise and lower the piston several times at slow speed to the flex the rolling diaphragm before making a lift.

ÅSafety instruction

- Remember that proper lifting knowledge and techniques are the responsibility of operator. Be sure to read and understand the instructions and safety warnings contained in this manual before using your vacuum lifter.

- If you do not understand everything in this manual, contact Aardwolf Industries LLC for assistance before using the lifter.

- Keep the lifter in a good condition and carry out the maintenance schedule established by the manufacturer.

- Keep the lifter clean and dry, and free from debris. Clean up loose dirt accumulated on surface and especially on the rubber dust cover that is visible from the top.

- Once a week, inspect vacuum seal on lifter to make sure that the sealing surface and especially the inner sealing ridge is intact and clean. If inner sealing ridge is damaged, replace seal. Damaged or cut seals are dangerous. Make sure no debris is trapped between seal and flange of vacuum pads or lifter.

- Once a week, check the vacuum loss sensor and warning device with test switch to make sure the horn and lights operate correctly. The low battery indicator will cause the horn and the LED active intermittently when battery power is low. Replace batteries when necessary.

- Once every month, check vacuum gauge(s) to make sure the dial uninterruptedly travels and the capacity indication is clearly visible.

- Once every month, check vacuum lifter on vacuum holding by lifting a test load of absolutely clean, flat, rigid an absolutely clean, flat, rigid material and note the amount of vacuum obtained at the start of the lift. To cancel any possible vacuum leakage due to an imperfect load surface, make load surface wet with water.
  Continue to test for one quarter hour and record holding vacuum at the end of test. If a drop in holding vacuum is less than 15% of initial vacuum, the lifter is in satisfactory condition for use. If vacuum drop is in excess of 15%, the lifter is unsafe and should be checked to locate the reason for vacuum loss.

- Once every month inspect vacuum lines, vacuum tube clamps, valves, fitting and pad suspensions for damage and abnormal wear. Tighten all clamps and fittings and replace damaged or worn parts. Check air inlet valve on top of cylinder cover to make sure valve disc is loose.

- If any other malfunctions are observed, check your trouble shooting guide or contact Aardwolf Industries LLC for service.

ÅDos and Donôts for operatorôs safety

Dangers always exist when loads are transported by lifting devices, especially if the equipment is not being used properly or is poorly maintained. Because accidents and severe bodily injury or death can result, special safety precautions apply to the operation, inspection and the maintenance of the vacuum lifter. Please read attentively Dos and Donôts for your safety and long-time life of lifter.

- Besides being properly trained and instructed on how to operate the equipment, operators should have specific abilities and skills for the type of work to be carried out and should be in suitable conditions to avoid any risks to peopleôs safety and health, as well as to avoid any commercial damage.

- Do not operate lifter without inspection and testing prior to each shift.

- Report any unusual operation or safety concerns to a qualified person and discontinue use of the vacuum lifting device until safety has been assured.

- Do not use vacuum lifting device with an ñOut of Orderò tag until it returned to proper operating condition.

- Do not use lifter if capacity or safety markings are missing.

- Do not use the equipment if the safety devices are not perfectly installed and working efficiently.

- Make sure that supporting structure and load-attaching devices (.e. crane, chain, and hook) are rated to support the weight of the lifter and load.

- Be sure to subtract the weight of the lifter from crane or hoist capacity when calculating the actual net capacity of the system.

- Use lifter only on non-porous smooth loads.

- De-rate load capacity by 3.5% for each 1000 ft. of elevation above sea level.

- Use lifter only on loads with clean surface; brush of loose debris, dirt, scale, chips, etc.

- Do not use lifter on; pad with the badly rusted, pitted, or scaled surface. Never lift loads weighted more than rated lifting capacity.

- Do not use lifter on loads that exceed recommended length and width for a particular thickness. Consult load overhang tables contained in this manual.

- Do not lift more than one work piece at a time. If sheets are sticky, place the load down immediately and split sheets into each single one prior to lifting.

- Use the equipment only for the tasks authorized by the manufacturer. Any unintended use can put peopleÕs safety and health at risk and threaten commercial damage.

- Use lifter only for horizontal lifting and free of overhead transportation. Do not use lifter to drag loads over floors.

- Use the handlebars to position the lifter and guide the load.

- Do not push or pull the load with your hands on the load.

- Accelerate and decelerate loads smoothly.

- Avoid contact of loads with obstructions.

- When adjusting cross arms and pads, keep vacuum lines free of twists and kinks. Do not pinch the vacuum lines.

- While applying the devices onto the material, make sure the grip is properly executed. Carry out the handling without lifting the equipment too high from the ground; avoid any abrupt movement and keep yourself at a safe distance.

- Do not lift loads higher than necessary.

- Prevent the outsiders from staying too close to the operating area while the equipment is being used. If necessary, stop the equipment operation immedi ately and keep everybody away from the working area.

- Do not tilt any load more than 15Üfrom horizontal. Never lift excessively wet or oily loads.

- Do not use lifter on loads less than 10% of rated capacity for single pad lifters.

- Always stay clear of the load. Do not place your feet or hands under the load. Keep your face and body away from lifter or load in event of accidental release.

- Do not keep loads suspended for unnecessarily long periods, such as during coffee or lunch breaks or other work stoppage.

- Do not stand under suspended loads or lift loads over people.

- Be sure to inform those near you that a lifting operation is about to begin.

- Check all fasteners for tightness. Vibration during shipping can loosen screws and bolts. All position locking knobs or wing nuts are tight and pads and/or cross-arms are correctly positioned.

- The shackle/master link is not twisted when hanging the unit on the crane hook.

- During operation always wear the individual protection clothing and/or devices indicated in the operating instructions supplied by the manufacturer and those provided by the applicable legislation concerning safety at the workplace.

• How mechanical vacuum lifter work?

Upward/downward movement controls vacuum pickup and release.

Simply on/off cycle is quick and reliable.

Raising the hoist hook and piston creates a vacuum in chamber formed by piston bottom, cylinder walls and load surface.

Flexible vacuum sealing ring around bottom flange seals out outside air. Vacuum secures powerful “bond” between lifter and load which now can be lifted. When the load and lifter are lowered, piston descends in cylinder. At lowest point the piston valve opens and lifter can be released from load, ready for next pick-up.

• Basic Operating Procedure

1. Lower lifter onto load until the shackle/master link is slack.

2. Raise hoist to lift shackle/master link and internal piston to create vacuum.

3. Vacuum pad of lifter attaches and lifts the load.

4. Transport the load to the expected location.

5. Lower the hoist until shackle/master link is slack again.

6. Internal valve now makes a cycle route to release the vacuum and detach the load.

7. Lifter may now be raised slowly until the load is released.

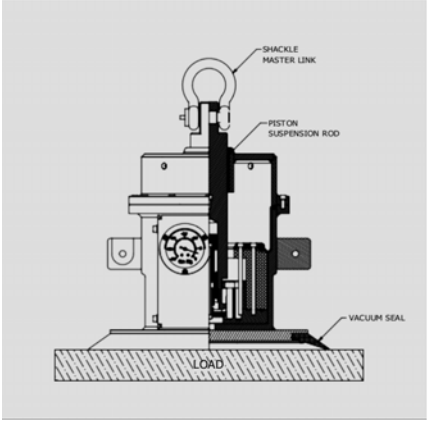
ÅTechnical description

The vacuum generator of the Aardwolf lifter consists of a free-moving piston within a closed cylinder. A rubber rolling diaphragm forms an airtight seal between piston and cylinder. Since the integrity of this seal does not depend on metal-to-metal contact, it does not lose efficiency in operation.

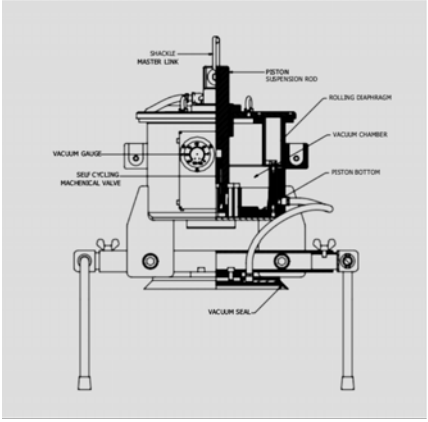
When the load is completely set down and the shackle/ master link is again slackened, the cam opens the piston valve, releasing the vacuum. The lifter then can be raised, ready for the next pickup.

The operation of grip and release is instantaneous. Since the valve can only cycle when the shackle/master link is completely slack, it cannot be shifted to the ñreleaseò position while a load is being held.

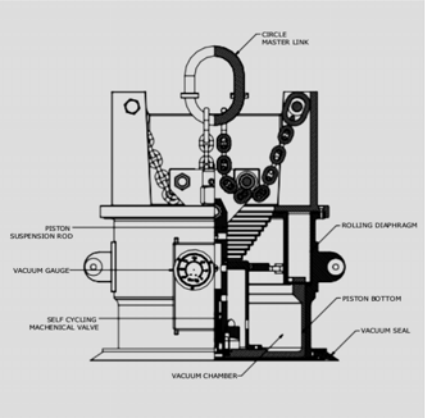
Hook suspended lifter is placed on load piston descends to lowest position, piston valve closes, weight of lifter compresses vacuum seal between bottom flange and load surface.



SECTION OF MECHANICAL
VACUUM LIFTER SERIES
250



SECTION OF MECHANICAL
VACUUM LIFTER SERIES
600



SECTION OF MECHANICAL
VACUUM LIFTER SERIES
1000

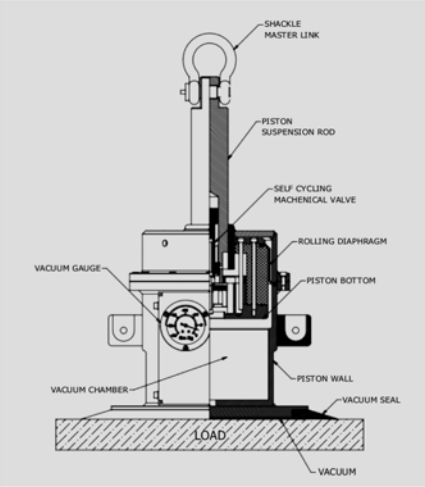
The vacuum grip and release cycle is controlled by an automatic self-cycling valve located in the bottom of the piston. When the unit is lowered onto the load and the shackle/master link slackens, a cam automatically closes the piston valve. Hoisting action then pulls up the piston, creating a powerful vacuum inside the cylinder and underneath the vacuum pads.

ÅHow safe is vacuum handling?

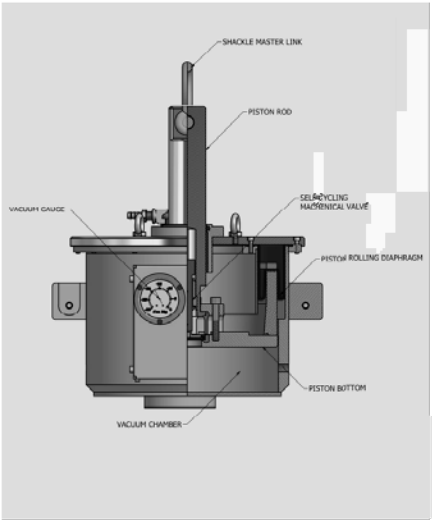
Vacuum uses the unfailing atmospheric pressure as a source of power and this energy source is totally safe and reliable.

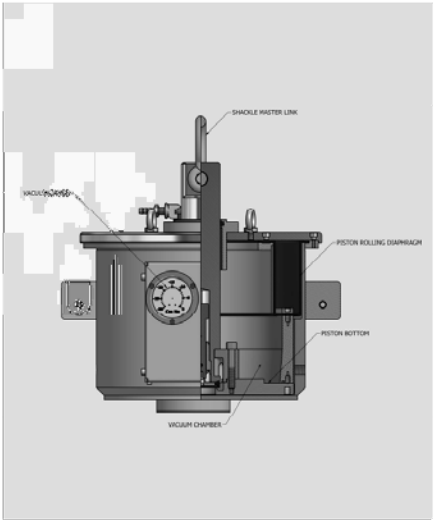
The vacuum between a vacuum pad and the surface of a suitable load which was held in place by a rubber seal compressed between pad and load, will never fail to ñholdô the load unless the vacuum is reduced by a leakage of air of the gap between the pad and the load surface.

All ñpoweredò vacuum lifters that generate vacuum with pumps or venturis must rely on an outside power source. The vacuum lifters will generally have vacuum leakage warning devices to detect leakage and vacuum reserve tanks to decrease the effects of leaks.

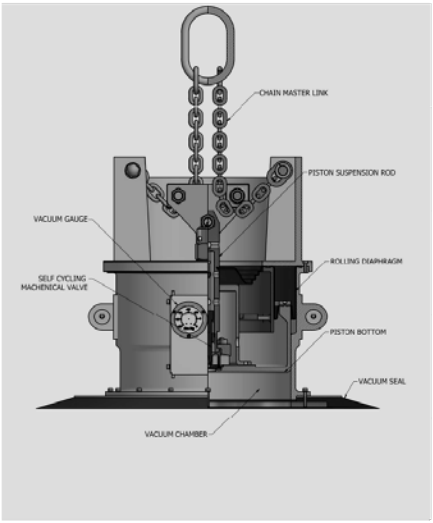


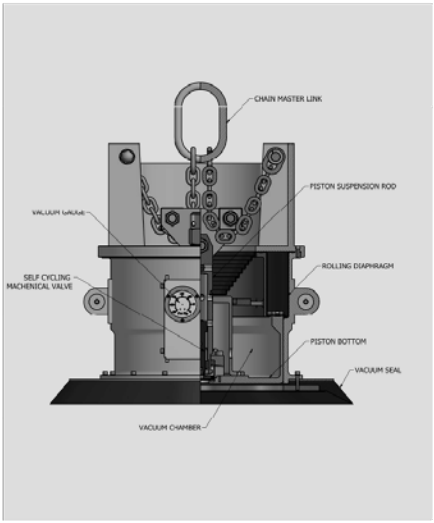
OPERATION OF MECHANICAL VACUUM LIFTER SERIES 250





OPERATION OF MECHANICAL VACUUM LIFTER SERIES 600





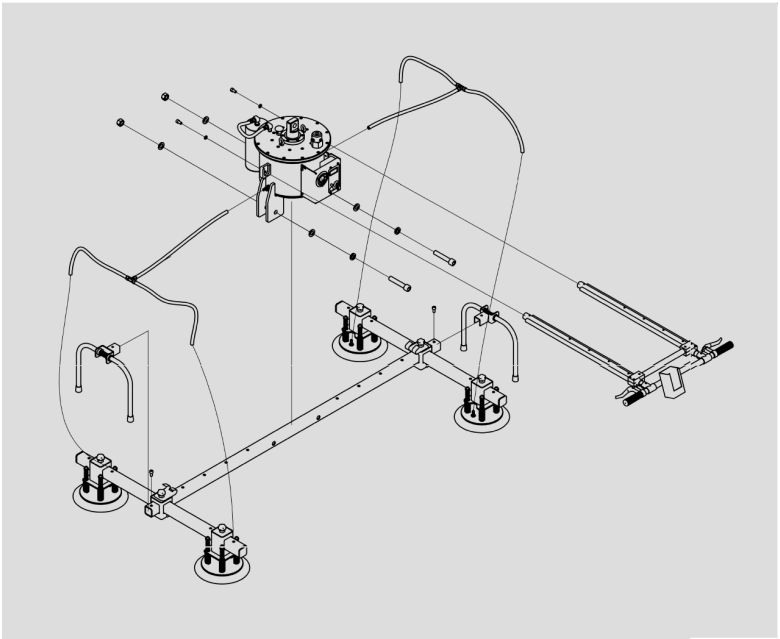
OPERATION OF MECHANICAL VACUUM LIFTER SERIES 1000

The greatest source of mishaps or failures with vacuum handling equipment occurs with misapplication and human failure. A vacuum lifter is a specialized lifting tool and should not be treated as a generalpurpose handler to be operated by untrained labor on any and all loads. (For detailed recommendations for safe vacuum handling, always refer to the vacuum lifter instruction manual and comply with all the laws, rules and regulations applicable to your country).

However, when operated as recommended by the suppliers of vacuum lifters, these system have been proven to be extremely safe for operators and floor personnel as no one needs to get close to the load and no hands are required to attach and detach the load.

ÅAssembly of lifter

Unbox and assembly the lifter based on the following technical drawing:



NOTE

1. The end user should check all spare parts based on the spare part list and ensure that no items has been damaged or lost during shipment. In event of lack or damage of any items, immediately inform the distributor or seller within 8 days since the date of good receipts.

2. The assembly of lifter should be carried out by only competent person who has been familiar with the lifters.

3. Aardwolf Industries LLC's warranty does not cover any claims due to incorrect assembly by an incompetent person or replacement of non-original items or failures to conformity of manufacturer's manual.

CAUTION

If the unit has been exposed to a cold environment (below 35ºF) the mechanical valve mechanism, sealing ring and the rolling diaphragm may be cold and stiff. To prevent damage to the internal rolling diaphragm and to ensure proper sealing of the rubber sealing ring, allow the unit to remain in a heated area (above 35ºF) for a few hours prior to operation.

Place the lifter with the seals off the ground to allow the sealing rings to relax from their compressed condition on the shipping skid. Do not hang lifter from shackle for long periods of time with no load.

When starting up a new and/or cold unit, raise and lower the piston several times at slow speed to the flex the rolling diaphragm before making a lift.

3.2 INSTRUCTIONS FOR USE

1. Make sure that the vacuum lifter is compatible with the equipment capacity.

2. Make sure that the operating area offers an appropriate maneuvering space and suitable environmental conditions.

3. While lifting, the vacuum gauge should be facing operator. For all lifters with a vacuum leakage sensor and warning device, test the signal with the test switch provided.

4. To start lifting, put the lifting master link into the hoist hook, center the lifter correctly on the load, and make sure shackle/ master link suspension is straight and not twisted or kinked.

5. Make sure vacuum pads are evenly spaced over the length and width of the load. Observe the load overhang tables in this manual.

