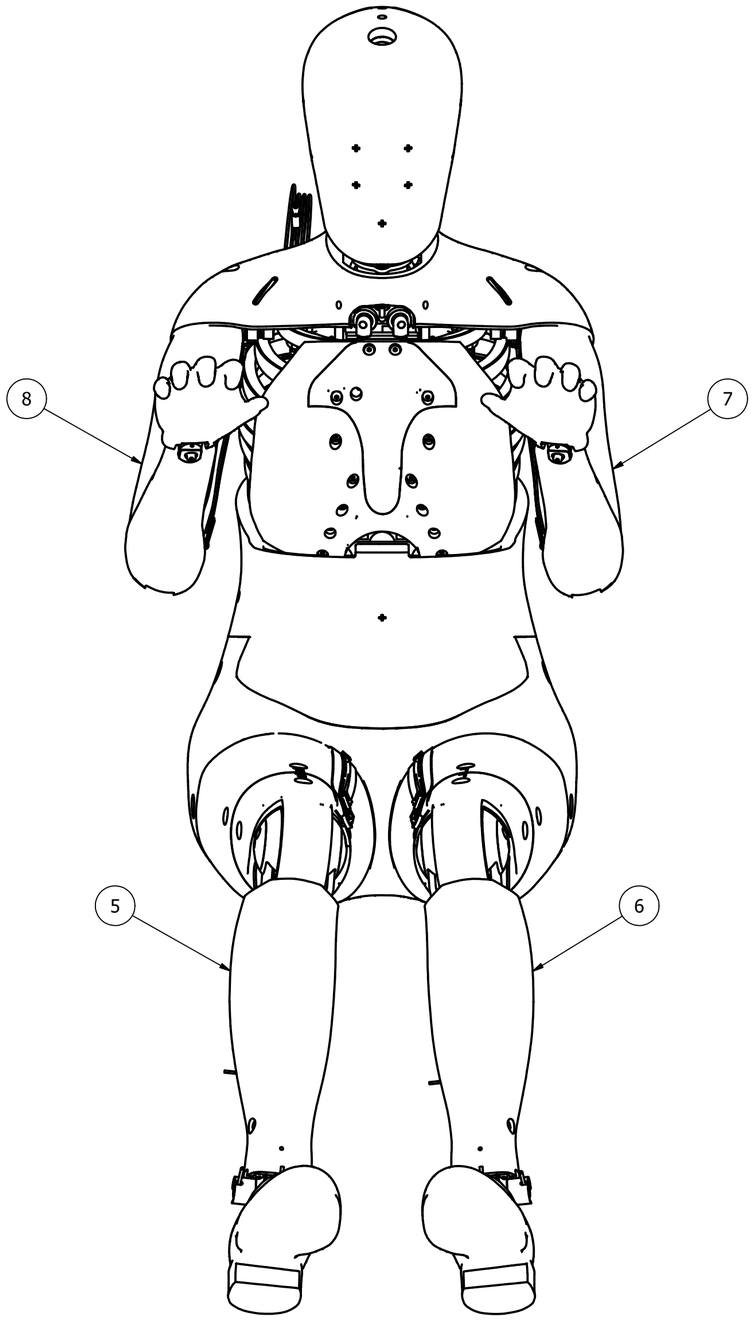
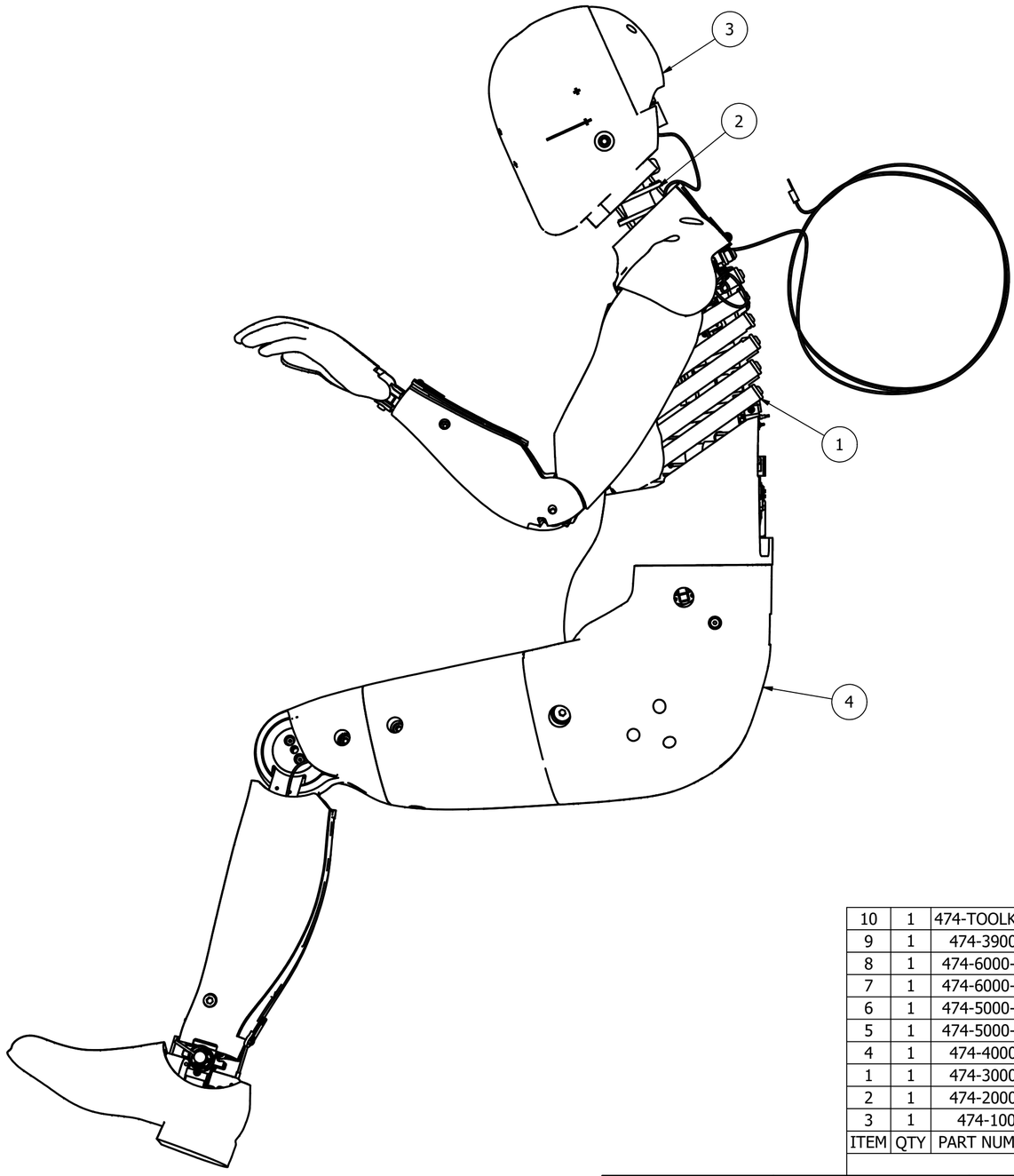
Drawings and Specifications for
THOR-05F Advanced Female Frontal Crash Test Dummy



Prepared by:
OFFICE OF CRASHWORTHINESS STANDARDS
and
VEHICLE RESEARCH and TEST CENTER
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	HEC	7/21/2023





ITEM	QTY	PART NUMBER	DESCRIPTION
10	1	474-TOOLKIT-A	THOR-05F TOOLKIT (NOT SHOWN)
9	1	474-3900-A	JACKET ASSEMBLY, THOR-05F (NOT SHOWN)
8	1	474-6000-2-A	RIGHT ARM ASSEMBLY
7	1	474-6000-1-A	LEFT ARM ASSEMBLY
6	1	474-5000-1-A	LEG ASSEMBLY, LEFT
5	1	474-5000-2-A	LEG ASSEMBLY, RIGHT
4	1	474-4000-A	PELVIS ASSEMBLY
1	1	474-3000-A	UPPER TORSO ASSEMBLY, THOR-05F
2	1	474-2000-A	NECK ASSEMBLY, THOR-05F
3	1	474-1000	HEAD ASSEMBLY, THOR-05F

PARTS LIST

NOTES:

1. SEE SHEET 2 FOR GROUND STRAPS.
2. SEE SHEETS 3 & 4 FOR INSTRUMENTATION LOCATIONS & DATA.
3. SEE SHEETS 5 & 6 FOR EXTERNAL MEASUREMENTS, WEIGHTS, AND CG/MOI DATA.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

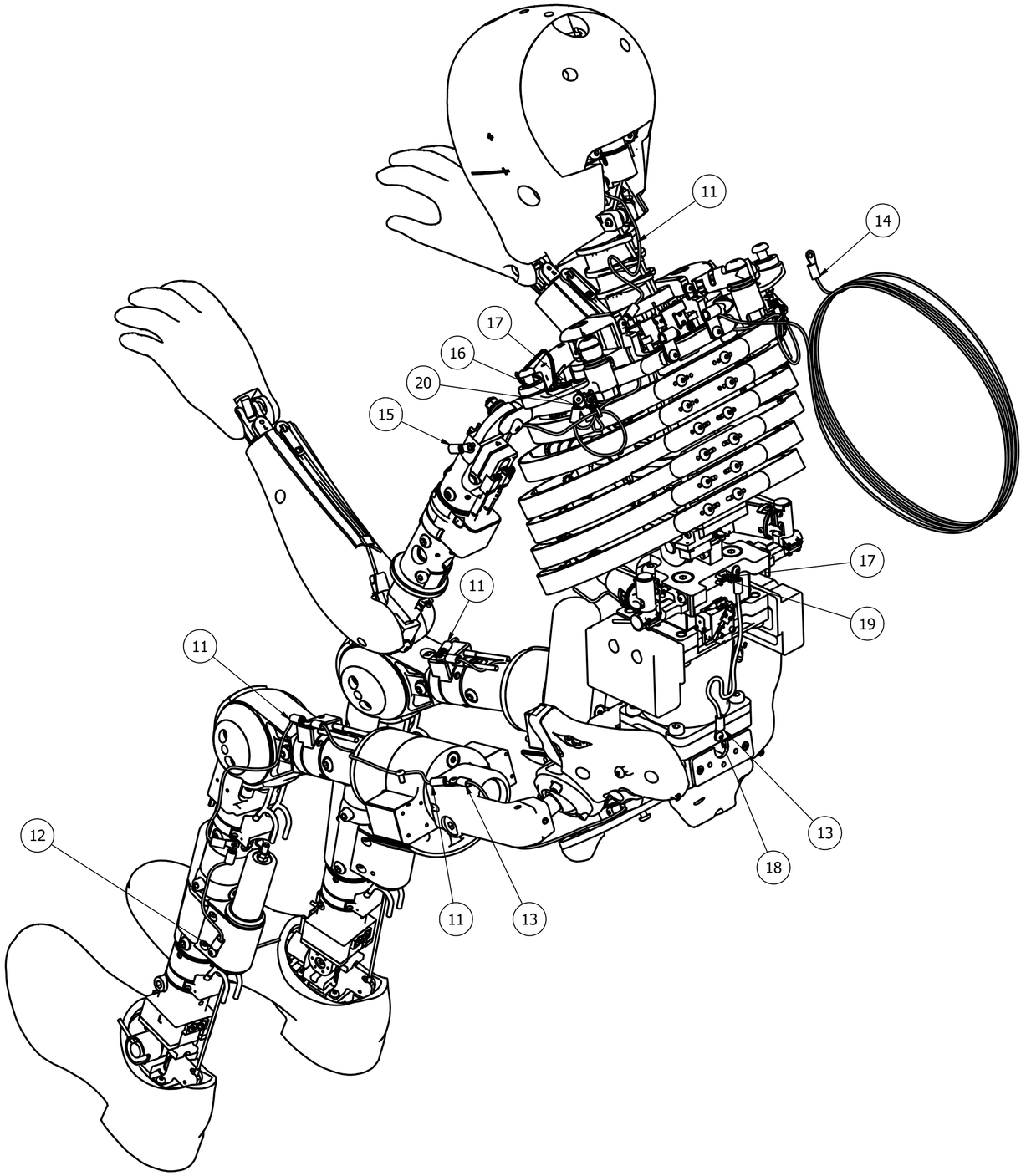
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ENG	
APPROVED	

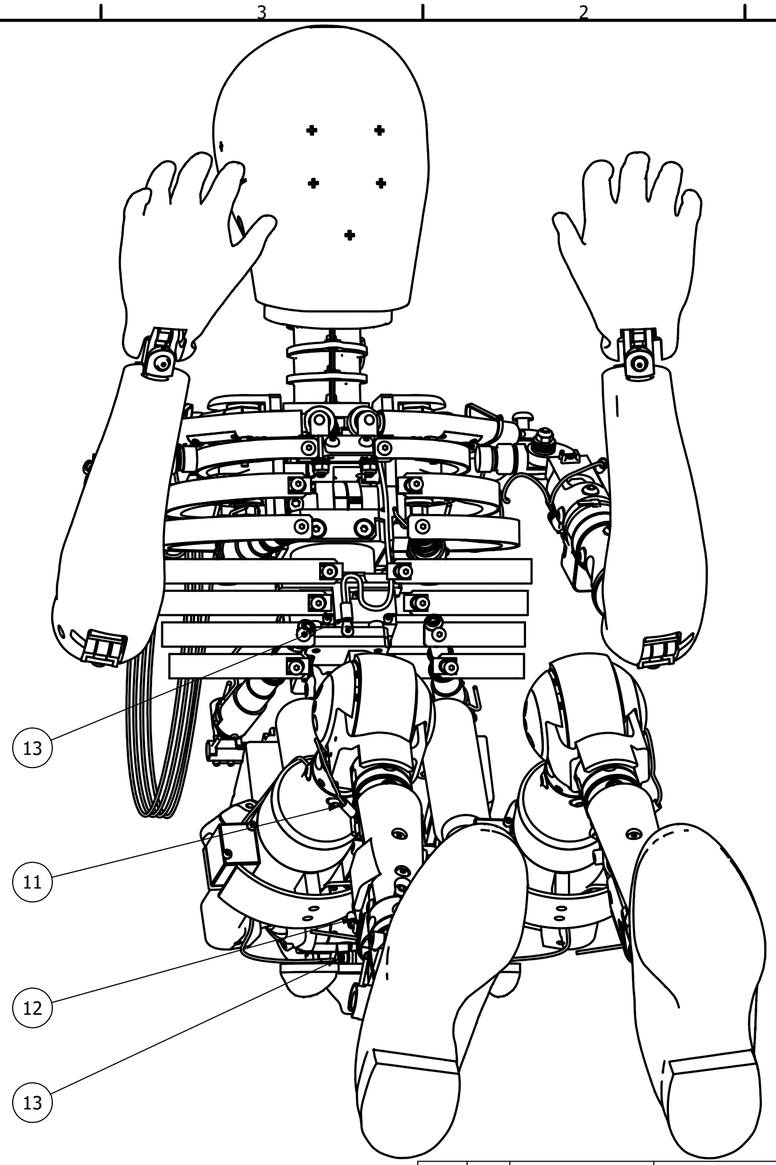
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

TOP ASSEMBLY, THOR-05F

THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-0000-A | REV: 1
SCALE: .25 : 1 | SHEET: 1 OF 7





ITEM	QTY	PART NUMBER	DESCRIPTION
20	2	6000004	CABLE TIE 7.4
19	3	5001067	M3 X 0.5 X 4 LG. BHCS
18	11	5001075	M4 X 0.7 X 6 LG. BHCS
17	3	6002036	CABLE TIE MOUNT, #4 SCREW
16	2	474-8702	GROUND CABLE, CLAVICLE
15	2	474-8701	GROUND CABLE, SHOULDER
14	1	474-8700-3000	GROUND CABLE, EXIT
13	4	474-8700-210	GROUND CABLE, UPPER LEG, TIBIA/KNEE, FEMUR/PELVIS, LUMBAR/CHEST
12	2	474-8700-110	GROUND CABLE, LOWER LEG/TORSO
11	5	474-8700-230	GROUND CABLE, HEAD/NECK, UPPER LEG, TIBIA/KNEE, FEMUR/PELVIS

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ✓ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

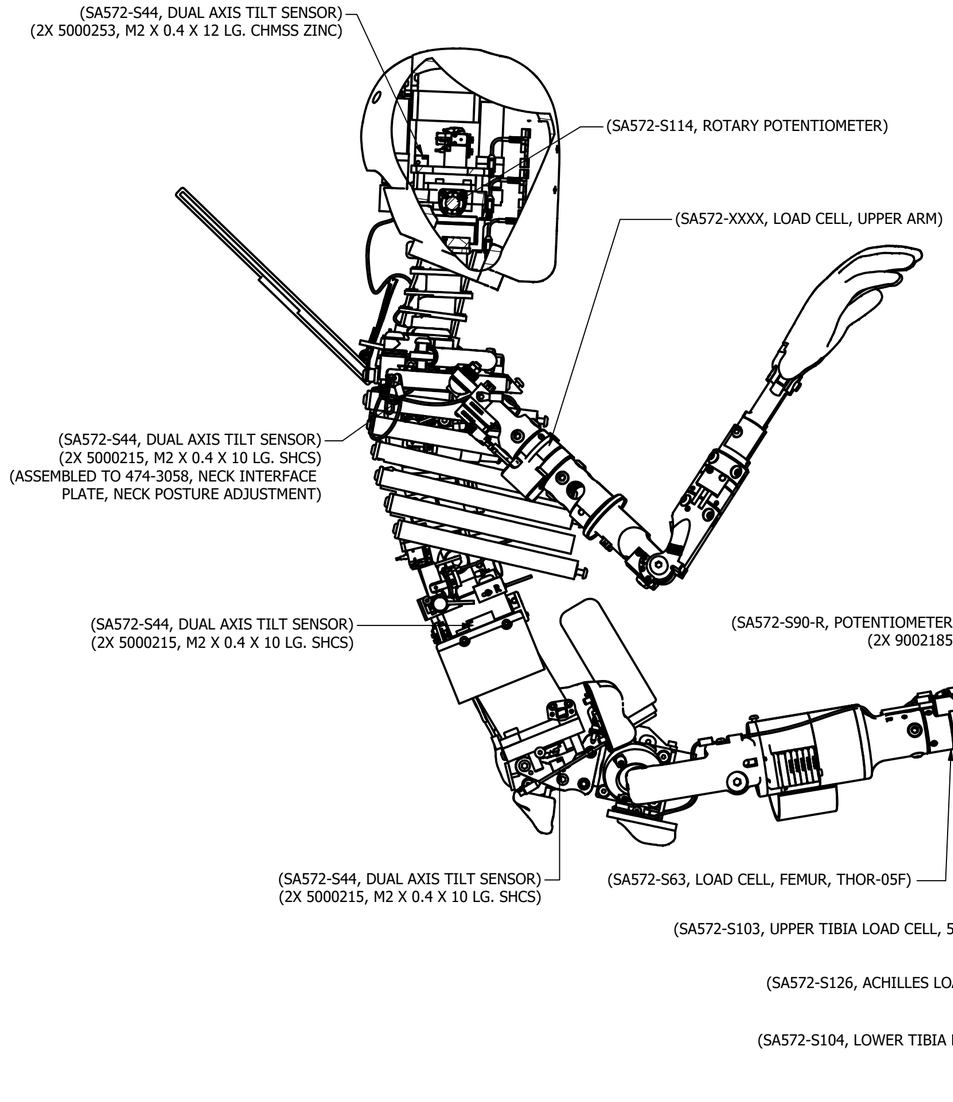
VEHICLE RESEARCH and TEST CENTER

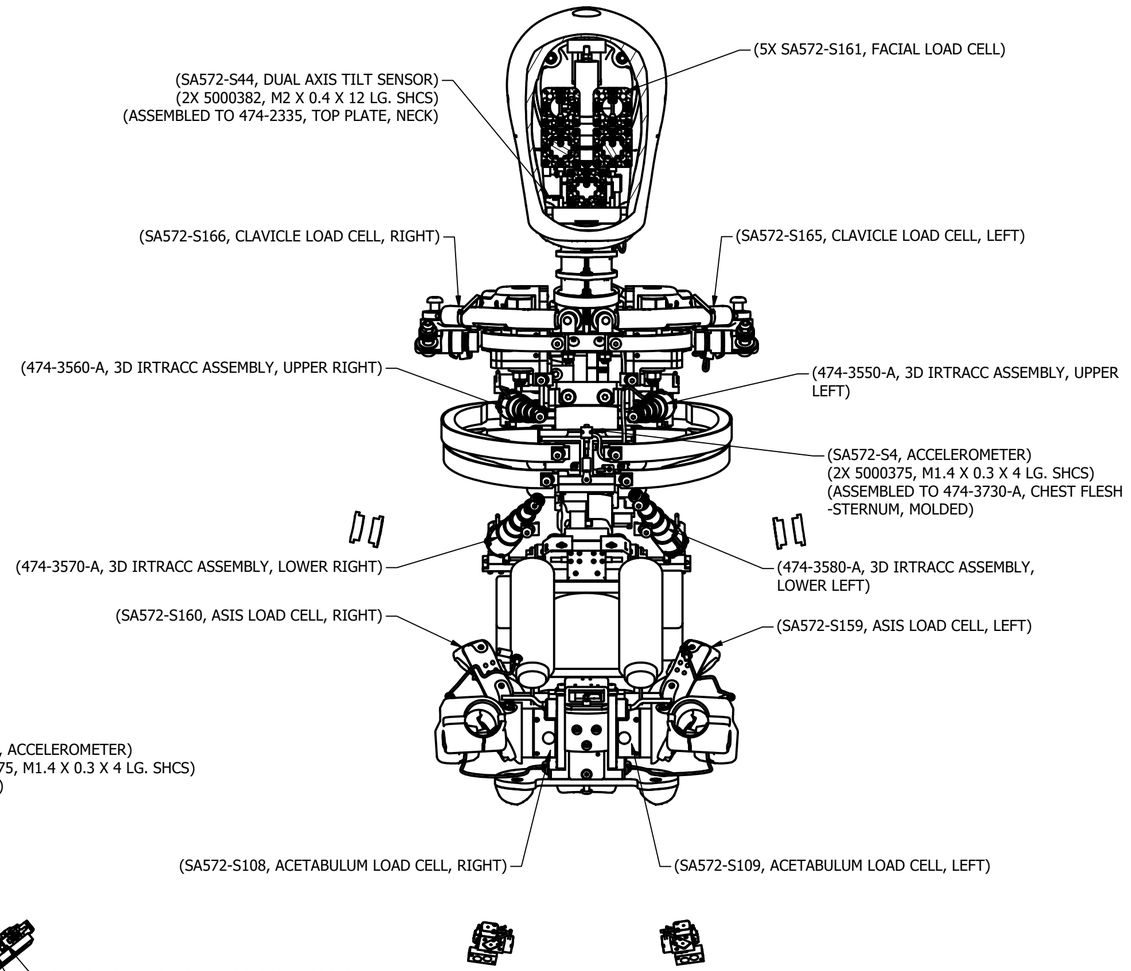
APPROVALS	DATE
DRAWN	
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

TOP ASSEMBLY, THOR-05F
GROUND CABLE LOCATIONS

THIRD ANGLE PROJECTION
SIZE: A2 | DRAWING NUMBER: 474-0000-A | REV: 1
SCALE: .33 : 1 | SHEET: 2 OF 7





SOME COMPONENTS NOT SHOWN FOR CLARITY

NOTES:

1. TUCK APTS SENSOR CABLE CONNECTORS IN CAVITY BETWEEN ACETABULAR LC/S.R. (SA572-S109, SA572-S108/474-4002-1, 474-4002-2) AND ILIAC WING ASSY, LEFT/RIGHT (474-4540-1-A/474-4540-2-A) AND GENTLY ROUTE TO AVOID BEND IN CABLE.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED XX, ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

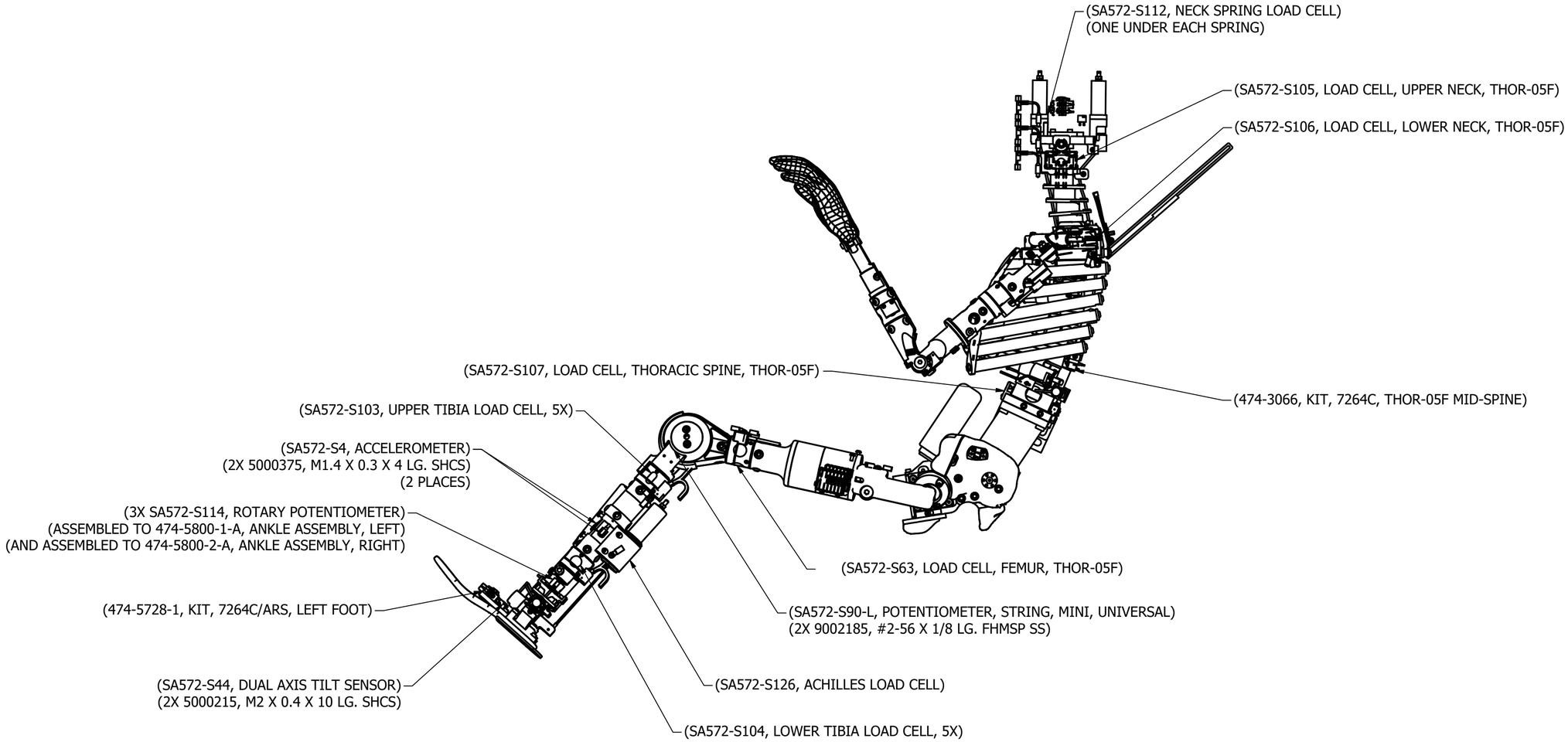
VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN	
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

TOP ASSEMBLY, THOR-05F
INSTRUMENTATION LOCATIONS & DATA

THIRD ANGLE PROJECTION
SIZE: A2 | DRAWING NUMBER: 474-0000-A | REV: 1
SCALE: 1 / 4 | SHEET: 3 OF 7



SOME COMPONENTS NOT SHOWN FOR CLARITY

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN	
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

TOP ASSEMBLY, THOR-05F

INSTRUMENTATION LOCATIONS & DATA

THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-0000-A | REV: 1

SCALE: 1 / 5 | SHEET: 4 OF 7

CENTER OF GRAVITY and MOMENT OF INTERTIA

DUMMY SEGMENT	PART NUMBER	CG DIR	SPEC mm	TOL. ±mm		MOI AXIS	MOI kg-cm²	TOL. ±kg-cm²
HEAD	474-1000	X	TBD	TBD		X	TBD	TBD
		Y	TBD	TBD		Y	TBD	TBD
		Z	TBD	TBD		Z	TBD	TBD
NECK	474-2000-A	X	TBD	TBD		X	TBD	TBD
		Y	TBD	TBD		Y	TBD	TBD
		Z	TBD	TBD		Z	TBD	TBD
UPPER TORSO	474-3000-A	X	TBD	TBD		X	TBD	TBD
		Y	TBD	TBD		Y	TBD	TBD
		Z	TBD	TBD		Z	TBD	TBD
UPPER ARM, LEFT	484-6100-1	X	TBD	TBD		X	TBD	TBD
		Y	TBD	TBD		Y	TBD	TBD
		Z	TBD	TBD		Z	TBD	TBD
UPPER ARM, RIGHT	484-6100-2	X	TBD	TBD		X	TBD	TBD
		Y	TBD	TBD		Y	TBD	TBD
		Z	TBD	TBD		Z	TBD	TBD
LOWER ARM, LEFT	474-6500-1	X	TBD	TBD		X	TBD	TBD
		Y	TBD	TBD		Y	TBD	TBD
		Z	TBD	TBD		Z	TBD	TBD
LOWER ARM, RIGHT	474-6500-2	X	TBD	TBD		X	TBD	TBD
		Y	TBD	TBD		Y	TBD	TBD
		Z	TBD	TBD		Z	TBD	TBD
HAND, LEFT	474-6900-1	X	TBD	TBD		X	TBD	TBD
		Y	TBD	TBD		Y	TBD	TBD
		Z	TBD	TBD		Z	TBD	TBD
HAND, RIGHT	474-6900-2	X	TBD	TBD		X	TBD	TBD
		Y	TBD	TBD		Y	TBD	TBD
		Z	TBD	TBD		Z	TBD	TBD
PELVIS	474-4000-A	X	TBD	TBD		X	TBD	TBD
		Y	TBD	TBD		Y	TBD	TBD
		Z	TBD	TBD		Z	TBD	TBD
UPPER LEG, LEFT	474-5100-1-A	X	TBD	TBD		X	TBD	TBD
		Y	TBD	TBD		Y	TBD	TBD
		Z	TBD	TBD		Z	TBD	TBD
UPPER LEG, RIGHT	474-5100-2-A	X	TBD	TBD		X	TBD	TBD
		Y	TBD	TBD		Y	TBD	TBD
		Z	TBD	TBD		Z	TBD	TBD
LOWER LEG, LEFT	474-5500-1	X	TBD	TBD		X	TBD	TBD
		Y	TBD	TBD		Y	TBD	TBD
		Z	TBD	TBD		Z	TBD	TBD
LOWER LEG, RIGHT	474-5500-2	X	TBD	TBD		X	TBD	TBD
		Y	TBD	TBD		Y	TBD	TBD
		Z	TBD	TBD		Z	TBD	TBD
MOLDED SHOE, LEFT	474-5903-1	X	TBD	TBD		X	TBD	TBD
		Y	TBD	TBD		Y	TBD	TBD
		Z	TBD	TBD		Z	TBD	TBD
MOLDED SHOE, RIGHT	474-5903-2	X	TBD	TBD		X	TBD	TBD
		Y	TBD	TBD		Y	TBD	TBD
		Z	TBD	TBD		Z	TBD	TBD

SEGMENT MASSES

DUMMY SEGMENT	PART NUMBER	MASS - Kg	TOL. - ±Kg
HEAD	474-1000	TBD	TBD
NECK	474-2000-A	TBD	TBD
UPPER TORSO	474-3000-A	TBD	TBD
UPPER ARM, LEFT	484-6100-1	TBD	TBD
UPPER ARM, RIGHT	484-6100-2	TBD	TBD
LOWER ARM, LEFT	474-6500-1	TBD	TBD
LOWER ARM, RIGHT	474-6500-2	TBD	TBD
HAND, LEFT	474-6900-1	TBD	TBD
HAND, RIGHT	474-6900-2	TBD	TBD
PELVIS	474-4000-A	TBD	TBD
UPPER LEG, LEFT	474-5100-1-A	TBD	TBD
UPPER LEG, RIGHT	474-5100-2-A	TBD	TBD
LOWER LEG, LEFT	474-5500-1	TBD	TBD
LOWER LEG, RIGHT	474-5500-2	TBD	TBD
MOLDED SHOE, LEFT	474-5903-1	TBD	TBD
MOLDED SHOE, RIGHT	474-5903-2	TBD	TBD

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

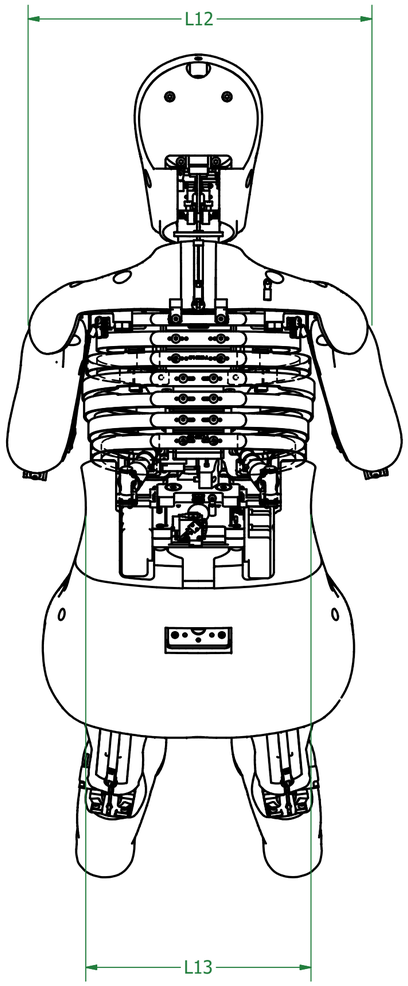
VEHICLE RESEARCH and TEST CENTER

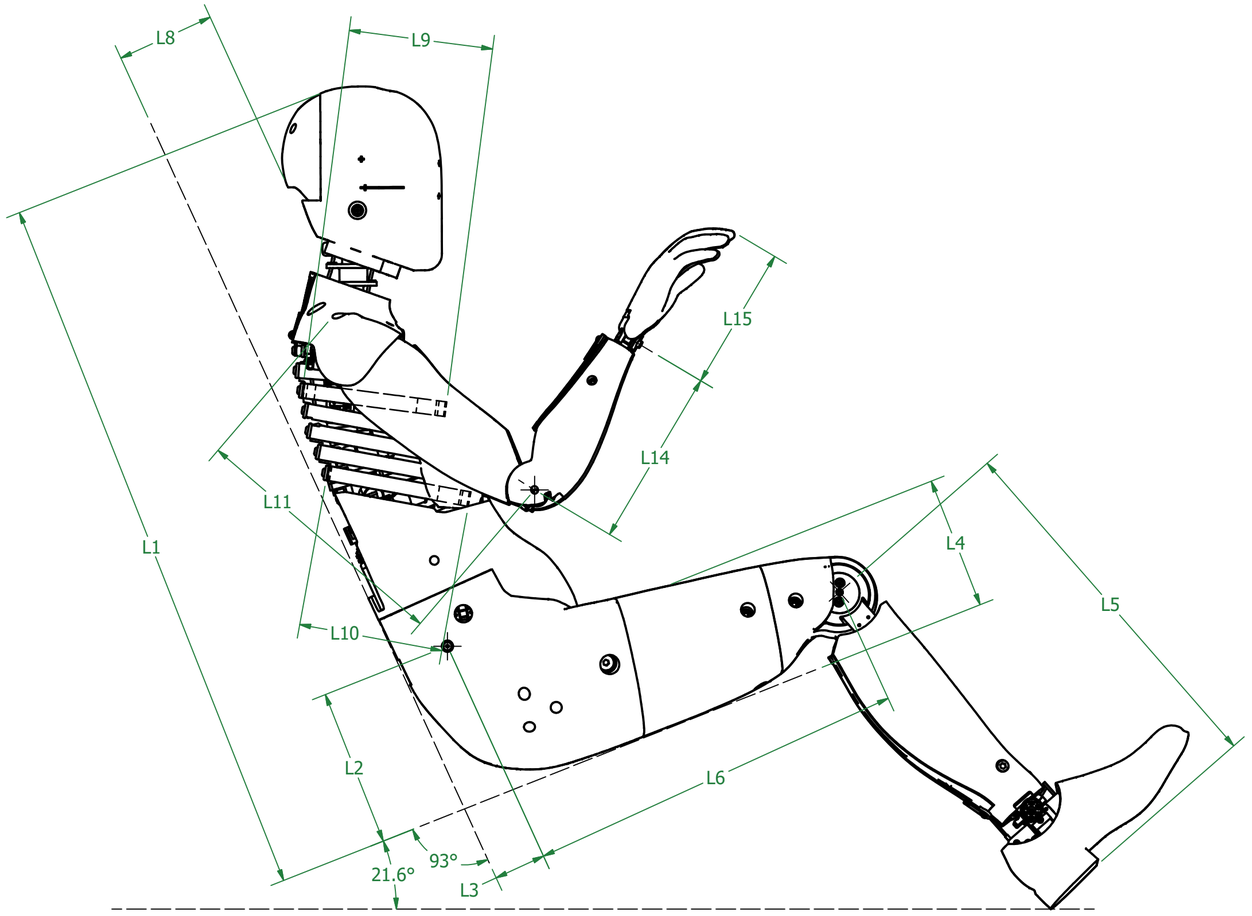
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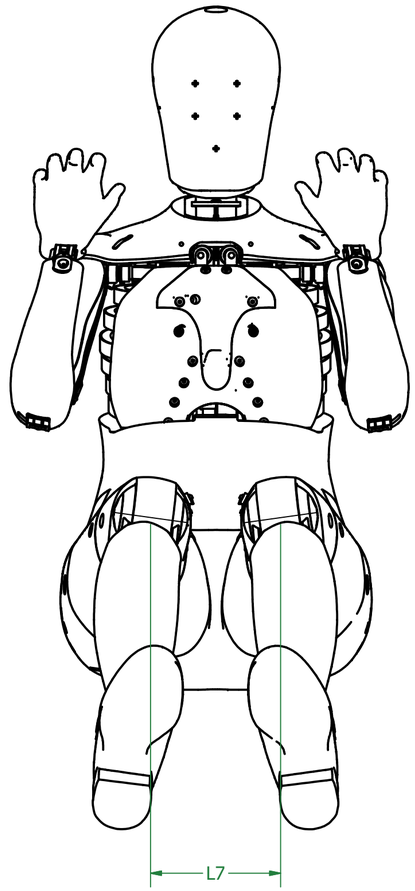
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

TOP ASSEMBLY, THOR-05F
CG, MOI, AND SEGMENT MASSES

THIRD ANGLE PROJECTION
SIZE A2
DRAWING NUMBER 474-0000-A
REV 1
SCALE:
SHEET 5 OF 7







EXTERNAL DIMENSIONS

SYMBOL	MEASUREMENT DESCIPTION	SPEC. - mm	TOL. - ±mm
L1	SEATED HIEGHT	TBD	TBD
L2	HIP PIVOT TO SEAT BASE (SETUP DIM)	TBD	TBD
L3	HIP PIVOT TO SEAT BACK (SETUP DIM)	TBD	TBD
L4	THIGH CLEARANCE	TBD	TBD
L5	KNEE PIVOT TO BOTTOM OF FOOT	TBD	TBD
L6	KNEE PIVOT TO HIP PIVOT	TBD	TBD
L7	KNEE CL TO KNEE CL (SETUP DIM)	TBD	TBD
L8	HEAD BACK TO SEAT BACK	TBD	TBD
L9	RIB 3 DEPTH	TBD	TBD
L10	RIB 7 DEPTH	TBD	TBD
L11	SHOULDER TO ELBOW LENGTH	TBD	TBD
L12	SHOULDER WIDTH	TBD	TBD
L13	WAIST WIDTH	TBD	TBD
L14	ELBOW PIVOT TO WRIST PIVOT	TBD	TBD
L15	WRIST PIVOT TO TIP OF MIDDLE FINGER	TBD	TBD

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED XX ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN	
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

TOP ASSEMBLY, THOR-05F
EXTERNAL DIMENSIONS

THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-0000-A | REV: 1
SCALE: 1/5 | SHEET: 6 OF 7

COMPLEX/IRREGULAR SHAPED PARTS	
Dwg./Part No.	Description
474-1401	FACE INSERT
474-1010	SKULL
474-1022	SKULL CAP
474-1008	HEAD SKIN
474-1025	CAP SKIN
474-2110	NECK ASSEMPLY, MOLDED
474-3559-A	SHOULDER PAD
474-3730-A	CHEST FLESH STERNUM, MOLDED
474-3736-A	STERNUM ASSEMBLY, MOLDED
474-3735-1	FOAM, BREAST INSERT LEFT
474-3735-2	FOAM, BREAST INSERT RIGHT
484-6120-1	UPPER ARM FLESH, LEFT
484-6120-2	UPPER ARM FLESH, RIGHT
484-6125-1	LOWER ARM FLESH, LEFT
484-6125-2	LOWER ARM FLESH, RIGHT
474-6900-1	HAND, MOLDED, LEFT
474-6900-2	HAND, MOLDED, RIGHT
484-4305	ABDOMEN
474-4521-A	PELVIS FLESH
474-4538-1-A	ILIAC WING, LEFT
474-4538-2-A	ILIAC WING, RIGHT
474-4547	STRUCTURAL REPLACEMENT, ASIS LOAD CELL
474-4542-A	PLATE, ISCHIUM BONE MOUNT
474-4003-1	FEMUR MOUNTING SOCKET, LEFT
474-4003-2	FEMUR MOUNTING SOCKET, RIGHT
474-5122-1	UPPER LEG FLESH, LEFT
474-5122-2	UPPER LEG FLESH, RIGHT
474-4703-1	FEMUR, LEFT
474-4703-2	FEMUR, RIGHT
474-5321-1	KNEE FLESH, LEFT
474-5321-2	KNEE FLESH, RIGHT
474-5410	KNEE CAP
474-5404	KNEE ROTATION STOP, POT
474-5405	KNEE ROTATION STOP, NO POT
483-5521-1	LOWER LEG FLESH (RIBBED), LEFT
483-5521-2	LOWER LEG FLESH (RIBBED), RIGHT
474-5518-1	SHIN GUARD, MOLDED, LEFT
474-5518-2	SHIN GUARD, MOLDED, RIGHT
474-5903-1	MOLDED SHOE ASSEMBLY, LEFT
474-5903-2	MOLDED SHOE ASSEMBLY, RIGHT
474-5906-1	LAMINATED SOLE PLATE ASSY, LEFT
474-5906-2	LAMINATED SOLE PLATE ASSY, RIGHT

NOTES

1. THERE ARE NO ADDITIONAL DIMENSIONS BEYOND WHAT IS PROVIDED ON THE DRAWINGS, BUT THE 3D SHAPE CAN BE FOUND WITHIN THE PARAMETRIC CAD MODELS.
2. NOTE THAT THE CAD MODELS ARE FOR REFERENCE ONLY AND ARE NOT USED TO SPECIFY IRREGULAR SHAPES FOR QUALIFICATION PURPOSES.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN	
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

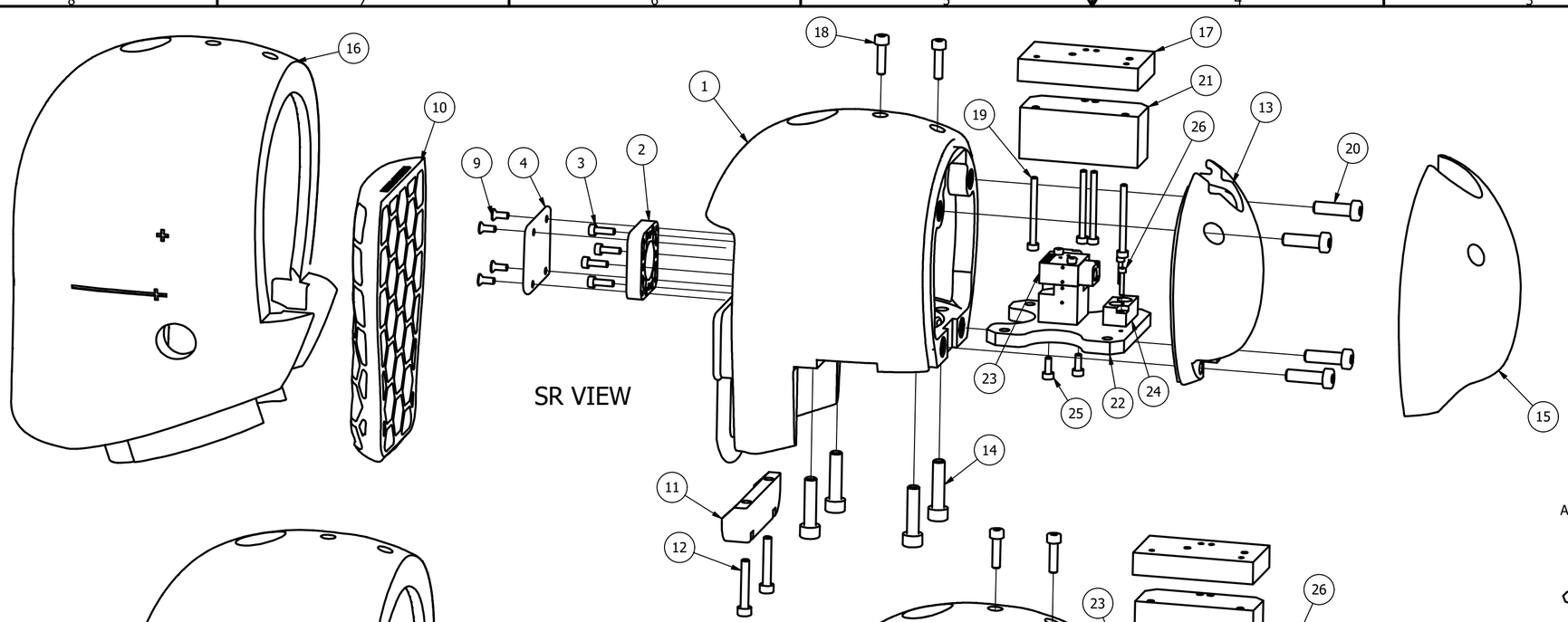
TOP ASSEMBLY, THOR-05F
EXTERNAL DIMENSIONS

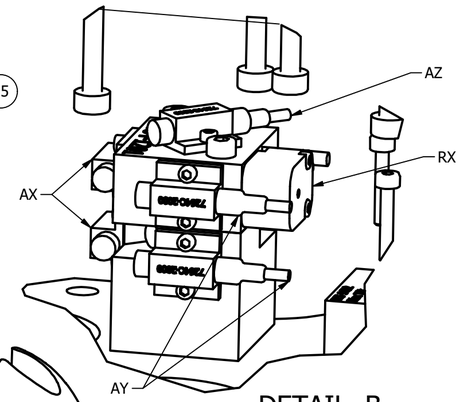
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-0000-A | REV: 1
SCALE: 1/5 | SHEET: 7 OF 7

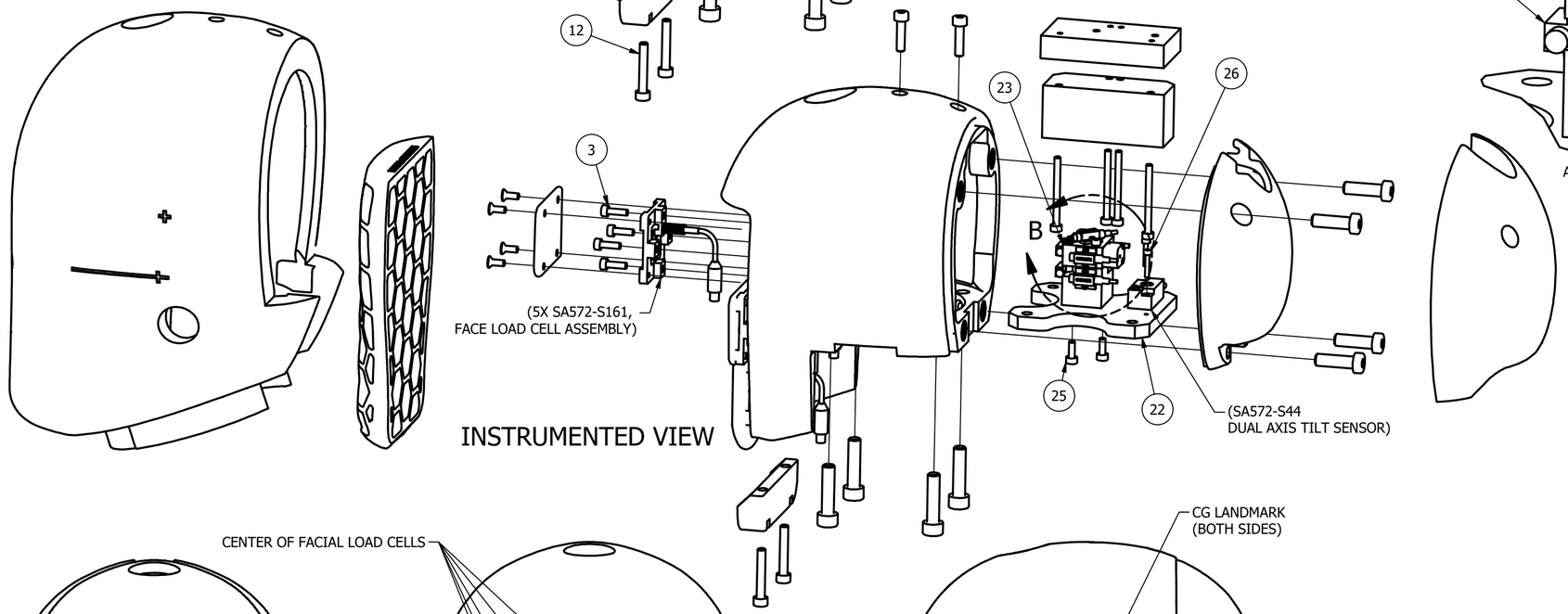
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	8	PROTOTYPE	DJI	DJI	8/18/2023

This design includes features covered by U.S. Patent No. 11,200,816 (face insert for crash test dummy), which is owned by Humanetics and its affiliated companies. No license is being granted to this patent and third parties are not authorized to make, use, sell, import, or export any products (physical or virtual) that practice the invention covered by this patent, or other patents owned by Humanetics. However, if a third party is interested in obtaining rights to the design, they are to contact Humanetics to discuss license terms.

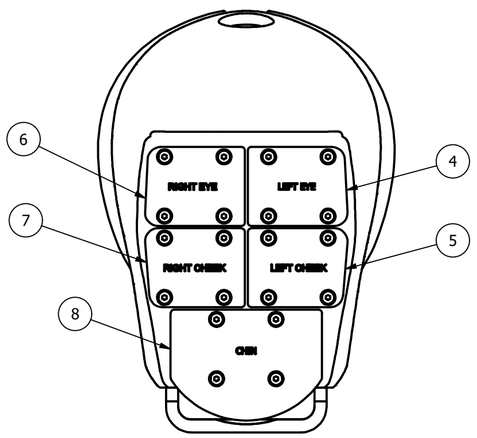




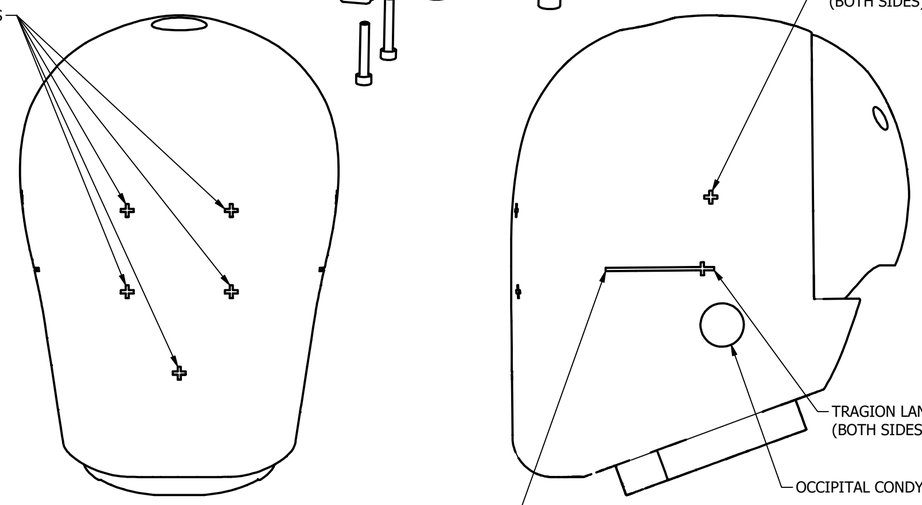
DETAIL B
SCALE 1.5



INSTRUMENTED VIEW



HEAD SKIN REMOVED



ITEM	QTY	PART NUMBER	DESCRIPTION
26	2	5000382	M2 X 0.4 X 12 LG. SHCS
25	2	5000388	M3 X 0.5 X 8 LG. SHCS
24	1	476-3604	TILT SENSOR S.R.
23	1	474-1034	KIT, REDUNDANT 7264C/ARS, THOR-05F HEAD
22	1	474-1031	SENSOR MOUNTING PLATE, HEAD
21	1	474-1033	DAS S.R.
20	4	5001316	M6 X 1 X 20 LG. LHCS
19	4	5000988	M3 X 0.5 X 35 LG. SHCS
18	2	5000025	M4 X 0.7 X 16 LG. SHCS
17	1	474-1051	DAS MOUNT
16	1	474-1008	HEAD SKIN, MOLDED
15	1	474-1025	CAP SKIN, THOR-05F
14	4	5000133	M6 X 1 X 25 LG. SHCS
13	1	474-1022	SKULL CAP, MACHINED
12	2	5000461	M4 X 0.7 X 25 LG. SHCS
11	1	474-1411	CHIN GUARD
10	1	474-1401	FACE INSERT
9	20	5000116	M3 X 0.5 X 8 LG. FHCS
8	1	474-1416	CHIN LOAD CELL PLATE
7	1	474-1414-2	RIGHT CHEEK LOAD CELL PLATE
6	1	474-1412-2	RIGHT EYE LOAD CELL PLATE
5	1	474-1414-1	LEFT CHEEK LOAD CELL PLATE
4	1	474-1412-1	LEFT EYE LOAD CELL PLATE
3	20	5000119	M3 X 0.5 X 10 LG. SHCS
2	5	474-1005	FACE LOAD CELL REPLACEMENT
1	1	474-1010	SKULL, MACHINED, THOR-05F

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ✓
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	B. KIMES	4/5/2016
MATERIAL		
CHECKED		
HEAT TREAT		
ENG	JW	4/5/2016
FINISH		
APPROVED		

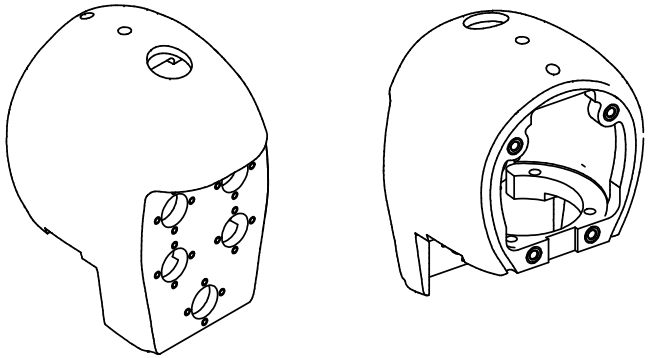
HEAD ASSEMBLY, THOR-05F
THOR-05F

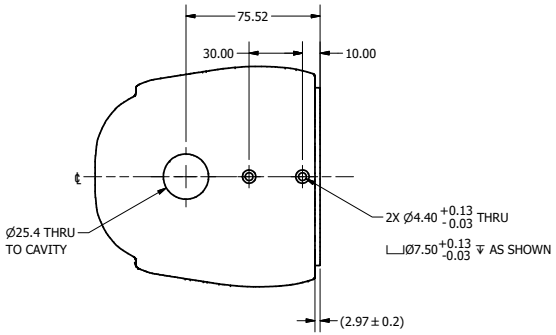
THIRD ANGLE PROJECTION

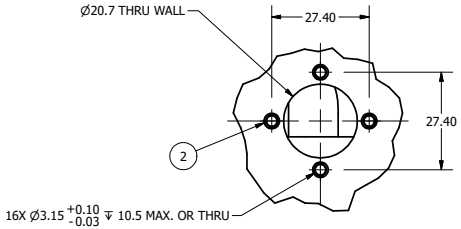
SIZE A2 | DRAWING NUMBER 474-1000 | REV 8

SCALE: 1 / 2 | SHEET 1 OF 1

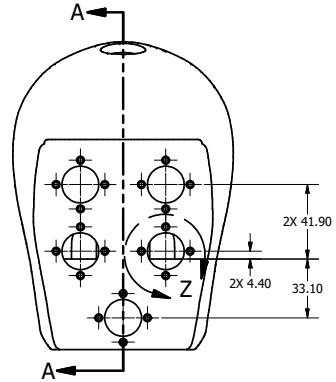
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	RELEASE FOR PROTOTYPE	SKR	DJI	09/21/2021

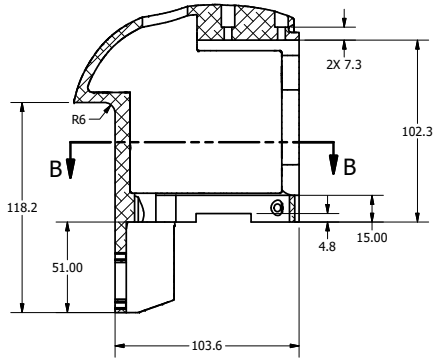




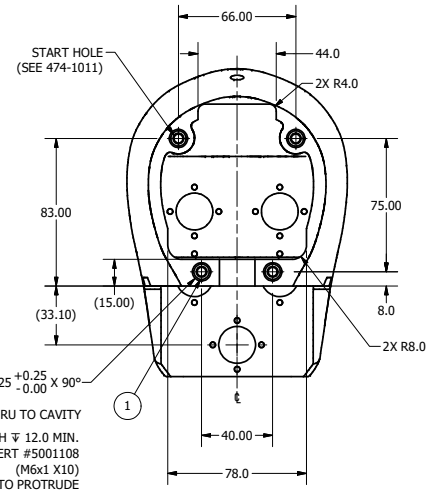


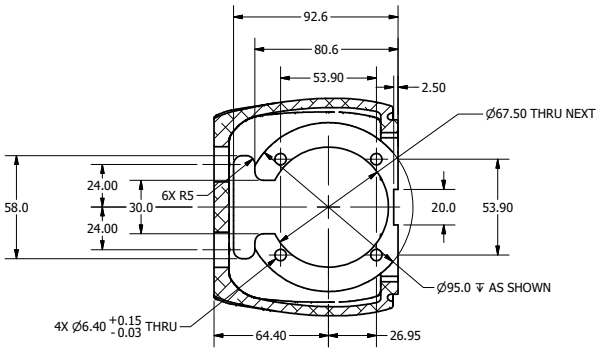
DETAIL Z
5 PLACES
SCALE 1 : 1



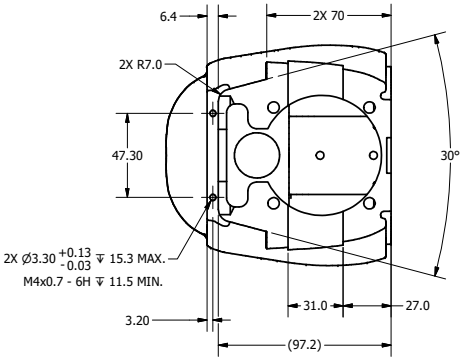


SECTION A-A





SECTION B-B



NOTES:

1. MAKE FROM 474-1011, MODIFY AS SHOWN (SEE DRAWING FOR START POINT).
2. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	20	5000333	HELICAL INSERT, M3 X 0.5 X 6
1	4	5001108	M6 X 1 X 10 LG.THREADED INSERT

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.1, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	4/4/2016
CHECKED	
ENG JW	4/3/2016
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

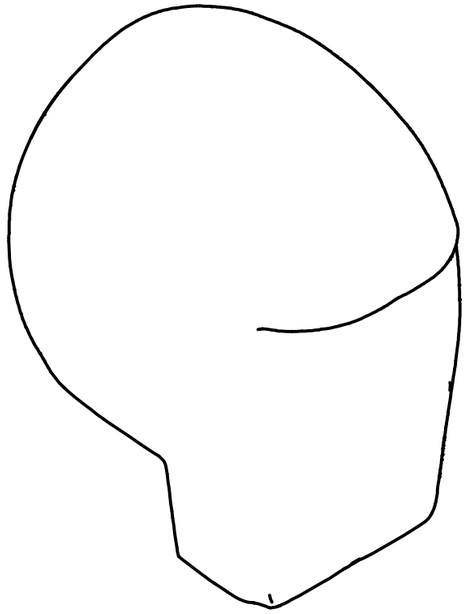
SKULL, MACHINED, THOR-05F

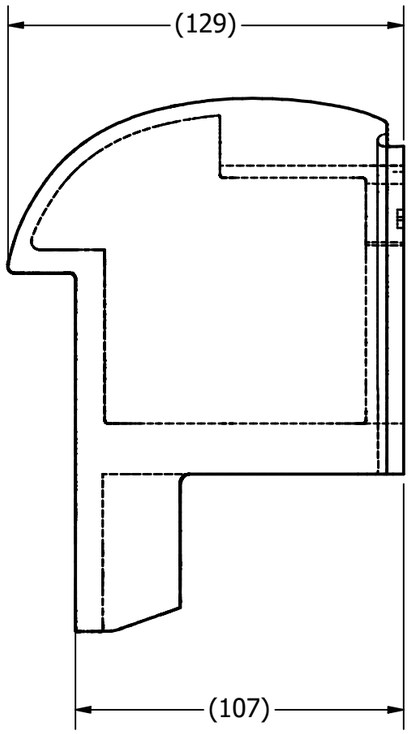
THIRD ANGLE PROJECTION

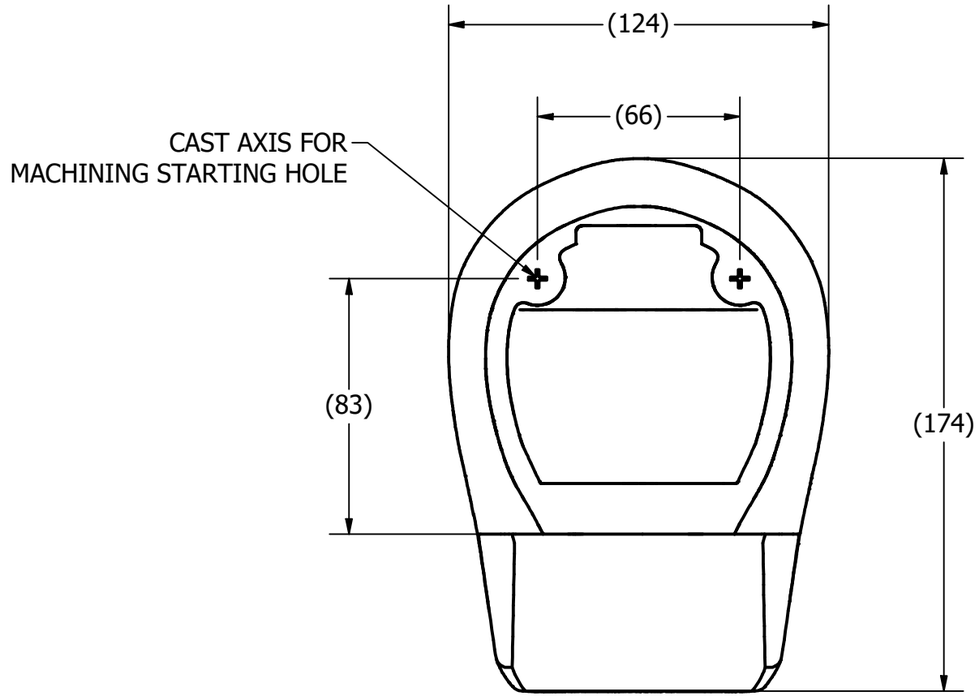
SIZE A2 | DRAWING NUMBER 474-1010 | REV 4

SCALE: 0.5 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	GCH		1/31/2017







NOTES:

1. REMOVE ALL CAST FLASHING

2. ALL CAST DIMENSION TOLERANCE ±2% BUT NO SMALLER THAN 0.5mm

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 357 CAST ALUMINUM
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/4/2016
CHECKED:	
ENG:	
APPROVED:	

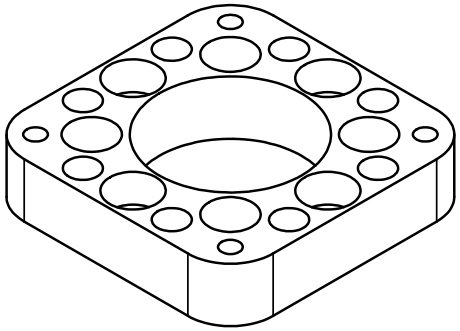
THIRD ANGLE PROJECTION

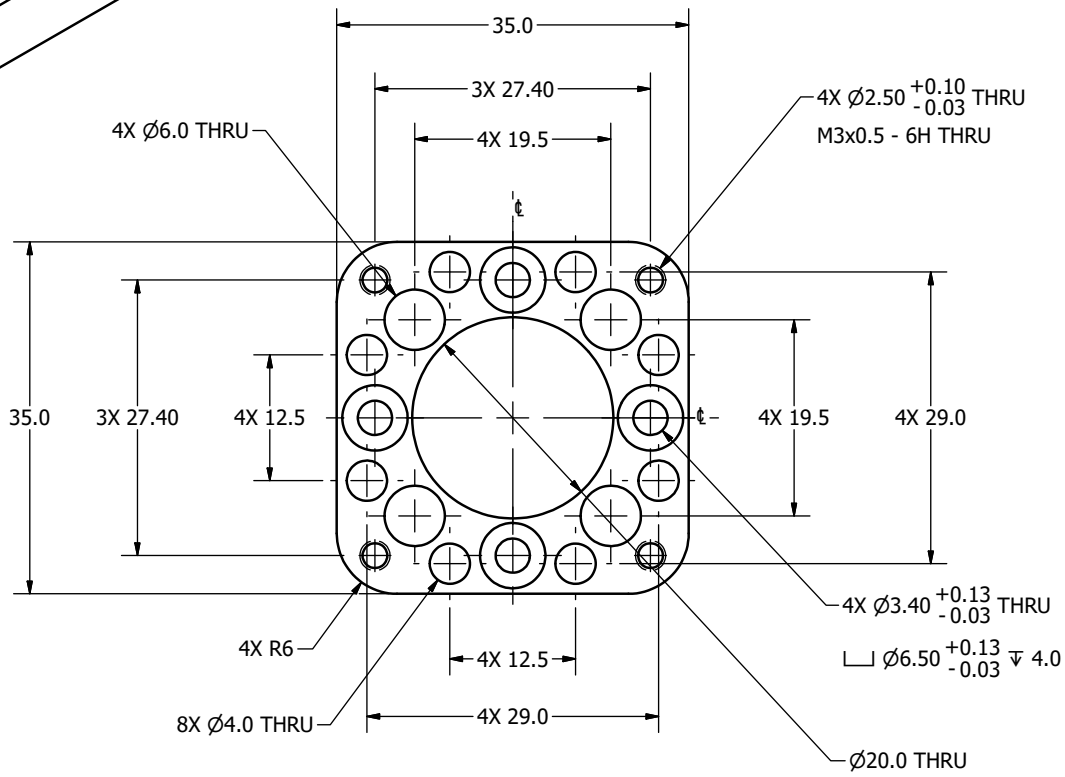
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

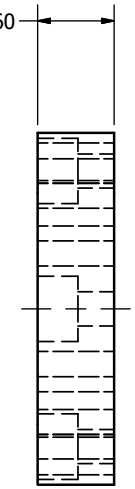
SKULL, CAST

SIZE: A3 | DRAWING NUMBER: 474-1011 | REV: 2
SCALE: 1 / 2 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	RELEASE FOR PROTOTYPE	SKR	DJI	09/20/2021







NOTES:

1. ALL DIMENSIONS ARE SYMMETRICAL ABOUT ℄, UNLESS OTHERWISE SPECIFIED

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 1018 STEEL
HEAT TREAT: N/A
FINISH: 0.008 ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN NKD	3/4/2015
CHECKED	
ENG JW	4/25/2016
APPROVED	

THIRD ANGLE PROJECTION

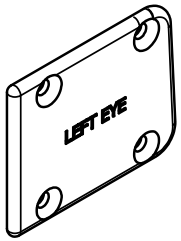
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

FACE LOAD CELL REPLACEMENT

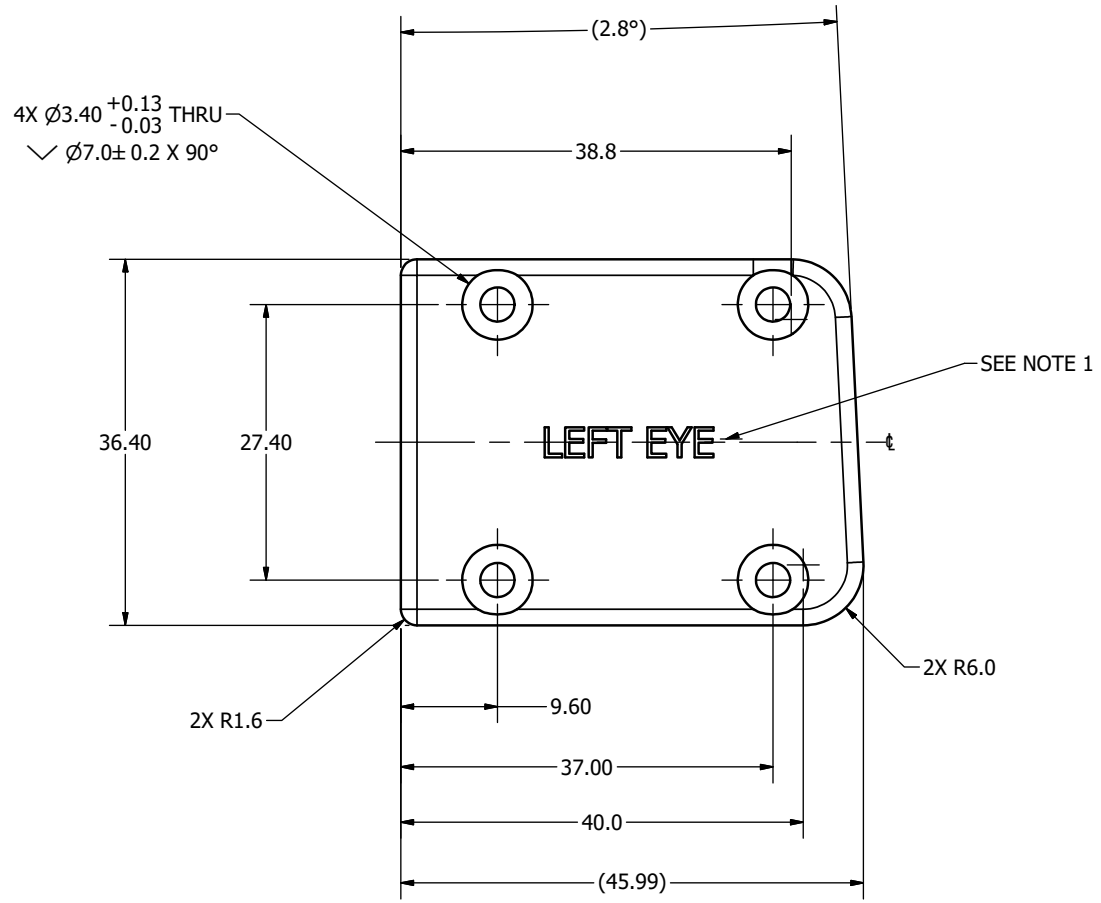
SIZE A3 | DRAWING NUMBER 474-1005 | REV 2

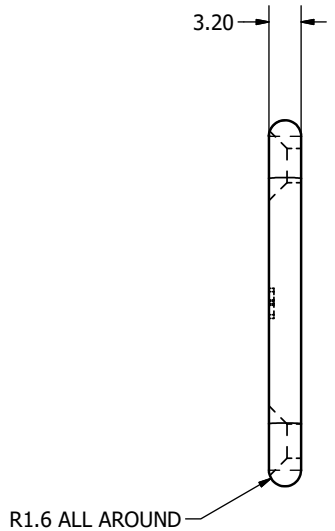
SCALE: 2 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	RELEASE FOR PROTOTYPE	EP	KMSP	7/6/2021



SCALE 1:1





NOTES:

1. STAMP OR ETCH "LEFT EYE" (3mm CHARACTERS) AS SHOWN.
2. DIMENSIONS SYMMETRICAL ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 6061-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN NKD	3/3/2015
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

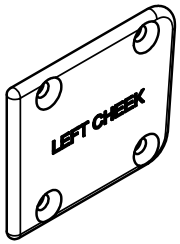
LEFT EYE LOAD CELL PLATE

THIRD ANGLE PROJECTION

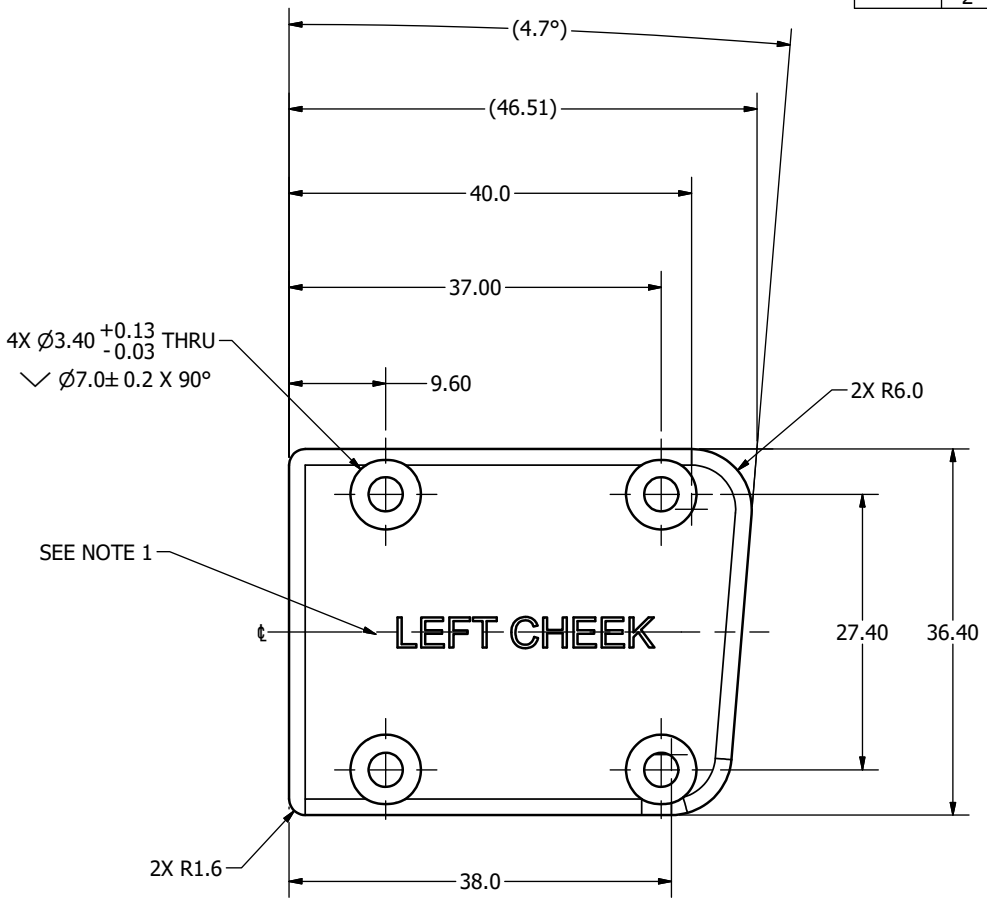
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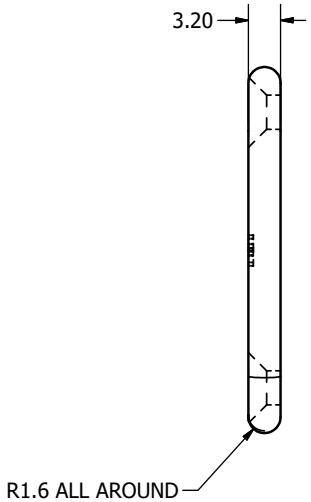
SCALE: 2.000 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	RELEASE FOR PROTOTYPE	EP	KMSP	7/6/2021



SCALE 1:1





NOTES:

1. STAMP OR ETCH "LEFT CHEEK" (3mm CHARACTERS) AS SHOWN.
2. DIMENSIONS SYMMETRICAL ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 6061-T6 ALUMINUM
HEAT TREAT:
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN NKD	3/4/2015
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

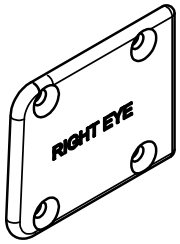
LEFT CHEEK LOAD CELL PLATE

THIRD ANGLE PROJECTION

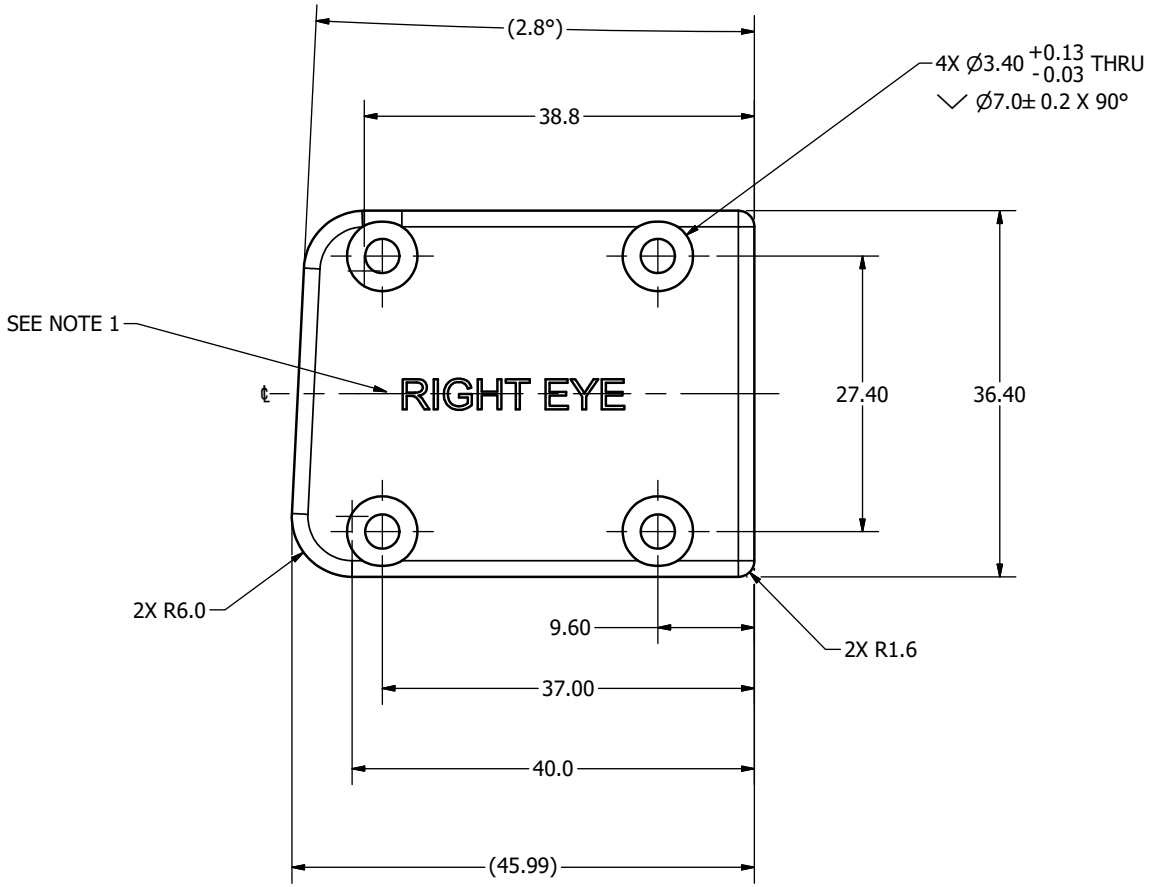
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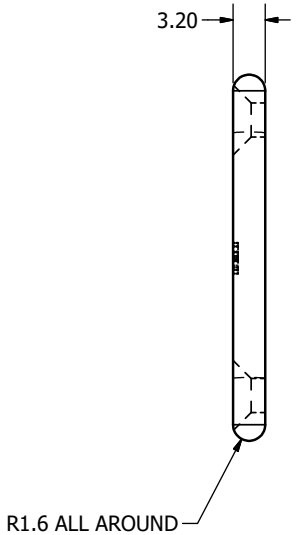
SCALE: 2.000 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	RELEASE FOR PROTOTYPE	EP	KMSP	7/6/2021



SCALE 1:1





NOTES:

1. STAMP OR ETCH "RIGHT EYE" (3mm CHARACTERS) AS SHOWN.
2. DIMENSIONS SYMMETRICAL ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 6061-T6 ALUMINUM
HEAT TREAT:
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN NKD	3/3/2015
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

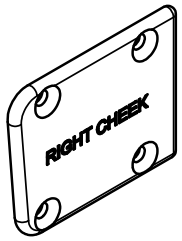
RIGHT EYE LOAD CELL PLATE

THIRD ANGLE PROJECTION

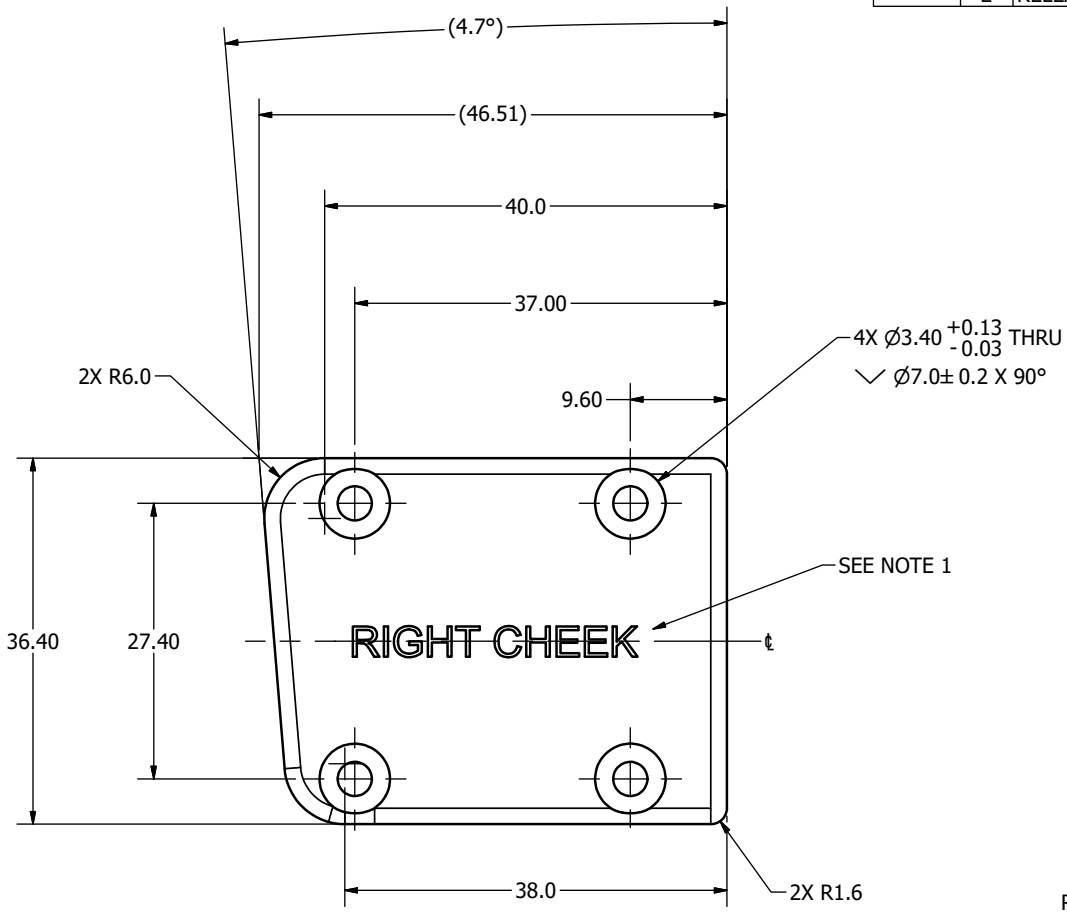
SIZE: A3 | DRAWING NUMBER: 474-1412-2 | REV: 2

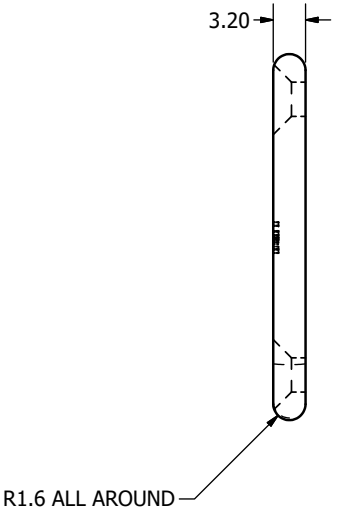
SCALE: 2.000 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	RELEASE FOR PROTOTYPE	EP	KMSP	7/6/2021



SCALE 1:1





NOTES:

1. STAMP OR ETCH "RIGHT CHEEK" (3mm CHARACTERS) AS SHOWN.
2. DIMENSIONS SYMMETRICAL ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 6061-T6 ALUMINUM
HEAT TREAT:
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN NKD	3/4/2015
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

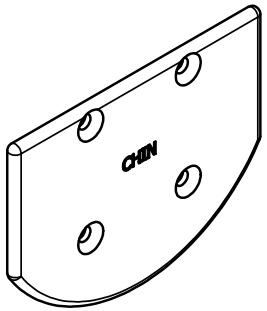
RIGHT CHEEK LOAD CELL PLATE

THIRD ANGLE PROJECTION

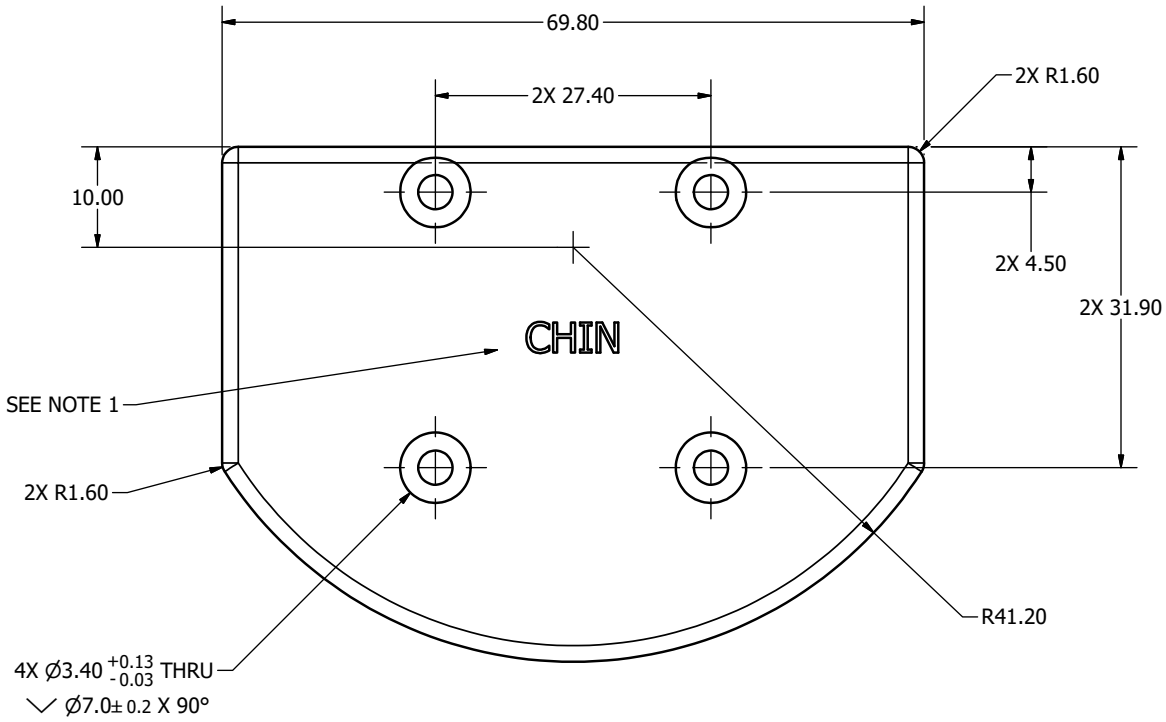
SIZE: A3 | DRAWING NUMBER: 474-1414-2 | REV: 2

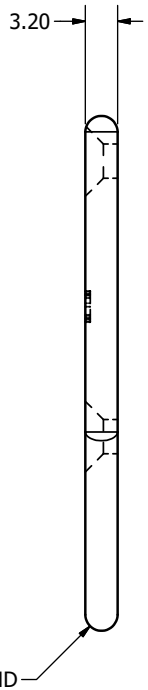
SCALE: 2.000 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	JH		4/27/2016



SCALE 1:1





NOTES:

1. STAMP OR ETCH "CHIN" (3mm CHARACTERS) AS SHOWN.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 6061-T6 ALUMINUM
HEAT TREAT:
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN NKD	3/4/2015
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

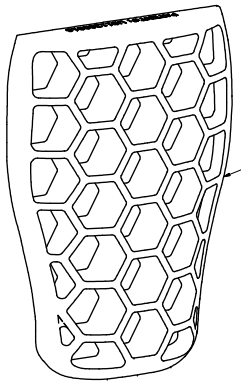
CHIN LOAD CELL PLATE

THIRD ANGLE PROJECTION

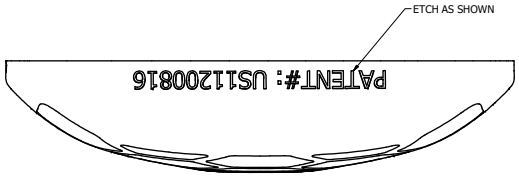
SIZE: A3 | DRAWING NUMBER: 474-1416 | REV: 1

SCALE: 2:1 | SHEET: 1 OF 1

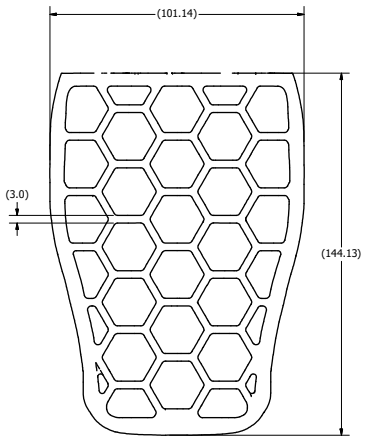
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	7	RELEASE FOR PROTOTYPE	DJI	DJI	12/16/2021

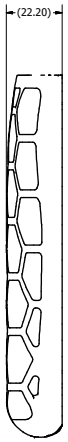


REFER TO DRA IN 474-0000 SHT. 7 FOR THE REFERENCE SHAPE AND INFORMATION.



SCALE 2:1





This design includes features covered by U.S. Patent No. 11,200,816 (face insert for crash test dummy), which is owned by Humanetics and its affiliated companies. No license is being granted to this patent and third parties are not authorized to make, use, sell, import, or export any products (physical or virtual) that practice the invention covered by this patent, or other patents owned by Humanetics. However, if a third party is interested in obtaining rights to the design, they are to contact Humanetics to discuss license terms.

