

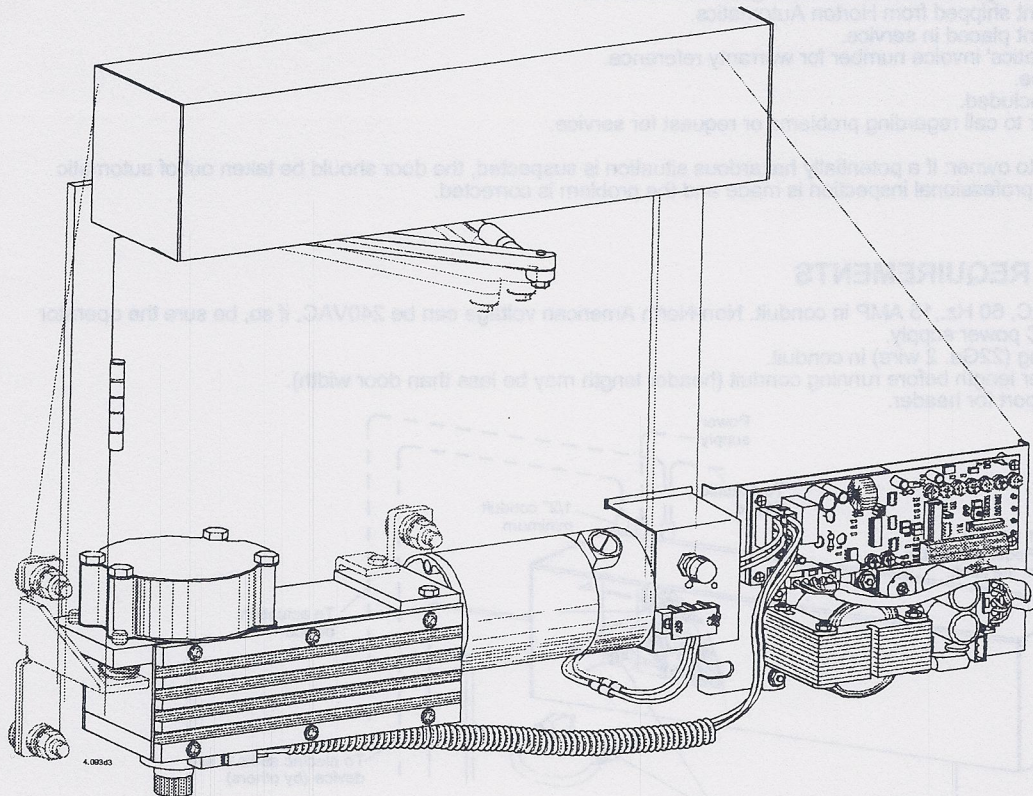
# Series 4100

## Swing Door Operator

### with C-4190 Control

# Installation Instructions

To be used in conjunction with H-SW C4190 Setup Instructions



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## 1. INSTRUCTIONS TO INSTALLER

- This door is to be installed by a trained and experienced installer AAADM certified with knowledge of local codes and ANSI A156.10 standards for power operated doors.
- To ensure safe and proper operation, the door must be installed and adjusted to conform to Horton Automatics recommendations, all code requirements and ANSI A156.10.
- If there are any questions about these instructions, call Horton Automatics Technical Assistance.

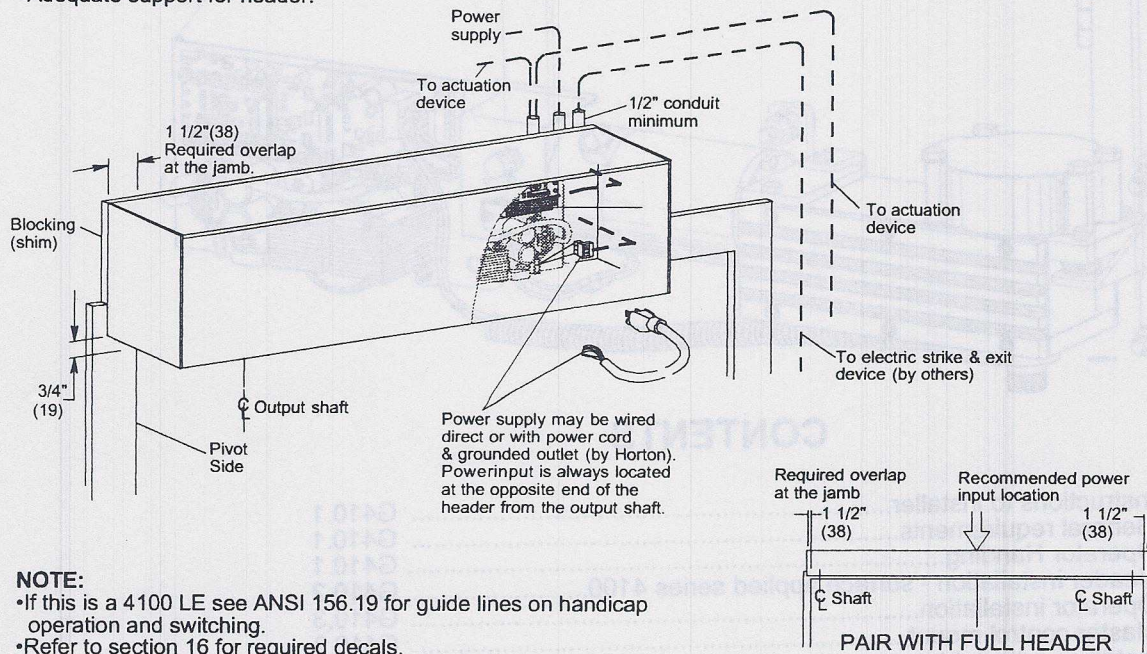
### INFORMATION TO BE PROVIDED BY THE DISTRIBUTOR TO THE OWNER

- After installation instruct the owner on the safe operation of the door.
- Present the Owner's Manual M310 and explain how to perform the Daily Safety Check.
- Location of power on / off switch.
- Necessary warnings not covered in these general instructions.
- Date equipment shipped from Horton Automatics.
- Date equipment placed in service.
- Horton Automatics' invoice number for warranty reference.
- Equipment type.
- Accessories included.
- Phone number to call regarding problems or request for service.

• **Give caution** to owner: If a potentially hazardous situation is suspected, the door should be taken out of automatic service until a professional inspection is made and the problem is corrected.