6. Push and press ñPush to Testò button to check if battery, light and horn are operable before each lift. If horn and light are intermittently active, regard less with or without vacuum, it indicates low level of battery, it is time to replace a new 9V Lipo battery.

7. When ready for lifting, raise hoist or crane hook slowly to obtain initial vacuum grip. If no vacuum is generated, lifter is in release cycle. Lower hook, slacken chain and repeat cycle.

8. When vacuum is obtained, and lifter starts raising the load, stop the crane or hoist and make sure that the holding vacuum is stable and that the load is balanced. If the dial on the vacuum gauge slowly travels to zero, you have an unsafe vacuum grip possibly due to an imperfect vacuum seal or an equipment malfunction. Lower the hook, check the seal, re-position the lifter and repeat the cycle. If lifter continues to leak, consult the trouble shooting procedures in this manual. If holding vacuum appears stable, continue to lift.

9. If the vacuum leakage sensor is activated while the load is suspended, put the load down and determine the reason for vacuum leakage.

10. When ready to put load down, lower the hook until the lifter shackle/master link suspension is slacken completely. Now raise the hook of crane or hoist and the lifter can be lifted from the load.

CAUTION Residual vacuum can be present at the vacuum pads. Lift slowly until pads are free from the load.

ÅErroneous Use

- Do not handle loads with a shape, size, mass and temperature, etc. that are incompatible with the features of the Aardwolf mechanical vacuum lifter.

- Do not handle loads with an adherence surface, which is not able to uphold the grip pressure of the Aardwolf mechanical vacuum lifter.

- Do not handle unknown materials unless you have carried out specific capacity and resistance tests.

ÅStorage of lifter

1. When the lifter is not being used, do not leave it suspended from the hook. Put it down on its parking stand. (Leaving lifter suspended for long periods without a load can cause damage to the internal diaphragm.) It is best to store the lifter with the vacuum pad sealing edges in their free state, supported off the floor.

2. Keep the slide valve in the ñOFFò position when not in operation. Disconnect the lifter from the power source. Disconnect the charging power plug after the battery is fully recharged

3. Store lifter inside. Clean the vacuum lifter and the whole equipment from any debris. Avoid any environment exposed to dampness or to inclement weather.

ÅOverhang Table

The following Load Overhang Tables are designed for all types of vacuum lifters to determine the numbers of vacuum pads required to handle glass or metal sheet and plate.

For Aardwolf Mechanical Vacuum Lifter, the tables can also be referred as determining the overhang of material.

Overhang is defined as the distance from the center of a vacuum pad to the edge of the load. To prevent the load from ñpeeling awayò from the pad, overhang rates for 120mm deflection should never be exceeded as using mechanical vacuum lifters. For maximum safety, we recommend that the Overhang rates for 50mm deflection should be followed for all vacuum lifters.

The lifter you select must have both a sufficient capacity to handle your heaviest load as well as an adequate number of pads to support your thinnest material and prevent the load from peeling away from the vacuum pads as the load defects during lifting. Lifting thin pickled, oiled, or magnetized sheet with a single pad or single row of pads can create a bond or vacuum between the sheets. This can pucker or deform the top sheet and scratch the sheet bellow it. This bonding can also occur with thicker sheets if the surface texture is very smooth. Lifters with row of multiple pads placed near the edges of such sheet allows lifting from the outside edges of the sheet which immediately breaks the bond and permits safe lifting of one sheet at a time.

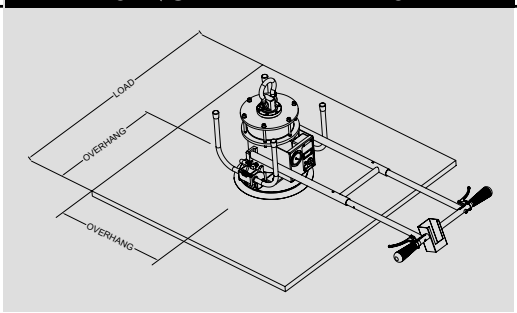
Heavy thick plate has sufficient structural rigidity such that defection and peeling away from overhang is generally not a problem. However, it can be difficult to center a single pad on large sheet.

GLASS SHEET		
Thickness (mm)	Weight (kg/m^2)	Overhang 'L' (cm)
4	8	50
5	10	65
7	20	75
8	20	80
10	25	90
13	30	100
16	40	120
20	50	130
23	60	140
26	70	150

STEEL SHEET & PLATE GAUGE			
Standard Steel Thickness (mm)	Weight (kg/m^2)	Overhang 'L'	
		50mm deflection (cm)	125mm deflection (cm)
0.5	4	35	50
0.6	5	40	55
0.8	6	45	60
1.0	8	55	70
1.2	9	60	75
1.5	12	65	85
1.8	14	70	90
2.0	16	75	95
2.5	20	85	100
3.0	24	95	120
4.0	31	100	130
5.0	39	120	150
6.0	47	140	170
8.0	63	150	190
9.0	71	160	220
10.0	79	175	225
11.0	86	185	230
12.0	94	195	245
15.0	118	200	255
16.0	126	220	275
18.0	141	230	290
19.0	149	240	300
22.0	173	260	325
25.0	196	280	350

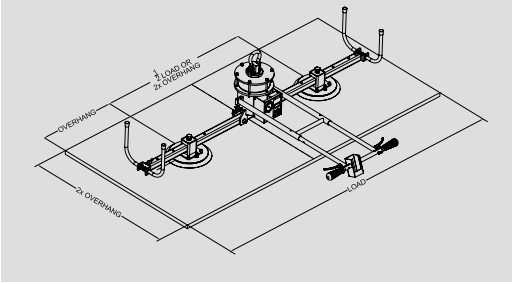
• Load Overhang Calculation

SINGLE PAD LIFTERS



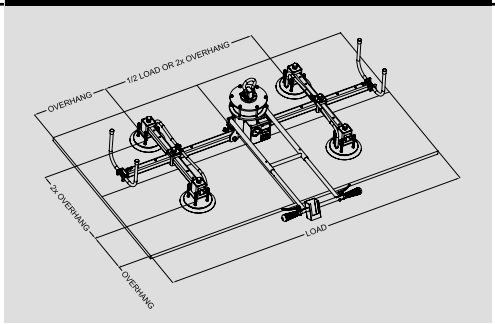
Single pad vacuum lifters are normally used to lift and transport single sheets of manageable dimensions. These dimensions vary greatly depending upon the material and application, and must be decided by the end user. AARDWOLF recommends the use of single pad lifters only on rigid or fairly rigid materials and where the operator can conveniently place the lifter in the center of the load. Even if the material is thick and light, such as foam core aluminum panels, a single pad lifter is difficult to center over a six foot or greater edge-to-edge load distance. A multiple pad lifter should be selected.

MULTIPLE IN-LINE LIFTERS



Large loads, or a load with a length dimension of two or three times its width, are best handled with a multiple-pad lifter. When possible, a center-cup to center-cup distance of one half, but not less than one third, of the length of the load should be chosen. When lifting a load with three pad, in-line lifter, the center-cup to center-cup dimension must be one third the length of the load to obtain correct load distribution.

MULTIPLE PAD LIFTER WITH CROSS-ARMS



Large or flexible loads are best handled with two or more rows of pads suspended from two or more cross-arms. For best balance and safety, each cup must carry the same share of the load. The cups must be evenly spaced along the width and length of the load for equal loading of the pads.

A 50 mm deflection or sag is the maximum we recommend for safe load handling. Equal loading of pads should be determined for the longest, widest load to be handled. Some limp or flexible materials require more support points to ensure level load handling. For every flexible materials, the overhang must be less than shown on the chart. Though we recommend near level load handling, the end user must determine the acceptable overhang for their application.

- Inspection and maintenance guides

A comprehensive checklist of inspection and maintenance is contained on page… in this manual. It is intentionally designed to support the operator to monitor the condition of lifter. Additionally, it is strongly recommended to follow the inspection and maintenance regulations stipulated by local authorities. Failures to carry out the inspection and maintenance could result in human and material losses. Aardwolf Industries LLC denies any claims due to such losses.

CAUTION **Maintenance service must not be carried out if the lifter and/or battery is being connected to power source.**

• Inspection schedule

Before every lift: the following lifter components should be examined before a lifting operation is carried out:

- Vacuum pad

- Load surface

Frequent period (20-40 hours use or one-month out-ofservice):
the following lifter components should be examined
before a lifting operation is carried out:

- Lifter structure

- Vacuum system (including a vacuum test)

Do not carry out any lifting operation if any issues are found until the solution is provided and taken.

NOTE In case the lifter is not used less than a day in a 2-week period, the inspection should be performed before using the lifter.

• Testing schedule

A lifting test including the vacuum test, the pumping test, and the load test should be performed to ensure that the lifter is in a good condition before using the lifter. If any issues are found, stop using the lifter until the solution is provided and taken.

• Load test

This test is purposed to prove the maximum lifter capacity can be reached without failure.

- Employ a load test with a maximum weight that meet the load capacity of lifter.

- Attach the pad onto the load with an Overhang as mentioned
above.

- Do the uplifting of load to a minimal distance to ensure the lifting is totally supported.

- Hold the load in five minute. If the lifting is failed, conduct a vacuum test and inspect the vacuum pad and load surface. Do not use the lifter until the solution is provided and taken.

• Vacuum test

This test is purposed to detect any vacuum-related issues such as vacuum leakage.

- Cleaning the pad contact surface.

- Attach the lifter to a load with a clean, smooth and nonporous surface and with a curvature that is no more than the deflection as mentioned in the Overhang table.

- Leave the pad attached to the pad surface. If the vacuum drops down at a 10% reduction in vacuum for VLD - 02 or 20% reduction in a vacuum for VLD - 02 with a leakage rate of less than 3.8cm Hg (1.5”Hg) per second, the alarm will be activated until a sufficient increase in vacuum is achieved.

- If the lifter fails the vacuum test, do not use it until the issues are detected and the solution is provided and taken.

• Vacuum pad maintenance

- Friction coefficient

The friction coefficient represents the ability of pad to engage the load during the lifting operation. The load capacity of most Aardwolf lifter is based on a friction coefficient of 1 (except for Flat lifters).

However, the ability of vacuum pad may be reduced by factors such as contamination, wear, aging and exposure to sunlight as well as the conditions of load surface.

Moreover, the rubber of pad may be effected by other elements such as working environment, which cause reduce the life of pad.

Therefore, it is strongly recommended that the pads should be replaced with a new, original one on a regularly 2-year basis to ensure the friction coefficient is not compromised.

Contact Aardwolf staff for more information.

- Pad inspection

To increase the life of rubber pad and to ensure the friction coefficient, the inspection of pad should follow the inspection schedule as mentioned above. Paying attention to the following elements that may effect on the pad:

+ Contaminants on the pad surface or sealing edge: soils can prevent pads from adequately attaching or reduce the friction coefficient.

+ Filter screen helps prevent debris from plugging the vacuum hose and air filter. If missing, replace with a new, original one.

+ Nicks, cuts or abrasion on sealing edge or wear, stiffness or glaze of pad can reduce the lifting capacity of lifter. Replace with a new, original one.

- Pad cleaning

The cleaning of pad surface should be carried out on a regular basis to remove oil, dust or any contaminants with acceptable cleaning agents including soapy water and other mild cleansers.

Never use solvents, petroleum-based products including kerosene, gasoline and diesel fuel or any hash chemical for cleaning.

Never 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. 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.

To prevent liquid from inflowing to 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.0

A toothbrush (or similar brush with bristles that do not harm rubber) may be used to remove contaminants clinging to sealing edges.

Wipe all residue from the pad face, and allow the pad to dry completely before using the lifter.

• Checklist of maintenance items

Inspect shackle/master link and suspension stud. Replace any worn or defective parts.

Check vacuum gauge(s) to make sure the dial has an uninterrupted travel. Make sure the capacity indication is clearly visible.

Check vacuum lifter on vacuum holding by lifting an absolutely clean, flat, nonporous, rigid test load and note amount of vacuum obtained at the start of the lift. If drop in vacuum is less than 10% within 4 min of initial vacuum, the lifter is in satisfactory condition for use. If vacuum drop is in excess of 10%, the lifter is unsafe and should be checked to find out the reason for vacuum leakage.

Tighten all clamps and lifting and replace damaged or worn parts. Check the air inlet valve on the top of cylinder cover to make sure that the valve disc is loose.

If any malfunctions are observed, check the trouble shooting procedure or contact your nearest Aardwolf service engineer or Aardwolf Industries LLC for service.

Dated records of inspection and maintenance should be kept by an appointed, responsible personnel.

A faulty or damaged vacuum lifting device shall be removed from service for repair. Return to service only after the defect has been

corrected by an approved method using approved parts or materials as specified by the manufacturer.

• Trouble shooting Procedures for Aardwolf Mechanical Vacuum Lifters

1. Multi-pad Lifter with Vacuum Generators
The Aardwolf Lifter has been engineered and built to provide trouble-free, satisfactory use. They are carefully checked and tested before they are shipped.

The following trouble shooting procedures will help you to correct any equipment problems which might occur.

The problem and their corrections are listed in the order of probability and should be checked in this order.

2. Trouble shooting procedures for AARDWOLF Mechanical Vacuum Lifters :

◊ Problem - lifter slowly loses vacuum

2.1. Possible cause - damaged sealing rings:

a. Check sealing rings for any cuts in lip or sealing ridges.

b. Discard damaged seals immediately and replace with new ones.

c. Clean the underside of sealing rings especially the sealing ridges, dirts may be trapped between sealing ring and grooves in vacuum pads.

2.2. Possible cause - surface condition of load:

a. Surface has debris, heavy corrosion or mill scale.

b. Use the lifter on clean loads and brush off loose debris, dirt, scale, chips, etc.

c. Do not use the lifter on badly rusted, pitted, or very scaly surfaces of loads.

2.3. Possible cause - damaged to plumbing:

a. Check flexible vacuum tubing for cuts or tears.

b. Check for loose fittings or hose of clamps.

c. Replace damaged tubing, pipe or fittings.

d. All pipe threads must be sealed with a pipe thread sealant.

2.4. Possible cause - loose or damaged vacuum gauge:

a. Replace damaged vacuum gauge.

b. When replacing gauge, use sealant on threads to insure tight seal.

3. Trouble shooting procedures for Aardwolf Mechanical Vacuum Lifters

3.1. Possible cause - dirty valve seat or loose or damaged rubber valve disc on piston rod valve assembly:

a. Lift piston out of cylinder housing and check and clean the valve seat.

b. If the valve seat is damaged, disassemble generator, following instruction in manual.

c. Replace old or damaged valve sealing disc.

3.2. Possible cause - damaged vacuum generator:

a. The Structural damage to the vacuum generator housing or to the flange of a vacuum pad may cause a loss of vacuum.

b. Consult factory for replacement or repair of damaged components.

◊ Problem - lifter rapidly loses vacuum:

3.3. Possible Cause - misapplication of lifter.

a. Load may be too heavy or too dirty.

b. Pads may not be completely seated on load surface or may be covering holes or welds.

c. The load's length may be too longer than that of lifter. See the load overhang tables.

d. Operator lifter following all instructions and safety rules in this manual.

3.4. Possible Cause - damaged sealing diaphragm.

a. If piston failed to 'bottom out' and has been forced down or if a load was suddenly dropped, the sealing diaphragm may be torn.

b. Never start disassembling vacuum generator without consulting your instruction manual.

c. Remove the outer circle or bolts on housing cover and lift out piston assembly.

d. Check for damaged to diaphragm. (See disassembly instructions).e. The most likely area for damaged the diaphragm is adjacent to the hold-down clamping ring.

f. Replace torn diaphragm following procedure indicated in disassembly instructions.

3.5. Possible Cause - shut off valve left open for pads not used.

a. Make certain shut off valves are completely closed to any vacuum pads not in use.

b. Make certain shut off valves are completely open to any vacuum pads being used.

◊ Problem - mechanical malfunction of lifter, lifter does not operator

3.6. Possible cause - Misapplication of lifter, the lifter is being used on loads that are not suitable for handling

a. Lifter should be used only on nonporous materials.

b. Make certain shut off valves are completely open to any vacuum pads being use.

4. Troubleshooting Procedures for Aardwolf Mechanical Vacuum Lifters

◊ Problem - piston fails to 'Bottom-out'

4.1. Possible cause - improper lubrication or foreign material on the diaphragm.

a. Reference instructions for disassembling / assembling of M100M generator information.

b. Wipe off old lubricant with clean cloth and re-lubricate with talcum powder, rubbing thoroughly into all exposed rubber surfaces.

c. Do not use oil or lubrication where this could cause swelling of rubber parts.

4.2. Possible cause - cold weather can stiffen diaphragm when lifter is stored at 200F or below.

a. If the lifter has been exposed to a cold environment (below 350F), the mechanical valve mechanism, sealing ring, and rolling diaphragm may be cold and stiff. To prevent damage to the internal rolling diaphragm, and to ensure proper sealing of the rubber sealing ring, allow the unit to remain in a heated area for a few hours prior to operation.

b. If this is not possible 'cycle' lifter several times to relax the iaphragm and to make sure that the piston will 'bottom out'

4.3. Possible cause - damage to the generator housing may cause the piston to bind.

Consult factory for repair or replacement of housing.

• Replacing vacuum pads and sealing rings

A sealing ring is one of the most important parts of any vacuum lifter. The ability to maintain a tight vacuum bond with the load surface is critical to the operation of the lifter. However, the seals are susceptible to damage. Generally, a sealing ring fails for one of five reasons:

1. A cut, tear or excessive abrasion (due to wear or physical abuse).

2. Aging: Visible as excessive surface cracks or crazing due to ozone attack.

3. Hardening of the rubber due to ozone attack.

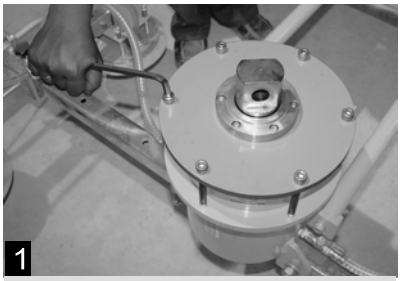
4. Compression set caused by improperly storing lifter.

