

Electro-Mechanical Swing Door Operators

(with 3-piece universal housing)

Complies with ANSI/BHMA A156.10-2005 standard for Power Operated Pedestrian Doors. UL 325 Listed.

***NOTE:** Pedestrian Door System shall comply with the requirements in the American National Standards A156.10-current edition for power operated pedestrian doors.

The glazing material of all doors shall comply with the requirements in the American National Standard Performance Specification and Methods of Test for Safety Glazing Material used in Buildings, Z97.1-1975.

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Swingmaster® 300 Series (No longer manufactured)

Model 300 (Overhead concealed)

- Double acting (spring return to closed position from the panic or full open position)
- Standard closing spring
- Closing force of approximately 23 lbs. to 34 lbs. depending on door width
- Non-handed. Converts easily to right hand or left hand swing

Model 305 (Same as 300 Model except:)

- Light closing spring
- Closing force of approximately 14 lbs. to 26 lbs. depending on door width

Model 350 (Surface mounted. Same as 300 Model except:)

- Rack gear extension and internal spring spacer to increase spindle shaft rotation to 135° which accommodates various pivoting arrangements (Butt hinge offset pivots and center pivots.)
- Closing force of approximately 23 lbs. to 34 lbs. depending on door width

Model 355 (Same as 350 Model except:)

- Light closing spring
- Closing forces of approximately 14 lbs to 26 lbs. depending on door width

Swingmaster® 400 Series

Model 400 (Overhead concealed)

- Factory handed operator for right hand or left hand operation
- Single acting (spring open to panic position)
- Requires closed door stop-retractable stop for panic breakout
- Internal clutch assembly
- Standard closing spring
- Closing forces of approximately 16 lbs. to 30 lbs. depending on door width
- Closing force adjustable dependent on application

Model 405 (Same as 400 Model except:)

- Light closing spring
- Closing force of approximately 11 lbs. to 23 lbs. depending on door width

Model 450 (Surface mounted. Same as 400 Model except:)

- Rack gear extension and internal spring space to increase spindle shaft rotation to 135° which accommodates various pivoting arrangements (hinge, offset pivots, and center pivots)
- Closing force of approximately 16 lbs. to 30 lbs. depending on door width

Model 455 (Same as 450 Model except:)

- Light closing spring
- Closing forces of approximately 11 lbs. to 23 lbs. depending on door width

NOTE: For Swingmaster® Model 850 instructions, please contact Besam US, Inc.

Performance and Safety

All swing door applications *intended for pedestrian use* must be properly ordered, installed, adjusted and maintained to the following American National Standard and applicable building codes.

- Power Operated Pedestrian Doors. ANSI/BHMA A156 10-current edition.

The ANSI Standards provides design and performance requirements for the following:

- Automatic/manual operation
- Entrapment protection
- Emergency egress
- Activating and safety devices
- Door markings
- Time delays
- Guide rails
- Others

For a copy of the Standard contact American National Standards Institute, 11 West 42nd Street, NY, NY 10036 (212) 642-4900. All questions regarding performance or safety please contact Besam US, Inc., 1900 Airport Road, Monroe, NC 28110, (704) 290-5520.

Swingmaster 300/400 Overhead Concealed Header and Operator Installation

General

The Swingmaster® overhead concealed housing assembly is made up of a three-piece factory assembled fixed extrusion, a removable cover (side mount) and two steel end caps for attachment to the vertical door frames. The housing assembly is 6" high by 6" wide by length as required for the door opening. To install operator and printed circuit board (PCB), see page 5.

Door Leaf Preparation Center Pivot Doors

In preparing the door leaf to receive the Swingmaster® operator, the following must be taken into consideration:

There must be cut-outs at the heel of the door both at the top for the door arm and the bottom for the door pivot. Door is mounted by applying the arm to the operator, moving the arm to an open position (90 degrees hold open or panic) and slipping the door over the bottom pivot and sliding the arm in the top rail until the screw holes for attaching the arm line up with the prepared holes in the door leaf.

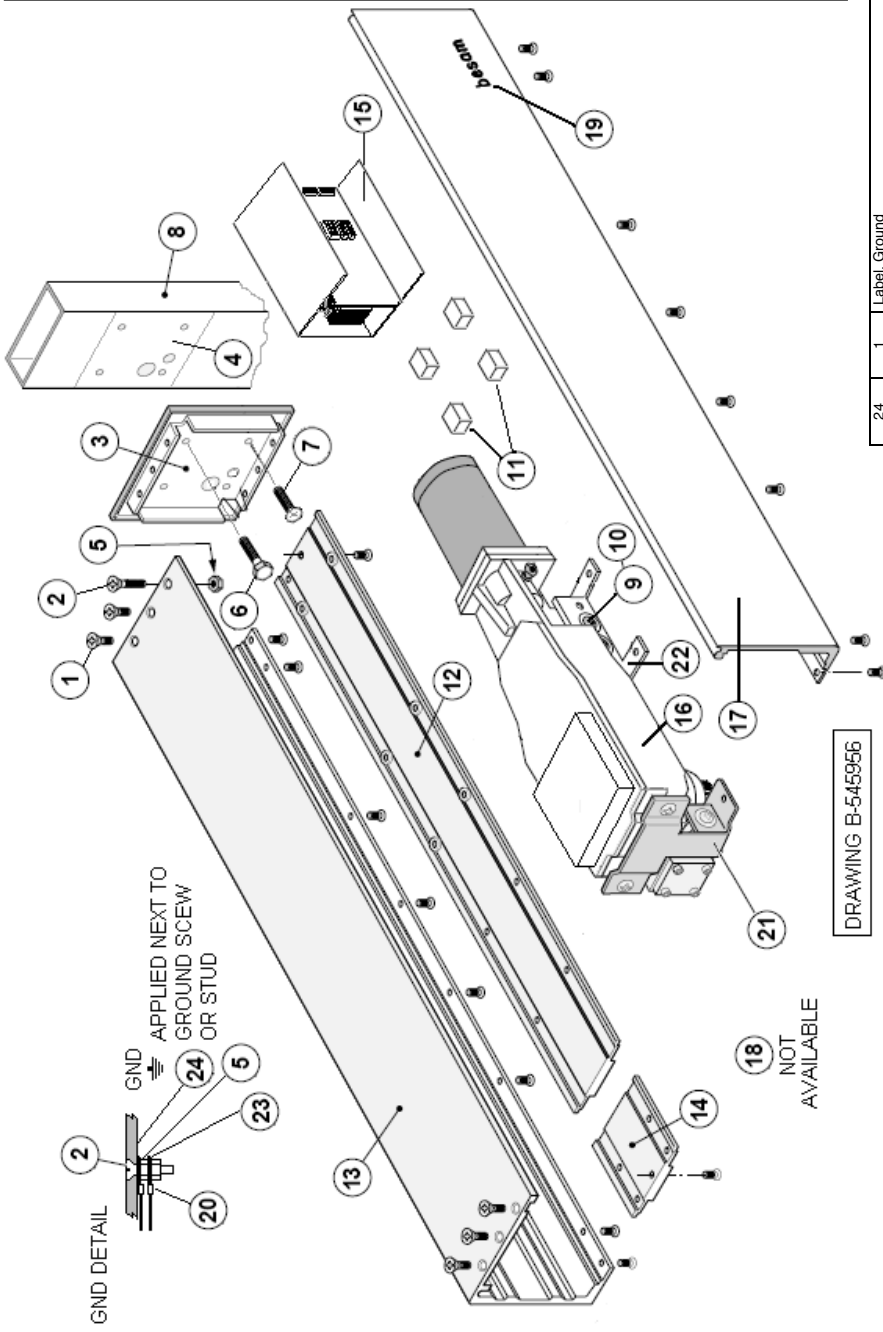
Referring to page 8, locate holes as shown in the top rail, drill four holes (.332 diameter - Q drill) and apply **#A25-140** flat head rivnuts as shown. Be sure that these holes are properly centered for good alignment of the door leaf.

Prepare and install bottom pivot in accordance with pivot manufacturer's recommended procedures making sure that the centerline of the bottom pivot shaft is the same as the centerline of the splined hole of the top door arm. Refer to page 8 for proper dimensional information of the top arm and bottom pivot.

Secure top door arm to top of door and check for dimensions as shown. In the event that a mistake has been made, the arm may be turned over and a new set of holes located to correct the problem. When arm is properly mounted remove same from door leaf.

Installation

1. ESTABLISH OPERATOR HOUSING HEIGHT (SEE NOTE A) AND THE DESIRED OPERATOR ACCESS. NOTE NEW HOUSING DIMENSIONS ARE 6"x6".
2. PREPARE MOUNTING AND ELECTRICAL ENTRY HOLES IN THE JAMBS UTILIZING THE TEMPLATE (4) PROVIDED.
3. INSTALL 1/4-20 COUNTER SUNK RIVNUTS INTO THE JAMB AS INDICATED.
4. POSITION HEADER BETWEEN JAMBS AND SECURE ENDCAPS. THE UPPER MOUNTING HOLE RECEIVES (2) 1/4-20 X 1" HEX HEAD MS. THE TWO LOWER MOUNTING HOLES (2) 1/4-20 X 1" F.H.M.S.
5. INSTALL MAIN POWER AND SWITCH WIRING INTO HOUSING, USING ACCESS HOLES INDICATED ON TEMPLATE (4). WIRING CAN ACCESS THE HOUSING FROM THE HINGE/PIVOT JAMB OR STRIKE JAMB. ACCESS THROUGH THE STRIKE JAMB IS PREFERRED DUE TO TIGHT CONDITIONS ON PIVOT SIDE.
6. INSTALL THE BOTTOM SPINDLE CLOSURE (14) ACCORDING TO THE REQUIRED DOOR HANDING. POSITION TO THE L.H. SIDE FOR L.H. REGULAR H. PARALLEL APPLICATION AND TO THE R.H. SIDE FOR R.H. REGULAR H. PARALLEL APPLICATION. THIS PROVIDES A SHELF SUPPORT WHEN INSTALLING THE OPERATOR(S).
7. INSTALL OPERATOR(S) (16) SECURING IT TO THE SPINDLE CLOSURE WITH (2) 1/4-20 X 3/8 F.H.M.S. INSTALL THE BOTTOM CLOSURE (12) AND SECURE THE CENTER OPERATOR SUPPORT BRACKET WITH (4) 1/4-20 X 3/8 F.H.M.S.
- NOTE: IF DUMMY PIVOT (18) IS BEING UTILIZED IT CAN BE INSTALLED AFTER BOTH BOTTOM CLOSURES (12) AND (14) ARE INSTALLED. THE DUMMY PIVOT IS SECURED WITH (2) 1/4-20 X 3/8 F.H.M.S. THRU THE SPINDLE CLOSURE (12).
8. INSTALL PCB CONTROL WIRE AND GROUND (GREEN) WIRES TO OPERATOR HOUSING BRACKET AS SHOWN. THE PCB CONTROL (15) IS SECURED TO THE BOTTOM CLOSURE WITH SELF ADHESIVE TAPE PROVIDED (11).
9. INSTALL DOORS AND TUNE ACCORDING TO INSTALLATION MANUAL PART NO. 30-23-025 INSTALL HOUSING COVER



NOTE A:
 DOOR OPENING HEIGHT 7'-0" STOCK 84" FROM BTM. OF OPER. HOUSING TO FINISHED FLOOR (SURFACE APPLIED MATS)
 DOOR OPENING HEIGHT 7'-0" STOCK DOOR--83-1/2" FROM BTM. OF OPER. HOUSING TO FINISHED FLOOR. (RECESSED MATS)
 DOOR OPENING HEIGHT--SPECIAL DOOR--TAKE DOOR HEIGHT AND ADD 13/16" FOR DOOR OPENINGS WITH SURFACE APPLIED MATS OR THRESHOLD.
 DOOR OPENING HEIGHT--SPECIAL DOOR--TAKE DOOR HEIGHT ADD 5/16" FOR DOOR OPENING WITH RECESSED MATS OR NO THRESHOLD.

NOTE B:
 GROUND SCREW TO BE USED ON SIDE OPPOSITE THE OPERATOR.

