

Instruction Manual
Revised March 2000
GT 710
Low Energy Operator

REVISED



Part Number 12-5660
Issue Date March 2000

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, as well as a troubleshooting section and optional wiring diagrams.

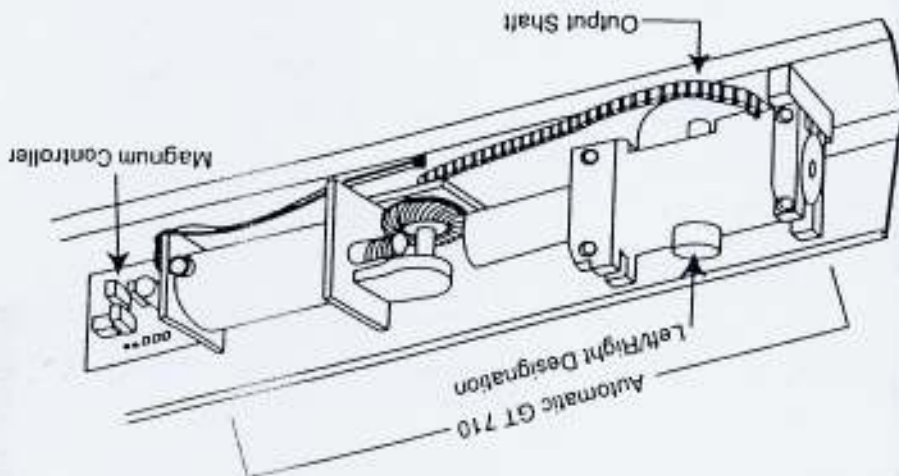


Figure 1 - Overview of GT 710.

Specifications

Power Input:	120 (± 10%) AC 50-60 Hz, 10 Amps
Available Current for Accessories	0.5 Amps 24 Volts AC
Minimum 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

- Use of a supplemental door stop is always required.
- Electrical conduit and switch or sensor wires should be pulled through the frame before mounting the GT 710.
- When applying the handicap labels, if "Push-N-Go" is not being used, remove the "PUSH DOOR TO OPERATE" portion of the automatic door sticker (see Figure 2).



Figure 2 - Door Sticker, Modified.

Installation and Adjustments

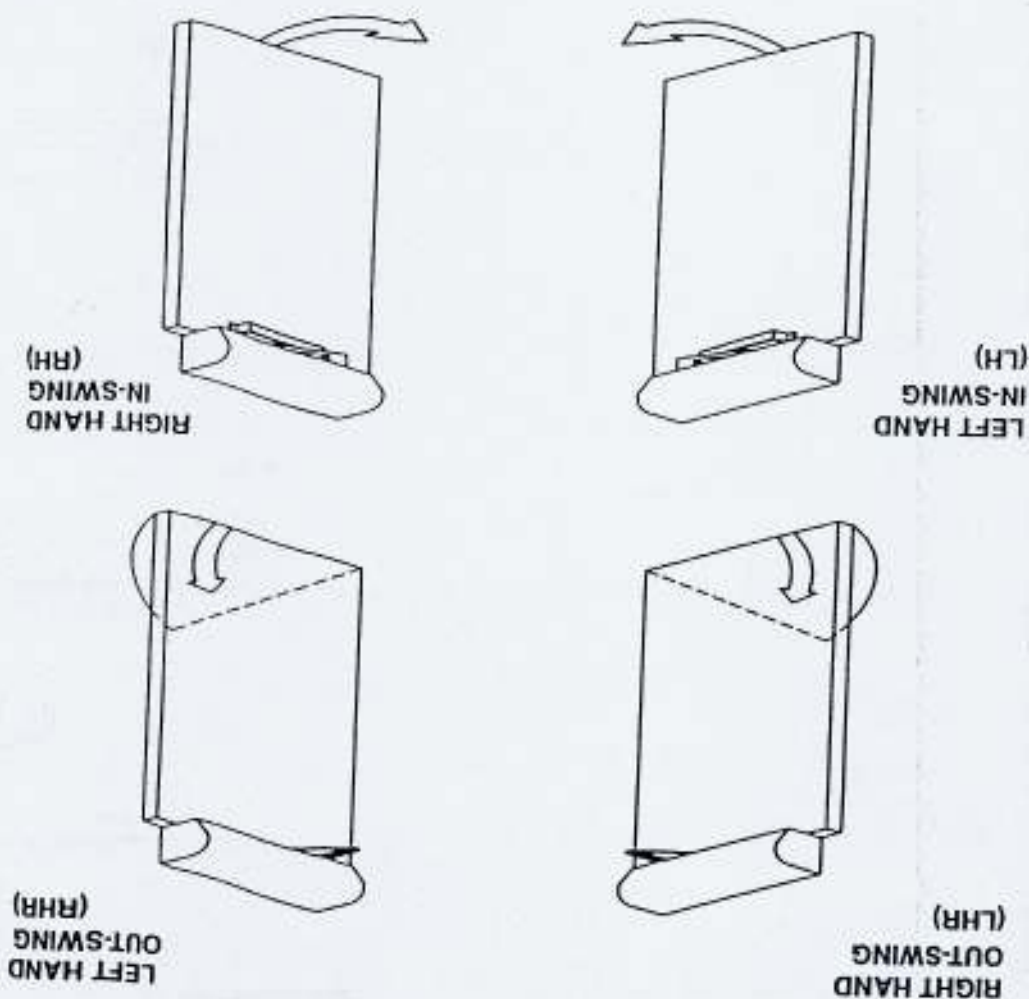
The label on the GT 710 will help identify the unit. It is located on the underside of the unit near the output shaft. The label provides important information, including manufacturing date which is necessary for warranty claims. See Page 38 for additional information on the warranty.



Figure 3 - Product Label.

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.

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



Tools Required

7/16" Wrench, Box or Open End
 1/2" Wrench, Box or Open End
 3/4" Wrench, Box or Open End, or Adjustable
 5/32" Hex Key (Allen Wrench)
 Phillips Screwdrivers, #0 (for potentiometers), #2
 Slotted Screwdrivers, Small and Medium
 Drill Bits: 3/16", 7/32", 1/4", 5/16", 11/64" and 7/8"
 Tape Measure

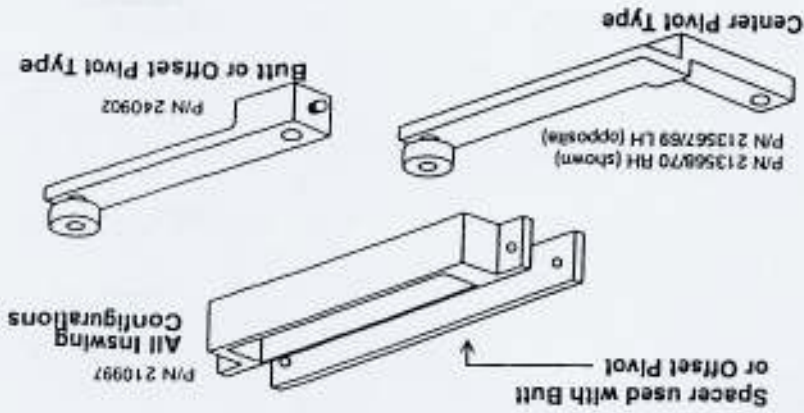
Requirements

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 6 - Outswing Arm and Shoe Assembly.

Figure 5 - Inswing Arm Assemblies.



To verify that your unit is right or left handed, look for "R" or "L" on the hydraulic closer (Figure 1). The letter is handwritten on top of the short post with black. 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 the installer.

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

Drilling Frame and Door

Figure 8 shows the dimensions for drilling mounting holes. The information is provided to mount the operator to the door frame and to mount the arm attachment to the door.

NOTE: The bolt patterns differ between outswing and inswing installations.

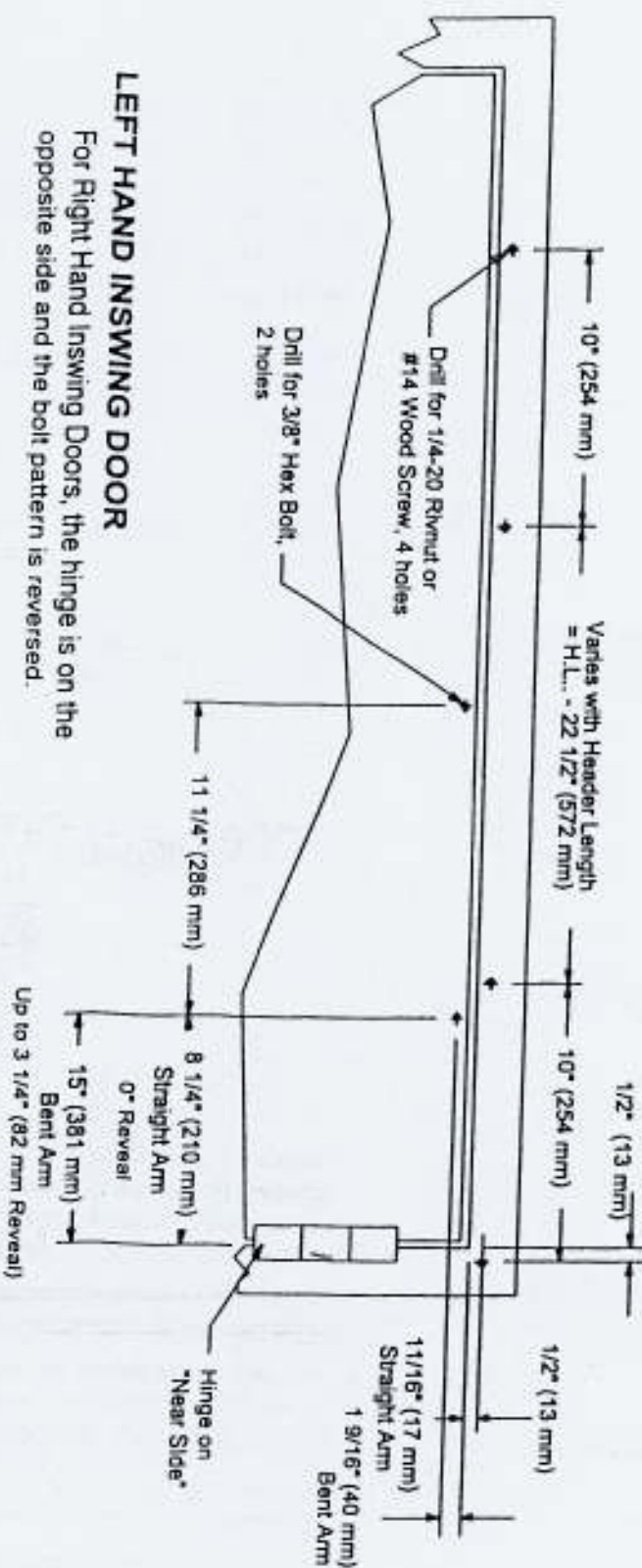
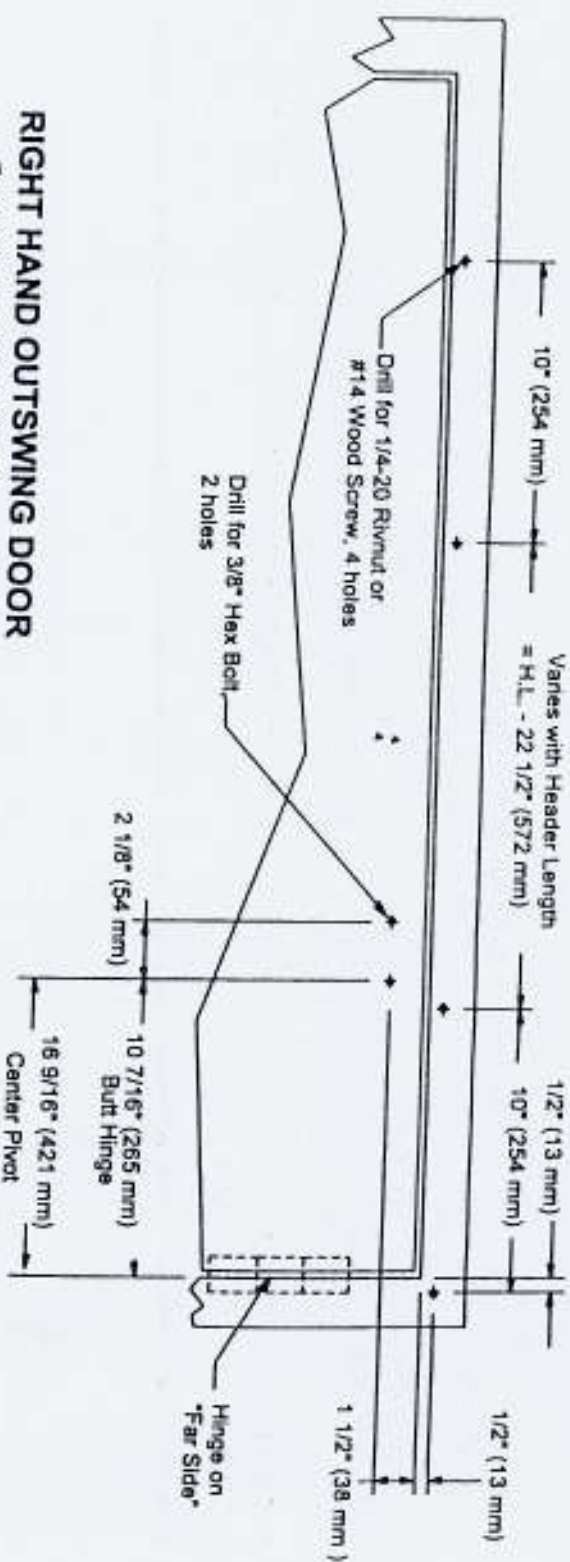
Figure 7 - Installation Hardware.



