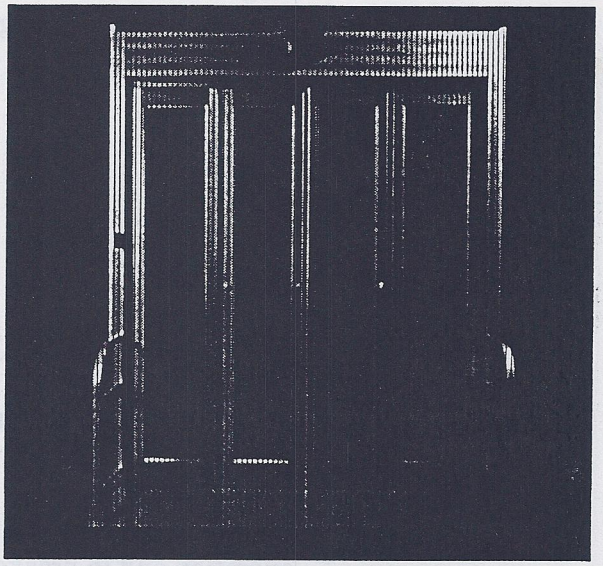
NEWMAN TONKS

NT Dor-O-Matic™

Astro-Fold™

Installation Instructions



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I. Door Frame Preparation and Installation

A. Preliminary Checks:

1. Check Architectural Drawings: Check architectural drawings and final approved shop drawings for the correct position of frame and structural openings.

2. Check Opening Dimensions: Check the opening dimensions of any masonry opening, making sure to allow 1/4" at each side and top (See Figure 1) so that the frame and the header may be leveled, plumbed, squared, and caulked.

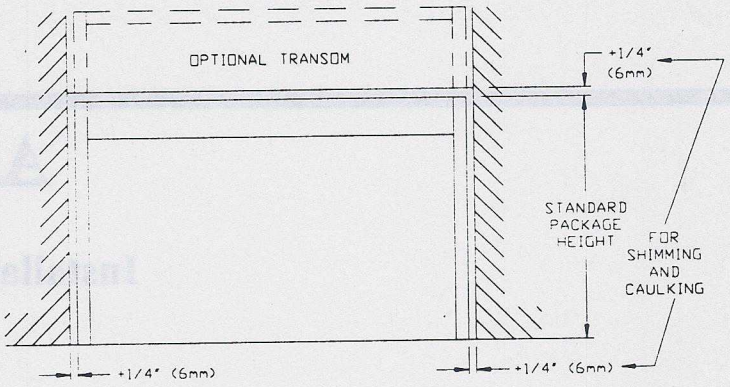


Figure 1: Checking the rough opening for clearances.

3. Check Floor Space: The surface must be flat and smooth. Carefully check for irregularities and, if necessary, ask the general contractor to relieve any high spots that would damage or cause interference with the operation of the door.

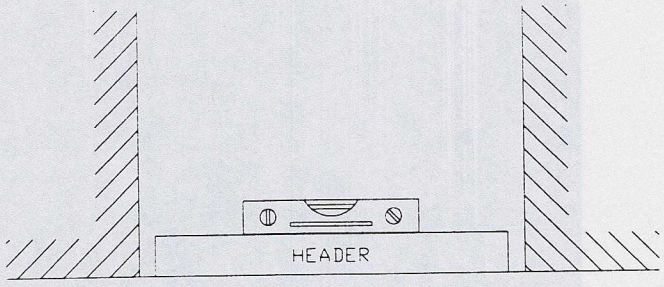


Figure 2: Using the header to check for a level floor.

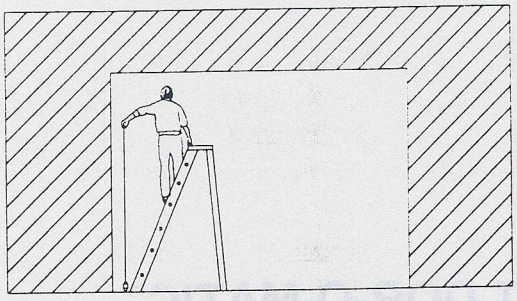


Figure 3: Using a plumb bob to check the rough opening.

4. Check Floor Grades: In order to allow for proper functioning both in normal operation and in breakout, the floor cannot be sloped upwards anywhere near the door opening.

5. Check Contents: Before proceeding with any stage of the installation, check the contents of the shipping container against the bill of material to see that all necessary parts and material have been included. Also, be sure that the door size and model are correct for the required installation.

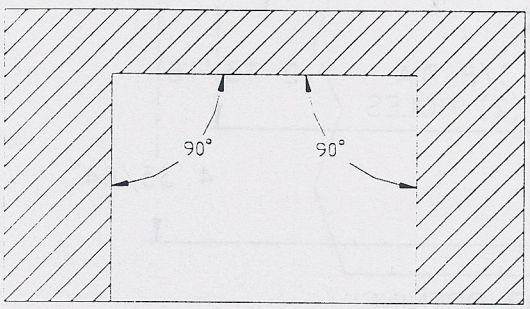


Figure 4: Checking the rough opening for squareness.

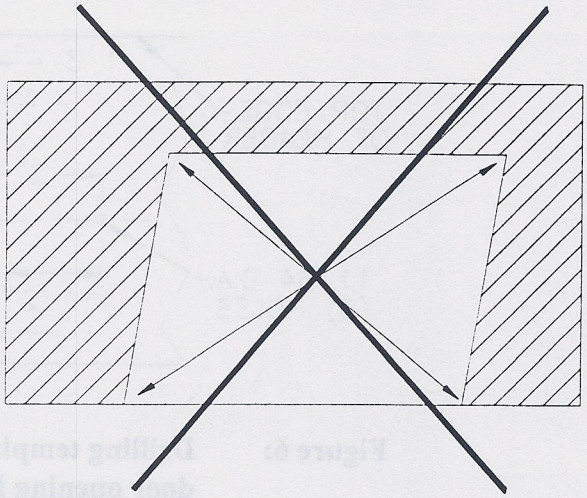


Figure 5: Do not install if opening is not square.

Do not attempt to install the Astro-Fold if all these items aren't correct. Have the contractor correct for any problems with the rough opening.

B. Assemble and Install Frame

1. Lay the header down on the floor using cardboard to protect it from scratching or other damage. Remove the two screws (three on some models) holding the cover in place.
2. If the cover will need to be removed for some purpose, you may wish to do it now. See Section IX for information on removing and replacing the cover.
3. Mount the Look-See to the bottom of the cover using the four (4) #10-32 screws supplied. All mounting and access holes have been pre-drilled and tapped for this operation. The Look-See can only be mounted in one orientation, due to the electrical access hole being off-center.
4. The headers do not come prepped for the motion detectors. You may wish to prep the holes for the motion detectors on each side while the header is still lying flat on the ground. If so, use the template shown in Figure 6 or the sticker supplied with the motion detector. Be sure to mount the motion detectors in the **center of the door opening**! For a bi-folding *pair* of doors, this will be the center of the header. However, for a *single* bi-folding door, the center of the door opening **will NOT be the center of the header**. If the detectors are mounted in the center of a single Astro-Fold header, they may register the door when it is closing, causing it to cycle open and closed endlessly. The Look-See will *also* be centered in the *opening*, so you may center the motion detectors above the Look-See. Otherwise, you will have to wait until after installing the doors to measure for the clear opening. **Be extremely careful not to damage any wires or other internal components when drilling these holes!** Do not actually mount the Astro-Scans until the header is up and the doors are on (See Section VI-E).

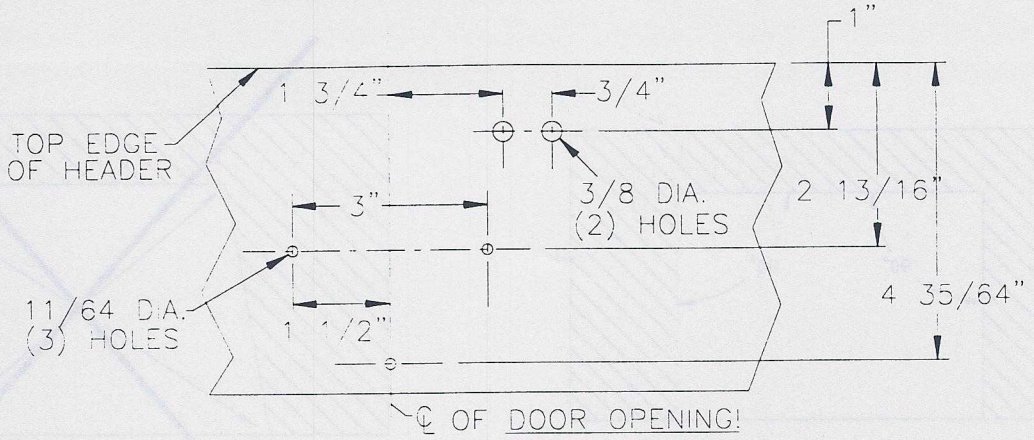


Figure 6: Drilling template for motion detectors. Center over the door opening NOT the center of the header!