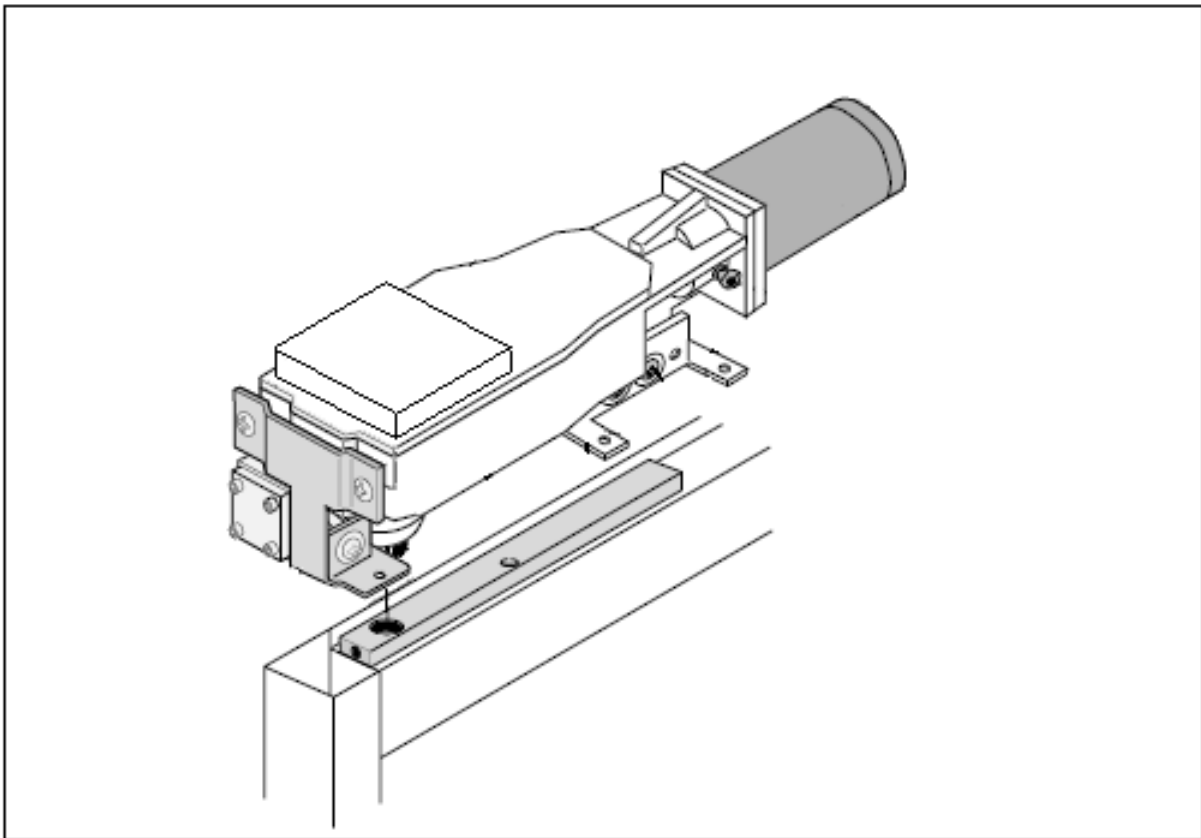
ITEM	QTY.	DESCRIPTION	PIN	CLEAR	P/N	BRONZE
24	1	Label, Ground	30-24-006			
23	2	1/4" Star Washer Int.	30-09-216			
22	*	MTG. BRKT. (OPERATOR) SEPARATE	30-04-006			
21	*	MTG. BRKT. (OPERATOR) SEPARATE	30-04-005			
20	2	LUG 1/4-20 CRIMP ON	30-02-019			
19	1	LABEL BESAM	11-20-203			
18	OPT	DUMMY PIVOT ASSY.	30-15-315			
17	1	REMOVABLE COVER	30-15-324			
16	1	OPERATOR	30-15-325			
15	1	P.C. BD. ASSY. (INC. 11 & 20)	30-15-010			
14	1	CENTER COVER, BTM SPINDLE CLOSURE	xxxxx			
13	1	FIXED COVER	30-15-322			30-15-323
12	1	CENTER COVER	30-15-320			30-15-321
11	4	BUMPONS	30-20-231			
10	5	WASHER, FLAT 3/8-16	30-09-224			
9	5	3/8-16 X 1-1/4 TRUSS HD. MACH. SCR.	30-09-223			
8	2	JAMB TUBE	30-09-274			
7	4	SCREW 1/4-20 X 1-1/4 FHMS	30-09-320			
6	4	SCREW 1/4-20 X 1-1/4 FHMS	50-09-107			
5	2	NUT 1/4-20 HEX	30-23-005			
4	1	TEMPLATE, DRILL SCHEDULE	30-15-300			
3	2	END CAP ASSY.	31-09-200			
2	1	SCREW 1/4-20 X 1 FHMS	40-99-200			
1	23	SCREW 1/4-20 X 3/8 F.H.				

Installation for center pivot doors

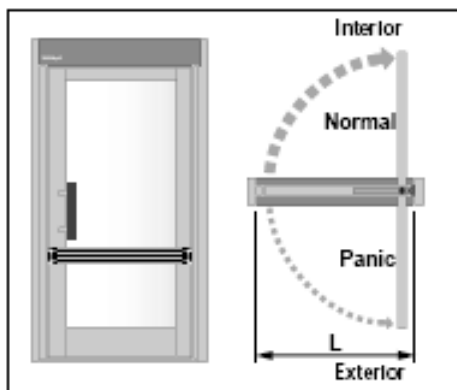
The concealed operator is used to control a center-pivot door, with the operator integrated and concealed in the header above the door.

The door can be opened in a direction opposite than normal in an emergency (panic breakout).

A concealed operator can also be installed in the ceiling space above the door (bottom load). Such applications may require field engineering of components and hardware.

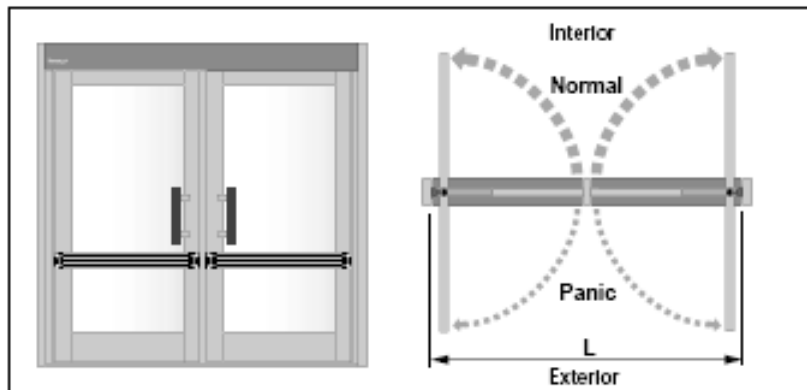


Operator for right handed doors



L= Header Length

Operator for left and right handed doors



L= Header Length

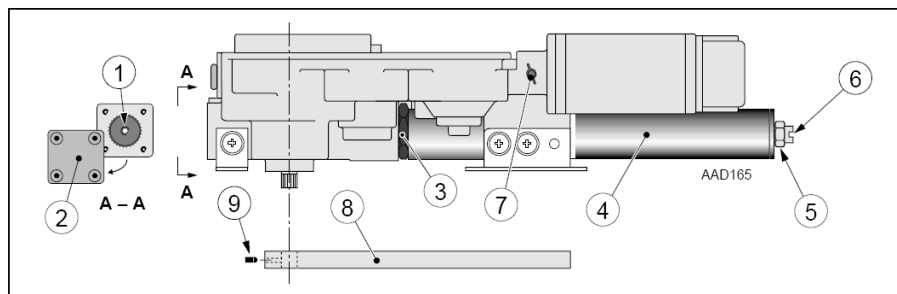
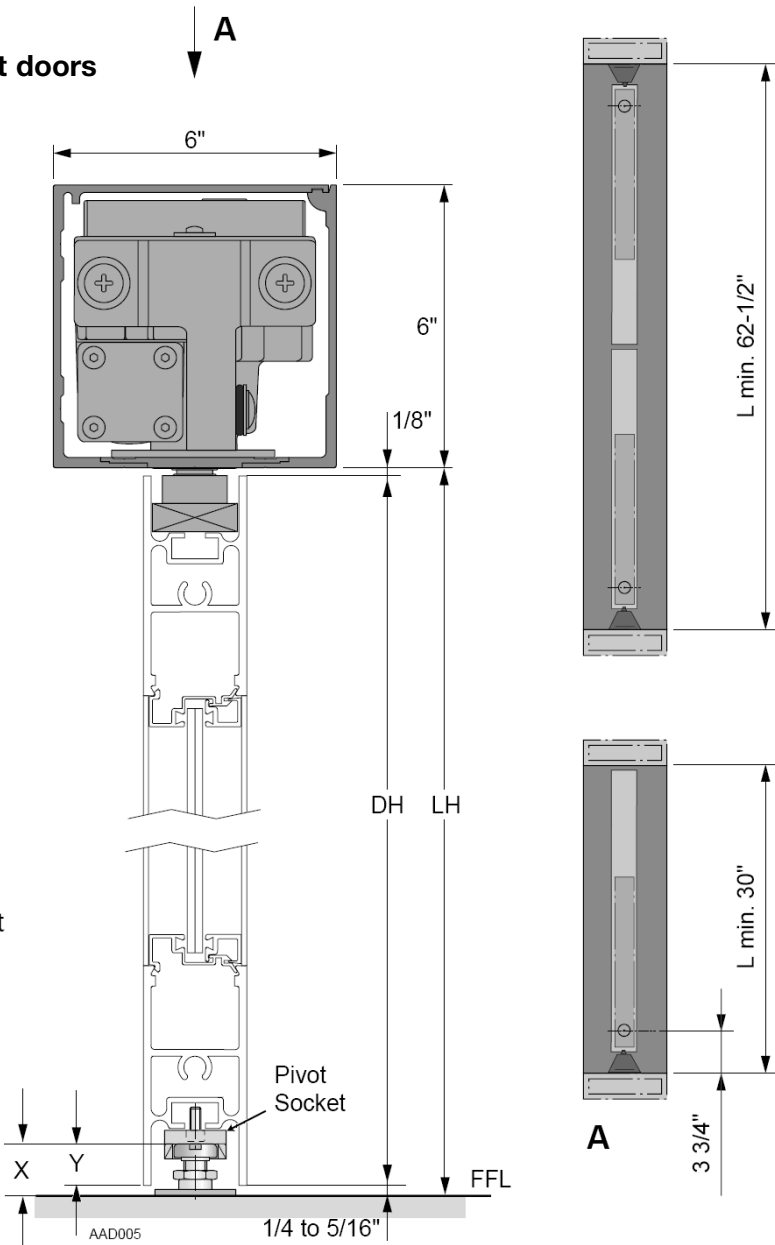
Installation for center pivot doors

