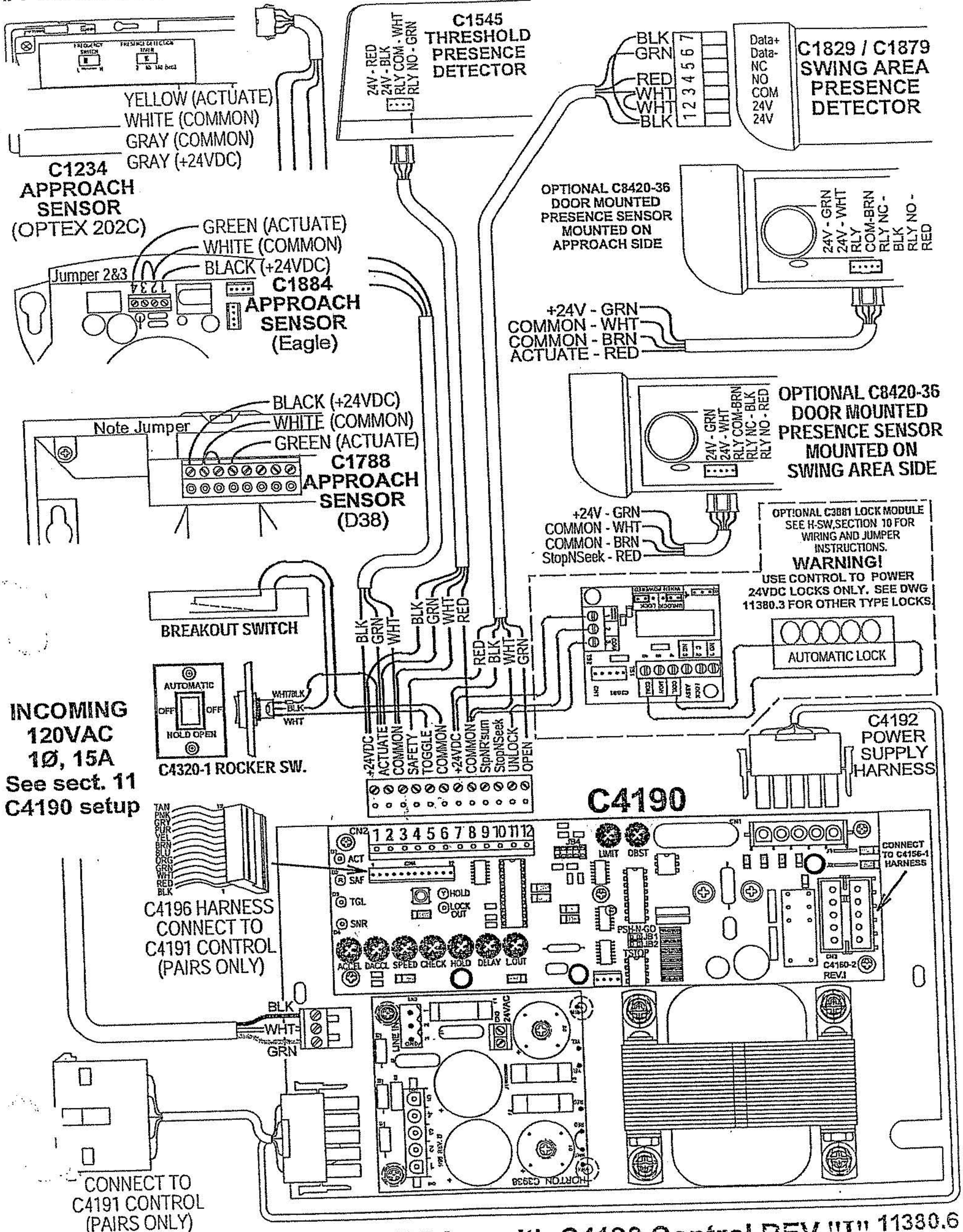


APPROACH MOTION DETECTOR

H-SW 7

AUTOMATIC OPERATION



CONTENTS

1. Installation and setup of the C4160-2 control.....	H-SW.1
2. Cam settings.....	H-SW.2
3. Control adjustments (open and close speeds).....	H-SW.2
4. Control adjustments (hold time).....	H-SW.3
5. Control adjustments (deceleration and lock out).....	H-SW.3
6. Control adjustments (opening force).....	H-SW.3
7. Control adjustments (obstructions).....	H-SW.3 & 4
8. Control adjustments (lock delay).....	H-SW.4
9. Control adjustments (time delay & push-n-go).....	H-SW.4
10. C3881 Lock Control.....	H-SW.4
11. Dual controls.....	H-SW.5
Diagram 1 Knowing-Act Operation.....	H-SW.6
Diagram 2 Automatic Operation.....	H-SW.7

APPENDIX

A. Activation and Safety Zones (swing)	H-SW.8
A1. Activation and Safety Zones (knowing act)	H-SW.8
A2. Activation and Safety Zones (folding).....	H-SW.9
A3. Operation Adjustments for Code Compliance.....	H-SW.9
B. Connecting a rev. "H" board to a rev. "I" board.....	H-SW 10

make sure you activate door with arm off
to fully open install arm with door at open
position.

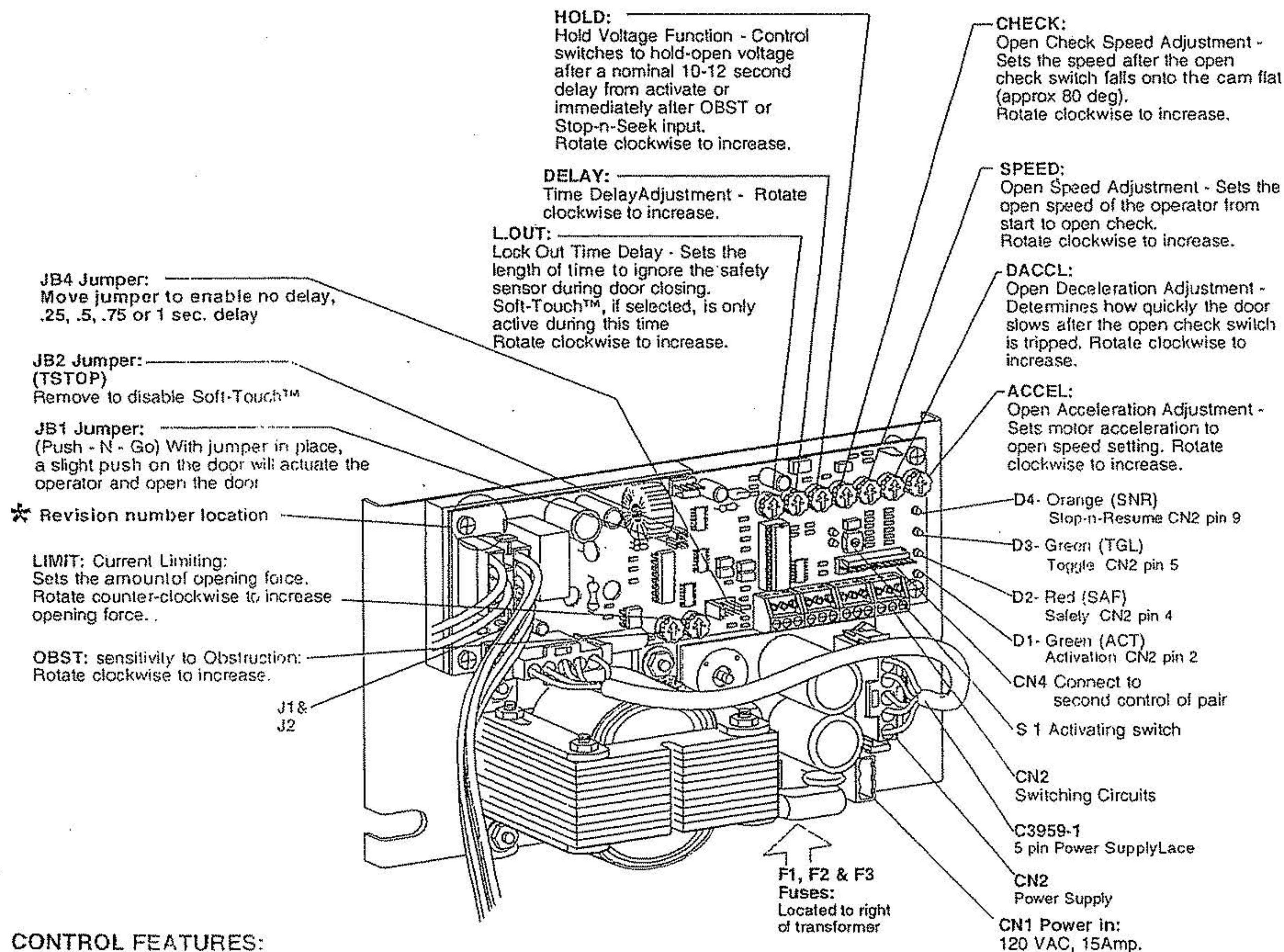
Close speed pot on operator

C4190 Control for Swing & Folding Door Operators

***REVISION " I "**

SETUP INSTRUCTIONS & TROUBLESHOOTING

To be used with either G410, G405, G710, G705 or G-BIF Installation Instructions



CONTROL FEATURES:

- Lockout relay
- Obstruction sensing
- Push-n-Go™
- Swing-Stop™ initiated by Stop-n-Seek input (CN2 pin 10) from C8420-36 door mounted sensor, safety beam or similar device. This forces the control into a hold mode which causes the door to slow to a creep speed -see section 4
- Stop-n-Resume™ initiated by Stop-n-resume input (CN2 pin 9) from C8420-36 door mounted sensor, safety beam or similar device which causes the door to stop and freeze until Stop -n-Resume clears, then door resumes normal open speed. This is primarily a European feature and not recommended for U.S. markets.
- Soft-Touch™ Causes the door to re-open if it hits an obstruction prior to reaching close check.
- Support for magnetic & mortise locks
- 1 power supply for 2 - C4160-2 controls
- Control supports 1/8 or 1/4hp motors
- Power supply operates all sensors & most locks
- Adjustable open torque

1. INSTALLATION AND SETUP OF THE C4160-2 CONTROL FOR 4000 AND 7000 OPERATORS

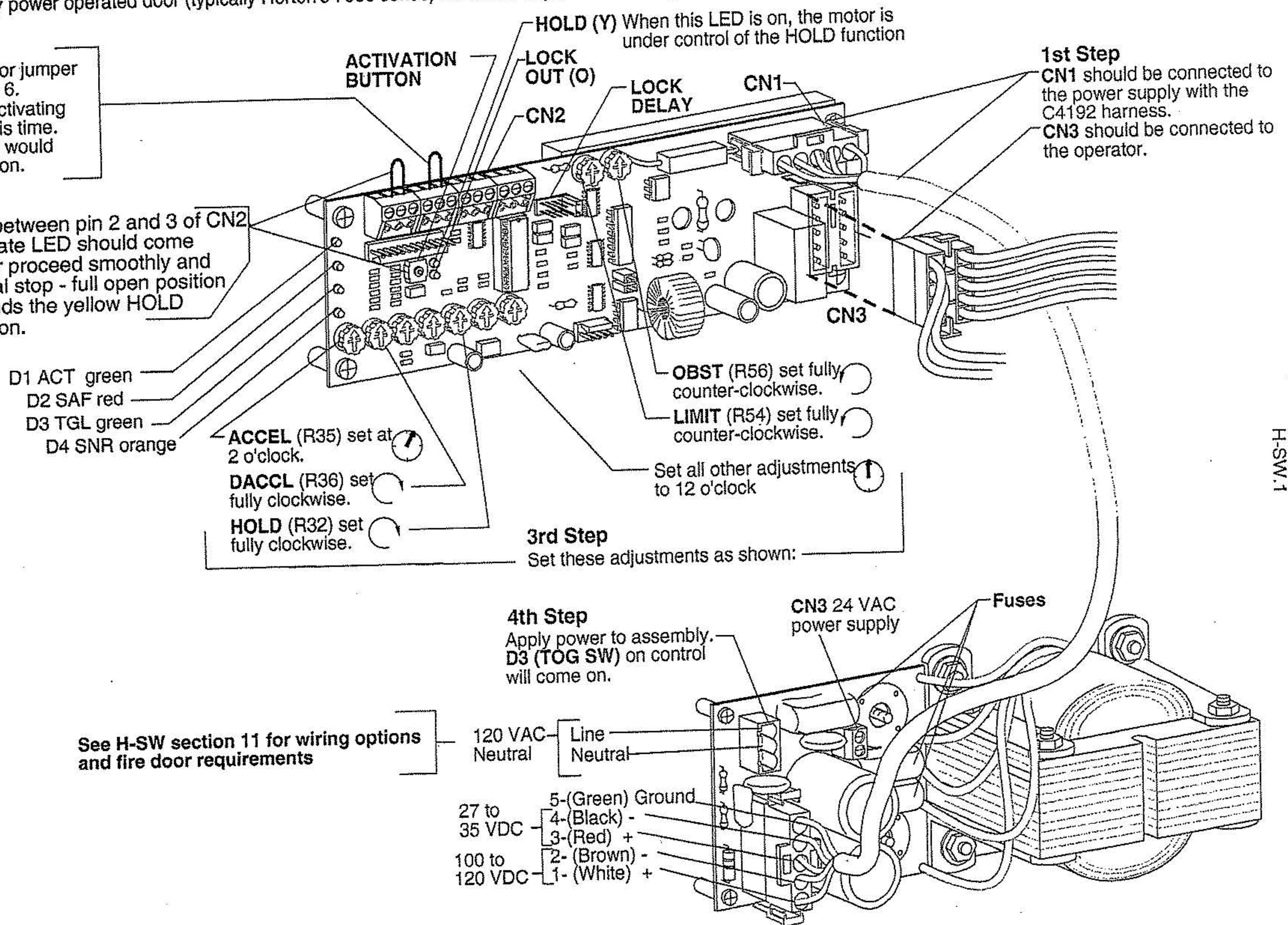
If this is a power operated pedestrian door with swing side protection (typically Horton's 4000 series) it must be adjusted according to ANSI/BHMA 156.10.
If this is a low energy power operated door (typically Horton's 7000 series) it must be adjusted according to ANSI/BHMA 156.19.