NOTES:

1. MATERIAL: THERMOSET POLYOL
   COLOR: AMBER
2. REMOVE ALL MOLD FLASHING.
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm.
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE POLYURETHANE MOLDING.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL X ±.3 X.X ±.1 X.XX ±.1 MACHINED ANGLES ±.5° DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN NKD	3/7/2015
CHECKED	
ENG DJI	12/16/2021
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

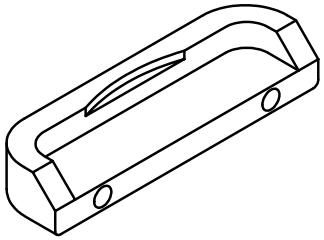
FACE INSERT

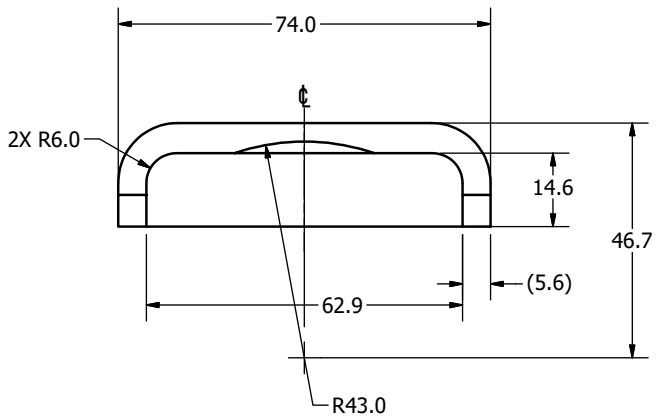
THIRD ANGLE PROJECTION

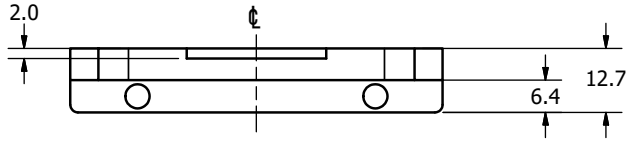
SIZE A1 | DRAWING NUMBER 474-1401 | REV 7

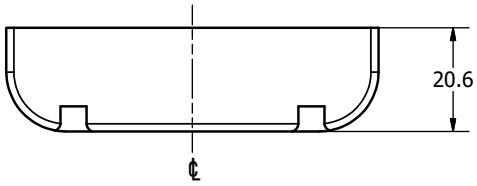
SCALE: 1 : 1 | SHEET 1 OF 1

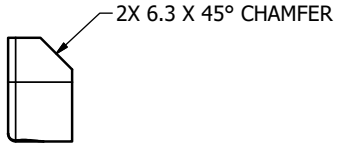
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	JH		4/27/2016

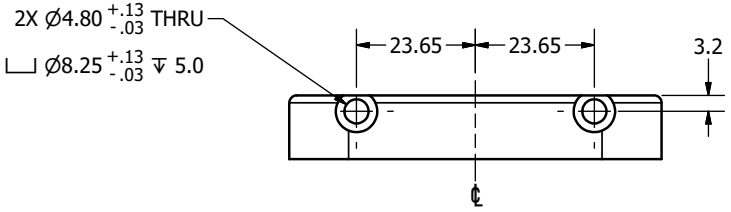












NOTES:

1. DIMENSIONS ARE SYMMETRICAL BETWEEN ℄ UNLESS OTHERWISE SPECIFIED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: ACETAL RESIN, BLACK
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	8/15/2013
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

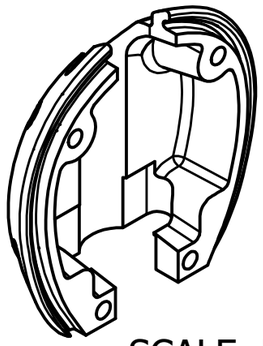
CHIN GUARD

THIRD ANGLE PROJECTION

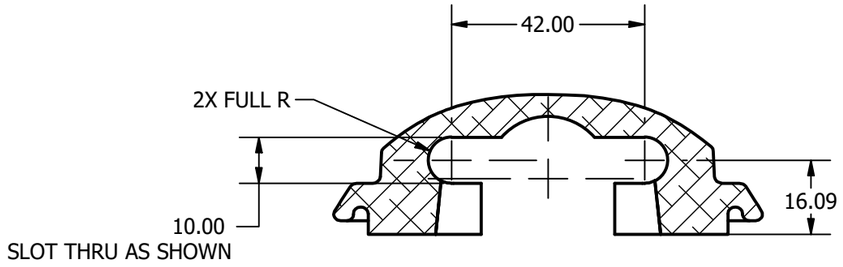
SIZE: A3 | DRAWING NUMBER: 474-1411 | REV: 1

SCALE: 1:1 | SHEET: 1 OF 1

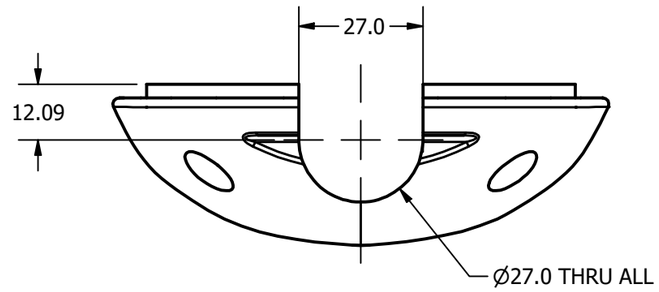
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	KMSP	KMSP	11/12/2019

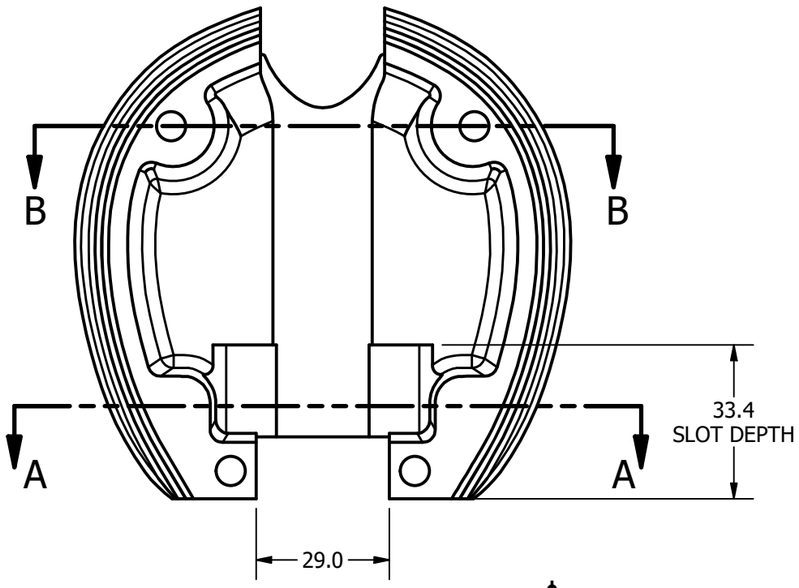


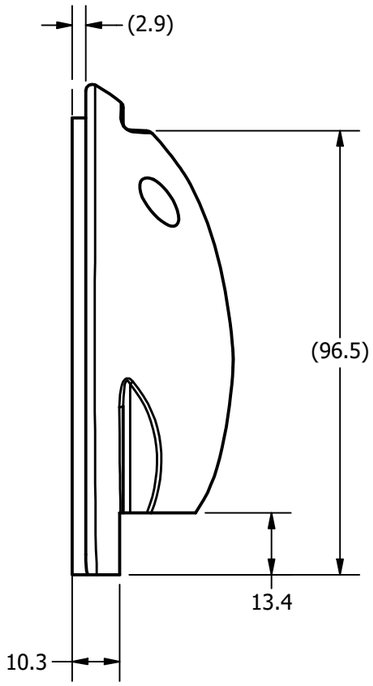
SCALE .5 : 1

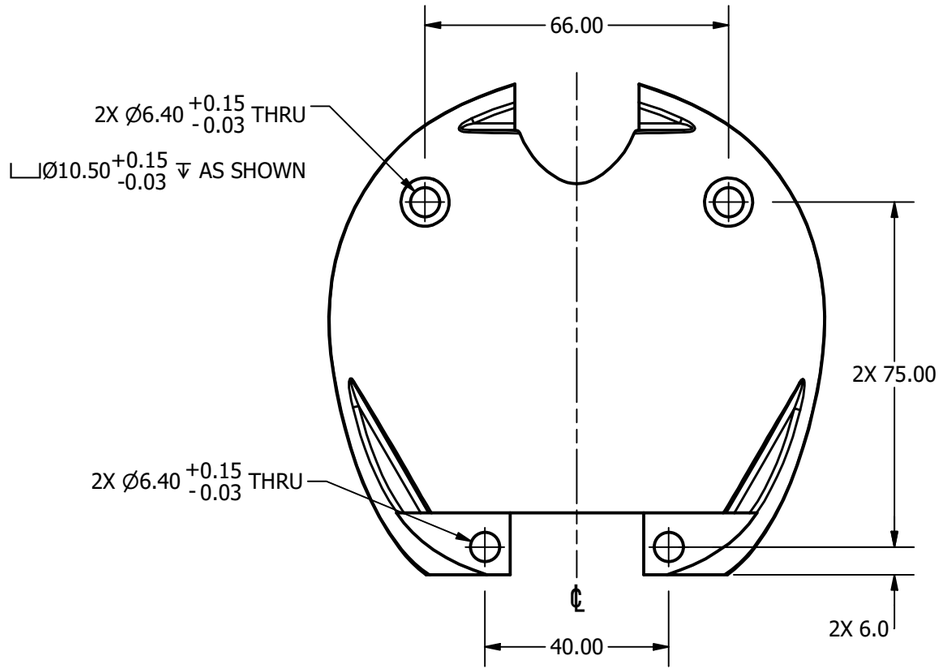


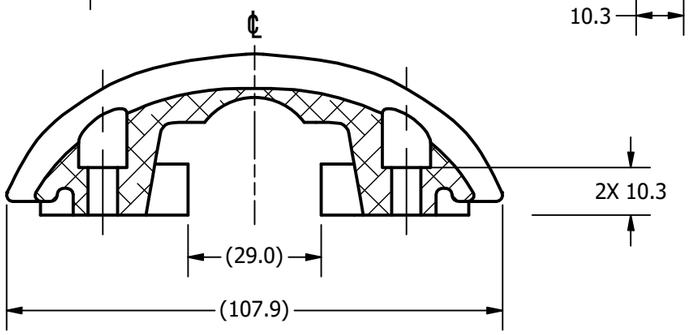
SECTION A-A











SECTION B-B

NOTES:

1. MAKE FROM 474-1112 CAST SKULL, MODIFY AS SHOWN.
2. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT: N/A
FINISH: N/A

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

APPROVALS	DATE
DRAWN: K STPIERRE	11/12/2019
CHECKED:	
ENG: K STPIERRE	11/12/2019
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

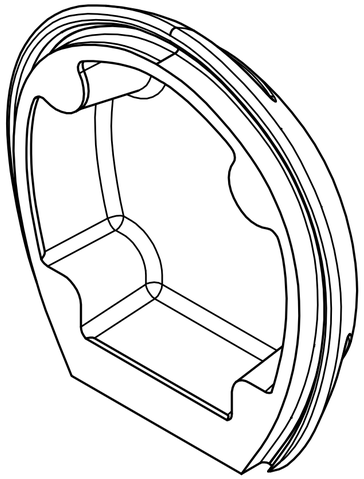
SKULL CAP, MACHINED

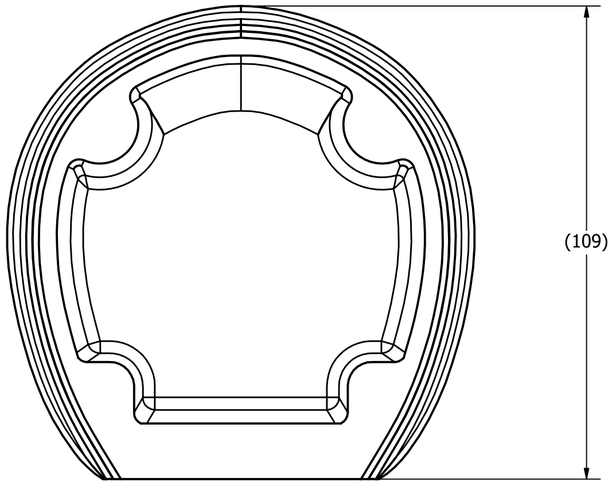
THIRD ANGLE PROJECTION

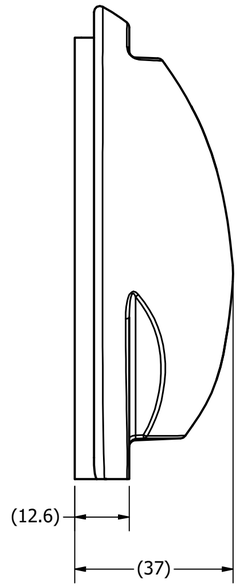
SIZE: A3 | DRAWING NUMBER: 474-1022 | REV: 1

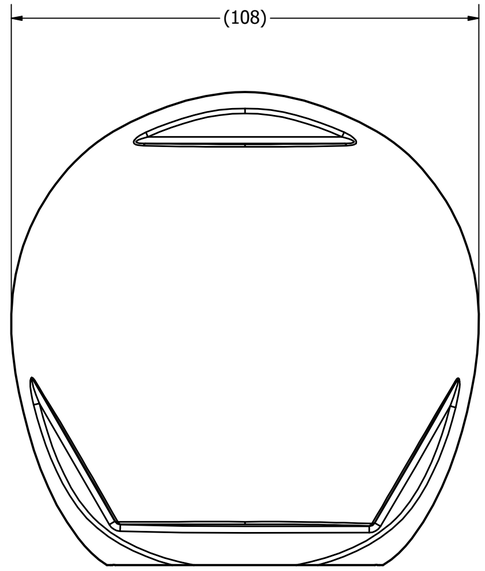
SCALE: .75:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	JW	11/11/2016









NOTES:

1. REMOVE ALL CAST FLASHING.

2. ALL CAST DIMENSION TOLERANCE ±2% BUT NO SMALLER THAN 0.5mm.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 357 CAST ALUMINUM
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: NKD	3/7/2015
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

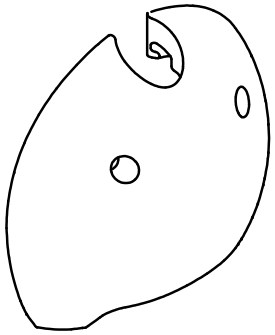
SKULL CAP CASTING
THOR-05F

THIRD ANGLE PROJECTION

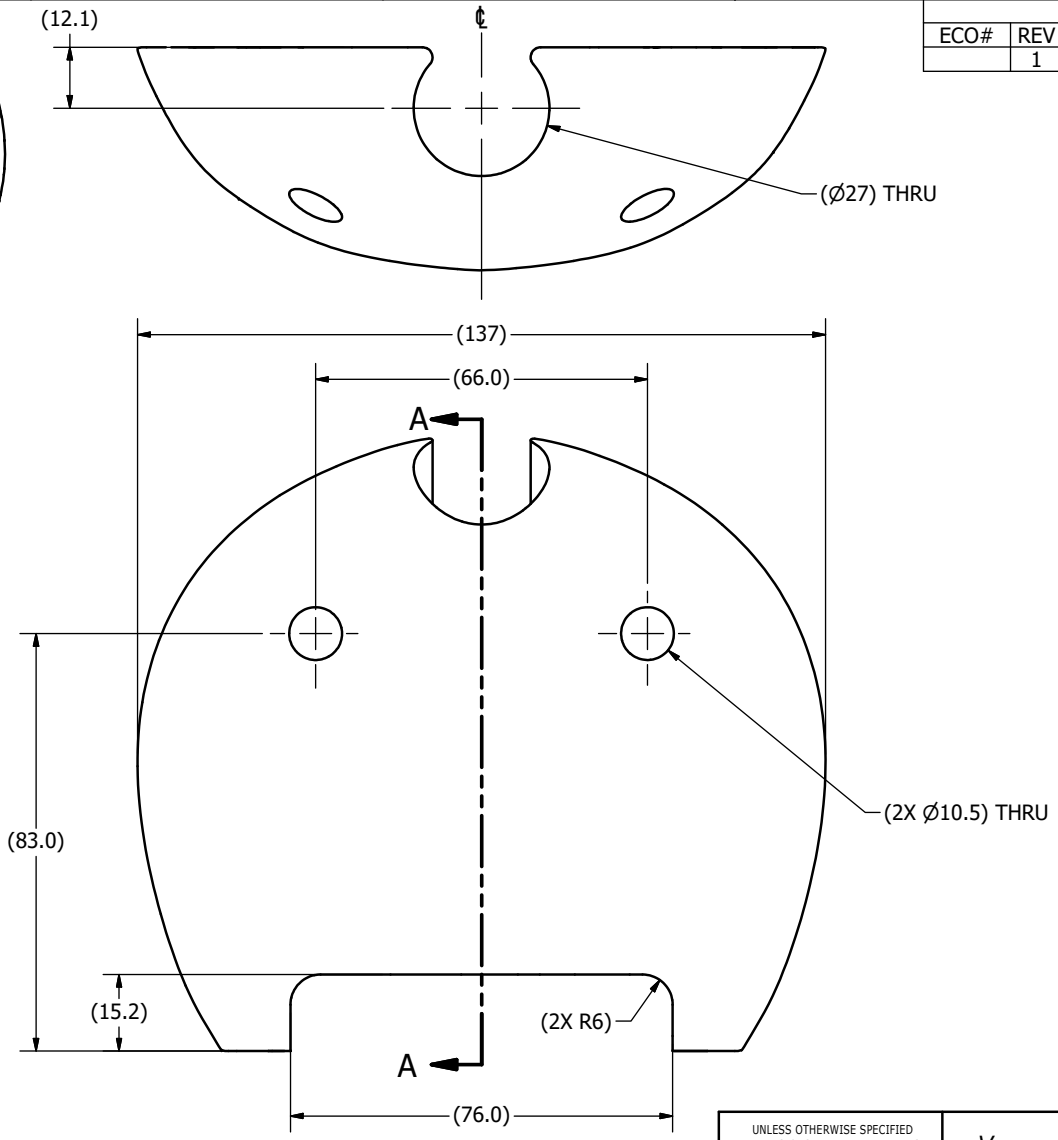
SIZE: A2 | DRAWING NUMBER: 474-1112 | REV: 2

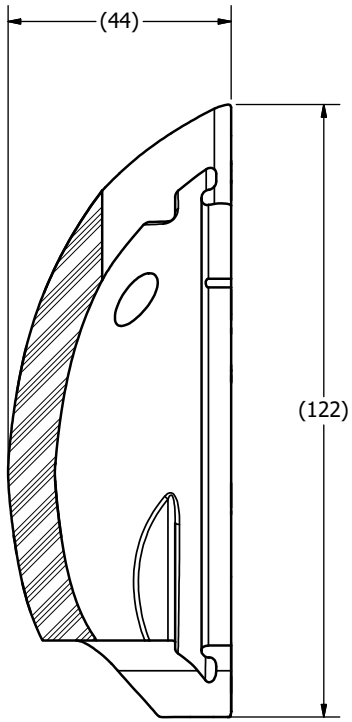
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	BK	JW	4/1/2016



SCALE .5 : 1





SECTION A-A

NOTES:

1. MATERIAL: THERMOSET PLASTIC
   COLOR: EURO BROWN
   DUROMETER: 72.5 2.5 SHORE "A"
2. REMOVE ALL MOLD FLASHING.
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm
4. MASS: 198±6 GRAMS.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/1/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

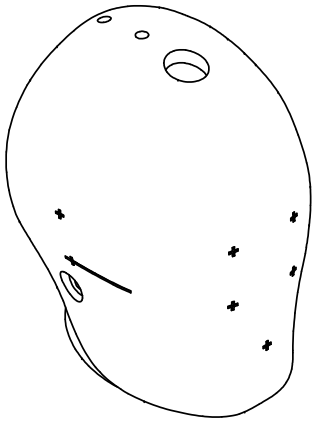
CAP SKIN, THOR-05F

THIRD ANGLE PROJECTION

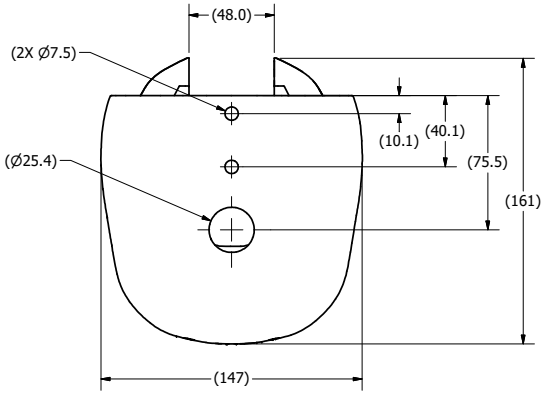
SIZE: A3 | DRAWING NUMBER: 474-1025 | REV: 1

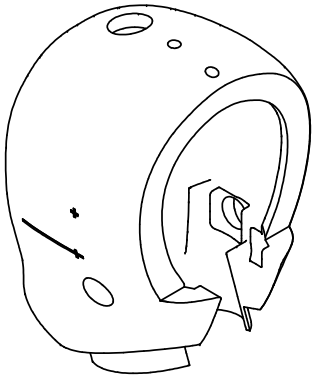
SCALE: 1:1 | SHEET: 1 OF 1

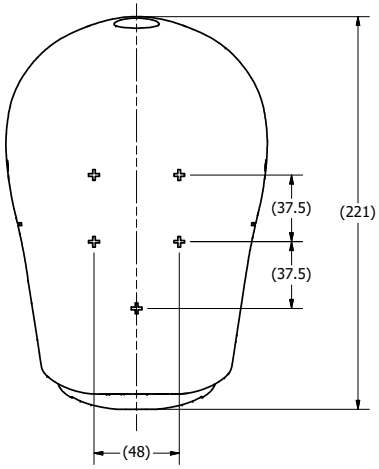
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	RELEASE FOR PROTOTYPE	HF	DJI	9/29/2021

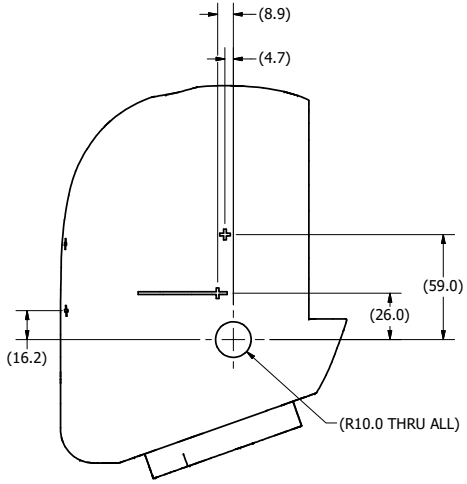


SCALE 1 / 2









NOTES:

1. MATERIAL: THERMOSET PLASTIC
   COLOR: EURO BROWN
   DUROMETER: 50± 5 SHORE "A"
2. REMOVE ALL MOLD FLASHING.
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm
4. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED
5. MASS: 830±25 GRAMS.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE 1
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	1/9/2017
CHECKED:	
ENG: JW	1/9/2017
APPROVED:	

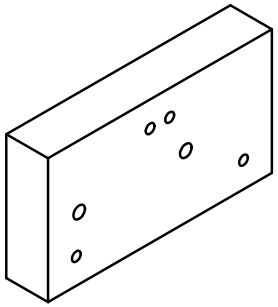
THIRD ANGLE PROJECTION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

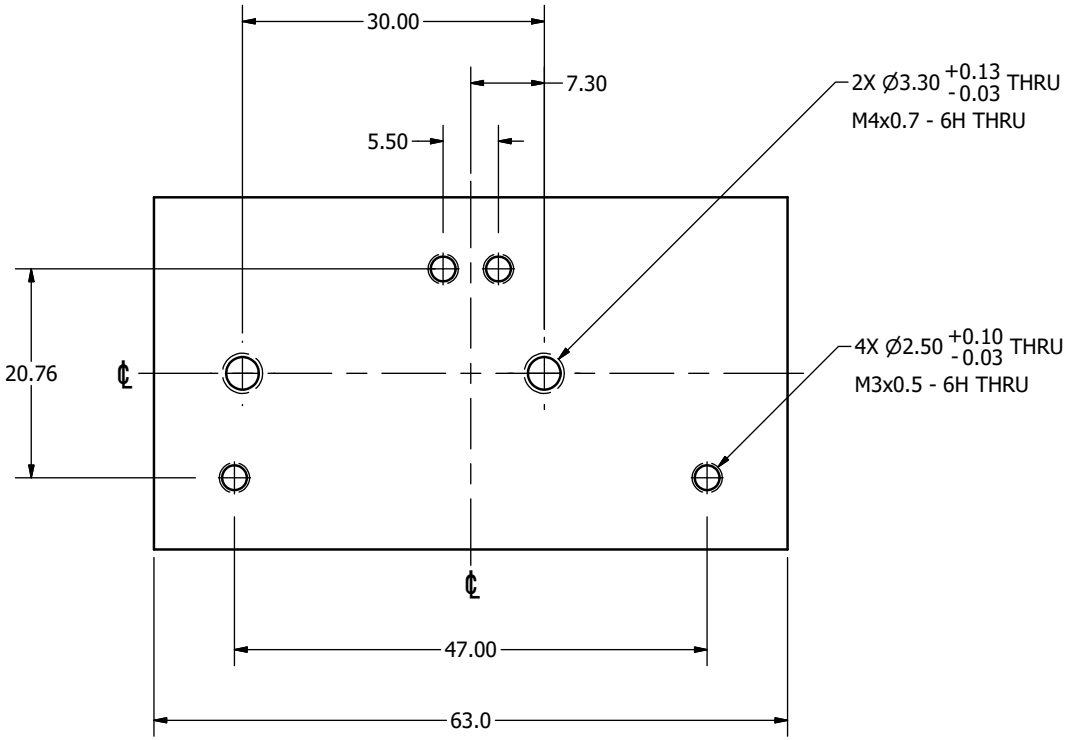
HEAD SKIN, MOLDED

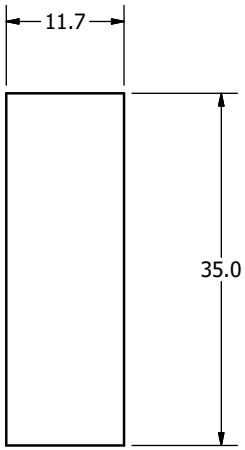
SIZE: A2 | DRAWING NUMBER: 474-1008 | REV: 3
SCALE: 1 / 2 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	RELEASE FOR PROTOTYPE	SKR	DJI	09/21/2021



SCALE 1 : 1





NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: HD-17 (TUNGSTEN)
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/1/2016
CHECKED	
ENG: JW	3/31/2016
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

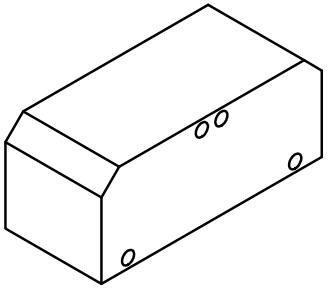
DAS MOUNT

THIRD ANGLE PROJECTION

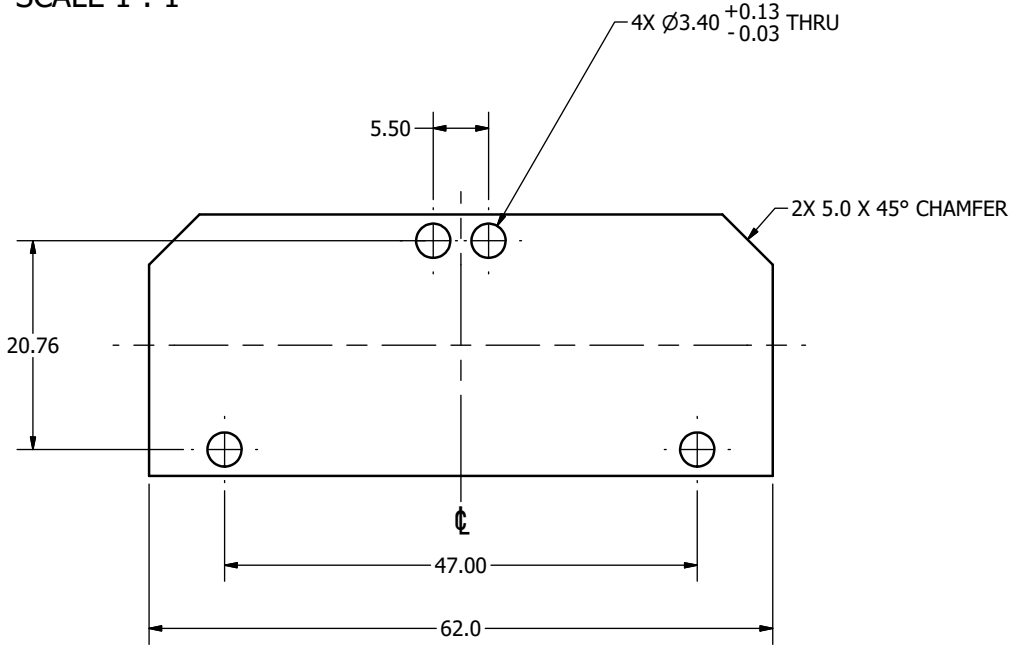
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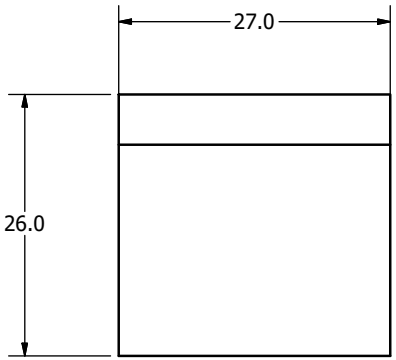
SCALE: 2 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	RELEASE FOR PROTOTYPE	SKR	DJI	09/21/2021



SCALE 1 : 1





NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED
2. (MASS = 118 grams ± 9 grams)

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/1/2016
CHECKED:	
ENG: JW	3/31/2016
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

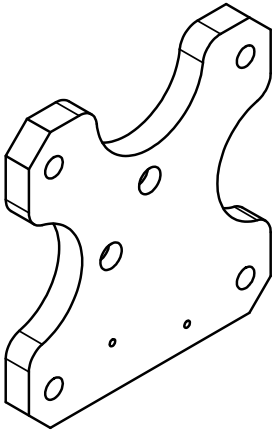
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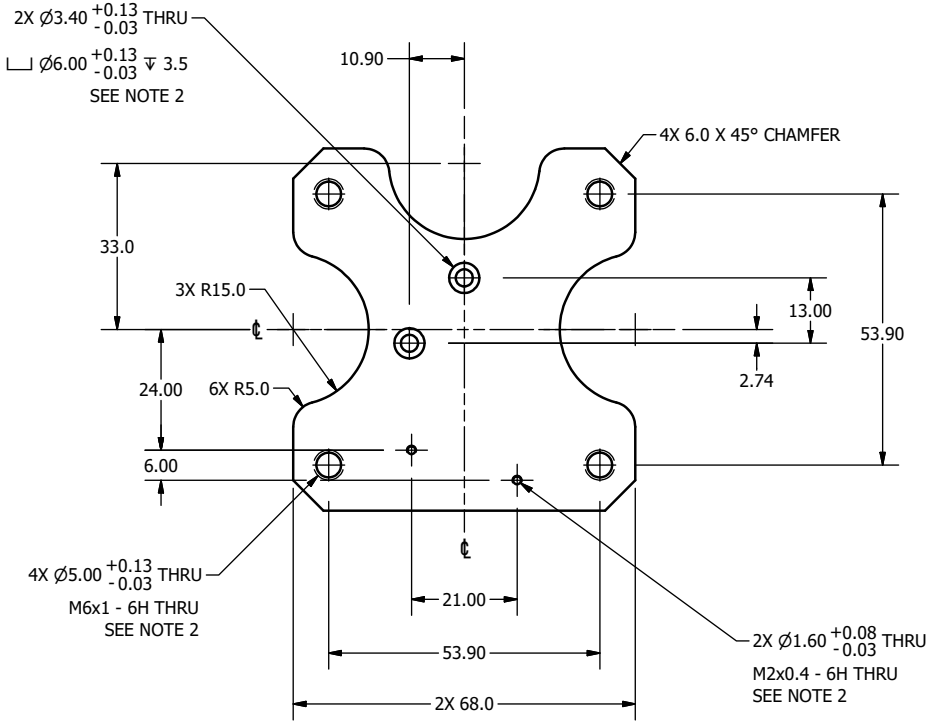
THIRD ANGLE PROJECTION

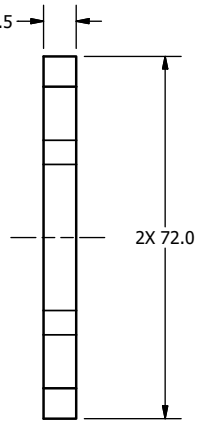
SIZE: A3 | DRAWING NUMBER: 474-1033 | REV: 2

SCALE: 2 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	RELEASE FOR PROTOTYPE	SKR	DJI	09/21/2021







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

2. PLUG HOLES BEFORE ANODIZE.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	4/4/2016
CHECKED	
ENG JW	4/3/2016
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

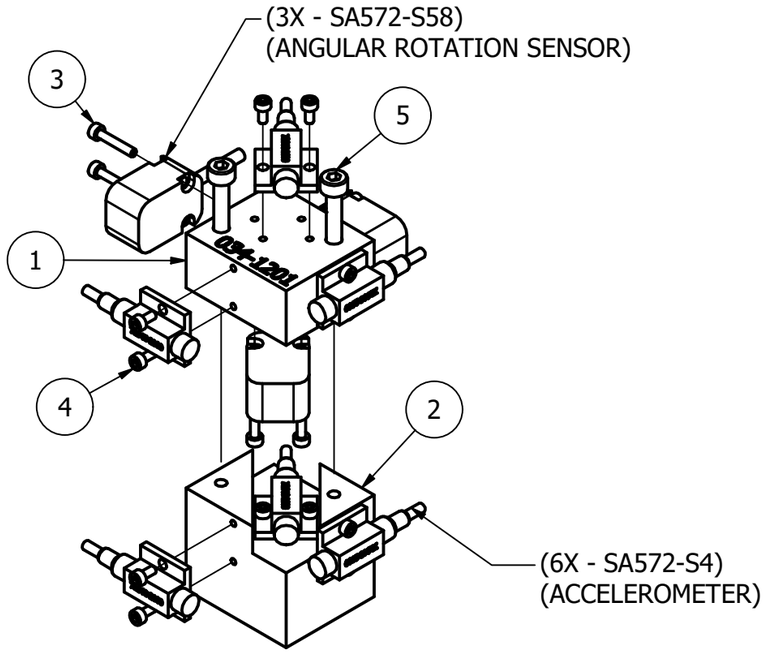
SENSOR MOUNTING PLATE, HEAD

THIRD ANGLE PROJECTION

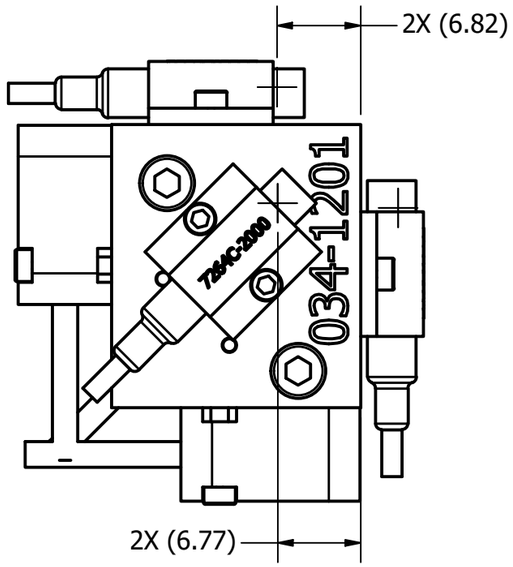
SIZE: A3 | DRAWING NUMBER: 474-1031 | REV: 4

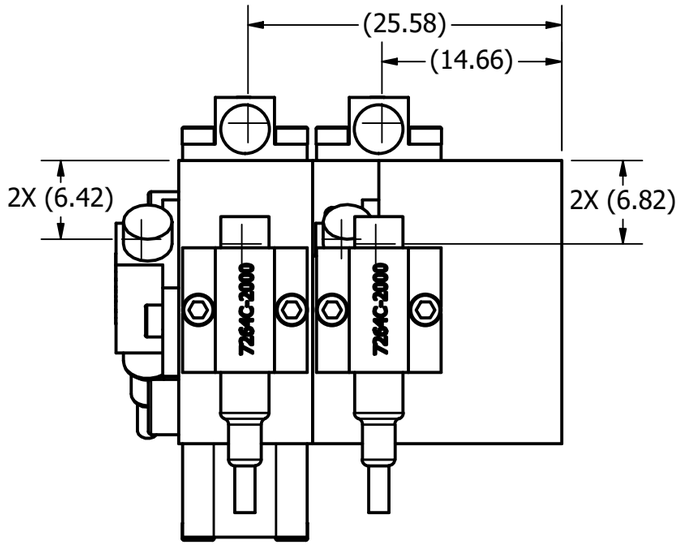
SCALE: 1 : 1 | SHEET: 1 OF 1

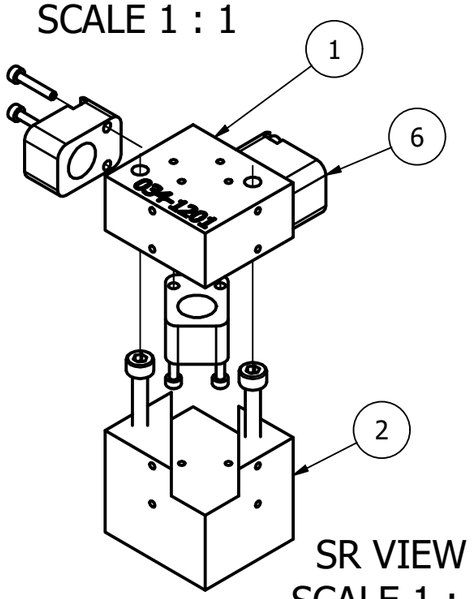
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	DJI	DJI	6/2/2023



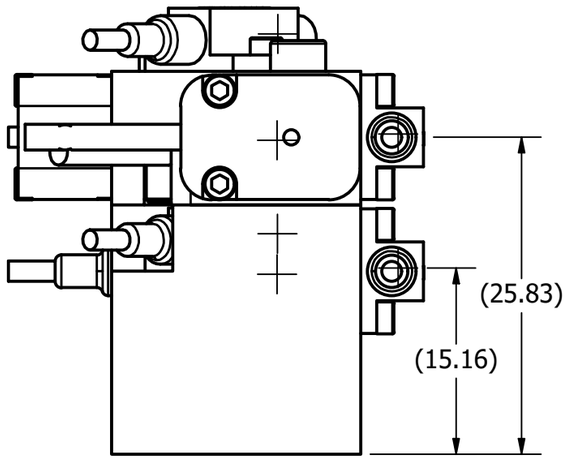
INSTRUMENTATION VIEW
SCALE 1 : 1







SR VIEW
SCALE 1 : 1



PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
6	3	477-3605	ARS S.R.
5	4	5000069	M2.5 X 0.45 X 16 LG. SHCS
4	12	5000068	M1.4 X 0.3 X 3 LG. SHCS
3	12	5000727	M1.4 X 0.3 X 8 LG. SHCS
2	2	474-1032	ACCEL MOUNT, THOR-05F (7264C)
1	2	034-1201	6 AXIS ACCEL/ARS MOUNT, (7264-2000)

PARTS LIST

NOTES:

1. 2X 034-1201 AND 474-1032 ARE SUPPLIED SO THAT ONE CAN BE USED FOR SR ASSEMBLY AND THE OTHER CAN BE USED FOR THE INSTRUMENTED ASSEMBLY.
2. 5000069 IS USED TO MOUNT BOTH ASSEMBLIES.
3. 12X 5000068 ARE NOT NEEDED FOR SR ASSEMBLY AND WILL REMAIN ON THE INSTRUMENTED ASSEMBLY.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN J. MCINNIS	5/3/2016
CHECKED	
ENG JW	5/3/2016
APPROVED	

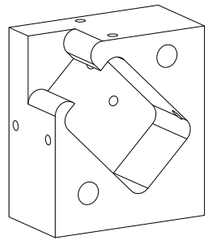
MATERIAL
HEAT TREAT
FINISH

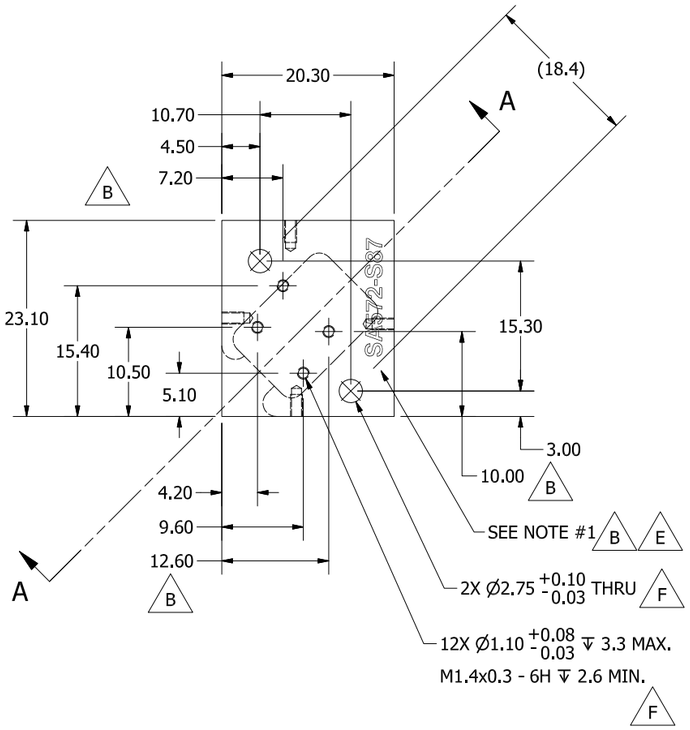
KIT, REDUNDANT 7264C/ARS, THOR-05F HEAD
THOR-05F

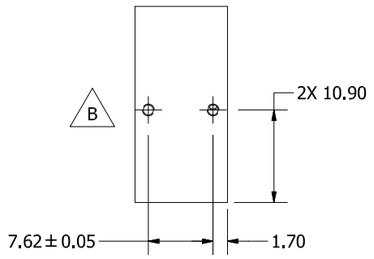
THIRD ANGLE PROJECTION

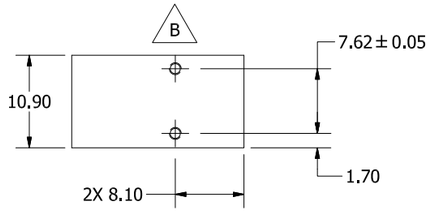
SIZE A3 | DRAWING NUMBER 474-1034 | REV 2
SCALE: 2 : 1 | SHEET 1 OF 1

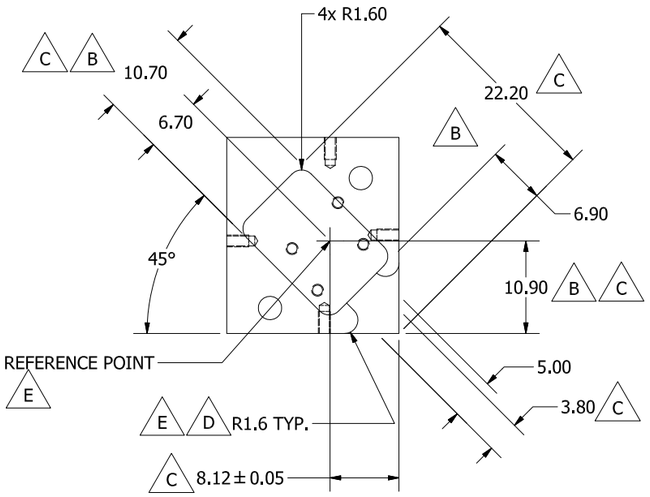
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
75659	A	RELEASE TO PRODUCTION	LP		6-15-07
76752	B	REMOVED NOTE TO STAMP "A" FOR ACCELEROMETERS & "B" FOR SENSORS; SEE NOTE #2 WAS #3; REDIMENSIONED TAP HOLES & POCKET TO CORNER OF SLOT	MT		7-7-09
77338	C	10.90 & 8.12±0.05 WAS 9.80 & 10.70; 3.80 WAS 2.50; 22.20 WAS 22.10; REMOVED 2X 5.33±0.05; ADDED 10.70 & 6.70	MT		10-26-09
77591	D	ADD R.1.59±0.05 * 2	FINK		1/11/11
72396	E	REDRAWN IN INVENTOR; MACHINING REFERENCE POINT WAS CENTER OF POCKET; REMOVE NOTE #1; NOTE #1 WAS NOTE #2; SEE NOTE #1 WAS SEE NOTE #2; 7075-T6 ALUMINUM WAS 7076-T6 ALUMINUM; R1.6 WAS R1.59	AB		02/14/14
74658	F	UPDATED HOLE CALLOUTS PER CURRENT STANDARDS	GCH		01/11/2016
74658	G	REGULATION RELEASE, PART NO. WAS 034-1201	AB/JHC		01/12/16

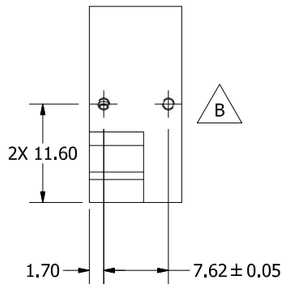


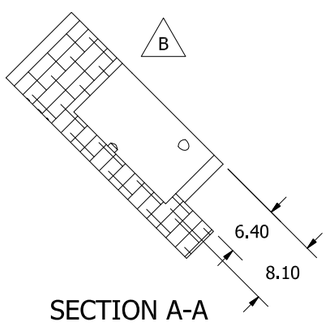




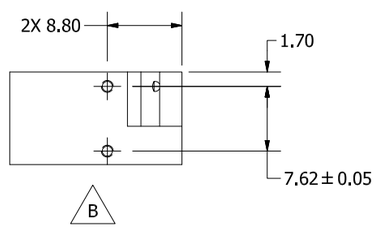








SECTION A-A



E B NOTES:

1. ETCH PART NUMBER WHERE SHOWN.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	14-Jun-07
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

6 AXIS ACCEL/ARS MOUNT, (7264-2000), HEAD & PELVIS, Q DUMMIES

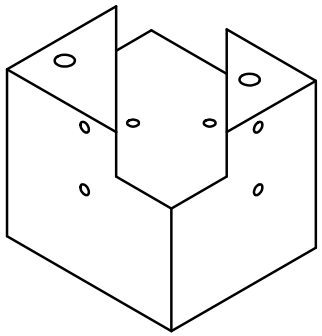
E

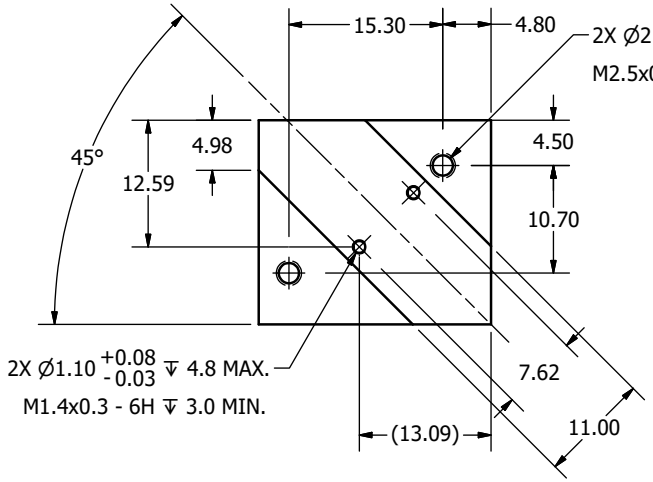
THIRD ANGLE PROJECTION

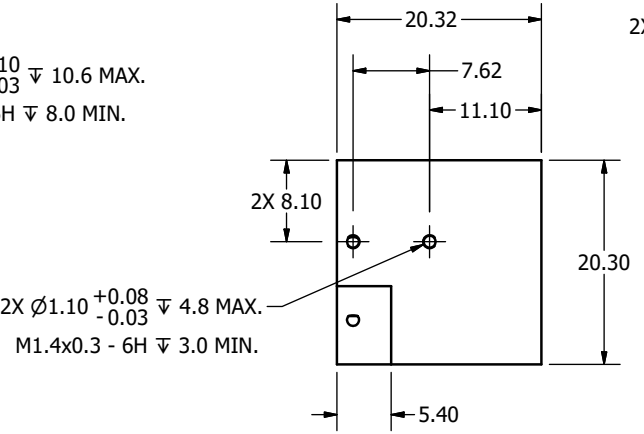
SIZE: A2 | DRAWING NUMBER: SA572-S87 | REV: G

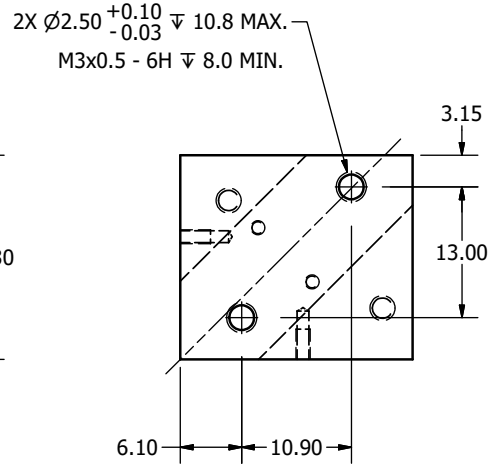
SCALE: 2:1 | SHEET: 1 OF 1

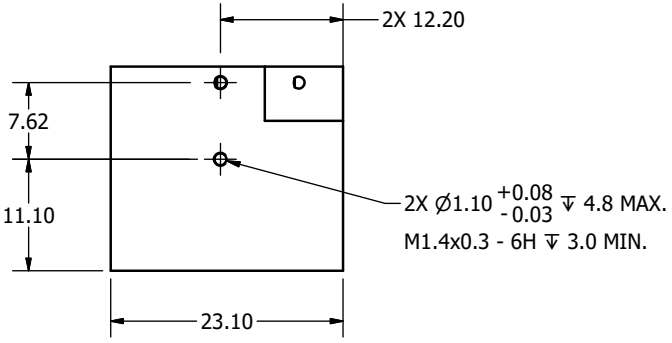
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	BK	JW	10/18/2017











NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT:
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/1/2016
CHECKED	
ENG	
APPROVED	

THIRD ANGLE PROJECTION

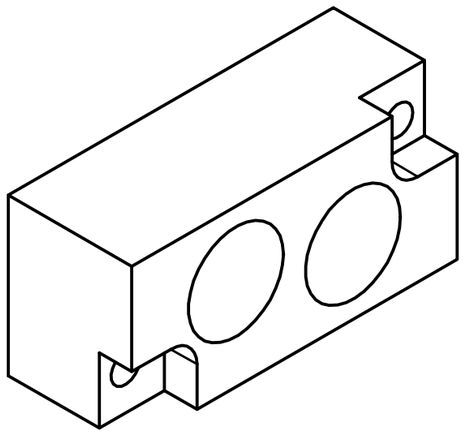
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

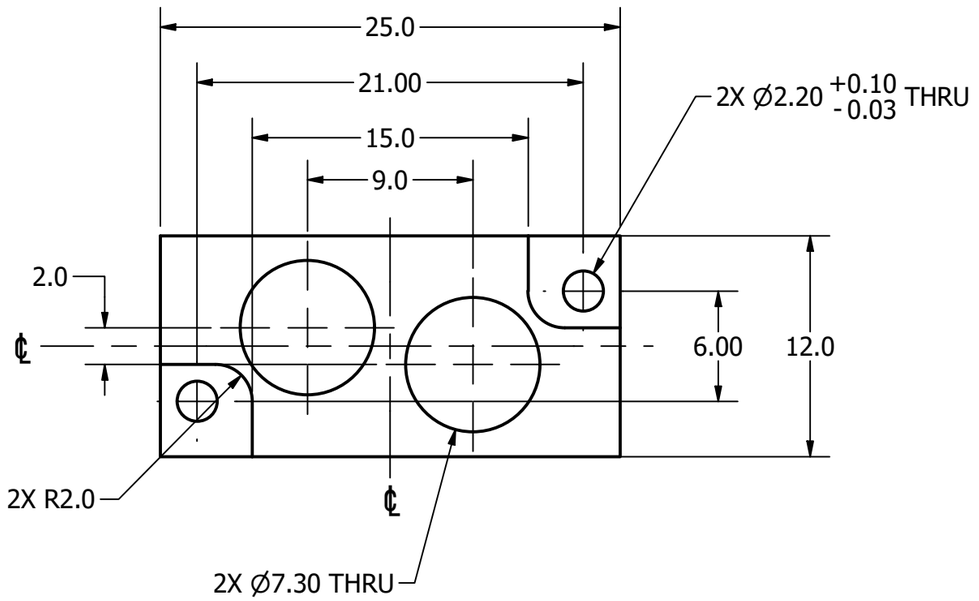
ACCEL MOUNT, THOR-05F (SA572-S4)

SIZE	DRAWING NUMBER	REV
A3	474-1032	1

SCALE: 2:1 SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	A	RELEASE FOR PRODUCTION	KMSP	MJS	10/10/2018







NOTES:

1. MASS: 5 ± 0.5g
2. 2X Ø7.30 DIMENSION CAN BE ADJUSTED TO MEET MASS REQUIREMENT.
3. DIMENSIONS ARE SYMMETRICAL ABOUT ℄, UNLESS OTHERWISE NOTED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

TILT SENSOR S.R.

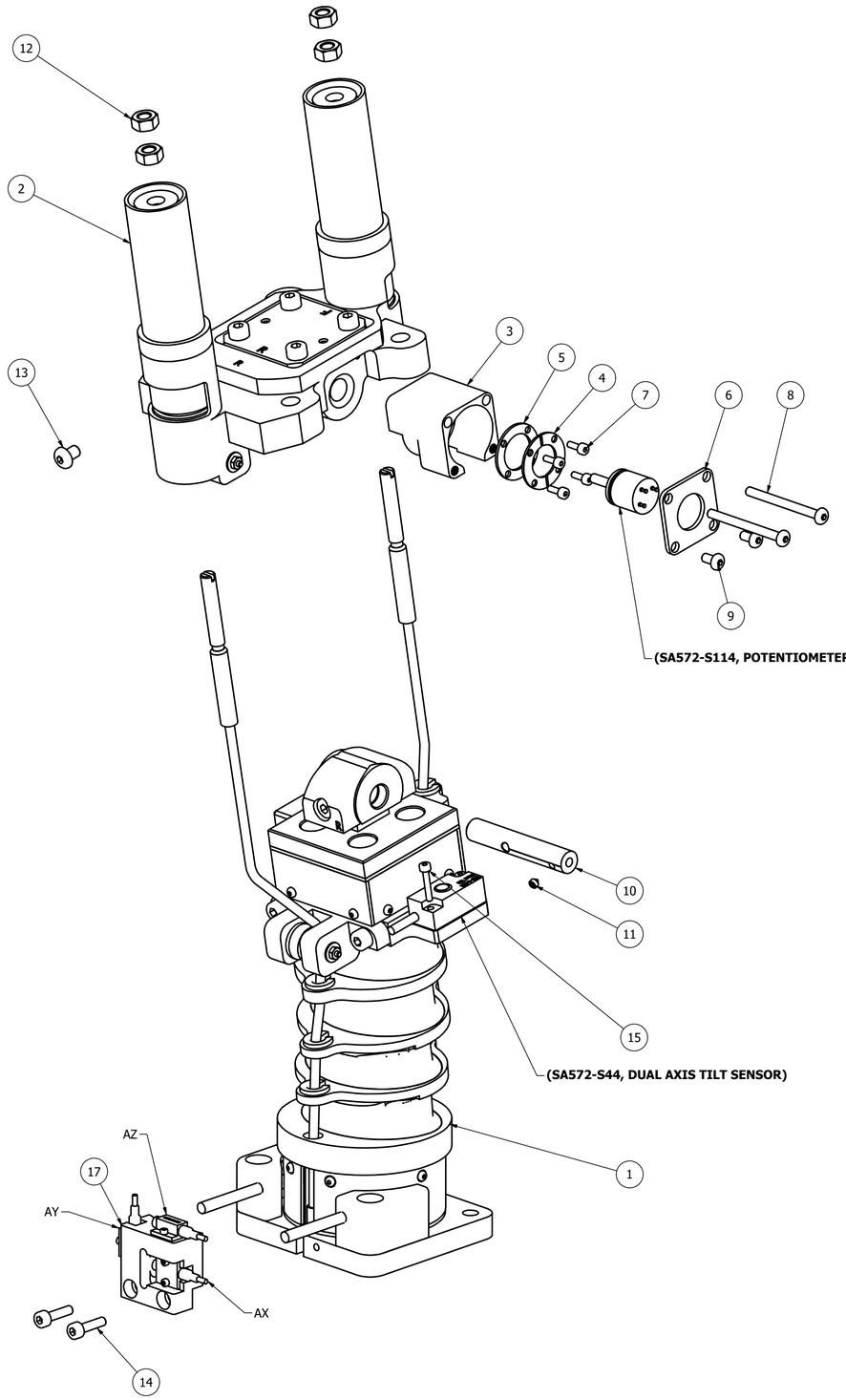
	APPROVALS	DATE
DRAWN	abastian	10/29/2018
CHECKED		
ENG	MJS	8/29/2017
APPROVED		

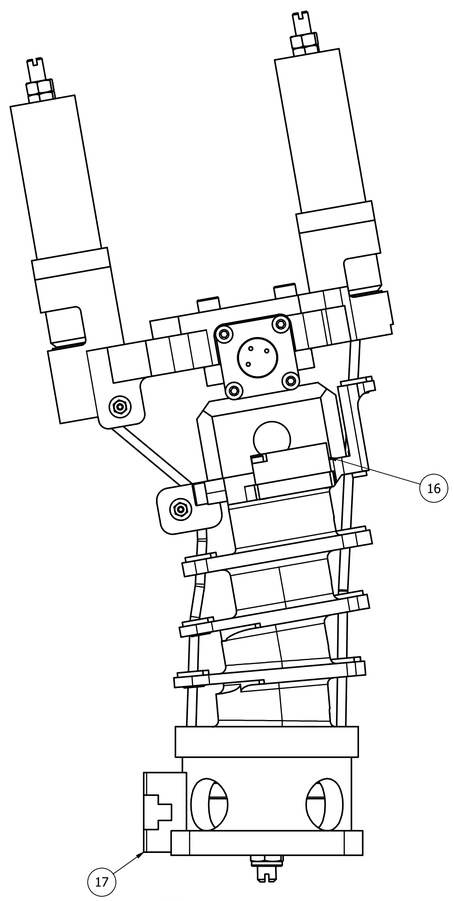
MATERIAL: 6061-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

THIRD ANGLE PROJECTION

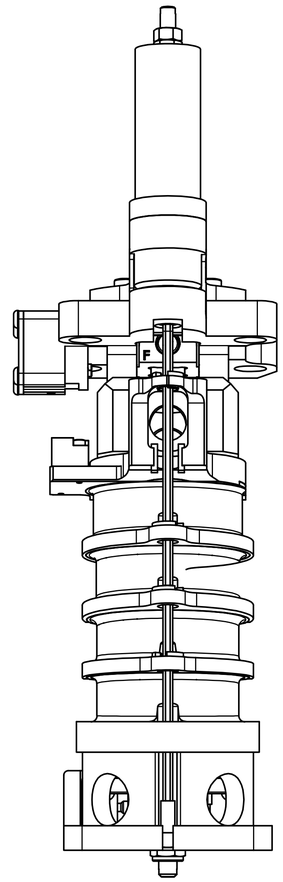
SIZE: A3 | DRAWING NUMBER: 476-3604 | REV: A
SCALE: 3 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	DJI	DJI	8/18/2023





SR VIEW



ITEM	QTY	PART NUMBER	DESCRIPTION
17	1	474-2022	KIT, 7264C, T1 THOR-05F NECK
16	1	476-3604	TILT SENSOR S.R.
15	2	5000382	SCREW, SHCS M2-0.4 X 12mm LONG
14	2	5001103	M3 X 0.5 X 12 LG. SHCS
13	1	5001075	M4 X 0.7 X 6 LG. BHCS
12	4	5000515	M5 X 0.8 HEX NUT ZINC
11	1	5001112	M3 X 0.5 X 3 LG. SSS CONE PT.
10	1	474-2340	PIN, OC
9	2	5000399	M3 X 0.5 X 6 LG. BHCS SS
8	2	5001313	M3 X 0.5 X 35 LG. BHCS SS
7	4	5000082	M2 X 0.4 X 6 LG. SHCS
6	1	472-2014	ROTARY POTENTIOMETER COVER, NECK
5	1	472-2021	ROTARY POTENTIOMETER WASHER, NECK
4	2	472-2020	ROTARY POTENTIOMETER CLAMP, NECK
3	1	484-2013	ROTARY POTENTIOMETER HOUSING, NECK
2	1	474-2300-A	HEAD/NECK PLATFORM ASSEMBLY
1	1	474-2100	NECK COLUMN ASSEMBLY

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∨ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/20/2023
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

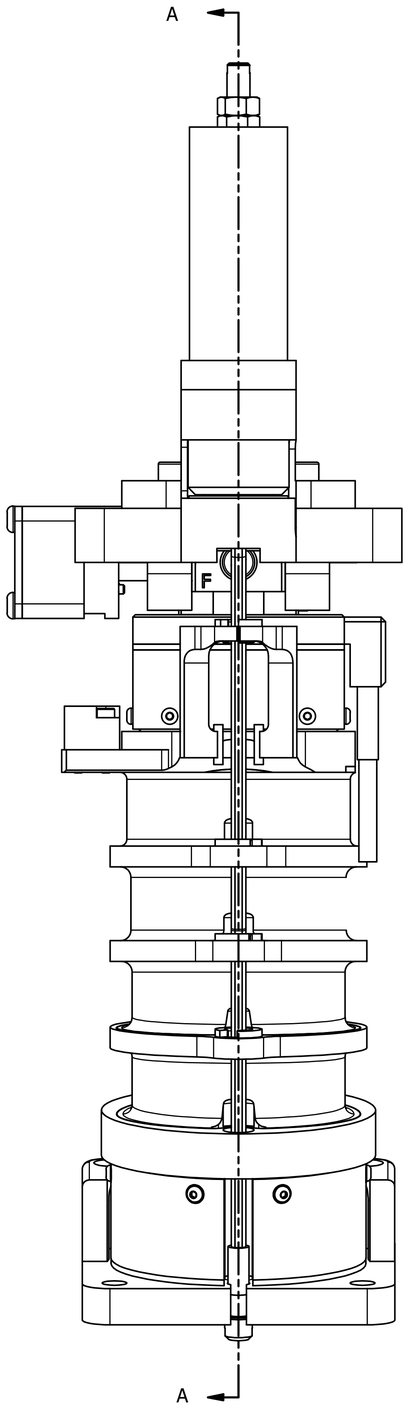
NECK ASSEMBLY, THOR-05F

THOR 05F

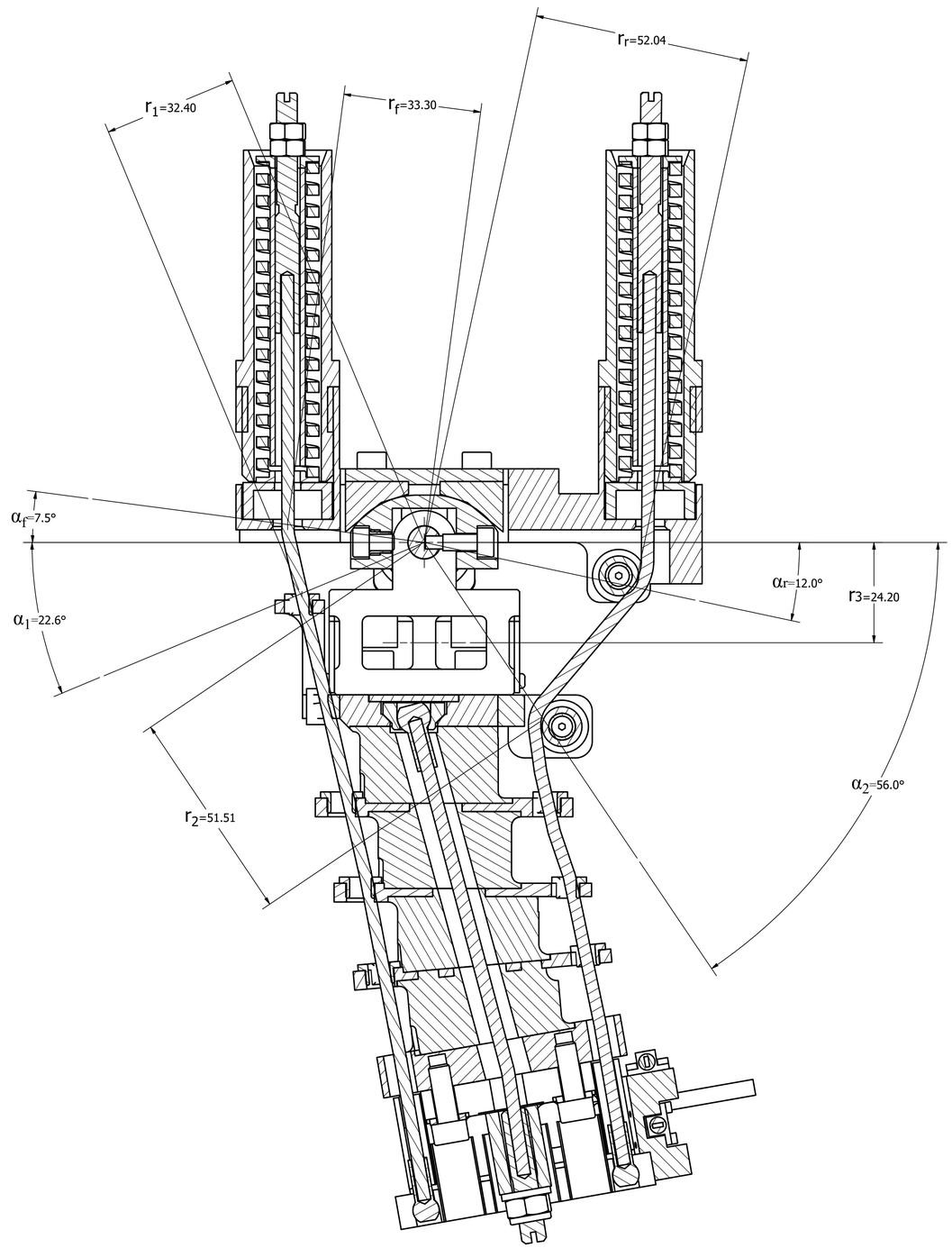
THIRD ANGLE PROJECTION

SIZE: A1 | DRAWING NUMBER: 474-2000-A | REV: 2

SCALE: 1 : 1 | SHEET: 1 OF 2



SCALE 1.5 : 1



SECTION A-A
SCALE 1.5 : 1

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.1, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/20/2023
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

NECK ASSEMBLY, THOR-05F

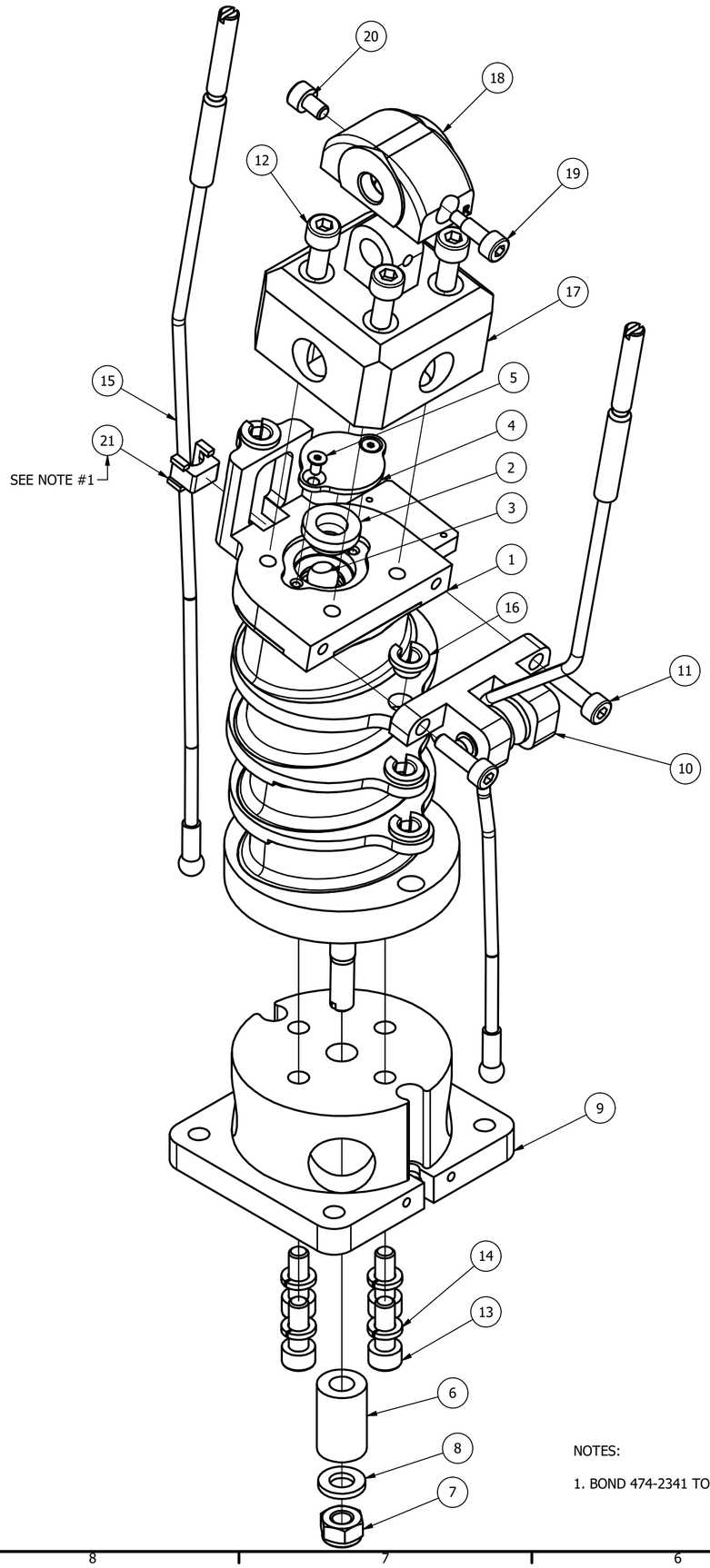
THOR 05F

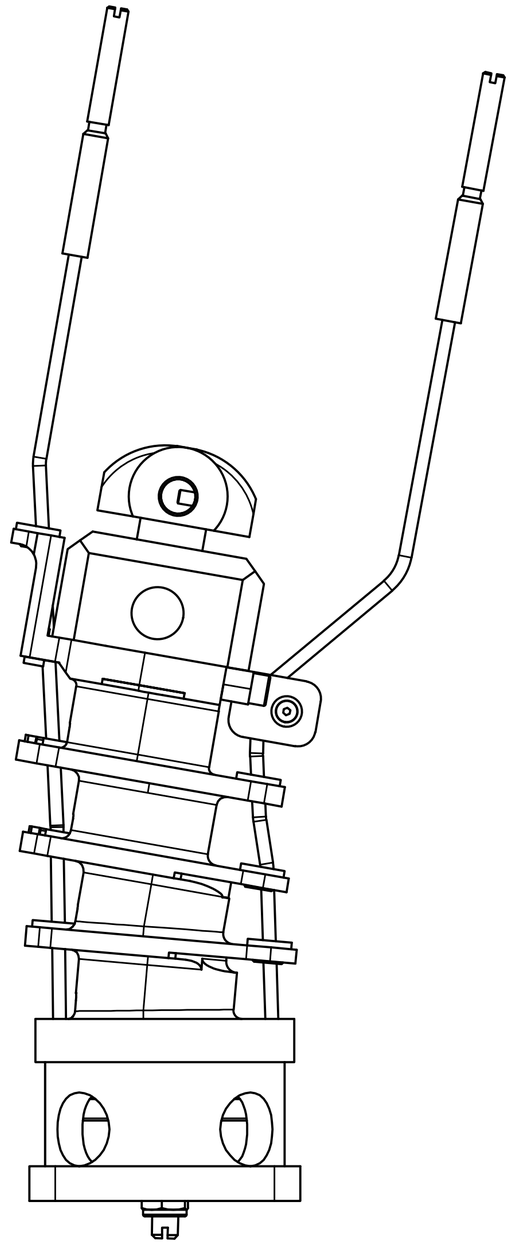
THIRD ANGLE PROJECTION

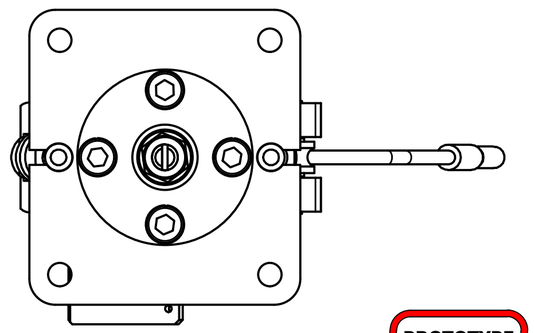
SIZE: A1 | DRAWING NUMBER: 474-2000-A | REV: 2

SCALE: 1.5 : 1 | SHEET 2 OF 2

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	PROTOTYPE	AT		5/19/2017







NOTES:

1. BOND 474-2341 TO 474-2110 WHEN ASSEMBLED

ITEM	QTY	PART NUMBER	DESCRIPTION
21	1	474-2341	TOP PLATE CABLE GUIDE, NECK
20	1	5000076	M4 X 0.7 X 6 LG. SHCS
19	1	472-2016	OCCIPITAL CONDYLE SCREW
18	1	474-2327	OC FLEXION-EXTENSION CAM
17	1	474-2326	STRUCTURAL REPLACEMENT, UPPER NECK LOAD CELL
16	7	474-2332	CABLE GUIDE HALF
15	2	474-2620	NECK CABLE ASSY., FRONT / REAR
14	4	5001400	WASHER, M5 SPLIT LOCK
13	4	5000300	M5 X 0.8 X 14 LG. SHCS
12	4	5000002	M5 X 0.8 X 12 LG. SHCS
11	2	5000459	M4 X 0.7 X 14 LG. SHCS
10	1	474-2330	REAR PULLEY ASSEMBLY
9	1	474-2325	STRUCTURAL REPLACEMENT, LOWER NECK LOAD CELL
8	1	5000013	M6 FLAT WASHER PLAIN ZINC
7	1	5000503	M6 X 1 HEX LOCK NUT SS
6	1	474-2331	COMPRESSION BUSHING, NECK CENTER CABLE
5	2	5000723	M2.5 X 0.45 X 5 LG. FHCS
4	1	474-2333	COVER, NECK CABLE
3	1	474-2600	CENTER CABLE ASSY., NECK
2	1	474-2334	CENTER CABLE FIXTURE
1	1	474-2110	NECK ASSEMBLY, MOLDED

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	4/6/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

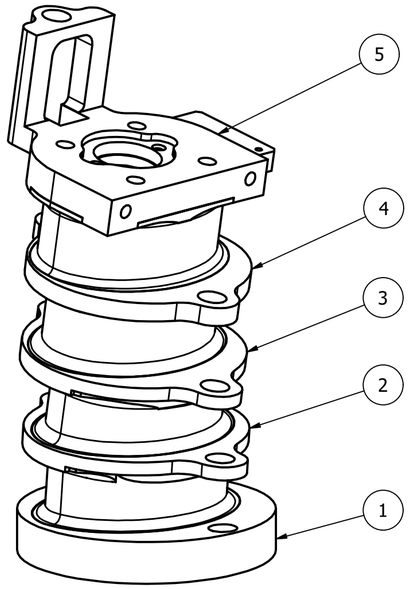
NECK COLUMN ASSEMBLY

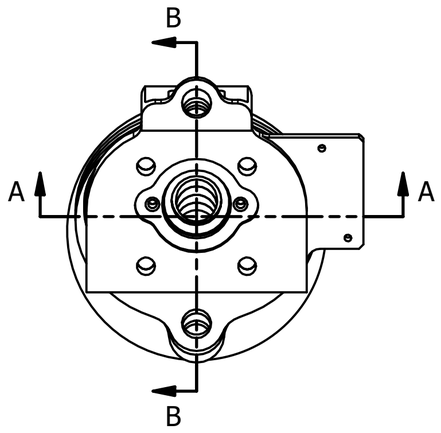
THIRD ANGLE PROJECTION

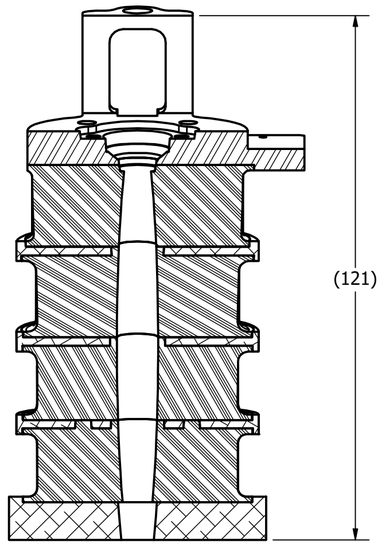
SIZE A2 | DRAWING NUMBER 474-2100 | REV 5

SCALE: 1 : 1 | SHEET 1 OF 1

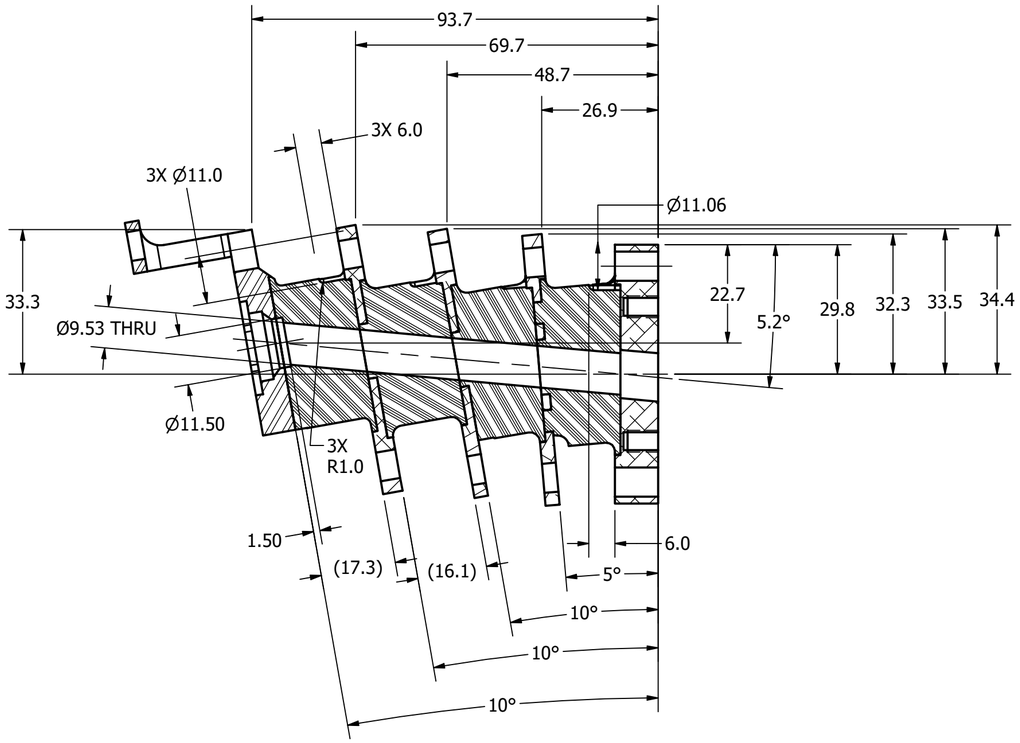
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	6	PROTOTYPE	AT	KMSP	6/12/2018







SECTION A-A



SECTION B-B

ITEM	QTY	PART NUMBER	DESCRIPTION
5	1	474-2335	TOP PLATE, NECK
4	1	474-2336	NECK PLATE 1
3	1	474-2337	NECK PLATE 2
2	1	474-2338	NECK PLATE 3
1	1	474-2339	BASE PLATE, NECK MOLD

PARTS LIST

NOTES:

1. MATERIAL: BUTYL RUBBER
   COLOR: BLACK
   DUROMETER: 86 ±10 SHORE "A". CAN BE ADJUSTED TO MEET PERFORMANCE SPEC.
2. REMOVE ALL MOLD FLASHING.
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm.
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE RUBBER MOLDING.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: jhaefner	4/6/2016
CHECKED:	
ENG:	
APPROVED:	

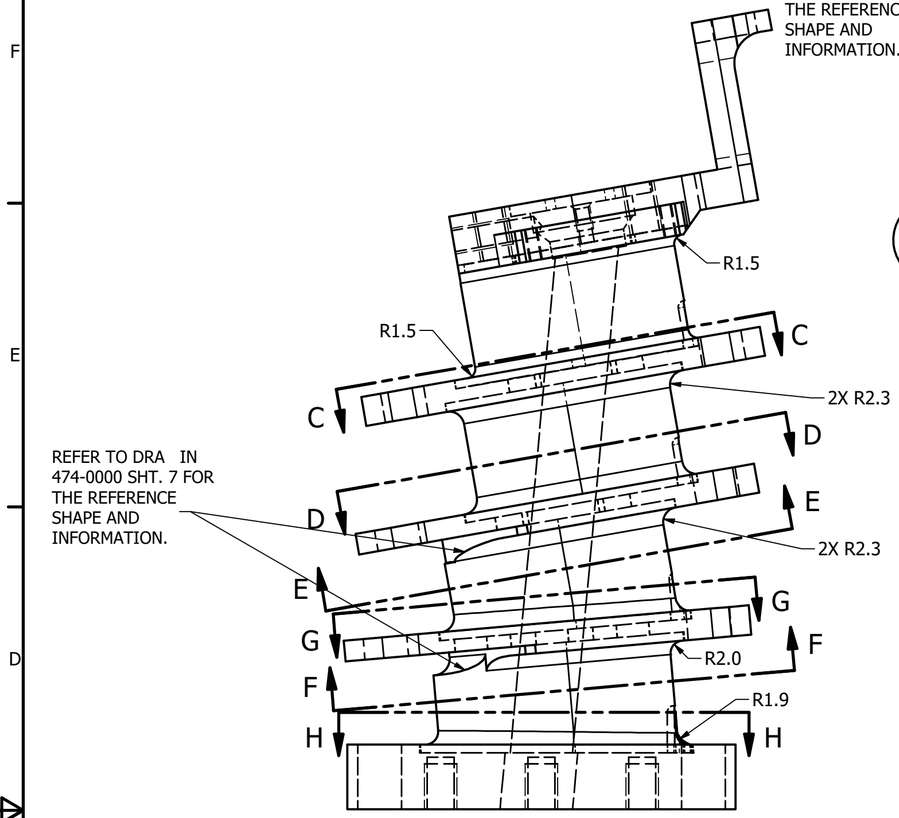
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

NECK ASSEMBLY, MOLDED

THIRD ANGLE PROJECTION

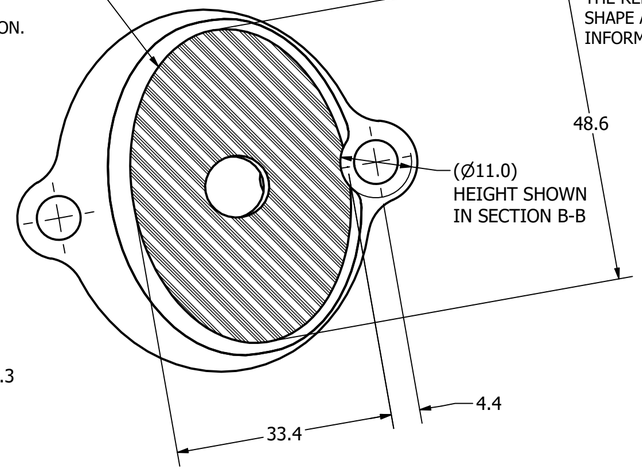
SIZE: A2 | DRAWING NUMBER: 474-2110 | REV: 6

SCALE: 1 : 1 | SHEET: 1 OF 2



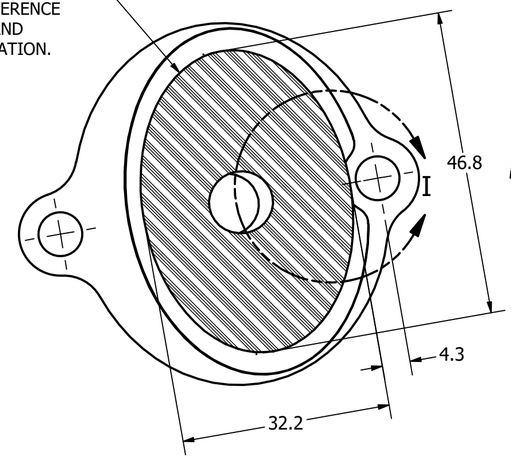
SCALE 1.5:1

REFER TO DRA IN 474-0000 SHT. 7 FOR THE REFERENCE SHAPE AND INFORMATION.

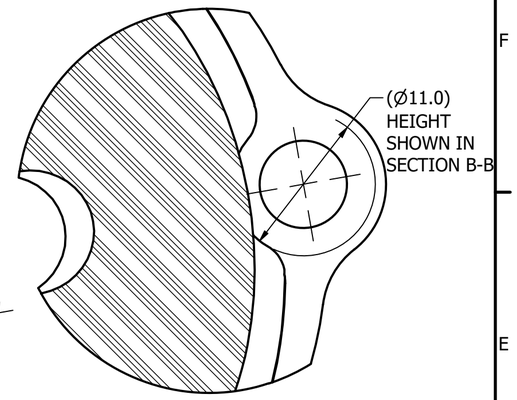


SECTION C-C
SCALE 1.5:1

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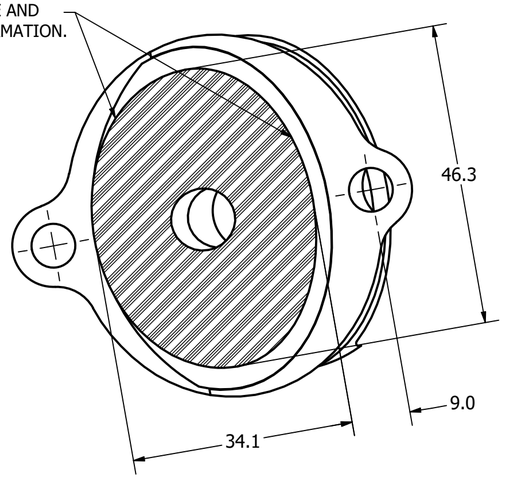


SECTION D-D
SCALE 1.5:1



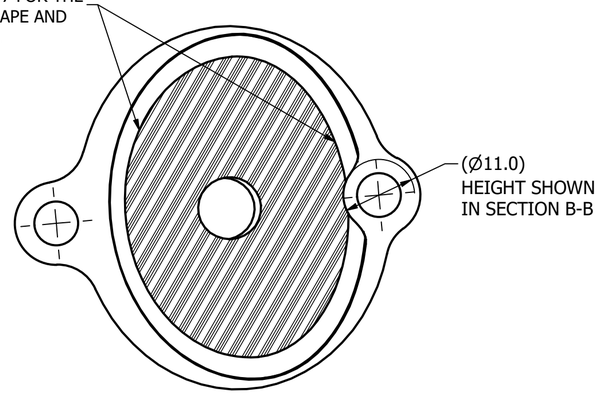
DETAIL I
SCALE 3 : 1

REFER TO DRA IN 474-0000 SHT. 7 FOR THE REFERENCE SHAPE AND INFORMATION.



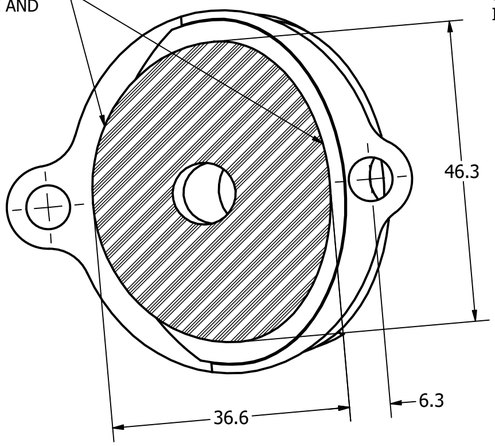
SECTION E-E
SCALE 1.5:1

REFER TO DRA IN 474-0000 SHT. 7 FOR THE REFERENCE SHAPE AND INFORMATION.



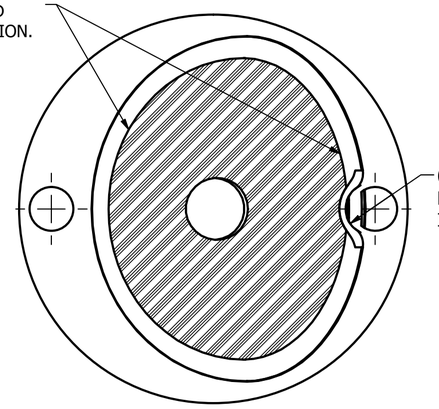
SECTION G-G
SCALE 1.5:1

REFER TO DRA IN 474-0000 SHT. 7 FOR THE REFERENCE SHAPE AND INFORMATION.



SECTION F-F
SCALE 1.5:1

REFER TO DRA IN 474-0000 SHT. 7 FOR THE REFERENCE SHAPE AND INFORMATION.



