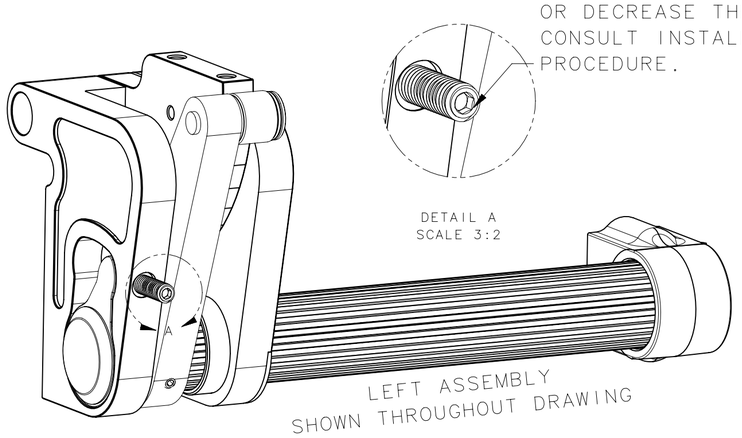
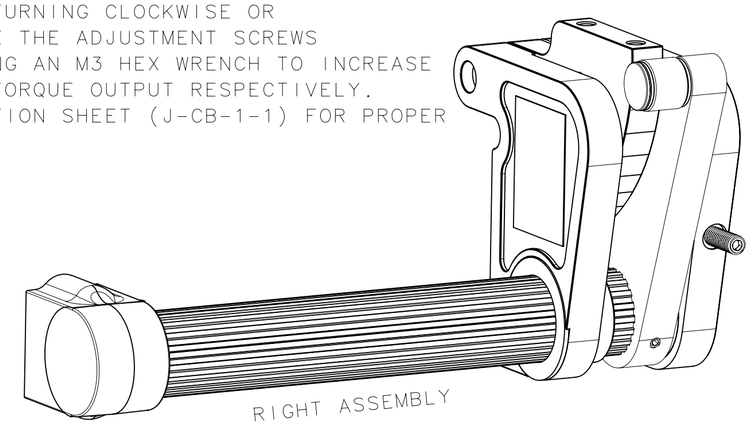
TORQUE ADJUSTMENT OF THE CB MECHANISM IS PERFORMED BY TURNING CLOCKWISE OR COUNTER-CLOCKWISE THE ADJUSTMENT SCREWS ON EACH UNIT USING AN M3 HEX WRENCH TO INCREASE OR DECREASE THE TORQUE OUTPUT RESPECTIVELY. CONSULT INSTALLATION SHEET (J-CB-1-1) FOR PROPER PROCEDURE.



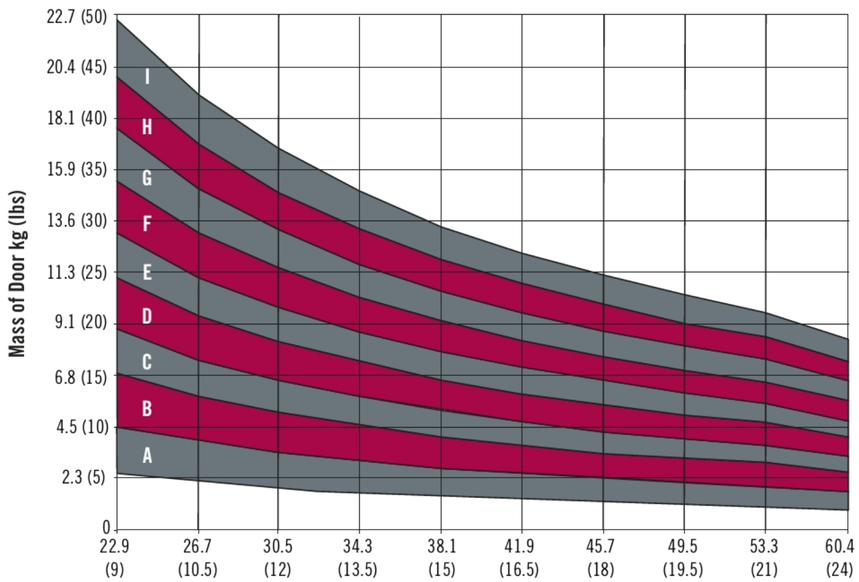
DETAIL A
SCALE 3:2

LEFT ASSEMBLY
SHOWN THROUGHOUT DRAWING



RIGHT ASSEMBLY

Counterbalance Hinge Selection Guide



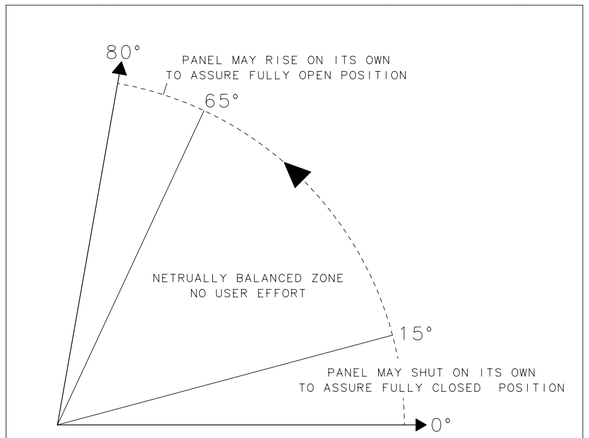
SELECTION GUIDE LEGEND			
A	CB-1X-101-00-10	E	CB-2X-101-00-10
B	CB-1X-102-00-10	F	CB-2X-102-00-10
C	CB-1X-103-00-10	G	CB-2X-103-00-10
D	CB-1X-104-00-10	H	CB-2X-104-00-10
		I	CB-2X-105-00-10