2nd Step

Install a toggle switch or jumper wire between pins 5 & 6.
Do not connect any activating or safety devices at this time.
Disable any locks that would hinder manual operation.

5th Step

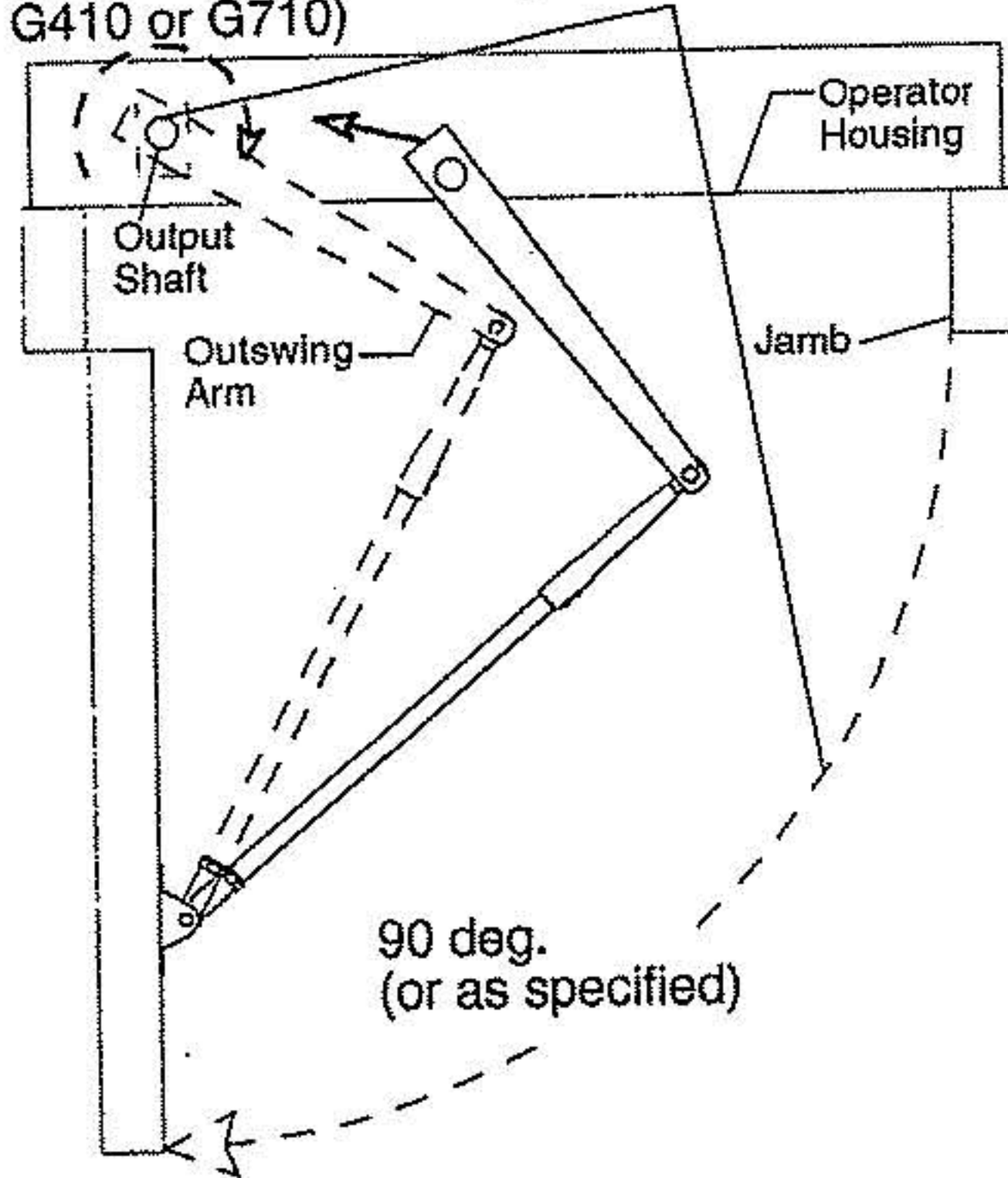
- Connect a jumper between pin 2 and 3 of CN2
- D1, the green activate LED should come on and the operator proceed smoothly and quickly to its internal stop - full open position
- After several seconds the yellow HOLD indicator will come on.



2. CAM SETTINGS

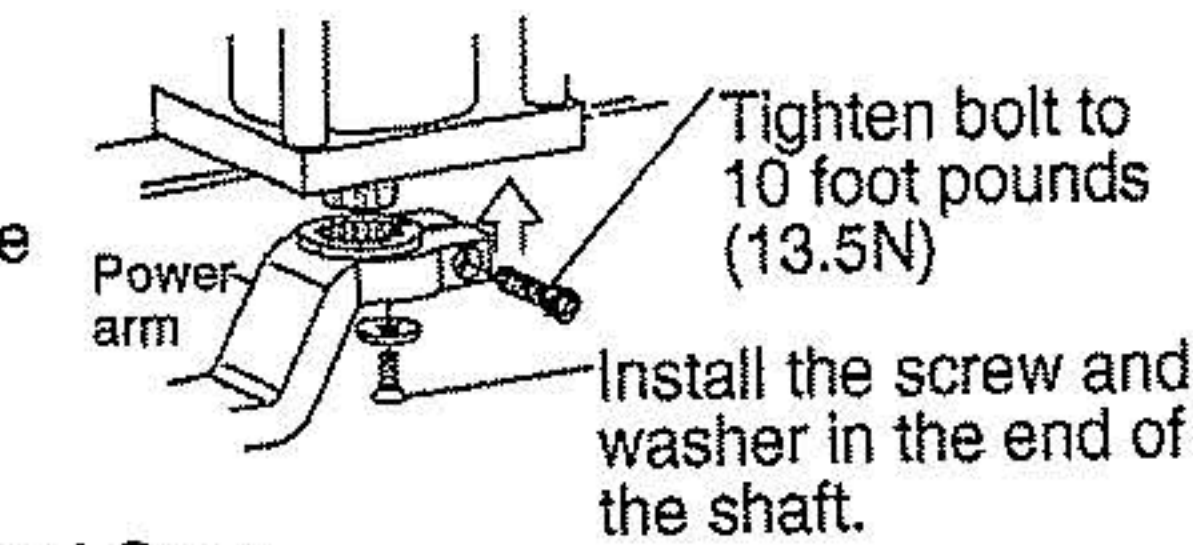
1st Step

With the operator powered open against the internal stop -manually move the door to its full open position (normally 90 deg from closed) and install the arm on the operator shaft and door. (See G410 or G710)

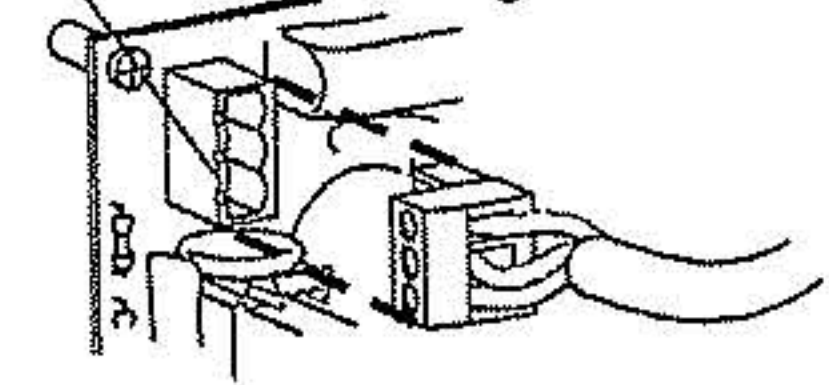


2nd Step

Remove the jumper between terminals 2 and 3 of CN2 and allow the door to close. Or release the activation button.

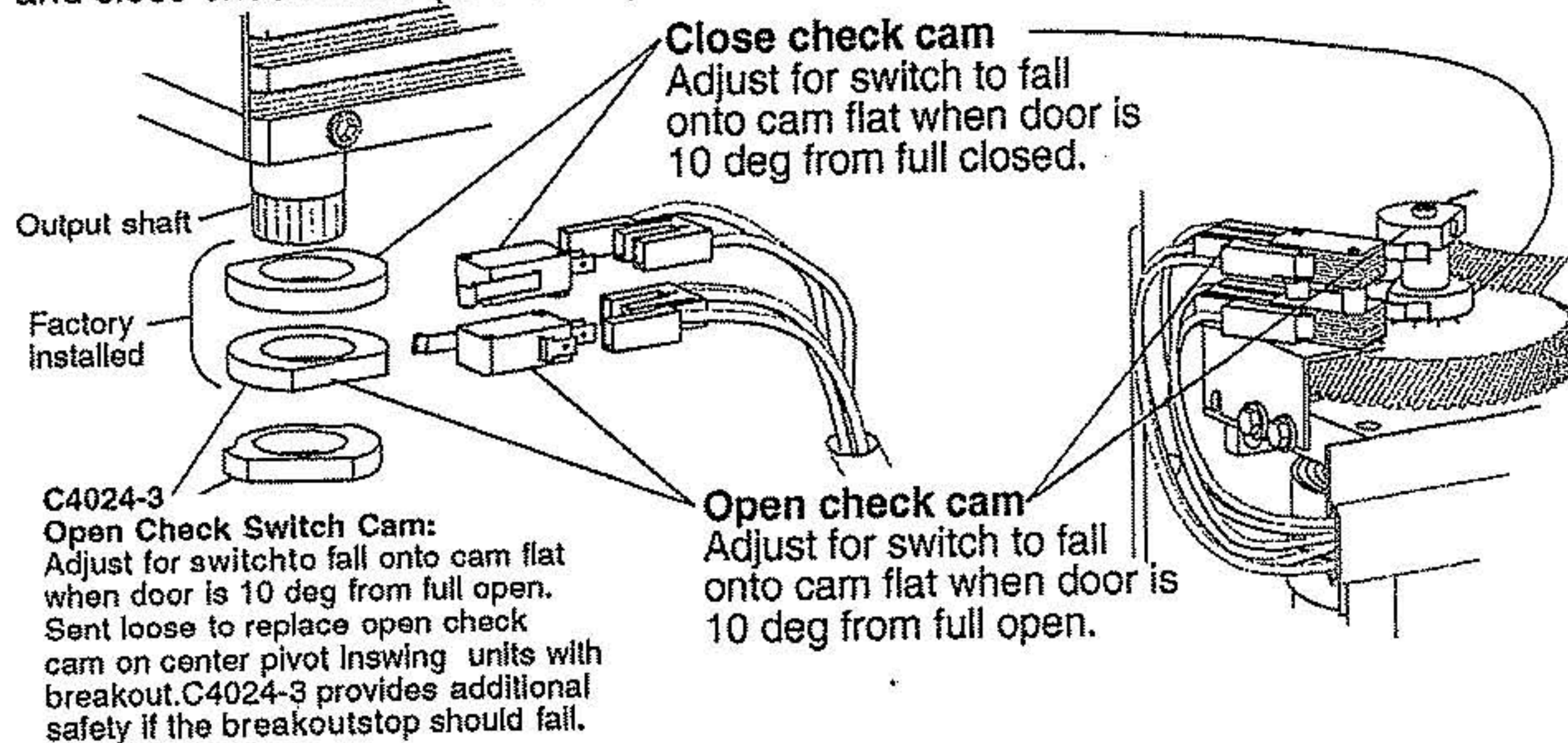


Remove line power temporarily for cam settings.



3rd Step

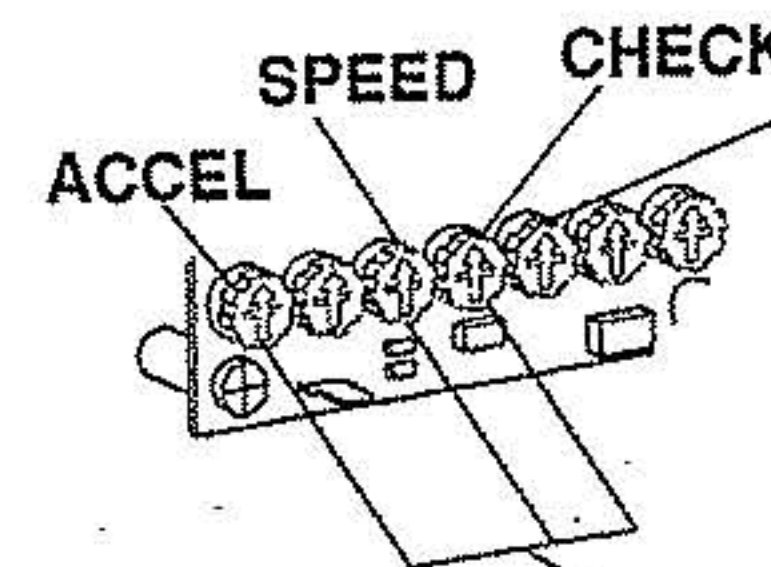
Push door open slowly and allow it to close while observing the operation of the open and close check cams (see below). Use a 3/32" ball end hex wrench to adjust the cams.



- In Horton series 4000 and 7000 operators, the cams release the switch arms when it's time to reduce the doors speed.
- Rotate a cam further in the direction normally traveling to increase the check zone.
- Rotate a cam in the opposite direction to decrease the zone.
- The adjustment of the open check cam is relatively critical to proper door operation.
- It may be necessary to increase the open check zone if a very fast open speed or slow deceleration is used.
- A smaller open check zone may acceptable if the door is being operated slowly.

3. CONTROL ADJUSTMENTS (open and close speeds)

Throughout the remaining steps, "cycle the door" means to press the activation button or apply a jumper between pin 2 and 3 of the terminal block CN2 to activate the door to open.



1st Step

- Set **HOLD** pot R32 fully counter-clockwise.
- Apply line power and cycle the door. The door should open smoothly and quickly, and then close after a brief delay.

