ROUND ELECTRO LIFT MAGNETS (RELM)
OPERATION MANUAL

MAG-MATE® **TOLL FREE: 888.582.0822**

INTRODUCTION

READ AND UNDERSTAND THIS MANUAL BEFORE INSTALLATION AND OPERATION OF YOUR LIFT MAGNET PRODUCT.

If used carelessly or improperly, there is a possibility that property damage or personal injury can result. The responsibility for safe operation ultimately rests with the operator.

WORKING LOAD LIMIT (WLL):
Your Lift Magnet has 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 value** of the Lift Magnet. 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. 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.

DE-RATING (DESIGN) FACTORS:
2:1 = 50% of **maximum value** - Round Electro Lift Magnet

LOSS OF MAGNETISM:
Under normal use conditions, an electromagnet magnet can experience a decrease in its original **Working Load Limit**. The most common factors which can cause a loss of strength include:

- Everyday wear and tear on the Lift Magnet's face such as: fine metal buildup on or between the Lift Magnet's poles, nicks or gouges in the magnet's poles, rust buildup, etc.
- Exposure to Extreme Temperatures (Maintain magnet within range of -20ºF to 150ºF)
- Severe blow or shock to the Lift Magnet
- Damage to the Lift Magnet Coil
- Disconnection of power supply
- Exposure to vibration can loosen connections overtime that may cause power supply disconnection

GENERAL INSTRUCTIONS

Installation and start-up are very simple and safe 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 the top of the Lift Magnet. Check the Lift Magnet for damage, loose terminal connections and missing and loose parts. Tighten as necessary or contact the manufacturer.
2. Verify that **120VAC/Single phase/60 Hz power source** is available. Magnet power cable is furnished with a mating Twist-Lock connector that is to be installed by the user onto the source power cable. **Do not replace Twist-Lock connectors with standard extension cord connectors.**
3. Verify that control switch is in good, working order and that power cable & Twist-Lock power plug are free of damage and contamination.
4. 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 the **Safety Precautions** section for more information.
5. Make sure the magnetic poles are in full and perfect contact with the load to be lifted. Do not energize the Lift Magnet until it has been placed in full contact with the piece to be lifted.
6. See the **Operation Instructions** section for specific information on how to safely operate the Lift Magnet.
7. Proceed to move the load observing applicable standards for handling any suspended load. See the **Safety Measures** for general safe lifting protocols.
8. 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.

OPERATING INSTRUCTIONS

1. Ensure that magnet switch is in the "OFF" position
2. Raise magnet vertically to inspect the face. Wipe any debris from the face of the lifting magnet and the contact area of the load.
3. Position magnet on the center of the load. Turn the switch handle to the "HOLD" position.
4. Keep back from the load. Raise load 2 to 3 inches and test the load to ensure it does not release from shaking or jarring. Do not attempt to lift non-flat, odd shaped parts or any material that may seem marginal. If a lift seems marginal, do not attempt it. **DO NOT HAVE FEET OR ANY PART OF THE BODY UNDER THE LOAD AT ANY TIME.**
5. Move the load smoothly to the desired location. Avoid jarring swinging or bouncing. Do not tilt the Lift Magnet at an angle greater than 25 degrees. **DO NOT HANDLE A LOAD OVER PERSONNEL AT ANY TIME.**
6. Position the load on a solid rest then move the switch from HOLD past OFF to RELEASE. Maintain in the RELEASE position for about one second for magnet polarity reverse circuit to overcome any residual magnetism built up in the work piece. Release the switch, allowing it to return to the OFF position.

MAGNET REPAIR

The magnet coil(s) seldom require replacement. However, They can be checked by using an ohmmeter to take a reading across the coil leads. Locate the coil leads by determining the wires that exit the magnet body and run to the screw terminals on the control switch. The coil resistances in Ohms are as follows:

- » RELM06 (144)
- » RELM08 (95)
- » RELM10 (73)
- » RELM12 (62)
- » RELM16 (42)
- » RELM20 (21)

If no reading is indicated then it is likely that the coil is open or the lead has a broken wire. If the reading is lower than that listed for your model, there is likely an internal short circuit. Check for a short to ground by attaching the ohmmeter to one coil lead and touching the other to the magnet face. If there is a short, the resistance will be low or zero. If your magnet is experiencing any of these conditions, return the magnet to the factory for coil replacement.

The control module is repairable and can be returned to the factory for repair without sending the entire magnet. First, disconnect the power cord. Next, remove the four mounting screws from the module face. Then, disconnect the two wires attached to the magnet coil.

ROUND ELECTRO LIFT PARTS LIST

DESCRIPTION	PART NO.
Fuse	MP208
Diode Assembly	MP002
Control Switch	9441H357B

DESCRIPTION	PART NO.
Reverse Resistor	MP066
Transient Suppressor	MP016
Control Module Complete	NT-110-300

The above is a list of General Lift Magnet Parts. Other parts specific to your Lift Magnet are available. Please contact us with the model and serial number of your unit for specific information.