-MODEL SELECTION CHART SHOULD BE USED TO SELECT CORRECT UNIT FOR BALANCING PANELS OUTSIDE OF THE NOMINAL TORQUE OUTPUT

-ALL TORQUE VALUES SHOULD BE CALCULATED USING:
TORQUE = HORIZONTAL CG * PANEL WEIGHT

-'PER HINGE' DESIGNATION INDICATES DUAL ASSEMBLIES WILL OUTPUT 'PER HINGE' TORQUE * 2

PANEL MOTION THROUGH OPENING ANGLE



TORQUE ADJUSTMENT:

PANEL DRIFTS DOWNWARDS IN NEUTRAL BALANCE RANGE
IF UNDESIRABLE, RAISE PANEL TO VERTICAL POSITION, INCREASE TORQUE BY TURNING ADJUSTMENT SCREW CLOCKWISE. CYCLE AND RECHECK BALANCE. IF ADJUSTMENT SCREW REACHES MAXIMUM POSITIVE TRAVEL AND PANEL CONTINUES TO DRIFT DOWNWARDS, TORQUE SELECTION SHOULD BE REVIEWED.

PANEL DRIFTS UPWARDS IN NEUTRAL BALANCE RANGE
IF UNDESIRABLE, RAISE PANEL TO VERTICAL POSITION, DECREASE TORQUE BY TURNING ADJUSTMENT SCREW COUNTER-CLOCKWISE, CYCLE AND RECHECK BALANCE. IF ADJUSTMENT SCREW REACHES MAXIMUM NEGATIVE TRAVEL AND PANEL CONTINUES TO DRIFT UPWARDS, TORQUE SELECTION SHOULD BE REVIEWED.

PANEL POPS UPWARDS IN 0-15° RANGE
IF UNDESIRABLE, RAISE PANEL TO VERTICAL POSITION, DECREASE TORQUE BY TURNING ADJUSTMENT SCREW COUNTER-CLOCKWISE, CYCLE AND RECHECK BALANCE. IF ADJUSTMENT SCREW REACHES MAXIMUM NEGATIVE TRAVEL AND PANEL CONTINUES TO POP UPWARDS, TORQUE SELECTION SHOULD BE REVIEWED.

PANEL DRIFTS DOWNWARDS IN 65-80° RANGE
IF UNDESIRABLE, RAISE PANEL TO VERTICAL POSITION, INCREASE TORQUE BY TURNING ADJUSTMENT SCREW CLOCKWISE, CYCLE AND RECHECK BALANCE. IF ADJUSTMENT SCREW REACHES MAXIMUM POSITIVE TRAVEL AND PANEL CONTINUES TO DRIFT DOWNWARDS, TORQUE SELECTION SHOULD BE REVIEWED.

NOTE:

PER THE FIGURE ABOVE, SOME DRIFT UPWARDS IN THE 65-80° RANGE AND DOWNWARD IN THE 0-15° IS EXPECTED. HAVING DRIFT IN THESE AREAS OF TRAVEL ASSURES THE PANEL STAYS IN POSITIVELY IN THE OPEN AND CLOSED POSITION OVER VARIATIONS IN WEIGHT AND CENTER OF GRAVITY.

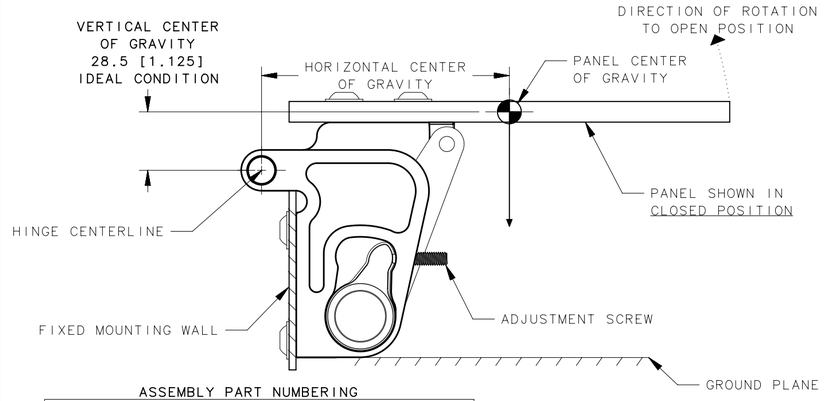
REVISION HISTORY			
REV	DATE	BY	DESCRIPTION
F	12AUG2024	SAK/DMS	PRN:P2024-1333

NOTE:

THE CB COUNTERBALANCE HINGE IS DESIGNED TO **OPERATE FROM 0° HORIZONTAL AND OPEN TO 80° FROM HORIZTONAL** AS WELL AS UNDER THE NOMINAL TORQUE CONDITIONS SPECIFIED IN TABLE 1.1, COLUMN 2 **AND AT THE IDEAL CENTER OF GRAVITY IN THE Y-DIRECTION SHOWN BELOW.** DEVIATIONS FROM NOMINAL CAN BE MADE WITHIN THE TORQUE LIMITS SPECIFIED IN TABLE 1.1, COLUMNS 3 & 4, HOWEVER PERFORMANCE CHANGES SUCH AS PANEL DRIFT AT THE 0-15° AND 65-80° ANGLES OF ROTATION MAY EXIST.

