



**INDUSTRIAL  
MAGNETICS**

ADVANTAGELIFT™ MAGNETS

# OPERATIONS MANUAL

*Permanent Rare Earth Magnetic Lift*

P.O. #:

Order #:

Part #:

## OVERVIEW & OPERATING PRINCIPLE

This On/Off Permanent Rare Earth Lift magnet is built to last in a heavy-duty industrial work environment while providing all the safety features that protect workers and equipment.

The handle operation is the best and most ergonomic feature of the magnet. The handle moves laterally in and out to enable the on-off function without the need to pull on the handle or press a release button or lever. This feature enables the user to utilize a pipe extension over the handle to operate the unit without the need to bend over.

The lifting bail is the "lock-out" feature for this magnet. When magnet is under load, the lifting bail lock-out prevents the handle from being rotated to the Off position. This feature works on the optional vertical lifting bail as well.

Standard  
horizontal lift



Vertical lift option



### FEATURES:

- » On/Off Permanent Rare Earth Magnet
- » Handle moves laterally instead of pulling, pressing buttons or levers
- » Locking lifting bail(s) prevents accidental load release during lift under minimum 45lb load
- » Recessed (protected) labels for extended life
- » Lifts flats both horizontally and vertically with Vertical Lift Bail
- » RFID Enabled - embedded RFID Chip
- » Supports custom pole shoes (1/4"-20 Tapped Holes, 1/2" deep)
- » Swiveling Lift Bail(s)
- » Operating temperature range is -10°F (-23°C) to 180°F (82°C)
- » 3:1 Design Factor

**Optional configuration:** addition of vertical lift hardware

**ASME B30.20 BTH-1 Design Category B Service Class 3**



## HEALTH AND SAFETY WARNINGS



### GENERAL



Please be advised that in and around the application of magnetic equipment, there are potential safety concerns that can arise with sensitive medical devices:



- » Pacemaker behavior can be affected when they are near strong magnetic fields
- » Medical implants and external fixation systems can be influenced by magnetic fields
- » Hearing aid behavior may be affected when exposed to strong magnetic fields

Any individual that carries the above equipment or other sensitive medical devices should use caution when they are around or handling magnets. For more specific information the wearer should contact their physician.



Beware of pinch points from sudden attraction and unexpected movement between magnets and ferrous metal equipment components or tools.



Beware of pinch points at the pivot, lift hook, and handle when adjusting Lift System positions.



Entrapment hazard: keep extremities clear of hoist, taut wire rope or strap & hook when operating the magnet or lift system.



Keep feet and other extremities out from beneath a lifted load.



### ADDITIONAL SAFETY PRECAUTIONS

1. Working Load Limit is not to exceed the weights outlined in the table in the specification section
2. Always stand clear of wire rope, chain, hook and hoist.
3. Inspect equipment frequently.

## MAGNET DEGRADATION

The force of a permanent magnet can degrade over time and when subjected to external influences. The most common factors for loss of performance or failure include:

- » Blunt force impact such as dropping or banging on a magnet which can cause fractures
- » Temperatures exceeding the operating range of the magnet material
  - » 180°F for neodymium material
  - » 480°F for ceramic grade 8
  - » High temperature options are available.
- » Exposure to electrical fields, like generators, lightning or welding ground circuits, can result in loss of magnetism

It is recommended that magnetic devices are audited annually. IMI can provide a Magnet Audit and Plant Survey to evaluate magnetic equipment performance and assist with compliance to global industry standards; Pull Test Kits are available for self-auditing plant activity.





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## GENERAL INSTRUCTIONS

Installation and start-up are very simple and safe for AdvantageLift magnets provided that the load limits and the application standards of the Lift Magnet are observed for handling suspended loads.

1. Remove the Lift Magnet from packaging and set on a non-ferrous floor or support structure. This operation is to be done with a crane or hoist of appropriate capacity by hooking to the lift lug on the top of the Lift Magnet.
2. Check the Lift Magnet for missing parts, loose bolts or damage. Tighten where necessary or contact the manufacturer.
3. Clean the area where the Lift Magnet will touch. With a crane or hoist of appropriate capacity, position the Lift Magnet in the center of the load to be moved. Be careful to make sure that the load to be lifted does not exceed the Lift Magnet's Working Load Limit for the steel's thickness (see Working Load Limit section). A minimum load of 45 lbs is required to engage the lockout bail.
4. Make sure the magnetic poles are in full and perfect contact with the load.



