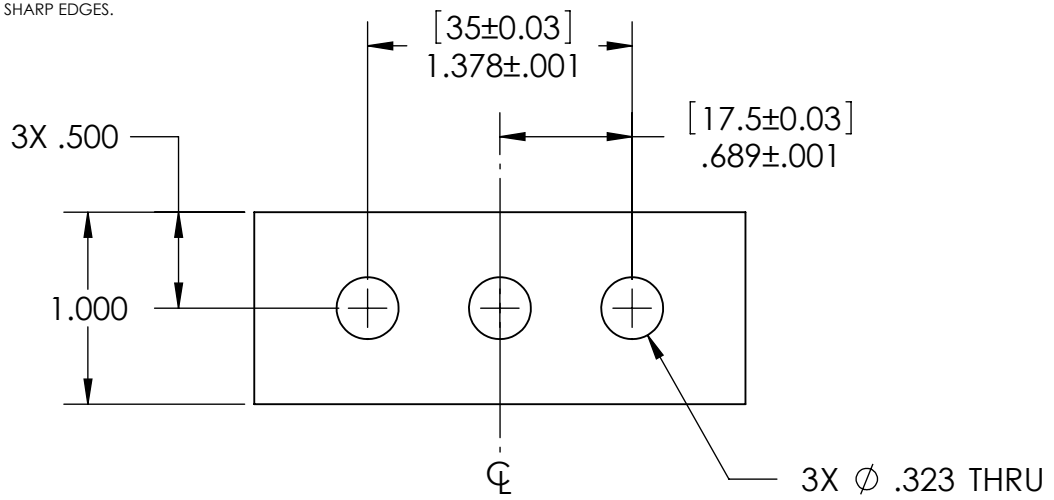
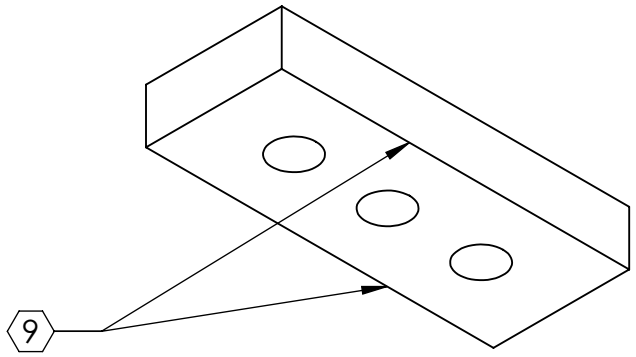
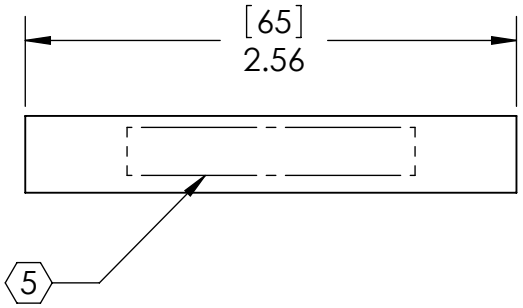
NOTES CONTINUED:

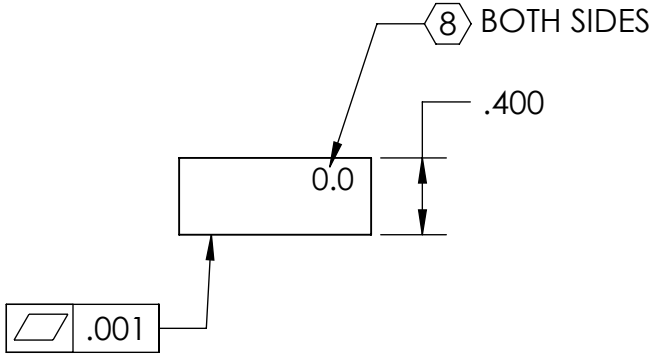
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 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. 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 ± .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, UPPER BLADE

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

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

SIZE A **DWG. NO.** D020601 **REV.** v2

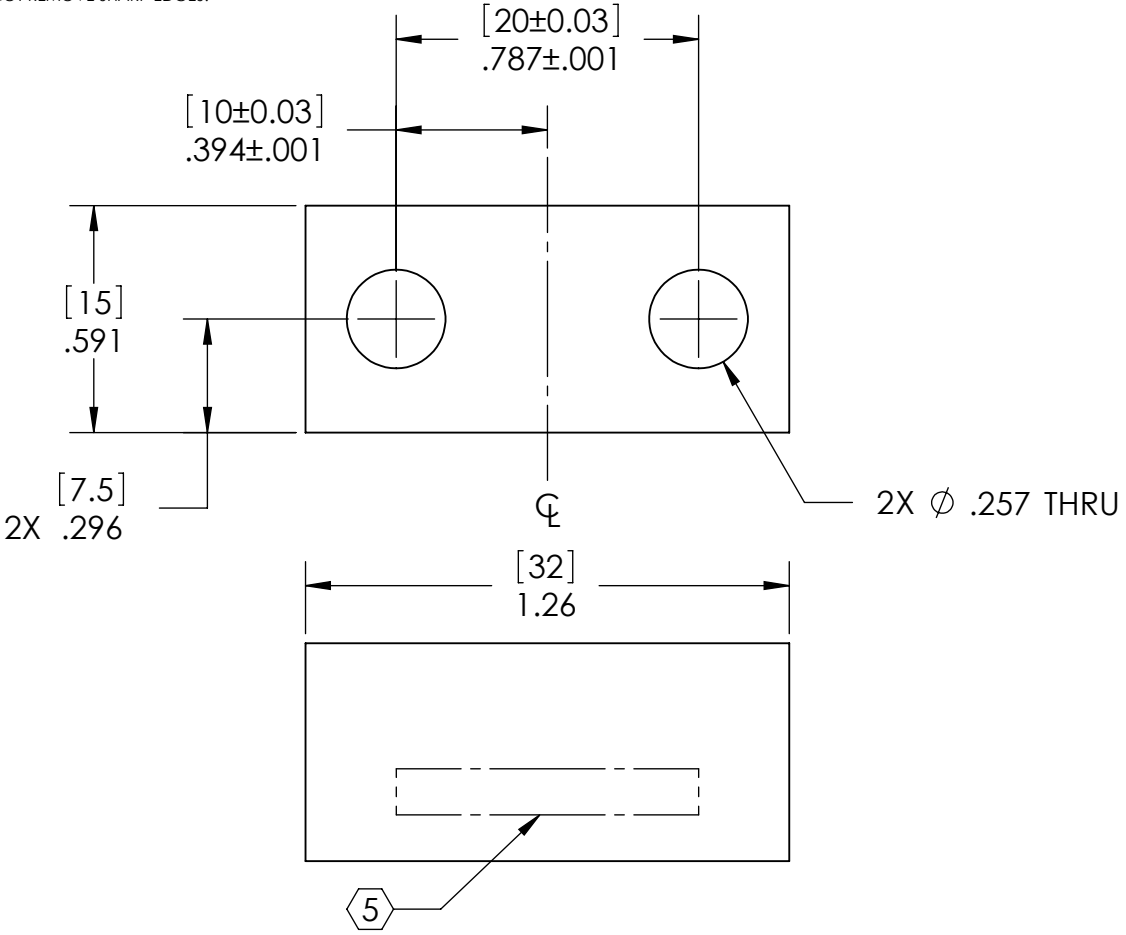
SCALE: 1:1 **PROJECTION:** SHEET 1 OF 1

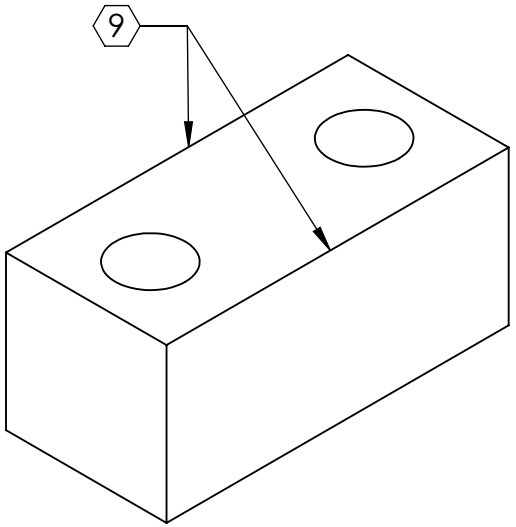
D020601_Advanced_LIGO_SUS_HLTS_Blade_Clamp,_Upper_Blade,_Outside, PART PDM REV: V1-000, DRAWING PDM REV: V1-001

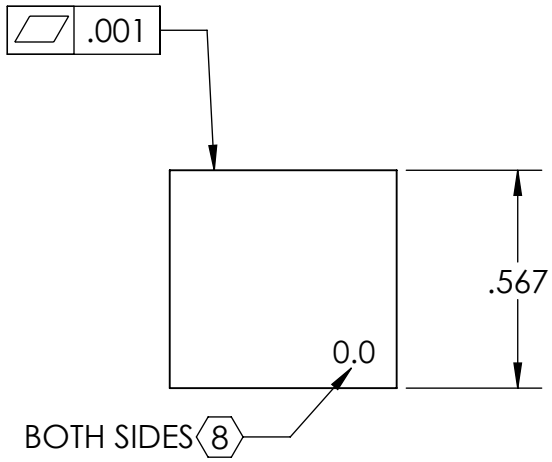
NOTES CONTINUED:

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: 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. 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 ± .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 (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 A **DWG. NO.** D020602 **REV.** v2

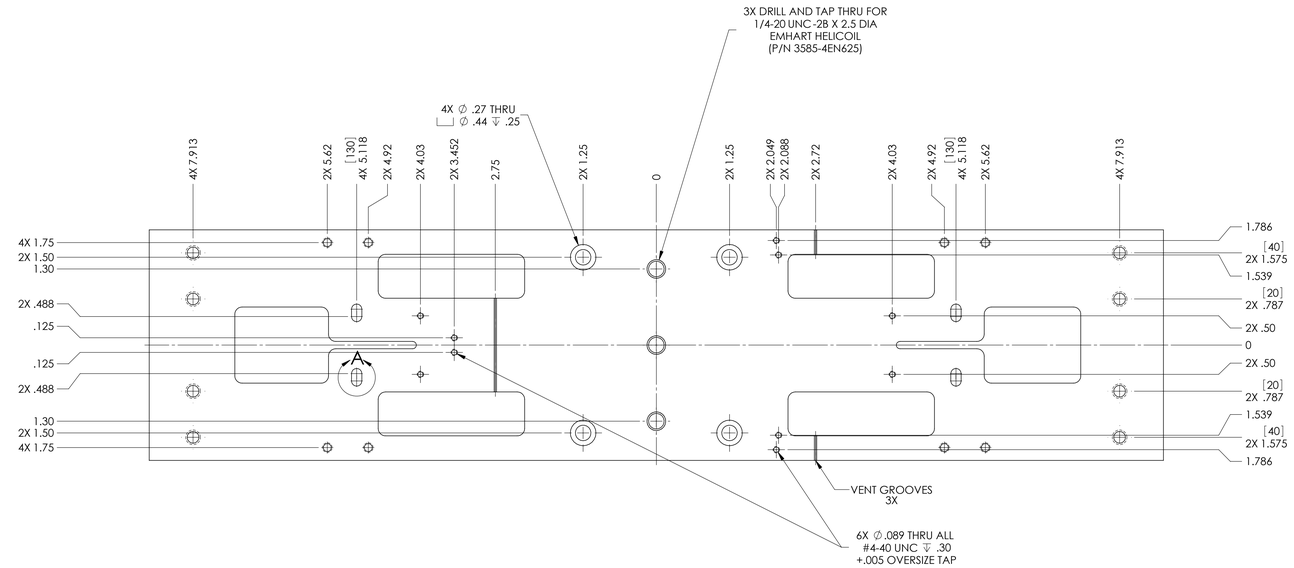
SCALE: 2:1 **PROJECTION:** SHEET 1 OF 1

D020602_Advanced_LIGO_SUS_HLTS_Blade_Clamp,_Lower_Blade,_Inside, PART PDM REV: V1-000, DRAWING PDM REV: V1-001

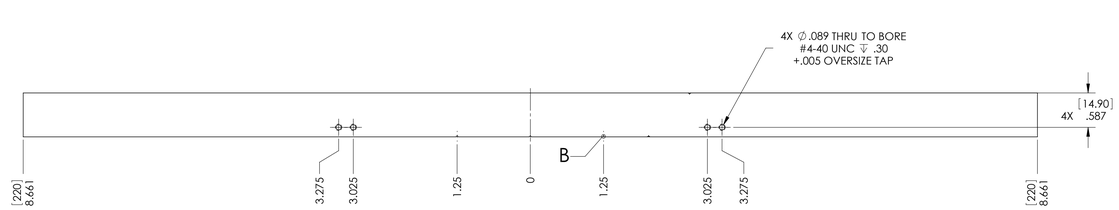
NOTES CONTINUED:

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: 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.

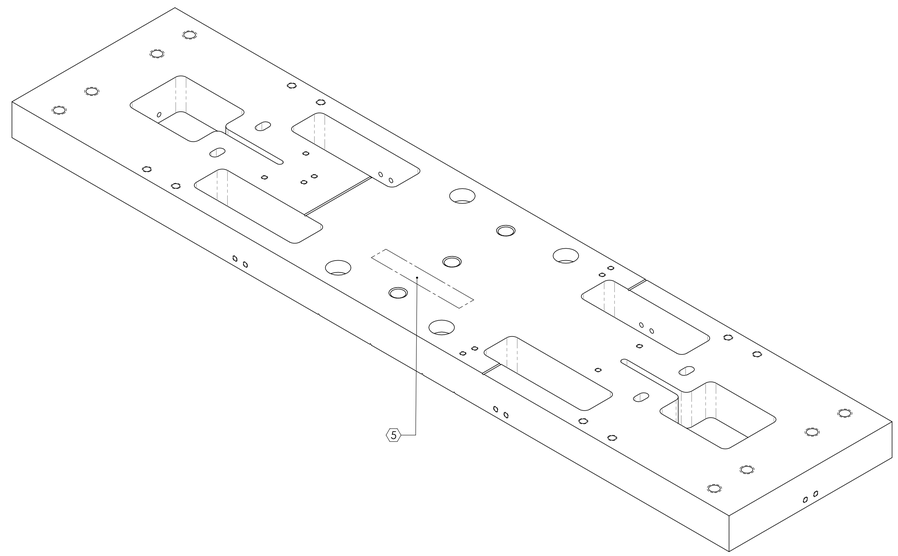
REV.	DATE	DCN #	DRAWING TREE #
v1	14 JUL 2009	E0900198	E080191
v2	02 DEC 2009	E0900446	E080191
v3	18 MAY 2010	E1000166	E080191



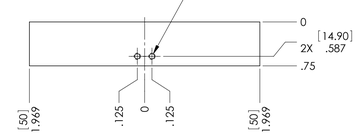
4X ∅ .089 THRU TO BORE



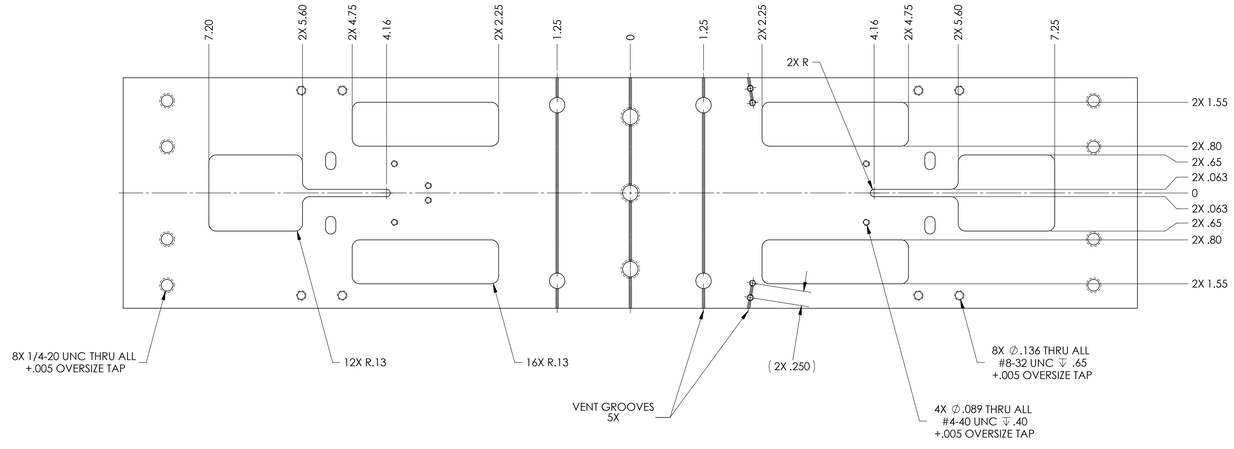
FRONT AND BACK SIDES

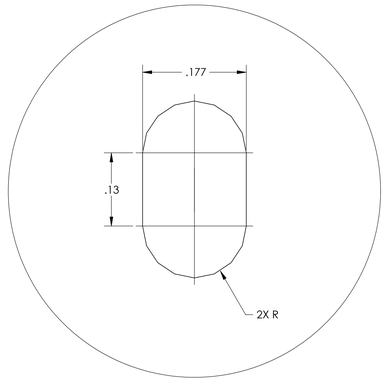


2X ∅ .089 THRU TO BORE

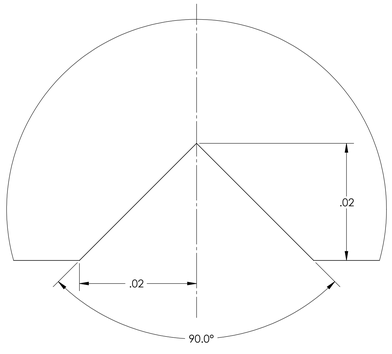


RIGHT AND LEFT SIDES





DETAIL A
SCALE 10 : 1
TYP



DETAIL B
SCALE 100 : 1
VENT GROOVE
TYP

DIMENSIONS ARE IN INCHES [MM]	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.	LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY
TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.5°	MATERIAL 304, 316 OR 302 SSTL FINISH 32 µinch	SYSTEM ADVANCED LIGO SUB-SYSTEM SUS NEXT ASSY UPPER MASS ASSY

PART NAME	MAIN SECTION				
DESIGNER	D. BRIDGES	10 JUL 2010	SIZE	DWG. NO.	REV.
DRAFTER	D. BRIDGES	21 JUL 2010	E	D020605	v3
CHECKER	M. MEYER	27 JUL 2010			
APPROVAL			SCALE: 1:1	PROJECTION:	SHEET 1 OF 1

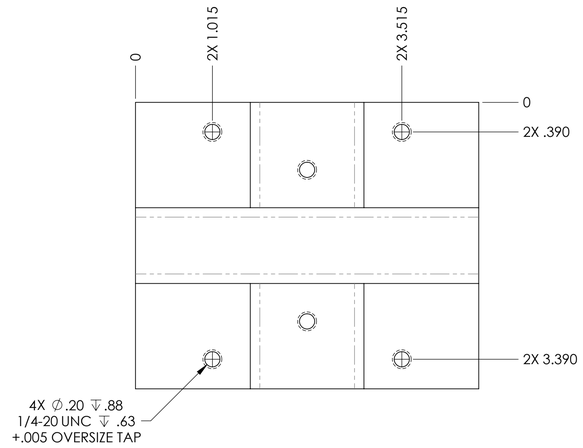
D020605_Advanced_LIGO_SUS_HLTS_Main_Section_Upper_Mass, PART PDM REV= V2-002, DRAWING PDM REV= V2-002

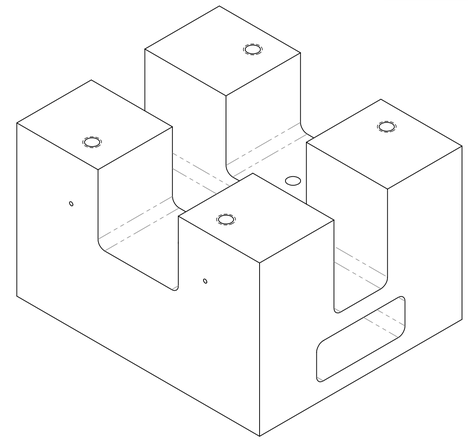
NOTES CONTINUED:

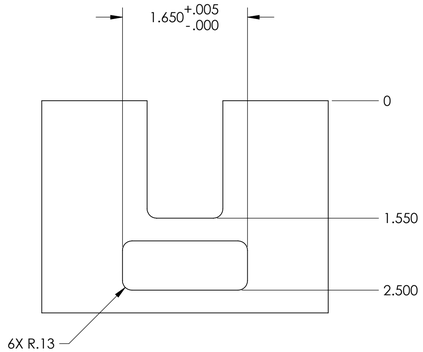
Ⓢ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 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

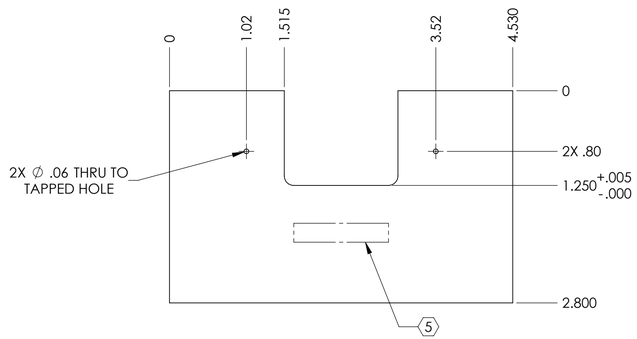
6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

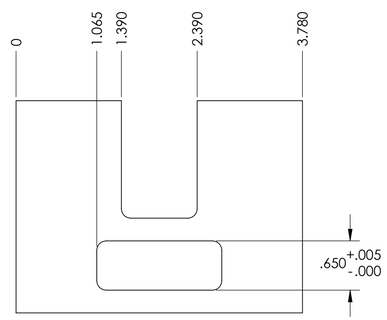
REV.	DATE	DCN #	DRAWING TREE #
v1	14 JUL 2009	E0900198	E080191
v2	02 DEC 2009	E0900446	E080191
v3	18 MAY 2010	E1000166	E080191

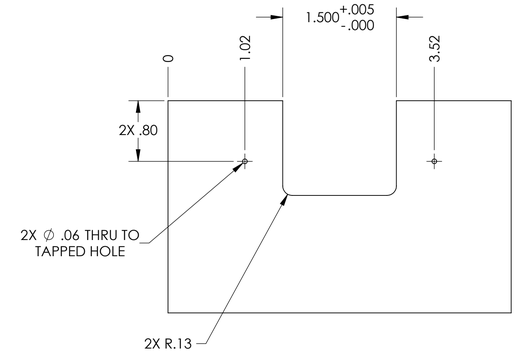


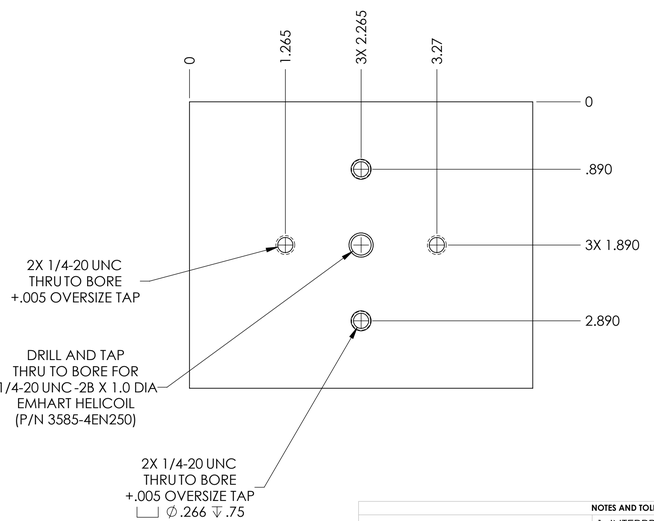












NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

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 SSTL
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: T-PIECE, UPPER MASS

DESIGNER	D. BRIDGES	01 JUL 2010	
DRAFTER	D. BRIDGES	01 JUL 2010	
CHECKER	M. MEYER	09 JUL 2010	
APPROVAL			

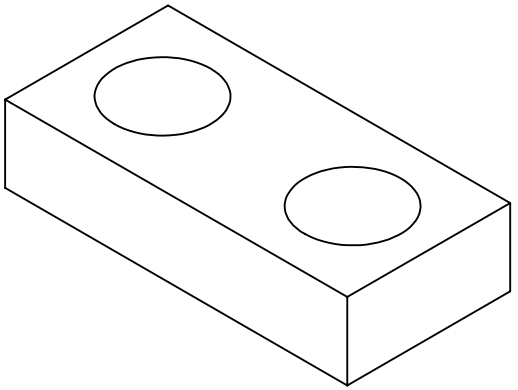
SIZE: D **DWG. NO.:** D020607 **REV.:** v3
SCALE: 1:1 **PROJECTION:** **SHEET** 1 OF 1

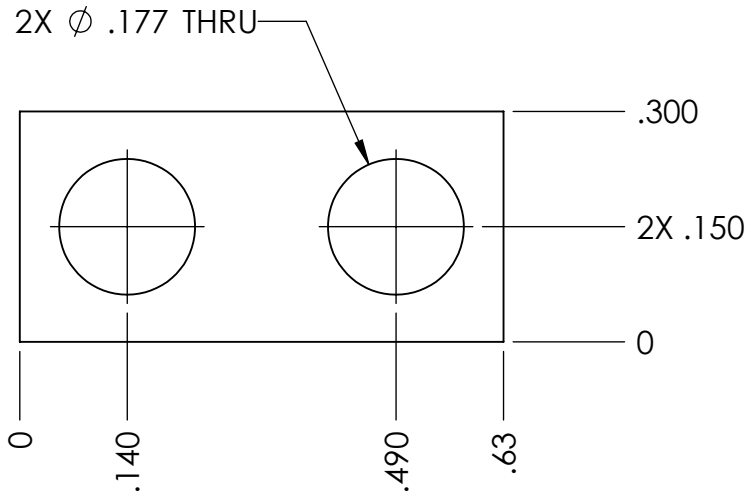
D020607_Advanced_LIGO_SUS_HLTS_T-Piece_Upper_Mass_PART PDM REV= V2-007, DRAWING PDM REV= V2-004

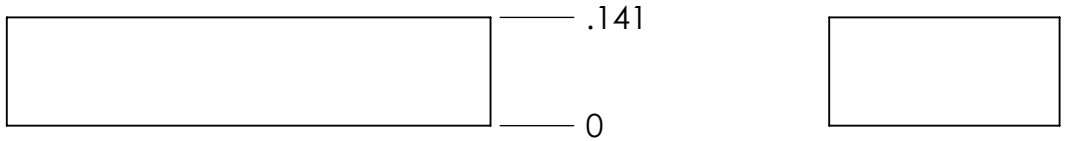
NOTES CONTINUED:

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): 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	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 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 LOWER CLAMP, UPPER WIRE, INSIDE

DESIGNER	B. KIRSNER	05 MAR 2008	
DRAFTER	R. BIEDENHARN	01 NOV 2010	
CHECKER	D. BRIDGES	04 NOV 2010	
APPROVAL			

SIZE A **DWG. NO.** D020610 **REV.** v2

SCALE: 4:1 **PROJECTION:**  SHEET 1 OF 1

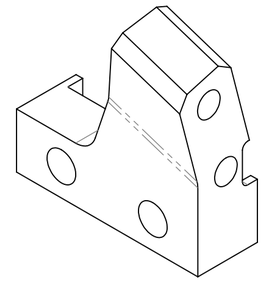
D020610_Advanced_LIGO_SUS_HLTS_Lower_Clamp,_Upper_Wire,_Inside, PART PDM REV: V1-002, DRAWING PDM REV: V1-003

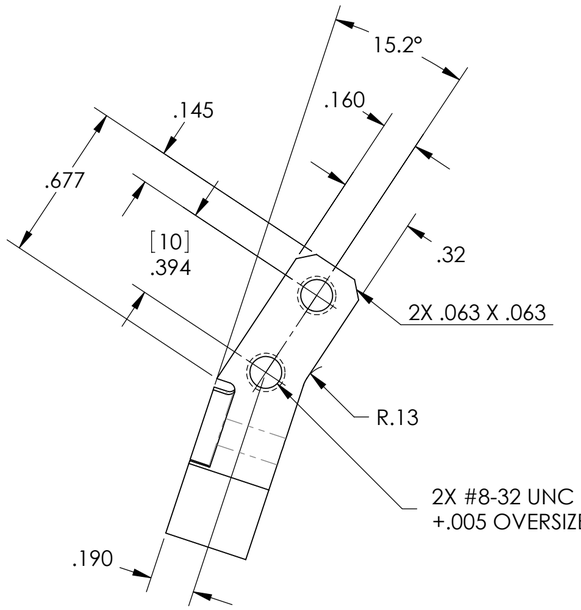
NOTES CONTINUED:

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

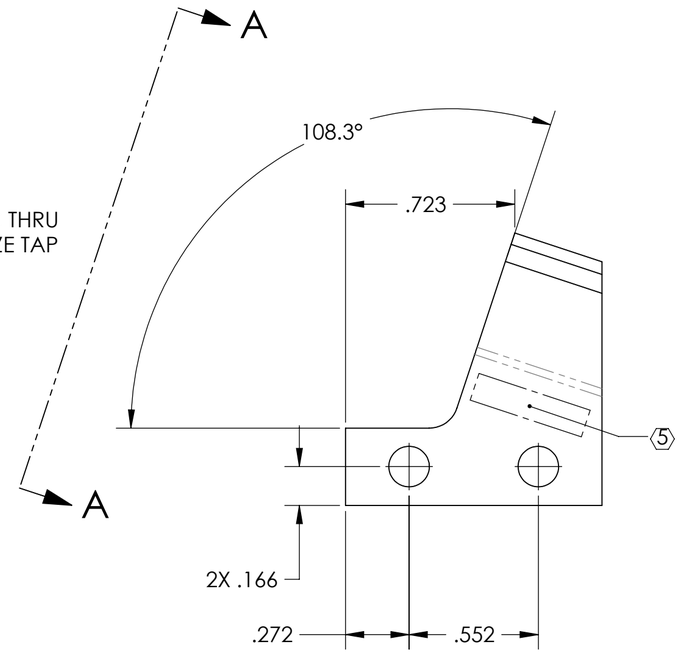
6. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
8. ALL HELICOIL HOLES TO BE PREPARED IN ACCORDANCE WITH EMHART HELICOIL PRODUCT CATALOG, HC2000, REV. 4.
9. ALL HELICOILS TO BE INSTALLED BY LIGO PERSONNEL AFTER DELIVERY, CLEANING AND BAKING OF FINISHED PARTS.

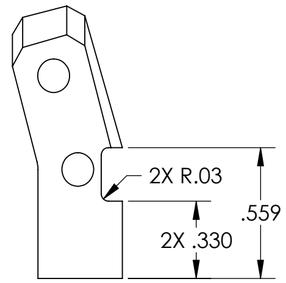
REV.	DATE	DCN #	DRAWING TREE #
A/v1	01 AUG 2008	E080418	E080191
v2	26 MAY 2009	E0900160	E080191
v3	28 JUN 2010	E1000236	E080191

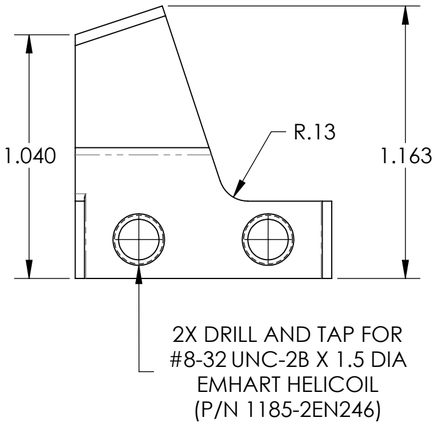


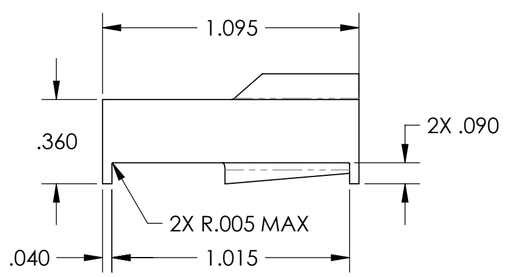


VIEW A-A









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	
DRAFTER	D. BRIDGES	25 OCT 2010	
CHECKER	B. MOORE	26 OCT 2010	
APPROVAL			

SIZE: C

DWG. NO.: D020611

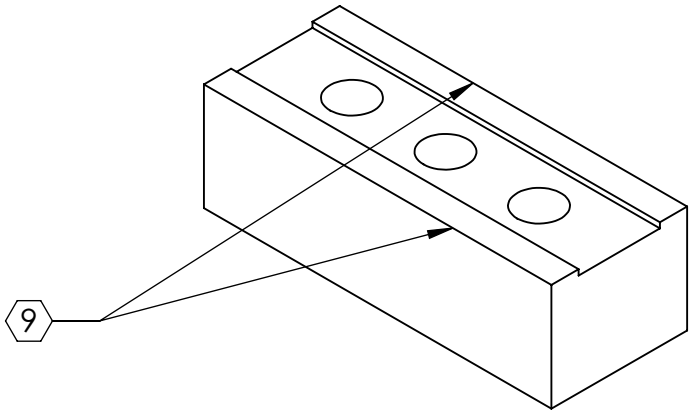
REV.: v3

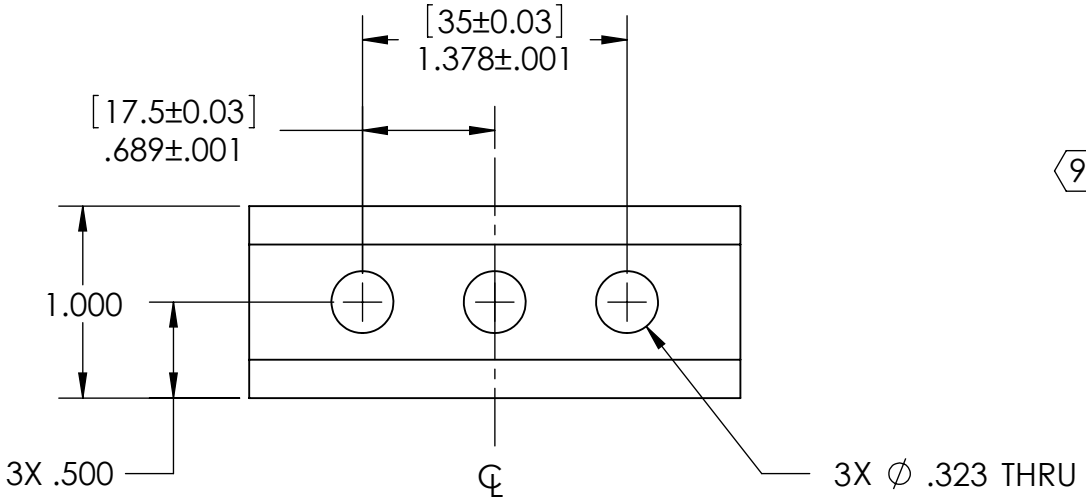
SCALE: 2:1 **PROJECTION:** **SHEET** 1 OF 1

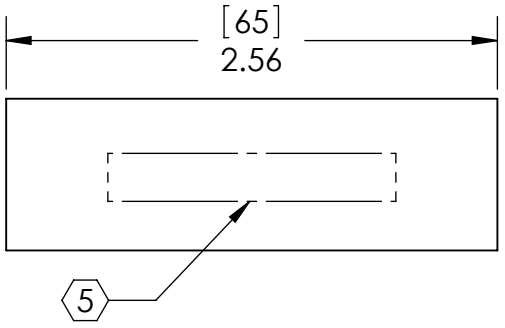
NOTES CONTINUED:

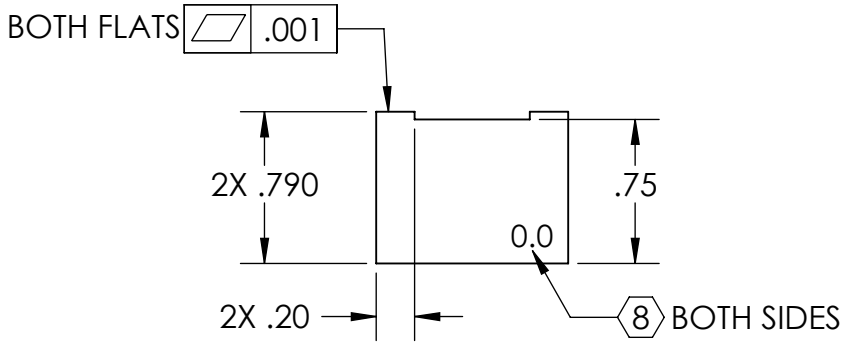
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

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

DESIGNER	D. BRIDGES	29 JUN 2010
DRAFTER	D. BRIDGES	29 JUN 2010
CHECKER	M. MEYER	30 JUN 2010
APPROVAL		

SIZE A **DWG. NO.** D020622 **REV.** v2

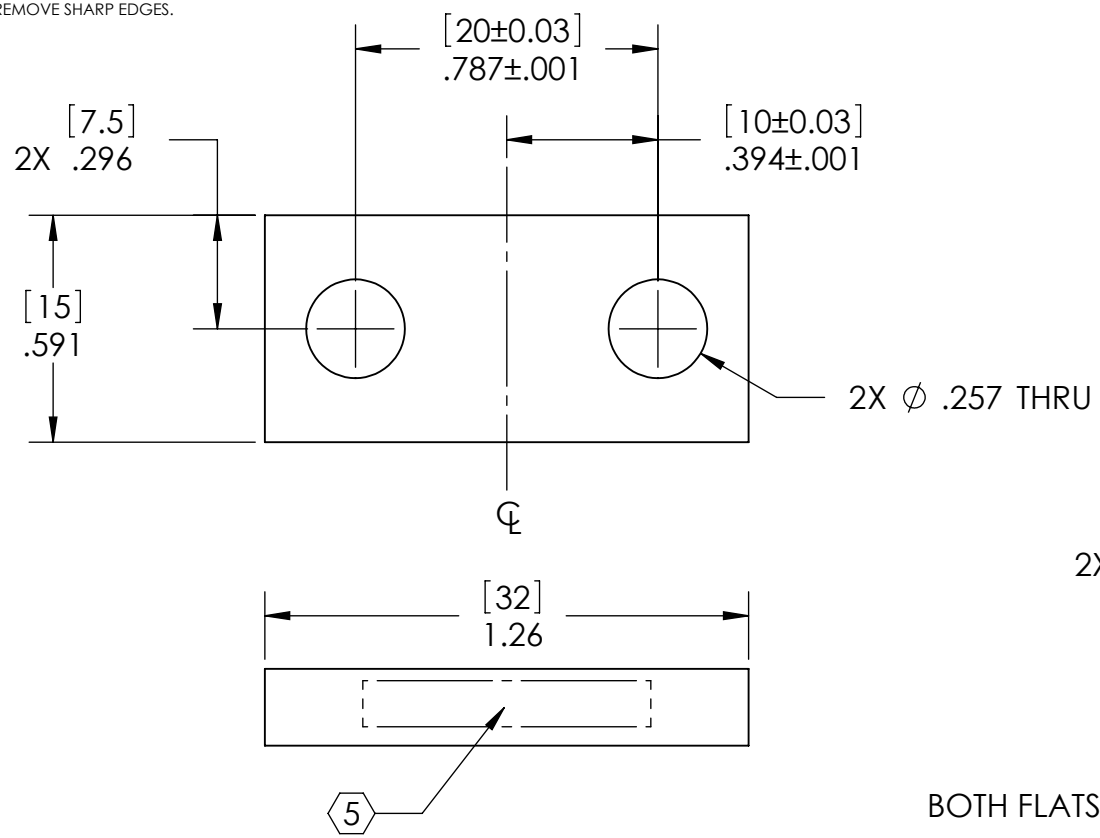
SCALE: 1:1 **PROJECTION:** SHEET 1 OF 1

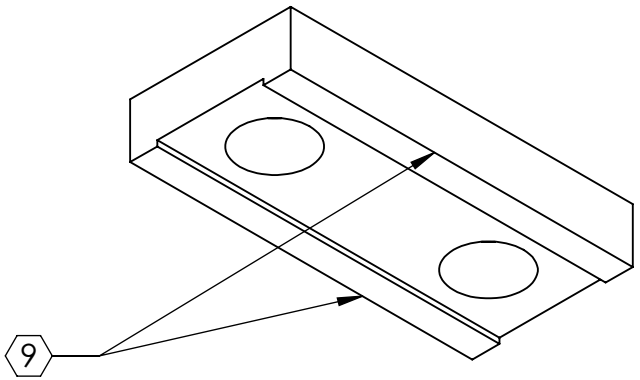
D020622_Advanced_LIGO_SUS_HLTS_Blade_Clamp,_Upper_Blade,_Inside, PART PDM REV: V1-001, DRAWING PDM REV: V1-001

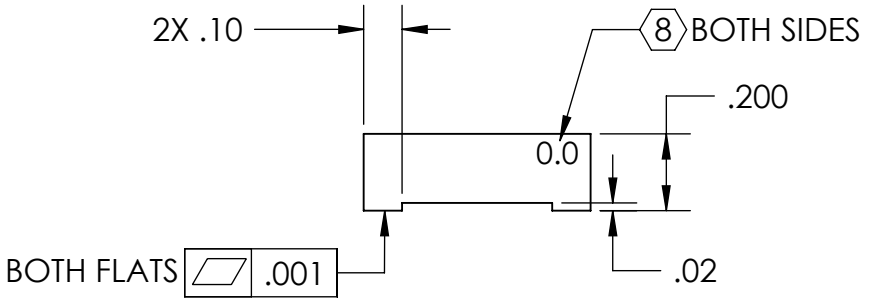
NOTES CONTINUED:

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: 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. 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 ± .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 (0.0 DEGREE), LOWER BLADE, OUTSIDE

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

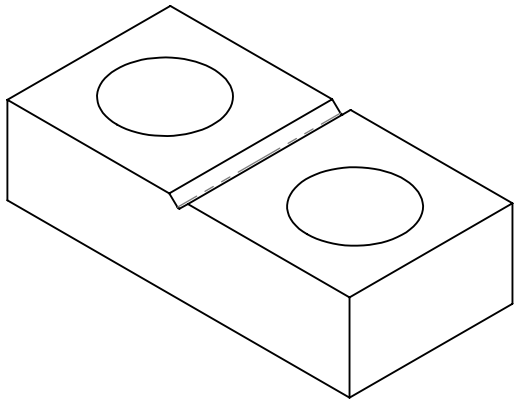
SIZE: A **DWG. NO.**: D020623 **REV.**: v2

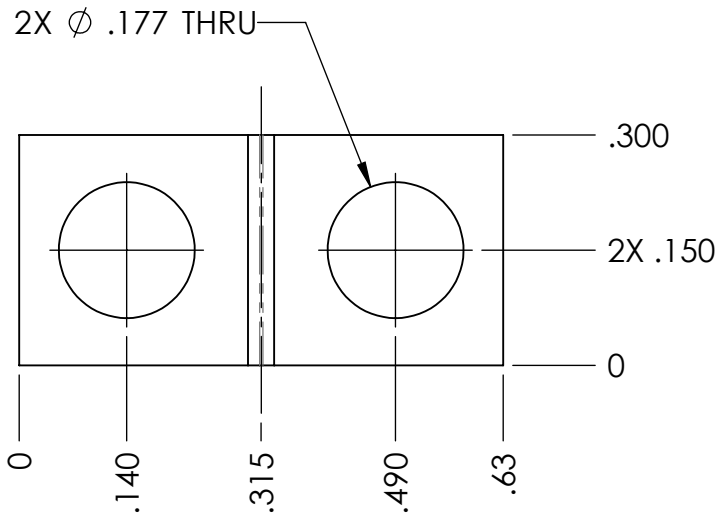
SCALE: 2:1 **PROJECTION**: **SHEET 1 OF 1**

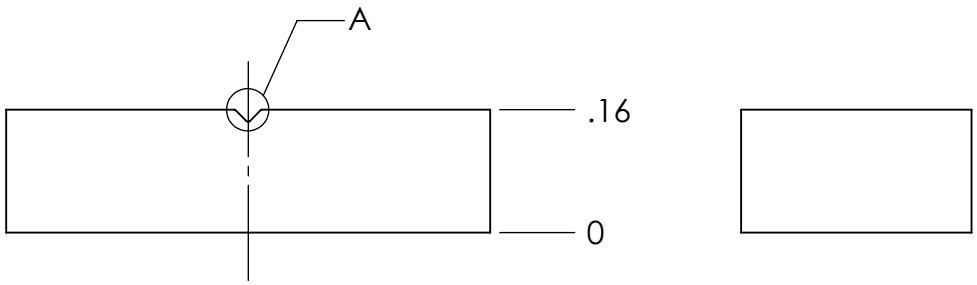
NOTES CONTINUED:

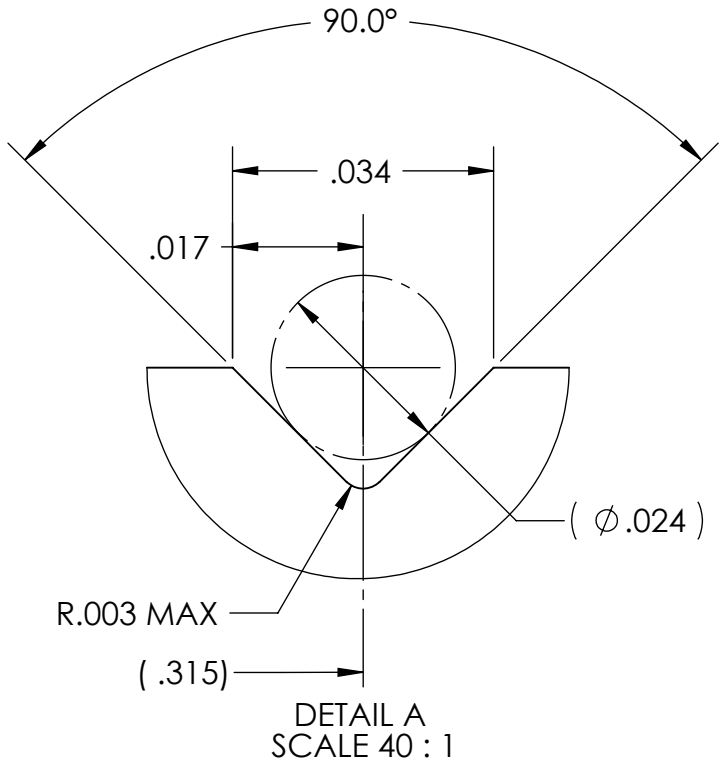
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND QUANTITY. IF PARTS ARE TOO SMALL TO SCRIBE, BAGGING AND TAGGING ALONE IS SUFFICIENT.
   EXAMPLE (PART): 001-v1
   EXAMPLE (TAG): 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	26 MAY 2009	E0900160	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 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 LOWER CLAMP, UPPER WIRE, OUTSIDE

DESIGNER	B. KIRSNER	05 MAR 2008	
DRAFTER	R. BIEDENHARN	01 NOV 2010	
CHECKER	D. BRIDGES	04 NOV 2010	
APPROVAL			

SIZE A **DWG. NO.** D020624 **REV.** v2

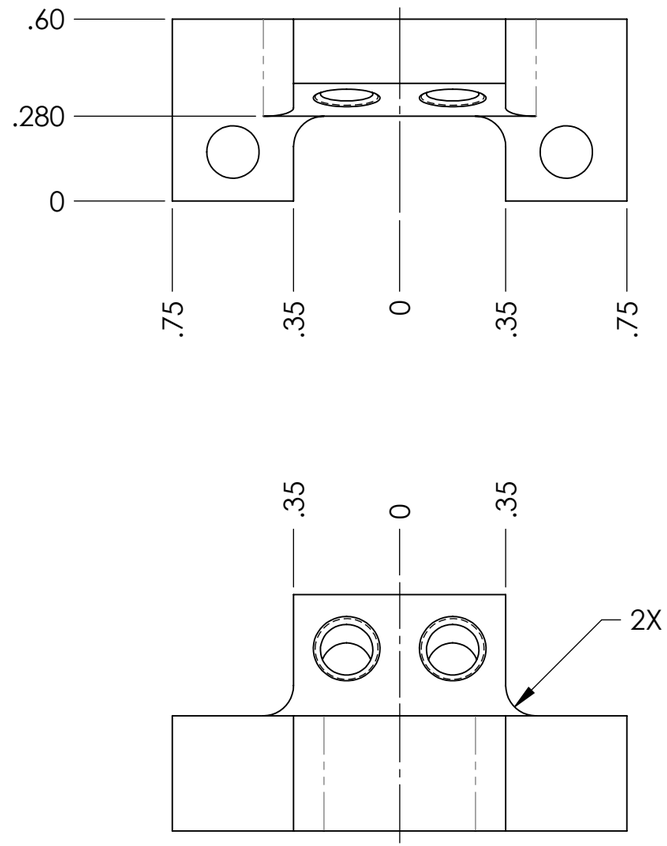
SCALE: 4:1 **PROJECTION:** SHEET 1 OF 1

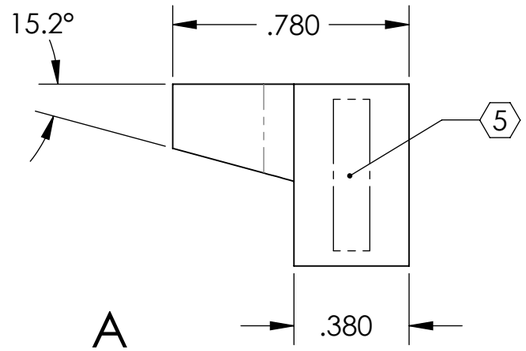
D020624_Advanced_LIGO_SUS_HLTS_Lower_Clamp,_Upper_Wire,_Outside, PART PDM REV: V1-002, DRAWING PDM REV: V1-002

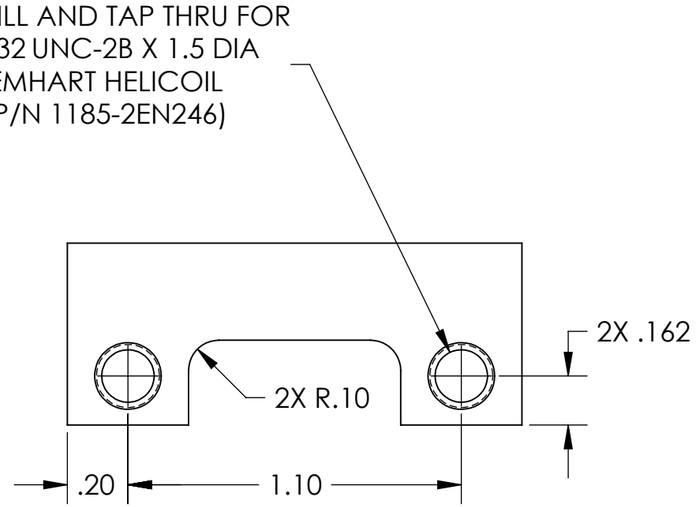
REV.	DATE	DCN #	DRAWING TREE #
v1	26 MAY 2009	E0900160	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-

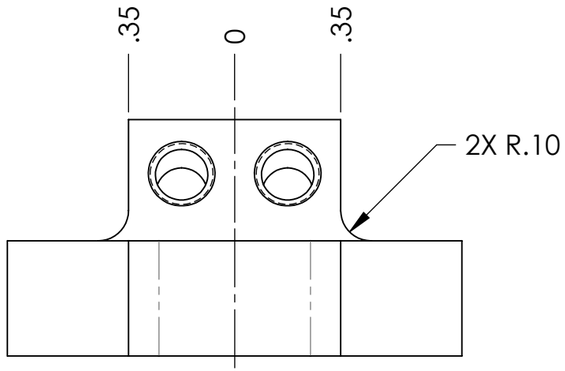
NOTES CONTINUED:

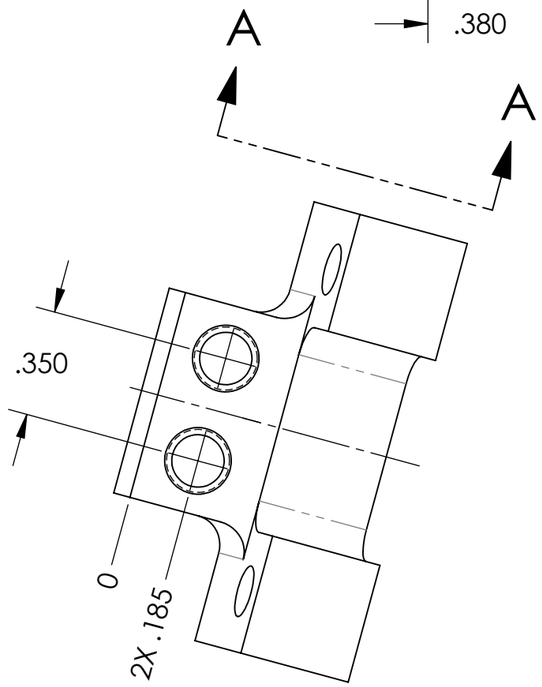
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 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.



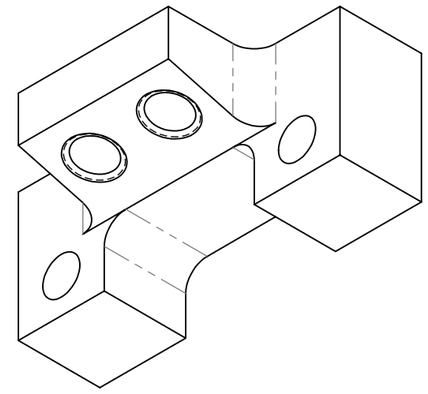








VIEW A-A



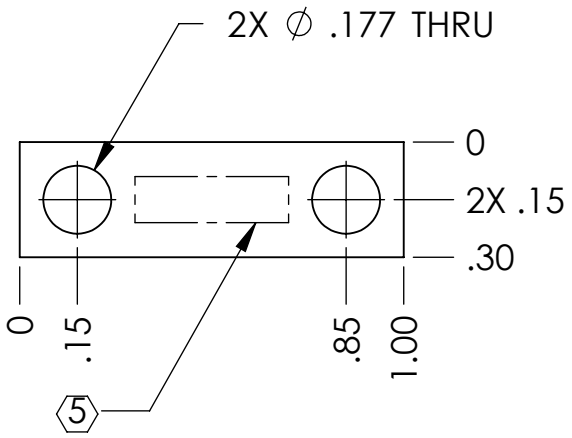
NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)								
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.1°	1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER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

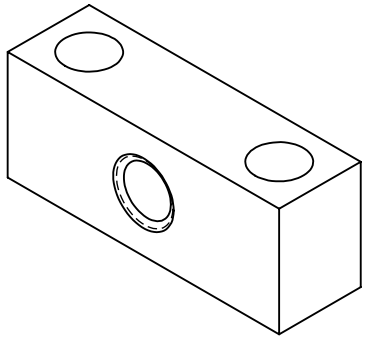
D020652_Advanced_LIGO_SUS_HLTS_C-Clamp_Upper_Mass, PART PDM REV: , DRAWING PDM REV: V1-004

NOTES CONTINUED:

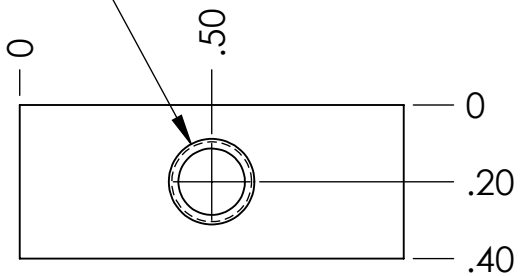
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

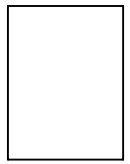
REV.	DATE	DCN #	DRAWING TREE #
v1	14 JUL 2009	E0900198	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-





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
DRAFTER	D. BRIDGES	20 JUL 2010
CHECKER	M. MEYER	21 JUL 2010
APPROVAL		

SIZE A **DWG. NO.** D020653 **REV.** v2

SCALE: 2:1 **PROJECTION:** SHEET 1 OF 1

D020653_Advanced_LIGO_SUS_HLTS_Screwdrive_System,_Upper_Mass, PART PDM REV: V1-001, DRAWING PDM REV: V1-003

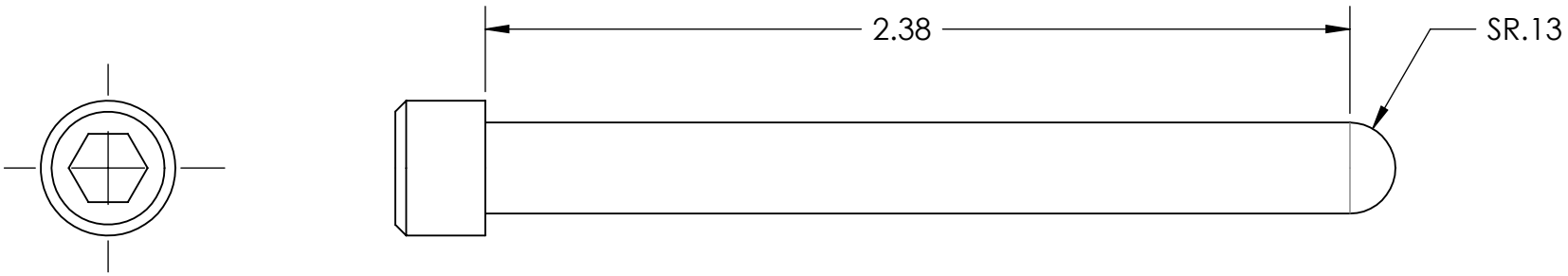
NOTES CONTINUED:

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. 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 SSTL (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 A | **DWG. NO.** D030021 | **REV.** v2

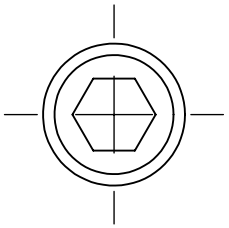
SCALE: 2:1 | **PROJECTION:** | SHEET 1 OF 1

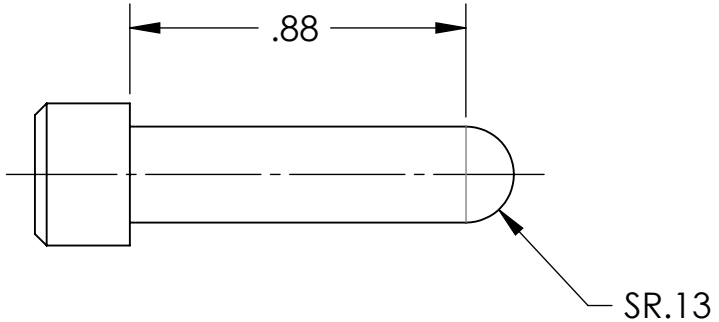
D030021_Rounded_End_SHCS_0.25-20_X_2.5_Long, PART PDM REV: X-015, DRAWING PDM REV: V1-001

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. 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 SSTL (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	
DRAFTER	D. BRIDGES	16 AUG 2010	
CHECKER	B. MOORE	18 AUG 2010	
APPROVAL			

SIZE A **DWG. NO.** D030023 **REV.** v3

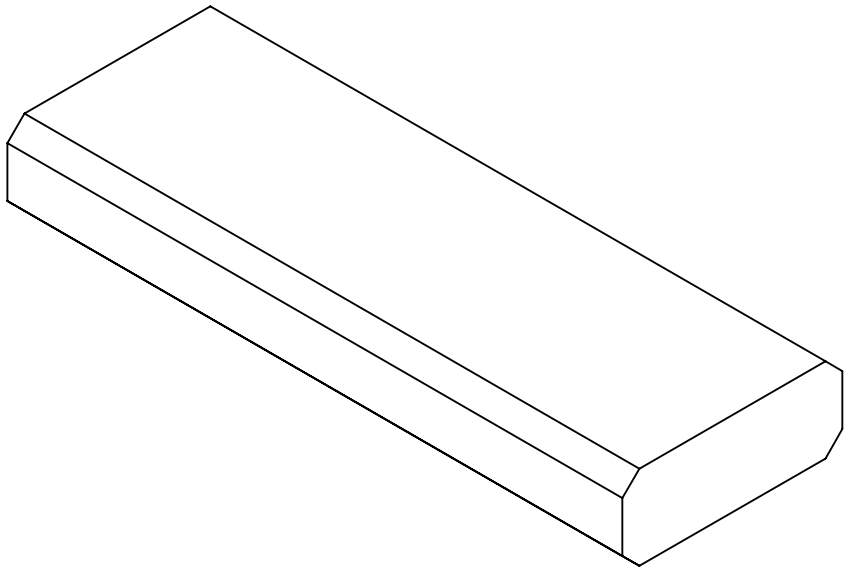
SCALE: 2:1 **PROJECTION:** **SHEET 1 OF 1**

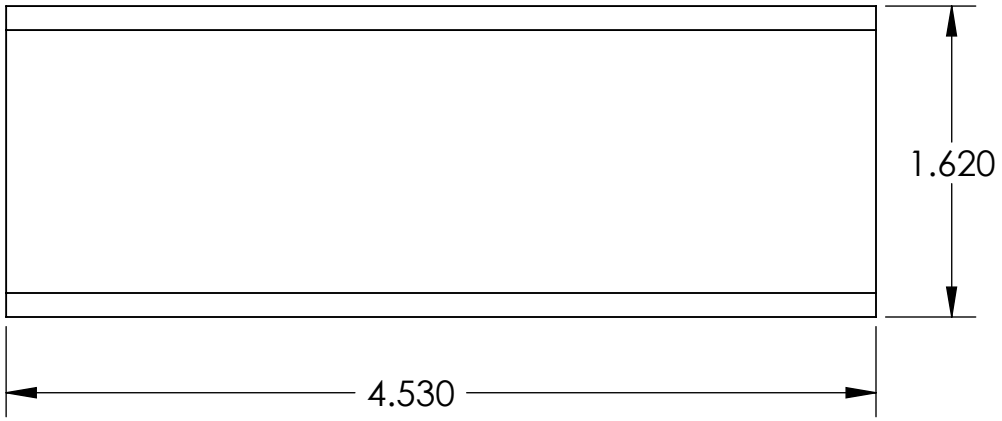
D030023_Rounded_End_SHCS_0.25-20_X_1_Long, PART PDM REV: X-015, DRAWING PDM REV: V2-000

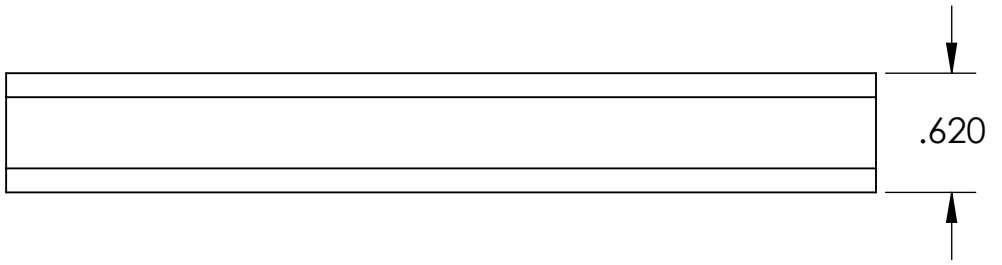
NOTES CONTINUED:

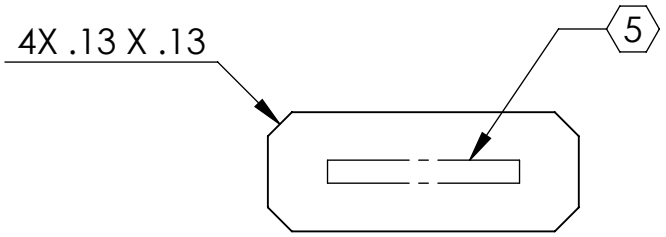
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

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 SSTL

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
DRAFTER	D. BRIDGES	01 JUL 2010
CHECKER	C. TORRIE	09 JUL 2010
APPROVAL		

