

Industrial Door

C6150 Control Microprocessor Control

For door operators with Version 4 Software

Field Quick-Start Instructions and Common Questions and Answers

H604, 2/96

Revised 2/97

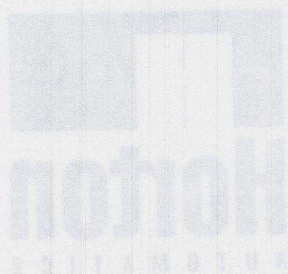


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Revised 2/97
Horton 2000

SERIES 6000 SLIDE DOOR OPERATOR

with C6150 Control and Version 4 Software

SECTION 1: QUICK-START INSTRUCTIONS

To get this operator up and running, do the following:

1. After completing the mechanical installation, proceed as follows:
 - a. Wire the motor/encoder assembly to the control. The terminal strip on the back of the motor includes connections for both the motor and encoder. Follow the wiring diagram provided (Drawing #11190). The motor is wired to CN4 on the C6475 board inside the control; the encoder to CN7 on the C6465 board.
 - b. Wire the close monitor reed switch to the control. The terminal strip for the reed switch is located on the motor bracket. Connect the wires to terminals #10 and #11 of CN2 on the C6465 board. Push the door fully closed, then attach the monitor switch magnet and bracket to the operator belt so that switch and magnet face each other when the door is fully closed.
2. Check the incoming power for proper voltage (**120VAC only!!**) and connections. Pin 1 of connector CN1 on the C6475 board is to be wired to the HOT side of the AC line (normally black-US or brown-international). Pin 2 of CN1 is for the NEUTRAL side of the AC line (normally white-US or blue-international). Pin 3 of CN1 is frame ground (green-US or green/yellow-international).
3. If you do not plan to use a 3-button station or an emergency stop switch, a jumper must be present between pins 15 and 16 of CN2, the main input connector. This wiring is normally done for you at the factory.
4. Set reversing sensitivity adjustment R9 fully counter-clockwise. Do not wire any motion detectors, safety beams, or other accessory devices at this time.
5. **Caution**, door will move! Move the door manually to a position in mid-stroke. Set slide switch S5 in the control to the **ON** position, and while holding down the **SET** button in the control, apply AC power.
 - a. The display should wink the version number in two parts (as in 4. then 03). The control will then check for the presence of a monitored lock. If no lock is present, or the lock does not have a monitor switch, **nL** (no Lock) will display briefly. *If a Horton C9910 in-line lock is installed, it will be taken care of in step 11 later. The nL indication is no cause for concern.*
 - b. Next, the display should indicate **FC** (for first run - Finding Close stop), and the door should fully close at slow speed. *If the door moves in the open direction instead, immediately turn off power and reverse the motor leads, either at the motor, or at pins 1 & 2 of connector CN4 on the C6475 board, then repeat step 5.*
 - c. When the door has fully closed, the yellow CLM (close monitor) indicator should come on, the display should switch to **FO** (for first run - Finding Open stop), and the door should drive fully open at slow speed.
 - d. After a brief delay, the display should show **tS** (total Stroke), followed by the stroke found in inches. *If instead of tS the display shows EP, this indicates that the encoder is "phased" improperly for the installation. Remove control power, reverse the green and white encoder leads (either at the encoder, or at the control), and repeat step 5.*
 - e. After **tS** is indicated, followed by the measured stroke, **dS** should display, indicating that the stroke and other factory default parameters are now stored in permanent memory. Finally, the display should switch to **d1**, and after a one second time delay, the door will start closing normally. *If the display switches to OS after dS and the door refuses to move from the open position, look at the green TOG SW indicator on the left side of the control. If it's off, insure that switch SW5 is in the ON position.*
6. Depressing the **DOWN** button on the C6150 control will now actuate the door to open, time delay, and close at the factory selected default settings. Inspect for smooth operation, free of any binds, excessive noise, etc. Upon subsequent power-up or reset, the control will not need to open the door again to re-learn the stroke; it will simply close the door at reduced speed while indicating **FC** (for first run - Finding Close stop). The door is then ready to operate.
7. If any speeds or other settings need to be changed, follow this procedure:
 - a. Move switch S5 to the **OFF** position. The display will show **OS** (for Open Speed), the first parameter that can be adjusted.
 - b. Refer to the chart on page H604.2 and scroll through the parameter list using the **UP** and **DOWN** buttons until you find the parameter you wish to change. When you've found it, press and hold the **SET** button. The display will now change to show the current value or setting of the parameter. While holding the **SET** button down, press or hold **UP** or **DOWN** to modify the setting. When the **SET** button is released, the display once again shows the parameter you just changed. You may then change another parameter, or turn switch S5 back on to check the change(s) you just made. The chart also shows the factory default settings for each parameter.
8. If you changed any adjustments, after you are satisfied with all control settings, insure that switch S5 is **ON**. Press and hold the **SET** button on the control until **dS** (data Saved) displays. All of your settings are now stored in the control's memory. You must perform this step if you changed any settings, otherwise the control will go back to the factory default settings after a reset or power failure!
9. Set the reversing sensitivity as desired using adjustment R9. Do NOT leave this adjustment at minimum!!
10. Install all accessory devices and wire them to CN2. If an external on/off toggle switch is added, reset switch S5 in the control to the **EXT** position. Check all devices for proper operation.

11. If you have a Horton C9910 in-line brake for door locking, wire the brake to terminals #4 and #5 of connector CN4 on the C6475 power supply board (polarity does not matter). Follow steps 7 and 8 above to set parameters LL and HL to on for the control to recognize the lock. Check for proper door locking and make mechanical brake adjustments if required.

This concludes the electrical installation and set-up.

The following chart shows all of the adjustable parameters. Refer to steps 7 and 8 on page H604.1 to make any necessary changes.

CODE	PARAMETER	FACTORY PRESET VALUE	ADJUSTS
OS	Open Speed	10	0-15
CS	Close Speed	12	0-15
OC	Open Check	6	0-15
CC	Close Check	6	0-15
OU	Open cUshion	4	0-15
CU	Close cUshion	4	0-15
d1	delay time 1 (full)	1 sec	1-199
d2	delay time 2 (partial)	1 sec	1-199
d3	delay time 3 (safety)	3 sec	1-199
CP	open Check Point	75% of stroke	50-90% tS
PO	Partial Open position	8"	8"- tS"
tS	total Stroke	(as determined by learn cycle)	20-199"
ct	cycle test	oF (no)	oF/on
AS	AutoSeal	oF (no)	oF/on
St	Stop OK on first run	on (yes)	oF/on
Hd	Heavy-duty door/motor	oF (no)	oF/on
PF	Power Fail	OP (power fail OPen)	OP/CL
Sn	Safety nosings	oF (no)	oF/on
Cb	Close braking	on (yes)	oF/on
br	brake on recycles	on (yes)	oF/on
SL	SLOW open speeds	oF (use regular open speeds)	oF/on
tC	turboCharge open speeds	oF (use regular open speeds)	oF/on
rA	reduced Acceleration	oF (use standard acceleration)	oF/on
3t	3-button station	oF (standard switches, not 3-button)	oF/on
LL	Lock present	oF (on if monitored lock found)	oF/on
SA	Fail-SAfe lock	oF (fail-secure/on if fail-safe lock found)	oF/on
UL	Unmonitored Lock	oF (monitored lock)	oF/on
HL	Horton in-line Lock	oF (standard lock, not in-line type)	oF/on
LO	Lock Open	oF (lock in closed position only)	oF/on
rP	reverse on encoder Pulses	on (Version 4.02 & up only)	oF/on
JS	Jam Sensing	on (Version 4.03 & up only)	oF/on

Note: a double dash (--) is a reserved parameter that is not implemented.

SECTION 2: OTHER DISPLAY CODES

(Version 4 software)

The following initialization, error, and diagnostic codes may also be displayed at various times:

==	Control is braking door.		cycle.
dS	Setup data stored.	nS	No close monitor microswitch found when expected.
Id	Door is closed and idle (waiting for actuate signal).	UF	Unlock failure of (monitored) automatic lock.
LA	Door is latched in full open position.	LF	Lock failure of (monitored) automatic lock.
PC	Partial open check (when partial opening is activated).	EF	Encoder failure.
nL	No automatic lock found.	LP	Loss of pulses from encoder.
IL	Interlocking active - contact on CN2, pin 20 inhibiting door open.	EP	Encoder phasing wrong.
nL	No lock found (or lock does not have monitor switch).	Et	Encoder test starting.
SE	Fail secure automatic lock (with monitor switch) found.	CL	Close direction pulse received during encoder test.
SA	Fail safe automatic lock (with monitor switch) found.	OP	Open direction pulse received during encoder test.
FC	First run - finding fully closed position.	SF	Stroke determination failure (measured stroke outside limits).
FO	First run - finding fully open position.	dF	Data storage failure.
J1	Jam sensed - door not moving at beginning of open or close cycle.	bF	Battery failure (when optional battery pack is installed).
Pd	Pedestrian (actuating or safety device) stopping "learn"	dd	Dimple type door option in use (jumper W4 installed).
		dE	Dimple error - door unable to climb out of dimple.

SECTION 3: COMMON QUESTIONS & ANSWERS

(Version 4 software)

*** QUESTIONS ABOUT CONTROL SET-UP ***

Q1-1 How do I reset the stroke stored in the control?

A1-1 Instruct the control to do a full 'learn' cycle by pressing and holding the SET button down while momentarily pressing RESET, or hold the SET button down while powering up the control. The control will restore all the factory default settings, learn the new stroke, and store all the information.

Q1-2 Can the control re-learn the stroke without changing any of my other settings?

A1-2 Yes. In Version 4.01 & later, holding both the SET and UP buttons while momentarily pressing RESET or powering up will retain all of your present settings except for the stroke.

Q1-3 How do I verify the stroke that a particular control is set to?

A1-3 Locate the tS parameter in the parameter list, and press SET to view it. The stroke will be displayed in inches. The total stroke can also be modified via the UP and DOWN buttons, but it's not recommended - we suggest letting the control determine the stroke automatically with a full learn cycle instead.

Q1-4 What are the default settings in the parameter list when I force the control to do a full learn cycle?

A1-4 Refer to the chart on page H604.2, which shows all the defaults.

Q1-5 I changed some settings, but every time I reset the control or there's a power loss, the control goes back to its original settings! What's going on?

A1-5 You must remember to save the settings you decided on before you leave the job site! To save your new settings into permanent memory, either the toggle circuit must be on, or switch S5 must be in the ON position (door must be in normal operation). Push and hold the SET button until the display shows dS. Your new settings are now stored. Data is only stored when the door arrives at the fully closed or open positions; also, note that normal door operation is disabled until the SET button is released.

Q1-6 I would like to move the point where the door goes into open check.

A1-6 Locate the CP (Check Point) parameter and modify it. This parameter is in inches of stroke and can be set from 50% to 90% of the total stroke learned on start-up.

Q1-7 I changed the total stroke manually, and the control also moved my check point. Why?

A1-7 This is normal, and is done to properly re-locate the open check point. You should have set the total stroke first, or allowed the control to automatically learn it, then reset the open check point to your desired value.

Q1-8 I changed some parameters and really messed things up. How do I get back where I started?

A1-8 Assuming that you haven't saved the new "messed up" parameters, simply pressing RESET will restore all of the settings you had before you started tinkering. If you did a data save, your original parameters are lost, and you will have to do a complete learn cycle to get back to a parameter set that at least works in your door.

Q1-9 The door goes through its full learn cycle, then the control starts flashing SF until reset. Why?

A1-9 This code indicates a 'Stroke Failure' - some encoder pulses were found, but not enough. Check the encoder and associated wiring carefully, and verify that the encoder wheel and other mechanical parts are not slipping. The minimum stroke this control will accept is 20" if Horton's standard 10:1 gear drive and 3.183" drive pulleys are in use.

Q1-10 When I power up the control, the door closes slowly on its first run, then the display starts flashing nS. What gives?

A1-10 This stands for 'no Switch' - the close monitor switch is not supplying a "door fully closed" indication to the control. Check your switch, its mechanical adjustments, and its wiring. Note that when a C6150 control is used, a close monitor switch must be provided. This is an added requirement compared to the earlier C6160/C6160W control.

Q1-11 My door seemed to set up properly, but then it refused to close and the display is showing St. What's wrong?

A1-11 This is the Stop code - the pushbutton "stop" input (SW-D, pin 16 of CN2) is active. This is a normally closed input - pin 16 must be jumpered to common (pin 15) for the door to work if a stop button isn't installed.

Q1-12 There's a red LED marked +100 next to the display that comes on when some parameters are accessed.

A1-12 This LED shows that you must add 100 inches (or seconds) to the display value. Think of it as a third '1' digit in front of the other two.

Q1-13 I installed a very heavy door (over 400 pounds), and/or am using a 1/2hp heavy-duty motor, and the braking seems very abrupt. Why?

A1-13 The standard braking on the C6150 control is optimized for light to medium weight doors with 1/4hp standard motors, and will suffice for the vast majority of applications. When installing a very heavy door or using a 1/2hp motor, you should set the Hd (Heavy duty) bit to the on position. This will change the braking to a more gentle curve and minimize wear and tear on the door and operator. Note that with the different braking, you may have to move the check point back and/or slow the door down a little to achieve smooth operation.

Q1-14 I can't get the toggle switch that I added to work. It doesn't do anything.

A1-14 Locate slide switch S5 on the control board underneath the UP, DOWN, and SET buttons. It is a three-position slide switch which must be set to **EXT** (EXternal switch) for an outside toggle switch to work. The other two settings of the slide switch override the external switch and force the door OFF or ON.

Q1-15 I installed a switch for partial opening operation and set the PO parameter for 36", but I'm getting 72" of partial opening on my bi-part operator. Why?

A1-15 All measurements in the C6150 control are based on inches of stroke, not inches of door opening. The 36" setting will yield a 36" door opening on single-slide operators - but for bi-part doors, you would set PO to 18".

Q1-16 I installed a stop button and wired it to pin 16 as shown on the drawing. When I push it and St displays, how do I get the door to run again?

A1-16 To recover from a stop signal, you may actuate the door with any of the standard inputs - partial open with delay, full open with delay, or latch - and the door will continue opening as if nothing had happened. You may also momentarily depress the DOWN button (service aid) to continue opening. Finally, actuating the "close" input (SW-C, pin 14 of CN2) or turning the toggle switch circuit off and back on again will continue the close cycle.

A1-17 I want to add an emergency stop switch. How can I do this?

A1-17 It depends on the switch type. All stop switches should have normally closed (NC) contacts. If you have a momentary switch, wire it between pins 15 and 16 of CN2. This is input SW-D as described above. If you have a "mushroom" palm switch or other switch that has maintained contacts, Horton recommends wiring it into the toggle circuit at pins 8 and 9 of CN2. In this case, the slide switch in the control box must be set to **EXT**. The door will stop when the switch contact is broken, and will remain disabled until the contact is restored.

Q1-18 My customer wants a three-button (open/close/stop) garage door type control box. Is this possible?

A1-18 This feature is built in as well. Find the 3t (3-button) station option and turn it on. Wire the pushbuttons as follows: open to pin 2 of CN2; close to pin 14; and stop to pin 16. The other side of all switches goes to common. **Note:** The 'stop' button must be normally closed - this is standard in three-button stations.

Q1-19 I installed a door with a three-button station, but all I get is a time delay following opening, then the door starts closing again.

A1-19 You forgot to turn on the 3t option.

Q1-20 How do the actuate inputs work on the C6150?

A1-20 The actuator system is very versatile and will meet the requirements for the vast majority of field installations. Basically, three actuate lines are available: latch, momentary full open with time delay d1, and momentary partial open with time delay d2. A full open input takes priority over a partial open input, and a latch input takes top priority. If the door has been opened to the partial open position and a full open input comes along, the door moves immediately to the full open position, executes delay d1, and closes. If the door is in the partial open position and a latch input arrives, the door moves immediately to the full open position and latches open - code LA will display. There are also optional input lines for close and stop which are discussed more fully above.

Q1-21 I need two delay times, one for full open and one for partial. Is this possible without extra equipment?

A1-21 No problem. Time delay d1 is used for full open, and d2 for partial open. Either may be set independently from 1-199 seconds.

Q1-22 When does the delay start?

A1-22 When the door reaches the partial- or full-open position and all the actuators have dropped out.

Q1-23 How is a safety beam trip (or reverser signal) handled in the C6150?