FINDING THE PIVOT HEIGHT

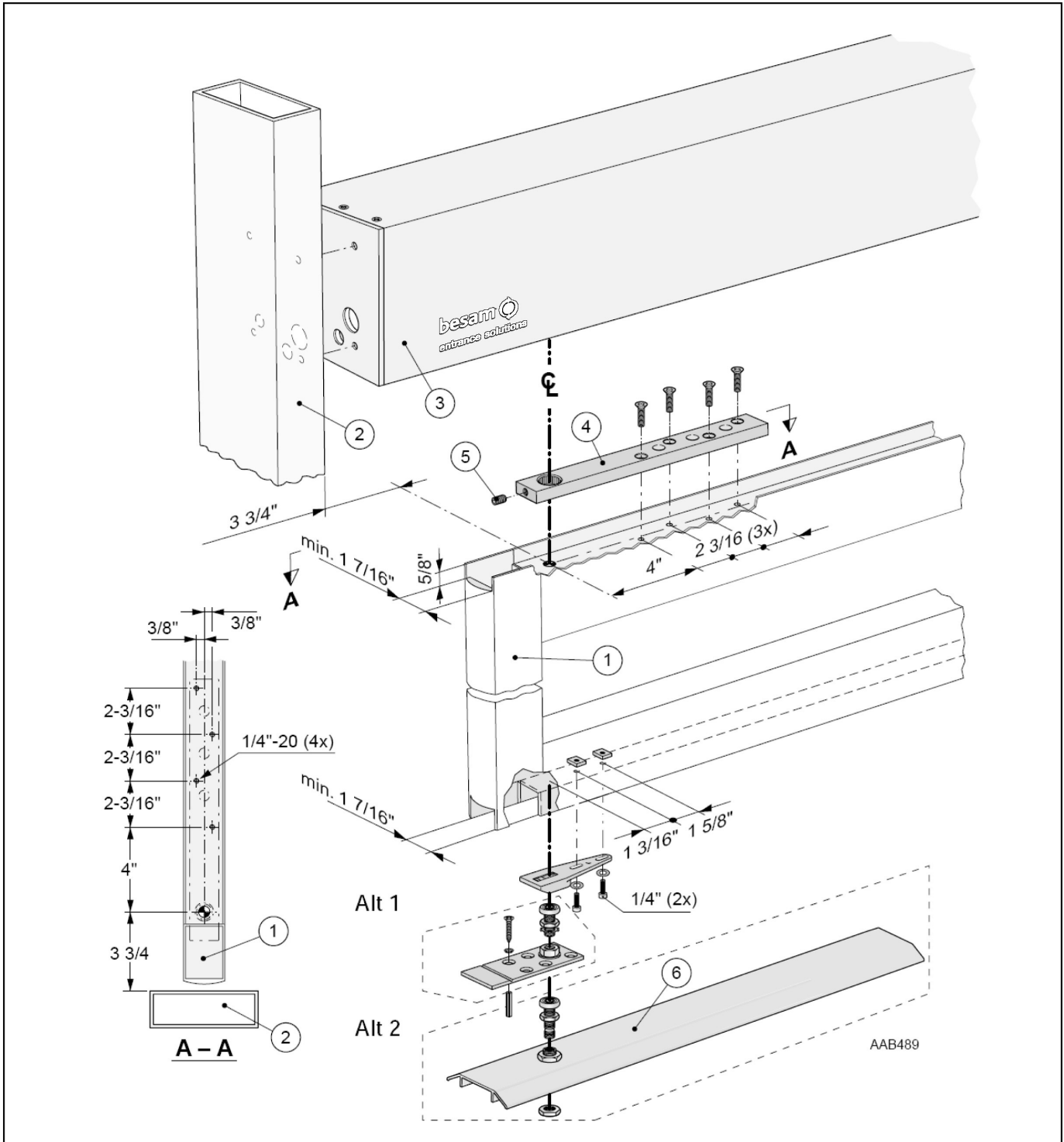
LH = Door Opening Height
 DH = Door Height
 X = Pivot Height
 Y = Door Bottom to Receiving Surface of Pivot Socket

1. Measure the height of the door (DH).
2. Measure from the bottom of the door to the receiving surface of the pivot socket (Y). Subtract (Y) from (DH).
3. Add 1/8" to allow for top clearance.
4. Subtract the total from (LH) to obtain the Pivot Height (X).

DH = Door leaf height
 LH = Door opening height
 FFL = Finished floor level
 L = Header length



- | | |
|--|---|
| ① Left-handed drive unit: Adjustment bolt for opening angle. Screw out to increase and in to decrease. Must be adjusted with drive unit removed from header! | ⑤ Door stop locking nut (right-handed drive unit) |
| ② Spring tube end plate | ⑥ Right-handed drive unit: Adjustment bolt for opening angle. Screw out to increase and in to decrease. |
| ③ Lock nut for the spring tube | ⑦ Locking thumb screw |
| ④ Spring tube | ⑧ Drive arm |
| | ⑨ Lock screw |



- | | | | |
|---|----------------|---|-------------------------|
| ① | Door leaf | ⑤ | Lock screw |
| ② | Jamb/wall | ⑥ | Threshold (optional) |
| ③ | Header housing | ⊥ | Drive shaft center line |
| ④ | Drive arm | | |

Installation of Control

The electronic control for the Swingmaster® 300/400 series is a printed circuit board (PCB) that sits inside of the housing and faces (see pg. 5) the removable side of the operator housing. The main power (110 volts) is connected to a two wire disconnect harness, factory wired to Terminal 3 (neutral leg) Terminal 5 (110 volt hot leg) and the ground is connected to grounding post located on the housing (see pg. 5). The motor(s) is plugged into either J1 or J2 on the PCB depending on the handing of the door swing. The switch harness is plugged into J3 on the PCB (see pg. 11). Wiring and adjustment procedures are contained on pg. 11. An optional three-position switch (off-hold open-automatic) can be installed (see pg.12) to control the function of the door.

Recommended Swingmaster ETIK Resistor Values for Various Door Weights

Use this table along with the appropriate ANSI standard to determine the best closing resistor for your application.

SwingMaster 455 Surfaced Applied with Butt Hinges		
Door Width	Closing Time from 90 to 10 degrees	OHM
36" to 48"	4.9 Seconds	50
36" to 48"	3.7 Seconds	82
36" to 48"	2.5 Seconds	180

ANSI 156.19

4.2.1 Doors shall be field adjusted to close from 90 degrees to 10 degrees is 3 seconds or longer as required in Table 1. Doors of other weights and widths can be calculated using the formula:

Table 1	"W" Door Weight in Pounds					$T = D\sqrt{W} / 133$
"D" Door Leaf Width - Inches	100	125	150	175	200	
36"	3	3.5	3.5	4	4	Seconds
42"	3.5	4	4	4.5	4.5	Seconds
48"	4	4.5	4.5	5	5.5	Seconds

*Check applicable Building Codes for clear width requirements in Means of Egress.

ANSI 156.10

10.2.5 A swinging door shall be adjusted so that closing times to latch check shall be the minimum values in the following table: For doors of other weights and widths: $T = D\sqrt{W} / 188$

(D)oor	Inches	36" & Under	36"	42"	42"	48"	48"
(W)eight	Pounds	to 100lbs	to 140lbs	to 110lbs	to 150lbs	to 120lbs	to 160lbs
(T)ime	Seconds	2	2.3	2.3	2.7	2.8	3.2

Installation Of Door

300 Series

To install the door leaf, it is required that the door arm be attached to the operator spindle shaft in the door closed position and then rotated to the full open position — 90 degrees (operate or panic). The arm must be held in the open position for proper installation of the door. To secure the arm in the open position, there are two ways this can be done: (1) Secure the activating mat or hold open switch, if one is installed, causing the arm to rotate and stay in position while power is on. (2) Move the arm to either operate or panic open position and install the supplied 5/16-18 thumb screw to the hole located in the housing approximately 1" from the motor mount. This hole is on both sides. By tightening the screw, pressure is applied to the motor coupling and will hold the door arm into whatever position it is set in until this thumb screw is released.

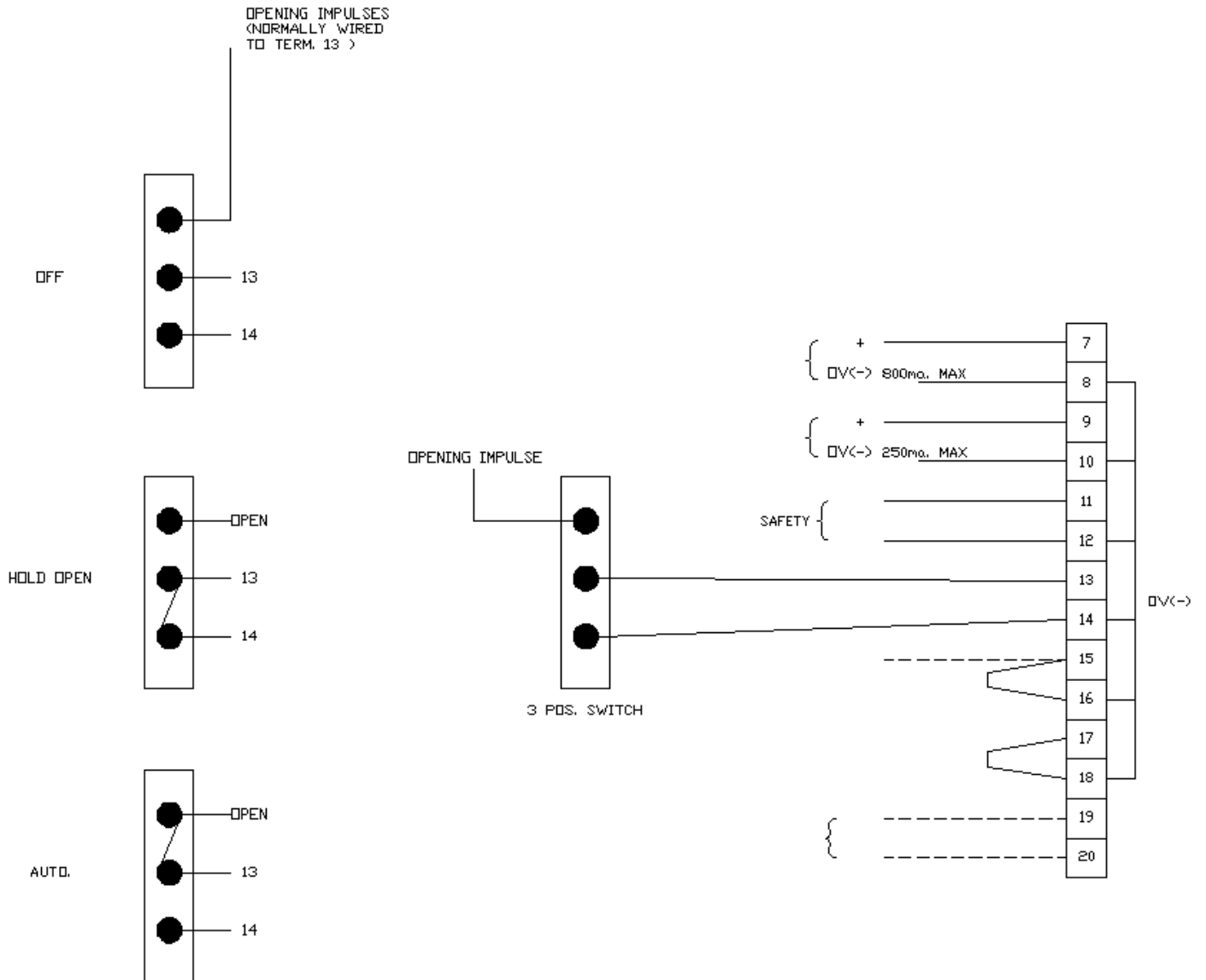
NOTE: See 400 Series instructions. Do not tighten excessively, only 2 or 3 pounds of force is required to hold the coupling. With the arm still attached to the operator shaft and the bottom pivot set in place, slide the door in from the hinge end over the bottom pivot and the operator arm being 3 guided into the top web of the door. Move door in until rivnuts line up with the screw holes in the top arm and secure with 4 1/4-20 x 1/ 1-4" flat head phillips machine screws through the arm to connect to the top of the door.

Now, loosen the set screw in the back of the operator arm which has been tightened to hold the arm on the operating shaft and allow the arm and door to settle against the bottom pivot. Re-tighten the top screws securely and then re-tighten the lock screw in the door operator arm. After this is complete, disconnect the activating device or release the screw holding the coupling arm allow the door to close. Re-check all operations of the door to see if the door is opening correctly and if adjustments in the opening speed and back-check are required. (See electrical installation drawings page 11 for these adjustments on the control box.) When the opening back-check, closing and latching speeds have been verified (latch speed is factory set and cannot be adjusted) the door should then be pushed in the direction opposite its normal swing to approximately 90° which is the panic position. The door in this position should be unable to operate under power and when released should return to the normal closed position in the same manner and speed as in the normal closing. There is one exception. Approximately 2" before the door reaches the stop position, the panic switch, being de-activated, will release the breaking force of the motor which is essential for the purpose of the door becoming ready to operate as a power unit again.

Having completed all of the above and having been satisfied that the door is in proper operating order, the removable cover plate on the housing should then be re-secured to the housing. The door is now ready to operate as an automatic unit.

400 Series

All 400 Series single acting (springs open to panic position) operators are supplied with the spindles secured in the 0° (closed) position by a 5/16"-18 thumb screw. Do not release thumb screw until door and external closed door stop has been installed. Note: For panic breakout applications a special retractable door stop (part no. 99-99-004) must be installed.



SWINGMASTER
3-POSITION SWITCH
WIRING DIAGRAM
DWG NO A-18018

Swingmaster® 350/450 Surface Applied Instructions

The Swingmaster® 350/450 Series operators are the same as the 300/400 Series with modifications added for use as a surface applied (conversion unit) operator.

