

NT DOR-O-MATIC



NEWMAN TONKS

SWING-12™ Safety System

Installation & Adjustment Manual

FOR ASTRO-SWING

The SWING-12 Safety System is an infra-red swing door safety system for use on NT Dor-O-Matic Astro-Swing automatic swing door packages.

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OVERVIEW

- **FUNCTION:** The SWING-12 Safety System will detect presence in the swing area as well as the threshold area of an automatic swinging door.

When the swing door is fully closed, the SWING-12 Sensor scans the entire swing area and will not allow the door to open if an object is detected. When the swing door is fully open, the SWING-12 Sensor scans the full threshold area as well as the entire swing area and will keep the door open if an object is detected. Any interruption of the "safety logic" beam while the door is opening will cause the door to go into a safety slow or safety stop mode. Any interruption of the "safety logic" beam while the door is closing will disallow all activation signals from reopening the door until the sensor checks the area behind the door after it closes.

- **FEATURES:** The SWING-12 Safety System retains all of the good features of the sensor rail system, but eliminates many of the difficulties associated with that type of system. The following improvements can be expected:

1. **LESS COMPONENTS:** The SWING-12 Sensor replaces beams 1 THRU 7 of the sensor rail system. This translates into less adjustment time and a faster installation. Servicing the system becomes much simpler too.
2. **IMPROVED OPERATION:** The SWING-12 Sensor communicates directly with the swing control box. As a result, the SWING-12 Sensor continuously monitors the swing area and never shuts off during normal operation of the automatic door.
3. **MORE APPLICATIONS:** The SWING-12 Safety System is not limited by solid doors, odd-sized doors, doors with wide stiles, tinted or reflective glass, or frost on the glass in the door or sensor rails.
4. **GREATER COVERAGE:** The SWING-12 Sensor housing has provisions for three different mounting angles. This allows for full threshold area coverage as well as the entire swing area.

- **IMPORTANT:** The SWING-12 Safety System only operates with NT Dor-O-Matic Universal Astro-Swing control boxes with a "**SWING-12**" function setting. Check the function label on the underside of the control box.

SWING-12 SENSOR

PART IDENTIFICATION AND FUNCTION DESCRIPTION

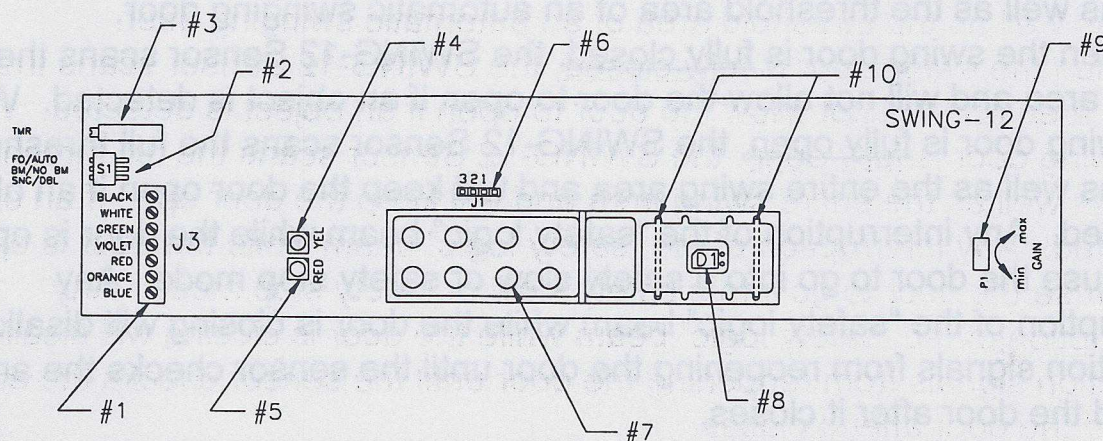


FIGURE 1: SWING-12 SENSOR PART IDENTIFICATION

#1 J3: Terminal Block: All wire connections are made here. Make sure all wires are connected correctly by color and not shorted to adjacent terminals. Also verify that enough insulation is stripped off so that good contact is made between the terminal and the wire.

#2 S1: Computer Function and Set-Up Selector:

This selector has three separate switches referred to as S1-3, S1-2, and S1-1. They must be set correctly when making any adjustments and for the SWING-12 Sensor to work properly. Each individual switch in this group is labeled on the circuit board as to its function. The switch-block itself is also labeled indicating which direction is "ON". When referring to these switches, the name of the function is followed by the corresponding on/off setting such as "AUTO (off)".

- **S1-3: FO / AUTO**
FO (on) for factory use only.
AUTO (off) for set-up and normal operating mode.
- **S1-2: BM / NO BM**
BM (on) for standard installation (with "safety logic" beam).
NO BM (off) for:
 - (a) preliminary testing of the SWING-12 Sensor when installed with the "safety logic" beam and,
 - (b) trained traffic installation (no "safety logic" beam)
- **S1-1: SNG / DBL**
SNG (on) for a door opening 36" to 49" wide (single door).
DBL (off) for a door opening 60" to 98" wide (pair of doors).

#3 **TMR: Timer Adjustment Potentiometer:** When there is a change in the environment (cloud cover, snowfall, etc.), the SWING-12 Sensor will re-adjust itself to the new environment. This potentiometer sets how long the new environment must exist before the auto-adjustment takes place. The adjustment range is 45 seconds to 5 minutes. The factory setting is 45 seconds.

COUNTERCLOCKWISE: Decreases auto-adjust time.

CLOCKWISE: Increases auto-adjust time.

#4 **YEL: Yellow LED Indicator:**

OFF: The unit is defective or not receiving power.

ON: The unit is on.

SLOW FLASH: The unit is automatically adjusting to the environment.

RAPID FLASH: The unit has completed its sizing mode.

#5 **RED: Red LED Indicator:**

OFF: No object is detected in the swing or threshold area.

ON: An object is detected in the swing or threshold area.

#6 **J1: Frequency Selector:** This is an operating frequency selector jumper used to prevent multiple SWING-12 Sensors in close proximity from "talking" to each other. Choose position 1, 2, or 3.

#7 **CR3, CR4, CR5, CR6, CR7, CR8, CR9, CR10: IR LED's:** The 4 IR LED's in the center are used in single door mode. All 8 IR LED's are used in pair of doors mode.

#8 **D1: Light receiving diode:** Reflected light from the IR LED's returns here.

#9 **P1: Gain Adjustment Potentiometer:** Used to adjust the detection distance. This pot may need to be adjusted for different installations. It should be adjusted so that the SWING-12 Sensor will detect an object right at the "safety logic" beam.

#10 **Dividers:** Used to focus detection pattern width for different door sizes.

