# MODEL 730 SERIES BEAM BARRIER

# INSTALLATION 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

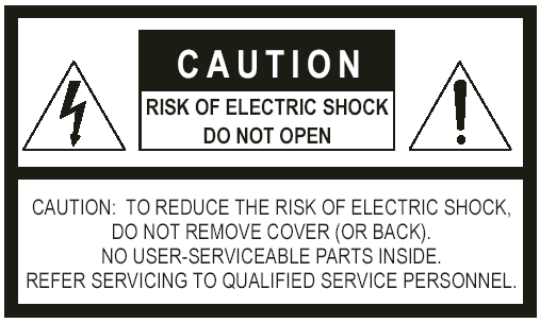
## Welcome!

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.

This steel barrier is heavy and may drop suddenly if installed improperly. EXTREME care should be given to ensure a safe installation barrier is completed.

Additional system safety devices may be included with this barrier system:

- Vehicle loop detector(s) – Safety loop
- Traffic arms
- Traffic lights

# How to Contact Us

If you have any questions or experience any problems with your vehicle barrier—or if we can help you with any other facility security issues—please contact us directly at:

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# 1 ORIENTATION

## 1.1 Overview

The Model 730 vehicle barrier is designed to contain a high-speed vehicle impact and prevent that vehicle from entering a restricted access control area. The barrier consists of cast in place foundation stanchions and a barrier beam designed to raise and lower with the aid of a hydraulic cylinder.

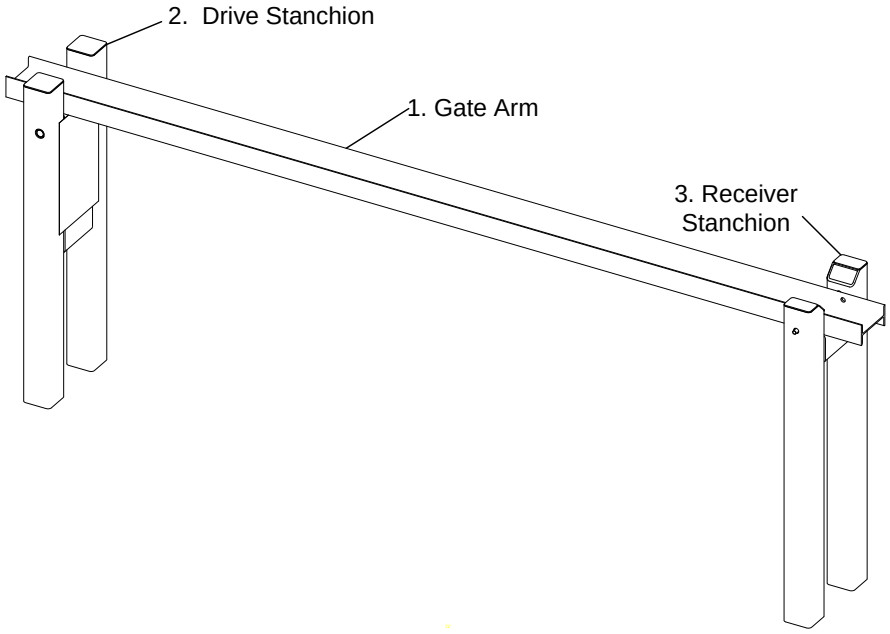



**Figure 1: Model 730 Gate Beam Barrier**

Figure 1 orients you to the basic components of the Model 730 vehicle barrier:

### 1.1.1 Gate Arm

The steel gate arm is engineered to distribute the crash impact load over the drive and receiver stanchion. Coupled with the specified concrete bases, the stanchion frames ensure the barrier does not move on impact.

