

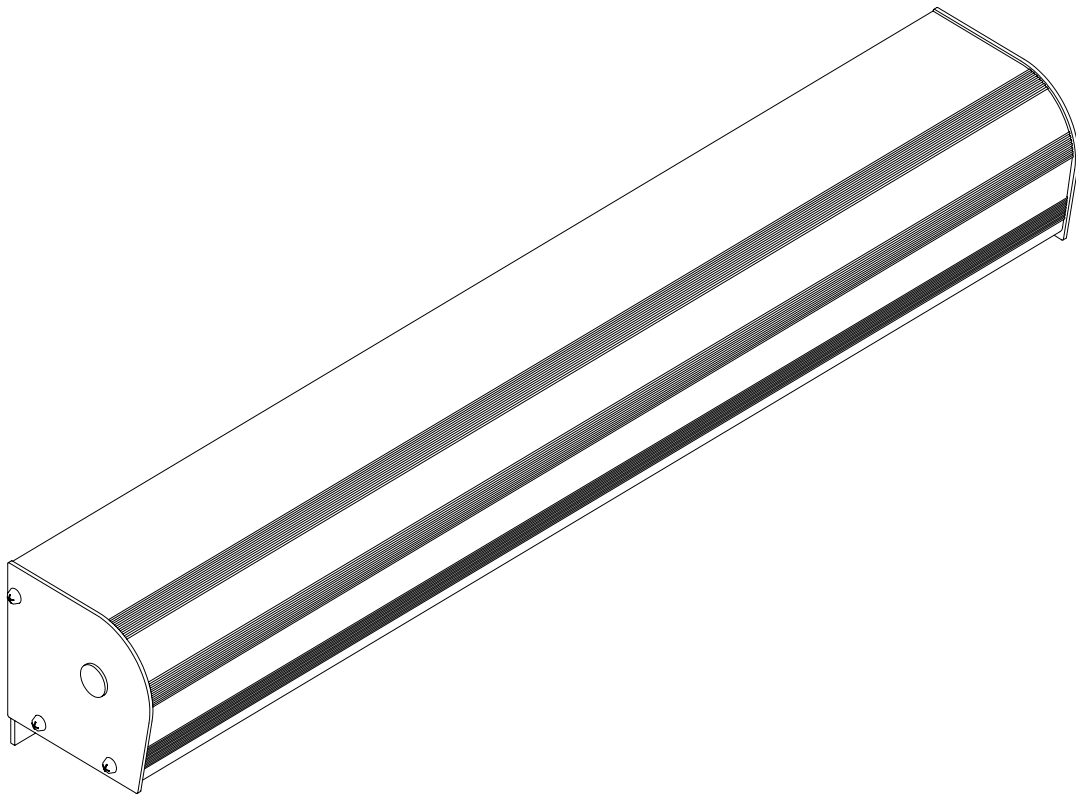


Automatic Entrance Systems

Magnum Board II.
(New Casting)

NABCO ENTRANCES Inc.
S82 W18717 Gemini Drive
P.O. Box 906
Muskego, WI 53150
Phone: 877-622-2694
Fax: 888-679-3319
Technical Assistance: 866-622-8325
www.nabcoentrances.com
Email: info@nabcoentrances.com

Model 710 Swing Door System Low Energy Operator



WARNING

Do not install, operate or service this product unless you have read and understand the Safety Practices, Warnings, Installation and Operating Instructions contained in this manual. Failure to do so may result in property damage, or bodily injury.

Part Number 1210279
September 30, 2003 Revision

INSTALLATION MANUAL

CAUTION:

Read these safety practices before installing, operating or servicing the automatic door. Failure to follow these practices may result in serious consequences.

Read, study and understand the operating instructions contained in or referenced in this manual before operating. If you do not understand the instruction, ask the installing qualified technician to teach you how to use the door.

This manual and the owners' manual must be given to and retained by the purchasing facility or end user.

- 1. If the door appears broken or does not seem to work correctly, it should be immediately removed from service and a qualified service technician contacted for corrective action.**
- 2. Disconnect power at the fused disconnect during all electrical or mechanical service. When uncertain whether power supply is disconnected, always verify using a voltmeter.**
- 3. All electrical troubleshooting or service must be performed by qualified electrical technicians and must comply with all applicable governing agency codes.**
- 4. It is the responsibility of the installing door technician to install all warning and instructional labels in accordance with ANSI A156.19.**
- 5. It is the responsibility of the purchasing facility or end user to keep warning and instructional labels and literature legible, intact and with the door.**
- 6. Replacement labels and literature may be obtained from local NABCO Entrances Inc. distributors. If the name of the local distributor is unknown, contact NABCO Entrances Inc. at (877-622-2694) for assistance.**
- 7. Do not place finger or uninsulated tools inside the electrical control box. Touching wires or other parts inside the enclosure may cause electrical shock, serious injury or death.**

Contents

| | | |
|------------|---|----------------|
| A. | Note to Installer/Overview | 4 |
| B. | Installation and Adjustments | 5 |
| C. | Handing Requirements | 6 - 7 |
| D. | Inswing and Outswing Arms | 7 |
| E. | Hardware Kit List | 8 |
| F. | Drilling Frame and Door | 9 |
| G. | Installation of Arm | 10 - 13 |
| H. | Fastening Outswing Shoe & Inswing Track to Door | 14 |
| I. | Installation Details, Right Hand Outswing Butt Hinge | 15 |
| J. | Installation Details, Right Hand Outswing Center Pivoted | 16 |
| K. | Installation Details, Left Hand Inswing Butt Hinge | 17 |
| L. | Installation Details, Left Hand Inswing Center Pivot | 18 |
| M. | Installation of Doorstop | 19 |
| N. | Hydraulic Closer | 19 |
| O. | Setting Back Check and Door Closed Switches | 20 - 28 |
| P. | Electrical Power | 29 |
| Q. | Wiring Connectors (Control Board) | 29 |
| R. | Basic Wiring Diagram | 31 |
| S. | Simultaneous Pair Installations | 32 |
| T. | Tuning for Performance | 32 |
| U. | Adjustments (Potentiometers & Dip Switches) | 33 - 36 |
| V. | Control Switches | 37 |
| W. | Signage | 37 |
| X. | Troubleshooting | 38 |
| Y. | Appendix A (Excerpts from ANSI/BHMA A156.19 – 1997) | 39 - 40 |
| Z. | Wiring Diagram for Wall Switch | 41 |
| AA. | Wiring Diagram for Simultaneous Pairs | 42 |
| BB. | Wiring Diagram for Radio Activation | 43 |
| CC. | Wiring Diagram for 5 Wire Radio Receiver and Electric Strike | 44 |
| DD. | Wiring Diagram for 3 Wire Radio Receiver and Electric Strike | 45 |
| EE. | Wiring Diagram for Electric Strike and Fire Alarm System | 46 |
| FF. | Transformer Installation and Wiring for 240 Volts | 47 |

To The Installer

The purpose of this manual is to familiarize the purchaser with the proper installation and operation of this system. It is essential that this equipment be properly installed and operational before the door is used by the public. It is the purchaser's responsibility to inspect the operation of the entrance system to be sure it complies with any applicable standards. In the United States, ANSI Standard 156.19 usually covers this type of door. Other local standards or codes may apply. Use them in addition to the ANSI Standard. The GT 710 is listed with the Underwriters Laboratory and is identified as such on the label.

Instruct the building owners/operator on the essentials of the operation of the door and this device. The owner should follow these instructions to determine whether the door is operating properly and should immediately call for service if there is any malfunction.

All installation changes and adjustments must be made by qualified, NABCO trained technicians.

Overview

The GT 710 Low Energy Operator is designed to be installed after the door frame is securely in place. Swing door movement is accomplished using the NABCO GT 710, controlled by the NABCO Magnum Controller. This combination offers several control features to accommodate most installation options.

This manual offers step-by-step instructions to install the GT 710 and make necessary adjustments on the Magnum Controller. Also included is a troubleshooting section and optional wiring diagrams.

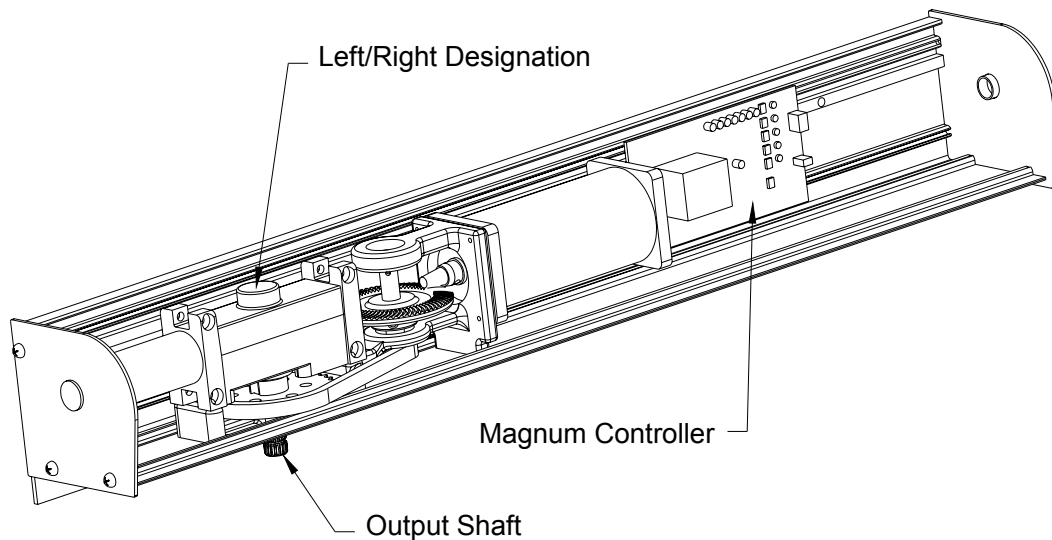


Figure 1 – Overview of GT 710

Specifications

| | |
|---|--|
| Power Input | 120 (±10%) AC 50-60 Hz, 10 Amps |
| Available current for Accessories | 0.5 Amps 24 Volts AC |
| Available Wire Size for Incoming Power | 14 AWG |
| Minimum Frame Face for Mounting | 1 3/4" (44 mm) |
| Minimum Clearance from Top of Door to Ceiling | 7" (178 mm) |
| Door Hinge Requirements | 3/4" Butt, Offset Pivot, or Center Pivot |
| Door Thickness | 1 3/4" (44 mm) Minimum |
| Door Width | Specify When Ordering |

- Door stop is included and always required.
- Electrical conduit and switch or sensor wires should be pulled through the frame before mounting the GT 710.
- Remove the “PUSH DOOR TO OPERATE” portion of the handicap label if the “Push-N-Go” feature is not being used. (See **Figure 2**).

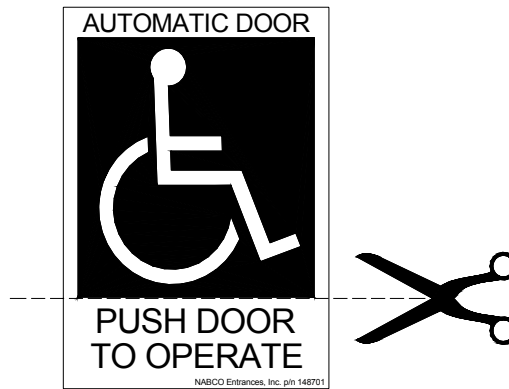


Figure 2 – Door Sticker, Modified.

Installation and Adjustments

The label on the GT 710 will help identify the unit. It is located on the underside of the unit near the output shaft. The label provides important information, including manufacturing date which is necessary for warranty claims. See Page 44 for additional information on the warranty.

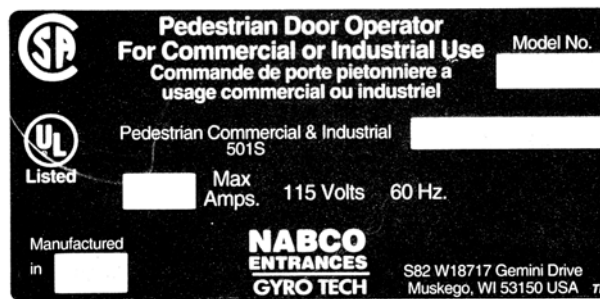


Figure 3 – Product Label

Handing Requirements

The type of door will determine whether a left-hand or a right-hand operator is required. **Figure 4** can be used to determine which unit is required.

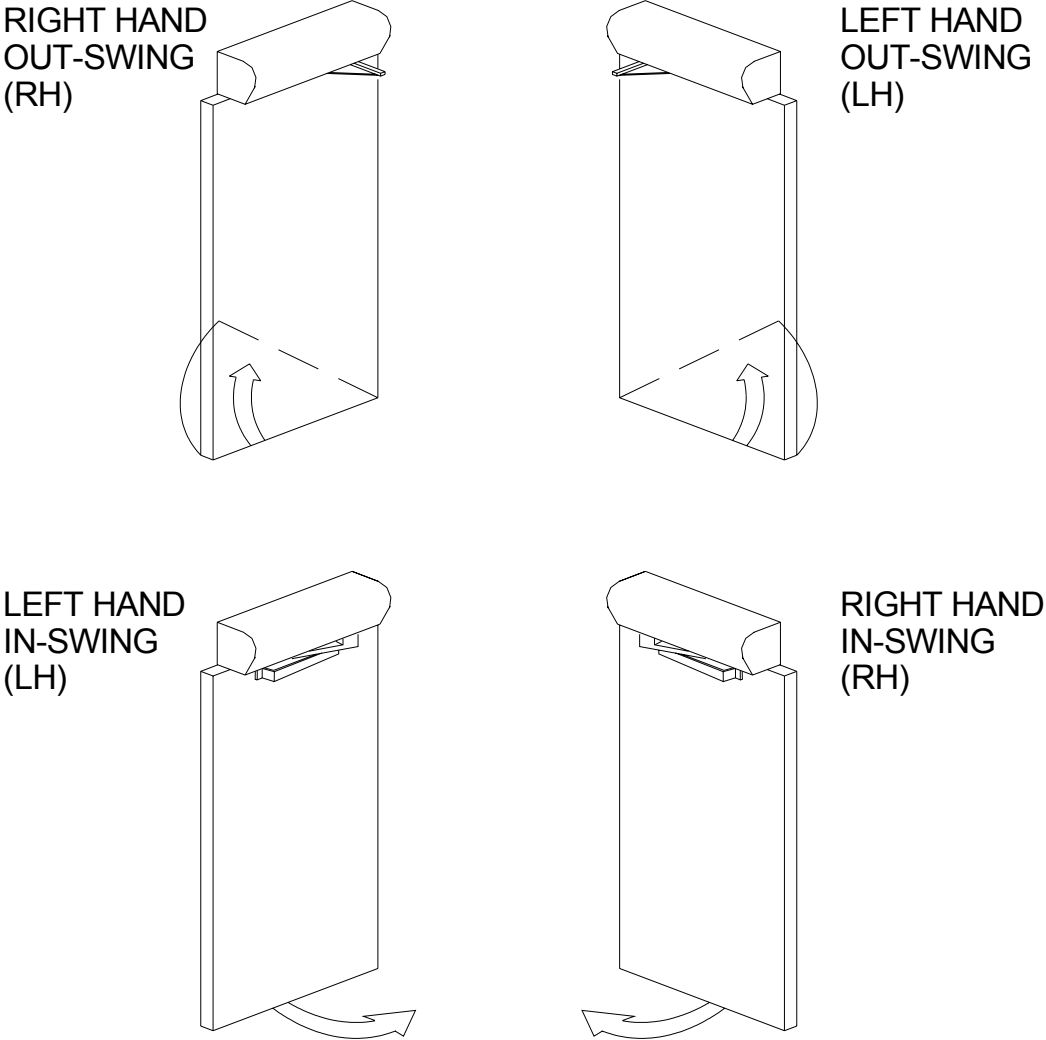


Figure 4 – Determine the Swing (Hand) of the Door.

Note: The hand of the unit and the hand of the door must be the same. The hand of the unit is not reversible and cannot be converted in the field.

To verify that your unit is right or left handed, look for “R” or “L” on the hydraulic closer (**Figure 1**).

Before starting installation, verify that the door swings freely throughout the full opening and closing range of movement. Check for minimum clearance of 7” (177 mm) from the top of the door to the ceiling and minimum of 1 3/4” (44 mm) frame face. The door frame should be properly reinforced and well anchored in the wall. Non-reinforced, hollow metal frames should be fitted with 1/4-20 blind rivnuts furnished by installer.

Figures 5 and 6 show the three swing arm assemblies. Use the assembly that suits the installation.