A1-23 The safety beam (or reverser) moves the door back to the last position used, either partial or full open, then executes time delay d3 and attempts to re-close the door.

Q1-24 I have a door or gate with a very long stroke, and would like a little more speed during opening. I already have the OS parameter maxed out at 15.

A1-24 Find the tC (turboCharge) option and turn it on. This selects an even higher speed bank for these installations. **Caution:** This operator is extremely powerful with tC on!!

Q1-25 I have a very small door, and even an open speed of '0' is too fast. Can I do anything about this?

A1-25 Yes, find the SL (SLoW speed) parameter and turn it on. This shifts the open speed range down to "low gear" for these installations. Note that you'll probably have to go back and increase the open speed setting after enabling SL - these speeds are quite slow. Also note that SL takes priority over tC.

Q1-26 I'm satisfied with the speeds I've selected, but the door seems to "take off" too abruptly (bumps anti-rise and/or jumps belt cogs).

A1-26 After insuring that belt tension is properly set, try locating the rA (reduced Acceleration) parameter and turning it on. This cuts the start-up acceleration in half and is better suited to some installations.

Q1-27 There seems to be a bit of hesitation when the door recycles open during closing. Why?

A1-27 To minimize wear and tear on both control and operator, we have chosen to default the br (brake on recycles) option to on in Version 4 software. This means that when a recycle is requested, the control actually brakes the door before recycling open. This prolongs belt and door life and is the preferred setting; however, if traffic requirements make this intolerable, br can be turned off and the recycles will be virtually identical to those of our other products.

Q1-28 I have safety nosings on this installation, and every time the nosings compress together as the door closes, they generate a false obstruction signal.

A1-28 Find the Sn (Safety nosings) parameter and turn it on. This will disable the safety beam/nosing input when the control switches to close cushion and will prevent this.

Q1-29 This is a door with a dimple track. What parameters do I need to change?

A1-29 Dimple door handling has been significantly improved in the C6150 control. To enable the dimple track option, find a small black jumper block covering two right-hand pins vertically near W4. Remove this block and place it horizontally over the two pins marked W4 instead.

When W4 is covered with the block, the control ignores loss of pulse situations while it clears the dimple in the open direction. A standard open speed of '3' is used for dimple climb-out. The door has a maximum of 6 seconds to climb out of the dimple; when it passes the 4.5" point, it accelerates to the open speed setting (if greater than '3') and continues a standard open cycle. On the first start-up run, if W4 is installed, dd (dimple door) displays until the control pulls the door up out of the dimple on the first run; then FO displays as usual while the door finishes its "learn" cycle. On Version 4.03 & later, dd also appears during normal operation when the door is climbing out of the dimple.

If the C6150 control cannot pull the door out of the dimple, it flashes dE (dimple Error) for 5 seconds while it cools off; it then tries again.

*** QUESTIONS ABOUT THE BUILT-IN DIAGNOSTICS ***

Q2-1 How do I run the encoder test?

A2-1 To run the test, press and hold the DOWN button while momentarily pressing RESET or powering up the control. The display will show Et (Encoder test). You may now release the DOWN button. As you slowly push the door, the display will wink OP if the door is opening, or CL if it's closing. You should push the door in both directions at least a few inches to confirm normal encoder operation. To exit the encoder test, press RESET.

Q2-2 Is there a way to manually cycle the door without using a jumper wire?

A2-2 Yes. Any time that the toggle switch input is active and the door is ready to run, the DOWN button is configured to simulate a detector input. This allows manually testing door operation. You may also set the ct option to cycle test the door repetitively if desired. Furthermore, if the door was latched open by the pull chain input (LA is showing on the display), the DOWN button will switch from latched open to delay mode and allow normal closing after delay d1.

*** QUESTIONS ABOUT LOCKS AND DOOR LOCKING ***

Q3-1 I want to add a lock. What should I do?

A3-1 The "typical" lock for an industrial door is Horton's C9910 in-line brake lock; however, locks are supported in a variety of ways in the C6150. You may also use Horton's locks for standard S2001 operators, magnetic locks, bi-stable (two coil) locks, or even screw-bolt type locks. If a standard Horton in-line brake lock is to be used, follow step 11 on page H604.2 to set the control properly.

Q3-2 What are the advantages and disadvantages of Horton's C9910 brake lock?

A3-2 The C9910 is a convenient way to add a fail-safe lock to the door operator. It is a 90V unit that is supplied by the same circuitry in the control that operates the motor, so no external transformer supply is needed for the lock. Also, the lock is mechanically "in series" between the motor and the gear drive, making installation easy. The two disadvantages of this locking scheme are (a) somewhat longer reaction time for the brake to unlock when an open cycle is requested compared to other locks, and (b) a very high frequency whine emitting from the brake itself (about 11 KHz) that is present at all times when the brake is engaged (this noise is normally not even heard, but it could be distracting in very quiet locations).

Q3-3 I'm using the C9910 brake lock, but my LOCK light never comes on. Is this normal?

A3-3 Yes. If the C9910 is in use, the regular LOCK output (and light) is not needed and is disabled.

Q3-4 If I add a magnetic or other non-Horton lock, how do I do it?

A3-4 The C6150 comes standard with a relay to drive non-Horton locks. These relay contacts are brought out to CN8 on the control board, and are clearly marked. Horton recommends using an external transformer to power your lock. Wire the lock and its power supply in series with the appropriate relay contact (typically, you will use the "normally closed" or NC contact for magnetic locks, and the "normally open" or NO contact for bolt locks). You must set the LL option to on so the control knows that a lock is present, and also set the UL (Unmonitored Lock) option to on since the lock doesn't have a monitor switch. The control will insert a fixed 3/4-second delay to allow the lock to clear before it attempts to open the door. During this delay, UL will display.

Q3-5 Is there a way to tell the control that it now has a lock without losing all of my preset speeds, check point, options, etc.?

A3-5 Yes, if you've already set other parameters and don't want to lose this information, look up the lock parameters LL, SA, UL, bL, and HL, and set them manually for the type of lock you're using. Normally, only parameters LL and HL will be on if a C9910 brake lock is added. (The control "knows" that this type of lock is always unmonitored, so parameter UL doesn't matter.) Don't forget to do a data save after you change the parameters!!!

Q3-6 I added a lock, and the door binds up against it.

A3-6 You forgot to tell the control that it now has a lock to deal with. See the answers above and re-configure the control.

Q3-7 My door binds against its lock, and I get a UF on the display.

A3-7 This means "Unlock Failure." The control is most likely looking for a non-existent lock monitor switch. If the lock does not have a monitor switch, you must turn the UL parameter on so the control knows the lock is unmonitored.

Q3-8 My customer wants a bi-stable (two-coil) lock. Is this possible?

A3-8 Yes - although Horton does not recommend bi-stable locks, the control will support them. Consult Horton to order the proper kit for this type of lock before installation. Set both option parameters LL and bL to on. Note that bi-stable locks must have a monitor switch for proper operation. Also note that the control cannot determine the presence of a bi-stable lock on power-up; you must manually set this option. Finally, fail-safe and fail-secure have no meaning for a bi-stable lock, so the SA parameter does nothing.

Q3-9 My door has both a battery pack and a lock, and I have the PF parameter set for power fail close. Will the door lock after closing?

A3-9 It depends on the lock type. Magnetic locks and Horton's C9910 in-line brake lock obviously are fail-safe and will leave the door unlocked, since there's no power to operate the electromagnet. With a fail-secure or bi-stable lock, the door will always lock after closing.

Q3-10 I have an inexpensive lock, and it buzzes (or burns out!) if the door is latched open for extended periods. What can I do?

A3-10 Find the LO (Lock Open) option and turn it on. This drops the lock when the door is latched open and prevents this problem. When the door is unlatched to close, it will first re-energize the lock, then start closing.

*** QUESTIONS ABOUT THE OPTIONAL BATTERY PACK ***

Q4-7 Which battery pack, self-monitored or standard, does Horton recommend?

A4-7 We strongly recommend that you stick with the standard version of battery pack unless there is a compelling reason not to. There are a variety of reasons as follows:

1. U.S. door operators typically use mechanical protection (e.g. breakouts) as the primary means for safety-to-life concerns - the battery pack operation is secondary.

2. ANSI standards for automatic doors in the U.S. do NOT require periodic testing of battery packs.

3. The battery manufacturers have stated that regular periodic testing is not only unnecessary, but it actually shortens the life expectancy of the batteries.

4. Eliminating the self-test circuitry reduces complexity (and hence, price). Finally, reliability is also enhanced, since there are fewer components.

Q4-1 I added a battery pack for power failure protection. Is there anything else I have to do besides plug it into CN3?

A4-1 You should set the PF parameter in the configuration to either OP if you want power fail open, or CL if you want power fail close.

Q4-2 Do the batteries continue to drain after the door completes its cycle on power failure?

A4-2 No.

Q4-3 My door is stuck open, and the display is flashing bF.

A4-3 You have a self-monitoring style battery pack, and the batteries may be defective; or, if the pack was just installed, the batteries may need to be charged. The orange 'FAIL' LED on the battery pack will also be lit when bF shows. Push the **FAIL RESET** button in the battery pack assembly to attempt to clear the condition. The **FAIL** indicator may or may not go out. If it goes out, do a manual battery test as explained below to determine whether the failure was due to a remotely possible 'glitch' or is really indicating a battery failure. If necessary, replace the batteries or the complete assembly.

Q4-4 Can the batteries be tested manually?

A4-4 Yes. If you have the unmonitored version of the pack circuitry, simply unplug power to the control, or turn off the breaker supplying power to the door. The display should switch to PF within 1 second, and the door should open or close, depending on whether the PF option bit is set to OP or CL. After the door arrives at the proper position, the entire control should go dead until power is restored. When power is restored, the red CHARGE indicator on the pack circuit board will glow for 4-6 minutes, then will dim and go out completely (this assumes that the batteries were fully charged when you performed the test).

If you have the self-monitoring version of the pack circuitry, press and hold the TEST button on the pack circuit board until the yellow TEST indicator comes on, then release it. The pack is now self-testing to insure that enough battery power is present to open or close the door for one cycle. If all is well, the TEST indicator will go out after about 15 seconds, and the red CHARGE indicator will come on. It will glow for 5-7 minutes, then will dim and go out completely (this assumes that the batteries were fully charged when you performed the test).

Q4-5 How often is the battery pack tested?

A4-5 In the self-monitoring pack, the batteries are tested immediately upon power-up and at least once every hour thereafter.

Q4-6 What happens if the pack test fails?

A4-6 A battery failure will move the door to the full open position. The door will stay open and the display will flash bF until the failure is corrected.

*** MISCELLANEOUS QUESTIONS ***

Q5-1 I arrived at the job site for troubleshooting, and the C6150 is flashing nS. The switch seems OK, and the yellow close monitor LED lights when the switch is tripped. What else could be wrong?

A5-1 Anytime that nS flashes, the door is not arriving at the fully closed position. Check for a mechanical jam at some point in door closing. Also, this will normally never happen if the reversing sensitivity is adjusted properly - the door will recycle instead when the obstruction is encountered. Find and correct the cause of the obstruction, then check the reversing sensitivity.

Q5-2 When the door starts opening, it slows down almost immediately, then slowly increases speed and eventually shuts off. The display flashes EF momentarily. Why?

A5-2 This display means 'Encoder Failure.' The position encoder is not connected, or is defective. Check your encoder wiring and run the quick encoder test.

Q5-3 When I try to store values, my control starts blinking dF and quits working until reset.

A5-3 The control has failed and must be replaced.

Q5-4 I keep blowing fuse F1. What could be wrong?

A5-4 The first thing to do in this situation is pull the motor/brake plug from connector CN4. Replace the fuse with a slow-blow 5A 5x20mm fuse (T5A). Power up the control again, and see if the new fuse holds with CN4 disconnected. If the fuse blows again, the control should be replaced. If the fuse holds, check the motor and motor harness assembly for a defective motor or a short between motor and frame ground. Also inspect the brake and its wiring, if one is present. If everything seems OK, check for mechanical binding or excessive friction in the operator and door itself (guides, track, wheels, etc.) **Caution**, disconnect power and wait 30 seconds before servicing the control fuses!

NOTE: If fuse F1 continues to blow at totally random intervals, there is a good possibility that the door is being locked manually without turning off the toggle circuit first. If Version 4.02 or earlier is installed, upgrading to a later version will normally circumvent this problem with the new jam sensing feature. See question 5-17 for more details.

Q5-5 The LIMIT light is coming on. Why?

A5-5 Any time that the LIMIT light comes on, it indicates that the control is protecting the drive system against excessive current. If door operation is reasonably normal, check for mechanical binds and other conditions that might cause excessive friction. It is also possible for the LIMIT light to come on briefly during normal operation of very large doors, especially with 1/2hp motors. If this is the case, brief flashes of the LIMIT light are no cause for concern.

If door operation is not normal and the LIMIT light is coming on, check the motor for a shorted armature or a frame short to ground. Also inspect for pinched or frayed motor wires. If the installation has a Horton brake lock, check its wiring and its coil as well, since it is also driven off the motor supply and could be drawing excessive current.

Q5-6 How do I know what software version I have?

A5-6 Reset the control. The version number will be displayed sequentially in two parts, as in 4. and then 03 (Version 4.03).

Q5-7 I installed a control with a non-Horton operator (Seino chain drive, for example). The displayed stroke is wrong, yet everything seems to operate properly. Is there a problem?

A5-7 All computations in the C6150 control are correct only when used with Horton's belt drive operator, where 1 pulse = 0.125". The control will work properly with other operators, but the inch measurements will not be correct in these cases.

Q5-8 Why is an open speed of '0' faster than a close speed of '5'?

A5-8 The control is working properly. In order to get maximum adjustment range and limit maximum closing speed, an open speed of '15' is approximately 140VDC, but a close speed of '15' is only around 80VDC.

Q5-9 I accidentally shorted the +24VDC control output to ground, and the whole control went dead. What do I check?

A5-9 Fuse F2 on the C6475 power supply assembly protects the low-voltage wiring. Replace it with a slow-blow 3.15A 5x20mm fuse (T3.15A) - Buss type GDC3.15, or equal. Also, if you have a battery pack, fuse F1 on the battery pack will be blown. Replace it with the same type fuse. **Caution**, disconnect power and wait 30 seconds before servicing the control fuses!!

Q5-10 How do I tell which connections on the C6150 control are common?

A5-10 Any terminal number with a period after it (4. 7. 9. 11. 15. 21.) is a common connection. These are all tied together internally.

Q5-11 How do I tell which connections are for power?

A5-11 The two +24V power terminals (1 & 5) have a small "DC power" symbol (⎓) next to them for your convenience.

Q5-12 Is the control common tied to ground inside the control?

A5-12 Not directly. To protect against noise, there is an AC path (10K Ω in parallel with 0.1 μ F, for those who are technically minded) from control common to frame ground, but if you install a beam set or motec that has its case grounded, or accidentally short from common to the door frame, everything will still work normally.

Q5-13 Is there a battery that saves the door parameters? Do I need the optional battery pack to save the parameters?

A5-13 To both questions, no. Control parameters are saved in a special chip called an E²PROM, which does not require a battery. When you save your parameters in the E²PROM, they will be retained for the lifetime of the control.

Q5-14 What are the Input characteristics?

A5-14 All inputs are well protected against EMI and random triggering, and are +5VDC levels. For an input to operate, the resistance must typically drop below 780Ω. A large amount of hysteresis protects against jittering - for the same input to release once it's triggered, the resistance must rise above 1800Ω or so. Typical current requirement per input is 8mA, and the inputs will not respond for about 2.5mS following activation. These requirements are well suited to the vast majority of applications with dry contact signals (e.g. mechanical switches, motecs, card readers, safety beams).

Q5-15 I need interlocked operation of two or more doors with C6150 controls. Is this supported?

A5-15 Yes. First, jumper pins 20 and 22 of CN2 on each control to be interlocked. Next, run a two-wire bus cable between each control - this connection and common. (All of the control pin 20s and pin 22s will be connected together, and all of the control commons as well). When a door is actuated, all the orange SW-H "busy" indicators in every control will light. If an actuate signal for any other door is presented, its display will indicate IL (InterLocking busy) and it will not open until the door that is currently open finishes closing. At this time, the SW-H "busy" indicators will go out, and any door may be opened. Note that this is "Level II" interlocking, where additional door requests are not memorized, but are simply ignored when a door is already open. If Level III true memory interlocking is desired, it is also available as an extra-cost option - consult the Horton factory for details.

