

INSTALLATION MANUAL

MODEL 828

Shallow Mount Wedge Vehicle Barrier



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MADE IN THE USA

Contents

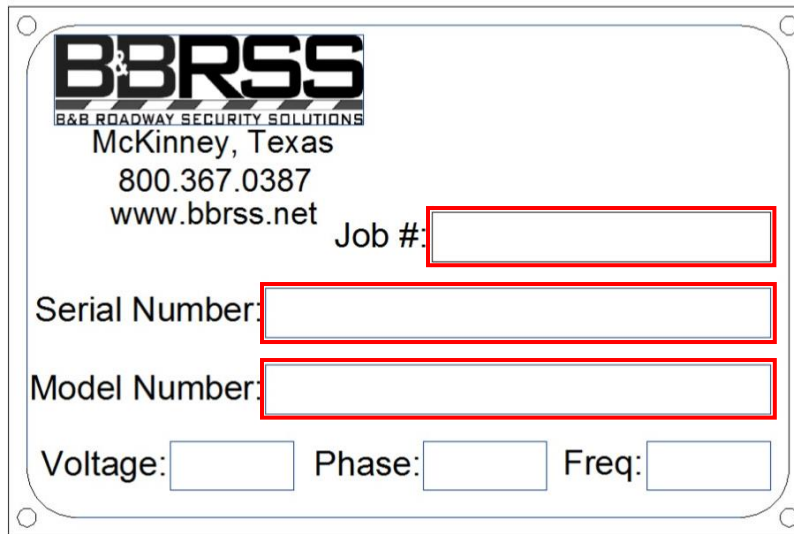
- System Installation Record 3
- 1. INTRODUCTION 4
 - 1.1. Preface 4
 - 1.2. Safety Considerations 4
 - 1.3. Safety Symbols 5
 - 1.4. How to Contact Us 6
- 2. ORIENTATION 6
 - 2.1. Overview 6
 - 2.2. Unit Internals 7
 - 2.3. Drive System 7
 - 2.3.1. Electric 7
 - 2.3.2. Hydraulic 7
 - 2.3.3. Manual 8
 - 2.4. Options 8
- 3. INSTALLATION 8
 - 3.1. Introduction 8
 - 3.2. Pre-Installation Considerations 9
 - 3.3. Installation Instructions 9
 - 3.3.1. Step 1 – Excavation 9
 - 3.3.2. Step 2 – Placement 10
 - 3.3.3. Step 3 – Conduit and Rebar Installation 11
 - 3.3.4. Step 4 – Concrete Emplacement 12
- 4. INITIAL STARTUP PROCESS 13
 - 4.1. Startup Sequence 13
- 5. TROUBLESHOOTING 14
 - 5.1. Model 828 Troubleshooting Guide 14
- 6. APPENDIX 16
 - 6.1. Drawings 16
 - 6.1.1. General Layout 16
 - 6.1.2. Foundation and Conduit Details 17
 - 6.2. Specifications 18
- Limited Warranty 19

System Installation Record

To assist in documenting the products installed in your system, please take a minute to record the following reference information. This information can be located on the blue B&B ARMR model number plate found inside the 828 service tray.

Additional columns are added for your convenience in documenting other components in the system.

	Model 828 Barrier		
Site:			
Job #:			
Date:			
Installer:			
Serial Number:			
Model Number:			
Voltage:			
Phase:			



Label 1 - B&B ARMR Product Label with important product data

DO NOT DISCARD THIS MANUAL!

1. INTRODUCTION

1.1. Preface

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, start-up and troubleshoot your wedge barrier. This manual should be fully reviewed in advance of any actual work being done on the equipment. If you require additional assistance with any aspect of your vehicle barrier's installation or operation, please contact B&B before proceeding.

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 perimeter security services:

- Turnkey installations.
- Routine barrier preventative maintenance or emergency repairs (including work on non-B&B products).
- Spare or replacement parts.
- Custom designs or special installations.
- Equipment upgrades or modernization.
- Ancillary security equipment such as security guard enclosures, access control points, security lighting, and many other security related products.
- Technical support via telephone and possible on-site support with advanced scheduling.

The equipment covered by this manual is available with a vast variety of options and accessories. See the Specification Chart at the end of this manual for general unit specifications. Consult the unit labels, approved submittal package, order acknowledgment and other manuals for details on the options, accessories and related specifications provided with the equipment on each project.

The instructions pertaining to the Model 828 Shallow Mount Wedge Barrier are intended as a guide and do not supersede local or national codes. Consult local codes before installation.

1.2. Safety Considerations

B&B does not assume responsibility for injury to persons or property during installation, operation, or maintenance. As the installer, you are responsible for correct, safe installation and first operation of this equipment. You must follow the specific instructions and safety precautions located in this manual. In addition, you shall:

- 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, installers must also follow applicable international, regional and local safety standards.
- Engage only trained and experienced staff to install and operate the equipment.
- Ensure that any modifications or repairs are performed correctly, using the correct tools and equipment, by properly trained technicians.