5. Swelling of the rubber due to prolonged contact with certain hydrocarbons, i.e., oils or solvents.

Damaged seals should be promptly replaced. Defective seals should be disposed of. Most vacuum seals have their part number molded on the outside lip. Please check the proper seal number before ordering replacements.

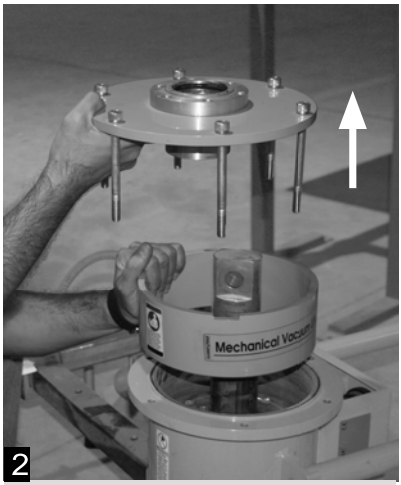
• Instructions of dissembling and inspection of diaphragm

FOR MECHANICAL VACUUM LIFTER SERIES 250



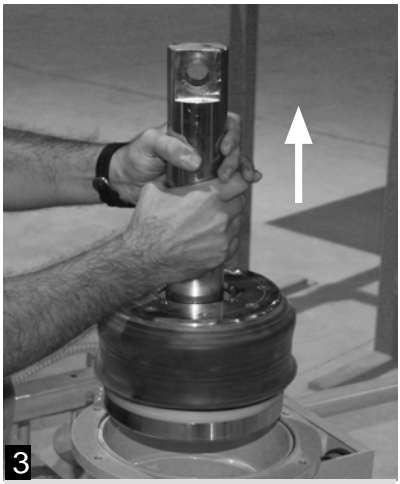
1

Remove outer circle of hold down bolts located on top of the housing cover



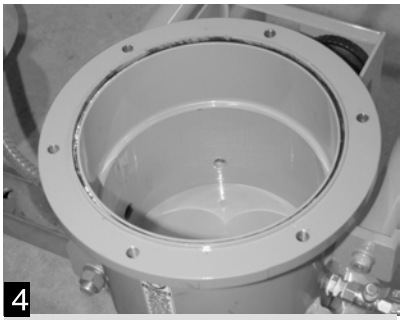
2

Lift housing cover until it clears the piston rod.



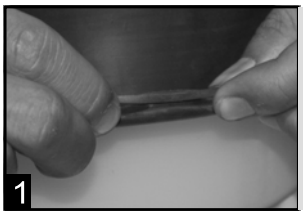
3

Lift the piston assembly out of housing.



4

Check empty cylinder housing for rust, dirt, debris or damage. Clean interior and if necessary repaint cylinder walls and bottom with zinc chromate metal primer.

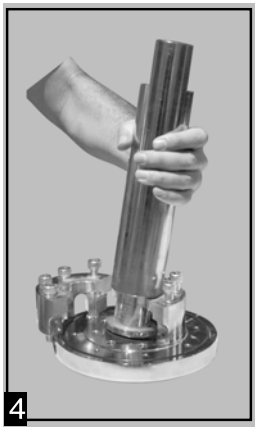


Roll the diaphragm down so that the top of the piston valve assembly body is visible and unscrew bolts.

Once all the bolts are removed, roll the diaphragm up and pull the diaphragm and clamping ring up off of the piston bottom. Separate the two and inspect the diaphragm for any tears or holes, especially along the lips. Roll the diaphragm inside and out to check both sides. Pull back the grooves in the diaphragm and check closely for tears, since this is where they may be hidden. (photos show tears along diaphragm lip).

If there is any damage, replace the diaphragm. If not, clean the diaphragm with a mild solvent or warm soapy water. Dry it thoroughly, lubricate with a fine talcum powder, and put aside.

Place piston assembly on clean area and check piston bottom plate for dirt or other obstructions. Clean with compressed air if necessary.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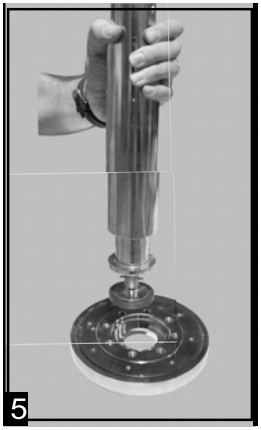

5

With you finger, feel around the upper edge of the piston bottom valve seat to check for a smooth surface. If any nicks, gouges, or defects are felt, replace the valve seat.

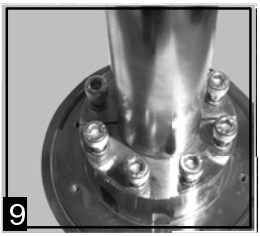
Unfasten the bolts on the mechanical valve assembly. Separate each haft to remove the piston rod. Push the valve sealing disc cover up with your fingers to be sure that it alternates freely between high and low position.


6

Examine the rubber disc cover for any cracks, rips, or tears. If any exist, peel it off the valve disc and replace it. If not, wipe the dirt and dust off the bottom of the disc cover. (photo shows rubber disc half peeled off of valve disc).


7

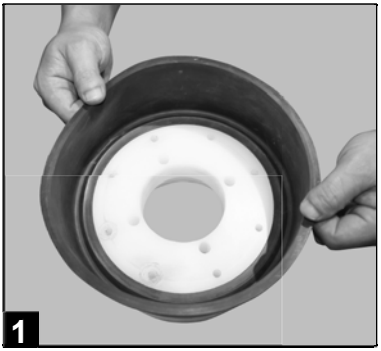

8


9

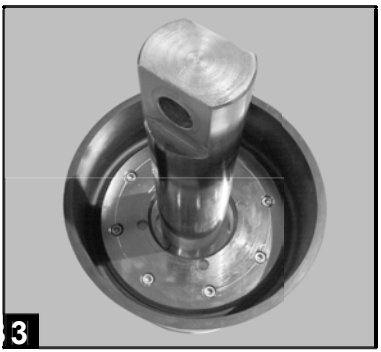
Check the thin gasket on the bottom for any tears. If damaged, replace. Reassemble the mechanical valve assembly. Secure the bolts using an 8mm hex key up to 15 ft-lbs in an alternating pattern.

Instruction for reassembly of generator

NOTE If any components or bolts are damaged of show signs of wear, they should be replaced (only with AARDWOLF approved fasteners). Clean all threads thoroughly, on bolts as well as on internal component threads, before reassembling.



Now place the diaphragm on the piston bottom with the tubing oriented as shown. Align it so the lip of the diaphragm rest evenly in the groove on the piston bottom. Run your finger along the edge of the diaphragm to ensure that it is resting evenly.



Insert the long bolts into the assembly and roll the diaphragm down over the piston bottom. Using the 5mm hex key, tighten the bolts to 10ft-lbs., securing the clamping ring to the piston bottom and the piston bottom to the bottom plate.

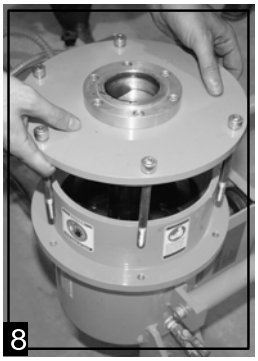
Once the clamping ring is tightly bolted down, pull the diaphragm flap back up and reinsert the piston rod assembly back into the generator body. Replace the generator housing extension, making sure that the air inlet valve notches are located on the top and not the bottom (circular orientation is irrelevant). Then take the housing cover and place it on the housing extension.

IMPORTANT Be sure that the groove in the housing cover is aligned with the housing extension so that it rests evenly and securely.


5


6

7


8

Insert 8mm bolts and finger tighten in a symmetric side to side manner before proceeding to torque tighten. In other words, tighten one srew, then tighten the one directly across from it (180^0). This way the housing cover is evenly secured with an even distribution of pressure and it will be not pull to the one side.

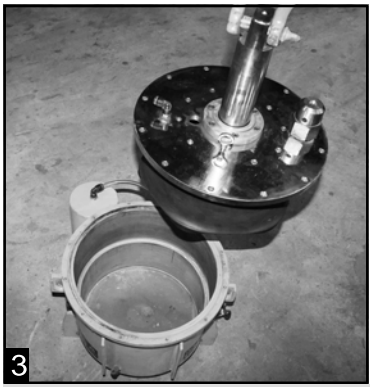
If the bolts are noy tightened this away, the cover can pull to one side and tear the diaphragm. Once all of the bolts are fastened, go arround again in the same manner and tighten them to approximately 24-25ft-lbs., using the 8mm hex key.

Secure the shackle to the generator by placing the shackle pin through the piston. Insert the lynch pin in the end of shackle pin. Diaphragm inspection and generator reassembly is complete.

FOR MECHANICAL VACUUM LIFTER SERIES 600

Remove the outer bolts on the housing cover.

Connect the lifter to a crane or hoist hook to slowly lift up the housing cover with piston.



Lift up the housing cover out of the cylinder housing. After checking the cylinder housing, continue to inspect the rubber diaphragm and piston.

Remove the inner bolts of housing cover to detach it from the rubber diaphragm.

Unscrew the bolts of the piston ring on the top of rubber diaphragm and take it out of the diaphragm. Roll up the diaphragm and take it out of the piston middle. Inspect the diaphragm for any tears or holes, especially along the slips.

- Roll the diaphragm inside and out to check both sides. Pull back the grooves in the diaphragm and check closely for tears, since this is where they may be hidden. If there is any damage, replace the original diaphragm.
- Check the coverage level of anti-friction powder to prevent the wear of diaphragm.
- Lift up the piston top out of the piston middle. Inspect the piston for any debris. Clean it with the compressed air if necessary.

Instruction for reassembly of generator

Place the diaphragm on the piston top and put the piston ring inside the diaphragm so that they match up to their screw holes to prevent from tearing the diaphragm.

Place the housing cover on the top of piston top and ensure all bolts match up, and firmly and securely fasten all bolts.

Place the housing cover on the piston middle and gently move it around the piston middle so that they match up to their screw holes to prevent from tearing the diaphragm.

5

Attentively screw each bolts of piston ring and piston cover in a firmly and securely manner.

6

Connect the housing cover to a crane or hoist hook and place it inside the housing and ensure that the diaphragm is not torn.

7

Attentively screw each bolts of housing cover in a firmly and securely manner.

The diaphragm inspection and generator reassembly are complete.

FOR MECHANICAL VACUUM LIFTER SERIES 1000 & 2200

1

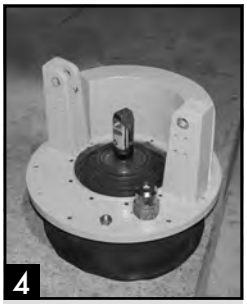
Remove outer bolts of housing cover.

2

Connect the lifter to a crane or hoist hook to slowly lift up the housing cover with piston.

3

Place the housing body on a firm and clean ground or table support.



Remove the rolling system from the housing body

Unscrew inner bolts of housing cover to detach the housing cover out of the piston.

Unscrew bolts of O-ring to detach the diaphragm out of the piston.

- Roll the diaphragm inside and out to check both sides. Pull back the grooves in the diaphragm and check closely for tears, since this is where they may be hidden. If there is any damage, replace the original diaphragm.
- Check the coverage level of anti-friction powder to prevent the wear of diaphragm.
- Lift up the piston top out of the piston middle. Inspect the piston for any debris. Clean it with the compressed air if necessary.

Instruction for reassembly of generator

Place the piston top on the housing, using wooden support legs to lift up the piston top.


2


3

- Place the diaphragm on the piston top, then position gently the housing cover on the diaphragm so that their screw holes match up to prevent from tearing the diaphragm, then firmly and securely fasten all bolts.
- Pull down the diaphragm, ensure the bolts of O rings, diaphragm and piston bottom match up and fasten all bolts in a firm and secure manner.


4


5

- Slowly place the piston body inside the house and ensure that the screw holes of piston body and housing match up to prevent from tearing the diaphragm. Fasten all bolts in a firm and secure manner.
- Connect the rolling system to the lifter in a firm and secure manner.
- The diaphragm inspection and generator reassembly are complete.

• Aardwolf Vacuum Leakage Detector VLD - 02

The Aardwolf Mechanical Vacuum Lifters are equipped with an Aardwolf Vacuum Leakage Detector VLD – 02.

It is powered by an independent Alkaline battery with the capacity of 9 v, monitoring the vacuum level automatically. It consists of a pressure sensor, an audible warning horn, red warning light, and vacuum unit switch, all controlled by a solid state microchip.

In event that the vacuum is lost during a lift, a loud horn sounds, and a red light flashes to warn the operator. The VLS-08 monitors vacuum level even if the operator is not looking at the lifter, a useful and popular option.

The system is packaged in a rugged polycarbonate enclosure with a 1/4" push-to-connect fitting for tubing connections.

During each lifting cycle the programmed 'intelligent' processor senses the peak vacuum level. From this point, a 10% loss (or 20% loss for VLS-08-20) of vacuum with a leakage rate of less than 1½ in. Hg per second from that peak level will trigger the horn and light, informing the operator of a leak. The alarm will not sound on the detach cycle as with other primitive systems using preset switches. Even the smallest leak anywhere in the system will be detected.

Features

- Advanced Solid State Circuitry with Micro-Controller
- Precise, Reliable, Board Mounted Vacuum Transducer
- LCD Digital Display of Vacuum Level in Inches of Hg
- Audible Warning Horn
- Bright Flashing Red LED Warning Light
- Push-to-Connect Vacuum Source Port to Connect to Vacuum Manifold
- Auxiliary Output Jack to Connect to Optional VLS-AUX Auxiliary Siren/Alarm
- Easy Access to Battery Compartment
- Low Battery "Chirp" Indicator
- Light / Horn / LCD Test Button
- Powered by One Standard 9V Lithium Battery (included)
- Weight: 0.2kg

The VLD-02 (series) vacuum leakage sensor is vacuum level differential detector which is preprogrammed to active the alarm at a 10% reduction in vacuum for VLD-02 or 20% reduction in a vacuum for VLD-02 with a leakage rate of less than 1.5"Hg per second. The alarm will continue until a sufficient increase in vacuum is achieved, indicating no additional leakage is present, or the indicated vacuum level drop below 5"Hg. The horn, LED (red light)

and LCD (digital display) can be tested by pressing and holding the “test button” for approximately 3 seconds. The unit is also equipped with a low battery indicator which will cause the horn to “chirp” and the LED to flash when battery power is low. The battery should be replace immediately with a standard 9V lithium battery. The auxiliary output jack on the VLD-02 (series) is an open collector output which can be connected directly to the VLD-02 or another I/O device, such as an emergency stop function on a CNC control, through a solid state relay.

Replacement of 9V Alkaline battery

It is time to replace a new 9V Alkaline battery if the Red led indicator does not light when pressing the “Push To Test” button.

Remove two screws on the right side of vacuum leakage detector and replace a new battery.

Please follow the regulations of battery disposal stipulated by local authorities.

WARNING

The VLD-02 is designed to be warning device for vacuum leakage detection. When properly installed on an Aardwolf vacuum lifter, the operator will be warned of a slow vacuum leakage and should have adequate time to safety lower the attached load. If the alarm signal is ignored and the lifting operation is continued, the vacuum loss may adversely affect the vacuum “hold”, possibly resulting in serious injury to the operator. The VLD-02 is not designed for neither effective in detecting fast leaks nor sudden failures of the vacuum system.

The vacuum level achieved, using a Mechanical Vacuum Generator, is weight sensitive, relative to the load and lifter weight, as well as the pad, manifold and generator volume.

Lighter loads will produce a lower vacuum reading, which may render the VLD-02 leakage sensor ineffective, as the achieved vacuum level approaches 6” of Hg.

CAUTION

This vacuum leakage warning device will not provide timely warning to the operator that a reduction in vacuum has occurred due to incorrect use of a vacuum lifter, such as overloading, lifting oversized loads, unbalanced lifting or improper operator of any kind.

• PS-150 Parking Stands

- Adjustable in four positions pull sideways, turn, let go and it locks in position.

- Spring-loaded locking mechanism snaps into position for onesided,quick adjustments.

These spring-loaded, adjustable, four position parking stands fulfill two functions:

- In the 'down' position, which is recommended when you store the lifter, they provide the support for the lifter so the rubber seals will not touch the ground. This helps prolong the life of the rubber seals by protecting them from the debris on the floor.

- In a folded in, out or up position, they provide a grab bar for positioning the lifter easily and precisely on the load from the side.

Parking stands folded down: Keep the rubber vacuum pads suspended above the ground when the lifter is stored. Extends the life of the rubber sealing rings

Parking stands folded in: For keeping it out of the way. A popular position when not in use.

Parking stands folded out: Can be used as 'positioning grab bars'.
Extends the length of the lifter for pushing or pulling from the side.

Parking stands folded up: Can be used as 'positioning grab bars'.

Parking stands feature rugged steel construction

Part no.	For use with
PS-150	Mechanical vacuum lifter up to 2000lb (909kg) capacity range and up to 190 inch (7.5M) beam length

Even with above criteria, there are some exceptions, especially when it comes to lifters. Parking stands are not available for all lifters. Consult factory for further information.

CE - DECLARATION OF CONFORMITY

We declare that the product is in conformity with the following standard: The Machinery Directive 2006/42/EC.

NOTE It is the responsibility of the user to adapt to state or local laws. The end user is responsible to use the equipment safely in a manner that it is designed for and within the rated capacity of the unit.

MECHANICAL VACUUM LIFTER INSPECTION REPORT

Model No._____ Serial No. _____
Inspector: _____ Date: _____

Condition Codes:

__ EX Excellent, like new condition
__ GD Good, used but no problem, well maintained
__ FR Fair, shows some wear but is serviceable
__ NW Needs work, limited usefulness, flag for maintenance
__ UN Unfit, unsafe, unusable, do not use until fixed

NOTICE This document is intended solely as an aid to the inspector as a reminder of the most frequently occurring lifter problems. It by no means cover every problem that can possibly occur. The inspector must be alert for any other conditions which could affect safe use of the equipment.

