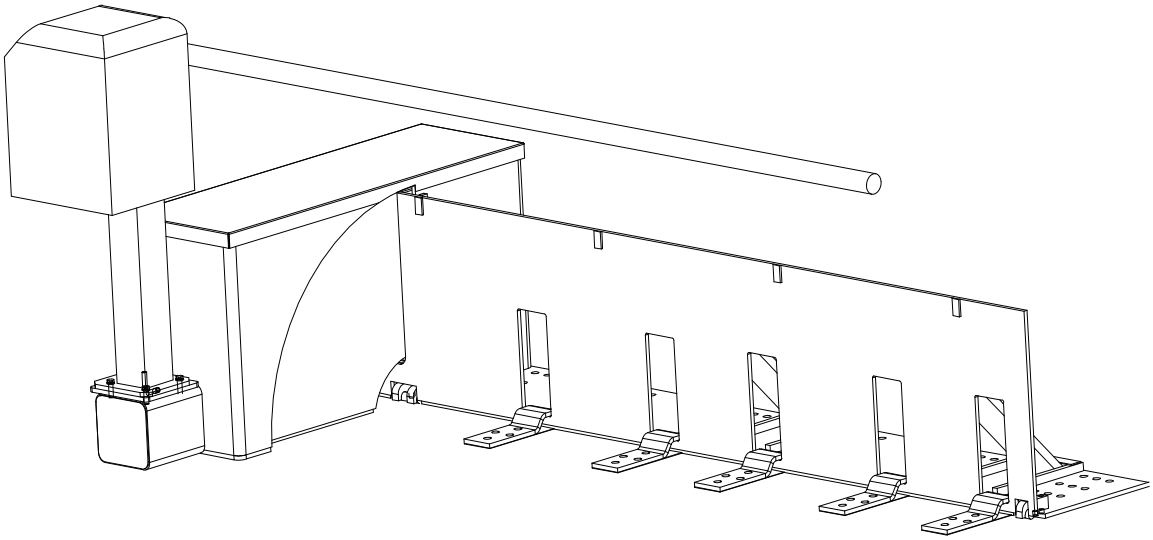
MODEL 890 SERIES SURFACE MOUNTED VEHICLE BARRICADE

OPERATIONS & MAINTENANCE MANUAL



B&B ARMR

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MADE IN THE USA

Your safety is extremely important to us. If you have any questions or are in doubt about any aspect of the equipment, please contact us.

INTRODUCTION

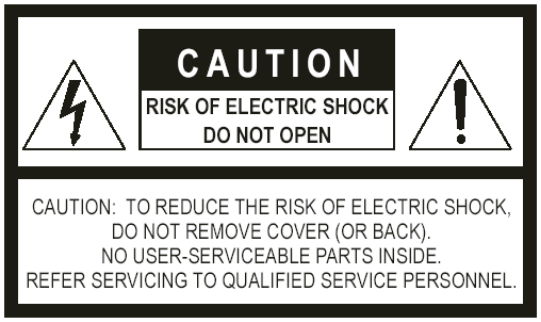
Welcome!

Congratulations on your purchase of a B&B ARMR vehicle barrier. In addition to providing detailed operating instructions, this manual describes how to install, maintain, and troubleshoot your vehicle barrier. If you require additional assistance with any aspect of your vehicle barrier's installation or operation, please contact us.

With years of experience in all aspects of perimeter security and related disciplines, our products are used throughout the world to control access and to protect people, equipment, and facilities. We offer a broad range of vehicle barrier and related security services:

- Turnkey installations
- Routine barrier preventative maintenance or emergency repairs (including work on non-B&B ARMR products)
- Spare or replacement parts
- Custom designs or special installations
- Equipment upgrades (modernize your old equipment with state-of-the-art hydraulics and control systems)
- Ancillary security equipment such as security guard enclosures, card readers, security lighting, and many other security related products.
- Technical support via telephone and possible on site support with advanced scheduling.

Safety



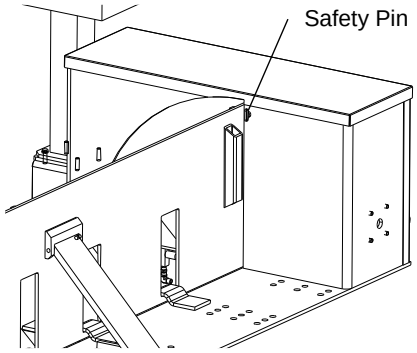
SYMBOL MEANING:

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of non-insulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instruction in the literature accompanying the product.

B&B ARMR does not assume responsibility for injury to persons or property during installation, operation, or maintenance. As the user, you are responsible for correct and safe installation, operation, and maintenance of this equipment. Users must follow the specific instructions and safety precautions located in this manual. In addition they must: Follow the safety standards of the Occupational Safety and Health Administration (OSHA), as well as other applicable federal, state, and local safety regulations and industry standards and procedures. For installation outside the United States, users must also follow applicable international, regional, and local safety standards.
Engage only trained and experienced staff to install, operate, and maintain the equipment. Ensure that all repairs are performed correctly, using properly trained technicians and the correct tools and equipment.

