

Manual

US23-0146-01-

# Navig-Aider<sup>®</sup>

(OPB & OPB-A)

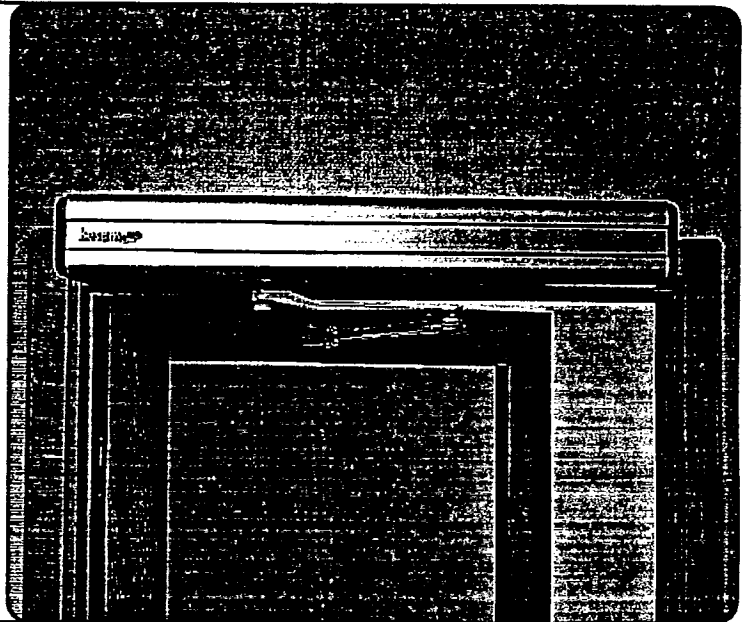
## Low Energy Swing Door Operator

Installation, Adjustment and Troubleshooting Manual

For Potentiometer (CU-OPB-120) and PMD Programmable (CUP) Controllers.

### Applications:

- ADA Compliance
- Colleges/Schools
- Medical Centers
- Office Buildings
- Physical Rehab Centers
- Residential
- Shopping Malls



Complies with ANSI/BHMA A156.19-1997 standards for  
low energy / handicap doors. UL 325 Listed

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# Important Information

## Important notice!

To avoid bodily injury, material damage and malfunction of the product, the instructions contained in this manual must be strictly observed during installation, adjustment, repairs and service etc. Only Besam trained experts should be allowed to carry out these operations.

## Radio and television reception

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been designed to comply with the emission limits in accordance with EN 50081-1 (US market FCC Part 15) which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient the receiving antenna.
- Relocate the receiver with respect to the equipment.
- Move the receiver away from the equipment.
- Plug the receiver into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions.

## Note!

Instructions, design, specifications and illustrations which are contained in this manual are not binding. Rights reserved for changes without previous notice.

## Environment

This operator may be equipped with batteries containing materials which are hazardous to the environment. Remove the batteries from the operator before it is scrapped. The batteries must be disposed of safely.

# Technical Specifications

Power supply Main Input:  
120 V AC  $\pm 10\%$ , 60 Hz fuse 10 A  
**Note!**  
A switch with clearly marked off-position, having a contact separation of at least 1/8" in all poles, must be incorporated in the Mains wiring.

Power consumption max. 200 W

Auxiliary voltage 18 V DC, 530 mA  
24 V DC, 100 mA  
24 V DC [Lock], 330 mA

Control fuse F1 2 A

Motor fuse F2 10 A for CUP; 5 A for CU-OPB-120

Recommended max. door weight: 220 lb. for door leaf width max. 48" \*  
SAS/Hybrid

Recommended max. door weight: 220 lb. for door leaf width max. 48" \*  
STL/STL-P

Opening time (0° – 80°) variable between 2 – 6 seconds \*

Closing time (90° – 10°) variable between 2 – 6 seconds \*

Hold open time 0-60 seconds \*

Ambient temperature +5° F to 113° F

## Dimensions:

Length: 31.5 "

Height: 4.5 "

Depth: 6.5 "

To be installed internally or externally with suitable weather protection.

\* ANSI/BHMA has certain requirements which must be met for low energy doors. See page 53.

# Introduction

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This manual contains the necessary instructions for the installation and maintenance of the Besam low energy swing door operator, Navig-Aider. The Besam Navig-Aider is non-handed, and is suitable for most types of external and internal swing doors. It can be installed onto most existing swing doors with little or no modification. The Navig-Aider can be mounted to walls above either side of the door for pull or push action, and is suitable for single or double doors with butt hinges, offset or centered pivots. When installed and maintained as directed in this manual, the Navig-Aider is fully ANSI/BHMA A156.19-1997 and ADA compliant.

## How The Navig-Aider Works

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The Navig-Aider uses a DC motor and belt-reduction system (the drive unit, or operator) to drive an arm system which opens the door. Closing power is provided by the motor and a coil spring. The door's movement is determined by an electronic control unit that uses an internal revolution counter to track the door's position.

### Opening

When an opening signal is received by the control unit, the door is opened at the Navig-Aider's high speed. Before the door is fully open, it slows to low speed. The motor stops when the selected door-opening angle has been reached. The open position is held by the motor.

If the "Push and Go" option is selected, the door, when opened by hand a short distance (about 3/4"), will continue to open automatically to the preset fully-open position. When the preset "Push and Go" hold-open time has elapsed, the door will close automatically.

If "Push and Go" is not selected, the door, when opened by hand, will close immediately once the door is released. In this case, the Navig-Aider acts only as a door closer.

### Closing

When the hold-open time has run out, the Navig-Aider will close the door automatically, using spring and motor force (the motor acts as a brake). The door will slow to low speed before it reaches the fully closed position. The door is kept closed (the 'zero-position') by spring power and with additional motor force, if so selected. With a CUP control unit, the door can be set to use spring force only when closing. (This may not be sufficient for some installations.)

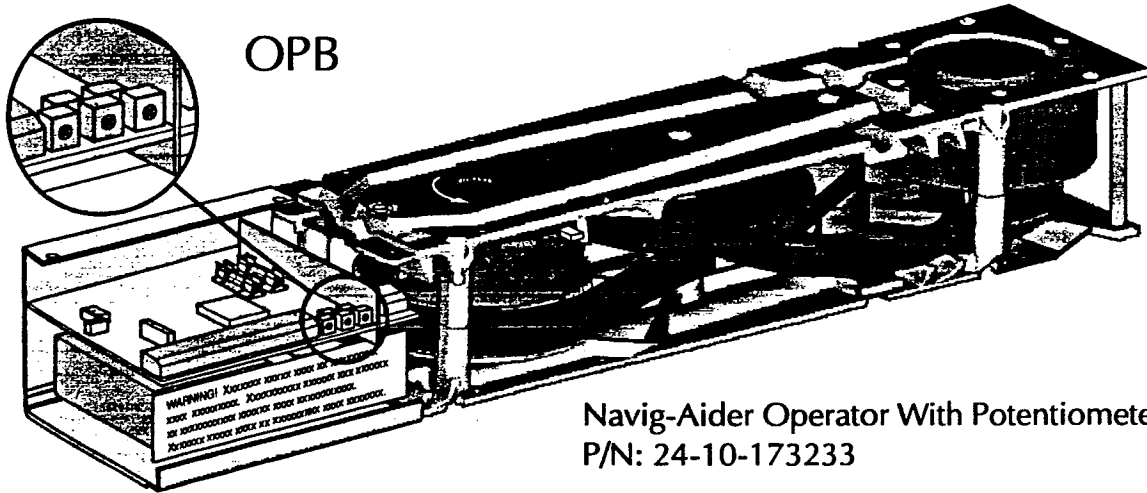
### Safety functions integrated in the Navig-Aider

If the door is obstructed while opening, it will immediately stop. After 5 seconds, the door will revert to the closed position. If the door is obstructed while closing, and "Push and Go" has not been selected, the door will stop, and will continue to close when the obstruction is removed. If "Push and Go" has been selected, the obstructed door will revert to open position and will close again when the "Push and Go" hold-open time has elapsed.

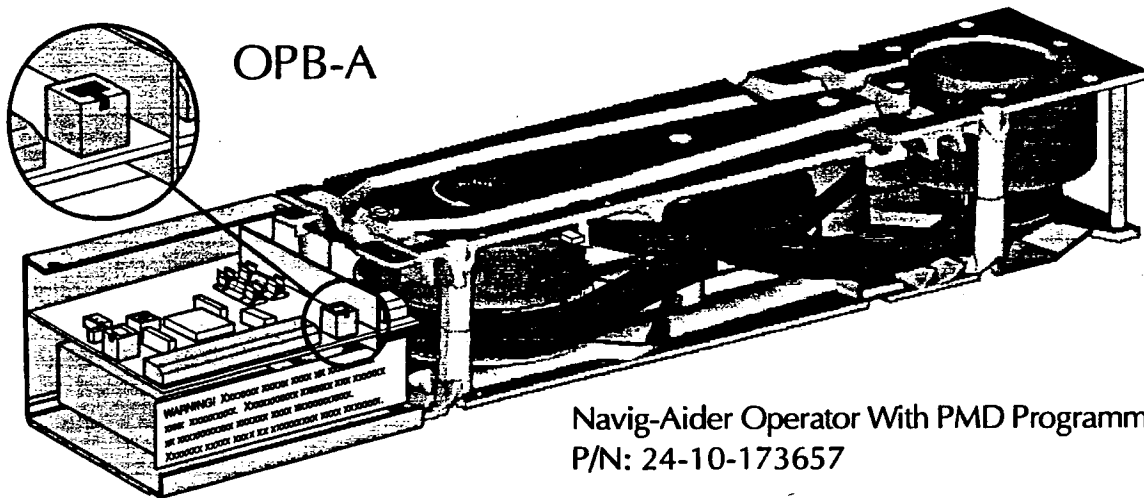
# Part Identification & Options

## Navig-Aider drive unit with control unit:

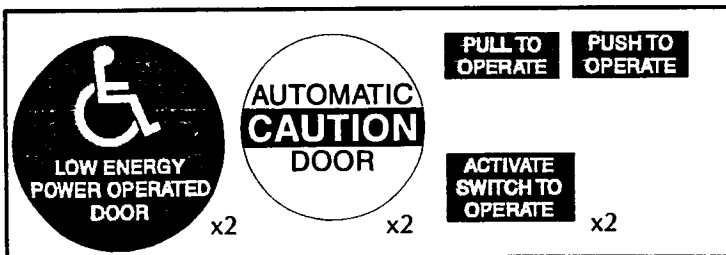
Two basic options are available. The OPB consists of the standard drive unit and a potentiometer control [CU-OPB-120]; the OPB-A consists of the standard drive unit and a PMD programmable control [CUP]. The PMD programming module, necessary for the CUP controller, is available separately.



Navig-Aider Operator With Potentiometer Control Unit  
P/N: 24-10-173233



Navig-Aider Operator With PMD Programmable Control Unit  
P/N: 24-10-173657



ANSI Door Label Kit:

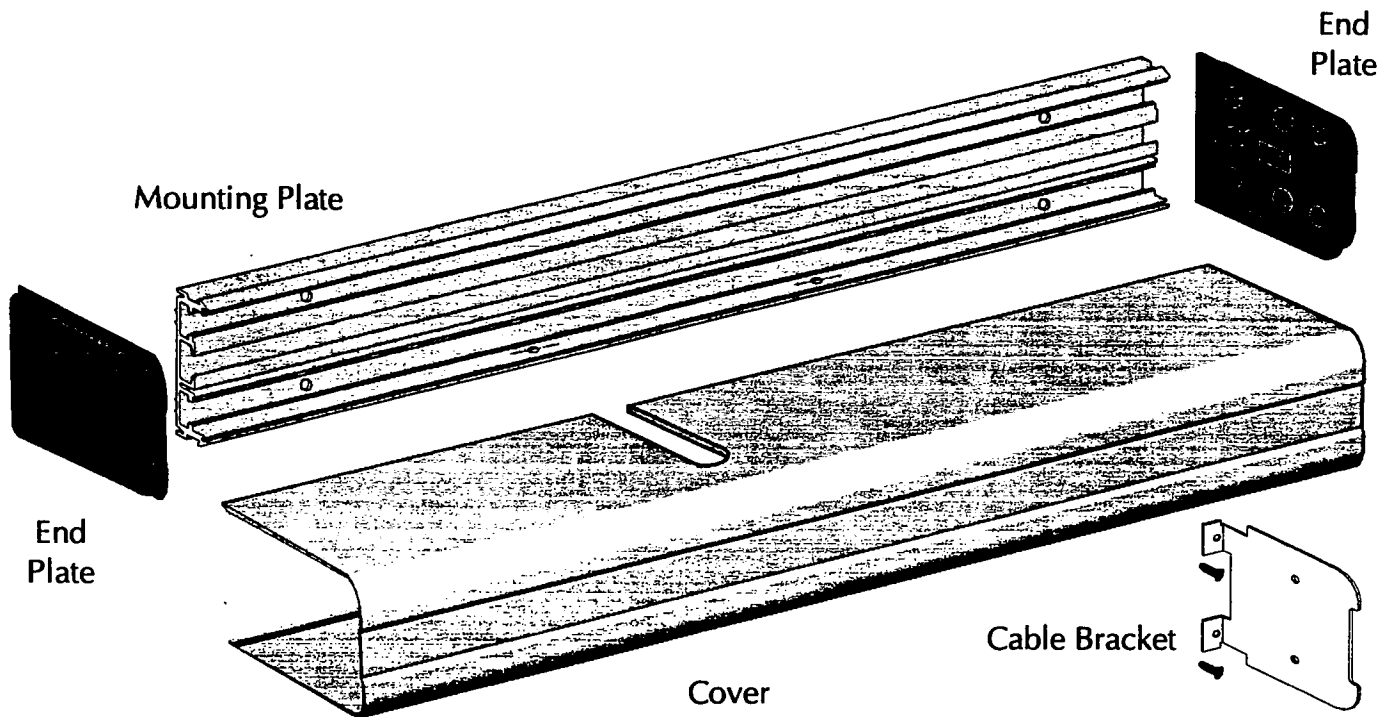
P/N: US15-0138-01

# Part Identification & Options

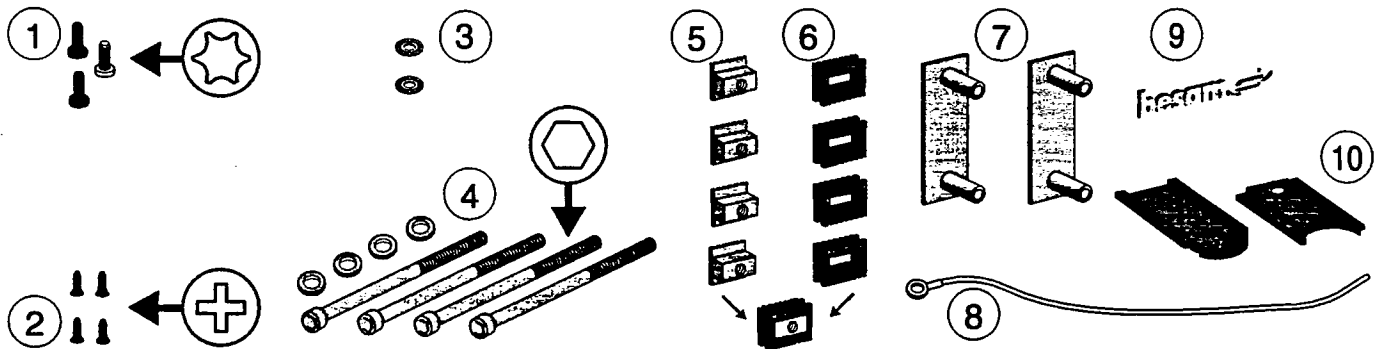
The cover and mounting plate are manufactured in clear anodized aluminum. The end plates are made of black self-extinguishing plastic. The cable bracket is used when wiring through the end plates.

## Cover and Mounting plate, with Assembly Hardware, Aluminum, Clear Only

P/N: 24-10-173522



**Note!** Hardware for attaching the Navig-Aider to the wall (bolts, rivnuts, etc.) is not included. You will need to purchase hardware suitable for the kind of wall on which you are installing the Navig-Aider. See page 12 for guidelines.



- |  |                                |
|--|--------------------------------|
| ① Cover mount and ground screw, Torx (3) | ⑥ Rubber absorbers (4)         |
| ② End plate screws, Phillips (4)         | ⑦ Spacer plates (2)            |
| ③ Lock washers (2)                       | ⑧ Ground cable                 |
| ④ Allen screws with washers (4)          | ⑨ Besam logo                   |
| ⑤ Square nuts (4)                        | ⑩ Cut out lids, top and bottom |

# Part Identification & Options

## Arms

The Navig-Aider can be equipped with two basic kinds of arms: pushing arms, which push the door open, and pulling arms, which pull the door open. Note: Only one arm is required per operator.

### Pushing arms:

**Standard Arm, SAS** – normal usage.

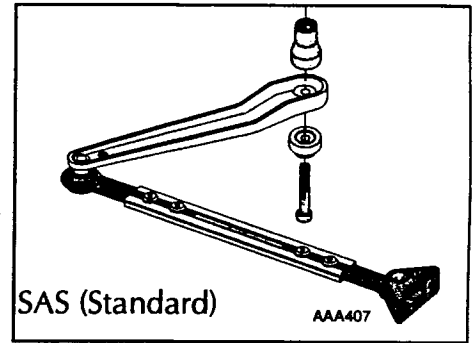
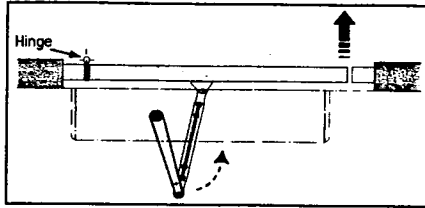
P/N: 21-06-006 – Clear

P/N: 21-06-007 – Black

**Hybrid Arm** – high-abuse.

P/N: 21-06-173382 – Clear

P/N: 21-06-173383 – Black



SAS (Standard)

AAA407

Pushing arms are used when installing the Navig-Aider on the opposite side of the wall from the direction in which the door opens. The Standard and Hybrid arms are installed similarly, but with different shaft adapters.

### Extensions for pushing arms (see page 14):

#### 9-7/8" Extension

P/N: 21-06-173002 – Clear

P/N: 21-06-173004 – Black

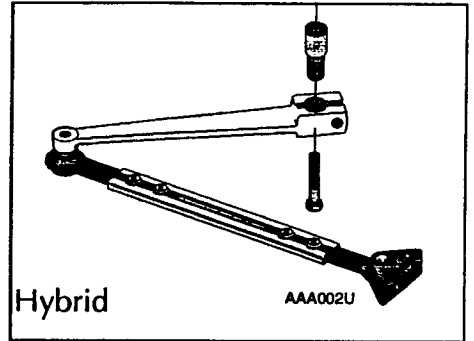
#### 14-3/4" Extension

P/N: 21-06-173003 – Clear

P/N: 21-06-173005 – Black

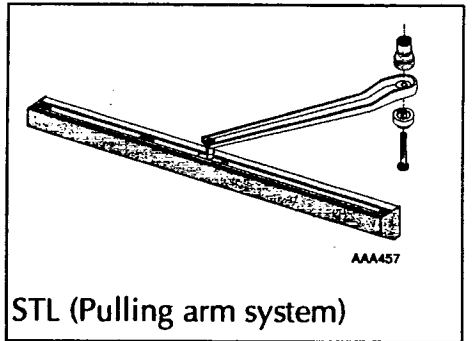
#### Extension Joiner

P/N: 21-06-173191



Hybrid

AAA002U



STL (Pulling arm system)

AAA457

### Pulling arms:

**Slide-Track Light Arm System, STL**

– normal usage.

P/N: 24-06-173125 – Clear

P/N: 24-06-173126 – Black

**Panic Breakout Kit, STL-P**

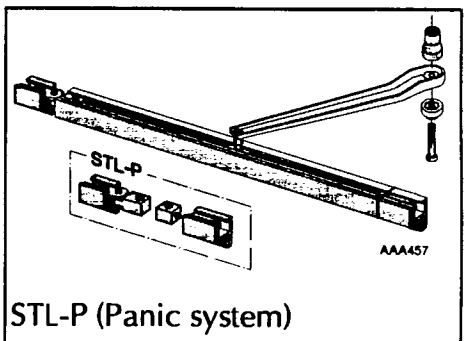
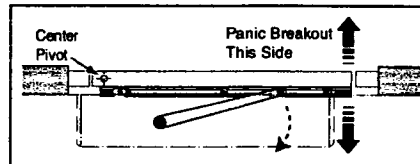
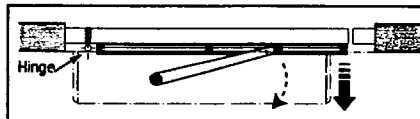
– for center pivot doors.

P/N: 24-15-832430 – Clear

P/N: 24-15-832431 – Black

**Doorstop Switch** – for use with STL-P

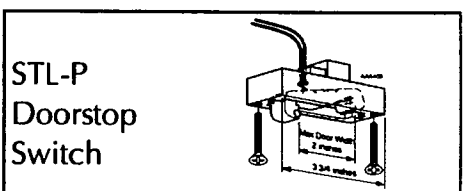
P/N: 99-99-004



STL-P (Panic system)

AAA457

The STL is used when installing the Navig-Aider on the same side of the wall on which the door opens. The STL-P is a kit for the STL with a hinge and a breakaway catch. It is used on doors with a center pivot to allow emergency exit in a reverse direction. The doorstop switch is both a breakaway doorstop and an indicator that a breakout has happened.



STL-P  
Doorstop  
Switch

# Part Identification & Options

## Options

Push Plates come in three shapes (Round, Square and Narrow), and in normal or remote switch configuration.