The following pages include drawings showing how the 350/450 mounts on the different types of doors and the type of arm assemblies required to operate them.

The electrical requirements for the 350/450 are the same as the 300/400. **NOTE:** The switch harness assembly (panic breakaway) is wired differently for a 300 (panic spring close) and 400 (panic spring open) Series Swingmaster®. See pg. 11.

Install Housing, Operator, and PCB

Refer to drawing on page 14 for installing operator housing, operator and printed circuit board (PCB).

Back-Check CAM Setting

Measure the reveal (distance between operator mounting surface and the face of the door) and adjust backcheck CAM according to the type of hinge/pivot, operator hand, and required linkage according to CAM Chart No. 2, page 21. Reinstall the cam cover. The cover **must** be installed for the operator to maintain its UL rating.

Install Arm Assembly

Check the arms to be sure that all parts necessary are included and review the exploded view of the shaft adapter system shown on the template drawings. Locate door in correct door closed position and secure temporarily in place.

350/450 Center Pivoted Door - OUTSwing

Install the shaft adapter in the operator shaft. Attach door shoe part of arm assembly to the door leaf and with the arm assembly rotated to align with the operator shaft slip the arm over adapter, gently tapping it in place. Apply shaft adapter lock and attach with screw to operator shaft. When lock and adapter are attached to the shaft, tighten the 7/16 socket head cap screw in the arm securely, using at least a 6" extension on the socket wrench. Re-tighten the shaft adapter lock to be sure all three parts are adequately secured to the shaft. (Do not try to rotate shaft when installing door; linkage and operator shaft must remain in the closed position.) This will hold the door in the normally closed position when not in operation. A permanent closed door stop is required on a 450 operator. The 5/16-18 locking thumb screw must be released on the 450 operator before moving the door.

350/450 Hinge Or Offset Pivot - OUTSwing

Follow the same instructions for center pivoted door with the following exception for the 350 operator onl., To assure that there will be spring pressure acting on the door to hold it in the closed position a pre-load must be established. After locating and preparing door to receive door shoe, set arm on operator shaft so that the shoe is approximately 1" (see Template No. 1) from door in the closed position.

350/450 Center Pivoted Door - INSwing

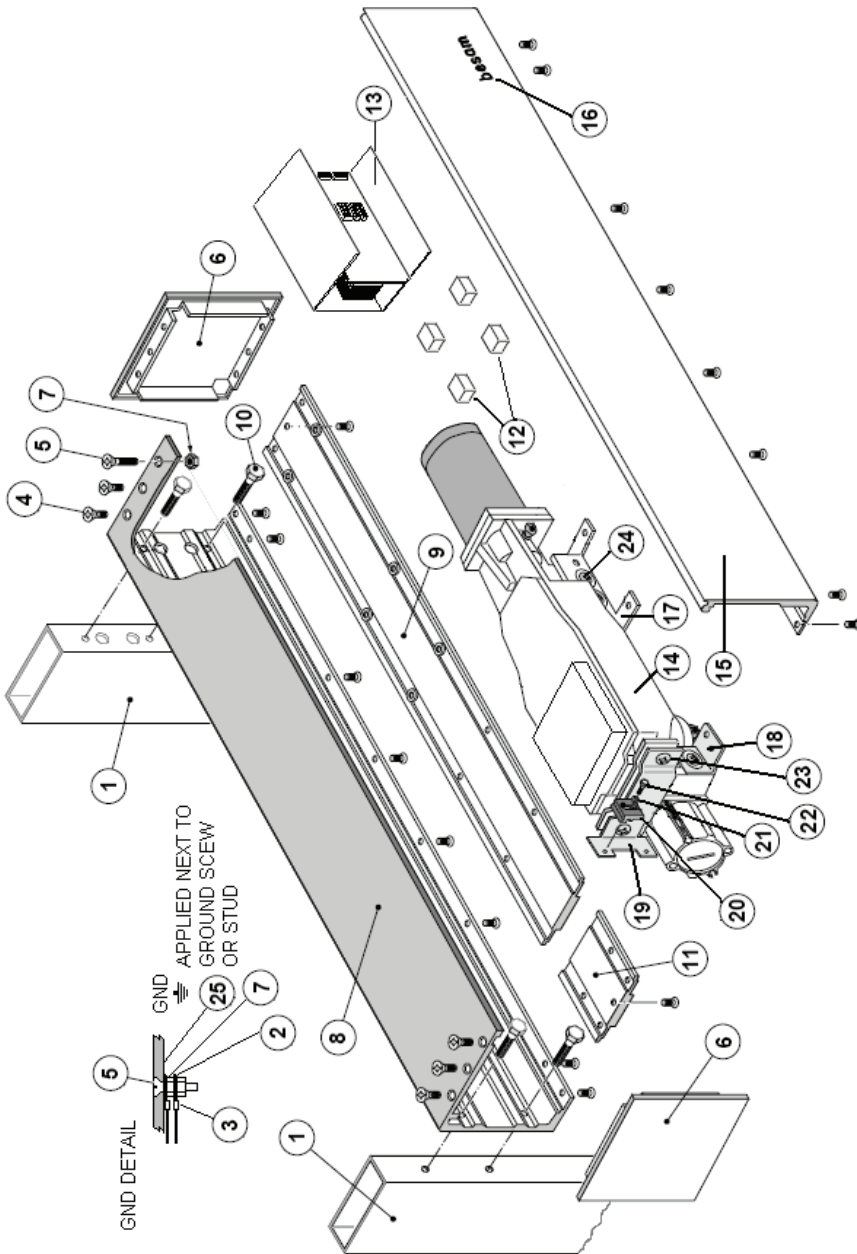
Attach door track to the door leaf. Install the shaft adapter on the operator shaft. Take the door arm with roller attached, insert the roller part into the track and align the arm with operator shaft. Slip the arm over the adapter gently tapping it into place. Apply shaft adapter lock and attach with screw to operator shaft. When lock and adapter are attached to shaft, tighten the 7/16 socket head cap screw in the arm securely using at least a 6" extension on the socket wrench. Re-tighten the shaft adapter lock to be sure all three parts are adequately secured to shaft (Do not try to rotate shaft when installing, because you are placing the arm with the door in the proper closed position and the operator shaft in the zero position. Release the door and it should be held in this position at the arm connection.

NOTE: The 450 Model requires a zero degree door stop. For panic breakaway applications a retractable stop must be installed.

350/450 Hinge Or Offset Pivot - INSwing

Follow the same instruction for center pivoted door with the following exception for the 350 operator. To assure that there will be spring pressure acting on the door to hold it in the closed position a pre-load must be established. After locating and preparing door to receive door track (do not install track yet), set arm on the operator shaft so the roller is approximately 1" from door in the closed position. Push the door to the open position and rotate the operator shaft to the open position by manually pushing it open with the arm and locking in place with the thumb screw or putting the function switch in HOLD OPEN. Slip the door track over the arm roller and secure to the door. For the 450 operator follow the same instructions for center pivot door.

1. ESTABLISH OPERATOR HOUSING HEIGHT AND CORRECT JAMB OVERLAP. NEW HOUSING DIMENSIONS ARE 6"x6".
2. PREPARE MOUNTING AND ELECTRICAL ENTRY HOLES IN THE JAMBS UTILIZING THE HEADER (8) AS A TEMPLATE AND AS SHOWN IN TEMPLATE DRAWINGS 1.4.5.8.
3. INSTALL 1/4-20 COUNTER SUNK RIVNUTS INTO THE JAMBS
4. INSTALL HOUSING (8) WITH 1/2-20 X 1" MS. INSTALL MAIN POWER AND SWITCH WIRING INTO THE HOUSING USING 3/4" ACCESS HOLES. WIRING CAN ENTER FROM HINGE OR STRIKE SIDE. IT IS PREFERRED TO ROUTE WIRING FROM STRIKE SIDE DUE TO LIMITED SPACE CONDITIONS ON HINGE SIDE. IF INSTALLING ON SHEET ROCK, CONCRETE, OR OTHER TYPE WALL USE APPROPRIATE MOUNTING HARDWARE FOR YOUR APPLICATION.
5. INSTALL THE BOTTOM SPINDLE CLOSURE (11) ACCORDING TO THE REQUIRED DOOR HANDING. POSITION TO THE L.H. SIDE FOR L.H. REGULAR/R.H. PARALLEL APPLICATION AND TO THE R.H. SIDE FOR R.H. REGULAR/L.H. PARALLEL APPLICATION. THIS PROVIDES A SHELF SUPPORT WHEN INSTALLING THE OPERATOR(S).
6. MEASURE THE DOOR REVEAL (DISTANCE FROM OPERATOR MOUNTING SURFACE AND FACE OF DOOR) AND ADJUST OPERATOR BACKCHECK CAM SETTING (SEE CAM CHART NO. 2). REINSTALL CAM COVER TO MAINTAIN LULLING.
7. INSTALL OPERATOR (14) SECURING IT TO THE SPINDLE CLOSURE WITH (2) 1/2-20 X 3/8 F.H.M.S. INSTALL THE BOTTOM CLOSURE (9) AND SECURE THE CENTER OPERATOR SUPPORT BRACKET (19) WITH (4) 1/4-20 X 3/8 F.H.M.S.
8. FAILURE TO INSTALL THE SUPPORT BRACKET WILL LEAD TO PREMATURE BUSHING FAILURE OF THE OPERATOR MOUNTS. IF NEEDED, THE HEADER CAP CAN BE REMOVED TO INSTALL THE SUPPORT BRACKET CLIP. REINSTALL END CAP AFTER SUPPORT BRACKET IS SECURED.
9. NOTE: IF DUMMY PIVOT (18) IS BEING UTILIZED IT CAN BE INSTALLED AFTER BOTH BOTTOM CLOSURES (12) AND (14) ARE INSTALLED. THE DUMMY PIVOT IS SECURED WITH (2) 1/2-20 X 3/8 F.H.M.S. THRU THE SPINDLE CLOSURE (12).
10. INSTALL PCB CONTROL WIRE (13) AND GROUND (GREEN) WIRES TO OPERATOR HOUSING BRACKET AS SHOWN. THE PCB CONTROL (13) IS SECURED TO THE BOTTOM CLOSURE (9) WITH SELF ADHESIVE TAPE PROVIDED (12).
11. INSTALL DOORS AND TUNE ACCORDING TO INSTALLATION MANUAL PART NO. 30-23-023
12. INSTALL HOUSING COVER(S) W/ 1/4-20 x 3/8" F.H.M.S.



