

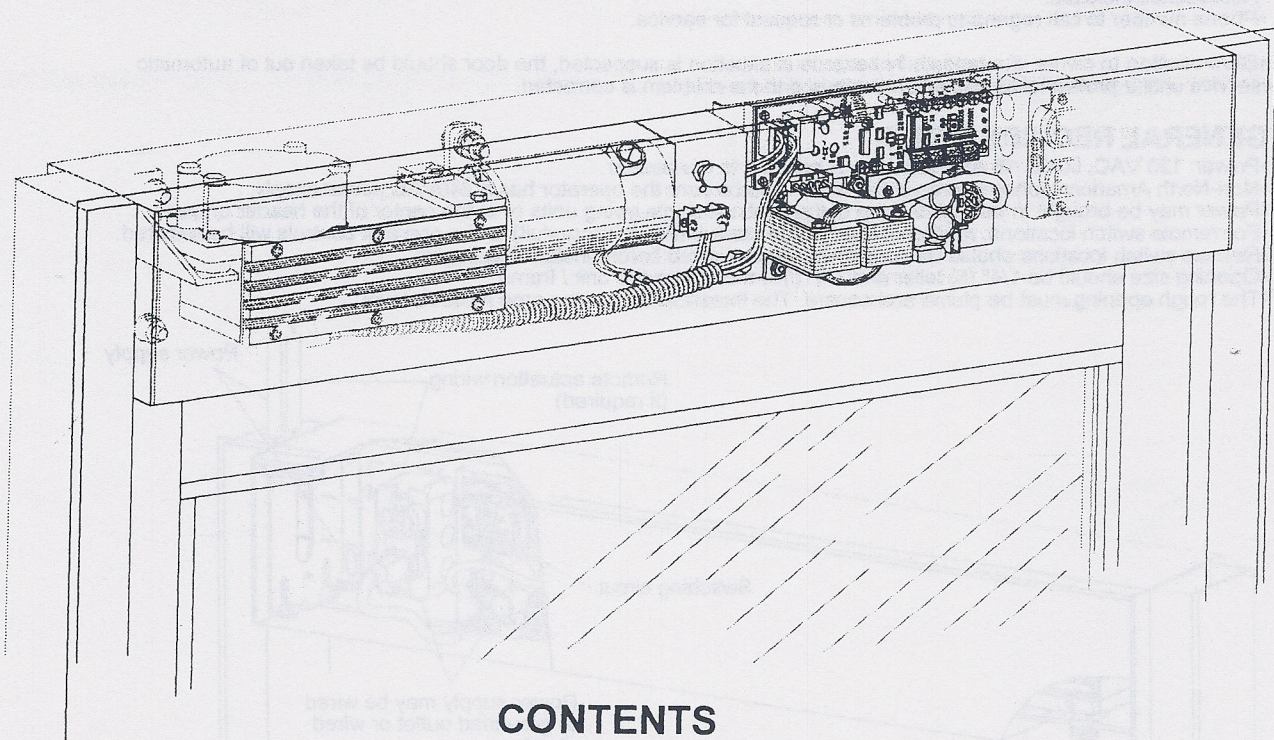
Series 4500

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 AAADM certified installer 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.

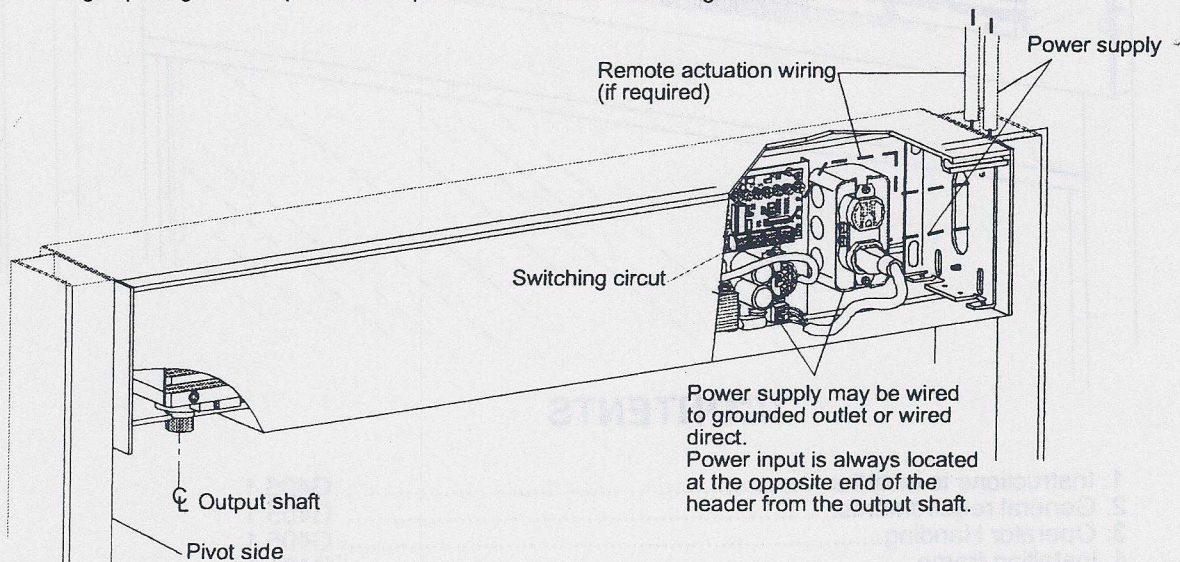
INFORMATION TO BE PROVIDED BY THE DISTRIBUTOR TO THE OWNER

- A completed AAADM inspection Compliance Report Form signed by an AAADM certified inspector.
- After installation instruct the owner on the safe operation of the door.
- Present the Owners 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.

