

Operating Instructions MAGSTOP Traffic Barrier MIB 10 MLC Controller Unit

Version 2004_04

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1.0 Safety

1.1 Safety symbols used in this handbook

The following symbols are used in this operating instruction to indicate potential risks and other safety information.



Warning!

This symbol is used in this manual to warn installer for potential harm. Please read these instructions very carefully.



Caution!

This symbol is used in this manual to designate those actions or states which represent a potential hazard to pedestrian, personal, property and equipment. Please read these instructions very carefully.



Note!

This symbol is used in this manual to designate useful information for the operator.

1.2 General safety information

This MAGSTOP barrier system has been designed, built and tested using state-of-the-art technology and left our factory only after passing stringent safety and reliability criteria. Nevertheless, the barrier system can represent a risk to persons and property if it is not installed and operated correctly. These operating instructions must therefore be read in their entirety and all safety information contained therein must be complied with.

The manufacturer shall refuse to accept liability and shall withdraw warranty if this barrier system is used incorrectly or is used for a purpose for which it was not intended.

1.3 Intended use

The MAGSTOP MIB 10 barriers are designed to control vehicular (see pictogram below) access and exits to toll roads, toll road toll plazas and highways.

The MAGTRONIC control units have been specially designed for controlling Magnetic barriers.

Any other use of these barrier systems is not permitted.

Modifications or changes to the barrier or to the control modules are prohibited.

Only original Magnetic spare parts and accessories shall be used.

1.4 Warning and safety signage

The Magnetic Automation Corp. MIB barriers come with two (2) safety-warning labels (see Figure 1 below) that must be applied to the barrier housing so it can easily be seen when a pedestrian, bicycle users, or motorized vehicle uses the lane. Magnetic Automation Corp. requires that you use universally identifiable pictograms in all entrance/exit lanes, roadways, post, and walls. It is strongly recommended to paint a "NO PEDESTRIAN" pictogram on the roadway immediately adjacent to the parking barrier gate.

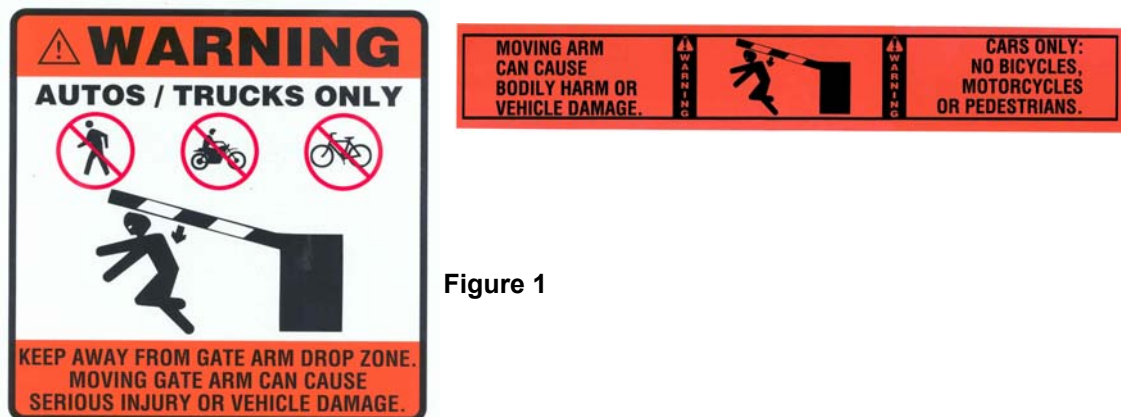


Figure 1

1.5 Safety Requirements



- Use vibrant colors on parking equipment
- Always provide proper signage, both on the road way and on other equipment
- Maintain manufacturers warning stickers on gate housing and gate arms.

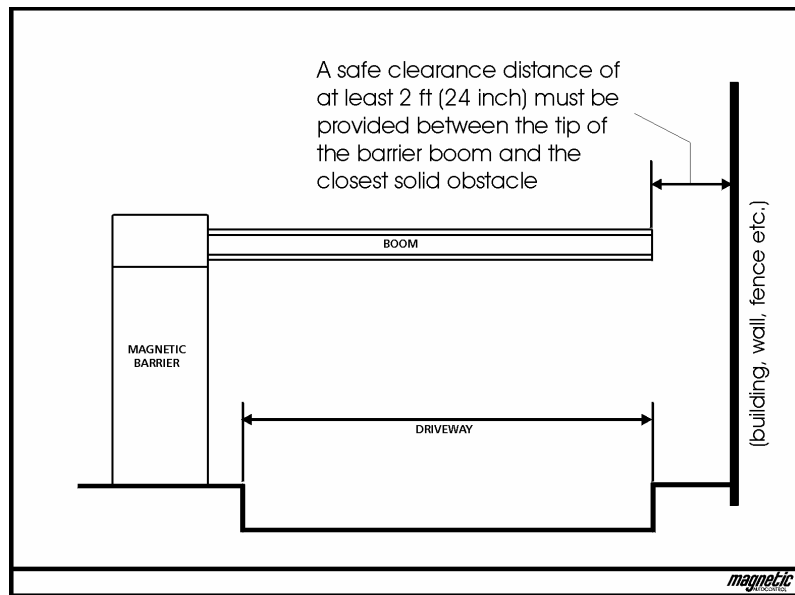
IMPORTANT:

It is A MUST to have pedestrian sidewalks be parallel to entrance and exit lanes or to have pedestrian walkways on the opposite sides of the facility away of vehicle traffic. It is also necessary to enforce that pedestrian are using those walkways and do not enter or leave the parking facility on vehicle traffic lanes.

