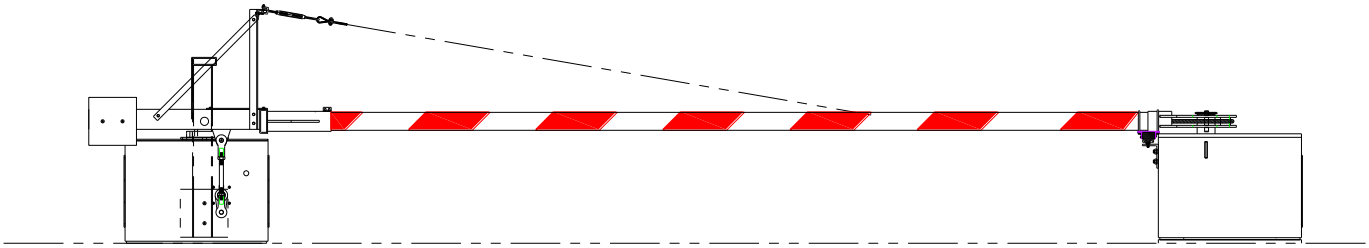
MODEL CR-25E

INSTALLATION MANUAL



B&B ARMR
Corporate Office & Tech Support:
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MADE IN THE USA

INTRODUCTION

Welcome

Congratulations on your purchase of a B&B ARMR warning gate. We have years of experience in all aspects of perimeter security and related disciplines, and our products are used throughout the world to control access and to protect people, equipment, and facilities. Your warning gate is designed to give you years of smooth, trouble-free operation.

In addition to providing detailed operating instructions, this manual describes how to install, maintain, and troubleshoot your vehicle barrier. To make it easy to locate the information you need, we've included a detailed Table of Contents immediately following this Introduction. All of this is important information, so be sure to keep the manual available for reference.

If you need help with any aspect of your vehicle barrier's installation or operation, please contact us. We offer a broad range of vehicle barrier and related security services, so you can also call on us for:

- 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 so on)
- Technical support available by phone or in person with advanced scheduled notice.

Safety

Your safety is important to us. If you have any questions or are in doubt about any aspect of the equipment, please contact us. While B&B ARMR does not assume responsibility for injury to persons or property during installation, operation, or maintenance, we can provide verbal guidance, additional written instructions, or the services of a factory engineer. We're here to help you operate your vehicle barrier safely and effectively.

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:

- Be aware of and 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 experienced staff, properly trained, to install, operate, and maintain the equipment.
- Ensure that all repairs are performed correctly, using properly trained staff and the right tools and equipment.

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:

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

INTRODUCTION.....ii

Welcome ..... *ii*

Safety ..... *ii*

How to Contact Us ..... *iii*

1. INSTALLATION & ADJUSTMENT.....4

1.1 CR-25E Installation Instructions (Reference Drawing: 0025-0050-A)..... 4

1.2 CR-25E Start Up Instructions 6

1.3 Field Balancing Instructions..... 6

1.4 Gate Arm Balancing Instructions..... 7

1.5 Adjusting the Barrier Movement 8

2. SPECIFICATIONS 12

3. ACCESSORIES AND MAJOR COMPONENTS 15

3.1 Housing Assembly – 0025-0050-A 15

3.2 Operator Assembly – 0025-0053-B.....16

3.3 Brake Assembly – 0040-0023-C.....17

3.4 Limit Switch Assembly - 0040-0009-F 18

3.5 Motor Cut Sheet 19

4. SYSTEM DRAWINGS 20

4.1 Installation – 22' Clear Opening 20

4.2 Installation – 14' Clear Opening 21

4.3 Wiring 22

5. WARRANTY..... 23

1. INSTALLATION & ADJUSTMENT

1.1 CR-25E Installation Instructions (Reference Drawing: 0025-0050-A)

NOTE: Failure to install your barrier properly could cause damage to the operating mechanism.

1. Read the instructions and review the drawings thoroughly. If you do not understand any part of these instructions, please contact the manufacturer.

2. Check the anchor bolt locations and prepare the foundation for the barrier. Set the barrier operator and be sure to seal the bottom with duct seal. Housing must be level. Anchor bolts must be tightened evenly.

3. Make sure the local power supply for the motor and control circuit are correct. *Reference the enclosed electrical drawing in the back of the handbook.

IMPORTANT: All conduits must be sealed and the housing grounded.

4. Using the hand crank, turn the drive crank 45 degrees noting rotation of the drive crank should be clockwise.

5. Open main disconnect switch (S1) and connect the power. Connect the control circuit if separate. If power is supplied from the motor circuit, check the connections at the terminals.

NOTE: At this point in the installation, no counterweights or arms should have been installed.

6. "Bump" test barrier operator for correct motor rotation.

NOTE: The drive cranks should rotate upwards toward roadway to raise barrier arm (viewing barrier operator from either drive crank side of the housing).

7. Run barrier operator (without arms or counterweights) through several complete cycles. Leave the barrier operator in the closed to traffic position and open the main disconnect switch.

NOTE: This barrier has been completely assembled and test run through 24 complete cycles under full power at the factory. If satisfactory operation is not displayed in step #7, recheck all electrical connections carefully. CONSULT FACTORY IF PROBLEM IS NOT FOUND.

8. Remove side arm tube cover plate (Item #2). Locate pillow block bearings (Item #12). Do not tighten set screws. Now center assembly with housing. When assembly is correctly centered, tighten bearing set screws.

9. Insert arm, with endlock intact, into the main arm tube base. Push tube far enough to make the cable, connections at the pivot. After cables have been securely bolted to the pivot mechanism, extend arm so that the endlock saddles satisfactorily over the anchor assembly (on the bollard). Slide lock collar into place and tighten allen bolts.

NOTE 6: If endlock fails to line up properly, loosen bearing bolts and rotate laterally. Re-tighten bolts. Now tighten arm base bolts securely. Replace side arm tube cover plate (tighten bolts securely).

10. With the arm in the down position, install the allotted amount of counterweights (Item #3) on the side arm tube assembly. Tighten bolts securely.

11. Close the main disconnect switch (S1) and operate the control circuit. If all connections are made correct, barrier arm will operate to fully up or fully down. The limit switch will automatically stop the motor at the extreme 90-degree movement of the arm.

12. With the barrier in the lowered position, check endlock mechanism for any type of hindrance with bollard post and adjust accordingly if required.

IMPORTANT: IF THREE PHASE POWERE CONNECTIONS TO THE MOTOR ARE REVERSED, THE LIMIT SWITCH WILL AUTOMATICALLY DISCONNECT THE MOTOR WHEN THE DRIVE CRANK HAS ROTATED ABOUT 30 DEGREES IN THE INCORRECT DIRECTION, DEPENDING ON THE POSITION OF THE CONTROLS, i.e., UP OR DOWN. DRIVE CRANK MUST THEN ROTATE BACK TO ORIGINAL (VERTICAL) POSITION USING HANDCRANK, IN ORDER TO RESET BARRIER.

If this problem occurs, phase must be reversed. The limit switch has been set at the factory and should NOT REQUIRE ADJUSTMENT. Arm should be raised or lowered by lengthening or shortening of the connecting rod not by adjustment of the limit switch cams.

1.2 CR-25E Start Up Instructions

NOTE: These instructions assume installation has been completed. If necessary, refer to the enclosed installation instructions.

1. Remove the rear operator door.
2. Connect power by flipping the disconnect switch to the "ON" position.
3. Test operate the barrier to be sure it is functioning properly.

1.3 Field Balancing Instructions

IMPORTANT: EVERY BARRIER IS BALANCED AT THE FACTORY BEFORE IT IS SHIPPED. IF ANY ADDITIONS OR CHANGES ARE MADE TO THE BARRIER ARM IN THE FIELD, THE BARRIER MAY REQUIRE RE-BALANCING. AN UNBALANCED ARM MAY DAMAGE THE OPERATOR.