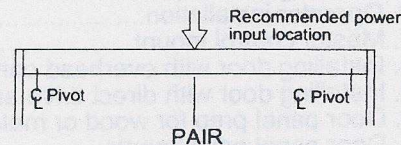
2. GENERAL REQUIREMENTS

- Power: 120 VAC, 60Hz, 15 Amp service (in conduit) to the header.
- Non-North American voltages can be 240 VAC, if so be sure the operator has a 240VAC power supply.
- Power may be brought in through the top of the jamb on single swing units or at the center of the header on pairs.
- For remote switch locations, routing of low voltage class II wiring (in conduit) to the operator controls will be required.
- Remote switch locations should be predetermined and wired before installation begins.
- Opening size should be 1/4" (6) taller and 1/2" (13) wider than the unit / frame.
- The rough opening must be plumb and square. The threshold and swing area must be level.



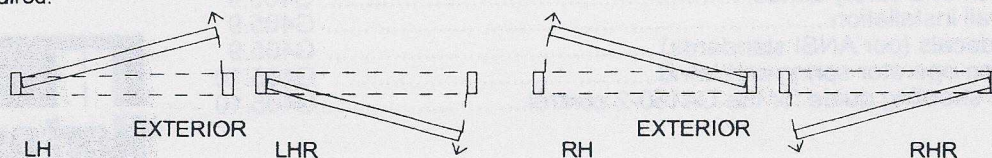
NOTE:

- If this is a 4500 LE see ANSI 156.19 for guidelines on handicap operation and switching.
- Refer to section 19 for required decals.



3. OPERATOR HANDING

Confirm handing of door before installing operator. Refer to section 18 for instructions if changing hand of operator is required.



4. INSTALLING FRAME

Take care the frame is not racked. Wood shingles will be needed to shim the unit. All fasteners shown below are provided with each unit. If these are inappropriate, alternate fasteners are shown in the fastener chart.

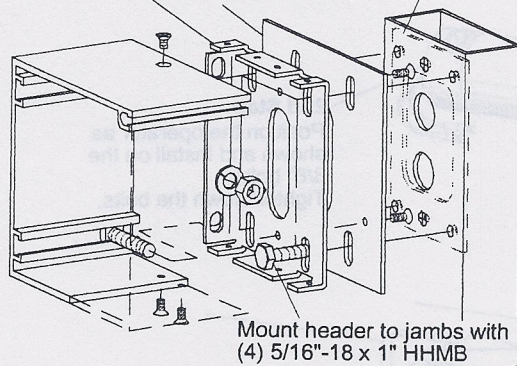
6" X 6" SIDE LOAD HEADER

Assemble header to jambs as shown

End bracket
(factory installed)

End cap
(factory installed)

Backup plate
(factory installed)



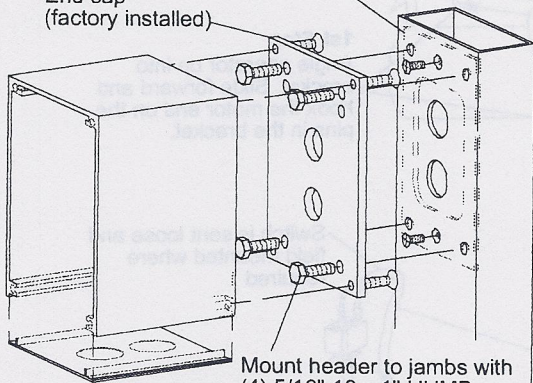
Mount header to jambs with
(4) 5/16"-18 x 1" HHMB

4 1/2" X 6" BOTTOM LOAD HEADER

Assemble header to jambs as shown

Backup plate
(factory installed)

End cap
(factory installed)



Mount header to jambs with
(4) 5/16"-18 x 1" HHMB

4th Step

Drill and countersink 3/16" (5mm) dia. holes and secure jambs with #14 x 3" FHSMS. Secure header with #14 HHSMS.

5th Step

Secure finger guard on the pivot side.

NOTE:
Be sure face plate is on the correct side for hand of unit.

2nd Step
Tilt unit up into place.

3rd Step

Level, plumb & shim. Shim bottom of jambs to be level with the highest point.

1st Step

Remove the face plate, place the header and jambs on the floor to assemble. **Note** place on a protective surface to avoid damage to the finish. The operator may be removed, if necessary, to provide ease in installation.

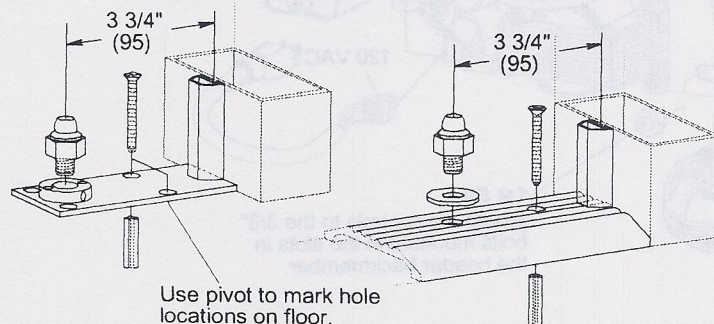
FASTENER CHART

FASTENER SIZE / TYPE	CLEAR DRILL / C'SINK	SHEET METAL DRILL HOLE	TAP DRILL	TAP SIZE	MASONRY
#6 SMS & #6-32 MS	#25 (.149) & #6 csk	#31 (.120)	#36 (.106)	#6-32	
#10 SMS & #10-24 MS	#7 (.201) & #10 csk	#21 (.159)	#25 (.149)	#10-24	Drill 1/4" (.25) & use C1423 green anchor
#14 SMS & #1/4-20 MS	#F (.257) & #14 csk	3/16 (.187)	#7 (.149)	1/4-20	Drill 5/16" (.312) & use C1424 blue anchor

5. INSTALLING BOTTOM PIVOT

All the pivots shown below are secured to the floor with FHSMS and plastic anchors. For bottom prep of doors by others see section 10.

