C2150 Control

with Version 11 Software

for Series
2000, 2000B, 2001 & 2003
Electric Slide Door Operators

SETUP INSTRUCTIONS & TROUBLESHOOTING

To be used with either G200, G2001, G230, G230T, G205 or G20B
Installation Instructions

Horton
A U T O M A T I C S

CONTENTS

SECTIONS

1. SLIDE OPERATOR QUICK START INSTRUCTIONS FOR SERIES 2000 LINEAR DRIVES & SERIES 2000B, 2001 & 2003 BELT DRIVES
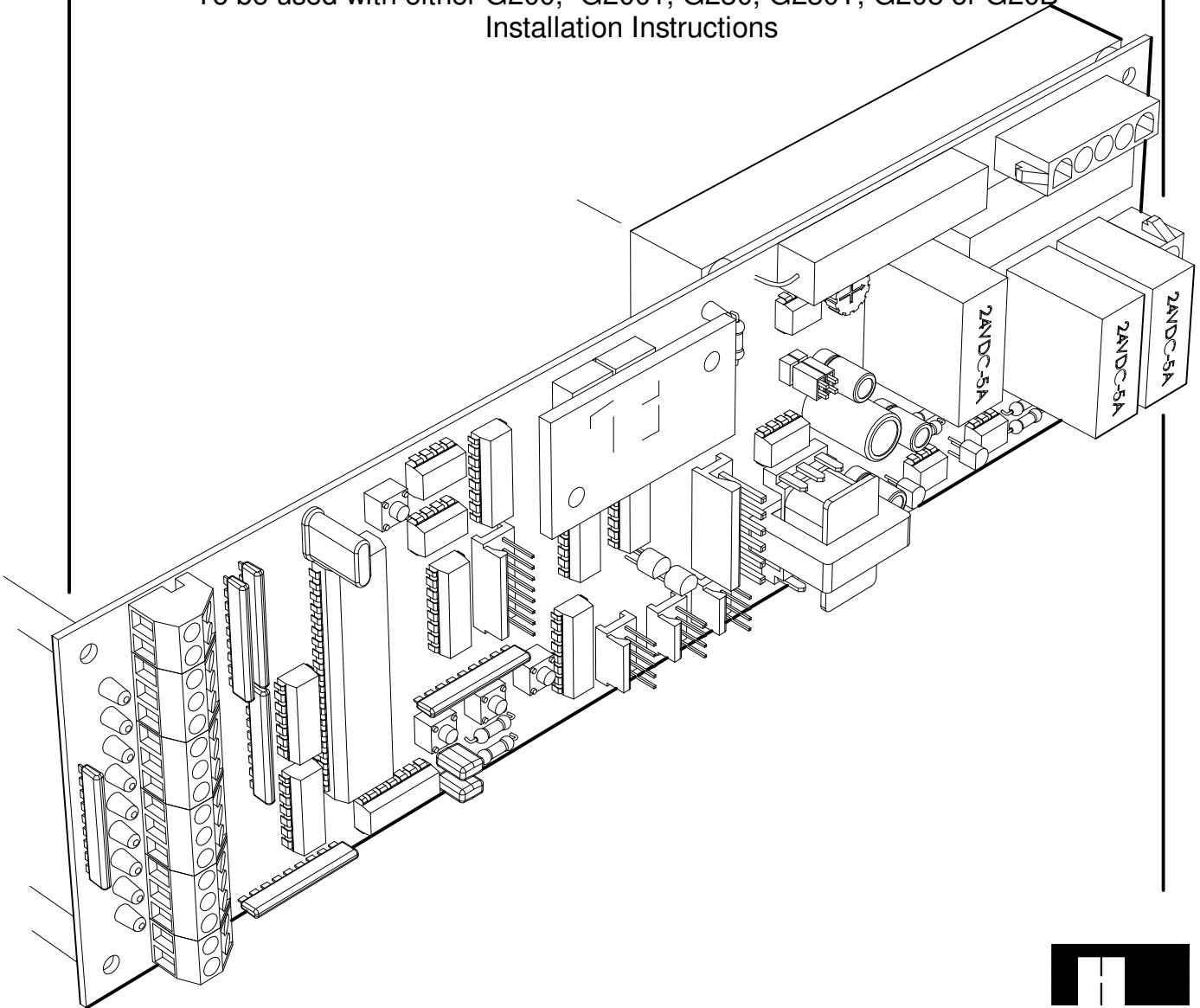
C2150 Control with version 10 software - S/N 08030006-_____ To get the operator up and running, check the items outlined below-

Do **NOT** wire any motion detectors or any other accessories at this time.
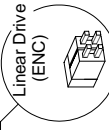Factory pre-wired beams (pins 5,6 & 7) may be left in place.

1st Step
A toggle switch or jumper must be present between pins 8 & 9. Switches are sent loose and field mounted. Break-outs are wired in series with the toggle switch .

10th Step
Verify jumpers JB1A & JB1B

Belt Drive (ENC)

Linear Drive (ENC)

9th Step
Temporarily turn the reversing sensitivity completely counter-clockwise.
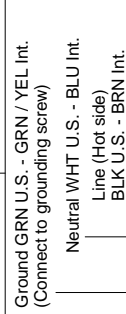
8th Step
Incoming voltages from power supply

+100 to +120 VDC from F2

+27 to + 35 VDC from F3

1 2 3 4 5GND

CN 8

BLK

RED

TO MOTOR

GRN / YEL motor ground

5th Step
The motor must be plugged into connector CN8

CN 7

TO LINEAR DRIVE

TO ENCODER

TO AUTOLOCK

4th Step
The encoder must be plugged into CN1 on the control. (The Linear Drive must be plugged into CN 11)

Field wiring options

CN 1 CN 11

CN 4

CN5

XXXX-V

CN 2

2001 switch

2003 switch

8
9

10

11

15
16

2nd Step
The close monitor switch(Belt Drives) must be connected to #10 & #11 of CN2. The switch must trip when the door is fully closed.

3rd Step
If the day / night mode is **NOT** to be used - there **MUST** be a jumper between 15 & 16. See Sections 5 thru 10 for actuating features and lock set-up.

D1

H210.1

NOTE:
On 2001 & 2003 Metal shields are **REQUIRED by UL** for protection against high voltage areas **Do not remove.**

Shields and chassis are not shown in this manual for clarity

7th Step
A 5 conductor cable attaches CN7 to the power supply.

6th Step
Check that the incoming power is wired as shown.

Ground GRN U.S. - GRN / YEL Int. (Connect to grounding screw)

Neutral WHT U.S. - BLU Int.

Line (Hot side) BLK U.S. - BRN Int.

1

2

3

FIELD WIRING OPTION 1
AC POWER IN

CN 1

F 1 Master fuse

All fuses are 5x20 mm Type "T" Rated 3.15 amp

F 3 +27 to +35VDC & processor

F 2 Motor +100 to +120 VDC

NOTE: Component arrangement may vary.

CN 2

POWER SUPPLY
C3925 for 120VAC-2001 (shown)
C3955 for 120VAC-2003
C3926 for 240VAC-2001
C3956 for 240 VAC-2003

FIELD WIRING OPTION 2

Grounding screw

Grounding screw

FIELD WIRING OPTION 3

Grounding screw

IMPORTANT
With wiring option 1, 2 or 3 The main ground wire must secured using the green grounding screw.

2.0468d
05/08

2000 LINEAR DRIVE

2. C2150 INITIALIZATION

RESET

1st Step - Power up
Be sure the toggle circuit is completed and apply AC power to the unit.
**CAUTION: THE DOOR WILL MOVE.**

2nd Step - Learn cycle
Instruct the control to perform a full learn cycle by:
-Holding down the SET button and the RESET button.
-Release the RESET button.
-Hold the SET button until **SU** appears
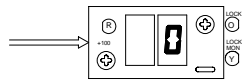
SET

3rd Step - Version display
The display should "blink" the version number
(as in 10 then 00) *The display will show the lock code (see below)
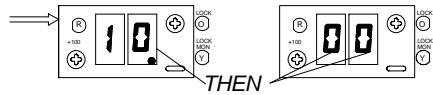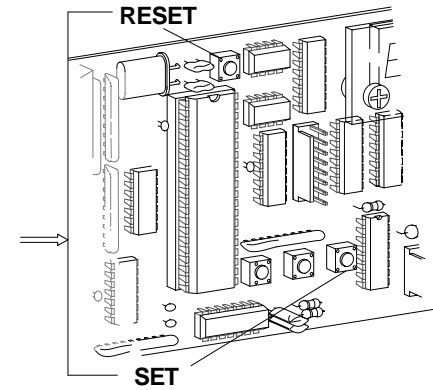
THEN

-The display should "blink" **BI** then **TY**
 Then defaul to **3**
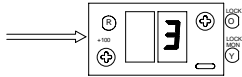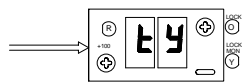
-Press down until **O** (zero) appears then press
 SET

*LOCK CODES
-The control will display **ONE** of the following lock codes depending the type of lock connected. (see Section 6)

OR
Fail Secure Autolock

OR
Fail Safe Autolock

No Autolock
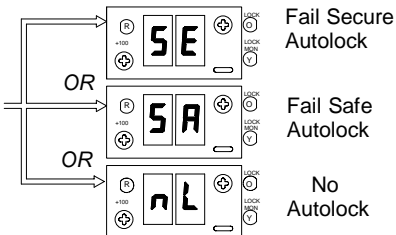
4th Step -Checking door cycle
When the toggle switch is on, the **DOWN** button acts as an actuation device.
The door will move - Be sure the safety beam area is clear of obstructions.
Activation devices should not yet be installed.

Start with the door in the closed position.
Press the **DOWN** button to actuate the door to open at factory selected default settings.

UP   DOWN   SET
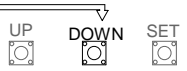
The chart below shows the position of the door and the display code for each position.

Inspect the unit for smooth operation, free of binds and excessive noise.

The follow cycles are carried out automatically by the C2150 control

-The display starts with:

Ver 1.17 or later

Open Cycle

-**O**pen **S**peed
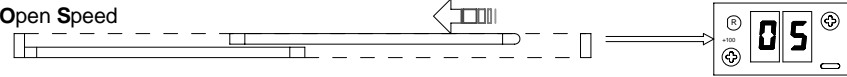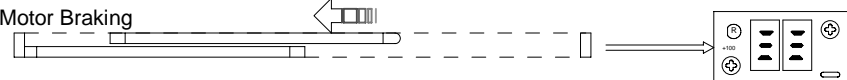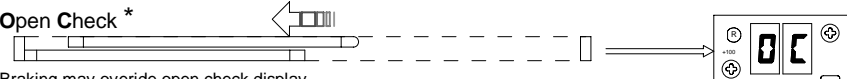
-Motor Braking

-**O**pen **C**heck *

*Braking may overide open check display

-**O**pen c**U**shion

-Time **D**elay

Close Cycle

-**C**lose **S**peed

The closing speed should not exceed the rate of **1 ft / sec**

-**C**lose **C**heck

-**C**lose c**U**shion

-The display returns to:

-If the above cycle check is OK and there are no parameters to be changed or an autolock to setup, this concludes the C2150 initialization.

IF THERE IS ANY DIFFICULITY SEE APPENDIX A

H210.2
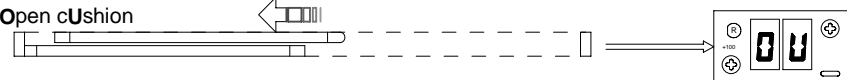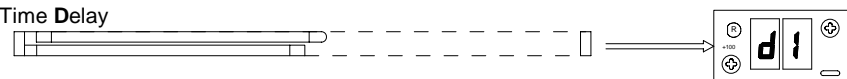
2000 LINEAR DRIVE

3. ADJUSTING PARAMETERS

9th Step - Changing parameter settings

A chart of preset values is shown to the right.
If any speeds or other settings need to be changed, follow this procedure:

-Turn the toggle switch **OFF**
 Or, leave the toggle **ON** and double click the **SET** button
 when the door is fully open or closed.

UP   DOWN   SET

-The display will switch to the menu of adjustable parameters

-The right decimal point will be blinking

-Refer to the chart in section 4 for a list of codes for
 adjustable parameters.

UP   DOWN   SET

-Scroll through the parameter list using the **UP** and
 DOWN buttons until the parameter to be changed is
 found.

-When the parameter to be changed is found, press
 and hold the **SET** button.

UP   DOWN   SET

-The display will show the current value or setting of
 the parameter.

-While holding the **SET** button,
 press the **UP** or **DOWN** button to modify the setting.

UP   DOWN   SET

-When the **SET** button is released, the display will show
 the parameter that was just changed. Another parameter
 may be changed, or the toggle circuit turned on to check the
 changes just made. The **SET** button may be double clicked
 to exit the menu (toggle must be on).

10th Step -Saving new settings

-When all adjustments have been made and checked, be
 sure the toggle circuit is on.