"On/Off" magnets feature an internal mechanism to control the Lift Magnet's magnetism. These magnets will be functionally on or off when the handle is in the corresponding locked "On" or "Off" position. See the Handle Operation Instructions section below for more specific information.

5. Proceed to move the load observing applicable standards for handling any suspended load.
6. Set the load on the floor or an appropriate support and ensure that the load is perfectly settled before releasing the Lift Magnet from the load.
7. See the Handle Operating Instructions section below more specific information.

## HANDLE OPERATING INSTRUCTIONS

To operate the ADVANTAGELIFT ON-OFF handle and ENGAGE the magnet:

1. Ensure that the magnet and surface of the load are clean and clear of dirt, chips or other debris.
2. Ensure that the magnet is flat on the surface of the load to be lifted.
3. Pull the handle lever outboard from the magnet body (PULL OUT) approximately 10 degrees to disengage the lock pin.
4. Rotate the lever to the ON position, release the lever to allow it to lock in the ON position

**Note** that the magnet needs to be engaged with a load in order to rotate the handle to the ON position.

5. Reconfirm the load and lift capacity and test the load with a 2-3" lift.
6. To release the load, settle the load on a stable surface to release the lifting bail lock-out, and reverse the handle operation.



**Note** the lock lever handle cannot be disengaged if there is a minimum load of 45 lbs on the lifting bail. This lock-out feature prevents the inadvertent drop of a load.