1.3. Safety Symbols

The following symbols are used in this document to alert the reader to areas of potential hazard:



DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION identifies a hazard which could lead to damage to the machine, damage to other equipment and/or environmental pollution. Usually an instruction will be given, together with a brief explanation.



NOTE is used to highlight additional information which may be helpful to you.



TIP indicates time saving information.



LIGHTNING FLASH with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of "dangerous voltage" within product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock.

1.4. How to Contact Us

If you have any questions or experience any problems with your wedge barrier, or if we can help you with any other facility security issues, please contact us:

Tech Support:

B&B ARMOR

5900 South Lake Forest Drive, Suite 230

McKinney, TX 75070 USA

Telephone: 800.367.0387

Fax: 972.385.9887

E-mail: info@bb-armr.com

E-mail2: techsupport@bb-armr.com

2. ORIENTATION

2.1. Overview

The B&B ARMOR Model 828 Shallow Mount Wedge Barrier *Figure 1- Model 828(-X) Shallow Mount Wedge Barrier* is a wedge-type barrier hinged at one side such that the wedge can be raised and lowered to restrict and control vehicle access. The wedge is constructed of heavy steel engineered weldments, connected by an attack plate to increase the barrier's vehicle stopping capability.

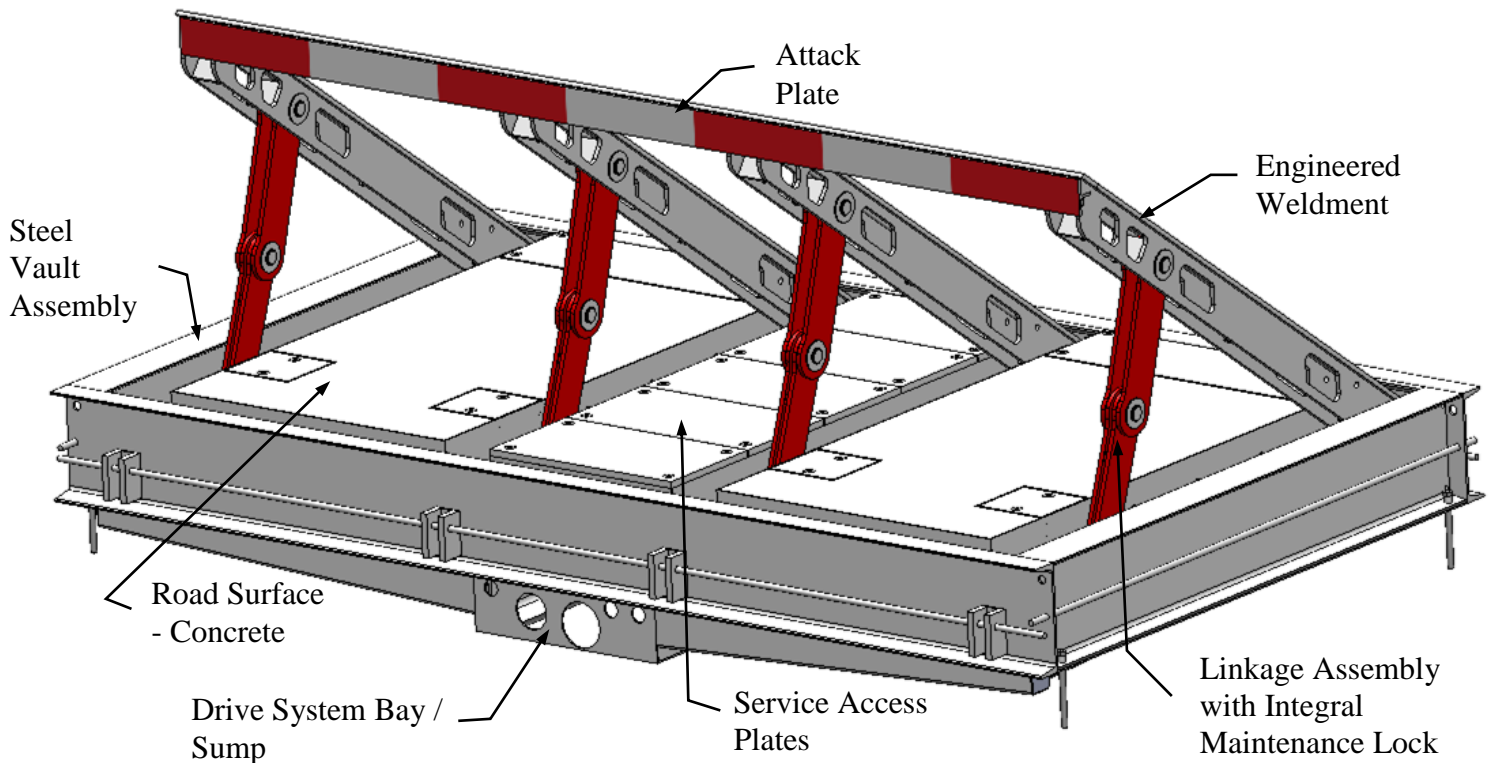


Figure 1- Model 828(-X) Shallow Mount Wedge Barrier

