Drawing Portfolio

At Action Target I worked in the Range Design Team. We would get orders for different types of shooting ranges. The other designers and I would have a general design to start with, but then we would modify, customize and re-engineer it to the customer's specifications under the guidance of the engineers. I would also design up other various mechanical components related to ballistics and targets. The drawings I had from here were lost on an external hard drive that got corrupted.

Edwards Lifesciences

At Edwards, I worked mostly in manufacturing engineering; designing fixtures, tools, jigs, machines and anything else to aid in the high volume manufacturing of Cardiovascular medical devices. I implemented Lean engineering practices to make my designs as efficient and mistake proof as possible. I also reworked existing designs to make improvements and updates. The drawings attached are a few examples of my designs. Their complexity varied, some were simple, others were very complex. I would estimate that I designed and built between 500-1000 different manufacturing instruments during my tenure at Edwards.

BIOFIRE

BioFire was initially similar work to Edwards; supporting medical device manufacturing. A year after I started I switched to BioFire Defense in more of an R&D role. There we worked on the tactical variant of the Film Array, which then transitioned into the new and improved version of the Film Array. I also used SolidWorks composer to create interactive Work Instruction Documents for the Film Array. Aside from R&D work, I would also assist in any manufacturing support by designing simple manufacturing aids, as well as update all of their patent drawings.

CIRCOR DeltaValve

At DeltaValve I worked in the Engineering department where we built our 'Un-Heading' valves to be used in the coking process at Oil Refineries. We had several different styles and we would modify them based on our Customer's needs. The attached drawing is a General Arrangement of one of their 'Top Un-Heading Valves.'

FLSmidth

At FLSmidth, I worked with the Crusher group. My team was responsible for the massive Gyratory crushers in the mining process. We modified, redesigned and created new crusher components depending on the customers needs. I also worked in SolidWorks Composer creating high resolution images for our Equipment manuals as well as images used for Marketing Material.

---

carterra

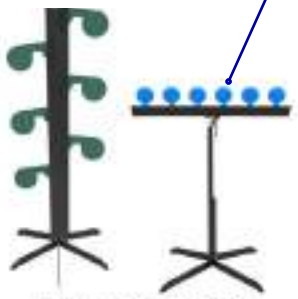
At Carterra, I work in the engineering group designing mechanical components that are part of our LSA Machine. This machine runs a process called 'Surface Plasmon Resonance.' This is a mircofluidics process that allows for precise antibody research in the field of drug discovery. Carterra is similar to BioFire, only their product is much larger than BioFire's. In addition to engineering work, I also manage the PDM system, overseeing the work flow and SolidWorks files.

This is one of the bullet traps used in the shooting ranges Action Target would build. I would make updates and modifications to this and other types of traps in CAD, then produce all the drawings for the contractors to build.

TOTAL CONTAINMENT TRAP COMPONENTS

1. DEFLECTION PLATES
2. DECELERATION CHAMBER
3. BULLET COLLECTION SYSTEM
4. DUST COLLECTION UNIT

These are some of the portable targets that I would also work on. Under the direction of the project manager, I would make changes and updates, create new ones, and produce all the shop drawings for manufacturing.


Shop Reactive Steel Targets


Shop Steel .22 Targets

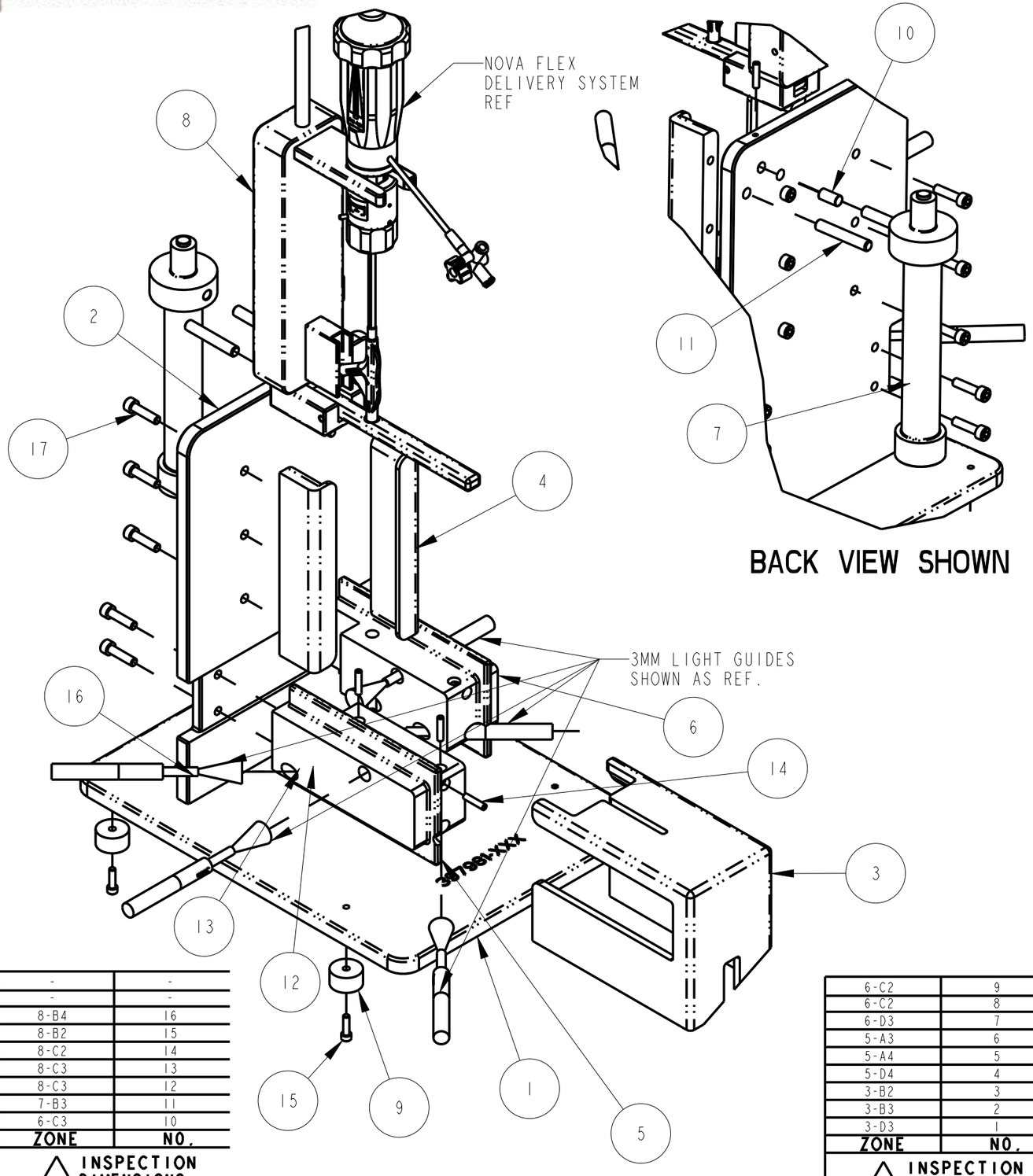

Shop Dueling Steel Targets


Shop Static Steel Targets


Shop Gong Steel Targets


Shop Steel Target Holders

Edwards Lifesciences



BACK VIEW SHOWN

DRAWING STATUS	X -	D -	P ECN093442

REV LTR	REL ID	APPROVAL			
		DFTSPN	DATE	APPD	DATE
A	ECN093442	K. CHRISTENSEN	4-12-13	SEE ECN	SEE ECN
-	-	-	-	-	-

GENERAL NOTES: UNLESS OTHERWISE SPECIFIED

1. DEBURR AND BREAK ALL SHARP EDGES AND CORNERS.
2. ALL PARTS TO BE CLEAN AND FREE OF CONTAMINANTS; OIL, SOLVENT & ETC.
3. PARTS TO BE CLEARLY LABEL AND PACKAGE AGAINST SHIPPING DAMAGE.
4. ALL FASTENERS TO BE IN STAINLESS STEEL.

ITEM	QTY	PART NO	DESCRIPTION
17	10	SHCS-SS-UNF-1032X750	SCREW, SHCS #10-32 X 3/4
16	3	SHCS-SS-UNF-1032X625	SCREW, SHCS #10-32 X 5/8
15	4	SHCS-SS-UNC-632X500	SCREW, SHCS UNC #6-32 X 1/2
14	7	SETSCREW-632X625	SCREW, SET UNC #6-32 X 5/8
13	1	SETSCREW-2520X750	SCREW, SET UNC 1/4-20 X 3/4
12	1	NUT-HEX-2520	NUT, HEX 1/4-20
11	2	DOWEL-PF-250X1500	PIN, DOWEL .250 DIA X 1-1/2
10	1	D48	MAGNET, AXIAL, .250 DIA X .500 LG
9	4	9540K55	RUBBER BUMPER (MCMASTER-CARR)
8	1	397983-001	Y CONNECTOR BOND NEST
7	1	397981-200	GAUGE ASSY
6	1	397981-106	RIGHT LIGHT GUIDE ARM
5	1	397981-105	LEFT LIGHT GUIDE ARM
4	2	397981-104	RAIL
3	1	397981-103	COVER
2	1	397981-102	CARRIAGE
1	1	397981-101	BASE

PARTS LIST

ZONE	NO.
-	-
-	-
8-B4	16
8-B2	15
8-C2	14
8-C3	13
8-C3	12
7-B3	11
6-C3	10

△ INSPECTION DIMENSIONS

ZONE	NO.
6-C2	9
6-C2	8
6-D3	7
5-A3	6
5-A4	5
5-D4	4
3-B2	3
3-B3	2
3-D3	1

△ INSPECTION DIMENSIONS

DASH NO. 001

TOLERANCES UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS IN INCHES
.X ± .015 FRACTION ± 1/32
.XX ± .01 ANGULAR DIMS ± 1°
.XXX ± .005

DO NOT SCALE DRAWING

APPROVALS	DATE
DRAWN K. CHRISTENSEN	9/21/12
CHECKED -	-
SOURCE FILE	Pro/E

Edwards Lifesciences
IRVINE, CALIF. 92614

TITLE FIXTURE, UV Y-FITTING

SCALE: SCALE | SHEET 1 OF 9

SIZE B | DRAW NO. 397981 | REV. A

EDWARDS_B.FRM 1270 REV B VER 1
ISSUED 4/9/03 PER ECN23964

PDM STATUS: A Under Review / APPROVED

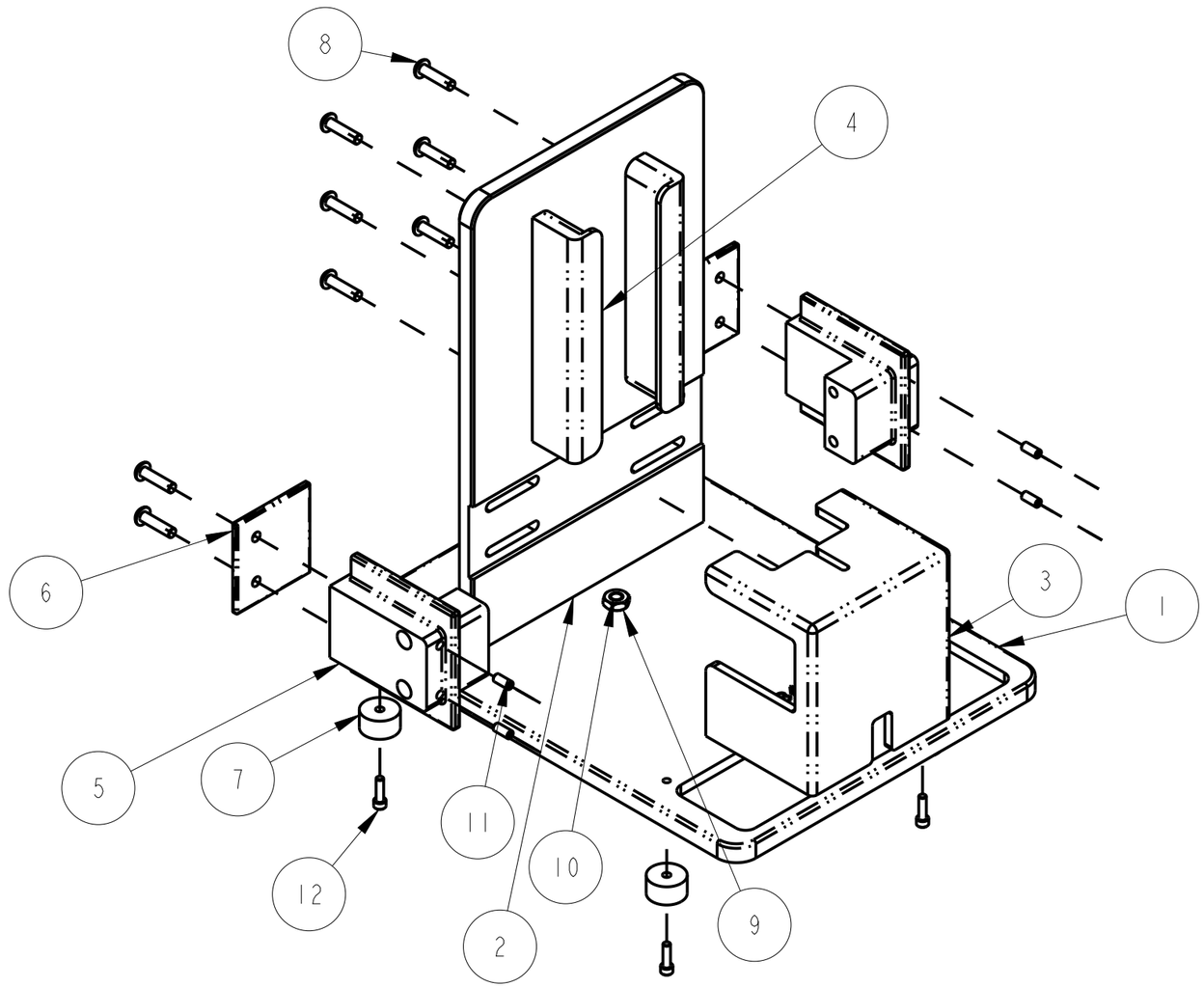
Edwards Lifesciences

DRAWING STATUS	X ECN62031	D ECN63992	P ECN093442

REV LTR	REL ID	APPROVAL			
		DFTSPN	DATE	APPD	DATE
C	ECN78528	L MOLINA	8/10/11	SEE ECN	SEE ECN
D	ECN093442	K. CHRISTENSEN	4-19-13	SEE ECN	SEE ECN

GENERAL NOTES: UNLESS OTHERWISE SPECIFIED

1. BREAK: .01 MAX UNLESS OTHERWISE SPECIFIED



395784-001 SHOWN
SCALE 0.375

ITEM	QTY	PART NO	DESCRIPTION
12	4	SHCS-SS-UNC-632X500	SCREW, SHCS UNC #6-32 X 1/2
11	4	SETSCREW-832X375	SCREW, SET UNC #8-32 X 3/8
10	1	SETSCREW-2520X750	SCREW, SET UNC 1/4-20 X 3/4
9	1	NUT-HEX-2520	NUT, HEX 1/4-20
8	13	BHCS-SS-UNF-1032X750	SCREW, SS BHCS #10-32 X 3/4
7	4	9540K55	RUBBER BUMPER (MCMASTER-CARR)
6	2	395784-106	COVER, LITE
5	2	395784-105	HOLDER, LIGHTGUIDE
4	2	395784-104	GUIDE RAIL
3	1	395784-103	COVER
2	1	395784-102	UPRIGHT PLATE
1	1	395784-101	BASE PLATE

PARTS LIST

INSPECTION DIMENSIONS ZONE	INSPECTION DIMENSIONS NO.	INSPECTION DIMENSIONS ZONE	INSPECTION DIMENSIONS NO.
-	-	10 C3	11
-	-	7 C2	9
-	-	7 C3	8, 10
-	-	7 D3	7
12 B3	18	6 A3	6
12 B4	16,17	6 A4	5
12 C3	15	6 D4	4
10 B3	14	4 B3	2,3
10 C4	12,13	4 D4	1

DASH NO. 001 002 -

TOLERANCES UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS IN INCHES
.X ± .015 FRACTION ± 1/32
.XX ± .01 ANGULAR DIMS ± 1°
.XXX ± .005

DO NOT SCALE DRAWING

APPROVALS	DATE
DRAWN K. CHRISTENSEN	5-7-10
CHECKED -	-
SOURCE FILE	Pro/E

Edwards Lifesciences
IRVINE, CALIF. 92614

TITLE FIXTURE, UV CURE, NOVA FLEX

SCALE: SEE VIEW | SHEET 1 OF 12

SIZE B | DRAW NO. 395784 | REV. D

PDM STATUS: D Concept / APPROVED

EDWARDS_B.FRM 1270 REV B VER 1
ISSUED 4/9/03 PER ECN23964

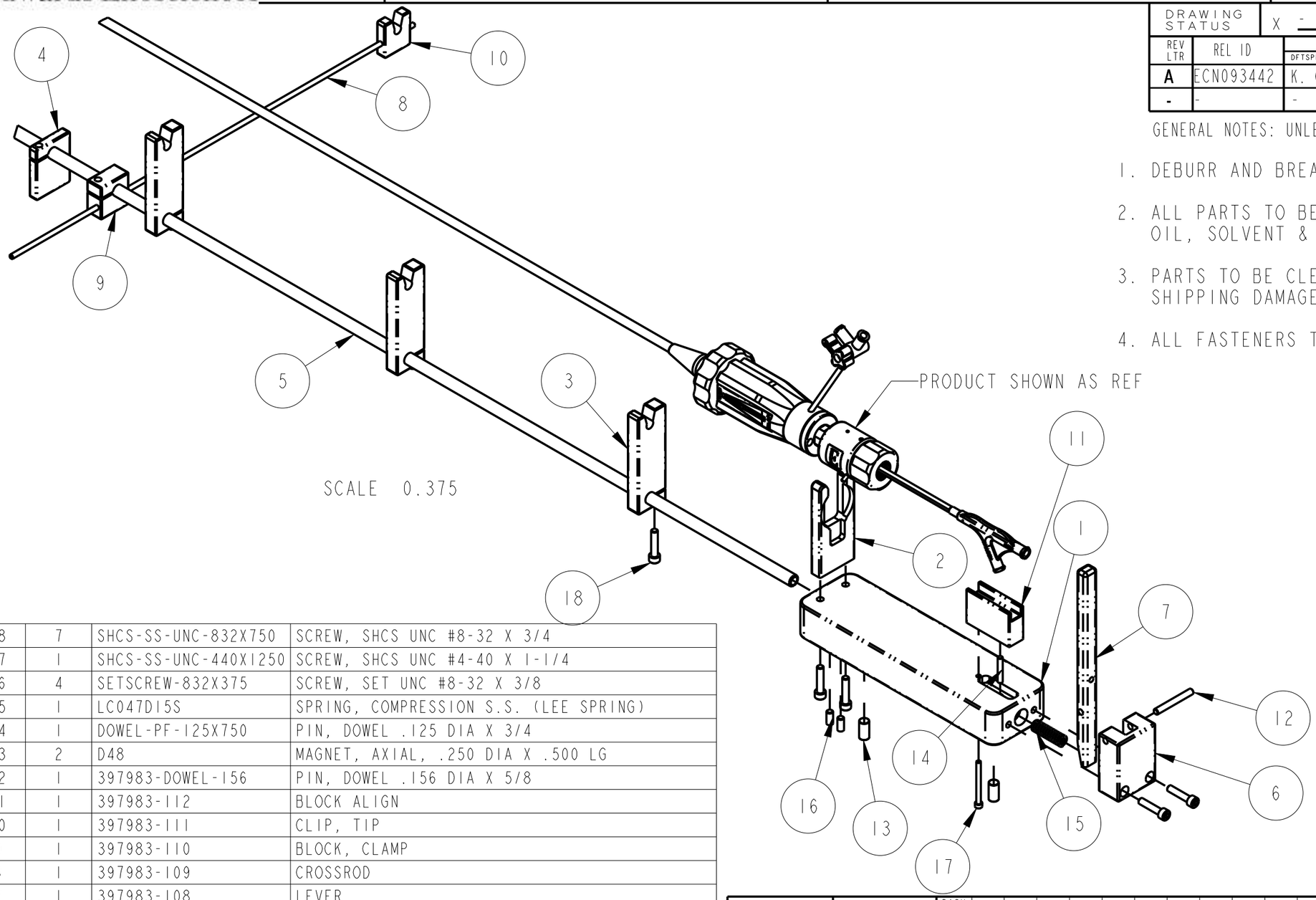
Edwards Lifesciences

DRAWING STATUS	X -	D -	P ECN093442

REV LTR	REL ID	APPROVAL			
		DFTSPN	DATE	APPD	DATE
A	ECN093442	K. CHRISTENSEN	4-19-13	SEE ECN	SEE ECN
-	-	-	-	-	-

GENERAL NOTES: UNLESS OTHERWISE SPECIFIED

1. DEBURR AND BREAK ALL SHARP EDGES AND CORNERS.
2. ALL PARTS TO BE CLEAN AND FREE OF CONTAMINANTS; OIL, SOLVENT & ETC.
3. PARTS TO BE CLEARLY LABEL AND PACKAGE AGAINST SHIPPING DAMAGE.
4. ALL FASTENERS TO BE IN STAINLESS STEEL.



SCALE 0.375

ITEM	QTY	PART NO	DESCRIPTION
18	7	SHCS-SS-UNC-832X750	SCREW, SHCS UNC #8-32 X 3/4
17	1	SHCS-SS-UNC-440X1250	SCREW, SHCS UNC #4-40 X 1-1/4
16	4	SETSCREW-832X375	SCREW, SET UNC #8-32 X 3/8
15	1	LC047D15S	SPRING, COMPRESSION S.S. (LEE SPRING)
14	1	DOWEL-PF-125X750	PIN, DOWEL .125 DIA X 3/4
13	2	D48	MAGNET, AXIAL, .250 DIA X .500 LG
12	1	397983-DOWEL-156	PIN, DOWEL .156 DIA X 5/8
11	1	397983-112	BLOCK ALIGN
10	1	397983-111	CLIP, TIP
9	1	397983-110	BLOCK, CLAMP
8	1	397983-109	CROSSROD
7	1	397983-108	LEVER
6	1	397983-107	BLOCK, LEVER
5	1	397983-106	ROD, CLAMP GUIDE
4	1	397983-105	CRUTCH
3	3	397983-104	PLATE, CLIP
2	1	397983-102	FORK PLATE
1	1	397983-101	BASE, FIXTURE IA

PARTS LIST

ZONE	NO.
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-

△ INSPECTION DIMENSIONS

DASH NO. 001

TOLERANCES UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS IN INCHES
.X ± .015 FRACTION ± 1/32
.XX ± .01 ANGULAR DIMS ± 1°
.XXX ± .005

DO NOT SCALE DRAWING

APPROVALS	DATE
DRAWN K. CHRISTENSEN	9/23/12
CHECKED -	-
SOURCE FILE	Pro/E

Edwards Lifesciences
IRVINE, CALIF. 92614

TITLE NEST, UV STOPCOCK

SCALE: SCALE | SHEET 1 OF 8

SIZE B | DRAW NO. 397983 | REV. A

PDM STATUS: A Concept / APPROVED

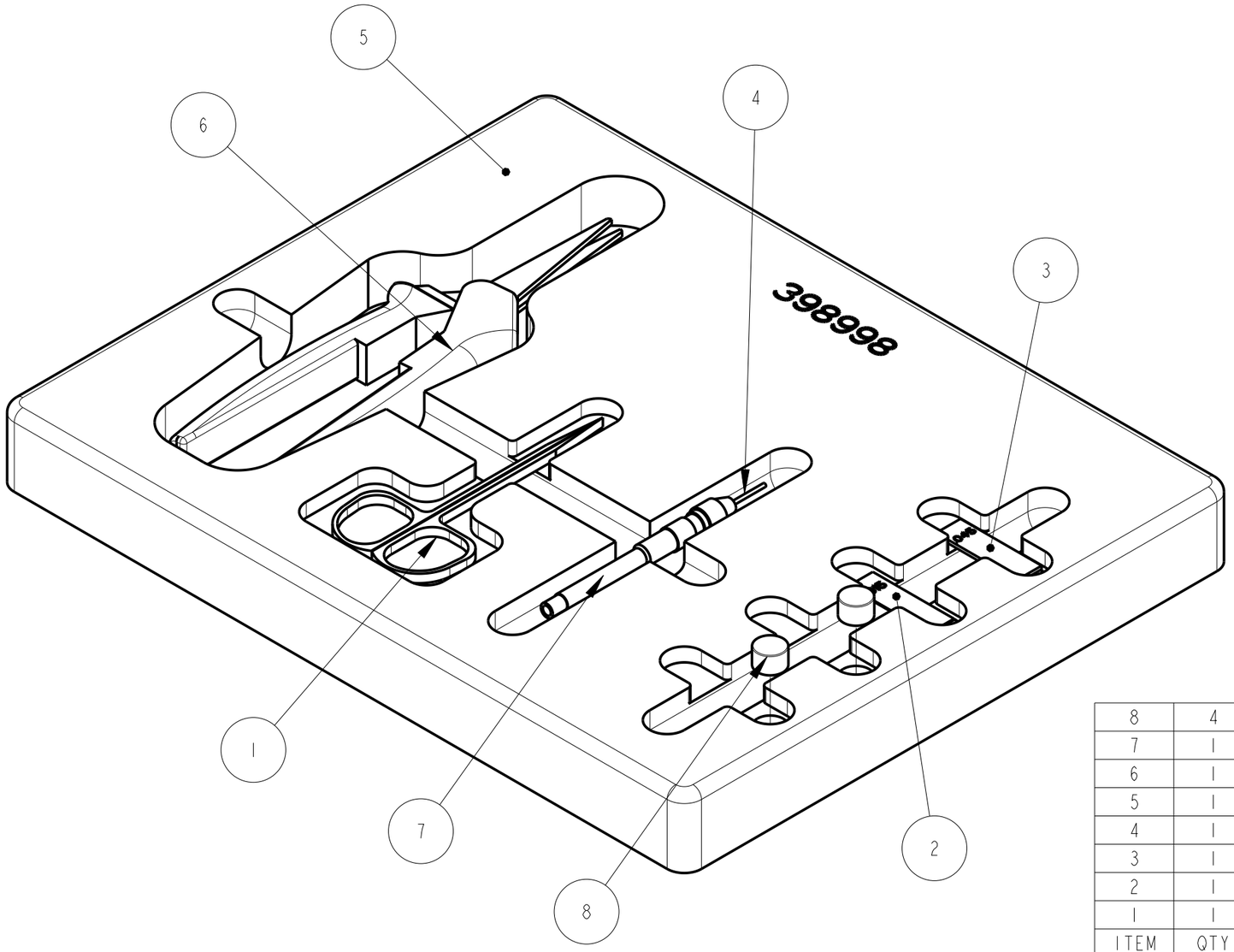
EDWARDS_B.FRM 1270 REV B VER 1
ISSUED 4/9/03 PER ECN23964