SECTION H-H
SCALE 1.5:1

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN jhaefner	4/6/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

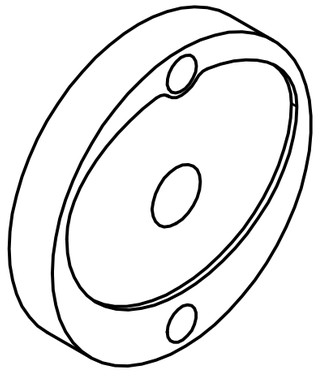
NECK ASSEMBLY, MOLDED

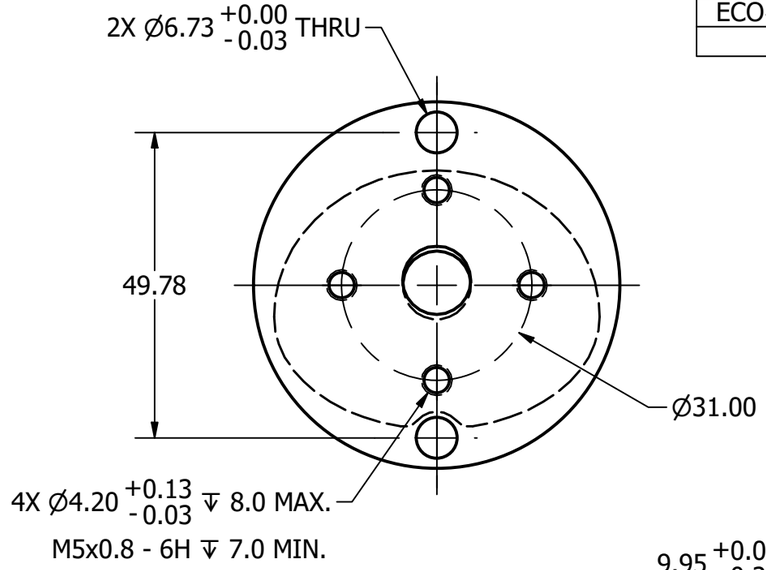
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-2110 | REV: 6

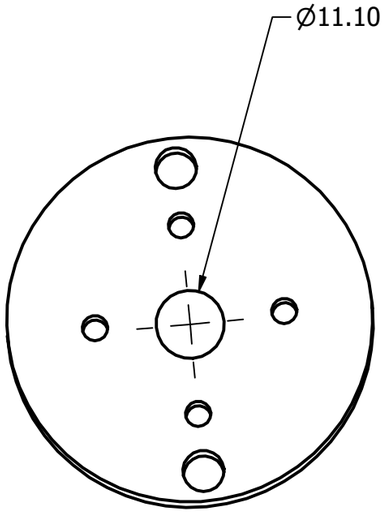
SCALE: 1.5:1 | SHEET: 2 OF 2

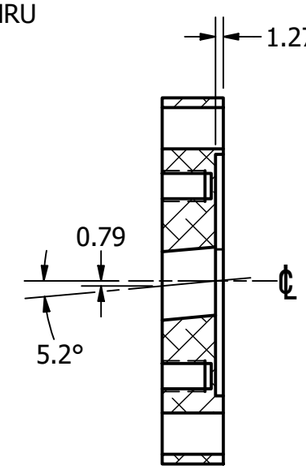
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	KMSP	KMSP	4/11/2019



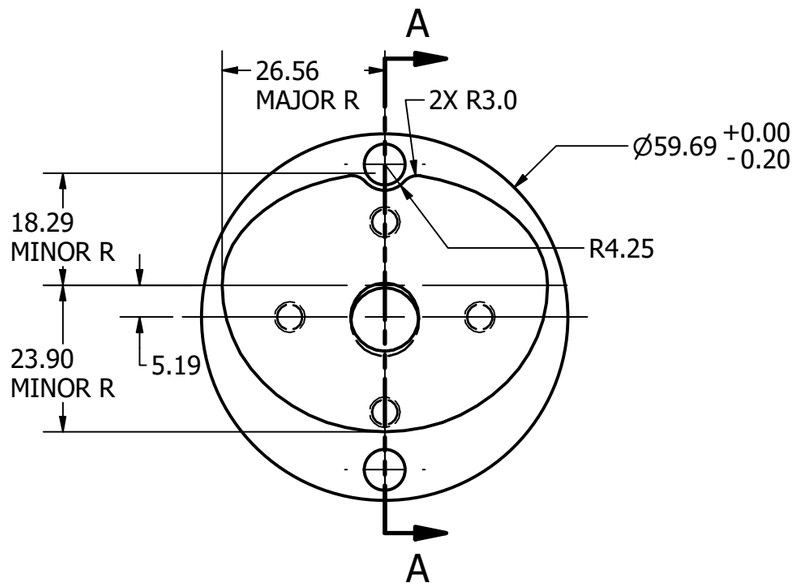








SECTION A-A



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

PROTOTYPE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN jhaefner	4/5/2016
CHECKED	
ENG	
APPROVED	

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: N/A

DEPARTMENT OF TRANSPORTATION — UNITED STATES OF AMERICA

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

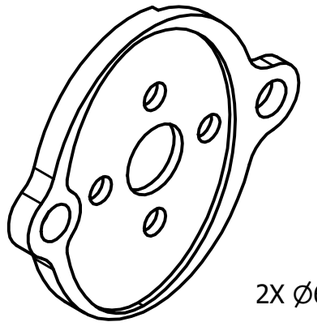
BASE PLATE, NECK MOLD

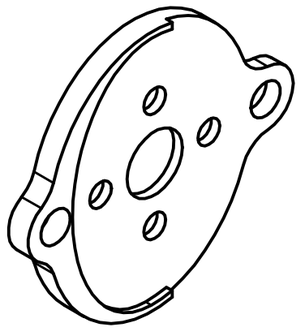
THIRD ANGLE PROJECTION

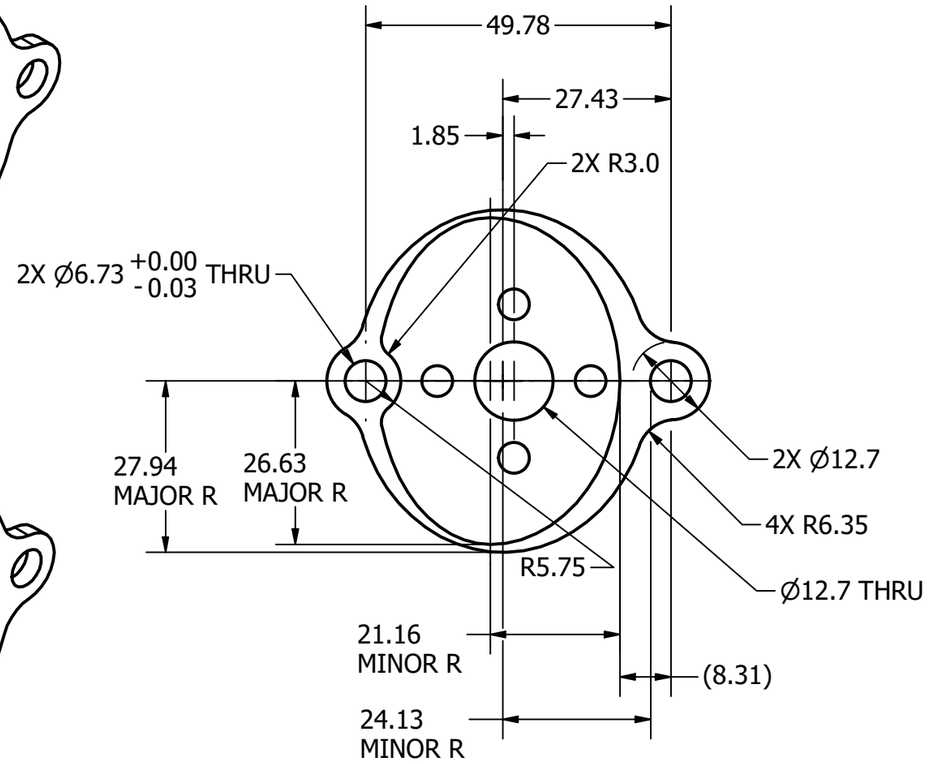
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A3	474-2339	4

SCALE: 1 : 1 | SHEET 1 OF 1

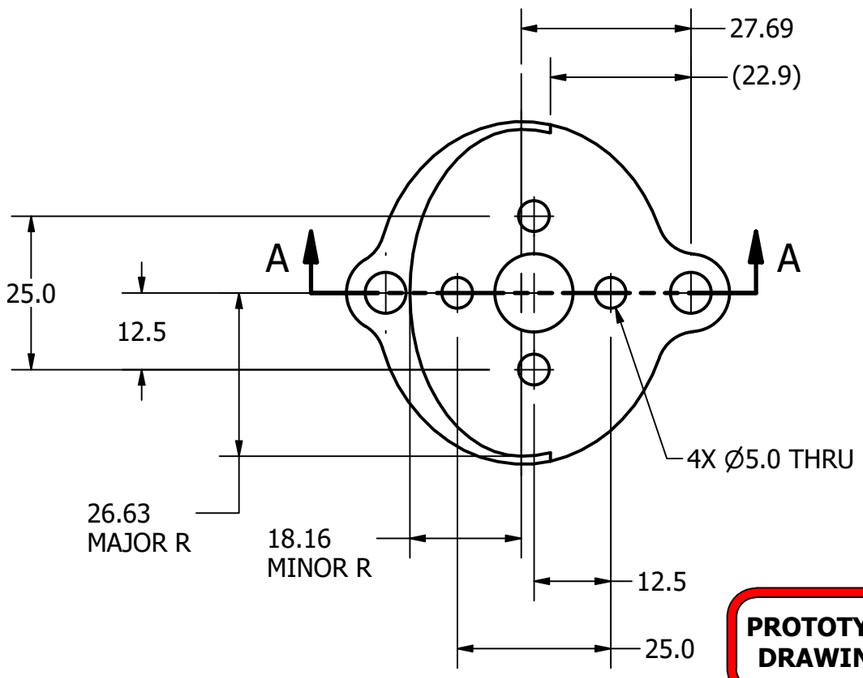
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	AB		06/29/2017

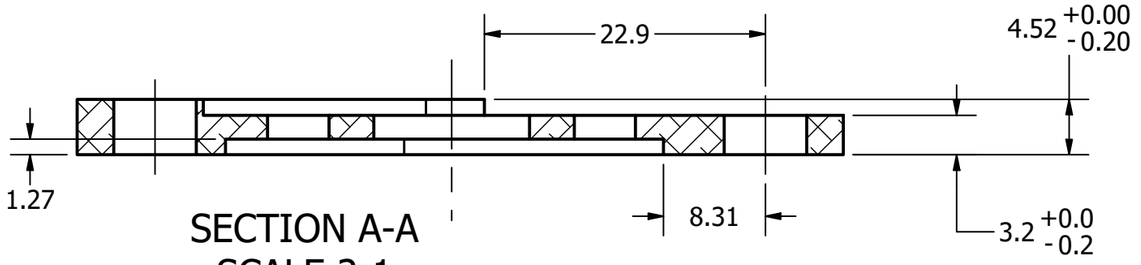












SECTION A-A
SCALE 2:1

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED √ | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN jhaefner	4/5/2016
CHECKED	
ENG	
APPROVED	

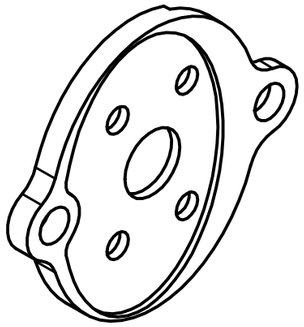
MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT:
FINISH:

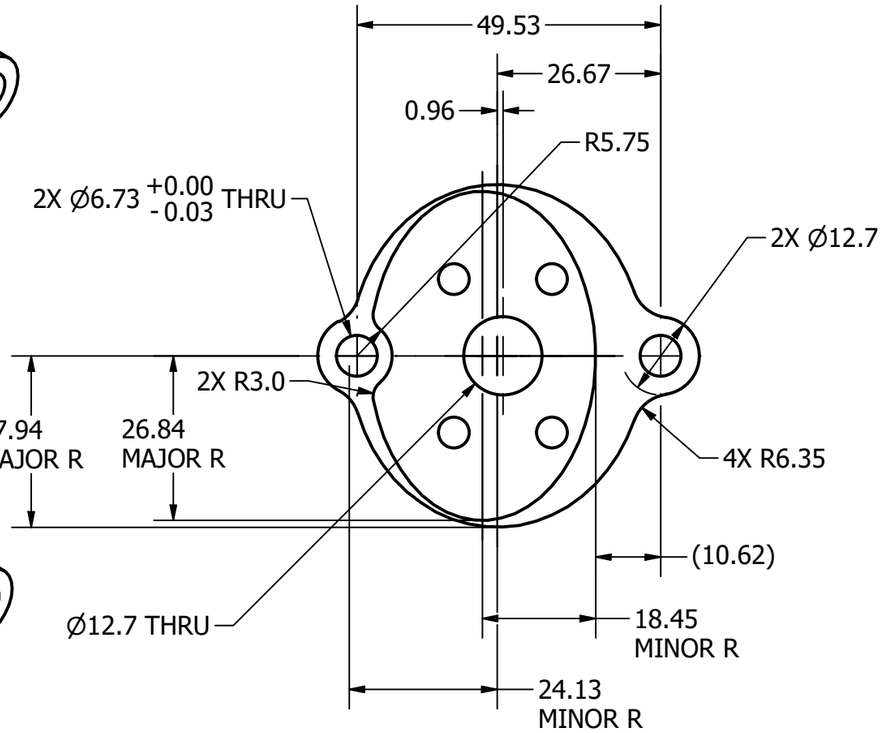
NECK PLATE 3

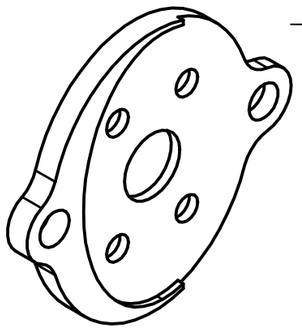
THIRD ANGLE PROJECTION

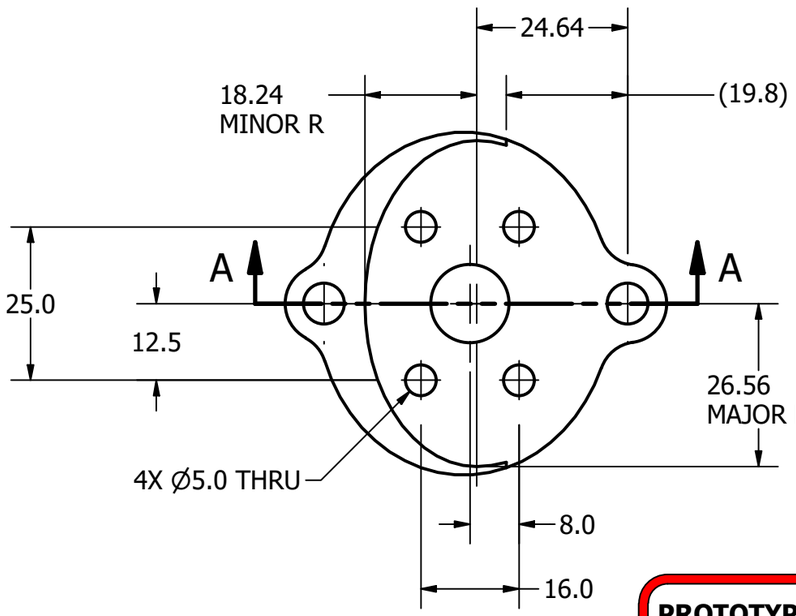
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SCALE: 1 : 1 | SHEET: 1 OF 1

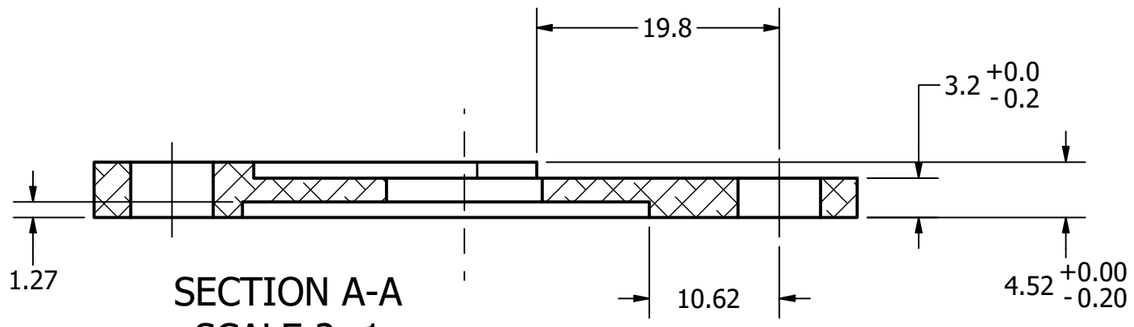
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	AB		06/29/2017











SECTION A-A
SCALE 2: 1

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED √C | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: jhaefner	4/5/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

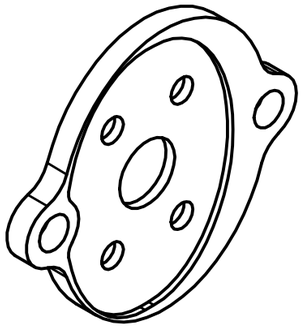
NECK PLATE 2

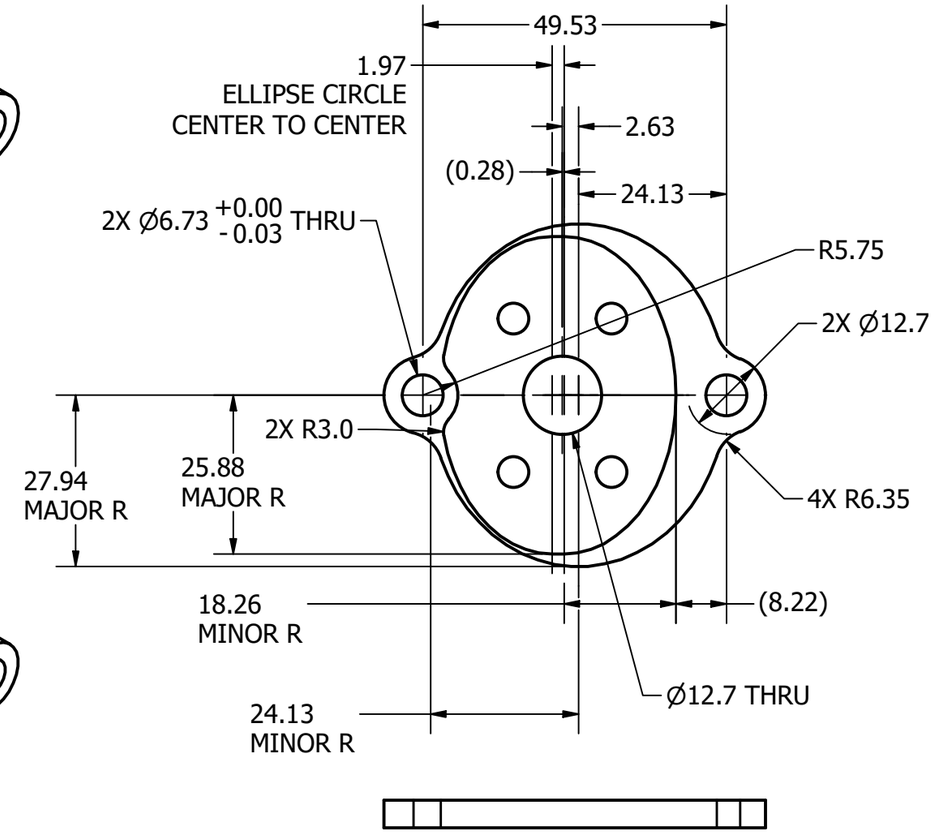
THIRD ANGLE PROJECTION

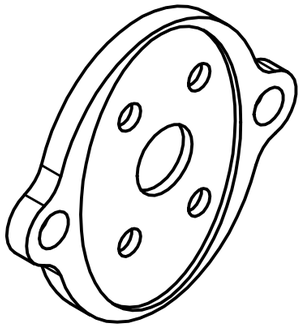
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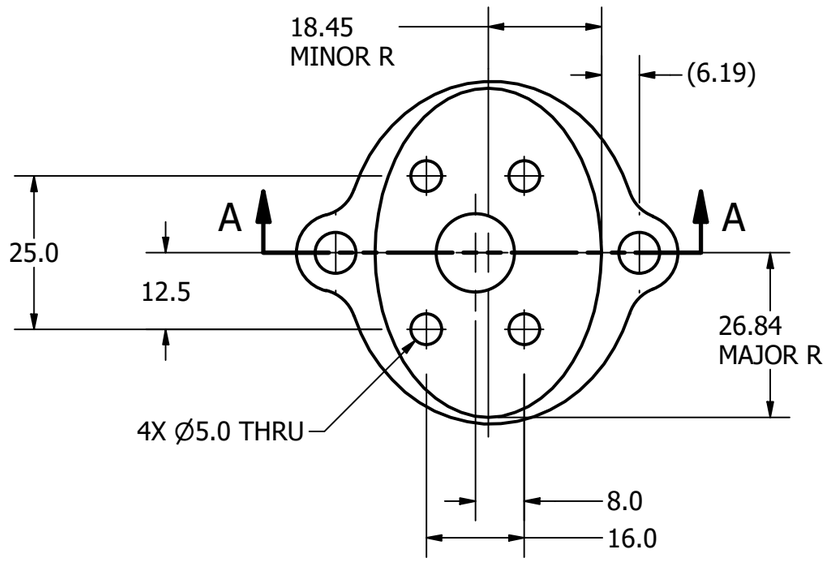
SCALE: 1 : 1 | SHEET: 1 OF 1

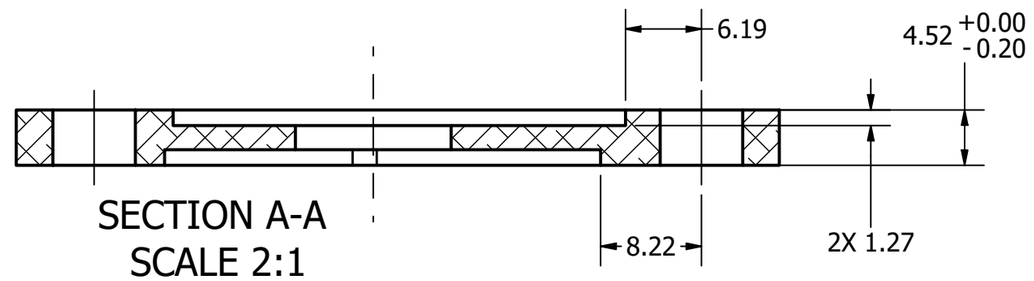
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	PROTOTYPE	AB		06/29/2017











SECTION A-A
SCALE 2:1

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

APPROVALS	DATE
DRAWN jhaefner	4/5/2016
CHECKED	
ENG	
APPROVED	

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

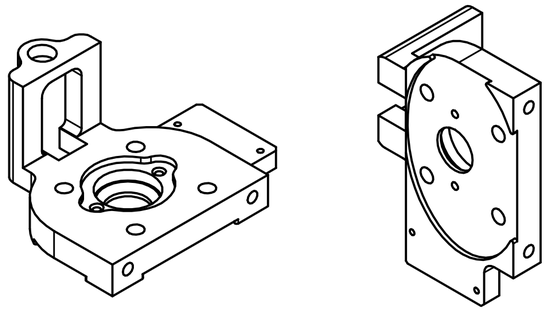
NECK PLATE 1

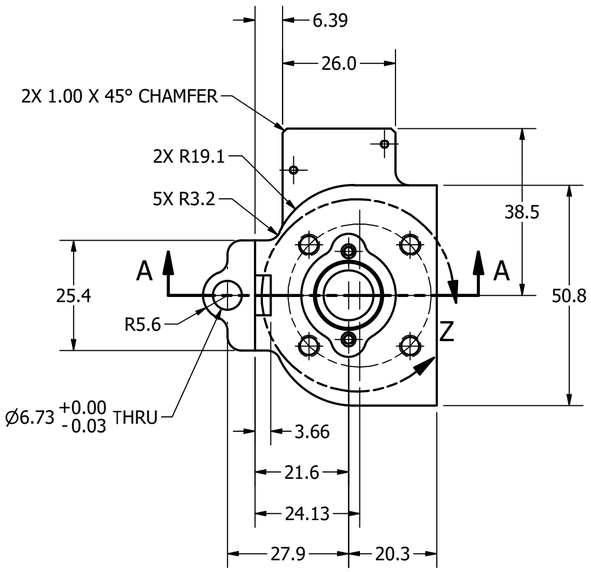
THIRD ANGLE PROJECTION

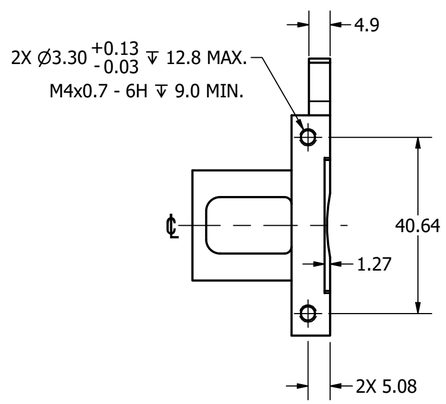
SIZE: A3 | DRAWING NUMBER: 474-2336 | REV: 5

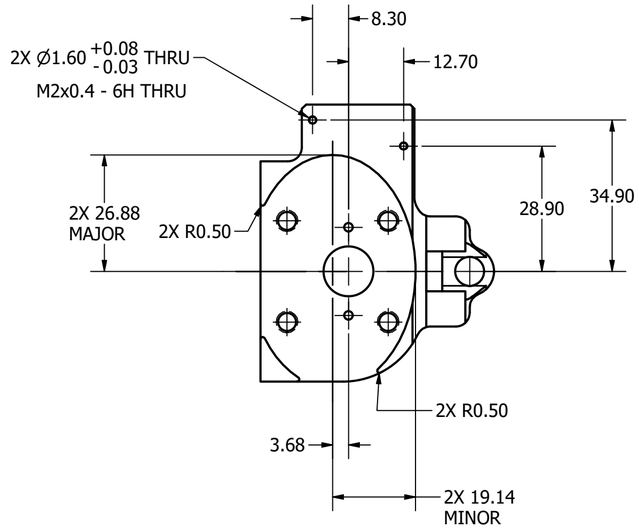
SCALE: 1 : 1 | SHEET: 1 OF 1

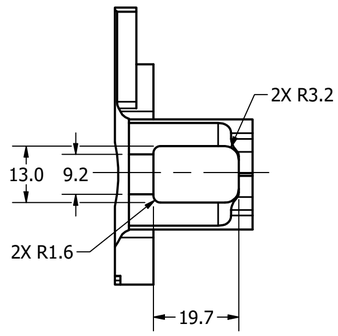
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	6	PROTOTYPE	AT		5/18/2017

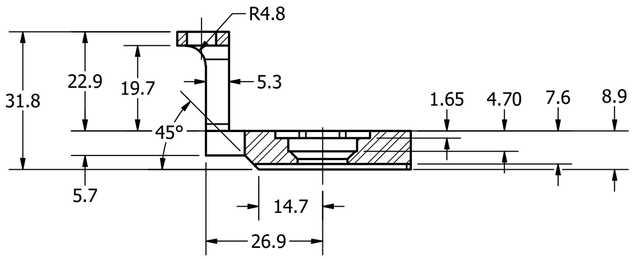




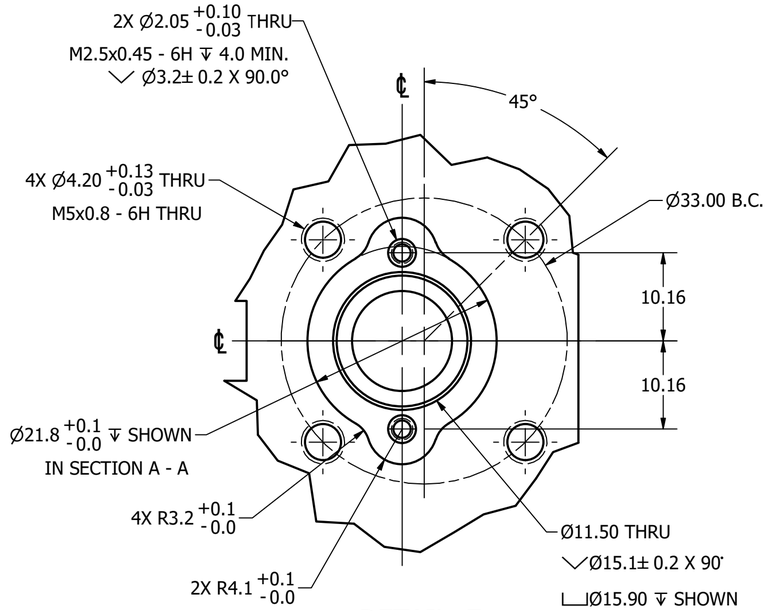








SECTION A-A
SCALE 1 : 1



DETAIL Z
SCALE 2 : 1

PROTOTYPE DRAWING

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ⌵ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

	APPROVALS	DATE
DRAWN	jhaefner	4/6/2016
CHECKED		
ENG		
APPROVED		

MATERIAL: 1018 STEEL
HEAT TREAT:
FINISH: SATIN FLASH CHROME

VEHICLE RESEARCH and TEST CENTER

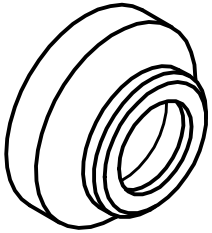
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

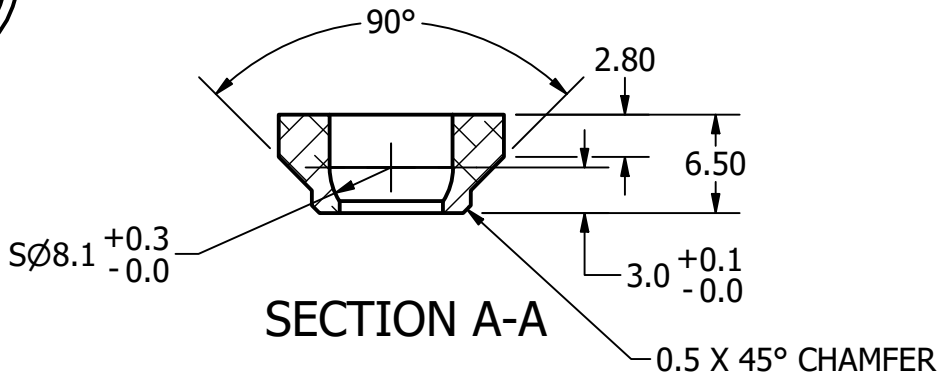
TOP PLATE, NECK

THIRD ANGLE PROJECTION

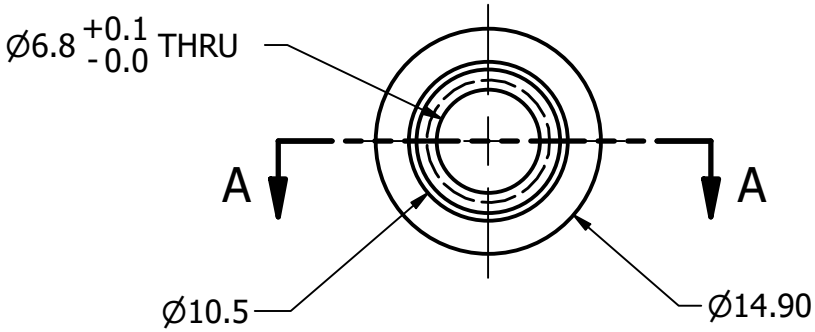
SIZE: A2 | DRAWING NUMBER: 474-2335 | REV: 6
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	JPM		9/30/16





SECTION A-A



UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ±.5
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

PROTOTYPE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

CENTER CABLE FIXTURE

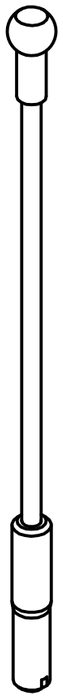
	APPROVALS	DATE
DRAWN	disopi	4/5/2016
CHECKED		
ENG		
APPROVED		

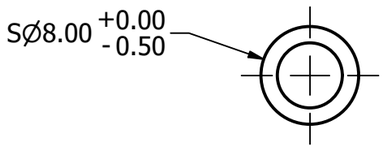
MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT:
FINISH: CLEAR ANODIZE

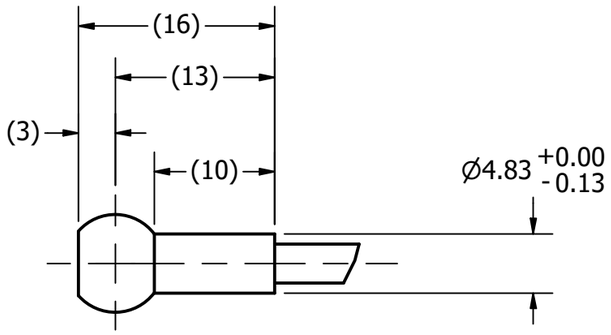
THIRD ANGLE PROJECTION

SIZE: A4 | DRAWING NUMBER: 474-2334 | REV: 2
SCALE: 2 : 1 | SHEET: 1 OF 1

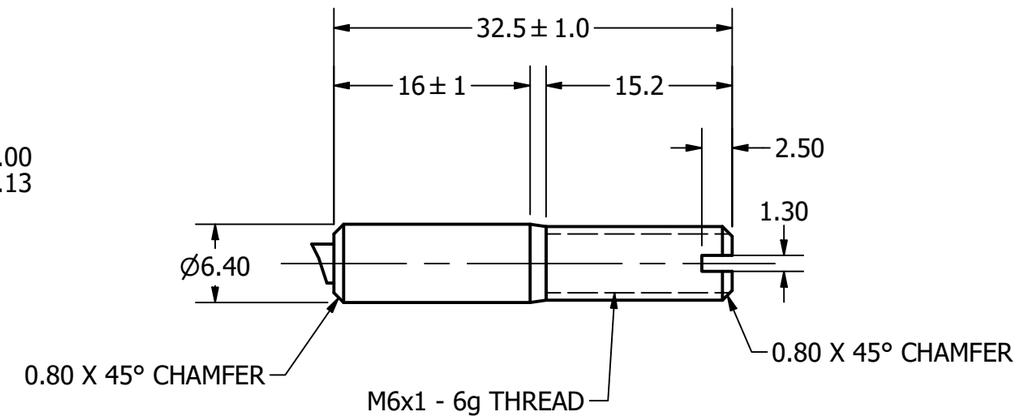
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	JPM		10/5/16



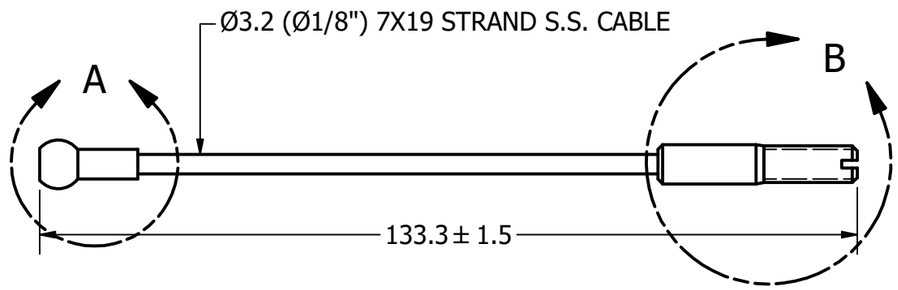




DETAIL A
SCALE 2 : 1



DETAIL B
SCALE 2 : 1



NOTES:

1. TENSILE STRENGTH OF CABLE ASSEMBLY: 771kg (1700 LBS).
2. DIMENSIONS SHOWN ARE AFTER SWAGING AND MACHINING.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	disopi	4/5/2016
CHECKED		
ENG		
APPROVED		

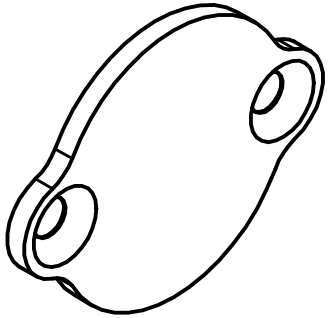
MATERIAL
HEAT TREAT
FINISH

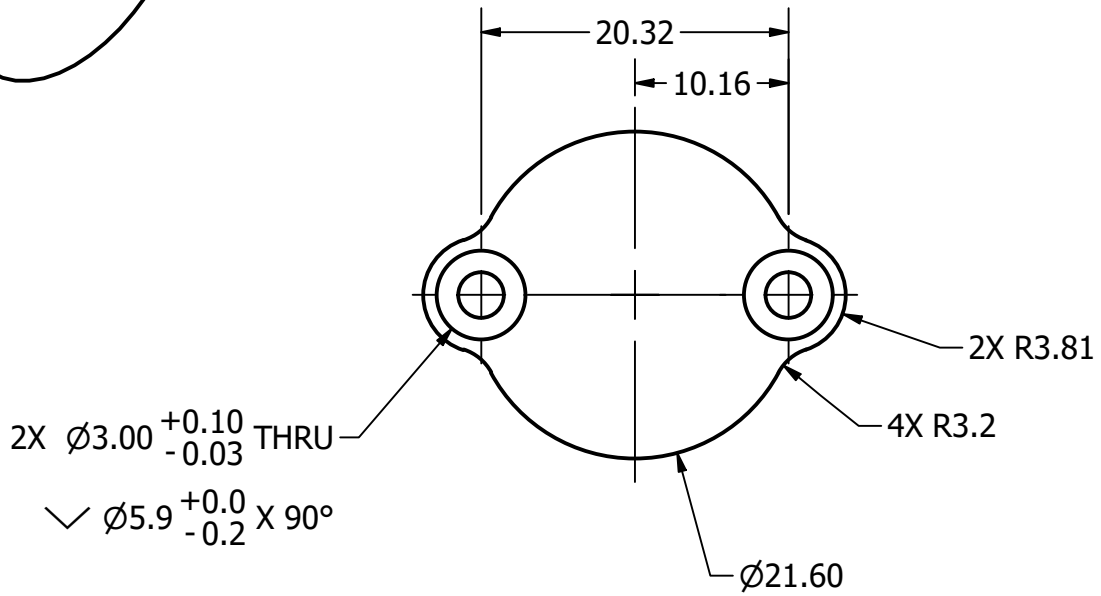
CENTER CABLE ASSY., NECK

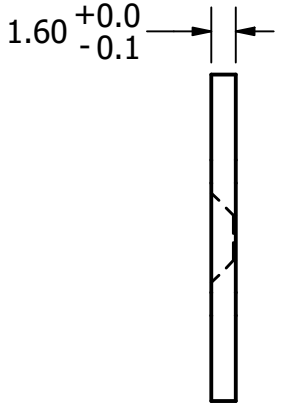
THIRD ANGLE PROJECTION

SIZE A3 | DRAWING NUMBER 474-2600 | REV 3
SCALE: 1 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	GCH		1/12/2017







PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Acetal Resin, Black
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	4/5/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

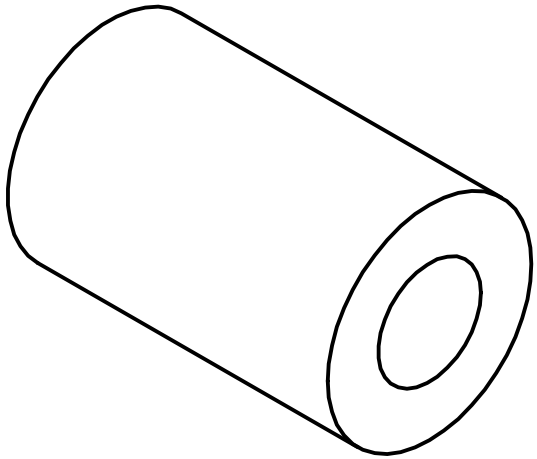
COVER, NECK CABLE

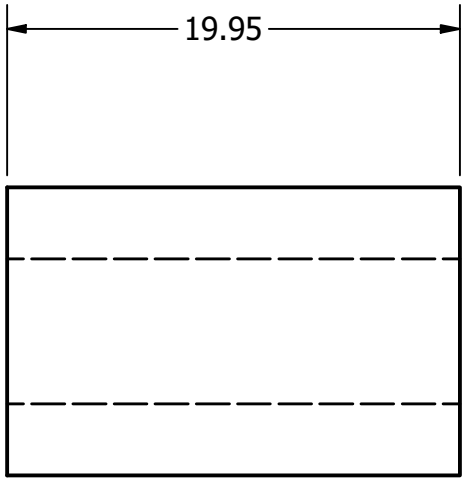
THIRD ANGLE PROJECTION

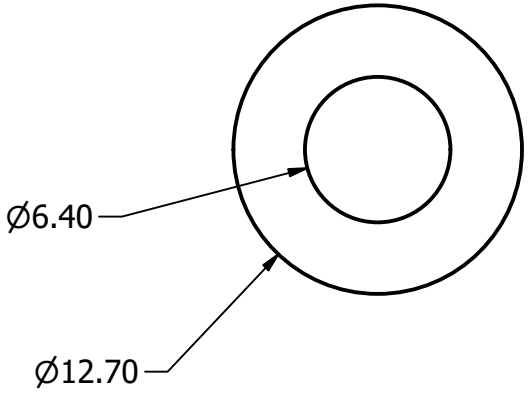
SIZE: A4 | DRAWING NUMBER: 474-2333 | REV: 2

SCALE: 2 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	AB	JW	04/24/2018







PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	HEAT TREAT	FINISH
Silicone		

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	4/7/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

COMPRESSION BUSHING, NECK CENTER CABLE

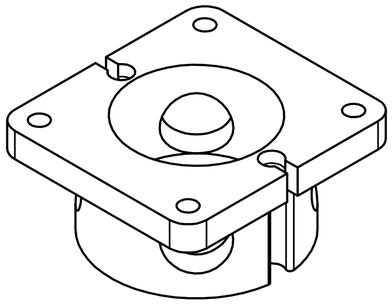
THIRD ANGLE PROJECTION

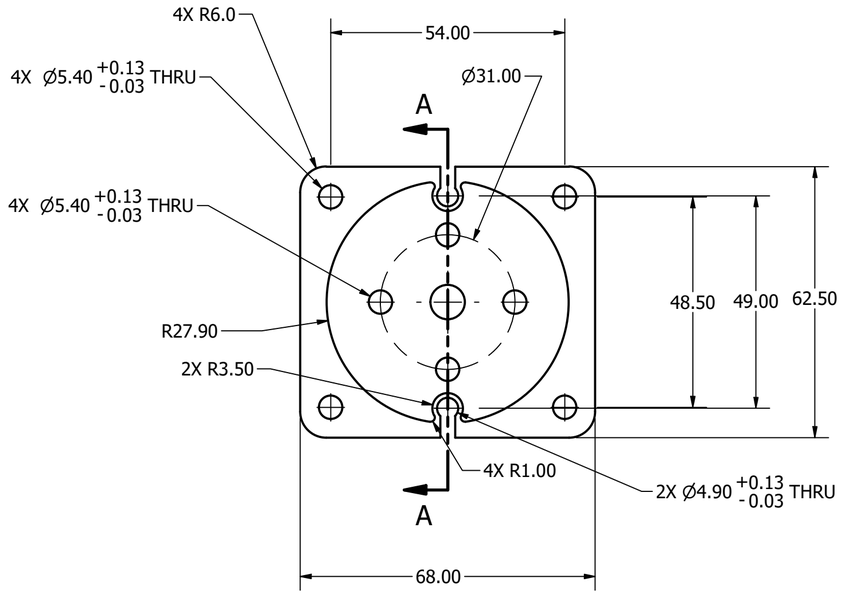
SIZE	DRAWING NUMBER	REV
A4	474-2331	2

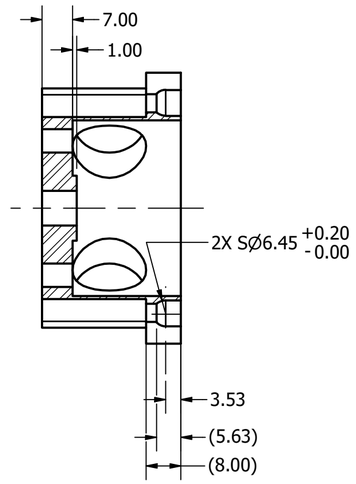
SCALE: 3 : 1

SHEET 1 OF 1

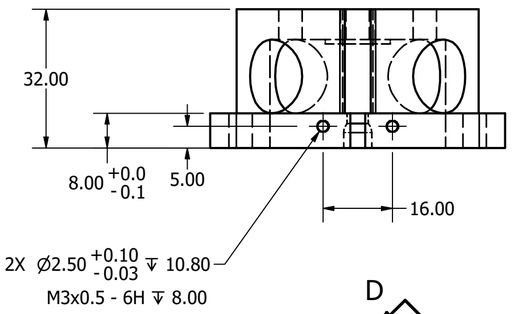
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	PROTOTYPE	HF	KMSP	10/6/2021

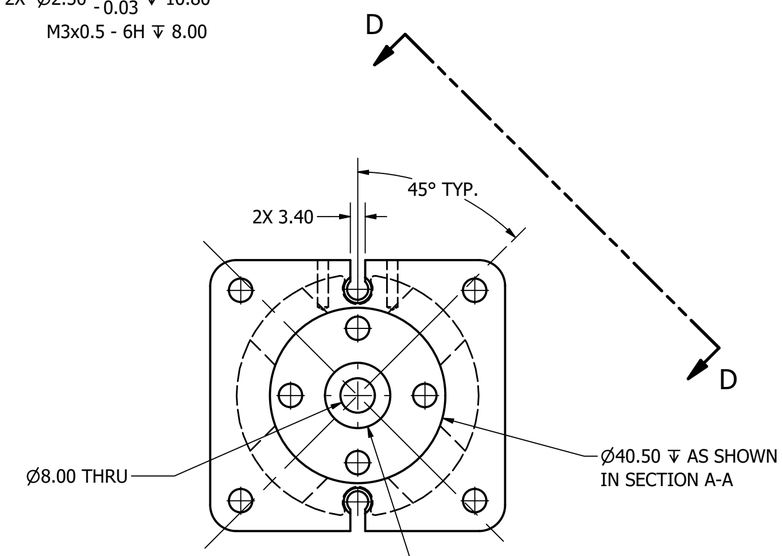


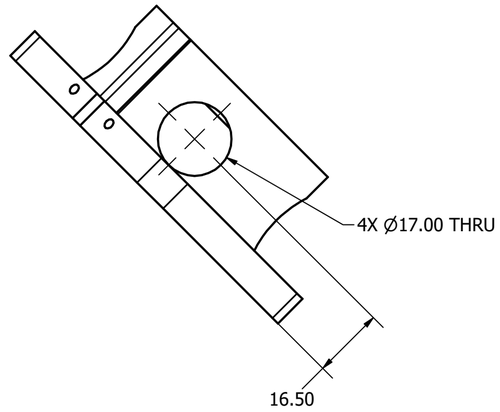




SECTION A-A







VIEW D-D

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 1018 STEEL
HEAT TREAT: N/A
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	4/5/2016
CHECKED:	
ENG: JW	4/5/2016
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

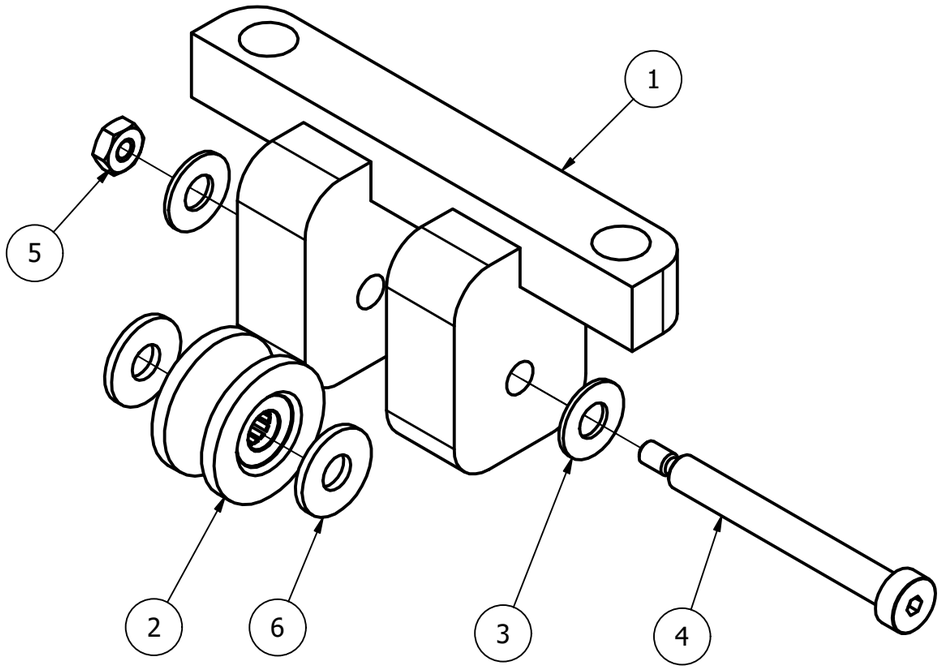
STRUCTURAL REPLACEMENT, LOWER NECK LOAD CELL
THOR-05F

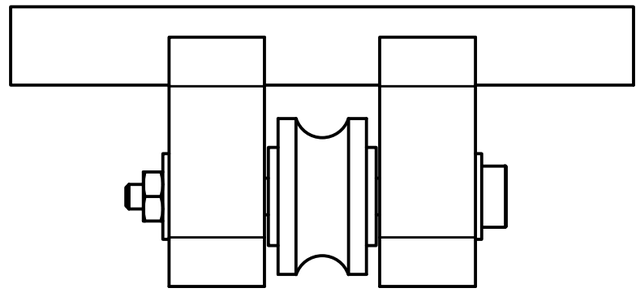
THIRD ANGLE PROJECTION

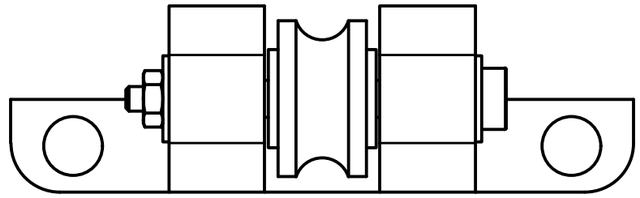
SIZE: A2 | DRAWING NUMBER: 474-2325 | REV: 5

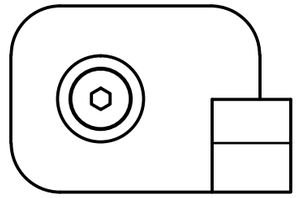
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	JW	10/18/2017









ITEM	QTY	PART NUMBER	DESCRIPTION
6	2	5001410	M3 FLAT WASHER PLAIN PTFE
5	1	5000764	M2 X 0.4 HEX NUT SS
4	1	5001395	3 X 25 LG. PREC. SHSS SS
3	2	5000634	M3 FLAT WASHER PLAIN SS
2	1	474-2308	REAR CABLE PULLEY ASSY.
1	1	474-2329	BRACKET, REAR PULLEY

PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED √ ±.5° | ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

PROTOTYPE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	4/6/2016
CHECKED	
ENG	
APPROVED	

MATERIAL
HEAT TREAT
FINISH

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

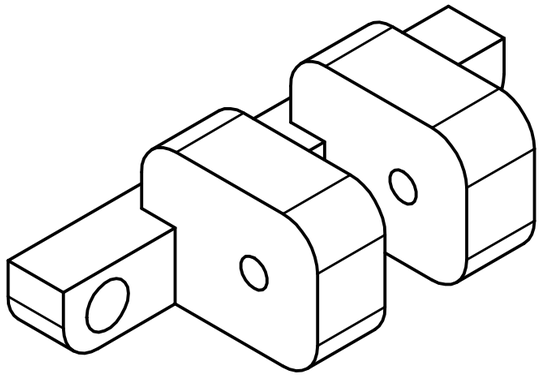
REAR PULLEY ASSEMBLY

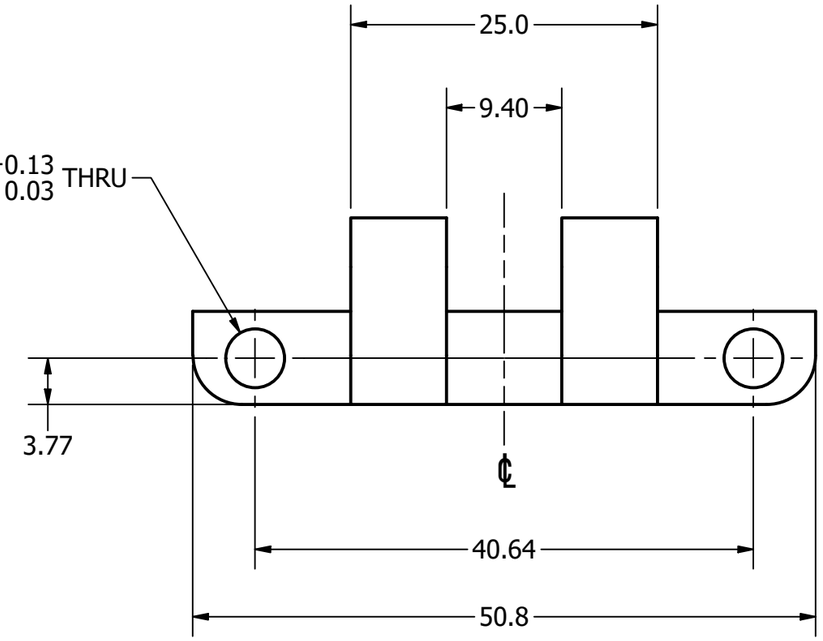
THIRD ANGLE PROJECTION

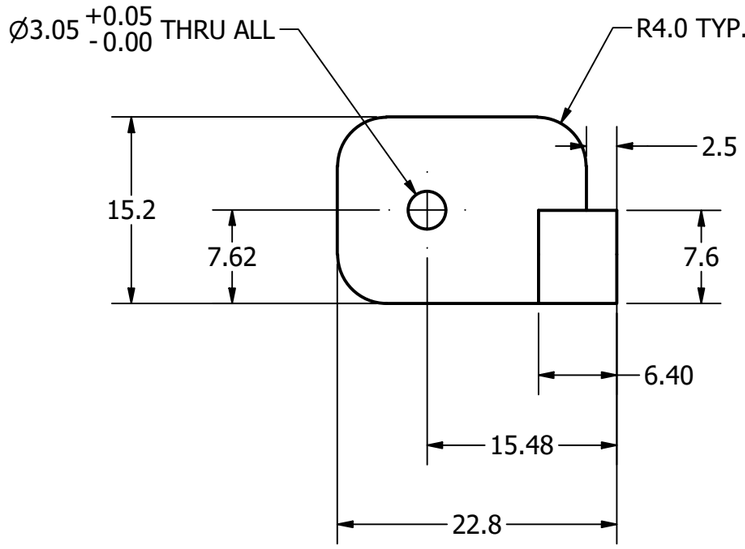
SIZE A3 | DRAWING NUMBER 474-2330 | REV 1

SCALE: 2:1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	JW	10/19/2017







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄ , UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 1018 STEEL
HEAT TREAT:
FINISH: 0.008mm MAX. ELECTROLESS NICKEL PLATE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/5/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

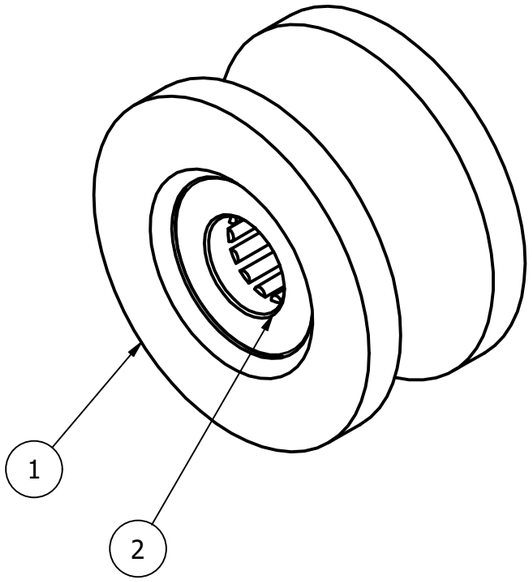
BRACKET, REAR PULLEY

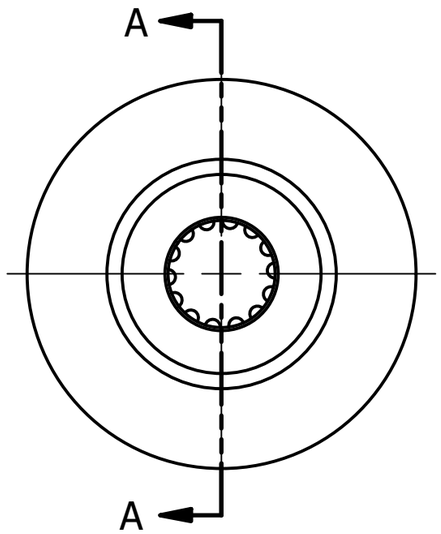
THIRD ANGLE PROJECTION

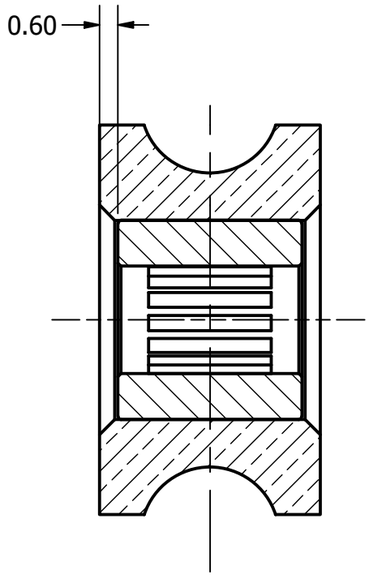
SIZE: A3 | DRAWING NUMBER: 474-2329 | REV: 1

SCALE: 2:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	JW	10/19/2017







SECTION A-A

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	5001409	ROLLER BEARING, M3 SHAFT
1	1	474-2307	CABLE PULLEY, REAR

PARTS LIST

NOTES:

1. PRESS BEARING INTO PULLEY AS SHOWN.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

REAR CABLE PULLEY ASSY.

APPROVALS	DATE
DRAWN B. KIMES	4/5/2016
CHECKED	
ENG	
APPROVED	

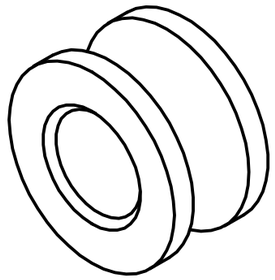
MATERIAL
HEAT TREAT
FINISH

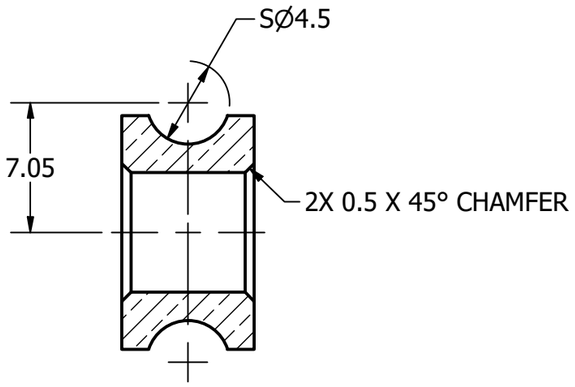
THIRD ANGLE PROJECTION

SIZE A3 | DRAWING NUMBER 474-2308 | REV 1

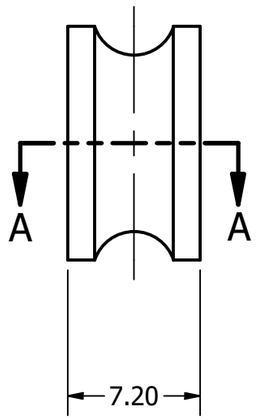
SCALE: 5:1 | SHEET 1 OF 1

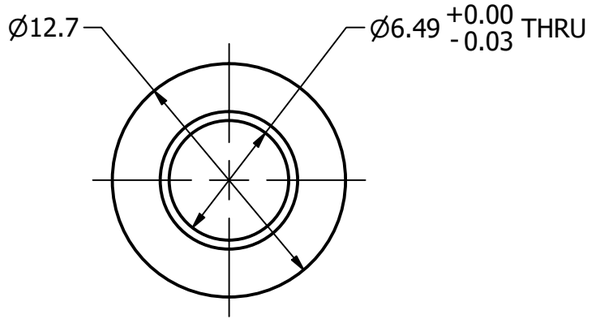
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	JPM		1/17/18





SECTION A-A





PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Brass, Soft Yellow

HEAT TREAT:

FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/5/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

CABLE PULLEY, REAR

THIRD ANGLE PROJECTION

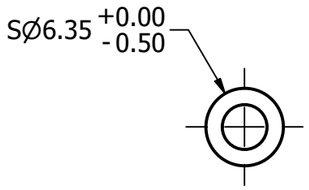
SIZE: A3 | DRAWING NUMBER: 474-2307 | REV: 2

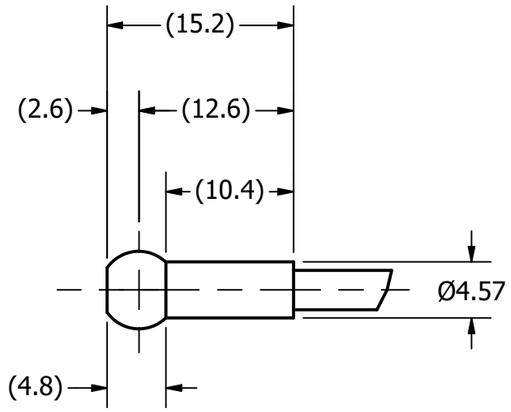
SCALE: 3 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	JPM		10/5/16

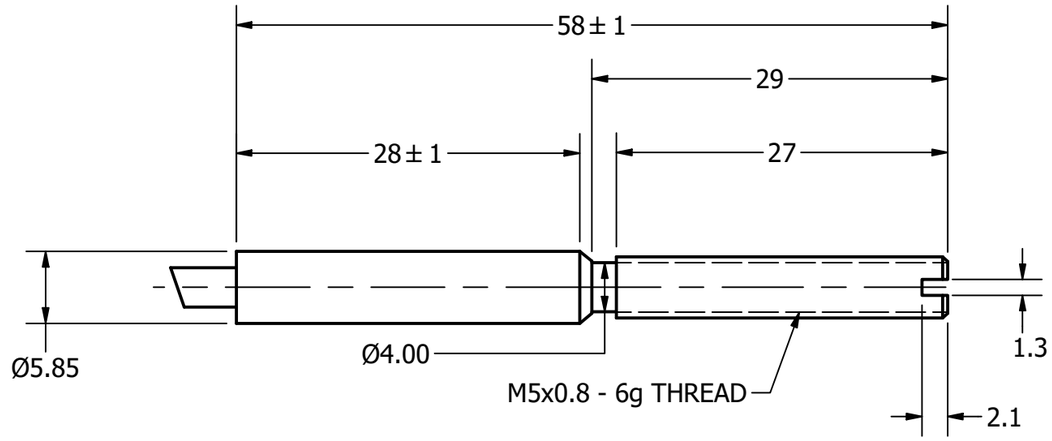


SCALE .5:1

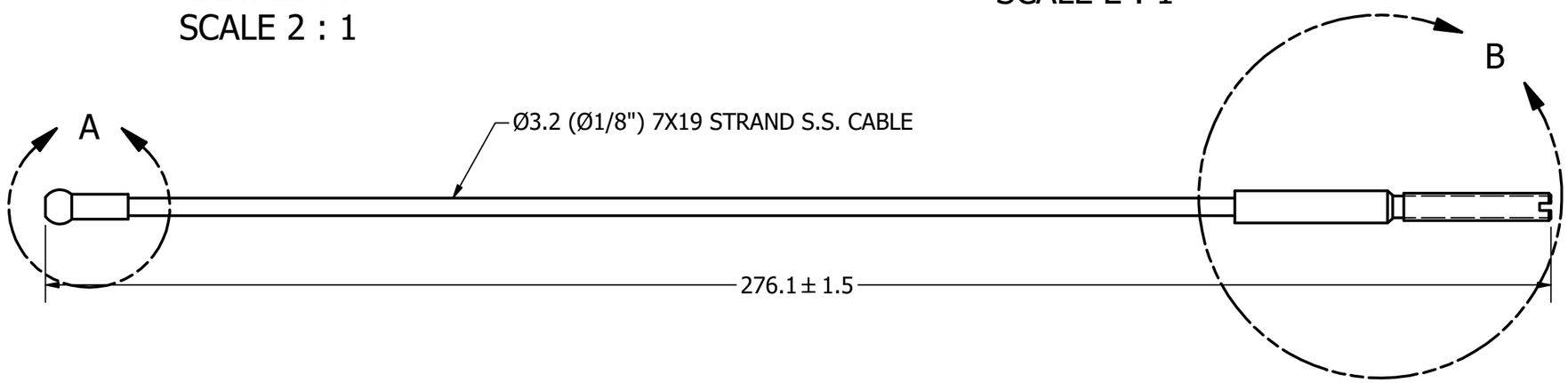




DETAIL A
SCALE 2 : 1



DETAIL B
SCALE 2 : 1



NOTES:

1. TENSILE STRENGTH OF CABLE ASSEMBLY: 771kg (1700 LBS).
2. DIMENSIONS SHOWN ARE AFTER SWAGING AND MACHINING.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED √ | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. KIMES	3/22/2016
CHECKED	
ENG	
APPROVED	

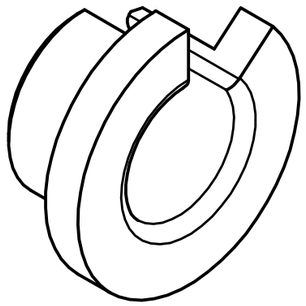
MATERIAL
HEAT TREAT
FINISH

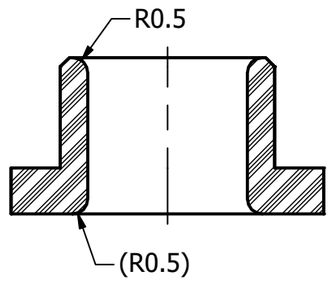
NECK CABLE ASSY., FRONT / REAR

THIRD ANGLE PROJECTION

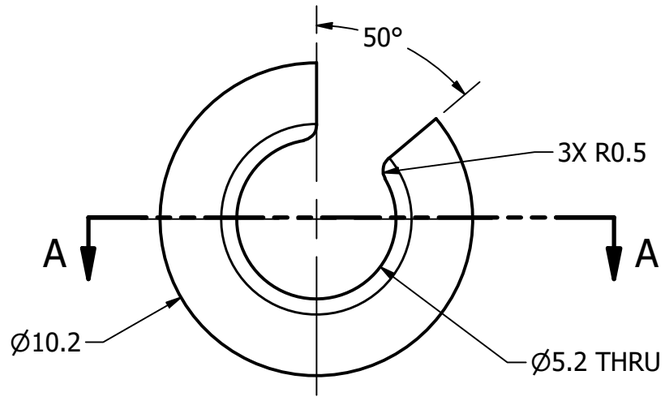
SIZE A3 | DRAWING NUMBER 474-2620 | REV 3
SCALE: 1 : 1 | SHEET 1 OF 1

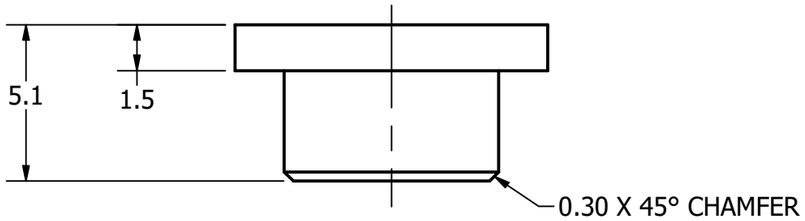
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	AT		5/19/2017

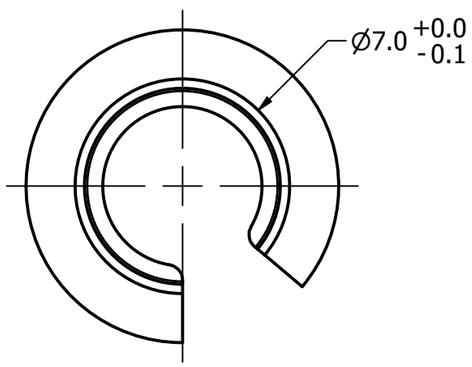




SECTION A-A







PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

CABLE GUIDE HALF

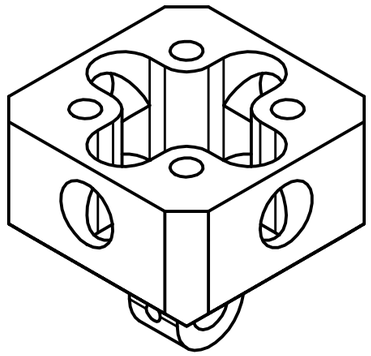
APPROVALS	DATE		
DRAWN: B. KIMES	4/6/2016		
MATERIAL: Acetal Resin, White	CHECKED		
HEAT TREAT	ENG		
FINISH	APPROVED		

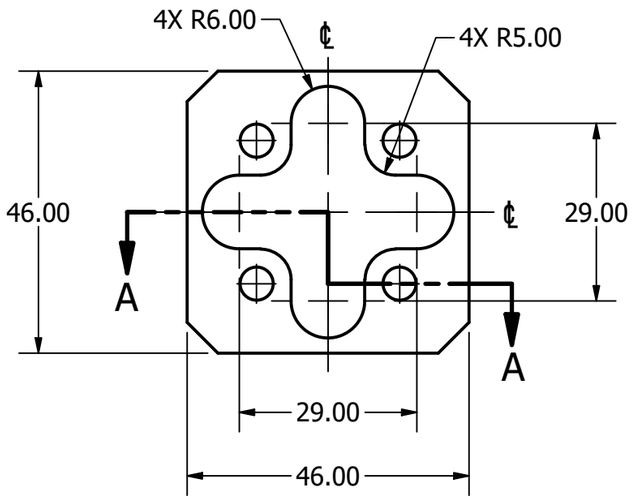
THIRD ANGLE PROJECTION

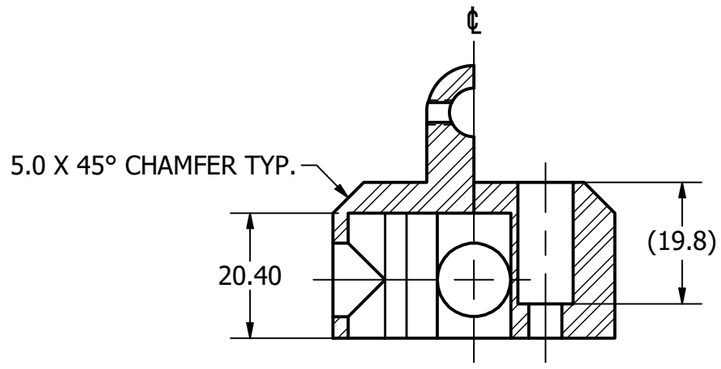
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SCALE: 5 : 1 | SHEET: 1 OF 1

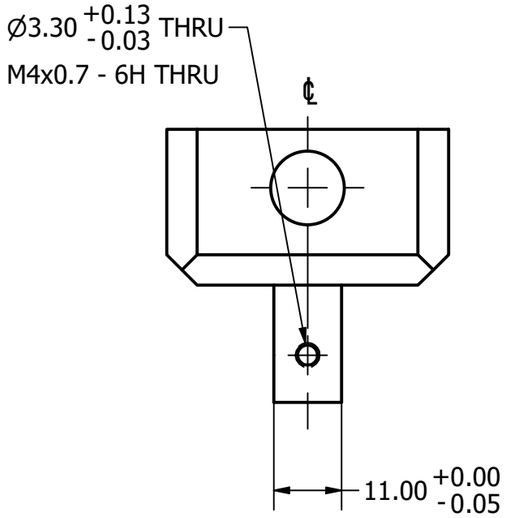
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	DJI		10/18/2017

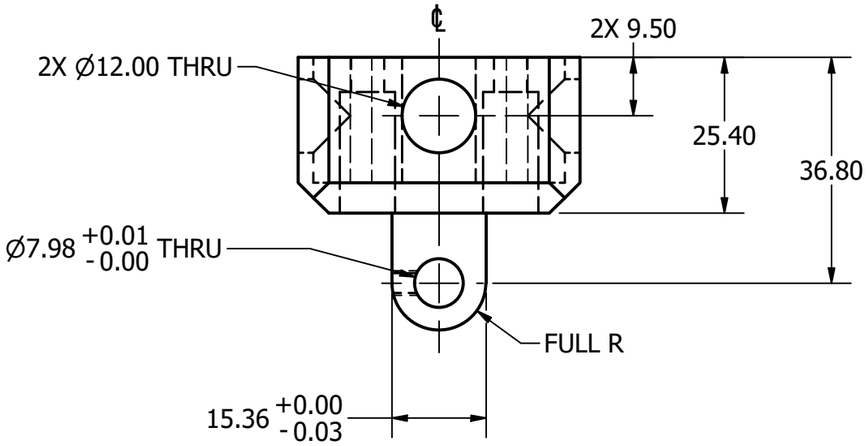


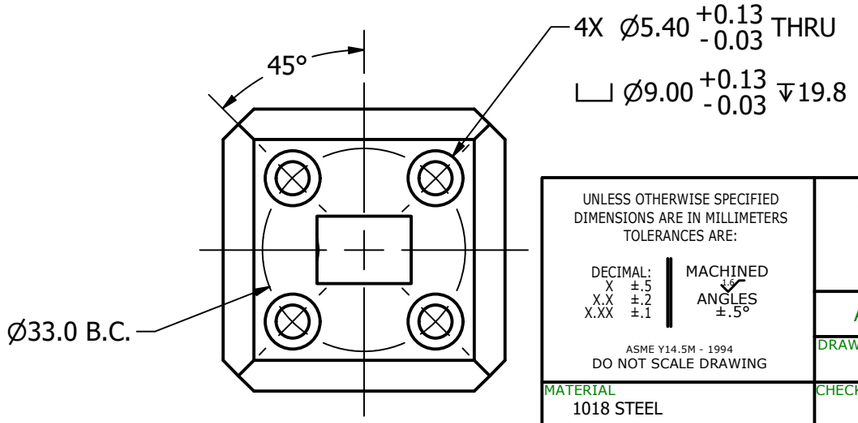




SECTION A-A







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

STRUCTURAL REPLACEMENT, UPPER NECK LOAD CELL

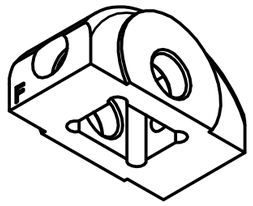
	APPROVALS	DATE
DRAWN	disopi	4/7/2016
CHECKED		
ENG		
APPROVED		

MATERIAL: 1018 STEEL
HEAT TREAT:
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

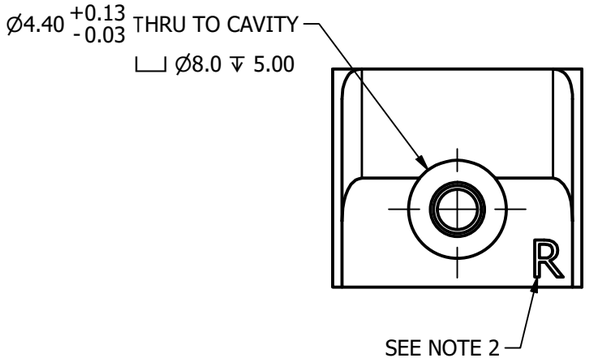
THIRD ANGLE PROJECTION

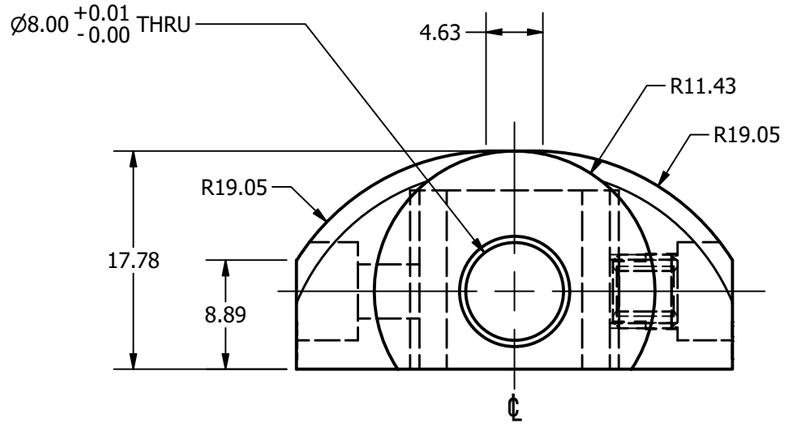
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SCALE: 1:1 | SHEET: 1 OF 1

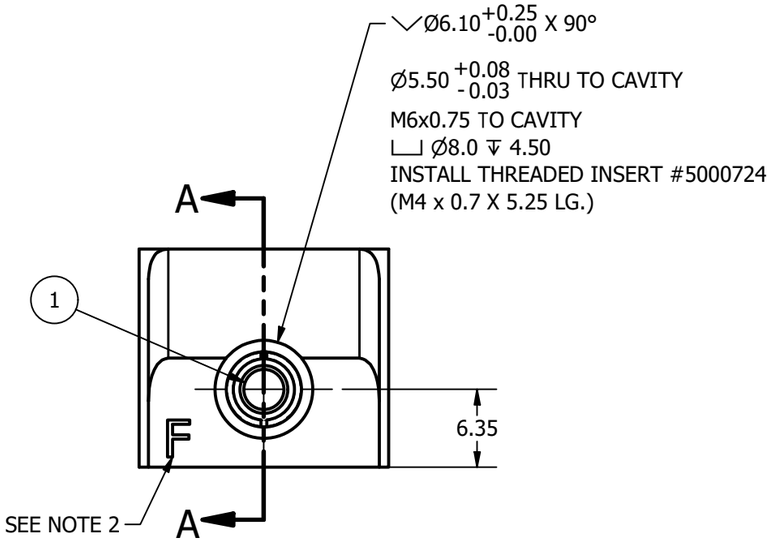
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	JPM		11/9/16

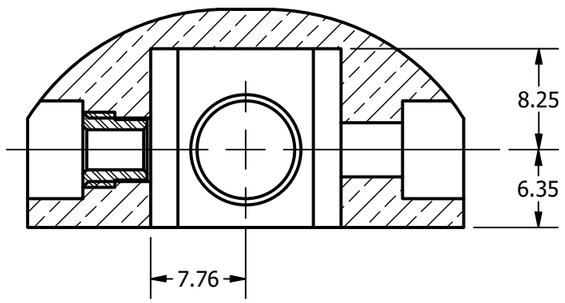


SCALE 1 : 1

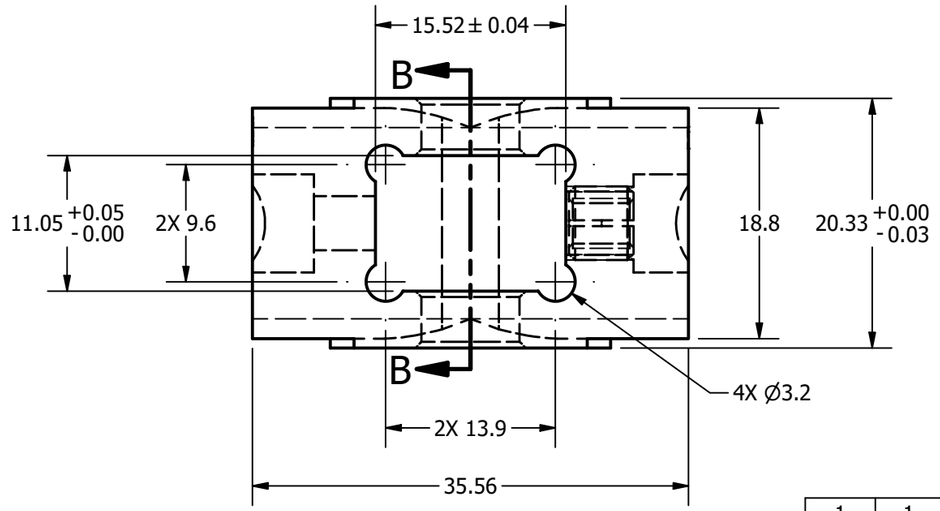


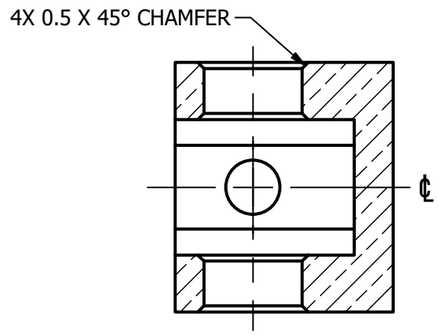






SECTION A-A





SECTION B-B

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5000724	M4 X 0.7 X 5.25 LG. MINI THREADED INSERT

PARTS LIST

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. STAMP OR ETCH (3mm CHARACTERS) AS SHOWN.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: BRASS, SOFT YELLOW
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	4/7/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

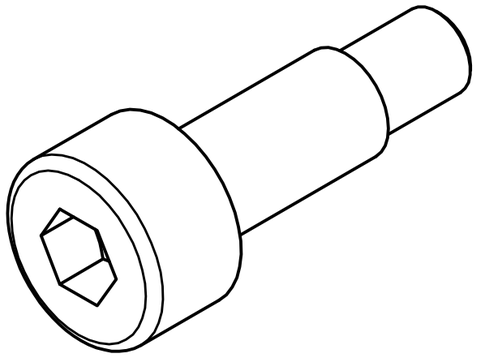
OC FLEXION-EXTENSION CAM

THIRD ANGLE PROJECTION

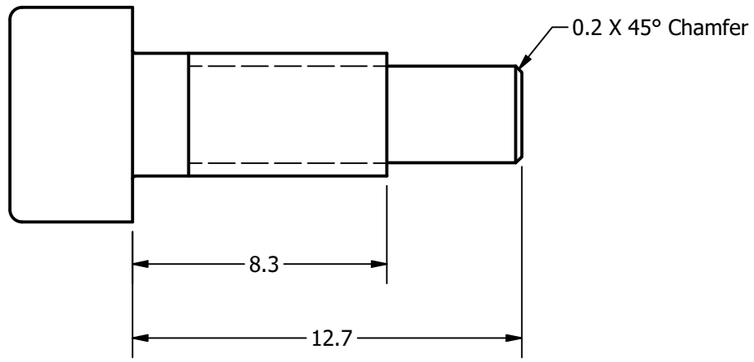
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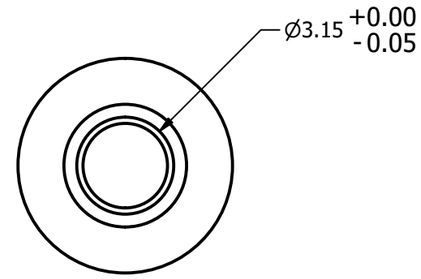
SCALE: 2:1 | SHEET: 1 OF 1

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RELEASE FOR PRODUCTION	7/28/2011	BK



SCALE 5.000





NOTES:

1. MAKE FROM M4 X0.7 X 14 SHCS, MODIFY AS SHOWN.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED √
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	7/14/2016
CHECKED	
ENG	
APPROVED	

MATERIAL
HEAT TREAT
FINISH

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

OCCIPITAL CONDYLE SCREW

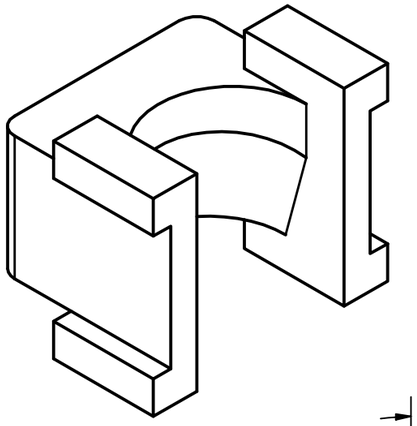
THIRD ANGLE PROJECTION

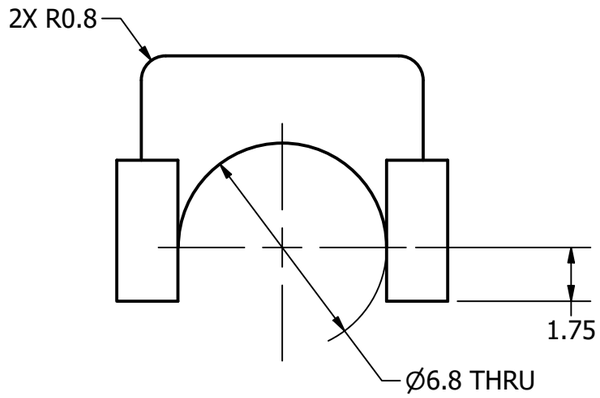
SIZE	DRAWING NUMBER	REV
A3	472-2016	A

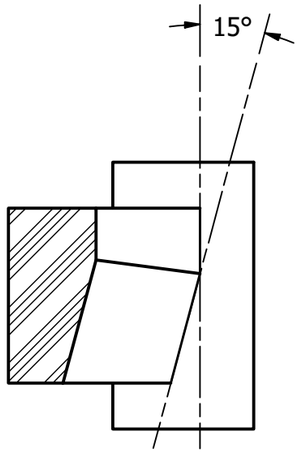
SCALE: 5.000

SHEET 1 OF 1

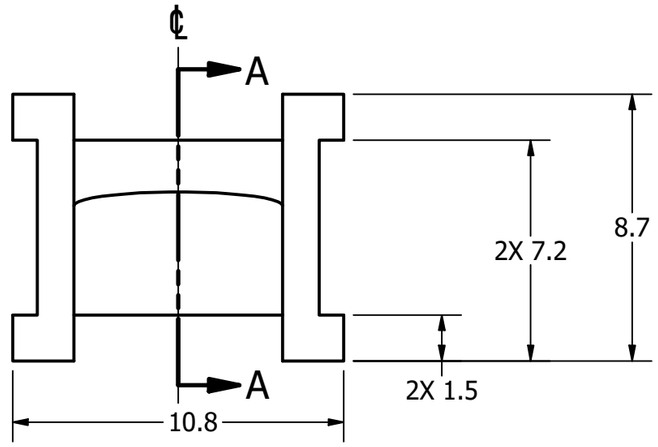
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
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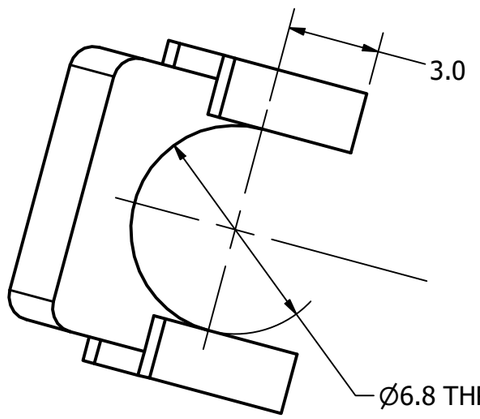


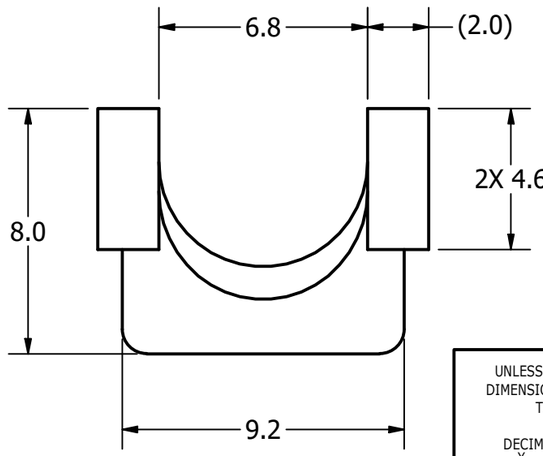




SECTION A-A







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	4/6/2016
CHECKED	
ENG	
APPROVED	

MATERIAL: Acetal Resin, Black
HEAT TREAT:
FINISH:

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

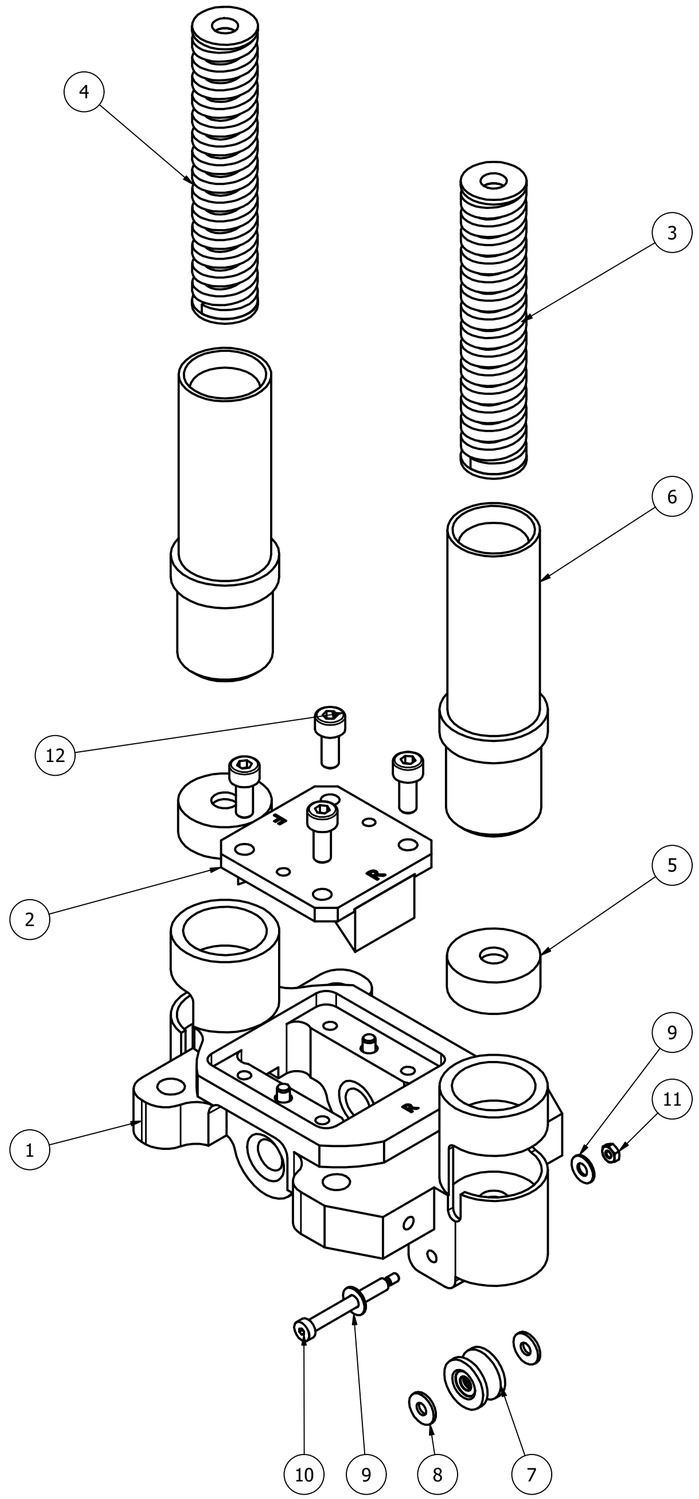
TOP PLATE CABLE GUIDE, NECK

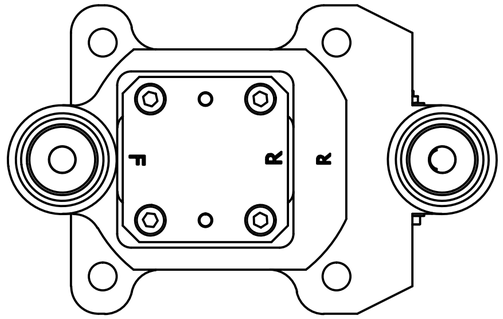
THIRD ANGLE PROJECTION

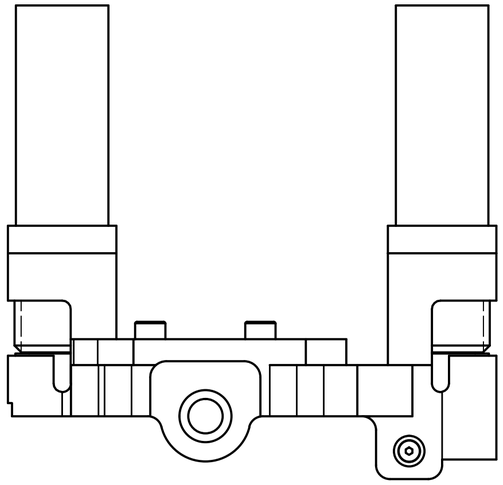
SIZE: A3 | DRAWING NUMBER: 474-2341 | REV: 1

SCALE: 5:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	HEC	4/20/2023







ITEM	QTY	PART NUMBER	DESCRIPTION
12	4	5000151	M4 X 0.7 X 10 LG. SHCS
11	1	5000764	M2 X 0.4 HEX NUT SS
10	1	5001395	3 X 25 LG. PREC. SHSS SS
9	2	5000634	M3 FLAT WASHER PLAIN SS
8	2	5001410	M3 FLAT WASHER PLAIN PTFE
7	1	474-2308	REAR CABLE PULLEY ASSY.
6	2	474-2303	FRONT/REAR SPRING TUBE
5	2	474-2306	SPRING LOAD CELL S.R.
4	1	474-2305	SPRING ASSEMBLY, FRONT
3	1	474-2304	SPRING ASSEMBLY, REAR
2	1	474-2115-A	FLEXION/EXTENSION STOP ASSEMBLY
1	1	474-2302-A	HEAD/NECK MOUNTING PLATFORM

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

HEAD/NECK PLATFORM ASSEMBLY

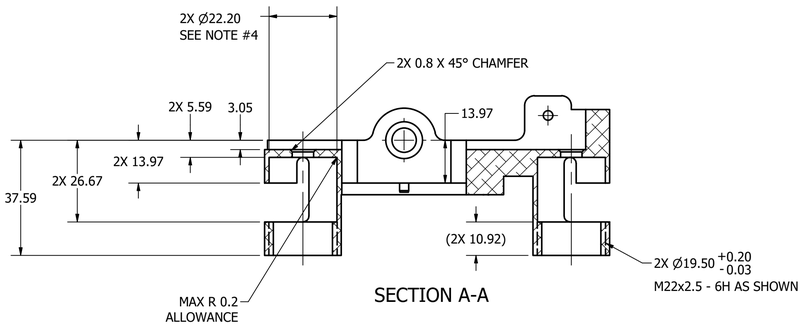
APPROVALS	DATE
DRAWN B. KIMES	4/20/2023
CHECKED	
ENG	
APPROVED	

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

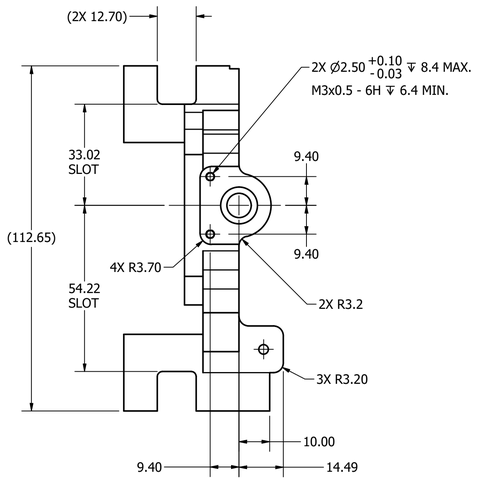
THIRD ANGLE PROJECTION

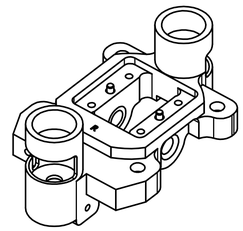
SIZE: A2 | DRAWING NUMBER: 474-2300-A | REV: 1
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	DJI	6/27/2022

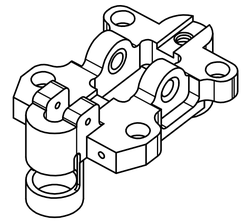


SECTION A-A

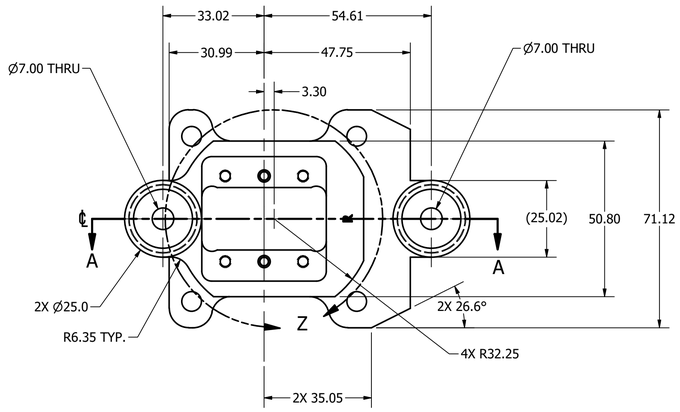


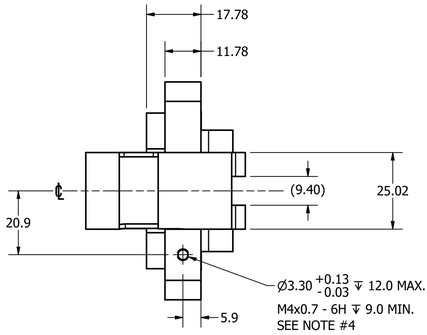


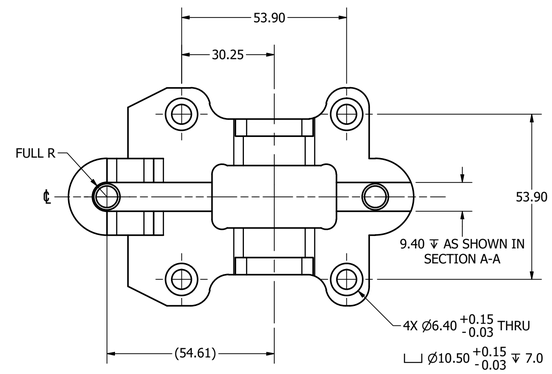
SCALE .75:1

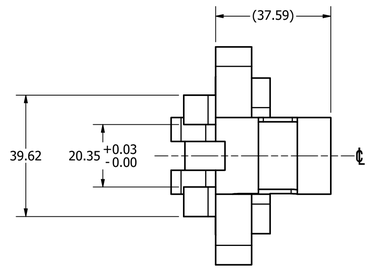


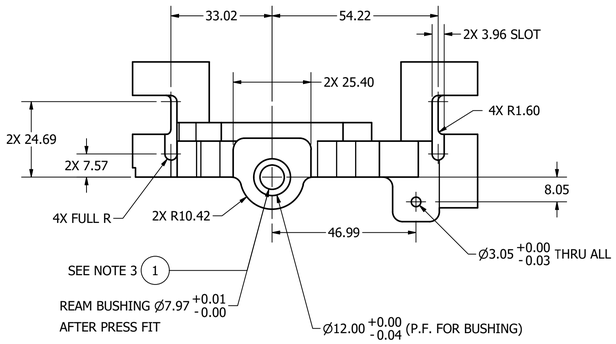
SCALE .75:1

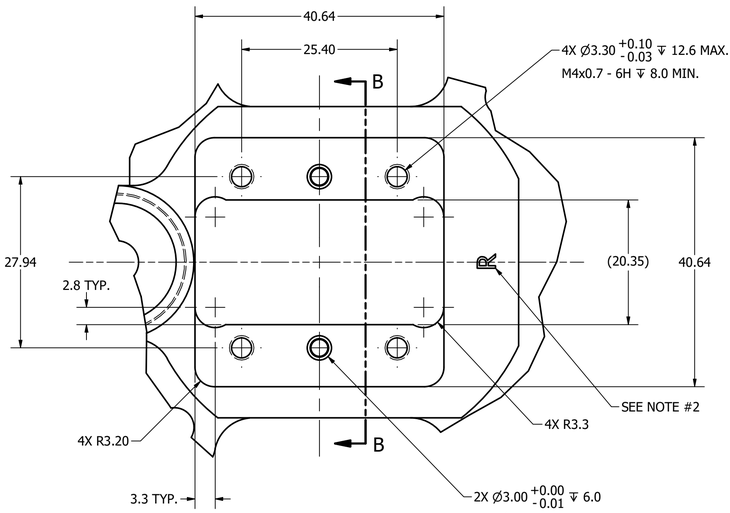




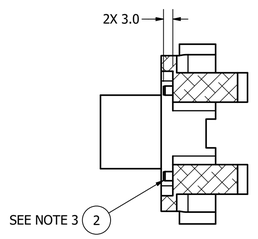








DETAIL Z
SCALE 2 : 1



SECTION B-B
SCALE 1 : 1

ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	5000384	M3 X 8 LG. DOWEL PIN
1	2	5001401	BEARING, SLEEVE (Ø8 x Ø12 x 8)

PARTS LIST

NOTES:

1. DIMENSIONS ARE SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE NOTED.
2. STAMP OR ETCH "R" (3mm CHARACTERS) AS SHOWN.
3. INSTALL DOWEL PINS AND BUSHINGS AFTER ANODIZE.
4. PLUG HOLES BEFORE ANODIZE.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL X ±.3 X.X ±.2 X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/13/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

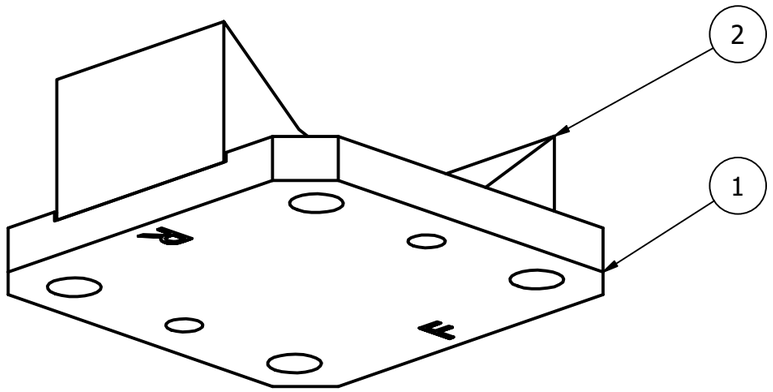
HEAD/NECK MOUNTING PLATFORM

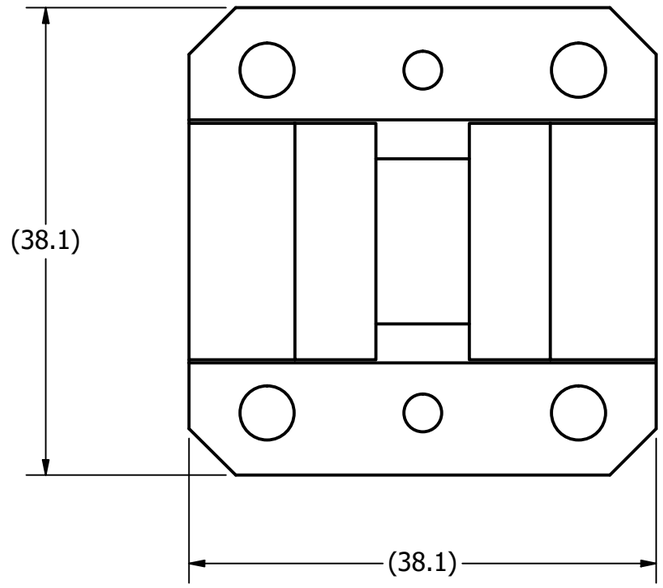
THIRD ANGLE PROJECTION

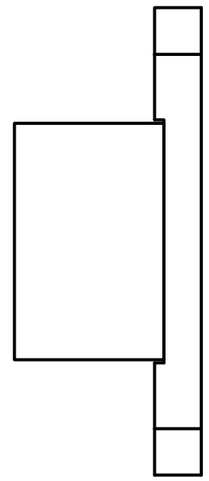
SIZE: A1 | DRAWING NUMBER: 474-2302-A | REV: 1

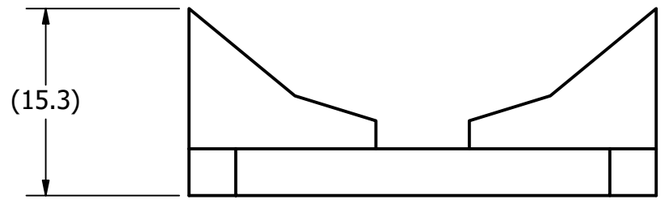
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	HEC	4/20/2023









ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	474-2321	FRONT/REAR OC STOP
1	1	474-2320-A	FLEXION/EXTENSION STOP PLATE

PARTS LIST

NOTES:

1. ASSEMBLE (2X) 474-2321 TO 474-2320-A AND BOND AS SHOWN.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. KIMES	4/20/2023
CHECKED	
ENG	
APPROVED	

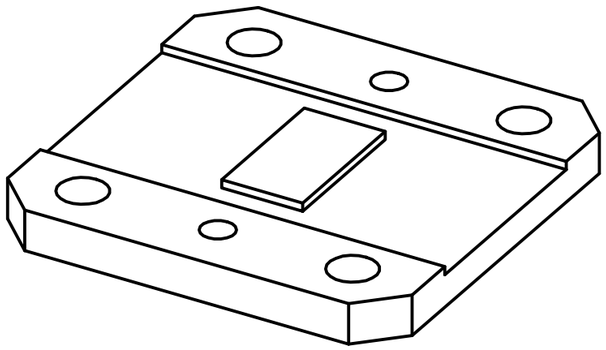
MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