THE RANGE CHART BELOW REFLECTS THE TOTAL AVAILABLE TORQUE RANGE (LOW TO HIGH) OF EACH AVAILABLE SPRING. NOMINAL CONDITIONS ARE AVAILABLE IN TABLE 1.1, COLUMN 2. PLEASE CONTACT SOUTHCO FOR ASSISTANCE IN DETERMINING THE PERFORMANCE OF YOUR APPLICATION.

IMPORTANT SAFETY NOTICE: DO NOT DISASSEMBLE UNIT. DISASSEMBLING UNIT MAY CAUSE SERIOUS INJURY. NO USER SERVICEABLE PARTS.



ASSEMBLY PART NUMBERING

CB-2X-10X-00-10

ASSEMBLY SIDE
1 - LEFT
2 - RIGHT

TORQUE OUTPUT
PER TABLE 1.1

PART NUMBERING EXAMPLE:

PANEL WEIGHT: 26.8LB
HORIZTONAL CG: 12IN
TORQUE = PANEL WEIGHT * CG
= 321 LBF-IN
TORQUE PER SIDE = 160.5 LBF-IN

CORRECT LEFT ASSEMBLY: CB-11-103-00-10
CORRECT RIGHT ASSEMBLY: CB-12-103-00-10

TABLE 1.1

ASSEMBLY	NOMINAL TORQUE OUTPUT PER HINGE (N-M [LBF-IN])	MIN. TORQUE OUTPUT PER HINGE (N-M [LBF-IN])	MAX. TORQUE OUTPUT PER HINGE (N-M [LBF-IN])
CB-1X-101-00-10	8.8 (78)	5.7 (50)	10.2 (90)
CB-1X-102-00-10	13.5 (119)	10.2 (90)	15.5 (137)
CB-1X-103-00-10	18.2 (161)	15.5 (137)	19.8 (175)
CB-1X-104-00-10	22.8 (202)	19.8 (175)	24.9 (220)
CB-2X-101-00-10	27.7 (245)	24.9 (220)	29.4 (260)
CB-2X-102-00-10	32.2 (285)	29.4 (260)	34.5 (305)
CB-2X-103-00-10	37.3 (330)	34.5 (305)	39.5 (350)
CB-2X-104-00-10	42.4 (375)	39.5 (350)	44.6 (395)
CB-2X-105-00-10	47.5 (420)	44.6 (395)	50.3 (445)

CPB NUMBER 2017-0015

THIRD ANGLE PROJECTION

MILLIMETERS [IN]

TOLERANCES UNLESS OTHERWISE NOTED

ALL DIMENSIONS WITHOUT TOLERANCES ARE FOR REFERENCE ONLY.

PER ASME Y14.5M-2009

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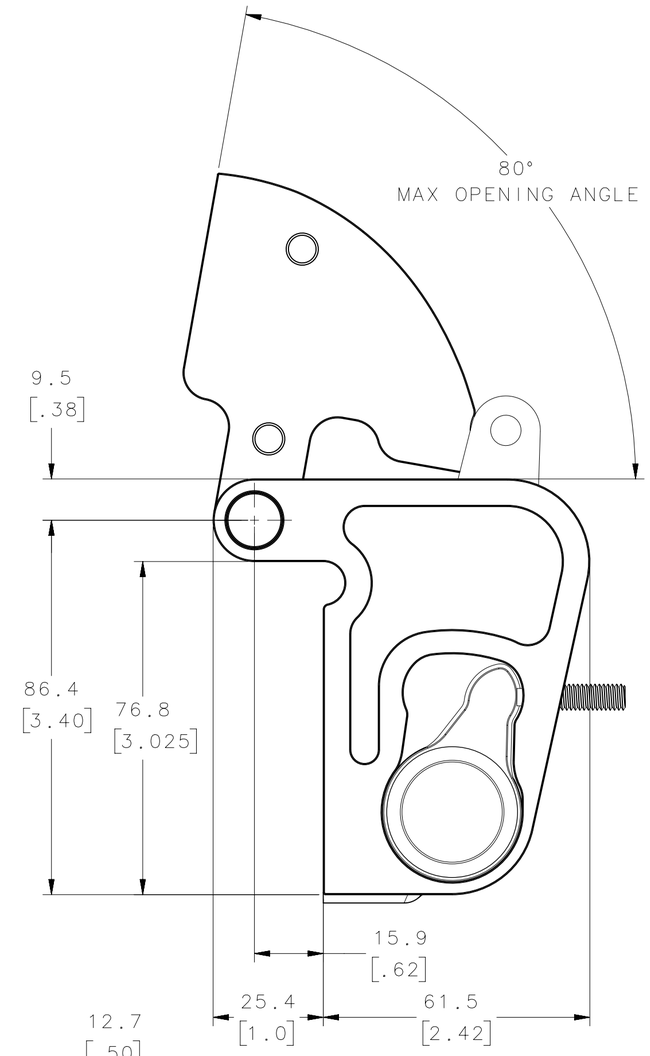
CONNECT·CREATE·INNOVATE