2nd Step

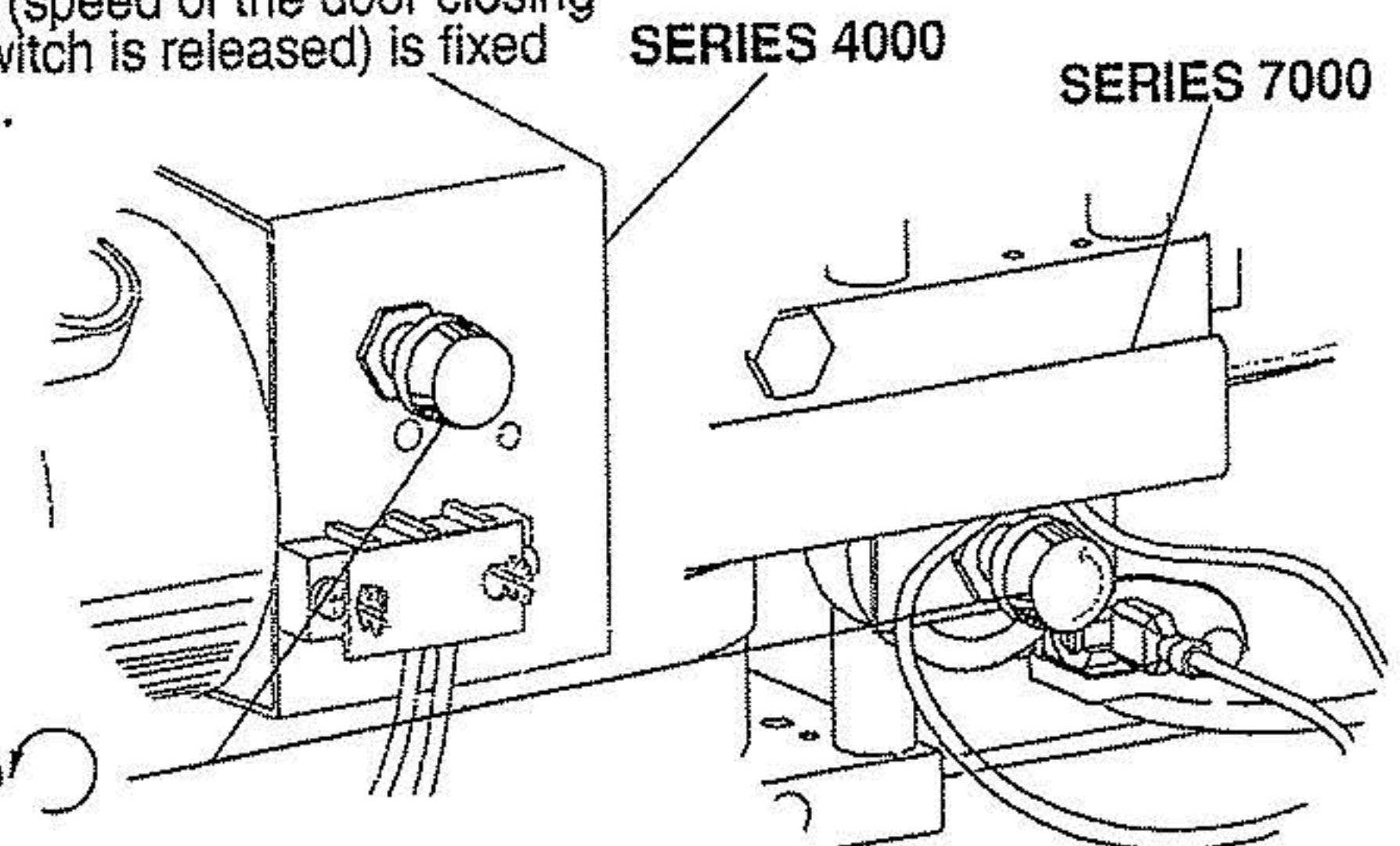
Activate the door again and adjust the opening characteristics.

- ACCEL** pot R35 clockwise to increase
- SPEED** pot R38 clockwise to increase
- CHECK** pot R30 clockwise to increase

3rd Step

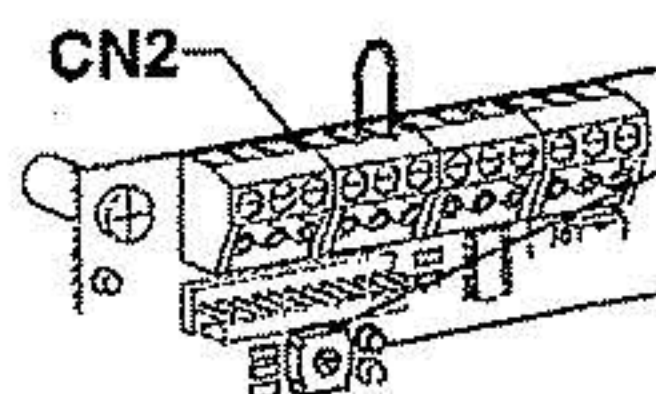
- Cycle the door.
- Use the adjustment knob located on the operator to adjust the closing speed as required. The close check speed (speed of the door closing after the close check switch is released) is fixed and cannot be adjusted.

Closing speed adjustment rotate counter-clockwise to increase. Suggested setting: 4 sec. minimum



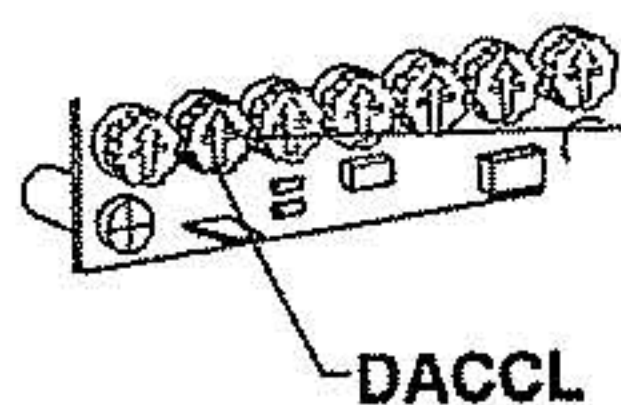
CAUTION: When installing the power arm or when servicing any swing door operator, be sure to keep your face, hands and arms clear of the power arm's swing path. **SERIOUS INJURY** could result should the operator be accidentally activated to an open position or should the operator return to a relaxed position.

4. CONTROL ADJUSTMENTS (hold function)



- Cycle the door, and hold the activation button. The door should open fully.
- After 10 - 12 seconds the yellow **HOLD** indicator should come on.
- At this point the door will begin drifting slowly back toward the closed position. Adjust the **HOLD** pot R32 to stop the drift and allow the door to slowly seek the open position.
- Release the activation button and allow the door to close.
- Cycle it again. The door should now maintain the full open position without drifting after the yellow **HOLD** indicator comes on. (see sect. 7)

5. CONTROL ADJUSTMENTS (deceleration and lock out)

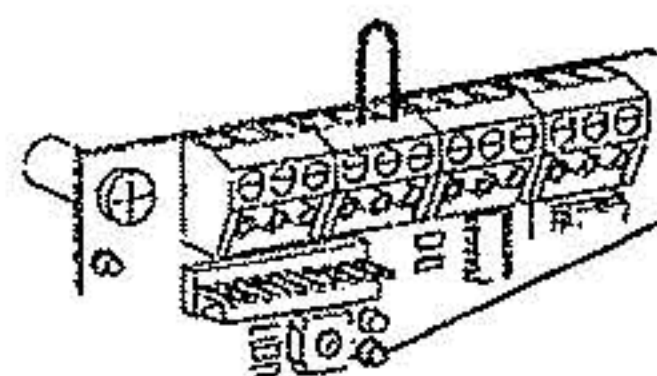


1st Step

If the door slows down too fast when switching from open speed to open check, **DACCL** pot R36 may be turned down (counter-clockwise) as required.

NOTE:

To provide the quickest response to an obstruction, Horton recommends that **DACCL** be left at maximum on all low-energy installations without additional safety devices, or on installations where the **Swing-Stop™** or **Stop and Resume™** features are used.



2nd Step

Set **L.OUT** pot R22 (Lockout delay) so that the orange **LOCK OUT** indicator stays on throughout the door closing and does not go out until immediately after the door completely closes.

Rotate clockwise to increase.

NOTE:

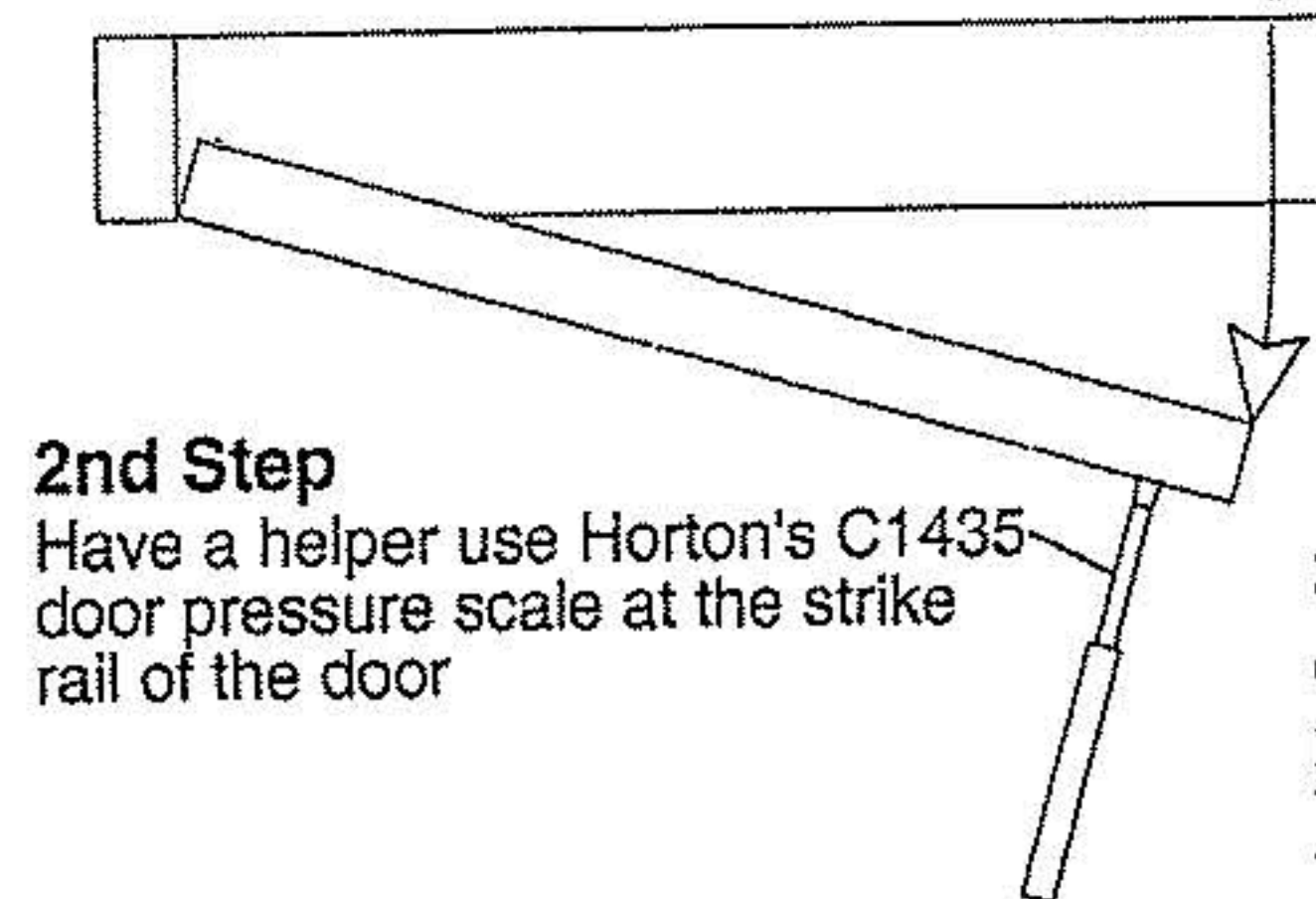
This step must be performed even if a swing side safety sensor is not used.

6. CONTROL ADJUSTMENTS (opening force)

The following adjustment is mandatory on low-energy operators without additional safety sensors (typically, series 7000 operators). It is optional, but highly recommended for maximum safety and control / operator protection, on series 4000 operators.

1st Step

Set the **LIMIT** pot R54 fully clockwise.



2nd Step

Have a helper use Horton's C1435 door pressure scale at the strike rail of the door

3rd Step

Cycle the door and turn the **LIMIT** pot R54 counter-clockwise to set maximum opening force. (See below)

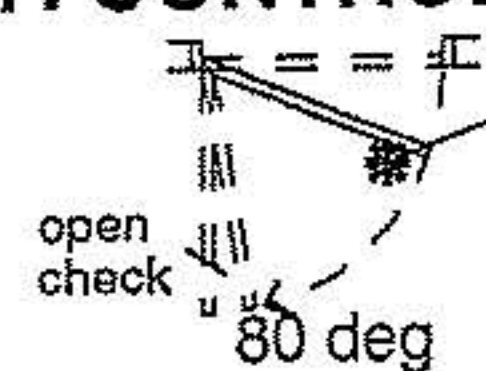
Low energy power operated swing doors series 7000 and 4000LE
The maximum force is 15 lb. (6.8kg) or less to comply with ANSI 156.19

Power operated swing doors series 4000
The maximum recommended opening force is 35-50 lb. (15.9-22.7 kg) unless there are requirements for a higher force.

NOTE:

- If more than 10 to 12 seconds lapses while you are trying to measure the opening force, the control will automatically switch to the hold open mode. If this occurs, allow the door to close, then cycle it again.
- If the limiting force is set very light, the door may have difficulty opening in windy or adverse conditions.