SIZE A **DWG. NO.** D030139 **REV.** v2

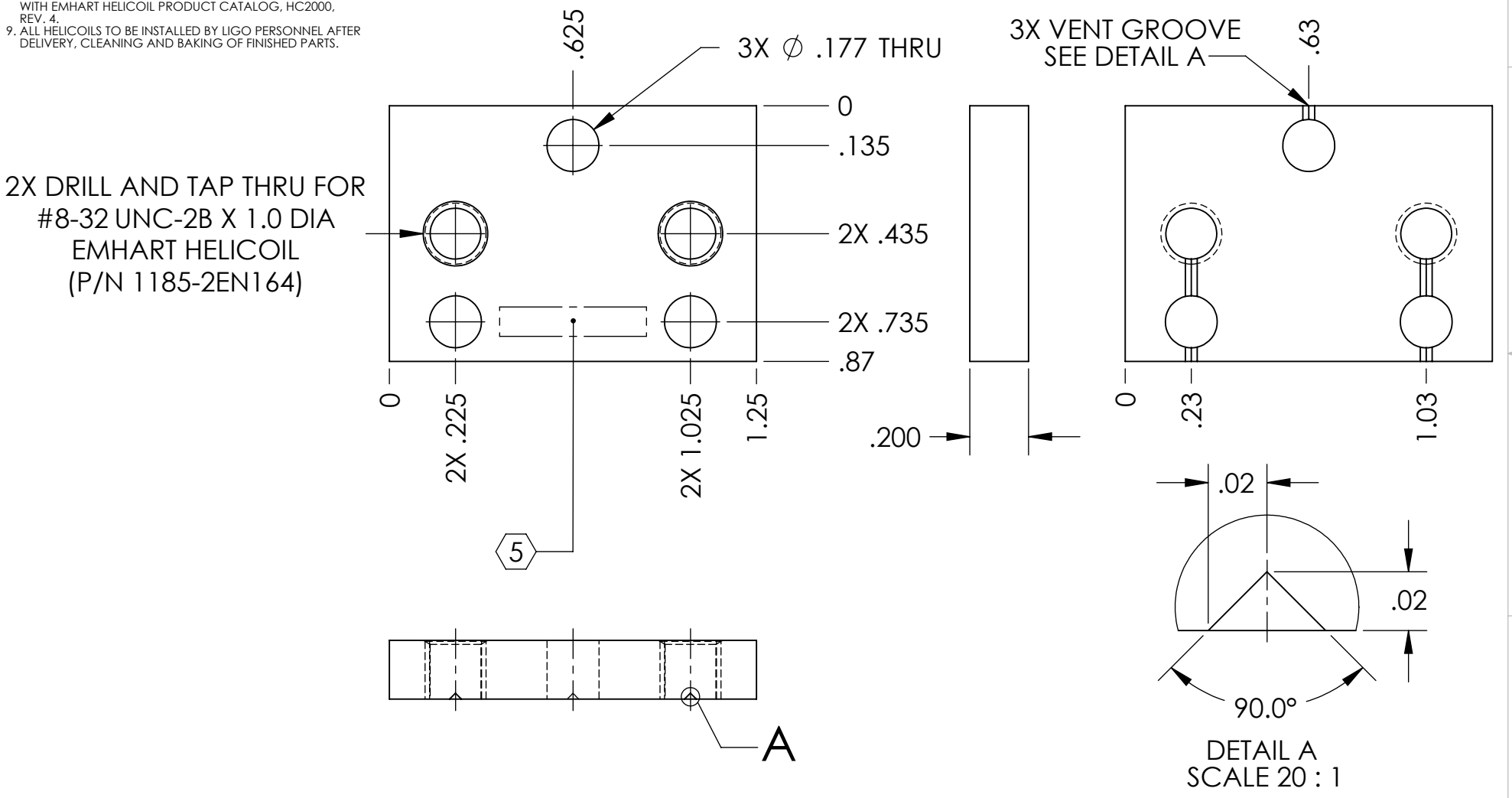
SCALE: 1:1 **PROJECTION:**  SHEET 1 OF 1

D030139_Advanced_LIGO_SUS_HLTS_Y-Direction_Offset,_T-Piece,_Upper_Mass, PART PDM REV: V1-000, 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: 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 #
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			

SIZE A **DWG. NO.** D030148 **REV.** v2

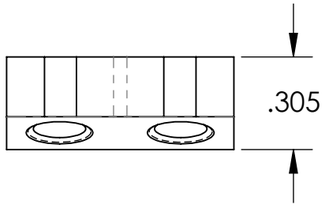
SCALE: 2:1 **PROJECTION:** **SHEET 1 OF 1**

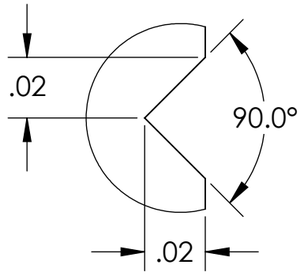
D030148_Advanced_LIGO_SUS_HLTS_Lower_Wire_Breakoff,_Intermediate_Mass, PART PDM REV: V1-003, DRAWING PDM REV: V1-004

NOTES CONTINUED:

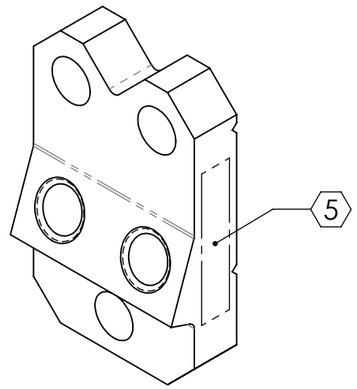
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
   EXAMPLE: 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 #
v1	30 JUN 2009	E0900184	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-

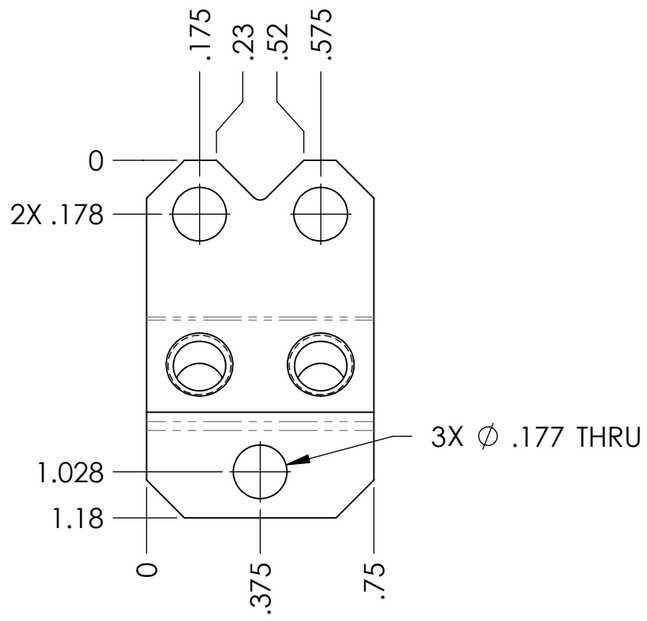


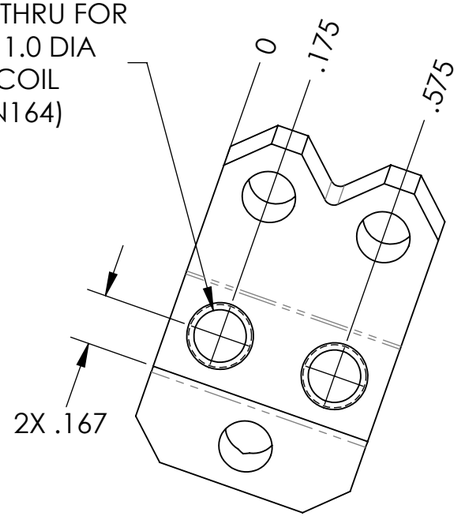


DETAIL B
SCALE 20 : 1

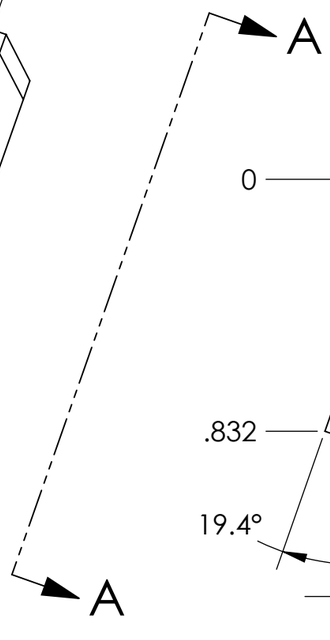


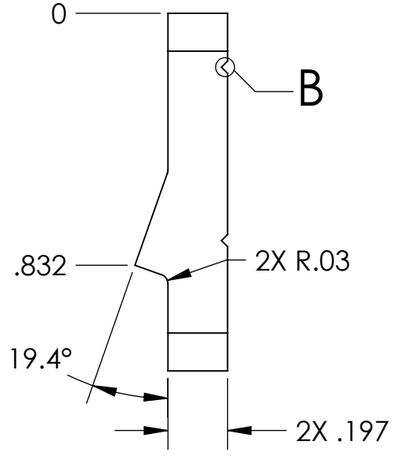
2X DRILL AND TAP THRU FOR
#8-32 UNC-2B X 1.0 DIA
EMHART HELICOIL
(P/N 1185-2EN164)

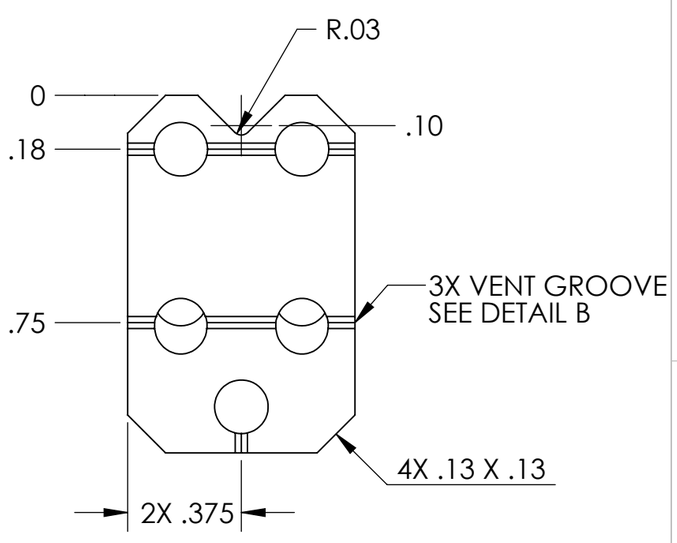




VIEW A-A







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

LIGO — 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
DRAFTER	R. BIEDENHARN	01 NOV 2010
CHECKER	D. BRIDGES	04 NOV 2010
APPROVAL		

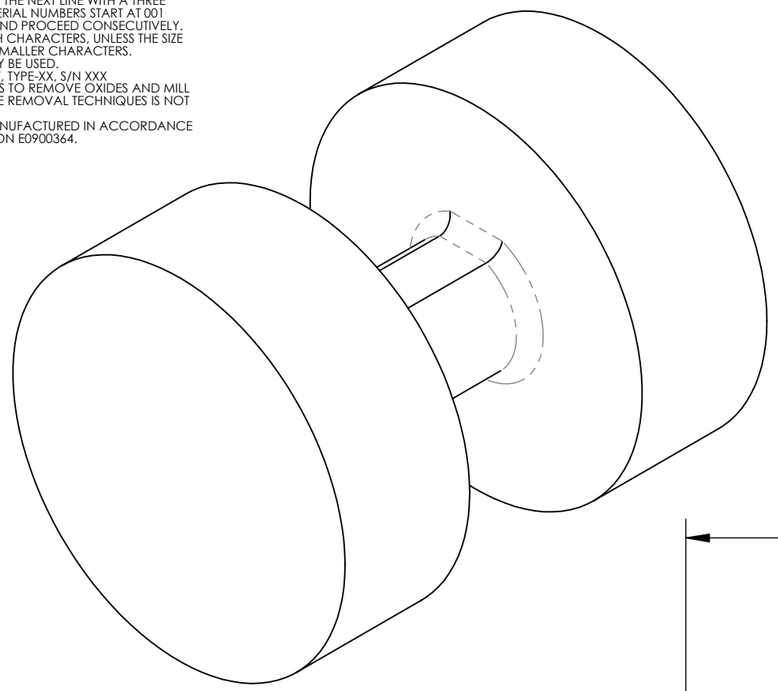
SIZE: B — DWG. NO.: D030149 — REV.: v2
SCALE: 2:1 — PROJECTION: — SHEET 1 OF 1

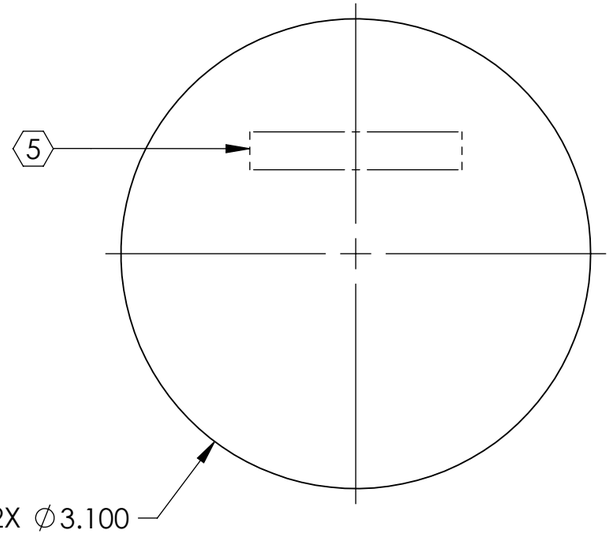
D030149_Advanced_LIGO_SUS_HLTS_Intermediate_Wire_Breakoff_Intermediate_Mass, PART PDM REV: V1-004, DRAWING PDM REV: V1-002

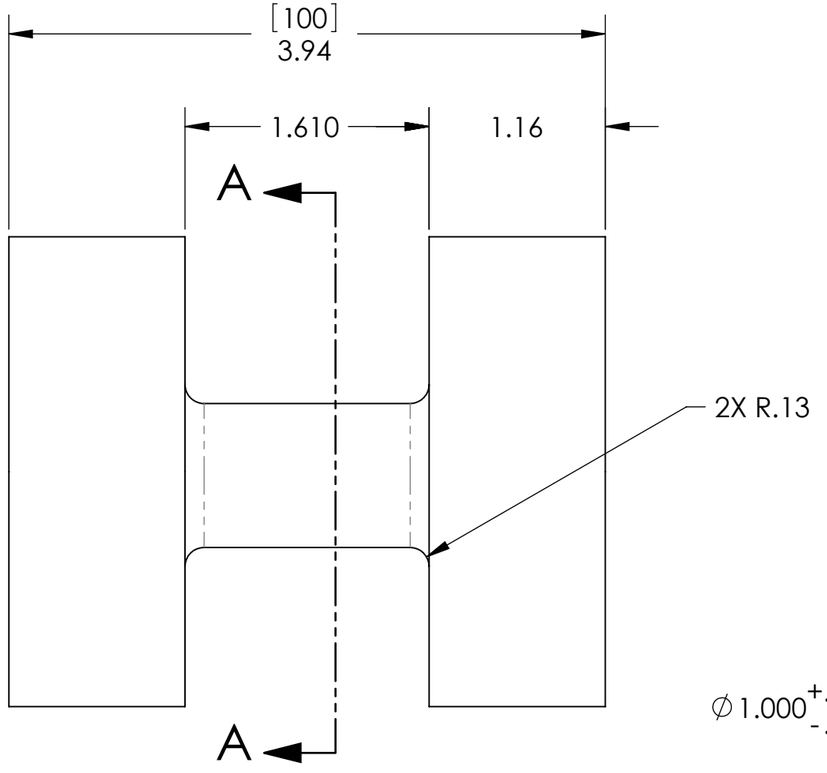
REV.	DATE	DCN #	DRAWING TREE #
v1	22 JUN 2009	E0900173	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-

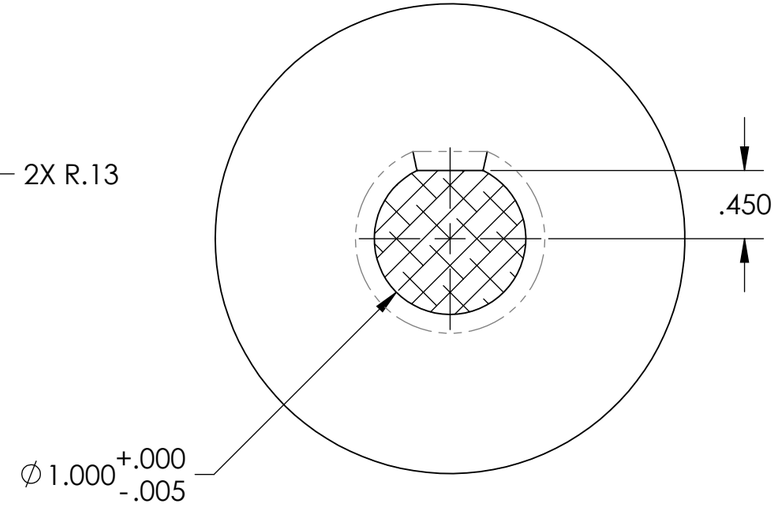
NOTES CONTINUED:

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.









SECTION A-A

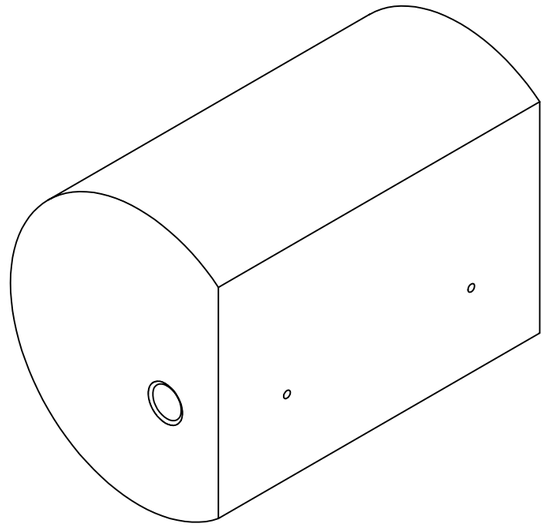
NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)									
DIMENSIONS ARE IN INCHES [MM] TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.5°	1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME: CENTER OFFSET				
	MATERIAL: 6061-T6 Al	FINISH: 32 µinch	SYSTEM: ADVANCED LIGO	SUB-SYSTEM: SUS	DESIGNER: D. BRIDGES 26 AUG 2008	SIZE: B	DWG. NO.: D030155	REV.: v2	
			NEXT ASSY: INT. MASS CHANGER		DRAFTER: R. BIEDENHARN 29 OCT 2010				
					CHECKER: D. BRIDGES 29 OCT 2010				
					APPROVAL	SCALE: 1:1	PROJECTION:	SHEET 1 OF 1	

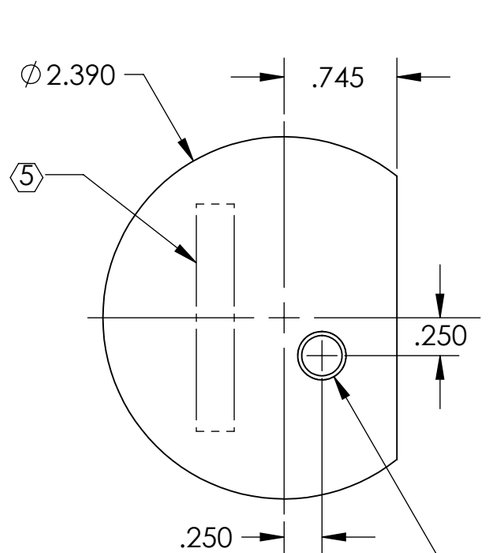
D030155_Advanced_LIGO_SUS_HLTS_Center_Offset_Intermediate_Mass, PART PDM REV: V1, DRAWING PDM REV: V1-004

NOTES CONTINUED:

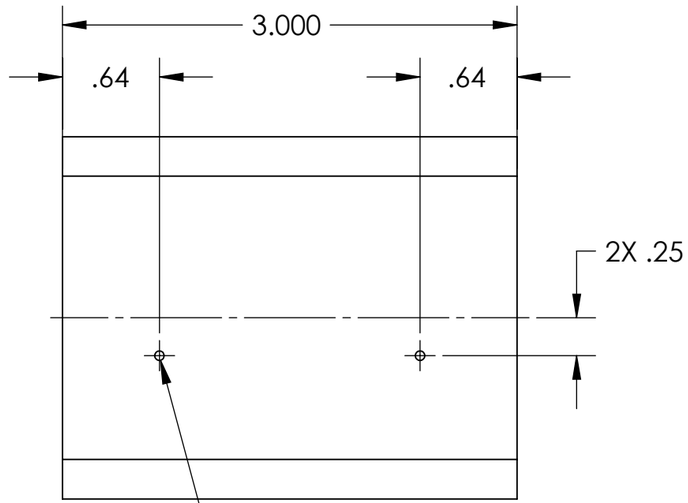
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
   EXAMPLE: 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 #
v1	22 JUN 2009	E0900173	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-

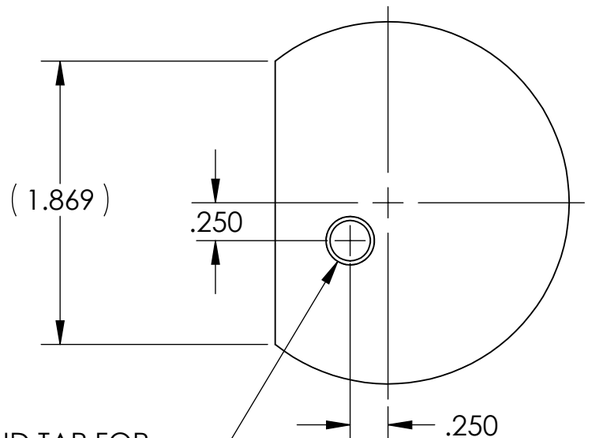




DRILL AND TAP FOR
1/4-20 UNC-2B X 1.0 DIA
EMHART HELICOIL
(P/N 3585-4EN250)



2X ∅ .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)

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: INTERMEDIATE MASS ASSY

PART NAME: SIDE OFFSET

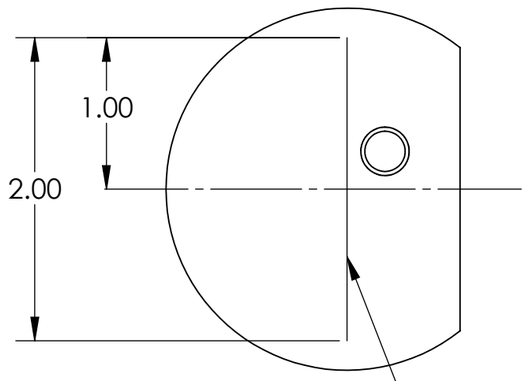
DESIGNER	D. BRIDGES	02 AUG 2010
DRAFTER	D. BRIDGES	03 AUG 2010
CHECKER	M. MEYER	03 AUG 2010
APPROVAL		

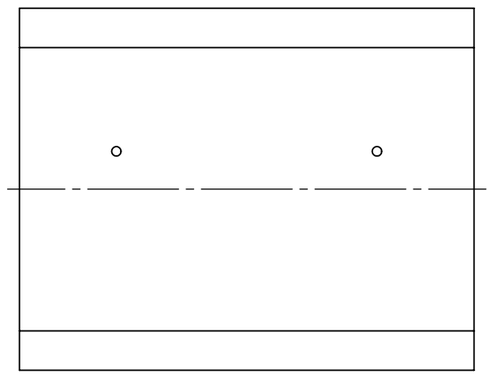
SIZE: B — DWG. NO.: D030156 — REV.: v2
SCALE: 1:1 — PROJECTION: — SHEET 1 OF 2

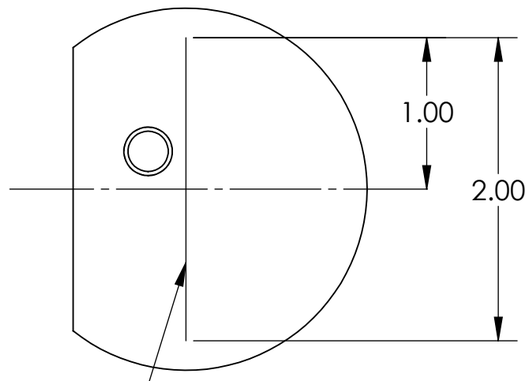
D030156_Advanced_LIGO_SUS_HLTS_Side_Offset_Intermediate_Mass, PART PDM REV: V1-000, DRAWING PDM REV: V1-001

NOTES CONTINUED:

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







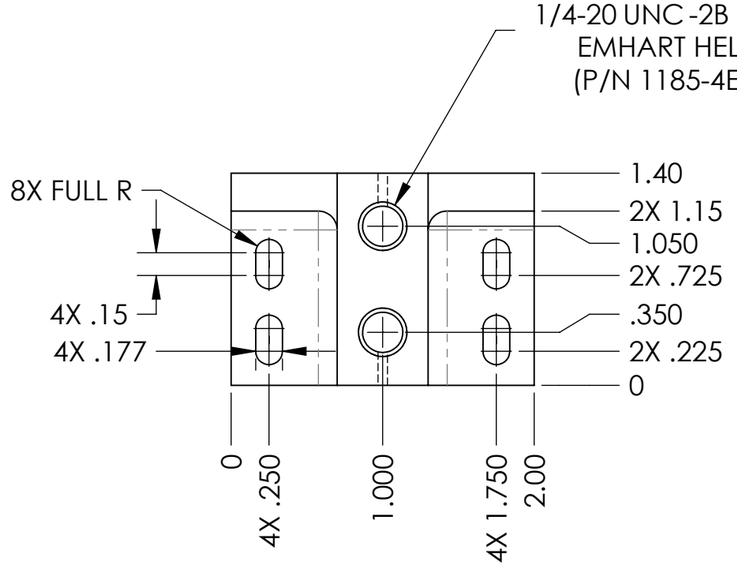
D030156_Advanced_LIGO_SUS_HLTS_Side_Offset_Intermediate_Mass, PART PDM REV: V1-000, DRAWING PDM REV: V1-001

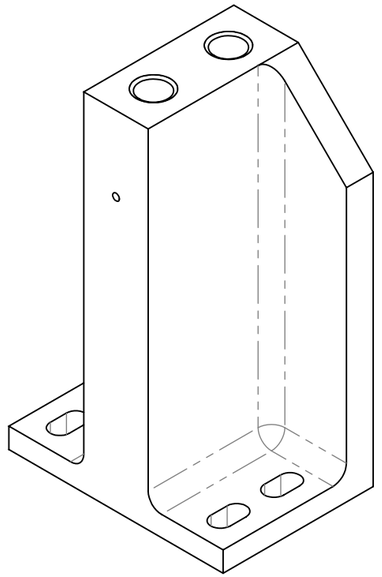
LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY			
SIZE B	DWG. NO. D030156		REV. v2
SCALE: 1:1	PROJECTION:	SHEET 2 OF 2	

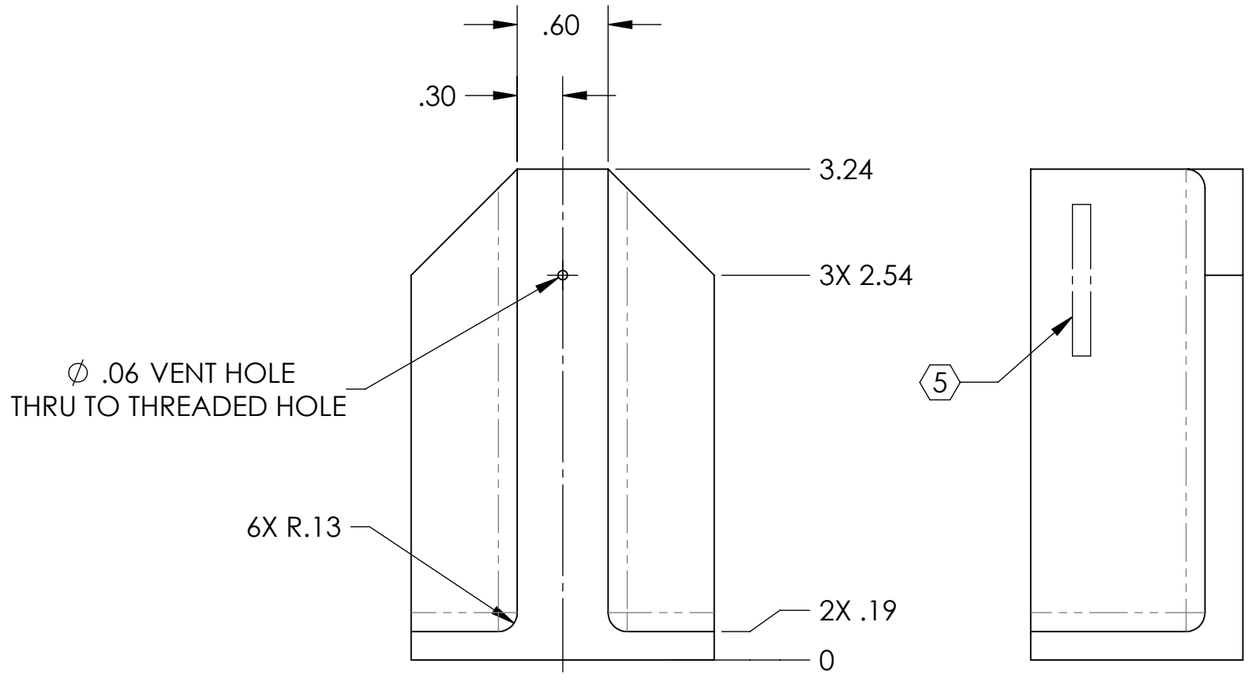
NOTES CONTINUED:

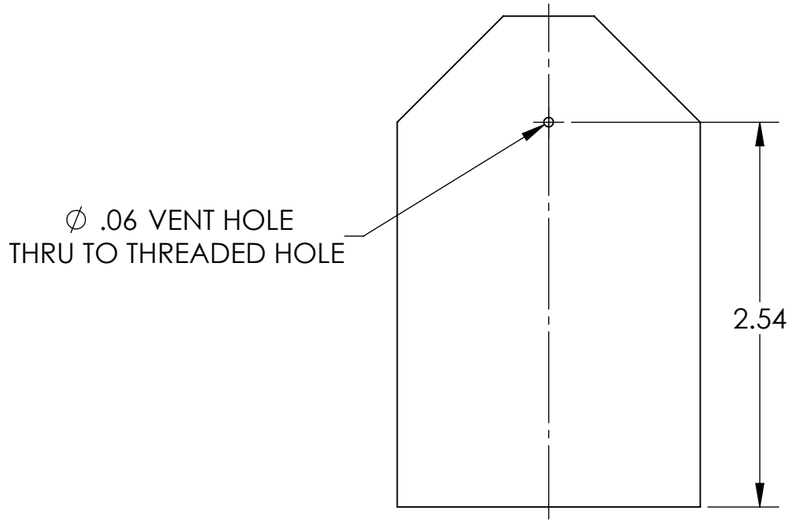
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 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 #
v1	26 MAY 2009	E0900159	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: 32 µinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: ADVANCED LIGO
SUB-SYSTEM: SUS
NEXT ASSY: TOP BLADE GUARD ASSY

PART NAME: TOP BLADE GUARD RISER

DESIGNER	D. BRIDGES	23 AUG 2010
DRAFTER	D. BRIDGES	23 AUG 2010
CHECKER	B. MOORE	25 AUG 2010
APPROVAL		

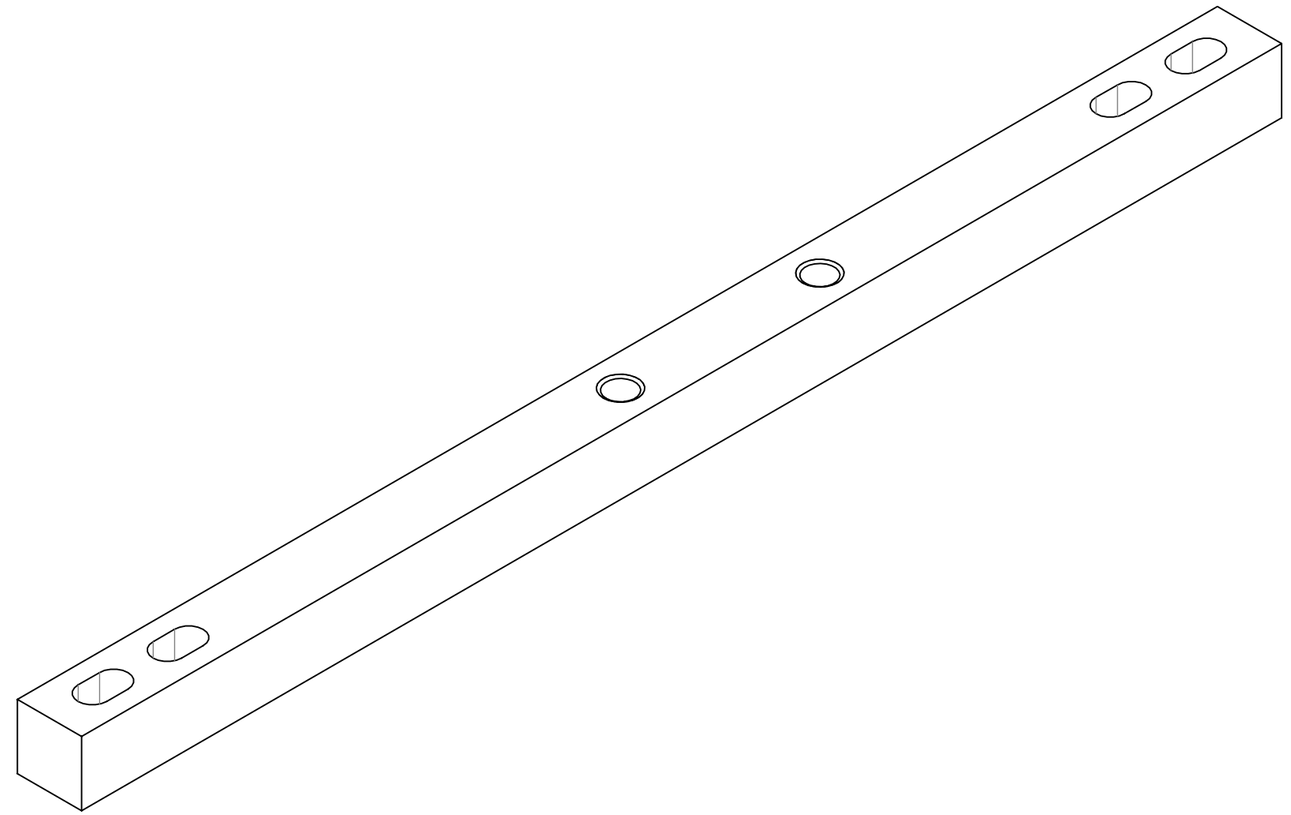
SIZE: B
DWG. NO.: D070309
REV.: v2
SCALE: 1:1
PROJECTION:
SHEET 1 OF 1

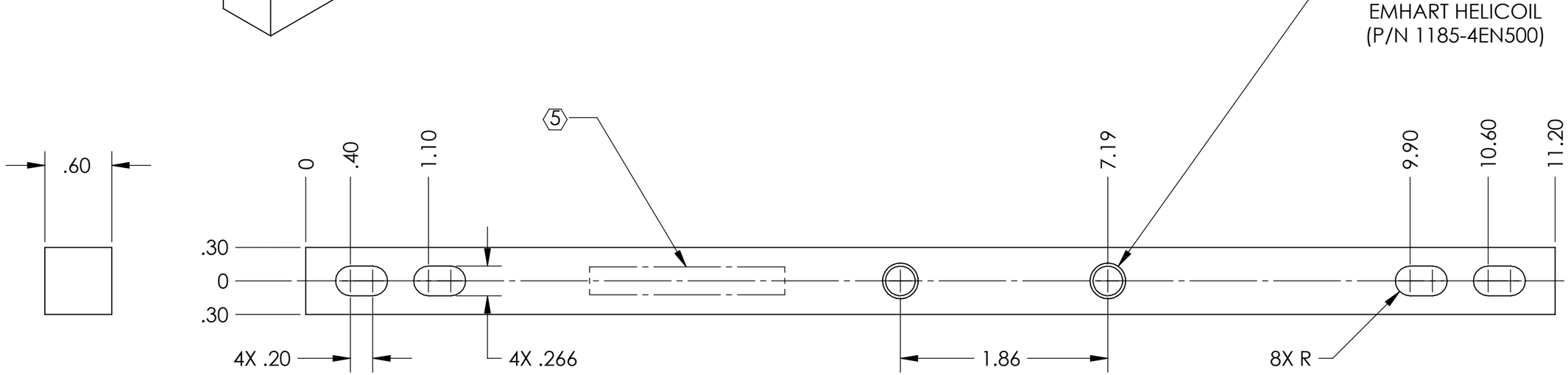
D070309_Advanced_LIGO_SUS_HLTS_Top_Blade_Guard_Riser, PART PDM REV: V1-000, DRAWING PDM REV: V1-002

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: 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 #
v1	26 MAY 2009	E0900159	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 32 µinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO

SUB-SYSTEM SUS

NEXT ASSY TOP BLADE GUARD ASSY

PART NAME TOP BLADE GUARD BAR

DESIGNER	D. BRIDGES	23 AUG 2010
DRAFTER	D. BRIDGES	25 AUG 2009
CHECKER	B. MOORE	25 AUG 2010
APPROVAL		

SIZE B **DWG. NO.** D070310 **REV.** v2

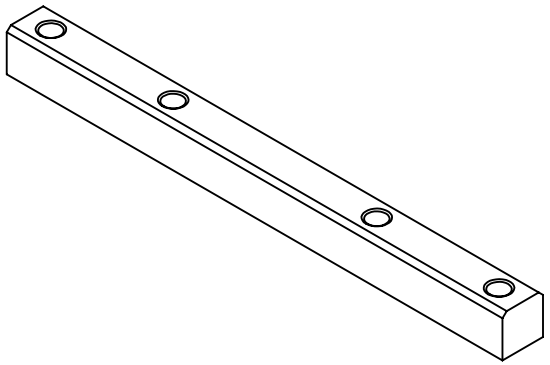
SCALE: 1:1 **PROJECTION:** SHEET 1 OF 1

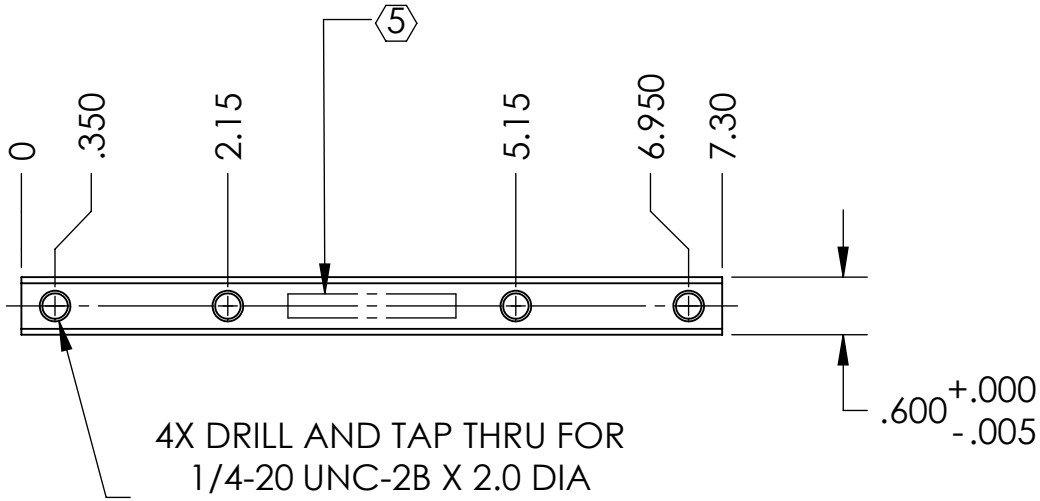
D070310_Advanced_LIGO_SUS_HLTS_Top_Blade_Guard_Bar, PART PDM REV: V1-001, DRAWING PDM REV: V1-002

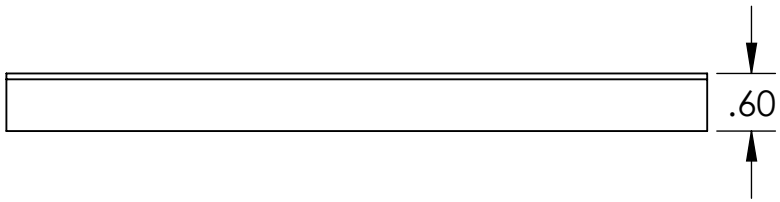
NOTES CONTINUED:

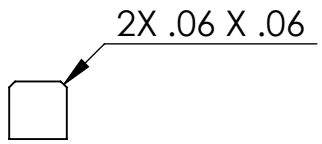
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
   EXAMPLE: 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 #
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
DRAFTER	D. BRIDGES	15 SEP 2010
CHECKER	B. MOORE	16 SEP 2010
APPROVAL		

SIZE A **DWG. NO.** D070321 **REV.** v2

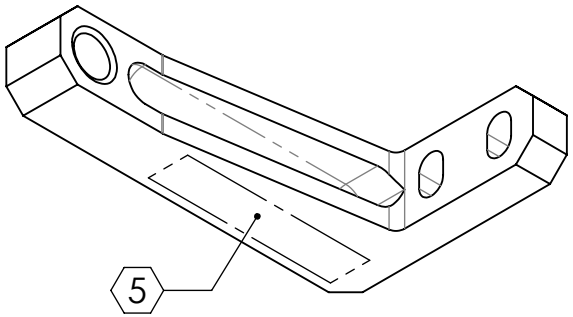
SCALE: 1:2 **PROJECTION:** **SHEET 1 OF 1**

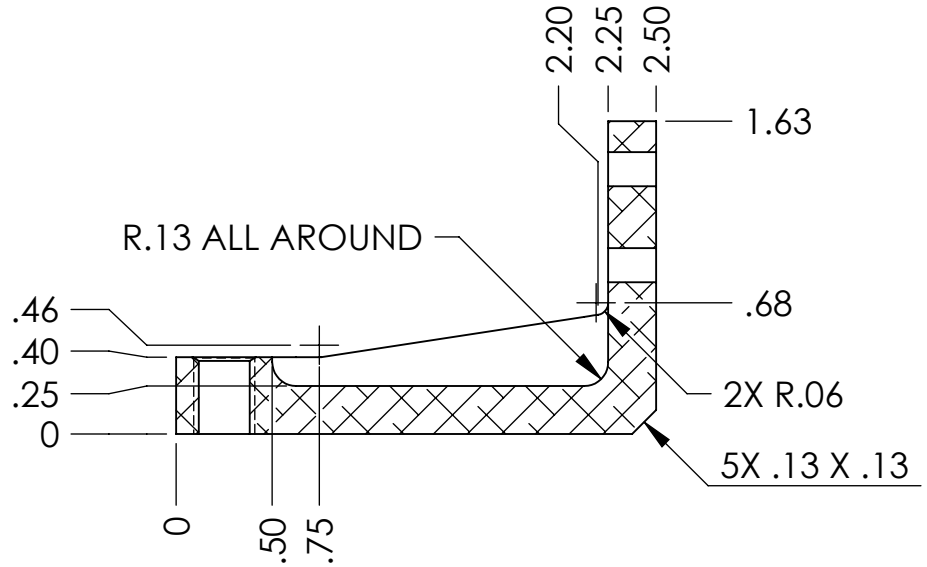
D070321_Advanced_LIGO_SUS_HLTS_Earthquake_Stop_Bridge_Crossbar, PART PDM REV: V1-000, DRAWING PDM REV: V1-001

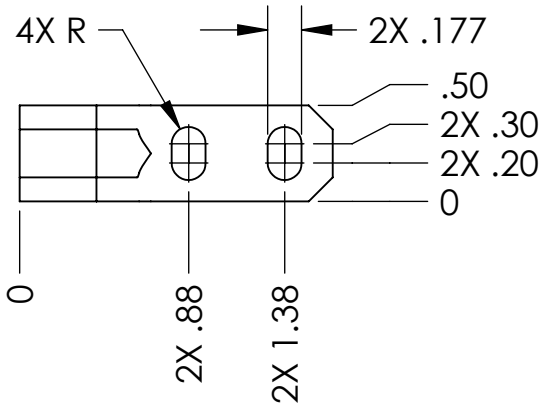
NOTES CONTINUED:

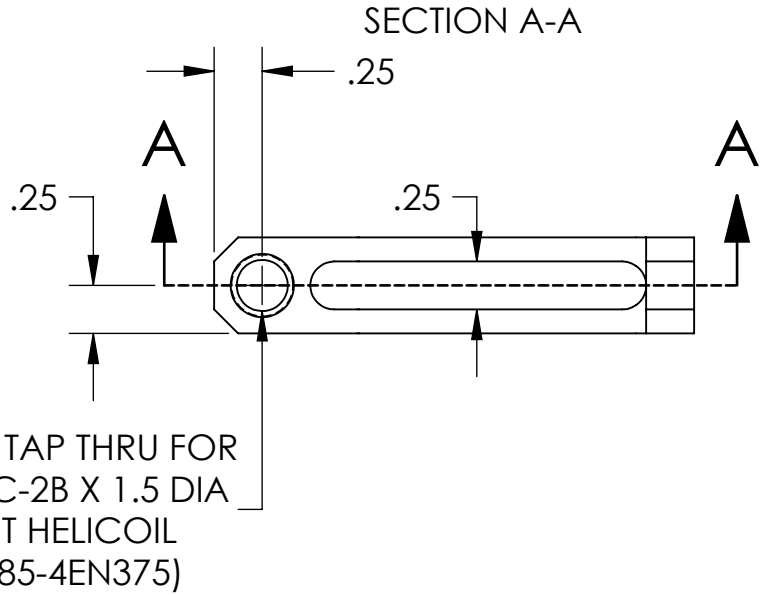
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED. EXAMPLE: 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 #
v1	02 JUN 2009	E0900162	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 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	
DRAFTER	D. BRIDGES	02 NOV 2010	
CHECKER	B. MOORE	03 NOV 2010	
APPROVAL			

SIZE A **DWG. NO.** D070322 **REV.** v2

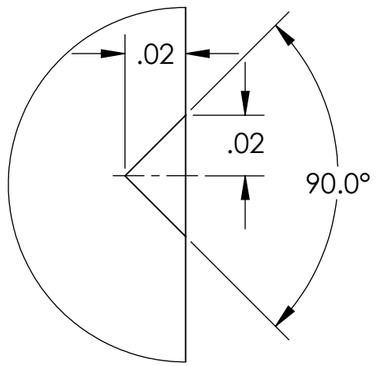
SCALE: 1:1 **PROJECTION:**  SHEET 1 OF 1

D070322_Advanced_LIGO_SUS_HLTS_Earthquake_Stop_Bracket,_Long, PART PDM REV: V1-001, DRAWING PDM REV: V1-001

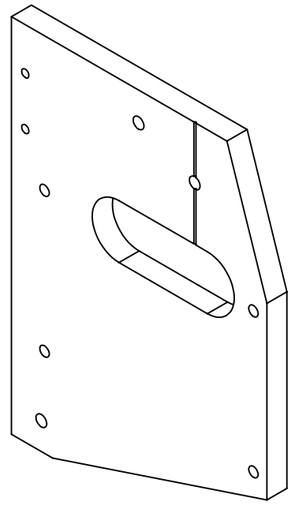
NOTES CONTINUED:

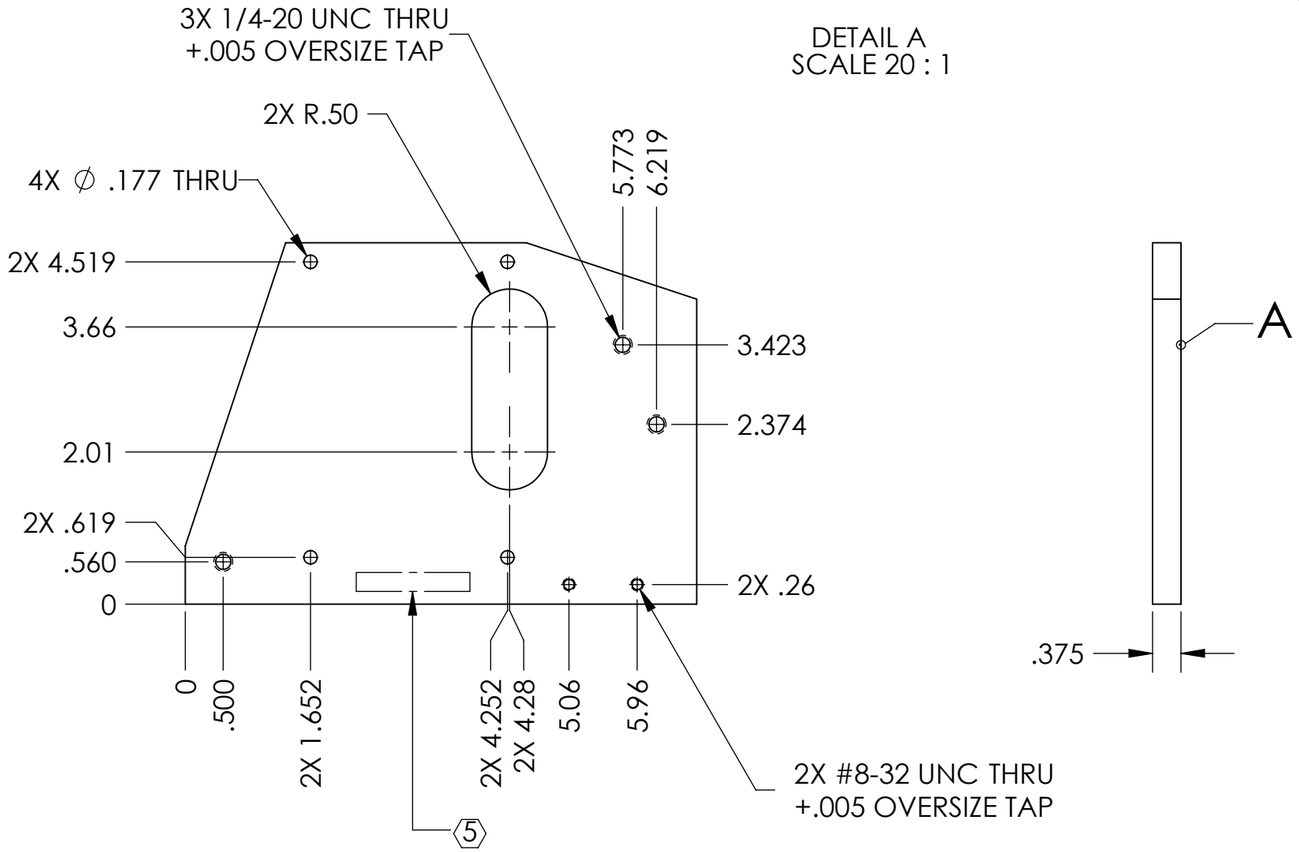
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

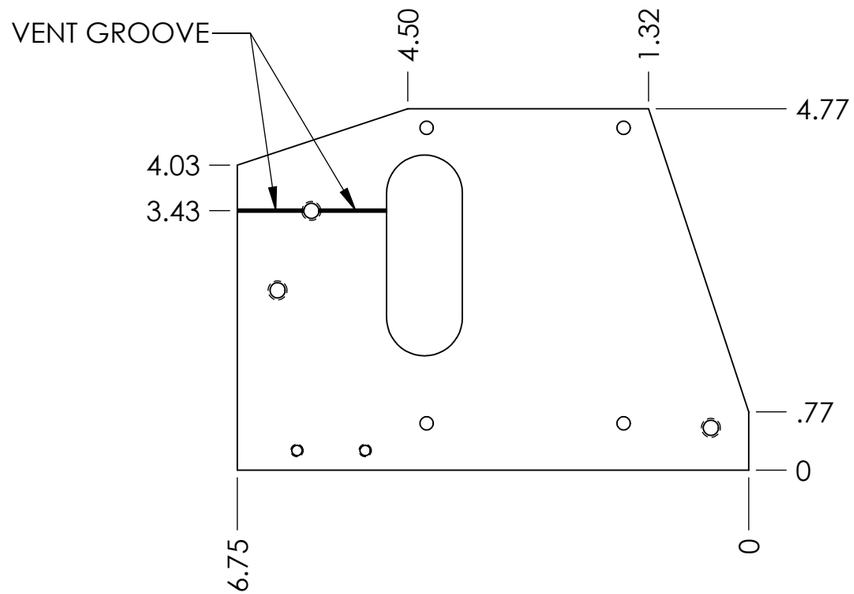
REV.	DATE	DCN #	DRAWING TREE #
v1	03 MAR 2009	E0900065	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



DETAIL A
SCALE 20 : 1







NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

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: ROTATIONAL ADJUSTER ASSY

PART NAME: BASE PLATE

DESIGNER	D. BRIDGES	26 JUL 2010
DRAFTER	D. BRIDGES	29 JUL 2010
CHECKER	M. MEYER	30 JUL 2010
APPROVAL		

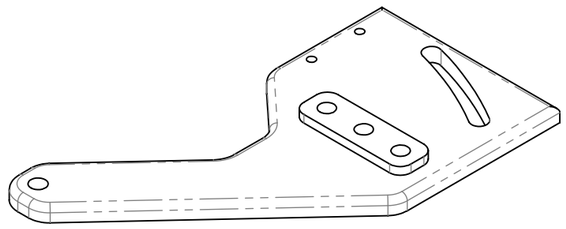
SIZE: B — DWG. NO.: D070327 — REV.: v2
SCALE: 1:2 — PROJECTION: — SHEET 1 OF 1

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

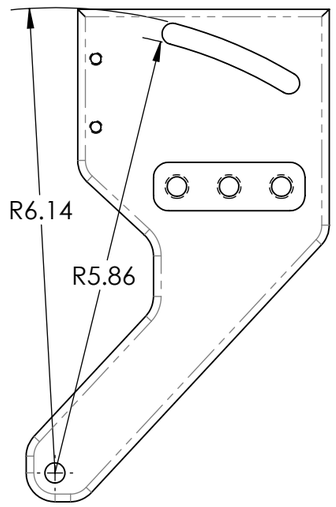
NOTES CONTINUED:

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: 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.

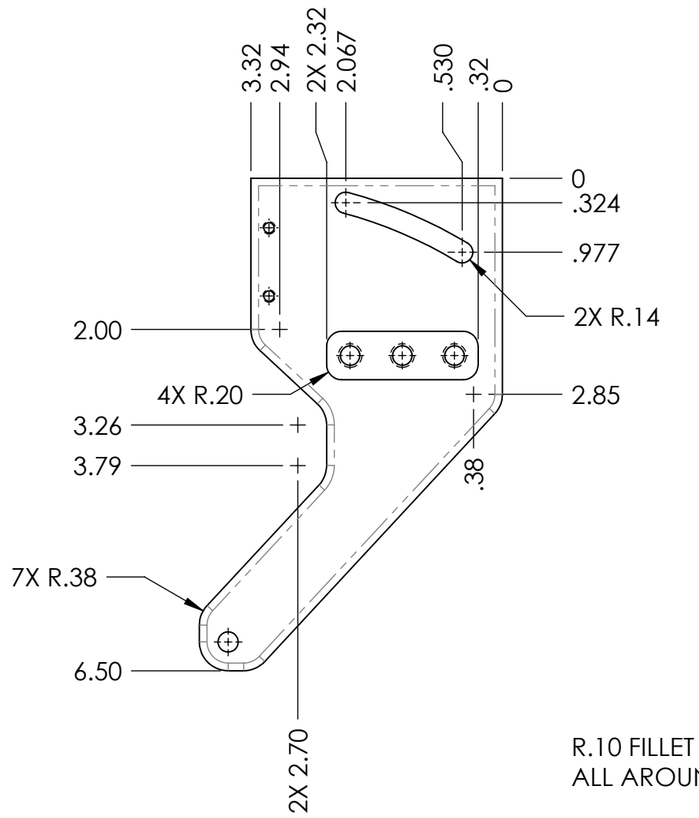
REV.	DATE	DCN #	DRAWING TREE #
v1	03 MAR 2009	E0900065	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-

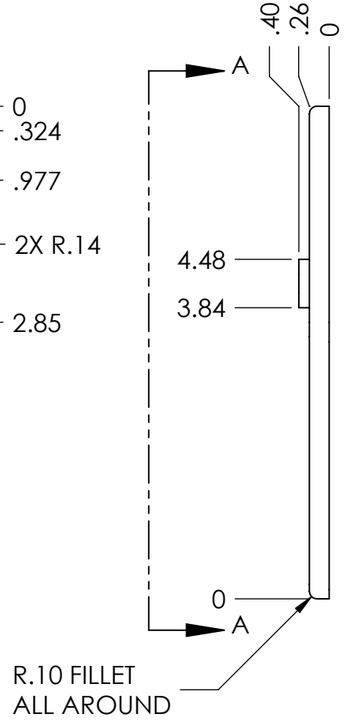


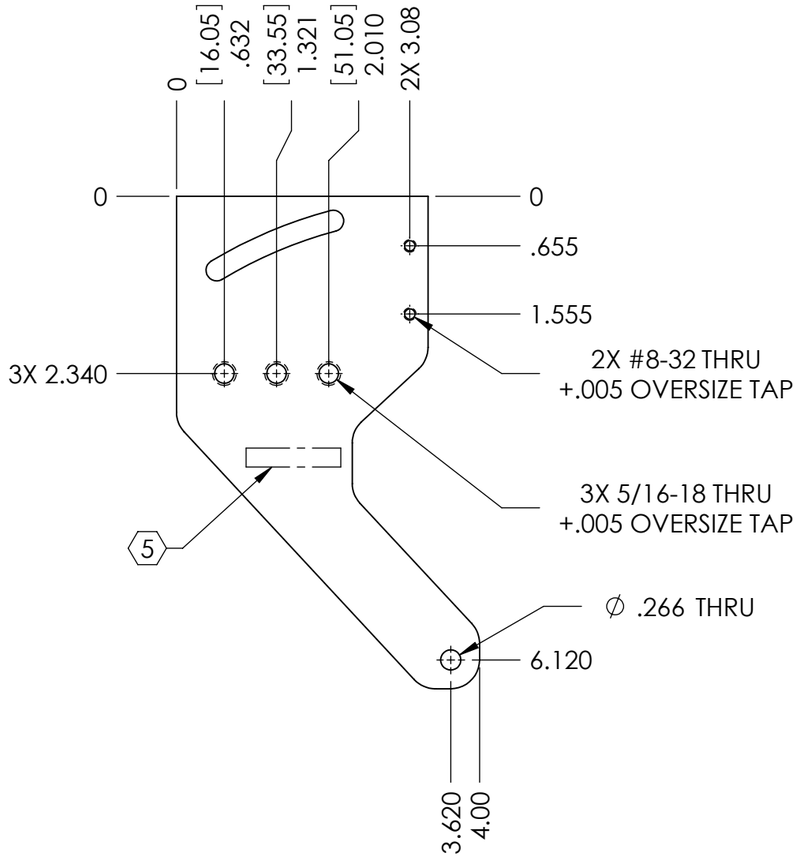
ISOMETRIC VIEW



VIEW A-A







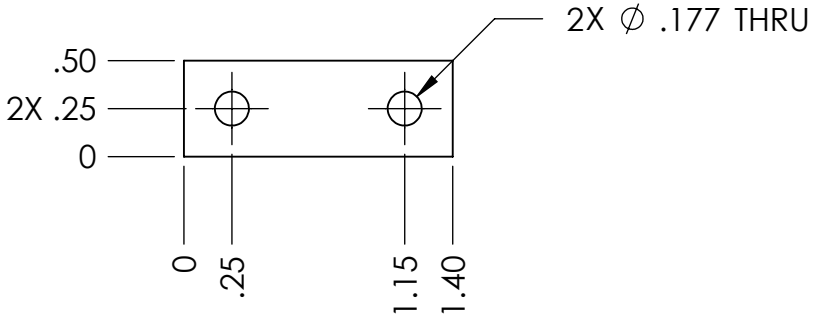
NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)									
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.1°	1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER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

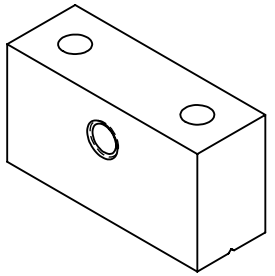
D070328_Advanced_LIGO_SUS_HLTS_Rotating_Plate, PART PDM REV: V1, DRAWING PDM REV: V1

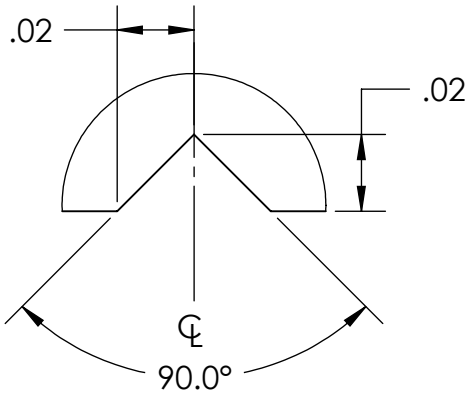
NOTES CONTINUED:

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: 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.

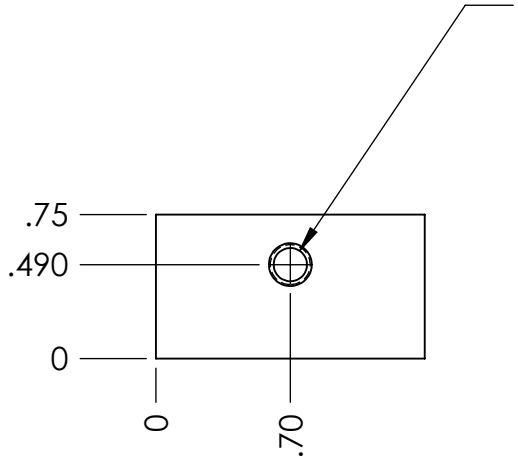
REV.	DATE	DCN #	DRAWING TREE #
v1	03 MAR 2009	E0900065	E080191
v2	18 MAY 2010	E1000166	E080191

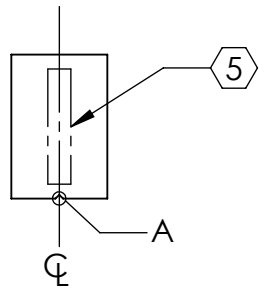






DETAIL A
SCALE 20 : 1





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 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 ROTATIONAL ADJUSTER ASSY

PART NAME PULL PLATE

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

SIZE A | **DWG. NO.** D070329 | **REV.** v2

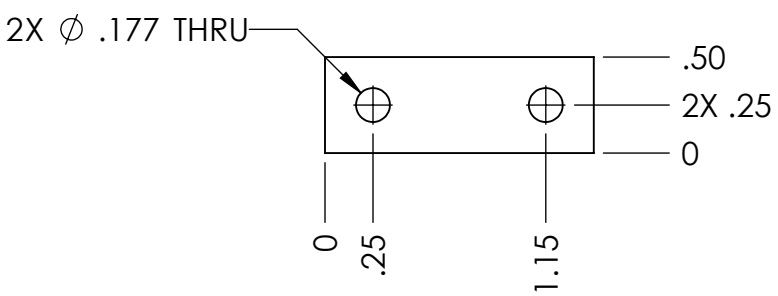
SCALE: 1:1 | **PROJECTION:** | SHEET 1 OF 1

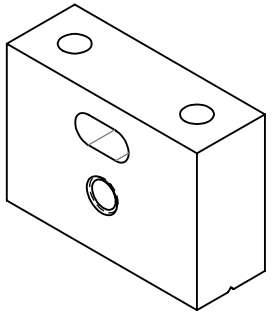
D070329_Advanced_LIGO_SUS_HLTS_Pull_Plate, PART PDM REV: V1-001, DRAWING PDM REV: V1-004

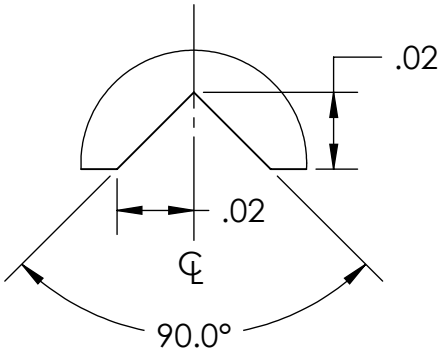
NOTES CONTINUED:

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: 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.