Insert safety pin when performing maintenance to barrier.



How to Contact Us

B&B ARMR works with an extensive list of value added resellers to best support our customers. Our resellers offer not only our superior products, but provide excellent support. If you should need advanced assistance with your vehicle barrier or would like further information on any physical security applications please contact us at:

Corporate/Tech Support:
B&B ARMR
5900 S. Lake Forest Drive, Suite 230
McKinney, TX 75070 USA
Telephone: (972) 385-7899
Toll Free: (800) 367-0387
Fax: (972) 385-9887
E-mail: **info@bb-armr.com**
techsupport@bb-armr.com

Table of Contents

1. ORIENTATION

1.1 Overview

The model 890 surface mounted vehicle barrier is designed to contain a medium speed vehicle impact and prevent that vehicle from entering a restricted access control area. The barrier consists of a bolt down foundation frame, raising plate with locking linkage, and associated hardware to allow the plate to move from a horizontal position to a raised, secure position with the aid of a hydraulic cylinder. The unit is designed for bolting to an existing concrete slab or roadway, and includes all necessary accesses for the required hydraulic conduits and electrical services.

The barrier is provided with safety pins, which are used during servicing to prevent the barrier from accidentally lowering. The safety locks are contained in a locked housing so the plate can be locked into the secure position for extended periods of time.

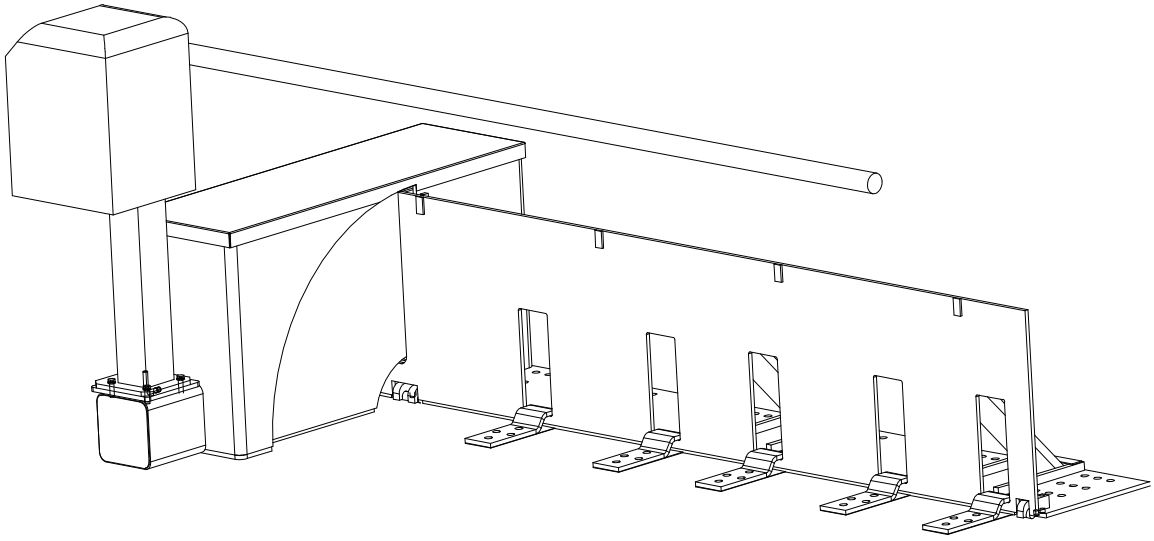


Figure 1 Model 890 Surface Mounted Barrier Basic Components

Figure 1 orients you to the basic components of the Model 890 vehicle barrier:

1.1.1 Attack plate

The attack plate is the structural component that transfers the vehicle impact energy to the base.

DANGER: This vehicle barrier is made of extremely heavy metal. Extreme care should be given to ensure all personnel are clear of the product during operation.

1.1.2 Buttress

The buttress houses the hydraulic and electric components that drive the attack plate. The top cover can be unscrewed and lifted off for maintenance. The side cover is held on with optional padlocks.

DANGER: High voltage electrical components are located in cabinet. Service by qualified technicians only.

CAUTION: Hydraulic linkages are located in cabinet. Do not operate barrier with cabinet door open.

1.1.3 Base Plate

The base plate is bolted to the concrete surface to hold the barrier in position during impact.

1.1.4 Hinge shims

Hinge shims are provided and required to be installed during assembly to provide a smooth hinge surface.

1.1.5 Brace Arms

The power brace arms are engineered to structurally transfer the impact energy to the base plate.