7. CONTROL ADJUSTMENTS (obstructions)



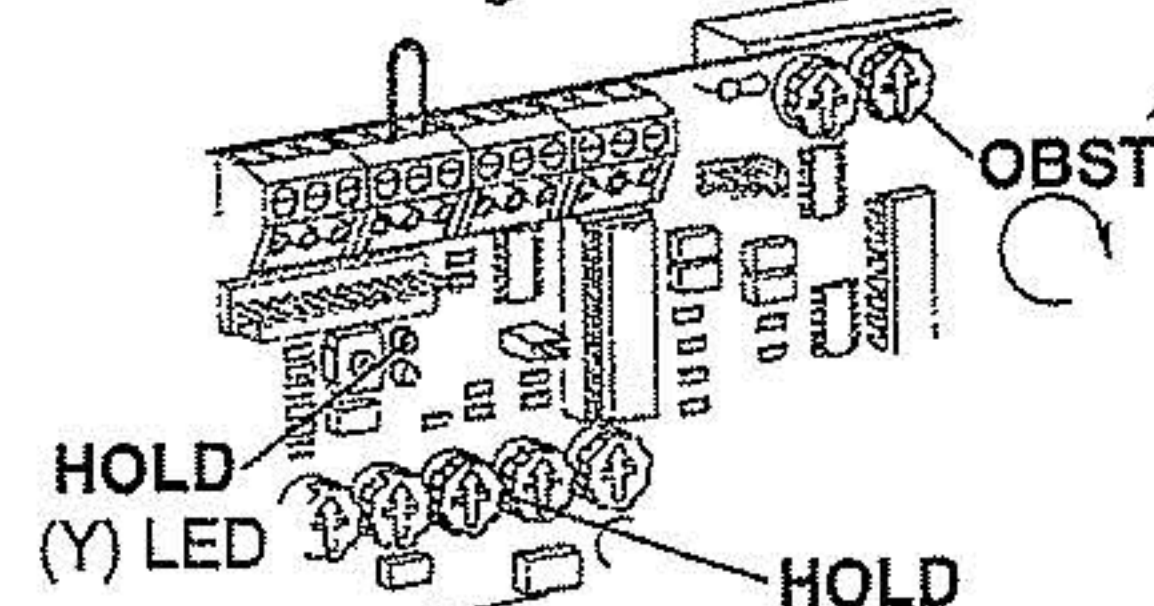
1st Step

Place an obstruction between the closed door and open check position.

2nd Step

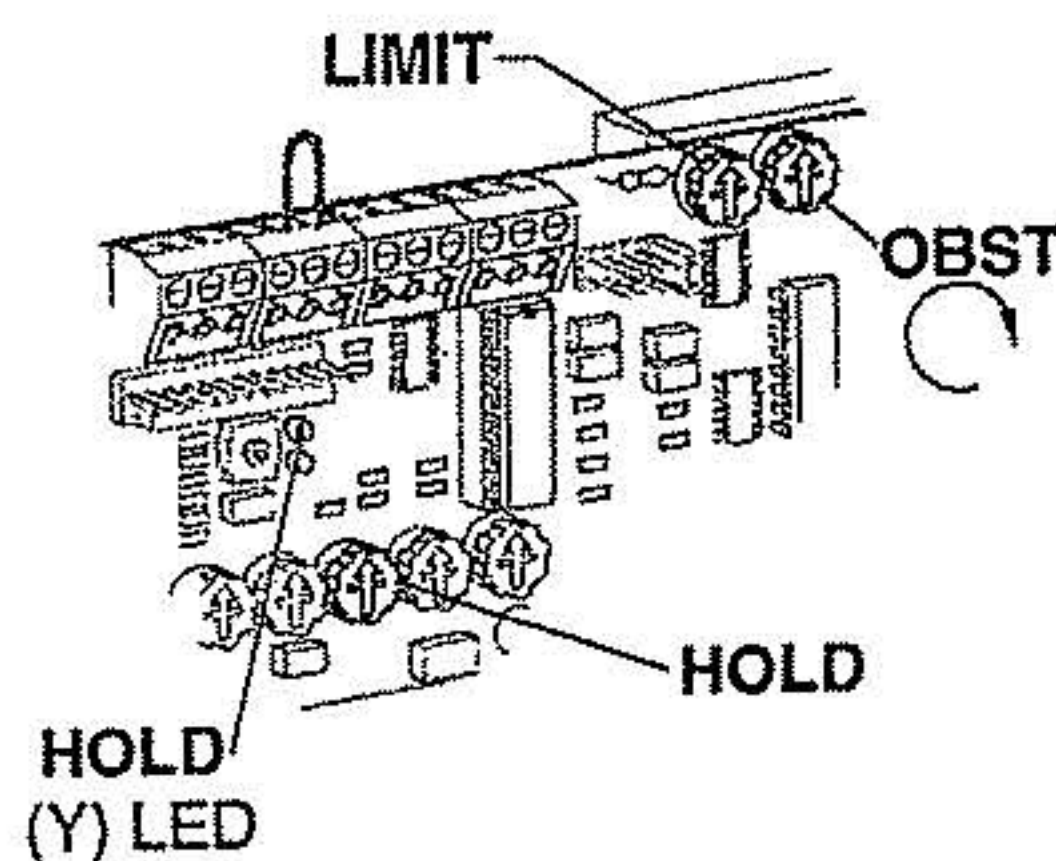
Cycle the door and adjust the **OBST** pot R56 clockwise until the **HOLD** indicator lights and switches to the hold-open mode.

With the hold-open adjustment made in section 4, any obstruction encountered will stop the door until the time delay expires and all safety devices clear - then the door will close.



7. CONTROL ADJUSTMENTS (obstructions) CON'T

The obstruction response does not occur until approximately one second after an obstruction is encountered. This prevents false response from wind gusts, etc.



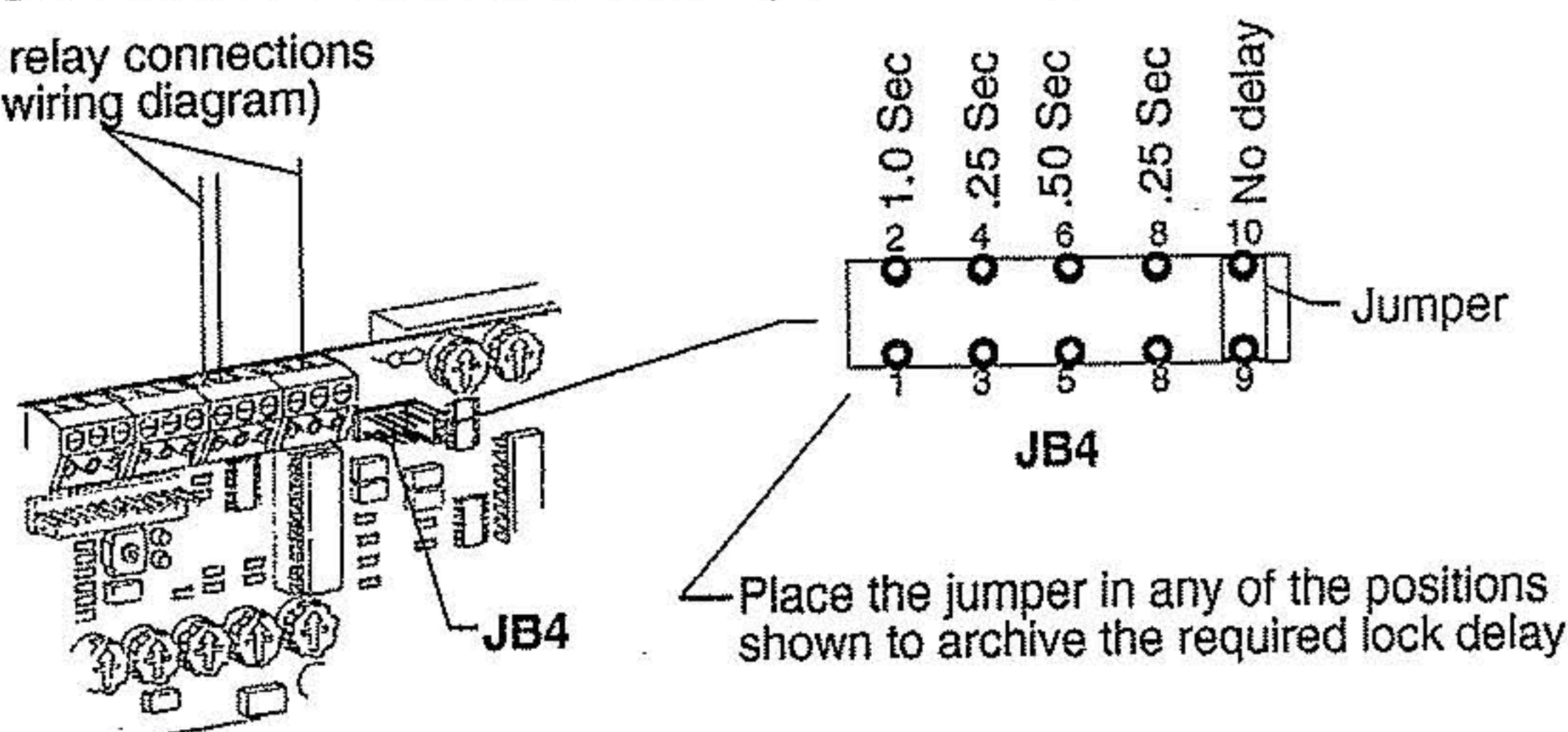
If a presence detector is installed on the swing side of the door, an obstruction response will "hang up" the presence detector and the door, until the door can get to the full open position.

It is recommended that these installations have the **HOLD** adjustment **R32** increased sufficiently to get the door to creep slowly open after encountering an obstruction.

It may not be possible to get the obstruction response if the **LIMIT** adjustment **R33** is set very light (16lb. - 7.3kg or less)
See section 6

8. CONTROL ADJUSTMENTS (lock delay)

Lock relay connections
(see wiring diagram)

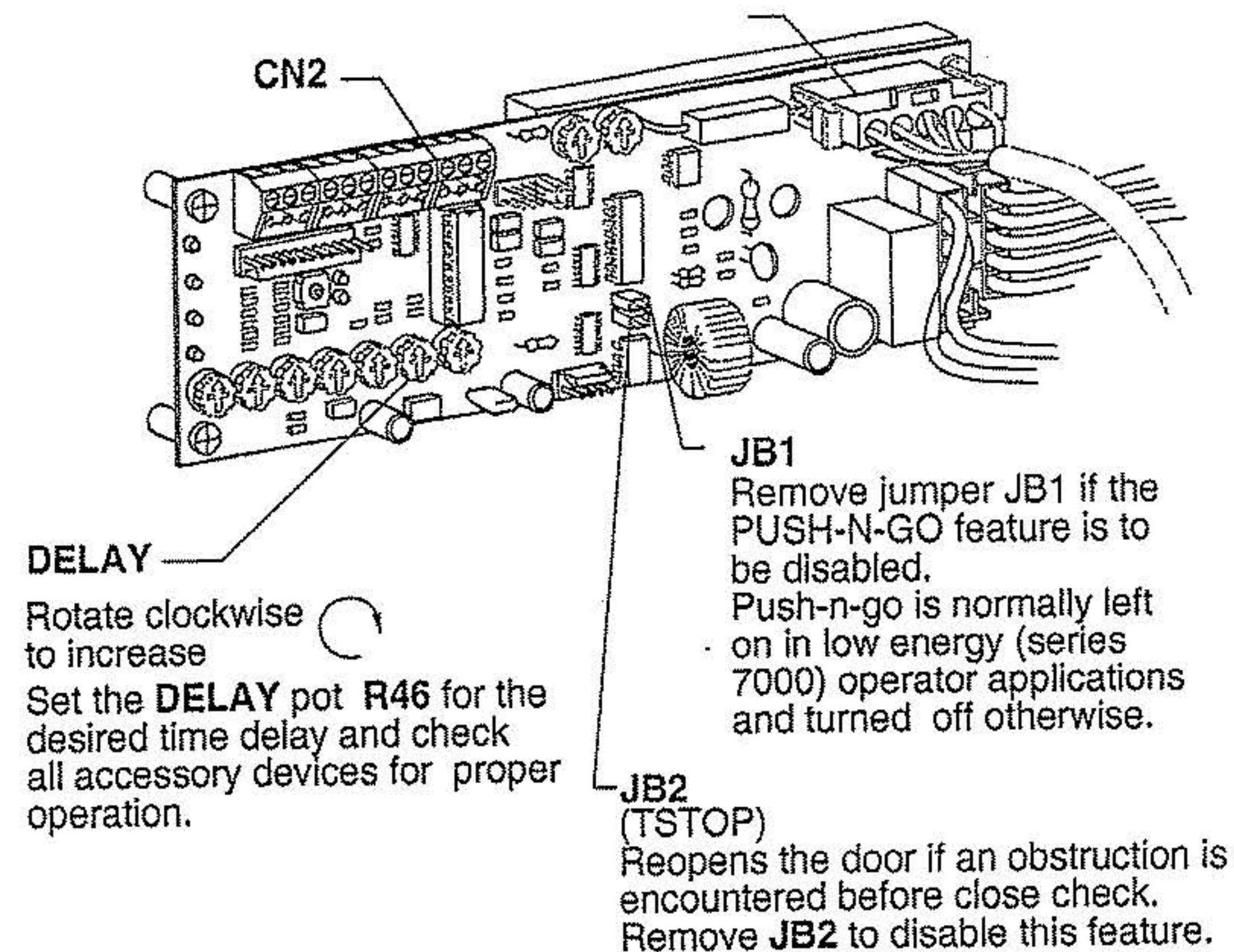


Place the jumper in any of the positions shown to archive the required lock delay