UP   DOWN   SET

-With the display reading 2d press and **HOLD** the
 SET button until dS (data save) is displayed. All of the
 changes are now stored in the control's memory.
 This step must be performed or the control will revert to
 the default settings after a power failure.

-Set the reversing sensitivity as required using R10. **Do not**
 leave this adjustment at minimum. Horton recommends setting
 the sensitivity so the door will **reverse at 28 ft.lb.** or less.
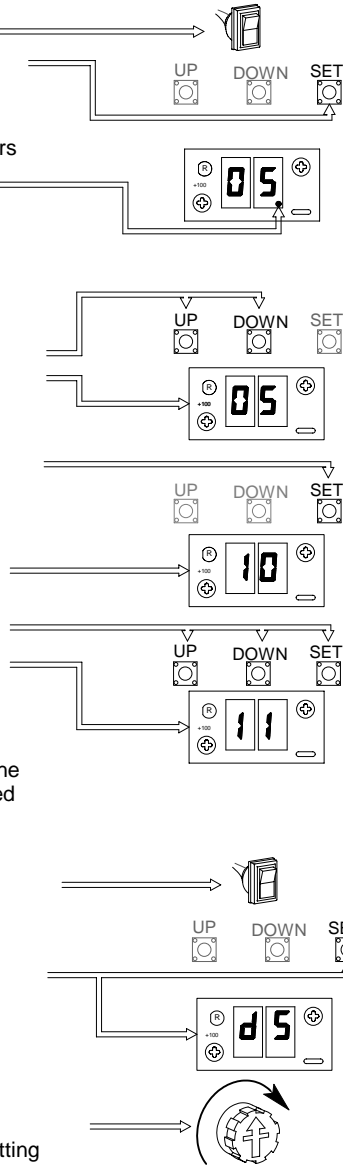
4.ADJUSTABLE PRESET PARAMETERS

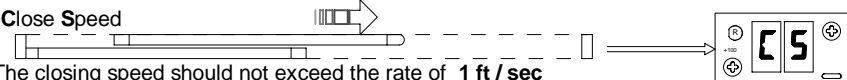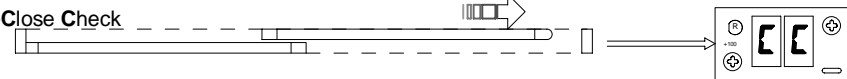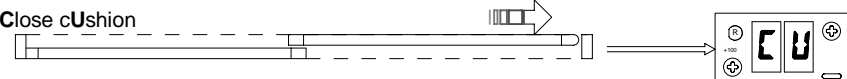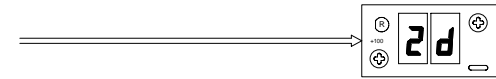The chart below shows all the adjustable parameters for **version 1 software.**
Follow the procedure outlined in step 9 to make any necessary changes.

CODE	PARAMETER	FACTORY PRESET VALUE	ADJUSTS
05	**O**pen **S**peed	10	0-15
C5	**C**lose **S**peed	9	0-15
OC	**O**pen **C**heck	4	0-15
CC	**C**lose**C**heck	3	0-15
OU	**O**pen c**U**shion	3	0-15
CU	**C**lose c**U**shion	2	0-15
d1	full open **d**elay	2 sec	60*
d2	partial open time **d**elay	2 sec	60*
AC	Factory set - do not change)	1	Factory Set
HO	Factory set - do not change)	3	Factory Set
rC	Factory set - do not change)	3	Factory Set
ct	**c**ycle **t**est	oF	oF/on
AS	**A**uto **S**eal	oF	oF/on
rA	**R**educed **A**ccel	oF	oF/on
PF	**P**ower **F**ail	OP (power fail OPen)	OP/CL
Pn	**P**ower fail **N**ight mode	on	oF/on
SL	Slow speed bank	oF	oF/on
Cb	**C**lose **b**raking	oF	oF/on
br	**b**rake on **r**ecycles	on	oF/on
LL	**L**ock present	oF	oF/on
SA	fail-**SA**fe lock	oF	oF/on
UL	**U**nmonitored **L**ock	oF	oF/on
dL	**d**aytime **L**ock	oF	oF/on
L1	**L**ock in **1**-way	oF	oF/on
SP	**S**idelite **P**rotection	oF	oF/on
--	5 reserved parameters		
Lt	**L**onger **T**imeouts	oF	
--	2 reserved parameters		oF/on
nA	**n**o **A**djustment permitted	oF	oF/on
--	2 reserved parameters		
bt	**b**rake **t**ime	20	0-100
--	1 reserved parameter		
tY	**t**y**p**e (read only)	3	0-4
--	4 reserved parameters		

*Time delay is 2-8, 10, 12, 14, 16, 18, 20, 25, 30, & 60 seconds

H210.3

2000 LINEAR DRIVE

5. ACTUATION FEATURES

Set jumpers or key switch for the type of operation required.
See wiring diagram for actuation and control switch connections

RESET

CODE DISPLAY

LOCK (Orange)

LOCK MON (Yellow)

1

D1

CN5

SET

Double click = off or on
Press and hold = data save

Connect to CN 4

CN4

2-way day mode factory setting is: jumper or switch from 15 to 16.

Com 15
Key Switch 16

2 d

UP   DOWN
Display Scroll

These displays apply to 1.17 and up only

1-way day mode setting is: jumper or switch from 13 to15 and 15 to 16.

13
15
16

1 d

2-way night mode setting is: **NO** jumpers or switches

13
15
16

2 n

1-way night mode setting is: jumper or switch from 13 to15 **NO** jumper or switch from 15 to 16

13
15

1 n

NOTE:

Many other features, for autolock and motion detector configuration, are available through additional adjustable parameters. These parameters can be discussed in greater detail by calling the technical service group.

FAIL SECURE
Remains locked at power failure

FAIL SAFE
Unlocks at power failure

TS 1 Security panel connections (optional)

1 2 3

CN 1

5 BLK
4 WHT
3 GRN
2 RED
1 BRN

Coil test points

Security panel switch (optional)

Lock monitor switch

Auto lock circuit board

6. AUTOLOCK SET UP AND INITIALIZATION

Press **SET** and **RESET** simultaneously, release **RESET**, wait 5 seconds, then release **SET** - version number will displayed.
During initialization the control clears all ports and the solenoid becomes inactive.

FAIL SECURE

The C2150 looks to see if there is a contact at the lock port CN4 and if the yellow lock monitor LED is off.

If the yellow LED is off...

The control sends a pulse to retract the solenoid...

SOLENOID

Turns On Parameter LL

5 E

If the control gets a response back, it knows there is a fail secure lock.

If there is no response it knows there is no lock.

n L

FAIL SAFE

The C2150 looks to see if there is a contact at the lock port CN4 and if the yellow lock monitor LED is on.

If the yellow LED is on...

The control sends a pulse to retract solenoid...

SOLENOID

Turns On LL & SA Parameters

5 A

If the control gets a response back, it knows there is a fail safe lock.

If there is no response it knows there is no lock.

n L

7. SETTING LOCK PARAMETERS

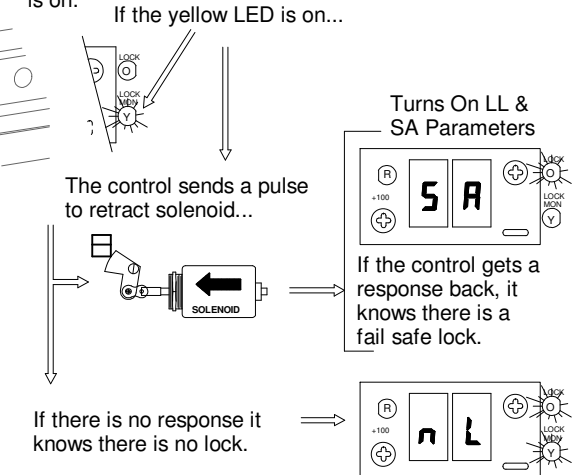| Traffic Mode SEE STEP 1 FOR SET UP		dL:oF L1:oF	dL:oF L1:on	dL:on L1: doesn't matter
Day	2-Way	Unlocked	Unlocked	Locked
Day	1-Way	Unlocked	Locked	Locked
Nite	2-Way	Locked	Locked	Locked
Nite	1-Way	Locked	Locked	Locked

SEE SECTION 3 STEP 10 FOR (ds) DATA SAVE PROCEDURE
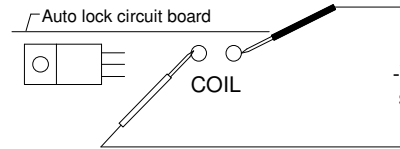
8. LOCK ERROR CODES

LF	**L**ock **F**ailure (**Fail Secure**) Indicates that the lock monitor input is remaining active (lock monitor light is still on) even though solonoid has de-energized.
UF	**U**n**L**ock Failure (**Fail Secure**) Indicates that the lock solenoid failed to move the plunger enough to activate the lock monitor switch and notify the control that the door is ready to be opened.

Check for mechanical binding. Check items under AUTOLOCK TEST POINTS and AUTOLOCK FUNCTIONS FOR FAIL SECURE autolocks.

LF	**L**ock **F**ailure (**Fail Safe**) Indicates that the lock solenoid failed to move the plunger enough to activate switch on the lock monitor.
UF	**U**n**L**ock Failure (**Fail Safe**) Indicates that the lock solenoid spring has failed to move the plunger enough to activate the lock monitor switch and notify the control that the door is ready to be opened.

Check for mechanical binding. Check items under AUTOLOCK TEST POINTS and AUTOLOCK FUNCTIONS FOR FAIL SAFE autolocks.

9. AUTOLOCK TEST POINTS
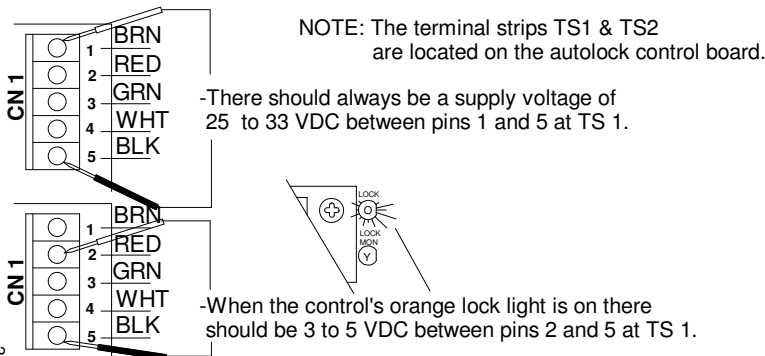
Basic voltage readings regardless of type. Set VOM at 200VDC.

CN 1
1 BRN
2 RED
3 GRN
4 WHT
5 BLK

NOTE: The terminal strips TS1 & TS2 are located on the autolock control board.

-There should always be a supply voltage of 25 to 33 VDC between pins 1 and 5 at TS 1.

CN 1
1 BRN
2 RED
3 GRN
4 WHT
5 BLK

-When the control's orange lock light is on there should be 3 to 5 VDC between pins 2 and 5 at TS 1.

Auto lock circuit board

COIL

-When the solenoid initially energizes there should be 25 to 33 VDC at TS2. After about a second the voltage will drop to about 30% of the supply voltage between pins 1 and 2 of TS2 .
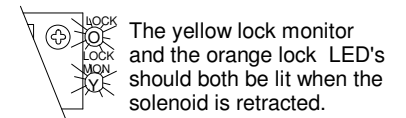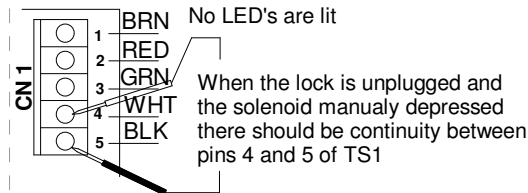
10. AUTOLOCK FUNCTIONS

The **FAIL SECURE** is the most common type of auto lock used with the C2150.

Lock spring

SOLENOID

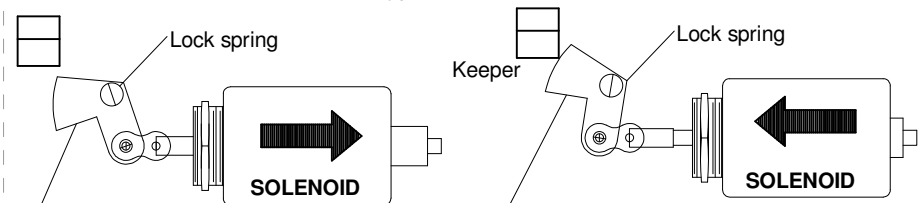Lock spring

Keeper

Latch bolt
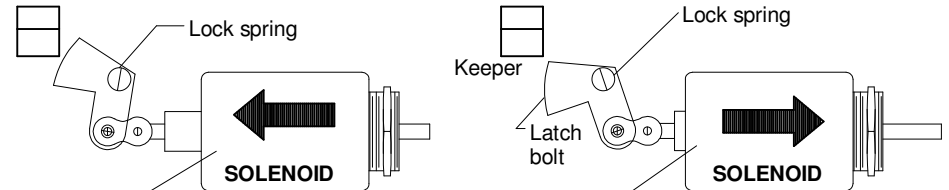
SOLENOID

When power is removed, the solenoid is extended by the lock spring. The door is locked.