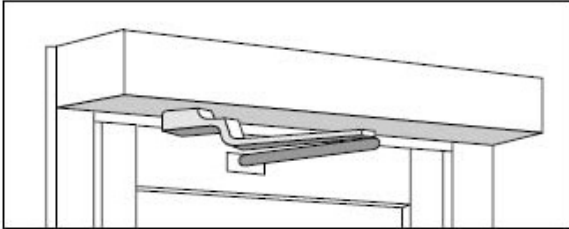
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ITEM	QTY.	DESCRIPTION	P/N	CLEAR	P/N	BRONZE
25	1	Label, Ground	30-24-006			
24	3	WASHER, FLAT, 3/8-16	30-09-224			
23	5	3/8-16 X 1-1/4 TRUSS HD. MACH. SCR.	30-09-223			
22	1	1/4-20 X 3/8 H.H.M.S.	21-09-004			
21	1	WASHER, FALT 1/4-20 THIN WALL	21-09-005			
20	1	CLAMP	21-04-003			
19	1	TOP STABILIZER BRACKET	35-03-001			
18	*	MTG. BRKT. (OPERATOR) SEPARATE	30-04-005			
17	*	MTG. BRKT. (OPERATOR) SEPARATE	30-04-006			
16	1	LABEL, BESAM	11-20-203			
15	1	REMOVABLE COVER	30-15-324			30-15-325
14	1	OPERATOR				
13	1	P.C. BD. ASSY. (INC. 11 & 20)	30-15-010			
12	4	BUMPONS	30-20-231			
11	1	CENTER COVER, BTM SPINDLE CLOSURE	XXXXX			
10	4	SCREW, 1/4-20 X 1-1/4 FHMS	30-09-274			
9	1	CENTER COVER	30-15-320			30-15-321
8	1	FIXED COVER	30-15-322			30-15-323
7	2	NUT, 1/4-20 HEX	50-09-107			
6	2	END CAP ASSY.	30-15-300			30-15-301
5	1	SCREW 1/4-20 X 1 FHPMS	31-09-200			
4	23	SCREW 1/4-20 X 3/8 F.F.H.	40-09-200			
3	2	LUG 1/4-20 CRIMPON	30-02-019			
2	2	1/4" Star Washer, Int.	30-09-216			
1	2	JAMB TUBE	XXXXX			

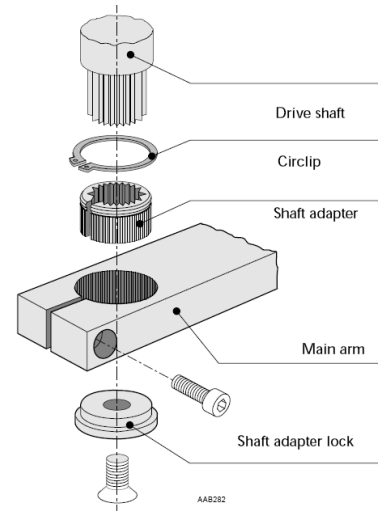
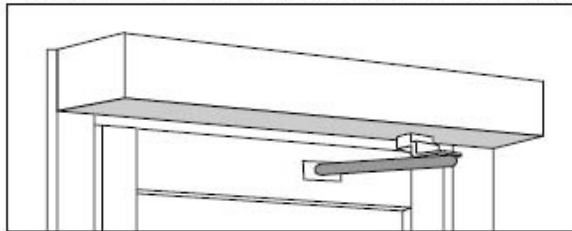
Installation for surface applied

Models

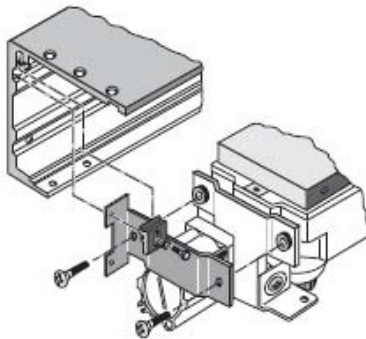
Pushing arm system on a left-handed door shown (header/case side).



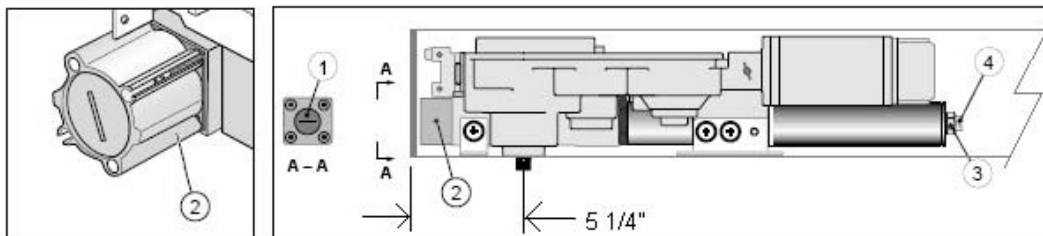
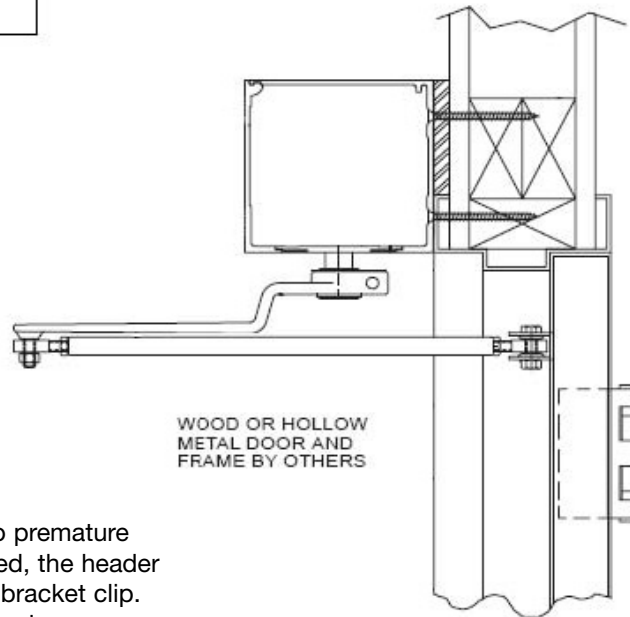
Pushing arm system on a right-handed door shown (header/case side).



Arm systems (Surface applied), shown above. The arm system incorporates an adapter, which fits the splines of the drive shaft and permits fine adjustment of the arm system angle. Note the orientation of the slots in both the arm and the adaptor is critical for secure connection.



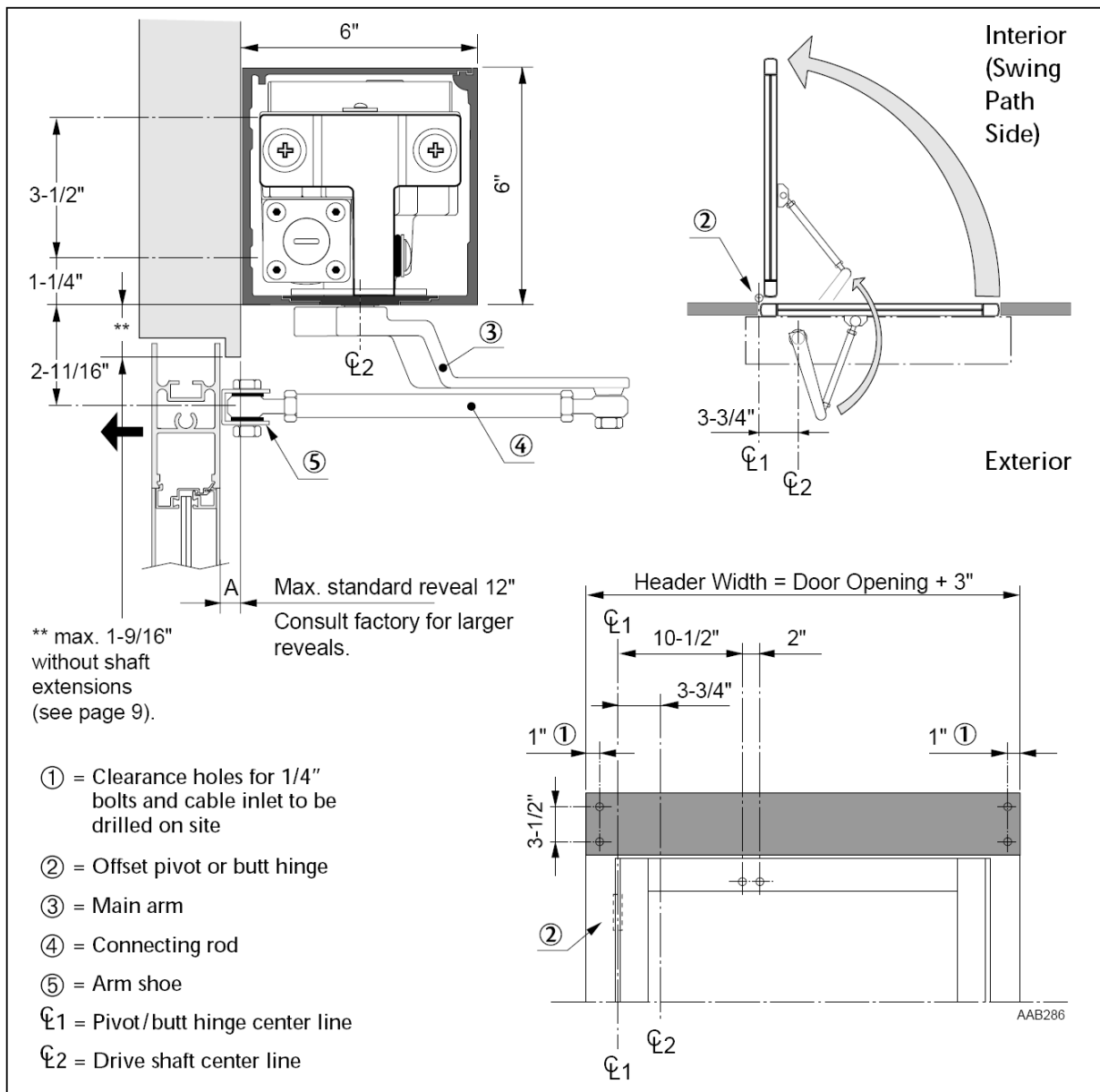
Failure to install the support bracket will lead to premature bushing failure of the operator mounts. If needed, the header end cap can be removed to install the support bracket clip. Reinstall end cap after support bracket is secured.



- (1) Left-handed drive unit: Adjustment bolt for opening angle. Screw out to increase and in to decrease.
- (2) Rack extension housing
- (3) Door stop locking nut (right-handed drive unit)
Silver color = Standard energy spring Gold color = Low energy spring
- (4) Door stop locking nut (right-handed drive unit)

Installation for surface applied Pushing arm system, NAS

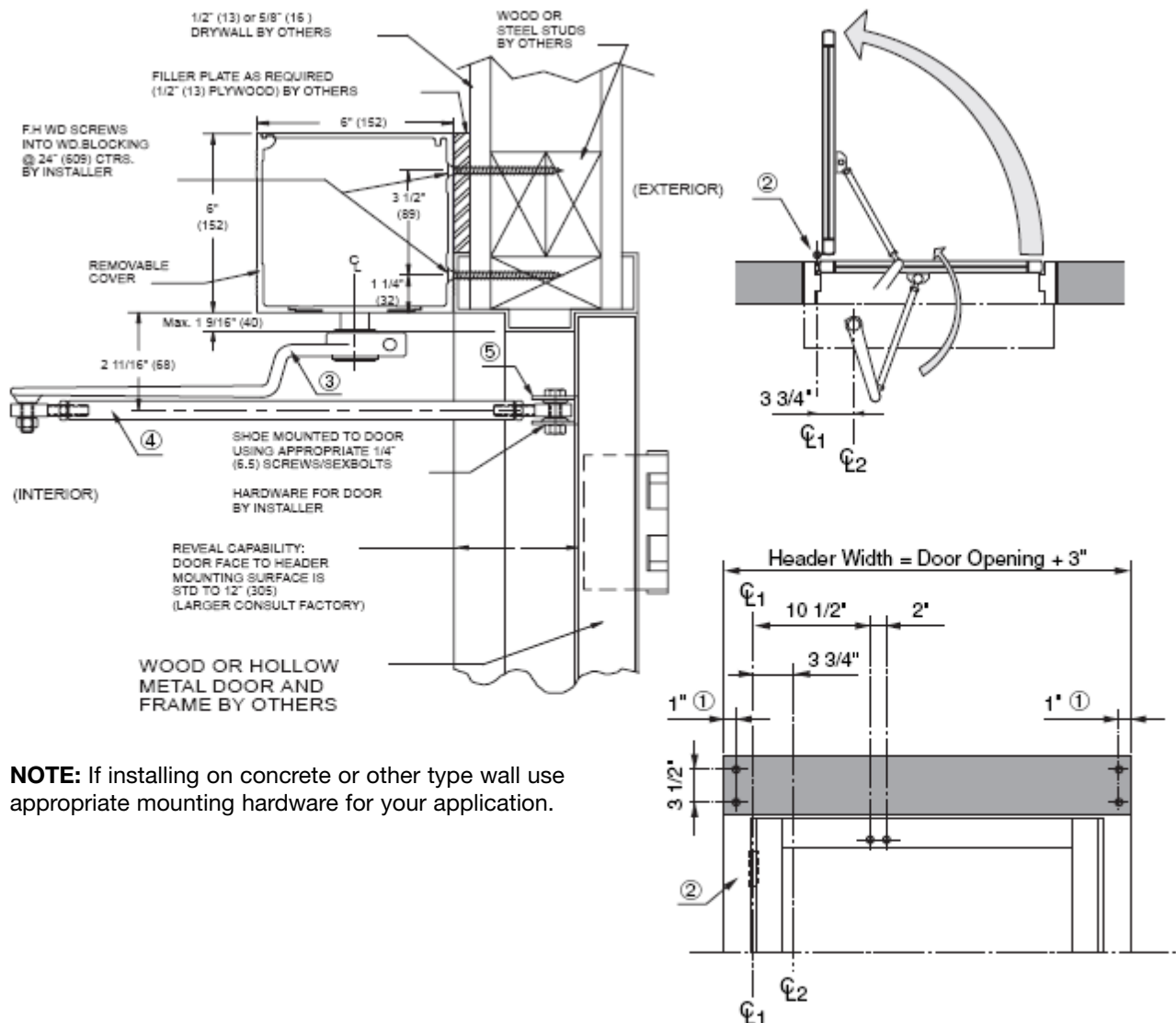
The NAS (pushing arm system) consists of a main arm, connecting rod, arm shoe and shaft adapter. If the reveal "A" (the distance from the wall surface to the door surface) is more than 4 inches, a longer connecting rod is needed for the NAS. The maximum standard reveal is 12" (consult factory for larger reveals). All dimensions given here correspond to an opening angle of 90-100°. Operator with NAS on a left-handed door shown (right-handed door mirror image).