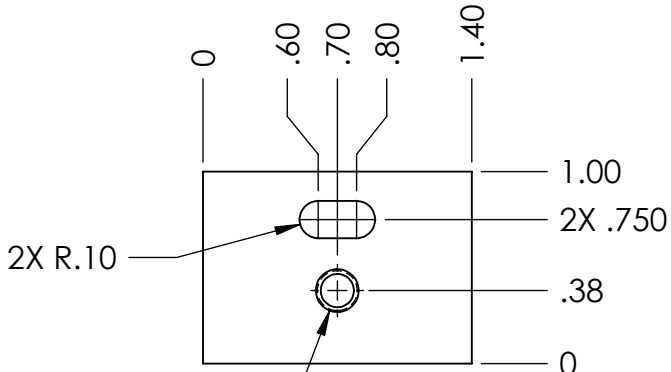
REV.	DATE	DCN #	DRAWING TREE #
v1	03 MAR 2009	E0900065	E080191
v2	18 MAY 2010	E1000166	E080191
-	-	-	-



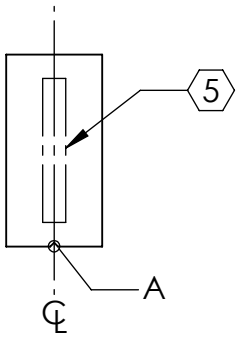




DETAIL A
SCALE 20 : 1



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 SSTL

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 PUSH PLATE

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

SIZE A **DWG. NO.** D070330 **REV.** v2

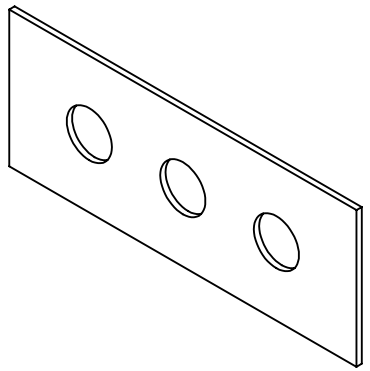
SCALE: 1:1 **PROJECTION:** SHEET 1 OF 1

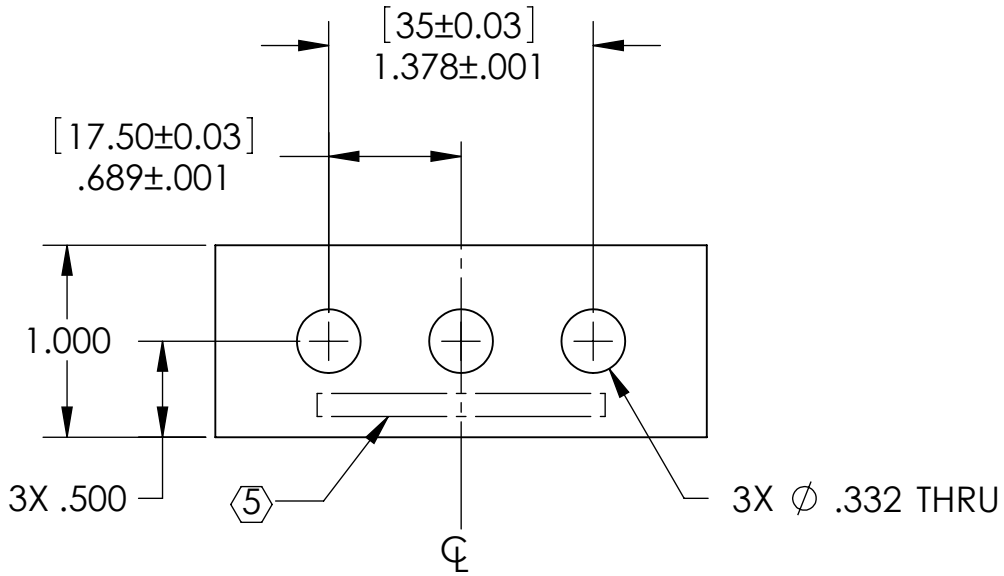
D070330_Advanced_LIGO_SUS_HLTS_Push_Plate, PART PDM REV: V1-001, DRAWING PDM REV: V1-003

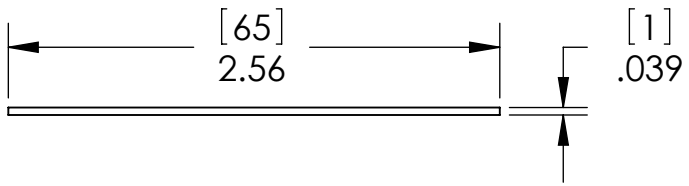
NOTES CONTINUED:

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.

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 ± 0.5°

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 SSTL

FINISH: 32 µinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: ADVANCED LIGO

SUB-SYSTEM: SUS

NEXT ASSY: ROTATIONAL ADJUSTER

PART NAME: SHIM, 1mm, UPPER BLADE

DESIGNER	D. BRIDGES	30 JUN 2010	
DRAFTER	D. BRIDGES	30 JUN 2010	
CHECKER	M. MEYER	30 JUN 2010	
APPROVAL			

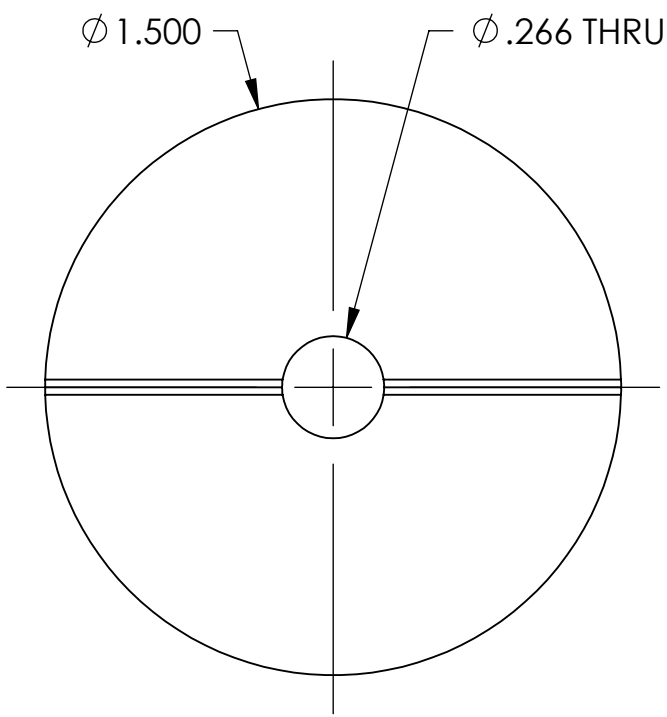
SIZE: A **DWG. NO.**: D070331 **REV.**: v2

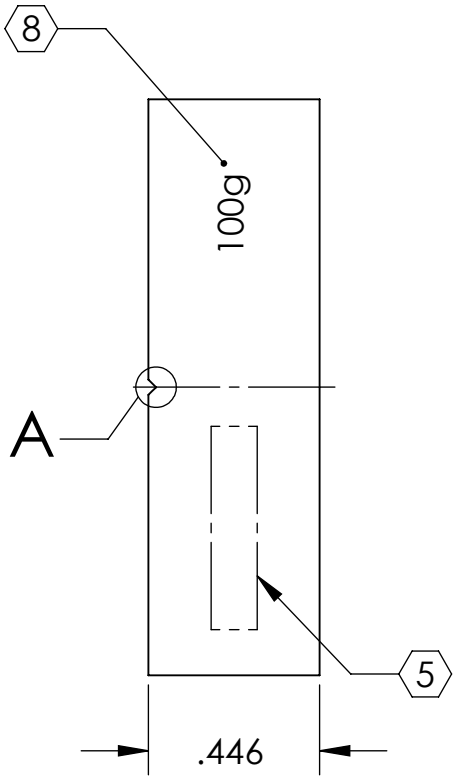
SCALE: 1:1 **PROJECTION**:  SHEET 1 OF 1

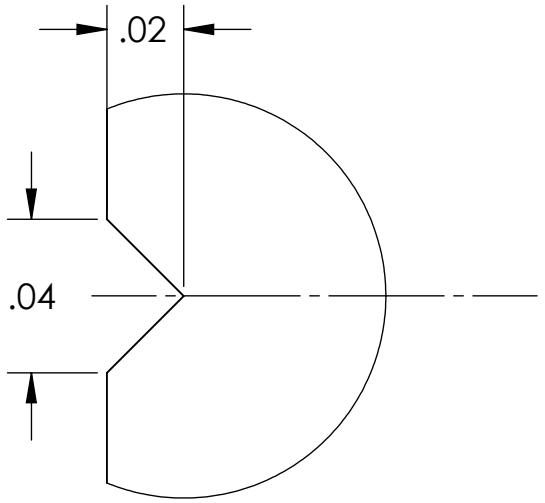
NOTES CONTINUED:

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: 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. 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	-
-	-	-	-







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 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 ADDITIONAL MASS DISK, 100g

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

SIZE A **DWG. NO.** D070333 **REV.** v2

SCALE: 2:1 **PROJECTION:** **SHEET 1 OF 1**

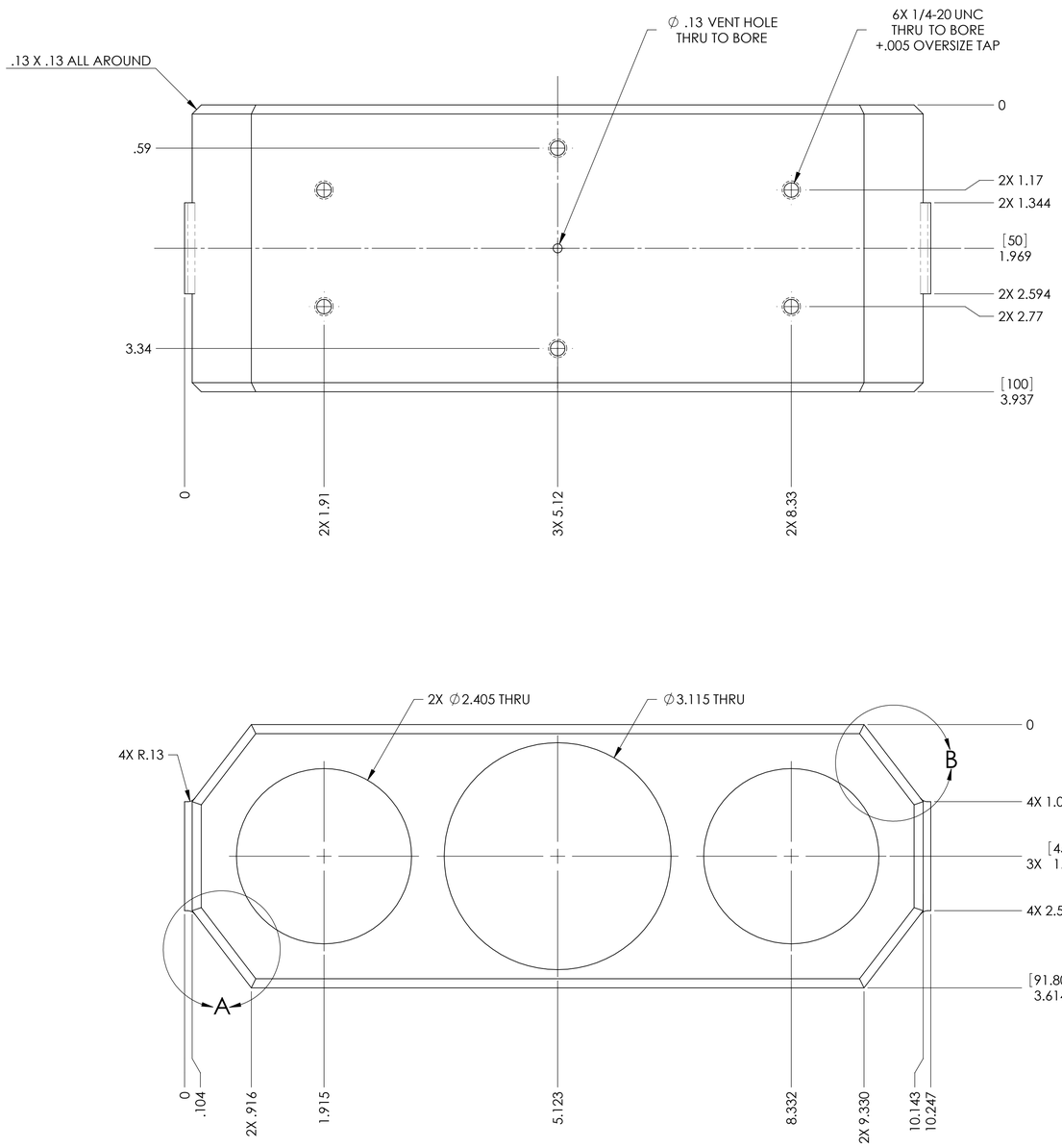
D070333_Advanced_LIGO_SUS_Additional_Mass_Disk,_100g, PART PDM REV: V1-008, DRAWING PDM REV: V1-002

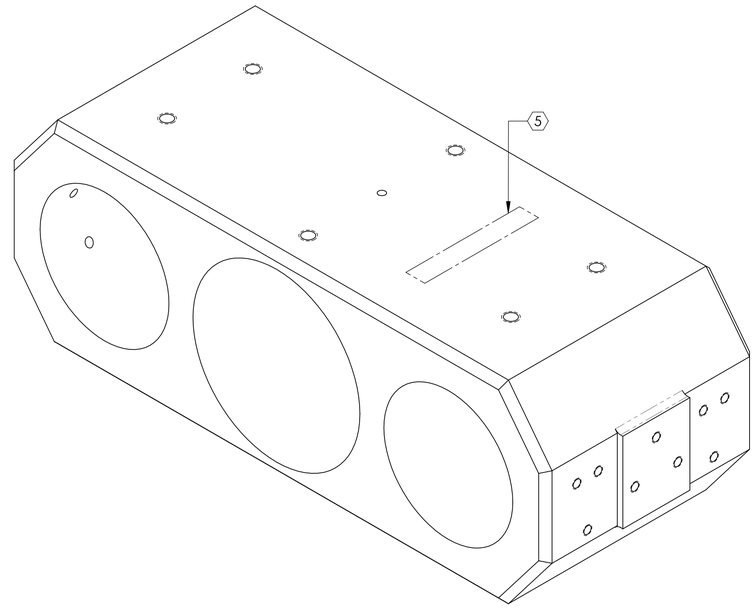
NOTES CONTINUED:

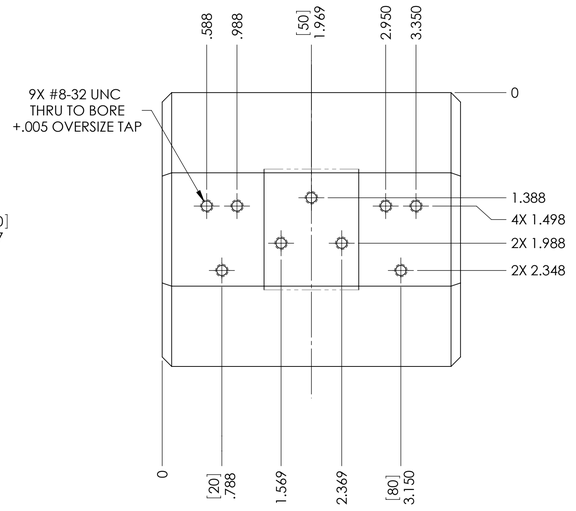
Ⓢ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 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.

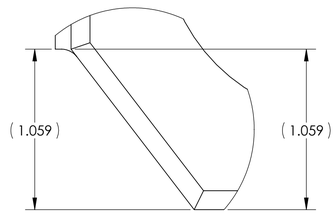
REV.	DATE	DCN #	DRAWING TREE #
v1	22 JUN 2009	E0900173	E080191
v2	06 JUL 2009	E0900189	E080191
v3	18 MAY 2010	E1000166	E080191



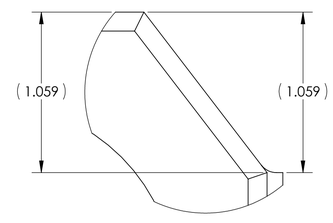




LEFT AND RIGHT SIDES



DETAIL A
SCALE 2 : 1



DETAIL B
SCALE 2 : 1

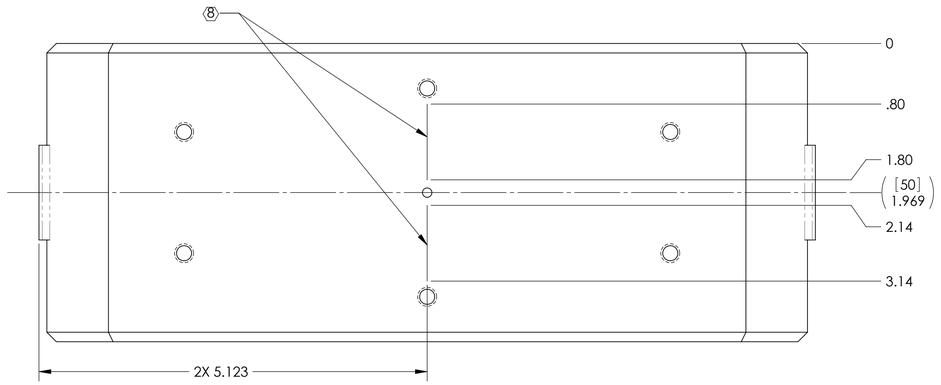
DIMENSIONS ARE IN INCHES [MM]	NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)
TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.5°	1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR,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

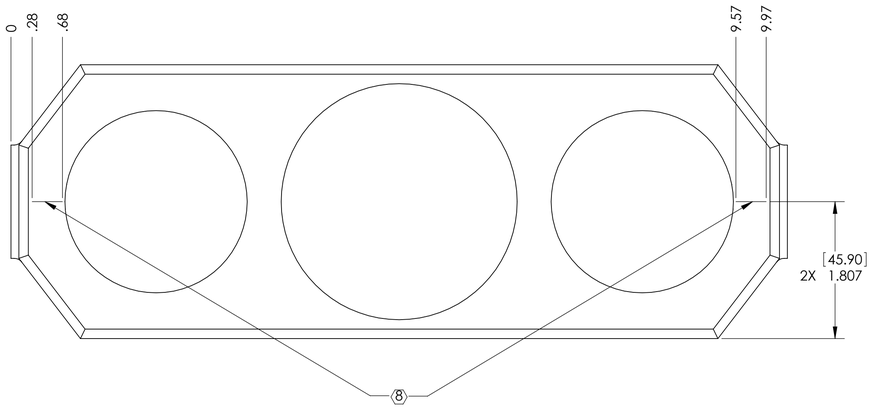
LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: ADVANCED LIGO	SUB-SYSTEM: SUS	PART NAME: MAIN SECTION				
NEXT ASSY: INTERMEDIATE MASS ASSY		DESIGNER	D. BRIDGES	02 AUG 2010	SIZE: D	REV: v3
		DRAFTER	D. BRIDGES	04 AUG 2010	DWG. NO.: D070336	
		CHECKER	M. MEYER	04 AUG 2010		
		APPROVAL			SCALE: 1:1	PROJECTION: SHEET 1 OF 2

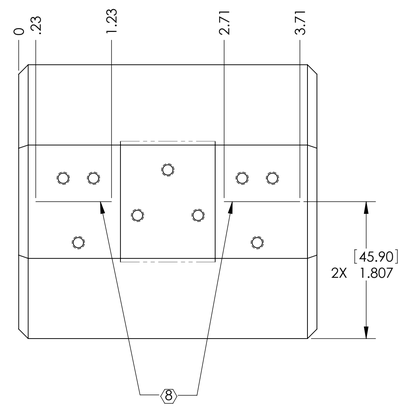
D070336_Advanced_LIGO_SUS_H1S_Main_Section_Intermediate_Mass_PART PDM REV- V2-003, DRAWING PDM REV- V2-001

⑧ SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART.

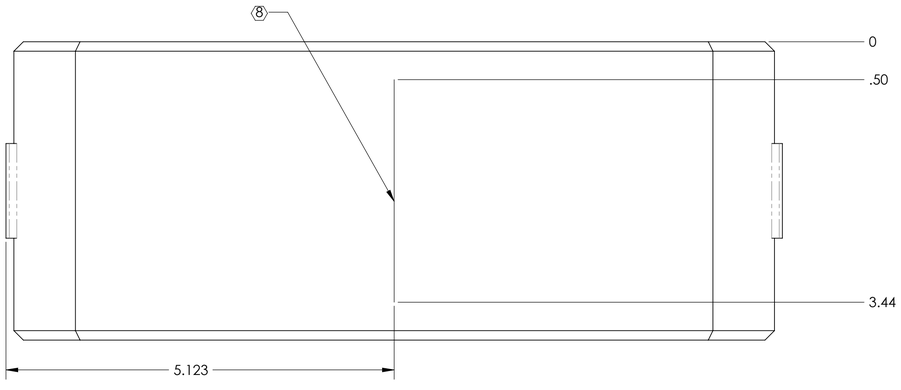




FRONT AND BACK SIDES



RIGHT AND LEFT SIDES



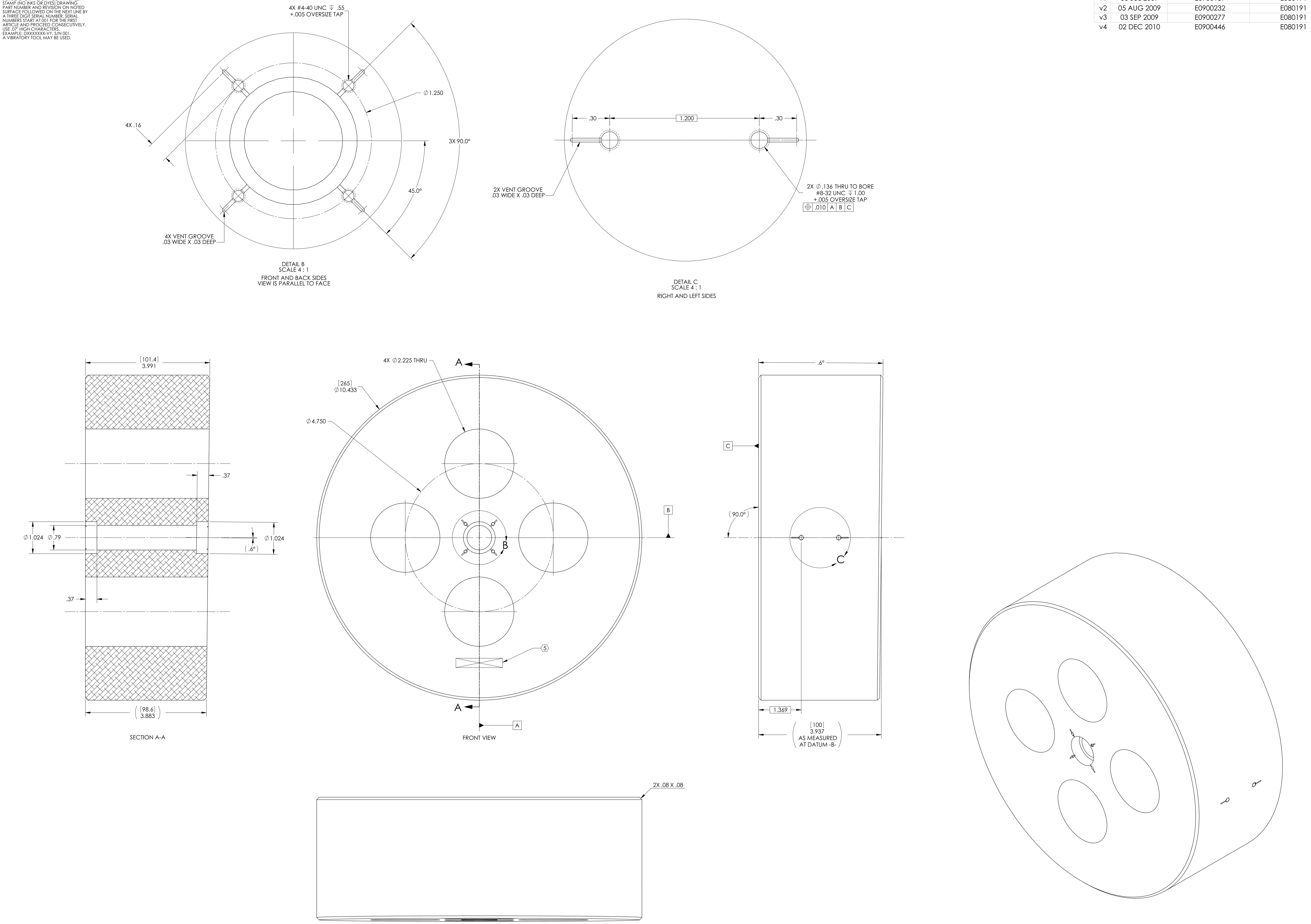
LIGO	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		
SIZE D	DWG. NO. D070336		REV. V3
SCALE: 1:1	PROJECTION:		SHEET 2 OF 2

D070336_Advanced_LIGO_SUS_HLTS_Main_Section_Intermediate_Mass_PART PDM REV: V2.003, DRAWING PDM REV: V2.001

NOTES CONTINUED:

⟨5⟩ 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 .07" HIGH CHARACTERS. EXAMPLE: DXXXXXXX-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



DIMENSIONS ARE IN INCHES [MM] TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.1°	**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.	LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	**PART NAME** METAL TEST MASS
	MATERIAL 6061-T6 Al **FINISH** 32 µinch	**SYSTEM** ADVANCED LIGO **SUB-SYSTEM** SUS **NEXT ASSY** TEST MASS ASSY	**DESIGNER** D. BRIDGES 06 JAN 2010 **DRAFTER** D. BRIDGES 06 JAN 2010 **CHECKER** M. MEYER 06 JAN 2010 **APPROVAL**

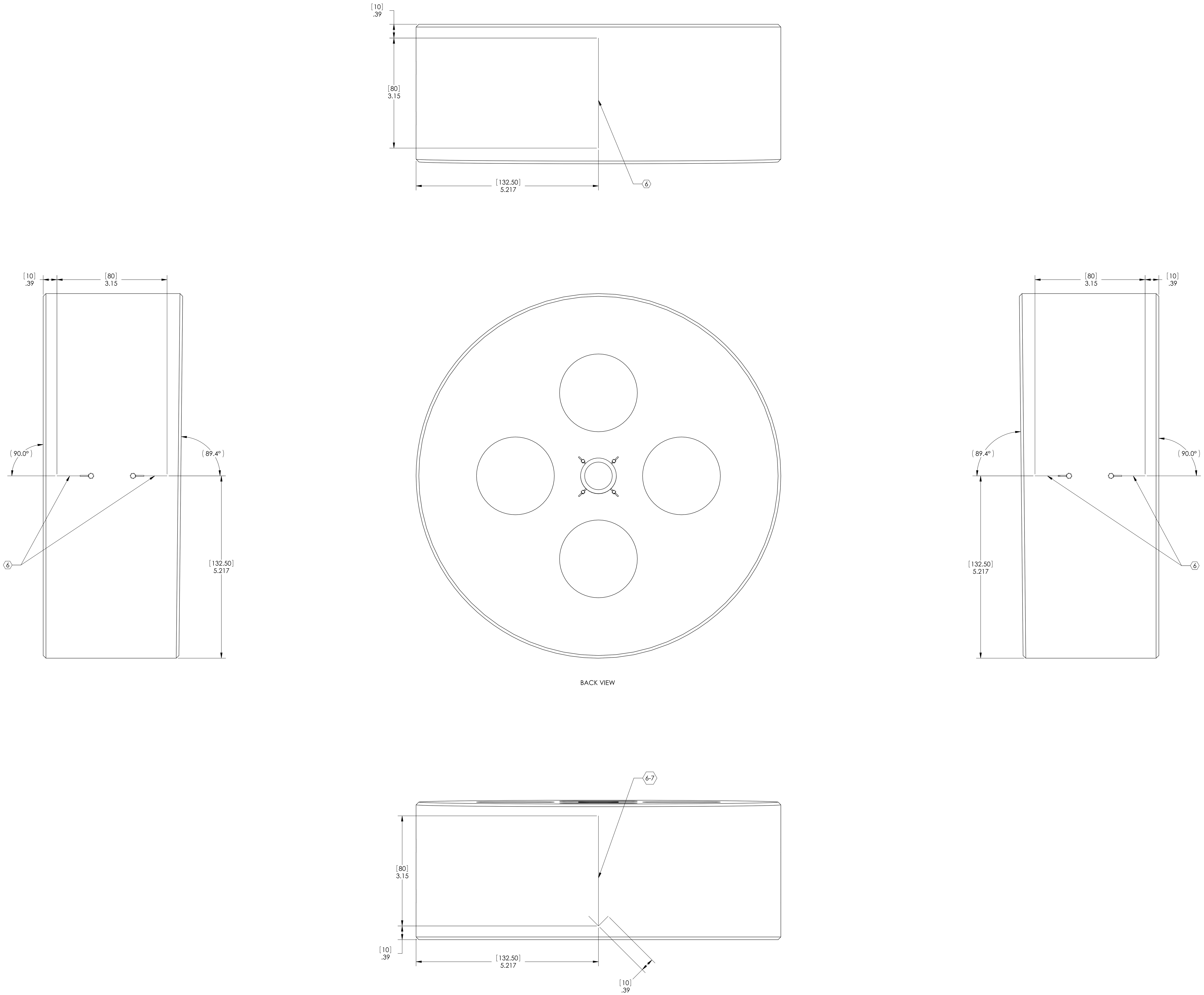
SIZE	DWG. NO.	REV.
E	D070338	v4

SCALE: 1:1 **PROJECTION:** 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.

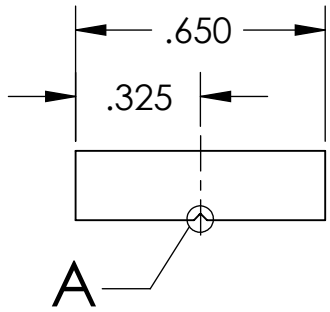


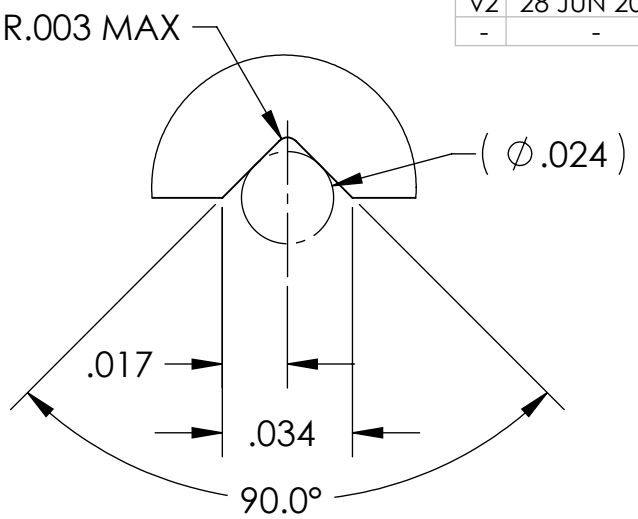
LIGO	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		
SIZE E	DWG. NO. D070338		REV. v4
SCALE: 1:1	PROJECTION:		SHEET 2 OF 2

NOTES CONTINUED:

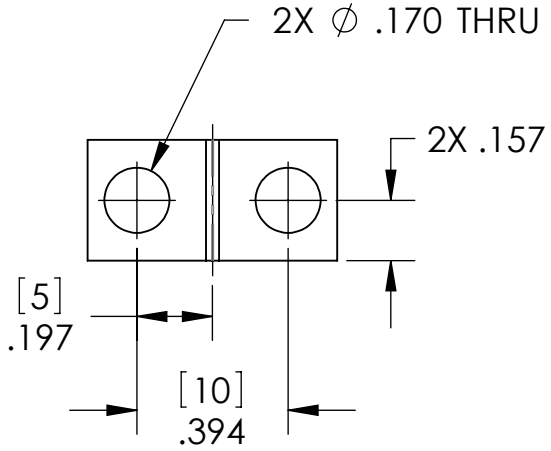
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND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

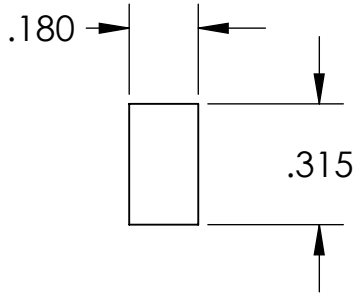
REV.	DATE	DCN #	DRAWING TREE #
A	01 AUG 2008	E080418	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-

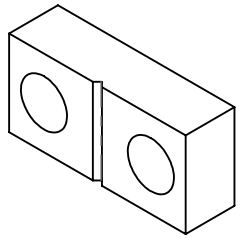




DETAIL A
SCALE 20 : 1







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 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, OUTSIDE

DESIGNER	D. BRIDGES	22 OCT 2010
DRAFTER	D. BRIDGES	22 OCT 2010
CHECKER	B. MOORE	24 OCT 2010
APPROVAL		

SIZE: A **DWG. NO.**: D070341 **REV.**: v2

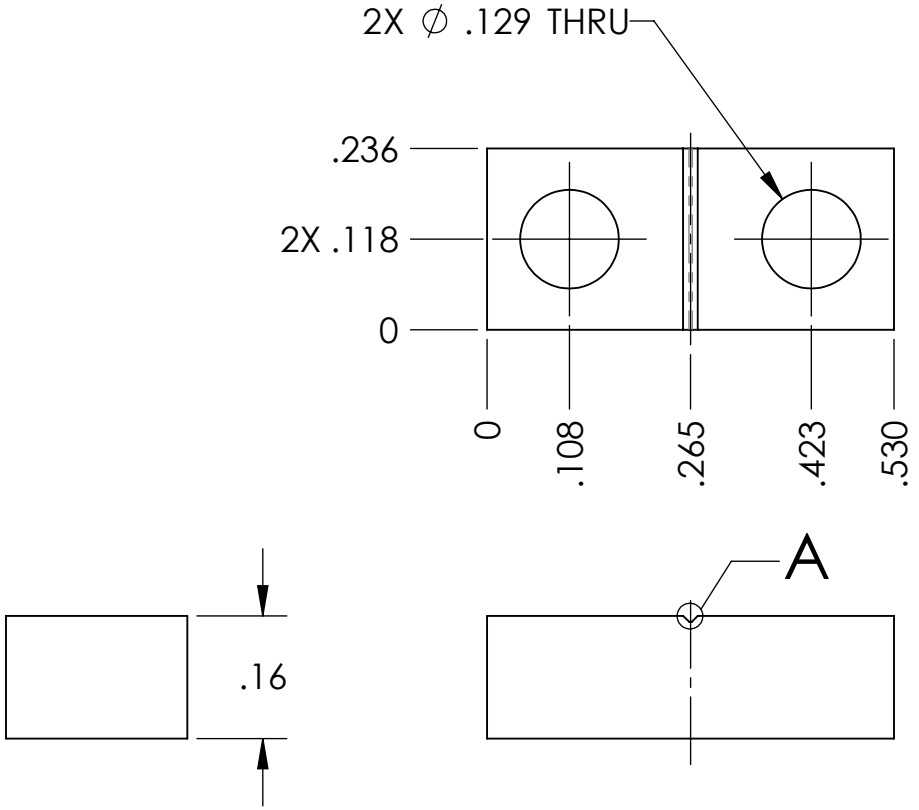
SCALE: 2:1 **PROJECTION**:  SHEET 1 OF 1

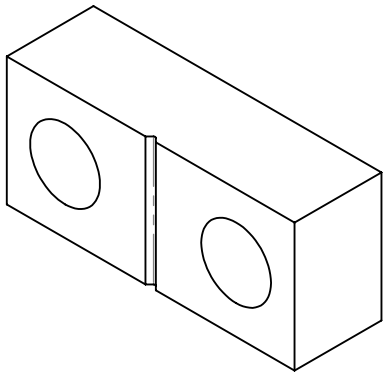
D070341_Advanced_LIGO_SUS_HLTS_Upper_Clamp,_Upper_Wire,_Outside, PART PDM REV: V1-000, DRAWING PDM REV: V1-001

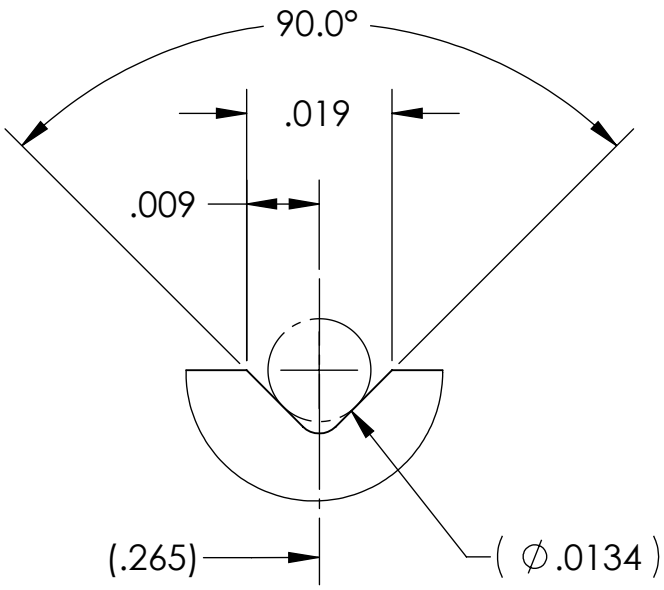
NOTES CONTINUED:

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/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

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 SSTL

FINISH: 32 µinch

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	07 MAR 2008	
DRAFTER	D. BRIDGES	01 NOV 2010	
CHECKER	B. MOORE	02 NOV 2010	
APPROVAL			

SIZE: A | **DWG. NO.**: D070394 | **REV.**: v2

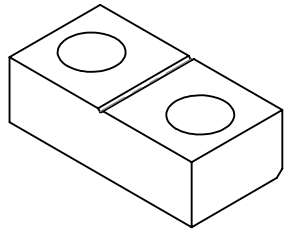
SCALE: 4:1 | **PROJECTION**: | SHEET 1 OF 1

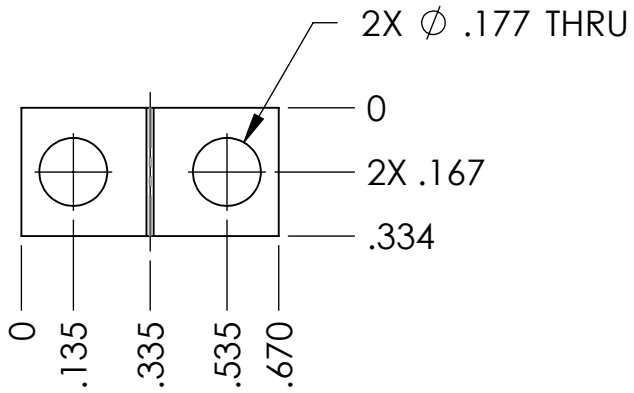
D070394_Advanced_LIGO_SUS_HLTS_Upper_Clamp,_Intermediate_Wire,_Outside, PART PDM REV: V1-004, DRAWING PDM REV: V1-001

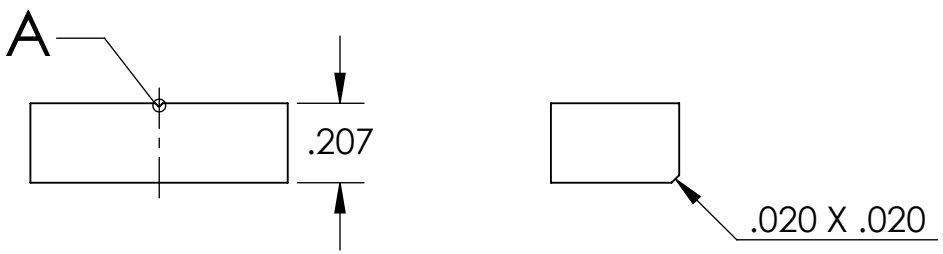
NOTES CONTINUED:

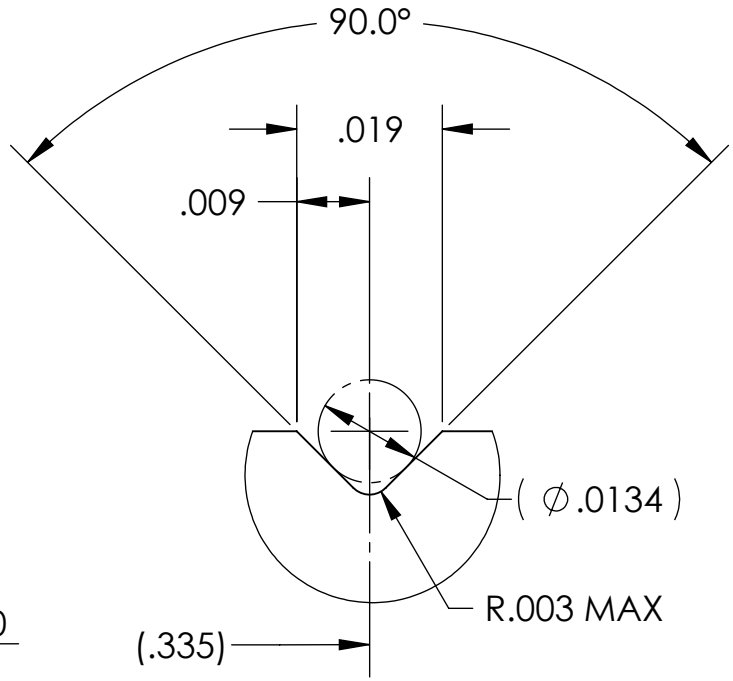
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND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

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	
DRAFTER	R. BIEDENHARN	01 NOV 2010	
CHECKER	D. BRIDGES	04 NOV 2010	
APPROVAL			

SIZE A **DWG. NO.** D070405 **REV.** v2

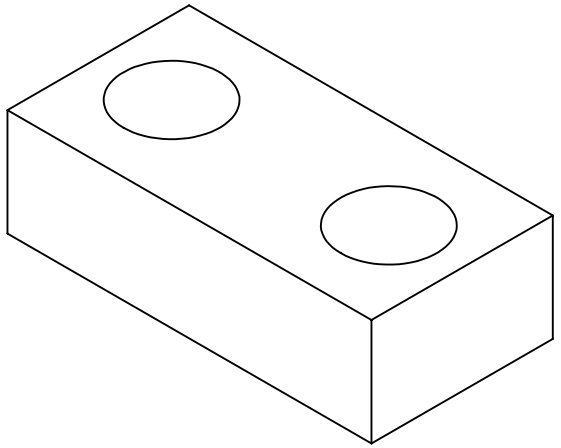
SCALE: 2:1 **PROJECTION:** **SHEET 1 OF 1**

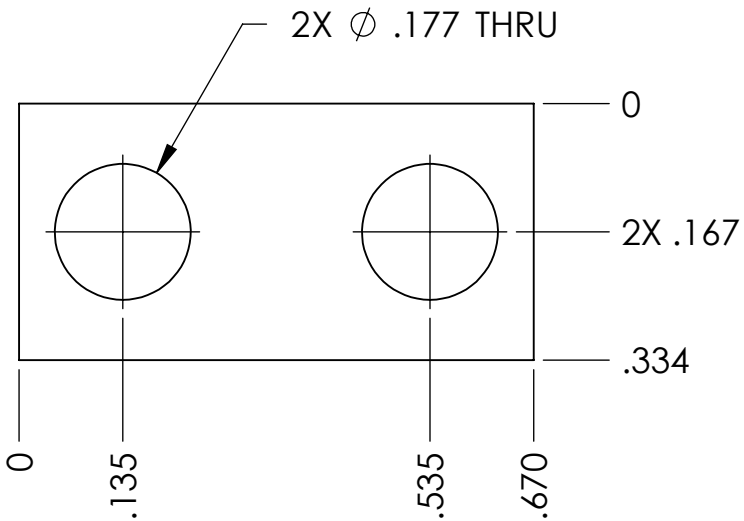
D070405_Advanced_LIGO_SUS_HLTS_Lower_Clamp,_Intermediate_Wire,_Inside, PART PDM REV: V1-001, DRAWING PDM REV: V1-003

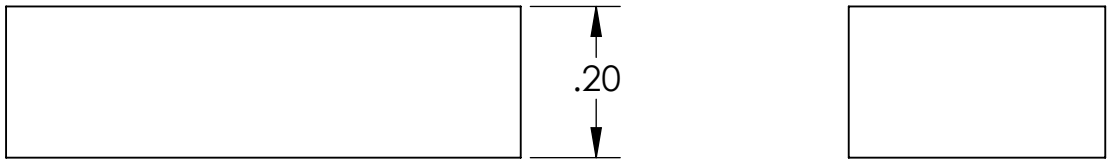
NOTES CONTINUED:

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	30 JUN 2009	E0900184	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 SSTL

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	
DRAFTER	R. BIEDENHARN	01 NOV 2010	
CHECKER	D. BRIDGES	04 NOV 2010	
APPROVAL			

SIZE A **DWG. NO.** D070406 **REV.** v2

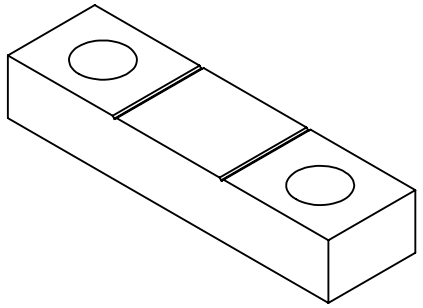
SCALE: 4:1 **PROJECTION:** **SHEET** 1 OF 1

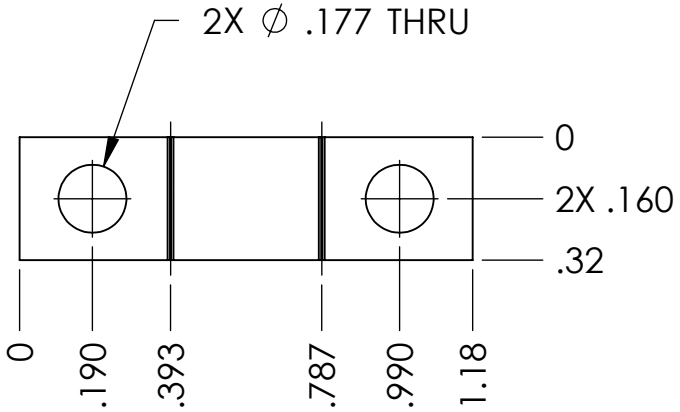
D070406_Advanced_LIGO_SUS_HLTS_Lower_Clamp,_Intermediate_Wire,_Outside, PART PDM REV: V1-001, DRAWING PDM REV: V1-002

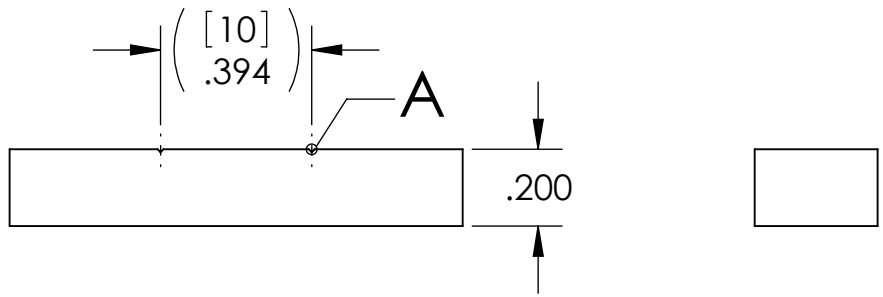
NOTES CONTINUED:

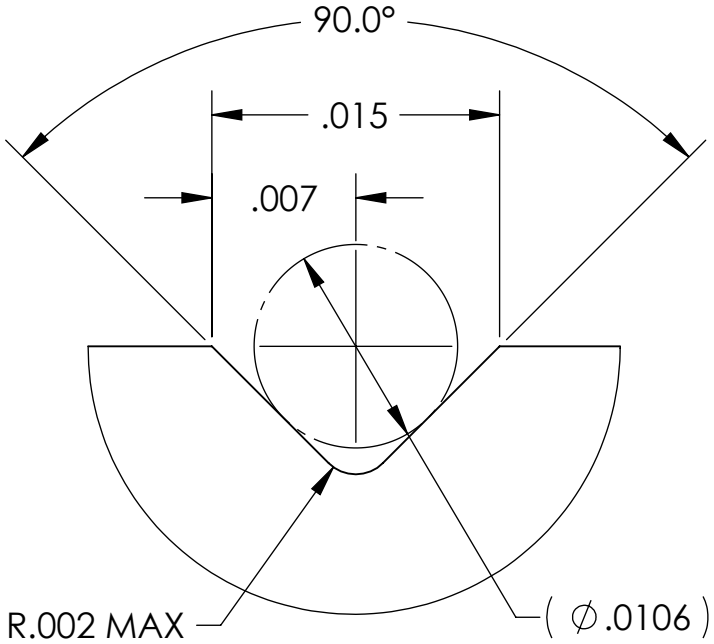
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND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

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 SSTL

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	09 SEP 2009
DRAFTER	R. BIEDENHARN	01 NOV 2010
CHECKER	D. BRIDGES	04 NOV 2010
APPROVAL		

SIZE A **DWG. NO.** D070438 **REV.** v3

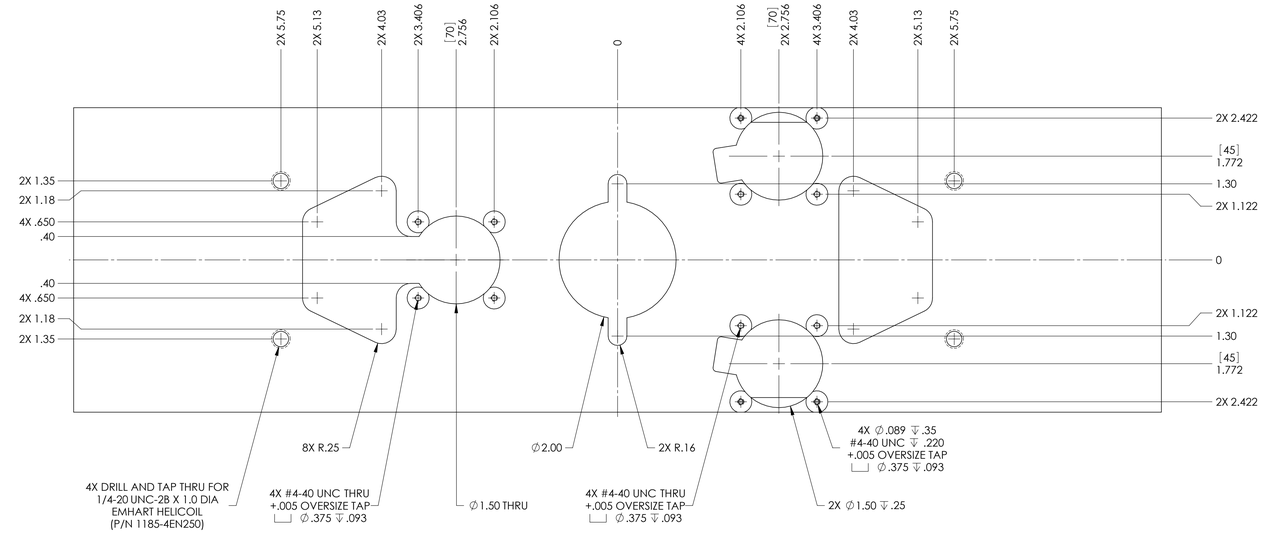
SCALE: 2:1 **PROJECTION:** **SHEET** 1 OF 1

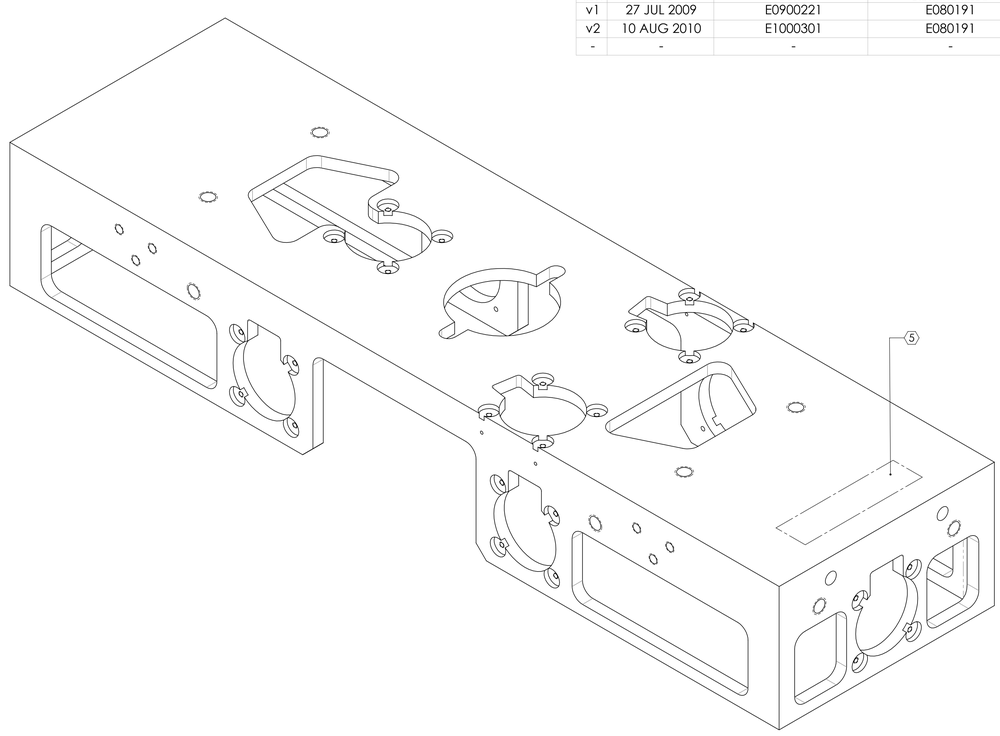
D070438_Advanced_LIGO_SUS_HLTS_Upper_Clamp,_Lower_Wire,_Outside, PART PDM REV: V2-000, DRAWING PDM REV: V2-001

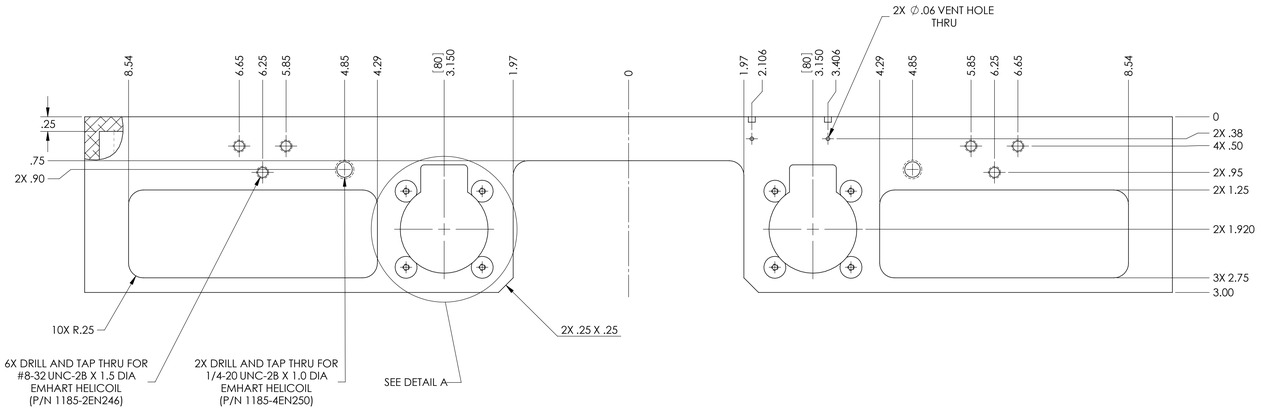
NOTES CONTINUED:

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: 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.

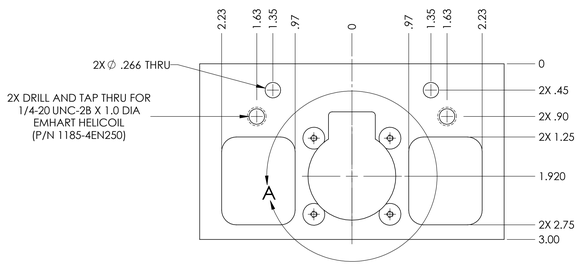
REV.	DATE	DCN #	DRAWING TREE #
v1	27 JUL 2009	E0900221	E080191
v2	10 AUG 2010	E1000301	E080191
-	-	-	-



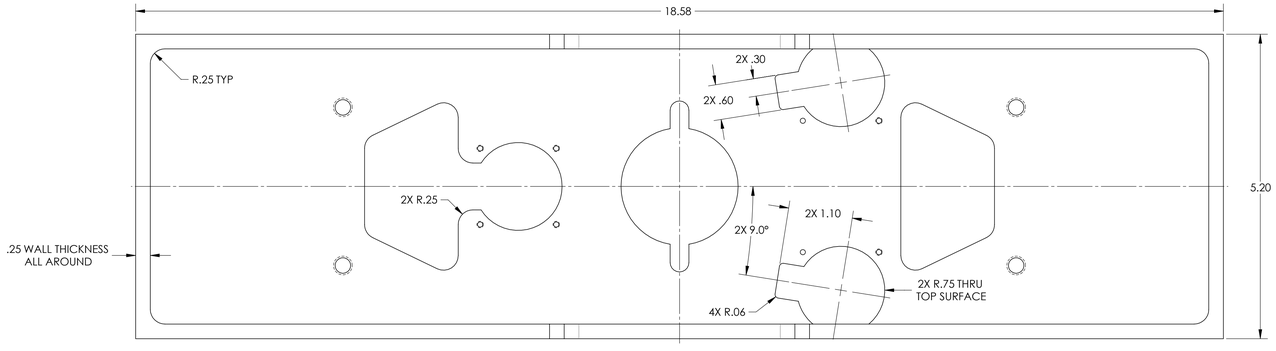


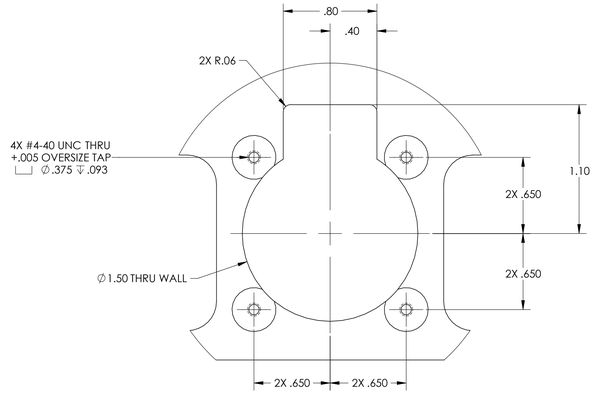


FRONT SIDE (BACK SIDE SYMMETRIC)



RIGHT AND LEFT SIDES





DETAIL A
SCALE 2 : 1

OSEM SLOT
6X

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: 6061-T6 Al	FINISH: 32 µinch				

LIGO — CALIFORNIA INSTITUTE OF TECHNOLOGY, MASSACHUSETTS INSTITUTE OF TECHNOLOGY

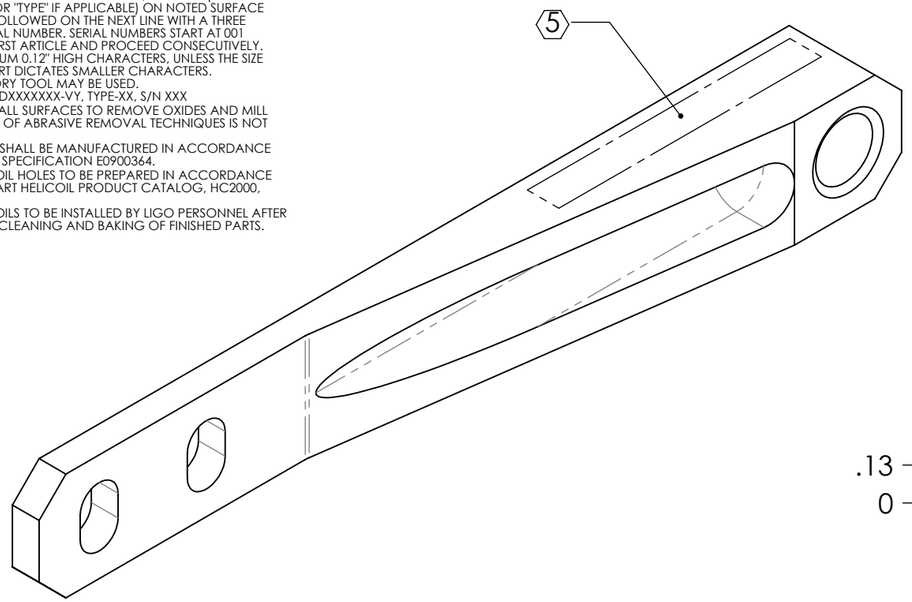
SYSTEM: ADVANCED LIGO	SUB-SYSTEM: SUS	PART NAME: COIL HOLDER			
NEXT ASSY: COIL HOLDER ASSY		DESIGNER: D. BRIDGES 09 AUG 2010	SIZE: E	DWG. NO.: D070449	REV.: v2
		DRAFTER: D. BRIDGES 10 AUG 2010			
		CHECKER: M. MEYER 11 AUG 2010			
		APPROVAL	SCALE: 1:1	PROJECTION:	SHEET 1 OF 1

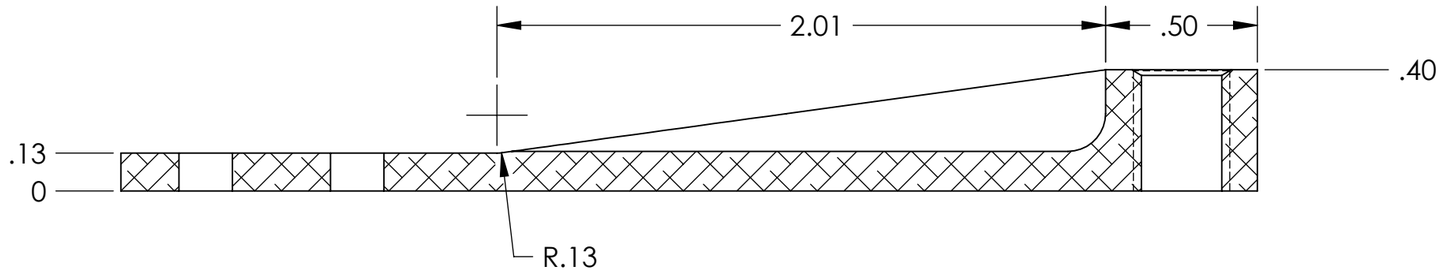
D070449_Advanced_LIGO_SUS_14.75_Coil_Holder_PART FDM REV V1-000_DRAWING FDM REV V1-002

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

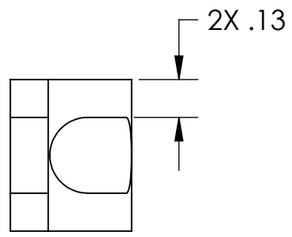
NOTES CONTINUED:

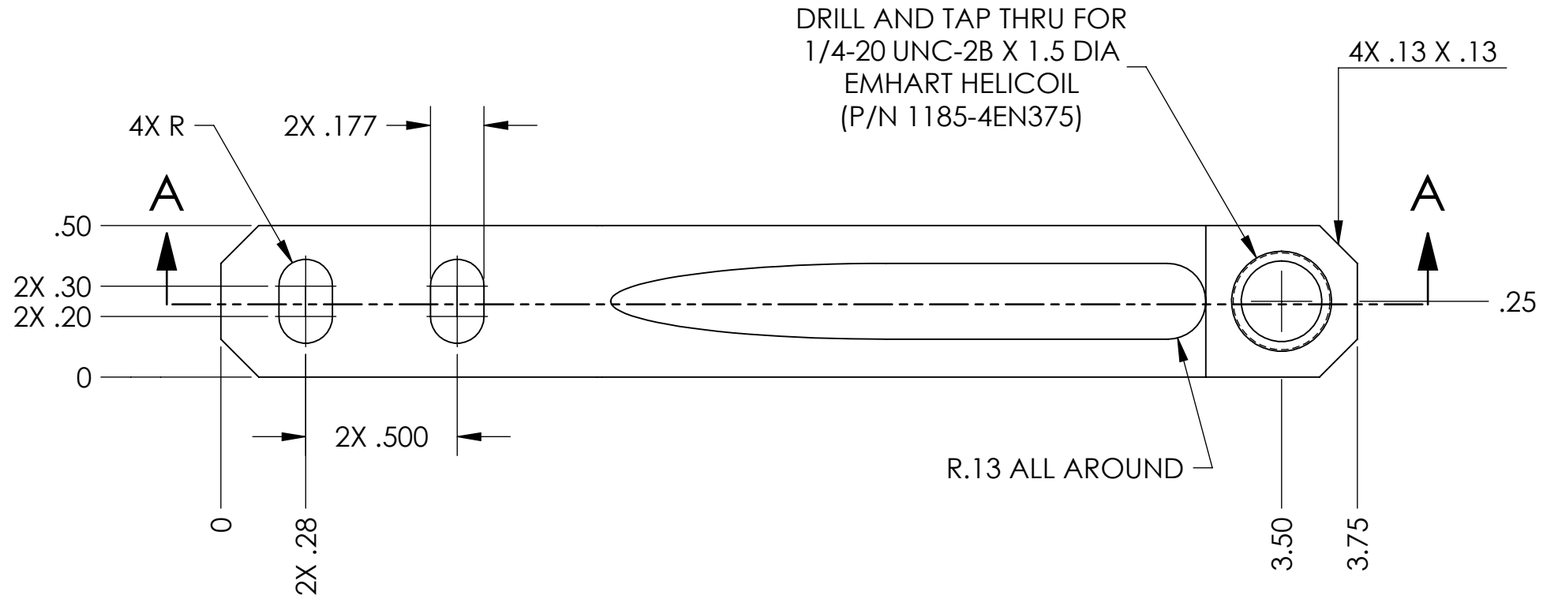
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 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.