PIVOTS FOR OVER HEAD CONCEALED UNITS

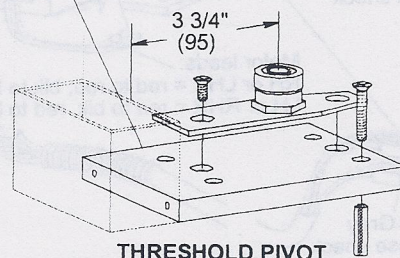


NON THRESHOLD PIVOT

THRESHOLD PIVOT

PIVOT FOR DIRECT DRIVE UNITS

For non threshold condition omit bottom plate. Mount pivot to floor with 1/4-20 x 1 1/2" FHSMS & anchors.

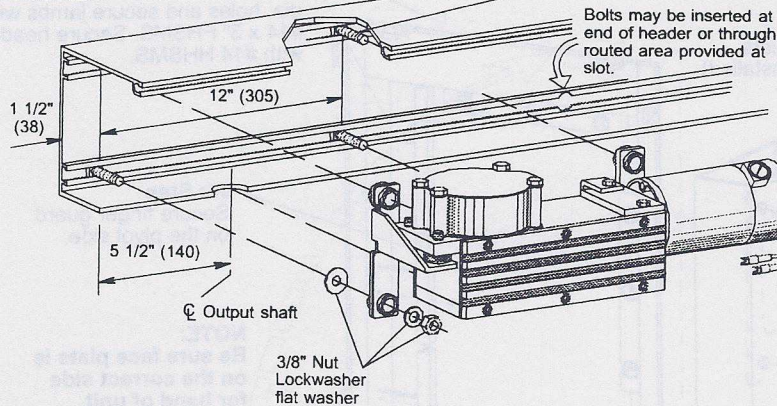


THRESHOLD PIVOT

6. OPERATOR INSTALLATION

If operator has been removed during frame installation re-install as shown.

SIDELOAD



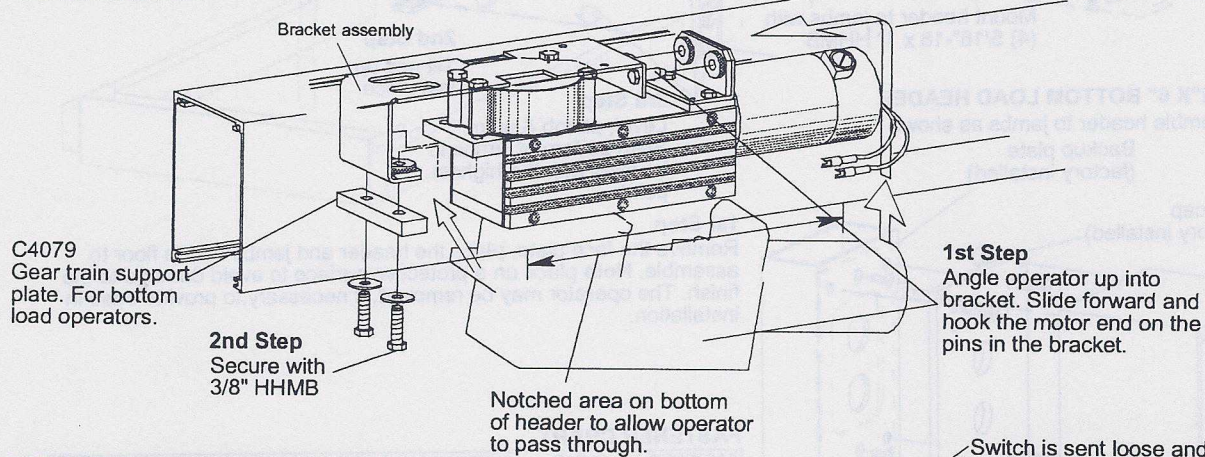
1st Step

Insert the square head bolts in the channel slots - two upper and two lower.

2nd Step

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

BOTTOM LOAD



7. MASTER CONTROL MOUNT

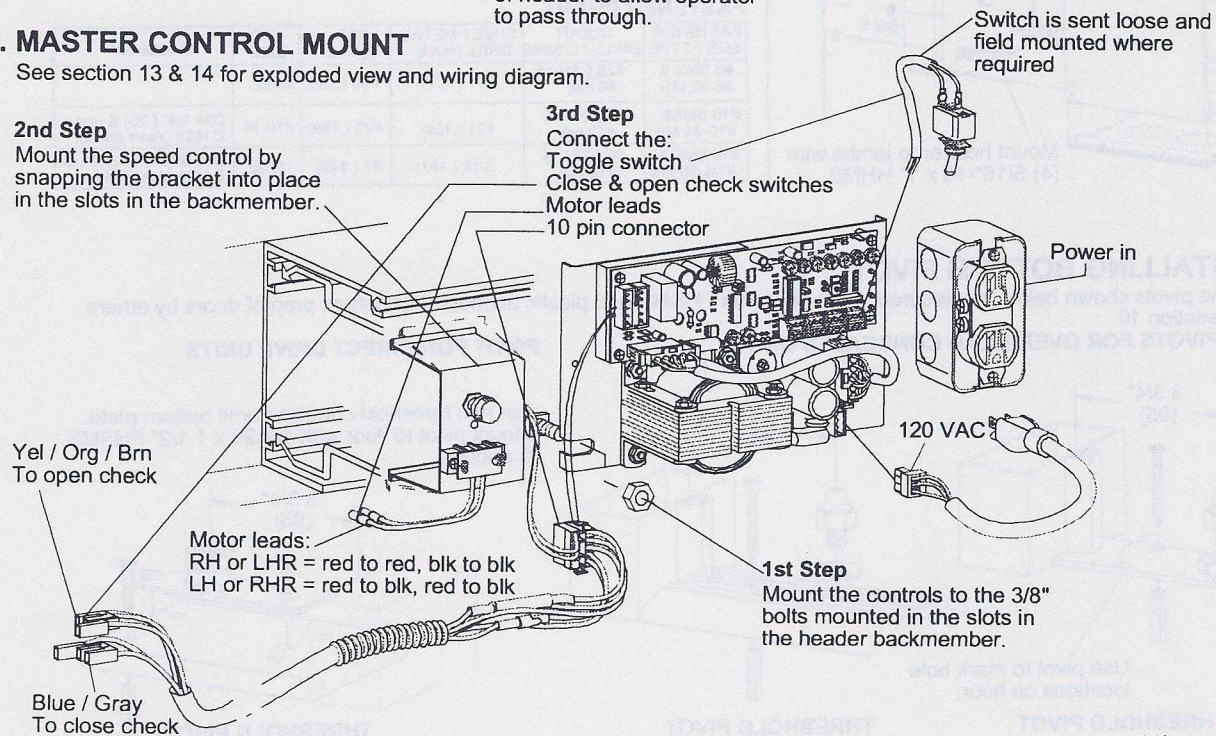
See section 13 & 14 for exploded view and wiring diagram.