This unit has been shipped with the following installation hardware.

Parts Kit - P/N 12-5662 (Figure 7):
 3/32" Hex Wrench, P/N 14-6283
 Screws for Door Stop, P/N 24-4941-04
 Screws for Control Switch, P/N 24-0011-104
 Wire Nuts, P/N 14-1218
 Supplemental Door/Arm Stop, P/N 14-5892
 Assorted Decals
 Epoxy Package, P/N 14-9944
 Stir Stick
 Magnets, P/N 14-9943
 Electrical Jumper P/N 11-9954

Figure 8 - Frame Drilling Details.



Mounting of Unit

Preloading Door

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

Adjust the arm length based on the frame and reveal as shown in the tables in Figures 11 through 14.

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.

The swing arm is mounted to the door as shown in Figures 11 through 14. Use the diagram that matches the desired installation.

To "pre-load" the closer, attach the swing arm to the closer shaft and force it to rotate approximately 45° in the direction that would open the door. Insert a screwdriver between the socket and the chain to prevent return movement as shown in Figure 9. Remove the arm but keep the screwdriver in the sprocket.

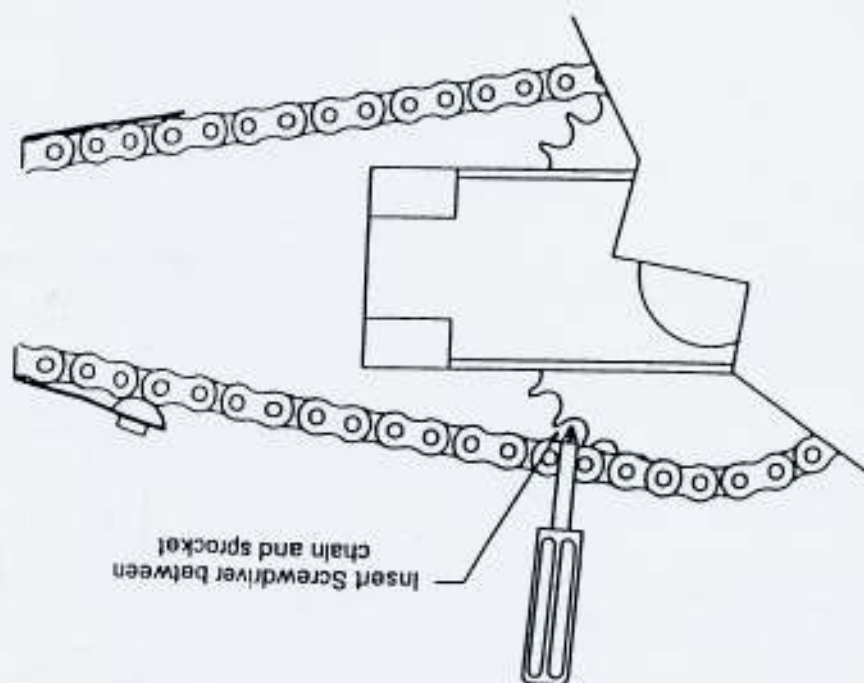


Figure 9 - Preloading the Door.

Close the door (but do not remove the screwdriver).

With **outswing** units, place the shoe against the door and in line with the holes in the door drilled earlier, slide the arm onto the spindle. It may be necessary to open the door slightly so that the splines line up with the hole in the arm.

Using the 5/32" Allen wrench, tighten the arm to the spindle.

With **inswing** units, set the roller into the track. With the track against the door and in line with the holes in the door drilled earlier, slide the arm onto the spindle. It may be necessary to open the door slightly so that the splines line up with the hole in the arm.

Using the 5/32" Allen wrench, tighten the arm to the spindle.

Installation of Swing Arm

Screwing Arm or Track to Door

Secure the track or shoe of the arm to the door in the holes drilled earlier. Use 1/4-20 sex bolts through the door (hollow doors) or #14 x 1-1/2" long wood screws (solid doors).

NOTE: If the configuration of your 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 so that the back of the track is even with the frame. If the spacer is not installed, the arm will hit the bottom of the header before the door is completely closed and the door will remain slightly ajar.

Remove the screwdriver from the sprocket.

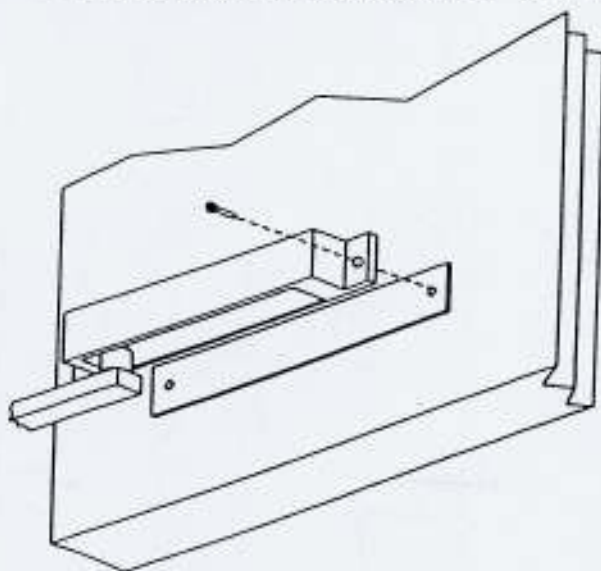


Figure 10 - Installing Track and Spacer to Door.

Figure 11 - Installation Details, Right Hand Outswinging Butt Hinge.

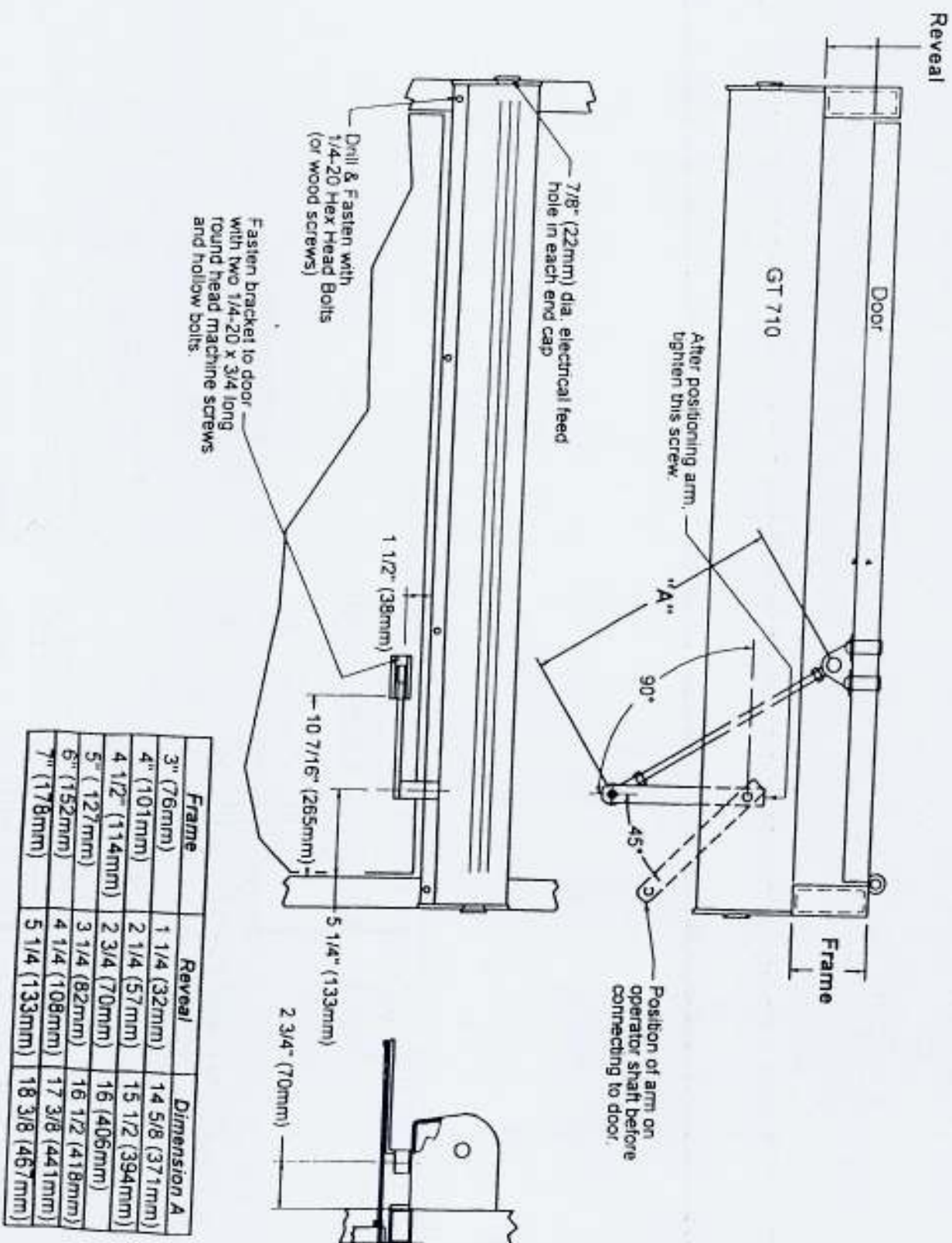


Figure 12 - Installation Details, Right Hand Outswing Center Pivoted.

