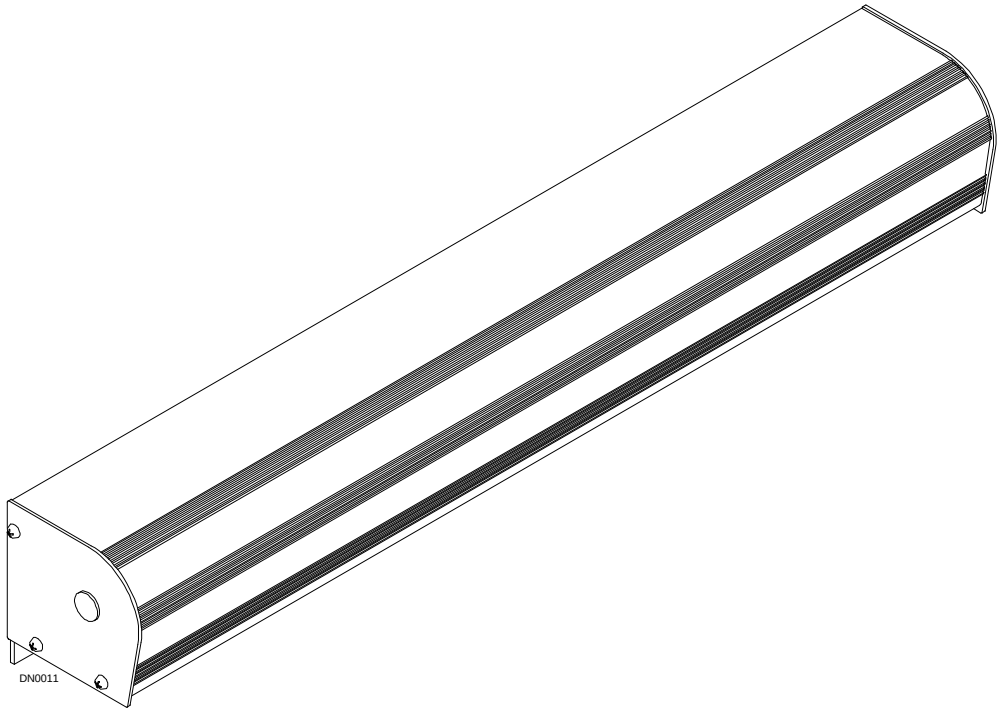
Automatic Entrance Systems

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

Retrofit Kit Manual
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 15-10677
August 23, 2004 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.**

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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

Earlier version of the NABCO GT710 can be retrofitted with the newer Magnum Control Board (Magnum IV). This combination offers several control features that accommodate most installations.

This Manual offers step-by-step instructions on how to upgrade an existing GT710 installation with the Magnum IV and related hardware.

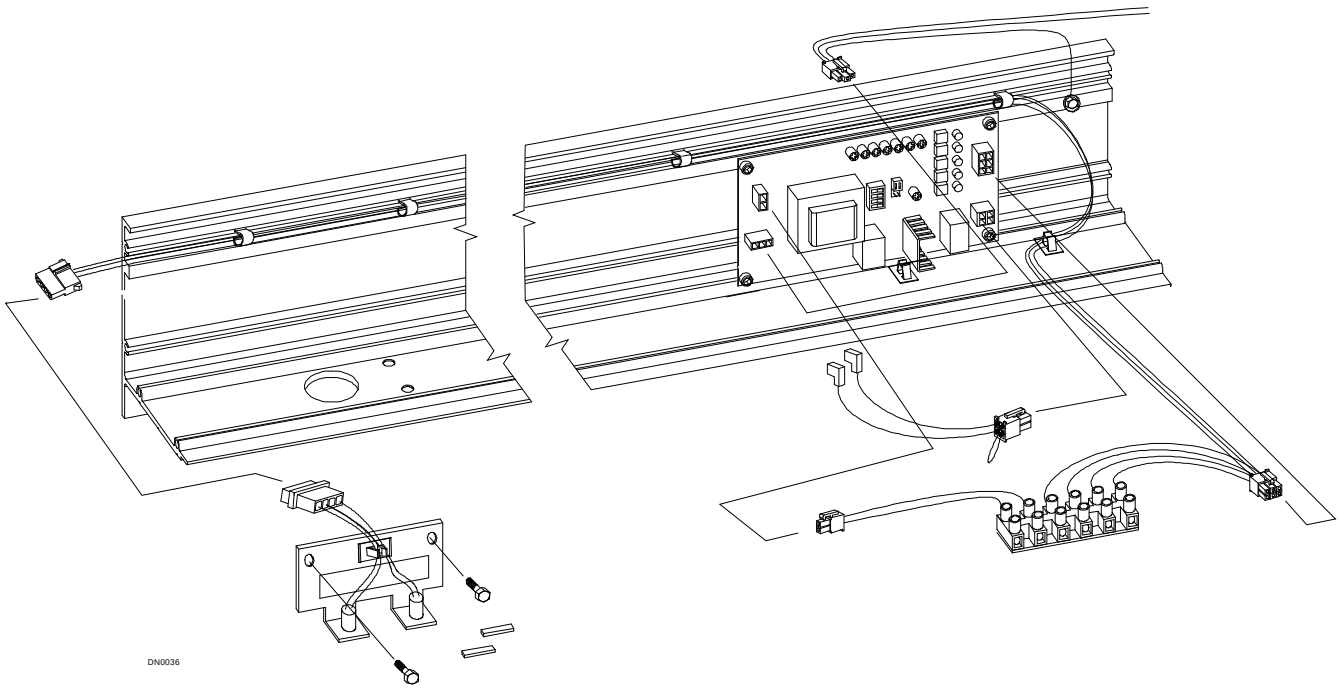


Figure 1 – Overview of GT710 with Magnum IV

Table 1 – Comparison of Magnum IV to the original GT710 Controller

Magnum IV Board	GT710 Controller
Adjustable opening speed.	Adjustable opening speed.
Adjustable current limit/door block trip.	Adjustable current limit/door block trip.
Adjustable activation timer (0 to 60 seconds)	One adjustable timer for activation and push-n-go (0 to 60 seconds)
Adjustable separate push-n-go timer (0 to 60 seconds)	None
Adjustable door action when detection (continuous safety) occurs – allow door to stop, creep open or creep closed.	No adjustment.
Automatic shut-off of motor if door does not open within 30 seconds.	Shut-off occurs when the timer for activation expired.
Connection provided for swing side mats and swing side presence detector (Continuous safety and safety with lockout).	N/A
Enable/disable sequential operation via dip switch.	Enable/disable sequential operation via onboard jumper.
Enable/disable push-n-go via dip switch.	Wiring change required to activate push-n-go.