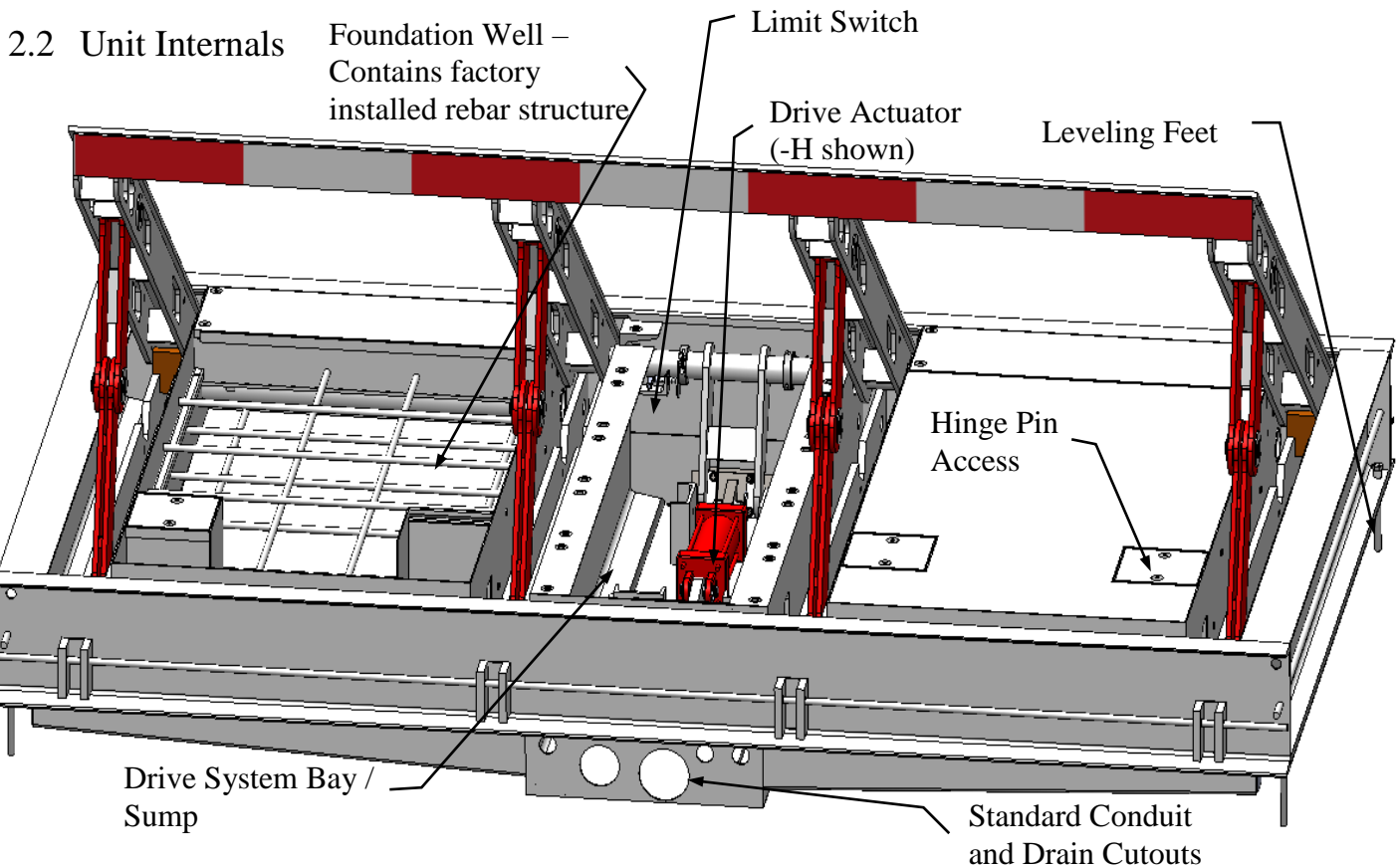


Figure 2 - Internals (Model 828-H Shown)

2.3 Drive System

The drive system options are:

2.3.1. Electric

The 828-E barrier operates with a self-contained electric drive actuator. A 828-E contains the actuator components, the electrical components and a programmable logic controller pre-programmed with the barrier's operating logic.

The unit includes a manual operation override so the barrier can be raised and lowered during power outages.

Refer to the separate Installation (IM) and Operation and Maintenance (O&M) manual for specifics on the Electric drive.

2.3.2. Hydraulic

The 828-H barrier operates with a remotely mounted hydraulic pumping (HPU) unit. A 828-H contains the hydraulic pump, control valves and connections and the programmable logic controller pre-programmed with the barrier's operating logic. Miscellaneous electrical components power the HPU and control circuits.

The system includes a manual operation override so the barrier can be raised and lowered during power outages.

Refer to the separate Installation (IM) and Operation and Maintenance (O&M) manual for specifics on the Hydraulic drive unit.

2.3.3. Manual

The 828-M barrier is manually operated by designated personnel. A standard 828-M contains no electrical components, but may include options or accessories that require electrical connections (e.g., led lights, sensors).

Consult the unit labels, approved submittal package or order acknowledgment on the options and accessories related to each project.