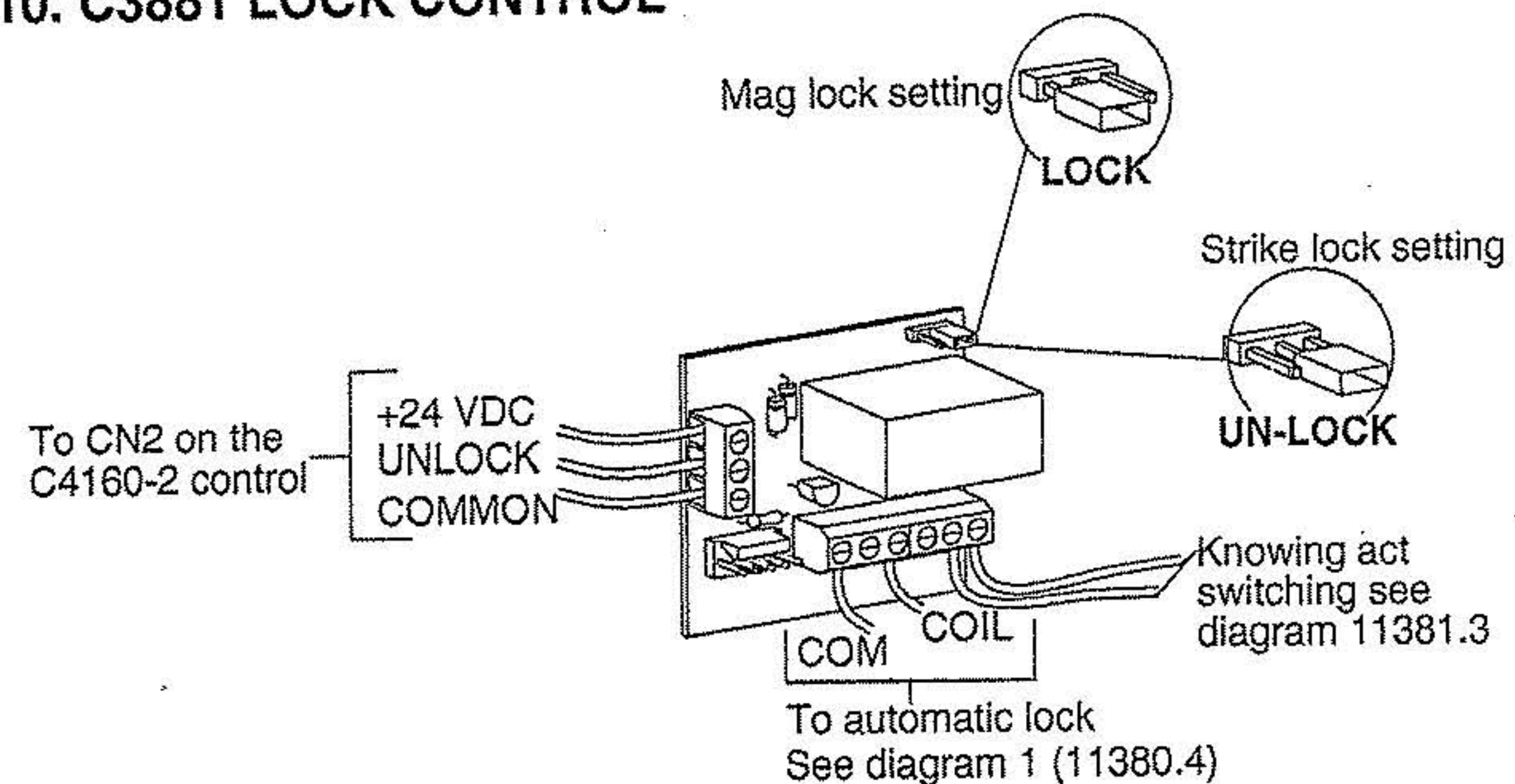
3rd Step

Wire the lock to a Horton C3881 auxiliary relay module as per diagram 11380.4. Connect the C3881 to CN2 as shown. Cycle the door and check for proper lock operation.

9. CONTROL ADJUSTMENTS (time delay & push-n-go)



10. C3881 LOCK CONTROL



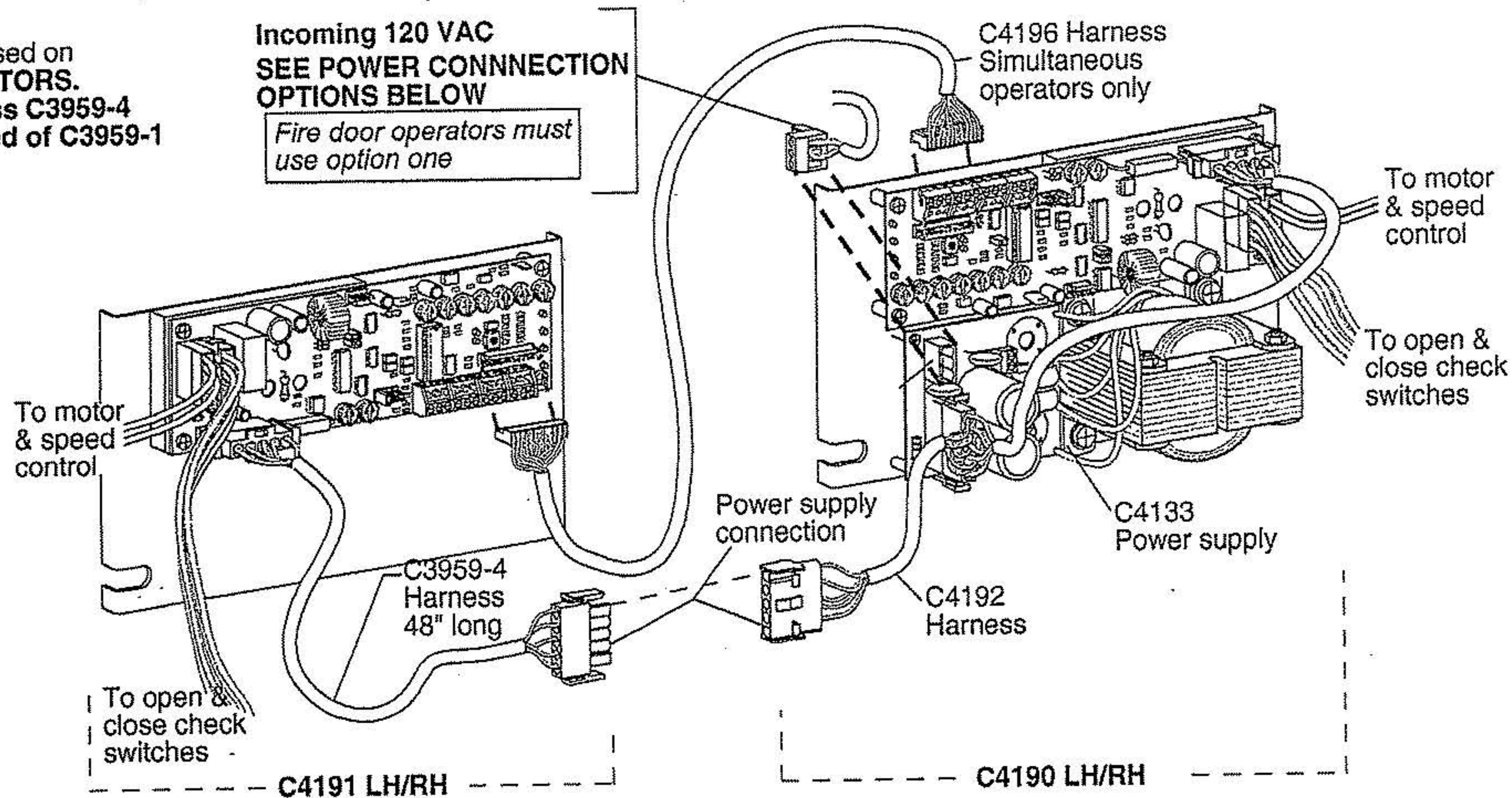
NOTE:

This control will provide power for most 25VDC magnetic locks and strikes. Do not use on 12 volt DC locks (see diagram 11380.4)

11. DUAL CONTROLS & FIELD WIRING OPTIONS & REQUIREMENTS

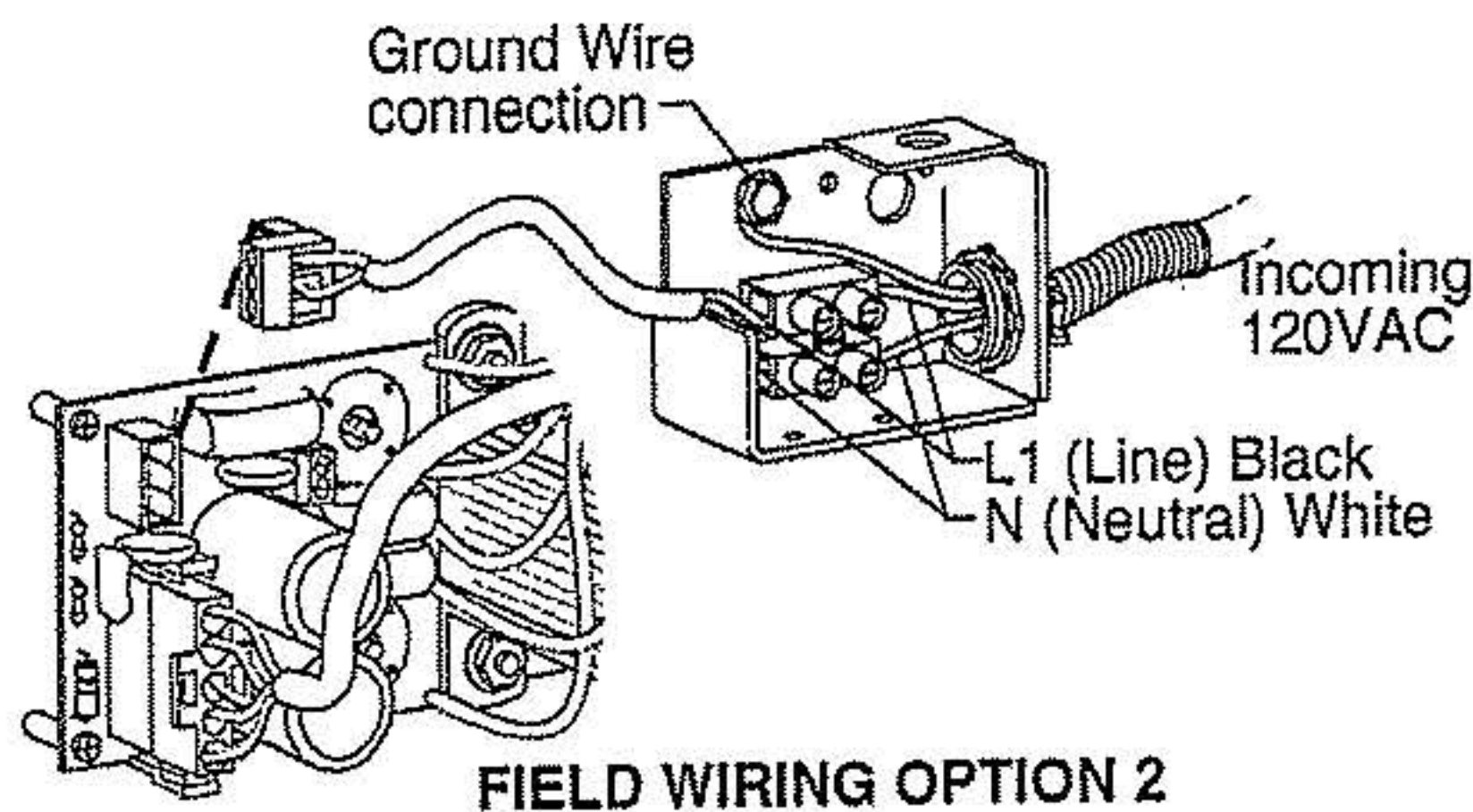
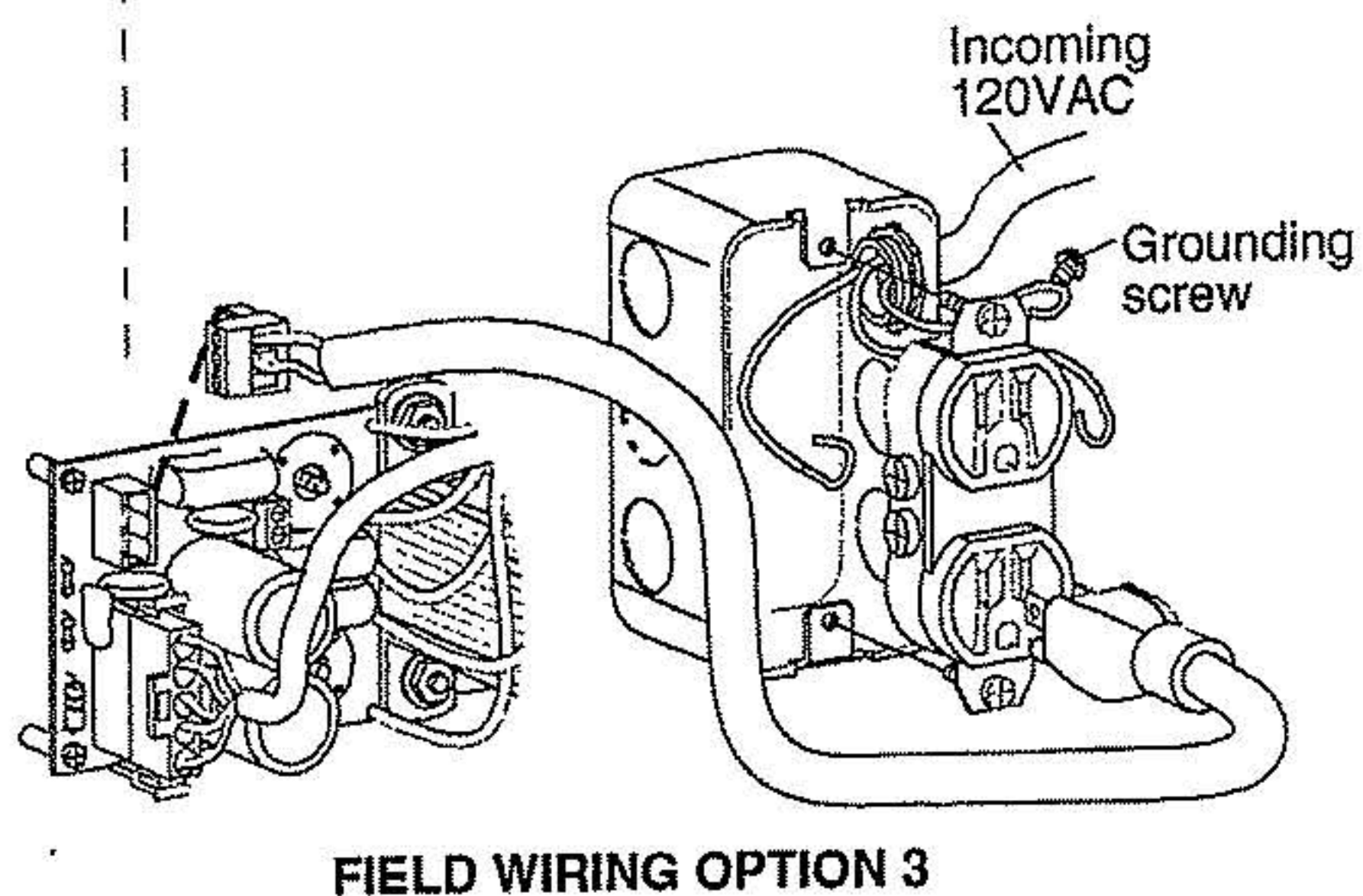
Set up the controls as outlined in the previous sections and make the connections as shown on this page.