5. You may wish to run a line, string, wire, etc. down the jambs now for use in fishing the various wires later.

6. When installing an overhead-concealed package with no thresholds, you must cut off 1/2" from the bottom of each jamb tube. You will also have to cut off 1/2" from each finger guard before installation. Do NOT do this if any of the following conditions applies!
   - The unit includes thresholds
   - The unit is a surface-applied package

7. Some headers may have notches in the rear channels for inserting square nuts. If yours does not have these notches, you will want to insert the appropriate square nuts into the channels before attaching the jamb tubes. For the operators, be sure that you insert nuts on the correct side of the header since the pencil-beam control box will be in the middle, preventing you from sliding the nuts to the other side.

	Nuts/Channel		
Component	**Top**	**Middle**	**Bottom**
LH Operator		2	2
RH Operator		2	2
Control Box	2		
Mag-Lock Panel	2		

8. Attaching the header to the jamb tubes: Your Astro-Fold may have either 1-piece or 2-piece jamb tubes. Use the section appropriate for you.

   a) If you have one-piece jamb tubes:

      (1) Attach the jamb tubes to the header assembly using the three (3) ¼-20 bolts provided (See Figure 7).

   b) If you have two-piece jamb tubes:

      (1) Attach the 3/4 section of the jamb tube to the header using the three (3) ¼-20 bolts provided (See Figure 7)

      (2) If the system is to be mounted "concealed" in the wall, snap the back section of the tube into place, concealing the screw-heads. Removing the snap-in strip is difficult, but it can be done.

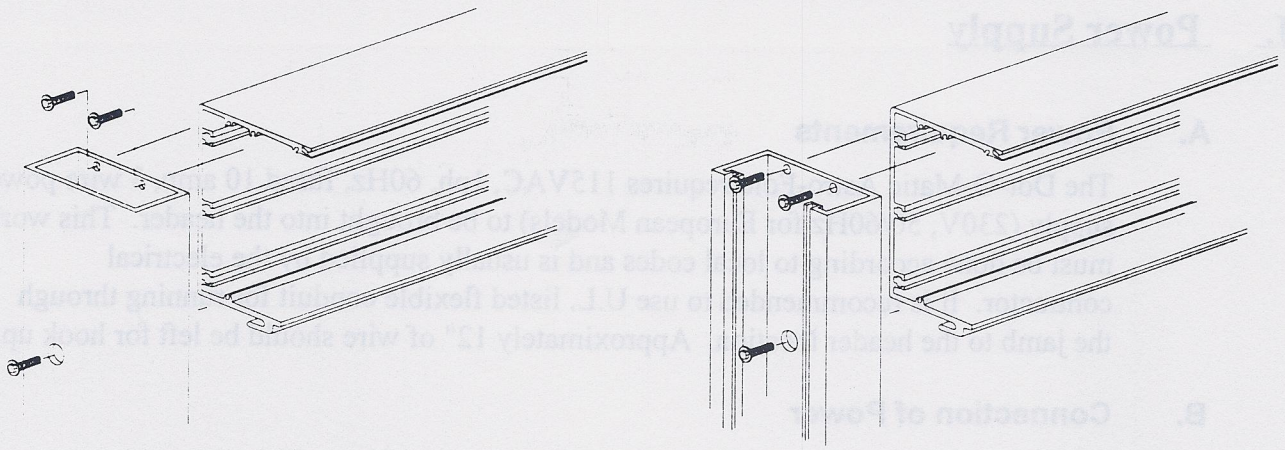


Figure 7: Attaching 1-piece and 2-piece jamb tubes to the header.

9. Raise the frame assembly into position and feed the main electrical supply wires and conduit through the pre-drilled 1" access hole in the side of the jamb. Be sure that the access cover is on the inside of the building so that the doors can break away toward the outside in case of an emergency (See Figure 8).

10. Use shims as necessary to assure that the entire frame is level, plumb, and square. Attach the jambs to the framing using the appropriate fasteners (at 4 per jamb). If installing a surface-applied system with 2-piece jambs, these fasteners may be concealed in the jamb tube.

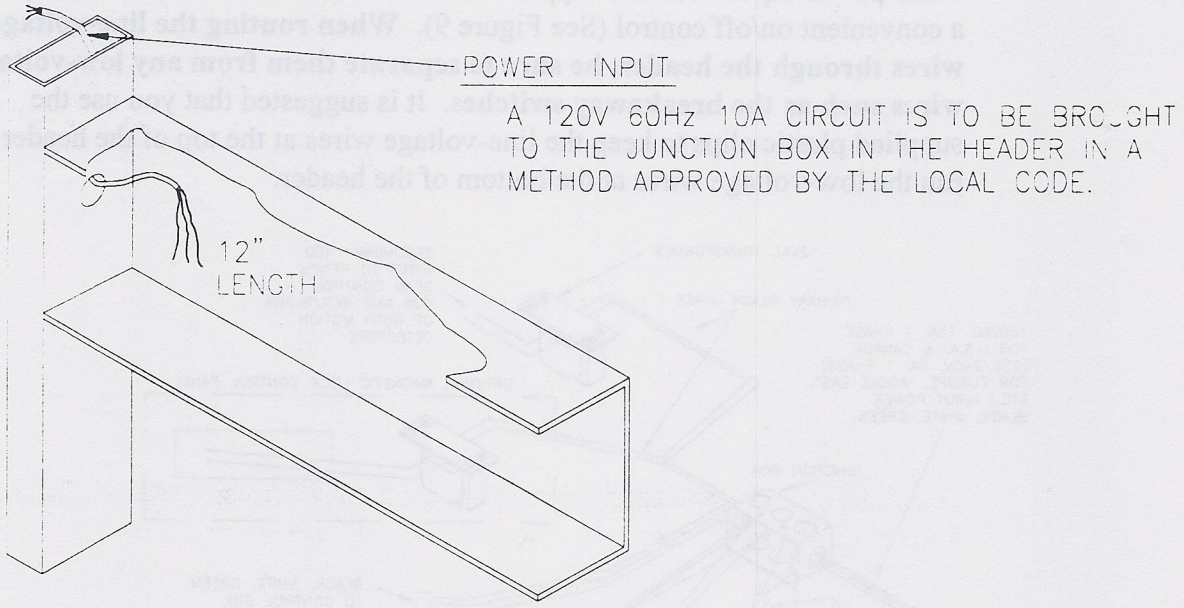


Figure 8: Bringing the power lines into the header.

11. If the system is surface-applied and you have 2-piece jamb tubes, you *may* now snap the back section of the tube into place, concealing the screw-heads. It is advisable however, to wait until the end of the installation so that fishing your beam wires will be easier.

II. Power Supply

A. Power Requirements

The Dor-O-Matic Astro-Fold requires 115VAC, 1ph, 60Hz, fused 10 amp, 3 wire power supply (230V, 50/60Hz for European Models) to be brought into the header. This work must be done according to local codes and is usually supplied by the electrical contractor. It is recommended to use U.L. listed flexible conduit for running through the jamb to the header location. Approximately 12" of wire should be left for hook up.

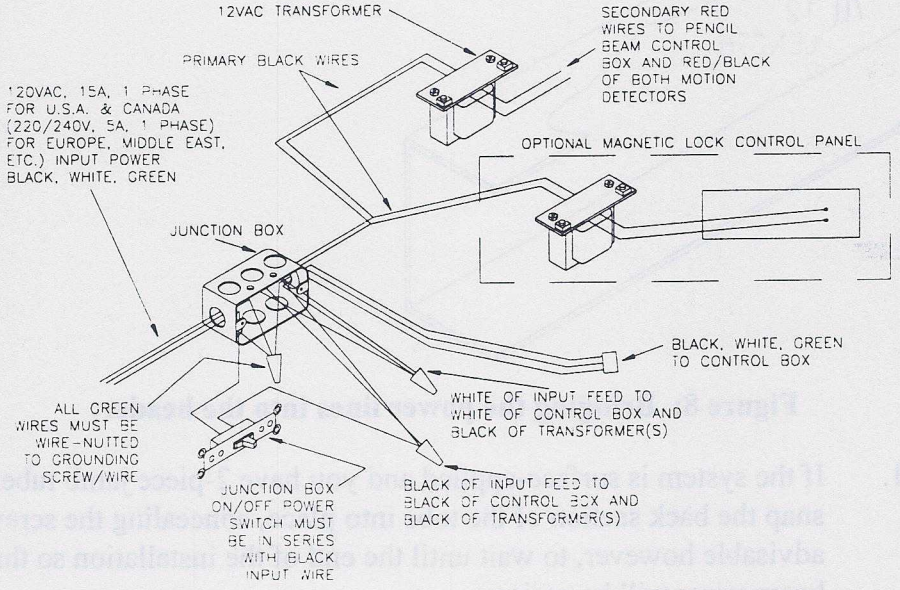
B. Connection of Power

1. 230 VAC Systems:

   Bring the 230 VAC power into the power-sled according to the wiring diagram. The black/white/green power harness with the female Molex plug which goes to the control box should be pre-wired for you at the factory.

