SEES SMOOTH OPERATOR
DOOR OPERATOR
INSTALLATION AND
ADJUSTING MANUAL

I

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COMMENTS
The SEES Smooth Operator is an off the shelf product and configured for general installation. It will require adjustments to actual job conditions.

IMPORTANT:
All equipment should be installed, adjusted, tested and to comply with all Federal, State, and Local codes. Section 7.1, page 37 displays the charts for Kinetic Energy and closing force requirements. Before mounting the operator, check that the car door is plumb, free and moves easily without bind. Refer to the dimensional charts for all kinematic dimensions for proper operation.

WARNINGS:

The SEES Smooth Operator should only be installed by licensed and trained elevator mechanic. Mechanical and electrical components could cause bodily harm to the installer or passengers if the instructions are not followed properly. Proper precautions should be followed to prevent electrical shock. The conduit should be firmly fastened to motor and control box. The box needs to be grounded and all electrical and building codes should be adhered to.

This operator has universal functions that may require field modifications such as cutting drive arms to proper length. Make sure to deburr all edges to prevent injury and damage to other mating parts that could cause premature failure.

** Be sure to set you input voltage to allow the controls to respond to the input signals. Set the input voltage 5V less than the measured voltage. If measured voltage is 24V, set input voltage to 20V. Unit will respond to any signal above 20V as that point.

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FOREWORD

The purpose of the document is to provide the trained service technician the proper guidelines for a safe and successful installation of the SEES Door Operator. It provides general instructions but not specific details on the applicable job nor provide details on the door headers, tracks, hangers and etc.

We hope this provides enough guidance to allow for a quick installation and operation of the Smooth Door Operator for continuous use and flawless operation.

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SOUTHERN ELEVATOR & ELECTRIC SUPPLY

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SEES SMOOTH OPERATOR

The SEES Smooth door operator is our latest model. It utilizes a 1/2 HP AC motor with a VVVF drive and a PC board. The illustrations on this page show the three different versions available; Left Hand, Right Hand and Center Parting
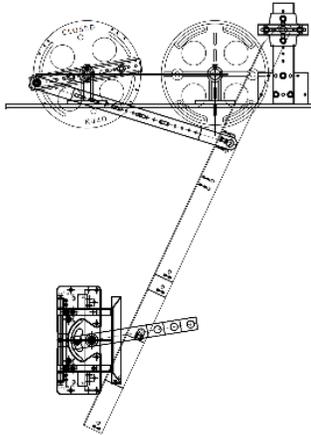
LH OPERATOR   **RH OPERATOR**

CENTER PARTING

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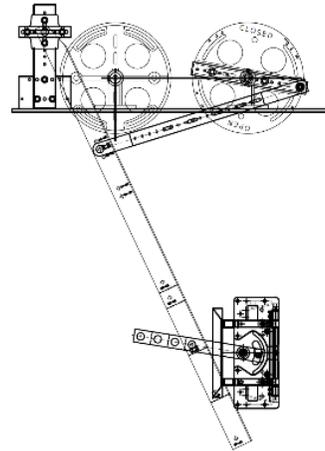
ESTABLISHING THE HAND OF THE DOOR

SEES Smooth door operators are available in right hand, left hand and center parting doors configurations. Center parting doors are a left hand operator 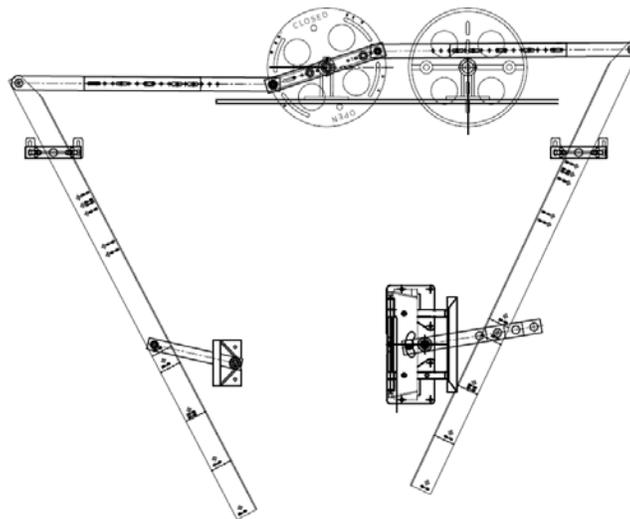with different linkages. To determine the hand of the door, stand outside the elevator facing the hall door. If the doors close to the left, it is a left hand door. If the door closes to the right it is a right hand door. It is possible to change a left hand into a right hand, but requires significant amount of work. The figures below show the door hand.
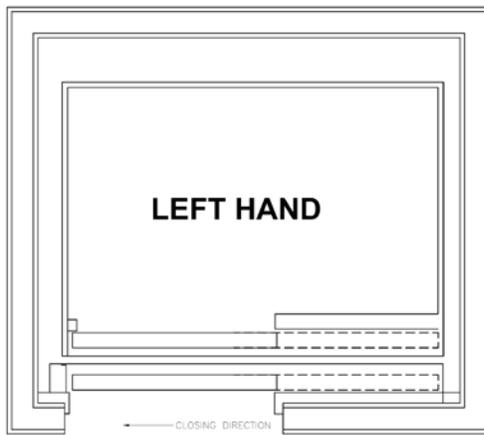
LEFT HAND DOOR
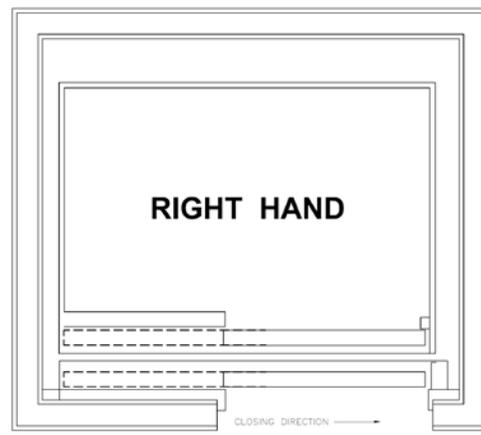
RIGHT HAND DOOR

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MOUNTING PROCEDURE

When installing a SEES Smooth operator, it is important to have the proper mechanical set up. Before proceeding, check that the doors are properly hung and operate smoothly. Ensure the door closers are installed properly and close the doors completely. The operator should be mounted in the proper position with the drive arm plumb and the operator arm and pivots set according to the Operator Data tables (SEES-SS for single speed, SEES-2S for two speed). Slight differences are acceptable.

Install the isolation pads.
Cork isolation pads are provided and should be used to minimize noise and vibration transmission into the cab. These pads are self-adhesive and should mount to the bottom of the operator base plate.

Set the header plumb.
Place the operator over the mating header holes on the header. Set the base flush with the face of the header assembly and tighten the front bolts only. Align the operator base and header, using a plumb bob to ensure proper alignment. Secure the rear of the base to the rear mounting brackets to prevent any unintended movement of the header. The header and rear supports should made of a metal with a thickness greater than 16ga steel and should not be of a combustable type.

Side opening Doors:
After securing the rear bolts from above operation, ensure the vertical centerline of the operator drive pulley is 9 3/4" from daylight for a door opening of 22" to 44" and 14 3/4" for a door opening of 45" to 48" (see figure 3 and Appendix drawings SEES-SS and SEES-2S).

Center parting Doors:
For center parting doors, the center of the door opening lines up with the center of the header track. The center of the drive pulley should also line up with center of the opening (see figure 6 and Appendix drawings SEES-CP)

Determining the position of the front edge of the door operator base:
Mount the drive arm assembly to the drive arm support brackets. Depending on if it is a side opening or center parting, the drive arm support brackets will vary. The mounting brackets are slotted to allow adjustment later on. Using the Appendix drawings determine the length of the drive arm and cut to size. Make sure to deburr edges to prevent injury or interference with mating parts. Cut on the etched lines.

At this time, position the arms in the center of the bracket and tighten it. Attach the connecting linkage assembly to the drive pulley, making sure that when the word "CLOSED" is on top the doors will be closed. Use the Appendix to determine the proper length, adjust and tighten the linkage to drive pulley.

Attach the clutch to the drive door using the pre-tapped holes on the door panel. Then connect the clutch linkage to the door drive arm. For center parting doors, attached the other door to its linkage and tighten the door bracket to the center of the slots.

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At this point, connect the rear supports to the door operator base, adjust so the drive pulley is vertically level. This helps to prevent binds in the opening and closing. Check that the operator arms hang free and are not forced to or away from the operator drive pulley. Make adjustments as needed.

Turn the drive pulley by hand making sure that the drive arms and connecting links are perpendicular and clear of door and track. Proper positioning of the operator is critical to the life of the arm bearings. Bending of the drive arms will place stress on the bearings reducing their operating life. Once the operator base is in correct position, permanently fasten the rear of the operator and tighten all mounting bolts. Make sure to use isolation pads on rear support as well.

Drive Arm Size:
SEES Smooth Operator comes with a universal drive arm that requires field modification. Each hole is marked with the door opening size and etched lines for cutting. Refer to the Appendix drawings SEES-SS, SEES-2S, SEES-CP for the required length. Cut on etched line and debur edges to prevent injury or inference with mating parts. See below diagram and example:

For a SS 40" door opening the dimensions "F" and "E" should be 20" and 26" respectively from the SEES-SS table.
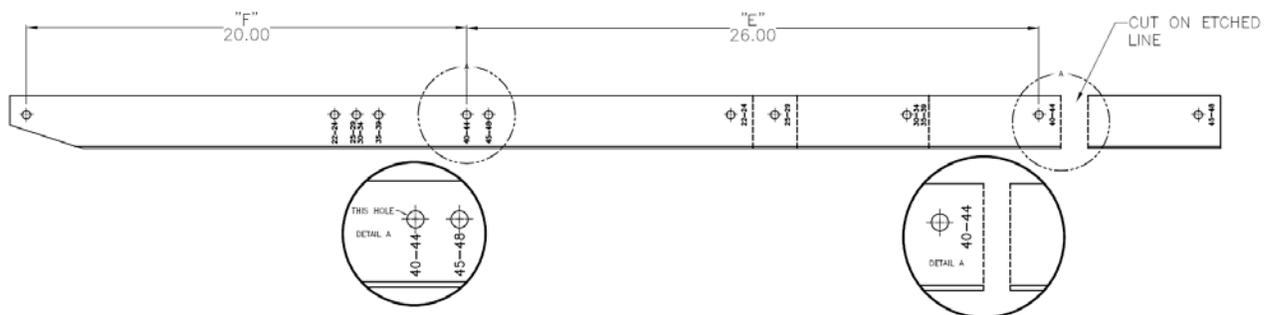
4
PRE-ADJUSTMENT

READ THE FOLLOWING BEFORE PROCEEDING TO THE ADJUSTMENT SECTIONS (REFER TO FIGURE 1)
The crank arm determines the total door travel. The further the mounting pin is away from the center of the drive pulley, the longer the door travels.
The connecting link determines the door position. The longer the arm, the further the door moves from the jamb.
Example:
If the door opening is 44" but the door travels only 42" as stopped by the open and close limit cams, do not alter the cams. The cams have been factory pre-set. Correct it by extending the crank arm outward from the drive pulley until the door travels 44" from fully open to fully closed (as determined by the limit cams), then fasten the crank arm in place.
Now, loosen the connecting link bolts, close the door against the stop roller and tighten one of the link bolts. Open the door until the open limit is activated and check the door position. If the door is not in the proper open position, close the door and readjust the connecting link. Repeat the above steps until the operation is complete and the fasten the two link bolts. Make sure that the closing door is stopped against the stop roller and not the strike post.

Remembering the above two points will facilitate door adjustments.