"SAFETY LOGIC" BEAM & RAIL INSTALLATION

Aluminum Rail without Panel (shown) or Aluminum Rail with Panel

COUNTERSINKS ON THE TOP AND BOTTOM OF THE BEAM RAIL ALLOW THE RAIL TO BE USED FOR RIGHT HAND OR LEFT HAND ASSEMBLIES. ROTATE THE RAIL SO THAT THE LOGIC BEAM HOLE FACES IN THE APPROPRIATE DIRECTION.

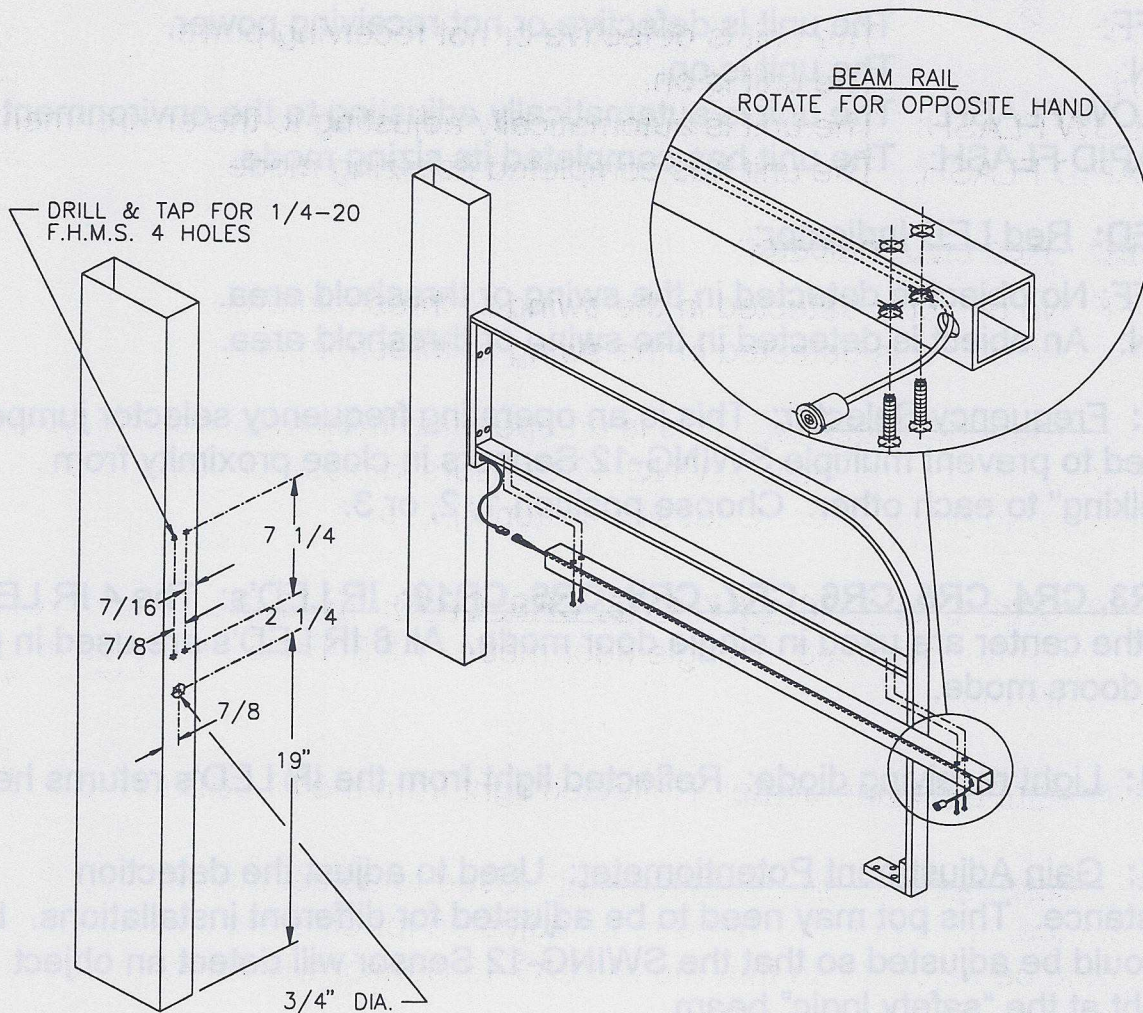


FIGURE 2

Wall Mount Rail

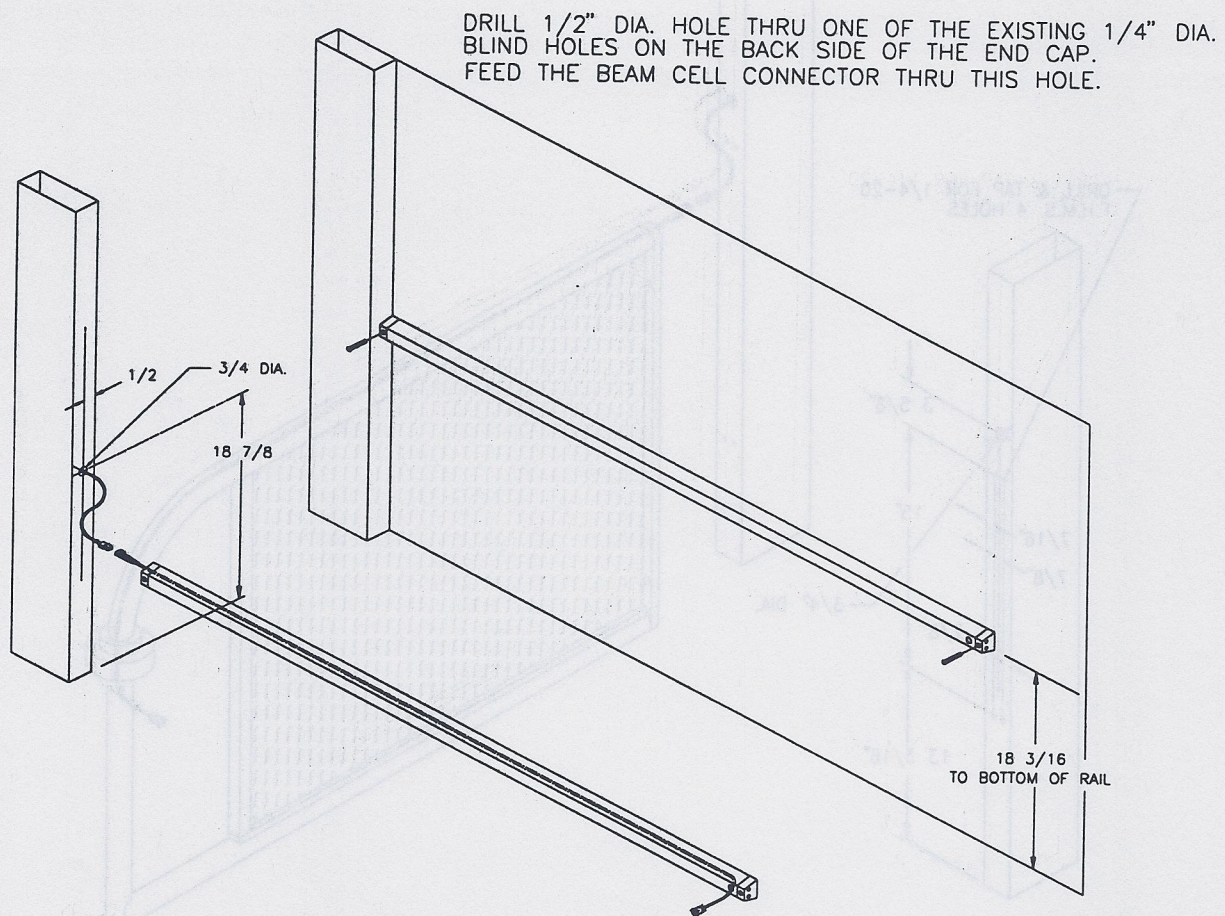


FIGURE 3

Stainless Steel Rail with Panel

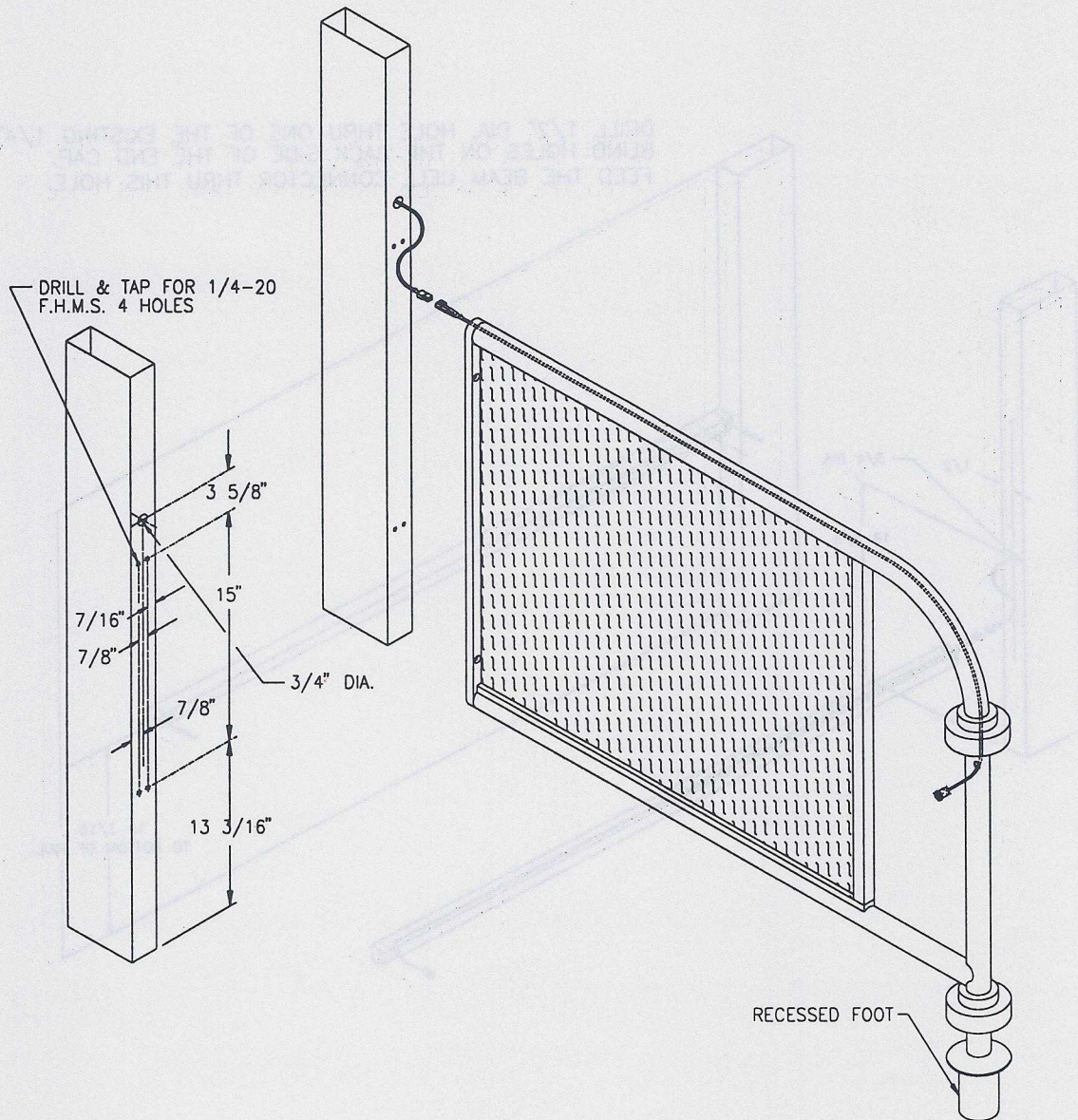


FIGURE 4

Stainless Steel Rail without Panel

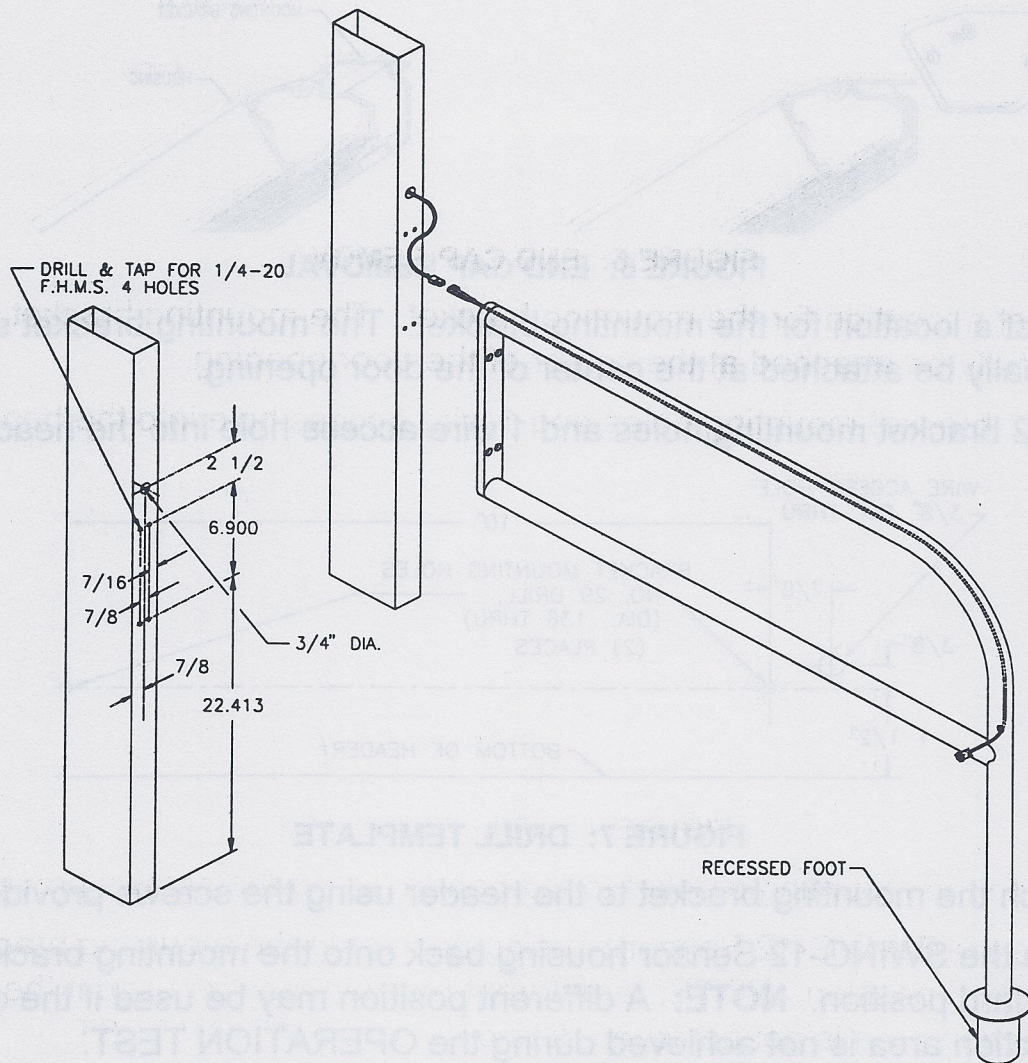


FIGURE 5

SWING-12 SENSOR INSTALLATION