DESCRIPTION: COUNTERBALANCE HINGE OVERVIEW

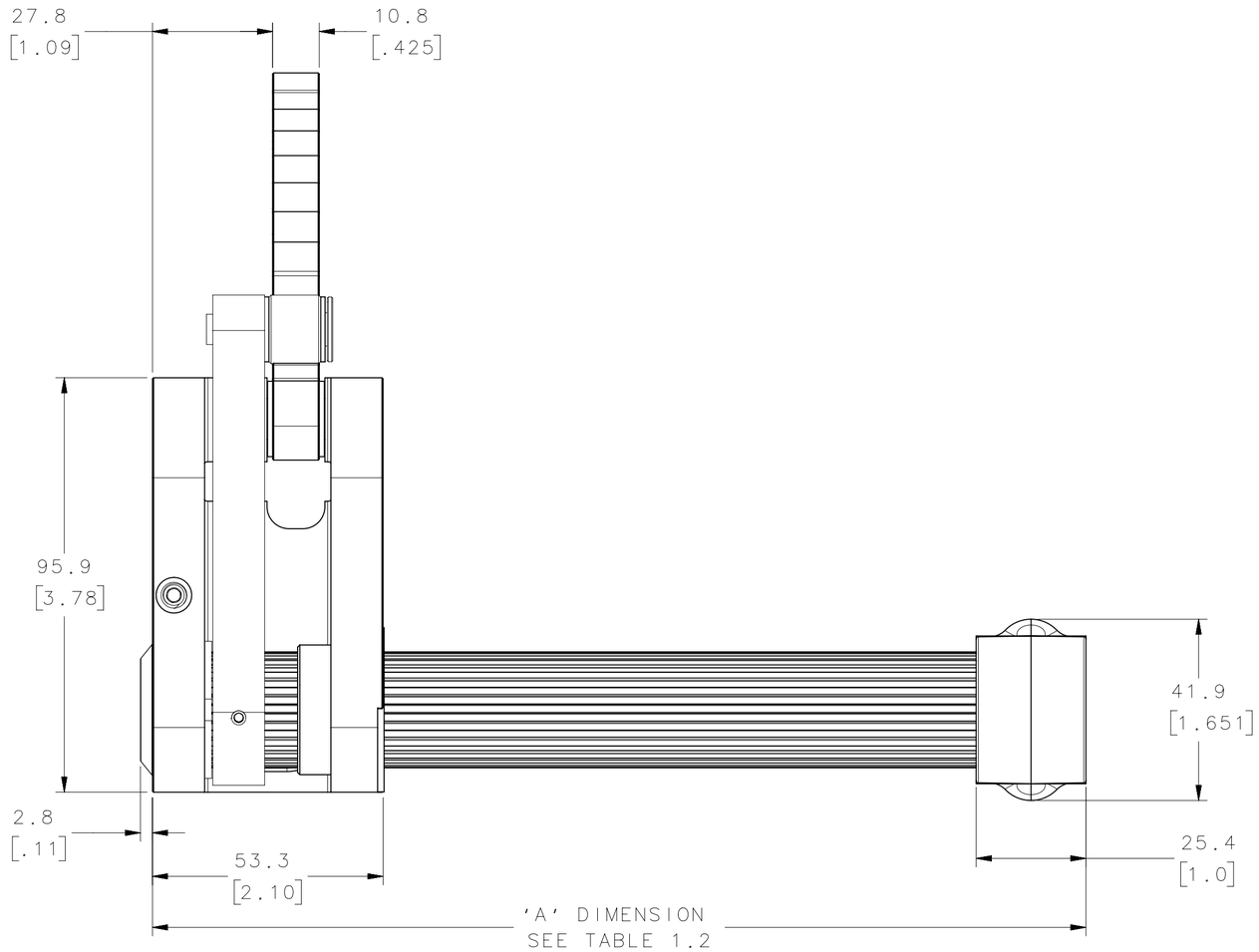
SIZE A2 | SYSTEM NX | DWG NO. J-CB-1

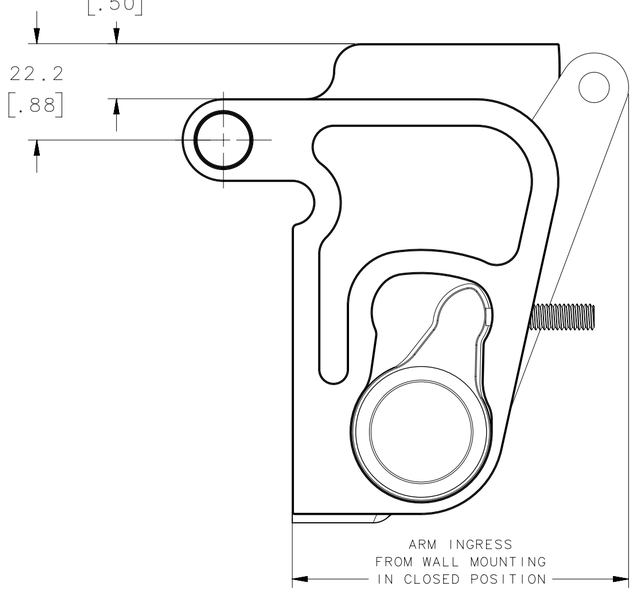
DRAWN BY CMG/JDS | DATE 10OCT2018 | SCALE NTS | SHEET 1 OF 4

REVISION HISTORY			
REV	DATE	BY	DESCRIPTION
F	12AUG2024	SAK/DMS	PRN:P2024-1333



OPEN (SHIPPING & INSTALLATION) POSITION





CLOSED POSITION

SEE TABLE 1.3

ONLY LEFT ASSEMBLY SHOWN
ALL GEOMETRY MIRRORED FOR RIGHT ASSEMBLIES

TABLE 1.2

ASSEMBLY	A' DIMENSION (CM [IN])
CB-1X-101-00-10	21.6 (8.50)
CB-1X-102-00-10	28.6 (11.13)
CB-1X-103-00-10	34.3 (13.50)
CB-1X-104-00-10	40.0 (15.75)
CB-2X-101-00-10	29.2 (11.50)
CB-2X-102-00-10	30.9 (12.17)
CB-2X-103-00-10	34.1 (13.42)
CB-2X-104-00-10	37.0 (14.54)
CB-2X-105-00-10	40.8 (16.04)