If any additions or changes are made to the barrier, the following guidelines will help you determine what changes, if any, need to be made to the barrier balance:

1. Make the desired changes to the barrier arm.

2. Secure the tip end of the arm to prevent injury or accident.

3. Disconnect the connecting rod which runs between the upper and lower cranks, this will free the arm to be balanced.

INDICATIONS	PROBLEM	SOLUTION
Barrier arm tends to raise Requires more than 20 lbs. to keep it closed to traffic.	Barrier is counterweight heavy.	1. Counterweights can be removed.
Barrier arm tends to lower Requires more than 20 lbs. to keep it open to traffic.	Barrier is arm heavy.	1. Counterweights can be added.

A properly balanced barrier can be manually operated by one person pushing on the end of the counterweight mounting channel. It should require only 20 lbs. of force to manually operate the barrier. For detailed instructions on balancing the operator with weights, refer to the next page.

1.4 Gate Arm Balancing Instructions

These adjustments are set at the manufacturing facility and should not need to be adjusted in the field unless the arms have been modified, causing the weight of the arm to change.

Calculating Counterweight Requirements

1. Disconnect arm drive by removing top connecting rod bolts located on each side of the operator.
2. Mark any place on the barrier arm and attach a weighing scale to the arm at that point.
3. Measure how much weight, in pounds, it takes to start raising the barrier arm. (arm lbs.)
4. Measure, in inches, the distance from the weight point to the center of the pivot point (arm distance).
5. Measure, in inches, the distance from center of pivot point to center of counterweight (counterweight distance).
6. Follow this formula to get the proper amount of counterweight to add to barrier.

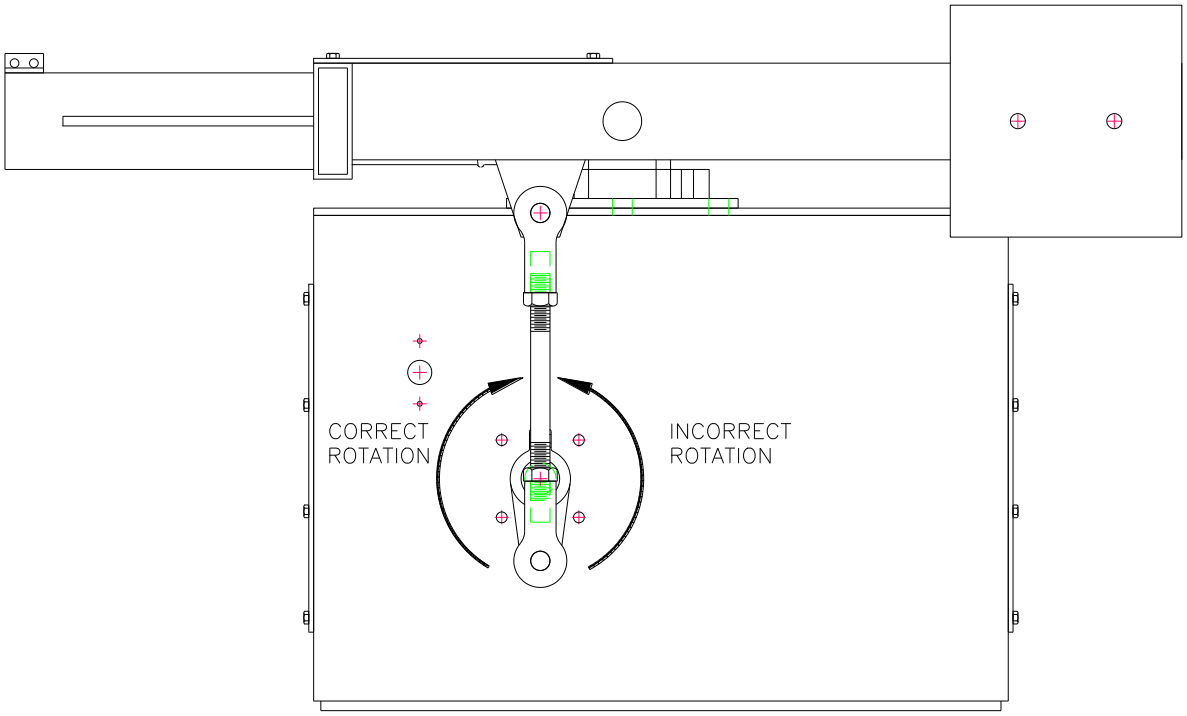
$$\frac{\text{arm lbs. x arm dist.}}{\text{cw dist.}}$$

COUNTERWEIGHT SIZES

12”X12”X1” THICK	**=**	**41 POUNDS**
12”X12”X2” THICK	**=**	**82 POUNDS**

1.5 Adjusting the Barrier Movement

When installing or maintaining a CR-25 barrier, setting the limit switches and connecting rod length properly can be confusing at times. The following instructions are intended to clarify this process. The steps can be broken into two sections, setting crank orientation, and setting barrier starting and stopping points.



SECTION 1: SETTING THE CRANK ORIENTATION AND ROTATION USING THE LIMIT SWITCHES

A standard CR-25 barrier operator with 90 degrees of travel is designed so that the barrier arm accelerates and decelerates smoothly as it pivots. This is achieved through the lengths of the two crank arms. In order to optimize this "sinusoidal" movement, the following steps should be followed when installing the operator.

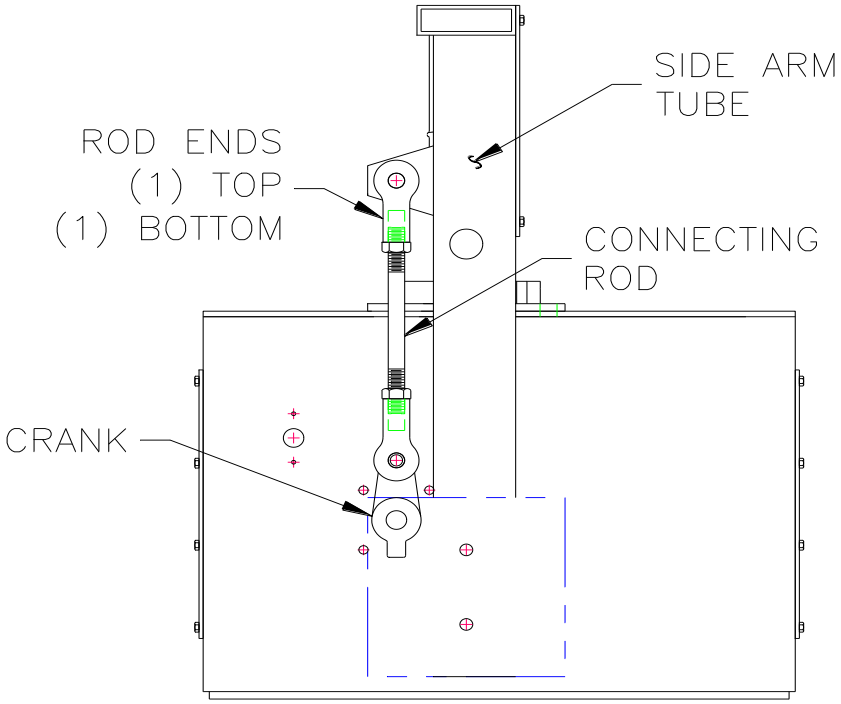
1) Determine the direction of rotation of the cranks. In a standard installation, the cranks pivot toward the motor, and the roadway.

The limit switch cams rotate the same direction that the pivot rotates. Cam 1 is always the raise stop, Cam 2 is always the lower stop, Cam 3 generally controls the arm lights if there are any.

IMPORTANT: Always power down at the main switch before adjusting the limit switches.