FIGURE 1

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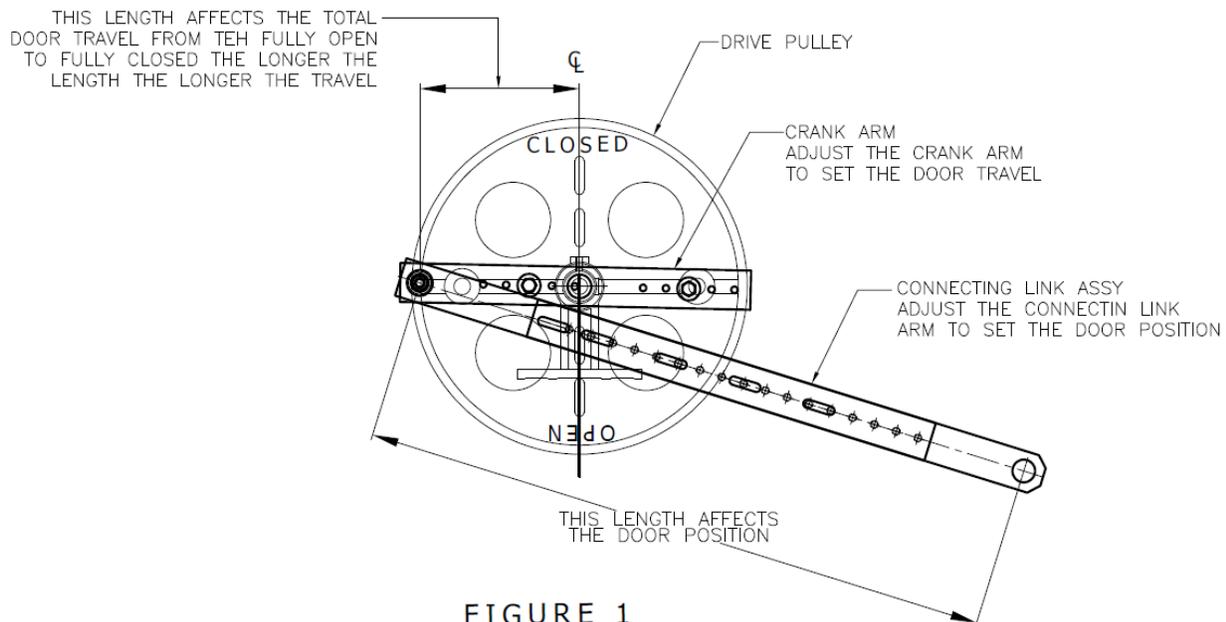
5
ADJUSTING THE SINGLE SPEED AND TWO SPEED SLIDE DOORS

5.1 Removing the zone locking device and the bumpers:
Before adjusting the operator, remove the car door bumpers and the locking cam from the zone locking device. By removing these items, you will not have any interference during adjustment.

5.2 Adjusting the release roller and clutch:
Referring to figure 2A, adjust the lock release rollers so that they will clear the clutch by about 3/16" when the car door is in its final closed position and the drive pulley stop roller is against the stop plate. Adjust the clutch cam and roller depth as per figures 2C and 2D. The clutch should retract as late as possible in the closing cycle

FIGURE 2A
DOORS FULLY CLOSED

FIGURE 2B
DOORS FULLY OPENED

FIGURE 2C
CAR DOOR OPEN 1/2"

FIGURE 2D
CAR DOOR OPEN 1/2"
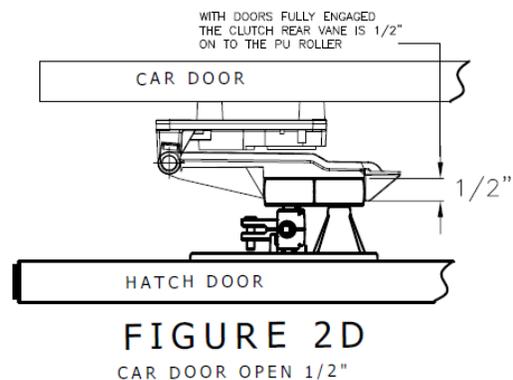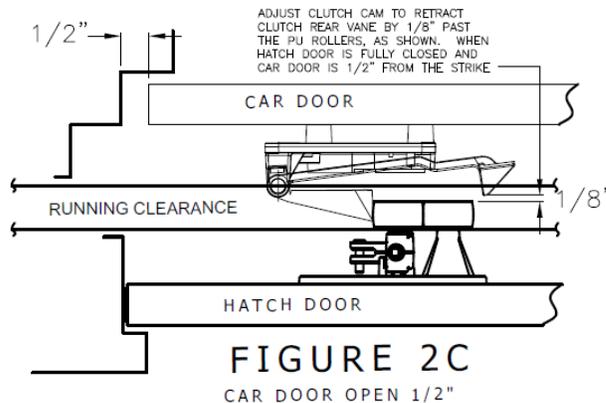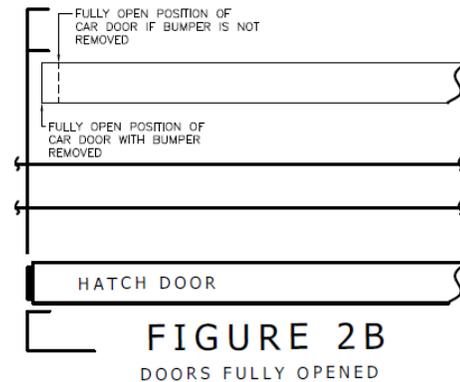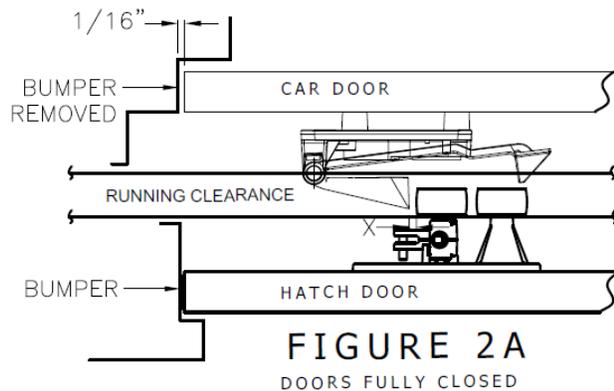
5.3 Crank arm and clutch link positions with door closed:

Referring to figure 3, with the door fully closed, the crank arm should be just a few degrees above the horizontal and the clutch link about 20 degrees above the horizontal. This setting will help prevent slamming and roll back. It will still allow manual opening of the doors when the car is stopped at a landing with no power.

If adjustments are necessary, close the car door. Loosen the two connecting link bolts and the two crank arm bolts. Keeping the door fully closed, adjust the link and arms to the proper positions. If necessary, move the bolts to new holes. Re-tighten all four bolts when finished.
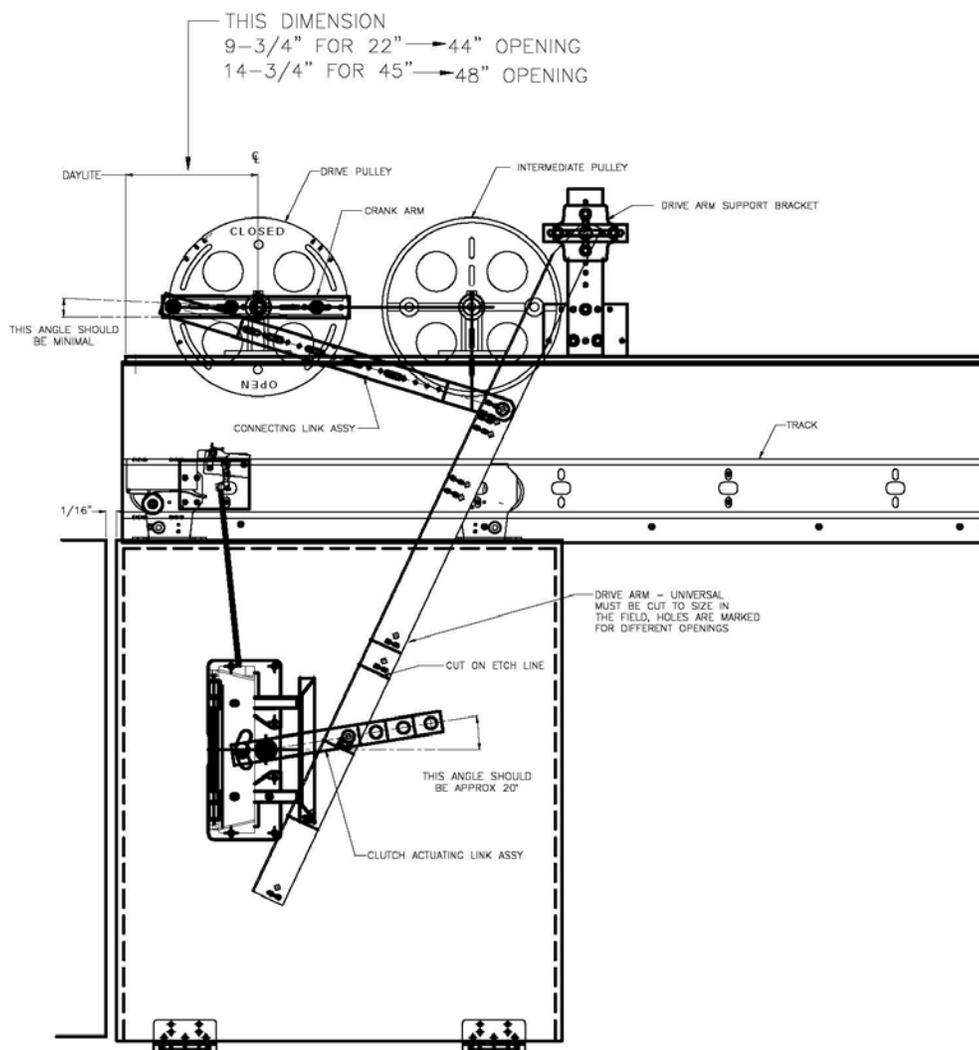
FIGURE 3
DOOR FULLY CLOSED

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5.4 Crank arm and clutch link positions with door open:

Referring to figure 4, the best practice is to align the crank arm and the connecting link in a straight line, the clutch link is about horizontal and the car door is approximately 1/2" past the return jamb. To make this adjustment, turn the drive pulley toward the open direction by hand until the crank arm and the connecting link are in line. Adjust the crank arm to bring the car door to 1/2" into the return jamb, then re-adjust the door open limit to stop the door at this position.
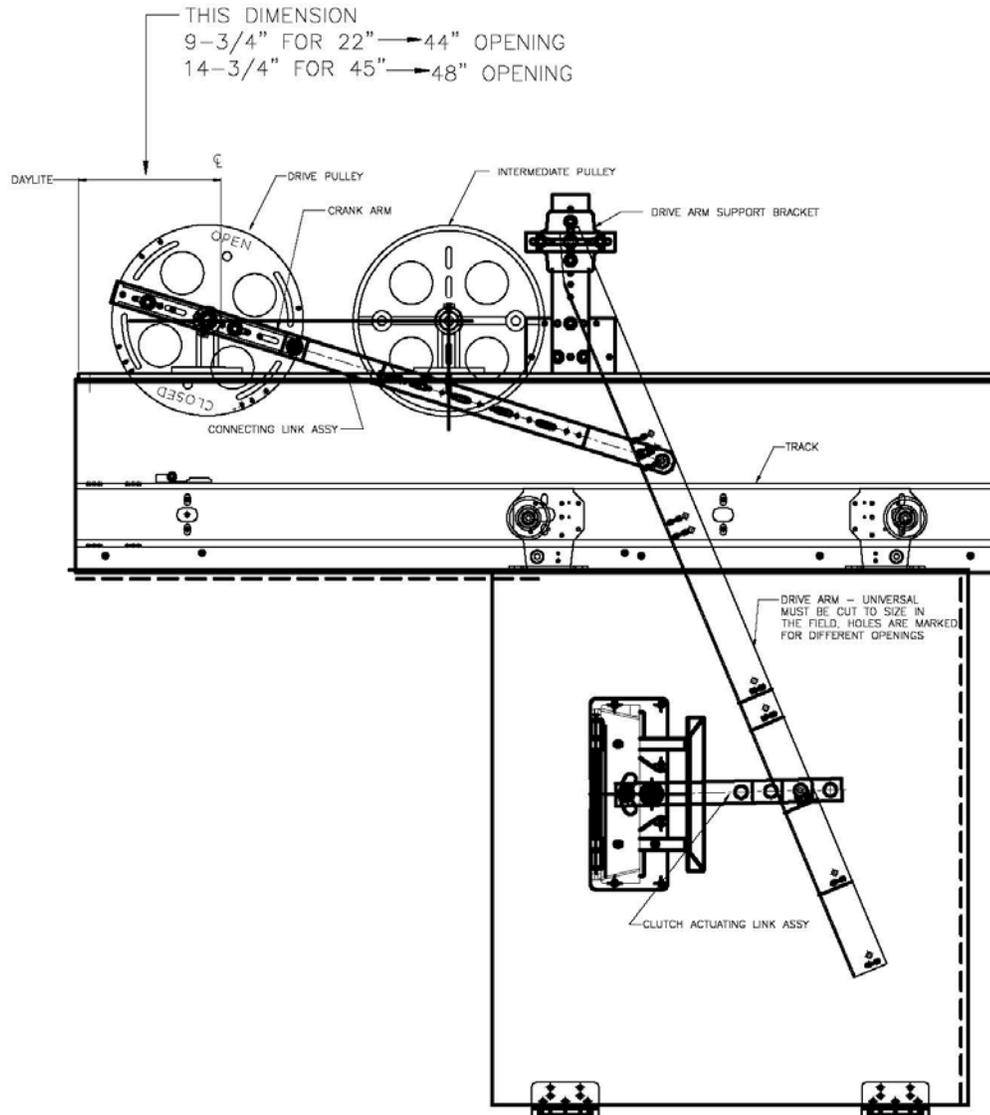
FIGURE 4
DOOR FULLY OPENED

6
ADJUSTING CENTER PARTING CAR DOORS

6.1 Adjusting the stop roller:

Referring to figure 5A, we recommend adjusting the driven car door so that it leads the hoistway door by 1/4". This will make the car door match the hoistway door when fully open. Adjust the stop roller on the drive pulley so that the closing doors will be stopped by the roller as they meet. Do not have pressure on the meeting car doors, otherwise it will place unwanted stress on the arms.

6.2 Adjusting the release roller and clutch:

Referring to figure 5A, adjust the lock release rollers so that they will clear the clutch by about 3/16" when the car doors are in their final closed position and the operator stop roller is against the stop plate. Adjust the clutch cam as per figures 5B and 5C. The clutch should retract as late as possible in the closing cycle
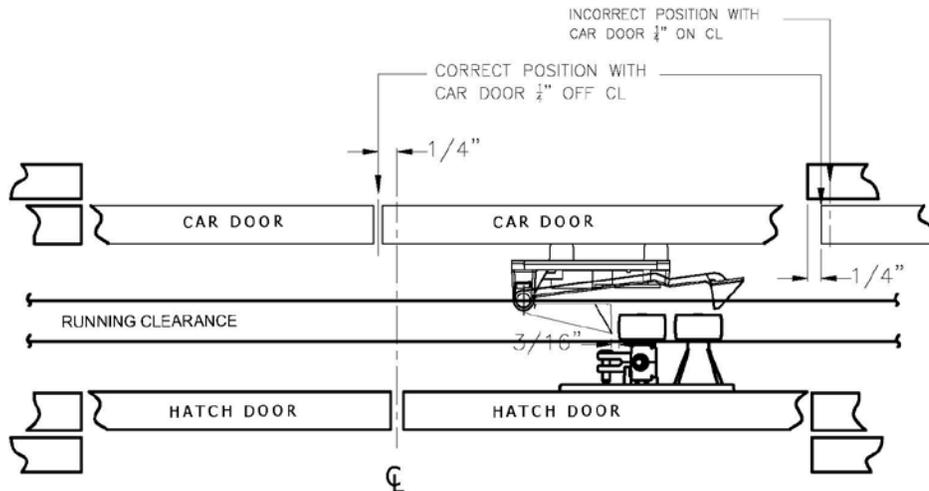
FIGURE 5A
DOORS FULLY CLOSED
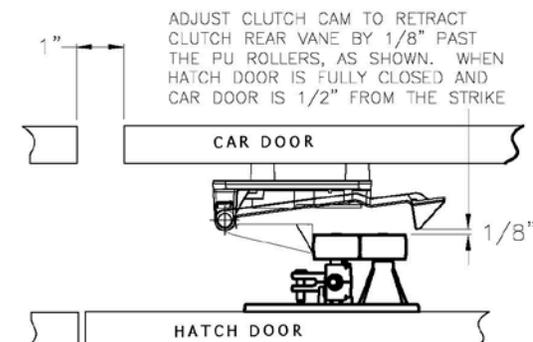
FIGURE 5B
CAR DOOR OPEN 1"
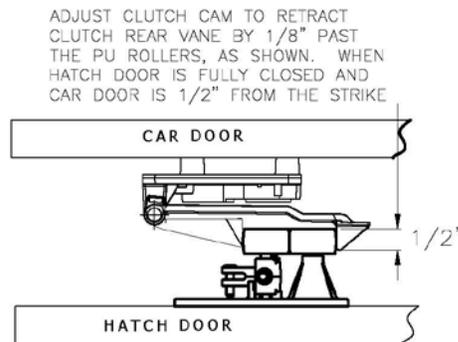
FIGURE 5C
DOORS FULLY ENGAGED

6.3 Crank arm and clutch link positions with doors closed:

Referring to figure 6, with the doors fully closed, the connecting links should be about 1 1/2" from the horizontal centerline of the pulley. The clutch link and door drive arm should both be at about 20 degrees above the horizontal. as shown.

FIGURE 6
DOOR FULLY CLOSED

6.4 Crank arm and clutch link positions with doors open:

Referring to figure 7, with the doors fully open, the connecting links should be about 1 1/2" apart. the clutch link should be at about 20 degrees above the horizontal.

FIGURE 7
DOOR FULLY OPENED

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SOUTHERN ELEVATOR
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45-48	6	
22-44	1	
D.O.	T	