2.4. Options

The Model 828 Shallow Mount Wedge Barrier is available with the following options. Consult your approved submittal package or purchase order to determine whether your unit has any optional equipment.

- Various control panel options (touch screen panels, multiple panels, remote mounting)
- Integrated LED Lights to increase visibility
- Cold weather package
- Battery Back Up System
- Custom Painted Finish

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

- In-ground loop detector.
- Pole mounted traffic lights.
- IR beams.
- Obstruction Detection.

3. INSTALLATION

3.1. Introduction

The section describes the procedure to set-up and configure a generic Model 828 shallow mount wedge barrier for first-time operation. Model 828 is designed for quick and easy installation; however, every site is different and each Model 828 varies due to the choice of options or special design features. Accordingly, the instructions below may have to be varied slightly for your particular installation.

Please refer to the unit label, approved project submittal package, order acknowledgment, or other manuals for details on the options and accessories provided on your Model 828. If you need help, or are unclear about any of these instructions, please contact B&B prior to installation for assistance.

3.2. Pre-Installation Considerations

Before beginning site excavation and barrier installation, note the following important considerations.

- Inspect the site and verify there are no underground utilities or overhead wires or obstructions in the excavation area.
- If possible, locate the installation away from routine foot traffic to reduce the chance for pedestrian injury from the barrier's moving arm.
- Soil compression strength around the barrier shall be a minimum of 1600 PSF or per submittal guidelines. Compact and add gravel where necessary to ensure solid soil base. Consult B&B Technical Support if soil compressive strength does not meet this minimum requirement.
- The barrier operates best when installed on a level surface
- Excavate install site to accommodate a minimum concrete pad dimension shown to match size of the barrier you have purchased. If site excavation cannot be completed per these minimum dimensions, please contact B&B Technical Support.

Before you begin installation, you will need the following available on site prior to installation:

- Equipment for excavation, soil compaction, removal and disposal of spoilage
- Concrete placing and finishing tools
- Steel re-bar
- Lifting equipment capable of moving and setting the Model 828 components into place
- Mix Concrete
- Demolition tools and/or equipment.
- Various hand tools for tightening screws, nuts and other fasteners
- Marking flags/paint and construction leveling string

3.3. Installation Instructions

Installing a Model 828(E,H,M) is a four (4) step process.

A more in-depth list of specifications and drawings can be found in Section 6.

3.3.1. Step 1 – Excavation

The excavation dimensions detailed in *Table 1 - Excavation Summary* are the minimum requirements needed to maintain Model 828(E, H, M) specified crash rating as defined by the submittal package.

Unit	EXCAVATION (L x W x H)	REBAR Type #4 Deformed, Grade 60 or better	SOIL Min Compaction	CONCRETE 4000 PSI min.
828 Barrier Vault	(CO + 42.5")W x 136.5"H x 19"D	Varies by size	1,600 PSF	Varies by size

Table 1 - Excavation Summary

The drawing titled **Drawing 1 -828 Series General Layout** (see Section 6 at the end of this manual) details GENERIC foundation pads, clear opening and other critical dimensions. Refer to the submittal package drawings for project specific dimensioning.

3.3.1.1. Measure and mark the area to be excavated with flags or marking paint as indicated by the project submittal package.



Final pad positioning should be within 1/2" dimensional tolerance.

3.3.1.2. Excavate the hole for the Wedge barrier.

3.3.1.3. Compact the soil per specifications on all sides of the hole.



To support the concrete foundation of the 828 Wedge Barrier and to ensure the barrier can properly stop vehicles at the designed rating, make sure surrounding soil is capable of withstanding the minimum compaction requirements.

3.3.2. Step 2 – Placement

Place the barrier in the hole per the submittal drawings. See **Figure 3 - 828 Wedge Barrier Install**. Align 828 barrier with flags, marking paint or string.



Figure 3 - 828 Wedge Barrier Install

3.3.3. Step 3 – Conduit and Rebar Installation

Install all conduit and drain connections. See project specific submittal drawing.

- 3.3.3.1. Place the appropriate rebar into the hole per the project specific submittal drawing. Tie the rebar to the barrier as detailed in *Drawing 2 - 828 Foundation and Conduit Details*. See *Figure 4 - Rebar install*



Figure 4 - Rebar install



Place tape over the exposed edges of the attack plate and engineered weldment assemblies. This will protect the gaps from getting concrete between them during the pour. Clean up after the pour is easy, simply remove the tape.

3.3.4. Step 4 – Concrete Emplacement

Pour the concrete into the excavated hole and barrier foundation well.

