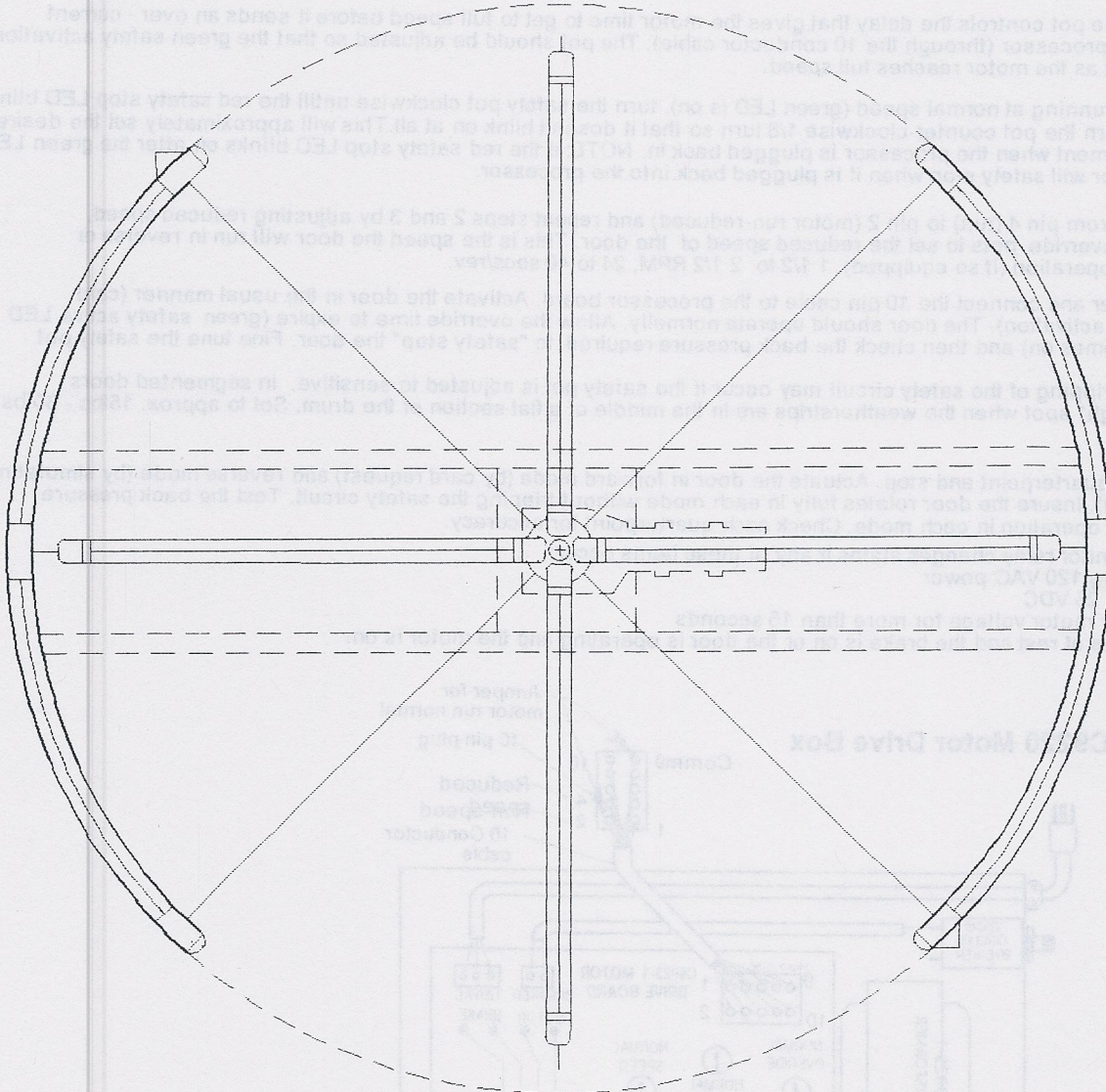


ADJUSTMENTS & TROUBLESHOOTING

for Security Revolving Doors with C9920, C9922 control

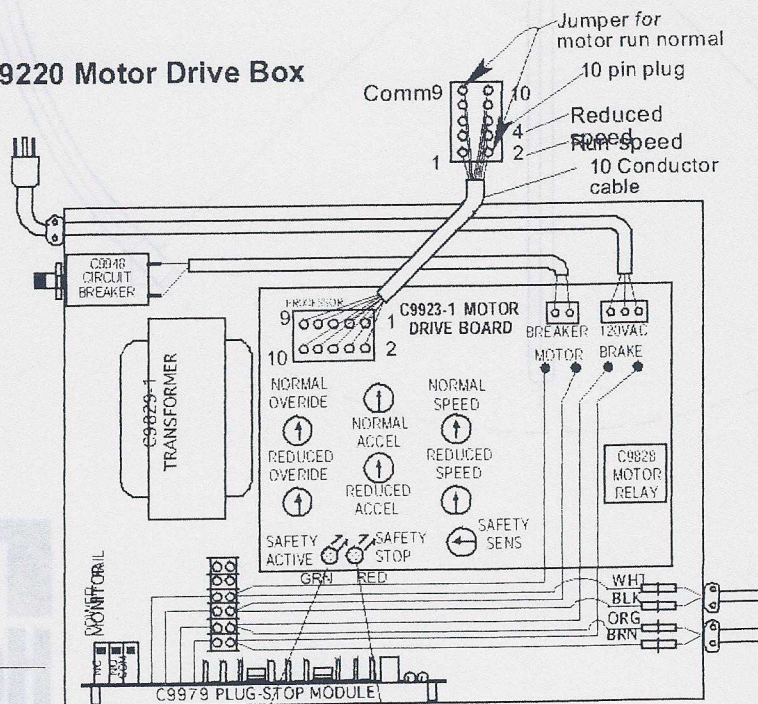


TWO-WAY FOUR WING SECURITY REVOLVING DOORS (9240 or 9241)