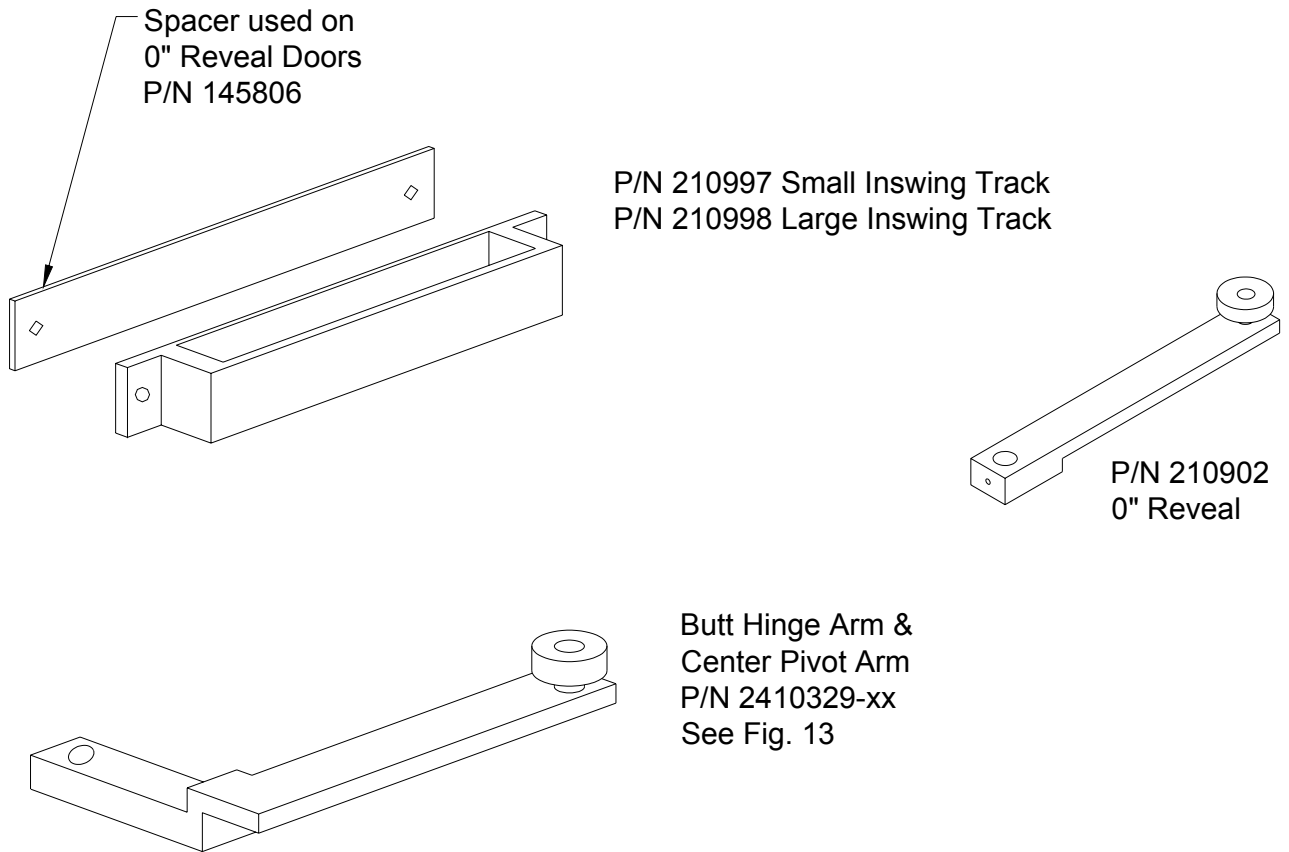


Figure 5 – Inswing Arm and Track Assemblies

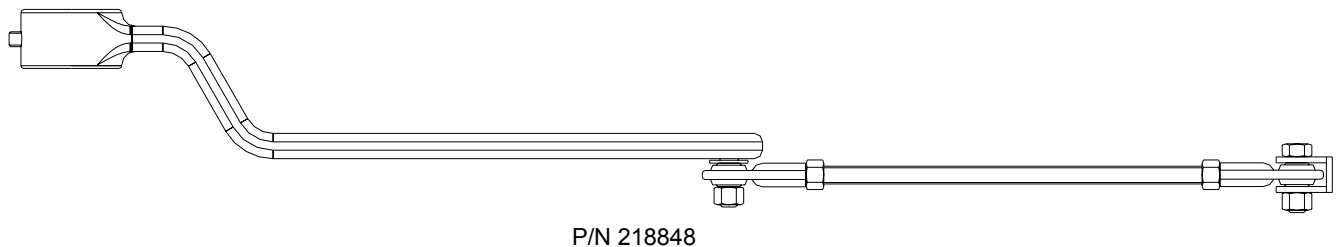
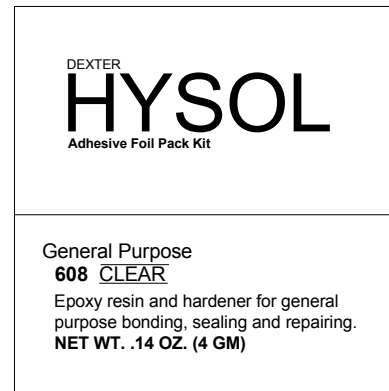
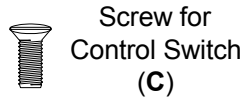
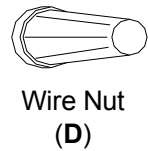
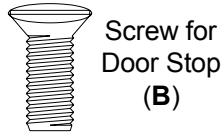
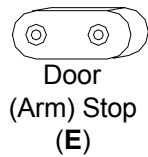


Figure 6 – Outswing Arm Assembly

This unit has been shipped with the following installation hardware.
Parts Kit – P/N 12-5662 (figure 7):

| Item | Quantity | Description | Part Number |
|------|----------|----------------------------|-------------|
| A | 1 | 3/32" Hex Wrench | 146583 |
| B | 2 | Screws for Door Stop | 244941-04 |
| C | 2 | Screws for Control Switch | 240011-104 |
| D | 2 | Wire Nuts | 141218 |
| E | 1 | Door (Arm) Stop | 145892 |
| F | 1 | Epoxy Package w/Stir Stick | 149944 |
| G | 2 | Magnets | 149943 |
| H | 8 | Assorted Decals | |



Epoxy and Stir Stick (F)



Assorted Decals (H)

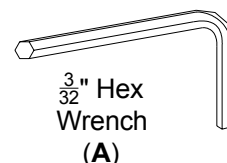
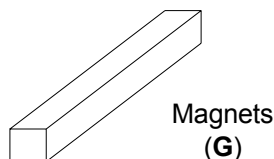
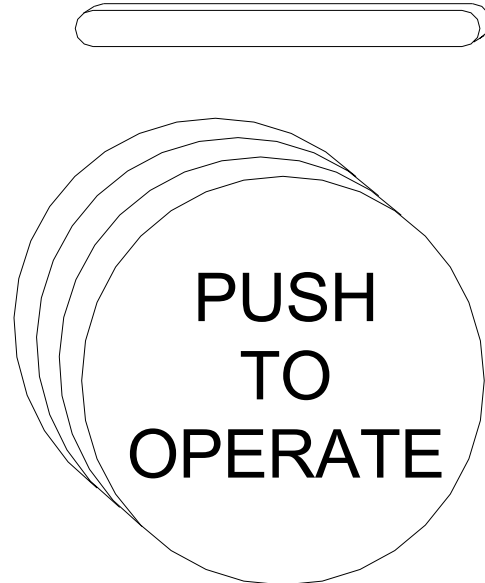
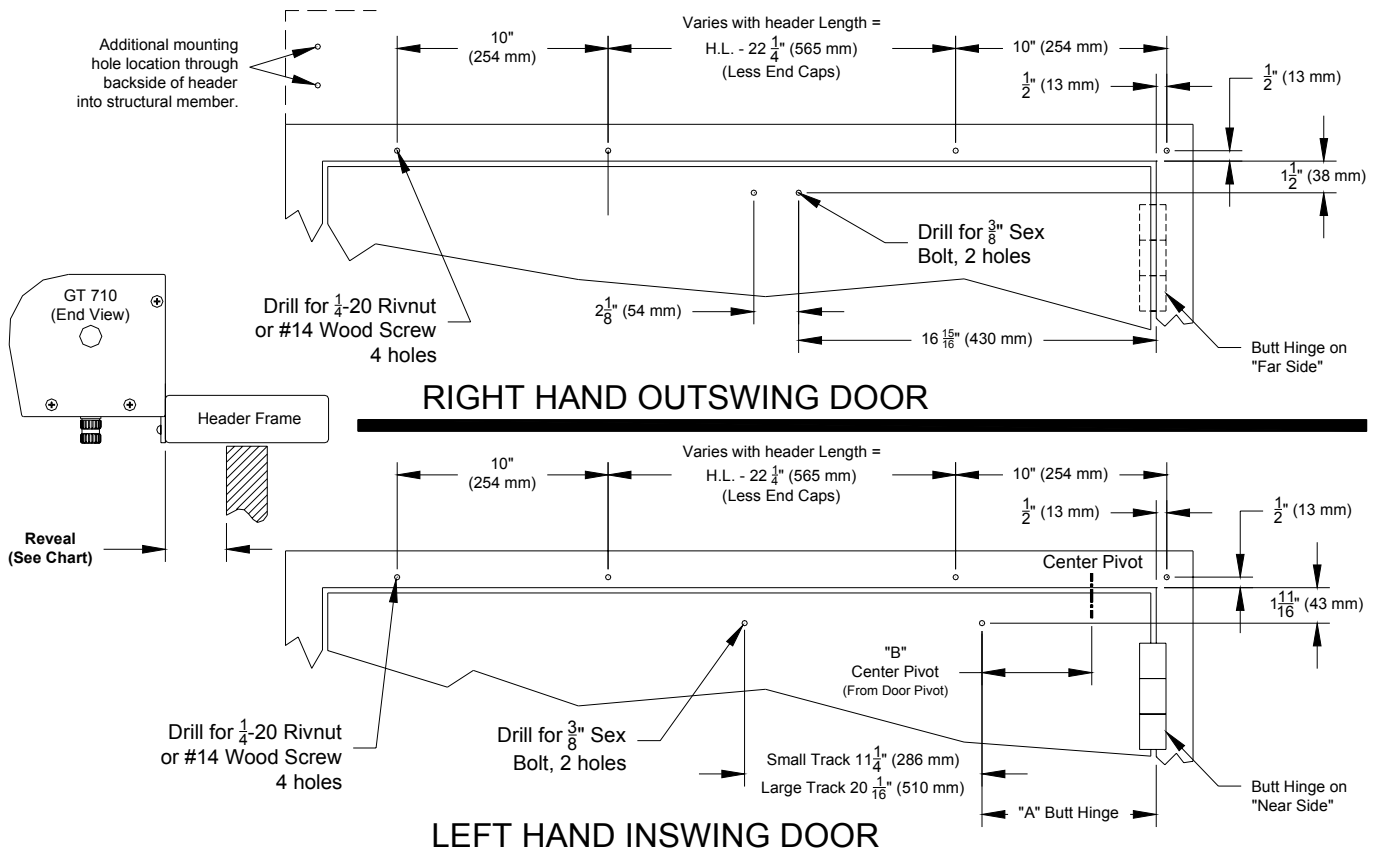


Figure 7 – Installation Hardware

Drilling Frame and Door Figure 8 shows the dimensions for drilling frame and door.



| INSWING CHART | | | |
|---------------|--------------------|----------------------|----------------------|
| Reveal | Dim "A" Butt Hinge | Dim "B" Center Pivot | Inswing Track |
| 0" | 7 5/8" (194 mm) | 7 3/16" (183 mm) | 210997 (Small Track) |
| 1/4" | 7 3/4" (197 mm) | 7 3/8" (187 mm) | |
| 1/2" | 7 15/16" (202 mm) | 7 9/16" (192 mm) | |
| 3/4" | 8 1/8" (206 mm) | 7 3/4" (197 mm) | |
| 1" | 8 5/16" (211 mm) | 7 15/16" (202 mm) | |
| 1 1/4" | 8 1/2" (216 mm) | 8 1/8" (206 mm) | |
| 1 1/2" | 8 11/16" (221 mm) | 8 5/16" (211 mm) | |
| 1 3/4" | 8 7/8" (225 mm) | 8 1/2" (216 mm) | |
| 2" | 8 1/16" (205 mm) | 8 3/4" (222 mm) | |
| 2 1/4" | 9 1/4" (235 mm) | 8 15/16" (227 mm) | |
| 2 1/2" | 9 1/2" (241 mm) | 9 1/8" (232 mm) | |
| 2 3/4" | 9 11/16" (246 mm) | 9 3/8" (238 mm) | |
| 3" | 13 1/8" (333 mm) | 9 9/16" (243 mm) | |
| 3 1/4" | 13 3/8" (340 mm) | 13 1/16" (332 mm) | |
| 3 1/2" | 13 9/16" (344 mm) | 13 1/4" (337 mm) | |
| 3 3/4" | 13 3/4" (349 mm) | 13 1/2" (343 mm) | |
| 4" | 14" (356 mm) | 13 1/16" (348 mm) | |
| 4 1/4" | 14 3/16" (360 mm) | 13 3/4" (349 mm) | |
| 4 1/2" | 14 7/16" (367 mm) | 13 3/4" (349 mm) | |

| INSWING CHART | | | |
|---------------|--------------------|----------------------|----------------------|
| Reveal | Dim "A" Butt Hinge | Dim "B" Center Pivot | Inswing Track |
| 4 3/4" | 14 1/2" (368 mm) | 13 3/4" (349 mm) | 210997 (Small Track) |
| 5" | | 13 3/4" (349 mm) | |
| 5 1/4" | | 13 13/16" (351 mm) | |
| 5 1/2" | | | |
| 5 3/4" | | | |
| 6" | 18 1/2" (470 mm) | 17 7/8" (454 mm) | |
| 6 1/4" | | 17 7/8" (454 mm) | |
| 6 1/2" | | 17 7/8" (454 mm) | |
| 6 3/4" | | 17 7/8" (454 mm) | |
| 7" | | 17 7/8" (454 mm) | |
| 7 1/4" | 18 1/4" (362 mm) | 17 15/16" (456 mm) | |
| 7 1/2" | | 17 15/16" (456 mm) | |
| 7 3/4" | | 17 15/16" (456 mm) | |
| 8" | | 17 15/16" (456 mm) | |
| 8 1/4" | | 17 15/16" (456 mm) | |
| 8 1/2" | 14 1/4" (362 mm) | 13 9/16" (344 mm) | |
| 8 3/4" | | 13 9/16" (344 mm) | |
| 9" | | 13 9/16" (344 mm) | |

| INSWING CHART | | | |
|---------------|--------------------|----------------------|----------------------|
| Reveal | Dim "A" Butt Hinge | Dim "B" Center Pivot | Inswing Track |
| 9 1/4" | 14 1/4" (362 mm) | 13 5/8" (346 mm) | 210998 (Large Track) |
| 9 1/2" | | 13 5/8" (346 mm) | |
| 9 3/4" | | 13 5/8" (346 mm) | |
| 10" | | 13 9/16" (344 mm) | |
| 10 1/4" | | 13 9/16" (344 mm) | |
| 10 1/2" | 19 5/16" (491 mm) | 13 9/16" (344 mm) | |
| 10 3/4" | | 18 5/8" (473 mm) | |
| 11" | | 18 5/8" (473 mm) | |
| 11 1/4" | | 18 11/16" (475 mm) | |
| 11 1/2" | | | |
| 11 3/4" | | | |
| 12" | | | |
| 12 1/4" | | | |
| 12 1/2" | 19 5/16" (491 mm) | 18 11/16" (475 mm) | |
| 12 3/4" | | | |
| 13" | | | |

Figure 8 – Frame Drilling Details.

Installation of Arm

Proper installation requires that the hydraulic closer apply a constant pressure to the door, keeping it in a closed position. This is accomplished by mounting the arm to the hydraulic closer in a “pre-loaded” position.

Install the arm before mounting the unit to the frame. The end of the output shaft has been marked with numbers 1 thru 4. These numbers mark the correct installation position to set the preload for the unit. **Figures 10 thru 15** show the proper alignment of the arm to the preset installation marks.

After installing the inswing arm, it will be necessary to rotate the arm in the direction that would **open** the door. Insert an allen wrench or screwdriver between the socket and the chain to prevent return movement as shown in **Figure 9**. Locking the arm in the open position like this is necessary so that the arm will not interfere with installing the unit. For inswing units it may be necessary to add one “tooth” of preload to engage latch check earlier in the closing cycle.

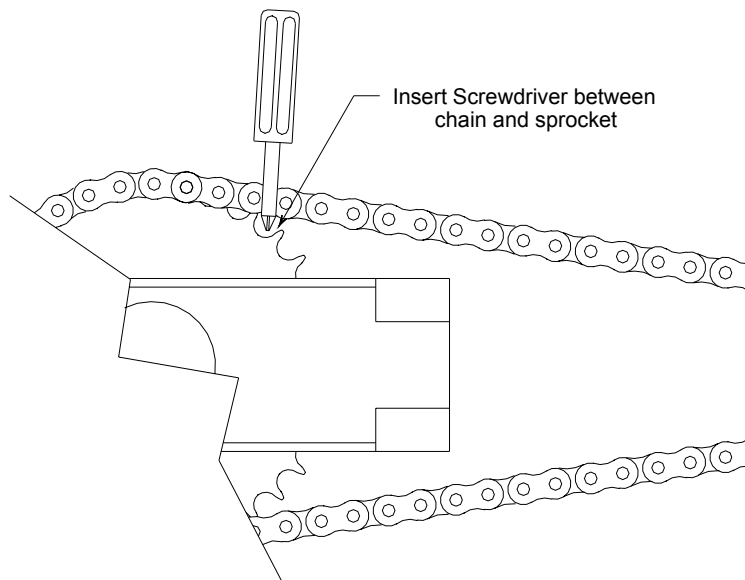
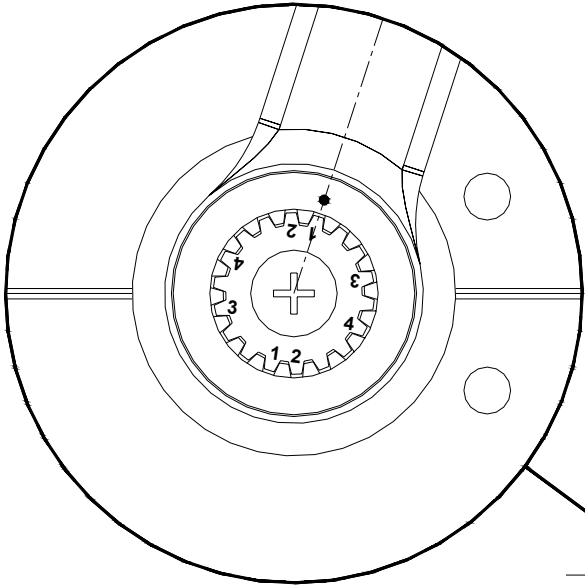


Figure 9 – Preloading the Door



RIGHT HAND OUTSWING

Align the preload mark on the arm with the number shown to properly preload the unit.

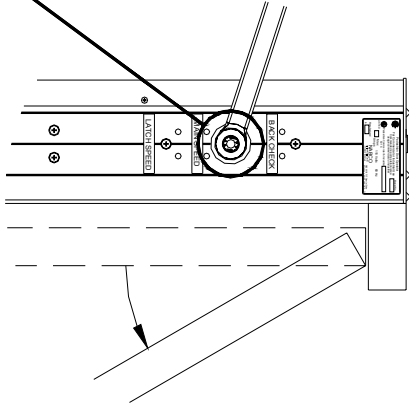
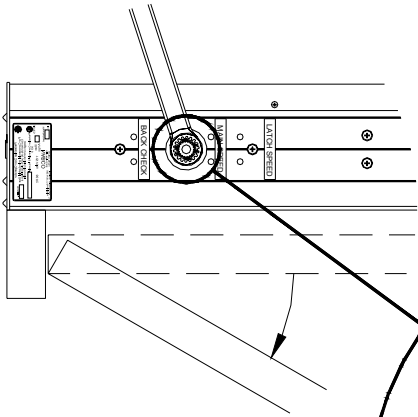


Figure 10 – Arm Installation RH Outswing



LEFT HAND OUTSWING

Align the preload mark on the arm with the number shown to properly preload the unit.

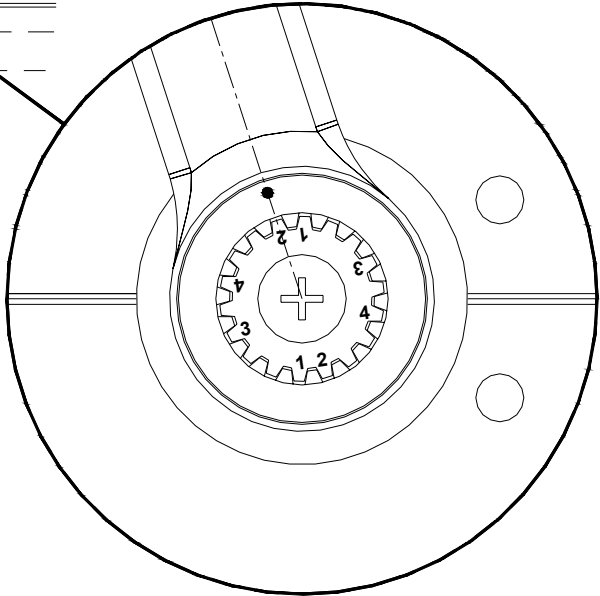
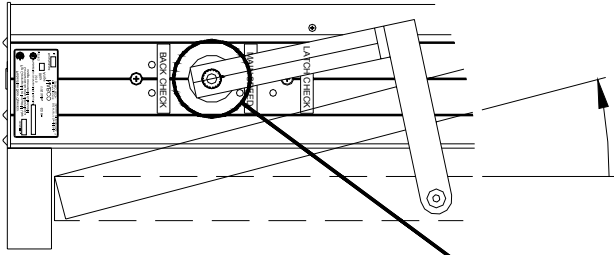


Figure 11 – Arm Installation LH Outswing



RIGHT HAND INSWING

Align the preload mark on the arm with the number shown to properly preload the unit.