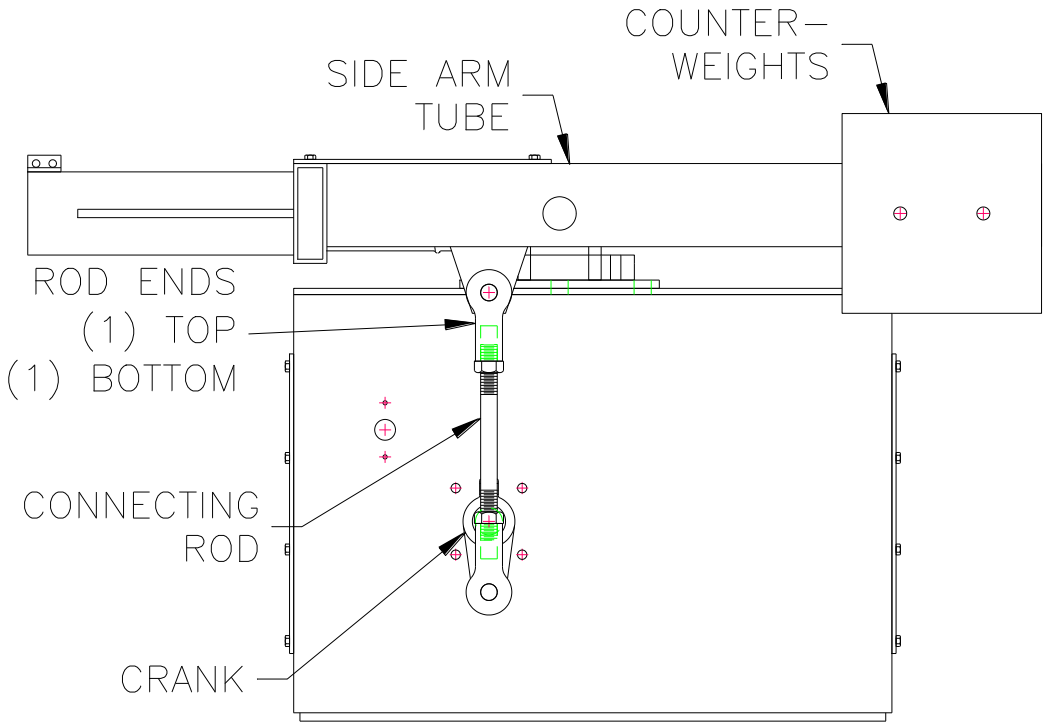
2) Manually rotate the barrier into its fully open to traffic (raised) position by inserting the manual crank onto the shaft extending from the top of the motor and turning it until the barrier reaches the desired position.

Note: At fully open, the connecting rods should be parallel with the sides of the operator and with the cranks. The cranks should be pointing straight up.



3) With an allen wrench loosen the limit switch cams just enough so that they will turn, but not so much that they are loose.

4) Rotate Cam 1 until the limit switch follower just falls off of the edge of the cam. Keep the direction of rotation of the cam in mind as you set it to ensure that when the barrier rotates, the limit switch follower will move back onto the cam.



5) Manually rotate the barrier into its fully closed to traffic position.

Note: At fully closed, the lower drive crank should have rotated through 180 degrees, and should be pointing straight down. The connecting rods should be parallel with the sides of the housing and the cranks.

6) Rotate Cam 2 until the limit switch follower just falls off of the edge of the cam. Keep the direction of rotation of the cam in mind as you set it to ensure that when the barrier rotates, the limit switch follower will move back onto the cam.

7) Re-apply power and run the barrier open and closed. If the cams require more adjustment it is important to disconnect power before moving the limit switch cams. Be sure to re-tighten the limit switch cams once they have been properly set.

NOTE: At this point in the adjustment, the crank orientation is more important than the barrier position. At the fully open and fully closed positions, the connecting rods should be parallel with the sides of the housing, and the drive cranks should point directly up or directly down.

STEP TWO: ADJUSTING THE STOPPING AND STARTING POINTS OF THE BARRIER ARM

If the starting and stopping points of the barrier arm need to be adjusted, this will be done using the connecting rods. This should only be done if the cranks and connecting rods positions are correct as described above.

8) With the barrier in the fully raised or lowered position, loosen the lock nuts on the connecting rods and turn the rods to increase or decrease their length. Adjust the rods until the barrier arm is in the desired position.

NOTE: Adjusting the connecting rods changes both the raised and lowered position by the same amount.

9) Run the barrier through several cycles to ensure proper starting and stopping points.

10) If the barrier panel travels slightly too far in either the open or closed direction, this can be adjusted using the limit switches. It is important to note that adjusting the limit switch at this point will stop the barrier arm before it has fully decelerated.

2. SPECIFICATIONS

APPLICATIONS
The CR-25 Electromechanical Crash Beam Barrier Gate will typically be used as a safety barrier. Typical applications will include embassies, nuclear facilities, "High-Risk" At-Grade crossings, government facilities where safety is an important consideration.

ENERGY ABSORPTION CAPACITY
The manual version of the CR-25 crash beam with 3/4" cable has been successfully crash tested per U.S. Navy specifications (OR-98-09-88 and M-56-86-05 with a level 1/L2 rating) and Department of the Army rating level of KN1-LN2. It is also listed by the U.S. Army Corps of Engineers in their document Protection Against Malevolent Use of Vehicles at Nuclear Power Plants (NUREG/CR-6190 Vol. 2, Rev. 1).

HOUSING
The housing will be fabricated from 3/8-inch steel plate and will be hot dip galvanized after fabrication. Formed, channel shaped side plates will be used to produce a strong configuration without welded corners. The housing will receive a finish coat of aluminum paint.

Access doors will be provided to service the operating mechanism and electrical equipment. The doors will be sealed with neoprene strip gaskets and bolted in place with corrosion-resistant, hex-head bolts.

The housing base will provide twelve 1-1/4 inch holes for mounting on the customer's foundation. Anchor bolts and template will be supplied by the gate manufacturer. Standard anchor bolts size will be 1.125-7 UNC X 2’-9” Long hot dip galvanized.

ARM
The beam arm will be constructed from 4-inch 6061-T6 aluminum pipe which will contain the wire rope assembly. Maximum arm length will be 25 feet.

Dimension "A", Shall be measured from the centerline of the pivot to the centerline of the bollard, will not exceed 322 inches. See Installation drawings for arm lengths.

Gate arms will be covered with 16-inch alternating red and white engineering grade reflective sheeting.

ARM MOUNTING TUBES
Arm mounting tubes will be hot dip galvanized carbon steel. The roadway arm shaft centerline will be 30-1/2 inches above the base line of the gate housing.

COUNTERWEIGHTS
Each gate will be equipped with suitable hot dip galvanized steel counterweights of the sectional, bolt-on type.
ARM SHAFTS

The main arm shaft will be mounted in heavy duty ball bearings. The main arm shaft will be not less than 2 inches in diameter. Shaft material will be ASTM A311 Class B high strength, stressproof steel.

TRANSMISSION
The transmission will be a fully enclosed, all gear, direct drive unit running in an oil bath. The drive train will not use belts or chains and will be connected to the arm shaft with a connecting rod having self-aligning ball ends. The connecting rod will be constructed of ASTM A311 Class B high strength stressproof steel.

During the opening and closing cycles, the gate arm will begin with zero velocity and accelerate smoothly reaching maximum velocity at mid-stroke (45 degrees). The arm will then decelerate smoothly to zero velocity at full stroke (90 degrees) preventing bounce or whip of the arm. Standard operating time to open or close the gate will be 13 seconds. Consult the factory for other available speeds.

MOTOR
A 110V, 1/2HP Single Phase motor will be supplied. The motor will be of the flange mounted type, attached to the transmission case with not less than four bolts. The motor will be of the instant reversing type to permit reversing movement of the arms at any point of travel. Motor data will appear in the manual.

BRAKING MECHANISM
A solenoid release, automatic motor brake will be furnished as part of the gate drive mechanism. The brake will automatically release when the hand crank is inserted to manually operate the gate.

HANDCRANK
A hand crank and drill crank will be included with each gate to operate the gate during power failure. An automatic safety disconnect switch will automatically break the control circuit power when the hand crank is inserted to allow for manual operation.

LIMIT SWITCH
The gate limit switch will be a unit assembly containing eight individual switches having one set of normally open and one set of normally closed contacts each. Contacts will be totally enclosed and will have U.L. rating of not less than 15 amperes at 220 volts AC. Limit switch will be readily accessible and easily replaced with normal hand tools. Each individual switch will be controlled by an independent cam, which will be adjustable with a hex socket cap screw. The limit switch body, shafts and cams will be of corrosion resistant non-ferrous materials.