Note: It may be easier to perform the set-up procedure before actually attaching the SWING-12 Sensor to the header.

1. Remove the end caps of the SWING-12 Sensor, and separate the SWING-12 housing from the mounting bracket by sliding it out.

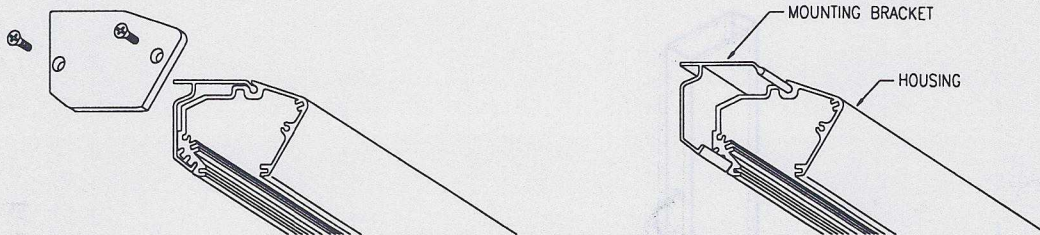


FIGURE 6: END CAP REMOVAL

2. Select a location for the mounting bracket. The mounting bracket should normally be attached at the center of the door opening.
3. Drill 2 bracket mounting holes and 1 wire access hole into the header.

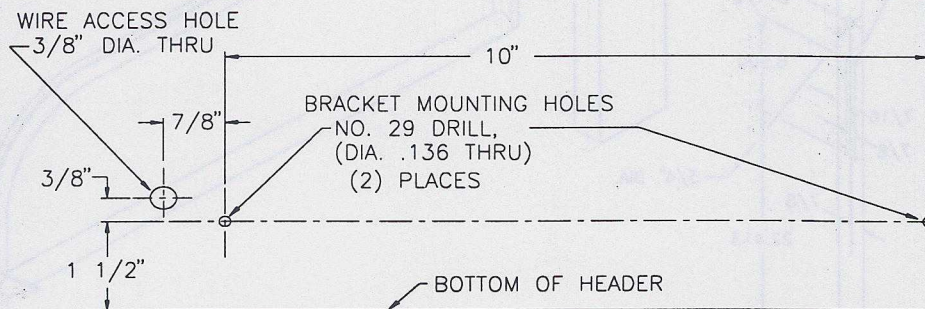


FIGURE 7: DRILL TEMPLATE

4. Attach the mounting bracket to the header using the screws provided.