CPB NUMBER 2017-0015

THIRD ANGLE PROJECTION

MILLIMETERS [IN]

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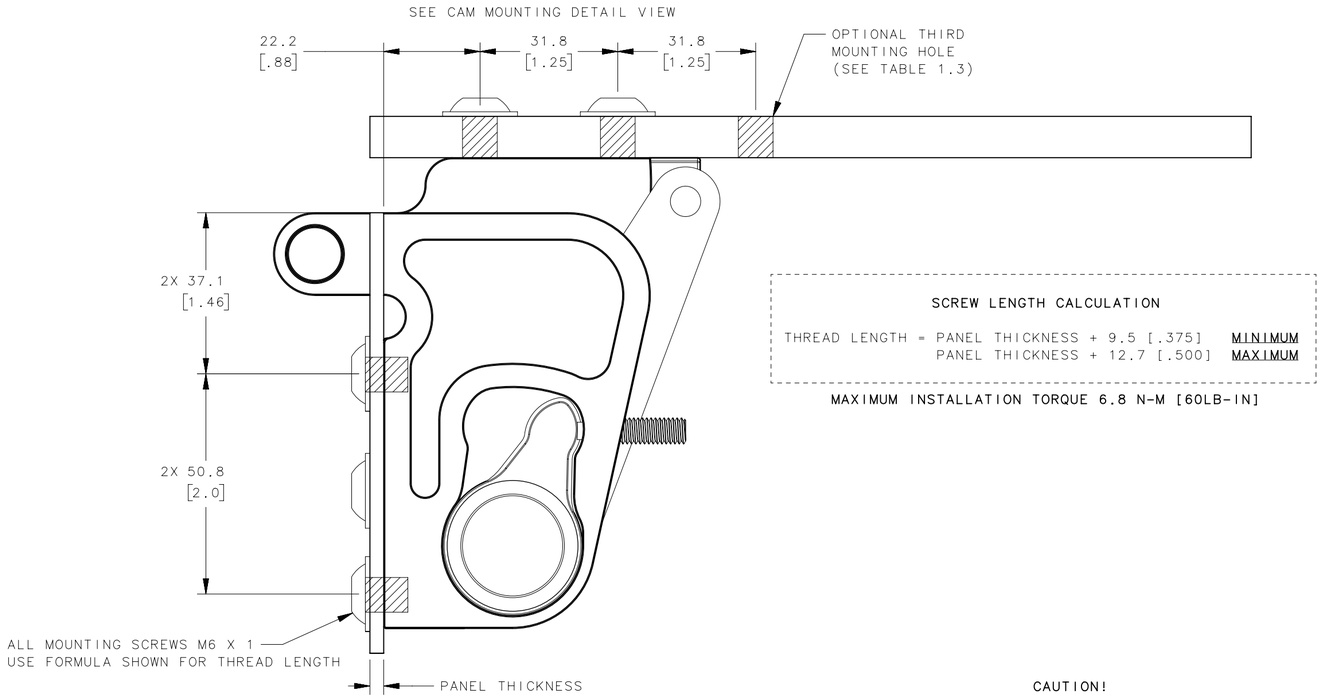
DESCRIPTION
COUNTERBALANCE HINGE SPRING DETAIL