Specifications

Power Input	120 (±10%) AC 50-60 Hz, 5 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 ¾" (44 mm)
Minimum Clearance from Top of Door to Ceiling	7" (178 mm)
Door Hinge Requirements	¾" Butt, Offset Pivot, or Center Pivot
Door Thickness	1 ¾" (44 mm) Minimum
Door Width	Specify When Ordering

Tools required

5/32" Hex Key (Allen Wrench)
Phillips Screwdriver #2
Slotted Screwdrivers, Small and Medium
Drill Bits: 11/64" and 7/8"

Handing Requirements The type of door will determine whether a left-hand or a right-hand operator is required. **Figure 2** can be used to determine which unit is required.

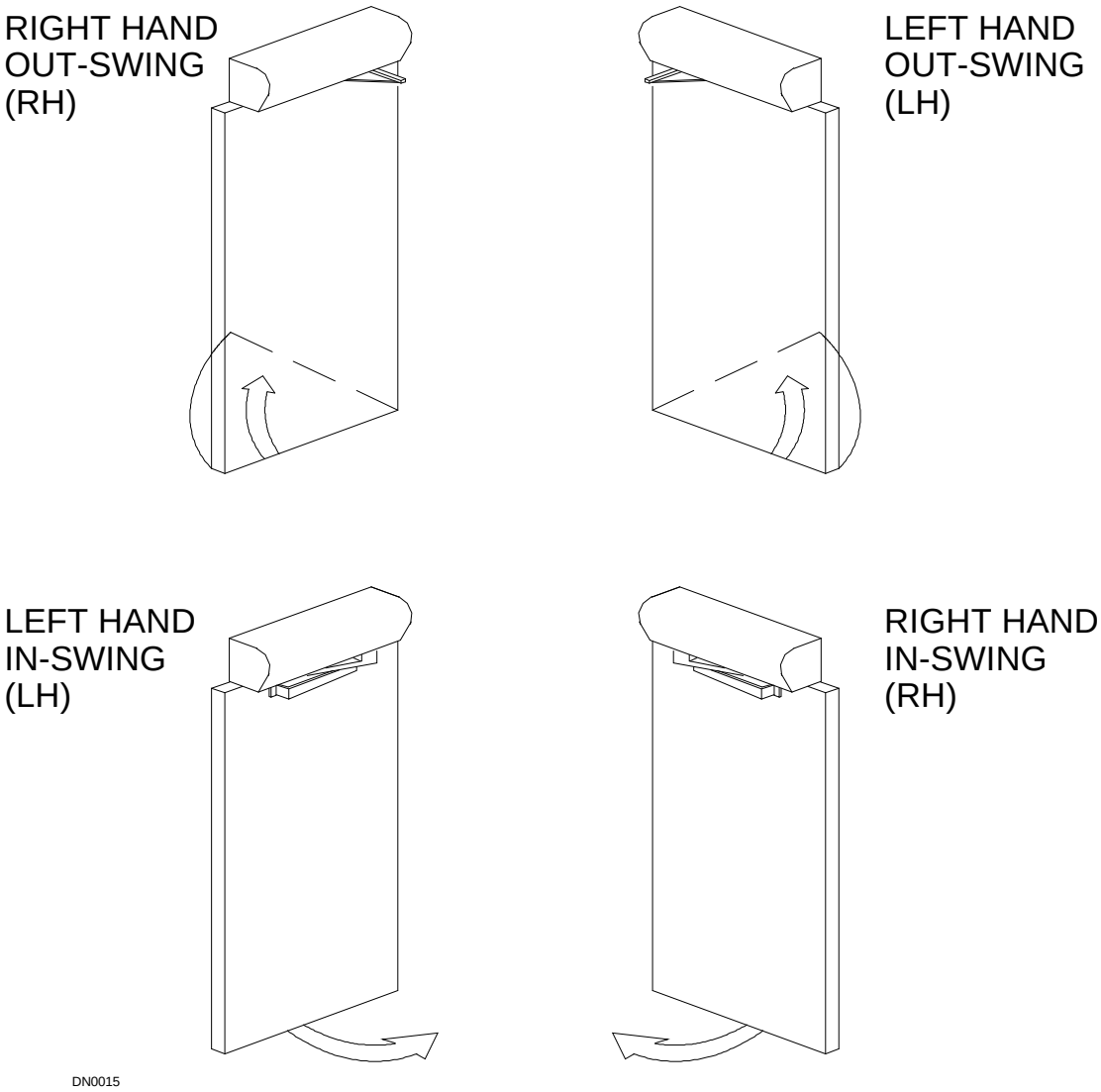


Figure 2 – Determine the Swing (Hand) of the Door.

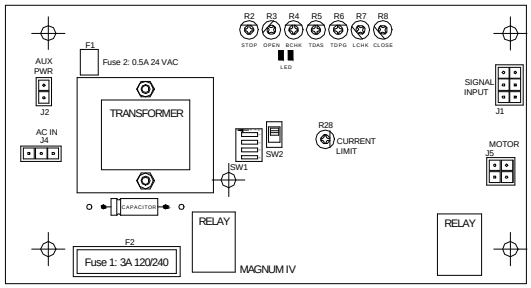
Note: The hand of the unit and the hand of the door must be the same. The hand of the unit is not reversible and cannot be converted in the field.

Hardware Kit List

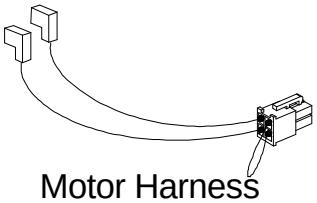
This kit has been shipped with the following installation hardware.