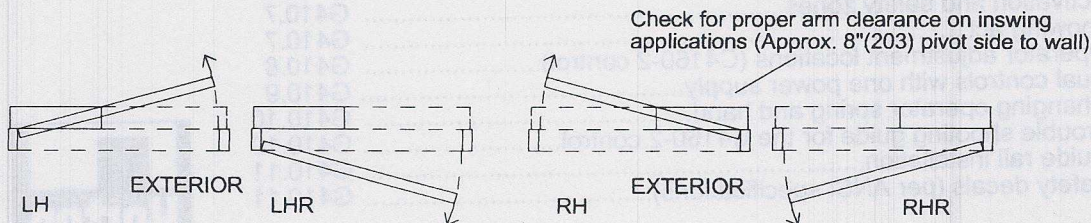
## 2. GENERAL REQUIREMENTS

- Power 120 VAC, 60 Hz., 15 AMP in conduit. Non-North American voltage can be 240VAC, if so, be sure the operator has a 240VAC power supply.
- Actuation wiring (22Ga. 2 wire) in conduit.
- Confirm header length before running conduit (header length may be less than door width).
- Adequate support for header.



## 3. OPERATOR HANDING

Confirm handing of door before installing operator. Refer to section 17 for instructions if changing hand of operator is required.



#### 4. HEADER INSTALLATION - SURFACE APPLIED SERIES 4100

The unit is shipped from the factory with the operator and controls installed. These should be removed for header installation.

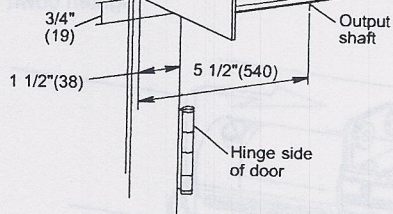
##### SIDE LOAD MOUNT (FULL ACCESS SIMILAR)

###### 1st Step

Check the mounting area for proper support. Wood blocking in wallboard wall is recommended. Shim if required.

###### 2nd Step

Mark location of header mount.



###### 3rd Step

Drill all holes #7 (.201) through backmember & frame. Drill "F" (.257) clearance holes through backmember only. Hole locations will vary as per job conditions.

###### 5th Step

Pull power and actuation wires into header.

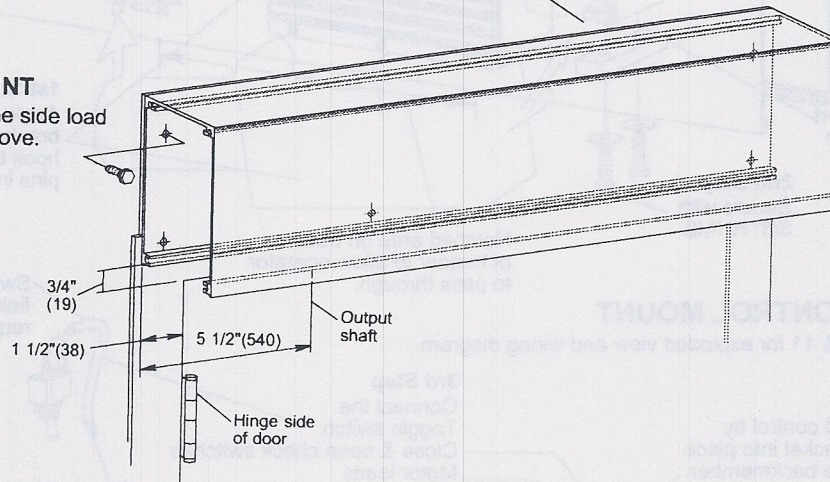
###### 4th Step

Secure with #14 x 1 1/2" HHSMS  
NOTE: More fasteners may be required than are shown

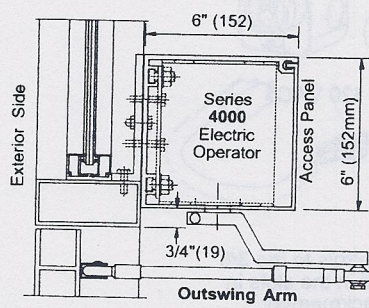
INSWING SHOWN

##### BOTTOM LOAD MOUNT

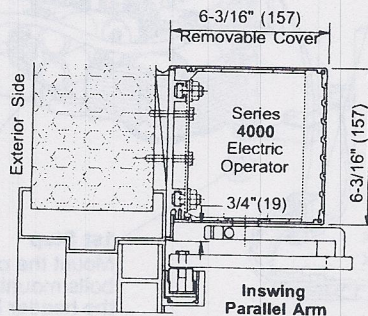
Installation is similar to the side load instructions described above.



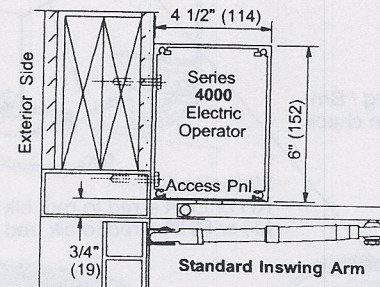
##### ADDITIONAL MOUNTING CONDITIONS



Series 4100 Side Load



Series 4100 Full Access

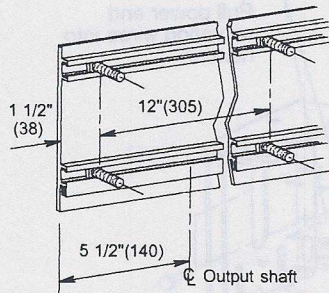


Series 4100 Bottom Load

G410.3

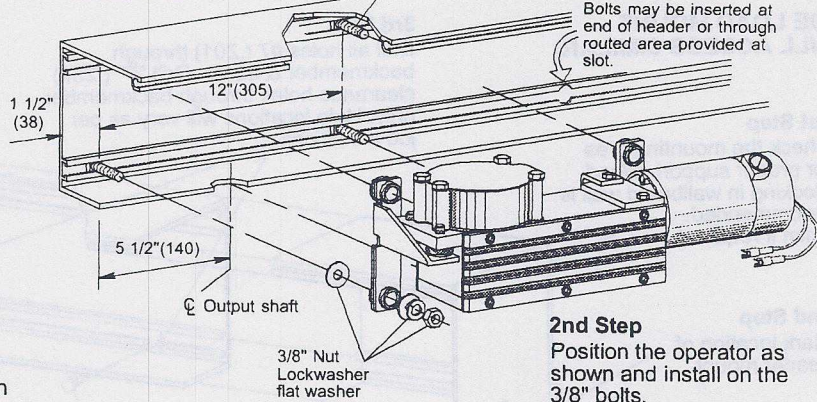
## 5. OPERATOR INSTALLATION

### FULL ACCESS



Full access operator installation same as side load

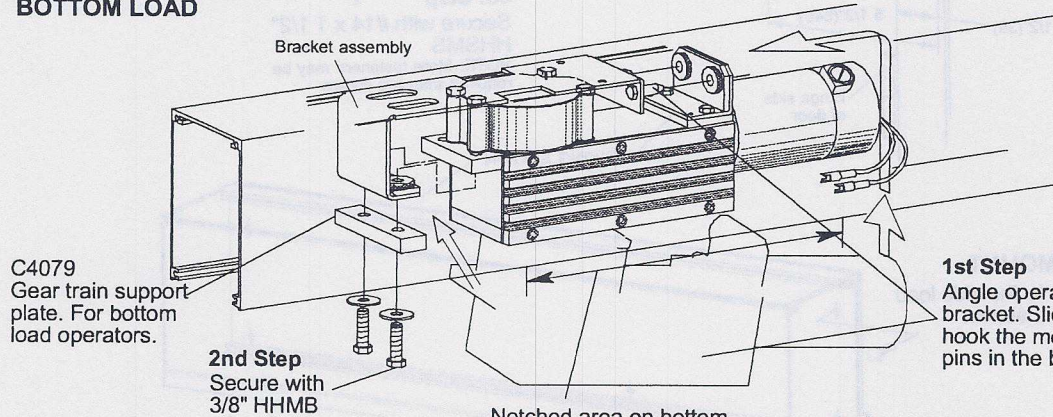
### SIDELOAD



#### 2nd Step

Position the operator as shown and install on the 3/8" bolts. Tighten down the bolts.