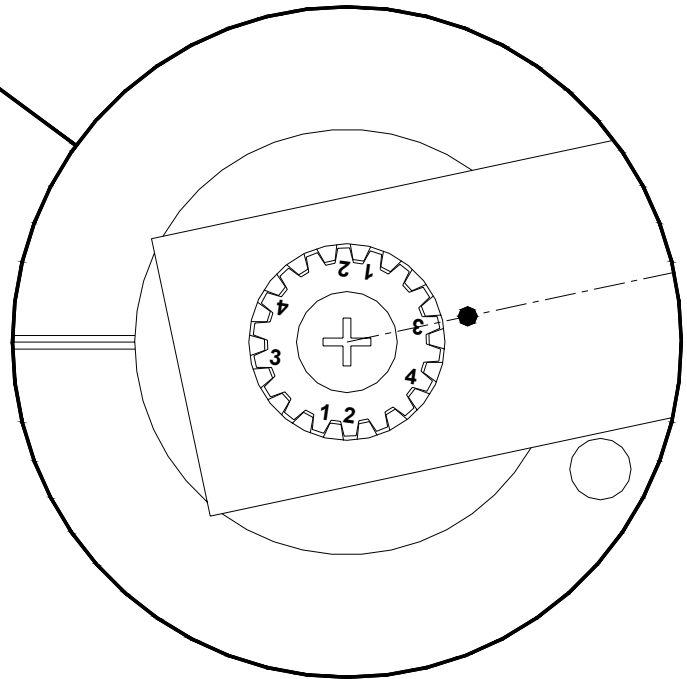
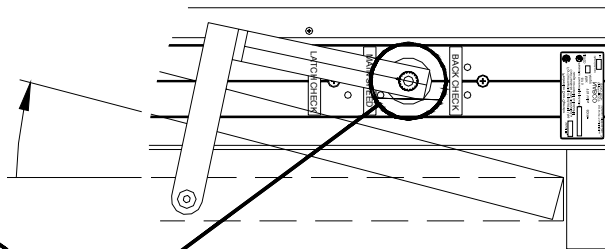


Figure 12 – Arm Installation RH Inswing



LEFT HAND INSWING

Align the preload mark on the arm with the number shown to properly preload the unit.

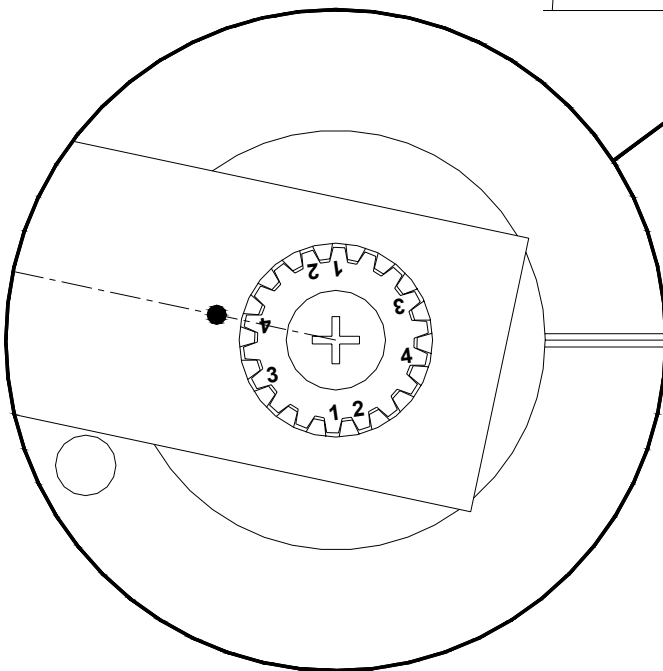
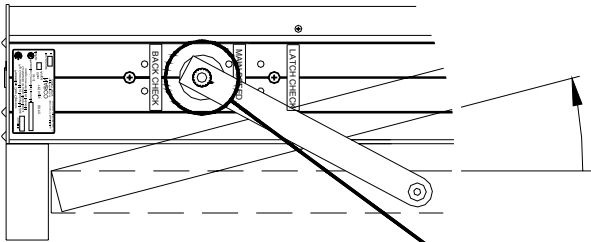


Figure 13 – Arm Installation LH Inswing



**RIGHT HAND INSWING
0" REVEAL**

Align the preload mark on the arm with the number shown to properly preload the unit.

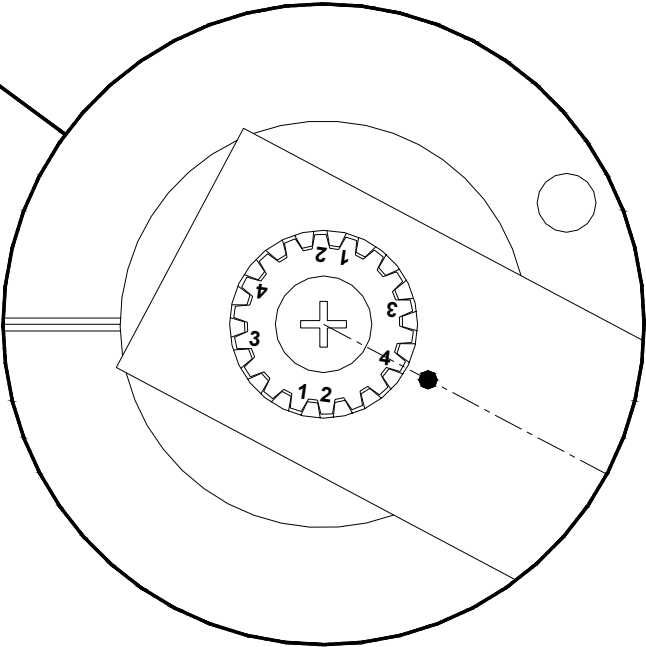
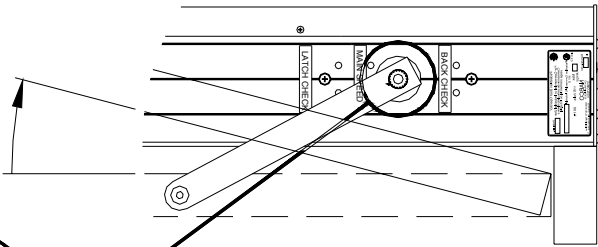


Figure 14 – Arm Installation RH Inswing 0" Reveal



**LEFT HAND INSWING
0" REVEAL**

Align the preload mark on the arm with the number shown to properly preload the unit.

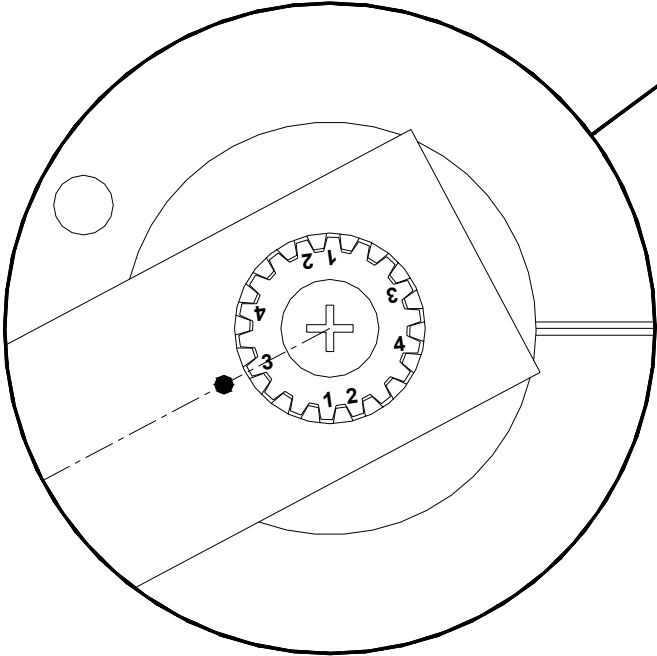


Figure 15 – Arm Installation LH Inswing 0" Reveal

Fastening Outswing Shoe Secure the track or shoe to the arm to the door in the holes drilled earlier. Use $\frac{1}{4}$
& Inswing Track to Door -20 sex bolts through the door (hollow doors) or #14 x 1-1/2" long wood screws (solid doors).

Note: If the configuration of your inswing door requires the straight arm, it may be necessary to install the spacer between the door and track. If the door is not flush with the door frame, the spacer is required to offset the track slightly, the arm will hit the bottom of the header before the door is completely closed and the door will remain slightly ajar.

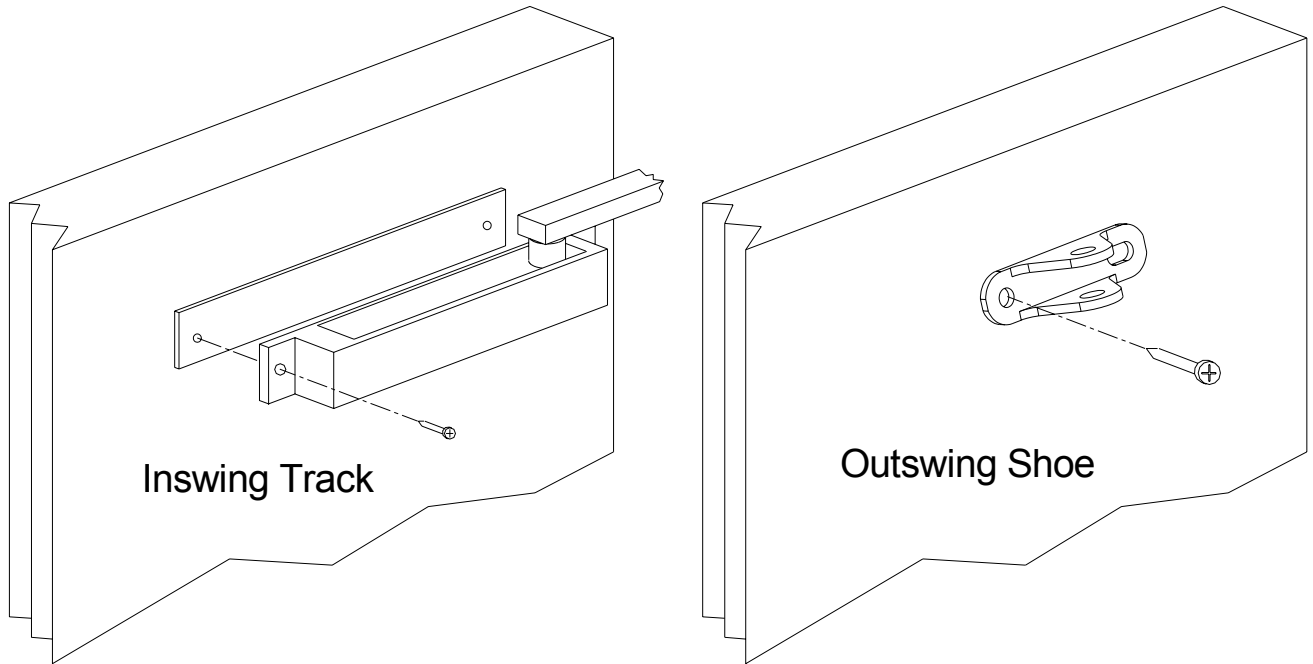


Figure 16 – Installing Track and Spacer to Door.

Mounting of Unit

For a secure installation of the operator frame, use $\frac{1}{4}$ -20 machine screws for hollow metal and aluminum door frames or #14-2 $\frac{3}{4}$ " long wood screws for wood frames. Additional fastening into the building may be necessary to prevent the operator from moving during operation.

Right Hand Outswing Butt Hinge

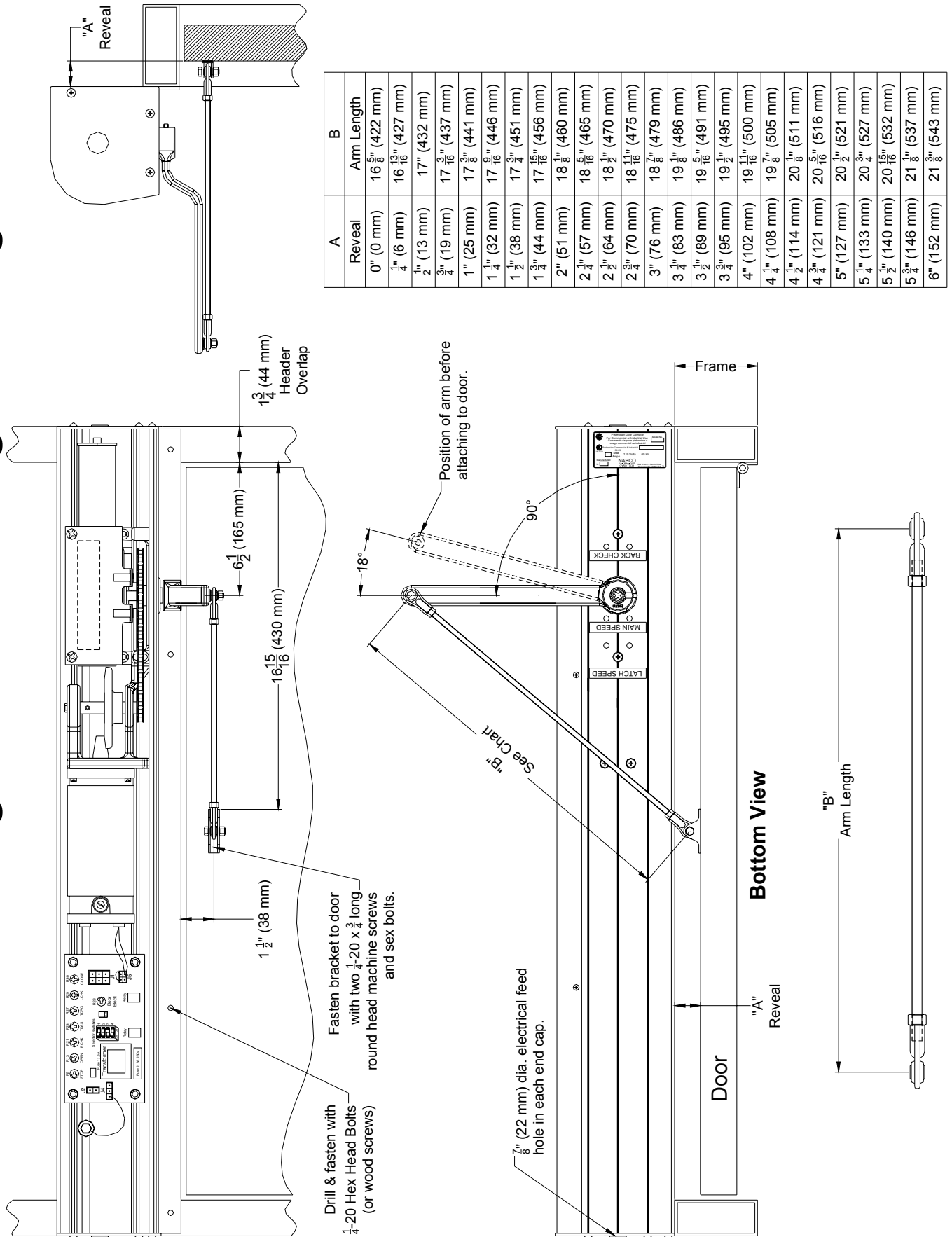


Figure 17 – Installation Details, Right Hand Outswing Butt Hinge.