5. Slide the SWING-12 Sensor housing back onto the mounting bracket in the standard position. **NOTE:** A different position may be used if the desired detection area is not achieved during the OPERATION TEST.

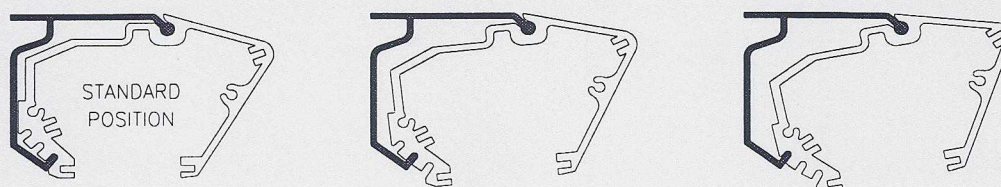


FIGURE 8: MOUNTING ANGLE

6. Remove the lenses from the sensor. Feed the appropriate SWING-12 cables through the wire access hole, and make all wire connections as indicated in the ELECTRICAL CONNECTION section of this manual.

ELECTRICAL CONNECTION (WITH “SAFETY LOGIC” BEAM)



SWING-12 SENSOR SET-UP

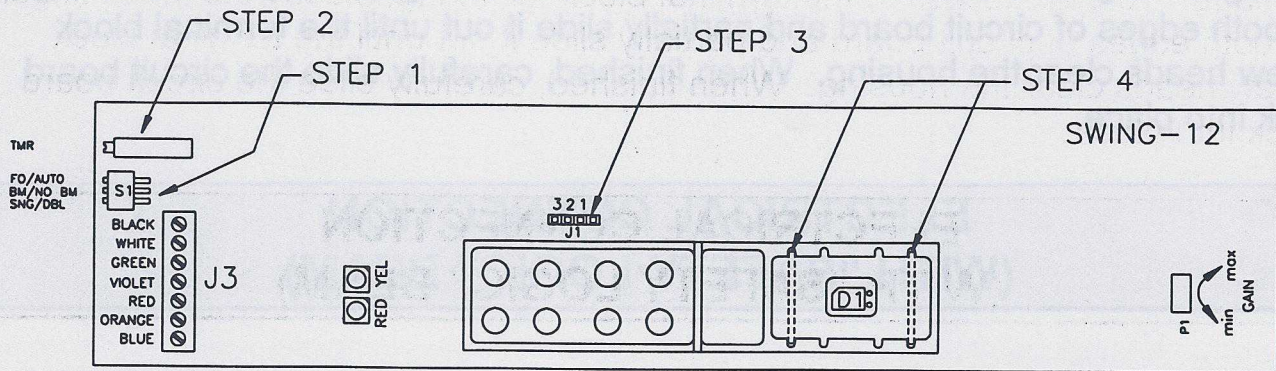


FIGURE 10: SWING-12 SENSOR SET-UP

The following steps are *required* to be performed for proper operation.