A. ADJUSTMENT PROCEDURES FOR MOTOR DRIVE CONTROL (C9920)

1. Set normal speed and override pots fully counterclockwise. Set acceleration pots fully clockwise.
2. Plug the 10 pin plug into the motor drive board only. On the free end of the 10 pin plug, place a jumper between pin 9 (comm) and pin 2 (motor run normal). Adjust normal speed pot until the desired speed for normal operation is reached (3-5 RPM or 12 to 20 secs/rev). **It is recommended to start at 4 RPM for run and 2 RPM for reduced speed.**
3. To adjust acceleration, start and stop the door rotation (place and remove the jumper) to observe acceleration. Adjust normal speed acceleration pot to the desired level. Use maximum acceleration (clockwise) on card access doors. Larger doors may require slower acceleration.
4. The normal override pot controls the delay that gives the motor time to get to full speed before it sends an over - current signal to the microprocessor (through the 10 conductor cable). The pot should be adjusted so that the green safety activation LED comes on just as the motor reaches full speed.
5. While the door is running at normal speed (green LED is on), turn the safety pot clockwise until the red safety stop LED blink on and off. Then turn the pot counter-clockwise 1/8 turn so that it doesn't blink on at all. This will approximately set the desired safety stop adjustment when the processor is plugged back in. **NOTE: if the red safety stop LED blinks on after the green LEI comes on, the door will safety stop when it is plugged back into the processor.**
6. Move the jumper from pin 4 (run) to pin 2 (motor run-reduced) and repeat steps 2 and 3 by adjusting reduced speed, acceleration and override pots to set the reduced speed of the door. This is the speed the door will run in reverse or during handicap operation (if so equipped). 1 1/2 to 2 1/2 RPM, 24 to 40 secs/rev.
7. Remove the jumper and connect the 10 pin cable to the processor board. Activate the door in the usual manner (card request or motec activation). The door should operate normally. Allow the override time to expire (green safety active LED on motor drive comes on) and then check the back pressure required to "safety stop" the door. Fine tune the safety pot if necessary.
NOTE: Nuisance tripping of the safety circuit may occur if the safety pot is adjusted to sensitive. In segmented doors there will be a "high" spot when the weatherstrips are in the middle of a flat section of the drum. Set to approx. 15lbs - 30lbs (16.7H - 133N)
8. Allow the door to quarterpoint and stop. Actuate the door in forward mode (by card request) and reverse mode (by simulating a security violation). Insure the door rotates fully in each mode without tripping the safety circuit. Test the back pressure sensing for proper operation in each mode. Check each quarterpoint for accuracy.
9. The power fail monitor relay changes states if any of these items occur:
 1. Loss of incoming 120 VAC power
 2. Loss of internal 25 VDC
 3. Loss of brake or motor voltage for more than 15 seconds
 Either the door is at rest and the brake is on or the door is operating and the motor is on.

C9920 Motor Drive Box



B. MICROPROCESSOR CONTROL - C9922

See the attached chart for a description of "standard" Logic version

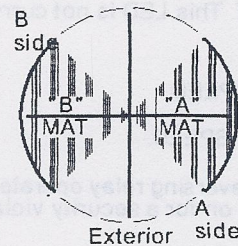
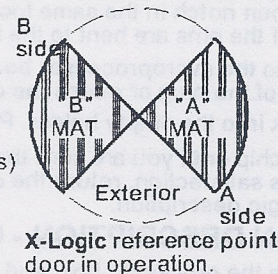
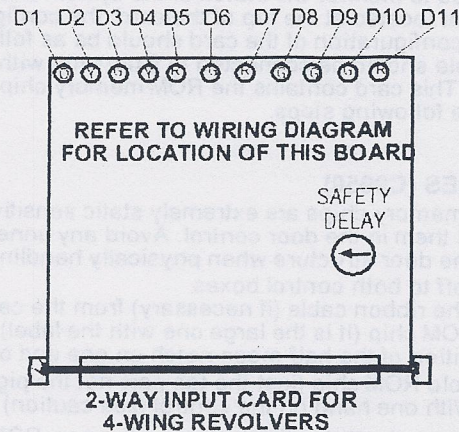
LED FUNCTION DESCRIPTION - INPUT CARD (C9952)

The LEDs are numbered left to right, the functions are described below. "2-WAY INPUT" is noted in the right hand corner.