SAFETY PRECAUTIONS

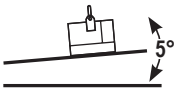
Even though a magnet works through non-magnetic bodies such as dirt and non-ferrous materials, in general, the best efficiency of any Lift Magnet is achieved when the poles (the areas or surfaces of the Lift Magnet which make contact with the load) make complete contact with the load. It is therefore recommended to:

1. Never stand under load being lifted or lift over any people. Always use extra caution. Only use on thick ferrous material that does not flex or bend.
2. Clear any foreign material from the load and magnet poles before placing the Lift Magnet on the load. Avoid placing the Lift Magnet on steel that has irregular surface conditions.
3. Occasionally check the surface condition of the magnetic poles to make sure they are flat and not damaged or corroded during its time in use.
4. Keep the surface of the Lift Magnet and materials clean and free of chips, oil, slag, welding-beads, dirt, etc. This can be done by wiping the surface of the Lift Magnet off frequently with a wire brush, or shop rag.
5. Thin or large sheets that sag may cause the sheet to peel off the face of the Lift Magnet. (See **Maximum Working Load Limit** and Sheet Length chart)
6. After a period of time the pole faces may become somewhat rounded, reducing the Lift Magnet's effectiveness. Poles can be resurfaced up to 0.015" maximum.

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



SAFETY MEASURES

ALWAYS *use the entire pole surface of the Lift Magnet.*

ALWAYS *keep contact pole areas perfectly flat & parallel on the surface of the load.*

ALWAYS *keep contact pole areas and surface of the load clean and free of debris.*

ALWAYS *protect pole surfaces from oxidation after use by treating with some oil.*

ALWAYS *store magnet in a dry environment.*

ALWAYS *check the magnetic poles to make sure they are flat and not damaged.*

ALWAYS *monitor to route through which the power cable will travel. Watch for snag points, sharp edges, etc.*

DO NOT *place any body part between the Lift Magnet's face and steel. Sudden magnetic attraction may occur causing bodily harm.*

DO NOT *hoist a load weighing more than the Lift Magnet's stated **Working Load Limit** or capacity.*

DO NOT *attempt to engage the Lift Magnet before resting it on the steel to be lifted.*

DO NOT *hoist a load if it is flexing or unbalanced. Load must not be angled more than 5 degrees from horizontal. Magnet peel-off may occur and the load may fall.*

DO NOT *tilt the magnet at an angle greater than 25 degrees to avoid load potentially sliding off of magnet face.*

DO NOT *hoist a load before ensuring perfect magnetic contact. First make a TEST lift of 2 or 3 inches (5-7.5 cm) to ensure proper magnetic holding force.*

DO NOT *disengage the Lift Magnet before firmly setting down the load on the floor or appropriate support and making sure the load is secure.*

DO NOT *lift people or loads with people on them*

DO NOT *leave suspended loads unattended.*

DO NOT *operate a Lift Magnet that is missing parts, damaged or malfunctioning.*

DO NOT *remove or obscure product labeling.*

DO NOT *lift loads higher than necessary or over people.*

DO NOT *center the Lift Magnet by pounding on the sides of the Lift Magnet with a hammer or other blunt instrument.*

MATERIAL SURFACE

Lifting ferrous items using a magnet requires a good look at 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

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

PERCENTAGE OF STATED LIFTING POWER BY SURFACE FINISH

SURFACE FINISH	
GROUND SURFACE	100%
ROUGH MACHINED	100%
FOUNDRY FINISH	85%
ROUGH CAST	65%

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

MAXIMUM WORKING LOAD LIMIT (WLL) IN LBS (KG) & SHEET LENGTH (FEET) FOR MATERIAL THICKNESS**

****NOTE:** These values are based on "Ideal Conditions" and are selected due to the sag characteristics of the specified sheet. It is recommended to use 2 or more Lift Magnets on a spreader bar when lifting sheets over 8 feet to prevent sheet flexing, sagging or peel-off. Thin material is susceptible to magnetic bleed through, resulting in two sheets being lifted at once. The item to be lifted must cover the entire length and width of the magnetic poles to properly engage and release. Consult the factory before attempting to use these magnets for round (non-flat) materials.

ROUND LIFT MAGNET - LIFTING GUIDELINES

MODEL NUMBER	WORKPIECE THICKNESS (in)	ZERO AIR GAP (Surface ground or CRS finish)		
		MAX. LOAD (lbs)	MAX. SIZE (Sq. Ft.)	MAX. LENGTH (Ft.)
RELM06	1+	1000	25	5
	3/4	600	20	5
	1/2	480	24	5
	3/8	400	25	5
	1/4	180	16	4
RELM08	1-1/2+	2000	32	6
	1-1/4	1400	27	6
	1	1000	25	6
	3/4	860	28	6
	1/2	700	35	6
	3/8	450	30	6
	1/4	200	20	5
RELM10	2+	3000	36	6
	1-1/2	2200	36	6
	1	1700	42	7
	3/4	1400	45	7
	1/2	700	35	7
	3/8	500	32	7
	1/4	250	25	5
RELM12	2+	4500	50	7
	1-1/2	3500	56	8
	1	2800	70	8
	3/4	2100	70	8
	1/2	1100	52	7
	3/8	600	40	7
	1/4	300	30	6
RELM16	2-1/2+	8000	78	10
	2	7500	90	10
	1-1/2	6500	100	10
	1	4500	112	10
	3/4	2500	82	9
	1/2	1300	64	8
	3/8	750	46	7
	1/4	350	35	6
RELM20	2-1/2+	12,000	117	11
	2	10,000	120	11
	1-1/2	8000	120	11
	1	5500	134	11
	3/4	3000	96	10
	1/2	1500	70	9
	3/8	1100	68	9
	1/4	400	40	7

COMMENTS, CONCERNS OR WARRANTY INFORMATION

We believe Industrial Magnetics, Inc. offers the finest line of Lift Magnets available today. Great pride has gone into the design and manufacture of this unit. Any comments, concerns or warranty questions should be directed to our Customer Service Department at 1-888-582-0822. **We appreciate the opportunity to serve you!**

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