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	FINISH
6061-T6 Al	63 µinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM	SUB-SYSTEM
ADVANCED LIGO	SUS

NEXT ASSY: EARTHQUAKE STOP ASSY, LONG MOUNT

PART NAME: EARTHQUAKE STOP MOUNT, LONG

DESIGNER	D. BRIDGES	05 NOV 2008
DRAFTER	D. BRIDGES	02 NOV 2010
CHECKER	B. MOORE	03 NOV 2010
APPROVAL		

SIZE: B | DWG. NO.: D070460 | REV.: v2

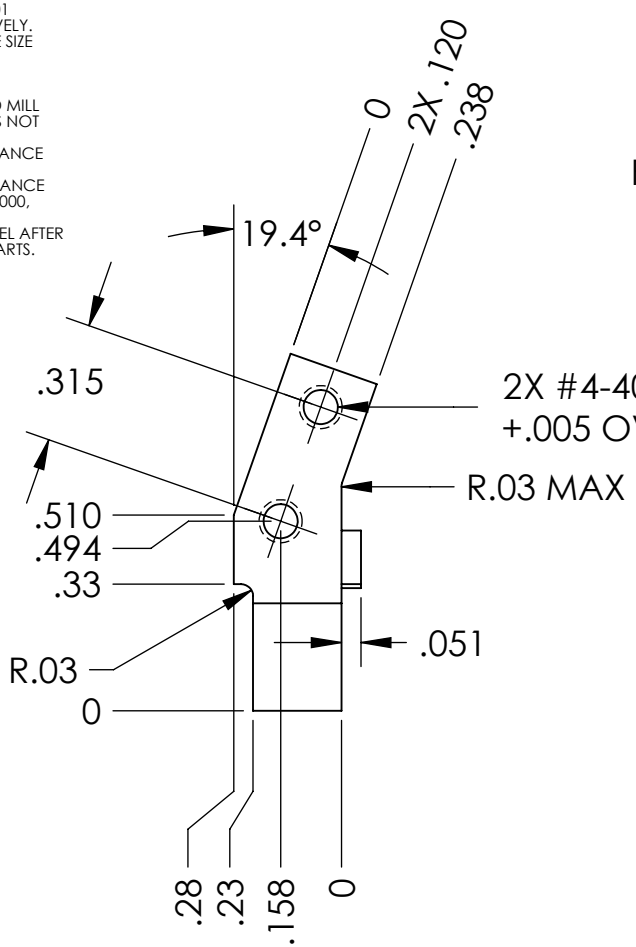
SCALE: 2:1 | PROJECTION: | SHEET 1 OF 1

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

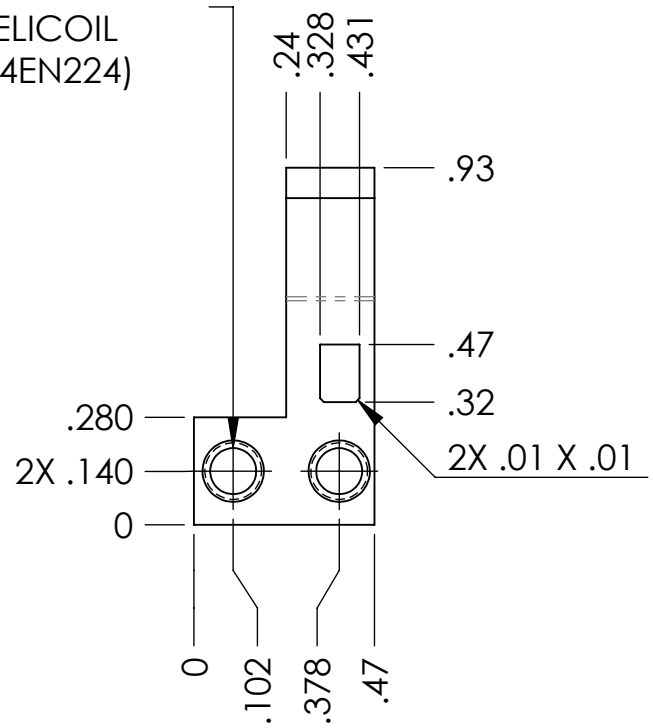
NOTES CONTINUED:

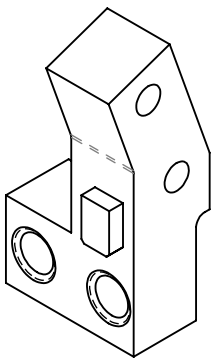
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

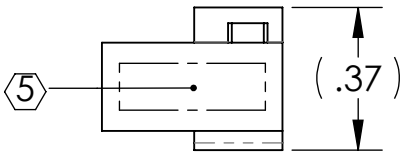
REV.	DATE	DCN #	DRAWING TREE #
v1	28 APR 2009	E080418	E080191
v2	30 JUN 2009	E0900184	E080191
v3	28 JUN 2010	E1000236	E080191



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 SSTL

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: UPPER CLAMP, INT. WIRE, INSIDE

DESIGNER	D. BRIDGES	10 OCT 2008	
DRAFTER	R. BIEDENHARN	01 NOV 2010	
CHECKER	D. BRIDGES	04 NOV 2010	
APPROVAL			

SIZE: A

DWG. NO.: D070585

REV.: v3

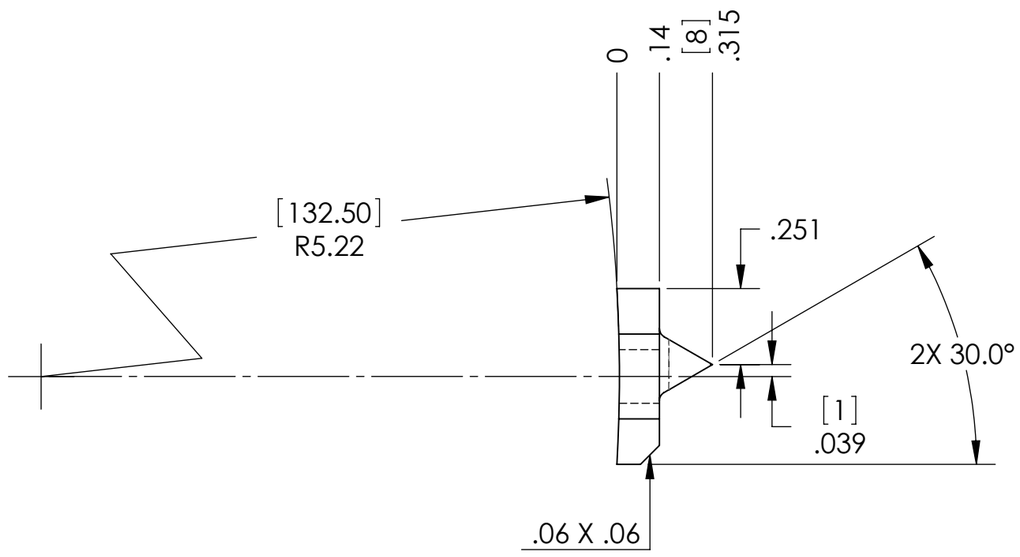
SCALE: 2:1 **PROJECTION**: SHEET 1 OF 1

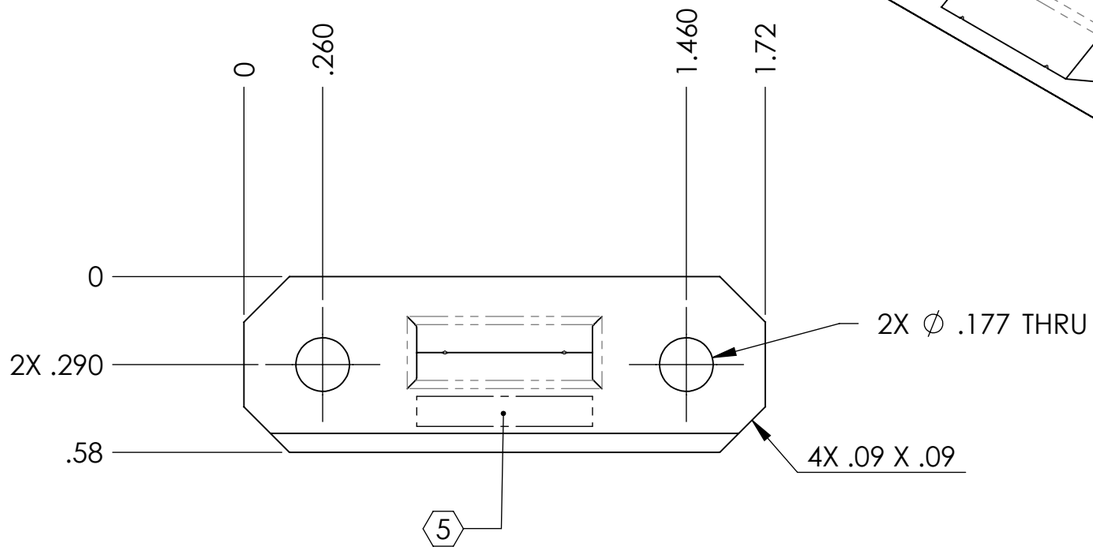
D070585_Advanced_LIGO_SUS_HLTS_Upper_Clamp,_Intermediate_Wire,_Inside, PART PDM REV: V2-001, DRAWING PDM REV: V2-005

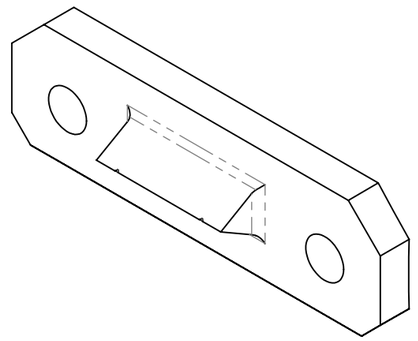
NOTES CONTINUED:

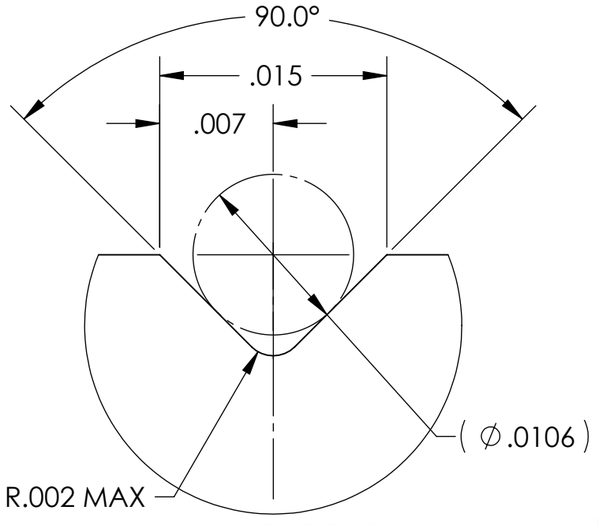
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 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.

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

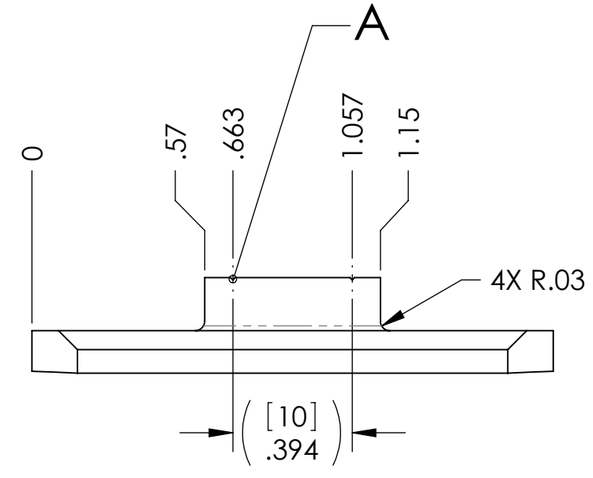








WIRE GROOVE
2X
DETAIL A
SCALE 100 : 1



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

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 SSTL
FINISH: 32 µinch

LIGO — CALIFORNIA INSTITUTE OF TECHNOLOGY, MASSACHUSETTS INSTITUTE OF TECHNOLOGY

PART NAME: PRISM BREAKOFF, LOWER WIRE

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

DESIGNER	D. BRIDGES	09 SEP 2009	
DRAFTER	R. BIEDENHARN	29 OCT 2010	
CHECKER	D. BRIDGES	04 NOV 2010	
APPROVAL			

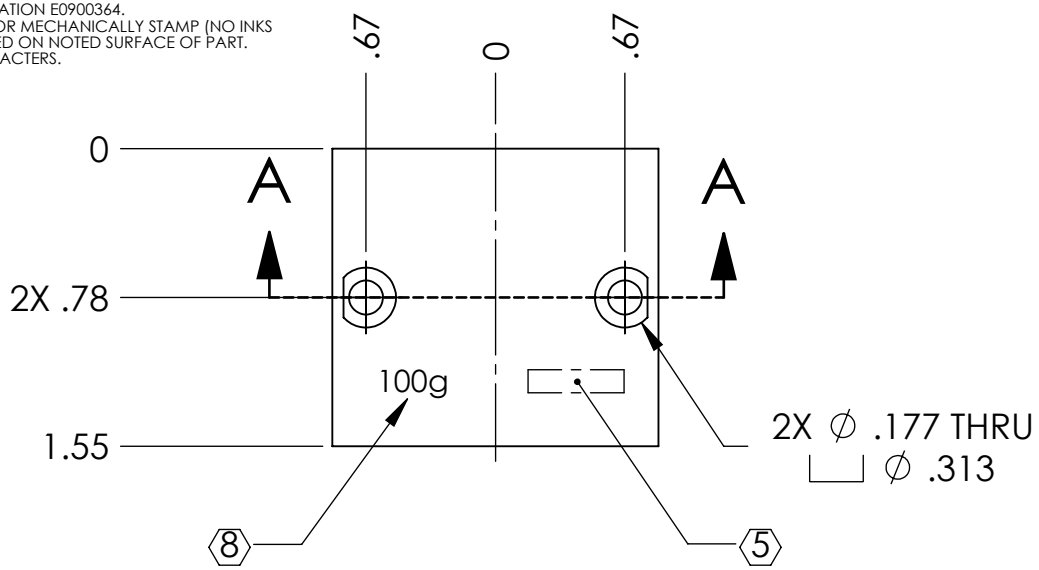
SIZE: B **DWG. NO.:** D080124 **REV.:** v3
SCALE: 2:1 **PROJECTION:** **SHEET** 1 OF 1

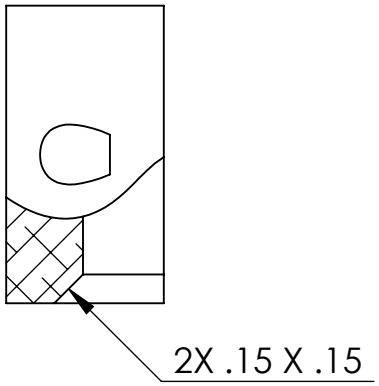
D080124_Advanced_LIGO_SUS_HLTS_Prism_Breakoff_Lower_Wire_Test_Mass, PART PDM REV: V2, DRAWING PDM REV: V2-001

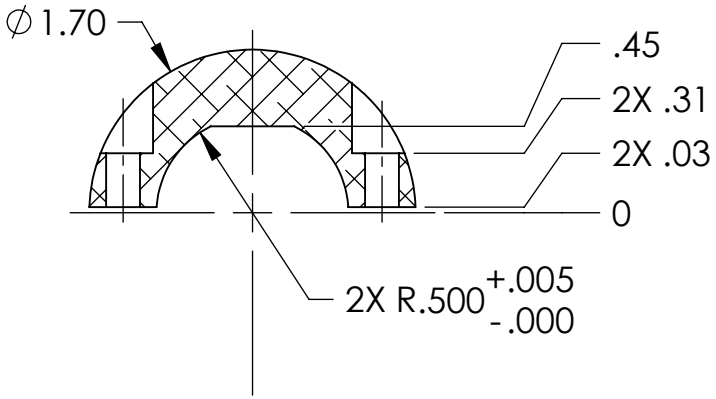
NOTES CONTINUED:

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

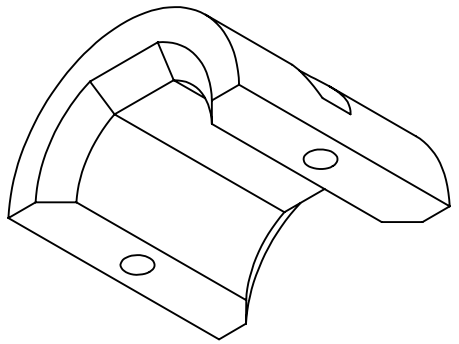
REV.	DATE	DCN #	DRAWING TREE #
v1	22 JUN 2009	E0900173	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-







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

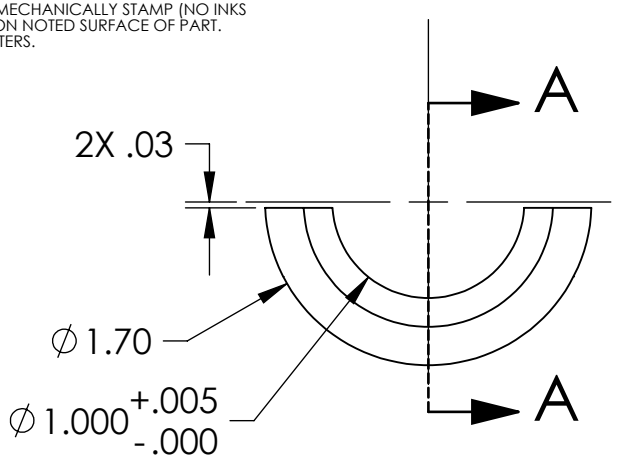
SCALE: 1:1 | **PROJECTION**: | SHEET 1 OF 1

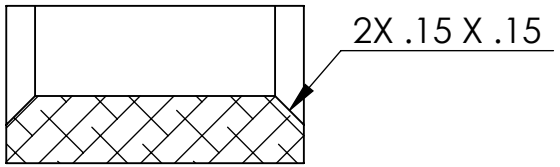
D080182_Advanced_LIGO_SUS_HLTS_Collar,_Upper,_100g,_Intermediate_Mass, PART PDM REV: V1, DRAWING PDM REV: V1-003

NOTES CONTINUED:

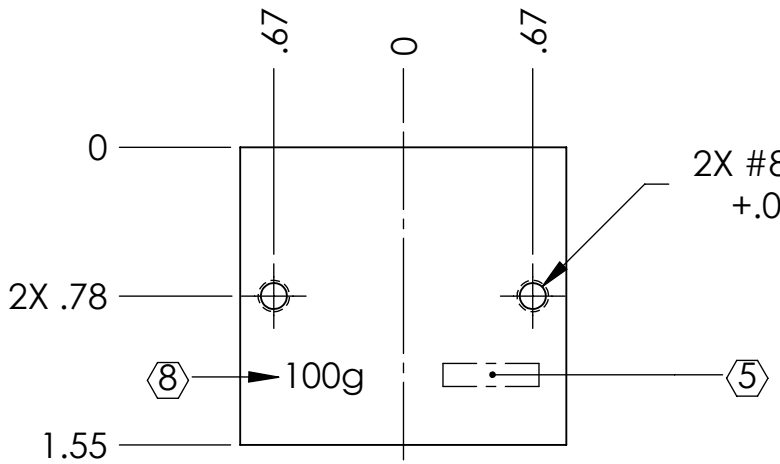
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 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. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

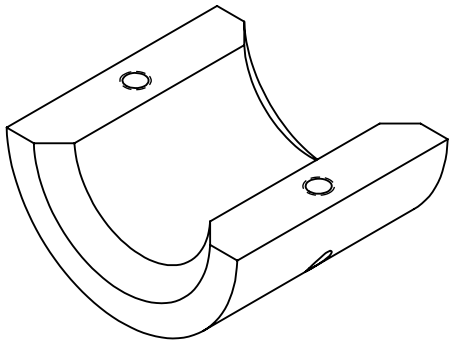
REV.	DATE	DCN #	DRAWING TREE #
v1	22 JUN 2009	E0900173	E080191
v1	28 JUN 2010	E1000236	E080191
-	-	-	-





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	
DRAFTER	R. BIEDENHARN	29 OCT 2010	
CHECKER	D. BRIDGES	04 NOV 2010	
APPROVAL			

SIZE A **DWG. NO.** D080183 **REV.** v2

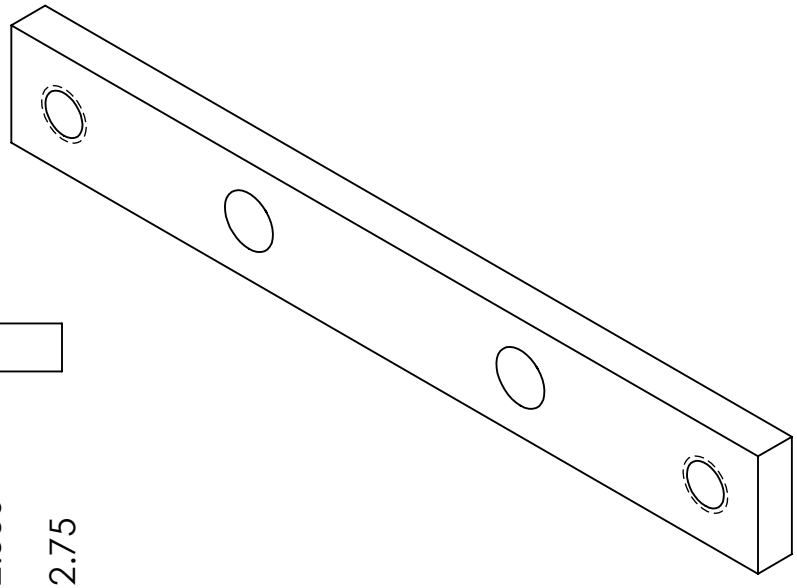
SCALE: 1:1 **PROJECTION:** SHEET 1 OF 1

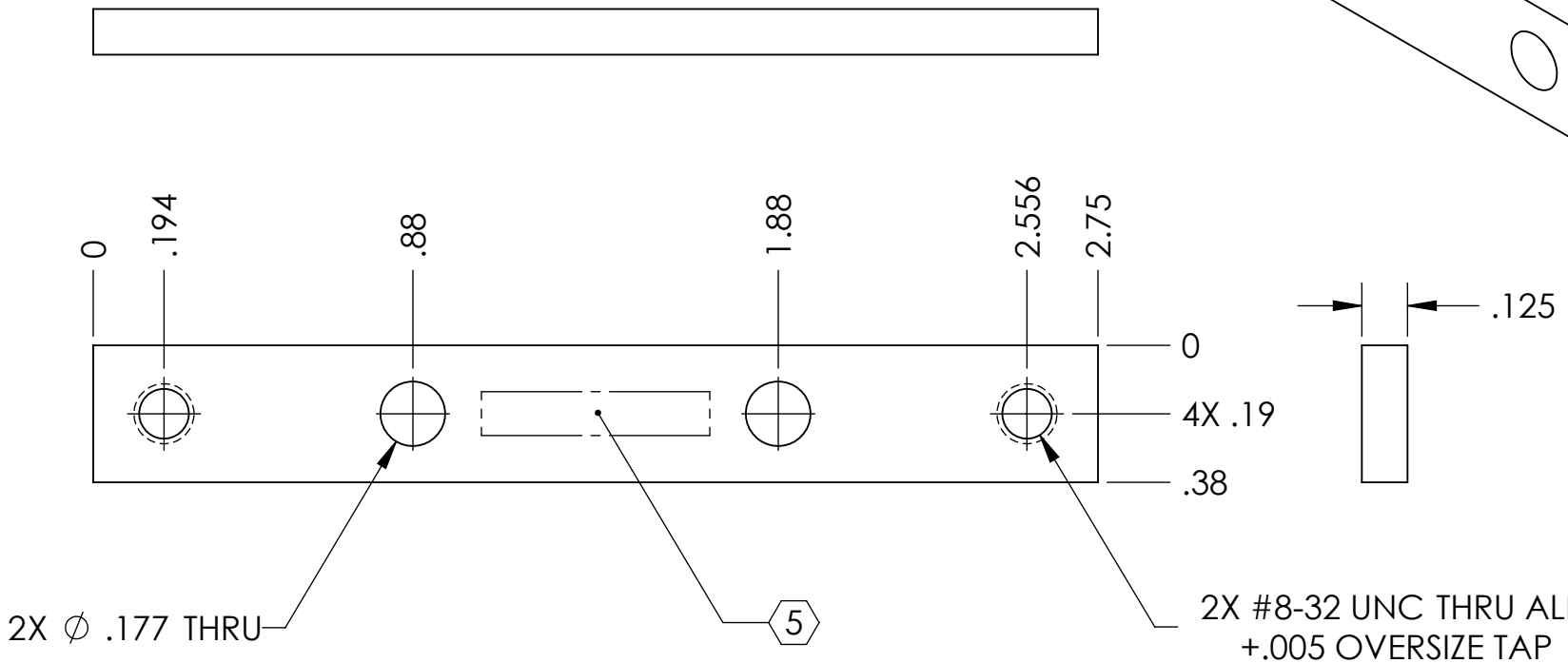
D080183_Advanced_LIGO_SUS_HLTS_Collar,_Lower,_100g,_Intermediate_Mass, PART PDM REV: V1, DRAWING PDM REV: V1-001

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: 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.

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 SSTL

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 GUARD, LOWER BLADE

DESIGNER	D. BRIDGES	07 JUL 2010
DRAFTER	D. BRIDGES	07 JUL 2010
CHECKER	C. TORRIE	09 JUL 2010
APPROVAL		

SIZE A **DWG. NO.** D080221 **REV.** v2

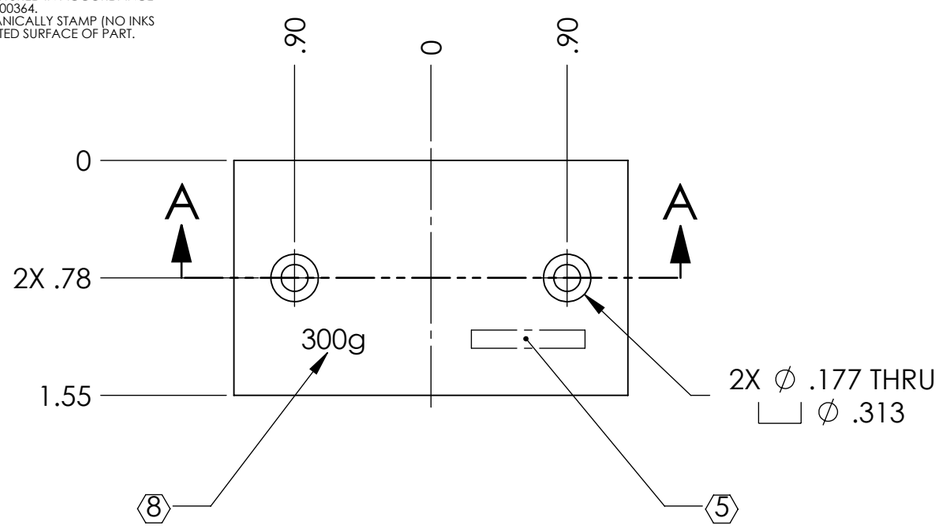
SCALE: 2:1 **PROJECTION:** SHEET 1 OF 1

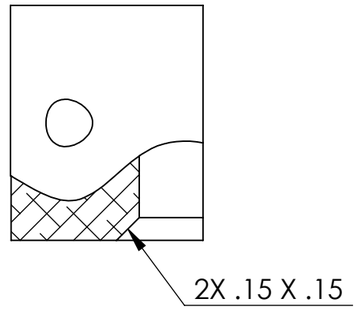
D080221_Advanced_LIGO_SUS_HLTS_Guard,_Lower_Blade, PART PDM REV: V1-001, DRAWING PDM REV: V1-000

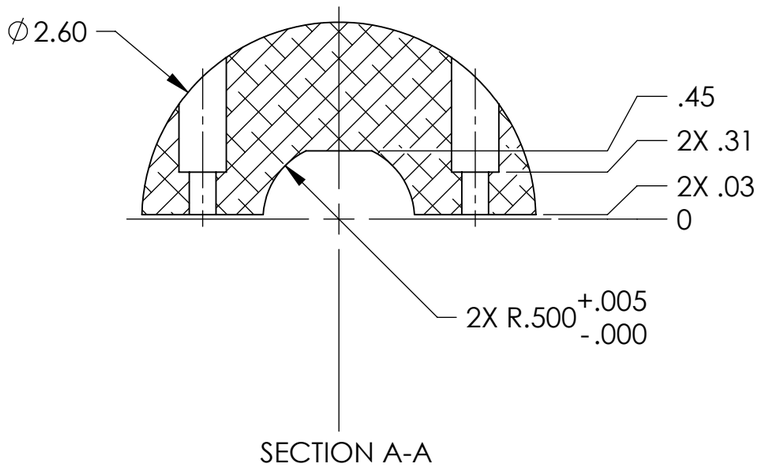
REV.	DATE	DCN #	DRAWING TREE #
v1	22 JUN 2009	E0900173	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-

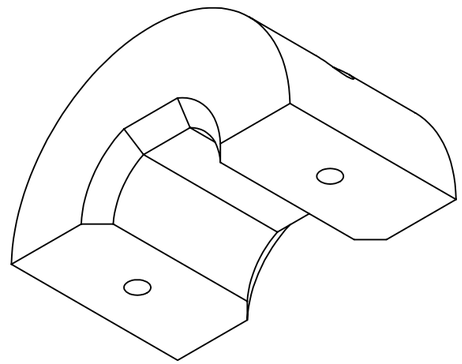
NOTES CONTINUED:

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









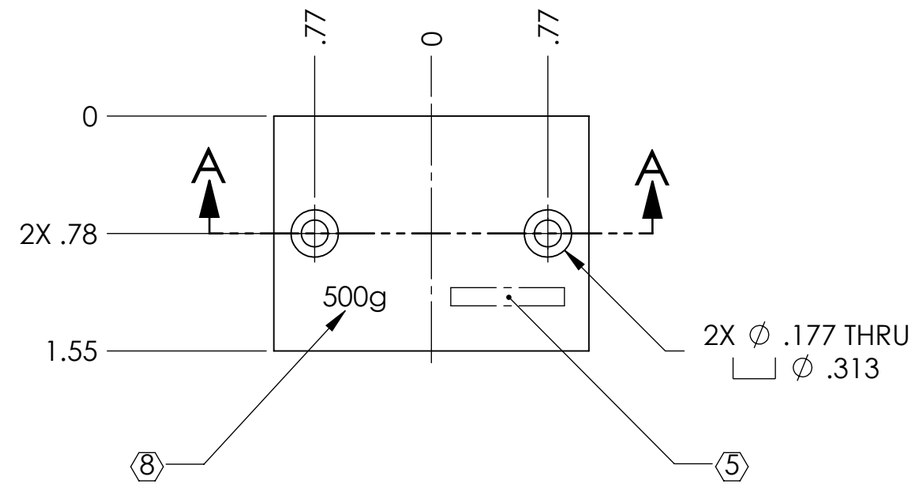
NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)										
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.5°	1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER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

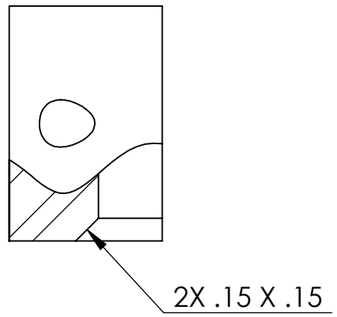
D080223_Advanced_LIGO_SUS_HLTS_Collar_Upper_300g_Intermediate_Mass, PART PDM REV: V1-002, DRAWING PDM REV: V1-001

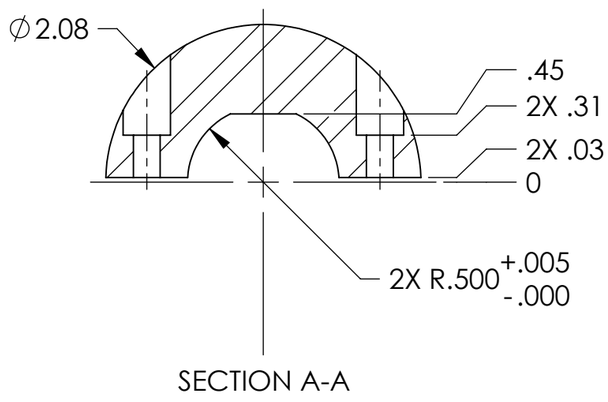
NOTES CONTINUED:

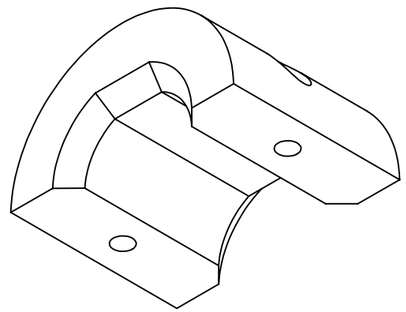
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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









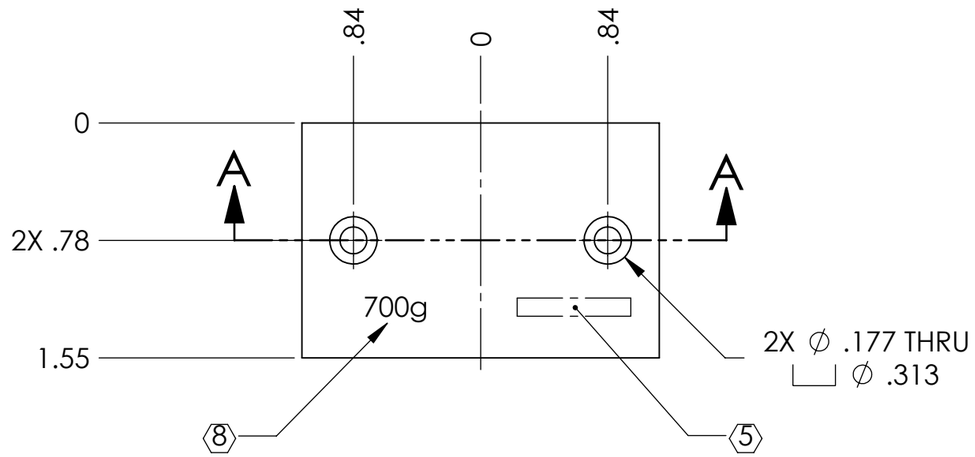
NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)										
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.5°	1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME: COLLAR, UPPER, 500g					
	MATERIAL: 304 SSTL	FINISH: 32 µinch	SYSTEM: ADVANCED LIGO	SUB-SYSTEM: SUS	DESIGNER: D. BRIDGES	28 AUG 2008	SIZE: B	DWG. NO.: D080225		REV.: v2
			NEXT ASSY: INT. MASS CHANGER		DRAFTER: R. BIEDENHARN	29 OCT 2010				
					CHECKER: D. BRIDGES	04 NOV 2010				
					APPROVAL		SCALE: 1:1	PROJECTION:	SHEET 1 OF 1	

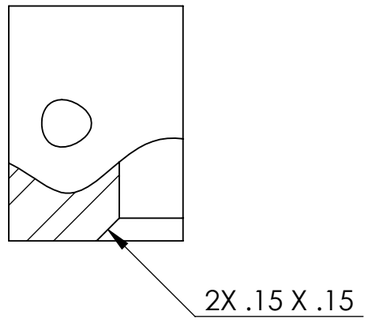
D080225_Advanced_LIGO_SUS_HLTS_Collar,_Upper,_500g,_Intermediate_Mass, PART PDM REV: V1-001, DRAWING PDM REV: V1-001

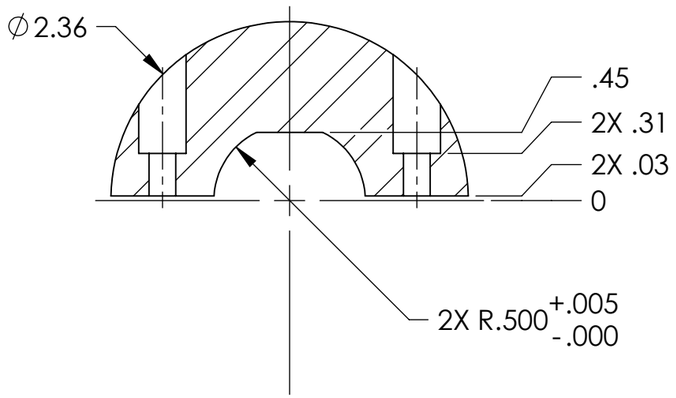
REV.	DATE	DCN #	DRAWING TREE #
v1	22 JUN 2009	E0900173	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-

NOTES CONTINUED:

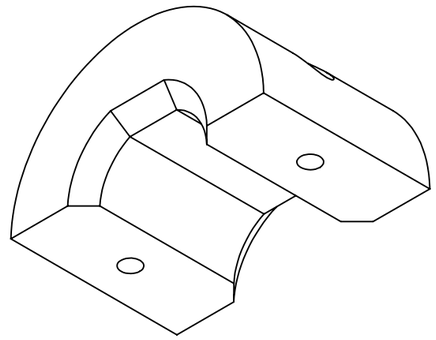
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 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. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.







SECTION A-A



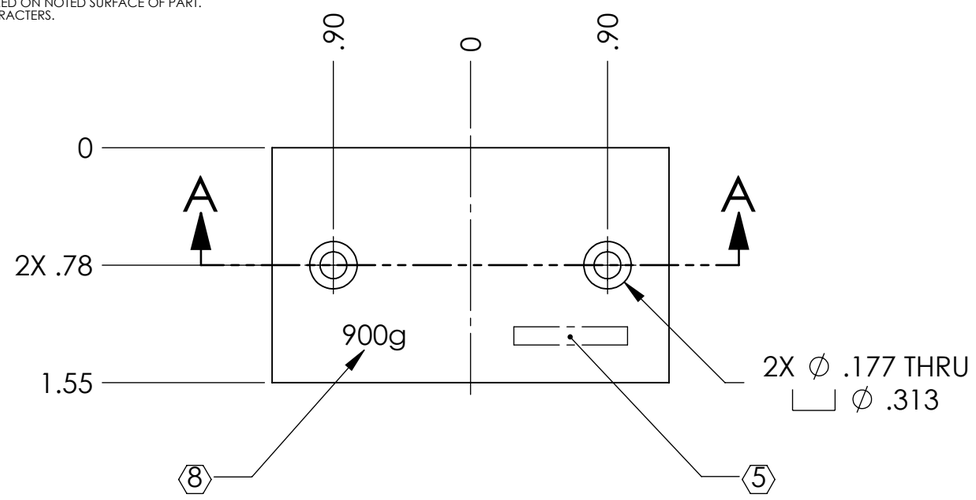
NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)										
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.5°	1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME: COLLAR, UPPER, 700g					
	MATERIAL: 304 SSTL	FINISH: 32 µinch	SYSTEM: ADVANCED LIGO	SUB-SYSTEM: SUS	DESIGNER	D. BRIDGES	28 AUG 2008	SIZE: B	DWG. NO.: D080227	REV.: v2
			NEXT ASSY: INT. MASS CHANGER		DRAFTER	R. BIEDENHARN	29 OCT 2010			
					CHECKER	D. BRIDGES	04 NOV 2010			
					APPROVAL			SCALE: 1:1	PROJECTION:	SHEET 1 OF 1

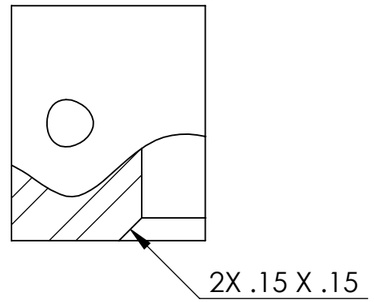
D080227_Advanced_LIGO_SUS_HLTS_Collar_Upper_700g_Intermediate_Mass, PART PDM REV: V1-001, DRAWING PDM REV: V1-002

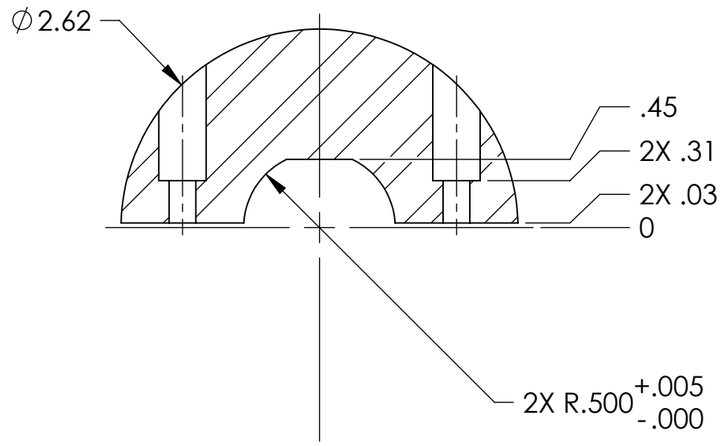
NOTES CONTINUED:

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

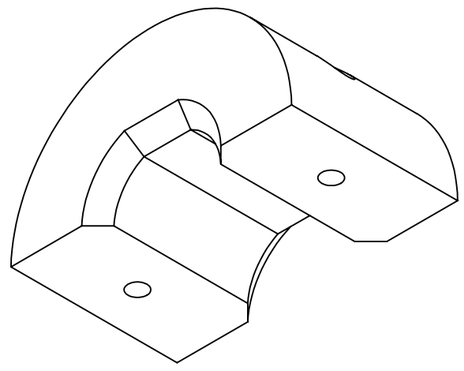
REV.	DATE	DCN #	DRAWING TREE #
v1	22 JUN 2009	E0900173	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-







SECTION A-A



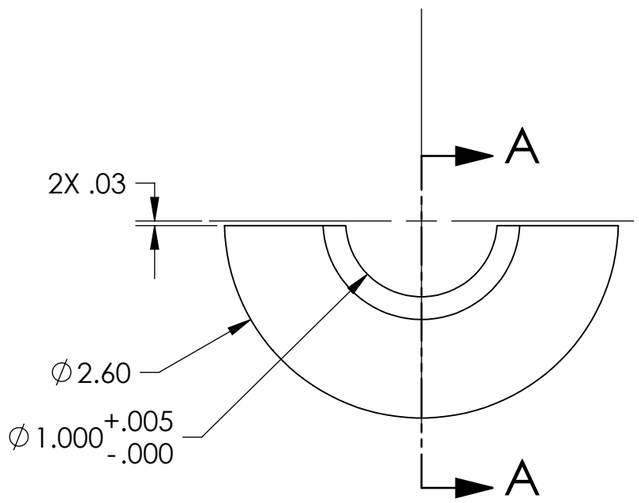
NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)										
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.5°	1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.			CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME: COLLAR, UPPER, 900g				
	MATERIAL: 304 SSTL	FINISH: 32 µinch		SYSTEM: ADVANCED LIGO	SUB-SYSTEM: SUS	DESIGNER: D. BRIDGES	28 AUG 2008	SIZE: B	DWG. NO.: D080229	REV.: v2
				NEXT ASSY: INT. MASS CHANGER		DRAFTER: R. BIEDENHARN	29 OCT 2010			
						CHECKER: D. BRIDGES	04 NOV 2010			
						APPROVAL		SCALE: 1:1	PROJECTION:	SHEET 1 OF 1

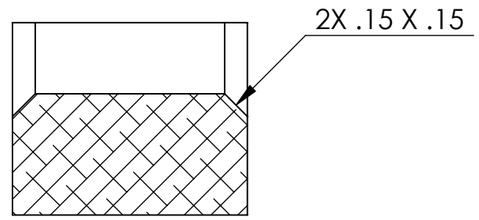
D080229_Advanced_LIGO_SUS_HLTS_Collar_Upper_900g_Intermediate_Mass, PART PDM REV: V1-001, DRAWING PDM REV: V1-001

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

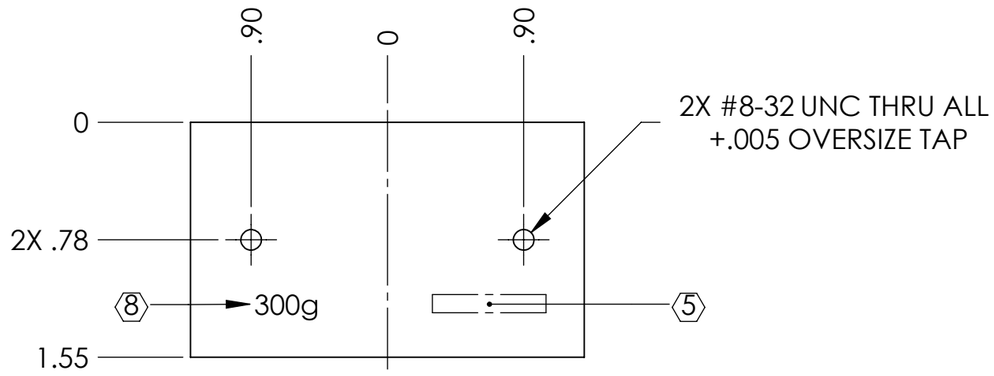
NOTES CONTINUED:

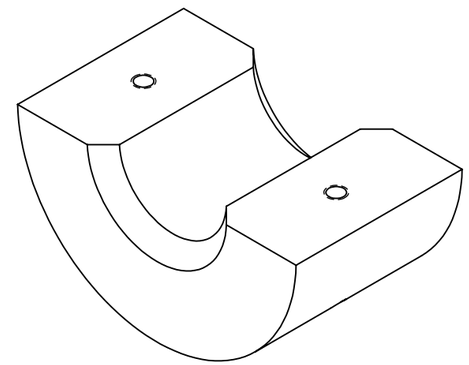
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 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. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.





SECTION A-A





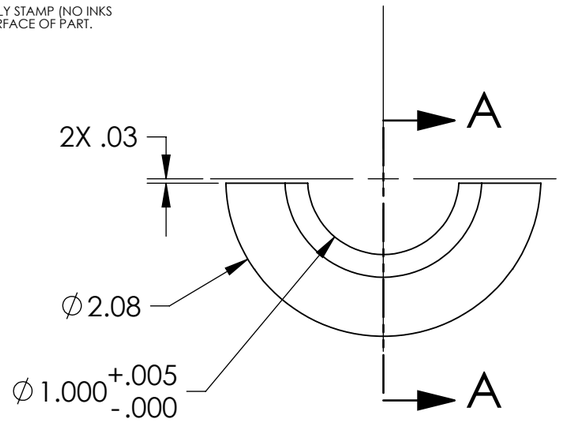
D080232_Advanced_LIGO_SUS_HLTS_Collar_Lower_300g_Intermediate_Mass, PART PDM REV: V1, DRAWING PDM REV: V1-001

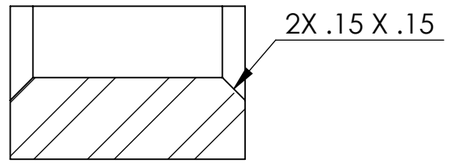
NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)									
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.1°	1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER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

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

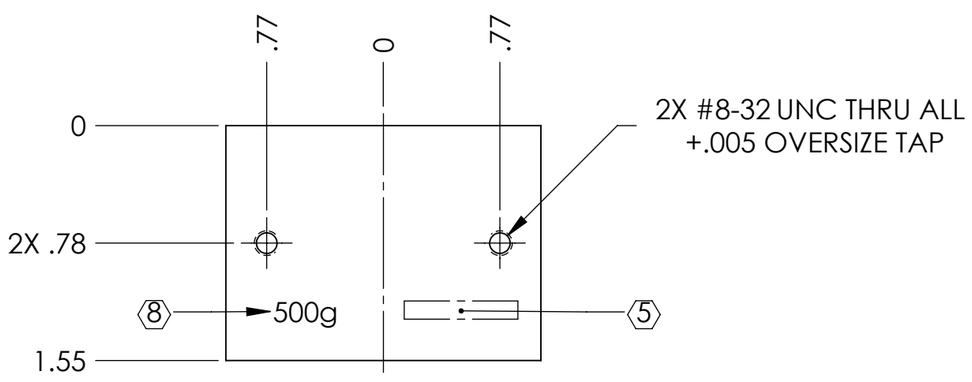
NOTES CONTINUED:

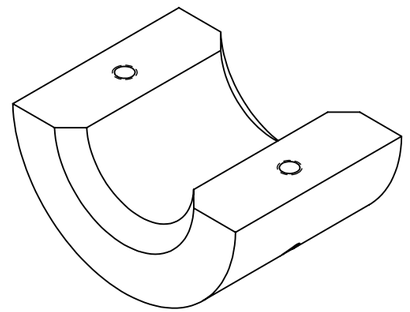
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 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. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.





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: 304 SSTL	FINISH: 32 µinch	

LIGO — CALIFORNIA INSTITUTE OF TECHNOLOGY, MASSACHUSETTS INSTITUTE OF TECHNOLOGY

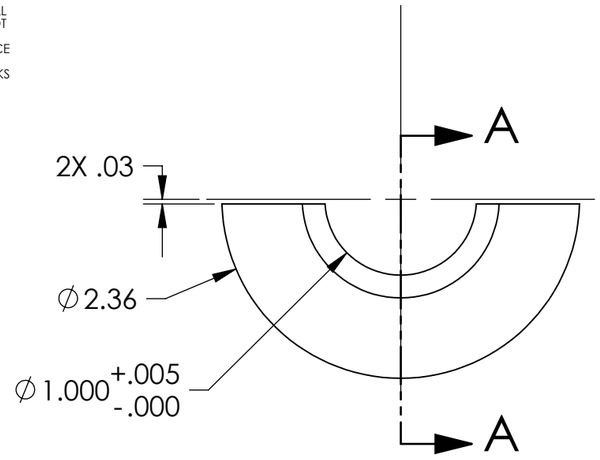
SYSTEM: ADVANCED LIGO	SUB-SYSTEM: SUS	PART NAME: COLLAR, LOWER, 500g					
NEXT ASSY: INT. MASS CHANGER		DESIGNER	D. BRIDGES	29 AUG 2008	SIZE: B	DWG. NO.: D080234	REV.: v2
		DRAFTER	R. BIEDENHARN	29 OCT 2010			
		CHECKER	D. BRIDGES	04 NOV 2010			
		APPROVAL			SCALE: 1:1	PROJECTION:	SHEET 1 OF 1

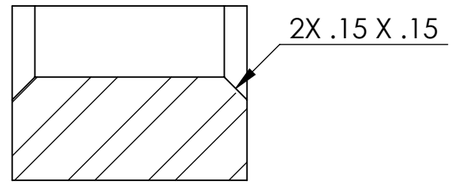
D080234_Advanced_LIGO_SUS_HLTS_Collar_Lower_500g_Intermediate_Mass, PART PDM REV: V1, DRAWING PDM REV: V1-001

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

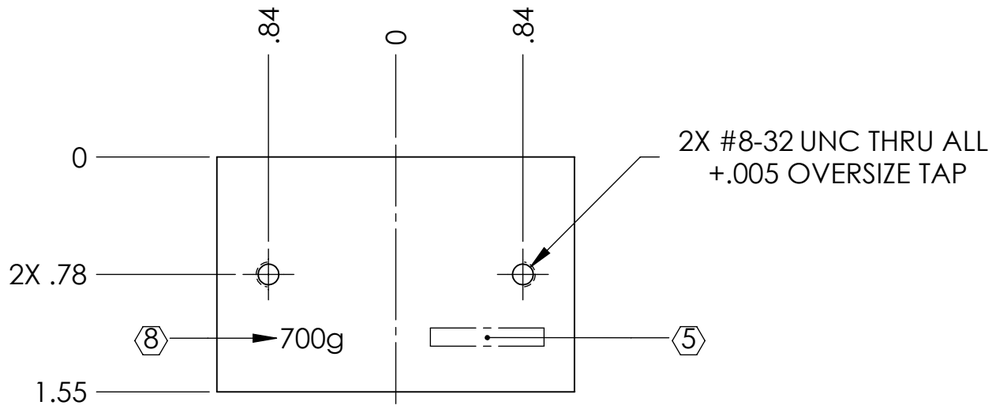
NOTES CONTINUED:

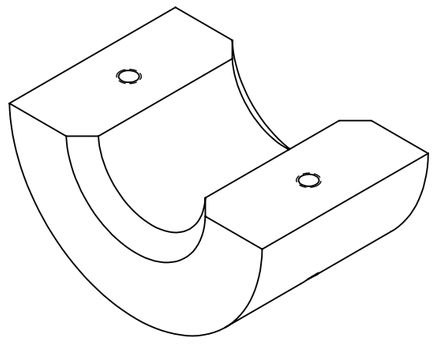
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 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. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.





SECTION A-A





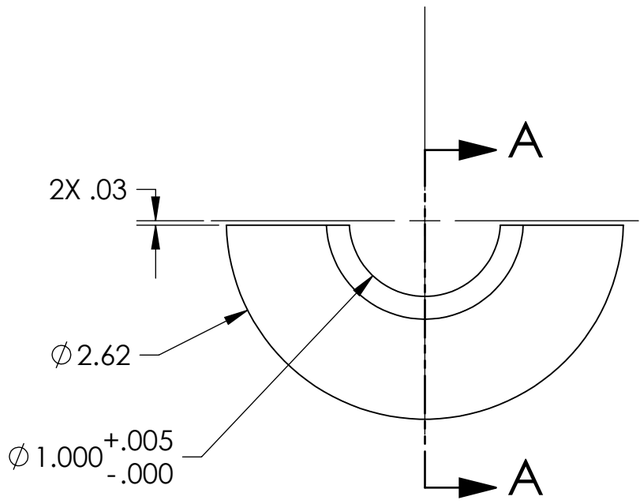
NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)							
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.5°	1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER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

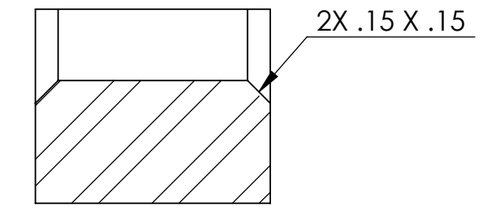
D080236_Advanced_LIGO_SUS_HLTS_Collar,_Lower,_700g,_Intermediate_Mass, PART PDM REV: V1, DRAWING PDM REV: V1-001

NOTES CONTINUED:

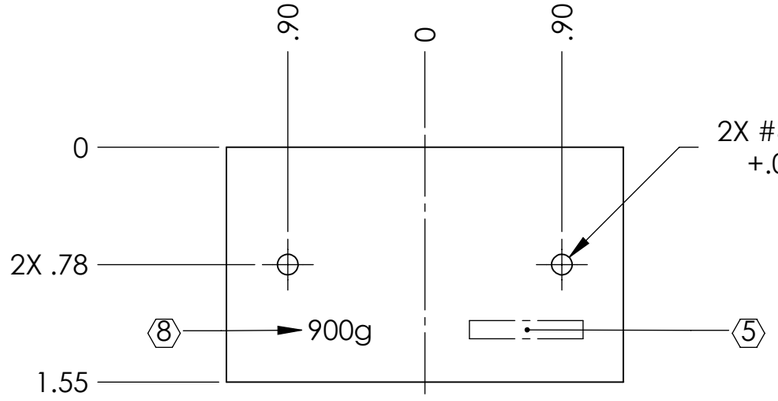
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
   EXAMPLE: 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. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) AS MARKED ON NOTED SURFACE OF PART. USE .12" HIGH CHARACTERS.

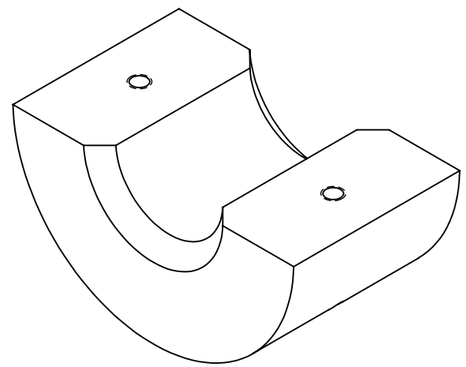
REV.	DATE	DCN #	DRAWING TREE #
v1	22 JUN 2009	E0900173	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-





SECTION A-A





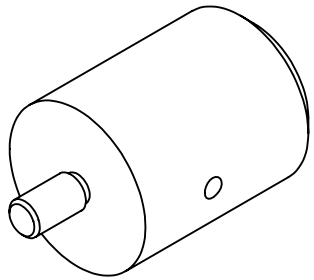
NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)									
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.5°	1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER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

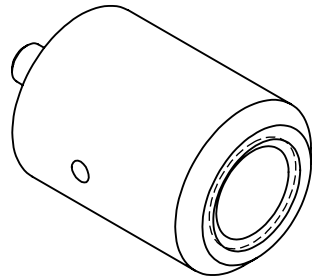
D080238_Advanced_LIGO_SUS_HLTS_Collar_Lower_900g_Intermediate_Mass, PART PDM REV: V1-001, DRAWING PDM REV: V1-000

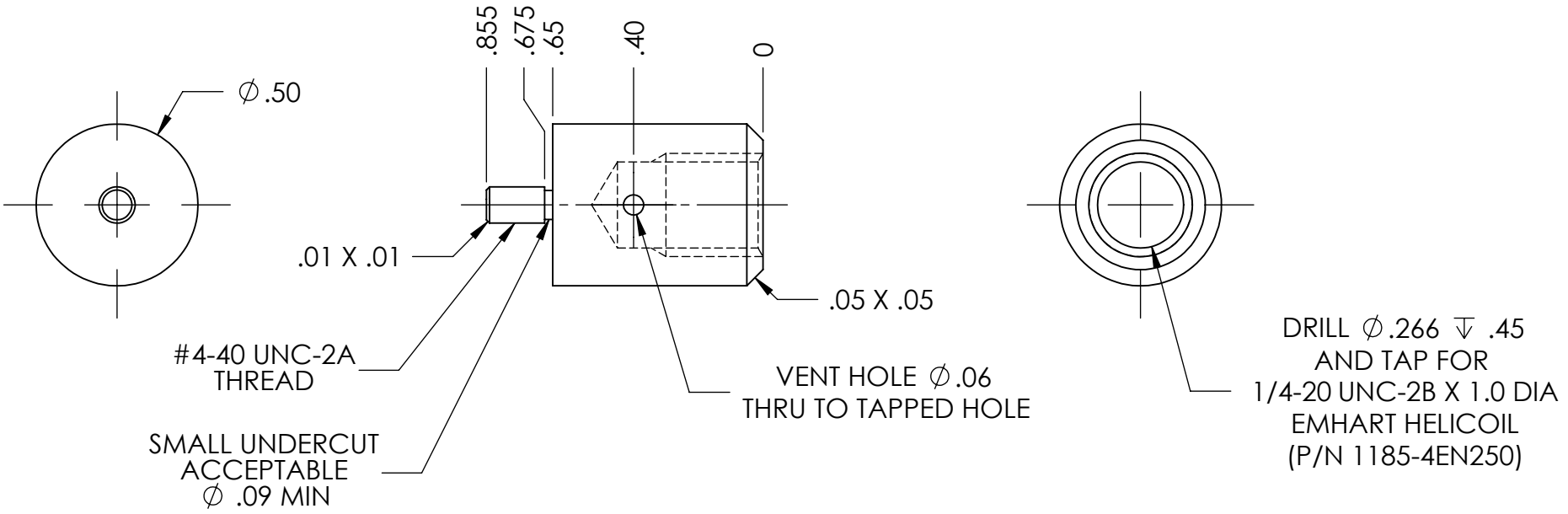
NOTES CONTINUED:

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.
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	-







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 SSTL

FINISH 63 µinch

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
APPROVAL		

SIZE A **DWG. NO.** D080724 **REV.** v3

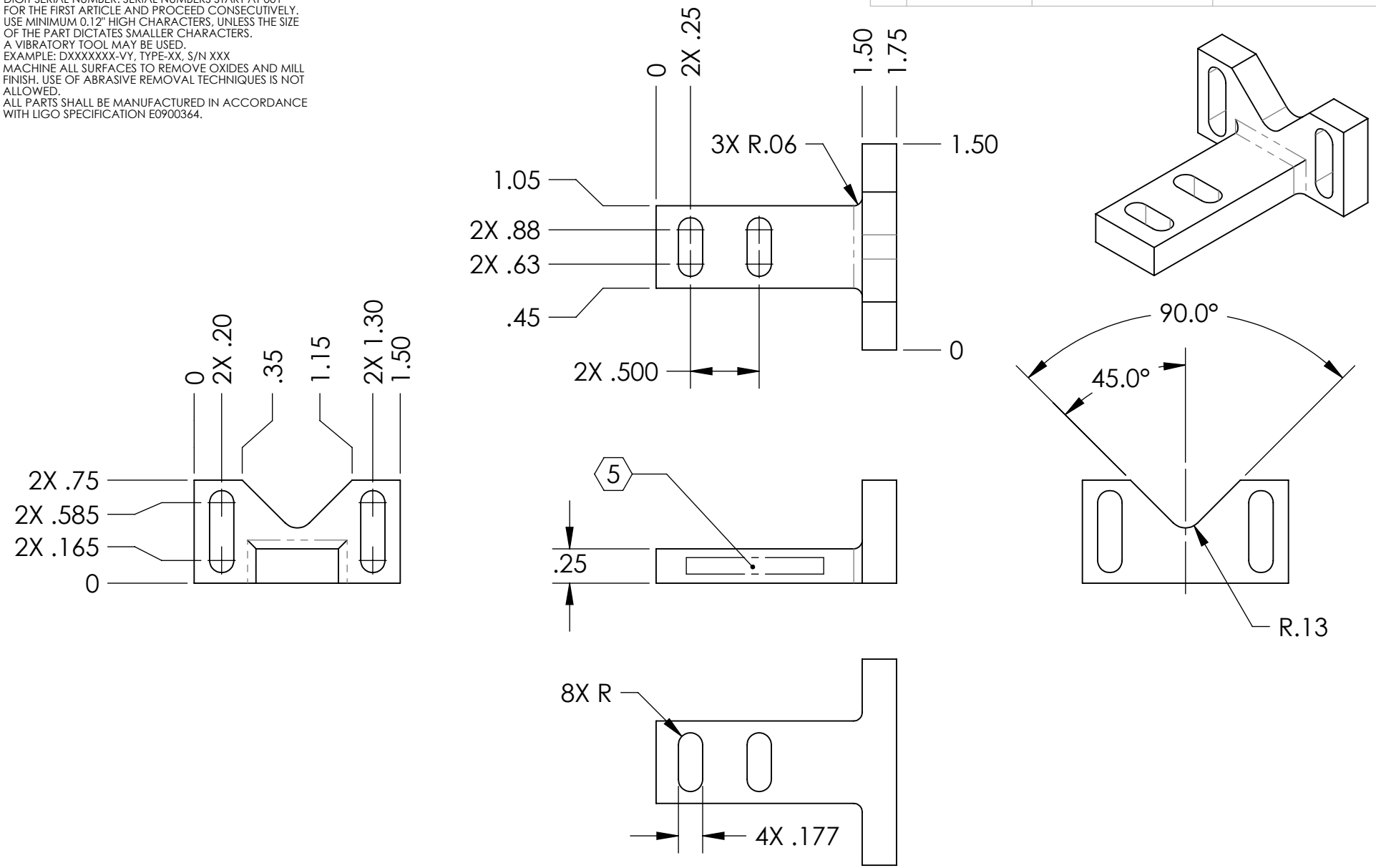
SCALE: 2:1 **PROJECTION:** SHEET 1 OF 1

D080724_Advanced_LIGO_Mounting_Cap,_Earthquake_Stop, PART PDM REV: V2, DRAWING PDM 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: 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.