- D1. AUTOMATIC / SECURITY (AUTO/SEC). This LED lights when the auto/sec switch (terminal 8 to comm) is closed. This lets you know that the door is in the auto mode. When this LED is on, the door will be in the less secure of two modes and will be in the (+) or (x) position depending on logic.
- D2. "X" REFERENCE (X/A QPT). This LED lights when the quarterpoint indicator switch senses the indicator on the quarterpoint disk. The bracket should be adjusted so that the LED comes on when the door is in the "X" position. With the brake disconnected and the controls turned on the door may be pushed around to check this function. This is when the microprocessor checks for violations and verifies entry. (See G918 for adjustment)
- D3. SECURITY PASS (SEC PASS). This LED lights when the security pass switch is closed (terminal 10 to comm). When this feature is activated it allows one person to pass through the door from either direction. After 5 seconds without mat activation, the security pass request is cancelled. This would be used by security guards and maintenance personnel.
- D4. "+" QUARTERPOINT ("+" /B QPT) This LED lights when the quarterpoint indicator switch senses the indicators on the quarterpoint disk. The individual indicators are adjusted so that the switch senses them when the door is in the standard quarterpoint position. (See G918 for adjustments)
- D5. (B MAT) This LED lights when the mat on the "B" side (exit) is activated.
- D6. AUXILIARY ACTIVATION (AUX ACT) This LED lights when a closure is present for the motion detector. It will light regardless of the automatic / security switch position, but activates the door when the auto mode is selected or arms the mat for free exit.
- D7. "A" SECURITY (A MAT) Lights when the "A" side is activated. The "A" side is considered the outside to inside (entry) direction.
- D8. "B" CARD. This LED lights when the "B" side card reader closes the connection between common and terminal 16. This LED stays lit as long as the connection is held. It must be released and reactivated to store another request. When this takes place the processor turns the bi-color LED (D8 on the Misc. card) from red to green on the "B" side (see terminals 4,5 & 6 on the wiring diagram). The LED on the card reader bracket will also change to green. The "B" side is the interior to exterior direction.
- D9. N/A (SP1) This LED is not used in this control unless you have special logic.
- D10. "A" CARD. This LED lights when the "A" card reader closes the connection between common and terminal 18. This LED stays lit as long as the connection is held. It must be released and reactivated to store another request. When this takes place the processor turns the bi-color LED (D7 on the Misc card) from red to green on the "A" side (see terminals 4,5 & 6 on the wiring diagram.) The LED on the card reader bracket will also change to green. The "A" side is the exterior to interior direction.
- D11. SAFETY (SAF TIMER) This LED lights when the safety nosing is bumped or excessive motor current is present. It will stay on until the timer times out (1 sec min. adjustable by the safety pot on the board) - typically this should be at the minimum unless the traffic requires longer delays.

All of these LEDs get their power from the motor drive board and all of them except the safety will light only if the motor drive board is turned on (the conductor cable must be connected). All mats, quarterpoint indicators, card readers, auto/sec switches and motion detector outputs may be tested by activating these devices and observing the LEDs.

The one pot on the card controls how long the door stays in safety stop mode after motor overcurrent or safety nosing activation. (see LED 11 above)



MAT LOCATION FOR CARD ACCESS 9240 and 9241 REVOLVERS

C. MICROPROCESSOR CARD C9950

Refer to diagram 11177.0 for information on this section. The microprocessor card has no adjustments or indicators on it. However, there is a reset button (top of the card, just left of the 232 port and marked as PB1 on the circuit board) that can be used to restore the control after power failure or as directed in this guide. It also has an RS232C communications port that can be used to monitor the status of the system and can also control the doors activities. The signal is available at the DB25 pin socket located at the top of the card. The configuration used is 1200 BAUD, 8DATA, 1STOP bit, no parity. The hardware configuration of the card should be as follows: IC6-6116 logic version chip. IC11-not used on version 3 logic. The ribbon cable should be connected to 9 pin plug with the brown wire on top (marked D0 on the circuit board and the mother board. This card contains the ROM memory chip that determines the characteristics of the door control and can be changed by the following steps.

ROM CHANGES (C9950)

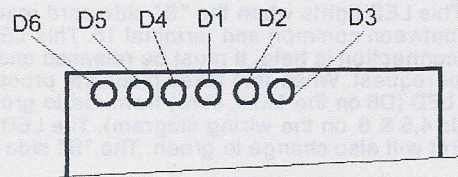
CAUTION: All memory chips are extremely static sensitive. Do not remove them from their contained (or foam block) until you are ready to install them in the door control. Avoid any unnecessary handling of the ROM chip. Keep one hand on the control or the metal part of the door structure when physically handling the chip.

1. Turn power off to both control boxes
2. Disconnect the ribbon cable (if necessary) from the card and remove the microprocessor card from the controller.
3. Locate the ROM chip (it is the large one with the label). This label should show the version number of the program stored. Note the position of the half-moon notch on one end of the chip. The new chip must be installed with the same orientation.
4. Remove the old ROM chip (just the top part-not the piggyback) for 3.xx logic by inserting a screwdriver at one end and gently prying up. With one hand on the control (see caution) the old chip can now be removed. Temporarily set it on a metal surface.
5. Observing the static precautions, remove the new ROM chip from its holder and check all its pins to be sure they are straight. Orientate the half-moon notch in the same location as the old chip and gently install into its socket on the circuit board. Check to make sure none of the pins are bent to the inside or outside of the socket.
6. Put the card back into the microprocessor box and reconnect the ribbon cable D0 to D0. The brown wire of the ribbon cable should be at the top of the plug or match the orientation on the mother board.
7. Put the old chip back into the empty holder. Power up the door and check for proper operation with the new program.
8. Don't return the old chip until you are sure that the new program is going to function as required. After everything checks out to the customer's satisfaction, return the old chip to Horton Automatics in the container the new one came in. Refer to the attached chart for logic description.

D. LED FUNCTION DESCRIPTION - OUTPUT CARD (C9953-1)

This is the third card in the processor box, and it has 6 LEDs on it. The function of each are listed below.