### 1.1.2 Drive Stanchion

The drive stanchion includes both the hinge pin assembly and the drive system solution. The product is offered in several configurations both manual and automatic. Either solution employs the use of a hydraulic cylinder to push the barrier beam open or allow gravity to lower the beam in a controlled descent. It is engineered using a "H" frame structure to assure strength and rigidity. The drive stanchion is cast in place in a subterranean concrete pour and has elevation grade locators to aid the installation. The installation requires no above-grade concrete.

CAUTION: This barrier is made of heavy steel components. Ensure all personnel are cleared of area during operation.

### 1.1.3 Receiver Stanchion

The receiver stanchion accepts the barrier beam as it lowers and provides the structure that transfers the crash impact energy to the surrounding ground. It is also engineered using a "H" frame structure to assure strength and rigidity. The receiver stanchion is cast in place in a subterranean concrete pour and has elevation grade locators to aid the installation. The installation requires no above-grade concrete.

### 1.1.4 Options

The Model 730 vehicle barrier is available with a broad array of options and field installed kits. Consult your ordering documentation to determine whether your system has the optional equipment.

- A traffic control gate arm to warn the vehicle operator. 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.
- 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.

# 2 INSTALLATION

## 2.1 Introduction

This section of the manual will describe the procedure to set-up and configure the Model 730 vehicle barrier for first-time operation. The product ships from the factory tested and ready for deployment following these steps.

DANGER: High voltage electrical components are located in the Hydraulic Pumping Unit (HPU) cabinet. Service by qualified technicians only.

CAUTION: Heavy components and pinch points are present in this product. Use extreme care when servicing this unit.

**NOTE: The hydraulic hoses are constructed with JIC fittings to allow removal and installation without sealant. Care should be used when disconnecting the pressure side of the hose to insure the pressure has been released prior to disconnecting the fitting. The pressure can be relieved by activating the down control button and visually watching the cylinder close. If the hydraulic cylinder does not fully close, the hose is still under pressure and must not be serviced until the cartridge valve has been manually released and the cylinder can be verified to be in a fully released position and the gate arm in the lower position.**

## 2.2 Site Preparation

The Model 730 Barrier's performance can be influenced by the surrounding soil conditions and grade. It is expected that the minimum soil compression force is 1600 PSI in and around the installation area. Please consult with B&B ARMR Technical Support if there are questions in regards to the installation site conditions.

The following lists some recommendations related to site choice and preparation:

1. Inspect the site and verify there are no underground utilities, overhead wires, and obstructions in the excavation area.
2. If possible, locate the installation away from routine foot traffic to reduce the chance for pedestrian injury from the barrier's moving arm.
3. The 730 barrier is powered by hydraulic pressure from a remotely located Hydraulic Pumping Unit (HPU). It is critical that the HPU and the 730 barrier be within proximity to ensure any pressure drop in the hydraulic lines is minimal.

Consult B&B ARMR Technical Support if HPU location is further than 30 feet from barrier.

4. Soil compression strength under barrier shall be a minimum of 1600 PSI. Compact and add gravel where necessary to ensure solid soil base. Consult B&B ARMR Technical Support if soil compressive strength does not meet this minimum requirement.
5. The barrier operates best when installed on a level surface. Both drive and receiver stanchions should be plumb and level. Level site side to side prior to barrier installation.
6. Excavate install site to accommodate a minimum concrete pad dimension shown to match size of the barrier you have purchased. If site excavation can not be completed per these minimum dimensions, please contact B&B ARMR Technical Support for a custom solution to meet the site requirements.