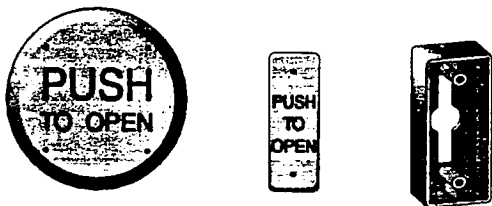
### Push Plates:



P/N: 75-02-101 | Round: Symbol  
 P/N: 75-02-102 | Round: Symbol & "Press To Open"

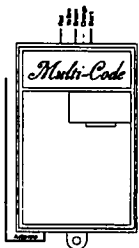


P/N: 75-02-107 | Square: Symbol  
 P/N: 75-02-108 | Square: Symbol & "Press To Open"  
 P/N: 75-02-280 | Narrow: Symbol & "Push To Open"



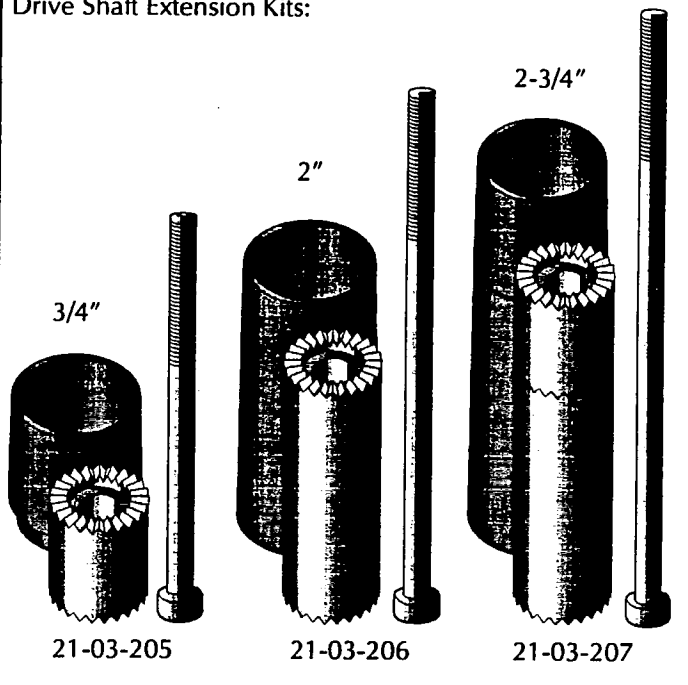
**Remote Push Plates (RF):**  
 P/N: 75-02-269 | Narrow: "Push To Open"  
 P/N: 75-02-270 | Narrow: Symbol & "Push To Open"  
 P/N: 75-02-272 | Round: Symbol "Push To Open"  
 P/N: 75-02-273 | Round: "Push To Open"

P/N: 75-21-002 | Installation box for Narrow plates



P/N: 75-02-271 | Remote Receiver

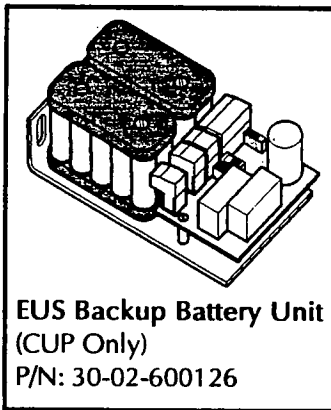
### Drive Shaft Extension Kits:



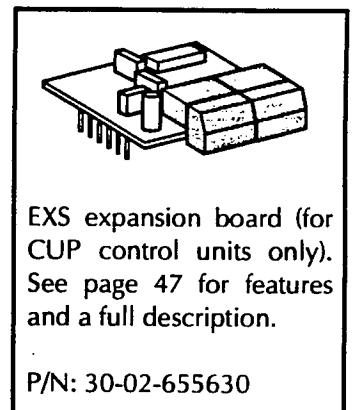
21-03-205

21-03-206

21-03-207

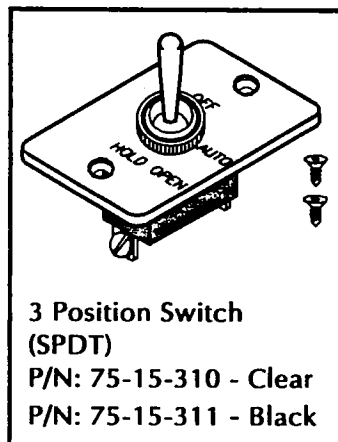


**EUS Backup Battery Unit (CUP Only)**  
 P/N: 30-02-600126

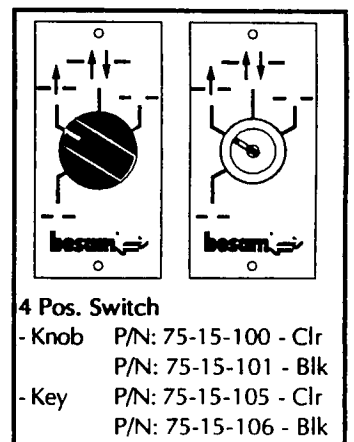


EXS expansion board (for CUP control units only). See page 47 for features and a full description.

P/N: 30-02-655630



**3 Position Switch (SPDT)**  
 P/N: 75-15-310 - Clear  
 P/N: 75-15-311 - Black



**4 Pos. Switch**  
 - Knob P/N: 75-15-100 - Clr  
 P/N: 75-15-101 - Blk  
 - Key P/N: 75-15-105 - Clr  
 P/N: 75-15-106 - Blk



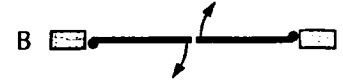
# Pre-Installation Questions

This section will help you to determine the appropriate Navig-Aider configuration for your doors.

A. Is this installation a pair of inswing/outswing doors?



B. Is this installation a pair of dual egress doors?



C. Is this installation a pair of inswing/outswing doors with an overlapping astragal?



If the answer to A, B or C is yes, please see page 31 for information on door pairs and matching height installations.

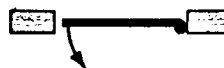
D. What is the handing of the door?



Left Hand In



Left Hand Out



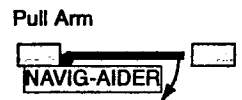
Right Hand In



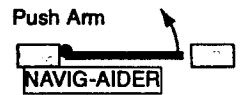
Right Hand Out

E. What type of arm system is required? [If breakout is required on a center-pivot door, use STL-P.]

If the door opens in a direction opposite to the side of the wall where you wish to install the drive unit, you will need a Push/Swing (SAS or Hybrid) arm. Use the installation instructions on pages 14-20



If the door opens on the same side of the wall where you wish to install the drive unit, you will need a Pull/Swing (STL) arm. If installing the STL on a central pivot-hinge door (door opens in both directions), you must install the Panic break out and door stop kit (STL-P) In both cases, use the installation instructions on pages 21-29.



F. What is the reveal of the installation, in inches? Is it within the arm's capability? (See pages 14, 21.)

G. What type of hinges are on the door? (Center Pivots, Butt Hinge, Offset Pivot.) Note: the Navig-Aider is not designed to be used with balance doors.

H. Where will power enter the operator housing? (Back, End cover.)

## General Tips / Safety Concerns

For enhanced security and vandalism protection, always mount the operator to the interior side of a building.

Make sure that the power is off before installing.

Make sure that the door leaf and the wall are properly reinforced at the installation points. See pages 11-12 for specifications and suggestions.

Inspect the door hinges before installation to ensure that they are in good repair.

# Installation Overview

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This is only a summary of the installation process. See the rest of this manual for detailed information.

Start by reading and answering the pre-installation questions on page 9. The answers will help you determine which sections of the manual to use, and provide information that will be used later in the installation.

## SAS/Hybrid Push Arm Systems:

- 1: Establish distance 'B' (page 13) and the installation height (page 15).
- 2: Install the mounting plate (page 16).
- 3: Attach the arm shoe to the door (page 17).
- 4: Attach the control unit to the drive unit (page 18)
- 5: Mount the drive unit so that the drive shaft is at proper distance from the hinge/pivot [distance 'B'] and that the drive shaft direction of rotation is correct (page 19).
- 6: Adjust the spring tension (page 33).
- 7: Mount the rest of the drive arm (page 20).
- 8: Complete all electrical connections to other operators or optional equipment (page 34).
- 9: Adjust the control unit for optimal and safe performance, in accordance with ANSI/BHMA specifications (page 53).
- 10: Apply safety signage to the door(s) (page 48).
- 11: Train facility manager in operation.

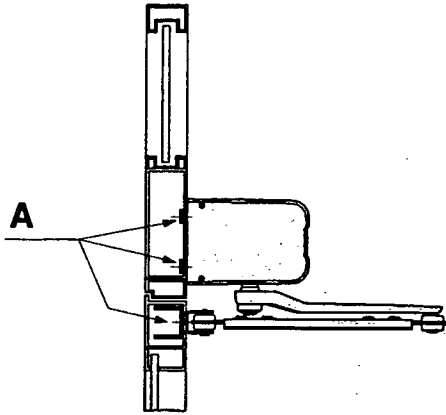
## STL/STL-P Pull Arm Systems:

- 1: Establish distance 'B' (page 13) and the installation height (page 22).
- 2: Install the mounting plate (page 23).
- 3: Attach the slide track to the door (STL, page 24; STL-P, page 25).
- 4: Install the panic stop /switch into the door frame (page 26).
- 5: Attach the control unit to the drive unit (page 27)
- 6: Mount the drive unit so that the drive shaft is at proper distance from the hinge/pivot [distance 'B'] and that the drive shaft direction of rotation is correct (page 28).
- 7: Adjust the spring tension (page 33).
- 7: Mount the rest of the drive arm (page 29).
- 8: Complete all electrical connections to other operators or optional equipment (page 34).
- 9: Adjust the control unit for optimal and safe performance, in accordance with ANSI/BHMA specifications (page 53).
- 10: Apply safety signage to the door(s) (page 48).
- 11: Train facility manager in operation.

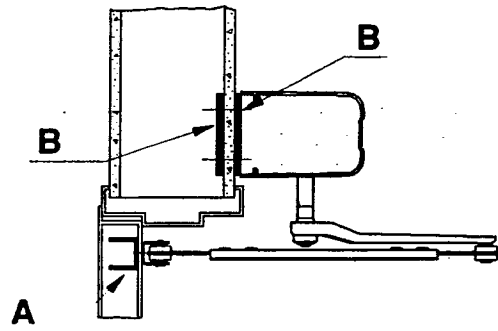
# Installation Examples

- A Steel reinforcement or rivnut
- B Steel reinforcement
- C Expansion-shell bolt
- D Wood reinforcement
- E Steel beam

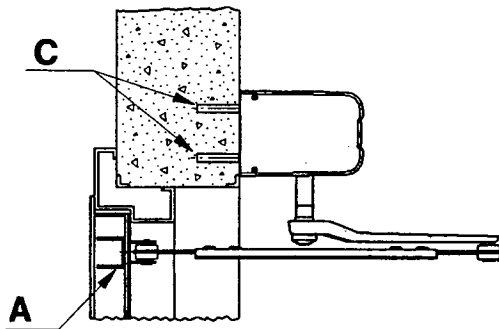
**1** Aluminum profile system



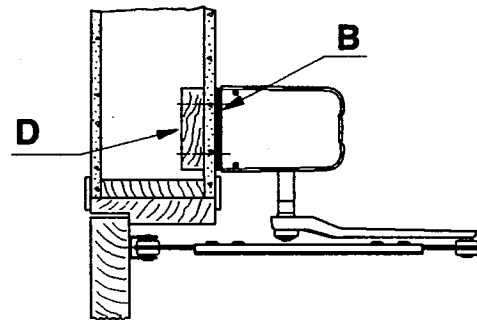
**2** Plasterboard wall



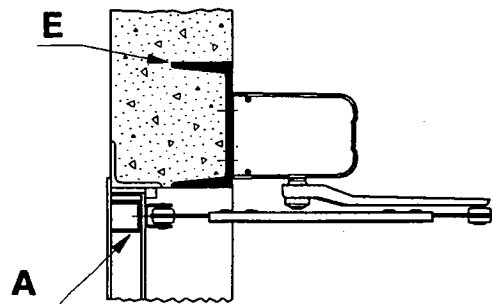
**3** Reinforced concrete wall and brick wall



**4** Plasterboard wall



**5** Reinforced concrete wall



AAB923

# Fastening Requirements

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Base door / wall material	Minimum anchor / bolt requirement *
Steel	3/16" **
Aluminum	1/4" **
Reinforced concrete	min. 2" from the underside
Wood	2"
Brick wall	Expansion-shell bolt, min. 1/4" x 3-1/2", min. 2" from the underside

\* Besam minimum recommended requirements. Building Codes may give different specifications.

\*\* Thin-wall profiles must be reinforced with rivnuts.

## Test Equipment

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Stopwatch  
Force gauge (50 lb force range)  
PMD (for CUP Control)  
Multimeter

## Tools Required

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Vice grips  
Carpenter's level  
Tape rule  
Power drill and set of drill bits  
Metric hex key set (6,5,4 mm and 2.5 mm for STL-P)  
Torx (T20)  
Hacksaw  
Center punch  
#2 Phillips screwdriver  
Flatblade screwdriver (small/med./large)  
Wire stripper  
Pencil  
Torque wrench /w/ metric allen sockets  
Additional mounting hardware (not supplied – see recommendations above)  
Silicone sealant

# Door Size & Finding Distance 'B'

The recommended force for manual opening of the door is less than 15 lbF. (See the ANSI/BHMA reference on page 53.) To obtain this force, check the width of your door against the proper table to the right. The Navig-Aider must be installed so that the distance between the center line of the door hinge/pivot (center, offset, or butt) and the center line of the Navig-Aider drive shaft equals distance 'B'.

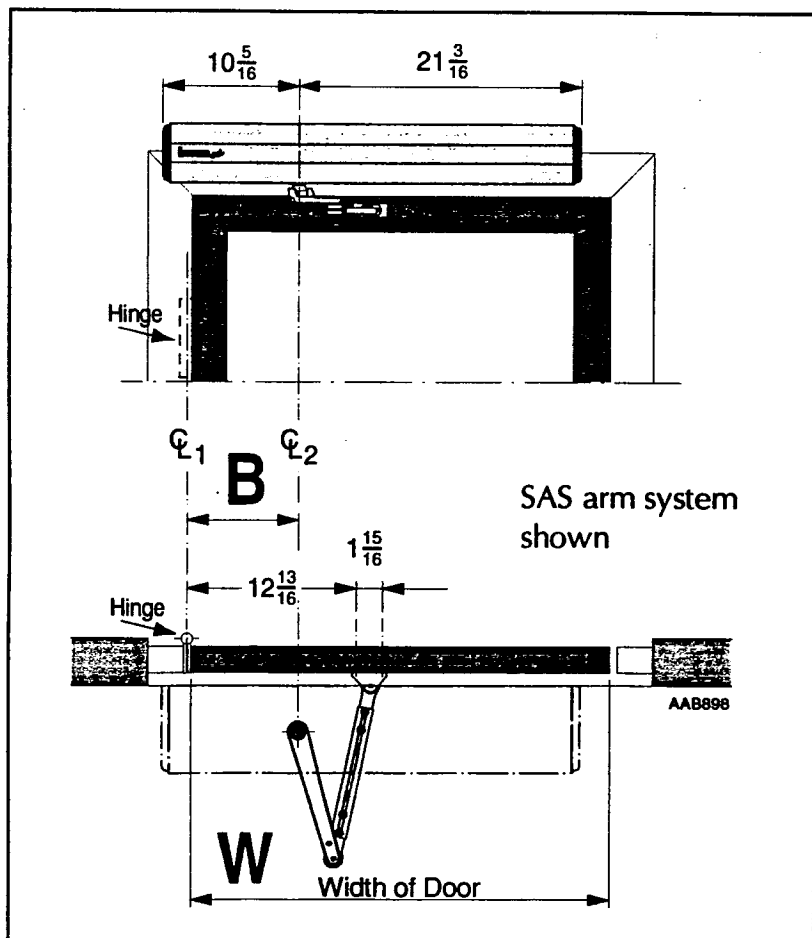
With this installation, the hold force on a closed door, with normal spring tension (see page 33), will be 7.87 lbF. Extra hold force can be selected with the PMD controller – see Functions and Values, page 41. (This option is not available for potentiometer controllers.)

**Note:** On the smallest door, distance 'B' is 8 5/16", but the distance from the drive shaft to the end of the cover (plus end plate) is 10 5/16". The mounting plate must be offset towards the hinge accordingly, which may produce an asymmetry with a double egress installation. See pages 31-32 for mounting the Navig-Aider with double doors.

SAS/Hybrid (Table 1)	
Door width (in inches)	B
30"	8 5/16"
32"	8 1/2"
33"	8 5/8"
36"	8 15/16"
37"	9"
42"	9 1/2"
43"	9 5/8"
48"	10 1/8"
49"	10 3/16"

STL (Table 2)	
Door width	B
All sizes	10 7/16"

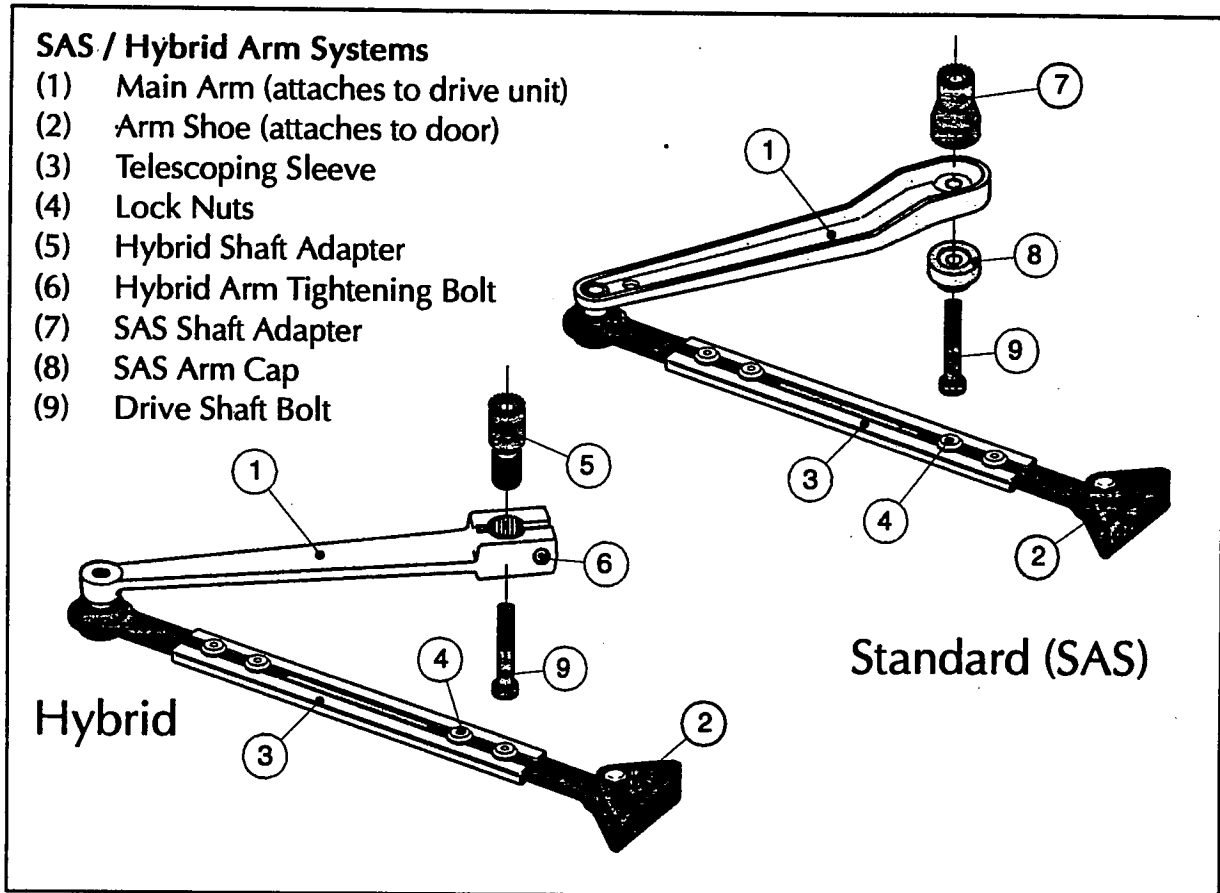
STL-P (Table 3)	
Door width (in inches)	B
30"	8 1/2"
32" and up	10 7/16"



- ☉1 = Door hinge/pivot center line
- ☉2 = Navig-Aider drive shaft center line
- B = Distance between door hinge/pivot center line and Navig-Aider drive shaft center line
- W = Door width

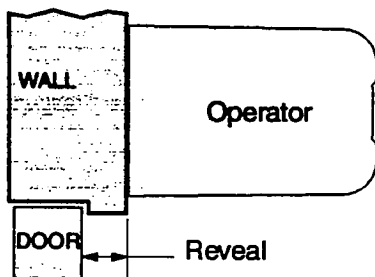
# Installation: Push – Swing Arm

The SAS arm consists of a main drive arm, a drive shaft adapter, a telescoping sleeve for adjusting arm length, and an arm shoe that attaches to the door. The Hybrid arm is similar, but differs in the way that it attaches to the drive shaft. Both arm types are installed in almost exactly the same way. This section shows the installation of the SAS arm, with exceptions for the Hybrid arm noted when appropriate.



## “Reveal” and SAS / Hybrid arm extensions:

The reveal is the distance between the wall surface on which the operator is mounted and the surface of the door (i.e., how deeply the door is set into the wall). See the chart below for reveal distances and arm extensions required:



SAS / Hybrid extensions consist of replacement telescoping sleeves. The sleeve that comes with the arm system is equivalent to a 9-7/8” extension.

SAS / Hybrid Extension	
Reveal:	Use this part:
Up to 4-3/8”	No extension needed
4-3/8” to 9-1/4”	14-3/4” extension <sup>1</sup>
9-1/4” to 14-1/8”	9-7/8” extension & joiner <sup>2</sup>
14-1/8” to 19”	14-3/4” extension & joiner <sup>3</sup>

- 1: Replace old telescoping sleeve.
- 2: Keep old sleeve; attach to new sleeve with joiner.
- 3: Keep old sleeve; attach to new sleeve with joiner.

# Installation: Push – Swing Arm

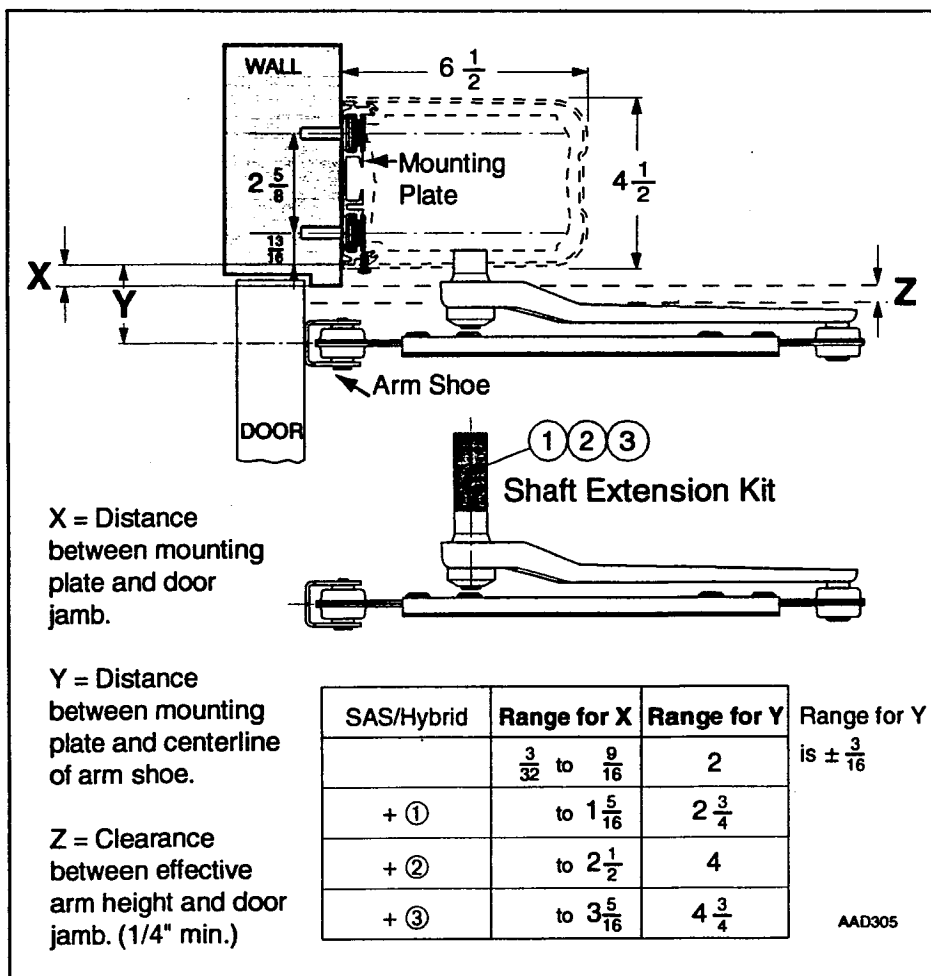
## Establish the installation height

The installation height,  $X$ , is the distance between the mounting plate and the underside of the door jamb.  $X$  can be between  $3/32''$  and  $3-5/16''$ , depending on the shaft extension used. The cover is  $3/32''$  thick, so it will be flush with the door jamb if a mounting plate installation height of  $3/32''$  is used. When determining  $X$ , examine three factors:

- 1) Where on the wall above the door can the drive unit be installed?
- 2) Where on the door can the arm shoe be installed?
- 3) Will the unit need to match the height of other units, such as with a double door installation?