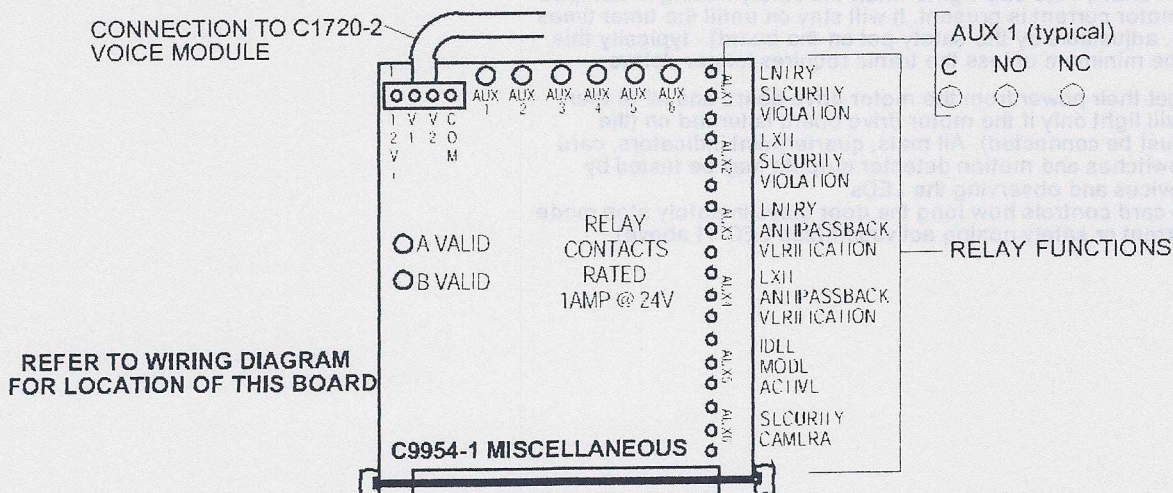
1. (D6- yellow) HOLD TIMERS. This is generated by the software and resets all timers when necessary. This LED will blink 4 times on start up. If it does not, there is a software problem.
2. (D5- green) AUX 1 OUT. This LED is not currently used.
3. (D4- red) BRAKE ON.
4. (D1- green) NORMAL SPEED.
5. (D2- yellow) REDUCED SPEED.
6. (D3- red) REVERSE. Reversing relay operated.
Note: D2 and D3 will be on for a security violation (reduced speed reverse).



**C9953-1 OUTPUT CARD
(TOP PORTION)**

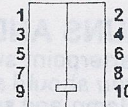
E. MISCELLANEOUS CARD (C9954-1)

This card contains the connection for the C1720-2 voice module and LEDs D1 thru D6. These LEDs indicate various messages that correspond to relays mounted on the edge of the card. The large bi-color LEDs D7 and D8 mimic the card reader bracket LED's and can be used for troubleshooting. See the following chart for an explanation of the relay functions.



F. GENERAL INFORMATION FOR SECURITY DOORS

1. When setting the speeds on the motor drive board, it is easier to unplug the 10 conductor cable from the processor (leaving it plugged into the motor drive board) and then to place a jumper (#12 solid copper works well) from #9 in the connector to #2 for normal speed and #4 for reduced speed. The brake can also be checked by placing the jumper from #9 to #10 in the Connector.
2. The 10 conductor cable provides the following functions:
 - a. Sends 12 volts from motor drive to processor (pin 1).
 - b. Sends ground from processor to motor drive for normal run (pin 2).
 - c. Sends ground from processor to motor drive for reduced run (pin 4).
 - d. Sends ground from motor drive to processor when motor overcurrent is present (pin 6).
 - e. Sends 25 volts from motor drive board to processor (#1 on terminal strip for motion detector) (pin 7).
 - f. Sends ground from processor to motor drive board to operate reversing relay (pin 8).
 - g. Sends ground from processor to motor drive board to operate brake (pin 10).
 - h. Common Ground (pin 9).



It is important to understand that all functions of the motor drive board are inputs to or outputs from the processor. The first thing that happens when the door is activated, is that the brake releases. Then the processor will send a signal (ground) for the door to run in normal speed. When all card requests have been acted upon, the door slows down and starts seeking a quarterpoint. When it receives the quarterpoint signal the processor removes the run signal, momentarily operates the reverse relay (dynamic braking), and then sets the brake. When the door reverses, both reduced run and reverse relay are operated. The door always reverses in reduced speed, so reduced speed, reduced override, and reduced acceleration pots must be set, it is also important to set the reduced override long enough to allow the weatherstripping to reverse and get up to speed after a security violation (door reversal). All LEDs in the processor, mats, quarterpoint switches, motion detectors, etc. go dead when the motor drive control is turned off.

G. TROUBLESHOOTING TWO-WAY/FOUR WING SECURITY REVOLVING DOORS

1. DOOR CONTROL DEAD

- a. Make sure all circuit cards are seated in card edge connectors.
- b. Check 120 VAC at plug at motor drive board (between white and black).
- c. Check breaker for continuity.
- d. Check 10 conductor cable, making sure it is plugged in properly.
- e. Check voltages at power supply board (see wiring diagram on processor).
- f. Check to make sure that the plug from the transformer to the circuit board (MOTOR DRIVE CONTROL) is secure (n/a on some models).