Q5-16 What do the W1-W4 pins (J1) do on the control?

A5-16 Only W4 is currently used. Normally, there will be one spare jumper block installed over two ground pins (right hand pins) on W1-W4. This is the same as having no jumper blocks installed and is the default configuration for standard doors. If this block is removed and is placed over the W4 pins, dimple door operation is enabled (see discussion on dimple doors above). Positions W1-W3 are currently used only for factory testing and have no function.

Q5-17 The door begins opening, then immediately stops and flashes J1, followed by d1. It then cushions back closed after the sensors drop out. Why?

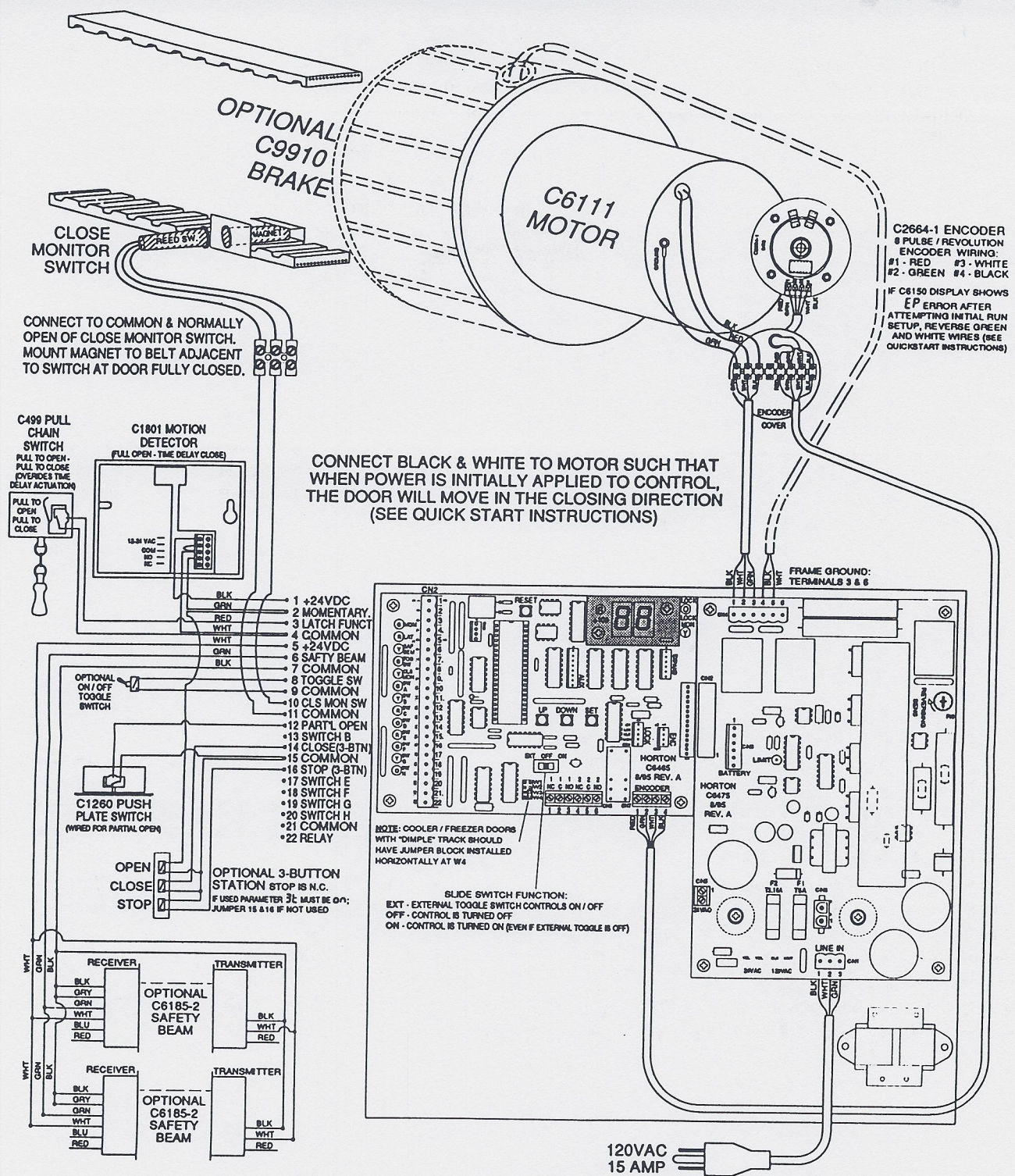
A5-17 Beginning in Version 4.03, the J1 (Jam 1) error appears any time that the door is starting to open or close and encounters a loss of mechanical motion for more than 0.1 second. This feature provides protection against blowing fuse F2 when the door has been locked manually (thumb turn, etc.) without turning off the toggle switch circuit. Other possible causes of the J1 code appearing include a defective or unplugged position encoder, a slipping encoder wheel, open motor, or no power to the motor circuit.

It is possible for this feature to cause problems if the open or close speeds are turned down enough to be extremely slow, although extensive testing at the plant has not revealed any difficulties. If a situation does come up where you are getting false J1 indications, the JS (Jam Sensing) parameter may be turned oF to defeat this feature. JS defaults to on in Version 4.03 software.

The J1 error is normally self-resetting; however, note that if any motion detectors or safety beams are held actuated after the error occurs, the door may have to be pushed open following manual unlocking, to let the first customer (or owner) in. When the detection devices time out, everything will be back to normal.

NOTE 1: If the C6150 control is retrofitted to an earlier operator that uses a 3ppr "paddle wheel" encoder, the JS parameter will probably need to be turned oF. These encoders do not generate pulses quickly enough to prevent timing out the software and generating a false J1 indication. If the customer persists in trying to run the door with it locked, your only recourse is to replace the motor/gear drive with an updated assembly having the 8ppr encoder. You may then leave the JS parameter on to protect against the situation.

NOTE 2: If dimple door operation is selected with jumper W4 (see question 1-29), jam sensing is automatically ignored regardless of the status of the JS parameter, due to the dimple in the track.



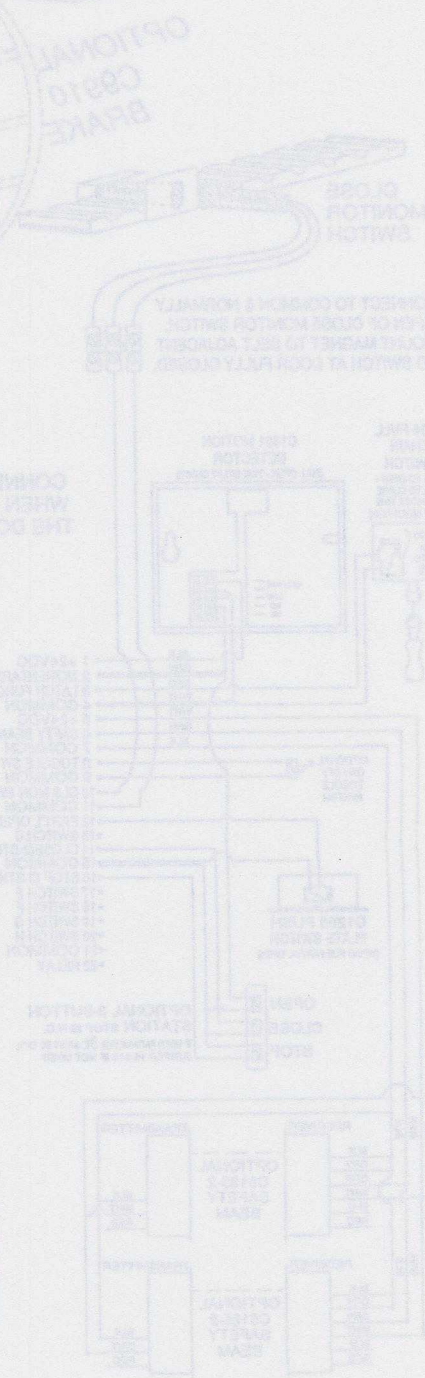
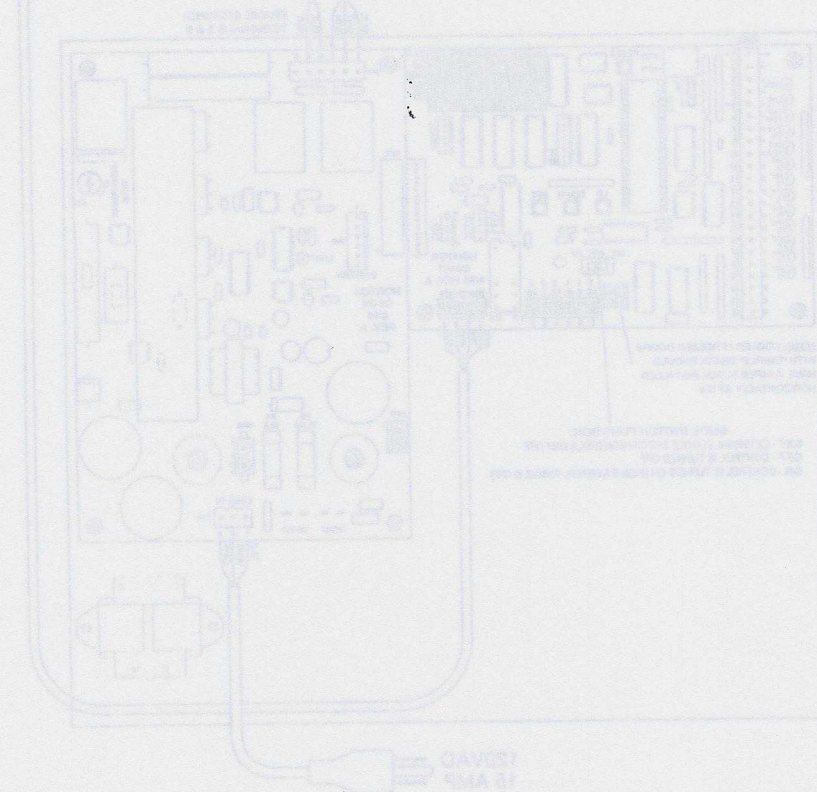
C6150 CONTROL PARAMETERS (Version 4)

##	Control is braking door.	IC	TurboCharged open speed mode (off / on)
ds	Setup data stored.	SL	Slow open speed mode (off / on)
TS	Total Stroke (measured in inches)	rA	Reduced Acceleration curve (off / on)
FC	First run - finding fully closed position.	br	Brake on recycle (off / on)
FO	First run - finding fully open position.	ct	Self-cycle test mode (off / on)
Pd	Pedestrian (actuating or safety device) stopping "learn" cycle.	Sn	Safety Nosings (reversing edge) present
ld	Door is closed and idle (waiting for actuate signal).	nS	No close monitor microswitch found when expected
dd	Dimple type door option in use (jumper W4 installed).	LL	Automatic Lock mode (off / on)
dE	Dimple error - door unable to climb out of dimple.	HL	Horton automatic lock present (off / on)
OS	Open Speed parameter	UL	Unmonitored lock present (off / on)
CS	Close Speed parameter	LO	Turn off automatic lock at full open position
OC	Open Check parameter	nL	No lock found (or lock does not have monitor switch).
CC	Close Check parameter	SE	Fail secure automatic lock (with monitor switch) found (off / on)
OU	Open Cushion parameter	SA	Fail safe automatic lock (with monitor switch) found (off / on)
CU	Close Cushion parameter	bl	Bi-stable automatic lock present (off / on)
d1	Time delay for momentary actuation to full open	UF	Unlock failure of (monitored) automatic lock.
d2	Time delay for momentary actuation to partial open	LF	Lock failure of (monitored) automatic lock.
d3	Time delay for safety beam (or reversing edge) recycle	EF	Encoder failure.
LA	Door is latched in full open position.	LP	Loss of pulses from encoder.
PO	Partial Open option (measured in inches)	EP	Encoder phasing wrong.
PC	Partial open check (when partial opening is activated).	Et	Encoder test starting.
CP	Check Point (measured in inches)	CL	Close direction pulse received during encoder test.
31	3-Button station option (off / on)	OP	Open direction pulse received during encoder test.
S1	Stop button on 3-Button station is pressed (or jumper 15 - 16 is missing)	SF	Stroke determination failure (measured stroke outside limits)
IL	Interlocking active - contact on CN2, pin 20 inhibiting door open.	PF	Power Fail option (off / on)
Hd	Heavy Duty braking - changes the braking curve for heavy doors	bF	Battery failure (when optional battery pack is installed)
AS	AutoSeal at full closed (off / on)	dF	Data storage failure.
Cb	Close braking (off / on)		

11190.1

GENERAL INSTRUCTIONS
 1. Read the instructions carefully before attempting to install or operate the unit.
 2. The unit is designed for use on 120VAC, 60Hz, single phase power.
 3. The unit is not to be used in wet or damp locations.
 4. The unit is not to be used in the presence of flammable or explosive vapors or gases.
 5. The unit is not to be used in the presence of magnetic fields or other electrical interference.
 6. The unit is not to be used in the presence of high voltage or high frequency electromagnetic fields.
 7. The unit is not to be used in the presence of high temperature or high pressure environments.
 8. The unit is not to be used in the presence of high speed moving parts or other mechanical hazards.
 9. The unit is not to be used in the presence of high speed moving parts or other mechanical hazards.
 10. The unit is not to be used in the presence of high speed moving parts or other mechanical hazards.

CONNECT BLACK & WHITE TO MOTOR SUCH THAT
 WHEN POWER IS INITIALLY APPLIED TO CONTROL
 THE DOOR WILL MOVE IN THE CLOSING DIRECTION
 (SEE QUICK START INSTRUCTIONS)



A Division of Overhead Door Corporation

Form H604, revised 2/97
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INSTALLATION INSTRUCTIONS

SERIES 6-3840 Automatic Industrial Fire Door and Series 6-3040 Non-Labeled Automatic Industrial Door DOOR OPERATOR SYSTEM

Horton Automatics
A Division of Overhead Door Corporation
4242 Baldwin Blvd.
Corpus Christi, TX 78405-3399
512-888-5591 1-800-531-3111
FAX # 1-800-531-3108

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Series 6-3840
Automatic Industrial Fire Door
And
Series 6-3040
Automatic Industrial Non-Labeled Door
Installation Instructions
Instructions To The Installer

This manual is intended to assist the installer with installation and adjustment of the door and operator and to serve as a guide for the owner so that he can keep them in good working order.

The door must be installed and adjusted properly to ensure its proper operation and safe use.

To install and adjust the door for proper and safe operation, the installer must carefully read these instructions before proceeding, then follow the instructions exactly.

This door is designed to be installed only by trained and knowledgeable installers.

The installer should be experienced in the installation of automatic entrances. He should know all local code requirements, NFPA 80 standards, and be familiar with the requirements for Power Operated Doors.

Fire rated sliding doors should be installed per NFPA 80 standards for fire doors and fire windows.

After Installation, the door must be adjusted to conform with Horton Automatics' recommendations and all code requirements. Be sure to carefully study the requirements included in the instructions.

After installation and adjustments, the installer's final responsibility is to properly instruct the owner in the safe use of the door. The installer must carefully explain how to perform certain daily safety check tests.

Each step, the installation, adjustment, and instructions, is important for proper and safe use of the door. If you have any questions about any item contained in these instructions, call Horton Automatics' Customer Service Department for assistance. Phone number 1-800-531-3111.

Information To Be Provided By the Distributor To The Owner

We suggest the distributor spend some time with the owner to discuss with him the operation of the door, location of related equipment, and preventative maintenance requirements. Door operation instructions are shipped with each door. This information should be turned over to the owner at the time of the discussion.

Discuss these items with owner:

1. Location of on/off switches and power circuits.
 2. Instructions on circuit breaker locations for operator.
 3. Necessary warnings not covered in these general instructions.
 4. Local phone number to call regarding problems or request for service. Caution the owner—if any potentially hazardous situation is suspected, lock the doors until a professional inspection is made and the problem is corrected.
 5. Daily safety check, plus all items of importance that are not included herein.
- The following information should also be furnished by the Horton Automatics distributor to the owner.

Date equipment shipped from Horton Automatics: _____

Date equipment placed into service: _____

Horton Automatics invoice number for warranty reference: _____

Equipment type: _____

Accessories included: _____

Owner's Information

We are pleased that you have chosen Horton Automatics Industrial Flex drive door systems. These products will offer many years of use as well as aid in energy conservation provided the door is properly installed and maintained.