When power is applied the solenoid is retracted and the door is unlocked.

CN 1
1 BRN   No LED's are lit
2 RED
3 GRN
4 WHT
5 BLK

When the lock is unplugged and the solenoid manualy depressed there should be continuity between pins 4 and 5 of TS1

LOCK O LOCK MON Y

The yellow lock monitor and the orange lock LED's should both be lit when the solenoid is retracted.

The **FAIL SAFE** is a less common type of auto lock used with the C2150.

Lock spring

SOLENOID

Lock spring

Keeper

SOLENOID

When power is removed the solenoid is retracted by the lock spring. The door is unlocked.

When power is applied the solenoid is extended and the door is locked.
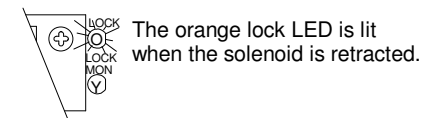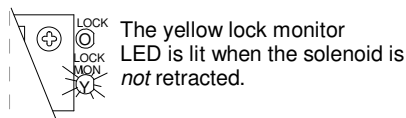
LOCK O LOCK MON Y

The yellow lock monitor LED is lit when the solenoid is *not* retracted.

LOCK O LOCK MON Y

The orange lock LED is lit when the solenoid is retracted.

When the lock is unplugged and the solenoid is *not* manualy depressed there should be continuity between pins 4 and 5 of TS1

H210.5

11. MICRO SWITCH DIAGNOSTICS
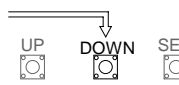### Running a microswitch test

See diagnostics for functional test

In software Version 1.00 or later, press the **RESET** & the **DOWN** button, release the **RESET** and hold the **DOWN** button until the display shows ut
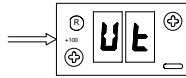
RESET

UP   DOWN   SET
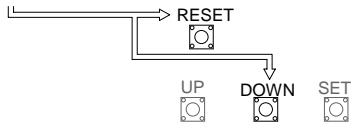
OR...

Power up the control while holding the DOWN button.

UP   DOWN   SET

The display will, briefly, show ut (for microswitch test)

ut

-Move the door manually through the open and closed positions to verify that each code is present for the position listed.(See the chart below)

-Missing codes, or codes that appear in improper order, indicate a problem with a switch assembly or a defective switch lace, or possibly the C2150.

-A blank display means that the door is in mid-stroke (no switches are tripped).

Open Cycle

-Open **C**heck

OC

-Full **OP**en

OP
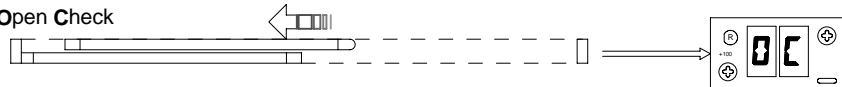
Close Cycle

-Close **C**heck

CC

-Fully **CL**osed

CC
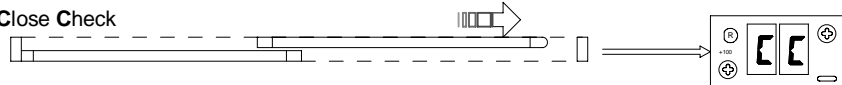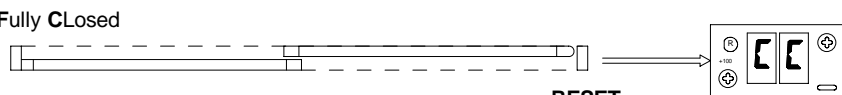
To exit the microswitch test press **RESET**

RESET

2000 LINEAR DRIVE

C2155-4 Harness

CN11 (on the C2150)
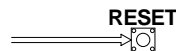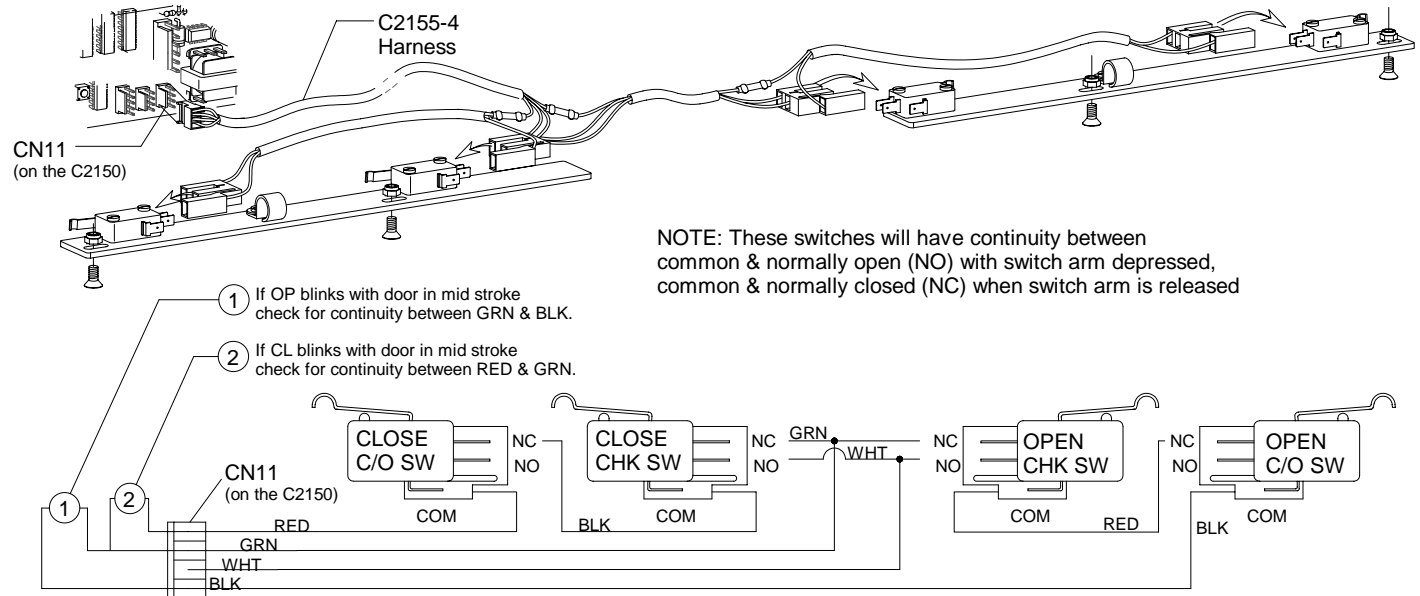
NOTE: These switches will have continuity between common & normally open (NO) with switch arm depressed, common & normally closed (NC) when switch arm is released

1 If OP blinks with door in mid stroke check for continuity between GRN & BLK.

2 If CL blinks with door in mid stroke check for continuity between RED & GRN.

CN11 (on the C2150)

CLOSE C/O SW   NC   NO   COM
CLOSE CHK SW   NC   NO   COM   GRN   WHT
OPEN CHK SW   NC   NO   COM   RED
OPEN C/O SW   NC   NO   COM   BLK

RED
GRN
WHT
BLK
BLK

---

12. PARTIAL OPEN SWITCH

CN2

10
11 com
12

COM

On off switch - locate as required

Mount the partial open switch at the position required.
Line up with existing microswitches.

Drill and counter sink for #8 screws

H210.6

2.0473d
09-07

BELT DRIVE

13. C2150 INITIALIZATION (learn cycle)

1st Step - Power up

Be sure the toggle circuit is complete and apply
AC power to the unit.
CAUTION: THE DOOR WILL MOVE.

2nd Step - Learn cycle

Instruct the control to perform a full learn cycle by:
-Holding down the **SET** button and the **RESET** button.
-Release the **RESET** button.
**-Hold the SET button approximately 5 seconds
until SU appears.**

3rd Step - Version display

VERSION 10

The display should "blink" the version number

THEN

-The display goes blank for 3 seconds

-**SU** appears (set button can be released)

-**TY** flashes brifely

-Then defaults to **3**

MOTOR TYPES
0 - Linear drive 2000 (see linear section)
1 - Dunker 2001 (10:1) 3.183" pully 8ppr
2 - Litton 2001 (8.75:1) 3.183" pully 8ppr
3 - Dunker 2003 (10:1) 2" pully 8ppr
4 - Litton 2003 (10.5:1) 2" pully 7ppr
-Press the **UP** or **DOWN** button to select the type.
Then press **SET.**

LOCK CODES
-The control will display **ONE** of the following
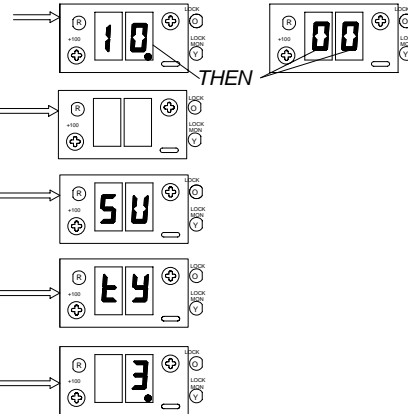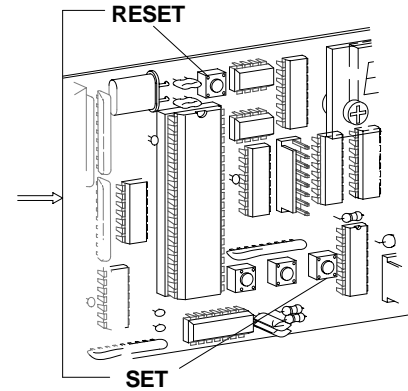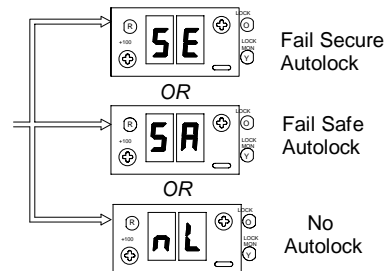lock codes depending the type of lock
connected. (see Section 17)

SE   Fail Secure Autolock

OR

SA   Fail Safe Autolock

OR

nL   No Autolock

4th Step - Close stop

-The display should indicate **FC** (for first run - **F**inding
Close stop) The door should fully close at slow speed.

-If the door moves a short distance then stops, and
the display indicates **Pd,** the pre-wired safety beams
or other actuating devices are stopping the door and
preventing the "learn cycle".

-**Pd** can be overcome by holding the up button untill
the door closes.

UP   DOWN   SET

D5

-The yellow **CLS MON** (close monitor) indicator will
come on when the door is fully closed, if not,
adjustments should be made to the switch.
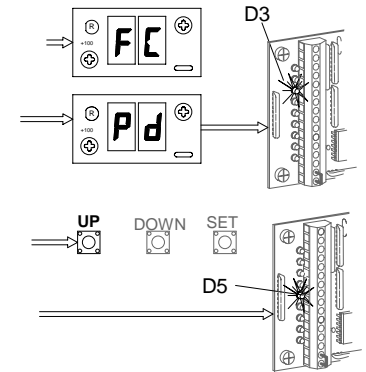
5th Step - Finding Open

-The display will show F0(**F**inding **O**pen). The door will travel
slowly open until it reaches full stroke. The stroke will be
displayed in inches.

-TS is displayed indicating **T**otal **S**troke.

-If the stroke on the display is not the same as the actual stroke
of the door,the wrong series type may have been selected.
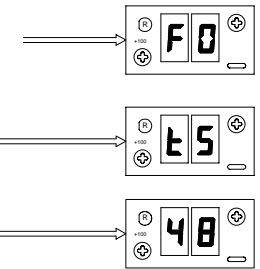
6th Step - Day mode

Version 10
-The display 2d (**2**-way **d**aytime mode).

-If the display switches to something besides (2d) and the door
refuses to do any thing else....
  CHECK
-The green TOG SW indicator on the control should be on.
-The toggle switch should be turned on.(between 8 & 9 on CN2)
-If there are SO panels, be sure the magnetic reed switches on
the breakouts are closed.

D4

Toggle circuit
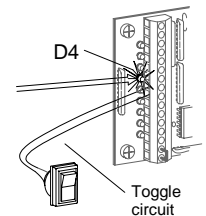
IF ANY OF THE CODES DEVIATE FROM THOSE SHOWN SEE APPENDIX B

H210.7

BELT DRIVE

13 (cont). C2150 INITIALIZATION (learn cycle cont.)

7th Step -Checking door cycle
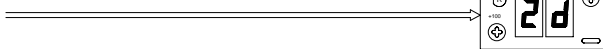
When the toggle switch is on, the **DOWN** button acts as an actuation device.
The door will move - Be sure the safety beam area is clear of obstructions.
Activation devices should not yet be installed.

Start with the door in the closed position.
Press the **DOWN** button to actuate the door to open at factory selected default settings.