FLEXION/EXTENSION STOP ASSEMBLY

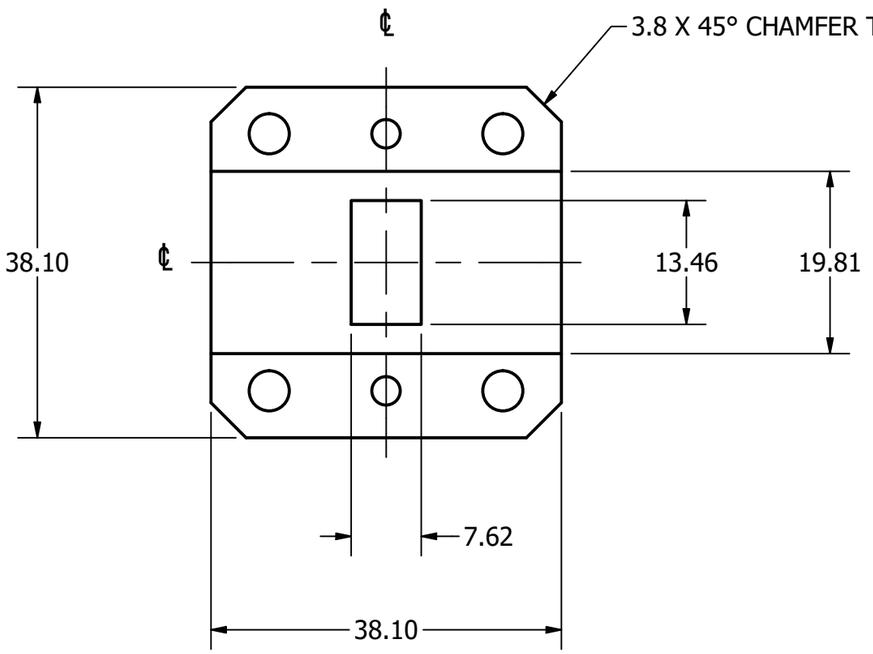
THIRD ANGLE PROJECTION

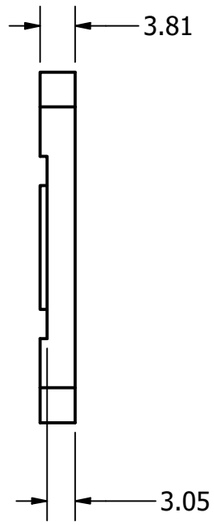
SIZE: A3 | DRAWING NUMBER: 474-2115-A | REV: 1
SCALE: 2 : 1 | SHEET: 1 OF 1

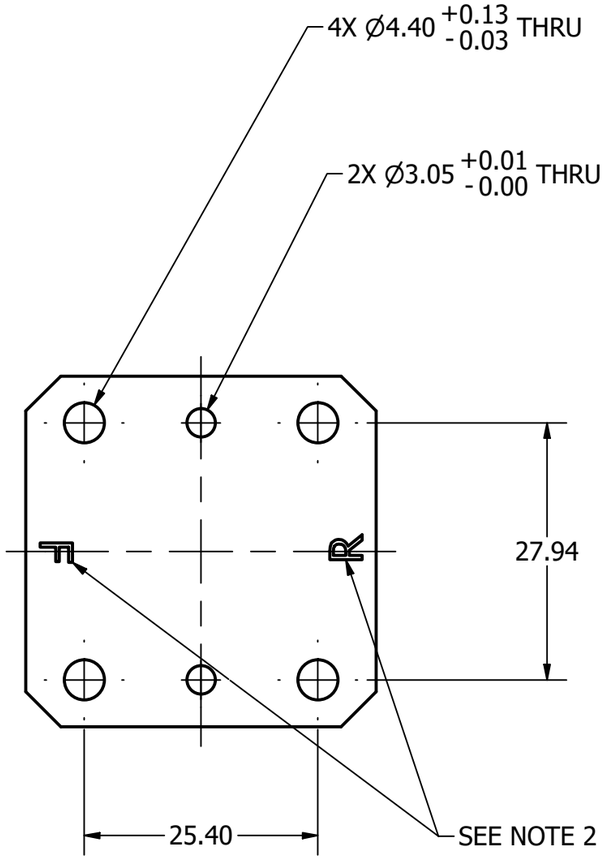
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	DJI	7/27/2022



SCALE 2 : 1







NOTES:

1. DIMENSIONS ARE SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE NOTED.
2. STAMP OR ETCH "F" AND "R" (3mm CHARACTERS MIN.) AS SHOWN.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: B. KIMES	6/27/2022
CHECKED	
ENG	
APPROVED	

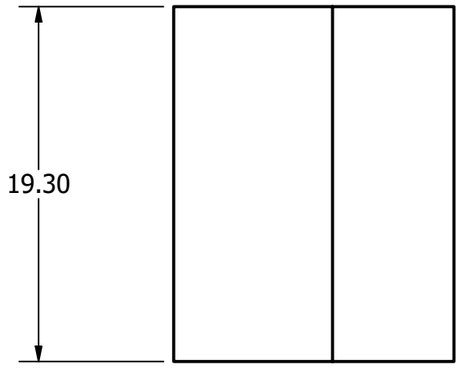
FLEXION/EXTENSION STOP PLATE

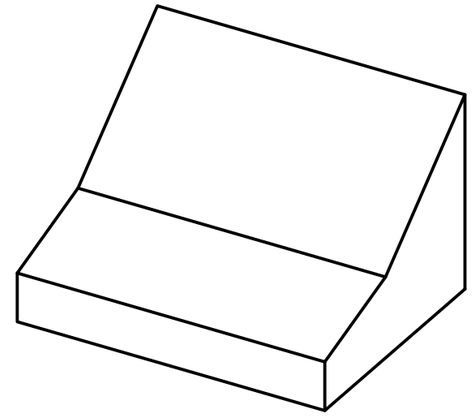
MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

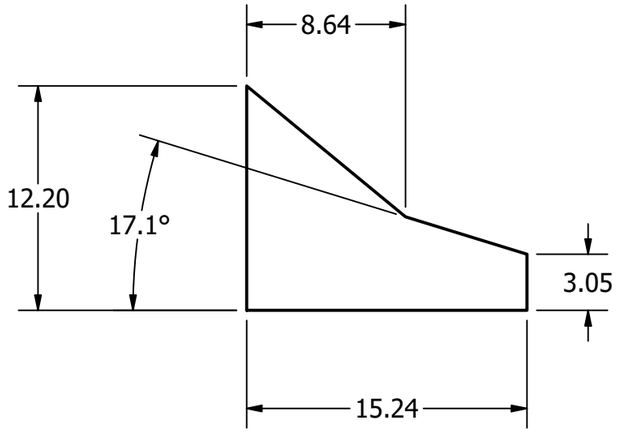
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-2320-A | REV: 1
SCALE: 1.5 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	AB	JW	04/06/16







NOTES:
1. MATERIAL: NATURAL RUBBER
   COLOR: BLACK
   DUROMETER: 70 ±10 SHORE "A"
2. REMOVE ALL MOLD FLASHING
3. ALL MOULD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE RUBBER MOLDING

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: A. Barchock	4/6/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

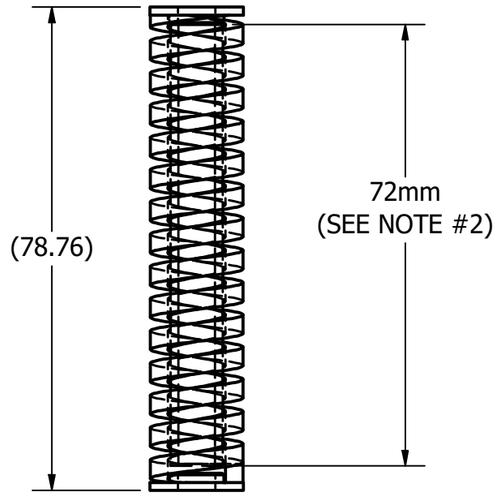
FRONT/REAR OC STOP

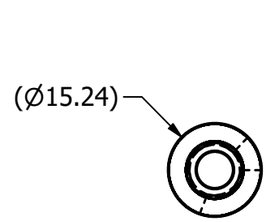
THIRD ANGLE PROJECTION

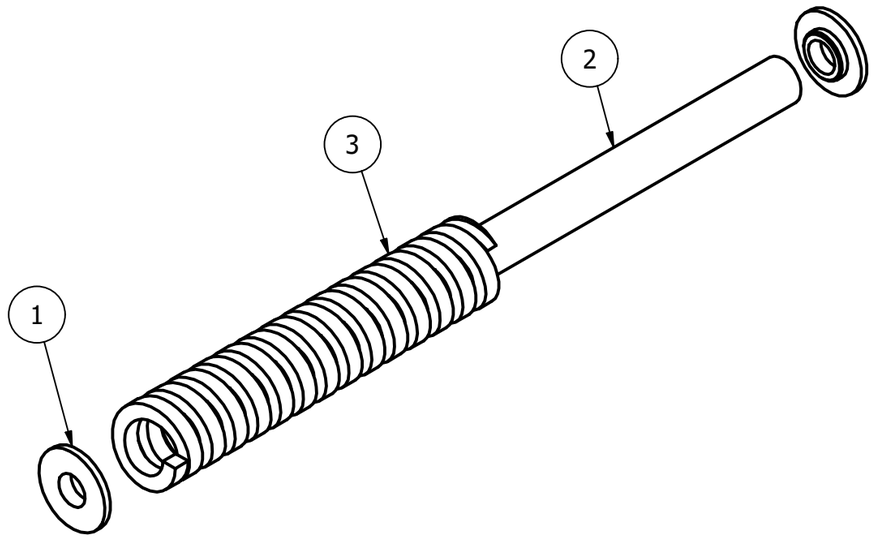
SIZE: A3 | DRAWING NUMBER: 474-2321 | REV: 1

SCALE: 3:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	JPM		11/27/17







ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	474-2924	SPRING, REAR
2	1	474-2323	FRONT/REAR SPRING DAMPING TUBE
1	2	474-2322	SPRING BUSHING

PARTS LIST

NOTES:

1. SPRING BUSHING: JOIN WITH 5 MINUTE EPOXY.
2. LENGTH OF RUBBER ELEMENT MAY BE ADJUSTED TO MEET PERFORMANCE REQUIREMENT.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

SPRING ASSEMBLY, REAR

APPROVALS	DATE
DRAWN: A. Barchock	4/12/2016
CHECKED	
ENG	
APPROVED	

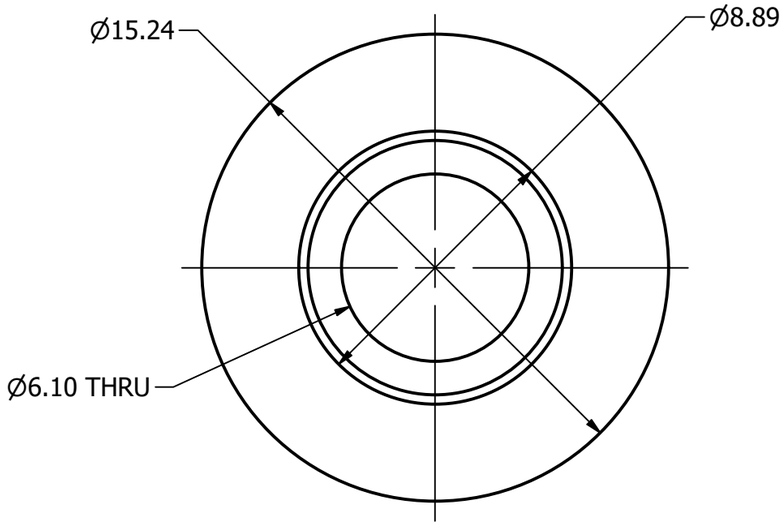
MATERIAL
HEAT TREAT
FINISH

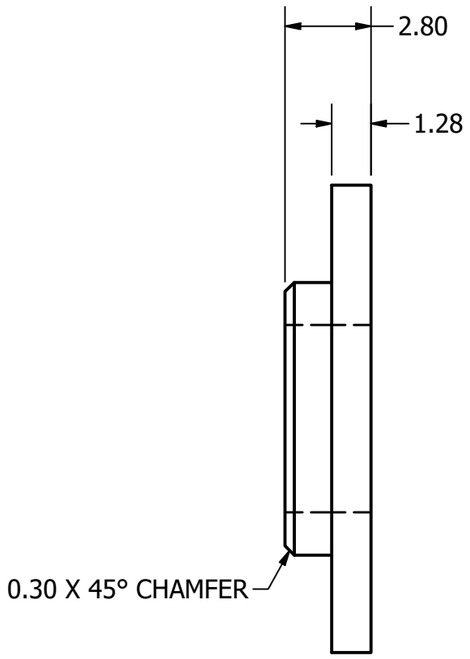
THIRD ANGLE PROJECTION

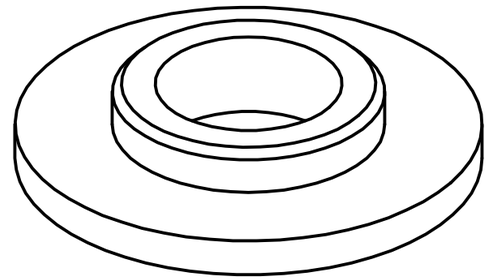
SIZE: A3 | DRAWING NUMBER: 474-2304 | REV: 2

SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	JPM		9/28/16







PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Steel
HEAT TREAT:
FINISH: .008 ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: A. Barchock	4/6/2016
CHECKED:	
ENG:	
APPROVED:	

DEPARTMENT OF TRANSPORTATION — UNITED STATES OF AMERICA

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

SPRING BUSHING

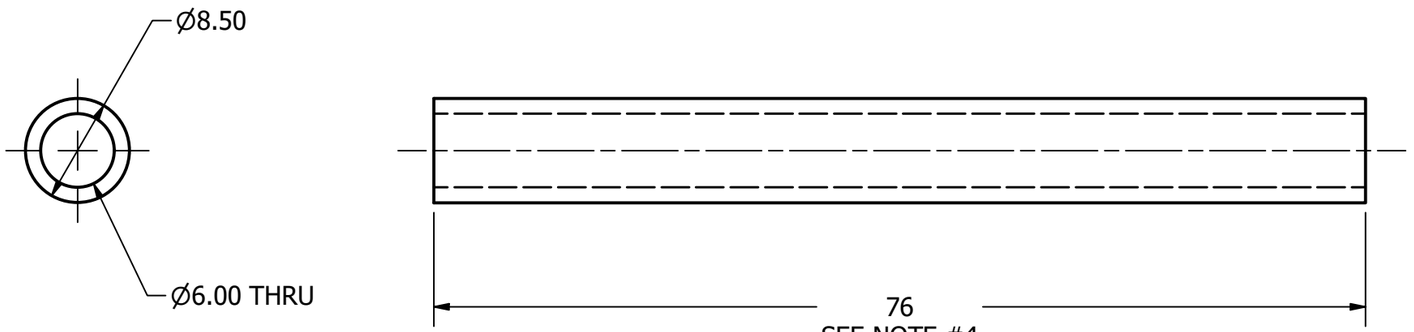
THIRD ANGLE PROJECTION

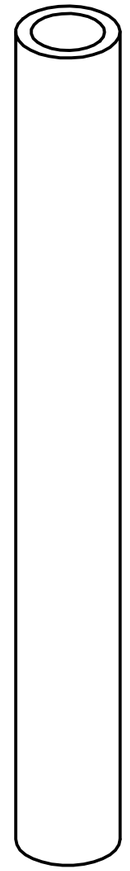
SIZE	DRAWING NUMBER	REV
A3	474-2322	2

SCALE: 5 : 1

SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	GCH		8/30/2016





NOTES:

1. MATERIAL: BUNA-N RUBBER
   COLOR: BLACK
   DUROMETER: 60 ±10 SHORE "A"
2. REMOVE ALL MOLD FLASHING
3. NO SPLIT OR DEFECTS ARE ALLOWED IN THE RUBBER MOLDING
4. FINAL LENGTH WILL BE DETERMINED DURING SPRING ASSEMBLY CERTIFICATION.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: A. Barchock	4/6/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

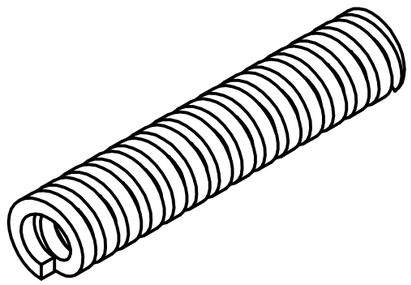
FRONT/REAR SPRING DAMPING TUBE

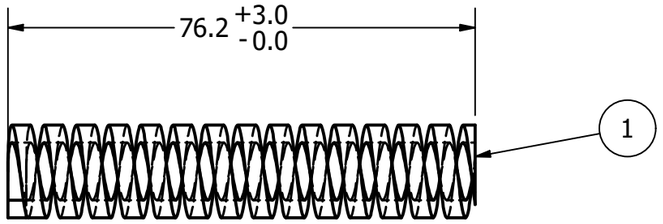
THIRD ANGLE PROJECTION

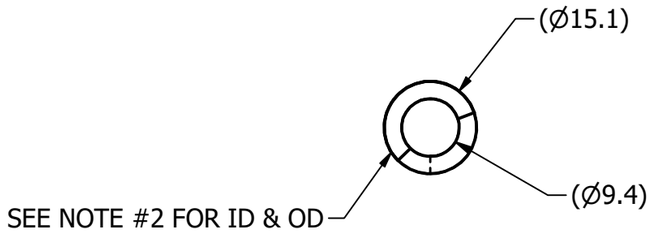
SIZE: A3 | DRAWING NUMBER: 474-2323 | REV: 2

SCALE: 2 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	HF	HF	10/5/2021







NOTES:

1. MATERIAL: HIGH TENSILE STRENGTH ALLOY STEEL.

2. SPRING RATE: 24.5 N/mm NOMINAL (± 5%)
   FREE LENGTH 76.2mm
   TOTAL TRAVEL TO SOLID 34.0mm AT 830 N.
   TO FIT OVER 8.5mm DIA RODE
   TO FIT INSIDE 16mm HOLE

3. SPRING COLOR: RED

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5001424-FT	SPRING, REAR

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	jhaefner	5/26/2016
CHECKED		
ENG	JH	5/26/2016
APPROVED		

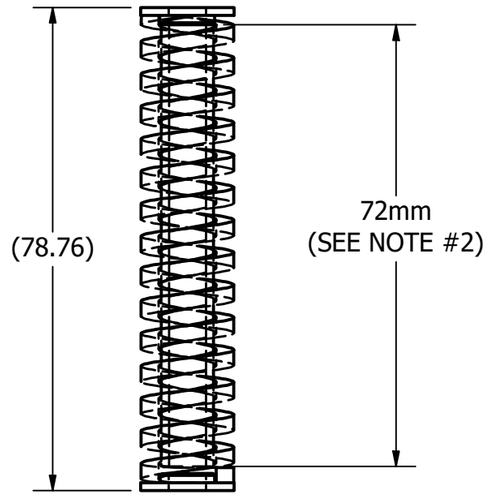
MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

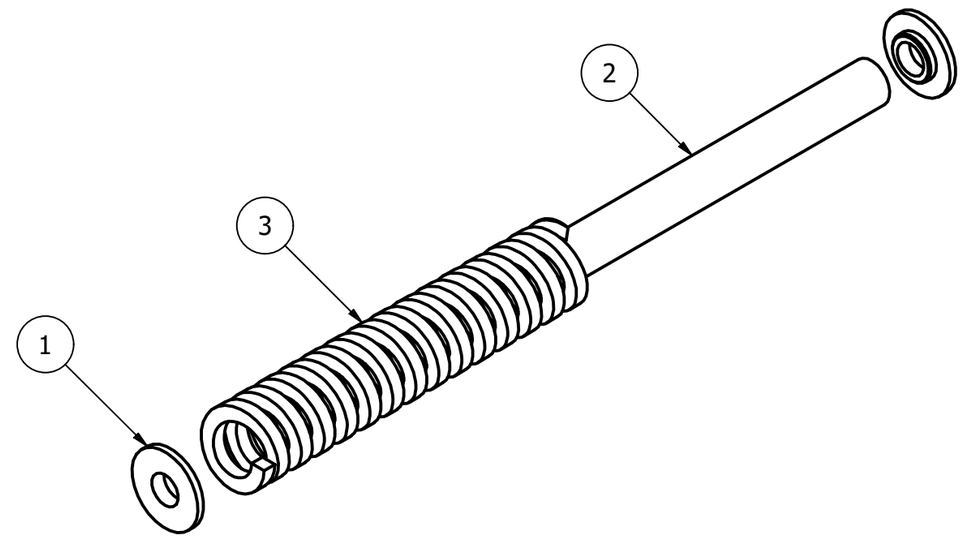
SPRING, REAR

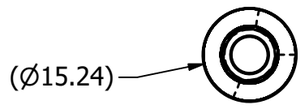
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-2924 | REV: 2
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	JPM		11/27/17







NOTES:

1. SPRING BUSHING: JOIN WITH 5 MINUTE EPOXY.
2. LENGTH OF RUBBER ELEMENT MAY BE ADJUSTED TO MEET PERFORMANCE REQUIREMENT.

ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	474-2925	SPRING, FRONT
2	1	474-2323	FRONT/REAR SPRING DAMPING TUBE
1	2	474-2322	SPRING BUSHING

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

SPRING ASSEMBLY, FRONT

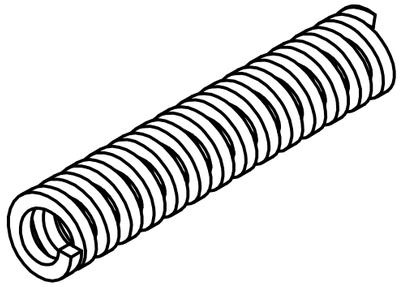
	APPROVALS	DATE
DRAWN	A. Barchock	4/12/2016
MATERIAL		
CHECKED		
HEAT TREAT		
ENG		
FINISH		
APPROVED		

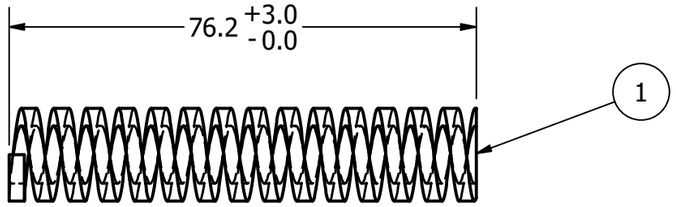
THIRD ANGLE PROJECTION

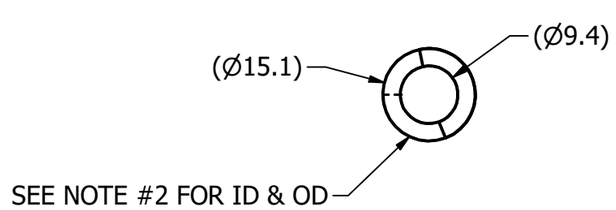
SIZE A3 | DRAWING NUMBER 474-2305 | REV 2

SCALE: 1 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	HF	DJI	10/5/2021







NOTES:

1. MATERIAL: HIGH TENSILE STRENGTH ALLOY STEEL.

2. SPRING RATE: 17.7 N/mm NOMINAL (± 5%)
   FREE LENGTH 76.2mm
   TOTAL TRAVEL TO SOLID 38.0mm AT 682 N
   TO FIT OVER 8.5mm DIA ROD
   TO FIT INSIDE 16mm DIA HOLE

3. SPRING COLOR: BLUE

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5001425-FT	SPRING, FRONT

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ±√ | ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN jhaefner	5/26/2016
CHECKED	
ENG JH	5/26/2016
APPROVED	

MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

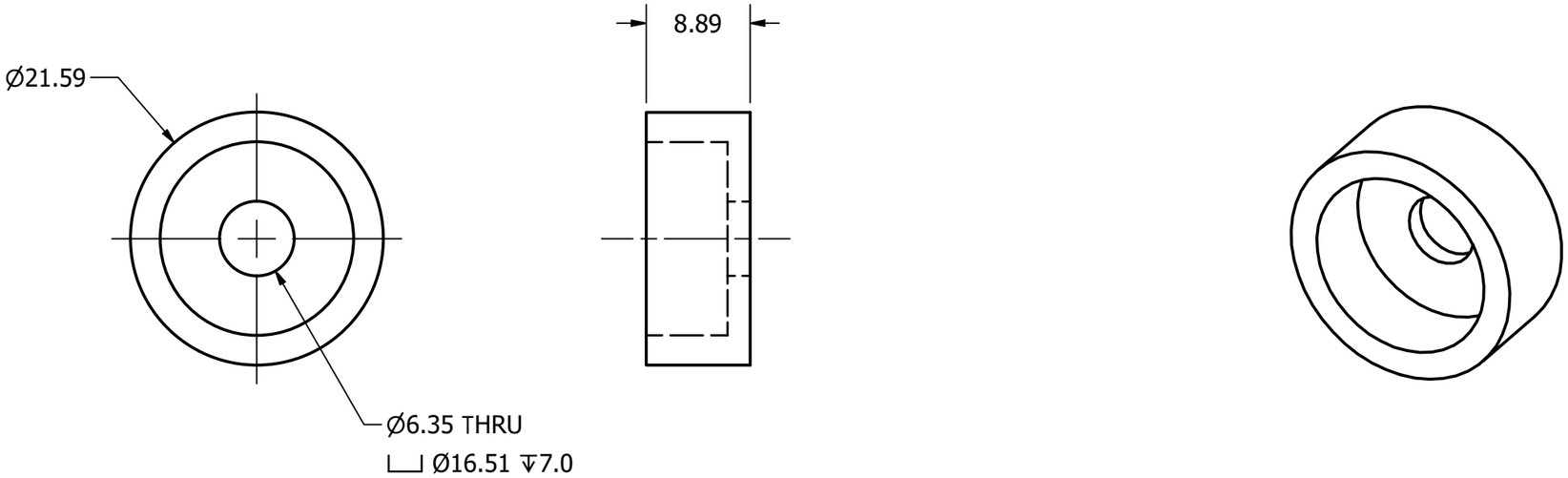
SPRING, FRONT

THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-2925 | REV: 2

SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	AB	JW	04/13/16



PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 304 STAINLESS STEEL
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: A. Barchock	4/13/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

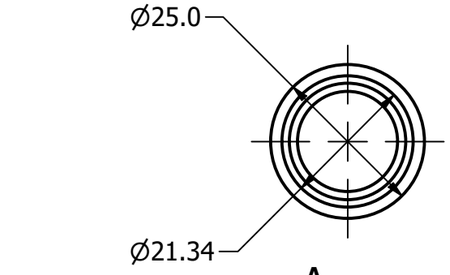
SPRING LOAD CELL S.R.

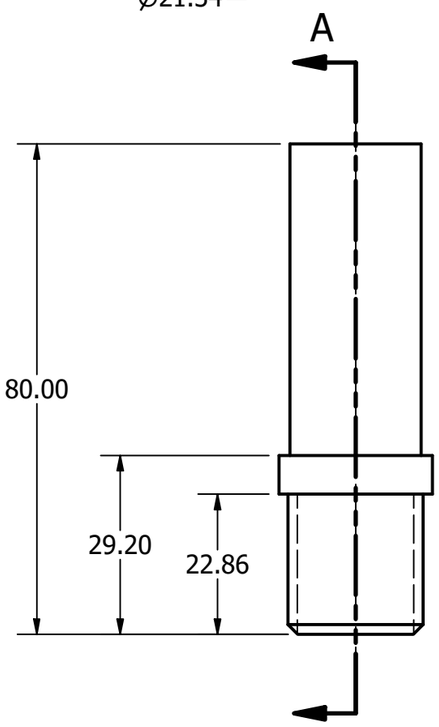
THIRD ANGLE PROJECTION

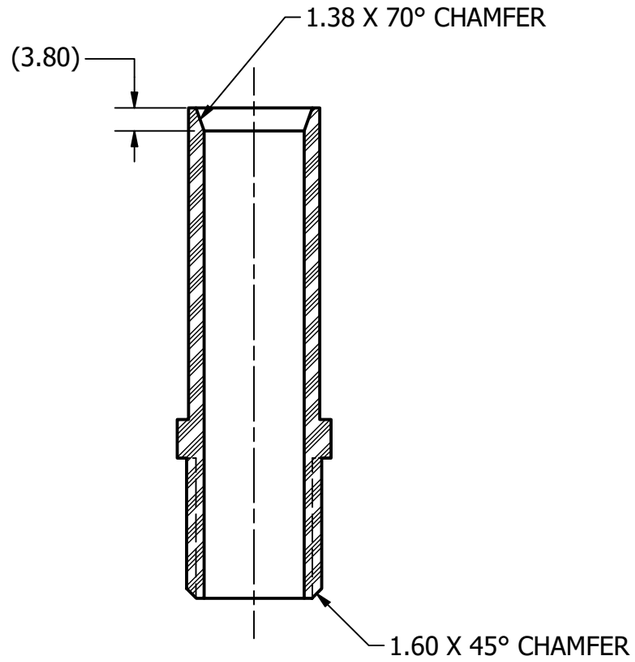
SIZE	DRAWING NUMBER	REV
A3	474-2306	1

SCALE: 2:1 SHEET: 1 OF 1

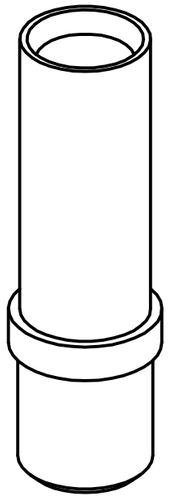
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	AB	JW	04/12/16

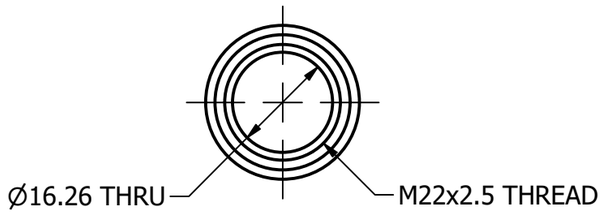






SECTION A-A





PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 125
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Acetal Resin, White
HEAT TREAT:
FINISH:

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

APPROVALS	DATE
DRAWN: A. Barchock	4/12/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

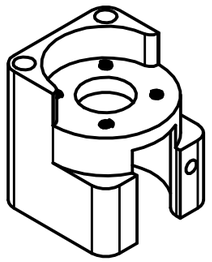
FRONT/REAR SPRING TUBE

THIRD ANGLE PROJECTION

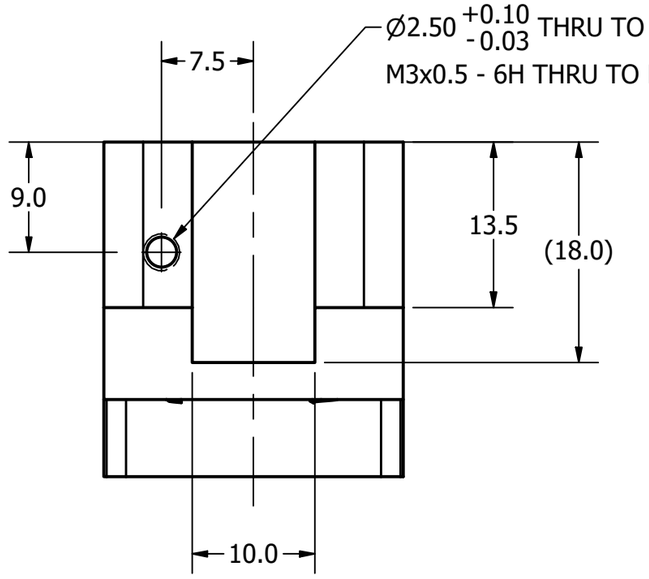
SIZE: A3 | DRAWING NUMBER: 474-2303 | REV: 1

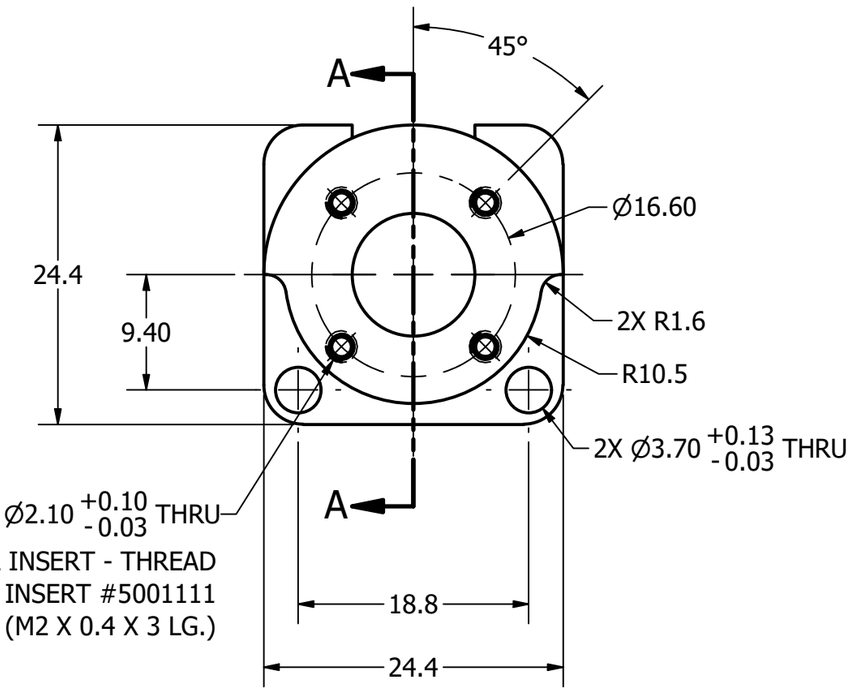
SCALE: 1:1 | SHEET: 1 OF 1

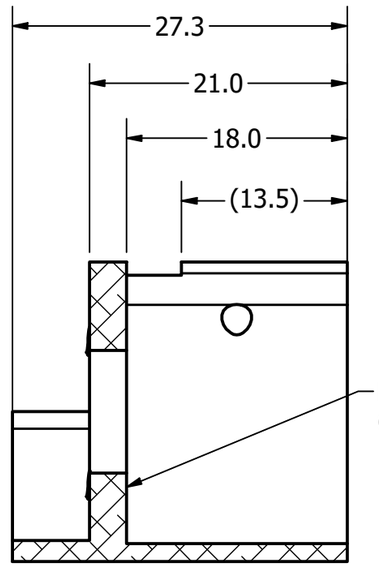
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	KMSP	MJS	8/2/2019



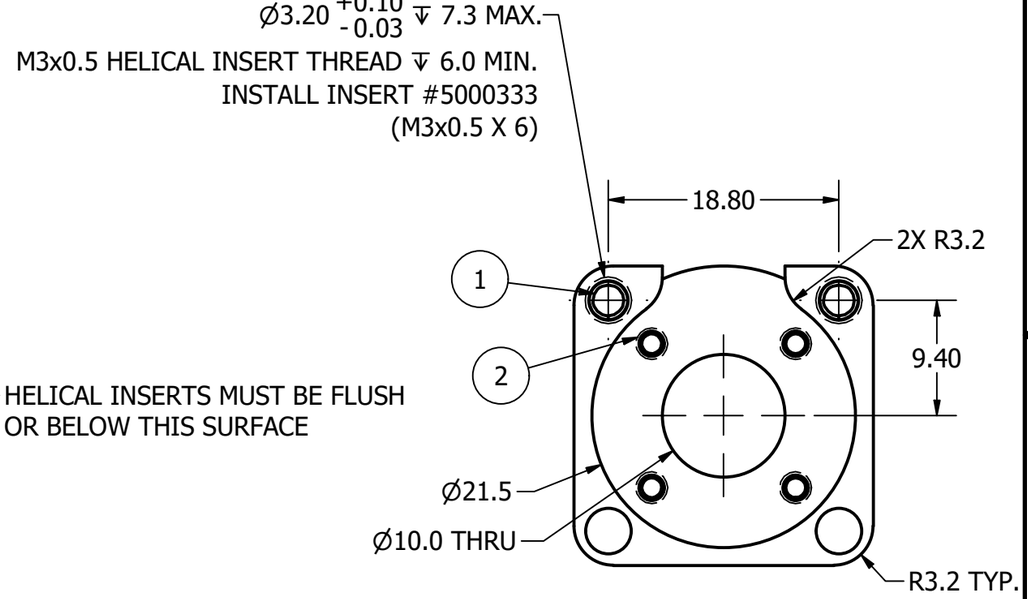
SCALE 1 : 1







SECTION A-A
SCALE 2 : 1



ITEM	QTY	PART NUMBER	DESCRIPTION
2	4	5001111	M2 X 0.4 X 3 LG. HELICAL INSERT
1	2	5000333	M3 X 0.5 X 6 LG. HELICAL INSERT

PARTS LIST

NOTES:

1. INSTALL HELICAL INSERTS AFTER FINISH.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ✓
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	kstpierre	3/11/2019
CHECKED		
ENG	MJS	5/9/2019
APPROVED		

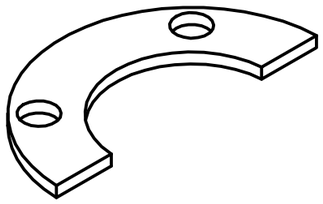
MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

ROTARY POTENTIOMETER HOUSING, NECK

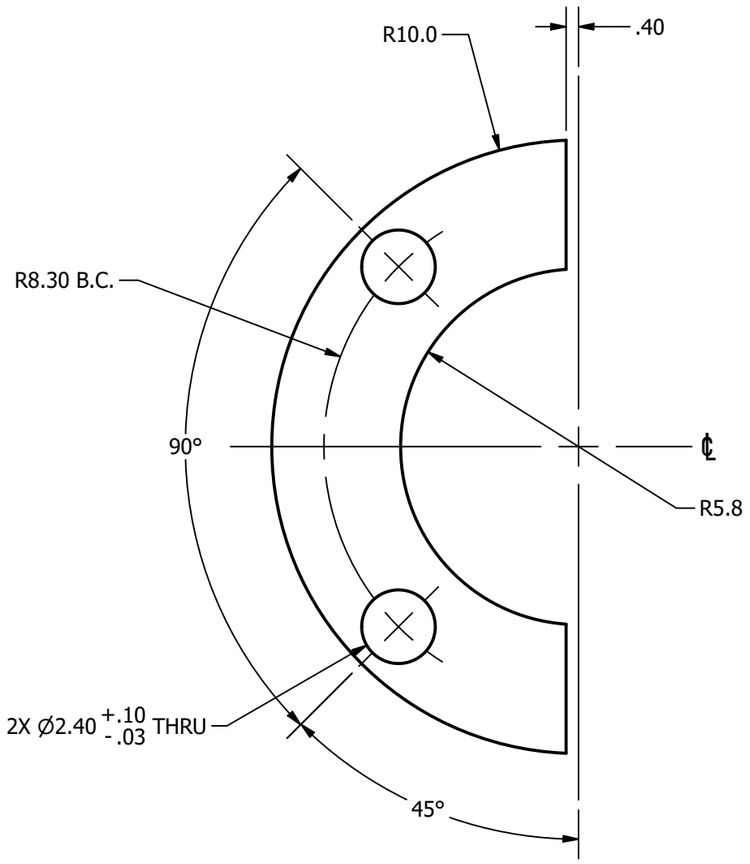
THIRD ANGLE PROJECTION

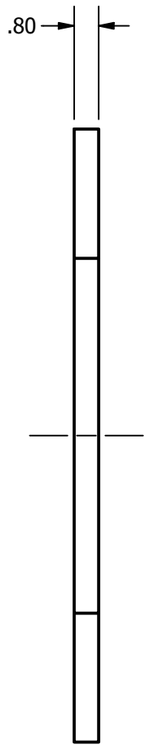
SIZE: A3 | DRAWING NUMBER: 484-2013 | REV: 1
SCALE: 2 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R	DATE
	C	RELEASE FOR PRODUCTION	DJI	TN	12/7/2016



SCALE 3.000



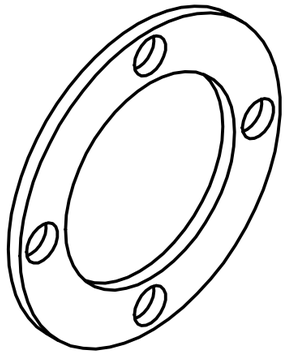


NOTES:

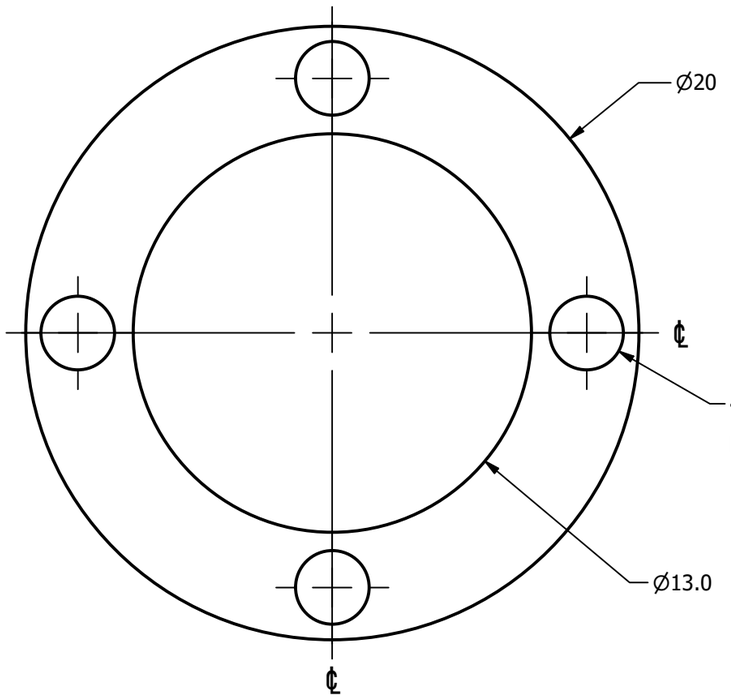
1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

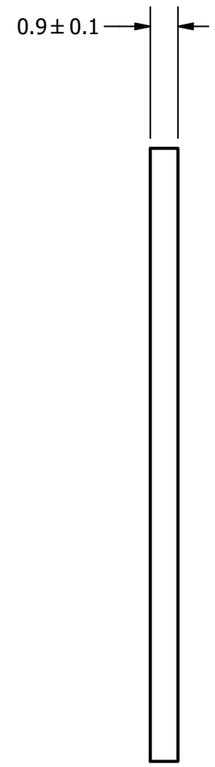
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED √C; ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	ROTARY POTENTIOMETER CLAMP, NECK
MATERIAL: 6061-T6 ALUMINUM	DRAWN: B. KIMES / 7/28/2011	
HEAT TREAT	CHECKED	SIZE: A3 / DRAWING NUMBER: 472-2020 / REV: C
FINISH: CLEAR ANODIZE	ENG / APPROVED	THIRD ANGLE PROJECTION / SCALE: 5.000 / SHEET: 1 OF 1

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	C	RELEASE FOR PRODUCTION	1/6/2014	BK



SCALE 3.000



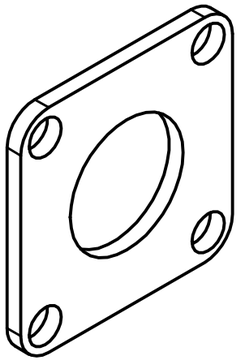


NOTES:

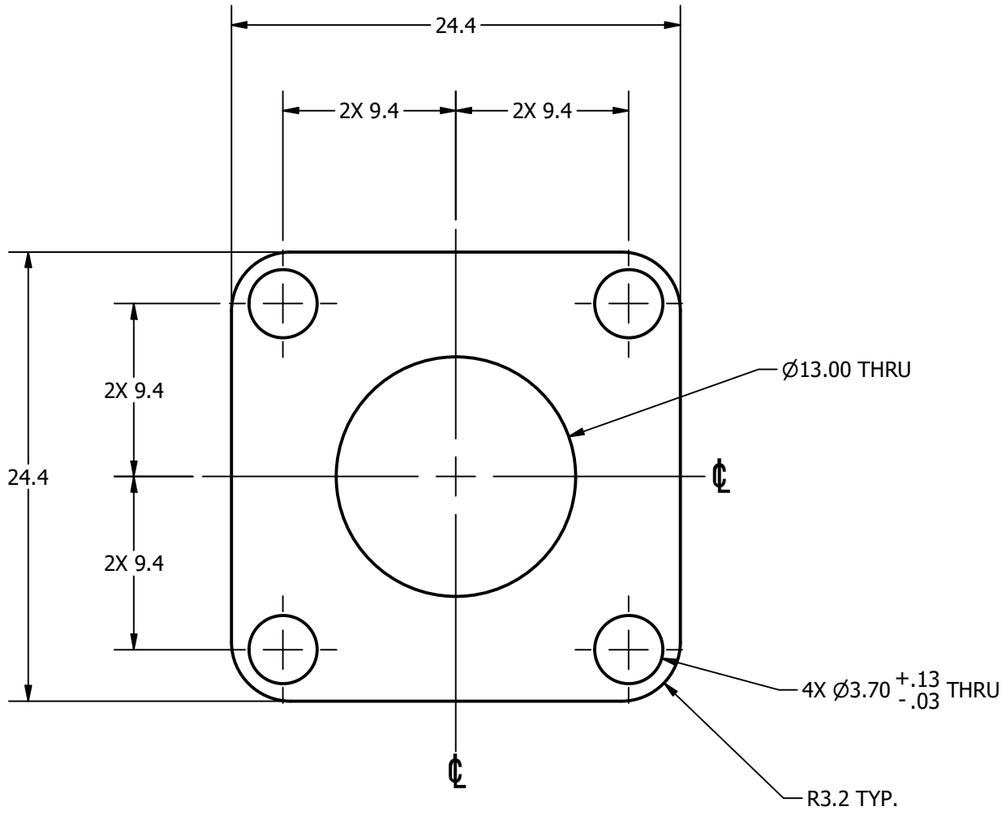
1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

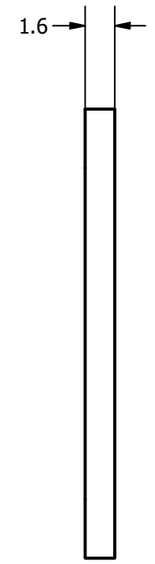
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 MACHINED √, ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	ROTARY POTENTIOMETER WASHER, NECK
	DRAWN: B. KIMES — 7/14/2016	
MATERIAL: 6061-T6 ALUMINUM	CHECKED	
HEAT TREAT	ENG	
FINISH: CLEAR ANODIZE	APPROVED	
THIRD ANGLE PROJECTION	SIZE: A3 — DRAWING NUMBER: 472-2021 — REV: C	
	SCALE: 5.000 — SHEET: 1 OF 1	

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	C	RELEASE FOR PRODUCTION	4/13/2013	BK



SCALE 2.000





NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED √ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

ROTARY POTENTIOMETER COVER, NECK

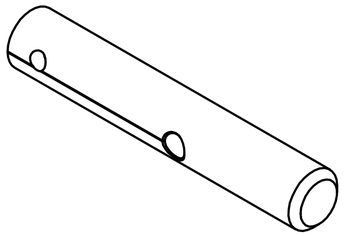
APPROVALS	DATE
DRAWN B. KIMES	7/14/2016
CHECKED	
ENG	
APPROVED	

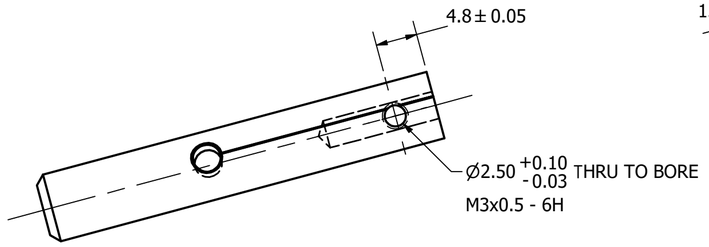
MATERIAL: 6061-T6 ALUMINUM
HEAT TREAT:
FINISH: CLEAR ANODIZE

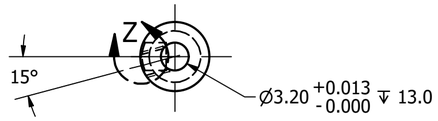
THIRD ANGLE PROJECTION

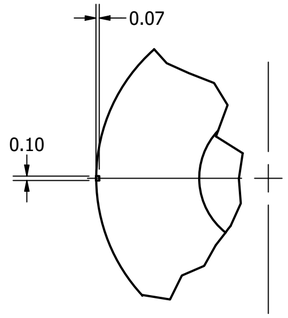
SIZE: A3 | DRAWING NUMBER: 472-2014 | REV: C
SCALE: 3.000 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	JPM		1/17/18

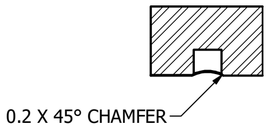




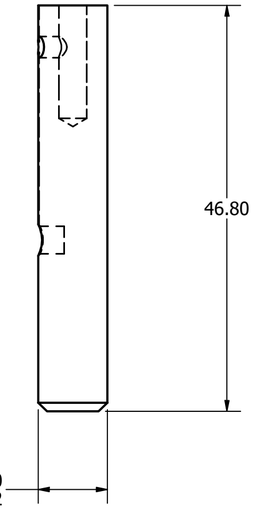


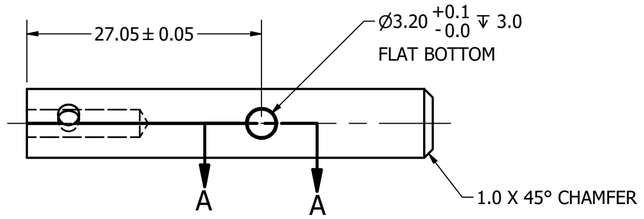


DETAIL Z
SCALE 10 : 1



SECTION A-A







NOTES:

1. POWDER OR BEAD BLAST.
2. DIMENSIONAL LIMITS AND THREADED HOLE SIZES APPLY AFTER FINISH.
3. CHECK HARDNESS ON END.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 01 TOOL STEEL
HEAT TREAT: Rc 55-57
FINISH: 0.008mm MAX. ELECTROLESS NICKEL PLATE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	4/8/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

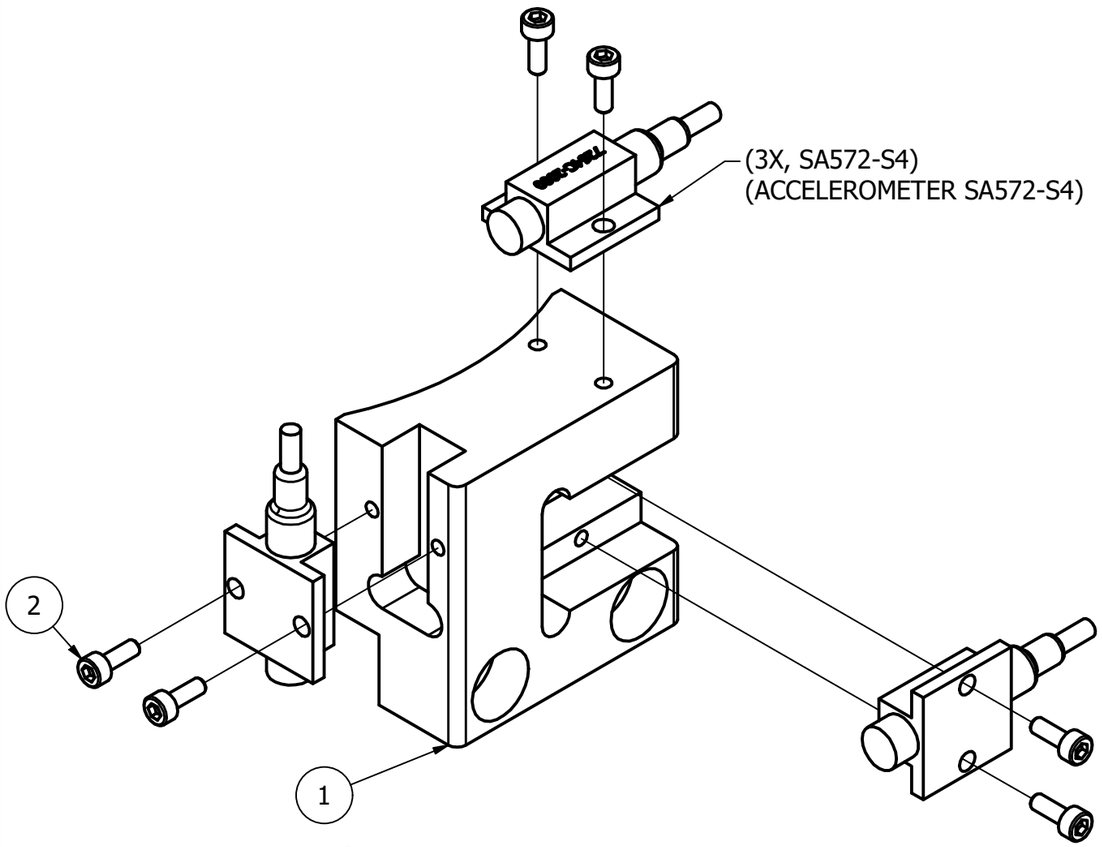
PIN, OC

THIRD ANGLE PROJECTION

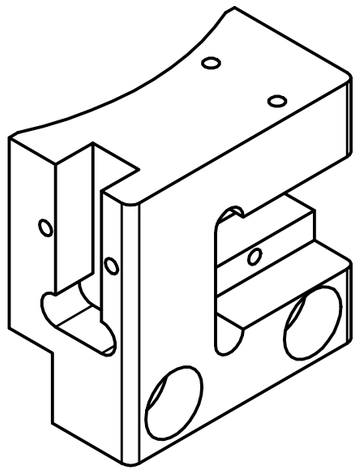
SIZE	DRAWING NUMBER	REV
A2	474-2340	3

SCALE: 2:1 | SHEET: 1 OF 1

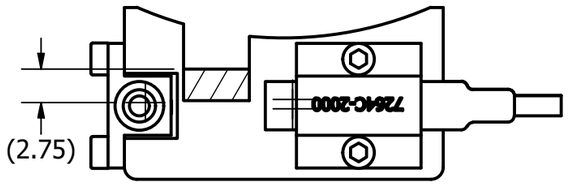
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	DJI	DJI	6/5/2023

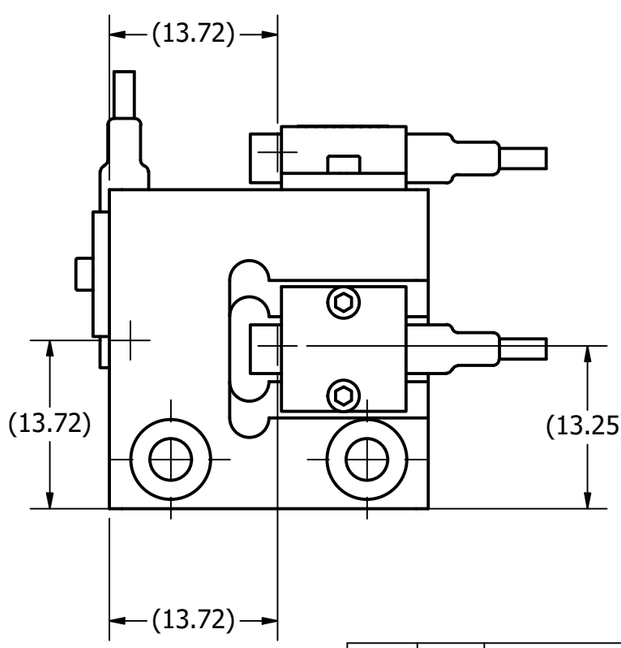


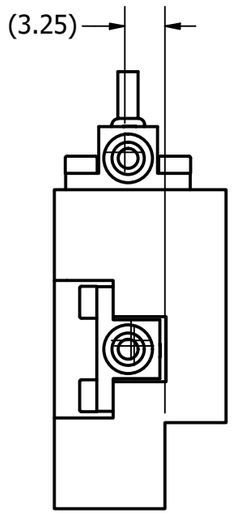
INSTRUMENT VIEW



SR VIEW







ITEM	QTY	PART NUMBER	DESCRIPTION
2	6	5000375	M1.4 X 0.3 X 4 LG. SHCS
1	2	474-2345	ACCEL MOUNT, T1, THOR-05F

PARTS LIST

NOTES:

1. 2X 474-2345 ARE SUPPLIED SO THAT ONE CAN BE USED FOR SR ASSEMBLY AND THE OTHER CAN BE USED FOR THE INSTRUMENTED ASSEMBLY.
2. 6X 5000375 ARE NOT NEEDED FOR SR ASSEMBLY AND WILL REMAIN ON THE INSTRUMENTED ASSEMBLY.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN J. MCINNIS	5/4/2016
CHECKED	
ENG JW	5/4/2016
APPROVED	

MATERIAL
HEAT TREAT
FINISH

KIT, 7264C, T1 THOR-05F NECK

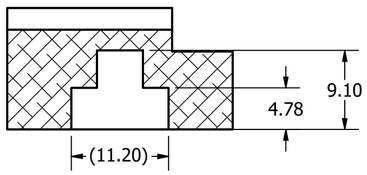
THOR-05F

THIRD ANGLE PROJECTION

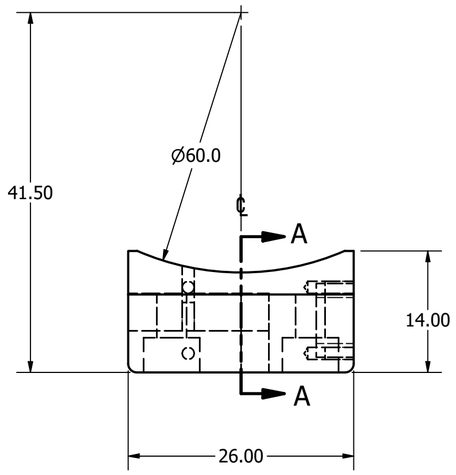
SIZE A3 | DRAWING NUMBER 474-2022 | REV 3

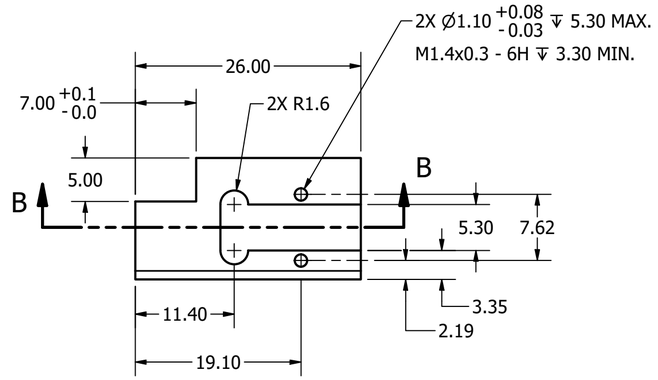
SCALE: 2 : 1 | SHEET 1 OF 1

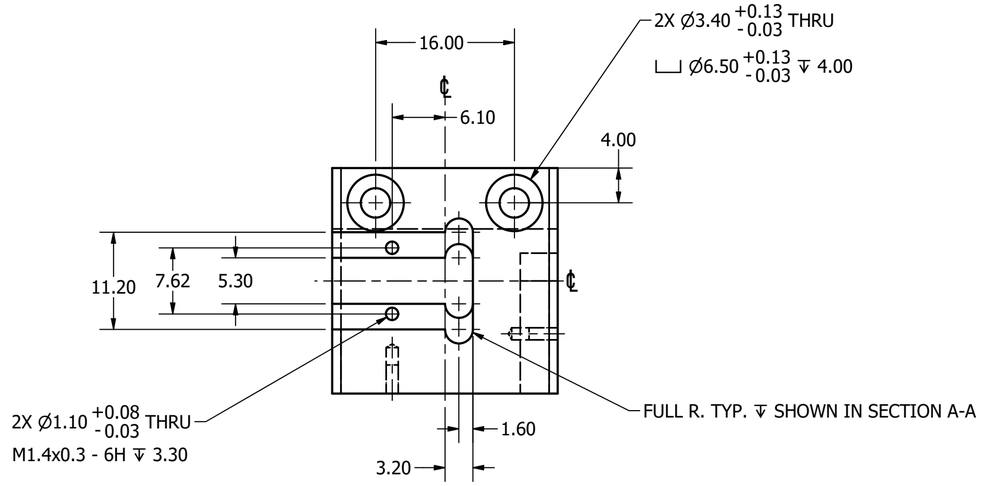
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	KMSP	RAB	2/28/2018

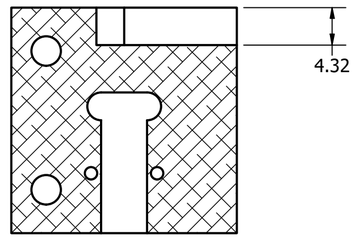


SECTION A-A

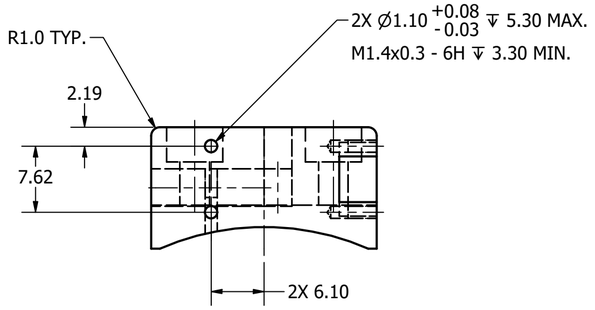


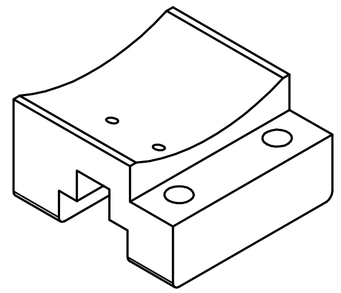


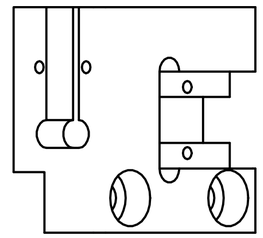




SECTION B-B







NOTES:

1. UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE SYMMETRICAL ABOUT ℄.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN ghayden	4/8/2016
CHECKED	
ENG TNGHI	4/8/2016
APPROVED	

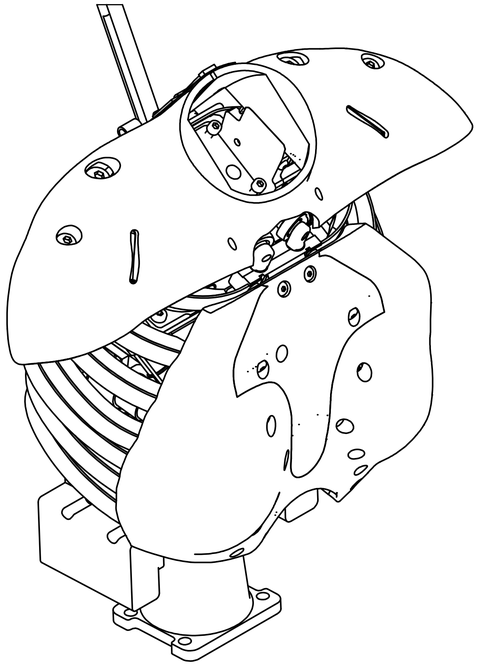
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

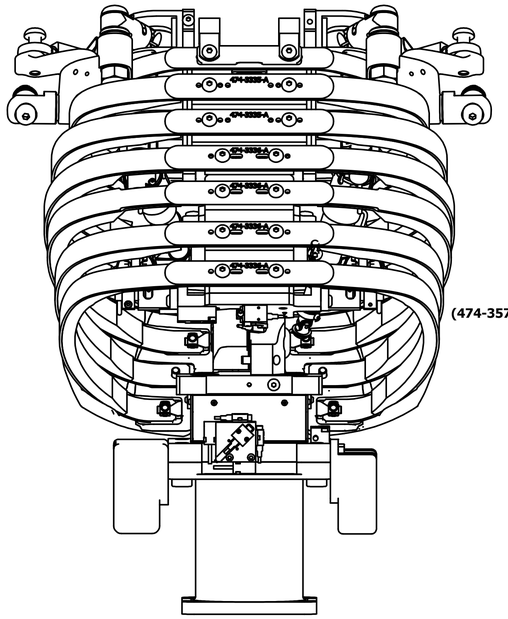
ACCEL MOUNT, T1, THOR-05F
474-2000

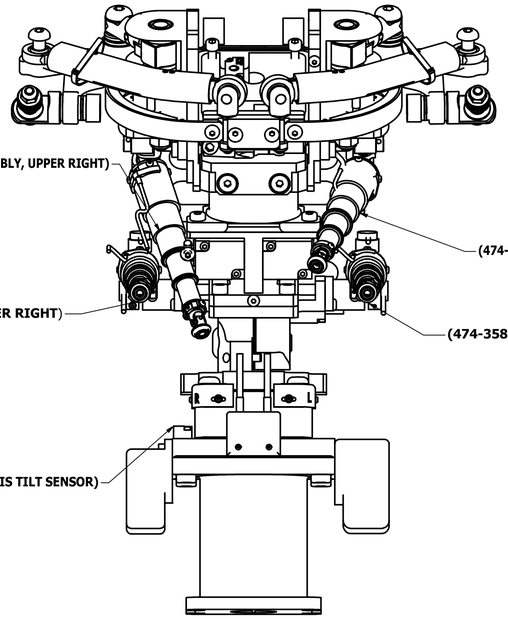
THIRD ANGLE PROJECTION

SIZE A2 | DRAWING NUMBER 474-2345 | REV 2
SCALE: 2:1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	8	PROTOTYPE	ANK	HEC	11/11/2024

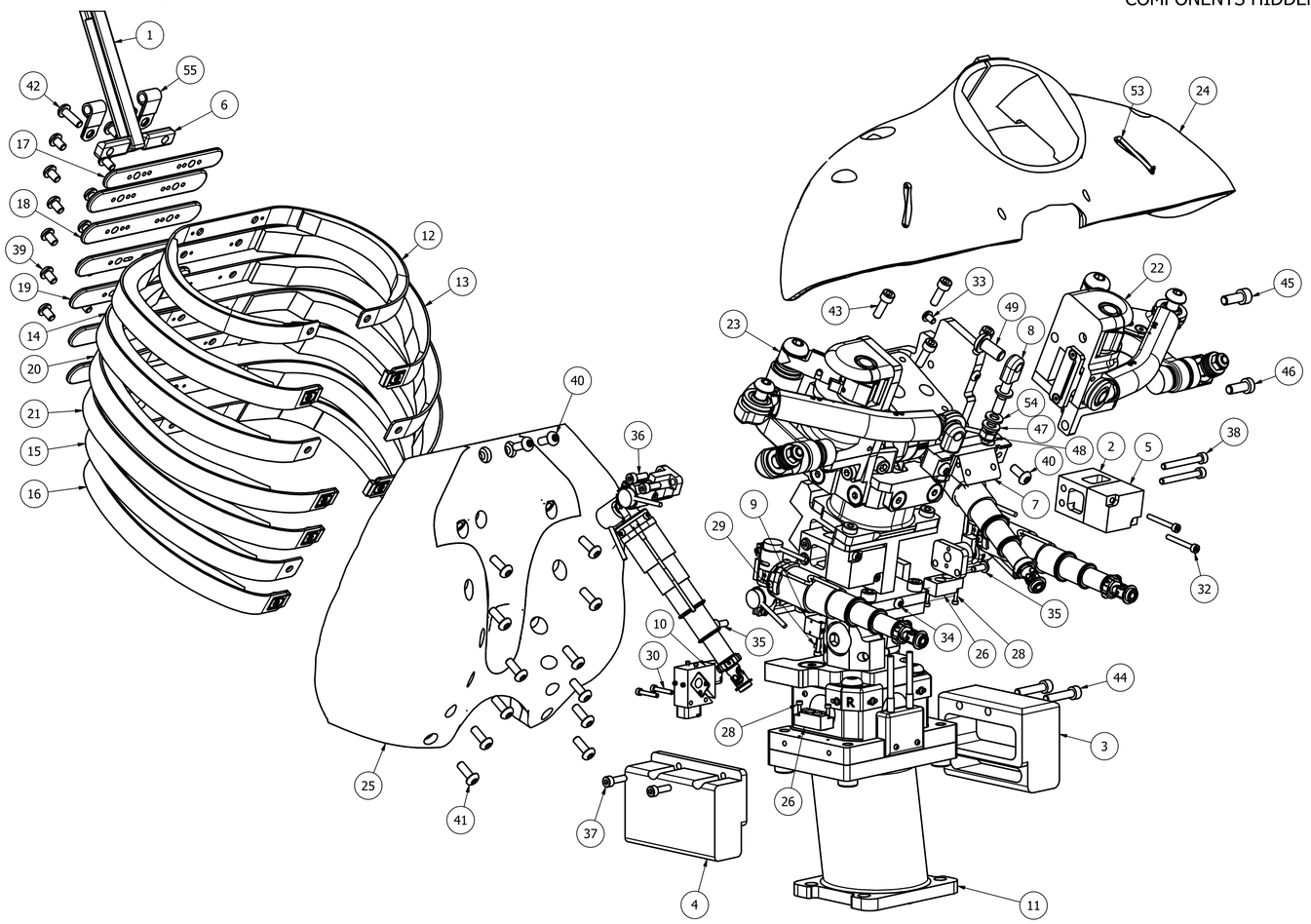


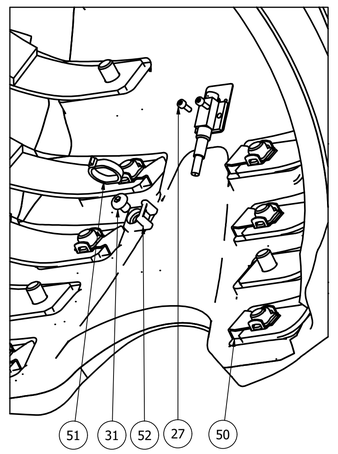




ELECTRONICS VIEWS
COMPONENTS HIDDEN

This design includes features covered by U.S. Patent Nos. 9,514,659 and 9,799,234 (upper arm assembly and shoulder assembly for crash test dummy), which is owned by Humanetics and its affiliated companies. No license is being granted to this patent and third parties are not authorized to make, use, sell, import, or export any products (physical or virtual) that practice the invention covered by this patent, or other patents owned by Humanetics. However, if a third party is interested in obtaining rights to the design, they are to contact Humanetics to discuss license terms.





INNER CHEST/RIBS VIEW COMPONENTS HIDDEN
SCALE 1 : 1

ITEM	QTY	PART NUMBER	DESCRIPTION
55	2	9003723	1/4 COATED CABLE CLAMP
54	4	6003562	M6 FLAT WASHER PLAIN NYLON
53	2	6002121	CABLE TIE, 3.5 x 280
52	1	6002036-M	MODIFIED CABLE TIE MOUNT, #4 SCREW
51	1	6000004	CABLE TIE
50	8	5001838	M5 CLIP NUT
49	2	5000563	M8 X 1.25 X 16 LG. BHCS SS
48	2	5000093	M6 X 1 HEX LOCK NUT ZINC
47	2	5000013	M6 FLAT WASHER PLAIN ZINC
46	2	5000296	M6 X 1 X 16 LG. LHCS
45	2	5000081	M6 X 1 X 16 LG. SHCS
44	2	5000721	M5 X 0.8 X 25 LG. SHCS
43	4	5000020	M5 X 0.8 X 16 LG. SHCS
42	2	5000416	M5 X 0.8 X 16 LG. BHCS
41	12	5001411	M5 X 0.8 X 14 LG. BHCS
40	4	5000654	M5 X 0.8 X 12 LG. BHCS
39	12	5001278	M5 X 0.8 X 8 LG. BHCS
38	4	5000549	M4 X 0.7 X 35 LG. SHCS SS
37	2	5000459	M4 X 0.7 X 14 LG. SHCS
36	4	5000152	M4 X 0.7 X 12 LG. SHCS
35	4	5001083	M4 X 0,7 X 10 LG. BHCS
34	1	5000103	M4 X 0.7 X 8 LG. BHCS
33	3	5001075	M4 X 0.7 X 6 LG. BHCS
32	4	5001057	M3 X 0.5 X 25 LG. SHCS
31	1	5001067	M3 X 0.5 X 4 LG. BHCS
30	2	5000069	M2.5 X 0.45 X 16 LG. SHCS
29	2	5001376	M2.5 X 0.45 X 14 LG. SHCS
28	4	5000215	M2 X 0.4 X 10 LG. SHCS
27	2	5000375	M1.4 X 0.3 X 4 LG. SHCS
26	2	476-3604	TILT SENSOR S.R.
25	1	474-3730-A	CHEST FLESH-STERNUM, MOLDED
24	1	474-3559-A	SHOULDER PAD
23	1	474-3500-2-A	SHOULDER ASSEMBLY, RIGHT
22	1	474-3500-1-A	SHOULDER ASSEMBLY, LEFT
21	1	474-3355-A	RIB 5 ASSEMBLY, EXTENDED
20	1	474-3354-A	RIB 4 ASSEMBLY, EXTENDED
19	4	474-3336-A	STIFFENER, RIBS 4, 5, 6, 7
18	2	474-3335-A	STIFFENER, RIBS 2, 3
17	1	474-3331	RIB 1 STIFFENER
16	1	474-3307-A	RIB 7 ASSEMBLY, EXTENDED
15	1	474-3306-A	RIB 6 ASSEMBLY, EXTENDED
14	1	474-3303-A	RIB 3 ASSEMBLY, EXTENDED
13	1	474-3302-A	RIB 2 ASSEMBLY, EXTENDED
12	1	474-3301-A	RIB 1 ASSEMBLY
11	1	474-3200-A	SPINE ASSEMBLY
10	1	474-3067	KIT, 7264C/ARS, THOR-05F LUMBAR
9	1	474-3066	KIT, 7264C, THOR-05F MID-SPINE
8	2	474-3041-A	CLAVICLE-STERNUM ADAPTOR
7	1	474-3040-A	ADAPTOR, RIB 1 TO STERNUM
6	1	474-3025	LIFTING STRAP BRACKET
5	2	474-3009-A	DAS STRUCTURAL REPLACEMENT
4	1	474-3002-2-A	LOWER SPINE BALLAST, RIGHT
3	1	474-3002-1-A	LOWER SPINE BALLAST, LEFT
2	2	474-3001-A	DAS MOUNTING BRACKET, THORAX
1	1	472-3116	THOR LIFT STRAP

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL X ±.1, X.X ±.1, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

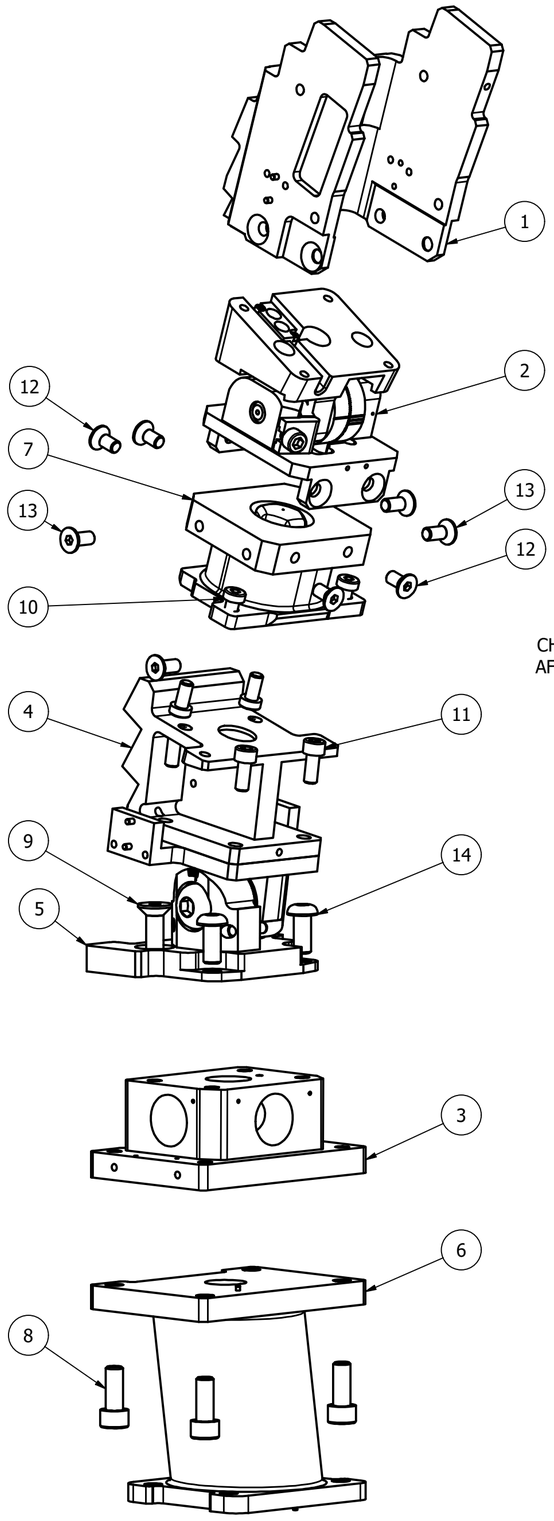
UPPER TORSO ASSEMBLY, THOR-05F

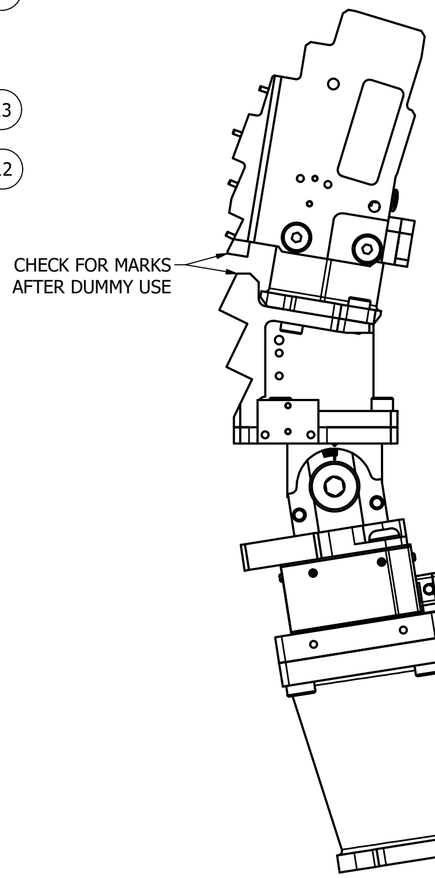
APPROVALS	DATE
DRAWN B. KIMES	10/18/2022
MATERIAL	
CHECKED	
HEAT TREAT N/A	
ENG	
FINISH N/A	
APPROVED	

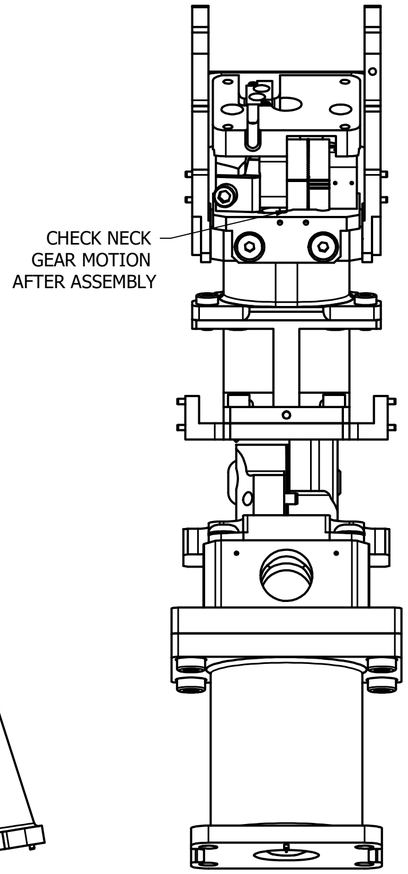
THIRD ANGLE PROJECTION

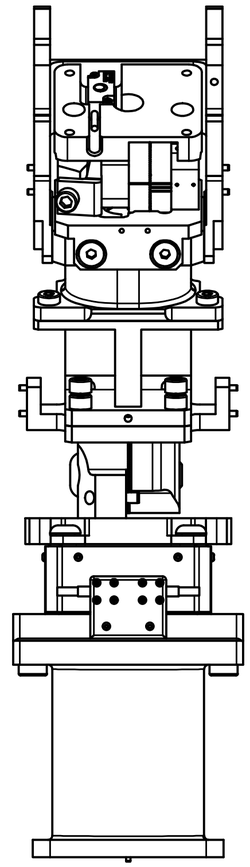
SIZE A1 | DRAWING NUMBER 474-3000-A | REV 8
SCALE: 0.5 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	PROTOTYPE	ARM	DJI	06/27/2025









ELECTRONICS VIEW

ITEM	QTY	PART NUMBER	DESCRIPTION
14	2	5000704	M8 X 1.25 X 18 LG. BHCS
13	4	5001324	M6 X 1 X 14 LG. FHCS
12	4	5000139	M6 X 1 X 12 LG. FHCS
11	4	5000604	M6 X 1 X 14 LG. SHCS
10	4	5001041	M6 X 1 X 12 LG. LHCS
9	2	5000117	M8 X 1.25 X 25 LG. FHCS
8	4	5000075	M8 X 1.25 X 20 LG. SHCS
7	1	474-3240	UPPER SPINE ASSEMBLY
6	1	474-3223-A	LUMBAR ASSEMBLY
5	1	474-3220-A	LUMBAR SPINE PITCH CHANGE ASSEMBLY
4	1	474-3101-A	LOWER SPINE BOX
3	1	474-3202-A	STRUCTURAL REPLACEMENT, THORACIC SPINE LOAD CELL
2	1	474-3050	NECK POSTURE ADJUSTMENT ASSEMBLY
1	1	474-3100-A	UPPER SPINE BOX

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	HEAT TREAT	FINISH
N/A	N/A	N/A

	APPROVALS	DATE
DRAWN	B. KIMES	11/7/2022
CHECKED		
ENG		
APPROVED		

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

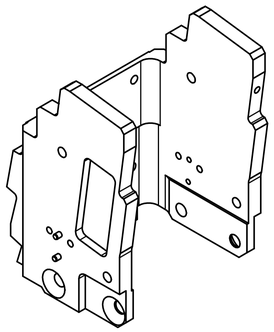
SPINE ASSEMBLY
THOR-05F

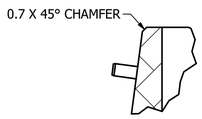
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
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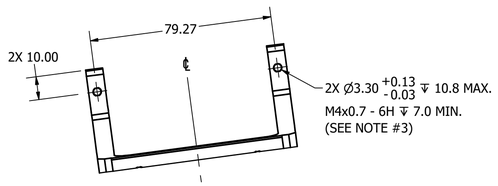
SCALE: 0.5 : 1 SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	BK	HEC	2/8/2023

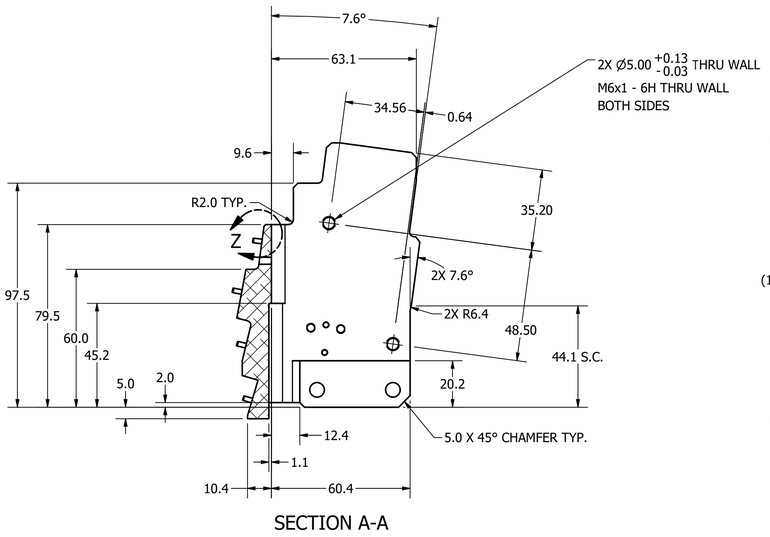




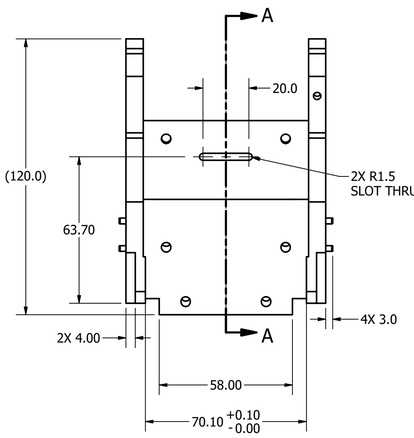
DETAIL Z
SCALE 2: 1

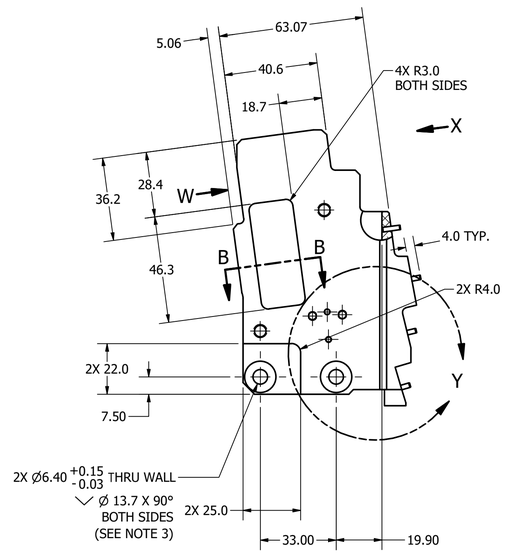


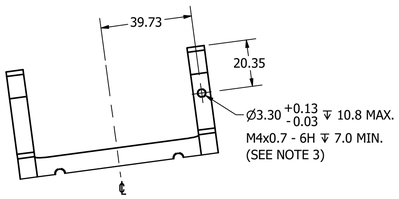
VIEW X
SCALE .75 : 1



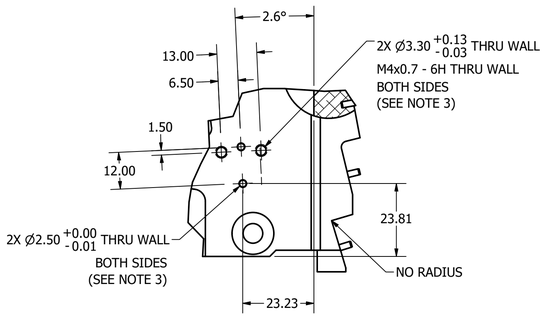
SECTION A-A



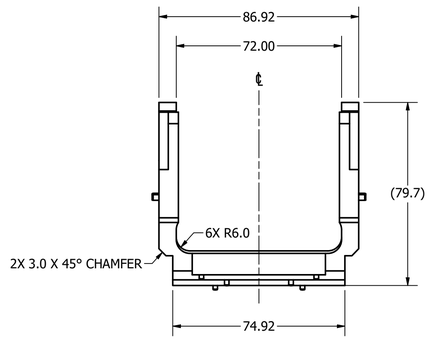


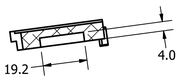


VIEW W
SCALE .75 : 1



DETAIL Y
BOTH SIDES
SCALE 1 : 1





SECTION B-B
BOTH SIDES

ITEM	QTY	PART NUMBER	DESCRIPTION
2	4	5000869	M2.5 X 8 LG. DOWEL PIN
1	8	5000064	M2 X 8 LG. DOWEL PIN

PARTS LIST

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. INSTALL DOWEL PINS AFTER ANODIZE.
3. PLUG HOLES BEFORE ANODIZE.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

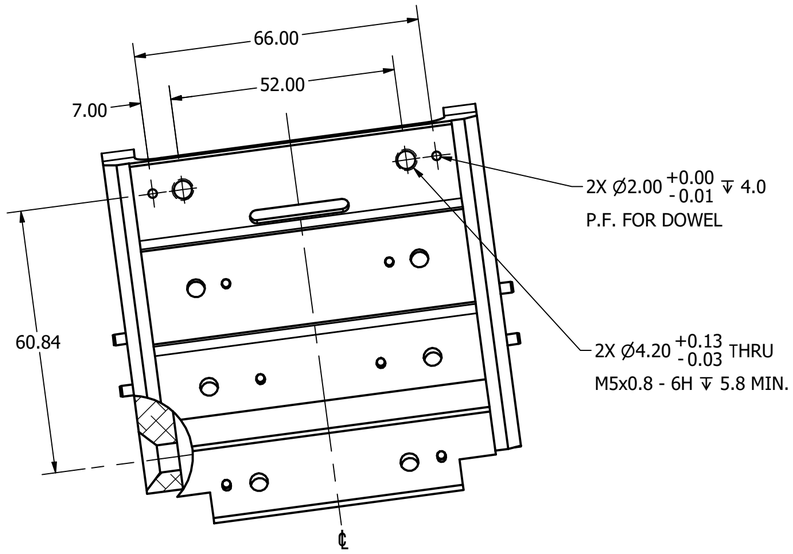
	APPROVALS	DATE
DRAWN	rkimes	5/5/2022
CHECKED		
ENG	HEC	8/1/2022
APPROVED		

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

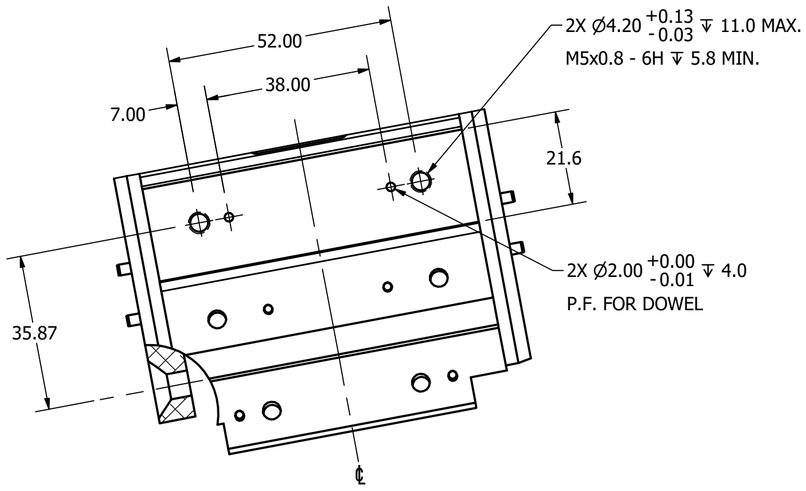
UPPER SPINE BOX
THOR-05F

THIRD ANGLE PROJECTION

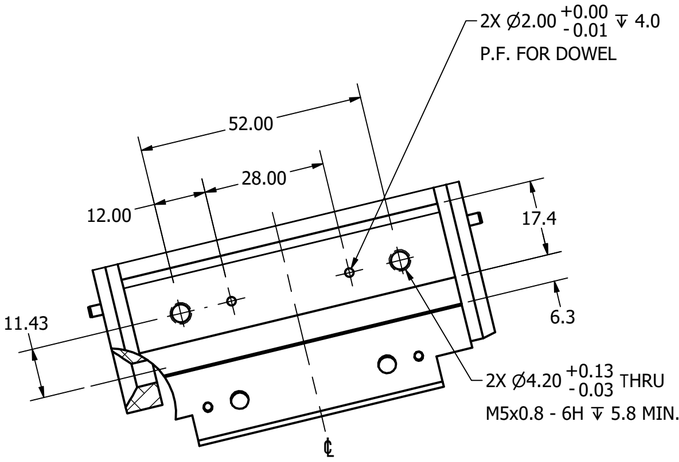
SIZE: A1 | DRAWING NUMBER: 474-3100-A | REV: 3
SCALE: .75 : 1 | SHEET: 1 OF 2



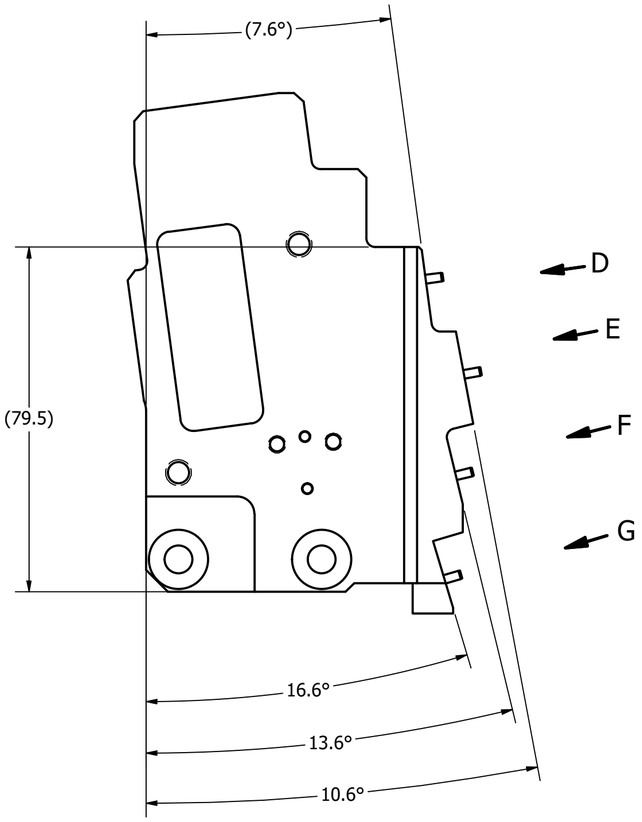
SCALE 1 : 1

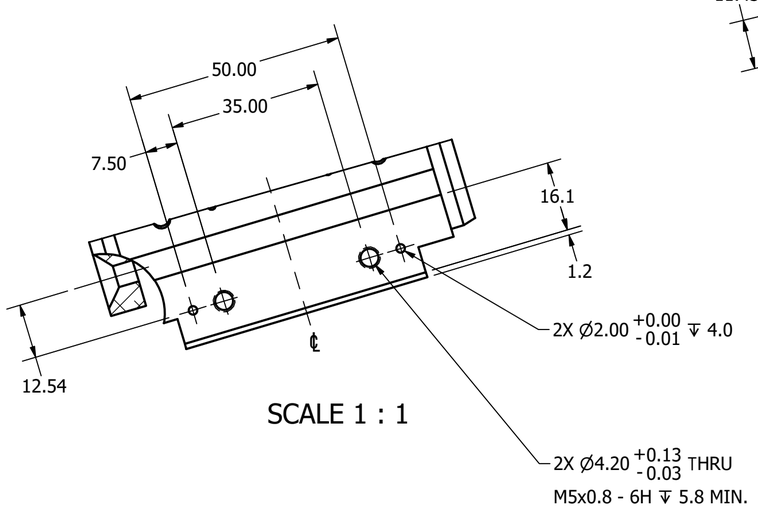


SCALE 1 : 1



SCALE 1 : 1





SCALE 1 : 1

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ✓ | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: rkimes	5/5/2022
CHECKED:	
ENG: HEC	8/1/2022
APPROVED:	

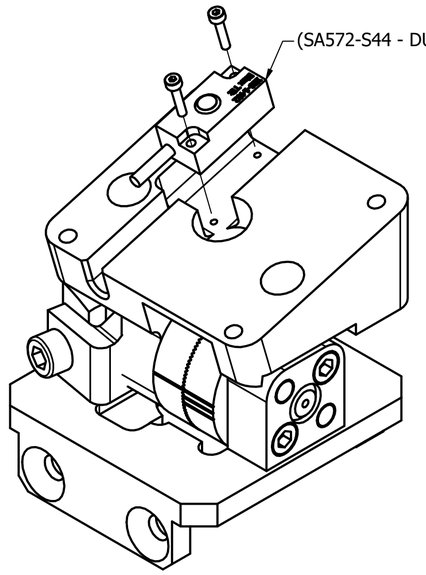
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

UPPER SPINE BOX
THOR-05F

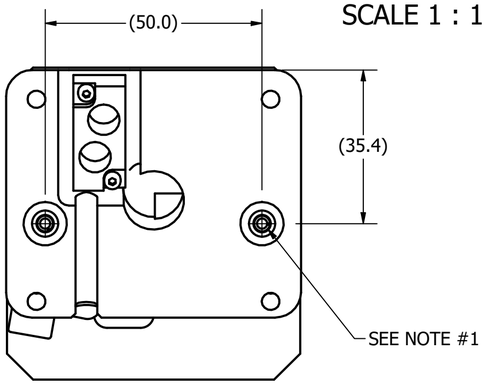
THIRD ANGLE PROJECTION

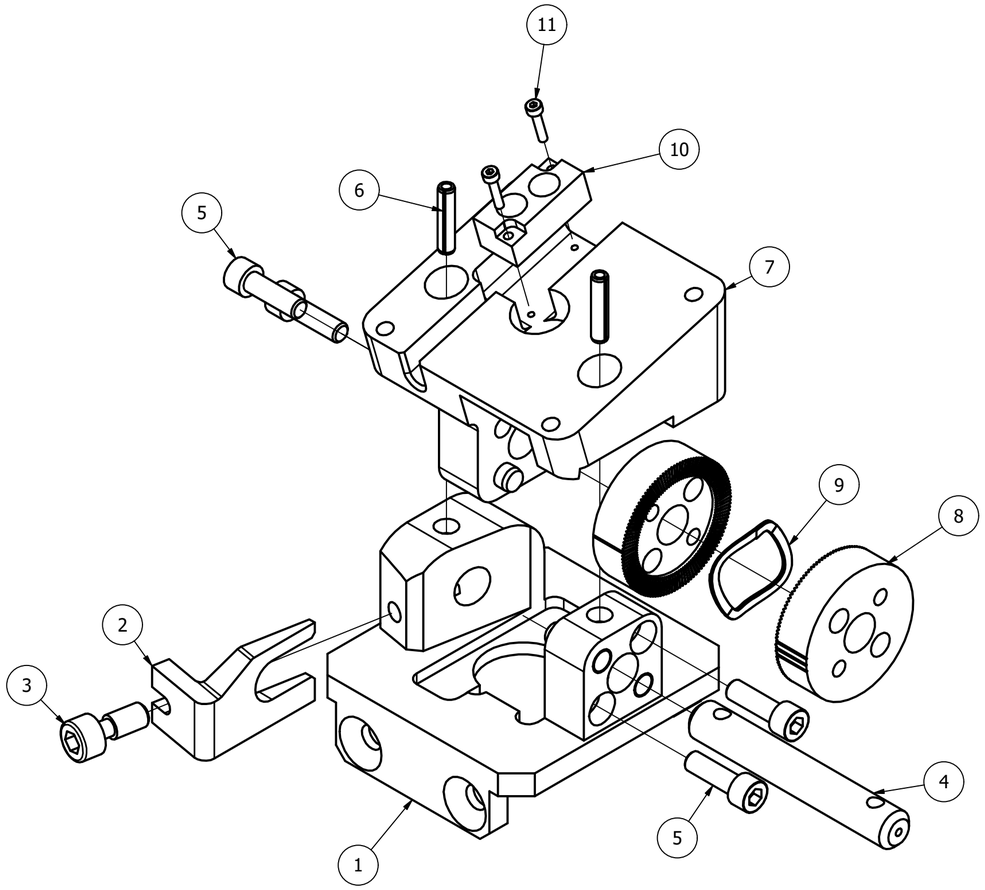
SIZE: A2 | DRAWING NUMBER: 474-3100-A | REV: 3
SCALE: 1 : 1 | SHEET: 2 OF 2