NOTE: NONE COMPLIANCE WITH THE ABOVE SAFETY REQUIREMENTS (Chapter 1.3 and 1.4) SHALL VOID ANY MANUFACTURERS LIABILITY!

1.6 Operational safety

A safe clearance distance of at least 2 ft (24 inch) must be provided between the tip of the barrier boom and the closest solid obstacle (building, wall, fence etc.).



Any activity in the entrance and exit lanes should be monitored to ensure a safe operation when opening or closing the barrier gates or to prevent altering or vandalism to the equipment from unauthorized persons.

The motion of the barrier boom must be directly observable by the person operating the barrier.

While the barrier boom is in motion, no pedestrian and no vehicle shall be in the immediate vicinity of the barrier.

The assembly and installation instructions must be complied with in their entirety. Any alterations must have received prior confirmation from Magnetic Automation Corp.

Only certified and trained electrical technicians may perform any electrical connections, wiring work or exchange of components.

Before installing or maintaining, the equipment the main power must be disconnected.

1.7 Technical developments

The manufacturer reserves the right to modify, without prior notice, the technical specifications in order to accommodate the latest technical developments. Magnetic Automation Corp. will provide information on the status of existing operating instructions and on any alterations and extensions that may be relevant.

1.8 Warranty

Magnetic provides a limited warranty on its barriers that covers all mechanical and electrical components for a period of two years from the date of first use or for a maximum of three years from the date on which the system was delivered. Magnetic Automation Corp. will only guarantee products that have been installed and used in compliance with our operating instructions, no unauthorized servicing of machine components has taken place, and no vandalistic damage to the machines is evident. Magnetic Automation Corp. excludes parts subject to wear and tear from the standard warranty. Please refer to our Warranty Statement.

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First Printing: 2001

2.0 Installation

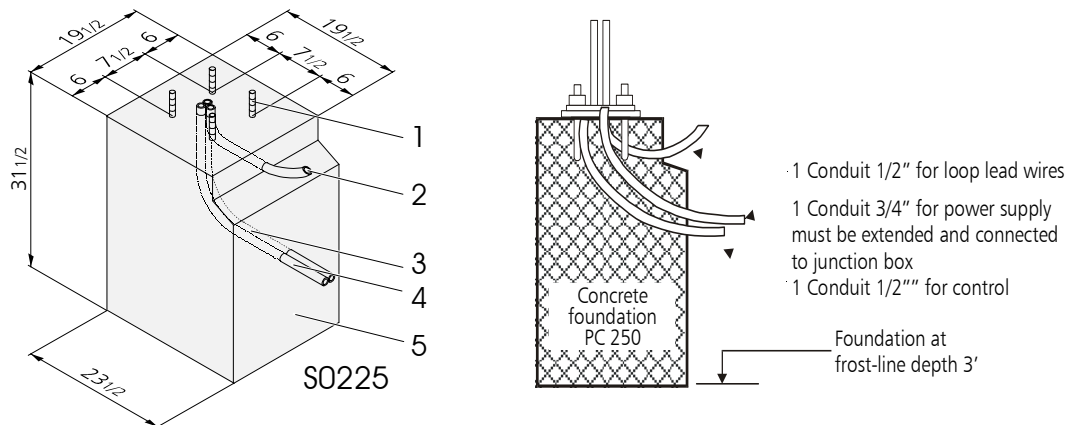
2.1 Guidelines for Foundation

To ensure that the equipment is solidly bolted to the ground under all operation conditions, a foundation with the following dimensions shall be provided:

Depth of foundation: at least 3ft (frost-depth)
 Base area of foundation: 19" x 23 1/2"

The base of the foundation is 4" wider towards the vehicle passage side, than in other section of the foundation (see Fig. S0225).

Fig. S0225
View of the foundation



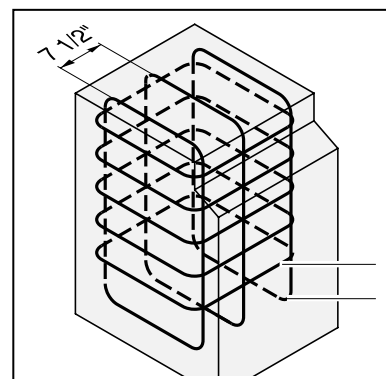
- 1 Anchor bolts (4x)
- 2 Empty conduit for induction loop lead wire, dia. 1/2"
- 3 Conduit for power cables, dia. 1"
- 4 Conduit for control cables, dia. 1/2"
- 5 Concrete foundation

Conduit pipes (with different diameters for low and high voltage cables as per Electrical code) must be installed to run the mains supply cable, the control cables and the induction loop lead wires.