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 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, BOTTOM MASS

PART NAME LOWER AOSEM MOUNTING BRACKET, BOTTOM MASS

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

SIZE A **DWG. NO.** D0900340 **REV.** v2

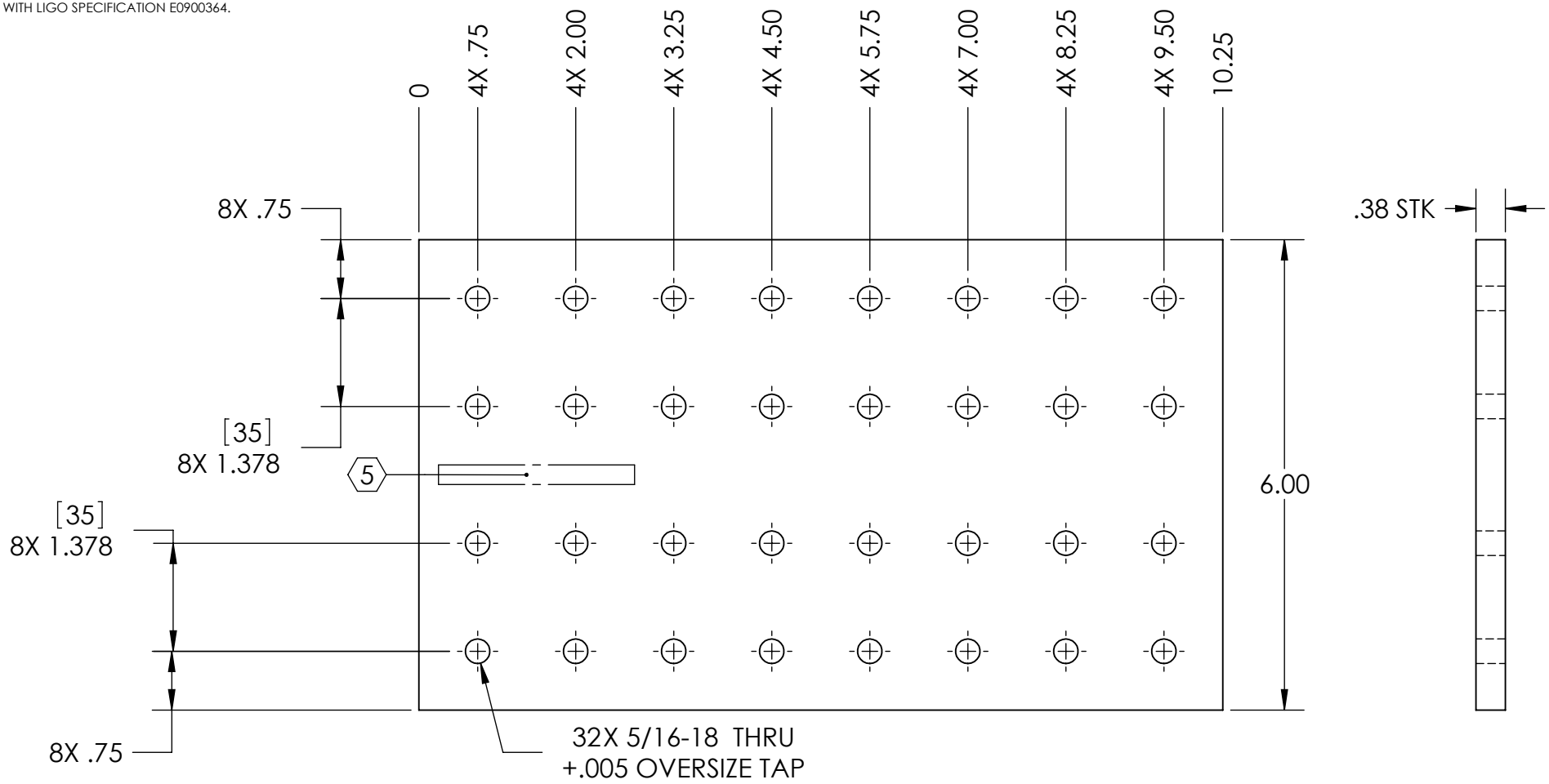
SCALE: 1:1 **PROJECTION:** SHEET 1 OF 1

D0900340_Advanced_LIGO_SUS_HLTS_Lower_AOSEM_Mounting_Bracket,_Test_Mass, 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: 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.

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]

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

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
DRAFTER	D. BRIDGES	06 JUL 2010
CHECKER	M. MEYER	07 JUL 2010
APPROVAL		

SIZE A | **DWG. NO.** D0900666 | **REV.** v2

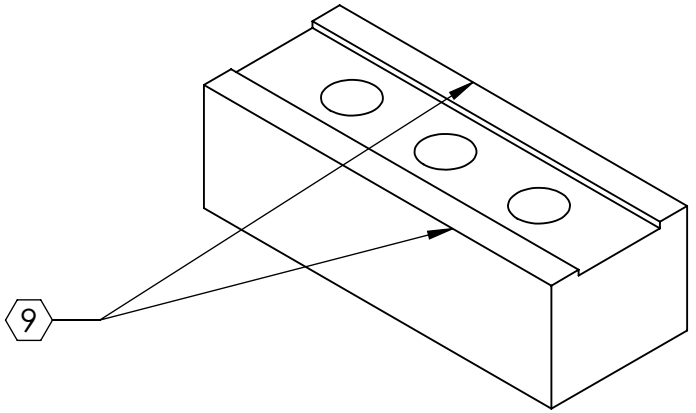
SCALE: 1:2 | **PROJECTION:** | SHEET 1 OF 1

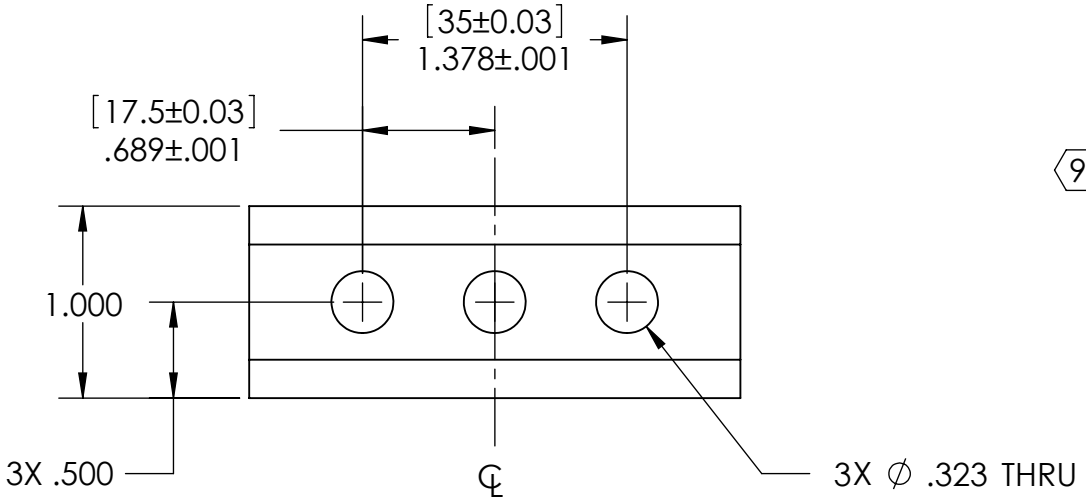
D0900666_Advanced_LIGO_SUS_HLTS_Base_Plate,_Library_of_Clamps,_Upper_Blade, PART PDM REV: V1-001, DRAWING PDM REV: V1-000

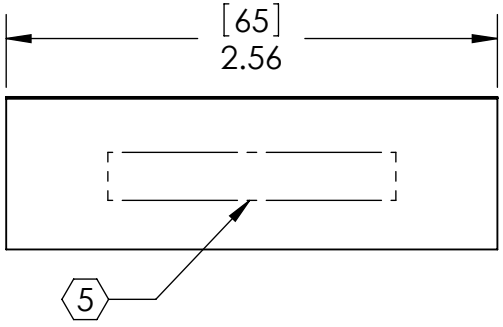
NOTES CONTINUED:

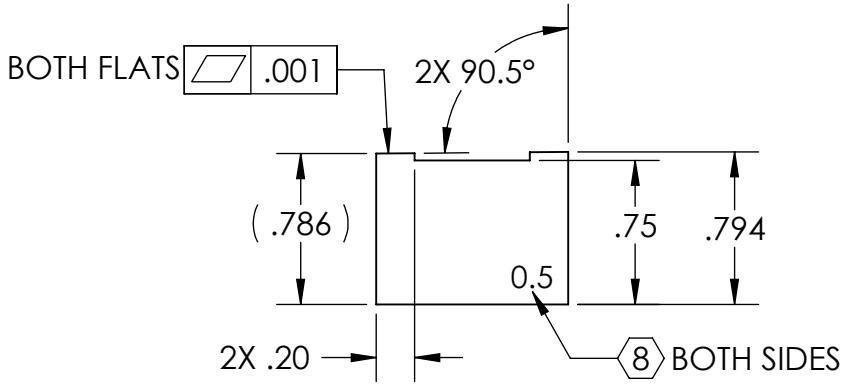
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

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, INSIDE

DESIGNER	D. BRIDGES	29 JUN 2010
DRAFTER	D. BRIDGES	29 JUN 2010
CHECKER	M. MEYER	30 JUN 2010
APPROVAL		

SIZE A **DWG. NO.** D0900667 **REV.** v2

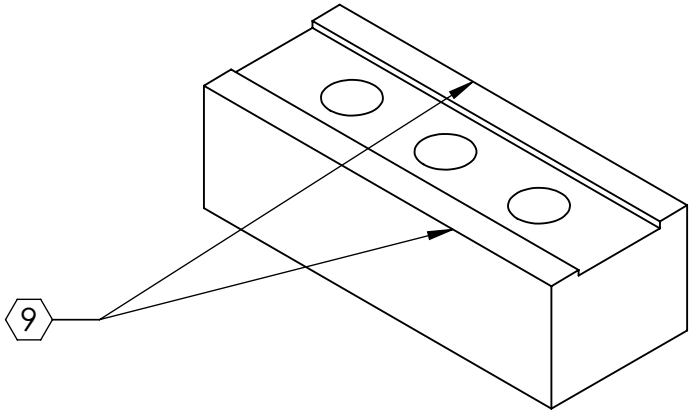
SCALE: 1:1 **PROJECTION:** SHEET 1 OF 1

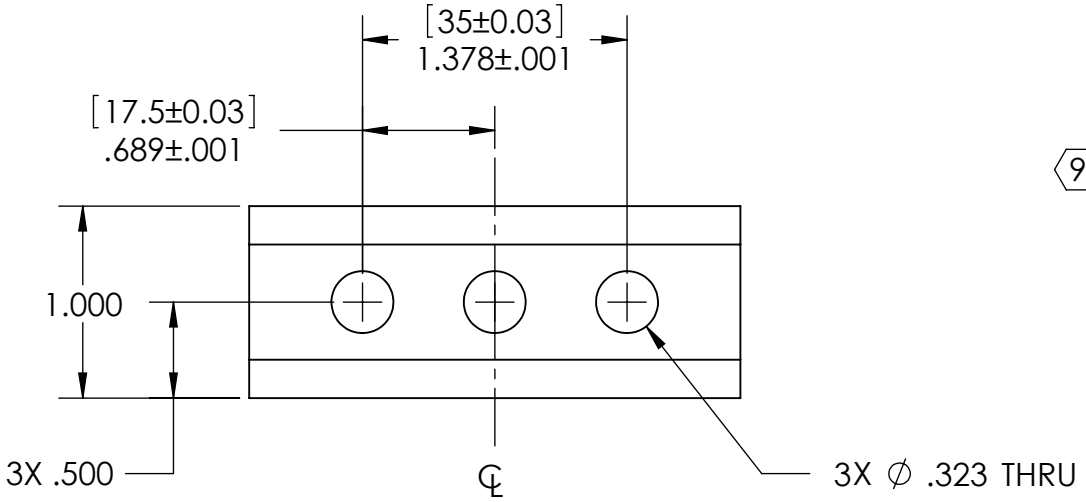
D0900667_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(0.5_Degree),_Upper_Blade,_Inside, PART PDM REV: V1-001, DRAWING PDM REV: V1-000

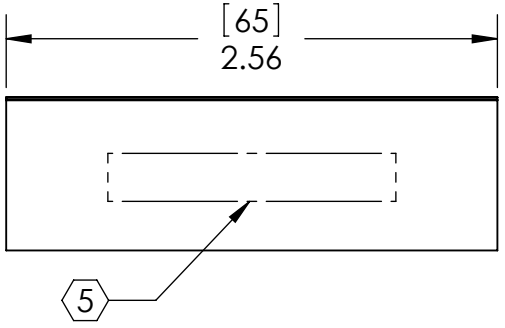
NOTES CONTINUED:

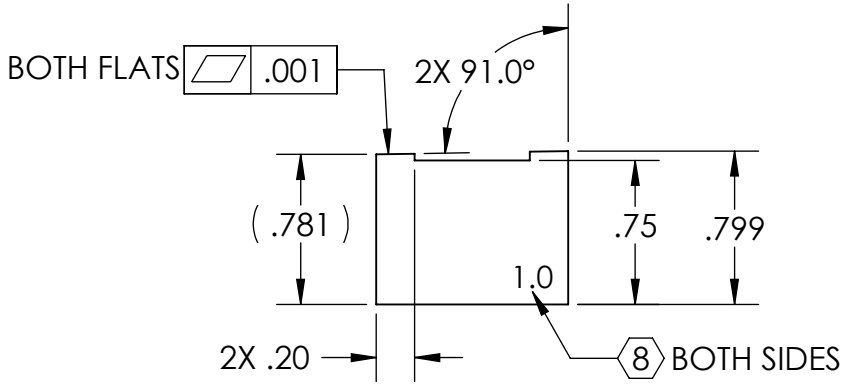
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

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 (1.0 DEGREE), UPPER BLADE, INSIDE

DESIGNER	D. BRIDGES	29 JUN 2010
DRAFTER	D. BRIDGES	29 JUN 2010
CHECKER	M. MEYER	30 JUN 2010
APPROVAL		

SIZE A **DWG. NO.** D0900668 **REV.** v2

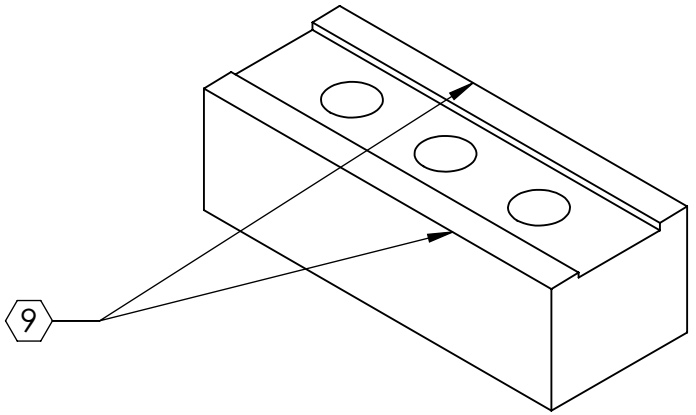
SCALE: 1:1 **PROJECTION:** SHEET 1 OF 1

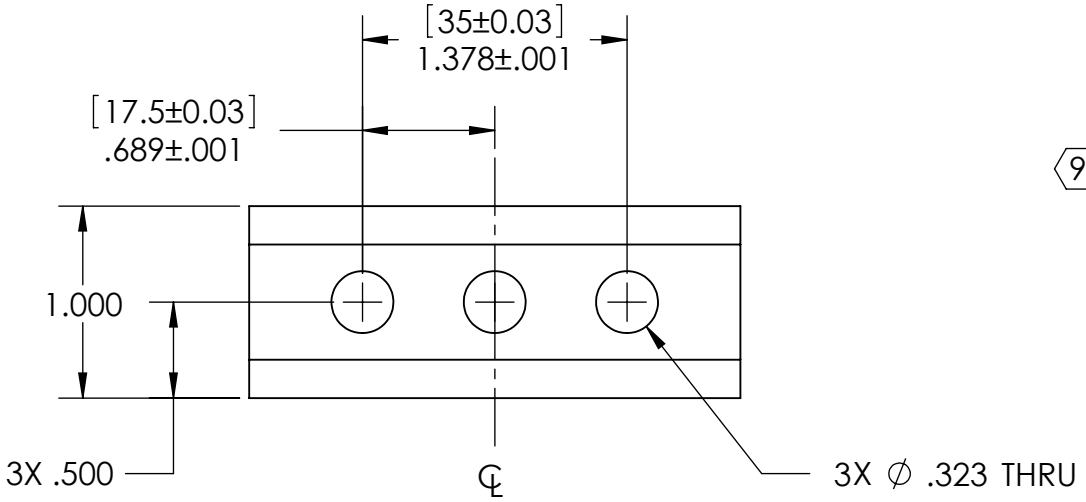
D0900668_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(1.0_Degree),_Upper_Blade,_Inside, PART PDM REV: V1-001, DRAWING PDM REV: V1-000

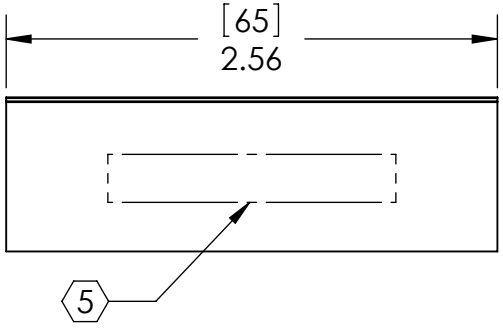
NOTES CONTINUED:

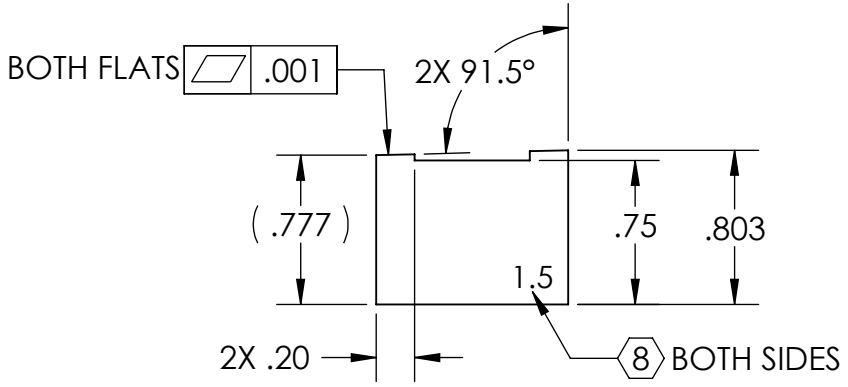
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

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, INSIDE

DESIGNER	D. BRIDGES	29 JUN 2010
DRAFTER	D. BRIDGES	29 JUN 2010
CHECKER	M. MEYER	30 JUN 2010
APPROVAL		

SIZE A | **DWG. NO.** D0900669 | **REV.** v2

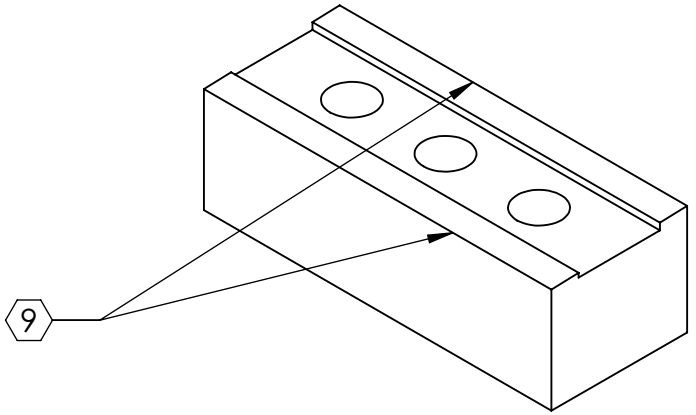
SCALE: 1:1 | **PROJECTION:** | SHEET 1 OF 1

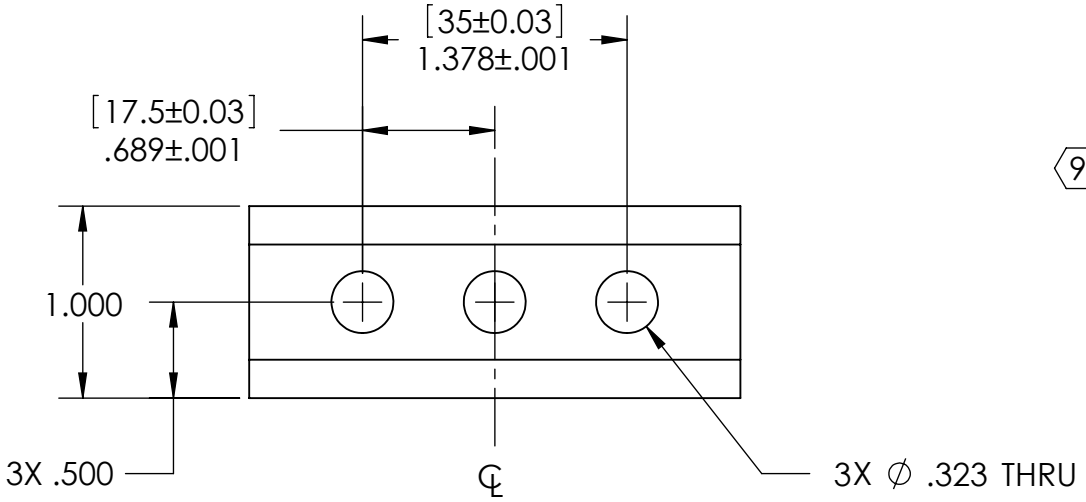
D0900669_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(1.5_Degree),_Upper_Blade,_Inside, PART PDM REV: V1-001, DRAWING PDM REV: V1-000

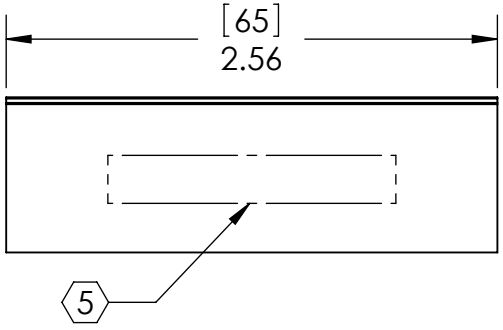
NOTES CONTINUED:

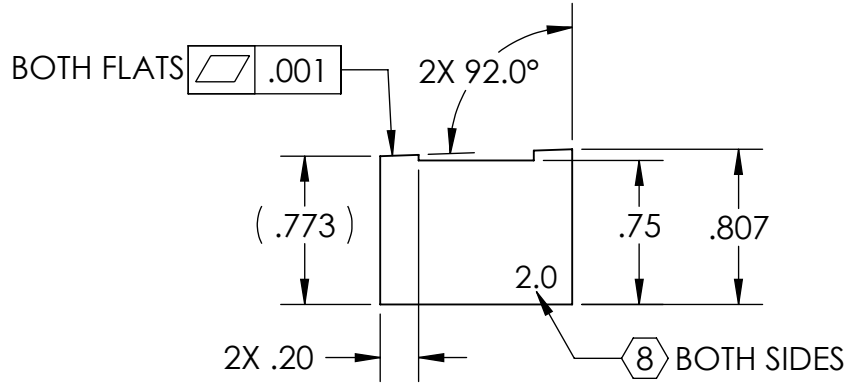
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

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, INSIDE

DESIGNER	D. BRIDGES	29 JUN 2010
DRAFTER	D. BRIDGES	29 JUN 2010
CHECKER	M. MEYER	30 JUN 2010
APPROVAL		

SIZE A | **DWG. NO.** D0900670 | **REV.** v2

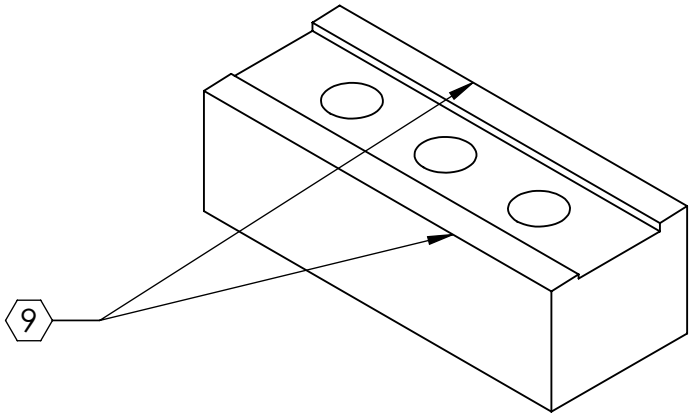
SCALE: 1:1 | **PROJECTION:** | SHEET 1 OF 1

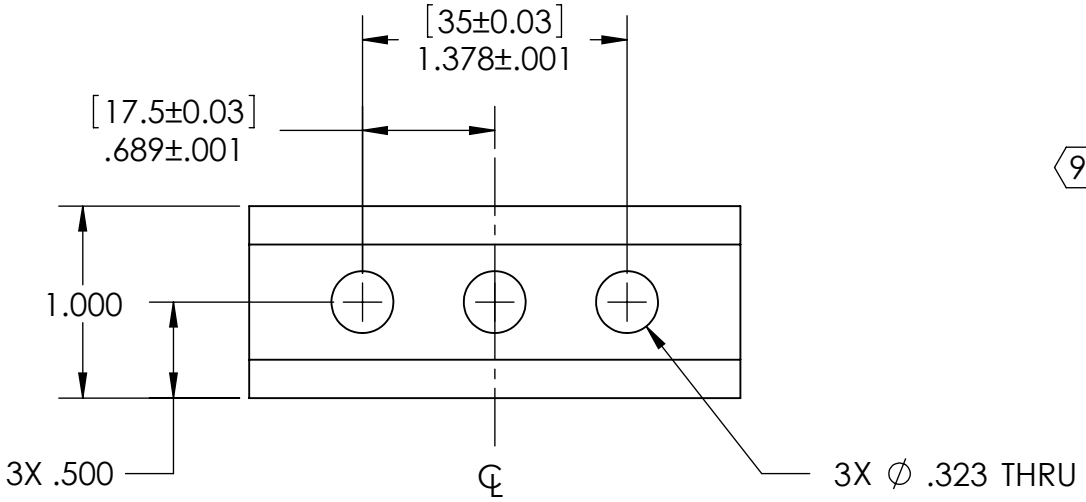
D0900670_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(2.0_Degree),_Upper_Blade,_Inside, PART PDM REV: V1-001, DRAWING PDM REV: V1-001

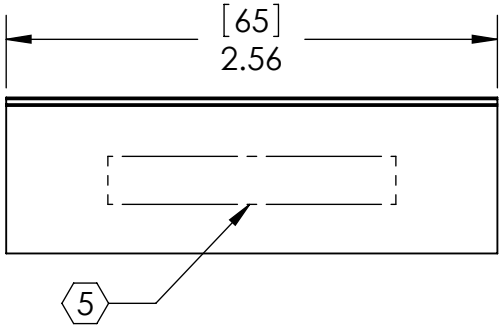
NOTES CONTINUED:

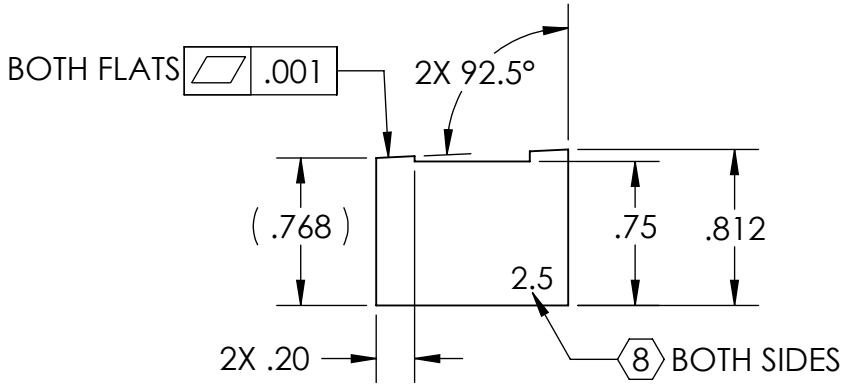
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

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, INSIDE

DESIGNER	D. BRIDGES	29 JUN 2010
DRAFTER	D. BRIDGES	29 JUN 2010
CHECKER	M. MEYER	30 JUN 2010
APPROVAL		

SIZE A **DWG. NO.** D0900671 **REV.** v2

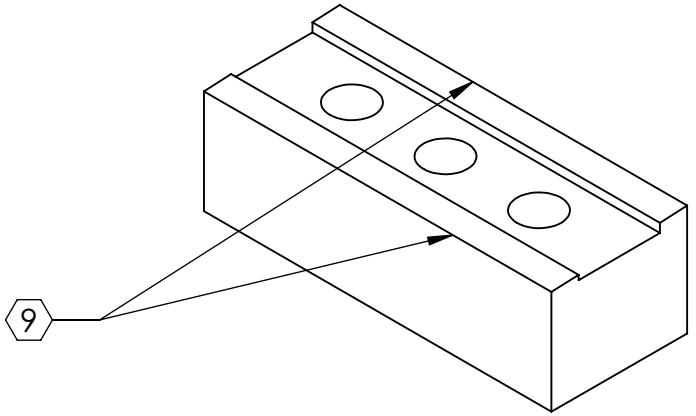
SCALE: 1:1 **PROJECTION:** SHEET 1 OF 1

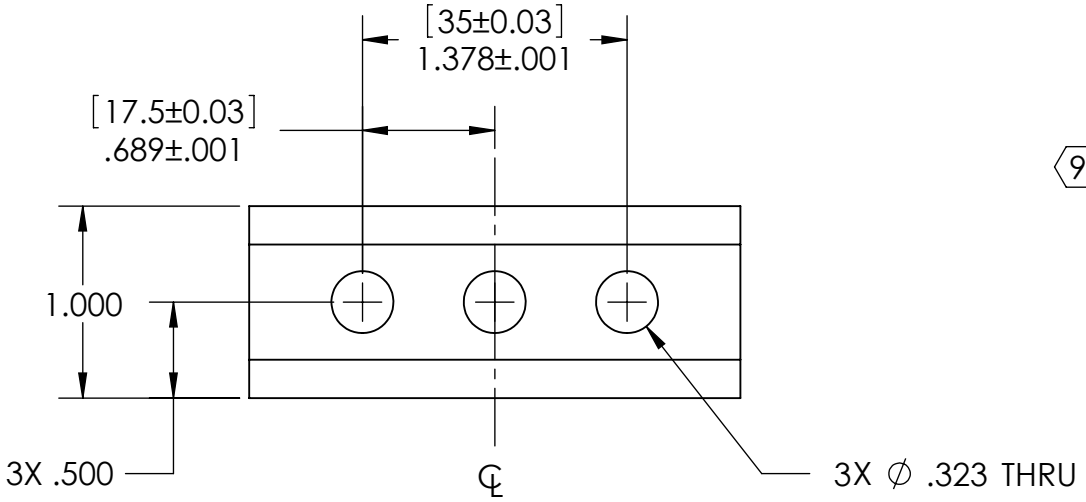
D0900671_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(2.5_Degree),_Upper_Blade,_Inside, PART PDM REV: V1-001, DRAWING PDM REV: V1-000

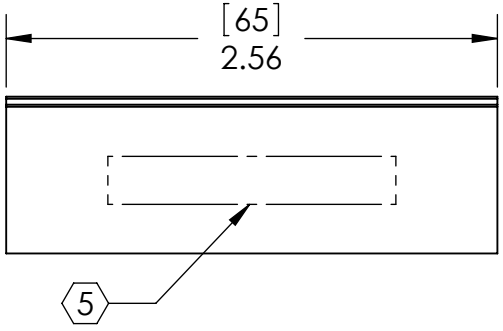
NOTES CONTINUED:

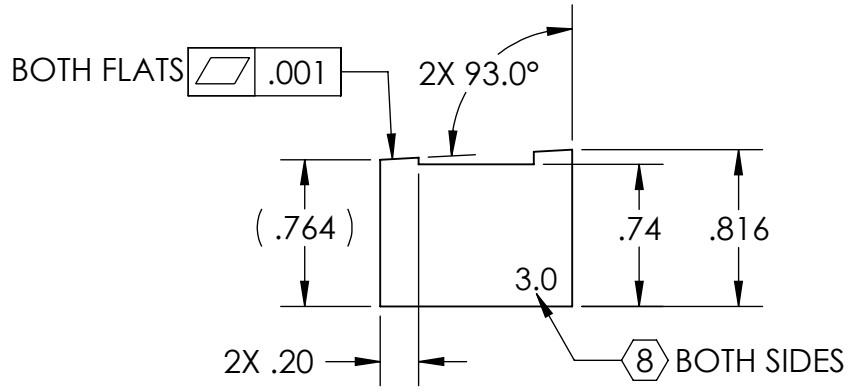
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

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 (3.0 DEGREE), UPPER BLADE, INSIDE

DESIGNER	D. BRIDGES	29 JUN 2010
DRAFTER	D. BRIDGES	29 JUN 2010
CHECKER	M. MEYER	30 JUN 2010
APPROVAL		

SIZE A | **DWG. NO.** D0900672 | **REV.** v2

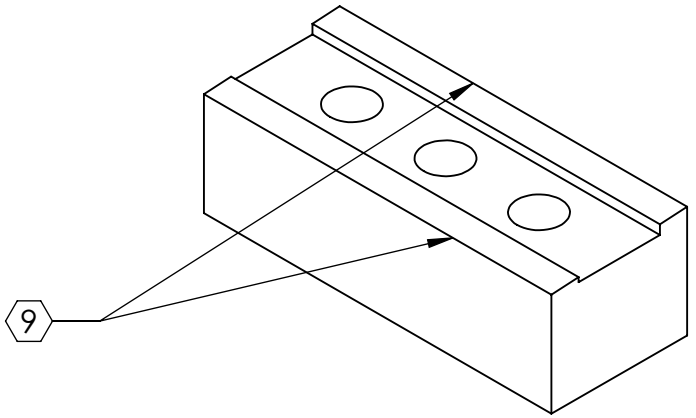
SCALE: 1:1 | **PROJECTION:** | SHEET 1 OF 1

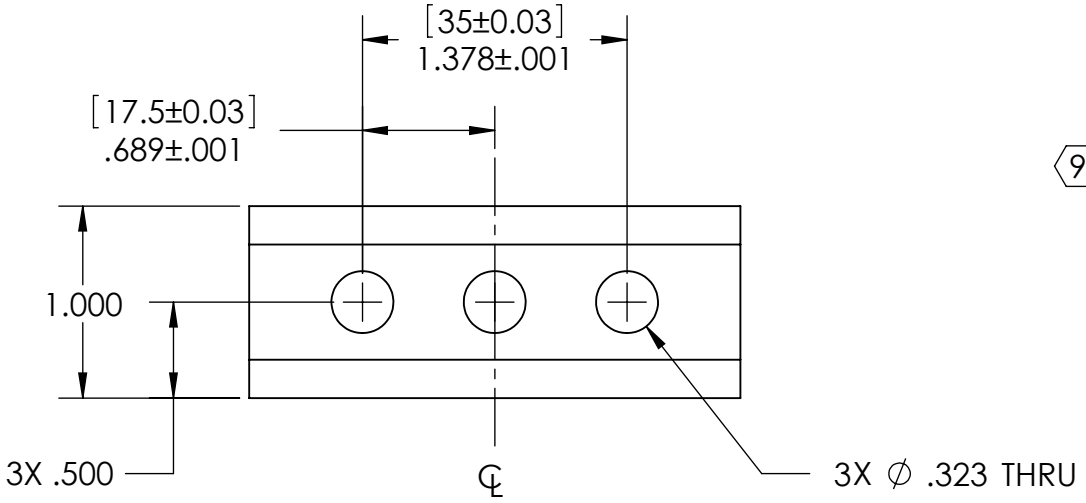
D0900672_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(3.0_Degree),_Upper_Blade,_Inside, PART PDM REV: V1-001, DRAWING PDM REV: V1-000

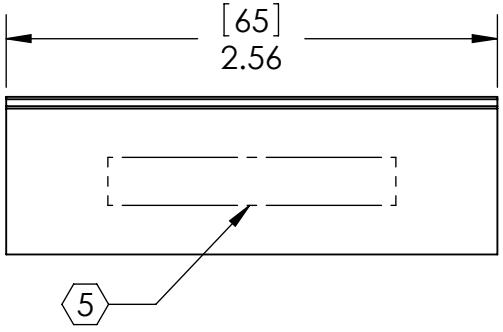
NOTES CONTINUED:

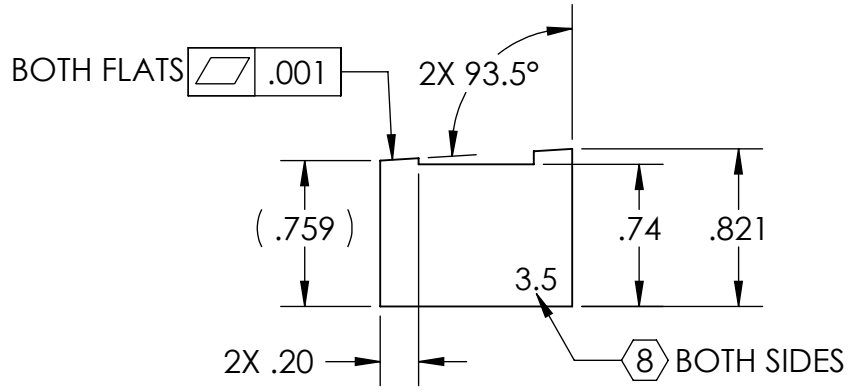
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

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 (3.5 DEGREE), UPPER BLADE, INSIDE

DESIGNER	D. BRIDGES	29 JUN 2010
DRAFTER	D. BRIDGES	29 JUN 2010
CHECKER	M. MEYER	30 JUN 2010
APPROVAL		

SIZE A | **DWG. NO.** D0900673 | **REV.** v2

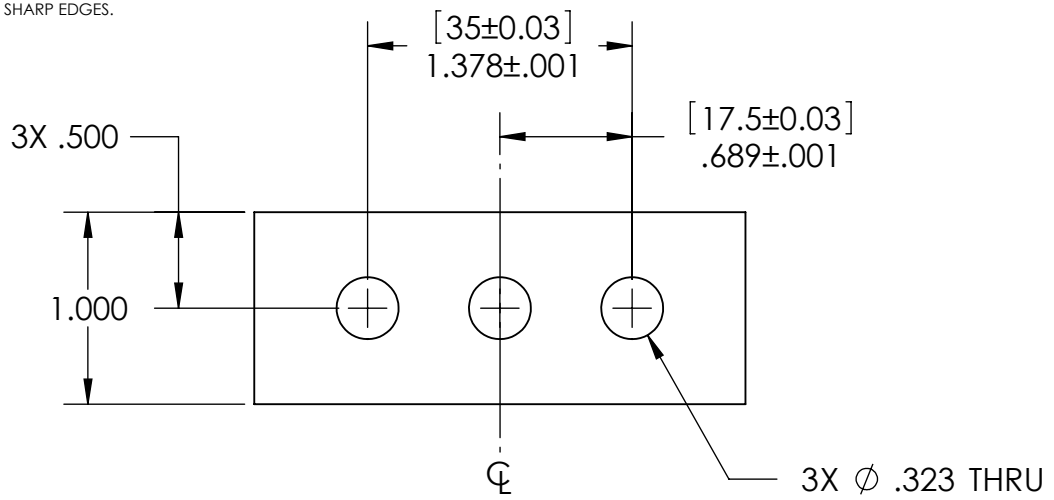
SCALE: 1:1 | **PROJECTION:** | SHEET 1 OF 1

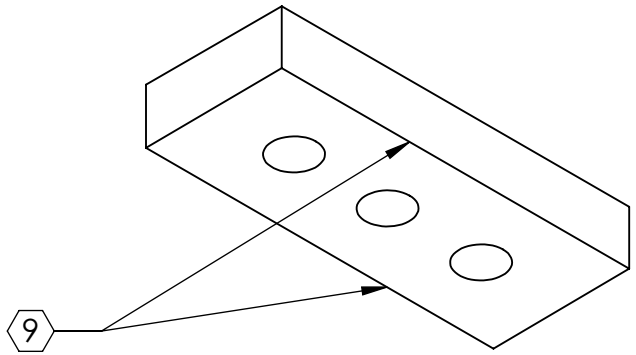
D0900673_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(3.5_Degree),_Upper_Blade,_Inside, PART PDM REV: V1-001, DRAWING PDM REV: V1-000

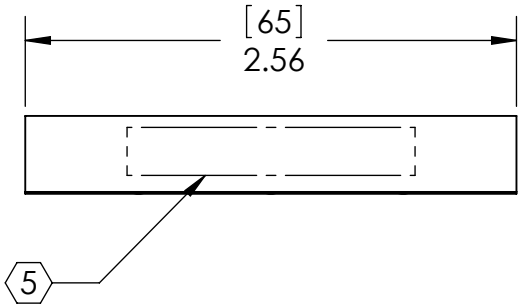
NOTES CONTINUED:

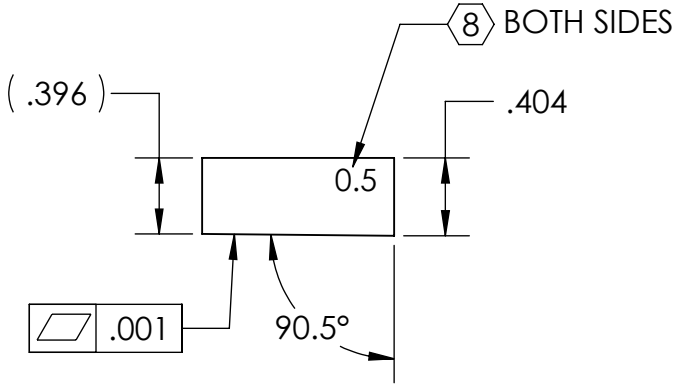
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

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

SIZE A **DWG. NO.** D0900674 **REV.** v2

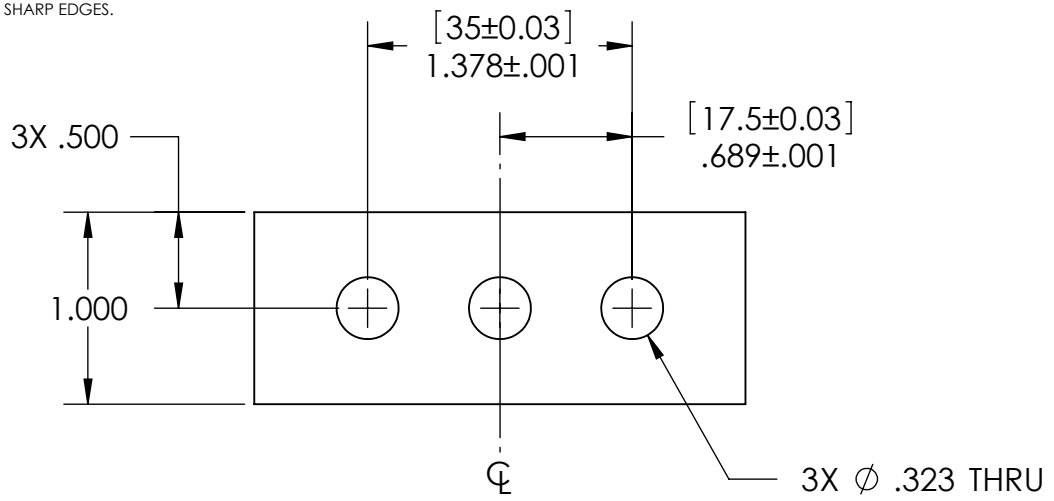
SCALE: 1:1 **PROJECTION:** SHEET 1 OF 1

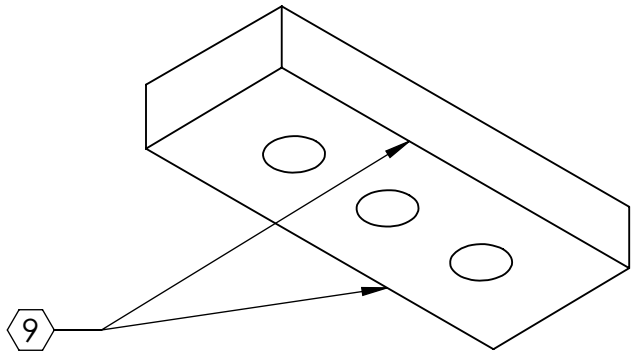
D0900674_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(0.5_Degree),_Upper_Blade,_Outside, PART PDM REV: V1-000, DRAWING PDM REV: V1-000

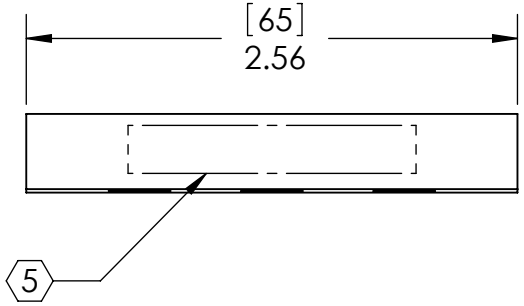
NOTES CONTINUED:

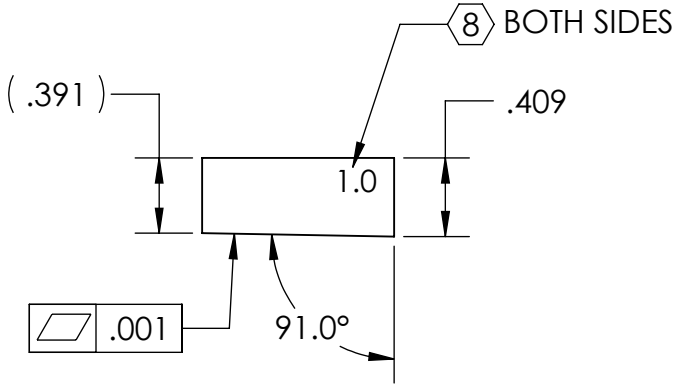
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

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 (1.0 DEGREE), UPPER BLADE, OUTSIDE

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

SIZE A **DWG. NO.** D0900675 **REV.** v2

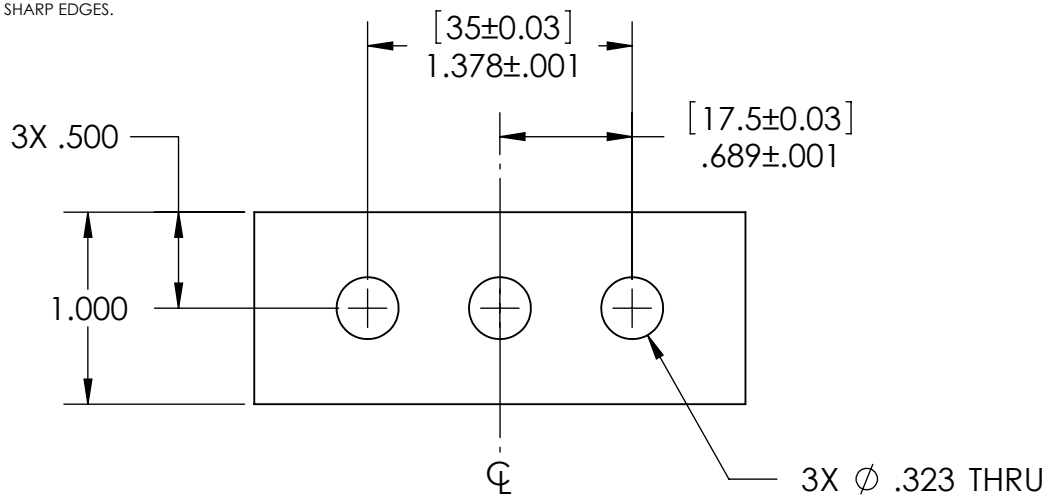
SCALE: 1:1 **PROJECTION:** SHEET 1 OF 1

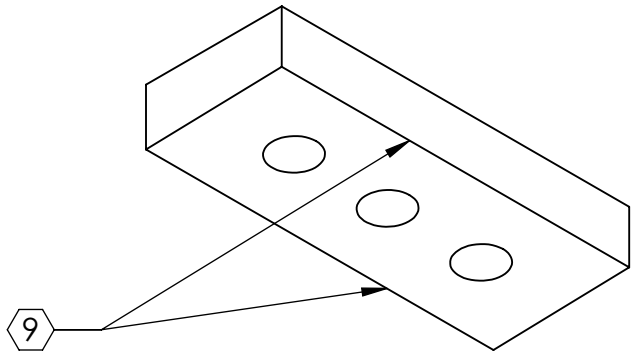
D0900675_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(1.0_Degree),_Upper_Blade,_Outside, PART PDM REV: V1-000, DRAWING PDM REV: V1-000

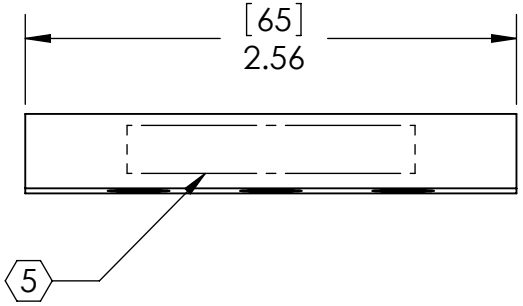
NOTES CONTINUED:

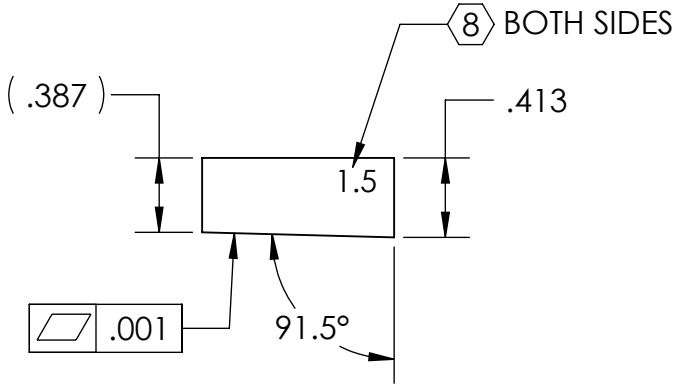
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

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 A **DWG. NO.** D0900676 **REV.** v2

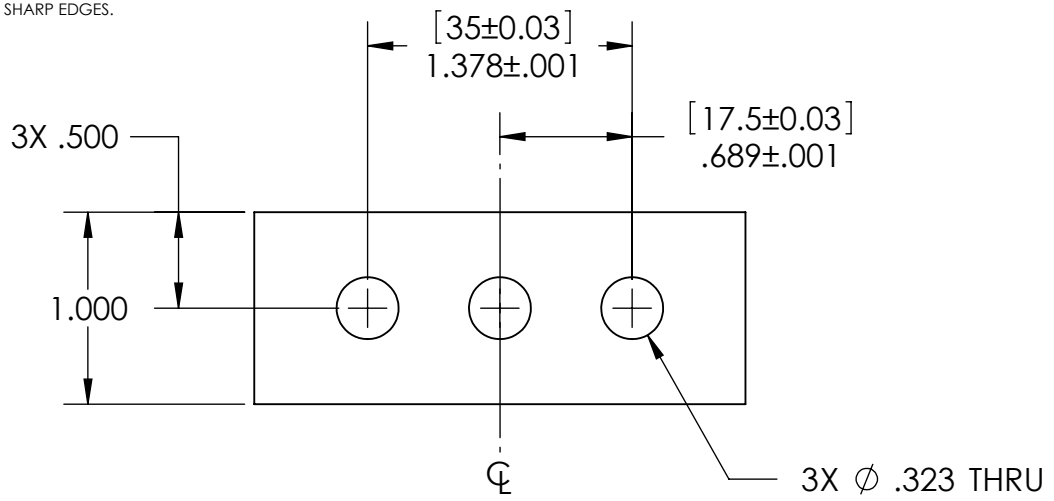
SCALE: 1:1 **PROJECTION:** SHEET 1 OF 1

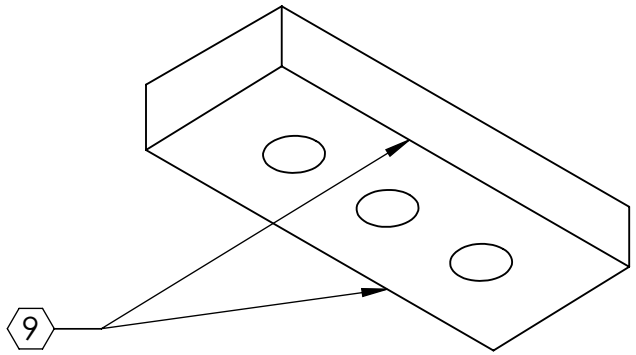
D0900676_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(1.5_Degree),_Upper_Blade,_Outside, PART PDM REV: V1-000, DRAWING PDM REV: V1-000

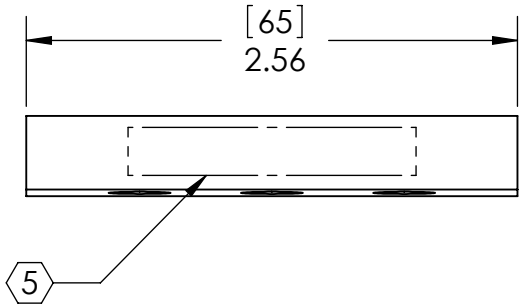
NOTES CONTINUED:

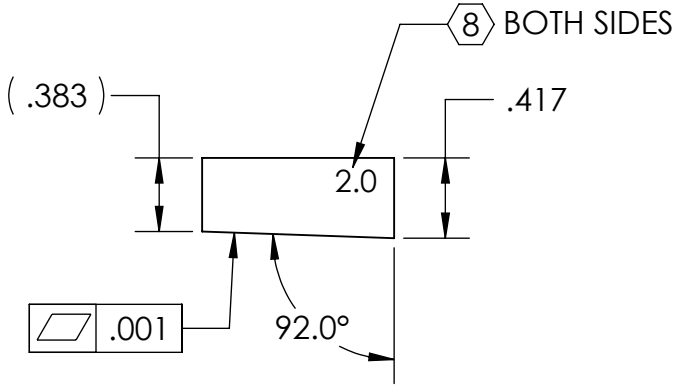
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

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 A **DWG. NO.** D0900677 **REV.** v2

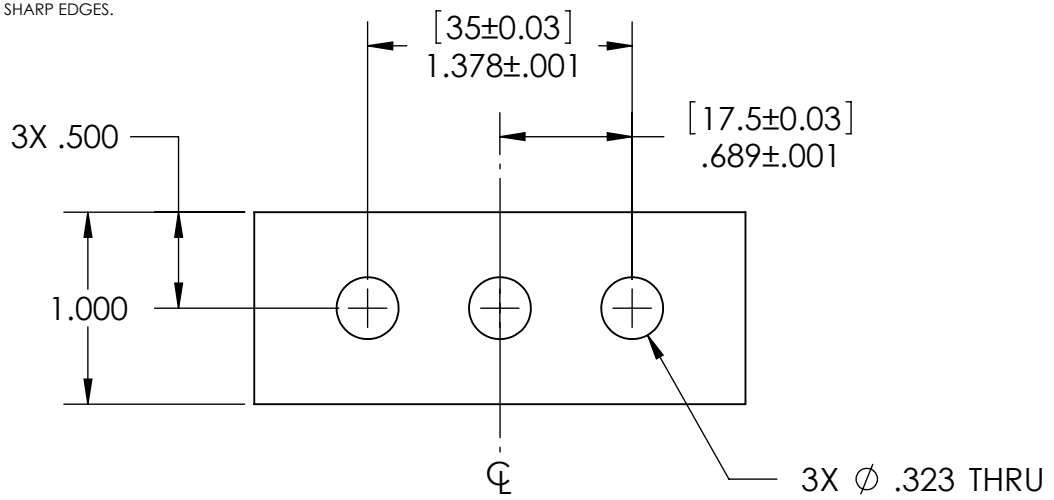
SCALE: 1:1 **PROJECTION:** SHEET 1 OF 1

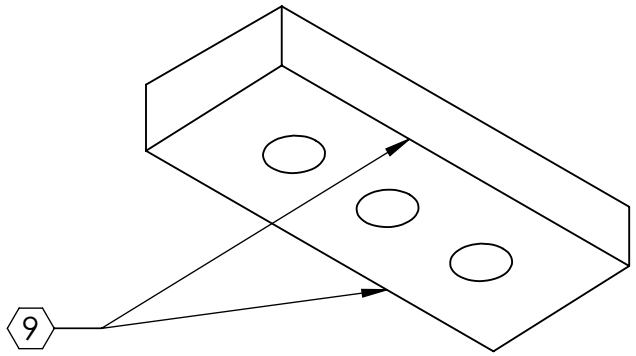
D0900677_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(2.0_Degree),_Upper_Blade,_Outside, PART PDM REV: V1-000, DRAWING PDM REV: V1-000

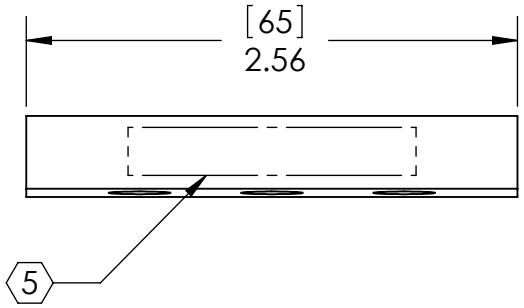
NOTES CONTINUED:

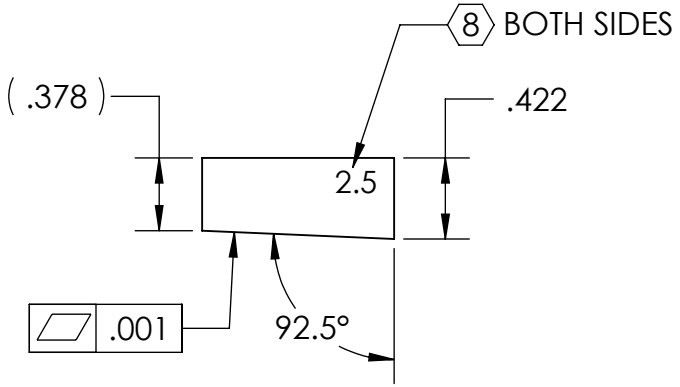
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

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 A | **DWG. NO.** D0900678 | **REV.** v2

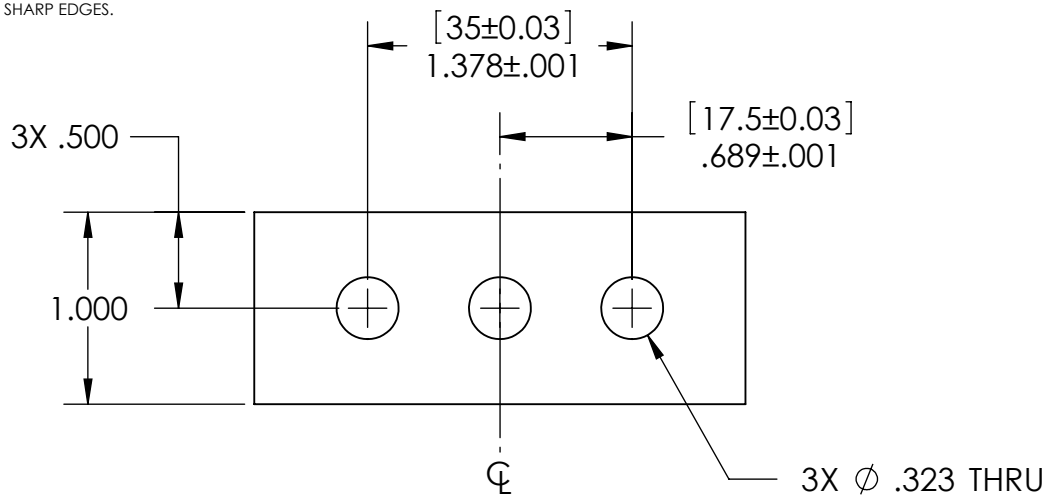
SCALE: 1:1 | **PROJECTION:** | SHEET 1 OF 1

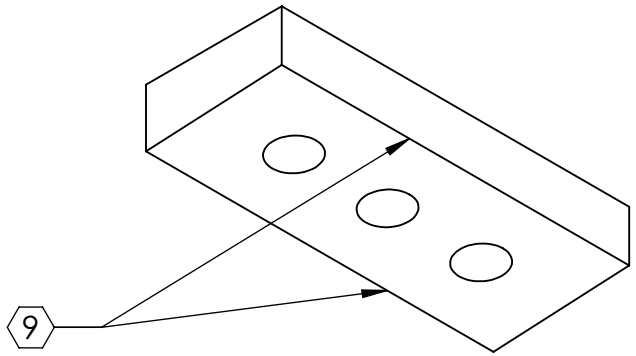
D0900678_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(2.5_Degree),_Upper_Blade,_Outside, PART PDM REV: V1-000, DRAWING PDM REV: V1-000

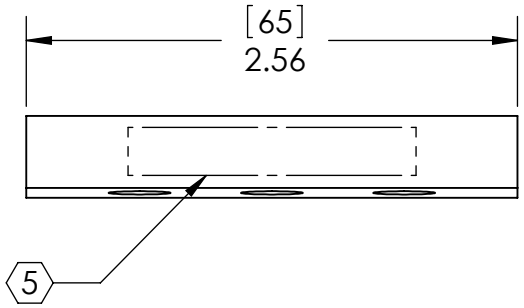
NOTES CONTINUED:

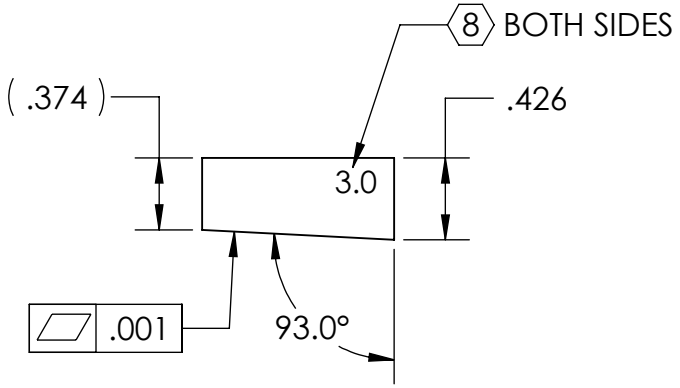
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

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 (3.0 DEGREE), UPPER BLADE, OUTSIDE

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

SIZE A **DWG. NO.** D0900679 **REV.** v2

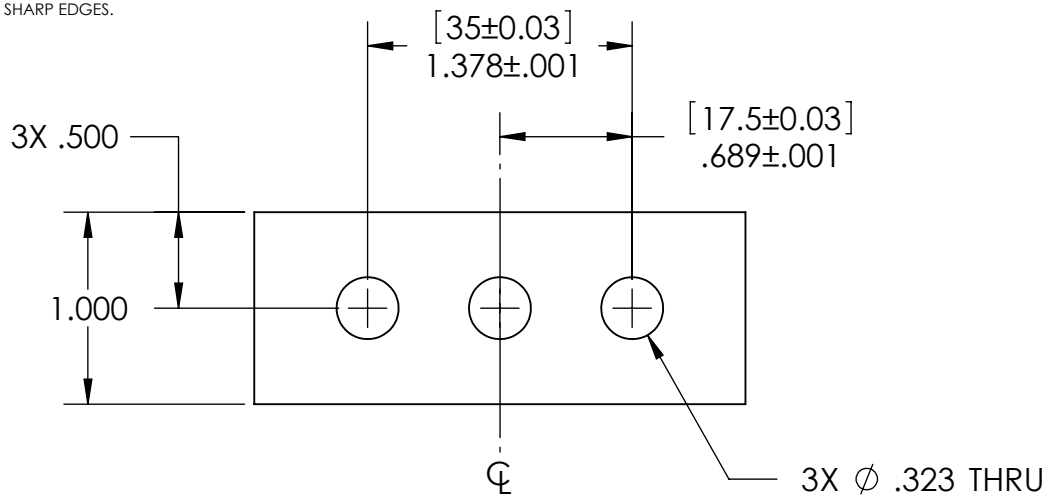
SCALE: 1:1 **PROJECTION:** SHEET 1 OF 1

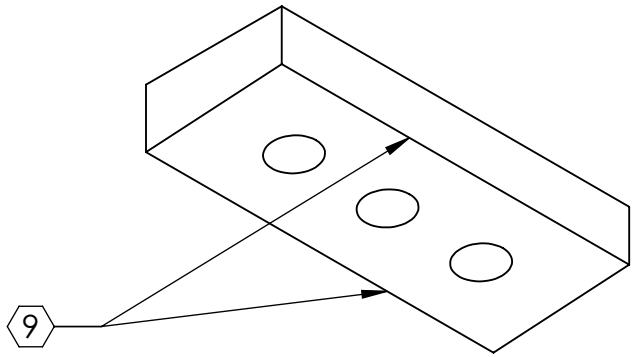
D0900679_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(3.0_Degree),_Upper_Blade,_Outside, PART PDM REV: V1-000, DRAWING PDM REV: V1-000