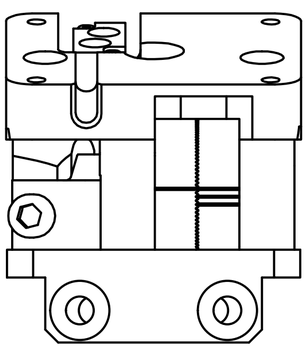
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	PROTOTYPE	KMSP	KMSP	7/13/2021



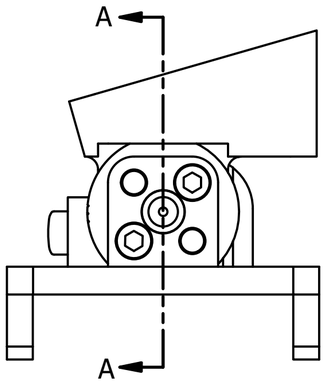
INSTRUMENT VIEW
SCALE 1 : 1

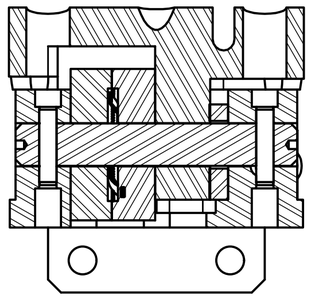






TOP VIEW
SCALE 1 : 1





SECTION A-A

ITEM	QTY	PART NUMBER	DESCRIPTION
11	2	5000215	M2 X 0.4 X 10 LG. SHCS
10	1	476-3604	TILT SENSOR S.R.
9	1	5001718	SPRING NESTED WAVE 17 X 24 X 4
8	1	474-3059	NECK POSTURE GEAR ASSEMBLY
7	1	474-3058	NECK INTERFACE PLATE, NECK POSTURE ADJUSTMENT
6	2	5001390	M4 X 18 LG. ROLL PIN
5	4	472-3638	M5 NECK PITCH CHANGE SCREW
4	1	474-3057	NECK ADJUSTMENT PIVOT PIN
3	1	474-3053	MODIFIED M6 X 1 X 14 LG. SHCS
2	1	474-3052	ADJUSTMENT WEDGE
1	1	474-3051	BASE PLATE, NECK POSTURE ADJUSTMENT

PARTS LIST

NOTES:

1. INSTALL (2X) ROLL PINS AS SHOWN IN SEC A-A.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	ghayden	3/23/2016
CHECKED		
ENG		
APPROVED		
MATERIAL		
HEAT TREAT		
FINISH		

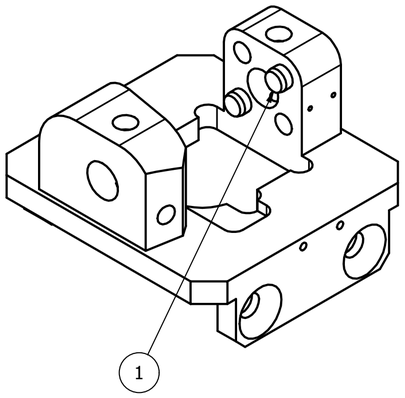
NECK POSTURE ADJUSTMENT ASSEMBLY
THOR-05F

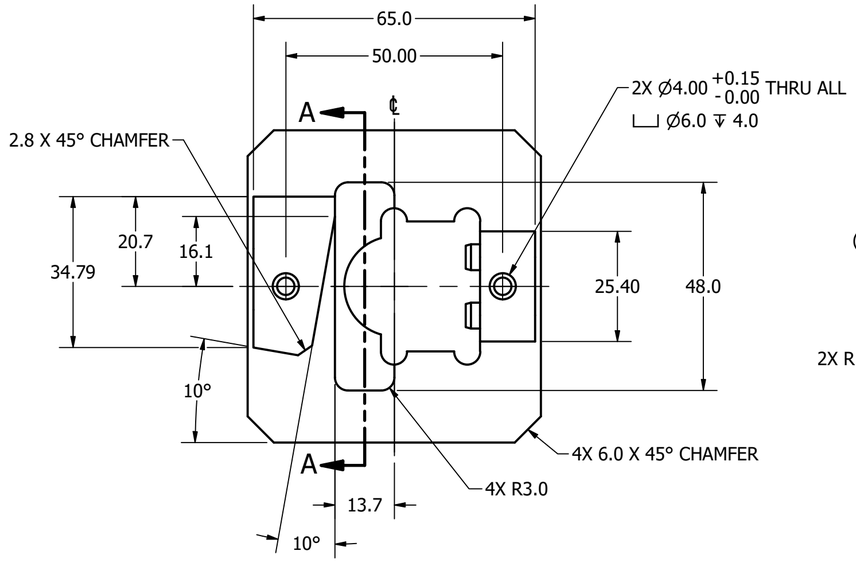
THIRD ANGLE PROJECTION

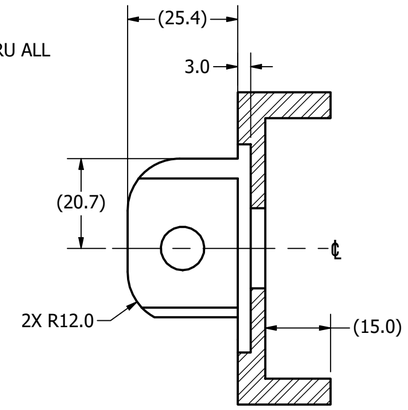
SIZE A2 | DRAWING NUMBER 474-3050 | REV 5

SCALE: 1 : 1 | SHEET 1 OF 1

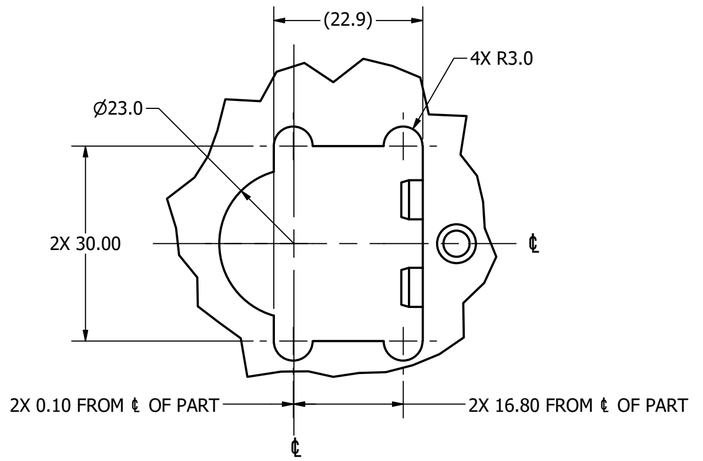
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	SKK	MJS	10/4/2024



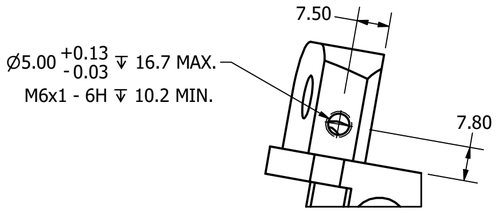


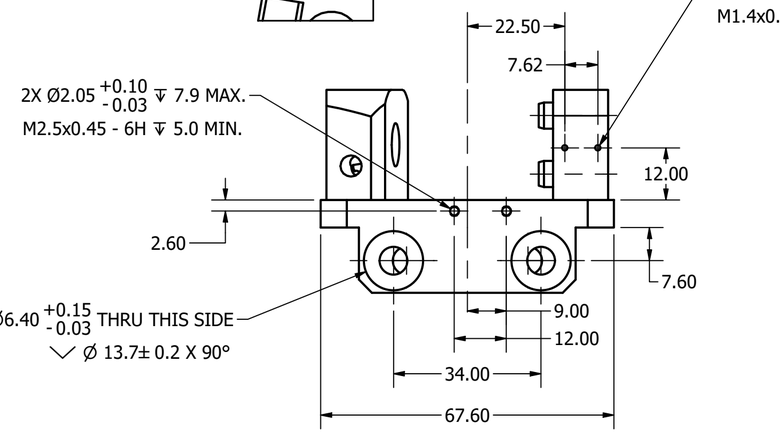


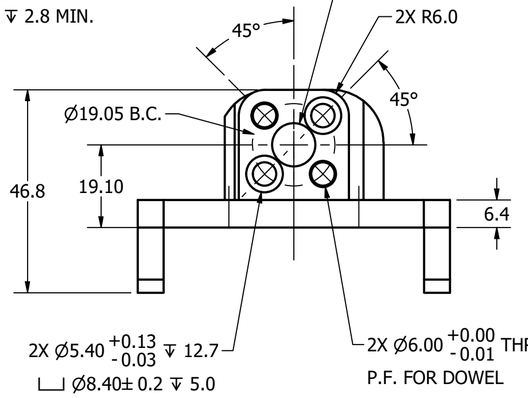
SECTION A-A

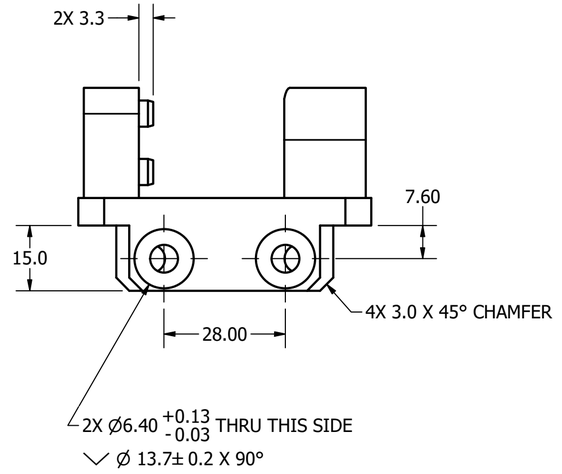


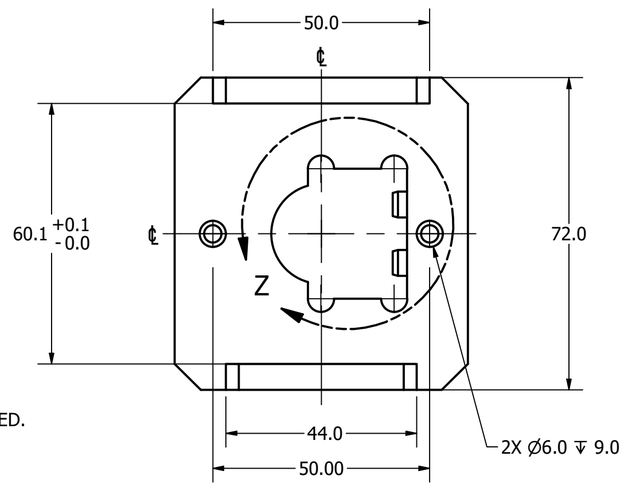
DETAIL Z
SCALE 1.5 : 1











NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

2. INSTALL DOWEL PINS AFTER PLATING.

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	5001266	M6 X 16 LG. DOWEL PIN

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

BASE PLATE, NECK POSTURE ADJUSTMENT

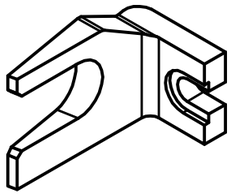
	APPROVALS	DATE
DRAWN	ghayden	3/23/2016
CHECKED		
ENG		
APPROVED		

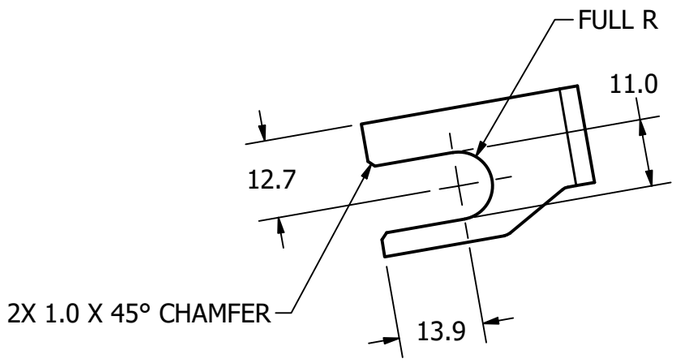
MATERIAL: 4140 DCFA
HEAT TREAT:
FINISH: 0.008 ELECTROLESS NICKEL PLATE PER SIDE

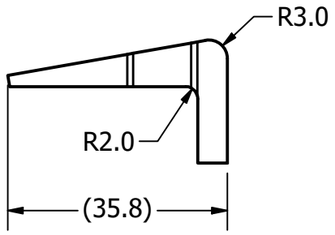
THIRD ANGLE PROJECTION

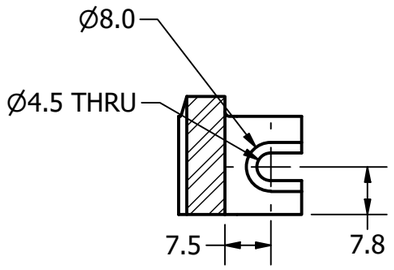
SIZE: A2 | DRAWING NUMBER: 474-3051 | REV: 4
SCALE: 1 : 1 | SHEET: 1 OF 1

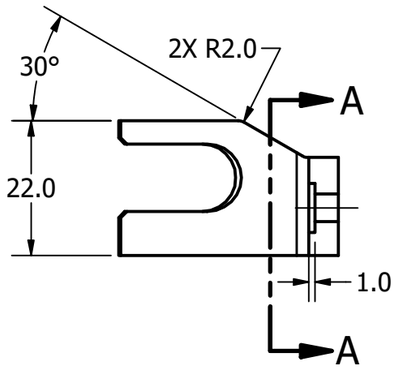
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	AB	JW	04/20/2017



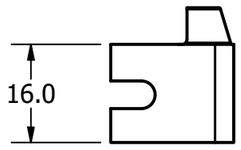


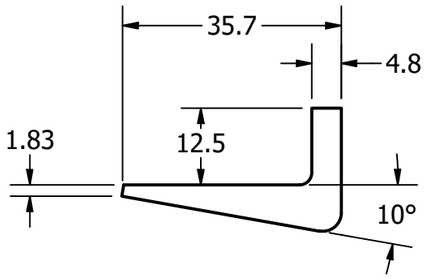






SECTION A-A





PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL:	MACHINED
X ±.5	ANGLES ±.5°
X.X ±.2	
X.XX ±.1	

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN ghayden	3/21/2016
CHECKED	
ENG	
APPROVED	

MATERIAL: 1018 STEEL
HEAT TREAT:
FINISH: 0.008 ELECTROLESS NICKEL PLATE PER SIDE

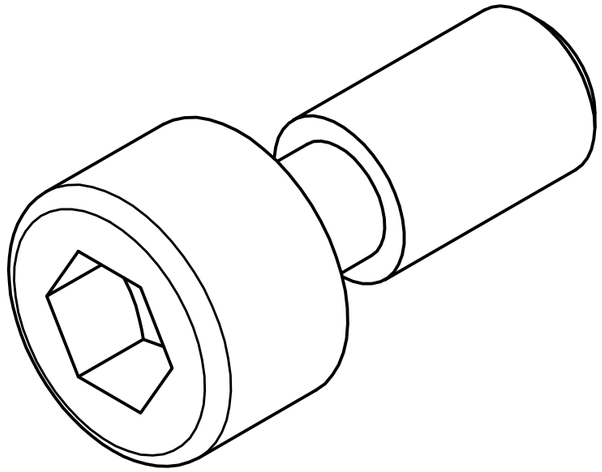
ADJUSTMENT WEDGE

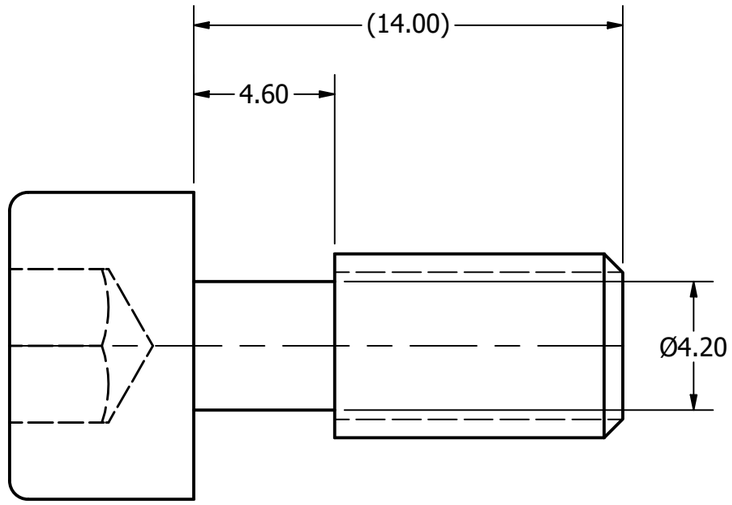
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A3	474-3052	2

SCALE: 1 : 1
SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	KMSP	KMSP	7/13/2021





NOTES:

1. MAKE FROM 5000604 (M6 X 1 X 14 SHCS), MODIFY AS SHOWN.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	3/21/2016
CHECKED:	
ENG:	
APPROVED:	

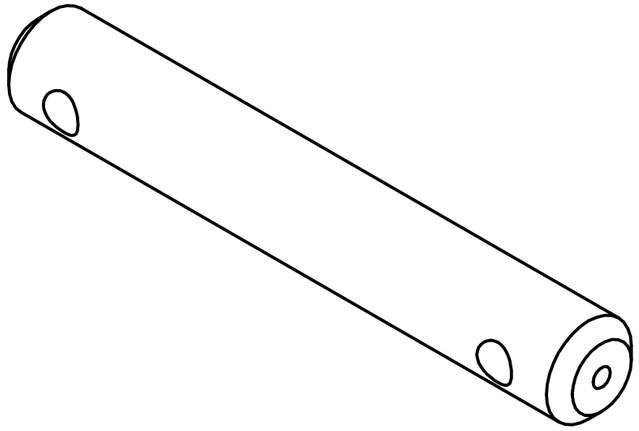
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

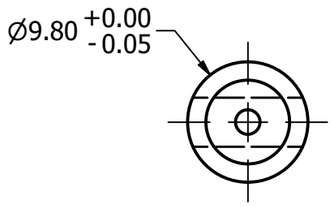
MODIFIED M6 X 1 X 14 LG. SHCS
THOR-05F

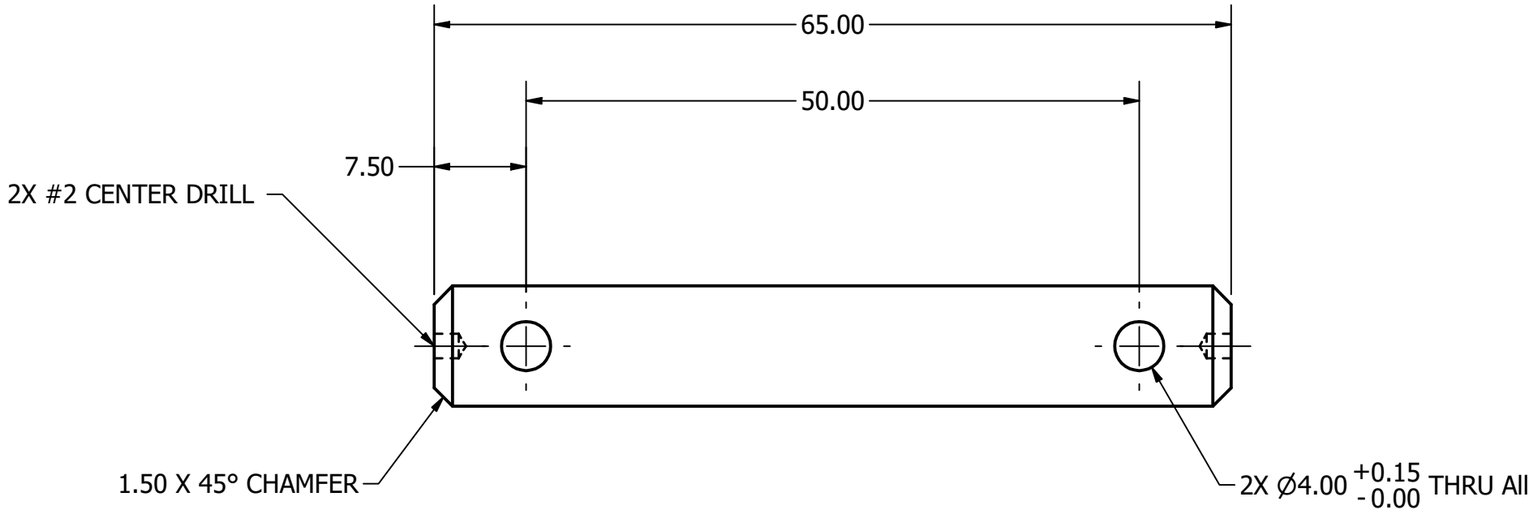
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-3053 | REV: 2
SCALE: 5 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	GCH		2/1/2017







PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN ghayden	3/18/2016
CHECKED	
ENG	
APPROVED	

MATERIAL: 1018 STEEL
HEAT TREAT:
FINISH: 0.008 ELECTROLESS NICKEL PLATE PER SIDE

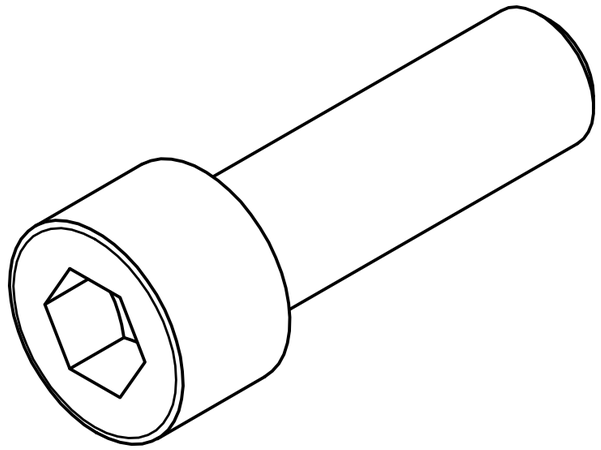
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

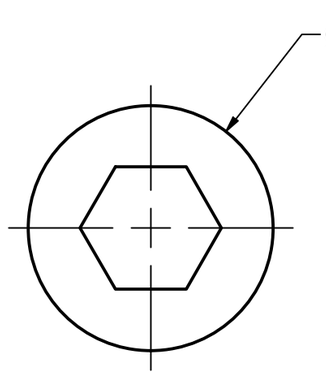
NECK ADJUSTMENT PIVOT PIN

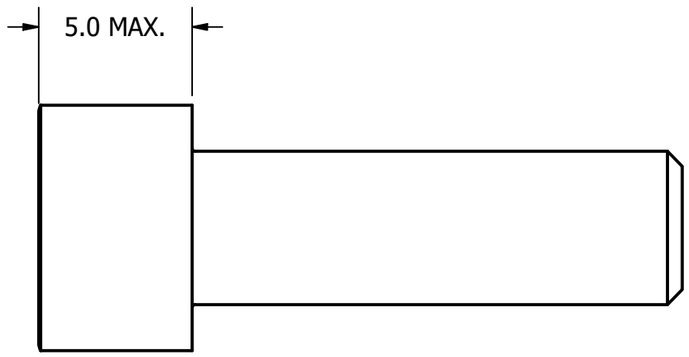
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-3057 | REV: 2
SCALE: 2 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	A	RELEASE FOR PRODUCTION	BK	JQG	7/13/2016







NOTES:

1. MAKE FROM M5x0.8 x 16 SHCS, MODIFY AS SHOWN.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

APPROVALS	DATE
DRAWN: B. KIMES	7/13/2016
CHECKED:	
ENG:	
APPROVED:	

THIRD ANGLE PROJECTION

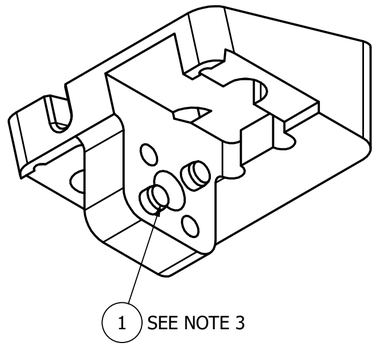
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

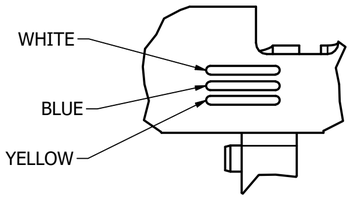
M5 NECK PITCH CHANGE SCREW

SIZE: A3 | DRAWING NUMBER: 472-3638 | REV: A

SCALE: 5:1 | SHEET: 1 OF 1

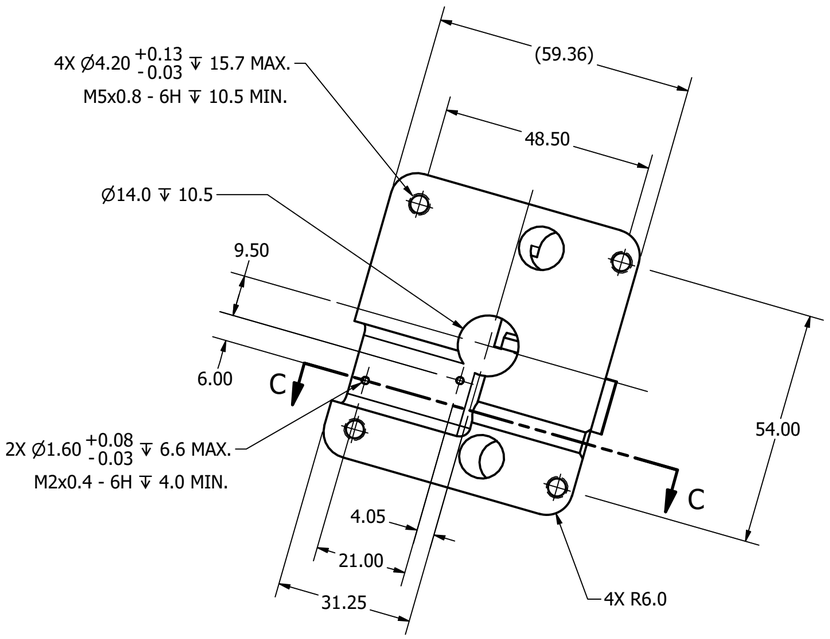
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	JW	9/27/2017

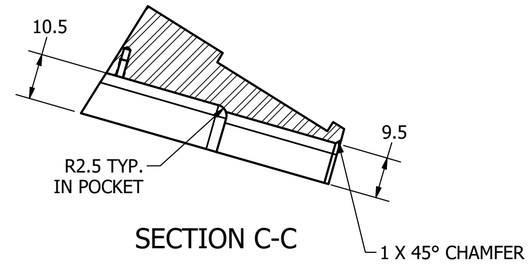




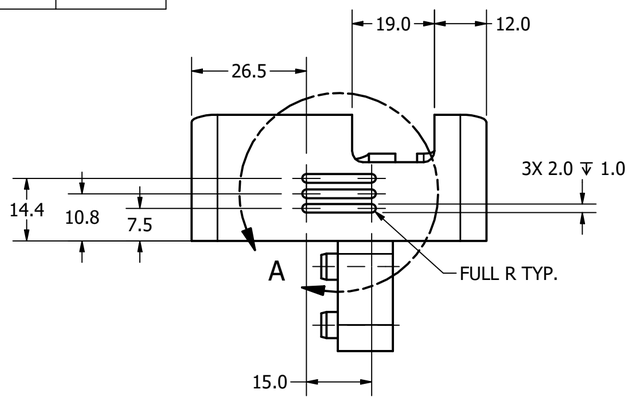
DETAIL A

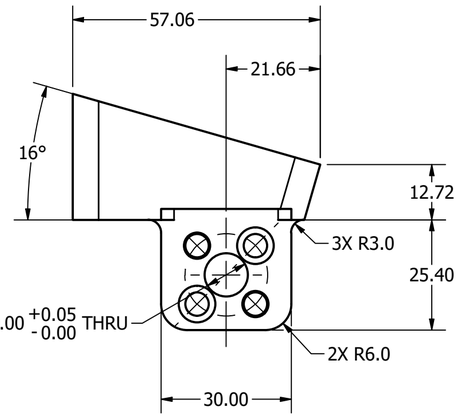
POSTURE CHART		
POSTURE	COLOR	ANGLE
NEUTRAL	WHITE	0°
FORWARD POSTURE 1	BLUE	6°
FORWARD POSTURE 2	YELLOW	12°

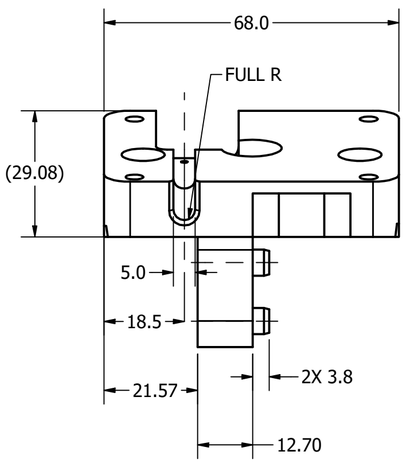


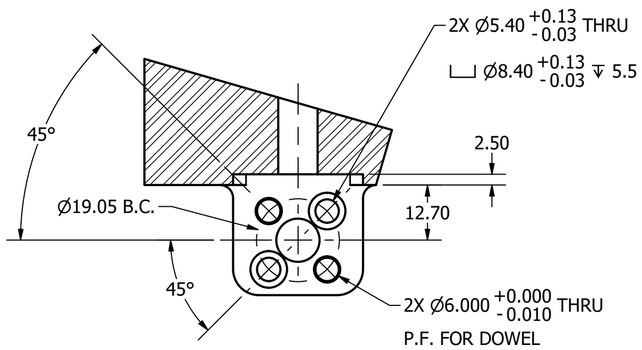


SECTION C-C

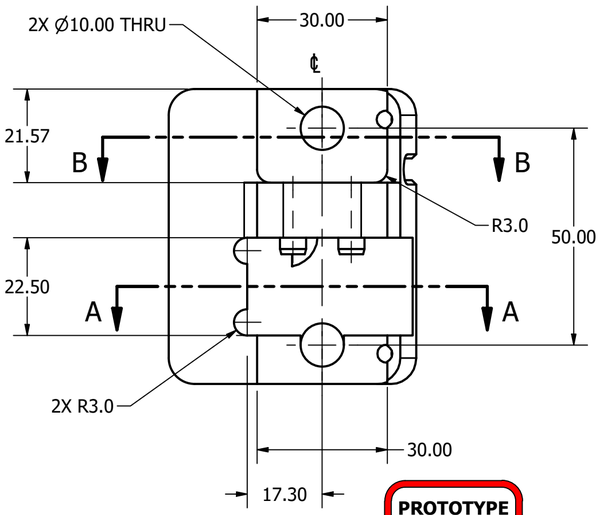


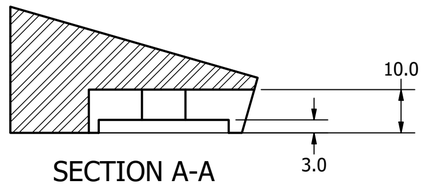






SECTION B-B





SECTION A-A

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. PAINT INDICATOR MARKS AS SHOWN IN DETAIL A.
3. INSTALL DOWEL PINS AFTER PLATING.

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	5001266	M6 X 16 LG. DOWEL PIN

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 4140 DCFA
HEAT TREAT:
FINISH: 0.008 ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	3/21/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

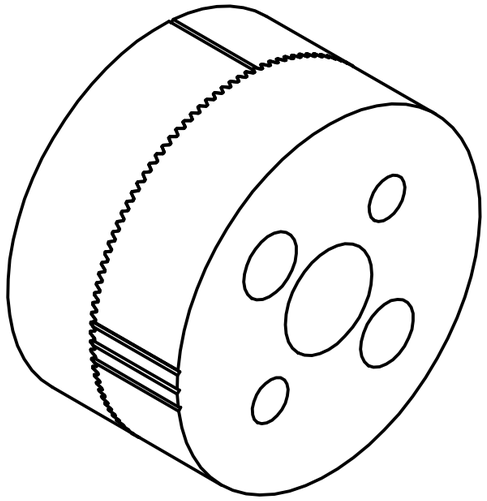
NECK INTERFACE PLATE, NECK POSTURE ADJUSTMENT

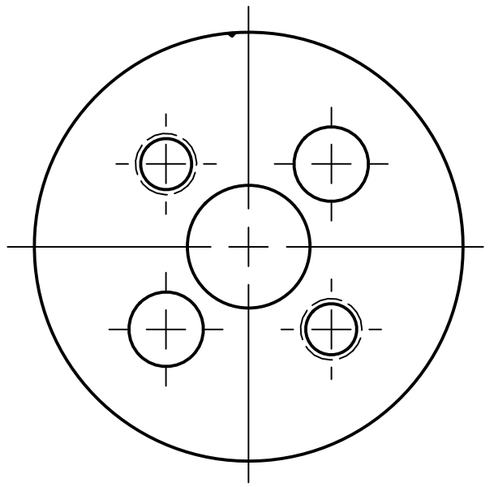
THIRD ANGLE PROJECTION

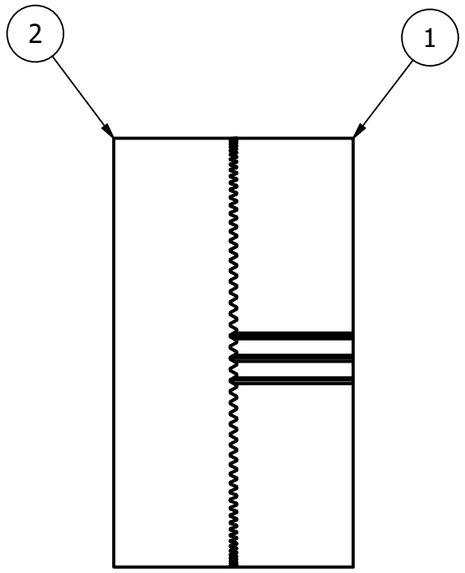
SIZE: A2 | DRAWING NUMBER: 474-3058 | REV: 2

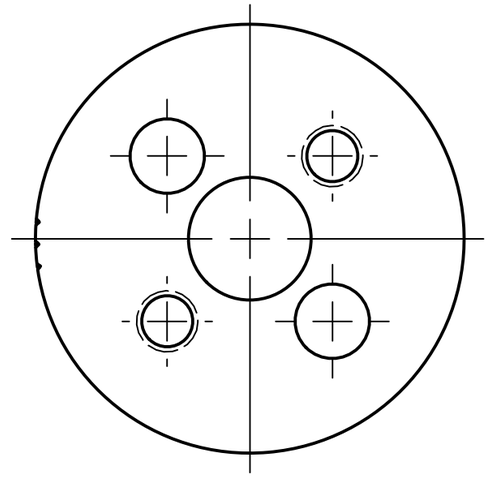
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	SKR		5/22/2019









NOTES:

1. TEETH MUST BE FULLY ENGAGED WITHOUT MECHANICAL PLAY.

2. ENSURE DOWEL HOLES MEET SIZE REQUIREMENTS OF THE INDIVIDUAL PART DRAWINGS 474-3054 AND 474-3055.

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	474-3055	TOP NECK POSTURE GEAR
1	1	474-3054	BOTTOM NECK POSTURE GEAR

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

NECK POSTURE GEAR ASSEMBLY

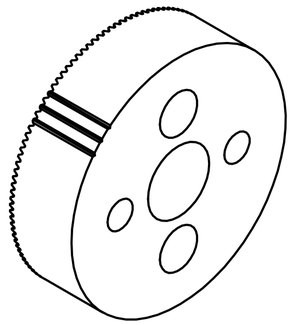
APPROVALS	DATE
DRAWN: J. MCINNIS	11/29/2016
CHECKED	
ENG	
APPROVED	

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

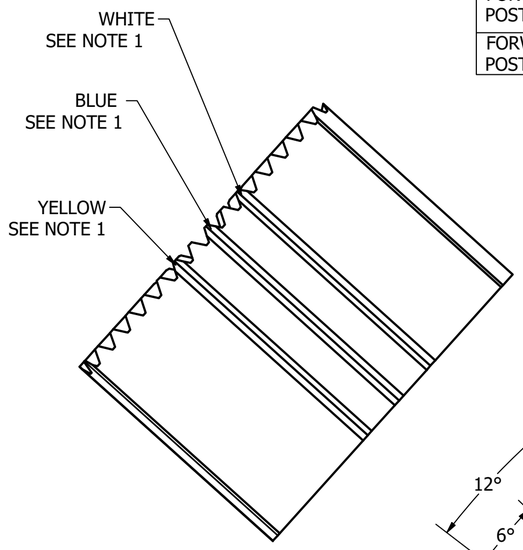
THIRD ANGLE PROJECTION

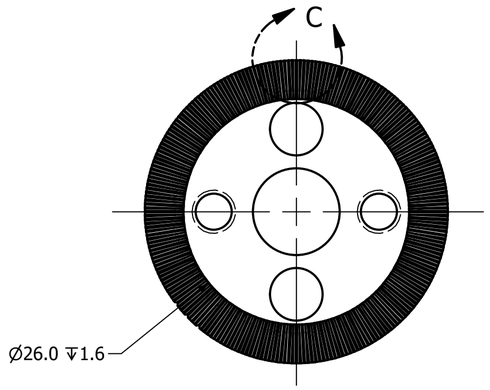
SIZE: A3 | DRAWING NUMBER: 474-3059 | REV: 2
SCALE: 2 : 1 | SHEET: 1 OF 1

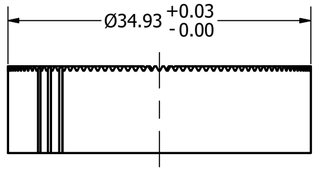
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	SKR		5/22/2019

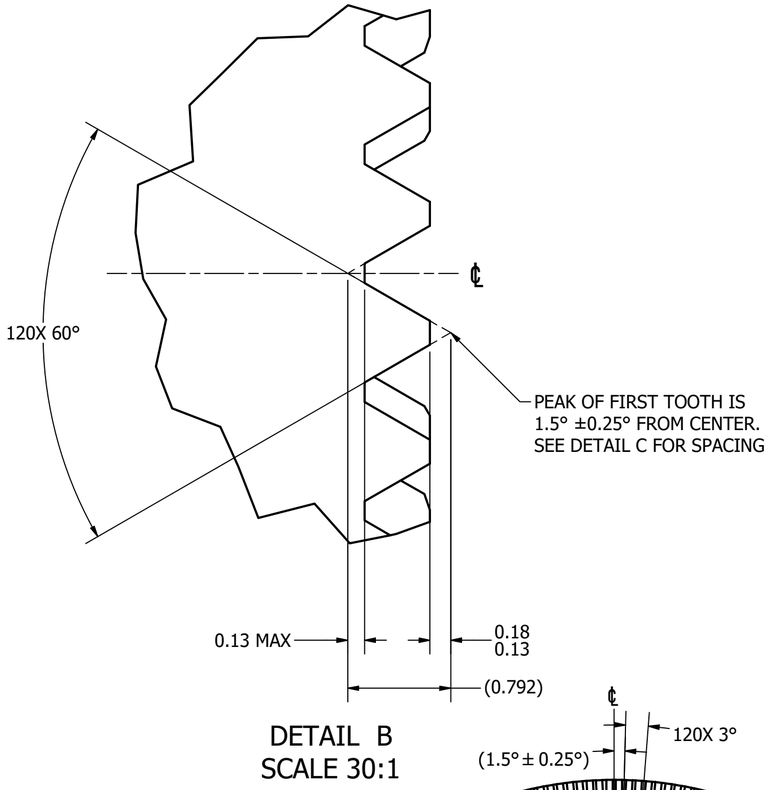


POSTURE CHART		
POSTURE	COLOR	ANGLE
NEUTRAL	WHITE	0°
FORWARD POSTURE 1	BLUE	6°
FORWARD POSTURE 2	YELLOW	12°

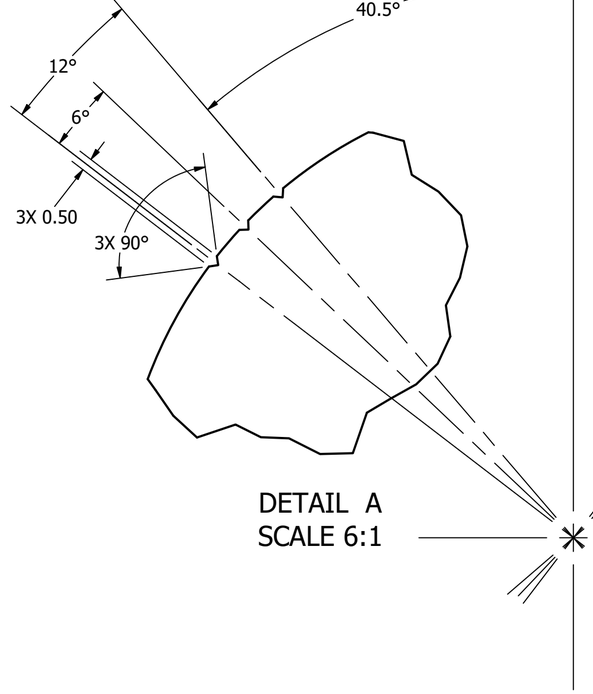




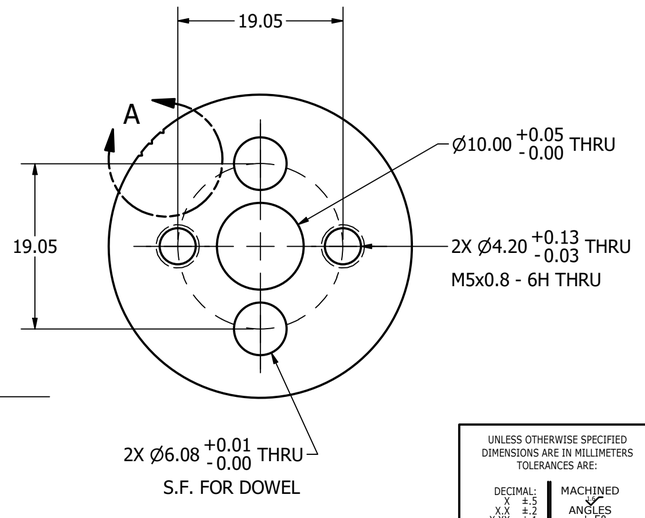


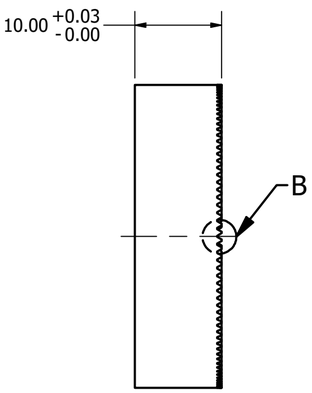


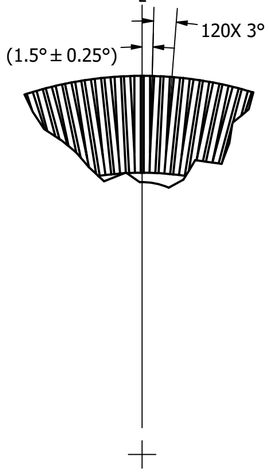
DETAIL B
SCALE 30:1



DETAIL A
SCALE 6:1







DETAIL C
SCALE 5 : 1

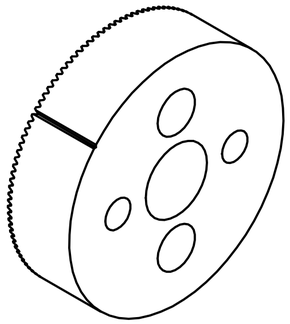
NOTES:

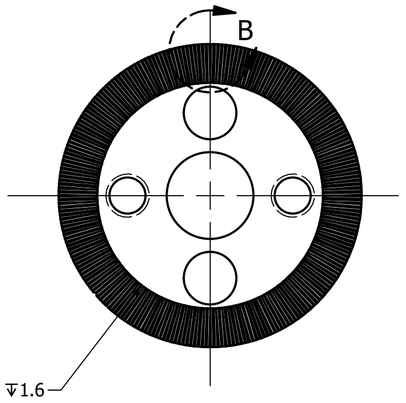
1. PAINT INDICATOR MARKS AS SHOWN.

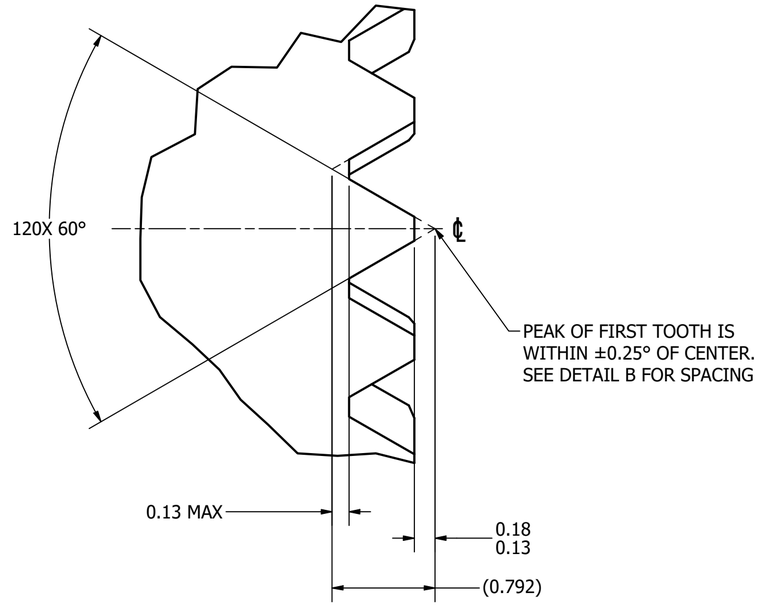
PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	BOTTOM NECK POSTURE GEAR
MATERIAL 440C STAINLESS STEEL	DRAWN ghayden	3/23/2016	
HEAT TREAT Rc 56-59	CHECKED		
FINISH N/A	ENG		
	APPROVED		THIRD ANGLE PROJECTION
			SIZE A2 · DRAWING NUMBER 474-3054 · REV 3 · SCALE: 2:1 · SHEET 1 OF 1

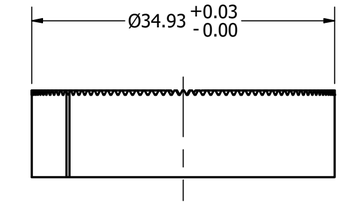
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	SKR		5/22/2019

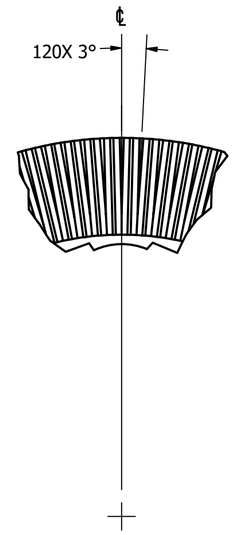




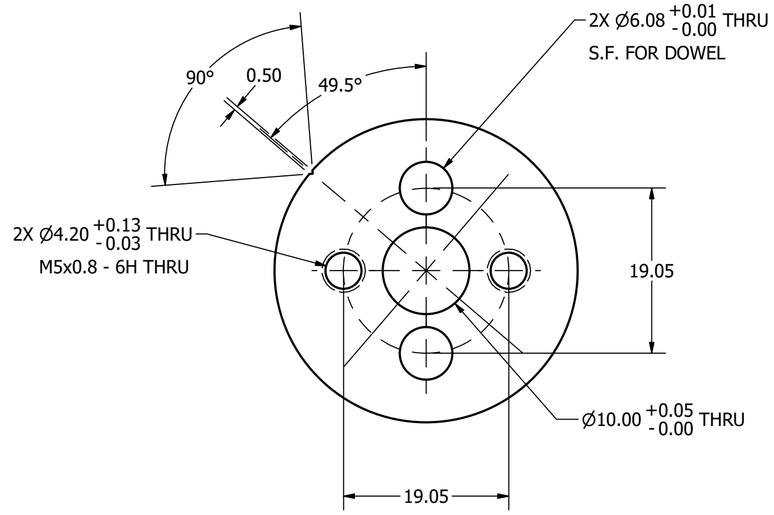


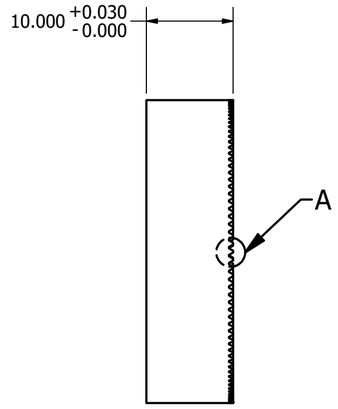
DETAIL A
SCALE 30:1





DETAIL B
SCALE 5:1





PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 440C STAINLESS STEEL
HEAT TREAT: Rc 56-59
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN ghayden	3/23/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

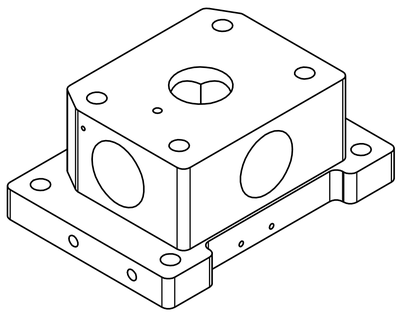
TOP NECK POSTURE GEAR

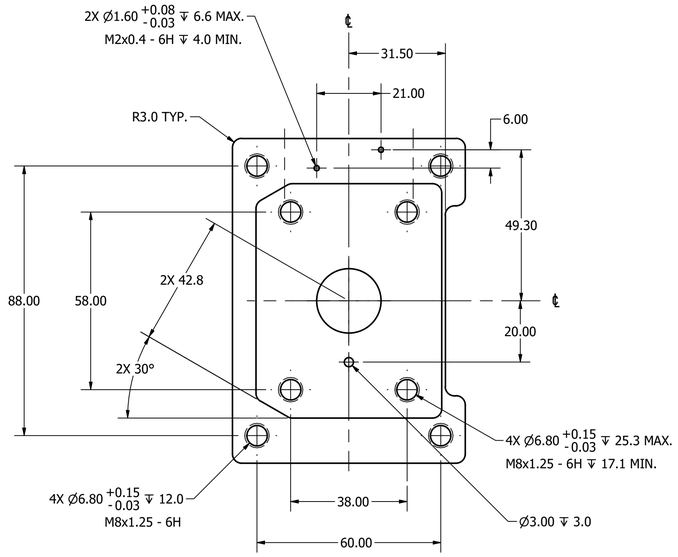
THIRD ANGLE PROJECTION

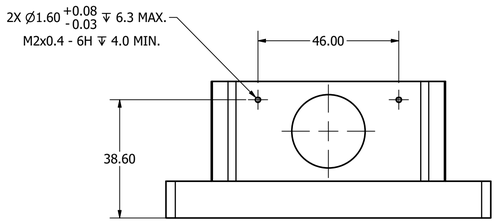
SIZE	DRAWING NUMBER	REV
A2	474-3055	3

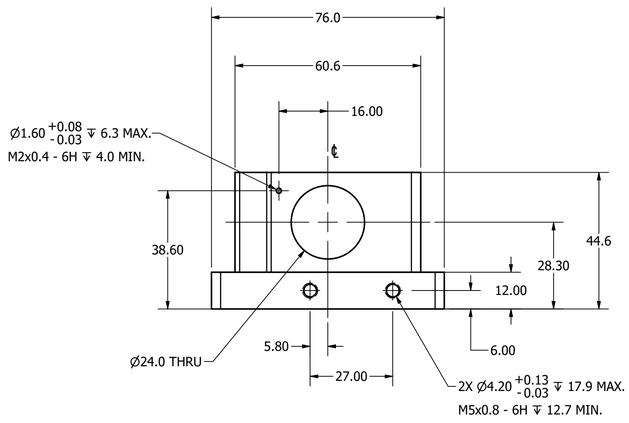
SCALE: 2:1 | SHEET 1 OF 1

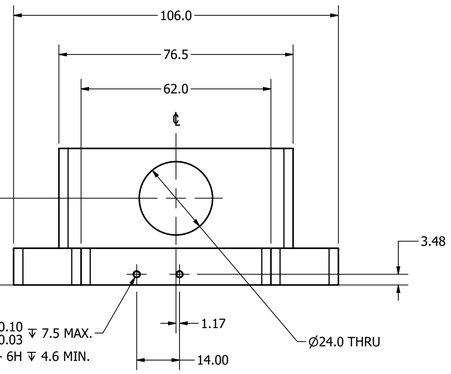
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	HEC	DJI	3/16/2023

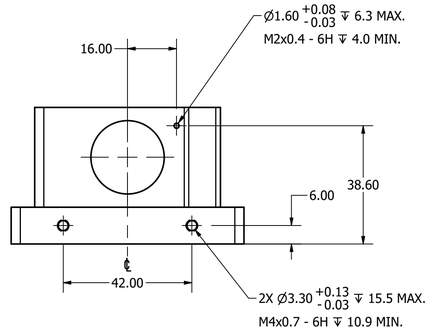


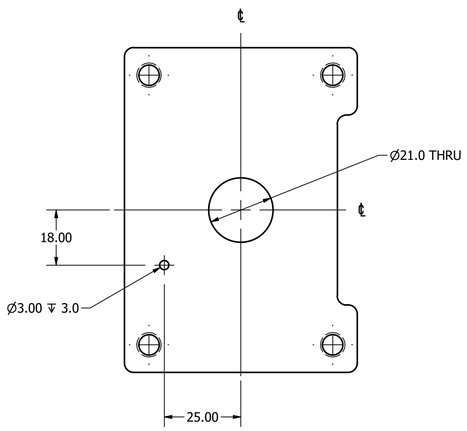












NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±1.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	7075-T6 ALUMINUM	
HEAT TREAT	N/A	
FINISH	CLEAR ANODIZE	

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN skantola	4/27/2022
CHECKED	
ENG MJS	4/27/2022
APPROVED	

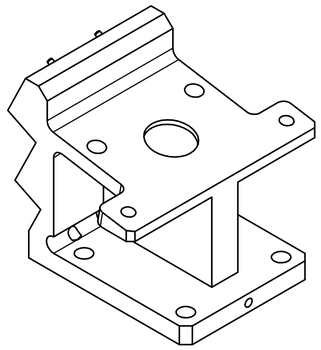
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

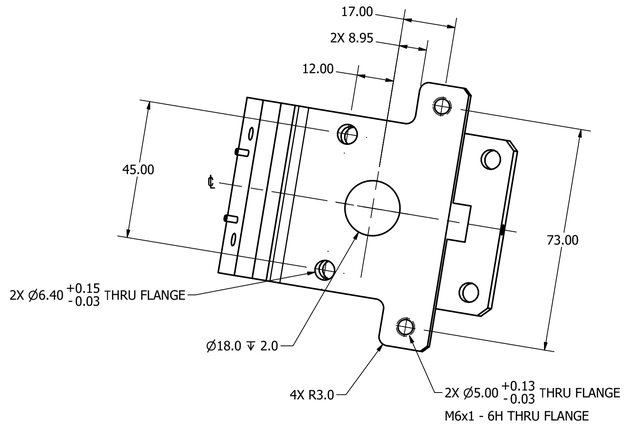
STRUCTURAL REPLACEMENT, THORACIC SPINE LOAD CELL
THOR-05F

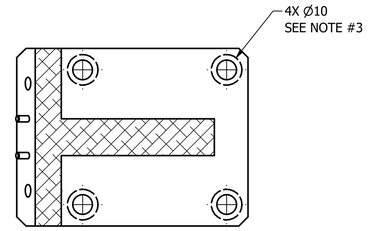
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A1	474-3202-A	2
SCALE: 1 : 1	SHEET 1 OF 1	

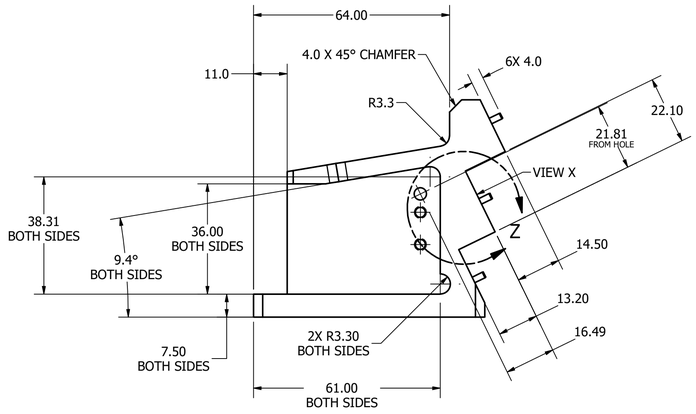
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	DJI	2/7/2023

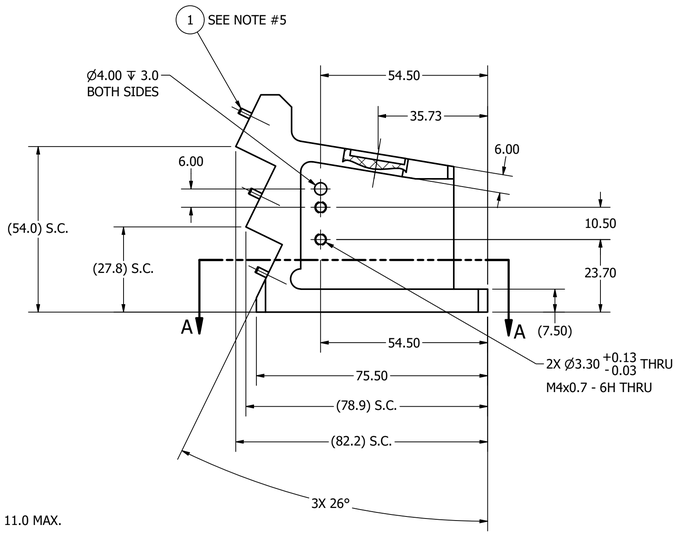


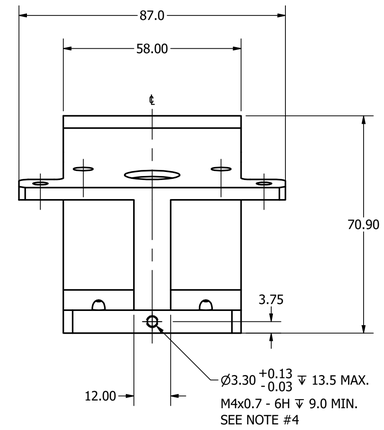


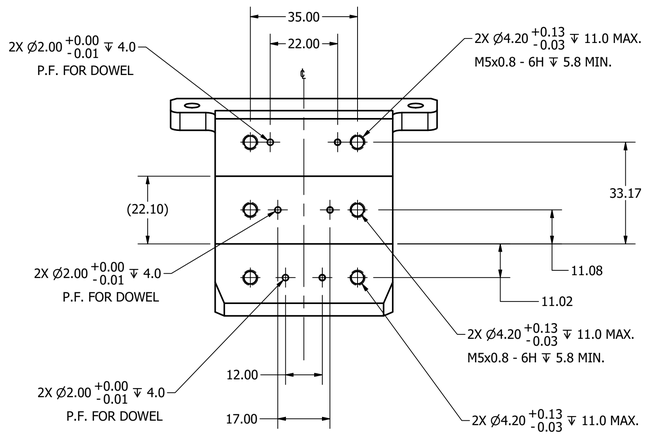


SECTION A-A

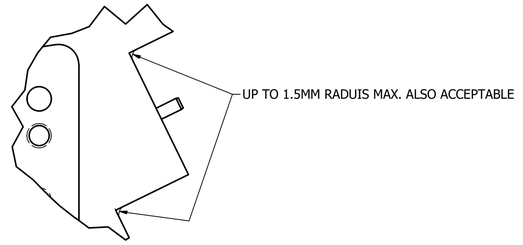




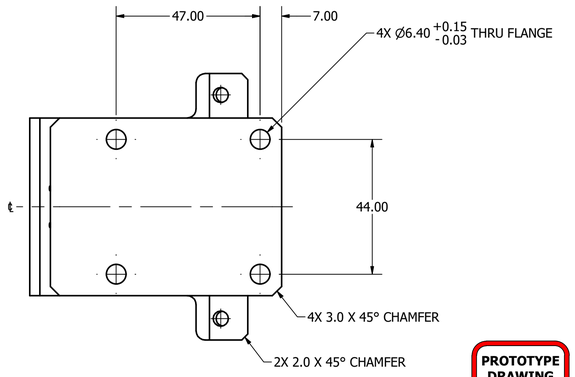




VIEW X



DETAIL Z
SCALE 2 : 1



NOTES:

1. DIMENSIONS ARE SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE NOTED.
2. FINISH: PRE-FINISH: CLEAR IRIDITE
   FINAL FINISH: CLEAR ANODIZE
3. MASK HOLES AS SHOWN AFTER IRIDITE & PLUG BEFORE ANODIZE.
4. PLUG HOLES BEFORE ANODIZE.
5. INSTALL DOWEL PINS AFTER IRIDITE & ANODIZE.

ITEM	QTY	PART NUMBER	DESCRIPTION
1	6	5000064	M2 X 8 LG. DOWEL PIN

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMALS: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: jhaefner	3/17/2016
CHECKED:	
ENG: JW	3/16/2016
APPROVED:	

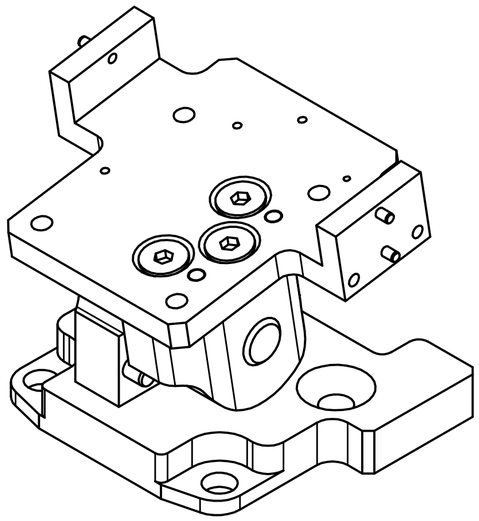
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

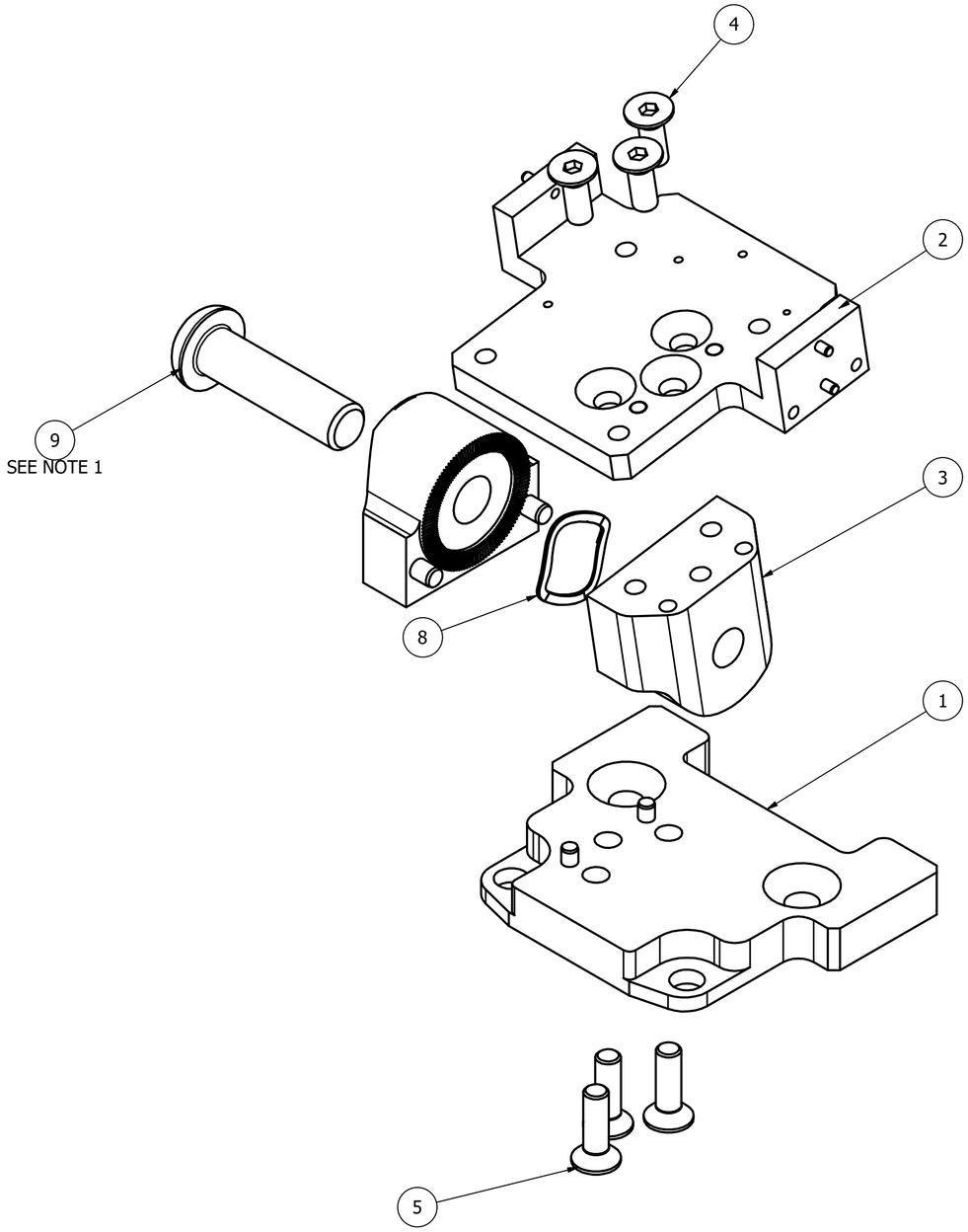
LOWER SPINE BOX ASSEMBLY
THOR-05F

THIRD ANGLE PROJECTION

SIZE: A1 | DRAWING NUMBER: 474-3101-A | REV: 1
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	BK	HEC	11/10/2022





ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	474-3072	SPINEBOX INTERFACE PLATE, LUMBAR POSTURE ADJUSTMENT
9	1	5001835	M12 X 1.75 X 45 LG. BHCS ZINC
8	1	5001718	SPRING NESTED WAVE 17 X 24 X 4
5	3	5001089	M6 X 1 X 20 LG. FHCS
4	3	5000090	M6 X 1 X 16 LG. FHCS
3	1	474-3068-A	LUMBAR POSTURE GEAR ASSEMBLY
1	1	474-3071-A	BASE PLATE, LUMBAR POSTURE ADJUSTMENT

PARTS LIST

NOTES:
1. TORQUE TO 50ftlbs (68Nm) ± 10%

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	11/8/2022
CHECKED	
ENG	
APPROVED	

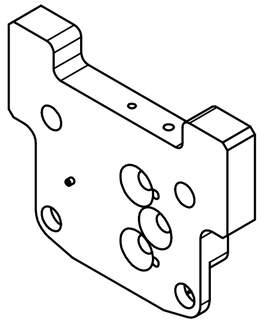
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LUMBAR SPINE PITCH CHANGE ASSEMBLY
THOR-05F

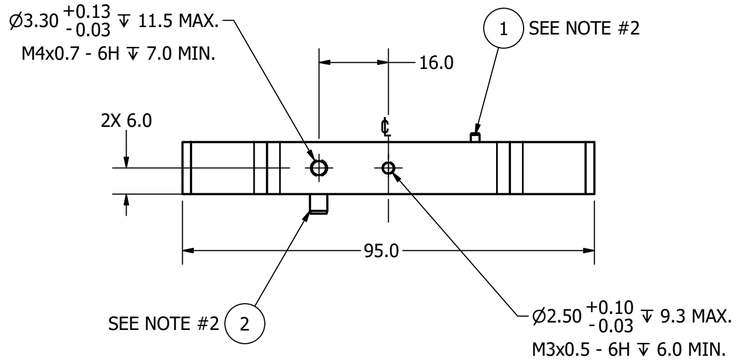
THIRD ANGLE PROJECTION

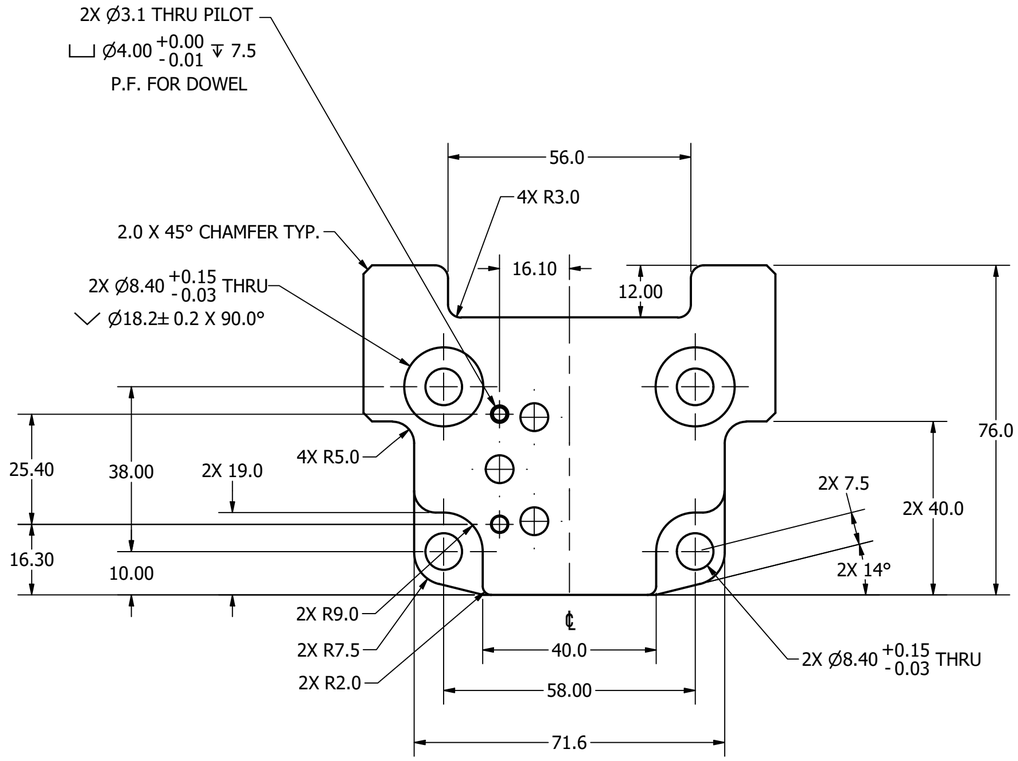
SIZE: A2 | DRAWING NUMBER: 474-3220-A | REV: 3
SCALE: 1 : 1 | SHEET: 1 OF 1

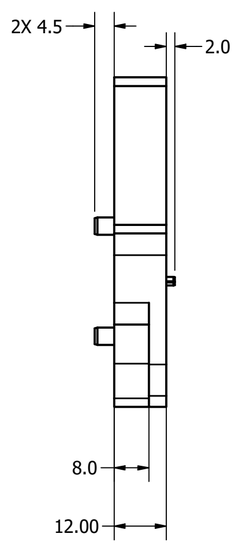
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	HEC	8/14/2024

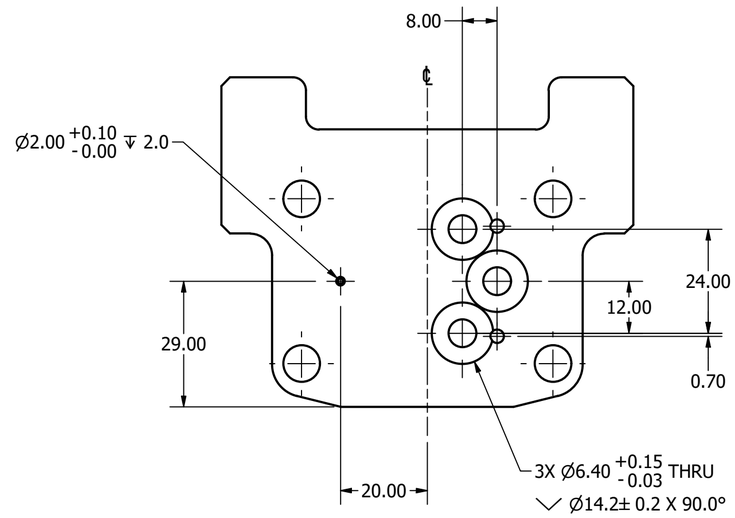


SCALE 0.75 : 1









ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	5000403	M4 X 12 LG. DOWEL PIN
1	1	5000765	M2 X 4 LG. ROLL PIN

PARTS LIST

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE SPECIFIED.

2. INSTALL PINS AS SHOWN AFTER FINISH.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL:
HEAT TREAT: N/A
FINISH: 0.008 ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: skantola	10/26/2022
CHECKED:	
ENG: SKK	10/31/2022
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

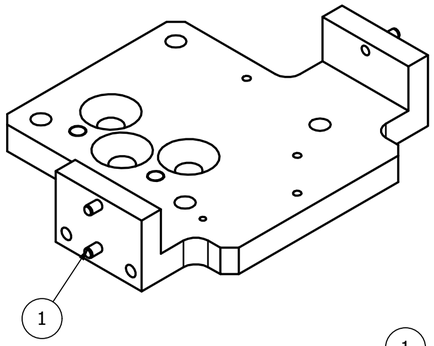
BASE PLATE, LUMBAR POSTURE ADJUSTMENT

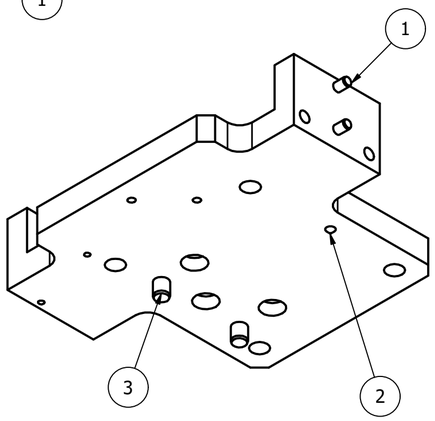
THIRD ANGLE PROJECTION

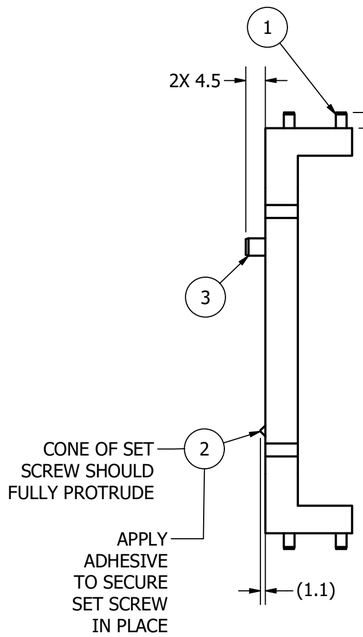
SIZE: A2 | DRAWING NUMBER: 474-3071-A | REV: 1

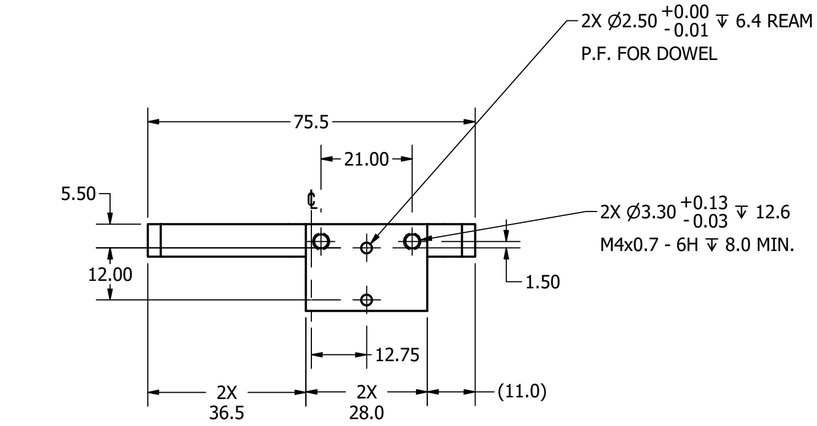
SCALE: 1 : 1 | SHEET: 1 OF 1

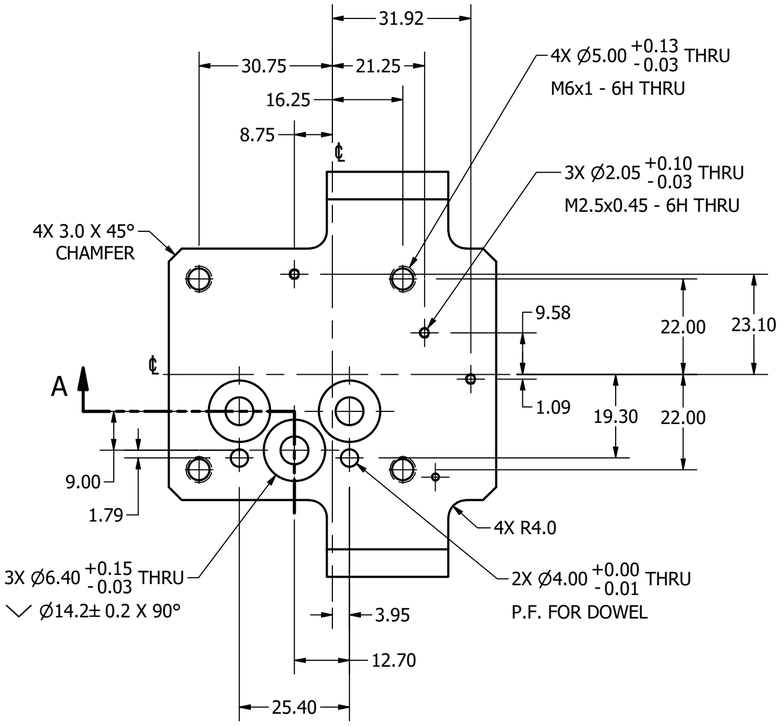
REVISION HISTORY					
ECO#	REV	DESCRIPTION	ENG'R.	CHECK	DATE
	1	RELEASE FOR PROTOTYPE	JSD	DJI	6/19/2024

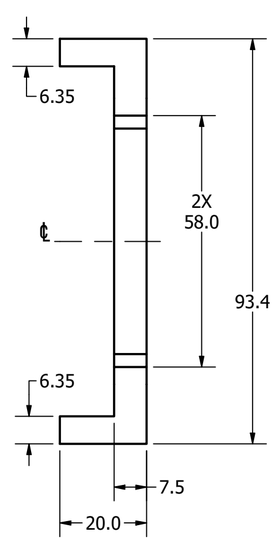


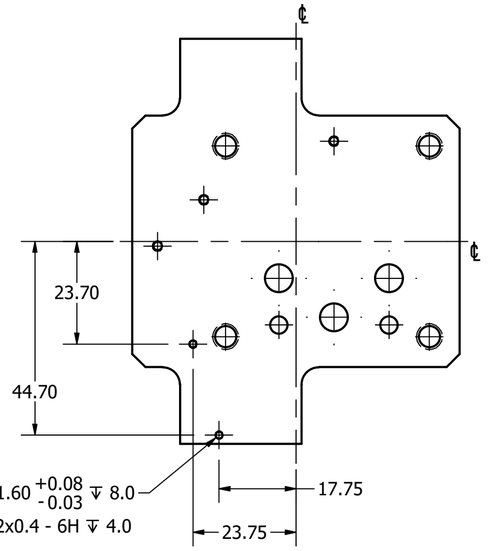


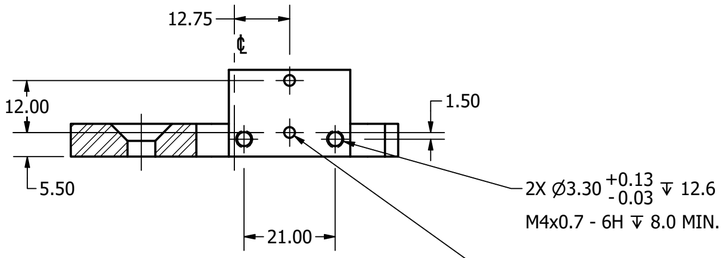












SECTION A-A
SCALE 1 : 1

ITEM	QTY	PART NUMBER	DESCRIPTION
3	2	5000403	M4 X 12 LG. DOWEL PIN
2	1	5001507	M2.5 X 0.45 X 6 LG. SSS CONE PT.
1	4	5000869	M2.5 X 8 LG. DOWEL PIN

PARTS LIST

NOTES:
1. INSERT DOWELS AND SET SCREW AFTER PLATING.
2. ALL DIMENSIONS ARE SYMMETRICAL ABOUT CENTERLINE, UNLESS NOTED OTHERWISE.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 4140 DCFA
HEAT TREAT:
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JSD	6/7/2024
CHECKED	
ENG DJI	6/19/2024
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

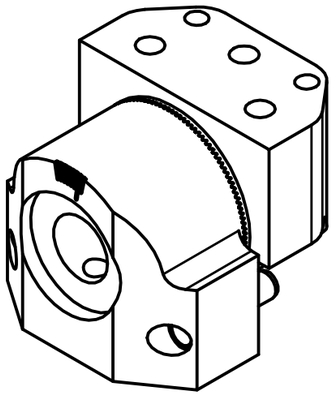
SPINEBOX INTERFACE PLATE, LUMBAR POSTURE ADJUSTMENT

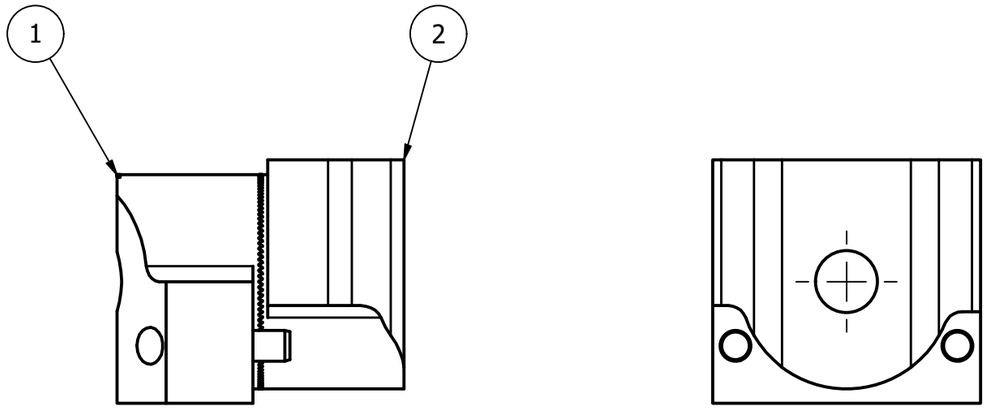
THIRD ANGLE PROJECTION

SIZE A2 | DRAWING NUMBER 474-3072 | REV 1

SCALE: 1 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	RM	DJI	12/07/2022





NOTES:

1. TEETH MUST BE FULLY ENGAGED WITHOUT MECHANICAL PLAY.

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	474-3065-A	TOP LUMBAR POSTURE GEAR
1	1	474-3063-A	BOTTOM LUMBAR POSTURE GEAR

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN A. Barchock	11/16/2022
CHECKED	
ENG	
APPROVED	

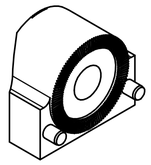
MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

LUMBAR POSTURE GEAR ASSEMBLY
THOR-05F

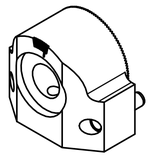
THIRD ANGLE PROJECTION

SIZE: A3
DRAWING NUMBER: 474-3068-A
REV: 2
SCALE: 1 : 1
SHEET: 1 OF 1

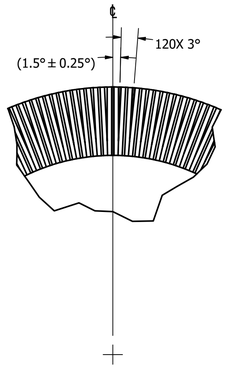
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	TM	DJI	02/09/2023



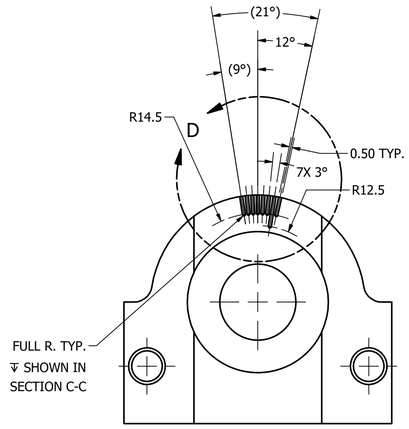
SCALE 1 : 1

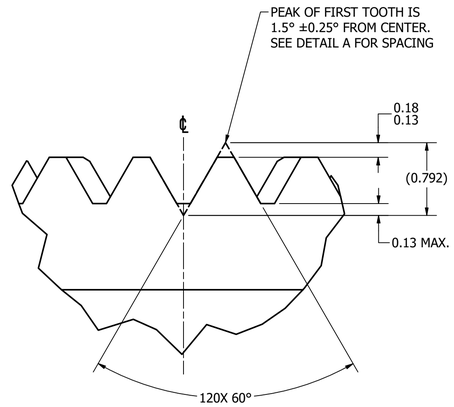


SCALE 1 : 1

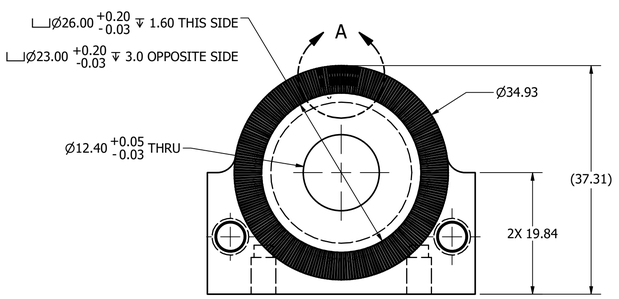


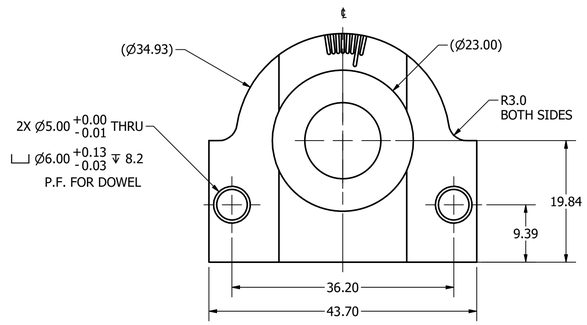
DETAIL A
SCALE 5:1



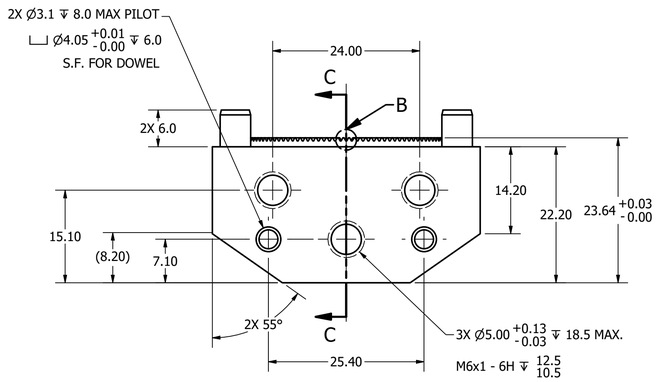


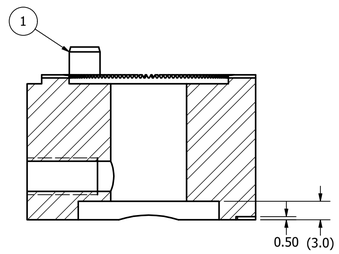
DETAIL B
SCALE 30:1



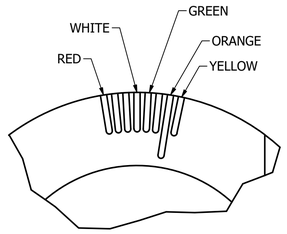


DOWEL PINS NOT SHOWN





SECTION C-C



DETAIL D
SCALE 4 : 1

POSTURE CHART		
POSTURE	COLOR	ANGLE
ERECT	RED	-9°
NEUTRAL	WHITE	0°
45° SEAT BACK	GREEN	3°
SLOUCHED (UMTRI AMVO POSTURE)	ORANGE	9°
SUPER SLOUCHED	YELLOW	12°

NOTES:

1. PAINT INDICATOR MARKS AS SHOWN IN DETAIL D.
2. DIMENSION SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE NOTED.

ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	5001155	M5 X 20 LG. DOWEL PIN

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 440C STAINLESS STEEL
HEAT TREAT: Rc 56-60
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

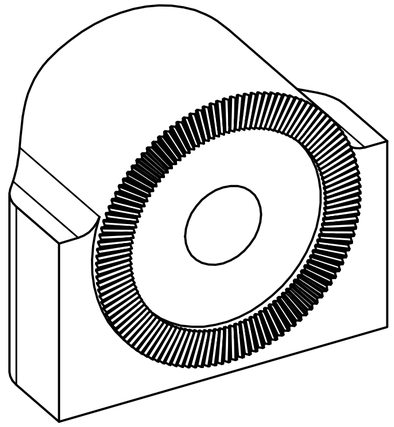
APPROVALS	DATE
DRAWN: A. Barchock	11/16/2022
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

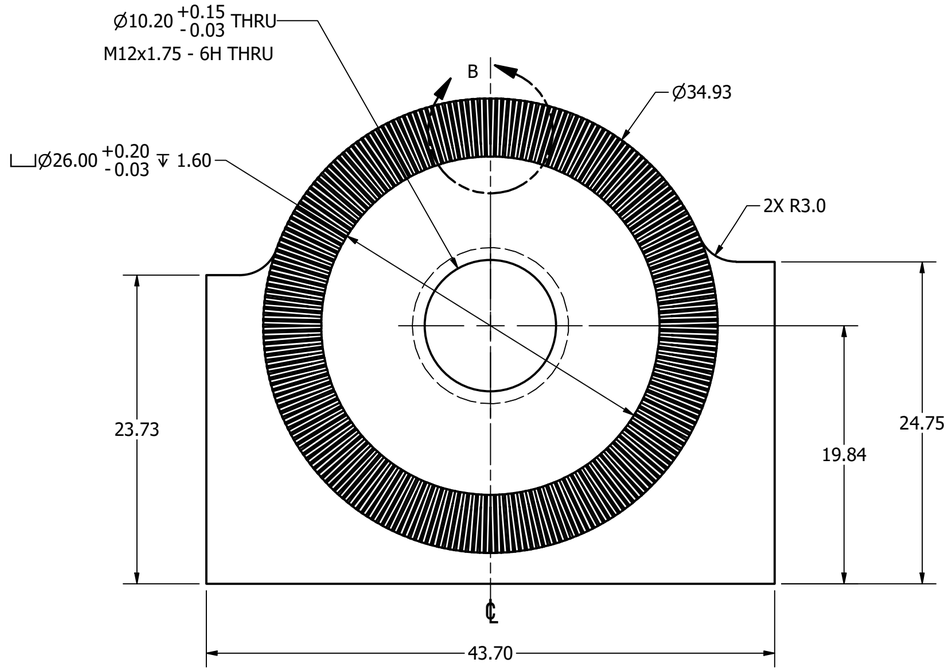
BOTTOM LUMBAR POSTURE GEAR
THOR-05F

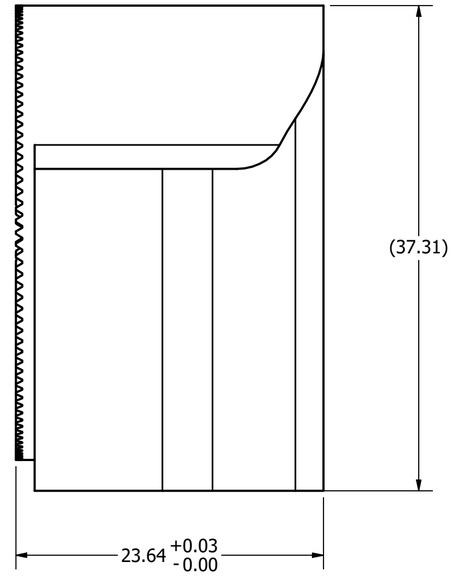
THIRD ANGLE PROJECTION
SIZE: A1 | DRAWING NUMBER: 474-3063-A | REV: 4
SCALE: 2 : 1 | SHEET: 1 OF 1

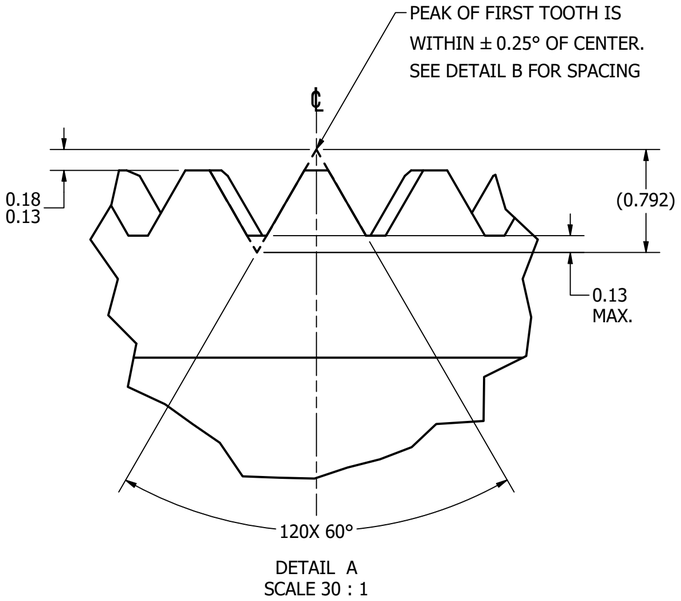
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	TM	DJI	02/09/2023



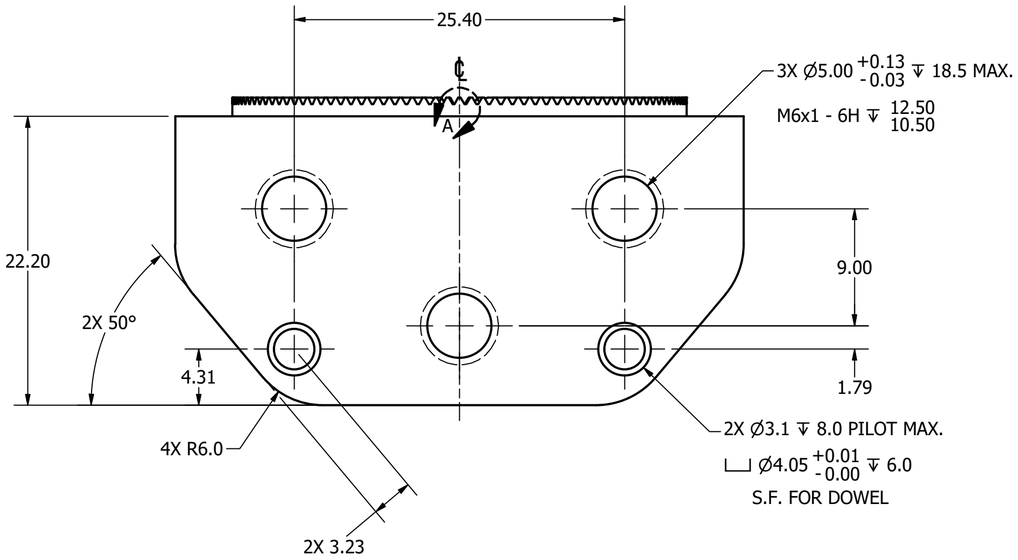
SCALE 2 : 1

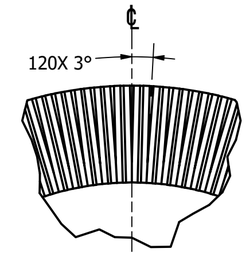






DETAIL A
SCALE 30 : 1





DETAIL B
SCALE 5 : 1

NOTES:

1. DIMENSIONS ARE SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 440C STAINLESS STEEL
HEAT TREAT: Rc 56-60
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: rmanjanna	12/6/2022
CHECKED:	
ENG: DJI	12/6/2022
APPROVED:	

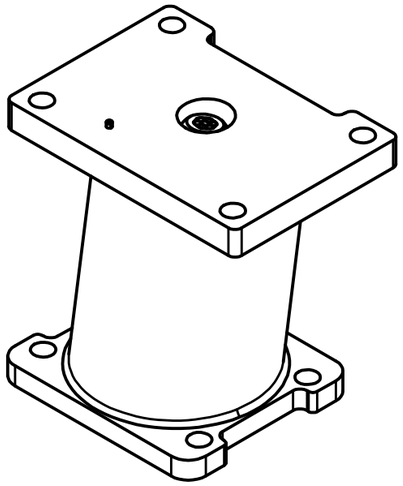
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

TOP LUMBAR POSTURE GEAR
THOR-AV 5F

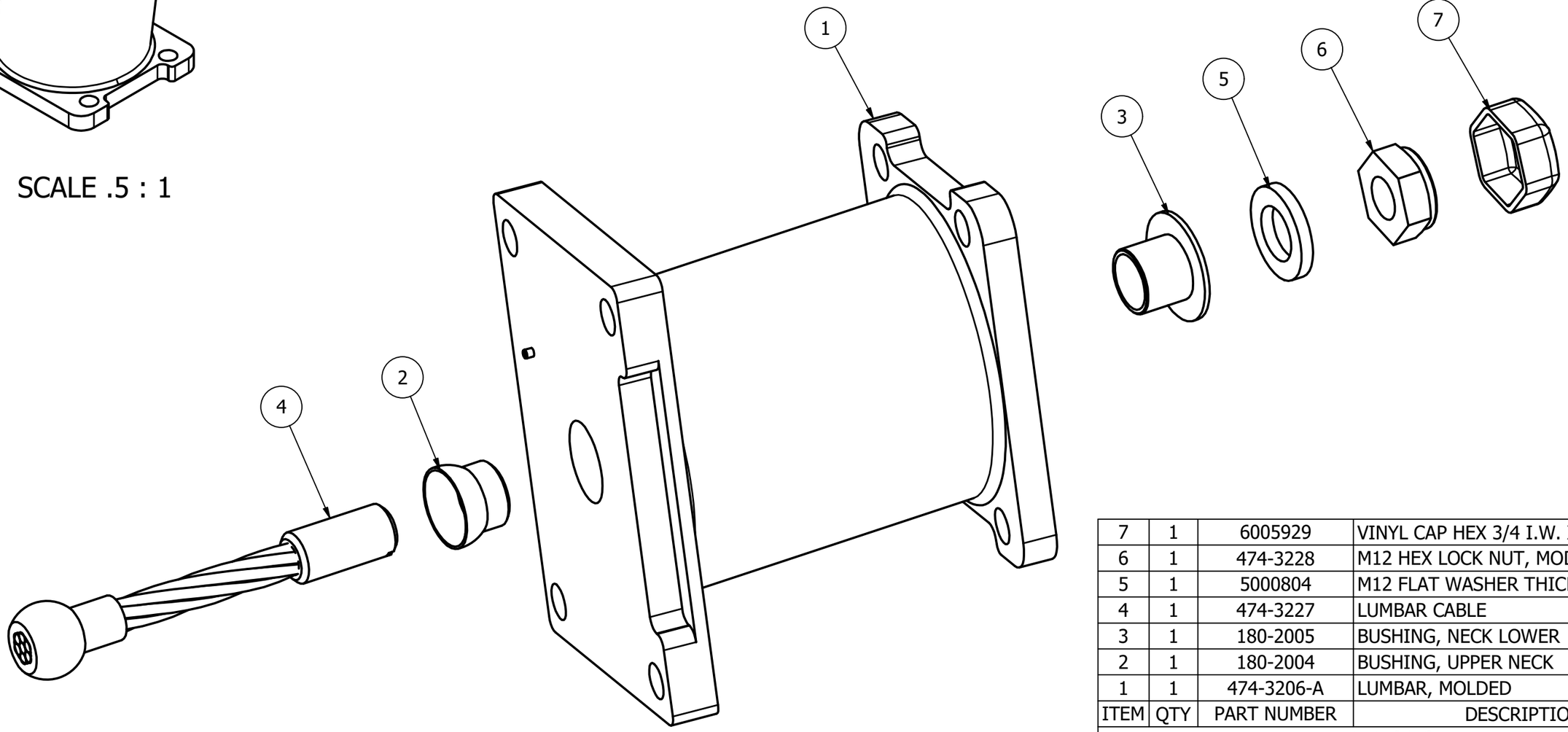
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-3065-A | REV: 3
SCALE: 3 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	HEC	5/2/2023



SCALE .5 : 1



ITEM	QTY	PART NUMBER	DESCRIPTION
7	1	6005929	VINYL CAP HEX 3/4 I.W. X 3/8 LG. RED
6	1	474-3228	M12 HEX LOCK NUT, MODIFIED
5	1	5000804	M12 FLAT WASHER THICK SS
4	1	474-3227	LUMBAR CABLE
3	1	180-2005	BUSHING, NECK LOWER
2	1	180-2004	BUSHING, UPPER NECK
1	1	474-3206-A	LUMBAR, MOLDED

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	B. KIMES	5/2/2023
CHECKED		
ENG		
APPROVED		

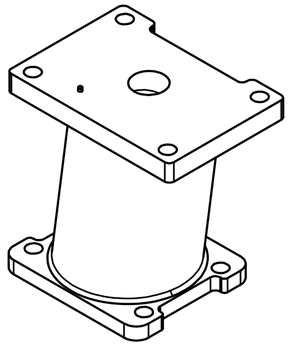
MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

LUMBAR ASSEMBLY

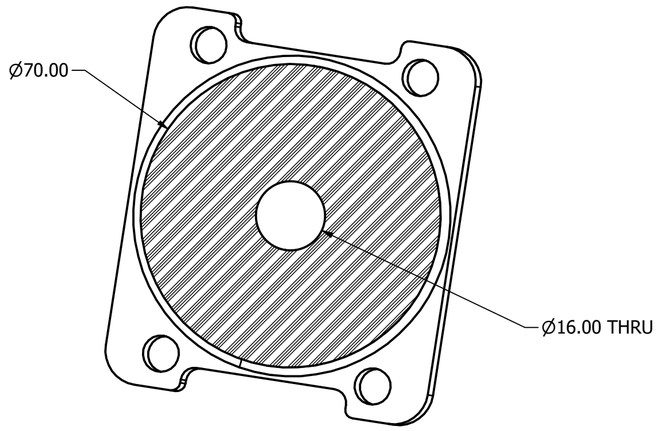
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-3223-A | REV: 1
SCALE: 1 : 1 | SHEET: 1 OF 1

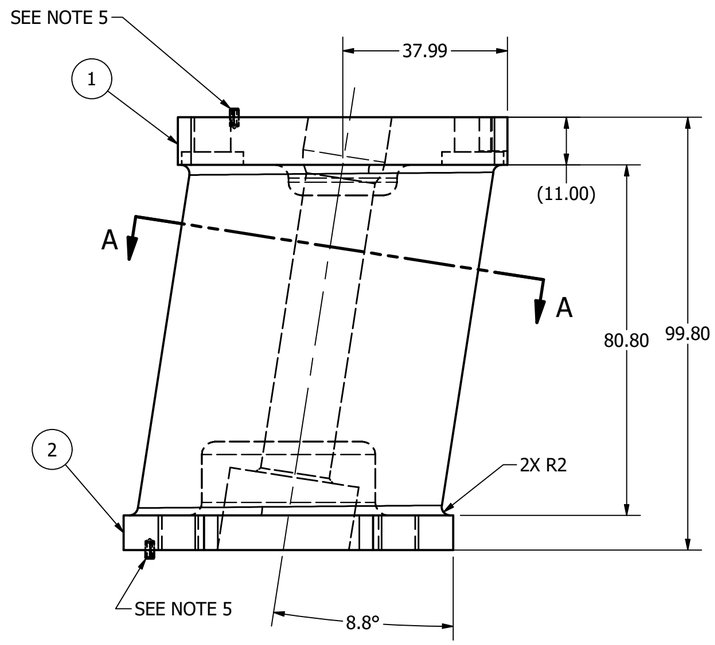
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	HEC	5/2/2023



SCALE .5:1



SECTION A-A



NOTES:
1. MATERIAL: NATURAL RUBBER
   COLOR: BLACK
   DUROMETER: 70 ±10 SHORE "A"

2. REMOVE ALL MOLD FLASHING

3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm

4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE RUBBER MOLDING

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	474-3204-A	LUMBAR PLATE, BOTTOM
1	1	474-3205	LUMBAR PLATE, TOP

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	5/2/2023
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

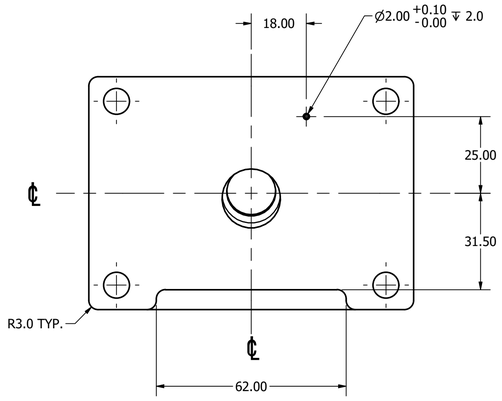
LUMBAR, MOLDED

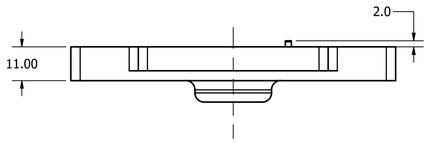
THIRD ANGLE PROJECTION

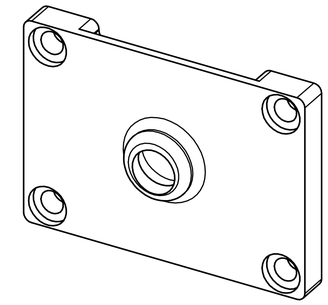
SIZE: A2 | DRAWING NUMBER: 474-3206-A | REV: 1

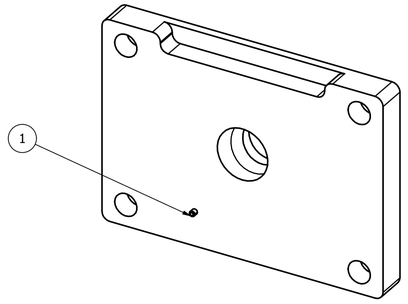
SCALE: 1 : 1 | SHEET: 1 OF 1

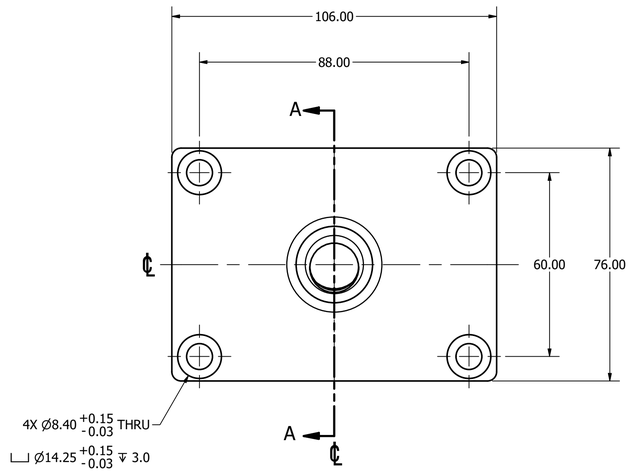
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	B	KMSP	11/29/2018

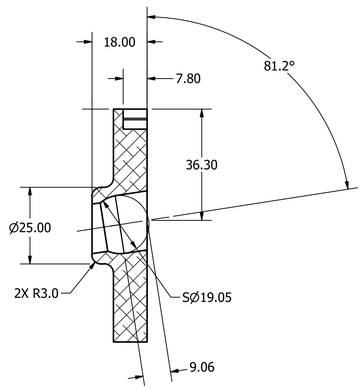




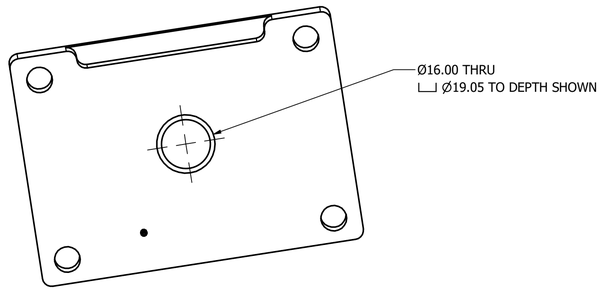








SECTION A-A



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5000765	M2 X 4 LG. ROLL PIN

PARTS LIST

NOTES:

1. DIMENSION SYMMETRICAL ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMALS X ±.5 X.X ±.2 X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075 T-6 ALUMINUM
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	3/14/2016
CHECKED	
ENG	
APPROVED	

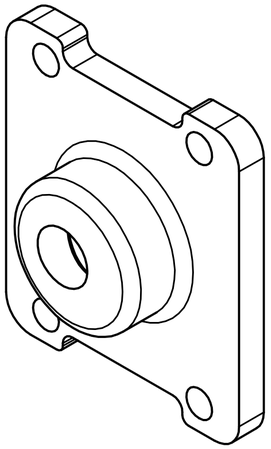
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

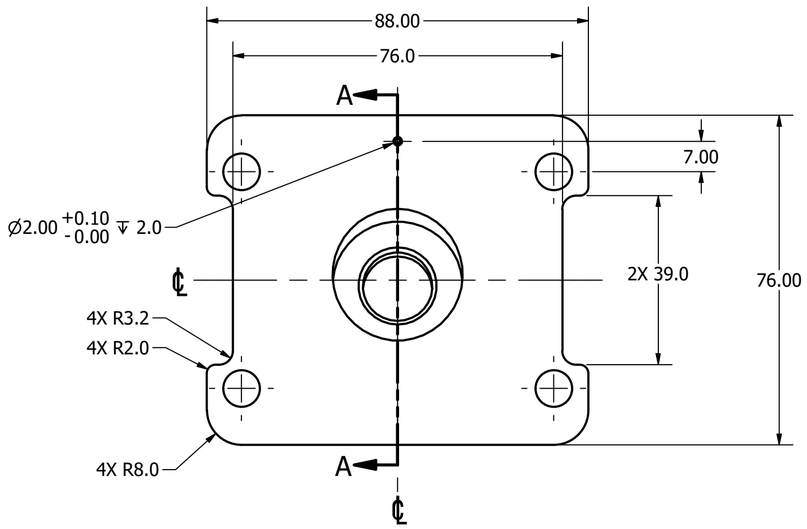
LUMBAR PLATE, TOP

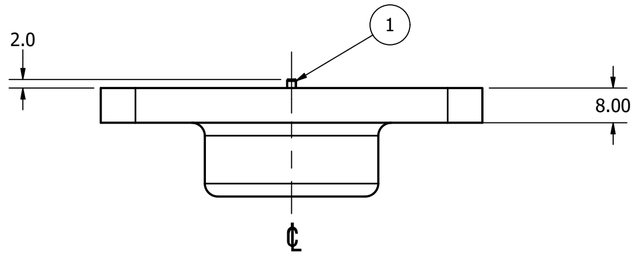
THIRD ANGLE PROJECTION

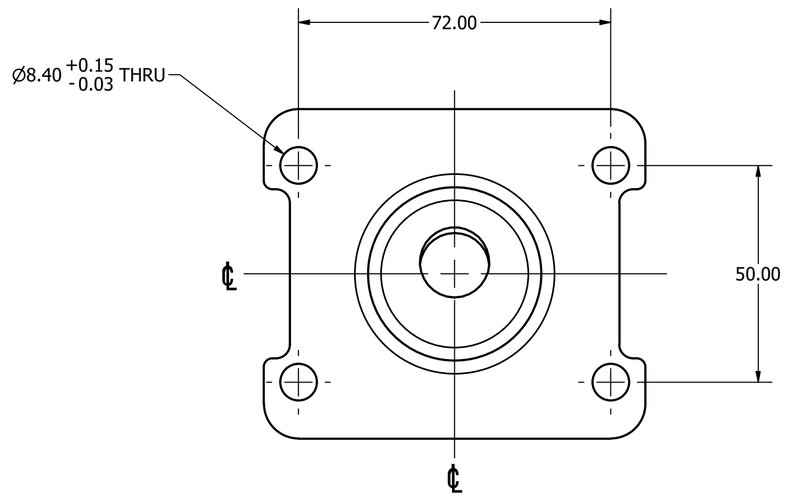
SIZE: A1 | DRAWING NUMBER: 474-3205 | REV: 3
SCALE: 1 : 1 | SHEET: 1 OF 1

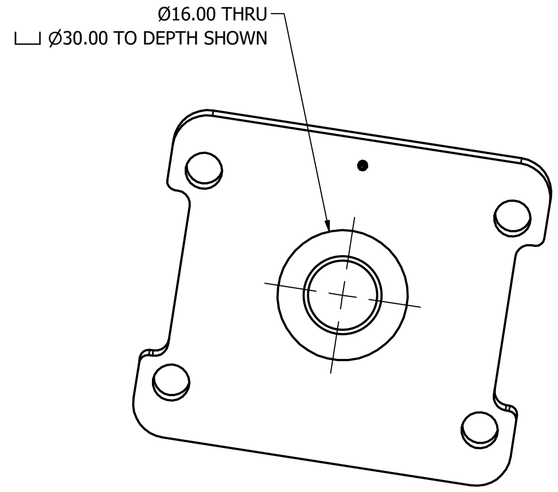
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	HEC	5/2/2023

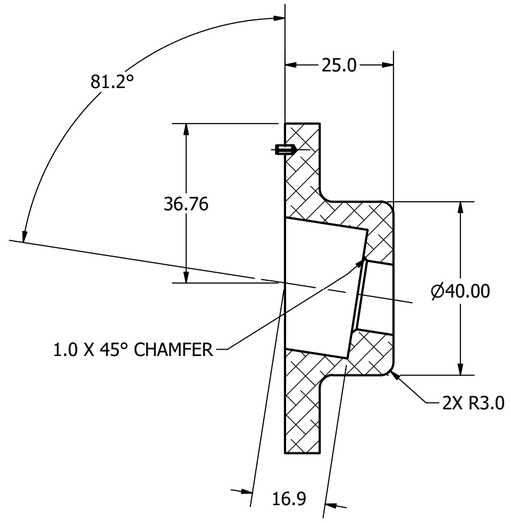












SECTION A-A

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5000765	M2 X 4 LG. ROLL PIN

PARTS LIST

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: B. KIMES	5/2/2023
CHECKED	
ENG	
APPROVED	

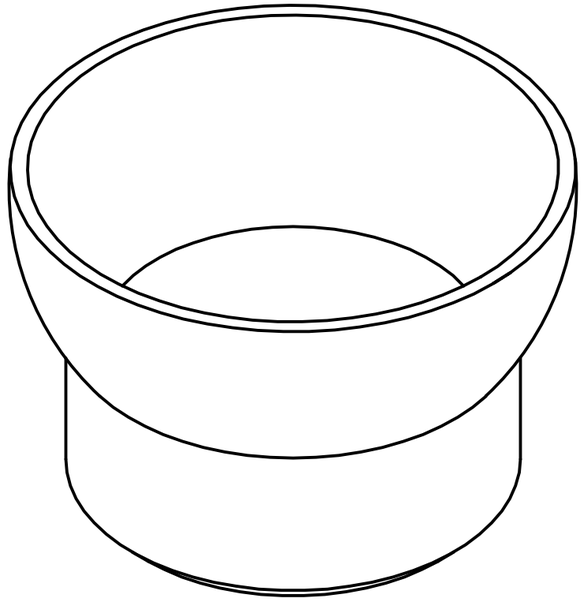
MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: N/A

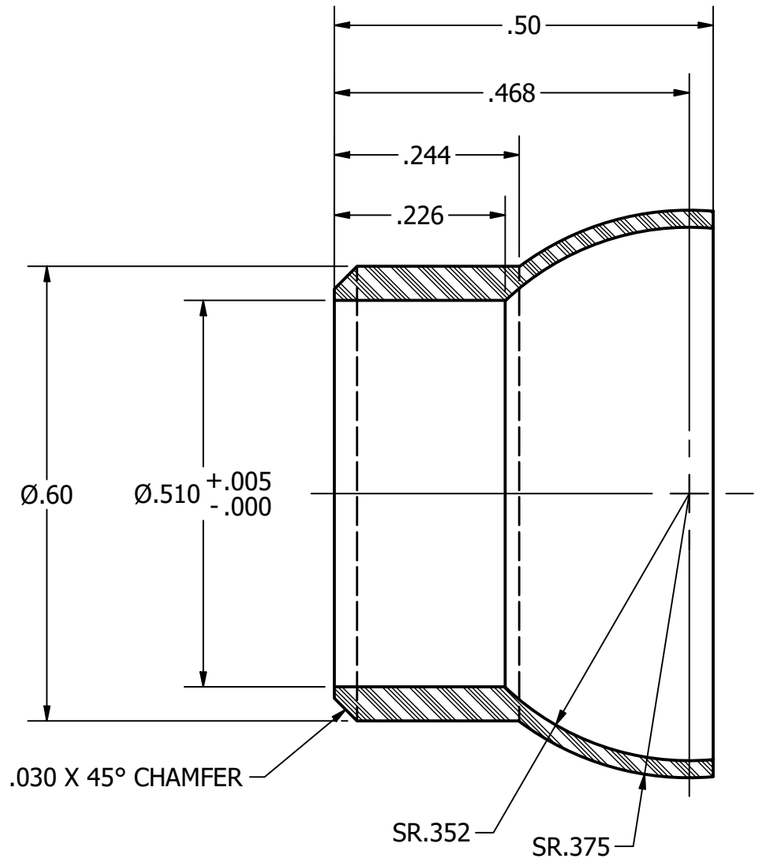
LUMBAR PLATE, BOTTOM

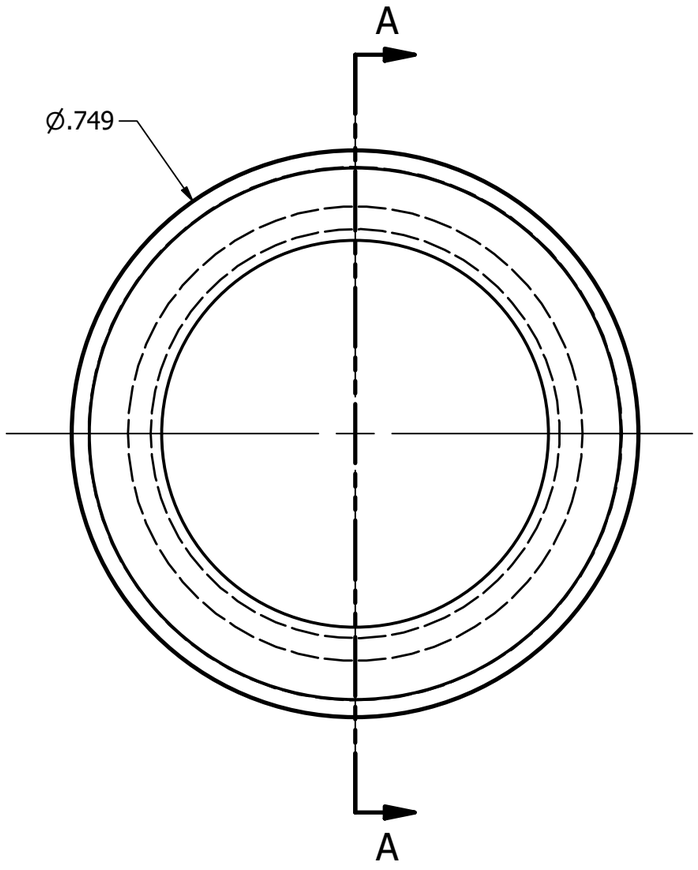
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-3204-A | REV: 1
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	E	RELEASE FOR PRODUCTION	MGT		12/6/2013







SECTION A-A
SCALE 5 : 1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

DECIMAL:		MACHINED
X	±.1	ANGLES ±.5°
.XX	±.01	FRACTIONS ±1/64
.XXX	±.005	
.XXXX	±.0005	

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	ACETAL RESIN, WHITE
HEAT TREAT	
FINISH	

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

APPROVALS	DATE
DRAWN A. NICKLE	6/5/2008
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

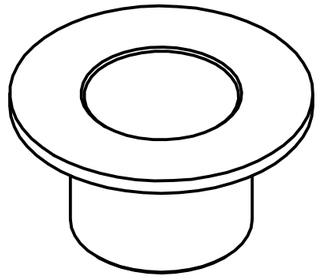
BUSHING, UPPER NECK

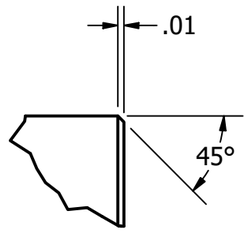
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
B	180-2004	E

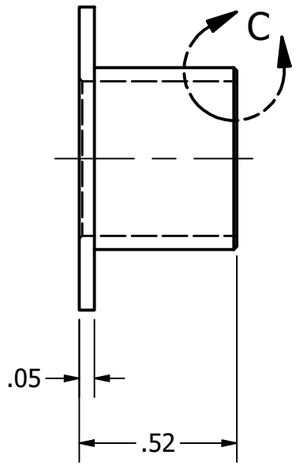
SCALE:	SHEET
5 : 1	1 OF 1

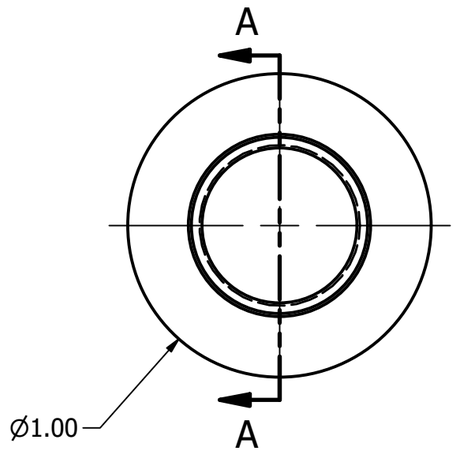
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	D	RELEASE FOR PRODUCTION	MGT		12/9/2013

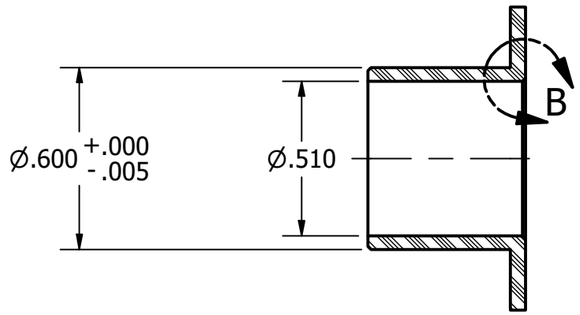




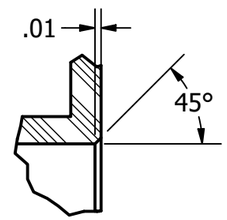
DETAIL C
SCALE 4 : 1







SECTION A-A
SCALE 2 : 1



DETAIL B
SCALE 4 : 1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

DECIMAL:		MACHINED	63
.X	±.1	ANGLES	±.5°
.XX	±.01	FRACTIONS	±1/64
.XXX	±.005		
.XXXX	±.0005		

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN KSG	8/10/2006
CHECKED	
ENG	
APPROVED	

MATERIAL: ACETAL RESIN, WHITE
HEAT TREAT:
FINISH:

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

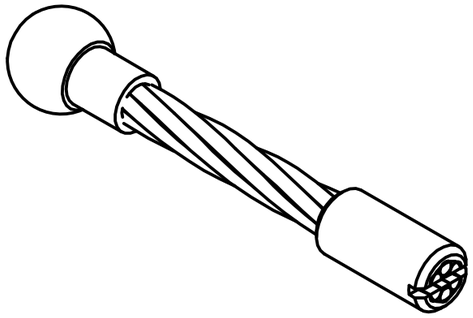
BUSHING, NECK LOWER

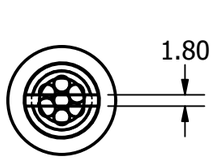
THIRD ANGLE PROJECTION

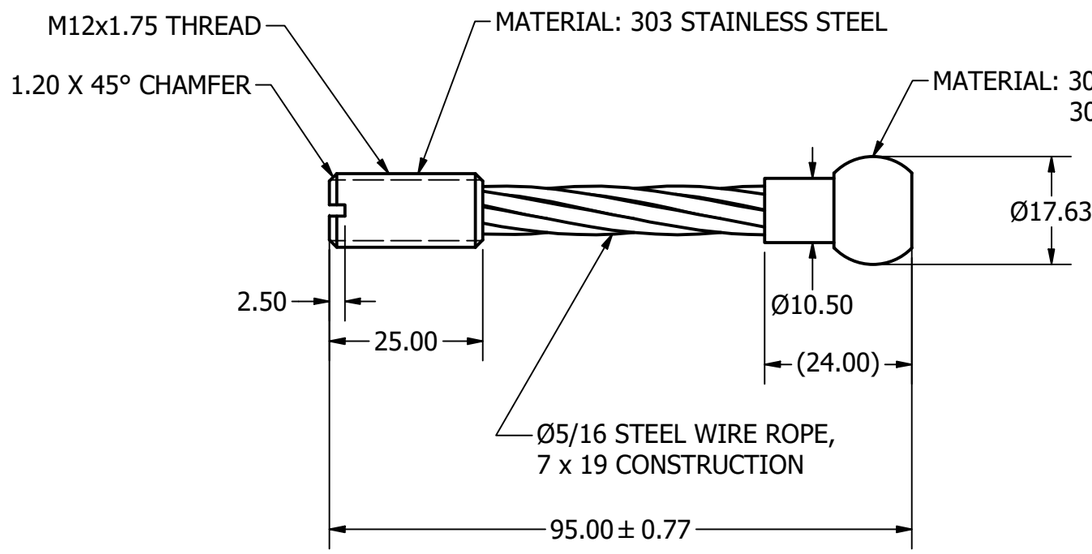
SIZE	DRAWING NUMBER	REV
B	180-2005	D

SCALE:	SHEET
2:1	1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	GCH	JW	11/3/2017







NOTES:

1. DIMENSIONS SHOWN ARE AFTER SWAGING AND MACHINING.
2. TENSILE STRENGTH OF CABLE ASSEMBLY SHALL BE 16kN MINIMUM.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LUMBAR CABLE

APPROVALS	DATE
DRAWN ghayden	3/14/2016
CHECKED	
ENG	
APPROVED	

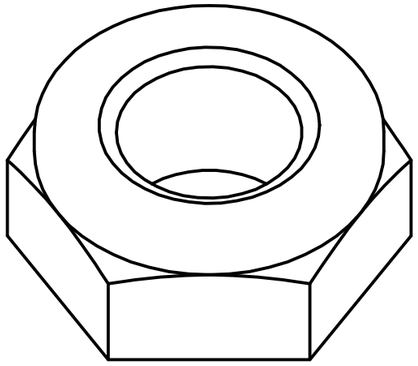
MATERIAL
HEAT TREAT
FINISH

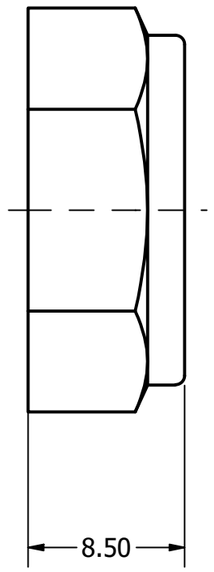
THIRD ANGLE PROJECTION

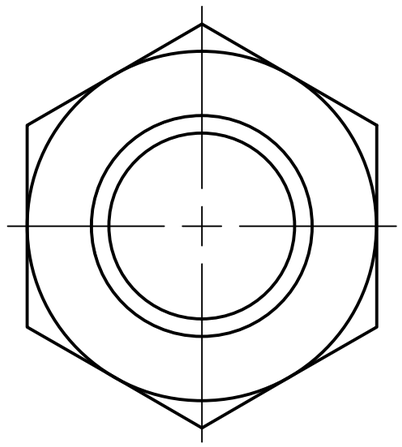
SIZE A3 | DRAWING NUMBER 474-3227 | REV 1

SCALE: 1:1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	DJI	JW	11/3/2017







NOTES:

1. MODIFY PART #5000462 AS SHOWN
   (M12 X 1.75 HEX LOCK NUT)

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

M12 HEX LOCK NUT, MODIFIED

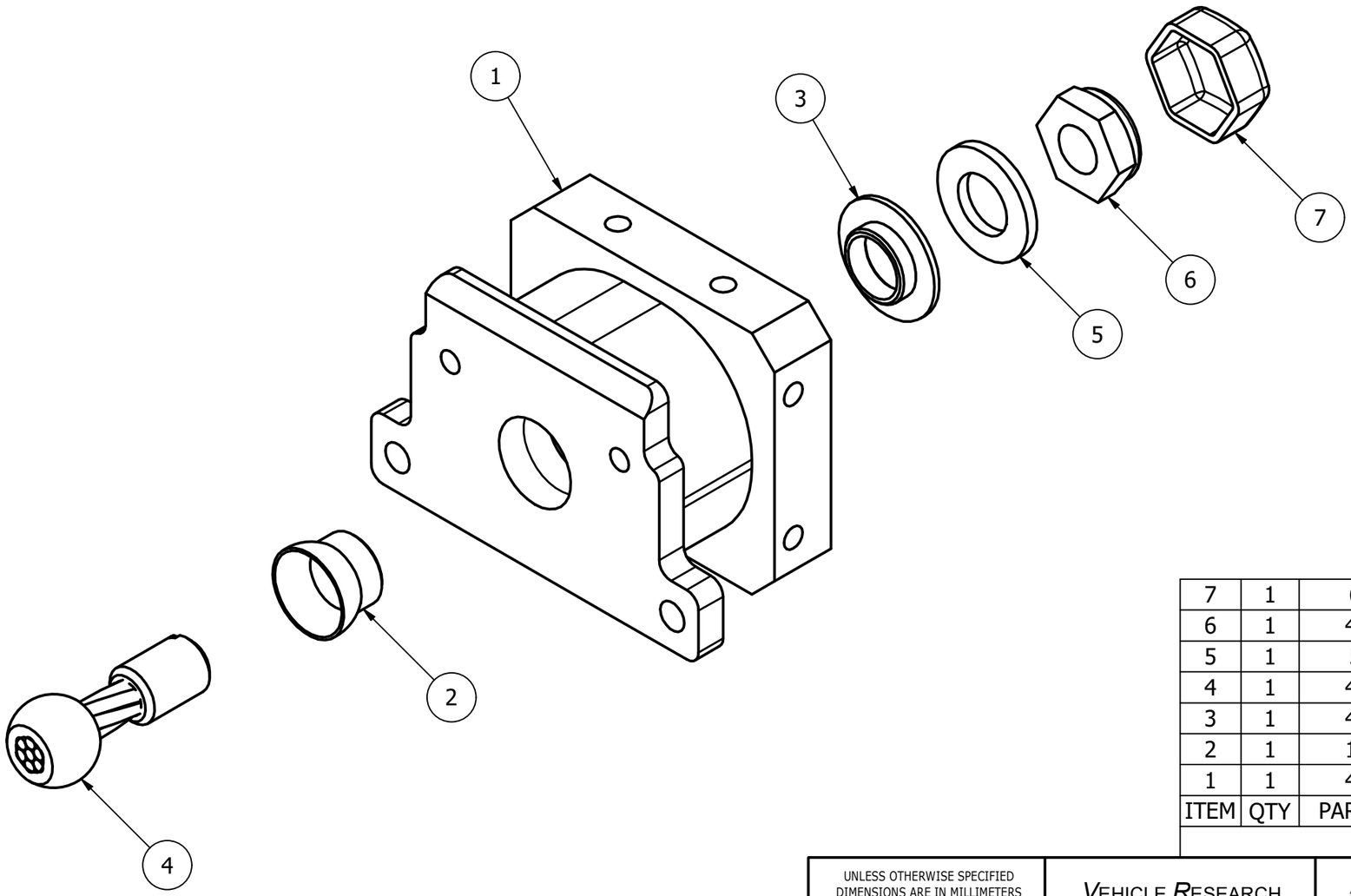
	APPROVALS	DATE
DRAWN	disopi	6/17/2016
CHECKED		
ENG		
APPROVED		

MATERIAL: SEE NOTE #1
HEAT TREAT:
FINISH:

THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-3228 | REV: 1
SCALE: 3:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	AB	JW	10/30/2019



ITEM	QTY	PART NUMBER	DESCRIPTION
7	1	6005929	VINYL CAP HEX 3/4 I.W. X 3/8 LG. RED
6	1	472-3747	M12x1.75 LOCKNUT, MODIFIED
5	1	5000267	M12 FLAT WASHER PLAIN ZINC
4	1	474-3224	UPPER SPINE CABLE
3	1	474-3226	CABLE BUSHING
2	1	180-2004	BUSHING, UPPER NECK
1	1	474-3241	UPPER SPINE, MOLDED

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED √ 1/2
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

PROTOTYPE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN ghayden	3/17/2016
CHECKED	
ENG	
APPROVED	

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

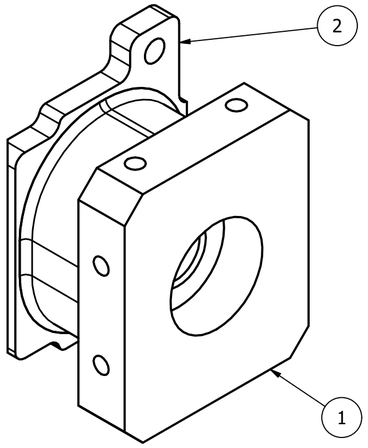
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

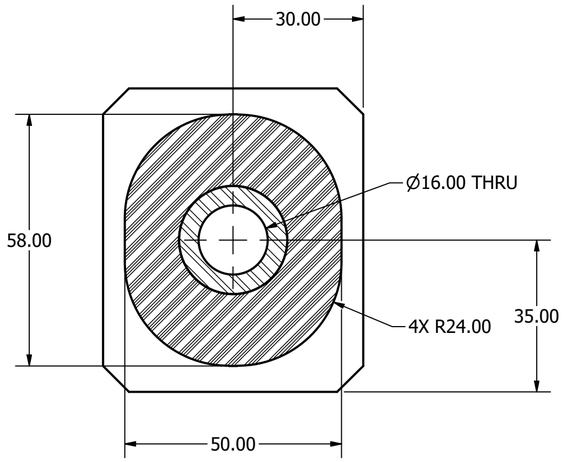
UPPER SPINE ASSEMBLY

THIRD ANGLE PROJECTION

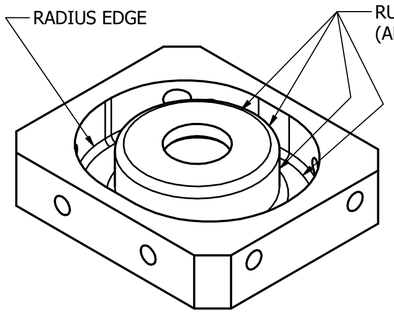
SIZE: A3 | DRAWING NUMBER: 474-3240 | REV: 3
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	JPM		3/27/17

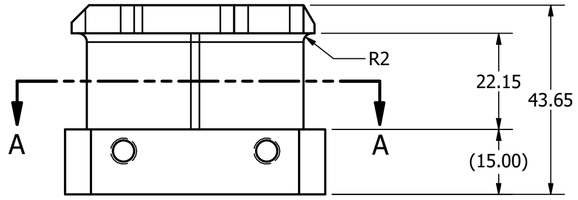


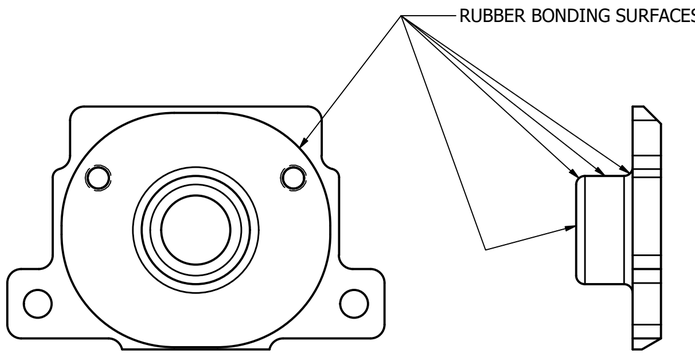


SECTION A-A

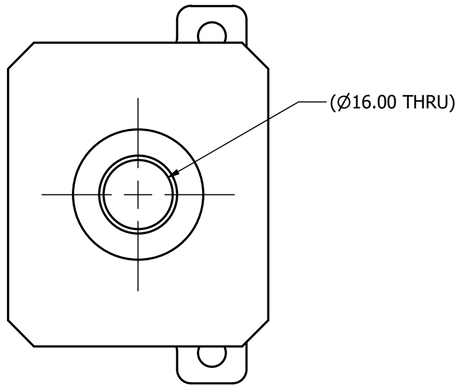


DETAIL VIEW OF 474-3242
SCALE 1 : 1





DETAIL VIEW OF 474-3243
SCALE 1 : 1



NOTES:

1. MATERIAL: BUTYL RUBBER
   COLOR: BLACK
   DUROMETER: 75±10 SHORE "A"

2. REMOVE ALL MOLD FLASHING.

3. ALL MOLD DIMENSION TOLERANCE +1%/-2% BUT NO SMALLER THAN 0.5mm.

4. NO SPLIT OR DEFECTS ARE ALLOWED IN THE RUBBER MOLDING.

5. ALL TAPPED HOLES MUST BE FREE OF RUBBER.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	474-3243	UPPER SPINE PLATE, BOTTOM
1	1	474-3242	UPPER SPINE PLATE, TOP

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT:
FINISH:

APPROVALS	DATE
DRAWN: ghayden	3/17/2016
CHECKED:	
ENG:	
APPROVED:	

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

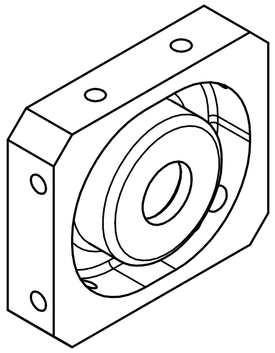
UPPER SPINE, MOLDED

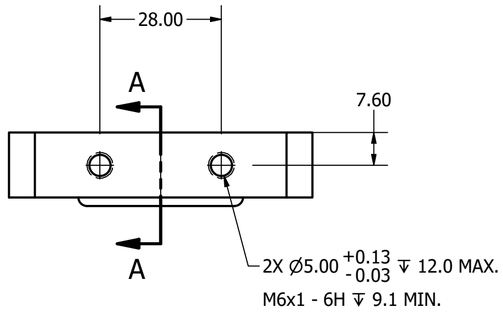
THIRD ANGLE PROJECTION

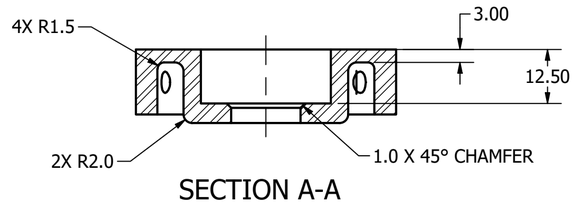
SIZE: A2 | DRAWING NUMBER: 474-3241 | REV: 2

SCALE: 1 : 1 | SHEET: 1 OF 1

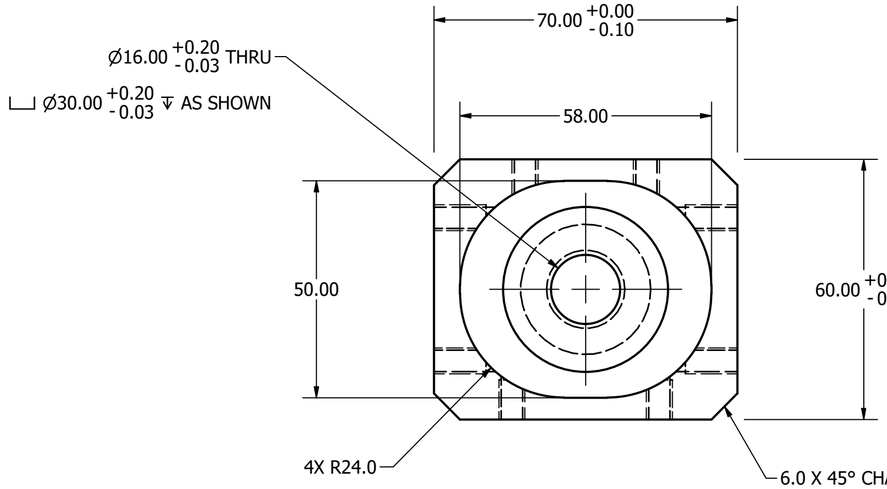
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	EP	KMSP	7/7/2021

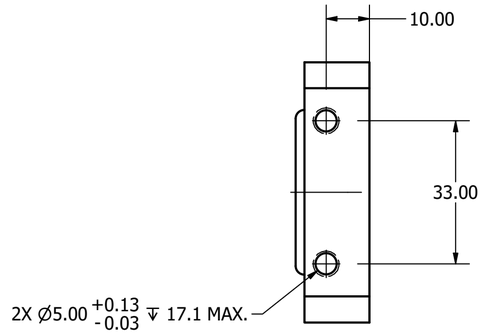


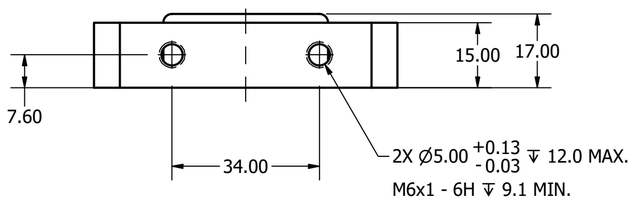




SECTION A-A







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	HEAT TREAT	FINISH
1018 STEEL	N/A	SATIN FLASH CHROME

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN ghayden	3/16/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

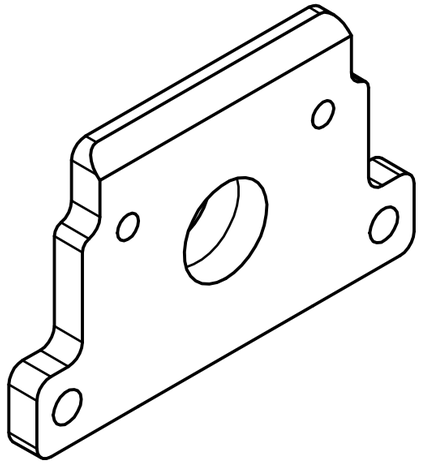
UPPER SPINE PLATE, TOP

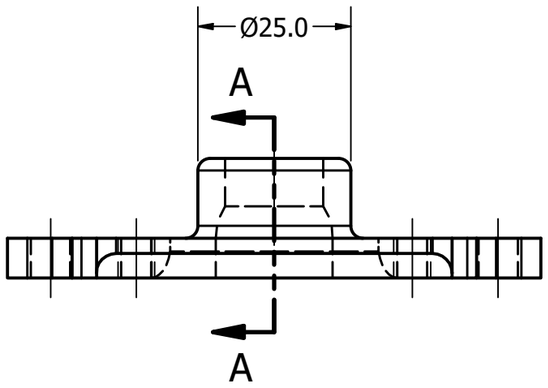
THIRD ANGLE PROJECTION

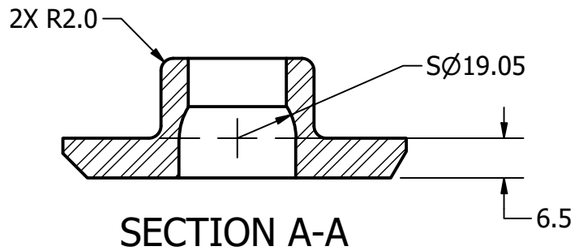
SIZE	DRAWING NUMBER	REV
A2	474-3242	2

SCALE: 1 : 1 SHEET 1 OF 1

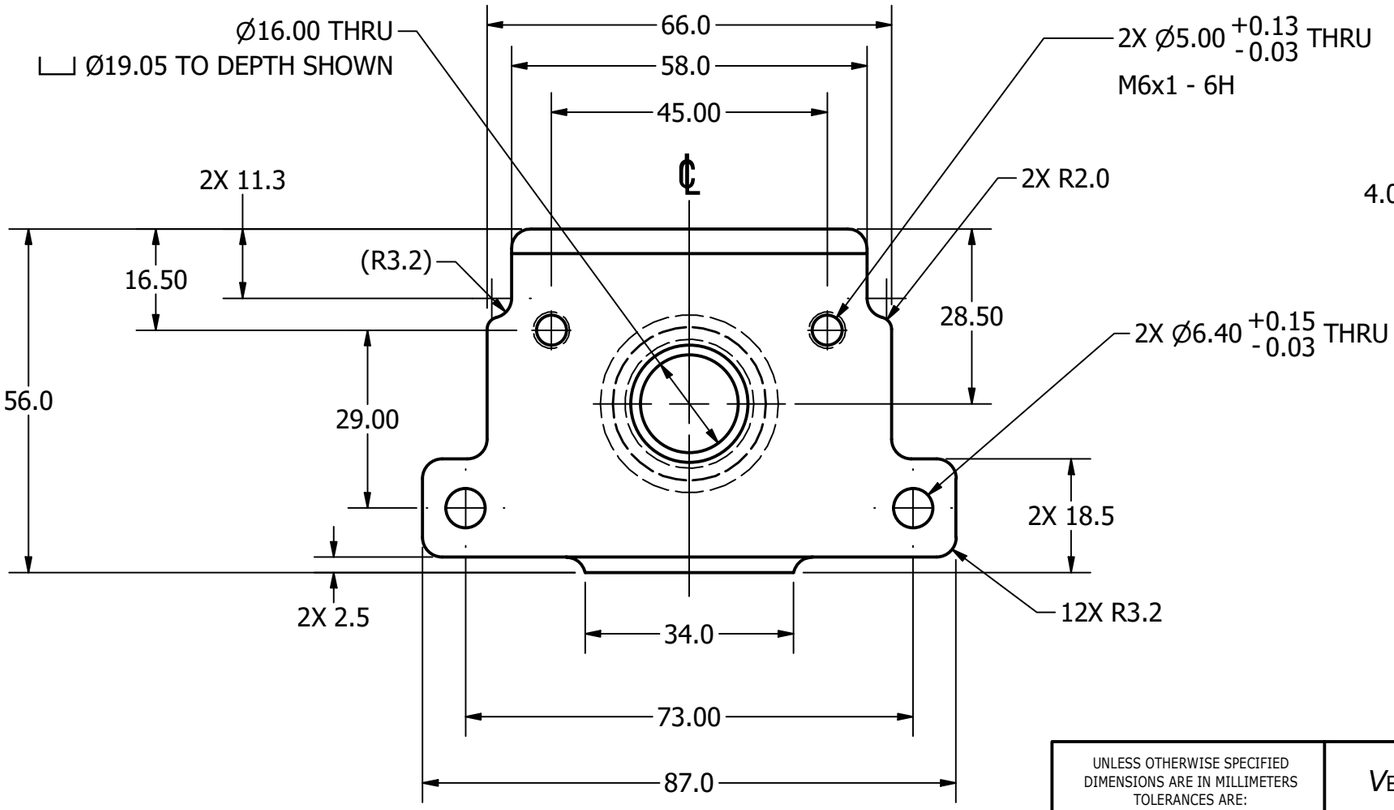
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	LKR	HF	10/6/2021

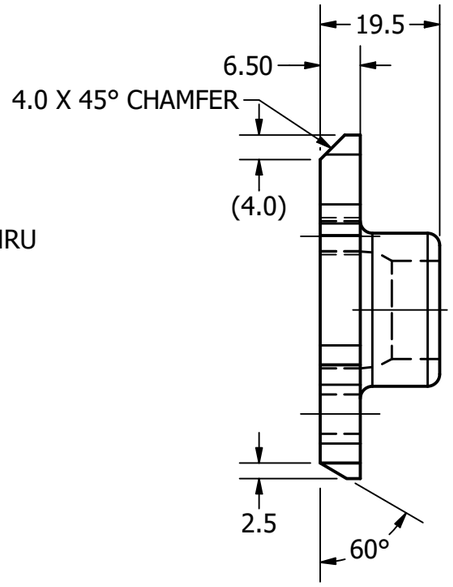






SECTION A-A





NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN ghayden	3/16/2016
CHECKED	
ENG JW	3/15/2016
APPROVED	

MATERIAL: 1018 STEEL
HEAT TREAT: N/A
FINISH: SATIN FLASH CHROME

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

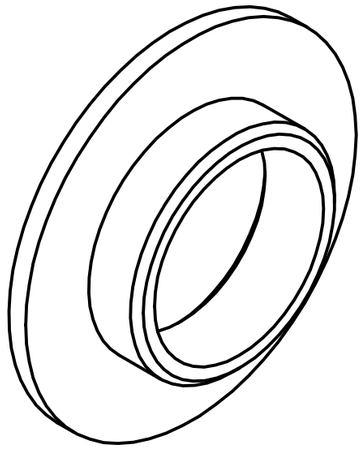
UPPER SPINE PLATE, BOTTOM
THOR-05F

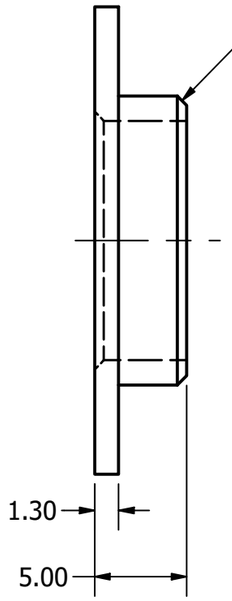
THIRD ANGLE PROJECTION

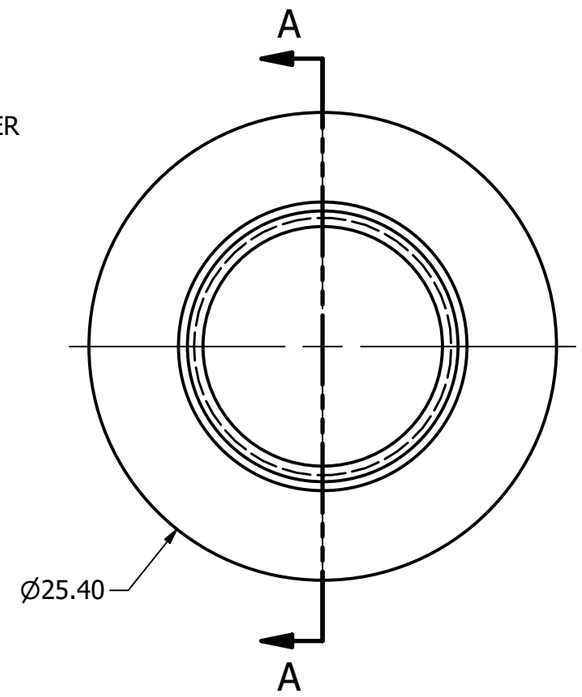
SIZE	DRAWING NUMBER	REV
A3	474-3243	3

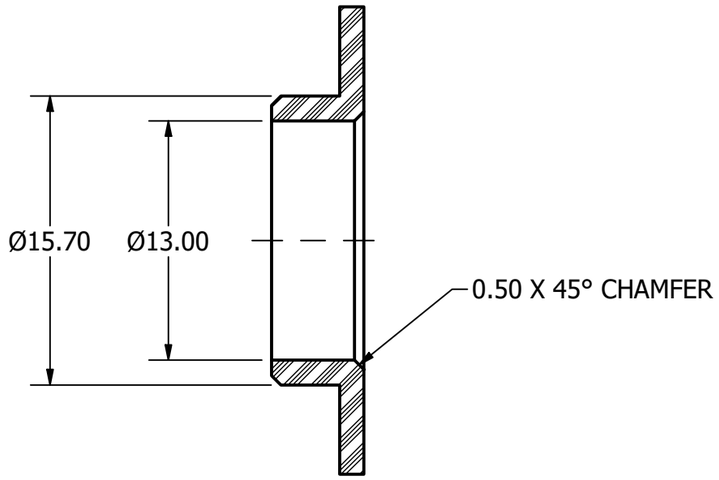
SCALE: 1 : 1
SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	GCH	JW	3/16/2016









SECTION A-A

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: ACETAL RESIN, WHITE
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	3/16/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

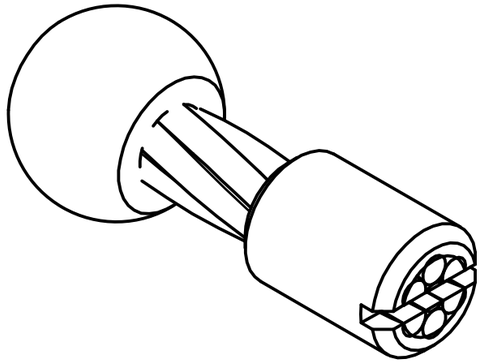
CABLE BUSHING

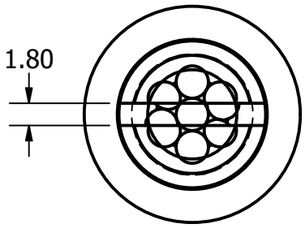
THIRD ANGLE PROJECTION

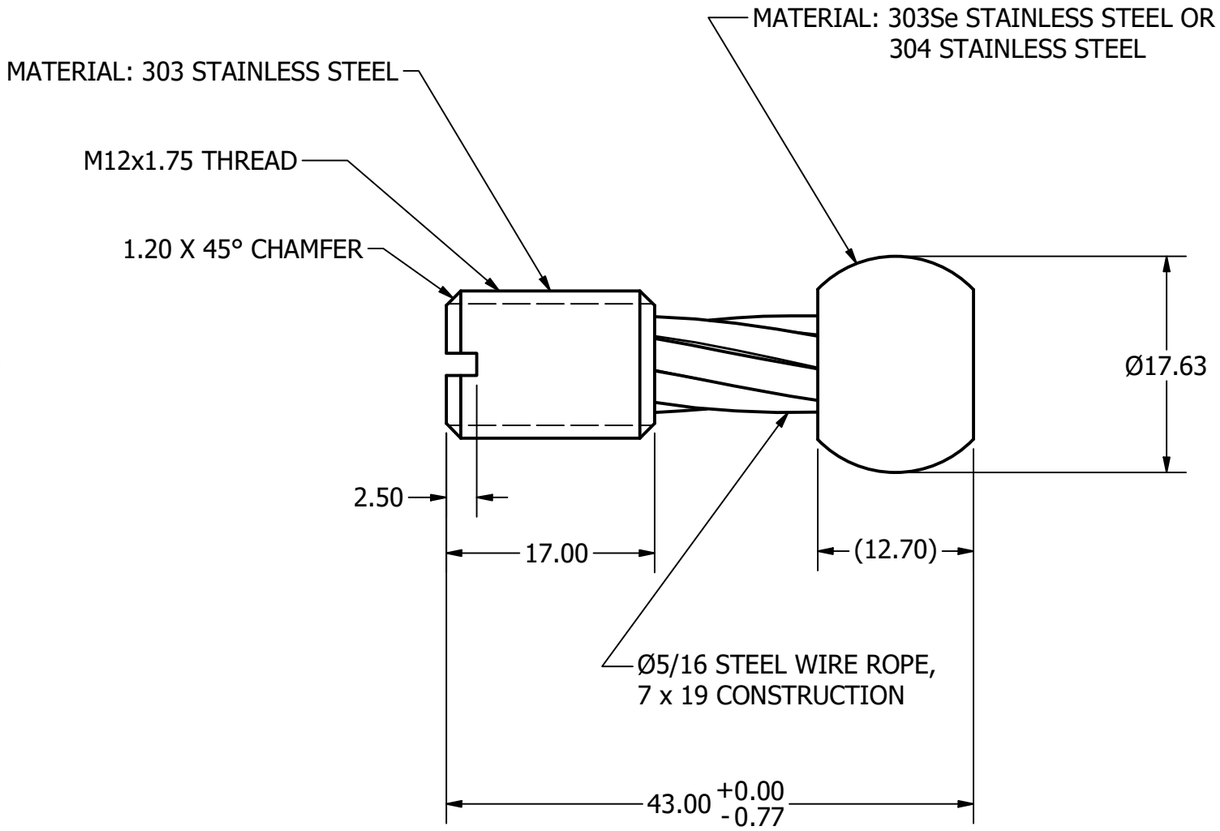
SIZE	DRAWING NUMBER	REV
A3	474-3226	1

SCALE: 3:1 SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	AB	JW	10/30/2019







NOTES:

1. DIMENSIONS SHOWN ARE AFTER SWAGING AND MACHINING.
2. TENSILE STRENGTH OF CABLE ASSEMBLY SHALL BE 16kN MINIMUM.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ✓, ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN ghayden	3/16/2016
CHECKED	
ENG	
APPROVED	

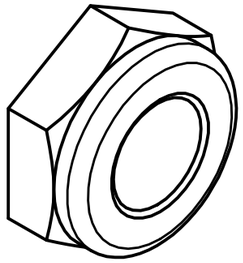
MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

UPPER SPINE CABLE

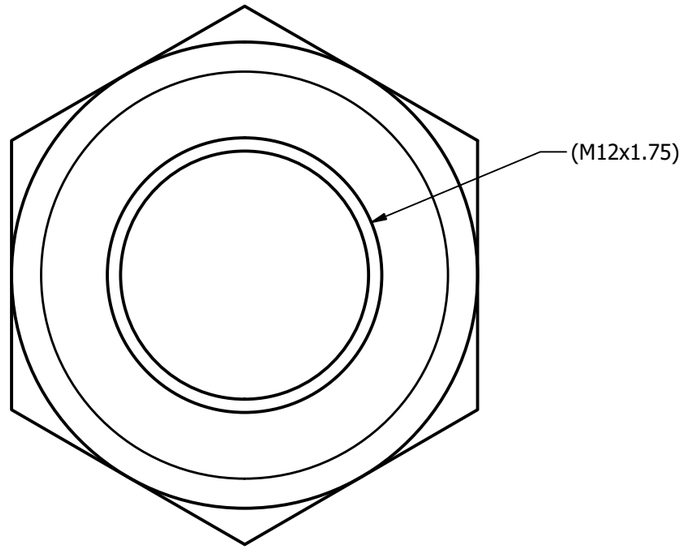
THIRD ANGLE PROJECTION

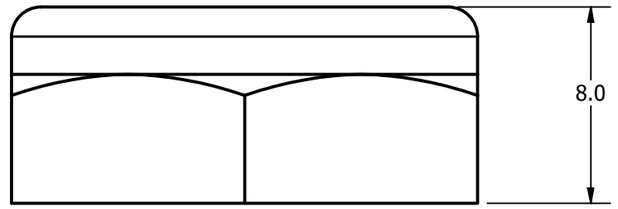
SIZE: A3 | DRAWING NUMBER: 474-3224 | REV: 2
SCALE: 2:1 | SHEET: 1 OF 1

REVISION HISTORY				
ECO#	REV	DESCRIPTION	DATE	BY
	A	RELEASE FOR PRODUCTION	10/25/2011	BK



SCALE 2.000





NOTES:

1. MAKE FROM 5000462 (M12x1.75 HEX HEAD LOCKNUT), MODIFY AS SHOWN.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

M12x1.75 LOCKNUT, MODIFIED

APPROVALS	DATE
DRAWN B. KIMES	10/25/2011
CHECKED	
ENG	
APPROVED	

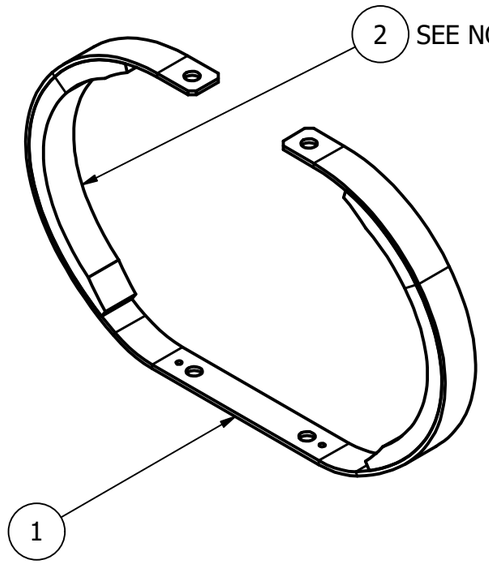
MATERIAL
HEAT TREAT
FINISH

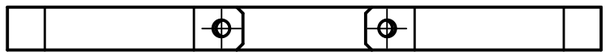
THIRD ANGLE PROJECTION

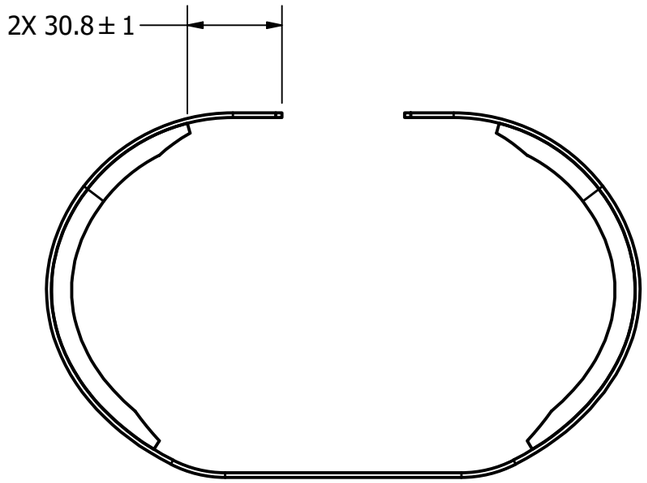
SIZE A3 | DRAWING NUMBER 472-3747 | REV A

SCALE: 4.000 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	BLG	11/3/2022











ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	474-3321	DAMPING, RIB 1
1	1	474-3311-A	RIB 1

PARTS LIST

NOTE:

1. BOND BOTH 474-3321 DAMPING RIB 1 TO 474-3311-A RIB 1 AS SHOWN USING EPOXY ADHESIVE.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

RIB 1 ASSEMBLY

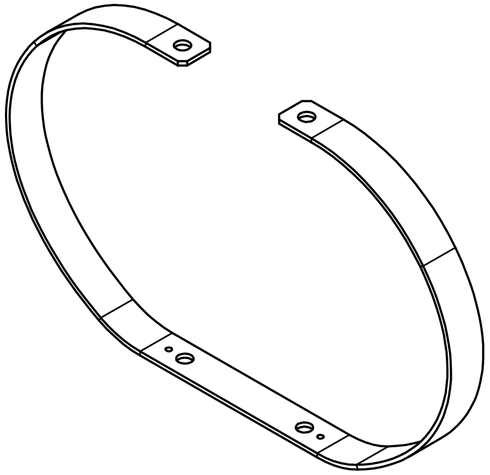
APPROVALS	DATE
DRAWN B. KIMES	11/3/2022
CHECKED	
ENG	
APPROVED	

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

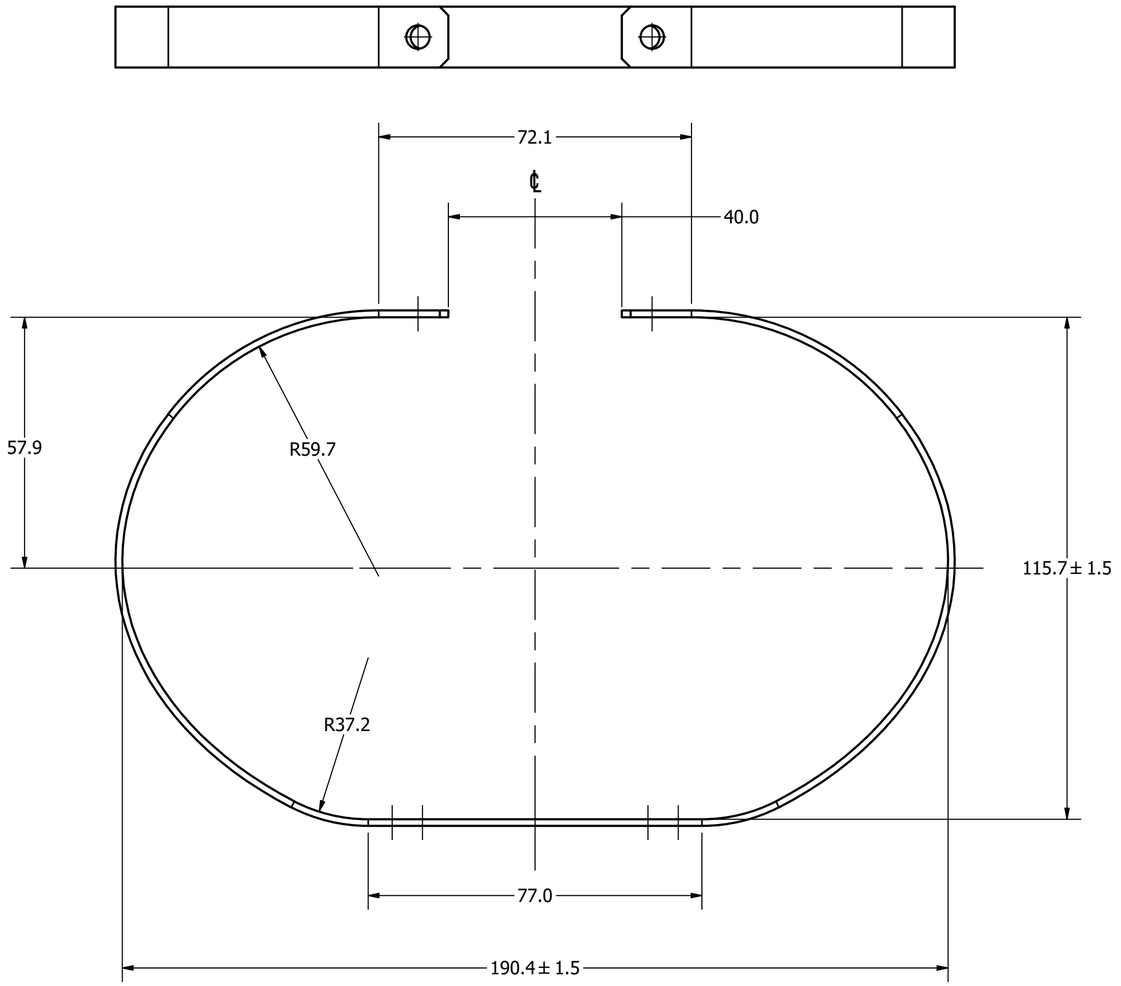
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-3301-A | REV: 1
SCALE: .5 : 1 | SHEET: 1 OF 1

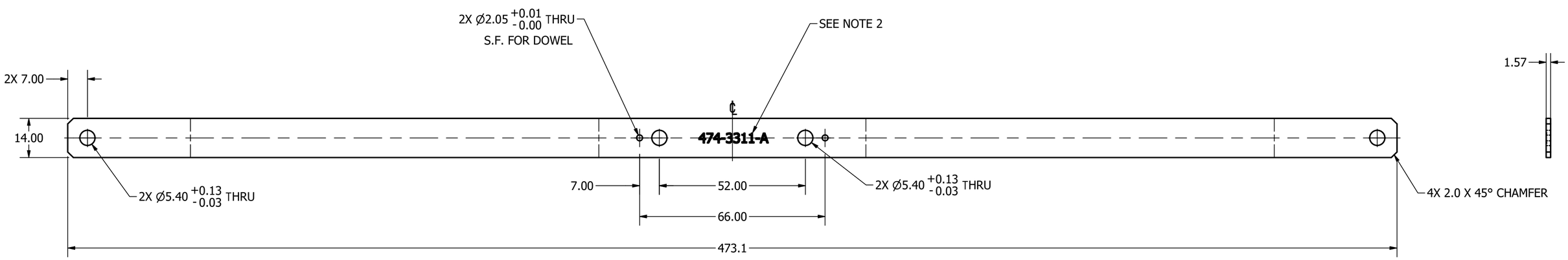
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	BLG	11/7/2022



SCALE .75:1







FLATTENED STATE

NOTES:

1. DIMENSIONS SYMMETRICAL ABOUT ℄, UNLESS OTHERWISE SPECIFIED .
2. ENGRAVE PART NUMBER WHERE SPECIFIED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: VascoMax C-300
HEAT TREAT: Rc 50-55
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	11/3/2022
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

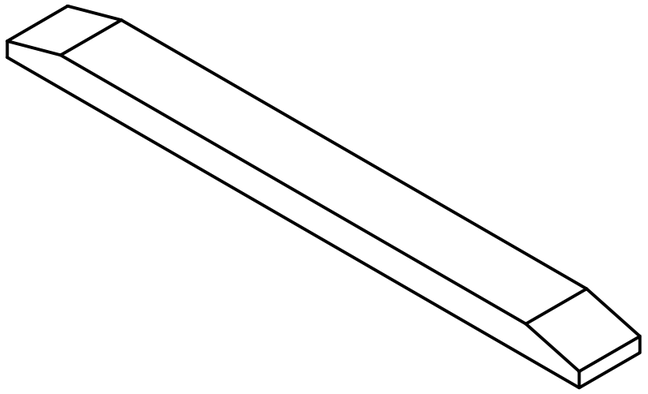
RIB 1

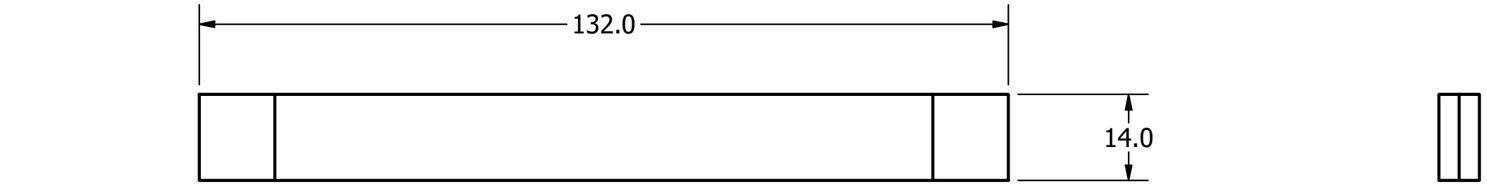
THIRD ANGLE PROJECTION

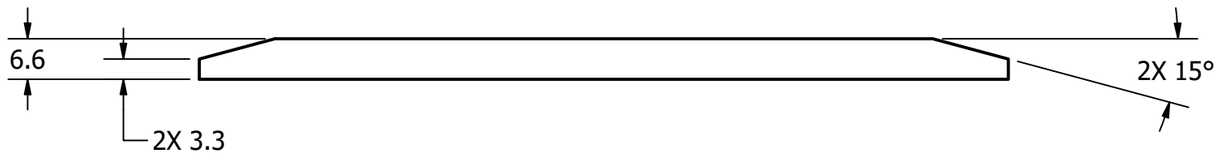
SIZE: A2 | DRAWING NUMBER: 474-3311-A | REV: 1

SCALE: 1:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	JH	JW	10/20/2017







PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN jhaefner	3/18/2016
CHECKED	
ENG	
APPROVED	

MATERIAL: ISODAMP CN-62
HEAT TREAT:
FINISH:

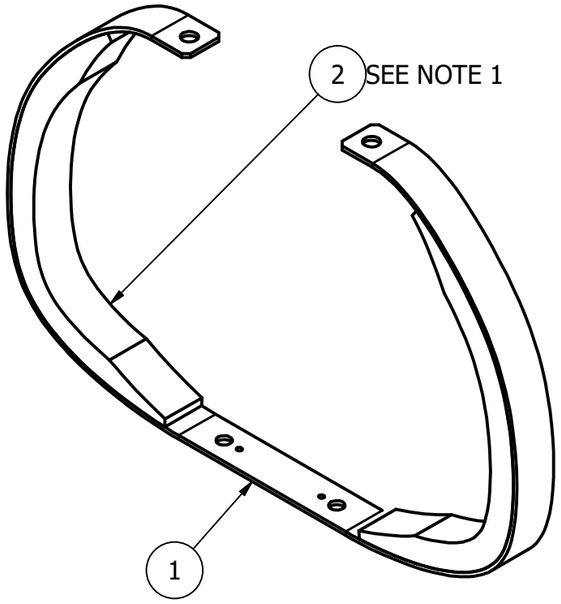
DAMPING, RIB 1

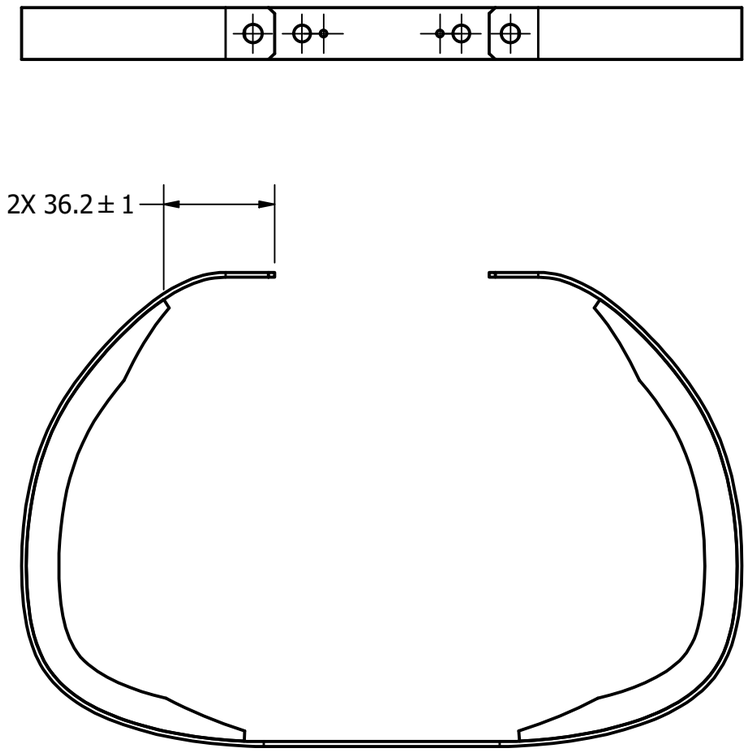
THIRD ANGLE PROJECTION

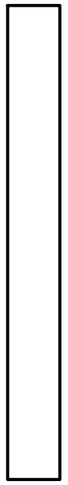
SIZE	DRAWING NUMBER	REV
A3	474-3321	1

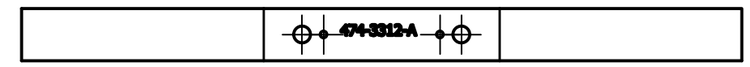
SCALE: 1:1
SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	BK	MJS	1/3/2023









ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	474-3322-A	DAMPING, RIB 2 EXTENDED
1	1	474-3312-A	RIB 2, EXTENDED

PARTS LIST

NOTES:

1. BOND BOTH 474-3322-A DAMPING RIB 2 TO 474-3312-A RIB 2 AS SHOWN USING EPOXY ADHESIVE.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

RIB 2 ASSEMBLY, EXTENDED

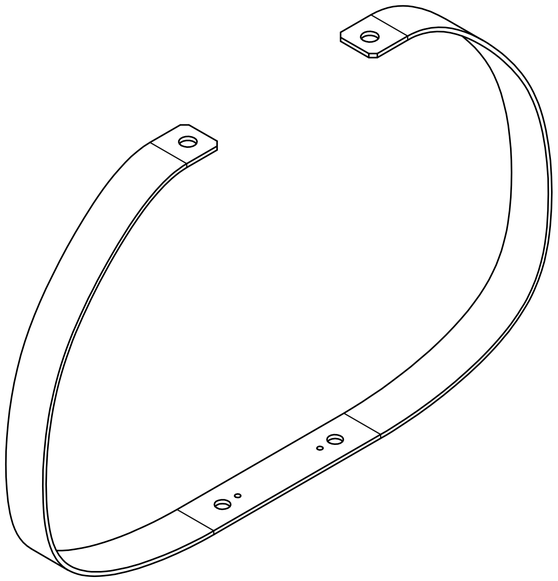
	APPROVALS	DATE
DRAWN	B. KIMES	3/18/2016
CHECKED		
ENG		
APPROVED		

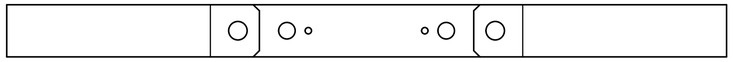
MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

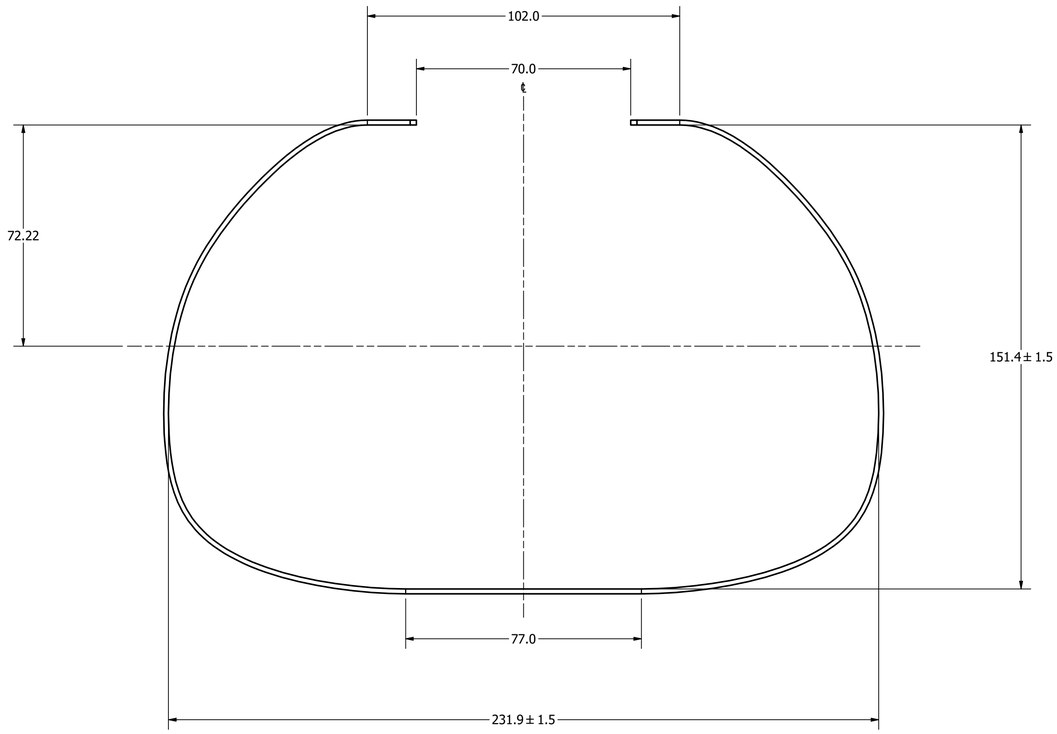
THIRD ANGLE PROJECTION

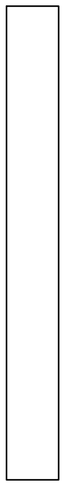
SIZE: A3 | DRAWING NUMBER: 474-3302-A | REV: 3
SCALE: .5 : 1 | SHEET: 1 OF 1

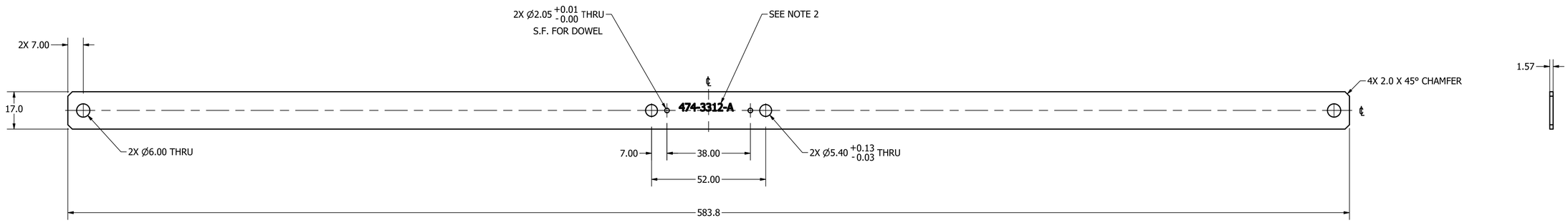
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	MJS	1/3/2023











FLATTENED STATE

NOTES:

1. DIMENSIONS SYMMETRICAL ABOUT ℄, UNLESS OTHERWISE SPECIFIED .
2. ENGRAVE PART NUMBER WHERE SPECIFIED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMALS: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	VascoMax C-300
HEAT TREAT	Rc 50-55
FINISH	N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. Kimes	8/25/2022
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

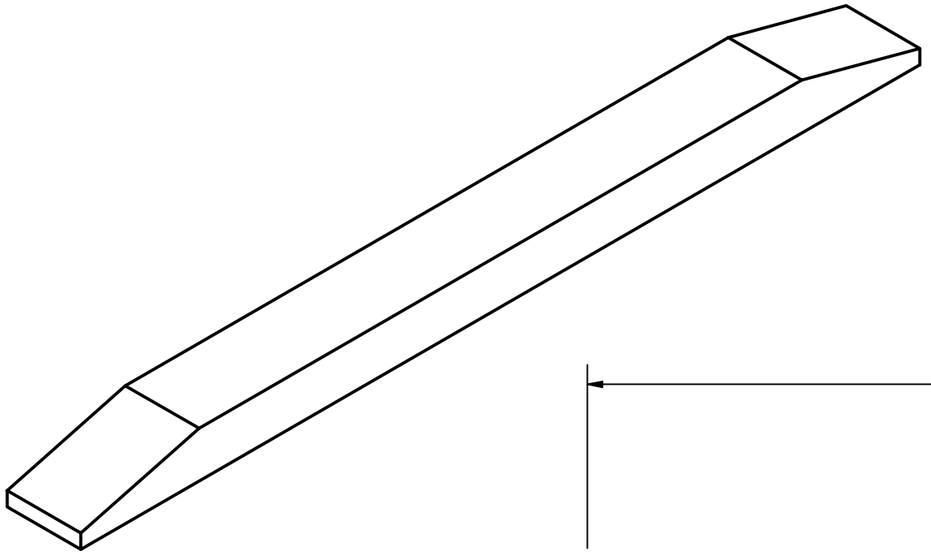
RIB 2, EXTENDED

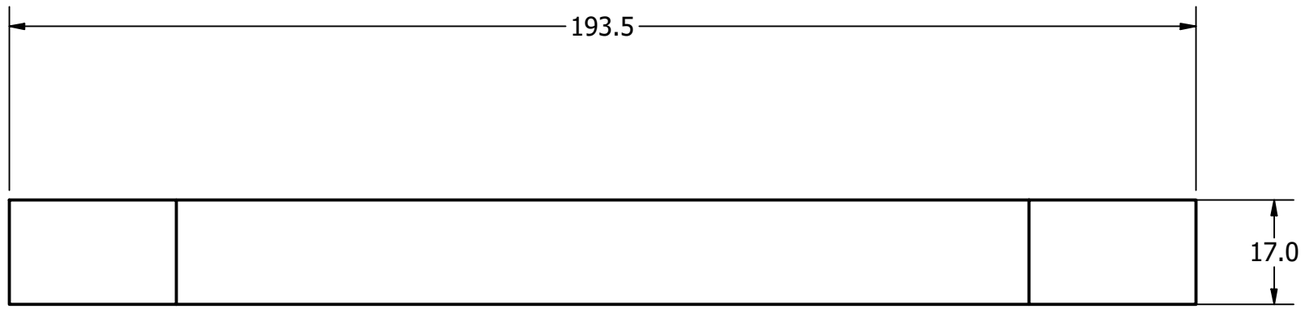
THIRD ANGLE PROJECTION

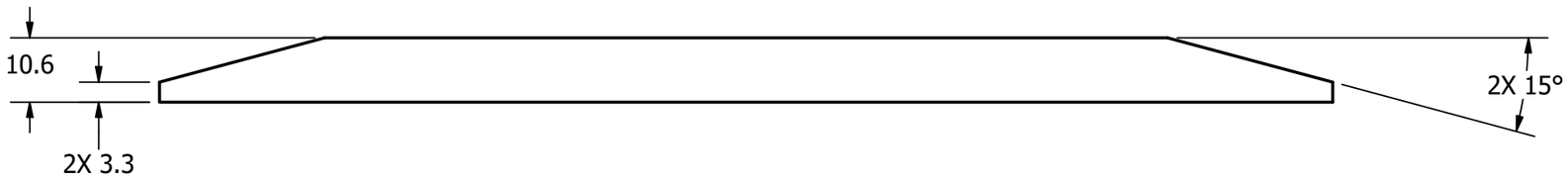
SIZE	DRAWING NUMBER	REV
A1	474-3312-A	2

SCALE: 1 : 1 SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	MJS	12/5/2022







PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: ISODAMP CN-62
HEAT TREAT: N/A
FINISH: N/A

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

APPROVALS	DATE
DRAWN: B. Kimes	8/25/2022
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

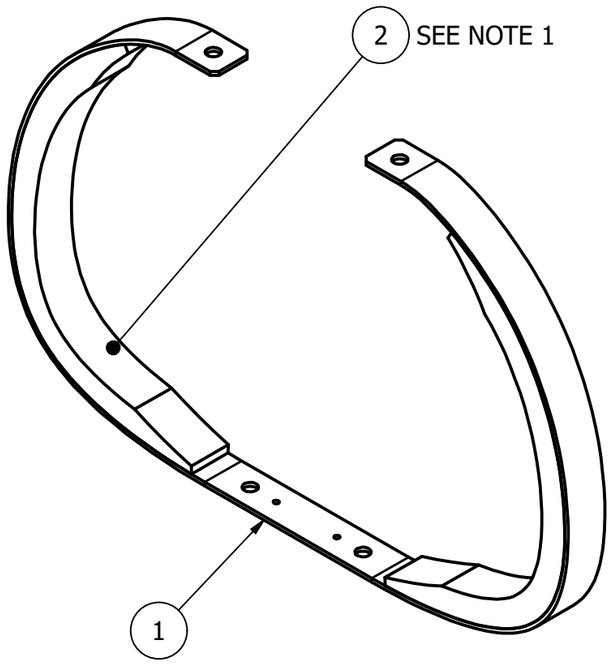
DAMPING, RIB 2 EXTENDED

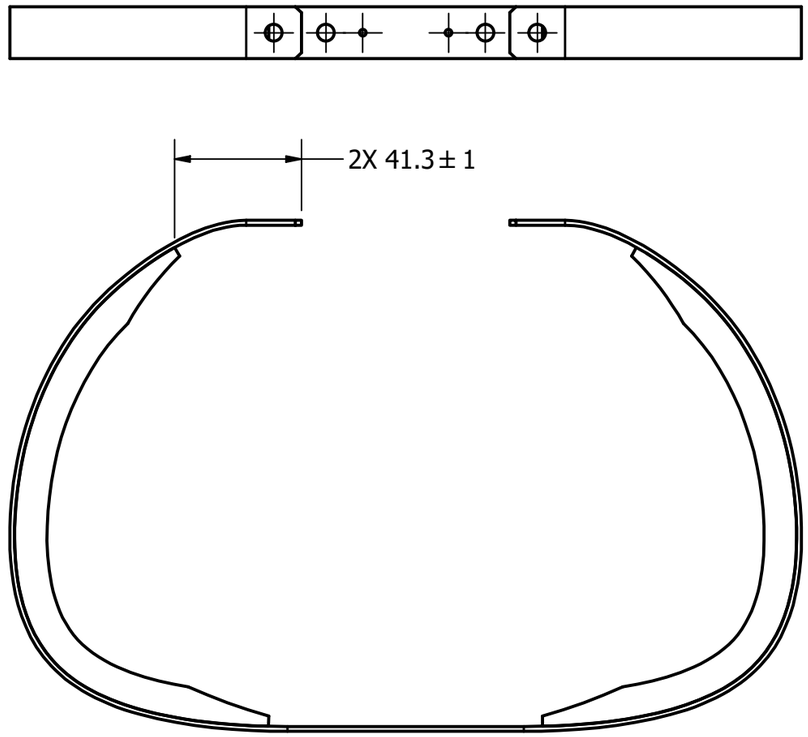
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-3322-A | REV: 2

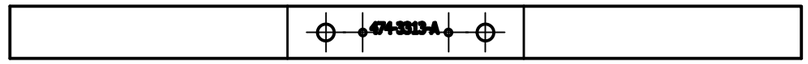
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	YK	HEC	12/6/2022









ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	474-3323-A	DAMPING, RIB 3, EXTENDED
1	1	474-3313-A	RIB 3, EXTENDED

PARTS LIST

PROTOTYPE DRAWING

NOTES:

1. BOND BOTH 474-3323-A DAMPING RIB 3 TO 474-3313-A RIB 3 AS SHOWN USING EPOXY ADHESIVE.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	8/25/2022
CHECKED	
ENG	
APPROVED	

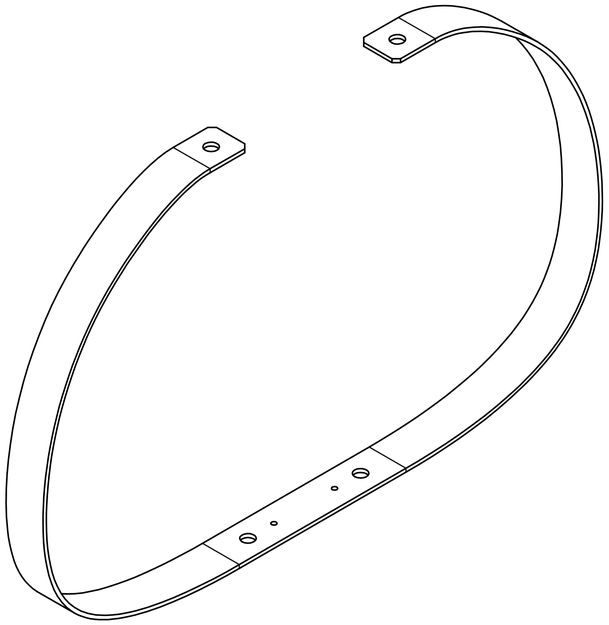
THIRD ANGLE PROJECTION

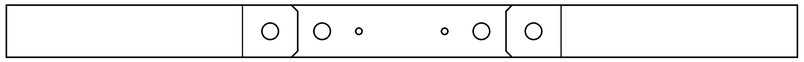
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