Establish the areas on the wall and door that are suitable for mounting the Navig-Aider, then determine a height within this range that matches the height of your other installations, if any. The part of the drive arm that passes under the door frame should maintain a vertical clearance of at least  $1/4''$  from the frame. (Distance 'Z' below.)

Note that the arm system has flexible joints. This allows an installation leeway of  $\pm 3/16''$  to the values for 'Y', as shown below.



- ① Shaft extension,  $3/4''$
- ② Shaft extension,  $2''$
- ③ Shaft extension,  $2-3/4''$

# Installation: Push – Swing Arm

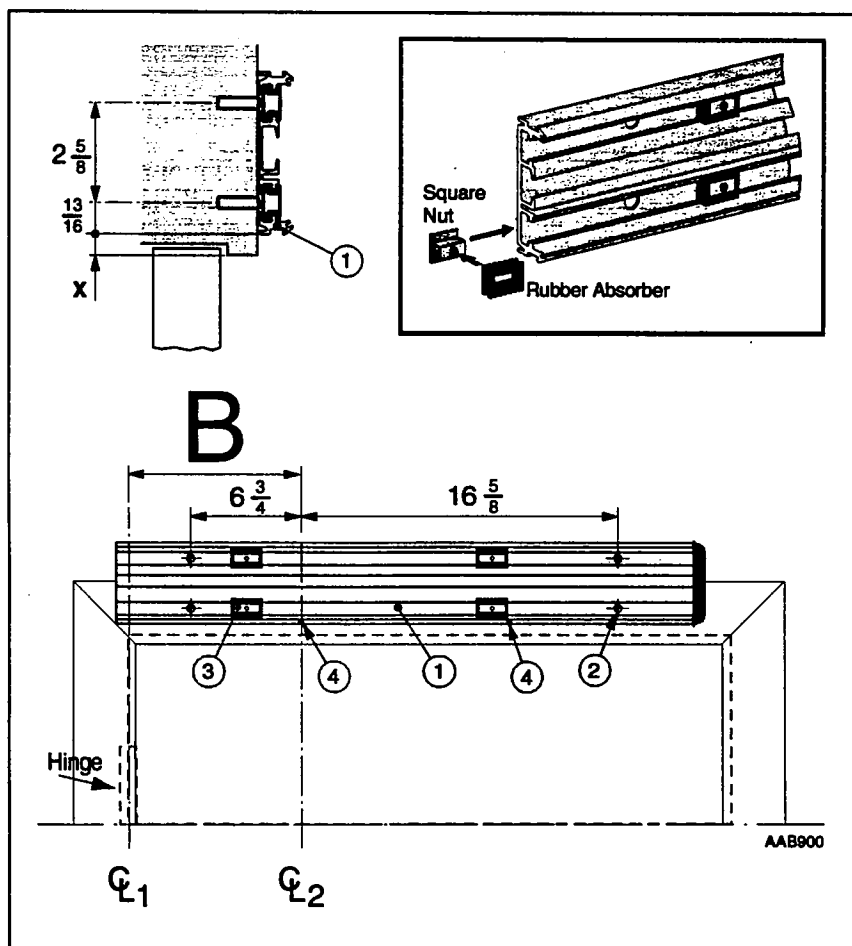
## Installing the mounting plate

1. Remove one of the plastic end plates from the cover assembly with a small screwdriver. Slide the cover from the mounting plate ①. Fit the rubber absorbers to the square nuts ③ and slide them into the top and bottom slots on the mounting plate, as shown below. Make sure that these nuts lie inbetween the mounting holes ②.

2. Mark out distance 'B' on the wall (see page 13) from the center line of the door hinge. Hold the mounting plate so that the side with two screw holes ④ (for attaching the cover) faces down, and place the mounting plate horizontally on the wall with the leftmost screw hole ④ aligned with the 'B' mark, as shown below (rightmost hole if hinges are on the right). The center of the drive shaft will align with this screw hole.

3. Align the bottom of the mounting plate with the installation height 'X' as measured on page 15. Using a level, ensure that the plate is perfectly horizontal.

4. Using the mounting plate as a template, mark the position of the four mounting holes ②. Drill, tap, plug, or reinforce with rivnuts, and screw the mounting plate tight.



- ① Mounting plate
- ② Mounting holes (4)
- ③ Square nut with rubber absorber (4)
- ④ Screw hole for the cover
- $C_1$  Center line – door hinge
- $C_2$  Center line – Navig-Aider drive shaft



# Installation: Push – Swing Arm

## Installing the arm shoe

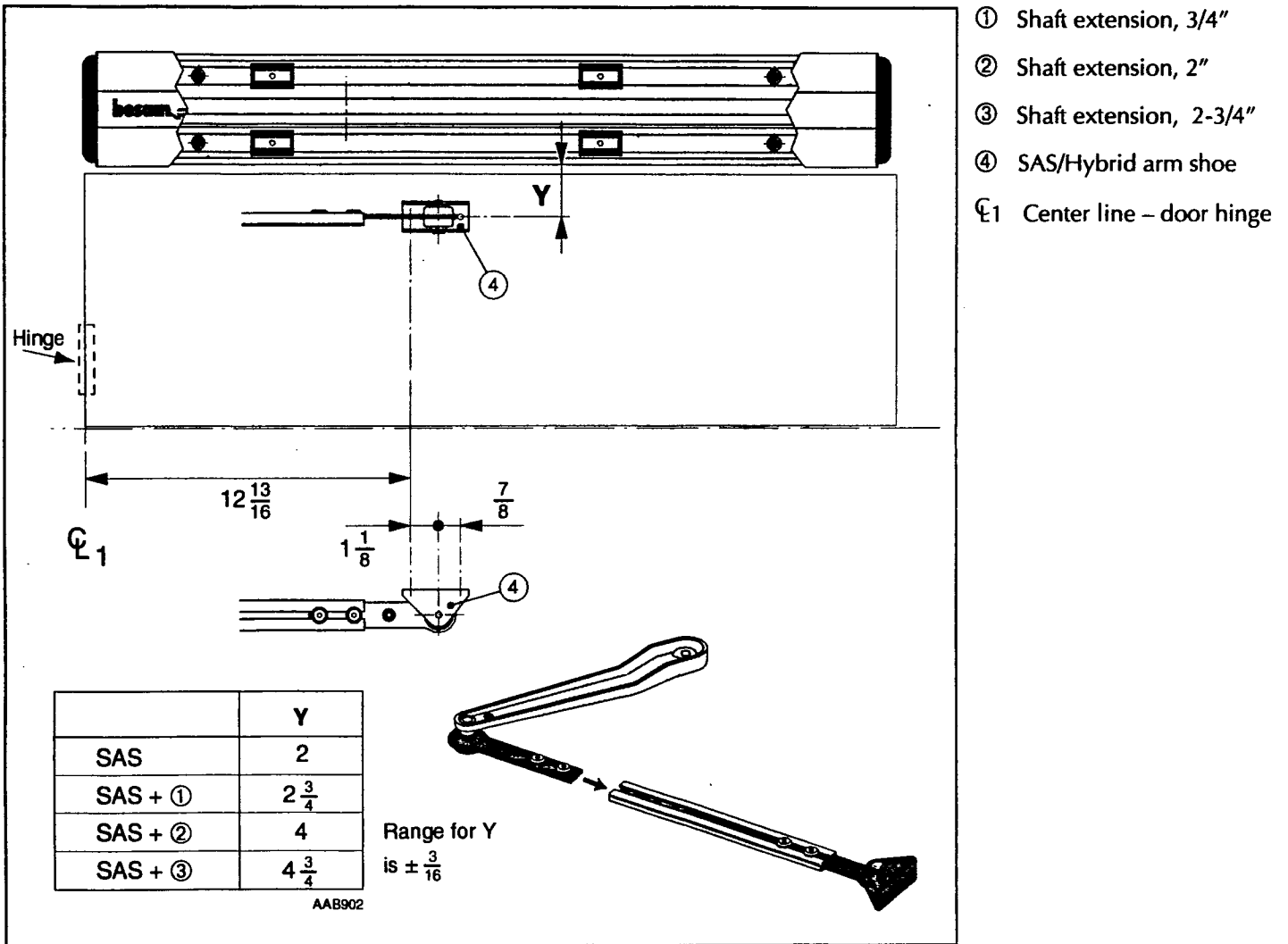
**Note!** The arm shoe, regardless of door size, is always fitted 12-13/16" from the door hinge/pivot center line.

1. Remove the arm shoe, along with the telescoping sleeve, from the arm system. Close the door tightly.

2. Referring to page 15, mark the vertical height Y (distance from the bottom of the mounting plate to the mounting holes for the arm shoe). Mark for the two mounting holes as shown on the illustration.

Note that the holes are **not** symmetrical compared with the center line of the arm shoe joint. This allows a slight mechanical force adjustment to be made by turning the arm shoe upside down. See Frequently Asked Questions, page 54.

3. Drill, tap or reinforce with rivnuts and screw the arm shoe on tight.



# Installation: Push – Swing Arm

## Mounting the drive unit

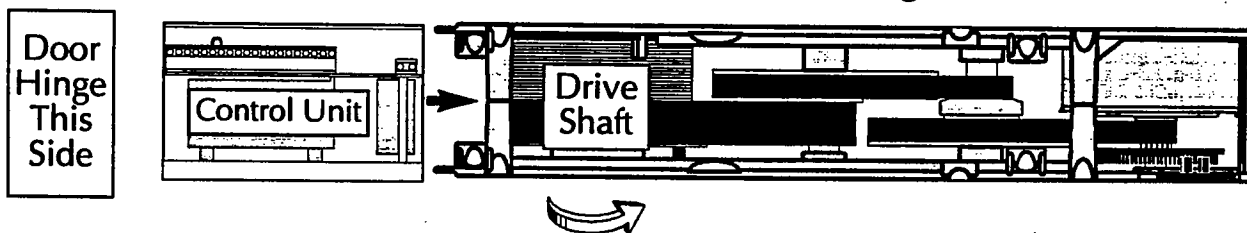
For push applications, the drive unit should be installed in one of two orientations, depending on which side of the door is hinged (see below). The rotation direction (opening) of the drive shaft is indicated with an arrow in the casting. The drive shaft extends completely through the drive unit, and the arm system may be attached to either end of the drive shaft.

**Note!** Although the drive unit may be mounted upside down, the control unit **must always** be mounted with the electronics board facing up, and will always be placed on the drive unit next to the drive shaft.

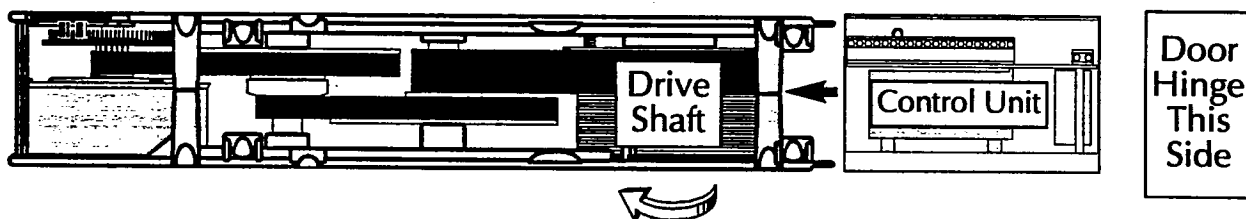
1. Determine in which orientation the drive unit is to be mounted, as shown below. If necessary, remove the control unit and reattach it as shown below. It may be necessary to re-route the motor and revolution counter cables through the wire channels on the top and bottom of the drive unit.

Viewed from operator side.

### Push (SAS/Hybrid), Left-hinged door



### Push (SAS/Hybrid), Right-hinged door



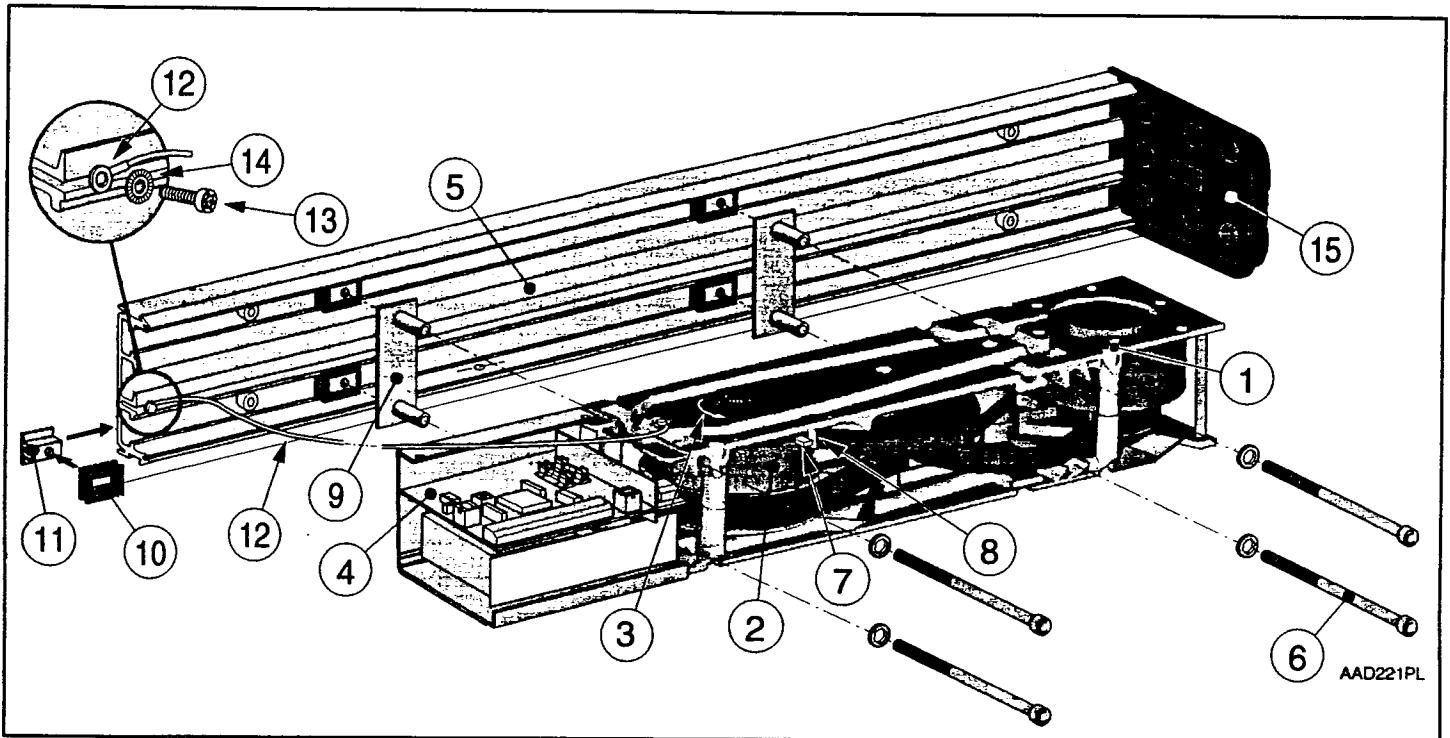
**Note!** Before proceeding further, make sure that this orientation of the operator will not conflict with your planned electrical connections. If you plan to drill through the mounting plate for electrical wiring, this should be done now, as close to the control unit as is feasible.

# Installation: Push – Swing Arm

## Mounting the drive unit (continued)

2. Position the four square nuts with rubber absorbers as shown in the illustration. Mount the drive unit loosely on the mounting plate, using the two spacers and the four screws and washers. (Tip: temporarily tape the spacers to the drive unit to hold them correctly in place while assembling.)

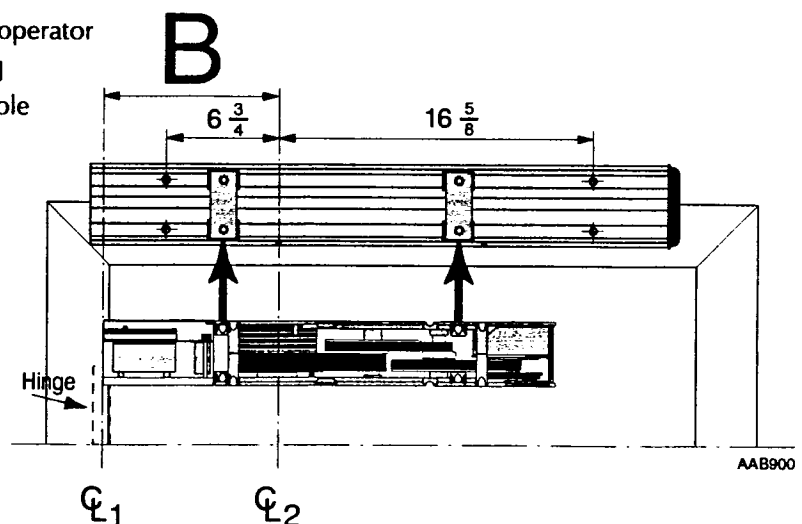
Slide the unit so that the centerline of the drive shaft matches the centerline of the cover screw hole, and tighten all four screws. Connect the enclosed ground cable to the mounting plate with ground screw and lock washer, as shown; then attach other end of ground cable to drive unit where indicated.



- (1) Drive unit
- (2) Closing spring
- (3) Opening direction arrow
- (4) Control unit
- (5) Mounting plate
- (6) Allen screws with washers
- (7) Spring-hook
- (8) Spring-hook stop
- (9) Spacer (2 pcs)
- (10) Rubber absorber (4 pcs)
- (11) Square nut (4 pcs)
- (12) Ground cable
- (13) Ground screw (Torx)
- (14) Lock washer
- (15) End plate

- ☉1 Center line butt/pivot hinge
- ☉2 Center line of operator drive shaft and cover screw hole

Left Hand Installation shown. See page 18.



# Installation: Push – Swing Arm

## Mounting the drive arm

**Note:** The shaft adapter can be damaged if not tightened carefully. Make sure that the teeth of the shaft adapter are engaged correctly with the teeth of the drive shaft before tightening.

1. Close the door and keep it closed.  
2. If using the SAS, mount the arm loosely on the drive shaft, using the arm cap, shaft adapter, and bolt, so that the arm turns freely. See diagram at right.

If using the Hybrid arm, attach the Hybrid arm tightly to the shaft adapter, then mount the shaft adapter loosely on the drive shaft so that it turns freely. See diagram at lower right.

(If you are using a shaft extension, use the bolt that came with the extension, and add the shaft extension and plastic sheathing between the shaft adapter and the drive shaft.)

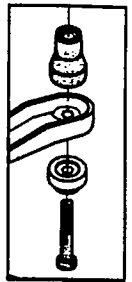
3. Make sure that the telescoping sleeve is positioned with the four lock nuts upwards. Connect the arm shoe/telescoping sleeve with the joint rod of the drive arm (do not tighten the lock nuts).

4. Adjust the drive arm and telescoping sleeve as shown in the illustration (same angle for drive arm and telescoping sleeve). **Note:** you can achieve a finer adjustment with the Hybrid arm by loosening it from the shaft adapter, turning, and retightening.

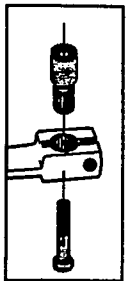
5. Tighten the telescoping sleeve with the four lock nuts.

6. Add tension to the drive shaft spring. See page 33.

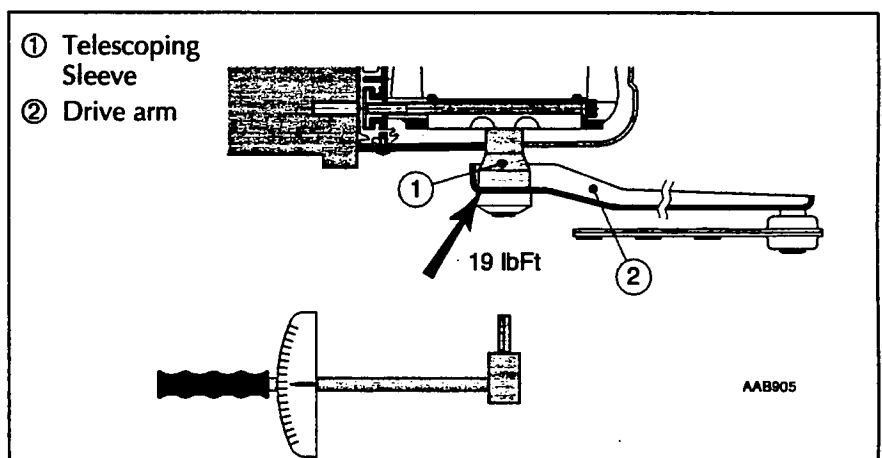
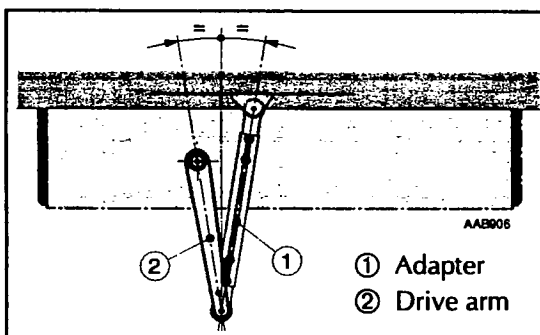
7. Hold the drive belt firmly. Tighten the shaft bolt to hand tightness, ensuring that the teeth of the shaft adapter engage fully with the drive shaft and the drive arm, so they are not damaged when the drive arm is tightened. When the assembly is secure, use the torque wrench to tighten the shaft bolt to a torque of 19 lbFt.