1. GENERAL

1.1 Cleanliness __EX __GD __FR __NW __UN

- Lifter must be clean enough to observe condition and read gauges
- Lifter must be free of dirt or debris which could affect safe operation

1.2 Labels __EX __GD __FR __NW __UN

- Nameplate
- Load capacity; entire lifter, each cross-arm, each pad
- Operating instructions
- Safety rules
- Warnings
- "Tighten slides" warnings

2. GENERATOR - MECHANICAL

2.1 Lift Sling __EX __GD __FR __NW __UN

Check condition of shackle / master link suspension stud and pins

2.2 Fasteners __EX __GD __FR __NW __UN

Check tightness and condition

2.3 Welds __EX __GD __FR __NW __UN

Uniform and free of cracks or defects

2.4 Gauges __EX __GD __FR __NW __UN

Dial readability, glass, indicator, guard

2.5 Ball Valves __EX __GD __FR __NW __UN

Operation, labels, general condition

2.6 Vacuum Loss Sensor __EX __GD __FR __NW __UN

Operate test switch for light and horn
Check general condition, display clarity

3. STRUCTURAL

3.1 Welding __EX __GD __FR __NW __UN

- Check for cracks, corrosion, deformation, fatigue
- Check welds and adjacent metal for signs of cracked or spilled paint indicating "working" of the metal

3.2 Frame

Check these items for damage; bent, broken or missing parts; adjustability distortion

Main beam	__EX	__GD	__FR	__NW	__UN
Cross-arm	__EX	__GD	__FR	__NW	__UN
Sides	__EX	__GD	__FR	__NW	__UN
Pad suspensions (Including plate, studs and springs)	__EX	__GD	__FR	__NW	__UN
Brackets	__EX	__GD	__FR	__NW	__UN
Attachment (Check parking stand operation)	__EX	__GD	__FR	__NW	__UN

3.3 Fasteners __EX __GD __FR __NW __UN

Check condition and tightness of all fasteners, hand knobs and wing nuts

4. VACUUM SYSTEM

4.1 Pads __EX __GD __FR __NW __UN

Check for cuts, tears, wear, aging (cracks, crazing or hardening of the rubber), embedded dirt or chips, inner seal condition.

4.2 Hoses and Connections __EX __GD __FR __NW __UN

- Check for cracks, wear or abrasion especially near connections, cracked or damaged fittings
- Check tightness of all hose clamps
- Check for collapsed or kinked vacuum lines

4.3 Ball Valves __EX __GD __FR __NW __UN

Check operation, condition, broken or missing handles, labels

5. LIFTER OPERATION __EX __GD __FR __NW __UN

Lift test

- Lift clean, dry, smooth, no-porous load, preferably weighing the maximum rated lift capacity.
- Operation should result in a clean, smooth lift.
- All gauges and indicators should be visible to the operator and work normally.
- Watch and listen for:
  + Drop in vacuum level
  + Vacuum leaks
  + "sticky gauges" or failure to return to zero
  + Unequal pad loading/unequal spring compression

Measure and record:

Attach time:_____sec.; Release time:_____ sec.

Vacuum loss sensor operation - if equipped with the VLS option

__EX __GD __FR __NW __UN

- Place an object under one side of a pad to create a vacuum leak large enough to cause level of vacuum to drop but not at a rate faster than 2"Hg per sec. Lift load a minimum distance off floor. Watch the vacuum level drop and observe operation of the VLS system.
- Does it give timely warning before load drops?

6. OPERATOR QUALIFICATION AND SAFETY TRAINING

- Check operator training records.
- Are all operators trained per all rules and regulation stipulated by local authorities? **__ YES __ NO**
- Do all operators know who the "qualified, designated persons" are for safety and maintenance? **__ YES __ NO**
- Do all operators have printed copies of operating and safety rules? **__ YES __ NO**

COMMENTS

_____

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VACUUM LIFTER INSPECTION REPORT SUMMARY SHEET

Model No. Serial No.

Lift capacity:

Inspected by: Date: Approved by: Date:

Overall Condition:

__Excellent, __Good, __fair, __Needs Works, __Unfit

Are any items rated "UNFIT"?

Which Items? _____

Action:

___ Repair and return to service.

___ Return to factory for overhaul

___ Other, _____

Tag lifter, "Out of service - DANGER - Do Not Use"

Authorization:

___ Return to service

Inspected and approved by: _____

Are any items rated “NEEDS WORK”?

Which Items? _____

Action:

___ Maintenance Scheduled For_____Date _____

___ Return to Temporary Service Until_____Date_____

Tag lifter, “Temporary Service Only”

___ Re-inspect Frequently:____Daily,____Weekly,____Other

Approved by: _____

COMMENTS

_____

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MAINTENANCE RECORD

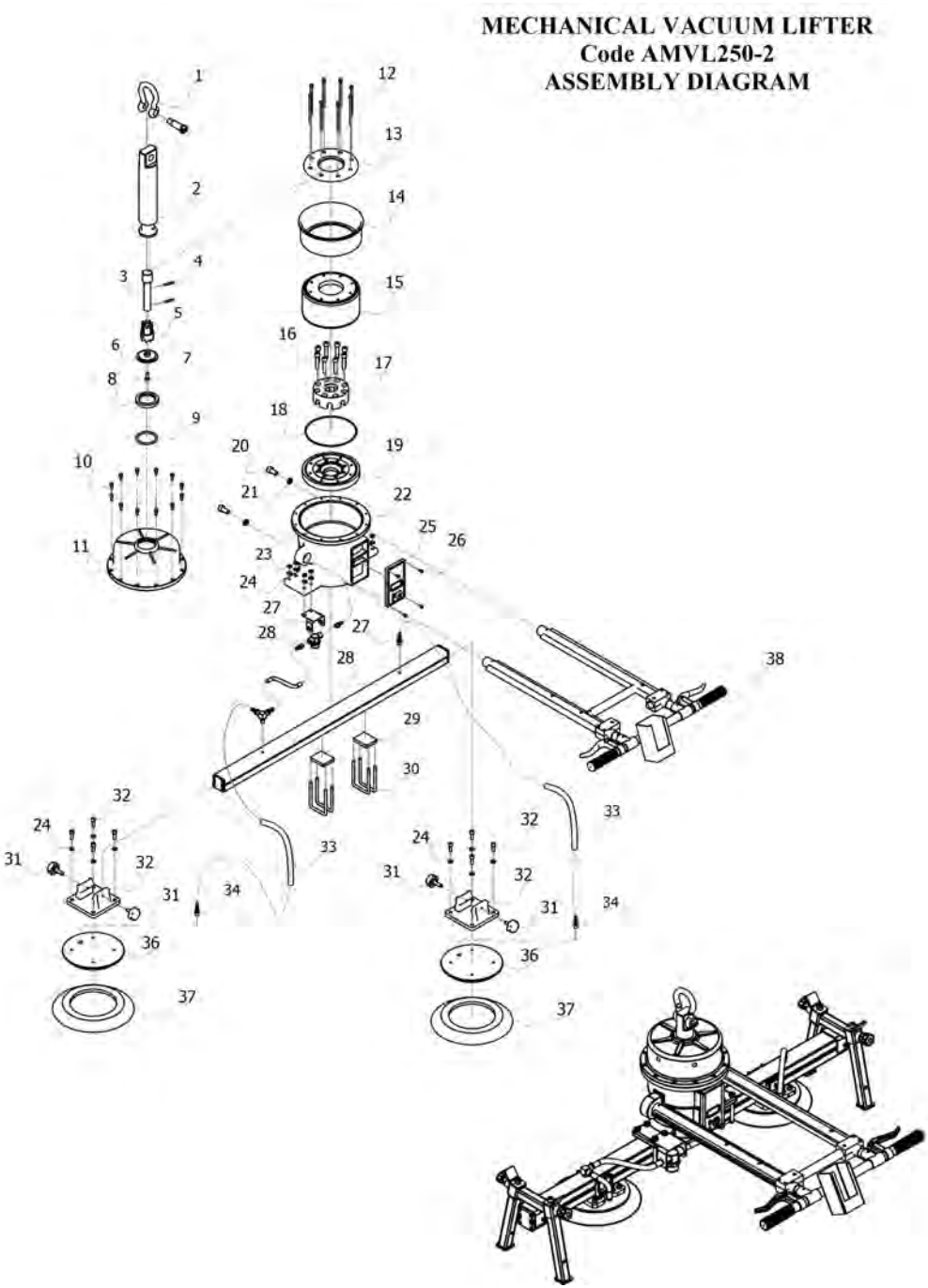
Always keep lifter clean and dry and free from debris. See maintenance instructions.

DAILY	WEEKLY		MONTHLY			
Inspect vacuum host condition	Inspect vacuum seal	Check vacuum leakage sensor	Inspect shackle / master link per OSHA regulations	Check vacuum gauge	Check vacuum stability	Inspect lifter for inspection report

NOTES _____

_____

_____


MECHANICAL VACUUM LIFTER
Code AMVL250-2
ASSEMBLY DIAGRAM
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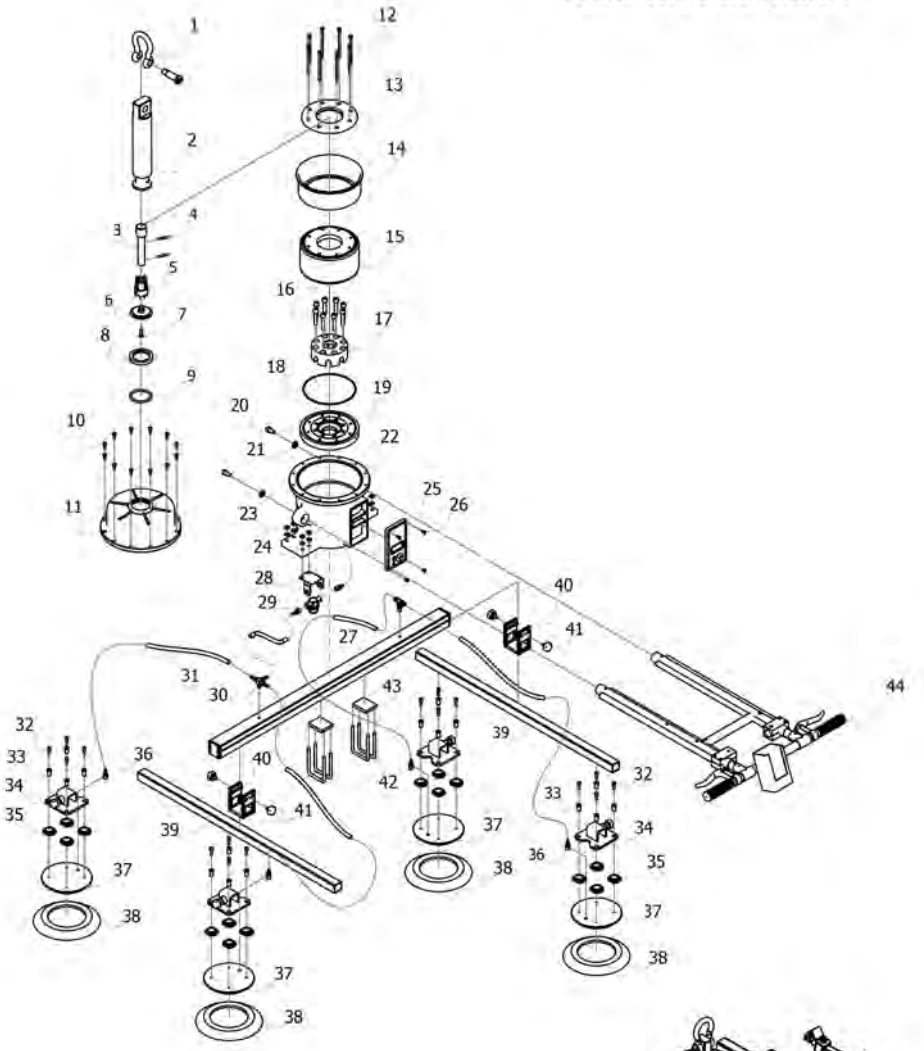
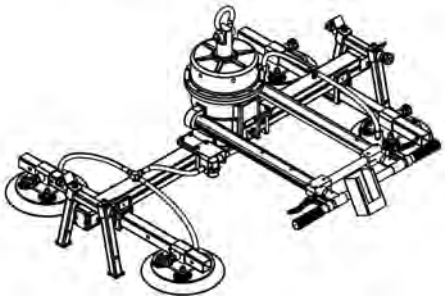
MECHANICAL VACUUM LIFTER
Code AMVL250-2
ASSEMBLY DIAGRAM

PARTS LIST			
No.	Code	Name Part	Qty.
01	AMVL250-001	Bow Shackles	01
02	AMVL250-002	Main spindle	01
03	AMVL250-003	Actuator shaft	01
04	AMVL250-004	Actuator pin ø4	02
05	AMVL250-005	Actuator lock	01
06	AMVL250-006	Actuator plate	01
07	AMVL250-007	Screw M6 x 12	01
08	AMVL250-008	Actuator rubber cover	01
09	AMVL250-009	O-ring 60 x 72 x 6	01
	AMVL250-010	Bolt M6 x 25	12
11	AMVL250-011	Top Housing	01
12	AMVL250-012	Bolt M6 x110	08
13	AMVL250-013	Top piston	01
14	AMVL250-014	Piston diaphragma	01
15	AMVL250-015	Middle piston	01
16	AMVL250-016	Bolt M10 x 50	08
17	AMVL250-017	Lift stop	02
18	AMVL250-018	O-ring 165 x 172 x 3.5	01
19	AMVL250-019	Bottom piston	01

PARTS LIST			
No.	Code	Name Part	Qty.
20	AMVL250-020	Bolt M10 x 20	02
21	AMVL250-021	Washer M10	02
22	AMVL250-022	Housing	01
23	AMVL250-023	Nut M8	04
24	AMVL250-024	Washer M8	12
25	AMVL250-025	Gauge guard	01
26	AMVL250-026	Bolt M5 x 16	04
27	AMVL250-027	Tailpiece male 1/4	02
28	AMVL250-028	Shaft Beam 60 x 60 x 1300	01
29	AMVL250-029	Plastic plate	02
30	AMVL250-030	U ø8 taro M8	04
31	AMVL250-031	Latch locking M6	04
32	AMVL250-032	Bolt M8 x 25	08
33	AMVL250-033	Air hose ø6	02
34	AMVL250-034	Tailpiece male 1/4	02
35	AMVL250-035	Bracket beam 60 x 60	02
36	AMVL250-036	Hub 300	02
37	AMVL250-037	Seal 300	02
37	AMVL250-037	Handle assembly	01

MECHANICAL VACUUM LIFTER
Code AMVL250-4
ASSEMBLY DIAGRAM

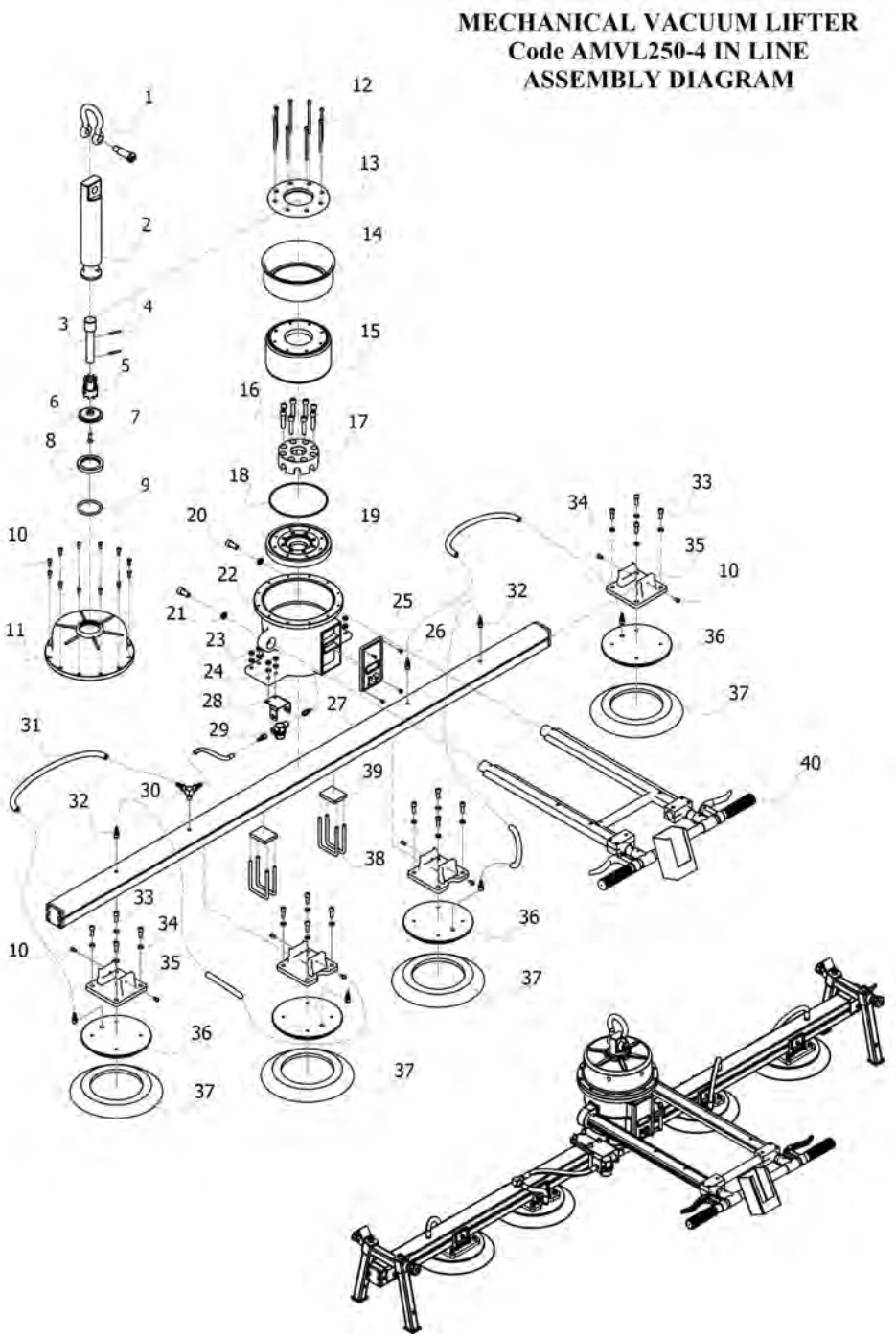




MECHANICAL VACUUM LIFTER
Code AMVL250-4
ASSEMBLY DIAGRAM

PARTS LIST			
No.	Code	Name Part	Qty.
01	AMVL250-001	Bow Shackles	01
02	AMVL250-002	Main spindle	01
03	AMVL250-003	Actuator shaft	01
04	AMVL250-004	Actuator pin ø4	02
05	AMVL250-005	Actuator lock	01
06	AMVL250-006	Actuator plate	01
07	AMVL250-007	Screw M6 x 12	01
08	AMVL250-008	Actuator rubber cover	01
09	AMVL250-009	O-ring 60 x 72 x 6	01
10	AMVL250-010	Bolt M6 x 25	12
11	AMVL250-011	Top Housing	01
12	AMVL250-012	Bolt M6 x110	08
13	AMVL250-013	Top piston	01
14	AMVL250-014	Piston diaphragma	01
15	AMVL250-015	Middle piston	01
16	AMVL250-016	Bolt M10 x 50	08
17	AMVL250-017	Lift stop	02
18	AMVL250-018	O-ring 165 x 172 x 3.5	01
19	AMVL250-019	Bottom piston	01
20	AMVL250-020	Bolt M10 x 30	02
21	AMVL250-021	Washer M10	02
22	AMVL250-021	Housing	01