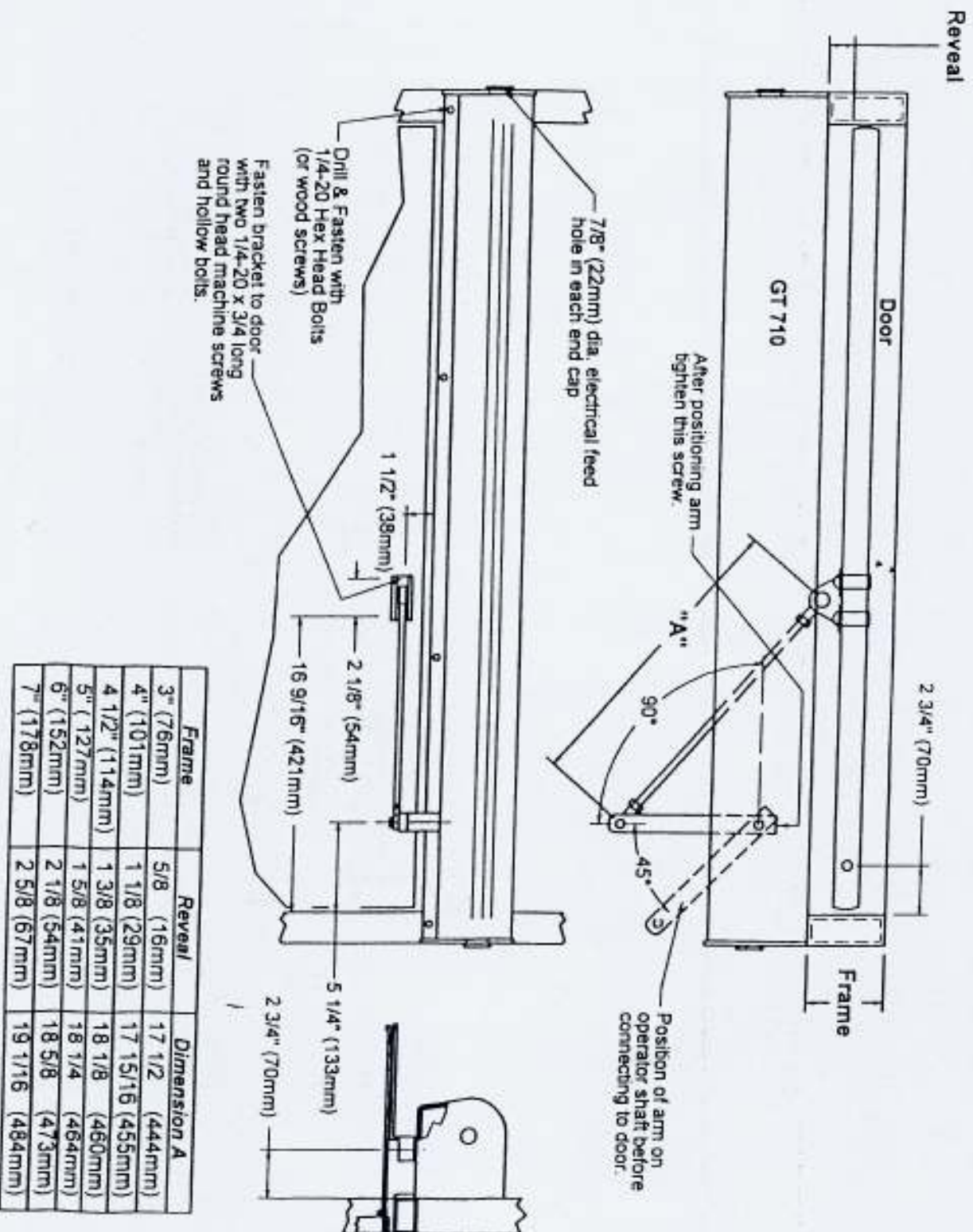


Figure 13 - Installation Details, Left Hand Inswing No Reveal.

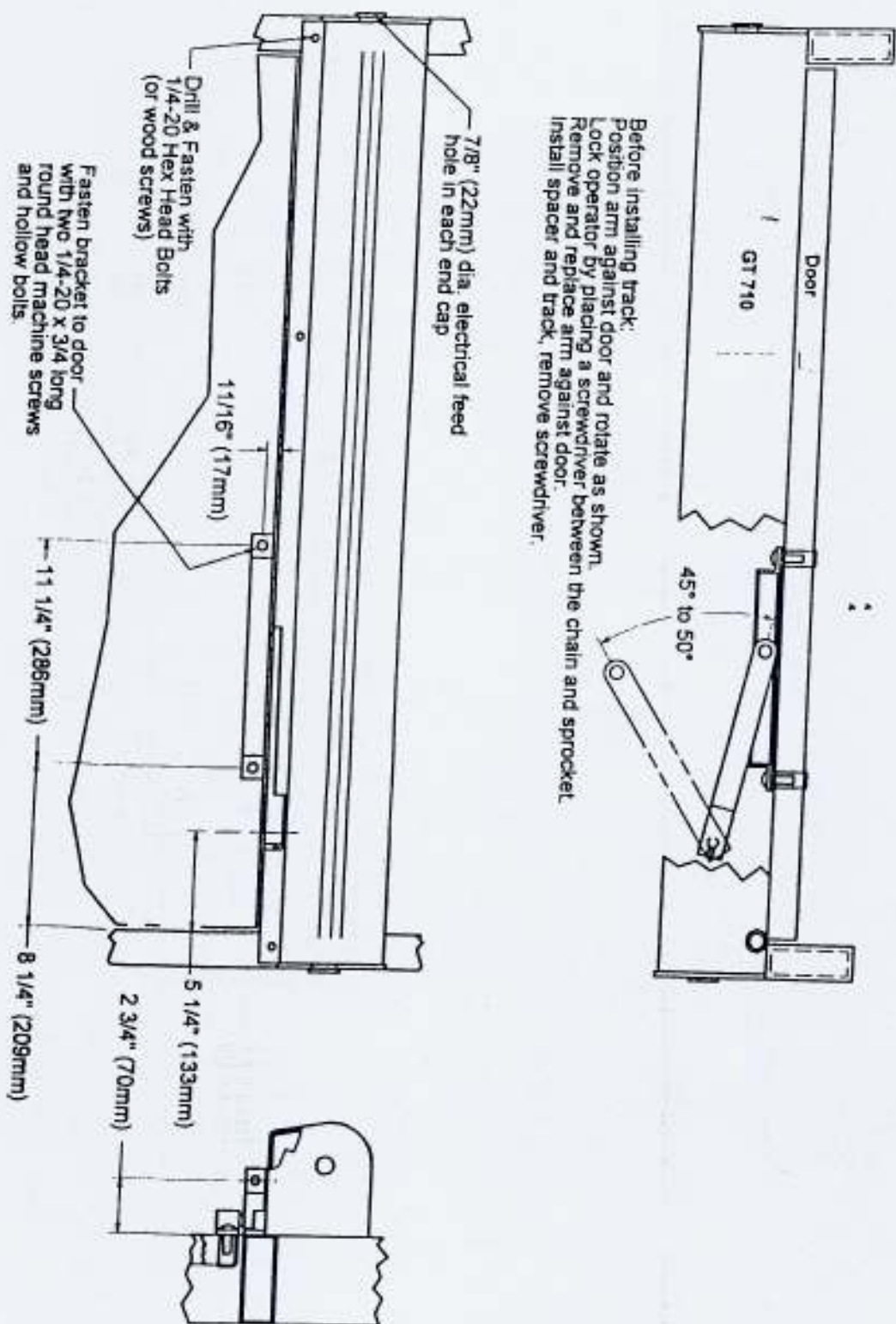
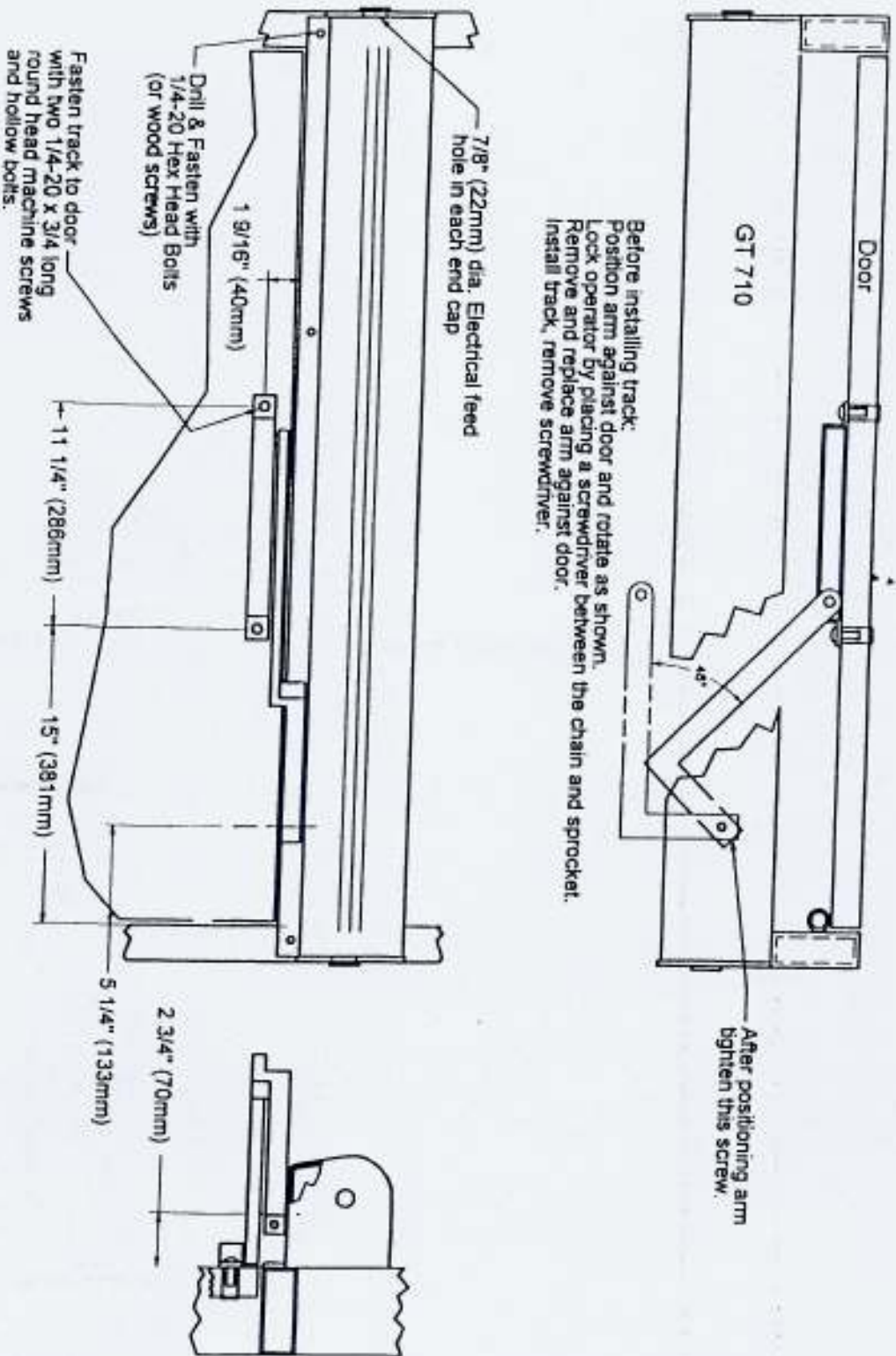


Figure 14 - Installation Details, Left Hand Inswing Up to 3 1/4" Reveal.



Hydraulic Closer

• •

The door closer has an adjustment for "opening force" when the door 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.

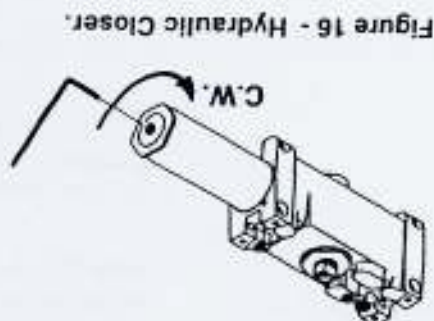
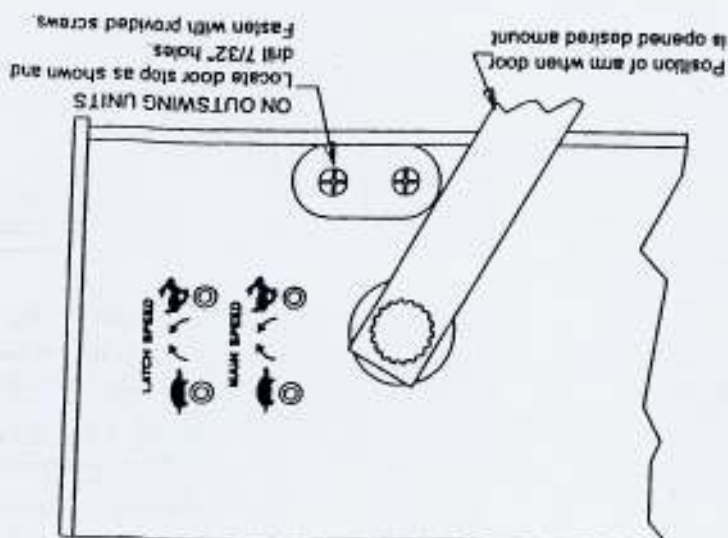


Figure 16 - Hydraulic Closer.