### BOTTOM LOAD



#### 1st Step

Angle operator up into bracket. Slide forward and hook the motor end on the pins in the bracket.

Notched area on bottom of header to allow operator to pass through.

## 6. MASTER CONTROL MOUNT

See section 10 & 11 for exploded view and wiring diagram.

#### 2nd Step

Mount the speed control by snapping the bracket into place in the slots in the backmember.

#### 3rd Step

Connect the:  
Toggle switch  
Close & open check switches  
Motor leads  
10 pin connector

Yel / Org / Brn  
To open check

Motor leads:  
RH or LHR = red to red, blk to blk  
LH or RHR = red to blk, red to blk

Blue / Gray  
To close check

#### 1st Step

Mount the controls to the 3/8" bolts mounted in the slots in the header backmember.

Switch is sent loose and field mounted where required

Power in

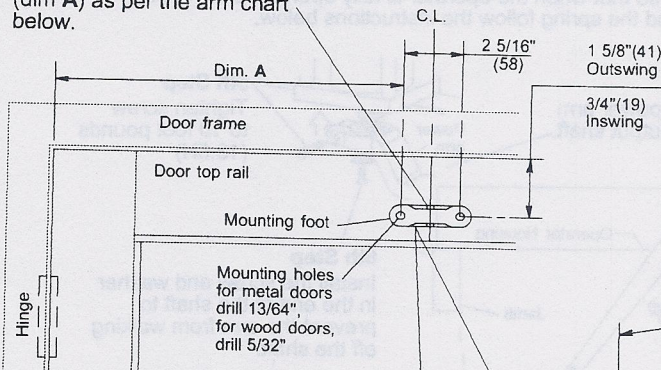
120 VAC

## 7. INSTALLING ADJUSTABLE CONNECTING ARM

NOTE: For inswing doors without arm clearance, see section 9 for parallel arm installation.

### 1st Step

Locate and mount the foot (dim A) as per the arm chart below.



#### Mounting Foot Assemblies -

##### A. Metal doors:

- (1) C5286-1 mounting foot
- (2) Bolts 1/4-20 x 2 1/4
- (2) Split ring lockwashers 1/4"
- (2) 1/4-20 acorn hex nut

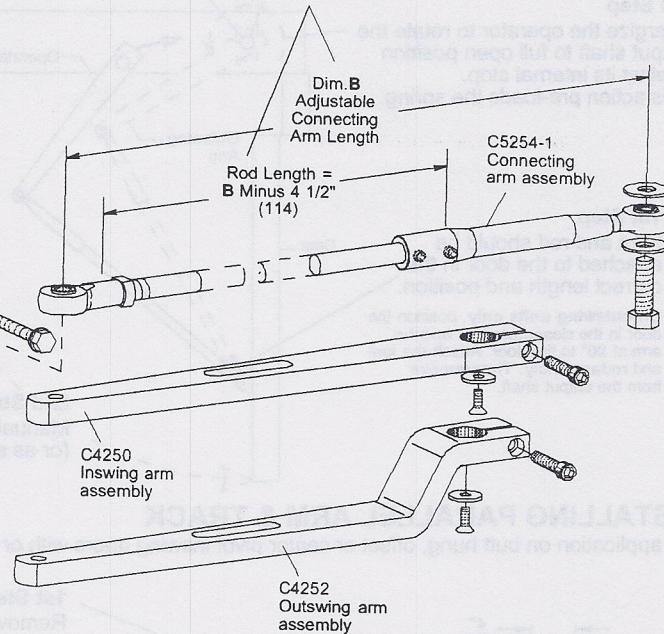
##### B. Wood doors:

- (1) C5286-1 mounting foot
- (2) Screws #14 x 1 1/2"

C5286-1  
Mounting foot

### 2nd Step

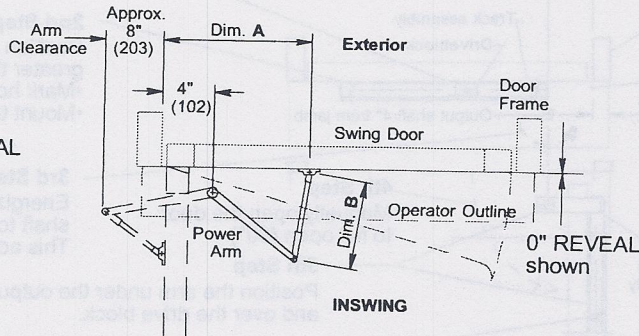
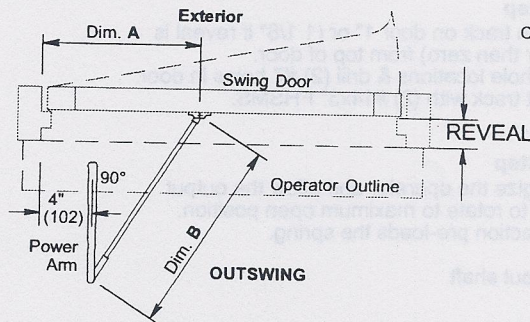
Determine the proper length of the adjustable rod (dim B) and cut as required.



### 3rd Step

Assemble the connecting arm and attach it to the mounting foot.