SIZE	SYSTEM	DWG NO.
A2	NX	J-CB-1

DRAWN BY	DATE	SCALE	SHEET
CMG/JDS	10OCT2018	NTS	2 OF 4

REVISION HISTORY			
REV	DATE	BY	DESCRIPTION
F	12AUG2024	SAK/DMS	PRN:P2024-1333



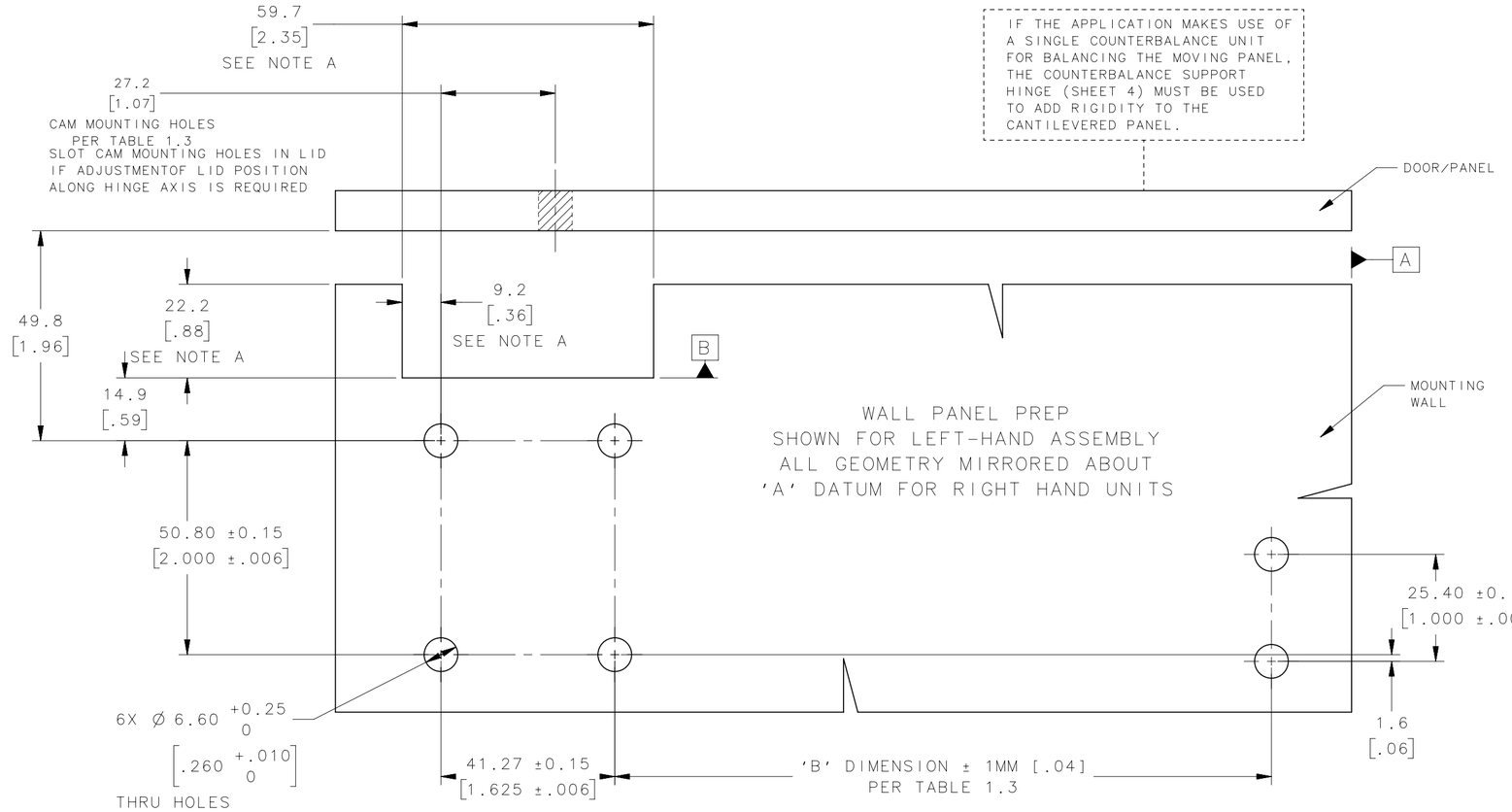
SCREW LENGTH CALCULATION

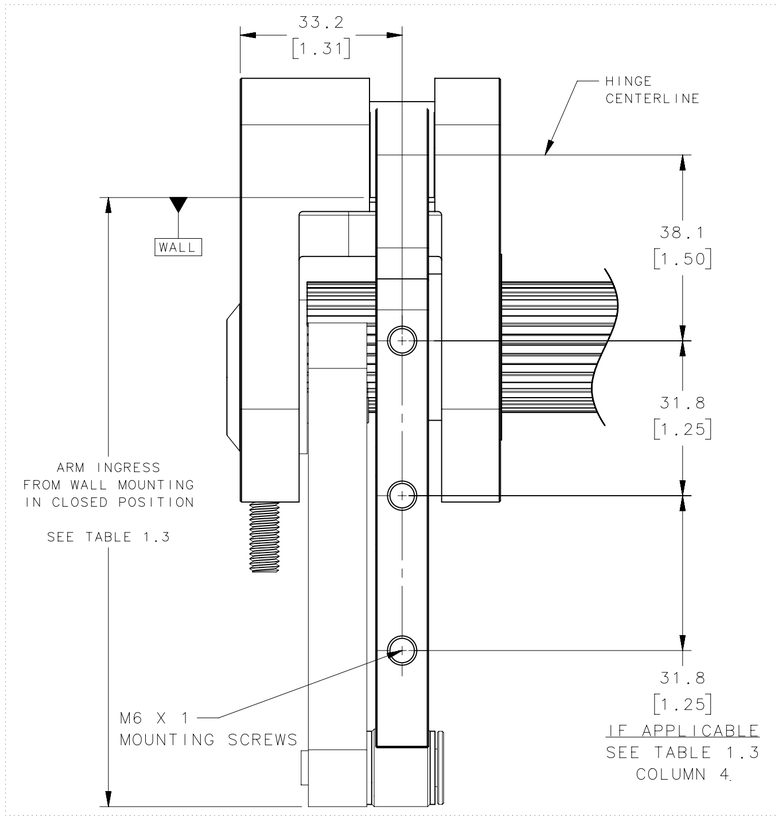
THREAD LENGTH = PANEL THICKNESS + 9.5 [.375] MINIMUM
PANEL THICKNESS + 12.7 [.500] MAXIMUM

MAXIMUM INSTALLATION TORQUE 6.8 N-M [60LB-IN]

CAUTION!

IF THE APPLICATION MAKES USE OF A SINGLE COUNTERBALANCE UNIT FOR BALANCING THE MOVING PANEL, THE COUNTERBALANCE SUPPORT HINGE (SHEET 4) MUST BE USED TO ADD RIGIDITY TO THE CANTILEVERED PANEL.





CAM MOUNTING DETAIL

NOTES:

A. CUTOUT GEOMETRY PROVIDED FOR CASES IN WHICH THE REQUIREMENT IS TO CONCEAL THE HOUSING AND FLUSH-MOUNT THE TOP FACE TO ALIGN WITH THE TOP OF THE REAR MOUNTING PANEL. CONCEALMENT IS NOT A REQUIREMENT AND DIMENSIONS CAN BE IGNORED FOR MOUNTING ON REAR PANELS ALONG THE 'B' DATUM.