MAGNUM IV RETRO FIT for SINGLE – P/N 11-10361-01
MAGNUM IV RETRO FIT for SIM.PAIR – P/N 11-10361-02

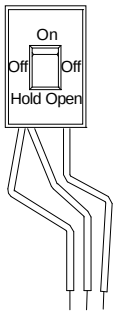
	Part #	Part Description	Qty		Notes
			Single	Sim-Pair	
All items (#1~#24) would be packed into 8”x6”x6” box (P/N 14-1159).					
1	24-9800-04	Magnum IV Control Board	1	2	
2	22-10065	Main Harness - Single	1	---	With Terminal Block
3	22-10270	Main Harness – Simultaneous Pair	---	1	With Terminal Block
4	11-10286	Motor Harness	1	2	Four Pin Connector
5	21-9933	Power Harness - Single	1	---	
6	14-5883	Power Harness – Simultaneous Pair	---	1	
7	11-10272	Rocker Switch Assy	1	1	No connector
8	21-9941-01	Magnetic Switch Assy - RH	---	1	
9	21-9941-02	Magnetic Switch Assy - LH	---	1	
10	21-10005	Magnetic Switch Plate Assy	1	---	
11	14-9940-01	Label for RH Operator	1	---	Use one of Labels.
12	14-9940-02	Label for LH Operator	1	---	
13	15-10677	GT710 Retrofit Kit Manual	1	1	
Packed into a 3”x4” ziplock bag (P/N 14-0828-01).					
14	14-9944	Epoxy Package & Stir Stick	1	2	
Packed into a 4”x6” ziplock bag (P/N 14-0828-03).					
15	14-9960	Wire Saddle	3	6	
16	24-1447	Wire Harness Clip	4	8	
17	14-9959	Cable Clamp	---	4	
18	14-9943	Ceramic Magnet	2	4	
19	14-8743	Spacer for Magnum Board	4	8	
20	14-1218	Wire Nut	2	4	
21	14-1838	Male Pin Housing , 4 circuit	1	---	For Magnetic Switch
22	24-0011-014	#10-32x1/2” Phillips Black Oxide Screw	2	2	For Rocker Switch
23	24-4941-19	3/8-16x3/4” Hex Washer Head Screw, F	2	4	For Magnetic Switch
24	24-0010-01	#10-24x7/8” Socket Head Cap Screw	4	8	For Magnum Board