Edwards Lifesciences

DRAWING STATUS	X -	D -	P -

REV LTR	REL ID	APPROVAL			
		DFTSPN	DATE	APPD	DATE
-	-	-	-	-	-
-	-	-	-	-	-

GENERAL NOTES: UNLESS OTHERWISE SPECIFIED



PRELIMINARY DRAWING
NOT RELEASED
K. CHRISTENSEN
09-27-13

ITEM	QTY	PART NO	DESCRIPTION
8	4	D64-N52	MAGNET (K&J MAGNETS)
7	1	8455A16	PIN VISE
6	1	398998-102	S.S. SCISSORS, McMASTER (MODIFIED)
5	1	398998-101	NEST
4	1	2321A001	Ø.045 Z GAUGE, McMASTER
3	1	19575A18	MITUTOYO GRADE .045 GAUGE BLOCK, McMASTER
2	1	19575A14	MITUTOYO GRADE .015 GAUGE BLOCK, McMASTER
1	1	18-1396	MILTEX IRIS SCISSORS, 3-1/2"

PARTS LIST

DASH NO.	001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TOLERANCES UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS IN INCHES
.X ± .015 FRACTION ± 1/32
.XX ± .01 ANGULAR DIMS ± 1°
.XXX ± .005

DO NOT SCALE DRAWING

APPROVALS	DATE
DRAWN K. CHRISTENSEN	09-27-13
CHECKED -	-
SOURCE FILE	Pro/E

Edwards Lifesciences
IRVINE, CALIF. 92614

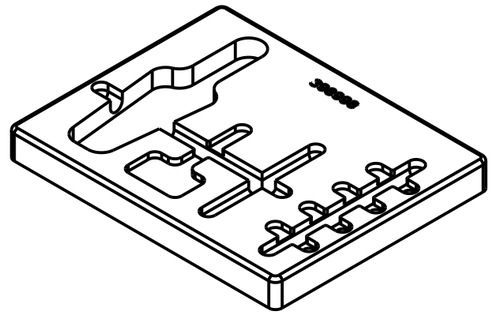
TITLE: TOOL NEST, TRIMMING, MEMBRANE

SCALE: SCALE | SHEET 1 OF 4

SIZE B | DRAW NO. 398998 | REV. A

PDM STATUS: X1 Concept / APPROVED

Edwards Lifesciences



398998-101
NEST
MATERIAL: HDPE
SCALE: .750

9.50
8.88
8.25
6.50
3.00
2.60
2.00
1.40
1.00

ENGRAVE AS SHOWN

8X Ø.50 ↧.20

7X Ø1.00 ↧.625

2X Ø.50 ↧.50
R.250 BOTTOM

398998

4X Ø.375 ↧.250
PRESS FIT FOR
D64-NF2 MAGNET

2X Ø.50 ↧.50
R.250 BOTTOM

1.25
1.25
1.25
1.75
8.00
6.375
5.000
1.00

7.00
5.42
4.50
4.25
3.00
2.00
1.25
.75

A
A

(12.2°)

R.063

SEE SHEET 3 FOR
SECTION A-A VIEW

.50
1.75
2.25
3.50
4.50
5.50
7.250
10.00

2X Ø.50 ↧.50
R.250 BOTTOM

7X Ø.50 ↧.200

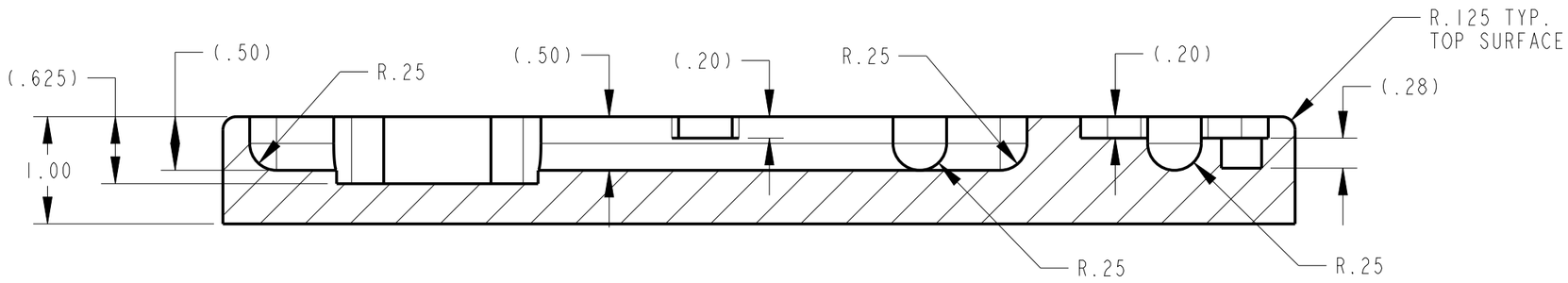
.875

4X R.25

Edwards Lifesciences IRVINE, CALIF. 92614			
TITLE: TOOL NEST, TRIMMING, MEMBRANE			
SCALE: SCALE		SHEET 2 OF 4	
SIZE: B	DRAW NO. 398998	REV. A	

EDWARDS.B.FRM 1270 REV B VER1

Edwards Lifesciences



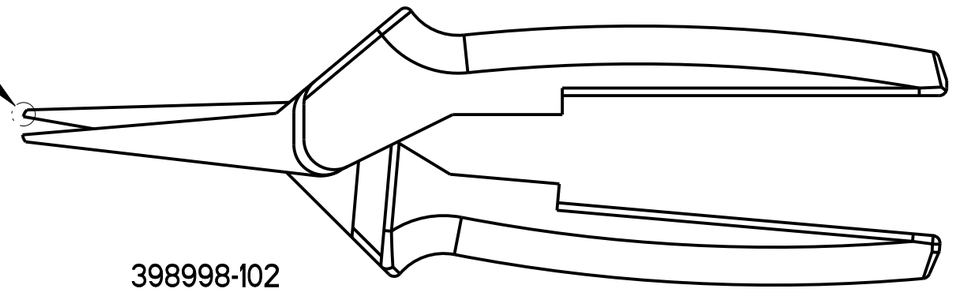
SECTION A-A

Edwards Lifesciences IRVINE, CALIF. 92614	
TITLE: TOOL NEST, TRIMMING, MEMBRANE	
SCALE: SCALE	SHEET 3 OF 4
SIZE: B	DRAW NO. 398998 / REV. A

EDWARDS.B.FRM 1270 REV B VER1

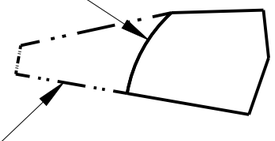
Edwards Lifesciences

SEE DETAIL A



398998-102
McMASTER #36705A49
S.S. SCISSORS
(MODIFIED)

R.078 MAX .0938
MIN .0625



MODIFY McMASTER SCISSORS
BY REMOVING MATERIAL TO ADD
5/64" RADIUS ON THE SHARP END

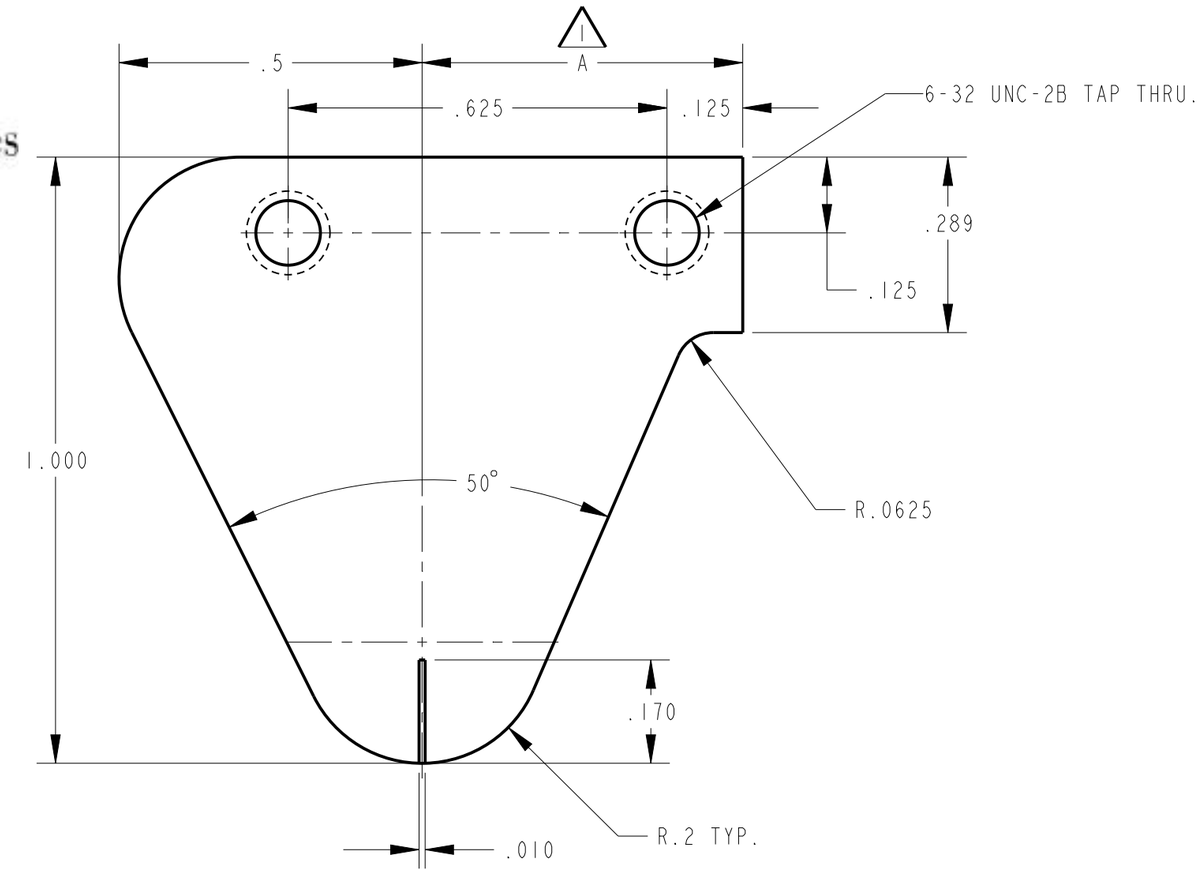
DETAIL A
SCALE 12.000

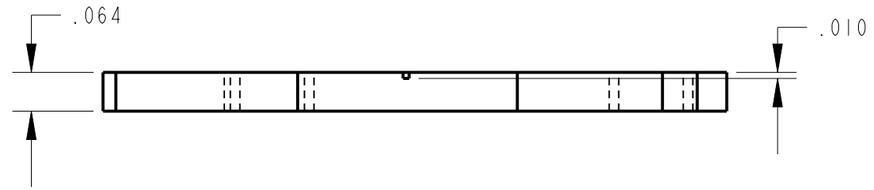
Edwards Lifesciences IRVINE, CALIF. 92614		
TITLE: TOOL NEST, TRIMMING, MEMBRANE		
SCALE: SCALE		SHEET 4 OF 4
SIZE B	DRAW NO. 398998	REV. A

EDWARDS_B.FRM 1270 REV B VER1

DASH NO.	A
-020	1.189
-023	.972
-026	.717
-029	.500

Edwards Lifesciences





DRAWING STATUS	X -	D ECN83006	P -

REV LTR	REL ID	APPROVAL			
		DFTSPN	DATE	APPD	DATE
A	ECN83006	K. CHRISTENSEN	02-10-12	SEE ECN	SEE ECN
-	-	-	-	-	-

GENERAL NOTES: UNLESS OTHERWISE SPECIFIED

1. MATERIAL: 400 SERIES STAINLESS STEEL

DASH NO.	001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TOLERANCES UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS IN INCHES
.X ± .015 FRACTION ± 1/32
.XX ± .01 ANGULAR DIMS ± 1°
.XXX ± .005

DO NOT SCALE DRAWING

APPROVALS	DATE
DRAWN K. CHRISTENSEN	02-08-12
CHECKED -	-
SOURCE FILE	Pro/E

Edwards Lifesciences
IRVINE, CALIF. 92614

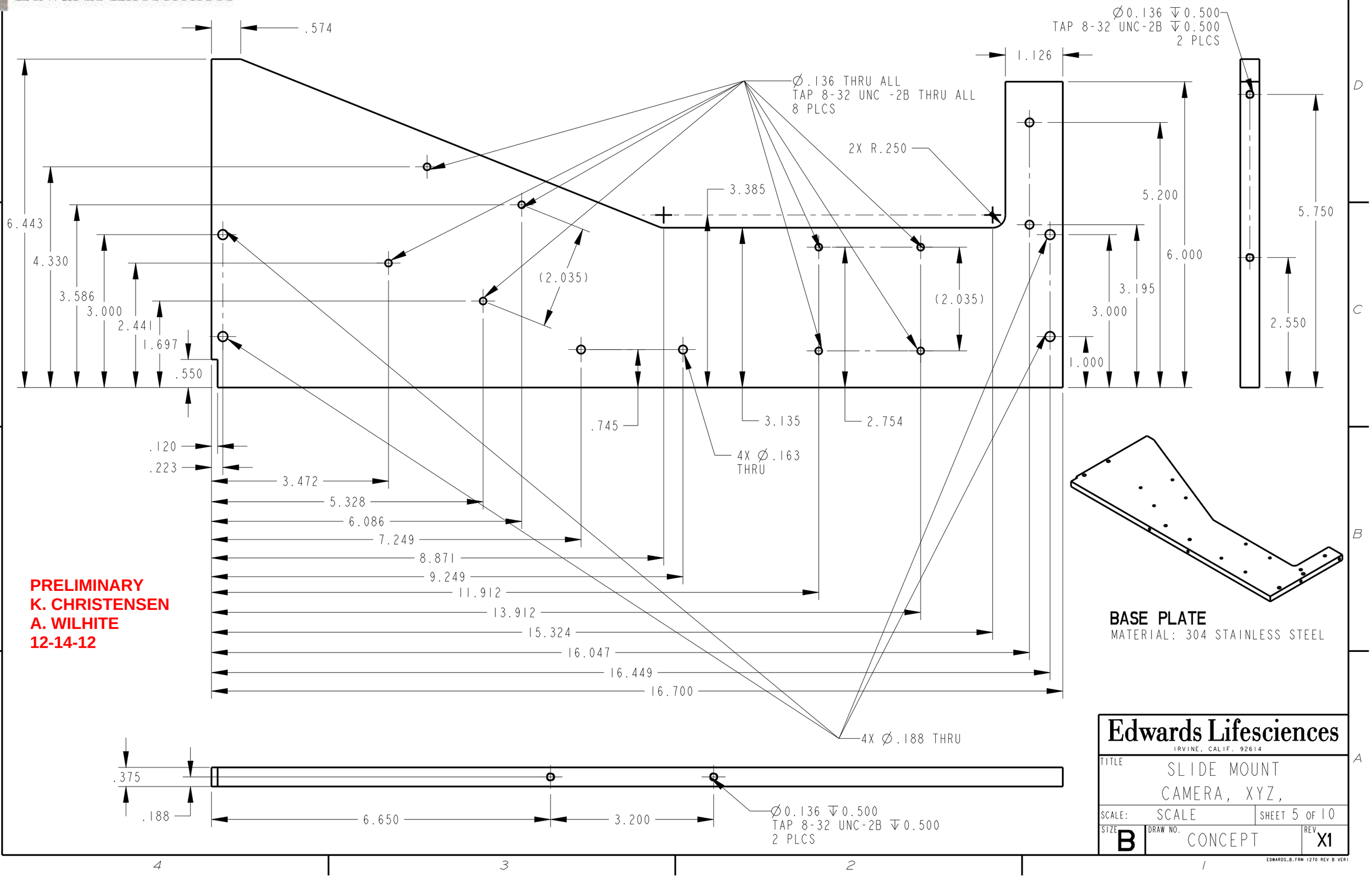
TITLE
INDICATOR, PLEAT AND FOLD

SCALE: NONE	SHEET 1 OF 1
SIZE B	DRAW NO. 397488	REV. A

PDM STATUS: A D / APPROVED

EDWARDS_B.FRM 1270 REV B VER 1
ISSUED 4/9/03 PER ECN23964

Edwards Lifesciences



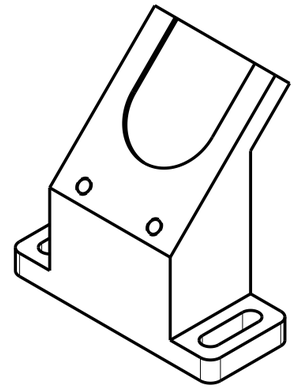
BASE PLATE
MATERIAL: 304 STAINLESS STEEL

PRELIMINARY
K. CHRISTENSEN
A. WILHITE
12-14-12

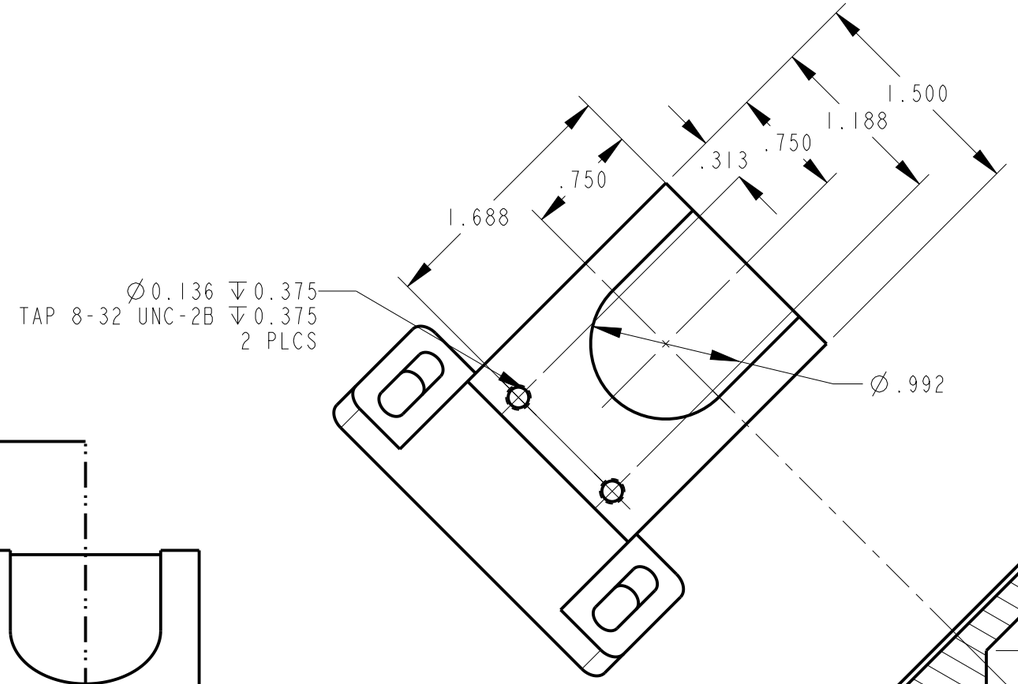
Edwards Lifesciences	IRVINE, CALIF. 92614
TITLE	SLIDE MOUNT CAMERA, XYZ,
SCALE: SCALE	SHEET 5 OF 10
SIZE B	DRAW NO. CONCEPT
	REV X1

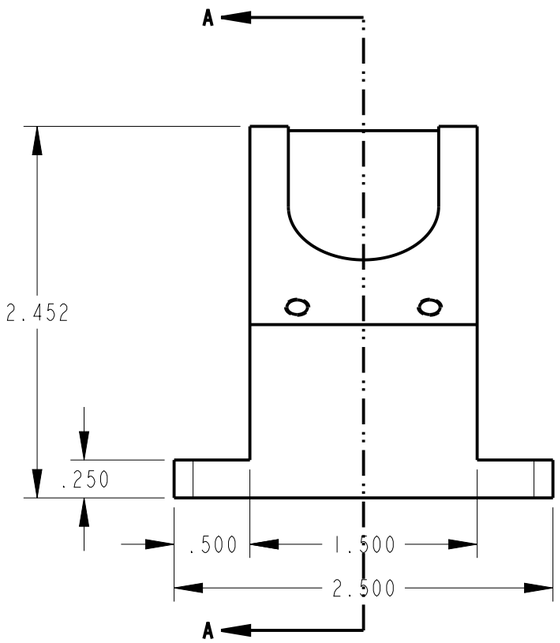
EDWARDS.B.FRM 1270 REV B VER1

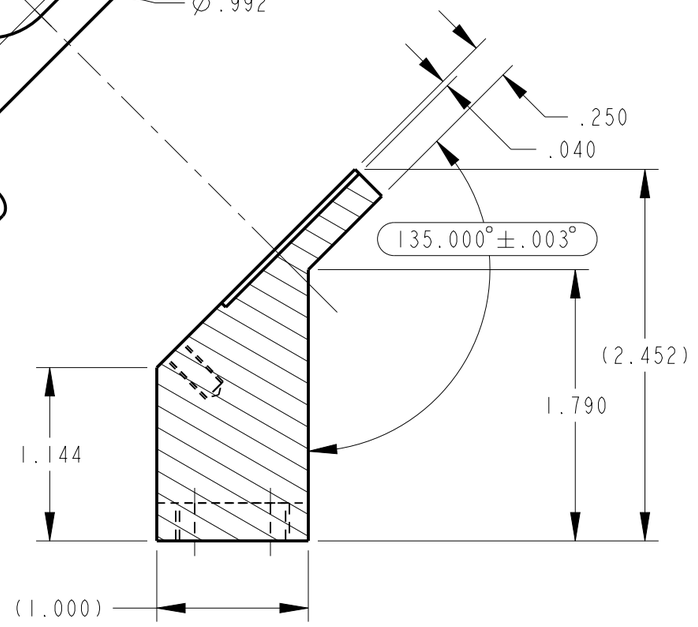
Edwards Lifesciences



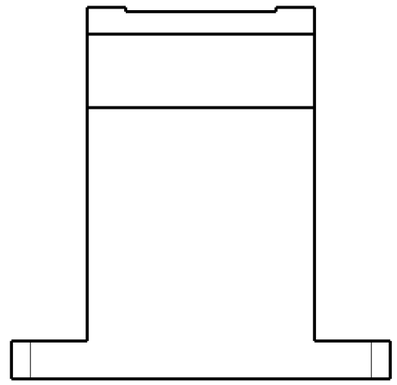
MIRROR MOUNT BASE
MATERIAL: BLACK DELRIN

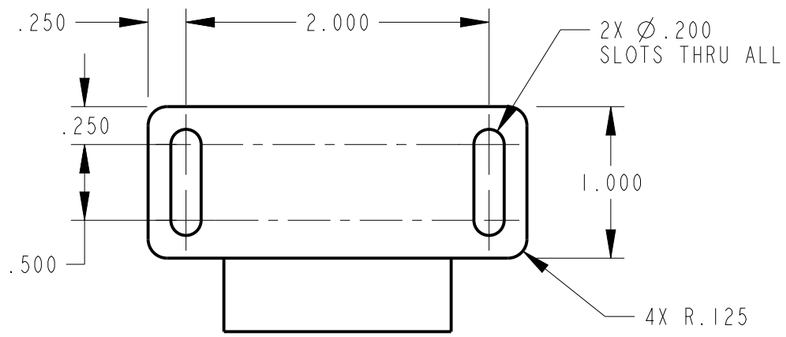






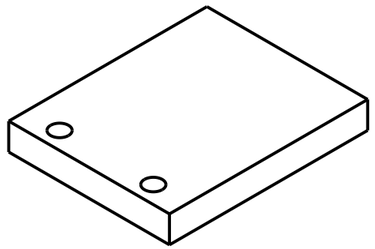
SECTION A-A



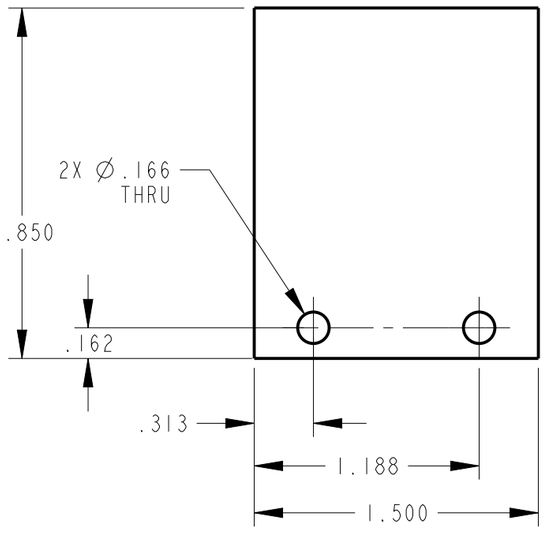


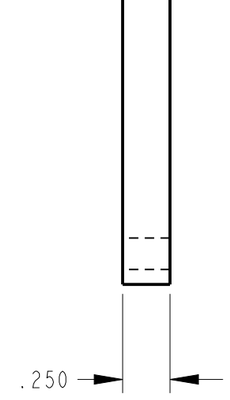
Edwards Lifesciences IRVINE, CALIF. 92614		
TITLE: SLIDE MOUNT CAMERA, XYZ,		
SCALE: SCALE		SHEET 6 OF 10
SIZE: B	DRAW NO.: CONCEPT	REV: X1