SAFETY SWITCHES, TERMINAL BLOCKS AND WIRING

To protect operating and maintenance personnel from injury during service or installation, a manual disconnect switch will be furnished, installed and fully wired in the main motor leads. Automatic disconnect switches will be arranged to break the control circuit when either door is opened. Pressure type terminal blocks will be provided and installed inside the housing on the roadway side. All control wires will terminate on these blocks. Each terminal will be clearly labeled and all conductors will be color coded and/or numbered. The wiring diagram will reflect such colors or numbers. A GFI receptacle will be supplied in the gate housing. No conductor will be smaller than #16 AWG stranded. Each housing will contain a laminated electrical schematic secured to the inside of the housing for reference by service personnel.

ENERGY ABSORPTION CABLES

A 7/8-inch diameter galvanized, double-extra improved plow steel 6 x 9 IWRC (independent wire rope center) wire rope will provide the primary vehicle restraint capability of the barrier. The cable will have closed, cad-plated swage sockets on each end. Both ends of the cable will be anchored securely at the operator end of the beam doubling the cable. The cable assembly will be enclosed inside the arm and will form a loop at the end of the beam arm.

CABLE ANCHORING SYSTEM

The cable assembly will be designed to securely engage an anchor post at the arm end on impact. The engaged assembly will be designed to anchor the cable assembly at each end of the beam at all times when the arm is in the closed position to withstand collision loads.

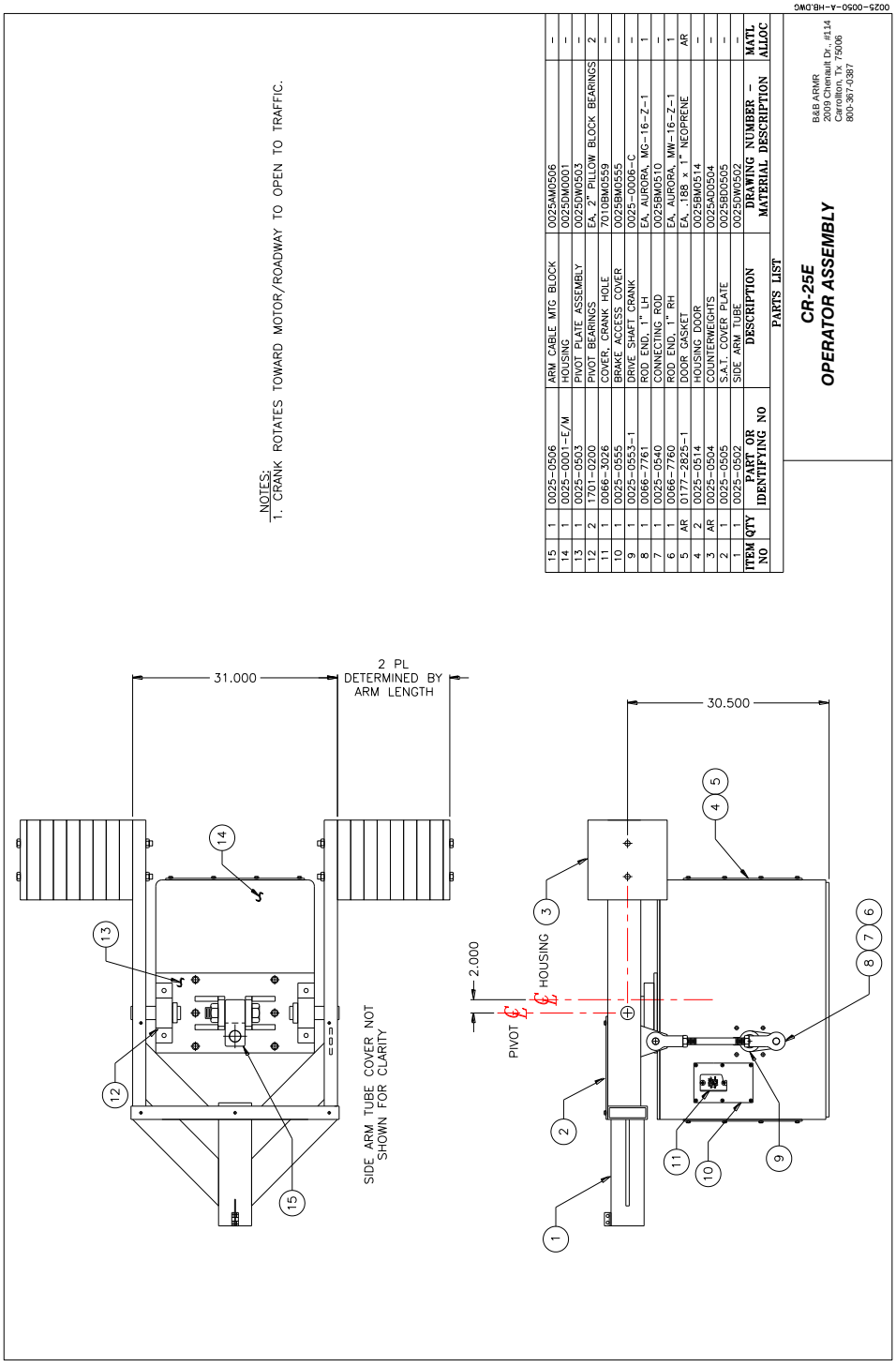
Engagement of the anchoring assemblies at each end will not rely upon any electrical, hydraulic, magnetic or other powered devices. A clevis mounted on the end of the crash beam will be designed to securely and passively engage and lock itself to the bollard upon vehicle impact with the beam.

QUALITY ASSURANCE

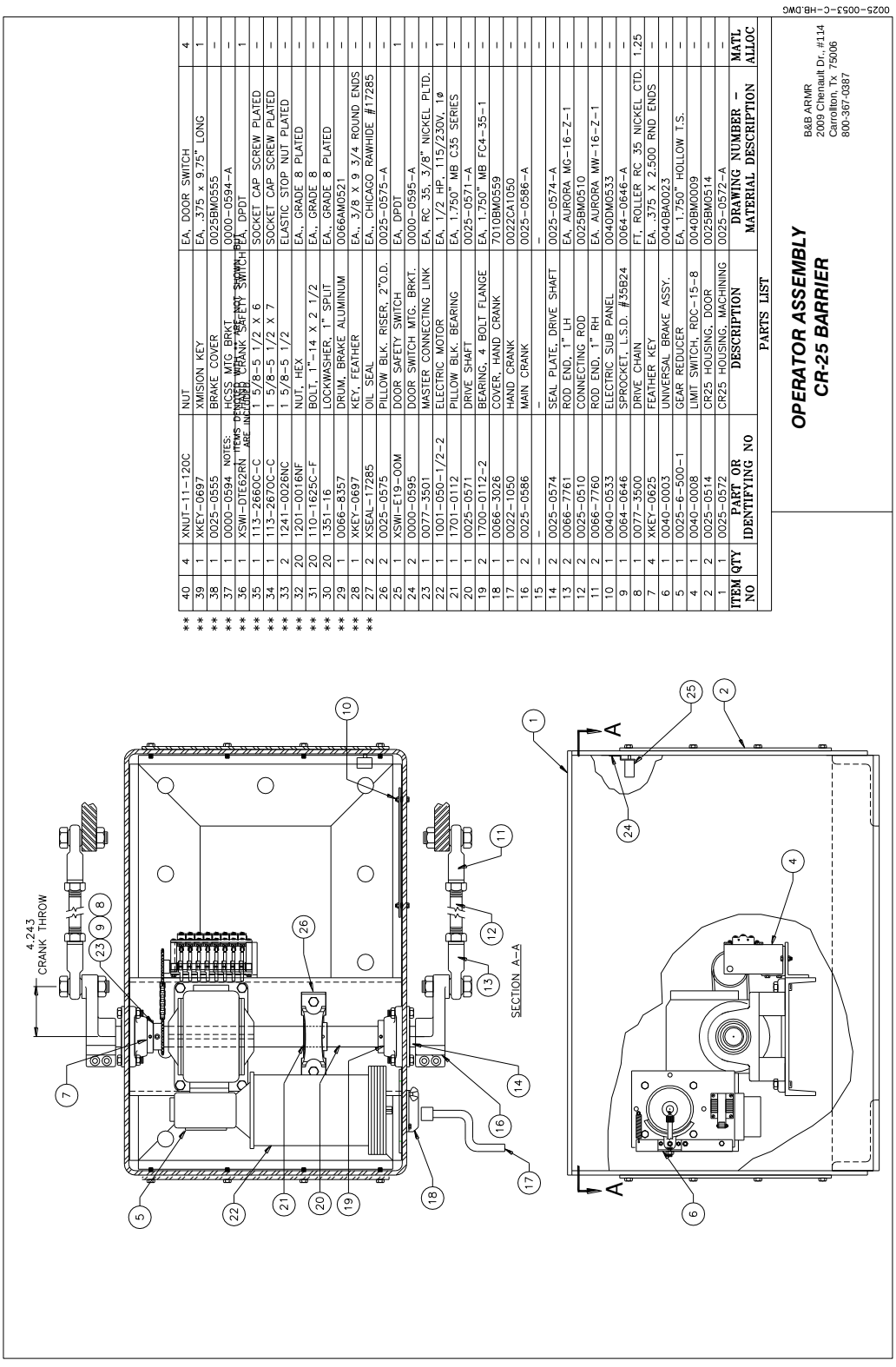
Manufacturer of the traffic control gate operator will have a minimum of five years experience in the manufacture of industrial gate operators and barriers, and will make available replacement parts for 10 years. All gates are individually inspected at time of final assembly and test. Each gate will be tagged "ACCEPTED" upon completion of inspection and “Certification of Testing” will be supplied in the handbook for validation of meeting internal Quality Assurance standards.