2. 115 VAC Systems:

   Bring the power leads into the junction box. Using wire-nuts and electrical tape, connect the female Molex power plug to the incoming electrical supply wires. Be sure to wire the green grounding wire from the junction box along with the other two ground wires. Connect one black lead from the transformer into the black power input. Connect the other black wire from the transformer into the white power input. Use the supplied switch to break the black wire and provide a convenient on/off control (See Figure 9). **When routing the line-voltage wires through the header, be sure to separate them from any low-voltage wires such as the breakaway switches.** It is suggested that you use the supplied plastic clips to keep the line-voltage wires at the top of the header and run the low-voltage wires at the bottom of the header.



NOTE: ALL HIGH VOLTAGE WIRING MUST BE WIRE-NUTTED IN THE JUNCTION BOX!

Figure 9: Wiring the power mains through the junction box.

III. Lower Pivots & Thresholds

A. Mounting the Operators:

Mount the operators to the brackets using four (4) 5/16-18 hex head bolts provided (See Figure 10). Attach the operator brackets to the square-nuts in the back of the header using four (4) ¼-20 hex head bolts provided.

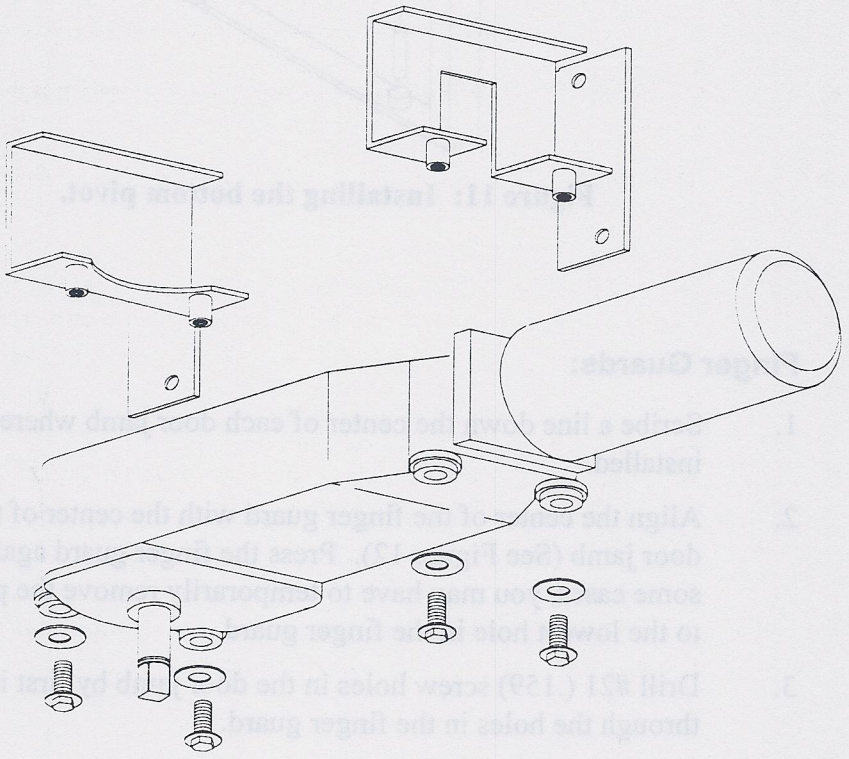


Figure 10: Mounting the operator(s).

B. Lower Pivots:

1. If using a threshold, make sure it is the correct length for the opening and cut if required. Secure the threshold to the floor.
2. Find the exact location for the lower pivots by dropping a plumb line from the center of the operator spindle to the center of the pivot. (See Figure 11)
3. Screw the lower pivot in place.

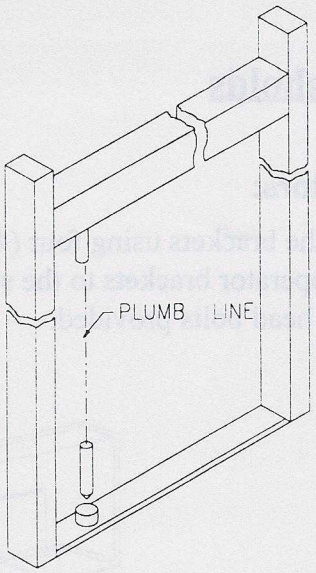


Figure 11: Installing the bottom pivot.

C. Finger Guards:

1. Scribe a line down the center of each door jamb where a finger guard is to be installed.
2. Align the center of the finger guard with the center of the scribed line on the door jamb (See Figure 12). Press the finger guard against the door jamb. In some cases, you may have to temporarily remove the pivot if it restricts access to the lowest hole in the finger guard.
3. Drill #21 (.159) screw holes in the door jamb by first inserting the drill bit through the holes in the finger guard.
4. Secure the finger guard to the jamb by first pushing #10 self-threading screws through the holes and turning them into the holes previously drilled. It is advisable to use a magnetic screwdriver.

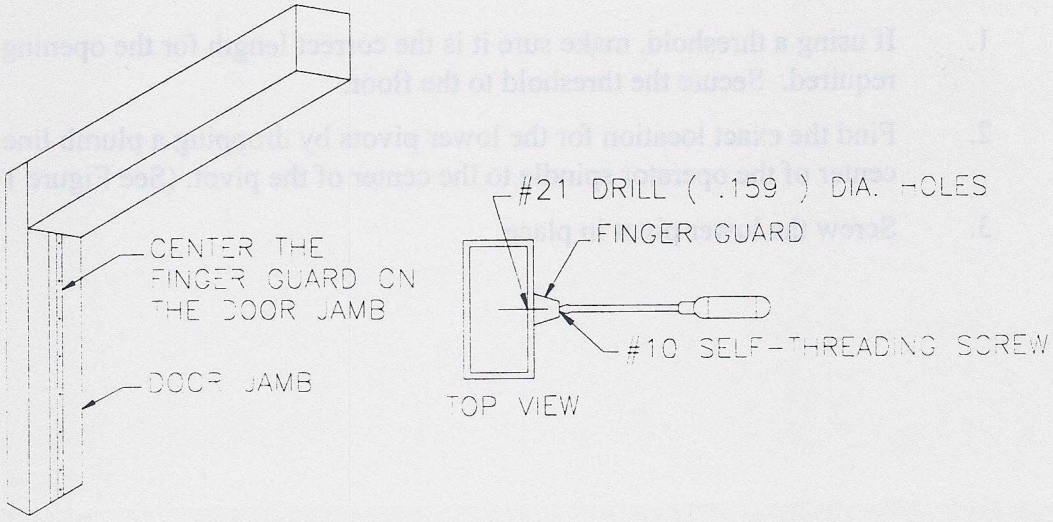


Figure 12: Finger guard installation.

IV. Safety Rails / Pencil Beams:

A. General

The Astro-Fold uses two Pencil-Eyes to provide additional safety. One of these beams is mounted in the mini safety rail and the other is mounted on the back side of the jamb tube. The pencil beams will be found coiled in the header.

B. Mounting the "Outside" Pencil-Eye:

1. On overhead-concealed units, the jambs need to be prepped with mounting and electrical access holes for the "outside" pencil eye. Refer to Figure 13 for details.
2. Feed the electrical wire through and press one of the pencil eyes into the mounting block as shown in Figure 14.
3. Fish the cable up the jamb, into the header. Be sure to mark this wire in the header so it can be identified later.
4. Secure the mounting block with the two (2) #8-32 screws provided.