1.1.6 Traffic Control Gate

The included traffic control gate cycles with the barrier to give a visual and physical sign the barrier is in the up or down position. This arm is positioned in front of the gate and does not rise until the gate is fully open, and it closes before the gate starts to close. The barrier gate is installed in the field.

1.1.7 Cabinet Lock Tabs

Cabinet lock tabs are located on the bottom outside edges of the cabinet door. Locks are customer supplied.

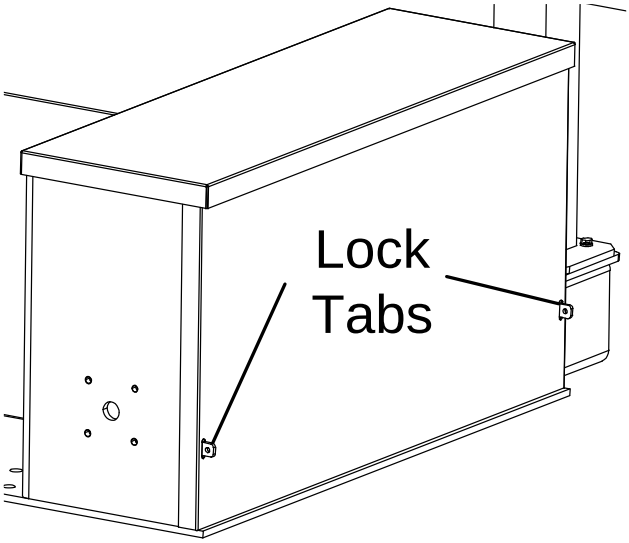


Figure 2 Model 890 Surface Mounted Barrier Lock Tabs

1.1.8 Options

The Model 890 vehicle barrier is available with a broad array of options. Consult your ordering documentation to determine whether your unit has the optional equipment.

- ❑ Red/amber traffic lights. The light remains red if the gate is in any position except fully open.
- ❑ Infrared safety beams to detect pedestrian traffic or as an additional vehicle sensing device.
- ❑ Heater for the electric/hydraulic system.
- ❑ Battery backup system.

2. OPERATION

1.2 Barrier Operation

The 890 barrier is designed to be controlled remotely. Please refer to the control schematic for specific operational controls available with the system.

1.3 Barrier Operation during a Power Outage

In case of electrical failure, the barrier plate can be raised or lowered manually with the assistance of the lifting bar. ***Manually raising or lowering the barrier plate requires two people.*** The lifting bar can be found within the control box housing the power unit components. Attach the lifting bar by sliding it into the 6" pipe receiver which is attached to the buttress end of the plate.

To use lift arm:

1. Raising the plate
    a. One person is positioned in front of the plate in close proximity to the lifting bar.
    b. Another person opens the access door on the barrier buttress and manually shifts the directional control valve to the left and holds in that position while the lifting bar up is pulled up.

> CAUTION: Heavy components and pinch points are present in this product. Use extreme care when working in and around the attack plate or hydraulic system. Attack plate can fall suddenly if hydraulic cylinder is disconnected.

    c. Once in the full up position, release the directional control valve, and release the lifting bar.
    d. Insert safety lock pin when attack plate is fully raised
    e. Close the access door.
2. Lowering the plate
    a. One person holds the lifting bar.
    b. Another person opens the access door on the barrier buttress manually shifts the directional control valve to the right and holds it in that position while the plate is carefully lowered using the lifting bar.
    c. Once in the full down position, release the directional control valve, and release the lifting bar.
    d. Close the access door.

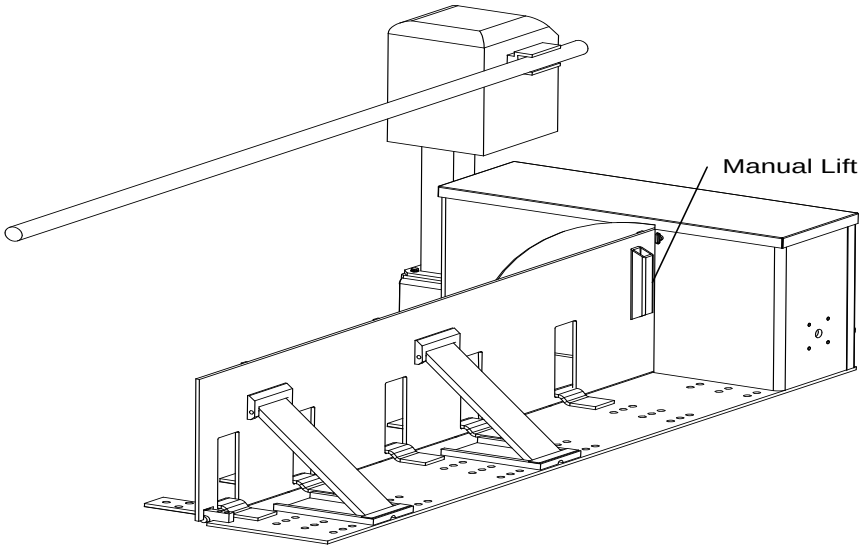


Figure 9 Manual Lift

3. MAINTENANCE

Do not attempt repairs unless you are trained and qualified. This vehicle barrier can cause equipment damage and severe injury if it is operated or maintained improperly.