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



8. INSTALLING DOOR WITH OVERHEAD CONCEALED ARM FOR 4500 / 4800 SERIES

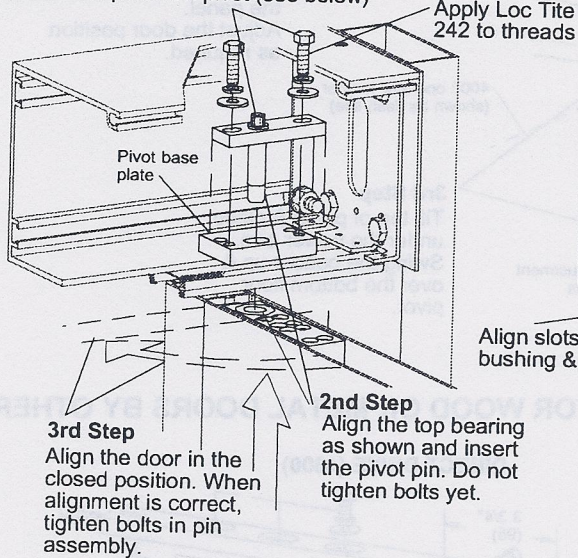
For 4600 / 4800 series (doors by others) see section 10 for door prep.

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.

INSTALLING THE DOOR PANEL (Side Load)

1st Step

Remove the 5/16" bolts and pin assembly. Place door panel on pivot (see below)



2nd Step

Align the top bearing as shown and insert the pivot pin. Do not tighten bolts yet.

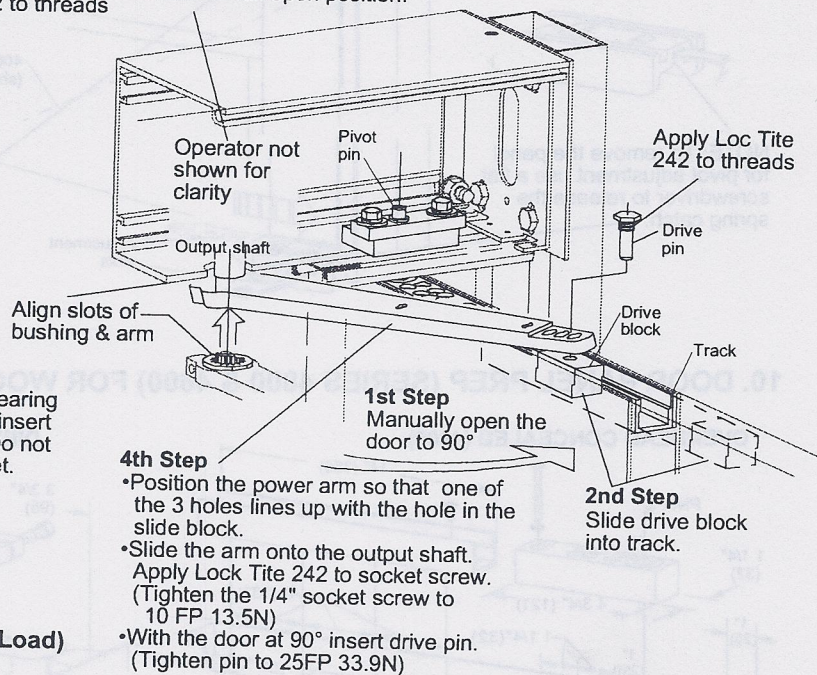
3rd Step

Align the door in the closed position. When alignment is correct, tighten bolts in pin assembly.

INSTALLING THE POWER ARM

3rd Step

Energize operator, shaft will rotate to full open position.



4th Step

- Position the power arm so that one of the 3 holes lines up with the hole in the slide block.
- Slide the arm onto the output shaft. Apply Lock Tite 242 to socket screw. (Tighten the 1/4" socket screw to 10 FP 13.5N)
- With the door at 90° insert drive pin. (Tighten pin to 25FP 33.9N)

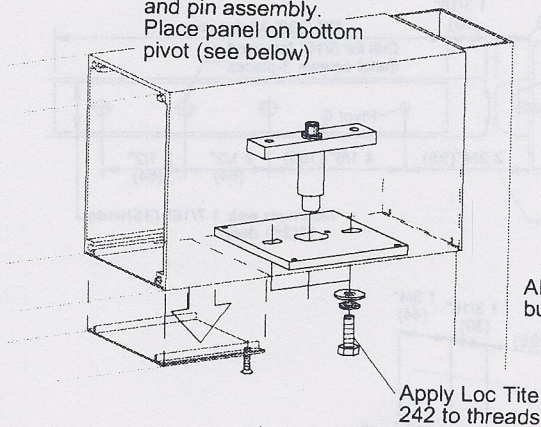
1st Step
Manually open the door to 90°

2nd Step
Slide drive block into track.