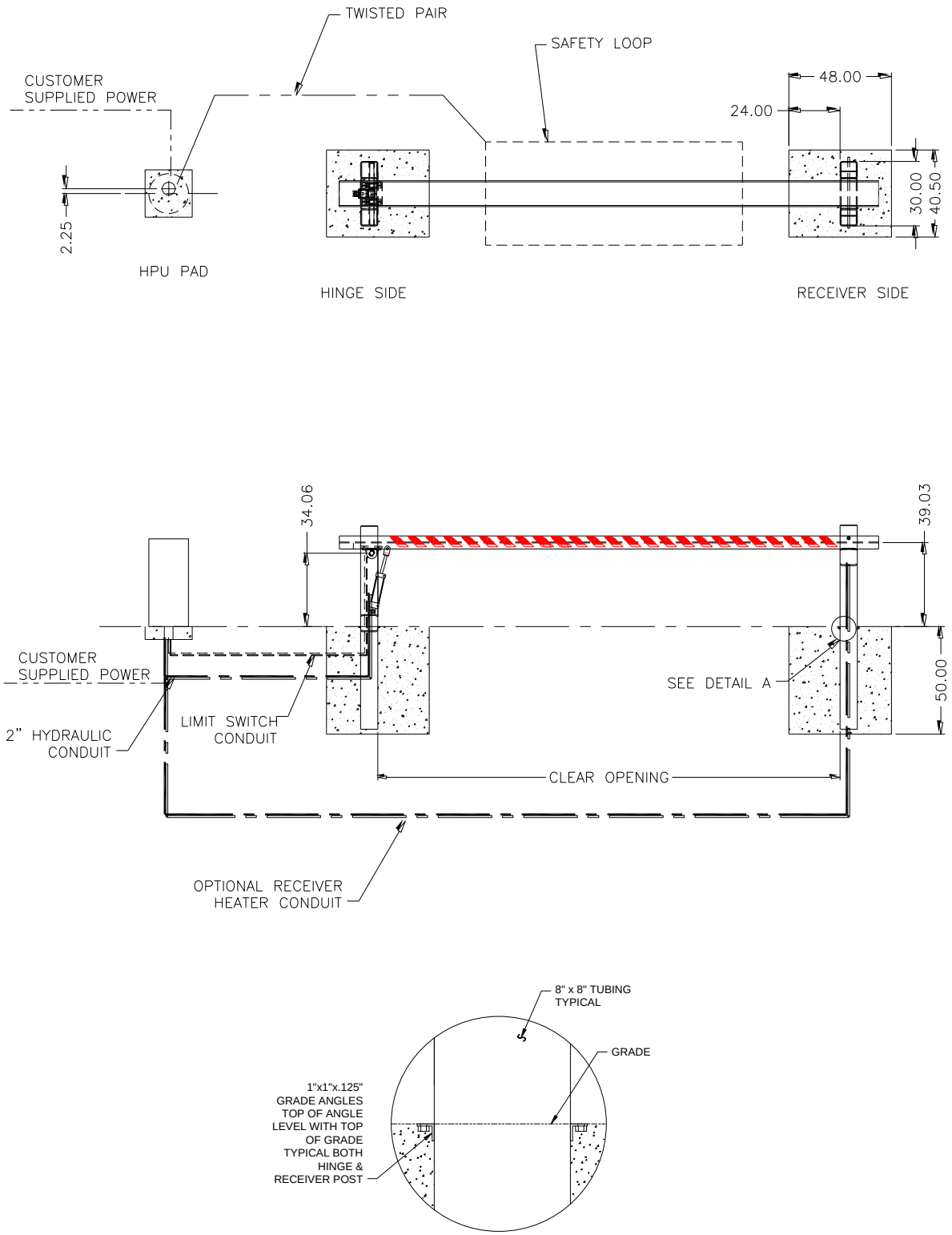



**Figure 2: 730 Site Layout and Foundation**

## 2.3 Positioning

CAUTION: Heavy components and pinch points are present in this product. Use extreme care when servicing this unit.