UP   DOWN
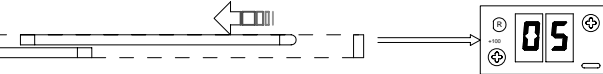
The chart (following) shows the position of the door and the display code for each position.
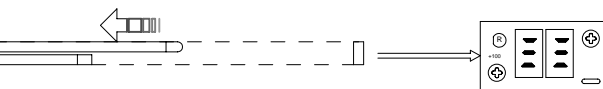
Inspect the unit for smooth operation, free of binds and excessive noise.
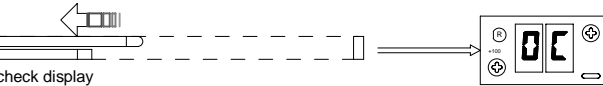
The following cycles are carried out automatically by the C2150 control

-The display starts with:

Open Cycle
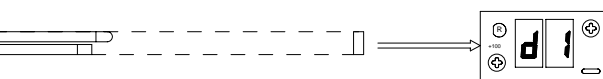
-Open **S**peed
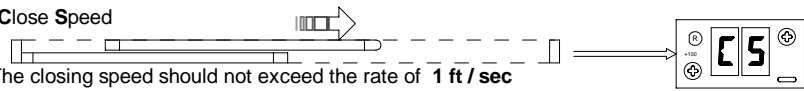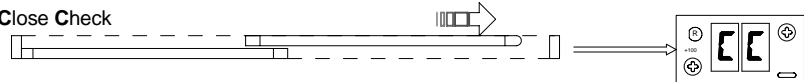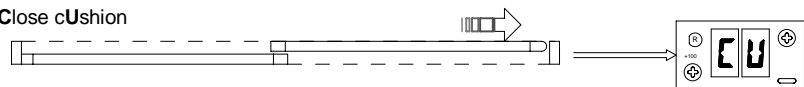
-Motor Braking

-Open **C**heck *

*Braking may overide open check display

-Open c**U**shion

-Time **D**elay

Close Cycle

-Close **S**peed

The closing speed should not exceed the rate of **1 ft / sec**

-Close **C**heck

-Close c**U**shion

-The display returns to:

-If the above cycle check is OK and there are no parameters to be changed or an autolock to setup, this concludes the C2150 initialization.

IF THERE IS ANY DIFFICULITY SEE APPENDIX A

H210.8
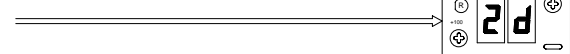
14. ADJUSTING PARAMETERS

1st Step - Changing parameter settings

A chart of preset values is shown to the right.
If any speeds or other settings need to be changed, follow this procedure:

-Turn the toggle switch **OFF**
  Or leave the toggle **ON** and
  double click the **SET** button.
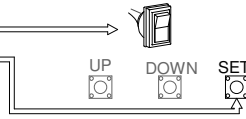
-The display will switch to the menu of adjustable parameters

-The right decimal point will be blinking
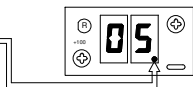
-Refer to the chart in section 4 for a list of codes for
  adjustable parameters.

-Scroll through the parameter list using the **UP** and
  DOWN buttons until the parameter to be changed is
  found.
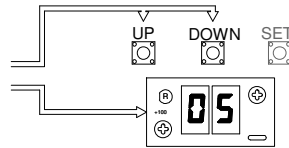
-When the parameter to be changed is found, press
  and hold the **SET** button.

-The display will show the current value or setting of
  the parameter.
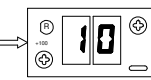
-While holding the **SET** button,
  press the **UP** or **DOWN** button to modify the setting.
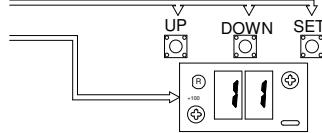
-When the **SET** button is released, the display will show
  the parameter that was just changed. Another parameter
  may be changed, or the toggle circuit turned on to check the
  changes just made. In versions 2.12 and up the **SET** button
  may be double clicked to exit the menu (toggle must be on).

2nd Step -Saving new settings

-When all adjustments have been made and checked, be
  sure the toggle circuit is on.

-With the display reading 2d press and **HOLD** the
  SET button until dS (data save) is displayed. All of the
  changes are now stored in the control's memory.
  This step must be performed or the control will revert to
  the default settings after a power failure.
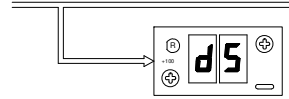
-Set the reversing sensitivity as required using R10. **Do not**
  leave this adjustment at minimum. Horton recommends setting
  the sensitivity so the door will **reverse at 28 ft.lb.** or less.
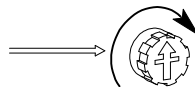
ADJUSTABLE PRESET PARAMETERS

The chart below shows all the adjustable parameters.
Follow the procedure outlined in step 1 to make any necessary changes.

| CODE	PARAMETER	FACTORY PRESET VALUE	ADJUSTS
OS	**O**pen **S**peed	10	0-15
CS	**C**lose **S**peed	9	0-15
OC	**O**pen **C**heck	4	0-15
CC	**C**lose**C**heck	3	0-15
OU	**O**pen c**U**shion	3 (Note: Cushion is reduced speed; not a brake)	0-15
CU	**C**lose c**U**shion	3	0-15
d1	full open **d**elay	2 sec	60*
d2	partial open **d**elay	2 sec	60*
AC	factory set - do not change	1	
HO	factory set - do not change	3	
rC	factory set - do not change	3	
ct	**c**ycle **t**est	oF	oF/on
AS	**A**uto **S**eal	oF	oF/on
rA	**R**educe **A**ccel	oF	oF/on
PF	**P**ower **F**ail (open mode)	OP	OP/CL
Pn	**P**ower fail **N**ight mode	on	oF/on
SL	**SL**ow speed bank	oF	oF/on
Cb	**C**lose **b**raking	oF	oF/on
br	**b**rake on **r**ecycles	on	oF/on
LL	**L**ock present	oF	oF/on
SA	fail-**SA**fe lock	oF	oF/on
UL	**U**nmonitored **L**ock	oF	oF/on
dL	**d**aytime **L**ock	oF	oF/on
L1	**L**ock in **1**-way	oF	oF/on
SP	**S**idelite **P**rotection	oF	oF/on
--	4 Reserved parameters		
An	Restricts close speed to 1ft/sec	on	oF/on
St	No stop during **F**ind **C**lose mode	oF	oF/on
JS	**J**am **S**ensing	on	oF/on
rP	**r**everse if no encoder **P**ulse	on	oF/on
LH	**L**eft **H**and parameter read only	on	oF/on
nA	**n**o **A**djustment permitted	oF	oF/on
--	1 Reserved parameter		
bt	**b**rake **t**ime**	3***	0-3
Ob	Opening **OB**struction detection	3 (factory set - most senisitve - 0 = off)	0-3
tY	**T**Y**pe (read only)	3	0-4
CP	**C**heck **P**oint in inches	90% of total stroke	
PO	**P**artial **O**pen stroke in inches	8	
tS	**t**otal **S**troke (read only)		

*Time delay is 2-8, 10, 12,14, 16, 20, 25, 30 or 60 seconds.
**This parameter changes the braking force during opening.
  3 is the most forceful with 0 being the mildest
***Defaults: 2001 = 3 2003 = 1

BELT *DRIVE*

15. ACTUATION FEATURES

Set jumpers or key switch for the type of operation required. See diagram 2 page H202.16

CODE DISPLAY

RESET

LOCK (Orange)

LOCK MON (Yellow)

SET
Double click = off or on
Press and hold = data save

Connect to CN 4

2-way day mode factory setting is: jumper or switch from 15 to16.

Com 15
16

UP   DOWN
Display Scroll

`2 d`

`1 d`

1-way day mode setting is: jumper or switch from 13 to15 and 15 to 16.

13
15
16

These displays apply to 2.19 and up only

2-way night mode setting is: **NO** jumpers or switches

13
15
16

`2 n`

1-way night mode setting is: jumper or switch from 13 to15 **NO** jumper or switch from 15 to 16

13
15

`1 n`

TS 1
TS 2

FAIL SECURE
Remains locked at power failure

Lock monitor SW

Fail secure

1st Step
Set jumpers as shown for fail secure or fail safe

TS 1
TS 2

FAIL SAFE
Unlocks at power failure

Lock monitor SW

Fail safe

NOTE:

Many other features, for autolock and motion detector configuration, are available through additional adjustable parameters. These parameters can be discussed in greater detail by calling the technical service group.

16. AUTOLOCK SET UP AND INITIALIZATION

Press **SET** and **RESET** simultaneously, release **RESET**, wait 5 seconds,then release **SET** - version number will displayed.
During initialization the control clears all ports and the solenoid becomes inactive.

FAIL SECURE

The C2150 looks to see if there is a contact at the lock port CN4 and if the yellow lock monitor LED is off.

If the yellow LED is off...

The control sends a pulse to retract the solenoid...

SOLENOID

If the control gets a response back, it knows there is a fail secure lock.

If there is no response it knows there is no lock.

`5 E`

`n L`

FAIL SAFE

The C2150 looks to see if there is a contact at the lock port CN4 and if the yellow lock monitor LED is on.

If the yellow LED is on...

The control sends a pulse to retract solenoid...

SOLENOID

If the control gets a response back, it knows there is a fail safe lock.

If there is no response it knows there is no lock.

`5 A`

`n L`

17. SETTING LOCK PARAMETERS

To set up the lock parameters on the C2150 turn off the toggle circuit or double click the **SET** button. Use the **UP / DOWN** buttons to locate **dL** & **L1**.
Press the set button to display the on or off setting. Set **dL** / **L1** as required from the table below.

Traffic Mode		dL:oF L1:oF	dL:oF L1:on	dL:on L1: doesn't matter
Day	2-Way	Unlocked	Unlocked	Locked
Day	1-Way	Unlocked	Locked	Locked
Nite	2-Way	Locked	Locked	Locked
Nite	1-Way	Locked	Locked	Locked

SEE SECTION 3 STEP 10 FOR (ds) DATA SAVE PROCEDURE

18. LOCK ERROR CODES

LF	**L**ock **F**ailure (**Fail Secure**) Indicates that the lock monitor input is remaining active (lock monitor light is still on) even though solonoid has de-energized.
UF	**U**nlock **F**ailure (**Fail Secure**) Indicates that the lock solenoid failed to move the plunger enough to activate the lock monitor switch and notify the control that the door is ready to be opened.

Check for mechanical binding. Check items under AUTOLOCK TEST POINTS and AUTOLOCK FUNCTIONS FOR FAIL SECURE autolocks.

LF	**L**ock **F**ailure (**Fail Safe**) Indicates that the lock solenoid failed to move the plunger enough to activate the lock monitor switch.
UF	**U**nlock **F**ailure (**Fail Safe**) Indicates that the lock solenoid spring has failed to move the plunger enough to activate the lock monitor switch and notify the control that the door is ready to be opened.

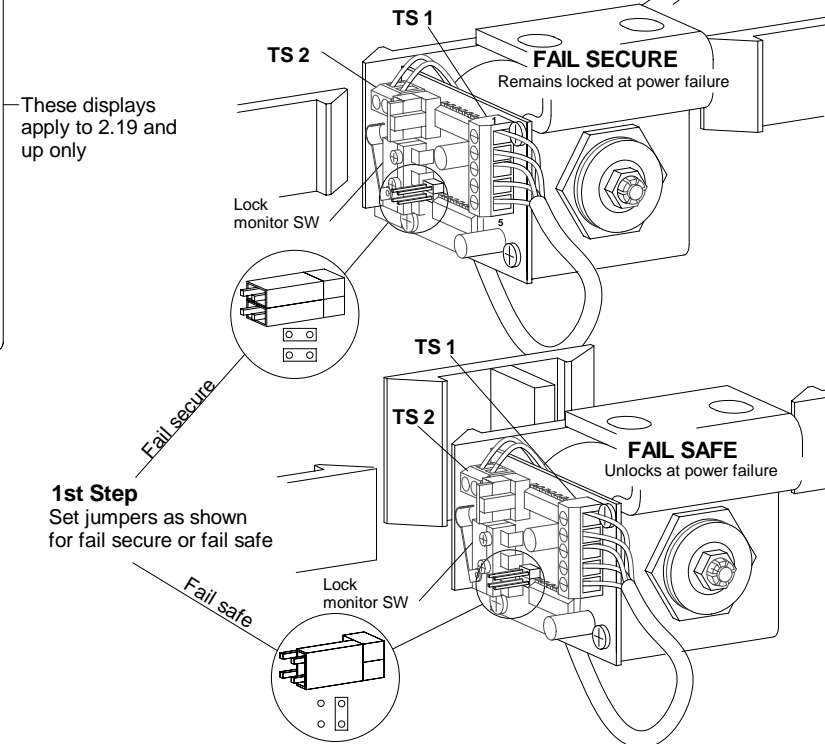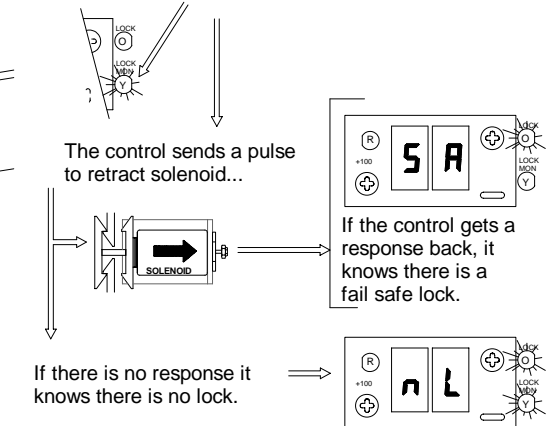Check for mechanical binding. Check items under AUTOLOCK TEST POINTS and AUTOLOCK FUNCTIONS FOR FAIL SAFE autolocks.

