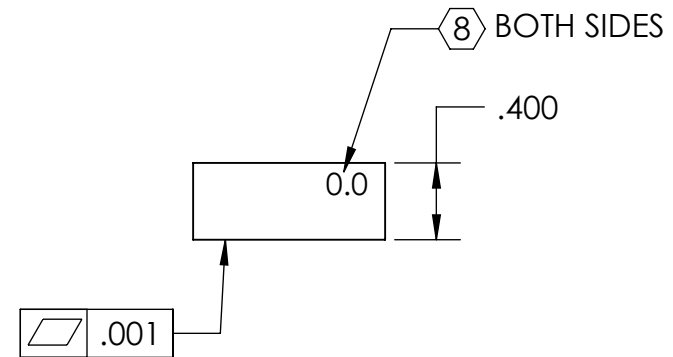
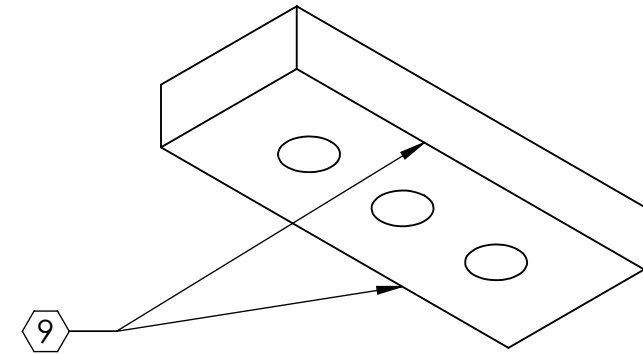
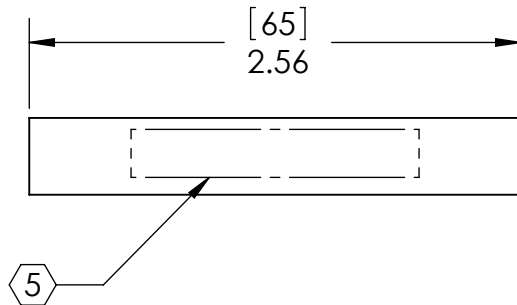
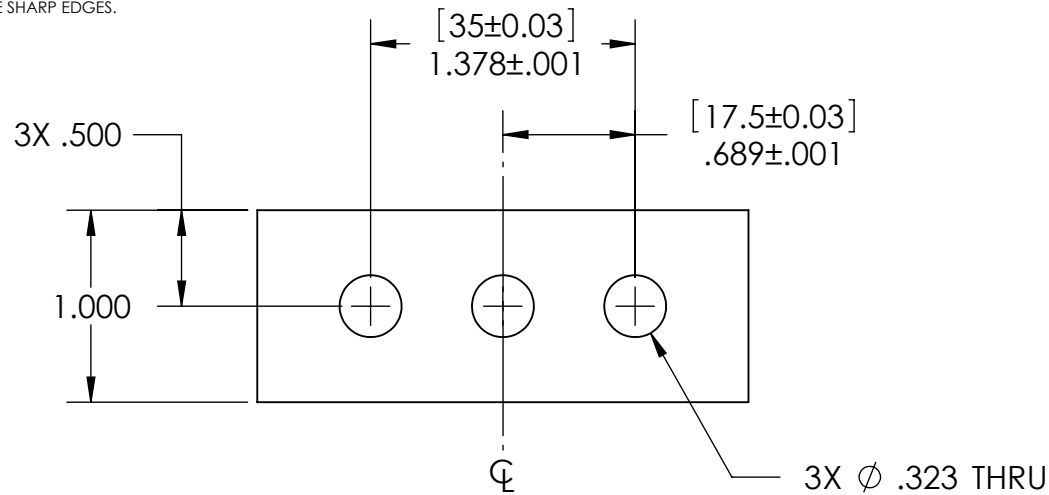


NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- 9. DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	01 AUG 2008	E080418	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM] 1. INTERPRET DRAWING PER ASME Y14.5-1994.
 TOLERANCES: .XX ± .01 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 .XXX ± .005 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

ANGULAR ± 0.1°

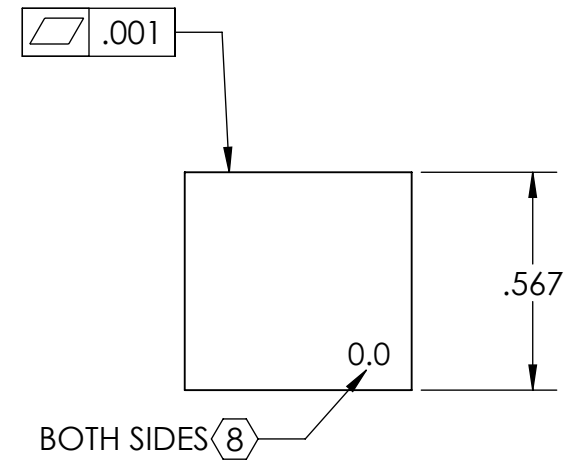
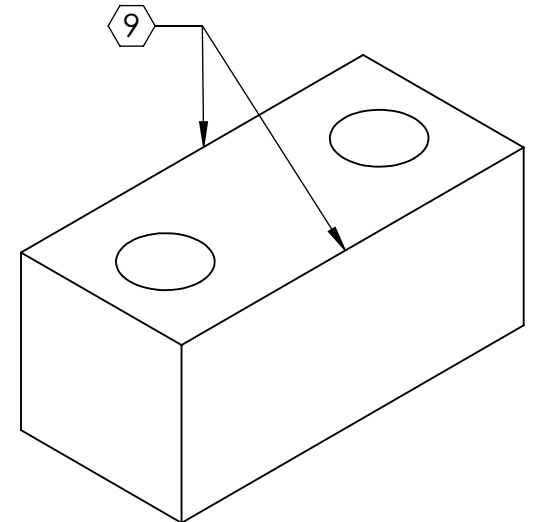
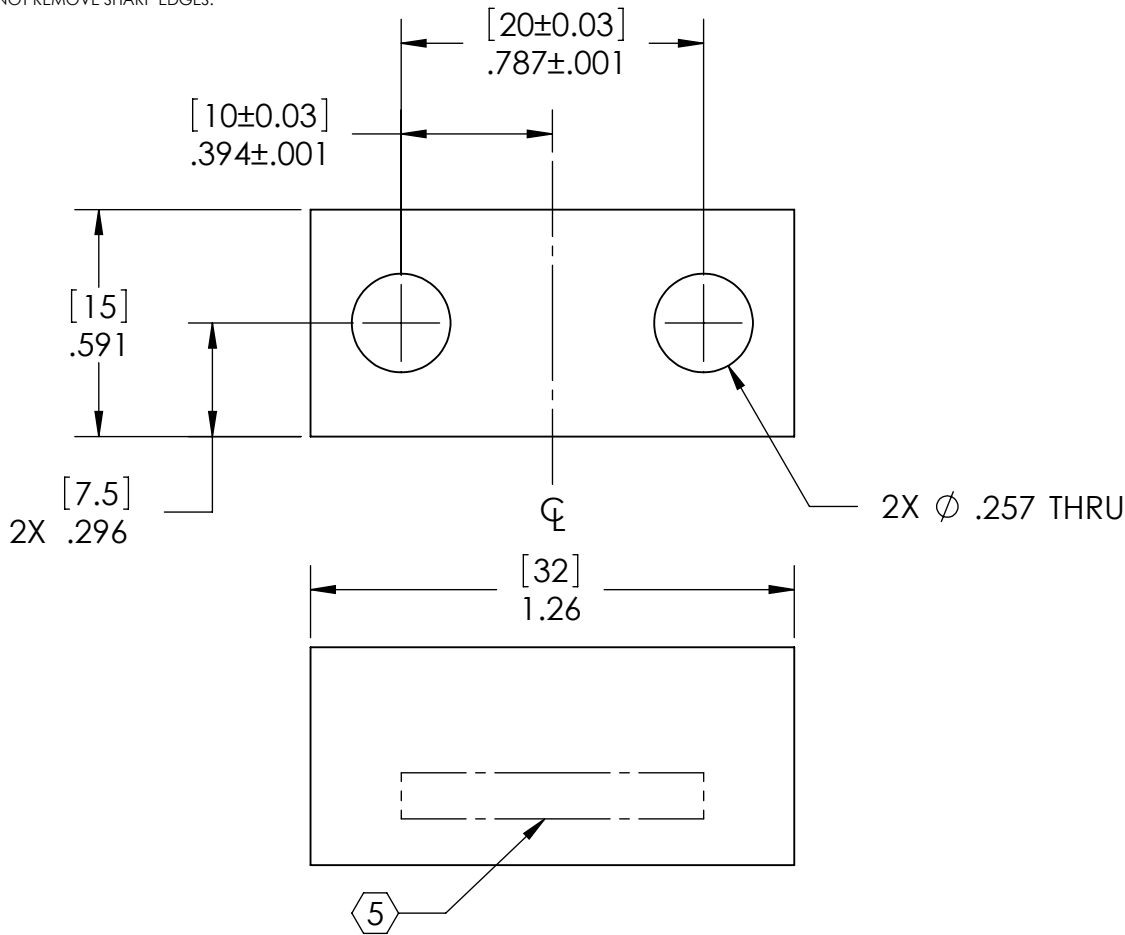
MATERIAL 304, 316 OR 302 SSTL **FINISH** 32 μinch

CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME BLADE CLAMP (0.0 DEGREE), UPPER BLADE, OUTSIDE	
SYSTEM ADVANCED LIGO	SUB-SYSTEM SUS	DESIGNER D. BRIDGES 21 APR 2009 DRAFTER D. BRIDGES 22 APR 2009 CHECKER M. MEYER 22 APR 2009 APPROVAL	SIZE DWG. NO. A D020601 REV. v2
NEXT ASSY LIBRARY OF CLAMPS, UPPER BLADE		SCALE: 1:1	PROJECTION: SHEET 1 OF 1

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- ⑥ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- ⑦ DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	01 AUG 2008	E080418	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSSL
 FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS
 NEXT ASSY LIBRARY OF CLAMPS, LOWER BLADE

PART NAME BLADE CLAMP (0.0 DEGREE), LOWER BLADE, INSIDE

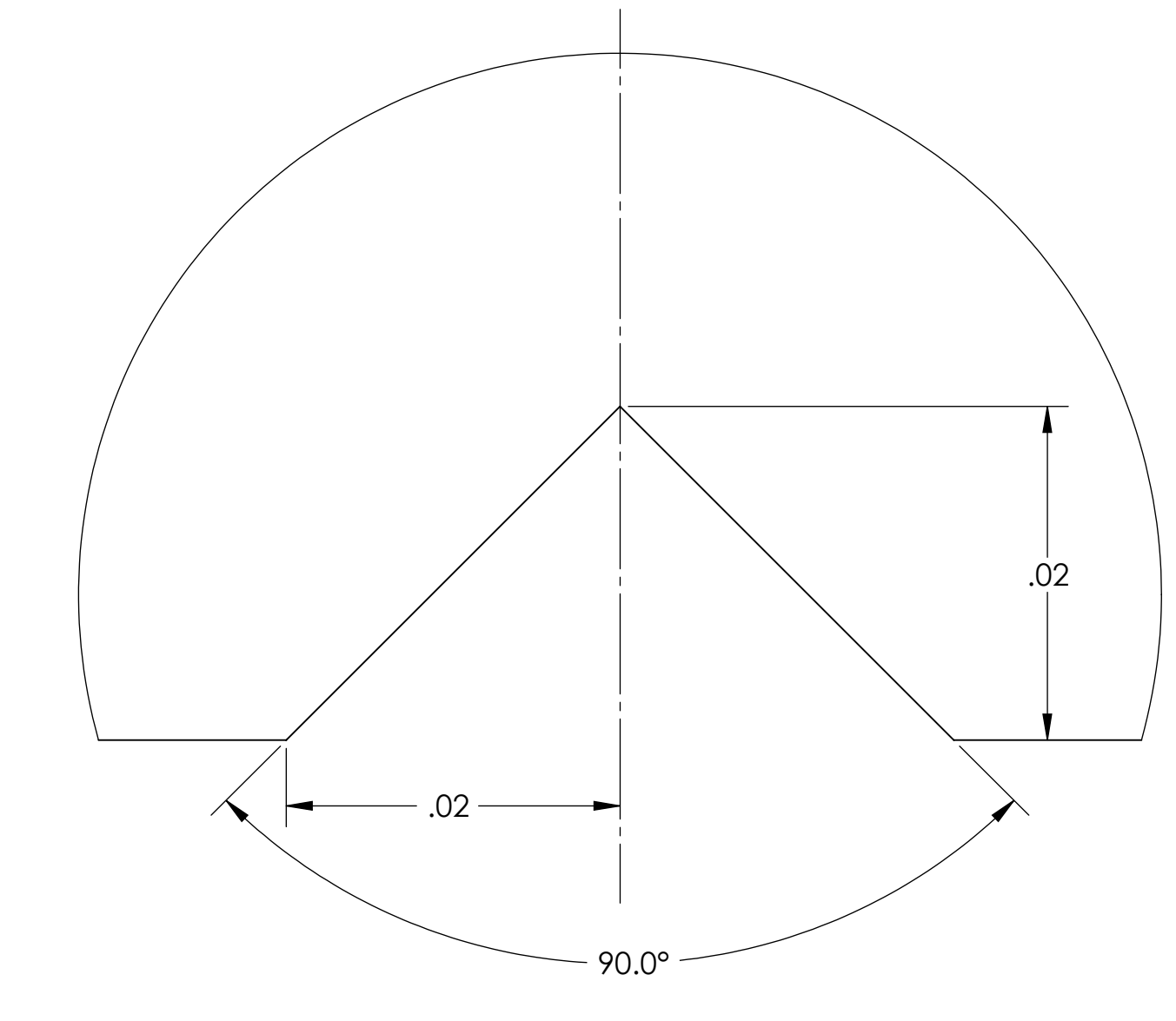
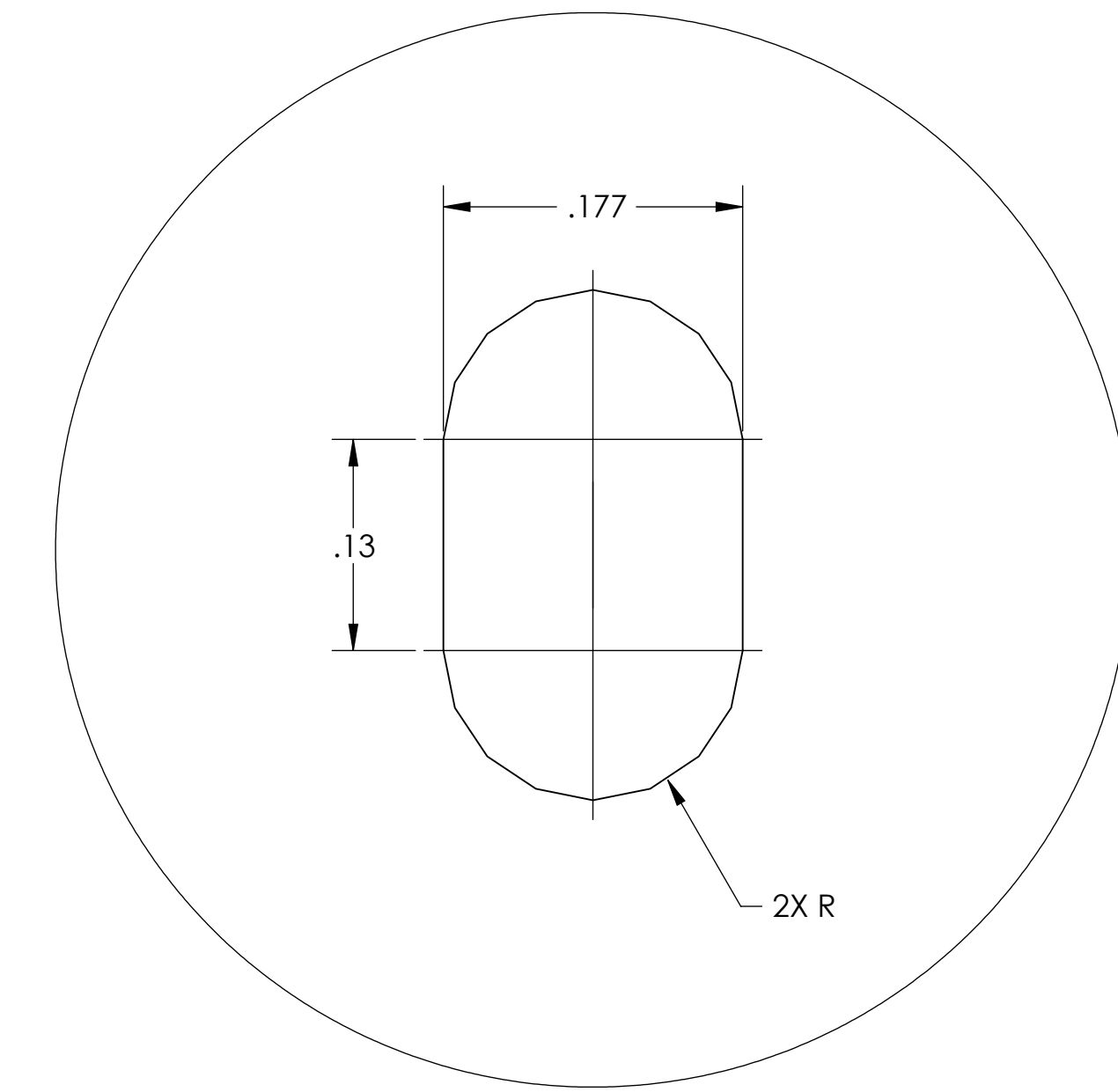
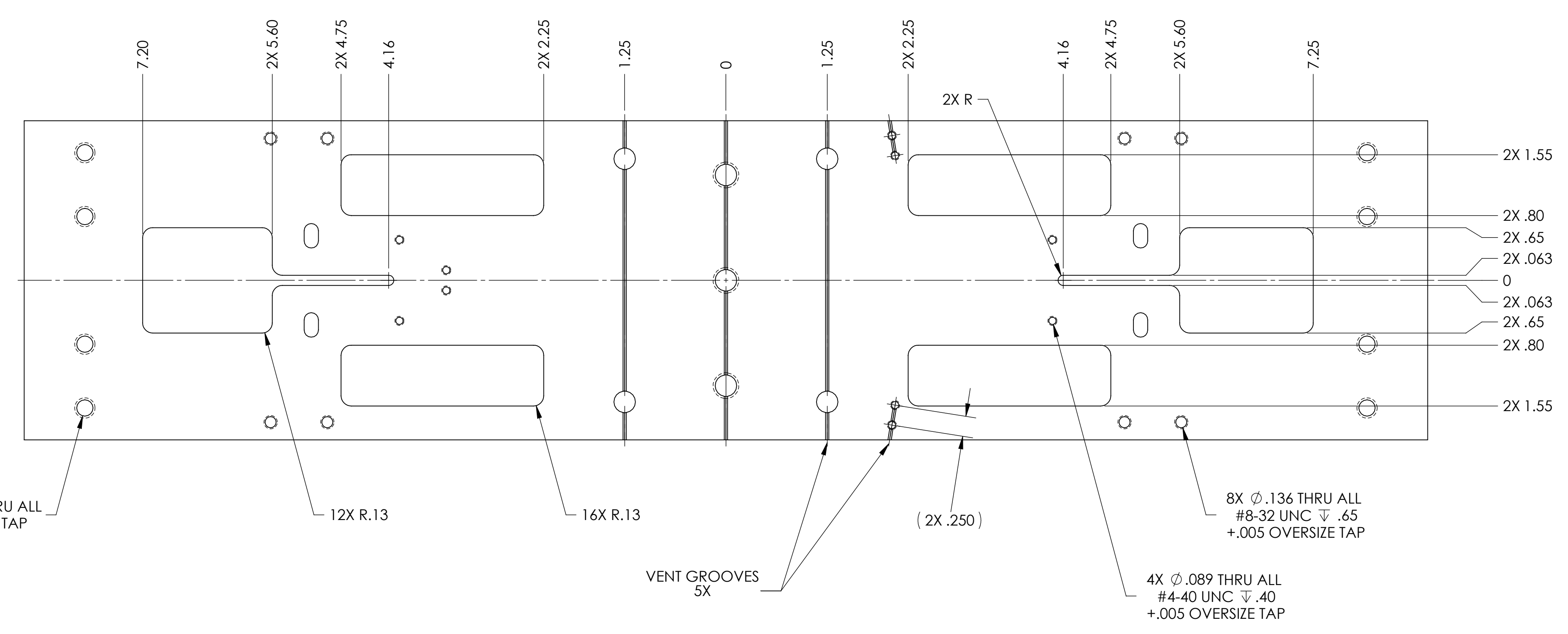
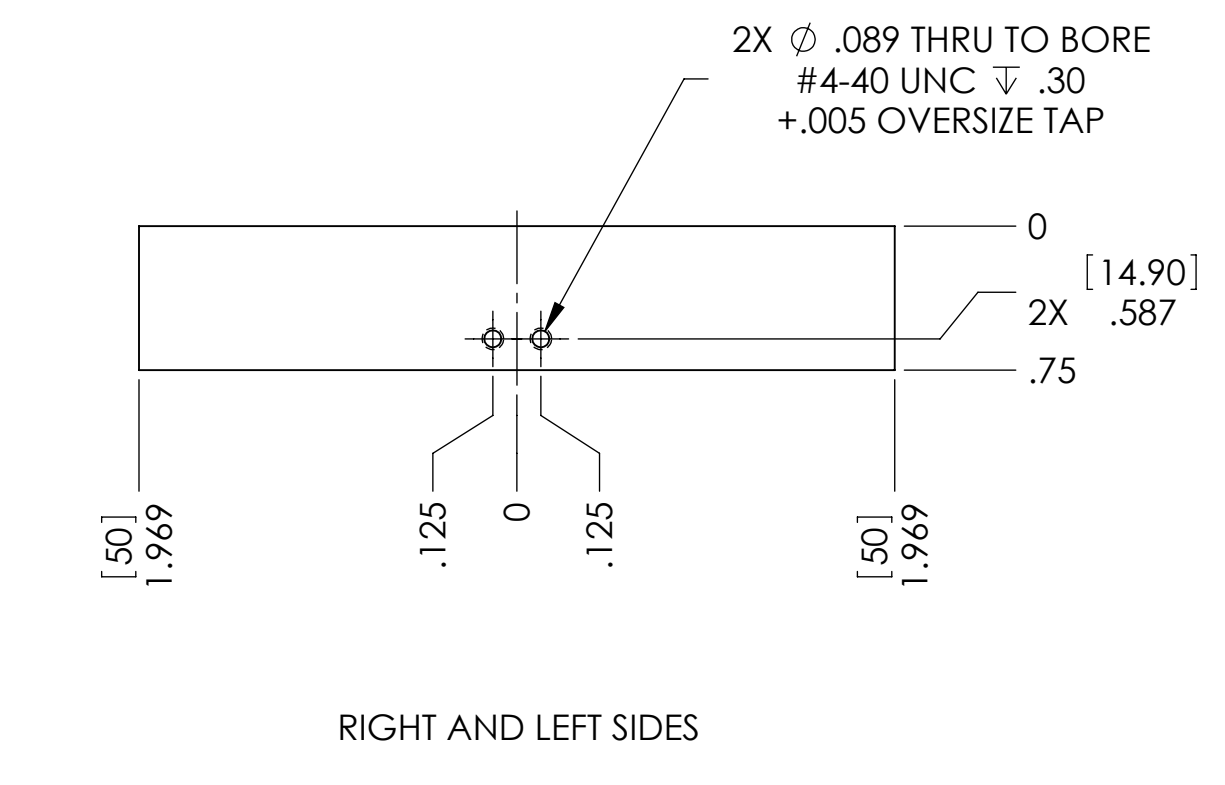
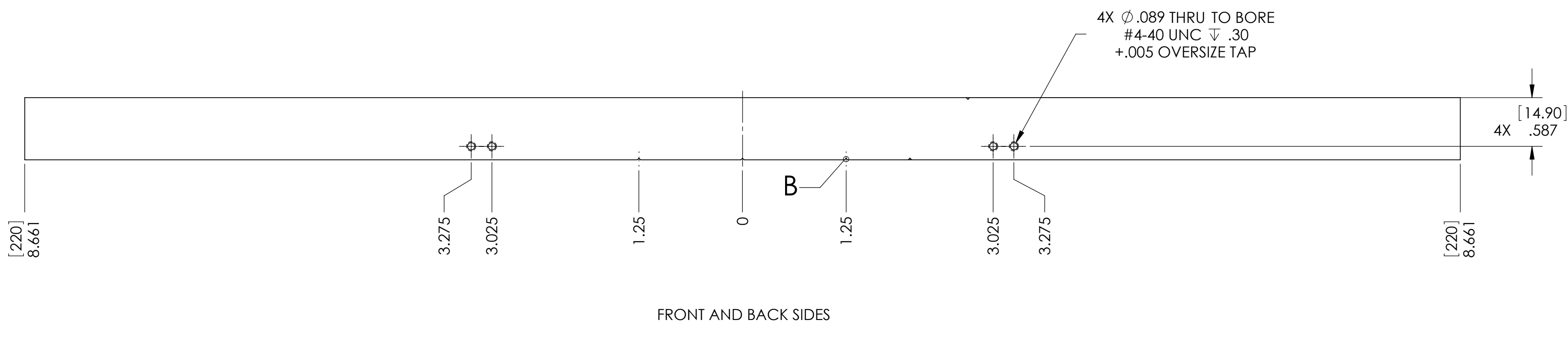
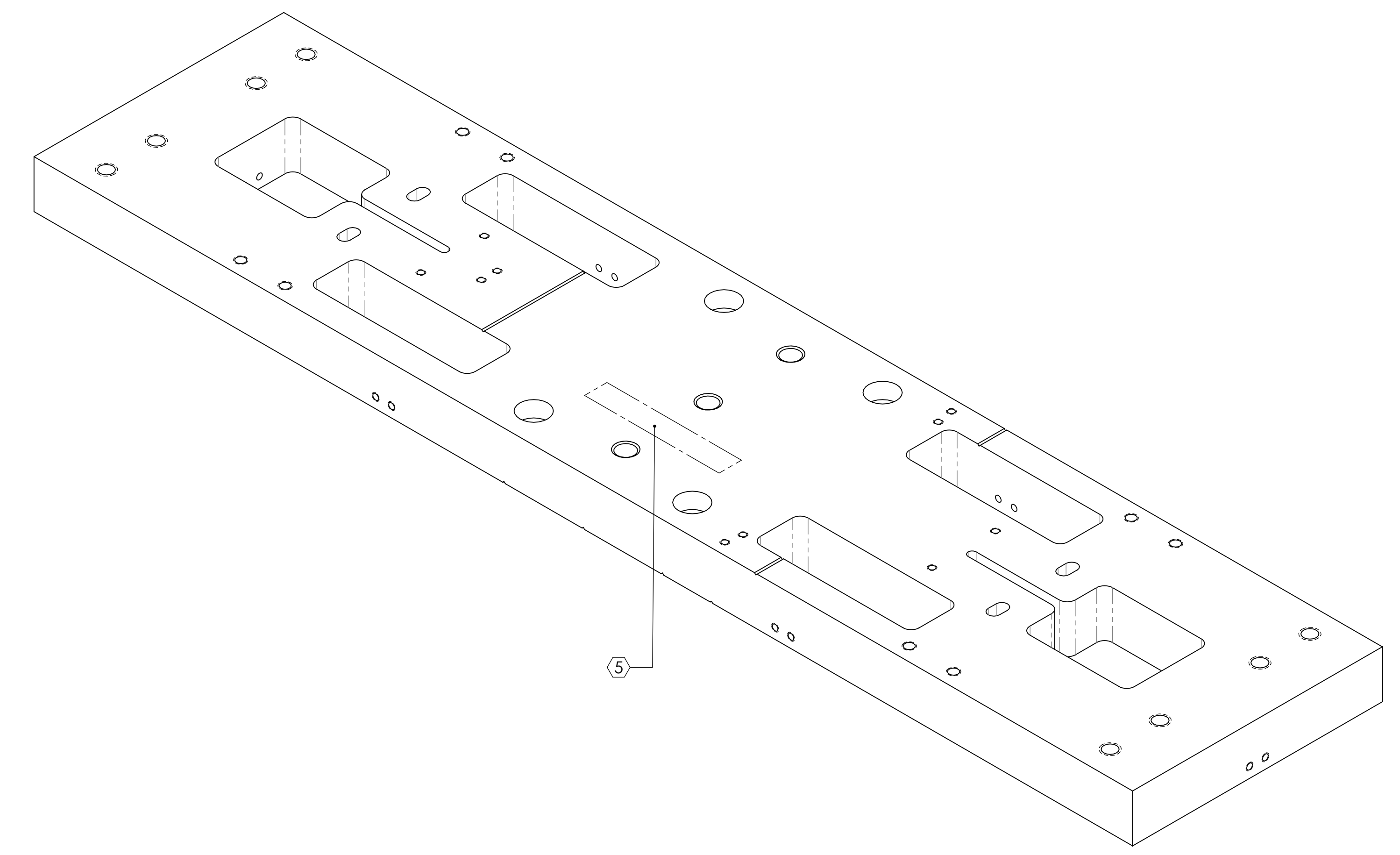
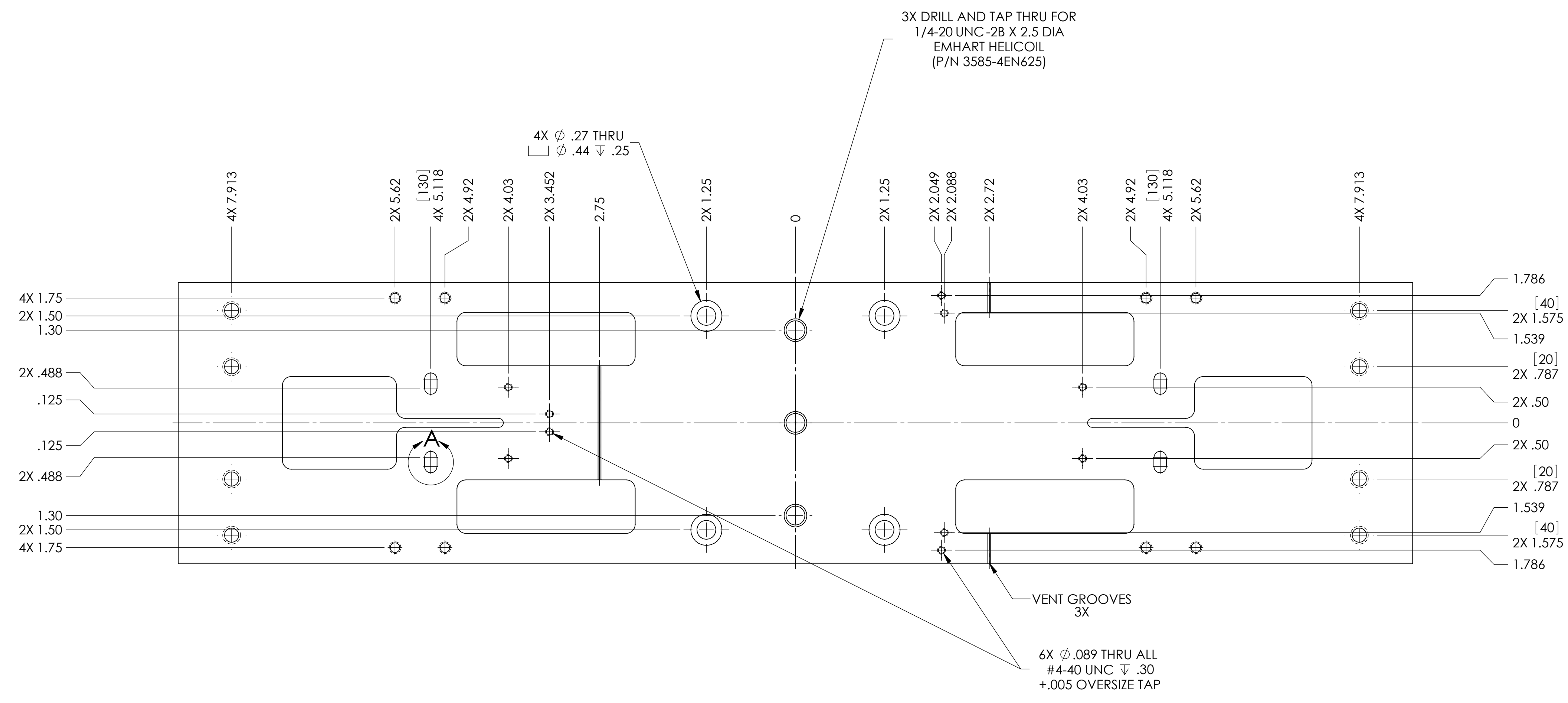
DESIGNER D. BRIDGES 22 APR 2009
 DRAFTER D. BRIDGES 25 JUN 2010
 CHECKER M. MEYER 28 JUN 2010
 APPROVAL

SIZE DWG. NO. A D020602
 SCALE: 2:1 PROJECTION: SHEET 1 OF 1

REV. v2

NOTES CONTINUED:
 3. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR TYPE IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
 EXAMPLE: DXXXXXX-VV-TYPE XX, S/N XXX
 4. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 5. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E090364.
 6. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EINHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
 7. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

REV.	DATE	DCN #	DRAWING TREE #
v1	14 JUL 2009	E0900198	E080191
v2	02 DEC 2009	E0900446	E080191
v3	18 MAY 2010	E1000166	E080191



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)		CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
DIMENSIONS ARE IN INCHES [MM]		LIGO		SYSTEM	
TOLERANCES: .XX ± .01 .XXX ± .005		ADVANCED LIGO		SUB-SYSTEM	
ANGULAR ± 0.5°		NEXT ASSY		UPPER MASS ASSY	
MATERIAL 304, 316 OR 302 SSSL		FINISH 32 μinch		DESIGNER D. BRIDGES	
				DRAFTER D. BRIDGES	
				CHECKER M. MEYER	
				APPROVAL	
				DATE 10 JUL 2010	
				DATE 21 JUL 2010	
				DATE 27 JUL 2010	
				SIZE DWG. NO. E	
				D020605	
				REV. v3	
				SCALE: 1:1	
				PROJECTION:	
				SHEET 1 OF 1	

NOTES CONTINUED:

5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX

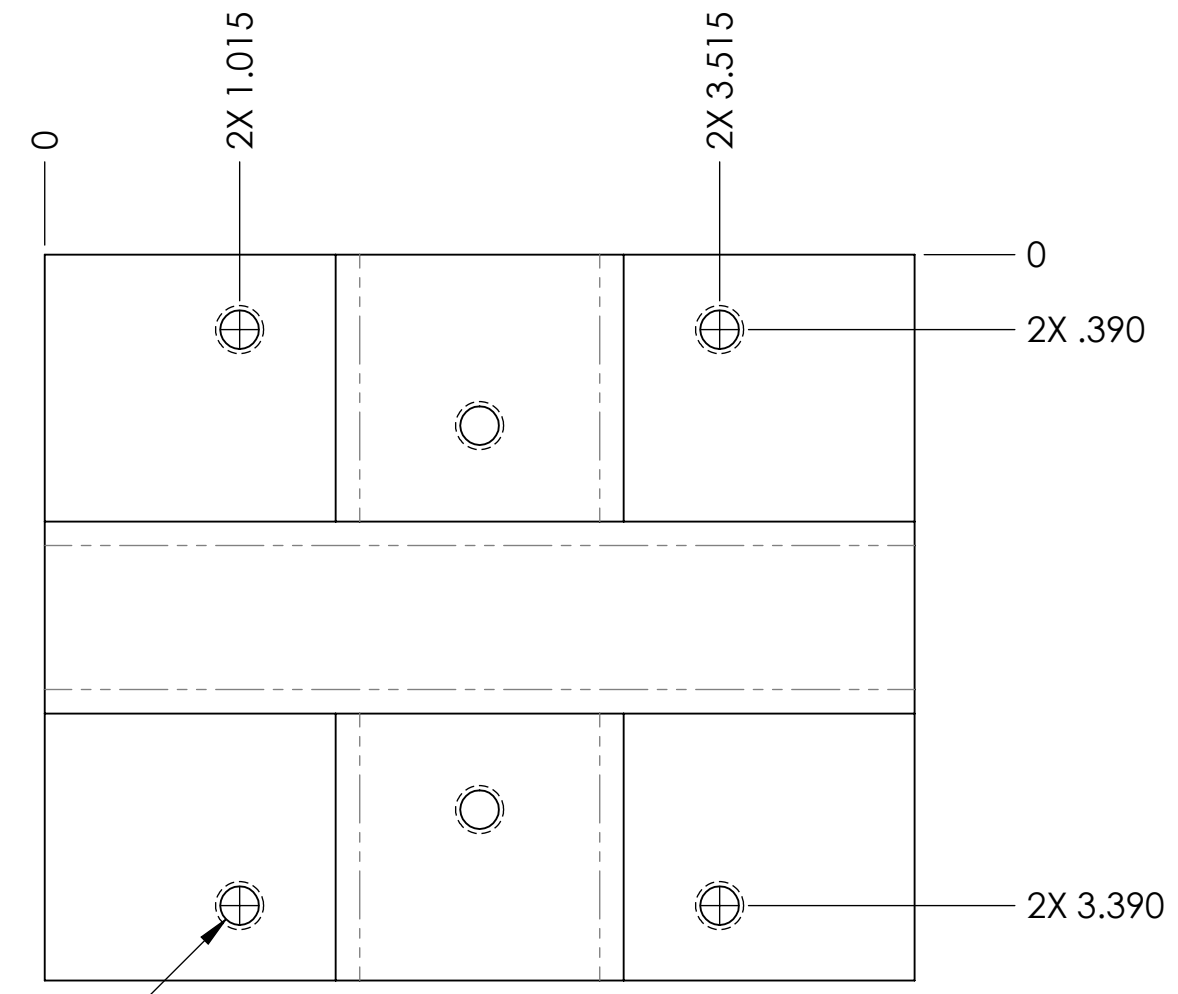
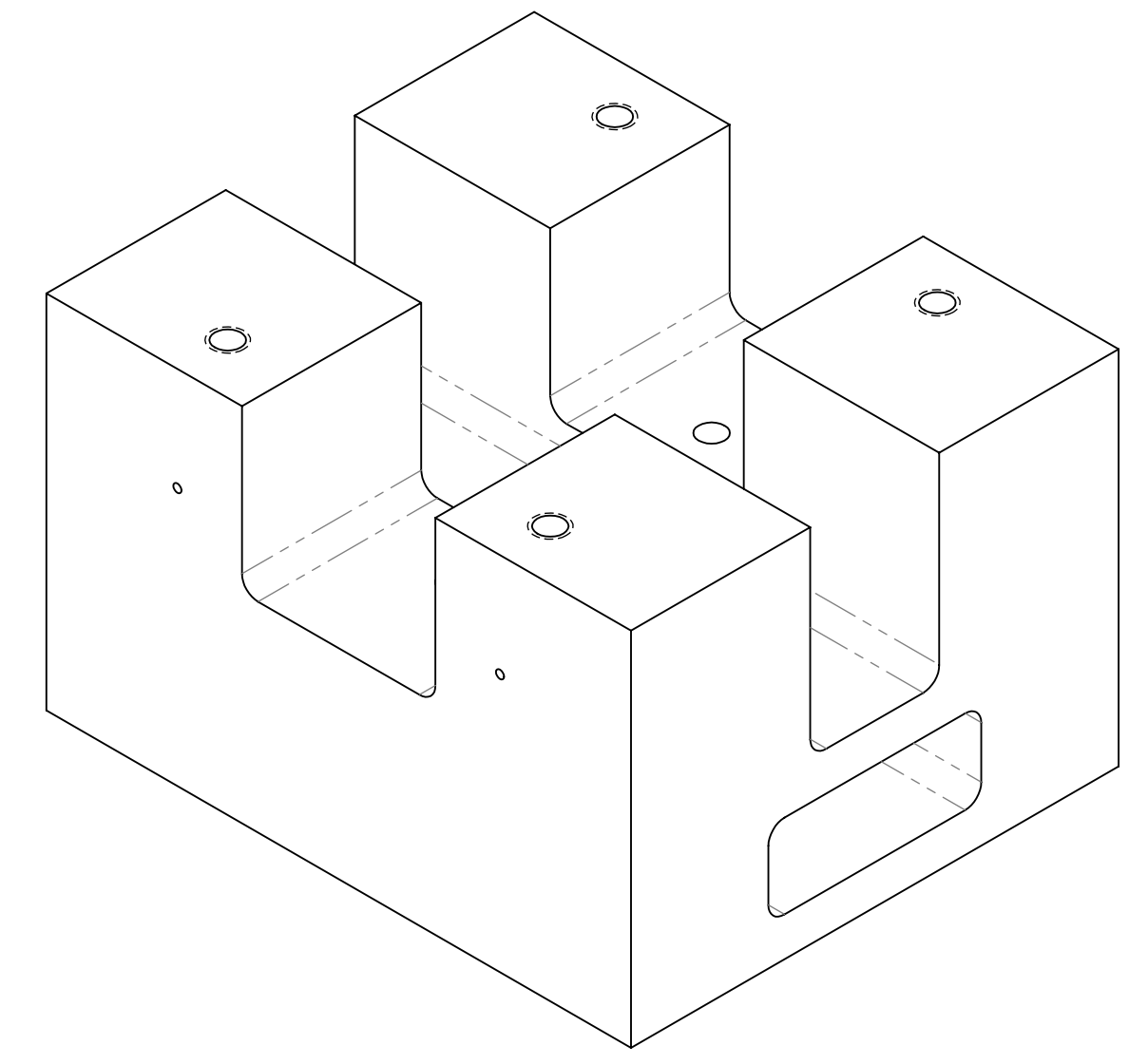
6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.

7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

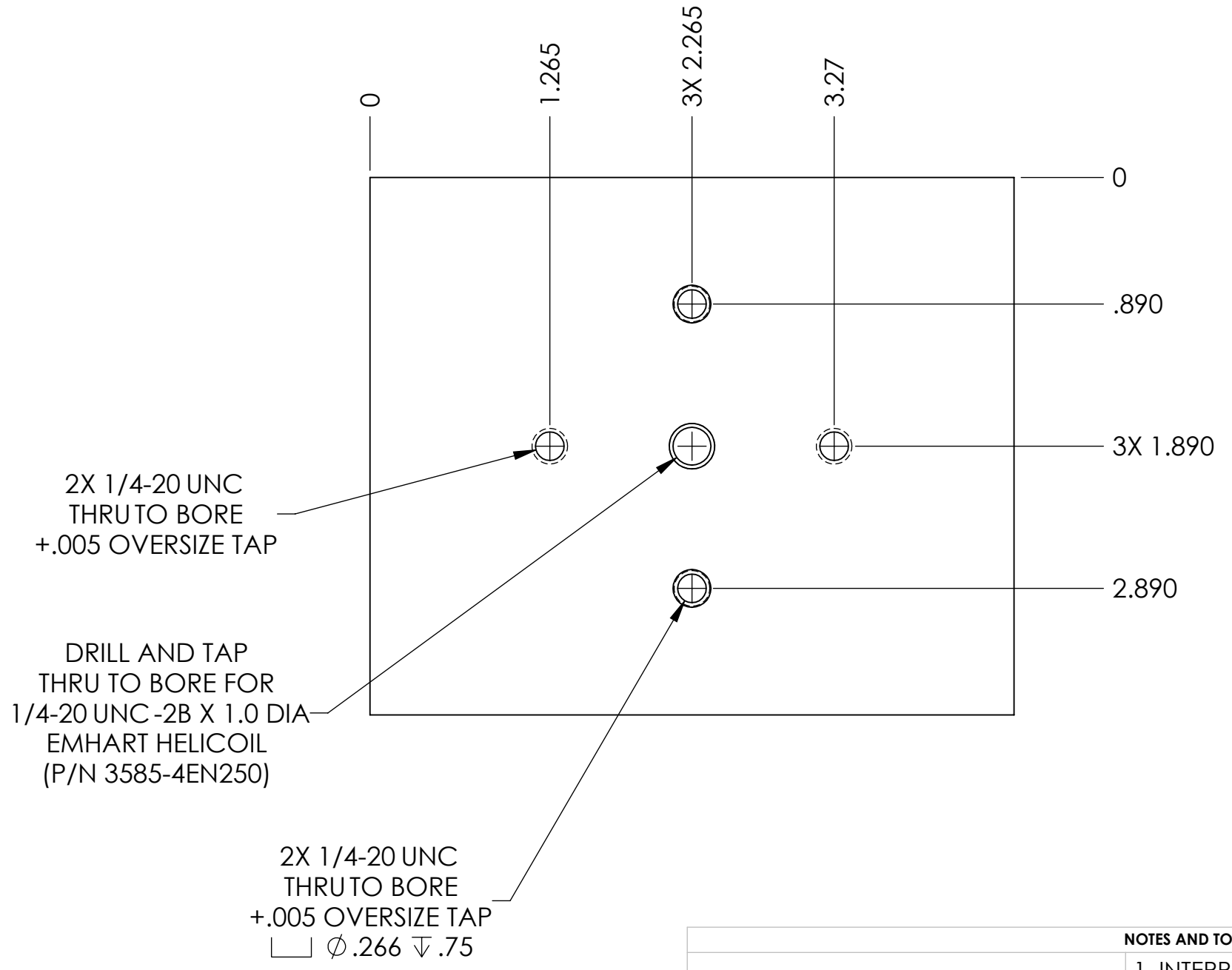
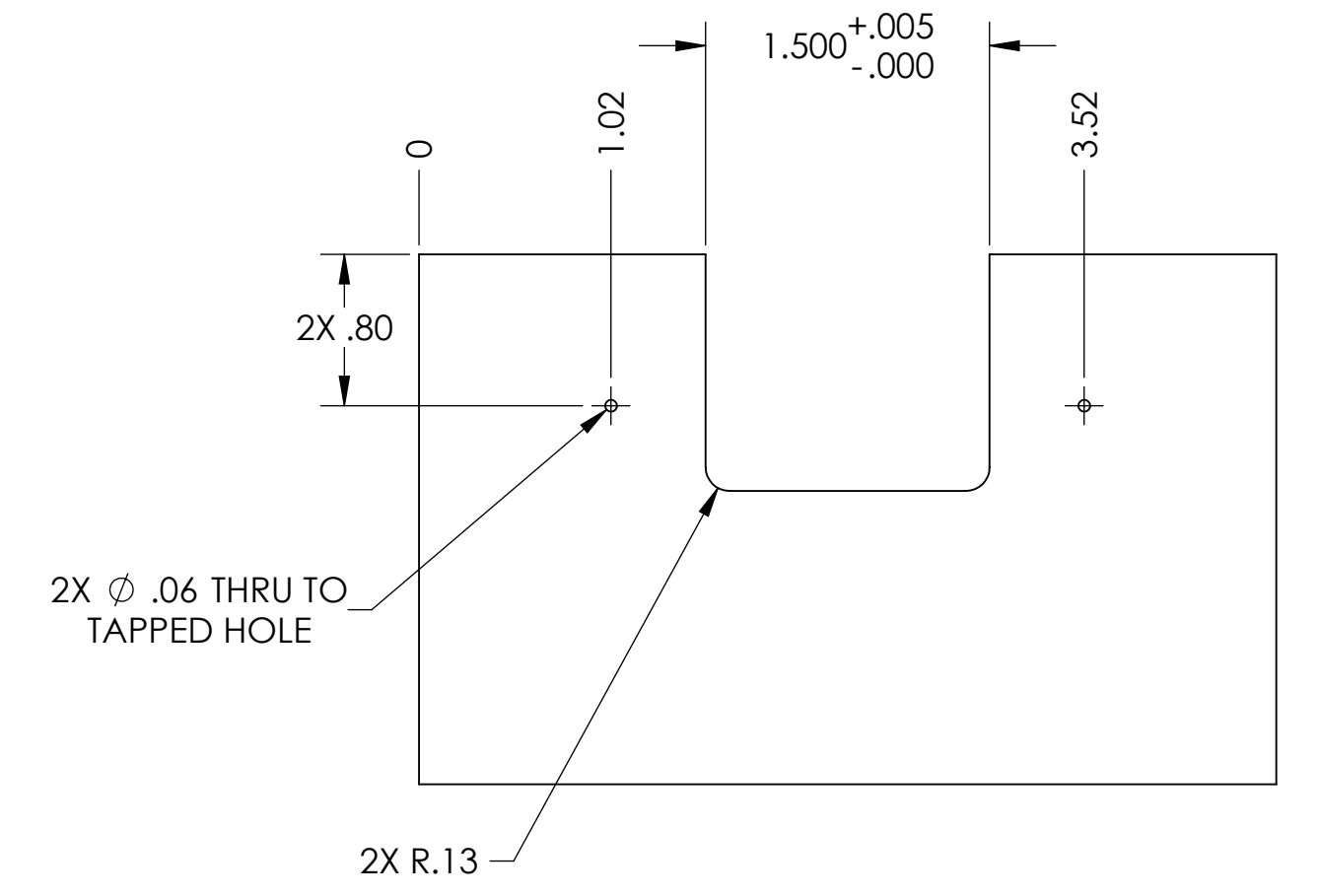
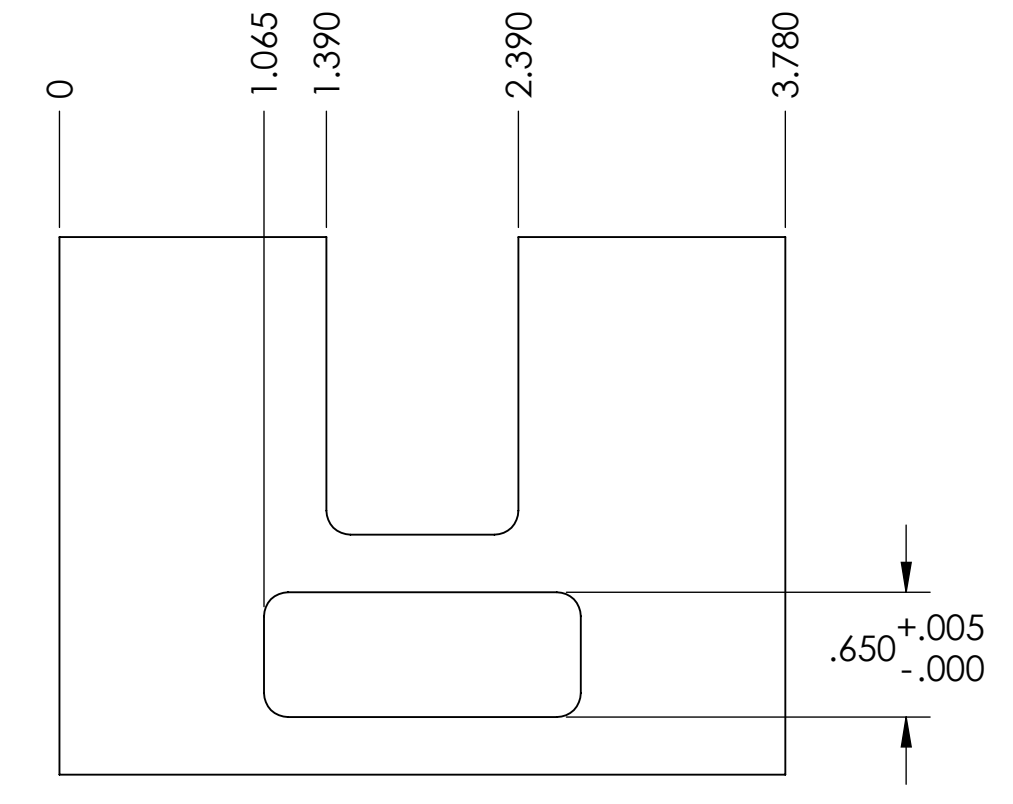
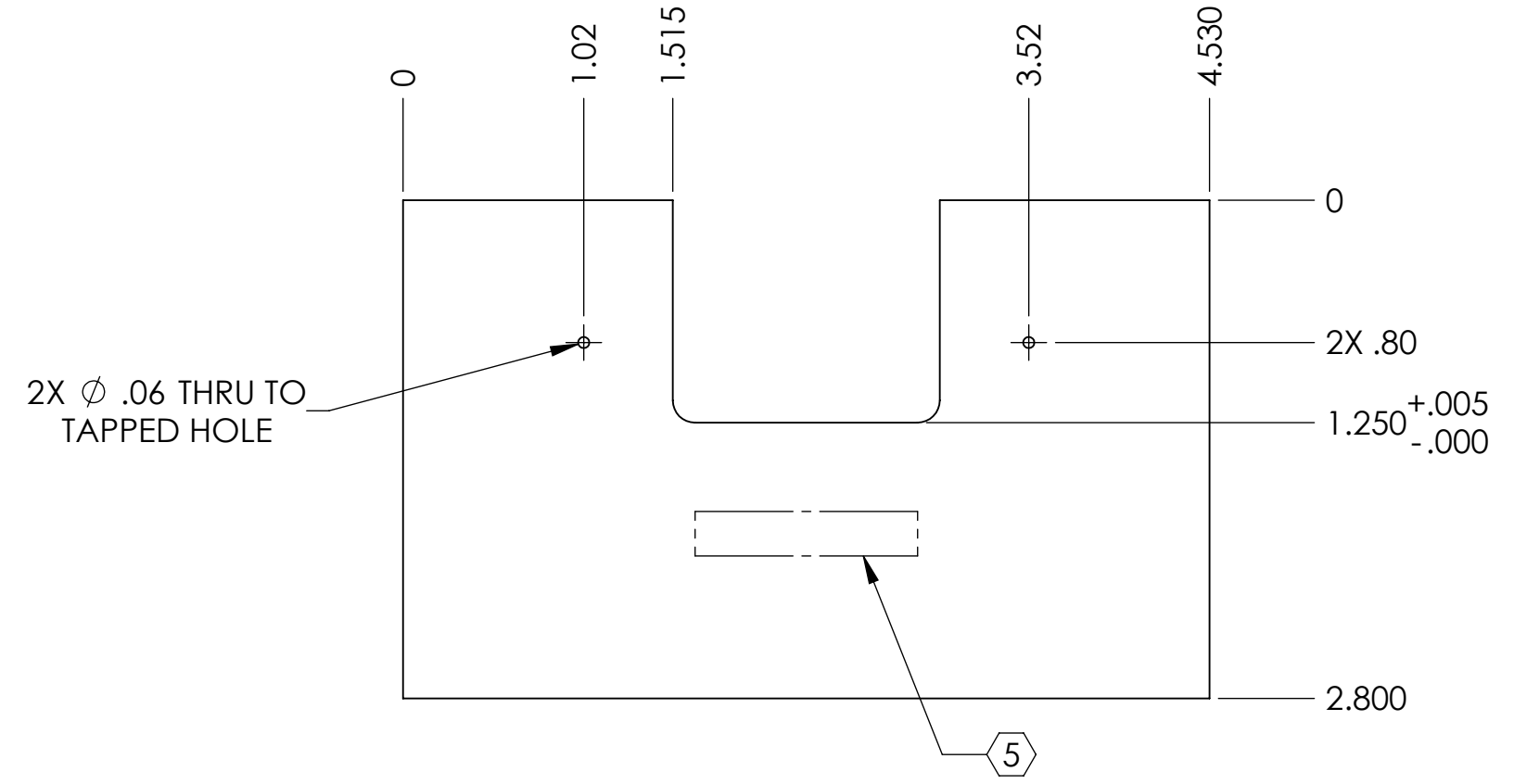
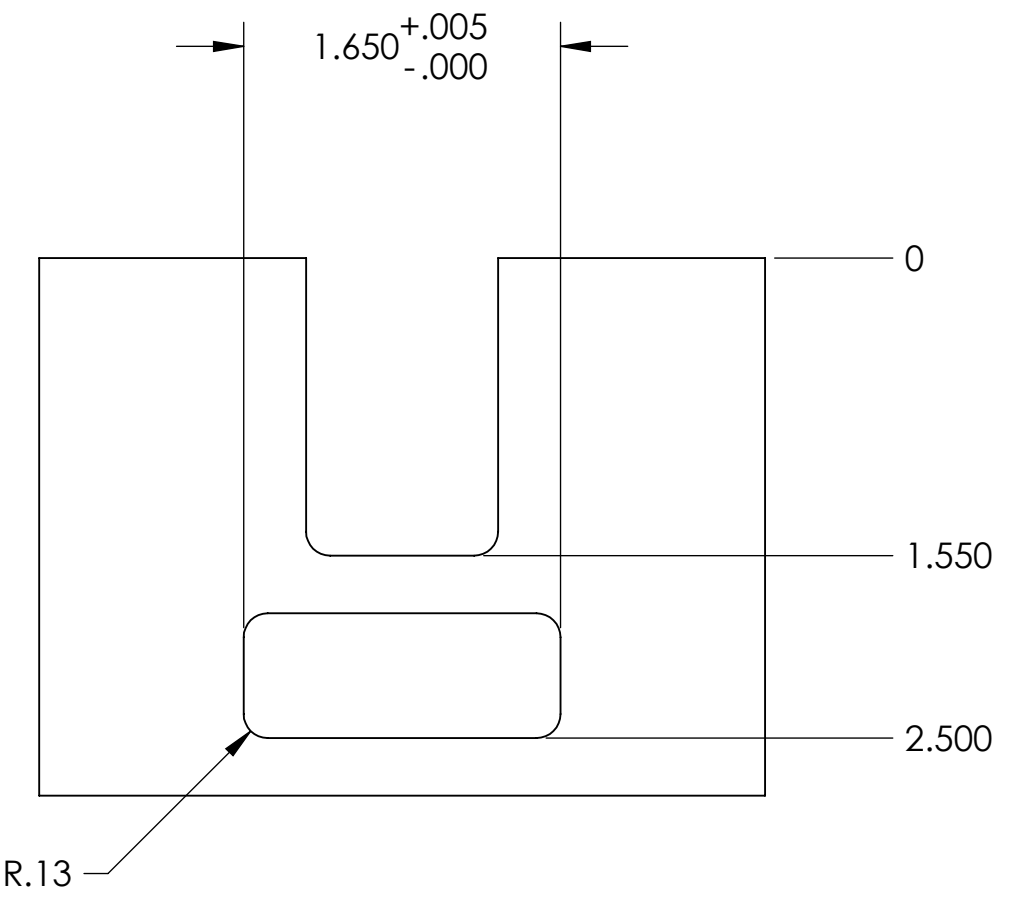
8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.

9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

REV.	DATE	DCN #	DRAWING TREE #
v1	14 JUL 2009	E0900198	E080191
v2	02 DEC 2009	E0900446	E080191
v3	18 MAY 2010	E1000166	E080191



4X $\phi .20 \nabla .88$
 1/4-20 UNC $\nabla .63$
 +.005 OVERSIZE TAP



2X 1/4-20 UNC
 THRU TO BORE
 +.005 OVERSIZE TAP
 $\square \phi .266 \nabla .75$

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)	
1. INTERPRET DRAWING PER ASME Y14.5-1994.	
2. REMOVE ALL SHARP EDGES, R.02 MIN.	
3. DO NOT SCALE FROM DRAWING.	
4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.	
DIMENSIONS ARE IN INCHES	
TOLERANCES: .XX ± .01 .XXX ± .005	
ANGULAR ± 0.5°	
MATERIAL	FINISH
304, 316 OR 302 SSSL	32 μ inch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: ADVANCED LIGO SUB-SYSTEM: SUS

NEXT ASSY: UPPER MASS ASSY

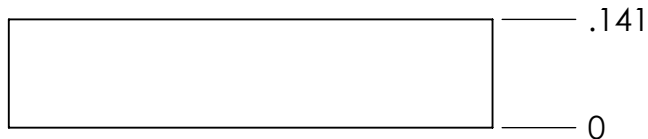
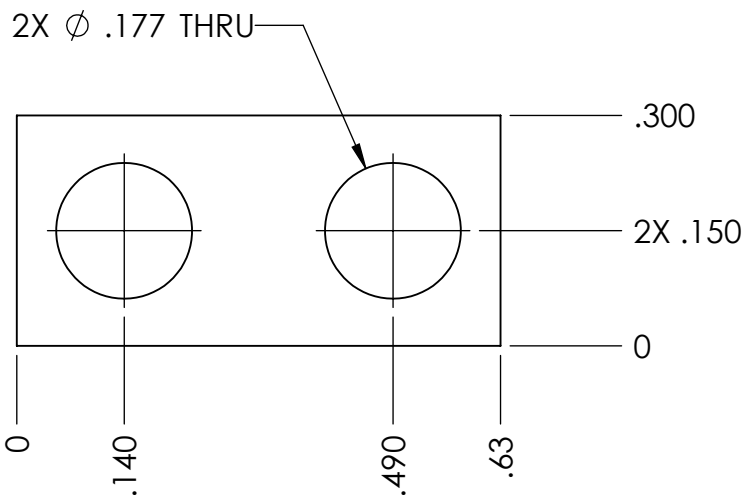
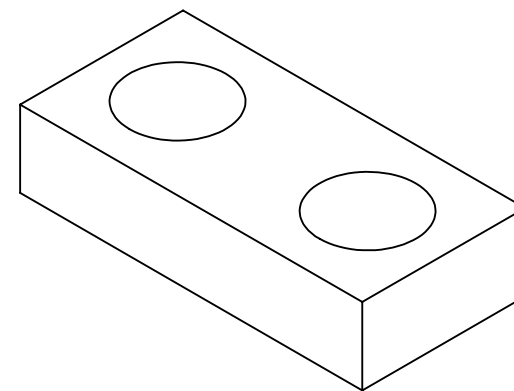
PART NAME		SIZE		DWG. NO.		REV.
T-PIECE, UPPER MASS		D		D020607		v3
DESIGNER	D. BRIDGES	01 JUL 2010				
DRAFTER	D. BRIDGES	01 JUL 2010				
CHECKER	M. MEYER	09 JUL 2010				
APPROVAL						
SCALE: 1:1		PROJECTION:		SHEET 1 OF 1		

D020607_Avancead_LIGO_SUS_H13_TPiece_Upper_Mass_PART_PDM_REV_V2-007_DRAWING_PDM_REV_V2-004

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND QUANTITY. IF PARTS ARE TOO SMALL TO SCRIBE, BAGGING AND TAGGING ALONE IS SUFFICIENT.
EXAMPLE (PART): 001-v1
EXAMPLE (TAG): DXXXXXX-VY, TYPE-XX, QTY: TBD
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	26 MAY 2009	E0900160	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 304, 316 OR 302 SSSL FINISH 32 μinch



SYSTEM ADVANCED LIGO SUB-SYSTEM SUS

NEXT ASSY UPPER WIRE ASSEMBLY

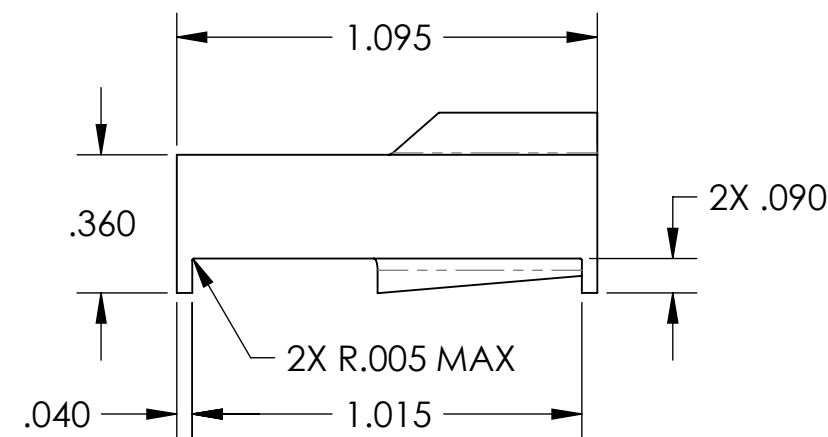
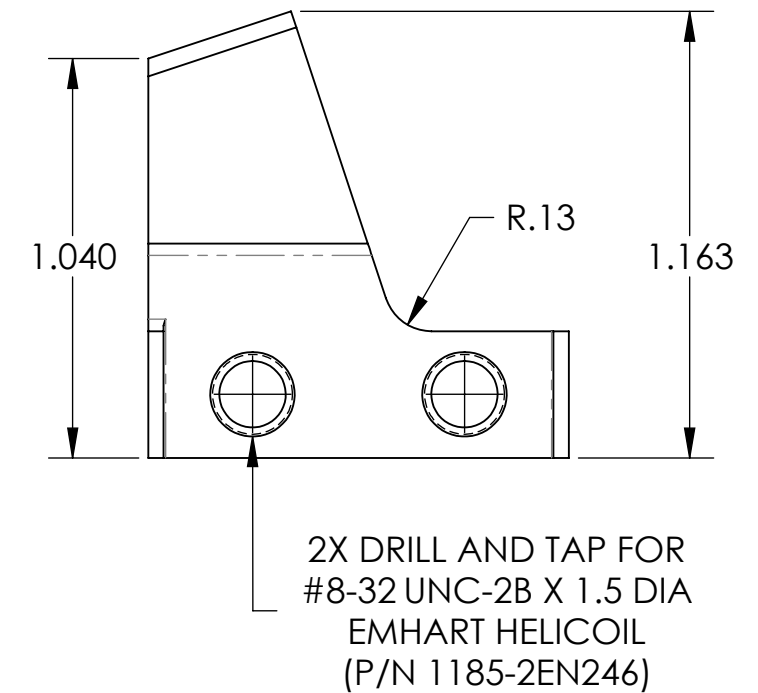
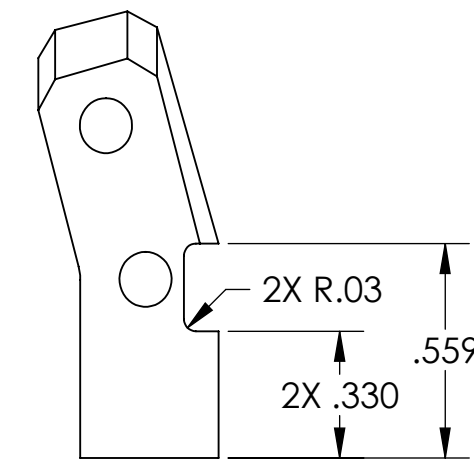
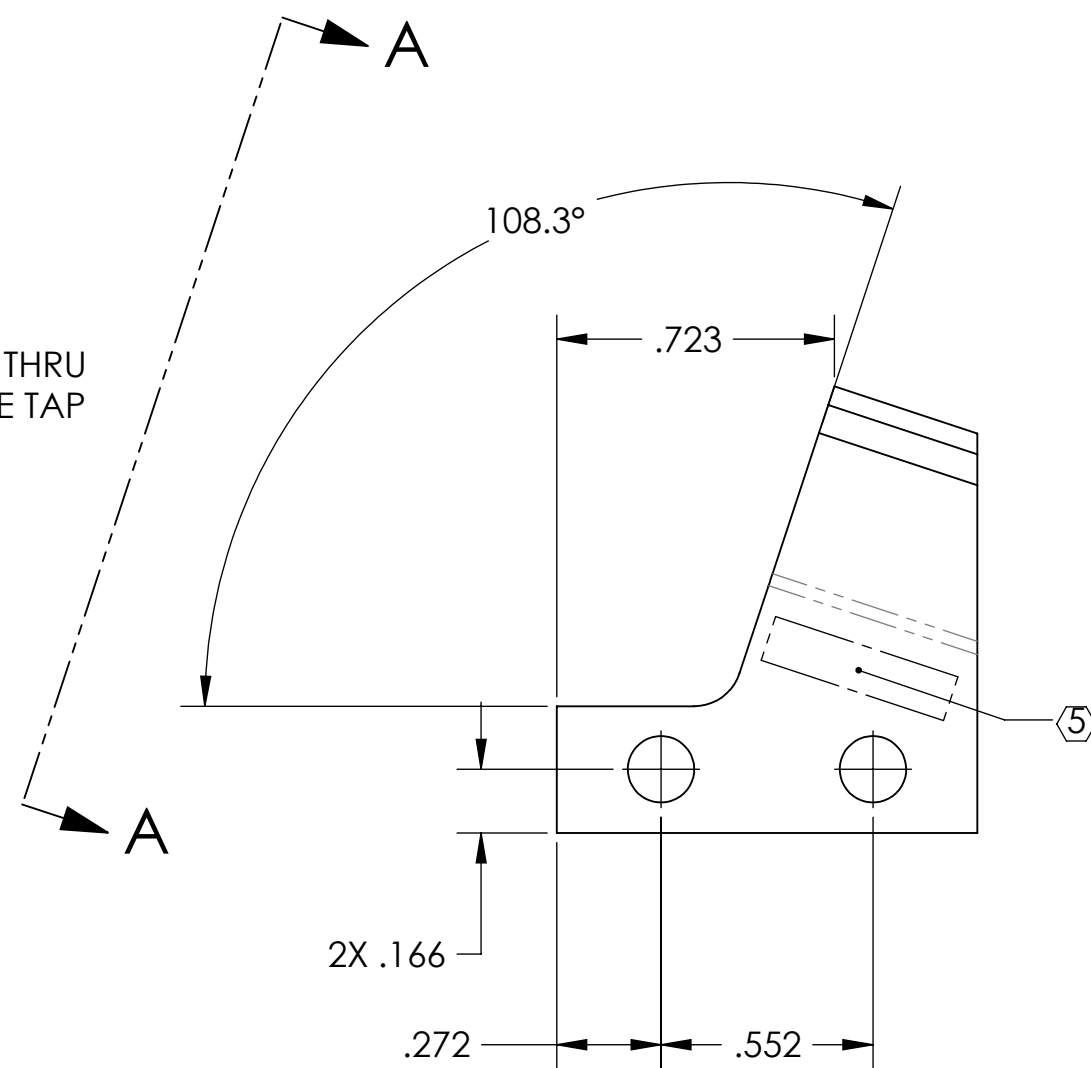
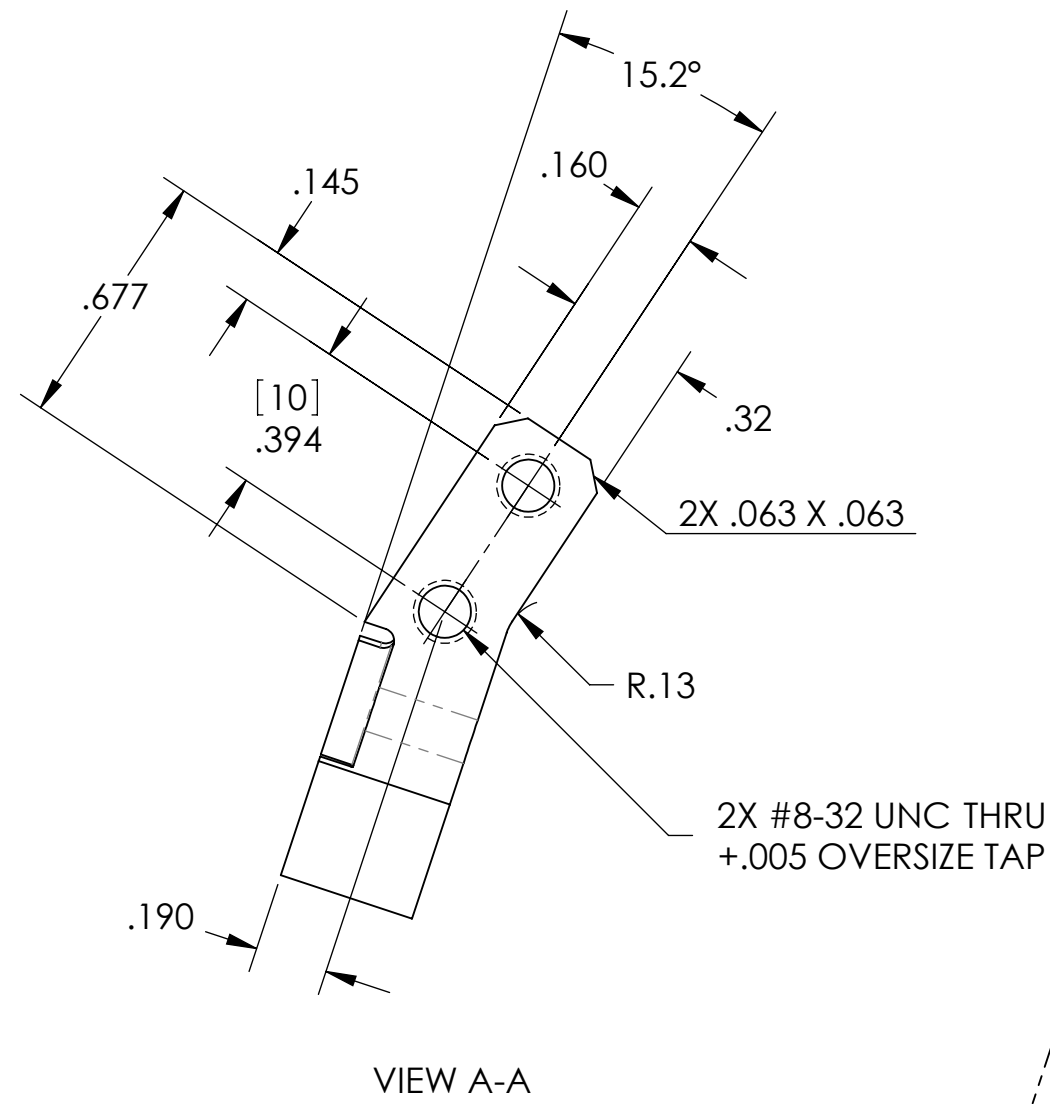
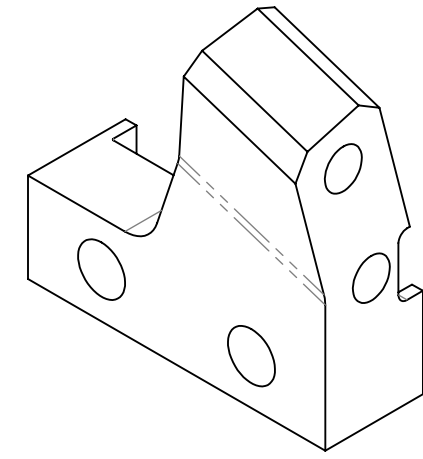
PART NAME LOWER CLAMP, UPPER WIRE, INSIDE

DESIGNER	B. KIRSNER	05 MAR 2008	SIZE	DWG. NO.	REV.
DRAFTER	R. BIEDENHARN	01 NOV 2010	A	D020610	v2
CHECKER	D. BRIDGES	04 NOV 2010	SCALE: 4:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED. EXAMPLE: DXXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
- 9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

REV.	DATE	DCN #	DRAWING TREE #
A/v1	01 AUG 2008	E080418	E080191
v2	26 MAY 2009	E0900160	E080191
v3	28 JUN 2010	E1000236	E080191



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL: 304, 316 OR 302 SSTL
 FINISH: 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: ADVANCED LIGO SUB-SYSTEM: SUS

NEXT ASSY: UPPER WIRE ASSEMBLY

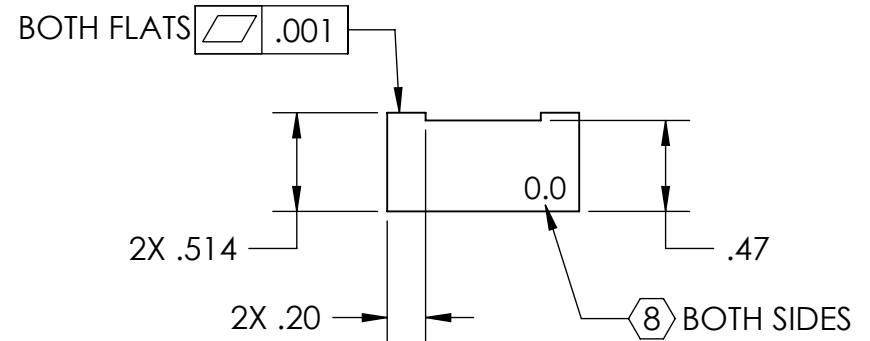
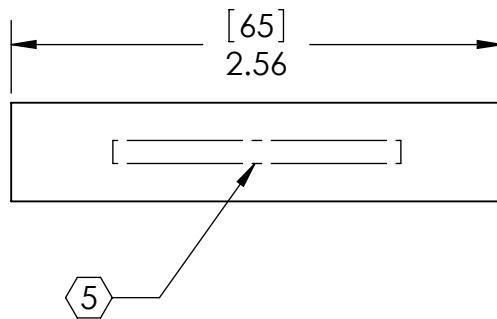
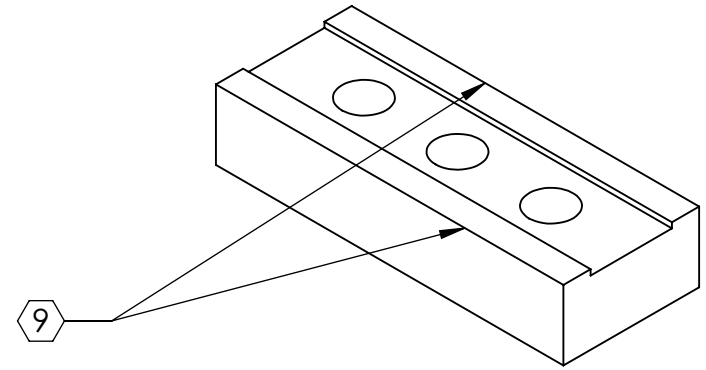
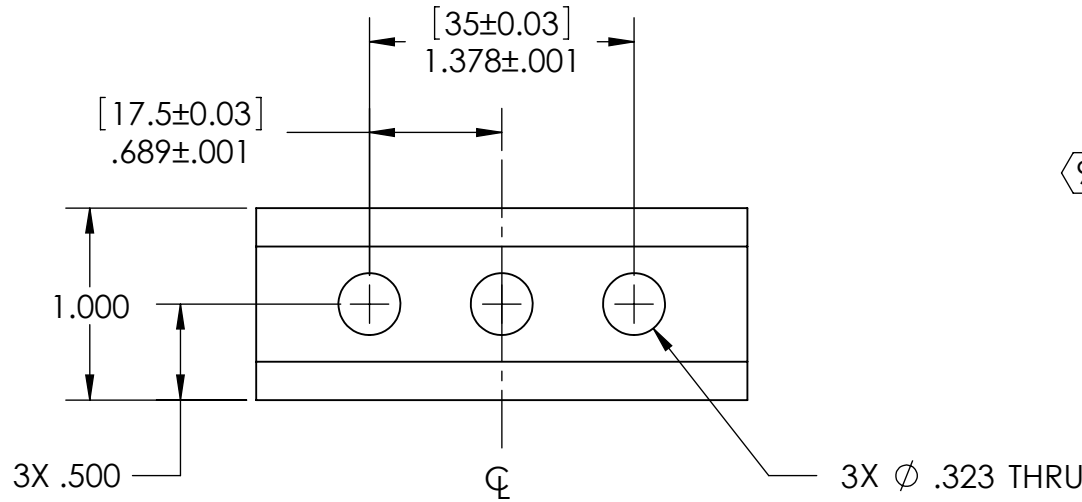
PART NAME: UPPER CLAMP, UPPER WIRE, INSIDE

DESIGNER	D. BRIDGES	25 OCT 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	25 OCT 2010	c	D020611	v3
CHECKER	B. MOORE	26 OCT 2010			
APPROVAL			SCALE: 2:1	PROJECTION:	SHEET 1 OF 1

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX; S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- ⑥ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- ⑦ DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	01 AUG 2008	E080418	E080191
v2	18 MAY 2010	E1000166	E080191
v3	21 NOV 2010	E1000741	E080191



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM] 1. INTERPRET DRAWING PER ASME Y14.5-1994.
 TOLERANCES: .XX ± .01 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 .XXX ± .005 3. DO NOT SCALE FROM DRAWING.
 ANGULAR ± 0.1° 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSSL **FINISH** 63 μinch

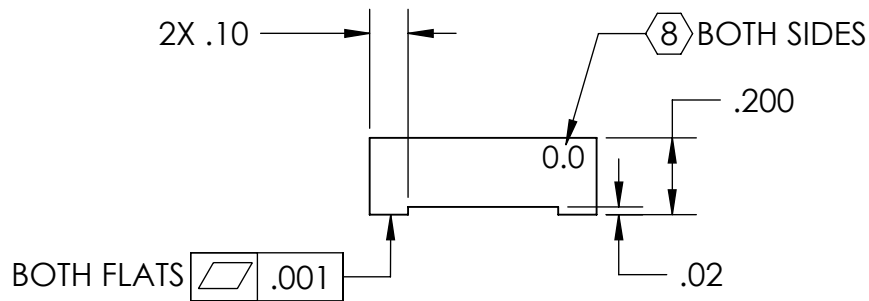
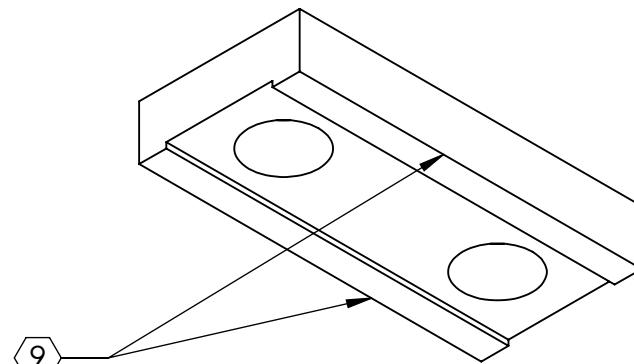
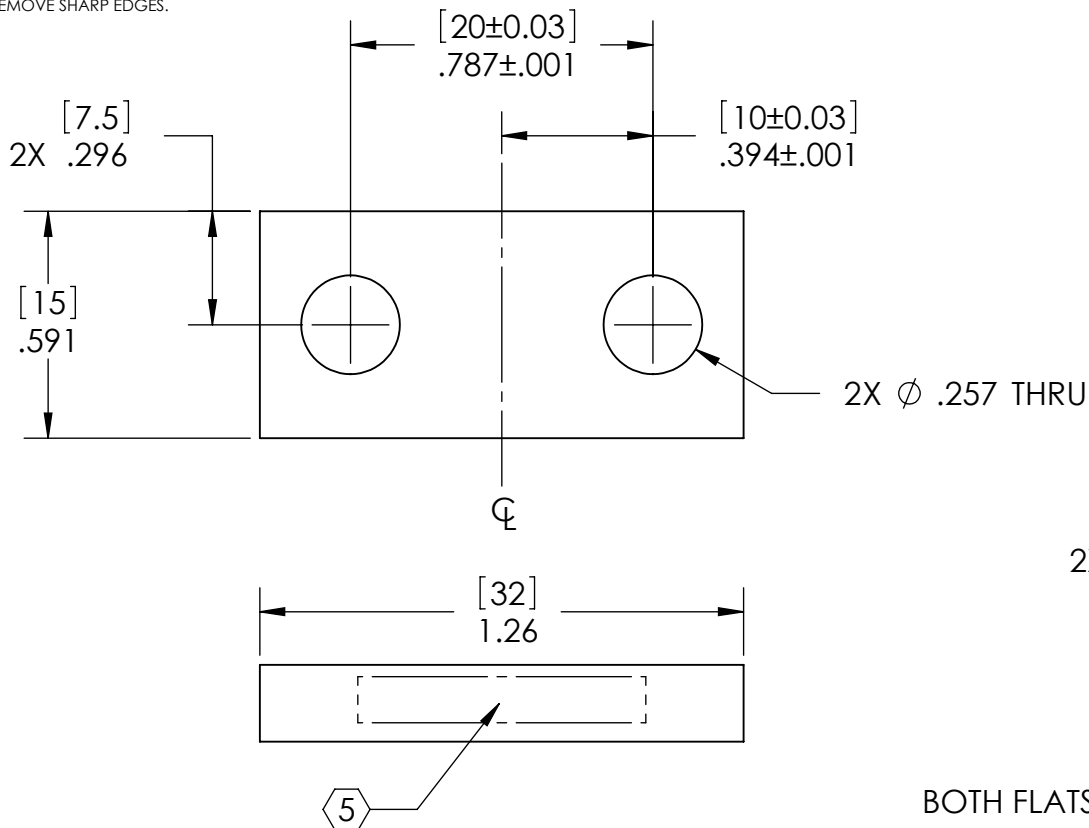
LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY
SYSTEM ADVANCED LIGO **SUB-SYSTEM** SUS
NEXT ASSY LIBRARY OF CLAMPS, UPPER BLADE

PART NAME BLADE CLAMP (0.0 DEGREE), UPPER BLADE, INSIDE
DESIGNER D. BRIDGES 20 NOV 2010 **SIZE** DWG. NO. **D020622**
DRAFTER D. BRIDGES 21 NOV 2010 **REVISION** v3
CHECKER M. MEYER 22 NOV 2010
APPROVAL SCALE: 1:1 PROJECTION: SHEET 1 OF 1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- 9. DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	01 AUG 2008	E080418	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX \pm .01
 .XXX \pm .005
 ANGULAR \pm 0.1°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSSL
 FINISH 32 μ inch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS

NEXT ASSY LIBRARY OF CLAMPS, LOWER BLADE

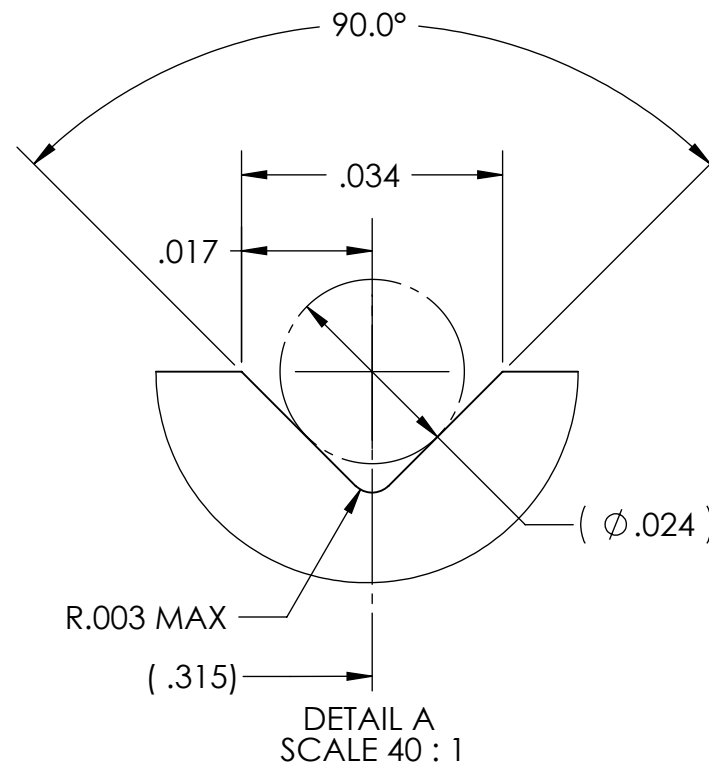
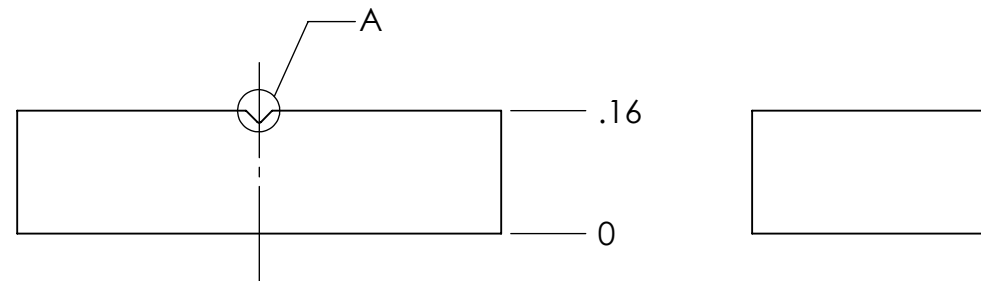
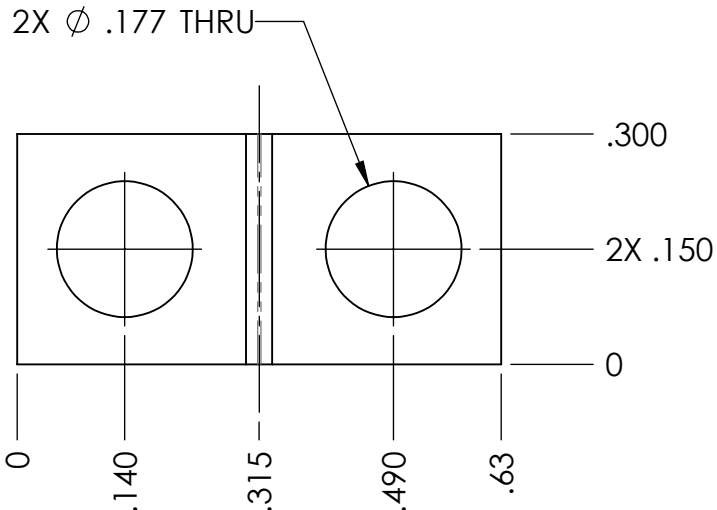
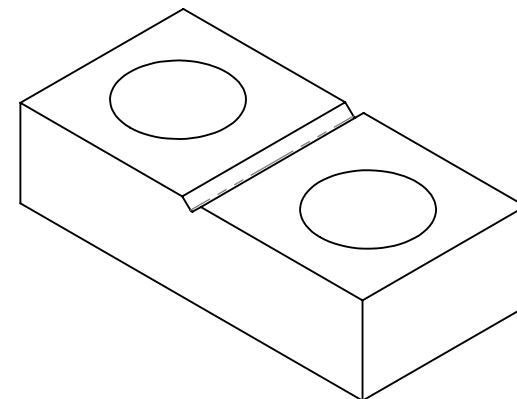
PART NAME BLADE CLAMP (0.0 DEGREE), LOWER BLADE, OUTSIDE

DESIGNER	D. BRIDGES	28 JUN 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	28 JUN 2010	A	D020623	v2
CHECKER	M. MEYER	29 JUN 2010	SCALE: 2:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS & REVISION NUMBER START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND QUANTITY. IF PARTS ARE TOO SMALL TO SCRIBE, BAGGING AND TAGGING ALONE IS SUFFICIENT.
EXAMPLE (PART): 001-v1
EXAMPLE (TAG): DXXXXXX-VY, TYPE-XX, QTY: TBD
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	26 MAY 2009	E0900160	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 304, 316 OR 302 SSSL
FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS
NEXT ASSY UPPER WIRE ASSEMBLY

PART NAME LOWER CLAMP, UPPER WIRE, OUTSIDE

DESIGNER	B. KIRSNER	05 MAR 2008	SIZE	DWG. NO.	REV.
DRAFTER	R. BIEDENHARN	01 NOV 2010	A	D020624	v2
CHECKER	D. BRIDGES	04 NOV 2010	SCALE: 4:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

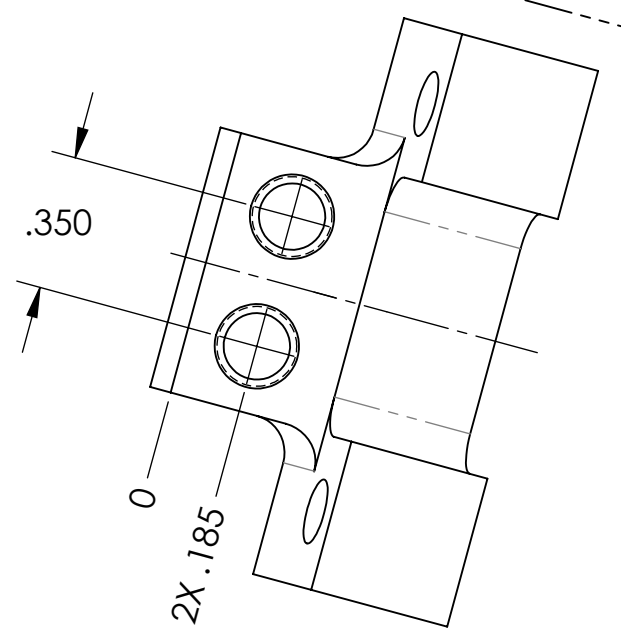
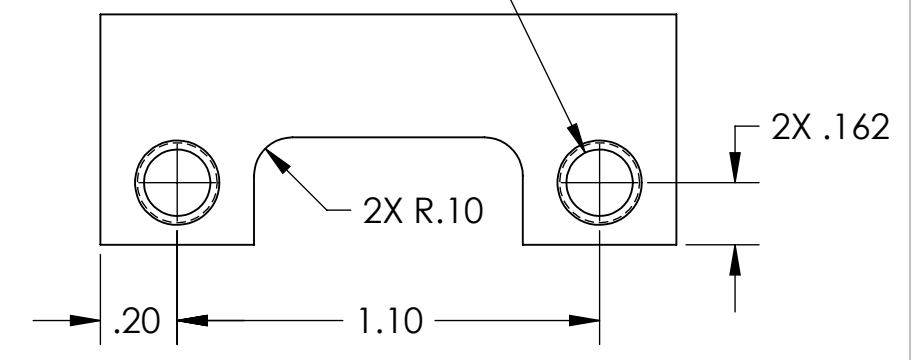
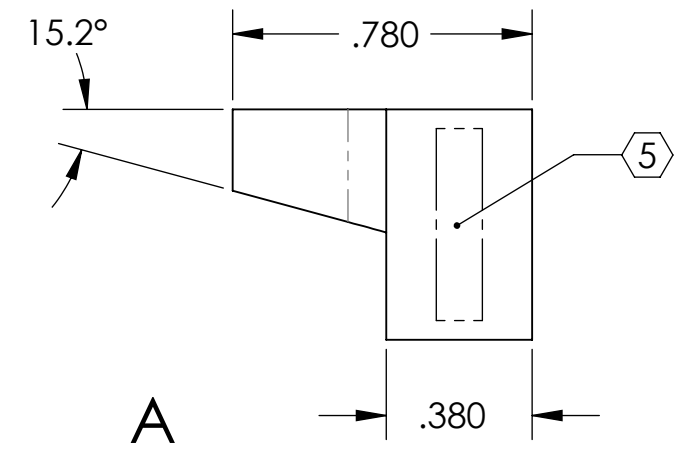
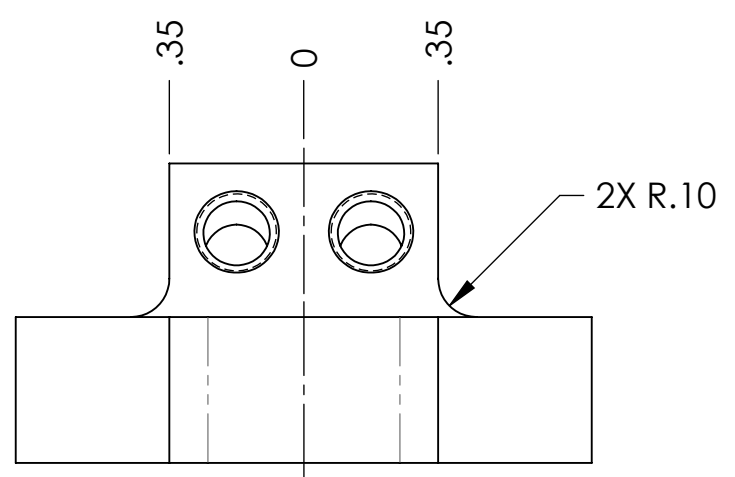
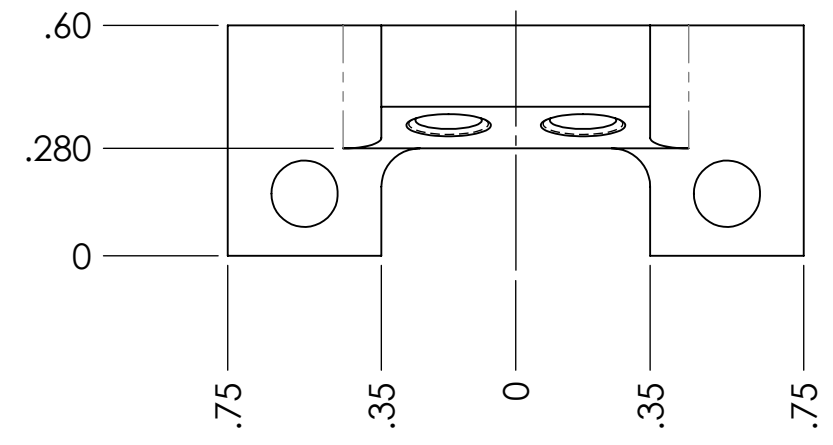
- NOTES CONTINUED:**
- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VV TYPE-XX S/N XXX
 - 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 - 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
 - 8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
 - 9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

REV.	DATE	DCN #	DRAWING TREE #
v1	26 MAY 2009	E0900160	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-

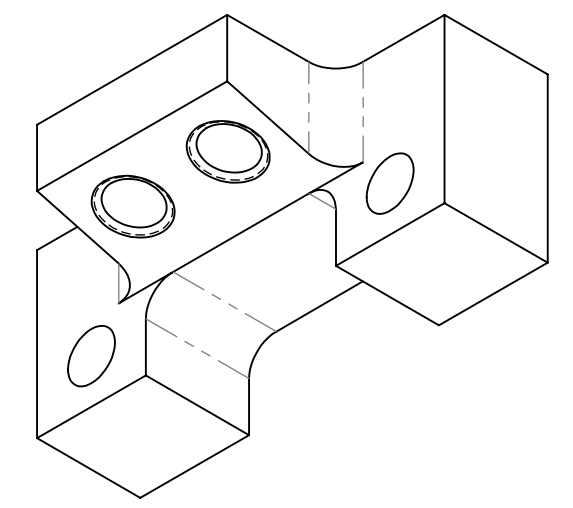
4X DRILL AND TAP THRU FOR
#8-32 UNC-2B X 1.5 DIA
EMHART HELICOIL
(P/N 1185-2EN246)

D
C
B
A

D
C
B
A



VIEW A-A

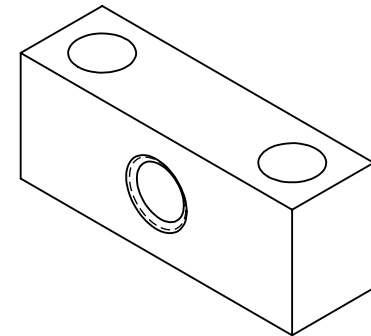
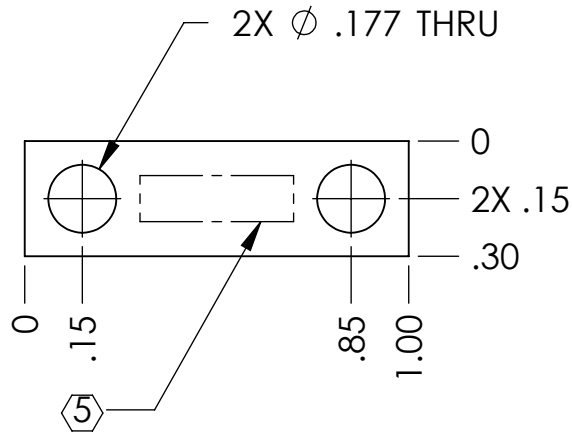


NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)				LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.1°				1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		C-CLAMP, UPPER MASS	
						MATERIAL 6061-T6 Al FINISH 32 μinch	
SYSTEM ADVANCED LIGO SUB-SYSTEM SUS NEXT ASSY UPPER WIRE ASSEMBLY				DESIGNER	B. KIRSNER	4 MAR 2008	SIZE DWG. NO.
				DRAFTER	R. BIEDENHARN	01 NOV 2010	B
				CHECKER	D. BRIDGES	04 NOV 2010	D020652
				APPROVAL			REV. v2
				SCALE: 2:1	PROJECTION:	SHEET 1 OF 1	

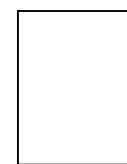
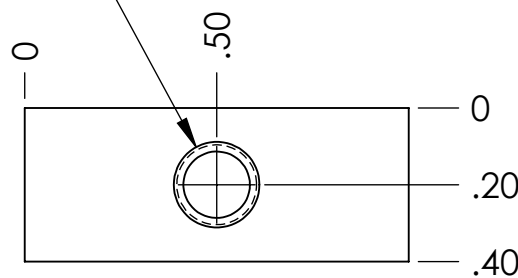
NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
- 9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

REV.	DATE	DCN #	DRAWING TREE #
v1	14 JUL 2009	E0900198	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



DRILL AND TAP THRU FOR
#8-32 UNC -2B X 1.5 DIA
EMHART HELICOIL
(P/N 1185-2EN246)



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES
TOLERANCES:
.XX ± .01
.XXX ± .005
ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
2. REMOVE ALL SHARP EDGES, R.02 MIN.
3. DO NOT SCALE FROM DRAWING.
4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.
MATERIAL 6061-T6 Al
FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS
NEXT ASSY UPPER MASS ASSY

PART NAME SCREWDRIVE SYSTEM

DESIGNER	D. BRIDGES	18 JUL 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	20 JUL 2010	A	D020653	v2
CHECKER	M. MEYER	21 JUL 2010	SCALE: 2:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

4

3

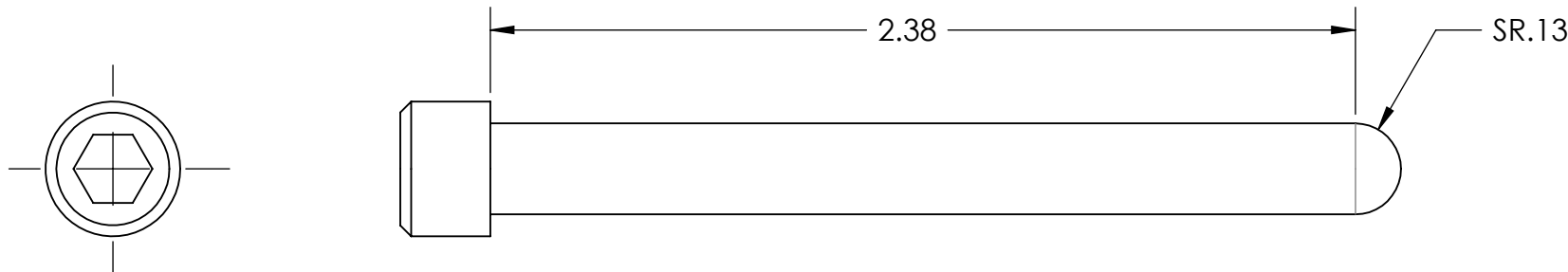
2

1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND QUANTITY, IF PARTS ARE TOO SMALL TO SCRIBE, BAGGING AND TAGGING ALONE IS SUFFICIENT. EXAMPLE (PART): 001-v1 EXAMPLE (TAG): DXXXXXX-VY, TYPE-XX, QTY: TBD
- 6. PART IS TO BE MADE FROM STOCK SOCKET HEAD CAP SCREW, 1/4-20 UNC-3A, FULLY THREADED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
A	JUL 2004	E040303	-
B	30 MAY 2008	E080195	-
v1	8 MAY 2009	E0900129	-
v2	28 JUN 2010	E1000236	



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.1°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
2. REMOVE ALL SHARP EDGES, R.02 MIN.
3. DO NOT SCALE FROM DRAWING.
4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 300 SSSL (6)

FINISH N/A μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM
NEXT ASSY MULTIPLE ASSYS

PART NAME SCREW, SOCKET HEAD CAP,
1/4-20 UNC-3A X 2.5 LONG, FULLY THREADED, ROUNDED END

DESIGNER		
DRAFTER	D. BRIDGES	24 AUG 2010
CHECKER	B. MOORE	25 AUG 2010
APPROVAL		

SIZE DWG. NO. A D030021

REV. v2

SCALE: 2:1 PROJECTION: SHEET 1 OF 1

4

3

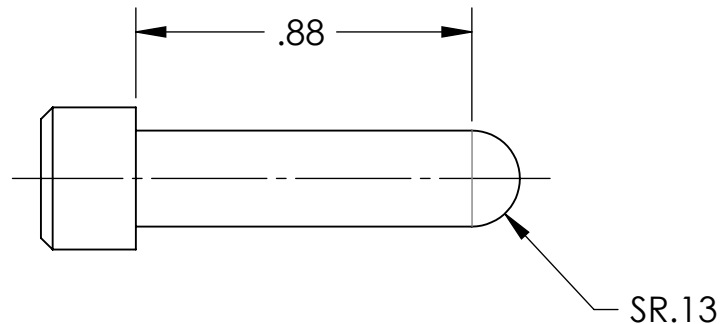
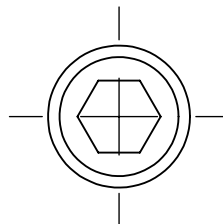
2

1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND QUANTITY. IF PARTS ARE TOO SMALL TO SCRIBE, BAGGING AND TAGGING ALONE IS SUFFICIENT.
EXAMPLE (PART): 001-v1
EXAMPLE (TAG): DXXXXXX-VY, TYPE-XX, QTY: TBD
- 6. PART IS TO BE MADE FROM STOCK SOCKET HEAD CAP SCREW, 1/4-20 UNC-3A, FULLY THREADED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	JUL 2004	E040303	-
v2	30 MAY 2008	E080195	-
v3	28 JUN 2010	E1000236	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL: 300 SSSL (6)
 FINISH: N/A μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: ADVANCED LIGO
 SUB-SYSTEM:
 NEXT ASSY: MULTIPLE ASSYS

PART NAME: SCREW, SOCKET HEAD CAP, 1/4-20 UNC-3A X 1 LONG, FULLY THREADED, ROUNDED END			DESIGNER: J. ROMIE	JAN 2003	SIZE: A	DWG. NO.: D030023	REV.: v3
DRAFTER: D. BRIDGES			16 AUG 2010		SCALE: 2:1		
CHECKER: B. MOORE			18 AUG 2010		PROJECTION:		
APPROVAL:					SHEET 1 OF 1		

4

3

2

1

4

3

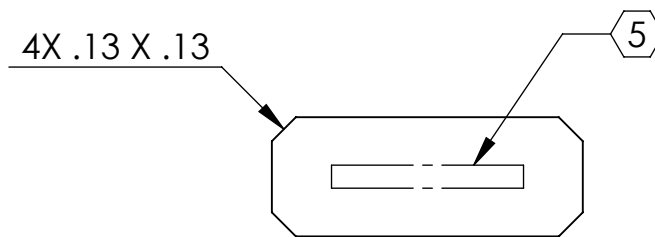
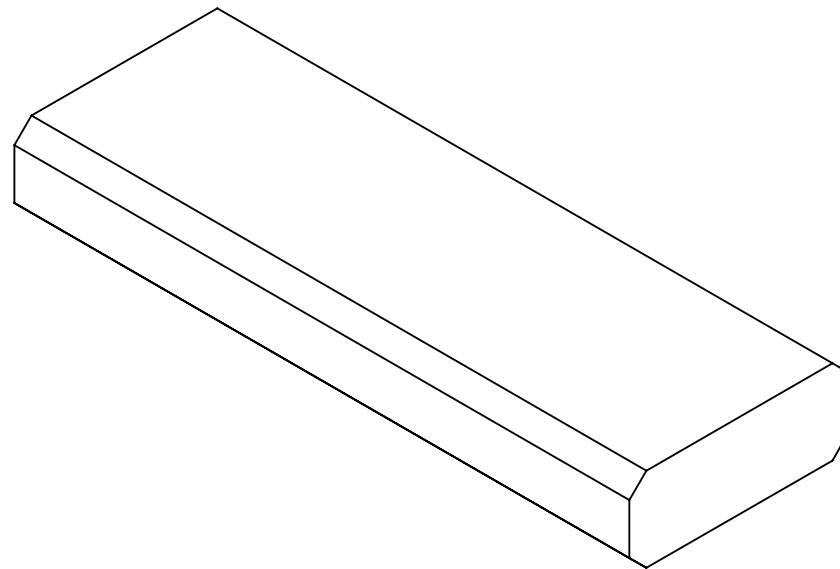
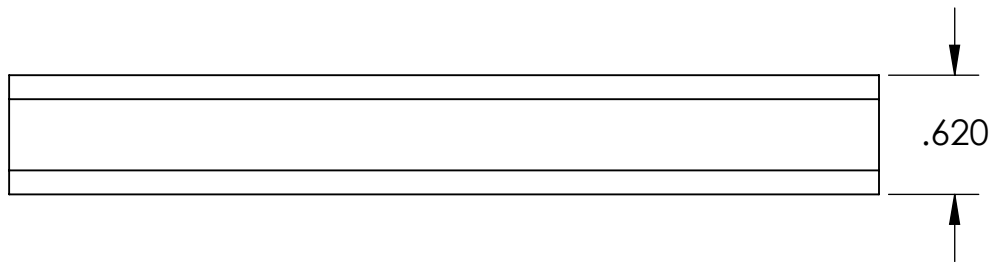
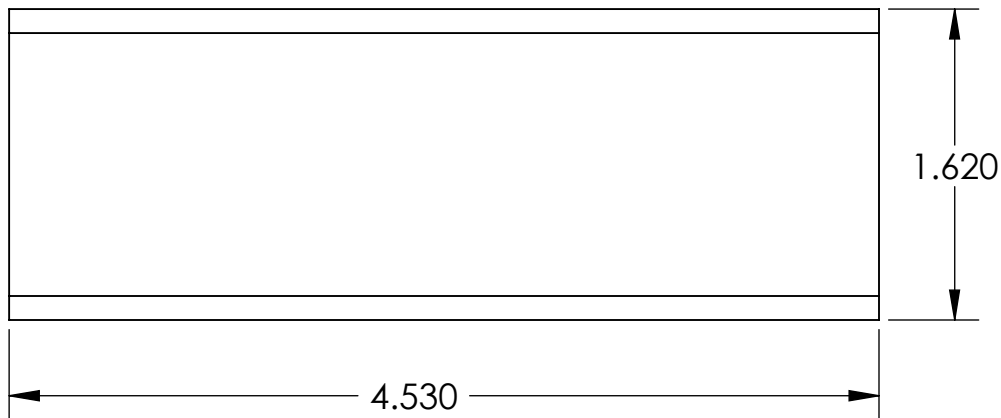
2

1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED. EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	14 JUL 2009	E0900198	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSSL **FINISH** 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM **ADVANCED LIGO** SUB-SYSTEM **SUS**

NEXT ASSY **UPPER MASS ASSY**

PART NAME ROLL OFFSET, T-PIECE

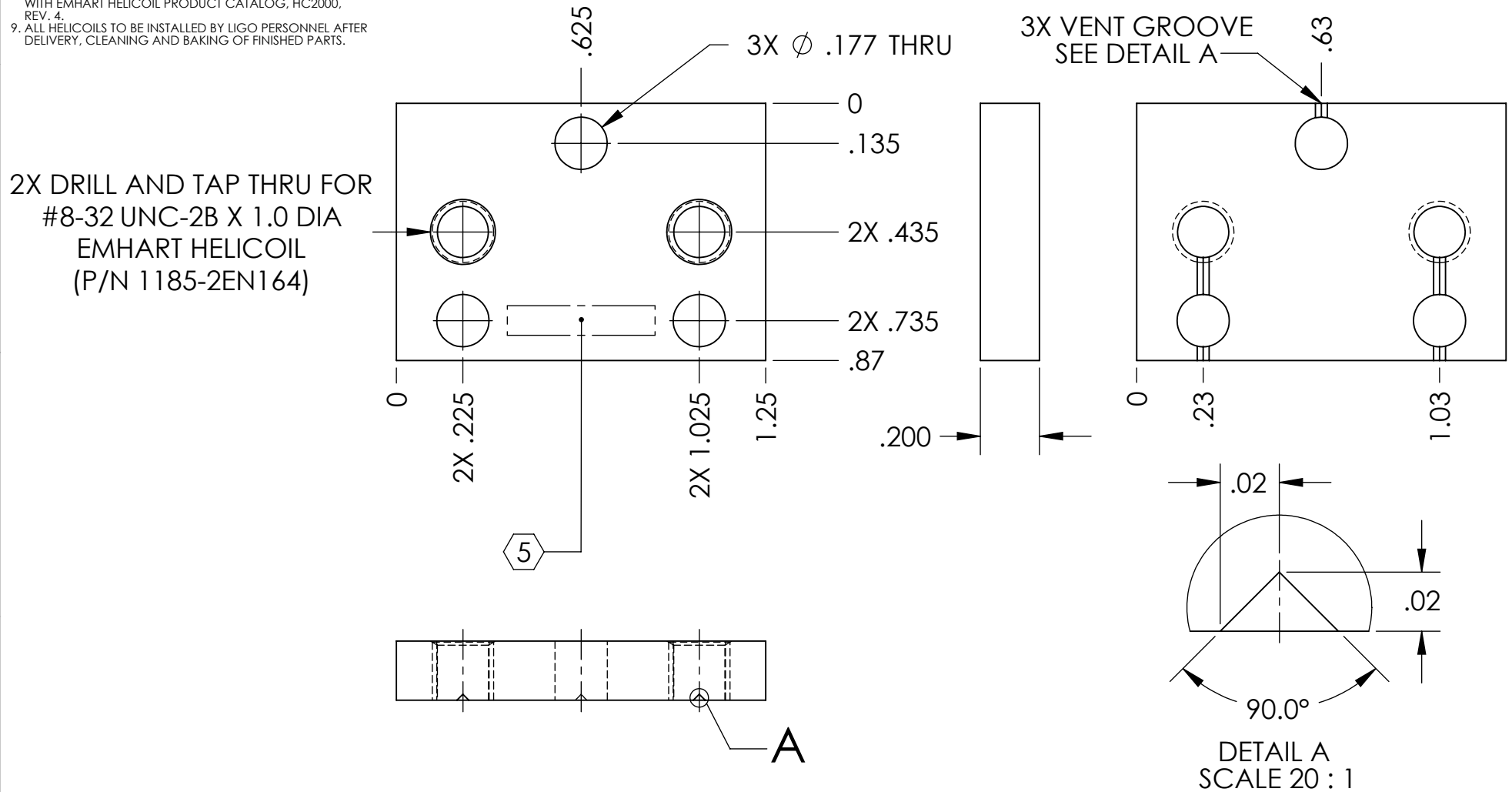
DESIGNER D. BRIDGES	01 JUL 2010	SIZE DWG. NO.	REV.
DRAFTER D. BRIDGES	01 JUL 2010	A	D030139
CHECKER C. TORRIE	09 JUL 2010		v2
APPROVAL		SCALE: 1:1	PROJECTION:

SHEET 1 OF 1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED. EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
- 9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

REV.	DATE	DCN #	DRAWING TREE #
v1	09 JUL 2009	E0900193	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL: 6061-T6 Al
 FINISH: 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: ADVANCED LIGO
 SUB-SYSTEM: SUS
 NEXT ASSY: LOWER LOOP WIRE ASSY

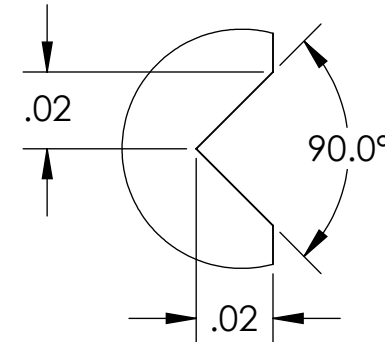
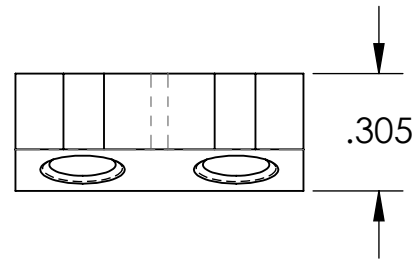
PART NAME: BREAKOFF, INT. MASS, LOWER LOOP WIRE

DESIGNER: D. BRIDGES 13 OCT 2008
 DRAFTER: R. BIEDENHARN 01 NOV 2010
 CHECKER: D. BRIDGES 04 NOV 2010
 APPROVAL: [Signature]
 SIZE: A
 DWG. NO.: D030148
 SCALE: 2:1
 PROJECTION: [Symbol]
 SHEET 1 OF 1

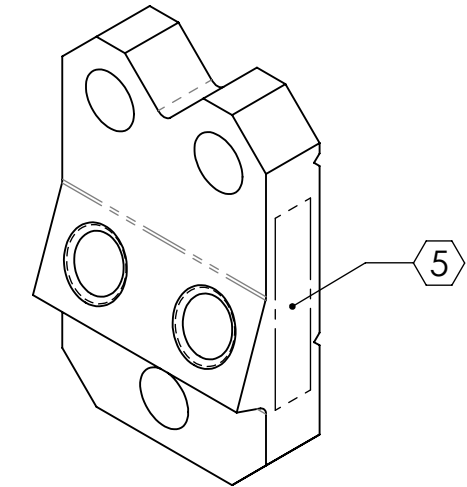
D030149_Advanced_LIGO_SUS_HLTS_Intermediate_Wire_Breakoff_Mass_PART PDM REV: V1-004, DRAWING PDM REV: V1-002

- NOTES CONTINUED:**
- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
 - 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 - 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
 - 8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
 - 9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

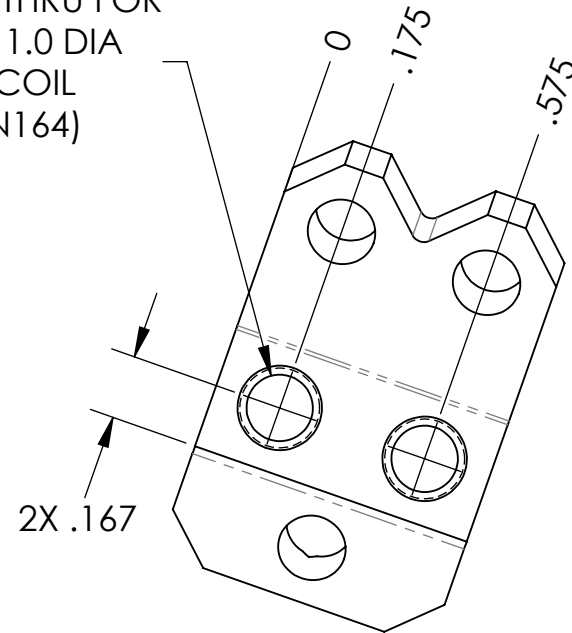
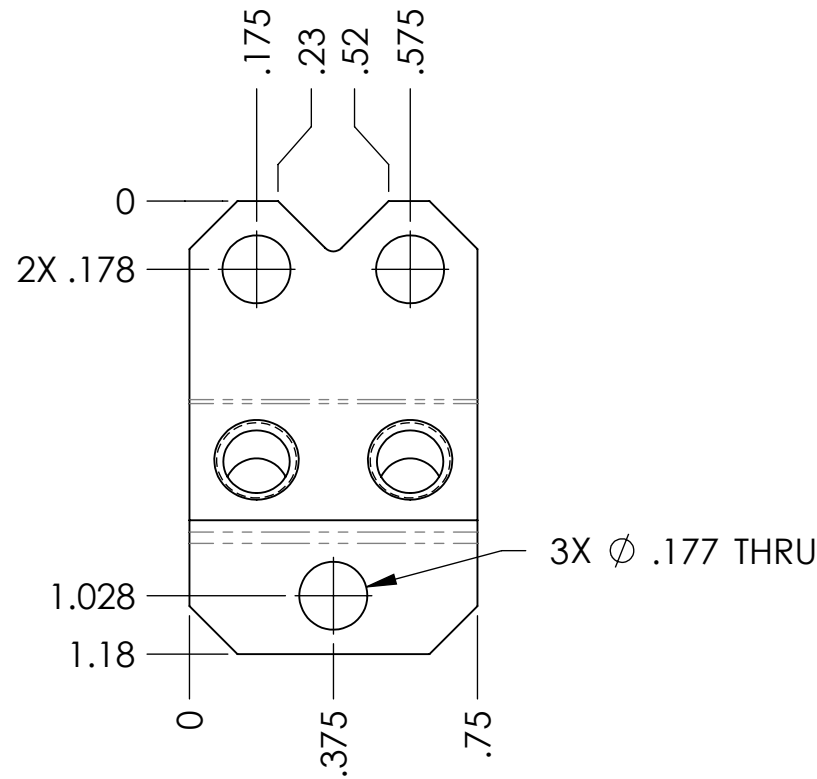
REV.	DATE	DCN #	DRAWING TREE #
v1	30 JUN 2009	E0900184	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-



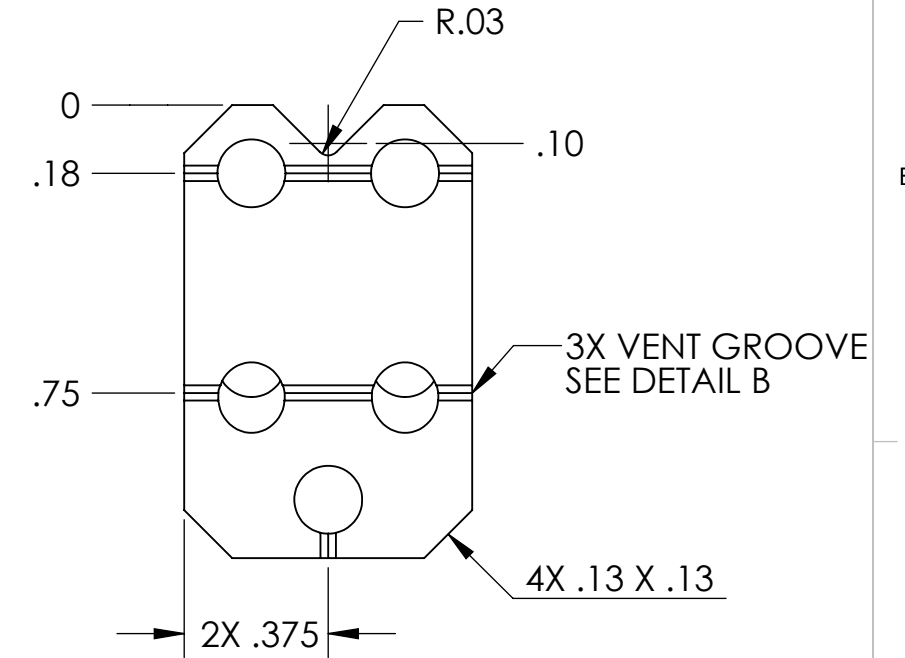
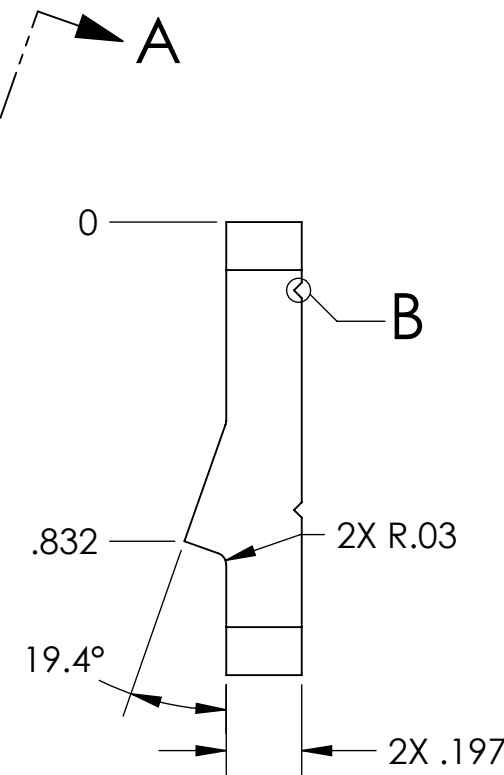
DETAIL B
SCALE 20 : 1



2X DRILL AND TAP THRU FOR
#8-32 UNC-2B X 1.0 DIA
EMHART HELICOIL
(P/N 1185-2EN164)



VIEW A-A



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005
ANGULAR ± 0.1°

1. INTERPRET DRAWING PER ASME Y14.5-1994.	
2. REMOVE ALL SHARP EDGES, R.02 MIN.	
3. DO NOT SCALE FROM DRAWING.	
4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.	
MATERIAL	6061-T6 Al
FINISH	32 μinch

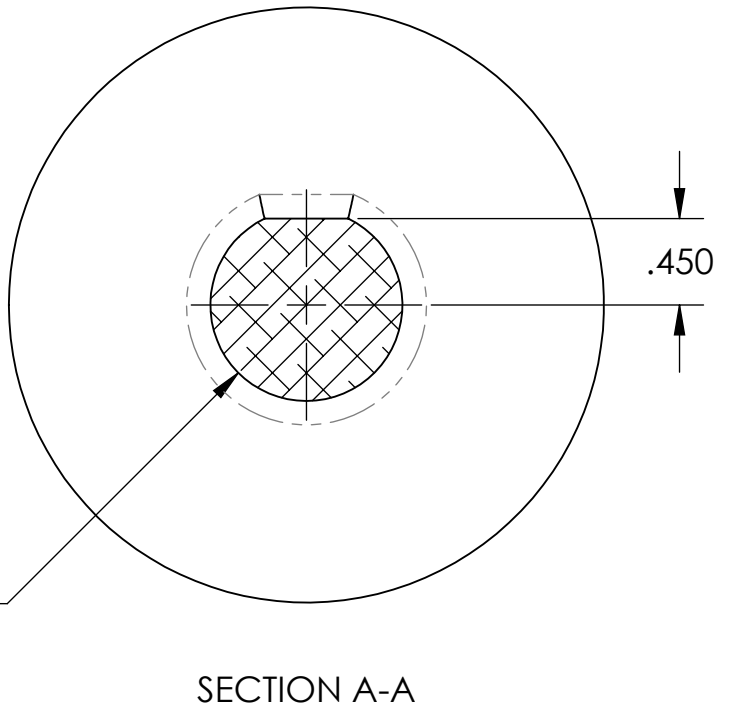
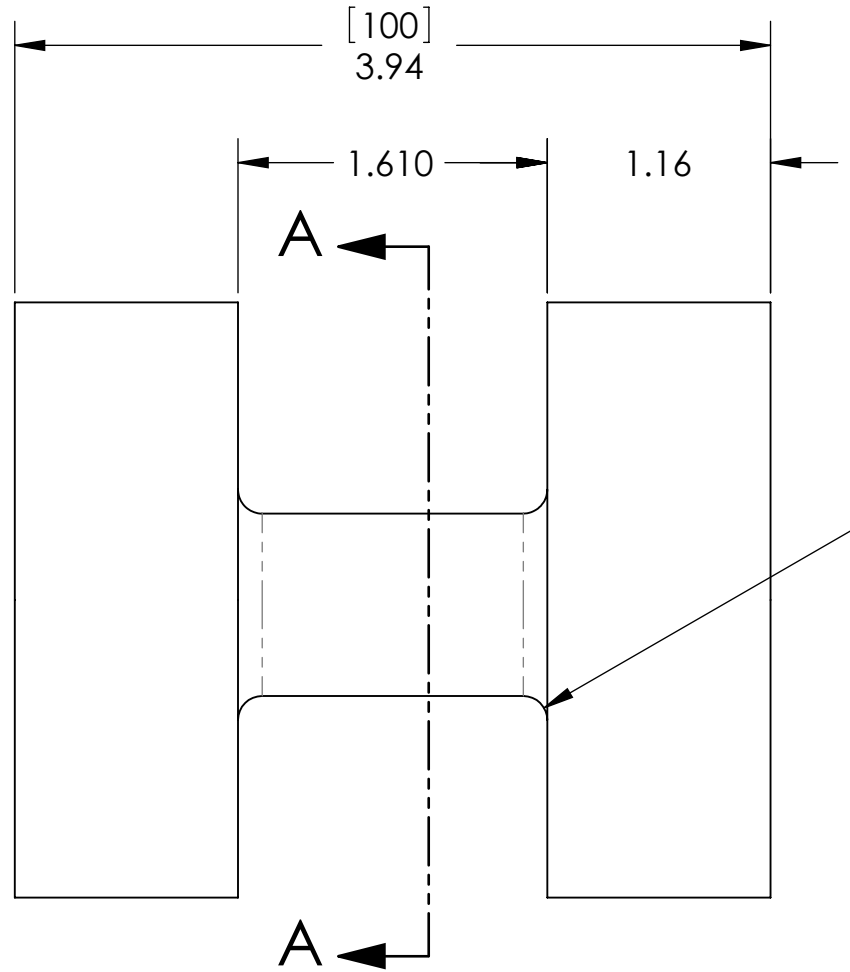
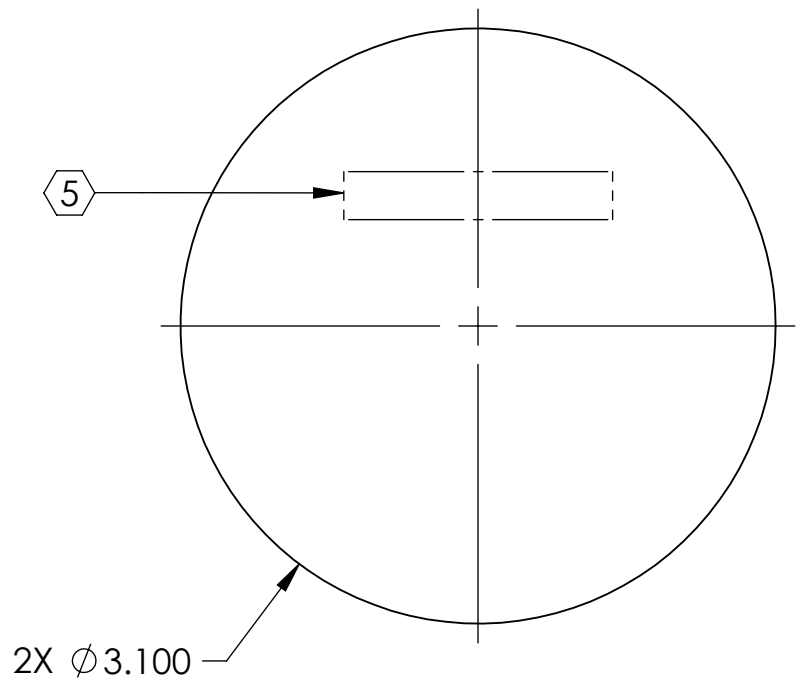
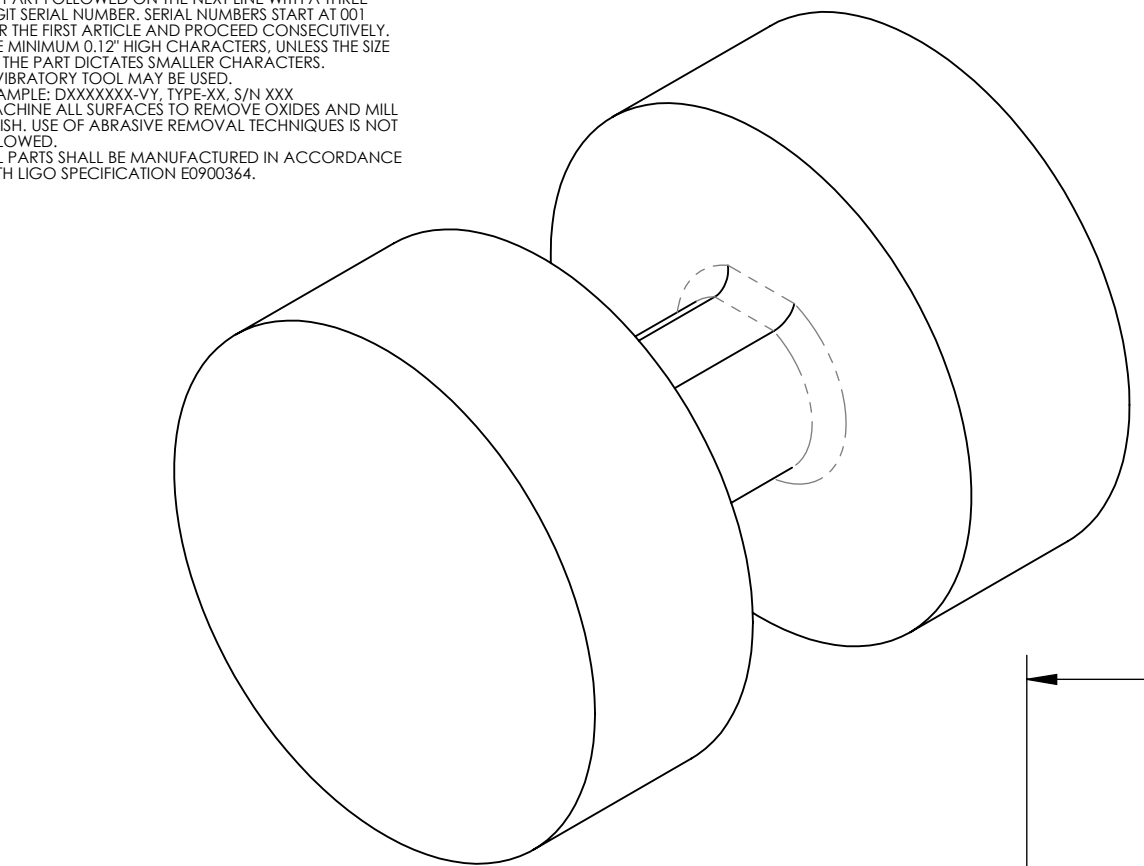
CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
SYSTEM	ADVANCED LIGO
SUB-SYSTEM	SUS
NEXT ASSY	INTERMEDIATE WIRE ASSY

PART NAME		BREAKOFF, INT. WIRE	
DESIGNER	D. BRIDGES	6 JUL 2009	SIZE DWG. NO.
DRAFTER	R. BIEDENHARN	01 NOV 2010	B
CHECKER	D. BRIDGES	04 NOV 2010	
APPROVAL			REV.
			v2
SCALE: 2:1		PROJECTION:	SHEET 1 OF 1

D030155_Advanced_LIGO_SUS_HLTS_Center_Offset_Mass_PART PDM REV: V1, DRAWING PDM REV: V1-004

NOTES CONTINUED:
 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
 EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	22 JUN 2009	E0900173	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-



DIMENSIONS ARE IN INCHES [MM]		FINISH	
TOLERANCES:	.XX ± .01	32	µinch
	.XXX ± .005		
ANGULAR ±	0.5°		

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)
 1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 6061-T6 Al

SYSTEM ADVANCED LIGO		SUB-SYSTEM SUS		PART NAME CENTER OFFSET	
DESIGNER D. BRIDGES	26 AUG 2008	SIZE B	DWG. NO. D030155	REV. v2	
DRAFTER R. BIEDENHARN	29 OCT 2010				
CHECKER D. BRIDGES	29 OCT 2010				
APPROVAL		SCALE: 1:1	PROJECTION:	SHEET 1 OF 1	

8 7 6 5 4 3 2 1

D
C
B
A

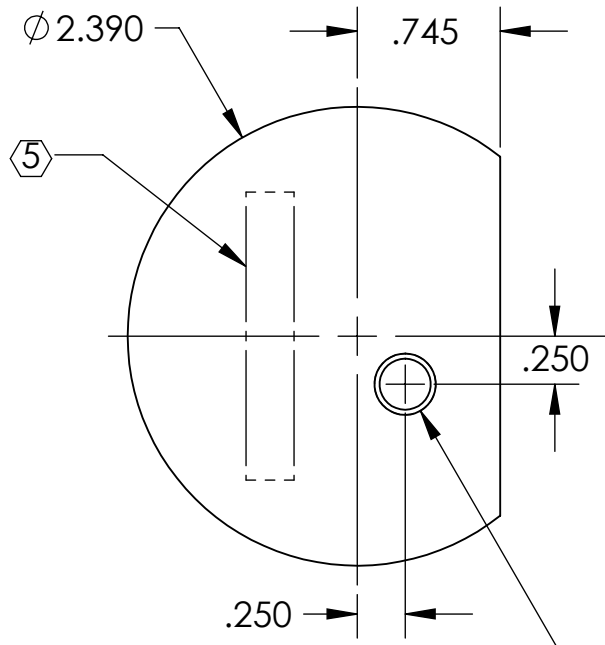
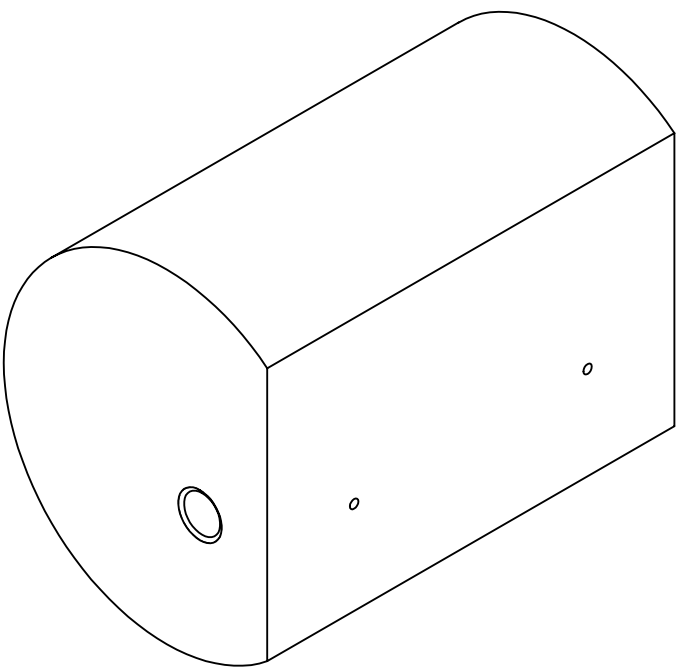
D
C
B
A

8 7 6 5 4 3 2 1

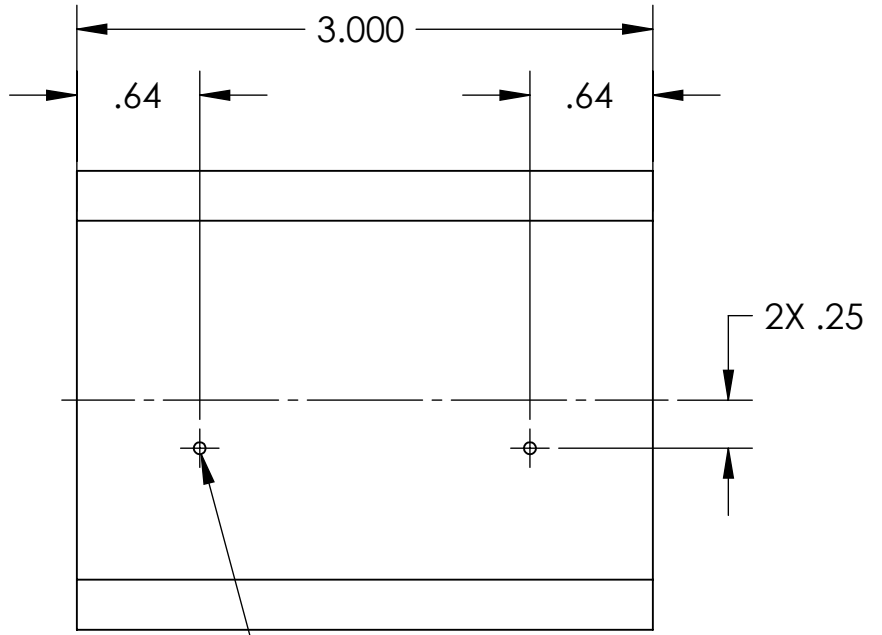
D030156_Advanced_LIGO_SUS_HLTs_Side_Offset_Intermediate_Mass_PART PDM REV: V1-000, DRAWING PDM REV: V1-001

- NOTES CONTINUED:**
- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
 - 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 - 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
 - 8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
 - 9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

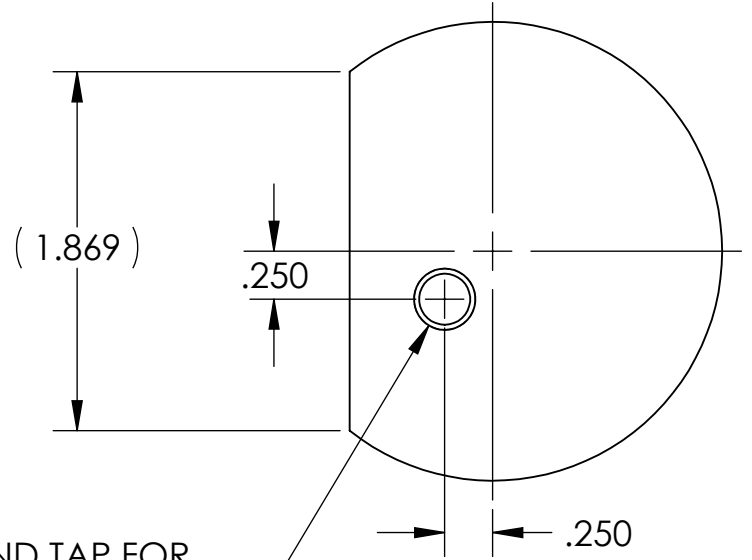
REV.	DATE	DCN #	DRAWING TREE #
v1	22 JUN 2009	E0900173	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



DRILL AND TAP FOR
1/4-20 UNC -2B X 1.0 DIA
EMHART HELICOIL
(P/N 3585-4EN250)



2X ϕ .06 THRU TO
TAPPED HOLE



DRILL AND TAP FOR
1/4-20 UNC -2B X 1.0 DIA
EMHART HELICOIL
(P/N 3585-4EN250)

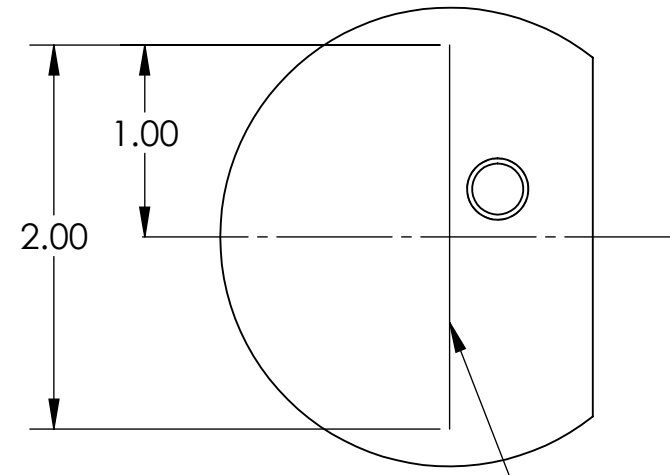
NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)				LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.5°				1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		SIDE OFFSET	
						MATERIAL 6061-T6 Al FINISH 32 μinch	
				SYSTEM ADVANCED LIGO SUB-SYSTEM SUS		SIZE DWG. NO. B D030156 REV. v2	
				NEXT ASSY INTERMEDIATE MASS ASSY		SCALE: 1:1 PROJECTION: SHEET 1 OF 2	

D030156_Advanced_LIGO_SUS_HLTS_Side_Offset_Intermediate_Mass_PART_PDM_REV: V1-000, DRAWING PDM REV: V1-001

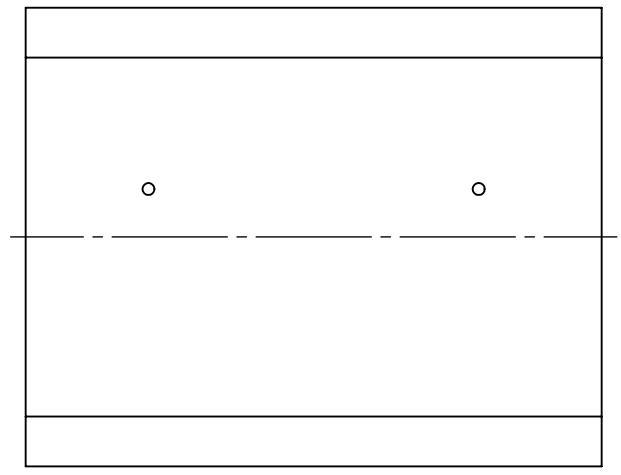
8 7 6 5 4 3 2 1

NOTES CONTINUED:
⑩ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

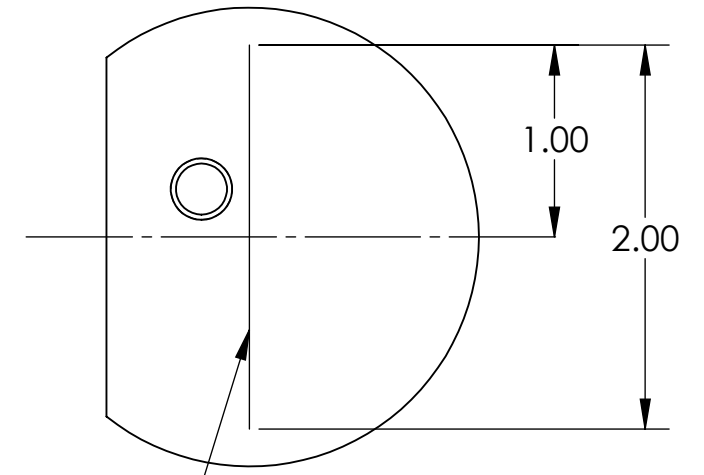
D
C
B
A





⑩ THRU CENTER OF CYLINDER



⑩ THRU CENTER OF CYLINDER



D
C
B
A

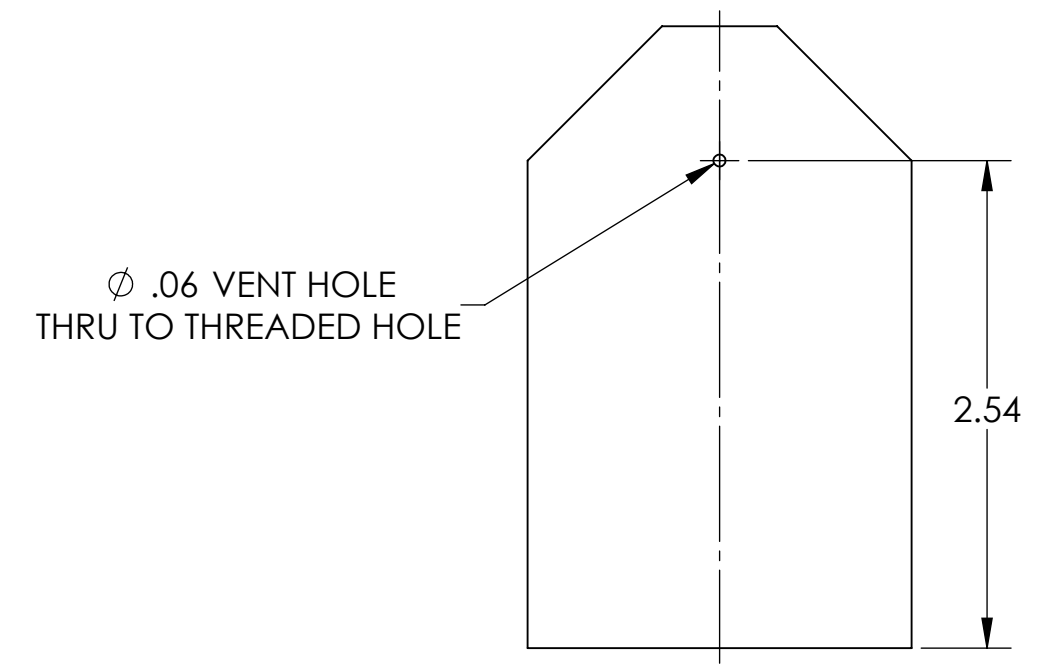
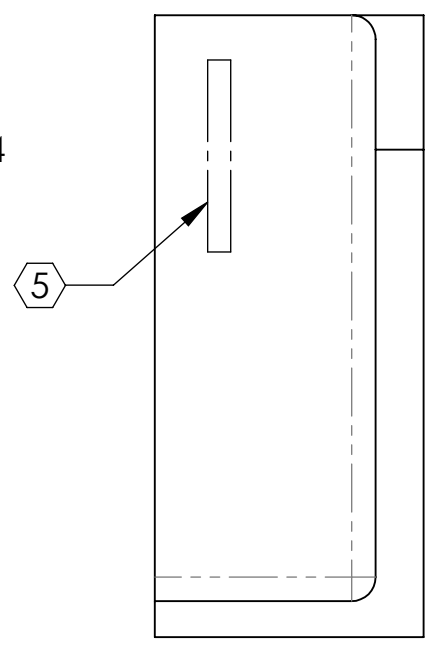
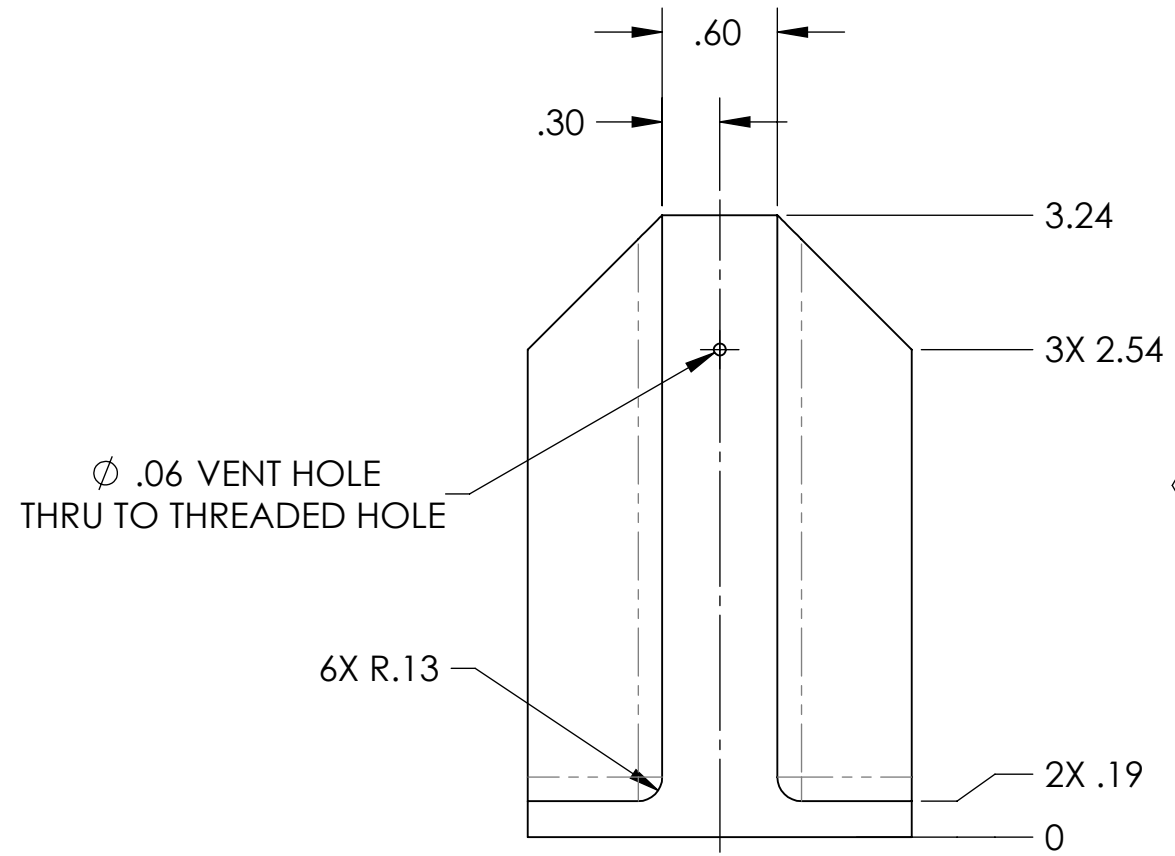
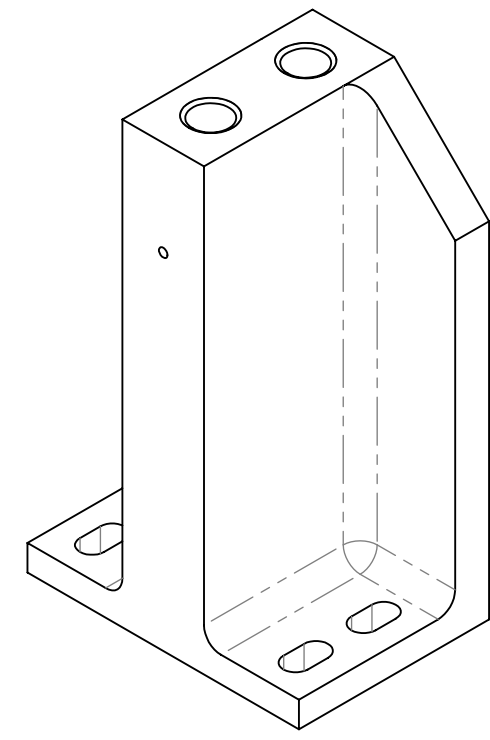
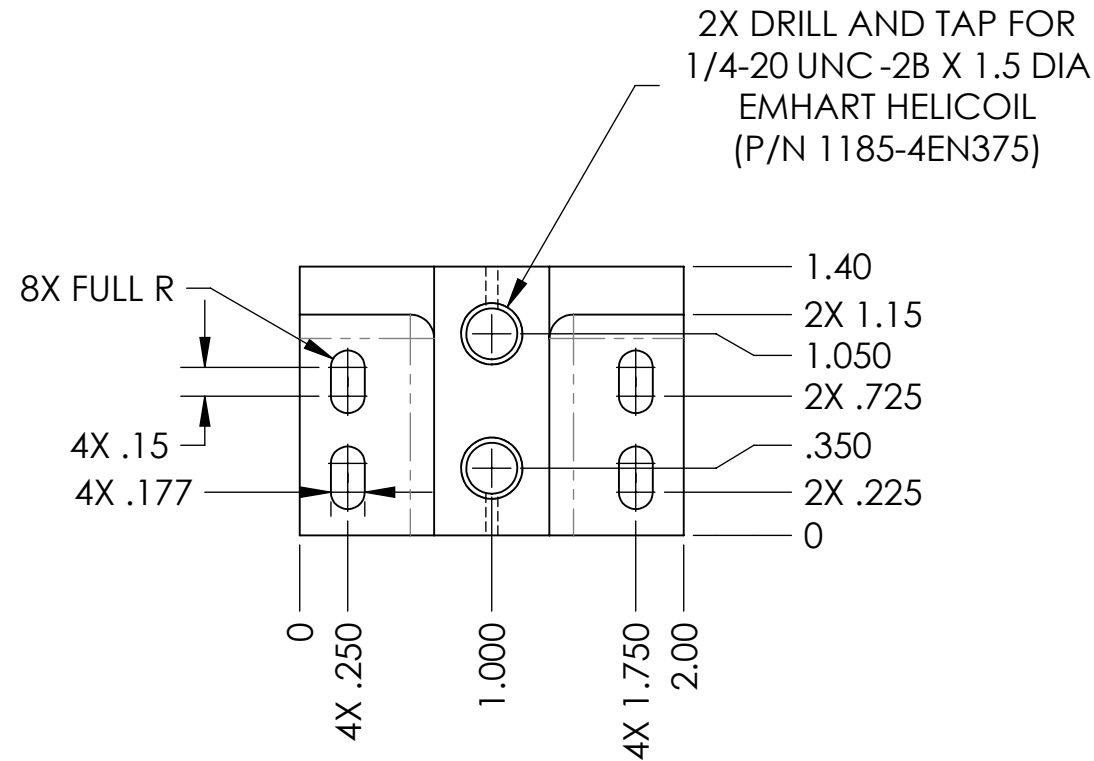
 CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
SIZE B	DWG. NO. D030156
SCALE: 1:1	PROJECTION:  SHEET 2 OF 2
REV. v2	

8 7 6 5 4 3 2 1

D070309_Advanced_LIGO_SUS_HLTs_Top_Blade_Guard_Riser, PART PDM REV: V1-000, DRAWING PDM REV: V1-002

NOTES CONTINUED:
 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
 EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
 8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
 9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

REV.	DATE	DCN #	DRAWING TREE #
v1	26 MAY 2009	E0900159	E080191
v2	10 AUG 2010	E1000301	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

DIMENSIONS ARE IN INCHES

TOLERANCES:
 .XX ± .01
 .XXX ± .005

ANGULAR ± 0.5°

MATERIAL 6061-T6 Al

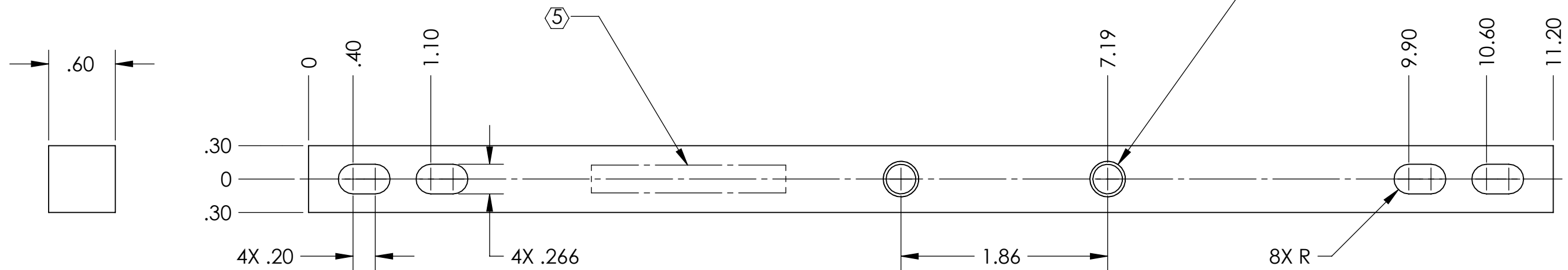
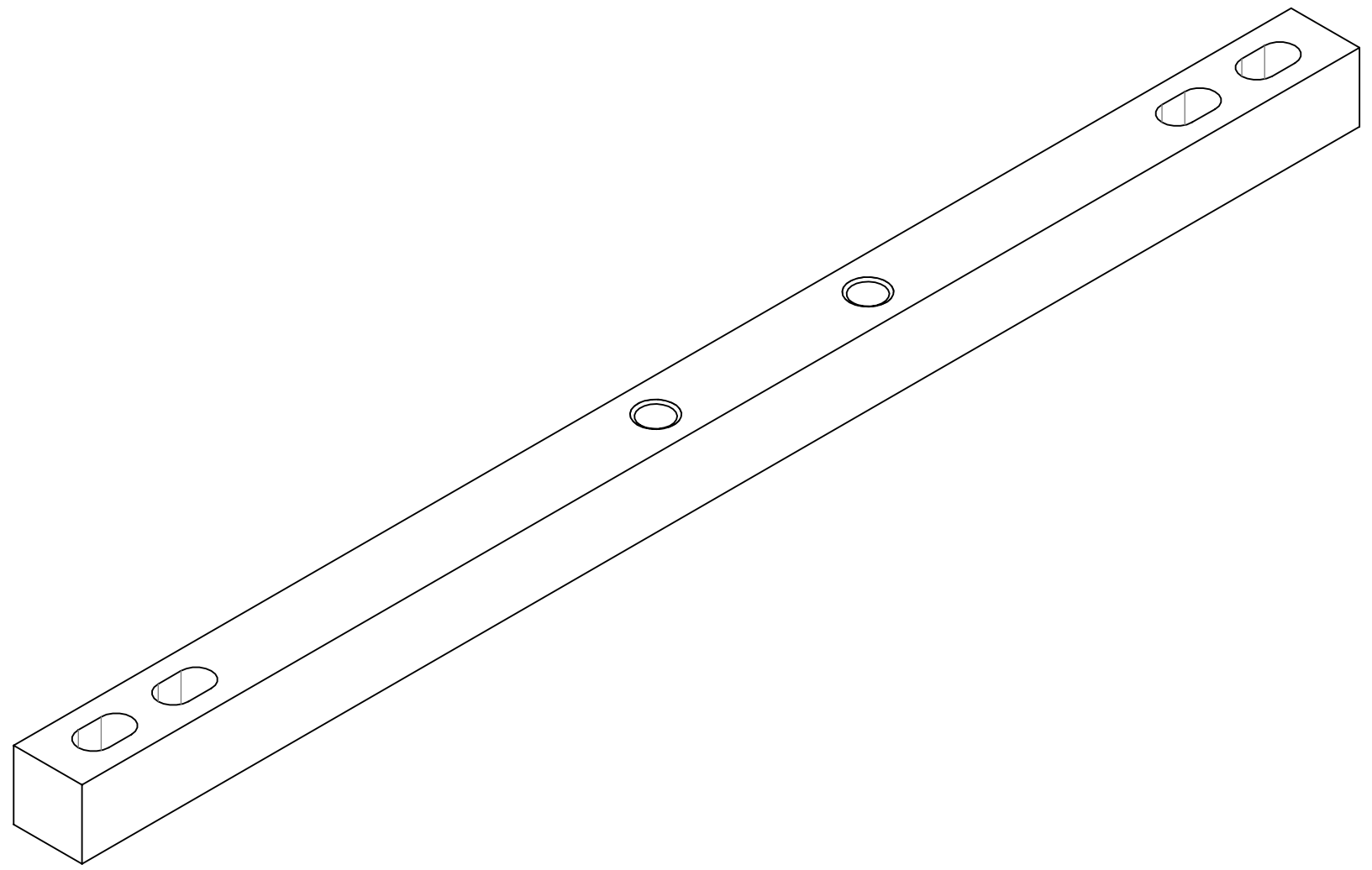
FINISH 32 µinch

CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME TOP BLADE GUARD RISER	
SYSTEM ADVANCED LIGO	SUB-SYSTEM SUS	DESIGNER D. BRIDGES	23 AUG 2010
DRAFTER D. BRIDGES	23 AUG 2010	CHECKER B. MOORE	25 AUG 2010
APPROVAL	[Signature]	SIZE B	DWG. NO. D070309
REV. v2	SCALE: 1:1	PROJECTION:	SHEET 1 OF 1

D070310_Advanced_LIGO_SUS_HLTs_Top_Blade_Guard_Bar_PART PDM REV: V1-001, DRAWING PDM REV: V1-002

- NOTES CONTINUED:**
- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
 - 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 - 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
 - 8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
 - 9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

REV.	DATE	DCN #	DRAWING TREE #
v1	26 MAY 2009	E0900159	E080191
v2	10 AUG 2010	E1000301	E080191
-	-	-	-

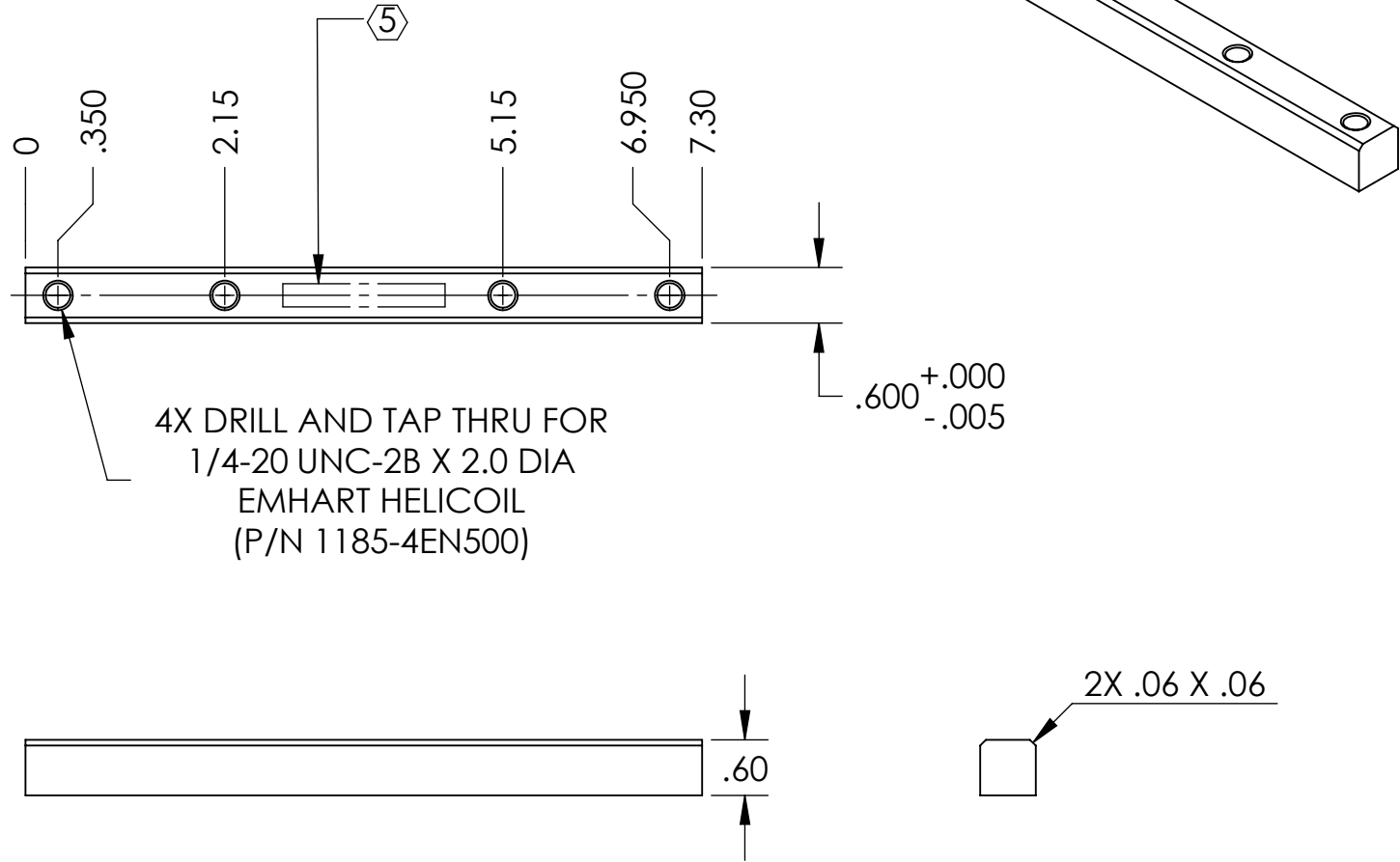


NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)				LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.5°				1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		TOP BLADE GUARD BAR	
MATERIAL 6061-T6 Al		FINISH 32 μinch		SYSTEM ADVANCED LIGO		SUB-SYSTEM SUS	
NEXT ASSY TOP BLADE GUARD ASSY				DESIGNER D. BRIDGES		DATE 23 AUG 2010	
				DRAFTER D. BRIDGES		DATE 25 AUG 2009	
				CHECKER B. MOORE		DATE 25 AUG 2010	
				APPROVAL		SIZE DWG. NO. B D070310	
				SCALE: 1:1		PROJECTION:	
						REV. v2	
						SHEET 1 OF 1	

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
- 9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

REV.	DATE	DCN #	DRAWING TREE #
v1	02 JUN 2009	E0900162	E080191
v2	10 AUG 2010	E1000301	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 6061-T6 Al FINISH 63 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS

NEXT ASSY EARTHQUAKE STOP ASSY, BRIDGE

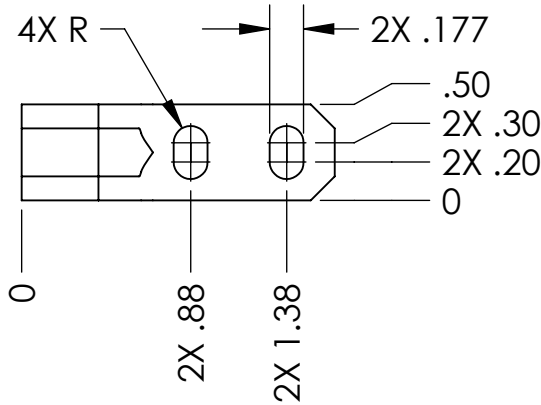
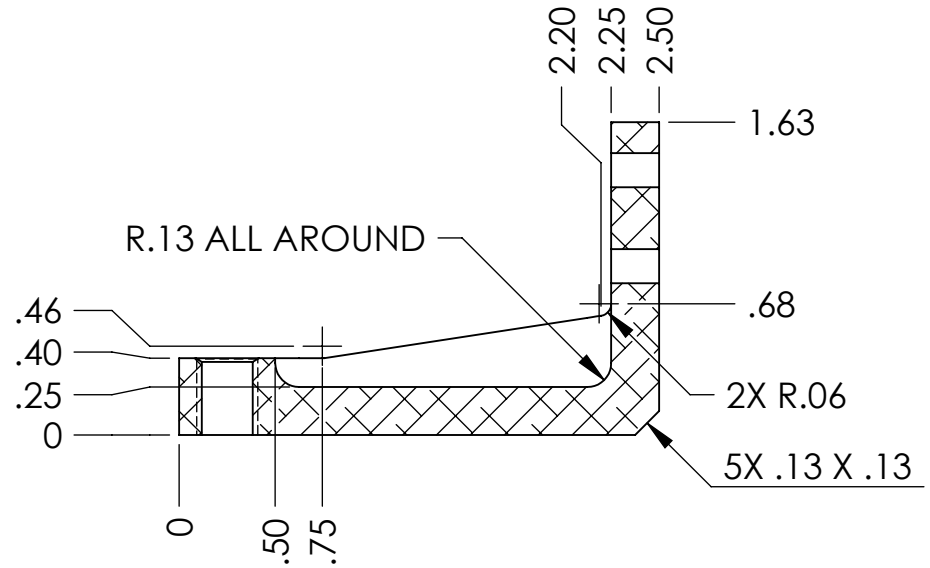
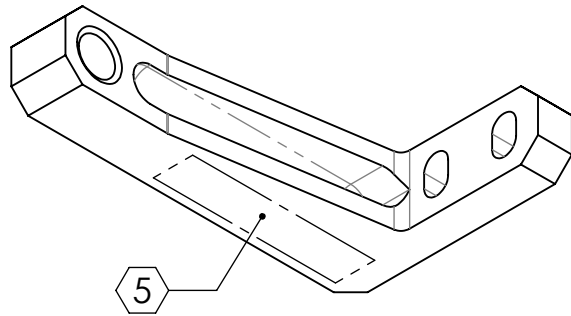
PART NAME EARTHQUAKE STOP BRIDGE CROSSBAR

DESIGNER	D. BRIDGES	26 AUG 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	15 SEP 2010	A	D070321	v2
CHECKER	B. MOORE	16 SEP 2010	SCALE: 1:2	PROJECTION:	SHEET 1 OF 1
APPROVAL					

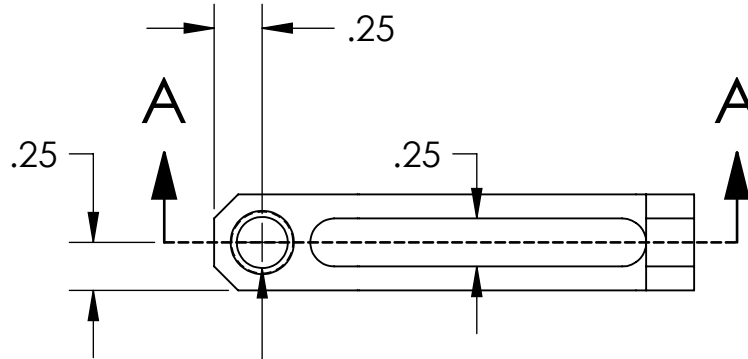
NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
- 9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

REV.	DATE	DCN #	DRAWING TREE #
v1	02 JUN 2009	E0900162	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-



SECTION A-A



DRILL AND TAP THRU FOR
1/4-20 UNC-2B X 1.5 DIA
EMHART HELICOIL
(P/N 1185-4EN375)

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 6061-T6 Al
FINISH 63 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS

NEXT ASSY EARTHQUAKE STOP ASSY, LONG BRACKET

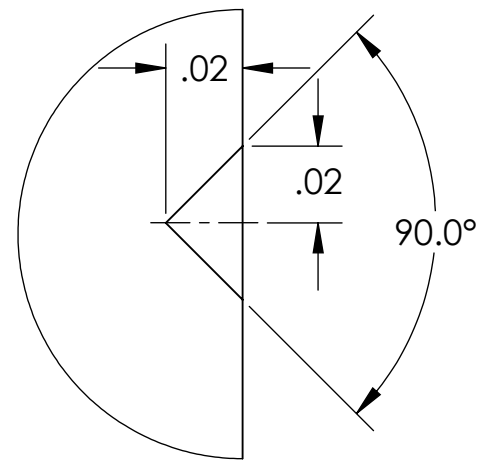
PART NAME EARTHQUAKE STOP BRACKET, LONG

DESIGNER	D. BRIDGES	16 NOV 2008	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	02 NOV 2010	A	D070322	v2
CHECKER	B. MOORE	03 NOV 2010	SCALE: 1:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