A reinforcing steel cage is absolutely essential for the stability of the foundation (see Fig. S0102).

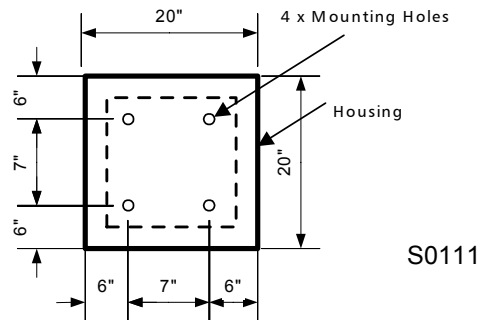
Abb. S0102

Steel reinforcement for
The concrete foundation



5 x \varnothing 3/8" / 17 1/2" x 17 1/2" St III
 3 x \varnothing 1/2" / 29" x 16" St III

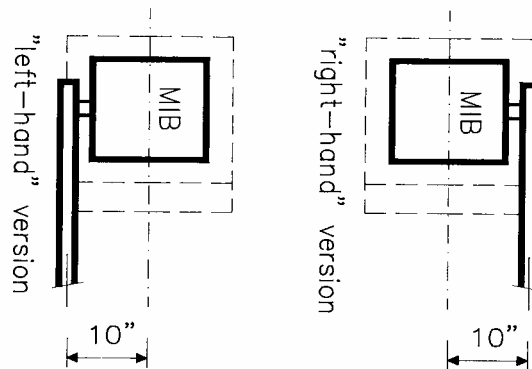
The foundation shall be constructed with at least 2500 PSI grade concrete. The mounting surface must be leveled to insure a solid base for the barrier gate. Once the concrete has set to an adequate hardness, the holes for the anchor bolts can be drilled using the dimensions shown in Fig. S0111 as a guide. Magnetic Automation Corp. recommends using \varnothing 3/8" anchor bolts. Please refer to the anchor bolt manufacturers installation requirements.



2.1 Mounting the housing to the ground

To mount the barrier gate on the concrete surface, follow the instructions below.

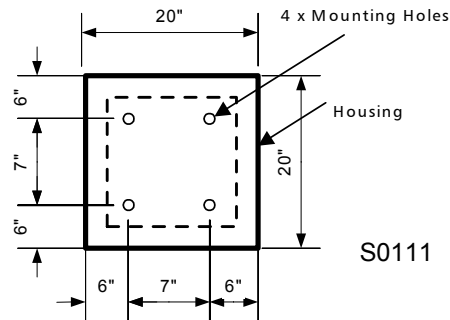
1. Carefully remove the gate from its shipping crate.
2. Open the barrier door
3. Place the gate on the desired position on the curb but leave 6"-12" distance from the front of the housing to the curb line.
4. Place the gate so that the gate arm flange faces the opposite direction of traffic. Please refer to the figure S0112 and compare the Packing list to assure the correct flange position (example: MIB10R* = RH, MIB10L* = LH).



◀ road ▶

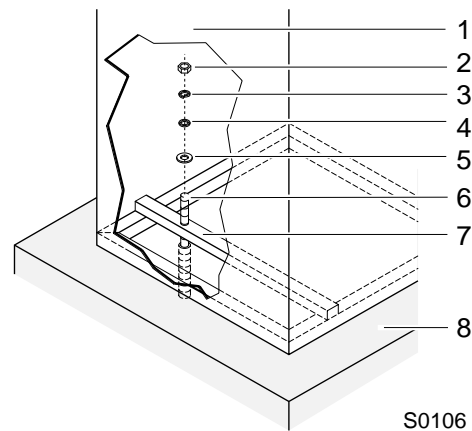
5. Using a marker, follow the outside and inside contours to the concrete.
6. Remove barrier gate.

- Using a pencil, mark the location of the mounting holes on the concrete. (See fig. S0111 for dimensions).



- Drill all four mounting holes and insert the bolts. (Please refer to anchor bolt manufacturers installation specifications). Make sure that the bolts stand up at least 2 inches above the concrete surface.
- Place the gate on top of the previous marked area.
- Using the supplied U-channel (in accessory box) secure the gate to the concrete (see Fig. S0106).

Abb, S0106
Mounting the barrier housing to the foundation

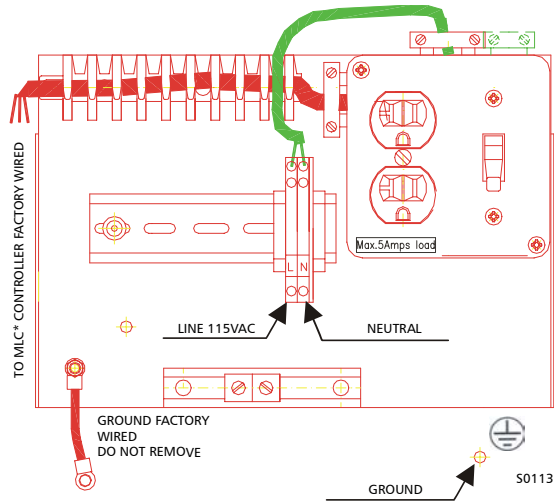


- barrier housing
- nut
- lock washer
- small flat washer
- large flat washer
- anchor bolt
- U-rail
- concrete foundation