1. Position barrier to ensure the stanchions are plumb and level. It is critical to the operational performance of the barrier that the support frame is not twisted.
2. After excavation, place supporting timbers over the excavation and parallel to the roadway. Place the hinge stanchion in the excavation supported by these timbers, using the grade locators on the post to ensure the hinge post is set to the proper depth. There are clearance holes for 3/8" bolts in the grade locators. Insert all-thread in these holes and through the supporting timbers and use the all-thread to adjust the hinge stanchion so it is plumb and level.
3. Place string lines on either side of the hinge stanchion and run the lines across the roadway to determine the receiver stanchion's location. Keep the string lines parallel and accurately measure the clear opening length. This length is the distance between the inside (side facing the road) faces of the hinge stanchion and the receiver stanchion. Once the receiver stanchion location is determined, excavate the receiver stanchion's hole and position and plumb the receiver stanchion as described above.
4. Verify the stanchions are positioned correctly by running a string line between the two. Pull the string from the center of the hinge stanchion and perpendicular to the axle and verify it falls directly on the center of the receiver stanchion, and the distance between the two is exactly the specified clear opening length for your barrier.

## 2.4 Rebar and Conduit Installation

Perform the following steps, to install the conduit for the power, hydraulic lines, and control circuits, referring to the figure 2 above.

1. The installation requires a minimum of three conduits. One 2" diameter conduit for the hydraulic lines, one ¾" diameter conduit for the power cables, and one ¾" diameter conduit for the control cables. One 3" diameter conduit for the hydraulic lines would be required if the runs exceed 25'. All conduits, fittings, sweeps, and couplings must be electrical grade (gray color) or what ever is required in your area to meet local codes. Additional conduits may be required for traffic lights, loop detectors, and other options. Contact B&B ARMR if you are unclear about the conduit requirements for your installation.
2. All conduits are run to the hydraulic pump unit, where they will enter the unit through a common 17" diameter opening. Accordingly, run all the conduits for your installation to the location where the hydraulic unit's concrete pad will be located. This pad is typically placed so that the centerline of the hydraulic unit is 4' from the back of the hinge post, though your installation may require that the pad be located a different distance from the hinge post (Not closer than 3' unless

the unit is off to one side). Run the conduits together and be sure the conduits are long enough to extend above the anticipated height of the hydraulic unit's pad.

3. After installing the conduits, verify that the hinge and receiver posts have not moved by repeating the positioning steps above.
4. Set #4 rebar in 12" center cross patterns in pad or use #6 screen on all four sides. There is no need to weld the rebar or screen to the frame.

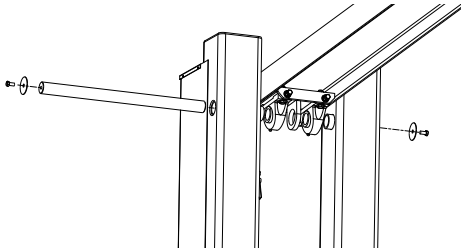
## 2.5 Concrete

1. Concrete shall be rated at 4000psi or higher.
2. Fill excavation holes with concrete.
3. Vibrate concrete to assure all air bubbles and voids are removed under and around barrier.
4. Clean any splatters that may have occurred on stanchions.
5. Finish concrete around stanchions.

## 2.6 Barrier Beam Installation

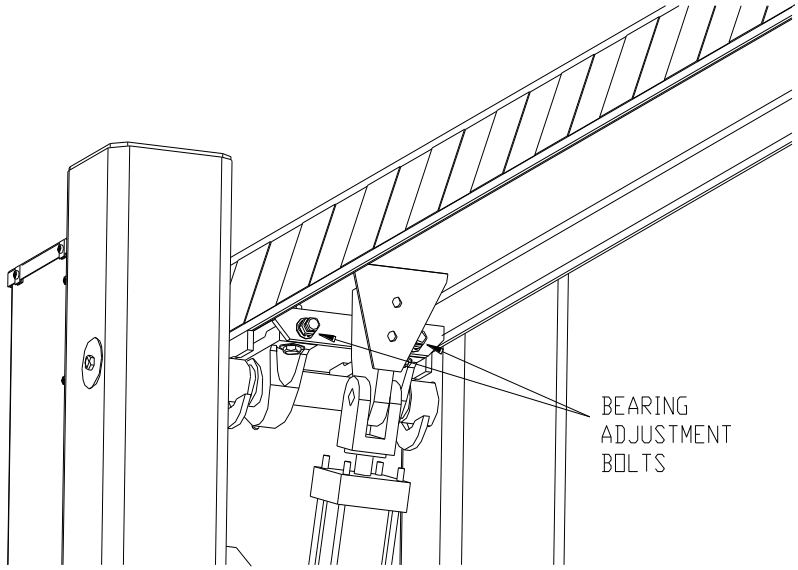
CAUTION: Heavy components and pinch points are present in this product. Use extreme care when servicing this unit.