2. LEDS LIGHT: MOTOR WON'T RUN

- a. Connect jumper from pin 9 in 10 conductor cable to pin 2, door should run at normal speed. Green LED should come on after override timer expires. If no green light see #1 above. If green light but motor won't run, try to adjust normal speed pot to obtain motor run.
- b. Check relay to make sure that it is seated properly; you can activate the relay by placing a jumper from pin 9 to pin 8 in the 8 conductor cable.
- c. Check output leads to the motor with a volt meter. You should see 30 to 115 volts of DC (this is with the jumper placed from 9 to 2).
- d. Check for physical bind by pushing the door around a full revolution.
- e. Make sure that the control is not safety stopped: the last LED #11 on the right hand side of the input board will be lit if the safety stop is on.
- f. If motor runs with jumper but not under processor control, check to see if normal speed LED #5 lights up on output board. If it doesn't, either you are not getting an actuate signal, or the processor is not operating properly.

3. DOOR DOES NOT LOCK

- a. Check to see what LEDs are lit on the output board. If the brake LED 4 is on, go to step b. if not, the control could be trying to run the motor (the other LEDs on the output board will tell you what its doing).
- b. Check for DC voltage on the brake leads at the motor drive circuit board; it should be in the 80-95 volt range. If it is 100-115 you probably have an open in the brake coil or the associated wiring. If it is down close to zero, disconnect the brake and measure again. If it then measures 100-115 volts, you probably have a shorted brake coil or associated wiring. If you still measure zero with the brake disconnected, and the BRAKE LED #4, on the output card is lit, place a jumper from 9 to 10 on the 10 conductor plug. If the brake activates, you have a problem with the 10 conductor cable or the processor.
- c. Try a processor reset. The door may have accidentally been placed into the idle mode).

4. BRAKE RELEASES-MOTOR WON'T RUN

- a. Motor drive box adjusted improperly (check output card LED #5).
- b. Bad motor or connections to motor.
- c. Relay not seated properly or not present.
- d. Check seating again on 10 conductor cable.
- e. Bad motor drive control (C9920).
- f. Malfunctioning processor control (C9922).

5. BRAKE STAYS LOCKED-DOOR WON'T RUN

- a. Safety nosing shorted (check input card LED #11 and output card LED #4).
- b. No actuate signal from card readers.
- c. Defective motor drive board (C9920).
- d. Malfunctioning processor control (C9922).

6. DOOR RUNS AND STOPS REPEATEDLY

- Is the 11th LED on the input card (safety) on? If it is, then the door is sensing an overcurrent condition and either the sensitivity adjustment or the override time delay needs to be adjusted.
- Are you bumping the safety nosing? If so, this will cause stop and start mode.

7. DOOR RUNS AND NEVER STOPS

- Check quarterpoint switches and make sure that they are being activated by the indicators (when the door is rotating, you should see the #2 and #4 LEDs on the input card blink alternately). If they are not, check gap between clamp and switch (1/16 to 1/8 inch). If gap is okay, hold something steel close to the switch and see if the LED comes on now. If not, you have a faulty switch or it is wired improperly.

8. DOOR WONT RUN AND WILL ANNUNCIATE REPEATEDLY

- Check LED #5 and LED #7 on the input card; if either one is lit the control is getting a closure from the respective mat. Disconnect the mat at terminal 12 (LED #5 is lit) or terminal 14 (LED #7 is lit). LED should go out. If it does, check mat and wiring for short or ground to the frame (Sometimes you won't see a short across the two wires to the mat, but if you check each side to ground you will find your trouble).
- Occasionally the weatherstrip on the bottom of the doors will be stiff enough to activate the mat. This usually occurs after a reversal when the brush is doubled back on itself.

9. DOOR WORKS INTERMITTENTLY

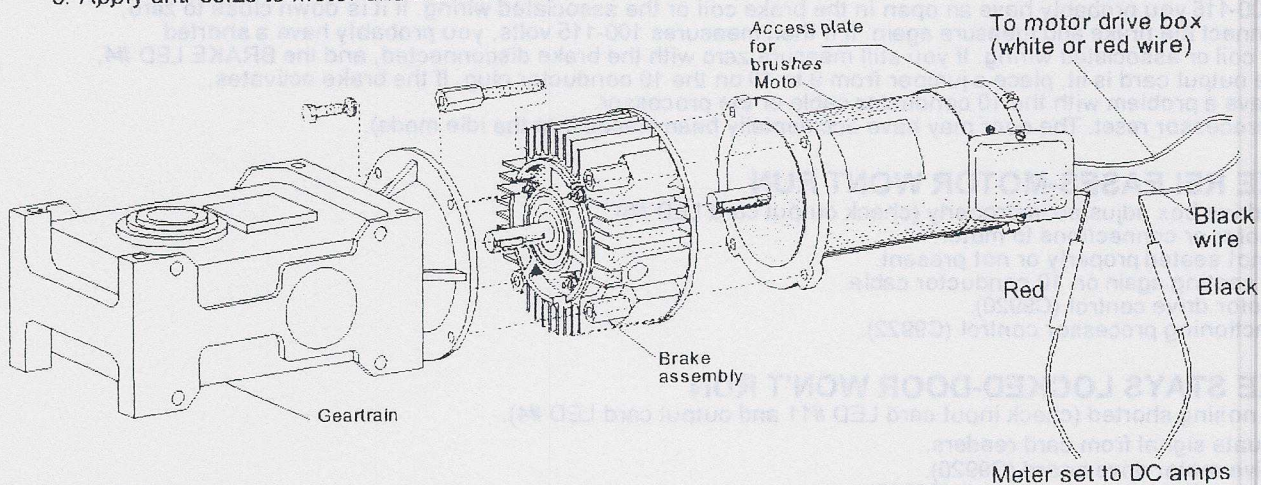
- Check steps H-1.a, 1.b, 1.e and H-2.b on page H910.20.
- Disconnect anything that is connected to terminal 1 (25 VDC supply). If the load is too great here (short or too much current draw) it will cause the thermal protection (PTC) to open and shut down the control until it cools off, then it repeats the cycle.
- Check Quarterpoint switches.