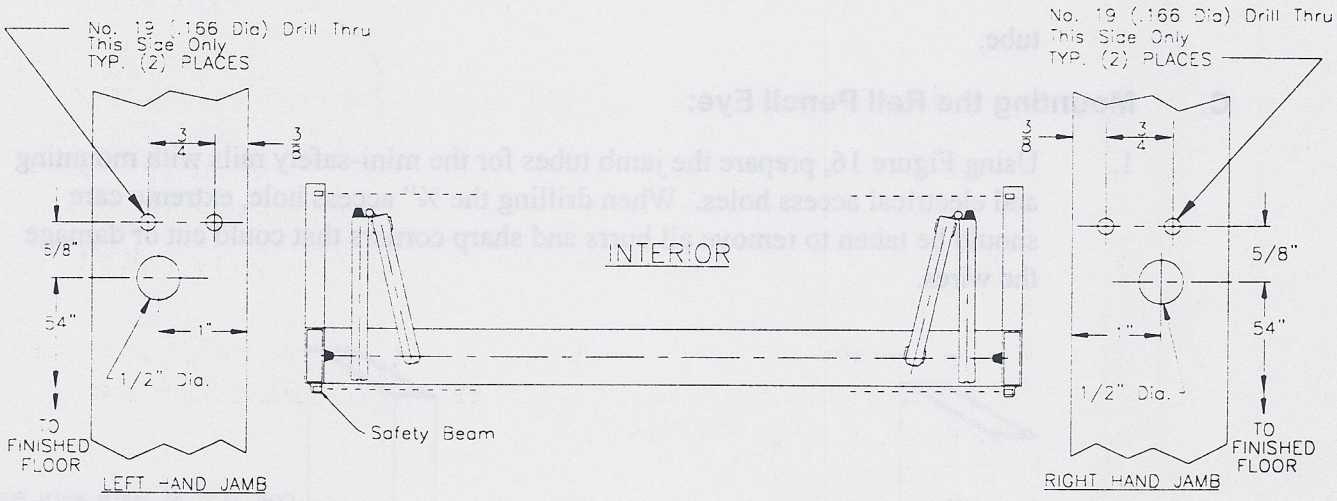


Figure 13: Jamb preparation for the outside pencil beam.

5. Repeat Steps 2 through 4 for the other side.

6. When installing a surface-applied unit on the inside of existing jamb tubes, the eyes must be mounted in the existing jamb without the mounting block. The preparation detail is shown in Figure 15. The installer will also have to drill holes to allow the beam wire to pass from the old jamb tube into the new jamb tube.

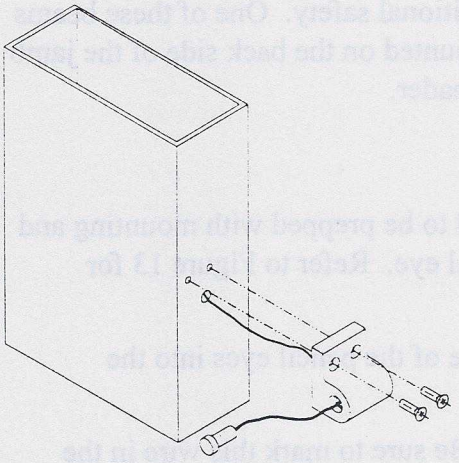


Figure 14: Pencil Beam Installation for Overhead-Concealed units.

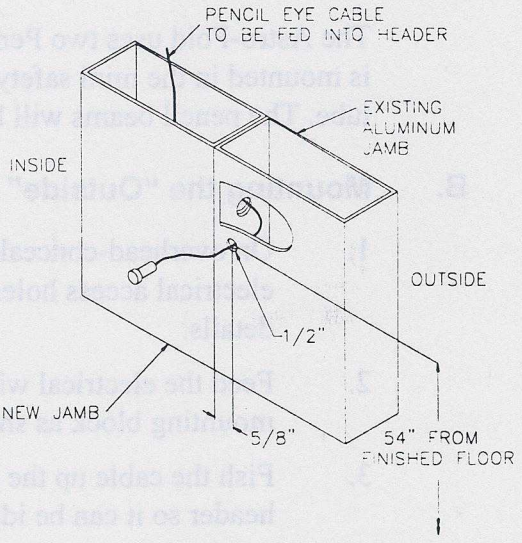


Figure 15: Pencil Beam Installation for Surface-Applied Units.

C. Mounting the Rail Pencil Eye:

1. Using Figure 16, prepare the jamb tubes for the mini-safety rails with mounting and electrical access holes. When drilling the ¾" access hole, extreme care should be taken to remove all burrs and sharp corners that could cut or damage the wires.

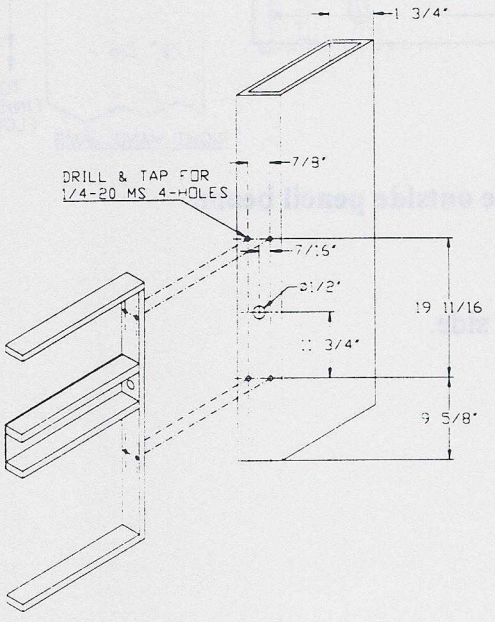


Figure 16: Preparing the jambs for mounting the safety rails.

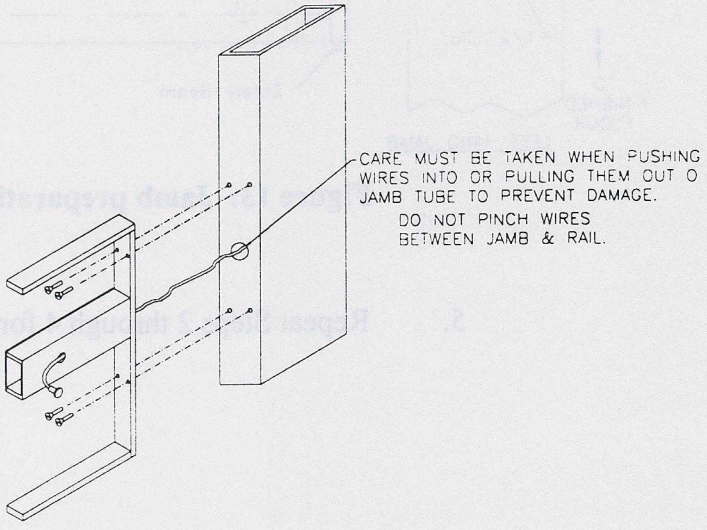


Figure 17: Mounting the safety rails.

2. The mini safety rails come with 2 pre-drilled beam holes. You will only use one of them depending on the size of your door. You will want to mount the pencil beam just beyond the leading edge of the door, but as close to the door as possible. Feed the cable from one of the pencil eyes through the hole in the rail and out the access hole in the back (See Figure 17). Push the eye into the hole so that it snaps into place.

3. Fish the wire up the jamb into the header, being extremely careful not to cut, kink, or otherwise damage the cable. Be sure to mark the cable so it can be identified later.

4. Mount the mini-rails with the ¼-20 FHMS and the appropriate floor anchors. **Care should be taken to assure that the rails are square to the door and parallel with each other**. Once again, be sure not to pinch any beam wires when securing the rail.

D. Electrical Connections

1. If you trim the pencil beam cables to length, make sure to leave enough extra cable to reach the other side of the pencil beam control box. Also be sure to re-mark the cable ends so you can identify which cable goes to which eye.

2. When connecting the beams to the control box, the beams on the jamb **must** be connected to XMTR1 and REC1 on the pencil beam control box. The beams in the rail **must** be connected to XMTR2 and REC2 on the pencil beam control box. **The beams will not work correctly if they are not connected this way!**

3. There are three relay terminals on the same side of the pencil beam box as the REC1 and REC2 terminals. The Astro-Fold ships with harnesses for the blue/gray/yellow and for the purple wires.. Refer to Figure 34 and 35 for details. These relay outputs must be connected to the Astro-Fold control box as follows:

   a) The Blue wire on the Astro-Fold control box must be connected to the terminal marked BRN.

   b) The Gray wire of the control box must be connected to the terminal marked WHT.

   c) The Purple wire must be connected to the unmarked terminal on the pencil beam control box.

4. Remove the two screws on the pencil beam control box. The red jumper will probably be on the top two pins indicated by the word "DUAL". Move the jumper to the lower two pins indicated by the word "SINGLE", or you can remove the jumper entirely. Refer to Figure 18.