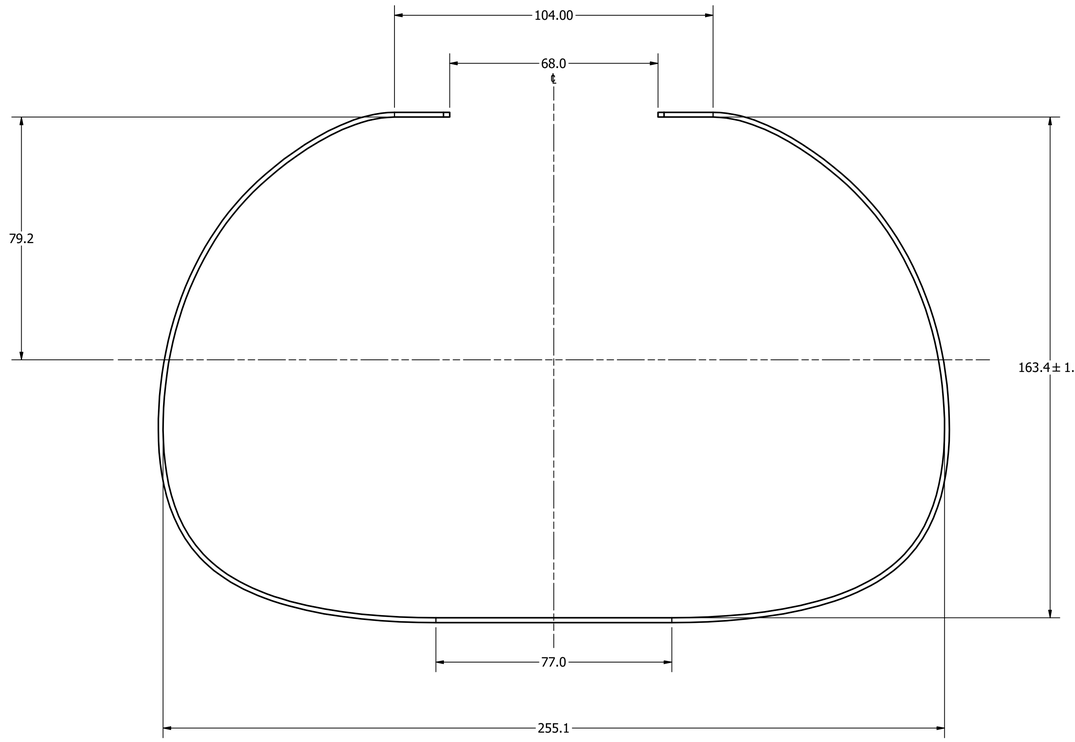
RIB 3 ASSEMBLY, EXTENDED

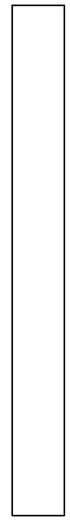
SIZE: A3 | DRAWING NUMBER: 474-3303-A | REV: 2
SCALE: .5 : 1 | SHEET: 1 OF 1

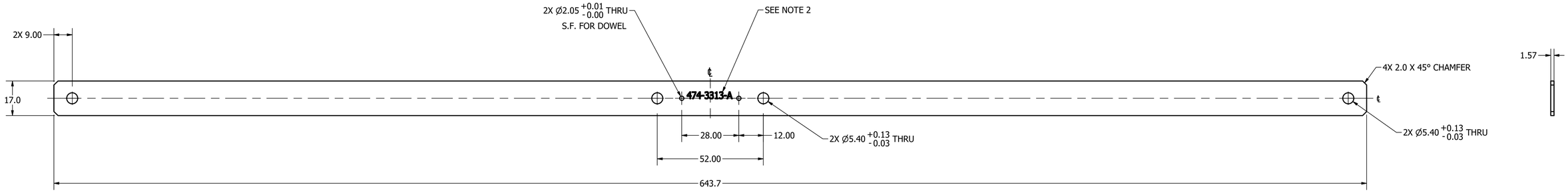
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	MJS	11/7/2022











FLATTENED STATE

NOTES:

1. DIMENSIONS SYMMETRICAL ABOUT ℄, UNLESS OTHERWISE SPECIFIED .
2. ENGRAVE PART NUMBER WHERE SPECIFIED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMALS: X ±.1, X.X ±.1, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: VascoMax C-300
HEAT TREAT: Rc 50-55
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. Kimes	8/25/2022
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

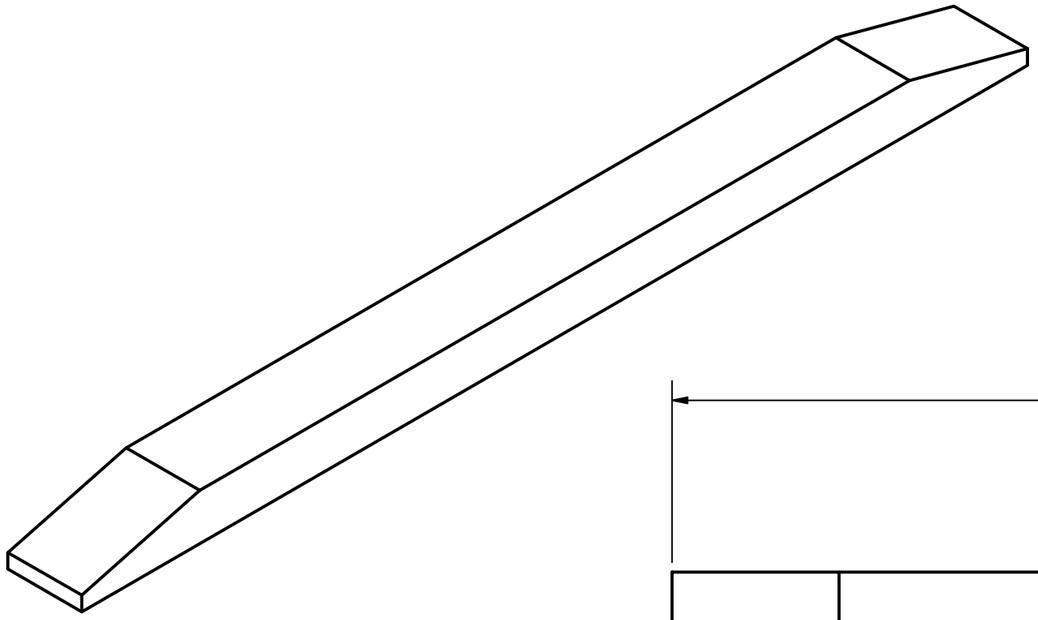
RIB 3, EXTENDED

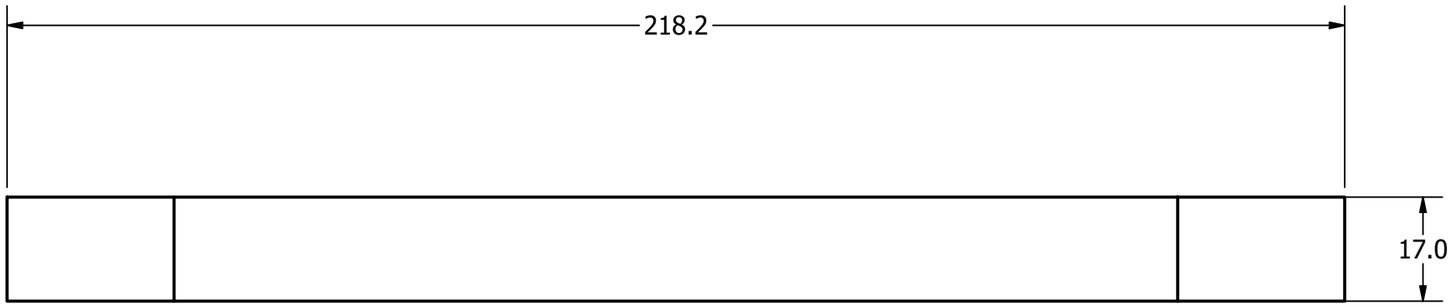
THIRD ANGLE PROJECTION

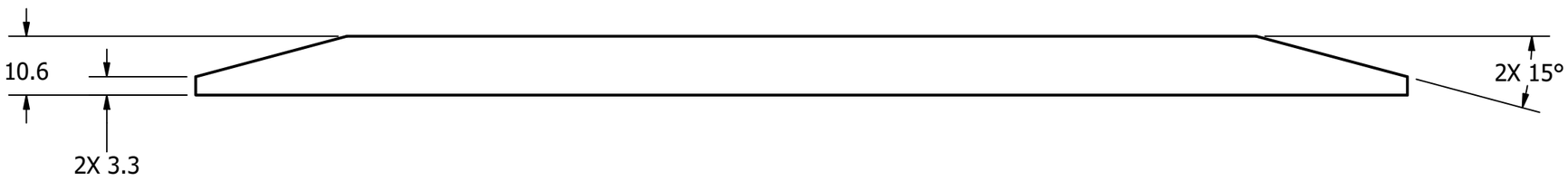
SIZE: A1 | DRAWING NUMBER: 474-3313-A | REV: 1

SCALE: 1 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	YK	HEC	12/5/2022







PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: ISODAMP CN-62	CHECKED	
HEAT TREAT: N/A	ENG	
FINISH: N/A	APPROVED	

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

APPROVALS	DATE
DRAWN: B. Kimes	8/25/2022

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

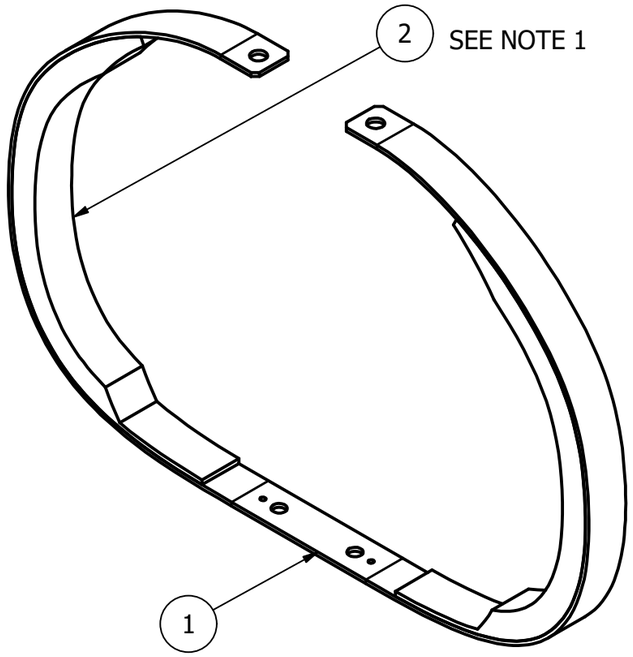
DAMPING, RIB 3, EXTENDED

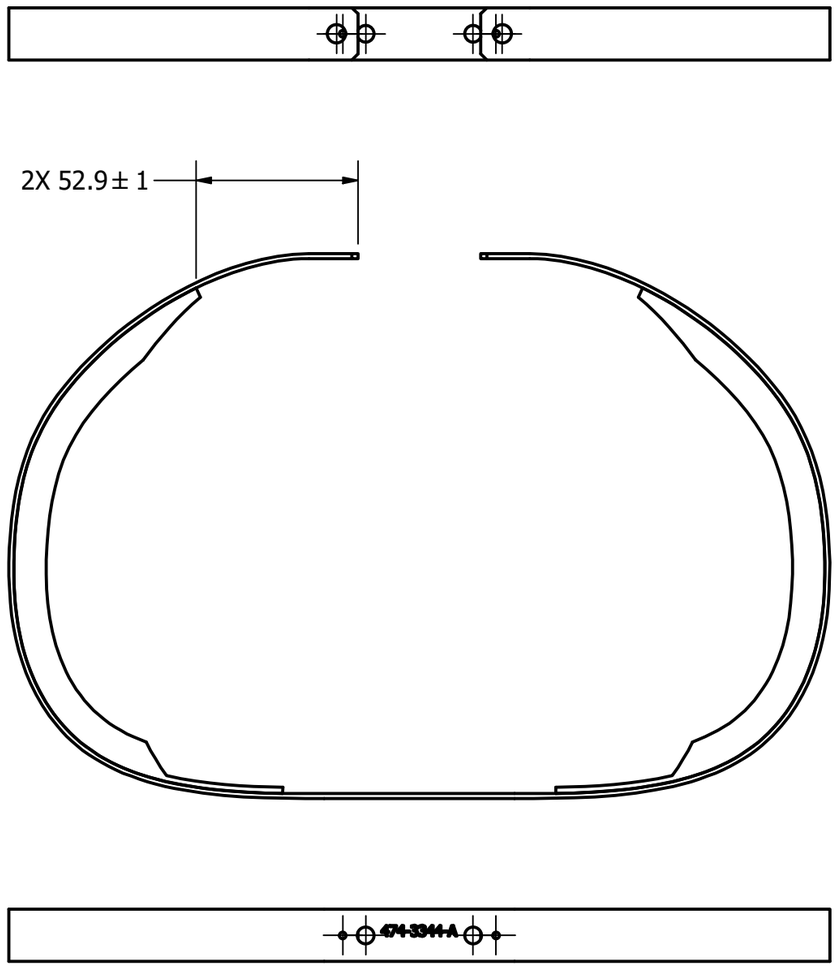
THIRD ANGLE PROJECTION

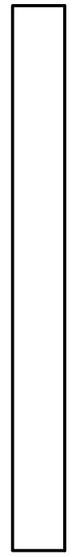
SIZE	DRAWING NUMBER	REV
A3	474-3323-A	2

SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	ENG'R.	CHECK	DATE
	1	PROTOTYPE	HEC	DJI	5/24/2024







ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	474-3324-A	DAMPING, RIB 4 EXTENDED
1	1	474-3344-A	RIB 4, EXTENDED

PARTS LIST

NOTES:
1. BOND BOTH 474-3324-A DAMPING RIB 4 TO 474-3344-A RIB 4 AS SHOWN USING ADHESIVE.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

RIB 4 ASSEMBLY, EXTENDED

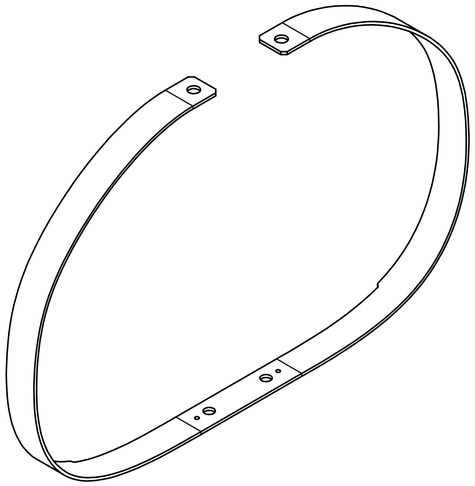
APPROVALS	DATE
DRAWN hcheco	5/24/2024
CHECKED	
ENG HEC	1/2/2024
APPROVED	

MATERIAL
HEAT TREAT N/A
FINISH N/A

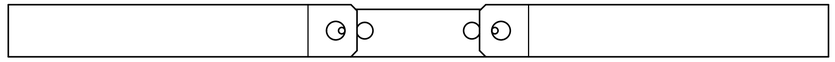
THIRD ANGLE PROJECTION

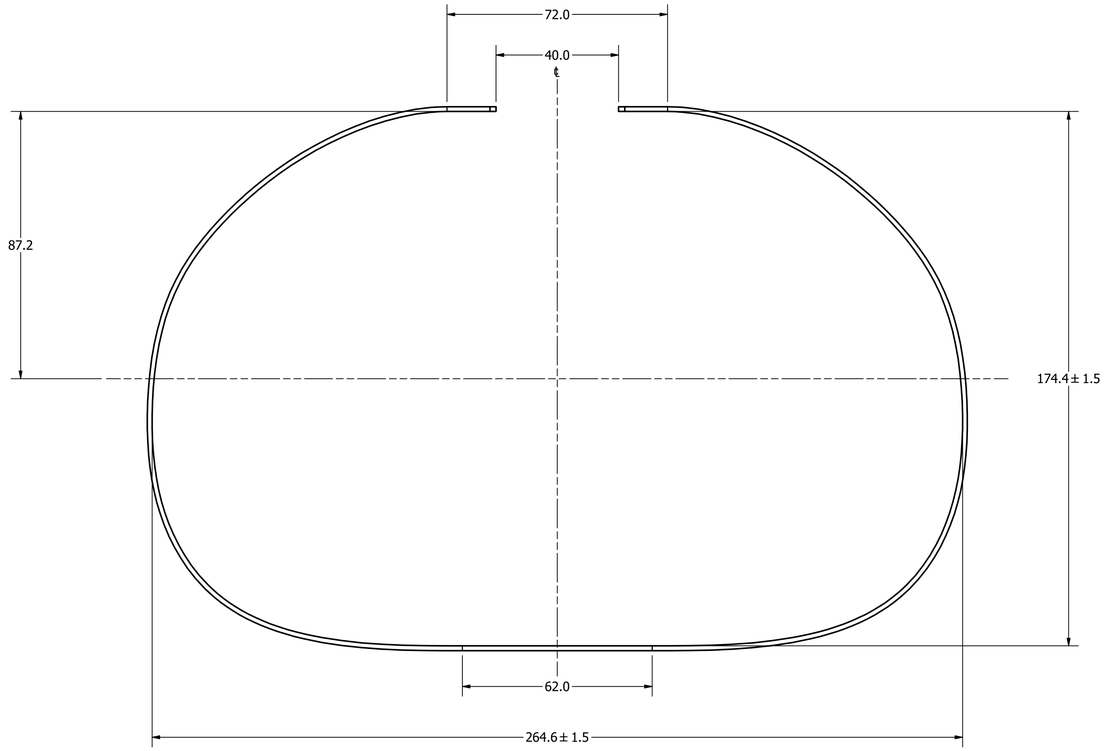
SIZE A3 | DRAWING NUMBER 474-3354-A | REV 1
SCALE: 1 / 2 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	BK	HEC	5/3/2023

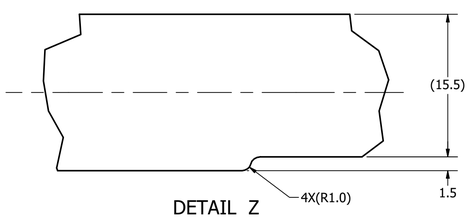


SCALE .75 : 1

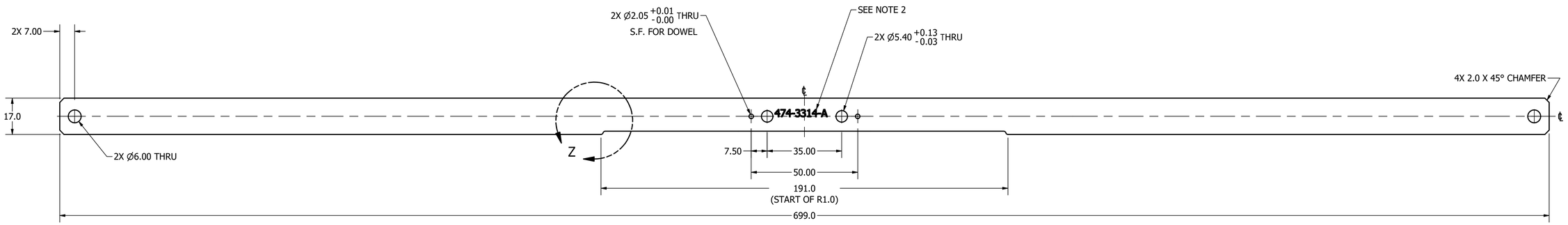








DETAIL Z
SCALE 3 : 1



FLATTENED STATE

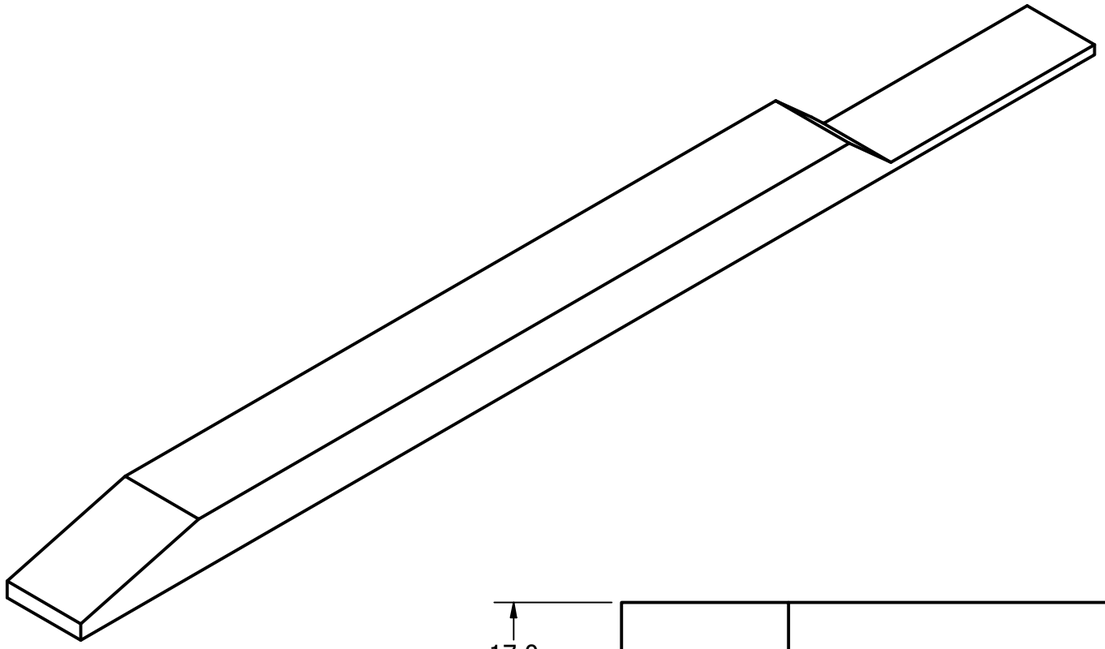
NOTES:

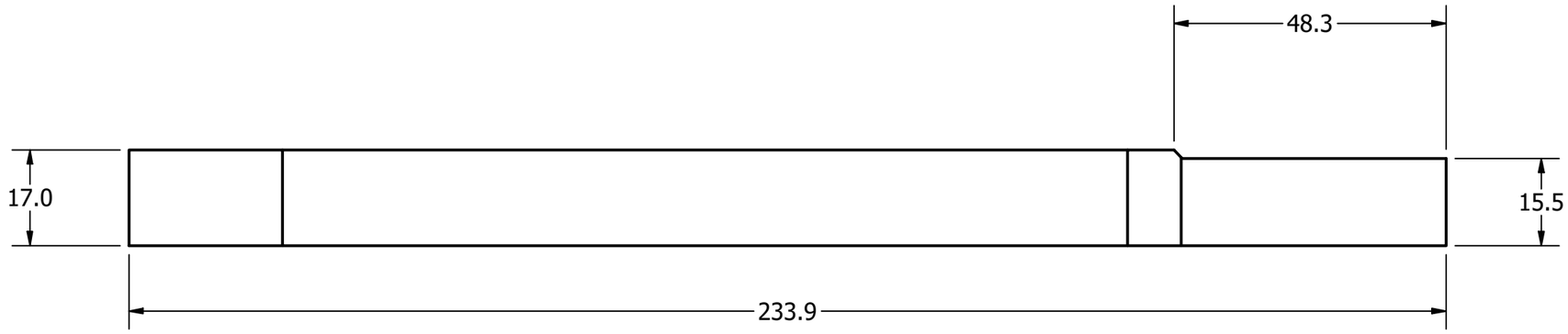
1. DIMENSIONS SYMMETRICAL ABOUT ℄ , UNLESS OTHERWISE SPECIFIED .
2. ENGRAVE PART NUMBER WHERE SPECIFIED.

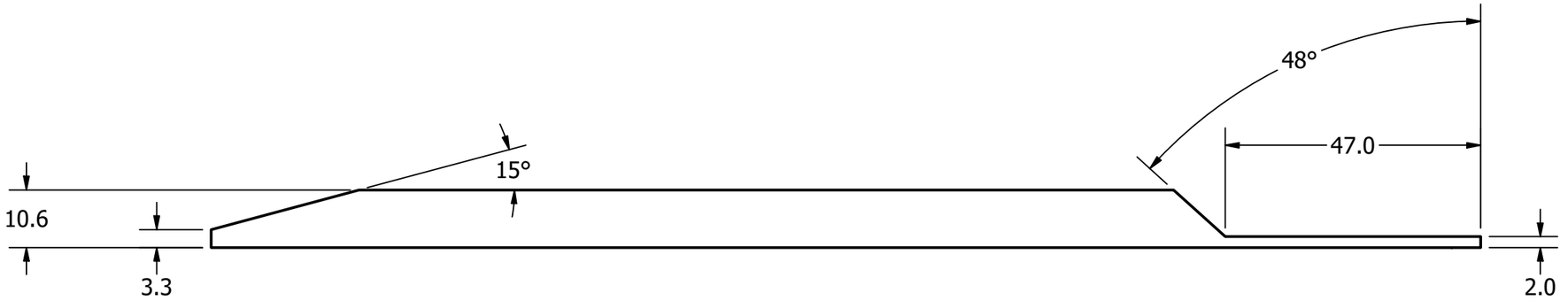
PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
APPROVALS / DATE		RIB 4, EXTENDED
DRAWN: B. Kimes / 8/25/2022		
MATERIAL: VascoMax C-300 / CHECKED		
HEAT TREAT: Rc 50-55 / ENG		SIZE A1 · DRAWING NUMBER 474-3314-A · REV 3
FINISH: N/A / APPROVED	THIRD ANGLE PROJECTION	SCALE: 1 : 1 · SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	BK	HEC	5/10/2023







PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 125
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DAMPING, LEFT, RIB 4 EXTENDED

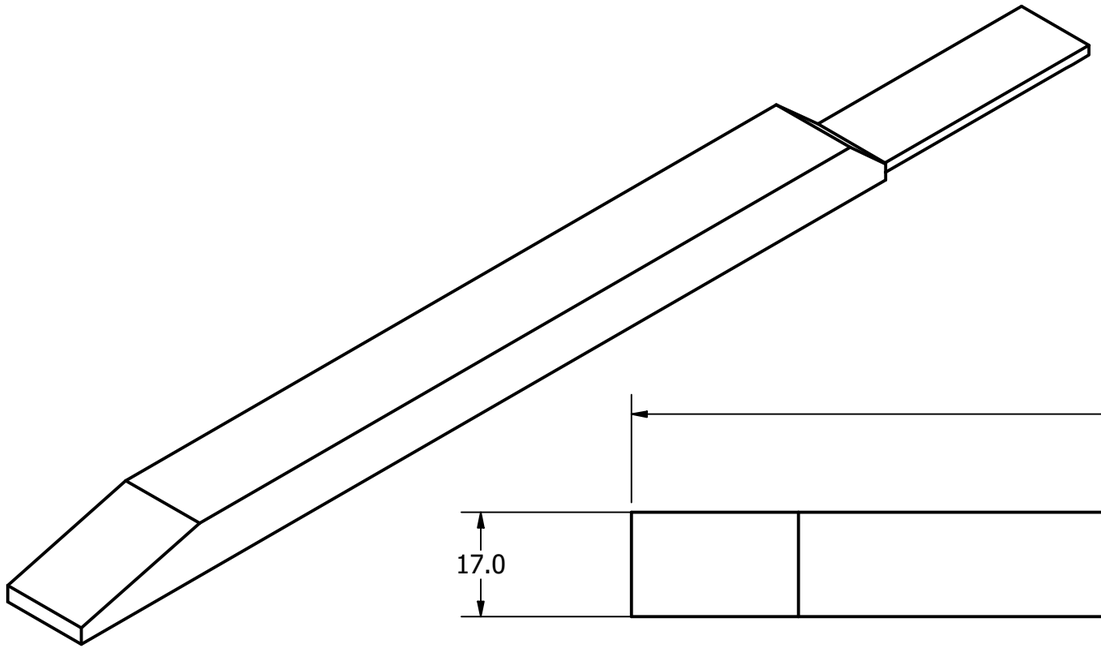
APPROVALS	DATE
DRAWN B. KIMES	5/10/2023
CHECKED	
ENG	
APPROVED	

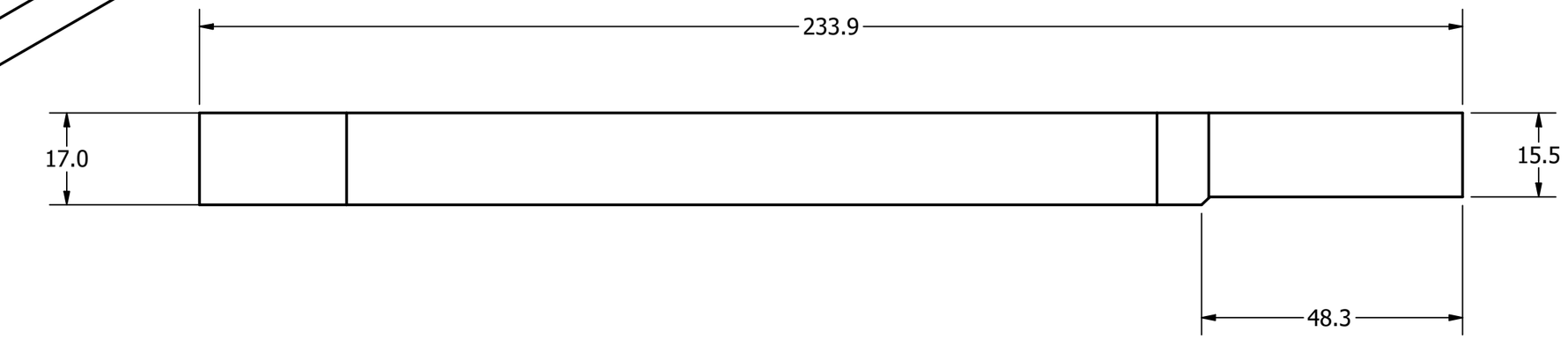
MATERIAL: ISODAMP CN-62
HEAT TREAT: N/A
FINISH: N/A

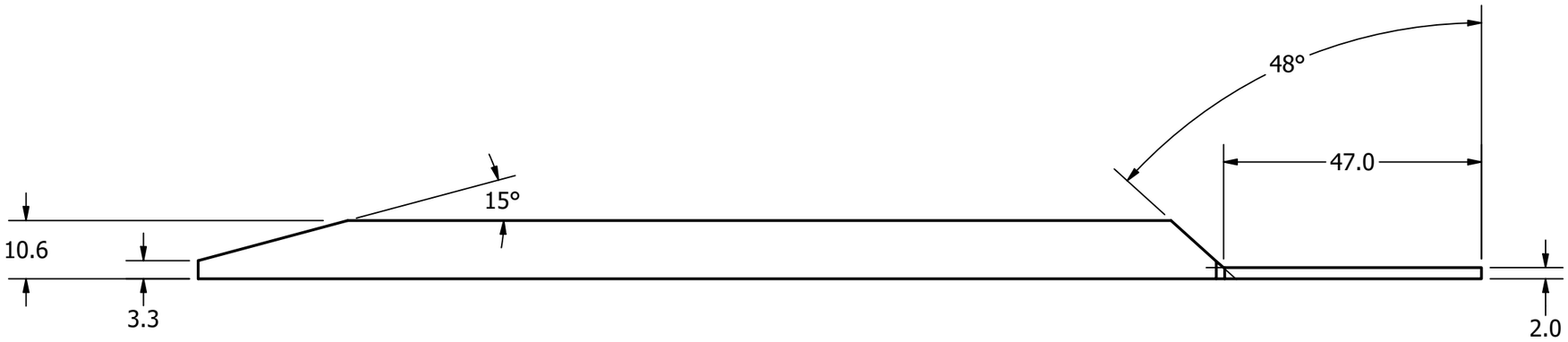
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-3324-1-A | REV: 4
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	BK	HEC	5/10/2023







PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 32
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. Kimes	8/30/2022
CHECKED	
ENG	
APPROVED	

MATERIAL: ISODAMP CN-62
HEAT TREAT: N/A
FINISH: N/A

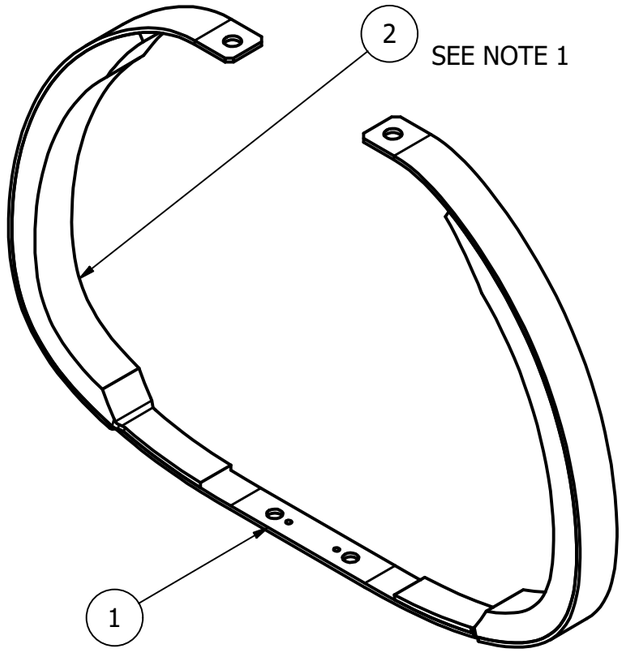
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

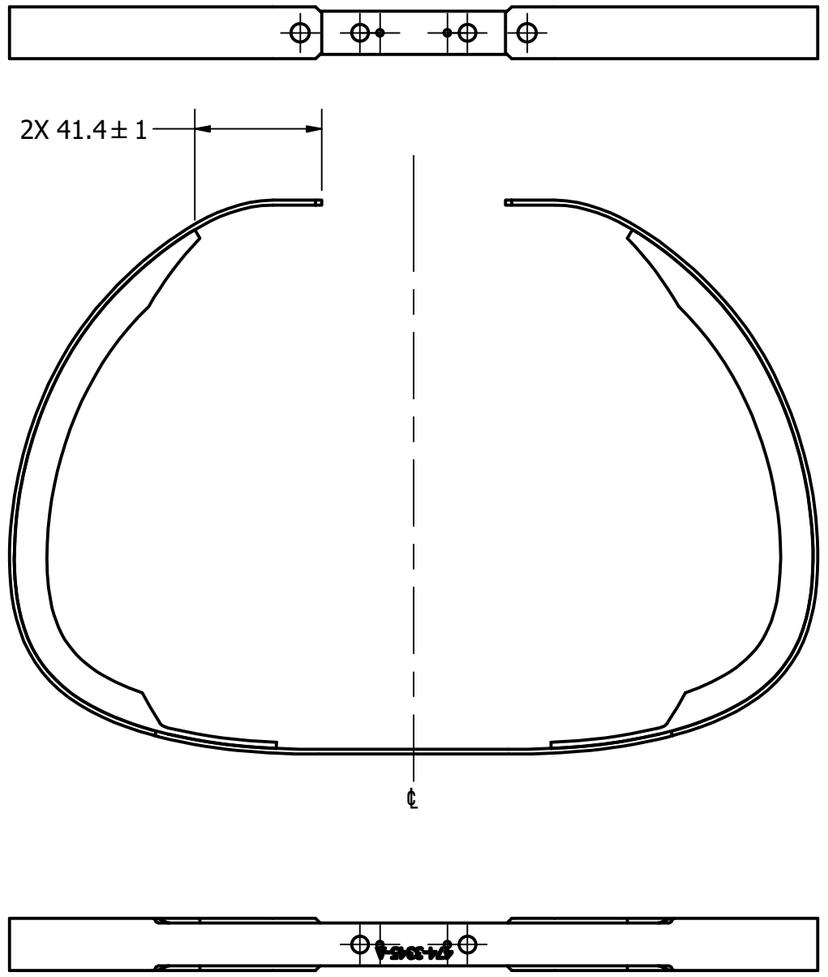
DAMPING, RIGHT, RIB 4 EXTENDED

THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-3324-2-A | REV: 4
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	ENG'R.	CHECK	DATE
	1	PROTOTYPE	HEC	DJI	5/24/2024







NOTES:
1. BOND BOTH 474-3325-A DAMPING RIB 5 TO 474-3345-A RIB 5 AS SHOWN USING ADHESIVE.

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	474-3325-A	DAMPING, RIB 5 EXTENDED
1	1	474-3345-A	RIB 5, EXTENDED

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

RIB 5 ASSEMBLY, EXTENDED

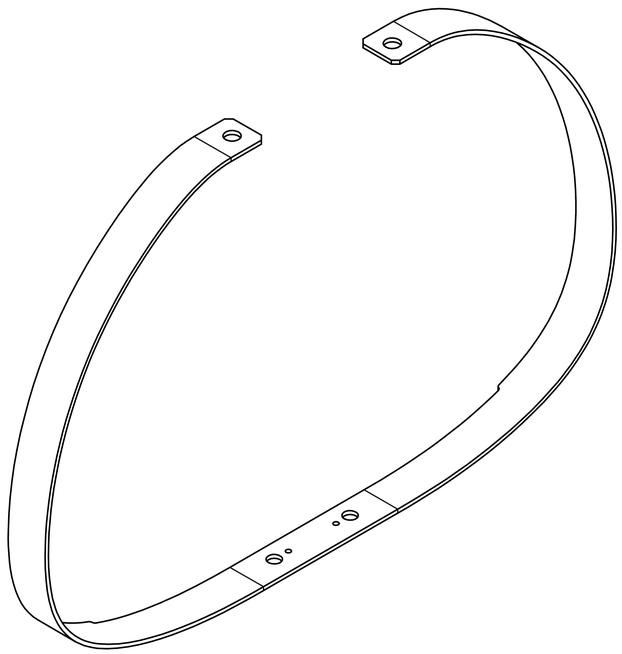
	APPROVALS	DATE
DRAWN	hcheco	5/24/2024
CHECKED		
ENG	HEC	1/2/2024
APPROVED		

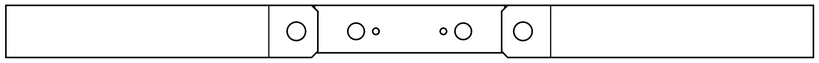
MATERIAL
HEAT TREAT: N/A
FINISH: N/A

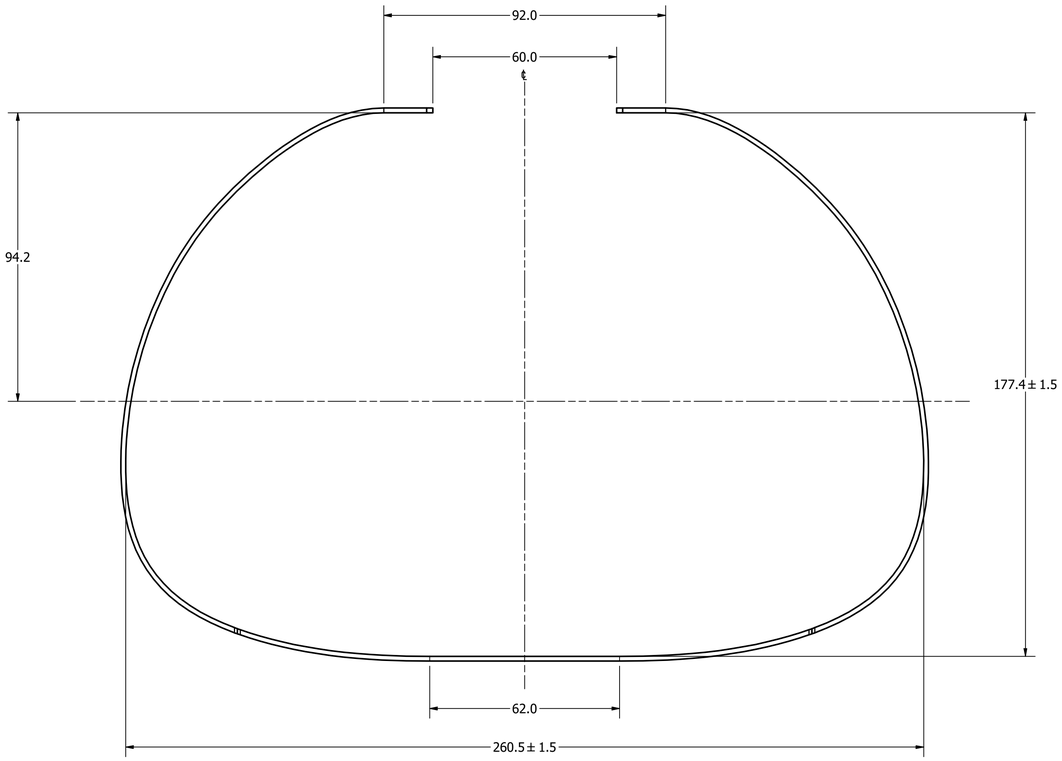
THIRD ANGLE PROJECTION

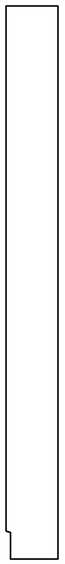
SIZE: A3 | DRAWING NUMBER: 474-3355-A | REV: 1
SCALE: 1 / 2 | SHEET: 1 OF 1

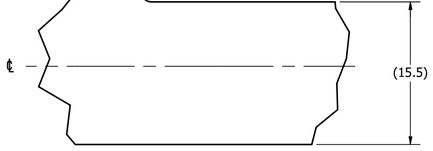
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	BK	HEC	5/3/2023



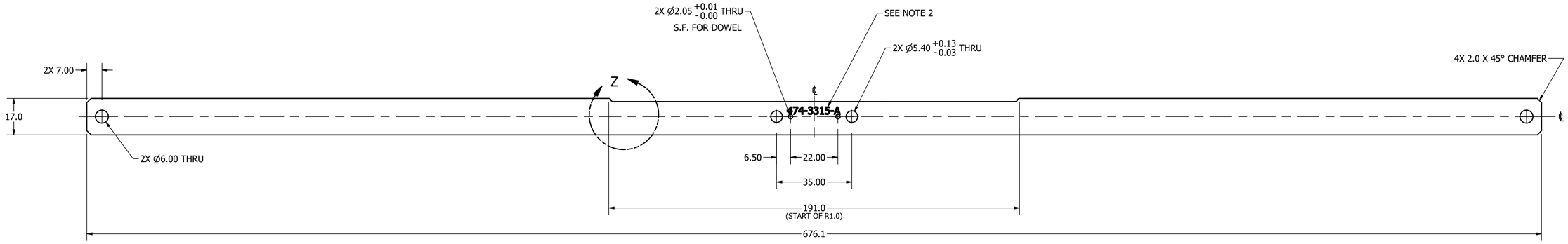








DETAIL Z
BOTH SIDES
SCALE 3 : 1



FLATTENED VIEW

NOTES:

1. DIMENSIONS SYMMETRICAL ABOUT ℄, UNLESS OTHERWISE SPECIFIED .
2. ENGRAVE PART NUMBER WHERE SPECIFIED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: VascoMax C-300
HEAT TREAT: Rc 50-55
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. Kimes	8/30/2022
CHECKED:	
ENG:	
APPROVED:	

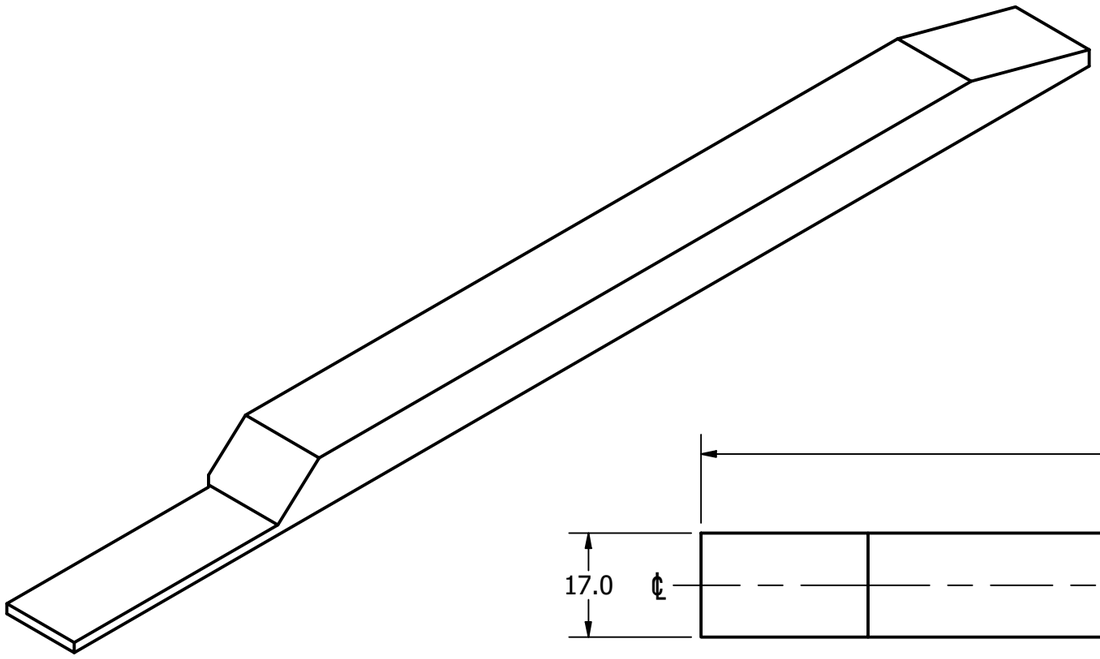
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

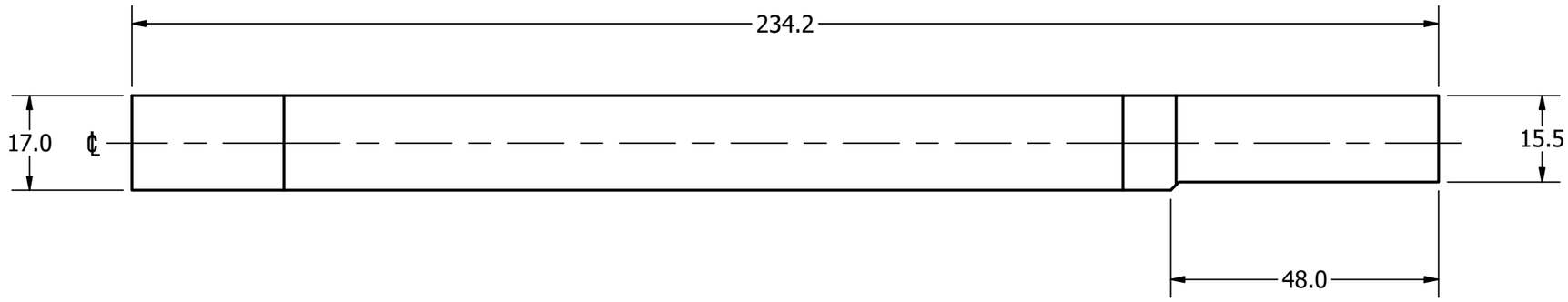
RIB 5, EXTENDED

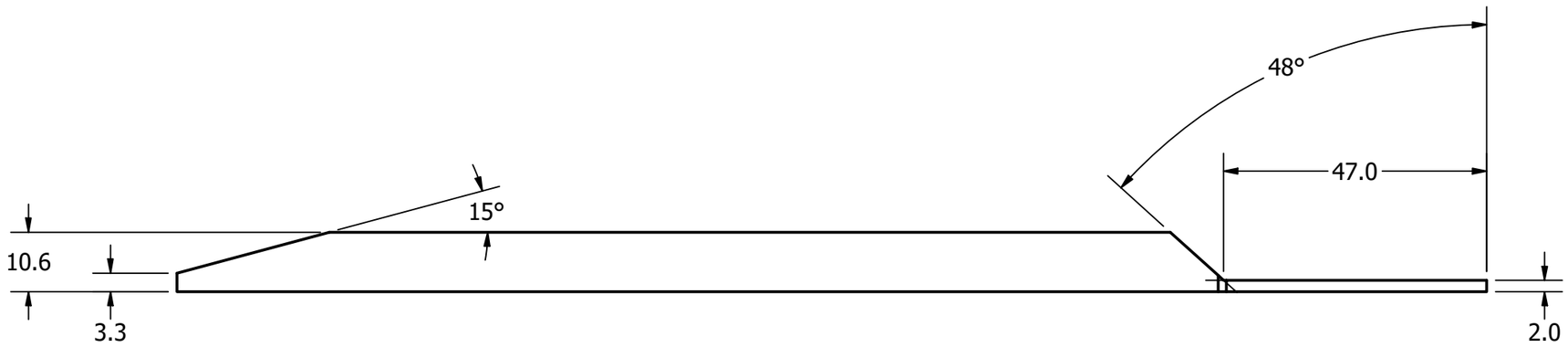
THIRD ANGLE PROJECTION

SIZE: A1 | DRAWING NUMBER: 474-3315-A | REV: 3
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	BK	HEC	5/10/2023







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 125 | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: ISODAMP CN-62
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. Kimes	8/30/2022
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

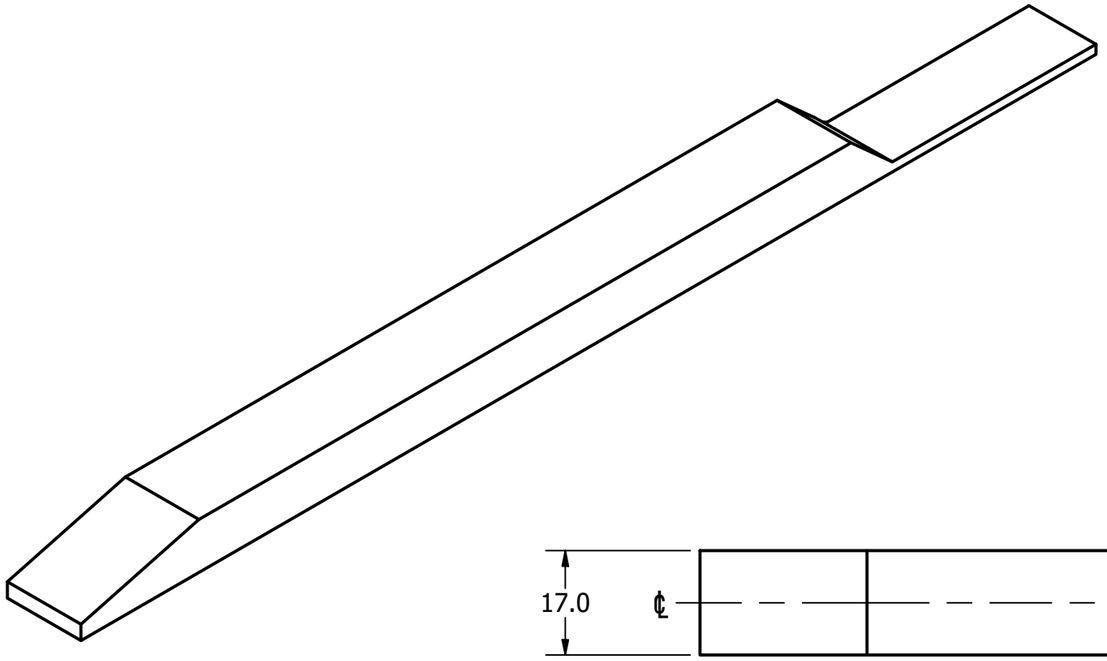
DAMPING, LEFT, RIB 5 EXTENDED

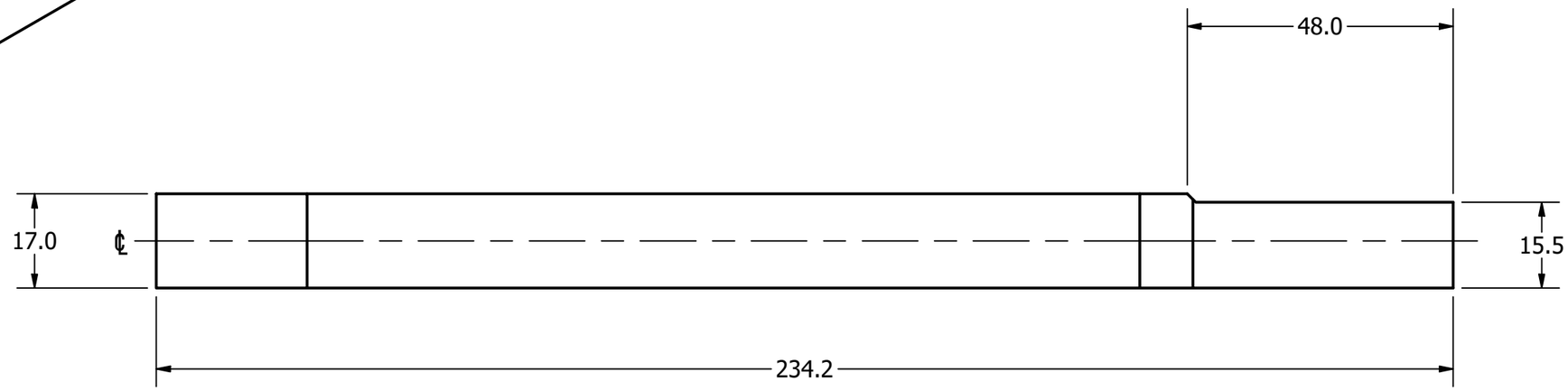
THIRD ANGLE PROJECTION

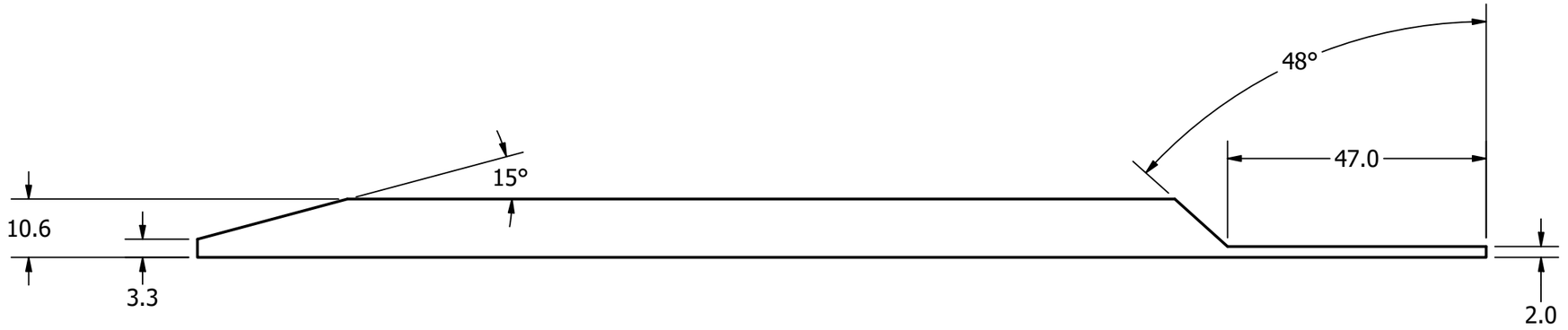
SIZE: A3 | DRAWING NUMBER: 474-3325-1-A | REV: 4

SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	BK	HEC	5/10/2023







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED √ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: ISODAMP CN-62	CHECKED	
HEAT TREAT: N/A	ENG	
FINISH: N/A	APPROVED	

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	5/9/2023

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

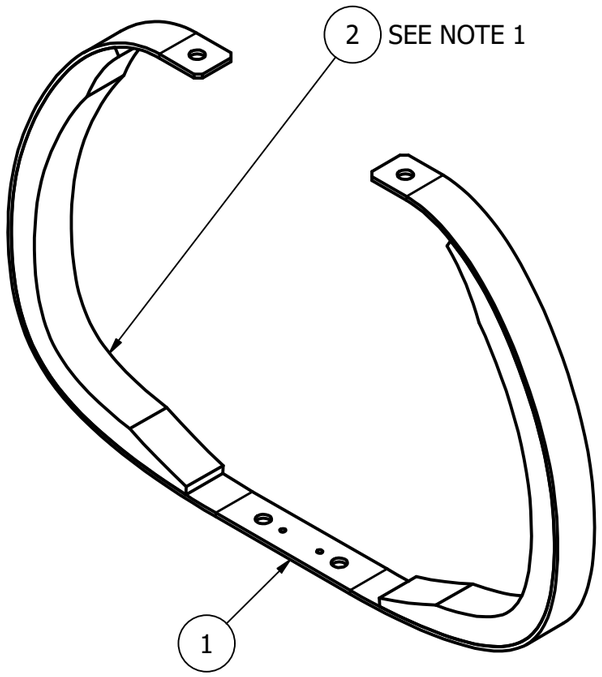
DAMPING, RIGHT, RIB 5 EXTENDED

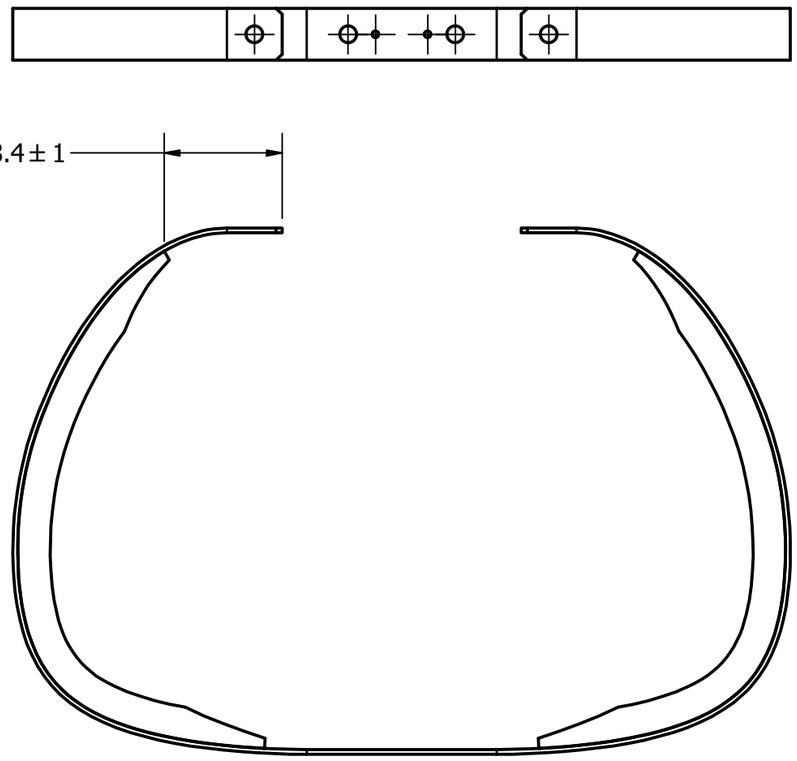
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A3	474-3325-2-A	4

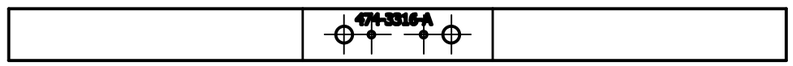
SCALE: 1 : 1 SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	YK	HEC	12/6/2022









ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	474-3326-A	DAMPING, RIB 6 EXTENDED
1	1	474-3316-A	RIB 6, EXTENDED

PARTS LIST

PROTOTYPE DRAWING

NOTES:

1. BOND BOTH 474-3326-A DAMPING RIB 6 TO 474-3316-A RIB 6 AS SHOWN USING EPOXY ADHESIVE.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	8/30/2022
CHECKED	
ENG	
APPROVED	

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

DEPARTMENT OF TRANSPORTATION UNITED STATES OF AMERICA

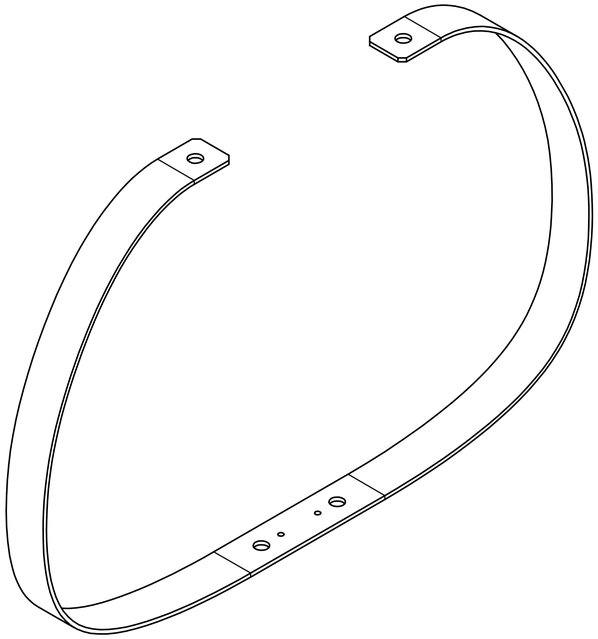
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

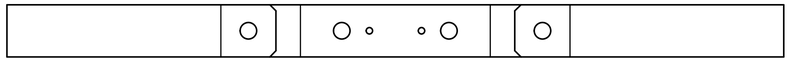
RIB 6 ASSEMBLY, EXTENDED

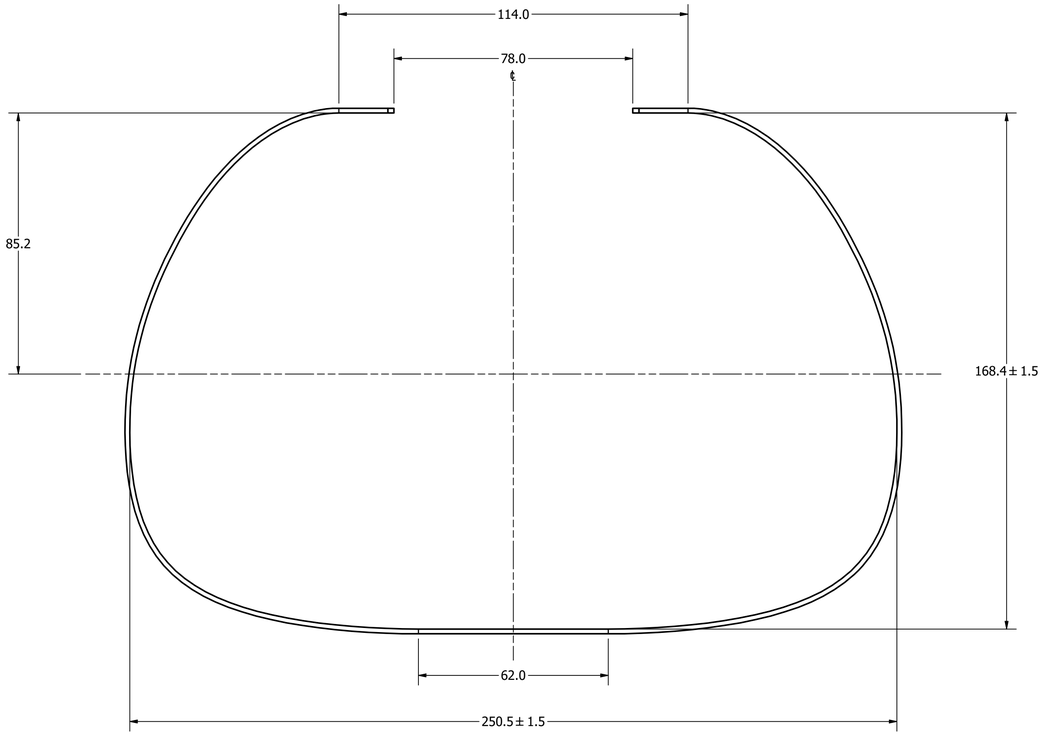
THIRD ANGLE PROJECTION

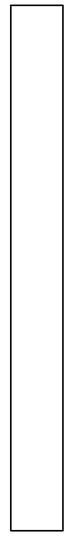
SIZE: A3
DRAWING NUMBER: 474-3306-A
REV: 2
SCALE: .5: 1
SHEET: 1 OF 1

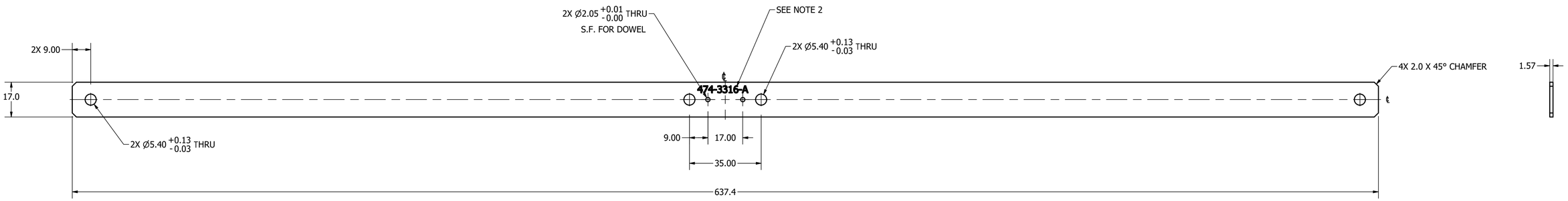
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	MJS	11/7/2022











NOTES:

1. DIMENSIONS SYMMETRICAL ABOUT ℄, UNLESS OTHERWISE SPECIFIED .
2. ENGRAVE PART NUMBER WHERE SPECIFIED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	ViscoMax C-300
HEAT TREAT	Rc 50-55
FINISH	N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. Kimes	8/30/2022
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

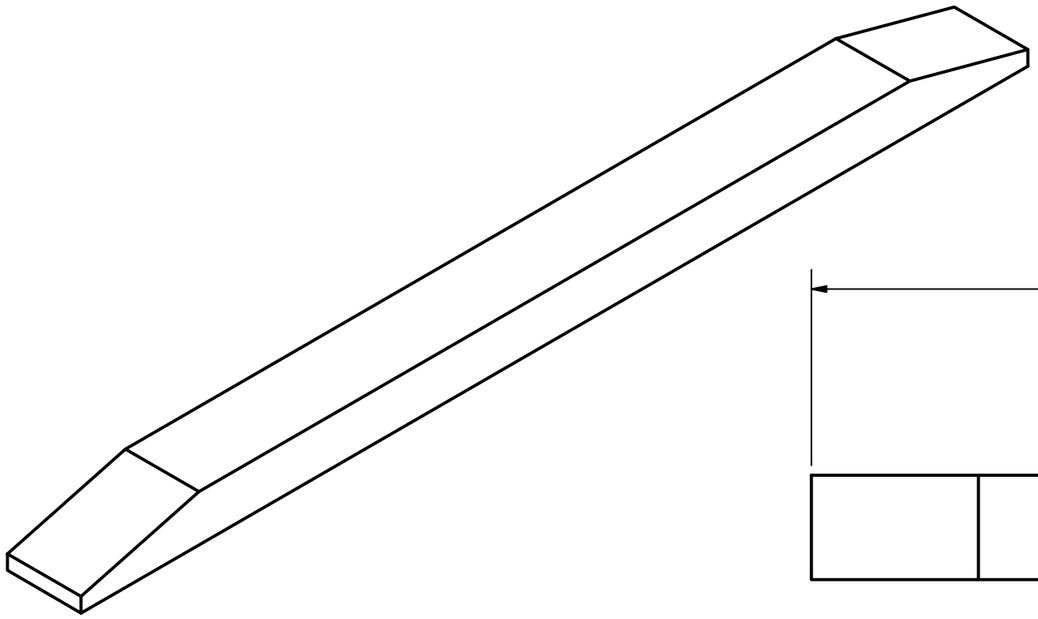
RIB 6, EXTENDED

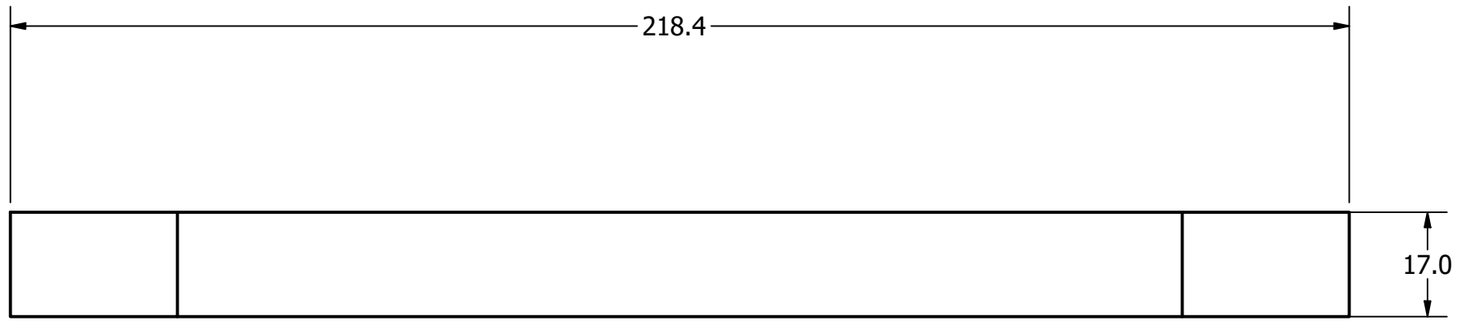
THIRD ANGLE PROJECTION

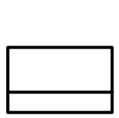
SIZE	DRAWING NUMBER	REV
A1	474-3316-A	1

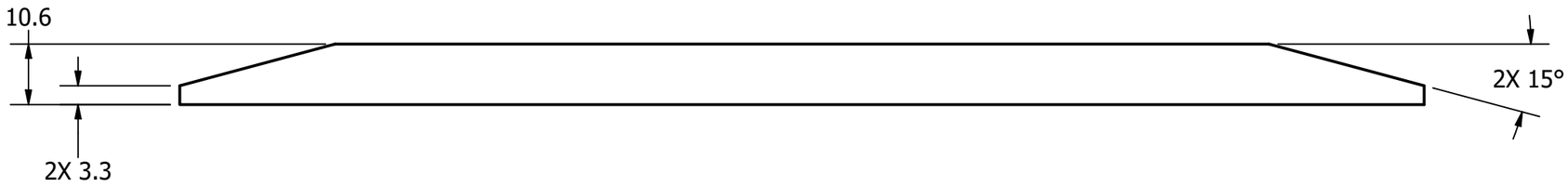
SCALE: 1 : 1 SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	YK	HEC	12/5/2022









PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 32
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: ISODAMP CN-62
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. Kimes	8/31/2022
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

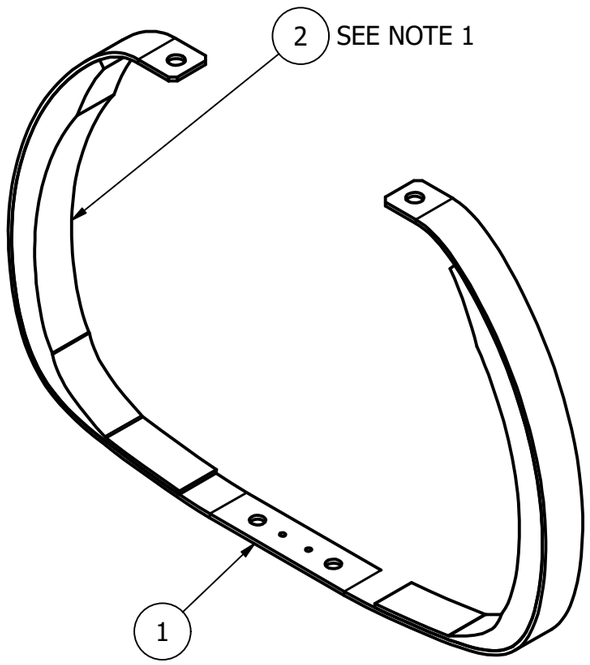
DAMPING, RIB 6 EXTENDED

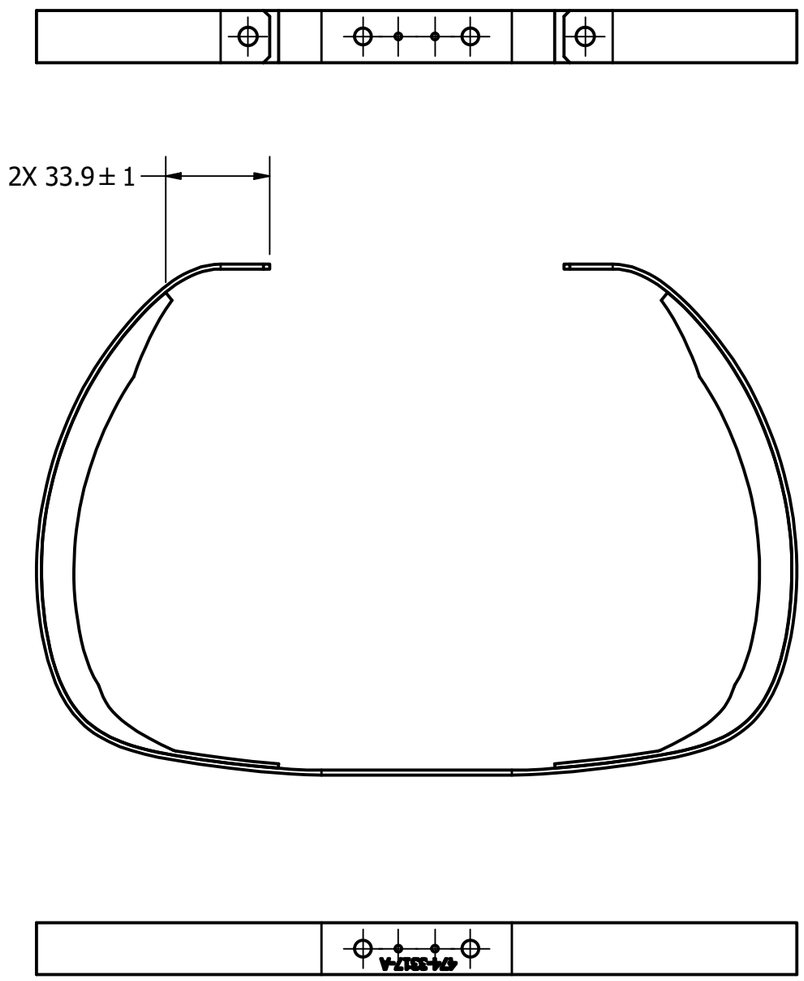
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-3326-A | REV: 2

SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	BK	MJS	1/3/2023





2	2	474-3327-A	DAMPING, RIB 7, EXTENDED
1	1	474-3317-A	RIB 7, EXTENDED
ITEM	QTY	PART NUMBER	DESCRIPTION

PARTS LIST

PROTOTYPE DRAWING

NOTES:

1. BOND BOTH 474-3327-A DAMPING RIB 7 TO 474-3317-A RIB 7 AS SHOWN USING EPOXY ADHESIVE.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 32
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: B. KIMES	8/31/2022
CHECKED	
ENG	
APPROVED	

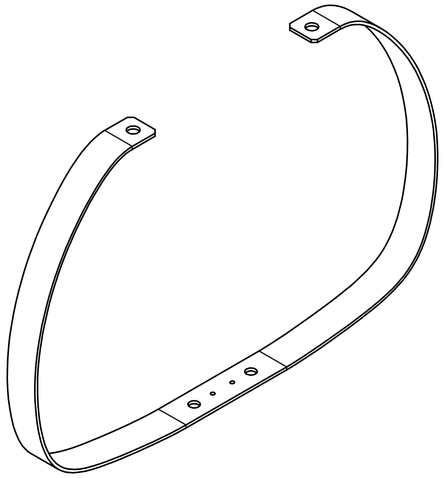
MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

RIB 7 ASSEMBLY, EXTENDED

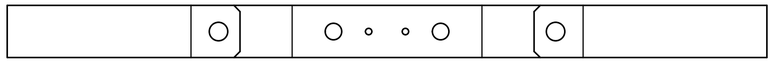
THIRD ANGLE PROJECTION

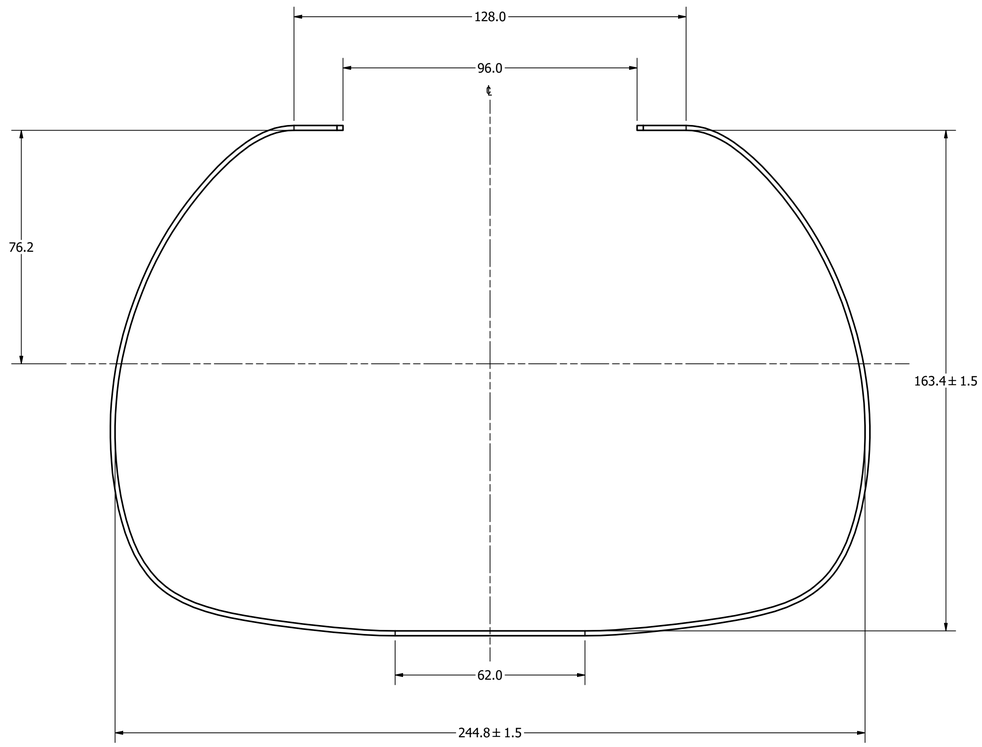
SIZE: A3 | DRAWING NUMBER: 474-3307-A | REV: 3
SCALE: .5 : 1 | SHEET: 1 OF 1

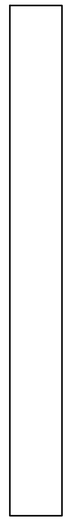
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	MJS	1/3/2023

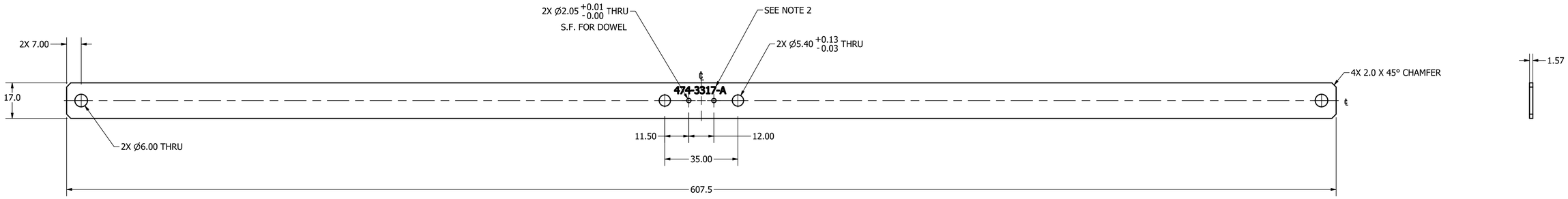


SCALE .75 : 1









NOTES:

1. DIMENSIONS SYMMETRICAL ABOUT ℄, UNLESS OTHERWISE SPECIFIED .
2. ENGRAVE PART NUMBER WHERE SPECIFIED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMALS X ±.5 X.X ±.2 X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: VascoMax C-300
HEAT TREAT: Rc 50-55
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. Kimes	8/31/2022
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

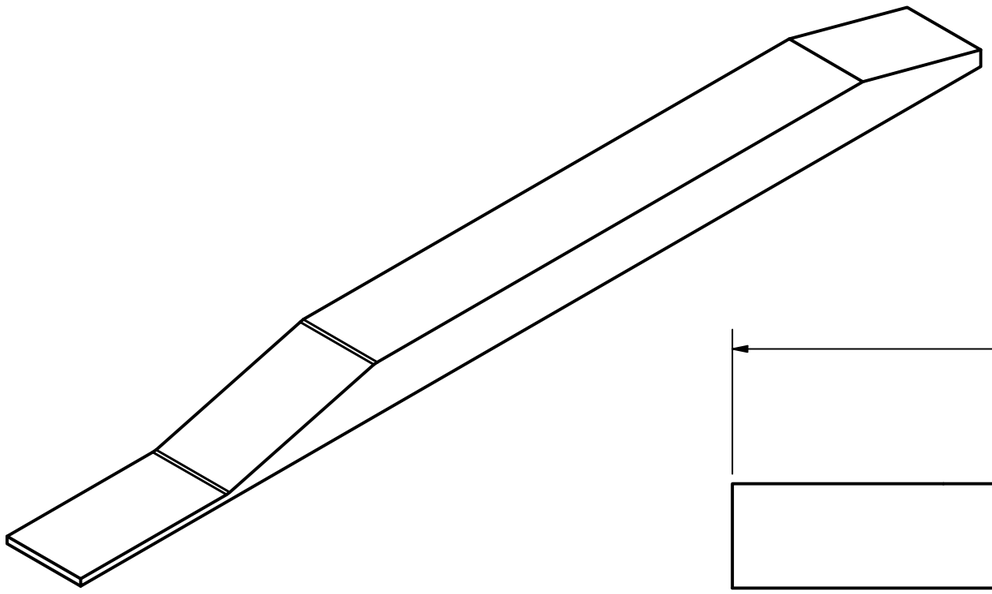
RIB 7, EXTENDED

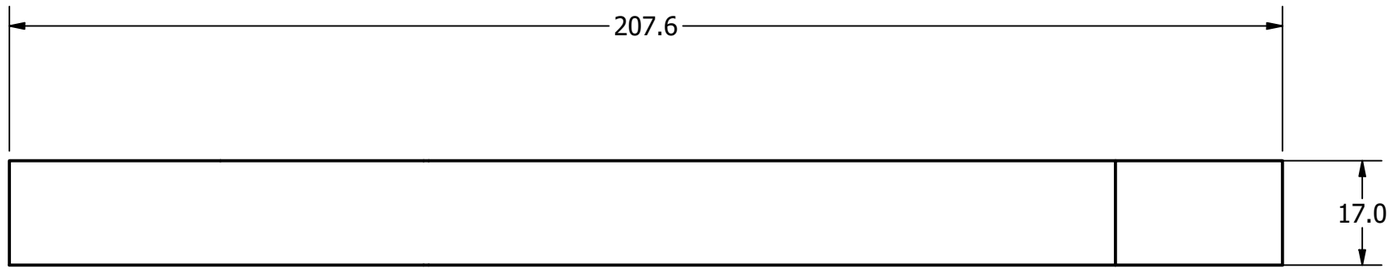
THIRD ANGLE PROJECTION

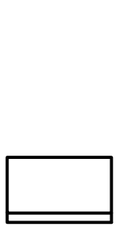
SIZE: A1 | DRAWING NUMBER: 474-3317-A | REV: 2

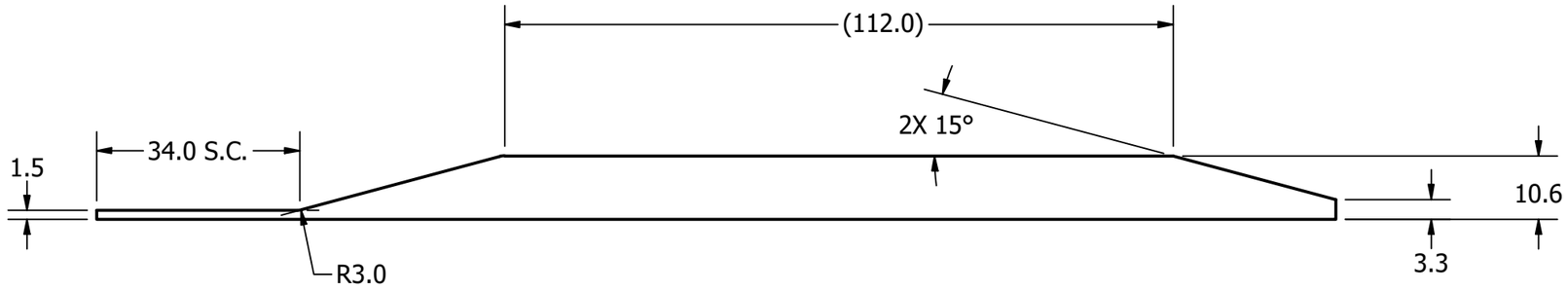
SCALE: 1 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	YK	HEC	12/5/2022









PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ±.5
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: ISODAMP CN-62
HEAT TREAT: N/A
FINISH: N/A

	APPROVALS	DATE
DRAWN	B. Kimes	8/31/2022
CHECKED		
ENG		
APPROVED		

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

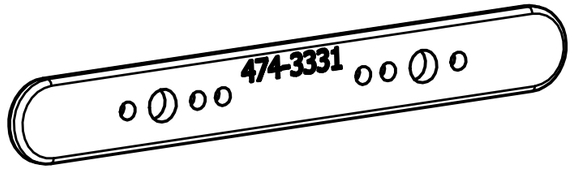
DAMPING, RIB 7, EXTENDED

THIRD ANGLE PROJECTION

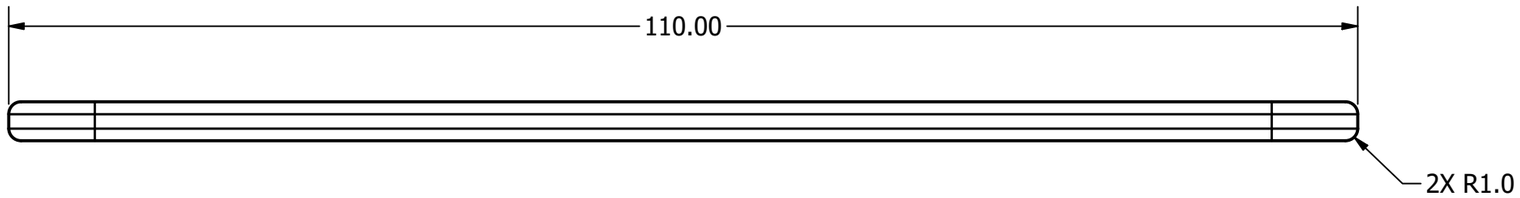
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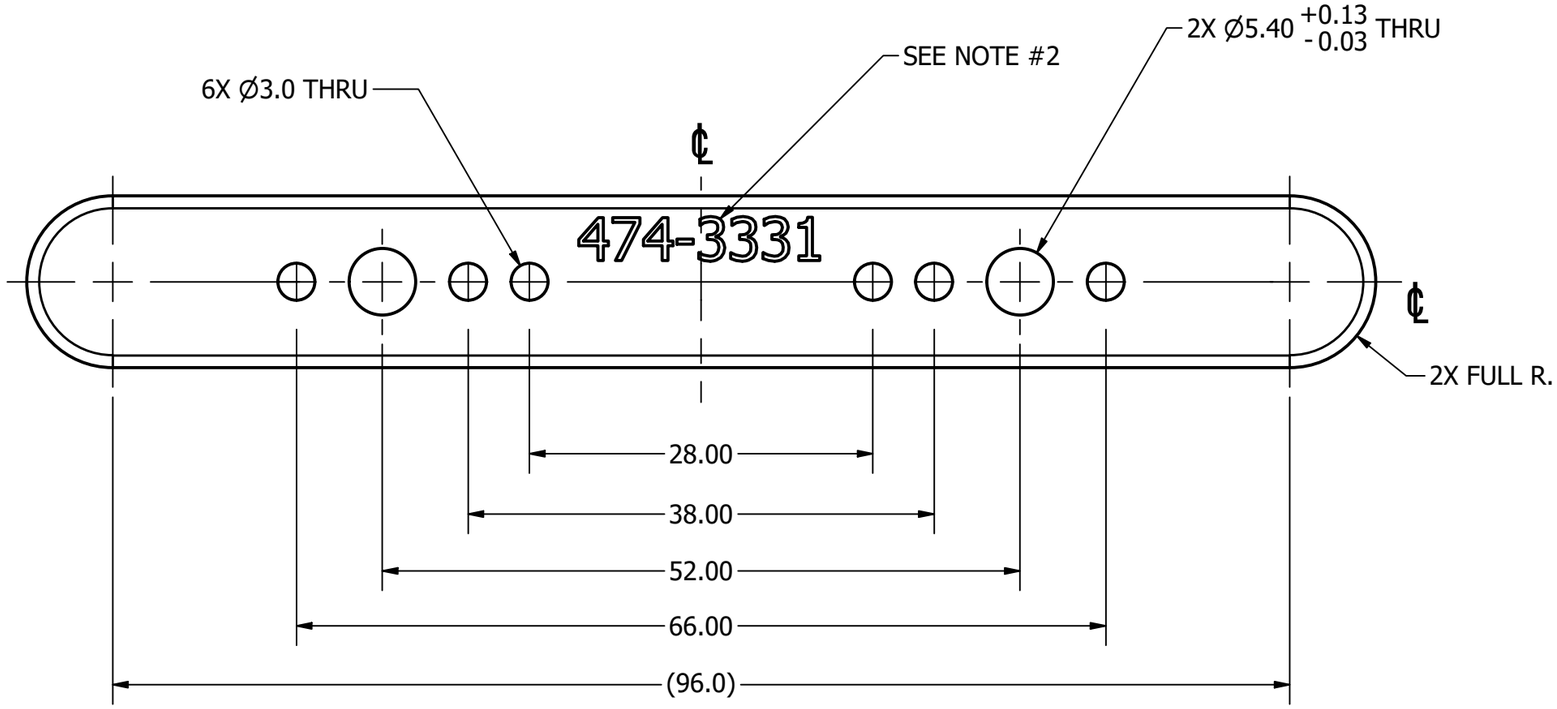
SCALE: 1 : 1 | SHEET: 1 OF 1

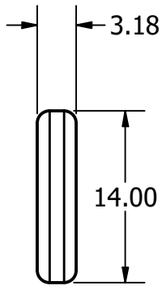
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	RELEASE FOR PROTOTYPE	ANK	HEC	11/08/2024



SCALE 1 : 1







NOTES:

1. DIMENSIONS ARE SYMMETRICAL ABOUT℄ UNLESS OTHERWISE NOTED.
2. STAMP OR ETCH TEXT 3.5mm TALL WHERE SHOWN.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED √ | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 1075 Spring Steel
HEAT TREAT: Rc 48-52
FINISH: E-COAT

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: jhaefner	3/21/2016
CHECKED:	
ENG: JW	3/21/2016
APPROVED:	

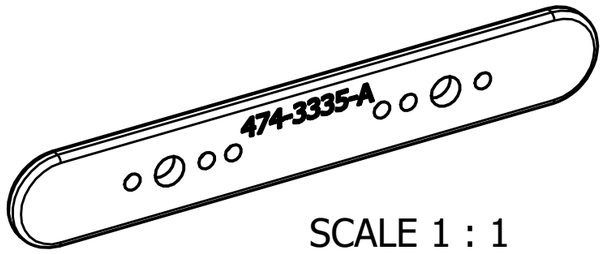
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

RIB 1 STIFFENER
THOR-05F

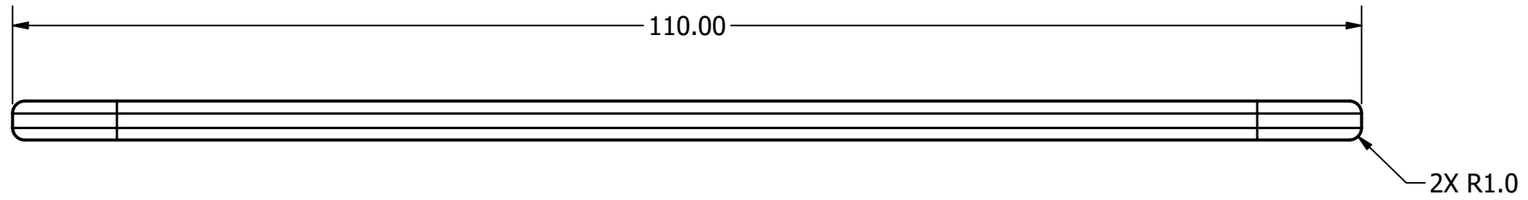
THIRD ANGLE PROJECTION

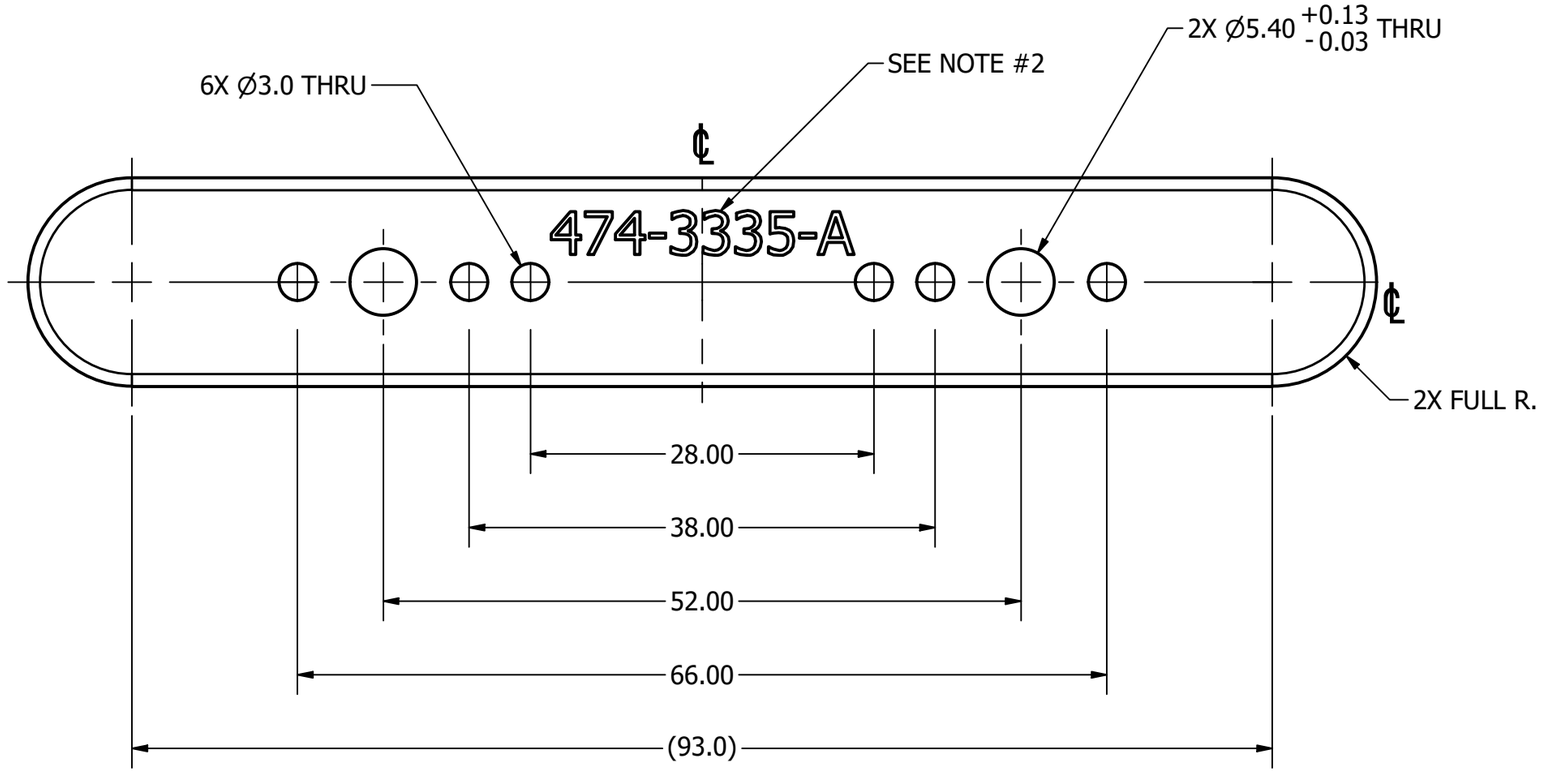
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SCALE: 2 : 1 | SHEET: 1 OF 1

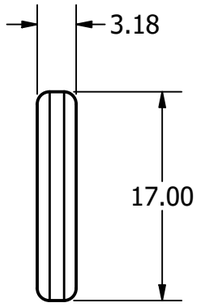
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	TM	DJI	04/24/2024



SCALE 1 : 1







NOTES:

1. DIMENSIONS ARE SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE NOTED.
2. STAMP OR ETCH TEXT 3.5mm TALL WHERE SHOWN.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	kreddy	12/5/2023
CHECKED		
ENG	hcheco	12/5/2023
APPROVED		

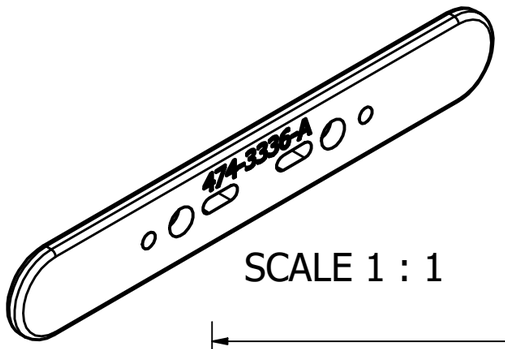
MATERIAL: 1075 Spring Steel
HEAT TREAT: Rc 48-52
FINISH: E-COAT

STIFFENER, RIBS 2, 3

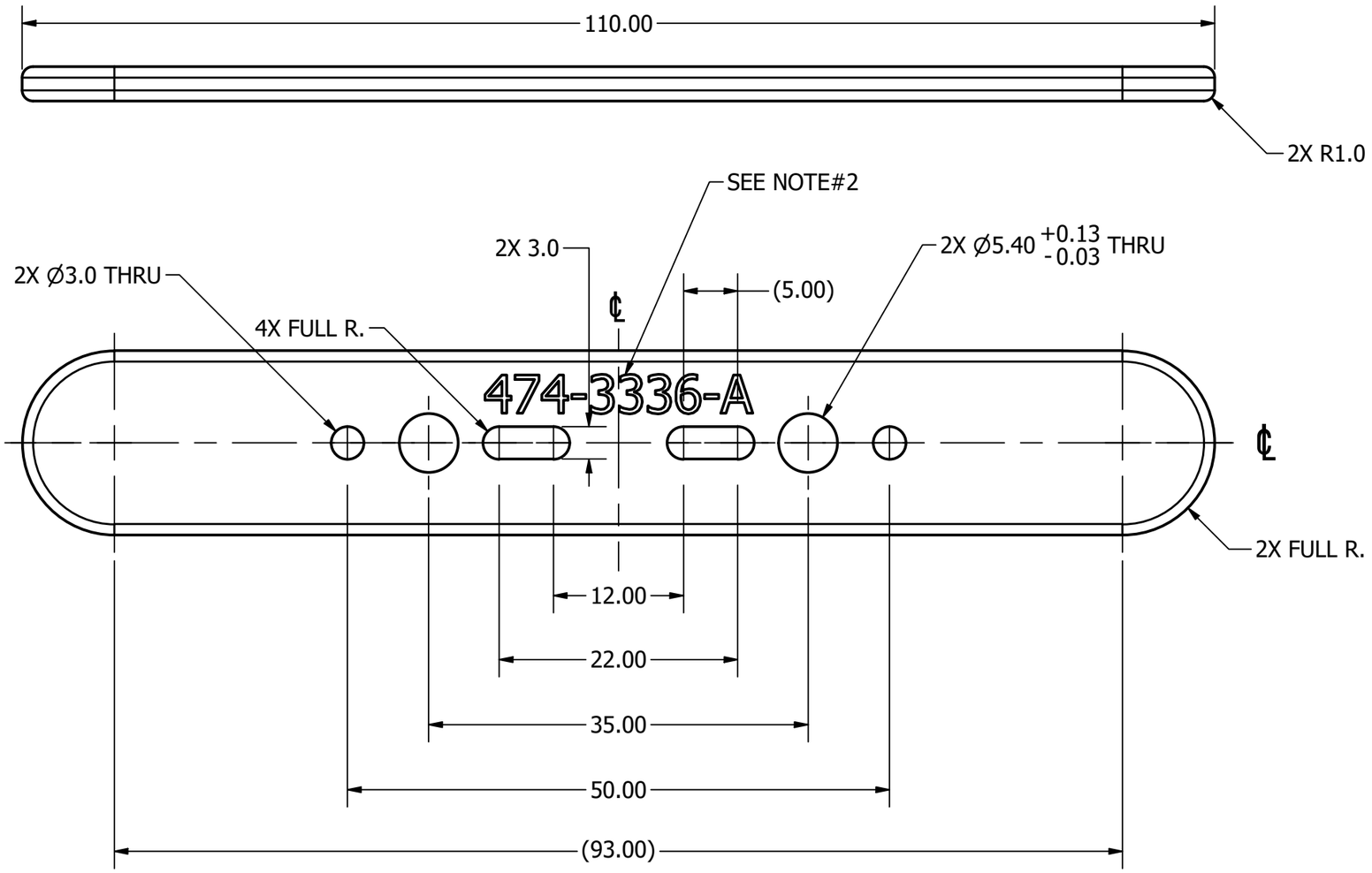
THIRD ANGLE PROJECTION

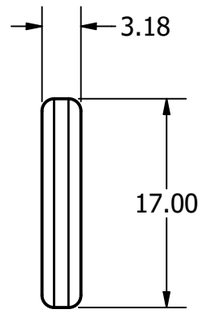
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SCALE: 2 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	TM	DJI	04/24/2024



SCALE 1 : 1





NOTES:

1. DIMENSIONS ARE SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE NOTED.
2. STAMP OR ETCH TEXT 3.5mm TALL WHERE SHOWN.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: kreddy	12/5/2023
CHECKED:	
ENG: hcheco	12/5/2023
APPROVED:	

STIFFENER, RIBS 4, 5, 6, 7

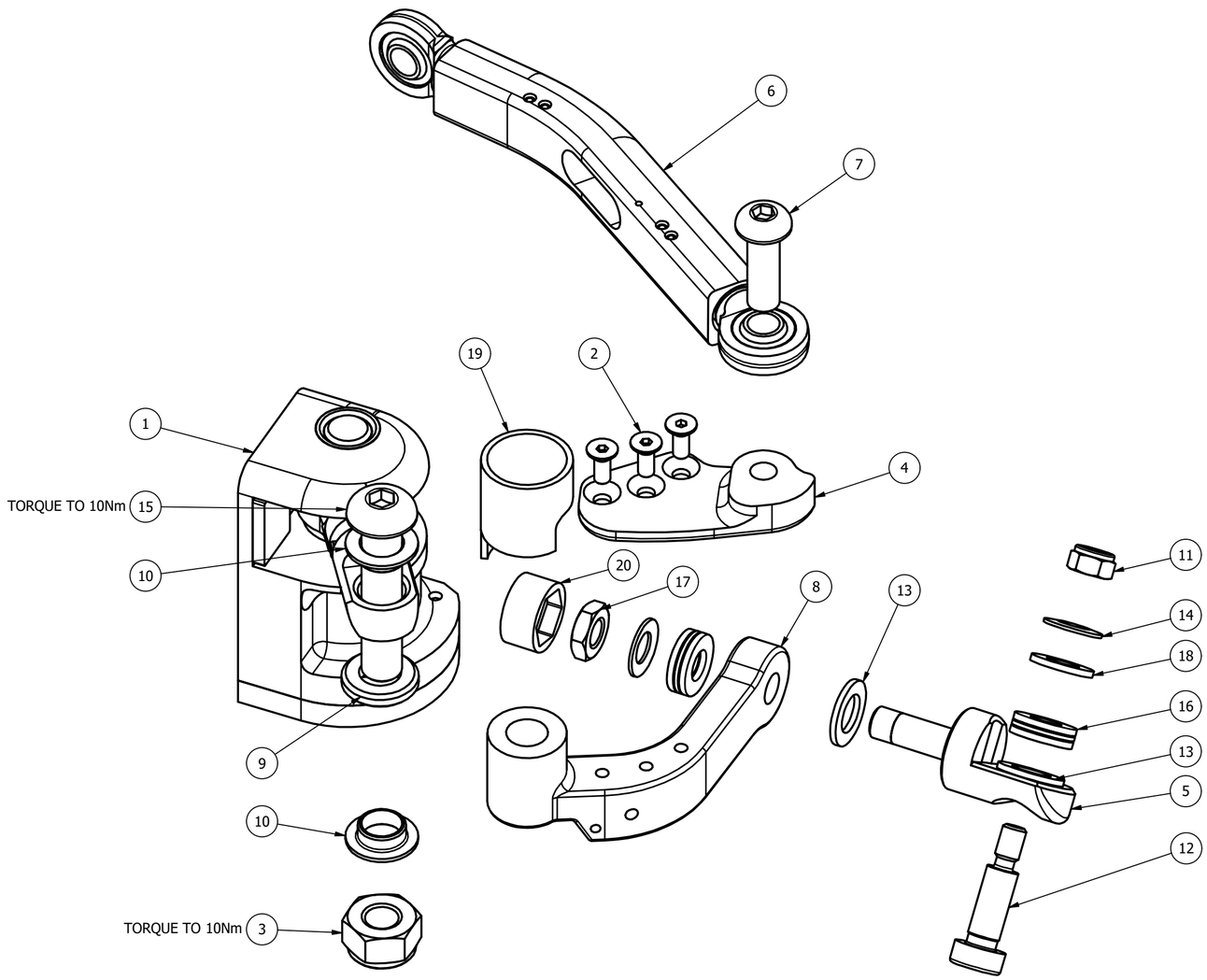
MATERIAL: 1075 Spring Steel
HEAT TREAT: Rc 48-52
FINISH: E-COAT

THIRD ANGLE PROJECTION

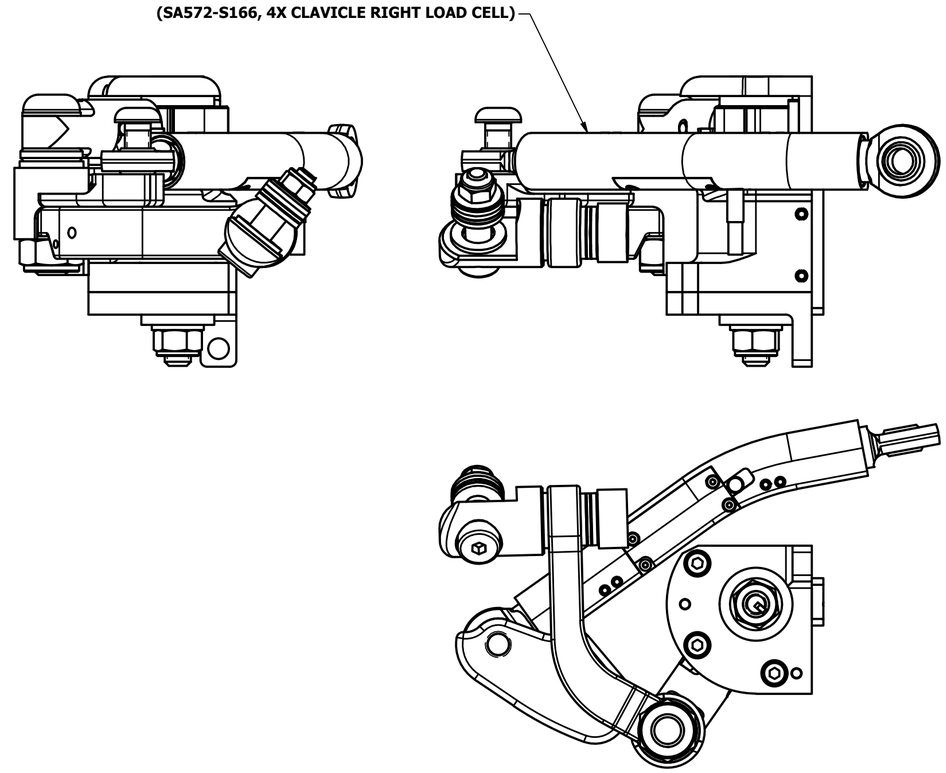
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SCALE: 2 : 1 | SHEET: 1 OF 1

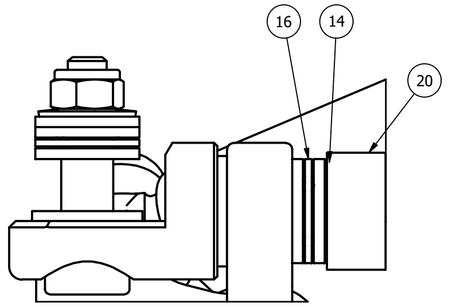
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	BK	HEC	8/24/2023

This design includes features covered by U.S. Patent Nos. 9,514,659 and 9,799,234 (upper arm assembly and shoulder assembly for crash test dummy), which is owned by Humanetics and its affiliated companies. No license is being granted to this patent and third parties are not authorized to make, use, sell, import, or export any products (physical or virtual) that practice the invention covered by this patent, or other patents owned by Humanetics. However, if a third party is interested in obtaining rights to the design, they are to contact Humanetics to discuss license terms.