Right Hand Outswing Center Pivoted

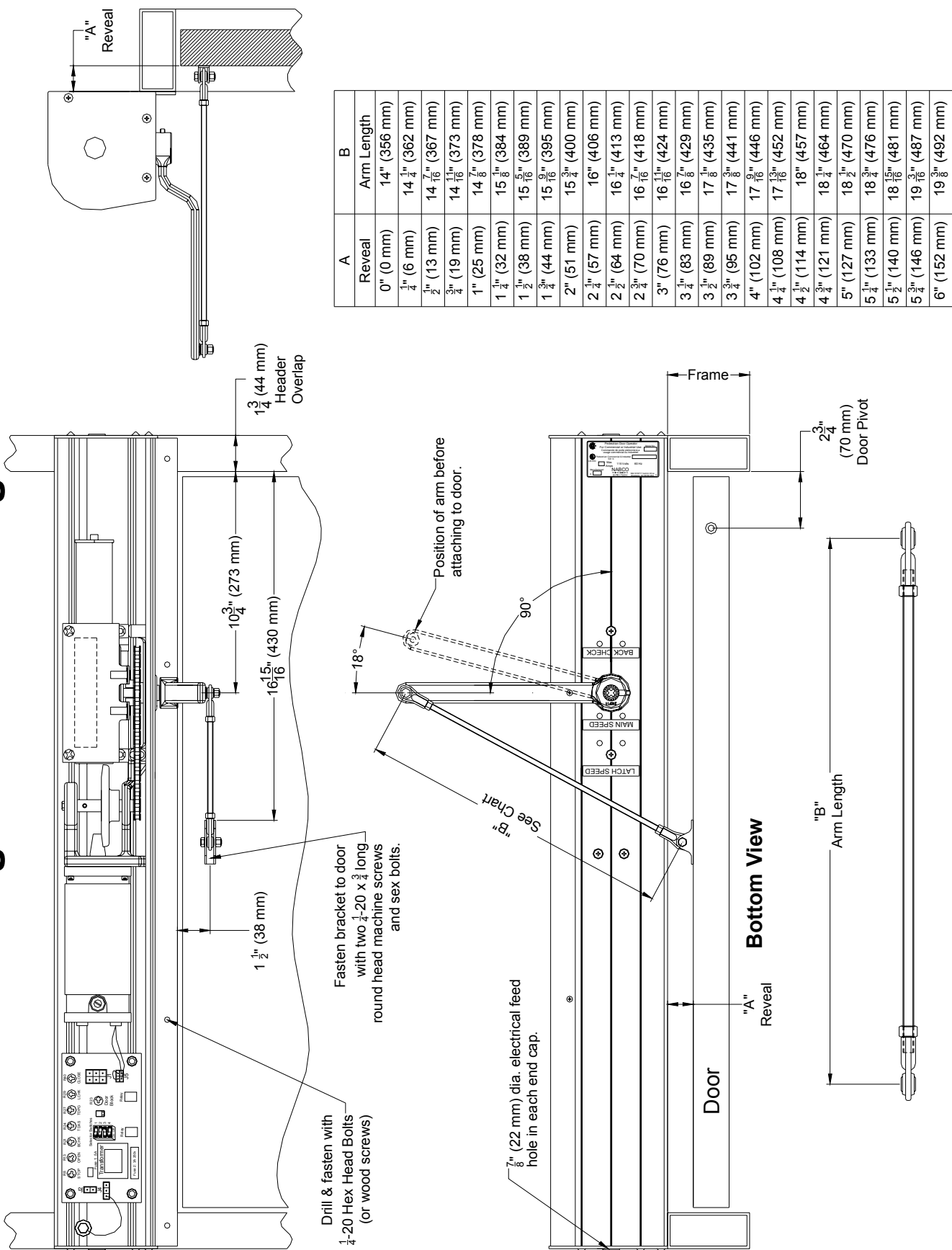
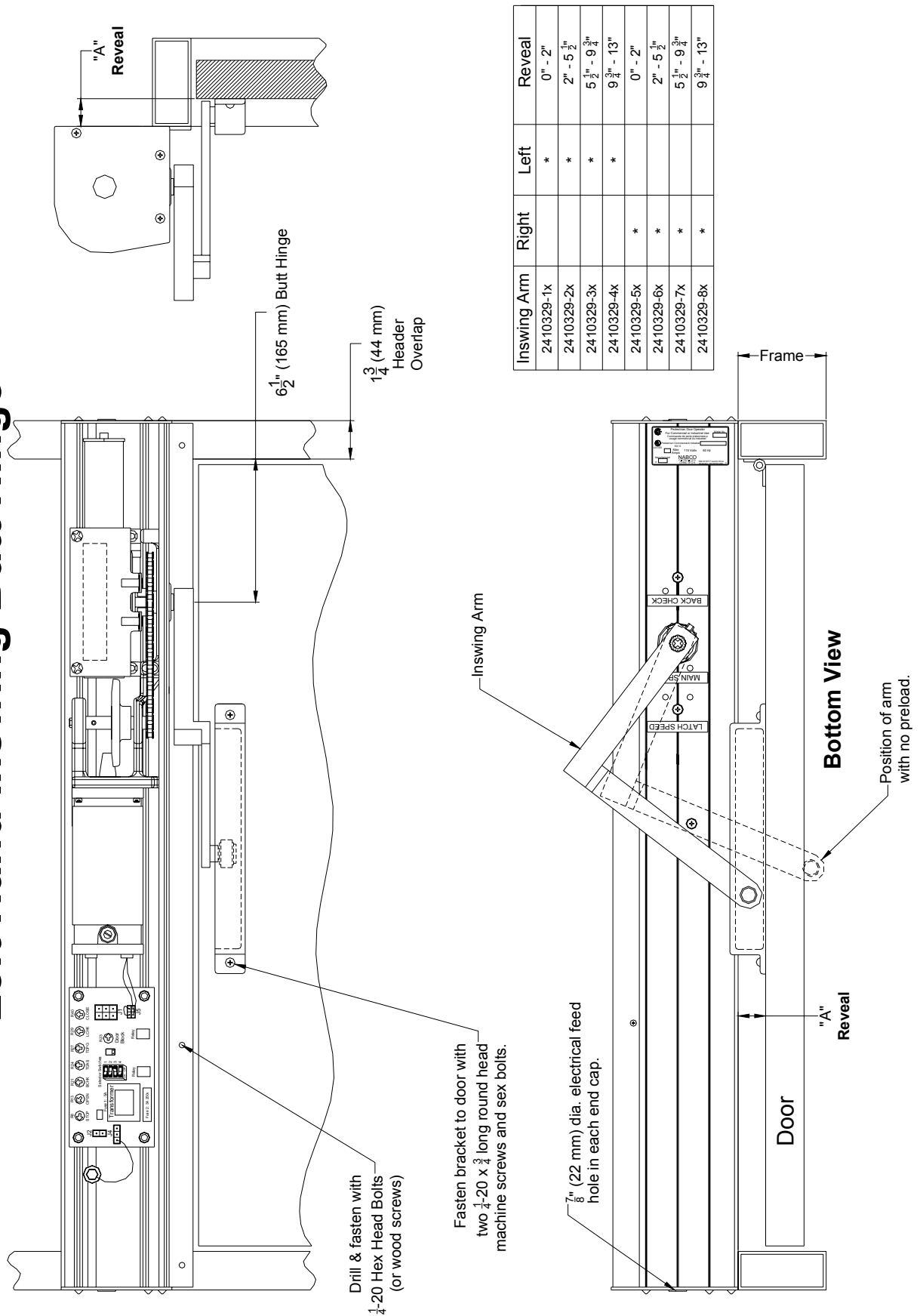


Figure 18 – Installation Details, Right Hand Outswing Center Pivoted.

Left Hand Inswing Butt Hinge



| Inswing Arm | Right | Left | Reveal |
|-------------|-------|------|-----------------|
| 2410329-1x | * | * | 0" - 2" |
| 2410329-2x | | * | 2" - 5 1/2" |
| 2410329-3x | | * | 5 1/2" - 9 3/4" |
| 2410329-4x | | * | 9 3/4" - 13" |
| 2410329-5x | * | * | 0" - 2" |
| 2410329-6x | * | * | 2" - 5 1/2" |
| 2410329-7x | * | * | 5 1/2" - 9 3/4" |
| 2410329-8x | * | * | 9 3/4" - 13" |

Figure 19 – Installation Details, Left Hand Inswing Butt Hinge

Left Hand Inswing Center Pivoted

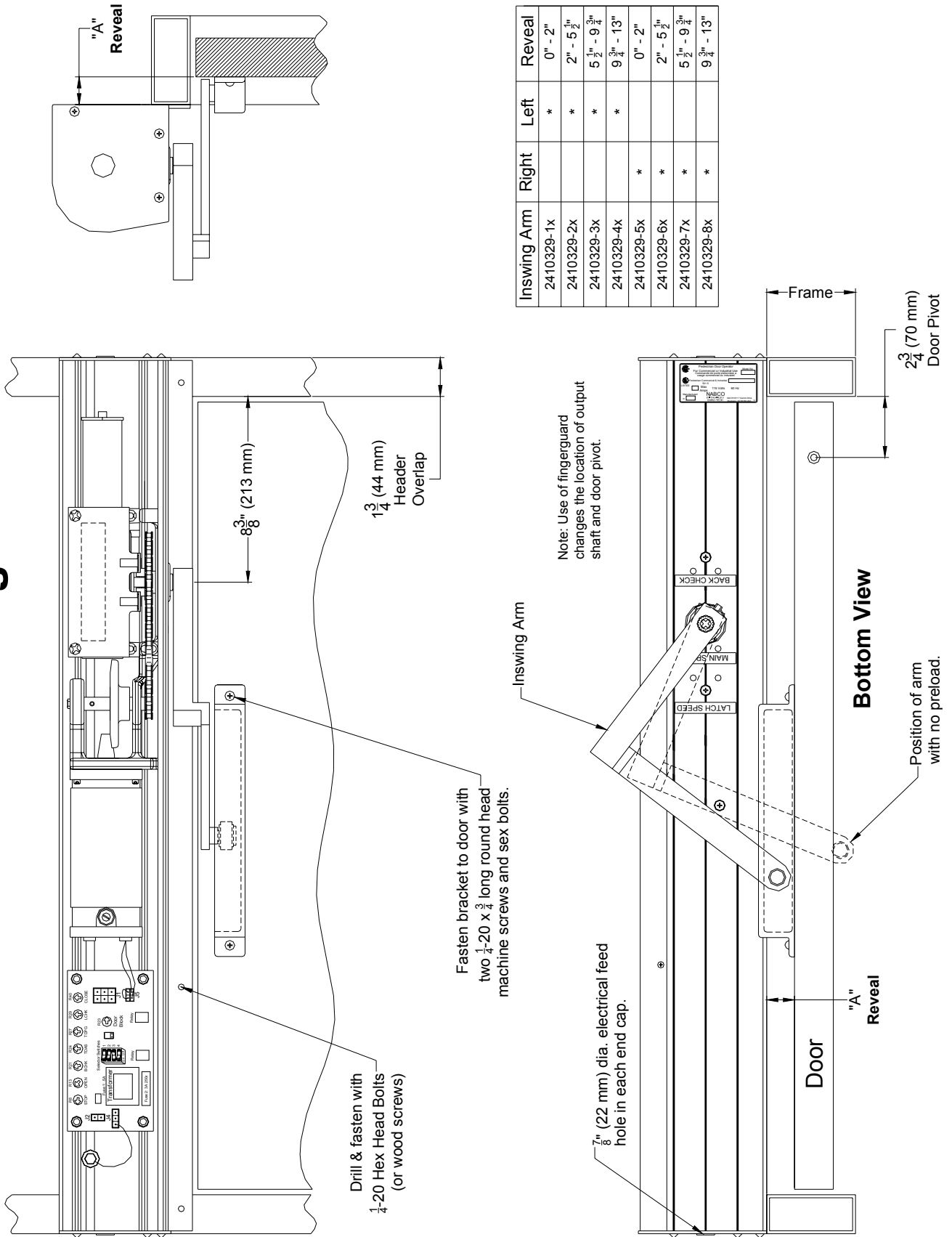


Figure 20 – Installation Details, Left Hand Inswing Center Pivoted

Installation of Door Stop

Open door to the desired position. Prop the door open in this position. Locate door stop as shown. Using door stop as template, drill two 7/32” mounting holes into the header. Secure the door stop with two black screws.

Release the door.

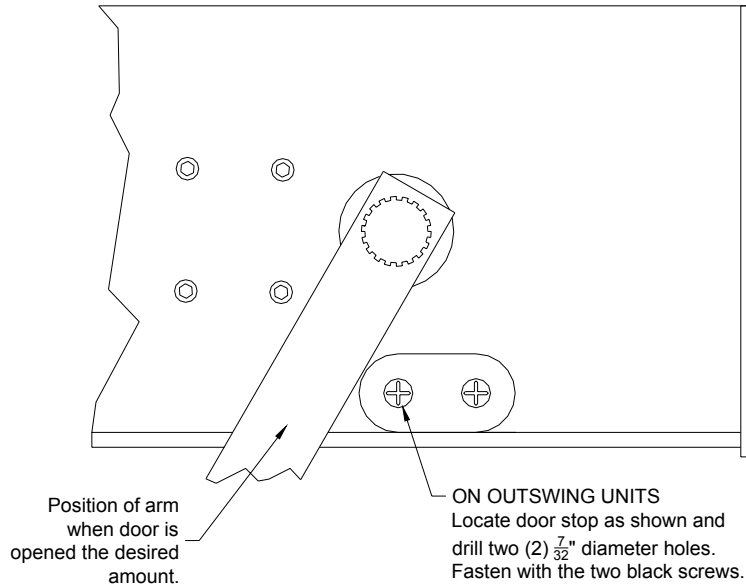


Figure 21 – Door Stop Location

Hydraulic Closer

The door closer has an adjustment for “opening force” when the doors is used in a manual mode that is preset at the factory. The setting is based on a 30-inch exterior door and a 38-inch interior door. Adjustments are made using an allen wrench as shown in **Figure 16**. Turn the screw clockwise for larger doors and counterclockwise for smaller doors.

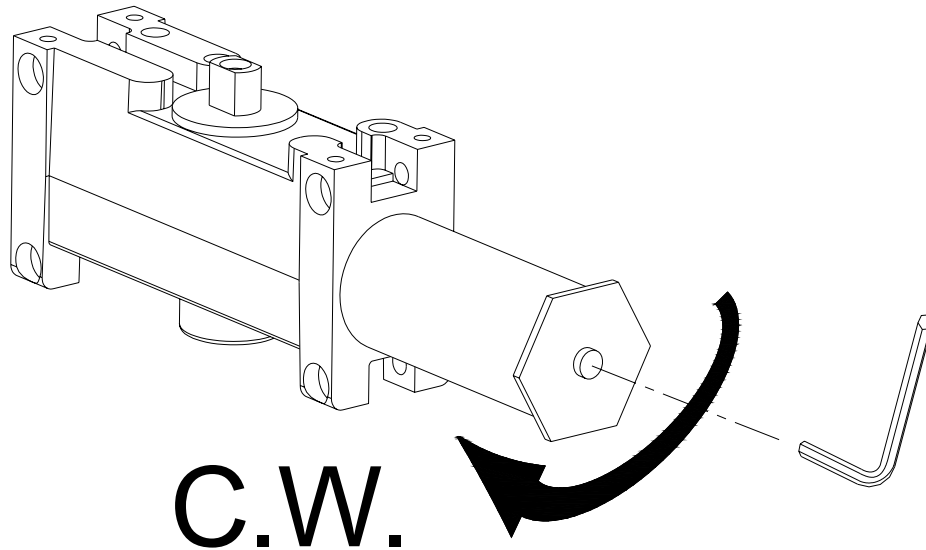


Figure 22 – Hydraulic Closer.

Setting Back Check and Door Closed Switches

The GT 710 has two magnetic switches that control the back check location and monitors the door closed position. The back check magnet must be installed before the unit is tested. It signals the motor to slow down so the door does not slam open.

The door closed magnet is optional. It is used to signal the control board that the door is closed. It is used in applications where a sensor is on the swing side of the door and wired into the safety with lockout circuit. The switches are closed by magnets installed by the installer onto the main sprocket gear.

The magnets are not inside the header!

Locate the ¼-inch square and 1-inch long magnets in the parts bag. To position the magnets, use the appropriate configuration from **Figures 23 through 30**.

Start with the door in the closed position. Place a magnet under the door closed switch with the white side up. This magnet will deactivate the optional presence detector as the door begins to open.

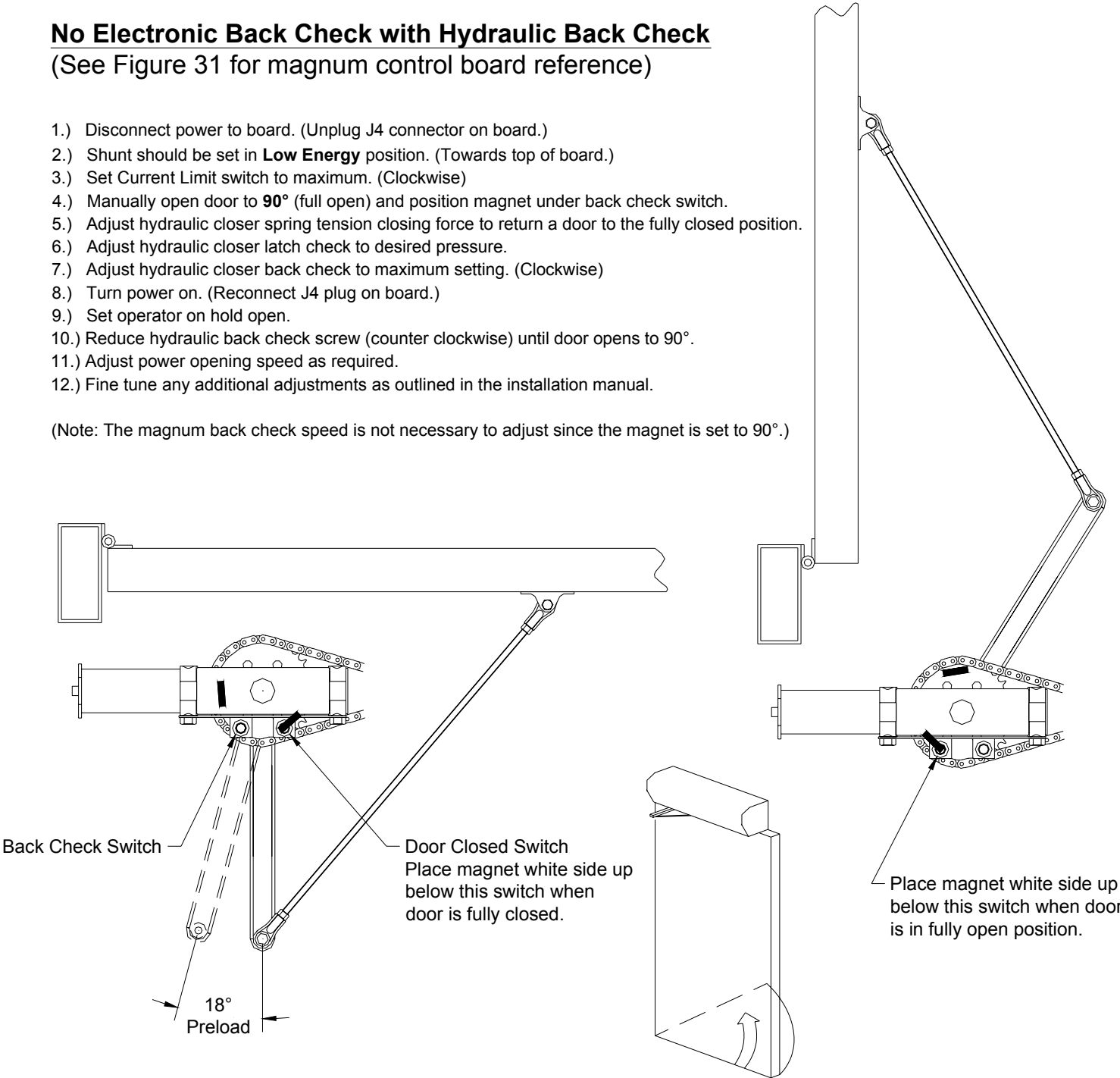
Position the back check magnet using the appropriate configuration from **Figures 23 through 30**. This magnet will command the motor to reduce the door speed to the setting of the back check potentiometer. Improper placement of this magnet can cause the door to slam into the door stop.

After power is applied to the unit and the position of the magnets is “fine tuned” to make the door functional, the magnets should be epoxied in place following the instructions on the epoxy packaging.

No Electronic Back Check with Hydraulic Back Check
(See Figure 31 for magnum control board reference)

- 1.) Disconnect power to board. (Unplug J4 connector on board.)
- 2.) Shunt should be set in **Low Energy** position. (Towards top of board.)
- 3.) Set Current Limit switch to maximum. (Clockwise)
- 4.) Manually open door to **90°** (full open) and position magnet under back check switch.
- 5.) Adjust hydraulic closer spring tension closing force to return a door to the fully closed position.
- 6.) Adjust hydraulic closer latch check to desired pressure.
- 7.) Adjust hydraulic closer back check to maximum setting. (Clockwise)
- 8.) Turn power on. (Reconnect J4 plug on board.)
- 9.) Set operator on hold open.
- 10.) Reduce hydraulic back check screw (counter clockwise) until door opens to 90°.
- 11.) Adjust power opening speed as required.
- 12.) Fine tune any additional adjustments as outlined in the installation manual.

(Note: The magnum back check speed is not necessary to adjust since the magnet is set to 90°.)