1. **IDENTIFICATION:** Each SWING-12 Sensor must be set up in accordance with its particular automatic door package.

- Set **S1-3** to:
AUTO (off) for set-up and normal operating mode.
- Set **S1-2** to:
NO BM (off) for preliminary testing of SWING-12 Sensor in all installations.

For a standard installation (with "safety logic" beam), **S1-2** will need to be set to BM (on) after completing the preliminary test.
For a trained traffic installation (no "safety logic" beam), **S1-2** will remain in NO BM (off) after completing the preliminary test.

- Set **S1-1** according to automatic door package size. Select:
SNG (on) for a door opening 36" to 49" wide (single door), or
DBL (off) for a door opening 60" to 98" wide (pair of doors).

2. **AUTO-ADJUST DELAY:**

Set **TMR** for the desired amount of time delay before the SWING-12 Sensor will auto-adjust. Turning counterclockwise will decrease the auto-adjust time. Turning clockwise will increase the auto-adjust time. The adjustment range is 45 seconds to 5 minutes. All units are pre-set at the factory for 45 seconds.

3. **CHOOSING FREQUENCIES:**

- On a SWING-12 Sensor separated from other SWING-12 Sensors, the frequency selector jumper may be set in any position.
- If you are installing multiple SWING-12 Sensors in close proximity to each other, you must assign different frequencies to each of the SWING-12 Sensors. Place the jumper in position 3, 2, or 1 accordingly.

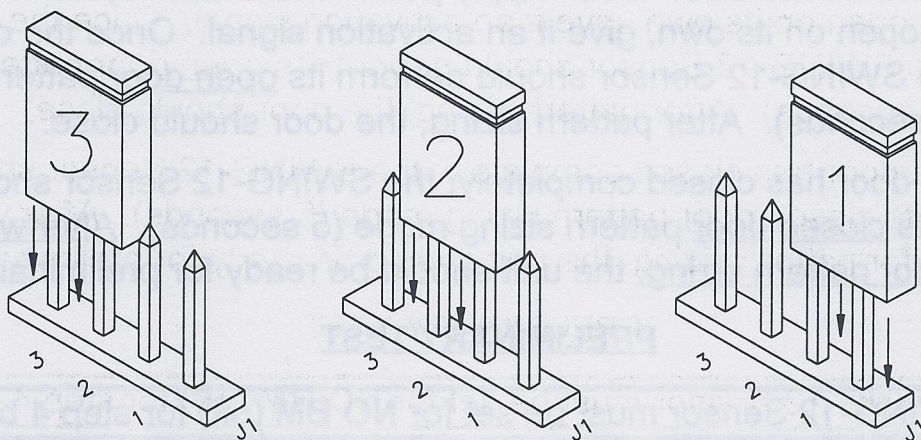


FIGURE 11: SWING-12 SENSOR FREQUENCY SELECTION

4. **DIVIDER PLACEMENT:**

- For a door opening 36" to 49" wide (single door), place the two dividers in the two inner slots of the chamber.
- For a door opening 60" to 74" wide (pair of doors), place the two dividers in the two outer slots of the chamber.
- For a door opening 74"⁺ to 98" wide (pair of doors), remove the two dividers entirely.

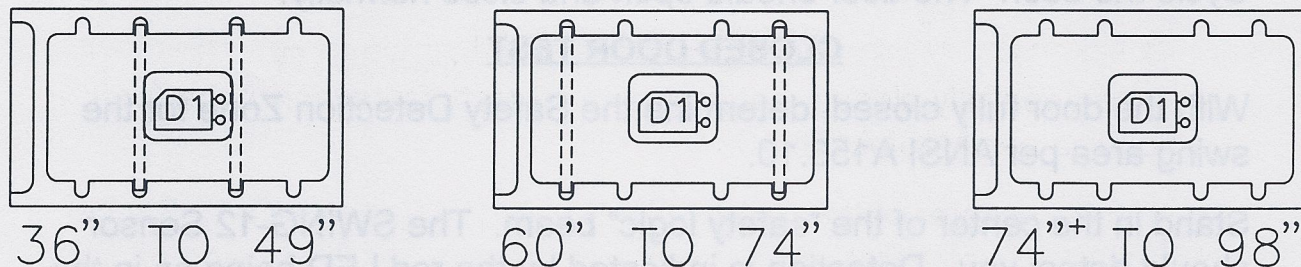


FIGURE 12: SWING-12 SENSOR DIVIDER PLACEMENT

OPERATION TEST (WITH "SAFETY LOGIC" BEAM)

INITIALIZATION

1. Verify that the SWING-12 Sensor is set for **AUTO** (off) and **NO BM** (off) and the lenses are installed in the SWING-12 Sensor.
2. **Stand clear of the door area.** Apply power to the door system. If the door does not open on its own, give it an activation signal. Once the door is fully open, the SWING-12 Sensor should perform its open door pattern sizing mode (5 seconds). After pattern sizing, the door should close.
3. Once the door has closed completely, the SWING-12 Sensor should perform its closed door pattern sizing mode (5 seconds). After waiting 5 seconds for pattern sizing, the unit should be ready for preliminary test.

PRELIMINARY TEST

SWING-12 Sensor must be set for **NO BM** (off) for step 4 below.

4. Check the detection range of the SWING-12 Sensor. Verify that it will detect an object (you) standing just beyond the end of the guide rail. Detection is indicated by the red LED being on in the SWING-12 Sensor. If detection is not made, try (a) using a different slot on the SWING-12 housing and/or (b) adjusting **P1** accordingly, then repeat steps 1 through 3 above.

When detection is made, set SWING-12 Sensor to **BM** (on). Go to step 5.

5. Give the door an activation signal. The door should open slowly the first time and close normally.
6. Cycle the door. The door should open and close normally.

CLOSED DOOR TEST

7. With the door fully closed, determine the Safety Detection Zone for the swing area per ANSI A156.10.

Stand in the center of the "safety logic" beam. The SWING-12 Sensor should detect you. Detection is indicated by the red LED being on in the SWING-12 Sensor. You must also be detected standing along the face of the door, along both guide rails (walls), in all the other various locations of the swing area, and just beyond the arc of the door swing. When being detected, the door should **NOT** open when given an activation signal.