SAS



Hybrid



## Checking the door movement

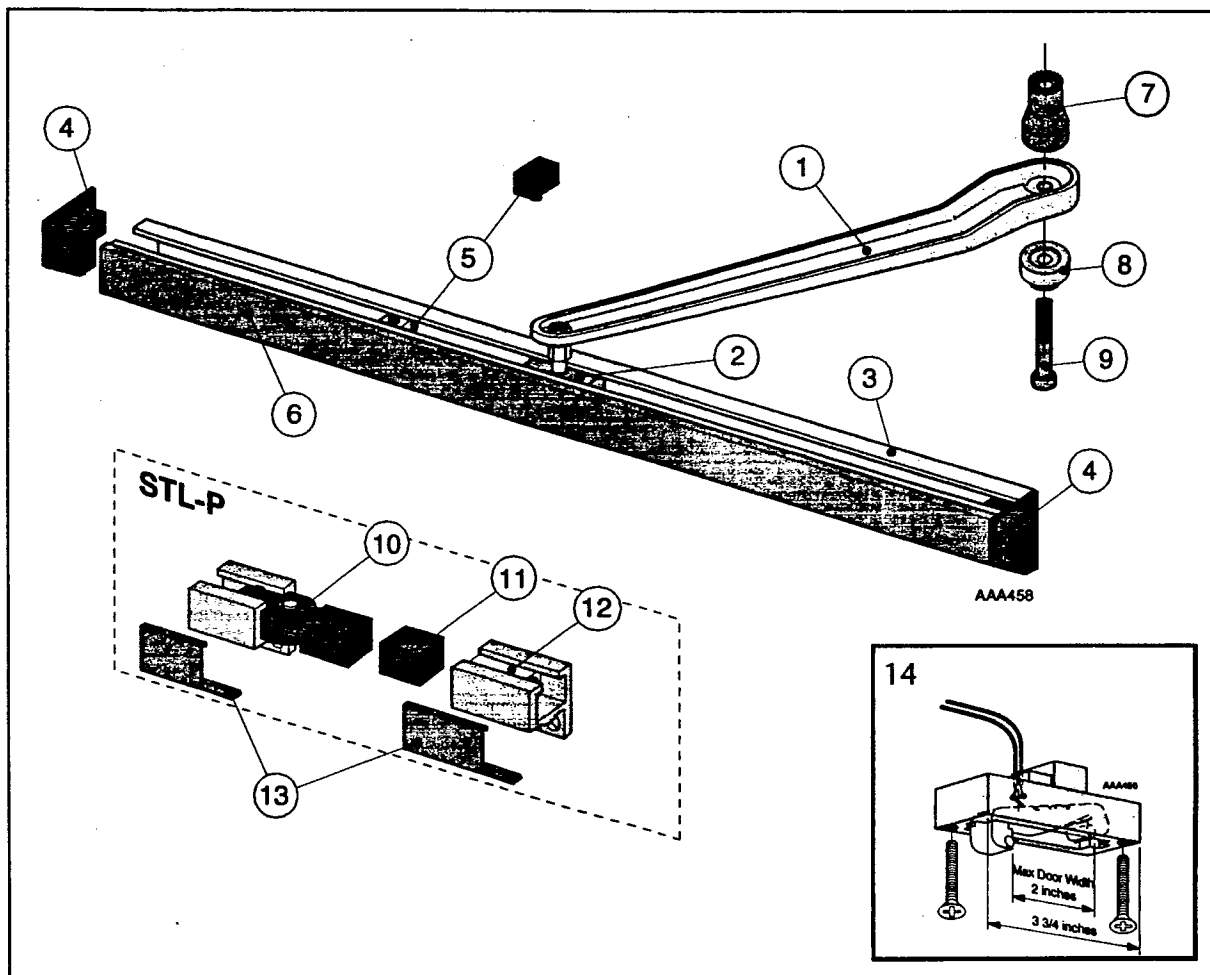
Open the door by hand to its maximum extent, then let it close of its own accord. Check that the opening/closing movements are smooth and free. Continue on page 34 for electrical installation.

# Installation: Pull – Swing Arm

The Slide Track Light arm system (STL) comes with drive arm and guide shoe, door fitting, cover and end plates. The supplementary panic break-out kit (STL-P) must be ordered separately.

## Note!

For the STL arm system to work effectively, the 'reveal,' which is the distance that the door is recessed from the wall where you are mounting the Navig-Aider, must not exceed 5-1/8" (see page 22). If there is a reveal, you must also allow a minimum distance of 1-5/16" between the underside of the door header and the top of the door, to allow clearance for the main arm.



### STL

- |                  |                   |
|------------------|-------------------|
| (1) Main Arm     | (6) Cover         |
| (2) Guide Shoe   | (7) Shaft Adapter |
| (3) Door Fitting | (8) Arm Cap       |
| (4) End Plate    | (9) Bolt          |
| (5) Arm Stop     |                   |

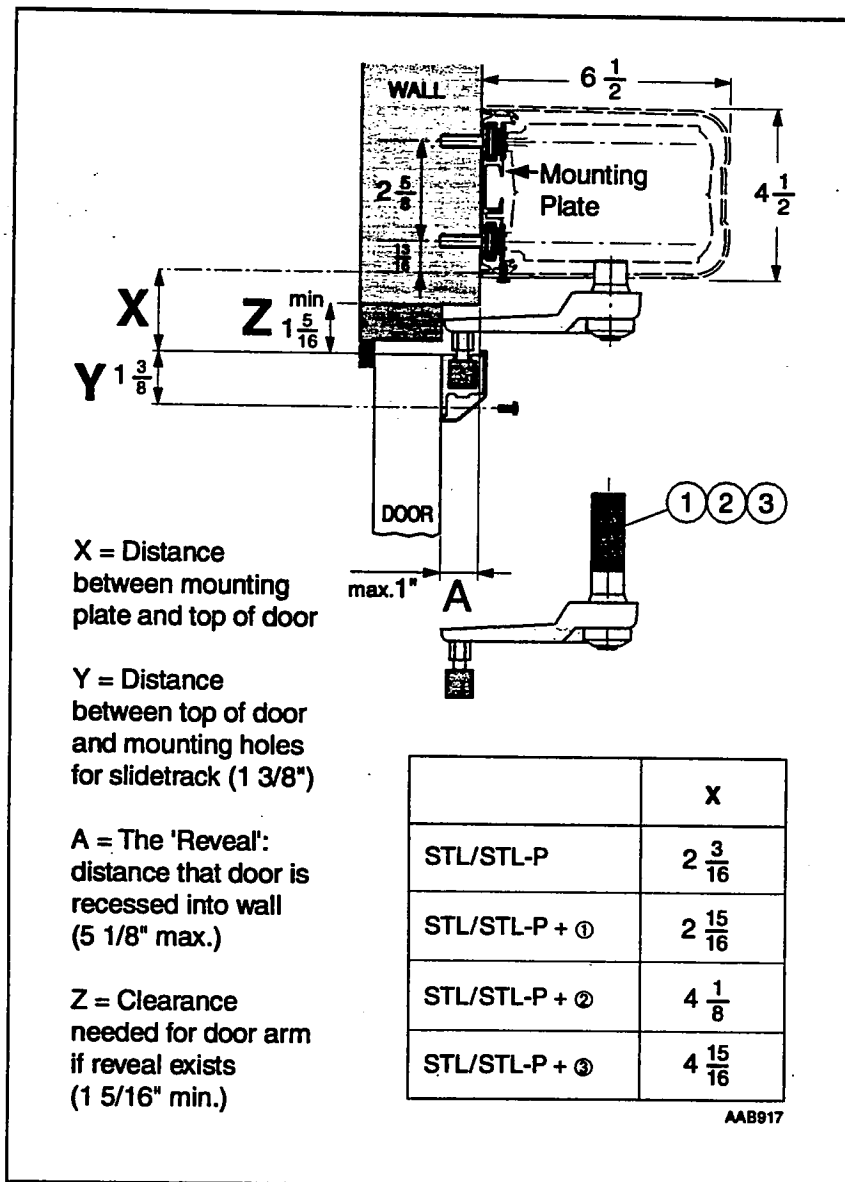
### STL-P

- |                           |
|---------------------------|
| (10) Panic Hinge          |
| (11) Ball Catch Stop      |
| (12) Ball Catch           |
| (13) Covers               |
| (14) Door Stop and Switch |

# Installation: Pull – Swing Arm

## Establish the installation height

Establish the installation height X with respect to the top edge of the door. X is the distance from the top of the door to the underside of the mounting plate. Mark distance X on the wall. X can be 2-3/16, 2-15/16, 4-1/8, or 4-15/16 inches depending on what shaft extension, if any, is used. Match the height to needs of your installation and to the heights of other installed units.



- ① Shaft extension, 3/4"
- ② Shaft extension, 2"
- ③ Shaft extension, 2-3/4"

# Installation: Pull – Swing Arm

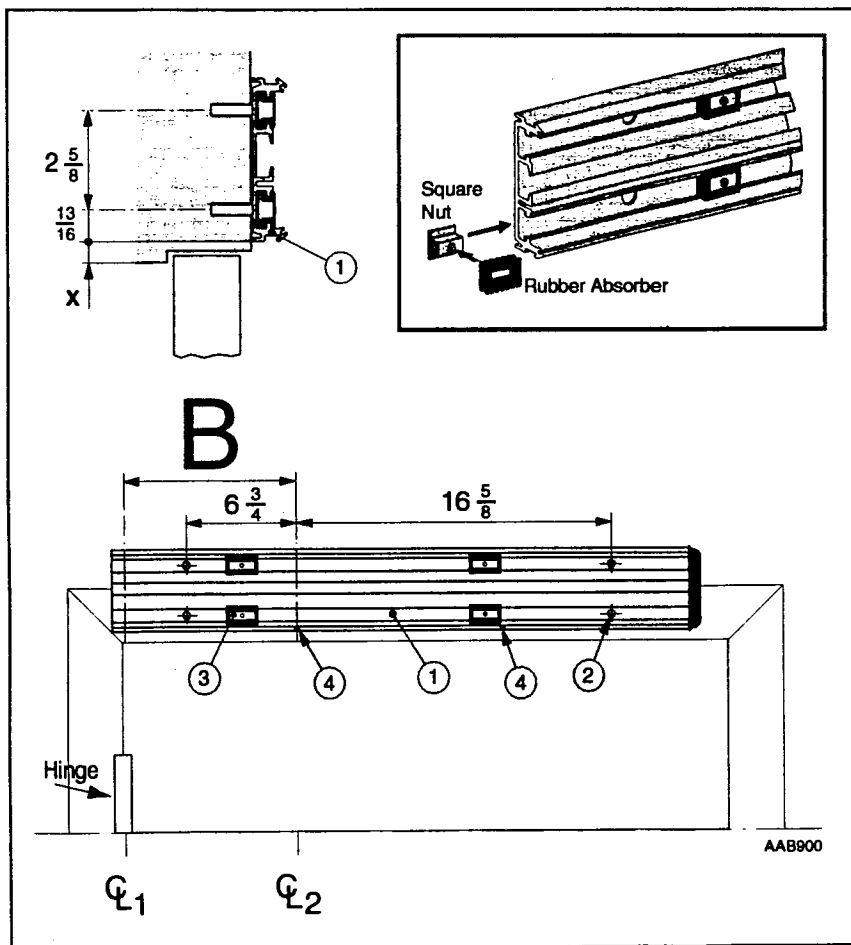
## Installing the mounting plate

1. Remove one of the plastic end plates from the cover assembly with a small screwdriver. Slide the cover from the mounting plate ①. Fit the rubber absorbers to the square nuts ③ and slide them into the top and bottom slots on the mounting plate, as shown below. Make sure that these nuts lie inbetween the mounting holes ②.

2. Mark out distance 'B' on the wall (see page 13) from the center line of the door hinge. Hold the mounting plate so that the side with two screw holes ④ (for attaching the cover) faces down, and place the mounting plate horizontally on the wall with the leftmost screw hole ④ aligned with the 'B' mark, as shown below (rightmost hole if hinges are on the right). The center of the drive shaft will align with this screw hole.

3. Align the bottom of the mounting plate with the installation height 'X' as measured on page 22. Using a level, ensure that the plate is perfectly horizontal.

4. Using the mounting plate as a template, mark the position of the four mounting holes ②. Drill, tap, plug, or reinforce with rivnuts, and screw the mounting plate tight.



- ① Mounting plate
- ② Mounting hole (4)
- ③ Square nut with rubber absorber (4)
- ④ Screw hole for the cover
- Ⓢ1 Center line – door hinge
- Ⓢ2 Center line – Navig-Aider drive shaft

# Installation: Pull – Swing Arm

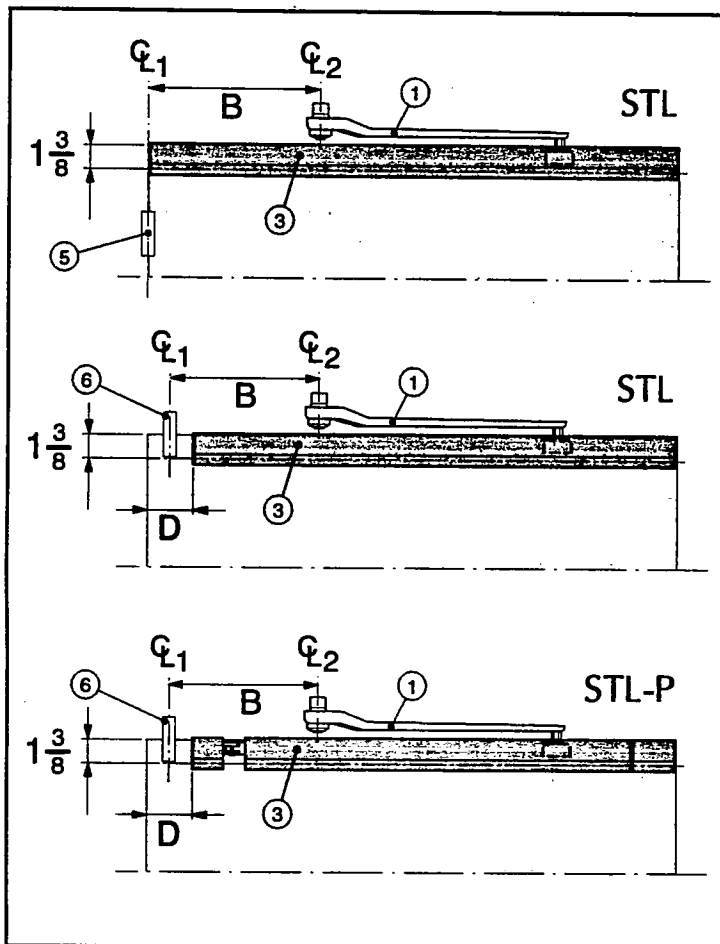
## Mounting the slidetrack, STL

**Note:** If the STL-P is to be used, see page 25.

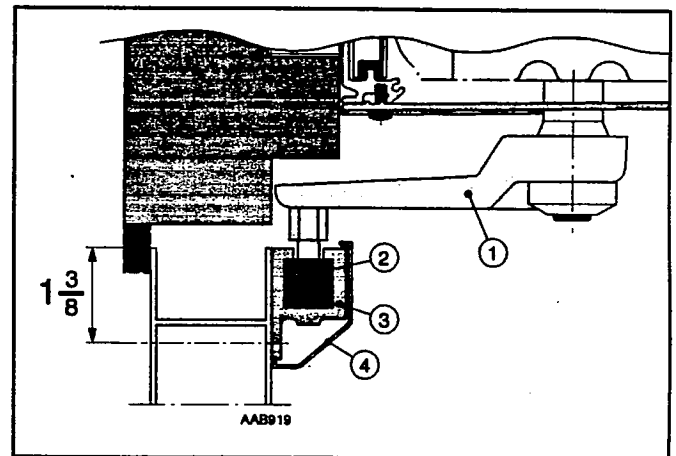
1. Cut the slidetrack ③ and cover ④ to appropriate length. For butt hinges, the length is the same as the door leaf. For center pivot hinged doors, you may need to shorten the slidetrack near the hinge (Distance D) so that the door will open freely. Set Distance D so that the slidetrack will not hit the door frame or the wall when the door is opened to its maximum extent on the side on which you are mounting the slidetrack. Allow 1/16" at each end for the two end plates.

2. Drill at least four 1/4" holes, equally spaced, in the bottom half of the slidetrack. Close the door tightly.

3. Place the slidetrack on the door, with the upper edge flush with the top edge of the door. Use the slidetrack as a template and mark the holes on the door. Drill, tap or reinforce with rivnuts and screw the slidetrack tight.



- ① Main Arm
- ② Guide Shoe
- ③ Slidetrack
- ④ Cover
- ⑤ Butt Hinge
- ⑥ Center Pivot
- C<sub>1</sub> Center Line – Door Hinge
- C<sub>2</sub> Center line – Navig-Aider Drive Shaft





# Installation: Pull – Swing Arm – STL-P

## Mounting the slidetrack, STL-P

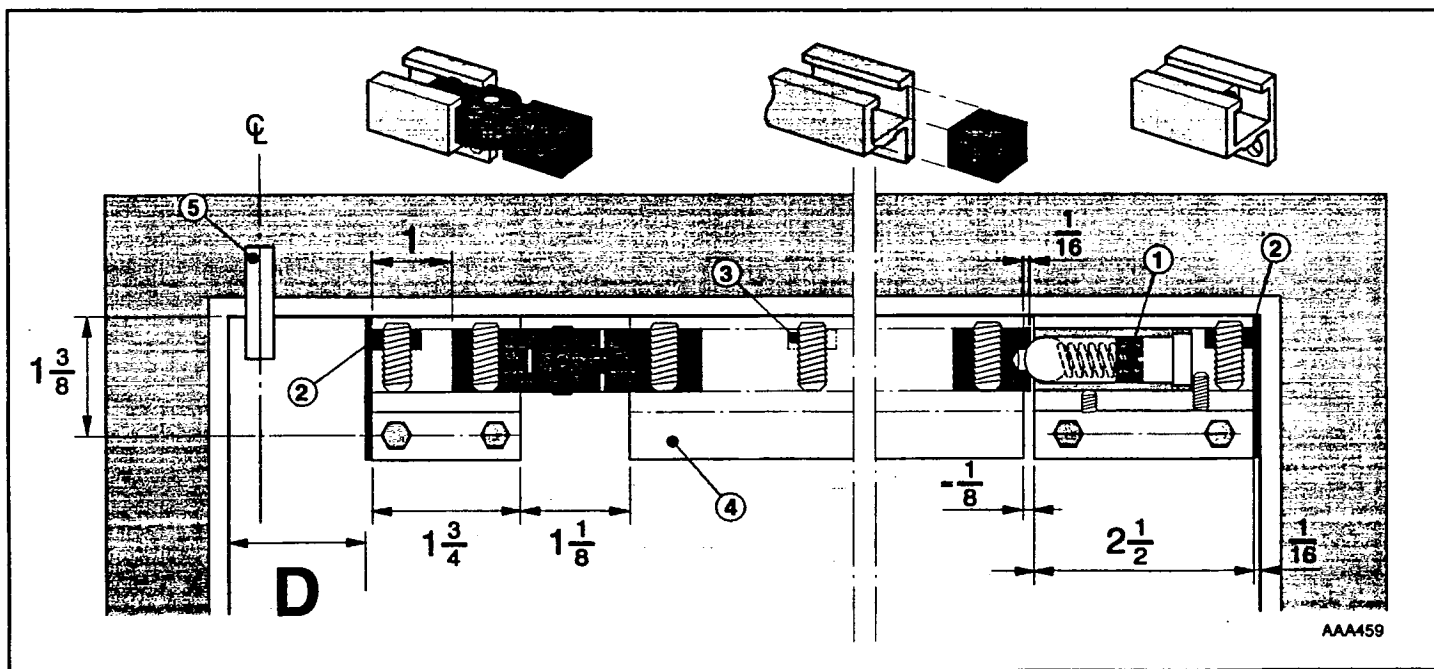
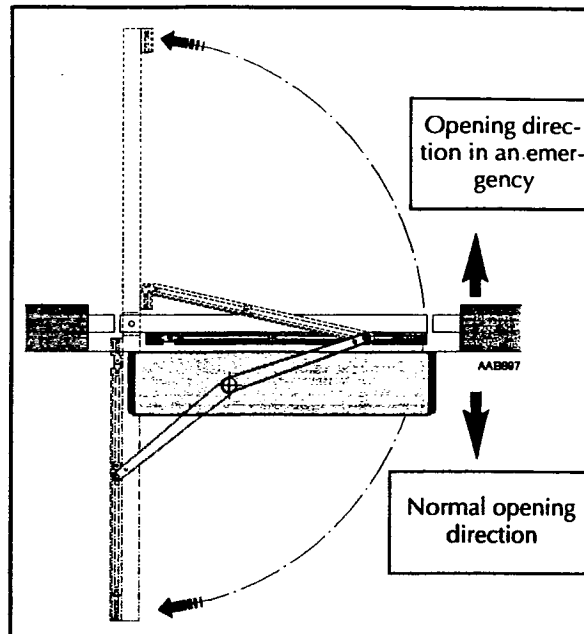
1. Calculate the length of the slidetrack as described on page 24. Use the diagram below to determine what additional length to subtract in order to fit the panic break-out parts. Cut the slidetrack to this modified length.

2. Drill at least four 1/4" holes, equally spaced, in the bottom half of the slidetrack. Close the door tightly.

3. Make sure that the arm stop and guide shoe are inserted in the slidetrack. Attach the panic hinge to the side of the slidetrack that will be closest to the door hinge. Attach the ball catch stop to the other end, leaving 1/16 inch protruding.

3. Starting at the edge of the door, place the ball catch and ball catch fitting on the door, with the upper edge flush with the top edge of the door. Use the fitting as a template and mark the holes on the door. Continue by placing the slidetrack and hinge in the same manner, and marking the holes. Drill, tap or reinforce with rivnuts and screw the fittings and the slidetrack tight.

4. Adjust the break out force of the ball catch by turning the interior adjusting screw (1). Adjust to 50 lbs force maximum, as measured 1" from the latch. Local building codes may require lower forces. **Note:** a breakout requires resetting the door by pressing the main slidetrack back into the ball bearing catch before normal operation may resume.