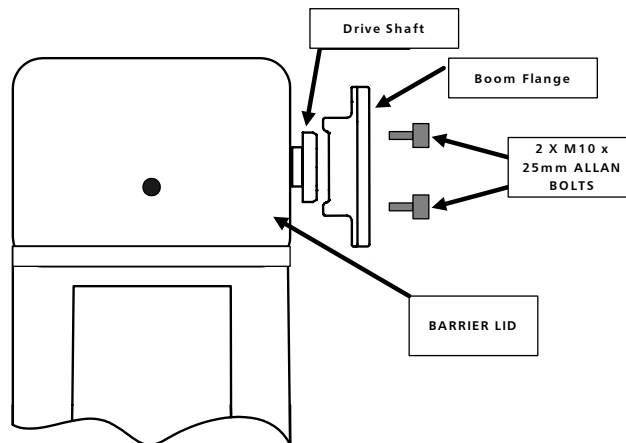
11. Attach the field wiring to the proper terminals at the main power board. See Drawing S0113 below. Make certain that the main circuit breaker is switched OFF. Connect all electrical wiring exactly as directed in the Connection Diagram.



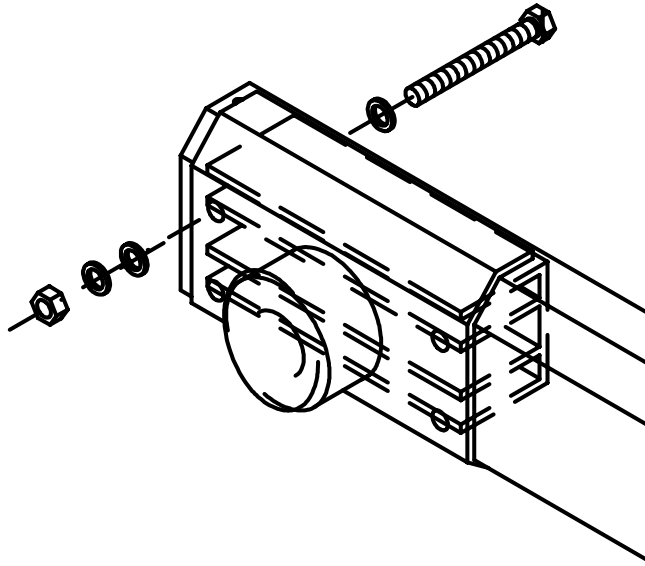
Fig ▶ S0113
Field wiring diagram



12. Secure the boom flange (in accessory box) to the drive shaft using the using two M10 mm x 25mm hexagon socket screws. See Drawing below.



13. Attach the boom arm to the flange using the boom attachment kit (in accessory box). Please refer to drawing below.



Notice:

With all MIB10 barriers 8mm Nylon hex nuts are provided to mount the boom arm to the flange. This break away feature is only available for boom arms up to 12 ft. For barrier arm length, exceeding 12 ft it is not recommended to use any material other than the provided 8mm steel hex nuts. Due to age deterioration (UV radiation), the plastic nuts must be replaced annually.

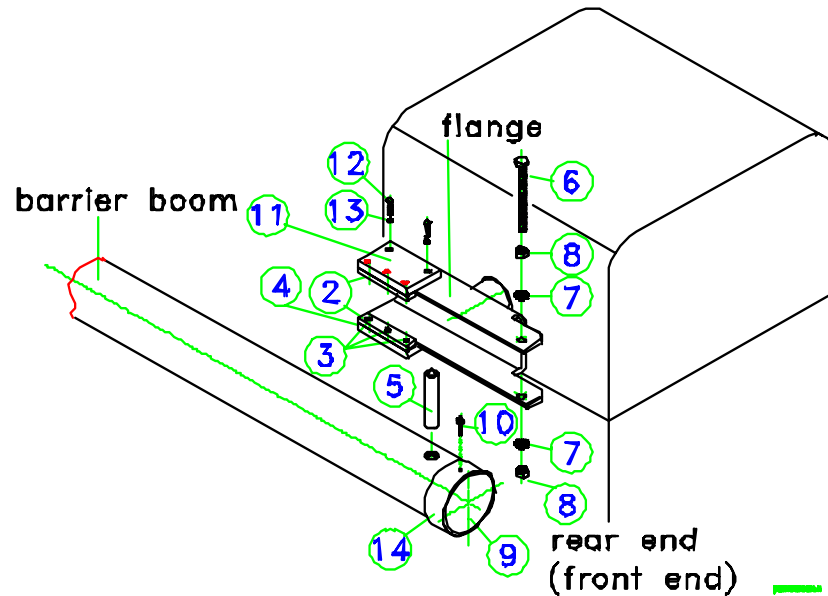
2.1.1 Installing the flange and the barrier boom

The gate arm is fastened to the flange as shown in Fig. F0102 using the fastenings fitted to the swing-away flange.