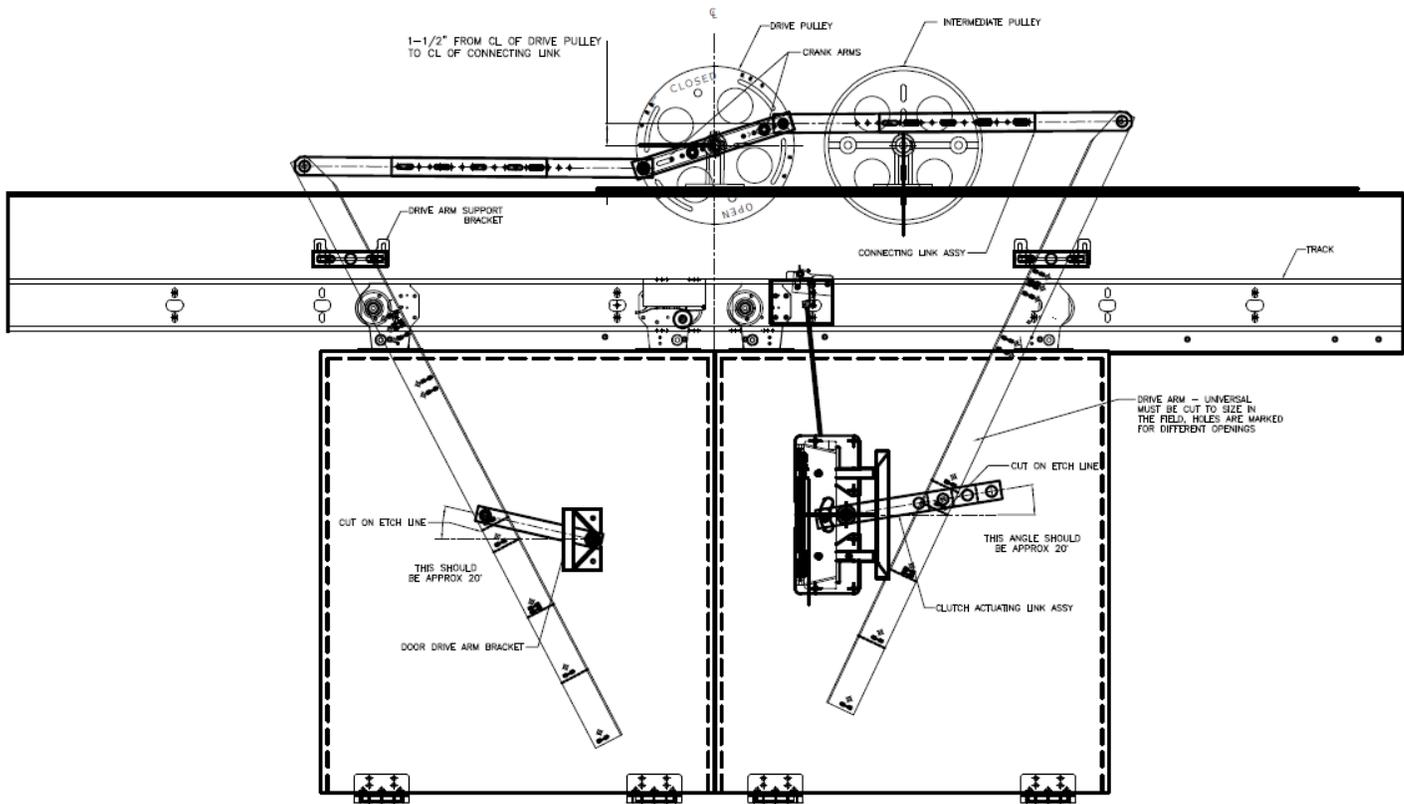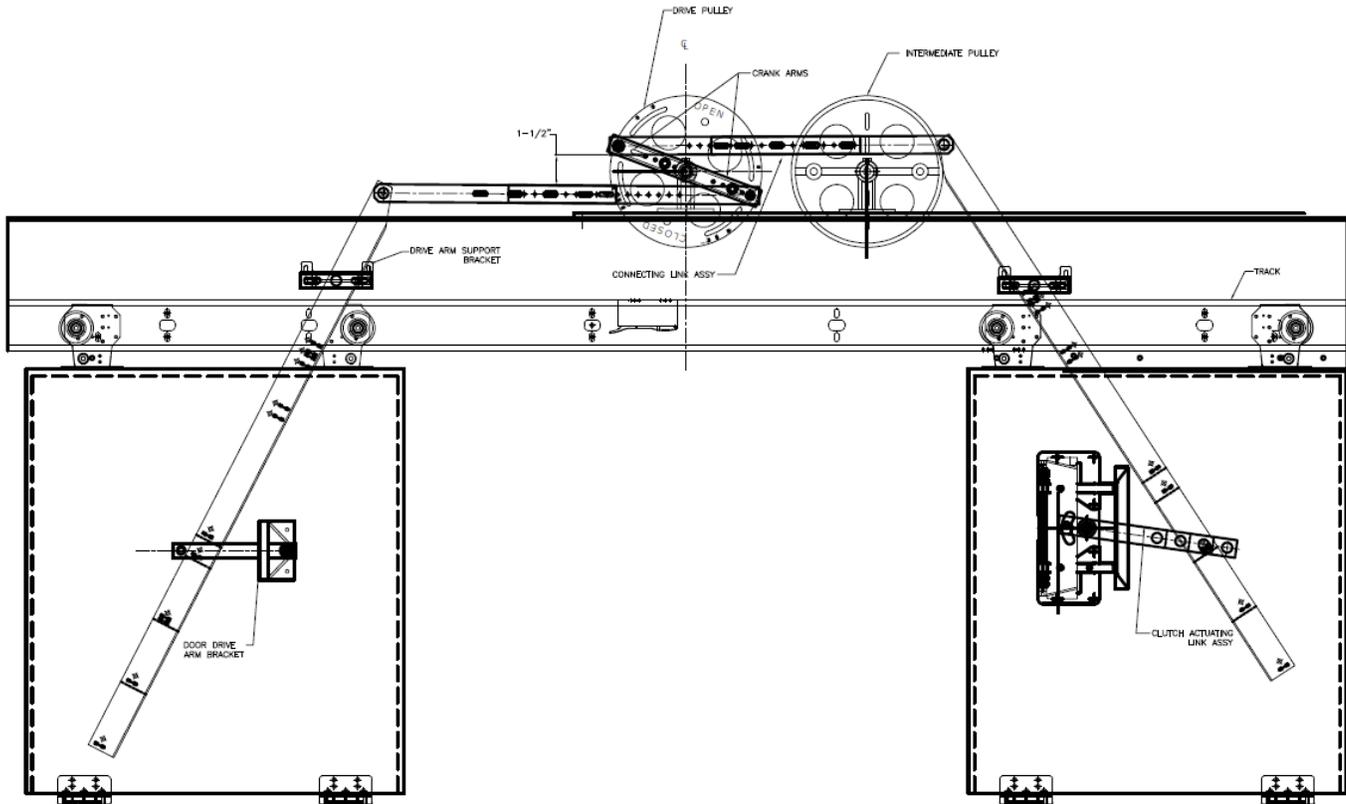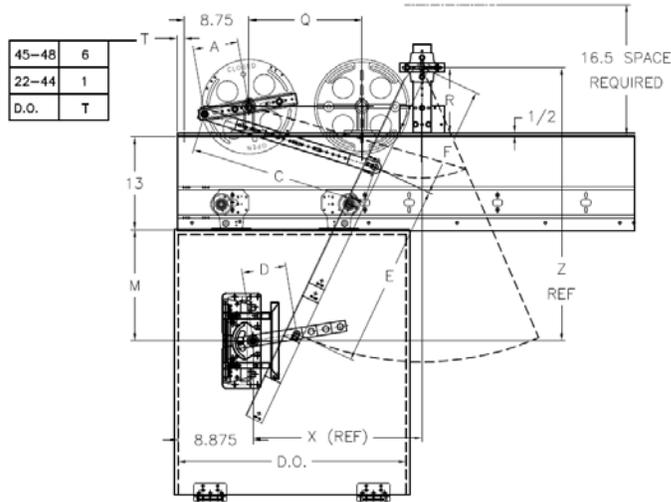| 4/4/2024	**22-48 D.O. OPERATOR DATA TABLE - SEES-SS**								
DOOR OPENING	OPERATOR ARMS		DOOR ARMS			CLUTCH	PIVOT		OPERATOR	
Inches	A	C	D	E	F	M	X	Z	Q	R
48	$10\frac{1}{16}$	$34\frac{5}{16}$	12	31	21	23	$39\frac{5}{8}$	$47\frac{1}{2}$	$33\frac{3}{4}$	11
47	$9\frac{7}{8}$	$34\frac{1}{8}$	12	31	21	23	$39\frac{5}{8}$	$47\frac{1}{2}$	$33\frac{3}{4}$	11
46	$9\frac{11}{16}$	$33\frac{15}{16}$	12	31	21	23	$39\frac{5}{8}$	$47\frac{1}{2}$	$33\frac{3}{4}$	11
45	$9\frac{1}{2}$	$33\frac{3}{4}$	12	31	21	23	$39\frac{5}{8}$	$47\frac{1}{2}$	$33\frac{3}{4}$	11
44	$9\frac{7}{8}$	$34\frac{3}{4}$	10	26	20	19	$34\frac{5}{8}$	42	$33\frac{3}{4}$	$9\frac{1}{2}$
43	$9\frac{11}{16}$	$34\frac{9}{16}$	10	26	20	19	$34\frac{5}{8}$	42	$33\frac{3}{4}$	$9\frac{1}{2}$
42	$9\frac{7}{16}$	$34\frac{3}{8}$	10	26	20	19	$34\frac{5}{8}$	42	$33\frac{3}{4}$	$9\frac{1}{2}$
41	$9\frac{3}{16}$	$34\frac{3}{16}$	10	26	20	19	$34\frac{5}{8}$	42	$33\frac{3}{4}$	$9\frac{1}{2}$
40	9	34	10	26	20	19	$34\frac{5}{8}$	42	$33\frac{3}{4}$	$9\frac{1}{2}$
39	8	$29\frac{3}{8}$	8	24	16	15	$29\frac{1}{4}$	$36\frac{1}{4}$	$28\frac{3}{8}$	$7\frac{3}{4}$
38	$7\frac{13}{16}$	$29\frac{3}{16}$	8	24	16	15	$29\frac{1}{4}$	$36\frac{1}{4}$	$28\frac{3}{8}$	$7\frac{3}{4}$
37	$7\frac{5}{8}$	29	8	24	16	15	$29\frac{1}{4}$	$36\frac{1}{4}$	$28\frac{3}{8}$	$7\frac{3}{4}$
36	$7\frac{7}{16}$	$28\frac{13}{16}$	8	24	16	15	$29\frac{1}{4}$	$36\frac{1}{4}$	$28\frac{3}{8}$	$7\frac{3}{4}$
35	$7\frac{1}{4}$	$28\frac{5}{8}$	8	24	16	15	$29\frac{1}{4}$	$36\frac{1}{4}$	$28\frac{3}{8}$	$7\frac{3}{4}$
34	$6\frac{1}{2}$	$25\frac{3}{16}$	6	25	15	15	$25\frac{1}{4}$	37	$24\frac{3}{8}$	$8\frac{1}{2}$
33	$6\frac{3}{8}$	25	6	25	15	15	$25\frac{1}{4}$	37	$24\frac{3}{8}$	$8\frac{1}{2}$
32	$6\frac{1}{8}$	$24\frac{1}{4}$	6	25	15	15	$24\frac{1}{2}$	$37\frac{3}{8}$	$23\frac{1}{2}$	$8\frac{7}{8}$
31	$5\frac{15}{16}$	$24\frac{1}{16}$	6	25	15	15	$24\frac{1}{2}$	$37\frac{3}{8}$	$23\frac{1}{2}$	$8\frac{7}{8}$
30	$5\frac{3}{4}$	$23\frac{7}{8}$	6	25	15	15	$24\frac{1}{2}$	$37\frac{3}{8}$	$23\frac{1}{2}$	$8\frac{7}{8}$
29	$6\frac{3}{4}$	$27\frac{1}{8}$	10	19	15	11	$27\frac{3}{4}$	32	$26\frac{7}{8}$	$7\frac{1}{2}$
28	$6\frac{9}{16}$	$26\frac{15}{16}$	10	19	15	11	$27\frac{3}{4}$	32	$26\frac{7}{8}$	$7\frac{1}{2}$
27	$6\frac{3}{8}$	$26\frac{3}{4}$	10	19	15	11	$27\frac{3}{4}$	32	$26\frac{7}{8}$	$7\frac{1}{2}$
26	$6\frac{3}{16}$	$26\frac{9}{16}$	10	19	15	11	$27\frac{3}{4}$	32	$26\frac{7}{8}$	$7\frac{1}{2}$
25	6	$26\frac{3}{8}$	10	19	15	11	$27\frac{3}{4}$	32	$26\frac{7}{8}$	$7\frac{1}{2}$
24	$5\frac{1}{2}$	$25\frac{3}{8}$	10	18	14	11	$25\frac{7}{8}$	$30\frac{3}{4}$	25	$6\frac{1}{4}$
23	$5\frac{5}{16}$	$25\frac{3}{16}$	10	18	14	11	$25\frac{7}{8}$	$30\frac{3}{4}$	25	$6\frac{1}{4}$
22	$5\frac{1}{8}$	25	10	18	14	11	$25\frac{7}{8}$	$30\frac{3}{4}$	25	$6\frac{1}{4}$
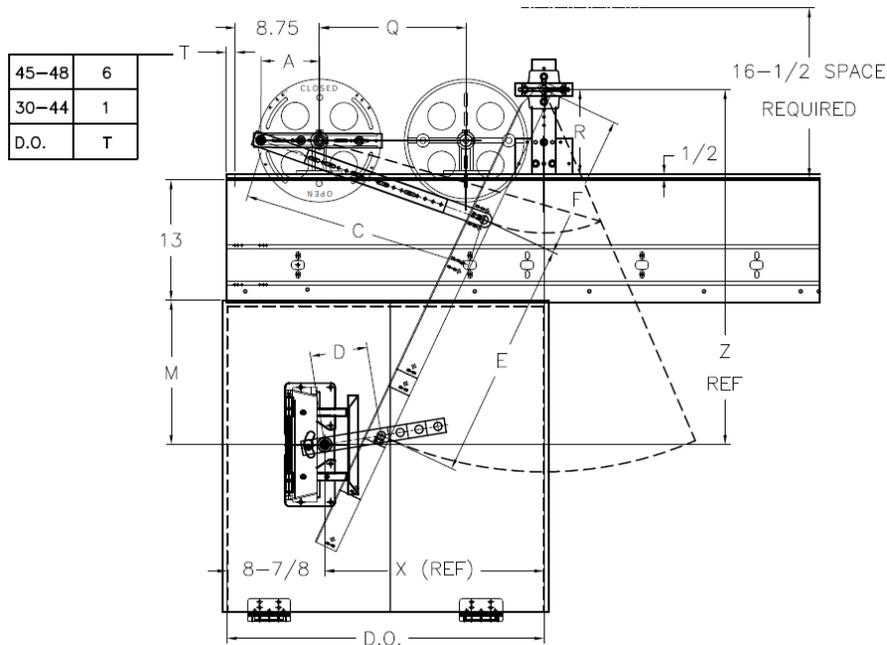
5/23/2024		**TWO SPEED 30-48 D.O. OPERATOR DATA TABLE- SEES-2S**								
DOOR OPENING	**OPERATOR ARMS**		**DOOR ARMS**			**CLUTCH**	**PIVOT**		**OPERATOR**	
Inches	**A**	**C**	**D**	**E**	**F**	**M**	**X**	**Z**	**Q**	**R**
48	$10\frac{1}{16}$	$34\frac{5}{16}$	12	31	21	23	$39\frac{5}{8}$	$47\frac{1}{2}$	$33\frac{3}{4}$	11
47	$9\frac{7}{8}$	$34\frac{1}{8}$	12	31	21	23	$39\frac{5}{8}$	$47\frac{1}{2}$	$33\frac{3}{4}$	11
46	$9\frac{11}{16}$	$33\frac{15}{16}$	12	31	21	23	$39\frac{5}{8}$	$47\frac{1}{2}$	$33\frac{3}{4}$	11
45	$9\frac{1}{2}$	$33\frac{3}{4}$	12	31	21	23	$39\frac{5}{8}$	$47\frac{1}{2}$	$33\frac{3}{4}$	11
44	$9\frac{7}{8}$	$34\frac{3}{4}$	10	26	20	19	$34\frac{5}{8}$	42	$33\frac{3}{4}$	$9\frac{1}{2}$
43	$9\frac{11}{16}$	$34\frac{9}{16}$	10	26	20	19	$34\frac{5}{8}$	42	$33\frac{3}{4}$	$9\frac{1}{2}$
42	$9\frac{7}{16}$	$34\frac{3}{8}$	10	26	20	19	$34\frac{5}{8}$	42	$33\frac{3}{4}$	$9\frac{1}{2}$
41	$9\frac{3}{16}$	$34\frac{3}{16}$	10	26	20	19	$34\frac{5}{8}$	42	$33\frac{3}{4}$	$9\frac{1}{2}$
40	9	34	10	26	20	19	$34\frac{5}{8}$	42	$33\frac{3}{4}$	$9\frac{1}{2}$
39	8	$29\frac{3}{8}$	8	24	16	15	$29\frac{1}{4}$	$36\frac{1}{4}$	$28\frac{3}{8}$	$7\frac{3}{4}$
38	$7\frac{13}{16}$	$29\frac{3}{16}$	8	24	16	15	$29\frac{1}{4}$	$36\frac{1}{4}$	$28\frac{3}{8}$	$7\frac{3}{4}$
37	$7\frac{5}{8}$	29	8	24	16	15	$29\frac{1}{4}$	$36\frac{1}{4}$	$28\frac{3}{8}$	$7\frac{3}{4}$
36	$7\frac{7}{16}$	$28\frac{13}{16}$	8	24	16	15	$29\frac{1}{4}$	$36\frac{1}{4}$	$28\frac{3}{8}$	$7\frac{3}{4}$
35	$7\frac{1}{4}$	$28\frac{5}{8}$	8	24	16	15	$29\frac{1}{4}$	$36\frac{1}{4}$	$28\frac{3}{8}$	$7\frac{3}{4}$
34	$6\frac{1}{2}$	$25\frac{3}{16}$	6	25	15	15	$25\frac{1}{4}$	37	$24\frac{3}{8}$	$8\frac{1}{2}$
33	$6\frac{3}{8}$	25	6	25	15	15	$25\frac{1}{4}$	37	$24\frac{3}{8}$	$8\frac{1}{2}$
32	$6\frac{1}{8}$	$24\frac{1}{4}$	6	25	15	15	$24\frac{1}{2}$	$37\frac{3}{8}$	$23\frac{1}{2}$	$8\frac{7}{8}$
31	$5\frac{15}{16}$	$24\frac{1}{16}$	6	25	15	15	$24\frac{1}{2}$	$37\frac{3}{8}$	$23\frac{1}{2}$	$8\frac{7}{8}$
30	$5\frac{3}{4}$	$23\frac{7}{8}$	6	25	15	15	$24\frac{1}{2}$	$37\frac{3}{8}$	$23\frac{1}{2}$	$8\frac{7}{8}$