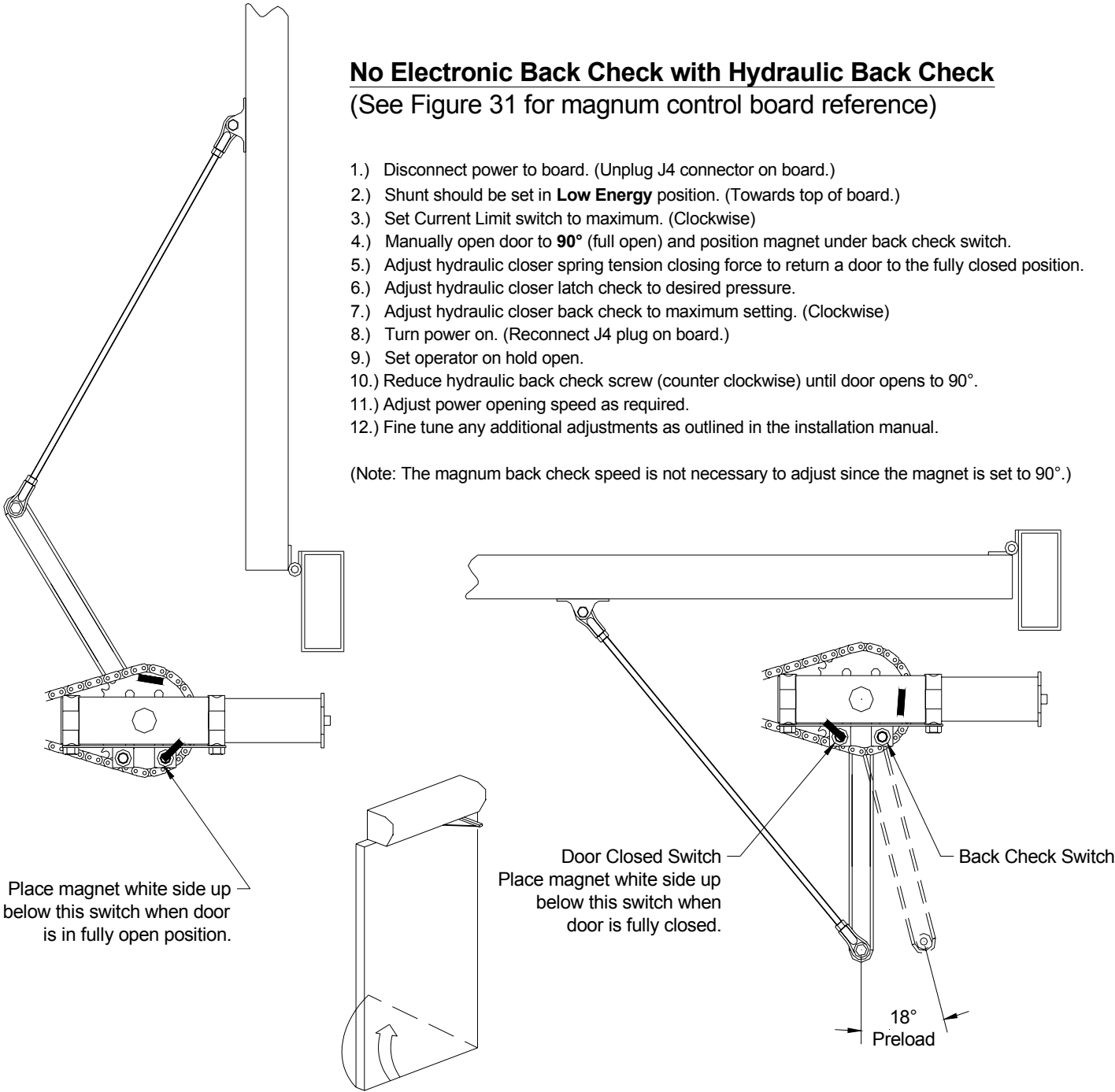
Left Hand Outswing

Figure 23 – Left Hand Outswing Door Shown

No Electronic Back Check with Hydraulic Back Check
(See Figure 31 for magnum control board reference)

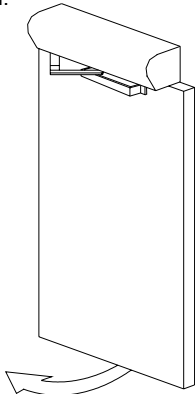
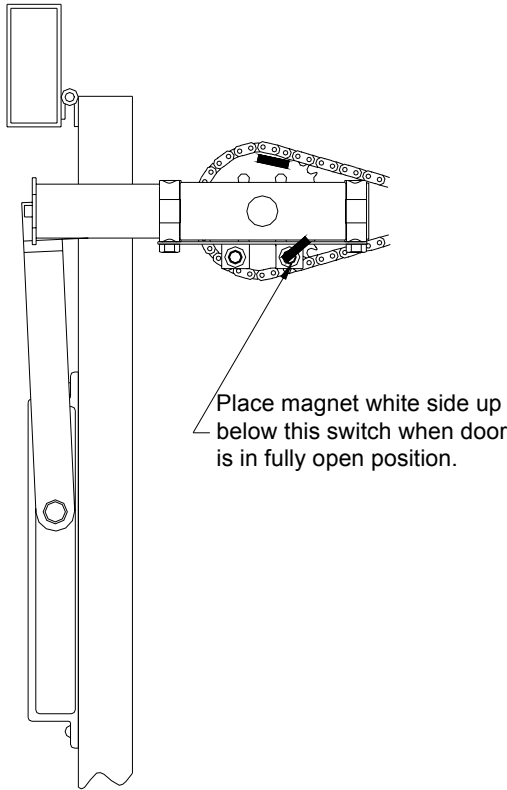
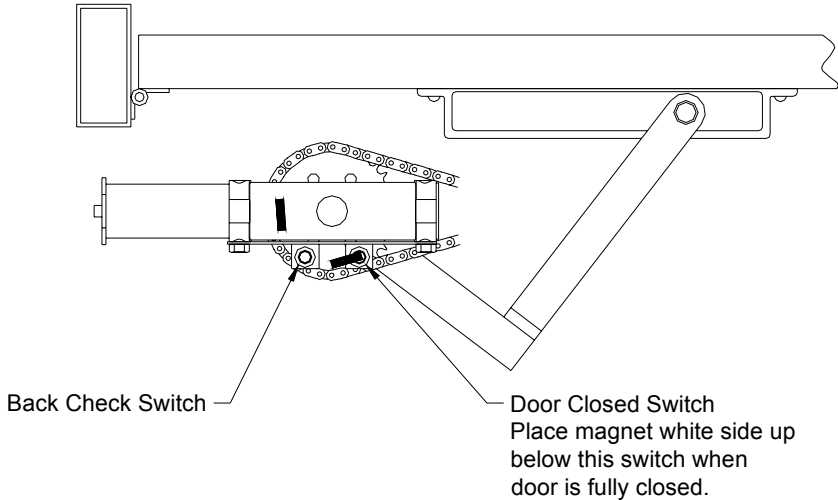
- 1.) Disconnect power to board. (Unplug J4 connector on board.)
- 2.) Shunt should be set in **Low Energy** position. (Towards top of board.)
- 3.) Set Current Limit switch to maximum. (Clockwise)
- 4.) Manually open door to **90°** (full open) and position magnet under back check switch.
- 5.) Adjust hydraulic closer spring tension closing force to return a door to the fully closed position.
- 6.) Adjust hydraulic closer latch check to desired pressure.
- 7.) Adjust hydraulic closer back check to maximum setting. (Clockwise)
- 8.) Turn power on. (Reconnect J4 plug on board.)
- 9.) Set operator on hold open.
- 10.) Reduce hydraulic back check screw (counter clockwise) until door opens to 90°.
- 11.) Adjust power opening speed as required.
- 12.) Fine tune any additional adjustments as outlined in the installation manual.

(Note: The magnum back check speed is not necessary to adjust since the magnet is set to 90°.)



Right Hand Outswing

Figure 24 – Right Hand Outswing Door Shown



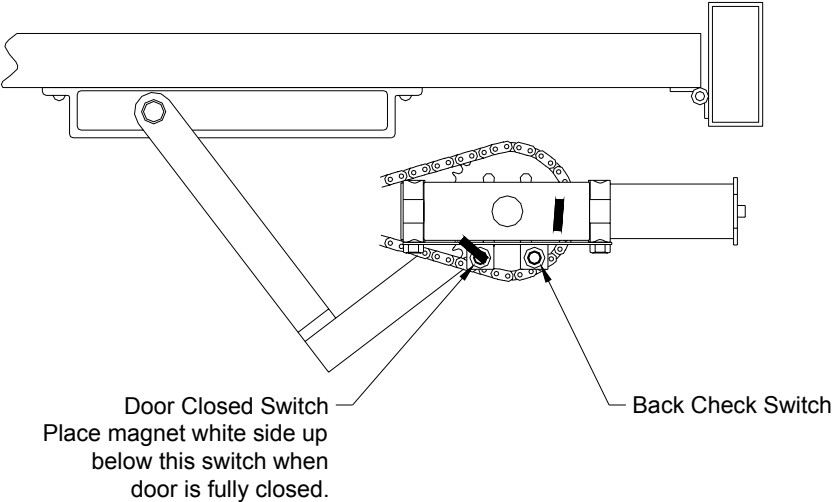
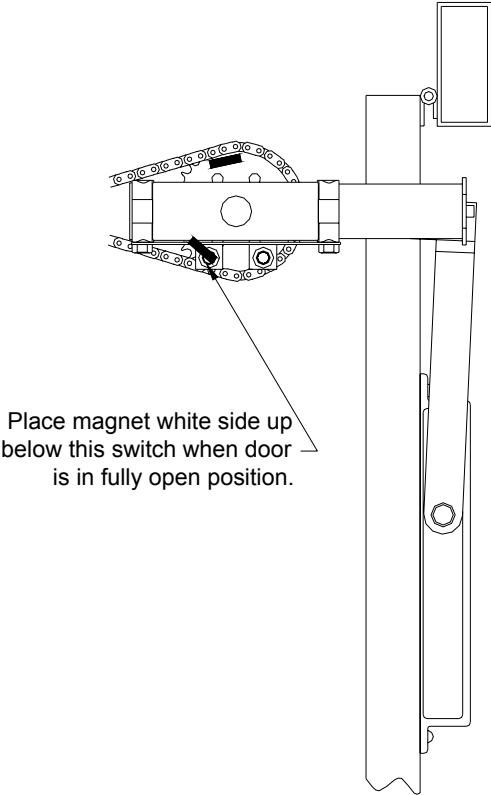
No Electronic Back Check with Hydraulic Back Check
(See Figure 31 for magnum control board reference)

- 1.) Disconnect power to board. (Unplug J4 connector on board.)
- 2.) Shunt should be set in **Low Energy** position. (Towards top of board.)
- 3.) Set Current Limit switch to maximum. (Clockwise)
- 4.) Manually open door to **90°** (full open) and position magnet under back check switch.
- 5.) Adjust hydraulic closer spring tension closing force to return a door to the fully closed position.
- 6.) Adjust hydraulic closer latch check to desired pressure.
- 7.) Adjust hydraulic closer back check to maximum setting. (Clockwise)
- 8.) Turn power on. (Reconnect J4 plug on board.)
- 9.) Set operator on hold open.
- 10.) Reduce hydraulic back check screw (counter clockwise) until door opens to 90°.
- 11.) Adjust power opening speed as required.
- 12.) Fine tune any additional adjustments as outlined in the installation manual.

(Note: The magnum back check speed is not necessary to adjust since the magnet is set to 90°.)

RIGHT HAND INSWING

Figure 25 – Right Hand Inswing Door Shown.



No Electronic Back Check with Hydraulic Back Check
 (See Figure 31 for magnum control board reference)

- 1.) Disconnect power to board. (Unplug J4 connector on board.)
- 2.) Shunt should be set in **Low Energy** position. (Towards top of board.)
- 3.) Set Current Limit switch to maximum. (Clockwise)
- 4.) Manually open door to **90°** (full open) and position magnet under back check switch.
- 5.) Adjust hydraulic closer spring tension closing force to return a door to the fully closed position.
- 6.) Adjust hydraulic closer latch check to desired pressure.
- 7.) Adjust hydraulic closer back check to maximum setting. (Clockwise)
- 8.) Turn power on. (Reconnect J4 plug on board.)
- 9.) Set operator on hold open.
- 10.) Reduce hydraulic back check screw (counter clockwise) until door opens to 90°.
- 11.) Adjust power opening speed as required.
- 12.) Fine tune any additional adjustments as outlined in the installation manual.

(Note: The magnum back check speed is not necessary to adjust since the magnet is set to 90°.)

LEFT HAND INSWING

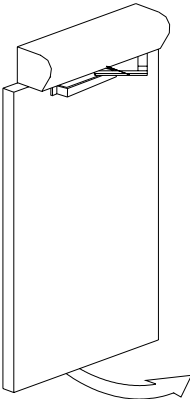
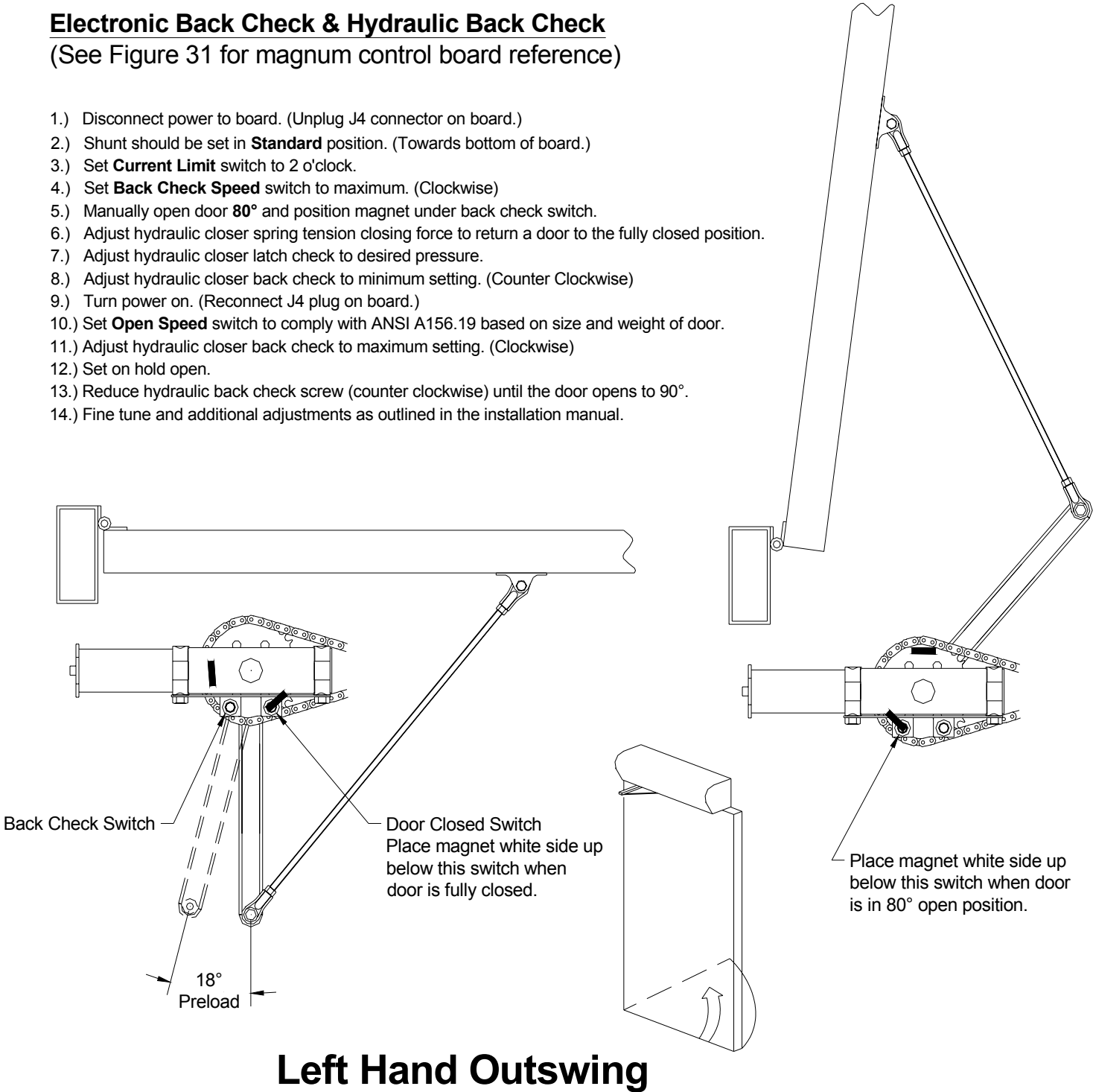


Figure 26 – Left Hand Door Inswing Shown

Electronic Back Check & Hydraulic Back Check
(See Figure 31 for magnum control board reference)

- 1.) Disconnect power to board. (Unplug J4 connector on board.)
- 2.) Shunt should be set in **Standard** position. (Towards bottom of board.)
- 3.) Set **Current Limit** switch to 2 o'clock.
- 4.) Set **Back Check Speed** switch to maximum. (Clockwise)
- 5.) Manually open door **80°** and position magnet under back check switch.
- 6.) Adjust hydraulic closer spring tension closing force to return a door to the fully closed position.
- 7.) Adjust hydraulic closer latch check to desired pressure.
- 8.) Adjust hydraulic closer back check to minimum setting. (Counter Clockwise)
- 9.) Turn power on. (Reconnect J4 plug on board.)
- 10.) Set **Open Speed** switch to comply with ANSI A156.19 based on size and weight of door.
- 11.) Adjust hydraulic closer back check to maximum setting. (Clockwise)
- 12.) Set on hold open.
- 13.) Reduce hydraulic back check screw (counter clockwise) until the door opens to 90°.
- 14.) Fine tune and additional adjustments as outlined in the installation manual.



Left Hand Outswing

Figure 27 – Left Hand Door Outswing Shown

Electronic Back Check & Hydraulic Back Check
(See Figure 31 for magnum control board reference)

- 1.) Disconnect power to board. (Unplug J4 connector on board.)
- 2.) Shunt should be set in **Standard** position. (Towards bottom of board.)
- 3.) Set **Current Limit** switch to 2 o'clock.
- 4.) Set **Back Check Speed** switch to maximum. (Clockwise)
- 5.) Manually open door **80°** and position magnet under back check switch.
- 6.) Adjust hydraulic closer spring tension closing force to return a door to the fully closed position.
- 7.) Adjust hydraulic closer latch check to desired pressure.
- 8.) Adjust hydraulic closer back check to minimum setting. (Counter Clockwise)
- 9.) Turn power on. (Reconnect J4 plug on board.)
- 10.) Set **Open Speed** switch to comply with ANSI A156.19 based on size and weight of door.
- 11.) Adjust hydraulic closer back check to maximum setting. (Clockwise)
- 12.) Set on hold open.
- 13.) Reduce hydraulic back check screw (counter clockwise) until the door opens to 90°.
- 14.) Fine tune and additional adjustments as outlined in the installation manual.