## STANDARD ARM CONNECTIONS



## ARM LENGTH CHART

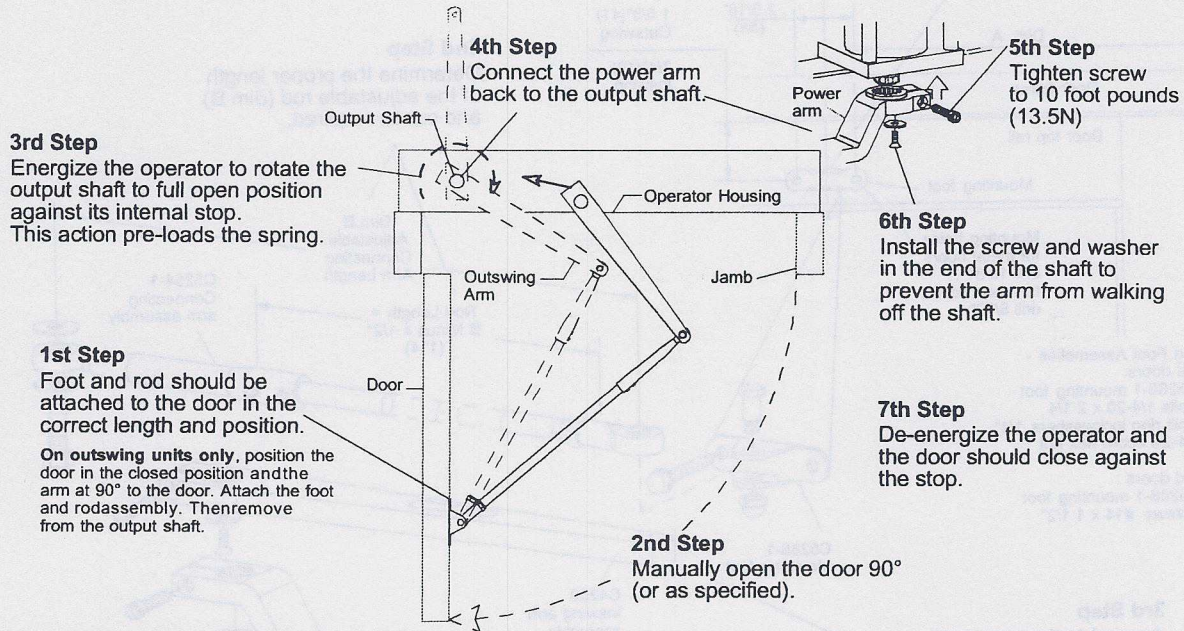
REVEAL	BUTT HINGE OR OFFSET PIVOT				CENTER PIVOT 2 3/4" *			
	INSWING		OUTSWING		INSWING		OUTSWING	
	A	B	A	B	A	B	A	B
0	13"(303)	10"(254)	16"(406)	17 1/8"(435)	17"(432)	9"(229)	16"(406)	16 1/2"(419)
1/2"(13)	13"(303)	10"(254)	16"(406)	17 1/2"(445)	17"(432)	9"(229)	16"(406)	16 7/8"(429)
1"(25)	13"(303)	10"(254)	16"(406)	17 3/4"(451)	17 1/2"(445)	9 1/2"(241)	16"(406)	17"(438)
1 1/2"(38)	14"(356)	10"(254)	16"(406)	18 1/4"(464)	17 1/2"(445)	9 1/2"(241)	16"(406)	17 3/4"(451)
2"(51)	14"(356)	10 1/2"(268)	16"(406)	18 1/4"(464)	18"(457)	10"(254)	17"(432)	18 3/4"(476)
2 1/2"(64)	14"(356)	11 1/2"(292)	16 1/2"(419)	19 1/4"(489)	19"(483)	10 1/2"(268)	17"(432)	19"(483)
3"(76)	15"(381)	12 1/2"(317)	16 1/2"(419)	19 3/4"(489)	19"(483)	10 1/2"(268)	18"(457)	20"(508)
3 1/2"(89)	16"(406)	11"(379)	16 1/2"(419)	20 1/8"(511)	19"(483)	10 1/2"(268)	18"(457)	20 1/2"(521)
4"(102)	17"(432)	12"(305)	17"(432)	20 3/4"(527)	25"(635)	17"(432)	19"(483)	21 1/2"(546)

NOTE: If reveal is greater than 4" consult factory.

\*Add 1" to dim. A for 3 3/4" center pivot

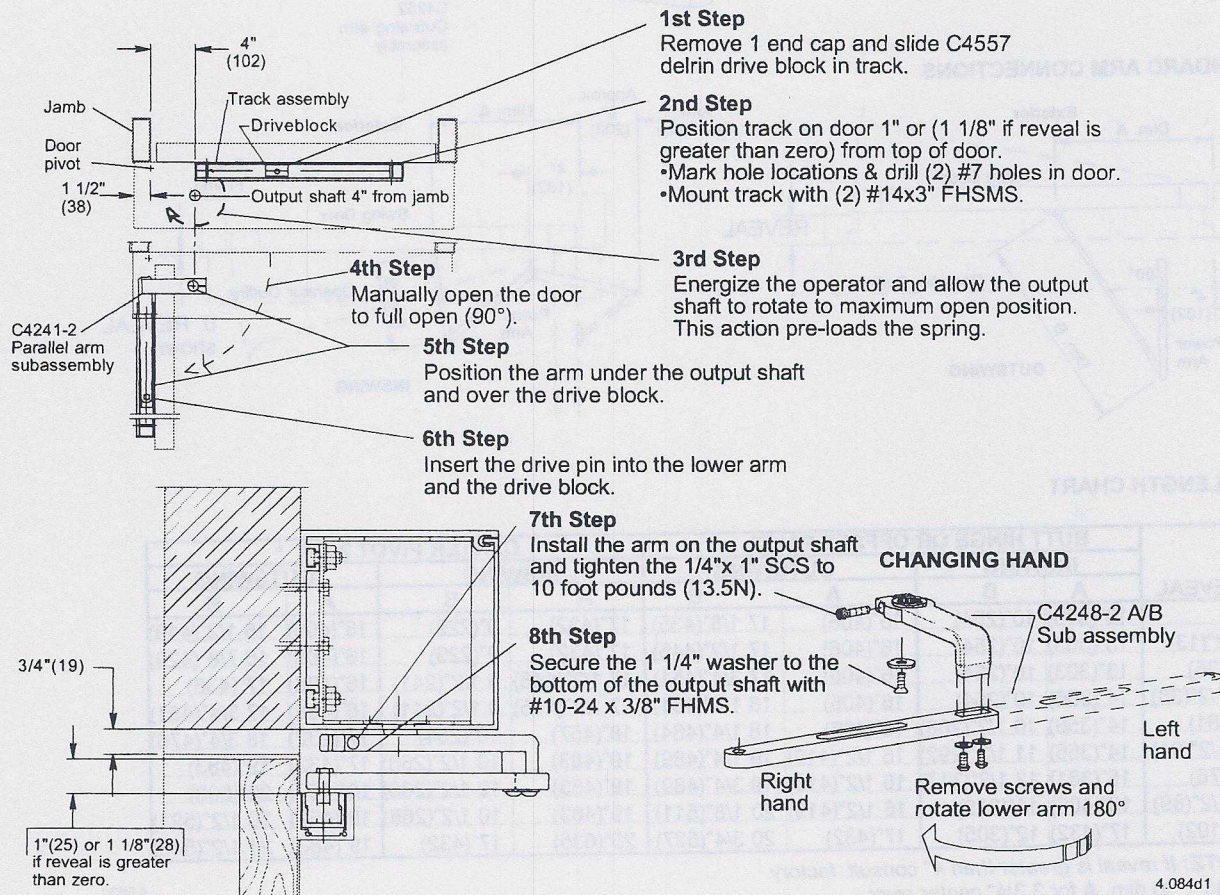
## 8. SETTING THE OPEN STOP and LOADING OPERATOR SPRING

**CAUTION:** When installing the power arm or when servicing any swing door operator, be sure to keep your face, hands and arms clear of the power arm's swing path. **SERIOUS INJURY** could result should the operator be accidentally activated to an open position or should the operator return to a relaxed position. The power arm must be located correctly on the output shaft so that when the operator is fully open the door will be positioned at 90° from its frame. To set the open stop and load the spring follow the instructions below.