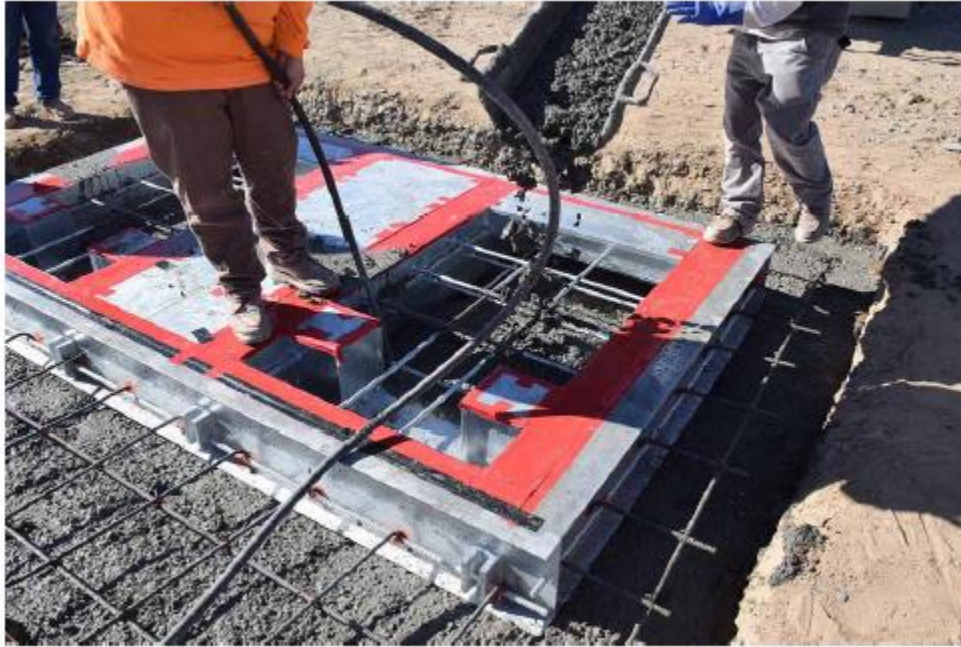


Figure 5 - Concrete Pour

- 3.3.4.1. Vibrate the concrete under, around and in the barrier foundation wells thoroughly.
- 3.3.4.2. Finish the concrete even with the barrier vault. See ***Figure 6 - Concrete Finishing***.



Figure 6 - Concrete Finishing

3.3.4.3. Allow the concrete to cure.

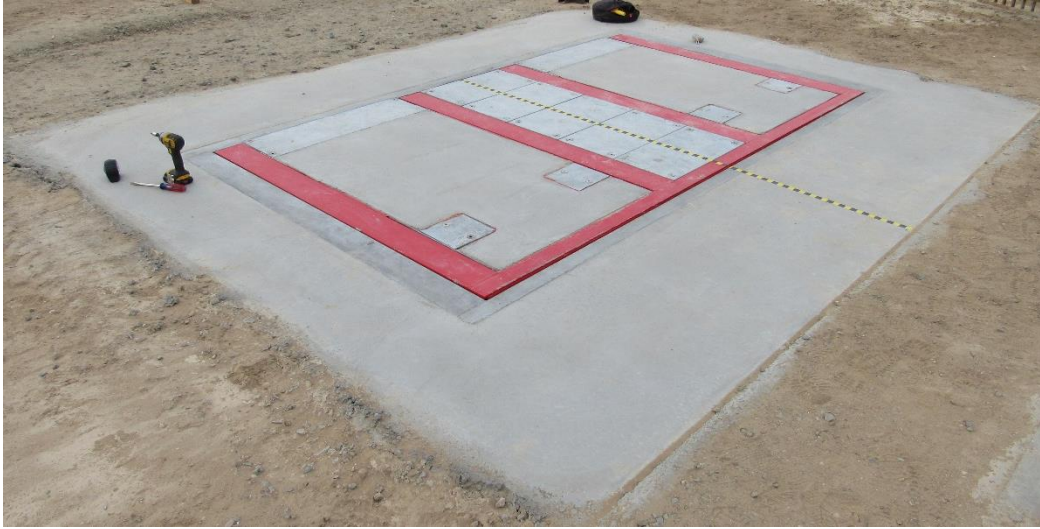


Figure 7 - Finished concrete

4. INITIAL STARTUP PROCESS



On initial startup, it is **MANDATORY** to close off the roadway and clear the Barrier area of nonessential personnel. When the 828 (E, H) Barrier is powered for the first time, all personnel should be located safely away from the roadway and barrier. Barrier movement might be very erratic during initial startup and could result in injury or death if not located safely away from unit.

For model 828E or 828H, see the appropriate supplementary Install Manual for electrical connections, option details and troubleshooting.

Each time the 828 (E, H) is restarted or maintenance is performed, the roadway and personnel should again be cleared to guard against unexpected movement.

4.1.Startup Sequence

- 4.1.1. Disable safety devices and project specific options, such that the unit will be able to cycle up and down without system interference.
- 4.1.2. Check that all remaining electrical or hydraulic connections (if applicable) are tight and correct.
- 4.1.3. Block all roadway traffic. Nonessential personnel should not be located in the Barrier area.
- 4.1.4. Verify the barrier has nothing sitting atop the unit.
- 4.1.5. Using the manual operator of the electric or hydraulic drive, cycle the system enough times to move the barrier upward until the weldments clear the top of the vault.
- 4.1.6. Verify there is no binding or alignment issues.