3. ACCESSORIES AND MAJOR COMPONENTS

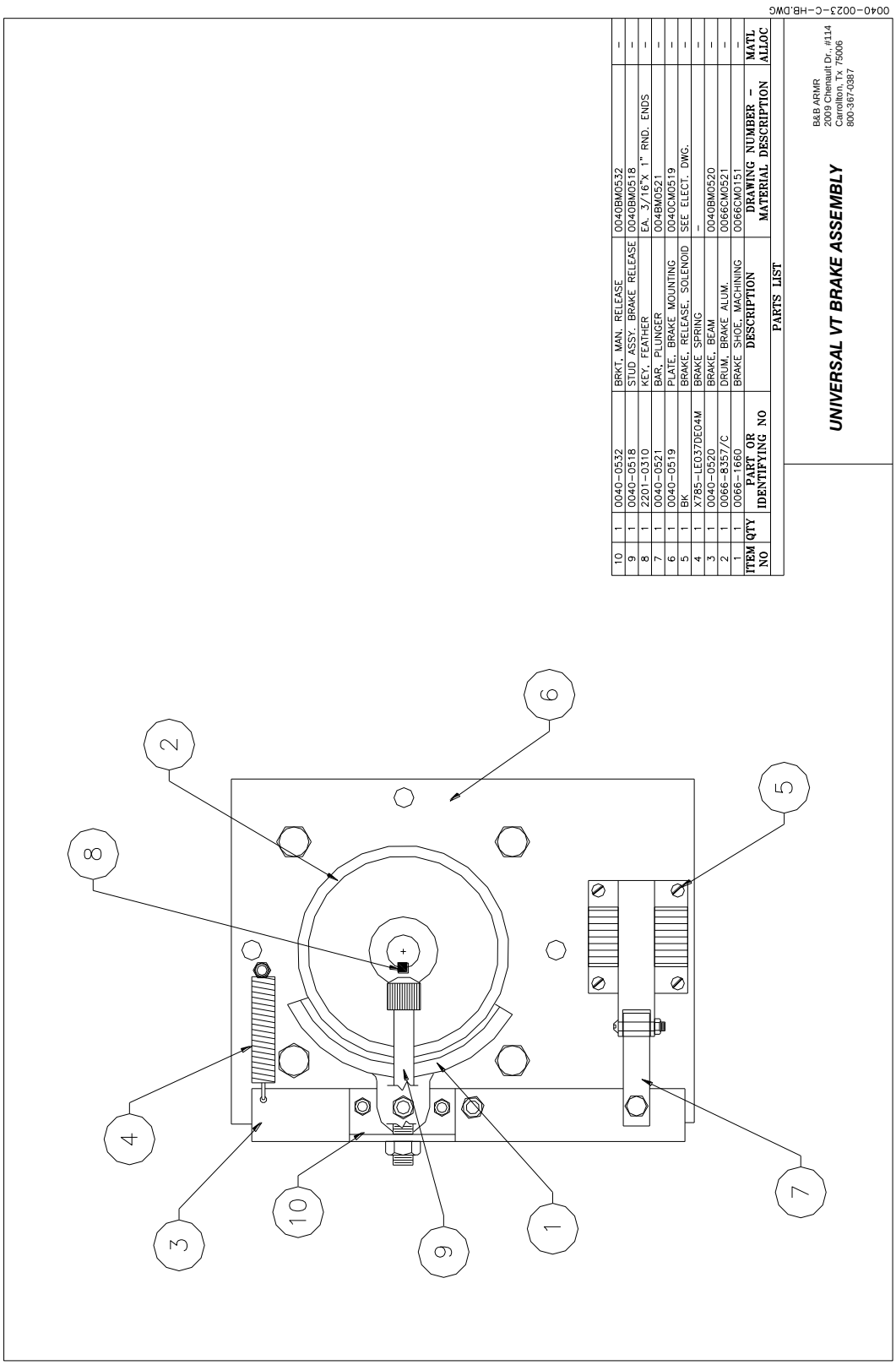
3.1 Housing Assembly – 0025-0050-A



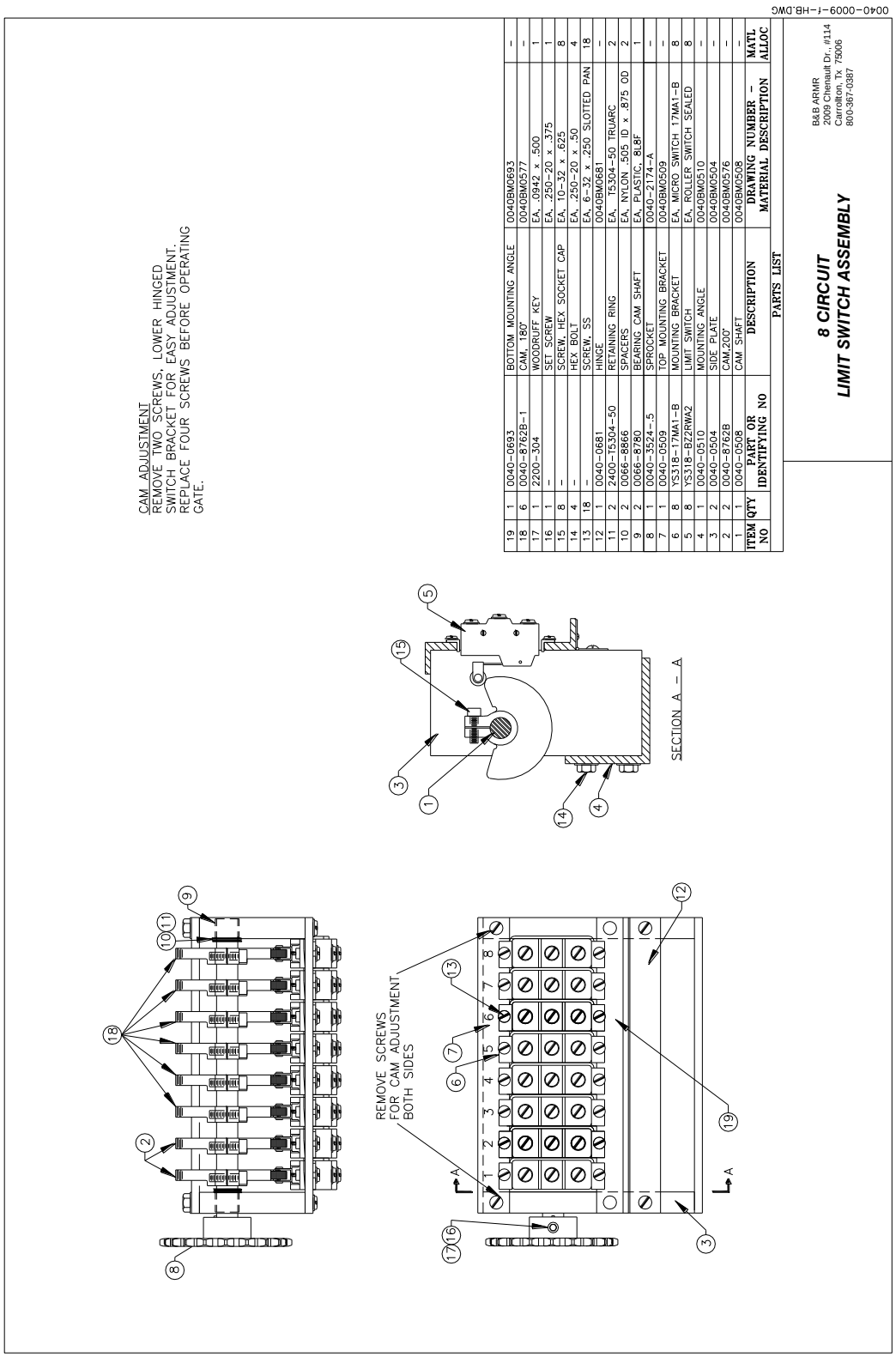
3.2 Operator Assembly – 0025-0053-B



3.3 Brake Assembly – 0040-0023-C

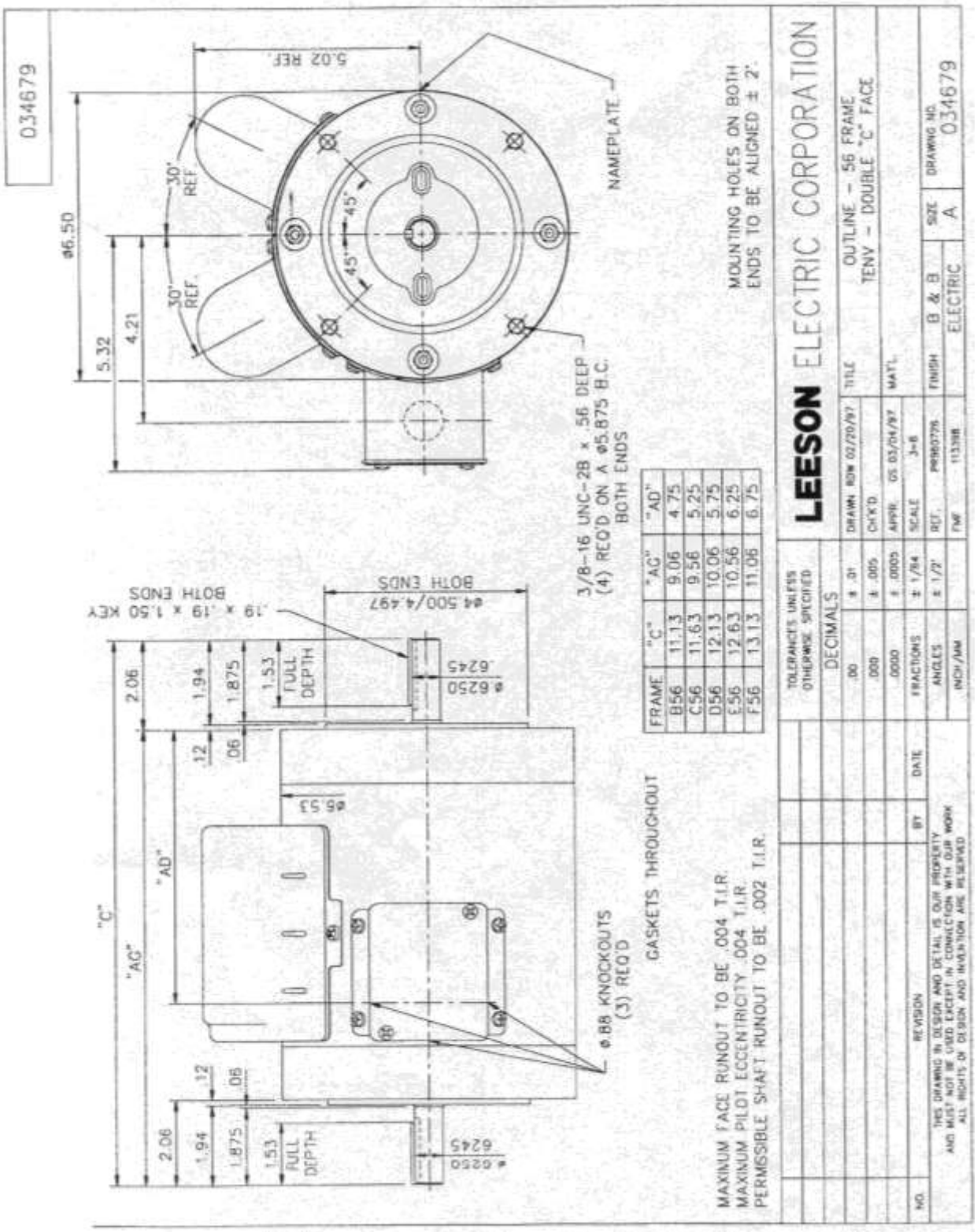


3.4 Limit Switch Assembly - 0040-0009-F



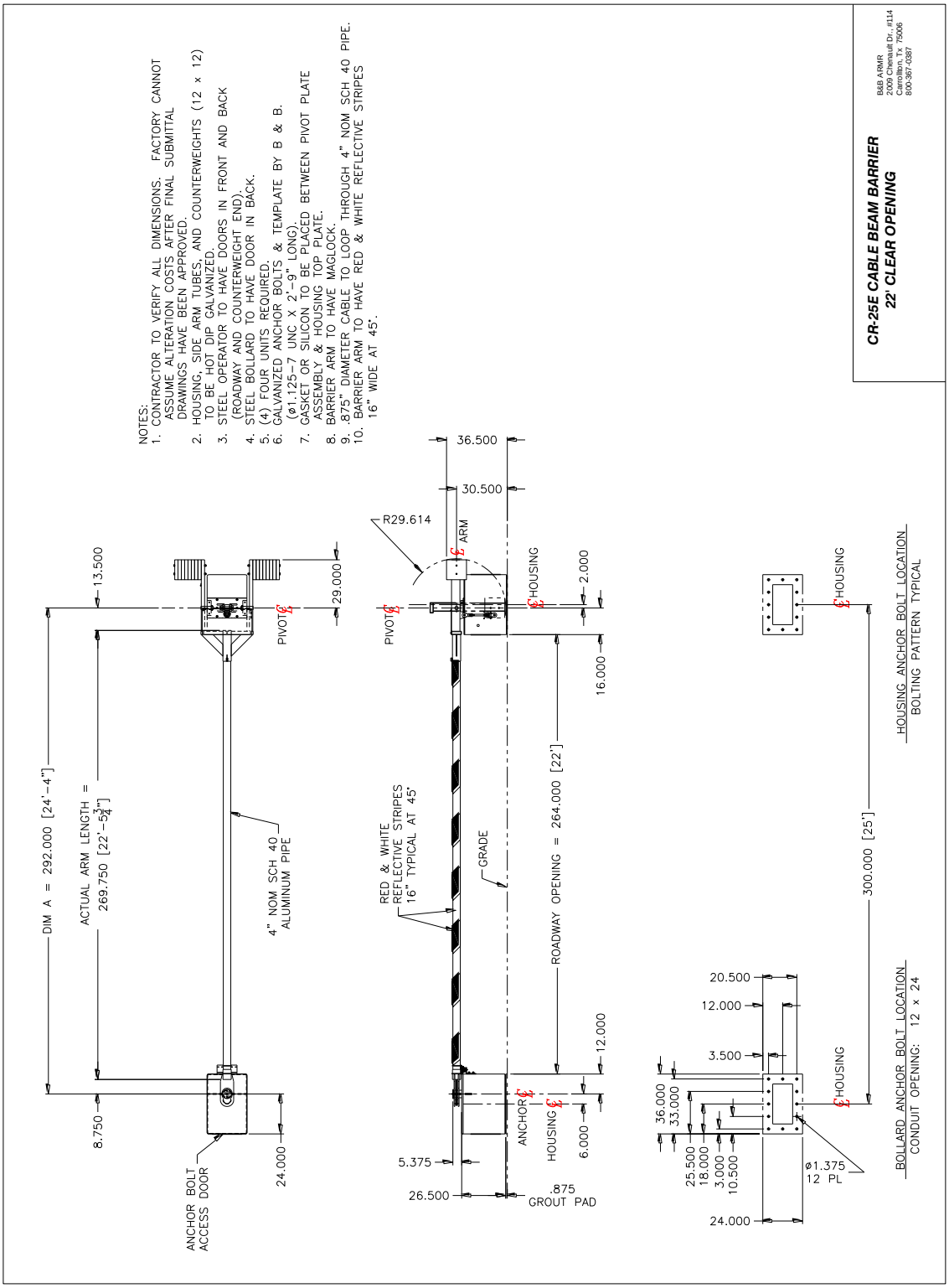
ITEM NO	QTY	PART OR IDENTIFYING NO	DESCRIPTION	DRAWING NUMBER – MATERIAL DESCRIPTION	MATL ALLOC
PARTS LIST					
19	1	0040-0693	BOTTOM MOUNTING ANGLE	0040BM0693	–
18	6	0040-8762B-1	CAM, 180°	0040BM0577	–
17	1	2200-304	WOODRUFF KEY	EA, .0942 x .500	1
16	1	–	SET SCREW	EA, .250-20 x .375	1