## 9. INSTALLING PARALLEL ARM & TRACK

For application on butt hung, offset or center pivot inswing doors with or without breakout capability.



## 10. OPERATOR ADJUSTMENTS FOR CODE COMPLIANCE

The following information is provided as a recommendation for safe operating speed adjustments and should be adhered to when installing or servicing the series 4000 swing door operator. See section 10 for C4160-2 control locations.

### NORMAL SPEED OPERATOR (ANSI 156.10)

**Opening Force:** Shall not exert more than 40 ft.lb (180N) through the last 10° (open check), measured 1" (25) from the lock edge of the door.

**Closing Force:** Shall not exert more than 40 ft.lb. (180N) at any point in the closing cycle, measured 1" (25) from the lock edge of the door.

**Opening Speed:** The opening time of a power operated swing door to open check shall not be less than 1.5 seconds.

**Closing Speed:** Through the last 10° (close check) shall be as follows:

ANSI CHART - CLOSING TIME IN SECONDS (NORMAL SPEED)

Door Leaf Width in Inches (mm)	Door Weight in Pounds (kg)					
	100 (45)	140 (64)	110 (50)	150 (68)	120 (55)	160 (73)
36 (914)	2.0 sec	2.3 sec				
42 (1067)			2.3 sec	2.7 sec		
48 (1219)					3.2 sec	2.8 sec

NOTE: Adjust to longer time to suit traffic conditions and remote mounted activating switch locations

#### Time Delay (Minimum):

After loss of actuating signal shall be as follows:  
Approach side using either sensors or mats... 1 1/2 to 2 Sec.  
Swing / safety side using either sensors or mats... 4 Sec.  
Using "knowing act" momentary contact switch... 5 Sec.  
Horton recommended time.

### LOW ENERGY, SLOW OPENING OPERATOR (ANSI 156.19)

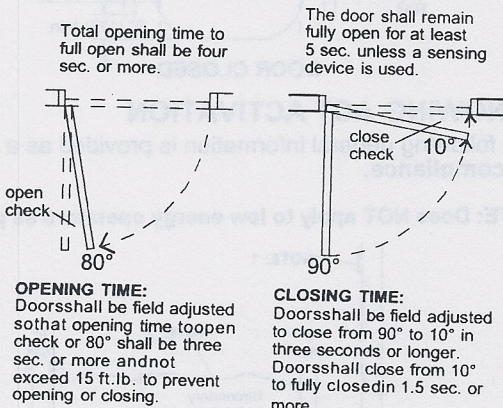
The door must be adjusted as follows if guide rails and safety sensors are not used. Horton recommends that a pushbutton or other "knowing act" device be used for activation.

ANSI CHART - OPENING & CLOSING TIME IN SECONDS (LOW ENERGY)

Door Leaf Width in Inches (mm)	Door Weight in Pounds (kg)				
	100 (45.4)	125 (56.7)	150 (68.0)	175 (79.4)	200 (90.7)
30 (762)	3.0 sec	3.0 sec	3.0 sec	3.0 sec	3.5 sec
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

The force required to prevent a door from opening or closing shall not exceed 15 ft.lb (67N) applied one inch (25 mm) from the latch edge at any point of opening or closing. The kinetic energy of a door in motion shall not exceed 1.25 lb-ft (1.69Nm). Note: The times shown in the chart above may need to be extended to be in compliance with ANSI force requirements.

**Power Failure:** manual pressure not to exceed 15 lb ft (111N) at a point one inch (25mm) from the latch edge (may vary by local code).

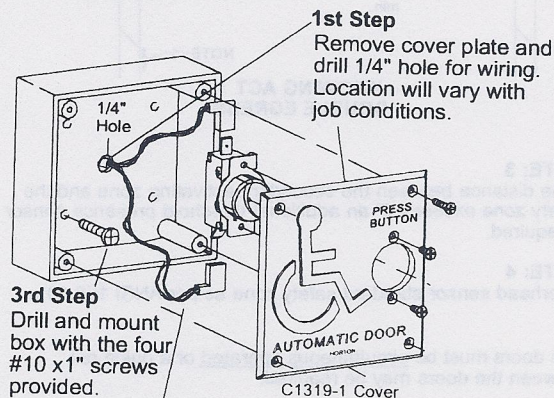


## 11. INSTALLING ACTUATION SWITCHES

If the 4000LE low energy operator is used, Horton recommends using a "knowing act" activating device.  
**Note: See ANSI 156.19 For switch location requirements.**

### C1316-2 SWITCH ASSEMBLY

Surface applied 4" x 4" x 1 1/2" plastic junction box. Use same size metal box for flush mount (not supplied).



### C1260 SWITCH ASSEMBLY

#### 1st Step

Pull the 24 VAC 2 conductor wire into the box and connect to the microswitch terminals.  
**Do not connect to high voltage.**

6 1/4" diameter plate. C1260-4 shown. See catalog for optional designs.



#### 2nd Step

Attach the microswitch & push plate to the junction box using the four allen screws provided.

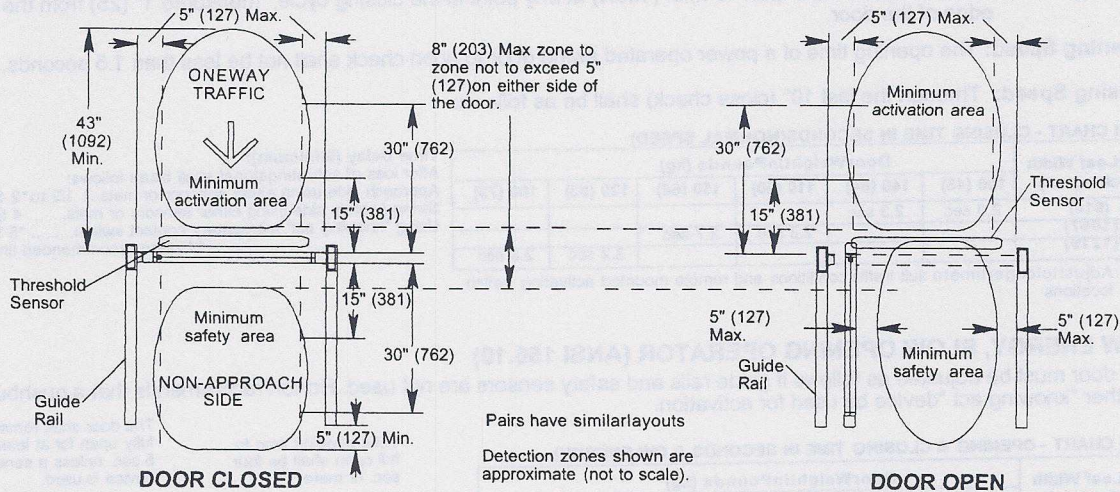
**Note: Junction box not included in assembly.**

## 12. ACTIVATION AND SAFETY ZONES

The following general information is provided as a recommendation for safe operation. **See ANSI 156.10-1999 for complete information** for swing door activation, safety zones, guide rails and mat layouts. See manufacturers instructions for installation and adjustments of motion and presence detectors.