- 4.1.7. Reverse the operation of the electric or hydraulic drive and move the barrier downward until it sits firmly in the closed position.
- 4.1.8. Turn on power to the unit. Turn on internal circuit breaker.
- 4.1.9. Allow electronic controls to cycle.
- 4.1.10. Provide **OPEN** command for the system.
- 4.1.11. Observe the barrier open. If the barrier does not open, makes a noise when doing so or is slow, consult the troubleshooting guides below for possible causes.
- 4.1.12. Provide **CLOSE** command for the system.
- 4.1.13. Observe the barrier close. If the barrier does not close, makes a noise when doing so or is slow, consult the troubleshooting guides below for possible causes.
- 4.1.14. Make adjustments, if necessary.
- 4.1.15. After adjustments, cycle the unit three (4) more times.

If at any time the unit acts erratically or a problem arises not detailed in the troubleshooting guide, please contact B&B technical support before proceeding.

- 4.1.17. Enable the safety devices and any installed project specific options.
- 4.1.18. Verify the complete sequence of operation per the approved project submittal package.
- 4.1.19. Check that all electrical or hydraulic connections (if applicable) are tight and correct, not pinched or leaking.
- 4.1.20. Commission the unit with appropriate customer.

If any additional support or service is needed during the commissioning, please contact B&B.

5. TROUBLESHOOTING

5.1. Model 828 Troubleshooting Guide

The tables below provide guidance on identifying and correcting any problems with your Model 828 Series wedge vehicle barrier. For model 828E or 828E, please refer to respective manual for more detailed troubleshooting guides referring to the electric actuator or hydraulic pumping unit.

If you encounter problems that you cannot fix, contact B&B ARMR and we will work with you to correct them.

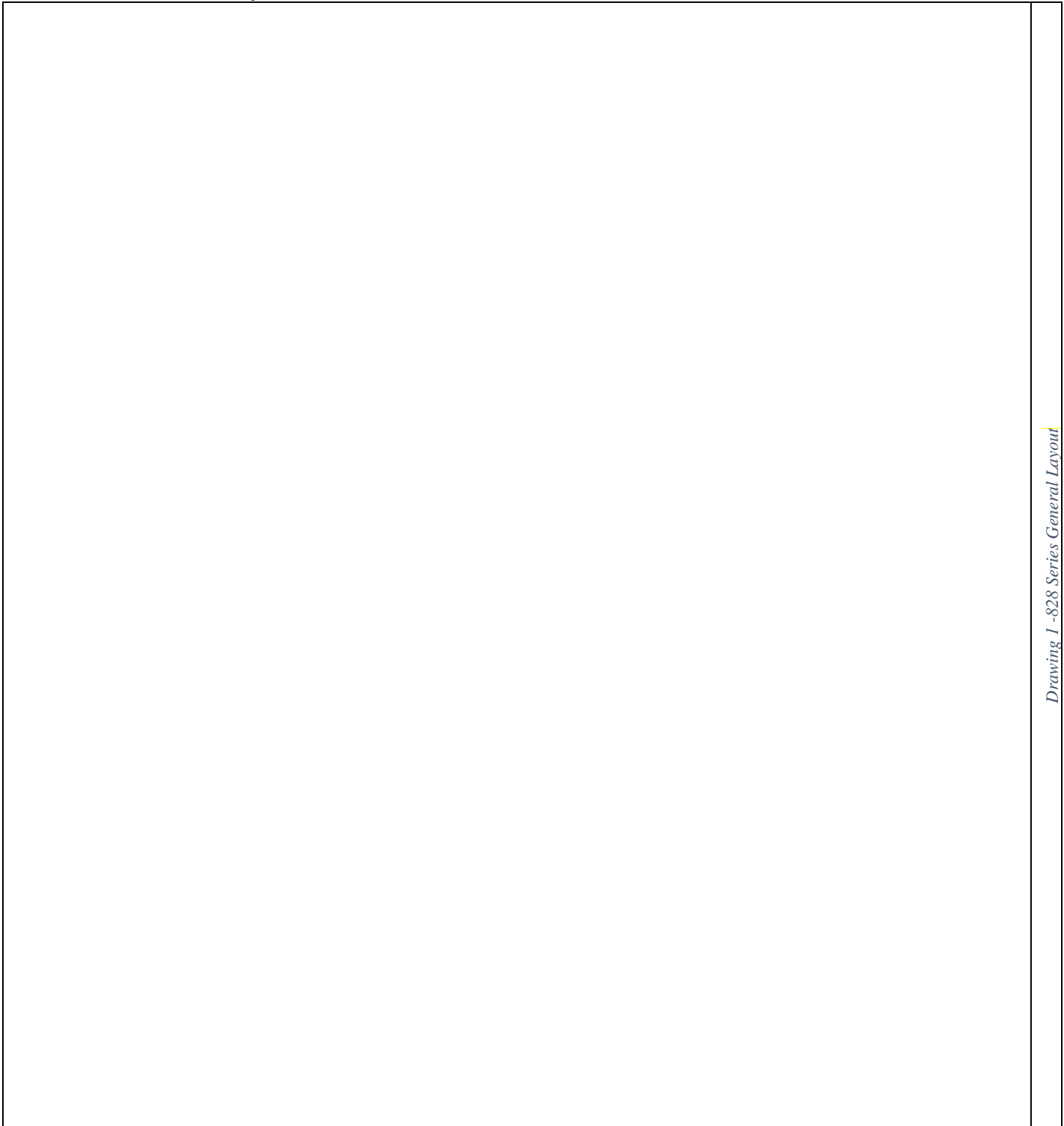
MODEL 828	
Symptom	Actions
Barrier does not raise up when commanded	<ol style="list-style-type: none"> 1. Verify power is supplied to the unit and the circuit breaker is set. 2. Check electrical connections are correct and tight. 3. Check for binding between weldment structures and foundation vault. 4. Cycle circuit breaker or check fuse(s). 5. If using the onboard controls confirm the correct sequence is followed. 6. Verify safety devices are not missing or have activated.
Barrier does not close when commanded	<ol style="list-style-type: none"> 1. Verify power is supplied to the unit. 2. Verify safety devices have not activated. 3. Cycle circuit breaker or check fuse(s). 4. Check electrical connections are correct and tight. 5. If using the onboard controls confirm the correct sequence is followed. (see Electrical unit controls supplement).
Barrier makes noise during operation	<ol style="list-style-type: none"> 1. Check linkage between arm and drive unit. Be sure it is secure and properly lubricated. 2. Check hinge area for debris and proper lubrication. 3. Check bearing grease.
Barrier moves too slowly	<ol style="list-style-type: none"> 1. Check for mechanical binds. 2. Check flow control valve (828H). 3. In extreme cold temperatures, a different hydraulic fluid may be required to keep viscosity constant (828H). 4. If using onboard controls, confirm the correct sequence is followed.