15	8	–	SCREW, HEX SOCKET CAP	EA, 10-32 x .625	8
14	4	–	HEX BOLT	EA, .250-20 x .50	4
13	18	–	SCREW, SS	EA, 6-32 x .250 SLOTTED PAN	18
12	1	0040-0681	HINGE	0040BM0681	–
11	2	2400-T5304-50	RETAINING RING	EA, T5304-50 TRUARC	2
10	2	0066-8866	SPACERS	EA, NYLON .505 ID x .875 OD	2
9	2	0066-8780	BEARING CAM SHAFT	EA, PLASTIC, BLBF	1
8	1	0040-3524-5	SPROCKET	0040-2174-A	–
7	1	0040-0509	TOP MOUNTING BRACKET	0040BM0509	–
6	8	YS318-17MA1-B	MOUNTING BRACKET	EA, MICRO SWITCH 17MA1-B	8
5	8	YS318-BZ2RWA2	LIMIT SWITCH	EA, ROLLER SWITCH SEALED	8
4	1	0040-0510	MOUNTING ANGLE	0040BM0510	–
3	2	0040-0504	SIDE PLATE	0040BM0504	–
2	2	0040-8762B	CAM,200°	0040BM0576	–
1	1	0040-0508	CAM SHAFT	0040BM0508	–