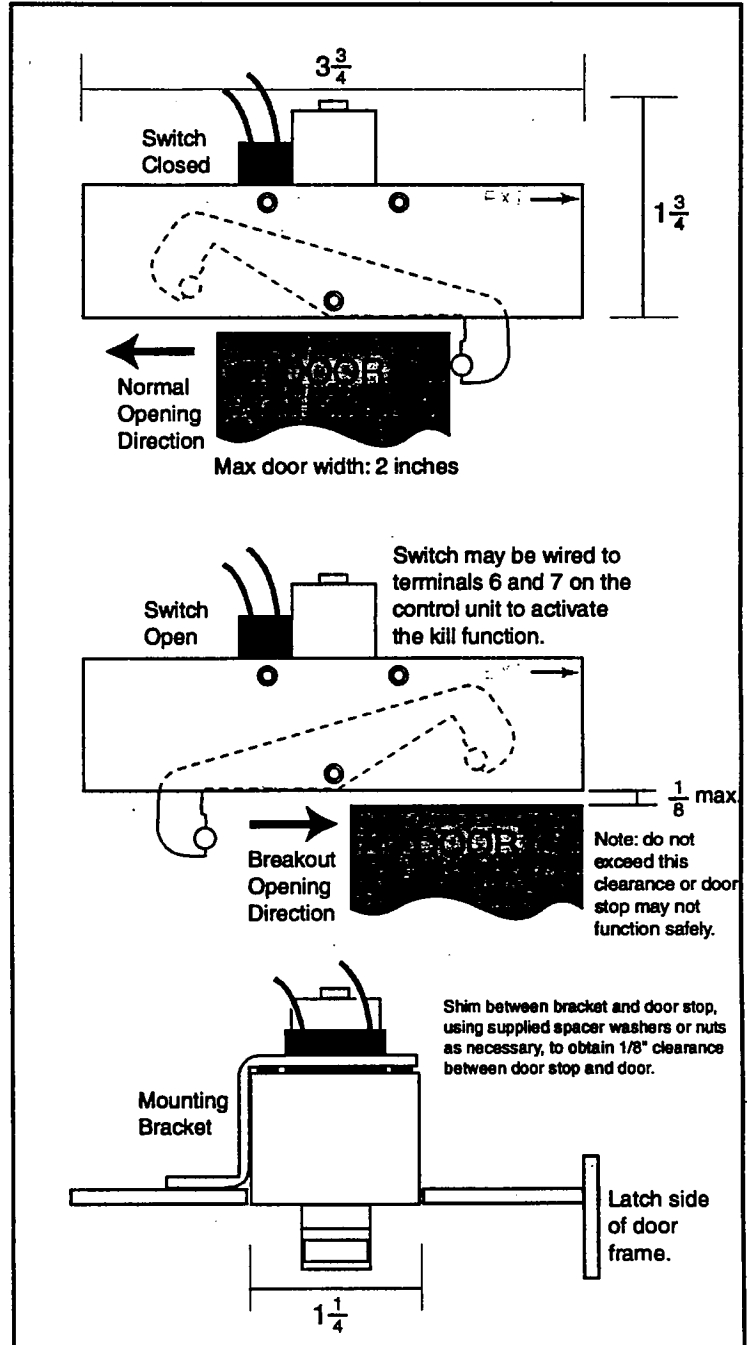
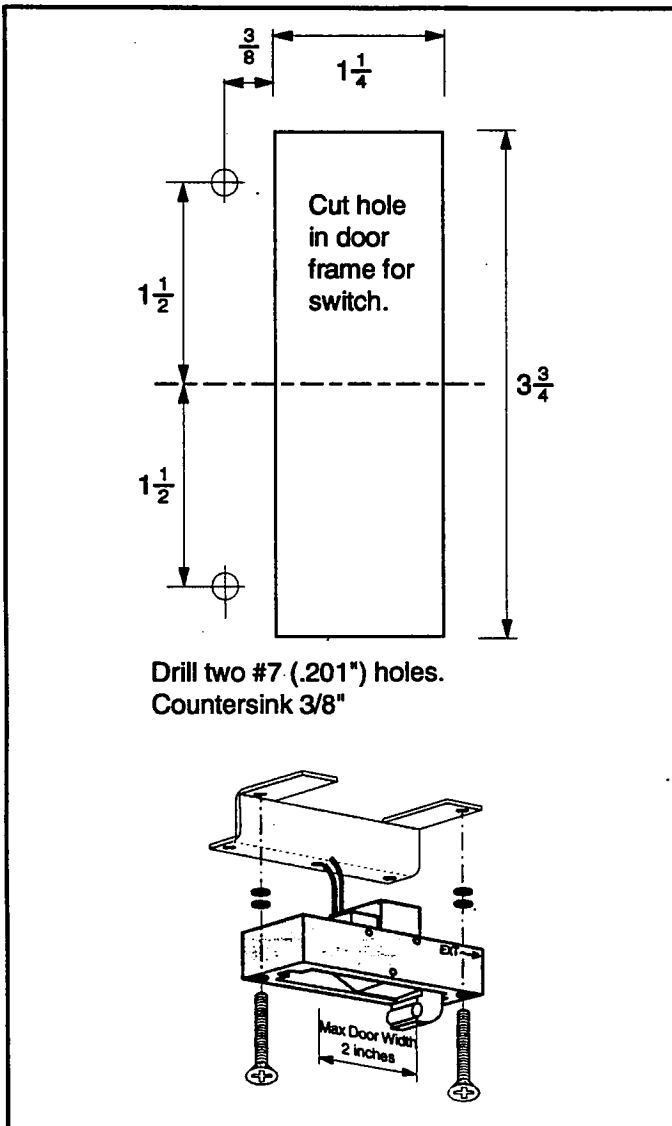
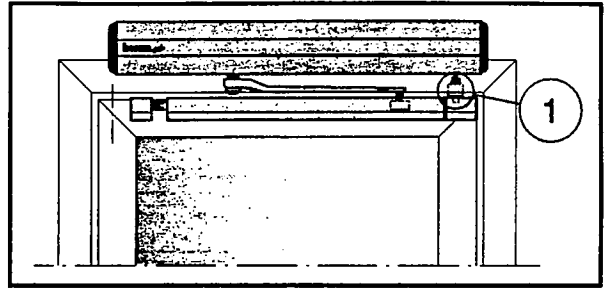
- ① Adjusting screw, break-out force
- ② End cover
- ③ Arm stop
- ④ slidetrack
- ⑤ Pivot hinge
- D Cut to keep slidetrack clear of door frame when door is open.

# Installation: Pull – Swing Arm – STL-P

## Panic stop and switch

The panic stop / switch acts as a door stop under normal use, and as an indicator switch in emergency conditions. It is installed in the top of the door frame, on the latch side of the door (See ① in diagram at right). The switch can be used to indicate a panic-opened door by connecting it to terminals No. 6 and 7 on the control unit. This will activate the kill function when the switch is triggered.

Note: There must be a maximum clearance of 1/8" between the bottom of the door stop and the top of the door. If this distance is exceeded, the door stop may not function correctly, resulting in an unsafe installation.



# Installation: Pull – Swing Arm

## Mounting the drive unit

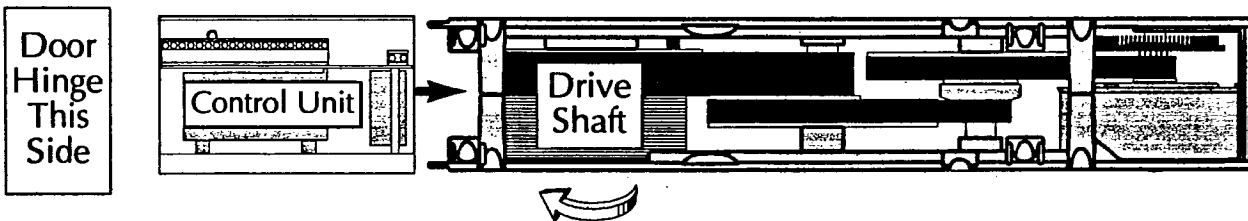
For pull applications, the drive unit should be installed in one of two orientations, depending on which side of the door is hinged (see below). The rotation direction (opening) of the drive shaft is indicated with an arrow in the casting. The drive shaft extends completely through the drive unit, and the arm system may be attached to either end of the drive shaft.

**Note!** Although the drive unit may be mounted upside down, the control unit **must always** be mounted with the electronics board facing up, and will always be placed on the drive unit next to the drive shaft.

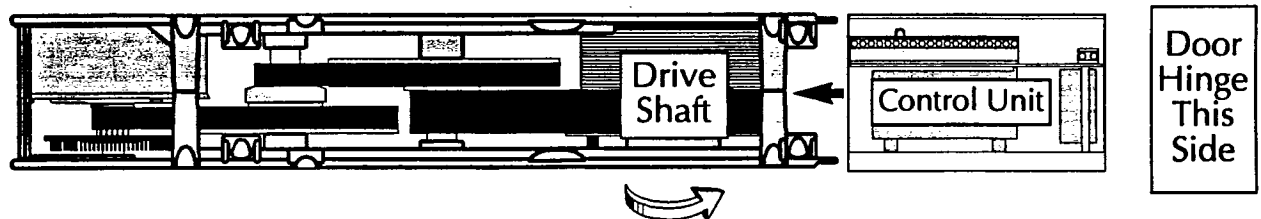
1. Determine in which orientation the drive unit is to be mounted, as shown below. If necessary, remove the control unit and reattach it as shown below. It may be necessary to re-route the motor and revolution counter cables through the wire channels on the top and bottom of the drive unit.

All viewed from operator side.

### Pull (STL), Left-hinged door



### Pull (STL), Right-hinged door



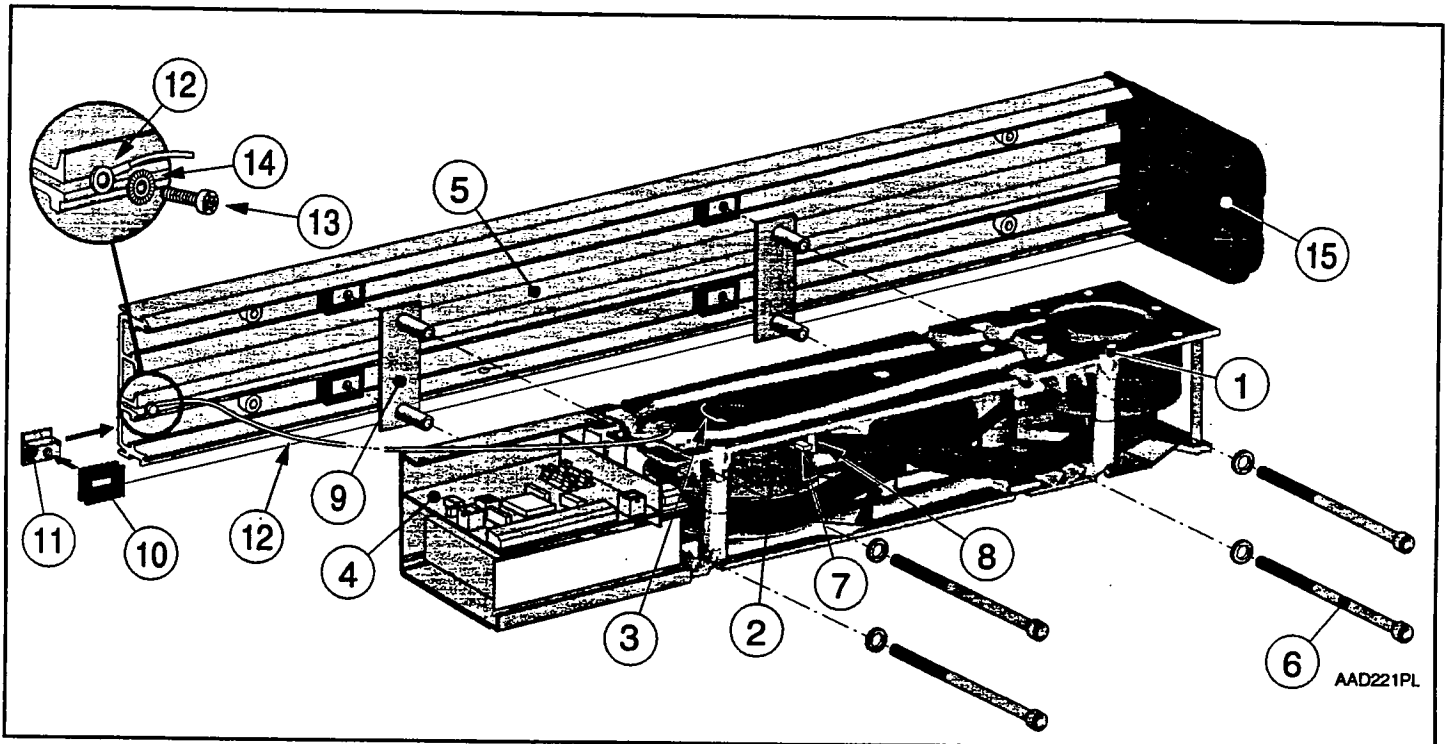
**Note!** Before proceeding further, make sure that this orientation of the operator will not conflict with your planned electrical connections. If you plan to drill through the mounting plate for electrical wiring, this should be done now, as close to the control unit as is feasible.

# Installation: Pull – Swing Arm

## Mounting the drive unit (continued)

2. Position the four square nuts with rubber absorbers as shown in the illustration. Mount the drive unit loosely on the mounting plate, using the two spacers and the four screws and washers. (Tip: temporarily tape the spacers to the drive unit to hold them correctly in place while assembling.)

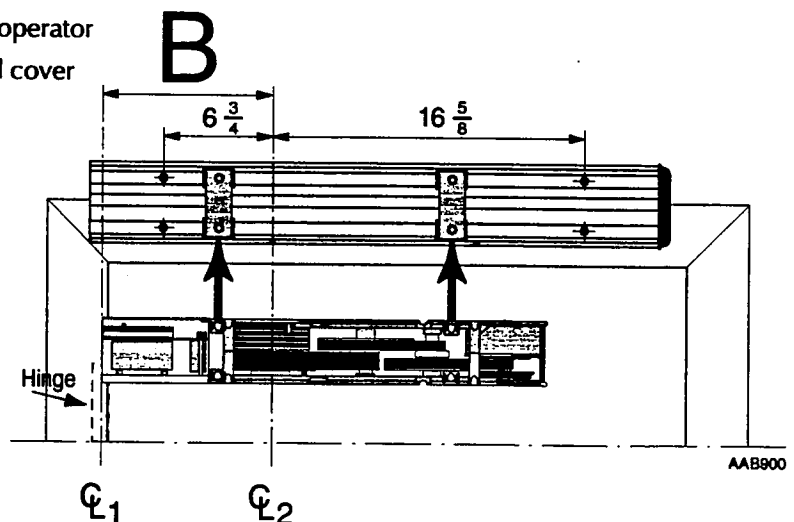
Slide the unit so that the shaft centerline matches the centerline of the cover screw hole, and tighten all four screws. Connect the enclosed ground cable to the mounting plate with ground screw and lock washer, as shown; then attach other end of ground cable to drive unit where indicated.



- (1) Drive unit
- (2) Closing spring
- (3) Opening direction arrow
- (4) Control unit
- (5) Mounting plate
- (6) Allen screws with washers
- (7) Spring-hook
- (8) Spring-hook stop
- (9) Spacer (2 pcs)
- (10) Rubber absorber (4 pcs)
- (11) Square nut (4 pcs)
- (12) Ground cable
- (13) Ground screw (Torx)
- (14) Lock washer
- (15) End plate

- ⊗1 Center line butt/pivot hinge
- ⊗2 Center line of operator drive shaft and cover screw hole

Left hand installation shown. See page 27.

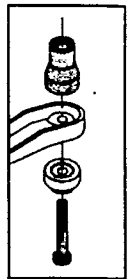


# Installation: Pull – Swing Arm

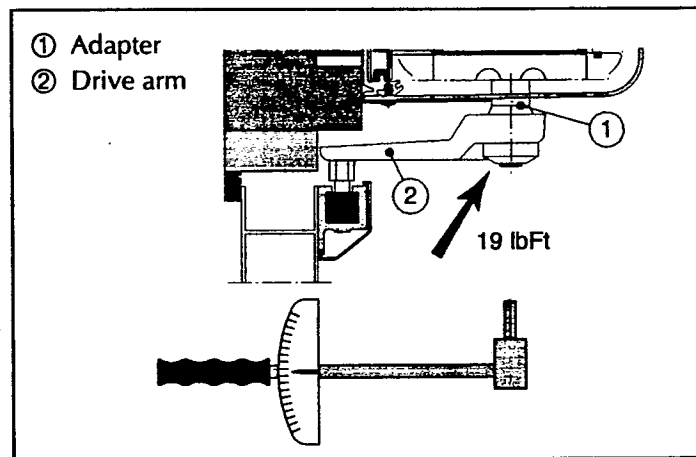
## Mounting the drive arm

Note: The shaft adapter can be damaged if not tightened carefully. Make sure that the teeth of the shaft adapter are engaged correctly with the teeth of the drive shaft before tightening.

1. Close the door and keep it closed.
2. With the drive arm's guide shoe in the slidetrack, mount the drive arm loosely on the drive shaft, using the arm cap, shaft adapter, and bolt. See diagram at right.
3. Add tension to the drive shaft spring – see page 33.
4. Hold the drive belt firmly. Tighten the shaft bolt to hand tightness, ensuring that the teeth of the shaft adapter engage fully with the drive shaft and the drive arm, so they are not damaged when the drive arm is tightened. When the assembly is secure, use the torque wrench to tighten the shaft bolt to a torque of 19 lbFt.
5. Open the door to the required opening angle (max. 100 ).
6. Slide the arm stop against the guide shoe and then back 1 inch. The guide shoe must not hit the arm stop during normal operation. Fasten the arm stop.



STL



## Checking the door movement

1. Pull the door to its fully open position. Check that it can open to the required angle and that the guide shoe runs easily in the slidetrack. Check that the complete arm system operates without problems.
2. If the STL-P panic kit is installed, the break-out force must be adjusted to a suitable value by adjusting the ball-catch adjusting screw (see page 25). Test the door by opening it in the breakout direction.

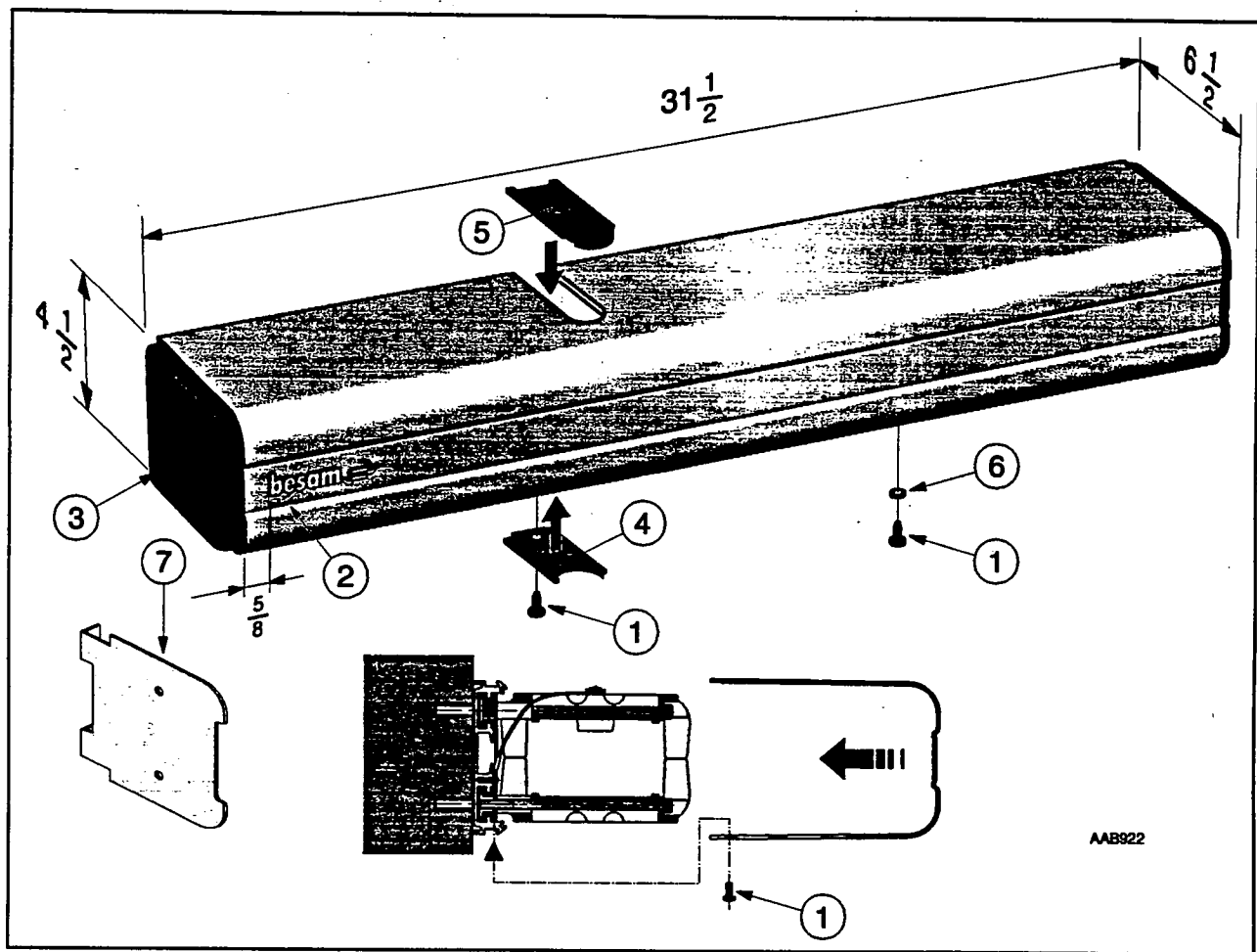
Continue on page 34 for electrical installation.

# Cover

## Installing and removing the cover

The cover is snapped over flanges in the mounting plate and fixed to the underside of the mounting plate with two screws. **Note:** To prevent cover from dislodging and causing possible injury, the two cover screws must always be securely installed!

The cable bracket is required if wires will be run through the plastic end caps; if all wiring is run through a hole drilled in the back plate, the cable bracket is not needed. The bracket is inserted into the two mounting grooves on the mounting plate and tightened with two screws.



- ① Fastening screws (2 pcs)
- ② Besam logo placement
- ③ Cable inlet (The cable bracket is predrilled with two .196" dia. holes. Using the bracket as a template, drill plastic end plates to size and add Romex,

BX or conduit. Optionally, run through back plate for open location. The second hole can be used for push plate wiring.)

- ④ Lid for cut-out at the arm system – use supplied screw to fasten.

- ⑤ Lid for cut-out on the upper side of the cover (fasten with tape or silicone sealant.
- ⑥ Lock washer for grounding purposes
- ⑦ Cable Bracket

# Installing Double Doors

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## Installation on double doors (dual egress)

If the operators are to be mounted at the same height, the height is determined by the arm systems used, in the following order:

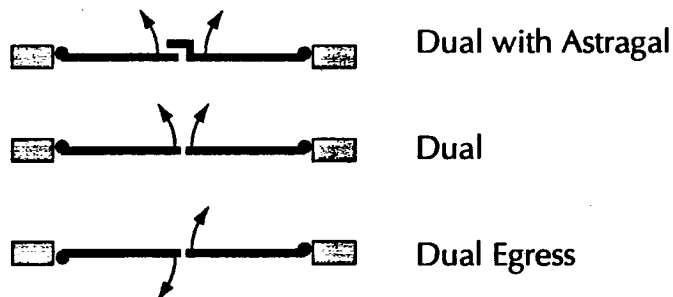
1. Slide-Track Light arm system, STL (pulling)
2. Standard arm system, SAS (pushing) \*

### \* Important Note!

When installing a pulling arm system, STL, together with a pushing arm system, SAS, the pushing system must always have a 2" or 2-3/4" shaft extension in order to have matching installation heights. Due to the leverage differences and manual open force requirements, the STL system will always have a different offset from the pivot than that of the SAS system.

For all other dual door applications with like arm systems, follow the instructions for the applicable arm system.

For dual doors with an astragal, refer to page 32 for specific programming instructions to ensure proper opening and closing order for the pair.



# Synchronizing Double Doors With Astragal

---

In this type of installation, both doors swing in the same direction and one door has an overlapping astragal, requiring one door to close before the other if both doors are to close properly.

## Synchronizing

The control unit/operator for the "active" door leaf (the door with the astragal) is called "master"; the "passive" door leaf is the "slave". The opening of the "passive" door leaf is delayed 0.2 seconds to guarantee for a correct opening order without jamming. The master and slave control units must be wired to each other between the terminals 8, 10, 11, and 12 (see page 35 for CUP; page 42 for the CU-120-OPB.) Note that both control units must be the same kind.

**Program selector, opening impulses and presence impulses, electro-mechanical locking devices.**

These devices are to be connected to the "master" only.

## "Push and go"

"Push and go" guarantees for a correct closing order. If one of the door leaves is stopped during the closing movement, both door leaves will revert to the open position and close after the hold open time set.

## Hold open time

The hold open time and the key hold open time are controlled by the "master" and must be set to "00" on the "slave".

## Opening speeds, closing speeds and balance force

These functions are to be adjusted separately for both control units. To make sure that the "passive" door leaf will close first, the closing speed for this leaf must be set faster than for the "active" door leaf (with astragal).

## Power supply

The power supply for activation units, 18 V DC on terminals 19/20, can be used from both control units.

## Kill signals

The kill signals are to be connected in series to both control units.



# Adjustment Of The Spring Tension

The Navig-Aider uses a pre-tensioned closing spring to assist the motor. This spring can be adjusted to increase the closing force applied to the door. This can be useful for an exterior door installation in an area with high winds, for instance.

Pre-tensioning is measured in degrees of rotation of the spring. The spring is factory pre-tensioned to 165° to protect the drive unit while in transit. A minimum of 15° additional tension must be added.

Make sure the drive arm is loose or disconnected from the drive shaft. Make a reference mark in pencil on the casing next to the drive shaft. Tension is added by pulling the belt wheel next to the motor so that the drive shaft moves in the direction of the arrow on the casing. Each tooth on the drive shaft = 15°. For example, to adjust the spring to a pre-tension of 210° (210 - 165 = 45 = 3 x 15), turn the wheel so that three teeth move past your reference mark. Adjust the amount of spring tension to conditions at the installation site. Use the table below as a guide.