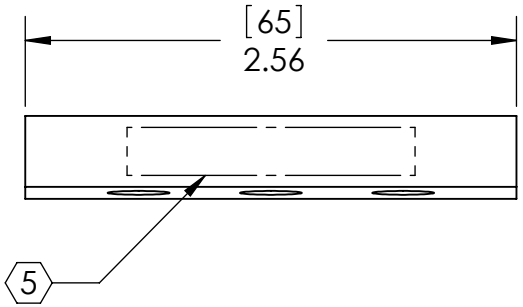
NOTES CONTINUED:

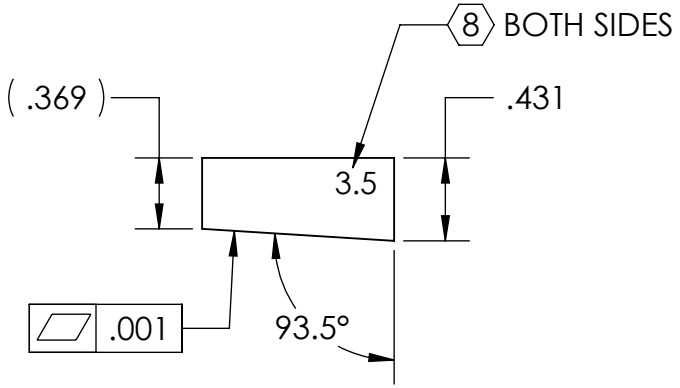
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

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 (3.5 DEGREE), UPPER BLADE, OUTSIDE

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

SIZE A | **DWG. NO.** D0900680 | **REV.** v2

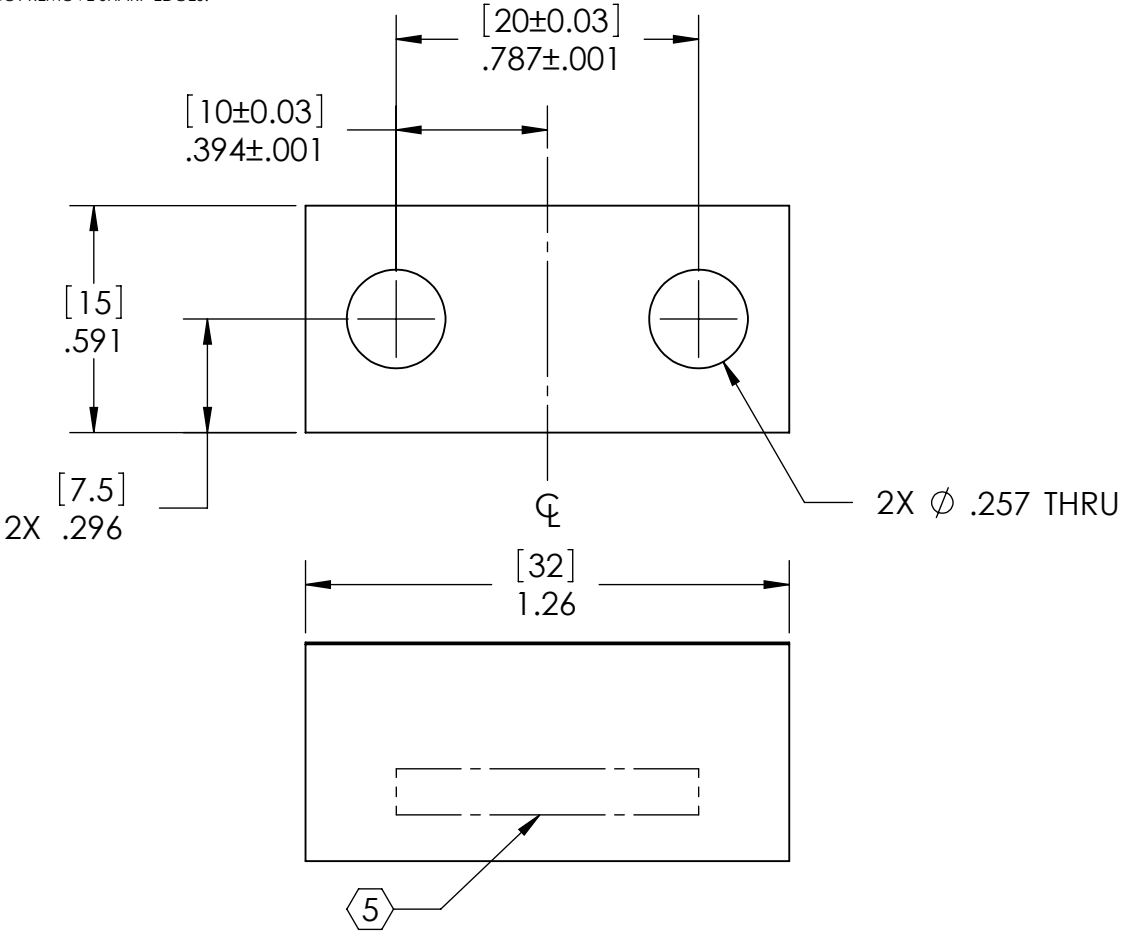
SCALE: 1:1 | **PROJECTION:** | SHEET 1 OF 1

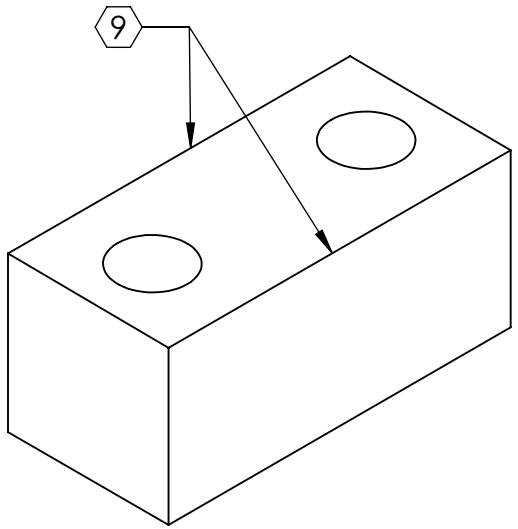
D0900680_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(3.5_Degree),_Upper_Blade,_Outside, PART PDM REV: V1-000, DRAWING PDM REV: V1-000

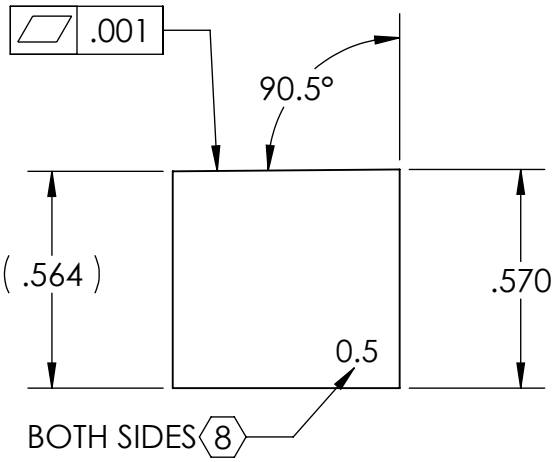
NOTES CONTINUED:

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: 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. 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 (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 A **DWG. NO.** D0900682 **REV.** v2

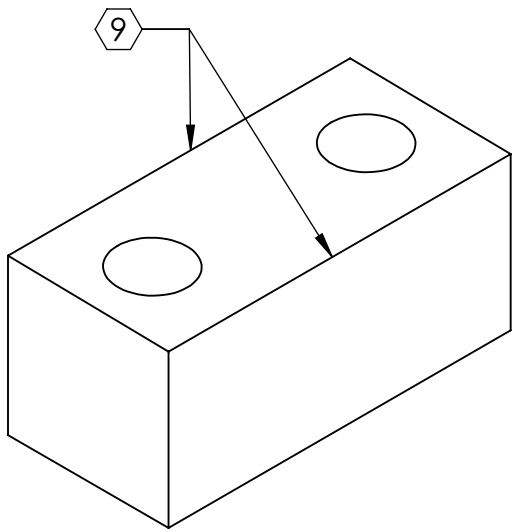
SCALE: 2:1 **PROJECTION:** SHEET 1 OF 1

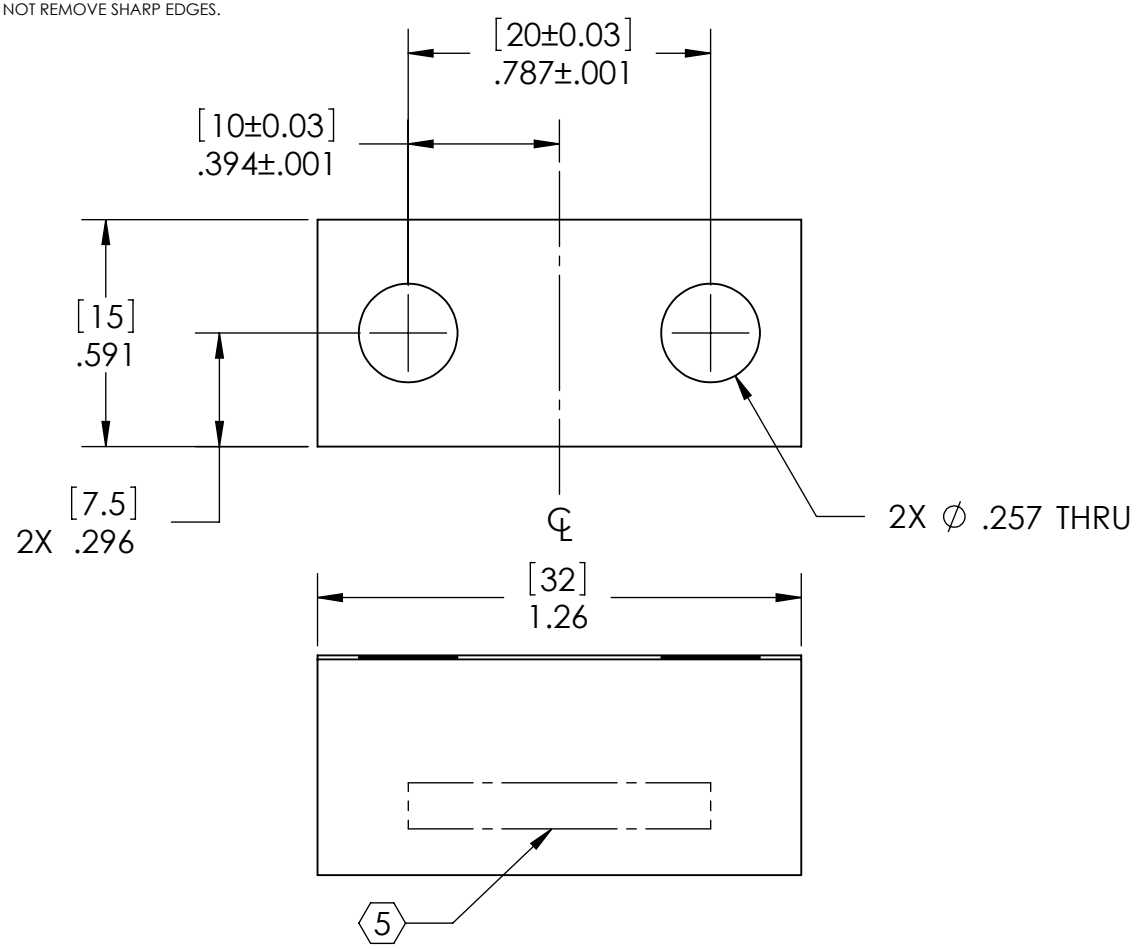
D0900682_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(0.5_Degree),_Lower_Blade,_Inside, PART PDM REV: V1-000, DRAWING PDM REV: V1-000

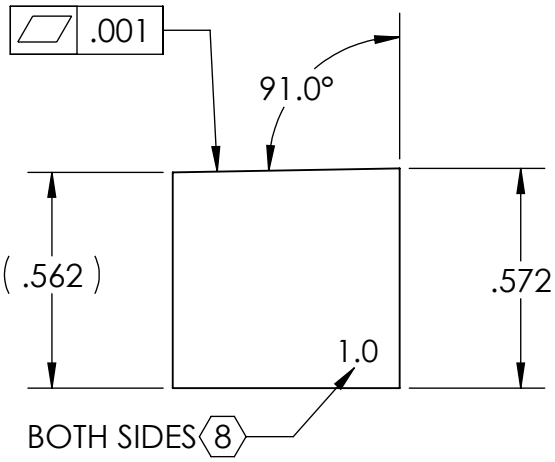
NOTES CONTINUED:

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: 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. 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, INSIDE

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

SIZE A **DWG. NO.** D0900683 **REV.** v2

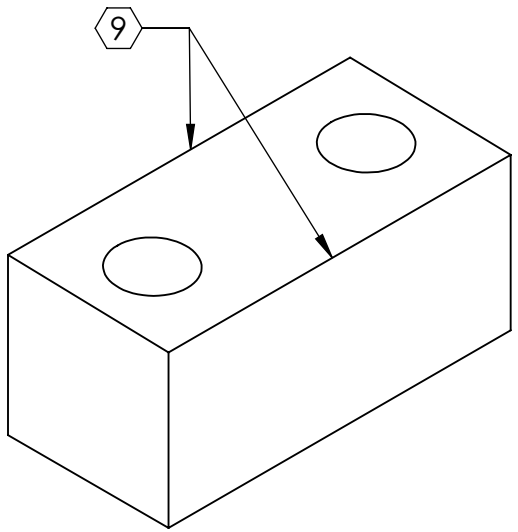
SCALE: 2:1 **PROJECTION:** **SHEET 1 OF 1**

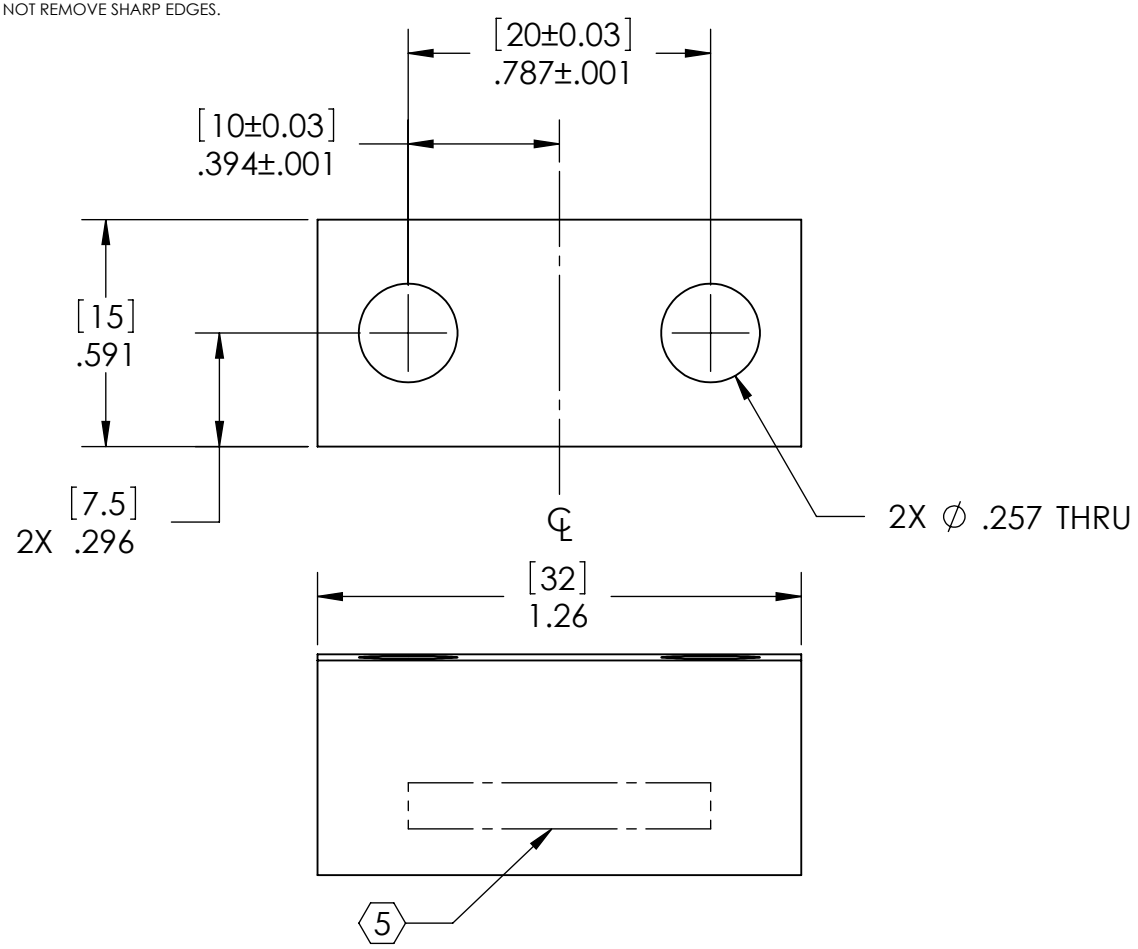
D0900683_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(1.0_Degree),_Lower_Blade,_Inside, PART PDM REV: V1-000, DRAWING PDM REV: V1-000

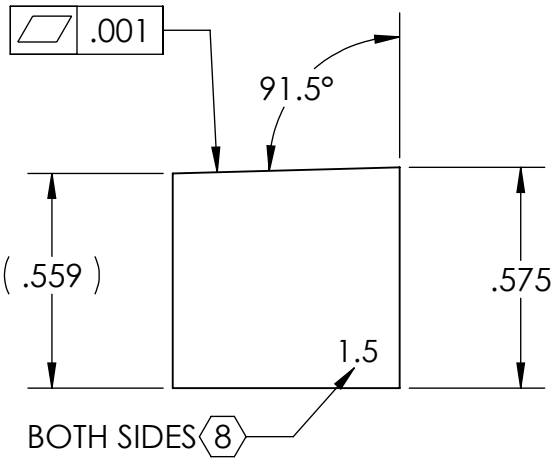
NOTES CONTINUED:

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: 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. 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 (1.5 DEGREE), LOWER BLADE, INSIDE

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

SIZE A **DWG. NO.** D0900684 **REV.** v2

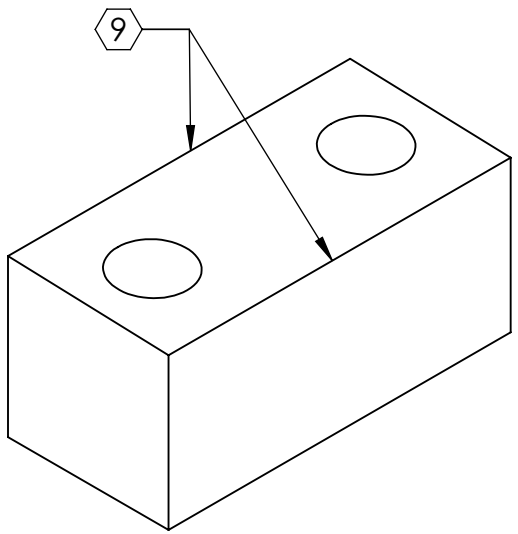
SCALE: 2:1 **PROJECTION:** SHEET 1 OF 1

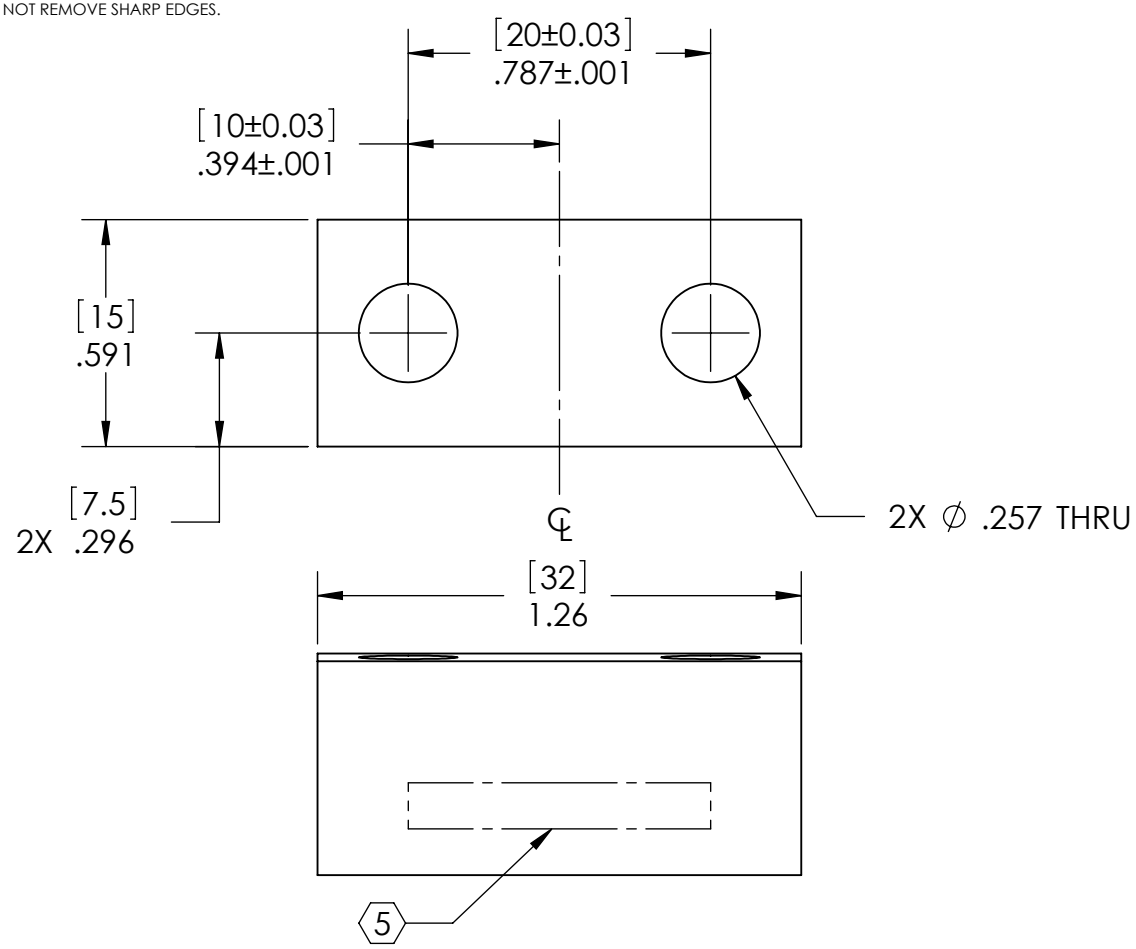
D0900684_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(1.5_Degree),_Lower_Blade,_Inside, PART PDM REV: V1-000, DRAWING PDM REV: V1-000

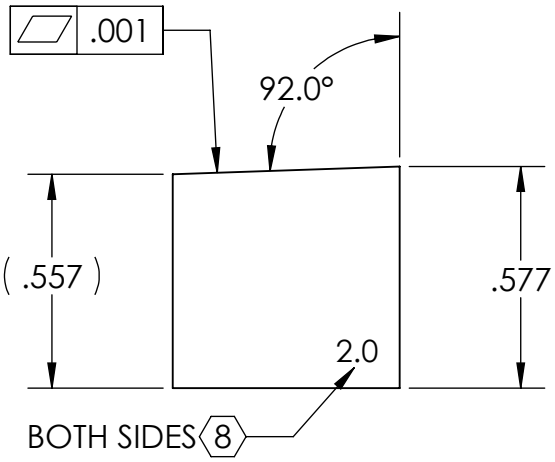
NOTES CONTINUED:

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: 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. 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, 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

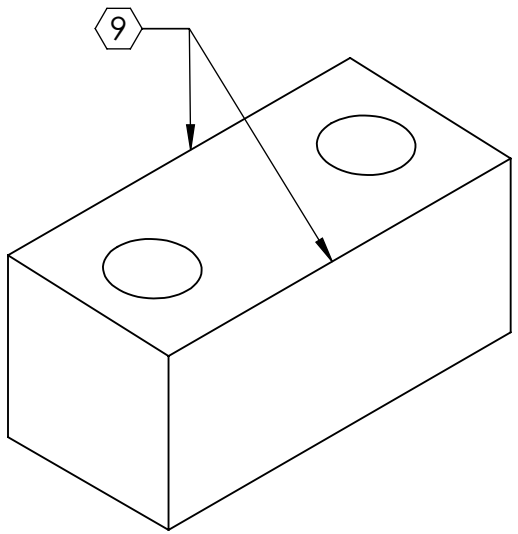
SCALE: 2:1 **PROJECTION:** **SHEET** 1 OF 1

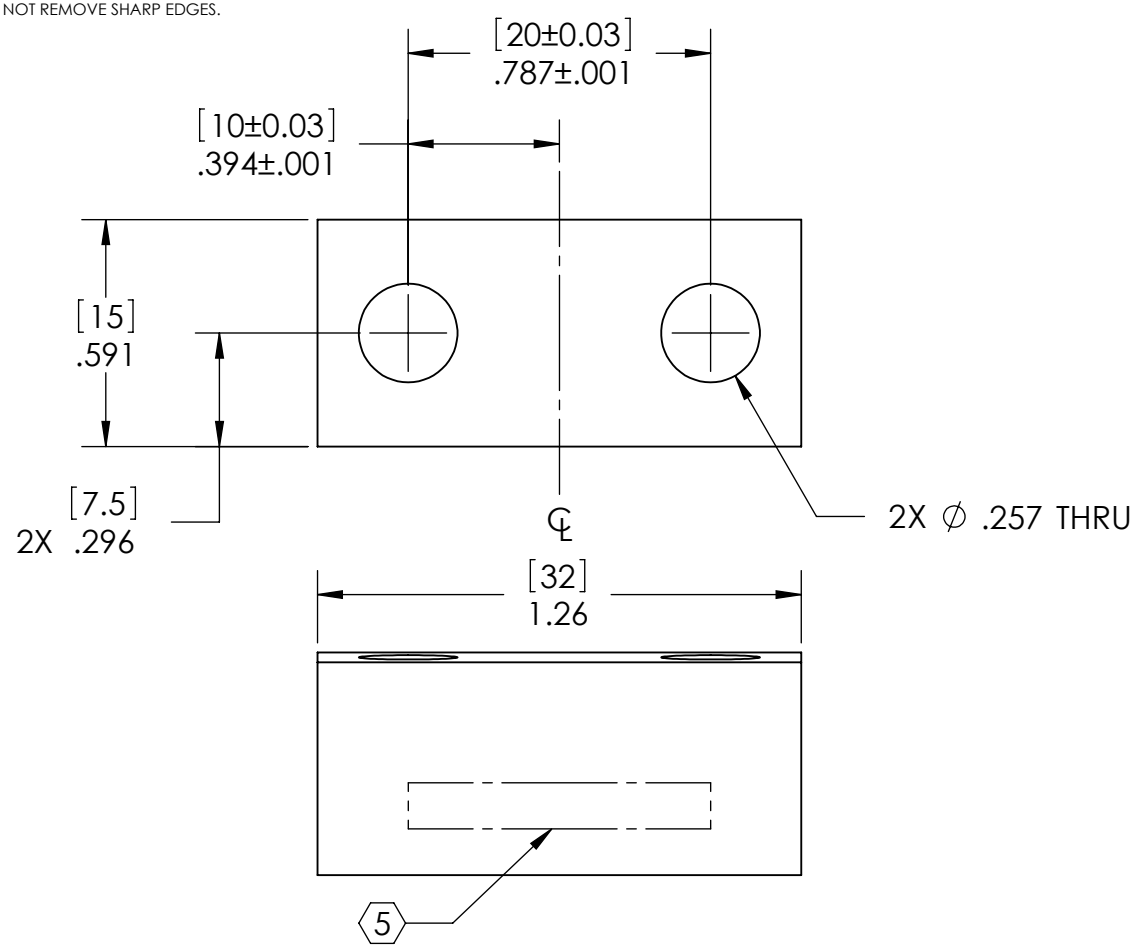
D0900685_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(2.0_Degree),_Lower_Blade,_Inside, PART PDM REV: V1-000, DRAWING PDM REV: V1-000

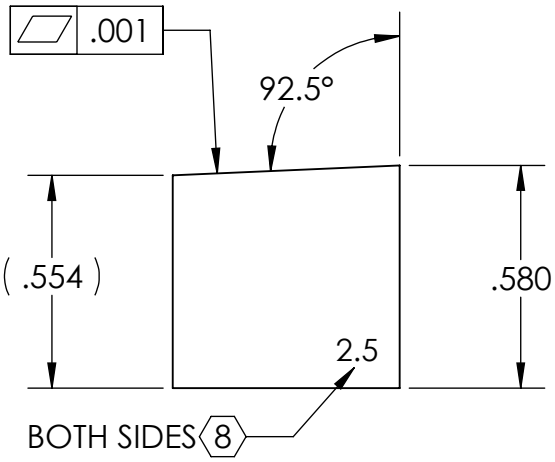
NOTES CONTINUED:

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: 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. 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 (2.5 DEGREE), LOWER BLADE, INSIDE

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

SIZE A **DWG. NO.** D0900686 **REV.** v2

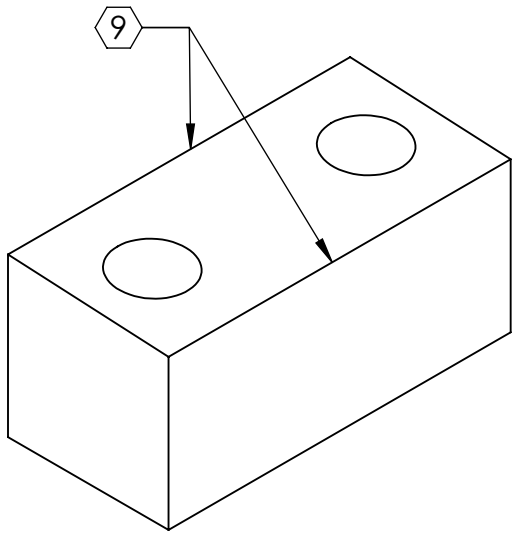
SCALE: 2:1 **PROJECTION:** SHEET 1 OF 1

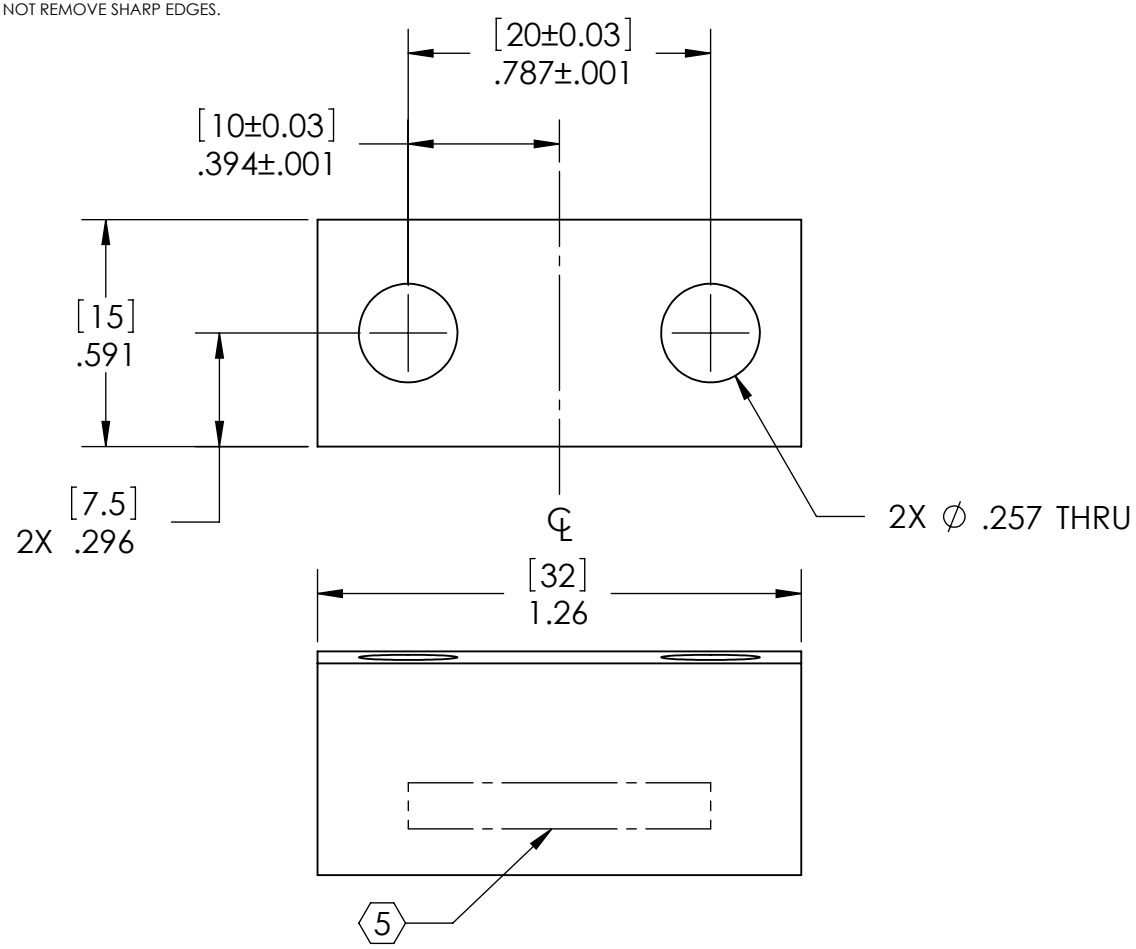
D0900686_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(2.5_Degree),_Lower_Blade,_Inside, PART PDM REV: V1-000, DRAWING PDM REV: V1-001

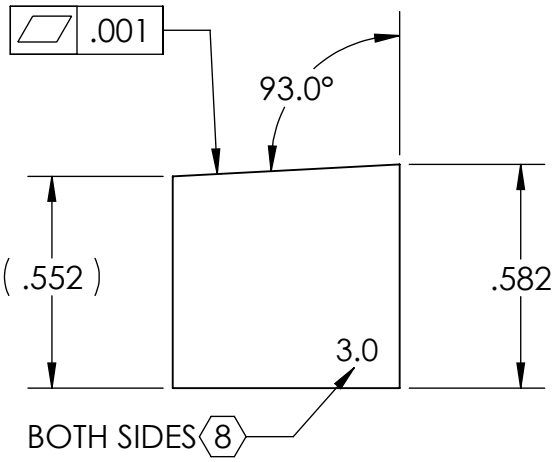
NOTES CONTINUED:

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: 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. 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.
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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 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 (3.0 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.** D0900687 **REV.** v2

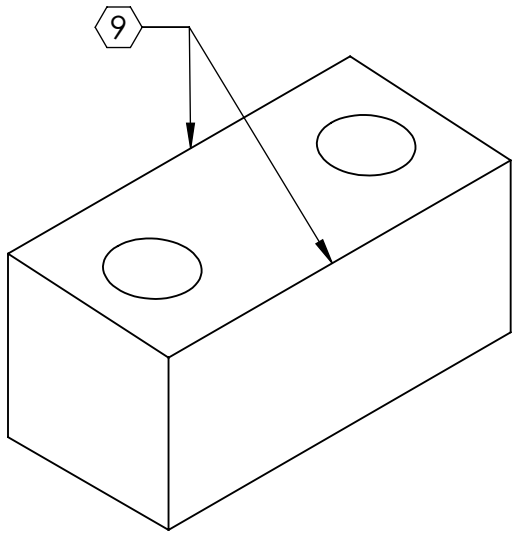
SCALE: 2:1 **PROJECTION:** **SHEET** 1 OF 1

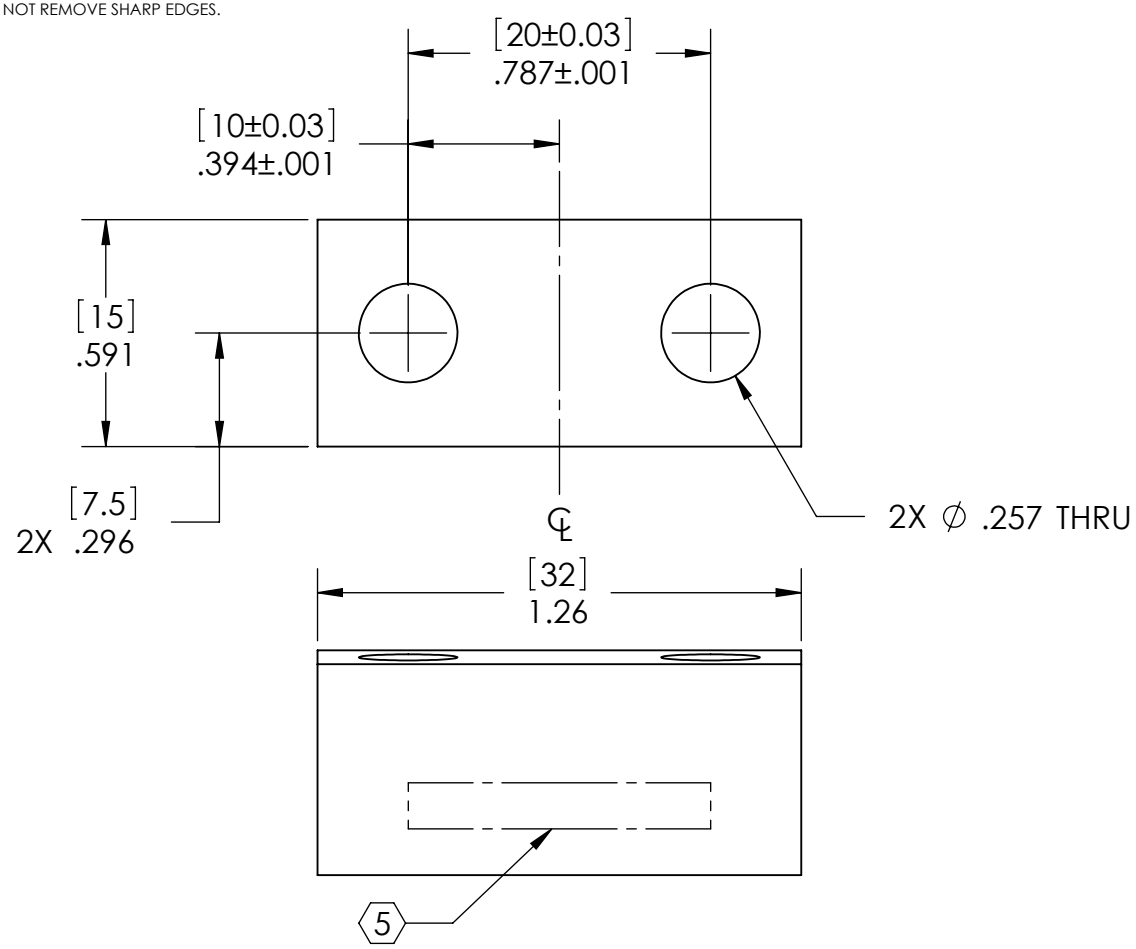
D0900687_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(3.0_Degree),_Lower_Blade,_Inside, PART PDM REV: V1-000, DRAWING PDM REV: V1-001

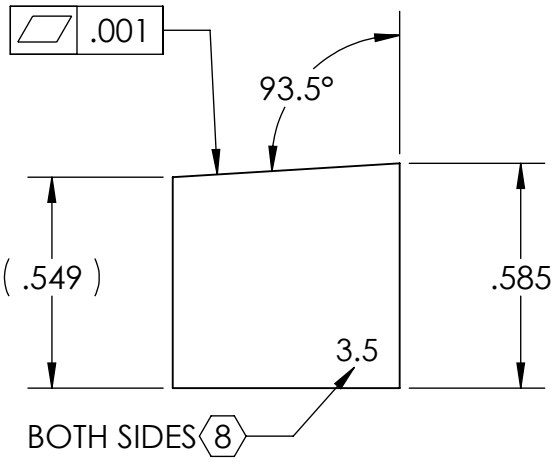
NOTES CONTINUED:

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: 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. 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 (3.5 DEGREE), LOWER BLADE, INSIDE

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

SIZE A **DWG. NO.** D0900688 **REV.** v2

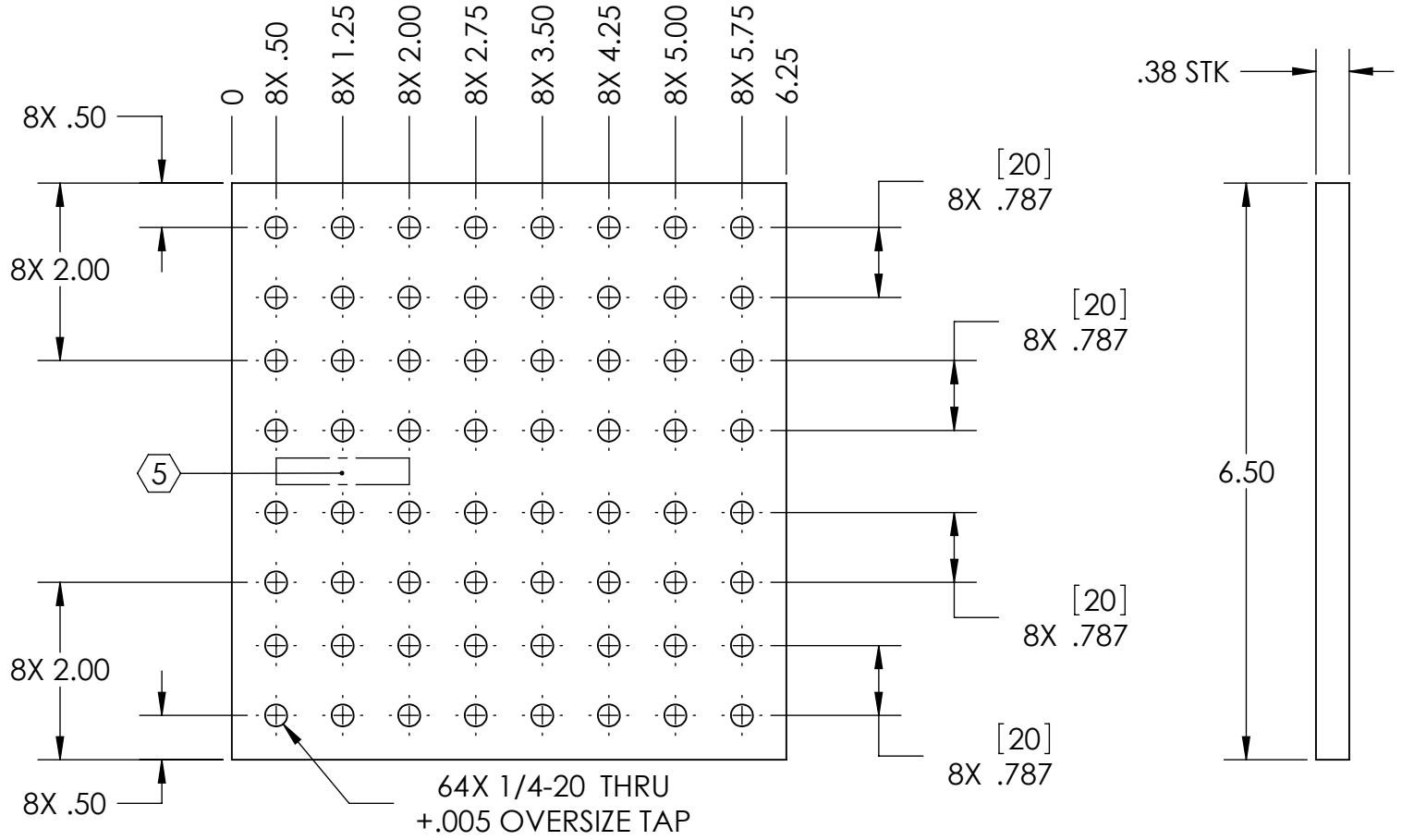
SCALE: 2:1 **PROJECTION:** **SHEET** 1 OF 1

D0900688_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(3.5_Degree),_Lower_Blade,_Inside, PART PDM REV: V1-000, DRAWING PDM REV: V1-003

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.

REV.	DATE	DCN #	DRAWING TREE #
v1	19 MAY 2009	E0900155	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 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
DRAFTER	D. BRIDGES	28 JUN 2009
CHECKER	M. MEYER	29 JUN 2009
APPROVAL		

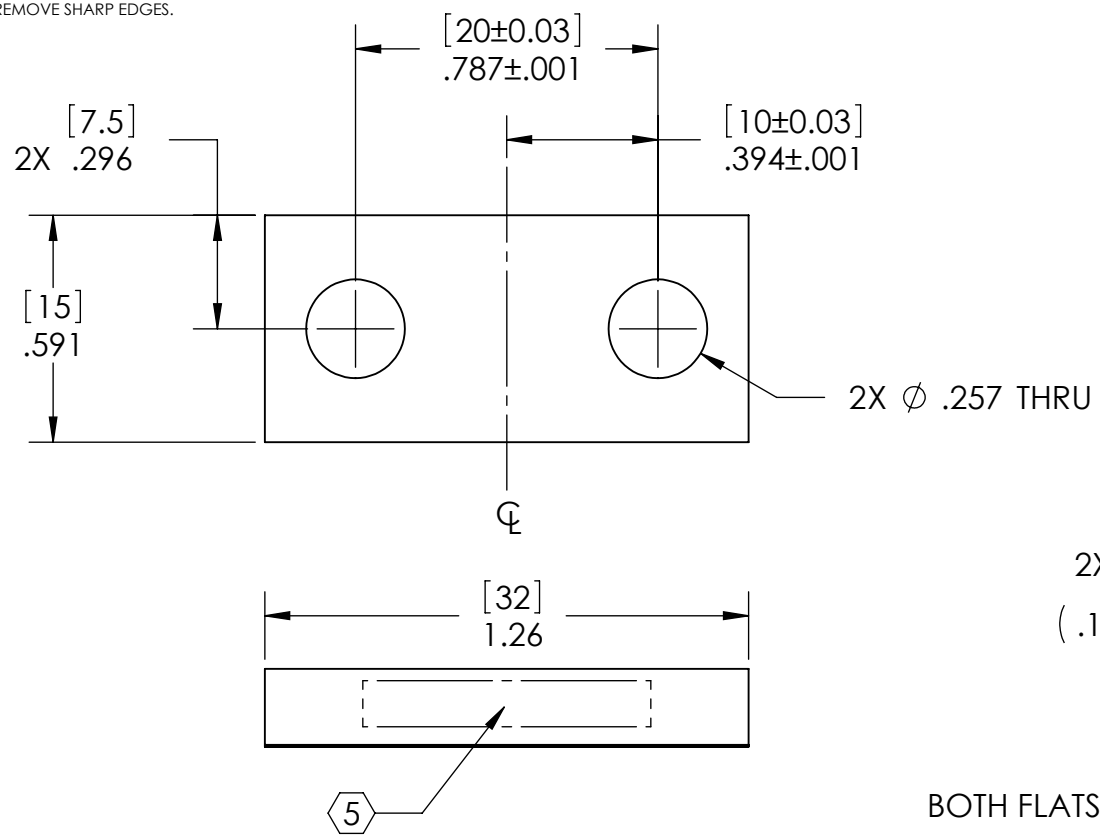
SIZE A **DWG. NO.** D0900689 **REV.** v2

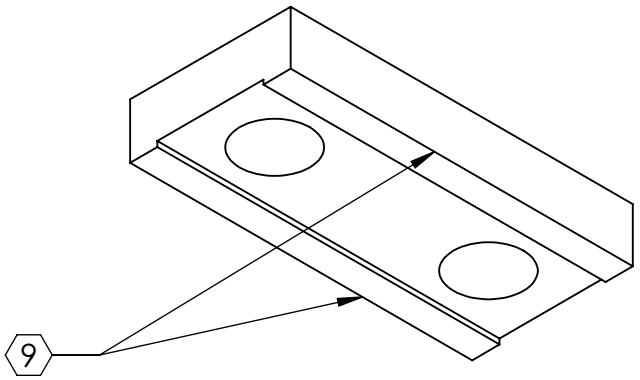
SCALE: 1:2 **PROJECTION:** SHEET 1 OF 1

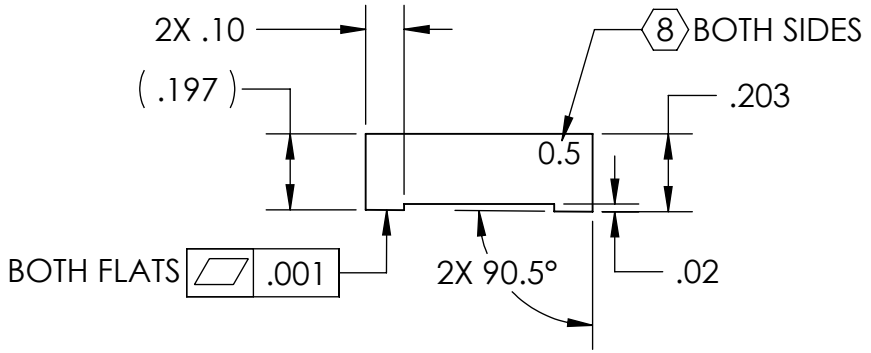
NOTES CONTINUED:

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: 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. 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 (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			

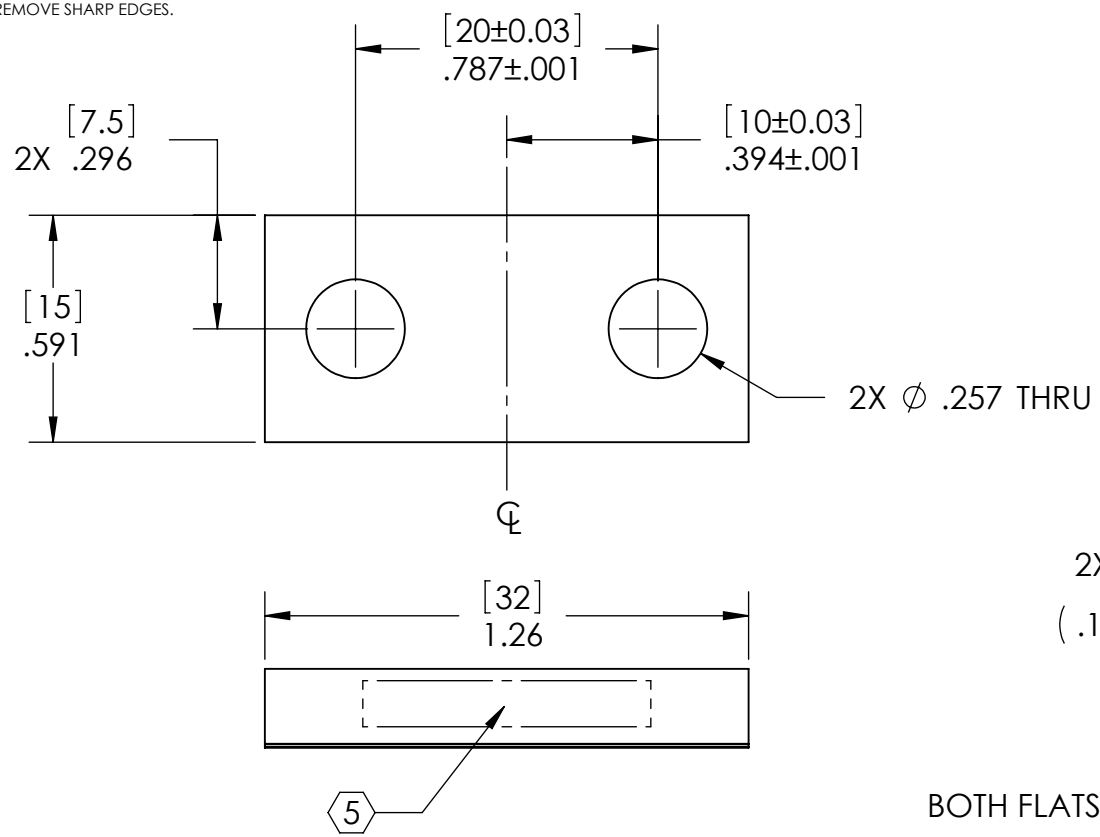
SIZE A **DWG. NO.** D0900690 **REV.** v2

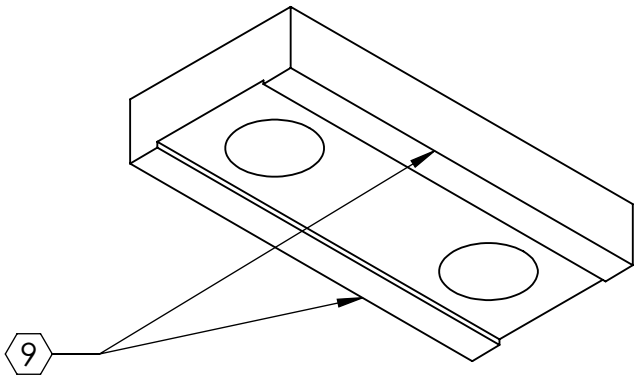
SCALE: 2:1 **PROJECTION:** **SHEET 1 OF 1**

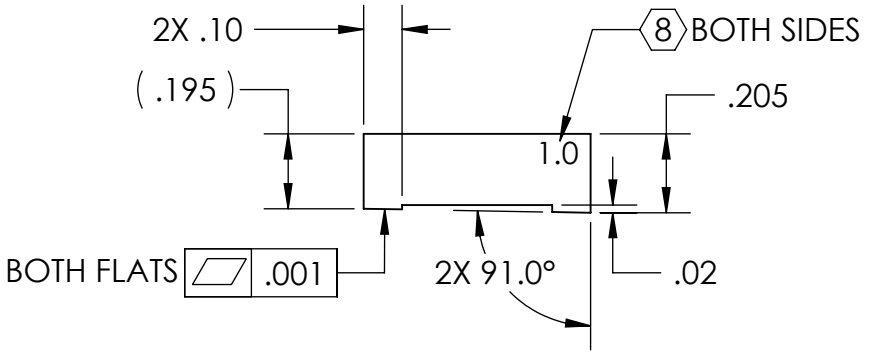
NOTES CONTINUED:

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

SIZE A **DWG. NO.** D0900691 **REV.** v2

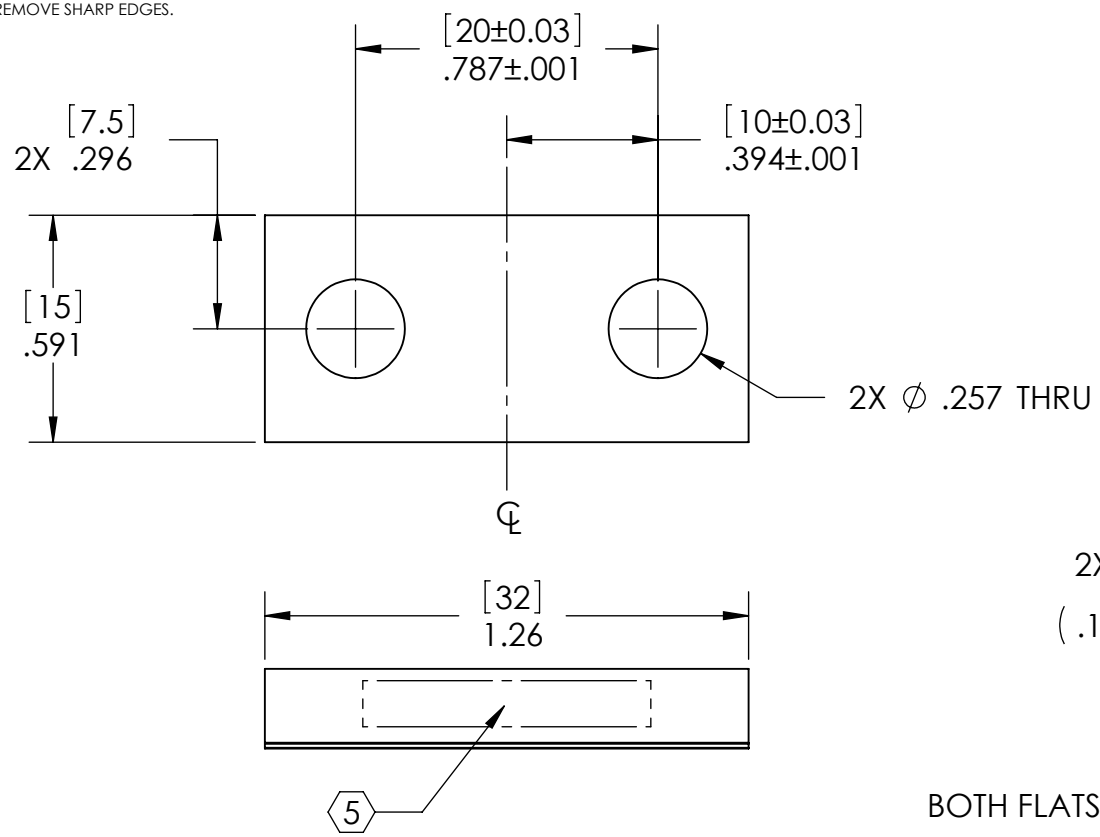
SCALE: 2:1 **PROJECTION:** **SHEET 1 OF 1**

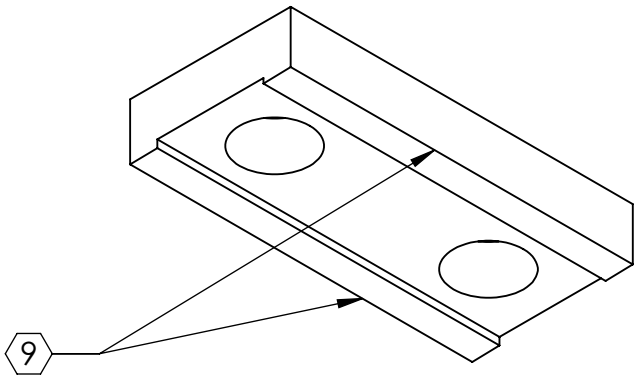
D0900691_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(1.0_Degree),_Lower_Blade,_Outside, PART PDM REV: V1-002, DRAWING PDM REV: V1-000

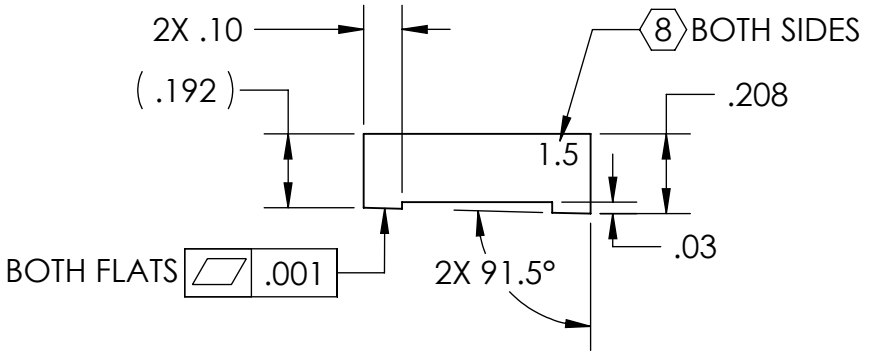
NOTES CONTINUED:

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: 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. 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 (1.5 DEGREE), LOWER BLADE, OUTSIDE

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

SIZE A **DWG. NO.** D0900692 **REV.** v2

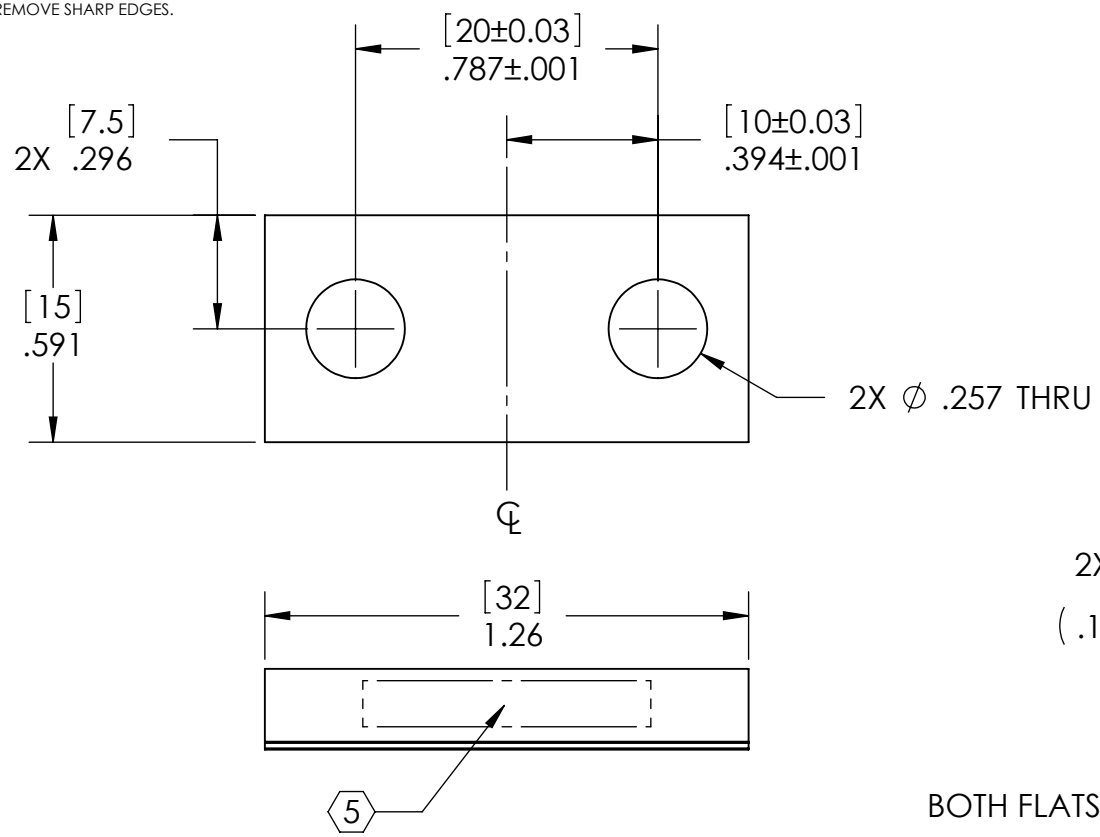
SCALE: 2:1 **PROJECTION:** **SHEET 1 OF 1**

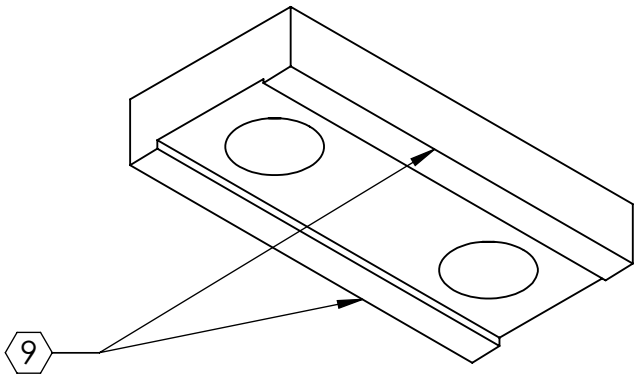
D0900692_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(1.5_Degree),_Lower_Blade,_Outside, PART PDM REV: V1-002, DRAWING PDM REV: V1-000