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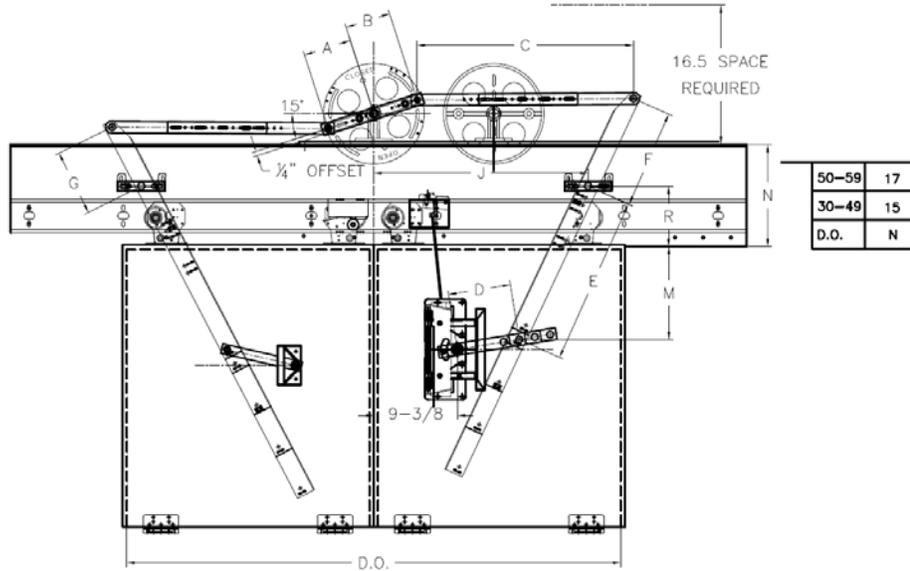Ph: 800-526-0026   www.seesinc.com   Rev 1

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& ELECTRIC SUPPLY

50–59	17
30–49	15
D.O.	N

5/23/2024	CENTER OPENING 30-59 D.O. OPERATOR DATA TABLE - SEES-CP									
DOOR OPENING	OPERATOR ARMS		DOOR ARMS					CLUTCH	PIVOT	
Inches	A	B	C	D	E	F	G	M	R	J
59	$7\frac{3}{4}$	$8\frac{3}{16}$	35	8	$29\frac{1}{2}$	15	$14\frac{1}{2}$	19	$7\frac{3}{4}$	34
58	$7\frac{5}{8}$	$8\frac{1}{6}$	$35\frac{1}{8}$	8	$29\frac{1}{2}$	15	$14\frac{1}{2}$	19	$7\frac{3}{4}$	34
57	$7\frac{1}{2}$	$7\frac{15}{16}$	$35\frac{1}{4}$	8	$29\frac{1}{2}$	15	$14\frac{1}{2}$	19	$7\frac{3}{4}$	34
56	$7\frac{3}{8}$	$7\frac{13}{16}$	$35\frac{3}{8}$	8	$29\frac{1}{2}$	15	$14\frac{1}{2}$	19	$7\frac{3}{4}$	34
55	$7\frac{1}{4}$	$7\frac{11}{16}$	$35\frac{1}{2}$	8	$29\frac{1}{2}$	15	$14\frac{1}{2}$	19	$7\frac{3}{4}$	34
54	$6\frac{7}{16}$	$7\frac{1}{2}$	34	8	$29\frac{1}{2}$	15	13	19	$8\frac{1}{2}$	33
53	$6\frac{5}{16}$	$7\frac{3}{8}$	$34\frac{3}{16}$	8	$29\frac{1}{2}$	15	13	19	$8\frac{1}{2}$	33
52	$6\frac{3}{16}$	$7\frac{1}{4}$	$34\frac{5}{16}$	8	$29\frac{1}{2}$	15	13	19	$8\frac{1}{2}$	33
51	$6\frac{1}{16}$	$7\frac{1}{8}$	$34\frac{7}{16}$	8	$29\frac{1}{2}$	15	13	19	$8\frac{1}{2}$	33
50	$5\frac{15}{16}$	7	$34\frac{9}{16}$	8	$29\frac{1}{2}$	15	13	19	$8\frac{1}{2}$	33
49	$5\frac{15}{16}$	$6\frac{1}{4}$	$29\frac{5}{8}$	6	$25\frac{1}{2}$	12	$11\frac{1}{2}$	15	$8\frac{1}{4}$	29
48	$5\frac{13}{16}$	$6\frac{1}{8}$	$29\frac{3}{4}$	6	$25\frac{1}{2}$	12	$11\frac{1}{2}$	15	$8\frac{1}{4}$	29
47	$5\frac{11}{16}$	6	$29\frac{7}{8}$	6	$25\frac{1}{2}$	12	$11\frac{1}{2}$	15	$8\frac{1}{4}$	29
46	$5\frac{9}{16}$	$5\frac{7}{8}$	30	6	$25\frac{1}{2}$	12	$11\frac{1}{2}$	15	$8\frac{1}{4}$	29
45	$5\frac{7}{16}$	$5\frac{3}{4}$	$30\frac{1}{8}$	6	$25\frac{1}{2}$	12	$11\frac{1}{2}$	15	$8\frac{1}{4}$	29
44	$5\frac{5}{16}$	$5\frac{5}{8}$	$29\frac{1}{8}$	6	$25\frac{1}{2}$	12	$11\frac{1}{2}$	15	$8\frac{5}{8}$	$28\frac{1}{4}$
43	$5\frac{3}{16}$	$5\frac{1}{2}$	$29\frac{1}{4}$	6	$25\frac{1}{2}$	12	$11\frac{1}{2}$	15	$8\frac{5}{8}$	$28\frac{1}{4}$
42	$5\frac{1}{16}$	$5\frac{3}{8}$	$29\frac{3}{8}$	6	$25\frac{1}{2}$	12	$11\frac{1}{2}$	15	$8\frac{5}{8}$	$28\frac{1}{4}$
41	$4\frac{15}{16}$	$5\frac{1}{4}$	$29\frac{1}{2}$	6	$25\frac{1}{2}$	12	$11\frac{1}{2}$	15	$8\frac{5}{8}$	$28\frac{1}{4}$
40	$4\frac{13}{16}$	$5\frac{1}{8}$	$29\frac{5}{8}$	6	$25\frac{1}{2}$	12	$11\frac{1}{2}$	15	$8\frac{5}{8}$	$28\frac{1}{4}$
39	$5\frac{7}{8}$	$6\frac{1}{8}$	$27\frac{1}{2}$	6	21	12	$11\frac{1}{2}$	11	$8\frac{1}{2}$	$26\frac{5}{8}$
38	$5\frac{5}{8}$	$5\frac{15}{16}$	$27\frac{5}{8}$	6	21	12	$11\frac{1}{2}$	11	$8\frac{1}{2}$	$26\frac{5}{8}$
37	$5\frac{1}{2}$	$5\frac{13}{16}$	$27\frac{3}{4}$	6	21	12	$11\frac{1}{2}$	11	$8\frac{1}{2}$	$26\frac{5}{8}$
36	$5\frac{5}{16}$	$5\frac{5}{8}$	$27\frac{7}{8}$	6	21	12	$11\frac{1}{2}$	11	$8\frac{1}{2}$	$26\frac{5}{8}$
35	$5\frac{1}{8}$	$5\frac{1}{2}$	28	6	21	12	$11\frac{1}{2}$	11	$8\frac{1}{2}$	$26\frac{5}{8}$
34	5	$5\frac{5}{16}$	$28\frac{1}{2}$	6	21	12	$11\frac{1}{2}$	11	$8\frac{1}{2}$	$26\frac{5}{8}$
33	$5\frac{3}{16}$	$5\frac{9}{16}$	$25\frac{1}{16}$	5	$19\frac{3}{4}$	12	$11\frac{1}{2}$	11	$7\frac{3}{4}$	$24\frac{1}{8}$
32	$5\frac{1}{16}$	$5\frac{3}{8}$	$25\frac{3}{16}$	5	$19\frac{3}{4}$	12	$11\frac{1}{2}$	11	$7\frac{3}{4}$	$24\frac{1}{8}$
31	$4\frac{15}{16}$	$5\frac{1}{4}$	$25\frac{3}{8}$	5	$19\frac{3}{4}$	12	$11\frac{1}{2}$	11	$7\frac{3}{4}$	$24\frac{1}{8}$
30	$4\frac{13}{16}$	$5\frac{1}{8}$	$25\frac{1}{2}$	5	$19\frac{3}{4}$	12	$11\frac{1}{2}$	11	$7\frac{3}{4}$	$24\frac{1}{8}$

Section 7

Door Board

Installation Manual

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1 Warning and Disclaimer

Thank you for purchasing equipment from SEES. We want your new equipment to operate safely. Anyone who installs or uses this equipment should read this publication (and any other relevant publications) before installing or operating the equipment.

To minimize the risk of potential safety problems, you should follow all applicable local and national codes that regulate the installation and operation of your equipment. These codes vary from area to area and usually change with time. It is your responsibility to determine which codes should be followed, and to verify that the equipment installation and operation is in compliance with the latest revision of these codes.