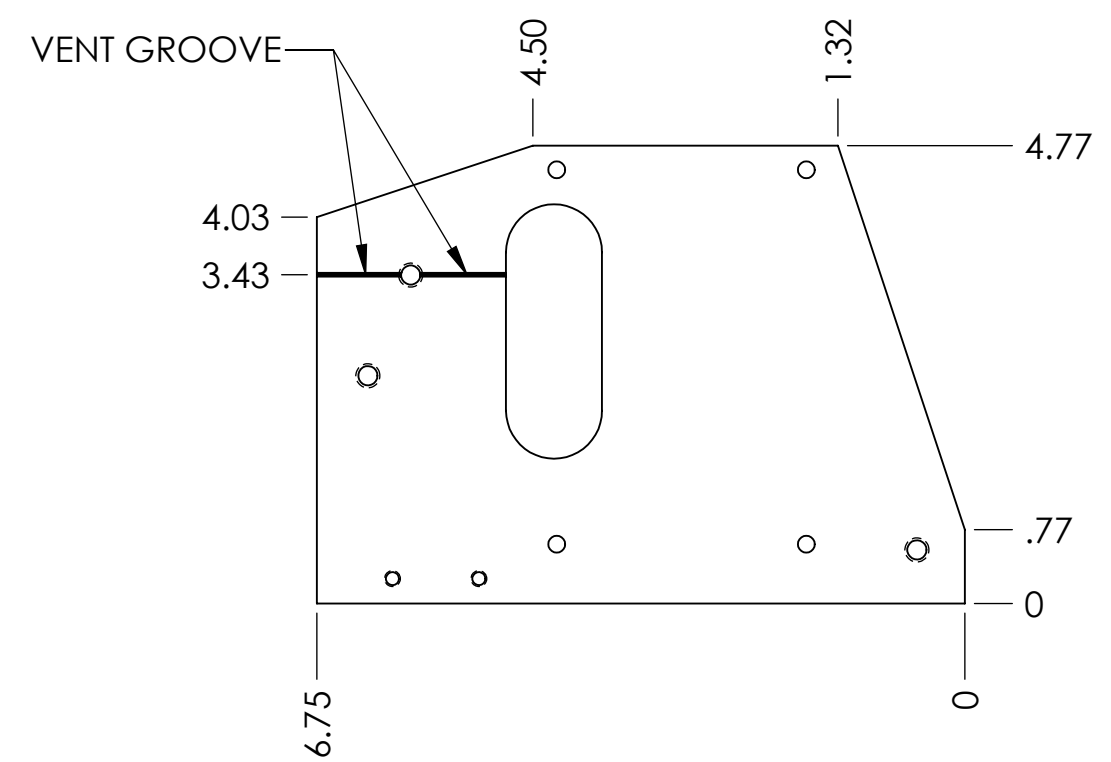
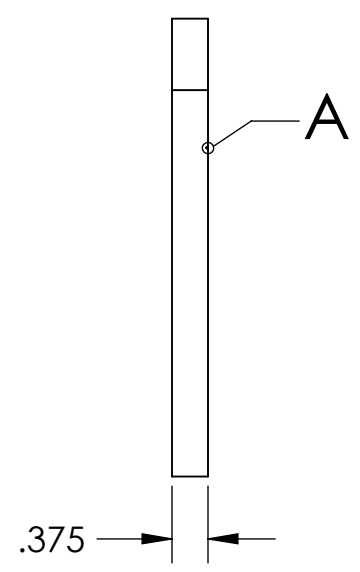
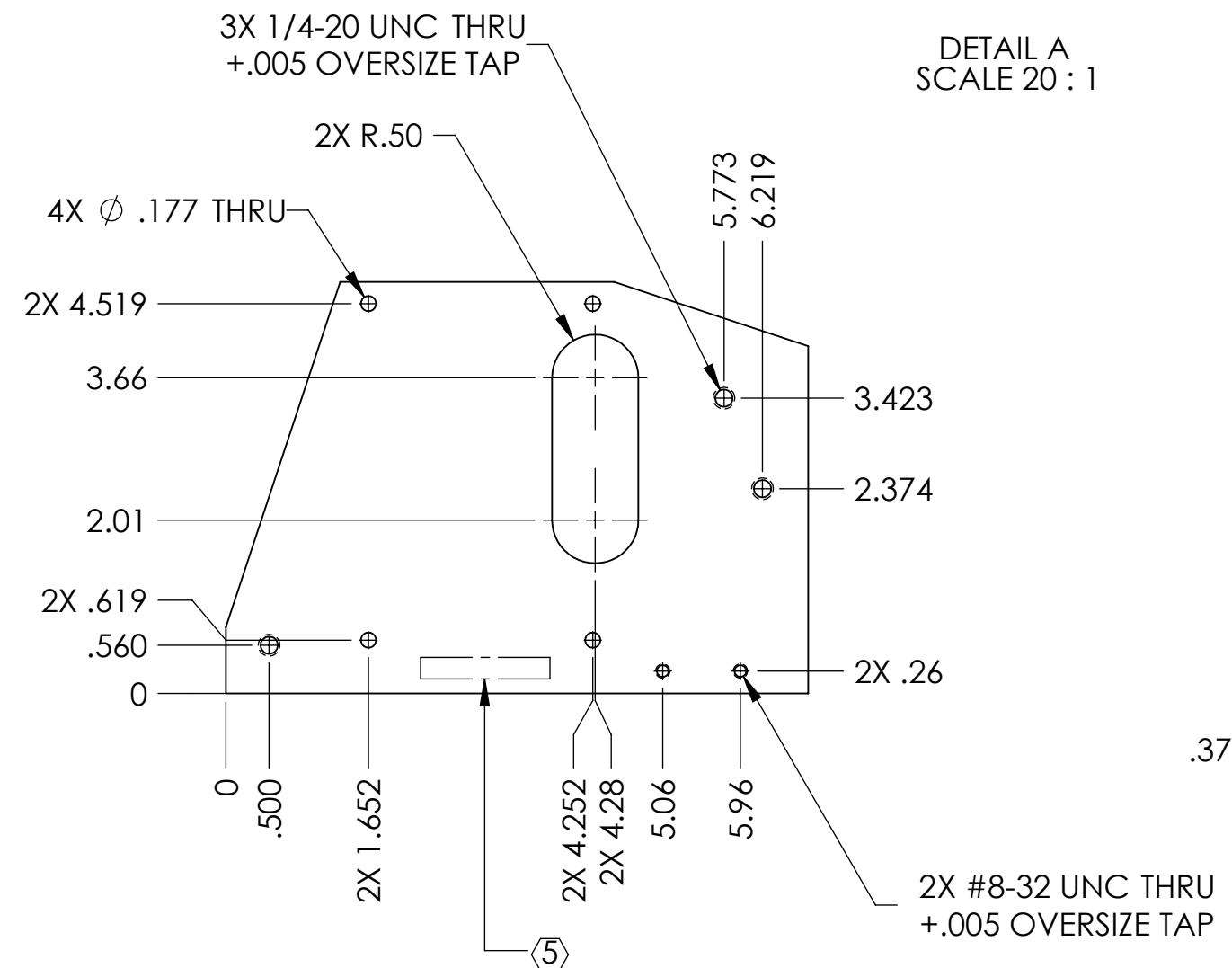
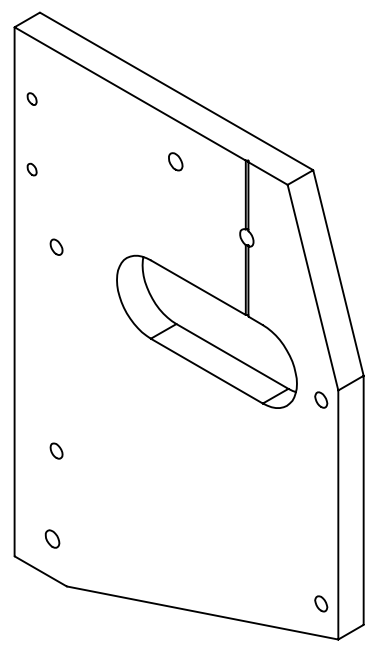
D070327_Advanced_LIGO_SUS_HLTS_Base_Plate, PART PDM REV: V1-000, DRAWING PDM REV: V1-000

NOTES CONTINUED:
 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
 EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	03 MAR 2009	E0900065	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



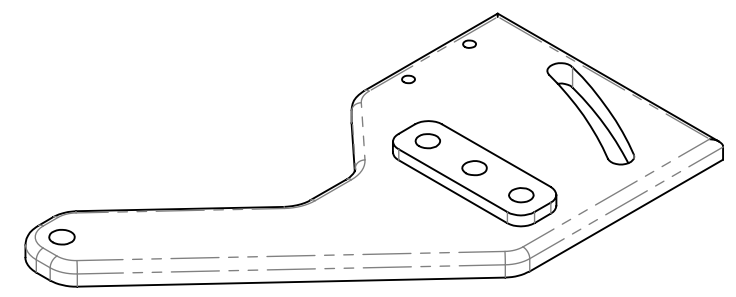
DETAIL A
SCALE 20 : 1



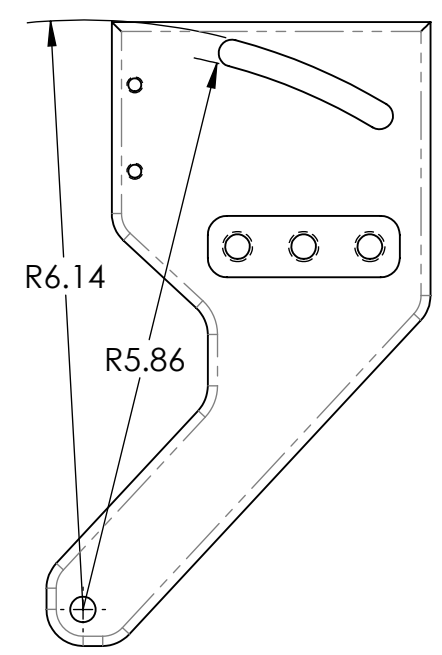
NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)				LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.5°				1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		BASE PLATE	
MATERIAL		FINISH		NEXT ASSY		DESIGNER	
6061-T6 Al		32 μinch		ROTATIONAL ADJUSTER ASSY		D. BRIDGES	
						26 JUL 2010	
						D. BRIDGES	
						29 JUL 2010	
						M. MEYER	
						30 JUL 2010	
						APPROVAL	
				SYSTEM		SUB-SYSTEM	
				ADVANCED LIGO		SUS	
				DRAWN		SIZE	
				D. BRIDGES		DWG. NO.	
				M. MEYER		B D070327	
				CHECKER		REV.	
				APPROVAL		v2	
				SCALE: 1:2		PROJECTION:	
						SHEET 1 OF 1	

NOTES CONTINUED:
 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
 EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

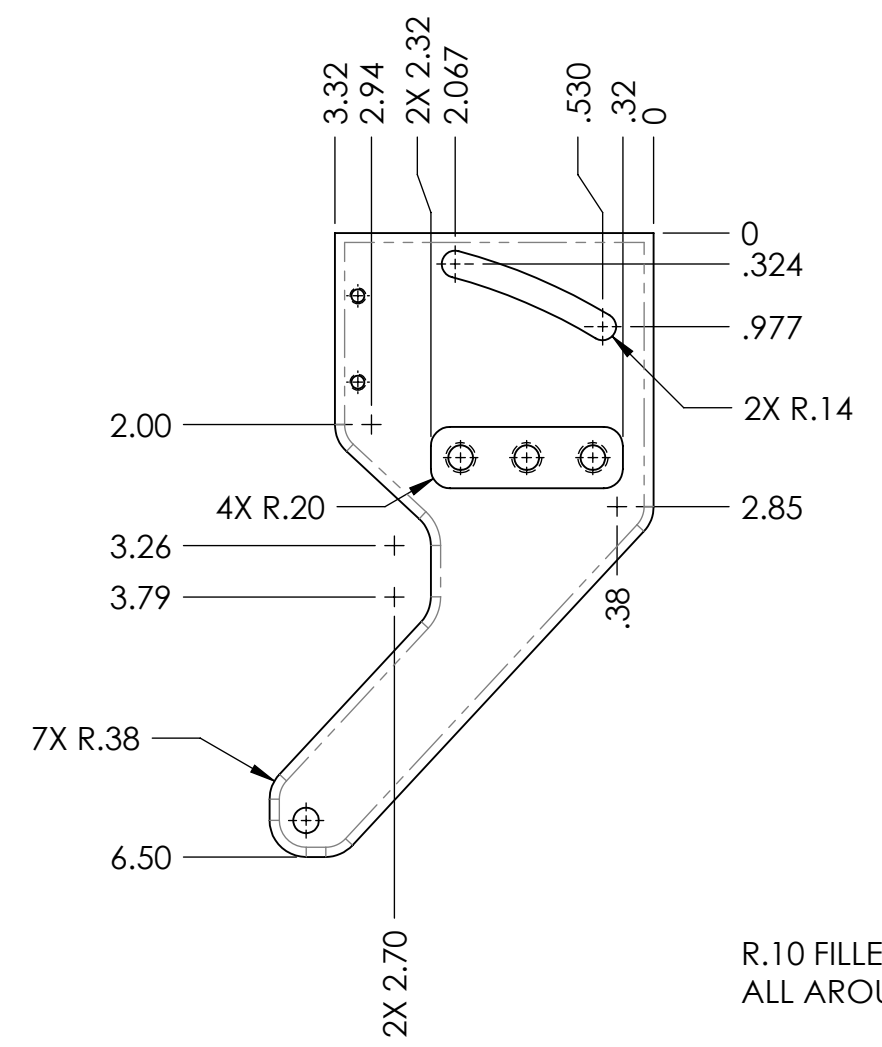
REV.	DATE	DCN #	DRAWING TREE #
v1	03 MAR 2009	E0900065	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-



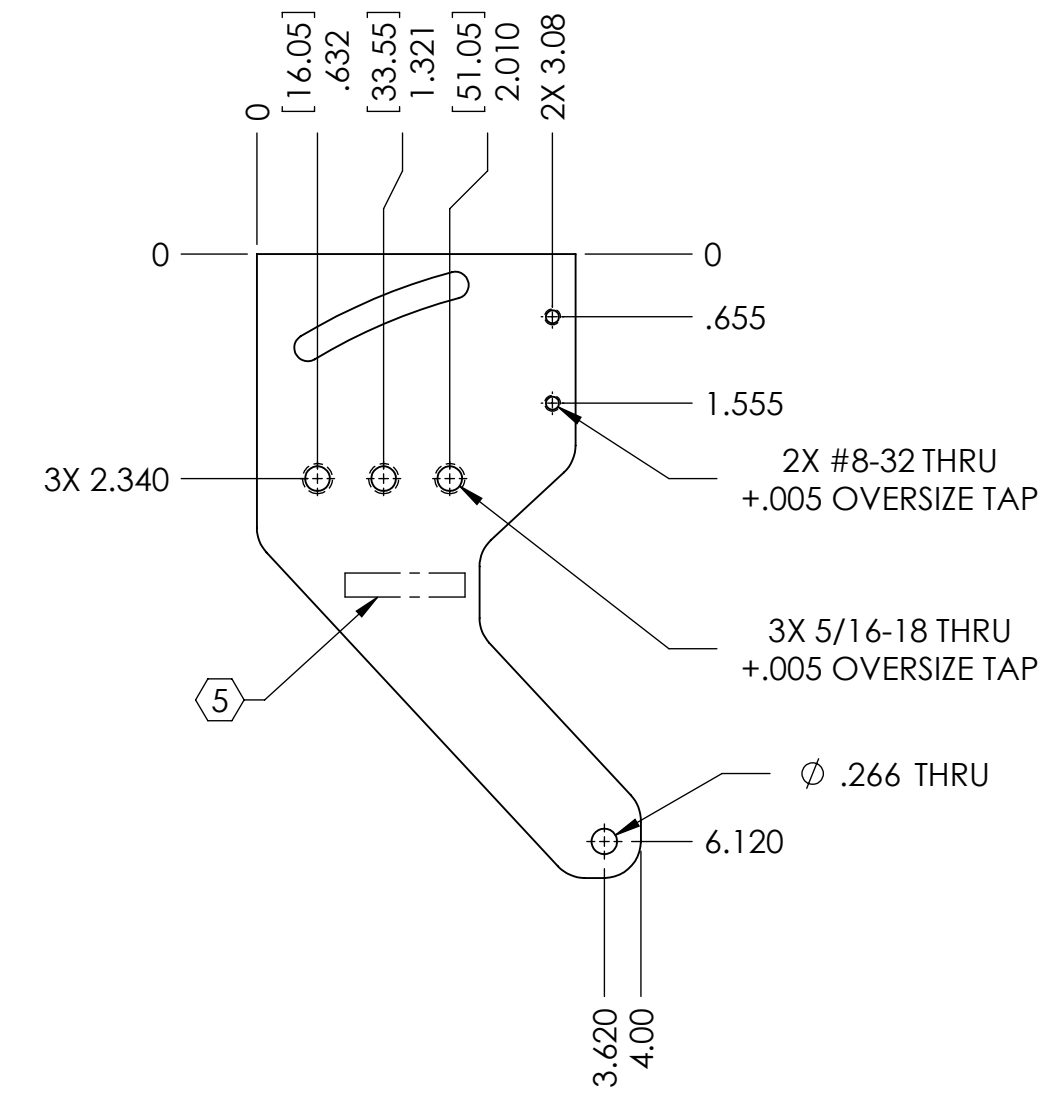
ISOMETRIC VIEW



VIEW A-A



R.10 FILLET ALL AROUND



2X #8-32 THRU
+.005 OVERSIZE TAP

3X 5/16-18 THRU
+.005 OVERSIZE TAP

Ø .266 THRU

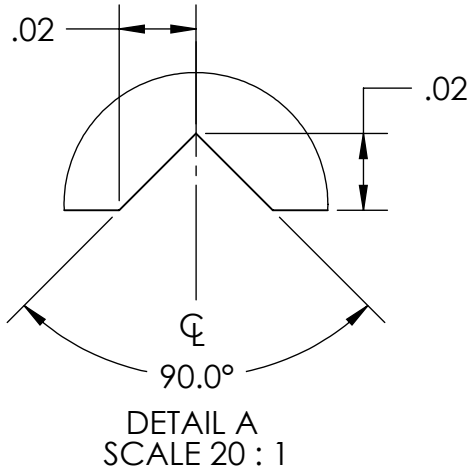
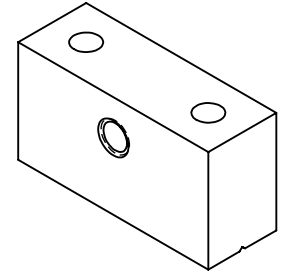
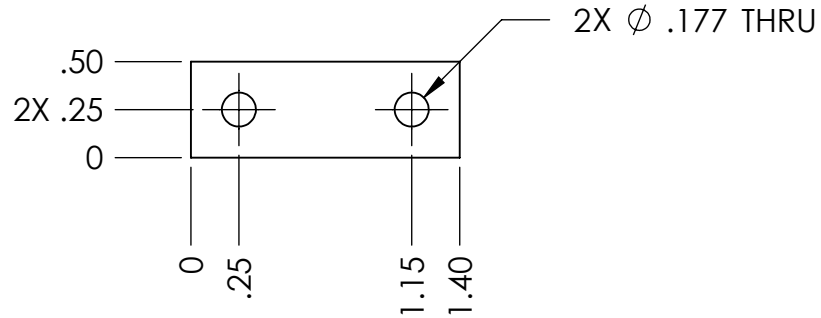
NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)				LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME			
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.1°				1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		ROTATING PLATE			
						MATERIAL 304, 316 OR 302 SSSL FINISH 32 µinch		DESIGNER D. BRIDGES 14 APR 2009 DRAFTER D. BRIDGES 24 SEP 2010 CHECKER M. MEYER 27 SEP 2010 APPROVAL	
						NEXT ASSY ROTATIONAL ADJUSTER ASSY		SIZE DWG. NO. B D070328 REV. v2	
				SCALE: 1:2 PROJECTION:		SHEET 1 OF 1			

D070328_Advanced_LIGO_SUS_HLTS_Rotating_Plate, PART PDM REV: V1, DRAWING PDM REV: V1

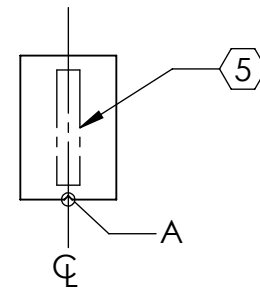
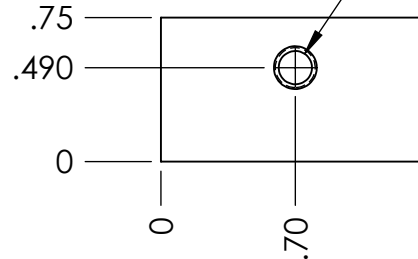
NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
- 9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

REV.	DATE	DCN #	DRAWING TREE #
v1	03 MAR 2009	E0900065	E080191
v2	18 MAY 2010	E1000166	E080191



DRILL AND TAP THRU FOR
#8-32 UNC -2B X 2.5 DIA
EMHART HELICOIL
(P/N 1185-2EN410)



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES
TOLERANCES:
.XX ± .01
.XXX ± .005
ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
2. REMOVE ALL SHARP EDGES, R.02 MIN.
3. DO NOT SCALE FROM DRAWING.
4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL
304, 316 OR 302 SSSL

FINISH
32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: **ADVANCED LIGO** SUB-SYSTEM: **SUS**

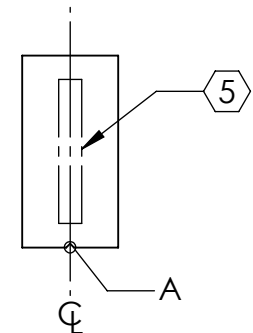
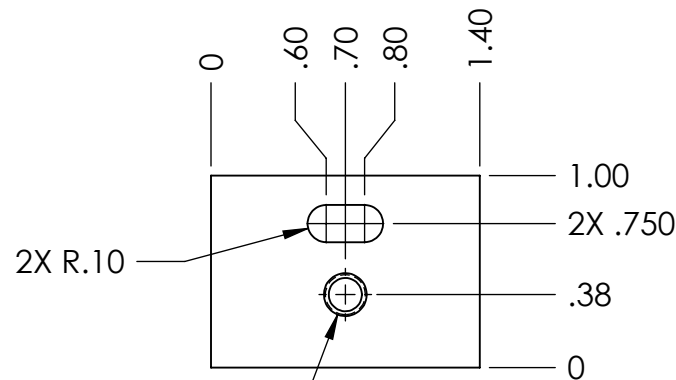
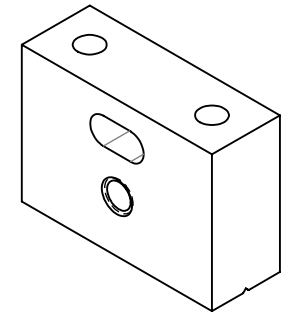
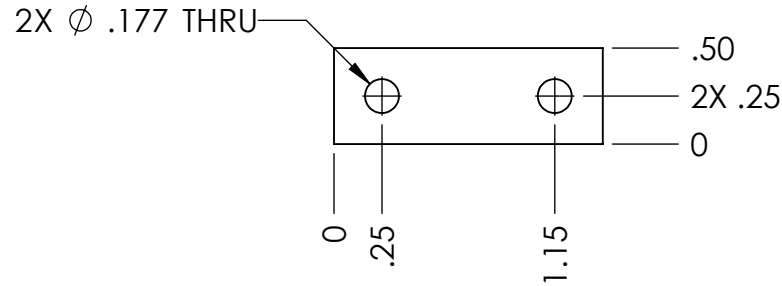
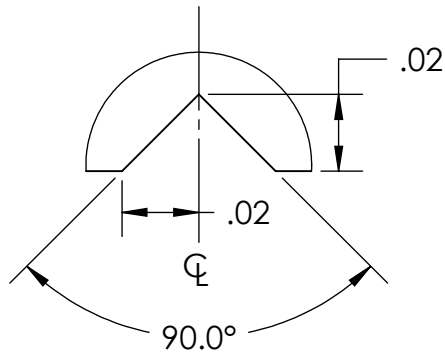
NEXT ASSY: **ROTATIONAL ADJUSTER ASSY**

PART NAME			PULL PLATE		REV.
DESIGNER	D. BRIDGES	20 JUL 2010	SIZE	DWG. NO.	v2
DRAFTER	D. BRIDGES	21 JUL 2010	A	D070329	
CHECKER	M. MEYER	22 JUL 2010	SCALE: 1:1	PROJECTION:	
APPROVAL				SHEET 1 OF 1	

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
- 9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

REV.	DATE	DCN #	DRAWING TREE #
v1	03 MAR 2009	E0900065	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



DRILL AND TAP THRU FOR
#8-32 UNC -2B X 2.5 DIA
EMHART HELICOIL
(P/N 1185-2EN410)

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:

.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL

304, 316 OR 302 SSSL

FINISH

32 μinch



SYSTEM

ADVANCED LIGO

SUB-SYSTEM

SUS

NEXT ASSY

ROTATIONAL ADJUSTER ASSY

PART NAME

PUSH PLATE

DESIGNER

D. BRIDGES

20 JUL 2010

DRAFTER

D. BRIDGES

21 JUL 2010

CHECKER

M. MEYER

22 JUL 2010

APPROVAL

SIZE DWG. NO.

A

D070330

REV.

v2

SCALE: 1:1

PROJECTION:

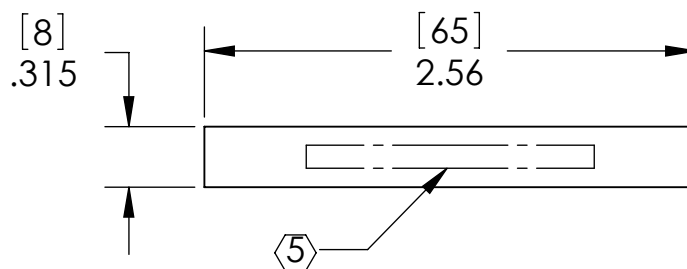
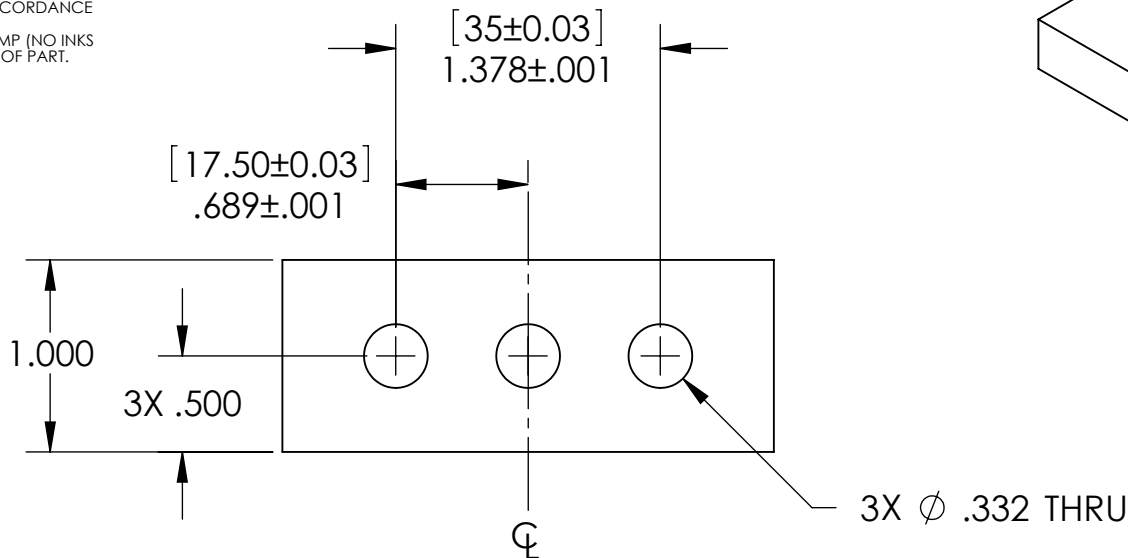
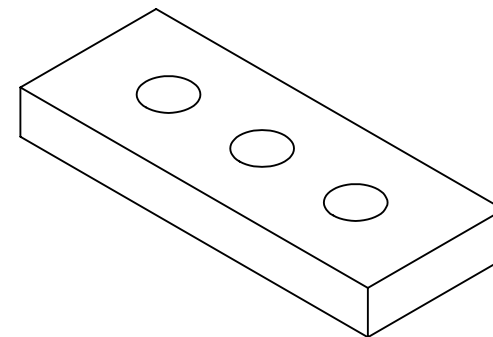


SHEET 1 OF 1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

REV.	DATE	DCN #	DRAWING TREE #
v1	01 AUG 2008	E080418	E080191
v2	18 MAY 2010	E1000166	E080191
v3	21 NOV 2010	E1000741	E080191



BOTH SIDES 8 1.0mm

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.
MATERIAL
 304, 316 OR 302 SSSL
FINISH
 63 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: **ADVANCED LIGO** SUB-SYSTEM: **SUS**

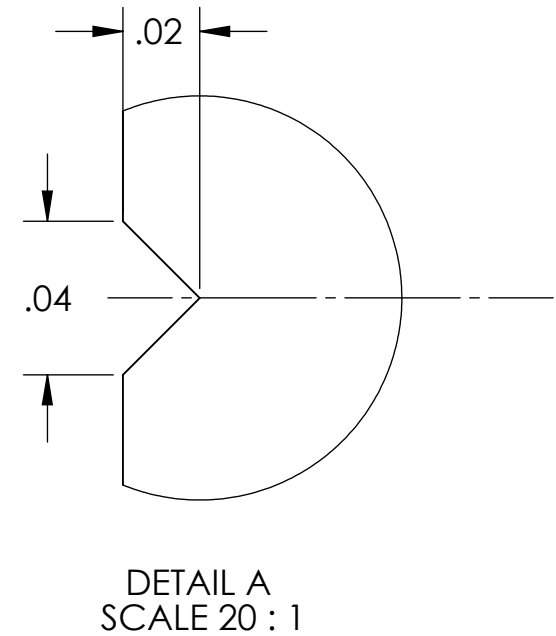
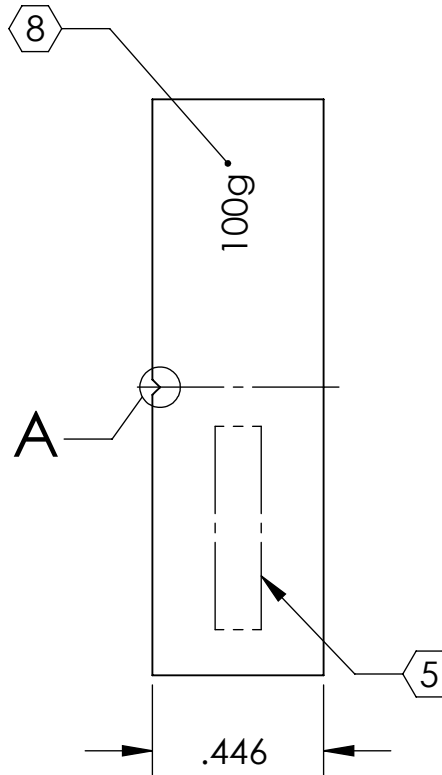
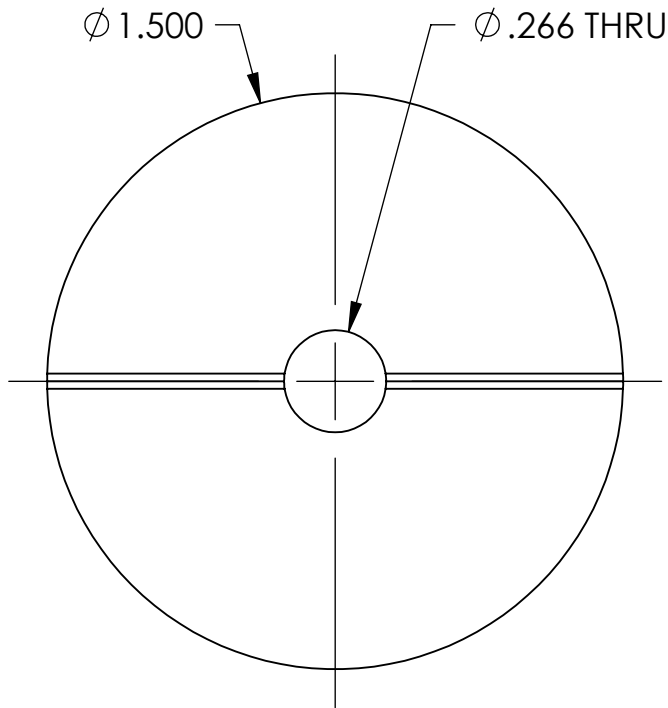
NEXT ASSY: **ROTATIONAL ADJUSTER**

PART NAME SHIM, 1.0mm, UPPER BLADE			DESIGNER D. BRIDGES 20 NOV 2010		SIZE DWG. NO. A D070331	REV. v3
DRAFTER D. BRIDGES 20 NOV 2010			CHECKER M. MEYER 21 NOV 2010			
APPROVAL			SCALE: 1:1		PROJECTION:	SHEET 1 OF 1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

REV.	DATE	DCN #	DRAWING TREE #
v1	14 JUL 2009	E0900198	-
v2	18 MAY 2010	E1000166	-
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:

.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 304, 316 OR 302 SSSL **FINISH** 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

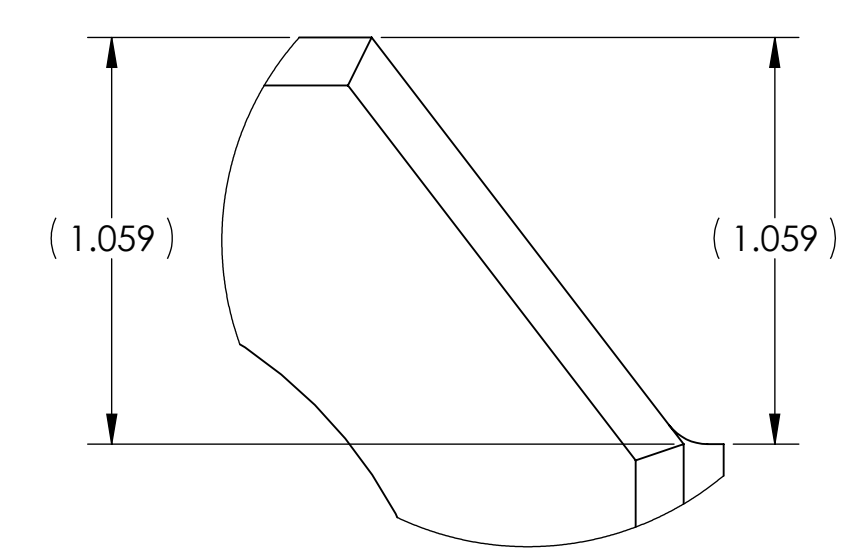
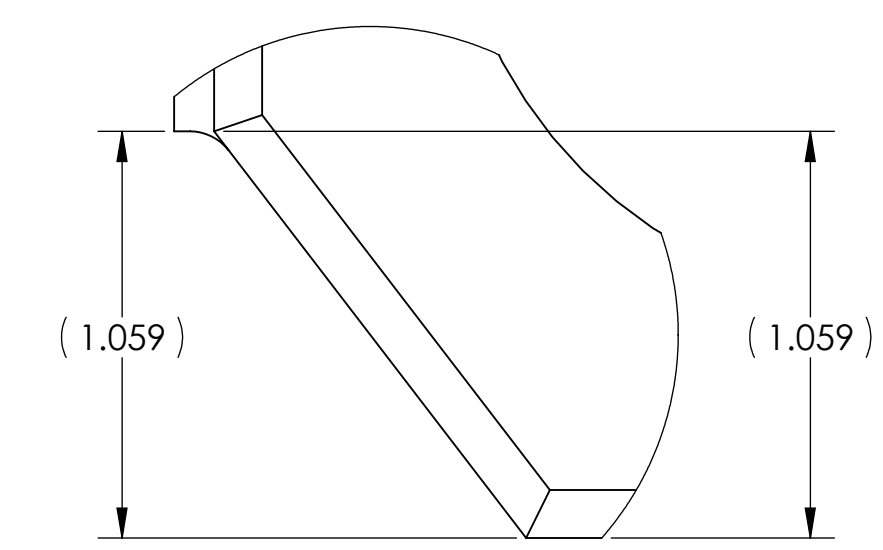
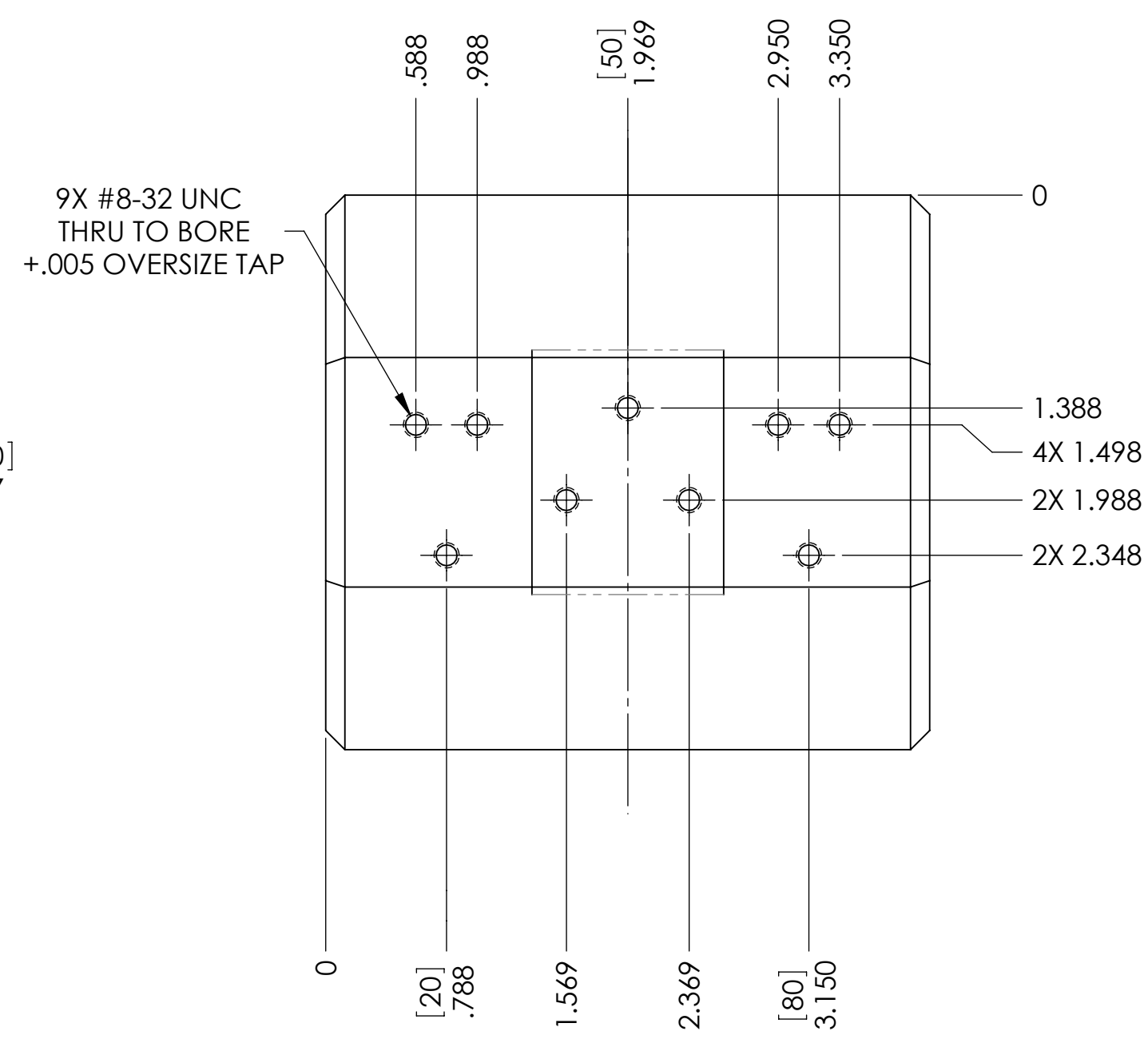
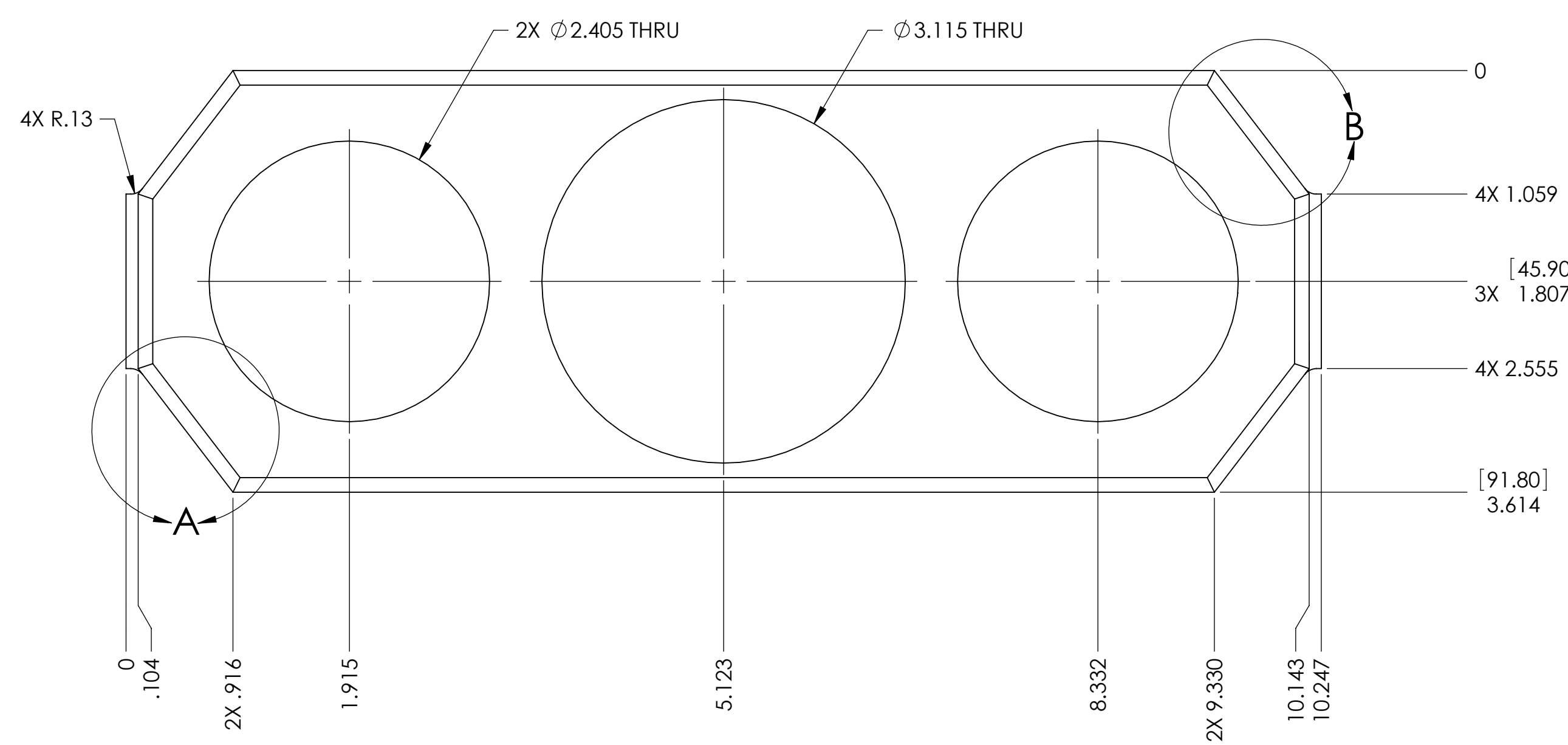
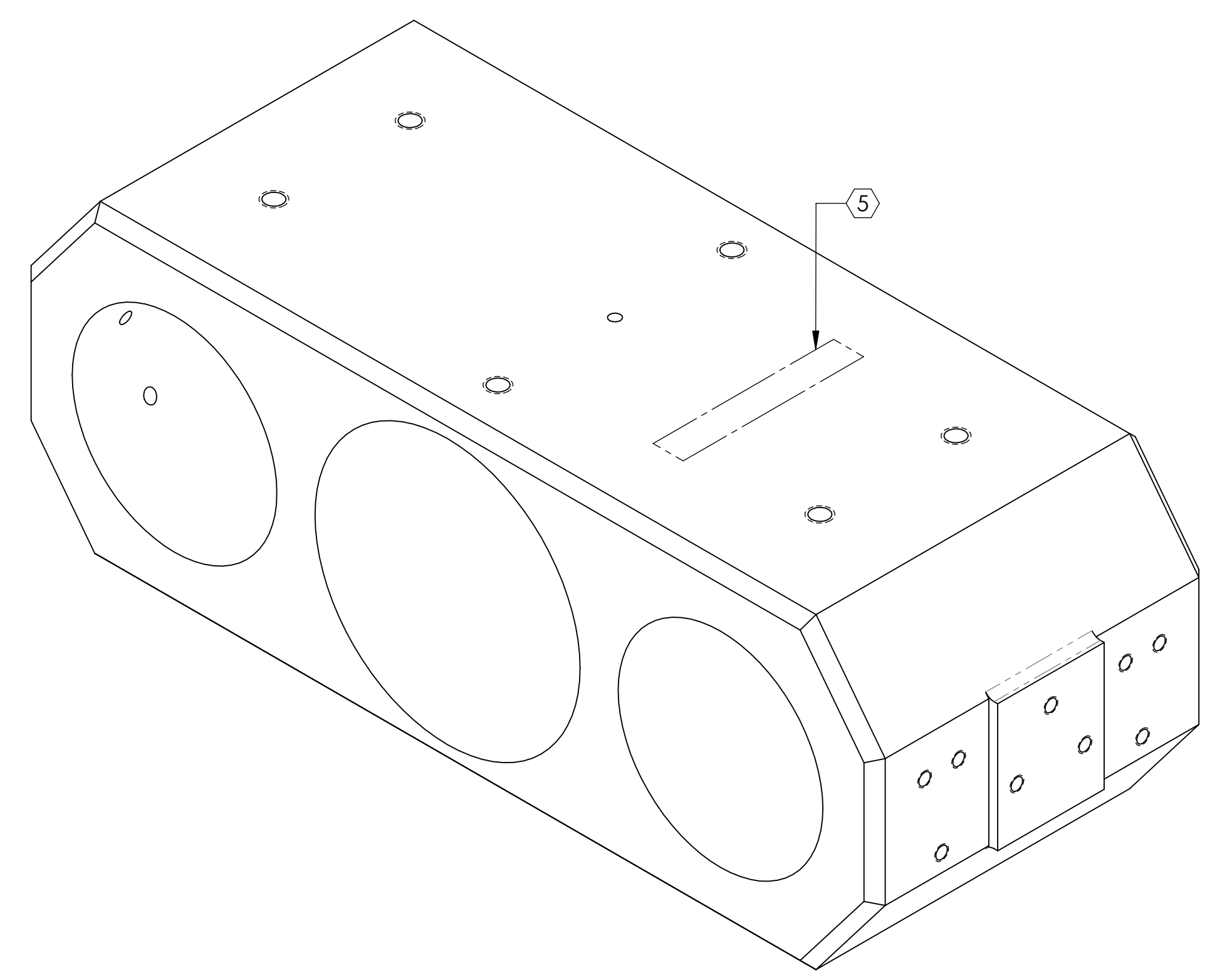
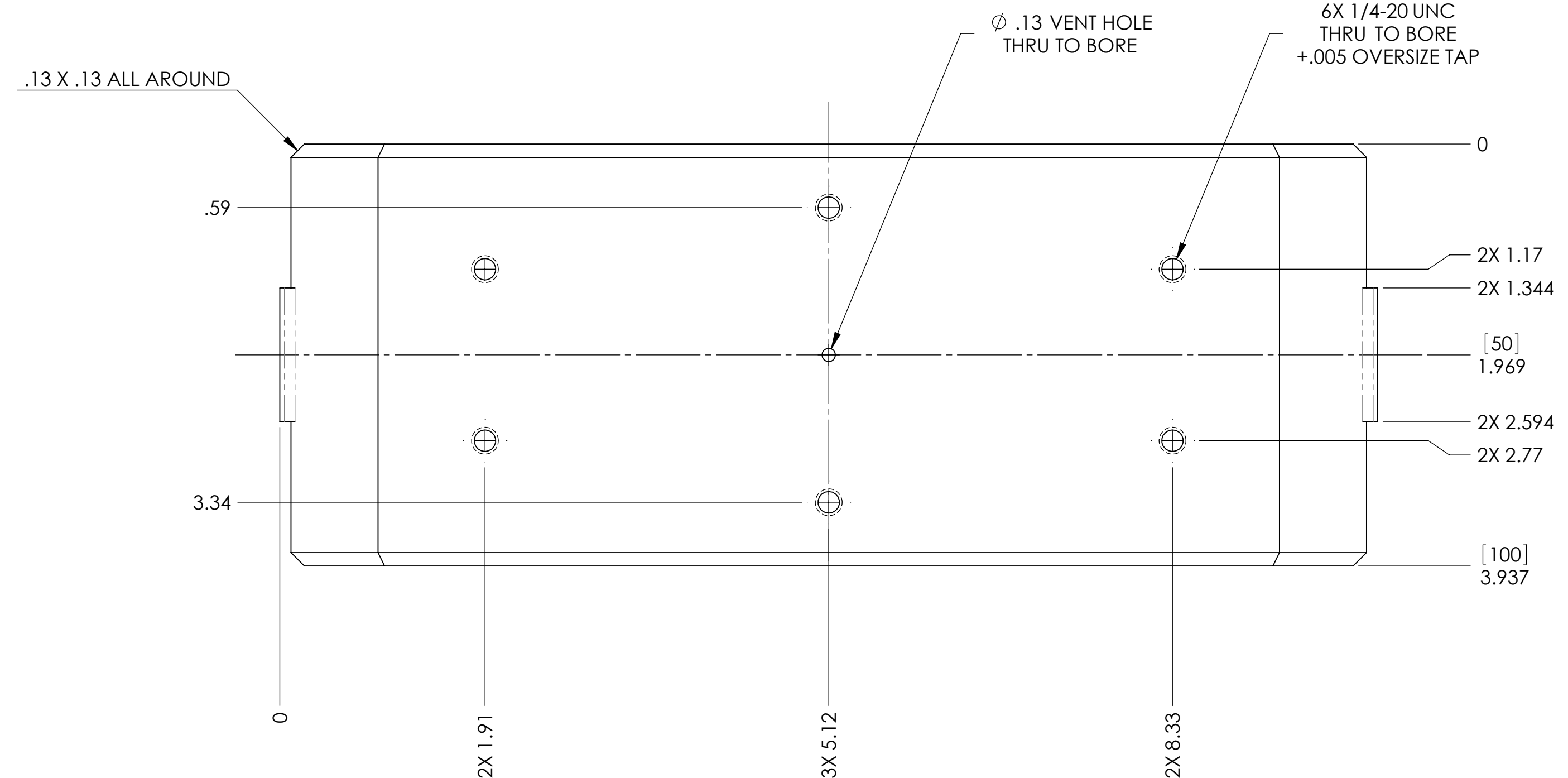
SYSTEM **ADVANCED LIGO** SUB-SYSTEM **SUS**

NEXT ASSY **MULTIPLE ASSYS**

PART NAME			ADDITIONAL MASS DISK, 100g		
DESIGNER	D. BRIDGES	18 MAY 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	18 MAY 2010	A	D070333	v2
CHECKER	J. ROMIE	19 MAY 2010	SCALE: 2:1	PROJECTION:	
APPROVAL					SHEET 1 OF 1

NOTES CONTINUED:
 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR TYPE IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
 EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	22 JUN 2009	E0900173	E080191
v2	06 JUL 2009	E0900189	E080191
v3	18 MAY 2010	E1000166	E080191



LEFT AND RIGHT SIDES

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)	
1. INTERPRET DRAWING PER ASME Y14.5-1994.	
2. REMOVE ALL SHARP EDGES, R.02 MIN.	
3. DO NOT SCALE FROM DRAWING.	
4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.	
DIMENSIONS ARE IN INCHES [MM]	
TOLERANCES: .XX ± .01 .XXX ± .005	
ANGULAR ± 0.5°	
MATERIAL	FINISH
304, 316 OR 302 SSSL	32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

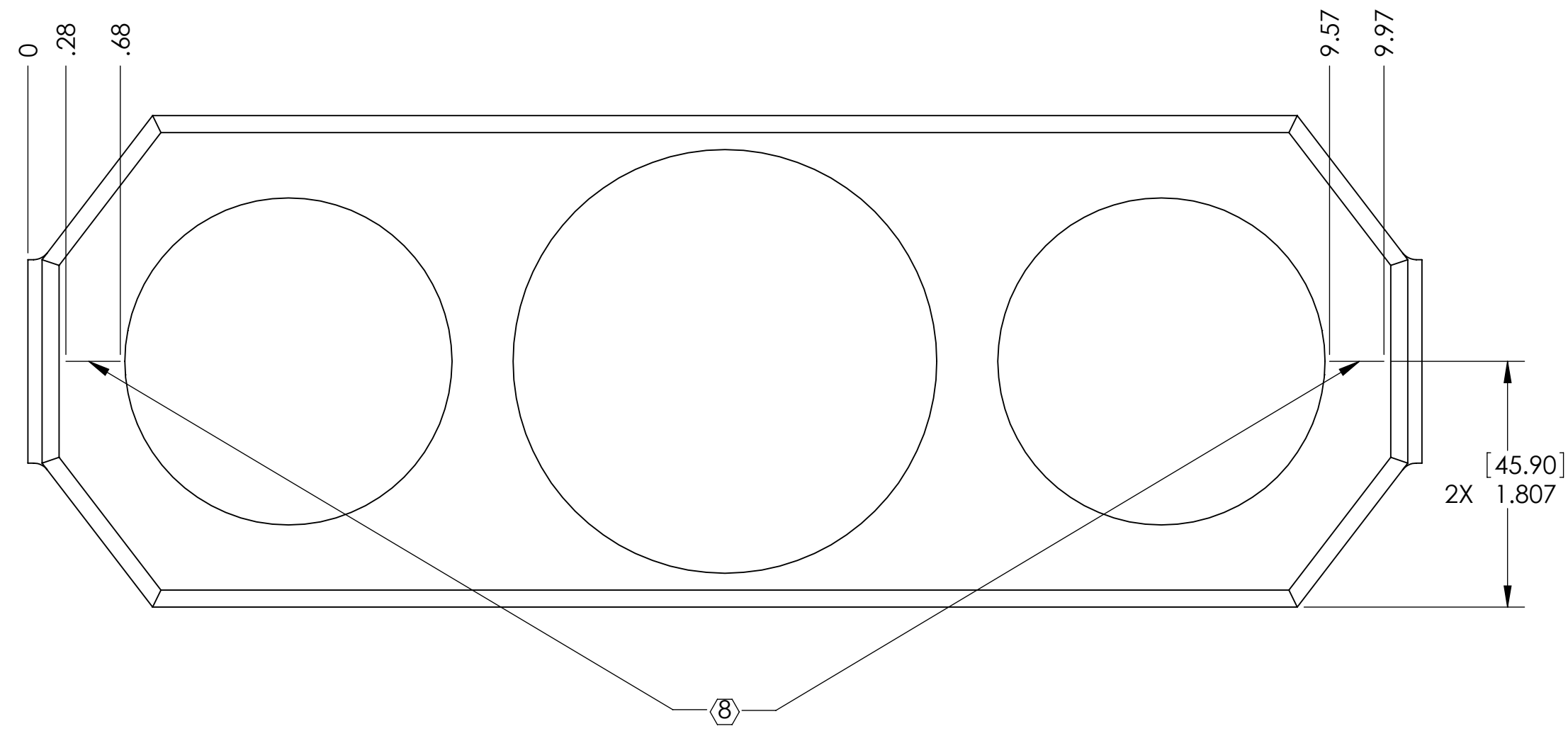
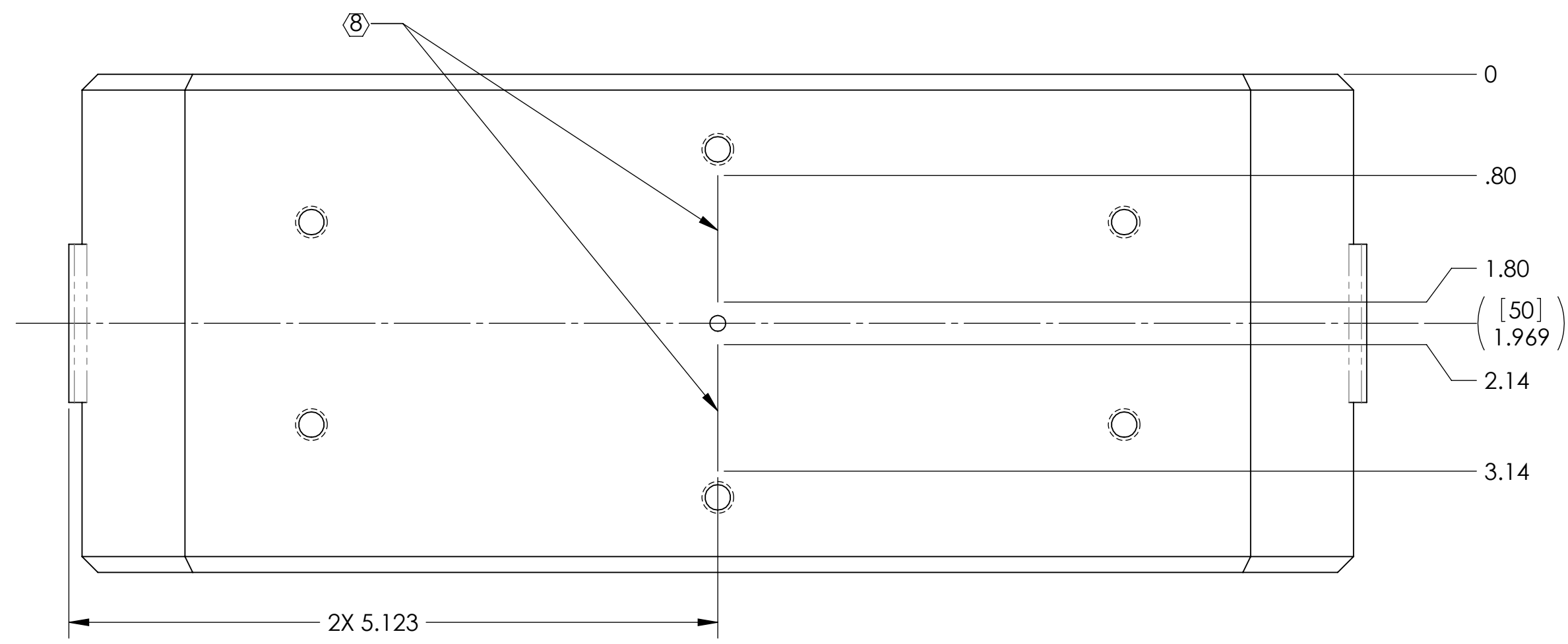
SYSTEM: ADVANCED LIGO
 SUB-SYSTEM: SUS
 NEXT ASSY: INTERMEDIATE MASS ASSY

PART NAME				MAIN SECTION		REV.	
DESIGNER	D. BRIDGES	02 AUG 2010	SIZE	DWG. NO.			
DRAFTER	D. BRIDGES	04 AUG 2010					
CHECKER	M. MEYER	04 AUG 2010					
APPROVAL							
SCALE: 1:1				PROJECTION:	SHEET 1 OF 2		

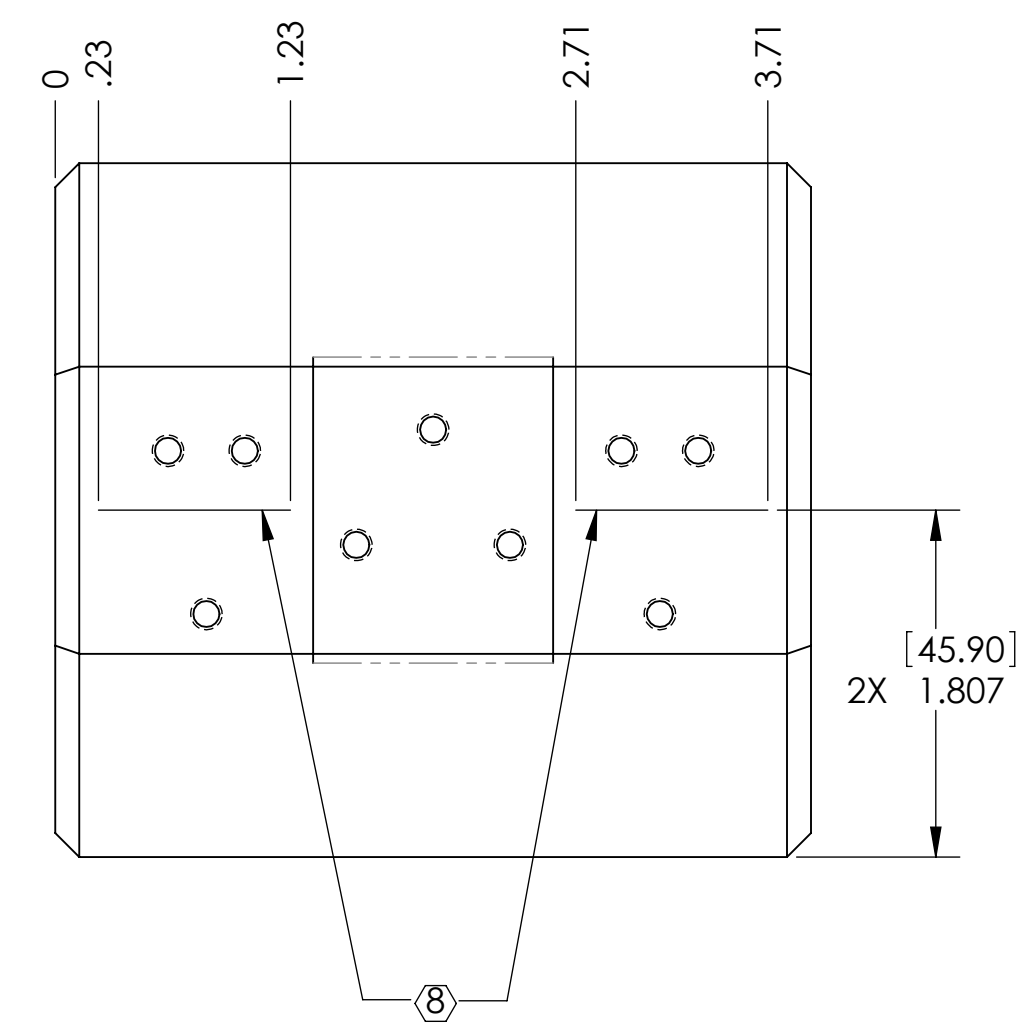
D070336

v3

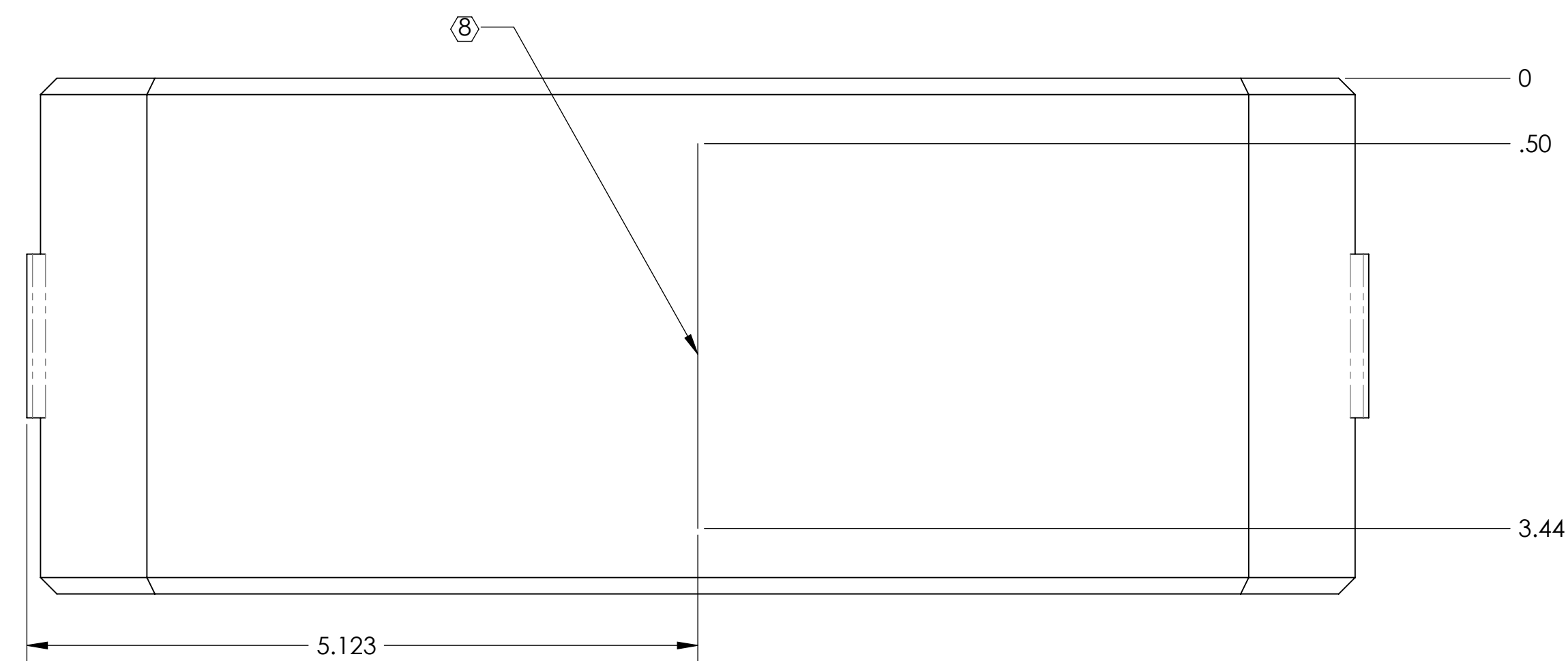
Ⓢ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART.



FRONT AND BACK SIDES



RIGHT AND LEFT SIDES

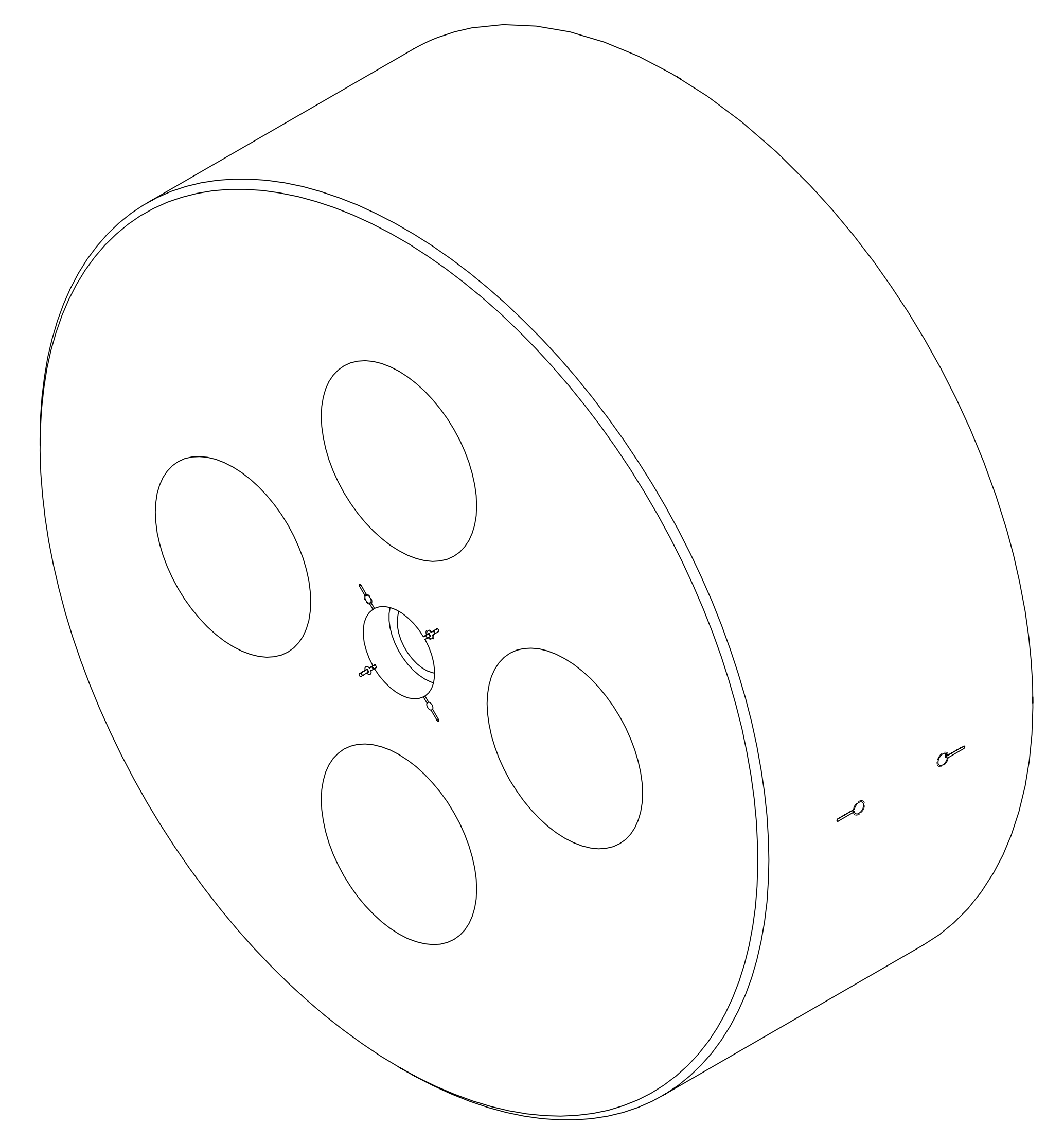
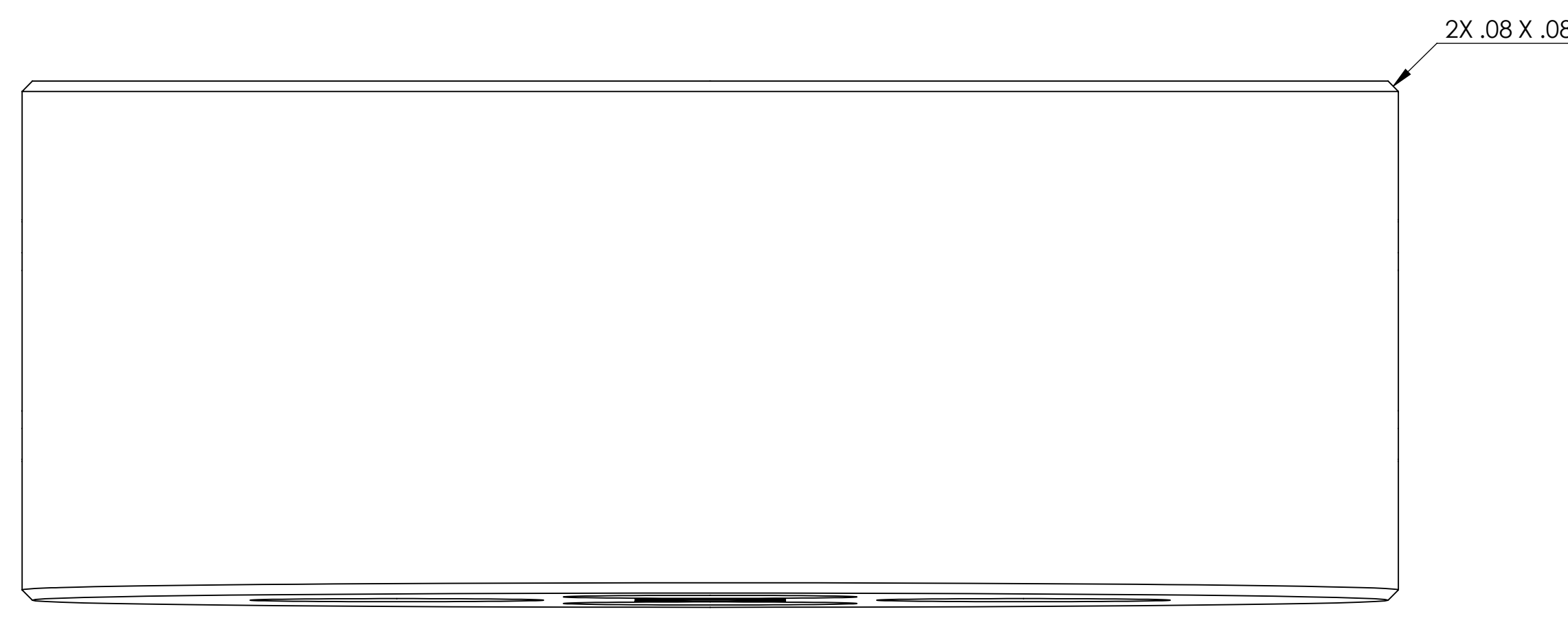
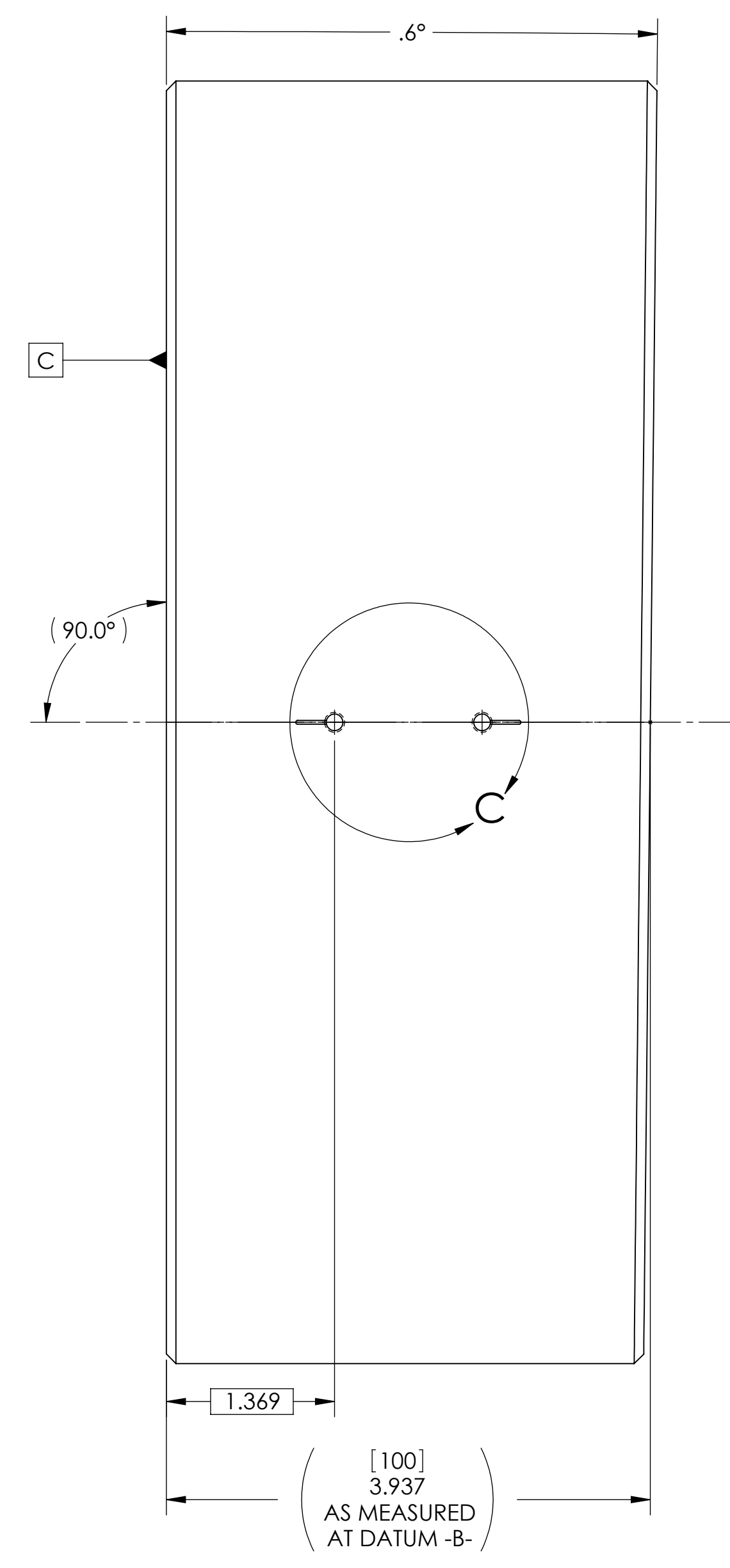
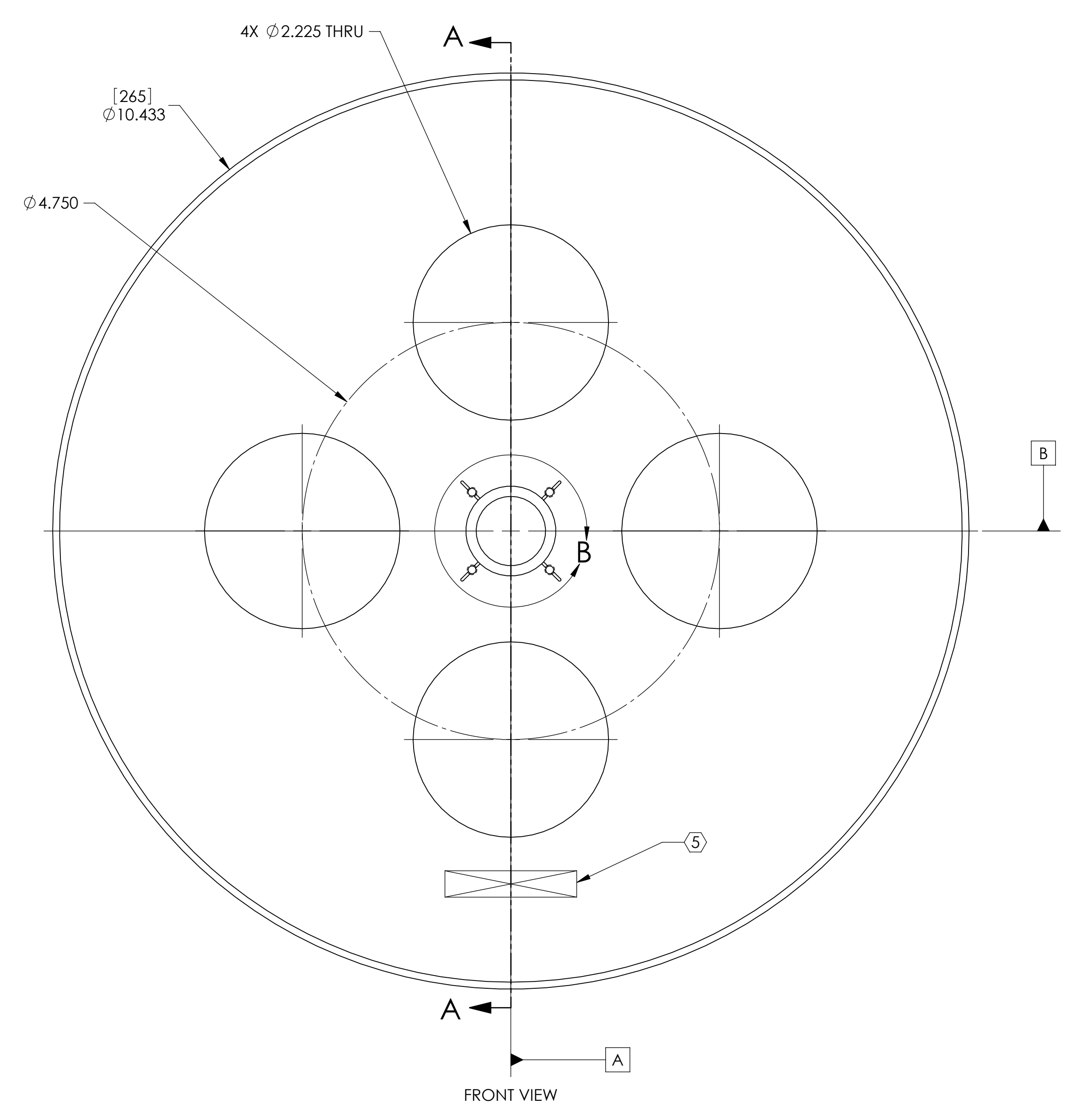
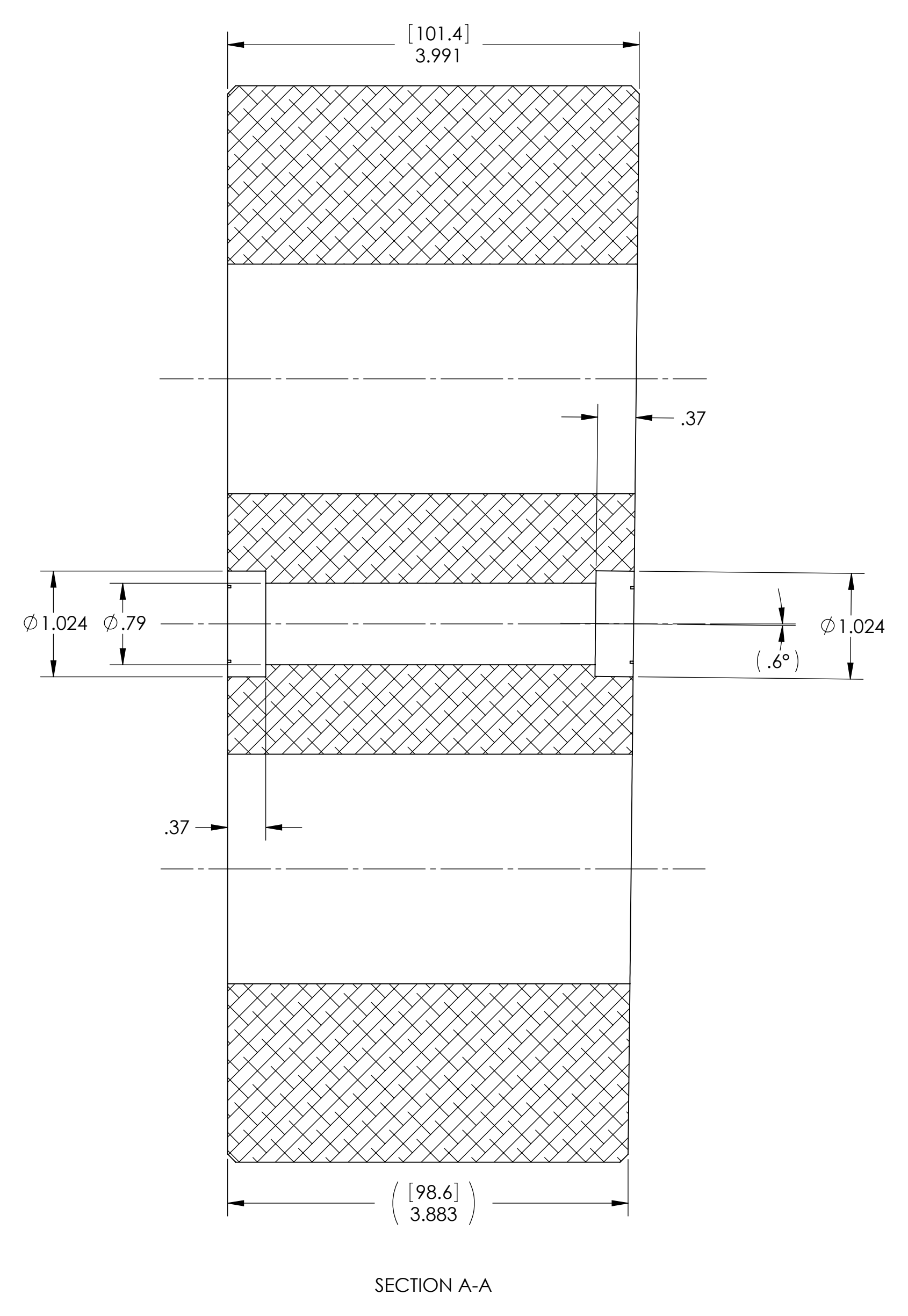
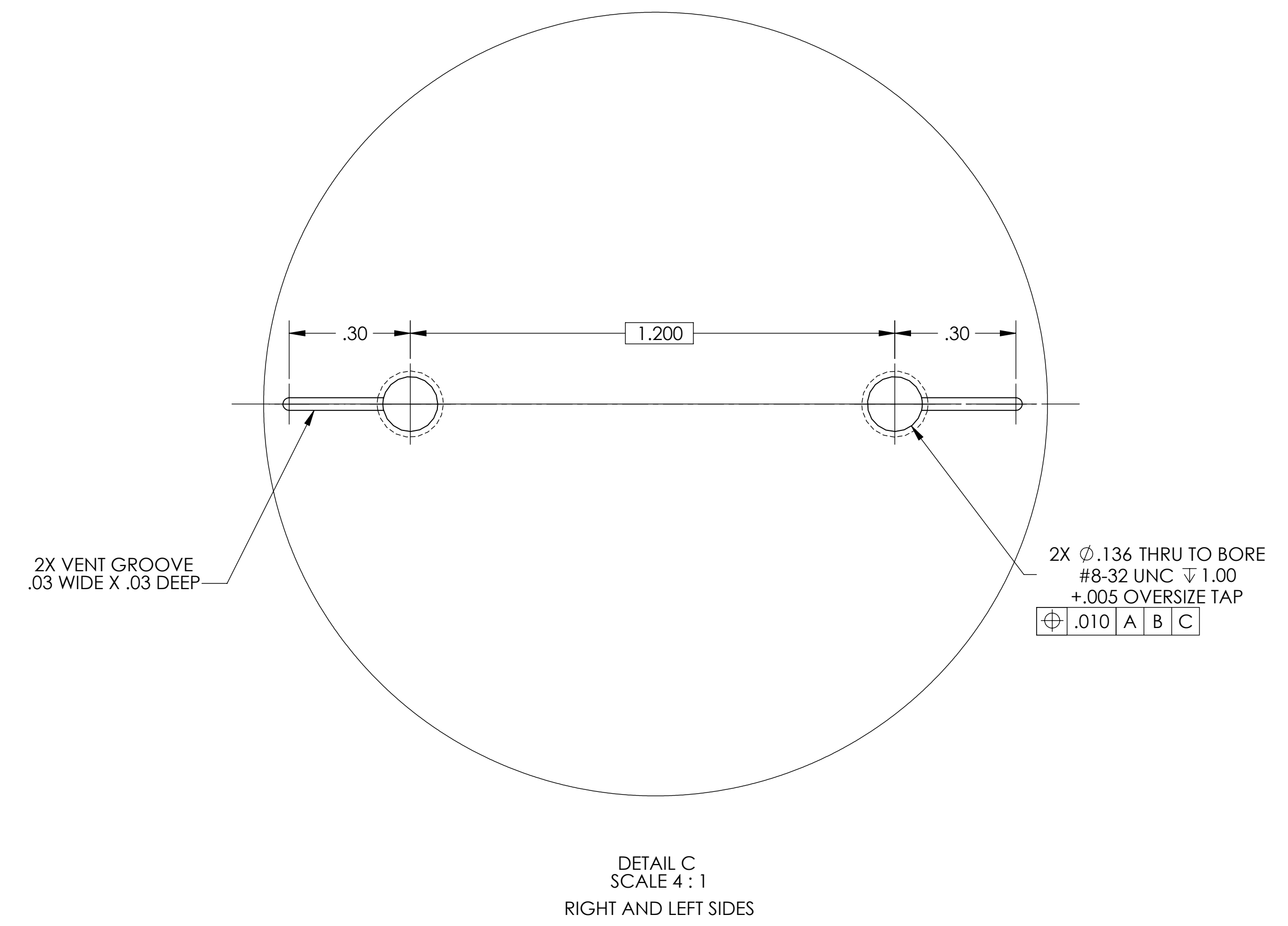
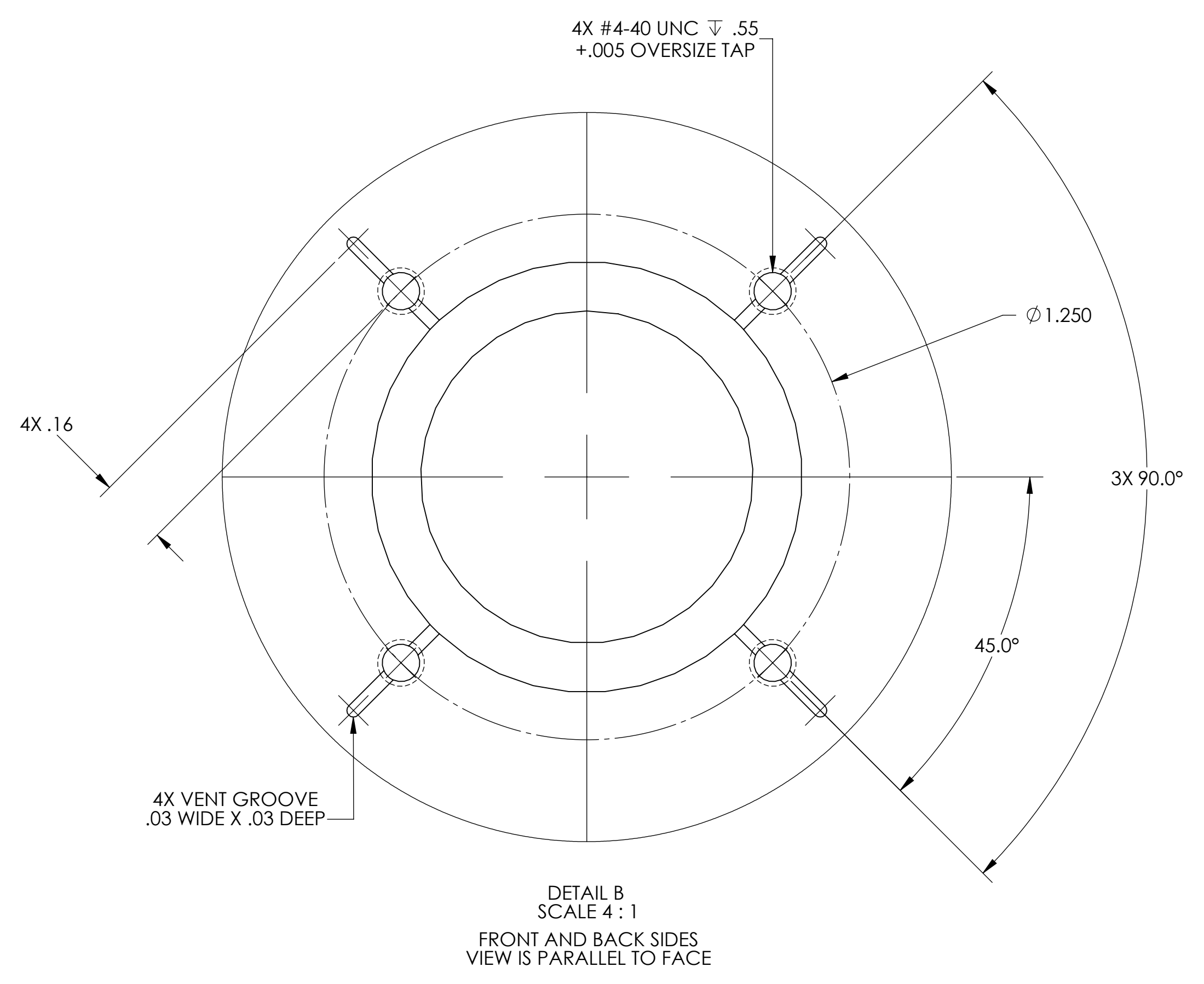


LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		REV.
SIZE	DWG. NO.	REV.
D	D070336	v3
SCALE: 1:1	PROJECTION:	SHEET 2 OF 2

D07036_Advanced_LIGO_SUS_HIT3_Mach_Section_Intermediate_Mach_Part_PDM_REV_V2-003_DRAWING_PDM_REV_V2-001

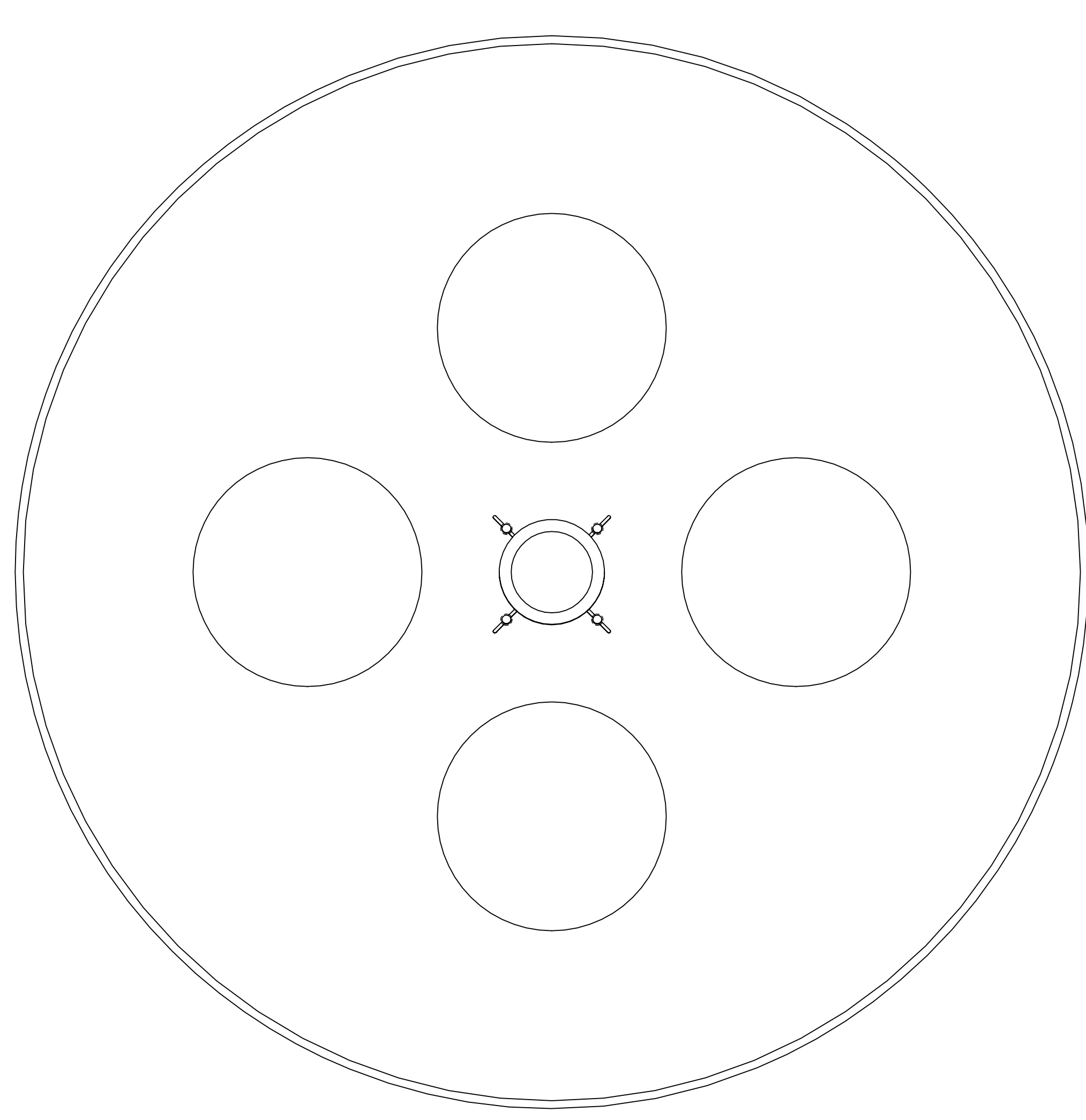
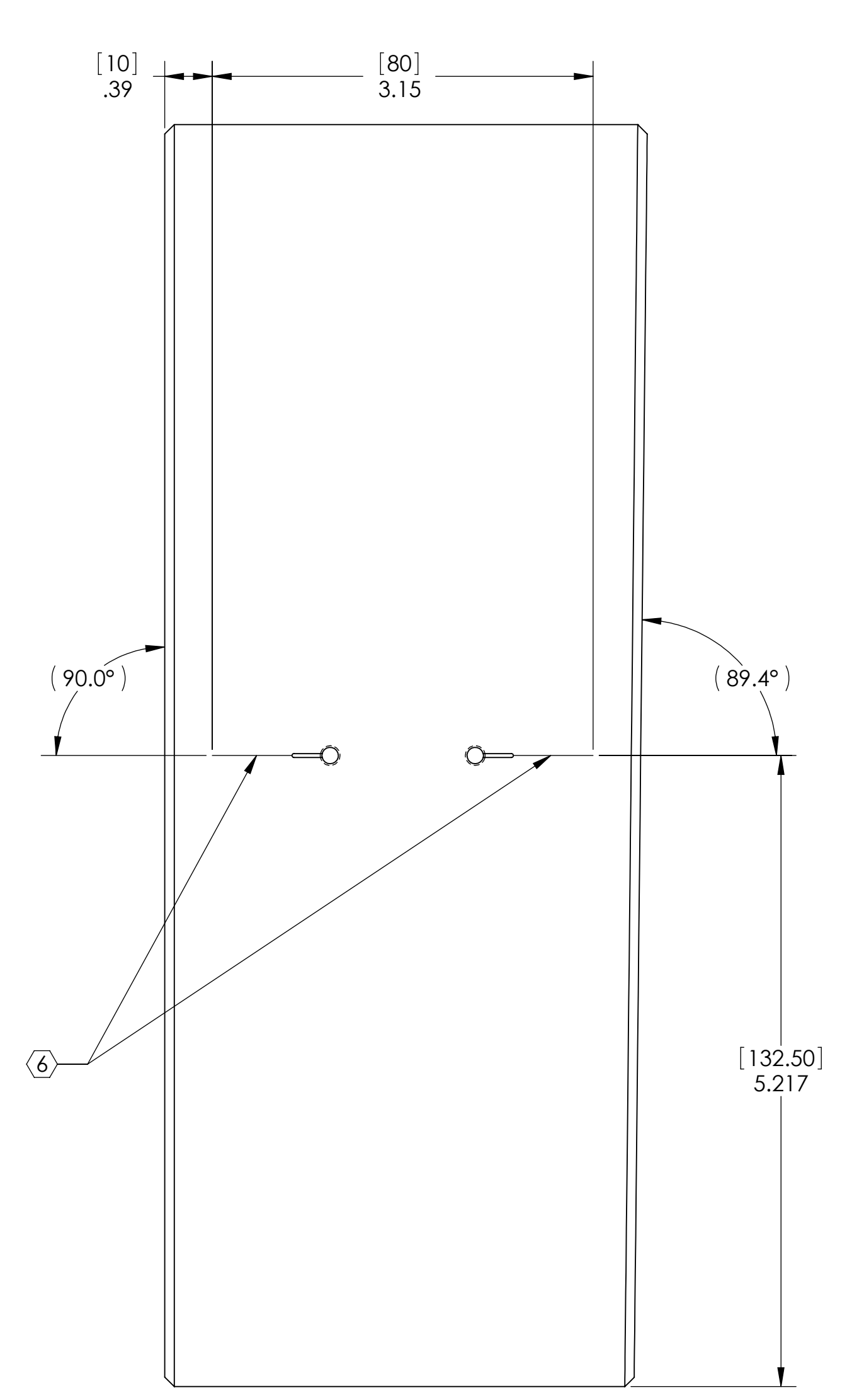
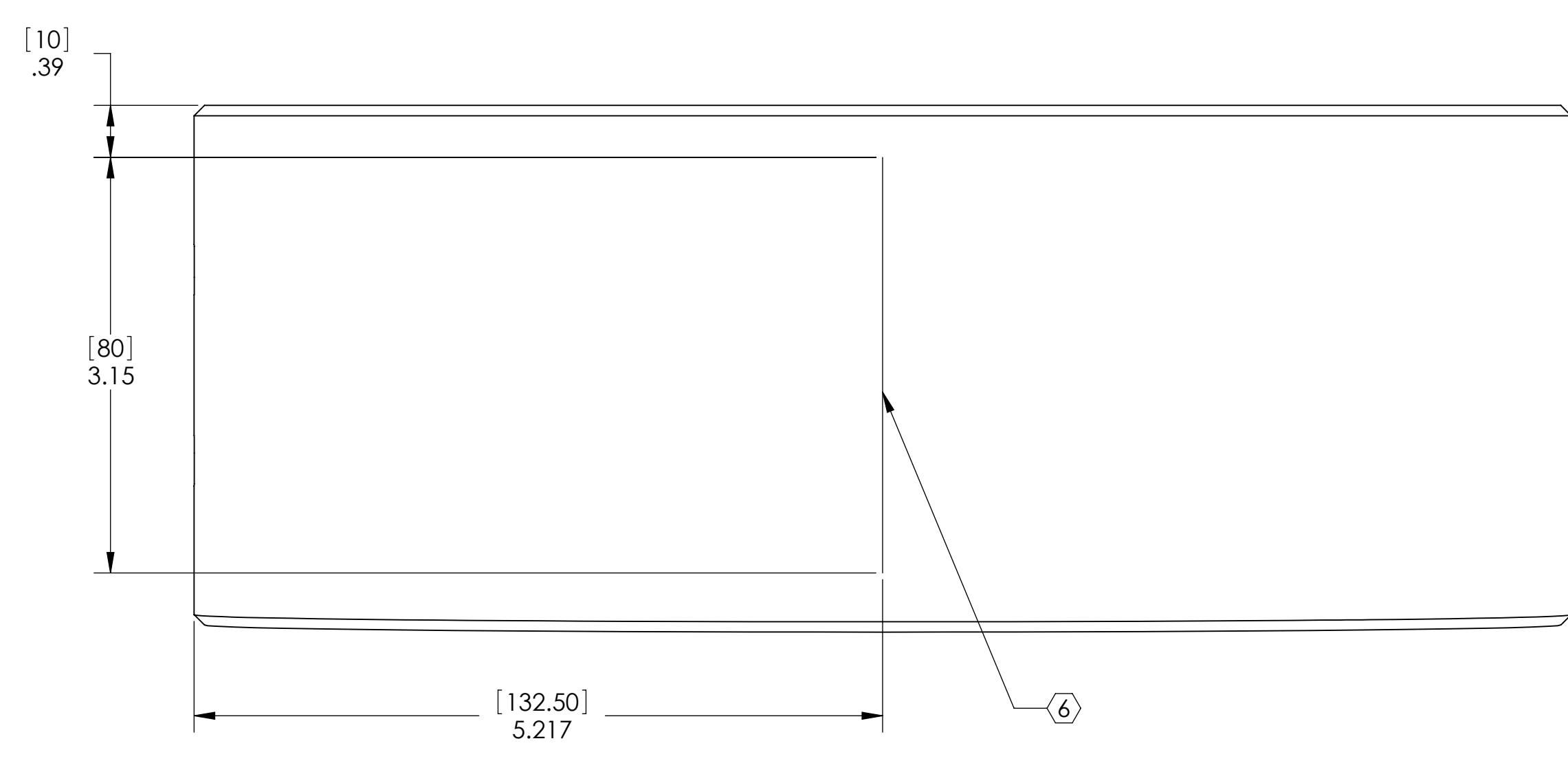
NOTES CONTINUED:
 ③ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER AND REVISION ON NOTED SURFACE FOLLOWED ON THE NEXT LINE BY A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE 27 HIGH CHARACTERS. EXAMPLE: DXXXXXX-VY, S/N 001. A VIBRATORY TOOL MAY BE USED.

REV.	DATE	DCN #	DRAWING TREE #
v1	06 JUL 2009	E0900189	E080191
v2	05 AUG 2009	E0900232	E080191
v3	03 SEP 2009	E0900277	E080191
v4	02 DEC 2010	E0900446	E080191

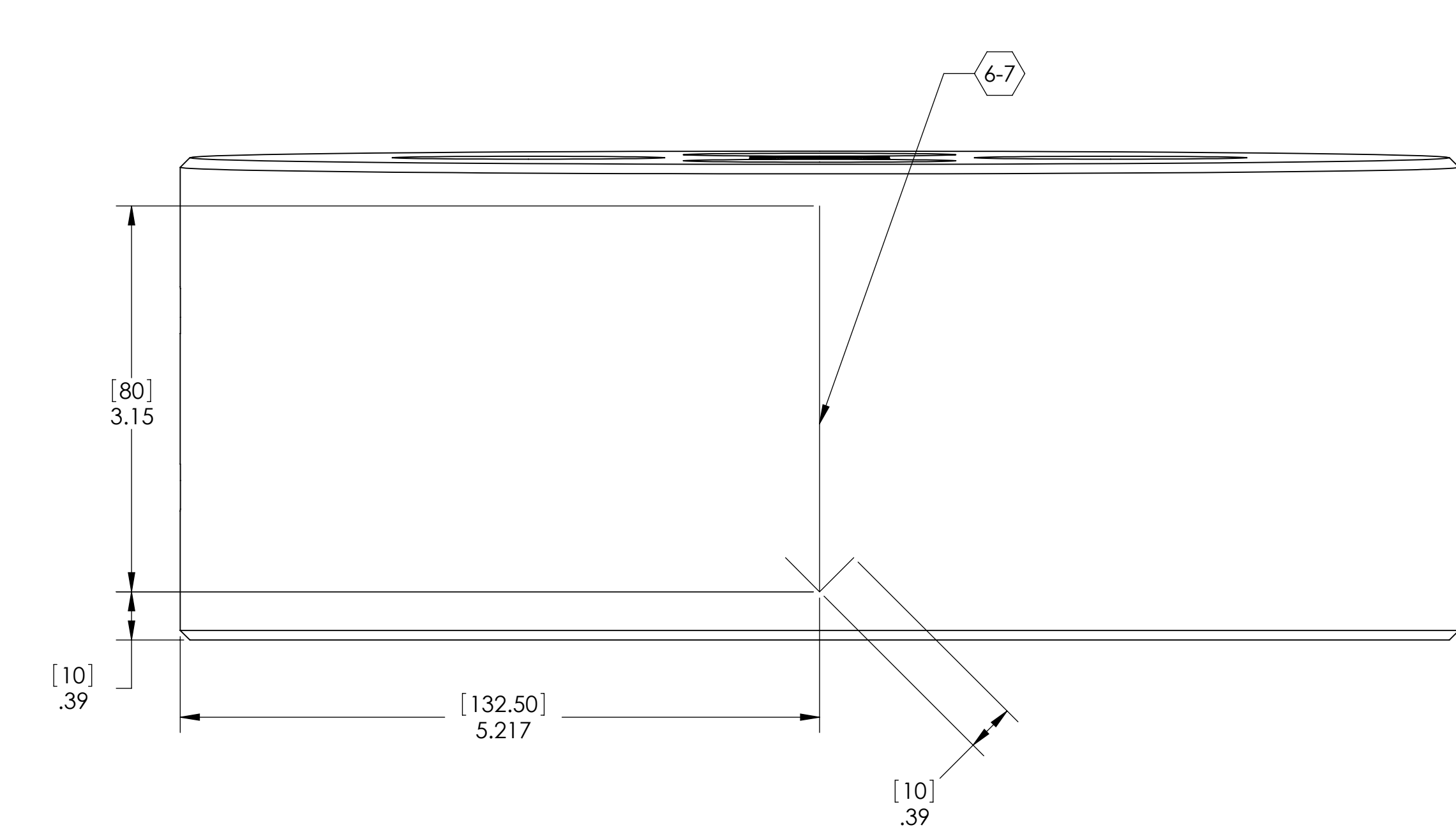
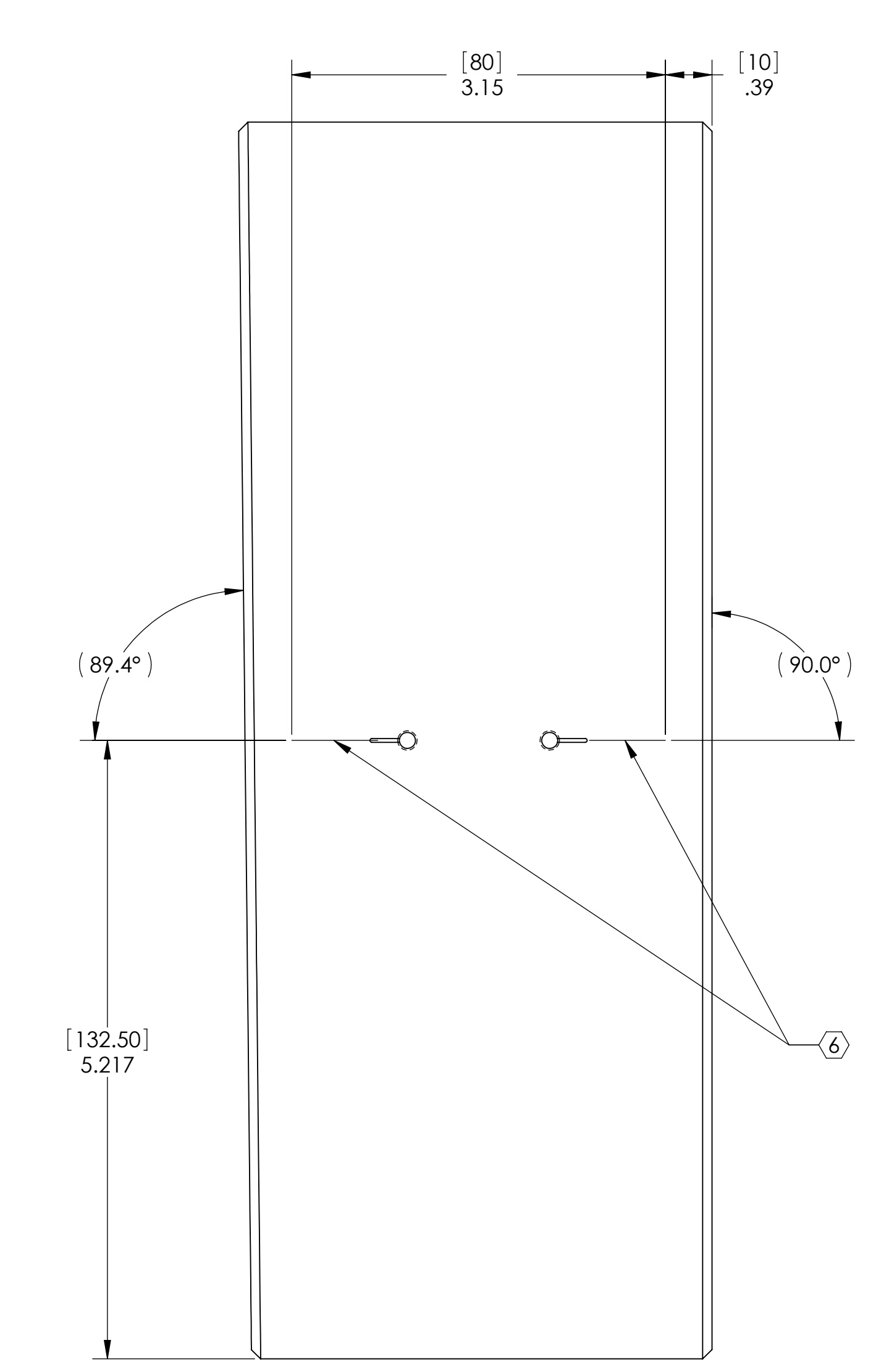


NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED) 1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.		CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY ADVANCED LIGO SUB-SYSTEM		PART NAME METAL TEST MASS	
DIMENSIONS ARE IN INCHES [MM] TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.1°		DESIGNER: D. BRIDGES 06 JAN 2010 DRAFTER: D. BRIDGES 06 JAN 2010 CHECKER: M. MEYER 06 JAN 2010 APPROVAL:		SIZE DWG. NO. E D070338 SCALE: 1:1 PROJECTION:	
MATERIAL: 6061-T6 Al FINISH: 32 μinch TEST MASS ASSY		NEXT ASSY:		REV. v4 SHEET 1 OF 2	

NOTES CONTINUED:
 (6) SCRIBE OR ENGRAVE LINES AS SHOWN
 .02 DEEP X .02 WIDE.
 (7) ARROW IS LOCATED AT MINIMUM THICKNESS OF PART WITH ARROW HEAD POINTING TOWARD WHAT IS THE HIGHLY REFLECTIVE SURFACE OF THE GLASS OPTIC.



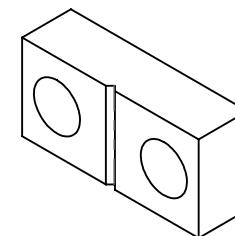
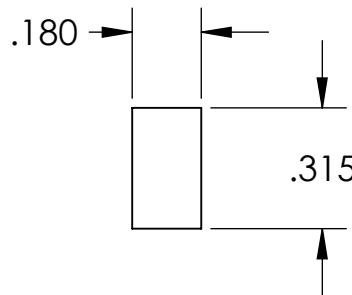
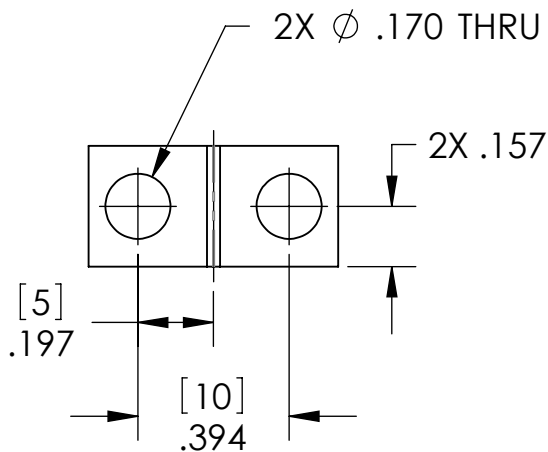
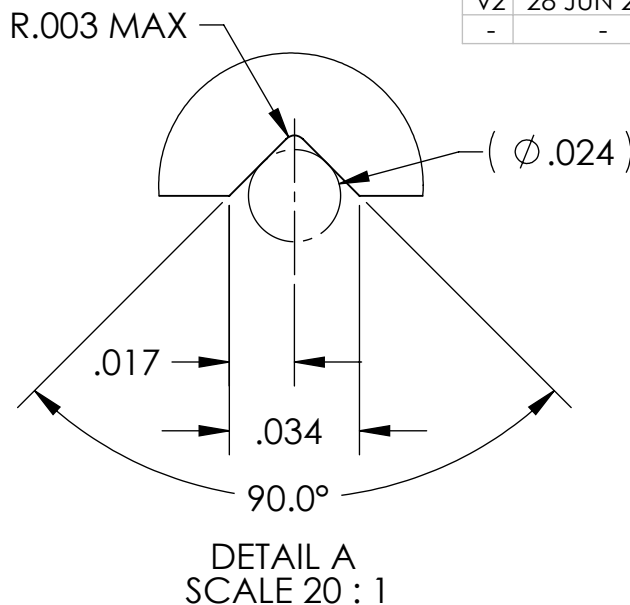
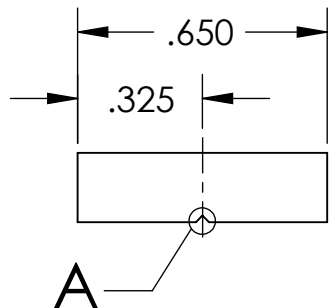
BACK VIEW



NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND QUANTITY. IF PARTS ARE TOO SMALL TO SCRIBE, BAGGING AND TAGGING ALONE IS SUFFICIENT.
EXAMPLE (PART): 001-v1
EXAMPLE (TAG): DXXXXXX-YY, TYPE-XX, QTY: TBD
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
A	01 AUG 2008	E080418	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.
- MATERIAL 304, 316 OR 302 SSSL
 FINISH 32 μinch

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 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS
 NEXT ASSY UPPER WIRE ASSEMBLY

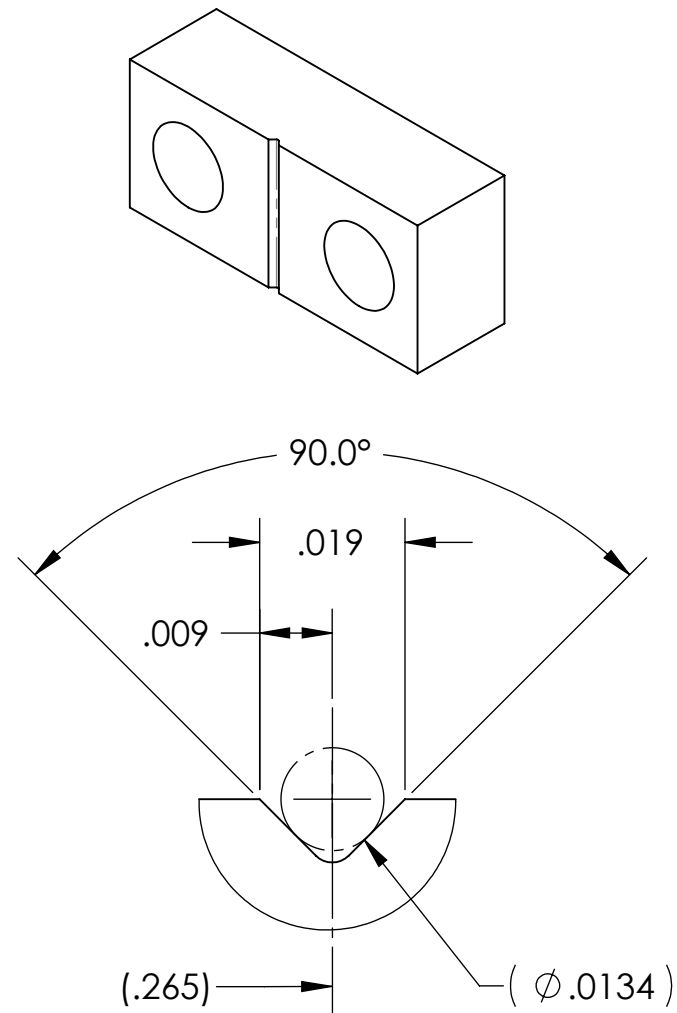
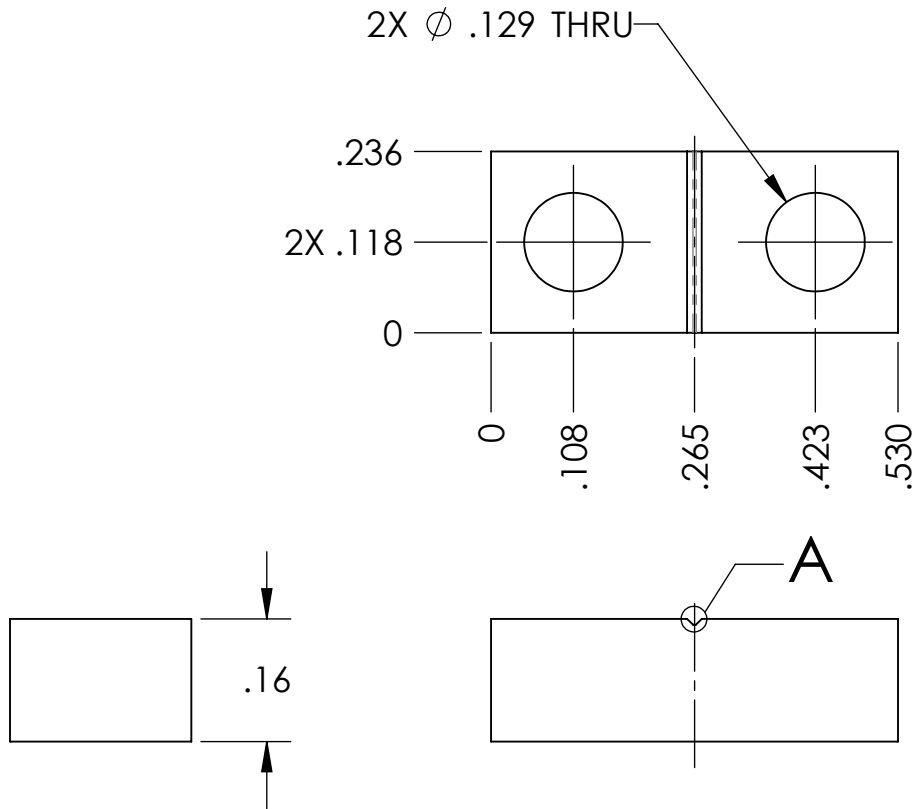
PART NAME UPPER CLAMP, UPPER WIRE, OUTSIDE

DESIGNER	D. BRIDGES	22 OCT 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	22 OCT 2010	A	D070341	v2
CHECKER	B. MOORE	24 OCT 2010	SCALE: 2:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND QUANTITY. IF PARTS ARE TOO SMALL TO SCRIBE, BAGGING AND TAGGING ALONE IS SUFFICIENT.
EXAMPLE (PART): 001-v1
EXAMPLE (TAG): DXXXXXX-VY, TYPE-XX, QTY: TBD
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1/A	01 AUG 2008	E080418	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-



DETAIL A
SCALE 40 : 1

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES	1. INTERPRET DRAWING PER ASME Y14.5-1994.
TOLERANCES: .XX ± .01 .XXX ± .005	2. REMOVE ALL SHARP EDGES, R.02 MIN.
ANGULAR ± 0.5°	3. DO NOT SCALE FROM DRAWING.
	4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.
MATERIAL 304, 316 OR 302 SSSL	FINISH 32 μ inch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: **ADVANCED LIGO** SUB-SYSTEM: **SUS**

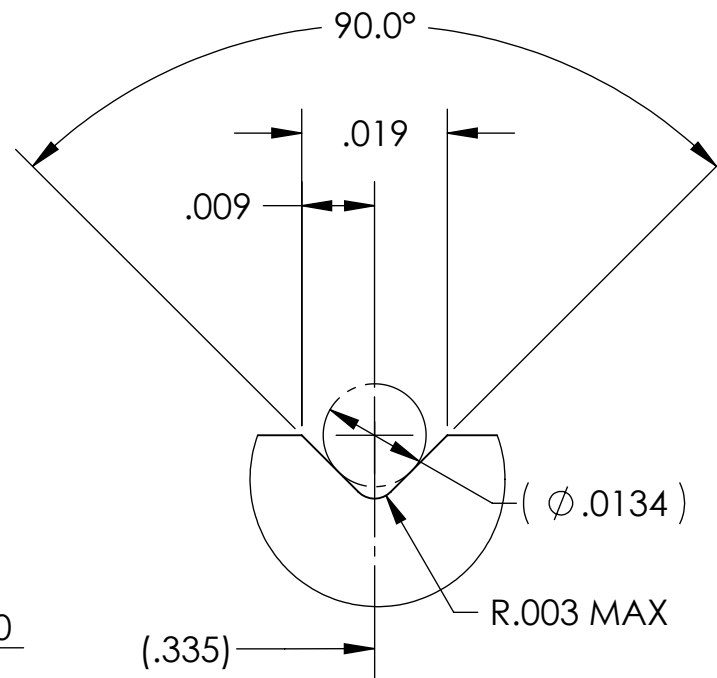
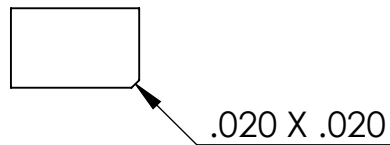
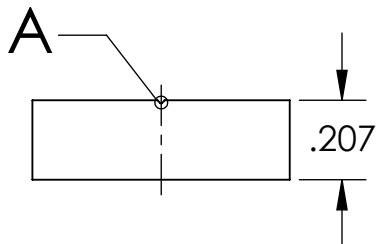
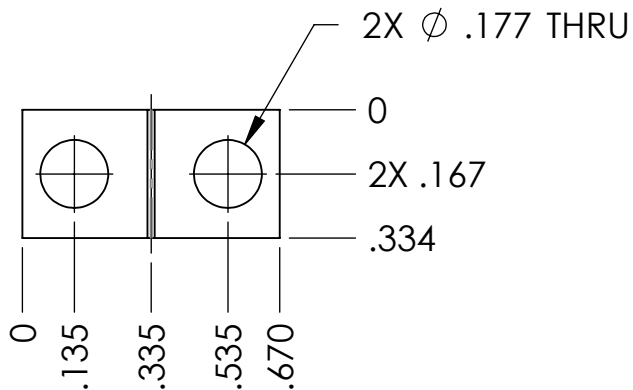
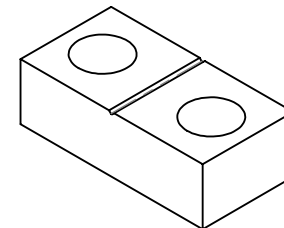
NEXT ASSY: **INTERMEDIATE WIRE ASSEMBLY**

PART NAME UPPER CLAMP, INTERMEDIATE WIRE, OUTSIDE		DESIGNER B. KIRSNER	DATE 07 MAR 2008	SIZE A	DWG. NO. D070394	REV. v2
DRAFTER D. BRIDGES	DATE 01 NOV 2010	CHECKER B. MOORE	DATE 02 NOV 2010	SCALE: 4:1	PROJECTION:	SHEET 1 OF 1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND QUANTITY. IF PARTS ARE TOO SMALL TO SCRIBE, BAGGING AND TAGGING ALONE IS SUFFICIENT.
EXAMPLE (PART): 001-v1
EXAMPLE (TAG): DXXXXXX-YY, TYPE-XX, QTY: TBD
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	30 JUN 2009	E0900184	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-



DETAIL A
SCALE 40 : 1

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 304, 316 OR 302 SSSL
 FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS
 NEXT ASSY INTERMEDIATE WIRE ASSY

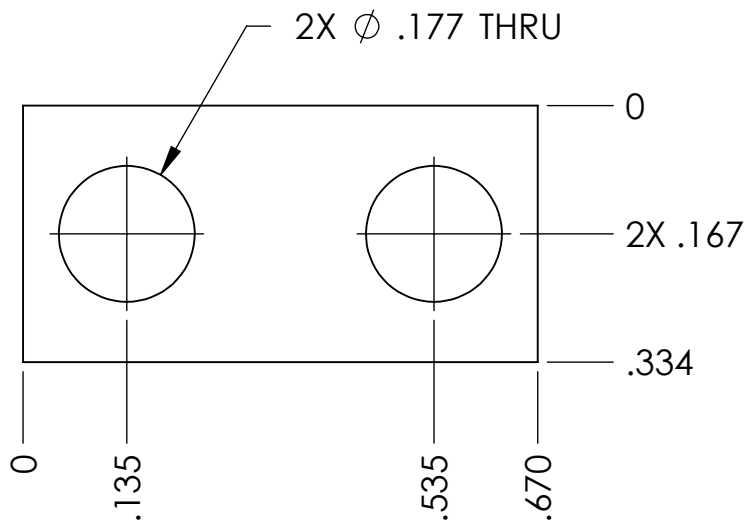
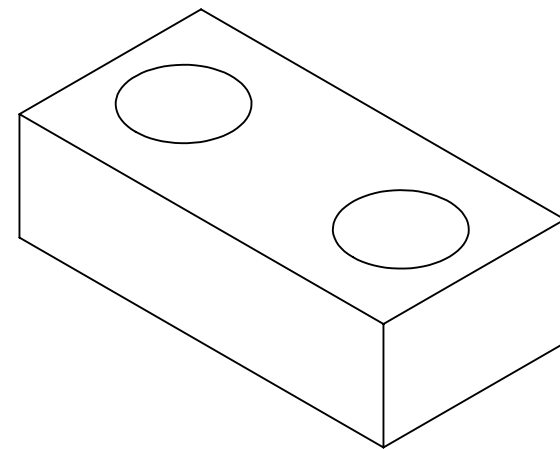
PART NAME LOWER CLAMP, INT. WIRE, INSIDE

DESIGNER	B. KIRSNER	14 MAR 2008	SIZE	DWG. NO.	REV.
DRAFTER	R. BIEDENHARN	01 NOV 2010	A	D070405	v2
CHECKER	D. BRIDGES	04 NOV 2010	SCALE: 2:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND QUANTITY. IF PARTS ARE TOO SMALL TO SCRIBE, BAGGING AND TAGGING ALONE IS SUFFICIENT.
EXAMPLE (PART): 001-v1
EXAMPLE (TAG): DXXXXXX-VY, TYPE-XX, QTY: TBD
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	30 JUN 2009	E0900184	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES	1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.
TOLERANCES: .XX ± .01 .XXX ± .005	
ANGULAR ± 0.5°	
MATERIAL 304, 316 OR 302 SSSL	FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: **ADVANCED LIGO** SUB-SYSTEM: **SUS**

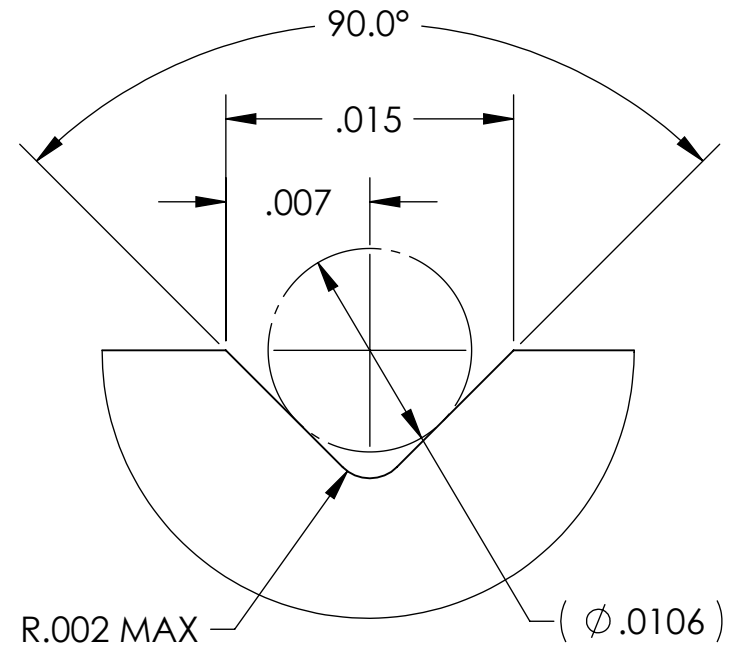
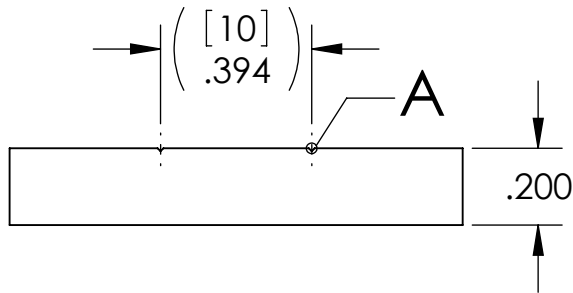
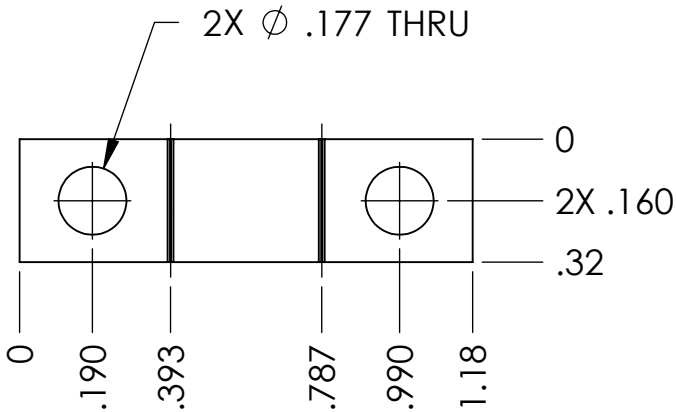
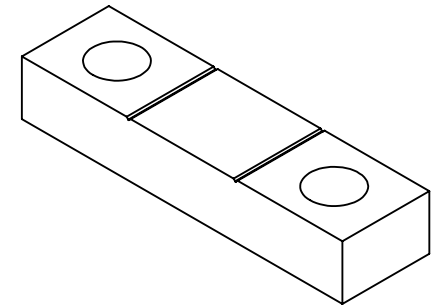
NEXT ASSY: **INTERMEDIATE WIRE ASSY**

PART NAME LOWER CLAMP, INT. WIRE, OUTSIDE			
DESIGNER B. KIRSNER	14 MAR 2009	SIZE A	DWG. NO. D070406
DRAFTER R. BIEDENHARN	01 NOV 2010		REV. v2
CHECKER D. BRIDGES	04 NOV 2010		
APPROVAL		SCALE: 4:1	PROJECTION:
			SHEET 1 OF 1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS & REVISION NUMBER START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND QUANTITY. IF PARTS ARE TOO SMALL TO SCRIBE, BAGGING AND TAGGING ALONE IS SUFFICIENT.
EXAMPLE (PART): 001-v1
EXAMPLE (TAG): DXXXXXXX-VY, TYPE-XX, QTY: TBD
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	09 JUL 2009	E0900193	E080191
v2	03 SEP 2009	E0900277	E080191
v3	28 JUN 2010	E1000236	E080191



DETAIL A
SCALE 100 : 1
WIRE GROOVE
2X

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]	1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.
TOLERANCES: .XX ± .01 .XXX ± .005	
ANGULAR ± 0.5°	
MATERIAL 304, 316 OR 302 SSSL	FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

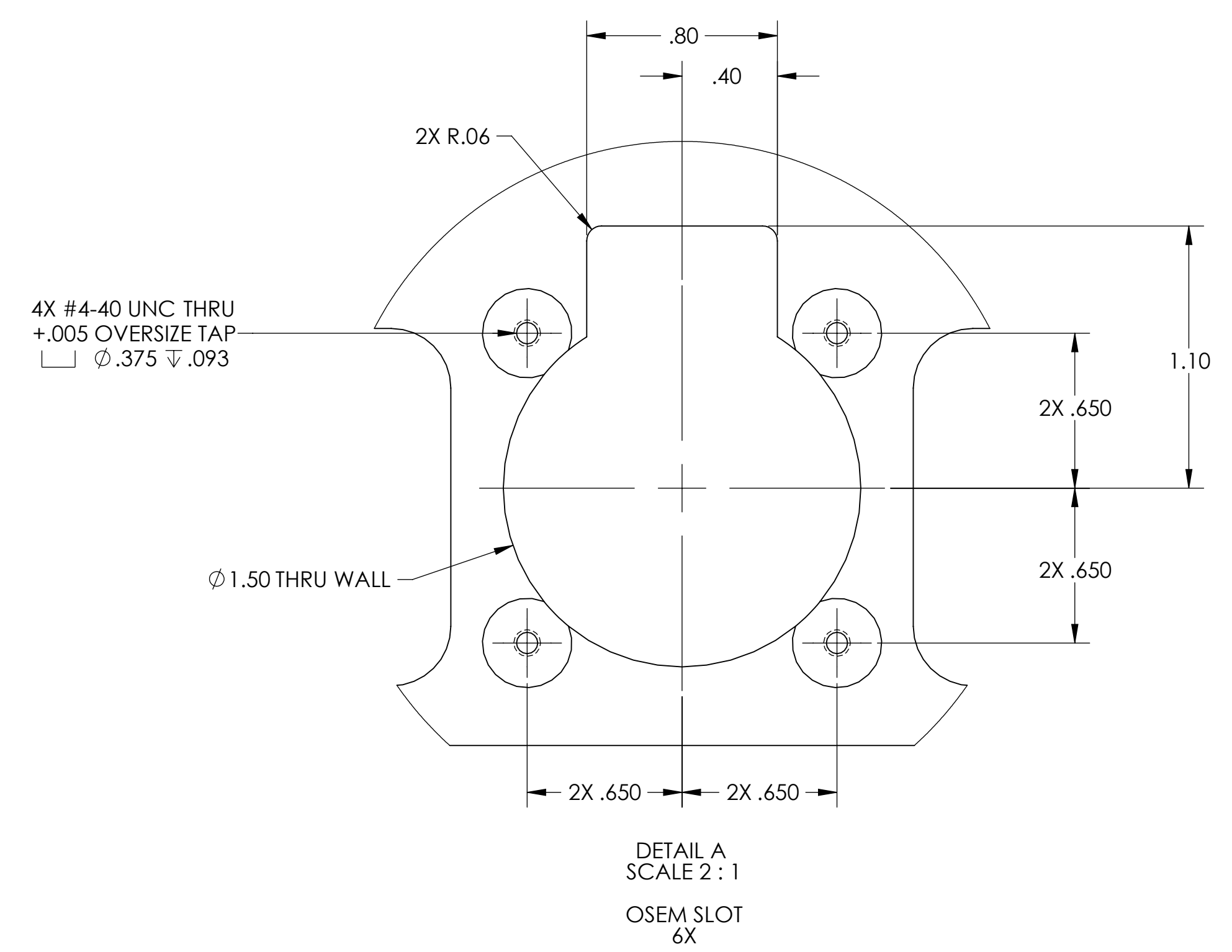
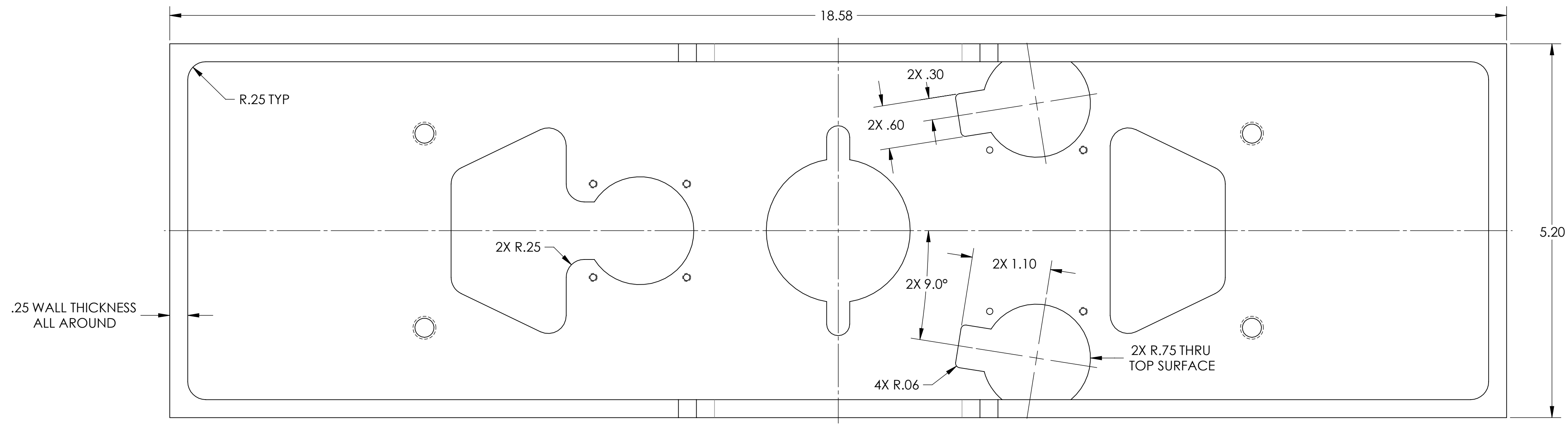
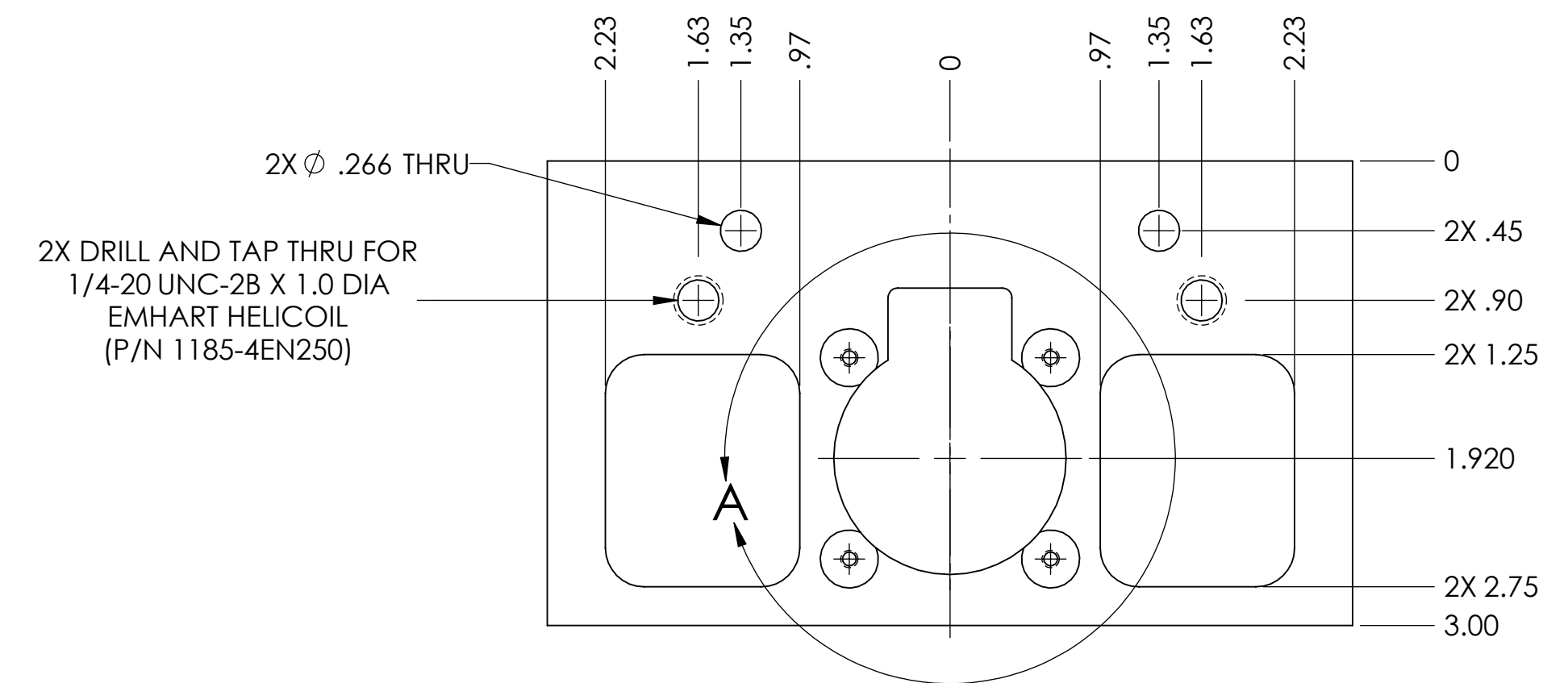
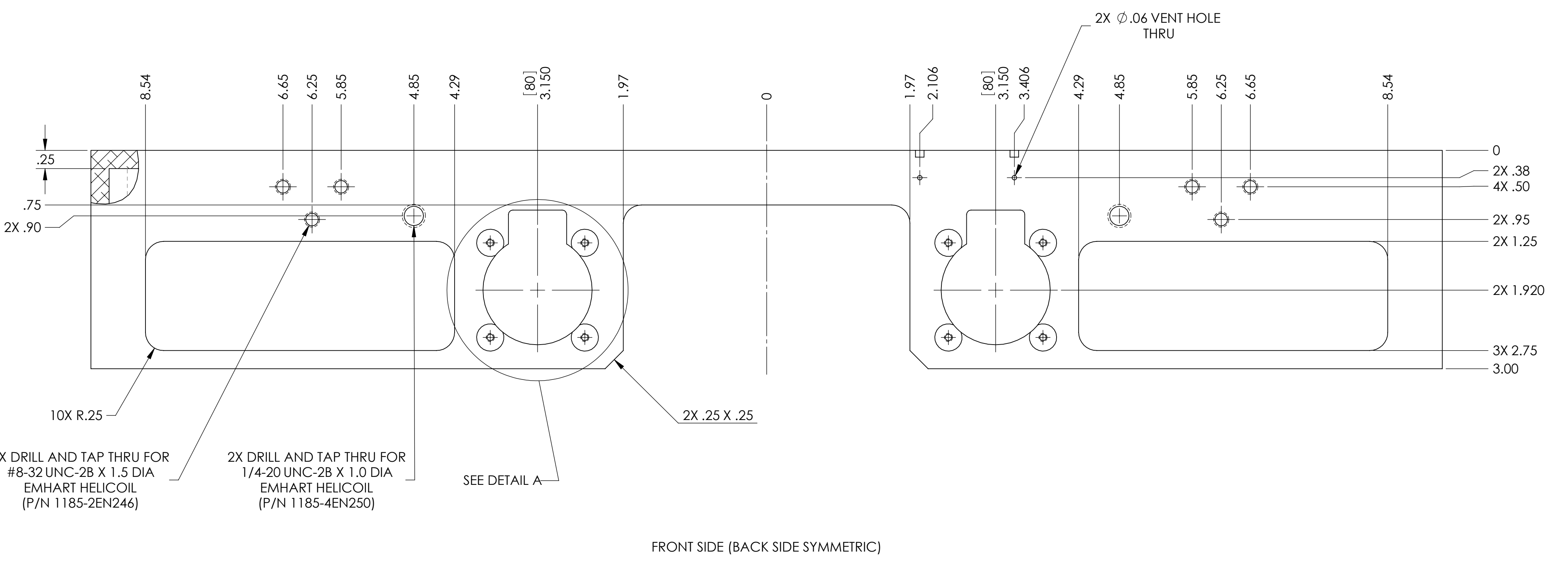
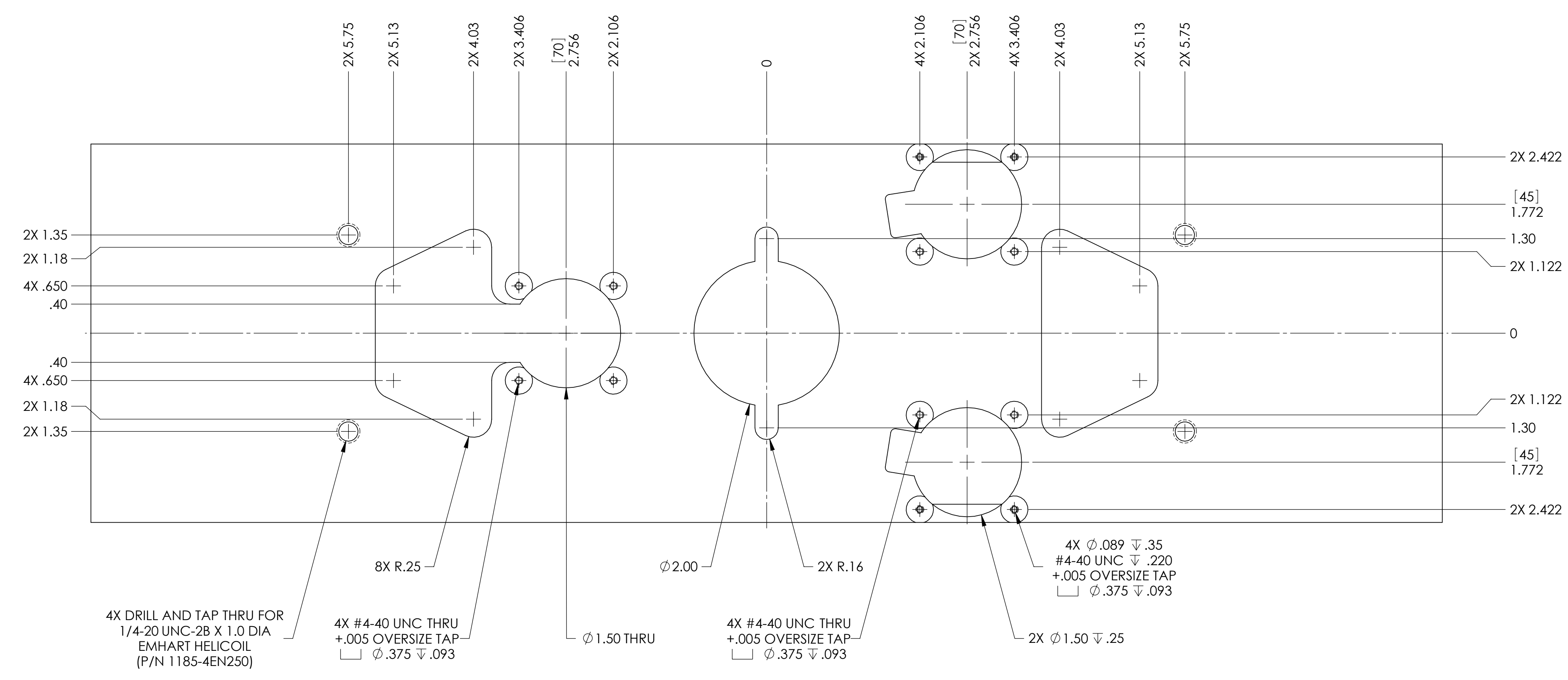
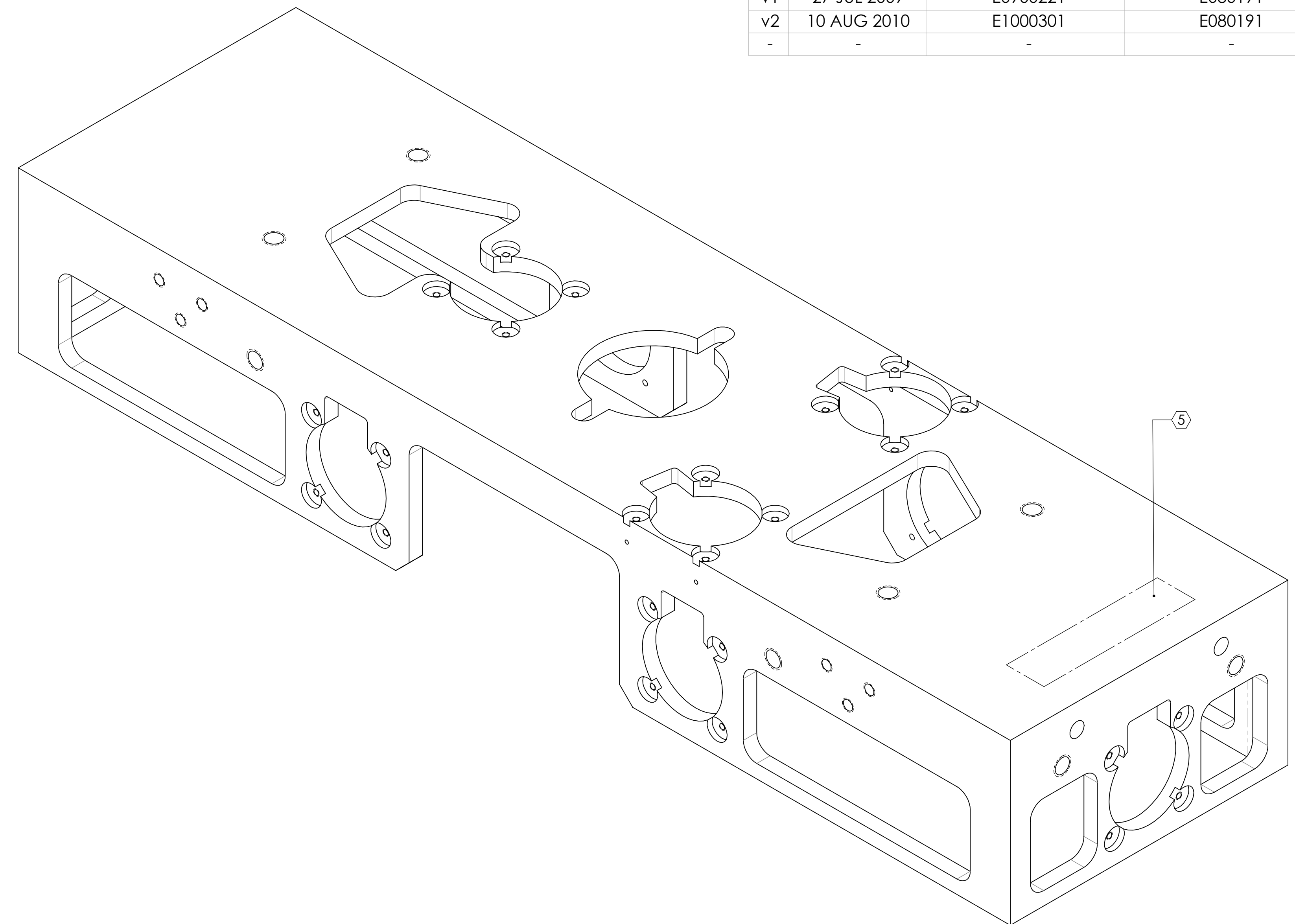
SYSTEM: **ADVANCED LIGO** SUB-SYSTEM: **SUS**

NEXT ASSY: **LOWER LOOP WIRE ASSY**

PART NAME CLAMP, LOWER LOOP WIRE		DESIGNER D. BRIDGES		DATE 09 SEP 2009		SIZE A		DWG. NO. D070438		REV. v3	
DRAFTER R. BIEDENHARN		CHECKER D. BRIDGES		DATE 01 NOV 2010		DATE 04 NOV 2010		SCALE: 2:1		PROJECTION:	
APPROVAL										SHEET 1 OF 1	

NOTES CONTINUED:
 3. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR TYPE IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE-DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
 EXAMPLE: DXXXXXX-Y; TYPE XX, S/N XXX
 4. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 5. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E900364.
 6. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
 7. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

REV.	DATE	DCN #	DRAWING TREE #
v1	27 JUL 2009	E0900221	E080191
v2	10 AUG 2010	E1000301	E080191
-	-	-	-

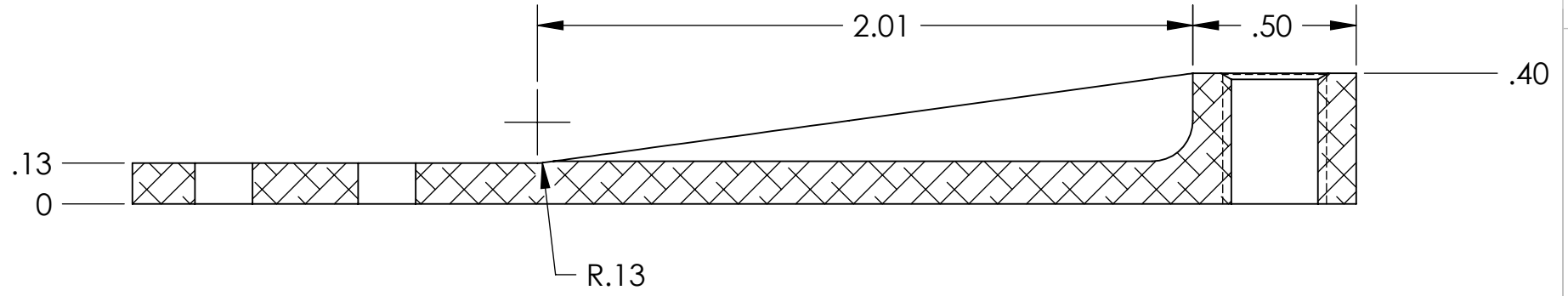
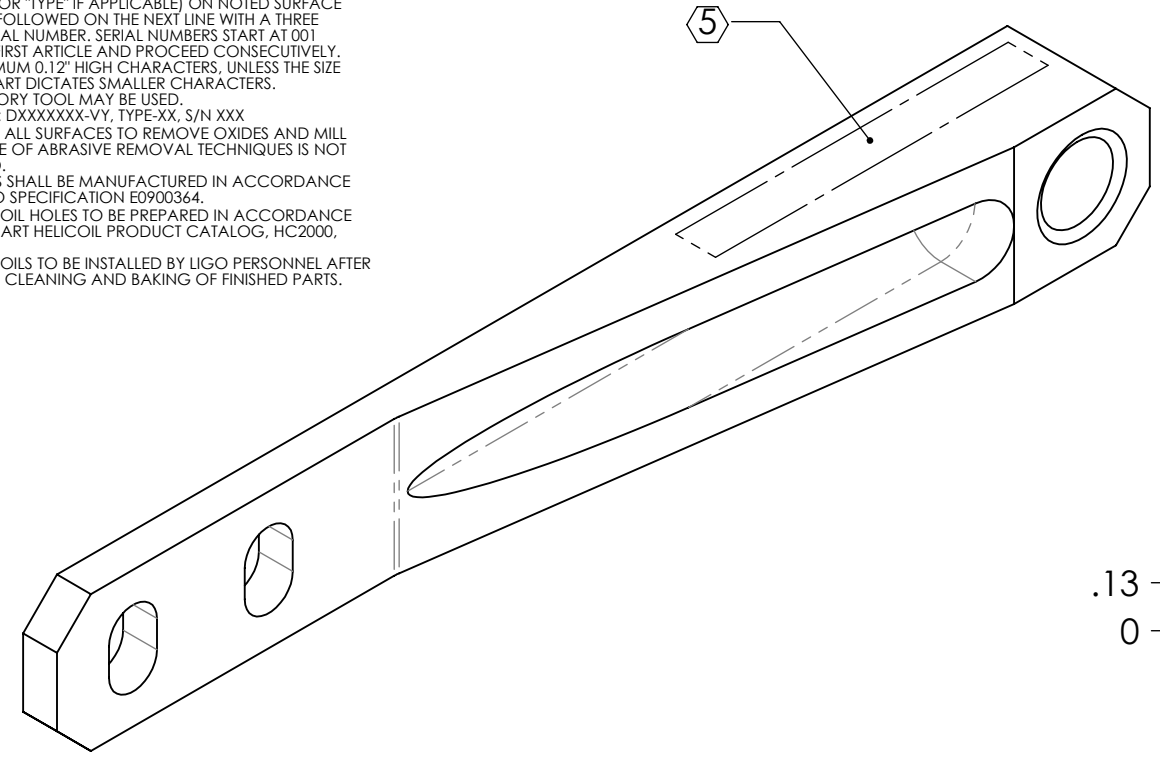


DIMENSIONS ARE IN INCHES [MM]		NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)		CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
TOLERANCES: .XX ± .01 .XXX ± .005		1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		LIGO		COIL HOLDER	
ANGULAR ± 0.5°		MATERIAL 6061-T6 Al		SYSTEM ADVANCED LIGO		DESIGNER D. BRIDGES	
		FINISH 32 μ inch		SUB-SYSTEM SUS		DRAFTER D. BRIDGES	
				NEXT ASSY COIL HOLDER ASSY		CHECKER M. MEYER	
						APPROVAL	
						DATE 09 AUG 2010	
						SIZE DWG. NO. E	
						D070449	
						REV. v2	
						SCALE: 1:1	
						PROJECTION:	
						SHEET 1 OF 1	

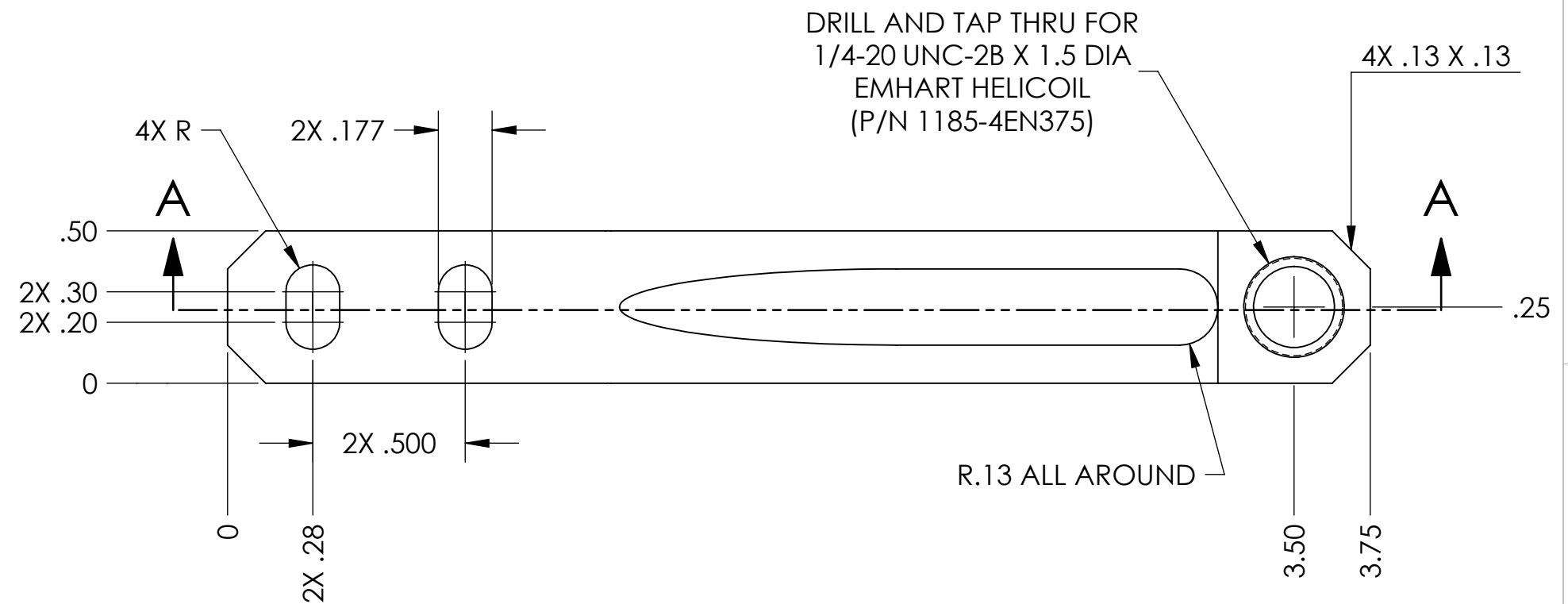
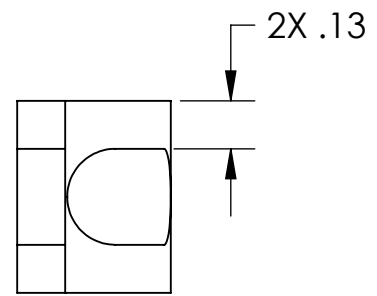
D070460_Advanced_LIGO_SUS_HLTS_Earthquake_Stop_Mount_Long, PART PDM REV: V1-001, DRAWING PDM REV: V1-000

- NOTES CONTINUED:**
- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
 - 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 - 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
 - 8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
 - 9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

REV.	DATE	DCN #	DRAWING TREE #
v1	02 JUN 2009	E0900162	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-



SECTION A-A



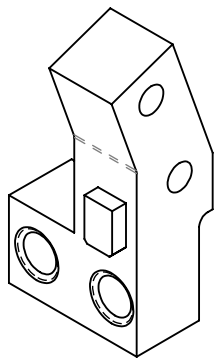
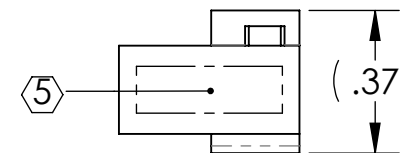
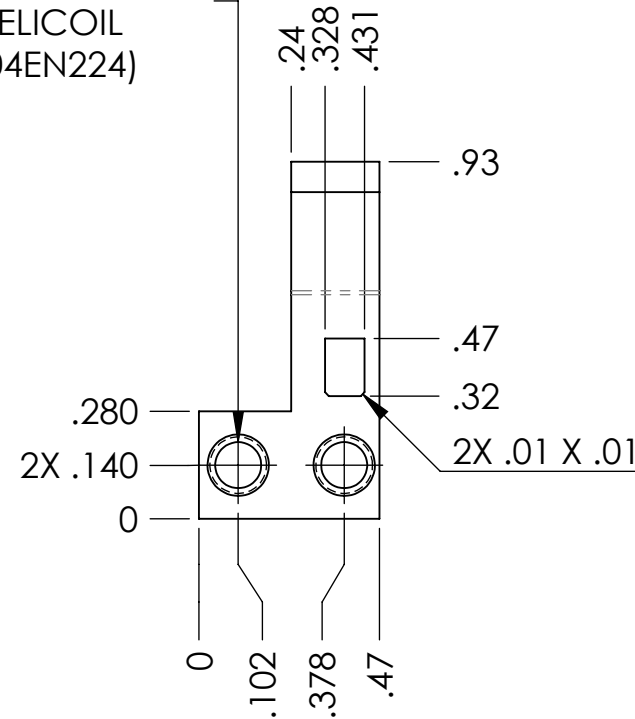
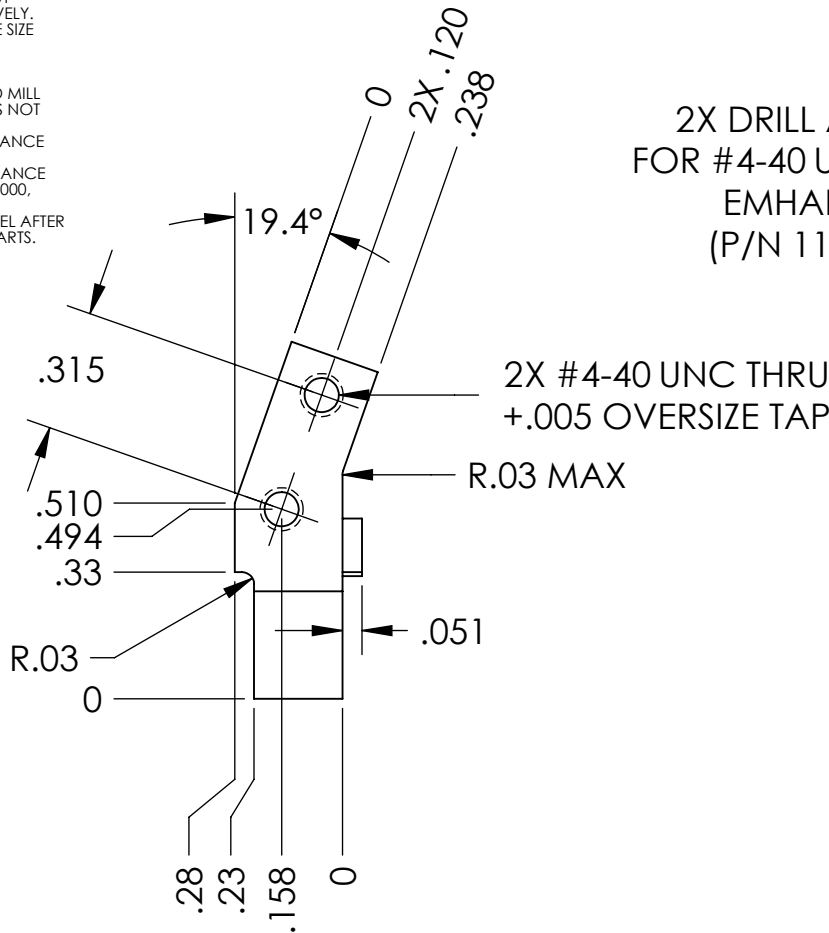
NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)				LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.5°				1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		EARTHQUAKE STOP MOUNT, LONG	
						MATERIAL 6061-T6 Al FINISH 63 μinch	
				NEXT ASSY EARTHQUAKE STOP ASSY, LONG MOUNT		DESIGNER D. BRIDGES 05 NOV 2008 DRAFTER D. BRIDGES 02 NOV 2010 CHECKER B. MOORE 03 NOV 2010 APPROVAL	
						SIZE DWG. NO. B D070460 REV. v2 SCALE: 2:1 PROJECTION: SHEET 1 OF 1	

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
- 9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

REV.	DATE	DCN #	DRAWING TREE #
v1	28 APR 2009	E080418	E080191
v2	30 JUN 2009	E0900184	E080191
v3	28 JUN 2010	E1000236	E080191

2X DRILL AND TAP THRU
FOR #4-40 UNC-2B X 2.0 DIA
EMHART HELICOIL
(P/N 1185-04EN224)



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.1°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 304, 316 OR 302 SSSL
FINISH 32 μinch



SYSTEM ADVANCED LIGO
SUB-SYSTEM SUS
NEXT ASSY INTERMEDIATE WIRE ASSY

PART NAME		UPPER CLAMP, INT. WIRE, INSIDE	
DESIGNER	D. BRIDGES	10 OCT 2008	SIZE DWG. NO.
DRAFTER	R. BIEDENHARN	01 NOV 2010	A D070585
CHECKER	D. BRIDGES	04 NOV 2010	REV. v3
APPROVAL		SCALE: 2:1	PROJECTION:

D080124_Advanced_LIGO_SUS_HLTS_Prism_Breakoff_Lower_Wire_Test_Mass_PART PDM REV: V2_DRAWING PDM REV: V2-001

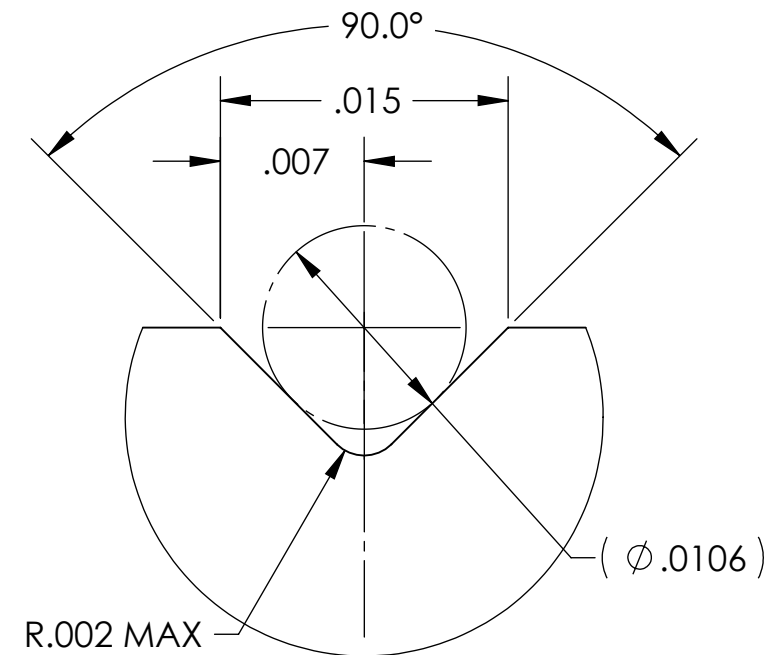
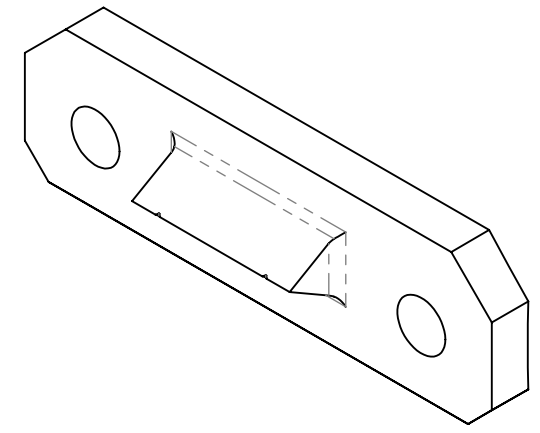
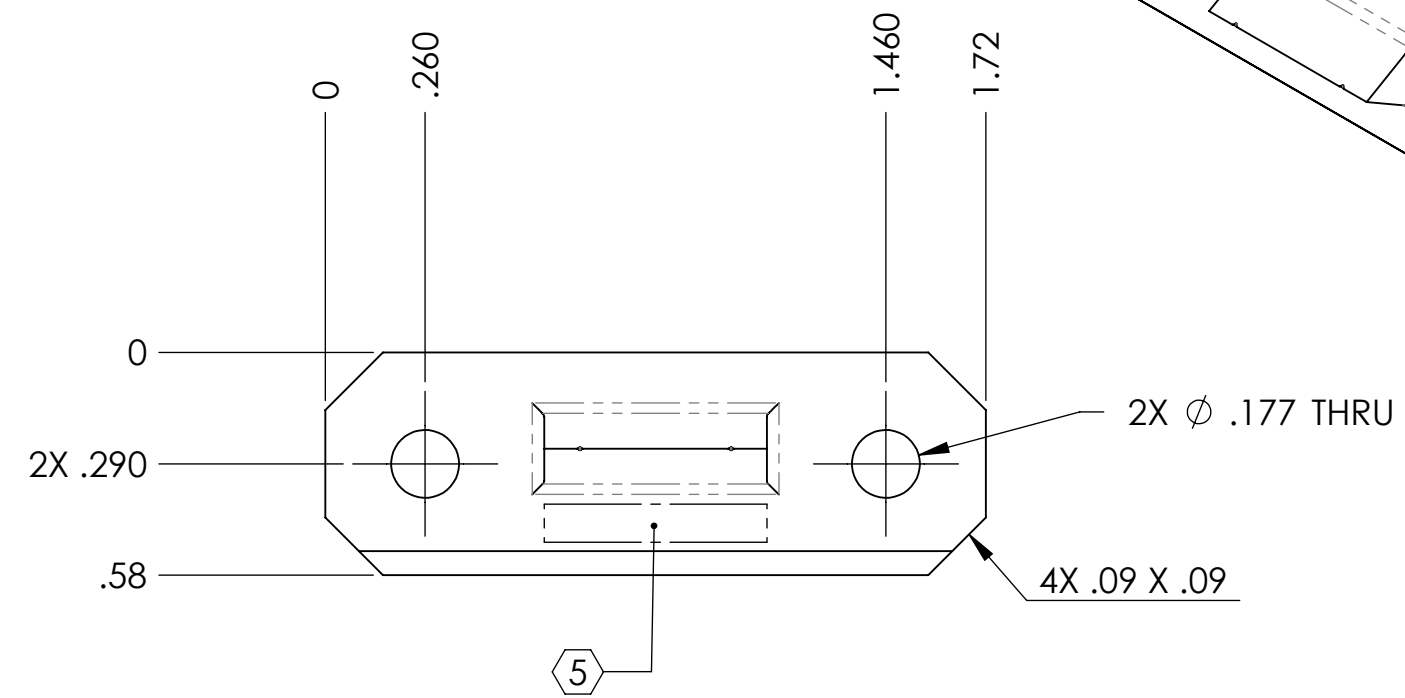
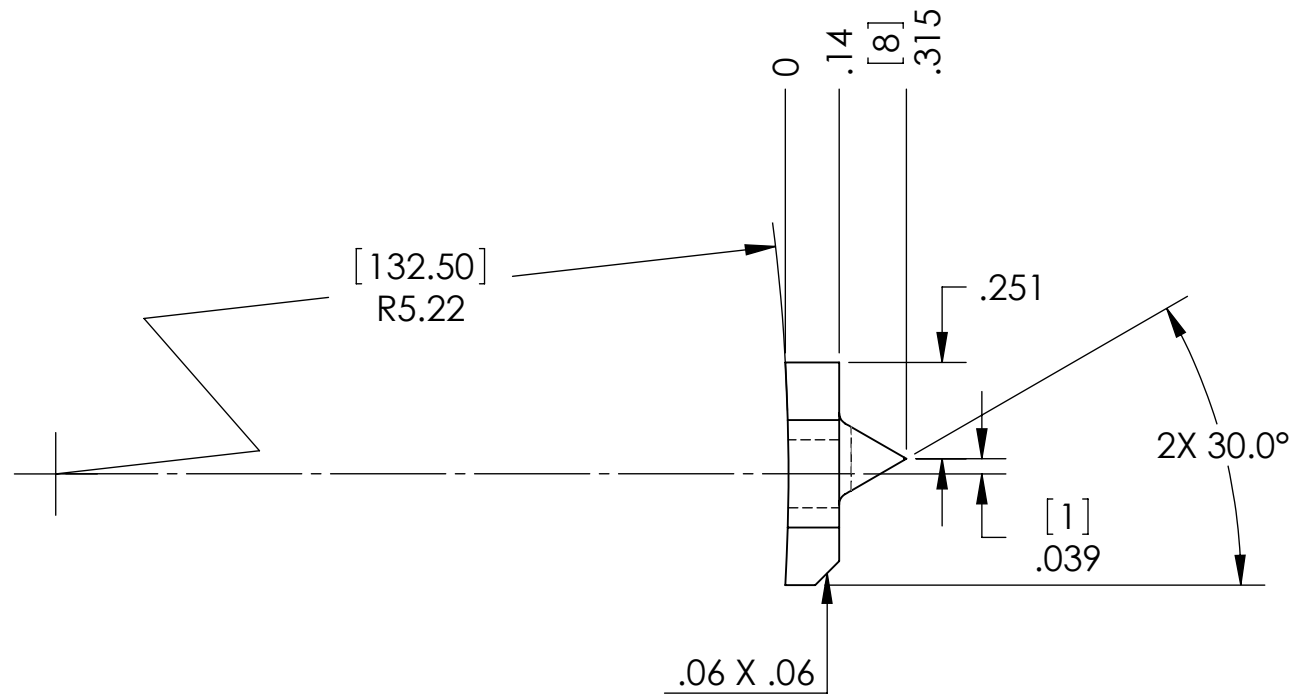
NOTES CONTINUED:

5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX

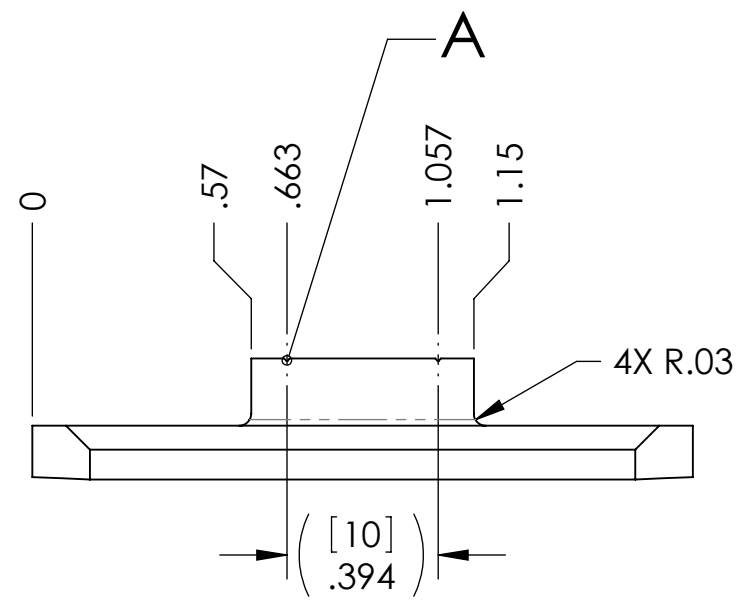
6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.