8. Step out of the swing area. The door should now open when activated.

OPEN DOOR TEST

9. Activate the door open.
 - (a) With the door fully open, step into the threshold area. The SWING-12 Sensor should detect you. Detection is indicated by the red LED being on in the SWING-12 Sensor and the door not closing.
 - (b) With the door continuing to be fully open, test the Safety Detection Zone established in step #7 above. Stand in the center of the "safety logic" beam. The SWING-12 Sensor should detect you. You must also be detected standing just in front of the threshold, along both guide rails (walls), in all the other various locations of the swing area, and just beyond the arc of the door swing. Detection is indicated by the red LED being on in the SWING-12 Sensor and the door not closing.
10. Step out of the threshold area and Safety Detection Zone. The door should close.

Note: If the proper Safety Detection Zone is not achieved, try (a) using a different slot on the SWING-12 housing and/or (b) adjusting P1 accordingly, then repeat operation test. When the proper Safety Detection Zone is achieved, attach the end caps to the sensor.

"SAFETY LOGIC" BEAM TEST

11. Block the "safety logic" beam with a piece of electrical tape. The red LED on the SWING-12 Control Box should stay on, and the door should **NOT** open when given an activation signal.
12. Remove the tape. The red LED should shut off, and the door should now open when given an activation signal.
13. Ask someone to give the door an activation signal. Immediately block the "safety logic" beam. The red LED should turn on, and the door should immediately go into a safety slow or safety stop mode.
14. Activate the door open again. Once the door is fully open, block the "safety logic" beam. Make certain that the SWING-12 Sensor is not detecting anything and the motion detector is not sensing movement. The red LED should stay on, and the door should remain open.
15. Unblock the "safety logic" beam to allow the door to close. Once the door begins closing, block the "safety logic" beam again. Ask someone to give the door an activation signal. The door should continue to close without re-opening.

AUTO-ADJUST PROCEDURE (WITH "SAFETY LOGIC" BEAM)

The auto-adjust procedure should be performed if the factory setting of 45 seconds needs to be changed due to environmental conditions or customer requirements. This auto-adjust procedure should be performed after the OPERATION TEST (WITH "SAFETY LOGIC" BEAM) has been completed.

1. With the door fully closed, cross the "safety logic" beam and stand in the swing area but just out of the swing path of the door. If the "safety logic" beam is not blocked, the yellow LED on the SWING-12 Sensor should begin to flash slowly. The yellow LED should continue to flash based on the setting of **TMR**. After that time has expired, you will become part of the closed door environment.

****IMPORTANT:*** In the **AUTO** mode, the SWING-12 Sensor will not begin its closed door auto-adjust mode until the "safety logic" beam is clear.

2. Ask someone to give the door an activation signal. The door should open slowly and stay open.
3. If the "safety logic" beam is not blocked and the motion detector is not sensing movement, the yellow LED on the SWING-12 Sensor should begin to flash slowly. The yellow LED should continue to flash slowly based on the setting of **TMR**. After that time has expired, you will become part of the open door environment and the door should close.

****IMPORTANT:*** In the **AUTO** mode, the SWING-12 Sensor will not begin its open door auto-adjust mode until both the "safety logic" beam and the motion detector are clear.

4. Remain in the same position and ask someone to cycle the door. The door should open and close normally.
5. With the door fully closed, step out of the swing area. The SWING-12 Sensor will now need to re-adjust to the closed door environment.
6. After the SWING-12 Sensor re-adjusts, give the door an activation signal. The door should open slowly. It will stay open while the SWING-12 Sensor re-adjusts to the open door environment, then it will close.
7. Cycle the door several times. The door should open and close normally.

ELECTRICAL CONNECTION TRAINED TRAFFIC INSTALLATION (NO "SAFETY LOGIC" BEAM) ONE SWING-12 SENSOR

The SWING-12 Sensor can be used on trained traffic installations. The "safety logic" beam component is not used in these applications. Check the function label on the underside of the Universal Astro-Swing control box for a **"SWING-12 Trained Traffic"** function setting.