19. AUTOLOCK TEST POINTS

Basic voltage readings regardless of type.Set VOM at 200VDC.

TS 1
1 BRN
2 RED
3 GRN
4 WHT
5 BLK
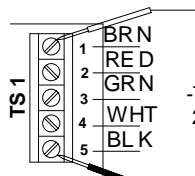
NOTE: The terminal strips TS1 & TS2 are located on the autolock

-There should always be a supply voltage of 25 to 33 VDC between pins 1 and 5 at TS 1.

TS 1
1 BRN
2 RED
3 GRN
4 WHT
5 BLK
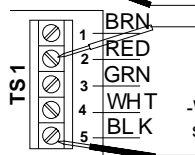
-When the control's orange lock light is on there should be 3 to 5 VDC between pins 2 and 5 at TS 1.

-When the solenoid initially energizes there should be 25 to 33 VDC at TS2.
After about a second the voltage will drop to about 30% of the supply voltage between pins 1 and 2 of TS2 .

TS 2
BLK
BLK
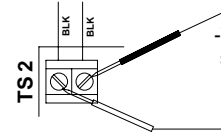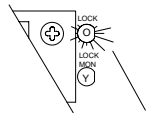
20. AUTOLOCK FUNCTIONS

The **FAIL SECURE** is the most common type of auto lock used with the C2150.

Lock spring
SOLENOID
top view locked

When power is removed, the solenoid is extended by the lock spring. The door is locked.

TS 1
1 BRN
2 RED
3 GRN
4 WHT
5 BLK
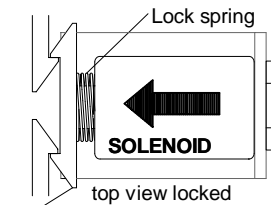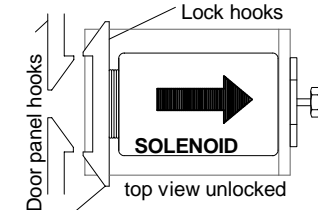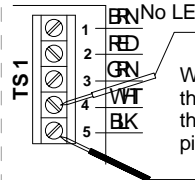
No LED's are lit

When the lock is unplugged and the solenoid manualy depressed there should be continuity between pins 4 and 5 of TS1

Lock hooks
SOLENOID
top view unlocked
Door panel hooks

When power is applied the solenoid is retracted and the door is unlocked.

The yellow lock monitor and the orange lock LED's should both be lit when the solenoid is retracted.

The **FAIL SAFE** is a less common type of auto lock used with the C2150.

Lock spring
SOLENOID
top view unlocked

When power is removed the solenoid is extended by the lock spring. The door is unlocked.

The yellow lock monitor LED is lit when the solenoid is *not* retracted.

Door panel hooks
SOLENOID
top view locked
Lock hooks

When power is applied the solenoid is retracted and the door is locked.

The orange lock LED is lit when the solenoid is retracted.

When the lock is unplugged and the solenoid is *not* manually depressed there should be continuity between pins 4 and 5 of TS1. Check the jumpers on the Autolock circuit board. (see section 6)

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09-07

BELT DRIVE

21. ENCODER ERROR CODES

Encoder error codes are displayed when the door is running. Normally codes will be displayed at the end of a stroke or when a door stops abruptly during an "open" command.

Types of failure codes that could be displayed:

EF   **E**ncoder **F**ailure - No pulses being received by the C2150.
           -Check all connections to encoder and the control.

LP   **L**oss of **P**ulses - All pulses required for proper operation were not received.
         -See encoder test points Section 13

EP   Encoder Phasing - Encoder indicates door is moving opposite direction it should be.
         -Power brackets are connected to the belt backwards
          (see appendix F)
         -Wires should be reversed at terminal 2 & 3 on the encoder
          on C5600 & C3675 only.

Et   **E**ncoder **T**est - The beginning of an encoder test procedure.
         -See section below

22. ENCODER DIAGNOSTICS

Encoder information is needed to provide consistent information on location, direction of travel, speed of door and door braking information to the C2150 control.

1st Step - Encoder test

-Press **RESET** and the **DOWN** button together
-Release **RESET** and continue to hold the **DOWN** button
until **ET** briefly appears - release the **DOWN** button.
Following **ET** 2 short lines will appear. The test
is ready to be performed.

RESET

UP   DOWN   SET

E t   *Then*   - -
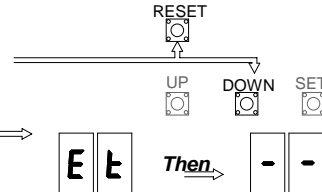
2nd Step - Performing test

View the display while manually
moving the door **slowly** towards the
open position.
The display will show a counter
clockwise rotation.

Open direction
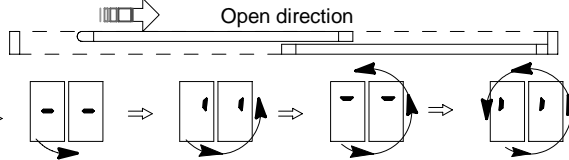
Manually move the door towards
the closed position.
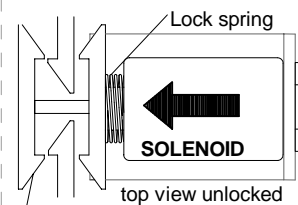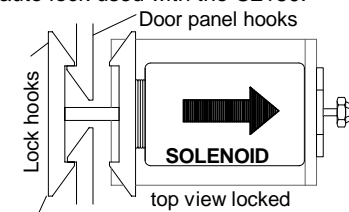The display will show a clockwise
rotation.

Close direction
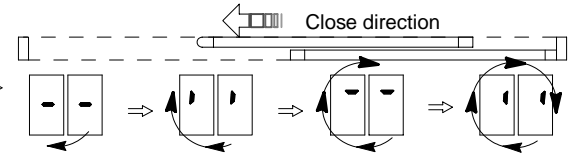
Each segment of 4 for a total of 8 segments should appear. No segment should be skipped.
If anything occurs other than the description shown above the C2150 will get improper
information and the door will not function properly.

23. ENCODER TEST POINTS

To test the encoder you will need a volt ohm meter (**VOM**) capable of reading DC Voltage.

Checking power and pulses

-Turn the toggle circuit off.
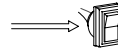
-Set the **VOM** to **200 DCV**

-Probe through the back
of the red plug leaving it
attached to CN 1.

5 Volts DC
(constant)

CN 1
1-RED
4-BLK
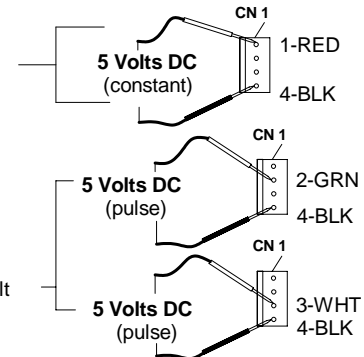
-To verify the encoder is
producing pulses slowly
move the door manually
with the meter attached
to 2 & 4 then 3 & 4.
Watch the meter for 5 volt
pulses.

5 Volts DC
(pulse)

CN 1
2-GRN
4-BLK

5 Volts DC
(pulse)

CN 1
3-WHT
4-BLK

CN 1
1
GND

BLK-4 WHT-3 GRN-2 RED-1
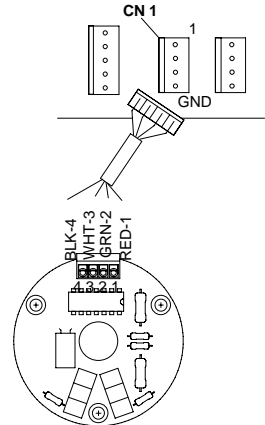
If the above voltages check out and the display does not rotate as shown
in section 12 then contact the technical services group.

Checking connections

-Check JB 1. This circuit should be open - jumpers off as shown.
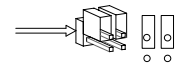
-Confirm that the encoder is pluged into CN1 and that
the wires are connected to the plug.

Encoder wheel

Power but no pulse

There is power between pins 1 & 4 but
there is no pulse between 2 & 4
or 3 & 4.

On the C5600 & C3675 only

-Remove the encoder cover and check
that all wiring is secured in the terminal
block.
-Check the rotation of the encoder wheel
as the door is moved manually.
-Check the depth of the encoder wheel as it
passes through the encoder optics.
-If all visual inspections pass, the encoder
board may have failed. Remove and replace.
See appendix E

CN 1

CN 1

C5600
2003

C3675
2001 (sim)

There are **no serviceable elements** on the C5600-1.
If the encoder fails replace the entire unit. **DO NOT REMOVE COVER**

CN 1

C5600-1
2003
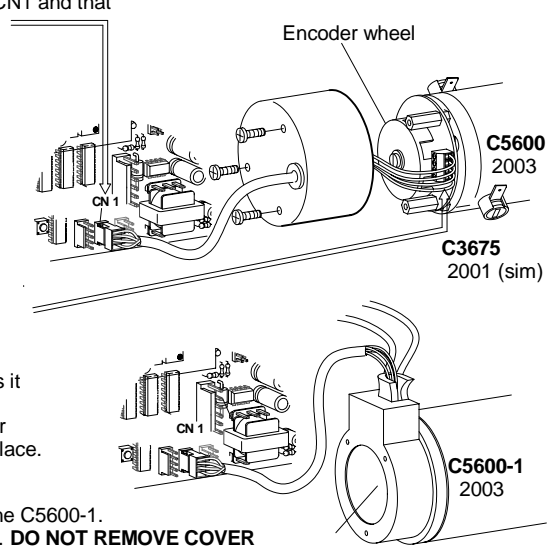
BELT DRIVE or 2000 LINEAR DRIVE

24. POWER FAILURE UNIT C3984

The function of a power failure unit is to open or close the door (as selected) in the event of a power failure.

4th Step
Go to the *PF* parameter in the C2150 (see section 4)
-Set to *0P* for the door to **open** when the power fails.
-Set to *CL* for the door to **close** when the power fails.
-To inhibit the power failure feature at night, go to the *Pn* parameter and turn it off.

3rd Step
Connect C3889 jumper from J1 on the C2150 to J1 on the power supply.

The batteries could take up to 10 hours to charge before they can be tested.

2nd Step
Connect the C3897 wiring harness from CN4 on the power fail unit to CN 2 on power supply CN7 on the C2150

1st Step
Mount the unit in the header.

C3984-1

CN4

CN7

C2150

J1

3 Conductor

CN3

5 Conductor

C3897

CN2

POWER SUPPLY

J1

H210.13

C3989

CN1
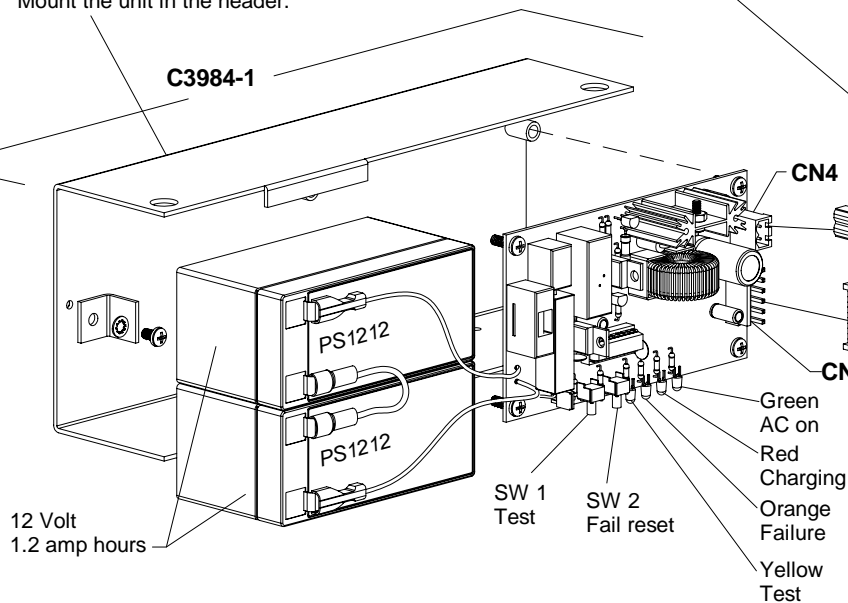
Green AC on

Red Charging

Orange Failure

Yellow Test

SW 1 Test

SW 2 Fail reset

PS1212

PS1212

12 Volt 1.2 amp hours

Monitored power fail unit

This unit automatically tests its batteries at startup and at least once an hour afterwards.
-If the batteries test fails during daytime operation it wil go to full open position (as per European standard) and stay open.The C2150 display will flash bF until the failure is corrected.
-To maintain security,battery failures are ignored in the night mode,but the failure is stored on the units circuit board. When the door is switched to the day mode it will open fully and indicate the failure on the C2150 display.