1.4 Introduction

Keep hinge area/brace clean
Keep area under the plate free of debris
Check the clevis pin oilite bushings for excessive wear. Replace as necessary.
Check and tighten the bolts
Check all electrical connections and tighten if necessary.
Check oil level. Fill if necessary.
Perform a visual inspection to verify that no leaks are present.

The Model 890 Series vehicle barriers are designed to be largely maintenance free. As with any complex electromechanical device however, they must be regularly inspected to ensure they are operating correctly. We recommend a simple monthly visual inspection and a more thorough biannual inspection as described below.

Remember, you may contact B&B ARMR for assistance with inspections, maintenance, or repairs.

Component damage is likely if a vehicle strikes the barrier. If this occurs, contact B&B ARMR. We will help you assess the damage and make sure there is no hidden damage that will compromise safety or effectiveness. We will help you determine which components should be replaced, and will provide guidance on the repairs.

1.5 Monthly Inspections

We recommend you perform the following visual inspections monthly. An equipment maintenance log is supplied in the appendix to assist in the logging.

- ❑ Open and close the gate and observe its motion. Verify the open/close time is within the normal range.
- ❑ During the opening and closing cycles, verify the gate operates smoothly and does not bind. Also verify that the gate does not hit with excessive force when it contacts its full-open or full-closed positions. If necessary, adjust the gate's speed.
- ❑ Inspect the condition of the paint. If rust is present, wire brush and sand the area then paint with a primer and the matching color.
- ❑ Verify torque on anchor bolts. Recommended torque is 100 ft-lbs.
- ❑ Check oil level and condition. (Recommended oil Mobil EAL 224)

- ❑ Check the hydraulic pumping unit for leaks at all points.
- ❑ Inspect the operation of electrical contacts. Verify tightness of electrical contacts.
- ❑ Check, adjust and tighten all limit switches.
- ❑ If applicable Check traffic lights and replace any burned bulbs or LEDs.
- ❑ Check safety devices (loop, IR, etc.) for proper operation and report any anomalies (If applicable).
- ❑ Measure the electrical resistance of the sensing loops and log the measurements and report anomalies (If applicable).
- ❑ Check the PLC for normal operation of all logic and functions.
- ❑ Grease fittings.
- ❑ Inspect the gate arm bushings and replace if necessary (if applicable).
- ❑ Inspect the gate arm drive system (if applicable).
- ❑ Inspect the cylinder and report abnormalities.
- ❑ Check hoses for wear and report any abnormalities.
- ❑ Check the operation of the control panel(s).
- ❑ Check the control panel's buttons and lights for proper operation and replace if necessary.
- ❑ Update the operation and maintenance log.

1.6 Six-Month Inspections

We recommend you perform the following inspections every six months.

- ❑ Repeat the visual inspections in the monthly inspection list.
- ❑ Turn the master power switch on the control circuit box to the OFF position.
- ❑ Inspect the hydraulic unit for signs of oil leaks. Check the hoses for wear or abrasion. Check all fittings for tightness. Inspect the oil level by opening the tank; the level should be 1-1.5 inches below the top of the tank. Add oil as necessary. We recommend using environmentally safe oil such as Mobil EAL 224.

If you replace a hydraulic hose you must make sure the pressure has been relieved before disconnecting the hose fittings. To do this you must turn the power back on and activate the gate close control on the control panel. Turn the power back off before continuing.

- ❑ Open the hydraulic oil tank and inspect the oil for dirt or water. If oil replacement is necessary, see section 5.2 below.
- ❑ When the inspection is complete, turn the power on.

4. TROUBLE- SHOOTING

The table below provides guidance on identifying and correcting any problems with your Model 890 Series vehicle barrier. If you encounter problems that you cannot fix, contact B&B ARMR and we will gladly work with you to correct them.

1.7 Model 890 Troubleshooting Guide

Symptom	Actions
Barrier does not open	Check power Check overload protector Control unit contacts Check that safeties are clear
Barrier does not close	Check power Check overload protector Check that safeties are clear Check push button operation
Barrier makes noise during operation	Check that barrier is not moving too fast
Hydraulic unit is excessively hot	Check that cooling fan on motor is working Check that the cover is on properly Check that the limit switch is turning the motor off, and/or motor is off when barrier is not moving. Check the heater element
Barrier moves too slowly	Check that heater element is working Check flow control valve
Traffic indicator light does not change	Check proper limit switch operation Check bulbs

1.8 Hydraulic Pumping Unit

This device should only be operated and maintained by qualified individuals with experience. These units should not be serviced with vehicle or pedestrian traffic in the vicinity. After being serviced, all required safety tests must be completed before it is returned to operation.