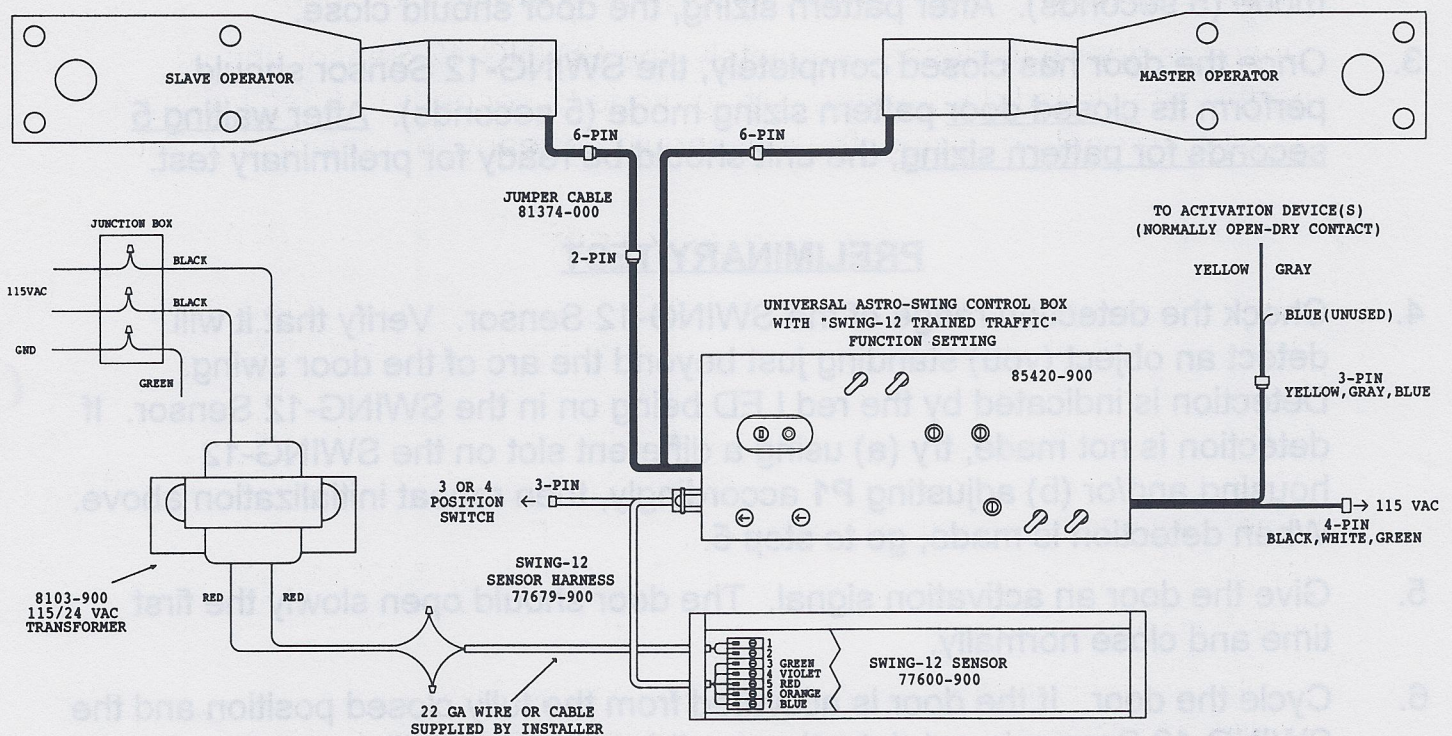


FIGURE 13

Note: See Figure 14 on page 21 for electrical connection of
SIMULTANEOUS PAIR FOR DOUBLE EGRESS
TRAINED TRAFFIC INSTALLATION
(NO "SAFETY LOGIC" BEAM)
TWO SWING-12 SENSORS

OPERATION TEST TRAINED TRAFFIC INSTALLATION (NO "SAFETY LOGIC" BEAM)

INITIALIZATION

1. Verify that the SWING-12 Sensor is set for **AUTO** (off) and **NO BM** (off) and the lenses are installed in the SWING-12 Sensor.
2. **Stand clear of the door area.** Apply power to the door system. If the door does not open on its own, give it an activation signal. Once the door is fully open, the SWING-12 Sensor should perform its open door pattern sizing mode (5 seconds). After pattern sizing, the door should close.
3. Once the door has closed completely, the SWING-12 Sensor should perform its closed door pattern sizing mode (5 seconds). After waiting 5 seconds for pattern sizing, the unit should be ready for preliminary test.

PRELIMINARY TEST

4. Check the detection range of the SWING-12 Sensor. Verify that it will detect an object (you) standing just beyond the arc of the door swing. Detection is indicated by the red LED being on in the SWING-12 Sensor. If detection is not made, try (a) using a different slot on the SWING-12 housing and/or (b) adjusting **P1** accordingly, then repeat initialization above. When detection is made, go to step 5.
5. Give the door an activation signal. The door should open slowly the first time and close normally.
6. Cycle the door. If the door is activated from the fully closed position and the SWING-12 Sensor is not detecting anything, the door will open at normal speed. However, if the door is activated during its closing cycle, the door will always re-open at safety slow speed.

CLOSED DOOR TEST

7. With the door fully closed, determine the Safety Detection Zone for the swing area per ANSI A156.10.

Stand just beyond the arc of the door swing. The SWING-12 Sensor should detect you. Detection is indicated by the red LED being on in the SWING-12 Sensor. You must also be detected standing along the face of the door, along both guide rails (walls), and in all the other various locations of the swing area. When being detected, the door should **NOT** open when given an activation signal.

8. Step out of the swing area. The door should now open when activated.

OPEN DOOR TEST

9. Activate the door open.

(a) With the door fully open, step into the threshold area. The SWING-12 Sensor should detect you. Detection is indicated by the red LED being on in the SWING-12 Sensor and the door not closing.

(b) With the door continuing to be fully open, test the Safety Detection Zone established in step #7 above. Stand just beyond the arc of the door swing. The SWING-12 Sensor should detect you. You must also be detected standing just in front of the threshold, along both guide rails (walls), and in all the other various locations of the swing area. Detection is indicated by the red LED being on in the SWING-12 Sensor and the door not closing.

10. Step out of the threshold area and Safety Detection Zone. The door should close.

Note: If the proper Safety Detection Zone is not achieved, try (a) using a different slot on the SWING-12 housing and/or (b) adjusting P1 accordingly, then repeat operation test. When the proper Safety Detection Zone is achieved, attach the end caps to the sensor.

AUTO-ADJUST PROCEDURE TRAINED TRAFFIC INSTALLATION (NO "SAFETY LOGIC" BEAM)

The auto-adjust procedure should be performed if the factory setting of 45 seconds needs to be changed due to environmental conditions or customer requirements. This auto-adjust procedure should be performed after the OPERATION TEST-TRAINED TRAFFIC INSTALLATION (NO "SAFETY LOGIC" BEAM) has been completed.

1. With the door fully closed, stand in the swing area but just out of the swing path of the door. The yellow LED on the SWING-12 Sensor should begin to flash slowly. The yellow LED should continue to flash slowly based on the setting of **TMR**. After that time has expired, you will become part of the closed door environment.
2. Ask someone to give the door an activation signal. The door should open slowly and stay open.
3. If the motion detector is not sensing movement, the yellow LED on the SWING-12 Sensor should begin to flash slowly. The yellow LED should continue to flash slowly based on the setting of **TMR**. After that time has expired, you will become part of the open door environment and the door should close.

****IMPORTANT:*** In the **AUTO** mode, the SWING-12 Sensor will not start its open door auto-adjust mode until the motion detector is clear.

4. Remain in the same position and ask someone to cycle the door. If the door is activated from the fully closed position and the SWING-12 Sensor is not detecting anything, the door will open at normal speed. However, if the door is activated during its closing cycle, the door will re-open at safety slow speed.
5. With the door fully closed, step out of the swing area. The SWING-12 Sensor will now need to re-adjust to the closed door environment.
6. After the SWING-12 Sensor re-adjusts, give the door an activation signal. The door should open slowly. It should stay open while the SWING-12 Sensor re-adjusts to the open door environment, then it should close.

SIMULTANEOUS PAIR FOR DOUBLE EGRESS

ELECTRICAL CONNECTION

TRAINED TRAFFIC INSTALLATION

(NO "SAFETY LOGIC" BEAM)

TWO SWING-12 SENSORS

The SWING-12 Sensor can be used on a simultaneous pair for double egress installations. All settings and adjustments should be made for a single door. The operation test is identical to the operation test for trained traffic installation.