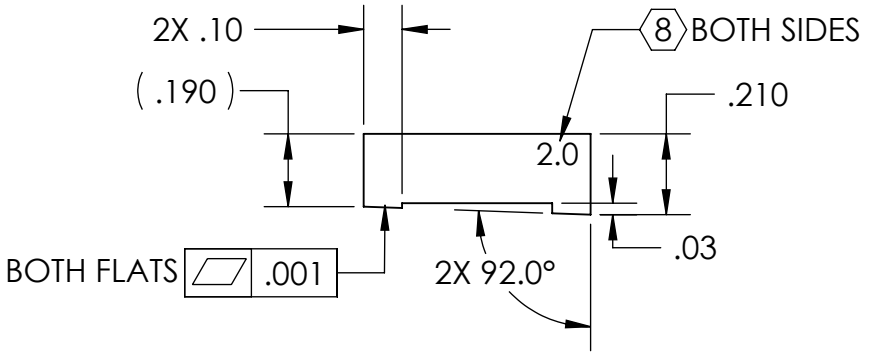
NOTES CONTINUED:

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

SIZE A **DWG. NO.** D0900693 **REV.** v2

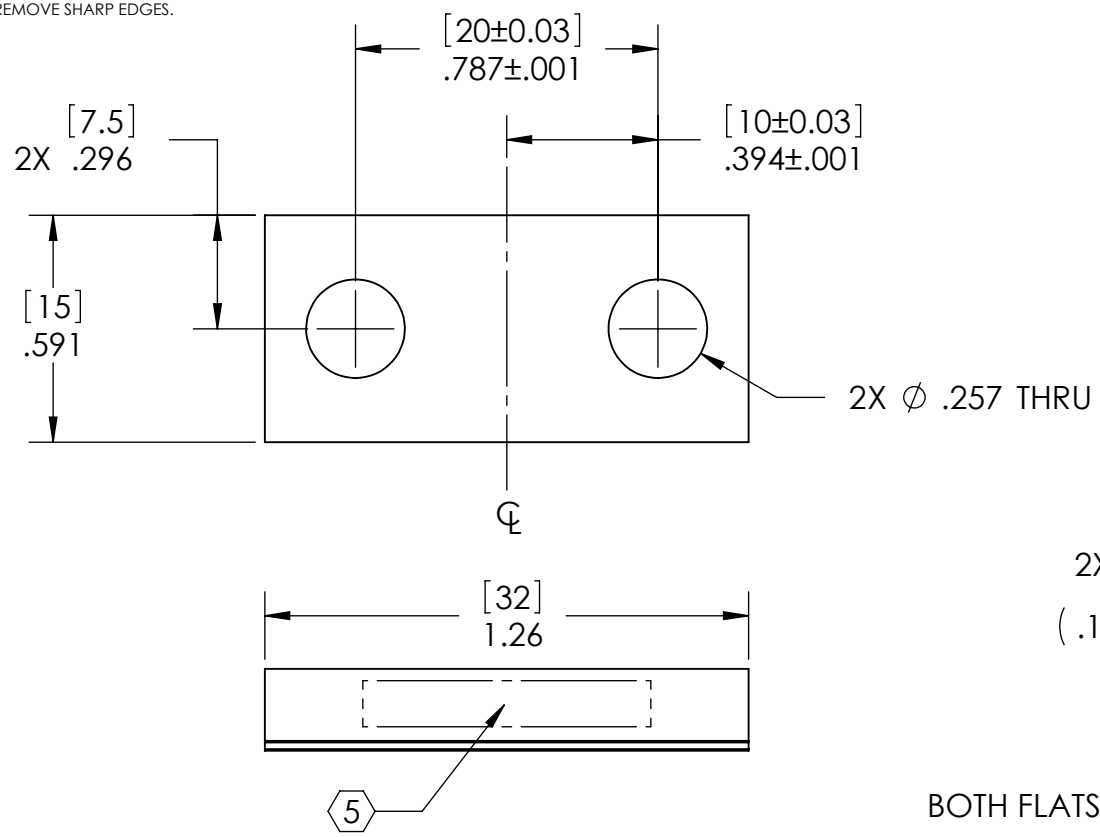
SCALE: 2:1 **PROJECTION:** **SHEET 1 OF 1**

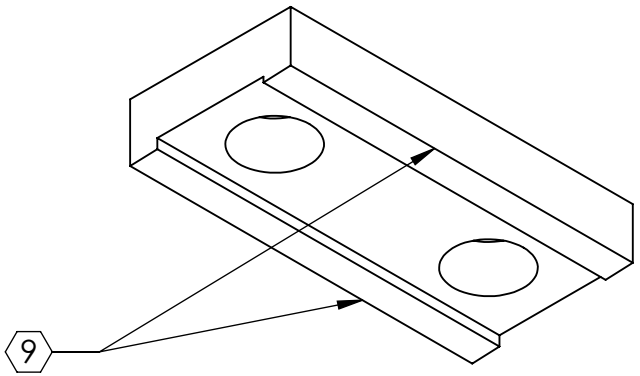
D0900693_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(2.0_Degree),_Lower_Blade,_Outside, PART PDM REV: V1-002, DRAWING PDM REV: V1-000

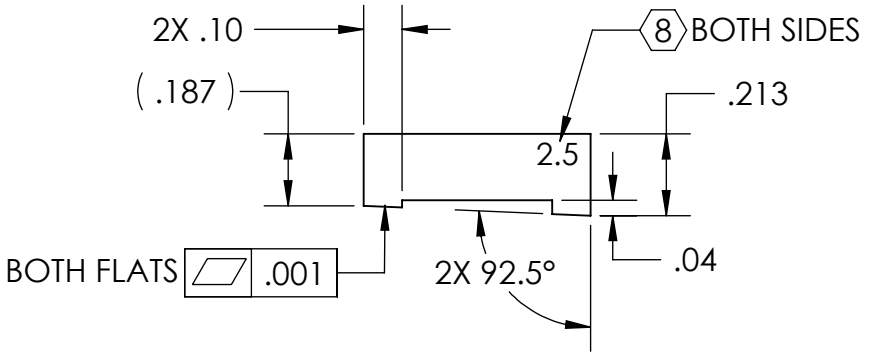
NOTES CONTINUED:

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: 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. 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 (2.5 DEGREE), LOWER BLADE, OUTSIDE

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

SIZE A **DWG. NO.** D0900694 **REV.** v2

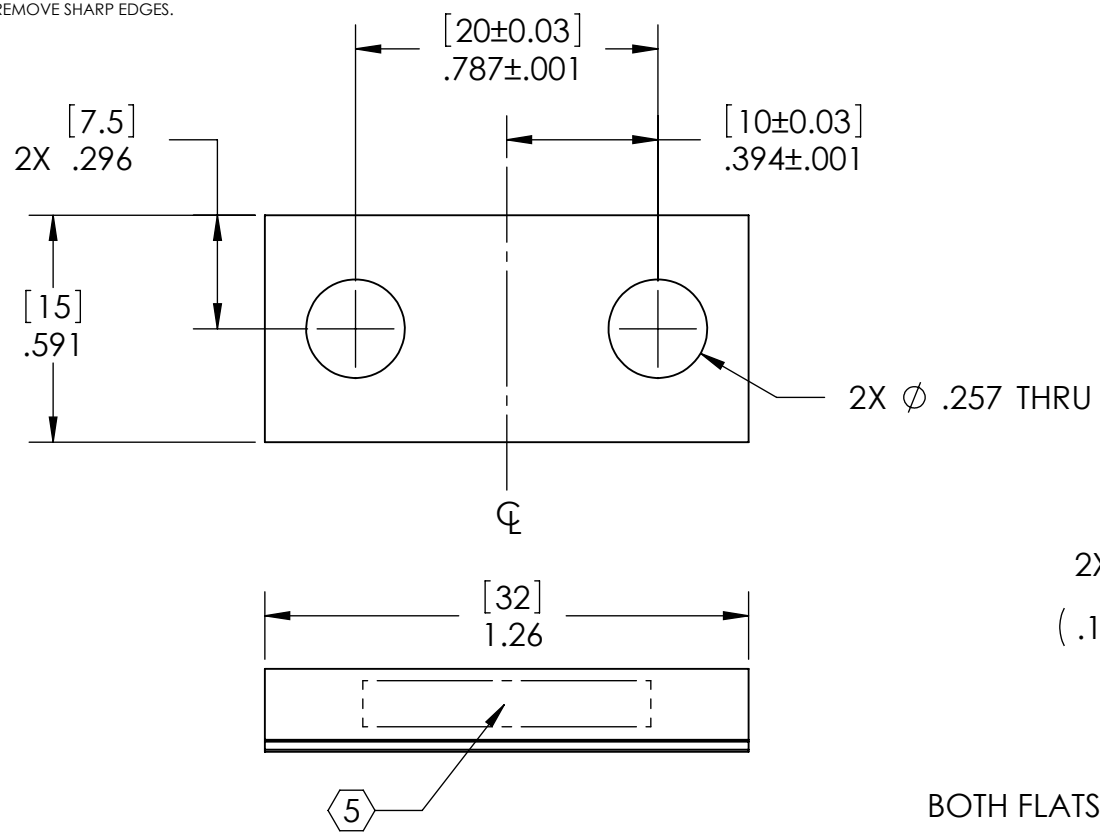
SCALE: 2:1 **PROJECTION:** **SHEET 1 OF 1**

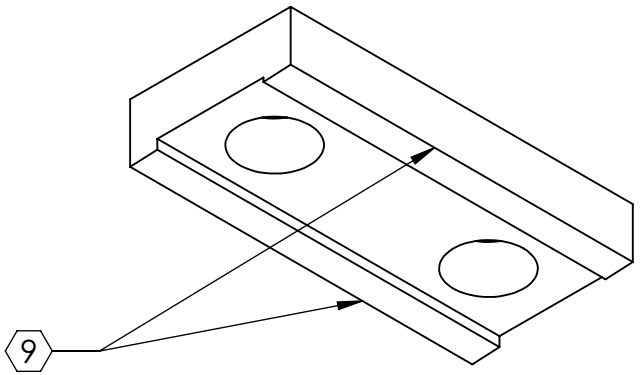
D0900694_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(2.5_Degree),_Lower_Blade,_Outside, PART PDM REV: V1-002, DRAWING PDM REV: V1-000

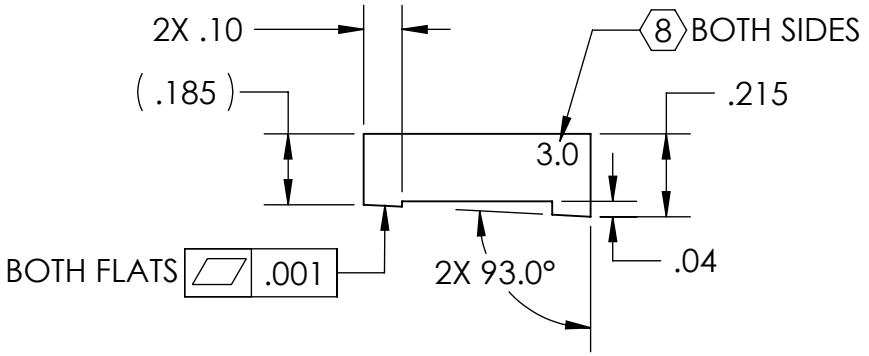
NOTES CONTINUED:

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: 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. 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 (3.0 DEGREE), LOWER BLADE, OUTSIDE

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

SIZE: A **DWG. NO.**: D0900695 **REV.**: v2

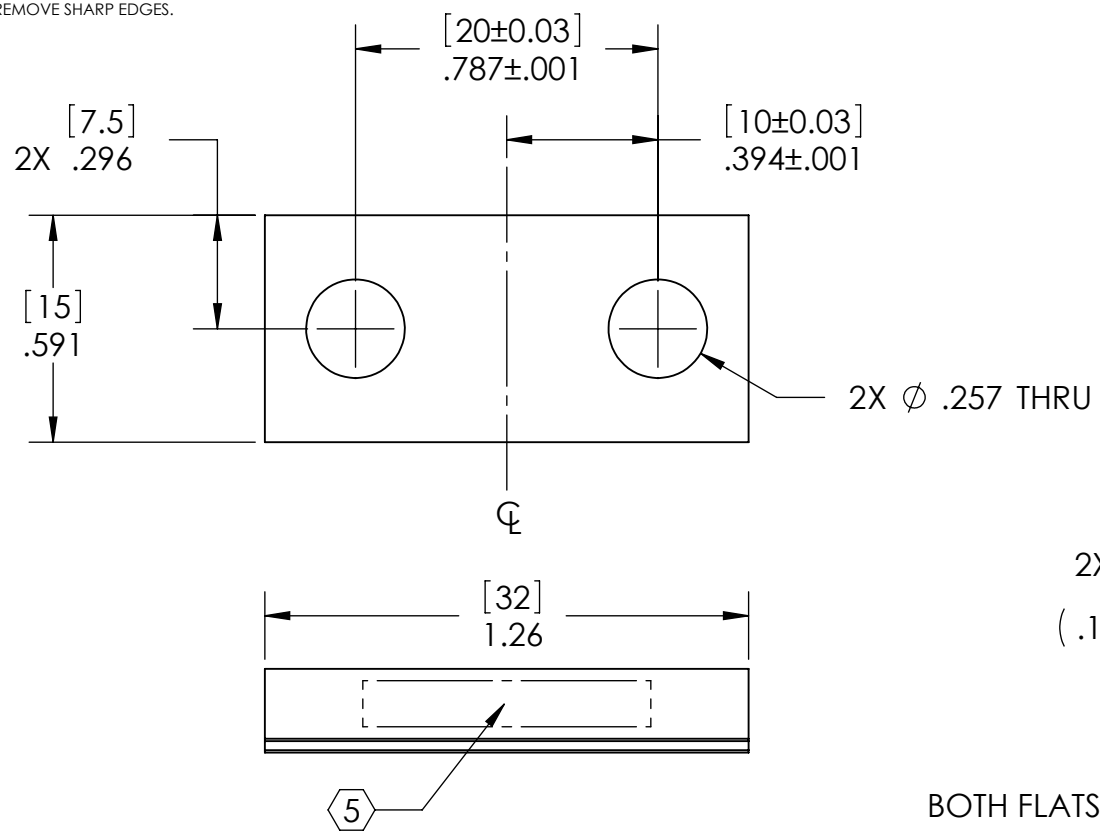
SCALE: 2:1 **PROJECTION**: **SHEET 1 OF 1**

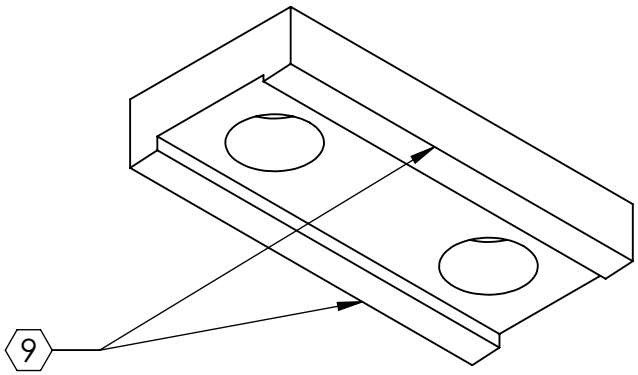
D0900695_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(3.0_Degree),_Lower_Blade,_Outside, PART PDM REV: V1-002, DRAWING PDM REV: V1-000

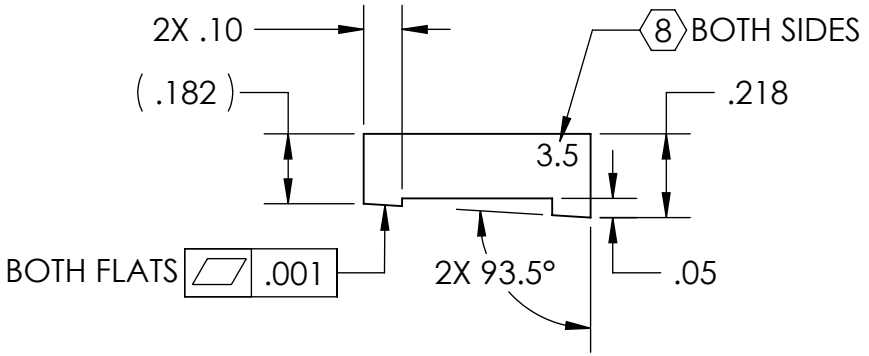
NOTES CONTINUED:

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: 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. 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 (3.5 DEGREE), LOWER BLADE, OUTSIDE

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

SIZE A **DWG. NO.** D0900696 **REV.** v2

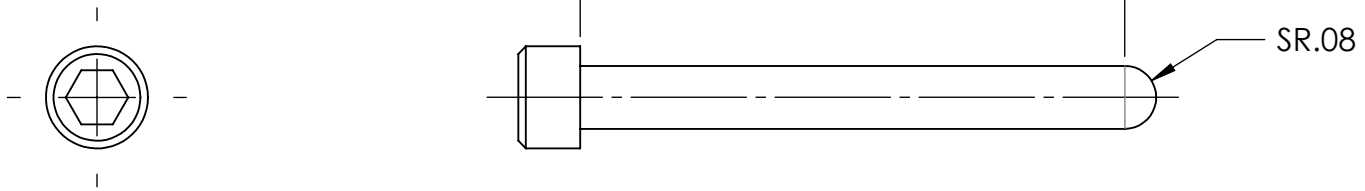
SCALE: 2:1 **PROJECTION:** **SHEET 1 OF 1**

D0900696_Advanced_LIGO_SUS_HLTS_Blade_Clamp_(3.5_Degree),_Lower_Blade,_Outside, PART PDM REV: V1-002, DRAWING PDM REV: V1-002

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): DXXXXXXX-VY, TYPE-XX, QTY: TBD
6. 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 SSTL (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		
DRAFTER	D. BRIDGES	19 JUL 2010
CHECKER	M. MEYER	20 JUL 2009
APPROVAL		

SIZE A **DWG. NO.** D0900990 **REV.** v2

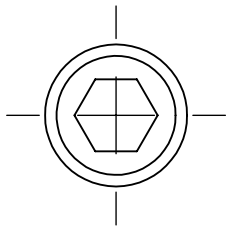
SCALE: 2:1 **PROJECTION:** **SHEET** 1 OF 1

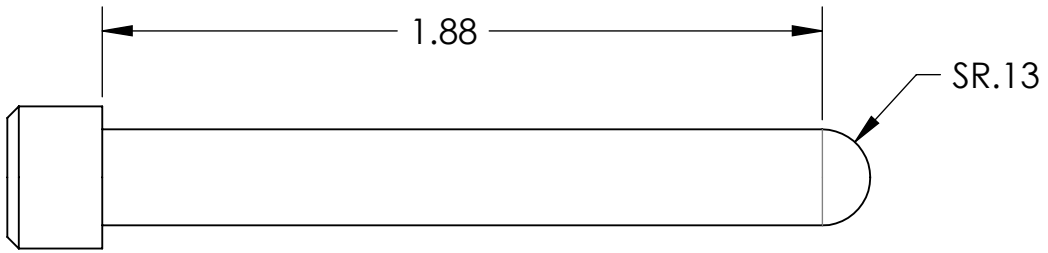
D0900990_Rounded_End_SHCS_8-32_X_1.5_Long, PART PDM REV: X-015, DRAWING PDM REV: V1-000

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

SIZE A **DWG. NO.** D0900999 **REV.** v3

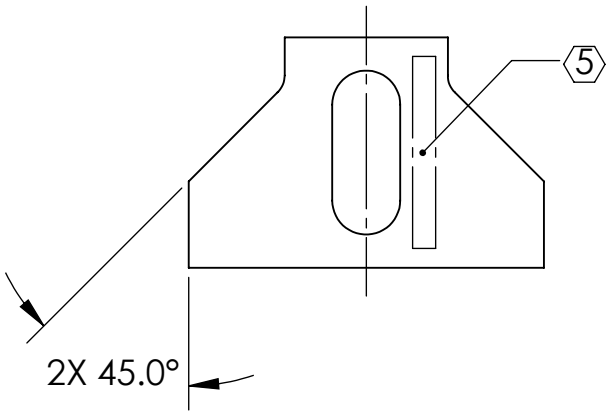
SCALE: 2:1 **PROJECTION:** **SHEET** 1 OF 1

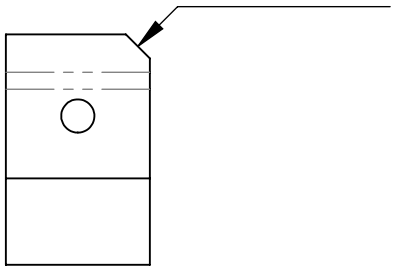
D0900999_Rounded_End_SHCS_0.25-20_X_2_Long, PART PDM REV: X-015, DRAWING PDM REV: V1-006

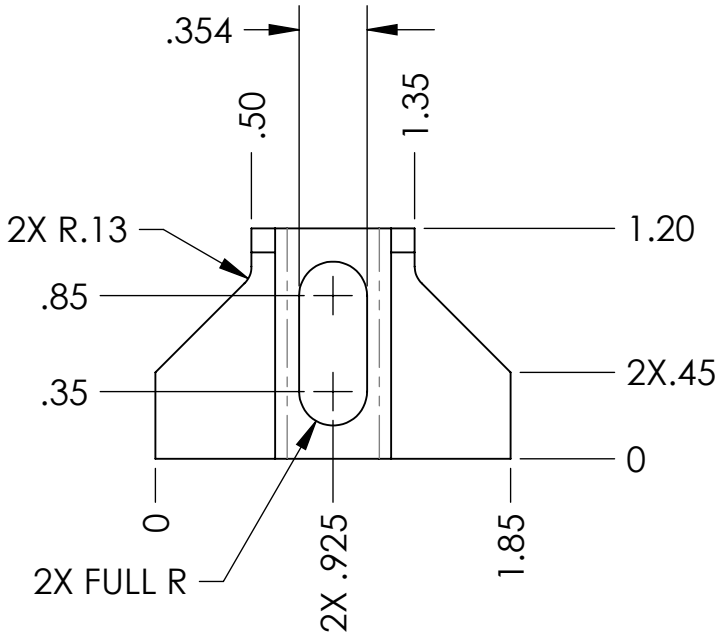
NOTES CONTINUED:

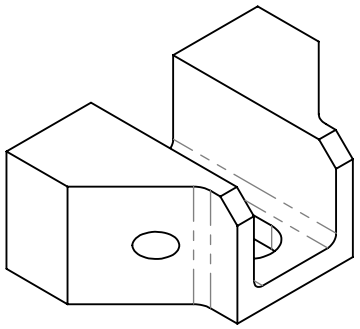
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 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 #
v1	02 JUN 2009	E0900162	E080191
v2	10 AUG 2010	E1000301	E080191
-	-	-	-

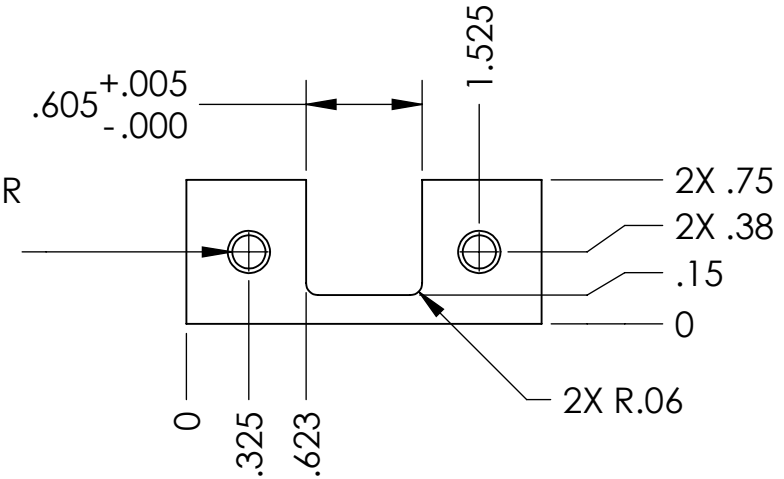








2X DRILL AND TAP THRU FOR
#8-32 UNC-2B X 2.5 DIA
EMHART HELICOIL
(P/N 1185-2EN410)



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			

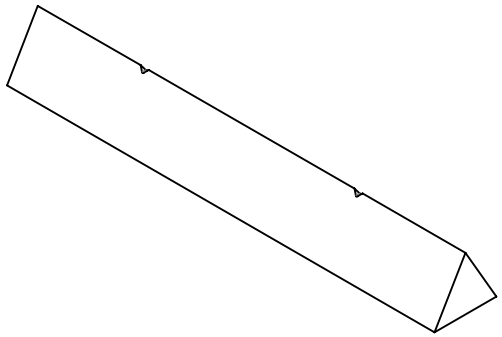
SIZE A **DWG. NO.** D0901241 **REV.** v2

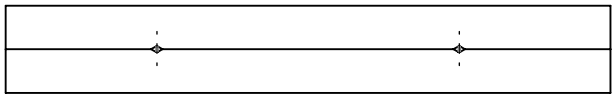
SCALE: 1:1 **PROJECTION:** **SHEET** 1 OF 1

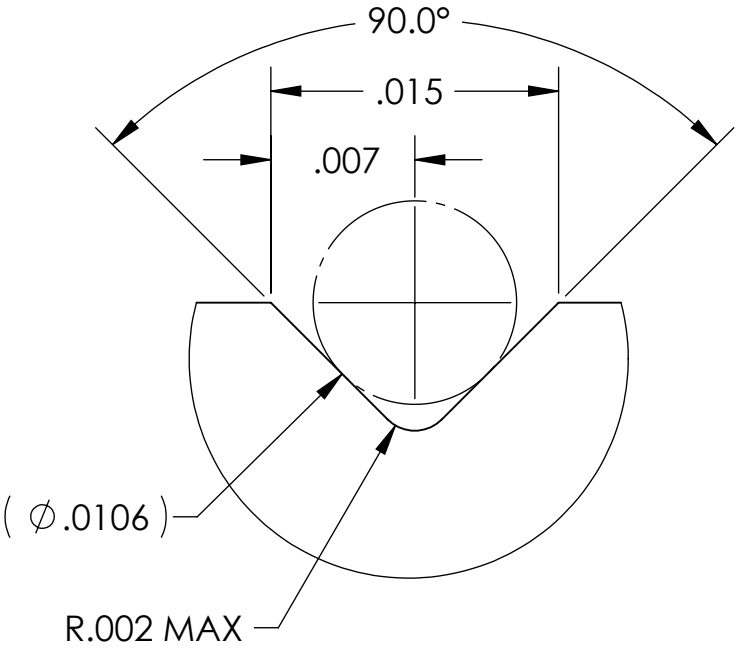
NOTES CONTINUED:

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): 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.

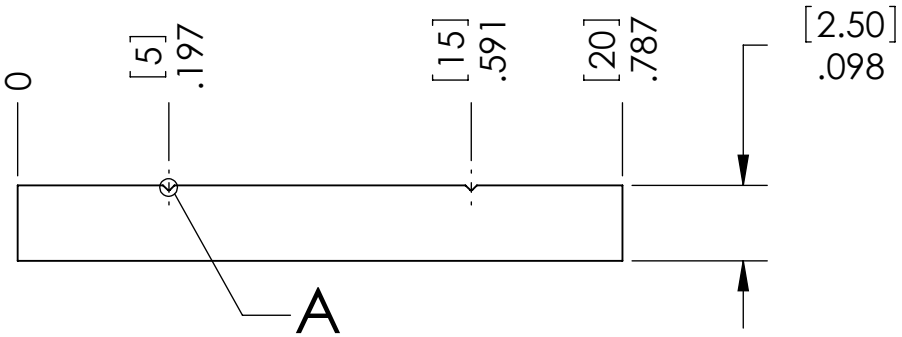
REV.	DATE	DCN #	DRAWING TREE #
v1	03 SEP 2009	E0900277	E080191
v2	28 JUN 2010	E1000236	E080191
-	-	-	-

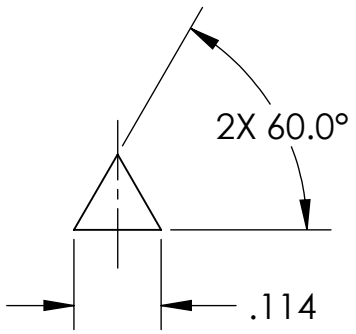






DETAIL A
SCALE 100 : 1
2X





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	
DRAFTER	R. BIEDENHARN	29 OCT 2010	
CHECKER	D. BRIDGES	04 NOV 2010	
APPROVAL			

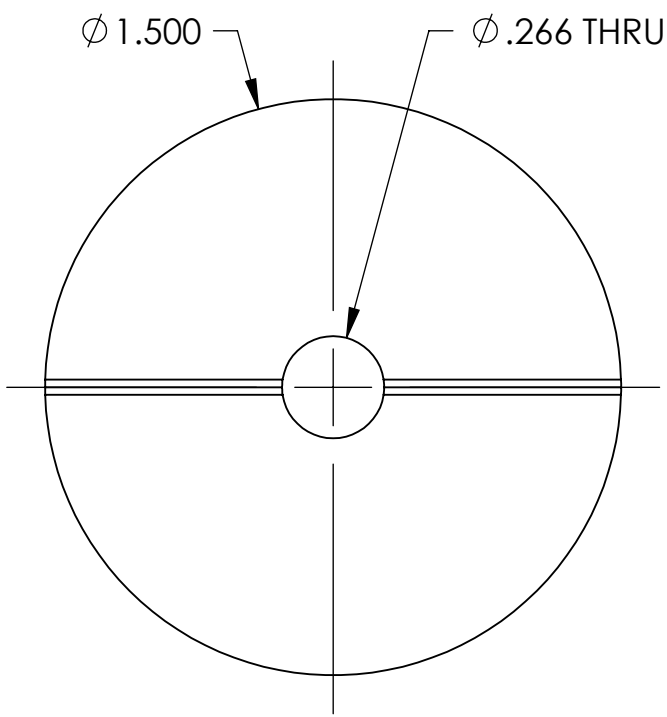
SIZE A **DWG. NO.** D0901286 **REV.** v2

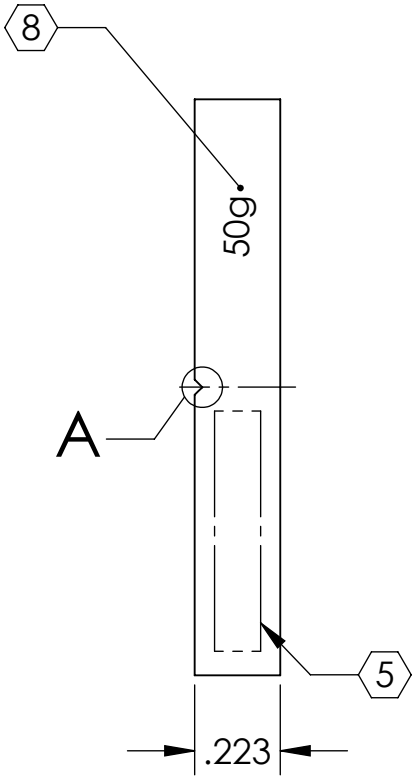
SCALE: 4:1 **PROJECTION:** **SHEET** 1 OF 1

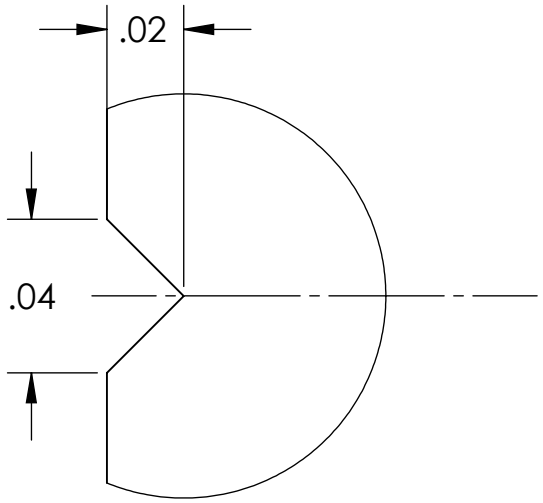
NOTES CONTINUED:

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: 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. 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	-
-	-	-	-







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 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: ADDITIONAL MASS DISK, 50g

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

SIZE: A **DWG. NO.**: D0901405 **REV.**: v2

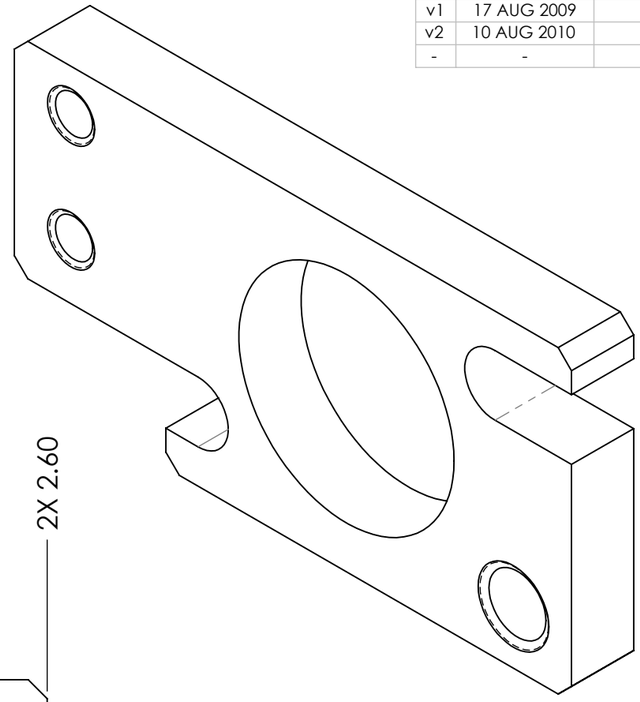
SCALE: 2:1 **PROJECTION:** SHEET 1 OF 1

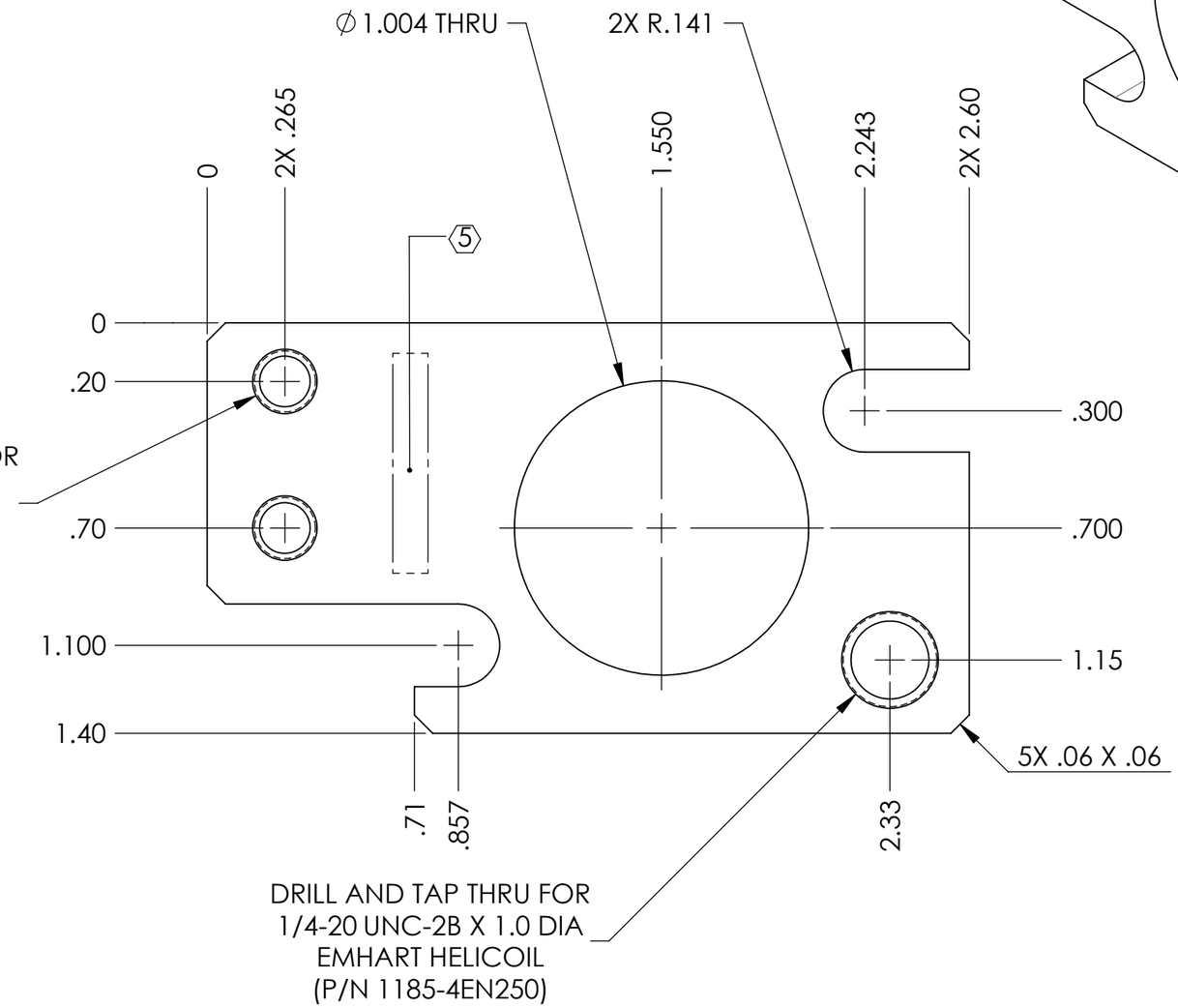
D0901405_Advanced_LIGO_SUS_Additional_Mass_Disk,_50g, PART PDM REV: V1-008, DRAWING PDM REV: V1-002

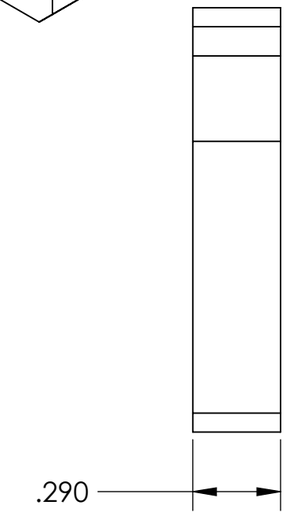
NOTES CONTINUED:

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: 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 #
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 6061-T6 Al

FINISH 63 µinch

LIGO — CALIFORNIA INSTITUTE OF TECHNOLOGY, MASSACHUSETTS INSTITUTE OF TECHNOLOGY

PART NAME AOSEM ALIGNMENT BRACKET, INT. MASS

SYSTEM ADVANCED LIGO

SUB-SYSTEM SUS

NEXT ASSY AOSEM ALIGNMENT ASSY, INT. MASS

DESIGNER	D. BRIDGES	28 OCT 2010
DRAFTER	D. BRIDGES	28 OCT 2010
CHECKER	B. MOORE	01 NOV 2010
APPROVAL		

SIZE B | **DWG. NO.** D0901492 | **REV.** v2

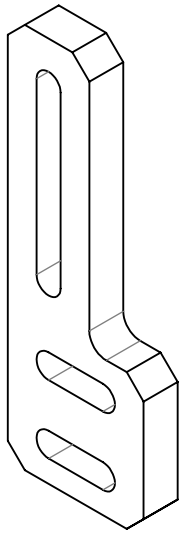
SCALE: 2:1 | **PROJECTION:** | SHEET 1 OF 1

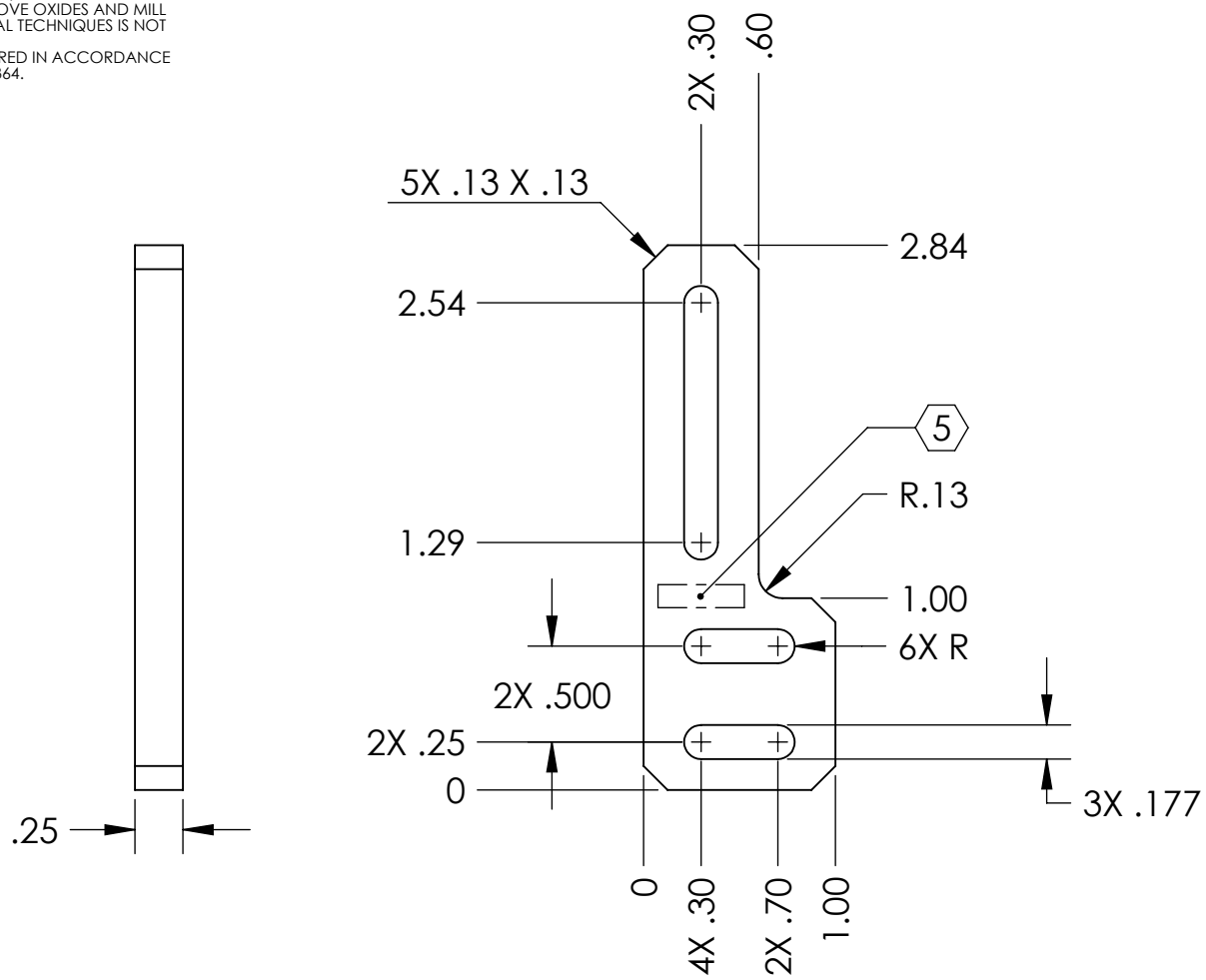
D0901492_Advanced_LIGO_SUS_HLTS_AOSEM_Alignment_Bracket_Intermediate_Mass, PART PDM REV: V1-002, DRAWING PDM REV: V1-001

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: 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.

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 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	
DRAFTER	D. BRIDGES	03 NOV 2010	
CHECKER	B. MOORE	04 NOV 2010	
APPROVAL			

SIZE A **DWG. NO.** D0901493 **REV.** v2

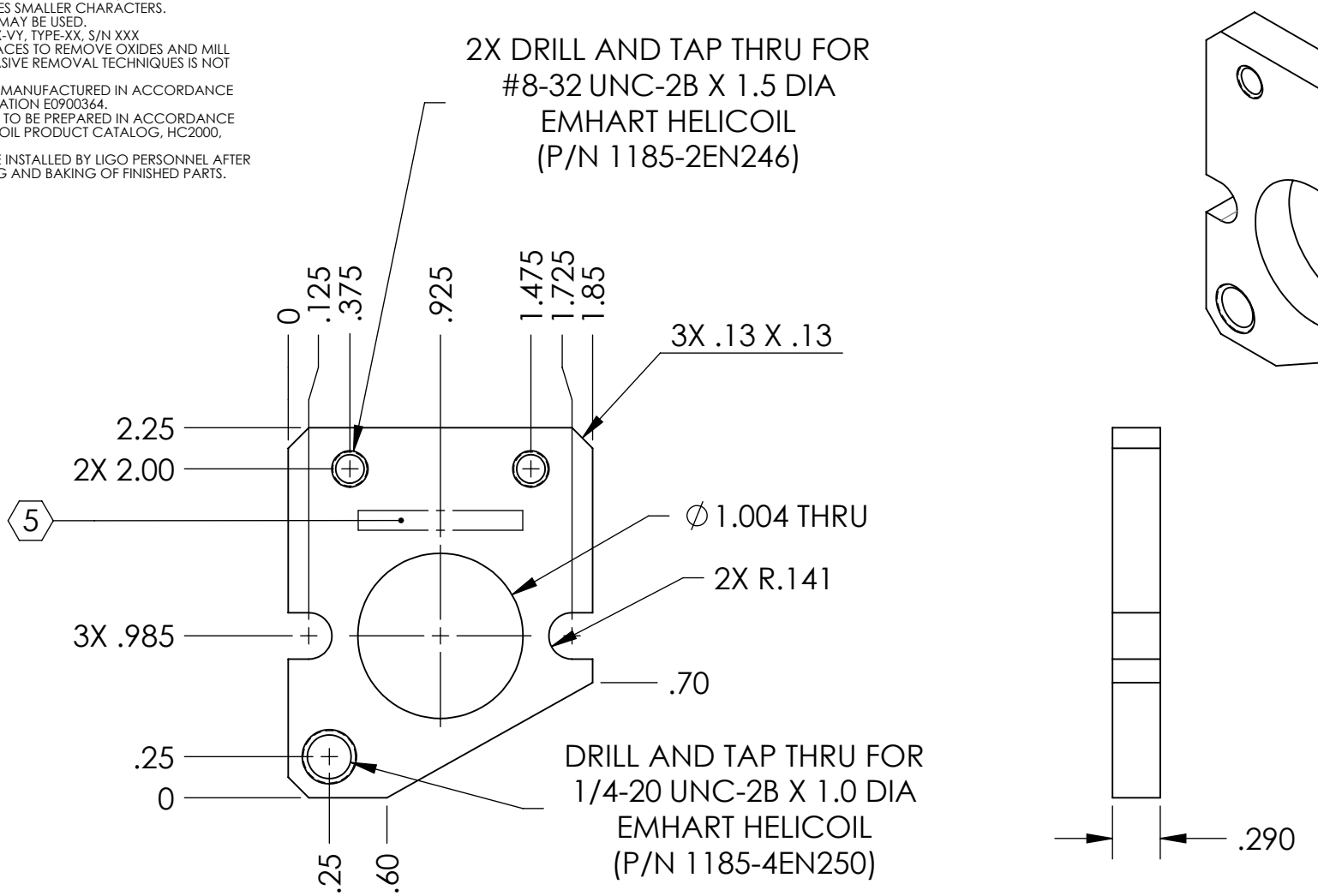
SCALE: 1:1 **PROJECTION:** SHEET 1 OF 1

D0901493_Advanced_LIGO_SUS_HLTS_Lower_AOSEM_Mounting_Bracket,_Intermediate_Mass, PART PDM REV: V1-000, 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: 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 #
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 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	
DRAFTER	D. BRIDGES	01 NOV 2010	
CHECKER	B. MOORE	02 NOV 2010	
APPROVAL			

SIZE A **DWG. NO.** D0901549 **REV.** v2

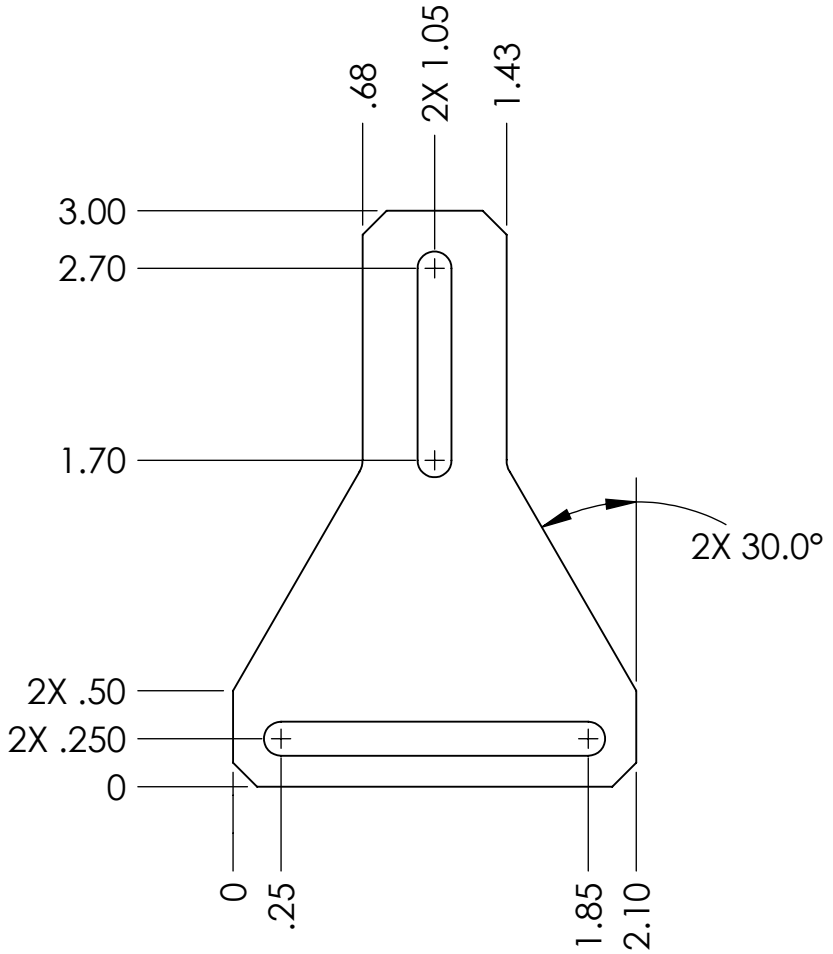
SCALE: 1:1 **PROJECTION:** **SHEET** 1 OF 1

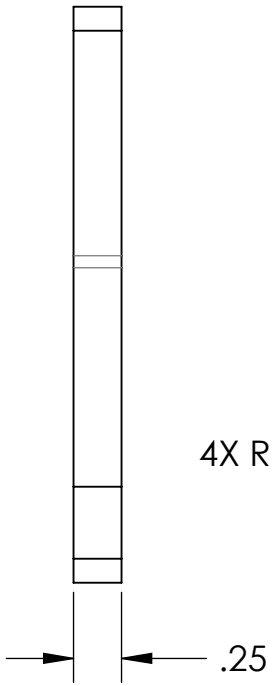
D0901549_Advanced_LIGO_SUS_HLTS_AOSEM_Alignment_Bracket,_Test_Mass, PART PDM REV: V1-000, DRAWING PDM REV: V1-002

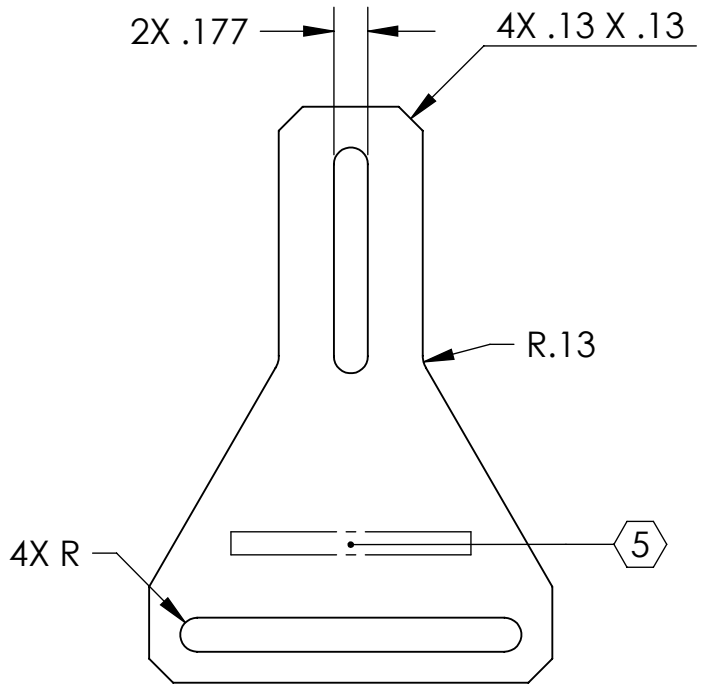
NOTES CONTINUED:

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: 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.

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 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	
APPROVAL			

SIZE A **DWG. NO.** D0901550 **REV.** v2

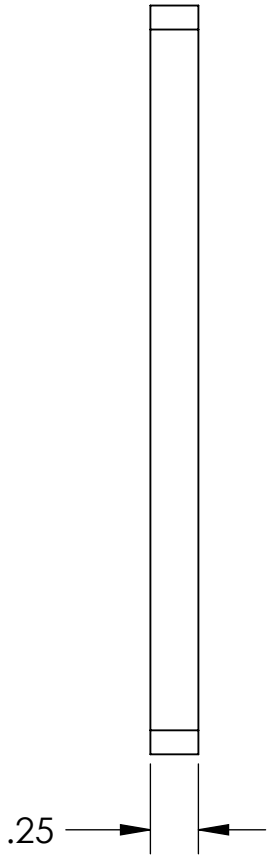
SCALE: 1:1 **PROJECTION:** SHEET 1 OF 1

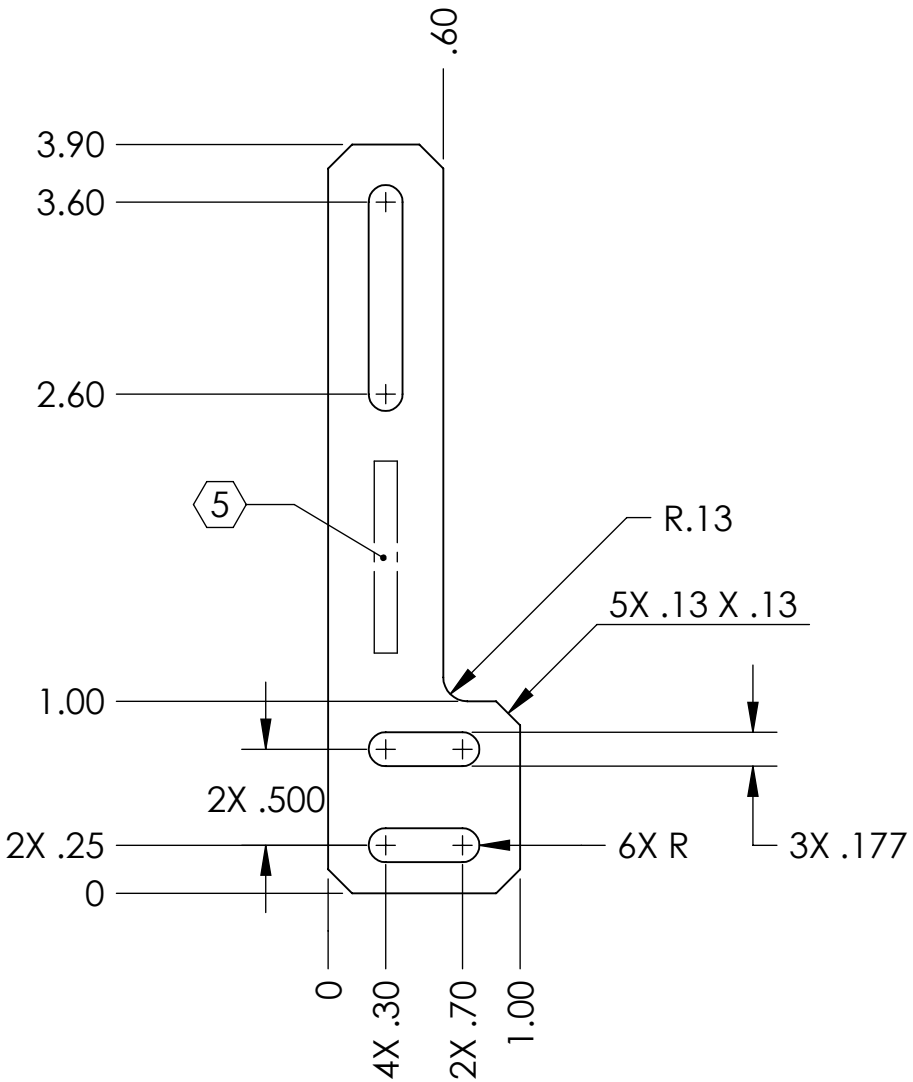
D0901550_Advanced_LIGO_SUS_HLTS_Upper_AOSEM_Mounting_Bracket,_Test_Mass, PART PDM REV: V1-001, DRAWING PDM REV: V1-001

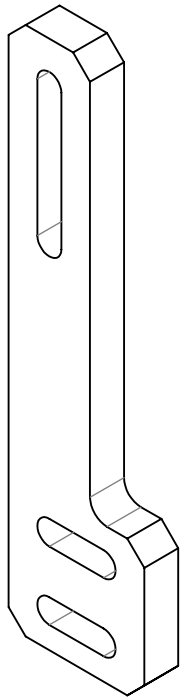
NOTES CONTINUED:

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: 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.

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 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 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	
APPROVAL			

SIZE A **DWG. NO.** D0902025 **REV.** v2

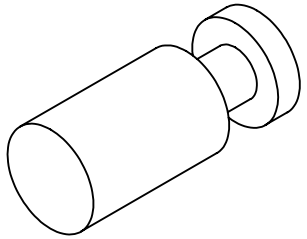
SCALE: 1:1 **PROJECTION:** **SHEET** 1 OF 1

D0902025_Advanced_LIGO_SUS_HLTS_Upper_AOSEM_Mounting_Bracket,_Intermediate_Mass, PART PDM REV: V1-001, DRAWING PDM REV: V1-002

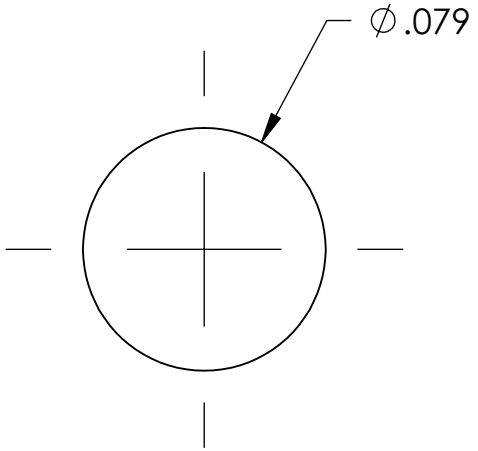
NOTES CONTINUED:

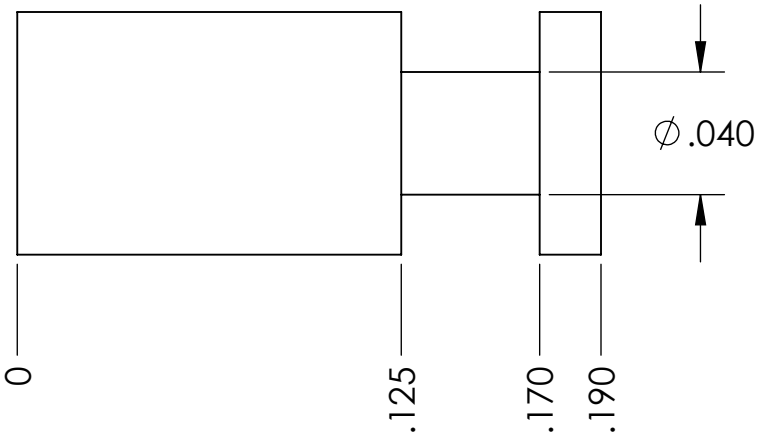
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 101 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
   EXAMPLE: DXXXXXXX-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	
DRAFTER	B. MOORE	18 NOV 2009	
CHECKER	M. MEYER	19 NOV 2009	
APPROVAL			

SIZE A **DWG. NO.** D0902431 **REV.** v1

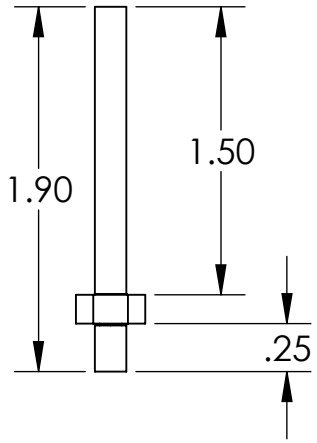
SCALE: 16:1 **PROJECTION:** SHEET 1 OF 1

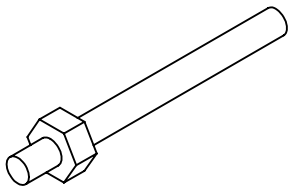
D0902431_AdvLIGO_SUS_HSTS_Magnet Standoff, Test Mass, PART PDM REV: V1, DRAWING PDM REV: V1

NOTES CONTINUED:

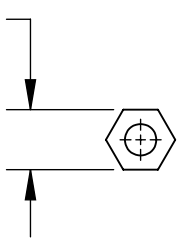
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 101 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
   EXAMPLE: DXXXXXXX-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.