The hydraulic pumping unit is designed to operate a double acting hydraulic system, which requires relatively low pressure and low flow. The electric motor is connected directly to a gear hydraulic pump, which operates only when a signal command is given to operate the cylinder. The oil from the pump is drawn through a filter and directed into a speed control valve, which monitors the operational speed of the vehicle barrier.

The pumping unit is designed to operate continuously with very little maintenance. The unit is equipped with a heater to ensure proper operating conditions. B&B ARMR recommends the use of environmentally friendly oil such as Mobil EAL 224 in all of our hydraulic systems. The oil should be replaced whenever it appears to contain contaminates such as water or dirt. All applications vary due to site conditions and temperature, so the amount and type of contamination will need to be monitored at each site. The oil should be replaced whenever a hydraulic part is replaced due to a mechanical failure, or there is a failure of the heating element.

1.9 Electrical Control Unit

The hydraulic pumping unit is a complete assembly containing all electrical components and logic necessary to operate the unit. The electrical components are mounted in a metal box, which include a motor starter, motor overload protector, and a programmable logic controller (PLC). The program installed in the PLC will vary based on the barrier style and application. If the controller should require replacing, please be sure to specify the model, location and type of application.

The control circuit box has a switch mounted externally to turn off power to the barrier. The switch should be turned off any time the unit is serviced. Do not restore power to the unit until all traffic and pedestrians have been cleared from the area.

5. WARRANTY

BBRSS warranties for a period of one (1) year FOB manufacturing facility, unless otherwise specified by BBRSS in writing, from defects due to faulty material or workmanship. Damage due to handling during shipment and installation are not covered under warranty. BBRSS assumes no responsibility for service at customer site. BBRSS is in no event responsible for any labor costs under the warranty. Subject to the above limitation, all service, parts, and replacements necessary to maintain the equipment as warranted shall be furnished by others. BBRSS shall not have any liability under these specifications, other than for repair or replacement as described above for faulty product material or workmanship. Equipment malfunction or equipment failure of any kind, caused for any reason, including, but not limited to unauthorized repairs, improper installation, installation not performed by BBRSS authorized personnel, incoming supply power is outside the tolerance for the product, failure to perform manufacturer's suggested preventative maintenance, modifications, misuse, accident, catastrophe, neglect, natural disaster, are not under warranty.

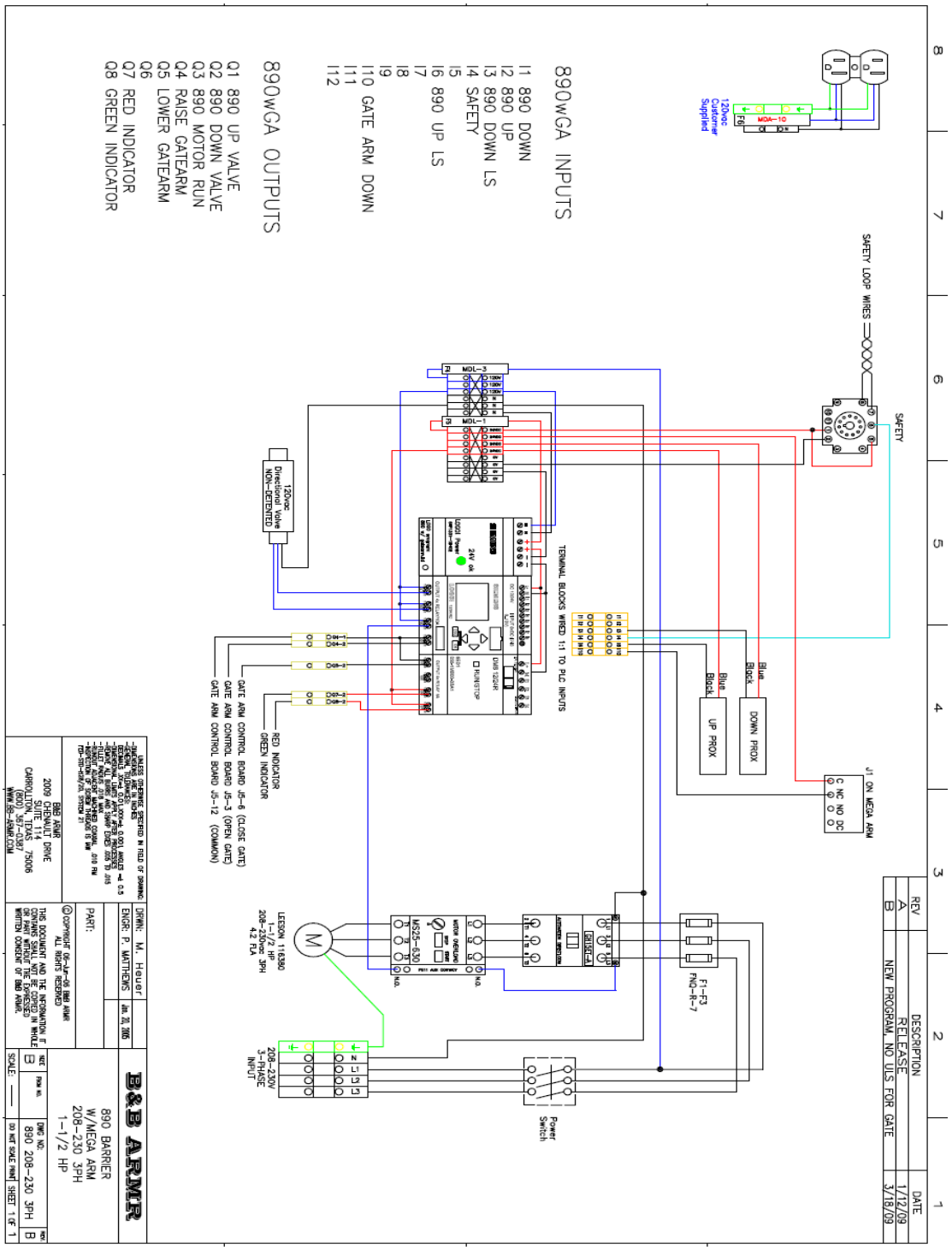
The exclusive remedy for breach of any warranty by BBRSS shall be the repair or replacement at BBRSS's option, of any defects in the equipment. **IN NO EVENT SHALL BBRSS BE LIABLE FOR CONSEQUENTIAL OR SPECIAL DAMAGES OR ANY KIND OF PERSONAL DAMAGES.** Except as provided herein, BBRSS makes no warranties or representations to consumer or to anyone else and consumer hereby waives all liability against BBRSS as well as any other person for the design, manufacture, sale, installation, and/or servicing of the Products.

THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. NO OTHER WARRANTIES EXIST.

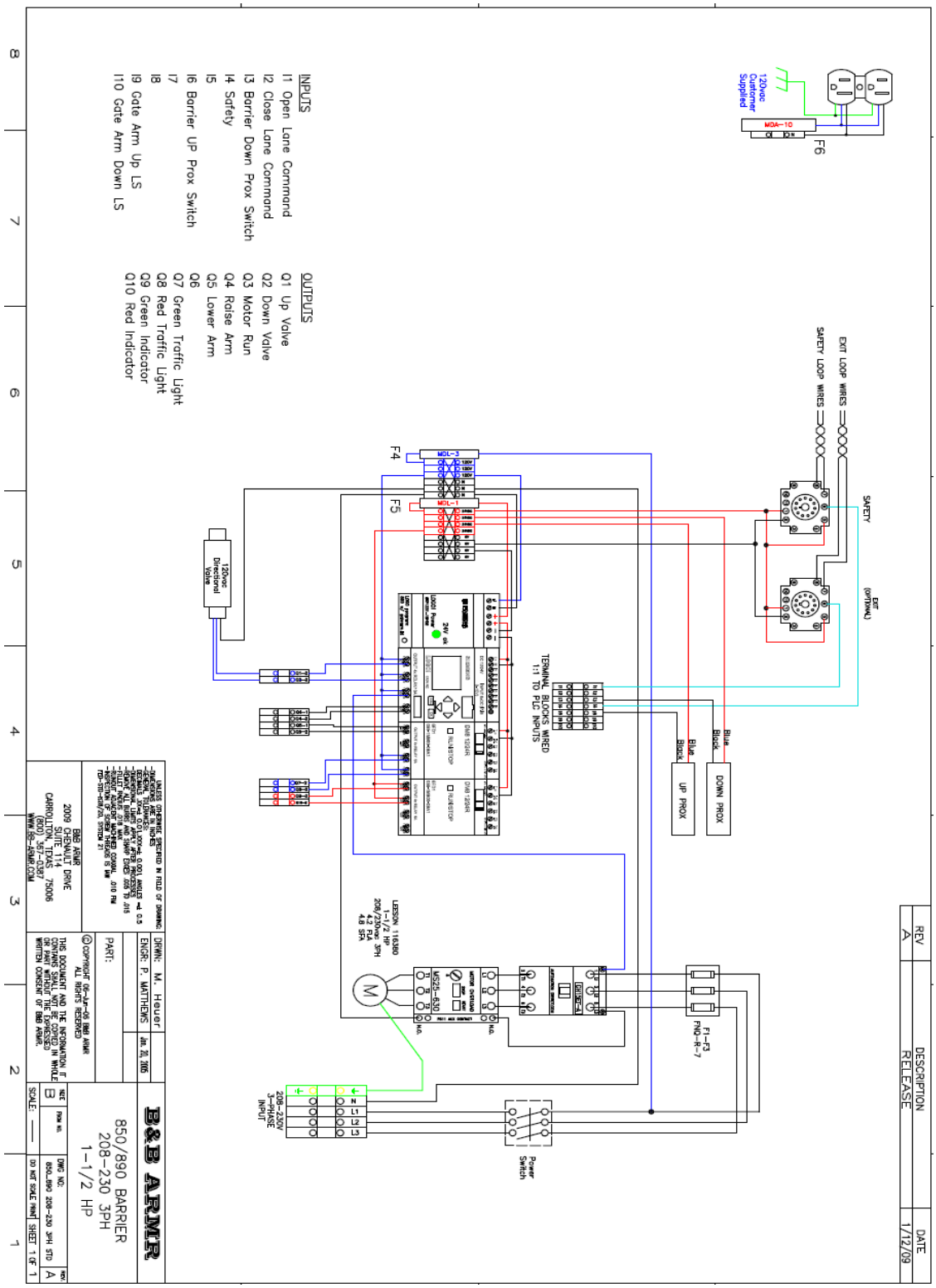
Any modification or alteration by anyone other than BBRSS will render the warranty herein as null and void.