10. CIRCUIT BREAKER TRIPS ON MOTOR DRIVE BOARD

- Check door for mechanical bind.
- Pull inspection plate from brake and make sure that the brake plate is disconnecting from the armature. If not, disconnect wires to the brake. Did it release? If not, the brake has a mechanical problem and will have to be replaced. If it did release, the problem is elsewhere.
- Occasionally the lovejoy coupling on the end of the brake will slide back and drag on the brake housing (if equipped). This is usually characterized by a grating, grinding noise and safety stopping. Test motor current per step d. below.
- Test motor current. Unplug one wire to the motor and put an amp meter between the wires that you have unplugged. Set meter in a position that will measure up to 10 DC amps. Run door and observe the current measurement. You should measure between 200 milliamps and 1 amp maximum. One amp of motor current is equal to approximately 2-1/2 amps of AC current on the circuit breaker.
- Test the motor for a frame short. With your meter in the resistance mode, and the motor unplugged, measure between each motor lead and the frame of the door. It should measure, on low the scale, 15 - 20 ohms on each set of commutators. Rotate and check for one full turn of the door.
- If the 120 volt power supply is interrupted or fluctuates in voltage the processor could malfunction. This can turn on the brake and motor at the same time, which naturally will trip the circuit breaker. If you suspect this is happening, you can unplug the brake, and if the breaker no longer trips, you either have a power problem or a processor problem. Try plugging the processor into an extension cord that is plugged into an outlet on a different circuit. If this resolves the problem, you need to let the owner know that he has a power problem. The UPS should solve any of these types of problems.

11. DOOR MAKES A GRINDING SOUND

- See 10-b and 10-c above.
- Check to make sure that the coupling between the geartrain and the main shaft is not rubbing on the access covers. This coupling has 2 set screws to inhibit sliding on the shafts.
- Apply anti-seize to motor and brake shafts.



I. WIRING DIAGRAM FOR SERIES 9100 3-WING 1-WAY SECURITY

SYSTEM INSTALLATION & FEATURES (VERSION 2.60):

SYSTEM INSTALLATION & FEATURES (VERSION 2.60):

1. Door positioning is encoder - based, using a single proximity switch indicating the door is in the "Y" position, i.e., one wing is centered in the "exit" throat opening. This is considered to be the 0° reference point in door rotation; therefore the door will align with the drum leading edge at 30°, align on the center of the drum section at 90°, and align with the drum trailing edge at 120°, at which point the next wing should be at the "Y" position / 0° reference point. A proximity switch actuator is required for each wing (3) at the "Y" position / 0° reference point. If the door rotates 225° without a reference actuation, the system will lockdown and initiate a repetitive 3 blink sequence of the "Timers Reset" LED on the C9953-1 Output Board.

2. Upon startup, if the door begins to run, then locks down and initiates a 2 blink sequence of the "Timers Reset" LED, the encoder phasing is wrong - switch the green and white wires on the encoder and restart. Proper encoder phasing can be checked by holding the security keyswitch actuated during startup for 5 seconds, then watching the "Timers Reset" and "AUX1 OUT" LEDs. The Timers Reset LED should illuminate first when the door is manually rotated in the forward direction.

3. Upon expiration of the motion detector actuate time delay and/or the handicap pushbutton delay, the door will slow down at the next 90° point and stop at the subsequent 270° point with the security mat switches enclosed by two door wings.

4. The Security Keyswitch has four different functions, depending upon door status:

A.) Door in normal mode - keyswitch will generate a security pass request (1 person is allowed to pass from the non-secure side to the secure side of the door).

B.) Door in safety stop (safety edge pressed) – keyswitch will switch door to "Idle" mode, allowing manual rotation of the door and unrestricted passage. Idle mode is exited & normal operation resumed when the keyswitch is momentarily actuated a second time.

C.) Door in security alarm lockup - keyswitch will clear the security alarm and return door to normal operation.

D.) Door in startup mode - If keyswitch is actuated during system initialization, the door will switch to "Startup Mode". In Startup Mode, the door will remain open until the keyswitch is released. After release, the door will close and lockup, requiring the keyswitch to reset to normal mode.

4) If the door is physically pushed backwards more than 5°, as indicated by the encoder.