EDWARDS.B.FRM 1270 REV B VER1



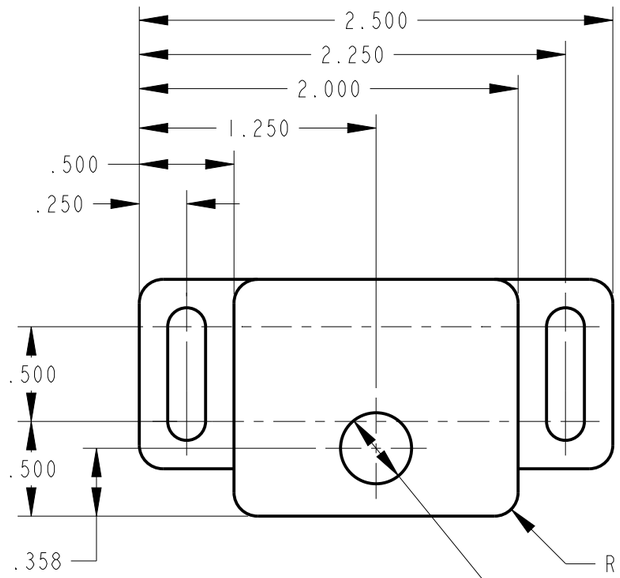
MIRROR MOUNT COVER
MATERIAL: BLACK DELRIN

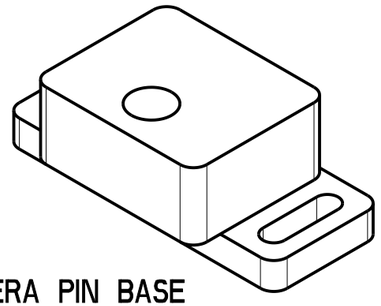




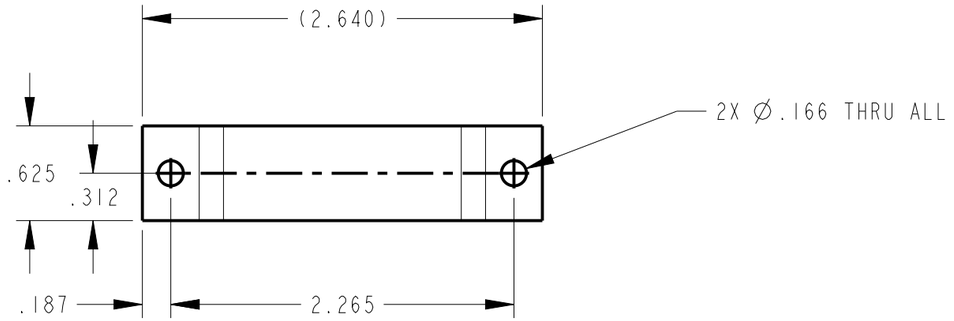
Edwards Lifesciences IRVINE, CALIF. 92614		
TITLE: SLIDE MOUNT CAMERA, XYZ,		
SCALE: SCALE		SHEET 7 OF 10
SIZE: B	DRAW NO.: CONCEPT	REV: X1

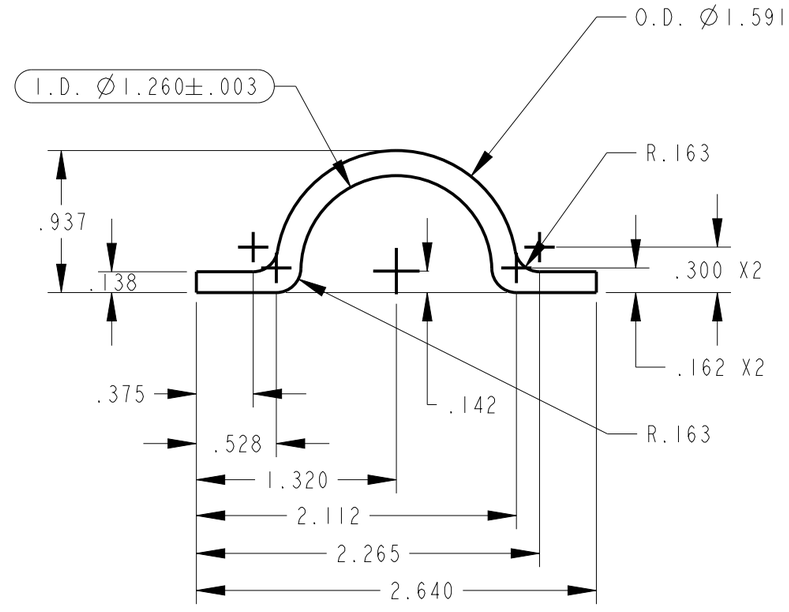
Edwards Lifesciences

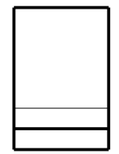


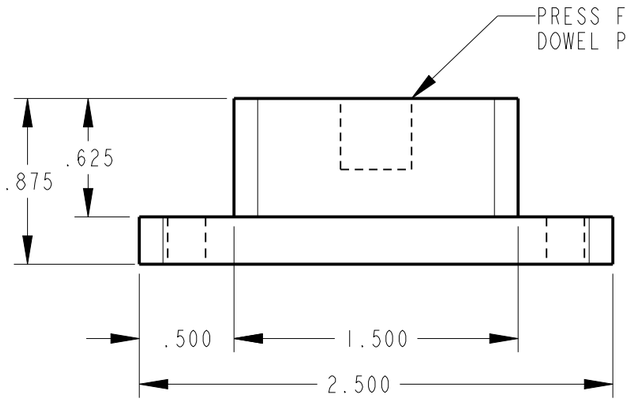


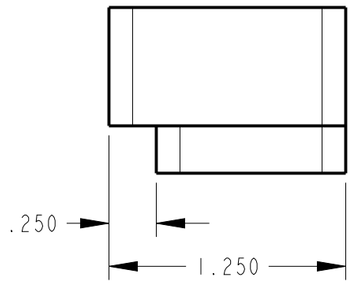
CAMERA PIN BASE
MATERIAL: BLACK DELRIN

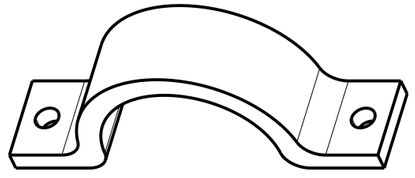












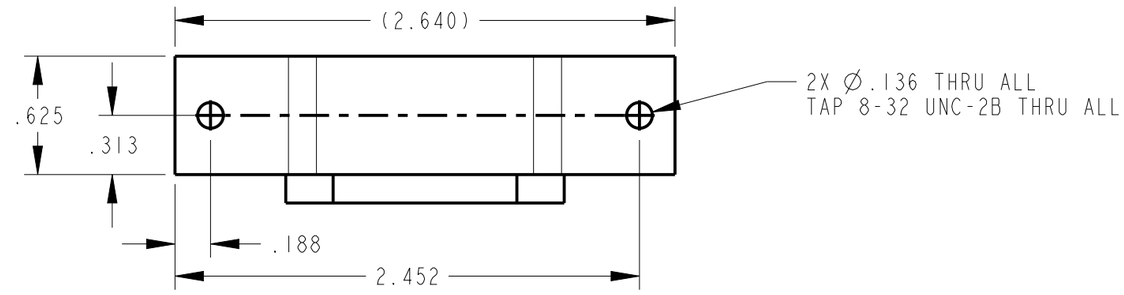
CAMERA CLAMP TOP
MATERIAL: 303 STAINLESS STEEL

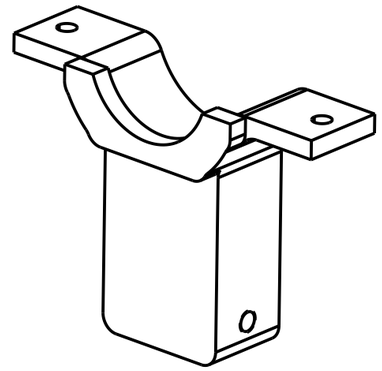
Edwards Lifesciences
IRVINE, CALIF. 92614

TITLE	SLIDE MOUNT CAMERA, XYZ,
SCALE: SCALE	SHEET 9 OF 10
SIZE B	DRAW NO. CONCEPT
	REV X1

EDWARDS_B.FRM 1270 REV B VER1

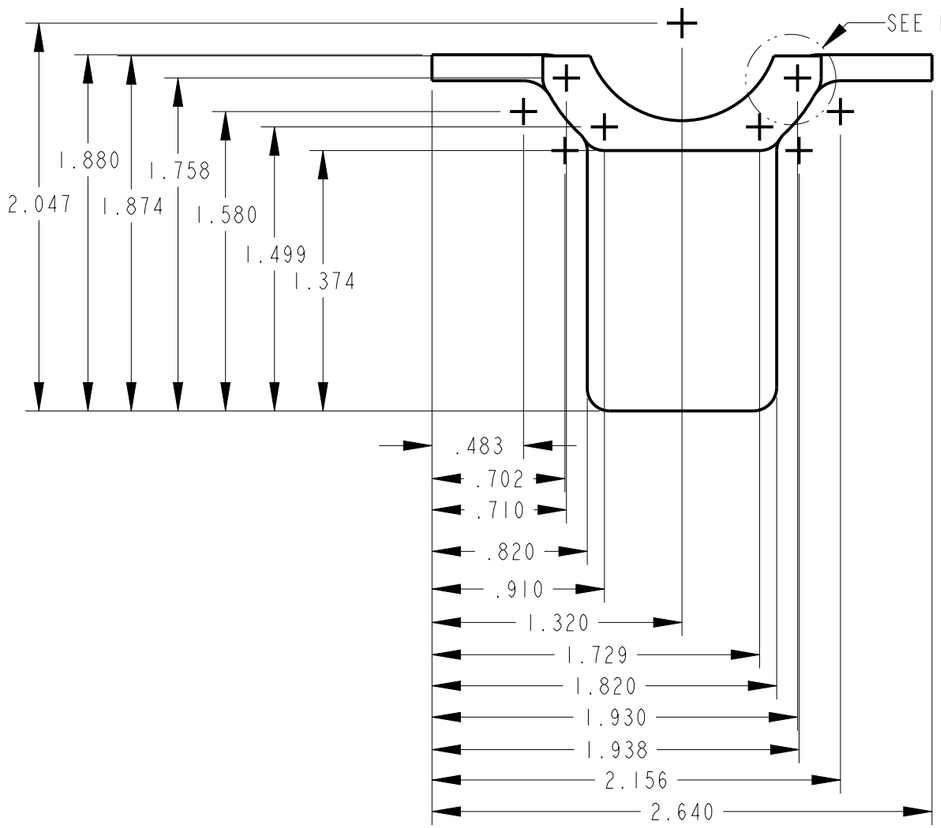
Edwards Lifesciences

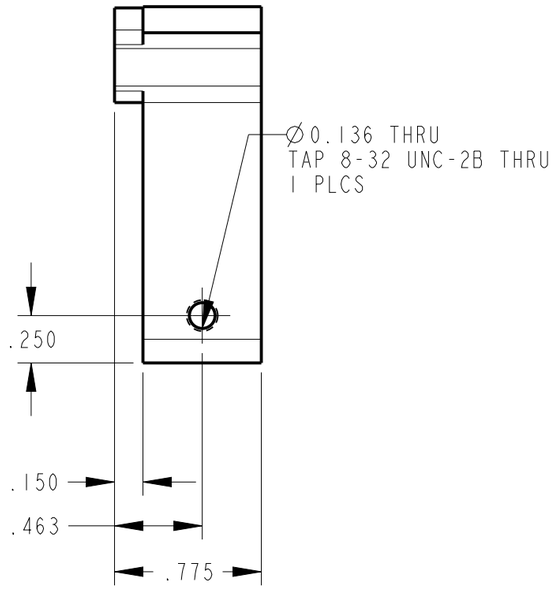


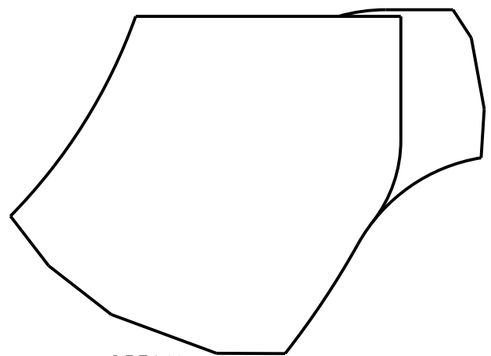


CAMERA CLAMP BASE
MATERIAL: 304 STAINLESS STEEL

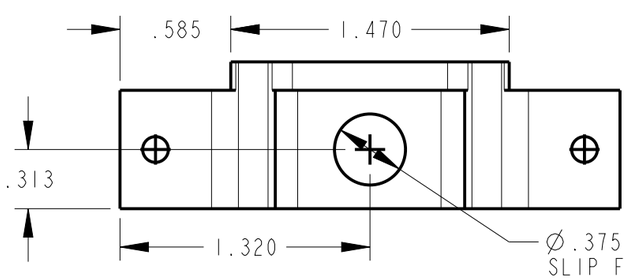
**REFER TO 3D CAD MODEL
FOR CLARIFICATION OF FEATURES
AS NEEDED.







DETAIL A
SCALE 7.000



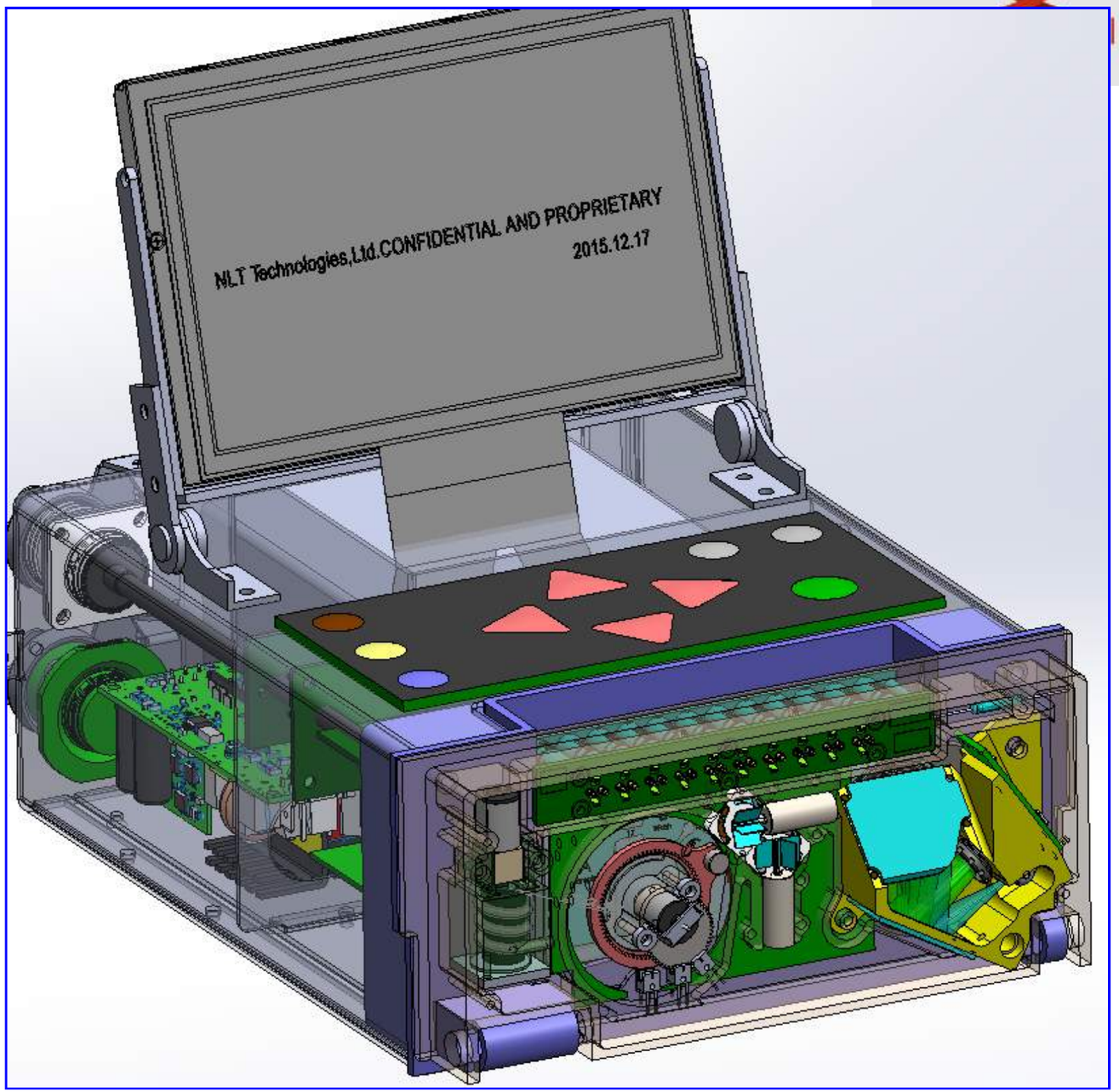
Edwards Lifesciences IRVINE, CALIF. 92614	
TITLE SLIDE MOUNT CAMERA, XYZ,	
SCALE: SCALE	SHEET 10 OF 10
SIZE B	DRAW NO. CONCEPT — REV X1

EDWARDS_B.FRM 1270 REV B VER1

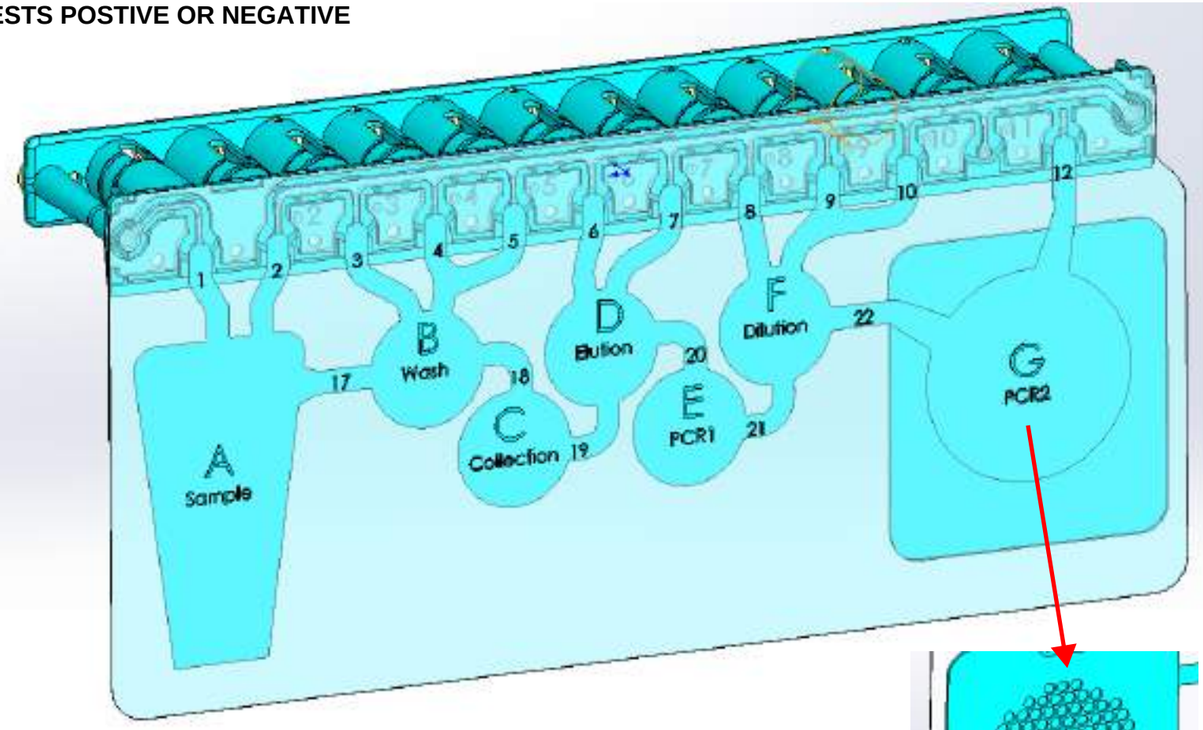
THIS IS BIOFIRES MAIN PRODUCT: THE *FILM ARRAY* MACHINE

THIS SPECIFIC ONE IS A VERY EARLY VERSION OF THE TACTICAL VARIANT THAT WE WERE WORKING ON FOR THE MILITARY AT BIOFIRE DEFENSE (CIRCA 2015).

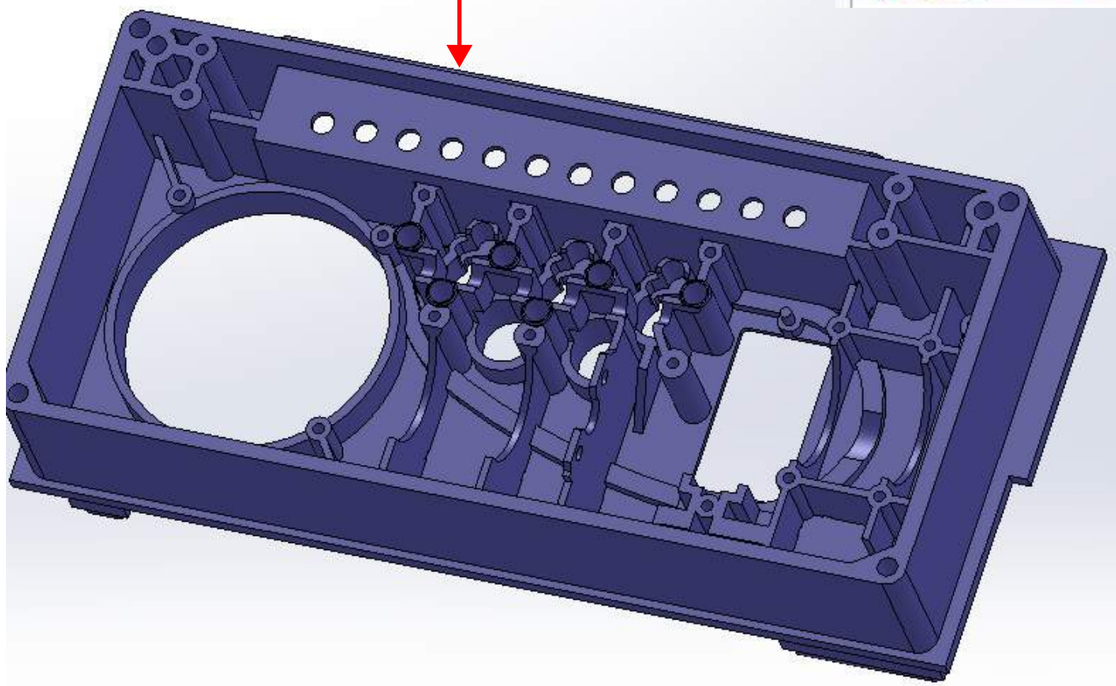
THE *FILM ARRAY* IS A PCR MACHINE THAT GUIDES THE DNA SAMPLE THROUGH EACH STATION OF THE *FILM ARRAY POUCH*. WE WERE DESIGNING THIS ONE TO BE A PORTABLE, RUGGED VERSION THAT SOLDIERS COULD EASILY USE IN THE FIELD. OUR ENGINEERING GROUP ALL WORKED ON DIFFERENT ASPECTS OF THIS MACHINE. I ASSISTED ALL OF THEM IN VARIOUS TASKS ASSOCIATED WITH ALL THE PARTS SHOWN HERE.



FILM ARRAY POUCH. THE DNA SAMPLE TRAVELS THROUGH EACH AREA FOR A UNIQUE STEP IN THE PCR PROCESS. ENDING IN SECTION 'G' WHERE IT FILLS THE ARRAY CANALS AND EITHER TESTS POSTIVE OR NEGATIVE

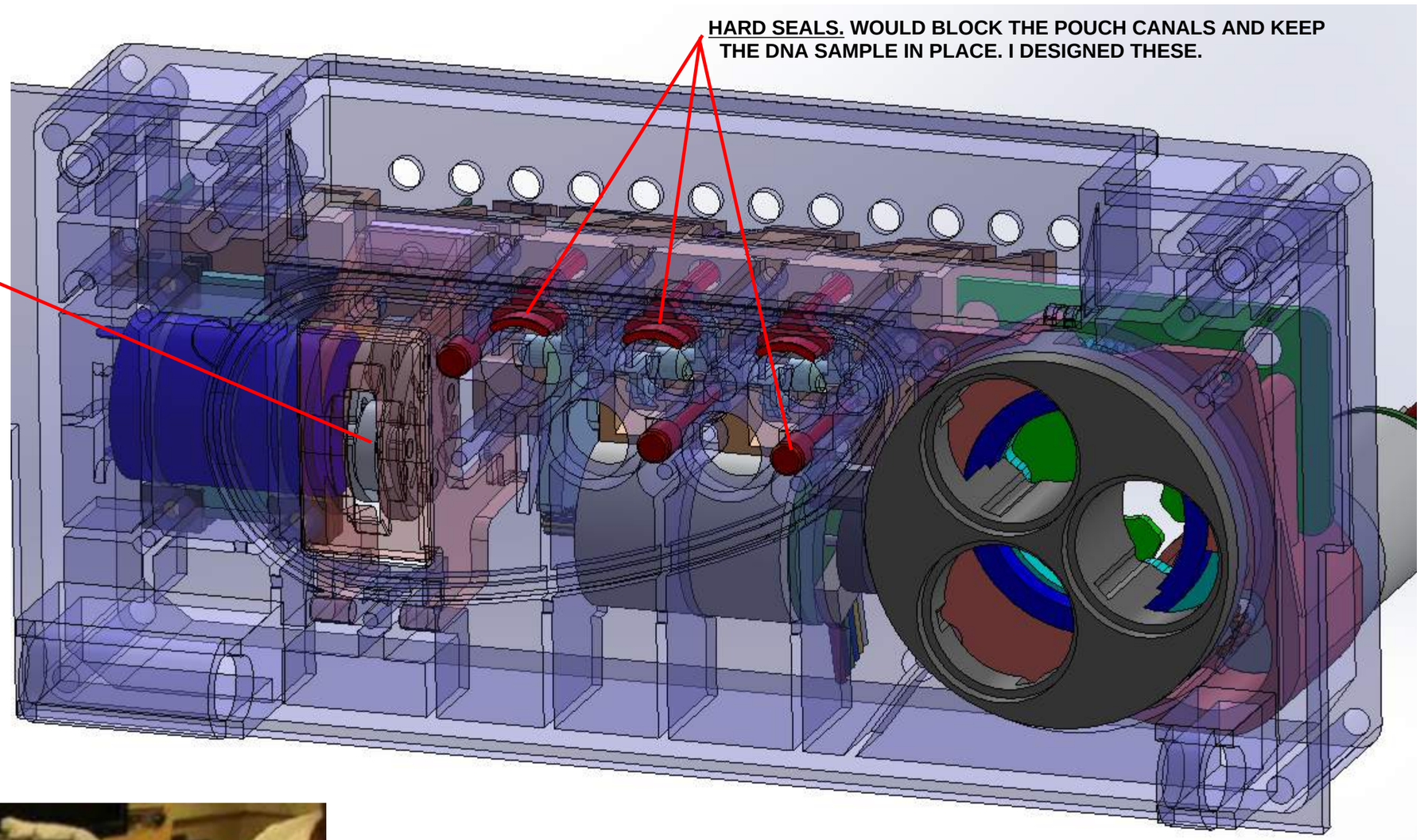


FIRST PHASE FRONT HOUSING. THIS IS ONE OF THE COMPONENTS I DESIGNED BASED ON INPUT FROM THE ENGINEERING TEAM. IT ALLOWED FOR THE MOUNTING OF MANY OF THE OTHER SMALLER SUB ASSEMBLIES. AS OUR PROTOTYPE MACHINE EVOLVED, I MADE CHANGES AND UPDATES TO IT.