6. APPENDIX

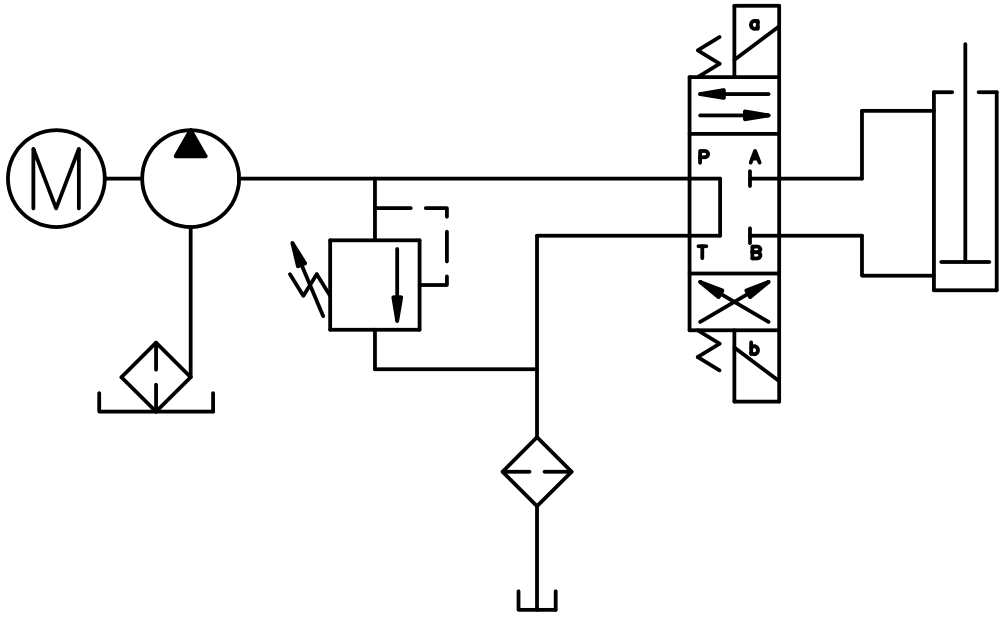
1.10 Electrical Schematic with Mega Arm



1.11 Electrical Schematic without Mega Arm



1.12 Hydraulic Diagram



1.13 Standard Wire Gage Chart

1 Ø Power Wiring				
HP	Voltage Amps	Wire Gage	mm^2	Max Distance
1/2	115 V 7.5 A.AC	12	3.309	70
		10	5.261	110
		8	8.366	180
		6	13.302	290
1/2	208 V 3.9 A.AC	12	3.309	250
		10	5.261	390
		8	8.366	630
		6	13.302	1010
1/2	230 V 3.7 A.AC	12	3.309	290
		10	5.261	470
		8	8.366	750
		6	13.302	1190
1	115 V 12 A.AC	12	3.309	50
		10	5.261	70
		8	8.366	120
		6	13.302	200
1	208 V 6.4 A.AC	12	3.309	160
		10	5.261	260
		8	8.366	420
		6	13.302	680
1	230 V 6 A.AC	12	3.309	200
		10	5.261	310
		8	8.366	500
		6	13.302	800
1 1/2	115 V 15 A.AC	12	3.309	40
		10	5.261	60
		8	8.366	100
		6	13.302	160
1 1/2	208 V 8.3 A.AC	12	3.309	130
		10	5.261	210
		8	8.366	340
		6	13.302	540
1 1/2	230 V 7.5 A.AC	12	3.309	160
		10	5.261	260
		8	8.366	410
		6	13.302	660
2	208 V 13.2 A.AC	12	3.309	80
		10	5.261	140
		8	8.366	220
		6	13.302	350
2	230 V 12 A.AC	12	3.309	100
		10	5.261	170
		8	8.366	270
		6	13.302	430
3	208 V 18.7 A.AC	12	3.309	60
		10	5.261	100
		8	8.366	160
		6	13.302	250
3	230 V 17 A.AC	12	3.309	70
		10	5.261	120
		8	8.366	190
		6	13.302	310