This manual is intended as a guide for the owner so that he can keep them in good working order.

Regular inspections of the door and operator are required to maintain their safe and proper working order. Please acquaint yourself with and follow all instructions in this manual.

Horton Automatics Industrial Flex drive door systems are offered with many options. It is possible that this manual does not contain all of them. Individual shop drawings and wiring diagrams should be kept with this manual.

The installation instructions are included as part of the owner's manual. They are furnished as a matter of record for controlled use. However, **non-qualified persons should not use them to adjust or repair the operator.**

Service Availability

Horton Automatics' products are distributed through a nationwide network of independently owned companies that offer both installation and service.

For the local Horton Automatics' distributor in your area, call 800-531-3111 in the U.S. and 512-888-5591 outside U.S., or consult the yellow pages under "Door-Operating Devices."

Limited Warranty

Horton Automatics' (Seller) warrants to the Buyer all products they manufacture to be free from defects in material and workmanship, under normal use and service, for twelve months from the date product is placed in operation. The Seller's obligation under this warranty is limited to repair or replacement at the factory, any parts which shall be returned to the Seller with transportation charges prepaid and which after examination, shall disclose to its satisfaction to be defective. Said warranty shall not apply to such products which shall have been installed, altered, or repaired by any person not expressly authorized in writing for such purpose by the Seller, or subjected to misuse, negligence or accident. The aforesaid warranty is made expressly in lieu of other warranties, expressed or implied, and in lieu of any other obligations or liabilities on the part of the Seller, and Seller neither assumes nor authorizes any person to assume for it any other liability or obligations in connection with the sale of such products to the Buyer.

There is no warranty of merchantability or fitness for any particular purpose, nor is there any warranty, expressed or implied, except as specifically stated above. Seller shall not be liable for special or consequential damages, nor for claims of any third party against the buyer.

Generally, the installing distributor provides a one-year warranty covering the labor and transportation charges for defective parts replacement. If this is the customer's wish, it should be specified.

General Information

The following instructions describe the installation of the Horton Automatics Series 6-3840 Automatic Industrial Fire door and Series 6-3040 Automatic Industrial non-labeled door. For other types of Tracks and Operators offered by Horton Automatics see the appropriate instructions.

Included are instructions for installation of:

Operator, Track, Door, Actuating Switches, Safety Devices and adjustments to the operator.

Upon receipt of operator package, verify that all operator assembly parts listed on the packing slip are included in the package.

Bills of Material

Horton Automatics normally furnishes the operator(s), track, door, and hanger brackets. The bottom guide is furnished only if Horton Automatics supplies the door. In some cases the door will be "by-others" or existing.

General Conditions

The door opening must be properly prepared. The wall area above and beneath the door must be straight to allow the door to slide without restriction. When installing the track, take into consideration any high point in the floor and allow proper clearance for the door to slide. The normal clearance between the floor and the door is 3/8" to 1/2". If door is "by-others", a copy of the door supplier's shop drawings are required to order the Horton Automatics equipment and for proper installation. This drawing must show the door panel size, door lap and stroke required.

The top of the door must be reinforced for the door hanger to be adequately secured to the door and support the door's weight.

Each operator requires a separate 120 VAC, 15 AMP electric supply. Control wires (actuating switch) are a 24 VAC circuit that must be routed to the operator.

All electric wiring must be in compliance with the National Electrical code. All actuating switches must be installed where the door operation may be observed by the person actuating it.

SLIDING DOOR

WALL

P-Wall Area

X-Sliding Door Panel

P-X-Single Door slides Left to open

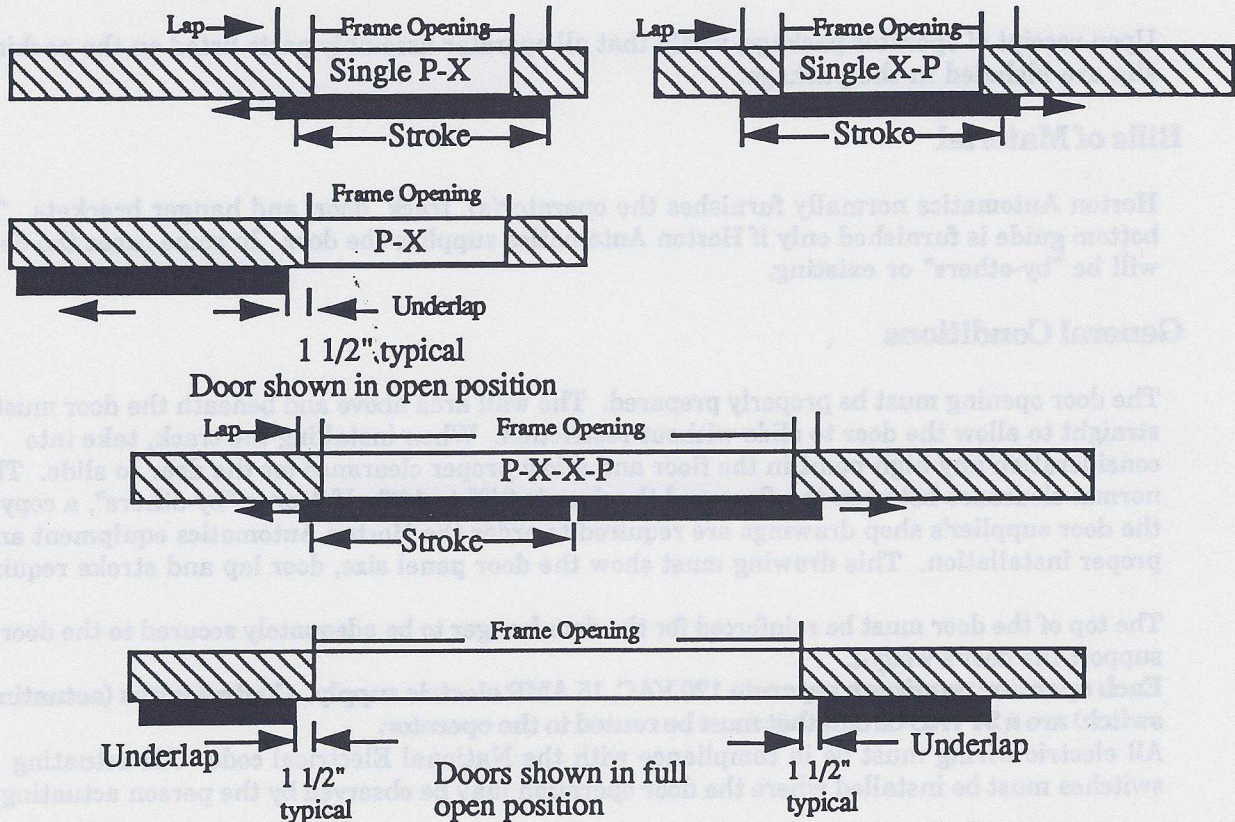
X-P-Single Door Slides Right to open

P-X-X-P-Pair of Doors Biparting

(C)-coactive Biparting Operator

(D)-Dual Operator

PLAN VIEW:



Hand is determined by movement of door as viewed for side on which the operator is attached.

Formula for Determining Surface Applied # 40 Track Length:

Excludes Area for mounting Operator

1. Single Slide

Overall track = O.A. door width plus stroke

O.A. Door width = Frame opening + lap at each side

Stroke = Frame opening + lap at lead edge + 'underlap' at trailing edge

2. Bi-Parting

Overall track = 2 x (O.A. door width + stroke)

O.A. door width = (1/2 Frame opening) + lap at one side

Stroke = 1/2 Frame opening + 'underlap' at trailing edge

Note: Standard Laps Are: 4" At Sides of Opening (Labeled and Non-Labeled)
2" At Top of Opening (Non-Labeled)
4" At Top of Opening (Labeled Fire Door)

Series 6-3840 Automatic Industrial Fire Door Assembly Parts List

Single Slide Track and Operator Assembly

- C6346 Track Mounting Accessory (1/Track Mount. Brkt.)
- C6363 Type 40 Steel Track Assembly
- C6369 Double Pendant Assembly (1)
- C6370 Pendant Bolt Accessory (4)
- C6908-1 Type 40 Accessory Package (1)
- C6911 Fire Door Clips and Bracket Kit (1)
- C6934 3/4" Track Shim (1/Track Mount. Brkt.)
- C6942 Track Mounted Bumper Assembly (2)

- C6147-3 Motor/Gear Drive Assembly
- C6160W Master Control
- C6170W Control Accessory Package
- C6905 Power Bracket/Release Assembly
- C6906 Idler Sheave Assembly
- C6909 Belt Drive Assembly
- C6954 Operator Disconnect (1)

Bi-Parting Track and Operator Assembly

- C6346 Track Mounting Accessory (1/Track Mount. Brkt.)
- C6363 Type 40 Steel Track Assembly
- C6369 Double Pendant Assembly (2)
- C6370 Pendant Bolt Accessory (8)
- C6908 Type 40 Accessory Package (2)
- C6911 Fire Door Clips and Bracket Kit (2)
- C6934 3/4" Track Shim (1/Track Mount. Brkt.)
- C6942 Track Mounted Bumper Assembly (2)

- C6147-3 Motor/Gear Drive Assembly
- C6160W Master Control
- C6170W Control Accessory Package
- C6905 Power Bracket/Release Assembly
- C6906 Idler Sheave Assembly
- C6907 Co-Active Drive Bracket/Release Assembly
- C6910 Belt Drive Assembly
- C6930 Operator Disconnect Extension (1)
- C6954 Operator Disconnect (2)

Door Panel (Single Slide)

- UL and FM Fire Labeled Hollow Metal Door
- Vertical Splice Column (When required)
- Concealed Bottom Stay Roller
- Jamb Binders
- Frame Interlocks (Top horizontal and Verticals)
- Through Wall Fusible Link System
- Cable Reel Closing System

Door Panel (Bi-Parting)

- UL and FM Fire Labeled Hollow Metal Door (2)
- Vertical Splice Column (When Required)
- Concealed Bottom Stay Roller (2)
- Frame Interlocks (Top Horiz. and Verticals)
- Through Wall Fusible Link System
- Cable Reel Closing System (2)

Series 6-3040 Automatic Industrial Non-Labeled Door Assembly Parts List

Single Slide Track and Operator Assembly

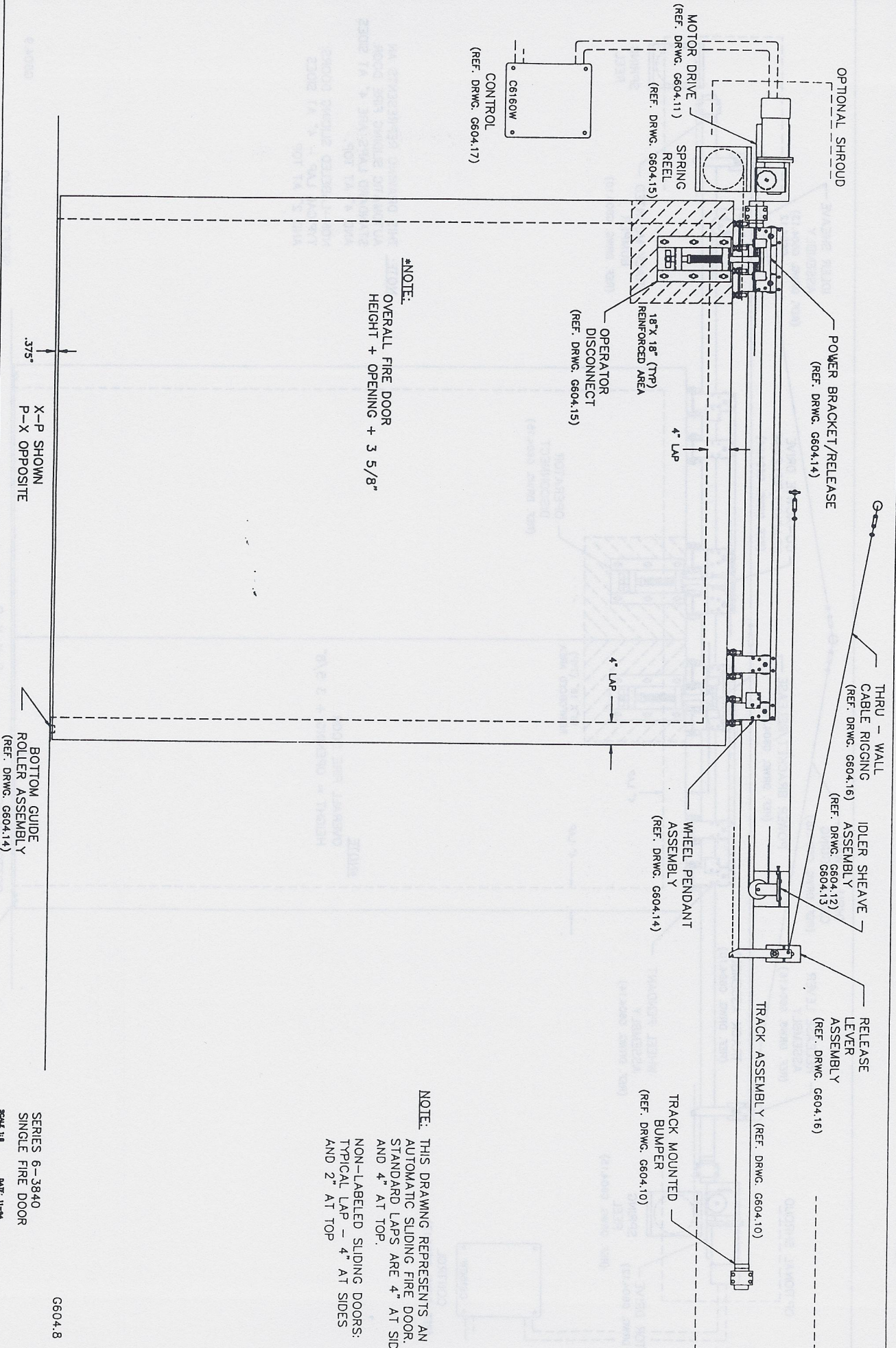
C6346	Track Mounting Accessory (1/Track Mount. Brkt.)
C6363	Type 40 Steel Track Assembly
C6369	Double Pendant Assembly (1)
C6370	Pendant Bolt Accessory (4)
C6908-1	Type 40 Accessory Package (1)
C6942	Track Mounted Bumper Assembly (2)
C6948	1" Track Shim (1/Track Mounting Brkt.)