Installation for surface applied

Pushing arm system, NAS

Drywall / wood frame installation.



NOTE: If installing on concrete or other type wall use appropriate mounting hardware for your application.

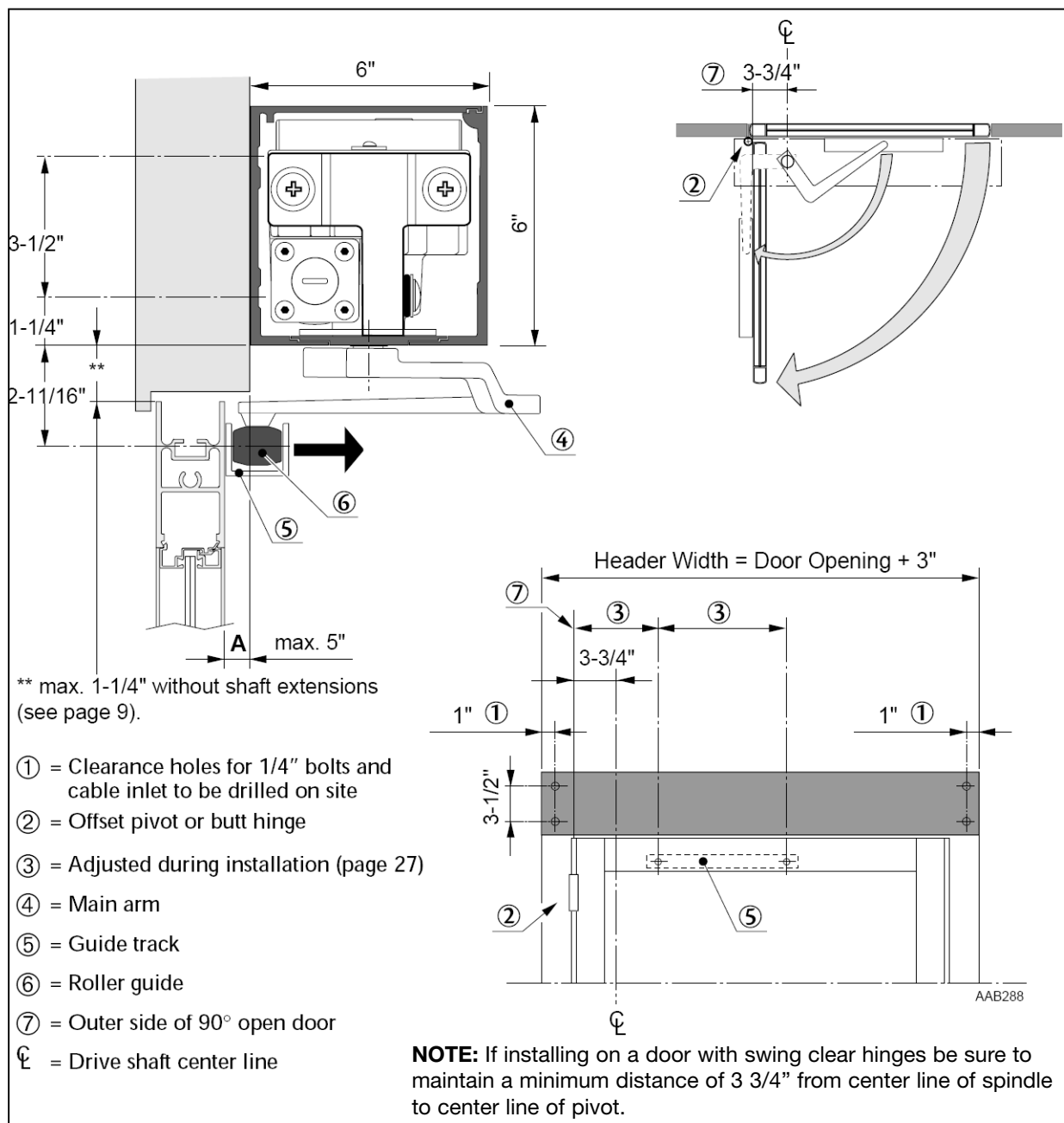
ILL-00231

Installation for surface applied Pulling arm system, PAS

The PAS (pulling arm system) consists of a main arm, guide track, roller guide and shaft adapter. The maximum reveal, or distance from the wall line to the door leaf (A), should not exceed 5 inches.

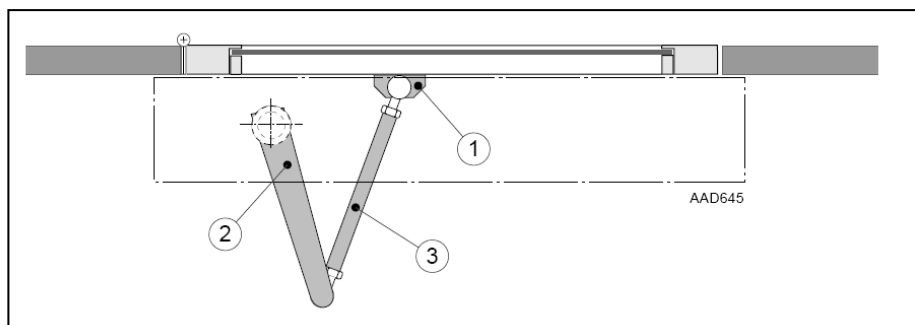
For center pivot doors only: if the reveal is one inch or less, use the standard length (15") guide track; if the distance is between 1" to 5", use a longer (20"+) guide track contact Besam Entrance Solutions. All dimensions given here correspond to an opening angle of 90-100°.

Operator with PAS on a right-handed door shown (left-handed door mirror image).



Installation for surface applied Push Arm system

1. Locate the door in closed position.
2. Mark the door for the arm shoe fixing holes (see page 16 or 17 for correct dimensions).
3. Drill and thread or use rivnuts or sex bolts.
4. Apply the shaft adapter to the drive shaft. Slip the main arm with connecting rod and arm shoe onto the shaft adapter so that the arm shoe meets the door in the proper place.
5. Tighten the main arm to the drive shaft.
6. Attach the arm shoe with screws as required.



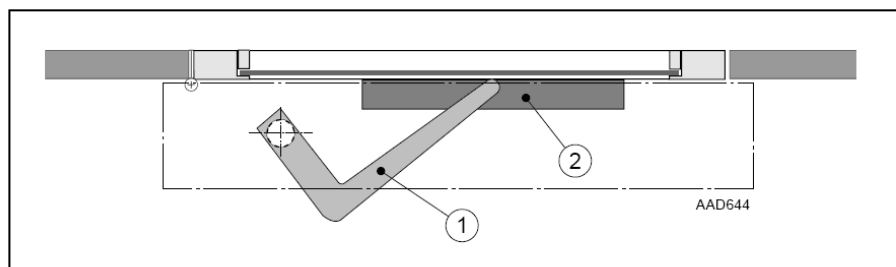
- ① Arm shoe
- ② Main arm
- ② Connecting rod

Pulling arm system, PAS

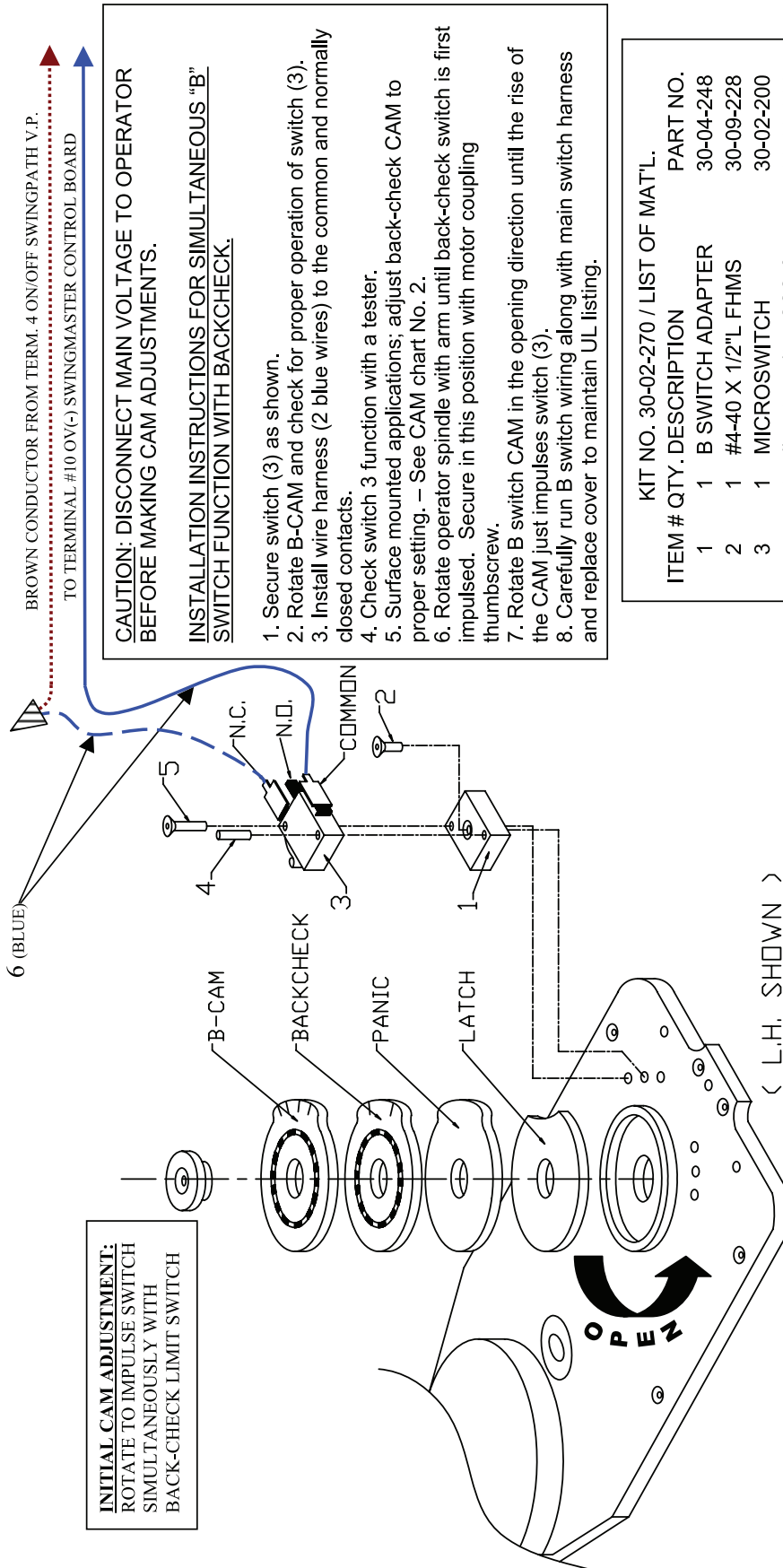
1. Locate the door in closed position.
2. Apply shaft adapter to the drive shaft. Slip the main arm with roller guide onto the shaft adapter, so that the roller is just in contact with the door.
3. Tighten the main arm to the drive shaft.
4. During the opening and closing movement of the door, the roller guide will move a certain distance on the door. Mark the end positions for this distance.

Note! The end positions do not always occur when the door is fully closed and fully open.)

5. To make the installation of the guide track easier, open the door to approx. 90°, lock the arm with the thumb screw and close the door.
6. Position the guide track symmetrically over the marks on the door, with the center of the fixing holes 2-3/4 from the lower edge of the operator. Mark on the door for the fixing holes. Drill and thread or use rivnuts or sex bolts.
7. Release the locking thumb screw. The main arm moves back and stops when the roller hits the door.
8. Attach the guide track to the door with the roller guide fitted into the track. Use appropriate screws.