Rotate lever to switch to ON



Magnet OFF



Magnet ON





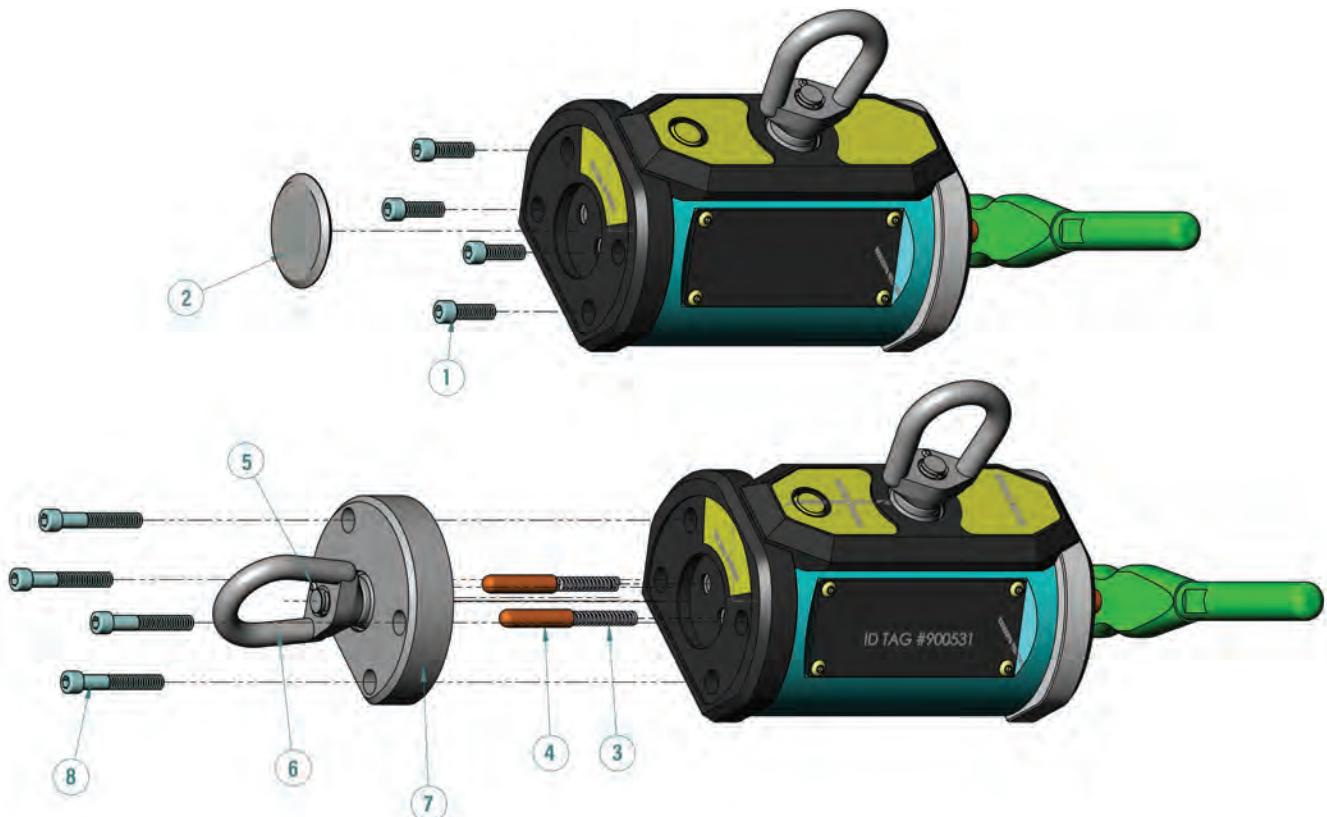
## LOCKING LIFT LUG OPERATING INSTRUCTIONS

The Advantage Lift magnet is equipped with a locking lift lug safety feature. To engage this safety feature, the magnet must be lifting a minimum of 45 pounds in horizontal or vertical orientation.

## VERTICAL LIFT LUG INSTALLATION INSTRUCTIONS

The Advantage Lift magnet can be used to lift loads in the vertical orientation with the purchase and addition of a vertical lift adapter (IMI Part Numbers ALLUG1 or ALLUG2). Follow the instructions to install your adapter. Lifting in the vertical orientation decreases the Working Load Limit of your magnet. Refer to the chart below for Vertical Working Load Limits for the Advantage Lift magnet. Magnet must be placed on Thick Flat Steel and turned to the "ON" position for this installation procedure.

1. Remove all 4 Socket Head Cap Screws (1) from the end where the lug will be installed
2. Remove center plastic cap (2) by prying it off with a flat head screwdriver
3. Place the 2 Springs (3) in the holes
4. Place locking plungers (4) into holes
5. Inspect ALLUG unit and verify Cotter Pin (5) is installed into Lifting Lug (6) and bent around the mount
6. Install ALLUG unit (7) onto the body
7. Install the 4 longer Socket Head Cap Screws (8) provided with the lug kit with Blue Loctite 242 (Loctite not provided in kit)



Model	Vertical Lift Working Load Limit	Load req'd to engage bail lock-out	NOTE
AL0660	165 lbs	45 lbs	AL series Magnets require Pole Shoes for 50% or better rating on materials smaller than 8" Diameter and wall thickness less than 1"
AL1200	300 lbs	45 lbs	
AL1600	400 lbs	45 lbs	
AL2200	550 lbs	45 lbs	



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## WORKING LOAD LIMIT (WLL)

Lift Magnets are rated with a stated Working Load Limit (WLL) which is sometimes referred to as the Lift Capacity.

The stated Working Load Limit value is calculated by applying a de-rating (Design) factor to the maximum break-away force of the Lift Magnet. In accordance with ASME B30.20 standards, the maximum value is determined by pulling a new magnet in a perpendicular motion off of a thick, newly machined piece of steel.

This method of testing is conducted under what is considered "ideal conditions." The amount of force it takes to break the Lift Magnet away from the steel test surface under these conditions is the Lift Magnet's maximum value.

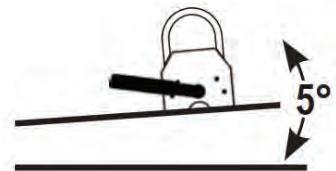
The stated Working Load Limit value is for the benefit and safety of the user. See notes on the following page.

Ideal conditions rarely exist in the field. Conditions such as worn or damaged magnet poles and steel surfaces that have mill scale, oxidation, dirt, or other coatings will cause a reduction in performance of the Lift Magnet.

### LIFTING ANGLE AND EFFECTS OF UNBALANCED LOADS

Maximum Working Load Limit is achieved when the direction of force is perpendicular (90°) to the metal surface. Sudden or excessive shear, slide, friction, and peeling forces associated with movement or impact will cause a Lift Magnet to fail prematurely when a conveyed load is not balanced or tipped at an angle.