INSTALLING THE DOOR PANEL (Bottom Load)

1st Step

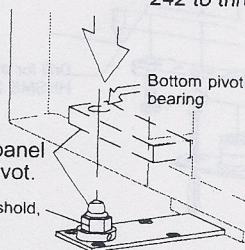
Remove the 5/16" bolts and pin assembly. Place panel on bottom pivot (see below)



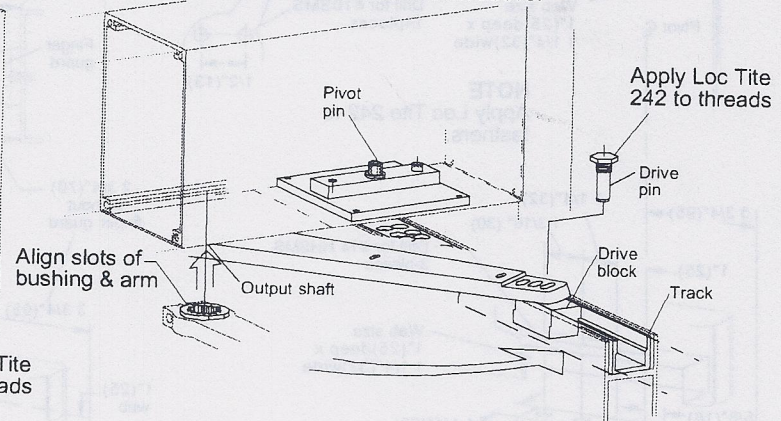
2nd Step

Place the door panel on the bottom pivot.

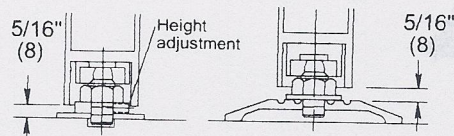
Adjustable, non threshold, pivot assembly.



Installation of door panel and arm on a bottom load header is the same as the side load shown above.



BOTTOM DOOR CLEARANCE



9. INSTALLING DOOR WITH DIRECT DRIVE ARM

See section 10 for door prep of 4600 & 4800 series.

NOTE
Apply Loc Tite 242 to fasteners.

2nd Step
Position power arm—
onto output shaft (90°
to the opening).
Tighten 1/4" SCS to
10 FP (13.5N)

NOTE: To remove the panel for pivot adjustment use a flat screwdriver to release the spring catch.

1st Step

Energize operator, shaft will rotate to full open position.
Maintain operator in this position until door panel installation is complete.

adjustment
rew.

4th Step
Secure the power arm to the panel.
Adjust the door position as required.

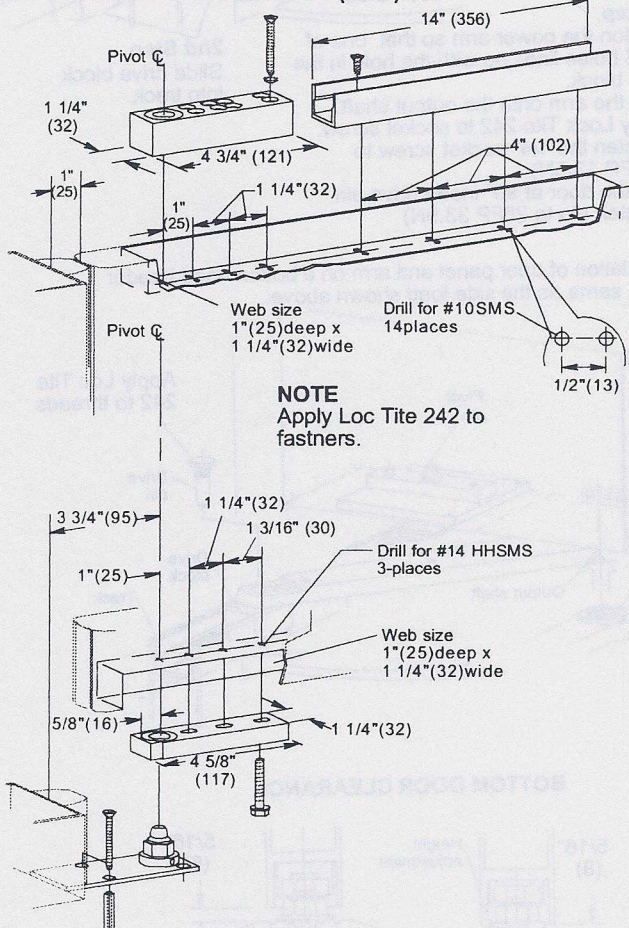
4000 operator header.
(shown as dash line)