3.5 Motor Cut Sheet

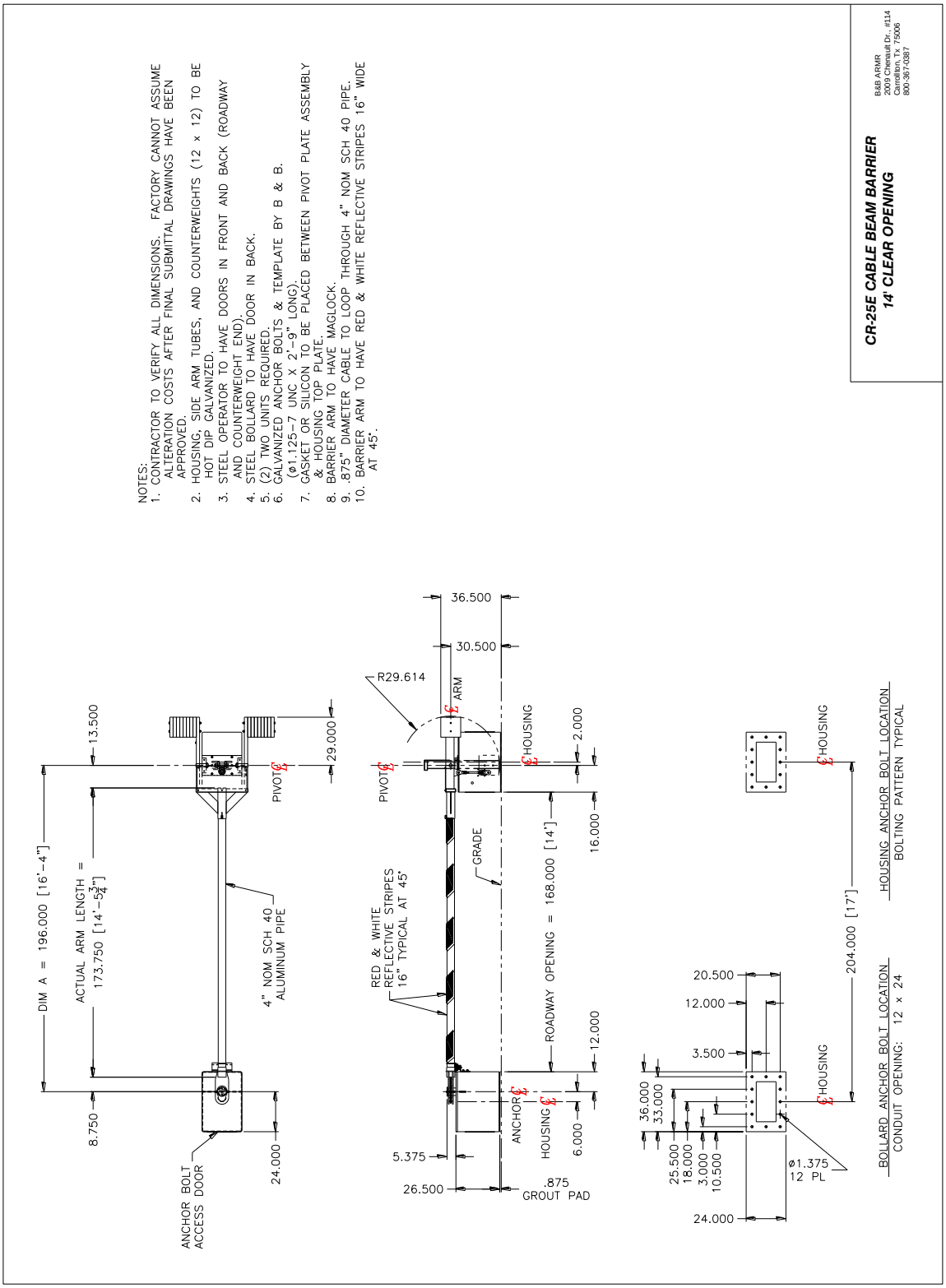


4. SYSTEM DRAWINGS

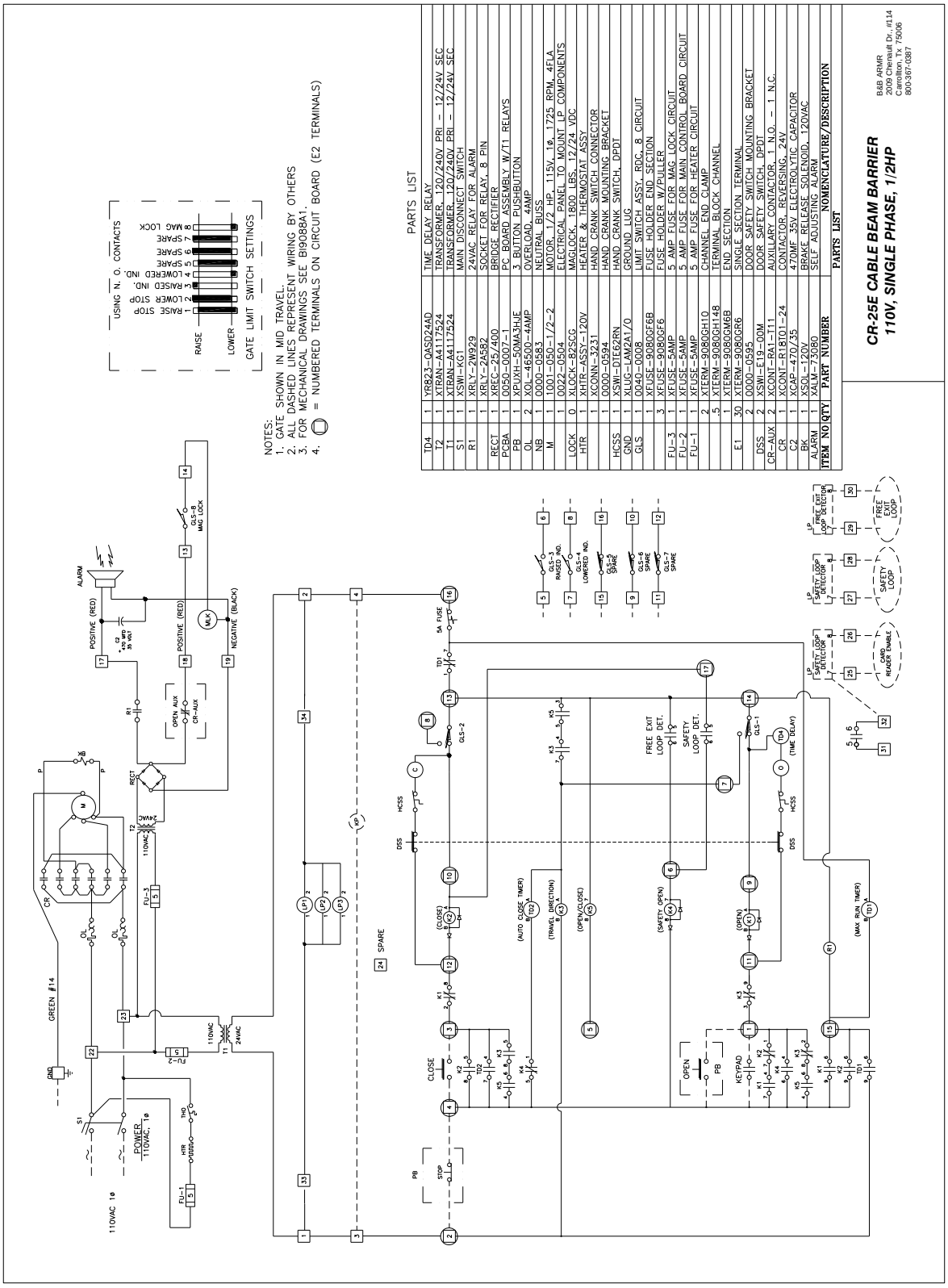
4.1 Installation – 22' Clear Opening



4.2 Installation – 14' Clear Opening



4.3 Wiring


CR-25E CABLE BEAM BARRIER
110V, SINGLE PHASE, 1/2HP
B&B ARMR
2009 Chenault Dr. #114
Carrollton, Tx 75006
800-367-0387
PARTS LIST
ITEM NO QTY PART NUMBER NOMENCLATURE/DESCRIPTION
TD4 1 YR823-0ASD24A0 TIME DELAY RELAY
T2 1 XTRAN-A4117524 TRANSFORMER, 120/240V PRI - 12/24V SEC
T1 1 XTRAN-A4117524 TRANSFORMER, 120/240V PRI - 12/24V SEC
S1 1 XSWI-KG1 MAIN DISCONNECT SWITCH
R1 1 XRLY-2W929 24VAC RELAY FOR ALARM
1 XRLY-2A582 SOCKET FOR RELAY, 8 PIN
RECT 1 XREC-25/400 BRIDGE RECTIFIER
PCBA 1 0050-0007-1 PC BOARD ASSEMBLY W/T1 RELAYS
PB 1 XPUXH-5OMA3HJE 3 BUTTON PUSHBUTTON
OL 2 XOL-46500-4AMP OVERLOAD, 4AMP
NB 1 0000-0583 NEUTRAL BUSS
M 1 1001-050-1/2-2 MOTOR, 1/2 HP, 115V, 1Ø, 1725 RPM, 4FLA
1 0022-0504 ELECTRICAL PANEL TO MOUNT LP COMPONENTS
LOCK 0 XLOCK-825CG MAGLOCK, 1800 LBS, 12/24 VDC
HTR 1 XHTR-ASSY-120V HEATER & THERMOSTAT ASSY
1 XCONN-3231 HAND CRANK SWITCH CONNECTOR
1 0000-0594 HAND CRANK MOUNTING BRACKET
HCSS 1 XSWI-DTE62RN HAND CRANK SWITCH, DPDT
GND 1 XLUG-LAM2A1/0 GROUND LUG
GLS 1 0040-0008 LIMIT SWITCH ASSY, RDC, 8 CIRCUIT
1 XFUSE-9080GF6B FUSE HOLDER END SECTION
3 XFUSE-9080GF6 FUSE HOLDER W/PULLER
FU-3 1 XFUSE-5AMP 5 AMP FUSE FOR MAG LOCK CIRCUIT