- Perform a magnet/load balance test lift by raising the load off the ground by 2"-3" only.
- Reposition the Lift Magnet until the load is level.
- Never lift a load at an angle in excess of 5 degrees from horizontal



### MATERIAL SURFACE

Lifting ferrous items using a magnet requires an assessment of the length, width and thickness of the item. Thin metals do not absorb as many of the magnetic flux lines (magnetic energy) as thicker metals.

Thin metals also flex, causing the steel to peel-off the Lift Magnet.

Equally important is the physical size, flatness, surface conditions and type of steel. The charts below illustrate how surface finish and Carbon content effect the Working Load Limit.

### PERCENTAGE OF STATED LIFTING POWER BY MATERIAL

<b>CARBON CONTENT</b>	<b>LOW CARBON 0.05 - 0.29%</b>	<b>100%</b>
	<b>MODERATE CARBON 0.30 - 0.59%</b>	<b>85%</b>
	<b>HIGH CARBON 0.60 - 0.99%</b>	<b>75%</b>
	<b>HIGHER CARBON = HIGHER RESIDUAL*</b>	

### PERCENTAGE OF STATED LIFTING POWER BY SURFACE FINISH

<b>SURFACE FINISH</b>	<b>GROUND SURFACE</b>	<b>100%</b>
	<b>ROUGH MACHINED</b>	<b>100%</b>
	<b>FOUNDRY FINISH</b>	<b>85%</b>
	<b>ROUGH CAST</b>	<b>65%</b>

\* HIGH CARBON STEEL (TOOL STEEL) WILL ABSORB MAGNETISM & MAY MAGNETICALLY STICK TO STEEL SURFACE, SUCH AS THE LIFT MAGNET OR ATTRACT FERROUS PARTICLES.



## SPECIFICATIONS

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**Working load limits (lbs) model by plate thickness, with maximum lengths to accomodate overhang sag.**

Model	3" plate 10 ft max lg	2" plate 10 ft max lg	1" plate 10 ft max lg	3/4" plate 8 ft max lg	1/2" plate 8 ft max lg	3/8" plate 8 ft max lg	1/4" plate 6 ft max lg
AL0660	660	660	660	660	480	410	220
AL1200	1200	1200	1200	1200	670	590	290
AL1600	1600	1600	1600	1500	870	670	340
AL2200	2200	2200	2200	1720	NA	NA	NA

**Working load limits (lbs) for 8" dia pipe with 1" wall thickness.**

Model	8" OD X 1" wall	NOTE
AL0660	330	AL series Magnets require Pole Shoes for 50% or better rating on materials smaller than 8" Diameter and wall thickness less than 1"
AL1200	600	
AL1600	800	
AL2200	NA	

**NOTES:**

- 1) The above values are based on "ideal conditions" and are selected due to sag characteristics of the specified sheet and overall characteristics of round stock.
- 2) NA indicates Not Applicable - the magnet listed will not turn "ON" with the indicated material thickness.
- 3) It is recommended to use two or more lift magnets on a spreader bar when lifting sheets over the indicated lengths to prevent sheet flexing, sagging or peeling.

## INSPECTION AND MAINTENANCE

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Keep the lifting surfaces of the magnet CLEAN, SMOOTH, FLAT, FREE OF RUST and any FOREIGN MATERIALS.

Nicks and burrs on the lifting surfaces will occur due to normal useage. Uneven wear and out of flatness can greatly reduce the lifting capacity because it will cause a non-magnetic separation (air gap) between the magnet and the surface of the load. If burrs occur, they can be removed by filing them away.

Industrial Magnetics recommends that lifting magnets be re-tested for breakaway force each year. In addition completely inspect and record the condition of the magnet and its suspension system and maintain this record. This will provide a health status of the magnet's overall condition when compared with values taken when the magnet was put in service.

## COMMENTS OR CONCERNS?

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We believe Industrial Magnetics, Inc. offers the finest Lift Magnets available today. Great pride has gone into the design and manufacture of this unit.

Any comments or concerns should be directed to our Customer Service Department at 1-888-582-0822.

**We appreciate the opportunity to serve you!**