NOTE:
C4196 harness is **ONLY** used on **SIMULTANEOUS OPERATORS**.
The power supply harness C3959-4 and C4192 are used insted of C3959-1 on pairs.

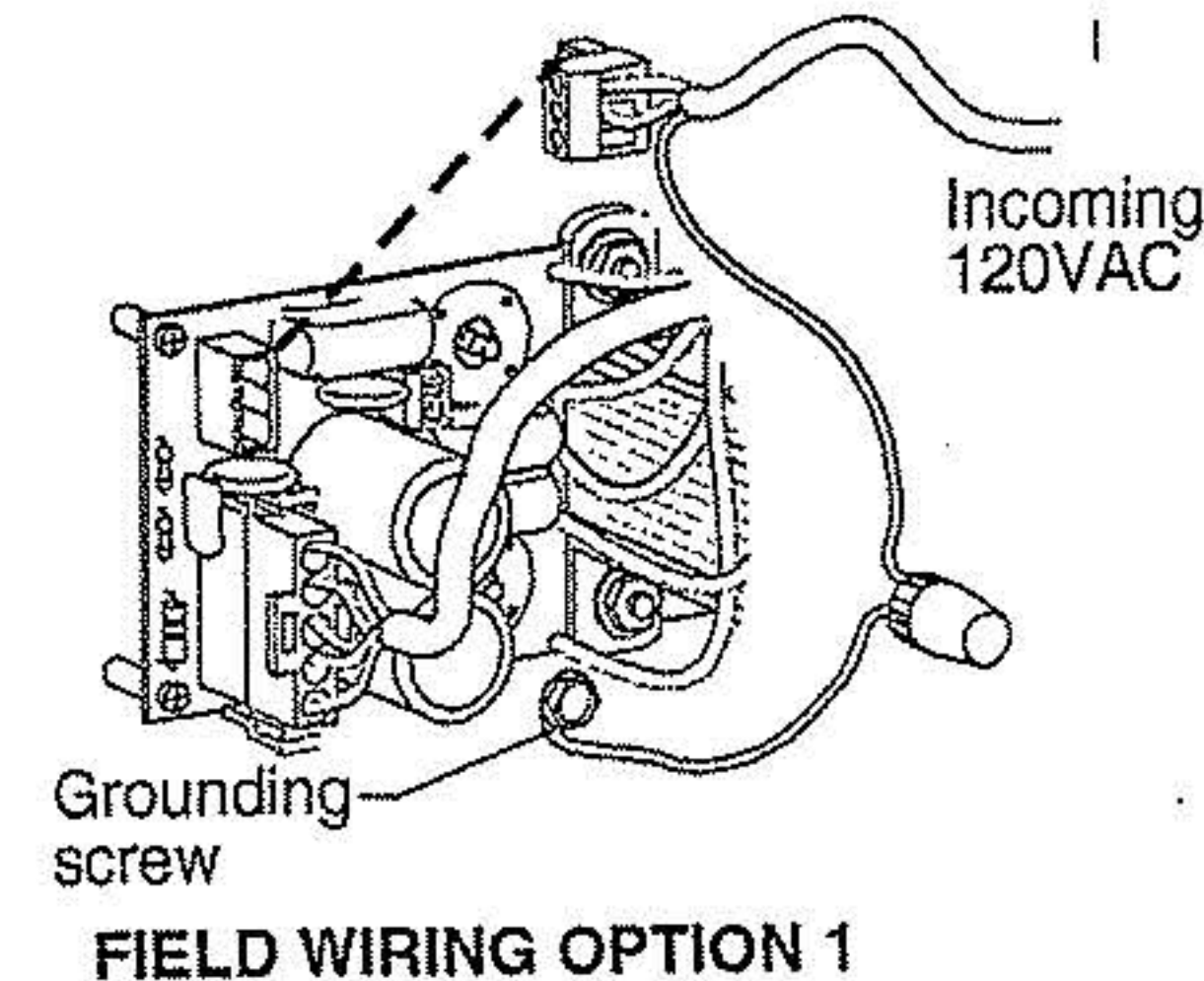


H-SW.5

FIELD WIRING OPTIONS AND REQUIREMENTS



This wiring option may be used on any swing door installation.....
It **MUST** be used on fire door operators



If operator is to be used as a S4900 or an S7900 fire door operator, connections must be in accordance with NFPA 72 and artical 760 of NEC.

KNOWING-ACT OPERATION

H-SW.6

NOTE: Secondary Activation Sensors shown at right are active only when the door is not closed. "OUT" Delay potentiometer must be adjusted that "LOCK OUT" orange LED remains on until door is closed. (See Adjustment Instructions)

Secondary Activation Motion Sensor

YELLOW (ACTUATE)
WHITE (UNLOCK)
GRAY (COMMON)
GRAY (+24VDC)

BLACK (+24VDC)
WHITE (COMMON)
GREEN (ACTUATE)
RED (UNLOCK)

C1234
RECYCLE
SENSOR
(OPTEX 202C)

C1884
RECYCLE
SENSOR
(Eagle)

C1788
RECYCLE
SENSOR
(D38)

C8420-36 SENSOR
DOOR MOUNTED
ON APPROACH SIDE

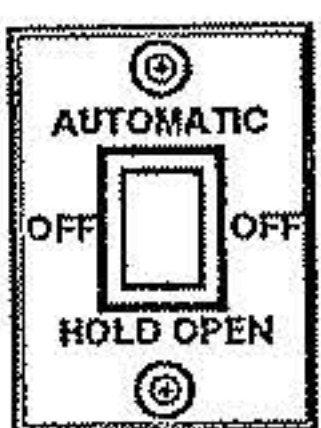
+24V - GRN
COMMON - WHT
UNLOCK - BRN
ACTUATE - RED

C4192
POWER
SUPPLY
HARNESS

C4190

INCOMING
120VAC
1Ø, 15A
See sect. 11
C4190 setup

C4320-1 ROCKER SW.



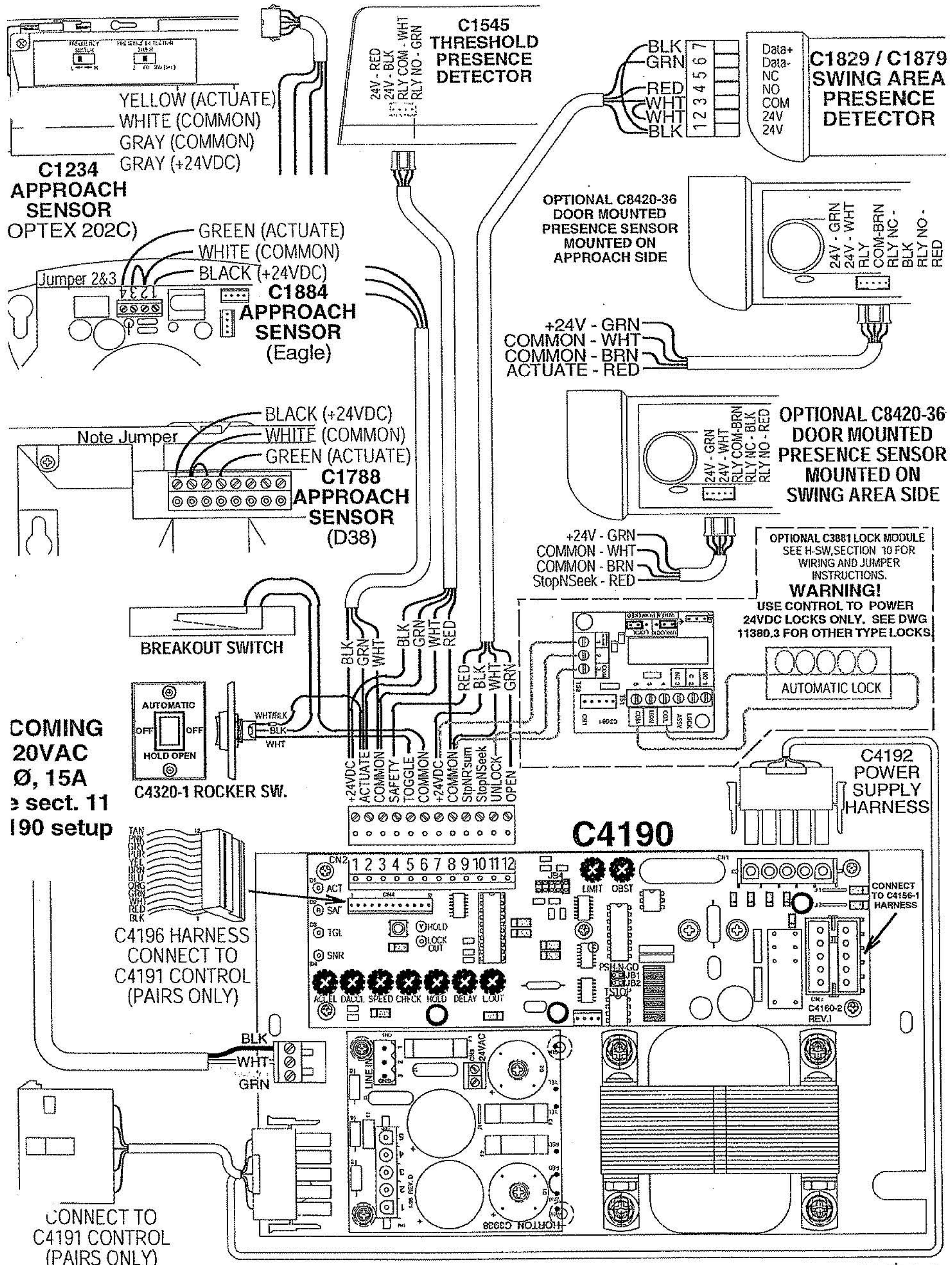
C4196 HARNESS
CONNECT TO
C4191 CONTROL
(PAIRS ONLY)

CONNECT TO
C4191 CONTROL
(PAIRS ONLY)

APPROACH MOTION DETECTOR

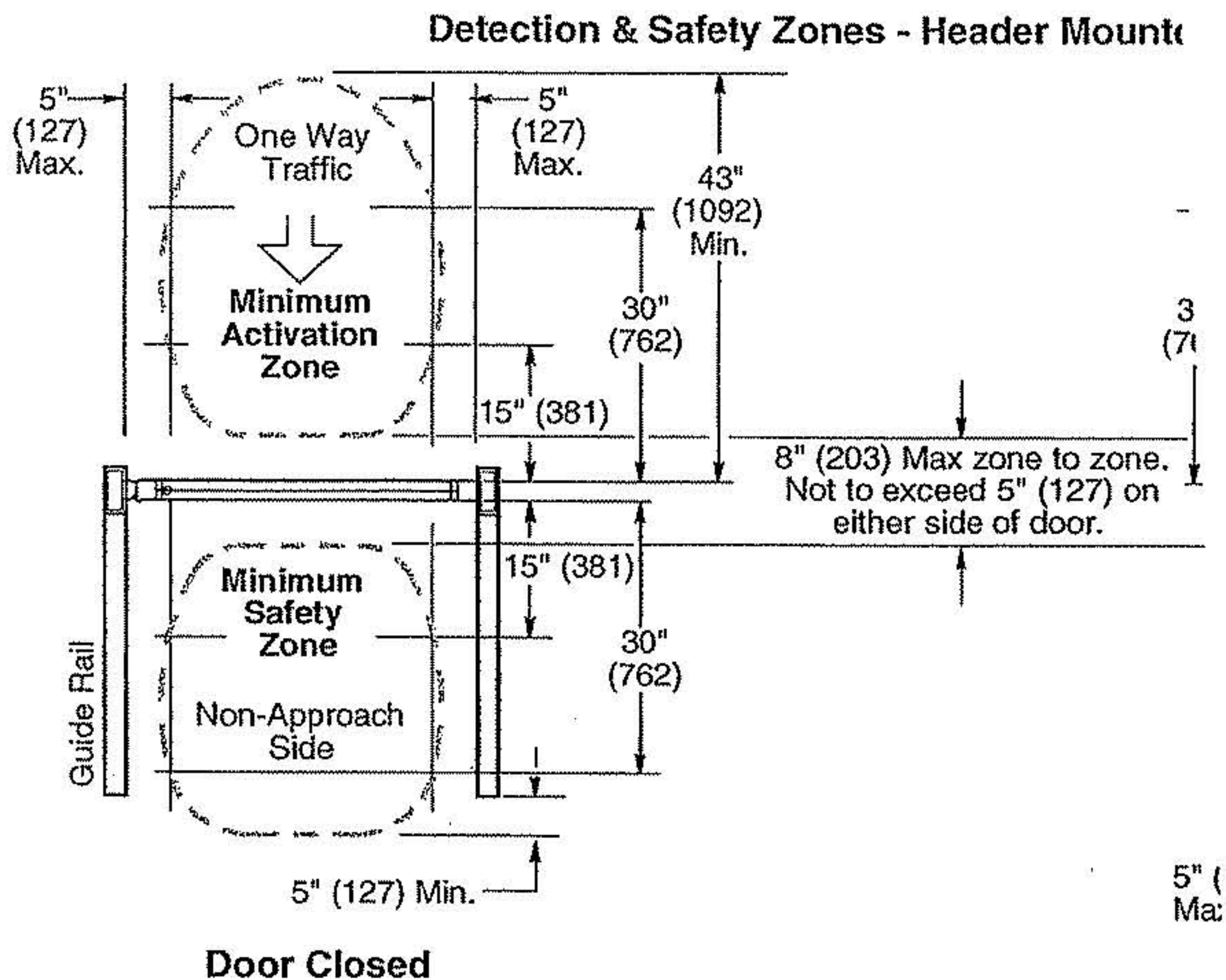
H-SW 7

AUTOMATIC OPERATION



APPENDIX A ACTIVATION AND SAFETY ZONES (swing)

The following general information is provided as a recommendation for complete information for swing door activation, safety zones and guide installation and adjustments of motion and presence detectors.