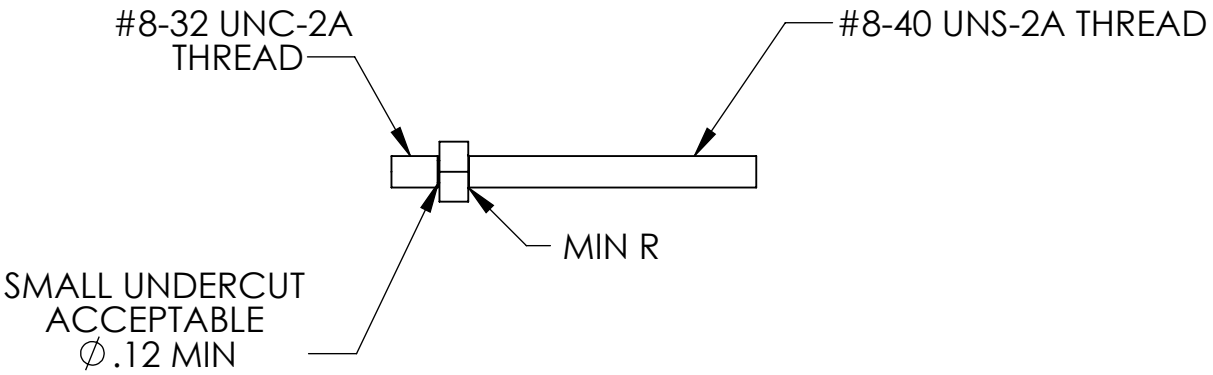
REV.	DATE	DCN #	DRAWING TREE #
v1	16 JUN 2010	E0900505	E0900353
-	-	-	-
-	-	-	-





ISOMETRIC VIEW





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 SSTL

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
DRAFTER	B. MOORE	26 MAR 2010
CHECKER	M. MEYER	26 MAR 2010
APPROVAL		

SIZE A **DWG. NO.** D1000659 **REV.** v1

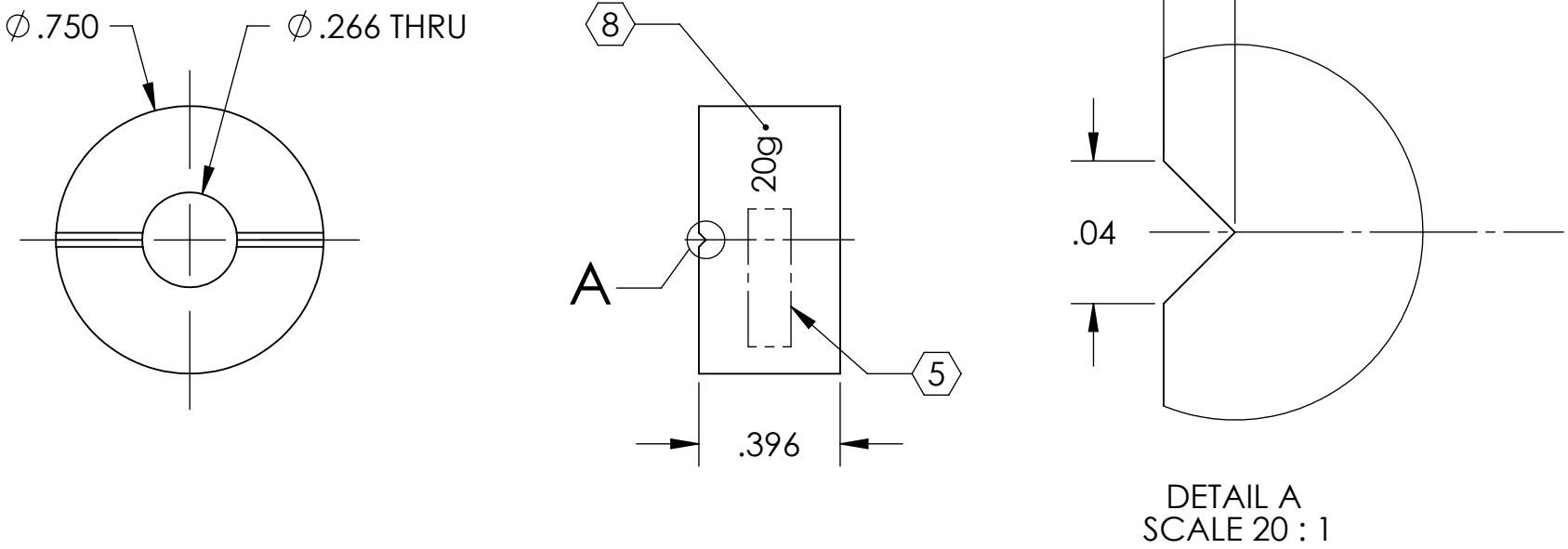
SCALE: 1:1 **PROJECTION:** **SHEET** 1 OF 1

D1000659_aLIGO_SUS_ADJUSTER SHAFT, PART PDM REV: X-001, DRAWING PDM REV: X-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: 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. 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 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 ADDITIONAL MASS DISK, 20g

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

SIZE A **DWG. NO.** D1001229 **REV.** v1

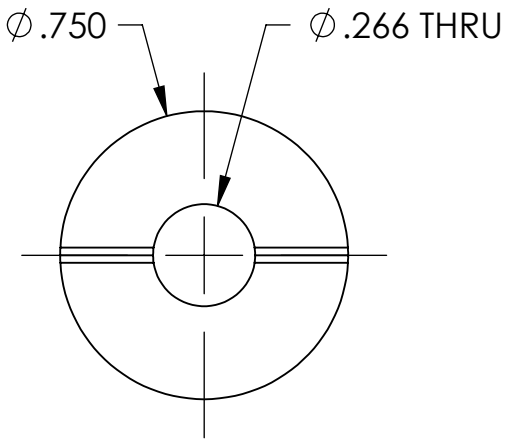
SCALE: 2:1 **PROJECTION:** **SHEET** 1 OF 1

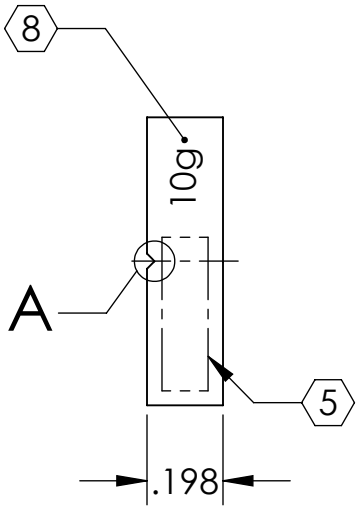
D1001229_Advanced_LIGO_SUS_Additional_Mass_Disk,_20g, PART PDM REV: V1-008, DRAWING PDM REV: X-000

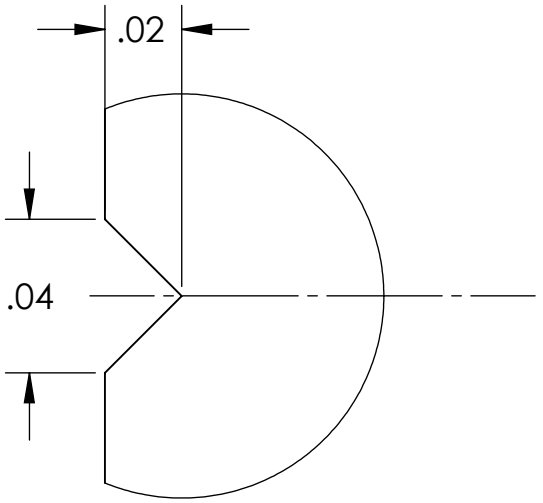
NOTES CONTINUED:

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: 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. 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 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 ADDITIONAL MASS DISK, 10g

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

SIZE A **DWG. NO.** D1001230 **REV.** v1

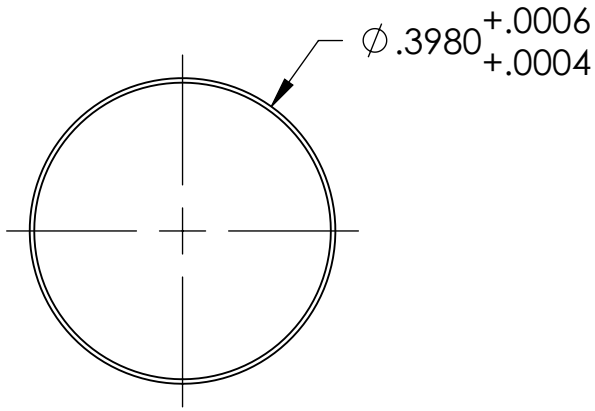
SCALE: 2:1 **PROJECTION:** **SHEET 1 OF 1**

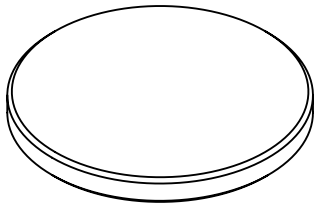
D1001230_Advanced_LIGO_SUS_Additional_Mass_Disk,_10g, PART PDM REV: V1-008, DRAWING PDM REV: X-001

NOTES CONTINUED:

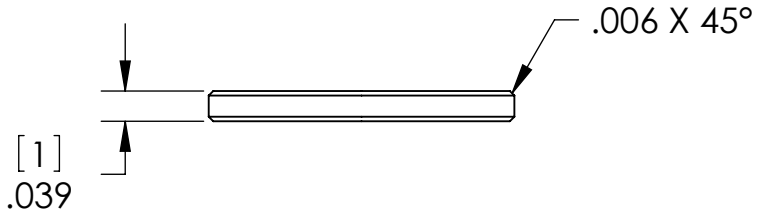
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 101 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND QUANTITY. IF PARTS ARE TOO SMALL TO SCRIBE, BAGGING AND TAGGING ALONE IS SUFFICIENT.
   EXAMPLE (PART): XXX-v1
   EXAMPLE (TAG): DXXXXXXX-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.

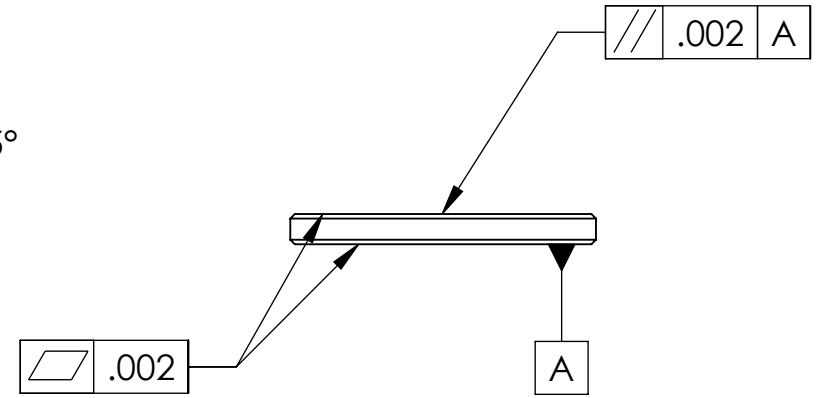
REV.	DATE	DCN #	DRAWING TREE #
v1	09 JUL 2010	E0900501	E0900353
-	-	-	-
-	-	-	-





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 SSTL

FINISH: 32 µinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: ADVANCED LIGO

SUB-SYSTEM: SUS

NEXT ASSY: MULTIPLE ASSY

PART NAME: MAGNETIC PLUG

DESIGNER	M. MEYER	14 JUN 2010
DRAFTER	B. MOORE	14 JUN 2010
CHECKER	M. MEYER	16 JUN 2010
APPROVAL		

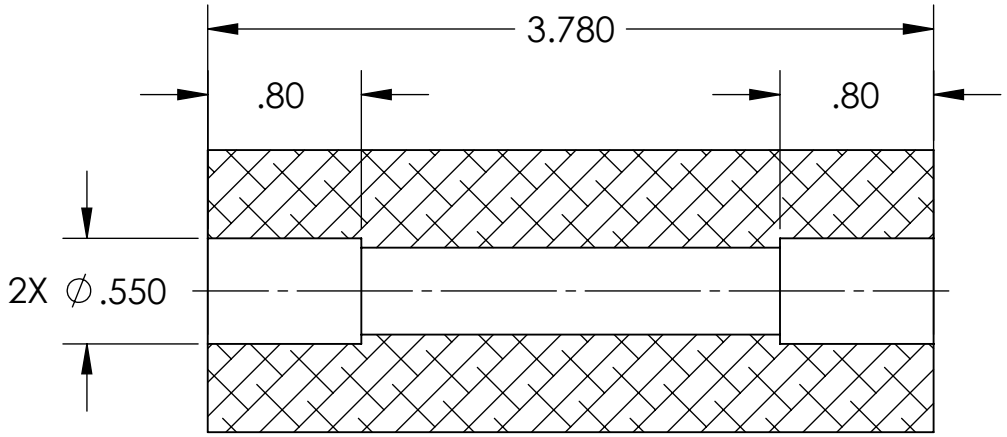
SIZE: A | **DWG. NO.**: D1001534 | **REV.**: v1

SCALE: 4:1 | **PROJECTION**: | SHEET 1 OF 1

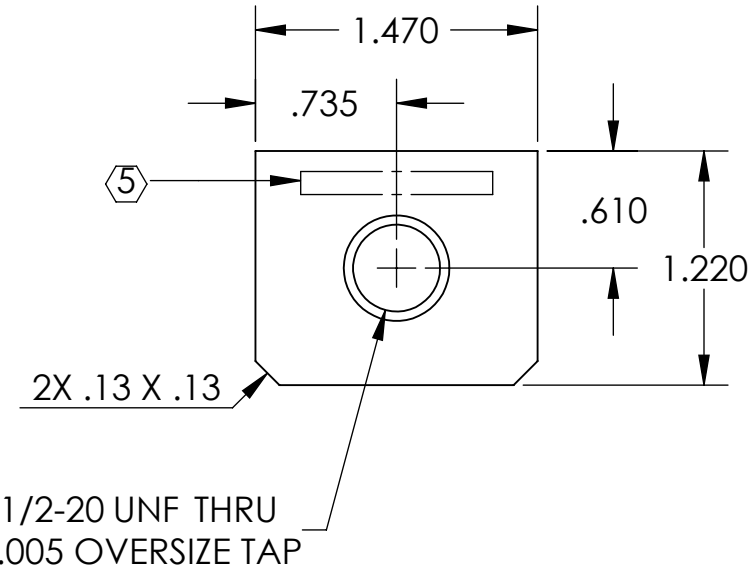
NOTES CONTINUED:

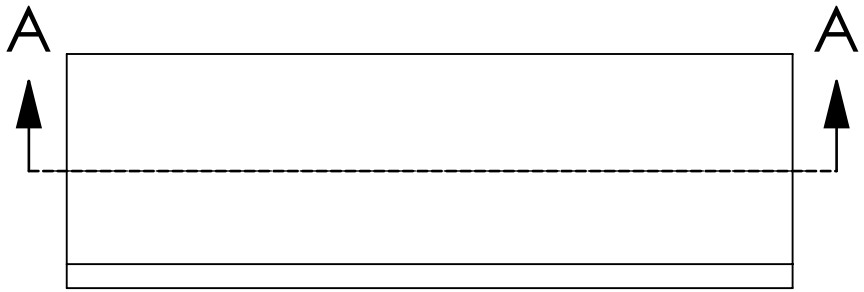
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

REV.	DATE	DCN #	DRAWING TREE #
v1	18 MAY 2010	E1000166	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 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 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 A **DWG. NO.** D1001669 **REV.** v1

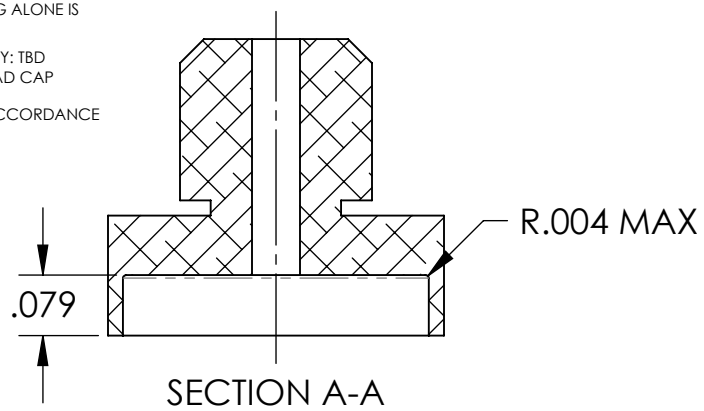
SCALE: 1:1 **PROJECTION:** SHEET 1 OF 1

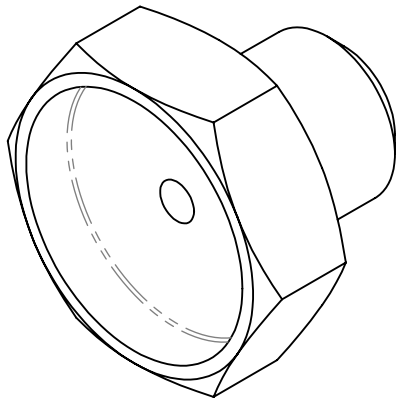
D1001669_Advanced_LIGO_SUS_HLTS_Cylindrical_Pitch_Insert,_T-Piece,_Upper_Mass, PART PDM REV: X-002, DRAWING PDM REV: X-003

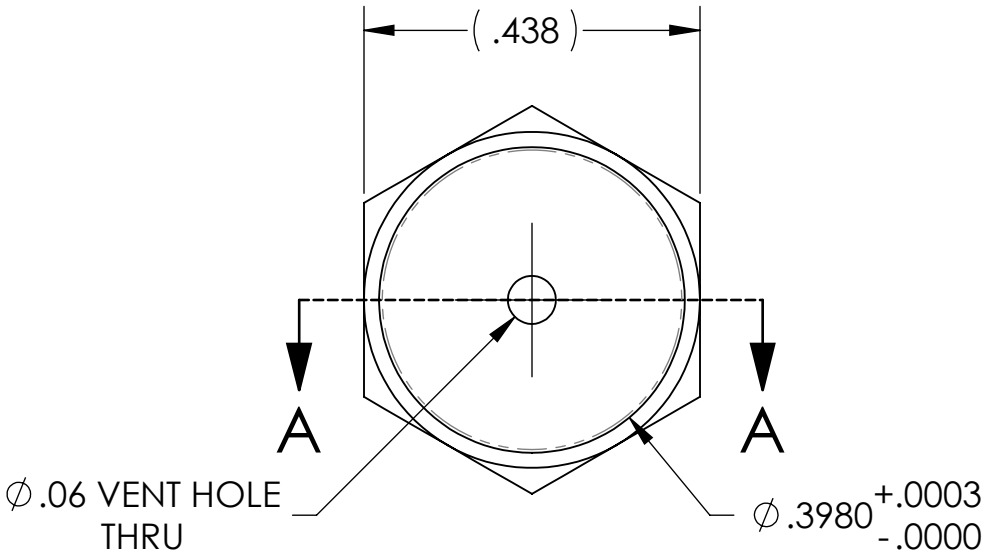
NOTES CONTINUED:

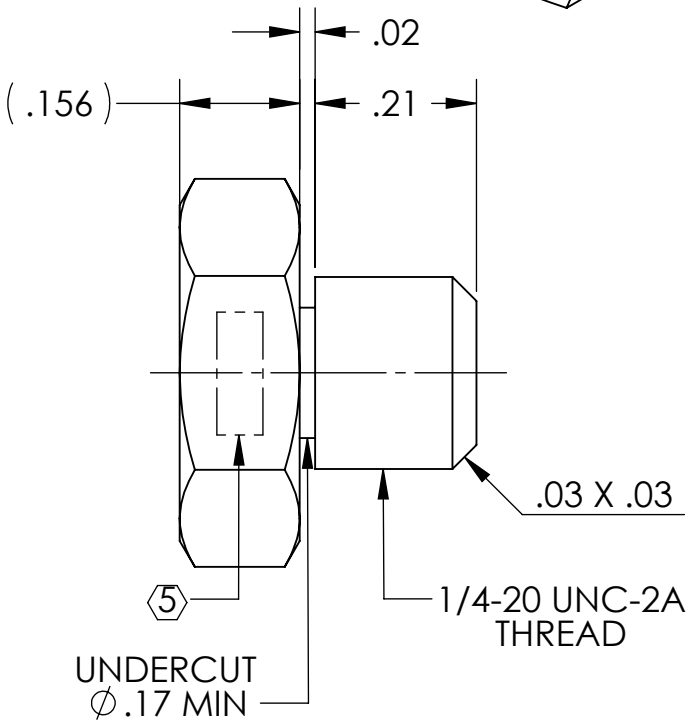
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND 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. 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
DRAFTER	D. BRIDGES	14 JUL 2010
CHECKER	M. MEYER	16 JUL 2010
APPROVAL		

SIZE: A **DWG. NO.**: D1001697 **REV.**: v1

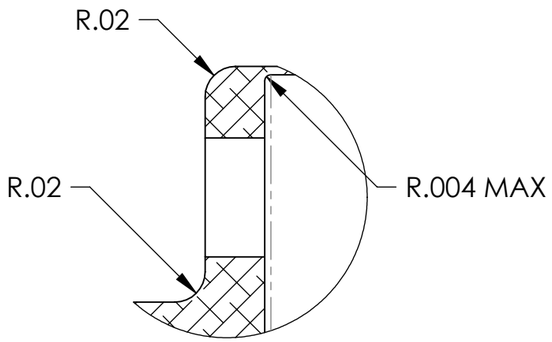
SCALE: 4:1 **PROJECTION**: **SHEET** 1 OF 1

D1001697_Advanced_LIGO_SUS_HLTS_Magnet_Retainer,_BOSEM, PART PDM REV: X-003, DRAWING PDM REV: X-002

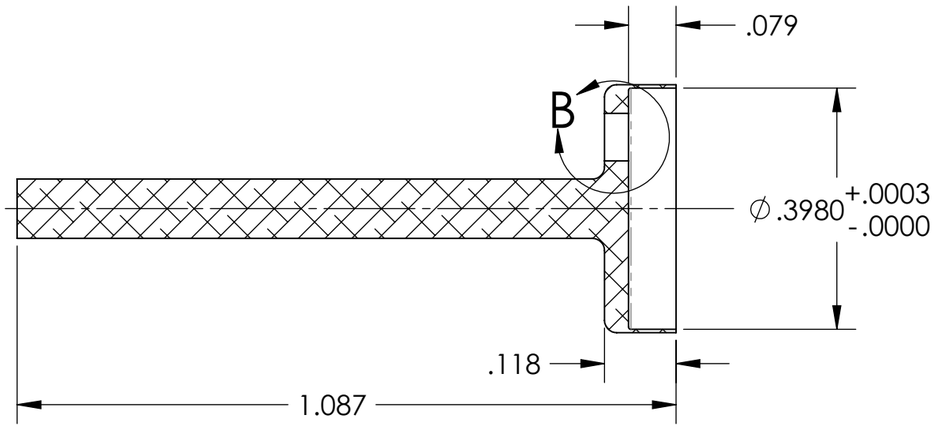
NOTES CONTINUED:

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.

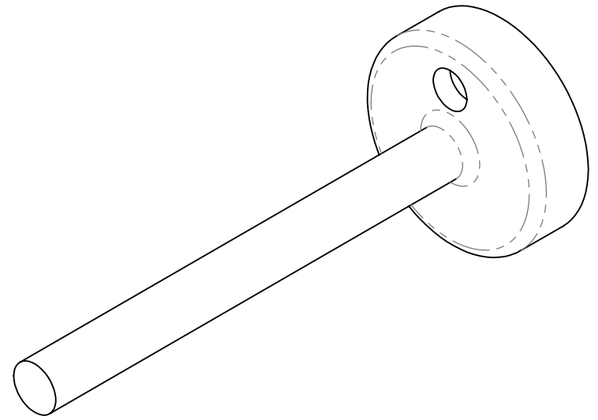
REV.	DATE	DCN #	DRAWING TREE #
v1	18 MAY 2010	E1000166	-
-	-	-	-
-	-	-	-

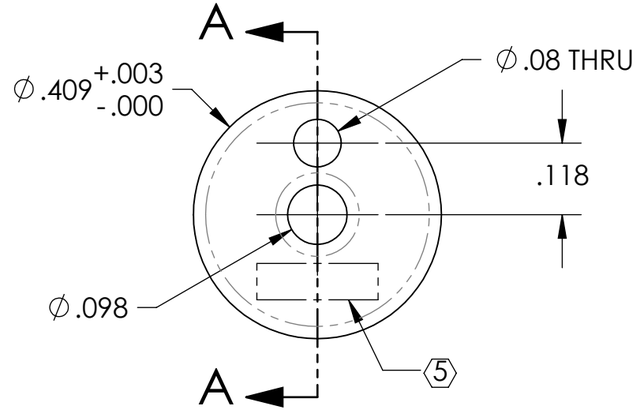


DETAIL B
SCALE 10 : 1



SECTION A-A





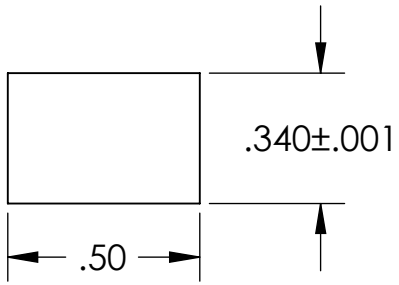
D1001698_Advanced_LIGO_SUS_HLTS_Magnet_Flag_BOSEM, PART PDM REV: X-000, DRAWING PDM REV:

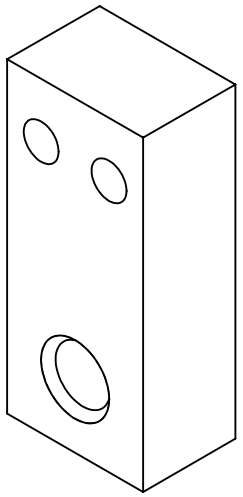
NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)										
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.5°	1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER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

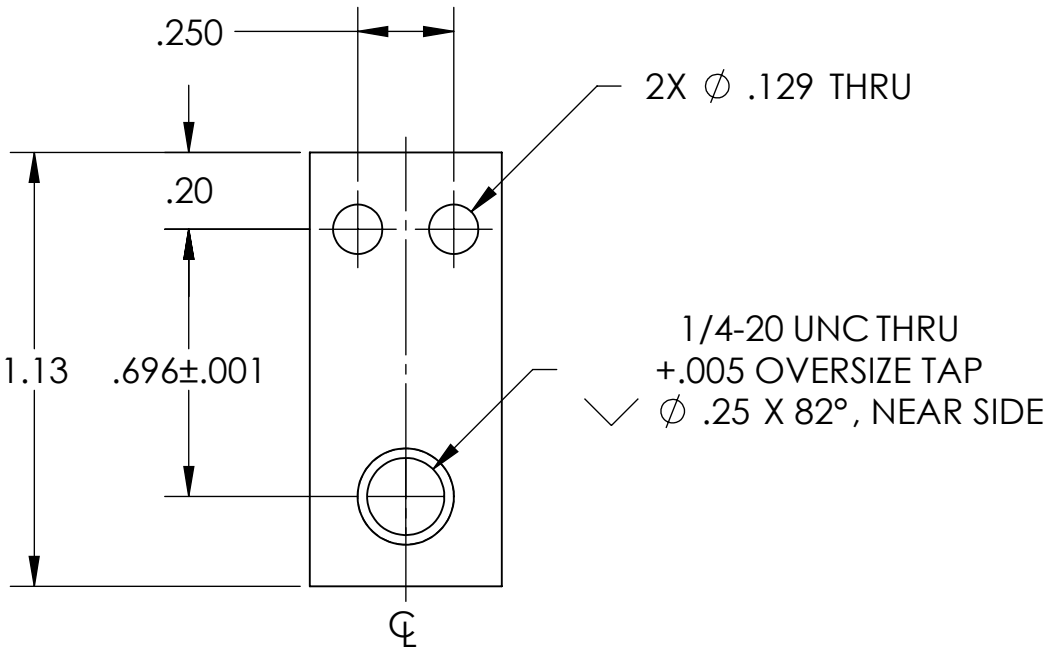
NOTES CONTINUED:

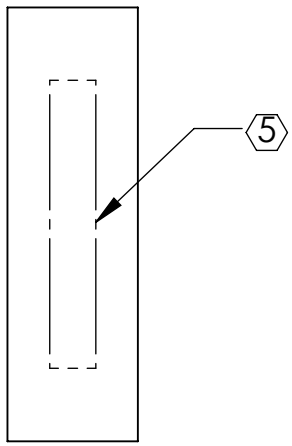
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

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

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: ADVANCED LIGO

SUB-SYSTEM: SUS

NEXT ASSY: UPPER MASS, HLTS

PART NAME: MAGNET HOLDER, BOSEM, HLTS

DESIGNER	D. BRIDGES	19 JUL 2010
DRAFTER	D. BRIDGES	20 JUL 2010
CHECKER	M. MEYER	21 JUI 2010
APPROVAL		

SIZE: A **DWG. NO.**: D1001699 **REV.**: v1

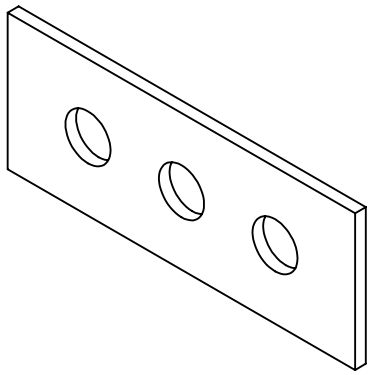
SCALE: 2:1 **PROJECTION:** SHEET 1 OF 1

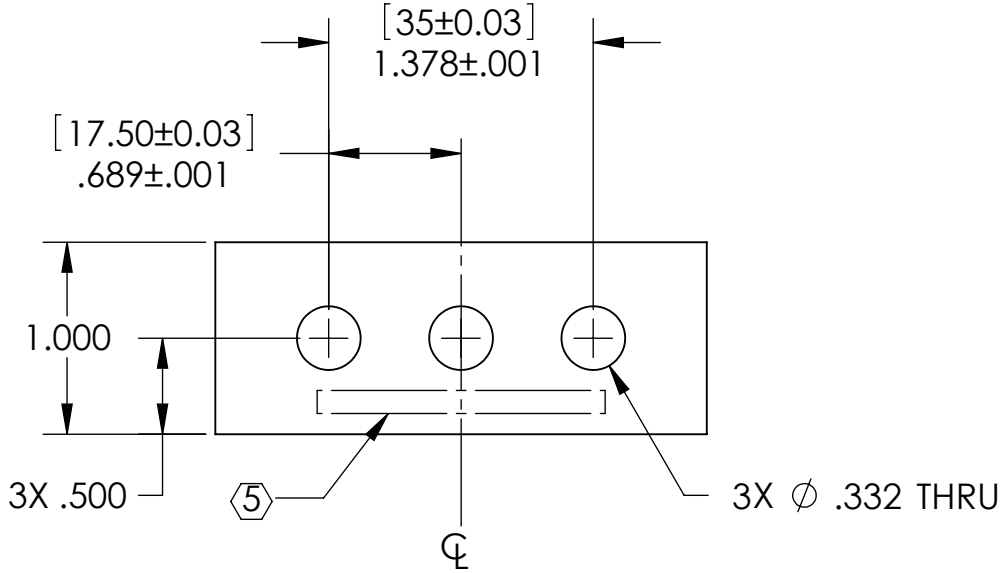
D1001699_Magnet_Holder,_BOSEM,_HLTS, PART PDM REV: X-003, DRAWING PDM REV: X-003

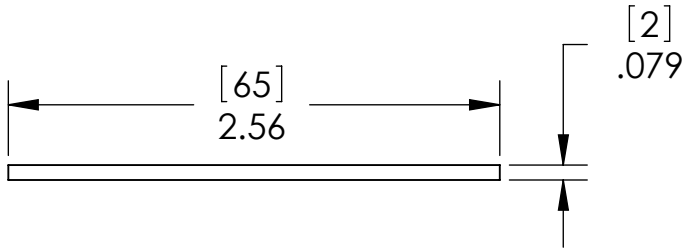
NOTES CONTINUED:

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.

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

FINISH 32 µinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM ADVANCED LIGO

SUB-SYSTEM SUS

NEXT ASSY ROTATIONAL ADJUSTER

PART NAME SHIM, 2mm, UPPER BLADE

DESIGNER	D. BRIDGES	27 JUL 2010	
DRAFTER	D. BRIDGES	27 JUL 2010	
CHECKER	M. MEYER	27 JUL 2010	
APPROVAL			

SIZE A **DWG. NO.** D1001914 **REV.** v1

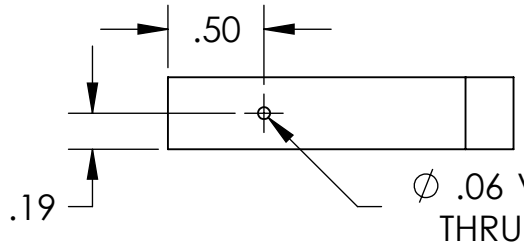
SCALE: 1:1 **PROJECTION:** **SHEET 1 OF 1**

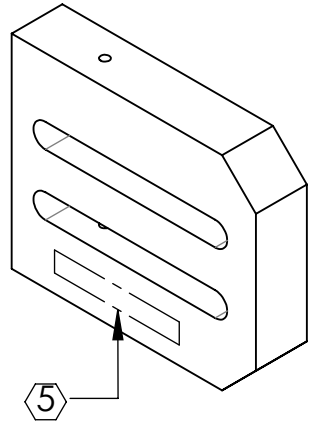
D1001914_Advanced_LIGO_SUS_HLTS_Shim,_2mm,_Upper_Blade, PART PDM REV: X-000, DRAWING PDM REV: X-001

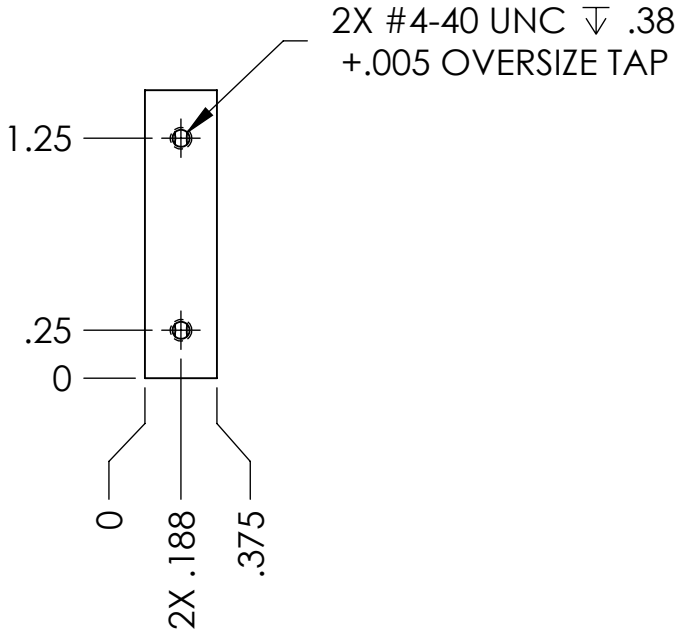
NOTES CONTINUED:

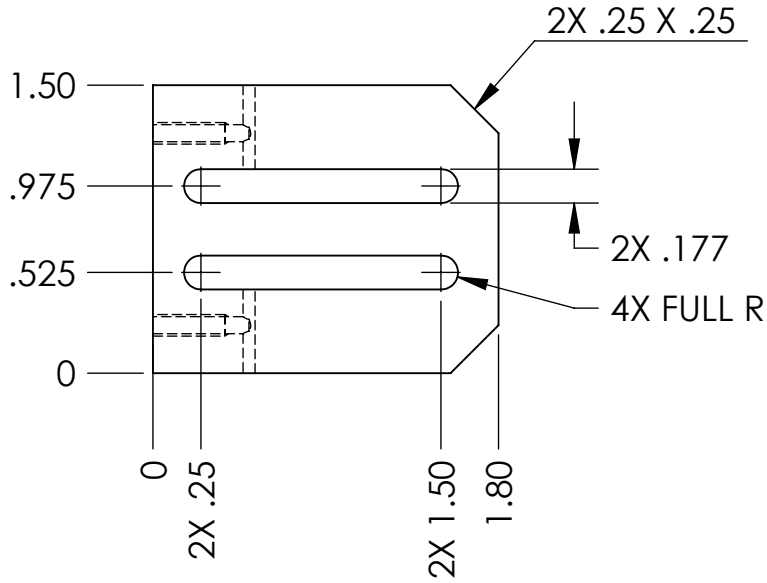
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM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

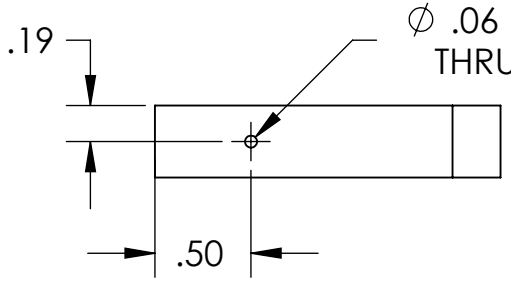
REV.	DATE	DCN #	DRAWING TREE #
v1	10 AUG 2010	E1000301	E080191
-	-	-	-
-	-	-	-











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, HLTS

PART NAME MOUNTING BRACKET LATERAL SECTION

DESIGNER	D. BRIDGES	11 AUG 2010	
DRAFTER	D. BRIDGES	12 AUG 2010	
CHECKER	B. MOORE	16 AUG 2010	
APPROVAL			

SIZE A **DWG. NO.** D1002134 **REV.** v1

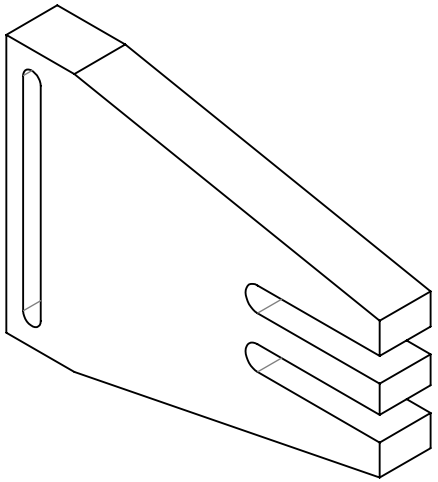
SCALE: 1:1 **PROJECTION:** **SHEET** 1 OF 1

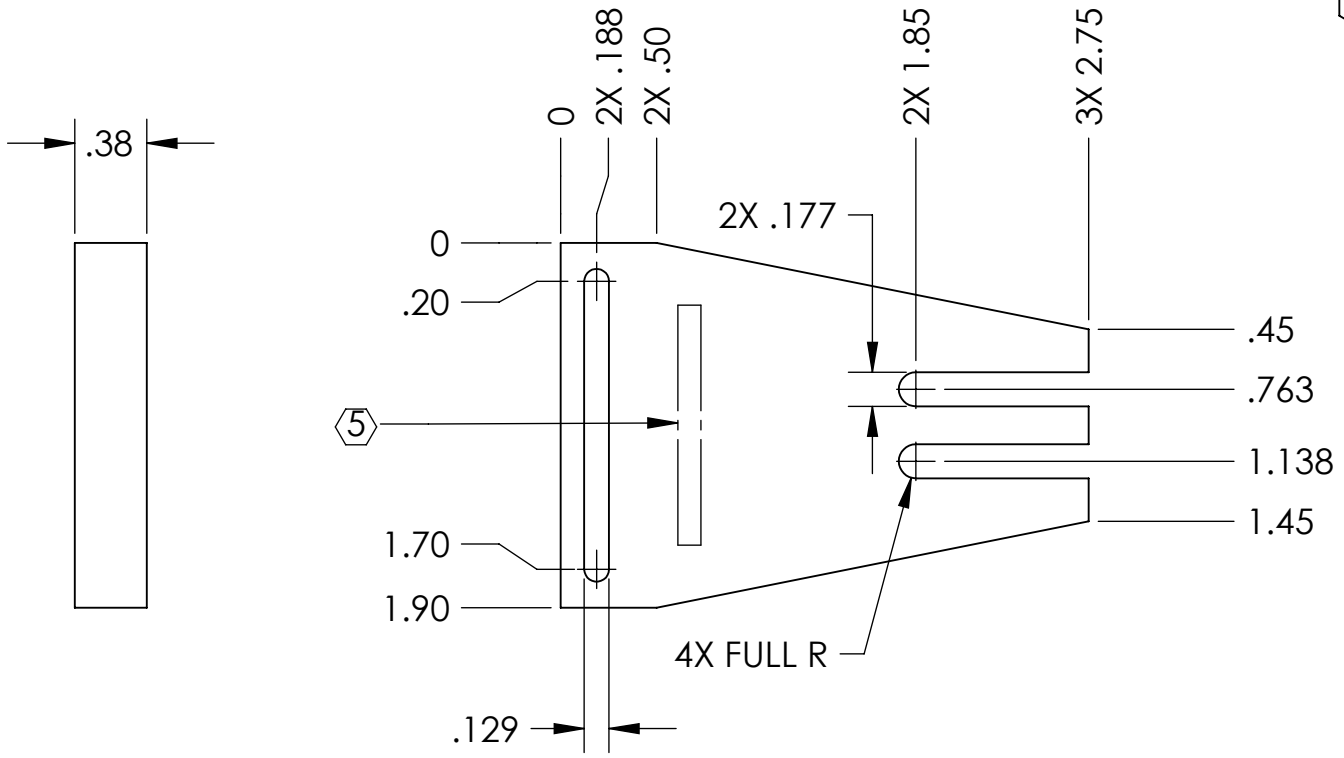
D1002134_Advanced_LIGO_SUS_HLTS_Mounting_Bracket_Lateral_Section,_Coil_Holder, PART PDM REV: X-000, DRAWING PDM REV: X-001

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: 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.

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	
DRAFTER	D. BRIDGES	14 AUG 2010	
CHECKER	B. MOORE	16 AUG 2010	
APPROVAL			

SIZE A **DWG. NO.** D1002135 **REV.** v1

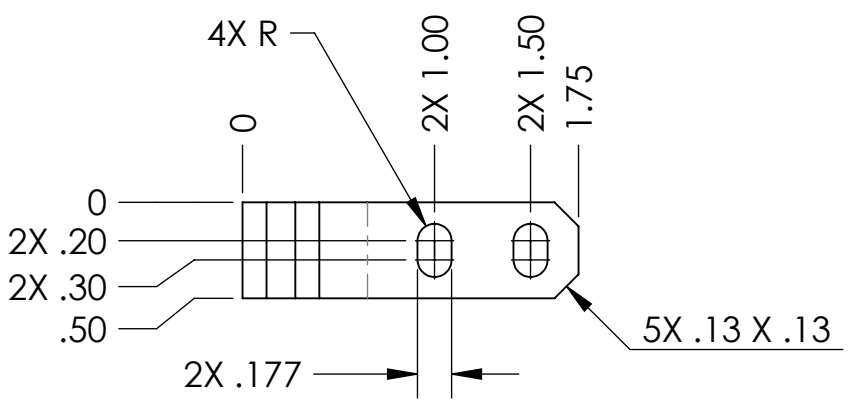
SCALE: 1:1 **PROJECTION:** SHEET 1 OF 1

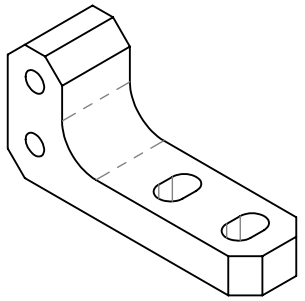
D1002135_Advanced_LIGO_SUS_HLTS_Mounting_Bracket_Longitudinal_Section,_Coil_Holder, PART PDM REV: X-001, DRAWING PDM REV: X-003

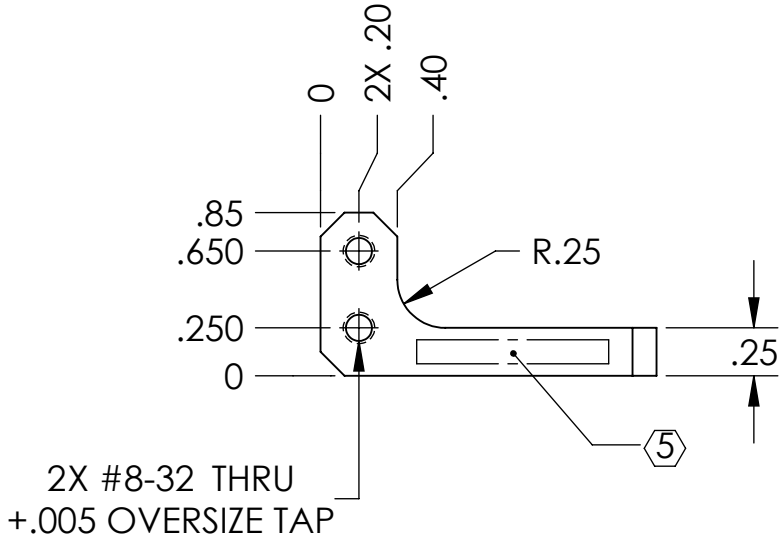
NOTES CONTINUED:

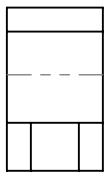
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 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.

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
DRAFTER	D. BRIDGES	27 OCT 2010
CHECKER	B. MOORE	28 OCT 2010
APPROVAL		

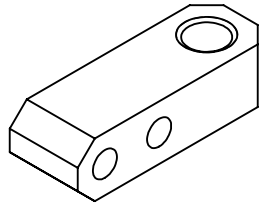
SIZE A **DWG. NO.** D1002823 **REV.** v1

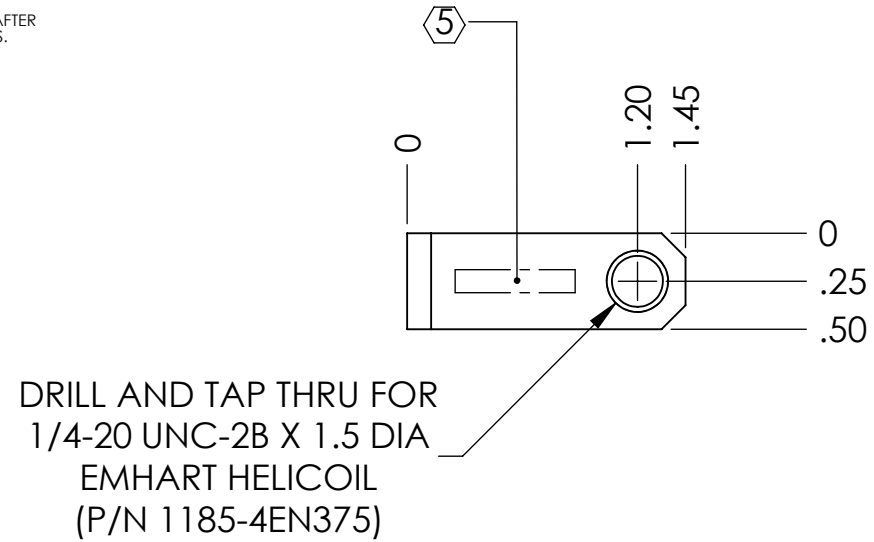
SCALE: 1:1 **PROJECTION:** SHEET 1 OF 1

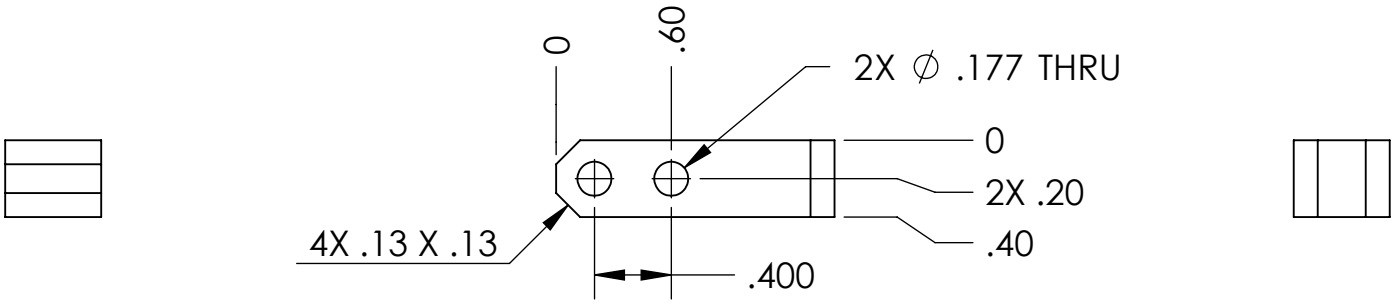
NOTES CONTINUED:

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: 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 #
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 SIDE, BOTTOM MASS, LOWER

DESIGNER	D. BRIDGES	25 OCT 2010
DRAFTER	D. BRIDGES	27 OCT 2010
CHECKER	B. MOORE	28 OCT 2010
APPROVAL		

SIZE A **DWG. NO.** D1002824 **REV.** v1

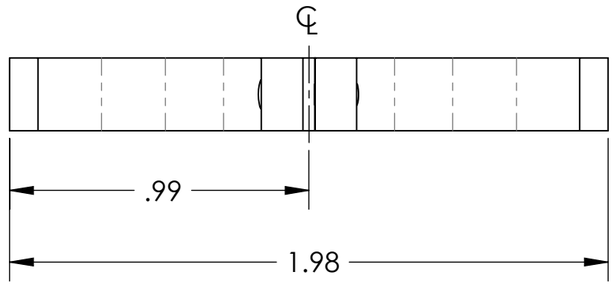
SCALE: 1:1 **PROJECTION:** **SHEET** 1 OF 1

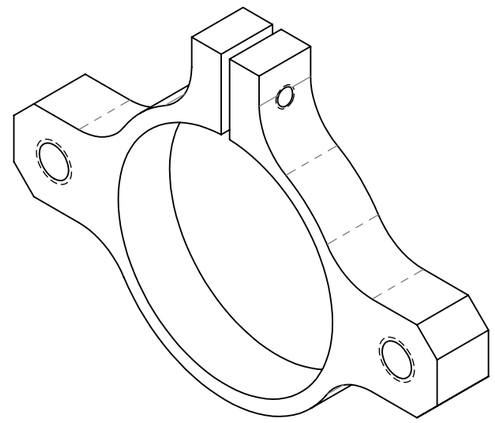
D1002824_Advanced_LIGO_SUS_HLTS_Lower_Bottom_Mass_Earthquake_Stop_Bracket_Side, PART PDM REV: X-000, DRAWING PDM REV: X-000

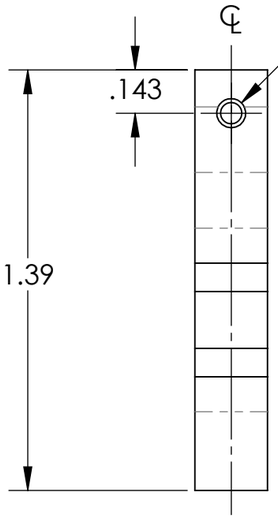
NOTES CONTINUED:

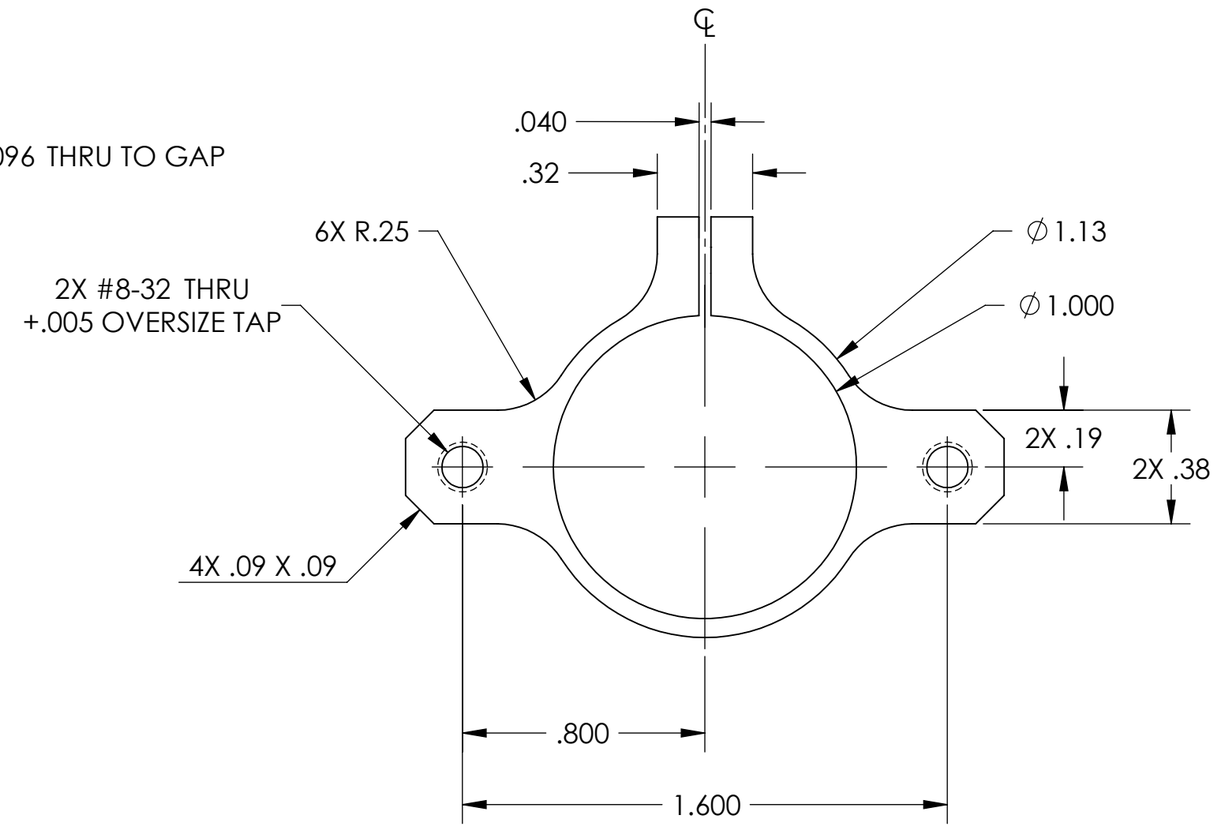
5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO DYES OR INKS) A UNIQUE THREE DIGIT SERIAL NUMBER & REVISION NUMBER ON EACH PART. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. BAG AND TAG PARTS WITH THEIR DRAWING PART NUMBER, REVISION, VARIANT OR "TYPE" (IF APPLICABLE), AND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

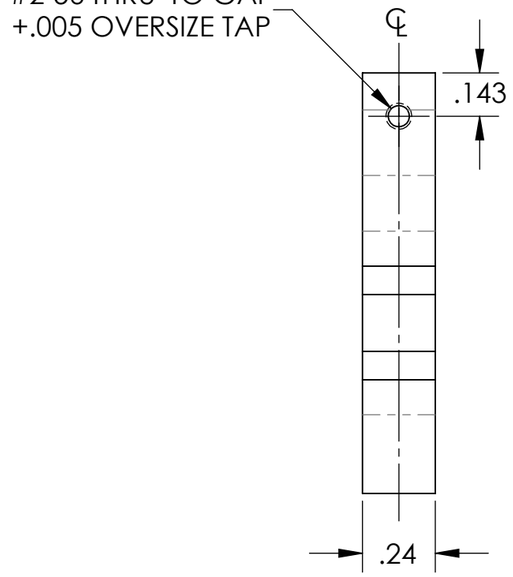
REV.	DATE	DCN #	DRAWING TREE #
v1	10 AUG 2010	E1000301	E080191
-	-	-	-
-	-	-	-











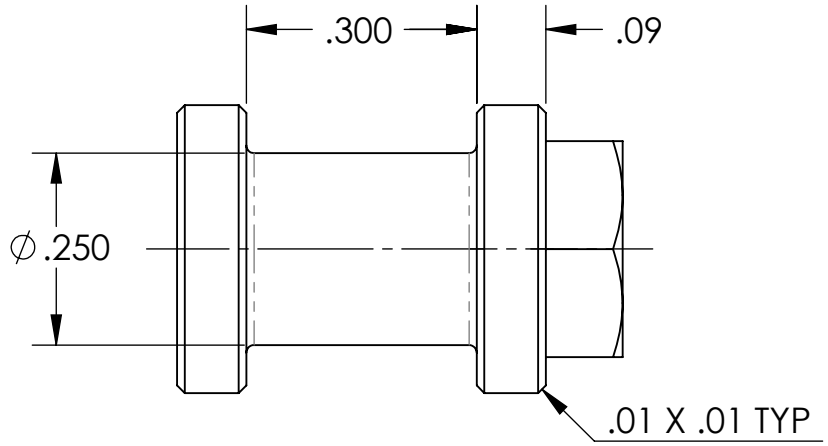
NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)									
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 0.5°	1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER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

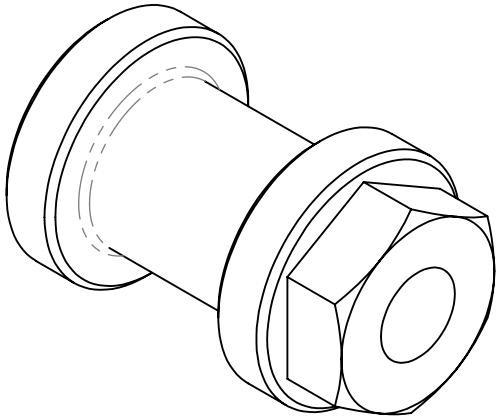
D1002858_Advanced_LIGO_SUS_AOSEM_Adjustment_Collar_(Reverse_Side), PART PDM REV: X-003, DRAWING PDM REV: X-000

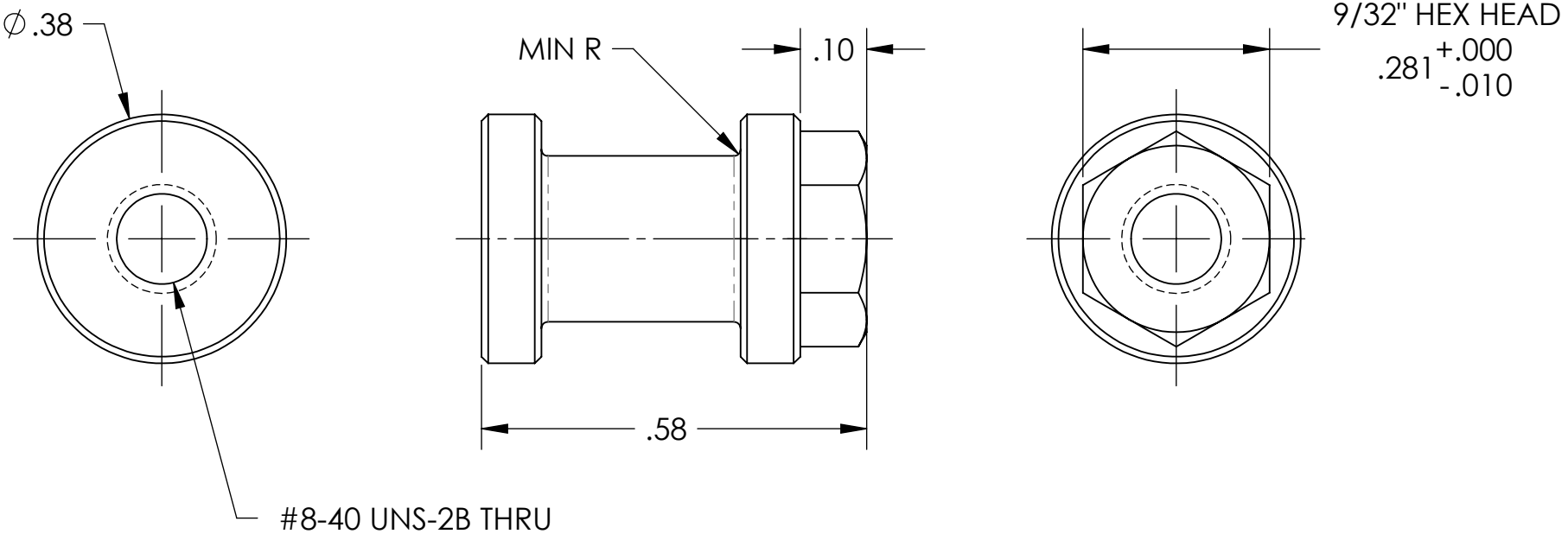
NOTES CONTINUED:

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. 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
-	-	-	-
-	-	-	-







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⟨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 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

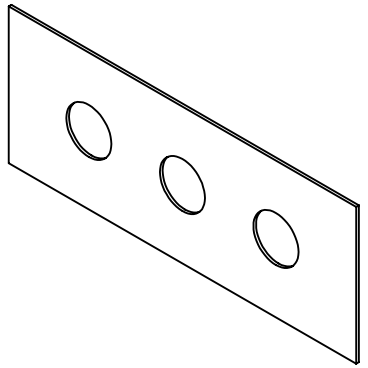
SCALE: 4:1 **PROJECTION:** **SHEET 1 OF 1**

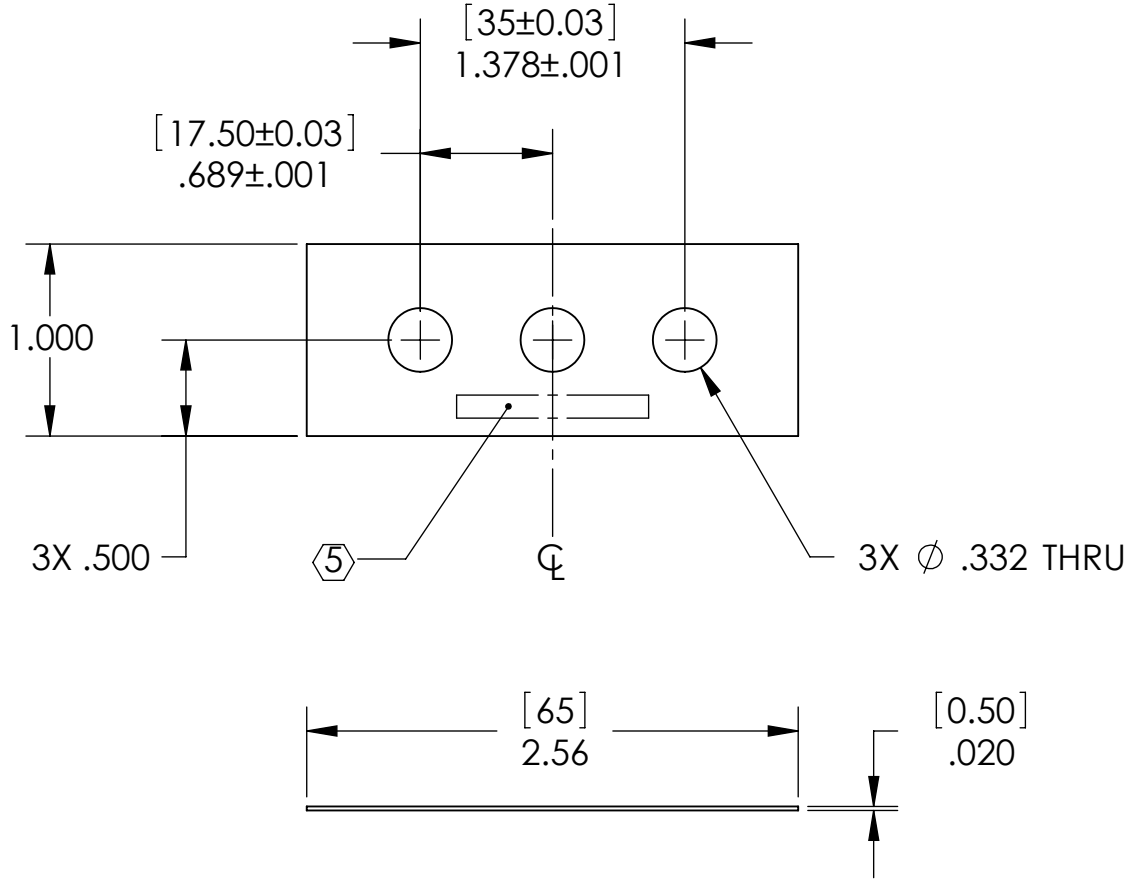
D1002865_Advanced_LIGO_SUS_Adjustment_Nut,_Thick,_AOSEM_Alignment_Assembly, PART PDM REV: X-001, DRAWING PDM REV: X-003

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)

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 SSTL

FINISH: 32 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	05 NOV 2010	
DRAFTER	D. BRIDGES	05 NOV 2010	
CHECKER	B. MOORE	08 NOV 2010	
APPROVAL			

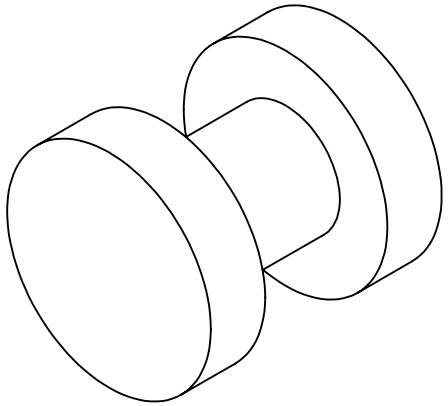
SIZE: A **DWG. NO.**: D1002973 **REV.**: v1

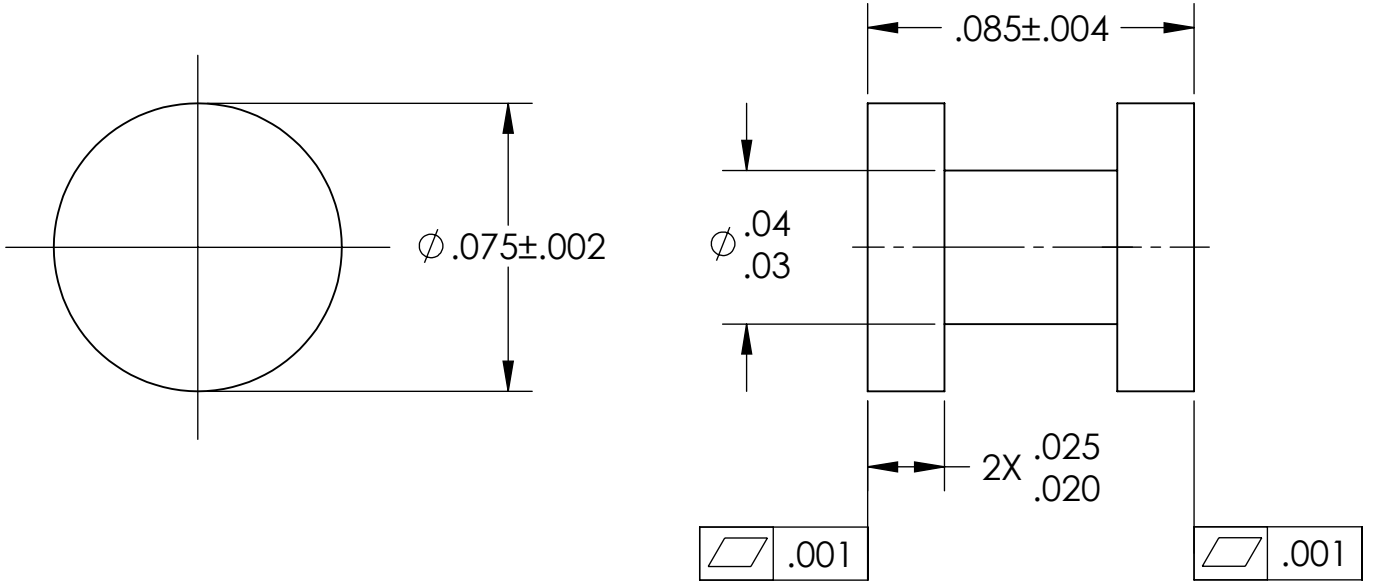
SCALE: 1:1 **PROJECTION**: **SHEET** 1 OF 1

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): 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 #
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	
DRAFTER	D. BRIDGES	01 NOV 2010	
CHECKER	B. MOORE	02 NOV 2010	
APPROVAL			

SIZE A **DWG. NO.** D970075 **REV.** v2

SCALE: 20:1 **PROJECTION:** **SHEET** 1 OF 1