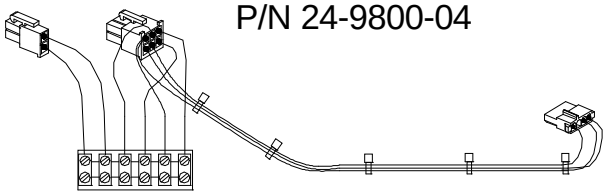
Magnum IV Board
P/N 24-9800-04



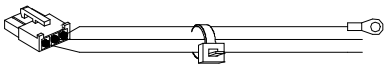
Motor Harness
P/N 11-10286



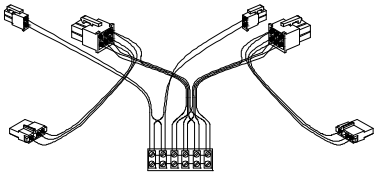
Rocker Switch Assy.
P/N 11-10272



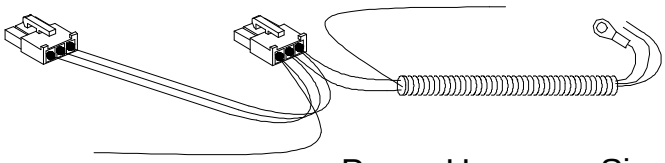
Main Harness - Single
P/N 22-10065



Power Harness - Single
P/N 21-9933



Main Harness - Sim. Pair
P/N 22-10270



Power Harness - Sim.Pair
P/N 14-5883

Epoxy & Stir Stick
P/N 14-9944

Wire Saddle
P/N 14-9960

Cable Clamp
P/N 14-9959

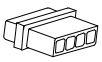
Wire Harness Clip
P/N 24-1447

DN0037

Ceramic Magnet
P/N 14-9943

Spacer
for Magnum Board
P/N 14-8743

Wire Nut
P/N 14-1218



Male Pin Housing
4 circuit
P/N 14-1838

#10-32x1/2"
Phillips Head Black Oxide Screw
P/N 24-0011-014

3/8-16x3/4"
Hex Washer Head Screw, Type F
P/N 24-4941-19

#10-24x7/8"
Socket Head Cap Screw
P/N 24-0010-01

Figure 3 – Installation Hardware

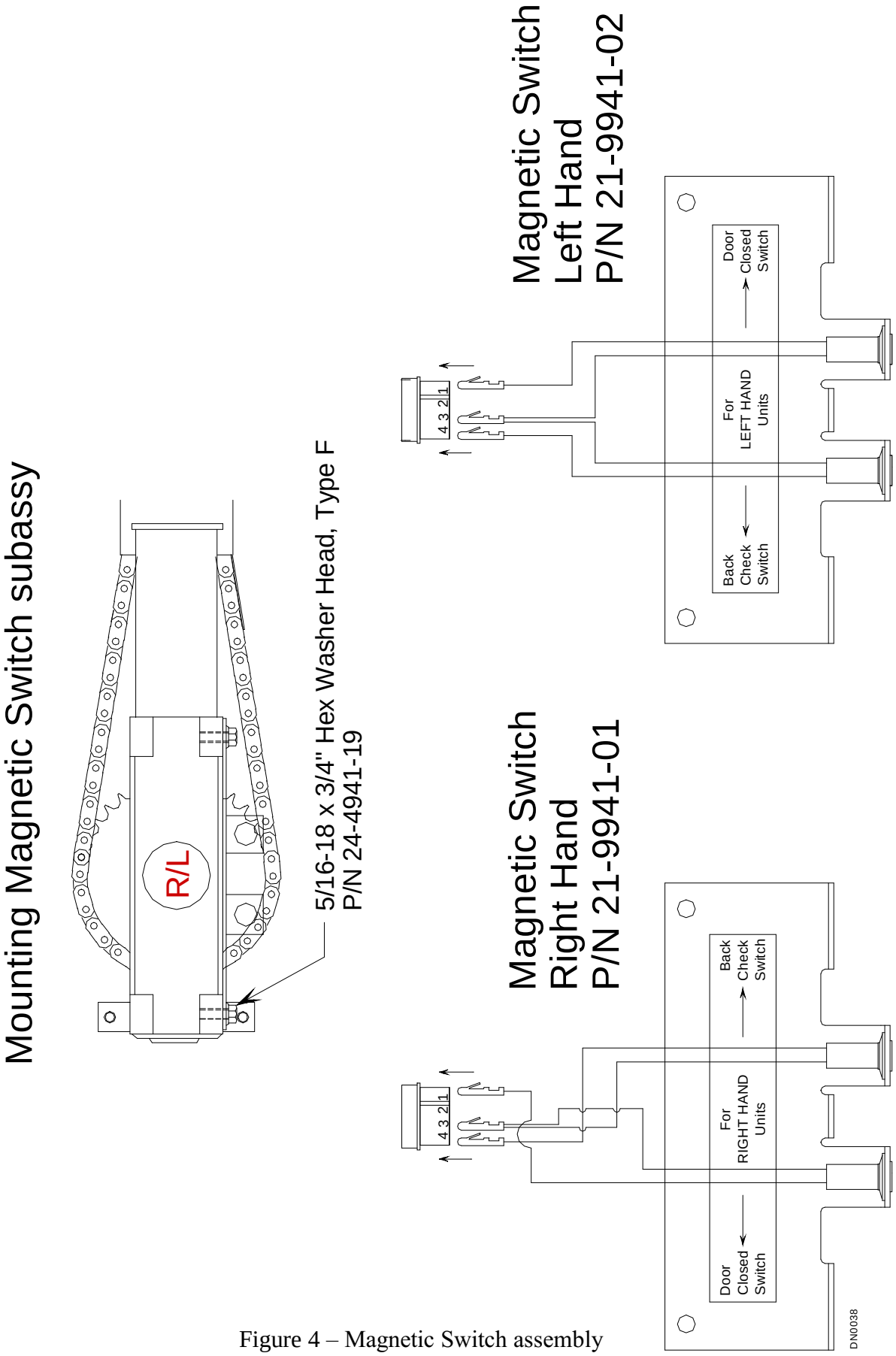


Figure 4 – Magnetic Switch assembly

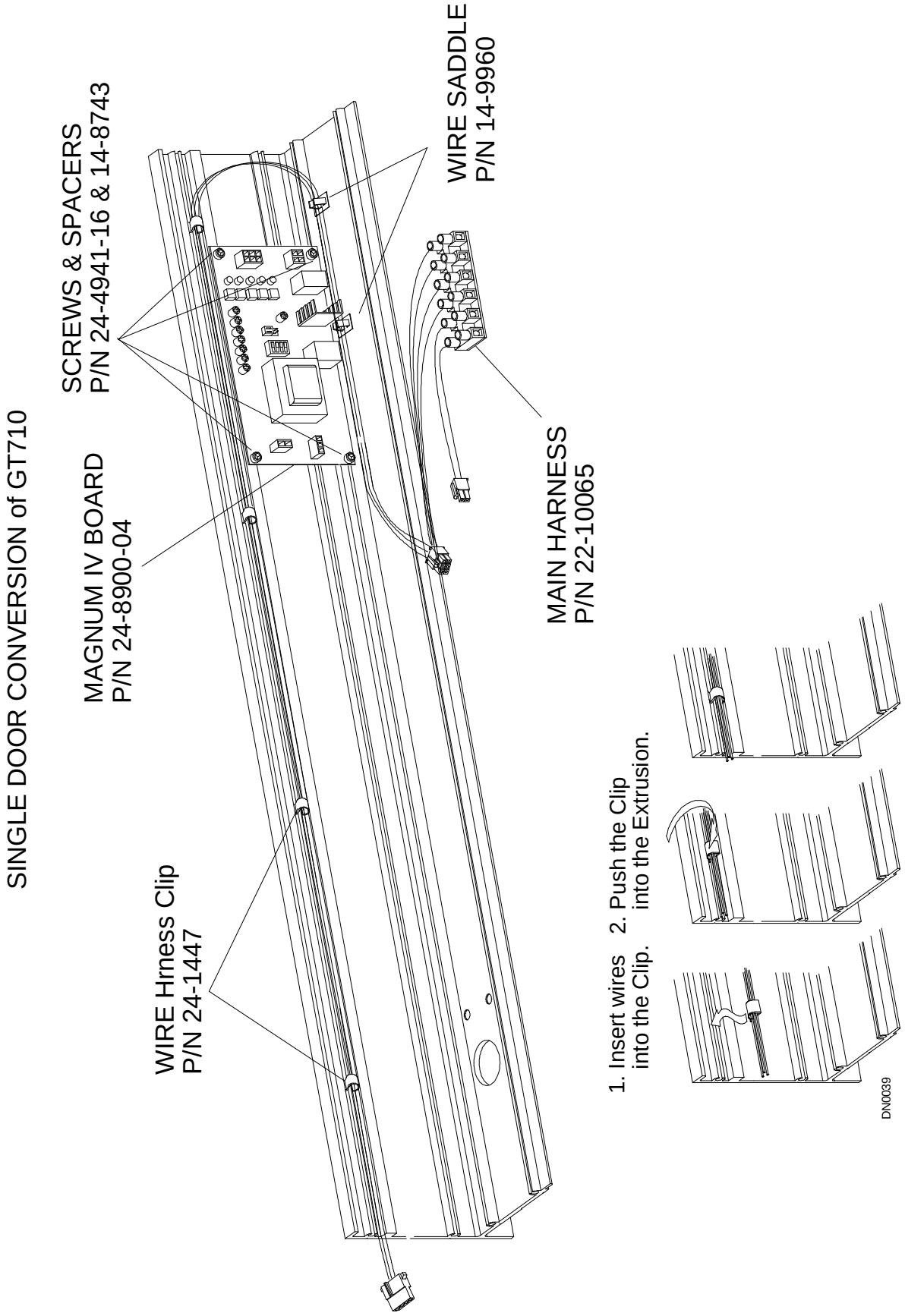


Figure 5 – Single Door Conversion of GT710

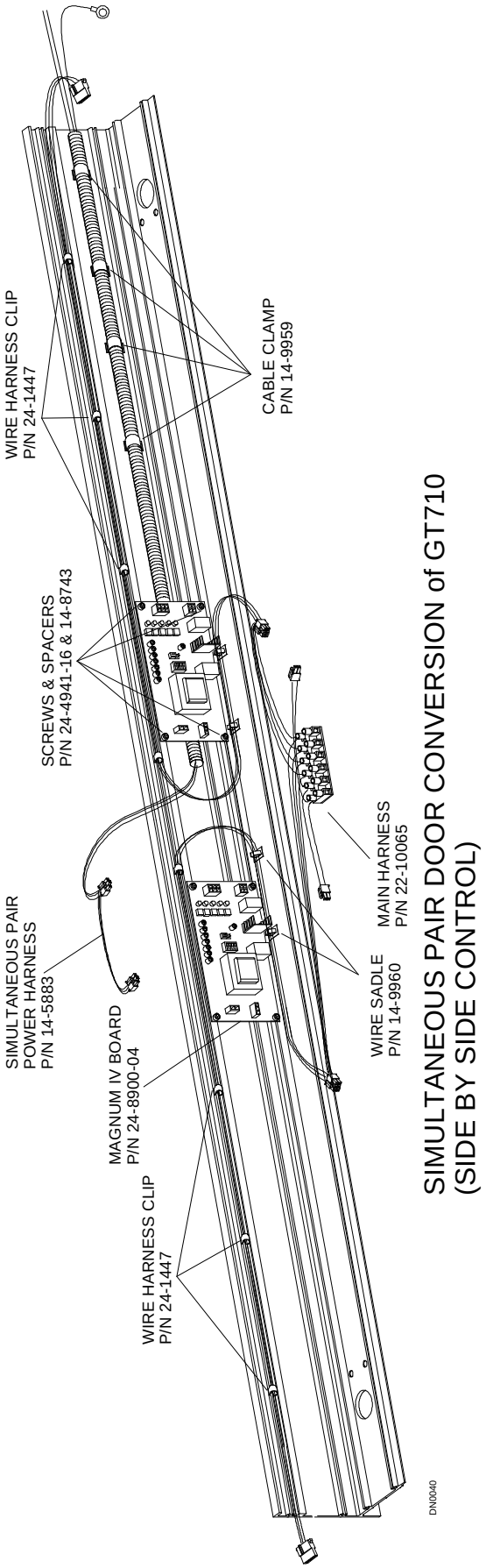