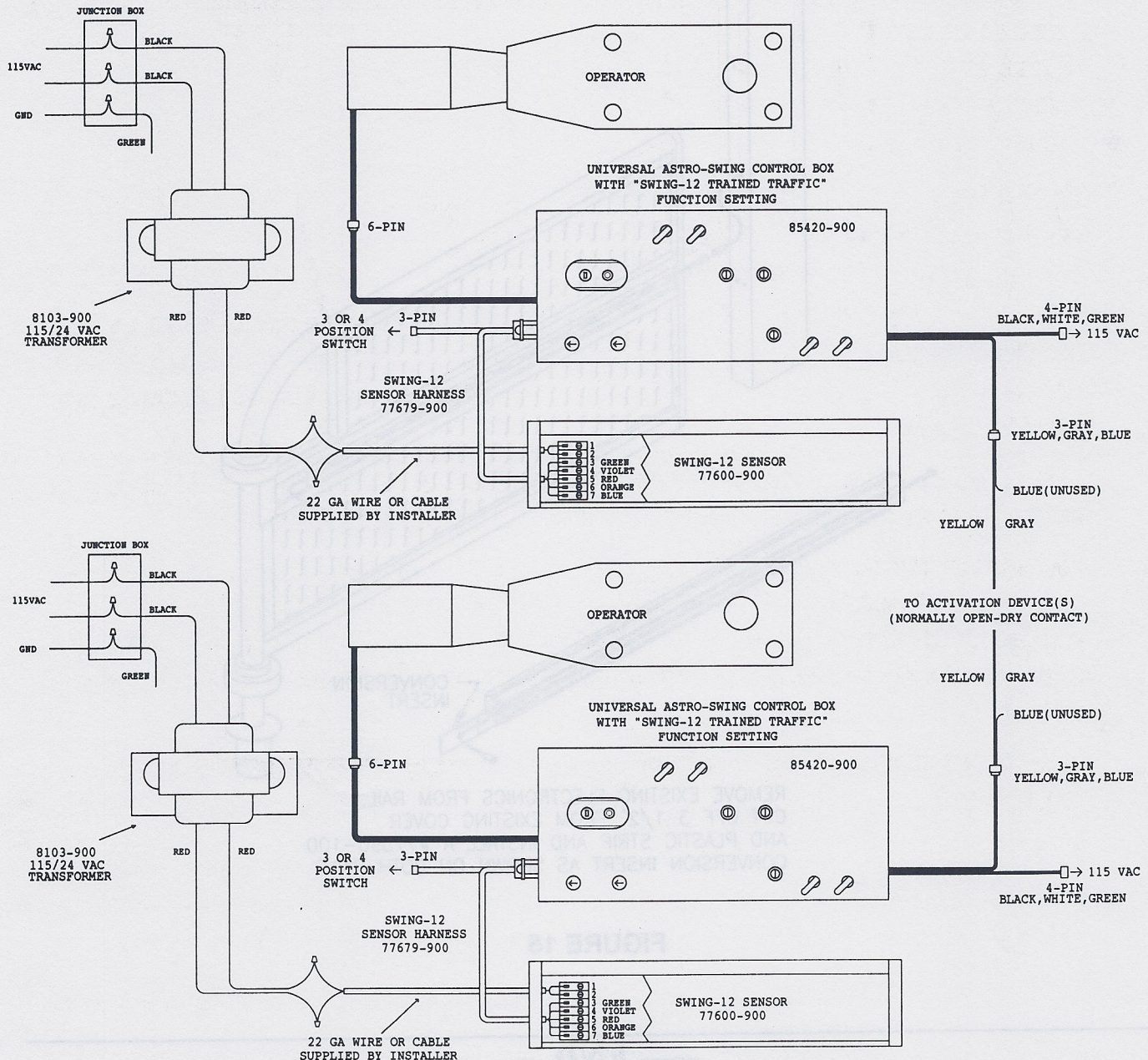
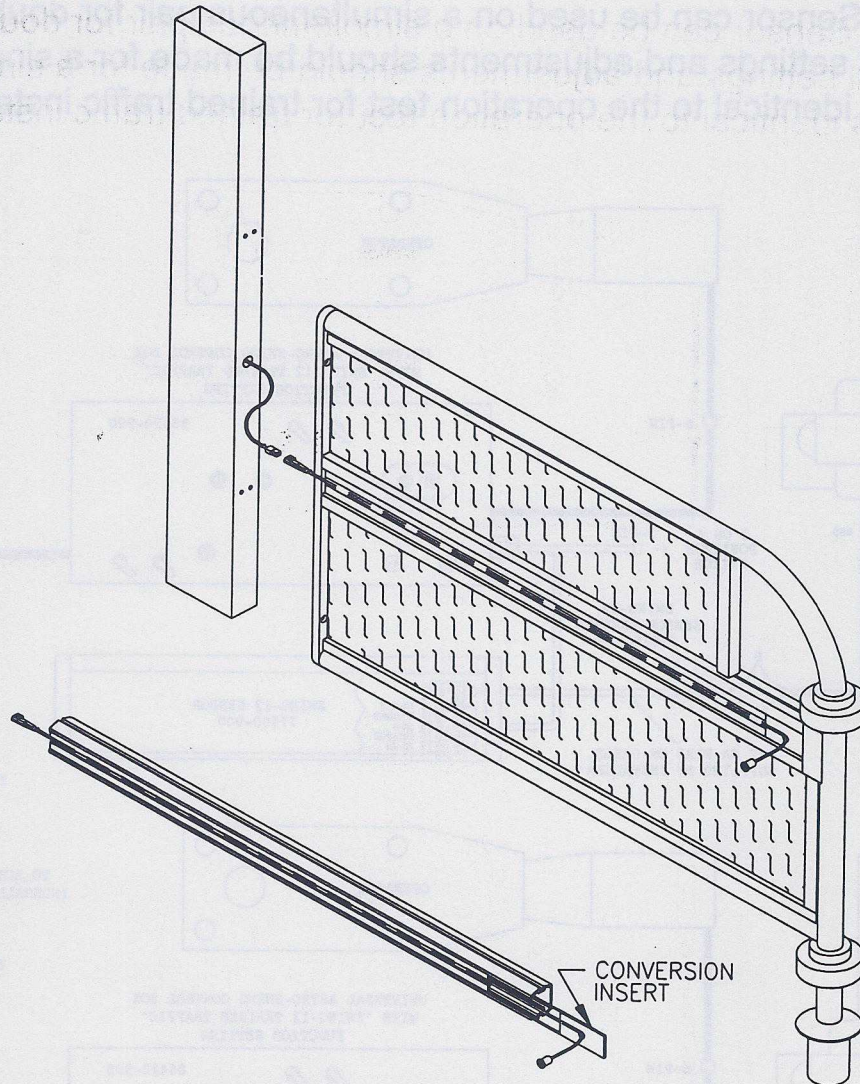


FIGURE 14

SENSOR RAIL CONVERSION

Stainless Steel Sensor Rail (shown) or Aluminum Sensor Rail



REMOVE EXISTING ELECTRONICS FROM RAIL,
CUT OFF 3 1/2" FROM EXISTING COVER
AND PLASTIC STRIP AND INSTALL A #77590-100
CONVERSION INSERT AS SHOWN ON BOTH RAILS

FIGURE 15

----- **END** -----