Figure 15 - Door Stop Location.



Release the door.

black screws.
Open door to the desired position (up to a maximum of 120°). 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

Installation of Door Stop -
Outswinging Doors Only

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 45° position. Place a magnet under the Backcheck switch with the white side up. The magnet is positioned to move under the switch when the door is opened to 45°. Use the appropriate configuration from *Figures 18 through 21*. This magnet will command the motor to reduce the door speed to the setting of the backcheck potentiometer. Improper placement of this magnet will cause the door to slam into the door stop.

Locate the 1/4-inch square and 1-inch long magnets in the parts bag. To position the magnets, use the appropriate configuration from *Figures 18 through 21*.

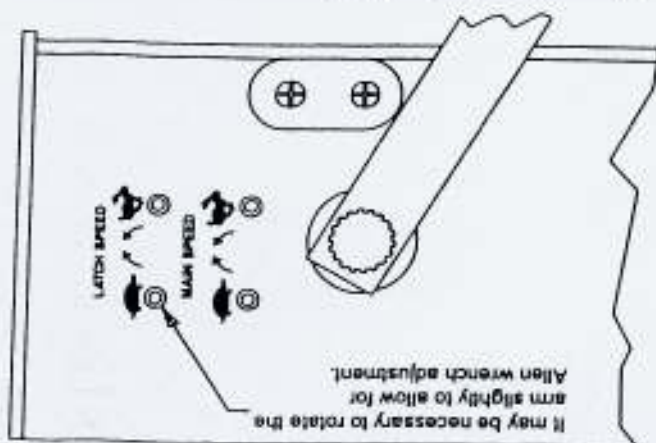
The magnets are not inside the header!

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

Setting Backcheck and Door Closed Switches

Figure 17 - Hydraulic Closer Adjustments.

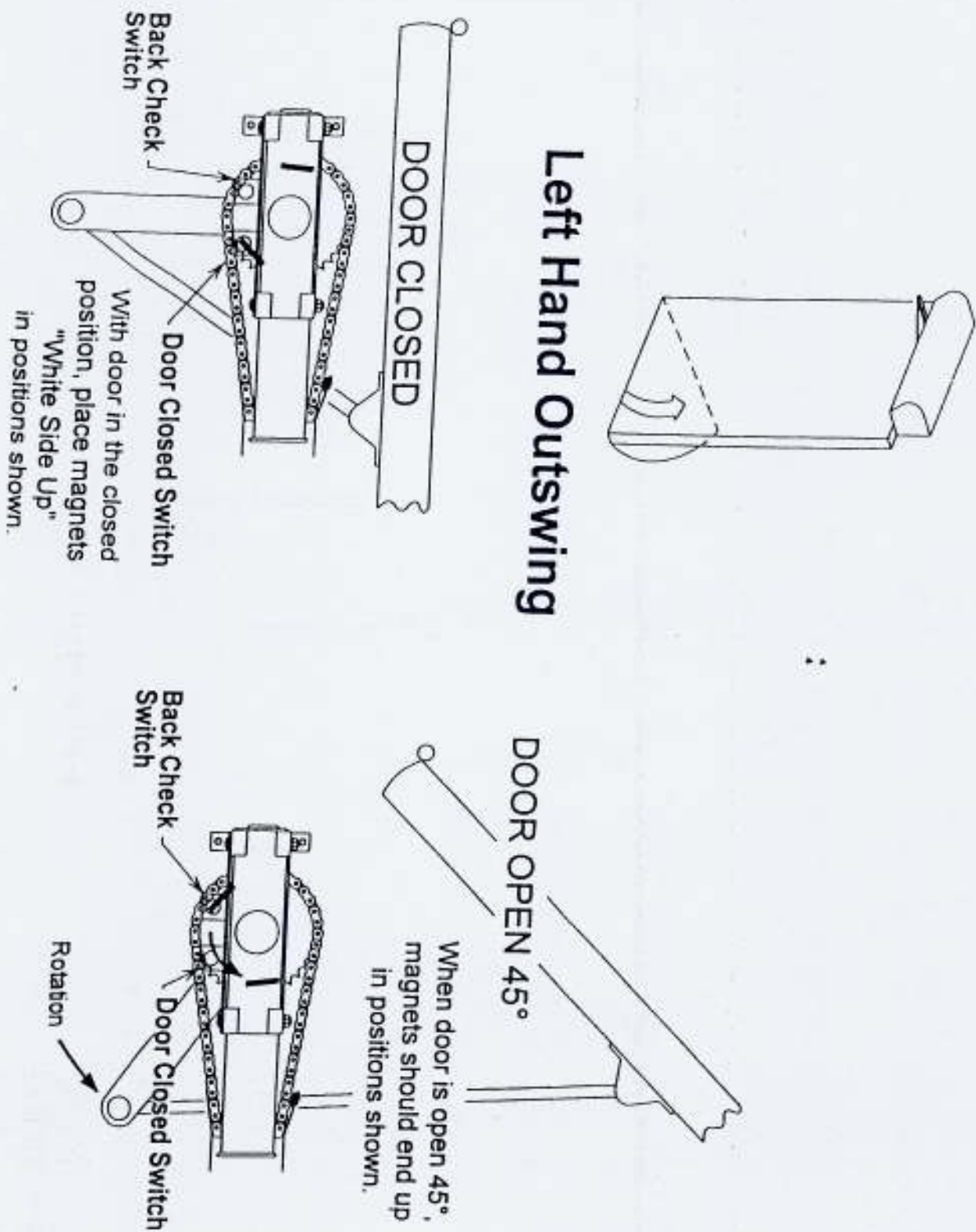


1. Remove one lead from the motor.
 2. Adjust the main and latch speeds.
 3. Reconnect motor lead.
- To slow MAIN SPEED of door, turn the main speed screw clockwise.
 - To slow LATCH SPEED of door, turn the latch speed screw clockwise.
- Do not allow the door to slam into the frame. A "normal" closing time from a 90° 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.
- WARNING:** Improperly installed or adjusted closers may cause property damage or personal injury. Please follow these instructions carefully.
- The hydraulic closer must be operating properly before the Magnum control is adjusted.



Door Closing Adjustment Procedure

Figure 18 - Left Hand Outswing Door Shown.



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

Figure 19 - Right Hand Outswing Door Shown.

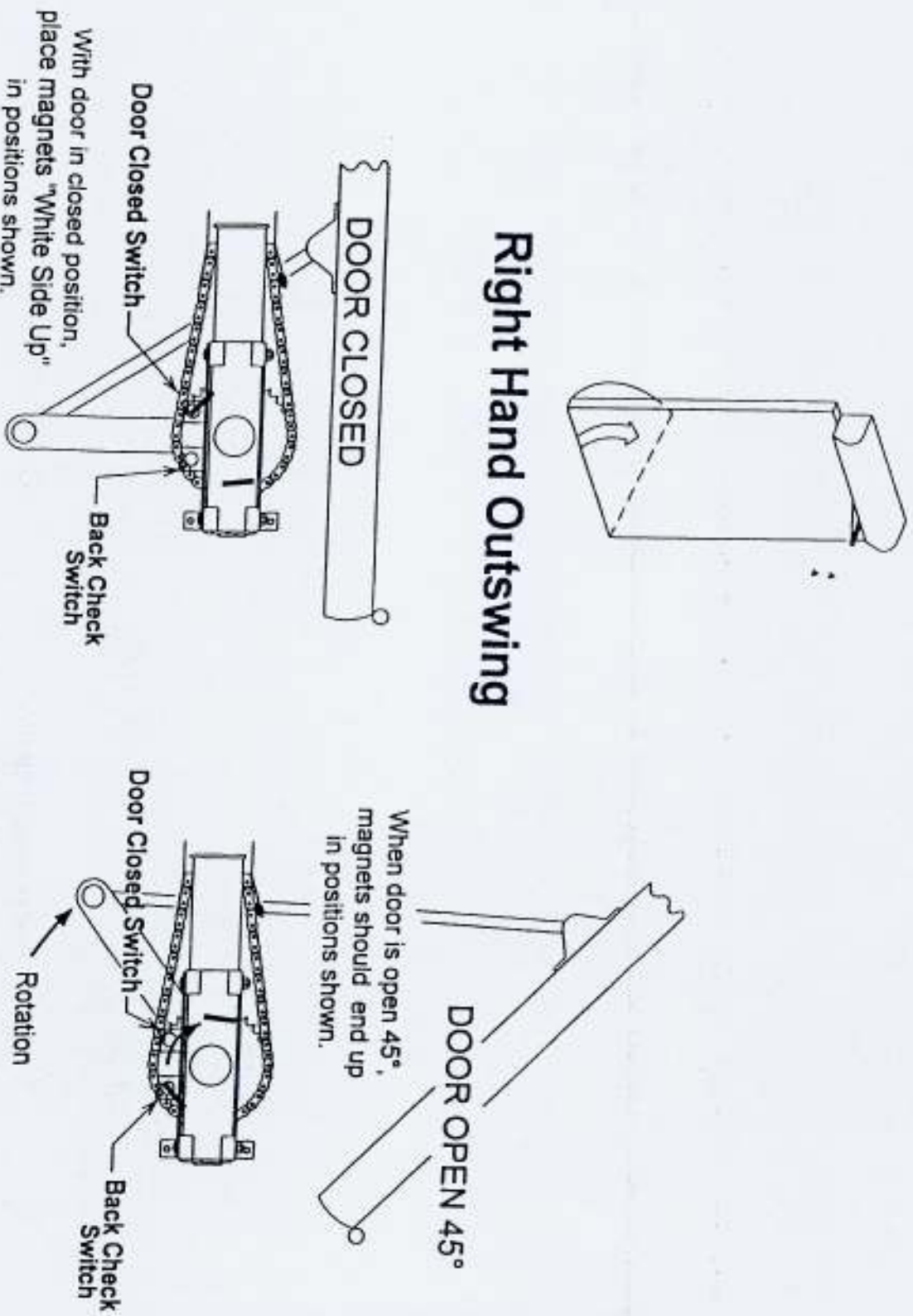


Figure 20 - Right Hand Inswing Door Shown.