2.1.2 with "break-away"- switch

The nut of the break-away switch has to be unscrewed, the O-seal taken away and the switch passed through the hole of the plastic ring.
The flange is fastened to the drive shaft using two M10 x 35 hexagon socket screws and spring washers.
O-seal, washer and nut have to be remount to the switch and the nut fixed so that the switch is positioned in the hole of the plastic ring.

2.2 Mounting instruction for gate arm "swing-away" flange



1. Place steel sleeve (Pos.5) through the bore holes (dia. 16,5mm = 0,65") of the gate arm. For this it is recommendable to unscrew the rear lid (Pos.9).
2. Put the gate arm into the rear end of the flange and fix it with the screws, spring washers and washers (Pos. 6,7,8). Tighten down the screws firmly in order to clamp the steel sleeve with the flange and to prevent the gate arm from rebounding.
3. Swing the gate arm to its normal position so that it is fixed in the clamping fixture (Pos.2).
4. Screw the rear lid (Pos.9) to the gate arm.

Function:

In the event that a vehicle is driving against the arm, it disengages from the clamping fixture and is swung sideways. The barrier housing and the arm are now in a rectangular position to each other. The break-away contact, mounted to the flange, becomes free, the safety function is activated and the flange will turn to the "OPEN" position and remain there. When the boom is manually brought in the normal position an automatically reset has been made and the gate is ready again. If there is a CLOSE-signal, the gate will close, if there is an OPEN-signal or no signal, the gate will remain open.

Note: For the first time the gate is closing with very slow speed. This is a safety function.

3.0 Operating the MIB* Barrier Gate

In automatic operation, the MIB* Barrier gate can be operated using following devices:

- Ticket Spitters
- Vehicle Detectors
- Card Readers
- Coin and Token acceptors
- Radio Controllers
- Switches, Push buttons, and other devices.
- Toll lanes of any kind

5.0 Program Modes

5.1.1 Program 1 (Mode 3):

(Maintained contact)

Rotary switch position 3.

Two potential free maintain contact switches control the barrier.

Safety input will not close the gate.

Connections:

Gate UP	Terminal S and 9
Gate DOWN	Terminal S and 10
External safety input	Terminal 13 and 33

External Safety device (Normally closed contact). The safety device will not close the gate.

Note:

All inputs must be potential free (dry contacts) contacts..

5.1.1 Program 2 (Mode 4):

(Maintained contact)

Rotary switch position 4

Two potential free momentary contact switches control the barrier.

Safety input will not close the gate.

Connections:

Gate UP	Terminal S and 9
Gate DOWN	Terminal S and 10
External safety input	Terminal 13 and 33

External Safety device (Normally closed contact). The safety device will not close the gate.

Note:

All inputs must be potential free (dry contacts) contacts.

6.0 Commissioning

6.1 Commissioning procedure

Once the barrier has been installed, the barrier boom attached and all electrical wiring work (including the installation of induction loops) have been completed, according to the instructions; the barrier can be put into operation.

To avoid the risk of injury and damage arising from any unintentional barrier movements during initial operations, all persons, and objects should be kept clear of the barrier.



7.0 Mechanical operation

The MIB10 is based on a unique technology in which the combination of the maintenance free brush-less DC motor, springs and sinusoidal lever system assures a reliable mechanical operation. This technology together with the uniquely designed controller, and the HALL-sensor will operate the barrier very reliably without bouncing the arm in the end positions.

The MIB10 barrier gates are equipped with two (2) rubber end stops to absorb the shock generated by the moving gate hitting the end positions.

7.1 Spring balance

The MIB series barriers are provided with springs to balance the weight of the barrier arm. Ex-Factory the springs are set to the ordered boom length. In some cases the boom arm must be cut on side or weight has been added to the arm (Signage). Adding or lowering the weight of the arm will influence the balance of the springs.

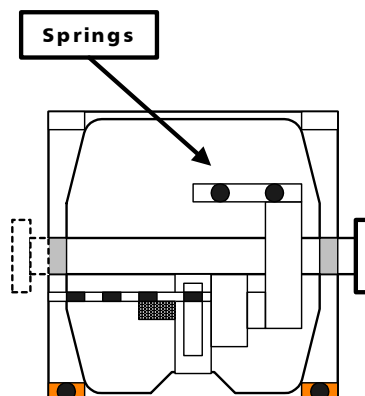
The possible boom length depends on what type of barrier you choose; following table shows the maximum boom length

Barrier Type	Maximum boom Length*
MIB10	10ft aluminum octagonal/10ft round boom, 8 ft articulated boom

* The maximum boom lengths refer to the Magnetic Automation Corp. manufactured boom models MSB5N-025 (8ft), MSB5N-030 (10ft).