At a minimum, you should follow all applicable sections of the National Fire Code, National Electrical Code, ASMEA17.1 Safety code for Elevators and Escalators and the codes of the National Electrical Manufacturer's Association (NEMA). There may be local regulatory or government offices that can also help determine which codes and standards are necessary for safe installation and operation. Equipment damage or serious injury to personnel can result from failure to follow all applicable codes and standards. We do not guarantee the products described in the publication are suitable for your particular application, nor do we assume any responsibility for your product design, installation or operation.

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2 Introduction

The SEES Smooth Operator Variable Frequency Drive LCD system is a 2-board combination. It includes a 110/230VAC input Variable Frequency Drive (VFD) board and a control board with keypad and LCD screen. All adjustments and system monitoring are performed through the on-board LCD screen eliminating the need for an external handheld device. All control inputs are compatible with 24 to 230 volt AC or DC signal or dry contact voltages.

3 Conventions Used

When you see the "notepad" icon in the left-hand margin, the paragraph to its immediate right will be a special note. Notes represent information that may make your work quicker and more efficient. The word NOTE: in boldface will mark the beginning of the text.

When you see the "exclamation point" icon in the left-hand margin the paragraph to its right will be a warning. The information could prevent injury, loss of property, or even death in extreme cases. Any waring in this document should be regarded as critical information that should be read in its entirety. The word WARNING: in boldface will mark the beginning of the text.

4   Safety Information

Know the safety hazards related to any procedure you are about to perform. Know what equipment has been specified for each specific contact and know what tools and materials you should plan to have available. Before connecting electrical wiring, take precautions to prevent accidents from happening to yourself and others around you.

ALWAYS CONSIDER SAFTY FIRST!

- Wear a hard hat when working in the hoist way.
- Wear safety glasses or goggles when using power tools
- Always wear protective gloves when installing or removing access covers, conduits, wire way or electrical devices.
- When working on car canopy, always be aware of where the sides of the car are located.
- Use properly grounded cords and power equipment (ground fault circuit interrupters).
- Make sure there are proper clearances in hoist way between the car and other devices. Before connecting wiring, cover sharp edges to keep hands and arms from being cut.
- Always know where other people are and how the elevator wiring can affect their safety.
- Safety lock and tag out procedures are always required before performing and kind of service, repair, adjustment, lubrication or inspection of power equipment.
- To reduce the danger of electrical shock, always make sure electrical connections are secure. Also make sure no bare wires are exposed after pulling cable.
- Use a circuit tester to be certain the circuit is not active before touching it.

5   System Overview

5.1   Control Board

Figure 1 - Control Board

5.1.1   Electrical

5.1.2   Connections

5.1.2.1   Input Signals

- **CLOSE** – Any 24 to 240 VAC/VDC input between CLOSE and COM will produce a CLOSE operation.
- **OPEN** – Any 24 to 240 VAC/VDC input between OPEN and COM will produce an OPEN operation.
- **NUDG** – Any 24 to 240 VAC/VDC input between NUDGE and COM, with a CLOSE input present, will produce a NUDGE operation
- **HEAVY** – Any 24 to 240 VAC/BDC input between HEAVY and COM, with OPEN or CLOSE valid, will move the door at the HEAVY parameter settings.
- **COM** – Common input for OPEN, CLOSE, and NUDGE inputs.

5.1.2.2   Output Relay Contacts

- AUX NO
- AUX COM   Auxiliary Relay contacts rated at 230V 10A. Energized when AUX optical
- AUX NC   sensor blocked

- DPM NO
- DPM COM   DPM Relay contacts rated at 230V 10A. Energized when DPM optical
- DPM NC   sensor blocked

- REOPEN NO
- REOPEN COM   REOPEN Relay contacts rated at 230V 10A. Energized
- REOPEN NC   when torque limit exceeded, obstruction of light curtain.

- DCL NO
- DCL COM   DCL Relay. Door Close Limit contacts rated at 230V 10A. Energized when
- DCL NC   DCL optical sensor blocked

- DOL NO
- DOL COM   DOL Relay. Door Open Limit. Energized when DOL optical sensor
- DOL NC   is blocked

5.1.2.3 Interfacing with Light Curtain

Connecting the light curtain directly to the Control board (CN4, CN5) produces a REOPEN signal to the controller in the event of an obstruction. The light curtain connectors CN4 and CN5 are enabled through the Light Curtain parameter setting in section 5.1.5.1.4 Light Curtain Reopen enable.
When there is an obstruction of the edges the REOPEN LED will light and the REOPEN relay will energize sending a command to the controller to OPEN the doors. The light curtain connectors CN4 and CN5 are interchangeable. ***Our connectors are 180deg from OEM, need to swap outer wires.**

5.1.2.3.1 Formula Systems ®

- The REOPEN relay contacts should be connected to the controller as shown in Figure 2 - Reopen Contact Connection. ***N.O. or N.C. depends on the controller being used.***
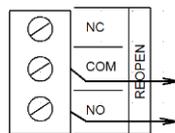

Figure 2 - Reopen Contact Connection

- CN4 and CN5 should be wired as shown in Figure 3- Formula Systems® Wiring (V+ is +24VDC)
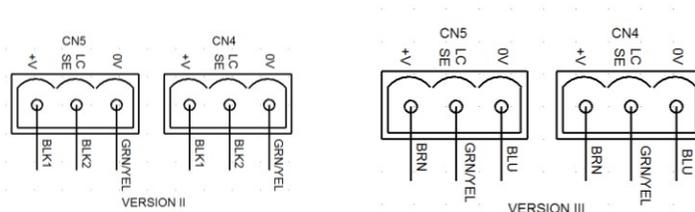

Figure 3- Formula Systems® Wiring

5.1.2.3.2 Tri-Tronics (Leading Edge)®

- The REOPEN relay contacts should be connected to the controller as shown in Figure 2 - Reopen Contact Connection.
- CN4 and CN5 should be wired as in Figure 4- Tri-Tronics® wiring
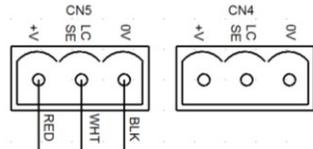
Figure 4- Tri-Tronics® wiring

5.1.3   User Interface
5.1.3.1.1 LCD Screen Main Menu


```
        SEES SGDO-PCB-001

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   Edit parameters
   Load defaults

   Diagnostics 1

   Diagnostics 2
```
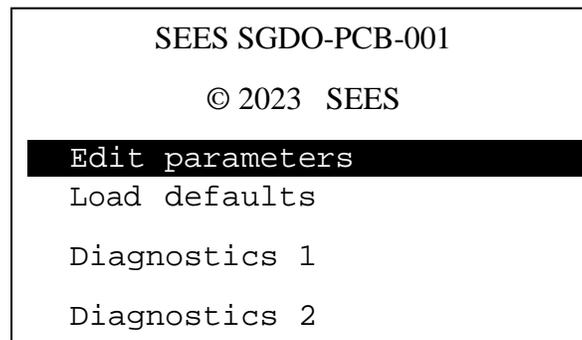
Figure 5 - LCD Screen Main Menu

Figure 5 - LCD Screen shows the main menu. Pressing the "-" button moves the curser down to the next selection. Pressing "+" button moves curser up.

There are 6 selections to the main menu.

- **Edit parameters** – Pressing ENTER with the Edit Parameters hi-lighted will enter the parameters menu.
- **Load Defaults** – Pressing ENTER with Load defaults hi-lighted will load the default settings for all parameters
- **Diagnostics 1** – Pressing ENTER with Diagnostics hi-lighted will display the first diagnostics screen.
- **Diagnostics 2** – Pressing ENTER with Diagnostics hi-lighted will display the second diagnostics screen.
- **Technical Support** – (not shown) Pressing ENTER with Technical support hi-lighted will display the technical support screen.
- **Rotate screen** – (Not shown above) Pressing ENTER with Rotate Screen hi-lighted will flip the screen 180°

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5.1.3.2   Control Board LEDs

- **OPEN –** Illuminated when OPEN input is valid
- **CLOSE –** Illuminated when CLOSE input is valid
- **NUDGE –** Illuminated when NUDGE input is valid
- **HEAVY –** Illuminated when HEAVY input is valid
- **SSO –** Slow Start Open. Speed setting is *OP slow start*. When illuminated indicates the start of the open cycle when the interlock rollers unlock hoistway door. SSO/FSO sensor blocked and MSO sensor open during an OPEN cycle.
- **HSO –** High Speed Open. Speed setting is *OP High Speed.* When illuminated indicates High speed open. SSO/FSO and MSO sensors open during an OPEN cycle.
- **MSO –** Medium Speed Open. Speed setting is *OP medium sp*. When Illuminated indicates Medium Speed open. SSO/FSO sensor open and MSO sensor blocked during an OPEN cycle.
- **FSO –** Final Speed Open. Speed setting is OP final speed. Illuminated during Final speed open when SSO/FSO and MSO sensors are blocked during an OPEN cycle.
- **HOLDING –** Illuminated when DCL or DOL sensors are blocked (fully OPEN or CLOSED positions) and *CL/OP hold torq* and *hold sp* parameter settings are greater than 0
- **NUDGE –** Nudge speed**.** Speed setting is *Nudge*. Illuminated when CLOSE and NUDGE inputs are active.
- **HSC –** High Speed Close. Speed setting is *CL high speed*. Illuminated during High speed close when FSC sensor is open during a CLOSE.
- **FSC –** Final Close Speed. Speed setting is *CL final speed*. Illuminated during final close speed when FSO sensor is blocked during a CLOSE.
- **AUX –** Illuminated when AUX sensor is blocked
- **DPM –** Illuminated when DPM sensor is blocked
- **DOL –** Door Open Limit. Illuminated when DOL sensor blocked
- **DCL –** Door Close Limit. Illuminated when DCL sensor is blocked
- **STALL REVERSE – Not used**
- **FREQUENCY FAILURE -**
- **REOPEN DEVICE –** Illuminated when the REOPEN relay is energized via the light curtain inputs.
- **FAULT –** Illuminated when there is a communications failure between Control and Drive boards
- **POWER –** Illuminated when power to board is good.

5.1.3.3   Keypad

- **+** Button - This button moves the curser up in the screen for selecting menus or parameters and increases the number of the setting being programmed.

- • - Button - This button moves the curser down in the screen for selecting menus and decreases the number of the setting being programmed
- • **Enter** Button - The ENTER button selects the menu or parameter indicated by the curser and enters the current number of the parameter being programmed.
- • **ESC** Button - The ESC button is used to move back to the previous menu.

5.1.3.4 Switches
- • **RUN / CAM SETUP** – 2 position switch. RUN position is for normal operation. CAM SETUP allows for adjusting CAMs with valid inputs to OPEN, CLOSE etc. without moving the doors.
- • **AUTO / MAN** – 2 position switch. AUTO position is for normal operation. MAN position is for controlling the doors using OPEN, CLOSE, HEAVY and NUDGE switches.
- • **CLOSE / OPEN** – 3 position switch. Center position no function. With AUTO/MAN switch in manual position this controls opening and closing the doors.
- • **NUDGE** – 3 position switch. Center position no function. With AUTO/MAN switch in MAN and the CLOSE switch in CLOSE this switch puts door at NUGDING speed.
- • **HEAVY / RESET** – 3 position switch. Center position no function. HEAVY position moves doors at heavy SPEED SETTING with AUTO/MAN at MAN and using OPEN/CLOSE switch. RESET position resets any active faults.