3rd Step

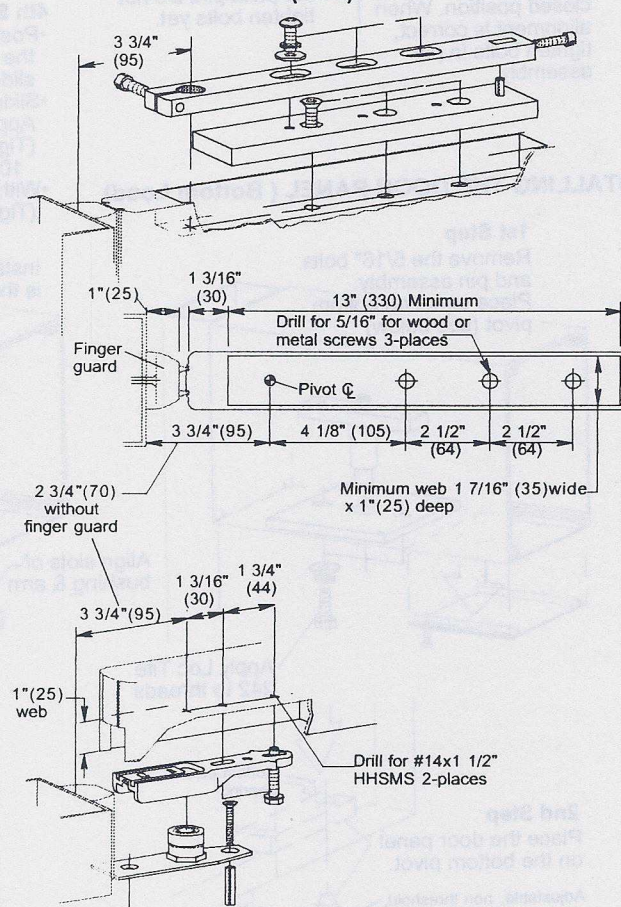
Tilt top of panel & place under the power arm. Swing the bottom up & over the bottom floor pivot.

10. DOOR PANEL PREP (SERIES 4800 & 4600) FOR WOOD OR METAL DOORS BY OTHERS

OVERHEAD CONCEALED (4800)



DIRECT DRIVE (4600)

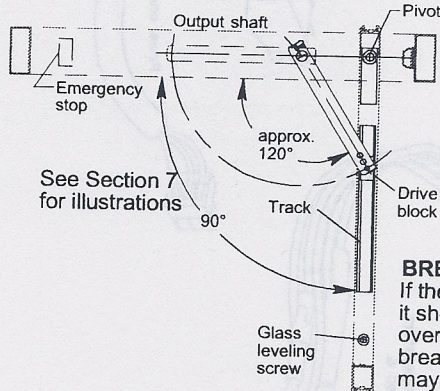


11. DOOR PANEL ADJUSTMENTS

Manually open the door, it should swing smoothly without binding. If adjustment is required follow the outline below.
NOTE: The added weight of the glass can influence adjustments to the panel. Glazing at this point is advised.
 After glazing adjust the glass leveling screw in the top rail close to the strike rail. The door must not drag at any point.

OVERHEAD CONCEALED

1. If the drive block binds the arm must be adjusted parallel to the track.
2. To adjust the door to 90° at full open the drive pin may be located at 3 different locations. Swing is decreased by moving the pin closer to the operator shaft.
3. After adjustments are complete replace power arm cover and face plate (be sure screws are replaced in face plate).

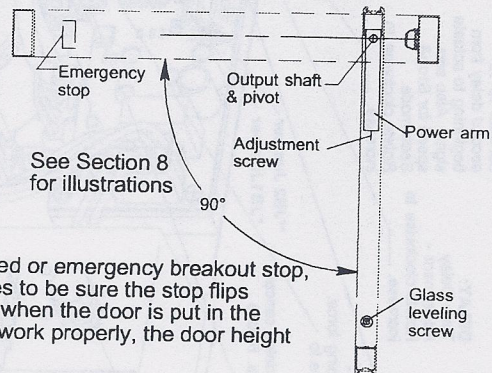


BREAKOUT STOP

If the door is equipped with a fixed or emergency breakout stop, it should be tested several times to be sure the stop flips over and turns off the operator when the door is put in the breakout position. If it does not work properly, the door height may need adjustment.

DIRECT DRIVE

1. The panel can be adjusted by loosening the socket head screws that secure the power arm and adjusting the screw at the end of the arm (see section 8).
2. To adjust the bottom pivot the panel will have to be removed.
 - Place the operator in hold open position.
 - Remove the socket head screws that secure the power arm.
 - Use a small flat screwdriver to release the catch on the back of the bottom pivot (See section 8).
 - Loosen the pivot bolts to adjust the pivot in the slots.



12. 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.
 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.

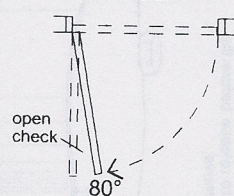
ANSI CHART - OPENING & CLOSING TIME IN SECONDS (LOW ENERGY)

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.

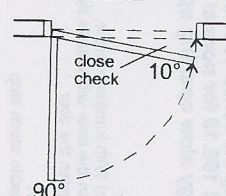
Power Failure: manual pressure not to exceed 15 lb ft (67N) at a point one inch (25mm) from the latch edge (may vary by local code).

Total opening time to full open shall be four sec. or more.