3 Ø Power Wiring				
HP	Voltage Amps	Wire Gage	mm^2	Max Distance
1/2	208 V 2 A.AC	12	3.309	400
		10	5.261	630
		8	8.366	1010
		6	13.302	1610
1/2	230 V 2 A.AC	12	3.309	450
		10	5.261	730
		8	8.366	1160
		6	13.302	1850
1/2	460 V 1 A.AC	12	3.309	1830
		10	5.261	2920
		8	8.366	4650
		6	13.302	7410
1	208 V 3.5 A.AC	12	3.309	270
		10	5.261	430
		8	8.366	690
		6	13.302	1100
1	230 V 3.2 A.AC	12	3.309	330
		10	5.261	520
		8	8.366	830
		6	13.302	1330
1	460 V 1.6 A.AC	12	3.309	1320
		10	5.261	2100
		8	8.366	3350
		6	13.302	5330
1 1/2	208 V 6.2 A.AC	12	3.309	170
		10	5.261	270
		8	8.366	430
		6	13.302	690
1 1/2	230 V 5.6 A.AC	12	3.309	210
		10	5.261	330
		8	8.366	530
		6	13.302	850
1 1/2	460 V 2.8 A.AC	12	3.309	840
		10	5.261	1340
		8	8.366	2140
		6	13.302	3420
2	208 V 6.2 A.AC	12	3.309	80
		10	5.261	140
		8	8.366	220
		6	13.302	350
2	230 V 5.6 A.AC	12	3.309	100
		10	5.261	170
		8	8.366	270
		6	13.302	430
2	460 V 2.8 A.AC	12	3.309	140
		10	5.261	230
		8	8.366	370
		6	13.302	590

3 Ø Power Wiring (Continued)				
HP	Voltage Amps	Wire Gage	mm^2	Max Distance
3	208 V 7.8 A.AC	12	3.309	140
		10	5.261	220
		8	8.366	360
		6	13.302	570
3	230 V 7.4 A.AC	12	3.309	160
		10	5.261	260
		8	8.366	420
		6	13.302	670
3	460 V 3.7 A.AC	12	3.309	660
		10	5.261	1060
		8	8.366	1690
		6	13.302	2690
5	208 V 15 A.AC	12	3.309	80
		10	5.261	140
		8	8.366	220
		6	13.302	350
5	230 V 13.2 A.AC	12	3.309	100
		10	5.261	170
		8	8.366	270
		6	13.302	430
5	460 V 6.6 A.AC	12	3.309	140
		10	5.261	230
		8	8.366	370
		6	13.302	590

Control Wiring				
Voltage	Wire Gage	mm^2	Max Distance (ft)	Voltage Drop
24 V	28	0.081	450	6V
24 V	26	0.129	710	6V
24 V	24	0.205	1140	6V
24 V	20	0.518	2890	6V
24 V	18	0.823	4600	6V

Notes	
1	Maximum distance is measured from Power Source to Operator.
2	Maximum distance for controls is measured from Operator to Pushbutton or Other device.
3	If distance to power Source is greater than value shown use a higher voltage or three phase unit or contact utility company for a service feeder.
4	If distance to Remote Control device is greater than 2000ft use a range extender device.
5	Power Tabels are based on stranded copper wires and allows up to 2% voltage drop.
6	Control Table is based on stranded copper wires and allows up to 25% Connect Power per local codes.
7	Connect Power per local codes.
8	Run Power and Control wiring seperately.
9	Ampere rating is motor full load; Startup up current may be higher.
10	250 VA Allowed for Controls & Heater
11	0.1 Amps for control current, these may vary for different models.

Maintenance Log Form

Equipment Maintenance Log

Type: _____

Location: _____

Tel: 800-367-0387
703-335-6006
email:servicedept@bb-armr.com

		Date	Perfomed By	Checklist complete?	Anomolies	Notes
Monthly	1			YES NO		
	2			YES NO		
	3			YES NO		
	4			YES NO		
	5			YES NO		
	6			YES NO		
	7			YES NO		
	8			YES NO		
	9			YES NO		
	10			YES NO		
	11			YES NO		
Annual	1			YES NO		

		Date	Perfomed By	Checklist complete?	Anomolies	Notes
Monthly	1			YES NO		
	2			YES NO		
	3			YES NO		
	4			YES NO		
	5			YES NO		
	6			YES NO		
	7			YES NO		
	8			YES NO		
	9			YES NO		
	10			YES NO		
	11			YES NO		
Annual	1			YES NO		