- ① Main arm
- ② Guide Track



INITIAL CAM ADJUSTMENT:
 ROTATE TO IMPULSE SWITCH
 SIMULTANEOUSLY WITH
 BACK-CHECK LIMIT SWITCH

CAUTION: DISCONNECT MAIN VOLTAGE TO OPERATOR BEFORE MAKING CAM ADJUSTMENTS.

INSTALLATION INSTRUCTIONS FOR SIMULTANEOUS "B" SWITCH FUNCTION WITH BACKCHECK.

1. Secure switch (3) as shown.
2. Rotate B-CAM and check for proper operation of switch (3).
3. Install wire harness (2 blue wires) to the common and normally closed contacts.
4. Check switch 3 function with a tester.
5. Surface mounted applications; adjust back-check CAM to proper setting. — See CAM chart No. 2.
6. Rotate operator spindle with arm until back-check switch is first impulsed. Secure in this position with motor coupling thumbscrew.
7. Rotate B switch CAM in the opening direction until the rise of the CAM just impulses switch (3).
8. Carefully run B switch wiring along with main switch harness and replace cover to maintain UL listing.

KIT NO. 30-02-270 / LIST OF MAT'L.		
ITEM #	QTY. DESCRIPTION	PART NO.
1	B SWITCH ADAPTER	30-04-248
2	#4-40 X 1/2" L FHMS	30-09-228
3	MICROSWITCH	30-02-200
4	#4-40 X 5/8" L SSS CUP PT.	30-09-261
5	#4-40 X 7/8" L RHMS (PH)	30-09-268
6	WIRE HARNESS	30-02-228
7	INSTALLATION DRAWING	30-23-031

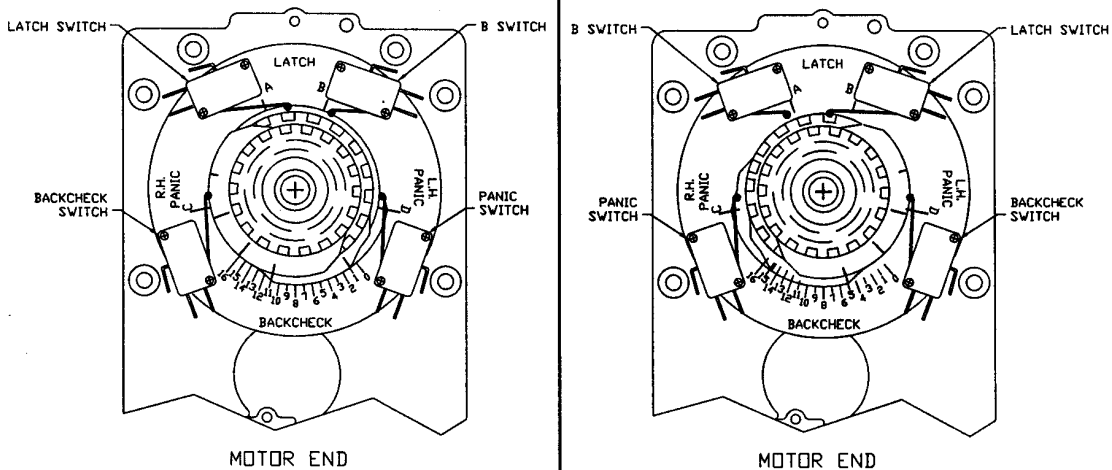
FOR CAM CHART: REFER TO INSTALLATION MANUAL P/N 30-03-025

B-CAM SWITCH KIT
 INSTALLATION
 W/ CAM KITS
 (#30-15-230 & #30-15-240)

DWG: B-90079
 P/N 30-23-031

MODEL	SWING	LATCH	PANIC	BACKCHECK
#300 AND #305	R.H.	A	D	#11 FOR 90° OPEN
	L.H.	B	C	#5 FOR 90° OPEN
#350 AND #355	R.H.	A	D	SEE BACKCHECK CHART #2
	L.H.	B	C	SEE BACKCHECK CHART #2
#400 AND #405	R.H.	A	D	#11 FOR 90° OPEN
	L.H.	B	C	#5 FOR 90° OPEN
#450 AND #455	R.H.	A	D	SEE BACKCHECK CHART #2
	L.H.	B	C	SEE BACKCHECK CHART #2

**SWITCH CAM SETTINGS
LATCH-PANIC-BACKCHECK
SWINGMASTER MODELS
#300 & #400 SERIES
OPERATORS
#300 SERIES: DOUBLE
ACTING
#400 SERIES: SINGLE
ACTING**



RIGHT HAND OPERATION

LEFT HAND OPERATION

**FOR REVEAL DIM'S., LINKAGE REQUIREMENTS AND BACKCHECK CAM SETTINGS
FOR SURFACE APPLICATION SEE CHART NO. 2. besam SWINGMASTER**

**SWITCH CAM SETTINGS
BACKCHECK
SWINGMASTER MODELS
#350 - #55 - #450 & #455
B.H. = BUTT HINGE
O.P. = OFFSET PIVOT
C.P. = CENTER PIVOT**

REVEAL DIM.	DOOR SWING	B.H. OUT	O.P. OUT	ROD LENGTH	C.P. OUT	ROD LENGTH	B.H. IN	O.P. IN	TRACK LENGTH	C.P. IN	TRACK LENGTH
0-1"	R.H.	#7	#8	10-1/4"	#11	10-1/4"	#5	#6	14"	#8	14"
	L.H.	#9	#8	10-1/4"	#5	10-1/4"	#11	#10	14"	#8	14"
2"	R.H.	#7	#8	10-1/4"	#12	10-1/4"	#5	#5	14"	#7	20"
	L.H.	#9	#8	10-1/4"	#4	10-1/4"	#11	#11	14"	#9	20"
3"	R.H.	#7	#8	10-1/4"	#12	12-1/4"	#4	#5	14"	#7	20"
	L.H.	#9	#8	10-1/4"	#4	12-1/4"	#12	#11	14"	#9	20"
4"	R.H.	#7	#9	10-1/4"	#12	12-1/4"	#4	#4	14"	#6	24"
	L.H.	#9	#7	10-1/4"	#4	12-1/4"	#12	#12	14"	#10	24"
5"	R.H.	#8	#9	12-1/4"	#13	14-1/4"	#4	#4	14"	#5	24"
	L.H.	#8	#7	12-1/4"	#3	14-1/4"	#12	#12	14"	#11	24"
6"	R.H.	#8	#9	12-1/4"	#13	14-1/4"	#2-1/2	#3	14"	#5	24"
	L.H.	#8	#7	12-1/4"	#3	14-1/4"	#13-1/2	#13	14"	#11	24"
7"	R.H.	#8	#9	14-1/4"	#13	16-1/4"					
	L.H.	#8	#7	14-1/4"	#3	16-1/4"					
8"	R.H.	#8	#9	14-1/4"	#13	16-1/4"					
	L.H.	#8	#7	14-1/4"	#3	16-1/4"					
9"	R.H.	#8	#9	16-1/4"	#13	18-1/4"					
	L.H.	#8	#7	16-1/4"	#3	18-1/4"					
10"	R.H.	#8	#9	16-1/4"	#13	18-1/4"					
	L.H.	#8	#7	16-1/4"	#3	18-1/4"					
11"	R.H.	#8-1/2	#9-1/2	18-1/4"	#13	20-1/4"					
	L.H.	#7-1/2	#6-1/2	18-1/4"	#3	20-1/4"					
12"	R.H.	#8-1/2	#9-1/2	18-1/4"	#13	20-1/4"					
	L.H.	#7-1/2	#6-1/2	18-1/4"	#3	20-1/4"					

**CONSULT FACTORY FOR
LARGER REVEALS ON
IN SWING DOORS.**

**BACKCHECK CAM
SETTINGS FOR CENTER PIVOT
DOORS ARE FOR 3-3/4" PIVOT
DIMENSIONS ONLY. SEE
LARGER CHART FOR 2-3/4"
PIVOT CAM SETTINGS.**

**besam
SWINGMASTER
CAM CHART NO. 2**

NOTE: After setting cams
reinstall cover to maintain
UL listing.

Setting Operator Stops

With arm securely attached to the door, move the door to the open position desired and secure temporarily with the 5/16-18 thumb screw in the hole located next to the motor and tighten finger tight against the motor coupling. (Be sure to release/remove before moving the door.) Referring to page 7, OHC and 15, SA adjust opening limit stop as required and secure stop lock to hold in place. If door cannot be opened to the full open position, adjust the limit stop to increase the door travel. When stop is secured, allow door to close.

When all of the above has been completed, apply cover, recheck all fasteners including all switches externally or otherwise. The door is now ready for operation when proper switches and activating devices have been installed.

Swingmaster® 300/350 Handing Conversion

(400/450 Series are handed and cannot be converted.)

There is basically one operator that when properly set up can handle all hands. The 300 Series operator and 350 Series surface applied conversion unit differ only by the addition of an extension block and a different spring tube assembly which provide the increased stroke required when surface linkage is utilized. The block acts as an adjustable left hand door stop. A 300 cannot be converted to a 350 or vice versa without changing to the proper spring tube assembly.

NOTE: The 350 extension is located in the 1 1/2" header overlap of the frame and cannot be cut down if overlap restrictions are found.

The header case is also designed to be versatile and the bottom closure piece can be repositioned (spindle opening) to accommodate a right hand or left hand application. Surface applied headers are always 3" longer in length than overhead concealed headers.

NOTE: Special decal aids for the alignment of the CAM positions and switch locations are installed in the operator for the convenience of the installer and performance for future service.

Remove the limit switch cover. To establish the hand of the operator, carefully inspect the location of the switches against the figures given on CAM Chart No. 1, page 21. If a handing change is necessary, proceed with the following:

1. Remove the latch switch (yellow wires and 1 spacer). Reverse and relocate to opposite side as indicated in CAM Chart No. 1. The wiring remains the same. Be sure to reinstall the 1 spacer on the bottom.
2. Remove back-check (3 spacers) and panic (2 spacers) switches. Remove spacers from each switch and reinstall spacers on opposite side of their respective switch. Reverse switches (with spacers reinstalled), wires, etc. and reinstall hold down screws. (See figure given on CAM Chart No. 1, page 21.)
3. Loosen the locking set screw holding the CAMS to allow the CAMS to be rotated and realigned.
4. Realign latch switch CAM (bottom CAM) by first centering the indicator marks around "A" and "B" on the alignment ring. For right hand operation align indicator mark approximately at "A" to be in line with "A". For left hand operation align mark at "B" to be in line with "B"

NOTE: The following step is for Swingmaster® 300, 305, 400 and 405 concealed models only.

5. Realign back-check CAM (3rd CAM from bottom) by first centering the CAM lobe (high point) between the back-check switch and the panic switch. For right hand operation: align the indicator mark (on the CAM) closest to the back-check switch with No. 11 on the alignment ring (back-check marks). For left hand operation: align the indicator mark (on the CAM) closest to the back-check switch with No 5.

NOTE: The following is for Swingmaster® 300, 350, 355, 450 and 455 surface mounted models only.

- 5.1 Realign back-check CAM (3rd CAM from bottom) by first centering the CAM lobe (high point) between back-check switch and panic switch. Determine the amount of reveal, hand of door and how door is to be; or is hung; i.e., butt hung, center pivot or offset pivot Refer to CAM Chart No. 2, page 21 for the specific reveal (Reveal is the distance from face of door to the back of the operator when installed)
6. Hold latch CAM and back-check CAM in place

NOTE: The following is for ALL models:

7. Rotate panic CAM (2nd CAM from bottom) by first centering the CAM lobe (high point) between backcheck and panic switches. For right hand operation: align the indicator mark (on the CAM) closest to the panic switch with "D" on alignment ring. For left hand operation: align the indicator mark (on the CAM) closest to the panic switch with "C" on alignment ring.
8. Holding the CAMS in their proper location tighten locking screw.
9. Activate the operator checking all the limit switch functions. It may be necessary to readjust the CAMS if the degree of activation of backcheck (70° - 75°), or latch (10° - 15°) is not satisfactory. Dress up the wiring and reinstall the switch cover to maintain UL listing. Reinstall the operator. Plug the motor into the opposite connector. Be sure to check the panic breakaway function by pushing the door in the panic direction approximately 2 - 3 degrees, the operator should deactivate. This setting allows for wind loads and keeps the controlled panic closing speed within the door frame.