Manual test

-Press and hold the test button on the circuit board untill the yellow LED test indicator comes on, then release it. The pack is now self testing to insure that enough power is available to open or close the door for one cycle.If the test is OK the indicator will go out in about 15 seconds and the red charge indicator will come on.It will glow for about 5-7 minutes, then dim and go out. (Assuming the batteries were fully charged when the test was started).

BELT DRIVE or *2000 LINEAR DRIVE*

APPENDIX A   IN CASE OF DIFFICULTY

1.If DISPLAY FAILS TO LIGHT

-Go to section 1 step 8 and check for DC voltages shown on CN7 terminals 3&4.
-If voltage is **not present**, check AC power at pins 1&2 of CN1 of power supply.
-If AC power **is present**, check fuses F1 & F3 of the power supply.

2.If DISPLAY LIGHTS, BUT DOOR NEVER MOVES - PERFORM FUNCTIONTEST

-Go to section 1 step 8 and check for DC voltages shown on CN7 terminals 1&2.
-If voltage is **not present**, check fuse F2 of the power swpply.
-If F2 is good power supply is faulty.
-If voltage **is present** on CN7 and display is showing a run code ie: `05`,`0U` ,`C5` ,
`CC` or`CU` check for motor voltage(with motor plugged in) on pins 1 and 2 of CN8
 leaving the control. Use 200 VDC scale.
-If voltage is **not present** at CN8, change control.
-If voltage **is present** at CN8, go to appendix C for motor test.

3.DOOR SLAMS OPEN and / or CLOSED WITH NO SPEED CONTROL

-Go to appendix C for motor test (to make sure motor did not ruin control)
-If motor test good, change control.

4.DISPLAY WILL ONLY SHOW OS

-Make sure toggle circuit is complete by turning toggle switch off and on. The
 green TSW LED should go off and come back on. This LED must be on for the
 door to operate.

5.ERROR CODE OR SOME OTHER ABNORMAL DISPLAY APPEARS.

-Go to appendix B - find the code and follow the instructions.

6.FUSE F2 BLOWS REPEATEDLY

 CAUTION: disconnect the power supply at CN1 and wait 30 seconds before
 servicing.
-Unplug the power harness at CN7 (section 1 step 8) and the motor at CN8 and
 replace the fuse (slow blow 5 x 20mm Buss type GDC 3.15 or equal)
-If the fuse blows again, replace the power supply.
-If the fuse does not blow,reconnect the power harness at CN7 and attempt to
 operate the door with the motor unplugged.
-If the fuse blows now, replace the C2150 control (first check motor as shown in
 appendix C).
-If the fuse does not blow, plug the motor in and try again.
-If the fuse blows again and the motor checked good, check for a mechanical bind.
 Check br and JS parameters in appendix A which can help prevent fuse blowing.
-Consult Technical Assistance at the Horton factory.

7.FUSE F3 BLOWS REPEATEDLY

 CAUTION: disconnect the power supply at CN1 and wait 30 seconds before
 servicing.
-Unplug the power harness at CN7 (section 1 step 8) and all connections of pins
 1 and 5 of CN2 and CN4 autolock, if present, and replace fuse F3 again
 (slow blow 5 x 20mm Buss type GDC 3.15 or equal)
-If the fuse blows again, replace the power supply.
-If the fuse does not blow, reconnect the power harness to CN7.
-If the fuse blows now replace the C2150 control.
-If the fuse does not blow replace the autolock, and connections at pins 1 and 5
 of CN2 one at a time until F3 blows indicating a short circuit in that component or
 its wiring. Beams and their wiring are the most frequent cause of F3 failure.

2000 LINEAR DRIVE

APPENDIX B LINEAR DRIVE FUNCTION TEST

-Press and hold RESET

RESET

-Press and hold DOWN and SET

UP DOWN SET

-Release RESET

UP DOWN SET

-Hold DOWN and SET until Ft appears
 (note: version number will appear first)

```
 1 0
```

UP DOWN SET

```
 0 0
```

-2 second pause

UP DOWN SET

```
 F t
```

MICROSWITCH DISPLAY

-Press and hold the UP button to drive the door open.
 The display will read as follows:

CL	CC	(Blank)	OC	OP
Close cut off	Close check	Blank	Open check	Open cut off
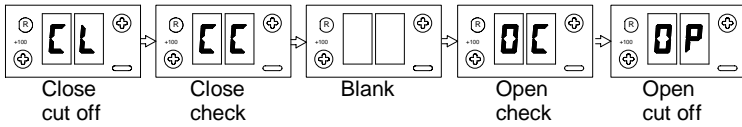
-Press and hold the DOWN button to drive the door closed.
 The display will read as follows:

OP	OC	(Blank)	CC	CL
Open cut off	Open check	Blank	Close check	Close cut off

UP DOWN SET

-Press the SET button to activate the lock

LOCK (Orange)

LOCK MON (Yellow)
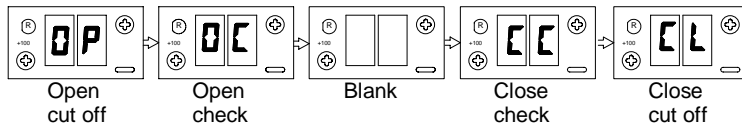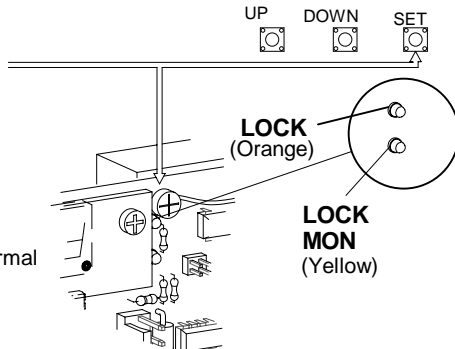
-Press the RESET to return the control to normal

BELT DRIVE

APPENDIX B1 BELT DRIVE FUNCTION TEST

-Manually move the door to mid stroke

RESET

-Press and hold RESET

-Press and hold DOWN and SET

UP DOWN SET

-Release RESET

-Hold DOWN and SET until Ft appears
 (note: version number will appear first)

UP DOWN SET

```
 1 0
```

UP DOWN SET

```
 0 0
```

-2 second pause

UP DOWN SET

```
 F t
```
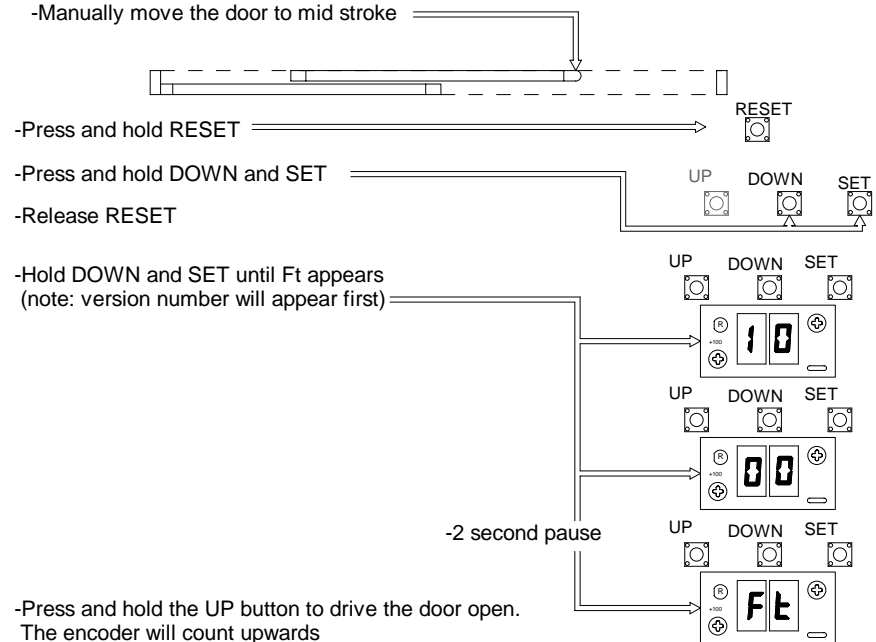
-Press and hold the UP button to drive the door open.
 The encoder will count upwards

1	2	3	. . . . . .
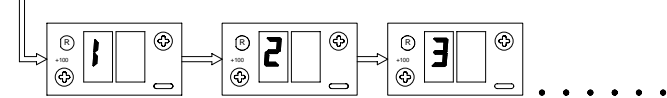
-Press and hold the DOWN button to drive the door closed.
 The encoder will count down
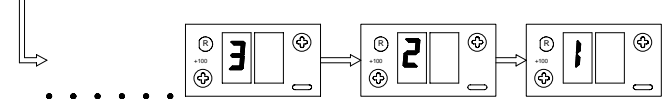
. . . . . .	3	2	1

UP DOWN SET

-Press the SET button to activate the lock

LOCK (Orange)

LOCK MON (Yellow)

-Press the RESET to return the control to normal

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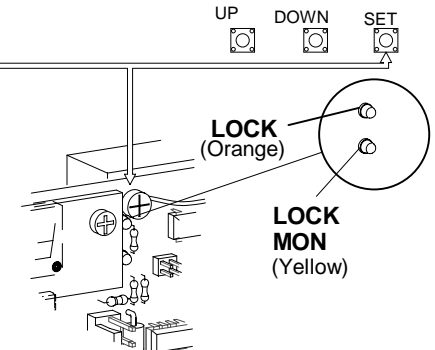
APPENDIX C CODE DISPLAYS Codes are arranged in alphanumeric order   (NOTE: D = Display, P = Parameter, E = Error)

CODE	DISPLAY MEANING	TYPE	VERSION
‗‗	Control is braking - door always brakes when opening. Close braking can be turned on at the **Cb** parameter	D	2.00 ⇧
88	Control has failed - must be replaced	E	2.00
1d	Door is idle in **1** way **d**ay mode. See section 5	D	2.19
1n	Door is idle in **1** way **n**ight mode. See section 5	D	2.19
2d	Door is idle in **2** way **d**ay mode. See section 5	D	2.19
2n	Door is idle in **2** way **n**ight mode. See section 5	D	2.19
AA	Door was activated or is being held open by SW 'C' input. See App. D CN2 for wiring & LED	D	2.15
AC	This parameter is factory set - do not change without consulting factory	P	2.00
AS	When **A**uto **S**eal parameter is turned on, the display will change to AS and the control will try to close the door every 15 seconds	PD	2.00
bF	This indicates battery failure of C3984 monitored power failure unit. See section 24	E	
br	**B**rake on **r**ecycle turned on, the control will slow door substantially before reversing on recycle	P	2.03
Cb	When **c**lose **b**raking parameter is turned on, the control brakes the door between **C**lose **S**peed and **C**lose **C**heck - recommended for heavy doors	P	2.03
CC	**C**lose **C**heck speed. See section 2 linear drive, section 13 belt drive	PD	2.00
CL	Power fail **CL**ose see section 24 - **CL** is displayed when **Pn** parameter is inhibiting close	D	2.11
CP	This parameter determines stroke to open check. Adjustable from 50-90% of total stroke	P	2.00
CS	**C**lose **S**peed. See section 2 linear drive, section 13 belt drive	PD	2.00
Ct	**C**ycle **t**est will cause door to open and close repeatedly for test purposes	PD	
CU	**C**lose **C**ushion speed. See section 2 linear drive, section 13 belt drive	PD	2.00
d1	Main time delay- starts when all activate and recycle inputs clear and door is fully open	PD	2.00
d2	Partial open delay is active when SW 'A' is on (App. D) & starts when all activate and recycle inputs have cleared & door is at partial open	PD	
dF	Control failed to store parameters (control must be replaced)	E	2.00
dL	**D**oor **L**ocks (in day mode) when this parameter is turned on. See section 7 linear drive, section 17 belt drive	P	2.00
dn	This is a cycle code (see foot note) from **DOWN** button	D	2.15
dS	This shows a successful Data Save. See section 3 step 10 linear drive, section 14 step 2 belt drive	D	
Et	Position error	E	2.11
EA	This is a cycle code (see foot note) from ext motec input see appendix D CN2	D	2.15
EF	**E**ncoder **F**ailure. See section 21	E	2.00
EP	**E**ncoder **P**hasing error. See section 21	E	2.02
Et	Brief display indicates start of **E**ncoder **t**est. See section 21	D	2.00
FC	**F**inding **C**lose is displayed when the door is closing to the fully closed position after a power failure or during learn initialization cycle. See section 13, 4th step	D	2.00 ⇧
FO	**F**inding **O**pen is displayed when the door is opening while counting encoder pulses. See section 13, 4th step	D	2.00 ⇧
Ft	**F**unction **T**est. See appendix B1	D	2.11 ⇧
HO	This parameter is factory set - do not change without consulting the factory	P	2.00 ⇧
IA	This is a cycle code (see foot note) from Interior Motec see appendix D	D	2.58
J1	This indicates the control tried to run the motor & received no response from the encoder. The run was aborted to save the fuse(functional 2.09 & up)	D	2.07
JS	Turn on this parameter to save the fuse if the door is actuated while jammed or locked (see J1)	P	2.07
L1	Provides **L**ocking in **1** way mode. See section 7 linear drive, section 17 belt drive	P	2.03
LF	Automatic **L**ock **F**ailed to lock. See section 8 linear drive, section 18 belt drive	E	2.00 ⇧
LL	On if lock is present. See section 6 linear drive, section 18 belt drive	P	2.18
LP	Indicates **L**oss of **P**ulses from encoder. See section 21	E	2.00 ⇧
nA	Access restricted call factory for assistance	PD	2.05 ⇧
nh	Position error. **No h**ome found	E	2.11 ⇧
nL	**N**o **L**ock found during initialization. See section 6 linear drive, section 16 belt drive	D	2.00 ⇧
nS	Door has not reached appropriate switch in linear drive	E	2.06
Ob	**OB**struction - If door is impeded while opening / stops displays Ob and opens in OC	PD	2.22 ⇧
OC	**O**pen **C**heck speed. See section 2 linear drive, section 13 belt drive	PD	2.00 ⇧
OP	This is a **P**ower fail **O**pen code. See section 24	D	2.11 ⇧
OS	**O**pen **S**peed. See section 2 linear drive, section 13 belt drive	PD	2.00 ⇧