C6147-3	Motor/Gear Drive Assembly
C6160W	Master Control
C6170W	Control Accessory Package
C6906	Idler Sheave Assembly
C6912	Drive Belt Assembly

Bi-Parting Track and Operator Assembly

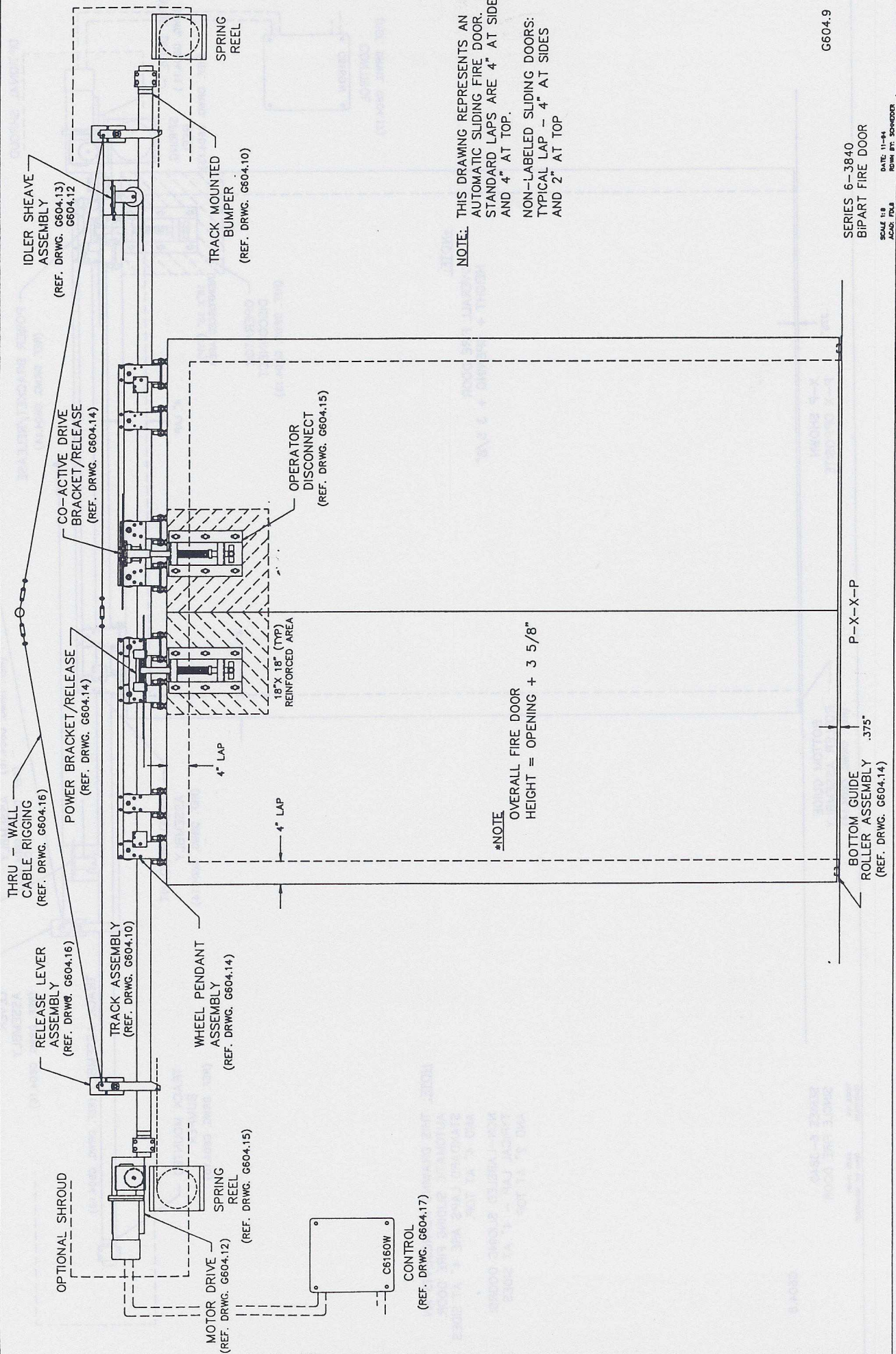
C6346	Track Mounting Accessory (1/Track Mount. Brkt.)
C6363	Type 40 Steel Track Assembly
C6369	Double Pendant Assembly (2)
C6370	Pendant Bolt Accessory (8)
C6908	Type 40 Accessory Package (2)
C6942	Track Mounted Bumper Assembly (2)
C6948	1" Track Shim (1/Track Mount. Brkt.)

C6147-3	Motor/Gear Drive Assembly
C6160W	Master Control
C6170W	Control Accessory Package
C6906	Idler Sheave Assembly
C6913	Drive Belt Assembly



SERIES 6-3840
SINGLE FIRE DOOR

DATE: 11-94
REV: 011
JANUARY 1995



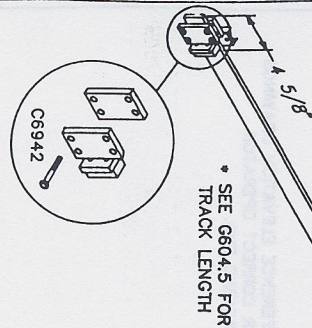
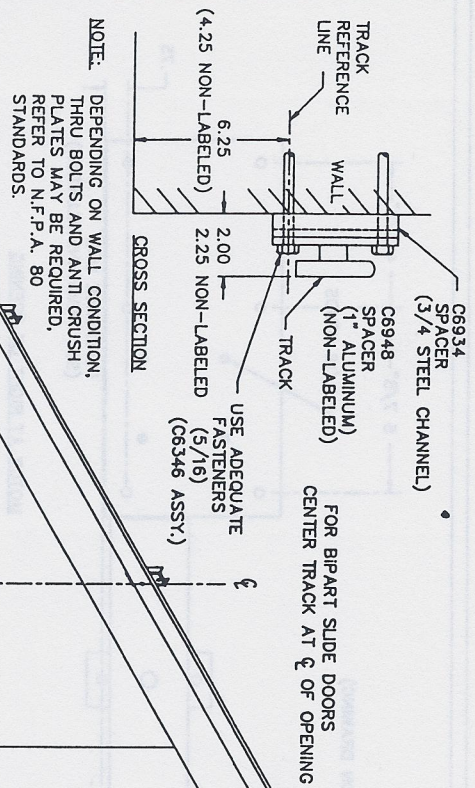
NOTE: THIS DRAWING REPRESENTS AN
AUTOMATIC SLIDING FIRE DOOR.
STANDARD LAPS ARE 4" AT SIDES
AND 4" AT TOP.
NON-LABELED SLIDING DOORS:
TYPICAL LAP - 4" AT SIDES
AND 2" AT TOP

*NOTE
OVERALL FIRE DOOR
HEIGHT = OPENING + 3 5/8"

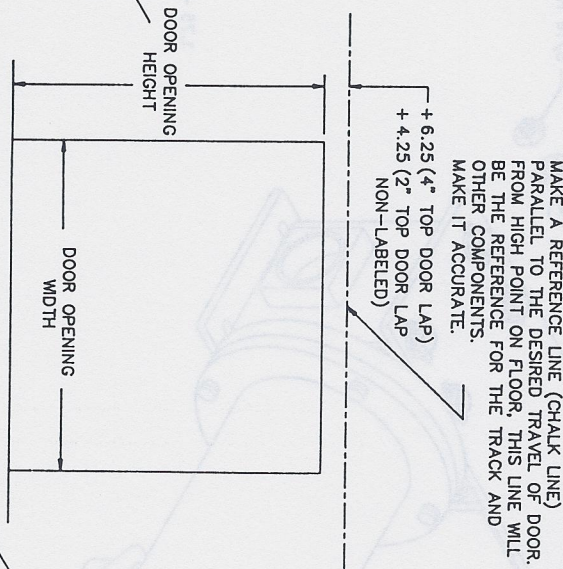
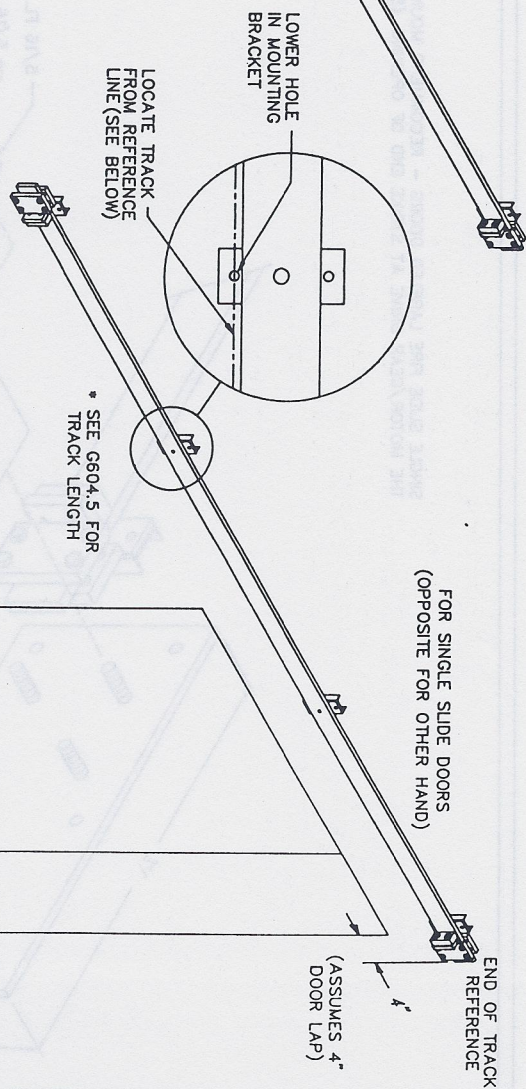
G604.9

SERIES 6-3840
BIPART FIRE DOOR

SCALE 1/8"
DATE 11-81
REVISED BY: BOWEN



NOTE: ALL DIMENSIONS ASSUME A 4" DOOR LAP AT SIDES AND TOP

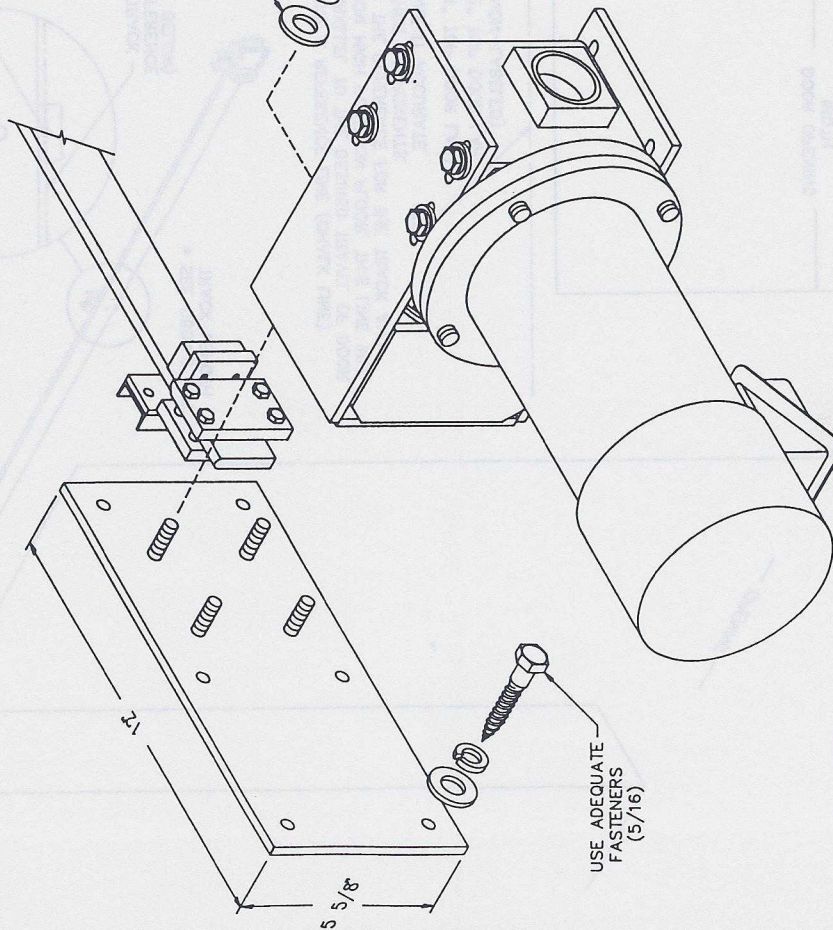


C6363 TRACK INSTALLATION - TYPE 40
- INSTALLATION DETAIL SHEET -

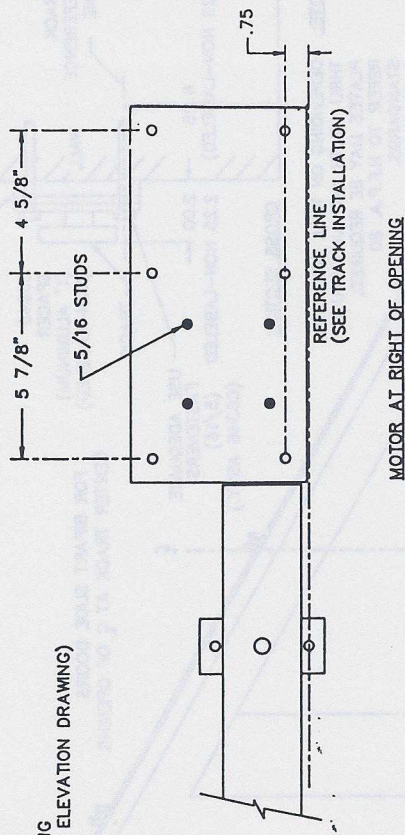
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ACAD FILE: F1

G604.10

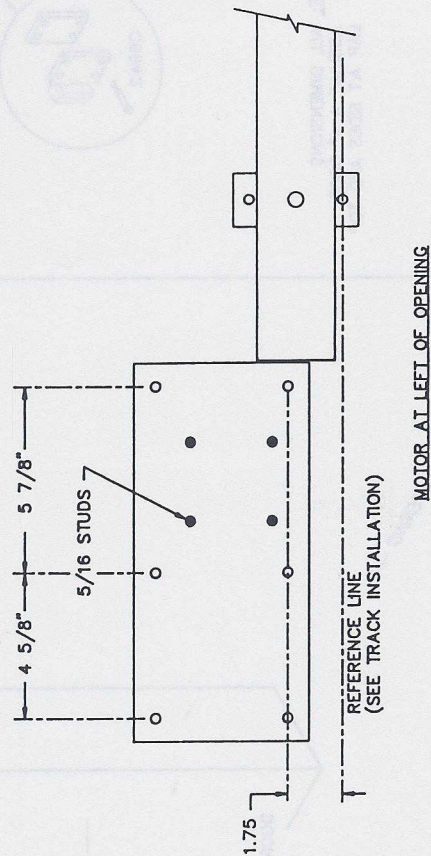
SINGLE SLIDE FIRE LABELED DOORS -- RECOMMEND MOUNTING THE MOTOR/GEAR DRIVE AT STRIKE END OF OPENING. (SEE ELEVATION DRAWING)



5/16 FL. WASHER
5/16 SPLIT LOCKWASHER
5/16 HEXNUT



REFERENCE ELEVATION DRAWINGS FOR CORRECT OPERATOR MOUNTING END.



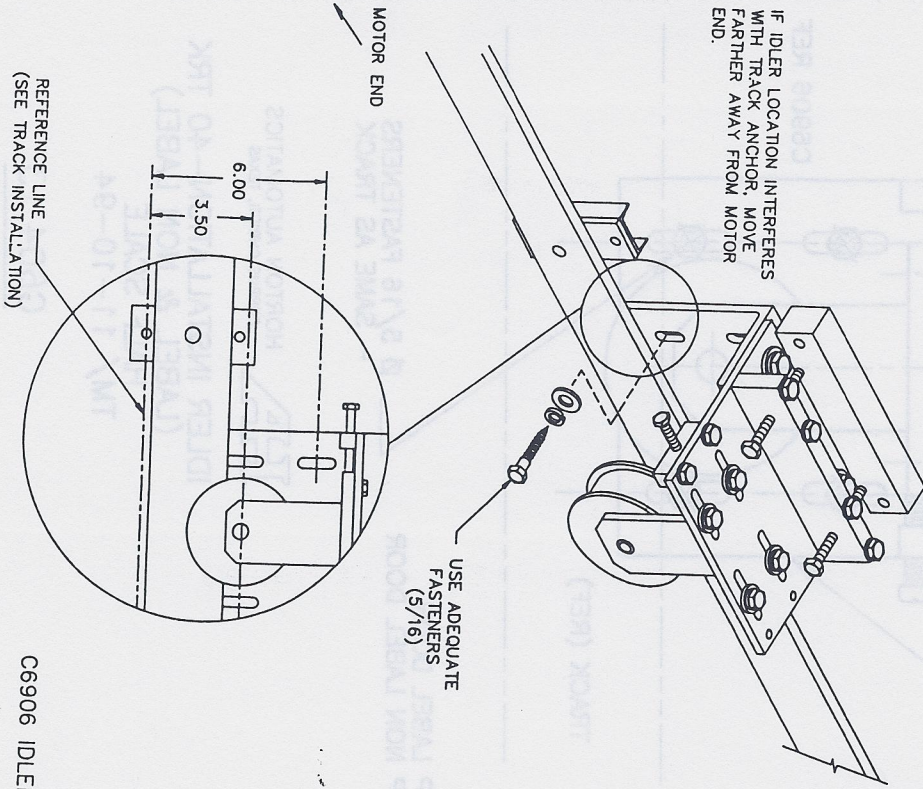
G604.11

C6147-1 MOTOR/GEAR DRIVE INSTALLATION (FLEX DRIVE/TYPE 40)

SCALE: NTS
ACAD FILE: F2

- INSTALLATION DETAIL SHEET -

IF IDLER LOCATION INTERFERES
WITH TRACK ANCHOR, MOVE
FARTHER AWAY FROM MOTOR
END.