7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	06 JUL 2009	E0900189	E080191
v2	03 SEP 2009	E0900277	E080191
v3	28 JUN 2010	E1000236	E080191



WIRE GROOVE
2X
DETAIL A
SCALE 100 : 1

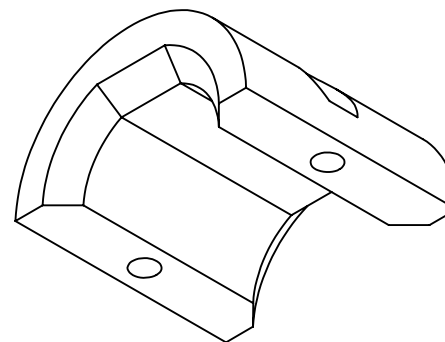
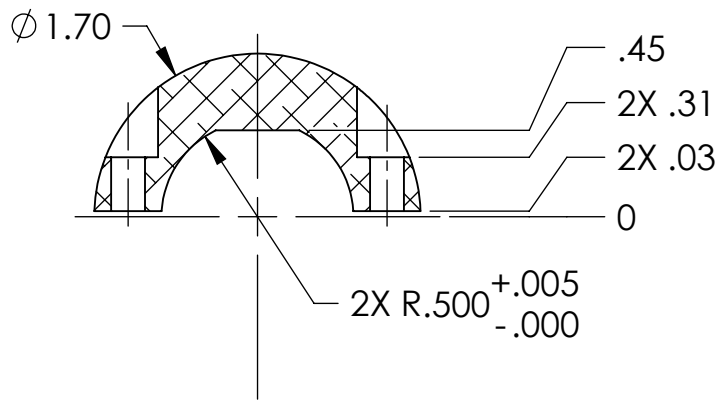
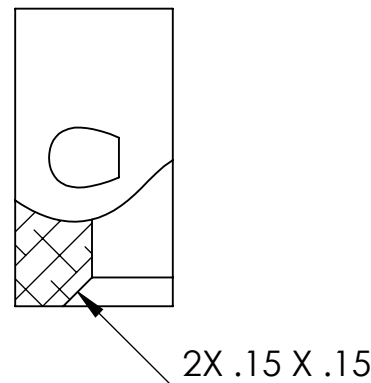
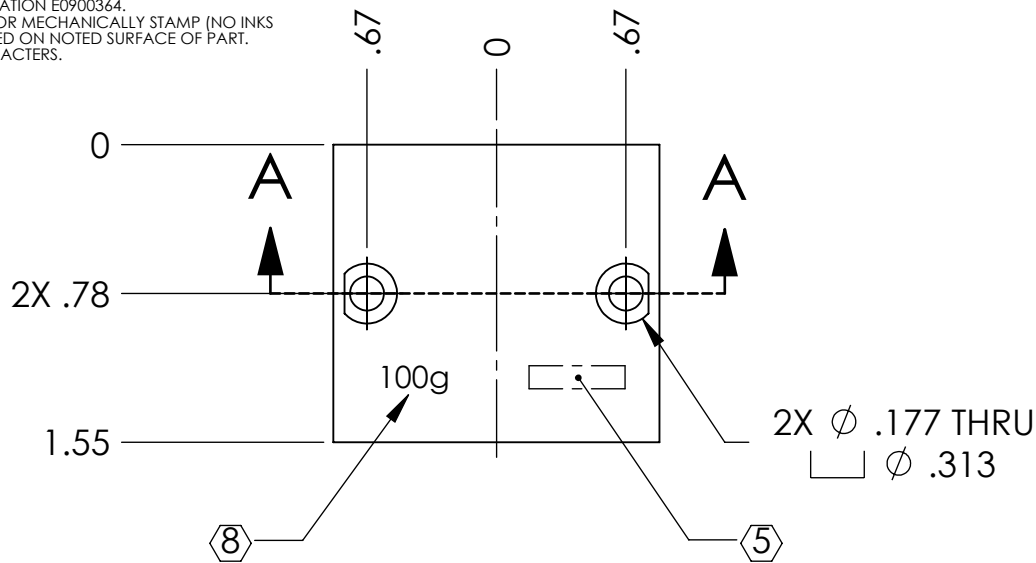


NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)				LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
DIMENSIONS ARE IN INCHES [MM]				1. INTERPRET DRAWING PER ASME Y14.5-1994.		PRISM BREAKOFF, LOWER WIRE	
TOLERANCES:				2. REMOVE ALL SHARP EDGES, R.02 MIN.		DESIGNER D. BRIDGES 09 SEP 2009	
.XX ± .01				3. DO NOT SCALE FROM DRAWING.		DRAFTER R. BIEDENHARN 29 OCT 2010	
.XXX ± .005				4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		SIZE DWG. NO. B D080124	
ANGULAR ± 0.5°				MATERIAL 304, 316 OR 302 SSSL		REV. v3	
				FINISH 32 μinch		SCALE: 2:1 PROJECTION:	
				NEXT ASSY BOTTOM MASS ASSY		SHEET 1 OF 1	

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- ⑧ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

REV.	DATE	DCN #	DRAWING TREE #
v1	22 JUN 2009	E0900173	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-



SECTION A-A

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL: 6061-T6 Al
 FINISH: 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: ADVANCED LIGO
 SUB-SYSTEM: SUS
 NEXT ASSY: INT. MASS CHANGER

PART NAME: COLLAR, UPPER, 100g

DESIGNER: D. BRIDGES 28 AUG 2008
 DRAFTER: R. BIEDENHARN 29 OCT 2010
 CHECKER: D. BRIDGES 04 NOV 2010
 APPROVAL: _____

SIZE: A
 DWG. NO.: D080182
 REV.: v2

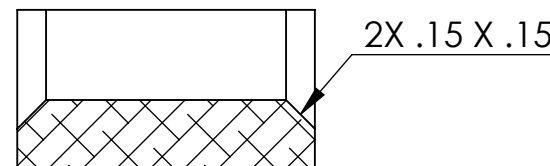
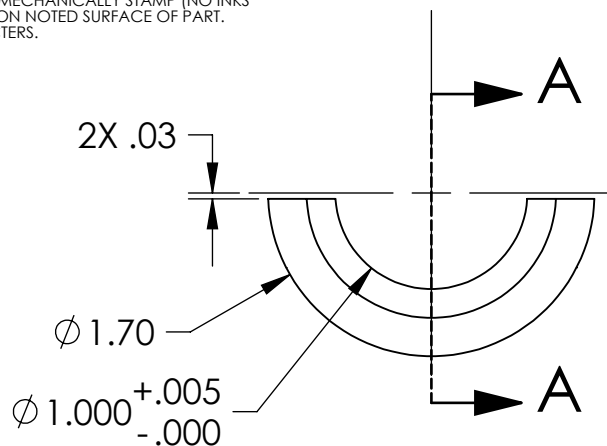
SCALE: 1:1
 PROJECTION:

SHEET 1 OF 1

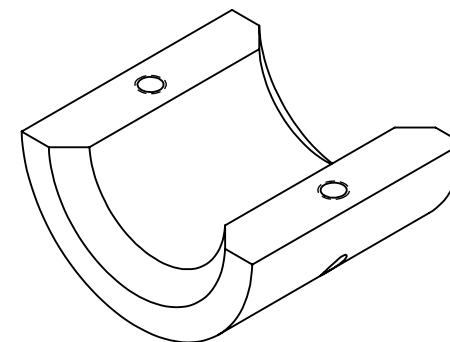
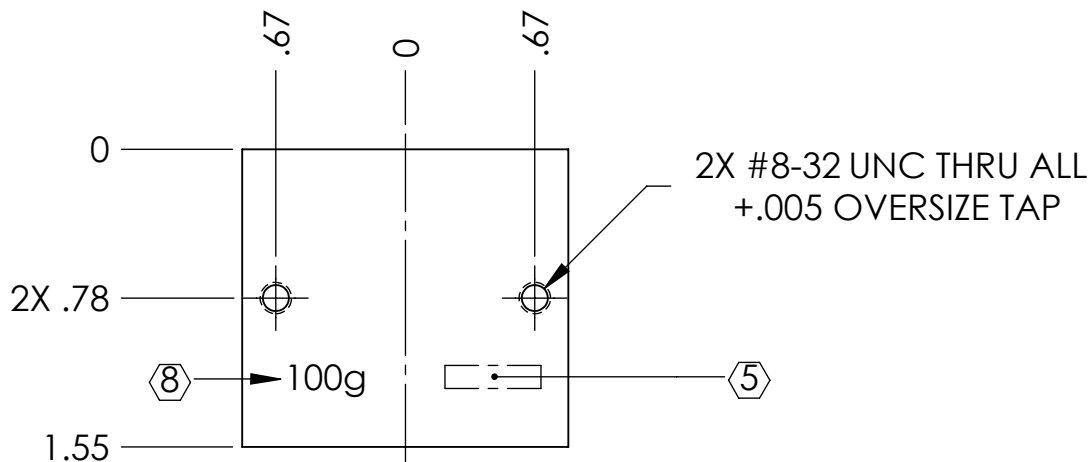
NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED. EXAMPLE: DXXXXXX-VY, TYPE XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

REV.	DATE	DCN #	DRAWING TREE #
v1	22 JUN 2009	E0900173	E080191
v1	28 JUN 2010	E1000236	E080191
-	-	-	-



SECTION A-A



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL: 6061-T6 Al
 FINISH: 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: ADVANCED LIGO
 SUB-SYSTEM: SUS
 NEXT ASSY: INT. MASS CHANGER

PART NAME		COLLAR, LOWER, 100g	
DESIGNER	D. BRIDGES	29 AUG 2008	SIZE DWG. NO.
DRAFTER	R. BIEDENHARN	29 OCT 2010	A D080183
CHECKER	D. BRIDGES	04 NOV 2010	REV. v2
APPROVAL		SCALE: 1:1	PROJECTION:

4

3

2

1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED. EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	14 JUL 2009	E0900198	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-

D

D

C

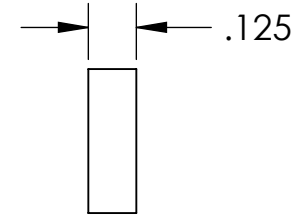
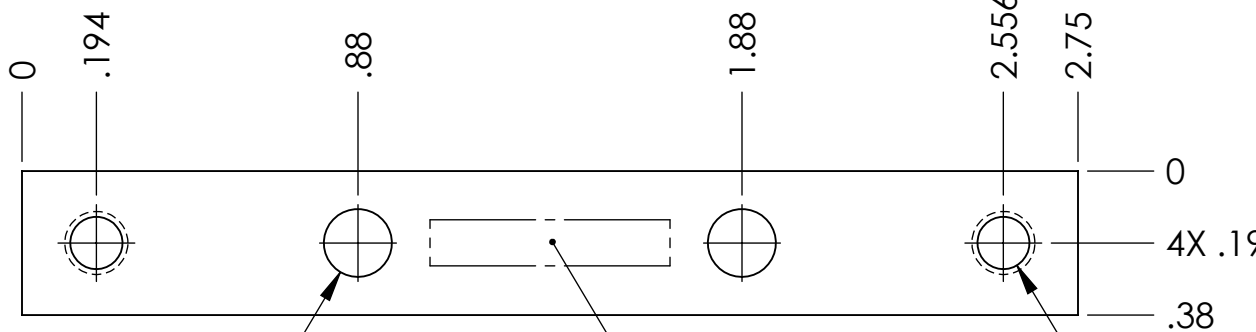
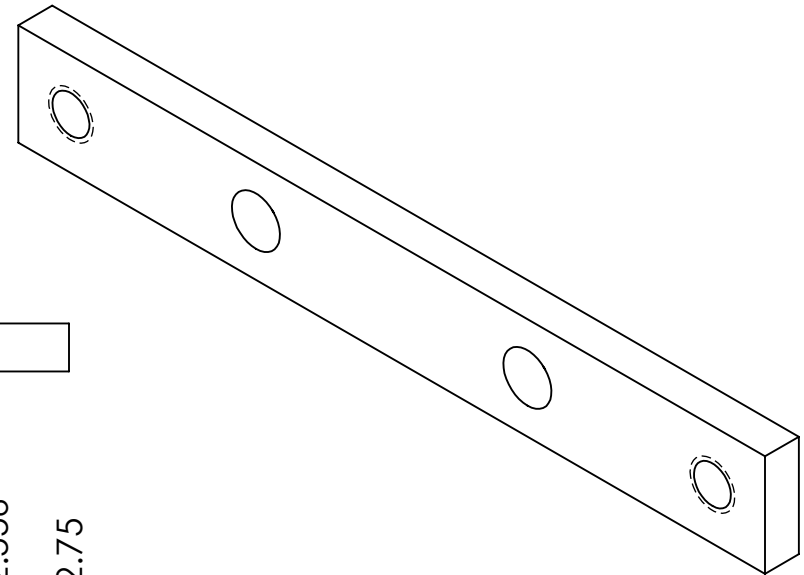
C

B

B

A

A



2X ϕ .177 THRU



2X #8-32 UNC THRU ALL
+.005 OVERSIZE TAP

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSSL
FINISH 32 μ inch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

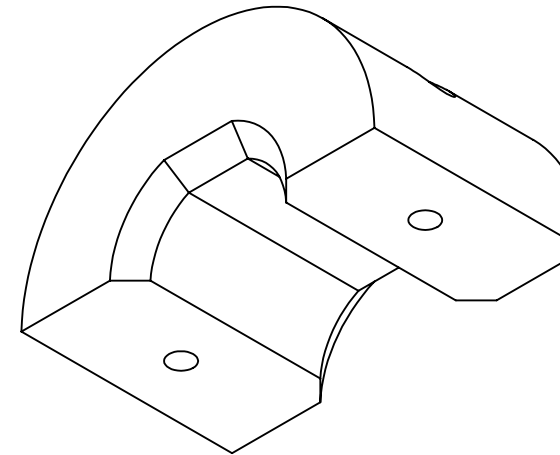
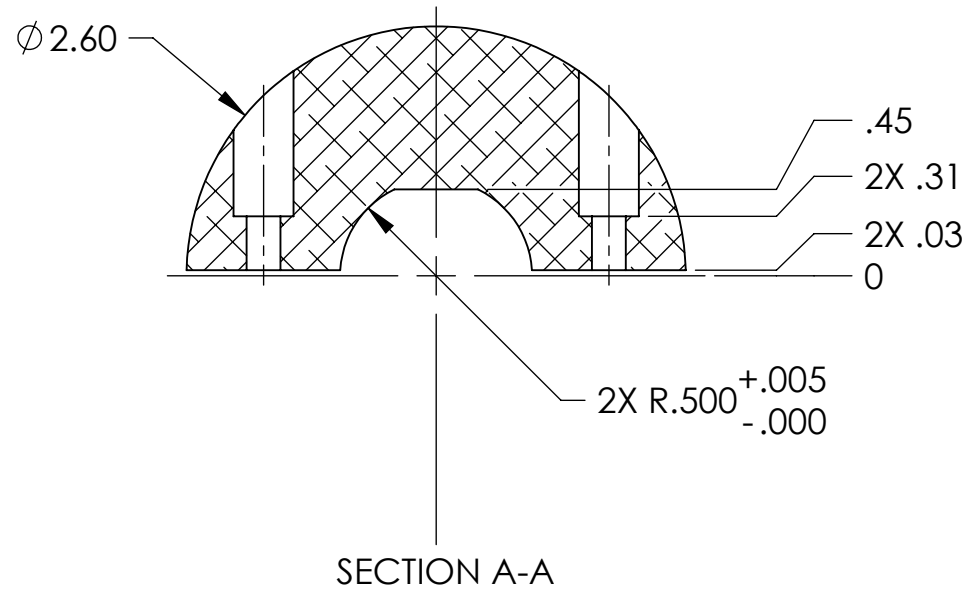
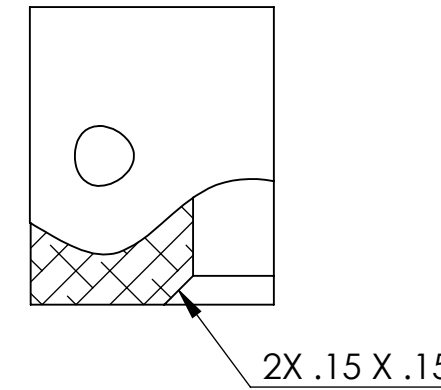
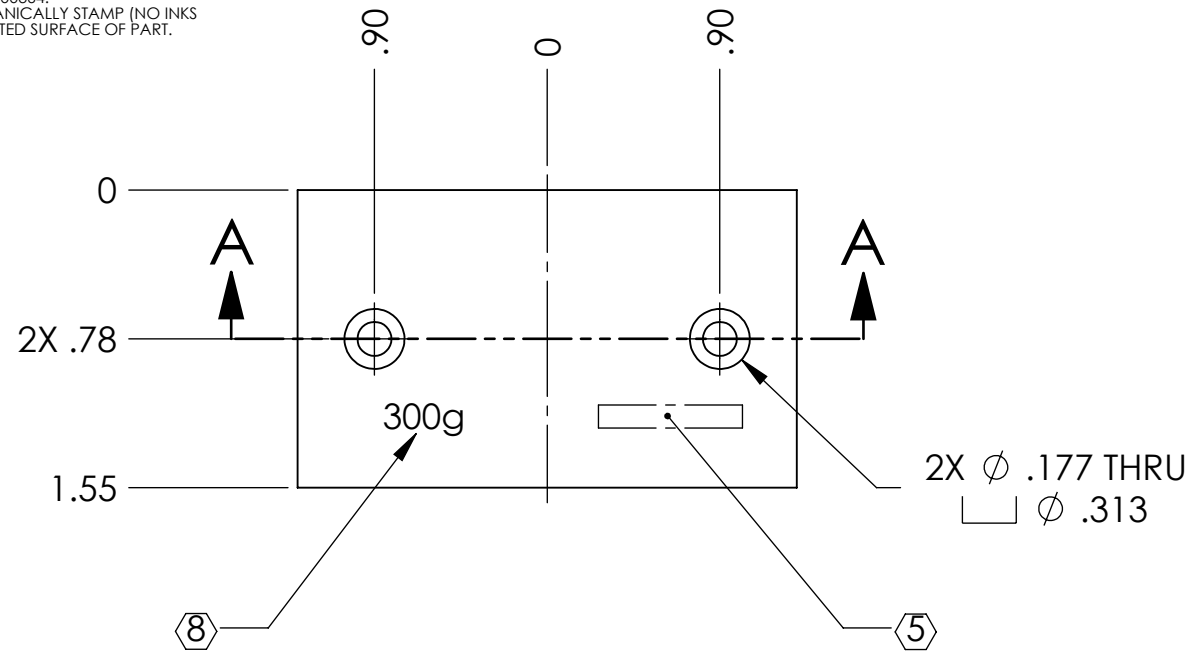
SYSTEM ADVANCED LIGO SUB-SYSTEM SUS
NEXT ASSY UPPER MASS ASSY

PART NAME			GUARD, LOWER BLADE	
DESIGNER	D. BRIDGES	07 JUL 2010	SIZE	DWG. NO.
DRAFTER	D. BRIDGES	07 JUL 2010	A	D080221
CHECKER	C. TORRIE	09 JUL 2010	SCALE: 2:1	PROJECTION:
APPROVAL				SHEET 1 OF 1

D080223_Advanced_LIGO_SUS_HLTS_Collar_Upper_300g_Intermediate_Mass_PART PDM REV: V1-001, DRAWING PDM REV: V1-002

NOTES CONTINUED:
 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
 EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

REV.	DATE	DCN #	DRAWING TREE #
v1	22 JUN 2009	E0900173	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-

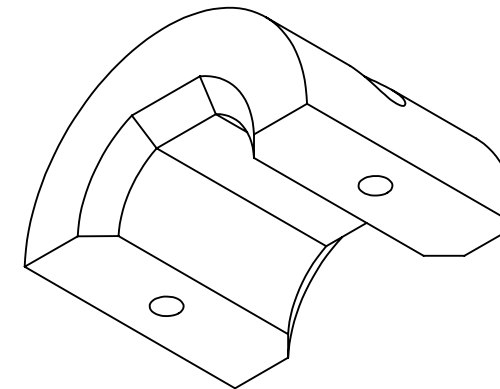
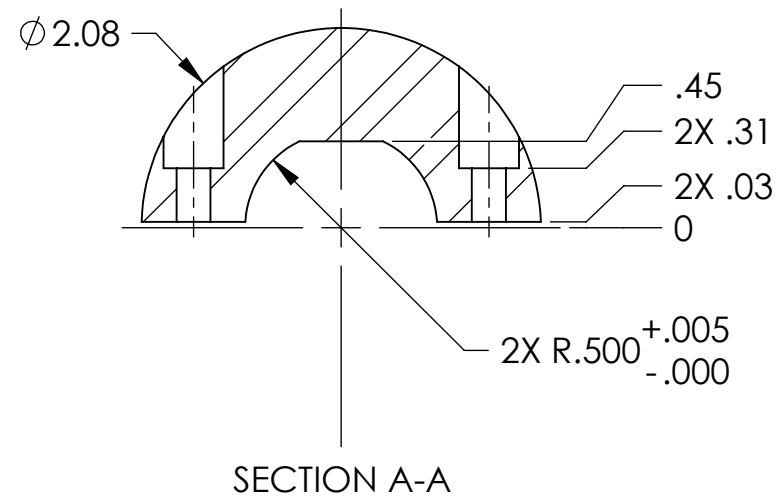
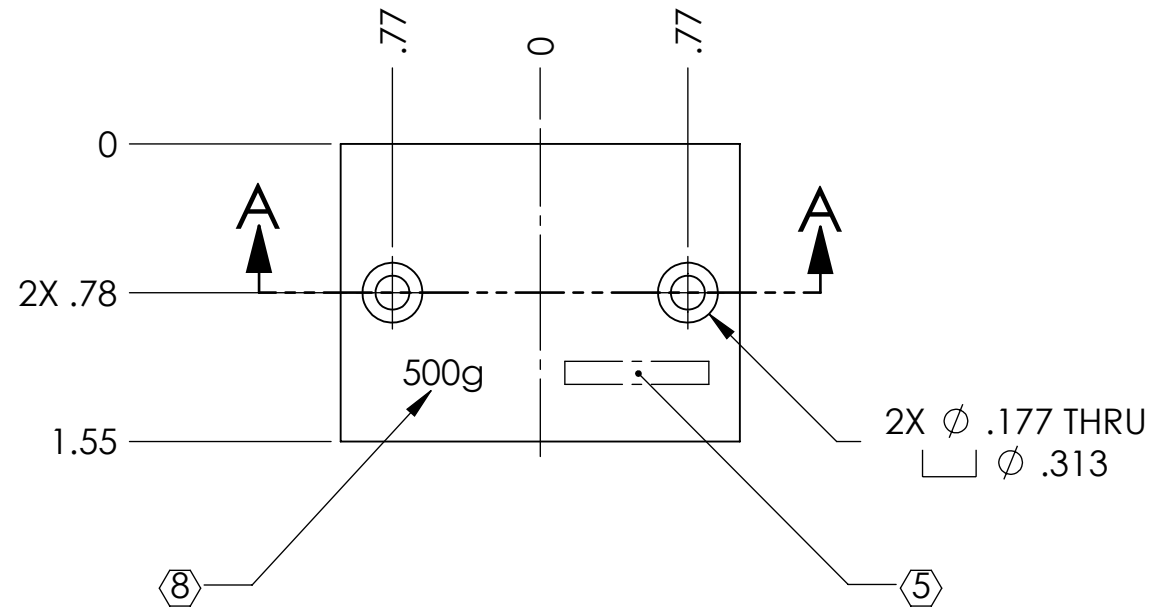


NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)				LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.5°				1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		COLLAR, UPPER, 300g	
MATERIAL 6061-T6 Al		FINISH 32 μinch		SYSTEM ADVANCED LIGO SUB-SYSTEM SUS		DESIGNER D. BRIDGES 28 AUG 2008 DRAFTER R. BIEDENHARN 29 OCT 2010 CHECKER D. BRIDGES 04 NOV 2010 APPROVAL	
NEXT ASSY INT. MASS CHANGER				SIZE DWG. NO. B D080223		REV. v2	
				SCALE: 1:1 PROJECTION:		SHEET 1 OF 1	

D080225_Advanced_LIGO_SUS_HLTS_Collar_Upper_500g_Intermediate_Mass_PART PDM REV: V1-001, DRAWING PDM REV: V1-001

NOTES CONTINUED:
 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
 EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

REV.	DATE	DCN #	DRAWING TREE #
v1	22 JUN 2009	E0900173	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES
 TOLERANCES:
 .XX \pm .01
 .XXX \pm .005
 ANGULAR \pm 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.
 MATERIAL 304 SSSL
 FINISH 32 μ inch

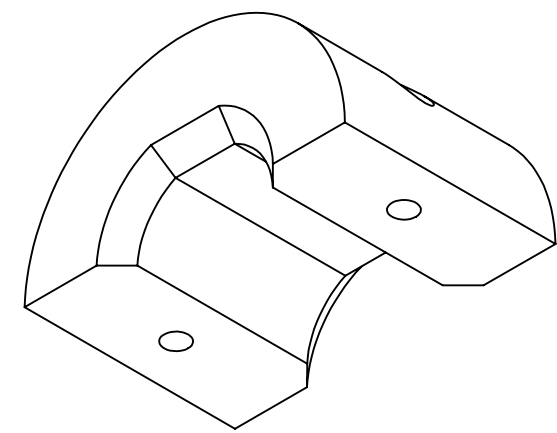
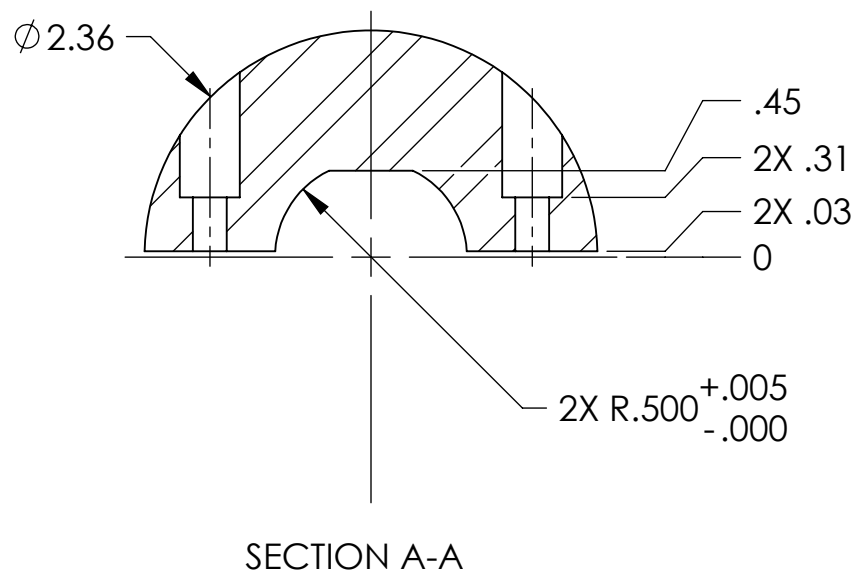
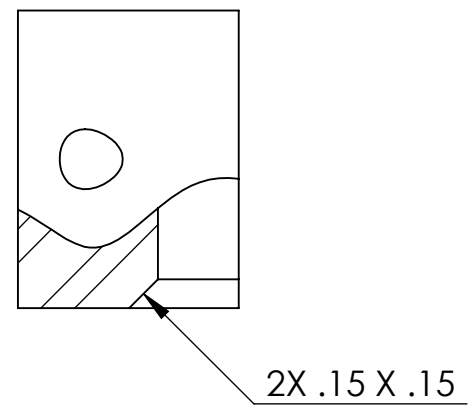
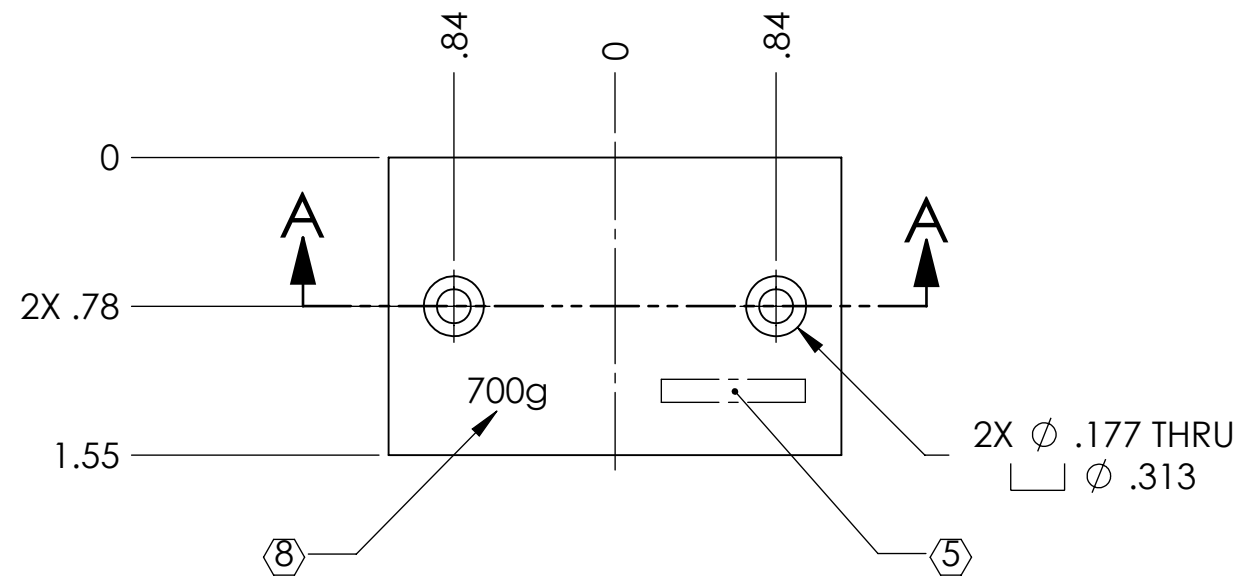
LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY
 SYSTEM ADVANCED LIGO SUB-SYSTEM SUS
 NEXT ASSY INT. MASS CHANGER

PART NAME			COLLAR, UPPER, 500g	
DESIGNER	D. BRIDGES	28 AUG 2008	SIZE DWG. NO.	D080225
DRAFTER	R. BIEDENHARN	29 OCT 2010	REV.	
CHECKER	D. BRIDGES	04 NOV 2010	SCALE: 1:1	v2
APPROVAL			PROJECTION:	SHEET 1 OF 1

D080227_Advanced_LIGO_SUS_HLTS_Collar_Upper_700g_Intermediate_Mass_PART PDM REV: V1-001, DRAWING PDM REV: V1-002

NOTES CONTINUED:
 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
 EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

REV.	DATE	DCN #	DRAWING TREE #
v1	22 JUN 2009	E0900173	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-

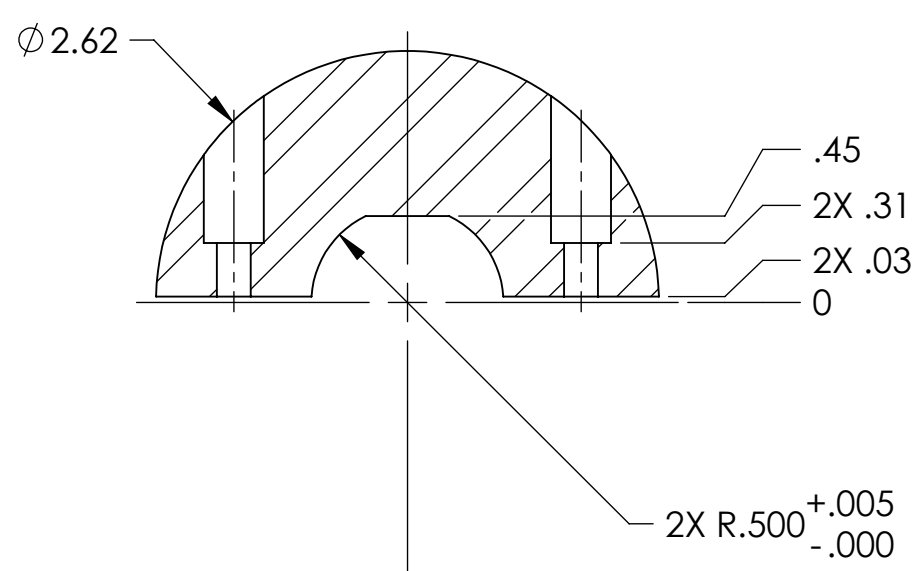
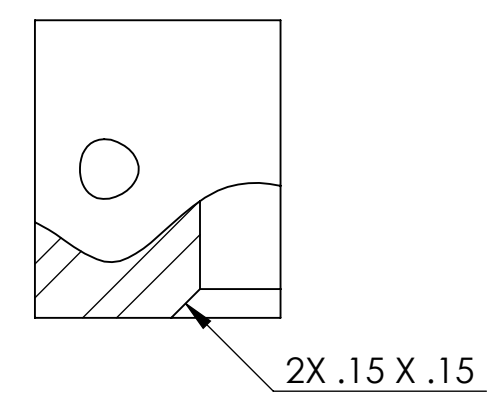
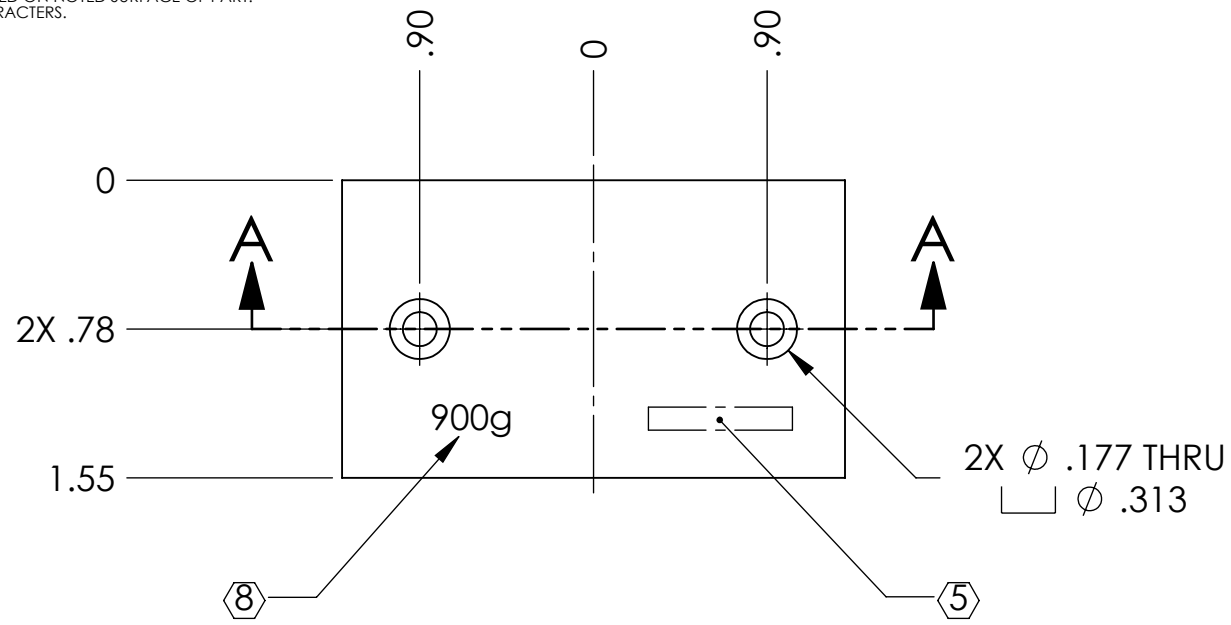


NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)				LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.5°				1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		COLLAR, UPPER, 700g	
MATERIAL		FINISH		SYSTEM		SUB-SYSTEM	
304 SSSL		32 μinch		ADVANCED LIGO		SUS	
NEXT ASSY				DESIGNER		DATE	
INT. MASS CHANGER				D. BRIDGES		28 AUG 2008	
				DRAFTER		DATE	
				R. BIEDENHARN		29 OCT 2010	
				CHECKER		DATE	
				D. BRIDGES		04 NOV 2010	
				APPROVAL			
				SCALE: 1:1		PROJECTION:	
						SHEET 1 OF 1	

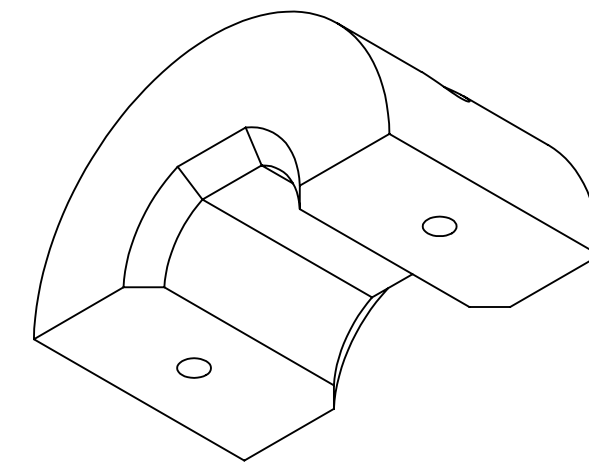
D080229_Advanced_LIGO_SUS_HLTs_Collar_Upper_900g_Intermediate_Mass_PART PDM REV: V1-001, DRAWING PDM REV: V1-001

NOTES CONTINUED:
 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
 EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

REV.	DATE	DCN #	DRAWING TREE #
v1	22 JUN 2009	E0900173	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-



SECTION A-A

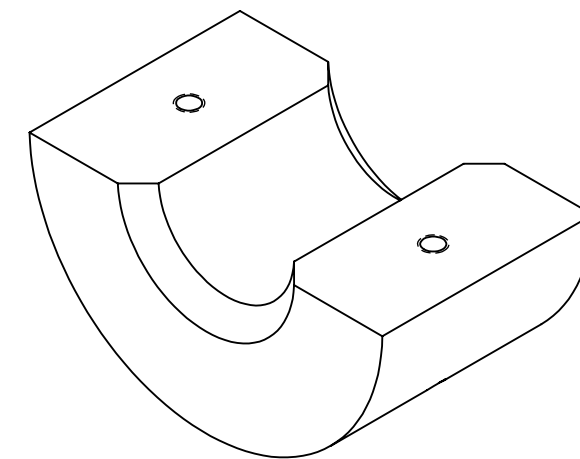
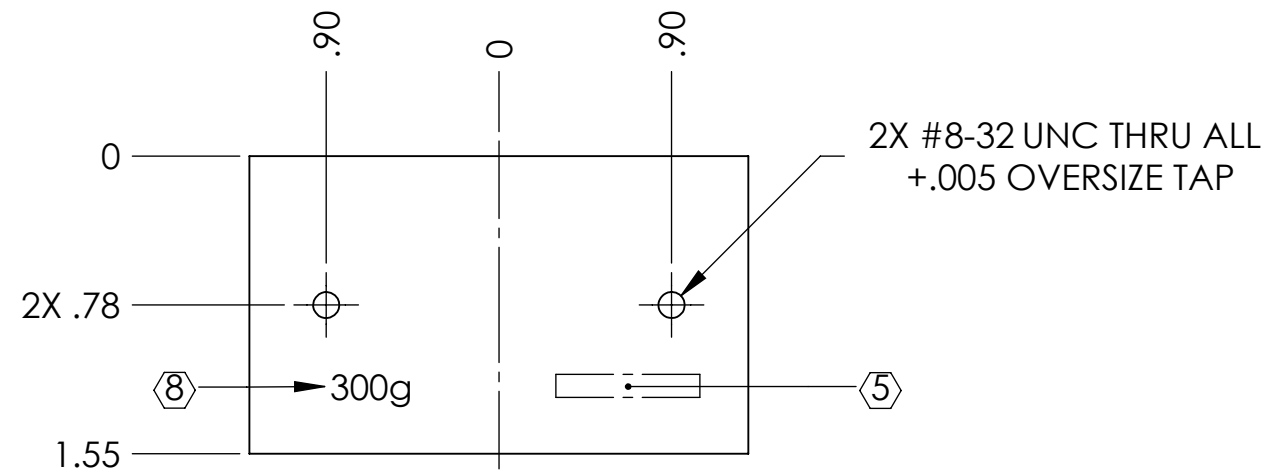
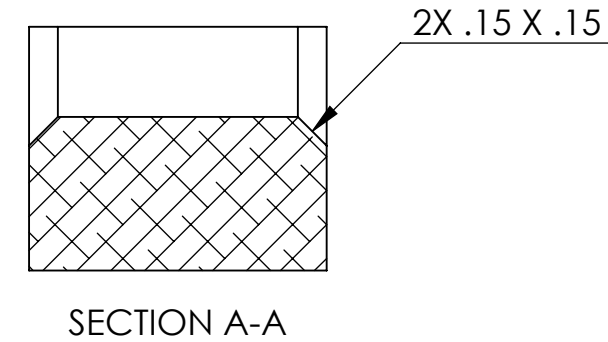
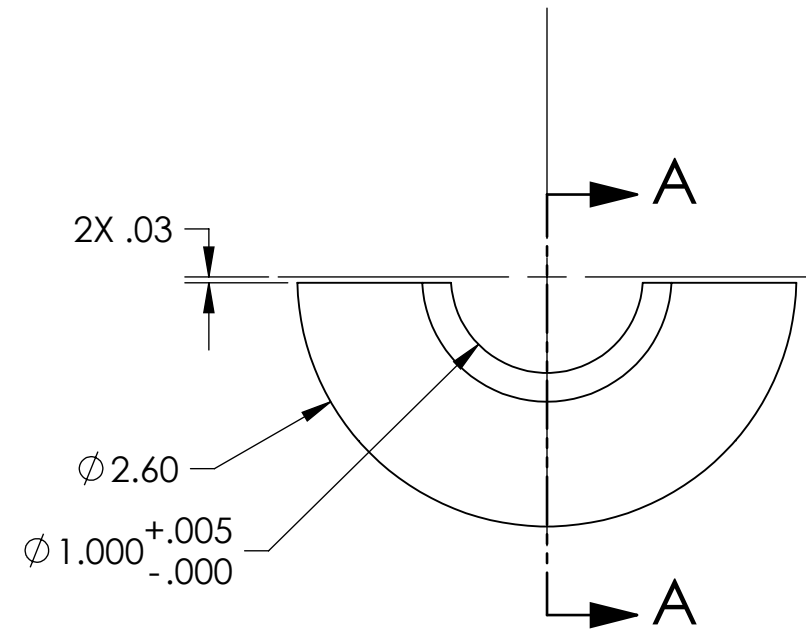


NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)				LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
DIMENSIONS ARE IN INCHES		1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		SYSTEM ADVANCED LIGO		SUB-SYSTEM SUS	
TOLERANCES: .XX ± .01 .XXX ± .005		MATERIAL 304 SSSL		FINISH 32 μ inch		NEXT ASSY INT. MASS CHANGER	
ANGULAR ± 0.5°						DESIGNER D. BRIDGES	
						DRAPER R. BIEDENHARN	
						CHECKER D. BRIDGES	
						APPROVAL	
						SCALE: 1:1	
						PROJECTION:	
						SHEET 1 OF 1	
				PART NAME COLLAR, UPPER, 900g		SIZE DWG. NO. B D080229	
						REV. v2	

D080232_Advanced_LIGO_SUS_HLTs_Collar_Lower_300g_Intermediate_Mass_PART PDM REV: V1, DRAWING PDM REV: V1-001

- NOTES CONTINUED:**
- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
 - 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 - 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
 - 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

REV.	DATE	DCN #	DRAWING TREE #
v1	22 JUN 2009	E0900173	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-

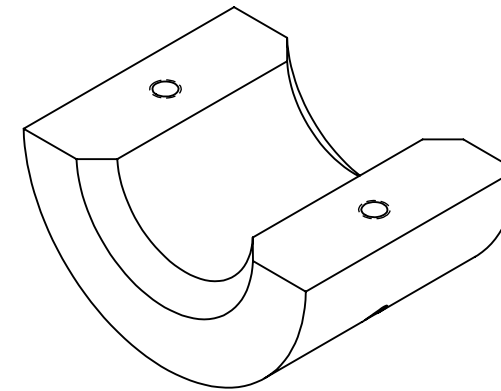
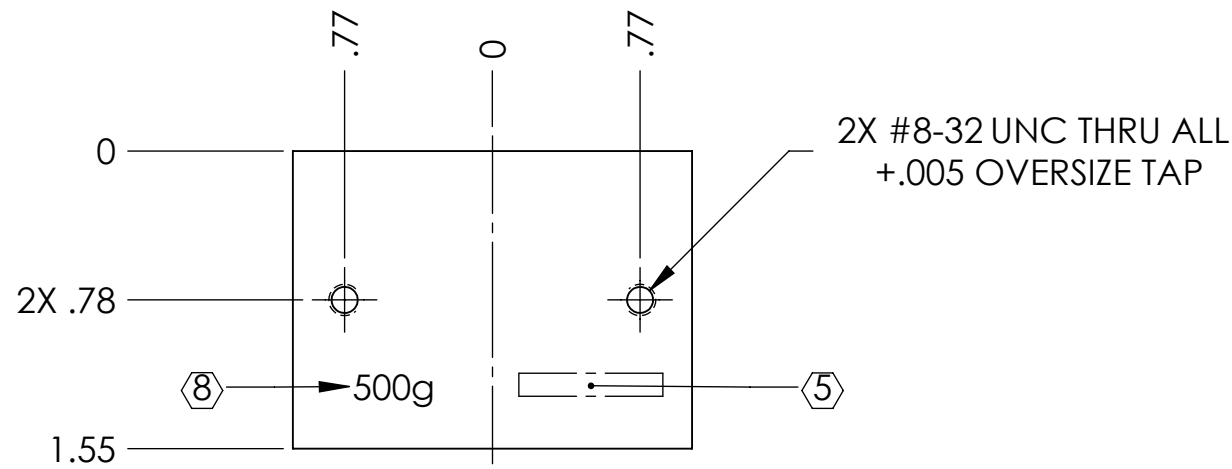
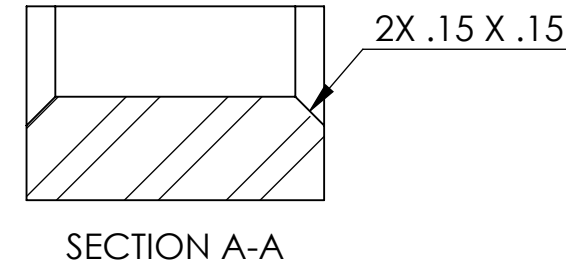
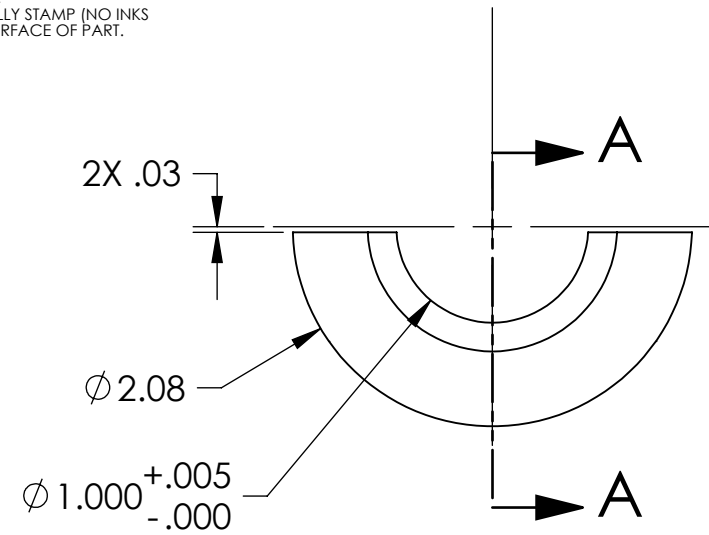


NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)				LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.1°				1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		COLLAR, LOWER, 300g	
MATERIAL 6061-T6 Al		FINISH 32 μinch		SYSTEM ADVANCED LIGO		SUB-SYSTEM SUS	
NEXT ASSY INT. MASS CHANGER				DESIGNER D. BRIDGES		DATE 29 AUG 2008	
				DRAFTER R. BIEDENHARN		DATE 29 OCT 2010	
				CHECKER D. BRIDGES		DATE 04 NOV 2010	
				APPROVAL		SCALE : 1:1	
				SIZE : B		DWG. NO. D080232	
						PROJECTION :	
						REV. v2	
						SHEET 1 OF 1	

D080234_Advanced_LIGO_SUS_HLTS_Collar_Lower_500g_Intermediate_Mass_PART PDM REV: V1, DRAWING PDM REV: V1-001

- NOTES CONTINUED:**
- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VV TYPE-XX S/N XXX
 - 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 - 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
 - ⑥ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

REV.	DATE	DCN #	DRAWING TREE #
v1	22 JUN 2009	E0900173	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-

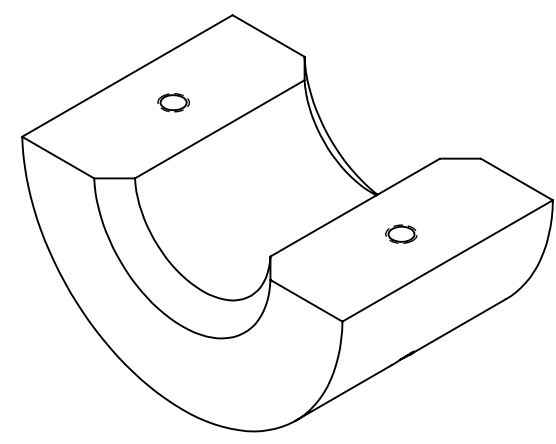
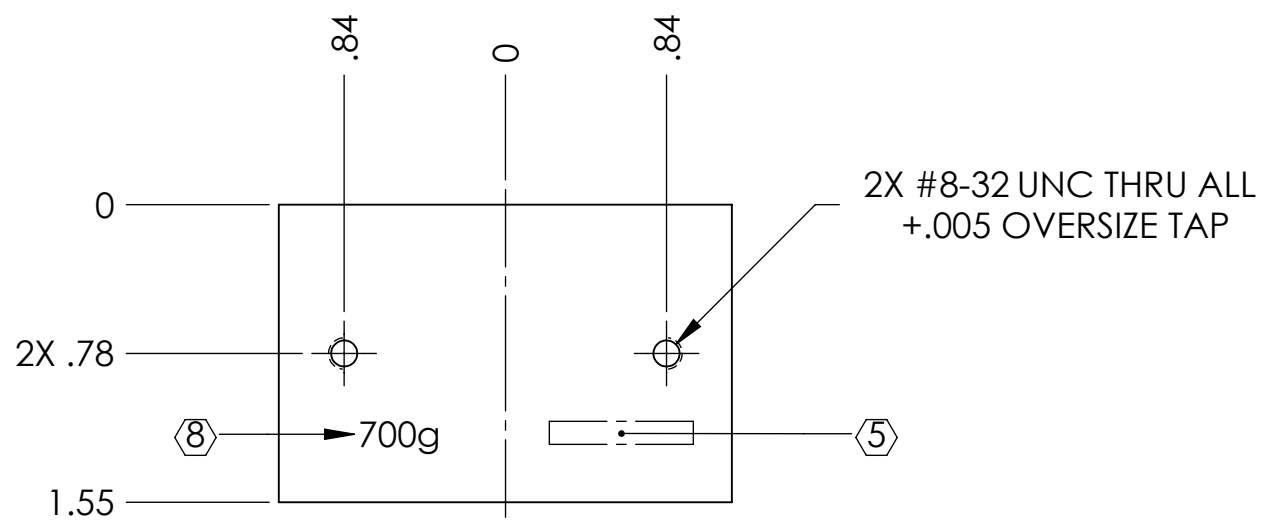
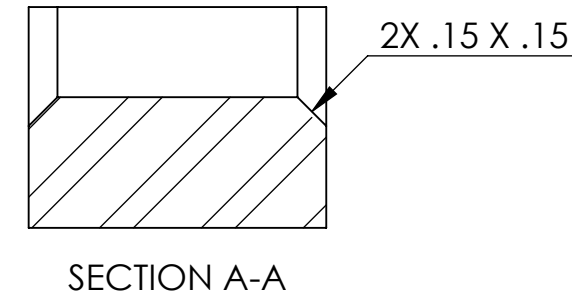
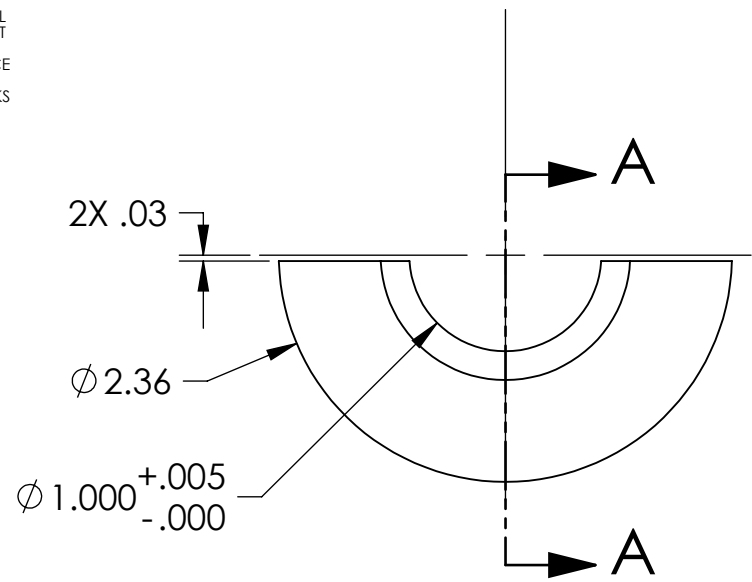


NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)				LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.5°				1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		COLLAR, LOWER, 500g	
MATERIAL 304 SSSL		FINISH 32 µinch		SYSTEM ADVANCED LIGO		SUB-SYSTEM SUS	
NEXT ASSY INT. MASS CHANGER				DESIGNER D. BRIDGES		DATE 29 AUG 2008	
				DRAFTER R. BIEDENHARN		DATE 29 OCT 2010	
				CHECKER D. BRIDGES		DATE 04 NOV 2010	
				APPROVAL		SCALE : 1:1	
						PROJECTION :	
						SIZE DWG. NO. B D080234	
						REV. v2	
						SHEET 1 OF 1	

D080236_Advanced_LIGO_SUS_HLTS_Collar_Lower_700g_Intermediate_Mass_PART PDM REV: V1, DRAWING PDM REV: V1-001

- NOTES CONTINUED:**
- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
 - 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 - 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
 - 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

REV.	DATE	DCN #	DRAWING TREE #
v1	22 JUN 2009	E0900173	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-

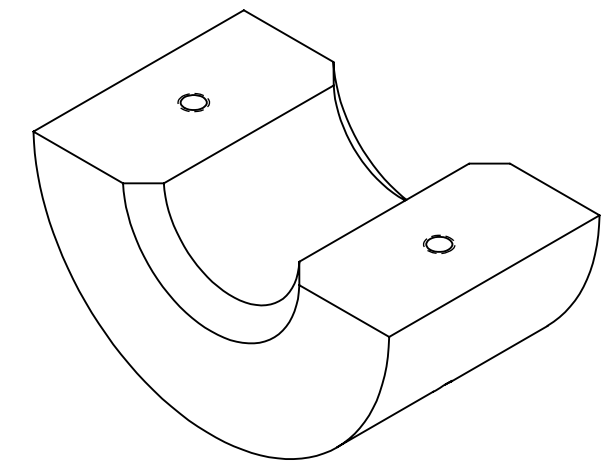
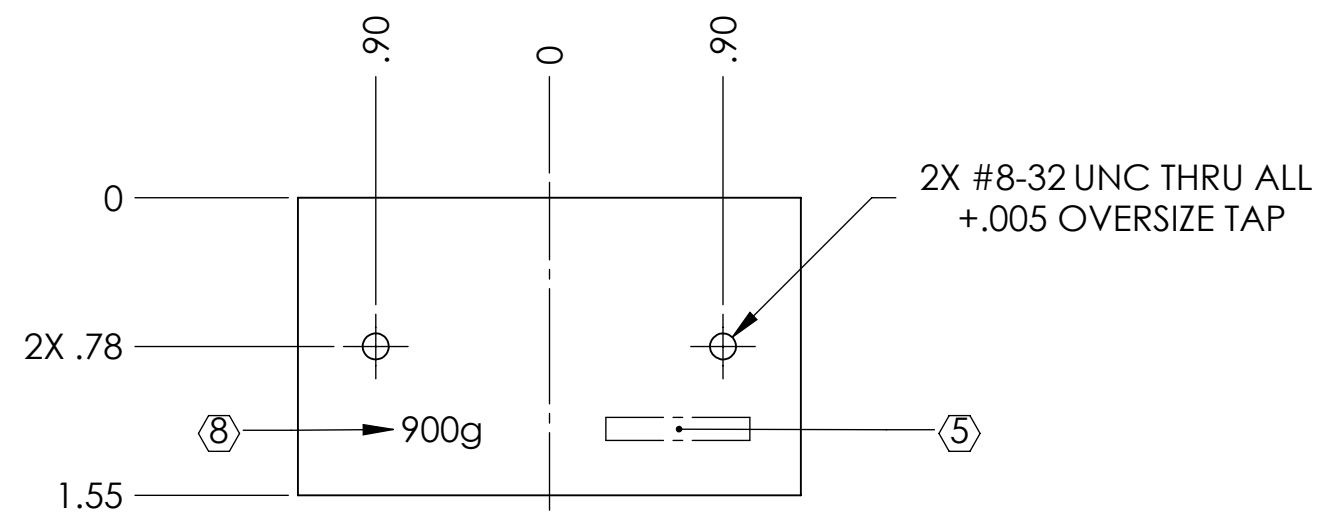
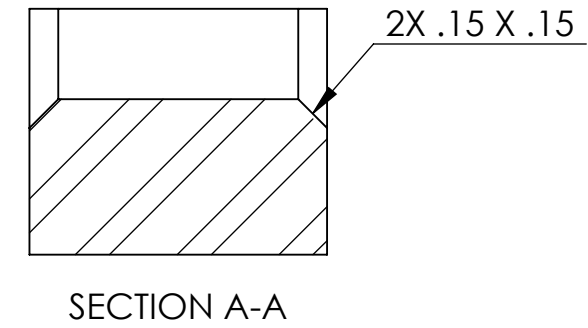
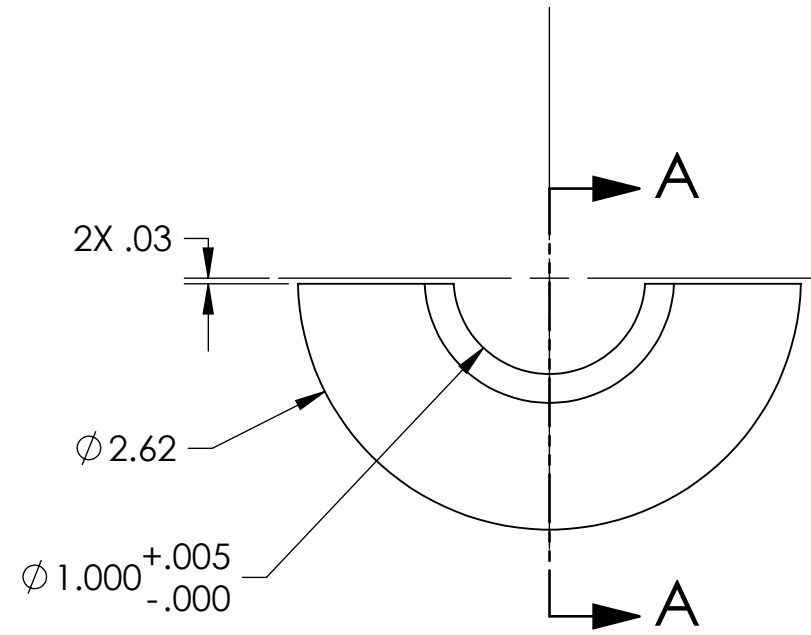


NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)				LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
DIMENSIONS ARE IN INCHES		1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		SYSTEM ADVANCED LIGO SUB-SYSTEM SUS		COLLAR, LOWER, 700g	
TOLERANCES: .XX ± .01 .XXX ± .005		MATERIAL 304 SSSL FINISH 32 μinch		DESIGNER D. BRIDGES 29 AUG 2008	SIZE DWG. NO. B D080236	REV. v2	
ANGULAR ± 0.5°		NEXT ASSY INT. MASS CHANGER		DRAFTER R. BIEDENHARN 29 OCT 2010	CHECKER D. BRIDGES 04 NOV 2010	SCALE: 1:1 PROJECTION: SHEET 1 OF 1	

D080238_Advanced_LIGO_SUS_HLTS_Collar_Lower_900g_Intermediate_Mass_PART PDM REV: V1-000, DRAWING PDM REV: V1-001

NOTES CONTINUED:
 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
 EXAMPLE: DXXXXXX-VV, TYPE-XX, S/N XXX
 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

REV.	DATE	DCN #	DRAWING TREE #
v1	22 JUN 2009	E0900173	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-

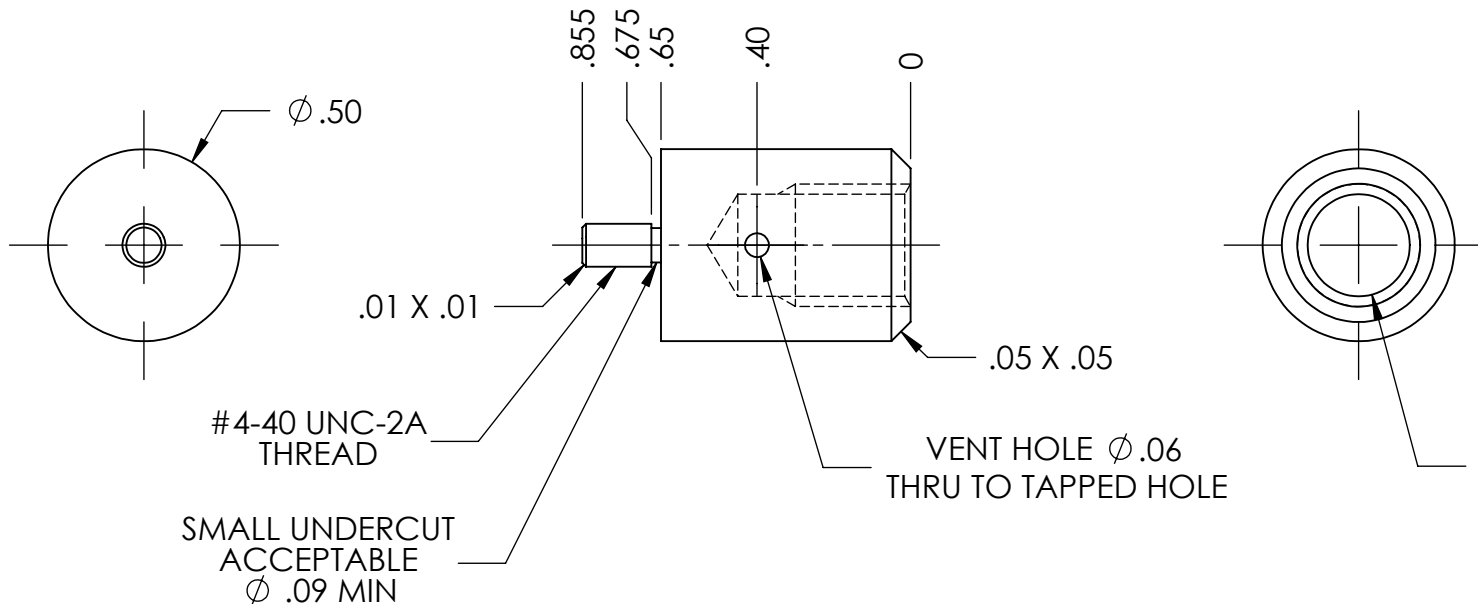
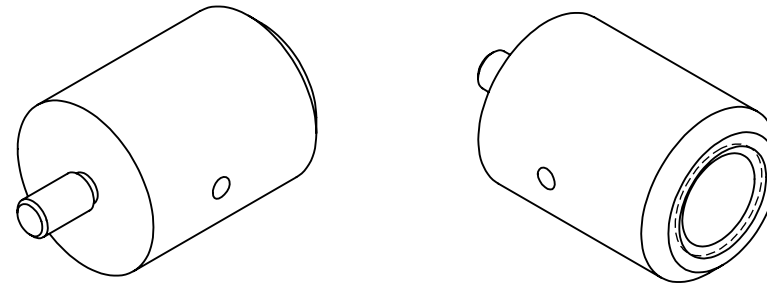


NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)				LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
DIMENSIONS ARE IN INCHES		1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		ADVANCED LIGO		COLLAR, LOWER, 900g	
TOLERANCES: .XX ± .01 .XXX ± .005		MATERIAL 304 SSSL		SUB-SYSTEM SUS		DESIGNER D. BRIDGES 29 AUG 2008	
ANGULAR ± 0.5°		FINISH 32 μinch		NEXT ASSY INT. MASS CHANGER		DRAFTER R. BIEDENHARN 29 OCT 2010	
				CHECKER D. BRIDGES 04 NOV 2010		SIZE DWG. NO. B D080238	
				APPROVAL		REV. v2	
				SCALE: 1:1		PROJECTION: SHEET 1 OF 1	

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND QUANTITY. IF PARTS ARE TOO SMALL TO SCRIBE, BAGGING AND TAGGING ALONE IS SUFFICIENT.
EXAMPLE (PART): 001-v1
EXAMPLE (TAG): DXXXXXX-VY, TYPE-XX, QTY: TBD
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
- 9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

REV.	DATE	DCN #	DRAWING TREE #
v1	3 MAR 2009	E0900066	-
v2	17 MAY 2009	E0900152	-
v3	28 JUN 2010	E1000236	-



DRILL $\phi .266 \nabla .45$
AND TAP FOR
1/4-20 UNC-2B X 1.0 DIA
EMHART HELICOIL
(P/N 1185-4EN250)

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX $\pm .01$
.XXX $\pm .005$

ANGULAR $\pm 0.5^\circ$

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL
304, 316 OR 302 SSSL

FINISH
63 μ inch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM
ADVANCED LIGO

SUB-SYSTEM
SUS

NEXT ASSY
EQ STOP FOR METAL/GLASS

PART NAME
MOUNTING CAP, EARTHQUAKE STOP

DESIGNER D. BRIDGES 22 SEP 2010
DRAFTER D. BRIDGES 23 SEP 2010
CHECKER M. MEYER 27 SEP 2010

SIZE DWG. NO.
A D080724

REV.
v3

APPROVAL SCALE: 2:1 PROJECTION: SHEET 1 OF 1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED. EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	17 AUG 2009	E0900243	E080191
v2	10 AUG 2010	E1000301	E080191
-	-	-	-

D

C

B

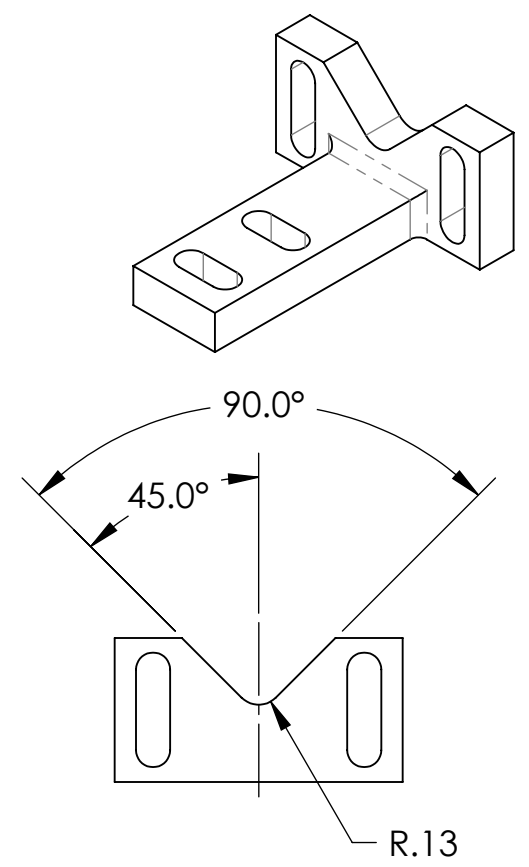
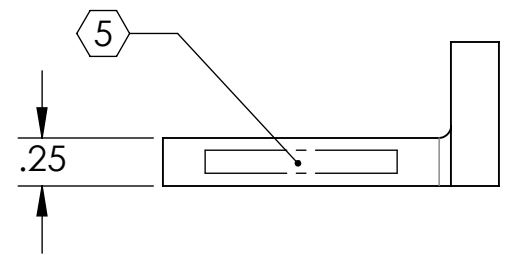
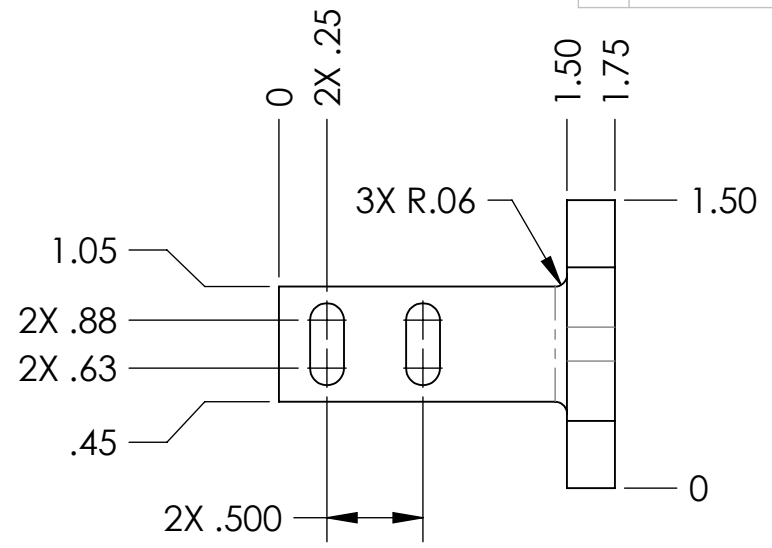
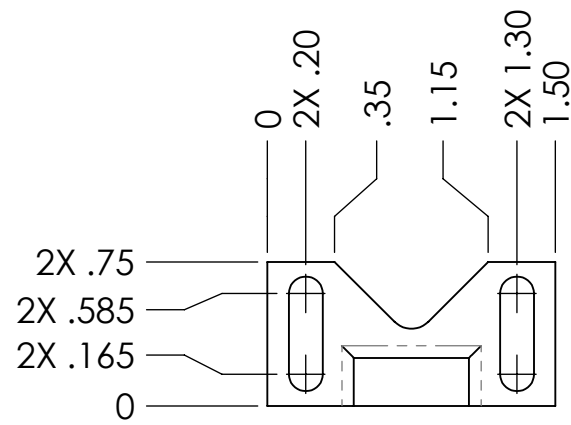
A

D

C

B

A



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 6061-T6 Al
FINISH 63 μinch



SYSTEM ADVANCED LIGO SUB-SYSTEM SUS

NEXT ASSY LOWER AOSEM ALIGNMENT ASSY, BOTTOM MASS

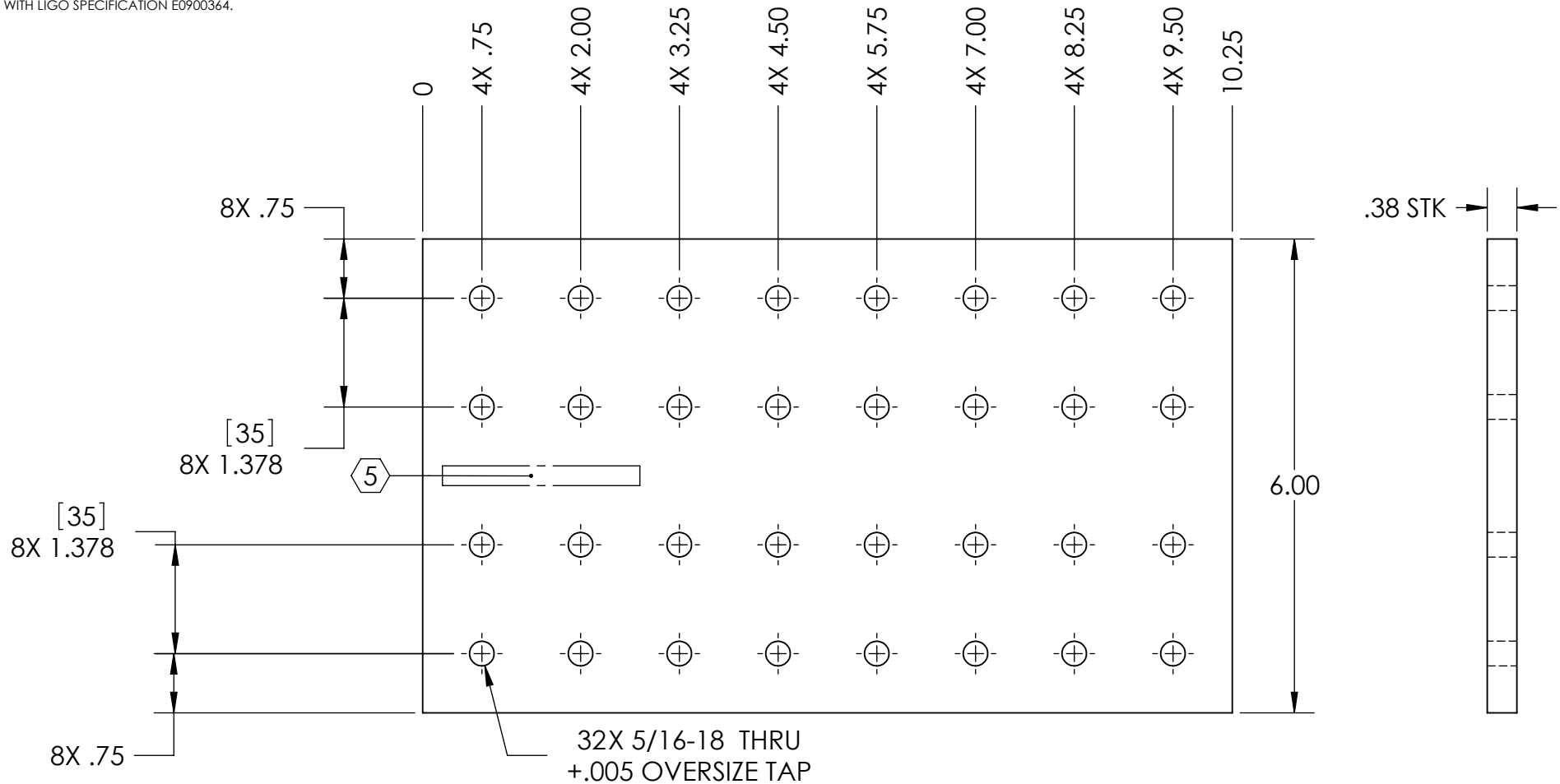
PART NAME LOWER AOSEM MOUNTING BRACKET, BOTTOM MASS

DESIGNER	D. BRIDGES	01 NOV 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	01 NOV 2010	A	D0900340	v2
CHECKER	B. MOORE	02 NOV 2010	SCALE: 1:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900154	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]	1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.
TOLERANCES: .XX ± .01 .XXX ± .005	
ANGULAR ± 0.5°	
MATERIAL 6061-T6 Al	FINISH 63 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: **ADVANCED LIGO** SUB-SYSTEM: **SUS**

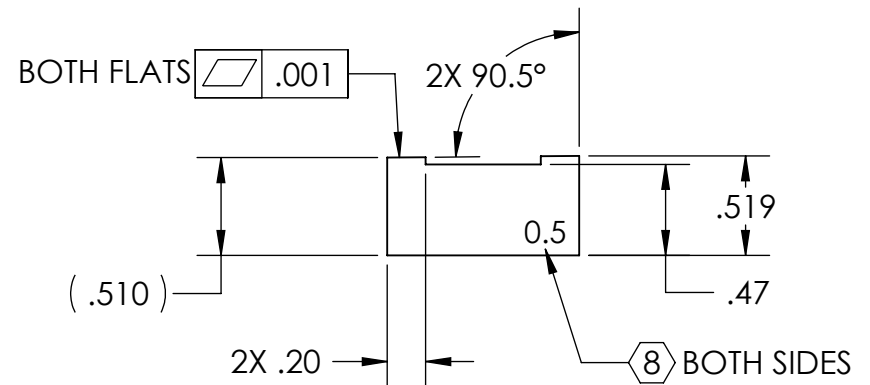
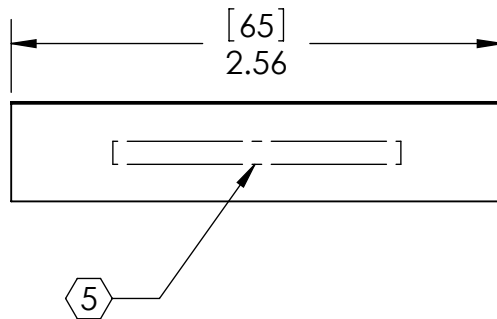
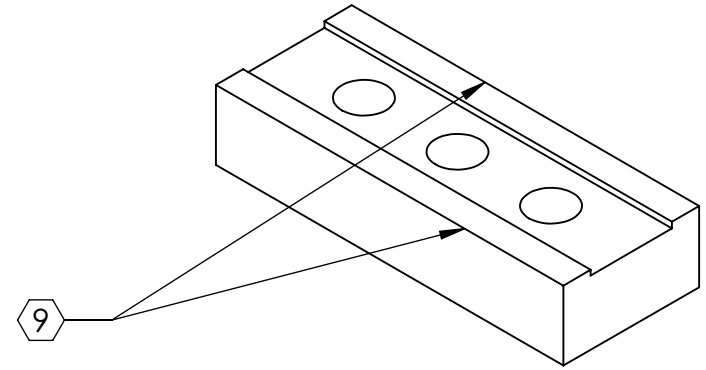
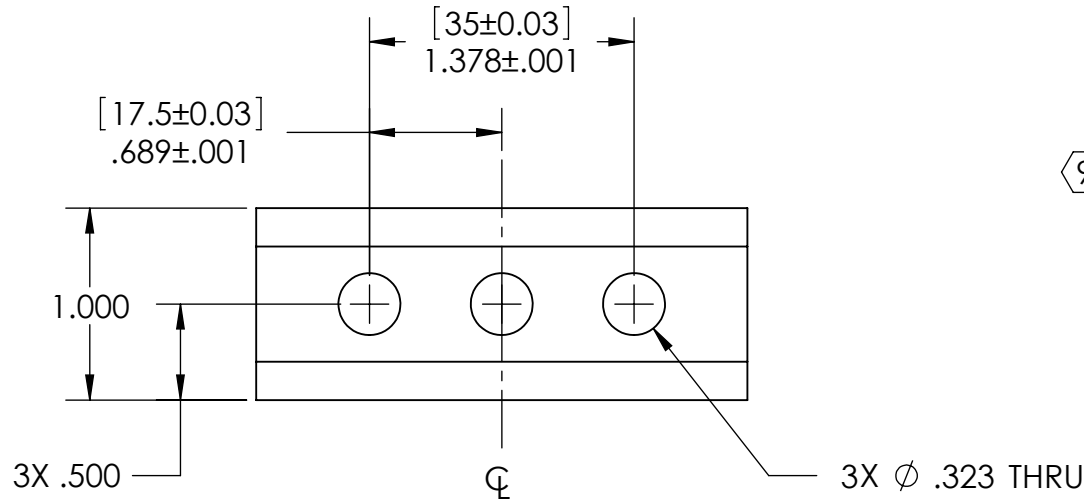
NEXT ASSY: LIBRARY OF CLAMPS, UPPER BLADE

PART NAME BASE PLATE, LIBRARY OF CLAMPS, UPPER BLADE			DESIGNER D. BRIDGES	21 APR 2009	SIZE A	DWG. NO. D0900666	REV. v2
DRAFTER D. BRIDGES	06 JUL 2010		CHECKER M. MEYER	07 JUL 2010	APPROVAL	SCALE: 1:2	PROJECTION:
						SHEET 1 OF 1	

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- ⑥ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- ⑦ DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900154	E080191
v2	18 MAY 2010	E1000166	E080191
v3	21 NOV 2010	E1000741	E080191



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSSL
FINISH 63 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO
SUB-SYSTEM SUS

NEXT ASSY LIBRARY OF CLAMPS, UPPER BLADE

PART NAME BLADE CLAMP (0.5 DEGREE), UPPER BLADE, INSIDE

DESIGNER D. BRIDGES 20 NOV 2010
DRAFTER D. BRIDGES 21 NOV 2010
CHECKER M. MEYER 22 NOV 2010
APPROVAL

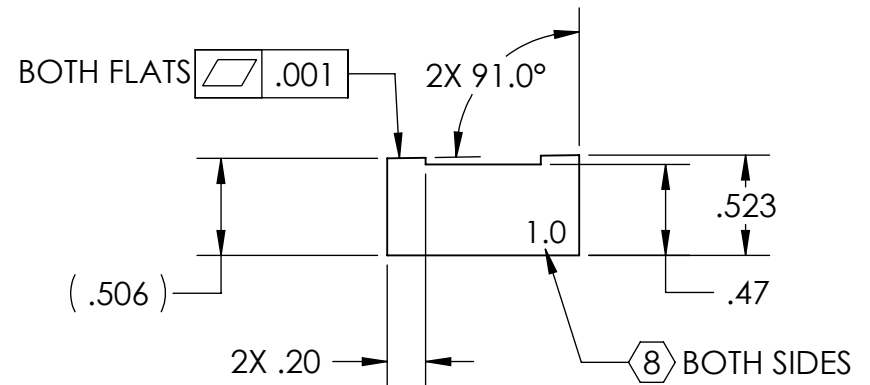
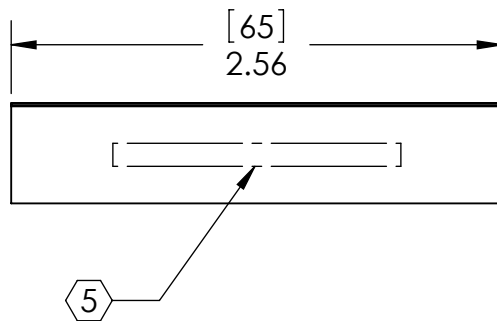
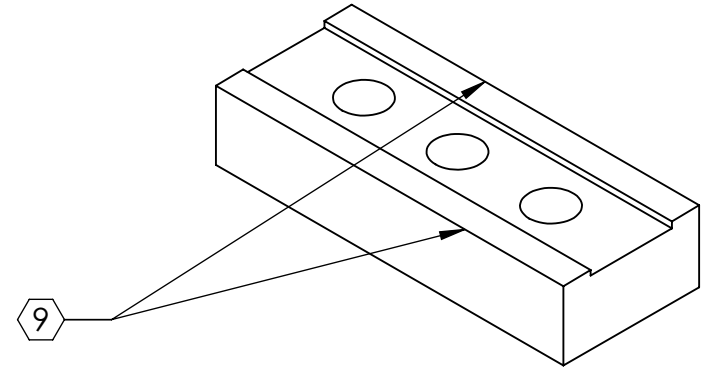
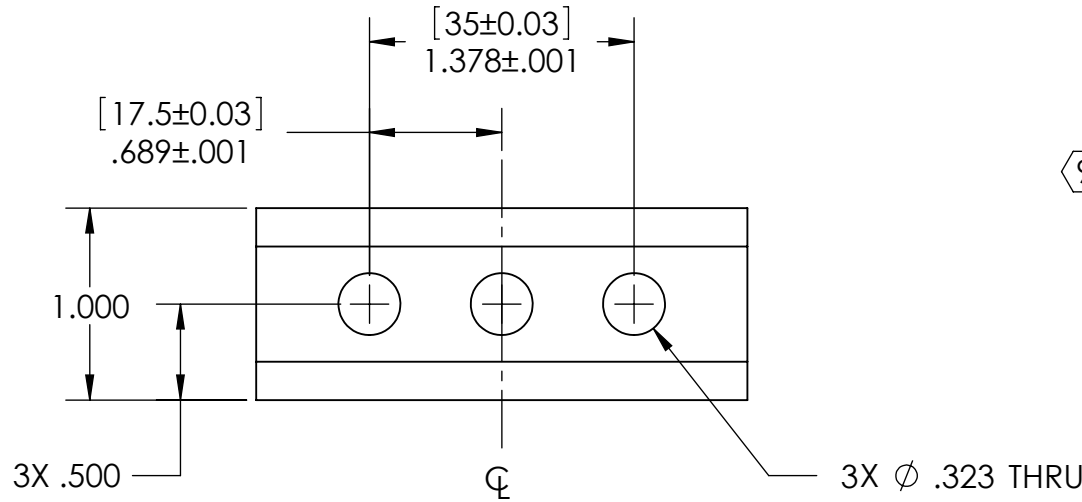
SIZE DWG. NO. **D0900667**
REV. v3

SCALE: 1:1 **PROJECTION:** **SHEET 1 OF 1**

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- ⑥ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- ⑦ DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900154	E080191
v2	18 MAY 2010	E1000166	E080191
v3	21 NOV 2010	E1000741	E080191



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
TOLERANCES:
.XX ±.01
.XXX ±.005
ANGULAR ± 0.1°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
2. REMOVE ALL SHARP EDGES, R.02 MIN.
3. DO NOT SCALE FROM DRAWING.
4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSTL
FINISH 63 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM **ADVANCED LIGO** SUB-SYSTEM **SUS**