PARTS LIST			
No.	Code	Name Part	Qty.
23	AMVL250-023	Nut M10	08
24	AMVL250-024	Washer M10	08
25	AMVL250-025	Housing cover	02
26	AMVL250-026	Bolt M5 x 16	04
27	AMVL250-027	Shaft beam 60 x 60 x 2200	01
28	AMVL250-028	Filter pad	01
29	AMVL250-029	Filter	01
30	AMVL250-030	Connector 1/4 x 3	01
31	AMVL250-031	Air hose ø13	06
32	AMVL250-032	Bolt M12	16
33	AMVL250-033	Spring bushing	16
34	AMVL250-034	Bracket	04
35	AMVL250-035	Spiral spring	16
36	AMVL250-036	Connector 1/4	06
37	AMVL250-037	Hub 250	04
38	AMVL250-038	Seal 250	04
39	AMVL250-039	Beam 40x40x3	02
40	AMVL250-040	Bracket beam 40x40x3	02
41	AMVL250-041	Latch locking M6	04
42	AMVL250-042	U ø10 taro M10	04
43	AMVL250-043	Plastic plate	02
44	AMVL250-044	Handle assembly	01

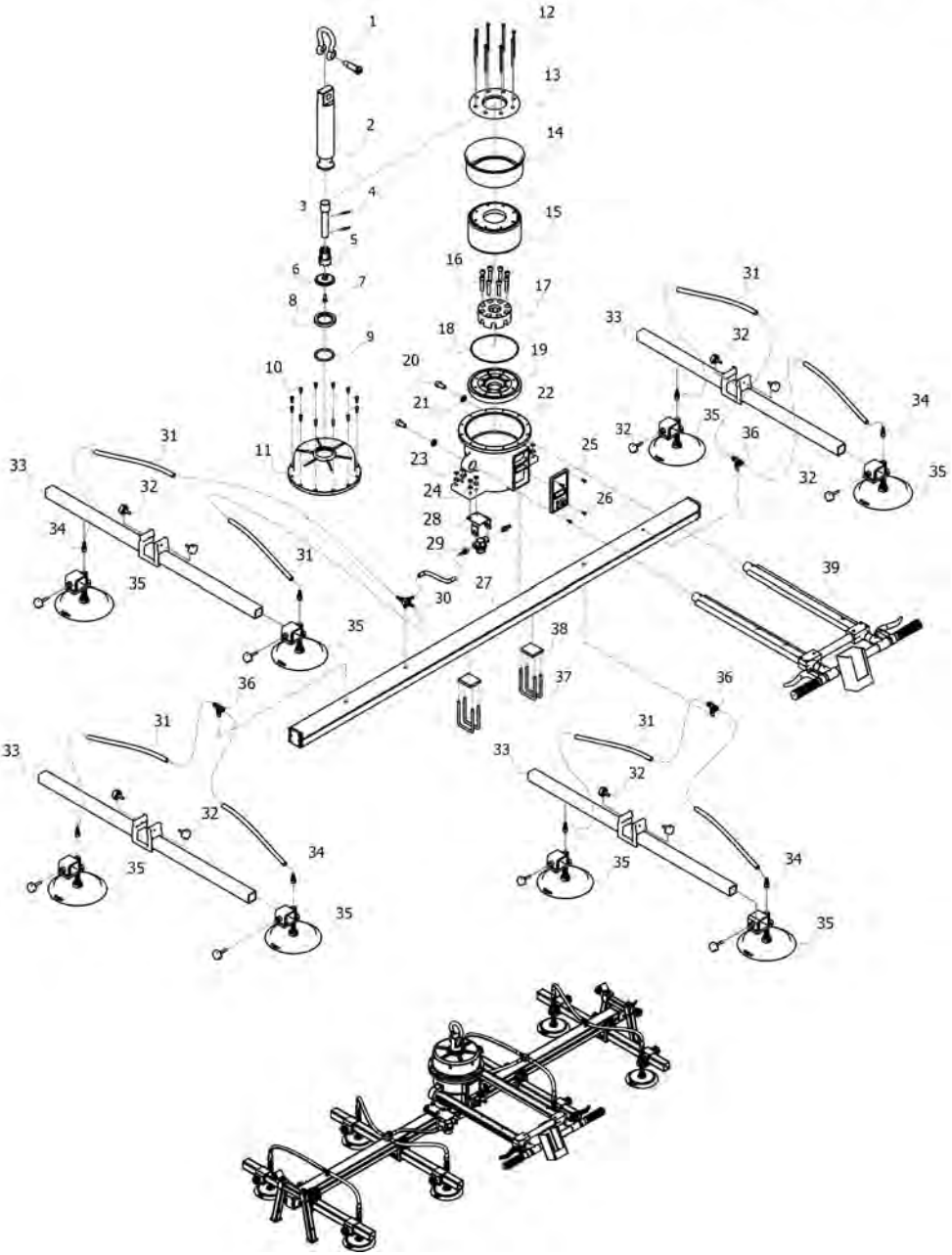

MECHANICAL VACUUM LIFTER
Code AMVL250-4 IN LINE
ASSEMBLY DIAGRAM

MECHANICAL VACUUM LIFTER
Code AMVL250-4 IN LINE
ASSEMBLY DIAGRAM

PARTS LIST			
No.	Code	Name Part	Qty.
01	AMVL250-001	Bow Shackles	01
02	AMVL250-002	Main spindle	01
03	AMVL250-003	Actuator shaft	01
04	AMVL250-004	Actuator pin ϕ4	02
05	AMVL250-005	Actuator lock	01
06	AMVL250-006	Actuator plate	01
07	AMVL250-007	Screw M6 x 12	01
08	AMVL250-008	Actuator rubber cover	01
09	AMVL250-009	O-ring 60 x 72 x 6	01
10	AMVL250-010	Bolt M6 x 25	12
11	AMVL250-011	Top Housing	01
12	AMVL250-012	Bolt M6 x110	08
13	AMVL250-013	Top piston	01
14	AMVL250-014	Piston diaphragma	01
15	AMVL250-015	Middle piston	01
16	AMVL250-016	Bolt M10 x 50	08
17	AMVL250-017	Lift stop	02
18	AMVL250-018	O-ring 165 x 172 x 3.5	01
19	AMVL250-019	Bottom piston	01
20	AMVL250-020	Bolt M10 x 30	02

PARTS LIST			
No.	Code	Name Part	Qty.
21	AMVL250-021	Washer M10	02
22	AMVL250-022	Housing	01
23	AMVL250-023	Nut M10	08
24	AMVL250-024	Washer M10	08
25	AMVL250-025	Housing cover	02
26	AMVL250-026	Bolt M5 x 16	04
27	AMVL250-027	Shaft beam 60 x 60 x 2200	01
28	AMVL250-028	Filter pad	01
29	AMVL250-029	Filter	01
30	AMVP250-030	Connector 1/4 x 3	01
31	AMVL250-031	Air hose ϕ13	06
32	AMVL250-032	Connector 1/4	09
33	AMVL250-033	Bolt M12	16
34	AMVL250-034	Washer M12	16
35	AMVL250-035	Bracket	04
36	AMVL250-036	Hub 250	04
37	AMVL250-037	Seal 250	04
38	AMVL250-038	U ϕ10 taro M10	04
39	AMVL250-039	Plastic plate	02
40	AMVL250-040	Handle assembly	01

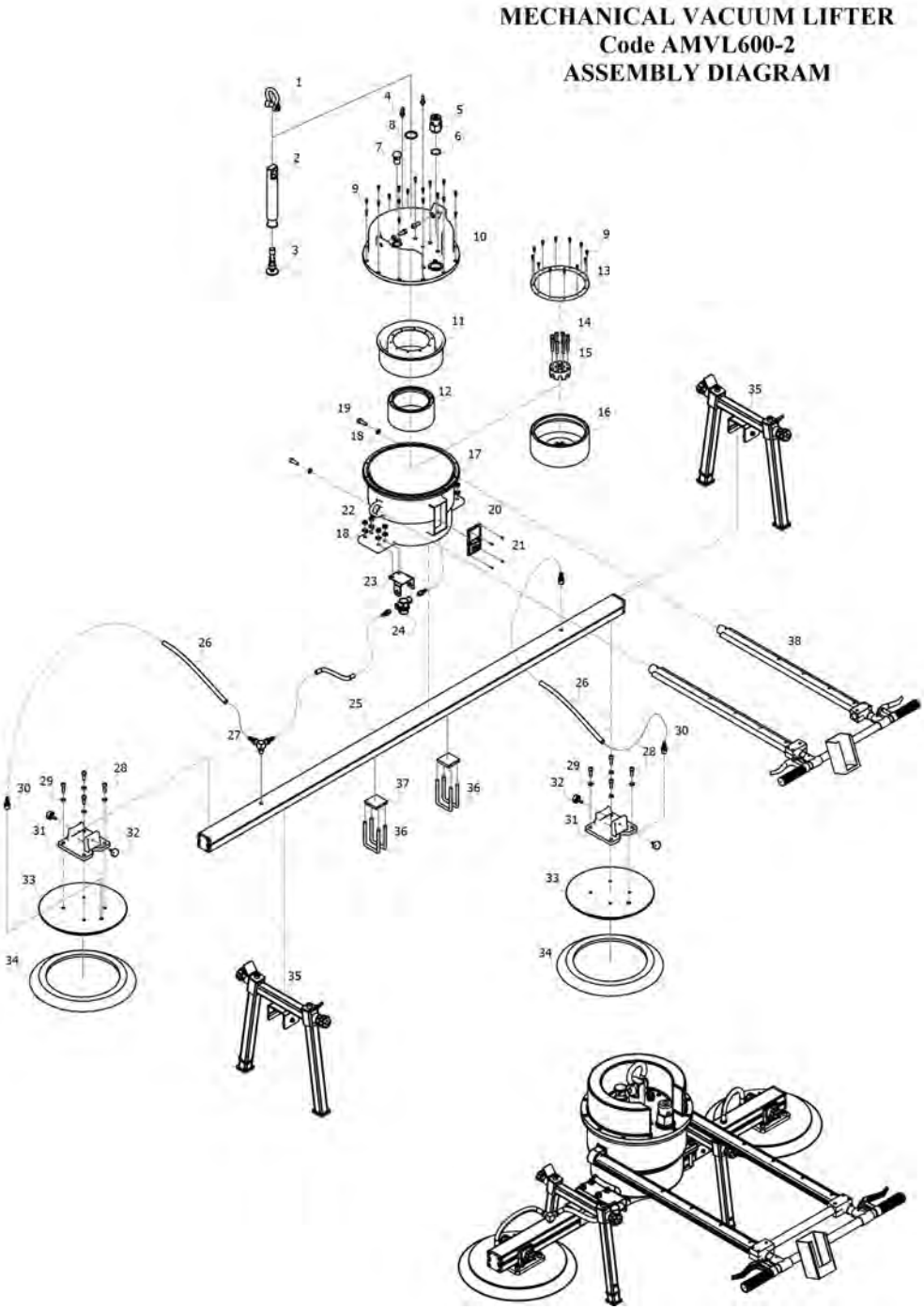
MECHANICAL VACUUM LIFTER
Code AMVL250-8
ASSEMBLY DIAGRAM



MECHANICAL VACUUM LIFTER
Code AMVL250-8
ASSEMBLY DIAGRAM

PARTS LIST			
No.	Code	Name Part	Qty.
01	AMVL250-001	Bow Shackles	01
02	AMVL250-002	Main spindle	01
03	AMVL250-003	Actuator shaft	01
04	AMVL250-004	Actuator pin ø4	02
05	AMVL250-005	Actuator lock	01
06	AMVL250-006	Actuator plate	01
07	AMVL250-007	Screw M6 x 12	01
08	AMVL250-008	Actuator rubber cover	01
09	AMVL250-009	O-ring 60 x 72 x 6	01
10	AMVL250-010	Bolt M6 x 25	12
11	AMVL250-011	Top Housing	01
12	AMVL250-012	Bolt M6 x110	08
13	AMVL250-013	Top piston	01
14	AMVL250-014	Piston diaphragma	01
15	AMVL250-015	Middle piston	01
16	AMVL250-016	Bolt M10 x 50	08
17	AMVL250-017	Lift stop	02
18	AMVL250-018	O-ring 165 x 172 x 3.5	01
19	AMVL250-019	Bottom piston	01
20	AMVL250-020	Bolt M10 x 30	02

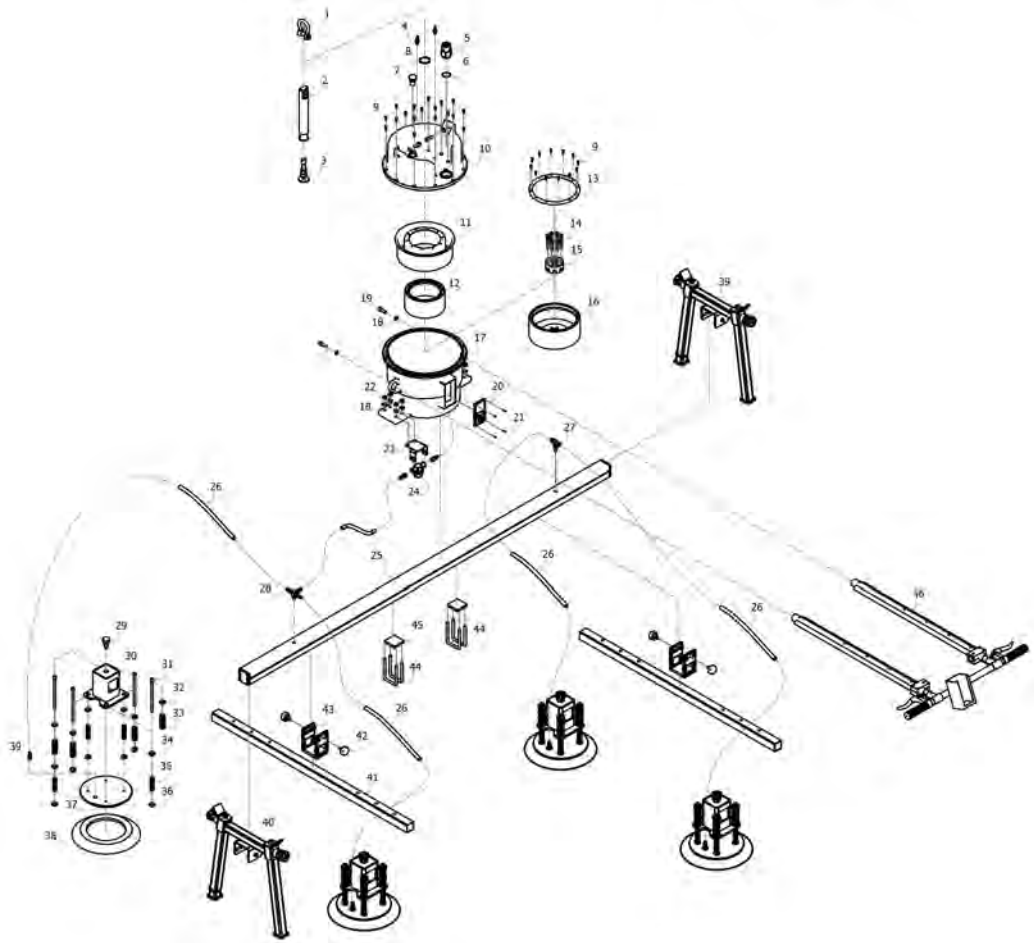
PARTS LIST			
No.	Code	Name Part	Qty.
21	AMVL250-021	Washer M10	02
22	AMVL250-022	Housing	01
23	AMVL250-023	Nut M10	08
24	AMVL250-024	Washer M10	08
25	AMVL250-025	Housing cover	02
26	AMVL250-026	Bolt M5 x 16	04
27	AMVL250-027	Shaft beam 60 x 60 x 2200	01
28	AMVL250-028	Filter pad	01
29	AMVL250-029	Filter	01
30	AMVL250-030	Connector 1/4 x 3	01
31	AMVL250-031	Air hose ø13	06
32	AMVL250-032	Connector 1/4	09
33	AMVL250-033	Beam 40 x 40 x 3	04
34	AMVL250-034	Bracket	04
35	AMVL250-035	Tee connector 1/4	04
36	AMVL250-036	SF 150	08
37	AMVL250-037	U ø10 taro M10	04
38	AMVL250-038	Plastic plate	02
39	AMVL250-039	Handle assembly	01