C6906 IDLER PULLEY INSTALLATION (FLEX DRIVE/TYPE 40)

- INSTALLATION DETAIL SHEET -

SINGLE SLIDE IDLER LOCATION
(OPPOSITE FOR OTHER HAND)

X-P SHOWN
P-X OPPOSITE

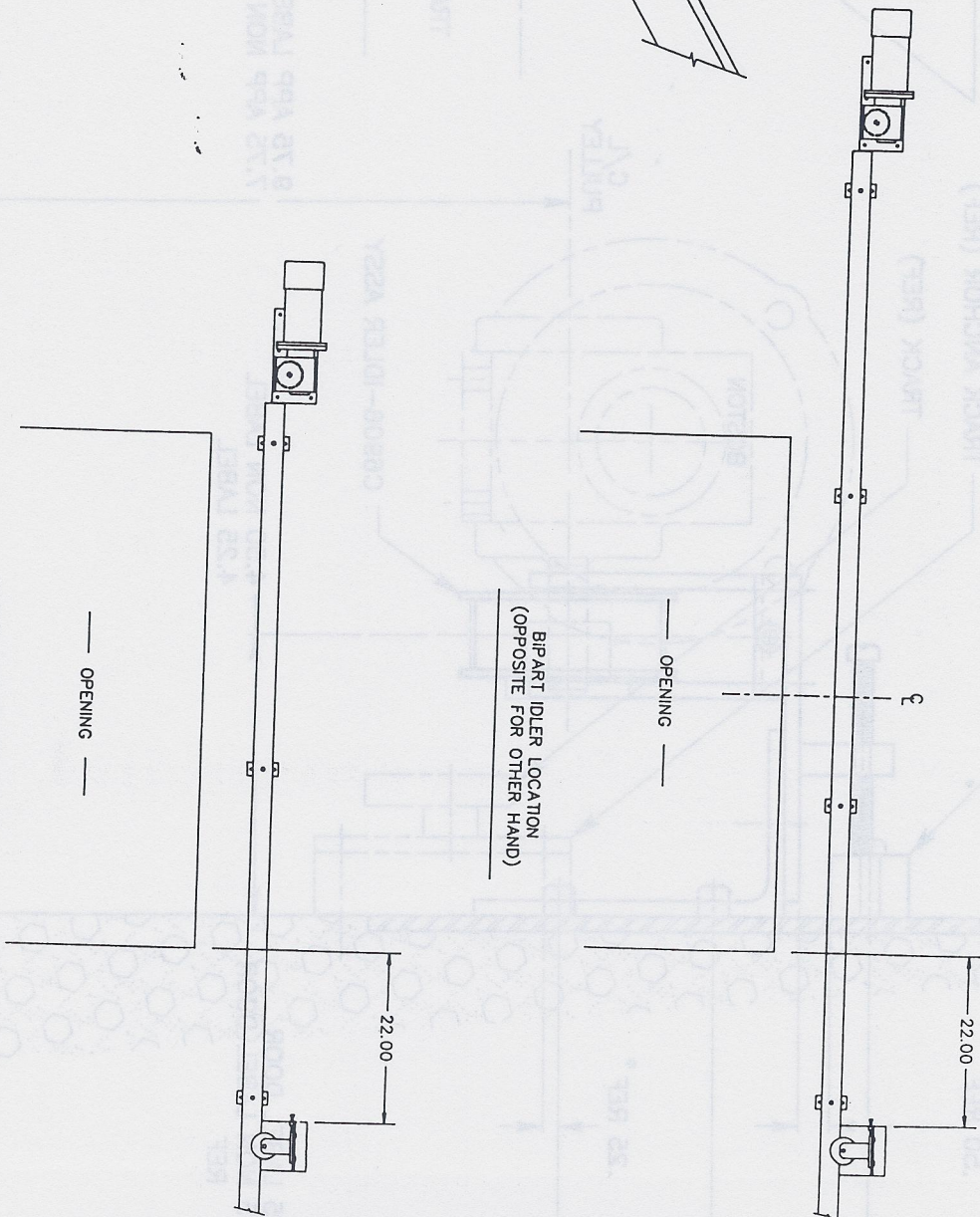
G604.12

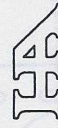
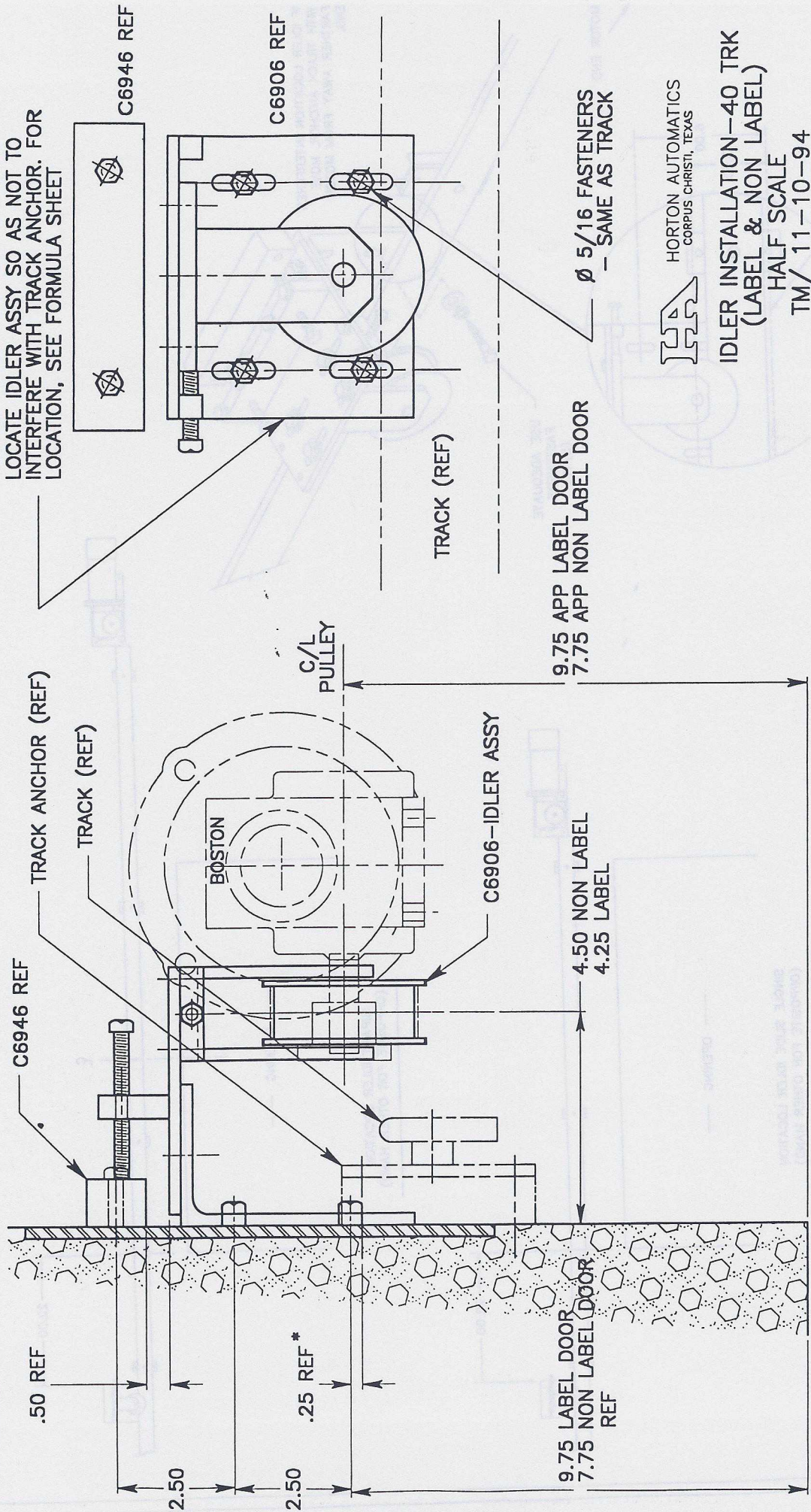
SCALE: NTS
ACAD FILE: F3

BIPART IDLER LOCATION
(OPPOSITE FOR OTHER HAND)

— OPENING —

— OPENING —





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IDLER INSTALLATION-40 TRK
(LABEL & NON LABEL)
HALF SCALE
TM/ 11-10-94

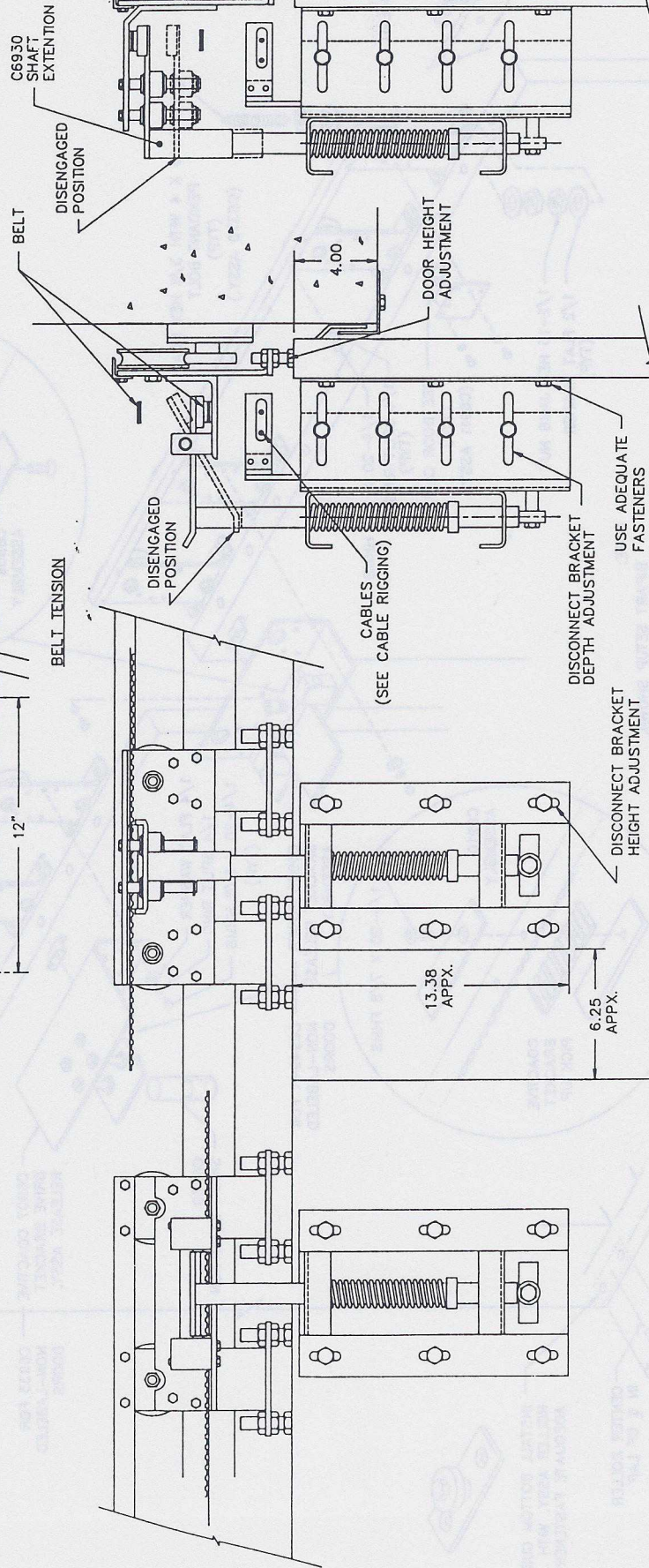
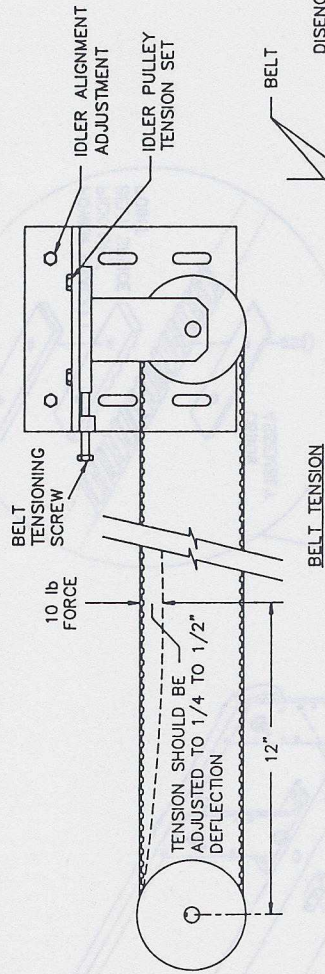
WALL OPENING

G604.13

INSTALLATION DETAIL SHEET

* MEASURE FROM TRACK REF LINE

REV/ 11-23-94



* NOTE:
MAKE ADJUSTMENTS AS REQUIRED
TO OBTAIN PROPER OPERATION.
MANUALLY TEST DOORS AND
DISCONNECTS.
MAINTAIN STRAIGHT BELT ALIGNMENT.