NEXT ASSY LIBRARY OF CLAMPS, UPPER BLADE

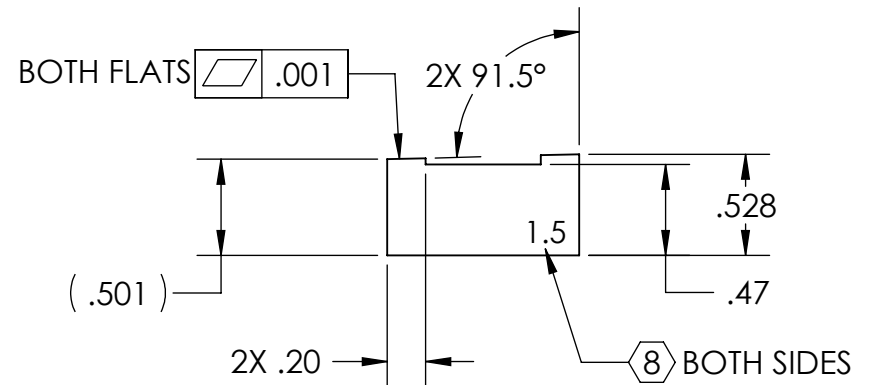
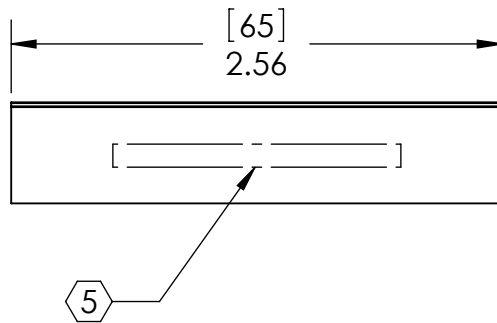
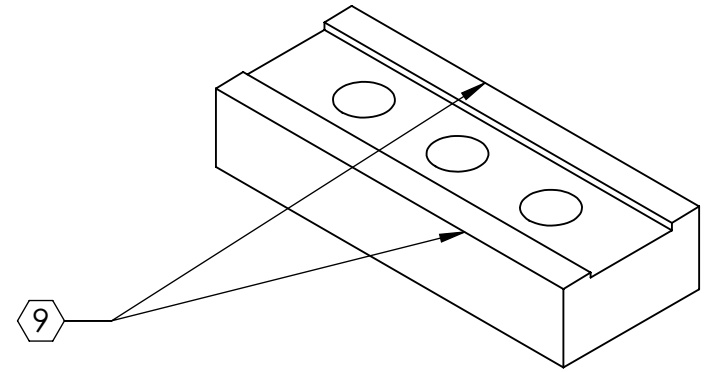
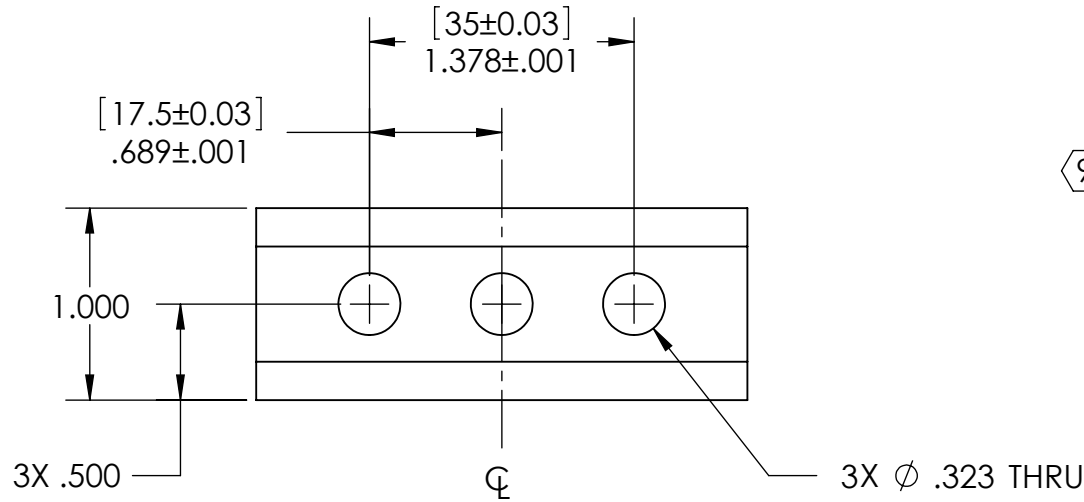
PART NAME BLADE CLAMP (1.0 DEGREE), UPPER BLADE, INSIDE

DESIGNER	D. BRIDGES	20 NOV 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	21 NOV 2010	A	D0900668	v3
CHECKER	M. MEYER	22 NOV 2010	SCALE: 1:1	PROJECTION:	SHEET 1 OF 1

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- ⑥ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- ⑦ DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900154	E080191
v2	18 MAY 2010	E1000166	E080191
v3	21 NOV 2010	E1000741	E080191



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.
MATERIAL
 304, 316 OR 302 SSSL
FINISH
 63 μinch

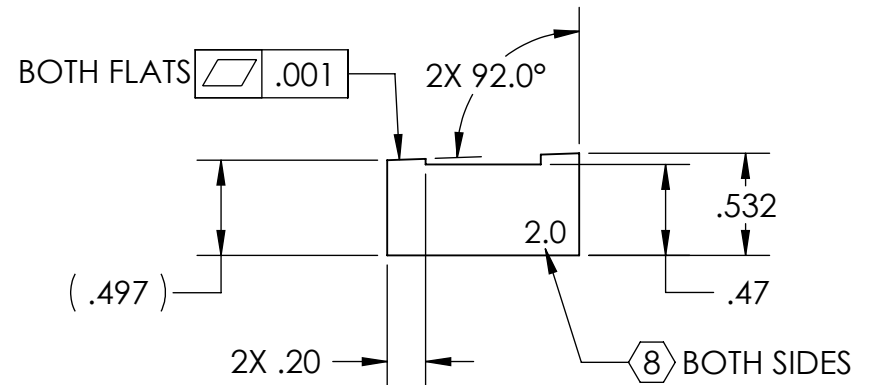
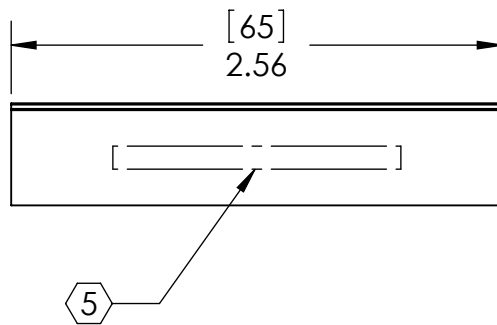
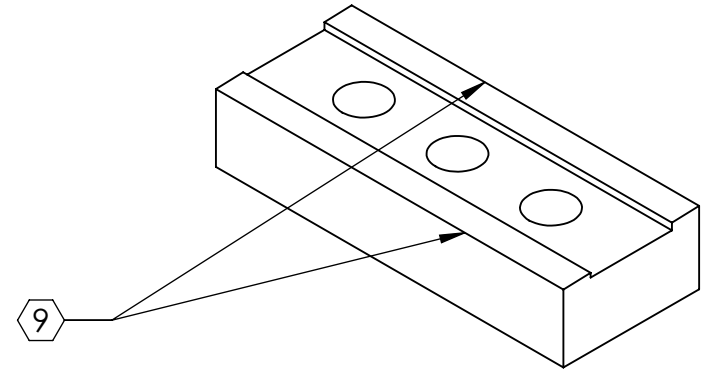
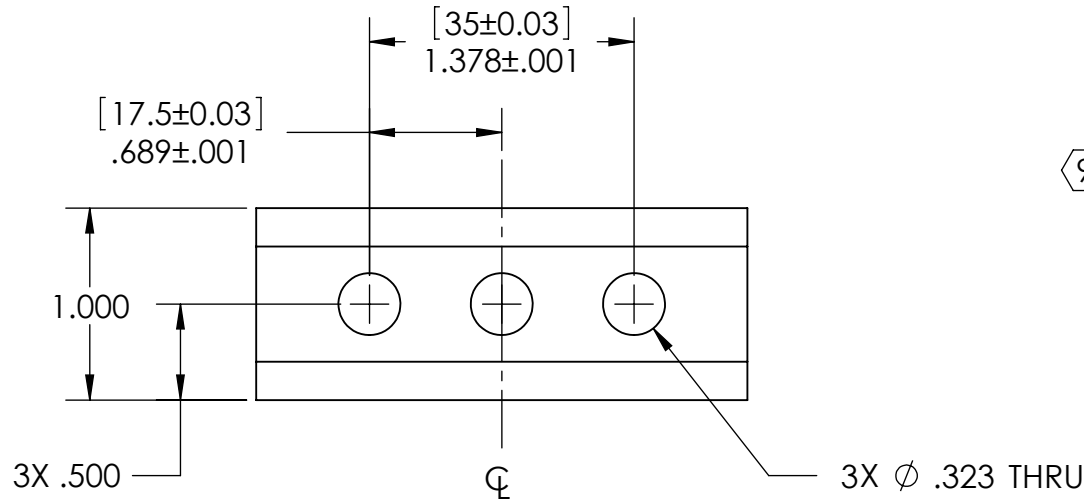
LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY
SYSTEM
 ADVANCED LIGO
SUB-SYSTEM
 SUS
NEXT ASSY
 LIBRARY OF CLAMPS, UPPER BLADE

PART NAME
 BLADE CLAMP (1.5 DEGREE), UPPER BLADE, INSIDE
DESIGNER D. BRIDGES 20 NOV 2010
DRAFTER D. BRIDGES 21 NOV 2010
CHECKER M. MEYER 22 NOV 2010
APPROVAL
SIZE DWG. NO. A D0900669
REV. v3
SCALE: 1:1 **PROJECTION:** SHEET 1 OF 1

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX; S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- ⑥ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- ⑦ DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900154	E080191
v2	18 MAY 2010	E1000166	E080191
v3	21 NOV 2010	E1000741	E080191



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSSL
FINISH 63 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO
SUB-SYSTEM SUS

NEXT ASSY LIBRARY OF CLAMPS, UPPER BLADE

PART NAME BLADE CLAMP (2.0 DEGREE), UPPER BLADE, INSIDE

DESIGNER D. BRIDGES 20 NOV 2010
DRAFTER D. BRIDGES 21 NOV 2010
CHECKER M. MEYER 22 NOV 2010
APPROVAL

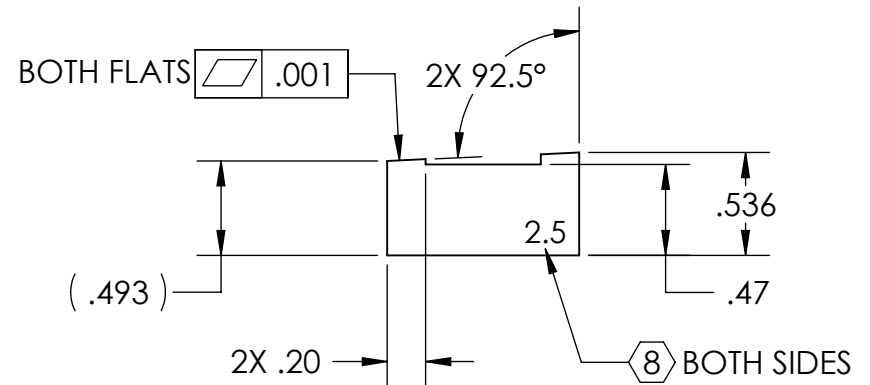
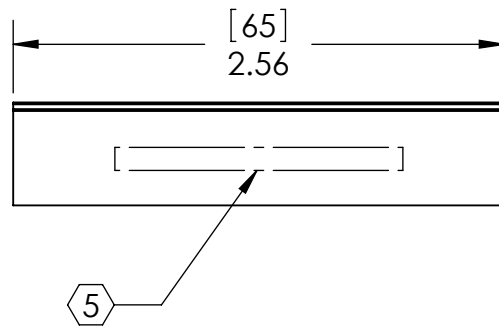
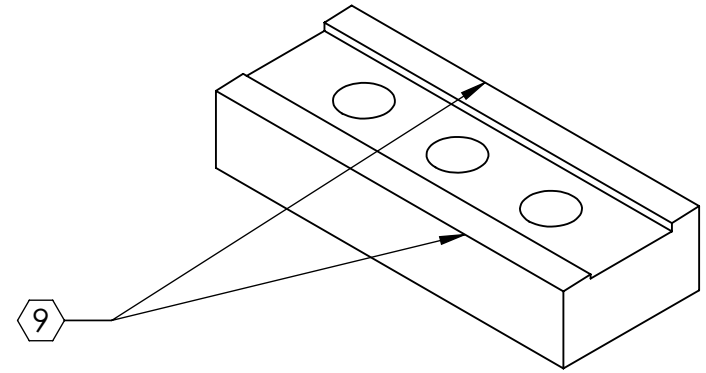
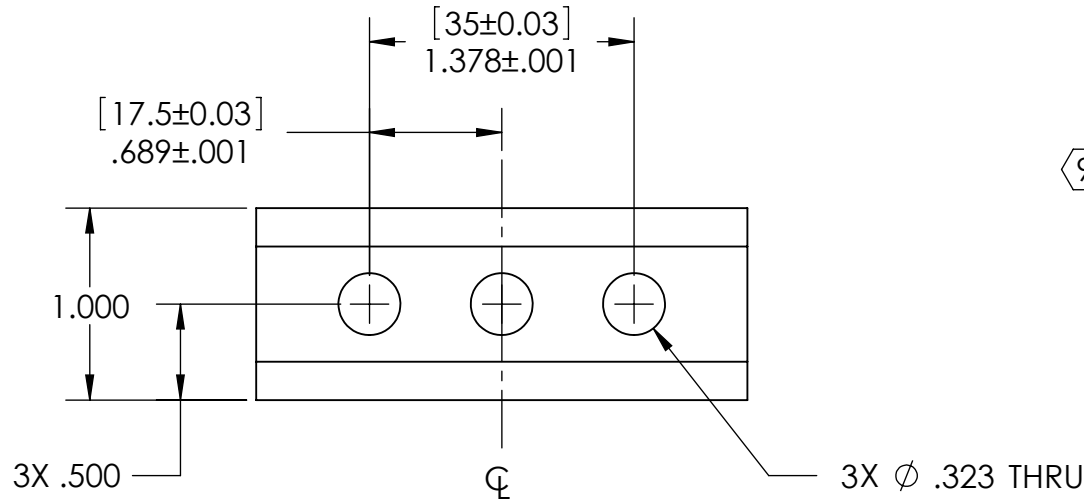
SIZE A
DWG. NO. D0900670
REV. v3

SCALE: 1:1
PROJECTION: SHEET 1 OF 1

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX; S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- ⑥ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- ⑦ DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900154	E080191
v2	18 MAY 2010	E1000166	E080191
v3	21 NOV 2010	E1000741	E080191



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL
304, 316 OR 302 SSSL

FINISH
63 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM
ADVANCED LIGO

SUB-SYSTEM
SUS

NEXT ASSY
LIBRARY OF CLAMPS, UPPER BLADE

PART NAME
BLADE CLAMP (2.5 DEGREE), UPPER BLADE, INSIDE

DESIGNER D. BRIDGES 20 NOV 2010
DRAFTER D. BRIDGES 21 NOV 2010
CHECKER M. MEYER 22 NOV 2010
APPROVAL

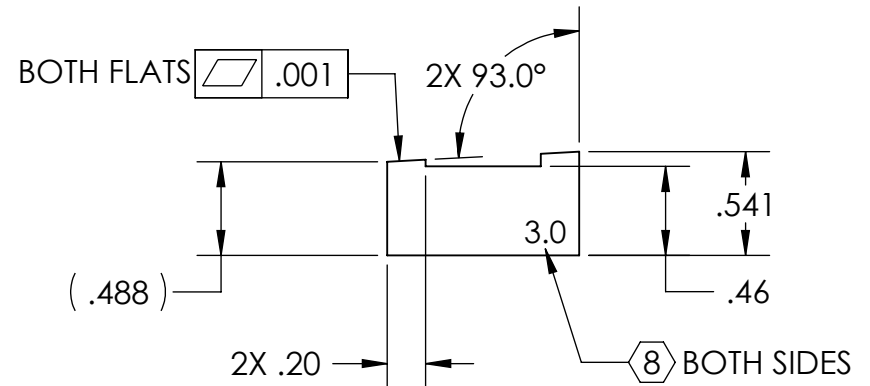
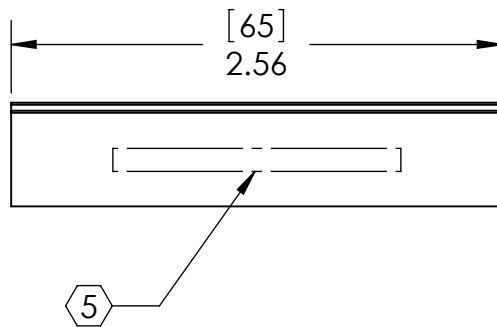
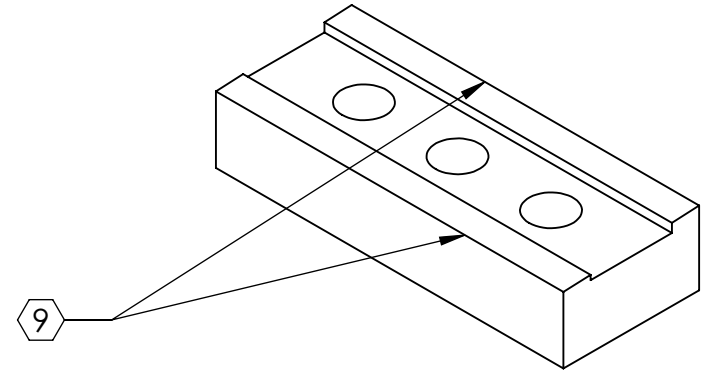
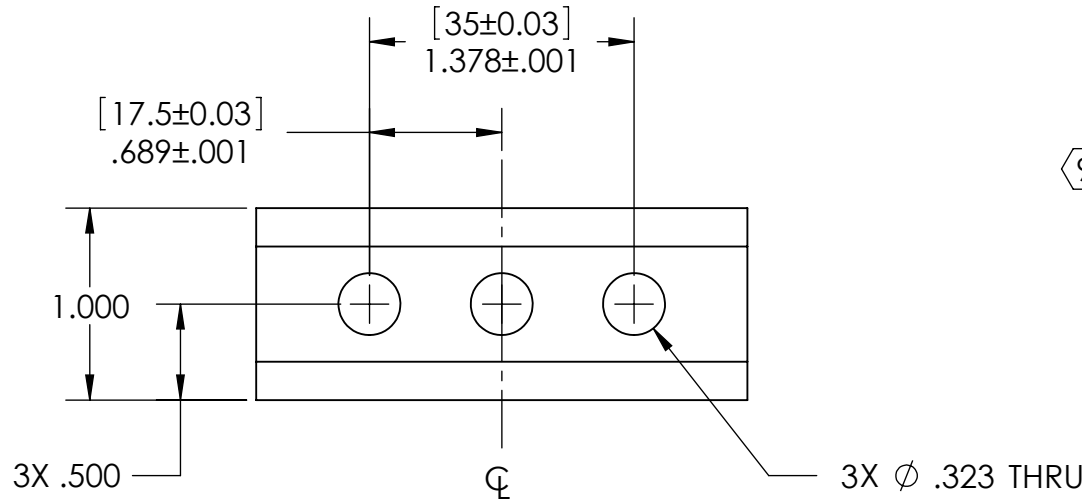
SIZE DWG. NO. **D0900671**
REV. v3

SCALE: 1:1 **PROJECTION:** **SHEET 1 OF 1**

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- ⑥ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- ⑦ DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900154	E080191
v2	18 MAY 2010	E1000166	E080191
v3	21 NOV 2010	E1000741	E080191



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSSL
FINISH 63 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO
SUB-SYSTEM SUS

NEXT ASSY LIBRARY OF CLAMPS, UPPER BLADE

PART NAME BLADE CLAMP (3.0 DEGREE), UPPER BLADE, INSIDE

DESIGNER D. BRIDGES 20 NOV 2010
DRAFTER D. BRIDGES 21 NOV 2010
CHECKER M. MEYER 22 NOV 2010

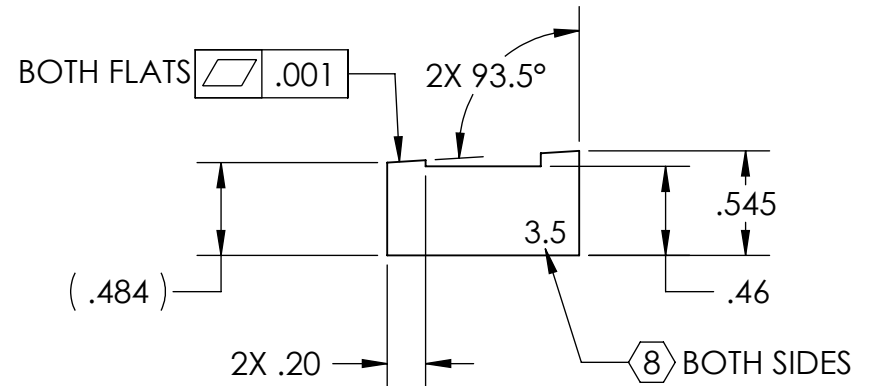
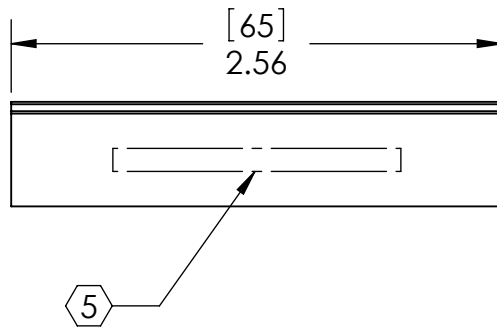
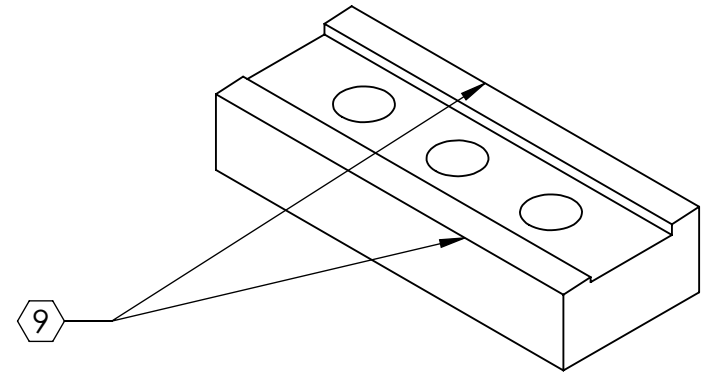
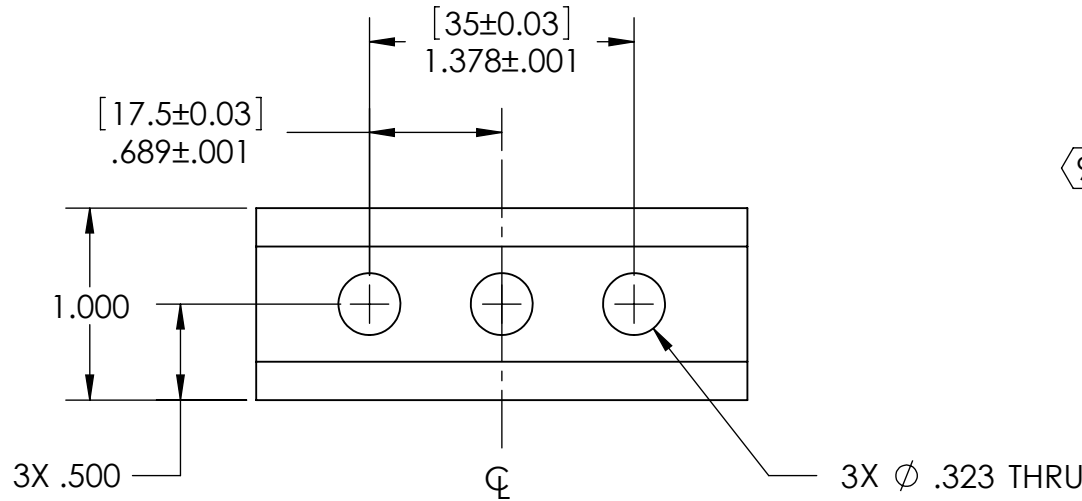
SIZE A
DWG. NO. D0900672
REV. v3

SCALE: 1:1
PROJECTION: SHEET 1 OF 1

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- ⑥ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- ⑦ DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900154	E080191
v2	18 MAY 2010	E1000166	E080191
v3	21 NOV 2010	E1000741	E080191



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSSL
FINISH 63 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO
SUB-SYSTEM SUS

NEXT ASSY LIBRARY OF CLAMPS, UPPER BLADE

PART NAME BLADE CLAMP (3.5 DEGREE), UPPER BLADE, INSIDE

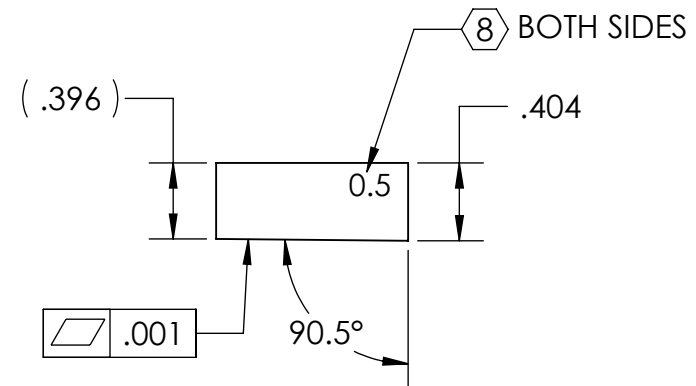
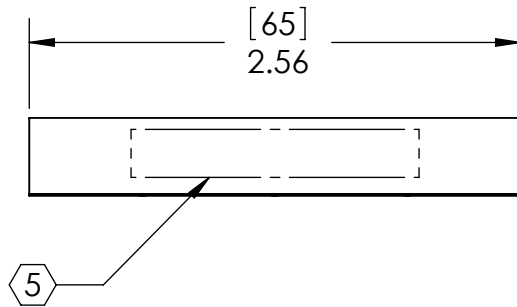
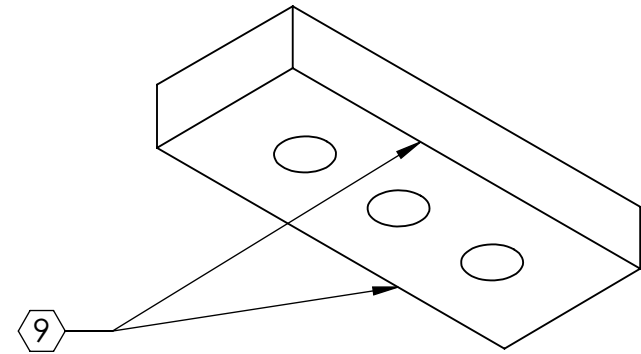
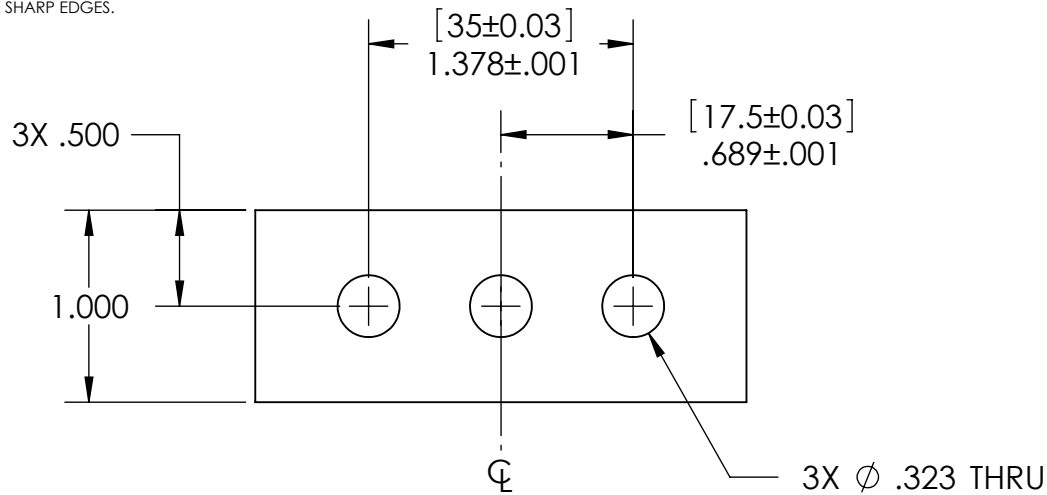
DESIGNER D. BRIDGES	20 NOV 2010	SIZE DWG. NO.	D0900673	REV. v3
DRAFTER D. BRIDGES	21 NOV 2010	A		
CHECKER M. MEYER	22 NOV 2010	APPROVAL		

SCALE: 1:1 **PROJECTION:** **SHEET 1 OF 1**

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- ⑥ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- ⑦ DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900154	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
TOLERANCES:
.XX ±.01
.XXX ±.005
ANGULAR ± 0.1°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSSL
FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM **ADVANCED LIGO** SUB-SYSTEM **SUS**

NEXT ASSY LIBRARY OF CLAMPS, UPPER BLADE

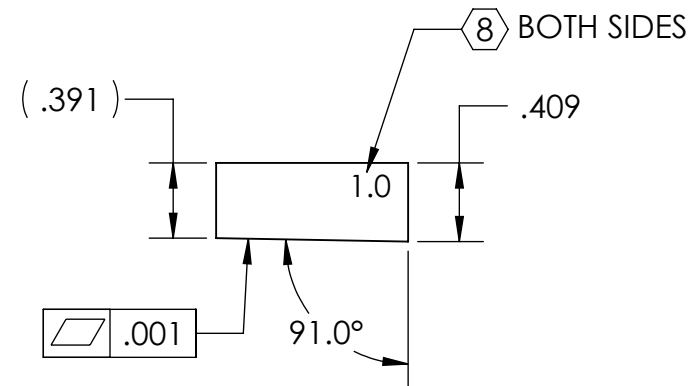
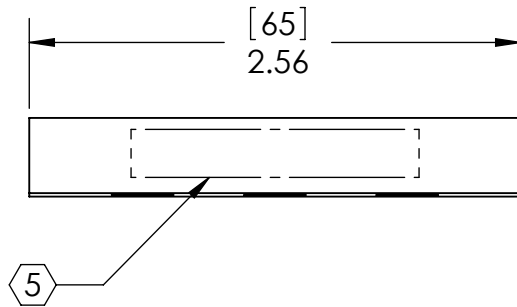
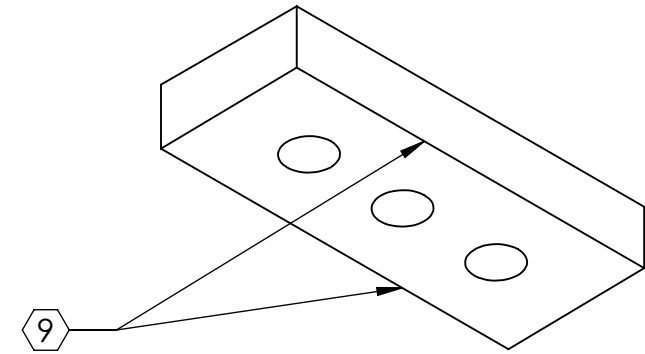
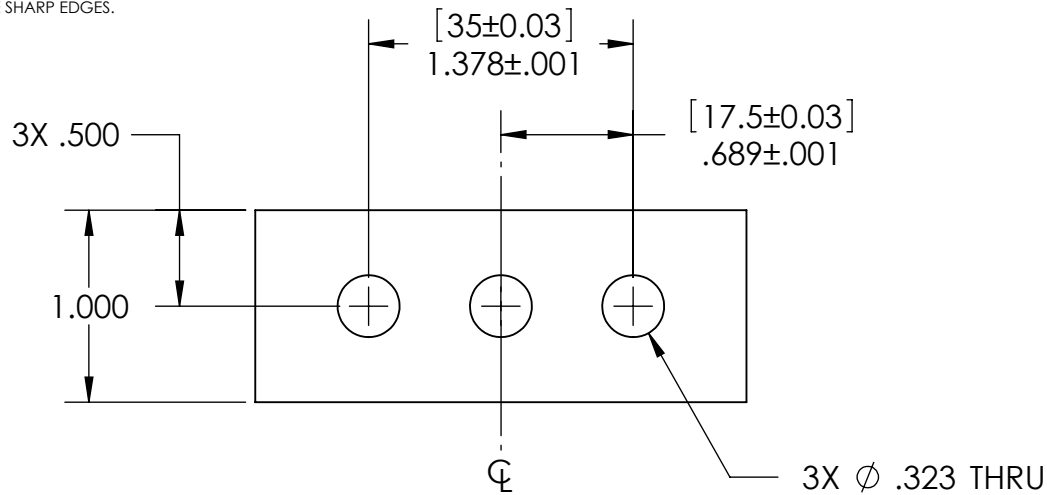
PART NAME BLADE CLAMP (0.5 DEGREE), UPPER BLADE, OUTSIDE

DESIGNER	D. BRIDGES	21 APR 2009	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	22 APR 2009	A	D0900674	v2
CHECKER	M. MEYER	22 APR 2009	SCALE: 1:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- ⑥ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- ⑦ DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900154	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

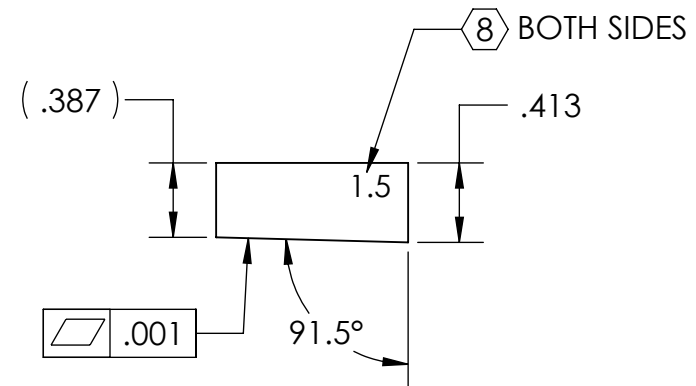
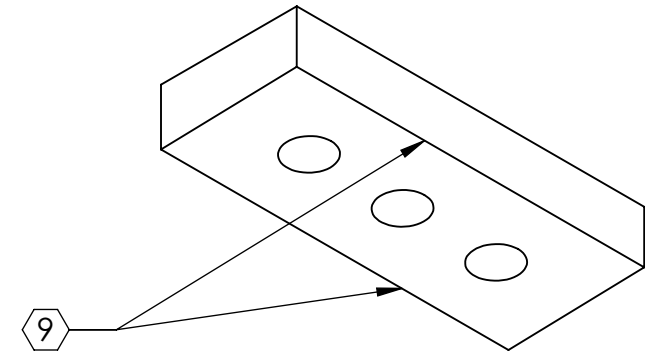
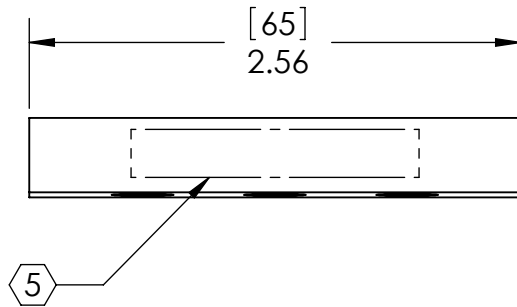
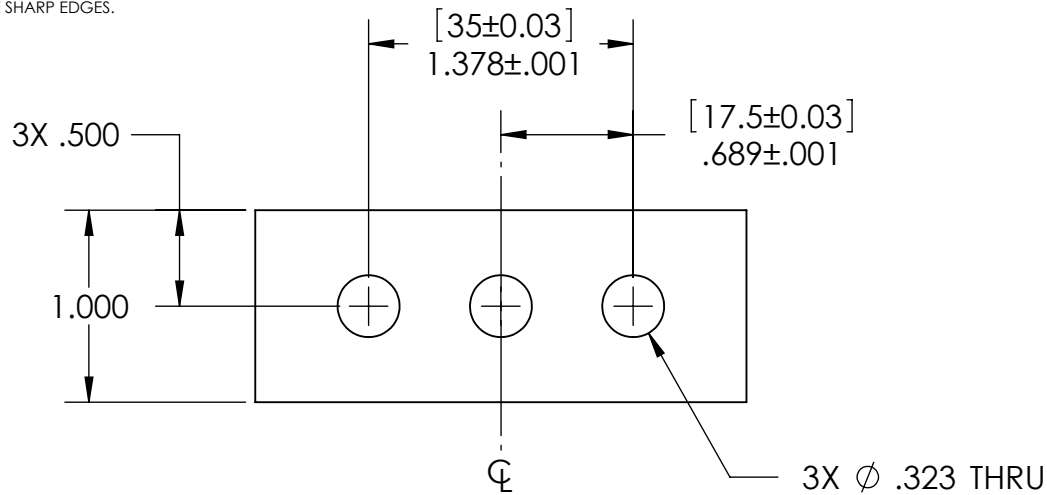
DIMENSIONS ARE IN INCHES [MM] 1. INTERPRET DRAWING PER ASME Y14.5-1994.
 TOLERANCES: .XX ± .01 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 .XXX ± .005 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.
 MATERIAL 304, 316 OR 302 SSSL FINISH 32 μinch
 ANGULAR ± 0.1°

CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME BLADE CLAMP (1.0 DEGREE), UPPER BLADE, OUTSIDE	
SYSTEM ADVANCED LIGO	SUB-SYSTEM SUS	DESIGNER D. BRIDGES 21 APR 2009 DRAFTER D. BRIDGES 22 APR 2009 CHECKER M. MEYER 22 APR 2009 APPROVAL	SIZE DWG. NO. A D0900675
NEXT ASSY LIBRARY OF CLAMPS, UPPER BLADE		REV. v2	SCALE: 1:1 PROJECTION: SHEET 1 OF 1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- 9. DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900154	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
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 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL
304, 316 OR 302 SSSL

FINISH
32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM
ADVANCED LIGO

SUB-SYSTEM
SUS

NEXT ASSY
LIBRARY OF CLAMPS, UPPER BLADE

PART NAME
BLADE CLAMP (1.5 DEGREE), UPPER BLADE, OUTSIDE

DESIGNER D. BRIDGES 21 APR 2009
DRAFTER D. BRIDGES 22 APR 2009
CHECKER M. MEYER 22 APR 2009
APPROVAL

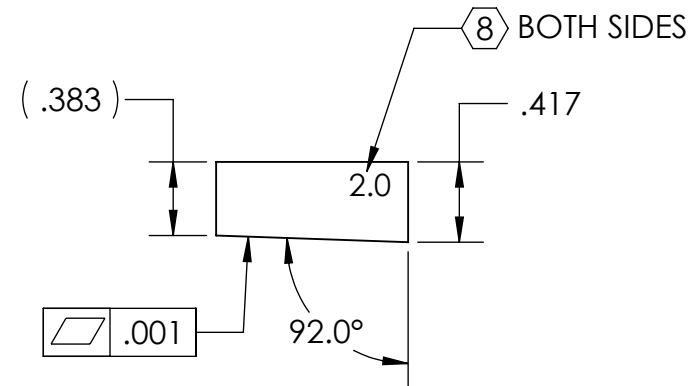
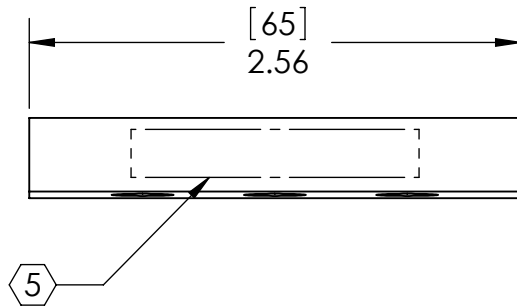
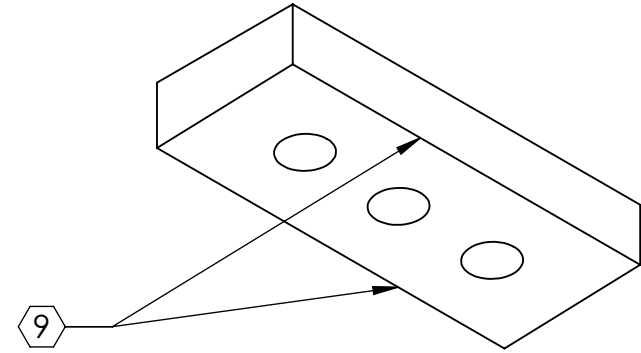
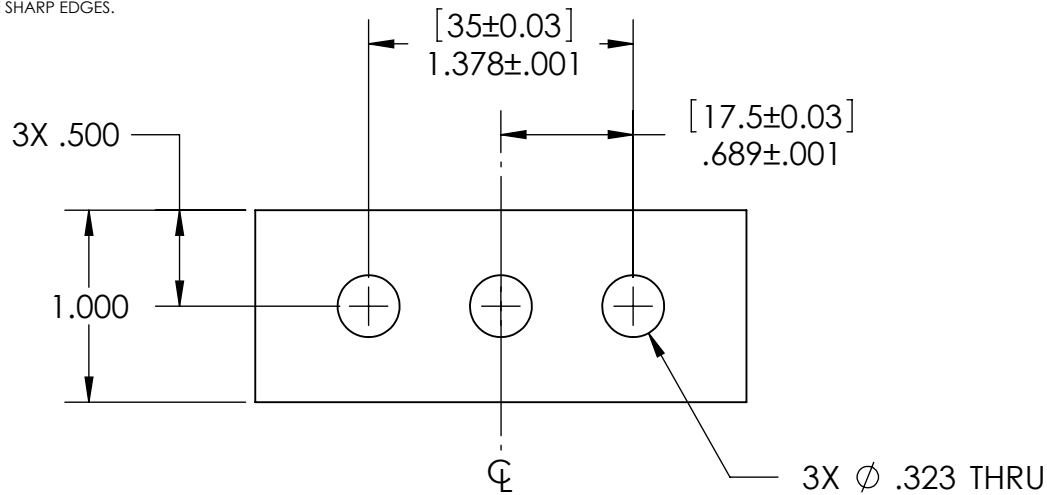
SIZE DWG. NO. **D0900676**
REV. v2

SCALE: 1:1 **PROJECTION:** **SHEET 1 OF 1**

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- ⑥ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- ⑦ DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900154	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
TOLERANCES:
.XX ±.01
.XXX ±.005
ANGULAR ± 0.1°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
2. REMOVE ALL SHARP EDGES, R.02 MIN.
3. DO NOT SCALE FROM DRAWING.
4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL
304, 316 OR 302 SSSL

FINISH
32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM
ADVANCED LIGO

SUB-SYSTEM
SUS

NEXT ASSY
LIBRARY OF CLAMPS, UPPER BLADE

PART NAME
BLADE CLAMP (2.0 DEGREE), UPPER BLADE, OUTSIDE

DESIGNER D. BRIDGES 21 APR 2009
DRAFTER D. BRIDGES 22 APR 2009
CHECKER M. MEYER 22 APR 2009
APPROVAL

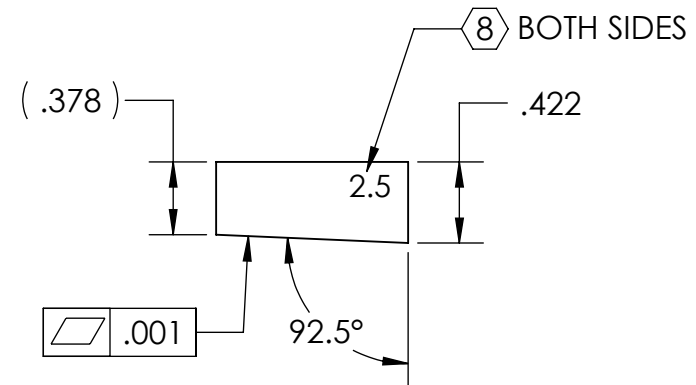
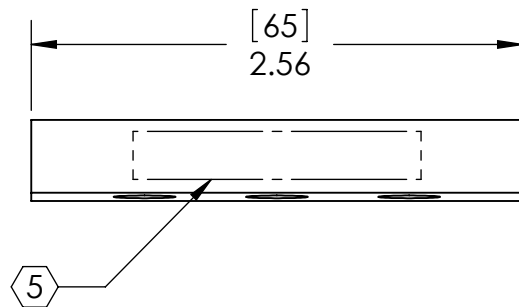
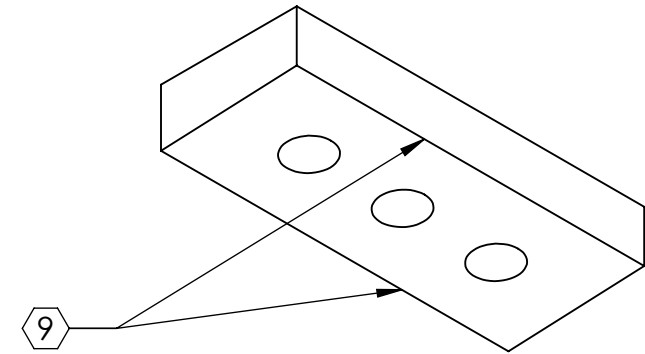
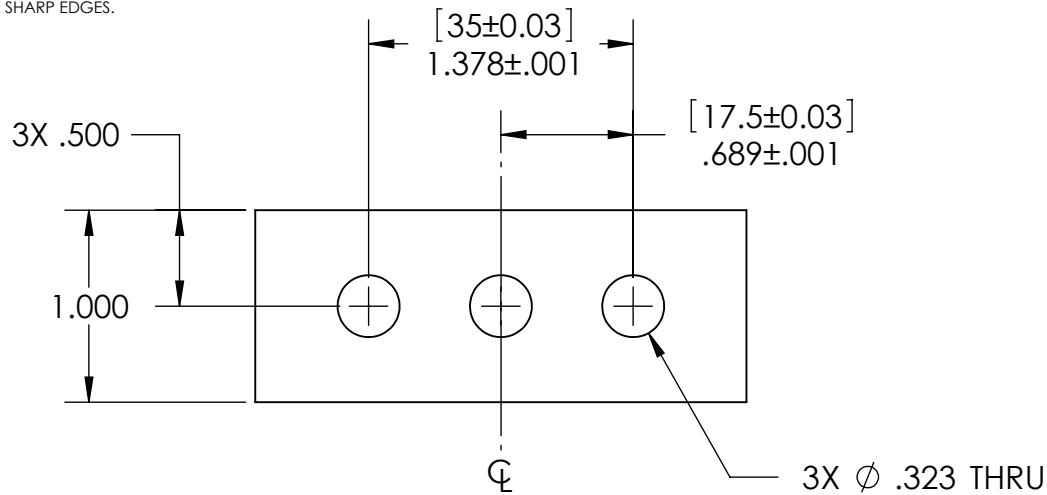
SIZE DWG. NO. A D0900677
REV. v2

SCALE: 1:1 **PROJECTION:** **SHEET 1 OF 1**

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- 9. DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900154	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]

TOLERANCES:
.XX ±.01
.XXX ±.005

ANGULAR ± 0.1°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
2. REMOVE ALL SHARP EDGES, R.02 MIN.
3. DO NOT SCALE FROM DRAWING.
4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL
304, 316 OR 302 SSSL

FINISH
32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM
ADVANCED LIGO

SUB-SYSTEM
SUS

NEXT ASSY
LIBRARY OF CLAMPS, UPPER BLADE

PART NAME
BLADE CLAMP (2.5 DEGREE), UPPER BLADE, OUTSIDE

DESIGNER D. BRIDGES 21 APR 2009
DRAFTER D. BRIDGES 22 APR 2009
CHECKER M. MEYER 22 APR 2009
APPROVAL

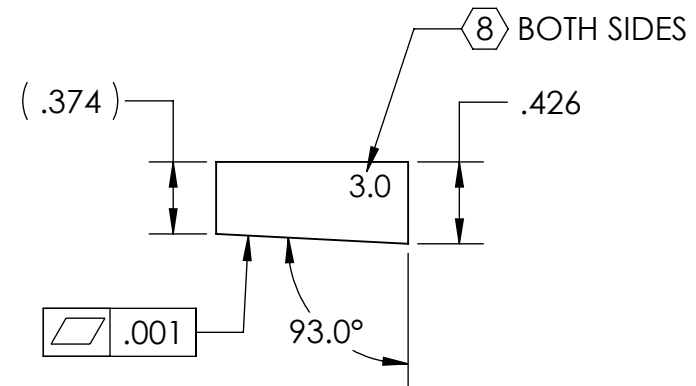
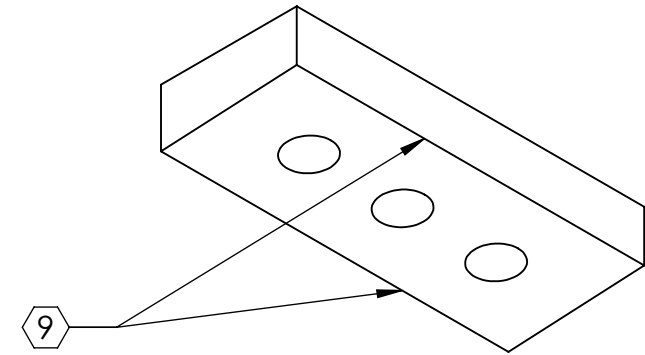
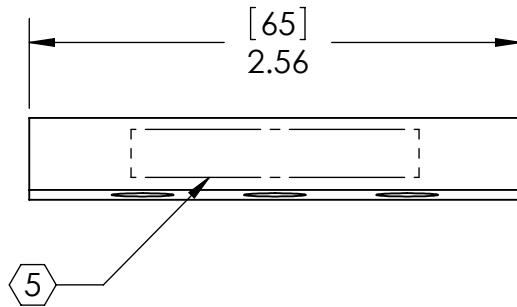
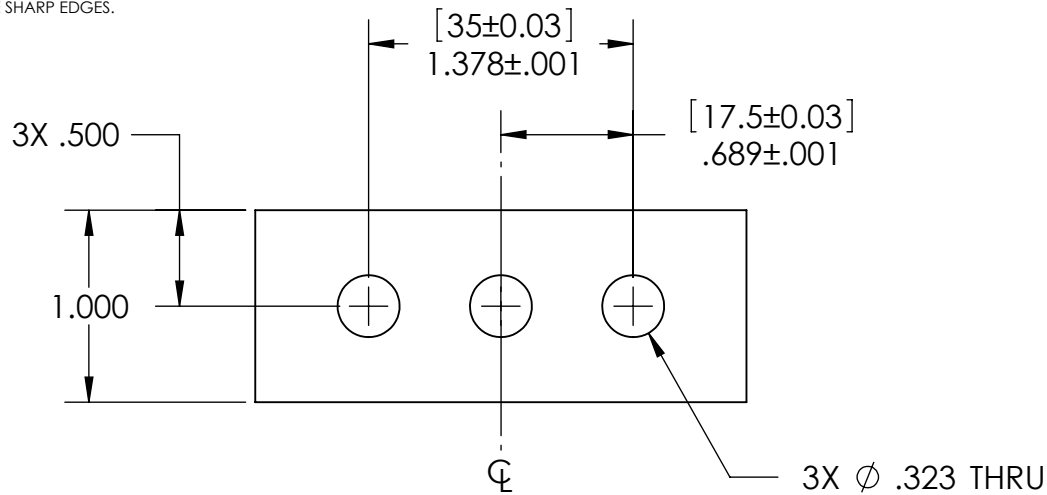
SIZE DWG. NO. A D0900678
REV. v2

SCALE: 1:1 **PROJECTION:** SHEET 1 OF 1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- 9. DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900154	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

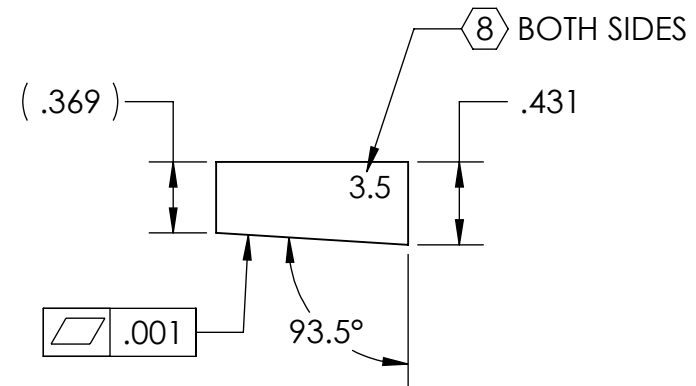
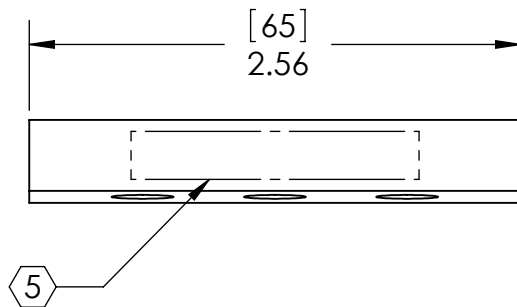
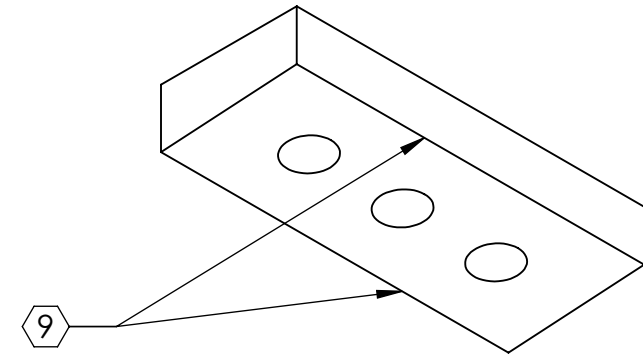
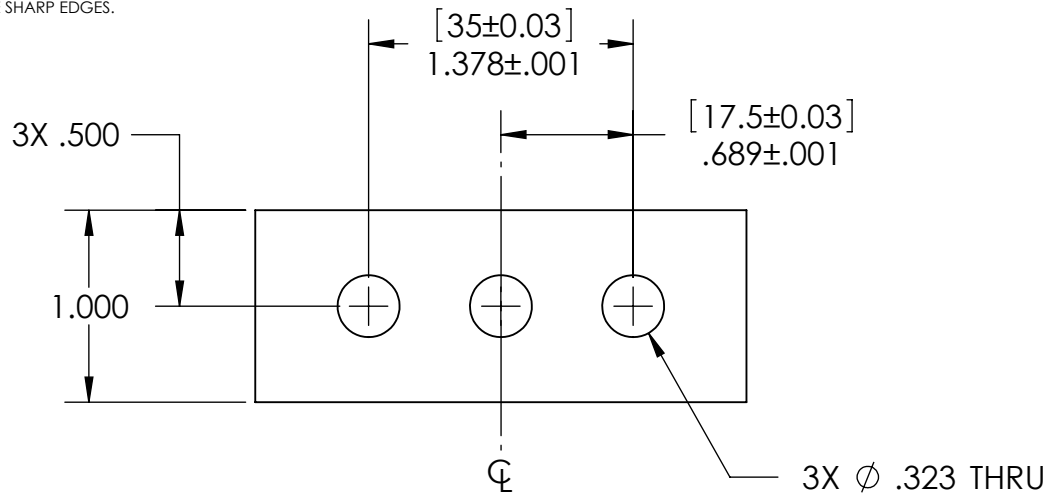
DIMENSIONS ARE IN INCHES [MM] 1. INTERPRET DRAWING PER ASME Y14.5-1994.
 TOLERANCES: .XX ± .01 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 .XXX ± .005 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.
 MATERIAL 304, 316 OR 302 SSSL FINISH 32 μinch
 ANGULAR ± 0.1°

CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME BLADE CLAMP (3.0 DEGREE), UPPER BLADE, OUTSIDE	
SYSTEM ADVANCED LIGO	SUB-SYSTEM SUS	DESIGNER D. BRIDGES 21 APR 2009 DRAFTER D. BRIDGES 22 APR 2009 CHECKER M. MEYER 22 APR 2009 APPROVAL	SIZE DWG. NO. A D0900679 REV. v2
NEXT ASSY LIBRARY OF CLAMPS, UPPER BLADE		SCALE: 1:1 PROJECTION:	SHEET 1 OF 1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- 9. DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900154	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL
304, 316 OR 302 SSSL

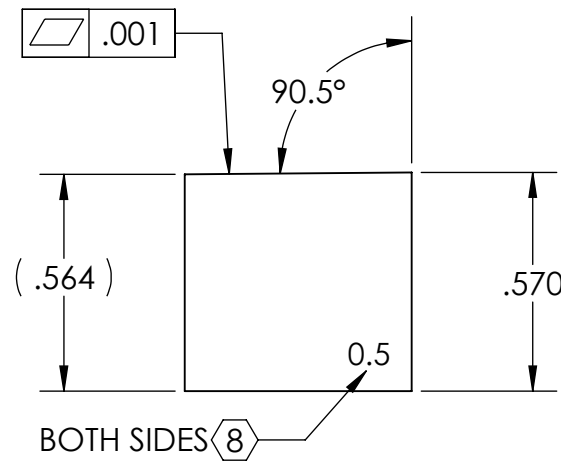
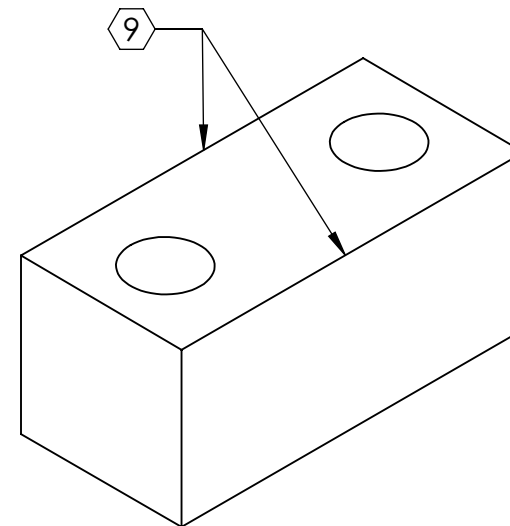
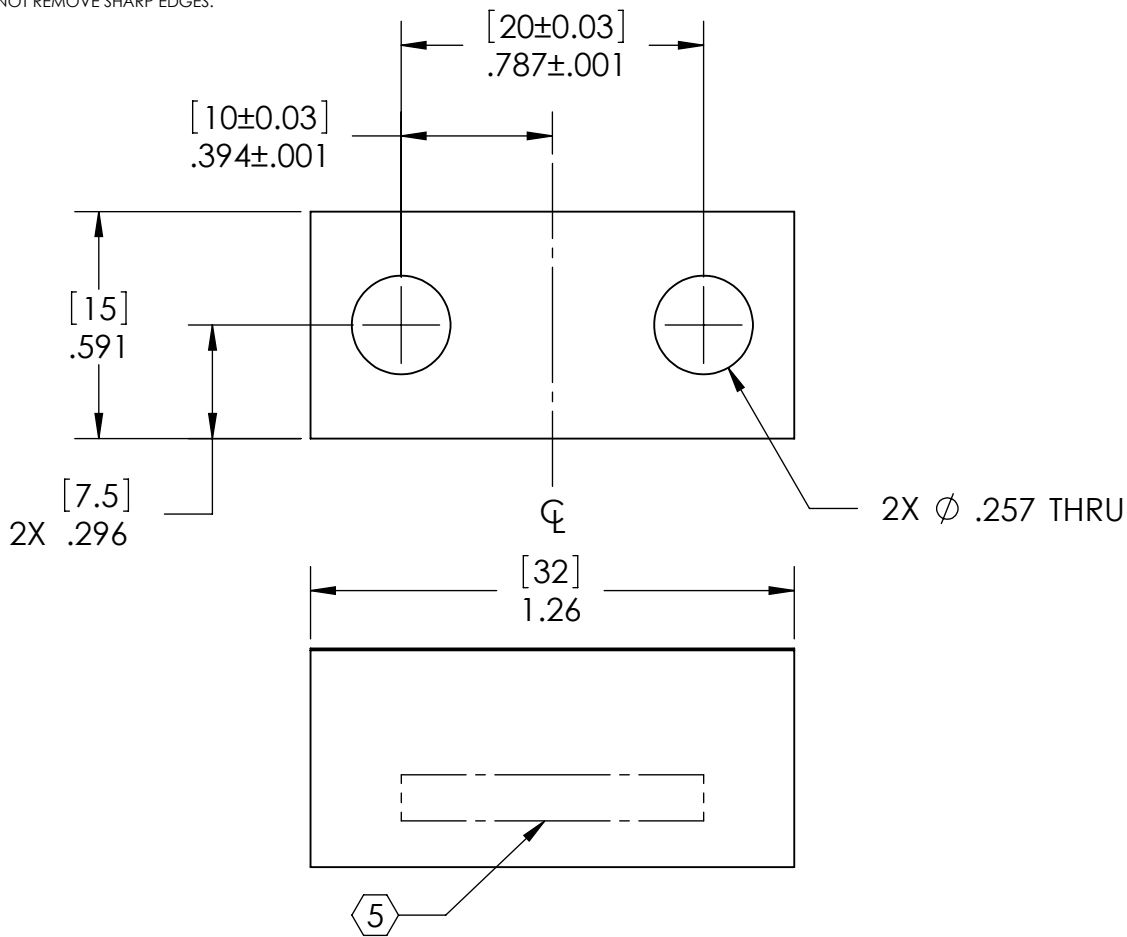
FINISH
32 μinch

CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME BLADE CLAMP (3.5 DEGREE), UPPER BLADE, OUTSIDE	
SYSTEM ADVANCED LIGO	SUB-SYSTEM SUS	DESIGNER D. BRIDGES 21 APR 2009	SIZE DWG. NO. A D0900680
NEXT ASSY LIBRARY OF CLAMPS, UPPER BLADE	CHECKER M. MEYER 22 APR 2009	APPROVAL	REV. v2
		SCALE: 1:1	PROJECTION:
			SHEET 1 OF 1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED. EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- 9. DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900155	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSSL
 FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS
 NEXT ASSY LIBRARY OF CLAMPS, LOWER BLADE

PART NAME BLADE CLAMP (0.5 DEGREE), LOWER BLADE, INSIDE

DESIGNER D. BRIDGES 22 APR 2009
 DRAFTER D. BRIDGES 25 JUN 2010
 CHECKER M. MEYER 28 JUN 2010
 APPROVAL

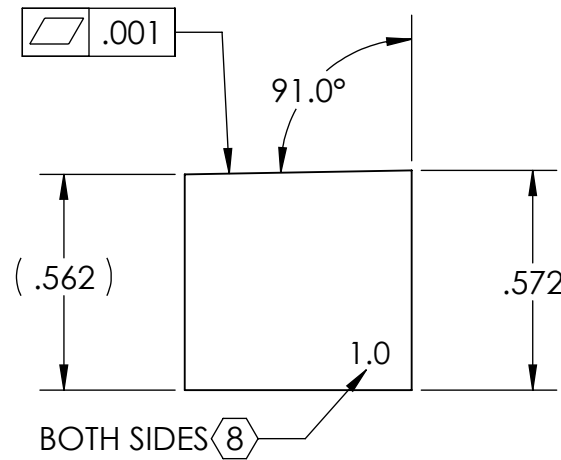
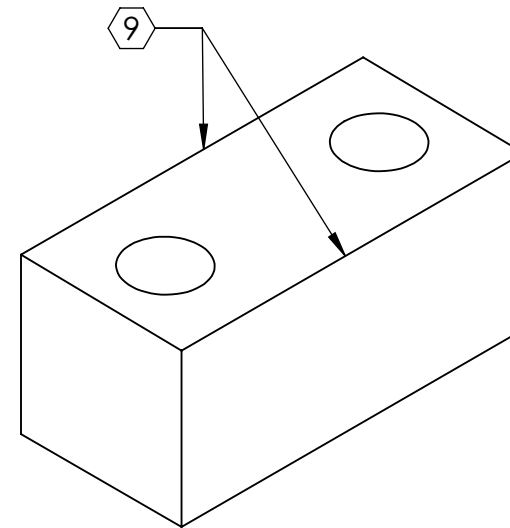
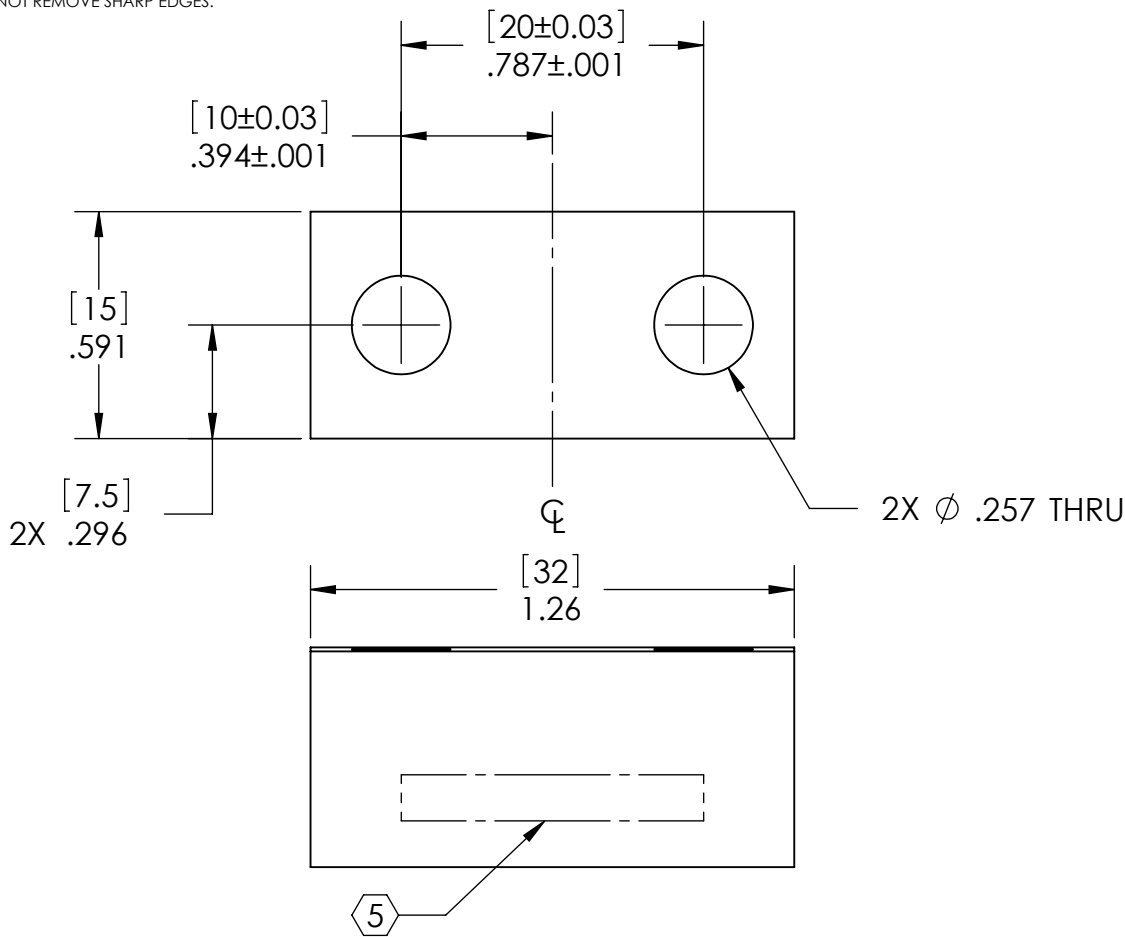
SIZE DWG. NO. A D0900682
 SCALE: 2:1 PROJECTION: SHEET 1 OF 1

REV. v2

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- ⑥ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- ⑦ DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900155	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSSL
 FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS
 NEXT ASSY LIBRARY OF CLAMPS, LOWER BLADE

PART NAME BLADE CLAMP (1.0 DEGREE), LOWER BLADE, INSIDE

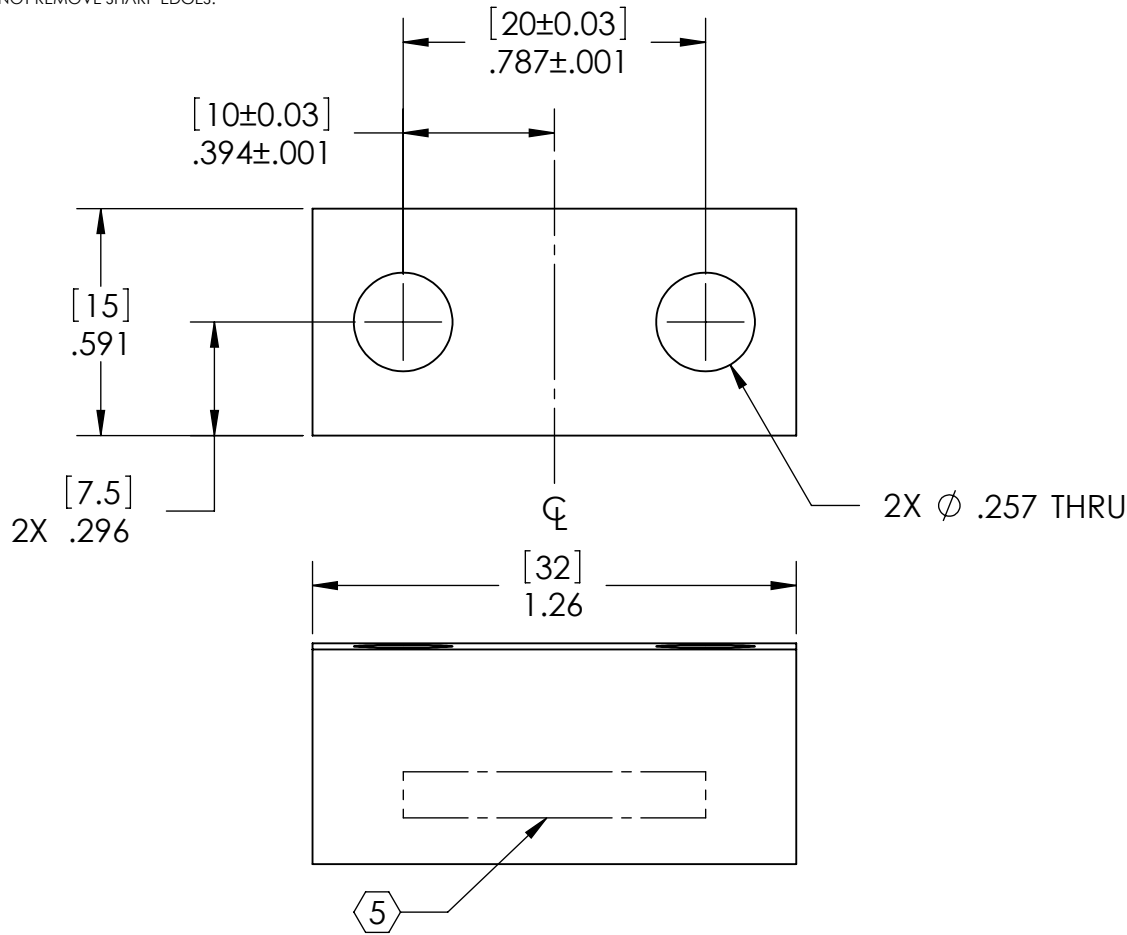
DESIGNER D. BRIDGES 22 APR 2009
 DRAFTER D. BRIDGES 25 JUN 2010
 CHECKER M. MEYER 28 JUN 2010
 APPROVAL

SIZE DWG. NO. A D0900683
 SCALE: 2:1 PROJECTION: SHEET 1 OF 1

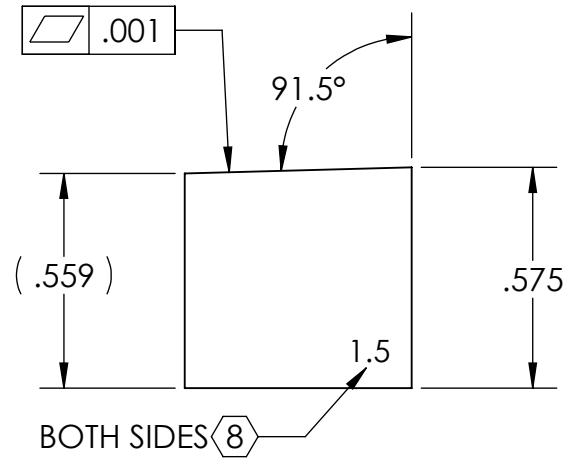
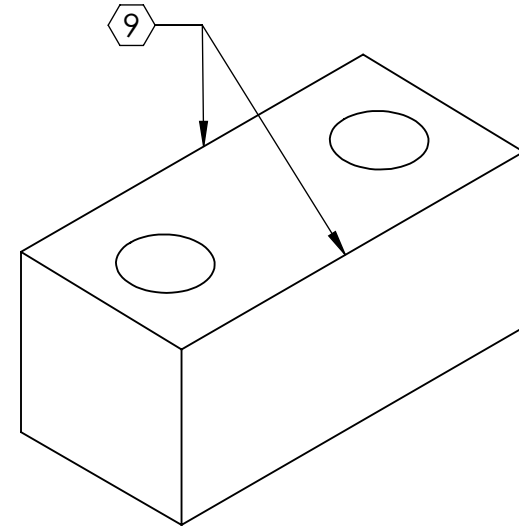
REV. v2

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- ⑥ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- ⑦ DO NOT REMOVE SHARP EDGES.



REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900155	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

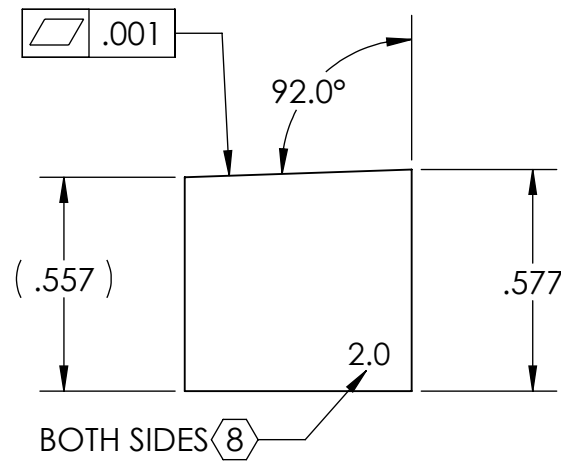
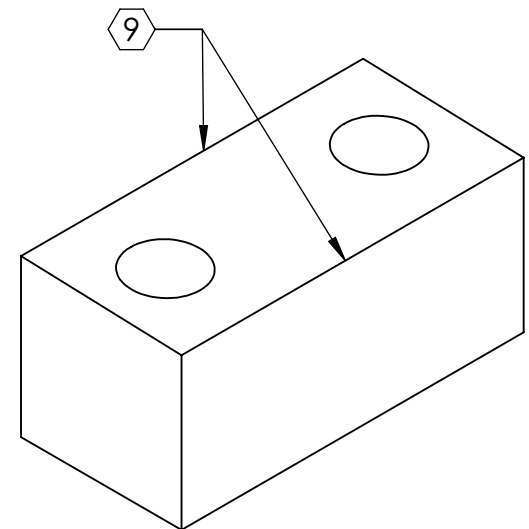
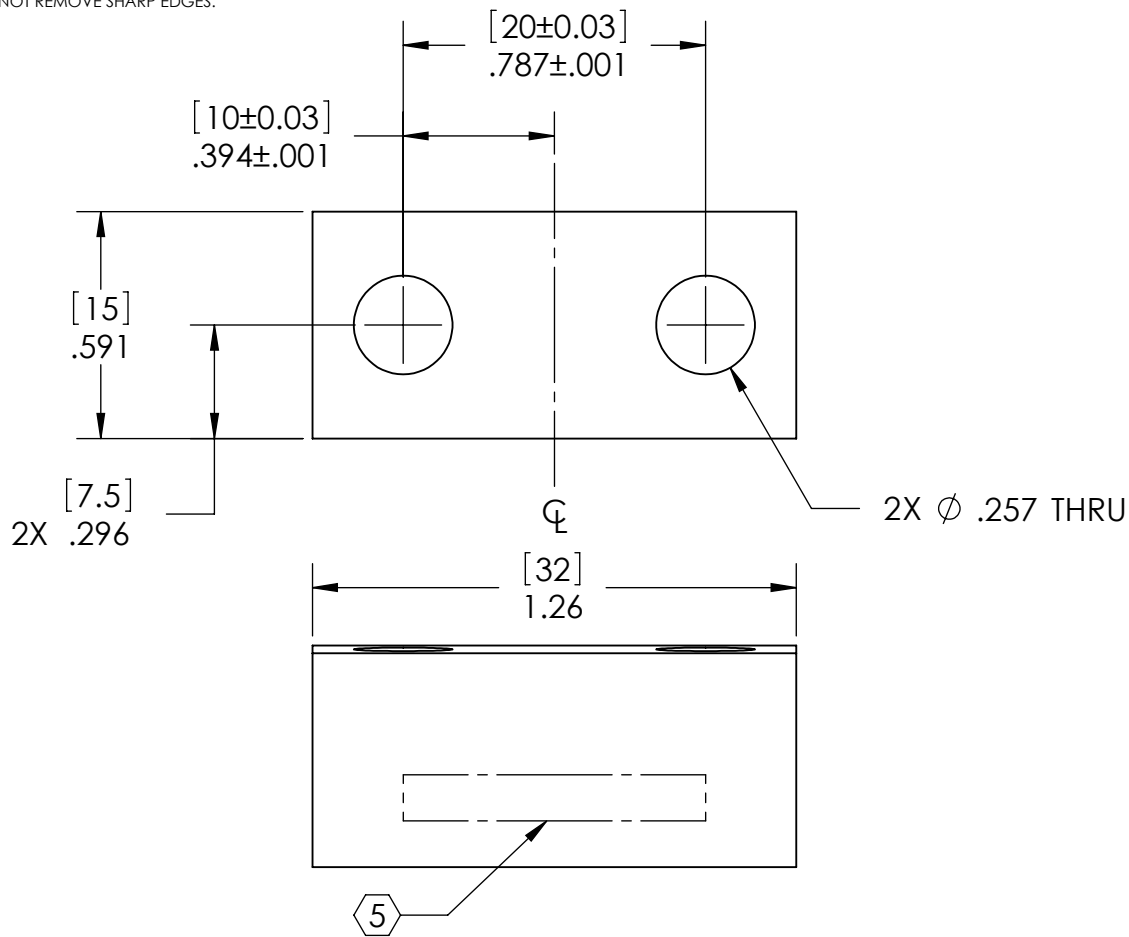
1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSSL
 FINISH 32 μinch

CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME BLADE CLAMP (1.5 DEGREE), LOWER BLADE, INSIDE	
SYSTEM ADVANCED LIGO	SUB-SYSTEM SUS	DESIGNER D. BRIDGES	22 APR 2009
NEXT ASSY LIBRARY OF CLAMPS, LOWER BLADE	APPROVAL	DRAFTER D. BRIDGES	25 JUN 2010
		CHECKER M. MEYER	28 JUN 2010
		SIZE A	DWG. NO. D0900684
		SCALE: 2:1	PROJECTION:
			REV. v2
			SHEET 1 OF 1

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- ⑥ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- ⑦ DO NOT REMOVE SHARP EDGES.



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSSL
 FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM **ADVANCED LIGO** SUB-SYSTEM **SUS**

NEXT ASSY LIBRARY OF CLAMPS, LOWER BLADE

PART NAME **BLADE CLAMP (2.0 DEGREE), LOWER BLADE, INSIDE**

DESIGNER D. BRIDGES 22 APR 2009
 DRAFTER D. BRIDGES 25 JUN 2010
 CHECKER M. MEYER 28 JUN 2010
 APPROVAL

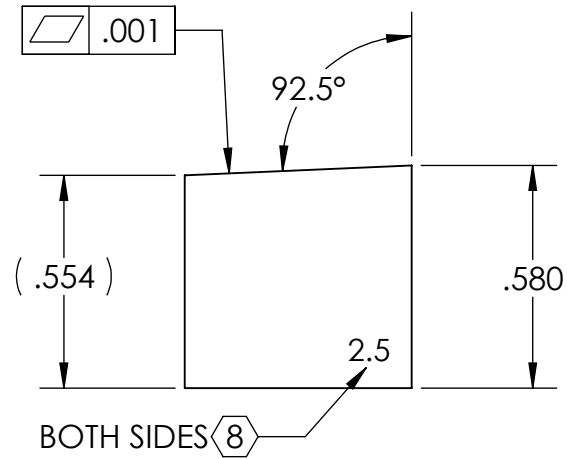
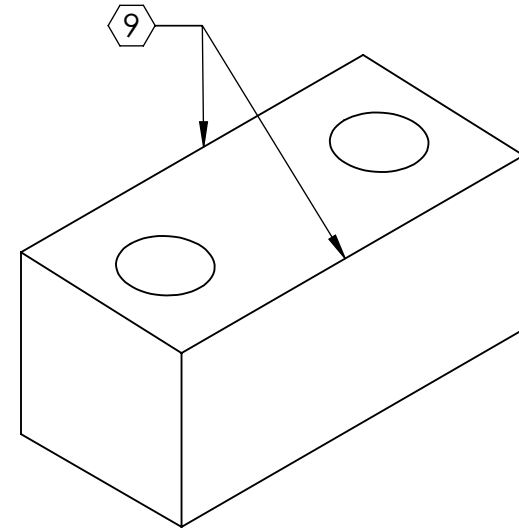
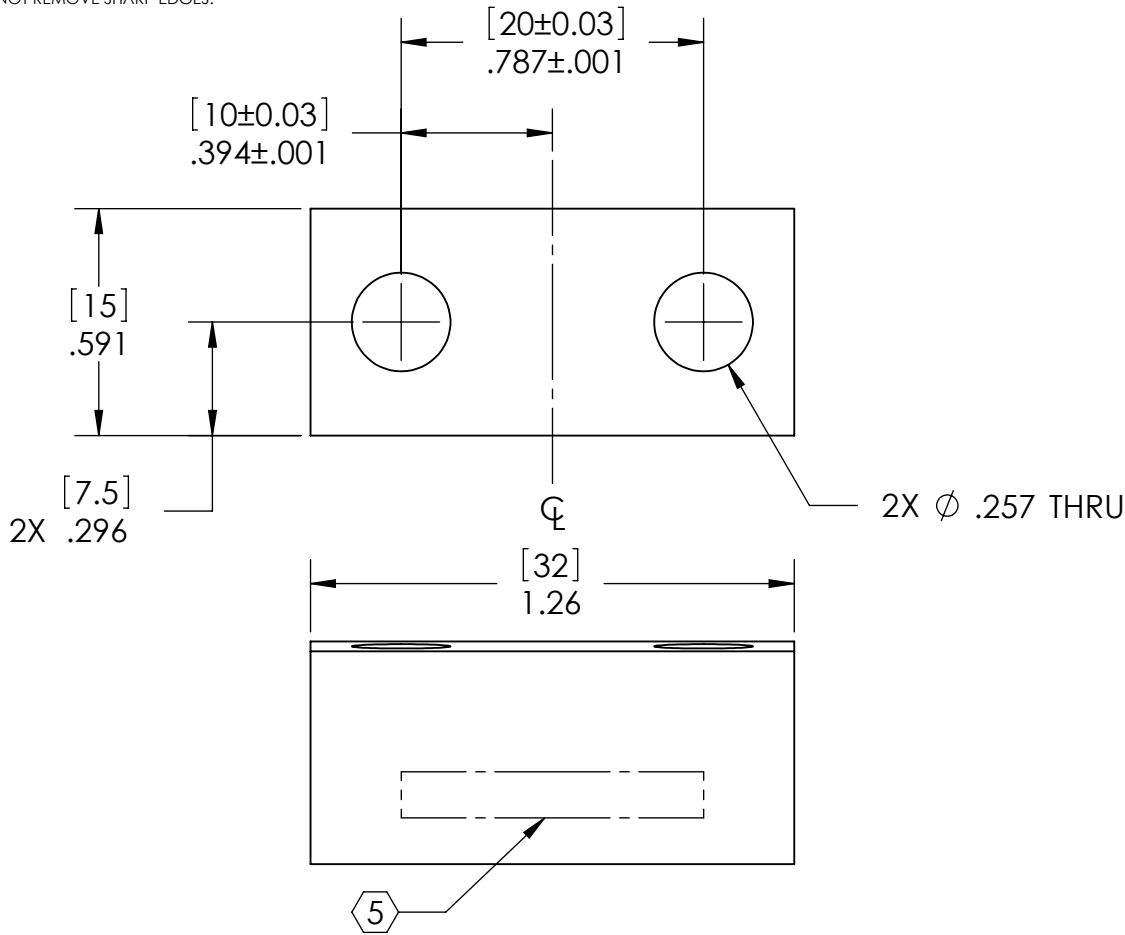
SIZE **A** DWG. NO. **D0900685** REV. **v2**

SCALE: 2:1 PROJECTION: SHEET 1 OF 1

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- ⑥ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- ⑦ DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900155	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSTL
 FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM **ADVANCED LIGO** SUB-SYSTEM **SUS**

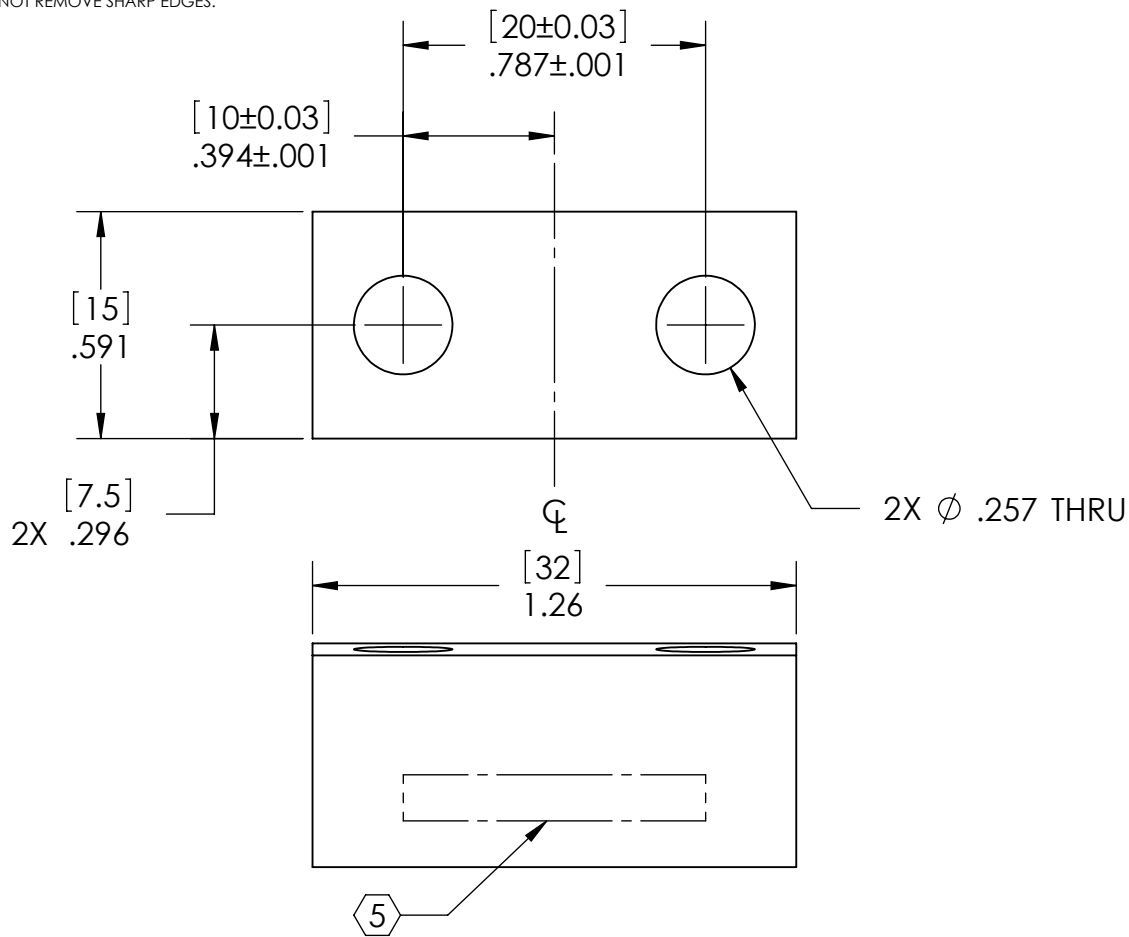
NEXT ASSY LIBRARY OF CLAMPS, LOWER BLADE

PART NAME **BLADE CLAMP (2.5 DEGREE), LOWER BLADE, INSIDE**

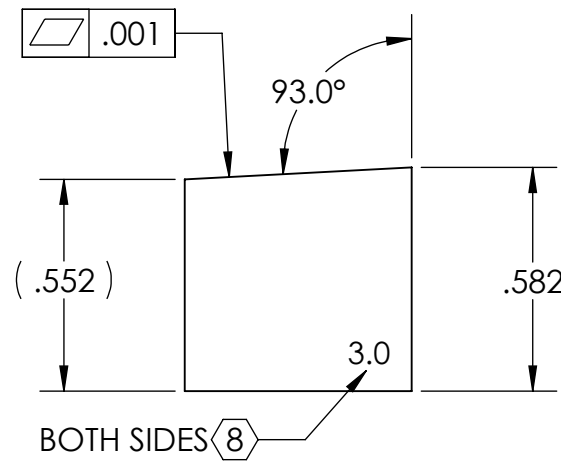
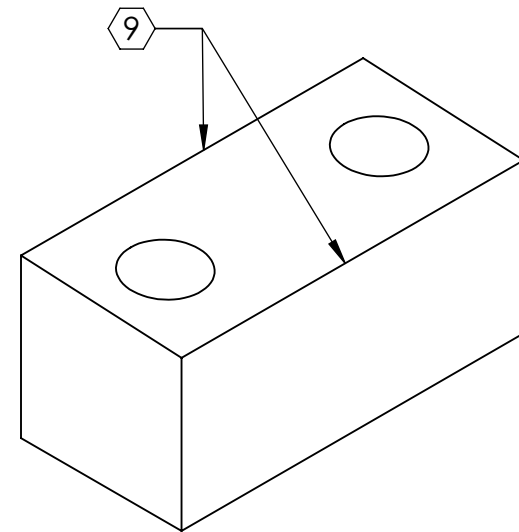
DESIGNER	D. BRIDGES	22 APR 2009	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	25 JUN 2010	A	D0900686	v2
CHECKER	M. MEYER	28 JUN 2010	SCALE: 2:1	PROJECTION:	SHEET 1 OF 1

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- ⑥ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- ⑦ DO NOT REMOVE SHARP EDGES.



REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900155	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM] 1. INTERPRET DRAWING PER ASME Y14.5-1994.
 TOLERANCES: .XX ± .01 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 .XXX ± .005 3. DO NOT SCALE FROM DRAWING.
 ANGULAR ± 0.1° 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSSL FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS

NEXT ASSY LIBRARY OF CLAMPS, LOWER BLADE

PART NAME BLADE CLAMP (3.0 DEGREE), LOWER BLADE, INSIDE

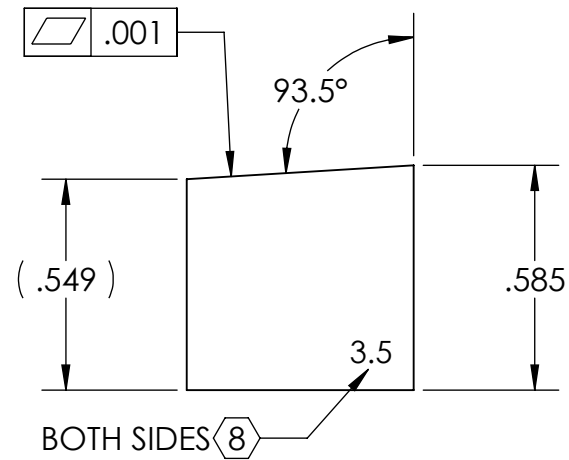
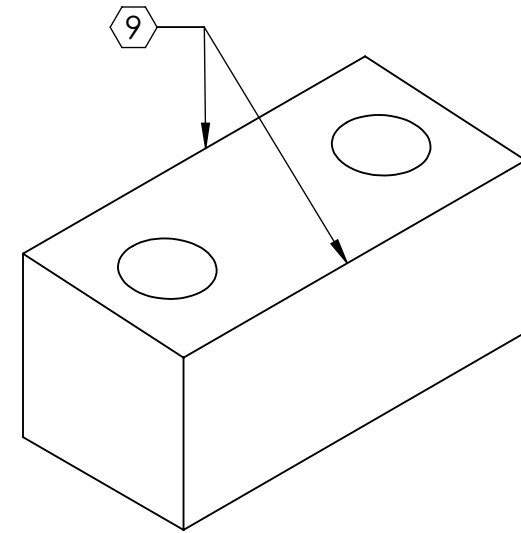
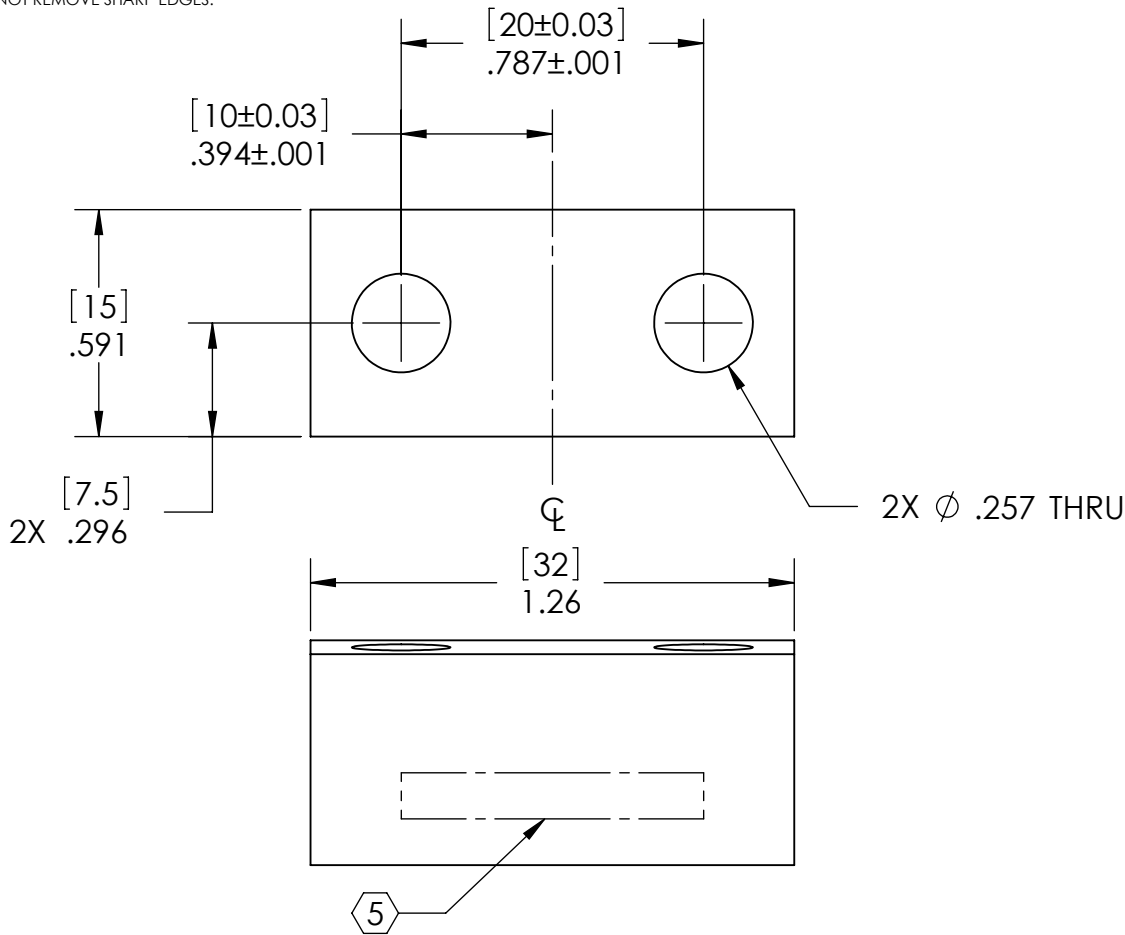
DESIGNER D. BRIDGES 22 APR 2009 SIZE DWG. NO. D0900687 REV. v2
 DRAFTER D. BRIDGES 25 JUN 2010
 CHECKER M. MEYER 28 JUN 2010
 APPROVAL

SCALE: 2:1 PROJECTION: SHEET 1 OF 1

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- ⑥ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- ⑦ DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900155	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM] 1. INTERPRET DRAWING PER ASME Y14.5-1994.
 TOLERANCES: .XX ± .01 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 .XXX ± .005 3. DO NOT SCALE FROM DRAWING.
 ANGULAR ± 0.1° 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSSL FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS

PART NAME BLADE CLAMP (3.5 DEGREE), LOWER BLADE, INSIDE

DESIGNER D. BRIDGES 22 APR 2009 SIZE DWG. NO. D0900688 REV. v2
 DRAFTER D. BRIDGES 25 JUN 2010
 CHECKER M. MEYER 28 JUN 2010
 APPROVAL

SCALE: 2:1 PROJECTION: SHEET 1 OF 1

4

3

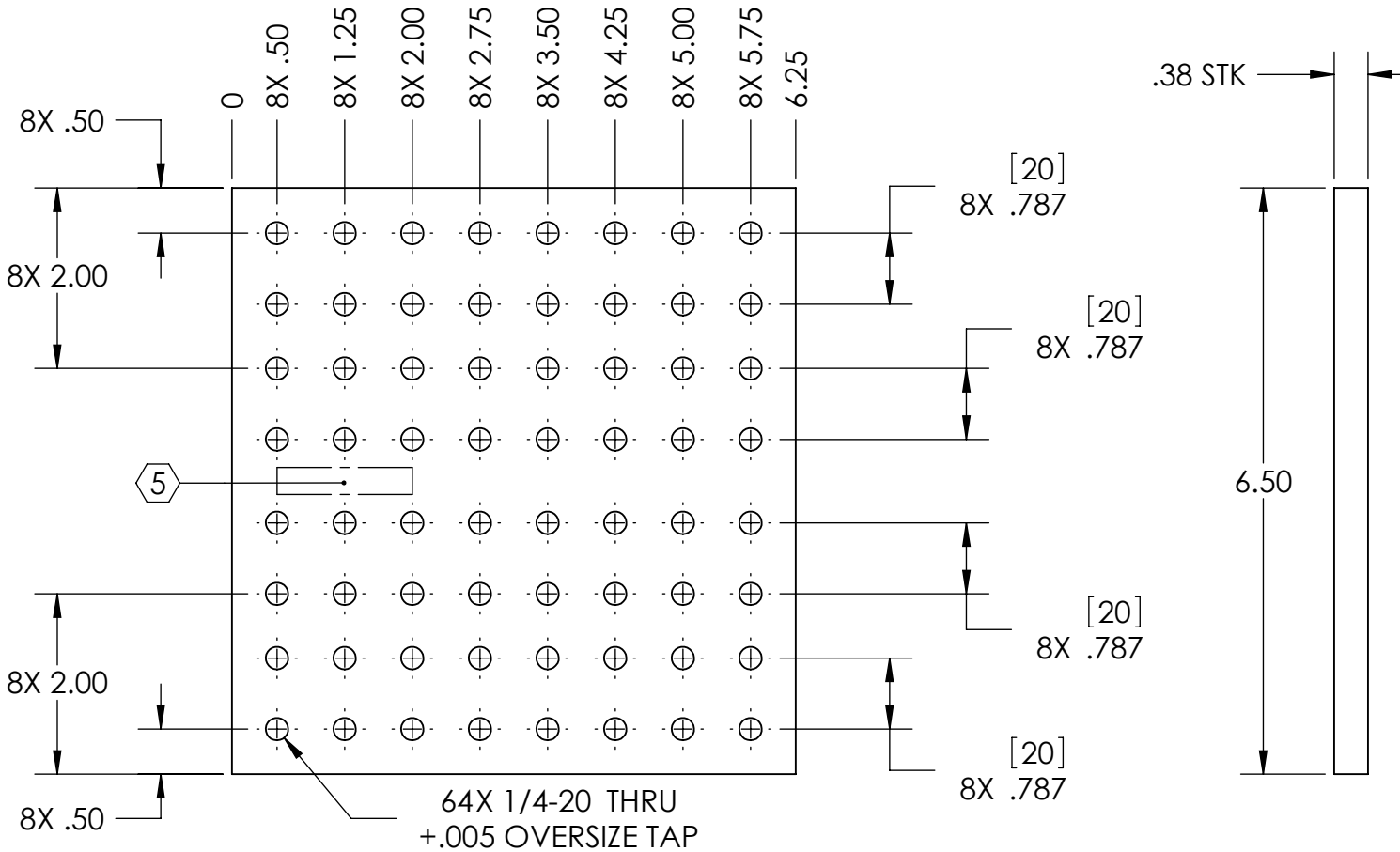
2

1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED. EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900155	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-



64X 1/4-20 THRU
+.005 OVERSIZE TAP

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]	1. INTERPRET DRAWING PER ASME Y14.5-1994.
TOLERANCES: .XX ± .01 .XXX ± .005	2. REMOVE ALL SHARP EDGES, R.02 MIN.
ANGULAR ± 0.5°	3. DO NOT SCALE FROM DRAWING.
	4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.
MATERIAL	6061-T6 Al
FINISH	63 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: **ADVANCED LIGO** SUB-SYSTEM: **SUS**

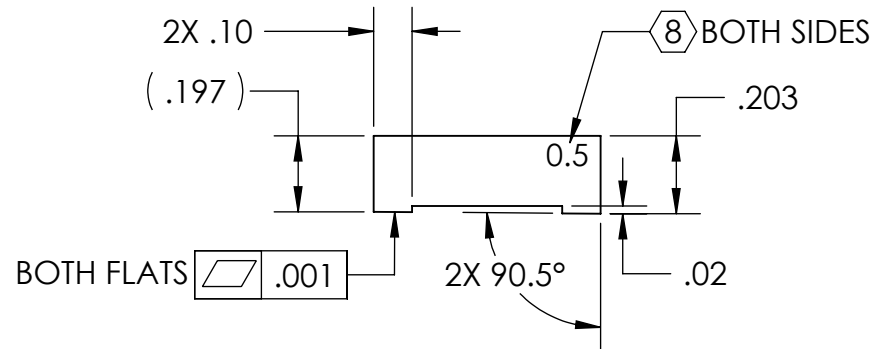
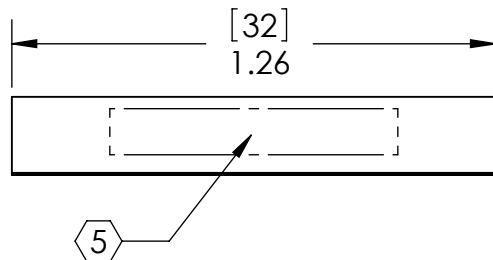
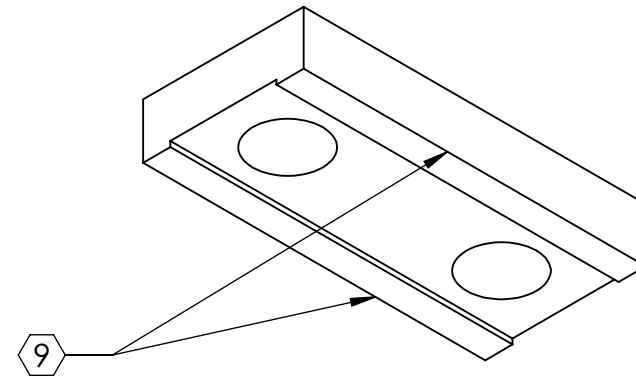
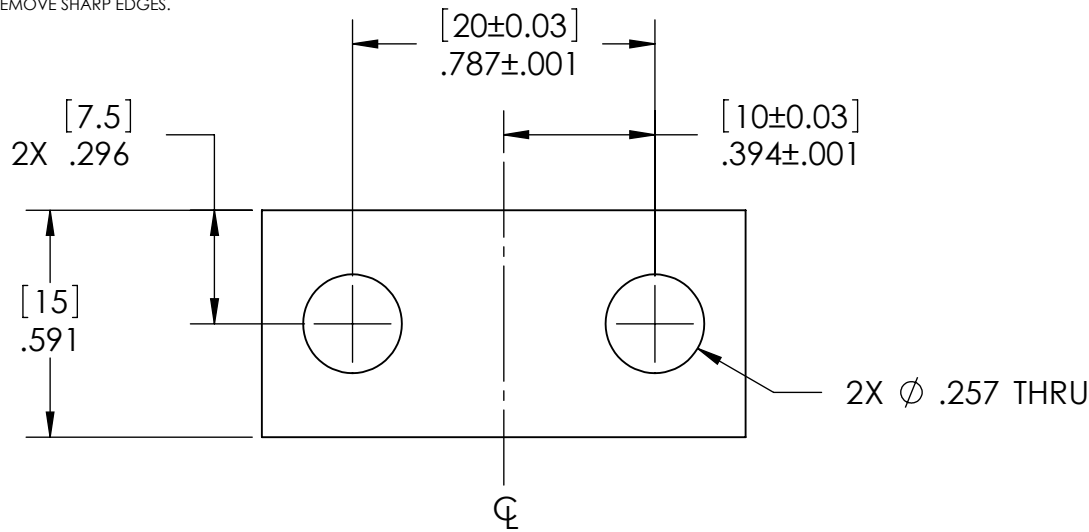
NEXT ASSY: LIBRARY OF CLAMPS, LOWER BLADE

PART NAME				BASE PLATE, LIBRARY OF CLAMPS, LOWER BLADE			
DESIGNER	D. BRIDGES	22 APR 2009	SIZE	DWG. NO.		REV.	
DRAFTER	D. BRIDGES	28 JUN 2009	A	D0900689		v2	
CHECKER	M. MEYER	29 JUN 2009	SCALE: 1:2	PROJECTION:	SHEET 1 OF 1		
APPROVAL							

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- 9. DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900155	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSSL
 FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS

NEXT ASSY LIBRARY OF CLAMPS, LOWER BLADE

PART NAME BLADE CLAMP (0.5 DEGREE), LOWER BLADE, OUTSIDE

DESIGNER D. BRIDGES 28 JUN 2010
 DRAFTER D. BRIDGES 28 JUN 2010
 CHECKER M. MEYER 29 JUN 2010
 APPROVAL

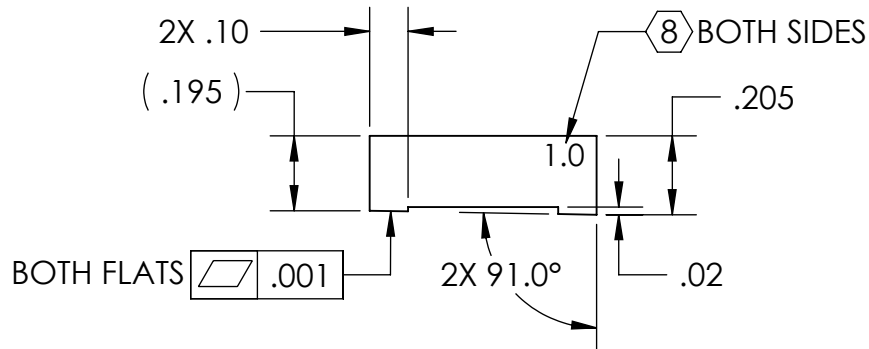
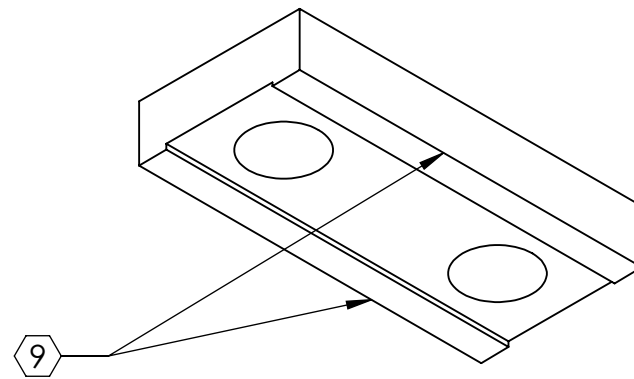
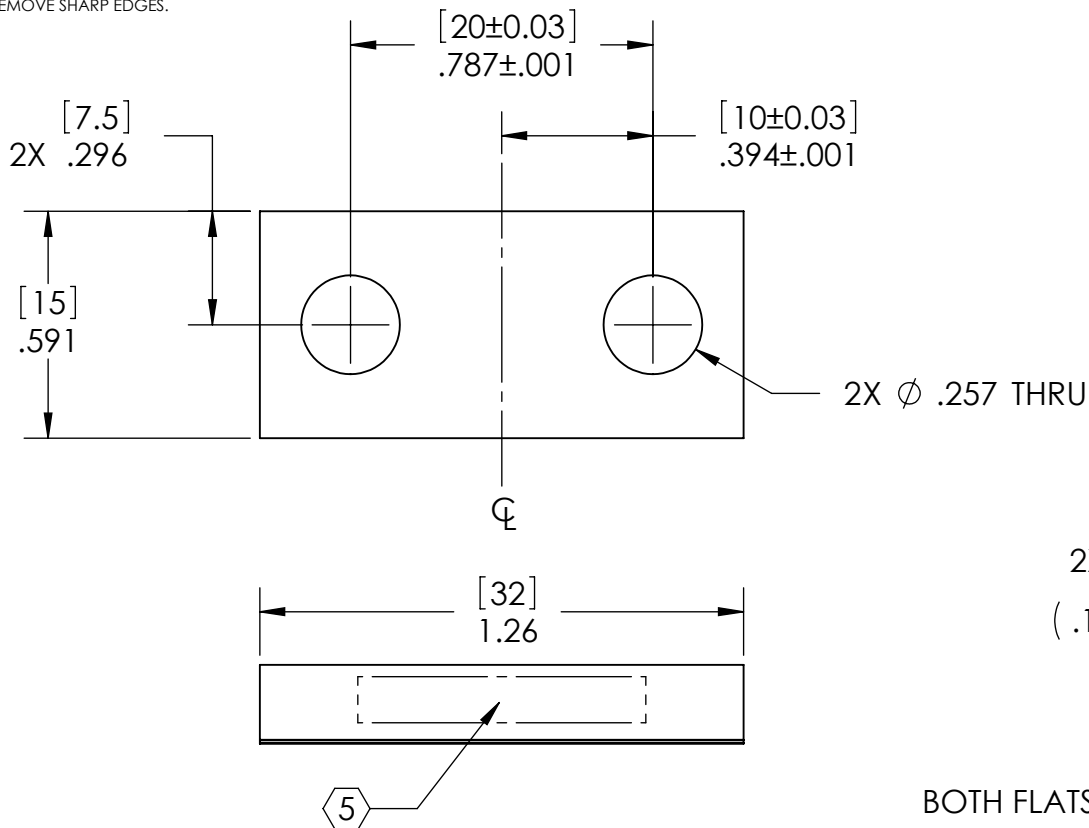
SIZE DWG. NO. A D0900690
 SCALE: 2:1 PROJECTION: SHEET 1 OF 1

REV. v2

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- 9. DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900155	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSTL
 FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS

NEXT ASSY LIBRARY OF CLAMPS, LOWER BLADE

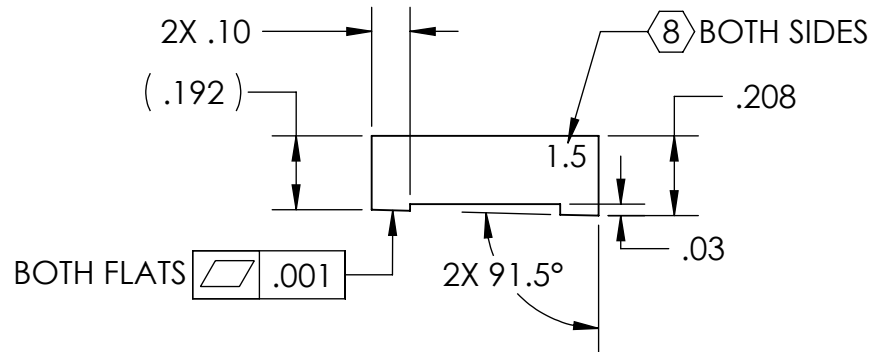
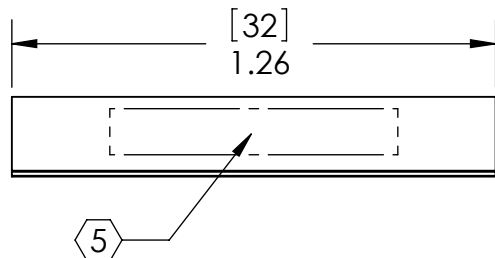
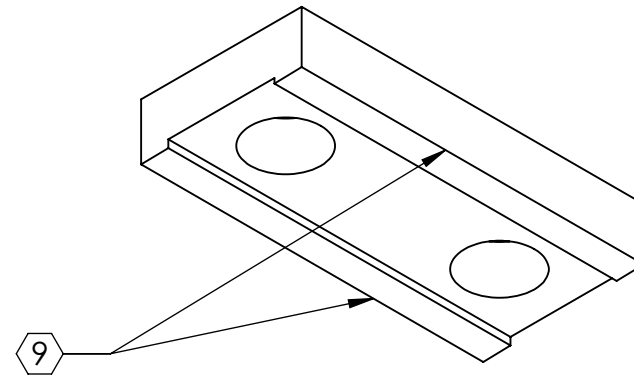
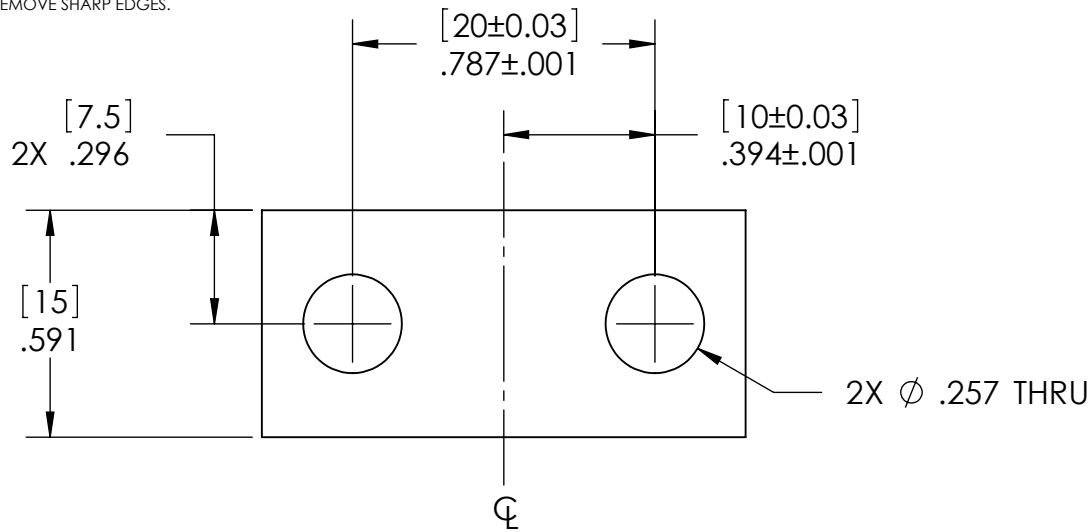
PART NAME BLADE CLAMP (1.0 DEGREE), LOWER BLADE, OUTSIDE

DESIGNER	D. BRIDGES	28 JUN 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	28 JUN 2010	A	D0900691	v2
CHECKER	M. MEYER	29 JUN 2010	SCALE: 2:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- 9. DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900155	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL
304, 316 OR 302 SSSL

FINISH
32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM
ADVANCED LIGO

SUB-SYSTEM
SUS

NEXT ASSY
LIBRARY OF CLAMPS, LOWER BLADE

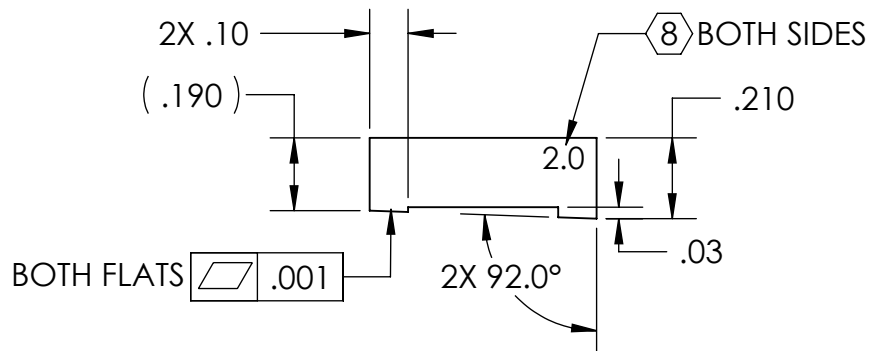
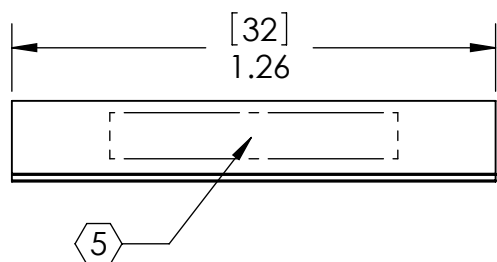
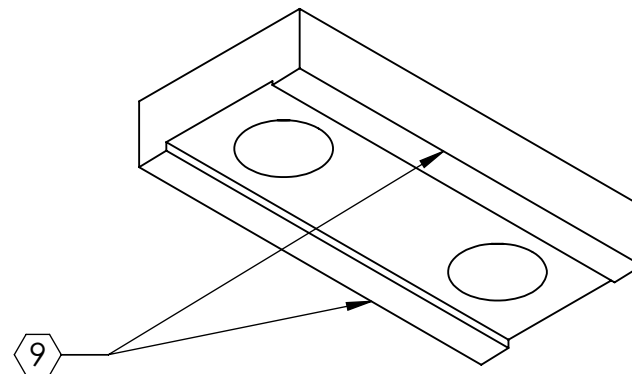
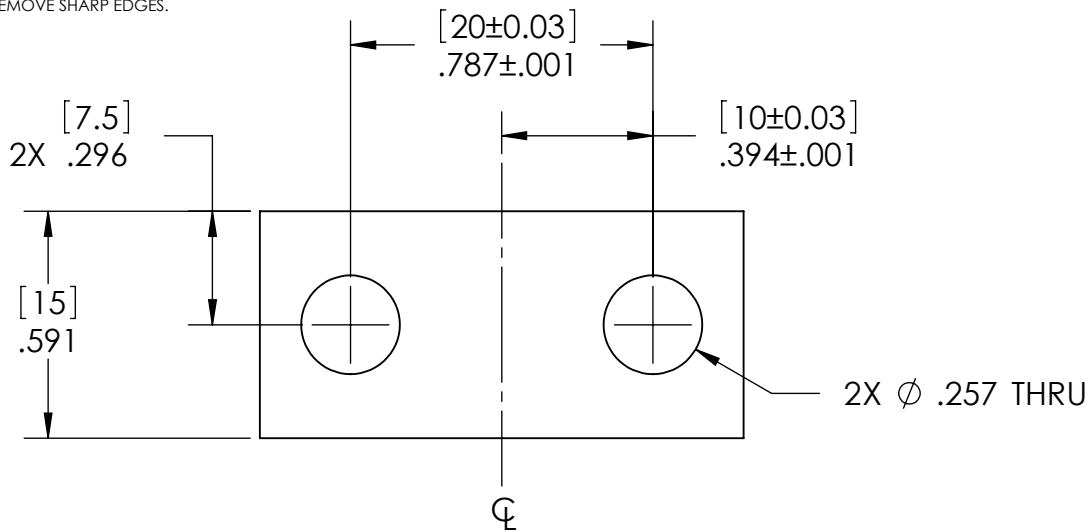
PART NAME
BLADE CLAMP (1.5 DEGREE), LOWER BLADE, OUTSIDE

DESIGNER	D. BRIDGES	28 JUN 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	28 JUN 2010	A	D0900692	v2
CHECKER	M. MEYER	29 JUN 2010			
APPROVAL			SCALE: 2:1	PROJECTION:	SHEET 1 OF 1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- 9. DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900155	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSTL
 FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS

NEXT ASSY LIBRARY OF CLAMPS, LOWER BLADE

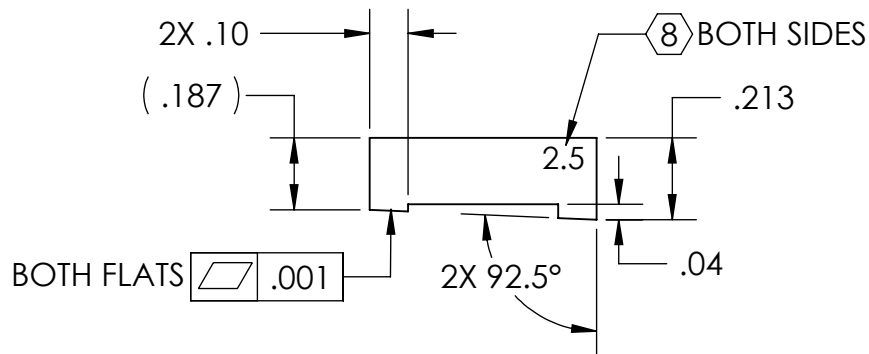
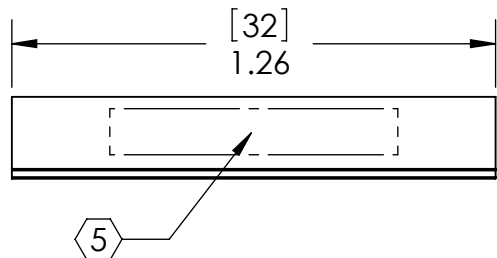
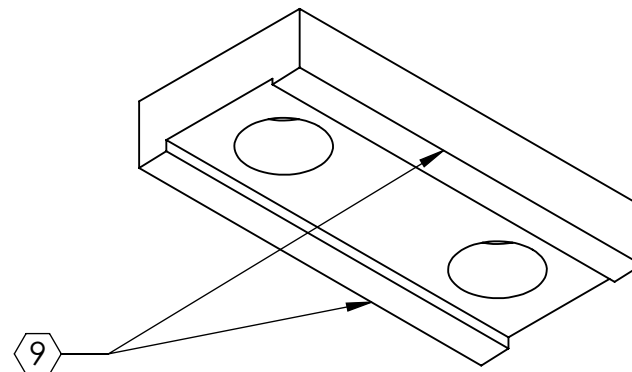
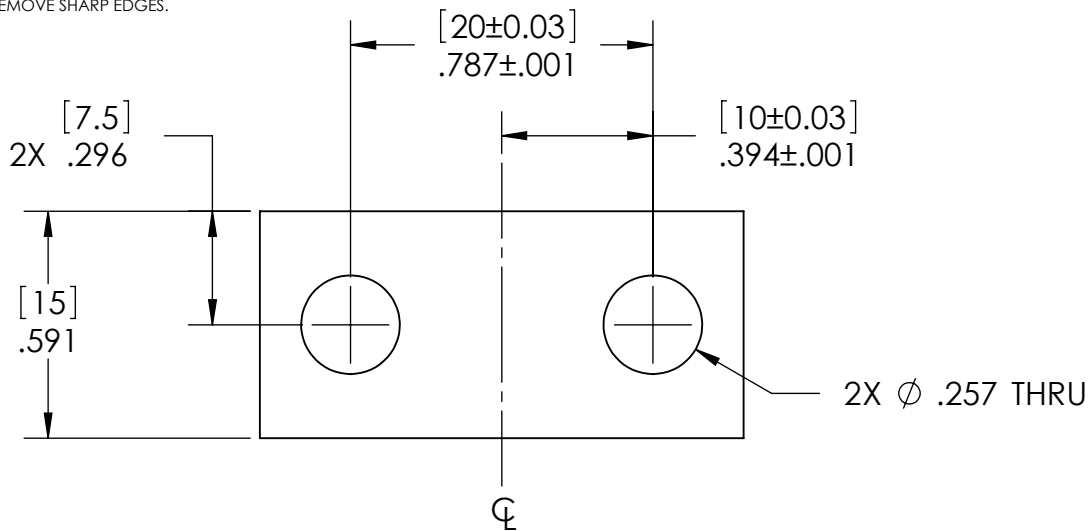
PART NAME BLADE CLAMP (2.0 DEGREE), LOWER BLADE, OUTSIDE

DESIGNER	D. BRIDGES	28 JUN 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	28 JUN 2010	A	D0900693	v2
CHECKER	M. MEYER	29 JUN 2010	SCALE: 2:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- 9. DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900155	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSSL
 FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM **ADVANCED LIGO** SUB-SYSTEM **SUS**

NEXT ASSY LIBRARY OF CLAMPS, LOWER BLADE

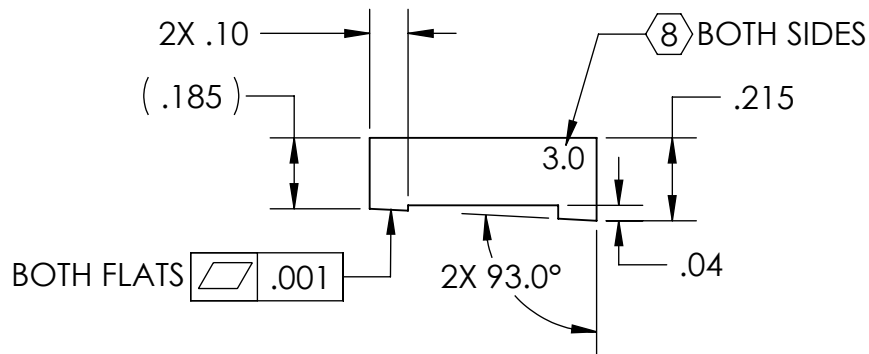
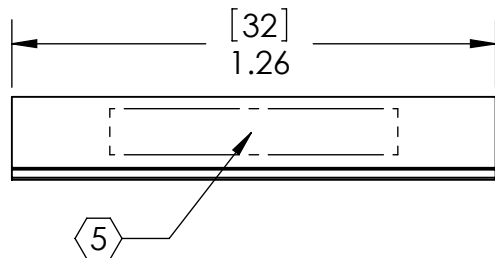
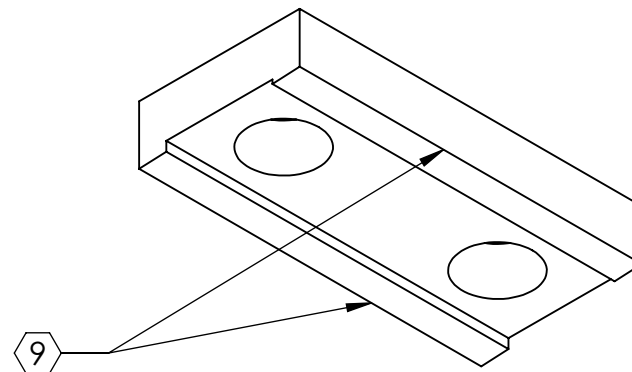
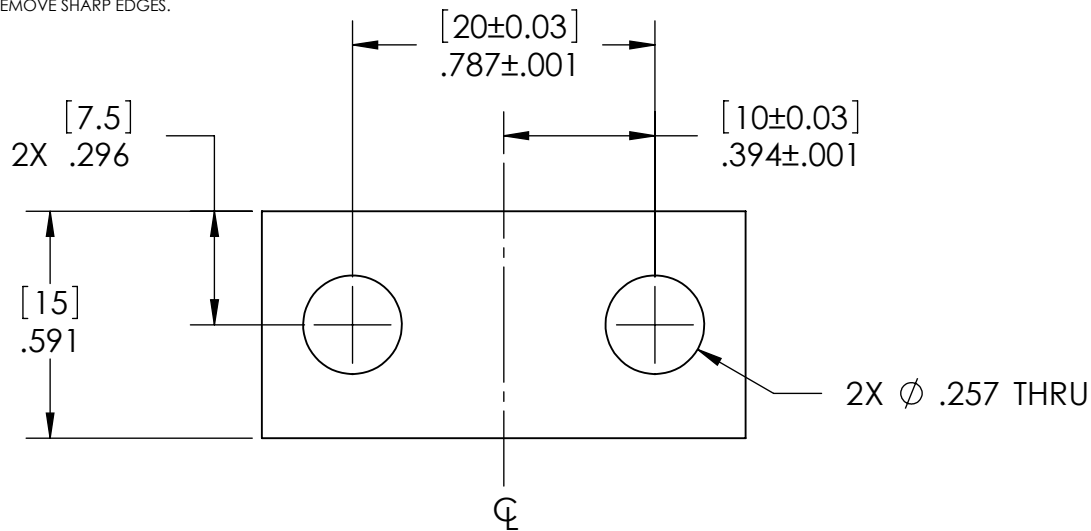
PART NAME **BLADE CLAMP (2.5 DEGREE), LOWER BLADE, OUTSIDE**

DESIGNER	D. BRIDGES	28 JUN 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	28 JUN 2010	A	D0900694	v2
CHECKER	M. MEYER	29 JUN 2010	SCALE: 2:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- 9. DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900155	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSSL
 FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS

NEXT ASSY LIBRARY OF CLAMPS, LOWER BLADE

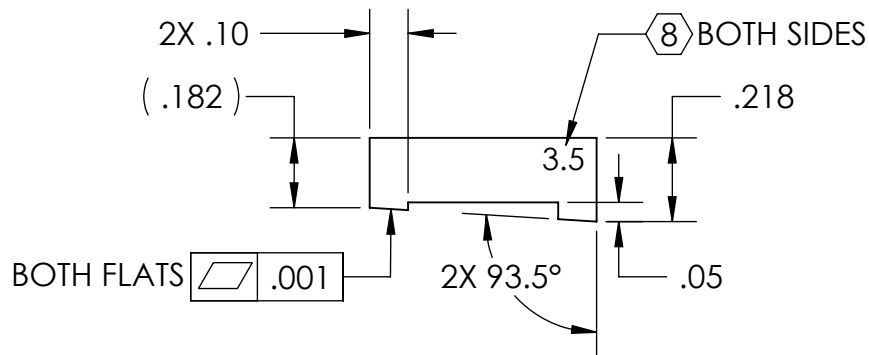
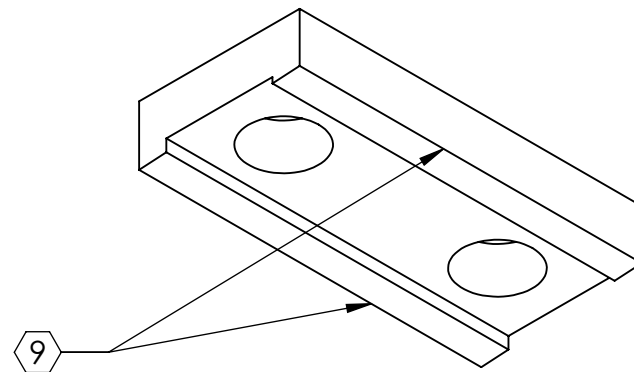
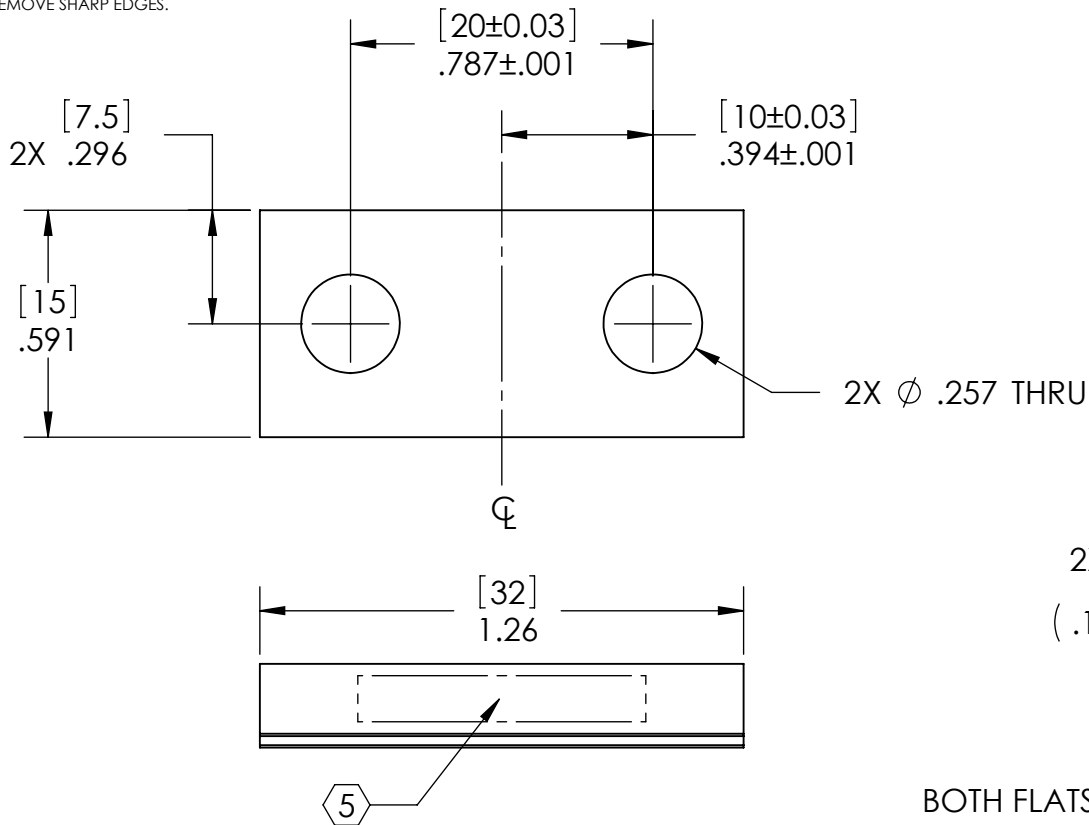
PART NAME BLADE CLAMP (3.0 DEGREE), LOWER BLADE, OUTSIDE

DESIGNER	D. BRIDGES	28 JUN 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	28 JUN 2010	A	D0900695	v2
CHECKER	M. MEYER	29 JUN 2010	SCALE: 2:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.
- 9. DO NOT REMOVE SHARP EDGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900155	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.1°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 304, 316 OR 302 SSSL
 FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS

NEXT ASSY LIBRARY OF CLAMPS, LOWER BLADE

PART NAME BLADE CLAMP (3.5 DEGREE), LOWER BLADE, OUTSIDE

DESIGNER	D. BRIDGES	28 JUN 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	28 JUN 2010	A	D0900696	v2
CHECKER	M. MEYER	29 JUN 2010	SCALE: 2:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

4

3

2

1

NOTES CONTINUED:

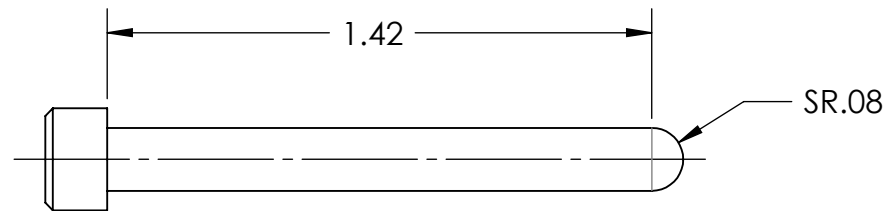
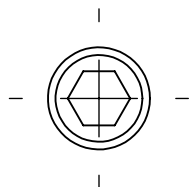
⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND QUANTITY. IF PARTS ARE TOO SMALL TO SCRIBE, BAGGING AND TAGGING ALONE IS SUFFICIENT.

EXAMPLE (TAG): DXXXXXX-VY, TYPE-XX, QTY: TBD

⑤ PART IS TO BE MADE FROM STOCK SOCKET HEAD CAP SCREW, #8-32 UNC-3A, FULLY THREADED.

7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	08 MAY 2009	E0900129	-
v2	28 JUN 2010	E1000236	-
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
 .XX ± .01
 .XXX ± .005

ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
2. REMOVE ALL SHARP EDGES, R.02 MIN.
3. DO NOT SCALE FROM DRAWING.
4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 300 SSSL ⑥ FINISH N/A μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM
 NEXT ASSY MULTIPLE ASSYS

PART NAME SCREW, SOCKET HEAD CAP, #8-32 UNC-3A X 1.5 LONG, FULLY THREADED, ROUNDED END

DESIGNER	D. BRIDGES	19 JUL 2010	SIZE DWG. NO.	REV.
DRAFTER	M. MEYER	20 JUL 2009	A D0900990	v2
CHECKER			SCALE: 2:1	PROJECTION:
APPROVAL				SHEET 1 OF 1

4

3

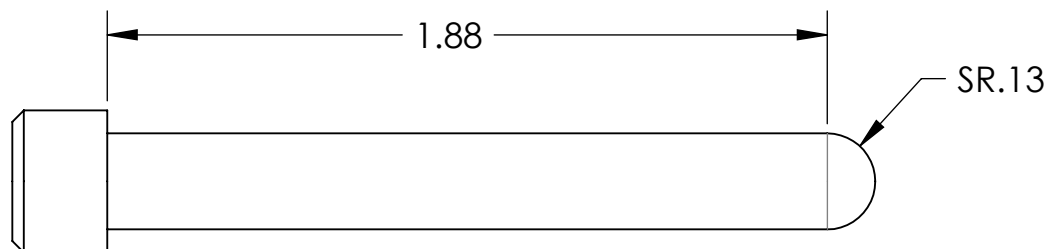
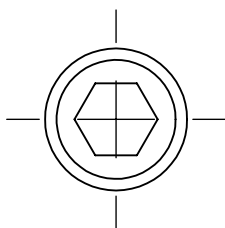
2

1

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND QUANTITY, IF PARTS ARE TOO SMALL TO SCRIBE. BAGGING AND TAGGING ALONE IS SUFFICIENT.
EXAMPLE (PART): 001-v1
EXAMPLE (TAG): DXXXXXX-VY, TYPE-XX, QTY: TBD
- ⑥ PART IS TO BE MADE FROM STOCK SOCKET HEAD CAP SCREW, 1/4-20 UNC-3A, FULLY THREADED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	12 AUG 2009	E0900239	-
v2	30 DEC 2009	E0900505	-
v3	28 JUN 2010	E1000236	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
 .XX ± .01
 .XXX ± .005

ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
2. REMOVE ALL SHARP EDGES, R.02 MIN.
3. DO NOT SCALE FROM DRAWING.
4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 300 SSSL ⑥

FINISH N/A μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM
 NEXT ASSY MULTIPLE ASSYS

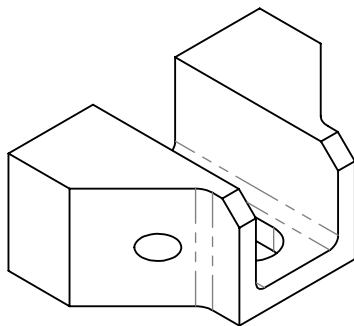
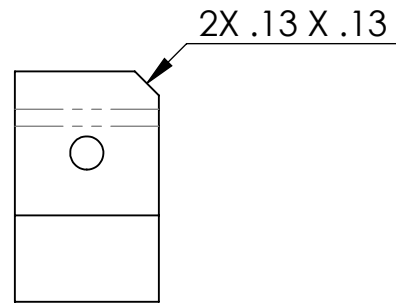
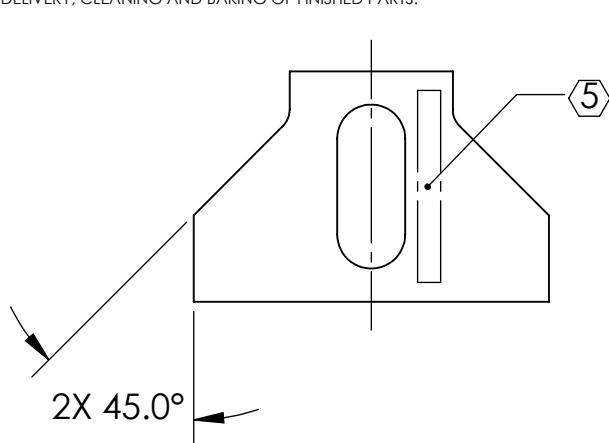
PART NAME SCREW, SOCKET HEAD CAP,
 1/4-20 UNC-3A X 2 LONG, FULLY THREADED, ROUNDED END

DESIGNER	D. BRIDGES	12 AUG 2009	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	24 AUG 2010	A	D0900999	v3
CHECKER	B. MOORE	25 AUG 2010	SCALE: 2:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

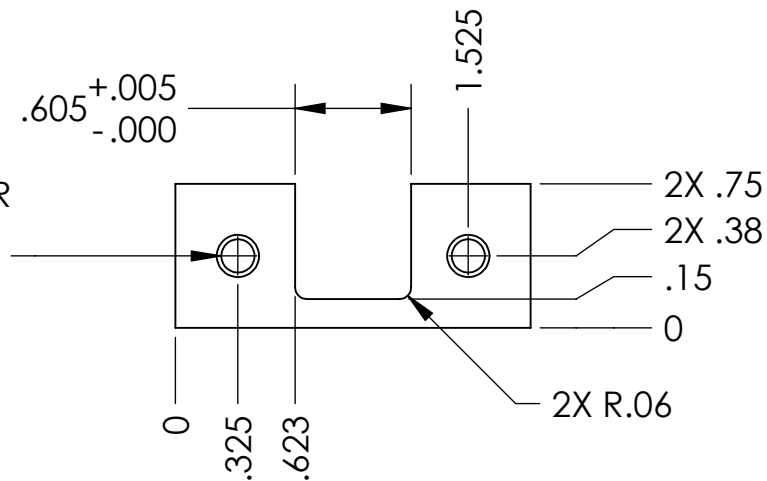
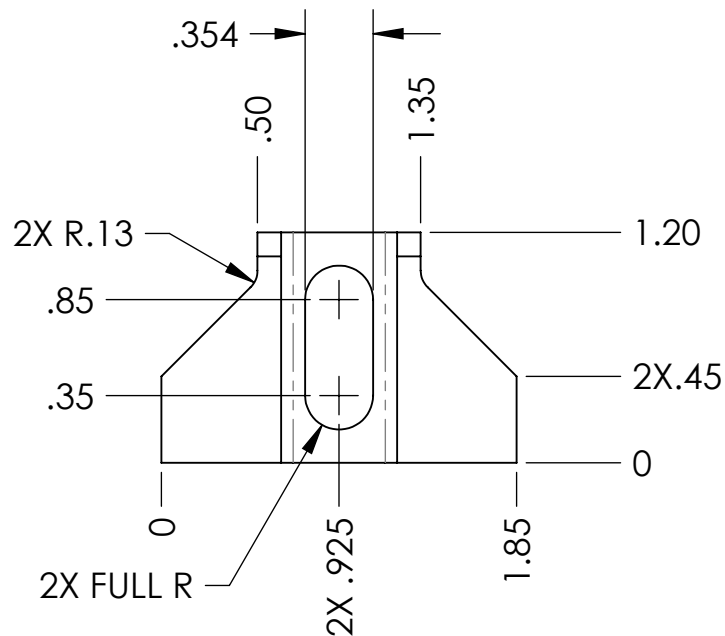
NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
- 9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

REV.	DATE	DCN #	DRAWING TREE #
v1	02 JUN 2009	E0900162	E080191
v2	10 AUG 2010	E1000301	E080191
-	-	-	-



2X DRILL AND TAP THRU FOR
#8-32 UNC-2B X 2.5 DIA
EMHART HELICOIL
(P/N 1185-2EN410)



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES
TOLERANCES:
.XX ± .01
.XXX ± .005
ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
2. REMOVE ALL SHARP EDGES, R.02 MIN.
3. DO NOT SCALE FROM DRAWING.
4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.
MATERIAL 6061-T6 Al
FINISH 63 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
SYSTEM ADVANCED LIGO SUB-SYSTEM SUS
NEXT ASSY EARTHQUAKE STOP ASSY, BRIDGE

PART NAME EARTHQUAKE STOP MOUNT, BRIDGE
DESIGNER D. BRIDGES 26 AUG 2010
DRAFTER D. BRIDGES 15 SEP 2010
CHECKER B. MOORE 16 SEP 2010
APPROVAL
SIZE DWG. NO. A D0901241
REV. v2
SCALE: 1:1 PROJECTION: SHEET 1 OF 1

4

3

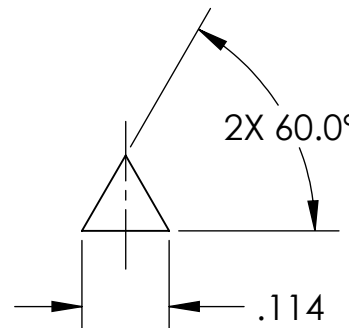
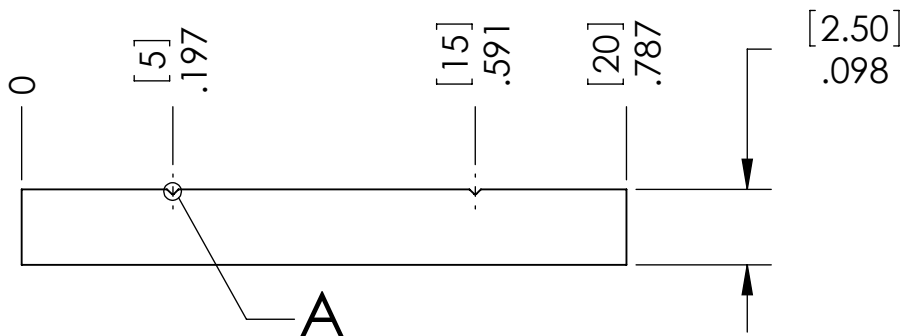
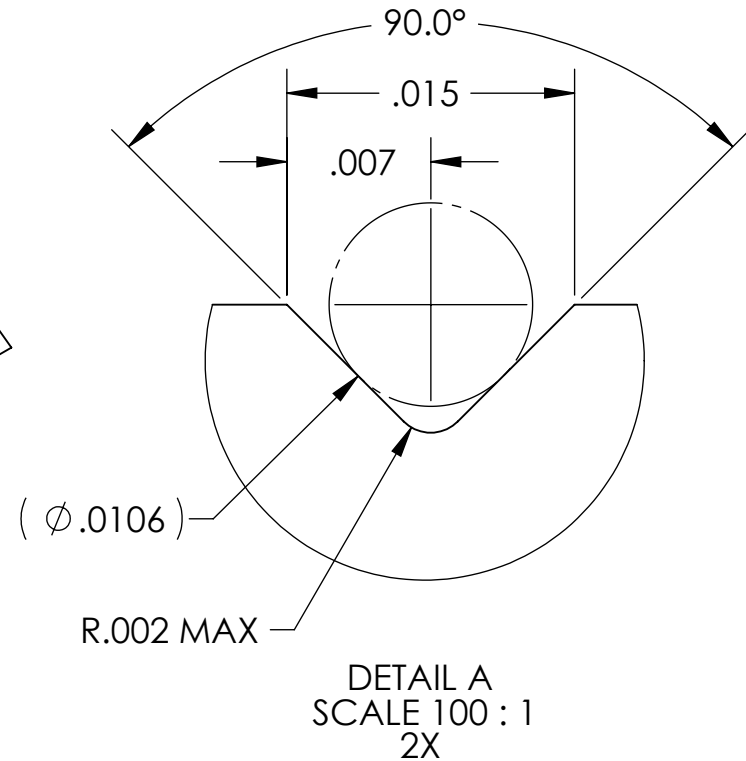
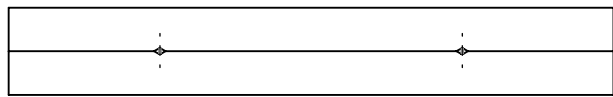
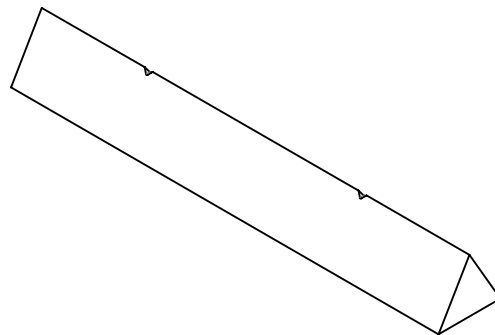
2

1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND QUANTITY. IF PARTS ARE TOO SMALL TO SCRIBE, BAGGING AND TAGGING ALONE IS SUFFICIENT.
EXAMPLE (PART): 001-v1
EXAMPLE (TAG): DXXXXXX-VY, TYPE-XX, QTY: TBD
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	03 SEP 2009	E0900277	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.
MATERIAL 316 SSTL
FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: **ADVANCED LIGO** SUB-SYSTEM: **SUS**

NEXT ASSY: **MULTIPLE ASSYS**

PART NAME: **SECONDARY METAL PRISM BREAKOFF, HLTS**

DESIGNER	M. MEYER	22 JUN 2009	SIZE	DWG. NO.	REV.
DRAFTER	R. BIEDENHARN	29 OCT 2010	A	D0901286	v2
CHECKER	D. BRIDGES	04 NOV 2010	SCALE: 4:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

4

3

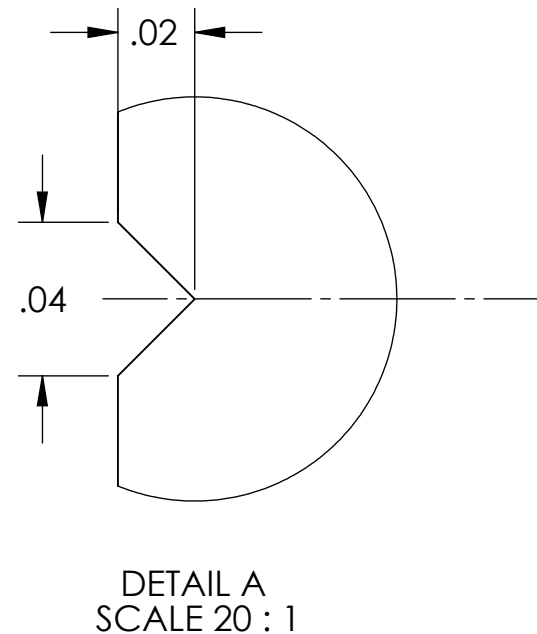
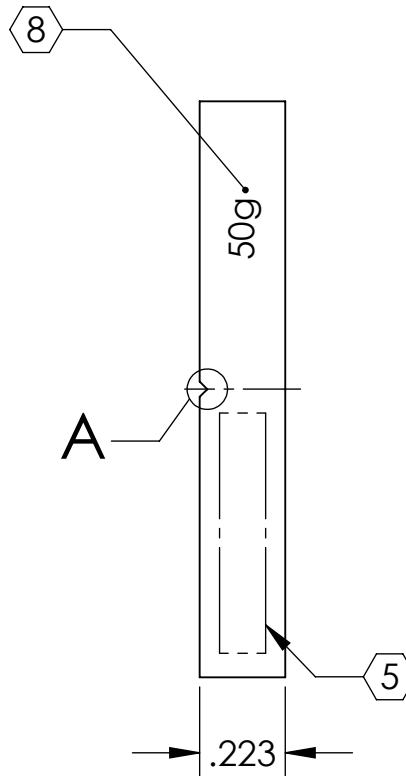
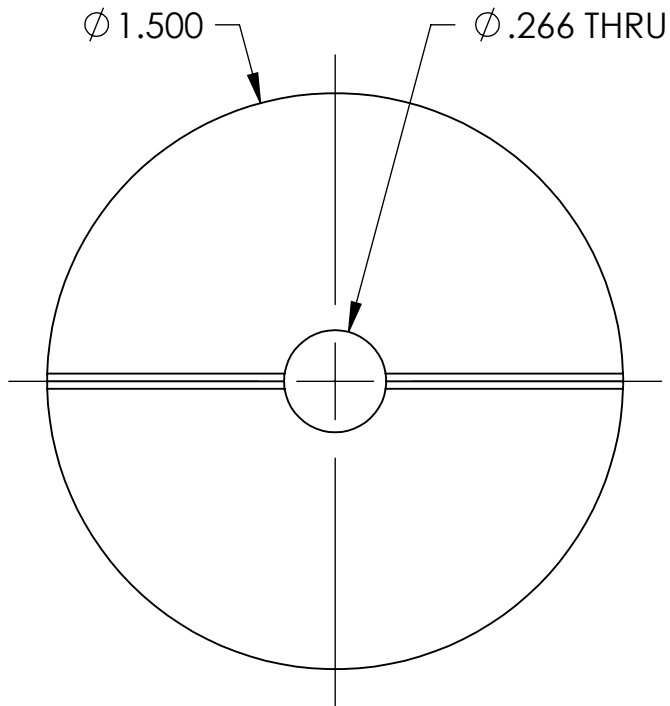
2

1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

REV.	DATE	DCN #	DRAWING TREE #
v1	14 JUL 2009	E0900198	-
v2	18 MAY 2010	E1000166	-
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 304, 316 OR 302 SSSL
FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

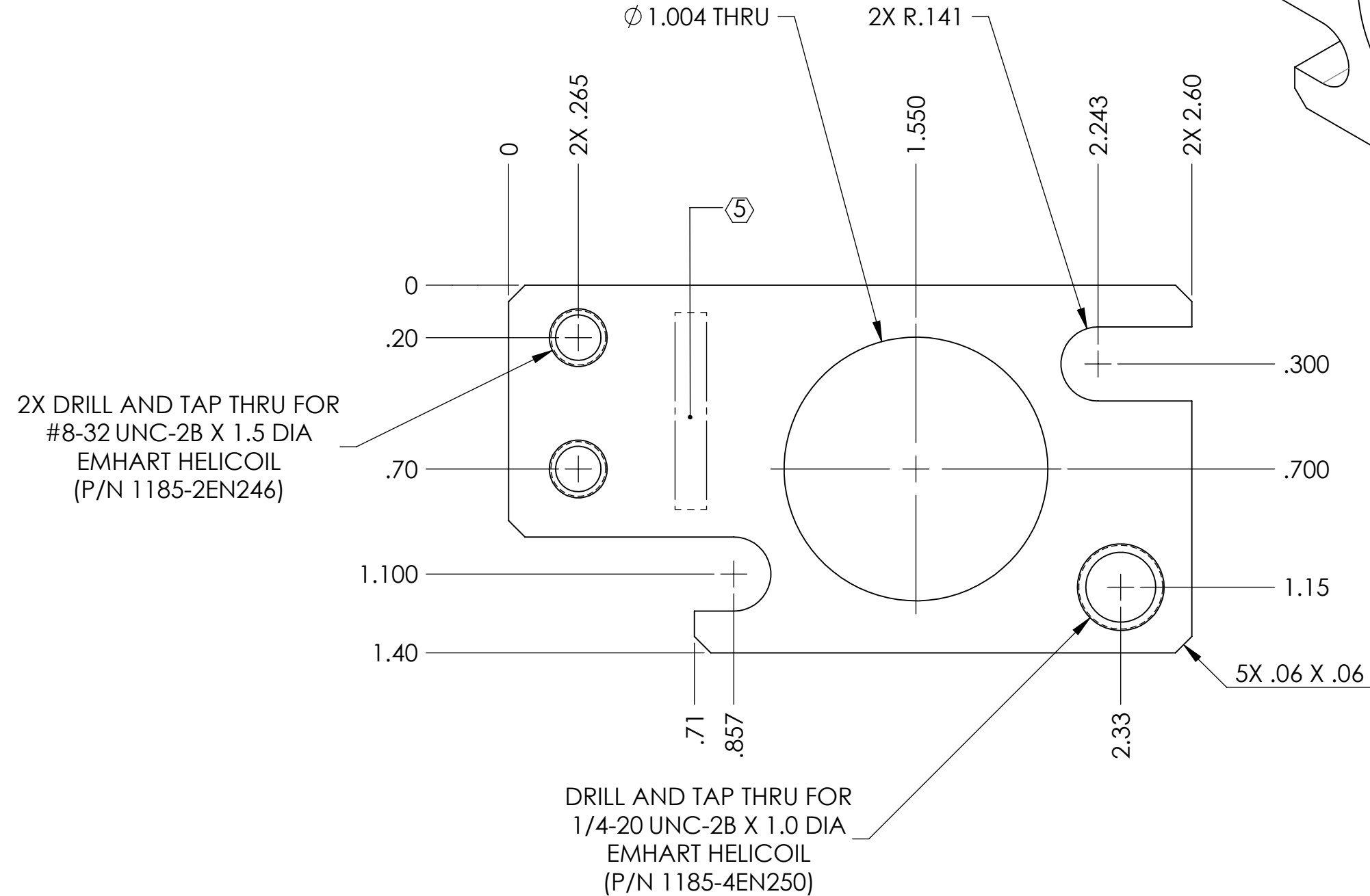
SYSTEM ADVANCED LIGO SUB-SYSTEM SUS
NEXT ASSY MULTIPLE ASSYS

PART NAME			ADDITIONAL MASS DISK, 50g		
DESIGNER	D. BRIDGES	18 MAY 2010	SIZE	DWG. NO.	
DRAFTER	D. BRIDGES	18 MAY 2010	A	D0901405	
CHECKER	J. ROMIE	19 MAY 2010	REVISION	v2	
APPROVAL			SCALE: 2:1	PROJECTION:	SHEET 1 OF 1

D0901492_Advanced_LIGO_SUS_HLTS_AOSEM_Alignment_Bracket_Intermediate_Mass_Part_PDM_Rev: V1-001, DRAWING PDM REV: V1-002

- NOTES CONTINUED:**
- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
 - 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 - 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
 - 8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
 - 9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

REV.	DATE	DCN #	DRAWING TREE #
v1	17 AUG 2009	E0900243	E080191
v2	10 AUG 2010	E1000301	E080191
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)	
DIMENSIONS ARE IN INCHES	
TOLERANCES: .XX ± .01 .XXX ± .005	
ANGULAR ± 0.5°	
1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.	
MATERIAL	FINISH
6061-T6 Al	63 μinch

CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
ADVANCED LIGO		AOSEM ALIGNMENT BRACKET, INT. MASS	
DESIGNER	D. BRIDGES	28 OCT 2010	SIZE DWG. NO.
DRAFTER	D. BRIDGES	28 OCT 2010	B
CHECKER	B. MOORE	01 NOV 2010	D0901492
APPROVAL			REV. v2
SCALE: 2:1		PROJECTION:	
SHEET 1 OF 1			

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED. EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

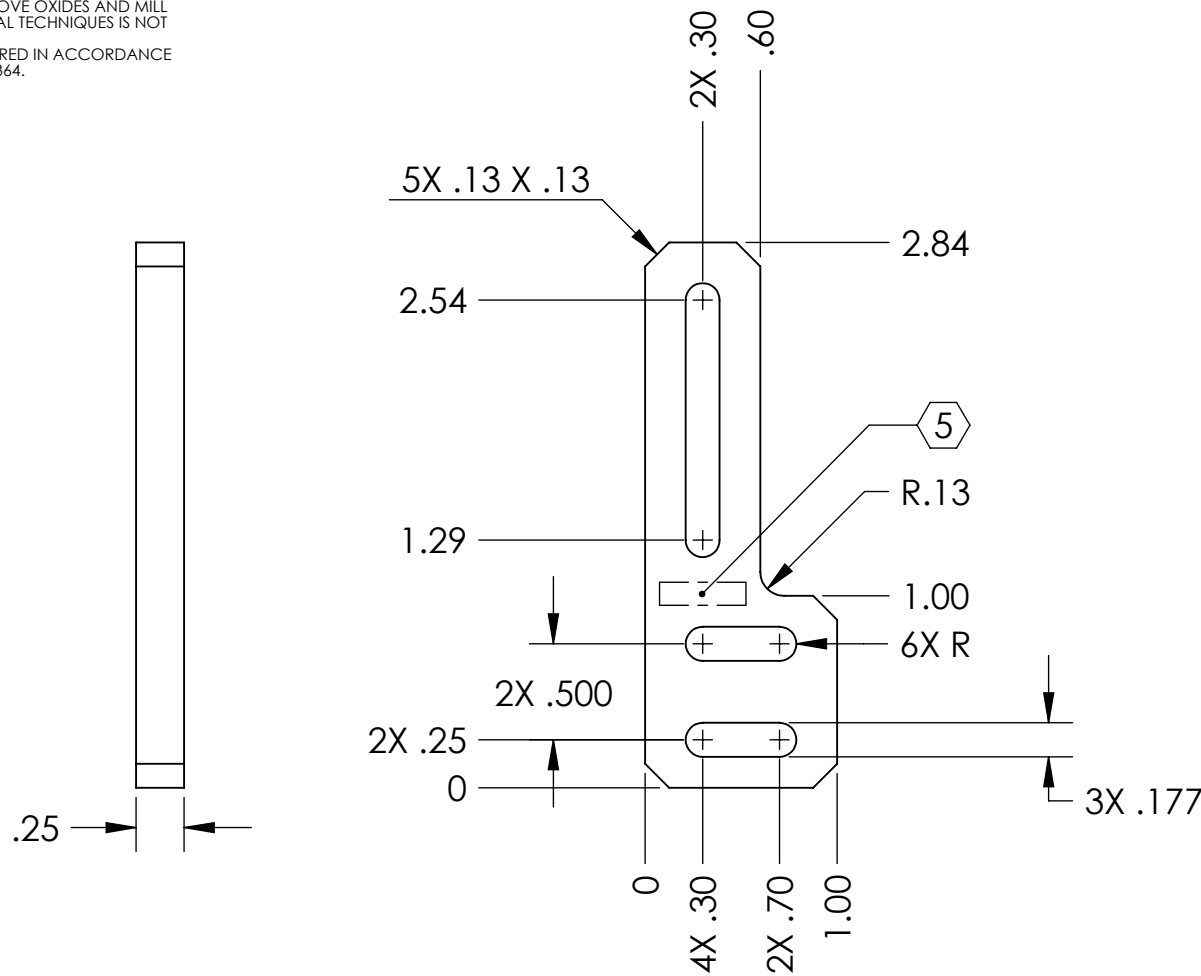
REV.	DATE	DCN #	DRAWING TREE #
v1	17 AUG 2009	E0900243	E080191
v2	10 AUG 2010	E1000301	E080191
-	-	-	-

D

C

B

A



D

C

B

A

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 6061-T6 Al
FINISH 63 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: **ADVANCED LIGO** SUB-SYSTEM: **SUS**

NEXT ASSY: LOWER AOSEM ALIGNMENT ASSY, INT. MASS

PART NAME: **LOWER AOSEM MOUNTING BRACKET, INT. MASS**

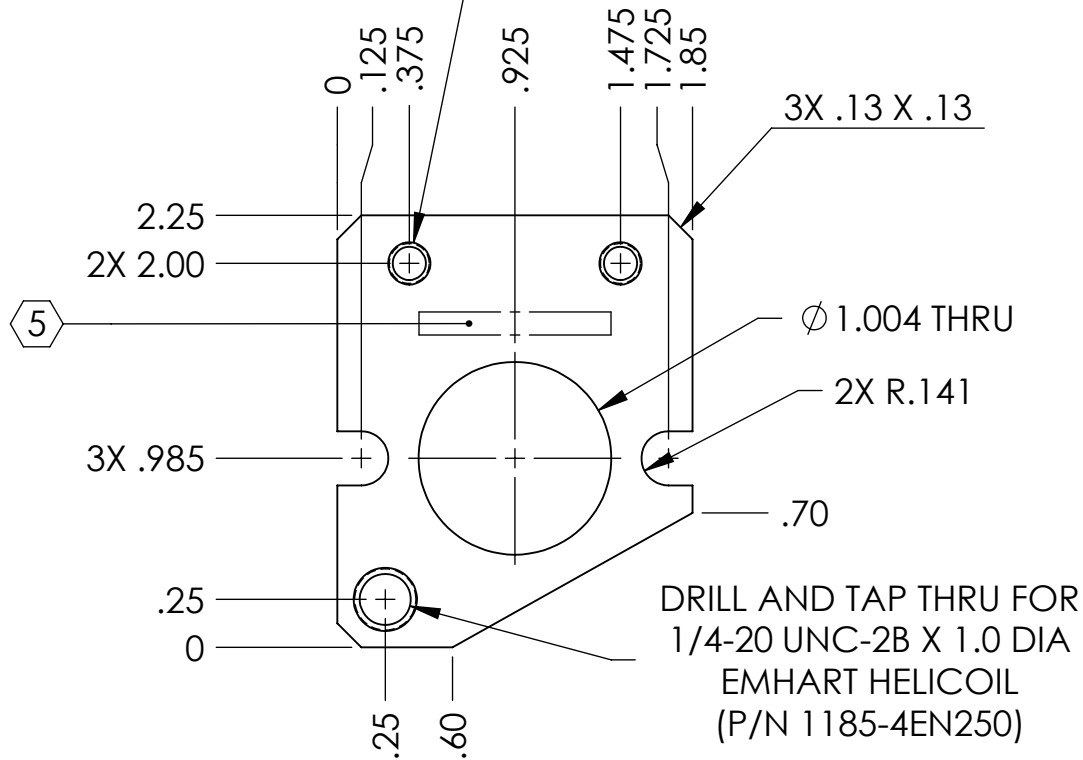
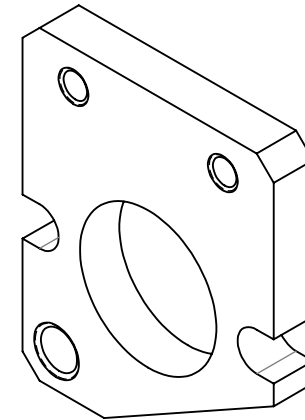
DESIGNER	D. BRIDGES	03 NOV 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	03 NOV 2010	A	D0901493	v2
CHECKER	B. MOORE	04 NOV 2010	SCALE: 1:1	PROJECTION:	SHEET 1 OF 1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
- 9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

REV.	DATE	DCN #	DRAWING TREE #
v1	17 AUG 2009	E0900243	E080191
v2	10 AUG 2010	E1000301	E080191
-	-	-	-

2X DRILL AND TAP THRU FOR
#8-32 UNC-2B X 1.5 DIA
EMHART HELICOIL
(P/N 1185-2EN246)



DRILL AND TAP THRU FOR
1/4-20 UNC-2B X 1.0 DIA
EMHART HELICOIL
(P/N 1185-4EN250)

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 6061-T6 Al FINISH 63 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS NEXT ASSY MULTIPLE ASSYS

PART NAME AOSEM ALIGNMENT BRACKET, BOTTOM MASS

DESIGNER	D. BRIDGES	01 NOV 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	01 NOV 2010	A	D0901549	v2
CHECKER	B. MOORE	02 NOV 2010	SCALE: 1:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED. EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	17 AUG 2009	E0900243	E080191
v2	10 AUG 2010	E1000301	E080191
-	-	-	-

D

D

C

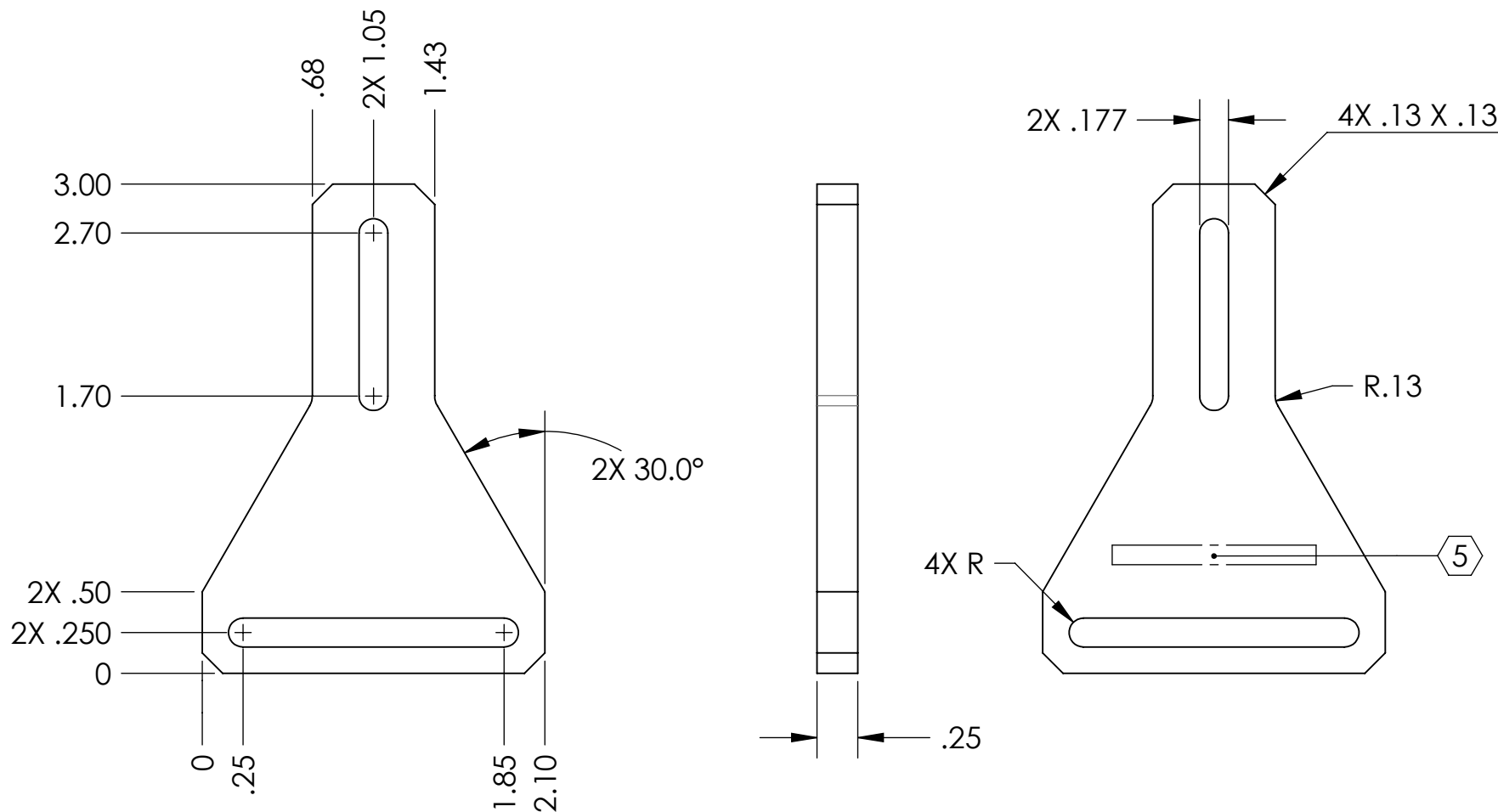
C

B

B

A

A



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 6061-T6 Al FINISH 63 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS

NEXT ASSY UPPER AOSEM ALIGNMENT ASSY, BOTTOM MASS

PART NAME UPPER AOSEM MOUNTING BRACKET, BOTTOM MASS

DESIGNER D. BRIDGES 01 NOV 2010
DRAFTER D. BRIDGES 01 NOV 2010
CHECKER B. MOORE 02 NOV 2010

SIZE DWG. NO. A D0901550 REV. v2

SCALE: 1:1 PROJECTION: SHEET 1 OF 1

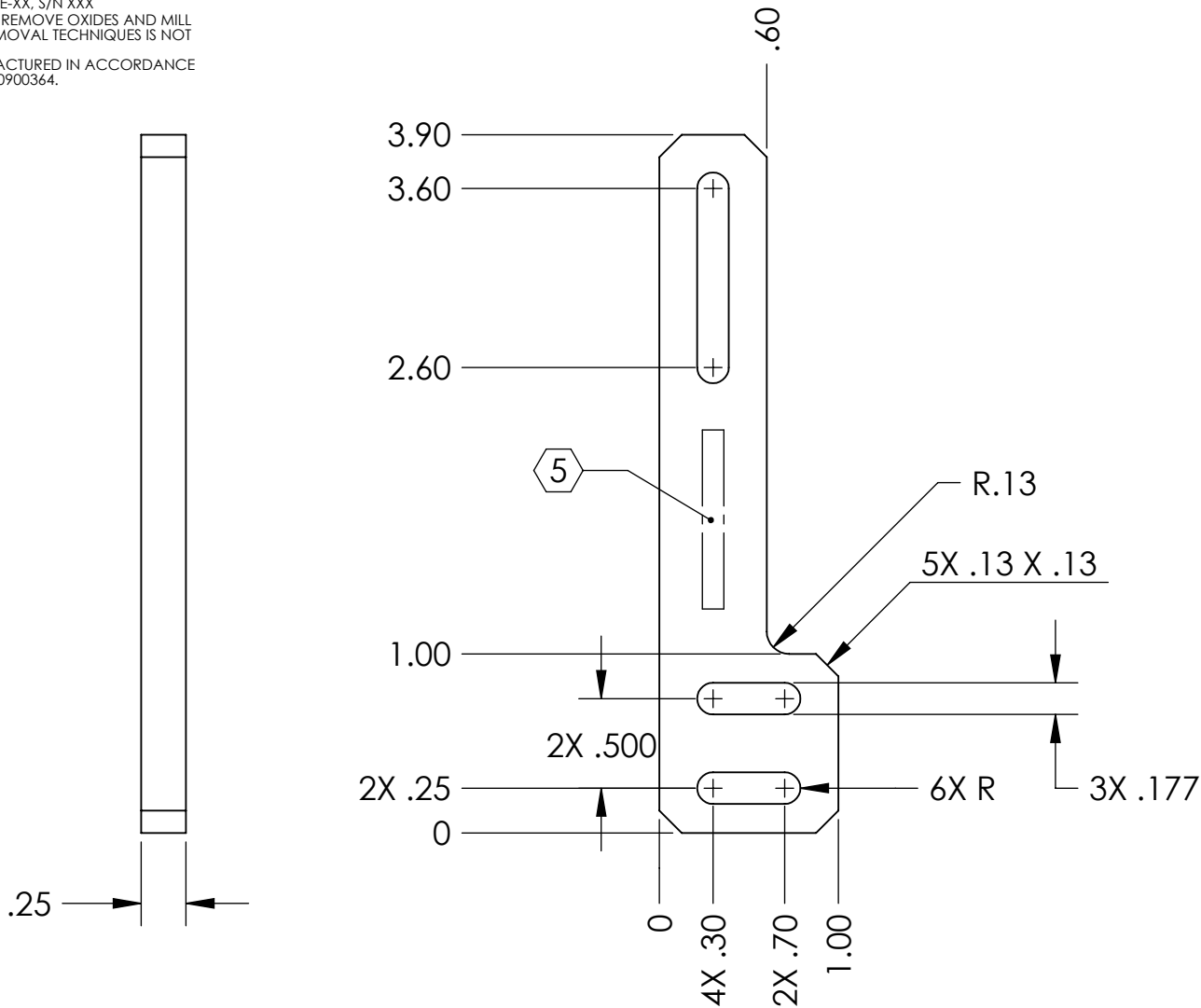
NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	17 AUG 2009	E0900243	E080191
v2	10 AUG 2010	E1000301	E080191
-	-	-	-

D
C
B
A

D
C
B
A



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410.