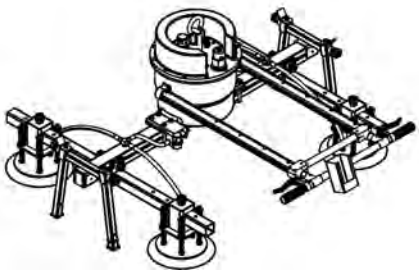

MECHANICAL VACUUM LIFTER
Code AMVL600-2
ASSEMBLY DIAGRAM

MECHANICAL VACUUM LIFTER
Code AMVL600-2
ASSEMBLY DIAGRAM

PARTS LIST			
No.	Code	Name Part	Qty.
1	AMVL600 - 001	Bow shackle	01
2	AMVL600 - 002	Main spindle	01
3	AMVL600 - 003	Actuator	01
4	AMVL600 - 004	Eye bolt M8	02
5	AMVL600 - 005	Valve locking	01
6	AMVL600 - 006	O-ring 40 x 47 x 3.5	01
7	AMVL600 - 007	Bolt G3/4	01
8	AMVL600 - 008	O-ring 50 x 60 x 5	01
9	AMVL600 - 009	Bolt M6 x 20	46
10	AMVL600 - 010	Top housing	01
11	AMVL600 - 011	Piston diaphragma	01
12	AMVL600 - 012	Piston small	01
13	AMVL600 - 013	Piston ring	01
14	AMVL600 - 014	Bolt M10 x 65	08
15	AMVL600 - 015	Lift stop	01
16	AMVL600 - 016	Bottom piston	01
17	AMVL600 - 017	Housing	01
18	AMVL600 - 018	Washer M10	16
19	AMVL600 - 019	Bolt M10 x 35	06
20	AMVL600 - 020	Box cover	01
21	AMVL600 - 021	Bolt M3 x 12	04
22	AMVL600 - 022	Nut M10	08
23	AMVL600 - 023	Filter pad	01
24	AMVL600 - 024	Filter 3/4	01
25	AMVL600 - 025	Main bar 1300	01
26	AMVL600 - 026	Air hose ϕ13	06
27	AMVL600 - 027	Connection 1/4 x 2	01
28	AMVL600 - 028	Bolt M12 x 35	08
29	AMVL600 - 029	Washer M12	08
30	AMVL600 - 030	Connection 1/4	05
31	AMVL600 - 031	Suction bracket	02
32	AMVL600 - 032	Latch locking M6	04
33	AMVL600 - 033	Hub 350	04
34	AMVL600 - 034	Seal 350	02
35	AMVL600 - 035	Parking	02
36	AMVL600 - 036	U bolt M10	02
37	AMVL600 - 037	Support plate	02
38	AMVL600 - 038	Handle assembly	01

MECHANICAL VACUUM LIFTER
Code AMVL600-4
ASSEMBLY DIAGRAM



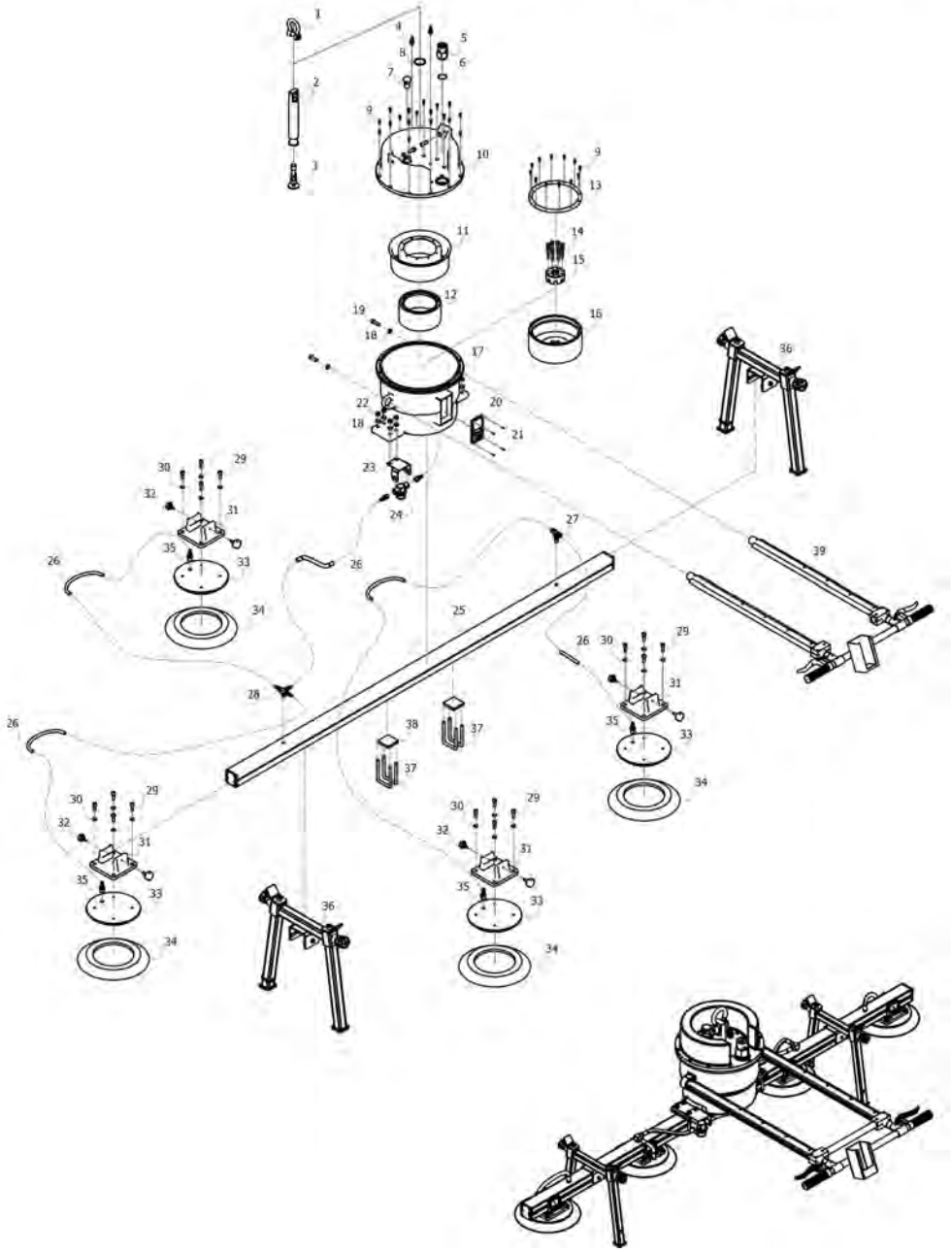


MECHANICAL VACUUM LIFTER
Code AMVL600-4
ASSEMBLY DIAGRAM

PARTS LIST			
No.	Code	Name Part	Qty.
1	AMVL600 - 001	Bow shackle	01
2	AMVL600 - 002	Main spindle	01
3	AMVL600 - 003	Actuator	01
4	AMVL600 - 004	Eye bolt M8	02
5	AMVL600 - 005	Valve locking	01
6	AMVL600 - 006	O-ring 40 x 47 x 3.5	01
7	AMVL600 - 007	Bolt G3/4	01
8	AMVL600 - 008	O-ring 50 x 60 x 5	01
9	AMVL600 - 009	Bolt M6 x 20	46
10	AMVL600 - 010	Top housing	01
11	AMVL600 - 011	Piston diaphragma	01
12	AMVL600 - 012	Piston small	01
13	AMVL600 - 013	Piston ring	01
14	AMVL600 - 014	Bolt M10 x 65	08
15	AMVL600 - 015	Lift stop	01
16	AMVL600 - 016	Bottom piston	01
17	AMVL600 - 017	Housing	01
18	AMVL600 - 018	Washer M10	16
19	AMVL600 - 019	Bolt M10 x 35	06
20	AMVL600 - 020	Box cover	01
21	AMVL600 - 021	Bolt M3 x 12	04
22	AMVL600 - 022	Nut M10	08
23	AMVL600 - 023	Filter pad	01

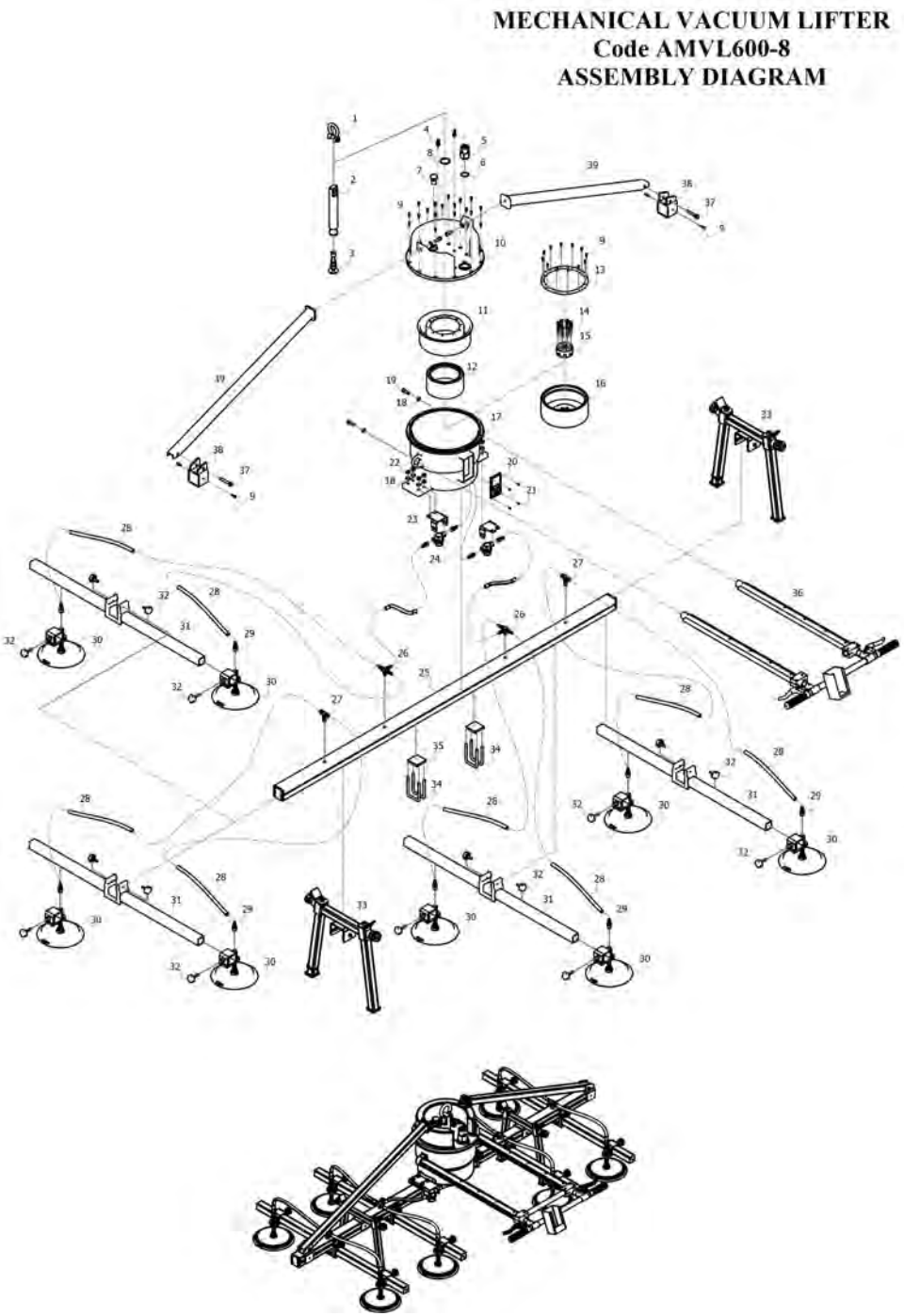
PARTS LIST			
No.	Code	Name Part	Qty.
24	AMVL600 - 024	Filter 3/4	01
25	AMVL600 - 025	Main bar 1300	01
26	AMVL600 - 026	Air hose ϕ13	08
27	AMVL600 - 027	Tee connection 1/4	01
28	AMVL600 - 028	Connection 1/4 x 2	01
29	AMVL600 - 029	Latch locking	04
30	AMVL600 - 030	Suction bracket	04
31	AMVL600 - 031	Bolt M12 x 160	16
32	AMVL600 - 032	Top bushing	32
33	AMVL600 - 033	Spring 2.5 x 60	16
34	AMVL600 - 034	Middle bushing	16
35	AMVL600 - 035	Spring 1.5 x 60	16
36	AMVL600 - 036	Bottom bushing	32
37	AMVL600 - 037	Hub 300	04
38	AMVL600 - 038	Seal 300	04
39	AMVL600 - 039	Connection 1/4	04
40	AMVL600 - 040	Parking	02
41	AMVL600 - 041	Beam 40 x 40 x 3	02
42	AMVL600 - 042	Latch locking M6	04
43	AMVL600 - 043	Beam bracket	02
44	AMVL600 - 044	U bolt M10	04
45	AMVL600 - 045	Support plate	02
46	AMVL600 - 046	Handle assembly	01

MECHANICAL VACUUM LIFTER
Code AMVL600-4 IN LINE
ASSEMBLY DIAGRAM



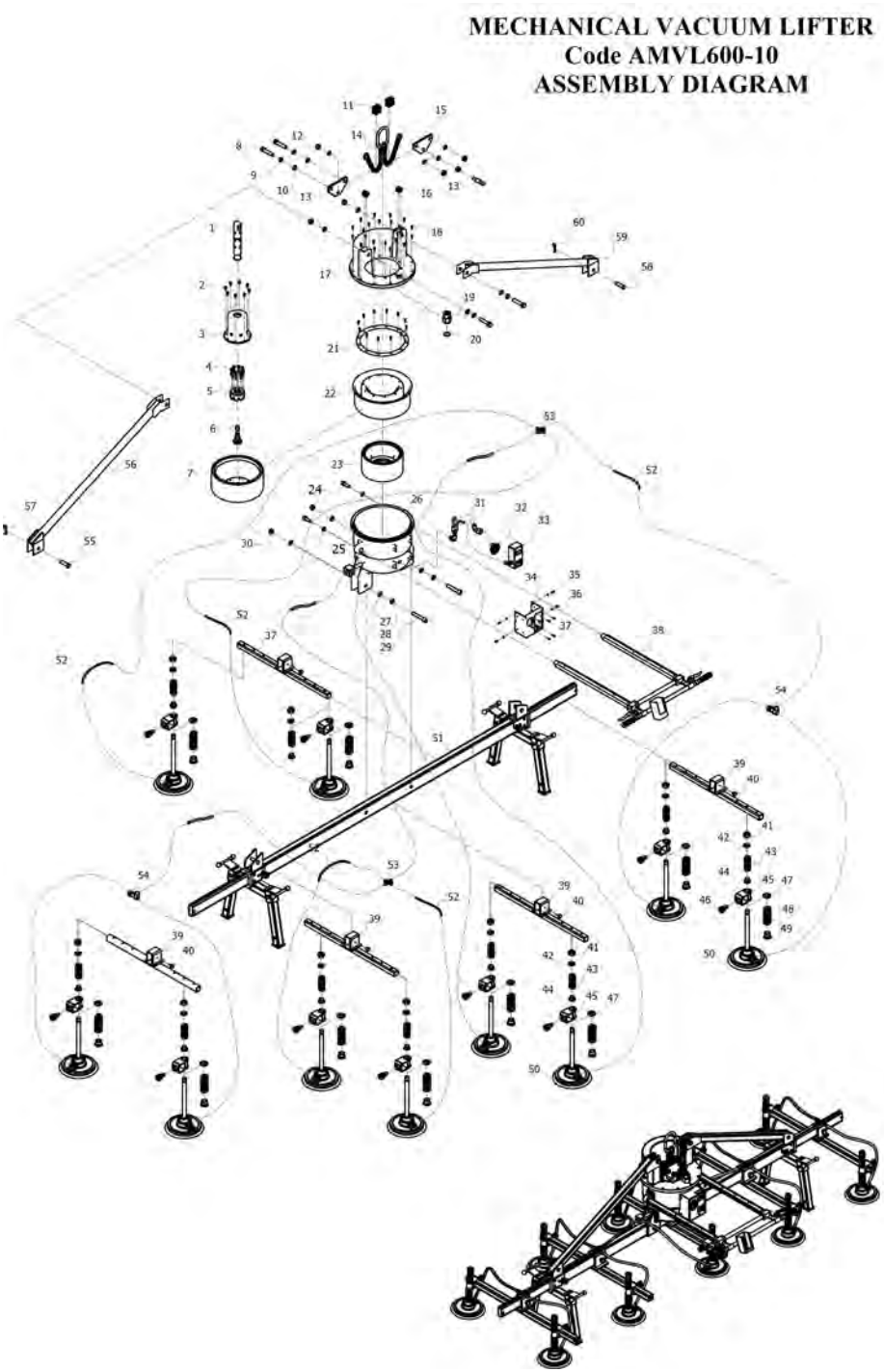
MECHANICAL VACUUM LIFTER
Code AMVL600-4 IN LINE
ASSEMBLY DIAGRAM

PARTS LIST			
No.	Code	Name Part	Qty.
1	AMVL600 - 001	Bow shackle	01
2	AMVL600 - 002	Main spindle	01
3	AMVL600 - 003	Actuator	01
4	AMVL600 - 004	Eye bolt M8	02
5	AMVL600 - 005	Valve locking	01
6	AMVL600 - 006	O-ring 40 x 47 x 3.5	01
7	AMVL600 - 007	Bolt G3/4	01
8	AMVL600 - 008	O-ring 50 x 60 x 5	01
9	AMVL600 - 009	Bolt M6 x 20	34
10	AMVL600 - 010	Top housing	01
11	AMVL600 - 011	Piston diaphragma	01
12	AMVL600 - 012	Piston small	01
13	AMVL600 - 013	Piston ring	01
14	AMVL600 - 014	Bolt M10 x 65	08
15	AMVL600 - 015	Lift stop	01
16	AMVL600 - 016	Bottom piston	01
17	AMVL600 - 017	Housing	01
18	AMVL600 - 018	Bolt M10 x 25	02
19	AMVL600 - 019	Washer M10	02
20	AMVL600 - 020	Box cover	01
21	AMVL600 - 021	Bolt M3 x 12	04
22	AMVL600 - 022	Nut M10	08
23	AMVL600 - 023	Filter pad	01
24	AMVL600 - 024	Filter	01
25	AMVL600 - 025	Main bar 2200	01
26	AMVL600 - 026	Air hose ϕ10	06
27	AMVL600 - 027	Tee connection 1/4	01
28	AMVL600 - 028	Connection 1/4 x 3	01
29	AMVL600 - 029	Bolt M12 x 35	22
30	AMVL600 - 030	Washer M12	16
31	AMVL600 - 031	Bracket	04
32	AMVL600 - 032	Latch locking M6	08
33	AMVL600 - 033	Hub 300	04
34	AMVL600 - 034	Seal 300	04
35	AMVL600 - 035	Connection 1/4	06
36	AMVL600 - 036	Parking	02
37	AMVL600 - 037	U bolt M10	04
38	AMVL600 - 038	Support plate	02
39	AMVL600 - 039	Handle assembly	01