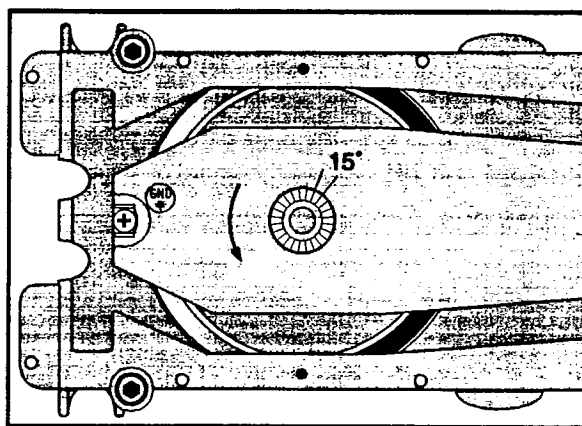
When you have added the desired tension, hold the drive belt firmly by hand or clamp with a vice grip, connect or tighten the drive arm in accordance with the instructions for the applicable arm system, then release the drive belt.

Add 15° pre-tension – 1 tooth = (180°). Lightest spring closing force. The door will be easier to open by hand.

Add 45° pre-tension – 3 teeth = (210°). Medium spring closing force. For normal usage

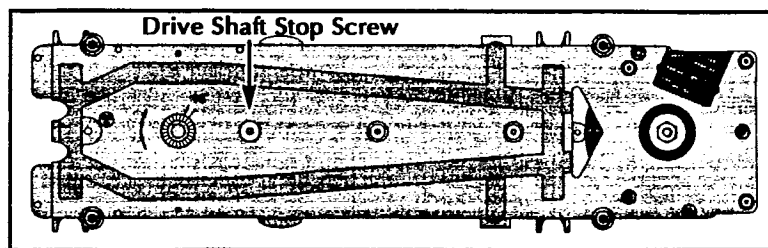
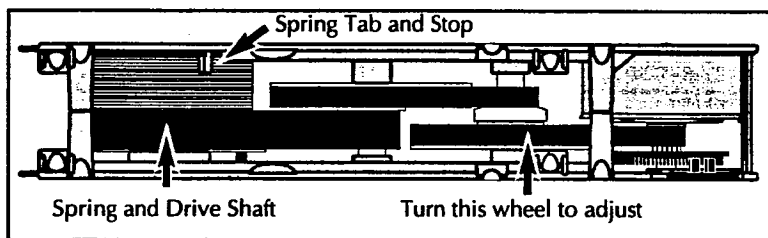
Add 150° pre-tension – 10 teeth = (315°). Maximum spring closing force. Use in high-wind situations

**Do not exceed this amount of tension! The Navig-Aider will no longer meet safety requirements and may be damaged!**



## Restoring lost tension

If the drive shaft stop screw has been removed or damaged, it is possible for the spring to lose the pre-set tension. If this occurs, turn the drive shaft as specified above, but in a direction opposite to the arrow on the casing, until the spring has lost all tension and the spring tab barely rests against the spring tab stop. Then add tension as described above, turning past 12 teeth (= 180°) to restore the minimum tension, then adding any remaining desired tension.



# Electrical Connections

## Note!

During any work with the electrical connections:

- The main input power (120 VAC) must be disconnected.
- The optional backup battery EUS (if used) must be disconnected.

To set up the CUP using the PMD programmable unit, see page 35.

To set up the CU-OPB-120, see page 42.

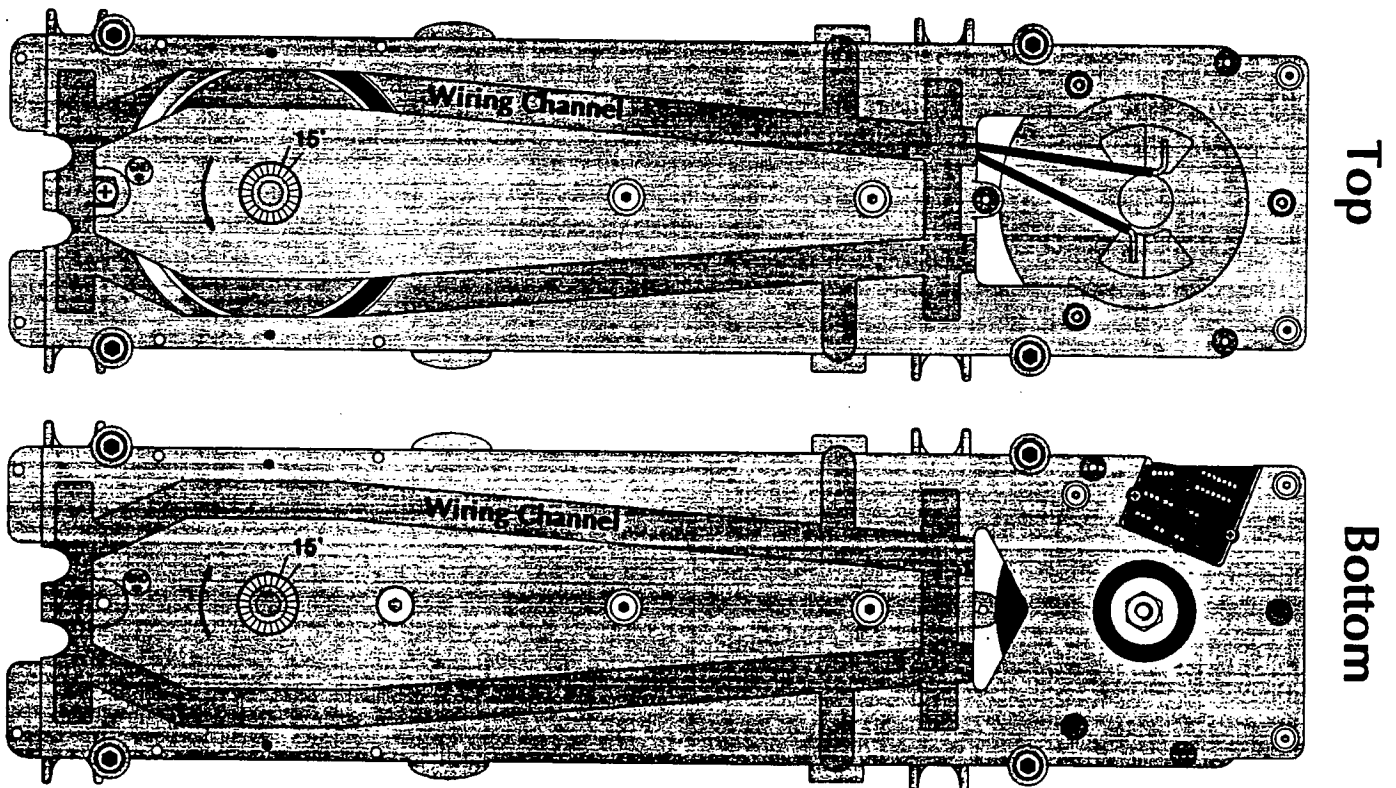
To set up external pushplates, switches and options, see pages 45-47.

**Note!** The push plates (if used) are not to be connected until the adjustment of speeds etc. has been carried out.

## Arranging wire inside the header

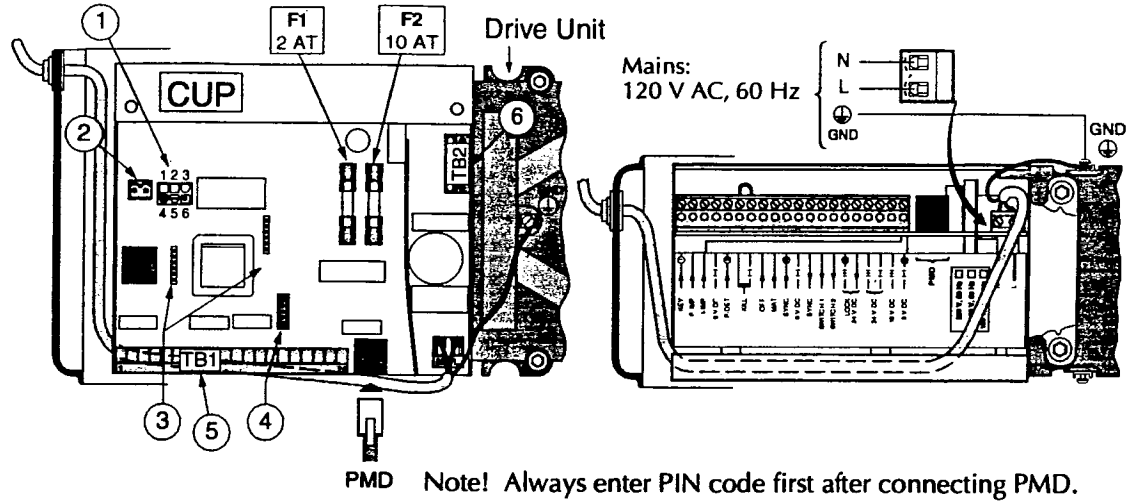
Extra wiring inside the header that travels the length of the header (such as for the backup battery or the remote switch receiver) should be run through one of the unused wiring channels on the top or bottom of the Navig-Aider drive unit. Cover the channel afterward with tape to keep the wires in place.

Alternately, long wires may be run through the center channel of the mounting plate, with tape used to seal the channel. It is important in any case to keep the wiring bundled neatly and well away from the exposed moving parts of the drive unit.



# Wiring The CUP Control Unit

- ① J7 Jumper. Do not remove. \*
- ② Connector for motor cable
- ③ Connectors for EXS extension unit
- ④ Connector for revolution counter cable
- ⑤ TB1 – Terminal block for external wiring
- ⑥ TB2 – Terminal block for backup battery, EUS

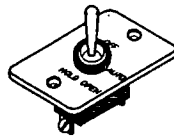


\* Note: Jumper J7 does not come with replacement CUPs. Retain this jumper if ordering a replacement, as it is necessary for correct operation of the Navig-Aider.

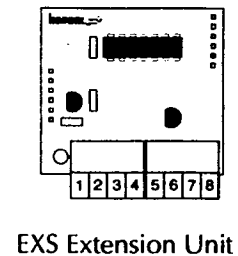
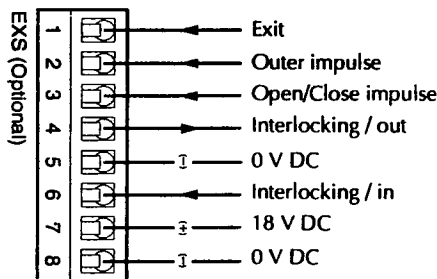
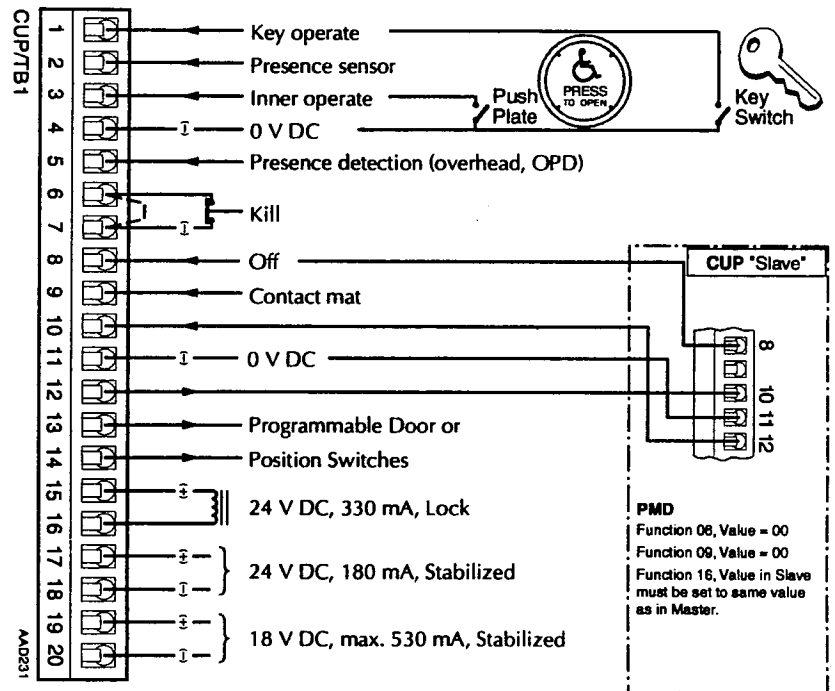
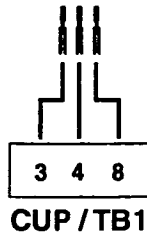
## Setting up the CUP:

1. Install the extension unit EXS (if ordered) onto the control unit. See page 47.
2. Connect the motor plug, revolution counter plug, and the protective ground (see page 19).
3. Connect the 120 VAC power cables and, if ordered, the backup battery EUS (see page 46).

**Three Position Switch:**  
 Short 3 & 4 to hold open  
 Short 4 & 8 to hold closed  
 The "Off, Auto, Hold Open" kit label is used.



**Note!**  
 If switched to Off position and Push and Go is selected, the door will still operate when pushed. See Wiring Options (page 45) on how to defeat Push and Go in the Off position.



# Adjusting The CUP Control Unit

## Important Notice!

The Navig-Aider, when installed and set up correctly, is a safe low-energy power door operator, but incorrect settings can defeat its purpose and create a safety hazard. For safety reasons, never set the opening or closing speed faster than necessary to handle the traffic situation through your door. Please refer to the ANSI/BHMA A156.19 - 1997 excerpt in this manual (page 53). A correctly adjusted door is a safe door!

The start-up and adjustment must be carried out in the following order:

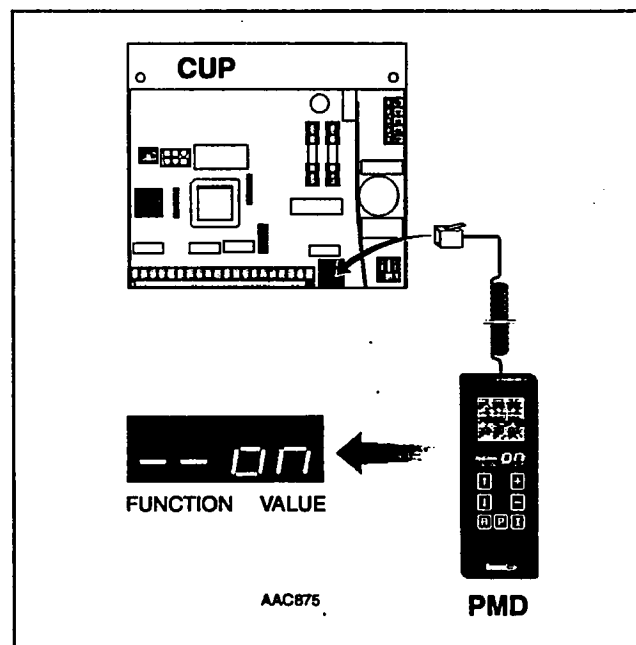
1. Connect the main input power (120 VAC).
2. Connect the PMD to the control unit (see diagram) and enter your PIN code (see page 37).

**Note! The PMD is not ready for use until a status or error code is displayed.**

3. Select function 15, value 01 and wait for "on".
4. Set the recommended values for the functions stated in the column \*\*) on page 41.
5. Press button No. 4 on the PMD (Auto).
6. Press the impulse button I. The operator carries out an open/ close cycle.
7. Select function 10 and enter a value for the desired door open angle. See page 41.
8. If necessary, adjust the door functions to a satisfactory performance.

**Note! The door must stand still at closed position when adjustments are carried out. The "balance force" should always be adjusted to the lowest possible value that will still hold the door open against the power of the spring. A value of 24 is a good setting.**

9. Check that the installation complies with valid regulations and requirements of ANSI/BHMA A156.16-1997 (reference given on page 53 of this manual.)
10. Unplug the PMD from the CUP control unit.



# Introduction To The PMD

---

The programming module PMD is used to program the CUP control unit.

The PMD has a limited service life. A countdown is made at every connection and the remaining "value" is shown on the display. When the figures "-- 71" are shown, the PMD is unusable and must be updated.

## PMD models:

PMDA	Service life: 6000 connections.
PMDB	Service life: 2000 connections.
PMDC	Service life: 400 connections.
PMDE	Customer version with restricted use. Service life: 400 connections.

## PIN-code

All new or updated PMDs are factory pre-programmed with the PIN-code "1234".

1. Connect the PMD to the control unit.
2. "Pin\_" with a flashing dash will be shown on the display.
3. Enter the code "1234". Every entered digit will be indicated with a dash "\_" on the display.

**Note!** After five unsuccessful attempts to enter the correct PIN-code the error code "71" will be displayed. This means that the PMD is unusable and must be returned to be updated.

4. Push the button "P".
5. The display will consecutively show:
  - a) Type of control unit e.g. CUD or CUP.
  - b) Remaining service life.
  - c) "00".
  - d) Actual status or error code e.g. "on".

**Note:** If status code 10 is displayed for swing doors, check that the correct operator type has been selected under function 15.

## Change of PIN-code

The factory pre-programmed PIN-code can be changed to a personal code as follows:

1. Carry out the instructions 1-5 under "PIN-code" above.
2. Select function "30", value "b".
3. Push the button "P".
4. The display will show four flashing dashes "\_ \_ \_ \_".
5. Enter your **personal code** (four digits). Every entered digit will be shown on the display.

**Note!** If a wrong digit is entered, disconnect and reconnect the PMD contact and start from the beginning with the factory pre-programmed PIN-code.

6. Push the button "P".
7. "Pin\_" with a flashing dash will be shown on the display.
8. Re-enter your **personal code** and push "P" once more to confirm that the correct code was entered.

**Note!** It is not possible to revert to old codes if you have forgotten the new one. If a mistake was made during the programming the PMD will revert to step 4 (" \_ \_ \_ \_").

# PMD – Push Button Set

## Function buttons

These buttons are used to set or check\* the functions (01-99) for speed, hold open time, monitoring, and so on. The up and down arrow buttons increase and decrease the number by one digit. If the button is held down for more than 1 second, the function number will be increased/decreased every 0.1 second. When the final function (99) has been reached, the digits will roll over to function 01 and start again.

\* **Note!** When selecting any of these functions, the last value programmed into the Navig-Aider control unit will be displayed, except for function 99, where value 01 will always be displayed.

## Value buttons

These buttons are used to set the value for the selected function. The plus and minus buttons increase and decrease the value by one digit. If the button is held down for more than 1 second, the value will be increased/decreased every 0.1 second. When the end value has been reached the digits will roll over and start again.

## Program button

This button is used to program the control unit with the function and value selected on the PMD. To indicate that data have been transferred into the control unit, the display will be blank (fractions of a second) and then show the selected digits.

## Impulse button

This button is used to give an opening impulse to the operator. If the button is held down, an impulse is given every 0.2 seconds.

## Reset button

This button is used to reset the control unit. Hold the button down for about 2 seconds to reset.

## Function display

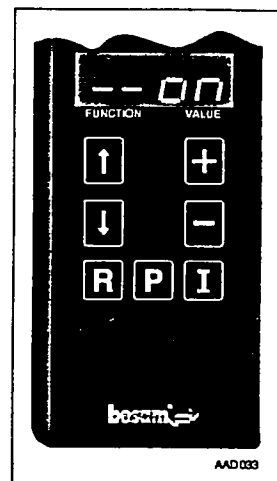
When a FUNCTION button is depressed, the latest function used will be presented on the function display. If no function has been selected previously, the function "01" will be shown. If the FUNCTION and VALUE buttons are not activated for 5 s, the display will show "--".

## Value display

The VALUE display shows the value for the selected function. If the FUNCTION and VALUE buttons are not activated for 5 seconds, the VALUE display will show the present status or error code for the operator.

## Back

The function description on the back of the PMD is reversible. The green side is to be used when adjusting sliding doors and the blue side when adjusting swing doors.












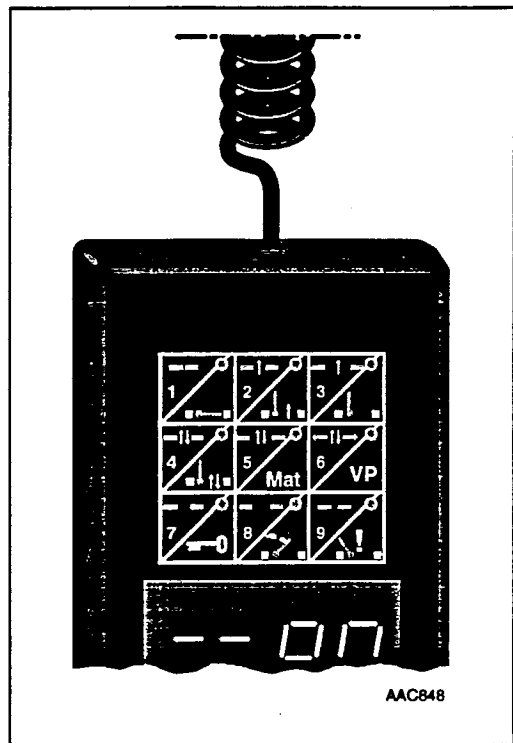
# PMD – Program Selection

## Program selector (blue push-button set to be used)

Buttons 1-4 control necessary functions of the operator. With the PMD connected to the control unit, these settings override the settings of the program selector, (if installed). The functions of the program selector will resume approximately 30 seconds after the PMD is removed.

## Settings

- |    |   |   |  |
|----|---|---|--|
| 1. |    | "Off"   | The door is closed.  |
| 2. |    | "Exit"  | Exit only. (One Way Traffic)   |
| 3. |    | "Open"  | The door is permanently open.  |
| 4. |    | "Auto"  | The door opens with inner and outer activation units.  |
| 5. |    | Mat   | Mat safety impulse.  |
| 6. |    | VP (IFD)  | Presence detection.  |
| 7. |    | "Key impulse"                                       | Key opening impulse.   |
| 8. |   | "Low speed opening" or "Learn" if VP-S is connected | Push the button for 3 s. The door opens with pre-set low speed. Used to automatically adjust the sensitivity of the VP-S.                      |
| 9. |  | "Door opening angle >99°"                           | Push the button for 3 s, then open the door to the required angle and close it by hand. The new angle is now programmed into the control unit. |



## Pre-programmed run programs (Function 98)

Pre-programmed basic values for six different run programs (operating performance) can be selected with the function 98 and any of the values from 01 to 06. The value 98/03 is factory pre-programmed and selected to give a satisfactory function for most doors.

When selecting the values in the order from 01 to 06, the performance of the operator is gradually increased and can be adapted to the valid operating conditions. If the performance has to be increased depending on door size and/or door weight, never use a higher value than necessary. To comply with authority requirements, the value selected must give the operator a smooth and safe closing.

## Programming the run programs into the control unit

1. Plug the PMD into the control unit on the operator.
2. Select function 98 and any of the values from 01 to 06.
3. Press the program button P within 5 seconds. The selected run program will now be transferred from the PMD to the control unit.

**Note!** The only values transferred will be values that affect the operator performance.

# PMD – Push Button Set

---

## Copying and transferring of programmed values (Function 98)

This function is used to facilitate the adjustment by copying and transferring the values from one smoothly running operator to another one with similar operating conditions. The values can be copied and transferred in two levels.

- Copying and transferring of user values only – Functions 01–27.
- Copying and transferring of all values.