Figure 6 – Simultaneous Pair Door Conversion of GT710

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 7**. Turn the screw clockwise for larger doors and counterclockwise for smaller doors.

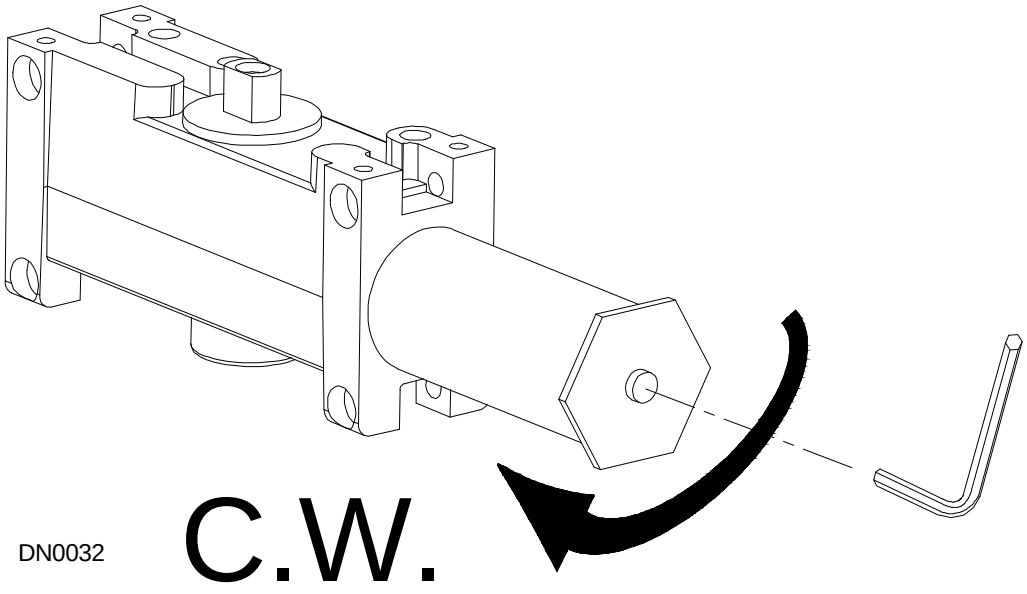


Figure 7 – Hydraulic Closer.

Door Closing Adjustment Procedure

The hydraulic closer must be operating properly **BEFORE** the Magnum control is adjusted.

Warning: Improperly installed or adjusted closers may cause property damage or personal injury. Please follow these instructions carefully.

Do not allow the door to slam into the frame. A "normal" closing time from a 90º open position is five to seven seconds, evenly divided between main swing speed and latch swing speed. Use the furnished hex key to adjust speed.

1. Remove one lead from the motor.
2. Adjust the main and latch speeds.

- To slow MAIN SPEED of door, turn the main speed screw clockwise.
- To slow LATCH SPEED of door, turn the latch speed screw clockwise.

3. Reconnect motor lead.

Note: It may be necessary to rotate the output shaft with the arm to align the holes in the large sprocket with the access holes in the header.