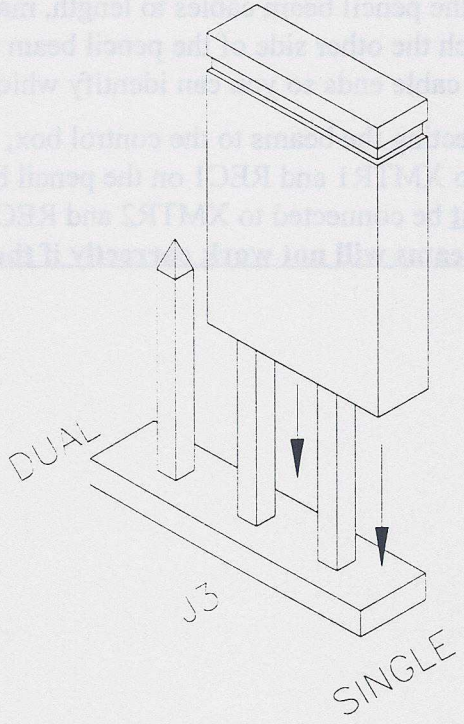


Figure 18: The red jumper in the pencil beam control box must be set to "Single".

V. Doors

A. Preparing the Doors:

1. All doors manufactured by Dor-O-Matic are factory prepared for necessary mounting hardware, arms, pivots, and locks, if required. The Astro-Fold system is intended for use only with Dor-O-Matic doors. If other types of doors are to be installed, consult with Dor-O-Matic Engineering for proper preparation instructions.
2. As shown in Figure 19, install the arm attachment bar #10301-000 with four (4) ¼-20 FHMS and the bottom pivot assembly #10140-000 with four (4) #10 pan-head screws.
3. The roller block is already installed in the leading edge of the top rail, but the roller itself must still be secured to the block. Position the spacer and roller over the roller block as shown in Figure 20. Secure them to the door with the 5/16-18 screws provided.

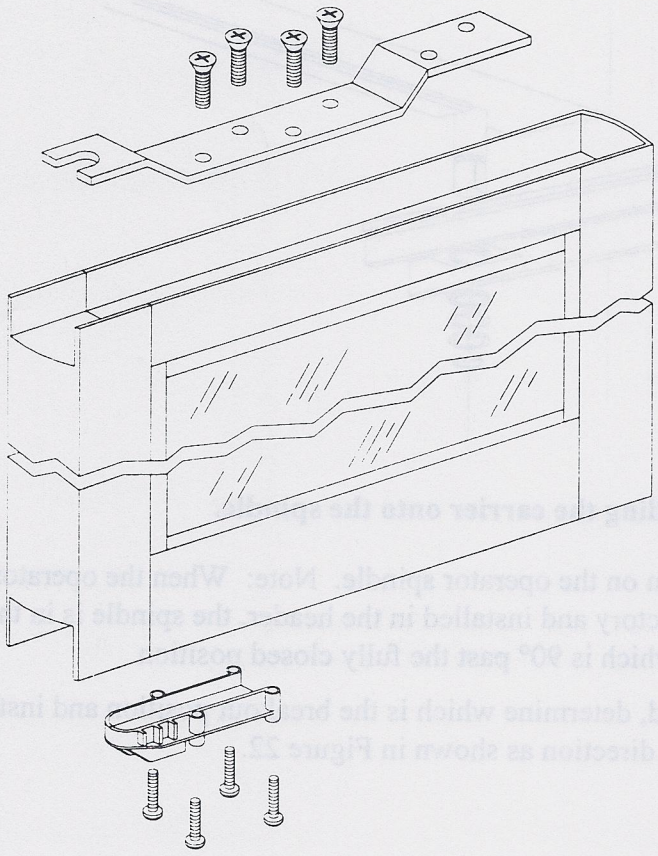


Figure 19: Installing the top arm and bottom pivot receiver on the door.

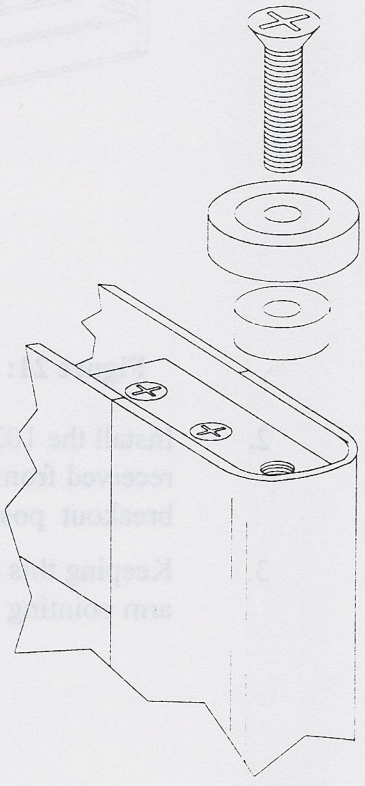


Figure 20: Installing the top roller on the door.

B. Preparing the Operators:

1. Install the carrier rail. Refer to Figure 21 for details.

   a) Slide it onto the spindle in the full breakout position and swing it closed until it seats in the header (this will hold it in place while you finish securing it).

   b) Place (1) the first washer, (2) the wave washer, (3) the second washer, and (4) the snap ring on the spindle. Snap ring should set securely in the groove on the spindle.

   c) The track should now be secured. Check to see that it is free to swing through the breakout position.

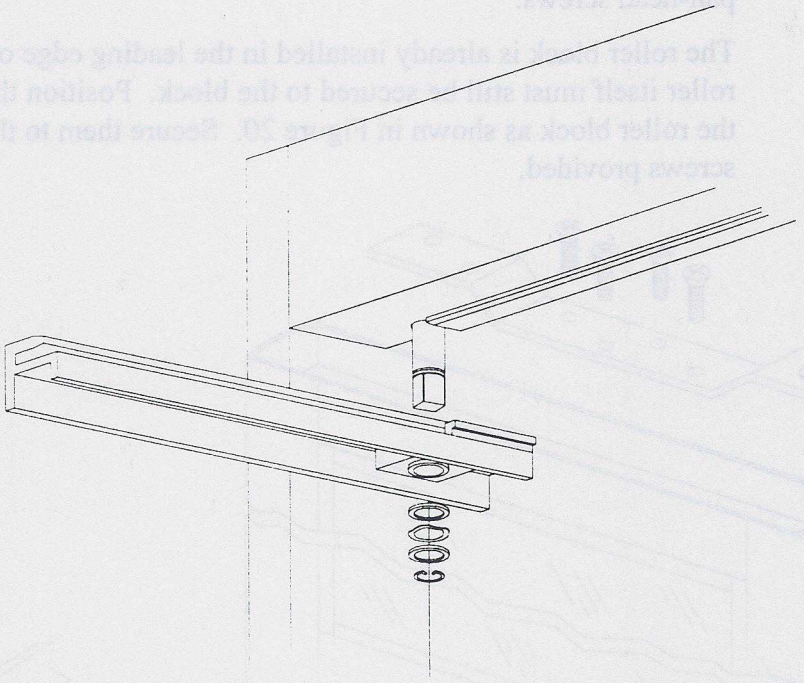


Figure 21: Installing the carrier onto the spindle.

2. Install the 10200 arm on the operator spindle. Note: When the operator is received from the factory and installed in the header, the spindle is in the normal breakout position which is 90° past the fully closed position.

3. Keeping this in mind, determine which is the breakout position and install the arm pointing in that direction as shown in Figure 22.

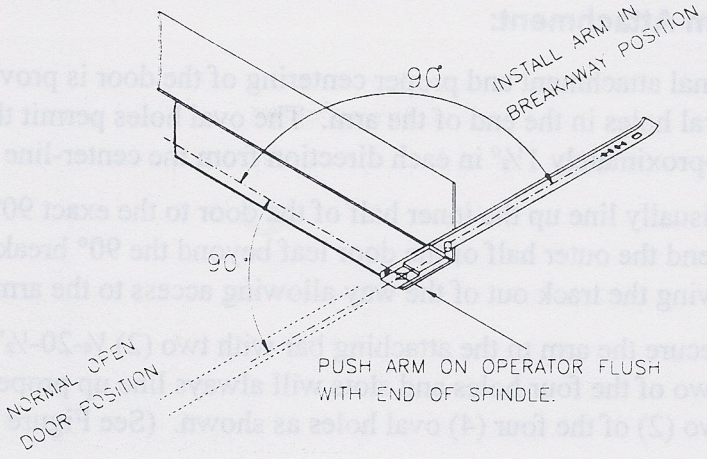


Figure 22: Installing the 10200 arm onto the spindle.