POWER SIDE

COACTIVE SIDE

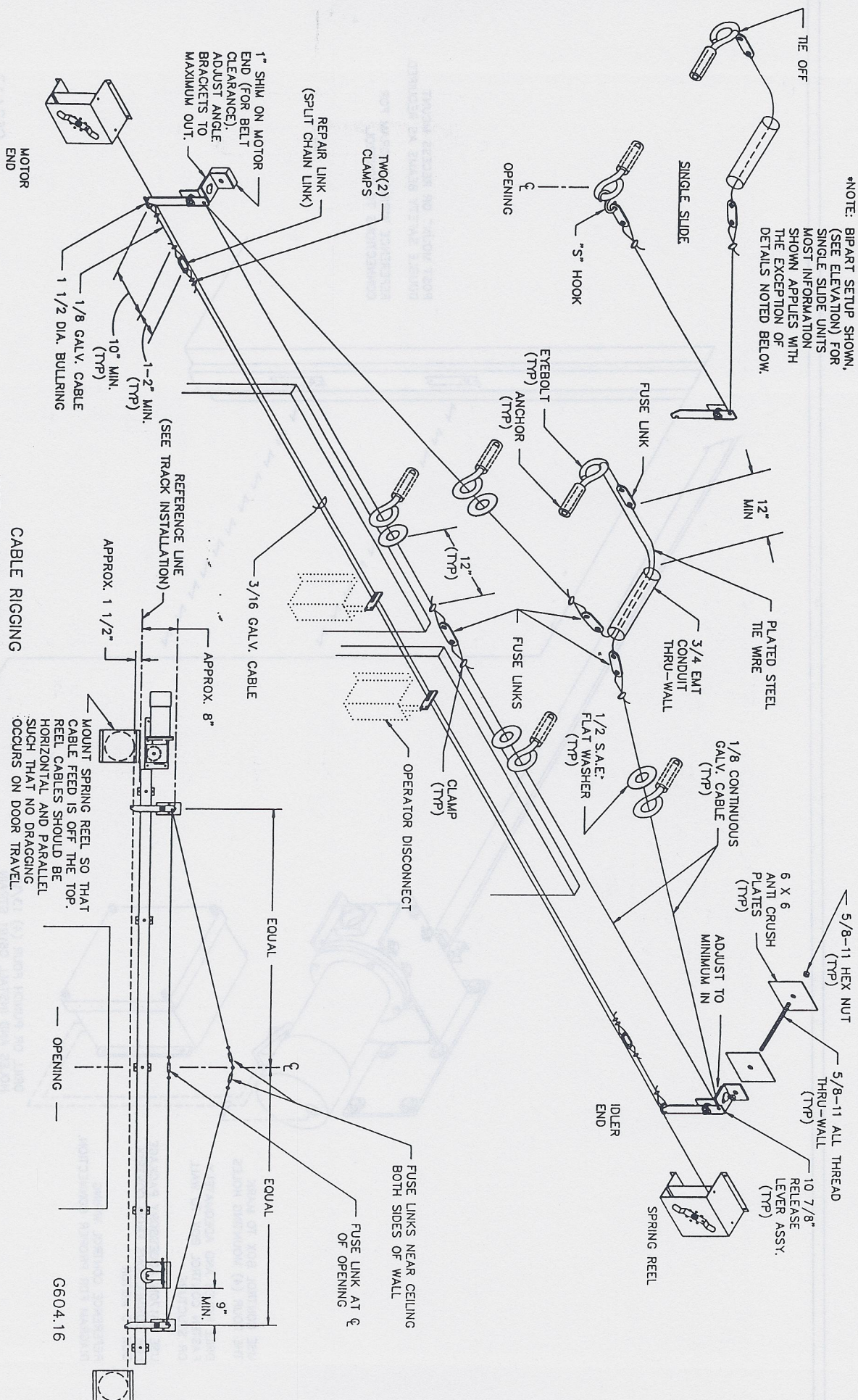
G604.15

C6954 OPERATOR DISCONNECT INSTALLATION

-- INSTALLATION DETAIL SHEET --

SCALE: NTS
ACAD FILE: F5

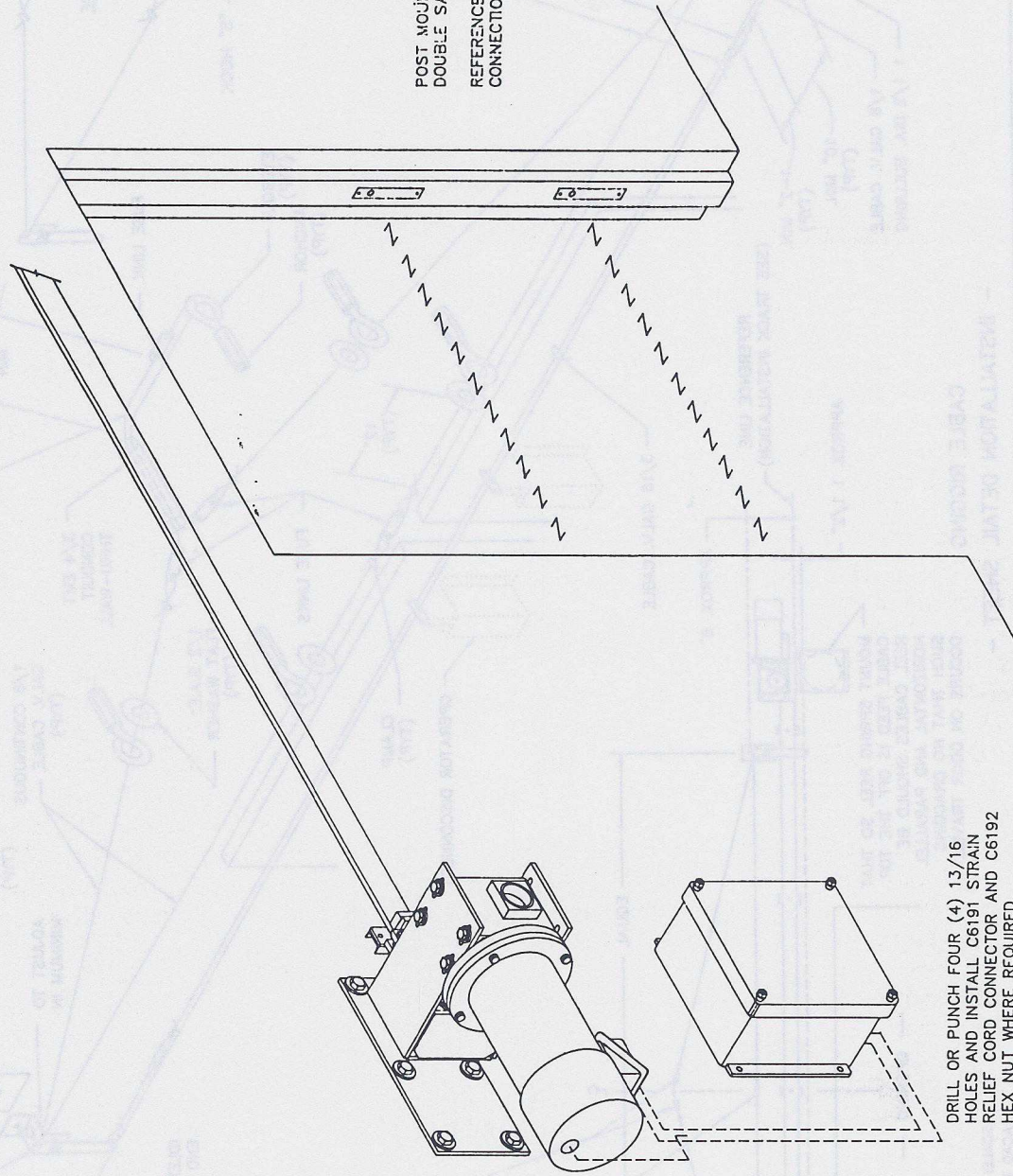
*NOTE: BIPART SETUP SHOWN,
(SEE ELEVATION) FOR
SINGLE SLIDE UNITS
MOST INFORMATION
SHOWN APPLIES WITH
THE EXCEPTION OF
DETAILS NOTED BELOW.



CABLE RIGGING
- INSTALLATION DETAIL SHEET -

SCALE: NTS
ACAD FILE: F6

G604.16



POST MOUNT OR RECESS MOUNT
DOUBLE SAFETY BEAMS AS REQUIRED.
REFERENCE WIRING DIAGRAM FOR
CONNECTIONS TO CONTROL

USE CONTROL BOX TO MARK
THE FOUR (4) MOUNTING HOLES
DRILL HOLES AND ADEQUATELY
FASTEN CONTROL BOX TO WALL
OR STRUCTURE

USE C6170W ACCESSORY PACKAGE
FOR CONNECTIONS FROM CONTROL
BOX TO MOTOR

REFERENCE CONTROL WIRING
DIAGRAM FOR PROPER CONNECTION.

DRILL OR PUNCH FOUR (4) 13/16
HOLES AND INSTALL C6191 STRAIN
RELIEF CORD CONNECTOR AND C6192
HEX NUT WHERE REQUIRED.

G6C4.17

C6160W CONTROL BOX INSTALLATION/C6185-3 SAFETY BEAM
- INSTALLATION DETAIL SHEET -

SCALE: NTS
ACAD FILE: F7

Wiring

G604.18

1. Wire operator to control and connect 120 VAC power per wiring diagram provided and/or located on inside cover of C6160W control box.
2. Wire Activating Devices and Safety Beams per wiring diagram located as per above.

Note: Pull chains and push button activation devices must be installed where user can view door's operation.

Horton Automatics requires the use of C6185-3 Dual Safety Beams for protection through the opening in all applications. Exclusion of the safety beams is not recommended by the manufacturer.

Initialize Control

1. Open Control Box
2. Turn on dip switch #1
3. Set open check and close check to #2 setting
4. Set open speed and close speed to #2 setting
5. For reduced speed, set Dip Switch #2 to ON
6. For cooler and freezer doors turn Dip Switch #3 to ON
7. If you are using an automatic lock relay, turn on Dip Switch #4 ON. Turn Dip Switch #5 on for Horton C9910 Brake and off for Autolock.
8. (With Dip Switch #4 off) Turn Dip Switch #5 OFF for autoseal or turn ON for autoseal enabled.
9. Turn Dip Switch #6 OFF for 10:1 ratio gear reducer and ON for 5:1 ratio gear reducer. Check ID plate on side of gear reducer.
10. Turn Dip Switch #8 OFF for bi-part door and turn ON for single slide door.
11. Set the door (s) near mid-stroke
12. Turn on the Circuit Breaker, Turn toggle ON
13. The red "TEST" LED should blink four(4) times then stay on
14. The door should go closed until it contacts the fully closed bumper or when doors meet at center of opening on BiPart Door.
15. If the door does not go closed first, re-check the placement of the power brackets. The power brackets may need to be reversed.
16. The door should then open slowly to the full open position against the bumper. If it does not move, increase the open check speed to #4 and press the RESET button.
17. After the door strikes the full open bumper, the red "TEST" LED should blink once to confirm the control has recorded the stroke length
18. If you are using a control with a C2512 Code Card for hardware backup of stroke information, you must set the switches now. See Addendum. (page G603.17).
19. The door will then close in normal close speed.
20. The door will begin cycling back and forth
21. Slowly increase the speed settings to obtain desired door operation. (Each switch adjustment will take effect at the beginning of the next open cycle)
22. The open check point selects the point in opening that the control switches from open speed to open check "0" setting=50% of opening "F"=75% of opening
23. Option switch A adjust the length of time that braking is applied to the motor between open speed and open check. This time is indicated by the red LED located on the C2534 Braking Module circuit board mounted on the large sink.
24. Option switch B adjusts the length of time that braking is applied to the motor between close speed and close check. This time is indicated by the red LED located on the Braking Module circuit board mounted on the large heated sink.
25. Turn Dip Switch #1 OFF and test Actuation Switches.



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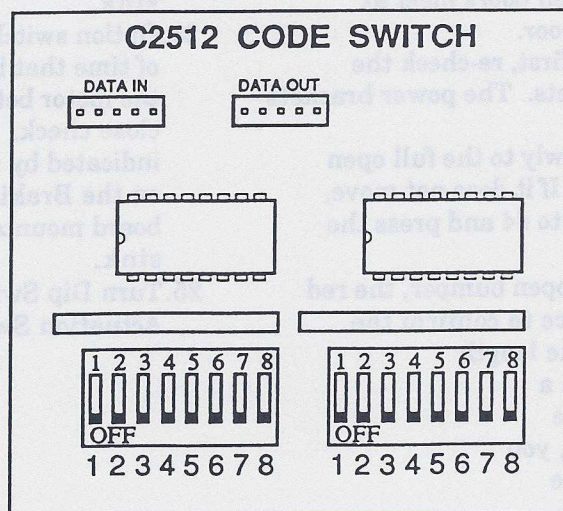
G604.19
2-94

ADDENDUM INSTRUCTIONS FOR SETTING OPTIONAL C2512 CODE SWITCH FOR C6160 INDUSTRIAL ELECTRIC CONTROL

FEB 94'

If your control contains a C2512 Code Card, then you must follow these instructions for proper setup of the unit. The C2512 code switch provides a method of storing the stroke of the operator during a loss of 120 vac power. To use, remove power to control, set dip switches on C2512 all "off", move the door to the mid-open position, and restore power. The red test led will turn on, the door will fully close, then reverse and fully open, and upon completion, will blink once, if the control was able to determine the stroke. Following this blink, will be a sequence of 16 blinks to show the code switch settings. The 16 blink sequence will repeat itself after a short delay. Write down the pattern, using red = "off", and green = "on". Then set the switches on the code card beginning with the farthest left switch. The control will continue to display the 16 - blink sequence until the code switches are set correctly. Then the door will then begin automatic operation and close, provided no open signals are present.

With the control set in this manner, when power is removed from the control, or if reset is pressed, the control will try to close the door, and, upon loss of encoder pulses during closing (indicating door fully closed), will read the code switches and automatically set the stroke correctly.



Install Warnings and Provide Instructions to Owner

G604.20

A. Warning Information

1. Place "Side" caution decals on walls that are covered by the doors when they slide open. Decals should be placed approximately 58 inches above the floor (See diagram below).
2. Place one "door" caution decal on the right hand door as viewed from each side of the doorway. Place only one decal on a side, approximately 58 inches above the floor. (See diagram below).
3. Paint a yellow stripe or install yellow and black, stripped hazard marking tape on floor 8 inches from wall that is covered when the doors slide open. (See diagram below).

B. Make daily inspection of door safety features.

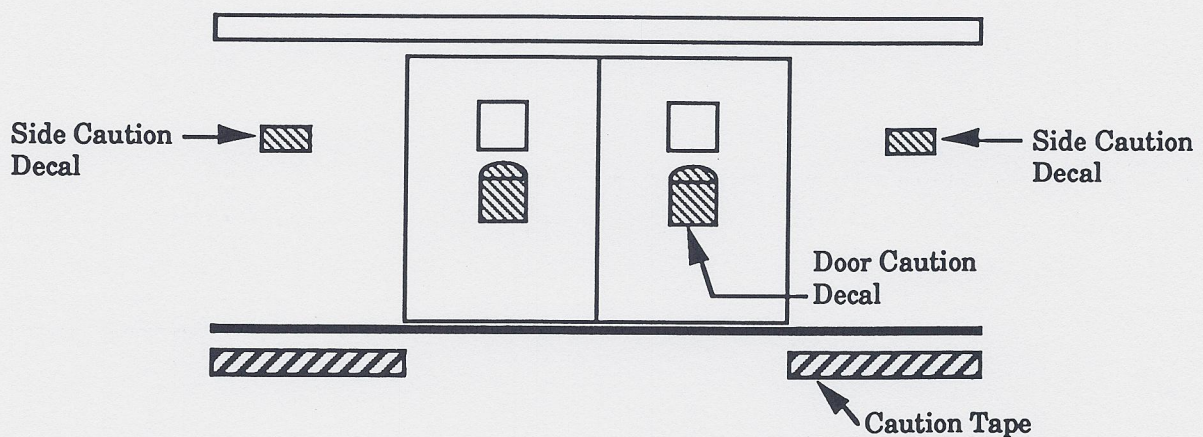
1. Ensure safety beam holds door open.
2. Check that time delay is correctly set to allow user comfortable passage through the doors before the doors begin to close.
3. Make sure door closing speed does not exceed 1 foot per second on doors that are lighter than 300 lbs. or 1/2 foot per second on doors over 300 lbs.
4. Test reverser by stalling the door when it is closing. Ensure it reopens and will not entrap a person.
5. Generally observe the door operations in progress.

C. Preventive Maintenance

Make a thorough inspection of the door system every 90 days. Look for loose door hangers, defective wheels, or loose bottom guide. Generally observe the track remains properly secured to the wall. Tighten parts as required.

D. Caution

If any safety feature is not working, turn off door and call your Horton Automatics distributor to make repairs.



Diagram, Warnings

Install Warnings and Provide Instructions to Owner

A. Warning Information

1. Place "Side" caution decals on walls that are covered by the doors when they slide open. Decals should be placed approximately 58 inches above the floor (See diagram below).
2. Place one "Door" caution decal on the right hand door as viewed from each side of the doorway. Place only one decal on a side, approximately 58 inches above the floor. (See diagram below).
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B. Make daily inspection of door safety features

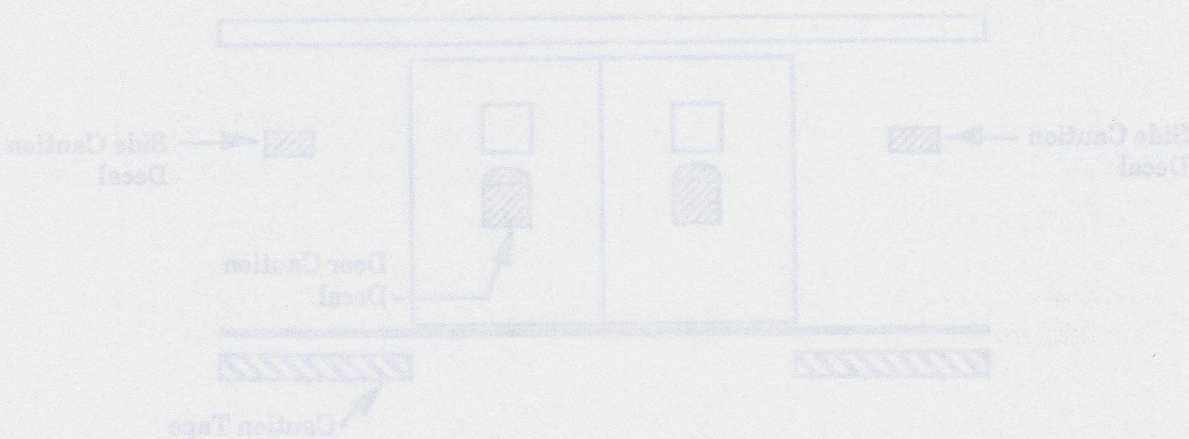
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Diagram, Warnings



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C6160W

AUTOMATIC INDUSTRIAL SLIDING DOORS

TROUBLESHOOTING PROCEDURES C6160W ELECTRIC FLEXDRIVE CONTROL

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This procedure is intended to provide assistance and helpful suggestions for troubleshooting C6160 controls and Series 6000 Electric FlexDrive Slide Door Operators. It is not comprehensive, nor will it cover all situations. The most common problems *are* addressed, with the most likely solutions. If a solution cannot be obtained using this guide, it will significantly reduce discussions with Horton Customer Service, as it will eliminate all of the preliminary questions they will have.