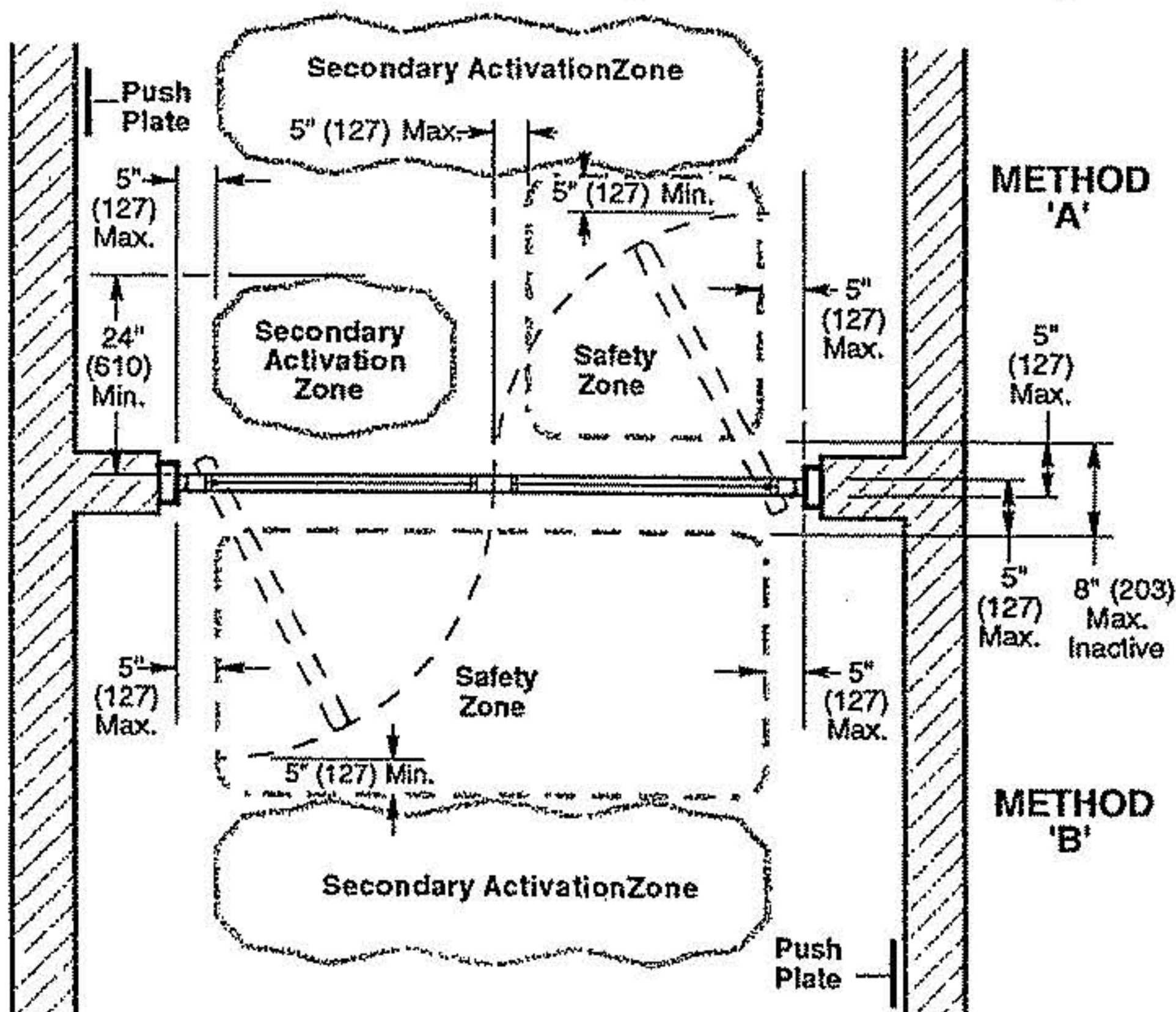
APPENDIX A1 ACTIVATION AND SAFETY ZONES (knowning)

The following general information is provided as a recommendation for safe for compliance.

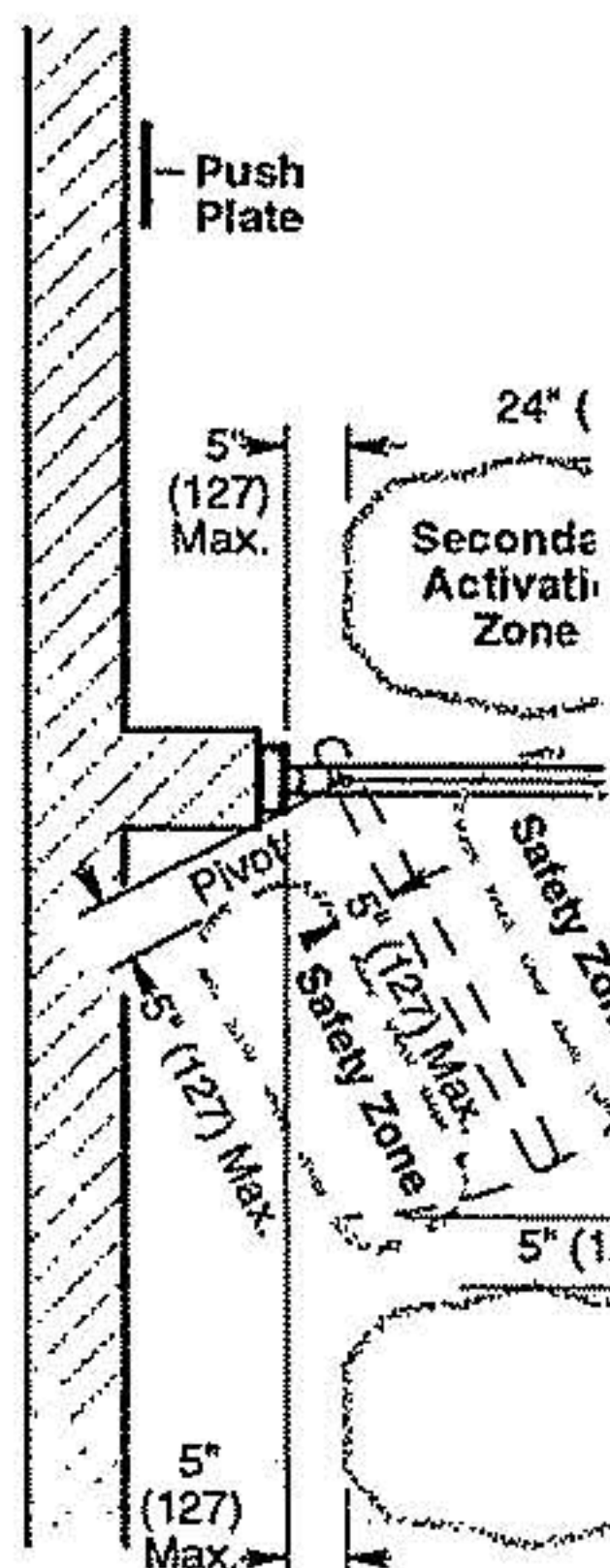
Push Plate Switch Activation:

After push plate is pressed & released door to remain open a minimum within view of door at a maximum distance of 144" (305mm) from the cent 36" (914mm) and maximum 48" (1219mm) from finished floor.

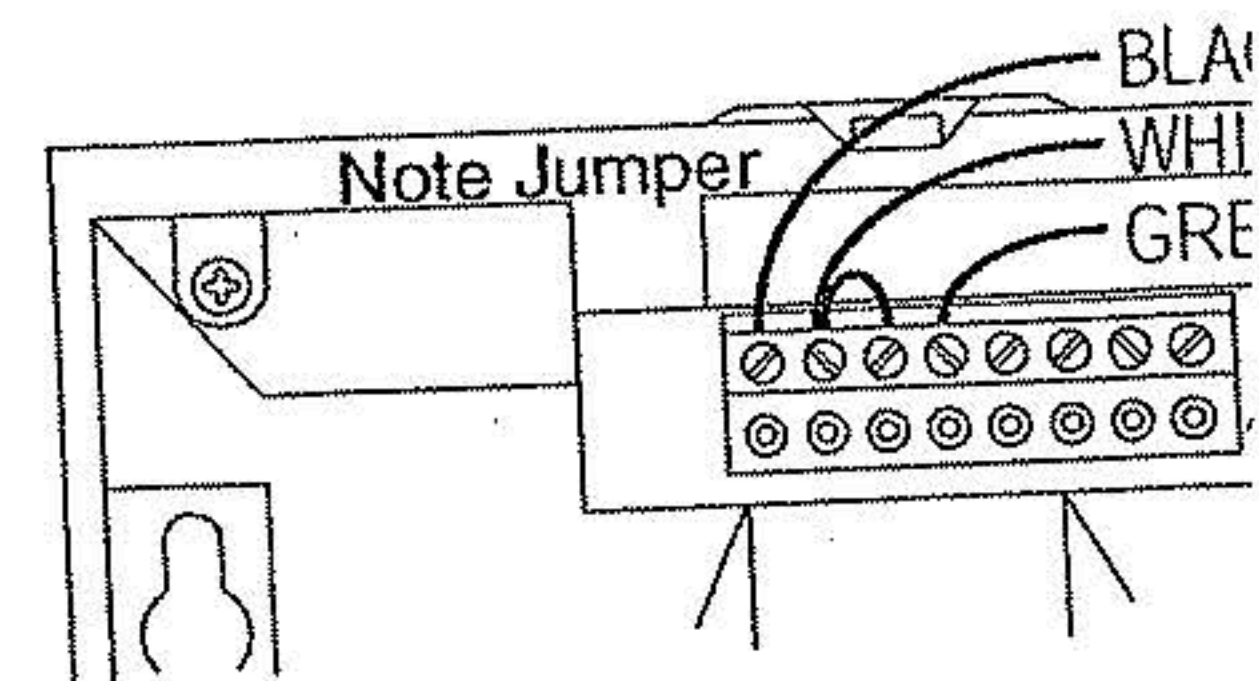
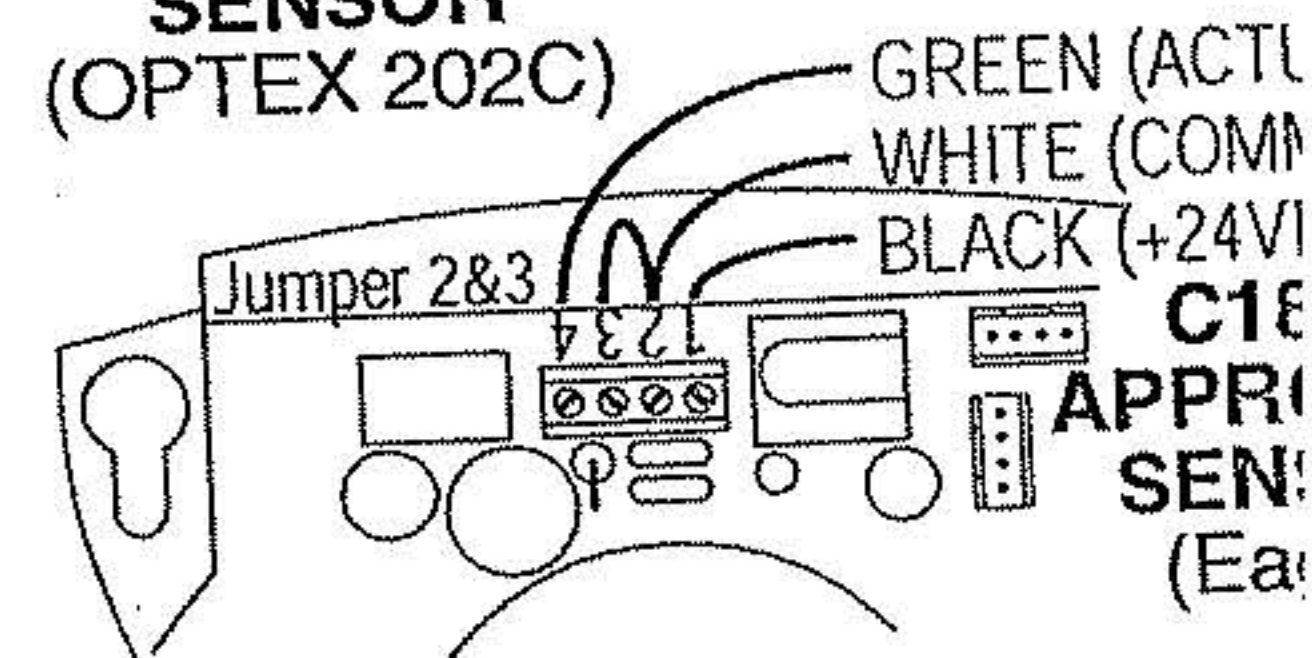
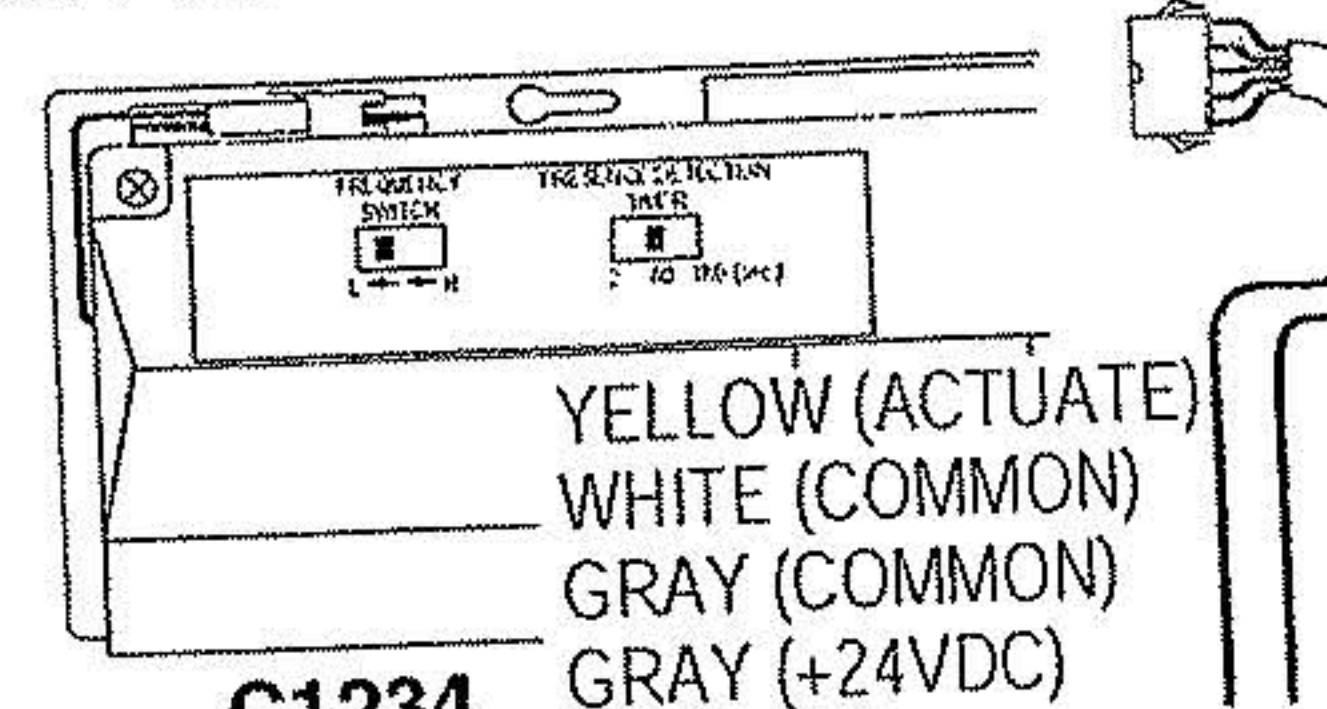
'Knowing Act' - Double Egress (Using Header Mounted Sensors)