**NOTE:** Does NOT apply to low energy operators as per ANS 156.19.

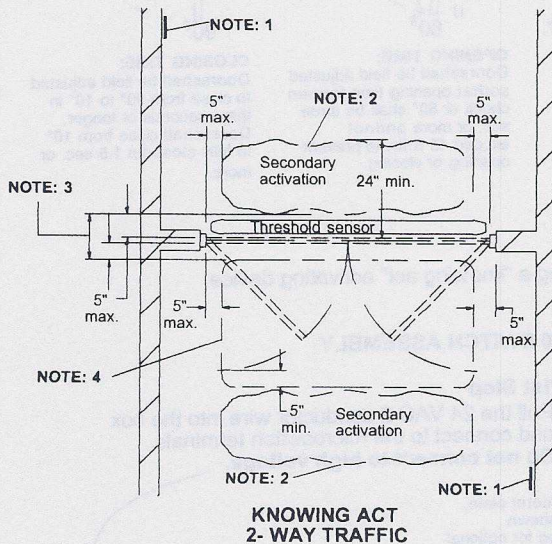
### DETECTION AND SAFETY ZONES - HEADER MOUNTED SAFETY SENSORS



## 13. KNOWING ACT ACTIVATION

The following general information is provided as a recommendation for safe operation. **See ANSI 156.10, SECT. 9 for compliance.**

**NOTE:** Does NOT apply to low energy operators as per ANS 156.19.



#### NOTE: 1

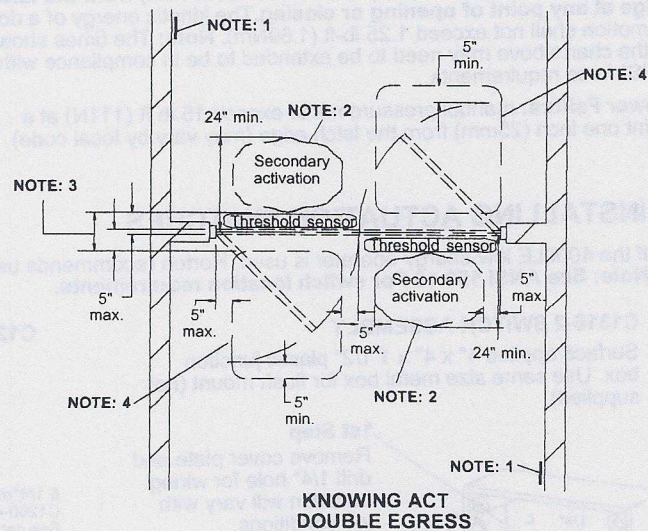
Push switch activation. (Knowing act)

- The door shall remain open a min. of 5 sec. after the switch is released.
- The switch must be installed within view of the door at a max. distance of 12' from the center of the door mounted a min. of 36" and a max. of 48" from the floor.

#### NOTE: 2

Secondary activating zone:

- Length: minimum 24" approach.
- Width: maximum of 5" on each side of door leaf.
- The activation zone is turned off when the door is within 6" of being closed and turned on when the switch is pushed.



#### NOTE: 3

If the distance between the secondary activating zone and the safety zone exceeds 8" an additional threshold presence sensor is required.

#### NOTE: 4

Overhead sensor standard safety zone as per ANSI 156.10.

The doors must be simultaneous operated or a guide rail between the doors may be required.

# 14. OPERATOR ADJUSTMENT LOCATIONS (C4160-2 CONTROL)

The following information is provided as a recommendation for safe operating speed adjustments and should be adhered to when installing or servicing the series 4000 swing door operator. (See section 12) See ANSI 156.10 for normal speed operators and ANSI 156.19 for low energy slow opening operators.

**\*JB1 Jumper:**  
(Push - N - Go) With jumper in place, a slight push on the door will actuate the operator and open the door.

**\*\*JB2 Jumper:**  
Removes disable touch stop

**\*\*\*JB3 Jumper:**  
Inserts a 0.25 second delay to allow the lock to release before the door starts to move.

**LOCK OUT:**  
Lock Out Time Delay - Sets the length of time needed to ignore the safesensor during door closing. Rotate clockwise to increase.

**DELAY:**  
Time Delay Adjustment - Rotate clockwise to increase.

**LIMIT:** Current Limiting - Sets the amount of opening force. Rotate counter-clockwise to increase.

**OBST:** Replace time delay cancel on old C7160-3 controls. Rotate clockwise to increase.

**Closing Speed Adjustment:**  
rotate counter-clockwise to increase. suggested setting: 4 seconds min.

**HOLD:**  
Hold Voltage Function - Control switches to hold-open voltage after a nominal 10-12 second delay from beginning of actuate signal. Also sets speed for Stop & Seek mode. Rotate clockwise to increase.

**SPEED:**  
Open Speed Adjustment - Sets the open speed of the operator. Rotate clockwise to increase.

**CHECK:**  
Open Check Speed Adjustment - Sets the speed after the open check switch falls onto the cam flat. Rotate clockwise to increase.

**\*\*\*JB3 Jumper:**  
Lock Enable

**\*\*JB2 Jumper**  
**\*JB1 Jumper**

**DACCL:**  
Open Deceleration Adjustment - Determines how quickly the door slows after the open check switch is tripped. Rotate clockwise to increase.

**ACCEL:**  
Open Acceleration Adjustment - Sets motor acceleration to open speed setting. Rotate clockwise to increase.

**CN2:**  
Switching Circuit

**C3955-1**  
5 pin Power Supply

**CN2:**  
Power Supply

**CN1 Power In:**  
120 VAC, 15Amp.

**F1, F2 & F3**  
Fuses: Located to right of transformer

To ground wire on incoming line

**Power cord**

**C4156-1**  
Harness

**C4024-2**  
Open Check Switch Cam:

Adjust for switch to fall onto cam flat when door is 10 deg from full open.

**C4024-3**  
Close Check Switch Cam:

Adjust for switch to fall onto cam flat when door is 10 deg from full closed.

**C4024-3**  
Open Check Switch Cam:

Adjust for switch to fall onto cam flat when door is 10 deg from full open.

Sent loose to replace open check cam on center pivot in swing units with breakout.

C4024-3 provides additional safety if the breakout stop should fail.