4. With the locking tabs pointing down towards the floor, gently press the arm on the spindle until the spindle end is flush with the bottom surface of the arm.
5. Tighten the allen-head cap screw through the arm securely.

C. Hanging the Doors:

1. The installation of the door is the same "snap-in" arrangement that Dor-O-Matic has used for several years. As shown in Figure 23, keeping the door "straight" (un-folded), line up the door with the top arm. Making sure the arm is in the top channel of the door and the roller is in the carrier channel, gently slide the door up against the lower pivot.
2. Lift up the door slightly and push back until the bottom pivot locks into place.
3. Raise up the nose of the door and push back until the top arm snaps into place.

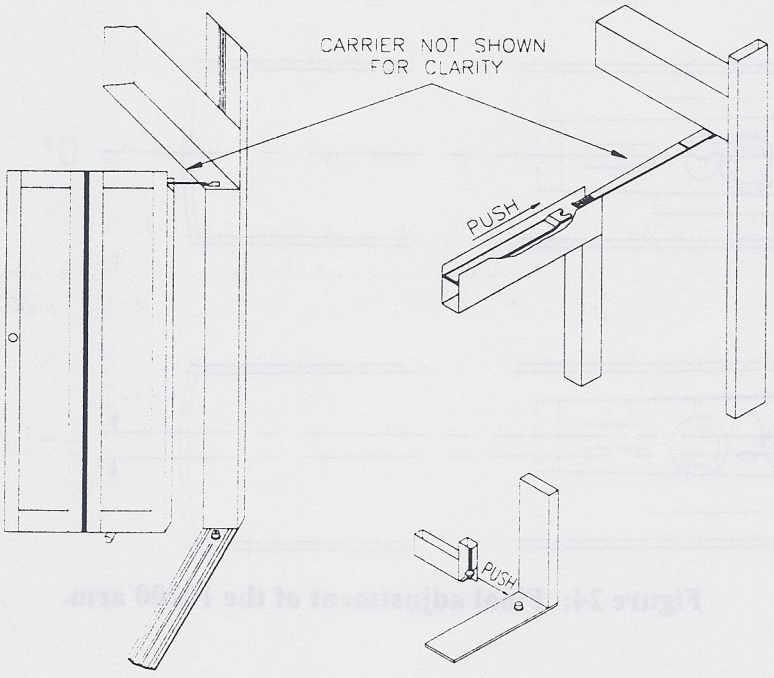


Figure 23: Installing the door on the snap-in pivots.

D. Final Arm Attachment:

1. Final attachment and proper centering of the door is provided by the four (4) oval holes in the end of the arm. The oval holes permit the door to be adjusted approximately 1½° in each direction from the center-line of the arm.

2. Visually line up the inner half of the door to the exact 90° breakout position. Bend the outer half of the door leaf beyond the 90° breakout position. This will swing the track out of the way allowing access to the arm for final attachment.

3. Secure the arm to the attaching bar with two (2) ¼-20-½" hex head cap screws. Two of the four holes and slots will always line up properly. Fasten using two (2) of the four (4) oval holes as shown. (See Figure 24).

4. Manually push the door through a full 180° arc of swing to make sure that everything is connected properly. If everything is correct, it will be possible to push the door up to the normal closed door position, snap the track into place, and fold the door into the 90° full open position. Release the door and it should close under spring control. If the control box is hooked to the operators and power is applied, the door will close quickly to the latch position and then glide slowly into the fully closed position. If the control box is not hooked up and/or has no power, the door will have no latching action -- this is normal.

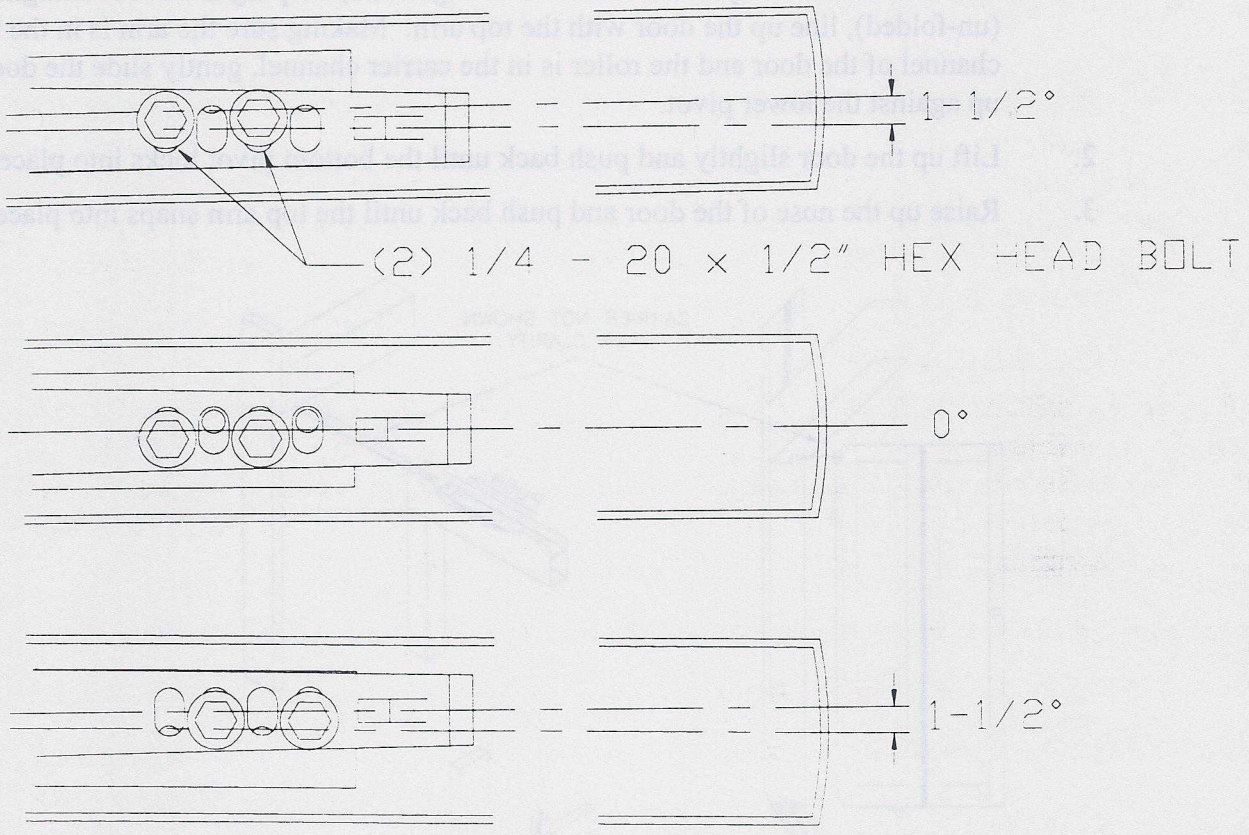


Figure 24: Final adjustment of the 10200 arm.

VI. Electrical Components

A. General:

The Astro-Fold is shipped with the switch (115V system), 12V transformer (115V system), power sled (230V system), and the dual pencil beam control box (115V/230V systems) installed.

B. Control Box Installation:

The 84585-900 Astro-Fold control box must be installed using the brackets provided in the 65213-900 header hardware kit.

C. Switches:

A 4-way switch (1-Way/2-Way/Hold-Open/Off) may be mounted in the jamb or elsewhere. In order to meet safety requirements, this switch **must** be mounted in a location from which the operation of the door can be observed by the person operating the switch. Connect with the cable included with the switch according to the wiring diagrams in Figure 34 and 35.

D. Breakaway System

1. Breakaway Switches

The breakaway switches should be pre-mounted in the header for you, but you will have to finish the wiring for them. Remove the 2-pin, orange jumper from the control box. Cut the wire loop and strip the ends. Using wire nuts, connect the jumper plug to the breakaway switch wires. If the installation is a pair of doors, be sure to wire the switches in series as per the wiring diagram shown in Figure 35. Finally, plug the newly wired Molex plug into the matching orange plug on the control box.

2. Ball Detents

The ball detents hold the rails in the closed position, but allow them to break out in emergency conditions. They are installed and adjusted in the factory, but field adjustment may be necessary. They should be adjusted to meet any applicable local codes. A breakaway force of 40lbs or less will satisfy most local codes, but these requirements vary according to location, type of building, etc.

E. Mounting of the Astro-Scan motion detectors:

1. If not done already, prep the holes for the Astro-Scans (see section I-B-4)
2. Remove the two (#6-32 FHMS) cover security screws and remove the snap-in cover as shown in Figure 25 by applying pressure at point A and pivoting the cover about axis B.
3. Locate the two mounting holes in the header that line up with the keyed mounting holes in the scanner head.