HARD SEALS. WOULD BLOCK THE POUCH CANALS AND KEEP THE DNA SAMPLE IN PLACE. I DESIGNED THESE.

BEAD BEATER: A SPINNING COMPONENT THAT WOULD BREAK THE SILICONE BEADS AND MIX THE DNA SAMPLE. ONE OF THE SUB-ASSEMBLIES I HELPED DESIGN



EVOLVED DESIGN. AS YOU CAN SEE IN THE PICTURE, WE ABANDONED THE "HINGED DOOR" DESIGN CIRCA 2018, AND THIS BECAME THE NEW DESIGN. A SLOT TO SLIDE THE POUCH IN.

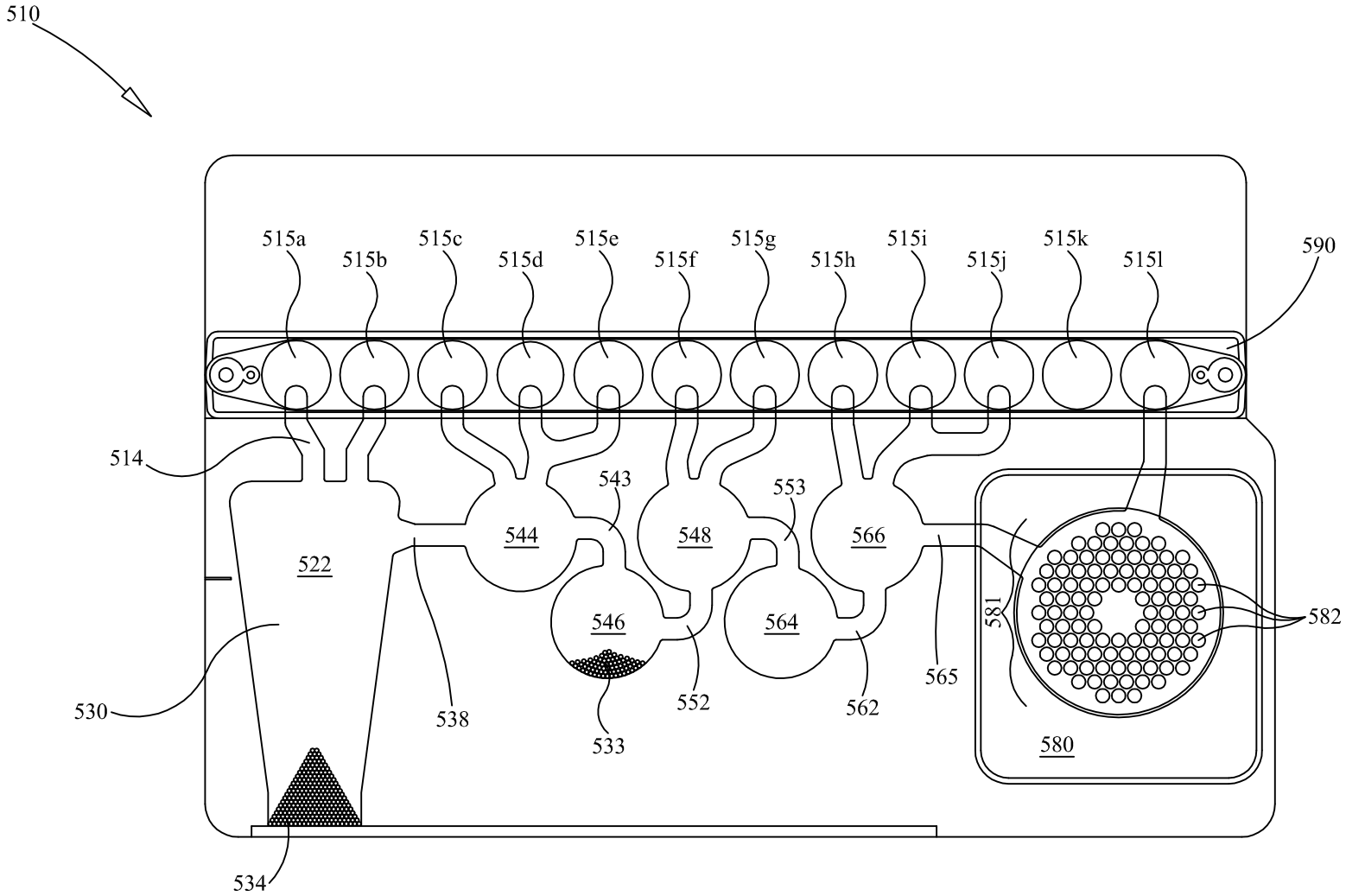

510
515a
515b
515c
515d
515e
515f
515g
515h
515i
515j
515k
515l
590
514
543
553
544
548
566
522
546
564
581
582
530
538
552
562
565
533
580
534

FIG. 1

Patent Drawings

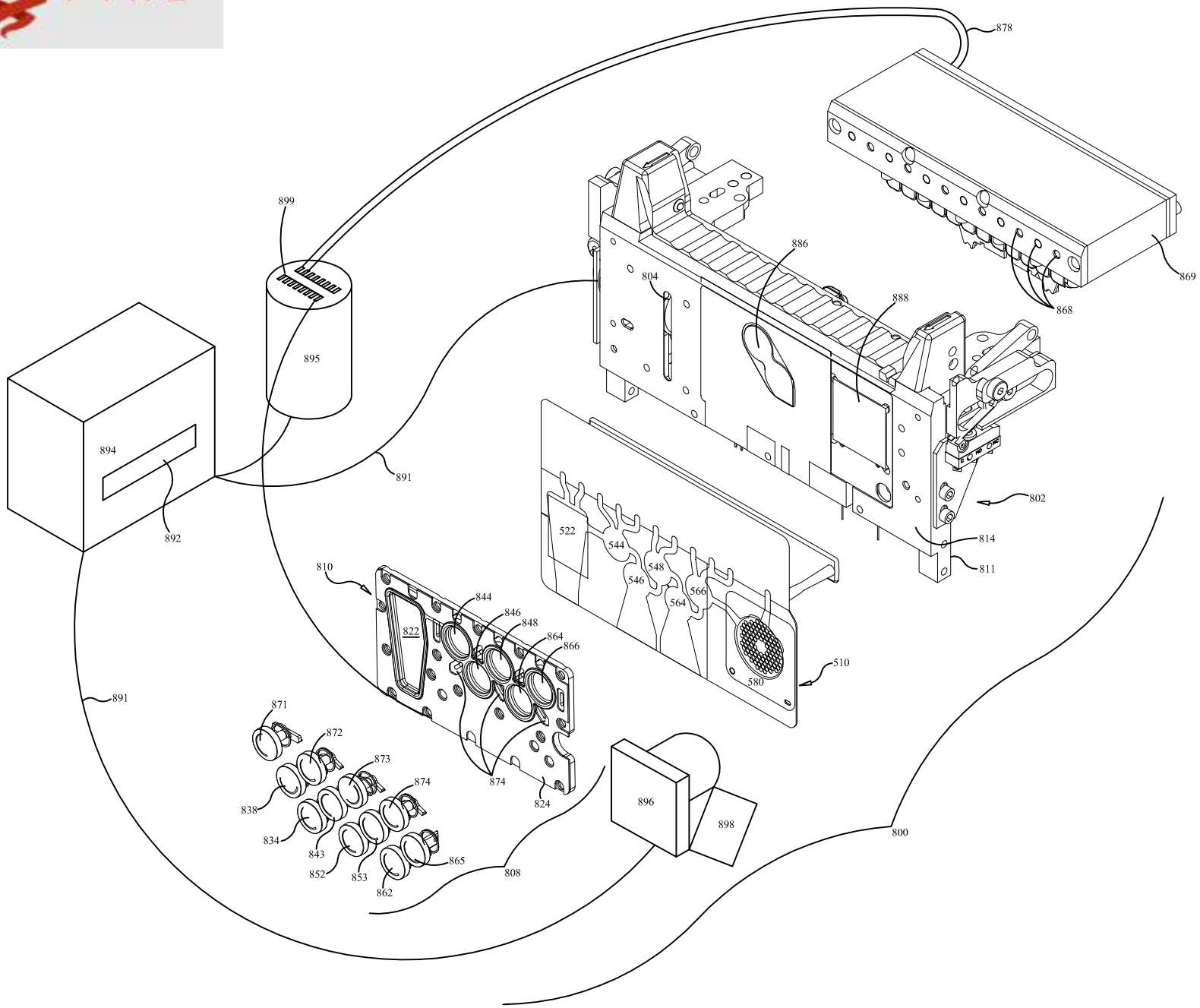


FIG. 2

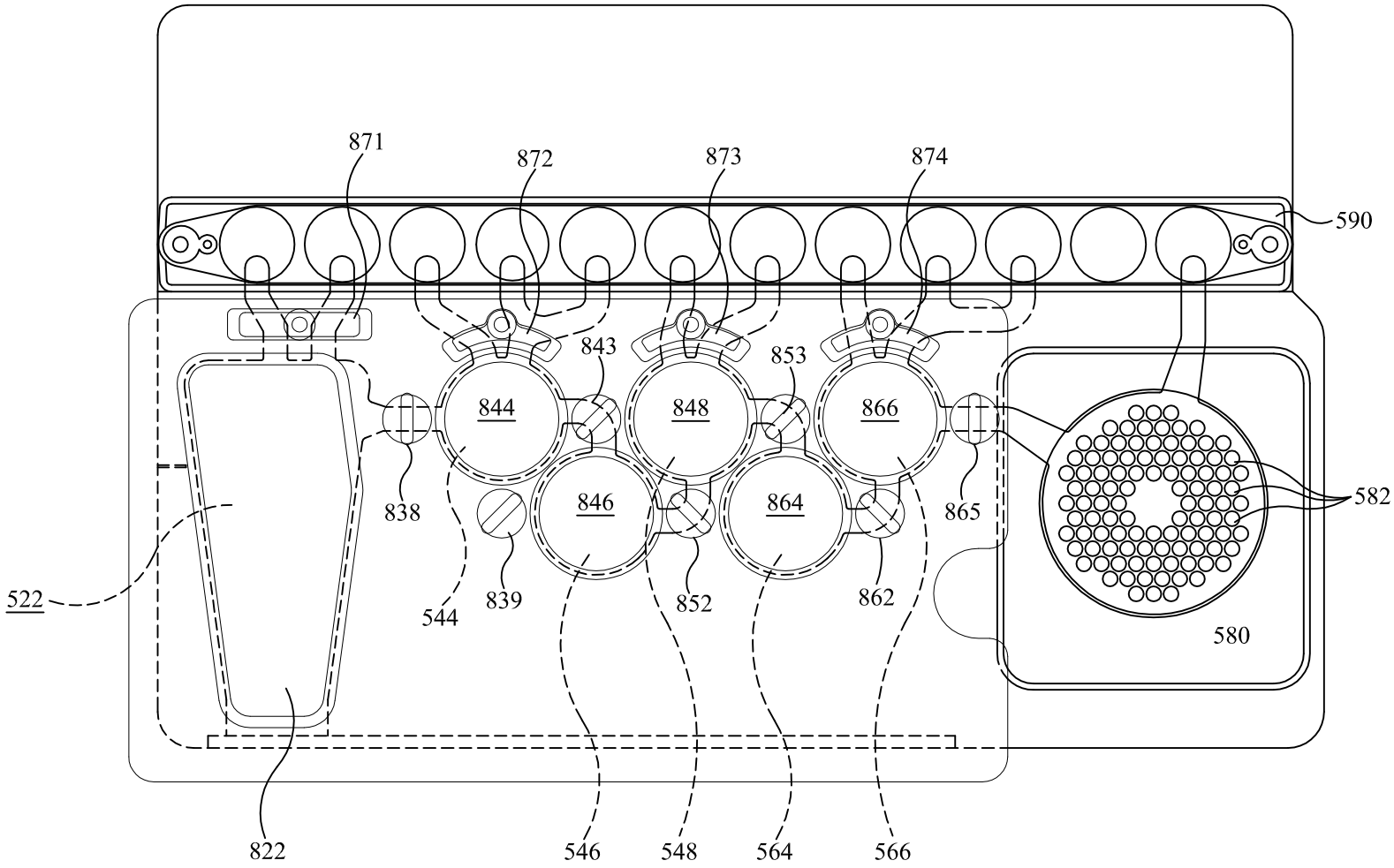

871
872
873
874
590
843
853
844
848
866
838
846
864
865
582
522
544
839
852
862
580
822
546
548
564
566

FIG. 3

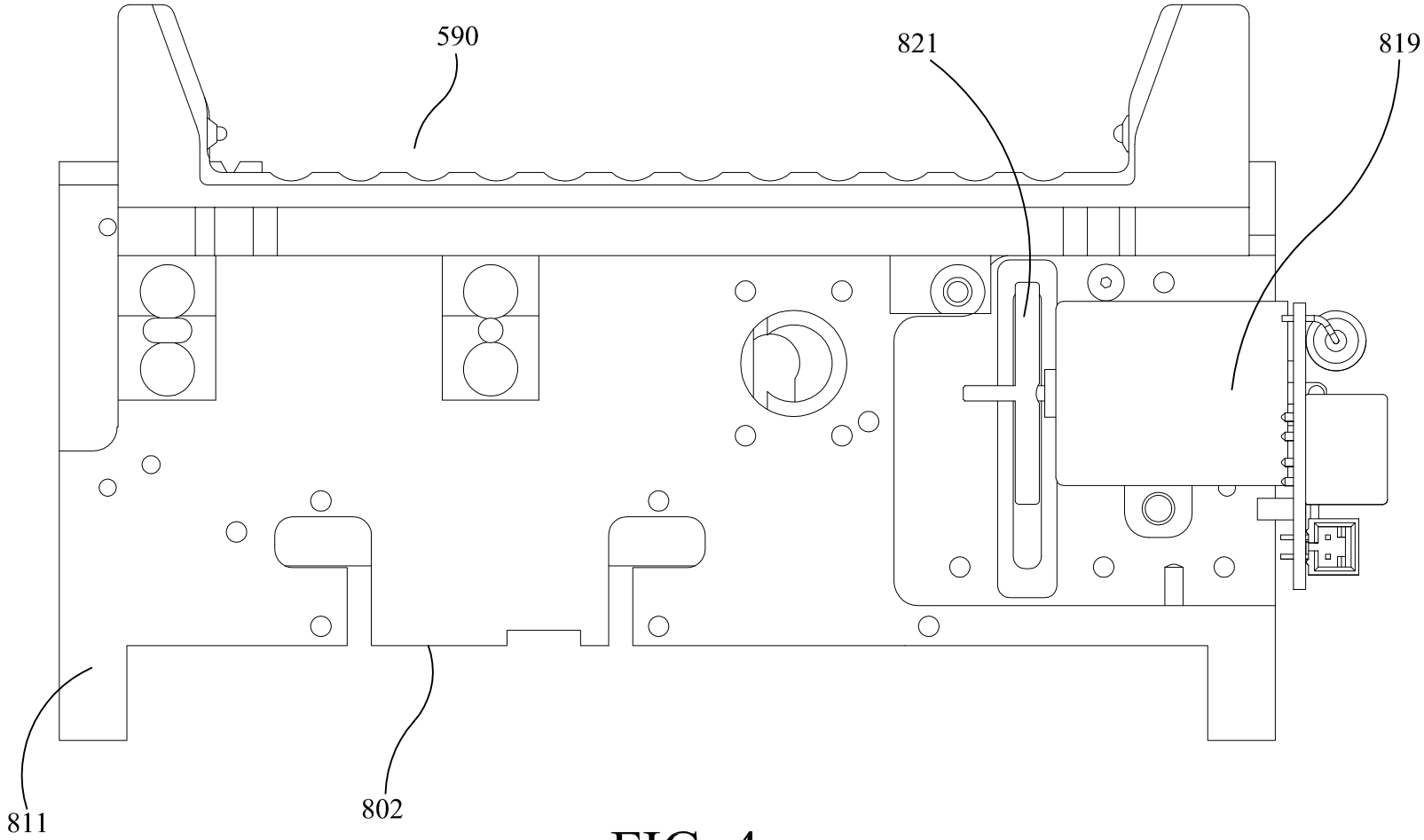


FIG. 4

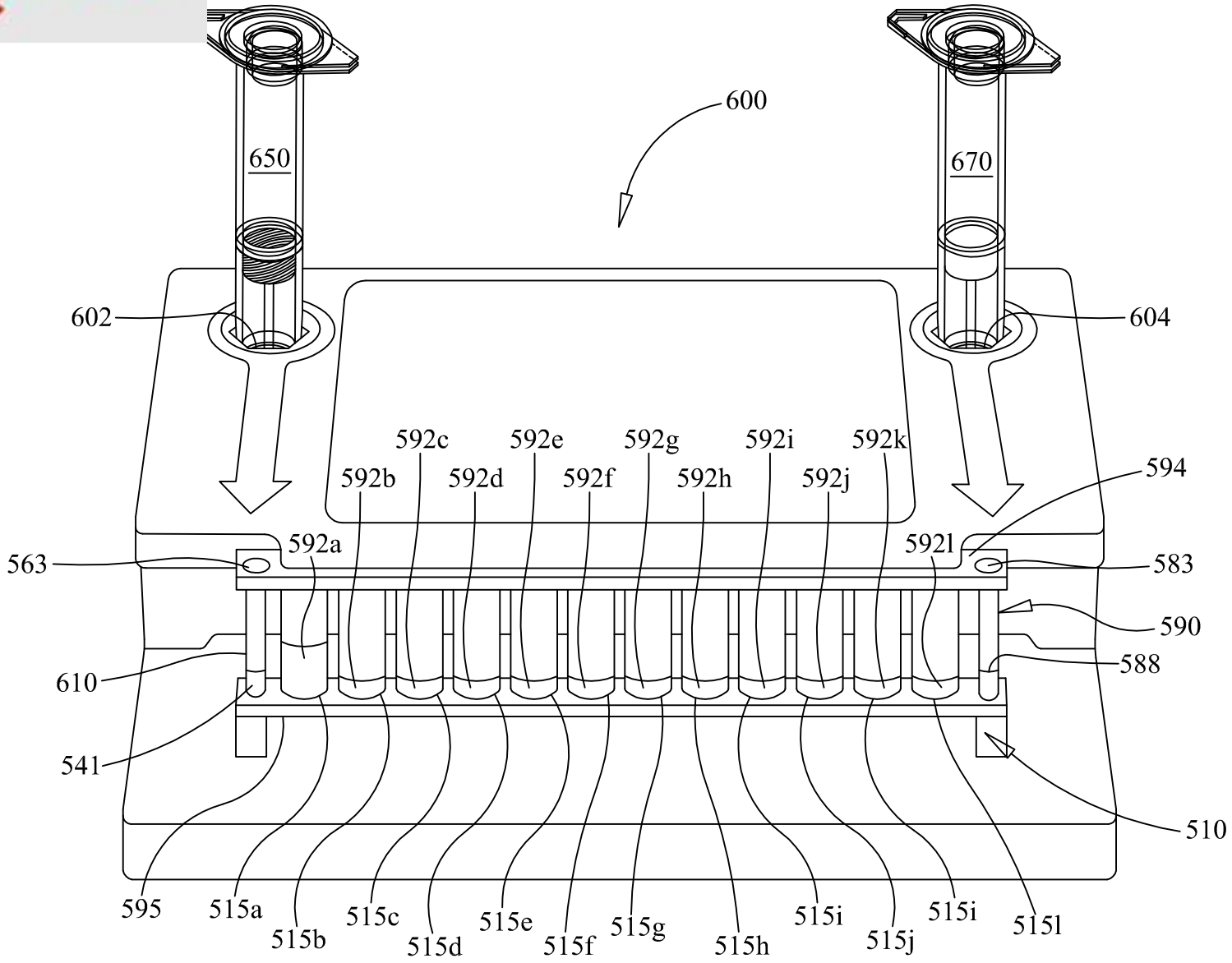

600
650
670
602
604
592c
592e
592g
592i
592k
592b
592d
592f
592h
592j
594
592a
592l
563
583
590
588
610
541
510
595
515a
515b
515c
515d
515e
515f
515g
515h
515i
515j
515i
515l