5.1.4 CAM Optical Sensors
- • **FSO/SSO** – Final Speed Open and Slow Speed Open sensor. Valid only during an open cycle.
- • **MSO** – Medium Speed Open sensor. Valid only during an open cycle.
- • **DOL** – Door Open Limit sensor. When blocked will energize the DOL relay.
- • **FSC** – Fast Speed Close sensor. Valid only during a close cycle.
- • **DPM** – Car Door Closed Sensor. When blocked will energize the DPM relay.
- • **DCL** – Door Close Limit sensor. When blocked will energize the DCL relay.
- • **AUX** – Auxiliary sensor. When blocked will energize the AUX relay.

5.1.5 Operation
5.1.5.1 Edit Parameters

```
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   CL hold torq.          50
   CL hold sp.             0
   CL torque               0
   CL High speed          45

```

Figure 6 - Edit Parameters Menu

Pressing the ENTER button while EDIT PARAMETERS is highlighted will display the parameters show in Figure 6 - Edit Parameters Menu. Pressing the – button moves the curser/highlight down. Pressing ENTER selects the highlighted parameter and the + and – buttons are used to change the setting.

5.1.5.1.1 Standard Parameter settings with defaults

- **CL hold torq. –** Enabled when the door reaches DCL and parameter is set to a value greater than 0. Together with CL Hold sp will prevent the door from drifting out of the DCL. Default setting is 0. Max setting is 100.

CAUTION: Holding power should be set less than 15W to prevent motor heating which will reduce motor life.

- **CL hold sp. –** Enabled when the door reaches DCL and the parameter is greater than 0. Together with the CL Hold Tq will prevent the door from drifting out of the DCL. Default setting is 0. Max setting is 100.

CAUTION: Holding power should be set less than 15W to prevent motor heating which will reduce motor life.

- **CL torque –** This parameter is used to set the closing force to the doors**.** A lower value produces less force. Default setting is 15. Min is 1 and max is 100.
- **CL high speed – HSC -** This is the fastest close speed. A higher value produces a faster speed. This should not be set higher than **Cl Max cl sp** parameter. Default setting is 40. Min is 1 and max is 100.
- **CL final speed – FSC –** This is the final close speed for the door entering into the DCL. A lower value produces a slower speed. This parameter should be set to prevent slamming or bouncing when to or reaches DCL. Default setting is 25. Min is 1 and max is 100.
- **CL nudge speed –** This parameter sets the nudging speed. Higher the value the faster the speed. Default setting is 30. Min is 1 and max is 100.
- **CL accel –** Sets the acceleration in the close direct. A lower value produces a quicker acceleration. Default setting is 100. Min setting is 1. Max setting is 255.
- **CL decel –** Sets the deceleration in the close direction. A lower value produces a quicker deceleration. Default setting is 100. Min setting is 1. Max setting is 255.
- **OP quick stp rev –** Determines how quickly the door opens after changing direction during a reopen. A higher value produces a faster speed. The default setting is 20. Min is 1 and max setting is 100.

- **OP slow start – SSO -** This is the speed for the start of the open cycle when the clutch engages the interlock and unlocks the hoistway door. A slower speed provides a smoother quiet start. A higher value produces a higher speed. The default setting is 25. Min is 1 and max is 100.
- **OP high speed – HSO –** This is the fastest speed of the open cycle. A higher value produces a faster speed. The default setting is 50. Min is 1 and max is 100.
- **OP medium speed – MSO –** This is the door speed setting through MSO range. When properly adjusted the doors will decelerate through MSO from HSO to FSO. The default setting is 35. Min is 1 and max is 100.
- **OP final speed – FSO –** This is the final open speed. This parameter should be set low to prevent slamming when the DOL and OPEN stop roller are reached. The default setting is 25. Min is 1 and max is 100.
- **OP accel –** A lower value produces a faster acceleration. This parameter should be set for smooth operation during an open cycle. This will also affect the REOPEN cycle acceleration. Default setting is 100. Min is 1 and max is 100.
- **OP decel –** A lower value produces a quicker deceleration. This should be set so the OP Final Speed FSO is reached before the DOL and OPEN stop roller to prevent slamming and bouncing. The default setting is 50. Min is 1 and max is 100.
- **OP torque –** Default setting is 15. Min is 1 and max is 100.
- **OP hold torq. –** Enabled when the door reaches DOL and parameter is set to a value greater than 0. Together with OP Hold sp will prevent the door from drifting out of the DOL. Default setting is 0. Min is 0 and max is 100.

⚠️ *CAUTION: Holding power should be set less than 15W to prevent motor heating which will reduce motor life.*

- **OP hold sp. –** Enabled when the door reaches DOL and the parameter is greater than 0. Together with the OP Hold Tq will prevent the door from drifting out of the DOL. Default setting is 0. Min is 0 and max is 100.

⚠️ *CAUTION: Holding power should be set less than 15W to prevent motor heating which will reduce motor life.*

5.1.5.1.2 Heavy Door Parameter settings with defaults

The heavy door parameters are enabled when the HEAVY input is valid during AUTO operation and when the HEAVY switch is on in MANUAL operation. These parameters are the same as the standard parameters so only the default and range settings are listed.

- **HCL hold torq. –** Default setting is 0. Min is 0 and max is 100.
- **HCL hold sp. –** Default setting is 0. Min is 0 and max is 100.

- **HCL torque –** Default setting is 15. Min is 1 and max is 100.
- **HCL high speed – HSC -** Default setting is 35. Min is 1 and max is 100.
- **HCL final speed – FSC -** Default setting is 25. Min is 1 and max is 100.
- **HCL nudge speed –** Default setting is 30. Min is 1 and max is 100.
- **HCL accel –** Default setting is 100. Min is 1 and max is 255.
- **HCL decel –** Default setting is 100. Min is 1 and max is 255.
- **HOP quick stp re –** Default setting is 20. Min is 1 and max is 100.
- **HOP slow start –** Default setting is 25. Min is 1 and max is 100.
- **HOP high Speed – HSO -** Default setting is 45. Min is 1 and max is 100.
- **HOP medium speed – MSO -** Default setting is 35. Min is 1 and max is 100.
- **HOP final speed – FSO -** Default setting is 25. Min is 1 and max is 100.
- **HOP accel –** Default setting is 100. Min is 1 and max is 100.
- **HOP decel –** Default setting is 50. Min is 1 and max is 100.
- **HOP torque –** Default setting is 1. Min is 1 and max is 100.
- **HOP hold torq –** Default setting is 0. Min is 0 and max is 100.
- **HOP hold sp. –** Default setting is 0. Min is 0 and max is 100.

5.1.5.1.3   Input Voltage setting Parameter

- **Input voltage –** Parameter for setting valid AC/DC voltage for CLOSE, OPEN, NUDGE and HEAVY inputs. Default setting is 24. Minimum is 12 and max is 240. Voltages below these settings will not be detected by the control board.

5.1.5.1.4   Light Curtain Reopen enable

The last parameter in the list is the light curtain setting. To enable the on board light curtain input (see section 5.1.2.3 Interfacing with Light Curtain) this parameter must be set to "1". "0" is the default.

NOTE: Setting this parameter to "1" without a light curtain connected will cause to door to remain open at all times.

5.1.5.2   Load Defaults

Selecting LOAD DEFAULTS will set all parameters to their default settings.

5.1.5.3   Diagnostics 1

```
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VBUS  :   317V    0s
SPEED :    0
TEMP  :    29C/   84F
MOTOR :     .0A
CYCLE :    xxxx       (ESC)
```

Figure 7 - Diagnostics 1 Screen

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VBUS – present DC voltage for motor driver.

0s – 16 second timer. Resets to 16 at each OPEN or CLOSE command and will time down to 0 if no limit switch is detected. At 0 all motor drive is stopped until present command is cycled off then on or a new command is issued.

SPEED – current speed of the motor. Reflects the actual speed setting.

TEMP – Current temp of the output driver.

MOTOR – Current to motor in amps.

CYCLE – Number of cycles (OPEN and CLOSE) since manufacture.

5.1.5.4   Diagnostics 2

Selecting Diagnostic 2 will display the voltage present on any of the inputs:

- Close Input
- Open Input
- Nudge Input
- Heavy Input

5.2   Variable Frequency Drive Board (VFD Board)
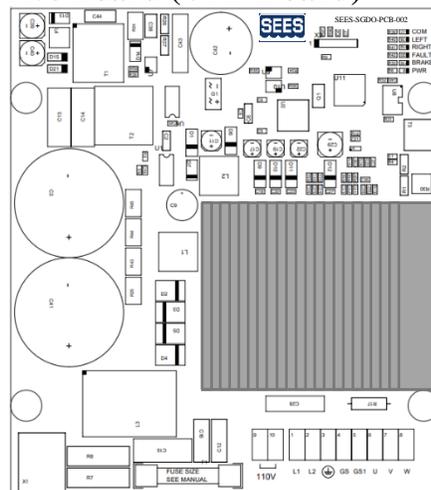
Figure 8 - Variable Frequency Drive Board

5.2.1   Frequency Board Electrical

- 110/220VAC
- 5A 250V fuse

5.2.2   Frequency Board Connections

- **L1** and **L2** – 110 or 240 VAC input power, Field installation
- **110V –** If using 110V Input Power, Place Jumper wire between these two terminals 9 &10
- **U V W** – motor connections

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Ph: 800-526-0026   www.seesinc.com   Rev 1

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- ⏚ Chassis Ground
- **GS and GS1 –** Gate switch dry contact.
- **RJ45 –** Communications port to Control Board.

5.2.3 Frequency Board LEDs

- **PWR** – On when power is present
- **BRAKE** – On all the time
- **FAULT** – On when no communications between Control board and Drive board
- **RIGHT** – On when motor turning a direction.
- **LEFT** – On when motor turning opposite direction of Right.
- **COM** – On when communications with Control board are good.

6   Initial Power Up and Test

6.1   Before applying power be sure to connect the Control and VFD boards using the 12" CAT5 cable

6.2   Manual Operation

- With the doors in the fully closed position and the AUTO/MAN switch in the MAN position, apply power to door operator.
  - o   LCD Display should show

```
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         Edit parameters
         Load defaults

         Diagnostics 1

         Diagnostics 2
```
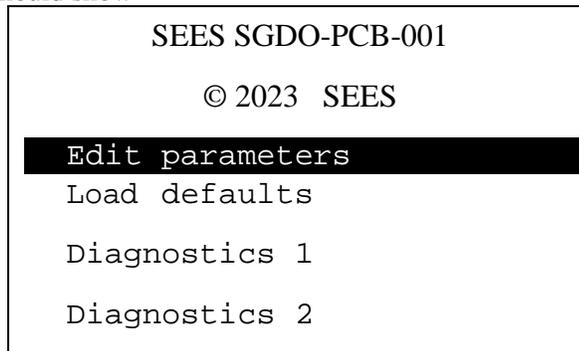
  - o   Check that the POWER on the display board and PWR LED on the drive board are lit.
  - o   Check that the COM, and BRAKE LEDs on the drive board are lit.
- Press Enter Button to select EDIT PARAMETERS
- Press – button until INPUT VOLTAGE is highlighted.
- Press ENTER button and set to proper input voltage using + button. Press ENTER then ESC buttons when complete. ***Set input voltage 5V less than the input voltage***
- Move curser down to DIAGNOSTICS 1 and press ENTER
  - o   LCD should show

```
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         VBUS  :   317V   0s   (ESC)
         SPEED :     0
         TEMP  :    29C/  84F
         MOTOR :     .0A
         CYCLE :    xxxx
```
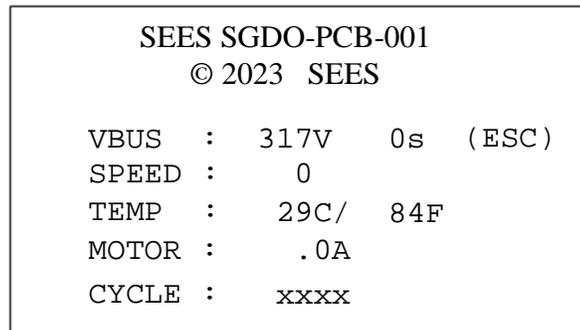
NOTE that the VBUS and TEMPs are estimates

- With the AUTO/MAN switch in MAN position set the CLOSE/OPEN switch to the OPEN position. (If motor moves in wrong direction, remove power from unit and swap 2 or the 3 motor leads.)
  - o The SPEED and MOTOR readings should increase as the door moves.
  - o Hold switch until door is fully open and the DOL LED lights.
    - ▪ When fully OPEN the SPEED and MOTOR reading should go to 0 even with the switch in OPEN position.
  - o **NOTE** that the HOLDING LED will not light as the OP HOLD SP and TORQ settings are at default 0 settings.
  - o Go to EDIT PARAMETERS screen and change OP hold torq and OP hold sp to 1.
    NOTE: these settings will have to be set >1 to ensure enough force to hold doors.
    NOTE: HOLDING power should not exceed 15W to prevent motor heating motor which can reduce its life.
  - o The HOLDING LED should light at the next open cycle.
- Repeat with the CLOSE/OPEN switch in the CLOSE position.
  - o **NOTE** that the HOLDING LED will not light with DCL due to the CL HOLD SP and TORQ settings are at default 0.
  - o Go to EDIT PARAMETERS screen and change CL hold torq and CL hold sp to 1.
    NOTE: these settings will have to be set >1 to ensure enough force to hold doors.
    NOTE: HOLDING power should not exceed 15W to prevent heating motor which can reduce its life.
  - o The HOLDING LED should light on the next close cycle.