MECHANICAL VACUUM LIFTER
Code AMVL600-8
ASSEMBLY DIAGRAM

MECHANICAL VACUUM LIFTER
Code AMVL600-8
ASSEMBLY DIAGRAM

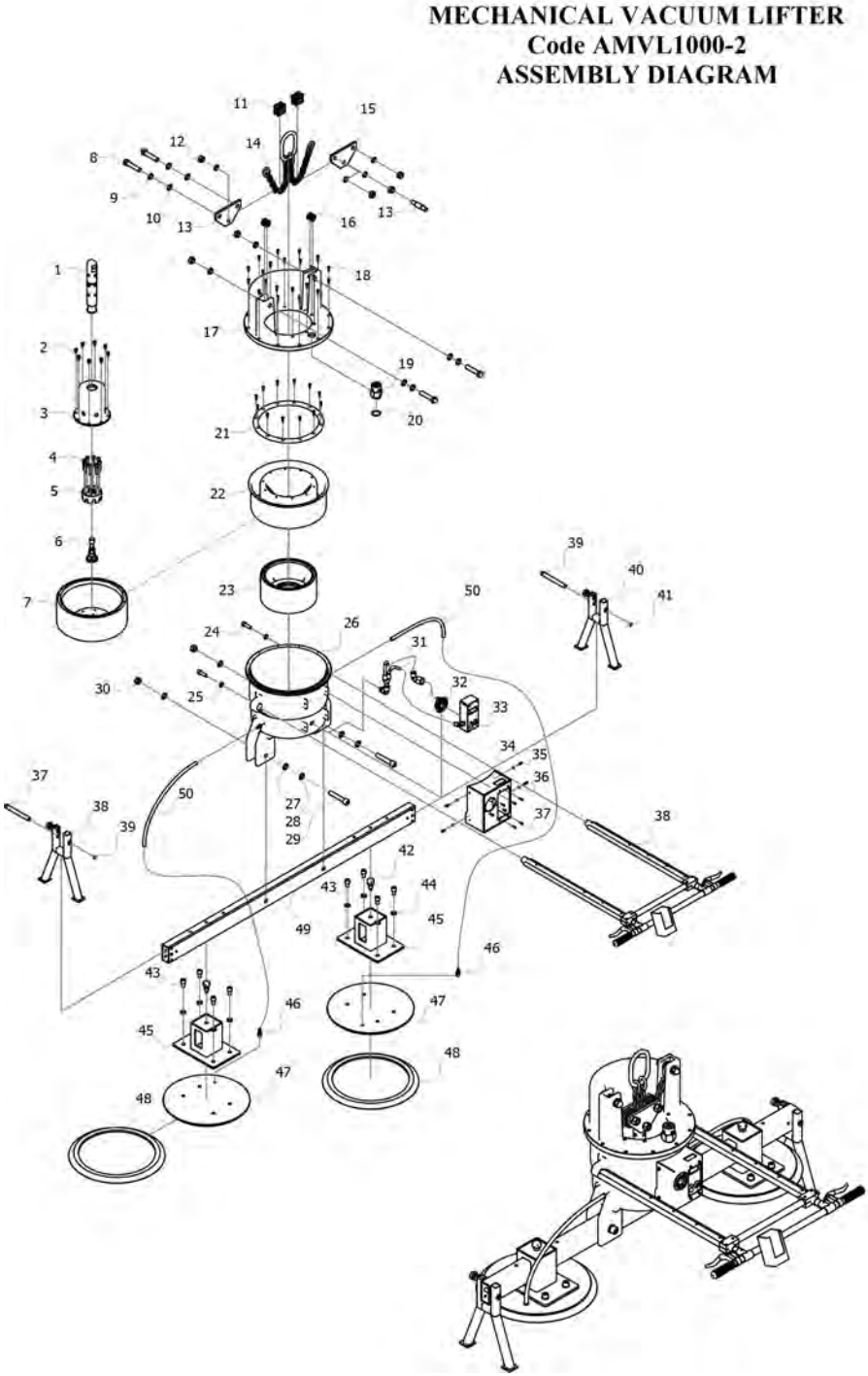
PARTS LIST			
No.	Code	Name Part	Qty.
1	AMVL600 - 001	Bow shackle	01
2	AMVL600 - 002	Main spindle	01
3	AMVL600 - 003	Actuator	01
4	AMVL600 - 004	Eye bolt M8	02
5	AMVL600 - 005	Valve locking	01
6	AMVL600 - 006	O-ring 40 x 47 x 3.5	01
7	AMVL600 - 007	Bolt G3/4	01
8	AMVL600 - 008	O-ring 50 x 60 x 5	01
9	AMVL600 - 009	Bolt M6 x 20	42
10	AMVL600 - 010	Top housing	01
11	AMVL600 - 011	Piston diaphragma	01
12	AMVL600 - 012	Piston small	01
13	AMVL600 - 013	Piston ring	01
14	AMVL600 - 014	Bolt M10 x 65	08
15	AMVL600 - 015	Lift stop	01
16	AMVL600 - 016	Bottom piston	01
17	AMVL600 - 017	Housing	01
18	AMVL600 - 018	Washer M10	16
19	AMVL600 - 019	Bolt M10 x 35	06
20	AMVL600 - 020	Box cover	01
21	AMVL600 - 021	Bolt M3 x 12	04
22	AMVL600 - 022	Nut M10	08
23	AMVL600 - 023	Filter pad	02
24	AMVL600 - 024	Filter	02
25	AMVL600 - 025	Main bar 2200	01
26	AMVL600 - 026	Connection 1/4 x 3	02
27	AMVL600 - 027	Tee connection 1/4	02
28	AMVL600 - 028	Air hose ϕ10	12
29	AMVL600 - 029	Connection 1/4	12
30	AMVL600 - 030	Suction pad SF200	08
31	AMVL600 - 031	Horizontal bar	04
32	AMVL600 - 032	Latch locking M8	16
33	AMVL600 - 033	Parking	02
34	AMVL600 - 034	U bolt M10	04
35	AMVL600 - 035	Support plate	02
36	AMVL600 - 036	Handle assembly	01
34	AMVL600 - 034	Pin ϕ10	02
35	AMVL600 - 035	Bracket support bar	02
36	AMVL600 - 036	Support bar	02


MECHANICAL VACUUM LIFTER
Code AMVL600-10
ASSEMBLY DIAGRAM

MECHANICAL VACUUM LIFTER
Code AMVL600-10
ASSEMBLY DIAGRAM

PARTS LIST			
No.	Code	Name Part	Qty.
01	AMVL600-001	Main spindle	01
02	AMVL600-002	Bolt M8 x 25	08
03	AMVL600-003	Guide Bushing	01
04	AMVL600-004	Bolt M10 x 50	08
05	AMVL600-005	Lift stop	01
06	AMVL600-006	Actuator	01
07	AMVL600-007	Bottom piston	01
08	AMVL600-008	Bolt M18 x 90	04
09	AMVL600-009	Spring washer M18	10
10	AMVL600-010	Washer M18	14
11	AMVL600-011	Rolling	02
12	AMVL600-012	Nut M18	06
13	AMVL600-013	Pin ϕ20 - M18	01
14	AMVL600-014	Chain ϕ8	02
15	AMVL600-015	Plate 12	02
16	AMVL600-016	Bushing M20 x 8	04
17	AMVL600-017	Housing cover	01
18	AMVL600-018	Bolt M6 x 25	28
19	AMVL600-019	Check valve	01
20	AMVL600-020	O - ring 47 - 40 - 3.5	01
21	AMVL600-021	Piston washer	01
22	AMVL600-022	Piston diaphragma	01
23	AMVL600-023	Top piston	01
24	AMVL600-024	Bolt M10 x 30	02
25	AMVL600-025	Washer M10	02
26	AMVL600-026	Housing	01
27	AMVL600-027	Washer M20	02
28	AMVL600-028	Spring washer M20	02
29	AMVL600-029	Bolt M20 x 110	02

PARTS LIST			
No.	Code	Name Part	Qty.
30	AMVL600-030	Nut M20	02
31	AMVL600-031	Connector	01
32	AMVL600-032	Vacuum gauge	01
33	AMVL600-033	Vacuum leakage sensor	01
34	AMVL600-034	Vacuum Guard	01
35	AMVL600-035	Washer M6	04
36	AMVL600-036	Bolt M6 x 12	04
37	AMVL600-037	Bolt M5 x 16	04
38	AMVL600-038	Handle assembly	01
39	AMVL600-039	Beam 50 x 50 x 5	04
40	AMVL600-040	Latch locking M10	04
41	AMVL600-041	Nut M24	10
42	AMVL600-042	Bushing top ϕ25	10
43	AMVL600-043	Spring ϕ5 x 96	10
44	AMVL600-044	Bushing top ϕ25 - 1	10
45	AMVL600-045	Bracket suction cup	10
46	AMVL600-046	Latch locking M10	10
47	AMVL600-047	Bushing bottom ϕ25	10
48	AMVL600-048	Spring ϕ4 x 116	10
49	AMVL600-049	Bushing bottom ϕ25 - 1	10
50	AMVL600-050	Suction cup	10
51	AMVL600-051	Beam 100 x 50 x 5	01
52	AMVL600-052	Air hose ϕ12	14
53	AMVL600-053	Cross connector 3/8	02
54	AMVL600-054	Tee connector 3/8	02
55	AMVL600-055	Clevis pin ϕ20	02
56	AMVL600-056	Support beam	02
57	AMVL600-057	Hair pin ϕ5	02

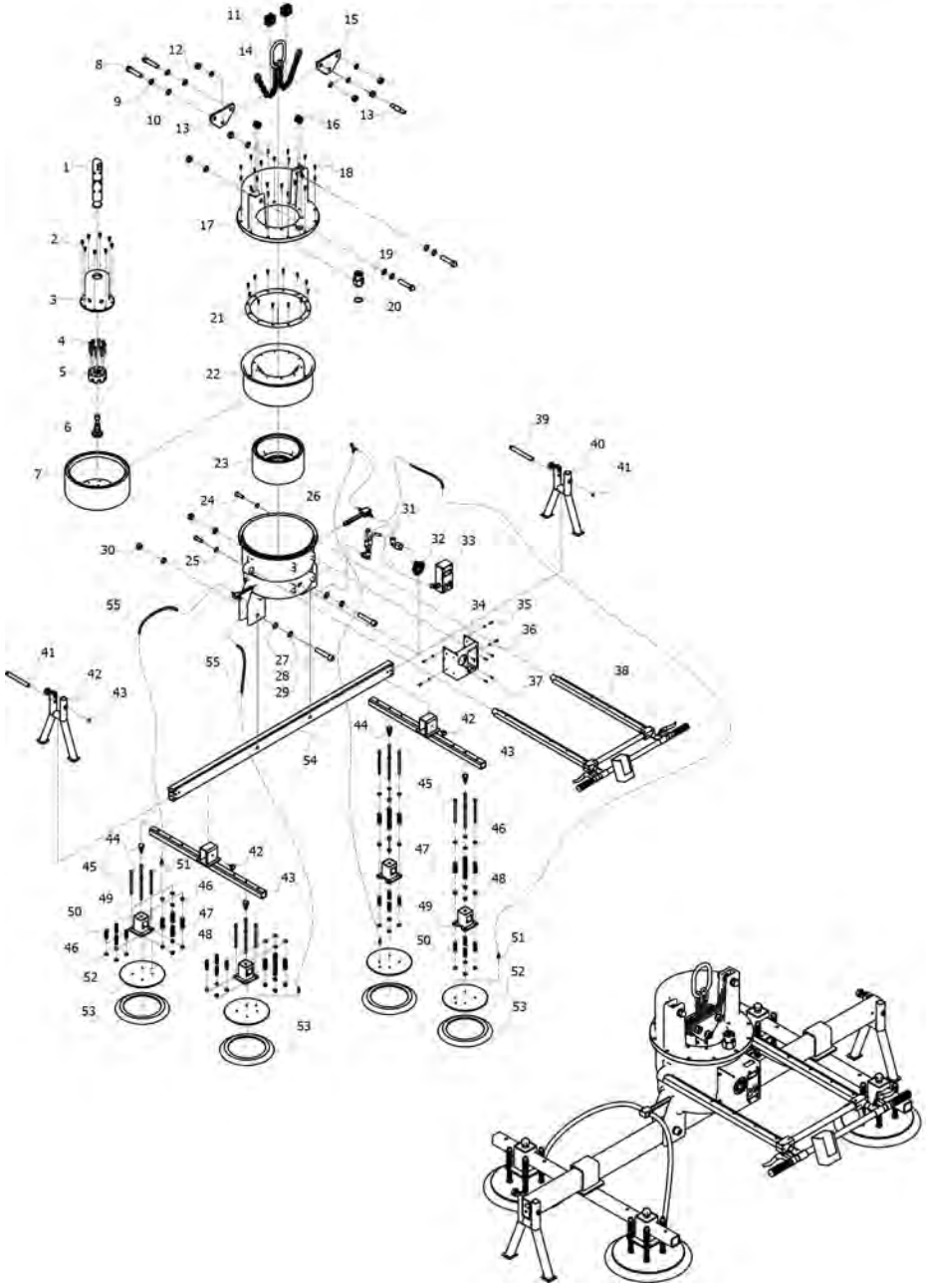

MECHANICAL VACUUM LIFTER
Code AMVL1000-2
ASSEMBLY DIAGRAM

MECHANICAL VACUUM LIFTER
Code AMVL1000-2
ASSEMBLY DIAGRAM

PARTS LIST			
No.	Code	Name Part	Qty.
01	AMVL1000-001	Main spindle	01
02	AMVL1000-002	Bolt M8 x 25	08
03	AMVL1000-003	Guide Bushing	01
04	AMVL1000-004	Bolt M10 x 50	08
05	AMVL1000-005	Lift stop	01
06	AMVL1000-006	Actuator	01
07	AMVL1000-007	Bottom piston	01
08	AMVL1000-008	Bolt M18 x 90	04
09	AMVL1000-009	Spring washer M18	10
10	AMVL1000-010	Washer M18	14
11	AMVL1000-011	Rolling	02
12	AMVL1000-012	Nut M18	06
13	AMVL1000-013	Pin ϕ20 - M18	01
14	AMVL1000-014	Chain ϕ8	02
15	AMVL1000-015	Plate 12	02
16	AMVL1000-016	Bushing M20 x 8	04
17	AMVL1000-017	Housing cover	01
18	AMVL1000-018	Bolt M6 x 25	28
19	AMVL1000-019	Check valve	01
20	AMVL1000-020	O - ring 47 - 40 - 3.5	01
21	AMVL1000-021	Piston washer	01
22	AMVL1000-022	Piston diaphragma	01
23	AMVL1000-023	Top piston	01
24	AMVL1000-024	Bolt M10 x 35	02
25	AMVL1000-025	Washer M10	02

PARTS LIST			
No.	Code	Name Part	Qty.
26	AMVL1000-026	Housing	01
27	AMVL1000-027	Washer M20	04
28	AMVL1000-028	Spring washer M20	02
29	AMVL1000-029	Bolt M20 x 110	02
30	AMVL1000-030	Nut M20	02
31	AMVL1000-031	Connector	01
32	AMVL1000-032	Vacuum gauge	01
33	AMVL1000-033	Vacuum leakage sensor	01
34	AMVL1000-034	Vacuum guard	01
35	AMVL1000-035	Bolt M6 x 12	04
36	AMVL1000-036	Washer M6	04
37	AMVL1000-037	Bolt M5 x 16	04
38	AMVL1000-038	Handle assembly	01
39	AMVL1000-039	Pin ϕ14 x 123	02
40	AMVL1000-040	Parking	02
41	AMVL1000-041	Circlip ϕ14	02
42	AMVL1000-042	Latch locking M20	02
43	AMVL1000-043	Bolt M16 x 30	08
44	AMVL1000-044	Washer M16	08
45	AMVL1000-045	Bracket suction pad	04
46	AMVL1000-046	Tailpiece male 3/8	04
47	AMVL1000-047	Hub 450	02
48	AMVL1000-048	Seal 450	02
49	AMVL1000-049	Beam 100 x 50 x 5	01
50	AMVL1000-050	Air hose ϕ12	04