FIG. 5

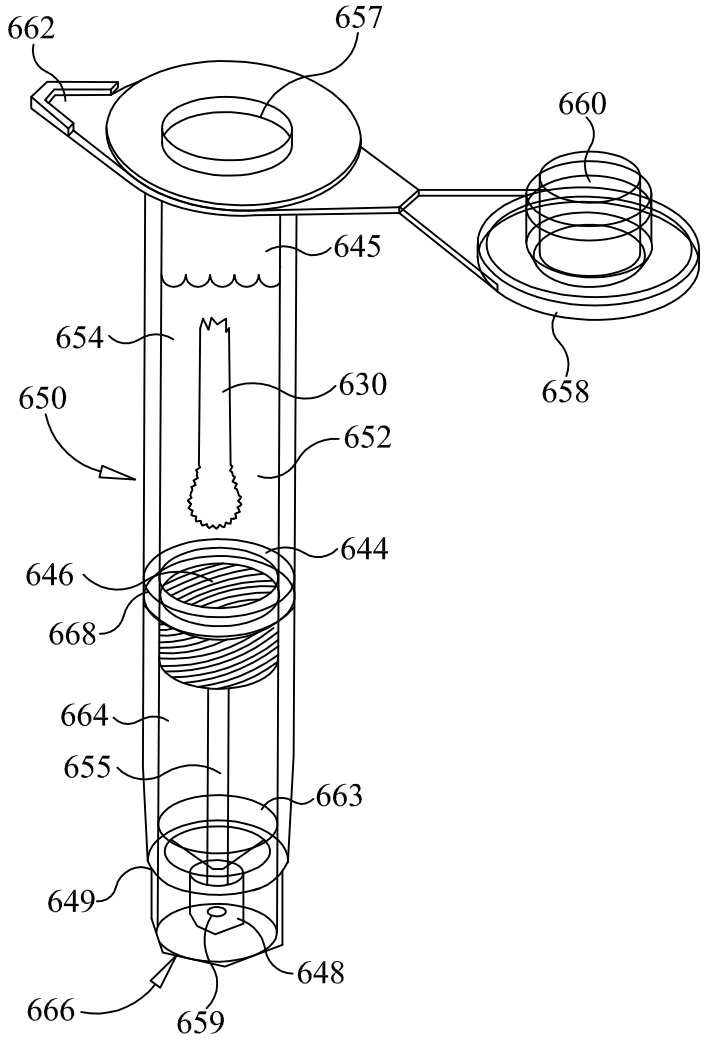

662
657
660
645
654
630
658
650
652
644
646
668
664
655
663
649
648
666
659

FIG. 6

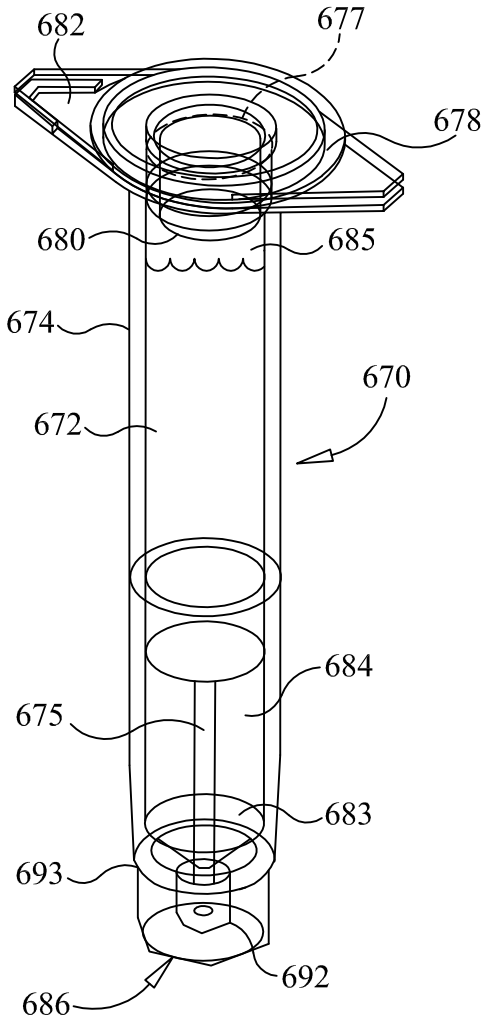

682
677
678
680
685
674
670
672
684
675
683
693
692
686

FIG. 7

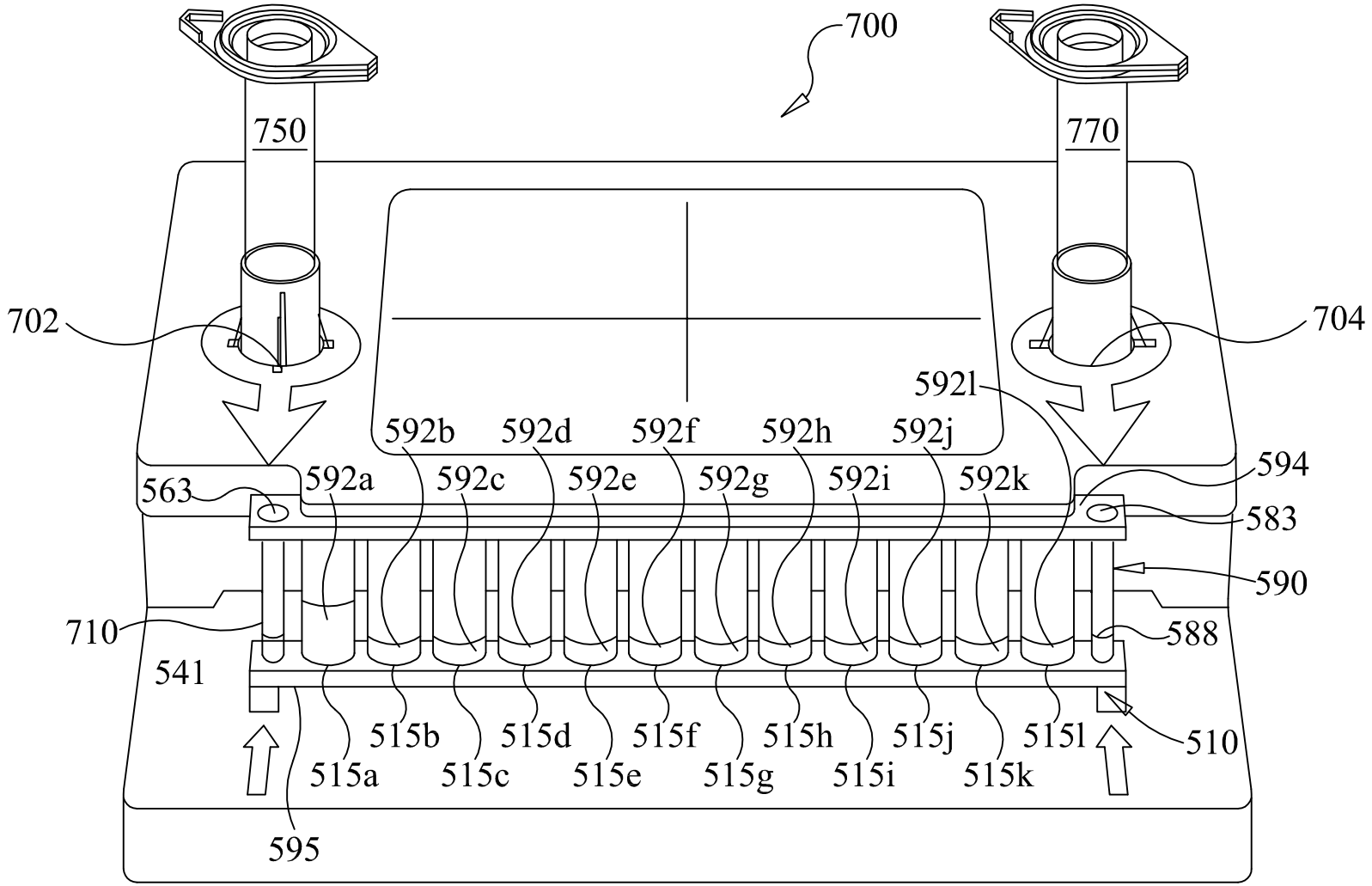

700
750
770
702
704
592l
592b
592d
592f
592h
592j
563
592a
592c
592e
592g
592i
592k
594
583
590
710
588
541
515b
515d
515f
515h
515j
515l
510
515a
515c
515e
515g
515i
515k
595

FIG. 8

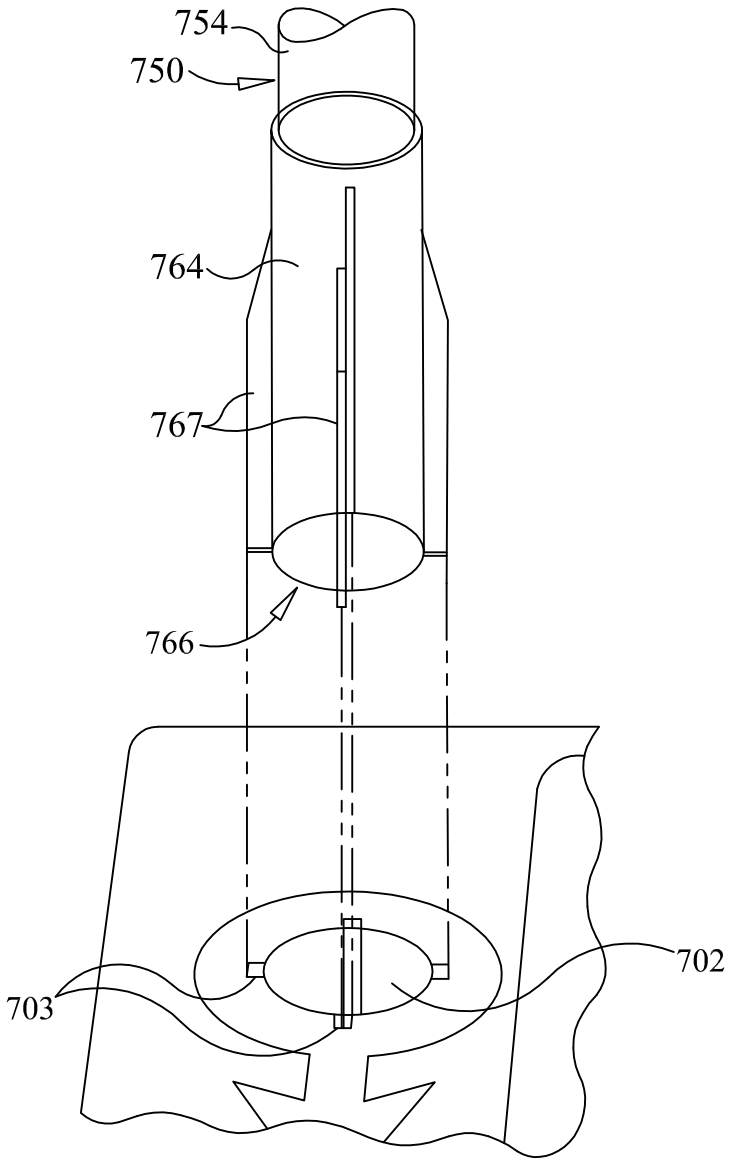


FIG. 9

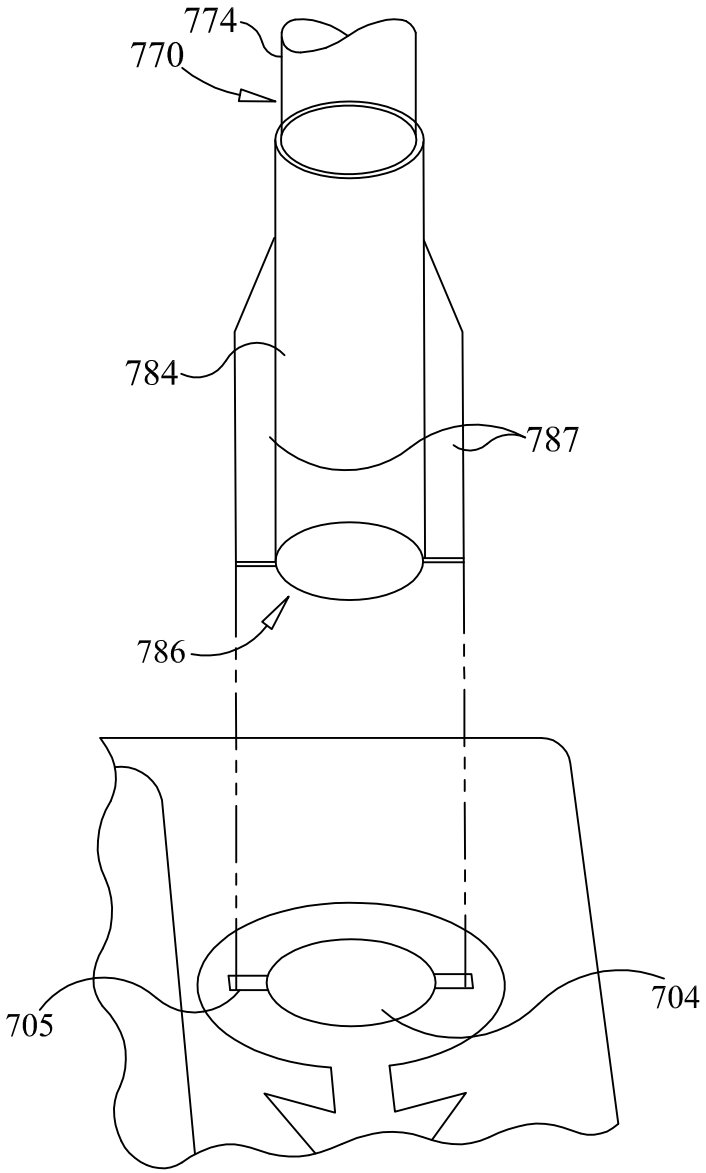


FIG. 10

CUSTOMER NAME:	EXXONMOBIL
PROJECT NAME:	EAST COKER SLIDE VALVES
DELTAVALVE JOB NO:	3664
CUSTOMER P.O. NO:	4540153834
IDENTIFICATION NO:	

DELTAVALVE SERIAL NO:	CUSTOMER TAG / EQUIPMENT NO:	YARD NO:
3664-06	PSEKXA0046MOV	<HOLD>
3664-07	PSEKXB0046MOV	<HOLD>
3664-08	PSEKXC0046MOV	<HOLD>
3664-09	PSEKXD0046MOV	<HOLD>
3664-10	PSEKXS0046MOV	<HOLD>

CIRCOR

DeltaValve

REVISIONS					
REV.	DESCRIPTION	DATE	DRWN	CHKD	ENG
00	INITIAL RELEASE	8/30/2018	DC	KT	DC
01	KICK-OFF REDLINES	9/20/2018	KC	KT	DC
02	NAMEPLATE UPDATE, ADDED CENTER OF GRAVITY SGE BOLT CENTER SPECS	12/4/2018	KC	DC	DC
03	ADDED DRILL STEM GUIDE ADAPTER	12/17/2018	KC	DC	DC
04	REMOVED CE AND 0038 MARK FROM NAMEPLATE	6/27/2019	KC	CJ	DC

DeltaValve UNHEADING VALVE

SIZE: 30" MODEL: GV835 MFG. DATE: 2019

SERIAL NO.: -SEE TABLE- TAG NO.: -SEE TABLE-

ORDER NO.: USJ / 4540153834 ORDER DATE.: AUG 2018

PROCESS DESIGN CONDITIONS: 65 psig @ 890°F

STEAM ZONE MAWP: 150 psig @ 450°F

C.E.T.: +10°F

TARGET STEAM PURGE PRES.: PROCESS PRESSURE + 10 psi

MATERIAL: BODY SA217 C5 GATE SA387 GR 5 CL 2

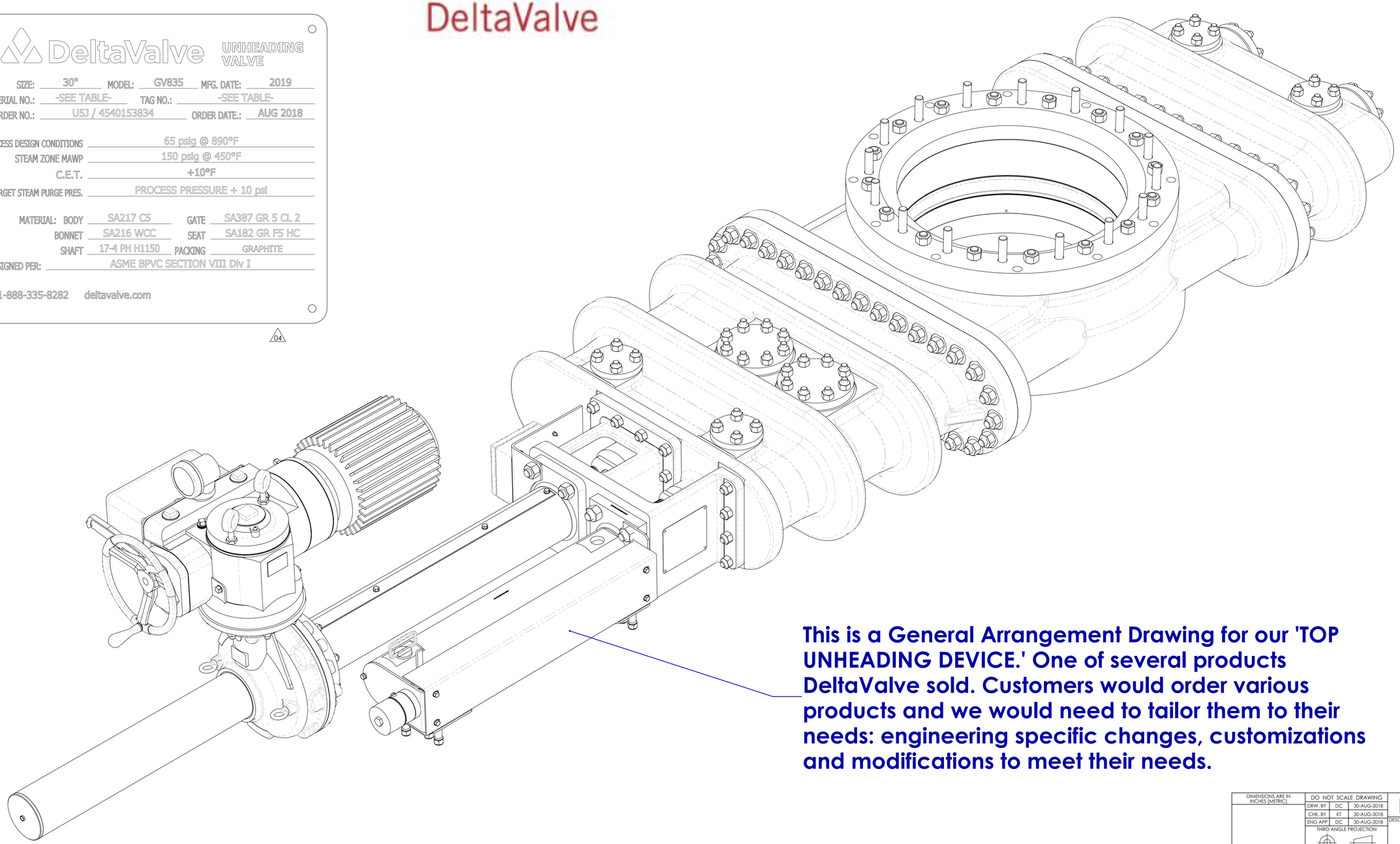
BONNET SA216 WCC SEAT SA182 GR F5 HC

SHAFT 17-4 PH H1150 PACKING GRAPHITE

DESIGNED PER: ASME BPVC SECTION VIII Div I

1-888-335-8282 deltavalve.com

△04



This is a General Arrangement Drawing for our 'TOP UNHEADING DEVICE.' One of several products DeltaValve sold. Customers would order various products and we would need to tailor them to their needs: engineering specific changes, customizations and modifications to meet their needs.

DIMENSIONS ARE IN INCHES [METRIC]

DO NOT SCALE DRAWING

DRW. BY	DC	30-AUG-2018
CHK. BY	KT	30-AUG-2018
ENG APP	DC	30-AUG-2018

THIRD ANGLE PROJECTION

DELTAVALVE

DESCRIPTION: GENERAL ASSEMBLY, 30" GV835, 3664, EXXON, BATON ROUGE

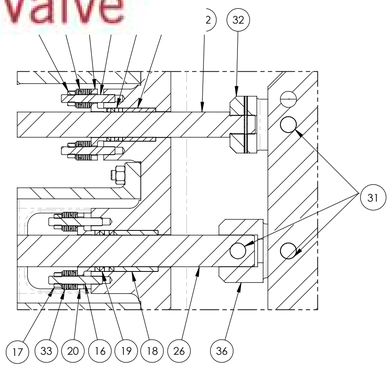
SIZE D | DRAWING NO. 0TUD-3664 | REV. 05

SCALE 1:5 | SHEET 1 of 3

Thursday, June 27, 2019 9:33:21 AM

CIRCOR

DeltaValve



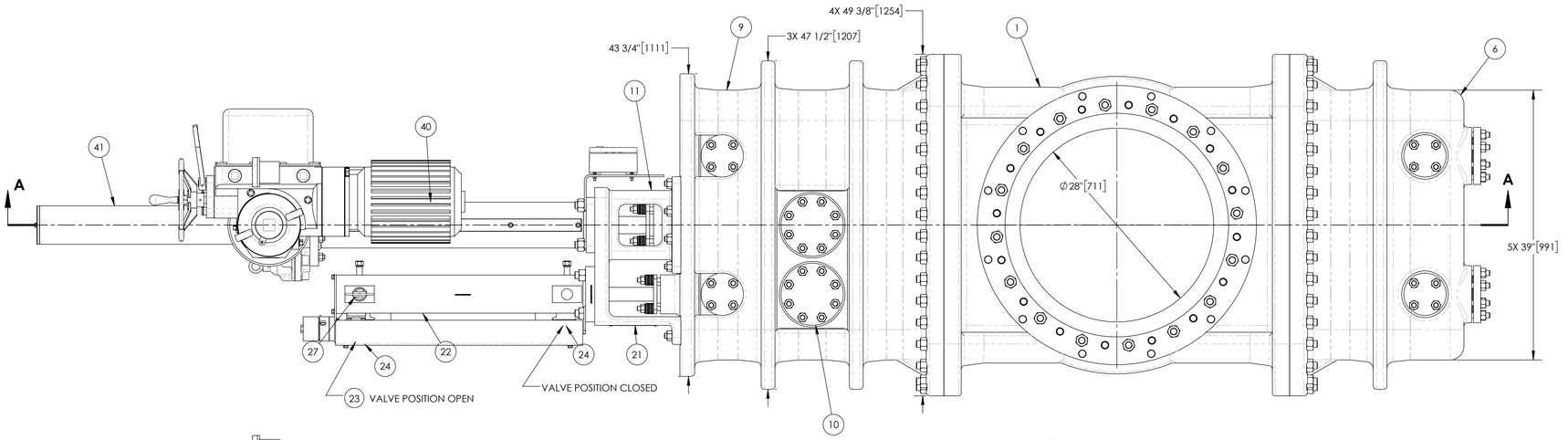
SECTION B-B

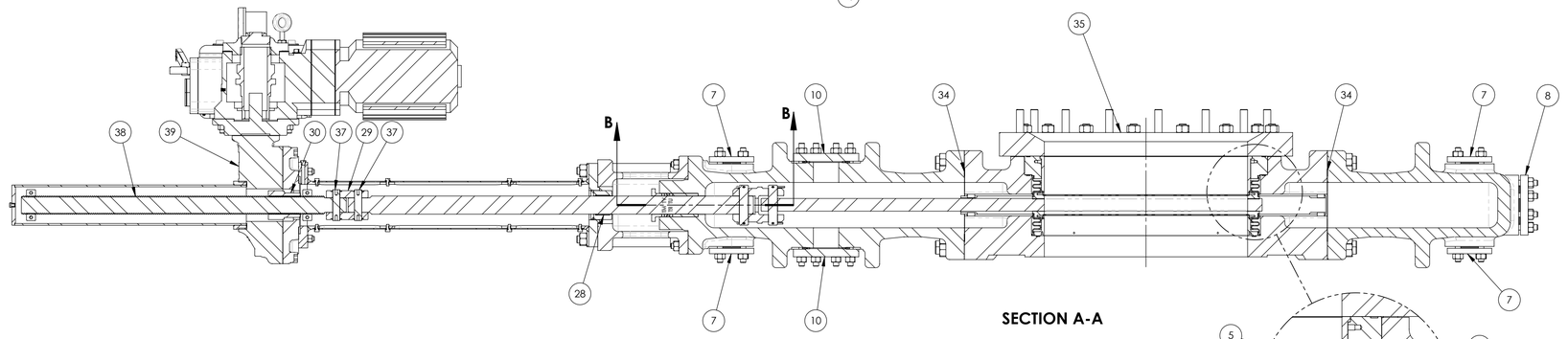
NOTES:

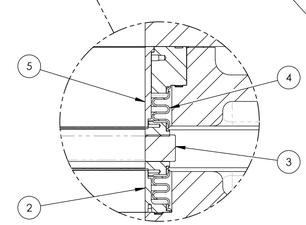
1. ON SEALING SURFACE
2. MATERIALS OF CONSTRUCTION DESIGNATED BY MANUFACTURER

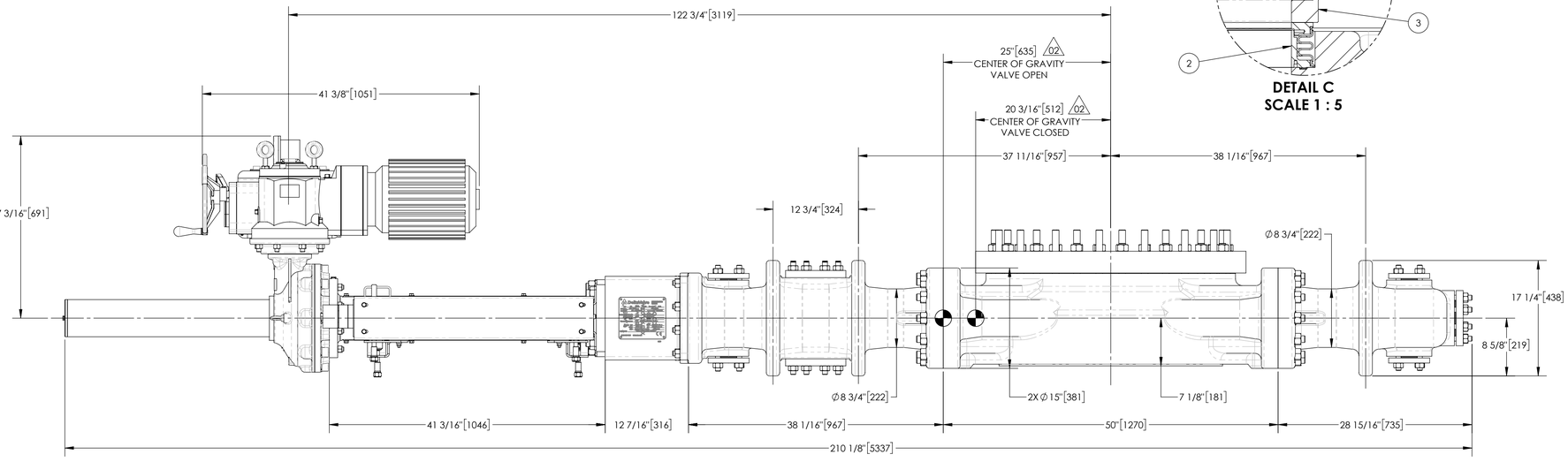
BILL OF MATERIALS

ITEM	DESCRIPTION	MATERIAL	QTY
1	BODY	SA-217 GR C5	1
2	LOWER SEAT ASSEMBLY	SA-182 GR F5 HC PLATED [1] / INCONEL 625	1
3	GATE	SA-387 GR 5 CL 2 NITRIDED	1
4	UPPER SEAT ASSEMBLY	SA-182 GR F5 HC PLATED [1] / INCONEL 625	1
5	UPPER SEAT RETAINER	SA-182 GR F5	1
6	LOWER BONNET	SA-216 GR WCC	1
7	STEAM / CONDENSATE FLANGE	SA-182 GR A105	8
8	CLEAN OUT PORT FLANGE	SA-182 GR A105	2
9	UPPER BONNET	SA-216 GR WCC	1
10	ACCESS PORT FLANGE	SA-182 GR A105	4
11	STANDOFF	SA-216 GR WCC	1
12	LOCKOUT STEM	SA-564 T 630 H1150	1
13	LOCKOUT STEM GUIDE	GRAPHITE GRADE 2020	1
14	LOCKOUT PACKING SET	FLEXIBLE BRAIDED GRAPHITE	1
15	LOCKOUT PACKING FOLLOWER	SA-240 TP 304	1
16	PACKING STUD	SA-193 GR B8M	4
17	PACKING NUT	SA-194 GR 8	4
18	ACTUATOR STEM GUIDE	GRAPHITE GRADE 2020	1
19	ACTUATOR PACKING SET	FLEXIBLE BRAIDED GRAPHITE	1
20	ACTUATOR PACKING FOLLOWER	SA-240 TP 304	1
21	NAME PLATE	AISI 304L SS	1
22	LOCKOUT TOWER	ASTM A106 GRB / ASTM A516 GR70	1
23	POSITION INDICATOR	ASTM A36	1
24	LIMIT SWITCH	MULTIPLE MATERIALS [2]	4
25	ACTUATOR, LIMITORQUE SMB-0	MULTIPLE MATERIALS [2]	1
26	ACTUATOR SMOOTH STEM	SA-564 T630 H1150	1
27	LOCKOUT PIN	SA-564 T630 H1150	1
28	WEAR RING	ORKOT C-351	1
29	ACTUATOR STEM COUPLER	SA-564 T630 H1150	1
30	ACTUATOR NUT	ALUMINUM BRONZE	1
31	CLEVIS PIN (ACTUATOR AND LOCKOUT)	SA-564 T630 H1150	3
32	LOCKOUT CLEVIS	SA-564 T630 H1150	1
33	PACKING BELLEVILLE SPRING SET	17-7PH	4
34	BODY TO BONNET GASKET	LAMONS CORRUGATED METAL GASKET	2
35	UPPER RETAINER FLANGE	ASME SA-182 GR F22 CL 1	1
36	ACTUATOR CLEVIS	SA-564 T630 H1150	1
37	COUPLER PIN	NITRONIC 60	2
38	ACTUATOR THREADED STEM	SA-564 T630 H1150	1
39	ACTUATOR V4 GEARBOX ASSEMBLY	MULTIPLE MATERIALS [2]	1
40	YOKE	ASTM A516 GR 70 / ASTM A106 GR B /ASTM A105	1
41	THREADED STEM COVER	ASTM A36	2









DeltaValve sold many accessories that would attach to these devices. Depending on what the customer ordered, we would also need to design those to spec, producing shop drawings and bills of materials.