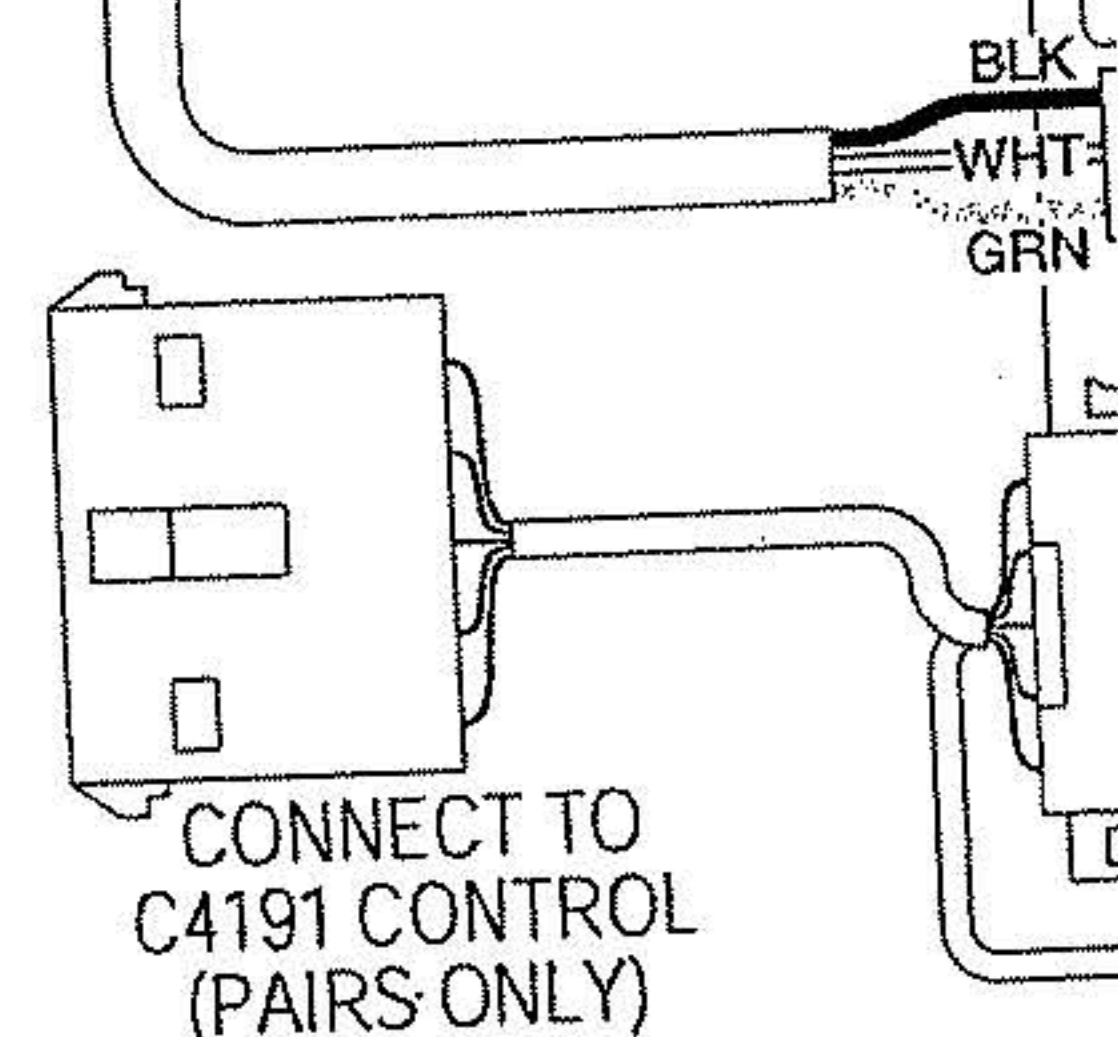
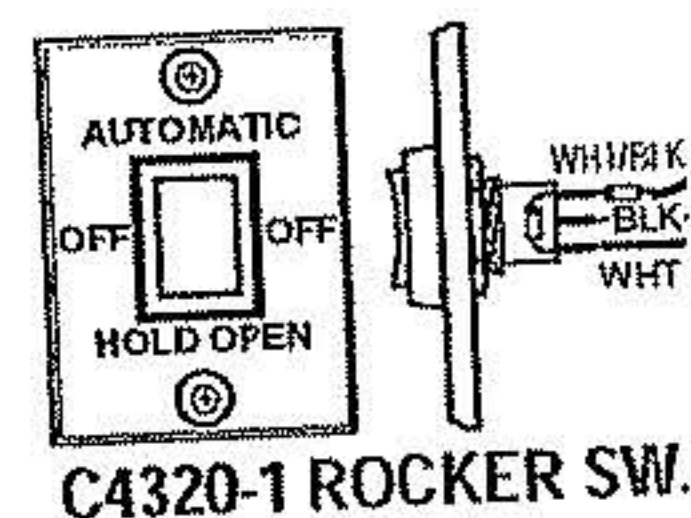
'Knowing Act' - Doub



APPROACH MOTION DETECTOR



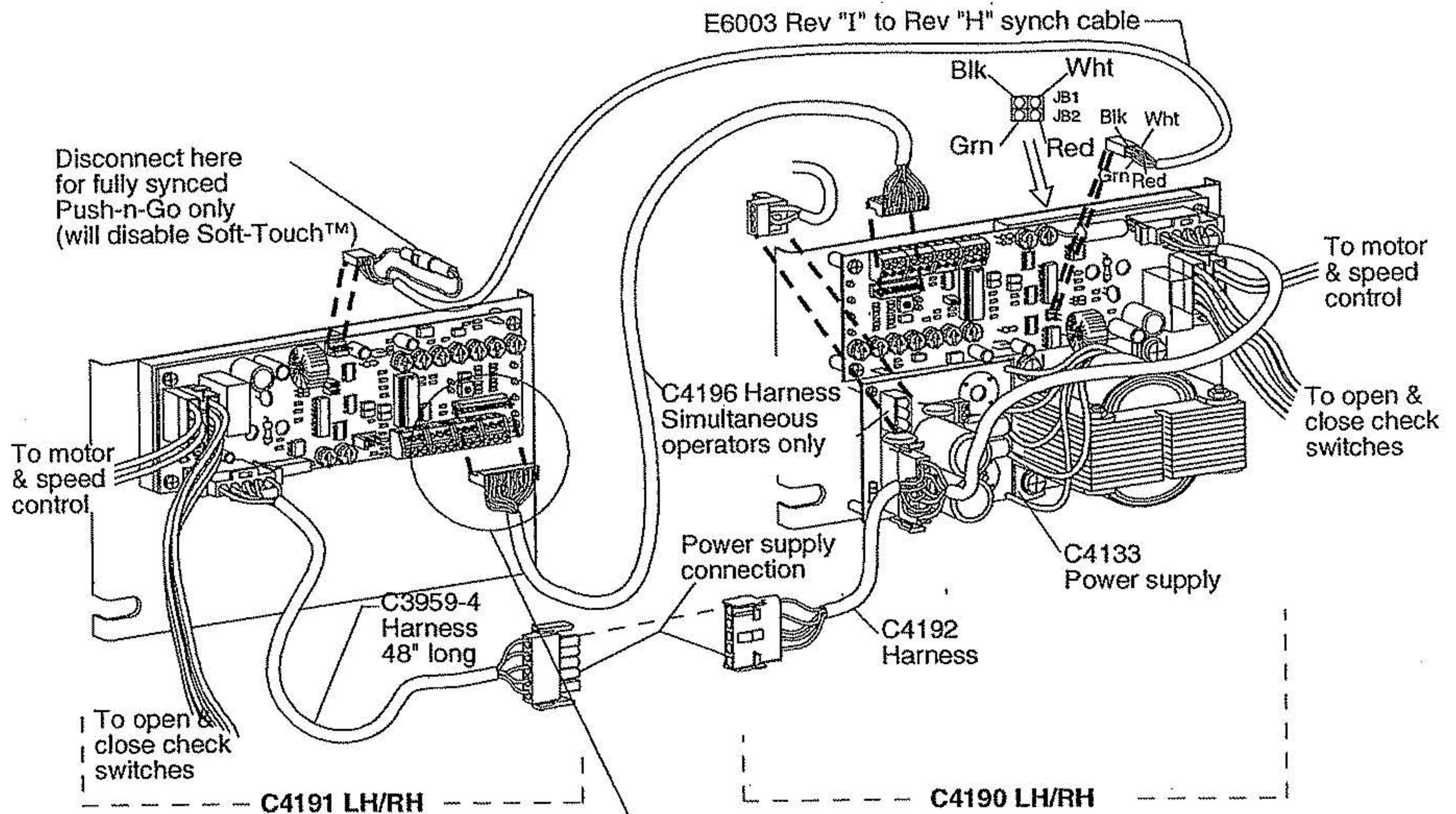
**INCOMING
120VAC
1Ø, 15A
See sect. 11
C4190 setup**



Automatic Swing Op

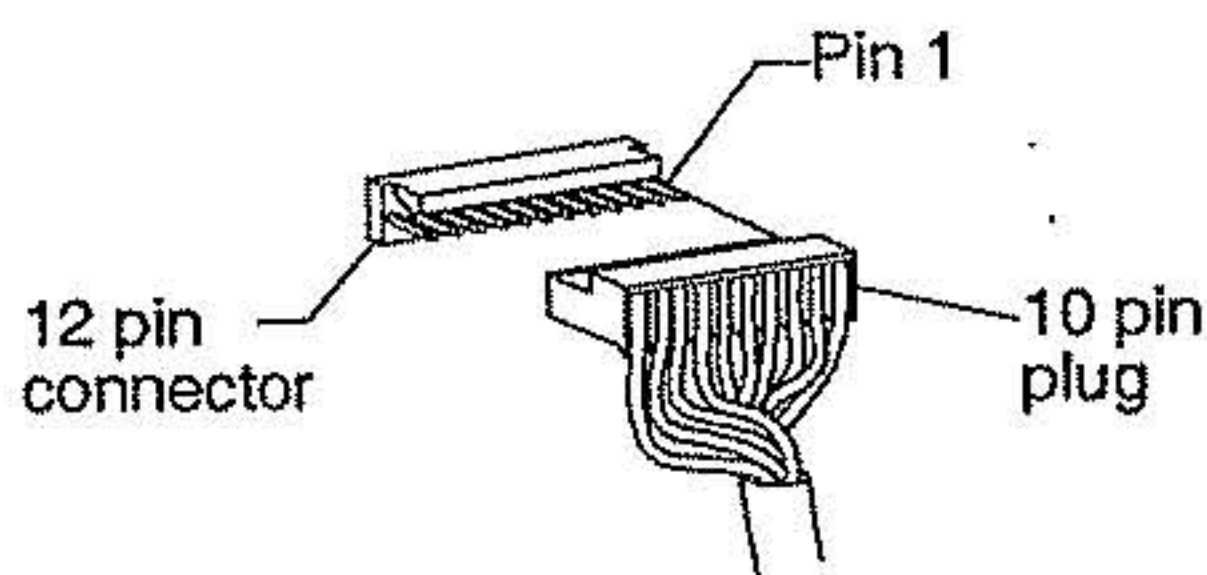
APPENDIX B CONNECTING A REV "H" BOARD TO A REV "I" BOARD

The connections shown are for use on **SIMULTANEOUS OPERATORS ONLY**.



Revision "I"

Revision "H"



NOTE:

If a 10 pin plug is connected to a 12 pin connector pin 1 on the connector must line up with pin 1 on the plug

OR...

If a 12 pin plug is connected to a 10 pin connector pin 1 on the connector must line up with pin 1 on the plug



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Fax: 800-531-3108, 361-888-6510
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International Fax: ++44-1952-670181

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Horton Automatics reserves the right to improve the product and change its specifications without notice.