4. Insert two #10-32 x 9/16" "combo" drive swageform screws into the punched holes and drive screw in 4 to 5 turns.

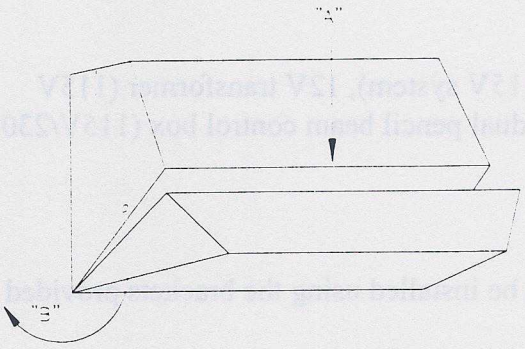


Figure 25: Removing the cover of the Dor-O-Matic Astro-Scan motion detector.

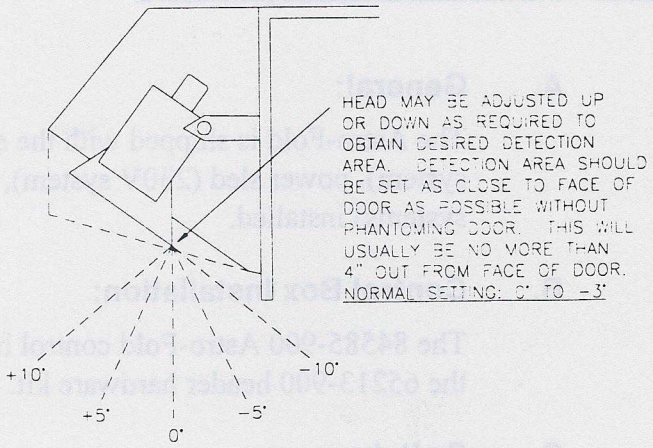


Figure 26: Adjusting the head angle of the motion detector.

5. Fit keyed holes in sensor head over mounting screws and slip down in place.

6. Add an additional #10-32x9/16" combo drive through lower locking screw hole. This prevents the sensor head from being pushed up off the mounting screws. Tighten all three (3) screws securely.

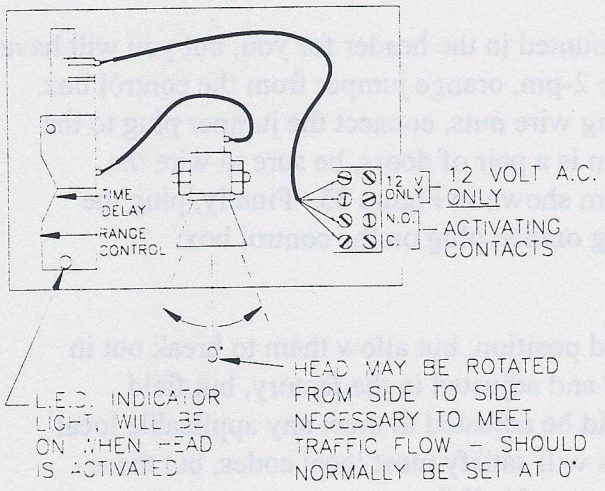


Figure 27: Connections and adjustments on the standard two-way motion detector.

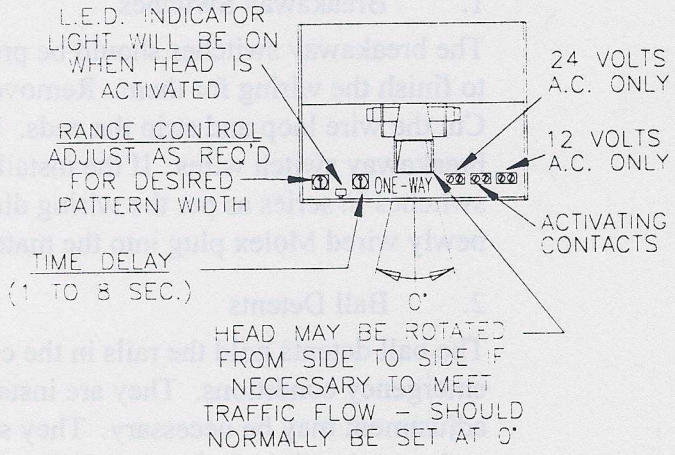


Figure 28: Connections and adjustments on the optional one-way motion detector.

7. 12VAC power is provided to the motion detectors through the 73148-900 cables as shown in Figure 34 and 35.

8. As shown in the wiring diagrams of Figure 34 and 35, the two motion detectors' activation circuits connect to different places. This allows for the proper functioning of the 4-way switch.

a) For the inside motion detector, the NO and C contacts connect to the yellow and gray wires from the control box.

b) For the outside motion detector, the NO and C contacts connect to the two-pin Molex coming off the 65245-900 harness.

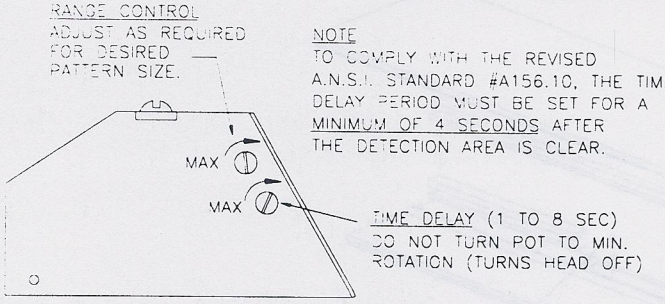


Figure 29: Adjustments for the Astro-Scan motion detector.

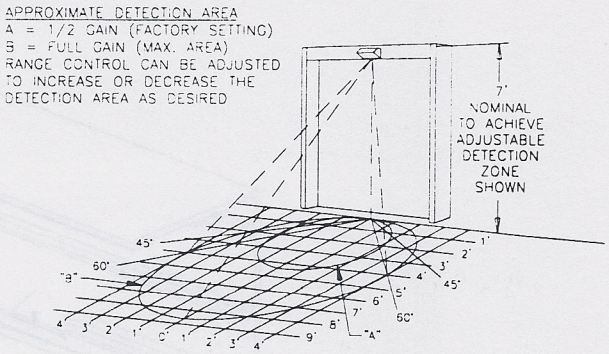


Figure 30: Approximate floor pattern for the 2-way motion detector. (wide pattern)

F. Dor-O-Matic Magnetic Locking System:

1. All holes for the magnetic locks should be pre-drilled for you at the factory. Simply attach the locks to the doors with the screws provided as shown in Figure 31 .

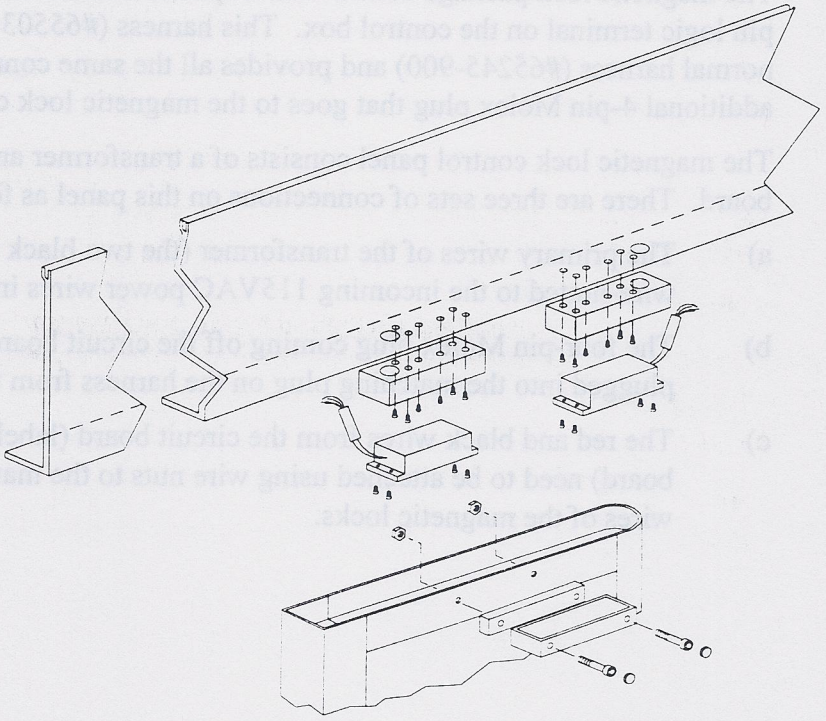


Figure 31: Attaching the Mag-Locks and Armatures to the Header and Doors.