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APPENDIX C2 CODE DISPLAYS

CODE	DISPLAY MEANING	TYPE	VERSION
OU	Open cUshion speed. See section 2 linear drive, section 13 belt drive.	PD	2.00 △
PC	Indicates control is slowing for partial open	D	2.00 △
Pd	Set up has stopped because of activation devices (see sect 2 step 5)	D	2.00 △
PF	Power Failure (see sect. 24)	PD	2.00 △
Pn	Power failure (see sect. 24)	P	2.13
PO	This parameter determines Partial Open stroke in inches.	P	2.00
rC	This parameter is factory set - do not change without consulting factory	P	2.00
rA	This parameter causes the door to recycle if open pulses are received during closing cycle	P	2.06
rU	This is a cycle code (see foot note) from reverser circuit.	D	2.18
SA	Indicates fail SAfe lock is found during initialization. See secton 6 linear drive, section 16 belt drive. Parameter should be turned on if a fail safe lock is present.	PD	2.00 △
Sb	This is a cycle code (see foot note) from safety beam input. See secton 6 linear drive, section 16 belt drive.	D	2.18
SG	Stroke Good.	PD	2.11 △
SE	Indicates fail SEcure lock is found during initialization (see sect. 6)	D	2.00 △
SF	Encoder failed during initialization. Do encoder test (see sect. 12)	E	2.00 △
SL	This parameter reduces all open speed values when turned on	P	2.18
SO	Stroke zeroed is displayed after forcing relearn (see short cuts)	D	2.00
St	Disables Pd during initialization	P	2.00 △
SP	Provides Sidelite Protection when turned on. Reduces opening speed to open check when safety beam input is activated (see app D)	P	2.03
SU	Displays at beginning of initialization	D	2.19
tS	Total stroke shown in inches at the end of initialization (read only)	PD	2.00 △
tY	This display type read only	PD	2.15 △
UF	Autolock has failed to unlock. See section 8 linear drive, section 18 belt drive	E	2.00
UL	When this is turned on it tells the software not to wait for the lock monitor but try to open after a brief delay. Rarely used, only for non Horton locks	P	2.00

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FOOT NOTES: APPENDIX D

-The latest versions, 2.15 and up, also have a new feature called cycle / hold codes. Immediately after the door has opened to its stopping point (full or partial open), a "cycle code" will flash briefly. This code indicates which device opened the door. The cycle code is useful if a door is ghosting and you are trying to figure out which activating device is causing the problem.

-If an actuator is holding the door open, the updated software shows a "hold code" instead of **d1** or **d2** , to indicate which device is holding the door open, The displays shows the various hold codes in sequence. When all devices are clear, the display will switch to **d2** or **d2** and the normal time delay will start.

The cycle / hold codes used are:

iA	Interior Actuator (pin 2 of CN 2)	**dn**	down button
Sb	Safety beam (pin 6 of CN 2)	**AA**	Auxiliary Actuator (pin 14 of CN 2)
EA	Exterior Actuator (pin 3 of CN 2)	**rU**	ReVerser (cycle code only)

-While the door is at rest in the open position, pressing and holding the **UP** button will switch the display to show the last cycle code; that is, the last device that cycled (or recycled) the door. Releasing the **UP** button takes you right back to normal operation. This is a kind of "mini-history" in case you didn't see the cycle code when the control flashed it the first time.

SHORT CUTS

SELF CYCLE MODE To initiate self cycle without accessing the **ct** parameter press and hold the **UP** button then press the **DOWN** button and release them at the same time. If you haven't saved any parameters, you can get out of this mode by pressing the **RESET** button only. Otherwise you must go to the **ct** parameter and turn off and do a data save.

CYCLE DOOR Push the **DOWN** button. The door will open, and stay open until **d1** expires and then close.

LEARN NEW STROKE ONLY(Version 2.03 and later) Hold **SET** and **UP** buttons. Press and release **RESET**, continue holding **SET** and **UP** buttons for 5 seconds.The door will go through the learn cycle without resetting any other parameters.

OVERRIDE PD(Version 2.11 and later) If you encounter "**Pd**" (or other hold codes) during initialization procedure, press and hold the **UP** button to override"**Pd**" and allow the door to set up. This prevents you from having to disconnect motecs or safety beams.

RETURN TO THE TOP OF THE MENU(Version 2.10 and later) Press **UP** and **DOWN** together to return to the top of the menu.

PARAMETER ACCESS (Version 2.12 and later) The menu may be accessed and parameters changed by rapidly double clicking the **SET** button when the door is fully closed or opened. To exit double click the **SET** button again and the control will return to normal mode. Turning the toggle off and on will override this function.

FORCED RELEARN To be absolutely sure that you have executed a relearn of the stroke, hold the **UP,DOWN** and **SET** buttons, then press **RESET** - hold for 5 seconds and release. The display will then start to flash**SO** and will continue to do so until the **RESET** button is pressed again. Then the control will execute a relearn as described in section 2 step 3.

APPENDIX D MOTOR TEST

This test is conducted to determine the resistance across the motor. A low or zero resistance will cause high current draw and damage to the control.

-Place OHM meter in range to measure :
 10 to 50 ½ analog Rx1 range
 R200 ½ digital.

-Unplug the motor and place probes
 in pins 1 and 2

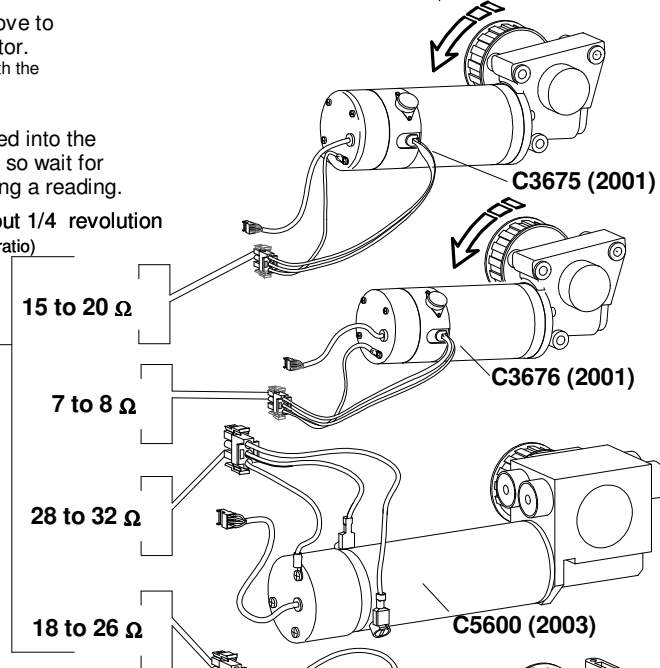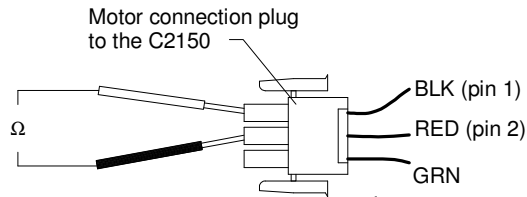-Read and record the resistance.

-Rotate the motor a little bit to move to
 the next section of the commutator.
 (Feel for the brushes to make contact with the
 next segment on the commutator.)

-**NOTICE**: a voltage will be induced into the
 meter when the motor is moved, so wait for
 the meter to stabilize before taking a reading.

-Continue taking readings for about 1/4 revolution
 of the out put pulley. (Pulley is 8:1 ratio)

-Acceptable ranges are
 shown by each motor type.

NOTE: A low reading is
critical and will cause
damage to the control.

Motor connection plug
to the C2150

BLK (pin 1)
RED (pin 2)
GRN

C3675 (2001)

C3676 (2001)

15 to 20 Ω

7 to 8 Ω

28 to 32 Ω

18 to 26 Ω

C5600 (2003)

C5600-1 (2003)

FRAME SHORT TEST

-Place the OHM meter in the range to
 measure at least 20,000
 The meter should show infinite resistance
 when connected .

-Place probes in pins 1(BLK) & 3(GRN/YEL)

THEN... | The meter should not move
            when the probes are connected.

-Place probes in pins 2(RED) & 3(GRN/YEL)

BLK (pin 1)
Ω = ∞   RED (pin 2)
GRN / YEL (pin3)

BLK (pin 1)
Ω = ∞   RED (pin 2)
GRN / YEL (pin3)

APPENDIX E TERMINAL CN2

Terminals
1 thru 15

LED's
D1 thru D9
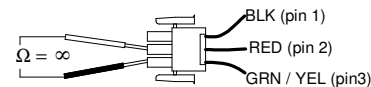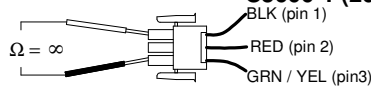
CN 2
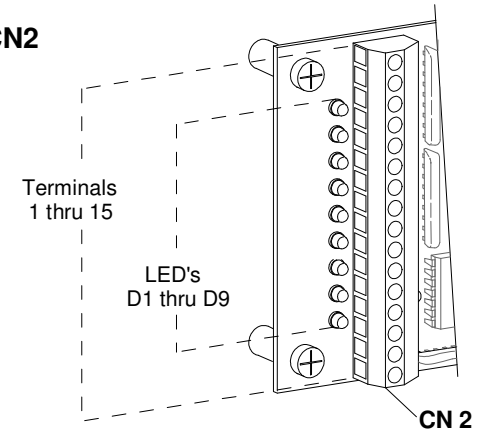
NOTE:

== This symbol indicates
    24 volts DC

4. A point behind a number
    indicates common (ground)

LED		TERMINAL	DESCRIPTION
	==	1	24 VDC
D1 (G) INT MOT		2	Interior Acitvation
D2 (R) EXT MOT		3	Exterior Activation
		4.	Common
	==	5	24 VDC
D3 (Y) SAF BEM		6	Safety beam & sidelite protection
		7.	Common
D4 (G) TOG SW		8	Toggle switch
		9.	Common
D5 (Y) CLS MON		10	N/A
		11.	Common
D6 (G) SW A		12	Partial open cutoff
D7 (Y) SW B		13	1 Way (Closed for one way- light on)
D8 (R) SW C		14	Auxillary activation
		15.	Common
D9 (O) KEY SW		16	Day night mode (closed for day mode-light on)

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DIAGRAM 1 ACTUATING and CONTROL SWITCH CONNECTIONS