DO NOT SCALE DRAWING
DIMENSIONS INCHES [METRIC]
THIRD ANGLE PROJECTION

DELTAVALVE

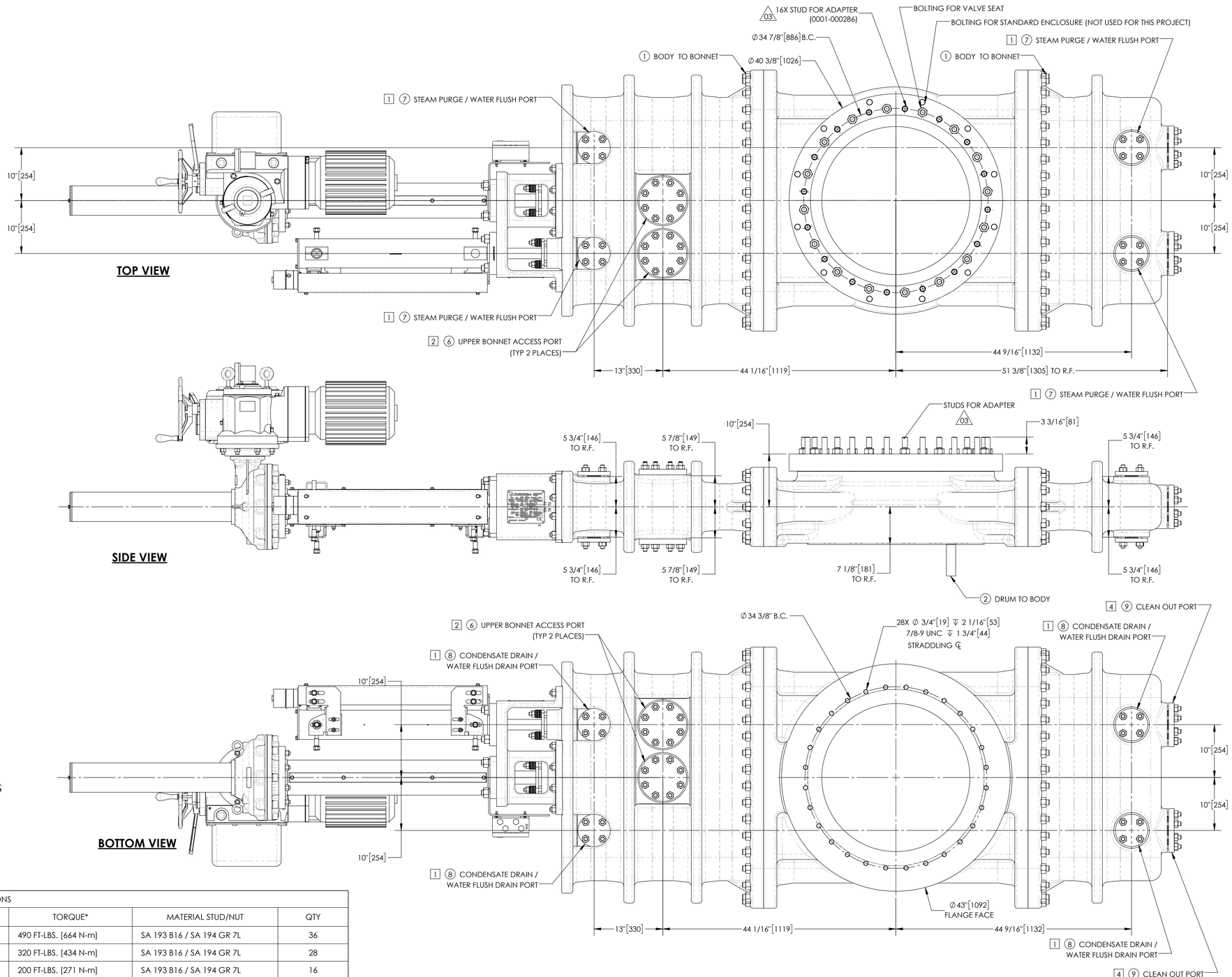
DESCRIPTION
GENERAL ASSEMBLY, 30" GV835, 3664, EXXON, BATON ROUGE

SIZE	DRAWING NO.	REV.
D	0TUD-3664	05

SCALE 1:10 SHEET 2 of 3

CIRCOR

DeltaValve



NOTES:

1. ONE (1) STEAM PURGE PORT REQUIRED TO BE USED PER BONNET
   ONE (1) CONDENSATE DRAIN PORT REQUIRED TO BE USED PER BONNET
2. NO PIPING TO THESE BLIND FLANGES. RESERVED FOR SERVICE / MAINTENANCE AND INSPECTION
3. ALL PROCESS FLANGES SMALLER THAN 30" ARE CLASS 300 R.F. WITH SPIRAL WOUND 316L SS & GRAPHITE GASKETS ACCORDING TO ASME B16.5
4. PORT IS USED FOR MAINTENANCE ACCESS. PORT IS ALSO ACCEPTABLE FOR PSV
5. ALL NUTS CALLED OUT ARE CLASIFIED AS HEAVY HEX
6. ALL BOLTING REFERENCED IN THIS DRAWING IS SUPPLIED BY DELTAVALVE

FLANGE AND BOLTING SPECIFICATIONS

ITEM	DESCRIPTION	FLANGE SIZE	STUD SIZE	TORQUE*	MATERIAL STUD/NUT	QTY
1	BODY TO BONNET		1"-8 UN-2A X 5-3/4" [146]	490 FT-LBS. [664 N-m]	SA 193 B16 / SA 194 GR 7L	36
2	DRUM TO BODY	30"	7/8"-9 UN-2A X 6-1/2" [215]	320 FT-LBS. [434 N-m]	SA 193 B16 / SA 194 GR 7L	28
3	STANDOFF TO UPPER BONNET		3/4"-10 UNC-2A X 3-3/4" [95]	200 FT-LBS. [271 N-m]	SA 193 B16 / SA 194 GR 7L	16
4	YOKE FLANGE TO STANDOFF		1"-8 UN-2A X 3-3/4" [95]	490 FT-LBS. [664 N-m]	SA 193 B7 / SA 194 GR 7L	4
5	LOCKOUT TOWER TO STANDOFF		1"-8 UN-2A X 3-3/4" [95]	490 FT-LBS. [664 N-m]	SA 193 B7 / SA 194 GR 7L	4
6	UPPER BONNET ACCESS PORTS 2	3-1/2"	3/4"-10 UNC-2A X 3-3/4" [95]	200 FT-LBS. [271 N-m]	SA 193 B16 / SA 194 GR 7L	8 EA
7	STEAM PURGE / WATER FLUSH PORT 1.	1-1/2"	3/4"-10 UNC-2A X 3-1/2" [89]	200 FT-LBS. [271 N-m]	SA 193 B16 / SA 194 GR 7L	4 EA
8	CONDENSATE DRAIN / WATER FLUSH DRAIN PORTS 1.	1-1/2"	3/4"-10 UNC-2A X 3-1/2" [89]	200 FT-LBS. [271 N-m]	SA 193 B16 / SA 194 GR 7L	4 EA
9	CLEAN-OUT PORT 4	3"	3/4"-10 UNC-2A X 3-1/2" [89]	200 FT-LBS. [271 N-m]	SA 193 B16 / SA 194 GR 7L	8 EA

*TORQUE VALUES BASED ON ALLOY STEEL BOLTING, WELL LUBRICATED WITH A HEAVY GRAPHITE & OIL MIXTURE

DELTAVALVE

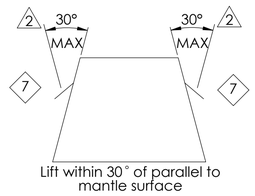
DESCRIPTION
GENERAL ASSEMBLY, 30" GV835, 3664, EXXON, BATON ROUGE

SIZE	DRAWING NO.	REV.
D	0TUD-3664	05

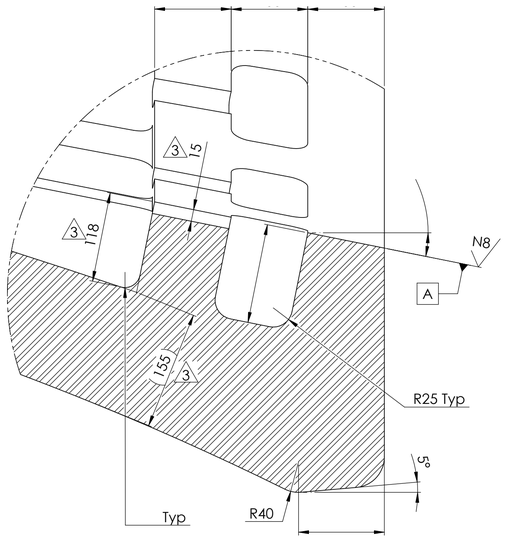
SCALE 1:10 SHEET 3 of 3

Dimensions and specs not shown to protect proprietary engineering.

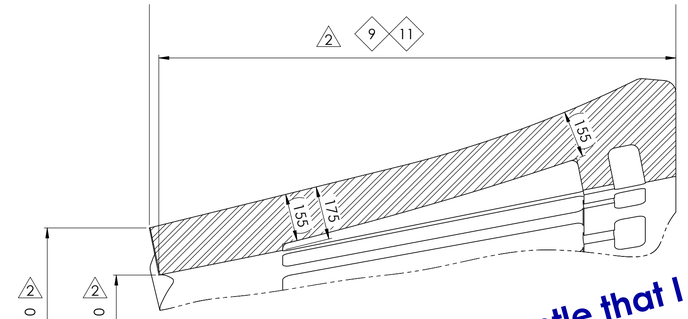
FLSmidth Part Number	xxxxxxxxxx
Heat Number	xxxxxxxxxx
Purchase Order Number	xxxxxxxxxx
Material Description	xxxxxxxxxx
Mantle Diameter	xxxxxxxxxx



Part number	Material grade	Notes
	SM 310	14% Standard
	SM 320	
	SM 330	14% Upgrade
	SM 340	
	HM 830	18% Upgrade
	HM 840	
	XM 1130	

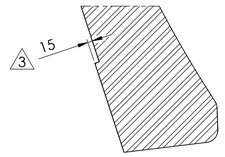


SECTION B-B

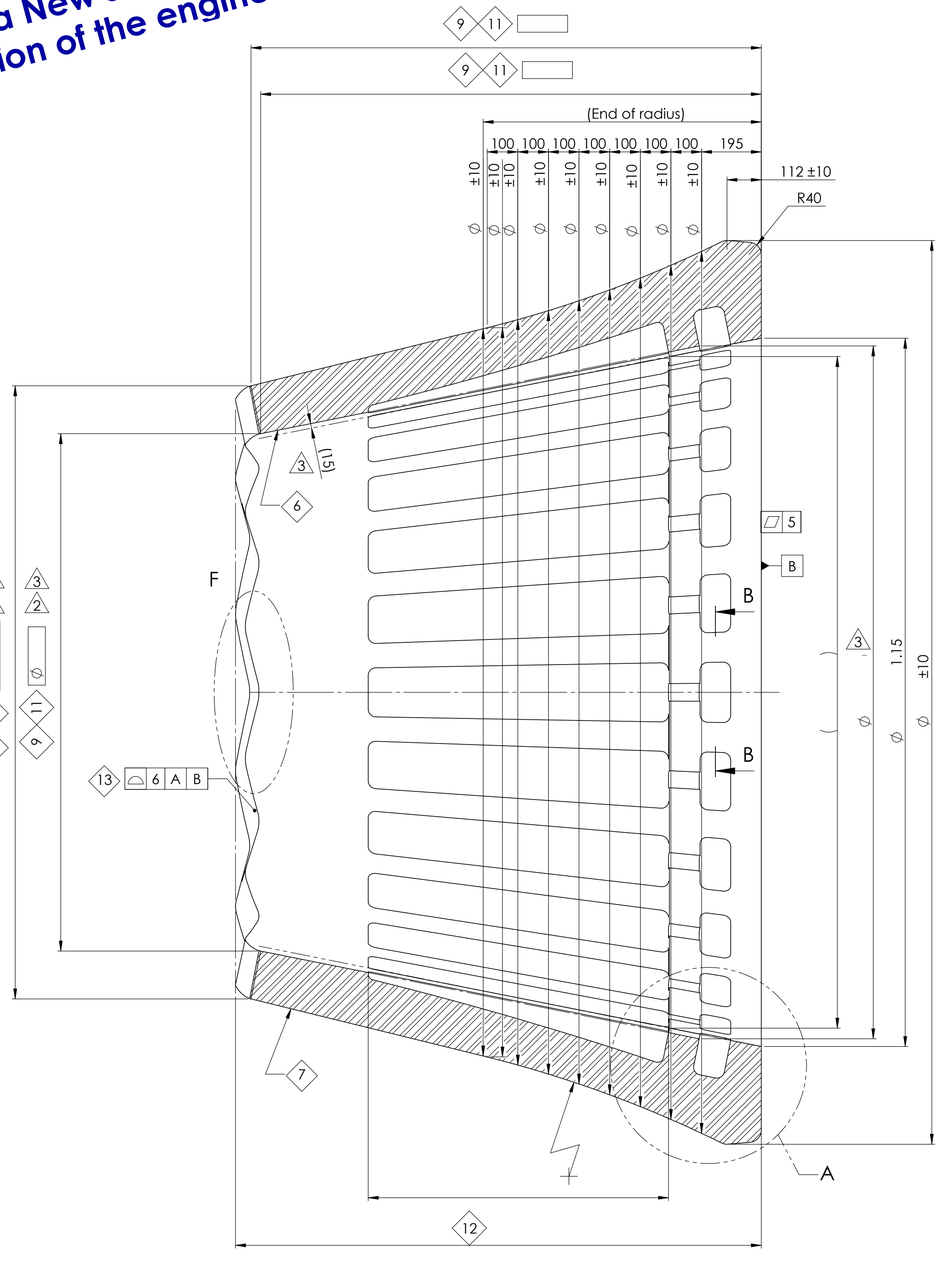


This is a New sized Mantle that I designed under direction of the engineering manager.

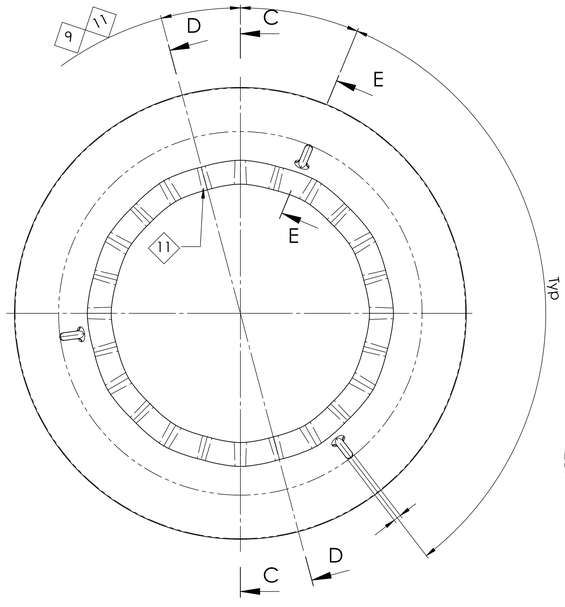
SECTION G-G



SECTION C-C

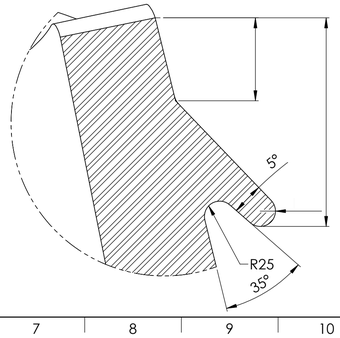


DETAIL F



SECTION E-E

Typ Lifting lug 3 features @120° apart



Notes:

1. All dimensions are in millimeters.
2. Material:
   - Designation and chemical composition as per part number.
   - Quality & Inspection criteria per FLSmidth workmanship standard WS-3 1000134858.
3. Refer to latest revision of FLSmidth workmanship standard WS-3 1000134858 for the following
   - Required manufacturing process
   - Casting Tolerances
   - Geometric inspection & acceptance criteria
   - Painting instructions
4. Manufacturer is responsible for all required machining allowance.
5. Break all sharp edges.

2 6. Vendor to cast the following information on surface of part where indicated. Letters to be 25mm tall and raised 5mm above surface
   - FLSmidth Logo
   - FLSmidth part number
   - Heat number
   - Purchase order number
   - Material grade
   - Mantle diameter

2 7. Vendor to paint on outside in two locations at 180° the following in 75mm tall letters.

   **To be cast in addition to paint

   - FLSmidth Logo**
   - FLSmidth part number
   - Material grade
   - Mantle diameter
   - Lifting figure and weight

8. To be used with upper mantle drawing 1000

9. (12) teeth equally spaced.

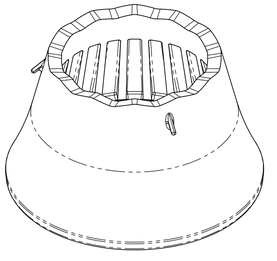
10. (24) required equally spaced.

11. Indicated dimensions are to theoretical sharp edges.

12. Indicated dimensions are to tangent face of radius.

13. Inspect with template drawing # 100C

14. This drawing replaces



Rev.	Drawn	Appr.	Appr. Date	Specific Description of Change
⊗ Pattern no.: 1000304326		embossed/countersunk		
Scale: N/A	Component drawing			Language Rev.:

Mantle oversize, lower
Assembly, mainshaft

Mat.: See Notes	Weight: 18661 kg	Welds: N/A	Based on: N/A	ISO-A
Unless otherwise specified, adhere to General Workshop Instruction No: 1000024420			Replacing:	Sheet 1 of 1

FLSmidth No.: Content Rev.: 3

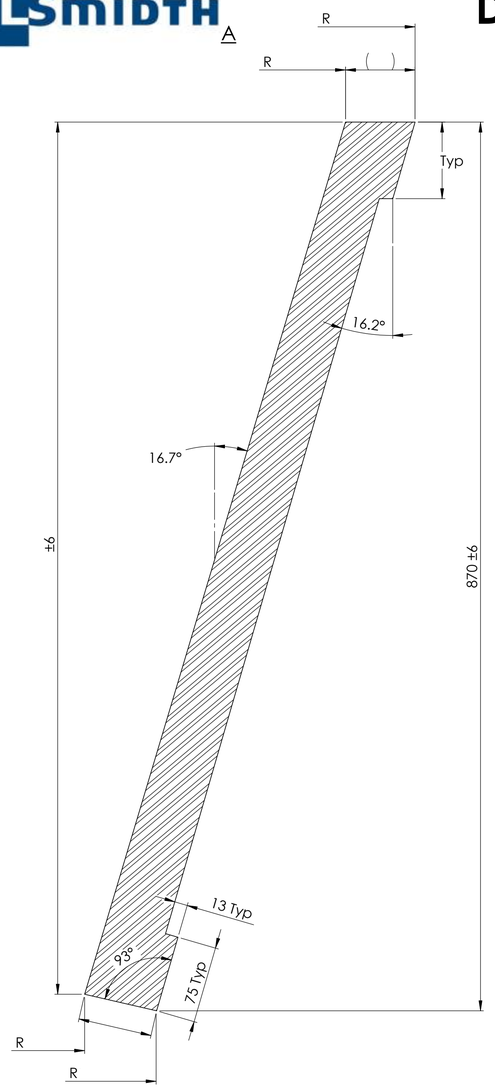
Dimensions and specs not shown to protect proprietary engineering.

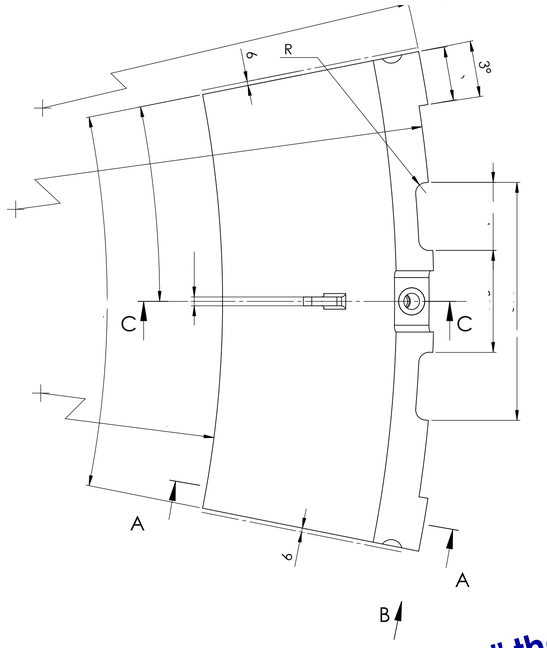
Part number	Material grade	Notes
	SM 330	14% Upgrade
	SM 340	
	HM 830	18% Upgrade
	HM 840	
	XM 1130	

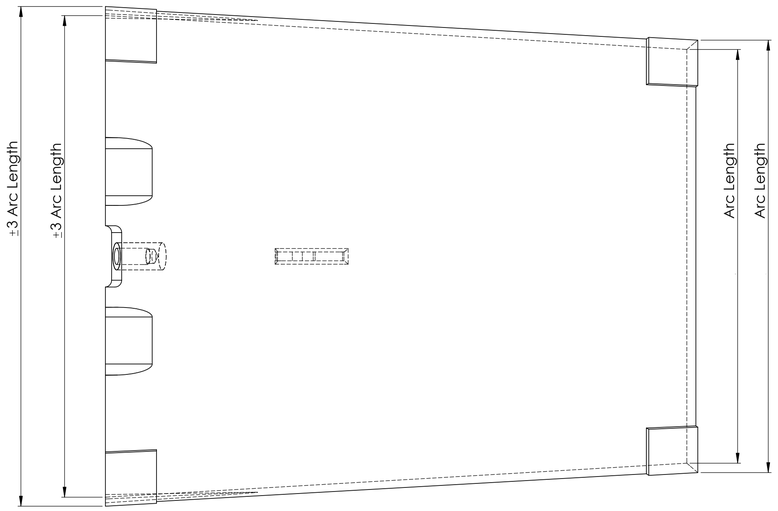
Notes:

1. All dimensions are in millimeters.
2. Material:
   - Designation and chemical composition as per part number.
   - Quality & Inspection criteria per FLSmidth workmanship standard WS-3 1000134858.
3. Refer to latest revision of FLSmidth workmanship standard WS-3 1000134858 for the following
   - Required manufacturing process
   - Casting Tolerances
   - Geometric inspection & acceptance criteria
   - Painting instructions
4. Manufacturer is responsible for all required machining/grinding allowance.
5. Unless otherwise noted all radii to be 5mm.
6. Vendor to cast the following information on surface of part where indicated. Letters to be 25mm tall and raised 10mm above surface
   - FLSmidth Logo
   - FLSmidth part number
   - Heat number
   - Purchase order number
   - Material grade
7. Vendor to paint on outside in 75mm tall letters
   - FLSmidth Logo
   - FLSmidth part number
   - Material grade
   - Lifting figure and note
8. (2) Locking grooves located as shown all grooves are to be parallel and clean before concaves.
9. Inspect with template drawing # 100
10. Inspect with template drawing # 100
11. Inspect with template drawing # 100
12. This drawing replaces

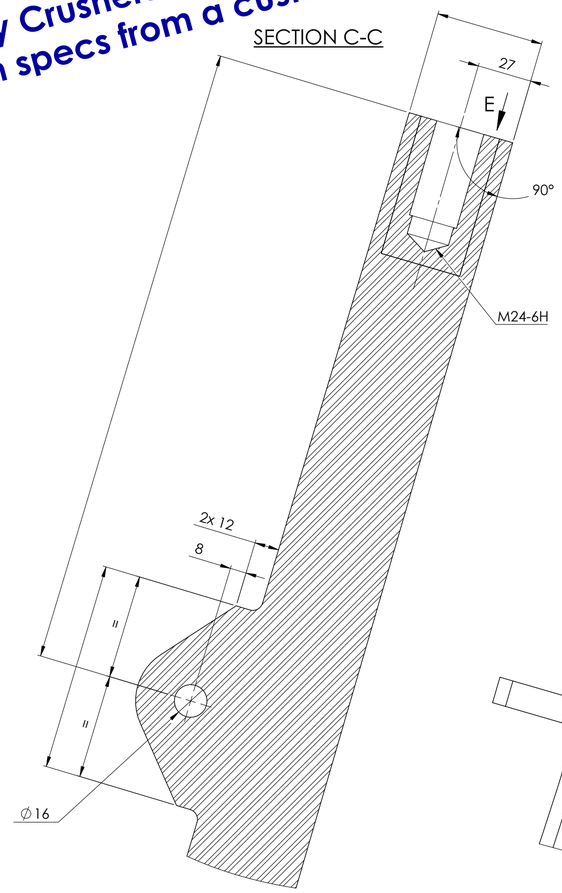
This is one of the Crushing "Plates" that lined the inside of our Gyratory Crushers. This is custom one I designed based on specs from a customer