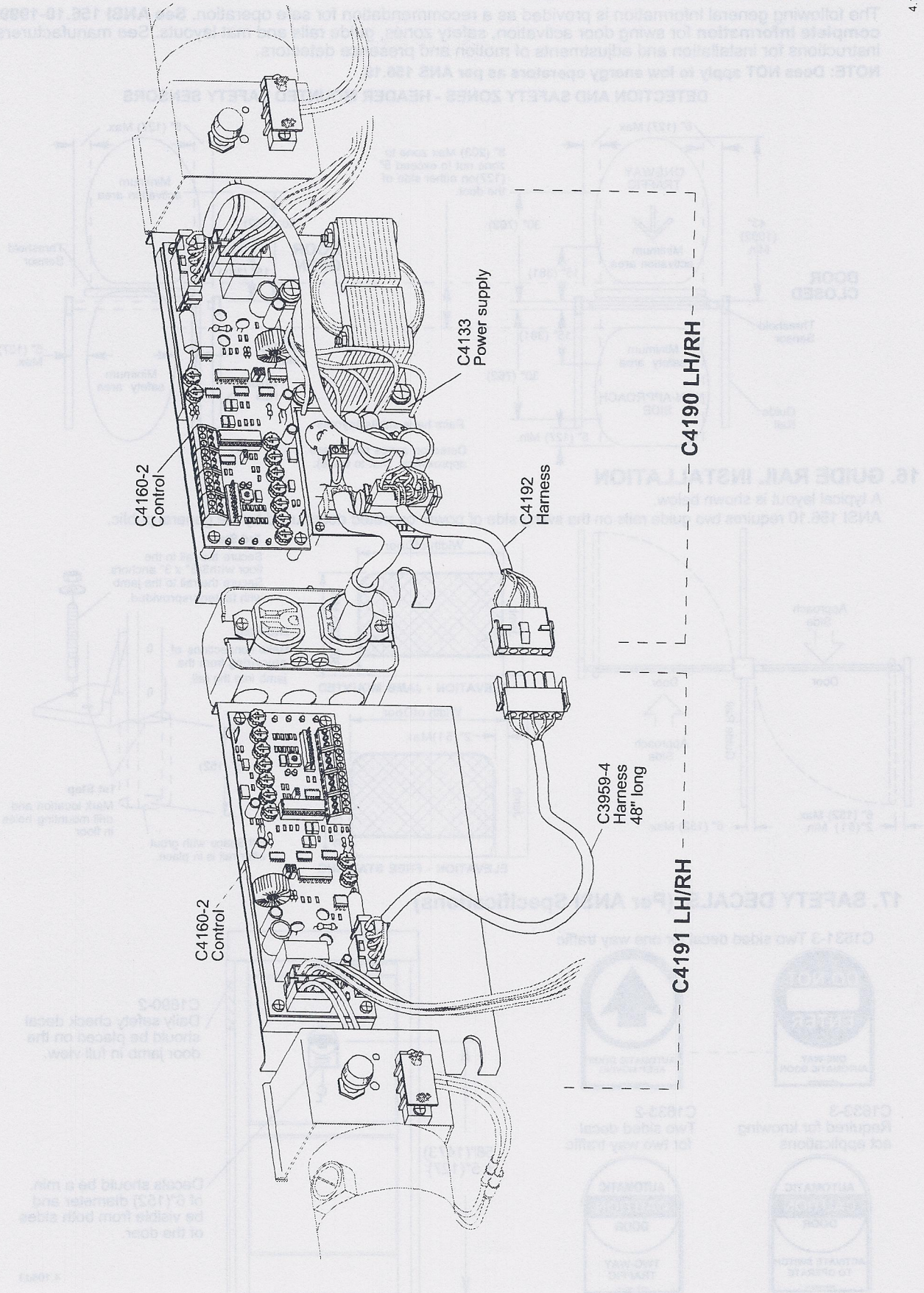
OPENING TIME:
 Door shall be field adjusted so that opening time to open check or 80° shall be three sec. or more and not exceed 15 ft.lb. to prevent opening or closing.

The door shall remain fully open for at least 5 sec. unless a sensing device is used.



CLOSING TIME:
 Door shall be field adjusted to close from 90° to 10° in three seconds or longer. Door shall close from 10° to fully closed in 1.5 sec. or more.

14. DUAL CONTROLS WITH ONE POWER SUPPLY

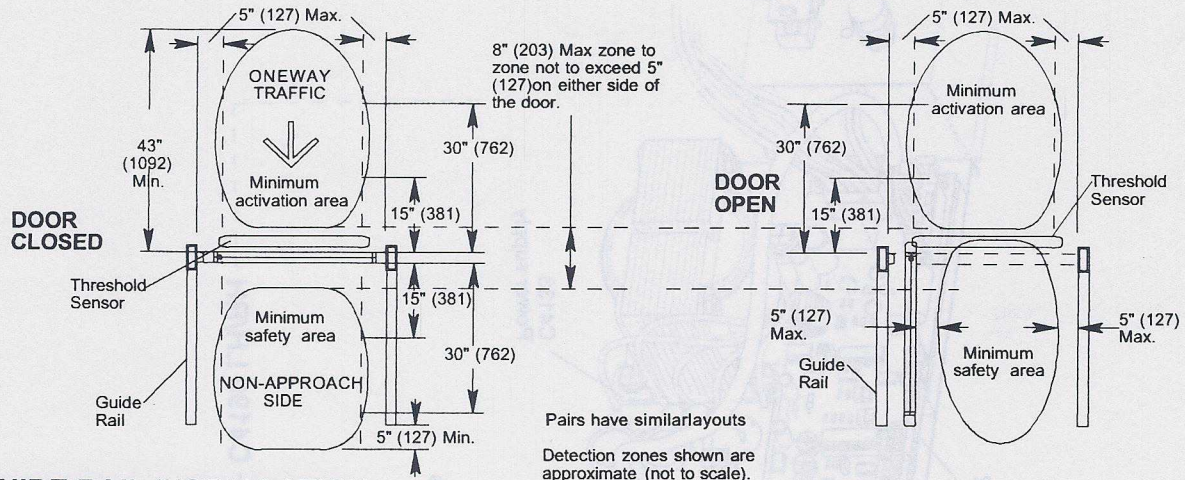


15. ACTIVATION AND SAFETY ZONES

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 ANSI 156.19.