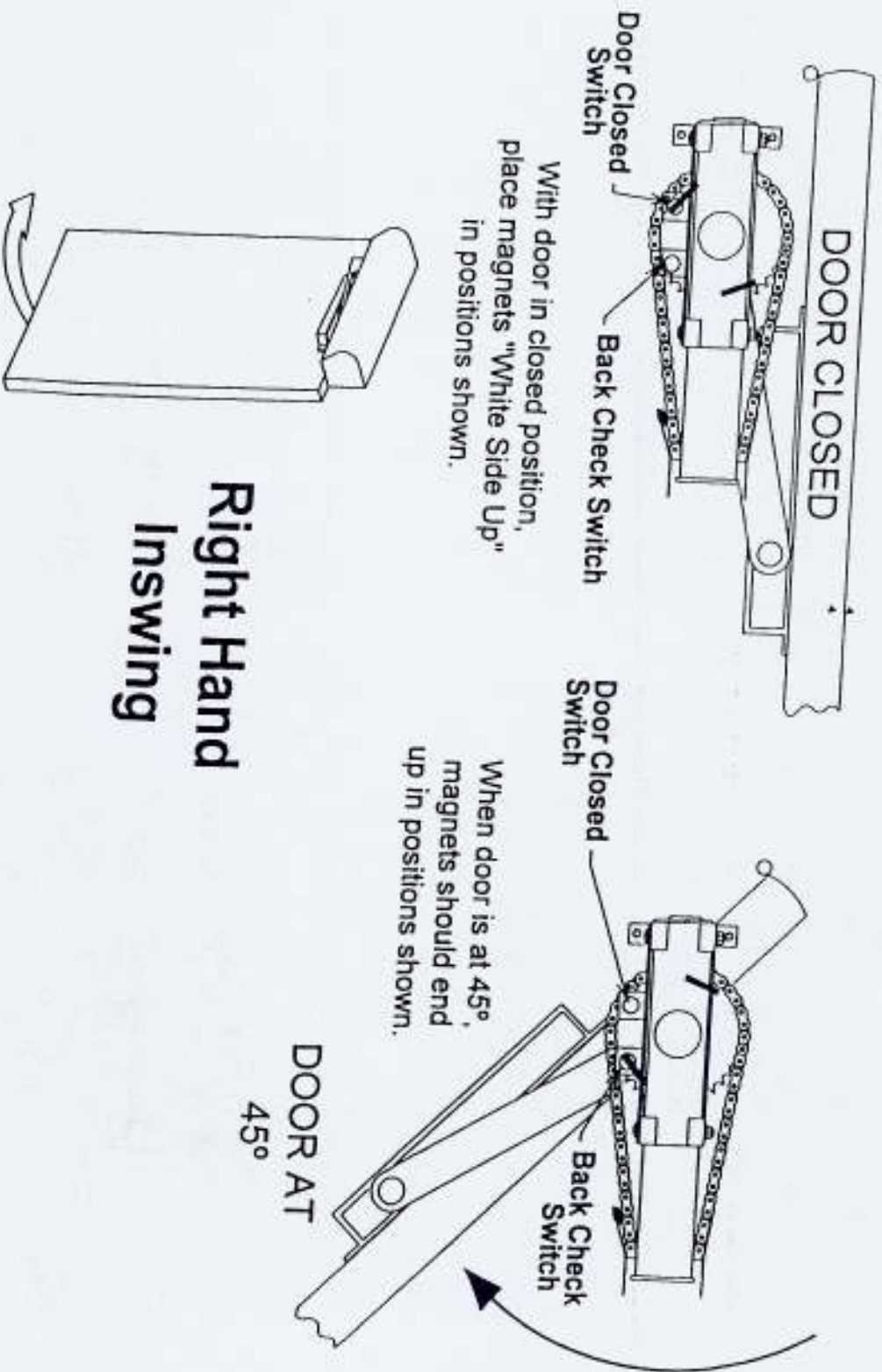
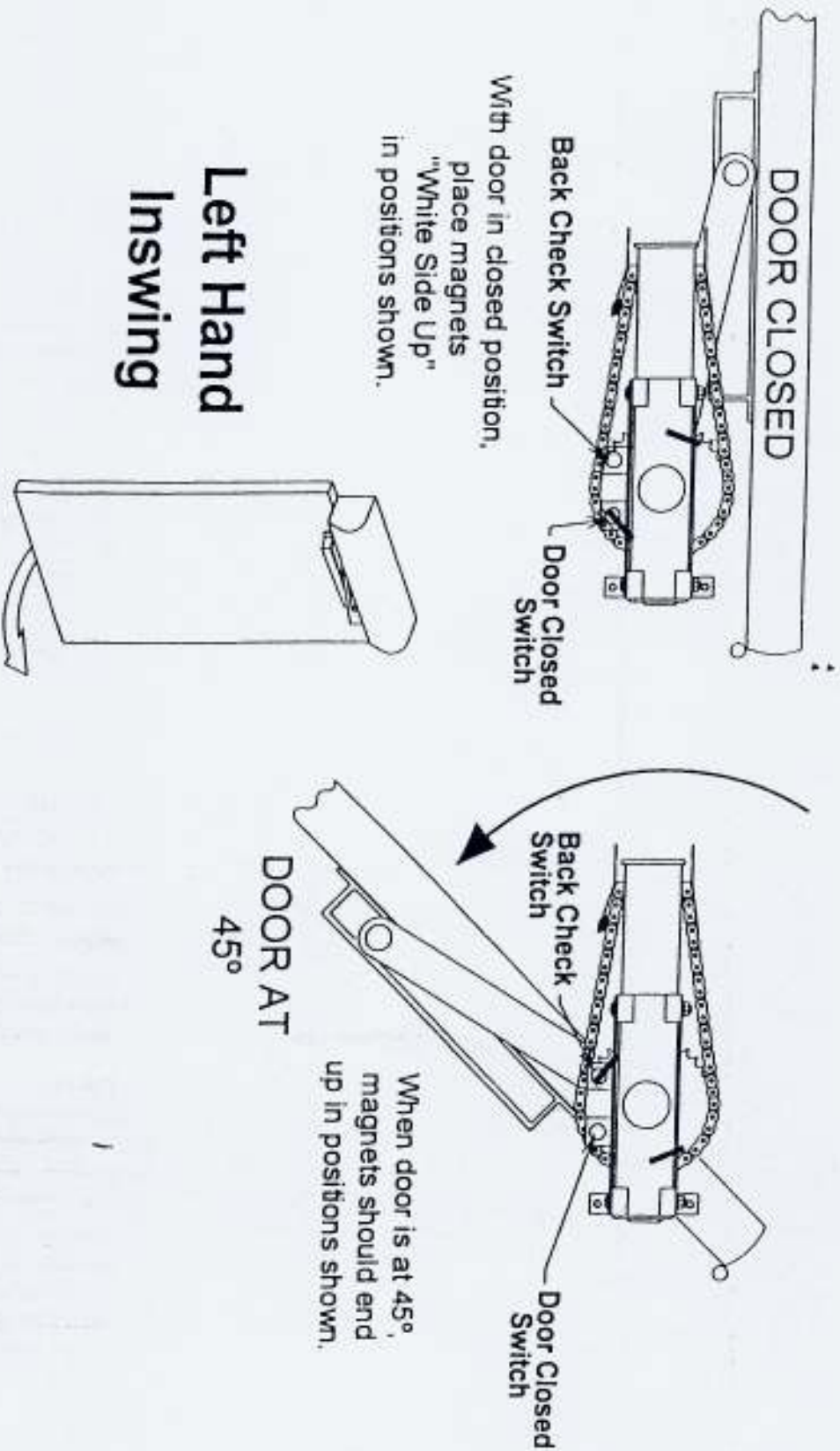


Figure 21 - Left Hand Door Inswing Shown.



Wiring Connectors

There is a 7/8" diameter hole for electrical conduit at each end of the header. Remove the decorative plug from 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.

There are four connectors located on the control board labeled J2, J3, J4, and J5 (Figure 22). There are two replaceable fuses as well, fuse 1 (F1) and fuse 2 (F2). A wiring diagram is provided at the end of this section.

NOTE: J2 and J5 are both 2-pin connectors. Make certain they are used according to the instructions.

- J2 is the 24 VAC output to the actuating device. It is a two-pin connector.
- Do not exceed 0.500-amp current draw.
- 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.
- Do not connect electric locks or solenoids to this circuit.

J3 is the 115 VAC input. It is a three-pin connector with a mating connector installed.

- Three amps are required to drive the board (6 amps for a simultaneous pair).
- The wire color for the harness connection to pin 1 is green (ground).
- The wire color for the harness connection to pin 2 is white (neutral).
- The wire color for the harness connection to pin 3 is black (hot).

J4 is the signal input. It is a six-pin connector with a mating connector installed.

- 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 purple.
- 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.
- Pin 3 should be connected to the back check switch. The wire to this pin is blue.
- Pin 4 receives the activate signal from the actuating device when someone approaches. The wire to this pin is black.
- 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 or 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 white.

Diagram of the control panel for the 1000 Series Motor Controller. The panel includes a 24 VAC input (J2), a 3A 120/240V fuse (F1), a 5A 24VAC fuse (F2), a transformer, a selector switch (1-4), and a current limit potentiometer (R23). The panel also features eight potentiometers (R8-R15) for setting various parameters: STOP, OPEN, BCHK, TDAS, TDPG, LCHK, CLOSE, and FULL CCW. A note indicates that R8 and R9 should be set to the same value. A legend defines the symbols for 'Set at' (a circle with a cross) and 'Set at the same setting' (a circle with a cross and a diagonal line).

Warning: J2 and J5 are physically the same. Do not switch the 24 Vac output and the motor connectors.

J5 is the motor feed. It is a two-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 2 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.

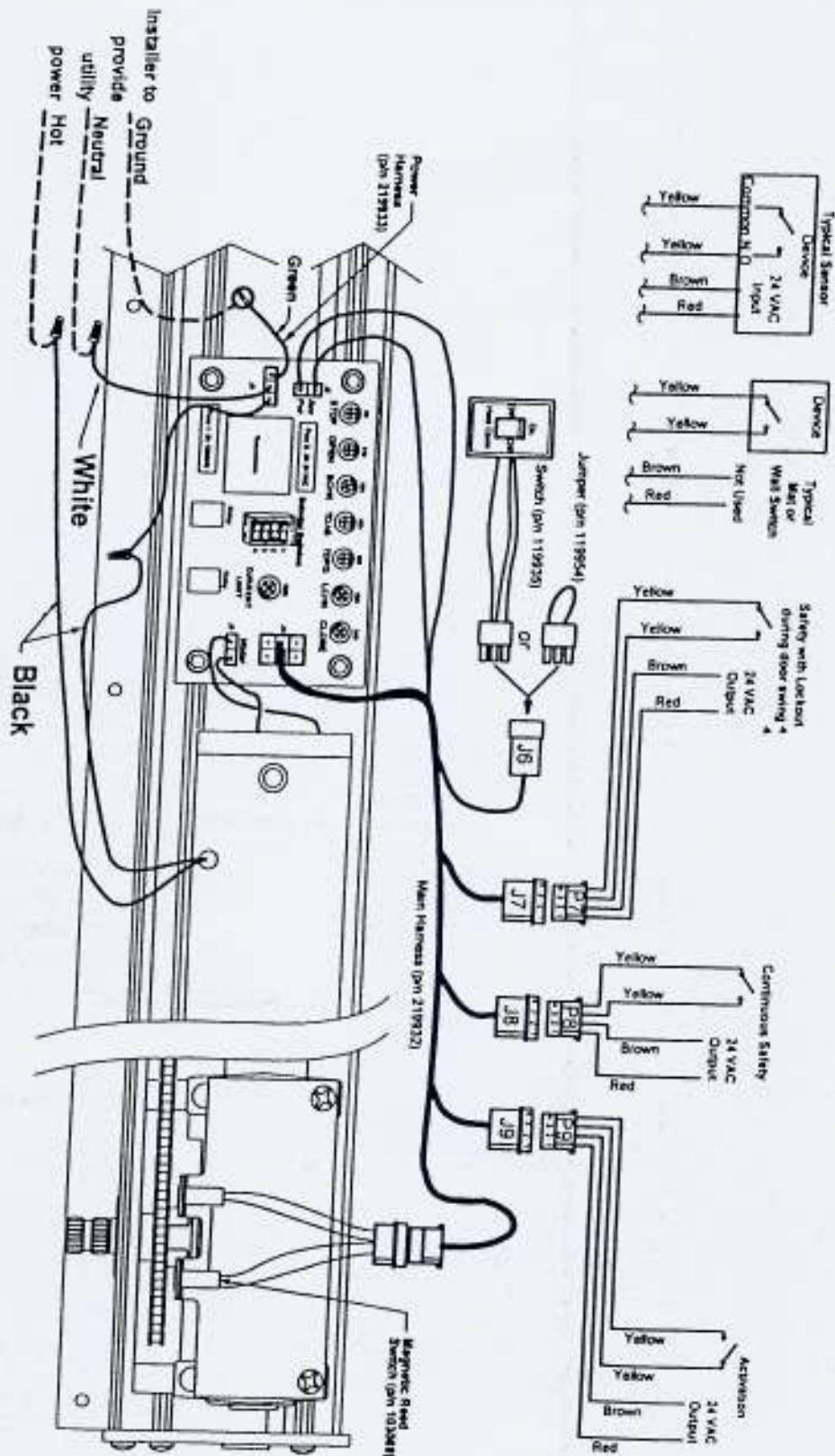
NOTE: If the unit is the wrong hand, it can NOT be corrected by reversing the wiring leads into the motor. The hydraulic closer is also handed and would need to be replaced.