1. Lift barrier beam with crane or hoist and lower in to position over drive stanchion.
2. Line up hinge bearings with drive stanchion sleeves and insert hinge shaft in to place.

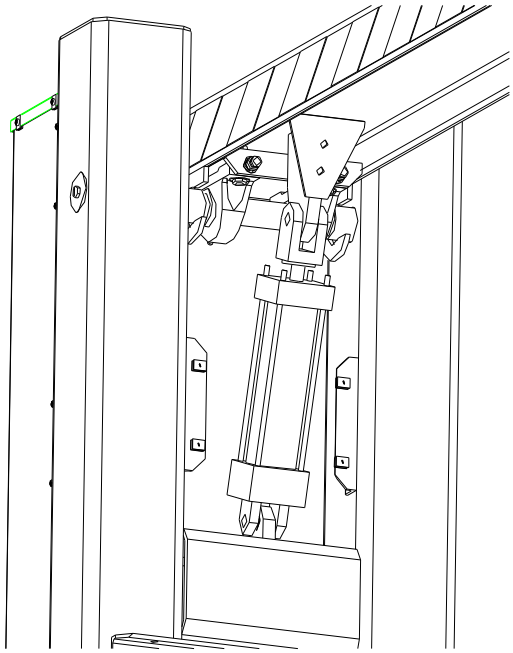


3. Lock shaft in place using locking screws in each bearing and shaft lock washers on either side of drive stanchion.
4. Verify receiving stanchion lines up with gate and there is no interference or binding on the shaft bearings.
5. If interference occurs, loosen bearing bolts and using adjustment bolts realign bearings.

CAUTION: Heavy components and pinch points are present in this product. Use extreme care when servicing this unit.
NOTE: Bearing bolts must be retightened to assure beam does not slide out of alignment during operation.




6. Install hydraulic cylinder.



## 2.7 Hydraulic Connections

Connect hydraulic lines through conduit to cylinder connection using JIC fittings. As a reference, use environmentally safe oil Mobil EAL 224 or equivalent when adding hydraulic oil to the HPU. Please reference the HPU user manual that came with the unit to verify connection points.

CAUTION: The hydraulic system when in operation is under extreme pressure. Verify pressure on the barrier is completely relieved prior to removal of any hydraulic fittings.

## 2.8 Proximity Switch Connections

The proximity switch is adjusted in the factory and should require no further adjustment. Route wires clear of cylinder travel and pinch points. The power wire will go to the 24VDC terminal block and the normally open wire will go back to the PLC input. Reference the schematic that came with the HPU for connection points.

## 2.9 Cover Installation

Depending on the options ordered, install the sheetmetal covers on the barrier. Assure covers do not come in contact with beam during operation.

## 2.10 Final Pre-operation Checklist

Before operating the Model 730 vehicle barrier, go through the checklist below and verify that each of these steps has been completed.

CAUTION: For your safety, complete each of these steps before operating the barrier!