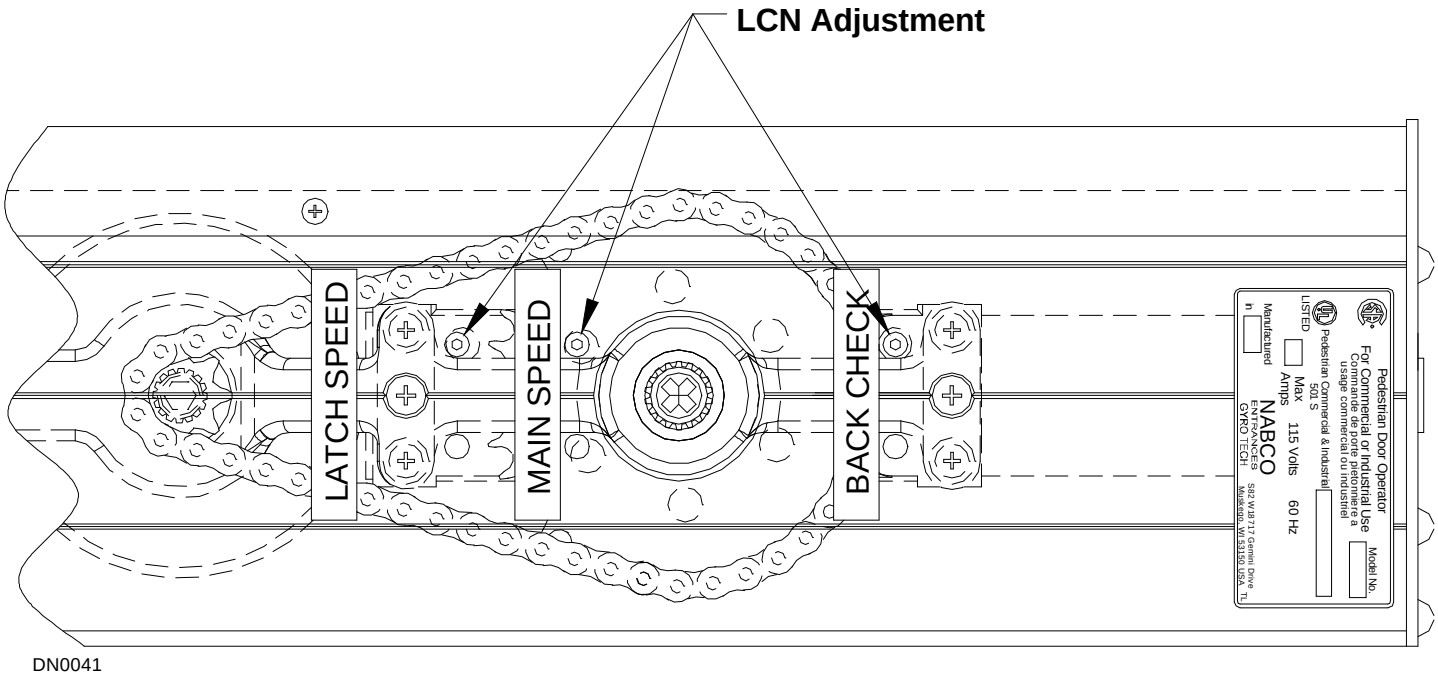


Figure 8 – Hydraulic Closer Adjustment.

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 10 through 13**.

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.

Move the door to the 45º position. Place a magnet under the back check switch with the white side up. The magnet is positioned to move under the switch when the door is opened to 45º. Use the appropriate configuration from **Figures 10 through 13**. This magnet will command the motor to reduce the door speed to the setting of the back check potentiometer. Improper placement of this magnet will 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.