2. The locks are usually shipped in the 24VDC position. Check with the instruction sheet provided with the locks and be sure to set them in the 12VDC position if they aren't already.

3. The Look-See® should be pre-mounted in the factory. If it is not, you will have to mount it as shown in Figure 32. Note that it is not mounted on the bottom of the cover as in the other Astro-Fold models.

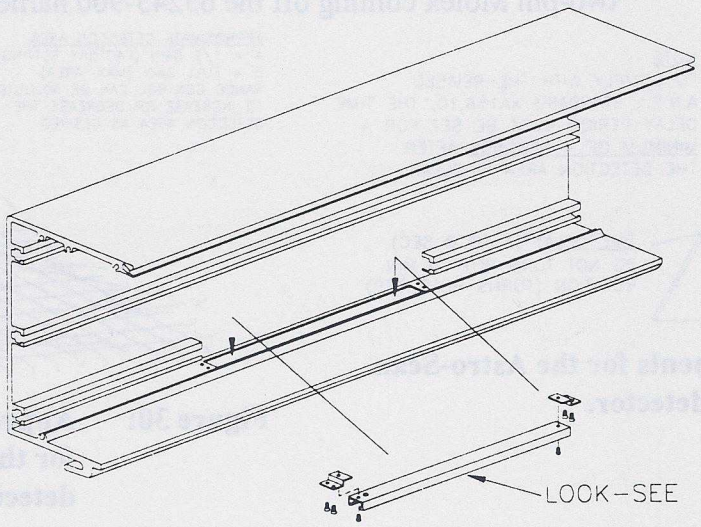


Figure 32 The Look-See is Mounted in a Different Position on Astro-Folds equipped with Magnetic Locks.

4. Refer to Figure 36 for complete mag-lock wiring diagram.

5. Be sure that the purple wires from the mag-lock are shorted together.

6. The magnetic lock package comes with a special harness that plugs into the 15-pin logic terminal on the control box. This harness (#65503-900) replaces the normal harness (#65245-900) and provides all the same connections plus an additional 4-pin Molex plug that goes to the magnetic lock control panel.

7. The magnetic lock control panel consists of a transformer and a small circuit board. There are three sets of connections on this panel as follows:

   a) The primary wires of the transformer (the two black wires) need to be wire-nutted to the incoming 115VAC power wires in the junction box.

   b) The four-pin Molex plug coming off the circuit board needs to be plugged into the matching plug on the harness from the control box.

   c) The red and black wires from the circuit board (labeled 1 & 2 on the board) need to be attached using wire nuts to the matching red and black wires of the magnetic locks.

8. The locks activate after the master operator has come fully closed. If the slave operator has not fully closed when the locks engage, the slave door will not be secure. To overcome this problem, do one of two things:

   a) Adjust the closing speed pots on the Astro-Fold control box so that the slave closes before or at the same time as the master.

   b) Adjust the time delay pots on the mag-locks. Follow the instructions included with the locks. This adjustment will cause the locks to delay engaging for a period of time after the master has closed. Each lock is adjusted separately.

9. The magnetic locking system also comes with a 2-position on/off switch. The installation of this switch is optional. If you wish to use it, follow the instruction sheet included with the switch.

G. Adjustments:

If adjustment is needed for any component, see its respective technical manual for proper procedures.

VII. Glazing

Necessary glass size may be determined by subtracting ½" from the clear opening width as shown in Figure 33. Glazing is normally provided by outside contractors. In any case, it must comply with the current UL-325 Standard Section 28.10 on Glazing Material. Generally this means that it must conform to ANSI Z97.1-1975 *Performance Specifications and Methods of Test for Safety Glazing Material Used in Buildings.*

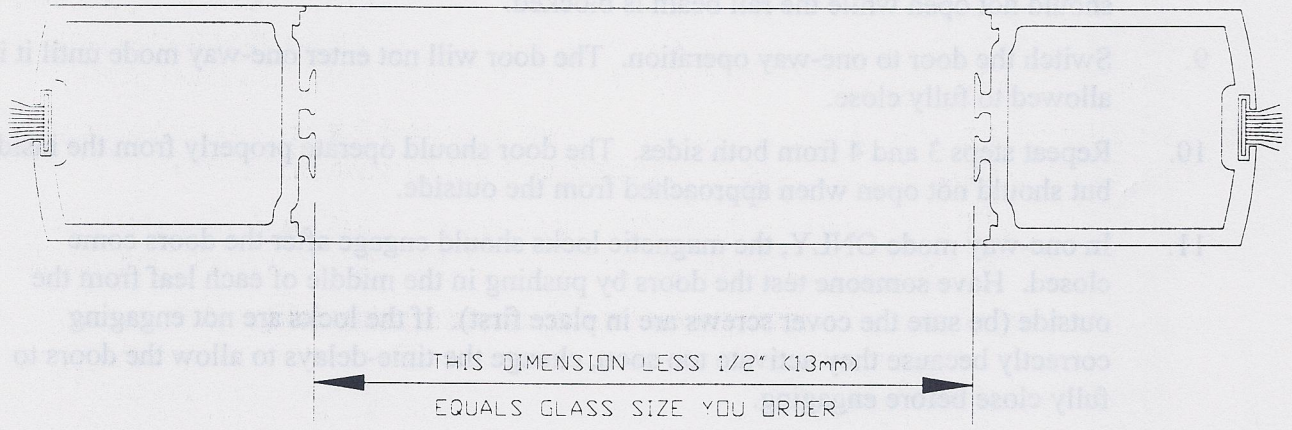


Figure 33: Measuring for correct glass size.

VIII. Walk-Through Test

Before releasing the Astro-Fold for service, you should perform a walk-through test to verify that all activating and safety devices are functioning properly.

1. Place the door in 2-way operation.
2. If power has not been applied, do so now. The first activation after power is applied will cycle the door open and closed 1 cycle very slowly. Be sure to let the door rest for a couple of seconds before activating again or it will still be in this sizing mode.
3. Walk up to the door from the swing side and stand anywhere in the closing path. The door should open and hold. The red light in the Look-See® should be on indicating that it is picking you up.
4. Walk out of the closing path. The Look-See® light should go off and the door should time-out and close.
5. Now repeat steps 3 and 4 approaching from the outside of the door.
6. Block the outside pencil-eye without activating the motion detector. Door should open and hold until the beam is cleared. (Note: On some installations, this may be difficult or impossible to do without disconnecting the motion detector.)
7. Approach the door from the inside so that the door opens. Cover the pencil eye in the rail and make sure you are out of range of the Look-See® (a piece of black electrical tape covering the eye works well). The door should hold open until the beam is cleared.
8. With the door closed, slowly (so as not to activate the door) approach from the swing side until you have blocked the rail pencil eye. Then try to open the door. The door should not open while the rail beam is blocked.
9. Switch the door to one-way operation. The door will not enter one-way mode until it is allowed to fully close.
10. Repeat steps 3 and 4 from both sides. The door should operate properly from the inside, but should not open when approached from the outside.
11. In one-way mode ONLY, the magnetic locks should engage after the doors come closed. Have someone test the doors by pushing in the middle of each leaf from the outside (be sure the cover screws are in place first). If the locks are not engaging correctly because they activate too soon, change the time-delays to allow the doors to fully close before engaging.
12. Move the 4-way switch to the "off" position. After the door comes fully closed, it should not activate again from either side. The door may open once on its own when the switch is moved to the "off" position -- this is normal.
13. Move the switch to the "hold-open" mode. The door should immediately move to its fully open position and stay there. The door can stay in this position indefinitely without damage to the automatic operator.

IX. Cover

The cover is shipped attached to the header. It can be removed for painting if required. Simply slide the cover off of the flexible hinge. If the unit is mounted in a narrow corridor or vestibule, there will not be room to slide it off. In this case, you will have to "pull" the cover off, destroying the hinge in the process. This is unfortunate, however the hinge is easily replaceable by sliding the old one out and sliding a new one in.

Re-installation can be done by sliding the cover on the same way, although snapping it straight in is usually easier.

Remember that the carrier rails will prevent the cover from closing properly when they are broken away, but will prevent access to the cover screws when closed. To finish the installation and secure the cover, follow these steps:

1. Snap the carriers into their normal "closed" position.
2. Close the cover.
3. Move the carriers into their breakaway position.
4. Secure the cover with the two (2) #8-32 screws provided (note: there are three (3) screws on packages with a pair of doors and magnetic locking device.)
5. Snap the carriers into their normal "closed" position.

Opening the header is basically the same process in reverse.

The Astro-Fold should now be ready for normal operation.