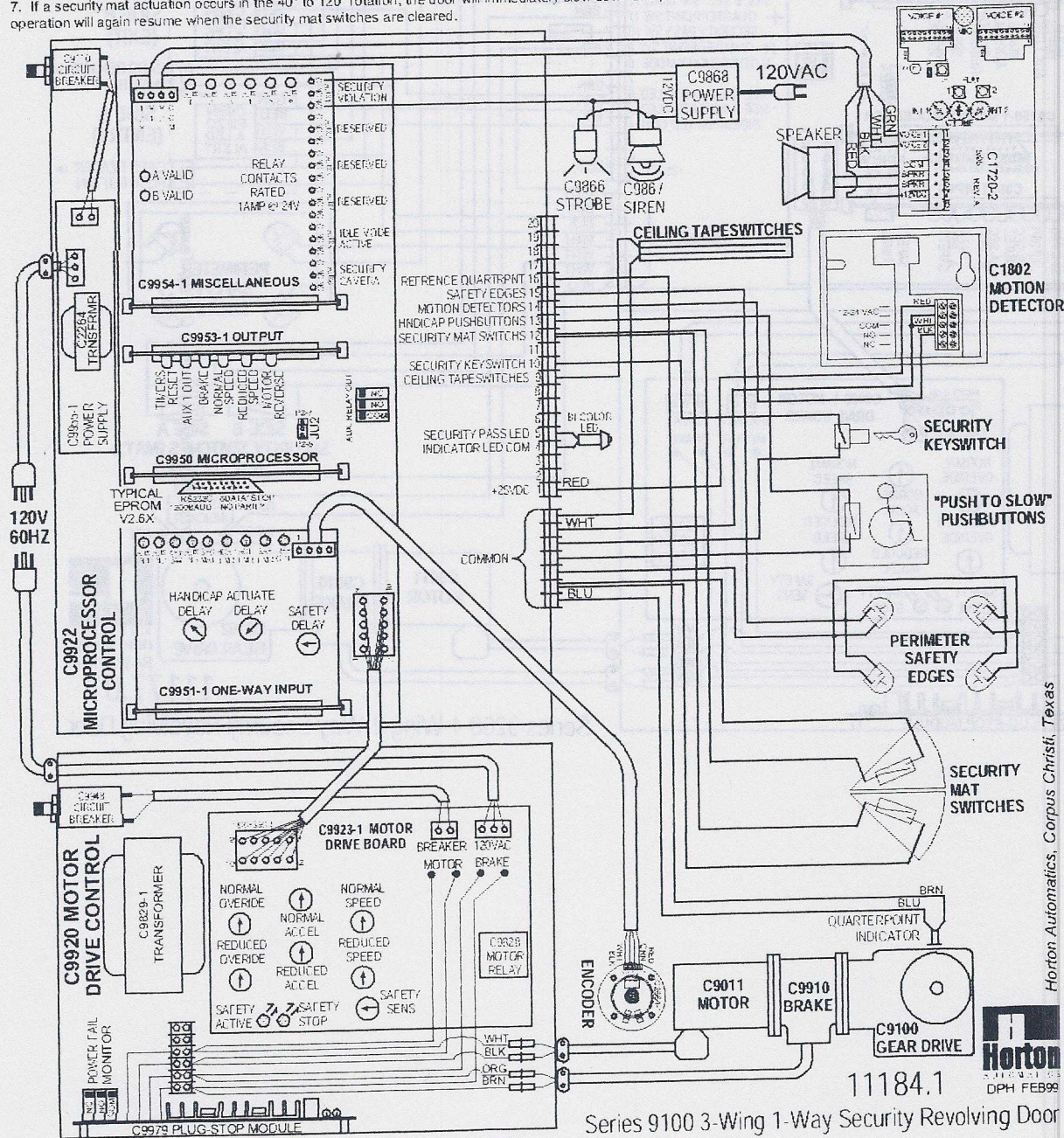
B.) If the ceiling mounted tapeswitches are actuated.

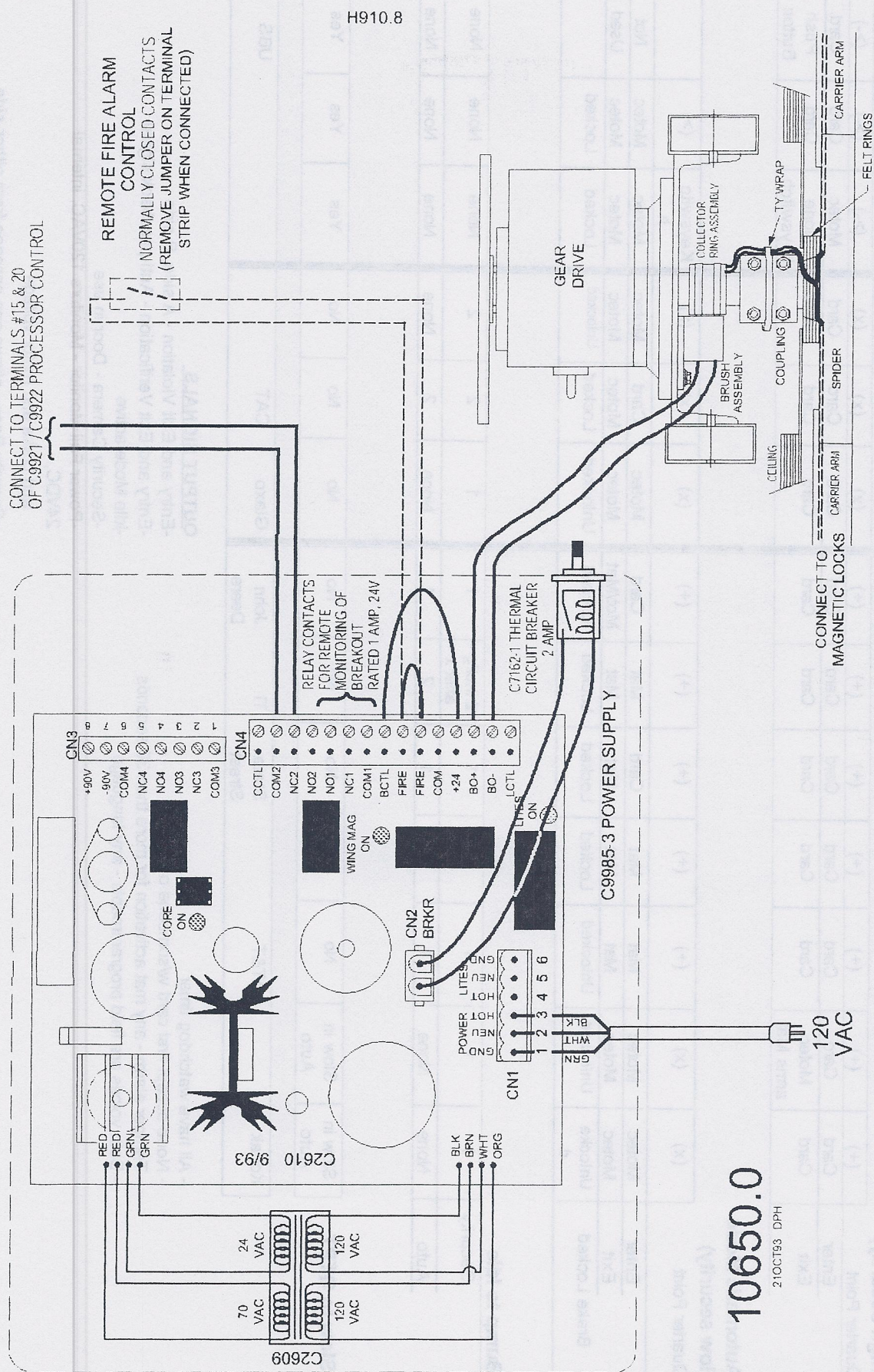
C.) If the security mat switches are actuated between 30° and 40° of door rotation from the "Y" position / 0° reference point. It is assumed an actuation at this time occurs at the last minute and deliberately attempting to breach security.