Table 2 – 828(E,H,M) Troubleshooting

6. APPENDIX

6.1. Drawings

6.1.1. General Layout



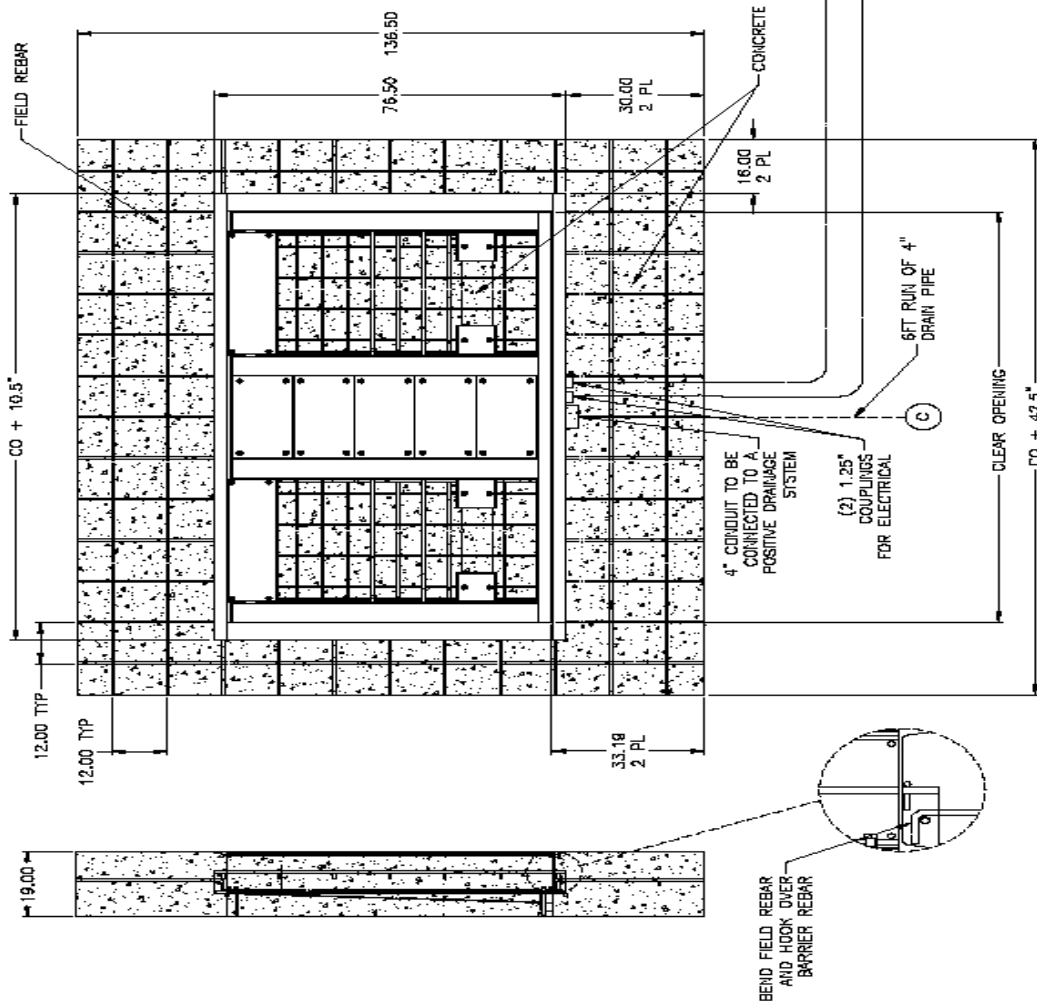
Drawing 1 - 828 Series General Layout

6.1.2. Foundation and Conduit Details

- NOTES:
1. THE CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI IN 28 DAYS. THE CEMENT SHALL BE AS PER ASTM C150. THE MAXIMUM AGGREGATE SIZE SHALL BE 1 INCH. CONCRETE UNDER THE BARRIER TO BE FULLY VIBRATED TO FILL VOIDS.
 2. REINFORCING STEEL SHALL BE #4 (1/2") MINIMUM AND SHALL CONFORM TO ASTM SPECIFICATION A-615, GRADE 60 OR BETTER.
 3. THE FOUNDATIONS SHALL BE POURED ON SOIL CAPABLE OF SUPPORTING A MINIMUM COMPACTION OF 1600 PSF.
 4. CONCRETE LEVEL INSIDE BARRIER TO BE FLUSH WITH TOP OF STEEL BOX FRAME.
 5. FOUNDATION DIMENSIONS AND STRUCTURE ARE CONSIDERED AS A MINIMUM REQUIREMENT. ADDITIONAL STRUCTURE MAY BE ADDED TO CONFORM TO LOCAL APPLICATION REQUIREMENTS.
 6. WIRE SIZE IS DEPENDANT ON ELECTRICAL RUN. IT IS NOT RECOMMENDED COMBINING WIRES IN DIFFERENT WIRE CONDUITS. ALL CONDUITS SUGGESTED IN TABLE ARE MINIMUMS. ALL CONDUITS ARE FIELD INSTALLED BY OTHERS.
 7. NOT ALL OPTIONS SHOWN.

REF	CONDUIT FOR	CONDUIT SIZE	RUN	VOLTAGE
A	SENSORS AND CONTROLS	1.25"	12X 18AWG	240DC
B	POWER FOR ELECTRIC DRIVE	1.25"	2X 10AWG	230VAC
C	GRAVITY DRAIN	4"	-	-

PROTECTED SIDE



ATTACK SIDE

Rev 081516
B&B ARMR
5920 South Lake Forest Dr.
Houston, TX 77050
800-387-0087

MODEL 828 BARRIER
UNSPECIFIED CLEAR OPENING
LAYOUT/FOUNDATION

6.2. Specifications

GENERAL		
TYPE		Shallow Mount Wedge Type Vehicle Arresting Barrier
CRASH RATING:		ASTM F2656-15, M50-P1 15,000 lbs. @ 50 mph (6,803 kg @ 80.5 km/h)
DRIVE SYSTEM		Electromechanical, Hydraulic or Manual
INSTALLATION		
EXCAVATION:		(CO + 42.5")W x 136.5"H x 19"D
SOIL COMPACTION		1,600 PSF Minimum
CONCRETE:		<ul style="list-style-type: none"> Concrete must develop a minimum compressive strength of 4000 PSI. Concrete must conform to American Concrete Institute (ACI) standards. Cement shall be per ASTM C150. Maximum aggregate size is 1" Cubic yards vary per size – refer to submittal package