Switch "B" Kit (Part No. 30-02-221)

All Swingmaster® models may already be equipped with a Switch "B" CAM Kit (see Drawing B-90079, pg. 20). The "B" Switch is primarily used with the Besam VisionPulse®. Swing Door Presence Sensor System. It can also be used as a low voltage door status (position) switch to control system such as airlocks, air curtains, annunciator, locks and etc.

Troubleshooting Swingmaster®

When troubleshooting suspected Swingmaster® PCB faults, all detectors should be disconnected. Jumpers should be in place across No's. 15-16, 17-18, 19-20. Door should be activated with a jumper across terminal 13 and 14.

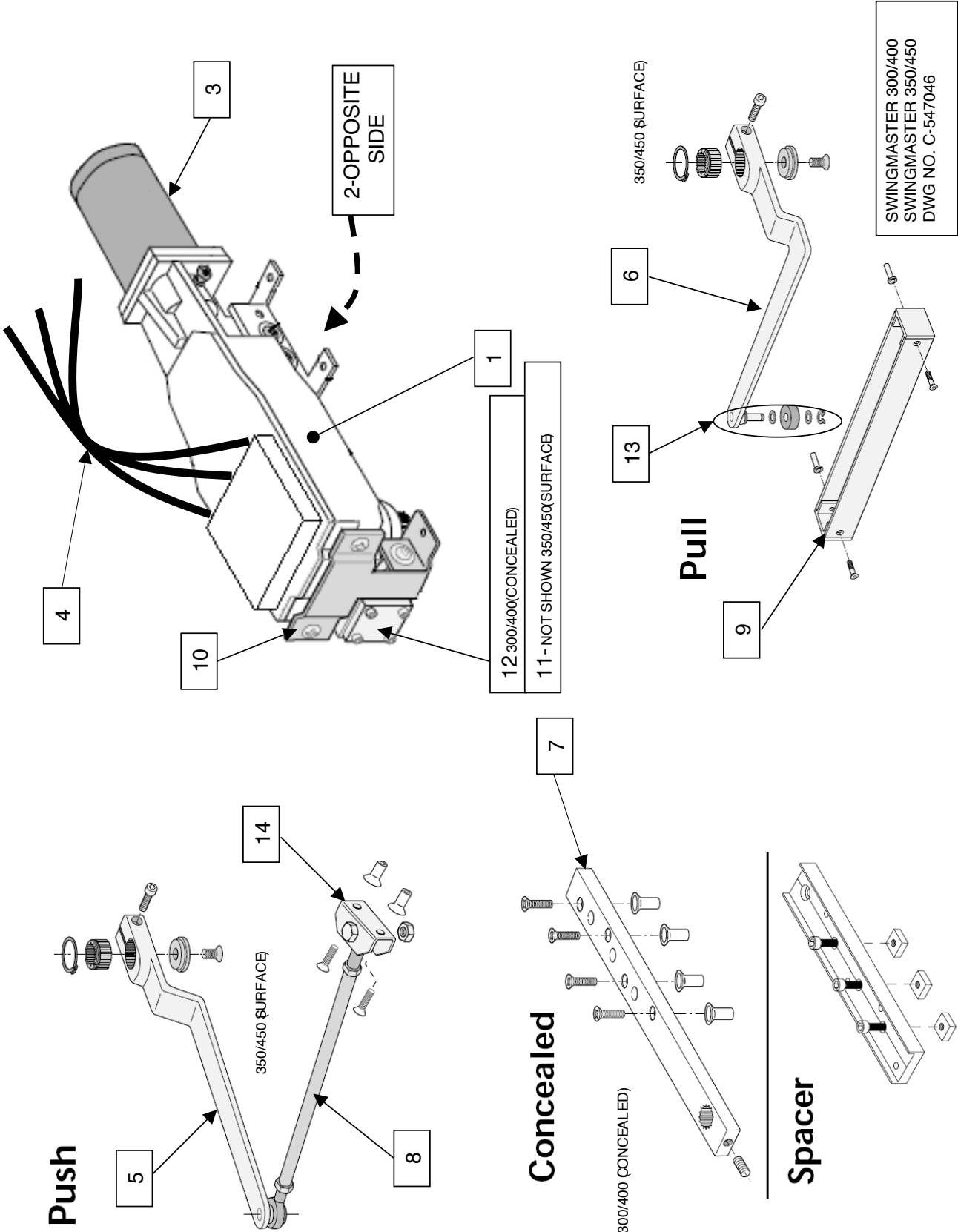
Fault	Possible Reasons Why	Remedies/Explanations
Door won't open	Low or absent main power.	Check for 110 VAC at Terminals 3 (NEU) and 5 (HOT).
	Blown main fuse.	Check 3AT fuse for single or 7A fuse for dual PCB for continuity.* NOTE: Also check PCB for physical damage or burnt components at this time.
	Blown control fuse.	Check both 1.5A fuse for continuity.* These fuses are in line with the 24 VCD regulated and the 15-20 VDC unregulated supplies used to power VisionPulse® sticks and/or other detectors
	CAM switches in incorrect position.	Check CAM chart and wiring Diagram for correct CAM and switch position at 0°. Also check for correct switch harness wiring to plugs. *All fuse continuity and switch function checks should be made with the mains disconnected.
Door won't open	Open motor windings.	Unplug motor from PCB. Short white and black leads or motor plug and manually open door. Release door carefully to prevent glass breakage and observe closing speed. If extremely slow, motor windings are okay. If door slams closed then motor windings are open. NOTE: PCB relay will still engage in both of these cases.
	Motor fuses blown	On dual PCB's check 3AT fuses located in fuse towers for continuity.*

Troubleshooting

Fault	Possible Reasons Why	Remedies/Explanations
Door holds open	Short PCB activate circuit.	PCB should be returned to Besam for repair.
	Mechanical problem with operator	Operator should be returned to Besam for repair
Door opens slow	Operating in back check speed.	Mispositioned CAM or defective back-check switch. Check function with ohm meter.*
Door closes slow.	Contacts on PC8 relay pitted or stuck	Replace relay or return PCB to Besam for repair.
	Operating in latch speed	Defective latch switch. Check function with ohm meter.*
	Closing resistor R-1 value incorrect.	Match operator type with correct resistor value.
No speed control. Door slams open.	Short in motor drive circuits.	Return PCB to Besam for repair.
Door stops at backcheck and recycles.	Problems with low speed switching control.	(1) Adjustment of back-check speed too low (2) Back-check switch not contacting CAM (3) Broken wire to back-check switch (4) Harness wiring incorrect.
Door closes fast	Closing resistor R-1 value incorrect.	Match operator type with correct resistor value.

NOTE:

When a lockout relay is used, such as the BEA LO-21, the hold voltage may have to be set higher so the lockout relay can work properly. Anytime a lockout is used on a 455 operator, the hold voltage must be set to about 12 VDC for the lockout to work. This causes the door to creep open when in hold.



SWINGMASTER 300/400
 SWINGMASTER 350/450
 DWG NO. C-547046

SPARE PARTS LIST FOR SWINGMASTER 300/400 & 350/450 SERIES (DWG. C-547046) PG. 1 OF 3

ITEM NO.	DESCRIPTION	PART NO.	300	305	400 RH	400 LH	405 RH	405 LH	350	355	450 RH	450 LH	455 RH	455 LH	REMARKS
1	OPERATOR COMPLETE	30-10-001	X												
1	OPERATOR COMPLETE	30-10-002		X											
1	OPERATOR COMPLETE	35-10-001			X										
1	OPERATOR COMPLETE	35-10-002				X									
1	OPERATOR COMPLETE	35-10-003					X								
1	OPERATOR COMPLETE	35-10-004						X							
1	OPERATOR COMPLETE	30-10-051							X						
1	OPERATOR COMPLETE	30-10-052								X					
1	OPERATOR COMPLETE	35-10-051									X				
1	OPERATOR COMPLETE	35-10-052										X			
1	OPERATOR COMPLETE	35-10-053											X		
1	OPERATOR COMPLETE	35-10-054												X	
2	SPRING TUBE ASSEMBLY	30-15-101	X												
2	SPRING TUBE ASSEMBLY	30-15-102		X											
2	SPRING TUBE ASSEMBLY	30-15-106			X										
2	SPRING TUBE ASSEMBLY	30-15-107				X									
2	SPRING TUBE ASSEMBLY	30-15-108					X								
2	SPRING TUBE ASSEMBLY	30-15-109						X							
2	SPRING TUBE ASSEMBLY	30-15-104							X						
2	SPRING TUBE ASSEMBLY	30-15-105								X					
2	SPRING TUBE ASSEMBLY	30-15-110									X				
2	SPRING TUBE ASSEMBLY	30-15-111										X			
2	SPRING TUBE ASSEMBLY	30-15-112											X		
2	SPRING TUBE ASSEMBLY	30-15-113												X	
3	ELECTRIC MOTOR	30-02-101	X	X	X	X	X	X	X	X	X	X	X	X	
4	SWITCH HARNESS	30-02-203	X	X					X						
4	SWITCH HARNESS	30-02-212			X	X	X	X			X	X	X	X	

SPARE PARTS LIST FOR SWINGMASTER 300/400 & 350/450 SERIES (DWG. C-547046) PG. 2 OF 3

ITEM NO.	DESCRIPTION	PART NO.	300	305	400 RH	400 LH	405 RH	405 LH	350	355	450 RH	450 LH	455 RH	455 LH	REMARKS
5	OUTSWING ARM (STD)	30-06-211							X	X	X	X	X	X	CLEAR
5	OUTSWING ARM (STD)	30-06-223							X	X	X	X	X	X	BRONZE
6	INSWING ARM (CAST) R.H.	30-06-213							X	X	X		X		CLEAR
6	INSWING ARM (CAST) R.H.	30-06-224							X	X			X		BRONZE
6	INSWING ARM (CAST) L.H.	30-06-216							X	X		X		X	CLEAR
6	INSWING ARM (CAST) L.H.	30-06-225							X	X		X		X	BRONZE
7	CENTER PIVOT ARM ASSY	30-06-101	X	X	X	X	X	X							
8	CONNECTING ROD (STD)	30-06-200							X	X	X	X	X	X	CLEAR
8	CONNECTING ROD (STD)	30-06-199							X	X	X	X	X	X	BRONZE
9	INSWING TRACK (STD)	30-06-202							X	X	X	X	X	X	CLEAR
9	INSWING TRACK (STD)	30-06-236							X	X	X	X	X	X	BRONZE
10	MOUNTING KIT	30-15-202							X	X	X	X	X	X	
10	MOUNTING KIT	30-15-211	X	X	X	X	X	X							
11	EXTENSION KIT	30-15-217							X	X	X	X	X	X	
12	RACK GEAR STOP KIT	30-15-216	X	X	X	X	X	X							
13	INSWING ROLLER KIT	30-15-224							X	X	X	X	X	X	
14	DOOR BRACKET	30-06-209							X	X	X	X	X	X	CLEAR
14	DOOR BRACKET	30-06-222							X	X	X	X	X	X	BRONZE
15	OIL SEAL	30-20-206	X	X	X	X	X	X	X	X	X	X	X	X	(NOT SHOWN)
16	OIL SEAL	30-20-207	X	X	X	X	X	X	X	X	X	X	X	X	(NOT SHOWN)
17	RUBBER MOUNTS	30-20-201	X	X	X	X	X	X	X	X	X	X	X	X	SET OF 5 (NOT SHOWN)
18	COVER	30-04-231	X	X	X	X	X	X	X	X	X	X	X	X	
19	SWITCH "B" KIT	30-02-221							X	X	X	X	X	X	
20	OUTSWING ARM ASSY (STD)	30-05-102							X	X	X	X	X	X	(CLEAR)
20	OUTSWING ARM ASSY (STD)	30-06-217							X	X	X	X	X	X	(BRONZE)
21	ADAPTER KIT	30-15-202							X	X	X	X	X	X	(NOT SHOWN)



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Monroe, NC 28110
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Besam Support Services

For 24 hour-a-day service, contact 1-877-BESAM-US

Besam follows a policy of advancements in development. For this reason, specifications may be changed without notice.

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