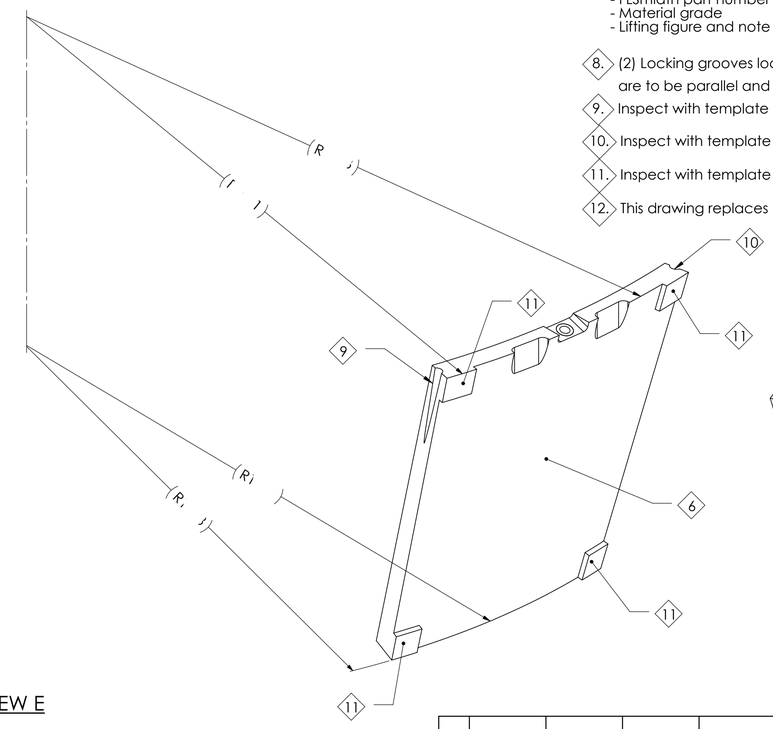




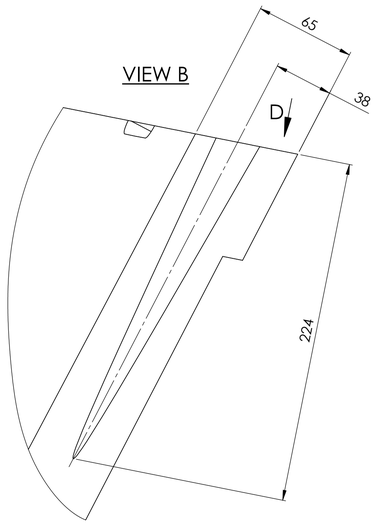


SECTION C-C

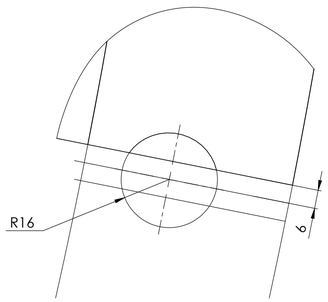




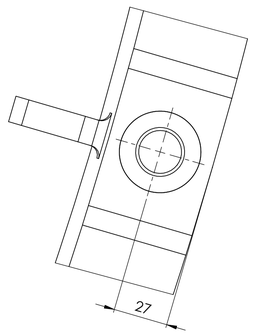
VIEW B



VIEW D
Pin groove detail Typ



VIEW E



Rev.	Drawn	Appr.	Appr. Date	Specific Description of Change
1	DCHR-US	VLJ	2-JUNE-2020	Initial Release

Lang Rev.:

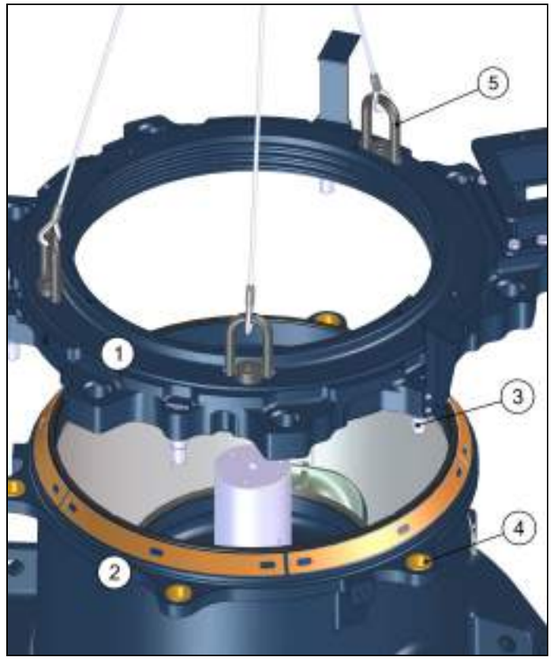
Scale: N/A | Component drawing

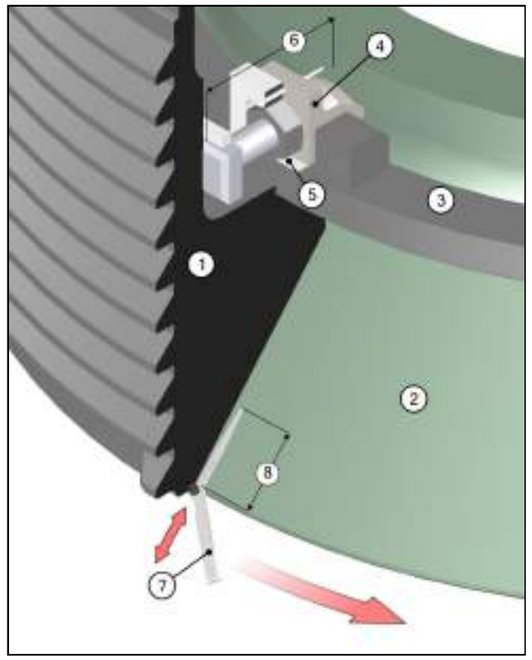
Climax concave, upper

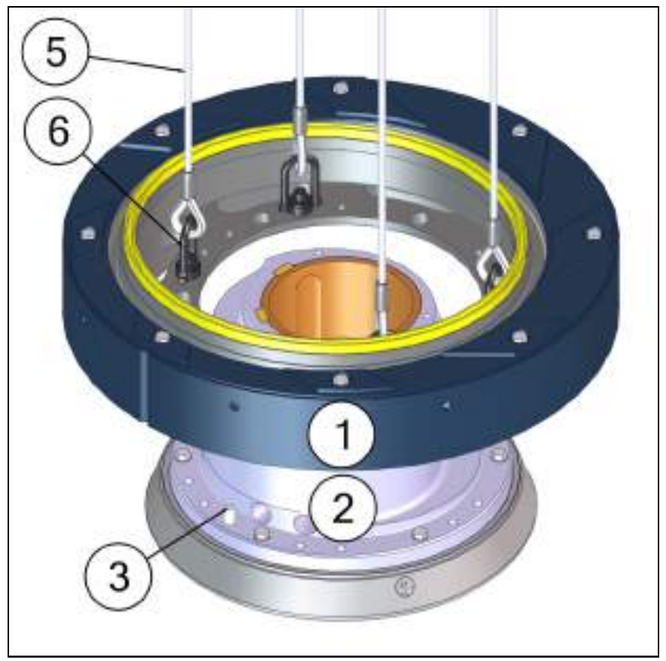
Mat.: | Weight: 266 kg | Welds: N/A | Based on: N/A | Replacing: | Sheet 1 of 1

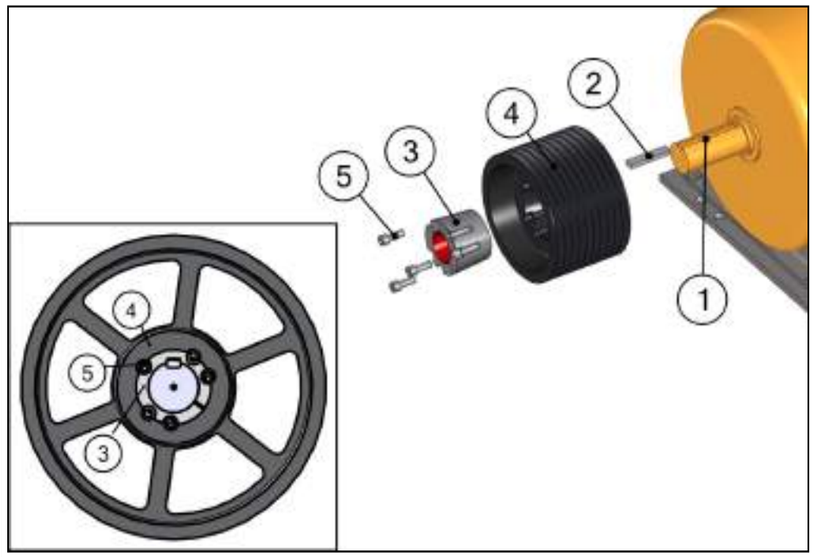
No.: | Content Rev.: 1.1

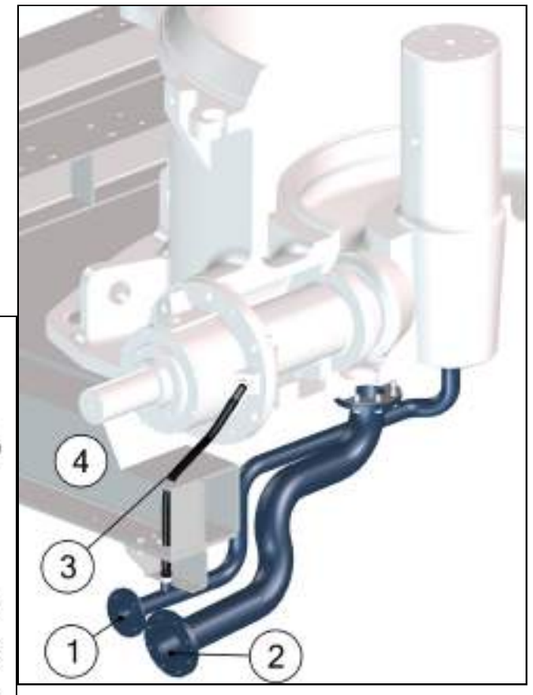
These are some examples of Images I created in SolidWorks Composer to be used in the Installation and Operation Manuals that we give to our customers. They use these manuals for maintenance, repairs, upgrades etc. of the crushers they buy from us.

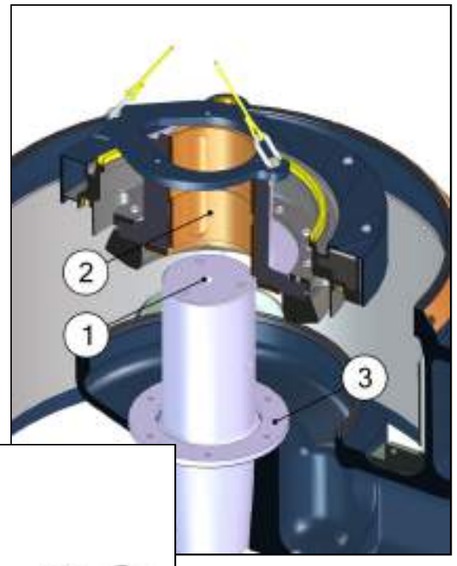


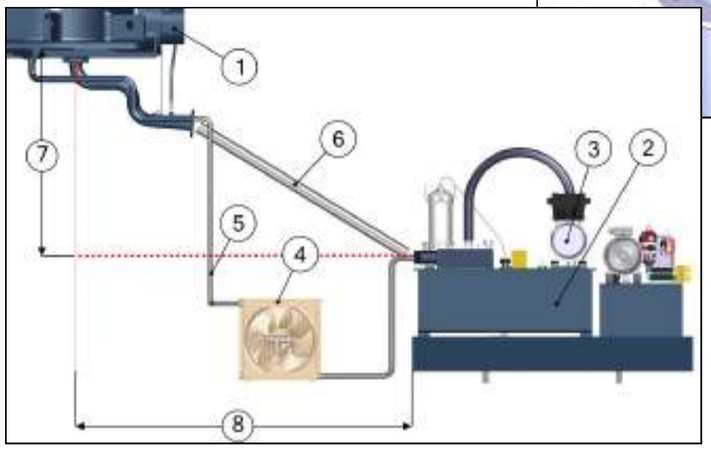


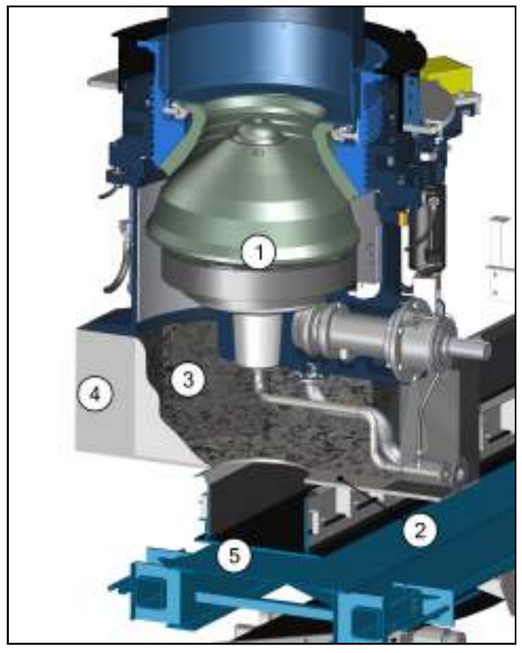


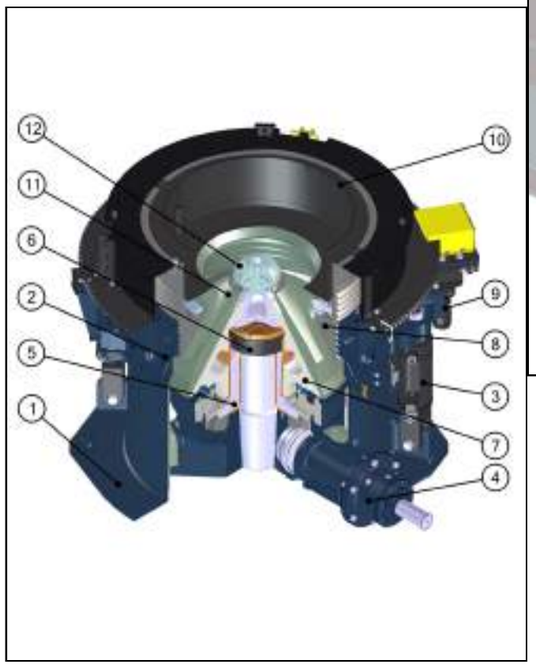




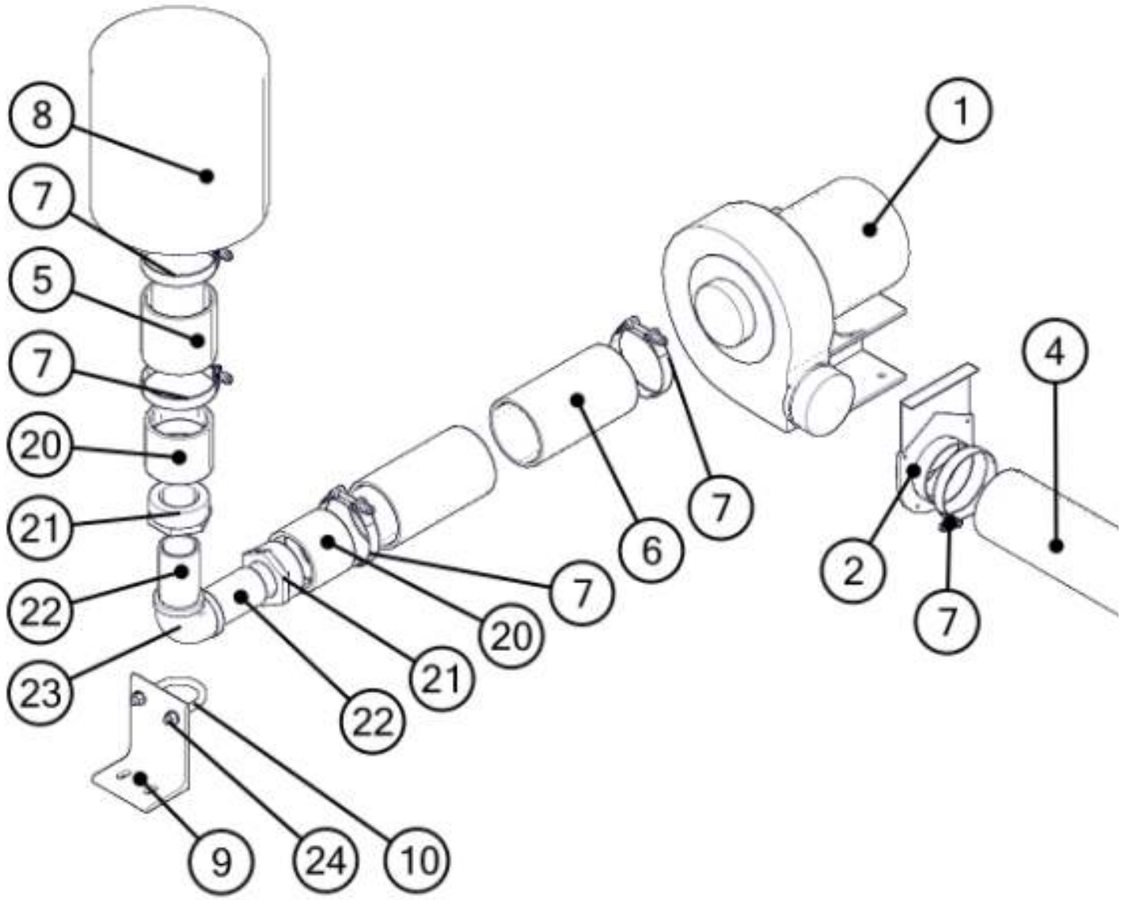




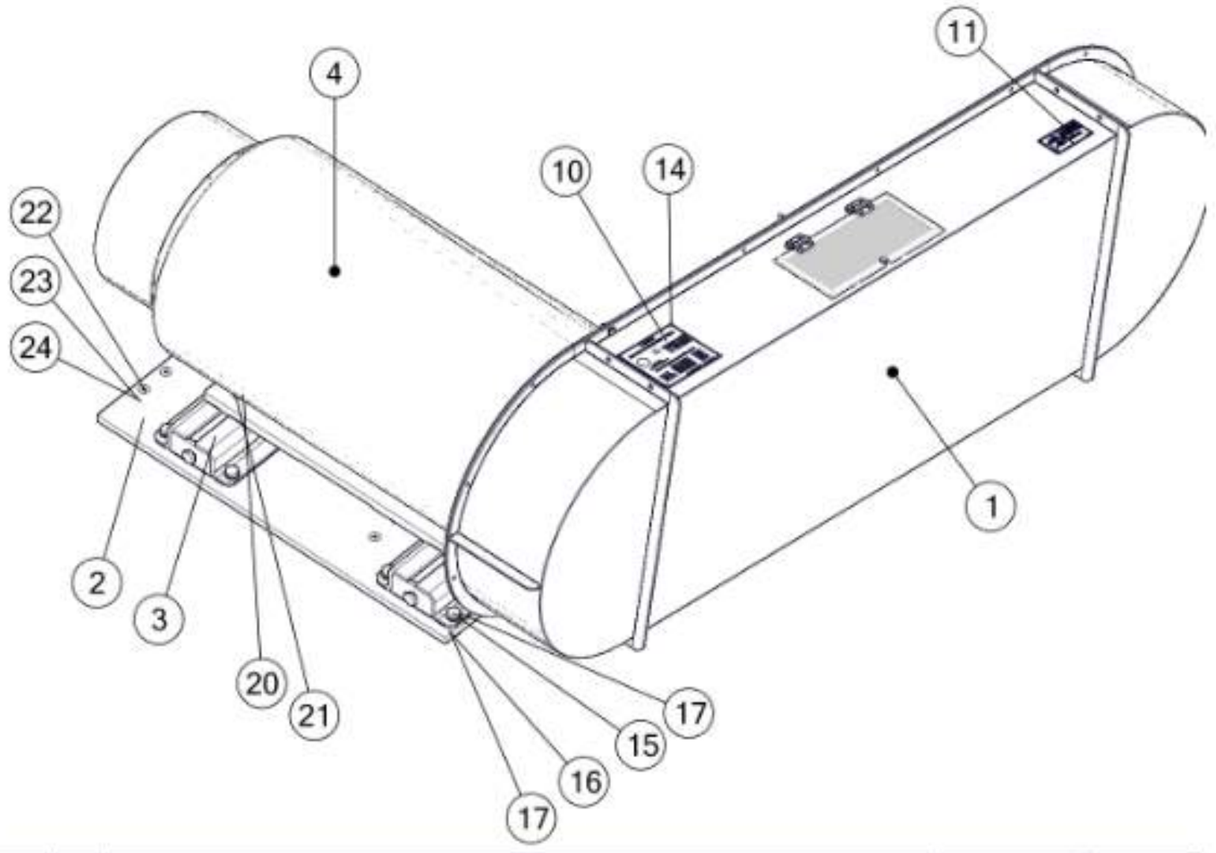




This is a 'Belt Guard Assembly' that I designed based on a new type of electrical motor we implemented



Item	Qty	Description	Part Number
1	1	Blower, turbo	1000436219
2	1	Damper, outlet	1000436345
4	1	Hose, air, dia 4" ID, 240" length	1000641892
5	1	Hose, air, dia 4" ID, 4" length	1000641488
6	1	Hose, air, dia 4" ID, 120" length	1000164702
7	5	Clamp, T-Bolt, i.d. 4 in	1000477114
8	1	Air filter	1000144444
9	1	Bracket, air filter	1000461474
10	1	U-Bolt, DN50 pipe	1000161184
20	2	Coupling, straight, NPT, ASTM A865, CL 150, 3 in	1000640997
21	2	Bushing, hexagon, 3M x 2F	1000462358
22	2	Nipple, pipe, NPT, ASTM A733, SCH 40, 2x5 in, black oxide finish	1000157473
23	1	Elbow, 90, NPT, ASME B16.3, CL 150, 2.0 in, galvanized	1000157521
24	2	Nut, hexagon, ISO 4032, M10, 8, electroplated	1000006023

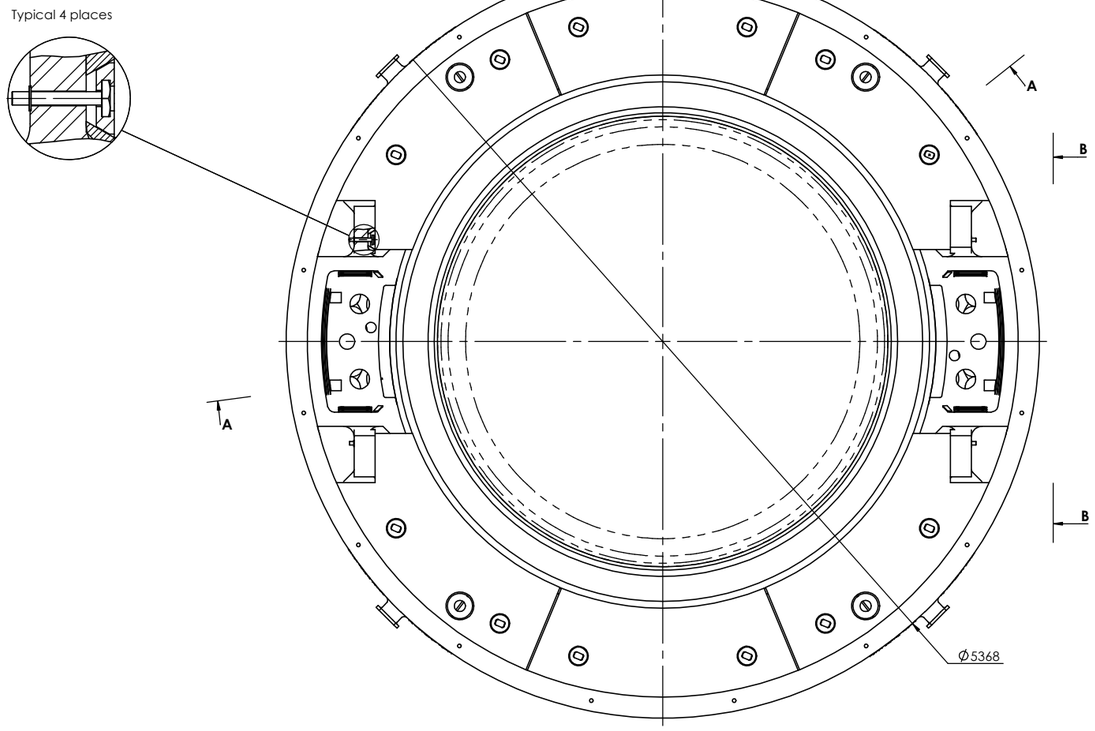


Item	Qty	Description	Part Number	Comment
1	1	Assembly, belt guard, R450	1000436244	
2	1	Sole plate, 50Hz TECO, R450	1000455243	
2	1	Sole plate, 50Hz WEG, R450	1000459707	
3	2	Slide rail, R250, R350, R450	1000413246	
4	1	Drive motor, 50Hz, TECO, R450	1000468338	
4	1	Drive motor, 50 Hz, WEG, R450	1000468667	
10	1	Plate, caution, v-belt tension	1000197975	
11	1	Decal - safety 'warning' belt guard	1000151570	
14	4	Screw, round head, metallic drive, type U, ASME B18.6.3, No.10x1/2	1000248797	
15	16	Screw, hexagon head, ISO 4017, M24x80, 8.8, electroplated	1000008571	
16	16	Nut, hexagon, ISO 4033, M24, 8, electroplated	1000024046	
17	32	Washer, ISO 7089, 24, 200 HV, electroplated	1000006568	
20	4	Nut, hexagon, ASME B18.2.2, 1-8, Gr 5, electroplated	1000130838	
21	4	Washer, type AN, ASME B18.21.1, 1.0, electroplated	1000159113	
22	16	Screw, countersunk head, hexagon socket, ISO 10642, M16x60, 8.8, electroplated	1000003597	
23	16	Nut, hexagon, ISO 4033, M16, 8, electroplated	1000024044	
24	16	Washer, ISO 7089, 16, 200 HV, electroplated	1000006562	

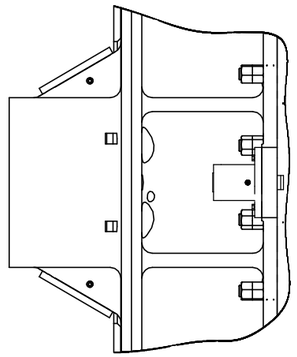
Dimensions and specs not shown to protect proprietary engineering.