REBAR:		<ul style="list-style-type: none"> Rebar shall be #4 deformed billet steel per ASTM A615, Grade 60. All joints shall be tied together using #4 ties or welded.
DESIGN		
CLEAR VEHICLE OPENING:		Ranges from 8 to 16 ft. (96 – 192 in. / 2.4 – 4.9 m)
CYCLE TIME:	ELECTRIC	STD. Operation 3-5 sec; Field Configurable
	HYDRAULIC	STD. Operation 3-5 sec; Field Configurable
DUTY CYCLE:		Continuous
OPERATING :	TEMPS	-20 – 140° F (-29 - 60° C)
MATERIALS:	VAULT	Hot dip galvanized Steel
	ATTACK WELDMENT	Hot dip galvanized Steel
ELECTRICAL REQUIREMENTS:	828E	• 115-240 VAC 1Ø; 208-480VAC 3Ø
	828H	• 115-240 VAC 1Ø; 208-480VAC 3Ø
	828M	• N/A
DIMENSIONS:		Project Specific – reference Submittal package
COLOR		Safety Red Enamel Finish – Std.; Other colors available

Limited Warranty

B&B ARMR warranties for a period of one (1) year FOB manufacturing facility, unless otherwise specified by B&B ARMR in writing, from defects due to faulty material or workmanship. Damage due to handling during shipment and installation are not covered under warranty. B&B ARMR assumes no responsibility for service at customer site. B&B ARMR 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. B&B ARMR 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 B&B ARMR 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 B&B ARMR shall be the repair or replacement at B&B ARMR's option, of any defects in the equipment. **IN NO EVENT SHALL B&B ARMR BE LIABLE FOR CONSEQUENTIAL OR SPECIAL DAMAGES OR ANY KIND OF PERSONAL DAMAGES.** Except as provided herein, B&B ARMR makes no warranties or representations to consumer or to anyone else and consumer hereby waives all liability against B&B ARMR 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 B&B ARMR WILL RENDER THE WARRANTY HEREIN AS NULL AND VOID.