## Copying and transferring of user values only:

- Control Unit → PMD**
1. Plug the PMD into the control unit on the operator having the values to be copied.
  2. Select function 98 and value 99.
  3. Press the program button P within 5 seconds. The user values only will now be transferred from the control unit to the PMD.

- PMD → Control Unit**
1. Plug the PMD into the control unit on the operator receiving the copied values.
  2. Select function 98 and value 98
  3. Press the program button P within 5 seconds. The user values will now be transferred from the PMD to the control unit on the new operator.

## Copying and transferring of all values:

- Control Unit → PMD**
1. Plug the PMD into the control unit on the operator having the values to be copied.
  2. Select function 98 and value 97.
  3. Press the program button P within 5 seconds. All programmed values will now be transferred from the control unit to the PMD.

- PMD → Control Unit**
1. Plug the PMD into the control unit on the operator receiving the copied values.
  2. Select function 98 and value 96.
  3. Press the program button P within 5 seconds. All values will now be transferred from the PMD to the control unit on the new operator.



# PMD – Functions And Values

Function	Description	Value	*)	**)
01	High speed opening	15-90 °/s	65	65
02	Low speed opening	05-15 °/s	10	10
03	Low speed distance opening	05-40 °	20	10
04	High speed closing	15-60 °/s	30	25
05	Low speed closing	05-15 °/s	10	10
06	Low speed distance closing	05-30 °	20	10
07	Lock kick, additional	00-40 °/s	00	05
08	Hold open time	00-60 s	05	04 min.
09	Key open time	00-60 s	05	04 min.
10	Door opening angle <sup>1</sup>	30-99 °	70	70
11	Switch 1, angle <sup>2</sup>	00-99°	10	Not Used.
12	Switch 2, angle <sup>2</sup>	00-99°	60	Not Used.
13	VP-S swing side <sup>3</sup>	A/b no/yes	A	A
14	VP-S approach side <sup>3</sup>	A/b no/yes	A	A
15	Type of operator <sup>4</sup>	00-99	00	01
16	Push and go, PAG <sup>5</sup>	00-60 s	02	04
17	Presence impulse monitoring <sup>6</sup>	00-20	00	00
18	Mat safety monitoring <sup>6</sup>	00-20	00	00
19	Presence detection type, break/make impulse <sup>7</sup>	A/b break/make	b	b
20	Overhead presence detection	A/b no/yes	A	A
21	Not used	00-99	00	00
22	Balance force, open door	00-40	24	10
23	Hold force, closed door <sup>8</sup>	00-40	00	00
24	Locking without/with power <sup>9</sup>	A/b w/o / w.	A	A
25	Opening delay for unlocking <sup>10</sup>	00-50 x 0,1 s	00	02
26	Spring closing only <sup>15</sup>	A/b no/yes	A	A
27	Door opening direction <sup>15</sup>	A/b	A	A
28	Number of operator cycles performed x 10000	00-99	00	Not Used.
29	Number of operator cycles performed x 100	00-99	00	Not Used.
30	Change of PIN-code <sup>11</sup>	A/b no/yes	A	A
96	VP-S swing side, status <sup>3</sup>	-9→.9	.F	Not Used.
97	VP-S approach side, status <sup>3</sup>	-9→.9	.F	Not Used.
98	Run program <sup>12</sup>	01-06	03	03
	Copying and transferring of values between operators <sup>13</sup>	96-99		–
99	System tests <sup>14</sup>	01-05		–

\*) Factory pre-programmed values in the spare part control unit. (Swingmaster)

\*\*) Recommended values for Navig-Aider (without accessories)

1) To set angle >99°, see item 9, page 39.

2) Used for switching of the VP (IFD) detection fields.

3) Used if VP-S is installed on swing/approach side.

4) OPB-A= 01

5) Value 00 = No PAG. 01-60 s = Hold open time.

6) Value 00 = No monitoring, 01-20 = Monitoring. The control unit will monitor the VP (IFD) and/or the mat. After set value of actuations (01-20) without VP (IFD)-mat impulse from pedestrians, the door will stay open.

7) Used for switching between break or make impulse for terminal No. 5 on the CUP.

8) Selects an additional hold force for a closed door.

9) After changing always press the reset button R.

10) If the operator is impulsed, it will send a lock release signal

11) See page 37.

12) Pre-programmed basic values for 6 different run programs can be selected (see page 39).

13) See page 40.

14) 5 functional tests can be performed (see page 52).

15) Must always be set to value A.

# Wiring The CU-OPB-120 Control Unit (Pot Control)

- Hold open time 0-30 seconds
- Inner and outer impulse input
- Power supply 18 V DC, max. 530 mA
- Power supply 24 V DC, stabilized, max 100 mA
- Power supply 24 V DC, max 330 mA for electric striking plate
- Input for "close"
- Inputs for connection of "slave unit"
- Inputs for connection of program selectors
- Function selector, FS

LM = Learn mode button

LS = Low speed, closing

BF = Balance force, open door

TD = Hold open time, 0-30 s

HSO = High speed, opening

HSC = High speed, closing

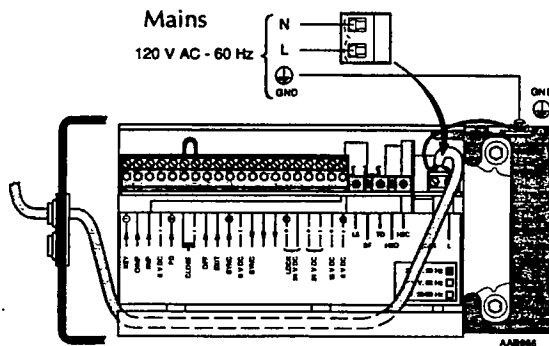
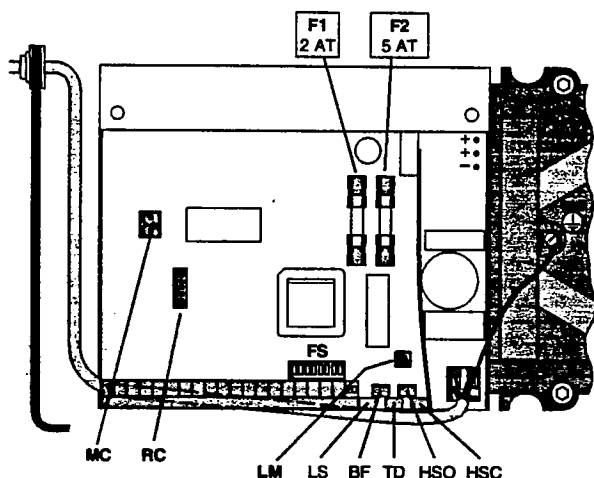
F1 = Control fuse

F2 = Motor fuse

FS = Function selector

RC = Connector for revolution counter cable

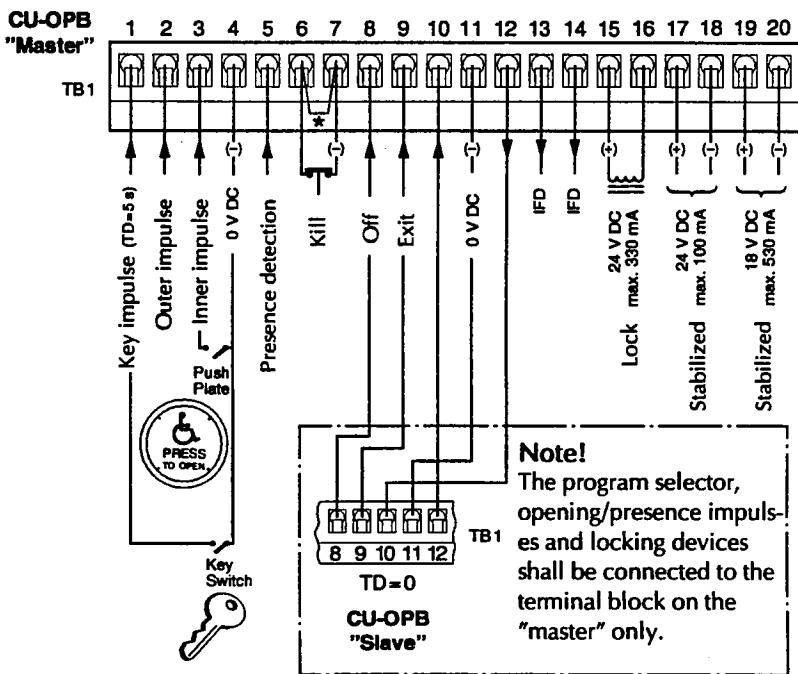
MC = Connector for motor cable



Power supply: 120 V AC  $\pm 6\%$ , 60 Hz  
 Motor fuse: 5.0 AT  
 Control fuse: 2.0 AT

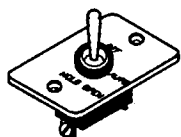
## Setting up the CU-OPB-120:

1. Connect the motor cable (MC), revolution counter cable (RC), and the protective ground (see page 19).
2. Connect the mains cables.
3. Connect accessories
4. Adjust Function selector FS (see page 44)



**Note!**  
 The program selector, opening/presence impulses and locking devices shall be connected to the terminal block on the "master" only.

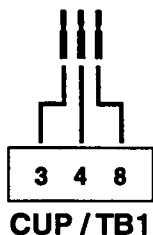
**\*) Note!** Remove jumper when connecting to terminals No. 6-7.



### Three Position Switch:

Short 3 & 4 to hold open  
 Short 4 & 8 to hold closed (Off)  
 The "Off, Auto, Hold Open" kit label is used.

**Note!**  
 If switched to Off position and Push and Go is selected, the door will still operate when pushed. See Wiring Options (page 45) on how to defeat Push and Go in the Off position.



# Adjusting The CU-OPB-120

---

## Important Notice!

The Navig-Aider, when installed and set up correctly, is a safe low-energy power door operator, but incorrect settings can defeat its purpose and create a safety hazard. For safety reasons, never set the opening or closing speed faster than necessary to handle the traffic situation through your door. Please refer to the ANSI/BHMA A156.19 – 1997 excerpt in this manual (page 53). A correctly adjusted door is a safe door!

## Adjustment

Note: When adjusting the potentiometers for the opening and closing speeds, clockwise turning increases the speed. When adjusting the hold open time, clockwise turning increases the time.

1. Switch on the power.
2. Wait for the control unit to make a double-click and for the operator to pull the door to closed position.
3. Press and release the learn mode button "LM".

Note: The door must be fully closed, and the motor must **not** be moving, before pressing the learn button.

4. Open the door manually to the required opening angle (max. 100°) and let the door close by means of the motor and spring force. The door will close slowly while in learn mode and will return to your settings later.

Note! It is important that the door returns to its fully closed position to accept the new opening angle. If the door does not close by itself, it must be manually pushed to the fully closed position.

5. The operator has now learned the correct opening angle.
6. Turn the potentiometer "BF" (balance force) max. counterclockwise.
7. Give constant impulse by jumping terminals 3 and 4.
8. Adjust the "BF" so that the door stands completely still when in fully open position. Check that correct "BF" is obtained by pulling the door backwards 45°. The door shall now slowly return to fully open position.

Note! When adjusting double doors, the "slave" control unit **must** be disconnected from the "master" by disconnecting terminals No. 10 and 12. Give constant impulse to the "slave" and adjust the "BF".

9. Remove the wiring from terminals 3 and 4, give a new impulse, and adjust the other potentiometers if necessary. Keep the door completely closed while turning the potentiometers.

### Note!

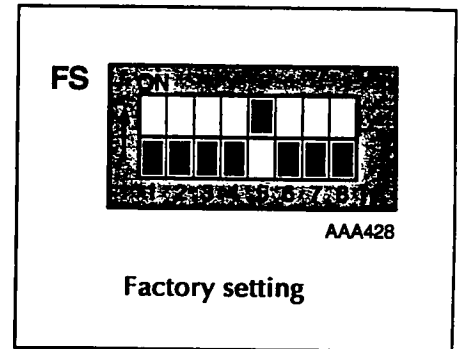
- If you need to push the learn mode button "LM" a second time, start from item 3.
- If operating disturbances occur, switch off the power temporarily (resets the computer). New adjustments in accordance with the instructions above are normally not needed.

# Adjusting The CU-OPB-120

## Function selector, FS

This selector, placed on the control unit, has 8 switches, FS No. 1 – FS No. 8, with different functions. The illustration shows the factory pre-set functions.

The pre-set functions can be changed in accordance with the table below.



FS	No.	OFF	ON
Lock kick <sup>1</sup>	1	No *	Yes
Extra hold force with 25 N on closed door	2	No *	Yes
"Push and go" <sup>2</sup>	3	No *	Yes
Not used for Low Energy Doors	4	*	-
Low speed distance opening	5	30°	15° *
Not used for Low Energy Doors	6	Factory Setting *	-
Function of the electro-mechanical locking device	7	Locked without power *	Locked with power
Not used for Low Energy Doors	8	Factory Setting *	-

<sup>1</sup> Adds an extra closing force (lock kick) just before the door reaches closed position. To be used e.g. when an electro-mechanical locking device is installed.

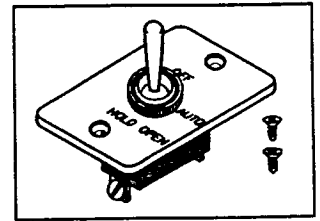
<sup>2</sup> The door is opened automatically if manually operated.

\* Factory setting

# Wiring Options

## Setting up the 3 position program switch kit .

The program switch has three functions (see pages 35 & 42 for hookup).



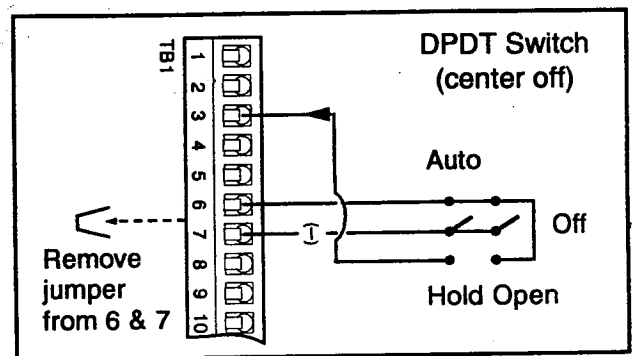
"Off" The door is closed. The inner and outer activation units are disconnected. The electric lock, if equipped, is engaged. The door can only be opened with the key impulse. Push and Go, if selected, will still function if the door is not locked.

"Auto" Normal position. The door can be opened with the inner and outer activation units and with key impulse. The electric lock, if equipped, is disengaged.

"Open" The door is held open.

## Setting up a 3 position program switch to deactivate Push and Go in the 'off' position.

Replace the kit-supplied SPDT switch with a DPDT (Double Pole, Double Throw) switch. Make connections to open the short between 6 and 7 on TB1. (See diagram at right.) The alternate kit label (Auto, Off, Hold Open) should be used.



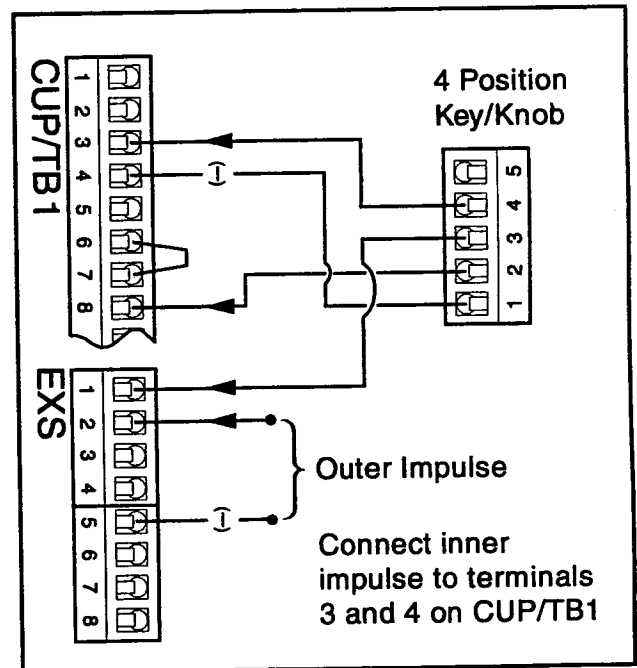
## Wiring an electric strike and 4 position switch for Auto / Off / Hold Open / Exit functionality

"Off" The door is closed. The inner and outer activation units are disconnected. The electric lock, if equipped, is engaged. The door can only be opened with the key impulse. Push and Go, if selected, will still function if the door is not locked.

"Auto" Normal position. The door can be opened with the inner and outer activation units and with key impulse. The electric lock, if equipped, is disengaged.

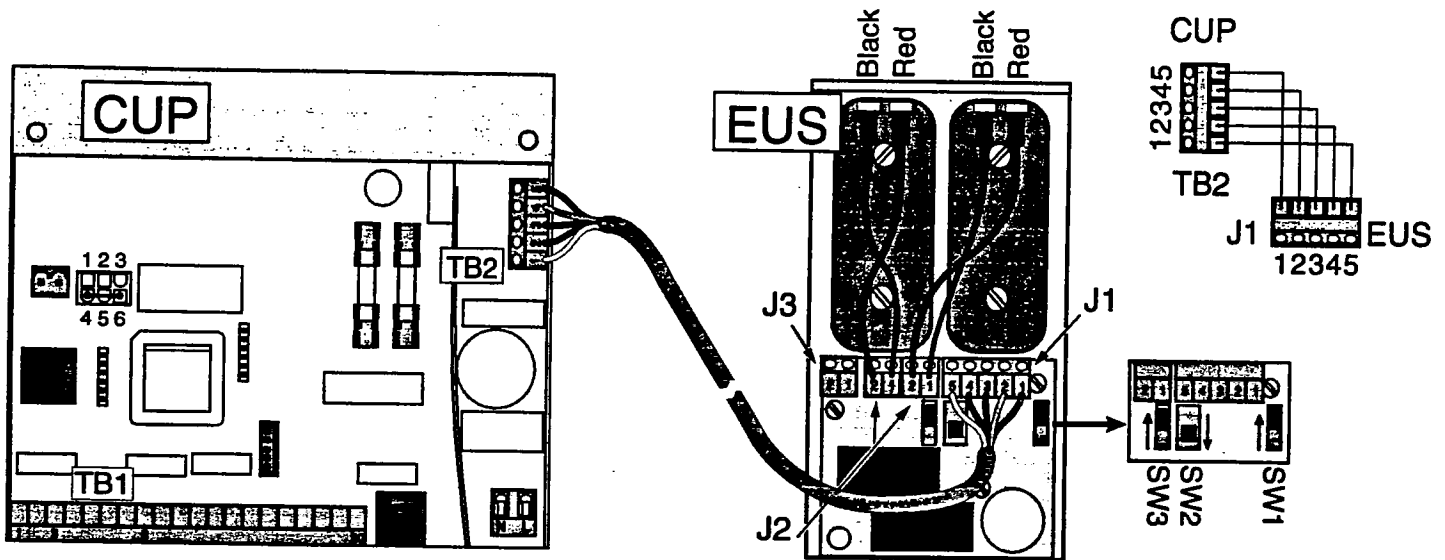
"Exit" One Way Traffic. The door is closed. It can be opened only with the inner activation units; the outer units are disconnected. The electric lock, if equipped, is engaged.

"Open" The door is held open.



# Wiring Options

## Wiring and setting up the backup battery



J1 connects to TB2 on the control unit. J2 is the terminal for the battery packs. J3 is not used.

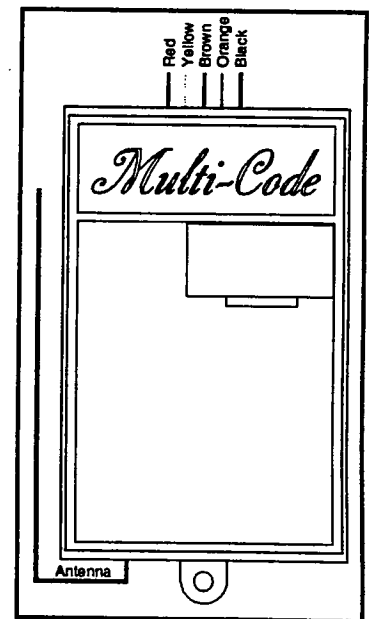
## Connecting the Radio Frequency (RF) remote control unit.

Place the receiver unit in the open space in the header. A good place is the plastic end cap on the other side of the header case from the control unit.

**Note!** The single black wire at the bottom of the receiver unit is the antenna, and must not be confused with the power input black wire in the group of five wires at the top of the receiver unit.

Connect the power input (red and top black wires) of the receiver unit, red to terminal 19 on TB1 and black to terminal 20 on TB1. Connect the switch output (orange and brown wires), orange to terminal 3 on TB1 and brown to terminal 4 on TB1.

Arrange the antenna wire just inside the plastic end cover. For improved range, drill a small hole in the plastic end cover and run the antenna outside the case and above the header. Fasten the wire with silicone sealant and seal the end cover hole as well.



## Using two pushplates, with different timing for each (e.g., normal and handicapped).

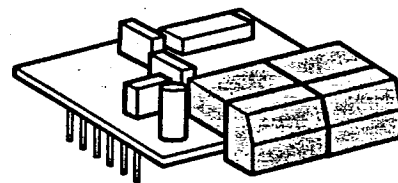
This can be done with a CUP programmable control. Wire a pushplate with a normally open switch to the key switch inputs (1 and 4), then use the PMD to program Function 09, "Key Operation", to a value other than 00 (e.g., 05 = 5 seconds of hold open time). See pages 35 and 42 for standard pushplate connection.

# Wiring Options – EXS Expansion Module

## Installing the EXS:

Note: Before installing the EXS, take suitable static precautions, such as use of a grounding strap, to avoid damage to the EXS module or the control unit.

Hold the CUP control unit so that the main terminal block (TB1) faces forward. Hold the EXS so that its terminal block also faces forward. Insert the EXS connector pins into the corresponding pin blocks on the control unit, making sure that the pins are not offset from the pin blocks (see illustration).



## EXS terminals & functions

**Terminal 1: EXIT ONLY** – Selecting this function through the 4-position switch (see page 45) turns on the electric lock feature and prevents any device connected to Outer Impulse from opening the door. Inner Impulse devices, when activated, cause the lock to unlock and the door to open after a delay (adjustable from 0 to 5 seconds in 0.1 second increments through the PMD function 25). When the door reaches the fully closed position, the lock will relock.

**Terminal 2: OUTER IMPULSE** – For 2-way traffic applications, connect the exterior activating device (push plate, card reader, motion detector, etc.) to this terminal and one of the 0v (-) terminals (5 or 8).

**Terminal 3: OPEN / CLOSE IMPULSE** – This terminal allows a push to open / push to close function. A momentary push button is connected across 3 and a 0v (-) terminal (5 or 8). Pushing the button once opens the door and holds it open until the button is pushed again, which closes the door.

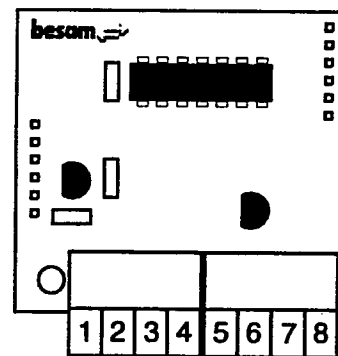
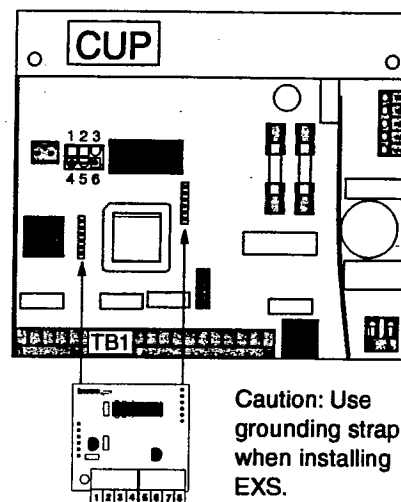
**Terminal 4: INTERLOCKING "OUT"** – This terminal, in conjunction with terminal #6, allows two doors to function in the manner of an "airlock". Each door will only open if the other door is fully closed.