TABLE 1.3

ASSEMBLY	B' DIMENSION (CM [IN])	ARM INGRESS (CM [IN])	# MOUNTING HOLES
CB-1X-101-00-10	15.59 (6.14)	7.76 (3.05)	2
CB-1X-102-00-10	22.25 (8.76)	9.28 (3.66)	2
CB-1X-103-00-10	28.29 (11.13)	10.31 (4.06)	3
CB-1X-104-00-10	34.00 (13.39)	11.14 (4.39)	3
CB-2X-101-00-10	22.04 (8.68)	8.75 (3.44)	2
CB-2X-102-00-10	24.89 (9.80)	9.45 (3.72)	2
CB-2X-103-00-10	28.07 (11.05)	9.95 (3.92)	2
CB-2X-104-00-10	30.93 (12.18)	10.5 (4.13)	3
CB-2X-105-00-10	34.74 (13.68)	10.96 (4.32)	3

CPB NUMBER 2017-0015

THIRD ANGLE PROJECTION

MILLIMETERS [IN]

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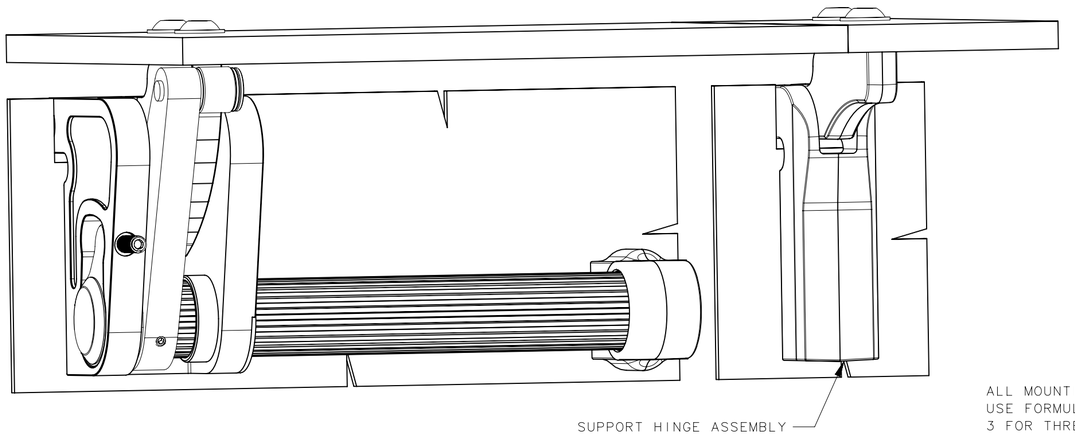
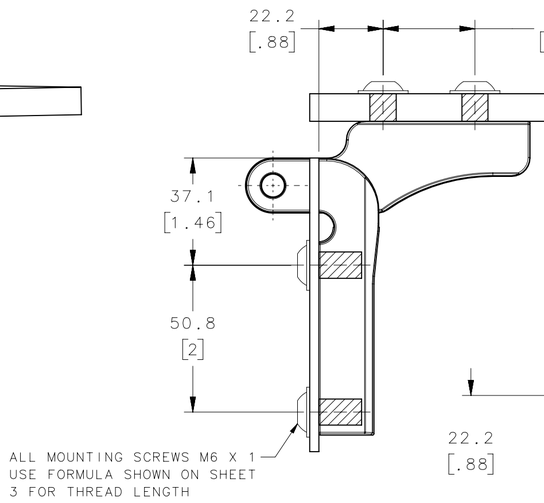
DESCRIPTION
COUNTERBALANCE HINGE ATTACHMENT DETAIL