INTERIOR ACTUATING SENSOR

+24VDC (BLK)
SIGNAL (RED)
COM (WHT)
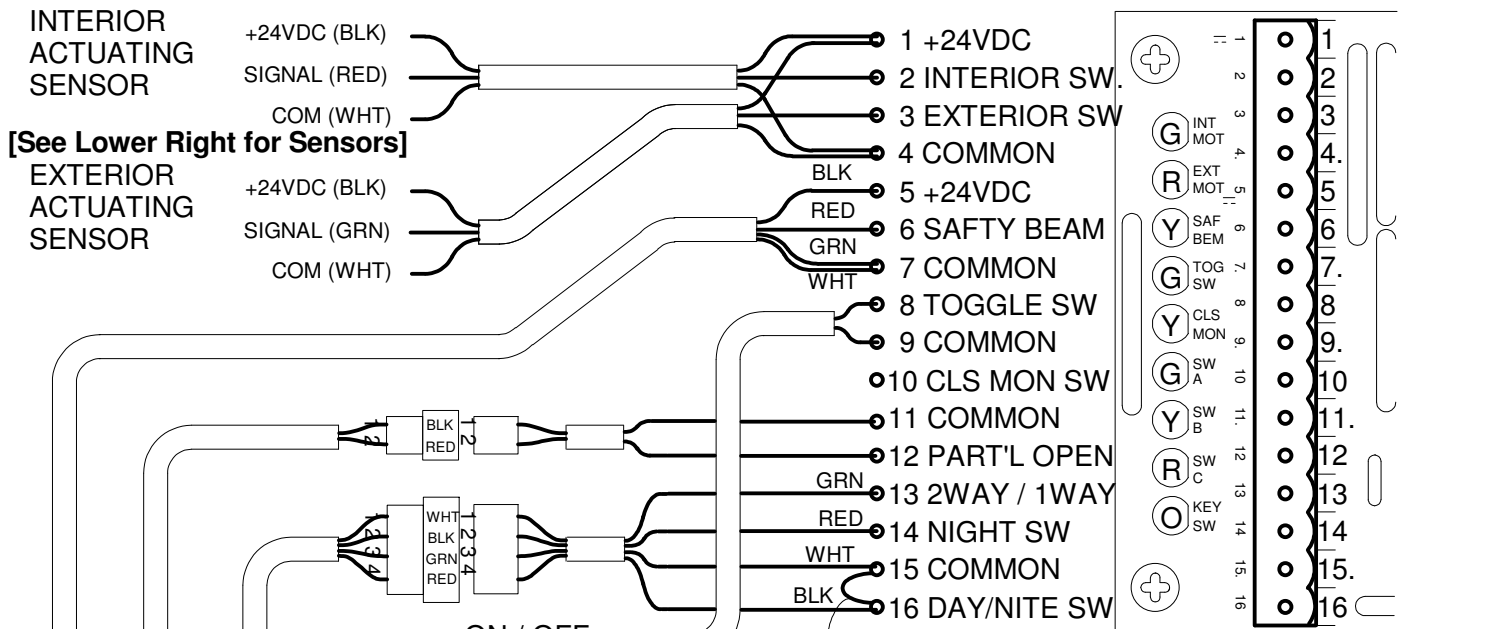
[See Lower Right for Sensors]

EXTERIOR ACTUATING SENSOR

+24VDC (BLK)
SIGNAL (GRN)
COM (WHT)

1 +24VDC
2 INTERIOR SW.
3 EXTERIOR SW
4 COMMON
BLK 5 +24VDC
RED 6 SAFTY BEAM
GRN 7 COMMON
WHT 8 TOGGLE SW
9 COMMON
10 CLS MON SW
11 COMMON
12 PART'L OPEN
GRN 13 2WAY / 1WAY
RED 14 NIGHT SW
WHT 15 COMMON
BLK 16 DAY/NITE SW

BLK / RED

WHT / BLK / GRN / RED

ON / OFF TOGGLE SWITCH

Jumper 15 & 16 if no Remote Switch is used

G INT MOT
R EXT MOT
Y SAF BEM
G TOG SW
Y CLS MON
G SW A
Y SW B
R SW C
O KEY SW

2 WAY AUTO
OFF
1 WAY
HOLD OPEN
FULL OPEN
1 / 2 OPEN

Optional C3725 KeySwitch Assembly / C3726 Rotary Switch Assembly

C1238 SENSOR (OPTEX i - one)

WIDTH ADJUSTMENT NO. 7, 8
1 ~ 8   2 ~ 7   3 ~ 6   NONE
7 8   7 8   7 8   7 8
SENSOR   SENSOR   SENSOR   SENSOR
APPROACH AREA ADJUSTMENT

GREEN (NOT USED)
YELLOW (SIGNAL)
WHITE (COMMON)
GRAY (COMMON)
GRAY (+24VDC)

C7775 THRESHOLD PHOTO BEAM SYSTEM (OPTEX OS-12C)

Blue (1)
Gray (2)

Emitter - Gray Wire
Shield (13)
Wire (12)
Pair 2

Receiver - Blue Wire
Shield (7)
Wire (6)
Pair 1

Gray (1)
Blue (2)

Receiver - Blue Wire
Shield (9)
Wire (8)
Pair 2

Emitter - Gray Wire
Shield (11)
Wire (10)
Pair 1

6 7 8 9 10 11 12 13

Receiver (Blue)   Emitter (Gray)
6 7 8 9 10 11 12 13

Power/Operation Indicator

GREEN
RED

OPTEX   OS-12C

POWER   OUTPUT
AC,DC, 12-24V   N.C. N.O.
1 2   3 4 5

TEACH IN

Power Harness
BLK (1)
WHT (2)
GRN (4)
RED (5)

1 2   4 5

GRAY WIRE   E
BLUE WIRE   R
BLUE WIRE   R
GRAY WIRE   E

C1234 SENSOR (OPTEX 202C)

FREQUENCY SWITCH
L H
PRESENCE DETECTION TIMER
2 60 180 (sec.)

GREEN (NOT USED)
YELLOW (SIGNAL)
WHITE (COMMON)
GRAY (COMMON)
GRAY (+24VDC)

RED (+24VAC/VDC)
BLACK (COMMON)
WHITE (COMMON)
GREEN(ACTIVATION)
BROWN (COMMON)
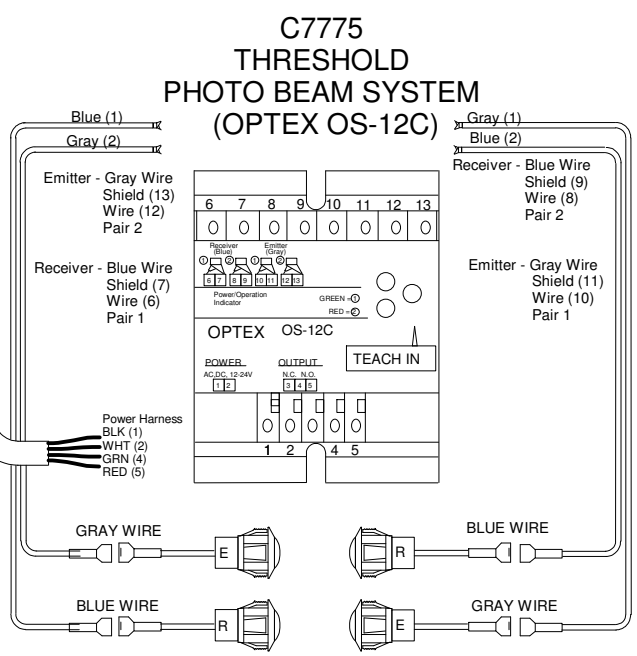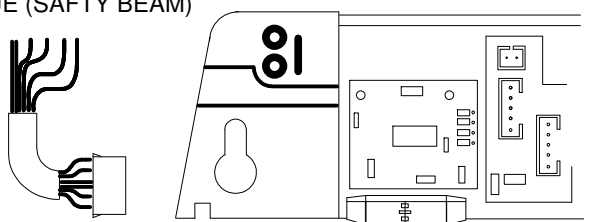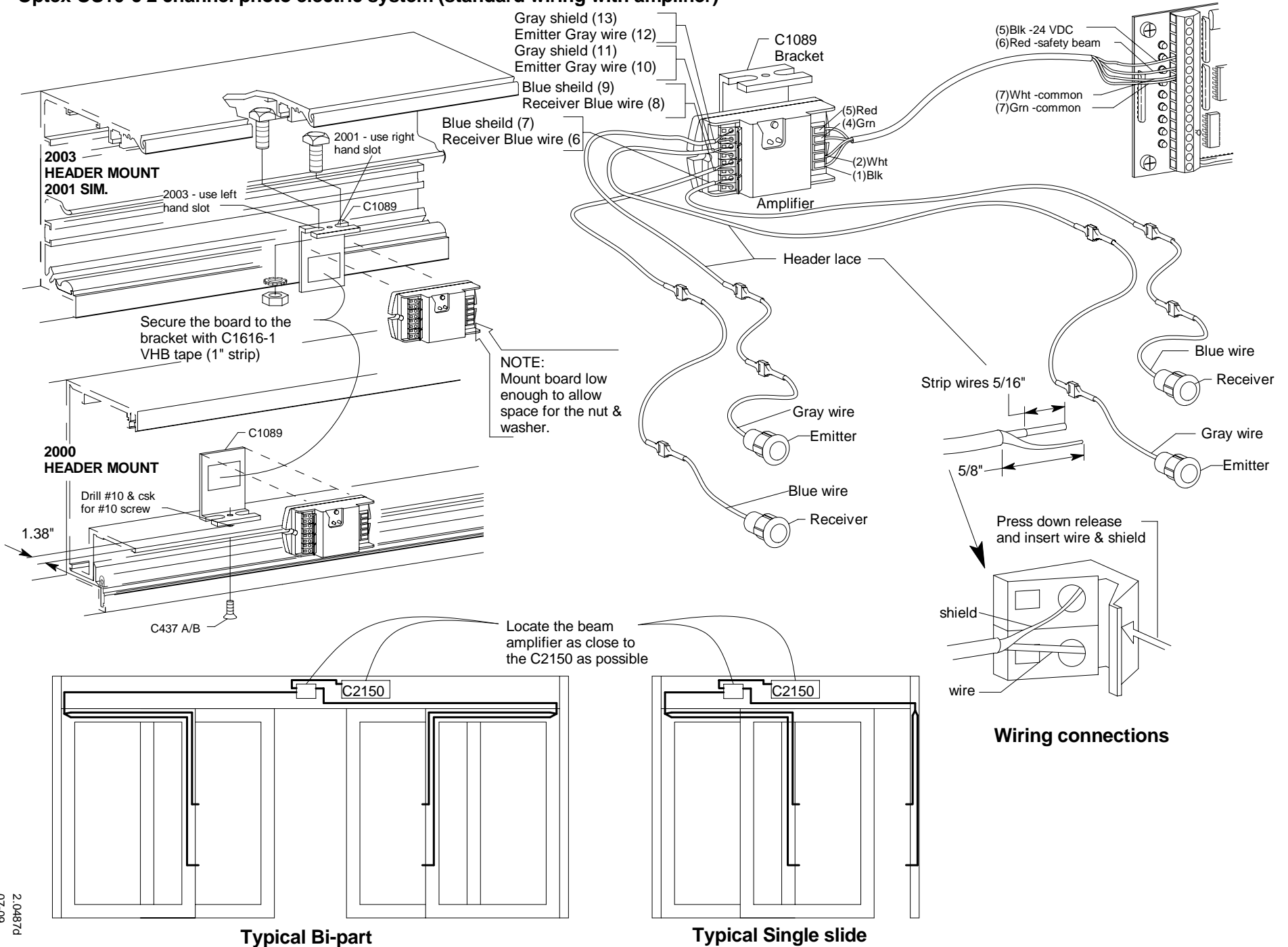BLUE (SAFTY BEAM)

C1827 SENSOR (BEA Wizard SMR)

2.0486d
01/14

DIAGRAM 2 TYPICAL WIRING for BEAMS and SWITCHES

Optex OS10-c 2 channel photo electric system (standard wiring with amplifier)

Gray shield (13)
Emitter Gray wire (12)
Gray shield (11)
Emitter Gray wire (10)
Blue sheild (9)
Receiver Blue wire (8)
Blue sheild (7)
Receiver Blue wire (6)

C1089
Bracket

(5)Blk -24 VDC
(6)Red -safety beam

(7)Wht -common
(7)Grn -common

(5)Red
(4)Grn

(2)Wht
(1)Blk

Amplifier

2003
HEADER MOUNT
2001 SIM.

2001 - use right hand slot

2003 - use left hand slot

C1089

Secure the board to the bracket with C1616-1 VHB tape (1" strip)

NOTE:
Mount board low enough to allow space for the nut & washer.

2000
HEADER MOUNT

C1089

Drill #10 & csk for #10 screw

1.38"

C437 A/B

Header lace

Gray wire
Emitter

Blue wire
Receiver

Strip wires 5/16"

5/8"

Blue wire
Receiver

Gray wire
Emitter

Press down release and insert wire & shield

shield

wire

Wiring connections

H210.20

Locate the beam amplifier as close to the C2150 as possible

C2150

C2150

Typical Bi-part

Typical Single slide

2.0487d
07-09

Horton
A U T O M A T I C S

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

Horton Automatics, Ltd.
Unit A, Hortonwood 31
Telford, Shropshire, England TF1-4GS
Tel: 01952 670169, Fax: 0192 670181
International Tel: ++44-1952-670169
International Fax: ++44-1952-670181

A Division of Overhead Door Corporation, A Sanwa Shutter Company

2.0488d