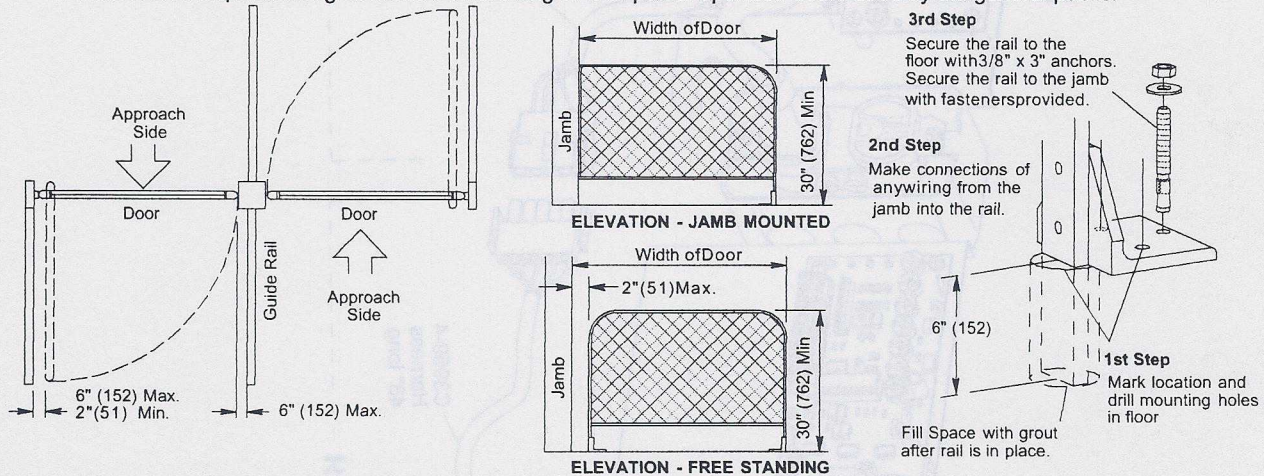
DETECTION AND SAFETY ZONES - HEADER MOUNTED SAFETY SENSORS



16. GUIDE RAIL INSTALLATION

A typical layout is shown below.

ANSI 156.10 requires two guide rails on the swing side of power operated doors used by the general public.



17. SAFETY DECALS (Per ANSI Specifications)

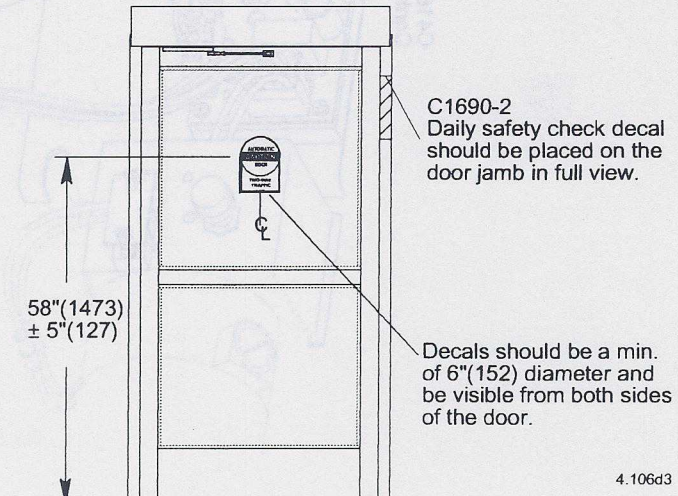
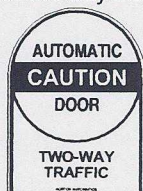
C1631-3 Two sided decal for one way traffic



C1633-3 Required for knowing act applications



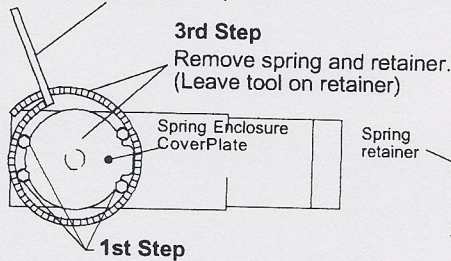
C1633-2 Two sided decal for two way traffic



18. 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).



4th Step

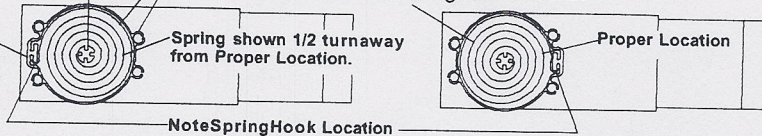
Rotate the spring arbor (output shaft) as far as it will go in the opposite direction (240°), use power arm for leverage if necessary.

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.



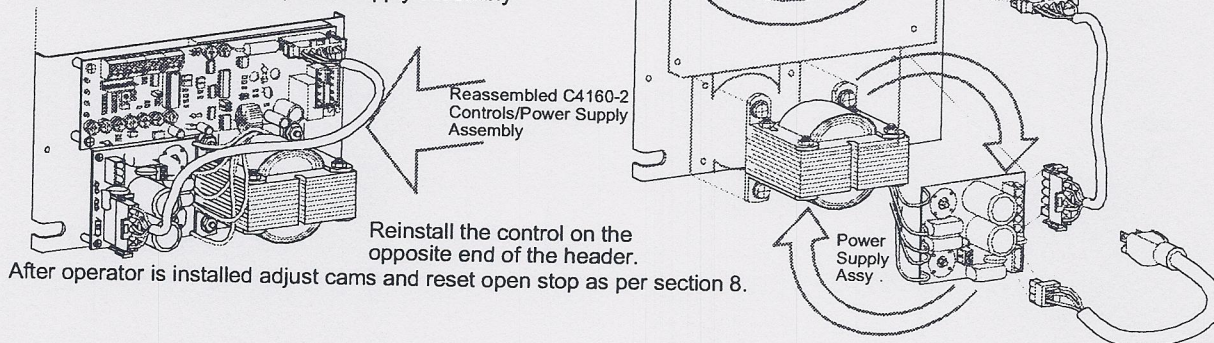
7th Step

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



19. 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.

- Is high voltage present. Check the power supply at CN1 input for 120VAC.
- 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.

- Disconnect 120VAC plug, disconnect 5 pin power supply plug, and disconnect motor leads. Replace fuse.
- Check motor for frame short or shorted motor. Checks good move on to step 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.

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

- 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.
- Confirm that the red D2 Safety Circuit light is off.
- 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.
- 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.



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