is due to someone attempting to jump into the security mat area at the last minute and deliberately attempting to breach security.

6. If a security mat actuation occurs in the 0° to 30° rotation, the door will immediately stop, annunciate "Security Violation, Door will Reverse", and slowly backup to the

7. If a security mat actuation occurs in the 40° to 120° rotation, the door will immediately slow down and proceed to the next "Y" position / 0° reference point. Normal operation will again resume when the security mat switches are cleared.





J. C9985-3 POWER SUPPLY WIRING DIAGRAM

SERIES 9100/9200 SECURITY DOORS STANDARD SECURITY LOGIC

3.00R1	3.05R1	3.10R1	3.12R1	3.15R1	3.16R1	3.20R1	3.40R1	3.45R1	3.50R1	3.60R1	3.80R1	3.80AR1
2.00R3	2.05R3	2.10R3	2.12R3	2.15R3	2.16R1	2.20R1	2.40R4	2.45R4	2.50R1	2.60R1	2.80R1	2.80AR1

9200 CARD ACCESS

\$3,000 LIST ADD

DIRECTIONAL CONTROL

Secure Mode (high security)

Quarter Point	(+)	(+)	(+)	(+)	(+)	(+)	(x)	(x)	(x)	(>-)	(>-)	(>-)
Enter	Card	Card	Card	Card	Card	Card	Card	Card	Card	Motec	Card	Card
Exit	Card	Motec	Card	Card	Card	Card	Card	Card	Motec	None	Card	Card
		ams Mat								keyswitch	Card	Push Button

Automatic Mode (low security)

Quarter Point	(x)	(x)	(+)	(+)	(+)	(+)	(x)	(x)	(x)	Keyswitc h	(>)	
Enter	Motec	Motec	Mat	Mat	Card	Mat	Card	Card	Motec	Motec	Motec	Not
Exit	Motec	Motec	Mat	Mat	Mat	Mat	Mot/Mat	Motec	Motec	Motec	Motec	Used
Brake Locked	Unlocked	Unlocked	Locked	Locked	Locked	Locked	Locked	Unlocked	Locked	Locked	Locked	

Bump to Idle

Security	1	1	1	2	1	2 incl'g after x	1	1	2	None	None	None
Auto	None	None	1	2	1	2	1	None	None	None	None	None

Slow to QTPT

Slow in Auto	Slow in Auto	No	No	No	No	No	No	No	No	Yes	Yes	Yes
Kodak	AT&T	State	TI	John Deere	Glaxo	CAT	UBS					

- All have watchdog timer

- None accept first card w/someone on mat

- Tamper alarm - any mat activation for more than 30 seconds

- Both voices are field programmable - any language

OUTPUT SIGNALS

-Entry and Exit Violation - A side, B side

-Entry and Exit Verification - Anti-passback signal

-Idle Mode active

-Security Camera - Door in use

-Power Fail Monitor - Monitors 120VAC, internal 24VDC,

and brake and motor voltage

-Security Pass - allows one passage from either side

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

Form H810, JAN 2003, printed in U.S.A.



Internet: <http://www.horton.com>
Fax: 800-551-3102, 361-882-6518
Tel: 800-531-3411, 361-828-2291
Toll-free U.S.A. 1-800-531-3411
Corporate Office

4342 Baldwin Boulevard

International Fax: +44-1923-670181
International Tel: +44-1923-670189
Tel: 01923 670189 Fax: 01923 670181
Telford, Shropshire, England TF1 7YX
Unit A, Hornwood 31
Horton Automotive Ltd.



4242 Baldwin Boulevard
Corpus Christi,
Texas, U.S.A. 78405-3399
Tel: 800-531-3111, 361-888-5591
Fax: 800-531-3108, 361-888-6510
Internet: <http://www.hortondoors.com>

A Division of Overhead Door Corporation, A Sanwa Shutter Company

Horton Automatics, Ltd.

Unit A, Hortonwood 31
Telford, Shropshire, England TF1-7YZ
Tel: 01952 670169, Fax: 0192 670181
International Tel: ++44-1952-670169
International Fax: ++44-1952-670181

Form H910, JAN 2003, printed in U.S.A.

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