- ❑ The gate arm is attached to the hinge post with the axle, and the setscrews securing the axle to the bearings are tight.
- ❑ The hydraulic cylinder is securely attached to the hinge post and the gate arm with clevis pins.
- ❑ Verify lock pin on receiver stanchion is removed.
- ❑ Verify unit has hydraulic fluid to recommended level.
- ❑ Verify control unit is plugged in and cable is routed clear of barrier operation.
- ❑ Verify area is clear of personnel and other obstructions.
- ❑ Ensure supplied power to HPU matches product requirements.
- ❑ Verify electrical hookups are completed per electrical wiring diagram matching particular product.
- ❑ It is recommended the unit be cycled 4 complete cycles prior to any vehicle or pedestrian traffic.

# 3 TROUBLESHOOTING

## 3.1 Model 730 Troubleshooting Guide

The table below provides guidance on identifying and correcting any problems with your Model 730 Series vehicle barrier. Please refer to the HPU O&M manual for more detailed troubleshooting guides referring to the pumping unit. If you encounter problems that you cannot fix, contact B&B ARMR and we will gladly work with you to correct them.

| Symptom | Actions |
|---|---|
| Barrier does not raise up when commanded on control panel | 1. Check power<br>2. Check for binding between beam and frame. Check connection of linkage between beam and frame. Check for foreign debris.<br>3. Check pressure gauge(option not standard on all units)<br>4. Check overload protector<br>5. Manually raise the barrier by using the manual hand crank to see if problem is mechanical or electrical.<br>6. Check PLC input on pumping unit.<br>7. Check that safeties are clear.<br>8. Check PLC output on pumping unit<br>9. Check push button operation |
| Barrier does not close when commanded on control panel | 1. Check power<br>2. Check for binding between beam and frame. Check connection of linkage between cylinder and beam. Check for foreign debris.<br>3. Check pressure gauge(option not standard on all units)<br>4. Check overload protector<br>5. Determine if it is electrical or mechanical by manually lowering the barrier arm. Open the cartridge valve located below the motor on the pump. Push in and turn the blue knob counter clockwise. This will manually dump the pressure in the lines and lower the barrier arm. When finished, push in the blue knob and turn clockwise to engage the cartridge valve to its normal state.<br>6. Check PLC input on pumping unit.<br>7. Check that safeties are clear.<br>8. Check PLC output on pumping unit<br>9. Check push button operation |
| HPU pump will not build up pressure but is running | 1. Check power<br>2. Close pressure relief valve |

| Symptom | Actions |
|---|---|
| HPU pump will not turn on | 1. Check power<br>2. Check motor overload, press start.<br>3. Check motor starter.<br>4. Check low level switch.<br>5. Check pressure switch. |
| Barrier makes noise during operation | 1. Check linkage between beam and frame. Be sure it is secure and properly lubricated (dry graphite spray).<br>2. Check hinge area for debris and proper lubrication (dry graphite spray).<br>3. Check hydraulic cylinder clevis pins for lubrication (multi-grade grease).<br>4. Check bearing grease. |
| Hydraulic unit excessively hot | 1. Check that the pressure relief valve is closed (fully clockwise).<br>2. Check that the limit switch is adjusted correctly and not allowing the HPU to run excessively.<br>3. Check for correct voltages. |
| Barrier moves too slowly | 1. Check for mechanical binds.<br>2. Check flow control valve.<br>3. In extreme cold temperatures, a higher grade hydraulic fluid may be required to keep viscosity constant. |
| Traffic indicator light does not change | 1. Check proper limit switch operation.<br>2. Check bulbs.<br>3. Check PLC outputs. |

# 4 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.

| | Date | Performed By | Checklist Complete | Anomalies | Notes |
|---|---|---|---|---|---|
| Jan | | | Yes No | | |
| Feb | | | Yes No | | |
| Mar | | | Yes No | | |
| Apr | | | Yes No | | |
| May | | | Yes No | | |
| Jun | | | Yes No | | |
| Jul | | | Yes No | | |
| Aug | | | Yes No | | |
| Sep | | | Yes No | | |
| Oct | | | Yes No | | |
| Nov | | | Yes No | | |
| Year | | | Yes No | | |