In order to balance the arm to the springs follow these steps:

1. Remove the top housing cover
2. The springs are located on the back of the drive unit (see drawing below)



3. Each boom length requires different spring tension and therefore different quantities of springs (see table below)
4. In order to balance the springs you have to move the barrier arm to a 45° angle. The gate arm is balanced when it stays at this position without any electrical power applied to the gate.
5. If the arm moves down, the springs are too weak; if it moves up the springs are too tight.
6. To adjust the springs to the correct tension, remove the plastic clips that hold the adjustment screws in place. Turn the adjustment screws to raise or lower the springs (raise= higher tension, low= lower tension) until the arm is balanced.
7. After balancing the arm replace the plastic spring clips.
8. Replace the housing lid and turn the power on.
9. The springs are not set.

8.0 Troubleshooting

WARNING!

Repair work may only be done by qualified staff.

In case of mal function or warnings it is recommended to check first the status of the indicator LED's located on the control panel. If no error occurred only the green LED display is permanently on. If any additional LED is on or flashing or if the green LED is off an error occurred. Most of the errors can simply be corrected by resetting (turn power off and back on) of the unit. Make sure to wait at least 20 sec until you turn the power back on.

8.1 Diagnostic / Status

Index:

-	LED is off
ON	LED permanently on
1 Hz	LED flashes every second
10 Hz	LED flickers
H	Output active (+24V)
L	Output inactive (0 V)

Error Description	LED			Barrier functioning	Actions/Possible causes
	LED red	LED yellow	LED green		
Control unit does not power up.	-	-	-	No	<p>- No power supply: Check the voltage at the mains supply Terminals. If not check you power source.</p> <p>- Mains fuse defective: Turn power off and check Fuse. Replace if necessary. Fuse is located on the bottom of the control below the aluminum cover.</p>
No error, control unit ready	-	-	On	Yes	OK
Motor too hot	-	On	-	No	Let motor cool down. Make sure cooling fan works.
Temperature warning limit reached	-	1 Hz	On	Yes	Warning: Control unit still running, however may stop if Temperature rises. Check cooling fan.
Self-test error After controller re-boot.	On	-	-	No	Return the control unit to the factory for repair.
Timer error After controller re-boot.	On	On	-	No	Return the control unit to the factory for repair.
Software error	On	On	On	No	Return the control unit to the factory for repair.
EPROM error	On	On	1 Hz	No	Return the control unit to the factory for repair.
RAM/EEPROM error	On	On	10 Hz	No	Return the control unit to the factory for repair.

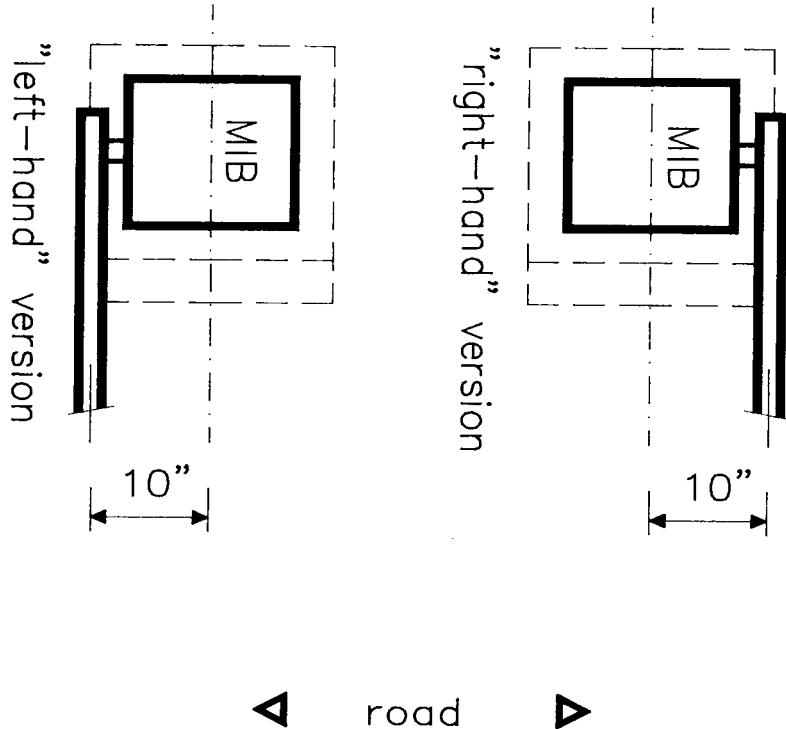
Hall- Sensor communication error	On	10 Hz	-	No	Try to restart the control Unit. In case of recurrence return it to the factory for repair. It may be possible that the reason for the fault is the motor.
Short circuit at digital output	1 Hz	-	-	No	Max. 60 mA per output, however all together up to 150 mA only -> check external wiring if it is a short circuit or if current load too high
Controller cannot find reference point.	1 Hz	-	1 Hz	No	If both LED are flashing the barrier tries to find. Try to restart the control Unit. In case of recurrence return it to the factory for repair. It may be possible that the reason for the fault is the motor
Watchdog timeout	10 Hz	-	-	No	Return the control unit to the factory for repair.