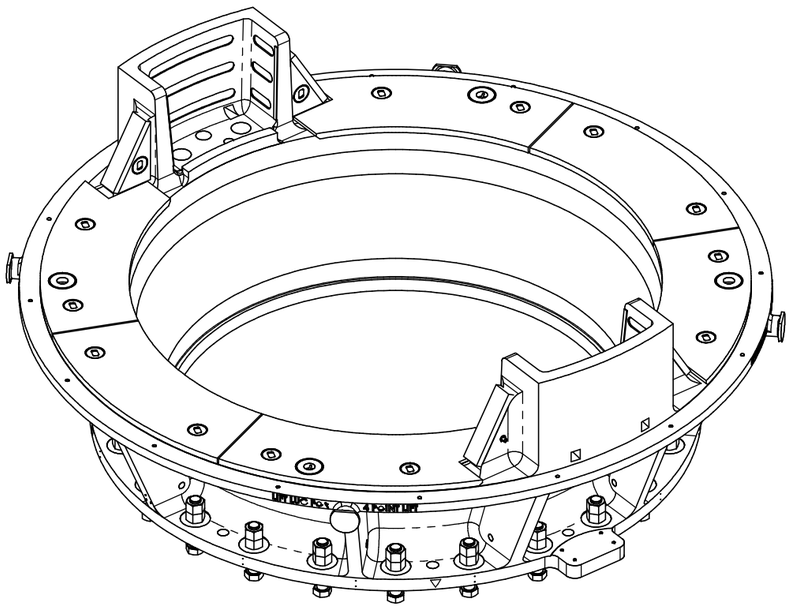
Notes:

1. All dimensions are in millimeters.
2. Unless otherwise specified, refer to crusher IOM for bolt tightening torques.
3. Protect surfaces during shipping, storage, and handling.
4. Shim between wear plates and Top shell to obtain a solid seat
5. Torque each M100 Shell Bolt 01.03.02.05 to value listed in IOM.
6. For handling weights and CG location refer to 1000755676.

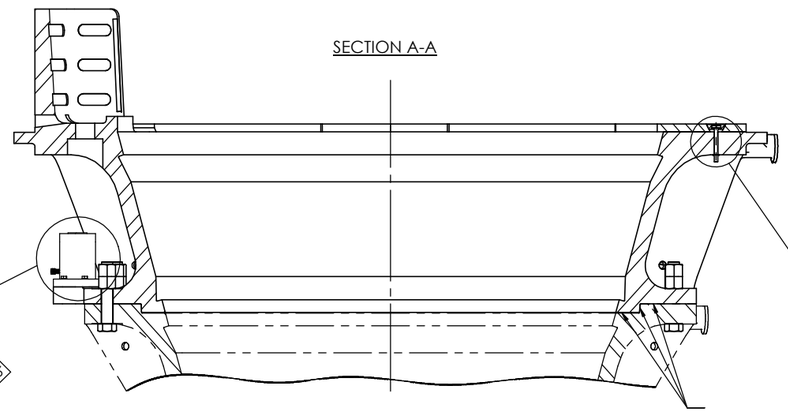


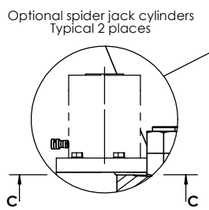
SECTION B-B





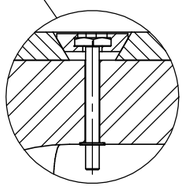
SECTION A-A



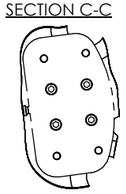


5 6

Typical 4 Places



SECTION C-C



This is a 'Top-Shell,' one of the integral parts of the Gyratory Crusher. This specific one is one that I had to redesign for a customer to compensate for a new type of seal they wanted to try.

Rev.	Drawn	Appr.	Appr. Date	Specific Description of Change
1	DCHR	DAUD	12/15/2021	Initial Release

Lang Rev.: 1

Scale: N/A | Component drawing

Assembly, Top Shell
HORIZON MINERALS
Gyratory Crusher

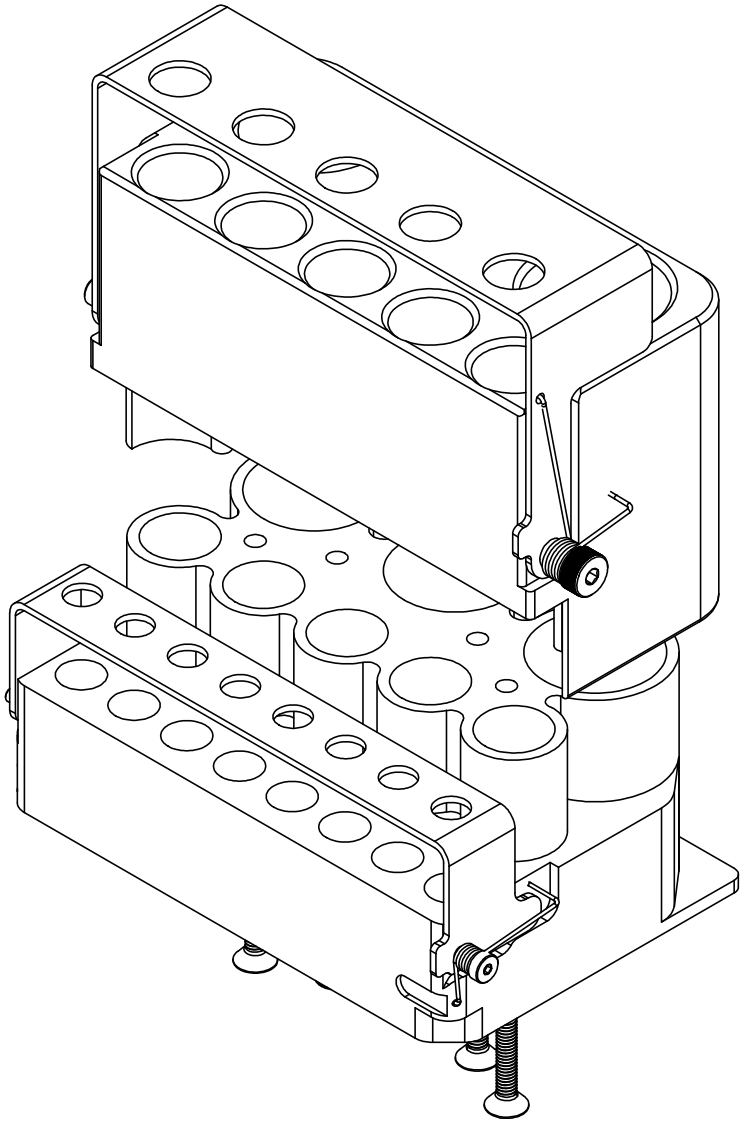
Mat.: N/A | Weight: N/A | Welds: N/A | Based on: N/A | ISO-A

Unless otherwise specified, adhere to General Workshop Instruction No: 1000024420 | Replacing: N/A | Sheet 1 of 1

FLSmidth | No.: 1000746731 | Content Rev.: 1

A1-H

REVISIONS					
ZONE	REV	CO #	DESCRIPTION	DATE	APPROVED
	01		INITIAL RELEASE	6/27/17	



Dimensions not shown to protect proprietary engineering

THIRD ANGLE PROJECTION

NEXT ASSY | USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

FRACTIONS ± 1/32 | DECIMALS .X ± .015, .XX ± .01, .XXX ± .005 | ANGLES ± 0.5°

MATERIAL SEE NOTE 2

FINISH SEE NOTE 3

DO NOT SCALE DRAWING

ENGINEERED BY: CARTERRA

APPROVALS		DATE
DRAWN	KC	8/12/2022
CHECKED		
ISSUED		

COMMENTS

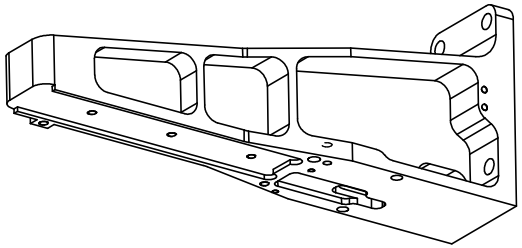
TITLE: ASSEMBLY, VIAL BLOCK

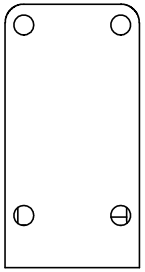
SIZE	DWG. NO.	REV
D	42302-2088	02

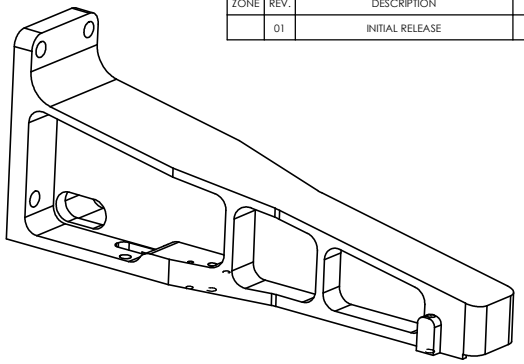
SCALE 1:2 | EST. WT. 2.78 pounds | SHEET 1 of 1

LE_INCH_D-FORMAT_SHEET-1

DWG NO. 42302-4045 | REV. 02 | SHEET 1 OF 1

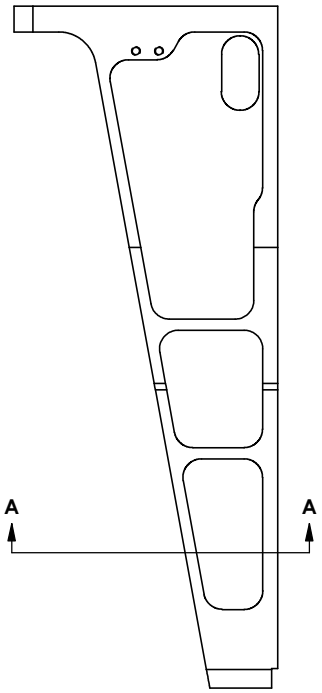


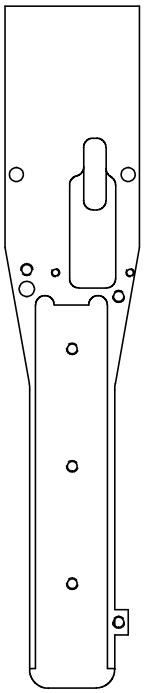


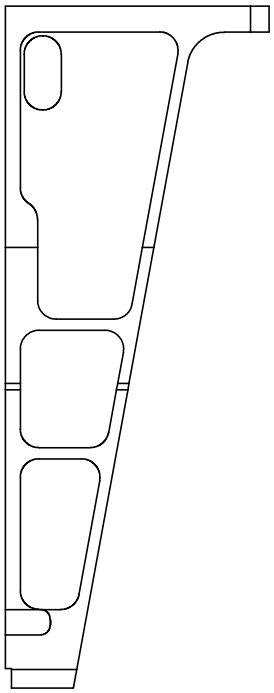


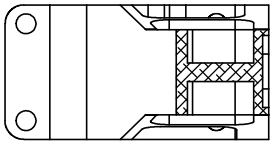
REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	01	INITIAL RELEASE	6/27/17	IHH

Dimensions not shown to protect proprietary engineering







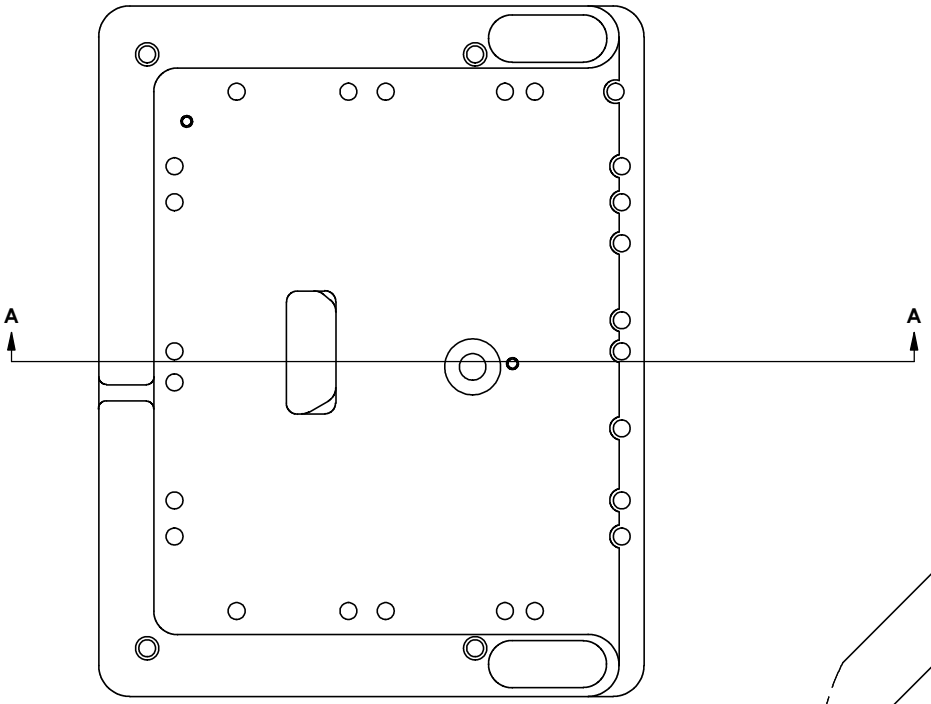


SECTION A-A
SCALE 1.2 : 1

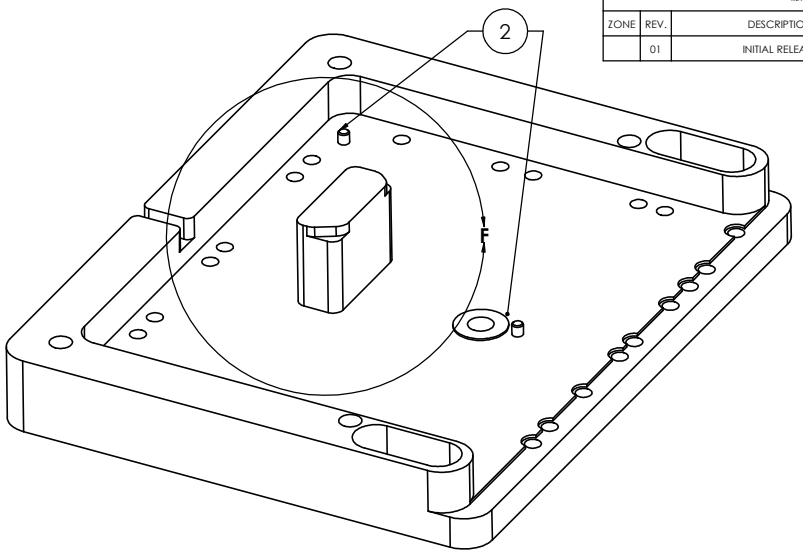
THIRD ANGLE PROJECTION			UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES ARE:	ENGINEERED BY: CARTERRA	cartorra
			FRACTIONS DECIMALS ANGLES ± 1/2" .XX ± 0.01 .XXX ± 0.005 ± 0.5 deg	APPROVALS / DRAWN KC 9/27/2022 / CHECKED / ISSUED	TITLE: Mount, LFC, fixed, YZ
PROPRIETARY AND CONFIDENTIAL			MATERIAL SEE NOTE 3	COMMENTS	SIZE D / DWG. NO. 42302-3021 / REV 04
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF **CARTERRA.** ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF **CARTERRA.** IS PROHIBITED.	NEXT ASSY	USED ON	FINISH SEE NOTE 4		SCALE 1:1 / EST. WT. 1.05 pounds / SHEET 1 of 1
	APPLICATION		DO NOT SCALE DRAWING		LE_INCH_D-FORMAT_SHEET-1

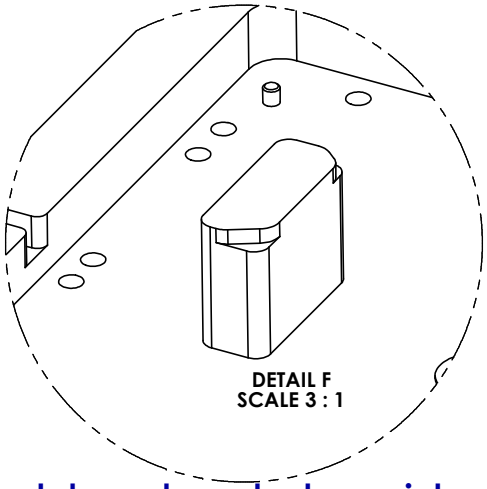
DWG NO. 42302-3021 | REV. 04 | SHEET 1 OF 1

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	01	INITIAL RELEASE	6/27/22	IHH



SECTION A-A
SCALE 2 : 1





DETAIL F
SCALE 3 : 1

NOTES: UNLESS OTHERWISE SPECIFIED

1. INTERPRET DRAWING PER ASME Y14.5M-2009.
2. MATERIAL: SEE SHEET 2
3. FINISH: SEE SHEET 2
4. BREAK ALL SHARP CORNERS AND EDGES.
5. FINISHED PART TO BE CLEAN, DRY, (NO OIL OR OTHER RESIDUES) AND FREE OF COSMETIC DEFECTS.
6. BAG OR TAG FINISHED PARTS USING THE FOLLOWING FORMAT:

   CARTERRA
   PART NAME: HEAT SINK ASSY WITH PINS
   PART NUMBER: 42302-3201
   REV: (PER P.O.)
   QTY: (PER P.O.)

Dimensions not shown to protect proprietary engineering

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	42302-3201		1
2	42302-1312	Pin, dowel, .094 dia x .375, SS 18-8	2

THIRD ANGLE PROJECTION

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

FRACTIONS ± 1/2" DECIMALS .XX ± 0.01 .XXX ± 0.005 ANGLES ± 0.5 deg

MATERIAL SEE NOTE 2

FINISH SEE NOTE 3

DO NOT SCALE DRAWING

ENGINEERED BY: CARTERRA

APPROVALS		DATE
DRAWN	KC	5/18/2022
CHECKED		
ISSUED		

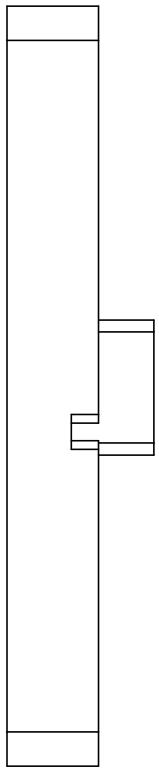
COMMENTS

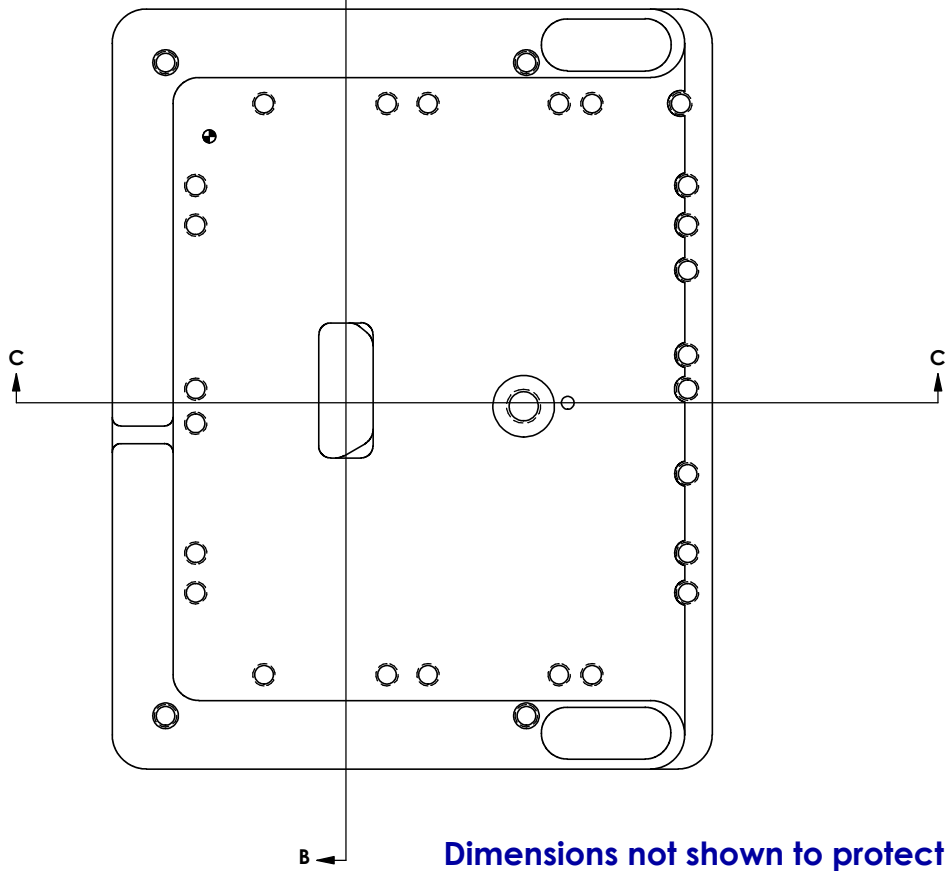
TITLE: HEAT SINK ASSY WITH PINS

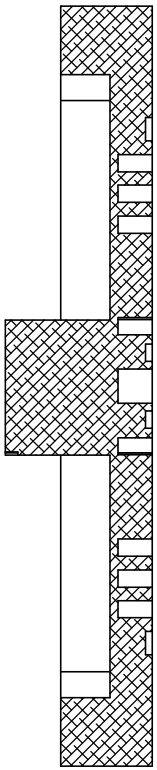
SIZE	DWG. NO.	REV
D	42302-2057	01

SCALE	1:1	EST. WT.	0.81 pounds	SHEET	1 of 3

LE_INCH_D-FORMAT_SHEET-1

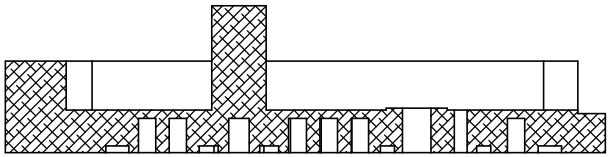






SECTION B-B
SCALE 2.2 : 1

Dimensions not shown to protect proprietary engineering



SECTION C-C
SCALE 2.2 : 1

NOTES: UNLESS OTHERWISE SPECIFIED

1. INTERPRET DRAWING PER ASME Y14.5M-2009.
2. MATERIAL: Aluminum 6061-T6
3. FINISH: Black Anodize per Mil-A-8625F Class 2 type 2
4. BREAK ALL SHARP CORNERS AND EDGES.
5. FINISHED PART TO BE CLEAN, DRY, (NO OIL OR OTHER RESIDUES) AND FREE OF COSMETIC DEFECTS.
6. USE 3D FILE "42302-3201.SLDPRT " TO GENERATE PART. ALL NON-DIMENSIONED FEATURES SHALL BE DEFINED BY THE ELECTRONIC CAD DATA BASE AND HELD TO THE 2 DECIMAL PLACE TOLERANCE AS NOTED IN DRAWING TOLERANCE BLOCK.

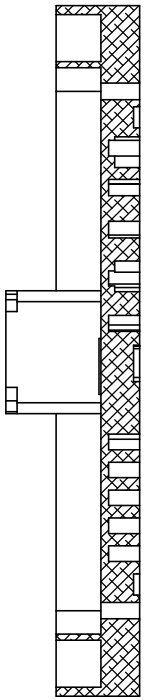
Carterra Bio

TITLE:

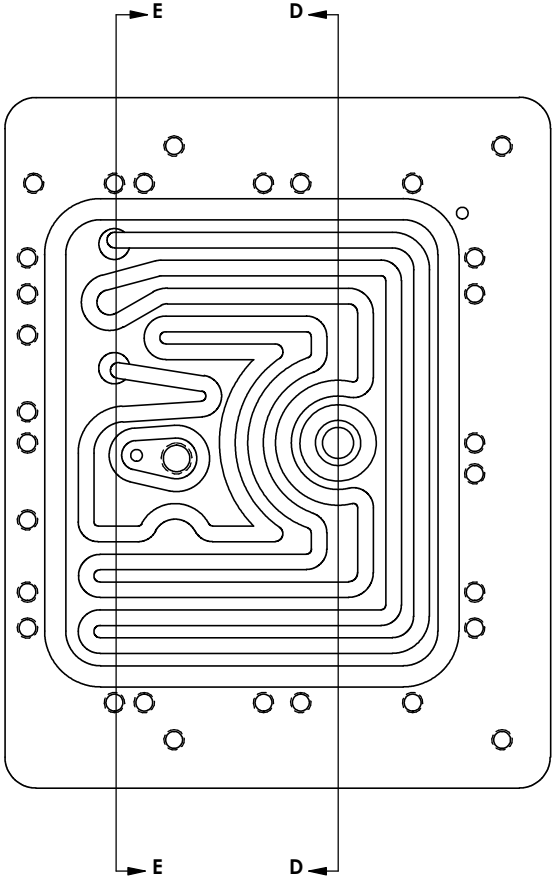
SIZE	DWG. NO.	REV
D	42302-2057	01

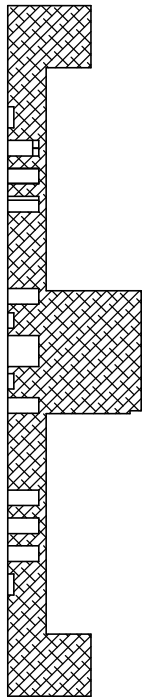
SCALE	EST. WT.	SHEET
1:1	0.81 pounds	2 of 3

LE_INCH_D-FORMAT_SHEET-2



SECTION E-E
SCALE 2 : 1





SECTION D-D
SCALE 2 : 1

Dimensions not shown to protect proprietary engineering

Carterra Bio		
TITLE:		
SIZE D	DWG. NO. 42302-2057	REV 01
SCALE 1:1	EST. WT. 0.81 pounds	SHEET 3 of 3

LE_INCH_D-FORMAT_SHEET-2