**Output shaft**

**Factory installed**

**C4011**  
Motor

**Red**

**Black**

For LH and RHR operators connect Black-Red & Red-Black

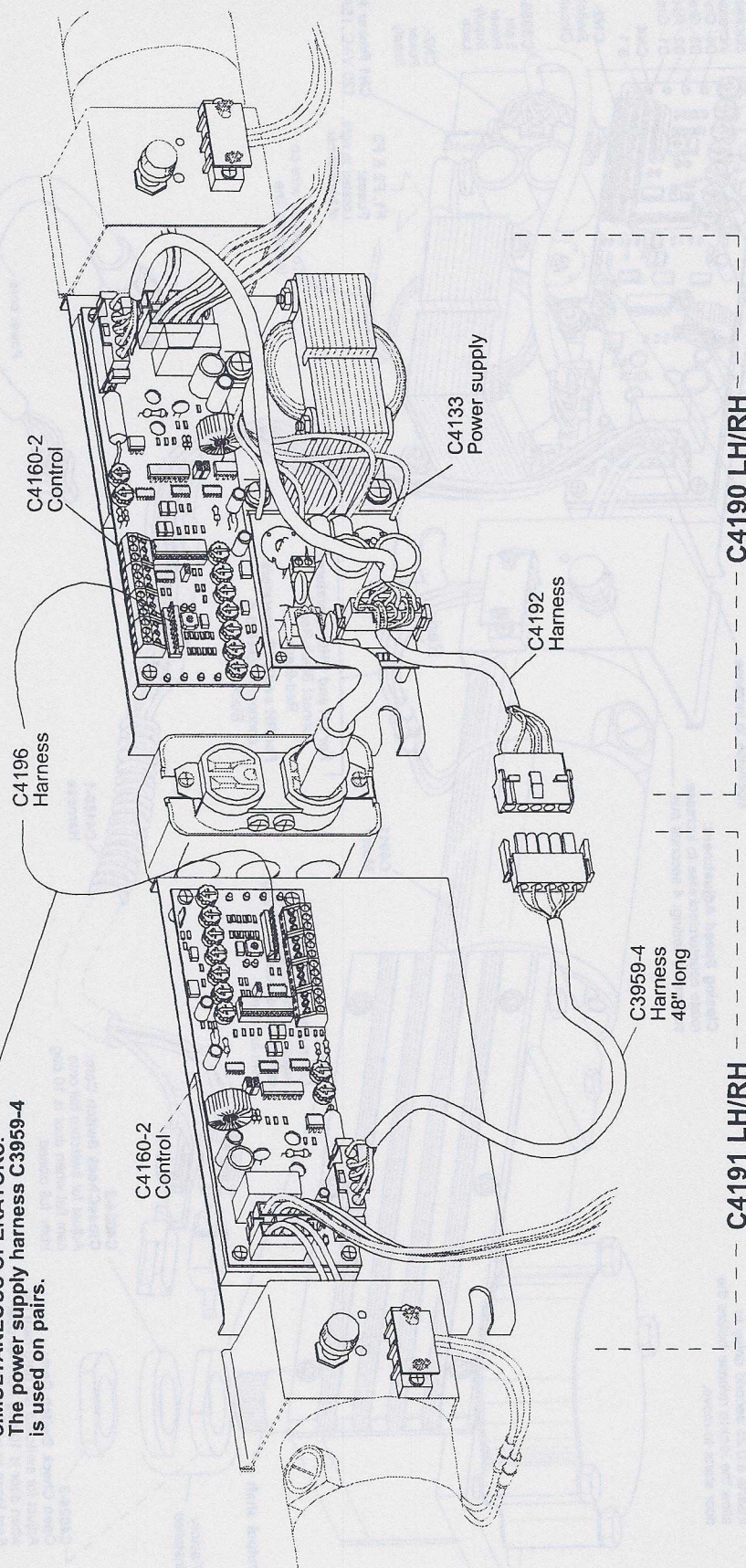
For RH and LHR operators connect RED-Red & Black-Black

**G410.8**

## 15. DUAL CONTROLS WITH ONE POWER SUPPLY

Set up the controls as outlined in previous sections and make the connections as shown on this page.

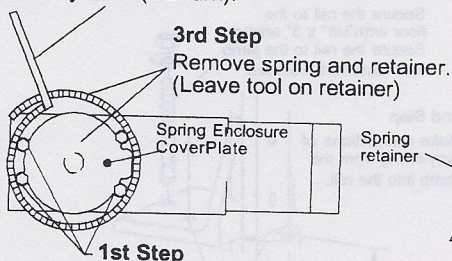
**NOTE:**  
C4196 harness is **ONLY** used on  
**SIMULTANEOUS OPERATORS.**  
The power supply harness C3959-4  
is used on pairs.



## 16. CHANGING OPERATOR SPRING AND HAND

### 2nd Step

Set the Horton spring removal tool or Rigid #2-24" strap wrench against the spring force. Hold the spring retainer in the correct position and remove the last 2 bolts. Allow the retainer to fully relax (1/2 turn).



### 3rd Step

Remove spring and retainer. (Leave tool on retainer)

### 1st Step

Clamp operator in a vise and remove two HHMB and loosen the third.

### 4th Step

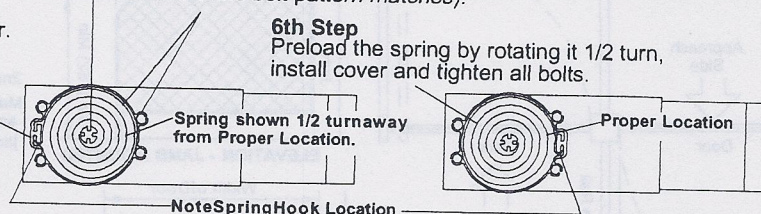
Rotate the spring arbor (output shaft) as far as it will go in the opposite direction (240°), use power arm for leverage if necessary.

### 5th Step

Turn spring retainer and spring over and place on the notched arbor approximately 1/2 turn away from proper location (proper location is where the bolt pattern matches).

### 6th Step

Preload the spring by rotating it 1/2 turn, install cover and tighten all bolts.



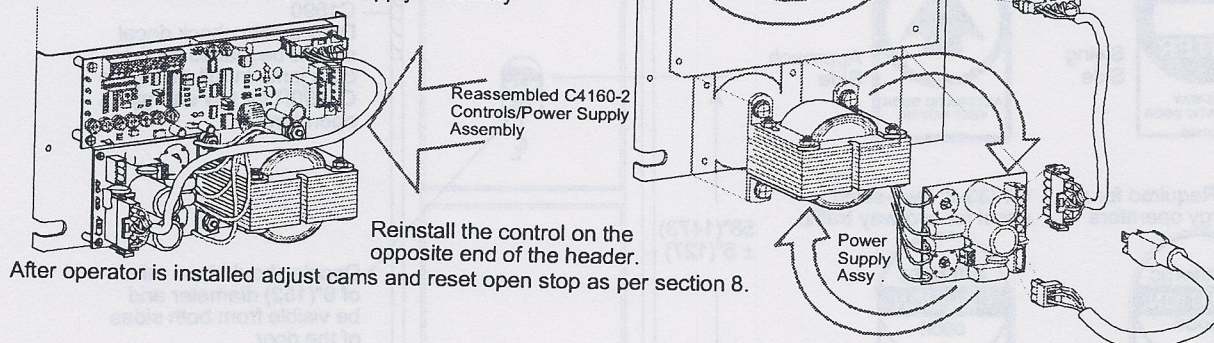
### 7th Step

Wire motor correctly for new hand. (See section 6) Reinstall operator and adjust cams as necessary.