Note:

- Before contacting Magnetic please check the following items first:
- All electrical connections, plug-in connections and mechanical components
 - Correct wiring
 - Position of slide switch, or any external device that is controlling the barrier.
 - Gate arm release contact
 - Spring adjustment
 - Make a reset

8.3 How to change from right-handed gate to left-handed?

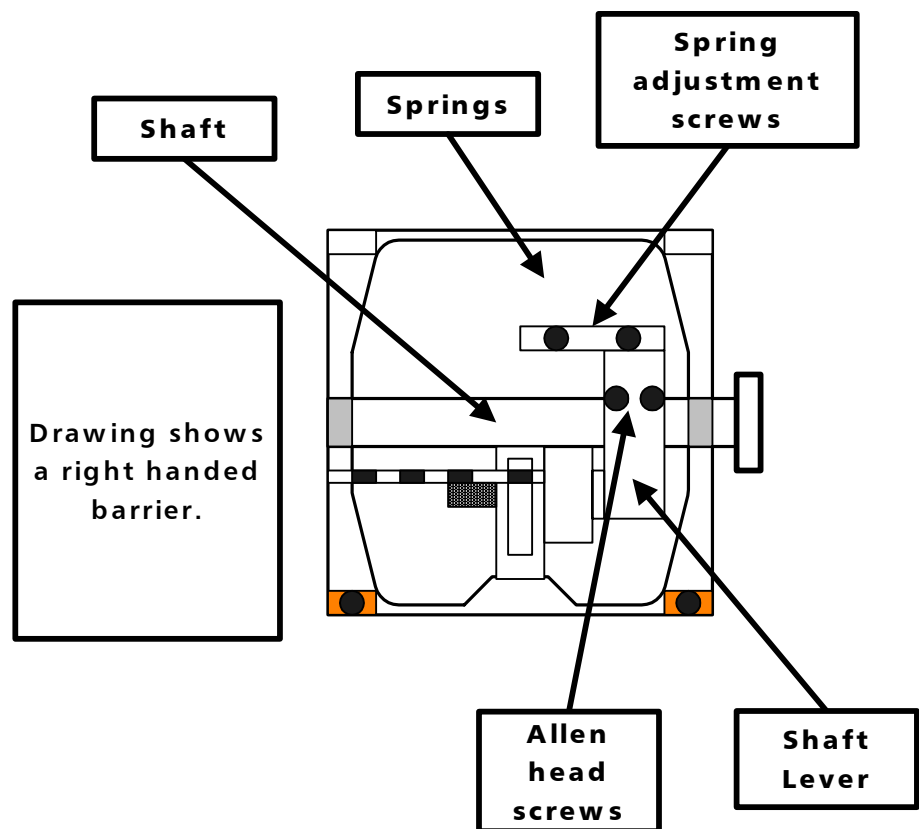
On which side of the housing the boom is positioned and in what relation to the road the housing is positioned determines if the gate is right or left handed. Please see drawing below for further details.



Ex-factory we ship the barrier as ordered, either right or left-handed. If during installation, the barrier has to be changed from right to left handed or vice versa please follow the steps below:

1. Move the barrier to the up position.
2. Turn the electrical power off.
3. Remove the gate arm from the flange.
4. Loosen up or remove the springs (before loosening up the springs please make sure you remember how tight they were when putting them back on).
5. Loosen (do not completely remove) the two Allen bolts that clamp the shaft lever to the shaft.
6. Remove the retainer ring that is holding the shaft in place opposite from the flange.
7. Take off the distance bushings.

8. You can now pull the shaft out of the drive unit frame. Sometimes it is necessary to use a screwdriver or a similar tool to wedge the shaft lever when pulling the shaft out.
9. Slide the shaft into the opposite side all the way through.
10. Replace the distance bushings and the retainer ring.
11. Level the boom flange parallel to the gate housing and retighten the two Allen head bolts.
12. Replace or re-tension the springs to the position in which they originally were.
13. Replace the barrier arm.
14. Turn the power back on.
15. Close the barrier
16. Check the horizontal position of the gate arm to the driveway.
17. If the gate arm is not parallel to the driveway, open up the two Allen head bolts that secure the shaft lever to the shaft and adjust the arm position.
18. When the arm is parallel to the driveway, re-tighten the two Allen head bolts.



9.0 Technical Data

9.1 MAGSTOP Barriers

	MIB10
Max. Boom length	10FT octagonal/10ft round
Opening/closing time	Adjustable 0.6-3.0sec.
Power consumption	400 W
Housing	Zinc-plated sheet steel with stainless steel bottom frame. color powder coated
Housing dimensions (W x D x H)	14" x 14"x 42"
Foundation base frame	Stainless steel
Weight (without arm)	110 lbs.
Operating temp. Range (Ambient)	-22°F TO +140°F
Drive Unit	Brush-less DC Motor

10. Maintenance

The MIB10 series barrier gates are designed for a long lifetime with only a minimum of maintenance required.

To guarantee the greatest available equipment uptime and maximize the lifetime of the MIB10 series barriers please follow the prescribed maintenance schedules.

Use the Maintenance Service Record, located on page 32, to keep track of your maintenance and upkeep activities on the MIB series barrier models.

10.1 Changing the Rubber End Stop

The MIB* series barrier gates are equipped with two (2) rubber end stops to absorb the shock generated by the moving gate hitting the end positions.