**Terminal 5: 0V DC** – This is a DC ground point for the connection of various devices to the EXS.

**Terminal 6: INTERLOCKING "IN"** – (See terminal #4 above)

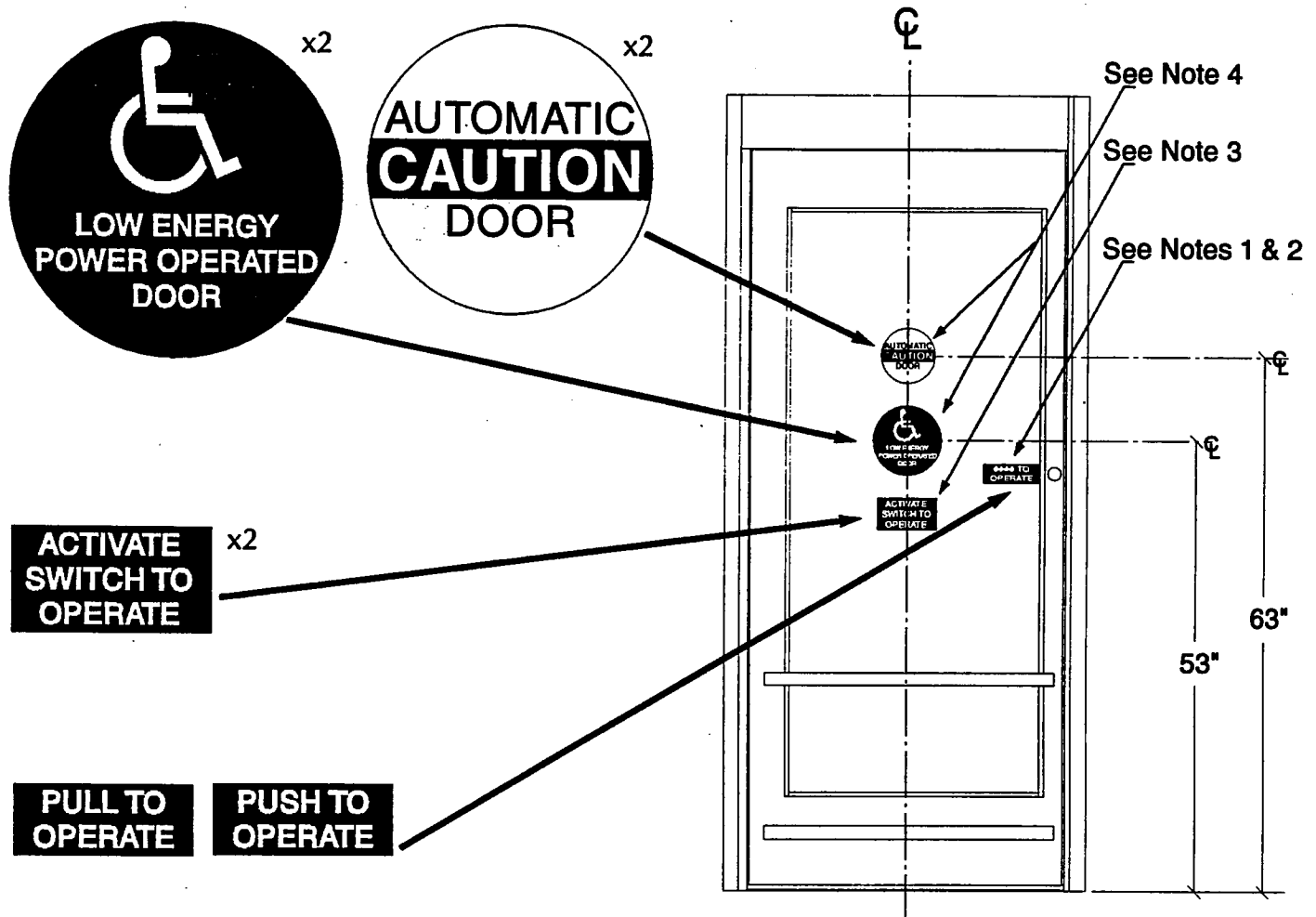
**Terminal 7: 18V DC** – This is an additional +18 volts DC connection point. It is in parallel with the 18 volt supply found on TB1 (terminal #19 and #20 of the CUP).

**Terminal 8: 0V DC** – This is a DC ground point for the connection of various devices to the EXS.



# Sign Placement

ANSI standard 156.19 specifies that caution signs must be affixed to both sides of any low-energy power operated door. The caution signs must be mounted at a height of 58 inches ( $\pm 5$  inches from the floor to the center of the sign). In addition to the ANSI specifications, Besam strongly recommends that the full sign kit be applied to every installation, in the manner shown below:



## Notes:

1. When using push/pull activation, apply the push decal to the push side of the door.
2. When using push/pull activation, apply the pull decal to the pull side of the door.
3. When using a wall switch to activate the door, apply this decal to both sides of the door.
4. Apply to both sides of the door.

Note – the circular decals are double-sided and normally will only need to be applied to one side of a clear glass door. If the decals are not clearly visible on the other side due to the condition of the glass (e.g., tinted or textured glass), the decals should be placed on both sides.

In a double door installation, signs should be applied to each door independently.



# Troubleshooting

## FAULT

## CHECK

1. The door does not open-motor does not start.

- Is there 120 VAC power at control box?

• Check / replace / reset main panel fuse or breaker.  
Note: if it repeatedly trips, there is a short.  
Check wiring from panel to control for an open circuit.  
Note: there may be an in-line on/off wall switch.

2. Control has power but still no operation.

- Is On/Off/hold open switch set to off?
- Is Push and Go properly selected?
- Is push plate working (if used)?
- Is motor power absent?
- Are the two fuses on the control blown?

- Change switch position to on.
- Select Push and Go
- Check push plate connections to control. Check for proper operation of push plate by using a multimeter to check for 0 ohms (when the switch is pressed) as measured at the control inputs.
- Check the motor cable plug on the control unit.
- Check with a multimeter for 0 ohms, and replace with a fuse of the same rating. Continued blowing of fuses suggests a short, miswiring or a bad control unit.
- This kill jumper must be in place (0 ohms) for the control to operate. If an external kill switch is wired, check functionality by temporarily shorting terminals 6 & 7. If the door now operates. fix the problem with the external kill switch and wiring.

3. The motor starts but door does not open, or does not open properly.

- Is the arm system loose?
- Is the spring tension set too high?
- Are the door hinges or arm binding anywhere?
- Is there a door strike (electric) in the system?
- Is the spindle rotation correct for the arm and handing of the door?
- Is the revolution counter cable plugged in?
- (Pot control) Has it gone through the learn cycle?
- (Pot control) Are the dip switches set correctly?
- (PMD control) Have the settings been checked and do they conform to the recommended settings in the instructions? Is the control unit a PMD programmable replacement unit?

- Remove power, close door fully and adjust and tighten arm per installation instructions.
- Reset the spring tension per installation instructions.
- Correct the binding condition.
- Check wiring and adjust strike.
- Check the instructions and correct if necessary.
- Check that the cable is connected properly
- Perform the proper learn cycle startup.
- Correct the dip switch settings.
- Connect the PMD and change settings to conform to recommended settings.  
Note that factory replacements are pre-programmed for the Swingmaster IK-A. The replacement control must be set via the PMD with the correct Navig-Aider settings. (7 jumper not provided with new units - see page 35.)

**FAULT****CHECK**

4. The door does not open to the required angle.

- (Pot control only) Was activation of the "Learn Mode" button accepted by the control?
- If the unit is a PMD programmable control, did you program the full open position?
- Is the encoder plugged into the control?
- Are the encoder, its wiring or the plug damaged?

5. The door does not open fully when impulsed during closing.

- Are the door hinges/pivots defective?
- Is the spring tension set too high?
- Is there binding in the door swing or arm system?
- Are speeds and power levels set correctly?

6. The door opens more than to the adjusted angle.

- Was the Pot based control "Learned" properly?
- Was the PMD based control adjusted properly?
- Is the revolution counter disc defective, loose, or missing teeth?

7. The door does not close, motor does not shut off.

- Is there a shorted input signal?
- Is the three position switch (if used) at the hold open position?

8. The door does not close fully.

- Are the door or hinges binding?
- Is the door arm binding or adjusted correctly?
- Is there excessive draft or wind conditions?

9. The spring is no longer pre-tensioned.

- Did you remove the stop screw and lose tension?

10. The opening angle won't adjust by the PMD or Learn Mode button.

- Has the door been allowed to reach its zero position (fully closed)?

11. The motor and transformer get hot.

- Is the balance force "BF" set too high?
- Is the hold force set too high?

**FIX / REMEDIES**

- Perform the proper Learn cycle startup.
- Refer to the instructions on using the PMD to set full open position.
- Plug it in to the proper socket.
- Repair or replace as necessary.
- Replace and/or lubricate.
- Re-tension spring per directions.
- Repair/replace of re-align as necessary.
- Retune control.
- Relearn
- Use the PMD to adjust opening angle.
- If loose try tightening the nut, otherwise replace the drive unit.
- Correct the short
- Switch to off position.
- If the door still does not close, replace the control unit.
- Repair or replace door or hinges.
- Repair or readjust door arm.
- On pot based controls select hold force on. On PMD based controls set 'spring closing only' to no, and, if needed, set hold force to a value between 01 -40 (40 being the strongest). Add spring tension – see instructions.
- Add spring tension – see instructions.
- Let the door shut fully when making adjustments – see instructions for steps.
- Readjust the balance force – see instructions.
- Readjust the hold force – see instructions.

**FAULT****CHECK****FIX / REMEDIES****12-17 PMD (CUP) control only.**

- 12. In absence of main power, unit closes fast.
  - Is the white jumper plug J7 in place, with a wire shorting terminals 4 and 6?
  - Is power present?
- 13. No lights on the PMD.
  - Check mains.
  - Check fuses
  - Check for 18V DC at terminals 19 & 20
  - PMD properly connected.
  - Try second PMD.
- 14. PMD will not communicate.
  - Can you do anything with PMD?
  - Enter PIN code.
  - Turn power off, wait 1 minute then on again.
  - If you still cannot adjust, first try 2nd PMD, then a new control.
- 15. PMD flashes an error code.
  - What is the code?

See chart below for explanation and correction.  
 Note: if more than one error code exists, correcting the first will now let the second display, be corrected, etc.

Reason	Error Code	Remedies
Door opened without impulse	50 flashing	Check why the door moved.
Mat safety error	51 flashing	Replace the contact mat.
Presence impulse error	52 flashing	Replace the VP/VPS.
Motor error	53 flashing	Replace the motor.
Revolution counter error	54 flashing	Replace the revolution counter.
Control unit error	55 flashing	Replace the control unit.
PMD error	69 flashing	Replace the PMD.
PMD-CUP communication error	70 flashing	Check the connections.
PMD access denied.	71 flashing	Return the PMD to be updated.

**FAULT**

**CHECK**

**16. Testing with PMD.**

The PMD has the ability to initiate some system tests. Select function 99 and then enter the values shown below to specify a particular test. Press the program button P on the PMD to start the test. If the test is unsuccessful an error code will flash on the value display.

Value	Test Of	Error Code
01	External program selector switch	51 flashing
02	Motor, Visual test. (Let the door close before commencing this test.)	The motor runs about 1 second in the opening direction, then closes the door(s) again.
03	Revolution counter	54 flashing
04	Mat safety monitoring	51 flashing
05	Presence impulse monitoring	52 flashing

**17. Status codes with the PMD.**

The PMD continuously shows the following status codes during operation. These status codes are not error codes. If any of the status codes are constantly displayed the corresponding unit has to be checked, and if necessary remedied or replaced.

**Note!**

If the fault persists and all the recommended measures have been taken, the operator and control must be returned, well packed, to the factory. Please include a detailed note of the problem with the unit being returned.

**Important!** When returning the drive unit, the drive spring tension of 165° must be restored. See page 33.

Status Code	Status	Remedies
on	Operation ok	Normal - everything is OK.
10	Search for closed position	Let the door finish its cycle.
11	Inner impulse active	Check this input.
12	Outer impulse active	Check this input.
13	Key impulse active	Check this input.
14	Synchronizing impulse active	Check this input.
15	Interlocking impulse active	Check the connections.
16	Mat safety active	Check this input.
17	Presence detection active	Check this input.
18	Presence impulse active	Check this input.
19	Door blocked	Check for obstacles
20	Kill impulse active	Check this input.
21	Low speed opening/Learn	Let the door finish its cycle.
22	Door opened with open/close impulse	Close the door with new impulse.

From American National Standard for power-assist and low-energy power operated doors. Please refer to full standard if necessary, obtainable through BHMA at (212) 661-4261.

### Opening Time

Doors shall be field adjusted so that opening time to back check or 80 degrees, whichever occurs first, shall be 3 seconds or longer as required in Table 1. Backcheck shall not occur before 60 degrees opening.

Total opening time to fully open shall be four seconds or longer.

### Closing Time

Doors shall be field adjusted to close from 90 degrees to 10 degrees in 3 seconds or longer as required in Table 1.

Doors shall be field adjusted to close from 10 degrees to fully closed in not less than 1.5 seconds.

The door shall be field adjusted to remain fully open for not less than 5 seconds, unless a sensing device is used to hold the door open.

The force required to prevent a stopped door from opening or closing shall not exceed a 15 lbf (67 N), applied 1 inch (25 mm) from the latch edge of the door at any point in the opening or closing cycle.

The kinetic energy of a door in motion shall not exceed 1.25 lbf-ft (1.69 Nm). Table 1 provides speed settings for various widths and weights of doors for obtaining results complying with this paragraph.

In the event of power failure to the operator, doors shall open with a manual force not to exceed a 15 lbf (67 N), or a torque of 40 lbf-in (4.5 Nm) to release a latch, a 30 lbf (133 N) to set the door in motion, and a 15 lbf (67 Nm) to fully open the door. These forces shall be applied at 1 inch (25 mm) from the latch edge of the door.

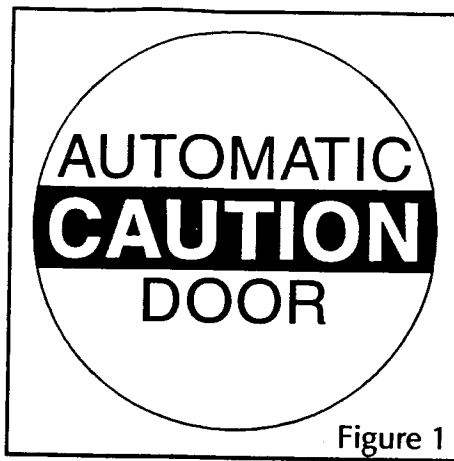


Figure 1

### Signs

Doors shall be equipped with (a) sign(s) visible from either side, instructing the user as to the operation and function of the door. The signs shall be mounted 58 inches  $\pm$  5 inches (1470  $\pm$  130 mm) from the floor to the center line of the sign. The letters shall be 1/2 inch (13 mm) high minimum.

**Low Energy Doors:** All low energy doors shall be marked with a sign, visible from both sides of the door,

with the words "AUTOMATIC CAUTION DOOR" (See Figure 1). The sign shall be mounted on the door at a height of 58 inches  $\pm$  5 inches (1470  $\pm$  130 mm) from the floor to the center line of the sign. The sign shall be a minimum of 6 inches (152 mm) in diameter and with black lettering on a yellow background.

When a separate wall switch is used to initiate the operation of the door operator, the doors shall be provided with signs on both sides of the door with the message "ACTIVATE SWITCH TO OPERATE." The lettering shall be white and the background shall be blue.

When door motion is used to initiate the operation of the door operator, the doors shall be provided with the message "Push to operate" on the push side of the door and "PULL TO OPERATE" on the pull side of the door. The lettering shall be white and the background shall be blue.

Table 1

Minimum opening time to Back Check or 80 degrees, whichever occurs first, or Minimum Closing Time from 90 degrees to Latch Check or 10 degrees. Back Check shall not occur before 60 degrees opening.

"D" Door Leaf Width - Inches (mm)	"W" Door Weight in Pounds (kg)				
	100 (45.4)	125 (56.7)	150 (68.0)	175 (79.4)	200 (90.7)
30 (762)	3.0	3.0	3.0	3.0	3.5
36 (914)	3.0	3.5	3.5	4.0	4.0
42 (1067)	3.5	4.0	4.0	4.5	4.5
48 (1219)	4.0	4.5	4.5	5.0	5.5

Matrix values are in seconds.

Doors of other weights and widths can be calculated using the formula:

$$T = D \sqrt{W} / 133 \text{ in US units} \quad T = D \sqrt{W} / 2260 \text{ in SI (metric) units}$$

Where T = Time, seconds; D = Door width, inches (mm); W = Door weight, lbs. (kg)

The values for "T" time have been rounded up to the nearest half second. These values are based on a kinetic energy of 1.25 lb-ft.

The value for the 30 inch wide, 100 pound door actually calculates to 2.5 seconds without rounding. 3.0 seconds was used as a more conservative value.

# Frequently Asked Questions

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Q. What is a low energy door?

A. There are three kinds of low energy doors as defined by ANSI/BHMA A156.19 - 1997:

**Low Energy Power Operated Door:** A door with (a) power mechanism(s) that opens and closes the door upon receipt of an actuating signal and does not generate more kinetic energy than specified in this standard. (Note: The Navig-Aider is in this category.)

**Low Energy Power Open Door:** A door with (a) power mechanism(s) that opens and closes the door upon receipt of an actuating signal and does not generate more kinetic energy than specified in this standard and which is closed by other means.

**Power assist door:** A door with a power mechanism that reduces the opening resistance of a self-closing door.

Q. Can the Navig-aider be used on a smoke control or fire door?

A. No. The Navig-Aider is not listed for use on either type of door.

Q. Can the Navig-Aider be used on exterior doors?

A. Yes. If the unit is installed outside, it should be protected from direct exposure to adverse weather by an overhang. Note that applications with high draft forces (high negative or positive building pressures) or high winds will be problematic for all low energy and manual doors.

Q. Can the Navig-Aider be used concealed on a center pivot?

A. Not currently.

Q. Can the Navig-Aider be used for pedestrian (non-low energy) applications?

A. Yes; however, installation, sensors, and guide rails are outside the scope of this manual and require adherence to ANSI/BHMA A156.10

Q. What is the purpose of the extra inputs and power capabilities on the control units?

A. These are for external sensors and other devices for pedestrian applications, which are beyond the scope of this manual. See above question.

Q. Why are the push arm shoe mounting holes not symmetrical?

A. By removing the arm shoe from the telescopic sleeve and turning the arm shoe upside down, the mechanical closing force is slightly modified. This can be used if your installation requires extra adjustment beyond the limits of the control unit. Care must be taken that this modification does not cause the door to exceed ANSI / BHMA requirements (see page 53).

Q. What will happen if I mount the operator at a 'B' distance different than the one recommended?

A. It will alter the manual push open force. Mounting the operator closer to the hinge gives the operator less leverage (power) to open the door, and thus lowers the manual push open force. It also lowers the amount of spring force available to close the door and hold it closed. Mounting the operator further from the hinge has the opposite effect.

**Note: Mounting the operator at any distance other than the recommended distance 'B' in this manual can damage the operator or exceed ANSI/BHMA requirements (see page 53).**

# Planned Maintenance Checklist

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- Measure / Adjust Speeds – Measure to ANSI A156.19 and adjust if necessary.
- Measure / Adjust Forces – Measure to ANSI A156.19 and adjust if necessary.
- Measure / Adjust Time Delays – Measure to ANSI A156.19 and adjust if necessary.
- Check Functioning.
- Check Signage – Are all signs in place, readable, and in good condition?
- Check Door Hinging / Mechanical Soundness of all attachments, covers, arms, etc.
- Check Finger Guards – Glass and Glass Stops – Trip Hazards
- Check Emergency Egress if so equipped.
- Check drive unit belts for excessive wear or stretching.
- Check rotation counter wheel for missing teeth, etc.
- Check all wiring to ensure good connection, proper insulation and clearances from moving parts.
- Check surrounding areas for items causing pedestrian traffic congestion (such as trash receptacles, retail displays, brochure racks, etc.) and alert the owner / manager to potential situations and hazards.





# Parts List

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P/N: 24-02-655311	CU-OPB-120 Controller (Potentiometer)
P/N: 24-02-655449	CUP Controller (PMD)
P/N: 30-02-655630	EXS Board – CUP Only
P/N: 30-02-600126	EUS Battery Backup – CUP Only
P/N: 30-02-654745	Replacement Battery Pack for EUS (2)
P/N: 24-05-173331	Drive Unit

## Pushing Arms:

P/N: 21-06-006	SAS Standard Arm – Clear
P/N: 21-06-007	SAS Standard Arm – Black
P/N: 21-06-173382	Hybrid Arm – Clear
P/N: 21-06-173383	Hybrid Arm – Black
P/N: 21-06-173002	9-7/8" Extension – Clear
P/N: 21-06-173004	9-7/8" Extension – Black
P/N: 21-06-173003	14-3/4" Extension – Clear
P/N: 21-06-173005	14-3/4" Extension – Black
P/N: 21-06-173191	Extension Joiner

## Pulling Arms:

P/N: 24-06-173125	STL Slide-Track Light Arm System – Clear
P/N: 24-06-173126	STL Slide-Track Light Arm System – Black
P/N: 24-15-832430	STL-P Panic Breakout Kit for STL – Clear
P/N: 24-15-832431	STL-P Panic Breakout Kit for STL – Black
P/N: 99-99-004	Doorstop Switch for STL-P

## Kits:

P/N: US15-0138-01	Door Label Kit – ANSI
P/N: US15-0164-01	Cable Bracket Kit (Plate And Screws)
P/N: 173107	3/4" Spindle Extension Kit
P/N: 173108	2" Spindle Extension Kit
P/N: 173109	2 3/4" Spindle Extension Kit
P/N: 75-15-310	3 Position Switch – Clear
P/N: 75-15-311	3 Position Switch – Black
P/N: 75-15-100	4 Position Switch – Knob – Clear
P/N: 75-15-101	4 Position Switch – Knob – Black
P/N: 75-15-105	4 Position Switch – Key – Clear
P/N: 75-15-106	4 Position Switch – Key – Black

## Push Plates:

P/N: 75-02-10	Round: Symbol
P/N: 75-02-102	Round: Symbol & "Press To Open"
P/N: 75-02-107	Square: Symbol
P/N: 75-02-108	Square: Symbol & "Press To Open"
P/N: 75-02-280	Narrow: Symbol & "Push To Open"

## Remote Push Plates (RF):

P/N: 75-02-269	Narrow: "Push To Open"
P/N: 75-02-270	Narrow: Symbol & "Push To Open"
P/N: 75-02-272	Round: Symbol "Push To Open"
P/N: 75-02-273	Round: "Push To Open"
P/N: 75-02-271	Remote Receiver
P/N: 75-21-002	Installation Box for Narrow plates

# Bulletins And Revisions

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No bulletins or revisions are presently available for this manual.