Fuse 1 (F1) is a 3 amp, 250 volt fuse that protects the circuit board from voltage spikes and incorrect voltage being applied to the board.

Fuse 2 (F2) is a 0.5 amp, 250 volt fuse that protects auxiliary equipment that may be connected to J2. It also protects the auxiliary power circuit of the magnon board.

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 wires will result in back check.

Wiring Diagram



Overview of Magnum Controller

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 22*. Activate the door to test settings. Make adjustments as needed (see Adjustments section).
- 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.

Simultaneous Pair Installations

- Figure 23* 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
- NOTE:** Simultaneous pair doors require two operators, two motors, two control boards, and a "Y" harness that ties the activation and presence signals together. 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 other door controller to closely mimic those settings.
- See Simultaneous Pair Wiring Diagram in Appendix B.

Adjustments

There are two types of adjustments on the Magnum Control Board, potentiometers and selector (dip) switches. See Figure 22 for the location of these adjustments.

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

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.

Time Delay Push-N-Go - This sets the time delay, which determines how long the door stays open, when the door is pushed open and the push-n-go switch is activated. It is adjustable up to 60 seconds.

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.

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.

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

Latch Speed - How fast the door moves in latch position.

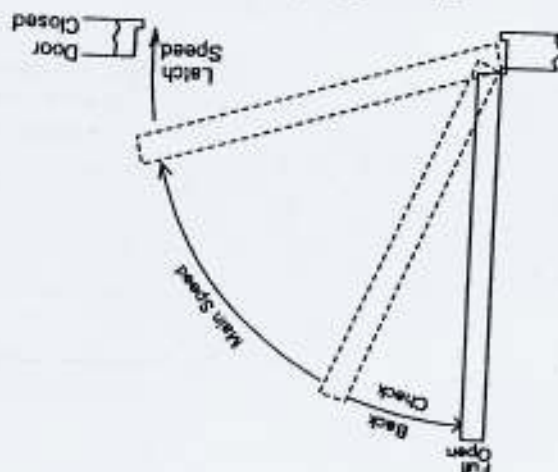
Latch Position - The last 10° of closing.

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

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

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

Figure 24 - Stages of Travel



Definitions

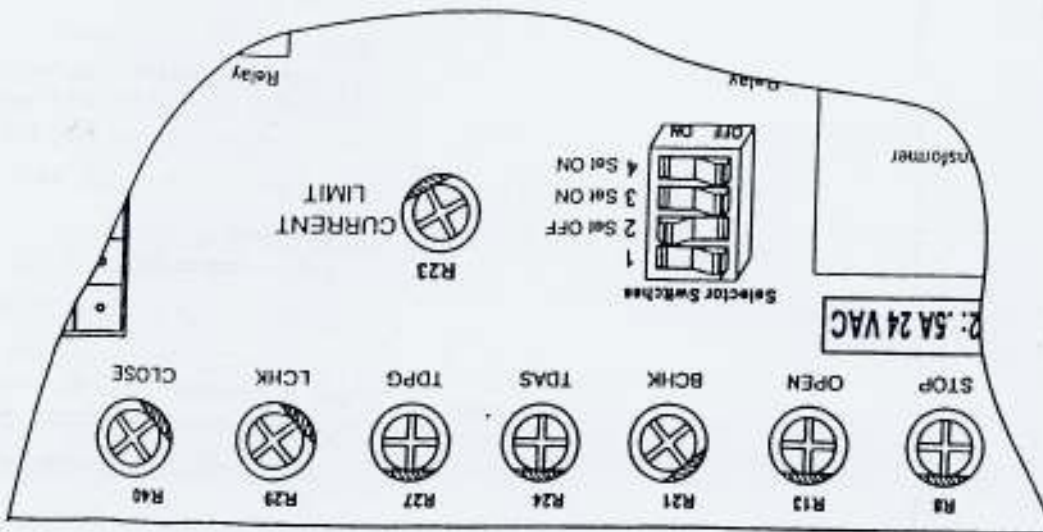
Potentiometers

Customized Settings GT 710 Control Board

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)

Figure 25 - Magnum Control Board.



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 adjustment on the hydraulic closer is not effective unless the door is opened more than 120°. Therefore back check is adjusted on the Magnum Control Board.

Stop Adjustment (STOP):

When an object is sensed in the path of a moving door by a safety mat connected 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 an 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.

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



Control Switch

A 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) 1/64" diameter mounting holes. Use the two screws provided to mount the switch. If the switch assembly is not desired, replace it with the jumper from the parts bag.

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

Switch 4

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

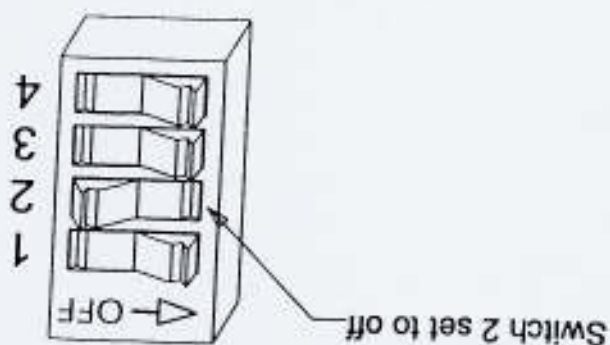
Switch 3

the processor that a door with a spring closer is in use and activates power to the braking circuitry. With this switch set incorrectly, adjustment of the controls for the hydraulic closer will have no effect.

Switch 1 - This is not active.

Dip Switches

Figure 26 - Dip Switches.



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 adjustment is 5 o'clock. Too sensitive of a 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.

Current Limit Adjustment (Current Limit):

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

Closing Speed Adjustment (CLOSE):

Loss
Sensitive

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 GT710 to comply with all the installation applications described in ANSI A156.19.

Troubleshooting

Symptom	Action/Cause	Solution
Operator does not function.	1. Check Fuse 1 (F1) connector J5. 2. Check for 120 VAC at connector J5. 3. Check power to activation device at connector J2. 4. Check Fuse 2 (F2).	1. Replace Fuse. 2. Check incoming power. If power is good, check connection to motor. Replace motor if necessary. 3. If power draw exceeds 0.5 amps at 24 VAC, replace with lower draw sensor. 4. If blown, replace fuse. If F2 is OK, check power to activating devices at J2. Voltage should be 24 VAC +/- 10%. If voltage is too low, reduce accessory load. Turn main speed in direction of turtle.
Door slams closed.	Main speed on hydraulic closer not adjusted properly.	Turn main speed in direction of turtle.
Door slams open.	Backcheck speed not adjusted or magnet not in proper location.	Adjust backcheck potentiometer or relocate magnet.
Fuse 2 (F2) blows when door open is triggered.	Check door activation device power consumption.	If power 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 from 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 45° as shown on Figures 11 through 14. 2. Upgrade operator unit to GT500.
Safety or Presence Sensor does not function.	No power to sensor or defective sensor.	Check harness wiring to wire diagram on Page 21.
Safety 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 or 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 229953)

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. Backcheck 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.

The values for "T" time have been rounded up to the nearest half second. These values are based on a 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.

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

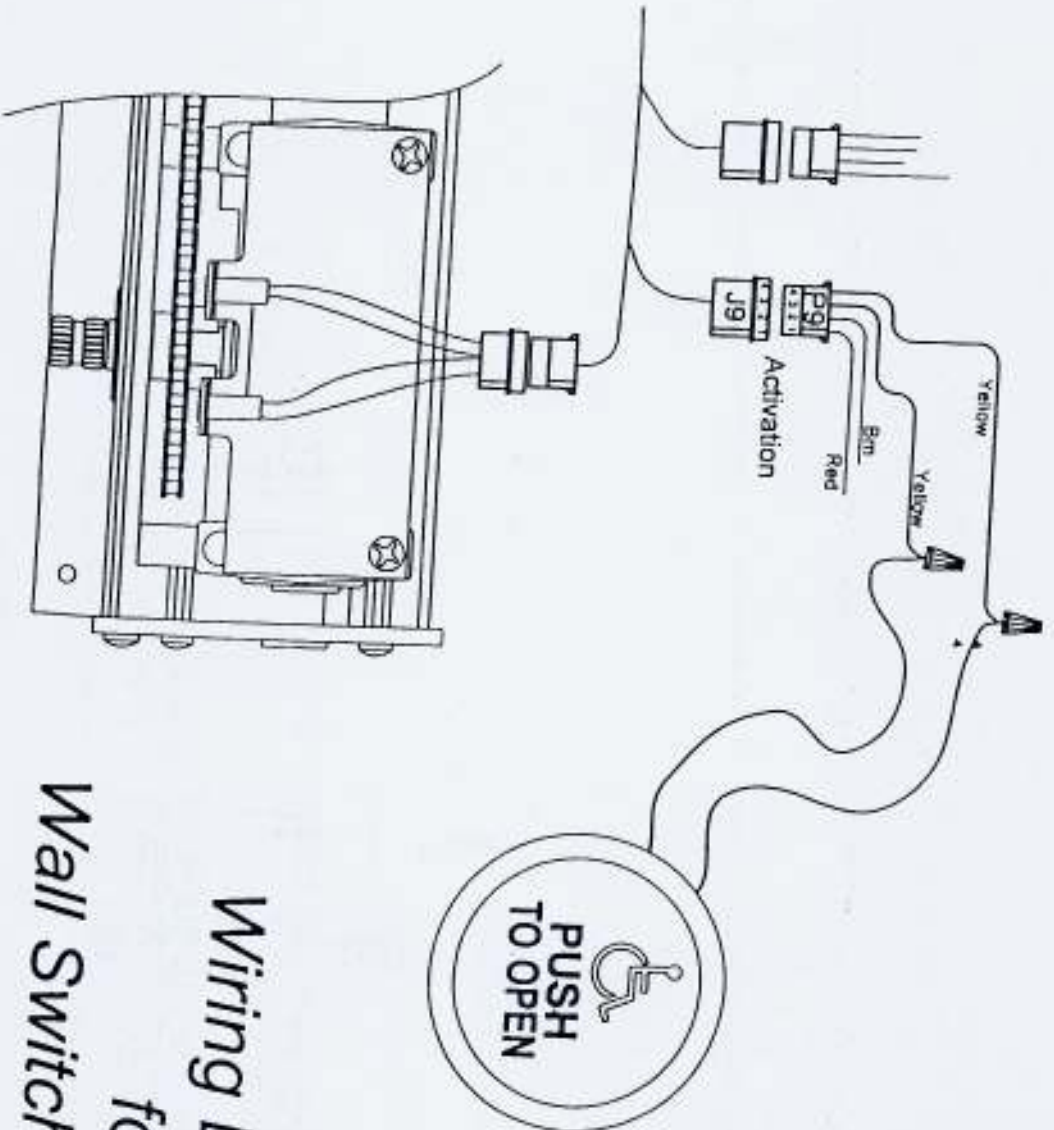
$$T = D \sqrt{W} \quad 133 \text{ lbf-ft} \quad 2260 \text{ Nm}$$