To change hand remove operator and mounts. Reverse mounts on the operator (turn brackets upside down and attach to the other side of the operator). Remove the C4160-2 controls and reposition components as shown.

### 1. REMOVING C4160-2 CONTROLS ASSEMBLY:

- Disconnect all plugs from controls assembly and remove from chassis.
- Remove controls from mounting plate, rotate 180° and reinstall. Do Likewise with power supply assembly



After operator is installed adjust cams and reset open stop as per section 8.

## 17. TROUBLE SHOOTING GUIDE FOR THE C4160-2 CONTROL

**Electrical** Check all plug connections and micro switches then the following items should be checked in the following order.

1. Is high voltage present. Check the power supply at CN1 input for 120VAC.
2. With high voltage present, move to the 5 pin power supply lace and check for voltages between 1 & 2, +90VDC, probe through back of plug with VOM leads and then between 3 & 4, +24VDC. Move the meter leads to the 5 pin plug at the control and confirm voltages again.

### No Voltage Present, No operation:

No Voltage at CN2 pins 1 & 2, check fuse at the F2 location on the power supply.

- A. Disconnect 120VAC plug, disconnect 5 pin power supply plug, and disconnect motor leads. Replace fuse.
- B. Check motor for frame short or shorted motor. Checks good move on to step C.
- C. Reestablish 120VAC and confirm fuse status. Reestablish 5 pin plug and confirm fuse status, if blown chances are we have a bad control. If the fuse is still good, reestablish motor connection and test operation.

No Voltage at 3 & 4, check fuses at the F1 and F3 location, located on the power supply.

- A. Disconnect 120VAC plug, disconnect 5 pin power supply plug, disconnect 2 pin motor plug and remove 6 pin input plug at CN2. Replace fuse.
- B. Check low voltage activation circuit for possible shorts in the 24VDC wiring, possible chaffing at frame to door cords or frame to header connections.

- C. Reestablish 120VAC and confirm fuse status. Reestablish 5 pin plug and confirm fuse status, if blown chances are we have a bad control. If the fuse is still good, reestablish CN2 input connection and 2 pin motor plug, test operation

### Voltage Present, No Operation:

Confirmation of switch circuits at CN2 can be made by watching led inputs.

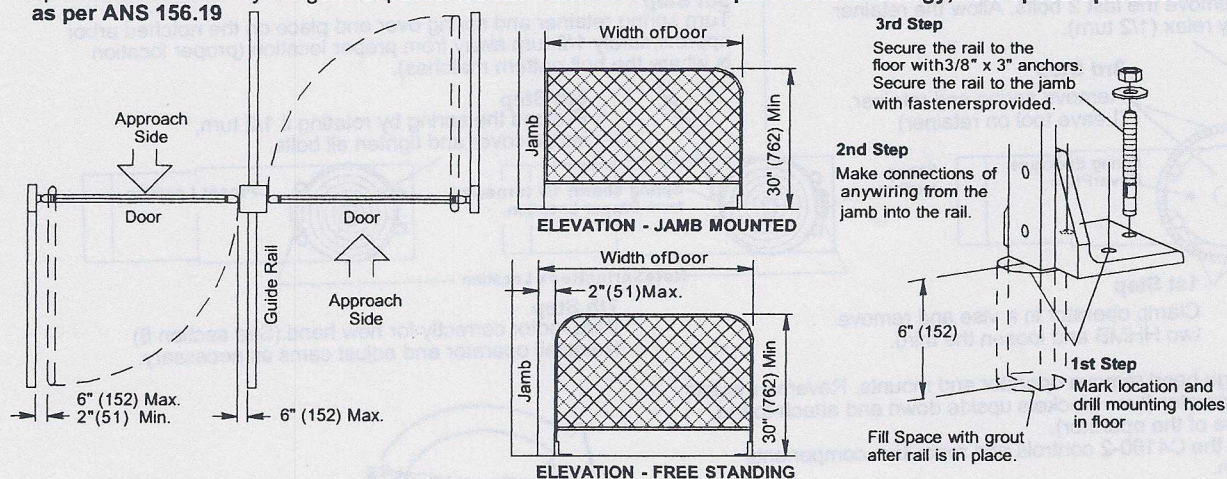
- A. First confirm D3 circuit is closed, green D3 light should be on. No light, check toggle circuit. A quick check of the circuit wiring can be made by jumping pins 5 & 6 of CN2.
- B. Confirm that the red D2 Safety Circuit light is off.
- C. Activate door with the external activate circuit, this will confirm the switching circuit. No light at D1 would indicate a malfunction in the circuit or wiring and could be confirmed by jumping pins 2 & 3 at CN2.
- D. Last but not least, confirm that the Open Speed pot is turned up enough to drive the door open.

### Voltage Present, High Speed, No Speed Control:

Usually indicates a blown or shorted Mosfet transistor, at this point the control must be replaced.

## 18. GUIDE RAIL INSTALLATION

A typical layout is shown below ANSI 156.10 requires two guide rails on the swing side of *normal speed power* operated doors used by the general public. **NOTE: Guide rails NOT required on low energy, slow speed operators as per ANSI 156.19**



## 19. SAFETY DECALS (Per ANSI Specifications)

C1631-3: Two-sided decal for one-way traffic



Swing Side

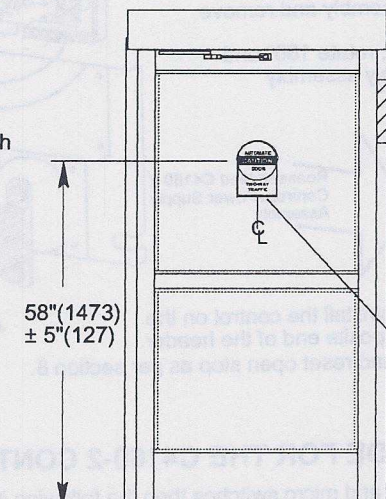


Approach Side

C7280: Required for all low energy operators



C1633-2: Two-sided decal for two-way traffic



C1690  
Daily safety check decal should be placed on the door jamb in full view (use C1690R for low energy operators).

Decals should be a min. of 6"(152) diameter and be visible from both sides of the door.



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