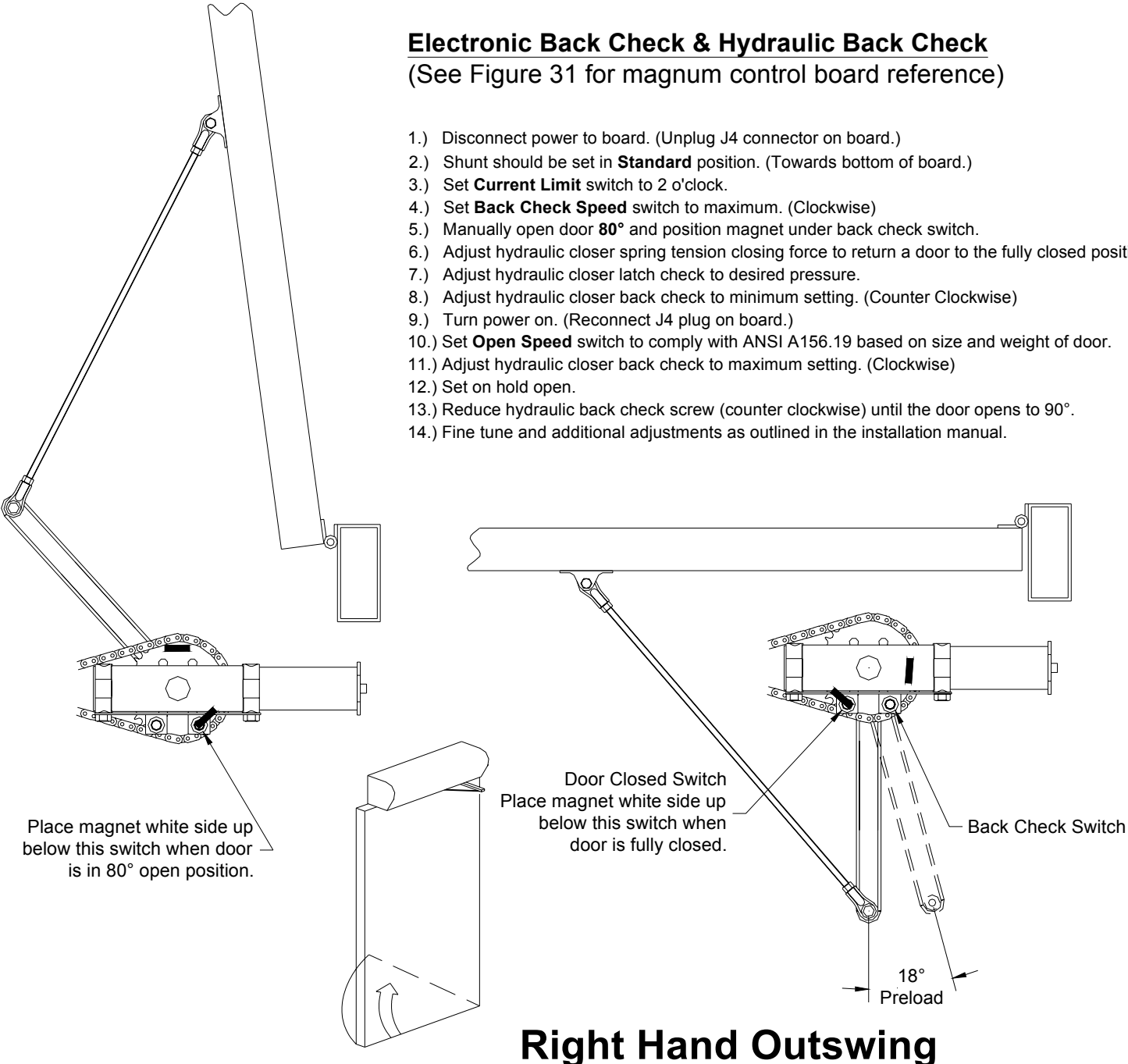
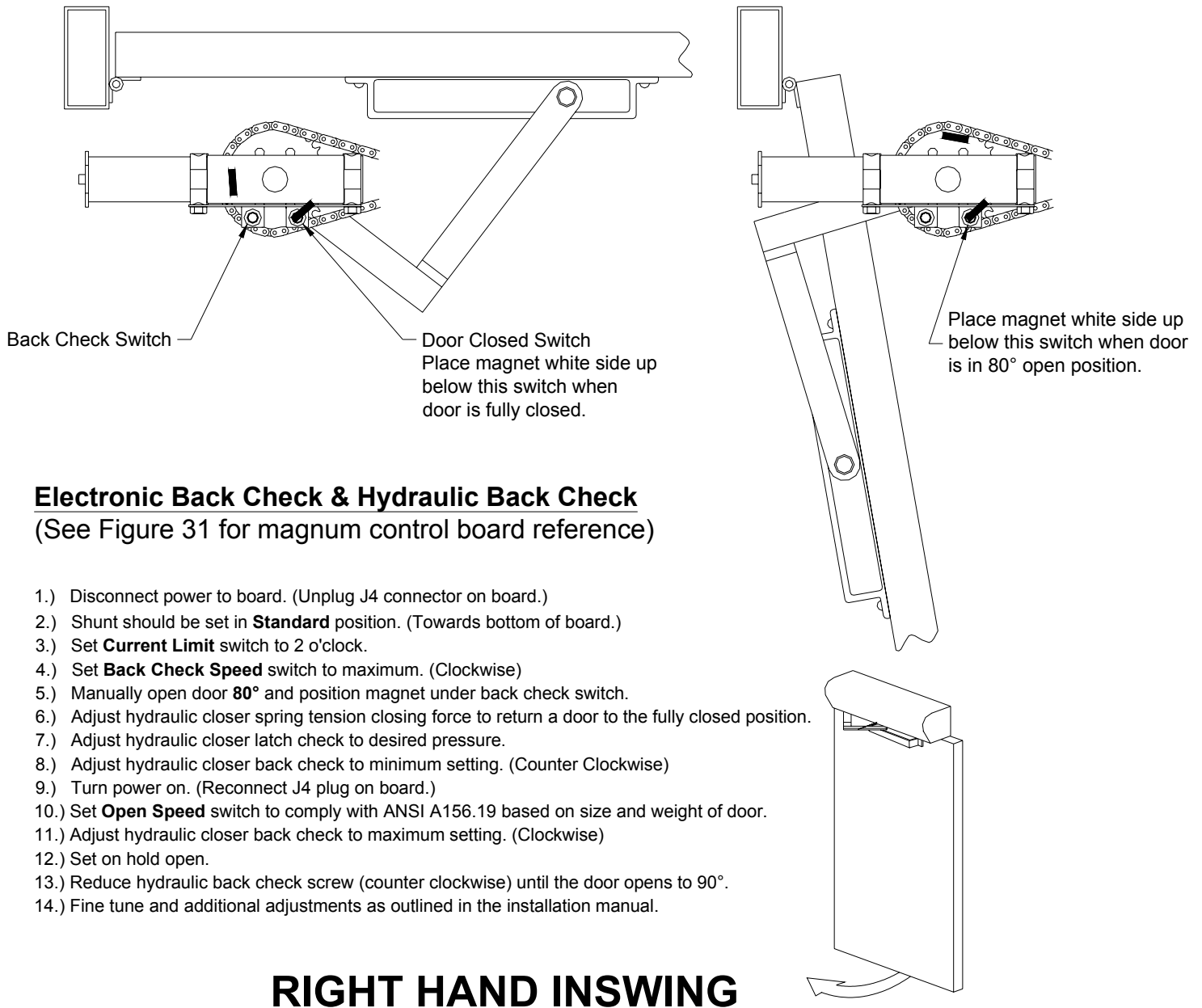


Figure 28 – Right Hand Door Outswing Shown



Electronic Back Check & Hydraulic Back Check
 (See Figure 31 for magnum control board reference)

- 1.) Disconnect power to board. (Unplug J4 connector on board.)
- 2.) Shunt should be set in **Standard** position. (Towards bottom of board.)
- 3.) Set **Current Limit** switch to 2 o'clock.
- 4.) Set **Back Check Speed** switch to maximum. (Clockwise)
- 5.) Manually open door **80°** and position magnet under back check switch.
- 6.) Adjust hydraulic closer spring tension closing force to return a door to the fully closed position.
- 7.) Adjust hydraulic closer latch check to desired pressure.
- 8.) Adjust hydraulic closer back check to minimum setting. (Counter Clockwise)
- 9.) Turn power on. (Reconnect J4 plug on board.)
- 10.) Set **Open Speed** switch to comply with ANSI A156.19 based on size and weight of door.
- 11.) Adjust hydraulic closer back check to maximum setting. (Clockwise)
- 12.) Set on hold open.
- 13.) Reduce hydraulic back check screw (counter clockwise) until the door opens to 90°.
- 14.) Fine tune and additional adjustments as outlined in the installation manual.

RIGHT HAND INSWING

Figure 29 – Right Hand Door Inswing Shown

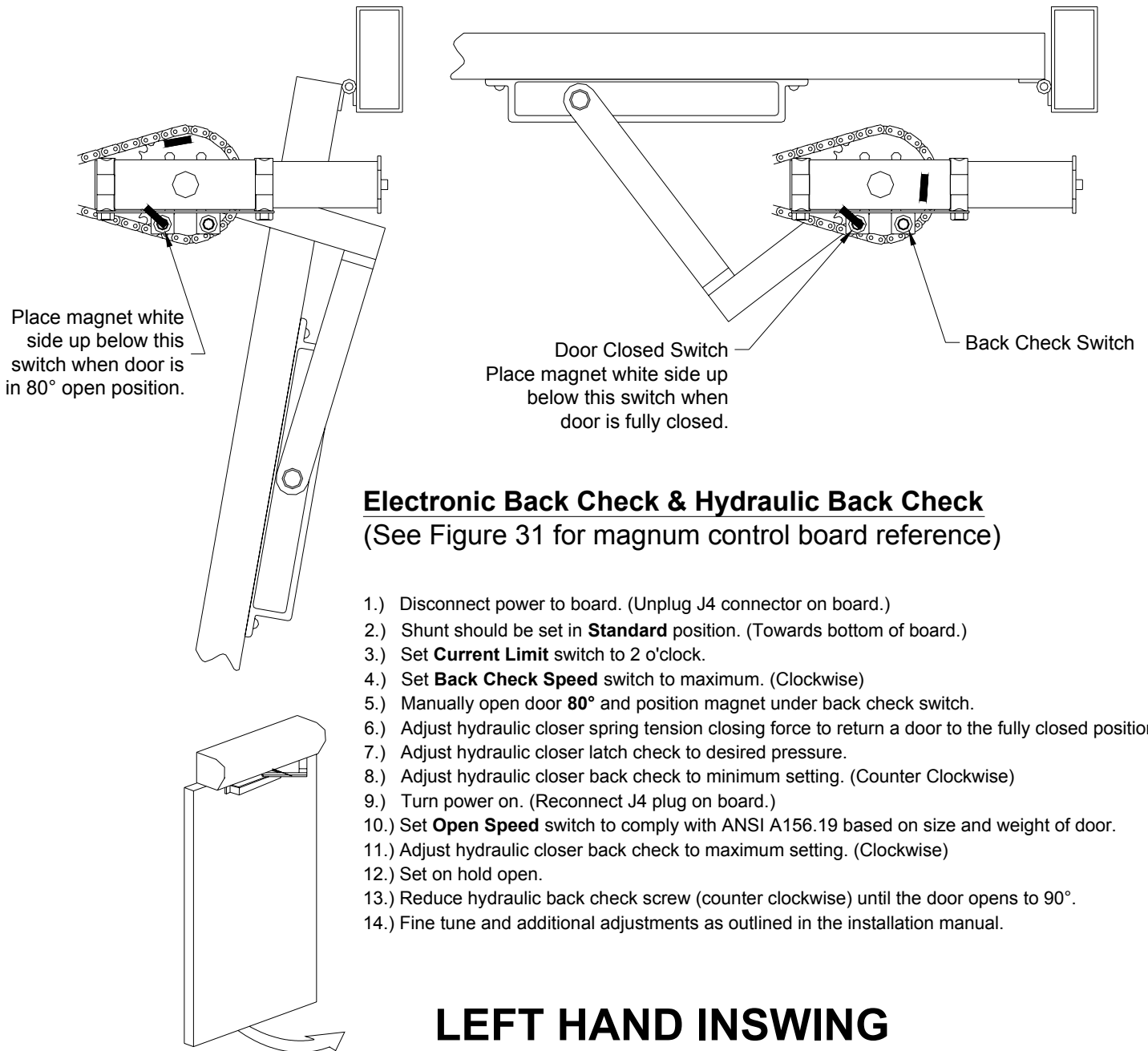


Figure 30 – Left Hand Door Inswing Shown

Electrical Power There is a 7/8" diameter hole for electrical conduit at each end of the header. Remove the decorative plug from the header closest to the power source and run the power wires into the header. It is also acceptable to drill a sufficient sized hole in the back of the header and bring power in from the attaching wall or frame. Ensure that all national electrical and local building codes are followed. It is essential that the ground wire is attached to the green ground screw found on the end of the header, opposite the pivot. The ground (green) wire from the control board must also be secured under this ground screw.

It is recommended that the power be run through a 120 VAC 5 amp (or higher) rated switch or circuit breaker so that power can be easily removed for maintenance. In any case, the power must be off for these connections. Connect the hot and neutral wires to the black and white wires from the control board.

Wiring Connectors

There are four connectors located on the control board labeled J1, J2, J4, and J5 (**Figure 31**). There is a replaceable fuse (Fuse: 2 (F2)) and a resettable fuse (Fuse: 1 (F1)). A wiring diagram is provided at the end of this section.

J1 is the signal input. It is a six-pin connector with a mating connector installed.

1. Pin 1 has a lock out circuit so that the signal only works when the door is in the closed or fully open position. The logic is turned off and on through back check and door closed switches. Completing the circuit from the common (pin 6) will prevent the door from opening or closing from a fully closed or fully open position. It is generally used for swing side presence detectors where the detector needs to be deactivated as the door sweeps across the detection zone. The wire to this pin is white.
2. Pin 2 should be connected to the door closed switch to determine when the door is closed and out of the detection area of the presence sensor. The wire to this pin is orange.
3. Pin 3 should be connected to the back check switch. The wire to this pin is blue.
4. Pin 4 receives the activate signal from the actuating device when someone approaches. The wire to this pin is black.
5. Pin 5 is used with floor mats, and other safety systems. Completing the circuit from the common (pin 6) will stop the door during opening of closing as well as prevent it from moving if it is fully open or closed. This safety circuit is always active unlike the safety circuit described for pin 1. The wire to this pin is purple.
6. Pin 6 is common, so connecting this red wire to any of the other five will cause that feature to be activated. For example, connecting the red and blue will result in back check.

J2 is the 24 VAC output to the actuating device. It is a two-pin connector.

1. Do not exceed 0.500-amp current draw.

2. This circuitry was designed to work with any NABCO Entrances sensor. It can be used to power other sensors as long as the 0.500-amp current draw is not exceeded.
3. Do not connect electric locks or solenoids to this circuit.

J5 is the motor feed. It is a Four-pin connector with a connector installed to the motor inputs.

1. Pin 1 is motor negative. The wire to this pin is red.
2. Pin 3 is motor positive. The wire to this pin is black.
3. Matching the color wires into the motor makes the unit work for right-hand doors. Mismatching the wires makes the unit work for left-hand doors.
4. Pin 2 & Pin 4 must be jumped by the white wire. If there is no jumper between Pin 2 & Pin 4 motor breaking will occur and adjustment of the controls for the hydraulic closer will have little or no effect.

NOTE: If the unit is the wrong hand, it **CANNOT** be corrected by only reversing the wiring leads into the motor, because the hydraulic closer is handed and would need to be replaced.

Fuse 1 (F1) is a 0.5 amp, resettable fuse that automatically resets to protect auxiliary equipment that may be connected to J2. It also protects the auxiliary power circuit of the magnum board.

Fuse2 (F2) is a 3 amp, 250 volt fuse that protects the circuit board from voltage spikes and incorrect voltage being applied to the board.

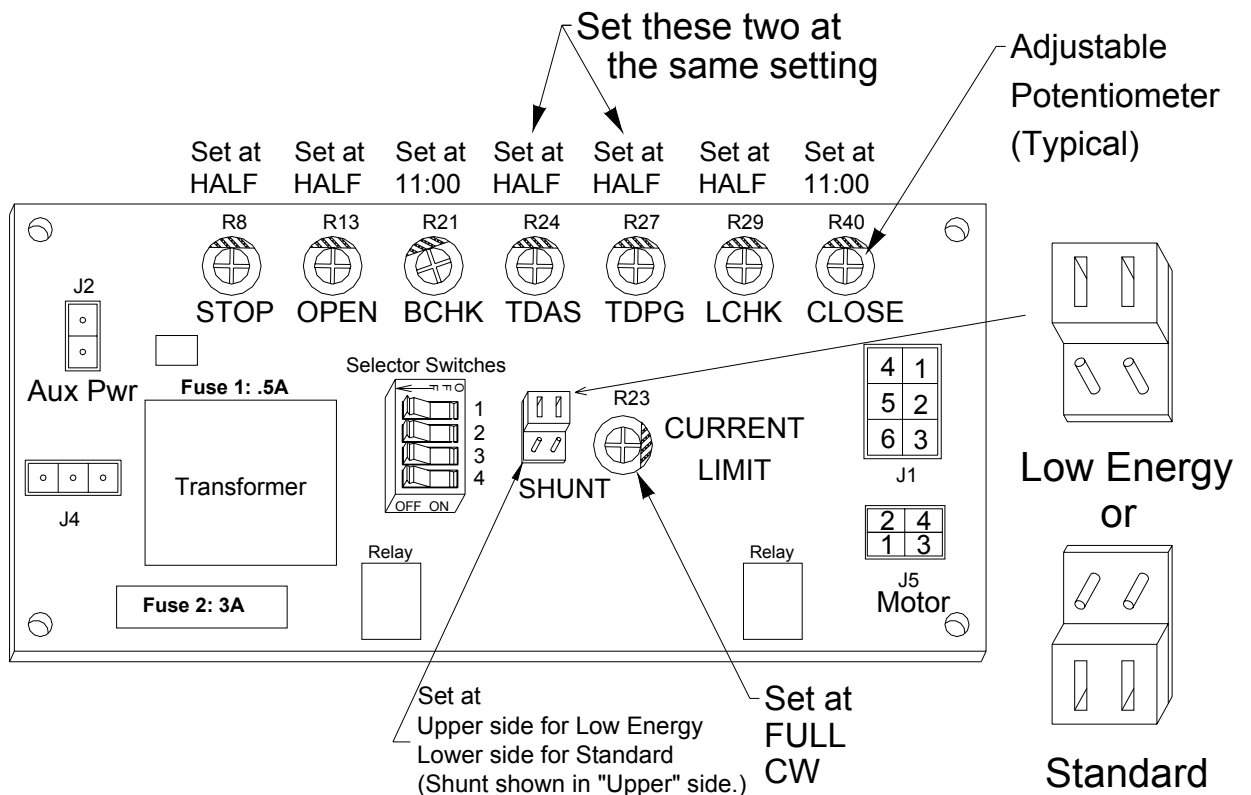
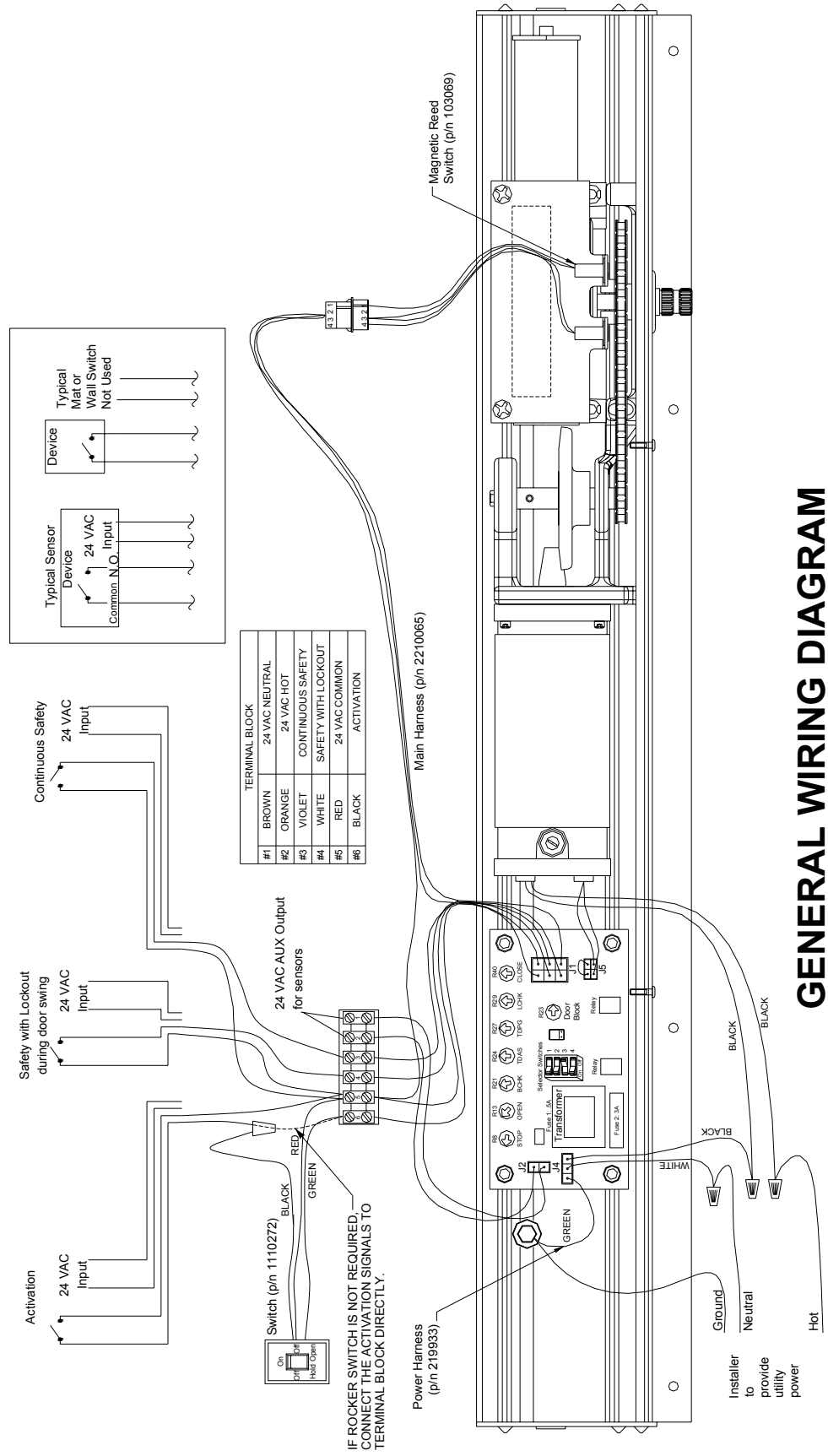