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

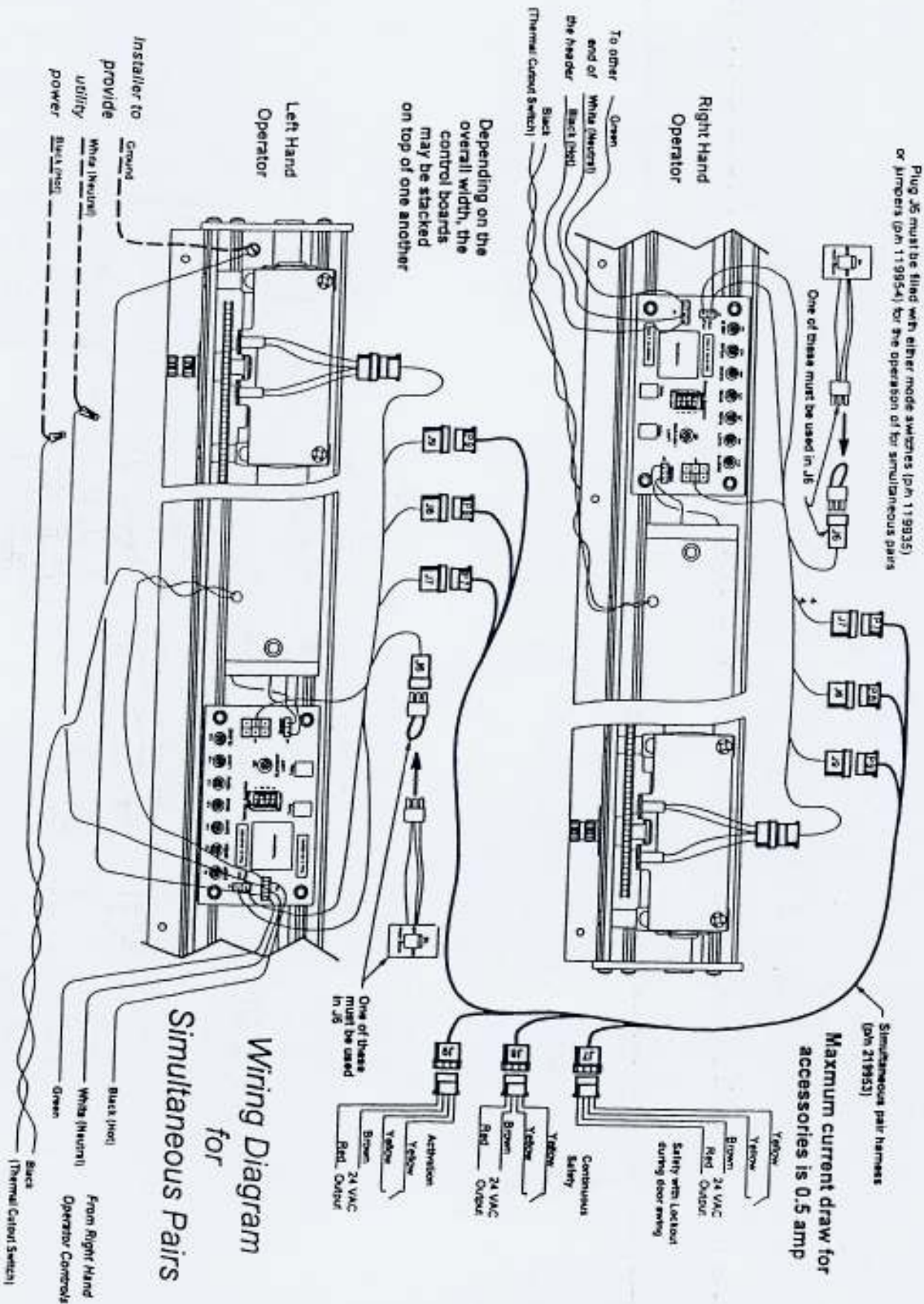
Matrix values are in seconds.

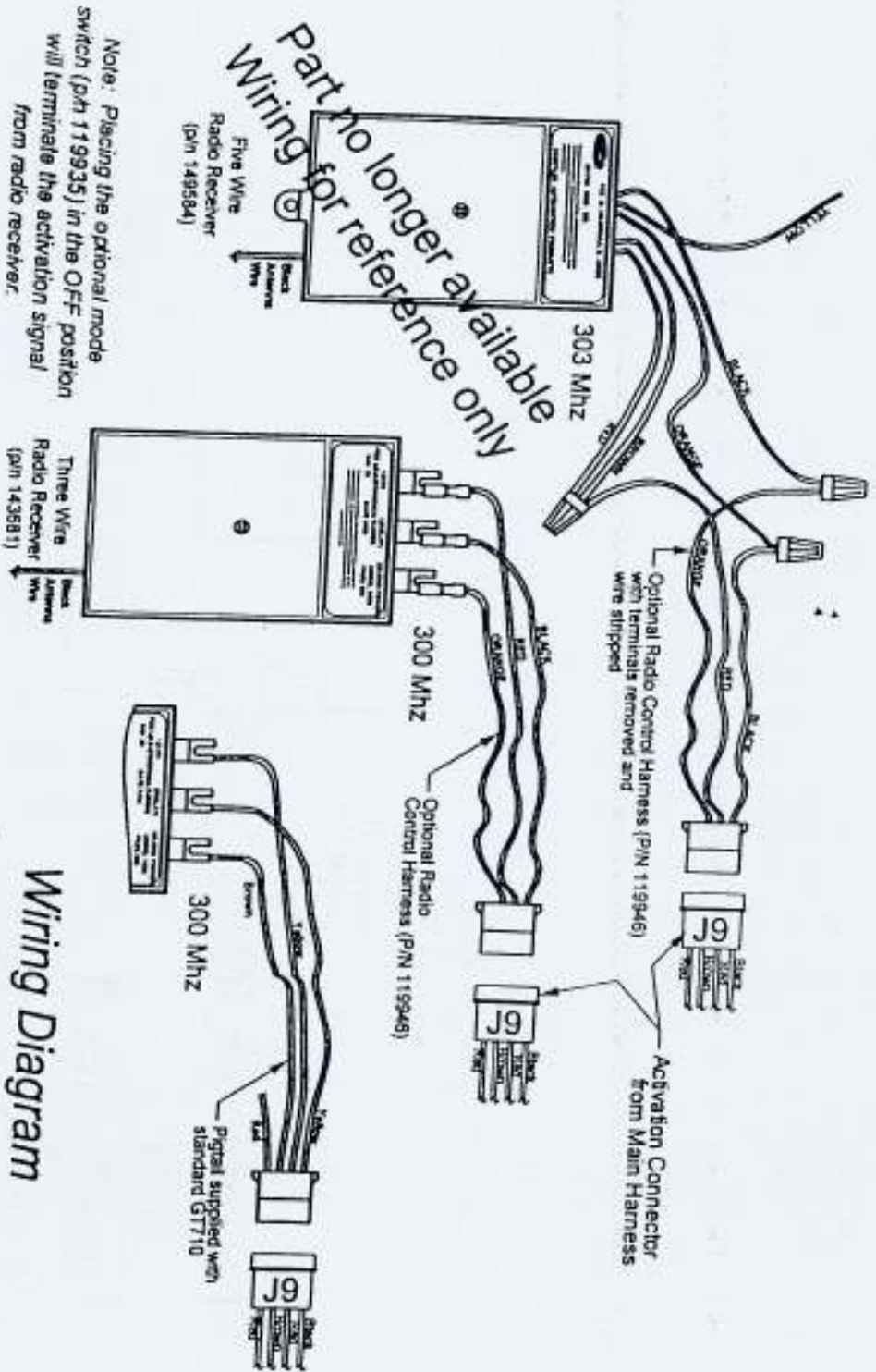
"D" = Door Leaf Width in inches (mm)	"W" = Door Weight in Pounds (kg)				
	100 (45.4)	125 (56.7)	150 (68.0)	175 (79.4)	200 (90.7)
30 (762)	3.0*	3.0	3.0	3.0	3.5
36 (914)	3.0	3.5	3.5	4.0	4.0
42 (1067)	3.5	4.0	4.0	4.5	4.5
48 (1219)	4.0	4.5	4.5	5.0	5.5

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.