Before beginning any of the following procedures, perform a preliminary setup of the C6160 as follows:

- A. Turn off the circuit breaker on the control.
- B. Disconnect the actuating **INPUTS** connector (8 conductor AMP plug).
- C. Turn the Toggle Switch OFF.
- D. Set the adjustments in the control as follows:

OPEN SPEED - 1	CLOSE SPEED - 5
OPEN CHECK - 4	CLOSE CHECK - 4
OPEN CUSHION - 3	CLOSE CUSHION - 3
OP(EN) CH(EC)K POINT - 0	TIME DELAY - 0
- E. Set **OPTIONS** DIP switch #1 - ON. Set **OPTIONS** DIP switch #3 - ON if the door is an AIC cooler / freezer door with a "dimple" track (OFF it is not). All other **OPTIONS** DIP switches should be OFF.
- F. Set the **REVERSING SENSITIVITY** potentiometer (on the C2544 Power Supply board) fully counterclockwise.
- G. Position the door(s) approximately one-half way open.

The troubleshooting procedure begins on the next page. Perform each step in the *exact* order indicated. After each step, two or more possible results are listed, and an instruction indicating which step to go to next. A good volt-ohmmeter is required for some tests.



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1. Turn on the circuit breaker. Watch the red **TEST LED** on the C2548 board when the breaker is turned on. It should blink four (4) times rapidly, indicating the microprocessor is functioning.
If the **TEST LED** blinks four times, go to step 2.
If it does not blink, proceed to step 20.
2. Turn on the Toggle Switch. The green **TGL LED** should illuminate.
If it turns **ON** - proceed to step 3
If it does not illuminate - proceed to step 25.
3. The door(s) should begin to close slowly.
If the door closes slowly - go to step 4.
If the door opens slowly - proceed to step 30.
If the door does not move at all - proceed to step 35.
If the door moves at full speed, proceed to step 40.
4. The door(s) must move all the way to the fully closed position (AIC cooler doors may have difficulty reaching fully closed, depending upon the tightness of the perimeter seal).
If the door moves all the way closed, go to step 5.
If the door closes slightly, pauses, opens slightly, then stops - proceed to step 45
5. The door should then move to the full open position. Note: If it is an AIC cooler / freezer door(s), **OPTIONS DIP switch #3** should be **ON**, and the initial 12" of opening should be at substantial power and speed.
If the door opens fully - go to step 6.
If the door does not move - proceed to step 50.
6. At the full open position, the red **TEST LED** should blink once.
If the **TEST LED** blinks once, go to step 7.
If the **TEST LED** blinks twice and the unit shuts down, proceed to step 55.
7. The door should close normally, using the settings for **CLOSE SPEED**, **CLOSE CHECK**, and **CLOSE CUSHION**.
If the door closes normally, go to step 8.
If the door slams closed, and the red **BRAKING LED** on the C2534 Motor Shunt board *does* turn on or blink at some point during door closing, proceed to step 60.
If the door slams closed, and the red **BRAKING LED** on the C2534 *does not* turn on or blink at some point during door closing, proceed to step 65.



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TROUBLESHOOTING PROCEDURES C6160W ELECTRIC FLEXDRIVE CONTROL

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8. After fully closing, the door should pause momentarily, then begin to open normally (if **OPTIONS** DIP switch #1 is ON), using the settings for **OPEN SPEED**, **OPEN CHECK**, **OPEN CUSHION**, and **OP(EN) CH(EC)K POINT**.
 - If the door opens normally, go to step 9.
 - If the door slams open, and the red **BRAKING** LED on the C2534 Motor Shunt board *does* turn on or blink at some point during door opening, proceed to step 70.
 - If the door slams open, and the red **BRAKING** LED on the C2534 *does not* turn on or blink at some point during door opening, proceed to step 75.
9. After fully opening, the door should pause momentarily, then begin to close as in step 7. At the closed position, the door will pause then reopen. During the closing cycle, momentarily jumper actuating **INPUTS** connector pins 2 and 5 (see attached control drawing). The yellow **SAF BEAM** LED should illuminate, and the door recycle open.
 - If the door recycles open, go to step 10.
 - If the door does not reopen, proceed to step 80.
10. While the door is closing, turn off **OPTIONS** DIP switch #1 to stop the automatic cycling. When the door completes the closing cycle, momentarily jumper actuating **INPUTS** connector pins 2 and 3. The door should open. Again momentarily jumper the same pins, and the door should close.
 - If the door functions as indicated, go to step 11.
 - If the door will not open, go to step 85.
11. Momentarily jumper actuating **INPUTS** connector pins 1 and 2. The door should open normally to the full open position, execute a time delay as set by the **TIME DELAY** adjustment, then automatically close normally.
 - If the door functions as indicated, go to step 12.
 - If the door opens partially, then shuts down, proceed to step 90.
 - If the door does not open at all, proceed to step 95.
12. The control appears to be functioning correctly. Other conditions may cause intermittent malfunctions, and should be investigated. These include:
 - a. Mechanical slip in the drive system - the encoder disk not tight; the key between the drive pulley and gear drive output shaft worn out or missing; the belt worn and jumping pulley teeth; or other slip problems.
 - b. Mechanical bind in the system causing the control microprocessor to move into a protection mode and shut down operation - excessively tight weatherstripping; an object lodged in the bottom guide; defective wheel bearings; etc.



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TROUBLESHOOTING PROCEDURES C6160W ELECTRIC FLEXDRIVE CONTROL

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- c. Power supply spikes, brownouts, or excessive fluctuations - can cause a variety of unusual symptoms including door slamming, periodic re-initializations, complete shutdowns, etc.
- d. Excessive motor electrical noise due to worn brushes, shorted winding(s), or accumulated brush dust. Severe motor noise can generate false signals in the encoder circuitry, yielding erroneous position information and either causing the door to slam, or slow down at inappropriate locations. Excessive brush dust can also create a frame short that can damage the C2555 Motor Drive board, and/or trip the 3 Amp circuit breaker.
- e. The door not consistently reaching the fully closed position before shutting off the motor. This is normally caused by excessive mechanical binding, particularly on AIC cooler doors. The door must arrive within 1.5" of the same position on every close cycle, as this position is the reference point for the next open cycle.

If the C6160 control has completed the above steps correctly, adjust all speeds and options as desired, including the **REVERSING SENSITIVITY**.

SYMPTOM RELATED CHECKS

- 20. The microprocessor does not start (no initial four blinks of **TEST LED**). With a DC voltmeter, measure the voltage between the violet wire (+) and brown wire (-) on the nine (9) conductor lace between the C2548 Adjustment board and the C2544 Power Supply board; do not unplug the harness, insert the meter probes into the back of one of the plugs until contact is made with the conductors. Voltage should be +5 volts. If this is not present, check for incoming power (120VAC), a defective power cord, or a defective circuit breaker. If they are good, then power should be applied to the C2544 Power Supply board, as indicated by the transformer warming up after 15 minutes of applied power (even if the door is not running). If the +5 volts is still not present, the problem is most likely a defective C2544 Power Supply board.
If +5 volts is present, then the problem is most likely in the C2593 Microprocessor board, located under the C2548 Adjustment board. Note: If a new EPROM has been installed, check to insure it is installed correctly; if installed backward, it will not function, and furthermore, the new EPROM will be damaged.
- 25. If the green **TGL LED** does not illuminate, disconnect the two (2) conductor **TOGGLE SWITCH** plug from the C2548 board and use a screwdriver or piece of wire to directly short across the pins on the board connector. If the LED then turns on, the problem is with the toggle switch itself, or the harness to the toggle. If the LED does not illuminate, replace the C2548 Adjustment board.



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30. Incorrect direction of initial door motion. If this is a new installation, turn the circuit breaker off, reverse the two motor wires and the Black and Clear leads (terminals 2 & 3) on the C2664-1 Encoder Board, and try again. If troubleshooting an installation that has been functioning correctly, locate the relay on the C2544 Power Supply board that is closest to the MOTOR connector and check it for welded or stuck contacts. If the relay appears okay, try replacing the C2593 Microprocessor board.
35. If the door does not move under power, turn off the circuit breaker and manually move the door, checking for physical binds. Inspect the C6171 Motor harness; measure its continuity with an ohmmeter. Also check the motor resistance with the ohmmeter; it should be 2 - 3 ohms at all points in its rotation. If this is an existing installation and the door was functioning, check the relay on the C2544 Power Supply board that is closest to the large stacked resistors for burned and/or pitted contacts. If the relay, motor, and harness appear good, replace the boards in the following order until the problem is resolved: C2555 Motor Drive, C2544 Power Supply, and C2593 Microprocessor.
40. If the door moves at full speed regardless of speed adjustment settings, the problem is most likely in the C2555 Motor Drive board. If replacing it does not resolve the problem, next replace the C2544 Power Supply, and finally the C2593 Microprocessor board.
45. If the door moves back and forth a couple of inches, then stops, the control is not receiving complete information from the encoder. Perform a quick encoder test by pressing and holding the **CLEAR** button, and momentarily pressing the **RESET** button. Release the **CLEAR** button after the 4 blinks of the **TEST** LED. Manually move the door, drive pulley, or encoder. The red **TEST** and green **SP2** LEDs should blink on and off as the encoder is rotated. If neither LED, or only one LED blinks, first check the C6169 Encoder harness for continuity and correct wiring. Next replace parts in the following order: C2664 Encoder Optic board, and C2548 Adjustment board.
50. If the door will not move after closing, or continues trying to close when it should be opening, inspect the motor direction relay (closest to the MOTOR connector) for burned and/or pitted contacts. If the relay appears good, replace the C2593 Microprocessor board (located underneath the C2548 Adjustment board).
55. If the **TEST** LED blinks twice and the unit shuts down, the control could not compute a proper stroke, between 48" and 168".
If this is a new installation, run the encoder test as shown in step 45 above and verify that when the door is pushed slowly in the OPEN direction, the red **TEST** LED comes on first, followed by the green **SP2** LED. When the door is pushed slowly in the CLOSE direction, the green **SP2** LED should come on first, followed by the red **TEST** LED.



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TROUBLESHOOTING PROCEDURES C6160W ELECTRIC FLEXDRIVE CONTROL

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If the indication sequence is reversed, turn off the circuit breaker and reverse the **BLACK** and **CLEAR** leads (terminals 2 & 3) on the C2664-1 Encoder Board, then try again.

If this is not a new installation, or the indication sequence is correct, the problem is most likely a slippage caused by one of the following:

encoder cup/disk is not secured to the motor shaft and spins loosely;

the motor drive pulley is not secured to the gear drive shaft; or

internal damage (broken gear) of the gear drive.

60. Door slams closed after successful initialization, and the red **BRAKING** LED on the C2534 Motor Shunt board *does* blink at some point in the closing cycle - First try adjusting the **CLOSE SPEED**, **CLOSE CHECK**, and **CLOSE CUSHION** to much lower settings for slower speed. If normal operation can be obtained, the door weight may be too high for operation at the previously set speeds, and slower speeds may be required. If the door had previously operated properly at the faster speeds, check the C2539 Wiring harness from the C2534 Motor Shunt board to the C2544 Power Supply board for continuity and/or loose connections. Next try replacing the C2534 Motor Shunt board.
65. Door slams closed after successful initialization, and the red **BRAKING** LED on the C2534 Motor Shunt board *does not* illuminate at any point in the closing cycle - If the door slams hard, complete information may not be obtained from the encoder. Perform a quick encoder test by pressing and holding the **CLEAR** button, and momentarily pressing the **RESET** button. Release the **CLEAR** button after the 4 blinks of the **TEST** LED. Manually move the door, drive pulley, or encoder. The red **TEST** and green **SP2** LEDs should blink on and off as the encoder is rotated. If neither LED, or only one LED blinks, first check the C6169 Encoder harness for continuity and correct wiring. Next replace parts in the following order: C2664 Encoder Optic board, and C2548 Adjustment board.
70. Door slams open after successful initialization, and the red **BRAKING** LED on the C2534 Motor Shunt board *does* blink at some point in the opening cycle - First try decreasing the number setting of the **OP(EN) CH(EC)K POINT** adjustment. If the door still slams, turn on **OPTIONS** switch #2, selecting a lower speed range, and **INCREASE** the **OPEN SPEED** setting to 3 or 4. If normal operation can be established at reduced speeds, check the C2539 Wiring harness from the C2534 Motor Shunt board to the C2544 Power Supply board for continuity and/or loose connections. Next try replacing the C2534 Motor Shunt board.

75. Door slams open after successful initialization, and the red **BRAKING** LED on the C2534 Motor Shunt board *does not* illuminate at any point in the closing cycle - If the door slams hard, complete information may not be obtained from the encoder. Perform a quick encoder test by pressing and holding the **CLEAR** button, and momentarily pressing the **RESET** button. Release the **CLEAR** button after the 4 blinks of the **TEST** LED. Manually move the door, drive pulley, or encoder. The red **TEST** and green **SP2** LEDs should blink on and off as the encoder is rotated. If neither LED, or only one LED blinks, first check the C6169 Encoder harness for continuity and correct wiring. Next replace parts in the following order: C2664 Encoder Optic board, and C2548 Adjustment board.
80. If the Safety Beam input will not recycle the door open during a closing cycle, replace the C2548 Adjustment board; if it still does not, replace the C2593 Microprocessor board.
85. If the Latched input will not open the door, replace the C2548 Adjustment board; if it still does not, replace the C2593 Microprocessor board.
90. If the door opens only partially in response to a **MOMENTARY** input, verify that **OPTIONS** DIP switch #7 is off; if it is on, the partial open feature has been selected. If it is off, replace the C2548 Adjustment board; if it still does not, replace the C2593 Microprocessor board.
95. If the **MOMENTARY** time delay input does not function, replace the C2548 Adjustment board; if it still does not, replace the C2593 Microprocessor board.

The following is a list of the major electrical components in the Horton Series 6000 Industrial Flexdrive Electric Sliding Door Operator.

C2651	Cable to connect Encoder to Control - 22AWG 3 Cond. with Shield
C2664-1	Encoder Optic Assembly
C6111	Motor - 1/4 Hp, 90VDC, 1800RPM
C6171-2	Harness to connect Motor to Control
C6160W	CONTROL - INDUSTRIAL ELECTRIC SLIDE
	C2251-9 Toggle Switch and Harness Assembly
C2534	Motor Shunt Board
C2538	Harness to connect C2548 Adjustment to C2544 Power Supply
C2539	Harness to connect C2534 Motor Shunt to C2544 Power Supply
C2540	Harness to connect C2555 Motor Drive to C2544 Power Supply
C2544	Power Supply Board
C2548	Adjustment Board
C2555	Motor Drive Board
C2592	Resistor - 1Ω 50W
C2593	Microprocessor Board
C6101	Terminal Block - 4 Cond. Plug-In
C6102	Terminal Block - 4 Cond. Rail Mount
C6103	Terminal Block - 10 Cond. Plug-In
C6104	Terminal Block - 10 Cond. Rail Mount
C6105	Terminal Block - 12 Cond. Plug-In
C6106	Terminal Block - 12 Cond. Rail Mount
C8237	Power Cord Harness - 120VAC
C9834	Circuit Breaker Harness
C9947	Bridge Rectifier - 35A
C9948	Circuit Breaker - 3A Thermal



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Caution: All memory I.C.'s are extremely static sensitive. Do not remove them from their container or foam block until you are ready to install in the door control. Avoid any unnecessary handling of the EPROM I.C. Keep one hand on the door frame or other grounded structure when physically handling the I.C. Use a grounded wrist strap if available.

1. Turn off power to the C6160W control.
2. Remove the phillips head screw in each corner of the C2548 Adjustment Board.
3. Gently pull out the circuit board. It is plugged into a mating plug in a circuit board underneath.
4. Locate the EPROM I.C. in the center of the lower circuit board (it will have a label on top). *****DO NOT REMOVE THIS LABEL*****. The label should show the version number of the program in memory. Note the direction of the half-moon notch on the end of the I.C. The new I.C. must be installed with its notch in the same location (toward the interboard connector).
5. Remove the old EPROM I.C. by inserting a small screwdriver under one end and gently prying up against the socket underneath. With one hand grounded (per the caution above) the I.C. can be removed. Temporarily set it aside on a metal surface.
6. The new chip can now be installed. Again observing the static precautions noted, remove the new EPROM I.C. from its holder. Check its pins to be sure they are straight. Orientate the half-moon notch in the same direction as the old chip and gently install it into the socket on the circuit board. Check to be sure none of the pins are bent to the inside or outside, and all pins are inserted into the socket.
7. Place the old I.C. into the empty container. Re-install the C2548 circuit board and re-apply power to the door. Check for proper operation with the new program.
8. It is a good idea to retain the old I.C. for a few days. In the unlikely event that something should go wrong with the new EPROM, the old one can be reinstalled in the door. After everything checks to the customer's satisfaction, return the old I.C. to Horton Automatics.