Figure 31 – Magnum Control Board.



GENERAL WIRING DIAGRAM

Figure 32 – Basic Wiring Diagram

Figure 32 is the wiring method used for basic installations. See **Appendix B** for wiring of:

- Wall switch activation
- Simultaneous pair of low energy operators
- Radio receiver activation
- Electric strike activation
- 240 volt wiring

Simultaneous Pair Installations

Note: Simultaneous pair doors require two operators, two motors, two control boards, and a simultaneous pair harness. All drilling and mounting dimensions for simultaneous pair doors should use both the left and right hand patterns for the specific swing direction and hinge configuration. The installer first has to configure one of the doors with the speeds and timing desired. Then adjust the potentiometers on the door controller to closely mimic those settings.

See Simultaneous Pair Wiring Diagram in **Appendix B**.

Tuning for Performance

With power turned on, the door is operational. The speeds and limits have been set at the factory. Check to ensure the control board settings match **Figure 31**. Activate the door to test settings. Make adjustments as needed (see Adjustments sections).

Overview of Magnum Controller

- All adjustments should be made with a small screwdriver. **DO NOT** use a pencil.
 - The ground wire must be attached to the ground screw, which is located in the header.
 - Reference ANSI standard 156.19 for low-energy swingers to make sure settings comply with codes (**Appendix A**).
1. The amount of energy stored in the door and imparted to an object on impact is determined by both the weight and speed of the door. NABCO Entrances Inc. recommends setting opening and closing speeds as slow as owners will accept, **AND** below the maximums stated by ANSI.
 2. The settings on the controller will vary slightly as the voltage supplied to the unit varies due to building and electrical supply loads increase/decrease. To allow for variations, the manufacturer recommends adding 1 second to ANSI's minimum opening or closing times. Use a stopwatch for assistance.

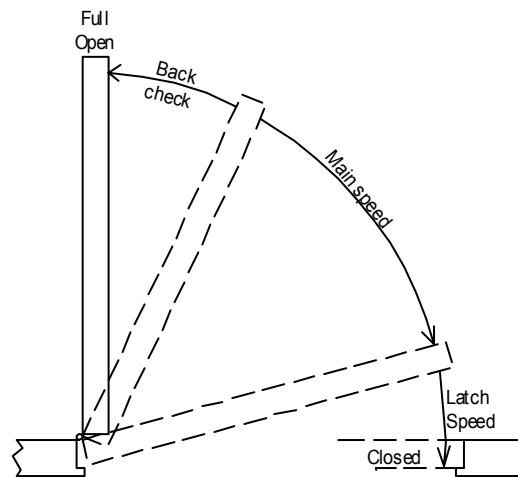


Figure 33 – Stages of Travel.

Back Check – This takes place from about the last 10° of sweep to the full open position.

Closing Speed – How fast the door moves from fully open to the final 10° before fully closed.

Current Limit (or Door Block) – This sensitivity adjustments stops the activation if the door encounters an object in the path of the moving door while opening.

Latch Position – The last 10° of closing.

Opening Speed – How fast the door opens from fully closed to approximately 80° open.

Push-N-Go – Activation of the GT 710 by manually pushing the door. The Magnum Control board senses the power generated by rotation of the motor and energizes the activation circuit.

Time Delay Activation Signal – When the door is activated via a push plate, a mat, a sensor, etc., this option determines how long the door will stay open. It is adjustable up to 60 seconds.

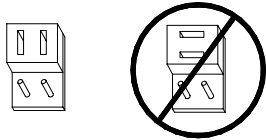
Stop Adjustment – When an object is detected in the path of a moving door while opening and the door is not in back check, this feature determines whether the door stops, slowly opens, or slowly closes.

Adjustments

There are three types of adjustments on the Magnum Control Board, shunt, potentiometers and selector (dip) switches. See **Figure 31** for the location of these adjustments.

NOTE: Before adjustment, check the setting of the following items.

1. Pin 2 & 4 of the motor connector must be jumped.
2. A shunt must be set to the Upper position. (see Figure 31)



Shunt

Shunt – The 2x2 shunts have the metal shorting bar exposed so that it is visible from above; thus if there is a way to make it known that these "lines" must be vertical and not horizontal it would define proper installation.

Potentiometers – There are eight potentiometers located on the control board. Use a small #0 Phillips screwdriver to adjust each potentiometer. Don't touch other parts of the board with the screwdriver. This could damage the electrical circuitry. Adjust potentiometers clockwise to increase the parameters (speeds, stops, delays, etc.), counterclockwise to decrease the parameters, except for closing speeds which is the direct opposite. Wait at least 5 seconds before testing the change.

Recommended starting settings correspond with positions on a clock with 12 o'clock at the top. The settings are a starting point. They are standard field approximations that might need to be adjusted for a specific situation.

Selector (Dip) Switches – There is one bank of four switches located on the control board. The screwdriver can be used to toggle the switches on and off. Do not use a pencil. Note that the edge of the switch bank closest to the transformer is the off position.

NOTE: Closing speed and latch speed are both adjusted at the hydraulic closer using a 3/32" allen wrench. Figure 17 shows the location of the adjusting screws and provides instructions.

Due to the NABCO arm geometry, the back check adjustments on the hydraulic closer are not effective unless the door is opened more than 120°. Therefore back check is adjusted on the Magnum Control Board.

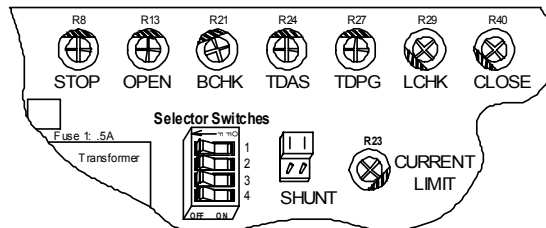


Figure 34 – Magnum Control Board

Customized Settings GT 710 Control Board

Potentiometers

STOP! Changes should only be made by trained, qualified technicians.

Each control board has 8 potentiometers:

1. Stop Adjustment (STOP)
2. Opening Speed Adjustment (OPEN)
3. Back Check Adjustment (BCHK)
4. Time Delay Activating Signal (TDAS)
5. Time Delay Push-N-Go (TDPG)
6. Latch Check Adjustment (LCHK)
7. Closing Speed Adjustment (CLOSE)
8. Current Limit Adjustment (CURRENT LIMIT)

Stop Adjustment (STOP):

When an object is sensed in the path of a moving door by a safety mat connected to the control to the control board through J8 and the door is not in back check, this feature determines whether the door stops, slowly opens, or slowly closes. The recommended starting setting is 12 o'clock.

Clockwise rotation of the potentiometer increases the stop power. If the stop power is increased and object is detected in the path of the opening door, the door will continue to open, but at a slower speed. If the stop power is decreased and an object is detected in the path of the opening door, the door will stop, reverse direction, and close slowly. Rotation of the potentiometer towards the midpoint of the setting reduces the speed at which the door moves.

NOTE: This adjustment is pertinent to signals from the continuous safety connector (J8) and is not related to current limit. Also, heavier doors will require more STOP power.

Opening Speed Adjustment (OPEN):

This sets the door opening speed. The recommended starting position is 12 o'clock. Clockwise rotation increases opening speed.

Back Check Adjustment (BCHK)

This sets back check speed. Back check takes place from about the last 10° of sweep to the full-open position. The recommended starting position is 11 o'clock. Clockwise rotation increases back check speed. If back check is set too high the door will slam open. The current limit will trip. If back check is set too low the motor will not be able to move the door. The door will slowly close.

Time Delay Activating Signal (TDAS):

When the door is activated, this option determines how long the door will stay open after the activation (or input signal) is released. It is adjustable up to 60 seconds. The recommended starting position is 12 o'clock. Clockwise rotation increases time delay.

Time Delay Push-N-Go (TDPG):

When the push-n-go feature is used, this sets the time delay, which determines how long the door stays open. It is adjustable up to 60 seconds. The recommended starting position is 12 o'clock. Clockwise rotation increases time delay.

NOTE: Push-N-Go time delay, when active, should be set for a shorter length of time than the Time Delay Activating Signal.

If TDPG is not used, the time delay adjustment must be set at the same setting as time delay activating signal (TDAS). Do not set TDPG at minimum (full CCW).

Latch Check Adjustment (LCHK):

Adjustment of this potentiometer is not required on the GT 710 system. The latch check adjustment is controlled entirely by the hydraulic closer and all adjustments should be made according to the closer adjustments procedures on

Page 14. To avoid conflict with the hydraulic closer settings, rotate this potentiometer fully counterclockwise.

Closing Speed Adjustment (CLOSE):

Adjustment of the potentiometer is not required on the GT 710 system. The latch check adjustment/closing speed is controlled entirely by the hydraulic closer and all adjustments should be made according to the closer adjustment procedure on Page 14. To avoid conflict with the hydraulic closer settings, rotate this potentiometer fully counterclockwise.

Current Limit Adjustment (Current Limit):

This should be set only when the door operation is satisfactory.

This stops activation and cuts power to the motor if the current exceeds the setting. It is used to set how much force the opening door will push on an encountered object before it recycles. When the recycle is triggered, the door will stop and coast to a close. This adjustment is affected by opening speed. Set opening speed first. The recommended starting position for current limit might not be appropriate in windy conditions. For example, strong wind gusts against an exterior door may inadvertently cause it to recycle. Clockwise rotation makes the door less sensitive to objects in its path.

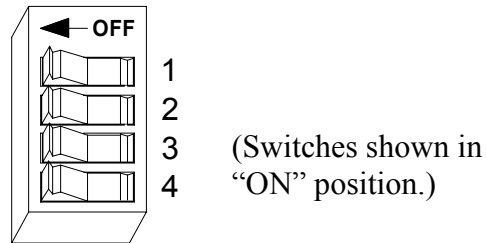


Figure 35 – Dip Switches

Dip Switches

Switch 1 – This is not active.

Switch 2 – This is not active.

Switch 3

1. When the switch is ON, push-n-go is not active.
2. When the switch is OFF, push-n-go is activated.

Switch 4

1. When the switch is ON, the door will open, time out and close.
2. When the switch is OFF, the door is in the sequential mode. One activation opens the door, a second activation is needed for the door to close.

Control Switches

An ON-OFF-HOLD OPEN switch assembly has been provided in the harness. It can be mounted inside the header or where it is easily accessible to the customer. Drill a 7/8” diameter hole in the center of the location to install the switch. Use the switch as a template to drill (2) 11/64” diameter mounting holes. Use the two screws provided to mount the switch. If the switch assembly is not desired, replace it with jumper from the parts bag.

Signage

After the door has been adjusted properly and tested, decals should be applied to the door such that they are visible from either side of the door. Depending on the type of the door activation, certain decals must be displayed. Refer to Section 6 of ANSI A156.19 Standard for Power Assist and Lower Energy Power Operated Doors. Decals have been provided with the GT 710 to comply with all the installation applications described in ANSI A156.19.

Troubleshooting

| Symptom | Action/Cause | Solution |
|---|---|---|
| Operator does not function. | <ol style="list-style-type: none"> 1. Check Fuse 2 (F2). 2. Check for 120 VAC at connector J5. 3. Check power to activation device at connector J2. 4. Check Fuse 1 (F1). | <ol style="list-style-type: none"> 1. Replace fuse. 2. Check incoming power. If power is good, check connection to motor. Replace motor if necessary. 3. If current exceeds 0.5 amps at 24 VAC, replace with lower draw sensor. 4. If blown, replace fuse. If F1 is OK, check power to activating devices at J2. Voltage is too low, reduce accessory load. |
| Adjustment of Hydraulic Closer has no effect. | Check 4 pin motor connector on the board. | Pin #2 and #4 must be jumped by a wire. |
| Door slams closed. | Main speed on hydraulic closer not adjusted properly. | Turn main speed in direction of turtle. |
| Door slams open. | Back check speed not adjusted or magnet not in proper location. | Adjust back check potentiometer or relocate magnet. |
| Fuse 1 (F1) blows when door open is triggered. | Check door activation device power consumption. | If current draw exceeds 0.5 amps at 24 VAC, replace with lower draw sensor. |
| Door moves in wrong direction. | Check polarity of motor input wires at connector on motor. | Reverse motor leads. |
| Back check adjustment on Magnum board has no effect. | The fully open door position is greater than 90° and the back check adjustment on the hydraulic closer is overriding the controls of the Magnum board. | Adjust the back check screw on the bottom of the header out one turn. |
| Unit leaks oil. | Adjusting screws on hydraulic closer have been removed. | Replace hydraulic closer. |
| No back check or motor continues to drive after door is closed. | Magnets on main sprocket not in correct position. | Follow instructions on Page 14 to properly align magnets. |
| Door does not stay tightly closed. | <ol style="list-style-type: none"> 1. Preload on swing arm is not correct. 2. Building stack pressure is excessive. | <ol style="list-style-type: none"> 1. Position arm 45° as shown on Figures 11 through 14. 2. Upgrade operator unit to GT 500. |
| Safety or Presence Sensor does not function. | No power to sensor or defective sensor. | Check harness wiring to wire diagram on Page 21. |
| Safety or Presence Sensor is activated by closing door. | Connection of sensor to wiring harness was to "Safety" not "Safety w/Lockout". | Rewire Safety Sensor to "Safety w/Lockout" connector. |
| Floor mat, holding beams or other accessories do not function while door is moving. | Connection of accessories was made to "Safety w/Lockout" not "Safety". | Rewire accessory to "Safety" connection. |
| Sensor shows activation signal sent, but door does not open. | Sensor not connected properly to activation connector. | Check harness wiring to wiring diagram on Page 21. |
| One sensor does not activate both doors on a simultaneous pair. | Sensor is not connected to both control boards. | Install simultaneous pair harness (P/N 2210270). |

Appendix A**EXCERPTS FROM ANSI/BHMA A156.19 – 1997****4.0 REQUIREMENTS FOR LOW ENERGY SWINGING POWER OPERATED DOORS OR LOW ENERGY SWINGING POWER OPEN DOORS****4.1 Opening Time**

4.1.1 Doors shall be field adjusted so that opening time to back check or 80 degrees, whichever ever occurs first, shall be 3 seconds or longer as required in Table 1. Back check shall not occur before 60 degrees opening.

4.1.2 Total opening time to fully open shall be 4 seconds or longer.

4.2 Closing Time

4.2.1 Doors shall be field adjusted to close from 90 degrees to 10 degrees in 3 seconds or longer as required in Table 1.

4.2.2 Doors shall be field adjusted to close from 10 degrees to fully closed in not less than 1.5 seconds.

4.3 The door shall be field adjusted to remain fully open for not less than 5 seconds unless a sensing device is used to hold the door open.

4.4 The force required to prevent a stopped door from opening or closing shall not exceed a 15 lbf (67 N) applied 1 in (25 mm) from the latch edge of the door at any point in the opening or closing cycle.

4.5 The kinetic energy of a door in motion shall not exceed 1.25 lbf-ft (1.69 Nm). Table 1 provides speed settings for various widths and weights of doors for obtaining results complying with this paragraph.

4.6 In the event of power failure to the operator, doors shall open with a manual force not to exceed a 15 lbf (67 N) or torque of 40 lbf-in (4.5 Nm) to release a latch, a 30 lbf (133 N) to set the door in motion, and a 15 lbf (67 N) to fully open the door. The forces shall be applied at 1" (25 mm) from the latch edge of the door.

Table 1

Minimum Opening Time to Back Check or 80 degrees, which ever occurs first, or Minimum Closing time from 90 degrees to Latch Check or 10 degrees. Back check shall not occur before 60 degree opening.

| “D” = Door Leaf Width in Inches (mm) | “W” = Door Weight in Pounds (kg) | | | | |
|--------------------------------------|----------------------------------|------------|------------|------------|------------|
| | 100 (45.4) | 125 (56.7) | 150 (68.0) | 175 (79.4) | 200 (90.7) |
| 30 (762) | 3.0* | 3.0 | 3.0 | 3.0 | 3.5 |
| 36 (914) | 3.0 | 3.5 | 3.5 | 4.0 | 4.0 |
| 42 (1067) | 3.5 | 4.0 | 4.0 | 4.5 | 4.5 |
| 48 (1219) | 4.0 | 4.5 | 4.5 | 5.0 | 5.5 |

Matrix values are in seconds.