FU-2 1 XFUSE-5AMP 5 AMP FUSE FOR MAIN CONTROL BOARD CIRCUIT
FU-1 1 XFUSE-5AMP 5 AMP FUSE FOR HEATER CIRCUIT
2 XTERM-9080GH10 CHANNEL END CLAMP
5 XTERM-9080GH148 TERMINAL BLOCK CHANNEL
1 XTERM-9080GM6B END SECTION
E1 30 XTERM-9080GR6 SINGLE SECTION TERMINAL
2 0000-0595 DOOR SAFETY SWITCH MOUNTING BRACKET
DSS 2 XSWI-E19-00M DOOR SAFETY SWITCH, DPDT
CR-AUX 2 XCONT-RA1-T11 AUXILLARY CONTACTOR, 1 N.O. - 1 N.C.
CR 1 XCONT-R18T01-24 CONTACTOR, REVERSING, 24V
C2 1 XCAP-470/35 470MF 35V ELECTROLYTIC CAPACITOR
BK 1 XSOL-120V BRAKE RELEASE SOLENOID, 120VAC
ALARM 1 XALM-7308O SELF ADJUSTING ALARM
NOTES:
1. GATE SHOWN IN MID TRAVEL.
2. ALL DASHED LINES REPRESENT WIRING BY OTHERS
3. FOR MECHANICAL DRAWINGS SEE BI9088A1.
4. = NUMBERED TERMINALS ON CIRCUIT BOARD (E2 TERMINALS)
GATE LIMIT SWITCH SETTINGS
LOWER
RAISE
USING N. O. CONTACTS
RAISE STOP
LOWER STOP
RAISED IND.
LOWERED IND.
SPARE
SPARE
SPARE
MAG LOCK
POWER 110VAC, 1Ø
110VAC 1Ø
GREEN #14
GND
ALARM
POSITIVE (RED)
NEGATIVE (BLACK)
MLK
OPEN AUX
CR-AUX
RECT
CR
OL
HTR
THO
T1
T2
24VAC
110VAC
SPARE
CLOSE
OPEN
STOP
PB
KEYPAD
SAFETY LOOP DET.
FREE EXIT LOOP DET.
(AUTO CLOSE TIMER)
(TRAVEL DIRECTION)
(OPEN/CLOSE)
(SAFETY OPEN)
(OPEN)
(MAX. RUN TIMER)
(TIME DELAY)
5A FUSE
MAG LOCK
RAISED IND.
LOWERED IND.
SPARE
SPARE
SPARE
SAFETY LOOP DETECTION
CARD READER ENABLE
FREE EXIT LOOP DETECTION
FREE EXIT LOOP

5. WARRANTY

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