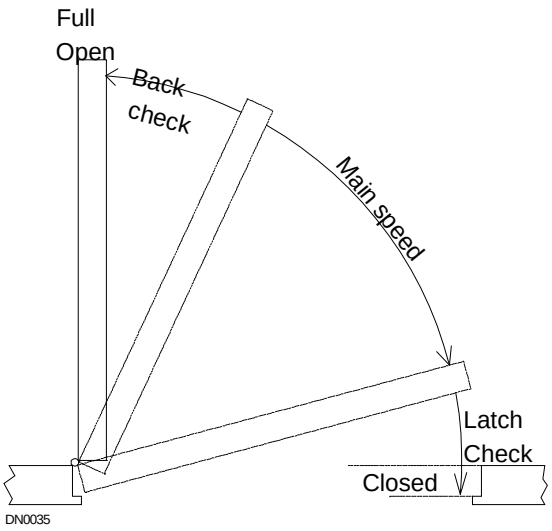


Figure 9 – Stages of Door Travel

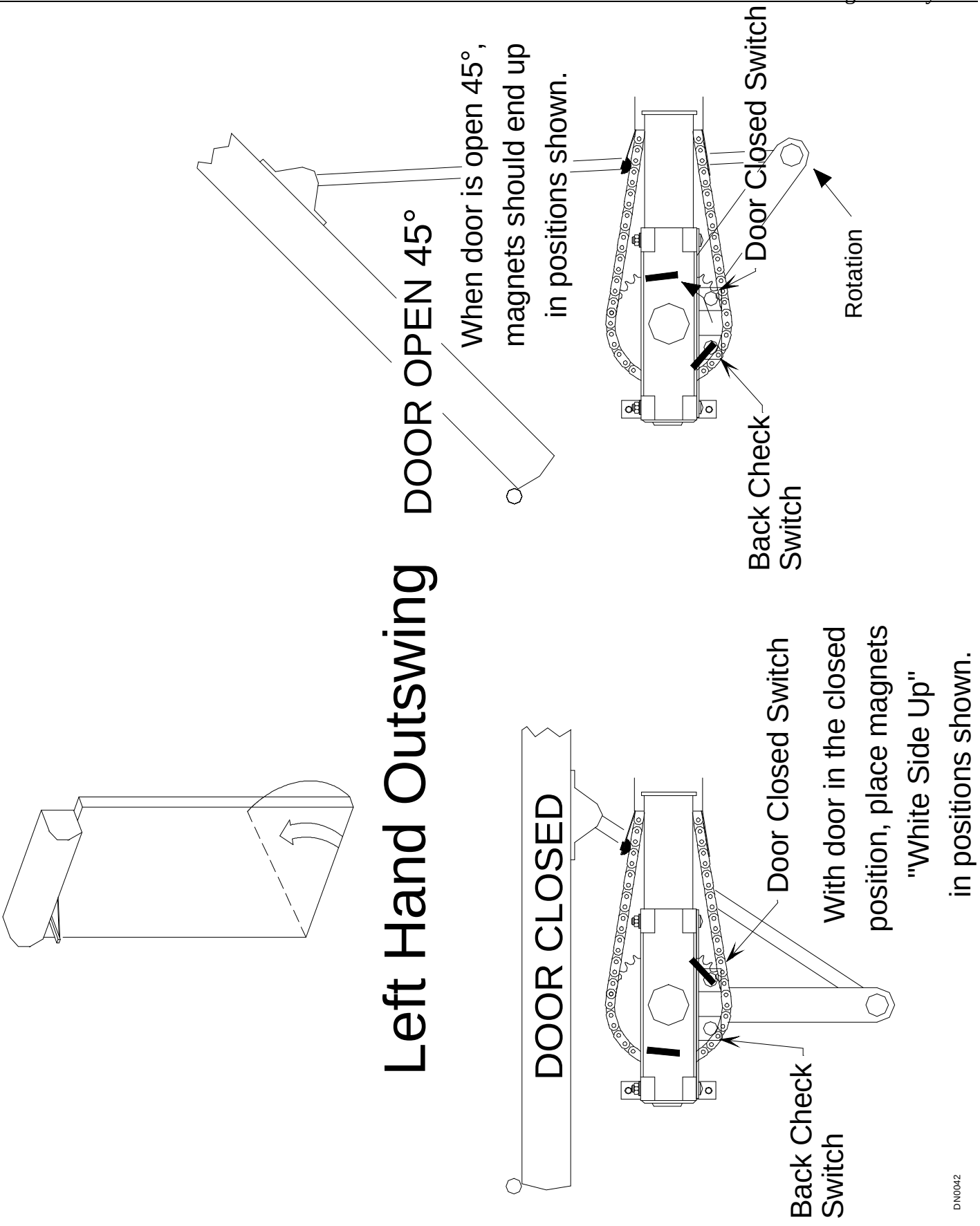


Figure 10 – Left Hand Outswing

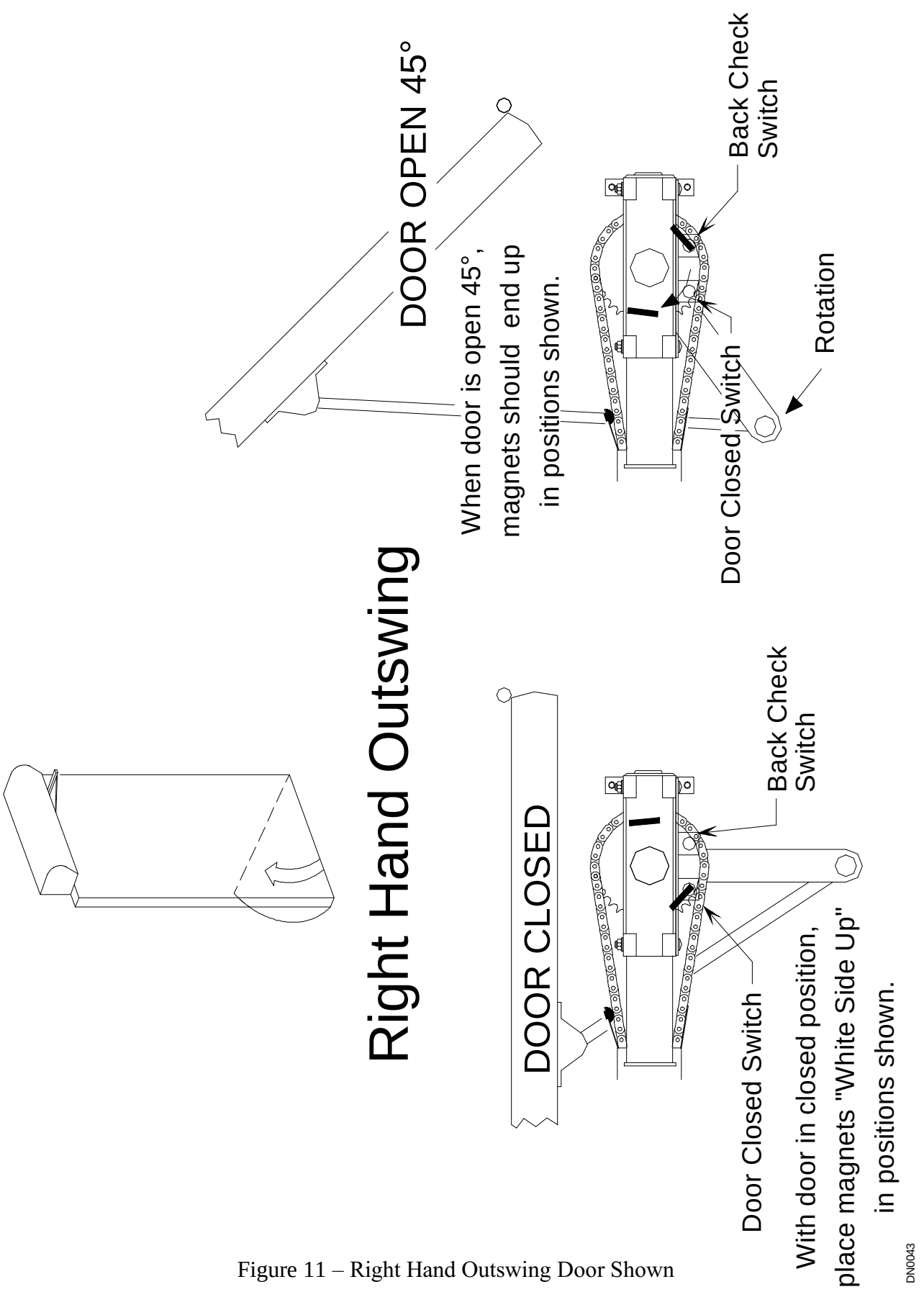


Figure 11 – Right Hand Outswing Door Shown

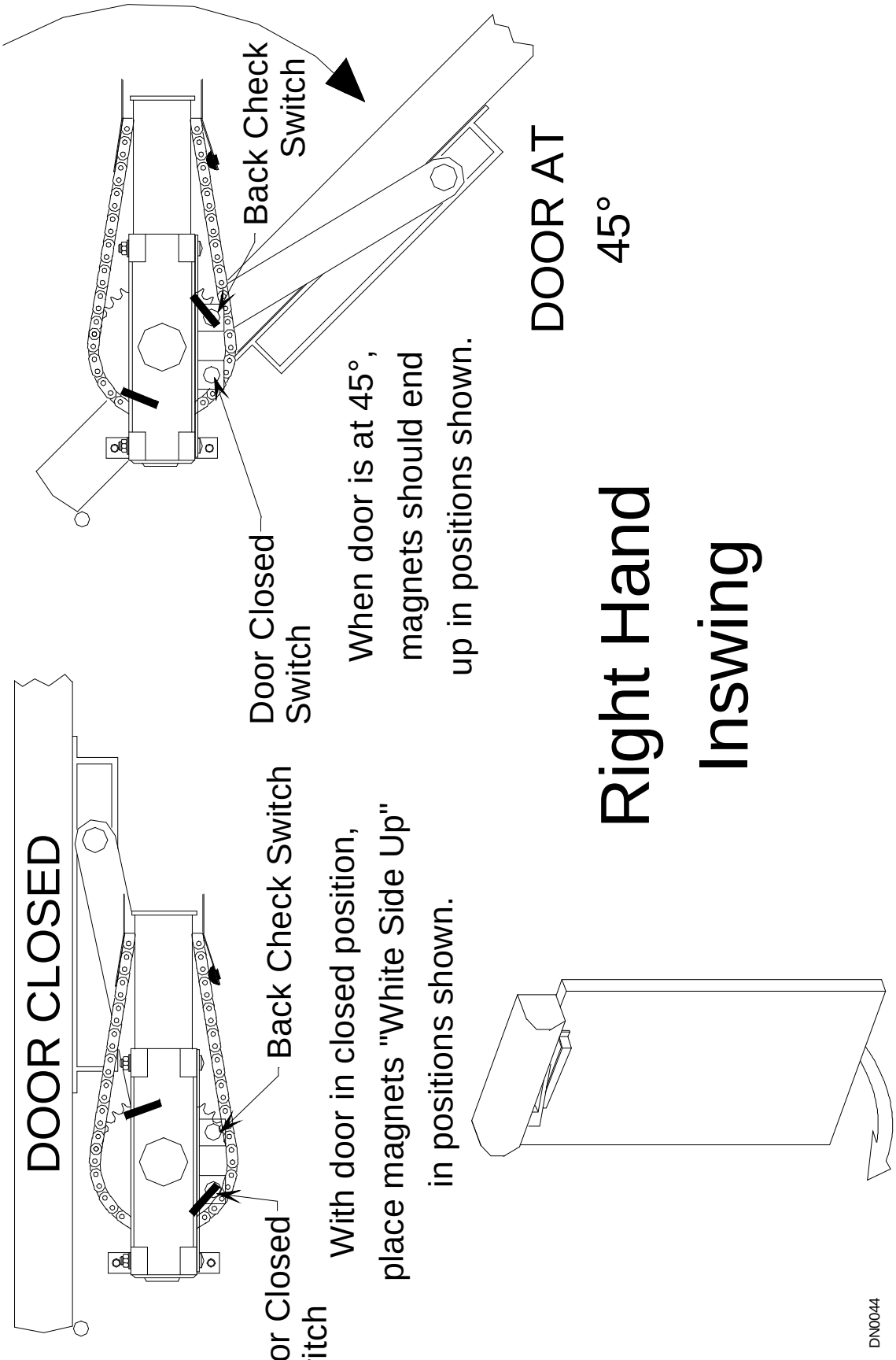


Figure 12 – Right Hand Inswing Door Shown.

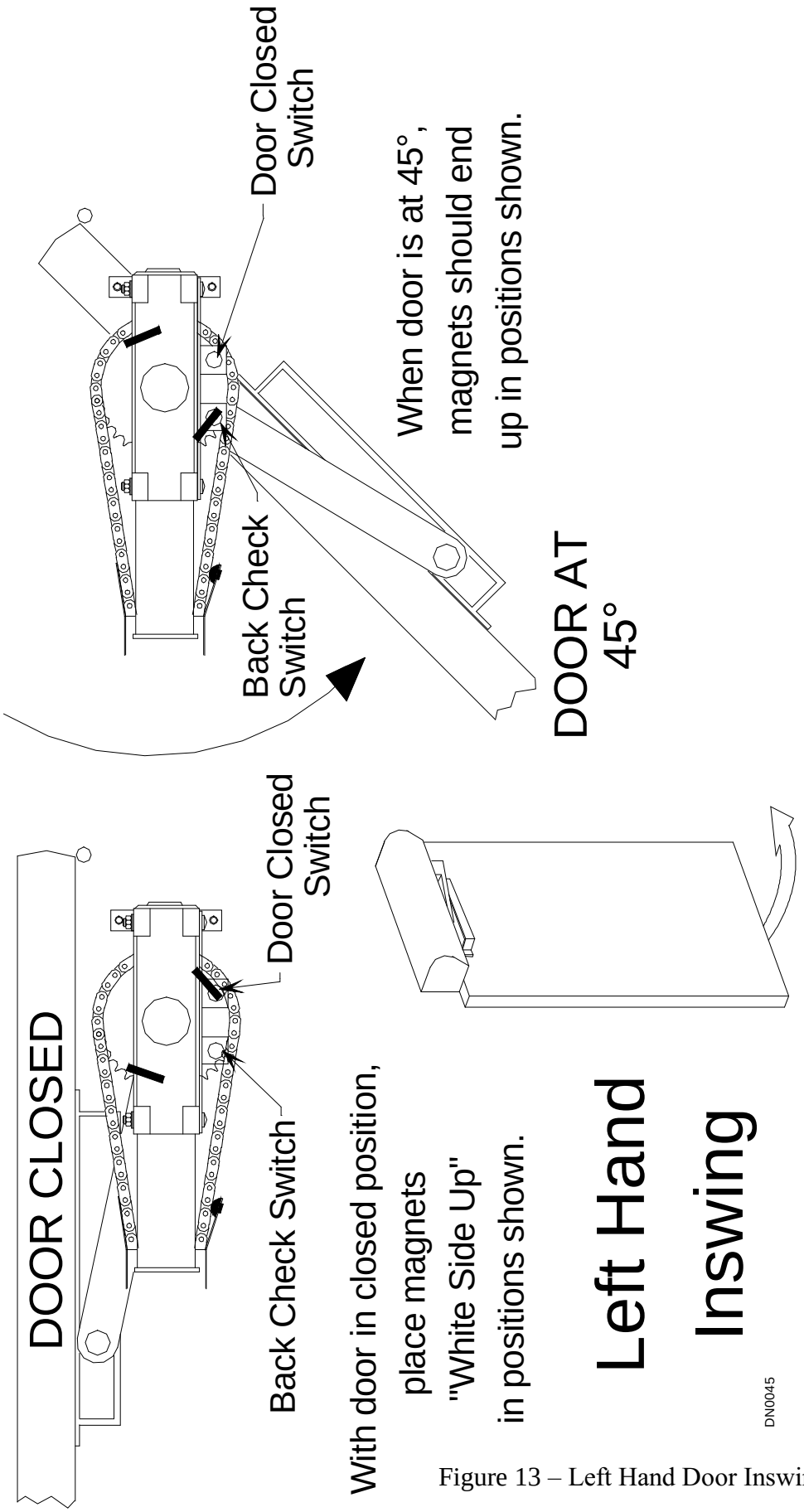


Figure 13 – Left Hand Door Inswing Shown

Simultaneous Pair Installations

The installer first has to configure each of the doors independently with the speeds and timing desired. Then adjust the potentiometers on the door controller to closely mimic those settings.

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. It 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.	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).	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 90º 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.	1. Preload on swing arm is not correct. 2. Building stack pressure is excessive.	1. Position arm 45º 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, which 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:

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

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.