7   Adjustments

At this time adjustments can be made through the parameter settings to produce smooth door operation and adjust OPEN and CLOSE torque settings. Refer to section 7.1 for speed profiles and CAM settings.

NOTE - For HEAVY DOOR adjustments the elevator car must be at a "heavy door" floor. When moving a heavy door in MAN operation the HEAVY switch must be used with the CLOSE and OPEN switches.

NOTE: IT IS IMPORTANT TO RETURN THE DISPLAY TO THE MAIN MENU WHEN ADJUSTMENTS ARE COMPLETE. FAILING TO DO SO WILL RESULT IN PARAMETERS REVERTING TO DEFAULT SETTINGS SHOULD POWER BE LOST.

7.1   Speed Profiles

7.1.1   Closing Speed Profile
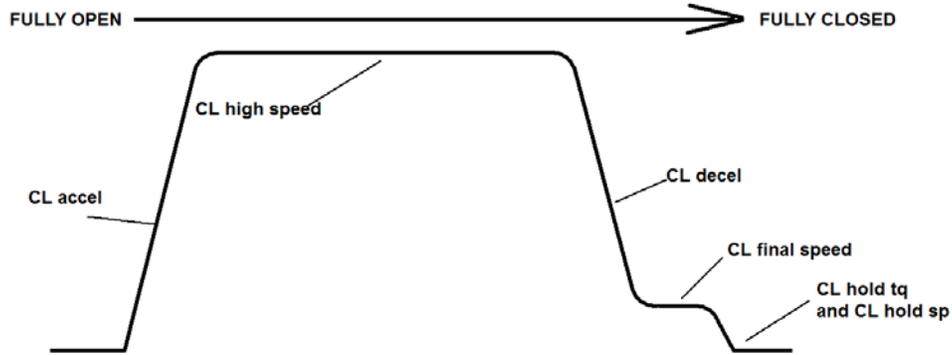
Figure 9- Close Speed Profile

7.1.2   Closing CAM/Sensor Sequence

Figure 10 - Close CAM/Sensor Sequence

7.1.3   Open Speed Profile
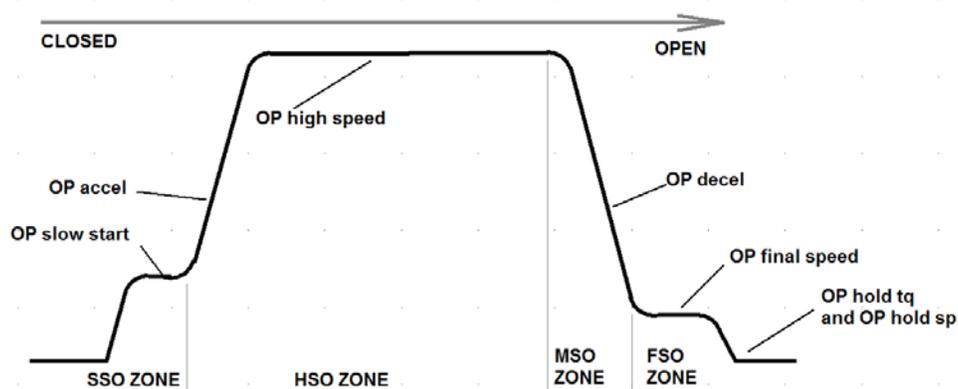
Figure 11 - Open Speed Profile

7.1.4 Open CAM/Sensor Sequence
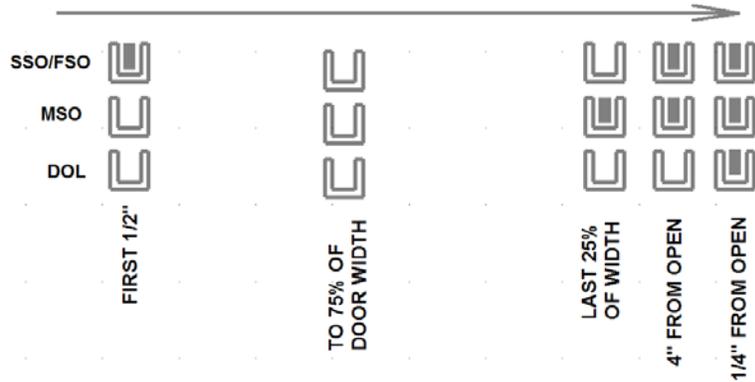
Figure 12 - OPEN CAM/SENSOR Sequence

7.2 CAM Settings

7.2.1 Right Hand CAMs
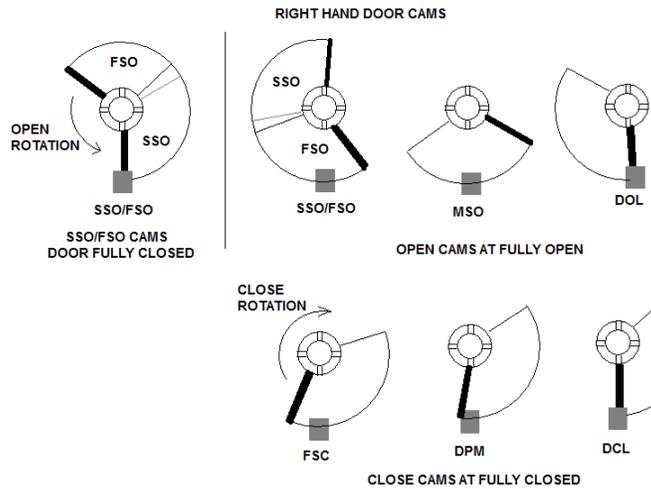
Figure 13- Right Hand CAM Settings

7.2.2   Left Hand CAMs
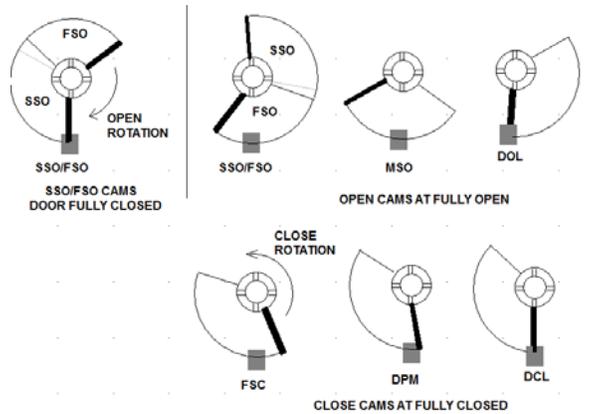
Figure 14 - Left Hand CAM Settings

8   AUTO Operation

- Go to EDIT PARAMETERS and change the INPUT VOLTAGE parameter to the proper voltage for your system.
- Switch the AUTO/MAN switch to AUTO position.
- Door operator is now ready for normal operation.

DOOR OPERATOR

*WARNING-MORE THAN ONE LIVE CIRCUIT, SEE DIAGRAM.
PARTS OF THIS CONTROLLER ARE NOT DE-ENERGIZED
BY THE DISCONNECT SWITCH

MOTOR WIRING
PROVIDED BY
MANUFACTURER

INCOMING POWER
FIELD WIRING
208-230VAC
OR 110VAC
(JUMPER REQUIRED)

COVER BONDING TO BASE
XHDW-1097
8-32 HEX WASHER HEAD SLOTTED
SCREW, S.Z. OR EQUIV.

RJ45 CABLE PROVIDES
POWER FROM DRIVE TO
CONTROL BOARD, DONE BY
MANUF.

GROUND LUG
FOR FIELD WIRING

**PLACE JUMPER
HERE ONLY IF USING 110V
POWER (FIELD WIRING)

GROUNDING POINTS

SEES-SDO-PCB-002

SEES-SDO-PCB-001

FIELD WIRING TO CONTROLLER

AUX, DPM, REOPEN, DCL, DCL RELAYS RATED 230V
10A, ANY INPUT SIGNAL FROM 24V - 240 VAC/VDC

CLOSE, OPEN, NUDGE, HEAVY, INPUT SIGNALS, ANY
INPUT SIGNAL FROM 24V - 240 VAC/VDC.

* POSSIBLY LIVE CIRCUITS - CAUTION

* FIELD HOOK UP TO BE DONE BY OTHERS, TYP RH & LH

Field Wiring
Field wiring requires certified conduit, junction box and/or trough for running wires to
Hoistway cable. Supplied by installer. Should only be performed by trained or certified personnel.

GATE SWITCH WIRING
PROVIDED BY MANUFACTURER

LIGHT CURTAIN WIRING
FIELD WIRING

PARTS LIST

| ITEM	QTY	PART NUMBER	DESCRIPTION
5		XWIR-044 AND XWIR-037	16 GA 105° 1015 BLACK WIRE
4		XHDW-850	10-32 HEX WASHER HEAD GROUND SCREW
3		3M-14 - OR EQUIV	#10 RING TERMINAL 16-14 AWG
2		XHDW-030	BRASS FLAT WASHER #8-S SMALL
1		XHDW-692	TERMINAL WASHER BRASS D3019

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MATERIAL: SEE PARTS LIST

QTY REQ'D	ITEM NO	PART OR IDENTIFYING NUMBER	DESCRIPTION

ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED
.X = ±.030
.XX = ±.010
.XXX = ±.005
ANGLES = ±1°
DO NOT SCALE DRAWING

	DRAWN BY	RR	DATE 08/19/24
APPROVED			
PROD.	RR		08/19/24
ENG.	RR		08/19/24
QA			
MGMT.			

MATERIAL
BOM

FINISH
NATURAL

THIRD ANGLE PROJECTION

SEES
SOUTHERN ELEVATOR & ELECTRIC SUPPLY
2781 W. MCNAB RD.
POMPANO BCH., FL. 33069
WWW.SEESINC.COM

DESCRIPTION
SEES DOOR OPERATOR

SIZE B
FILE SEES-SDO-001-DR

DWG NO
SEES-SDO-001-DR REV 01

SCALE NONE
SHEET 1 OF 1

SEES-SDO-001 SERIES

REV	DESCRIPTION	APPROVED	DATE
00	PRELIMINARY	RR	08/19/24
01	UPDATED GROUND DETAILS	RR	08/20/24