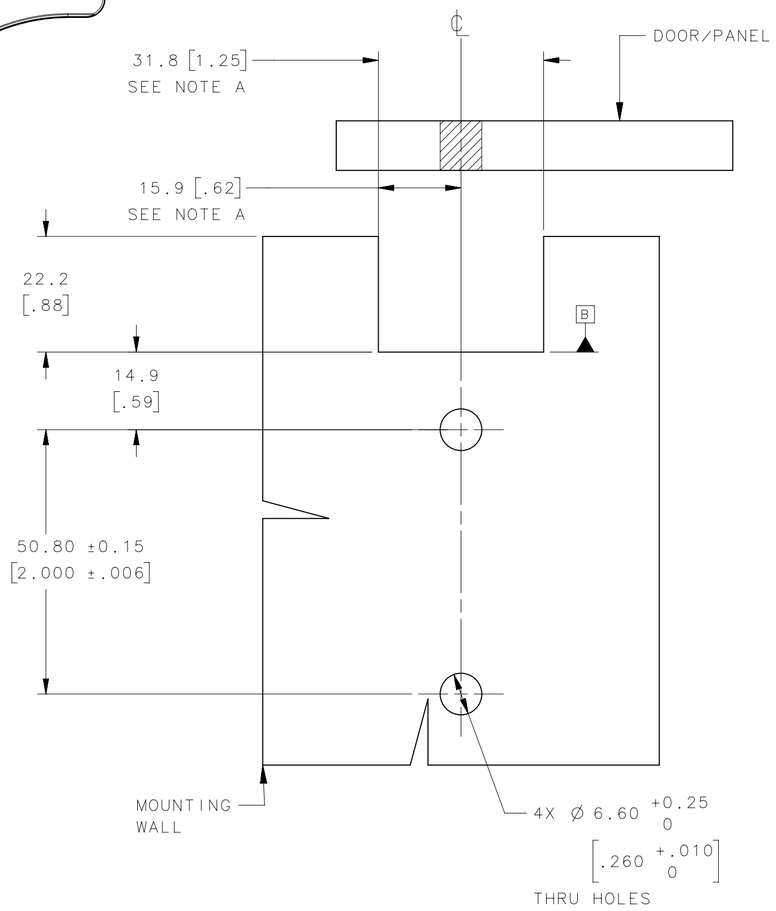
SIZE	SYSTEM	DWG NO.
A2	NX	J-CB-1

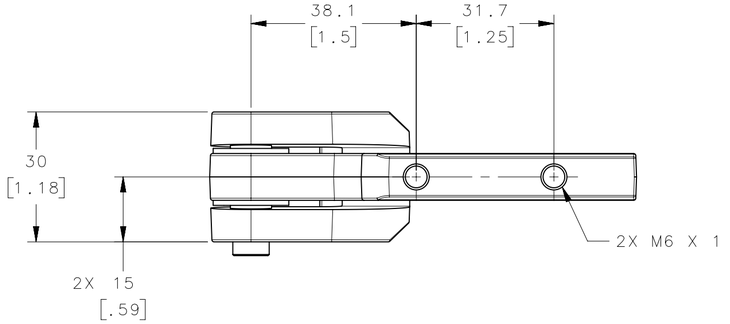
DRAWN BY	DATE	SCALE	SHEET
CMG/JDS	10OCT2018	NTS	3 OF 4

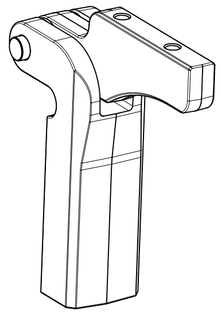
COUNTERBALANCE SUPPORT HINGE

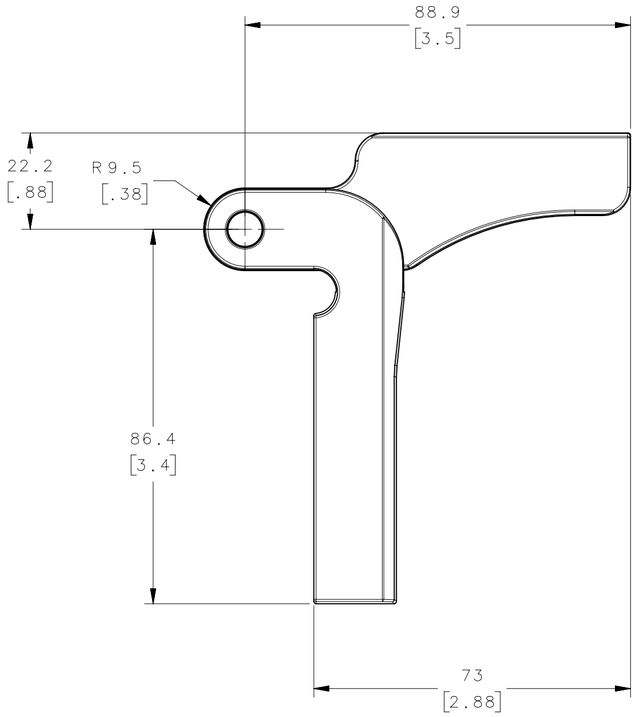


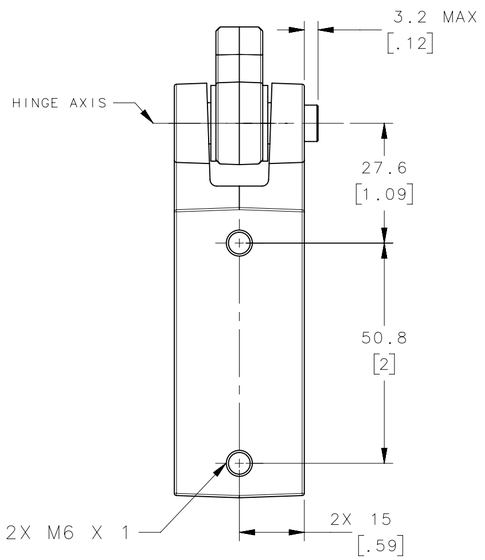












NOTES:
A. CUTOUT GEOMETRY PROVIDED FOR CASES IN WHICH THE REQUIREMENT IS TO CONCEAL THE HOUSING AND FLUSH-MOUNT THE TOP FACE TO ALIGN WITH THE TOP OF THE REAR MOUNTING PANEL. CONCEALMENT IS NOT A REQUIREMENT AND DIMENSIONS CAN BE IGNORED FOR MOUNTING ON REAR PANELS ALONG THE 'B' DATUM.

SUPPORT HINGE PANEL PREPARATION

THE COUNTERBALANCE SUPPORT HINGE IS DESIGNED TO BE USED ON PANELS UTILIZING A SINGLE COUNTERBALANCE HINGE. THE SUPPORT HINGE PROVIDES RIGIDITY TO THE CANTILEVERED END OF THE PANEL TO RESIST TWISTING, BOWING, ETC.

THE SUPPORT HINGE DOES NOT PROVIDE ANY SPRING ASSISTANCE.

REVISION HISTORY

REV	DATE	BY	DESCRIPTION
F	12AUG2024	SAK/DMS	PRN:P2024-1333

TABLE 1.4

ASSEMBLY PART NUMBER	COLOR/FINISH	ATTACHMENT
CB-10-100-10	BLACK ANODIZE	M6 X 1
CB-10-100-11	CLEAR ANODIZE	M6 X 1

CPB NUMBER 2019-0427

SURFACE AREA

VOLUME

PROPRIETARY ITEM

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THIRD ANGLE PROJECTION

MILLIMETERS [IN]

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DESCRIPTION: SUPPORT HINGE DETAIL

SIZE	SYSTEM	DWG NO.	
A2	NX	J-CB-1	
DRAWN BY	DATE	SCALE	SHEET
CMG/GSF	09JUL2019	NTS	4 OF 4