Doors of weights and widths can be calculated using the formula:

$$T = \frac{D\sqrt{W}}{133\text{lb}f - ft} \qquad T = \frac{D\sqrt{W}}{2260Nm}$$

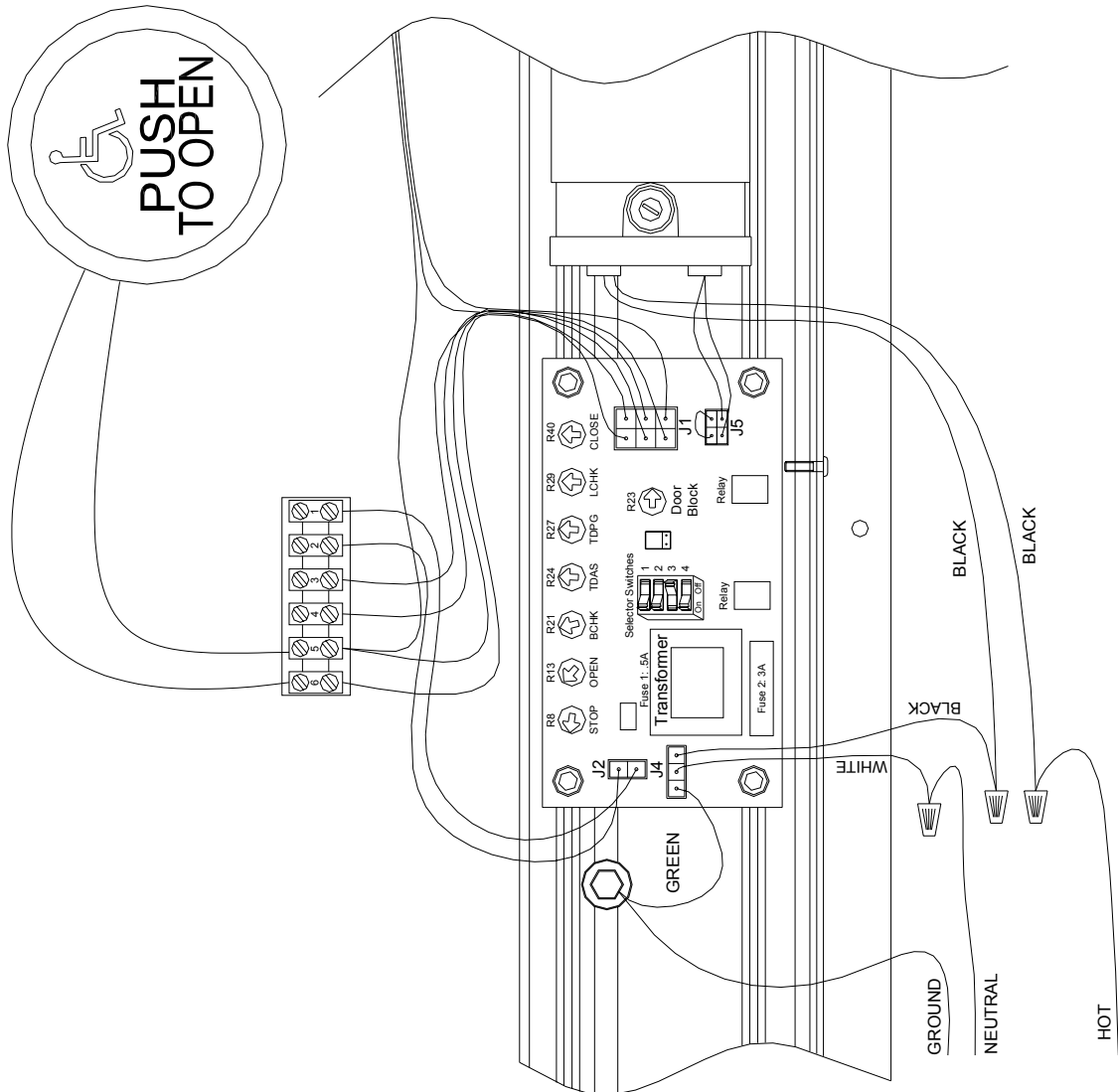
WHERE: T = Time, seconds
 D = Door width, inches (mm)
 W = Door weight, lbs (kg)

The values for “T” time have been rounded up to the nearest half second. These values are based on kinetic energy of 1.25 lbf-ft.

The value for the 30 inch wide, 100 pound door actually calculates to 2.5 seconds with rounding. 3.0 seconds was used as a more conservative value.

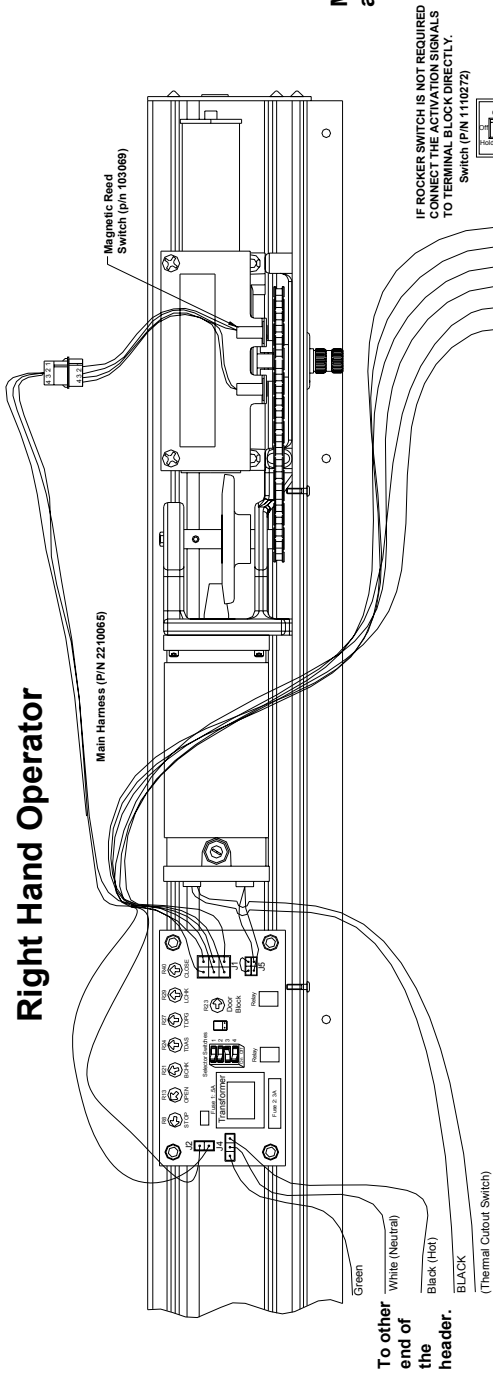
Appendix B1

Wiring Diagram for Wall Switch Activation



APPENDIX B2

Right Hand Operator

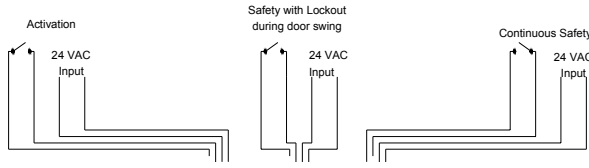
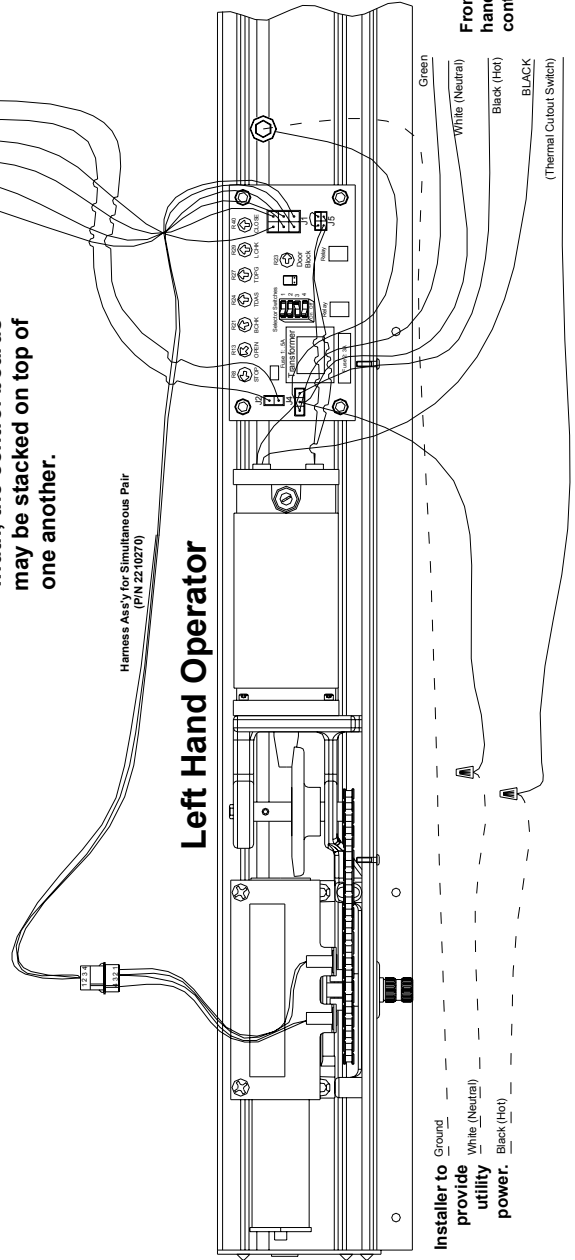


| TERMINAL BLOCK | |
|----------------|---------------------------|
| #1 | BROWN 24 VAC NEUTRAL |
| #2 | ORANGE 24 VAC HOT |
| #3 | VIOLET CONTINUOUS SAFETY |
| #4 | WHITE SAFETY WITH LOCKOUT |
| #5 | RED 24 VAC COMMON |
| #6 | BLACK ACTIVATION |

WIRING DIAGRAM FOR SIMULTANEOUS PAIRS

Depending on the overall width, the control boards may be stacked on top of one another.

Left Hand Operator



IF ROCKER SWITCH IS NOT REQUIRED CONNECT THE ACTIVATION SIGNALS TO TERMINAL BLOCK DIRECTLY.



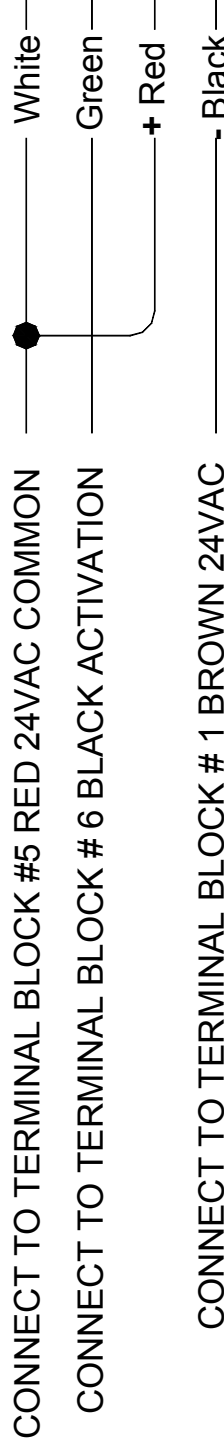
BLACK RED GREEN

24 VAC AUX Output for sensors

APPENDIX B3

Wiring Diagram for Radio Activation

| |
|---|
| <p>Four Wire Radio Receiver (part # 24-3681-05)</p> |
|---|



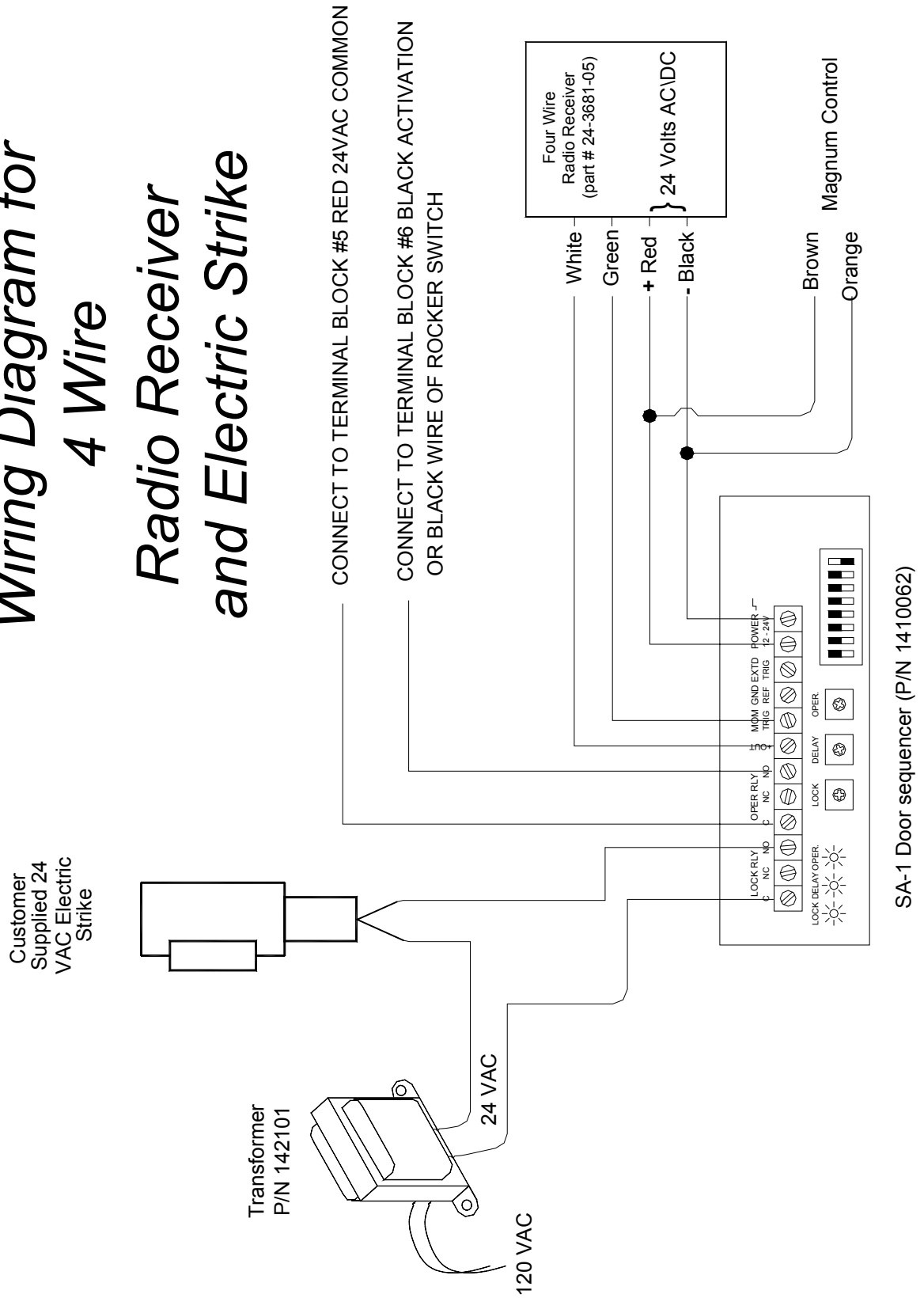
CONNECT TO TERMINAL BLOCK #5 RED 24VAC COMMON

CONNECT TO TERMINAL BLOCK #6 BLACK ACTIVATION

CONNECT TO TERMINAL BLOCK #1 BROWN 24VAC

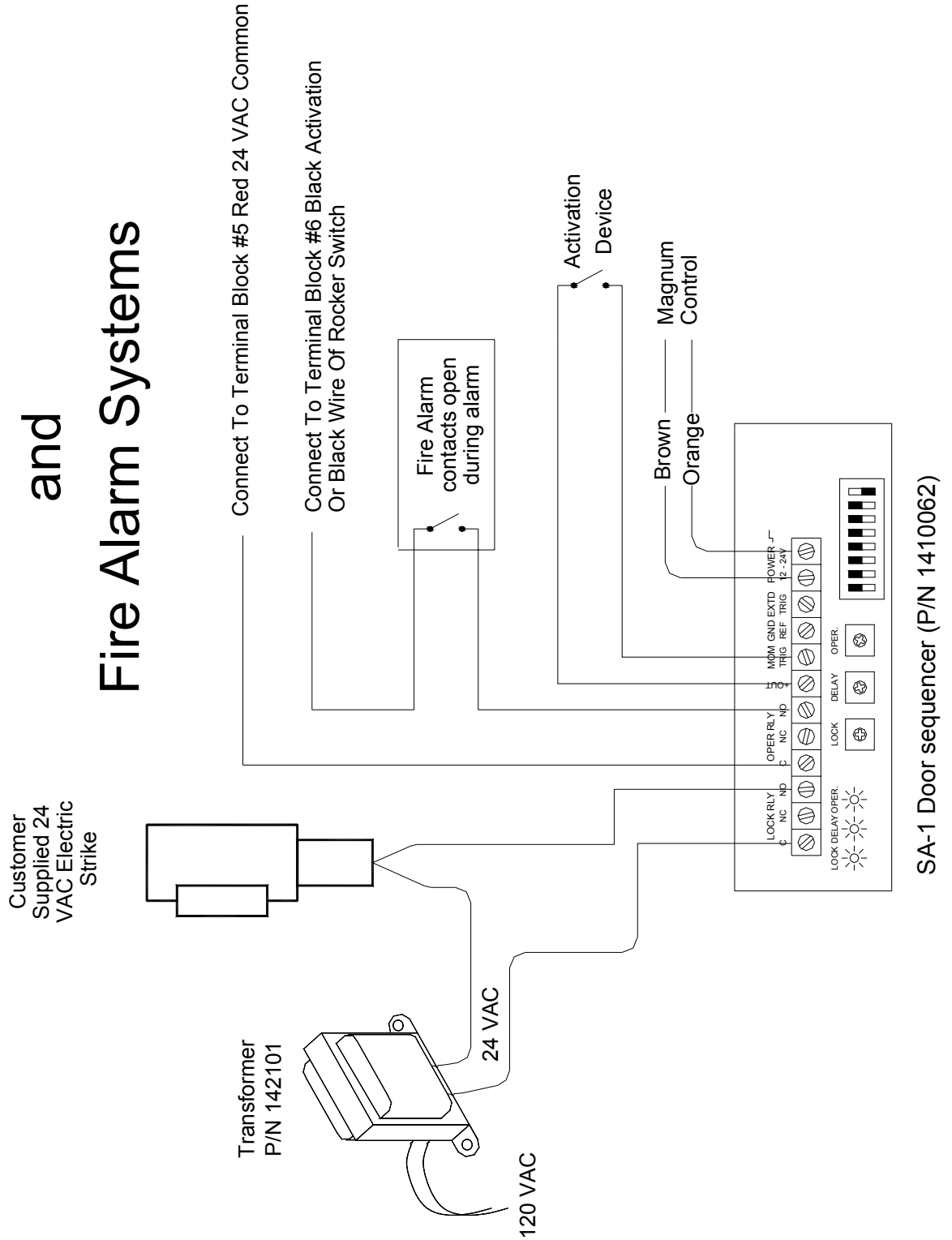
APPENDIX B4

Wiring Diagram for 4 Wire Radio Receiver and Electric Strike



Wiring Diagram for Electric Strike and Fire Alarm Systems

APPENDIX B5



APPENDIX B6

Transformer Installation
and Wiring
for 240 Volts