Those rubber end stops need to be replaced once per year or after one million cycles whatever comes first.

10.2 Checking the Exterior of Cabinet

Inspect the housing for vehicular damage every six months.

10.3 Check the barrier arm and the attachment kit

Inspect the barrier arm for physical damage and check if the barrier arm attachment kit is used properly and all parts are in place and tight. Perform this inspection every six months.

10.4 Checking the Loop Detectors and Loop Wires

Check the frequencies of the loops every six months. The loop wires should be replaced approximately every four years or as needed. Check the loop sealant every year for cracks or peeling. Replace if needed.

10.5 Check safety signage

Inspect for proper attachment of all safety related signage such as Gate Cabinet and barrier arm safety sticker.

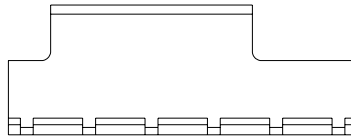
10.6 Maintenance Service Record

Maintenance Schedule and Service Record

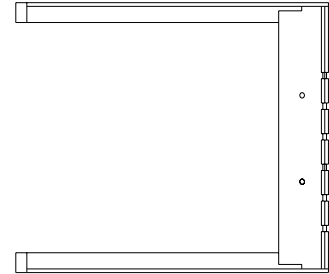
Gate Model						
Gate Serial Number						
Date Of Installation						
	Minimum	Date	Date	Date	Date	Date
Replace Rubber End Stop	Every year					
Inspect Cabinet	Every 6 months					
Inspect barrier arm	Every 6 months					
Check Loop Frequencies	Every 6 months					
Check Loop Sealant	Every year					
Check/replace Loop wires	Every 4 years					
Replace Gate safety sticker	Every 4 years					

Notes:

11. Spare parts MIB10



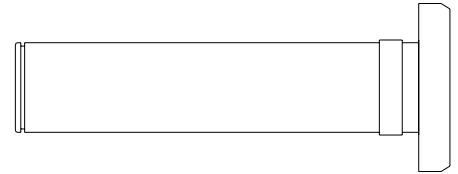
2047,5000
Upper spring bracket



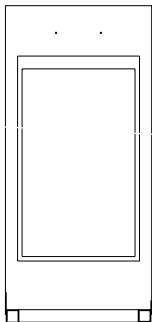
1071,5004
Lower spring bracket



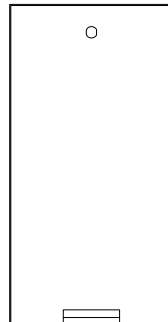
3004,0001
Rubber
End stop



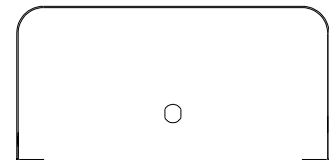
1014,0029
Flange-shaft



Housing base
2061,0070 (Orange)
2061.5027 (White)
2061.5042 (Yellow)
2061.5041 (Red)



Housing door
2043,0152 (Orange)
2043.5082 (White)
2043.5097 (Yellow)
2061.5096 (Red)



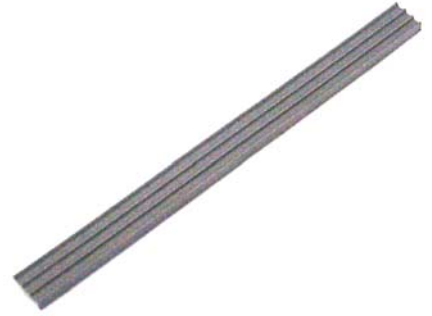
Housing Lid
2029,0023 (Orange)
2029.5031 (White)
2043.5040 (Yellow)
2061.5039 (Red)



3468,0028
#18 Lock for hood and door



3004,0005
Hood bumper



3224,0020
Door Gasket



3466,0019
#18 Key



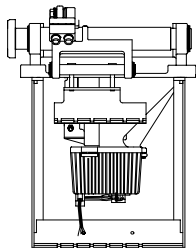
3514,5000
Wave-ring
For hood plug



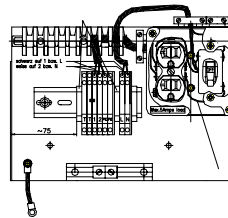
3502,5001
Distance Ring
For hood plug



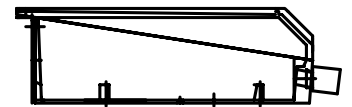
2036,0022
Spring weak
For MIB20



1056,5035↓ (drive unit)



1031,5146 (supply unit)



MLC90-c100 (controller)



1031,0180
Boom attachment kit



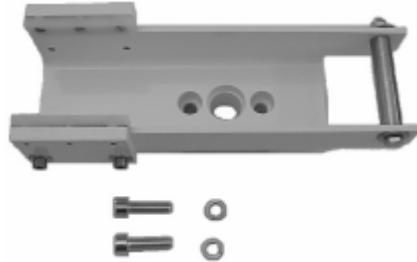
1031,0253
Boom Flange



1031,5055
Flange-set complete



1031,5052
Octagonal swing away flange-set



1031,0282
Round boom swing away flange set



1031,5037
Wood boom flange set



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