MATERIAL 6061-T6 Al

FINISH 63 μinch



SYSTEM ADVANCED LIGO SUB-SYSTEM SUS

NEXT ASSY UPPER AOSEM ALIGNMENT ASSY, INT. MASS

PART NAME UPPER AOSEM MOUNTING BRACKET, INT. MASS

DESIGNER D. BRIDGES 29 OCT 2010
 DRAFTER D. BRIDGES 29 OCT 2010
 CHECKER B. MOORE 01 NOV 2010

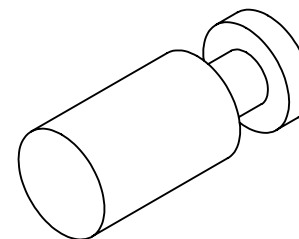
SIZE DWG. NO. A D0902025
 REV. v2

APPROVAL SCALE: 1:1 PROJECTION: SHEET 1 OF 1

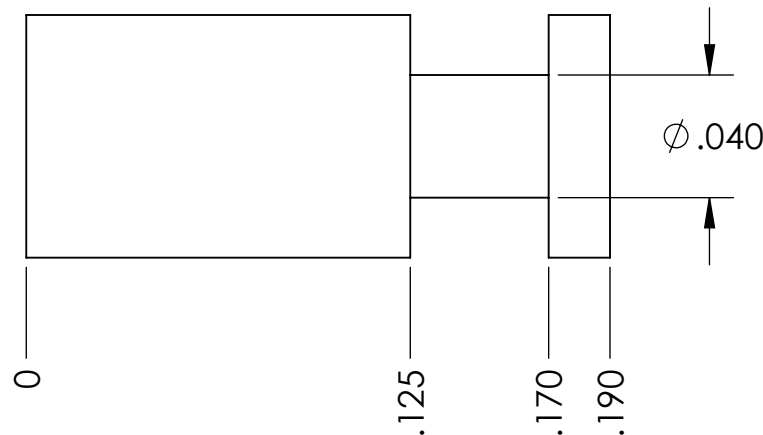
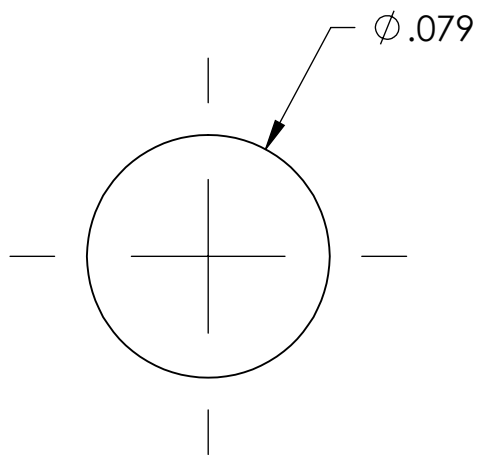
NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 101 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. APPROXIMATE WEIGHT = 0.034g
- 7. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 8. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	16 JUN 2010	E0900507	E0900353
-	-	-	-
-	-	-	-



ISOMETRIC VIEW



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
 .XX ± .01
 .XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 6061-T6 Al FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS

NEXT ASSY HSTS TEST MASS

PART NAME MAGNET STANDOFF, HSTS TEST MASS

DESIGNER	M. MEYER	14 OCT 2009	SIZE	DWG. NO.	REV.
DRAFTER	B. MOORE	18 NOV 2009	A	D0902431	v1
CHECKER	M. MEYER	19 NOV 2009	APPROVAL		

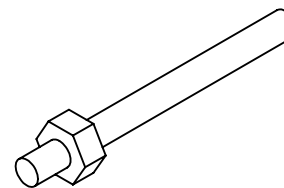
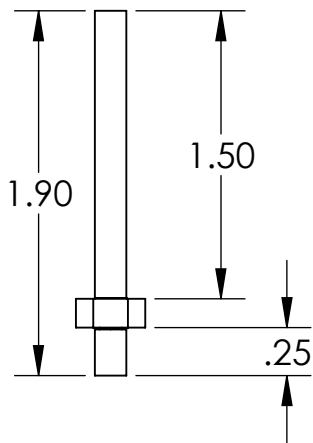
SCALE: 16:1 PROJECTION:

SHEET 1 OF 1

NOTES CONTINUED:

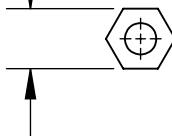
- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 101 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED. EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. APPROXIMATE WEIGHT = 0.014 LB.
- 7. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 8. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	16 JUN 2010	E0900505	E0900353
-	-	-	-
-	-	-	-



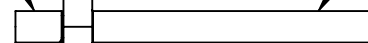
ISOMETRIC VIEW

5/16" HEX



#8-32 UNC-2A THREAD

#8-40 UNS-2A THREAD



MIN R

SMALL UNDERCUT ACCEPTABLE
Ø.12 MIN

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .03
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 304, 316 OR 302 SSSL
FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

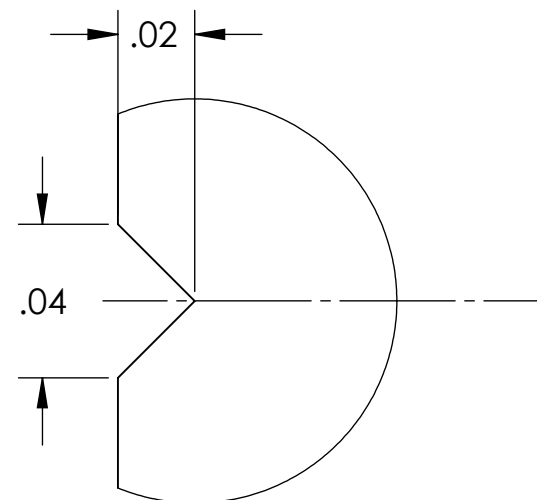
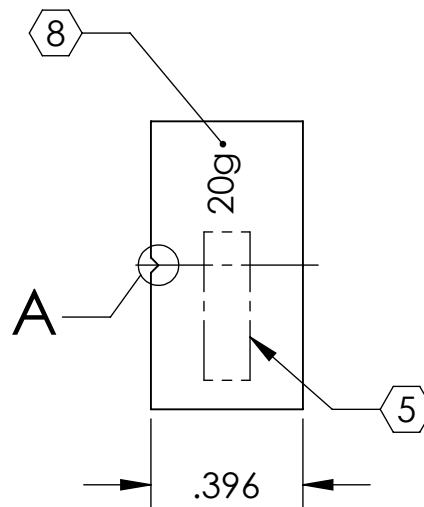
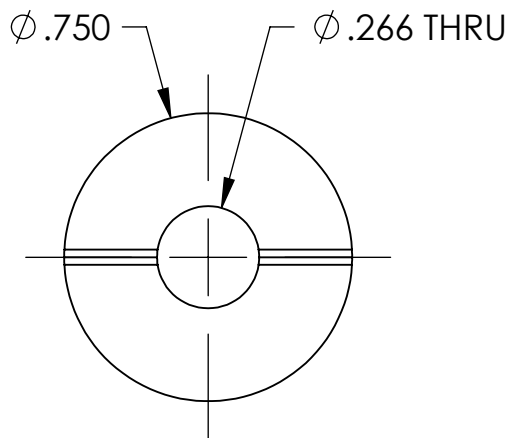
SYSTEM ADVANCED LIGO SUB-SYSTEM SUS
NEXT ASSY MULTIPLE ASSY

PART NAME			ADJUSTER SHAFT		
DESIGNER	B. MOORE	17 MAR 2010	SIZE	DWG. NO.	
DRAFTER	B. MOORE	26 MAR 2010	A	D1000659	
CHECKER	M. MEYER	26 MAR 2010	SCALE: 1:1	PROJECTION:	⊕
APPROVAL					SHEET 1 OF 1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

REV.	DATE	DCN #	DRAWING TREE #
v1	18 MAY 2010	E1000166	-
-	-	-	-
-	-	-	-



DETAIL A
SCALE 20 : 1

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 304, 316 OR 302 SSSL
FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS

NEXT ASSY MULTIPLE ASSYS

PART NAME

ADDITIONAL MASS DISK, 20g

DESIGNER	D. BRIDGES	18 MAY 2010
DRAFTER	D. BRIDGES	18 MAY 2010
CHECKER	J. ROMIE	19 MAY 2010
APPROVAL		

SIZE DWG. NO. A D1001229

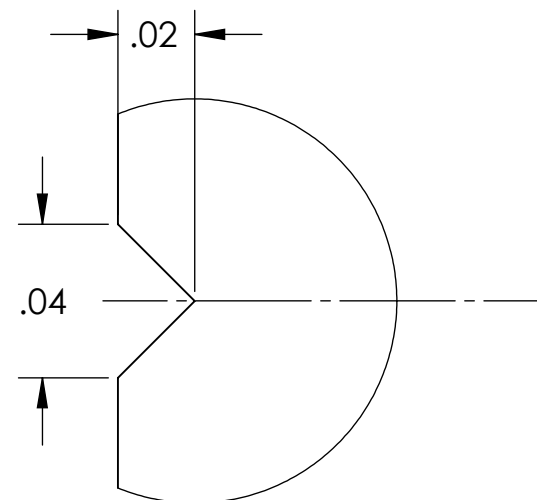
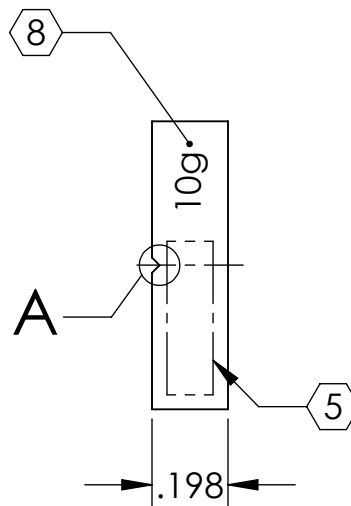
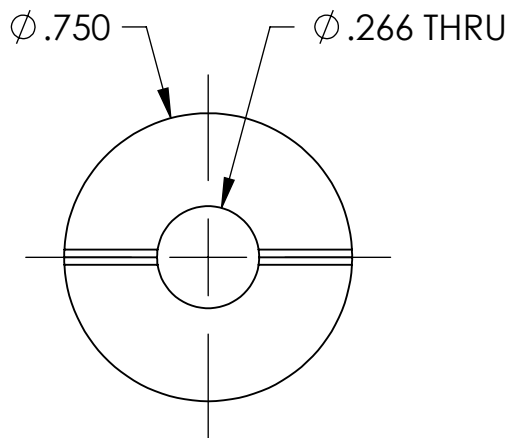
REV. v1

SCALE: 2:1 PROJECTION: SHEET 1 OF 1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

REV.	DATE	DCN #	DRAWING TREE #
v1	18 MAY 2010	E1000166	-
-	-	-	-
-	-	-	-



DETAIL A
SCALE 20 : 1

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 304, 316 OR 302 SSSL
FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS
NEXT ASSY MULTIPLE ASSYS

PART NAME			ADDITIONAL MASS DISK, 10g		
DESIGNER	D. BRIDGES	18 MAY 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	18 MAY 2010	A	D1001230	v1
CHECKER	J. ROMIE	19 MAY 2010			
APPROVAL			SCALE: 2:1	PROJECTION:	SHEET 1 OF 1

4

3

2

1

NOTES CONTINUED:

5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 101 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND QUANTITY. IF PARTS ARE TOO SMALL TO SCRIBE, BAGGING AND TAGGING ALONE IS SUFFICIENT.

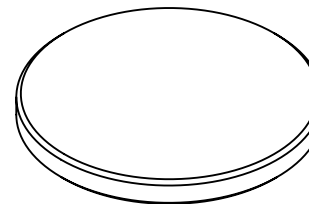
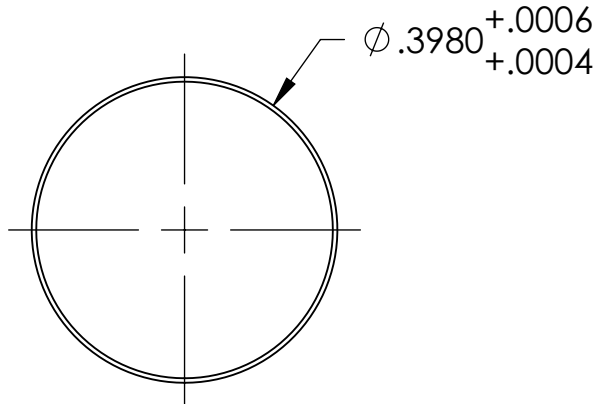
EXAMPLE (PART): XXX-v1
 EXAMPLE (TAG): DXXXXXX-VY, TYPE-XX, QTY: TBD

6. APPROXIMATE WEIGHT = 0.644g

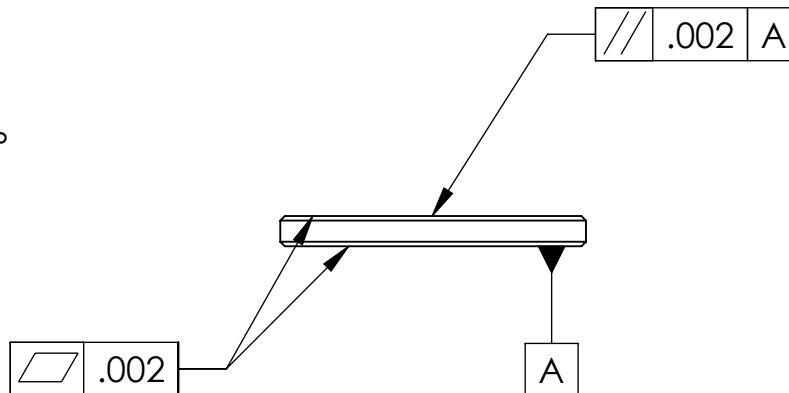
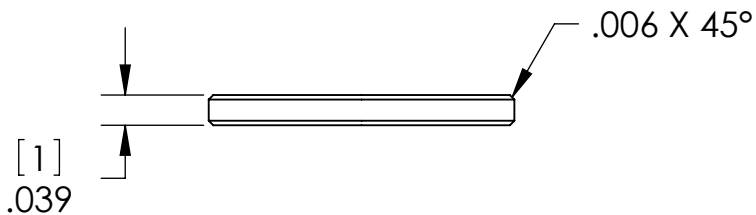
7. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.

8. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	09 JUL 2010	E0900501	E0900353
-	-	-	-
-	-	-	-



ISOMETRIC VIEW



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
 .XX ± .03
 .XXX ± .005

ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
2. REMOVE ALL SHARP EDGES, R.02 MIN.
3. DO NOT SCALE FROM DRAWING.
4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 416 SSSL FINISH 32 μinch



SYSTEM ADVANCED LIGO SUB-SYSTEM SUS

NEXT ASSY MULTIPLE ASSY

PART NAME				MAGNETIC PLUG	
DESIGNER	M. MEYER	14 JUN 2010	SIZE	DWG. NO.	REV.
DRAFTER	B. MOORE	14 JUN 2010	A	D1001534	v1
CHECKER	M. MEYER	16 JUN 2010	SCALE: 4:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

4

3

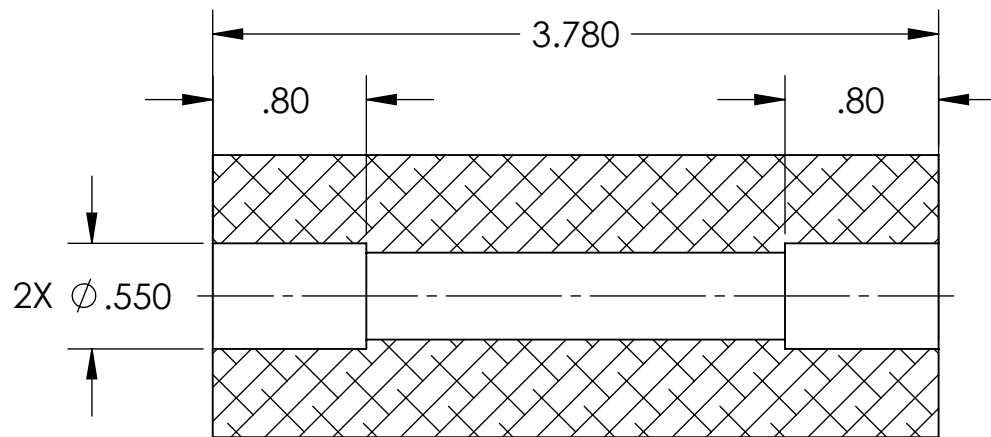
2

1

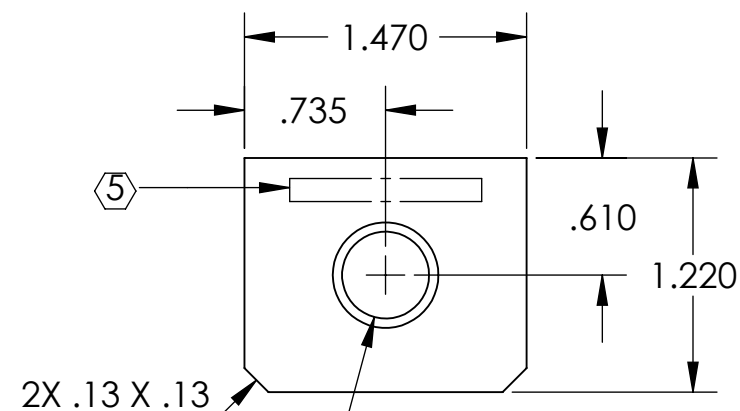
NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED. EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

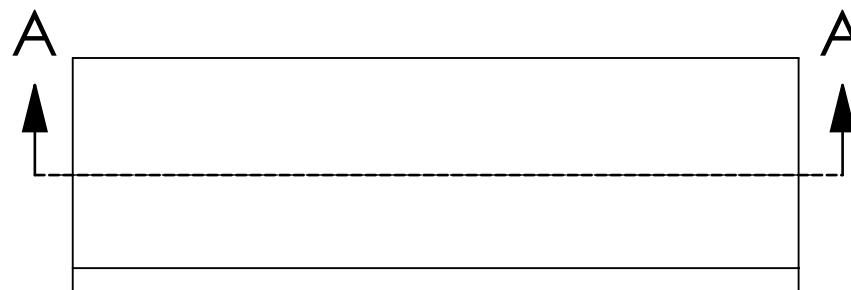
REV.	DATE	DCN #	DRAWING TREE #
v1	18 MAY 2010	E1000166	E080191
-	-	-	-
-	-	-	-



SECTION A-A



1/2-20 UNF THRU
+.005 OVERSIZE TAP



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 304, 316 OR 302 SSSL
FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS

NEXT ASSY UPPER MASS ASSY

PART NAME

PITCH INSERT, T-PIECE

DESIGNER D. BRIDGES 30 JUN 2010
DRAFTER D. BRIDGES 30 JUN 2010
CHECKER C. TORRIE 09 JUL 2010
APPROVAL

SIZE DWG. NO. A D1001669

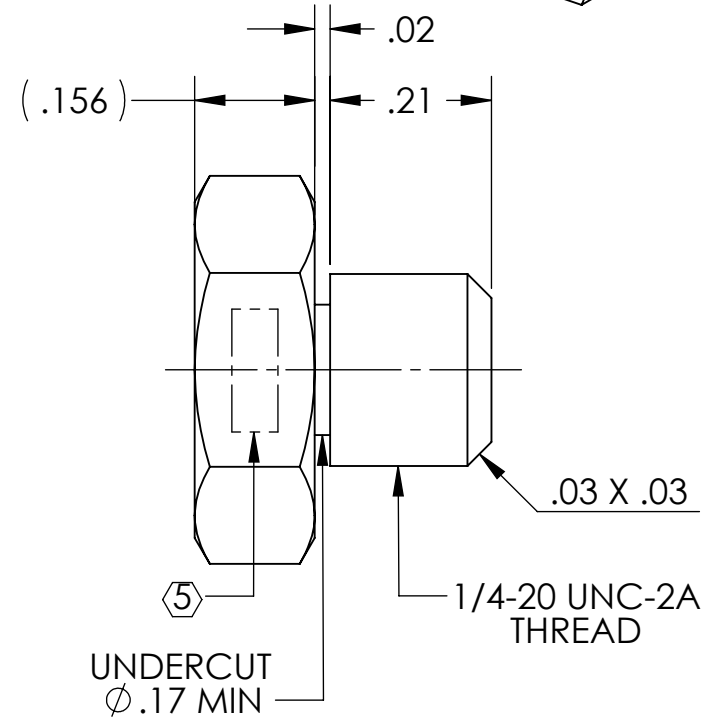
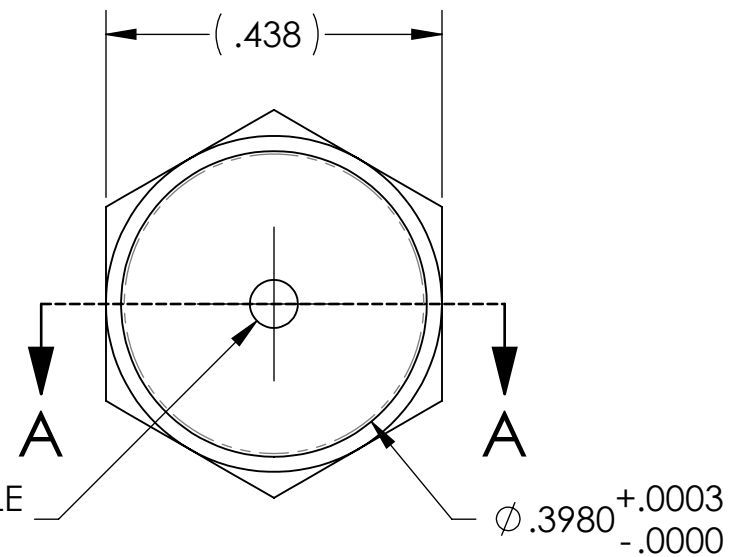
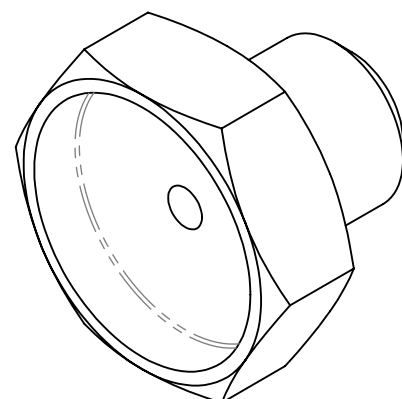
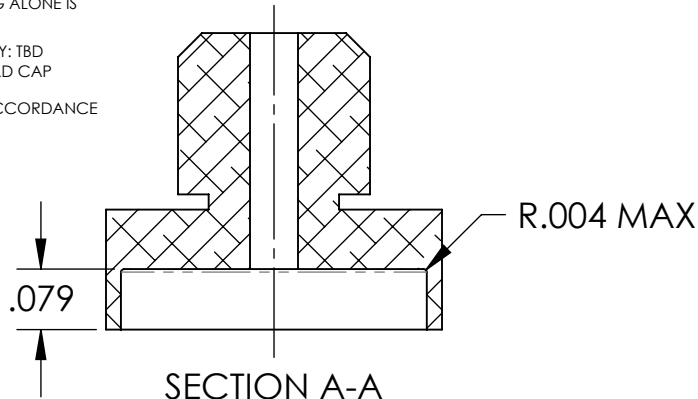
REV. v1

SCALE: 1:1 PROJECTION: SHEET 1 OF 1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND QUANTITY. IF PARTS ARE TOO SMALL TO SCRIBE, BAGGING AND TAGGING ALONE IS SUFFICIENT.
EXAMPLE (PART): 001-v1
EXAMPLE (TAG): DXXXXXX-VY, TYPE-XX, QTY: TBD
- 6. PART IS TO BE MADE FROM STOCK HEX HEAD CAP SCREW, 1/4-20 UNC-2A, FULLY THREADED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	18 MAY 2010	E1000166	-
-	-	-	-
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 316 SSTL (6) FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

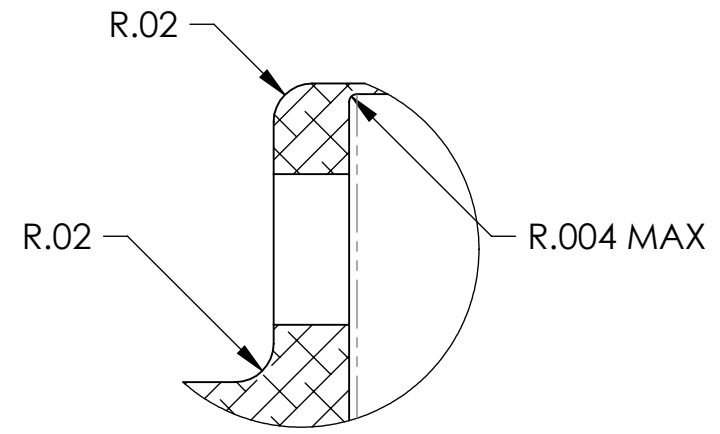
SYSTEM ADVANCED LIGO SUB-SYSTEM SUS NEXT ASSY MULTIPLE ASSYS

PART NAME MAGNET RETAINER, BOSEM

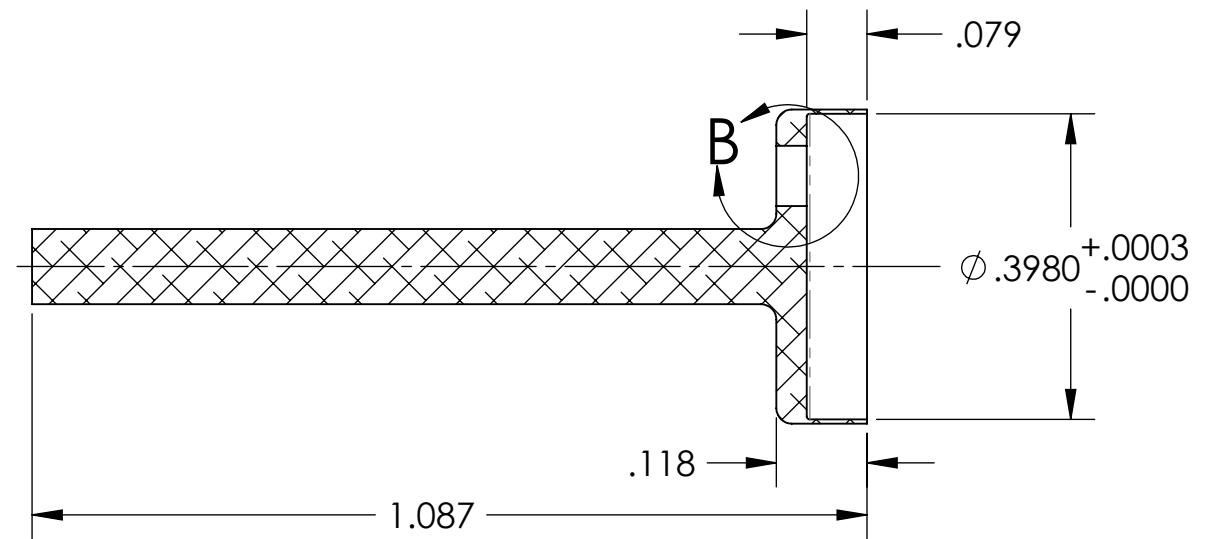
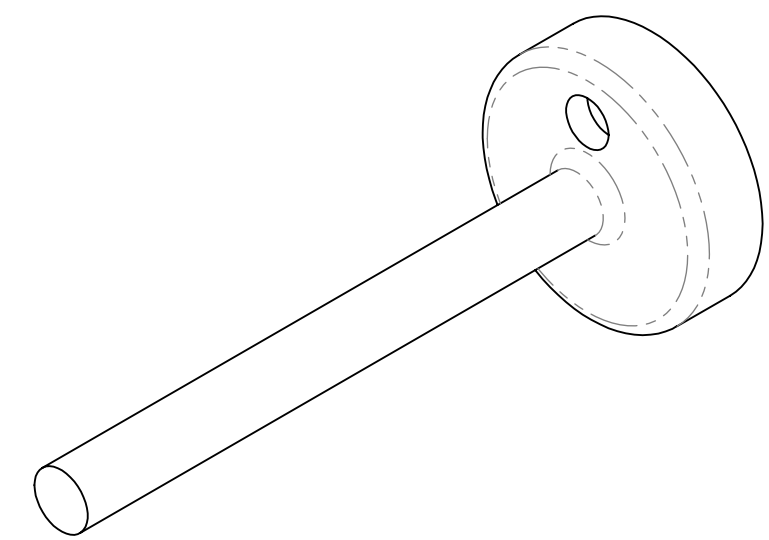
DESIGNER D. BRIDGES	13 JUL 2010	SIZE DWG. NO. A	D1001697	REV. v1
DRAFTER D. BRIDGES	14 JUL 2010			
CHECKER M. MEYER	16 JUL 2010			
APPROVAL		SCALE: 4:1	PROJECTION:	SHEET 1 OF 1

NOTES CONTINUED:
 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND QUANTITY. IF PARTS ARE TOO SMALL TO SCRIBE, BAGGING AND TAGGING ALONE IS SUFFICIENT.
 EXAMPLE (PART): 001-v1
 EXAMPLE (TAG): DXXXXXX-VY, TYPE-XX, QTY: TBD
 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

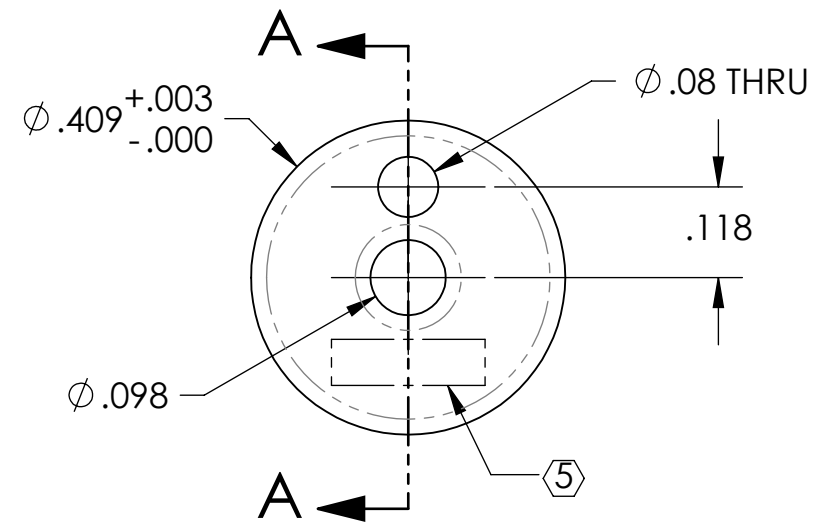
REV.	DATE	DCN #	DRAWING TREE #
v1	18 MAY 2010	E1000166	-
-	-	-	-
-	-	-	-



DETAIL B
SCALE 10 : 1



SECTION A-A



D1001698_Advanced_LIGO_SUS_HLTS_Magnet_Flag_BOSEM_PART_PDM_REV: X-000, DRAWING PDM REV:

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)				LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.5°				1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		MAGNET FLAG, BOSEM	
MATERIAL		FINISH		SYSTEM		SUB-SYSTEM	
6061-T6 Al		32 μinch		ADVANCED LIGO		SUS	
NEXT ASSY				DESIGNER		DATE	
MAGNET AND FLAG ASSY, BOSEM				D. BRIDGES		13 JUL 2010	
APPROVAL				DRAFTER		DATE	
M. MEYER				D. BRIDGES		14 JUL 2010	
CHECKER				M. MEYER		16 JUL 2010	
SCALE: 4:1				PROJECTION:		SHEET 1 OF 1	
SIZE DWG. NO.				REV.		REV.	
B D1001698				v1		v1	

4

3

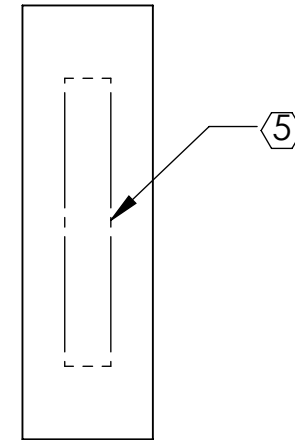
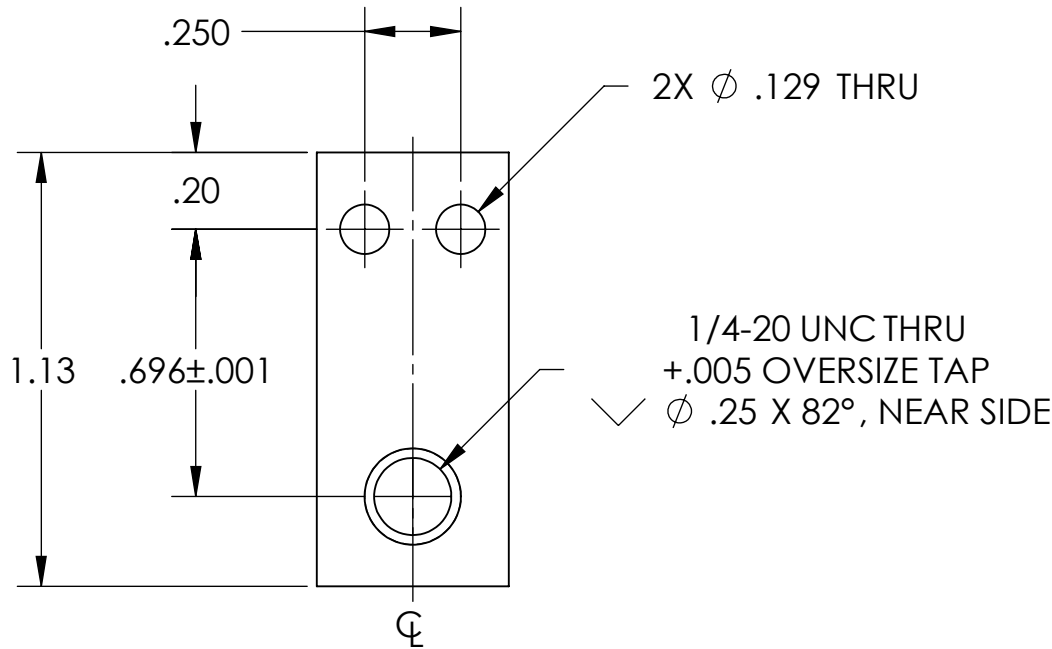
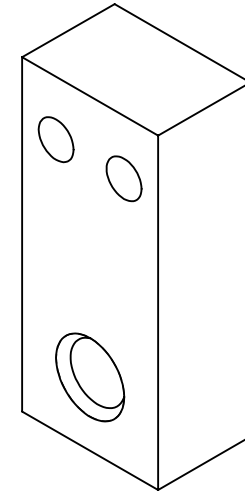
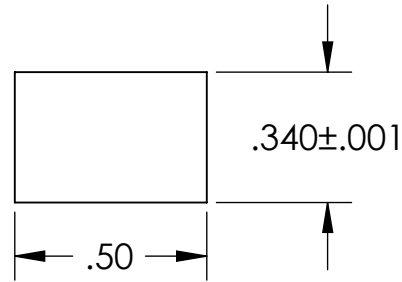
2

1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED. EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	18 MAY 2010	E1000166	E080191
-	-	-	-
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 6061-T6 Al FINISH 32 μinch



SYSTEM ADVANCED LIGO SUB-SYSTEM SUS
NEXT ASSY UPPER MASS, HLTS

PART NAME			MAGNET HOLDER, BOSEM, HLTS		
DESIGNER	D. BRIDGES	19 JUL 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	20 JUL 2010	A	D1001699	v1
CHECKER	M. MEYER	21 JUL 2010	SCALE: 2:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

4

3

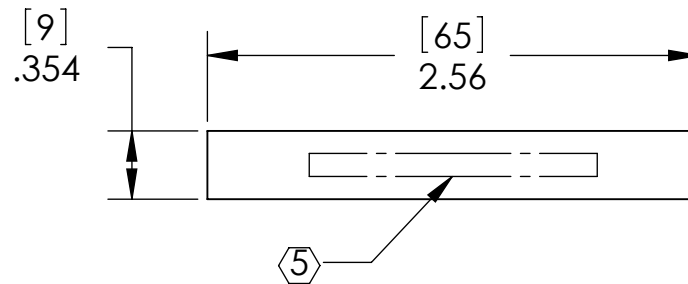
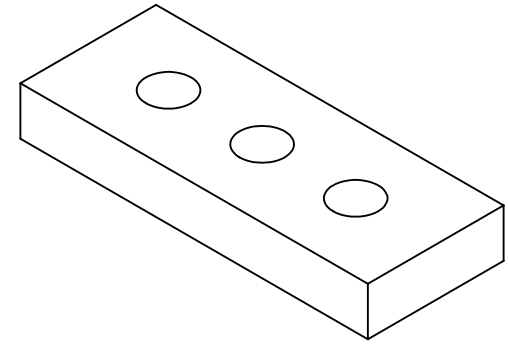
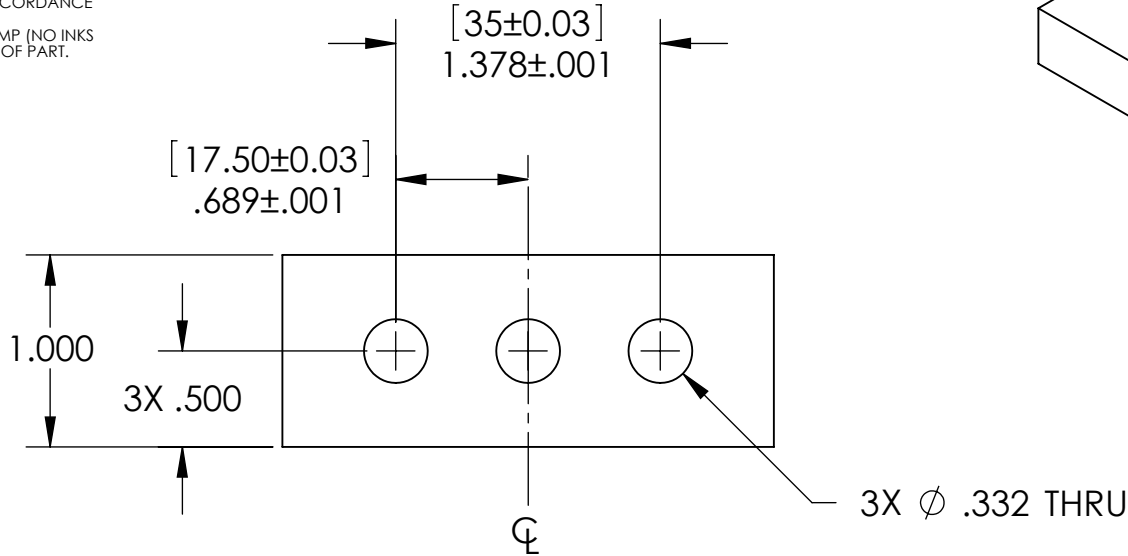
2

1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

REV.	DATE	DCN #	DRAWING TREE #
v1	18 MAY 2010	E1000166	E080191
v2	21 NOV 2010	E1000741	E080191
-	-	-	-



2.0mm
BOTH SIDES

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]	1. INTERPRET DRAWING PER ASME Y14.5-1994.
TOLERANCES: .XX ± .01 .XXX ± .005	2. REMOVE ALL SHARP EDGES, R.02 MIN.
ANGULAR ± 0.5°	3. DO NOT SCALE FROM DRAWING.
	4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.
MATERIAL	304, 316 OR 302 SSSL
FINISH	63 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: ADVANCED LIGO SUB-SYSTEM: SUS

NEXT ASSY: ROTATIONAL ADJUSTER

PART NAME			SHIM, 2.0mm, UPPER BLADE		
DESIGNER	D. BRIDGES	20 NOV 2010	SIZE	DWG. NO.	
DRAFTER	D. BRIDGES	20 NOV 2010	A	D1001914	
CHECKER	M. MEYER	21 NOV 2010	REV.	v2	
APPROVAL			SCALE: 1:1	PROJECTION:	SHEET 1 OF 1

4

3

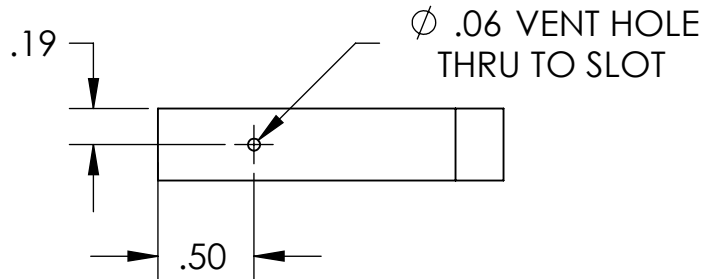
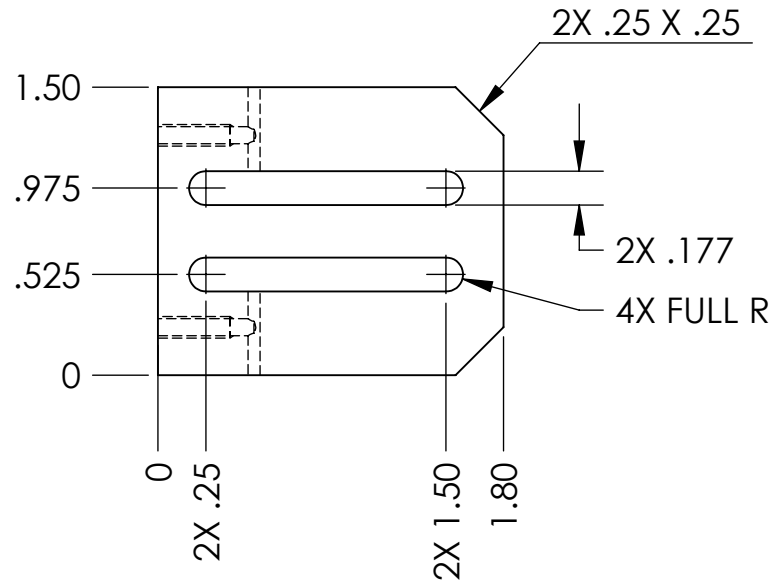
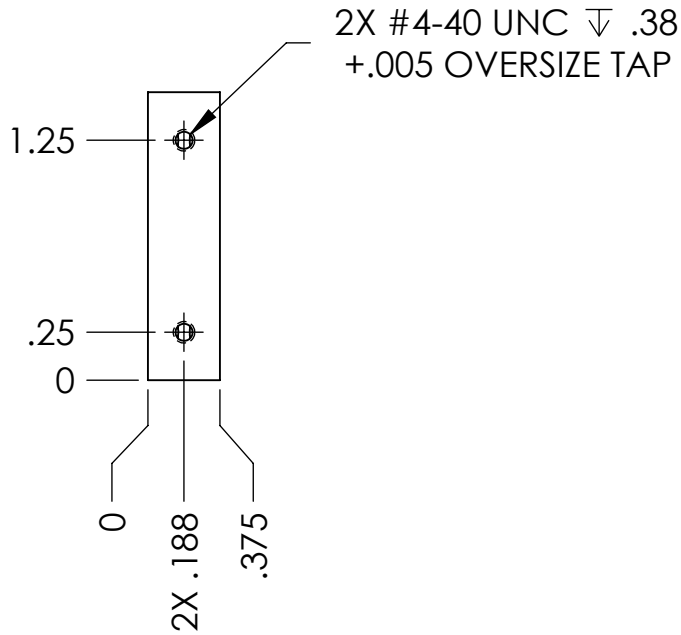
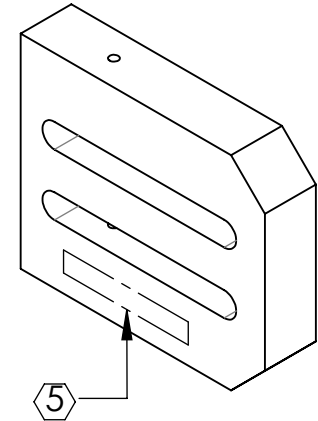
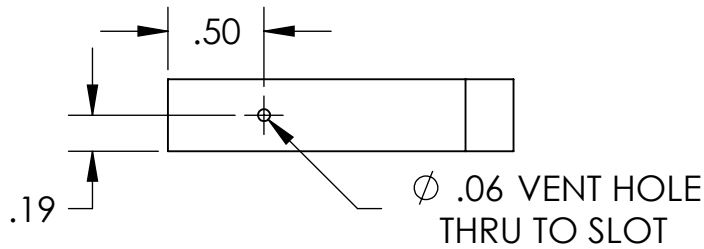
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1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	10 AUG 2010	E1000301	E080191
-	-	-	-
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 6061-T6 Al
FINISH 32 μ inch



SYSTEM ADVANCED LIGO SUB-SYSTEM SUS

NEXT ASSY MOUNTING BRACKET, COIL HOLDER, HLTS

PART NAME MOUNTING BRACKET LATERAL SECTION

DESIGNER	D. BRIDGES	11 AUG 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	12 AUG 2010	A	D1002134	v1
CHECKER	B. MOORE	16 AUG 2010	SCALE: 1:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

4

3

2

1

4

3

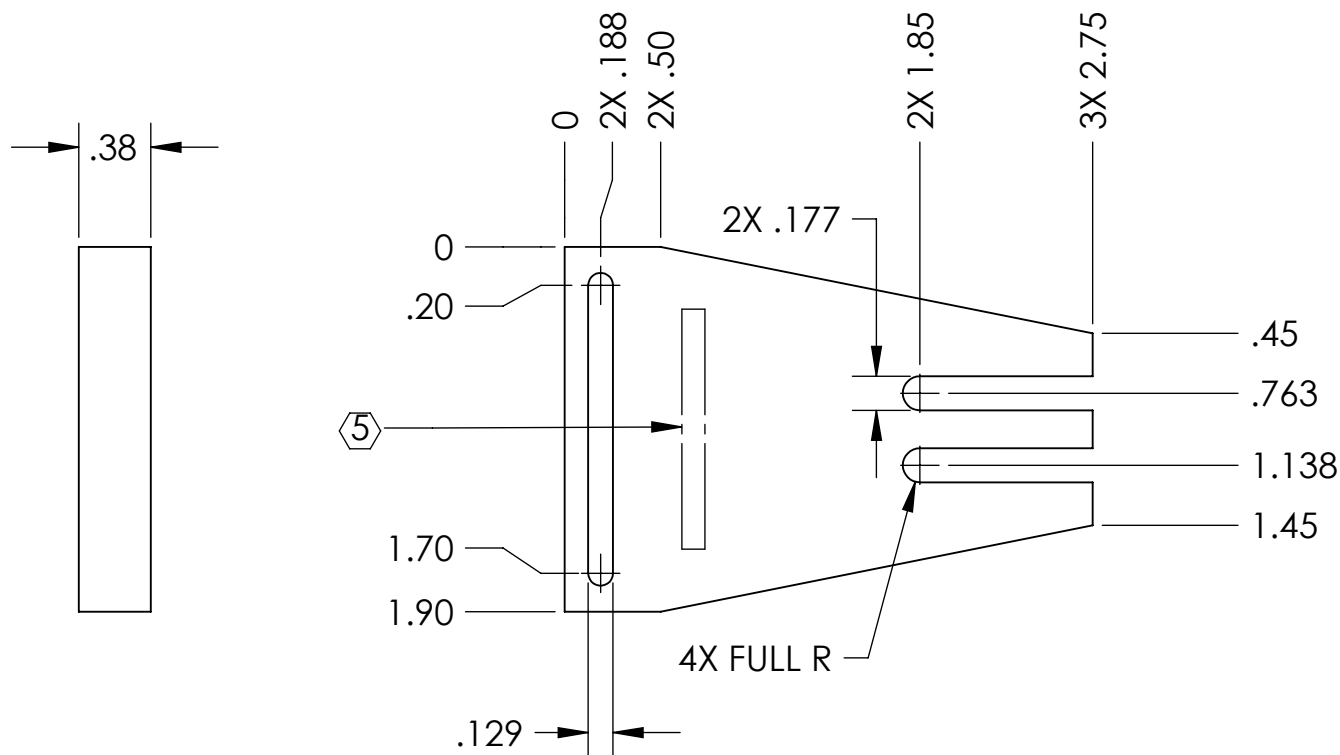
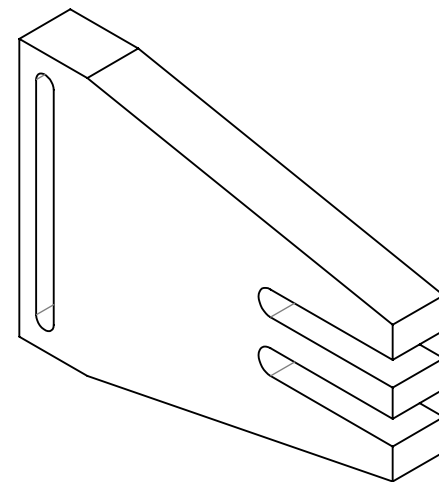
2

1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED. EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	10 AUG 2010	E1000301	E080191
-	-	-	-
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 6061-T6 Al
FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS

NEXT ASSY MOUNTING BRACKET, COIL HOLDER

PART NAME MOUNTING BRACKET LONGITUDINAL SECTION

DESIGNER	D. BRIDGES	11 AUG 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	14 AUG 2010	A	D1002135	v1
CHECKER	B. MOORE	16 AUG 2010	SCALE: 1:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

4

3

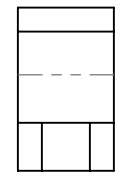
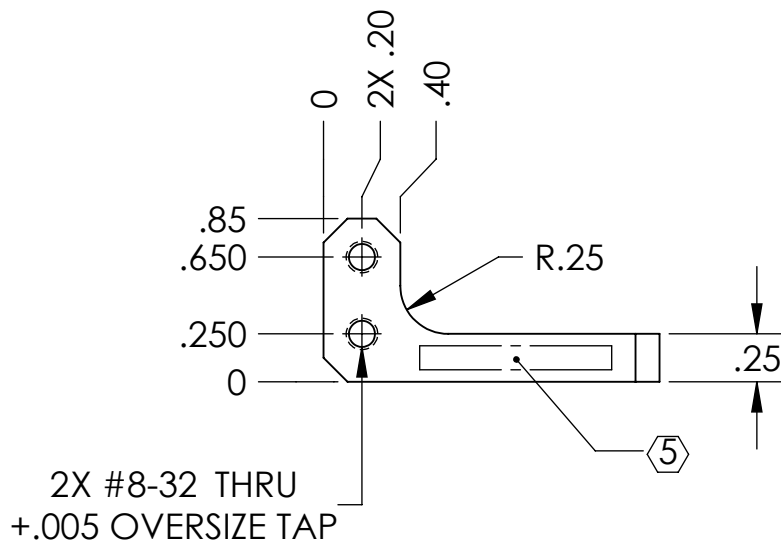
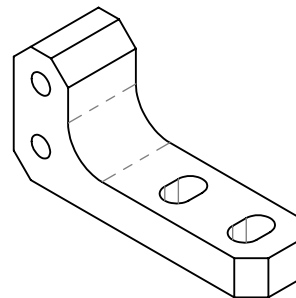
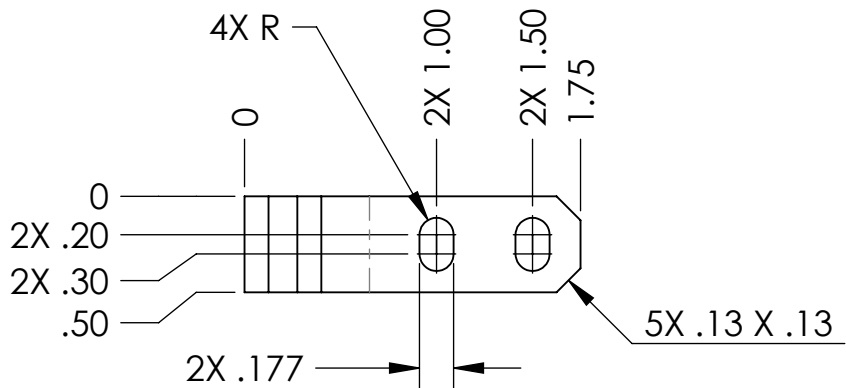
2

1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	10 AUG 2010	E1000301	E080191
-	-	-	-
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 6061-T6 Al FINISH 63 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS

NEXT ASSY EARTHQUAKE STOP BRACKET ASSY, BOTTOM MASS, LOWER

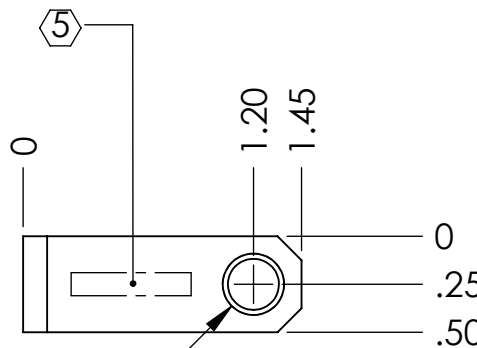
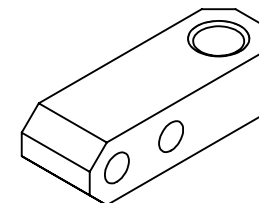
PART NAME EARTHQUAKE STOP BRACKET BACK, BOTTOM MASS, LOWER

DESIGNER	D. BRIDGES	25 OCT 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	27 OCT 2010	A	D1002823	v1
CHECKER	B. MOORE	28 OCT 2010	SCALE: 1:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

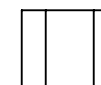
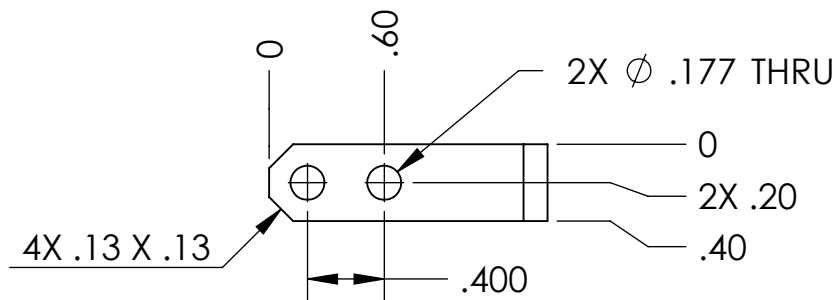
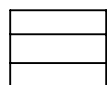
NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
- 9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

REV.	DATE	DCN #	DRAWING TREE #
v1	10 AUG 2010	E1000301	E080191
-	-	-	-
-	-	-	-



DRILL AND TAP THRU FOR
1/4-20 UNC-2B X 1.5 DIA
EMHART HELICOIL
(P/N 1185-4EN375)



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 6061-T6 Al FINISH 63 μinch



SYSTEM ADVANCED LIGO SUB-SYSTEM SUS
NEXT ASSY EARTHQUAKE STOP BRACKET ASSY, BOTTOM MASS, LOWER

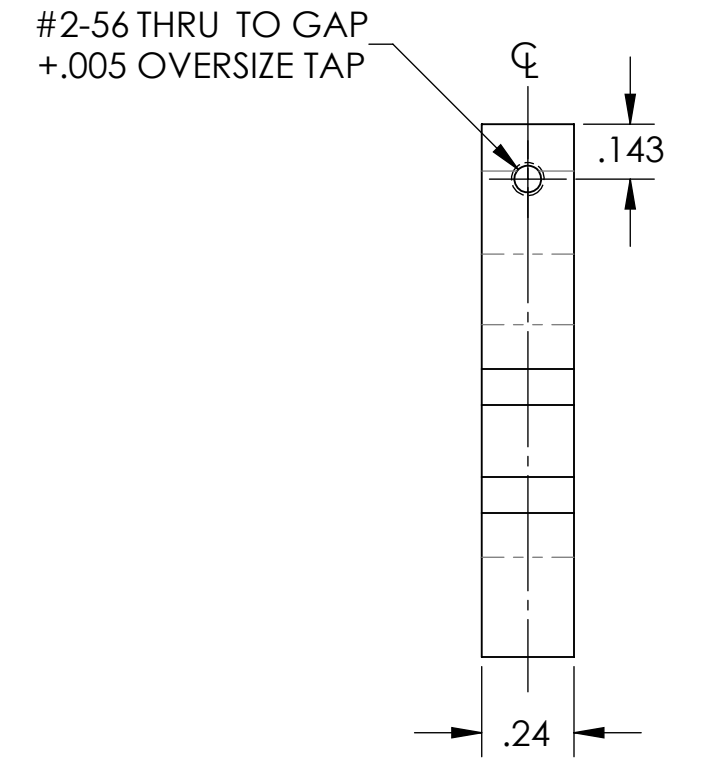
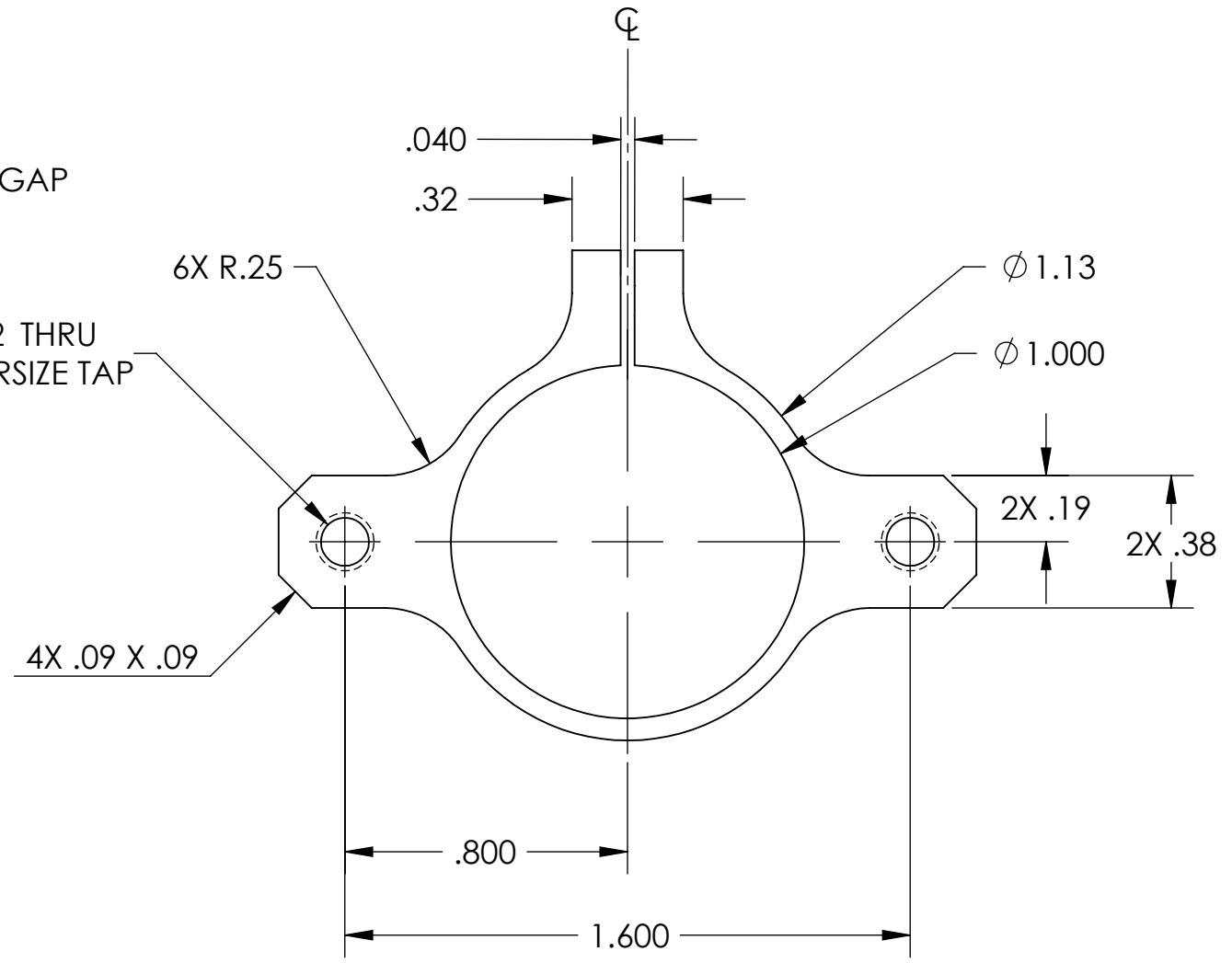
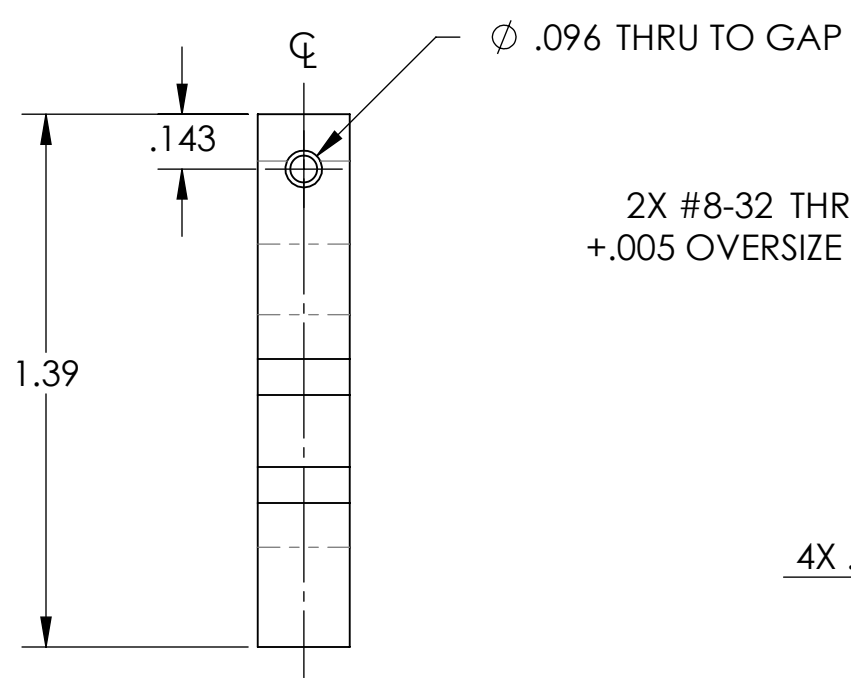
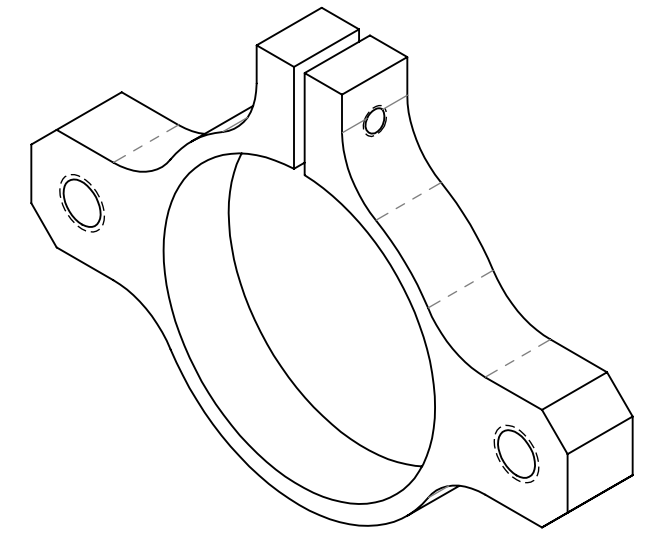
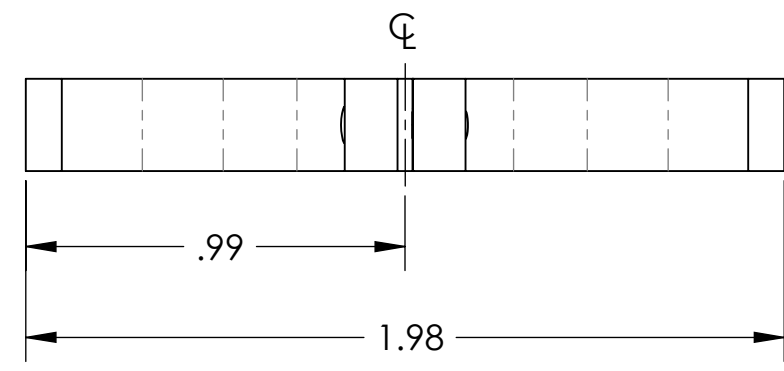
PART NAME EARTHQUAKE STOP BRACKET SIDE, BOTTOM MASS, LOWER

DESIGNER	D. BRIDGES	25 OCT 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	27 OCT 2010	A	D1002824	v1
CHECKER	B. MOORE	28 OCT 2010	SCALE: 1:1	PROJECTION:	SHEET 1 OF 1
APPROVAL					

D1002858_Advanced_LIGO_SUS_AOSEM_Adjustment_Collar_(Reverse_Side), PART PDM REV: X-003, DRAWING PDM REV: X-000

NOTES CONTINUED:
 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND QUANTITY. IF PARTS ARE TOO SMALL TO SCRIBE, BAGGING AND TAGGING ALONE IS SUFFICIENT.
 EXAMPLE (PART): 001-v1
 EXAMPLE (TAG): DXXXXXXX-VY, TYPE-XX, QTY: TBD
 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	10 AUG 2010	E1000301	E080191
-	-	-	-
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)				LIGO		PART NAME	
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.5°				CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		AOSEM ADJUSTMENT COLLAR (REVERSE SIDE)	
1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.				ADVANCED LIGO		SUS	
MATERIAL 6061-T6 Al				FINISH 63 μinch		NEXT ASSY MULTIPLE ASSYS	
		DESIGNER D. BRIDGES 28 OCT 2010		SIZE DWG. NO. B		REV. v1	
		DRAFTER D. BRIDGES 28 OCT 2010		D1002858			
		CHECKER B. MOORE 01 NOV 2010		SCALE: 2:1		PROJECTION:	
		APPROVAL		SHEET 1 OF 1			

4

3

2

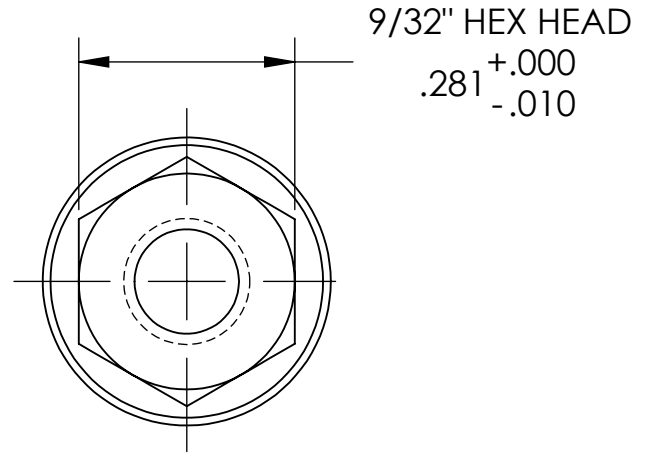
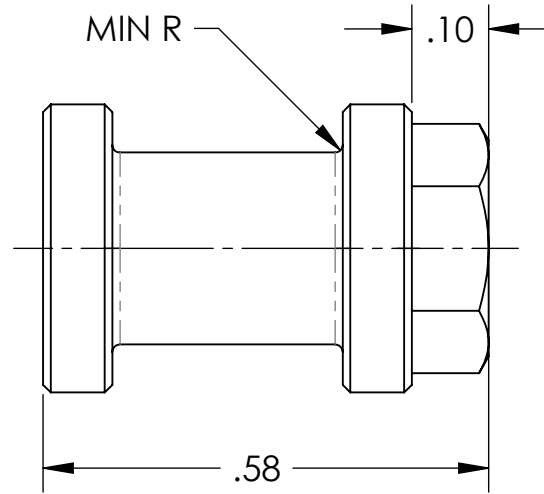
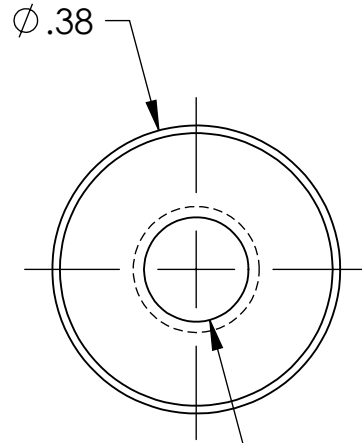
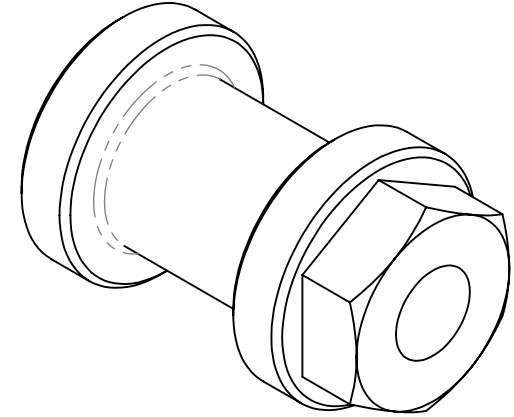
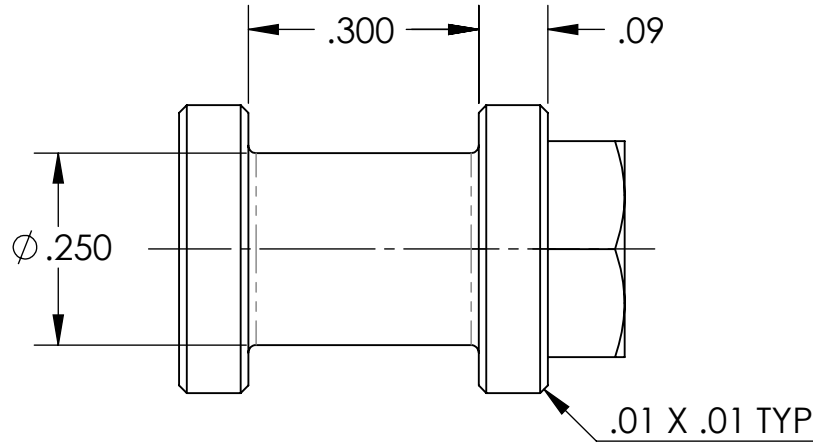
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NOTES CONTINUED:

5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND QUANTITY. IF PARTS ARE TOO SMALL TO SCRIBE, BAGGING AND TAGGING ALONE IS SUFFICIENT.
 EXAMPLE (PART): 001-v1
 EXAMPLE (TAG): DXXXXXX-VY, TYPE-XX, QTY: TBD

6. MATERIAL IS TO BE VICTREX 450G VIRGIN PEEK RESIN. NO OTHER ADDITIVES ARE PERMITTED.
 7. MACHINE ALL SURFACES. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.

REV.	DATE	DCN #	DRAWING TREE #
v1	10 AUG 2010	E1000301	E080191
-	-	-	-
-	-	-	-



#8-40 UNS-2B THRU

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
 .XX ± .01
 .XXX ± .005

ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
2. REMOVE ALL SHARP EDGES, R.02 MIN.
3. DO NOT SCALE FROM DRAWING.
4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL

PEEK

FINISH

32 μinch



CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM

ADVANCED LIGO

SUB-SYSTEM

SUS

NEXT ASSY

MULTIPLE ASSYS

PART NAME

ADJUSTMENT NUT, THICK

DESIGNER

B. MOORE 29 OCT 2010

DRAFTER

D. BRIDGES 29 OCT 2010

CHECKER

B. MOORE 01 NOV 2010

APPROVAL

SIZE

A

DWG. NO.

D1002865

REV.

v1

SCALE: 4:1

PROJECTION:



SHEET 1 OF 1

4

3

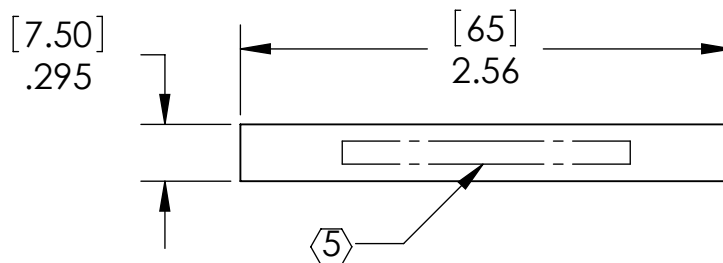
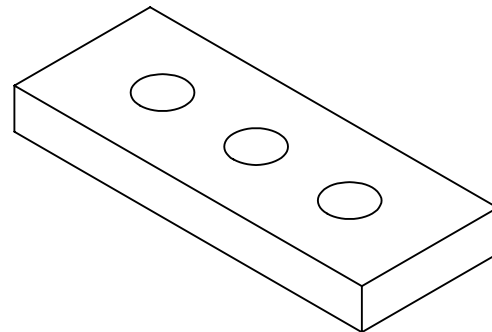
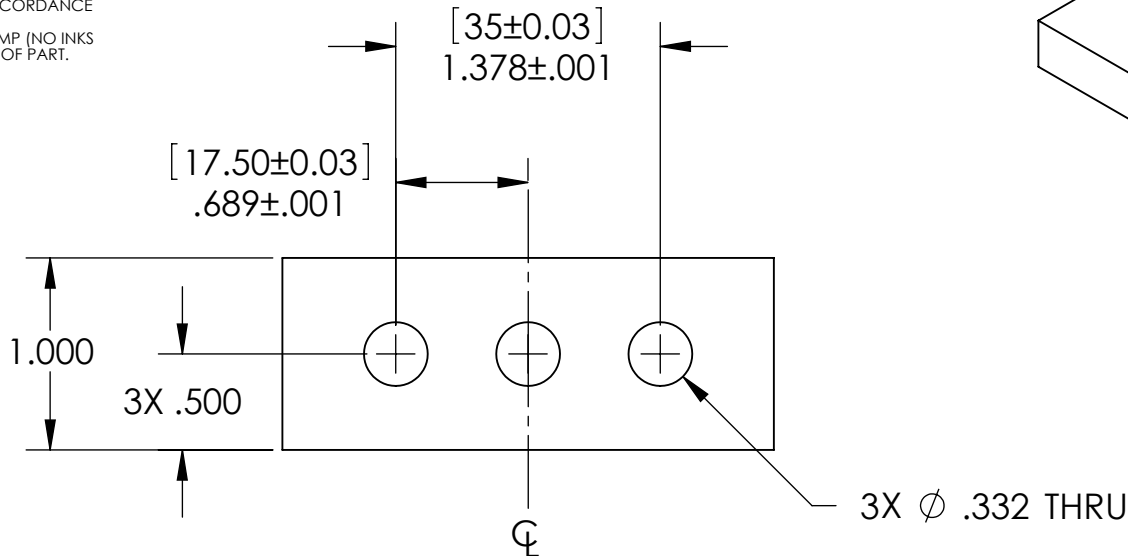
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1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

REV.	DATE	DCN #	DRAWING TREE #
v1	10 AUG 2010	E1000301	E080191
v2	21 NOV 2010	E1000741	E080191
-	-	-	-



0.5mm

BOTH SIDES 8

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]	1. INTERPRET DRAWING PER ASME Y14.5-1994.
TOLERANCES: .XX ± .01 .XXX ± .005	2. REMOVE ALL SHARP EDGES, R.02 MIN.
ANGULAR ± 0.5°	3. DO NOT SCALE FROM DRAWING.
	4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.
MATERIAL	304, 316 OR 302 SSSL
FINISH	63 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: **ADVANCED LIGO** SUB-SYSTEM: **SUS**

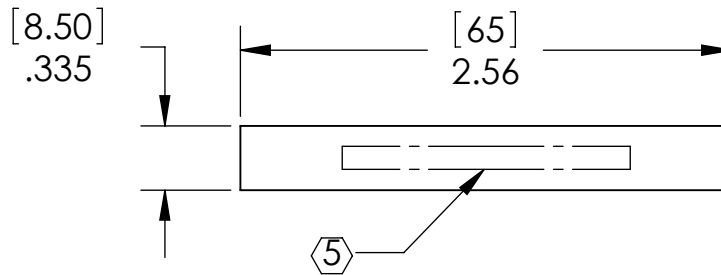
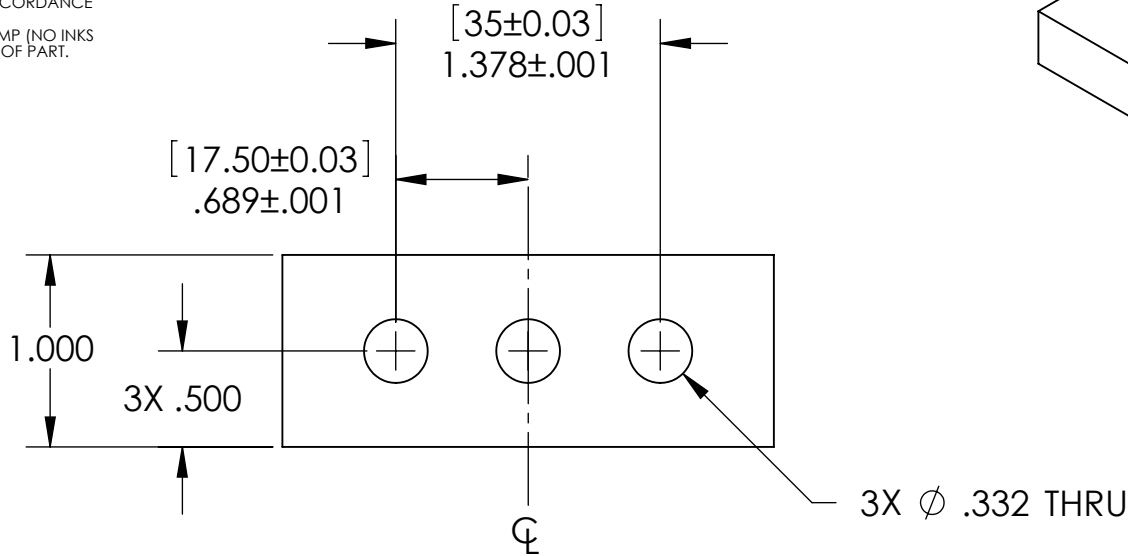
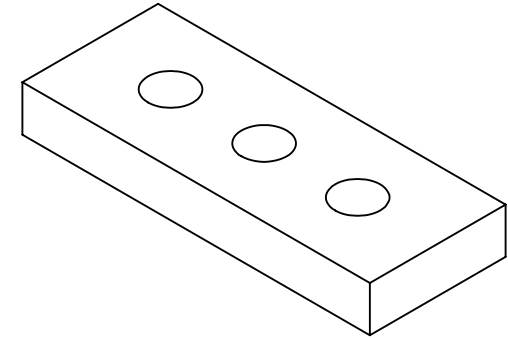
NEXT ASSY: **ROTATIONAL ADJUSTER**

PART NAME			SHIM, 0.5mm, UPPER BLADE		
DESIGNER	D. BRIDGES	20 NOV 2010	SIZE	DWG. NO.	
DRAFTER	D. BRIDGES	20 NOV 2010	A	D1002973	
CHECKER	M. MEYER	21 NOV 2010	REV.	v2	
APPROVAL			SCALE: 1:1	PROJECTION:	SHEET 1 OF 1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

REV.	DATE	DCN #	DRAWING TREE #
v1	21 NOV 2010	E1000741	E080191
-	-	-	-
-	-	-	-



1.5mm

BOTH SIDES

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]	1. INTERPRET DRAWING PER ASME Y14.5-1994.
TOLERANCES: .XX ± .01 .XXX ± .005	2. REMOVE ALL SHARP EDGES, R.02 MIN.
ANGULAR ± 0.5°	3. DO NOT SCALE FROM DRAWING.
	4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.
MATERIAL	304, 316 OR 302 SSSL
FINISH	63 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: **ADVANCED LIGO** SUB-SYSTEM: **SUS**

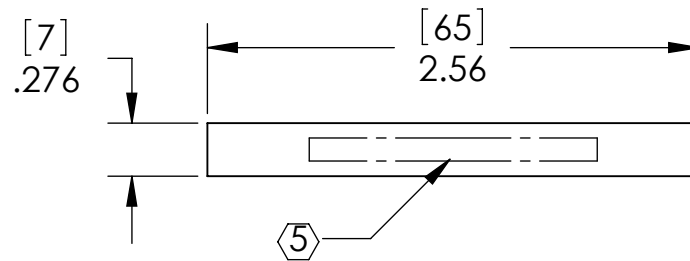
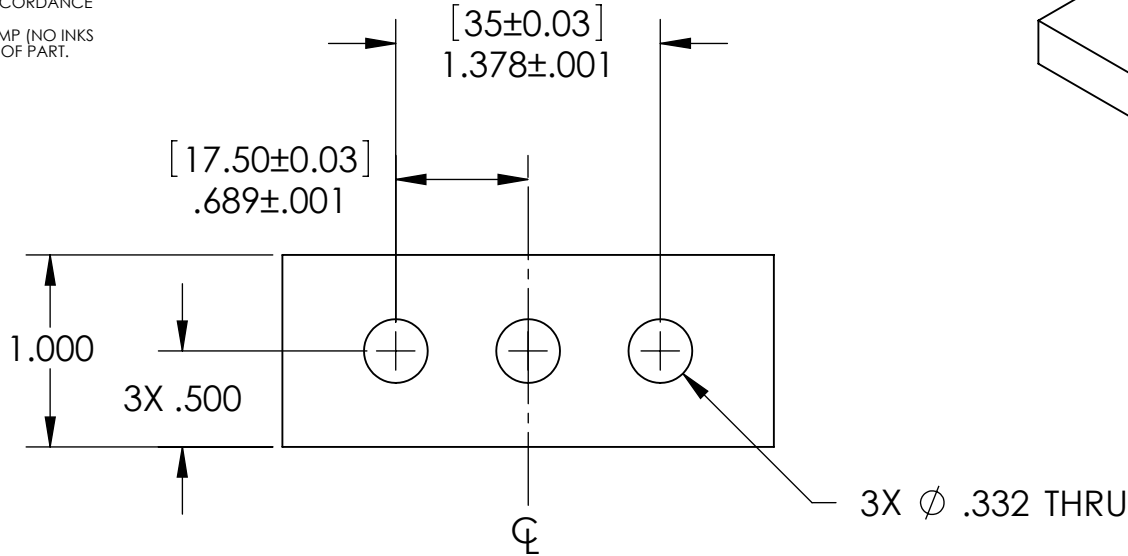
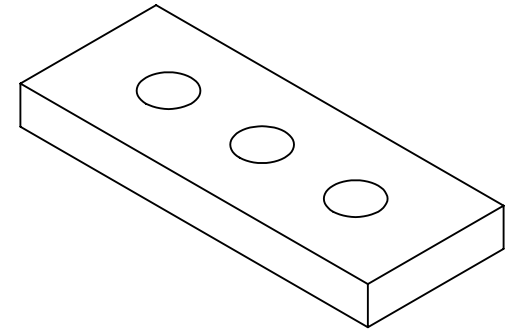
NEXT ASSY: **ROTATIONAL ADJUSTER**

PART NAME				SHIM, 1.5mm, UPPER BLADE			
DESIGNER	D. BRIDGES	20 NOV 2010	SIZE	DWG. NO.	REV.		
DRAFTER	D. BRIDGES	20 NOV 2010	A	D1003104	v1		
CHECKER	M. MEYER	21 NOV 2010	SCALE: 1:1	PROJECTION:			
APPROVAL					SHEET 1 OF 1		

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

REV.	DATE	DCN #	DRAWING TREE #
v1	21 NOV 2010	E1000741	E080191
-	-	-	-
-	-	-	-



BOTH SIDES 8 0.0mm

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES [MM]
 TOLERANCES:
 .XX ± .01
 .XXX ± .005
 ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, R.02 MIN.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 304, 316 OR 302 SSSL
 FINISH 63 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS
 NEXT ASSY ROTATIONAL ADJUSTER

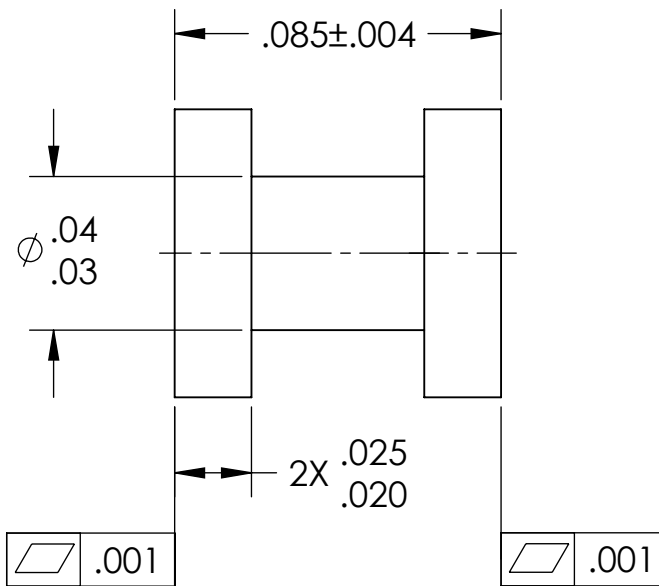
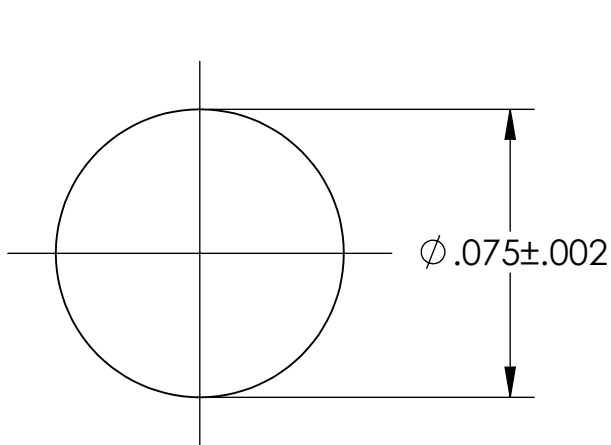
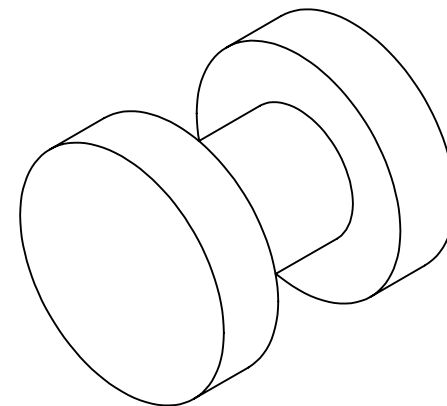
PART NAME SHIM, 0.0mm, UPPER BLADE

DESIGNER	D. BRIDGES	20 NOV 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	20 NOV 2010	A	D1003105	v1
CHECKER	M. MEYER	21 NOV 2010	SCALE: 1:1	PROJECTION:	SHEET 1 OF 1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND QUANTITY. IF PARTS ARE TOO SMALL TO SCRIBE, BAGGING AND TAGGING ALONE IS SUFFICIENT.
EXAMPLE (PART): 001-v1
EXAMPLE (TAG): DXXXXXX-VY, TYPE-XX, QTY: TBD
- 6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

REV.	DATE	DCN #	DRAWING TREE #
A	30 JUL 1997	E970121	-
v1	06 JUL 2009	E0900189	-
v2	28 JUN 2010	E1000236	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .01
.XXX ± .005

ANGULAR ± 0.5°

- 1. INTERPRET DRAWING PER ASME Y14.5-1994.
- 2. REMOVE ALL SHARP EDGES, R.02 MIN.
- 3. DO NOT SCALE FROM DRAWING.
- 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 6061-T6 Al FINISH 32 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO SUB-SYSTEM SUS NEXT ASSY MULTIPLE ASSYS

PART NAME DUMBBELL STANDOFF

DESIGNER C. TORRIE 12 JUL 2004	SIZE DWG. NO. A D970075	REV. v2
DRAFTER D. BRIDGES 01 NOV 2010		
CHECKER B. MOORE 02 NOV 2010		
APPROVAL	SCALE: 20:1	PROJECTION:

SHEET 1 OF 1