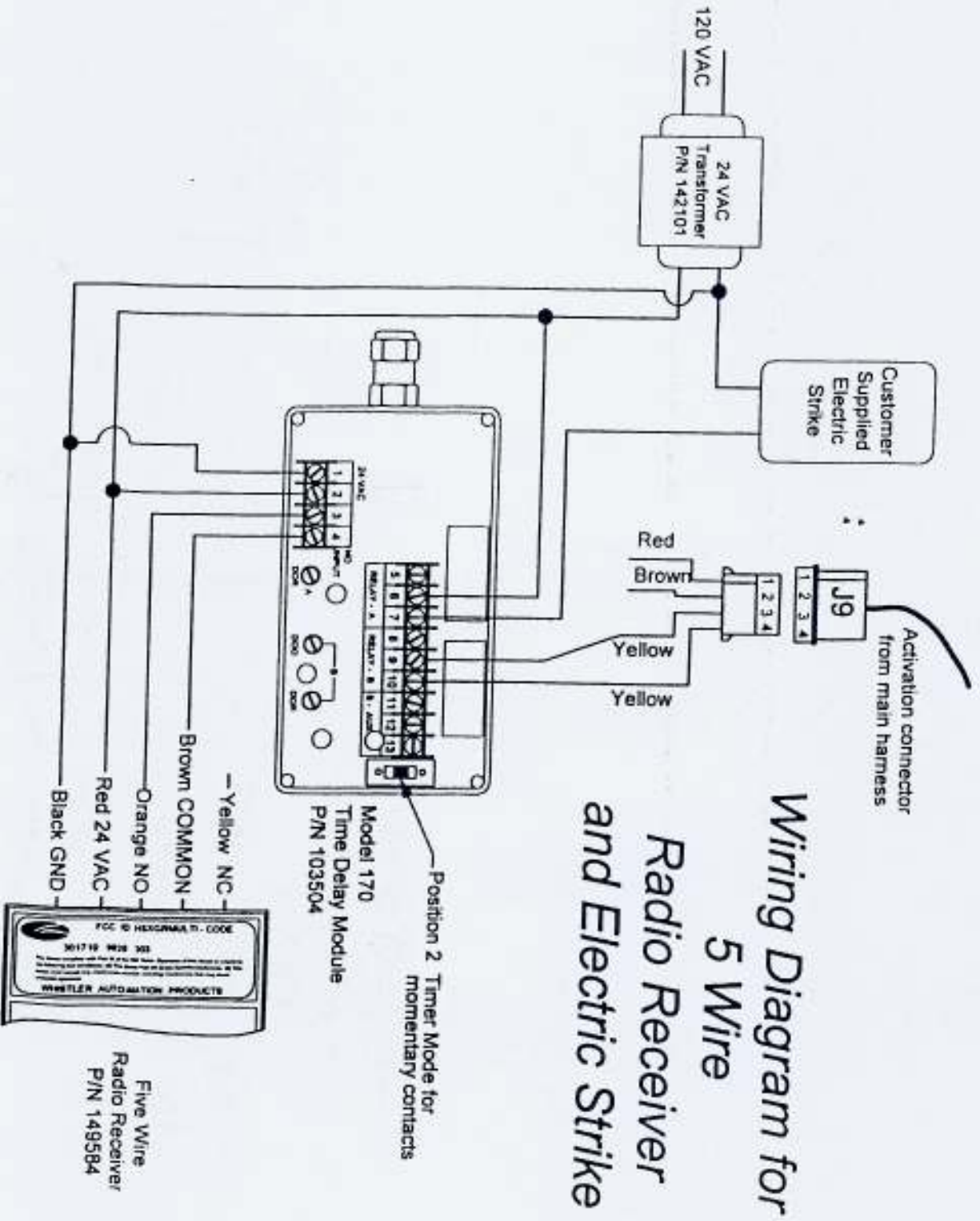


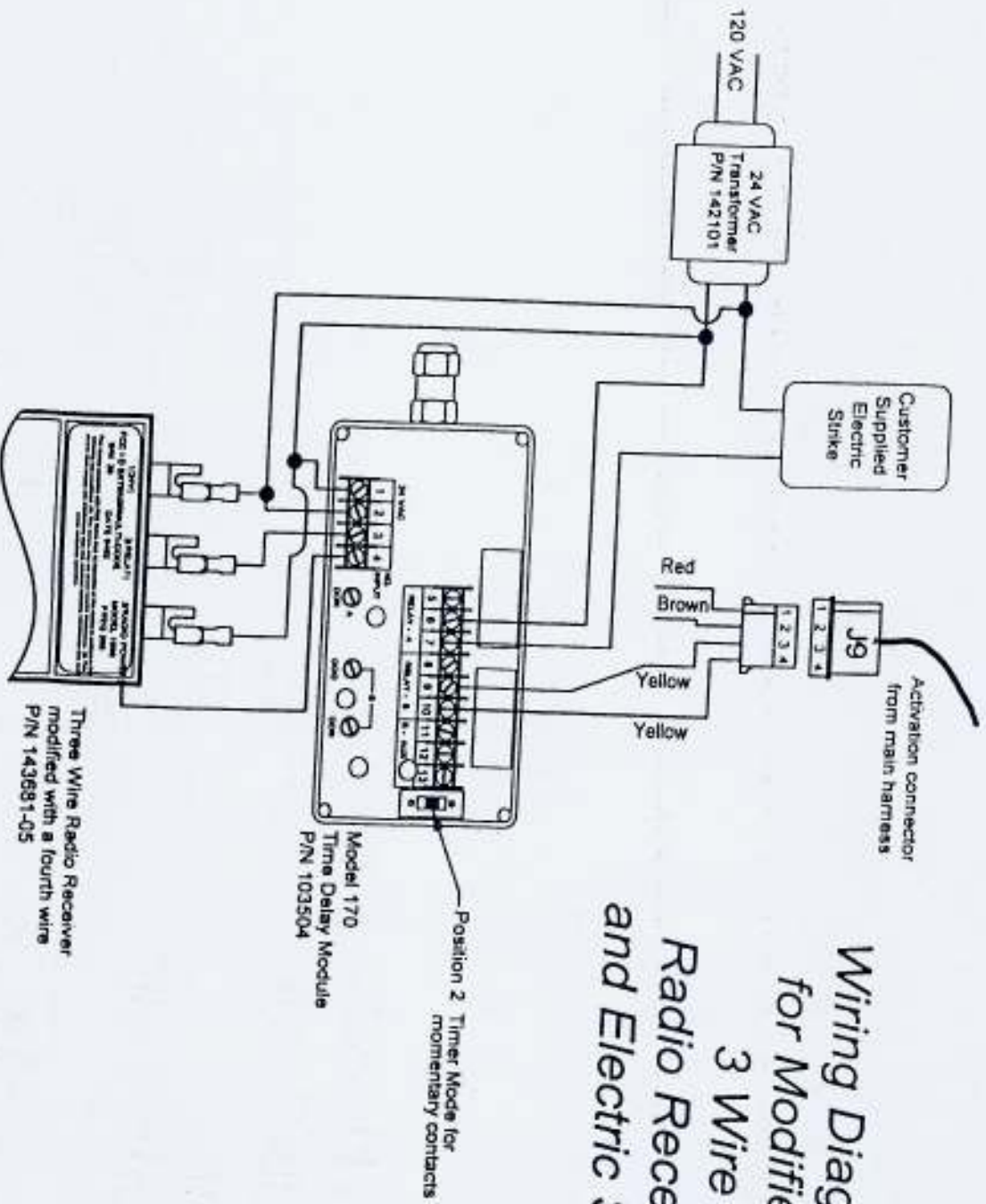
Wiring Diagram for Wall Switch Activation



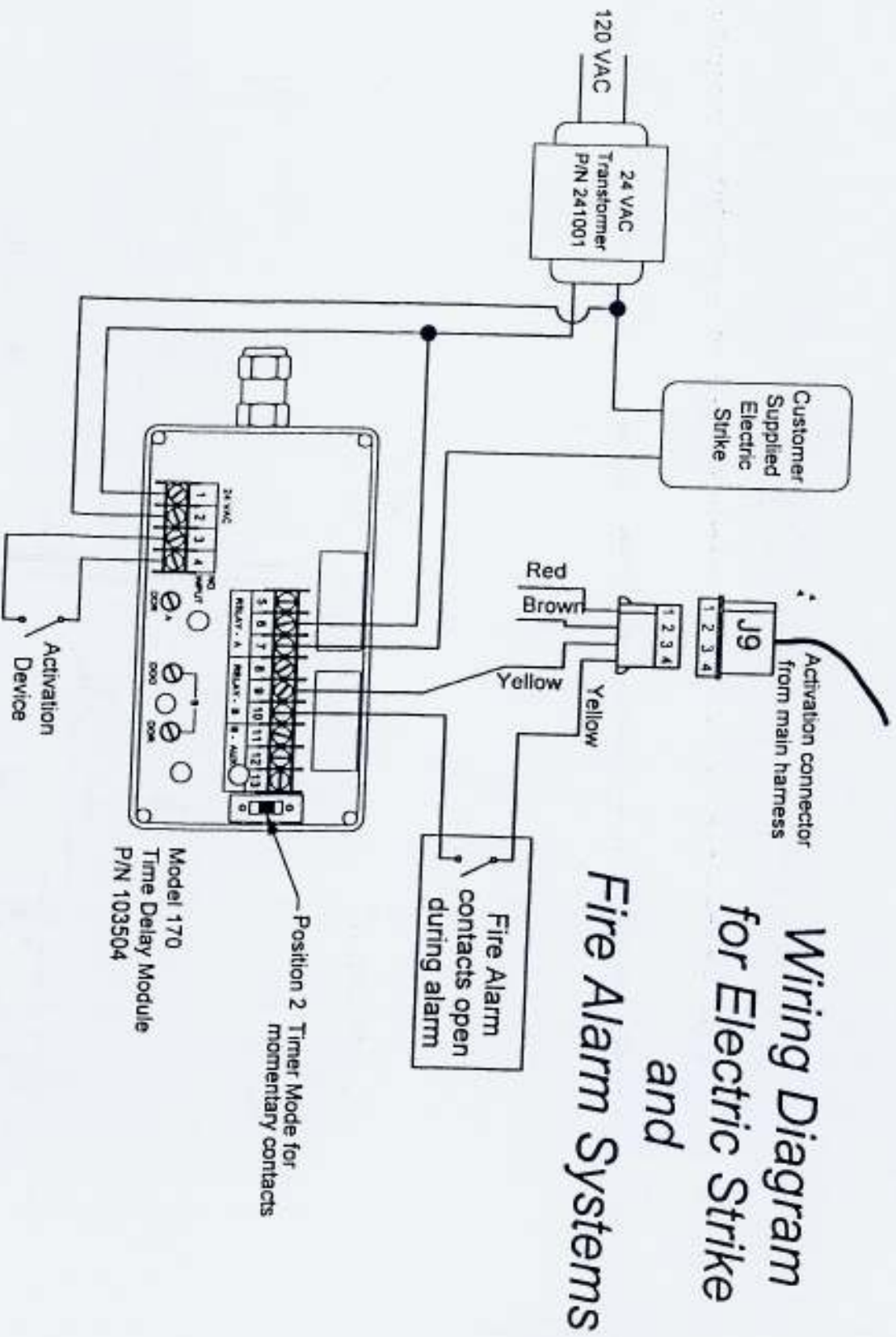


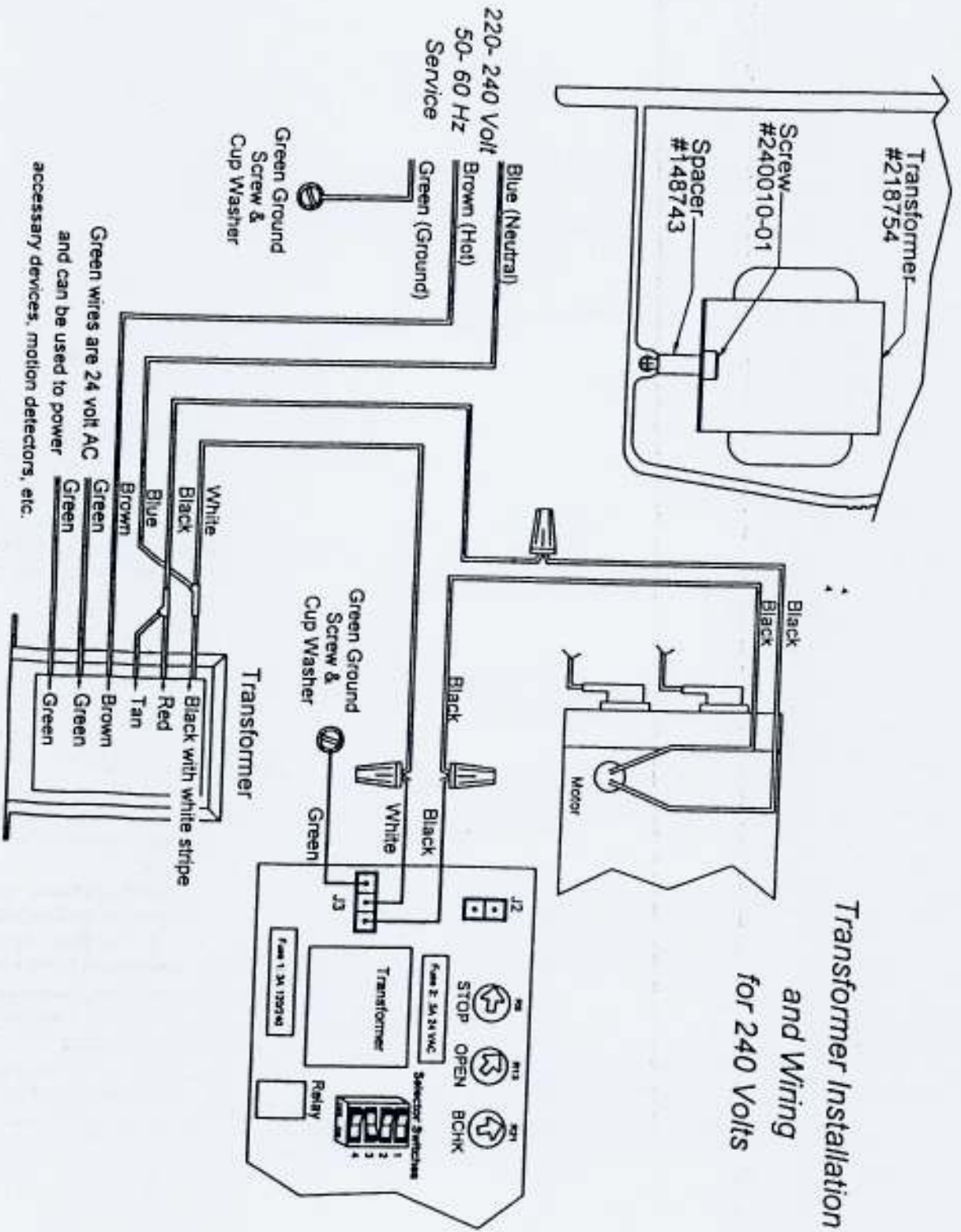
**Wiring Diagram
for Radio Activation**





**Wiring Diagram
for Modified
3 Wire
Radio Receiver
and Electric Strike**





NABCO Entrances Return Policy

If it is necessary to return a malfunctioning unit to NABCO, please use the following guidelines:

Return Material Tags (RMT) are to be used for in and out or warranty materials. The RMT is also used for repair and return as well as return for credit transactions. An RMT must accompany all returned items. Complete one RMT for each item that will be returned. The following information should be recorded on the tag:

- Serial No. or Part No. - Serial numbers for electronic components are stamped, engraved or printed on stickers and located on the component.
- Non-electrical parts usually do not have serial numbers.
- Part Name
- Expiration Date - Expiration dates for electronic components are stamped, engraved or printed on stickers and located on the component. Non-electrical parts usually do not have expiration dates. For "warranty claims of non-electrical parts", please include a photocopy of the original NABCO invoice the part was purchased on.
- Date Returned - The date that the part is returned to NABCO Entrances Inc.
- Requested Repair and Return Action - Specify in/out warranty for R & R, Exchange, or in warranty for credit. For requests for credits, please write the number of the invoice you want credited.
- Firm Name
- Date of Installation
- Installed at Job
- Describe Part Problem

The RMT tag is printed in triplicate. Please keep the top copy of the tag for your returns. Send the remaining two copies along with the part to the attention of the Repair and Return Department at NABCO Entrances Inc. Please remember to package the parts properly. Ship the parts freight prepaid. Collect shipments will be refused. If inquiring on the returned part, please use the RMT number associated with that part.

NABCO Entrances Standard Terms & Conditions and Warranty govern all returned items. These are provided in detail in the Terms and Conditions section of the NABCO Entrances Price Book. If you have any questions on warranty or the use of the RMT tags, please call NABCO's Customer Service Department toll free at 1-877-NABCO WI (1-877-622-2694).