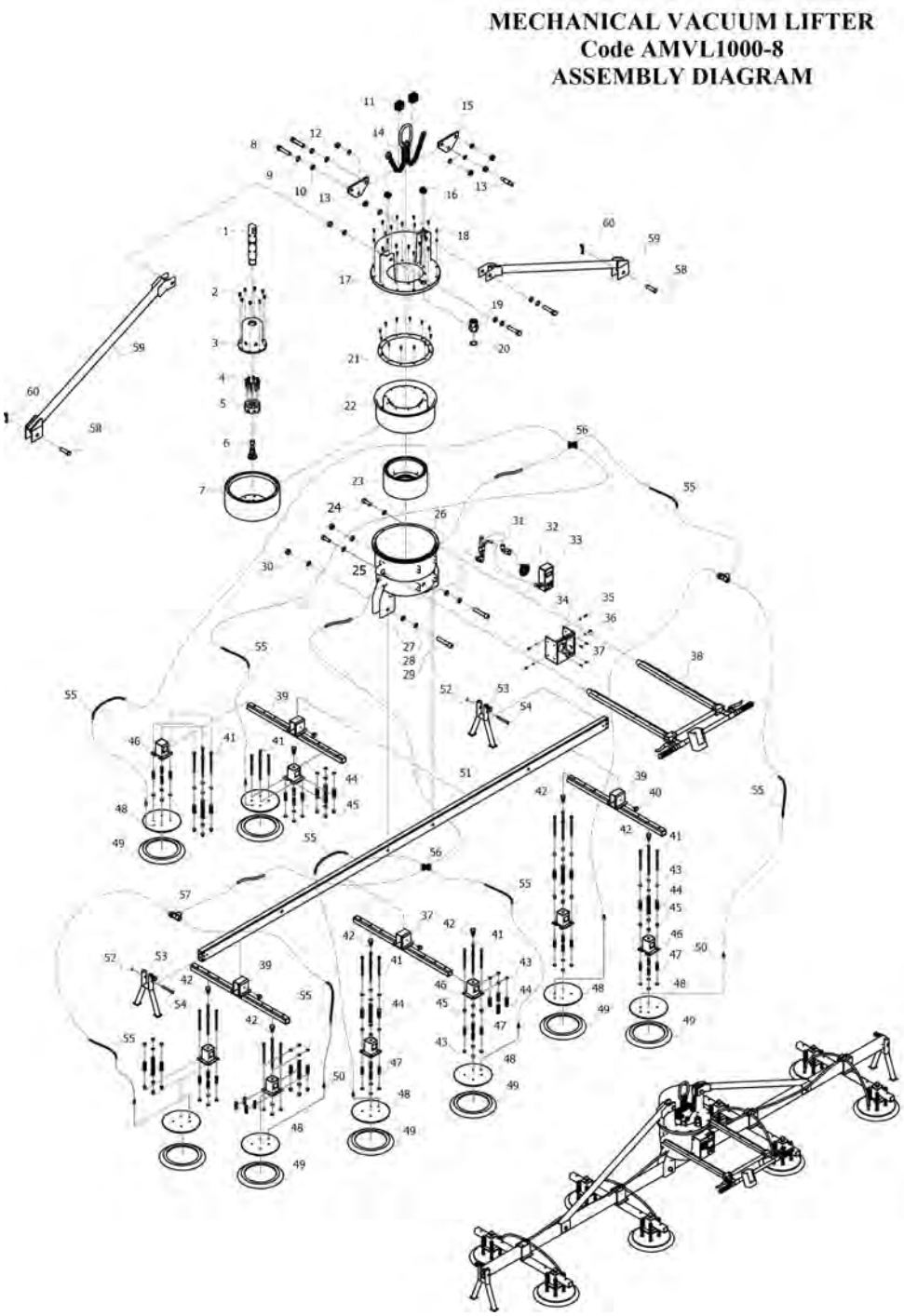
MECHANICAL VACUUM LIFTER
Code AMVL1000-4
ASSEMBLY DIAGRAM



MECHANICAL VACUUM LIFTER
Code AMVL1000-4
ASSEMBLY DIAGRAM

PARTS LIST			
No.	Code	Name Part	Qty.
01	AMVL1000-001	Main spindle	01
02	AMVL1000-002	Bolt M8 x 25	08
03	AMVL1000-003	Guide bushing	01
04	AMVL1000-004	Bolt M10 x 50	08
05	AMVL1000-005	Lift stop	01
06	AMVL1000-006	Actuator	01
07	AMVL1000-007	Bottom piston	01
08	AMVL1000-008	Bolt M18 x 90	04
09	AMVL1000-009	Spring washer M18	10
10	AMVL1000-010	Washer M18	14
11	AMVL1000-011	Rolling	02
12	AMVL1000-012	Nut M18	06
13	AMVL1000-013	Pin ϕ20 - M18	01
14	AMVL1000-014	Chain ϕ8	02
15	AMVL1000-015	Plate 12	02
16	AMVL1000-016	Bushing M20 x 8	04
17	AMVL1000-017	Housing cover	01
18	AMVL1000-018	Bolt M6 x 25	28
19	AMVL1000-019	Check valve	01
20	AMVL1000-020	O - ring 47 - 40 - 3.5	01
21	AMVL1000-021	Piston washer	01
22	AMVL1000-022	Piston diaphragma	01
23	AMVL1000-023	Top piston	01
24	AMVL1000-024	Bolt M10 x 30	02
25	AMVL1000-025	Washer M10	02
26	AMVL1000-026	Housing	01
27	AMVL1000-027	Washer M20	02
28	AMVL1000-028	Spring washer M20	02

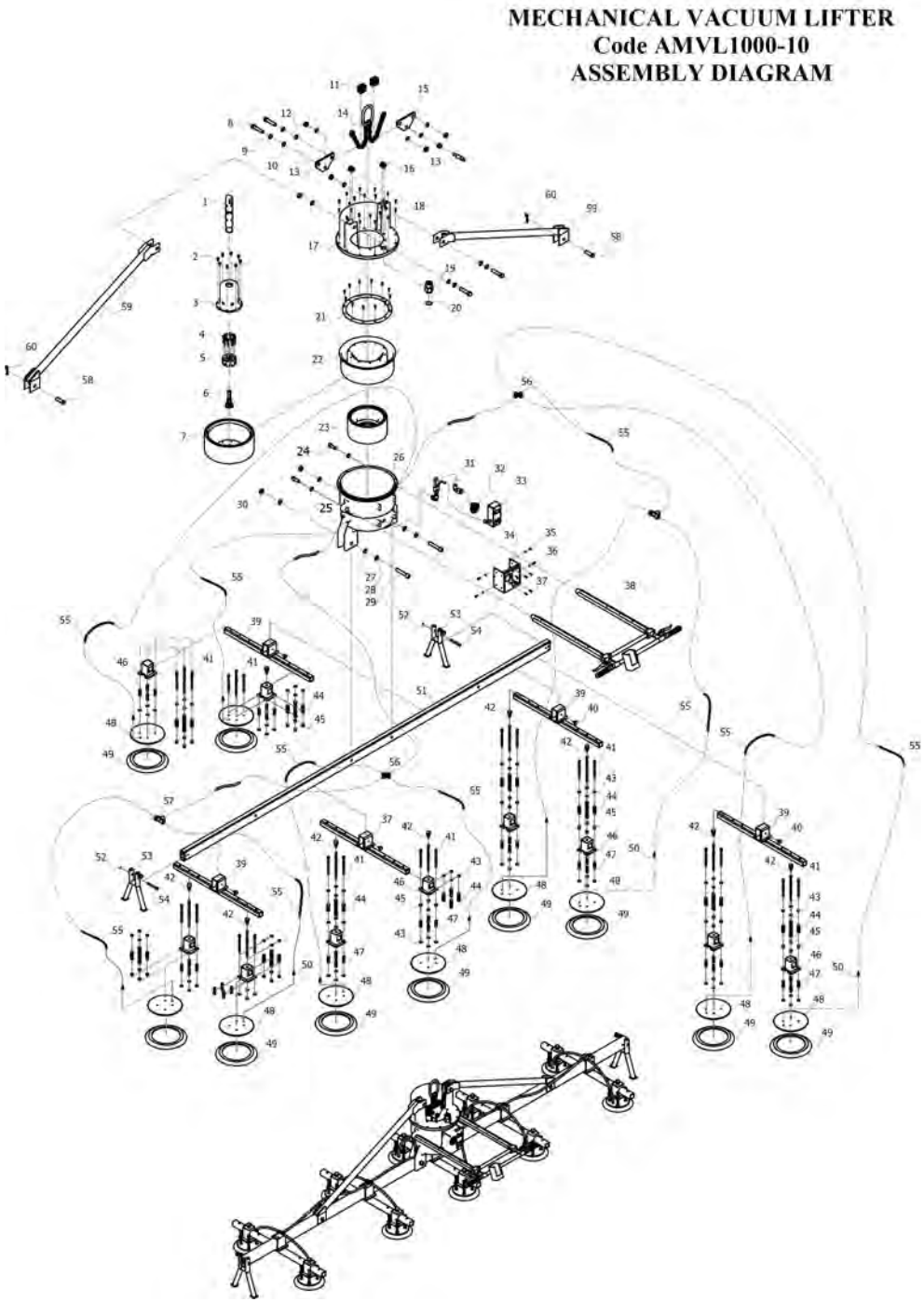
PARTS LIST			
No.	Code	Name Part	Qty.
29	AMVL1000-029	Bolt M20 x 110	02
30	AMVL1000-030	Nut M20	02
31	AMVL1000-031	Connector	01
32	AMVL1000-032	Vacuum gauge	01
33	AMVL1000-033	Vacuum leakage sensor	01
34	AMVL1000-034	Vacuum Guard	01
35	AMVL1000-035	Bolt M6 x 12	04
36	AMVL1000-036	Washer M6	04
37	AMVL1000-037	Bolt M5 x 16	04
38	AMVL1000-038	Handle assembly	01
39	AMVL1000-039	Pin ϕ14 x 123	02
40	AMVL1000-040	Parking	02
41	AMVL1000-041	Circlip ϕ14	02
42	AMVL1000-042	Latch locking M10	02
43	AMVL1000-043	Beam 50 x 50 x 5	02
44	AMVL1000-044	Latch locking M20	04
45	AMVL1000-045	Bolt M12 x 185	16
46	AMVL1000-046	Bushing ϕ30	32
47	AMVL1000-047	Spring ϕ4 x 80	16
48	AMVL1000-048	Bushing ϕ30 - 1	16
49	AMVL1000-049	Bracket suction pad	04
50	AMVL1000-050	Spring ϕ2.5 x 70	02
51	AMVL1000-051	Tailpiece male 3/8	04
52	AMVL1000-052	Hub 350	04
53	AMVL1000-053	Seal 350	04
54	AMVL1000-054	Beam 100 x 50 x 5	01
55	AMVL1000-055	Air hose ϕ12	04


MECHANICAL VACUUM LIFTER
Code AMVL1000-8
ASSEMBLY DIAGRAM

MECHANICAL VACUUM LIFTER
Code AMVL1000-8
ASSEMBLY DIAGRAM

PARTS LIST			
No.	Code	Name Part	Qty.
01	AMVL1000-001	Main spindle	01
02	AMVL1000-002	Bolt M8 x 25	08
03	AMVL1000-003	Guide Bushing	01
04	AMVL1000-004	Bolt M10 x 50	08
05	AMVL1000-005	Lift stop	01
06	AMVL1000-006	Actuator	01
07	AMVL1000-007	Bottom piston	01
08	AMVL1000-008	Bolt M18 x 90	04
09	AMVL1000-009	Spring washer M18	10
10	AMVL1000-010	Washer M18	14
11	AMVL1000-011	Rolling	02
12	AMVL1000-012	Nut M18	06
13	AMVL1000-013	Pin ⌀20 - M18	01
14	AMVL1000-014	Chain ⌀8	02
15	AMVL1000-015	Plate 12	02
16	AMVL1000-016	Bushing M20 x 8	04
17	AMVL1000-017	Housing cover	01
18	AMVL1000-018	Bolt M6 x 25	28
19	AMVL1000-019	Check valve	01
20	AMVL1000-020	O - ring 47 - 40 - 3.5	01
21	AMVL1000-021	Piston washer	01
22	AMVL1000-022	Piston diaphragma	01
23	AMVL1000-023	Top piston	01
24	AMVL1000-024	Bolt M10 x 30	02
25	AMVL1000-025	Washer M10	02
26	AMVL1000-026	Housing	01
27	AMVL1000-027	Washer M20	02
28	AMVL1000-028	Spring washer M20	02
29	AMVL1000-029	Bolt M20 x 110	02
30	AMVL1000-030	Nut M20	02

PARTS LIST			
No.	Code	Name Part	Qty.
31	AMVL1000-031	Connector	01
32	AMVL1000-032	Vacuum gauge	01
33	AMVL1000-033	Vacuum leakage sensor	01
34	AMVL1000-034	Vacuum Guard	01
35	AMVL1000-035	Washer M6	04
36	AMVL1000-036	Bolt M6 x 12	04
37	AMVL1000-037	Bolt M5 x 16	04
38	AMVL1000-038	Handle assembly	01
39	AMVL1000-039	Beam 50 x 50 x 5	04
40	AMVL1000-040	Latch locking M10	04
41	AMVL1000-041	Bolt M12 x 185	16
42	AMVL1000-042	Latch locking M20	04
43	AMVL1000-043	Bushing ⌀30	64
44	AMVL1000-044	Spring ⌀4 x 80	32
45	AMVL1000-045	Bushing ⌀30 - 1	64
46	AMVL1000-046	Bracket suction pad	04
47	AMVL1000-047	Spring ⌀2.5 x 70	32
48	AMVL1000-048	Hub 350	08
49	AMVL1000-049	Seal 350	08
50	AMVL1000-050	Tailpiece male 3/8	08
51	AMVL1000-051	Beam 100 x 50 x 5	01
52	AMVL1000-052	Pin ⌀14 x 123	02
53	AMVL1000-053	Parking	02
54	AMVL1000-054	Circlip ⌀14	02
55	AMVL1000-055	Air hose ⌀16	10
56	AMVL1000-056	Cross connector 3/8	02
57	AMVL1000-057	Tee connector 3/8	02
58	AMVL1000-058	Clevis pin ⌀20	02
59	AMVL1000-059	Support beam	02
60	AMVL1000-060	Hair pin ⌀5	02


MECHANICAL VACUUM LIFTER
Code AMVL1000-10
ASSEMBLY DIAGRAM

MECHANICAL VACUUM LIFTER
Code AMVL1000-10
ASSEMBLY DIAGRAM

PARTS LIST			
No.	Code	Name Part	Qty.
01	AMVL1000-001	Main spindle	01
02	AMVL1000-002	Bolt M8 x 25	08
03	AMVL1000-003	Guide Bushing	01
04	AMVL1000-004	Bolt M10 x 50	08
05	AMVL1000-005	Lift stop	01
06	AMVL1000-006	Actuator	01
07	AMVL1000-007	Bottom piston	01
08	AMVL1000-008	Bolt M18 x 90	04
09	AMVL1000-009	Spring washer M18	10
10	AMVL1000-010	Washer M18	14
11	AMVL1000-011	Rolling	02
12	AMVL1000-012	Nut M18	06
13	AMVL1000-013	Pin ϕ20 - M18	01
14	AMVL1000-014	Chain ϕ8	02
15	AMVL1000-015	Plate 12	02
16	AMVL1000-016	Bushing M20 x 8	04
17	AMVL1000-017	Housing cover	01
18	AMVL1000-018	Bolt M6 x 25	28
19	AMVL1000-019	Check valve	01
20	AMVL1000-020	O - ring 47 - 40 - 3.5	01
21	AMVL1000-021	Piston washer	01
22	AMVL1000-022	Piston diaphragma	01
23	AMVL1000-023	Top piston	01
24	AMVL1000-024	Bolt M10 x 30	02
25	AMVL1000-025	Washer M10	02
26	AMVL1000-026	Housing	01
27	AMVL1000-027	Washer M20	02
28	AMVL1000-028	Spring washer M20	02
29	AMVL1000-029	Bolt M20 x 110	02
30	AMVL1000-030	Nut M20	02

PARTS LIST			
No.	Code	Name Part	Qty.
31	AMVL1000-031	Connector	01
32	AMVL1000-032	Vacuum gauge	01
33	AMVL1000-033	Vacuum leakage sensor	01
34	AMVL1000-034	Vacuum Guard	01
35	AMVL1000-035	Washer M6	04
36	AMVL1000-036	Bolt M6 x 12	04
37	AMVL1000-037	Bolt M5 x 16	04
38	AMVL1000-038	Handle assembly	01
39	AMVL1000-039	Beam 50 x 50 x 5	05
40	AMVL1000-040	Latch locking M10	05
41	AMVL1000-041	Bolt M12 x 185	40
42	AMVL1000-042	Latch locking M20	05
43	AMVL1000-043	Bushing ϕ30	80
44	AMVL1000-044	Spring ϕ4 x 80	40
45	AMVL1000-045	Bushing ϕ30 - 1	80
46	AMVL1000-046	Bracket suction pad	05
47	AMVL1000-047	Spring ϕ2.5 x 70	40
48	AMVL1000-048	Hub 250	10
49	AMVL1000-049	Seal 250	10
50	AMVL1000-050	Tailpiece male 3/8	10
51	AMVL1000-051	Beam 100 x 50 x 5	01
52	AMVL1000-052	Pin ϕ14 x 123	02
53	AMVL1000-053	Parking	02
54	AMVL1000-054	Circlip ϕ14	02
55	AMVL1000-055	Air hose ϕ16	12
56	AMVL1000-056	Cross connector 3/8	02
57	AMVL1000-057	Tee connector 3/8	02
58	AMVL1000-058	Clevis pin ϕ20	02
59	AMVL1000-059	Support beam	02
60	AMVL1000-060	Hair pin ϕ5	02

6.1 Warranty

After receiving the goods, it is strongly recommended to the buyer to check for sure, based on the spare part list and spare drawing attached with the goods, that the spare parts has not been damaged or lost during shipment. Any damages or losses must be officially claimed to Aardwolf Industries LLC's within 8 days since the date of goods receipts.

This lifter is granted a 12-month warranty based on Aardwolf Industries LLC's warranty policy since the date of purchase.

The warranty coverage is not applicable:

Whenever the clamp is handled incorrectly during manoeuvring.

Whenever the operator fails to comply with the instructions in this booklet.

Whenever the clamp's maximum permissible capacity is exceeded. Whenever the specifications for slab thickness are not followed.

When damages are due to inadequate maintenance and inspections.

When damage is due to improper storage.

Whenever repairs were performed by the user without our permission.

Whenever non-original spare parts were used.

6.2 Disclaimer

Aardwolf Industries LLC's warranty does not cover the incorrect assembly and misuse of lifter, the lack of maintenance and repair of lifter as scheduled by the manufacturer, the operation carried out by non-competent or non-permission operator or non-original spare parts used or installed.

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