SCALE 1 : 1





WASHER/BEARING VIEW
SCALE 1.5 : 1

ITEM	QTY	PART NUMBER	DESCRIPTION
20	1	474-3512	MEDIAL LOWER SCAPULA CAP
19	1	474-3511-2	POSTERIOR LOWER SCAPULA COVER, RIGHT
18	1	5000123	M8 FLAT WASHER PLAIN ZINC
17	1	5001101	M8 X 1.25 HEX JAM NUT ZINC
16	2	5001520	BEARING, BALL THRUST, 8 X 16 X 5 THK.
15	1	5001405	M10 X 1.5 X 50 LG. BHCS SS
14	2	5001388	WASHER BELLEVILLE M8 (8.2 X 15 X 0.8)
13	2	474-3533	FRICTION WASHER
12	1	5001154	M8 X 20 LG. SHSS
11	1	5000093	M6 X 1 HEX LOCK NUT ZINC
10	2	474-3583-A	SCAPULA LINK BEARING
9	1	474-3534	SPACER WASHER, M10, NYLON
8	1	474-3505-2	LOWER SCAPULA, RIGHT
7	1	5000255	M8 X 1.25 X 25 LG. BHCS
6	1	474-3508	CLAVICLE ASSEMBLY
5	1	483-3504	SHOULDER CLEVIS, THOR-5F
4	1	474-3506-2	UPPER SCAPULA, RIGHT
3	1	5000149	M10 X 1.5 HEX LOCK NUT ZINC
2	3	5000023	M4 X 0.7 X 10 LG. FHCS
1	1	474-3524-2-A	SPINE-SHOULDER COUPLER ASSEMBLY, RIGHT

PARTS LIST

NOTES:

1. U.S. PATENT NO. 9,799,234

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	N/A	
HEAT TREAT	N/A	
FINISH	N/A	

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	7/20/2022
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

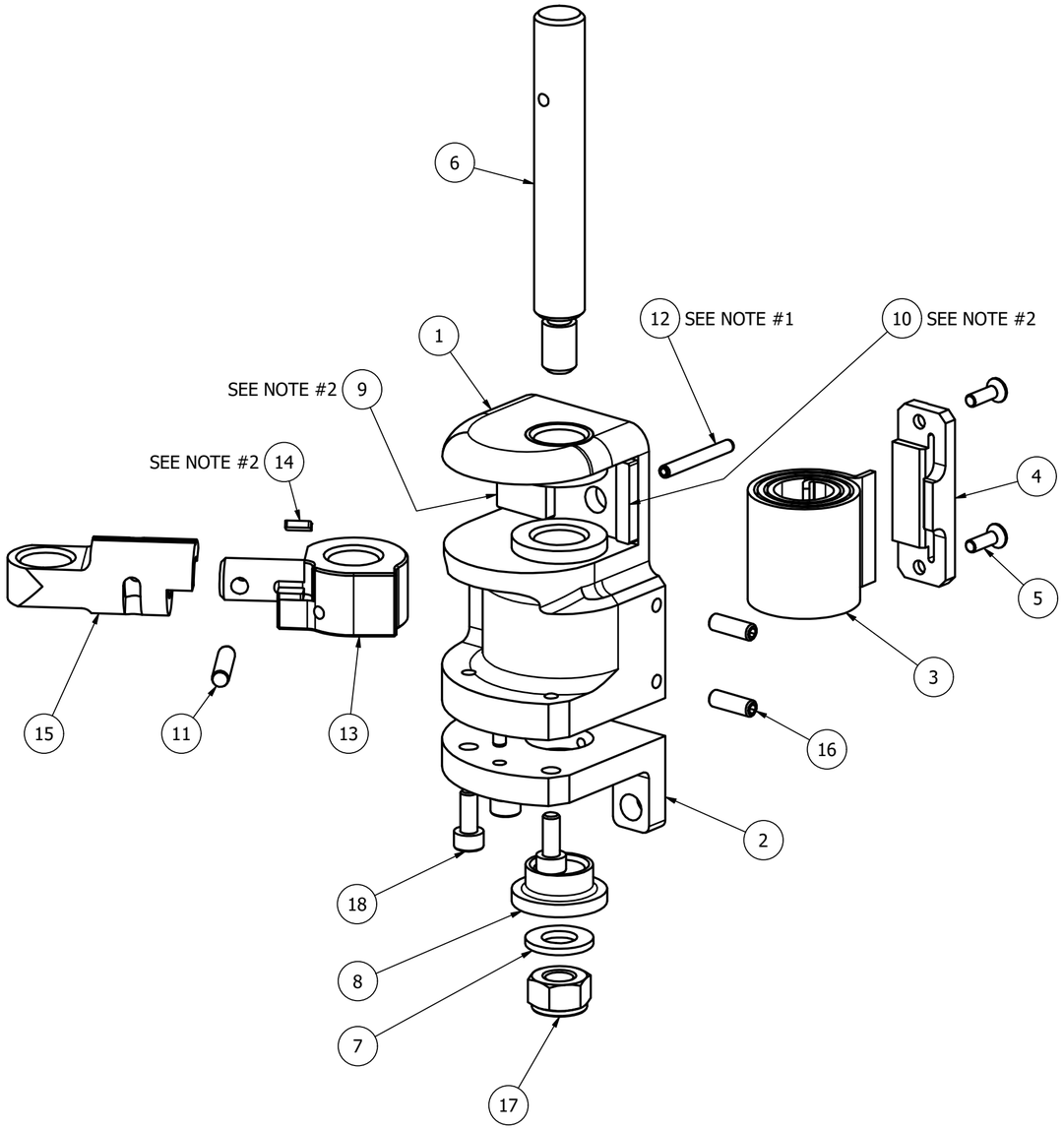
SHOULDER ASSEMBLY, RIGHT
THOR-05F

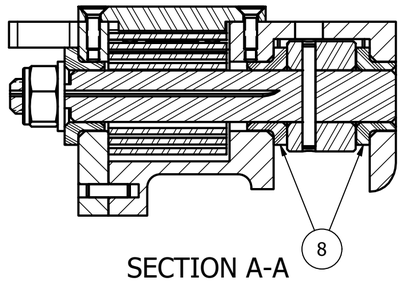
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
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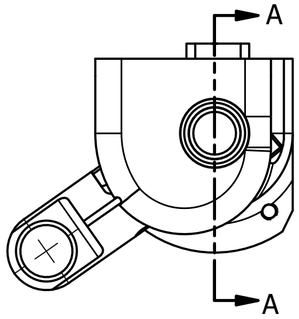
SCALE: 1 : 1 SHEET 1 OF 1

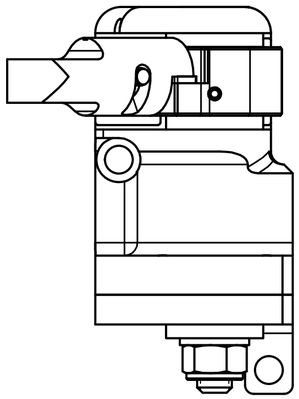
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	HF	7/15/2022





SECTION A-A





ITEM	QTY	PART NUMBER	DESCRIPTION
18	3	5000737	M4 X 0.7 X 10 LG. SHCS SS
17	1	5000318	M8 X 1.25 HEX LOCK NUT SS
16	2	5001813	M4 X 0.7 X 12 LG. SSSFP SS
15	1	474-3503-2	SCAPULA LINK, RIGHT
14	2	474-3539	SCAPULA LINK BUMPER
13	1	474-3507-2	CLEVIS, RIGHT SCAPULA LINK
12	1	5000140	M3 X 24 LG. ROLL PIN
11	1	5000815	M4 X 18 LG. DOWEL PIN
10	1	474-3558	FRONT SHOULDER STOP
9	1	474-3529	REAR SHOULDER STOP
8	3	474-3527	SHAFT SLEEVE
7	1	5000123	M8 FLAT WASHER PLAIN ZINC
6	1	474-3519	PIN, SPRING TENSION
5	2	5000203	M3 X 0.5 X 10 LG. FHCS
4	1	474-3526	SPRING RETAINER
3	1	474-3582	SPRING, SHOULDER
2	1	474-3502-2-A	SPINE-SHOULDER COUPLER, BOTTOM, RIGHT
1	1	474-3501-2-A	SPINE-SHOULDER COUPLER, TOP, RIGHT

PARTS LIST

NOTES:

1. SEE SHEET #2 FOR MACHINING INSTRUCTIONS FOR ROLL PIN HOLE.
2. SEE SHEET #2 FOR BONDING INSTRUCTIONS FOR PADS.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

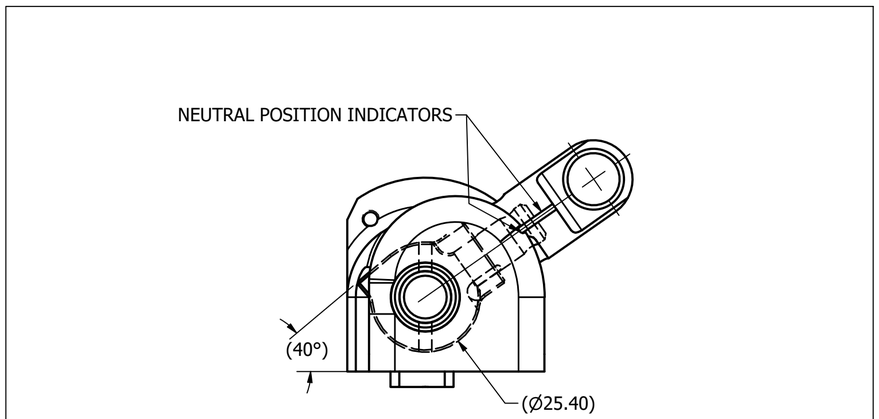
VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	7/20/2022
CHECKED	
ENG	
APPROVED	

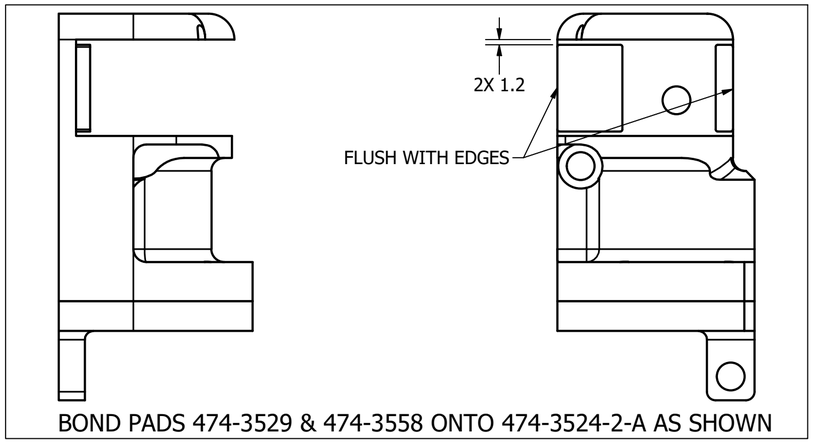
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

SPINE-SHOULDER COUPLER ASSEMBLY, RIGHT
THOR-05F

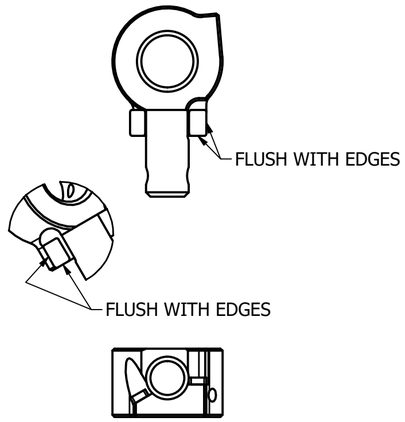
THIRD ANGLE PROJECTION | SIZE A2 | DRAWING NUMBER 474-3524-2-A | REV 2 | SCALE: 1 : 1 | SHEET 1 OF 2



HOLE MACHINING FOR NEUTRAL POSITION



BOND PADS 474-3529 & 474-3558 ONTO 474-3524-2-A AS SHOWN



BOND PADS (2X) 474-3539 ONTO
474-3507-2 AS SHOWN.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED √F
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	7/20/2022
CHECKED	
ENG	
APPROVED	

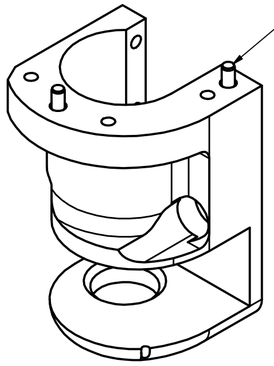
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

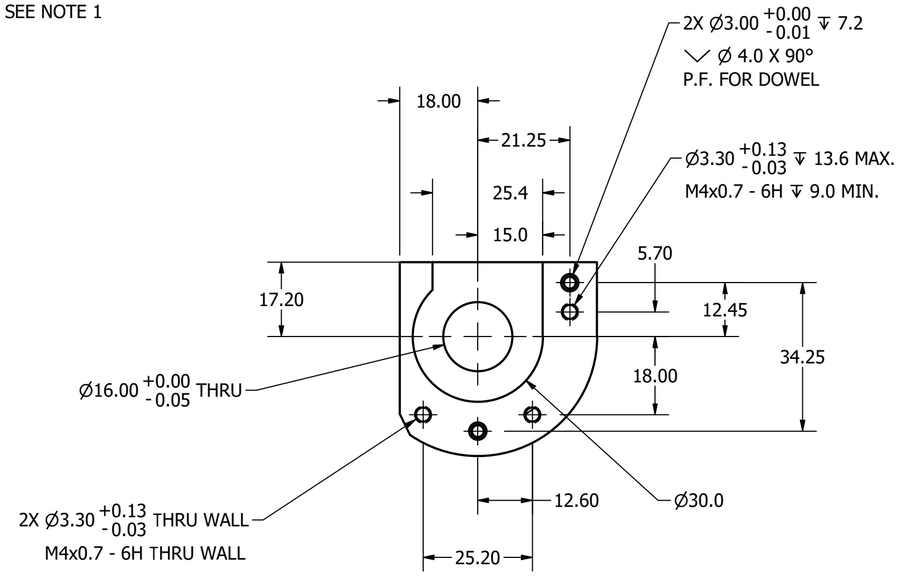
SPINE-SHOULDER COUPLER ASSEMBLY, RIGHT
THOR-05F

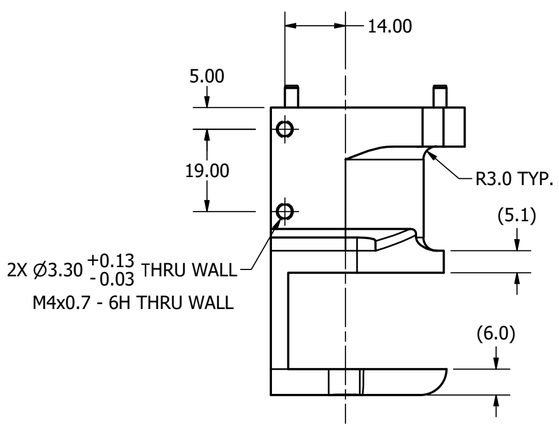
THIRD ANGLE PROJECTION

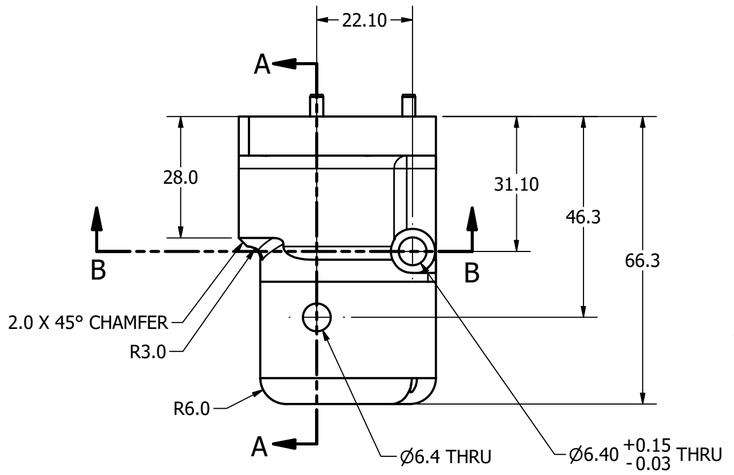
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SCALE: 1 : 1 | SHEET: 2 OF 2

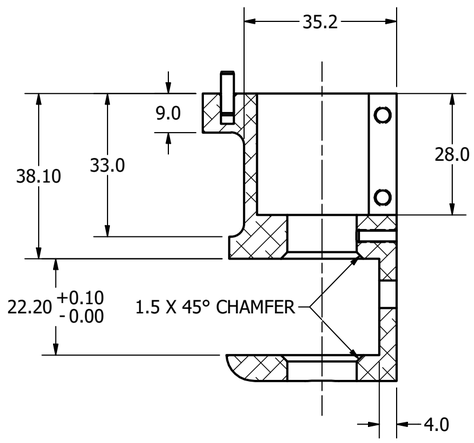
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
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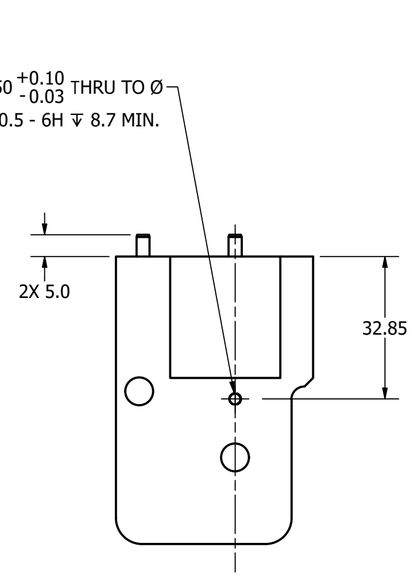


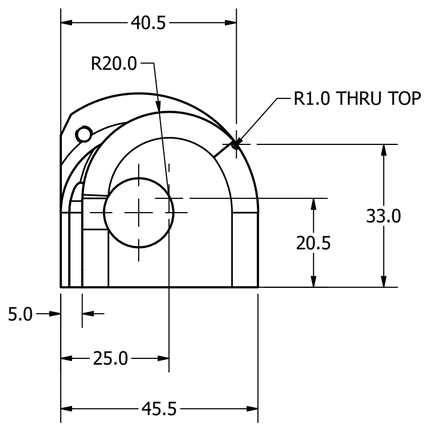


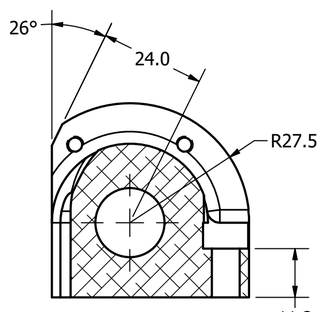




SECTION A-A







SECTION B-B

NOTES:

1. INSTALL DOWEL PINS AFTER ANODIZE.

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	5000284	M3 X 10 LG. DOWEL PIN

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

SPINE-SHOULDER COUPLER, TOP, RIGHT

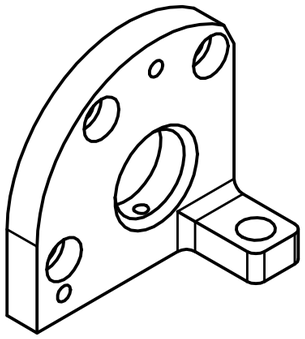
APPROVALS	DATE
DRAWN rkimes	5/5/2022
CHECKED	
ENG	
APPROVED	

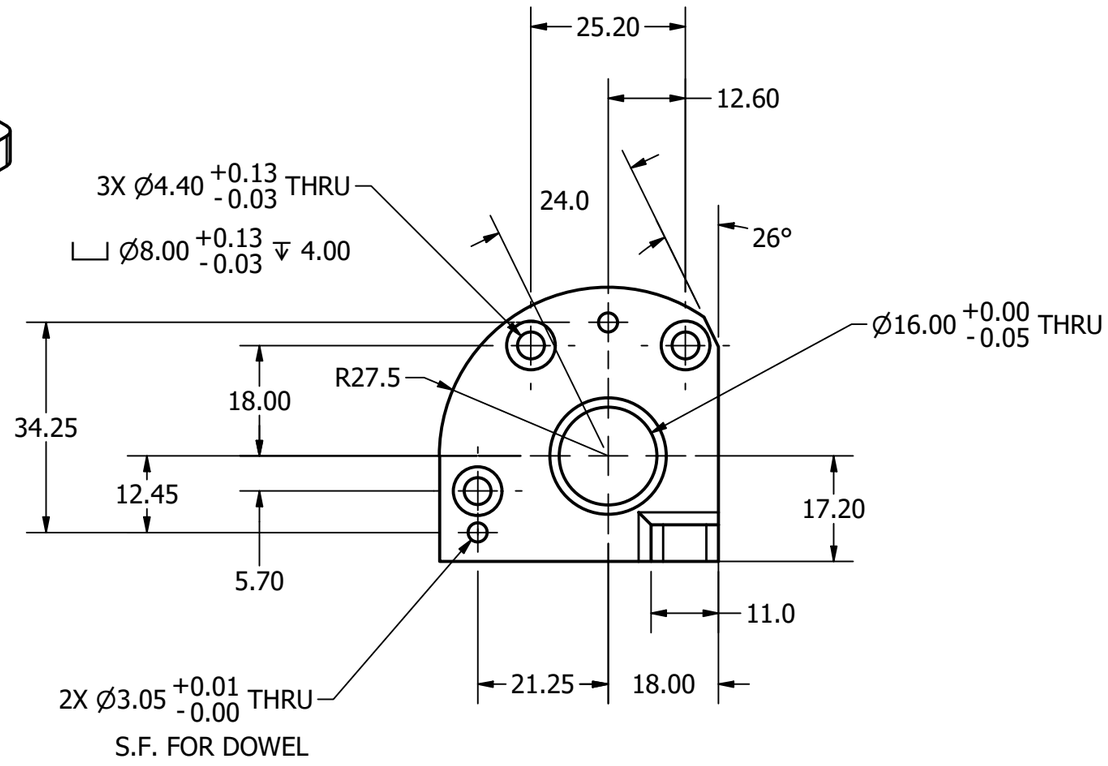
MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODOZE

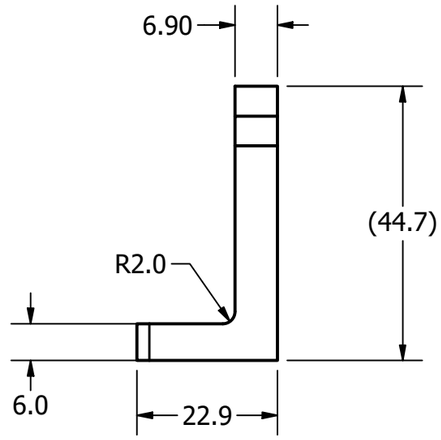
THIRD ANGLE PROJECTION

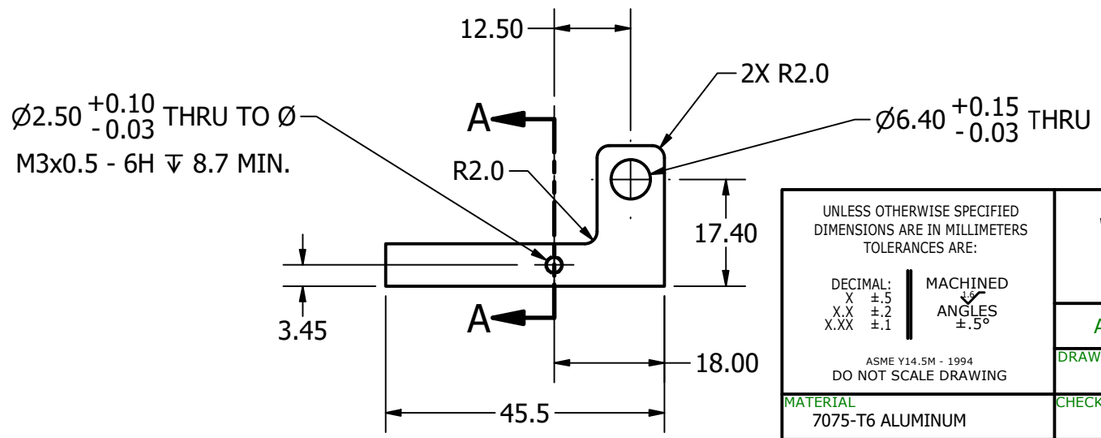
SIZE: A2 | DRAWING NUMBER: 474-3501-2-A | REV: 1
SCALE: 1 : 1 | SHEET: 1 OF 1

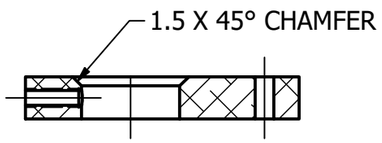
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	HF	5/5/2022











SECTION A-A

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

SPINE-SHOULDER COUPLER, BOTTOM, RIGHT

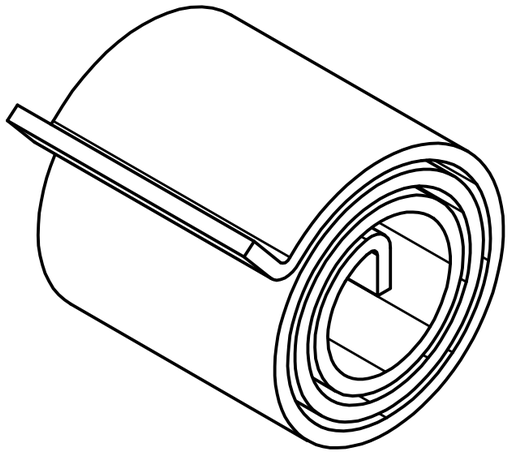
APPROVALS	DATE
DRAWN rkimes	5/5/2022
CHECKED	
ENG	
APPROVED	

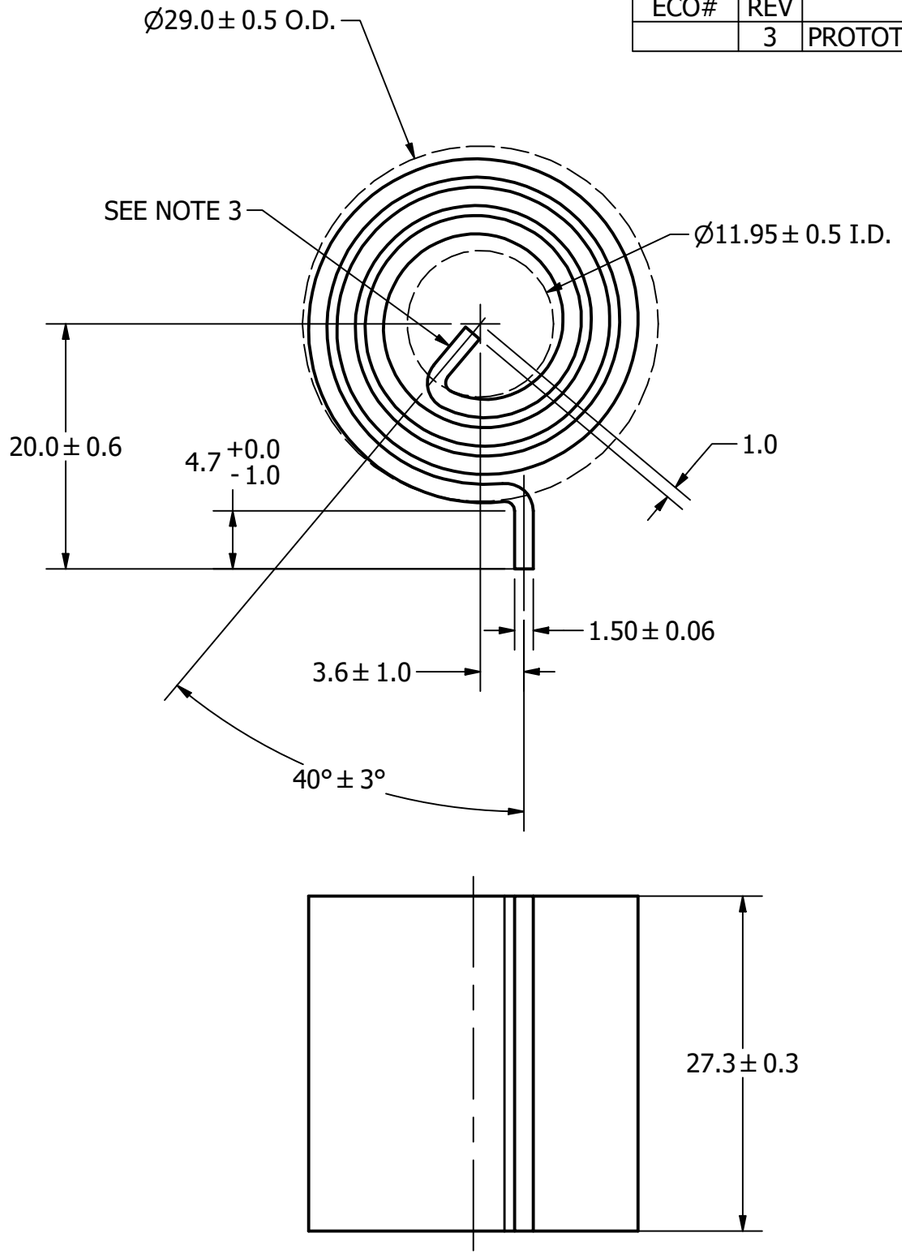
MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-3502-2-A | REV: 1
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	AB	JW	04/02/2019





NOTES:

1. MATERIAL: SPRING STEEL

2. ROTATION: 50° MINIMUM IN COIL DIRECTION
   35° MINIMUM IN UNCOIL DIRECTION.

3. INSPECT FIT OF INNER TANG TO 474-3519

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT: Rc 44-50
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	6/13/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

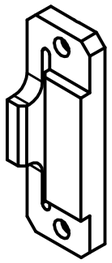
SPRING, SHOULDER

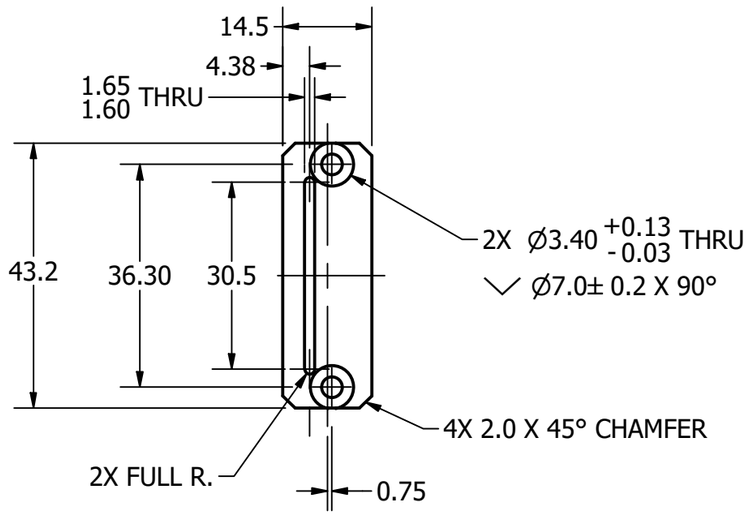
THIRD ANGLE PROJECTION

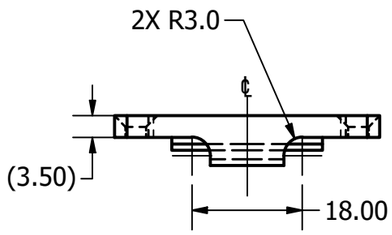
SIZE: A3 | DRAWING NUMBER: 474-3582 | REV: 3

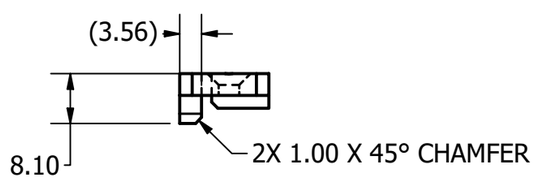
SCALE: 2 : 1 | SHEET: 1 OF 1

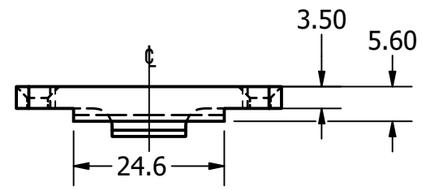
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	GCH	JW	8/29/2016











NOTES:

1. DIMENSIONS ARE SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED √ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	3/29/2016
CHECKED	
ENG	
APPROVED	

MATERIAL: 1018 STEEL
HEAT TREAT:
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

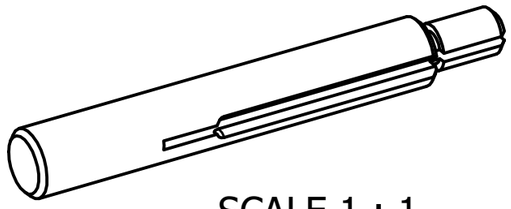
SPRING RETAINER

THIRD ANGLE PROJECTION

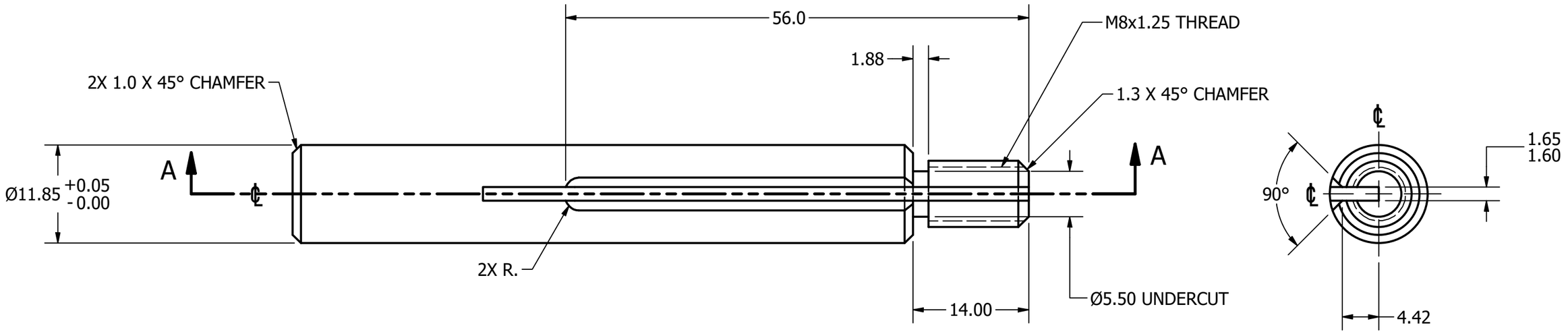
SIZE	DRAWING NUMBER	REV
A3	474-3526	3

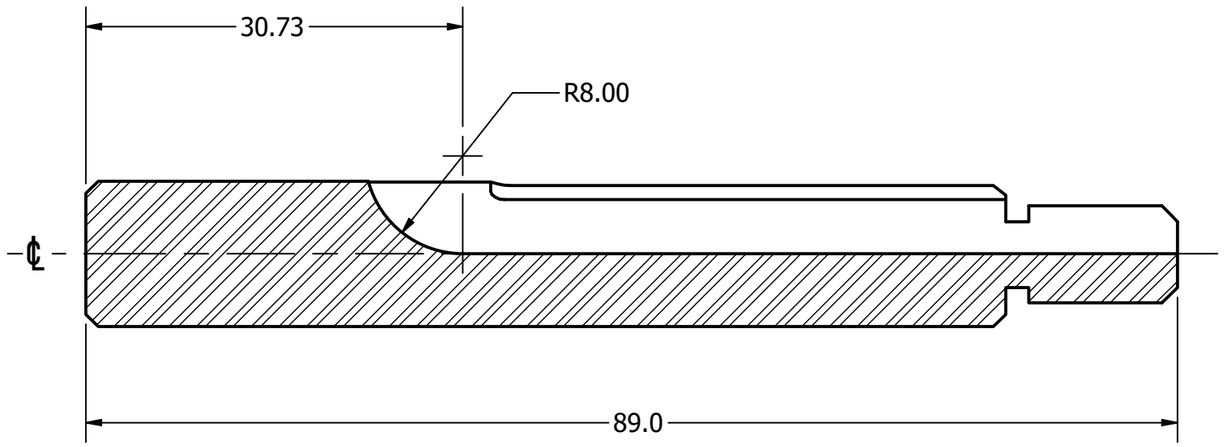
SCALE: 1 : 1
SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	SKR	HF	04/05/2022



SCALE 1 : 1





SECTION A-A

NOTES:

1. DIMENSIONS ARE SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 1018 STEEL
HEAT TREAT: N/A
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	3/22/2016
CHECKED:	
ENG: JW	3/21/2016
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

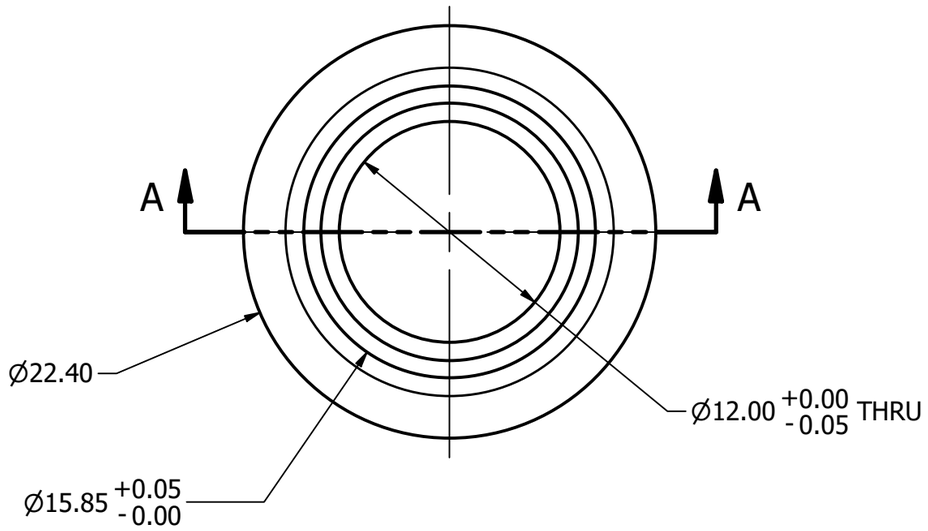
PIN, SPRING TENSION
THOR-05F

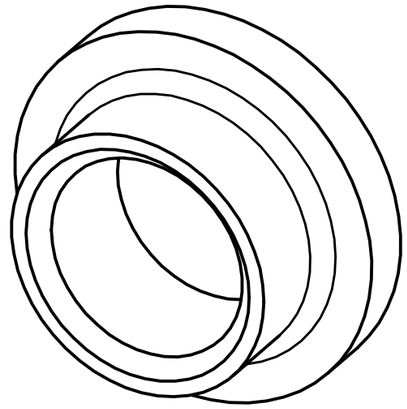
THIRD ANGLE PROJECTION

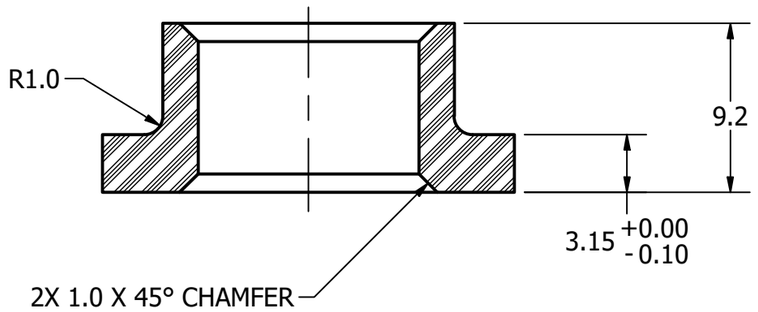
SIZE	DRAWING NUMBER	REV
A3	474-3519	4

SCALE: 2 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	DJI	JW	3/24/2016







SECTION A-A

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: ACETAL RESIN, BLACK
HEAT TREAT:
FINISH:

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

APPROVALS	DATE
DRAWN: disopi	3/24/2016
CHECKED:	
ENG:	
APPROVED:	

THIRD ANGLE PROJECTION

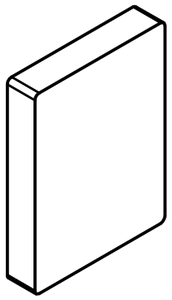
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

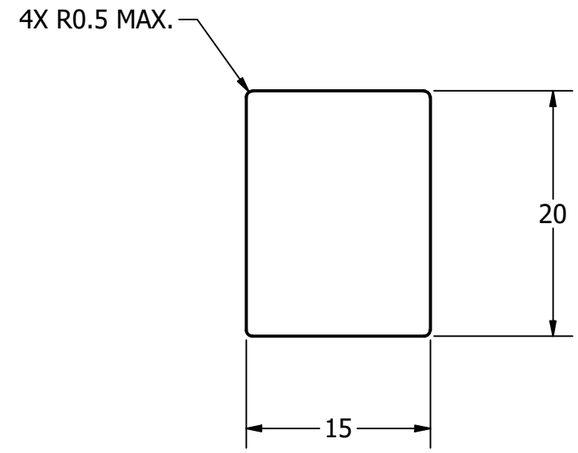
SHAFT SLEEVE

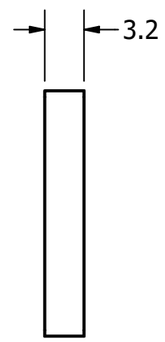
SIZE	DRAWING NUMBER	REV
A3	474-3527	1

SCALE: 3:1 SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	JPM		12/12/17







NOTES:
1. MATERIAL: NATURAL RUBBER
   COLOR: BLACK
   DUROMETER: 55 ±10 SHORE "A"
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE RUBBER MOLDING

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE 1
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	3/31/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

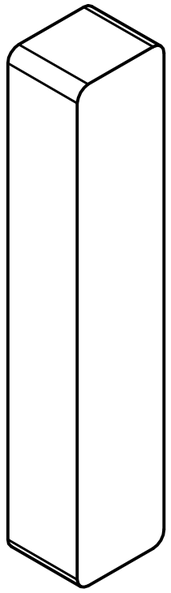
REAR SHOULDER STOP

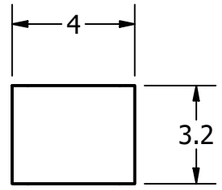
THIRD ANGLE PROJECTION

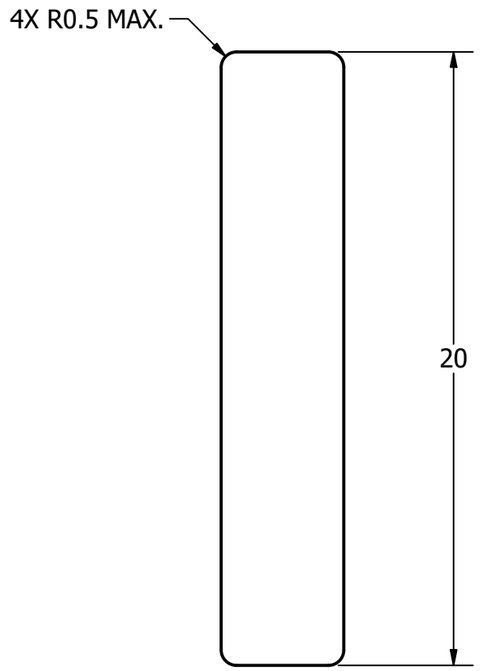
SIZE: A3 | DRAWING NUMBER: 474-3529 | REV: 3

SCALE: 2 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	JPM		12/12/17







NOTES:
1. MATERIAL: NATURAL RUBBER
   COLOR: BLACK
   DUROMETER: 55 ±10 SHORE "A"
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE RUBBER MOLDING

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED √
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT:
FINISH:

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

APPROVALS	DATE
DRAWN: ghayden	4/11/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

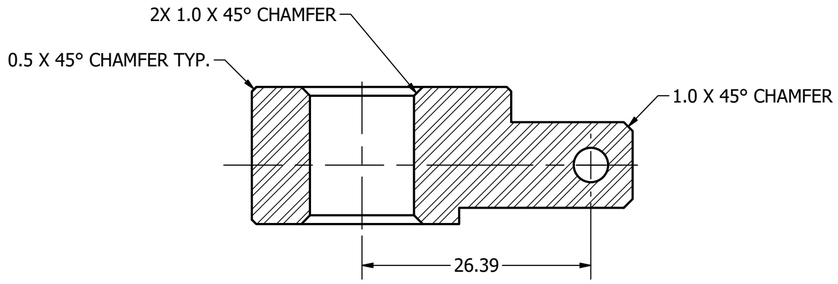
FRONT SHOULDER STOP

THIRD ANGLE PROJECTION

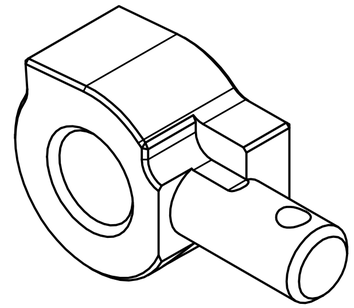
SIZE: A3 | DRAWING NUMBER: 474-3558 | REV: 3

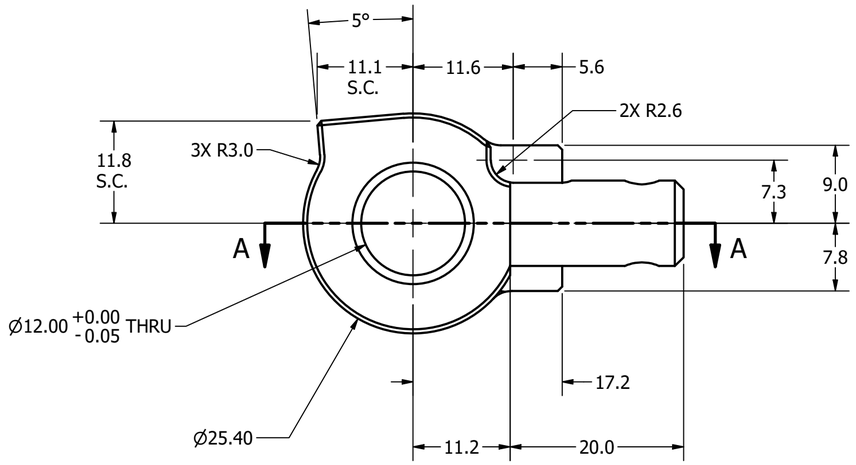
SCALE: 5 : 1 | SHEET: 1 OF 1

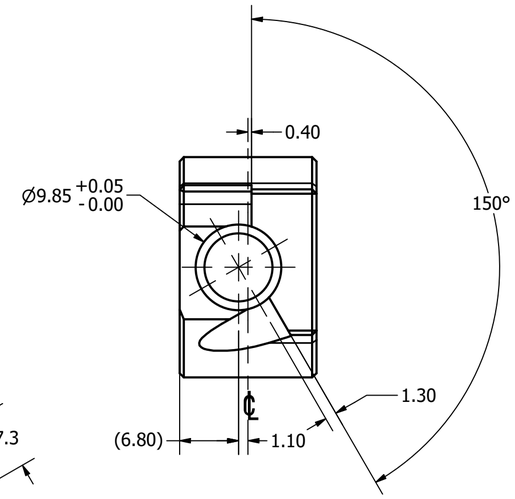
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	LKR	HF	10/21/2021

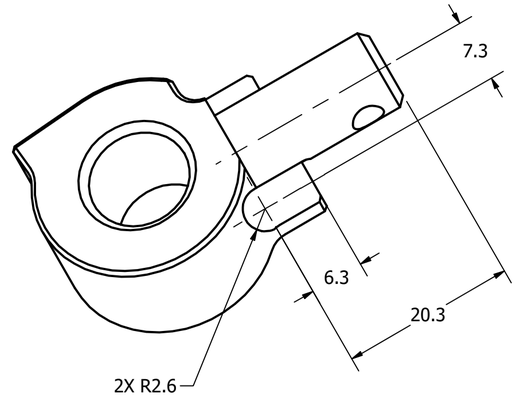


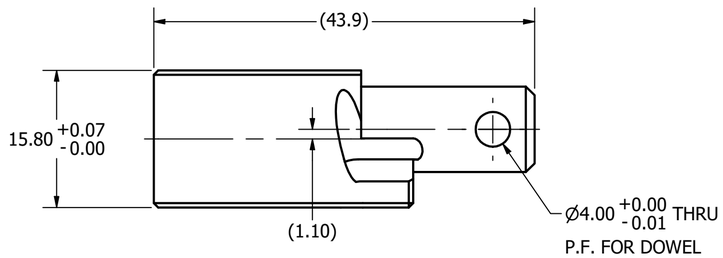
SECTION A-A











PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 4130 STEEL
HEAT TREAT: N/A
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	3/29/2016
CHECKED:	
ENG: JW	3/28/2016
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

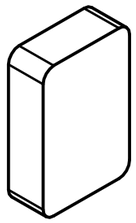
CLEVIS, RIGHT SCAPULA LINK
THOR-05F

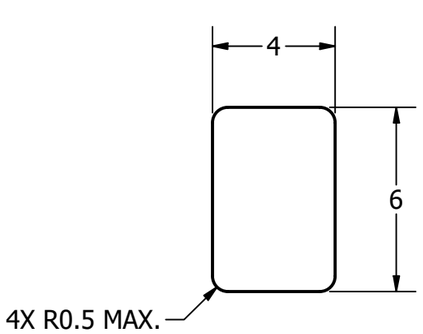
THIRD ANGLE PROJECTION

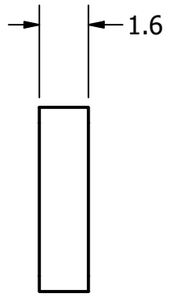
SIZE: A2 | DRAWING NUMBER: 474-3507-2 | REV: 3

SCALE: 2 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	JPM		12/12/17







NOTES:
1. MATERIAL: NATURAL RUBBER
   COLOR: BLACK
   DUROMETER: 55 ±10 SHORE "A"
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE RUBBER MOLDING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE 1
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	3/29/2016
CHECKED:	
ENG:	
APPROVED:	

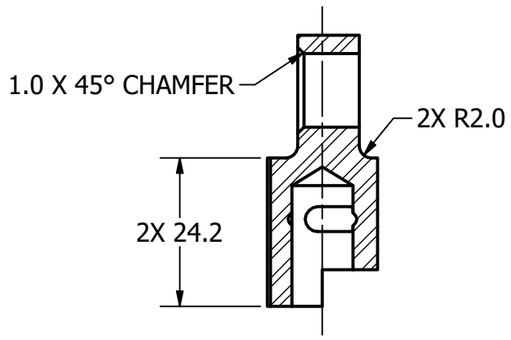
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

SCAPULA LINK BUMPER

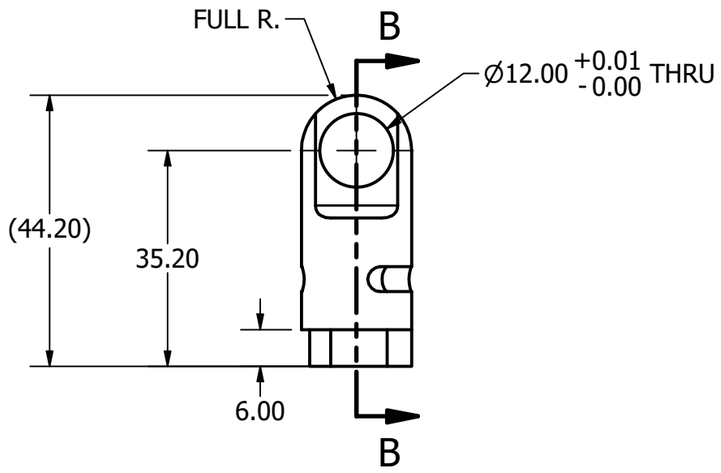
THIRD ANGLE PROJECTION

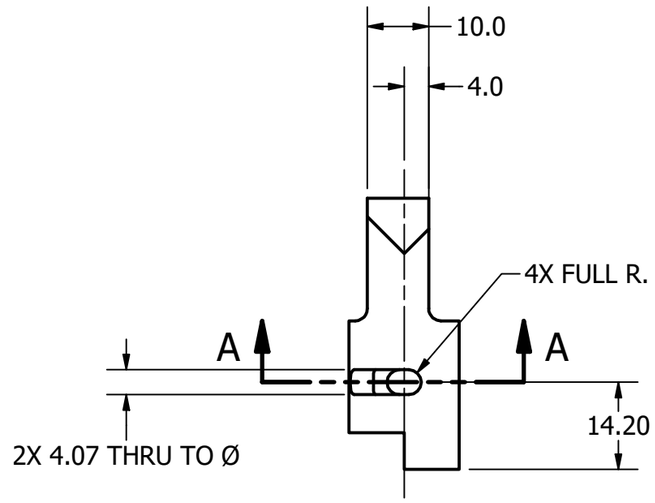
SIZE: A3 | DRAWING NUMBER: 474-3539 | REV: 3
SCALE: 5 : 1 | SHEET: 1 OF 1

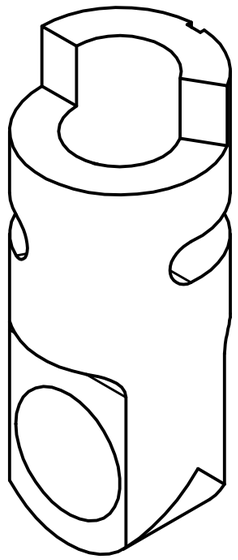
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	LKR	HF	10/22/2021



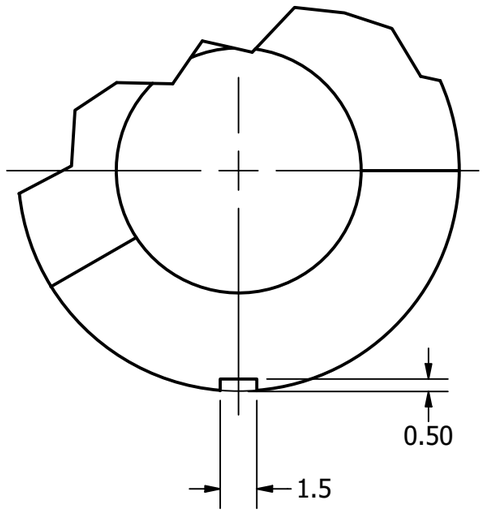
SECTION B-B



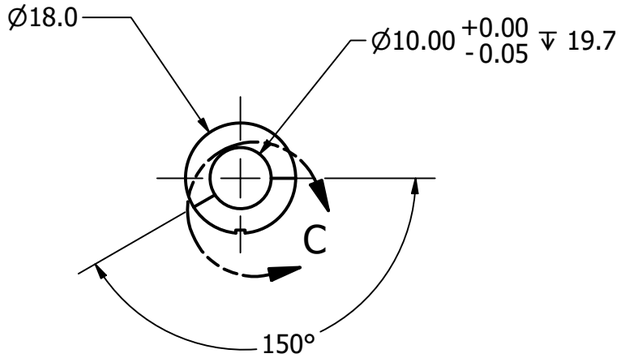


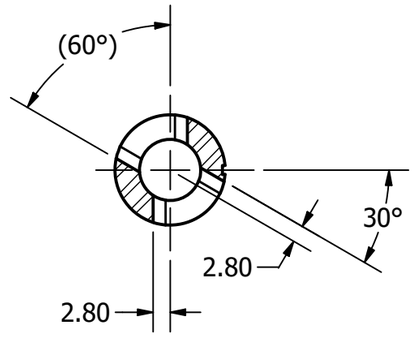


SCALE 2: 1



DETAIL C
SCALE 4 : 1





SECTION A-A

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 125
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	disopi	3/31/2016
CHECKED		
ENG	JW	3/30/2016
APPROVED		

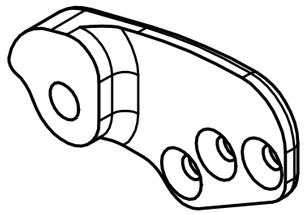
MATERIAL: 4130 STEEL
HEAT TREAT: N/A
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

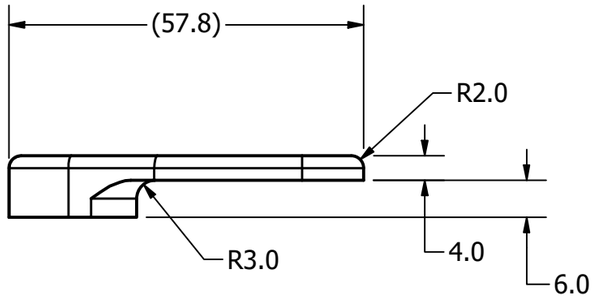
SCAPULA LINK, RIGHT
THOR-05F

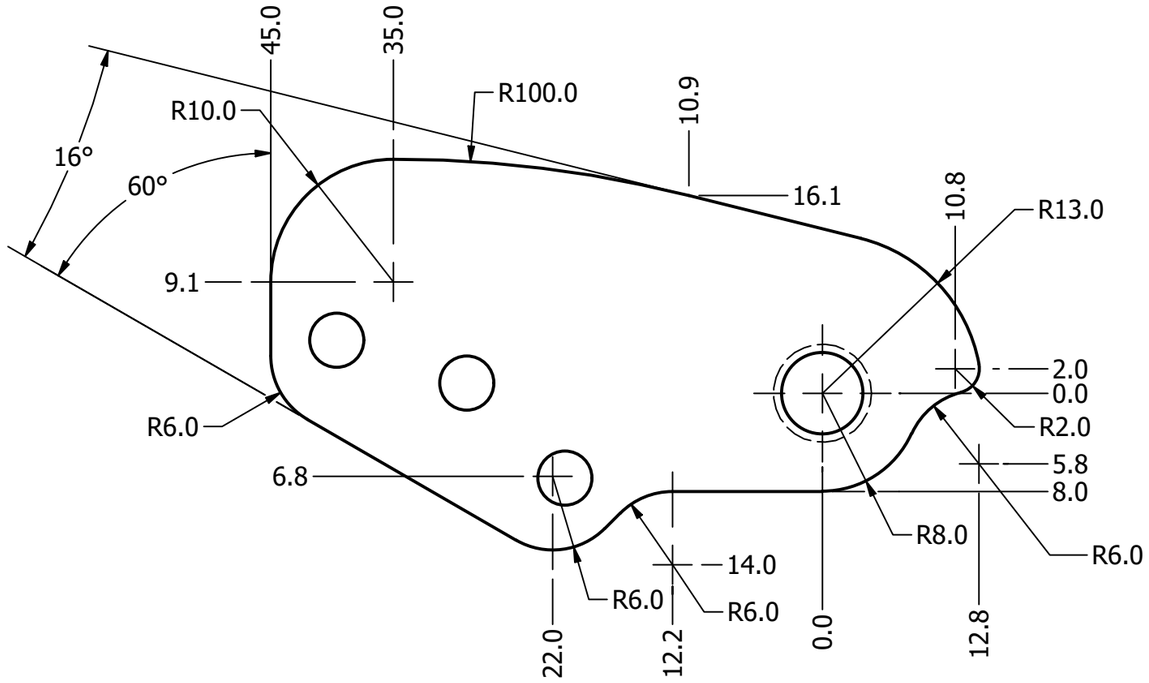
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-3503-2 | REV: 4
SCALE: 1 : 1 | SHEET: 1 OF 1

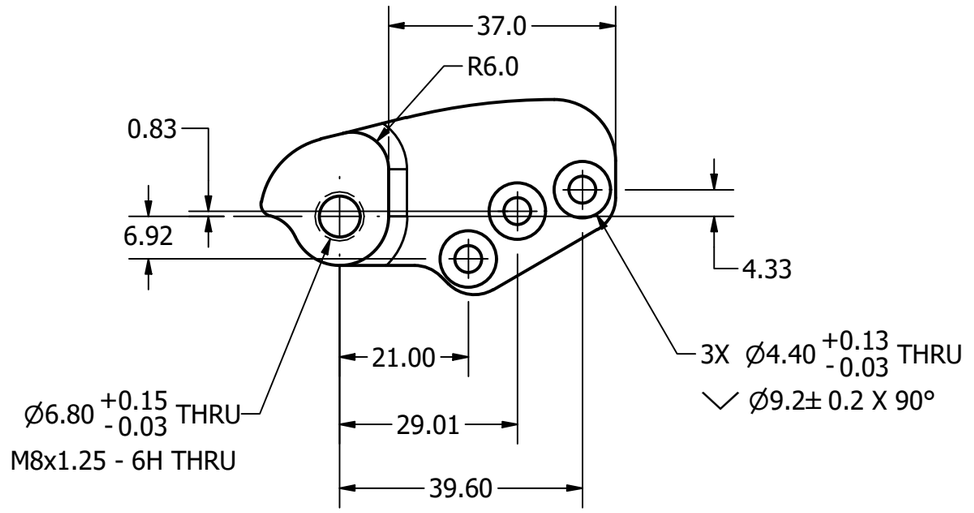
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	DJI	JW	11/3/2017

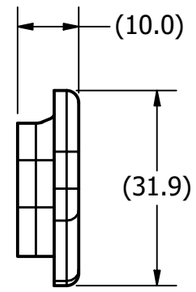






SCALE 2 : 1





PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: disopi	3/24/2016
CHECKED	
ENG	
APPROVED	

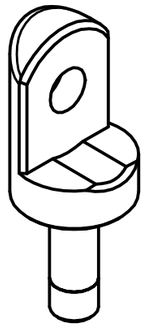
UPPER SCAPULA, RIGHT

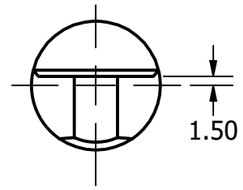
MATERIAL: 4140 STEEL
HEAT TREAT: Rc 44-48
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

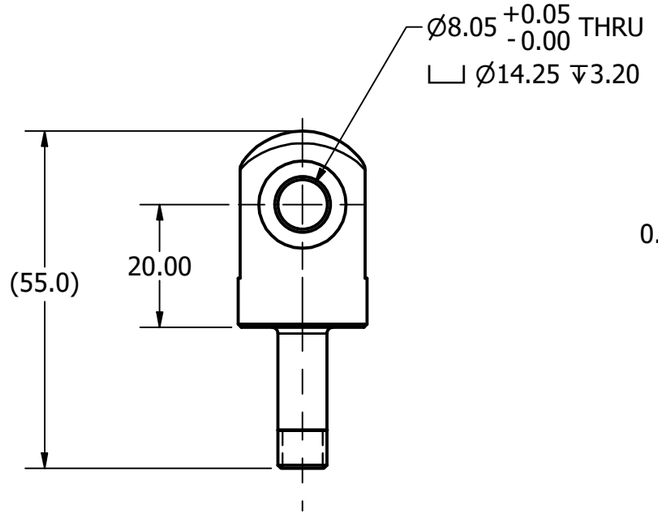
THIRD ANGLE PROJECTION

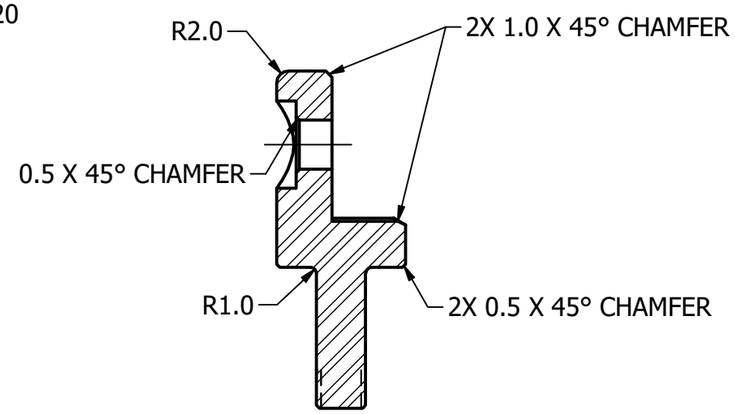
SIZE: A3 | DRAWING NUMBER: 474-3506-2 | REV: 1
SCALE: 1:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	RM	DJI	07/19/2023

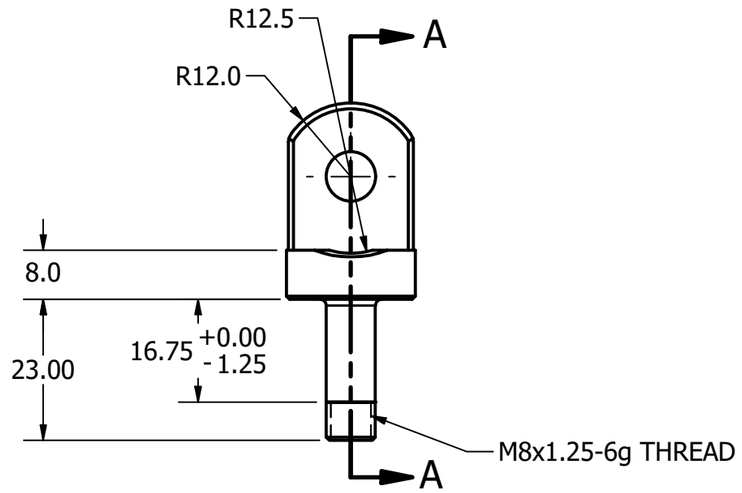


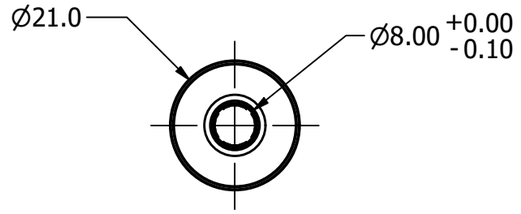






SECTION A-A





PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ±√
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	B. KIMES	2/10/2020
CHECKED		
ENG		
APPROVED		

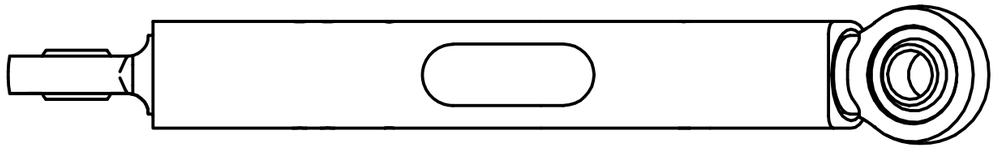
MATERIAL: 4130 STEEL
HEAT TREAT: Rc 30-34
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

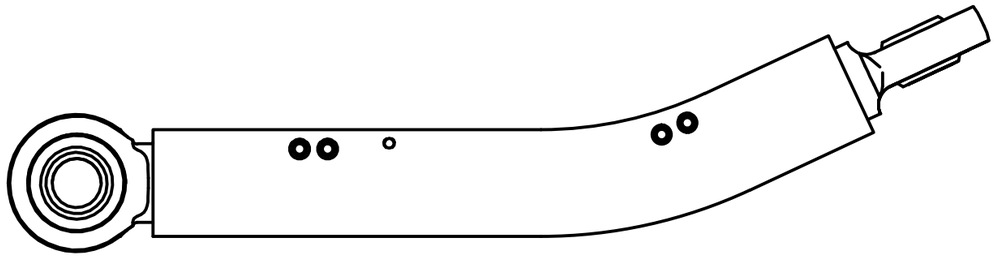
SHOULDER CLEVIS,
THOR-05F

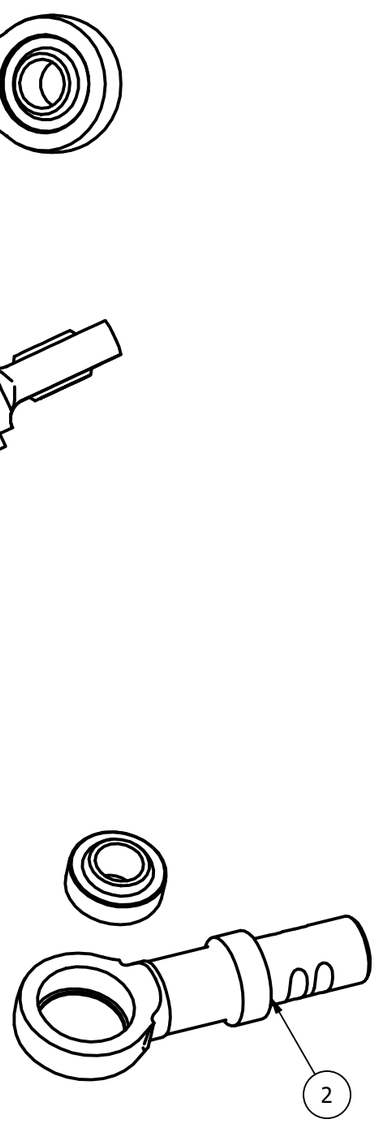
THIRD ANGLE PROJECTION

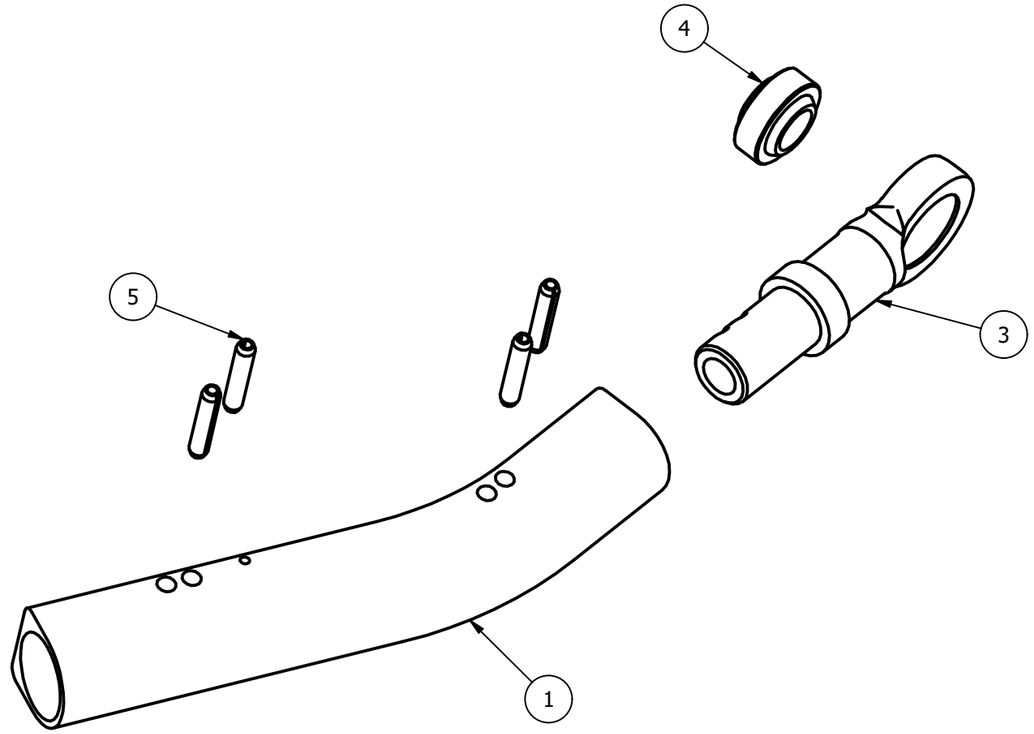
SIZE: A3 | DRAWING NUMBER: 483-3504 | REV: 2
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	EP	KMSP	7/7/2021









ITEM	QTY	PART NUMBER	DESCRIPTION
5	4	9002330	1/8 x 5/8 LG. ROLL PIN
4	2	5000946	METRIC SPHERICAL BEARING
3	1	AXSDM104	MEDIAL SENSOR STRUCTRUAL REPLACEMENT
2	1	AXSDM103	LATERAL STRUCTURAL REPLACEMENT
1	1	474-3509	CLAVICLE

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

CLAVICLE ASSEMBLY

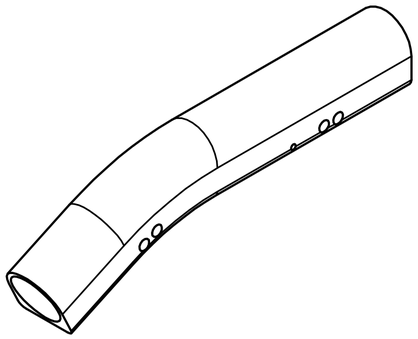
	APPROVALS	DATE
DRAWN	ghayden	3/30/2016
MATERIAL		
CHECKED		
HEAT TREAT		
ENG		
FINISH		
APPROVED		

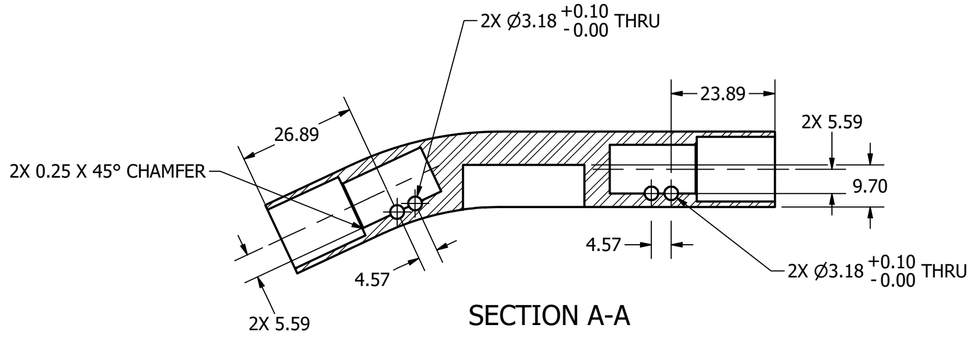
THIRD ANGLE PROJECTION

SIZE A3 | DRAWING NUMBER 474-3508 | REV 4

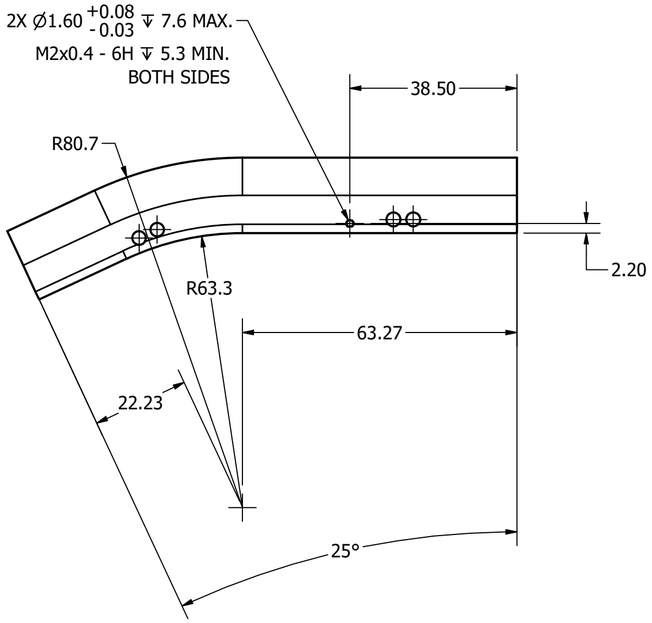
SCALE: 1 : 1 | SHEET 1 OF 1

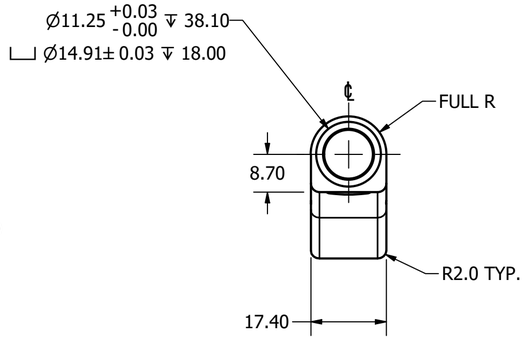
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	AB	JW	06/19/2019

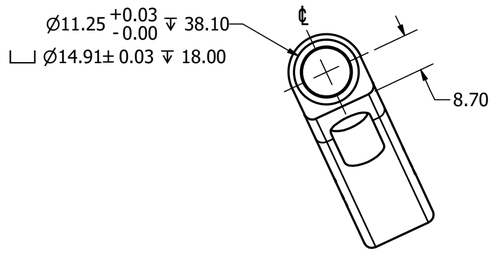


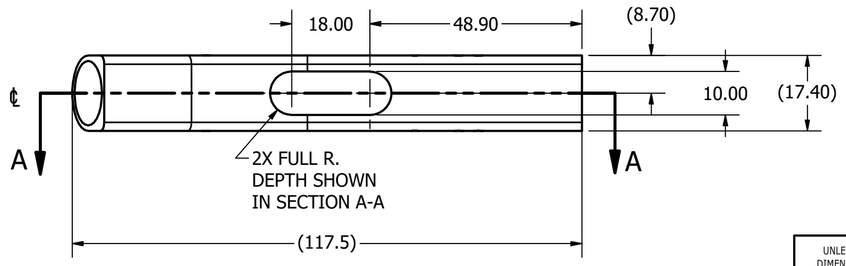


SECTION A-A









PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 4140 PHT STEEL
HEAT TREAT: Rc 28-32
FINISH: 0.008 ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN ghayden	3/30/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

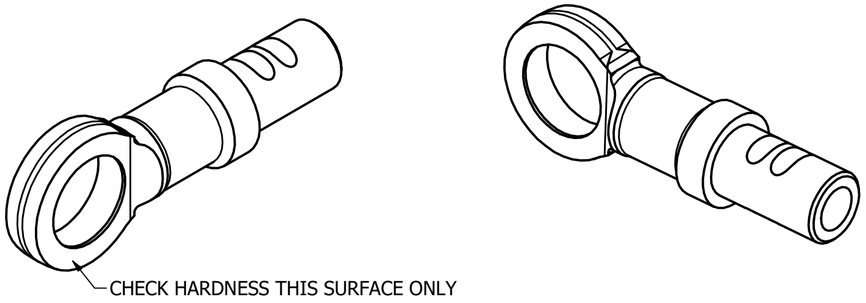
CLAVICLE

THIRD ANGLE PROJECTION

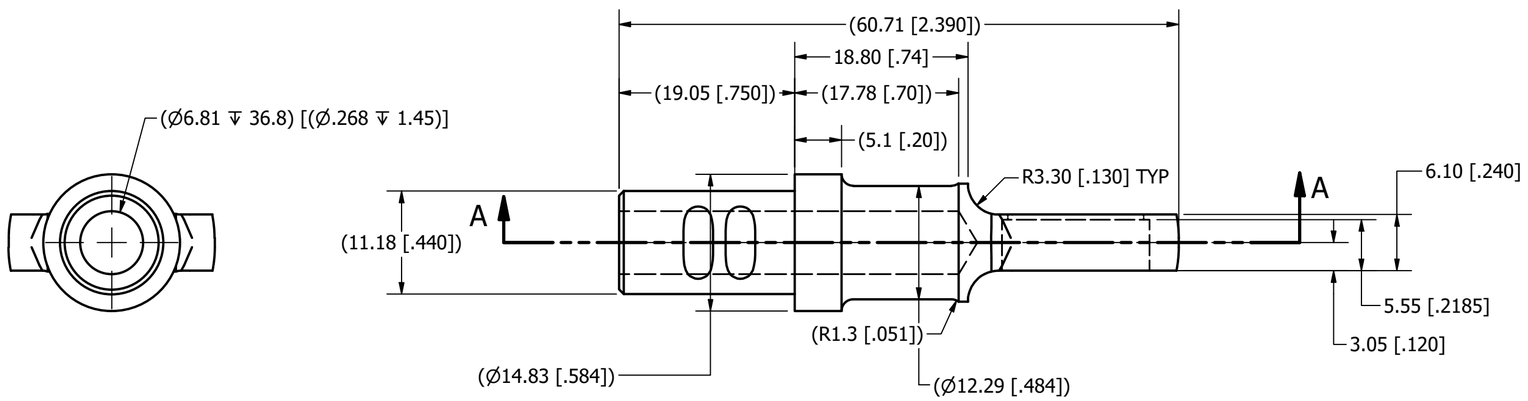
SIZE A2 | DRAWING NUMBER 474-3509 | REV 4

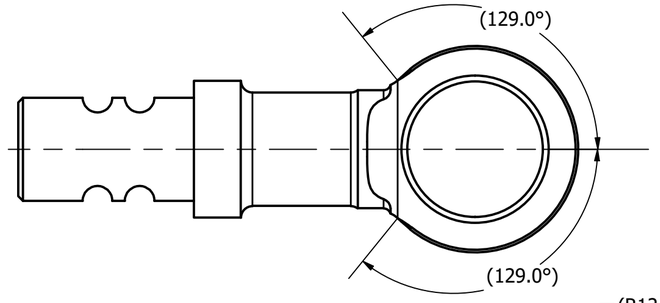
SCALE: 1 : 1 | SHEET 1 OF 1

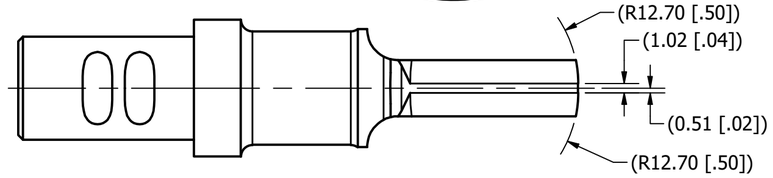
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	H	RELEASE FOR PRODUCTION	RAB	LB	3/13/2018

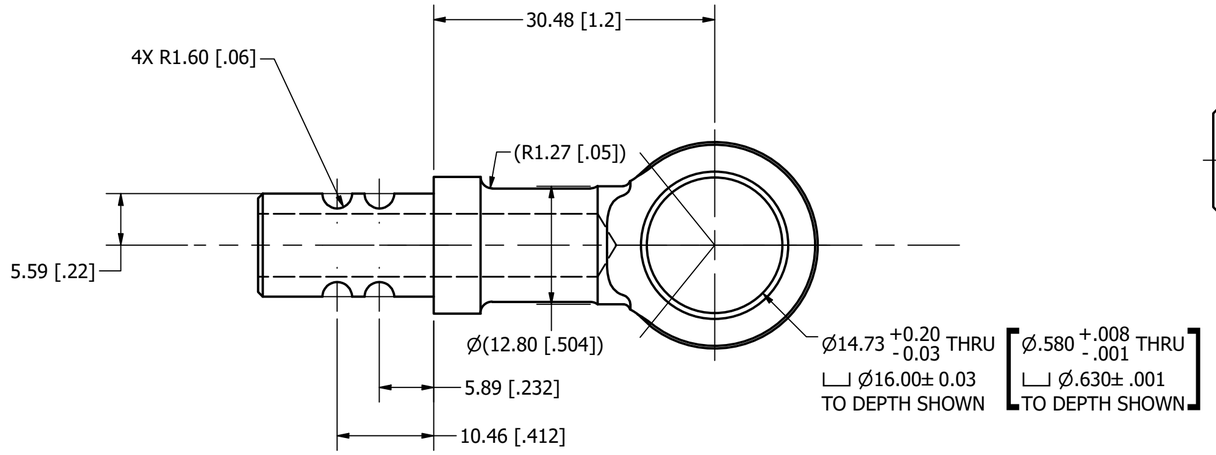


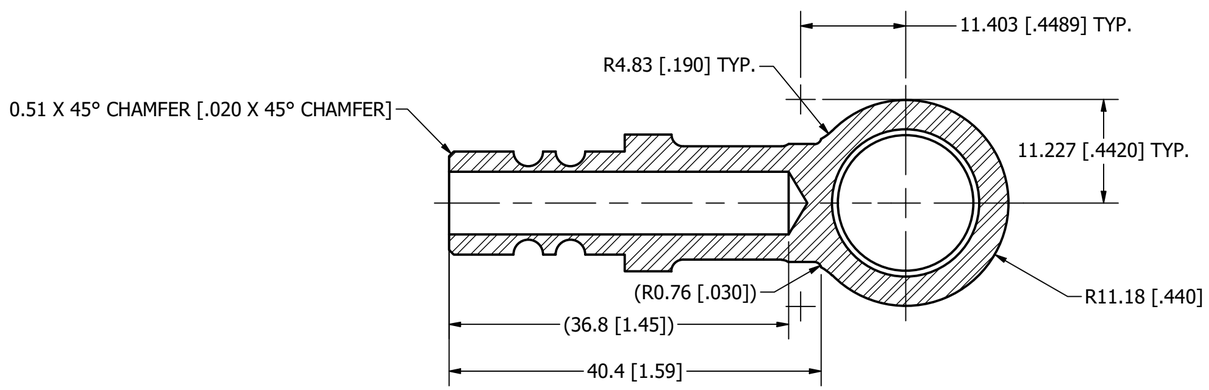
This design includes features covered by U.S. Patent No US9799234 (SD3 Shoulder Assembly), which is owned by Humanetics and its affiliated companies. No license is being granted to this patent and third parties are not authorized to make, use, sell, import, or export any products (physical or virtual) that practice the invention covered by this patent, or other patents owned by Humanetics. However, if a third party is interested in obtaining rights to the design, they are to contact Humanetics to discuss license terms.











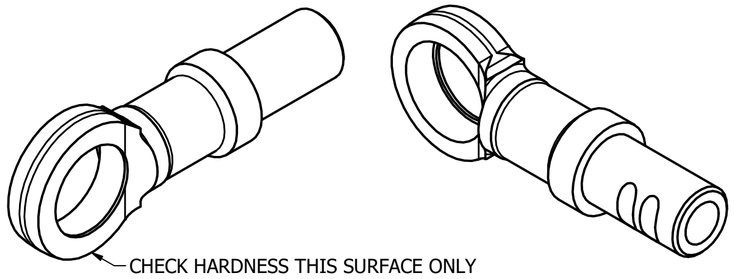
SECTION A-A
SCALE 2 : 1

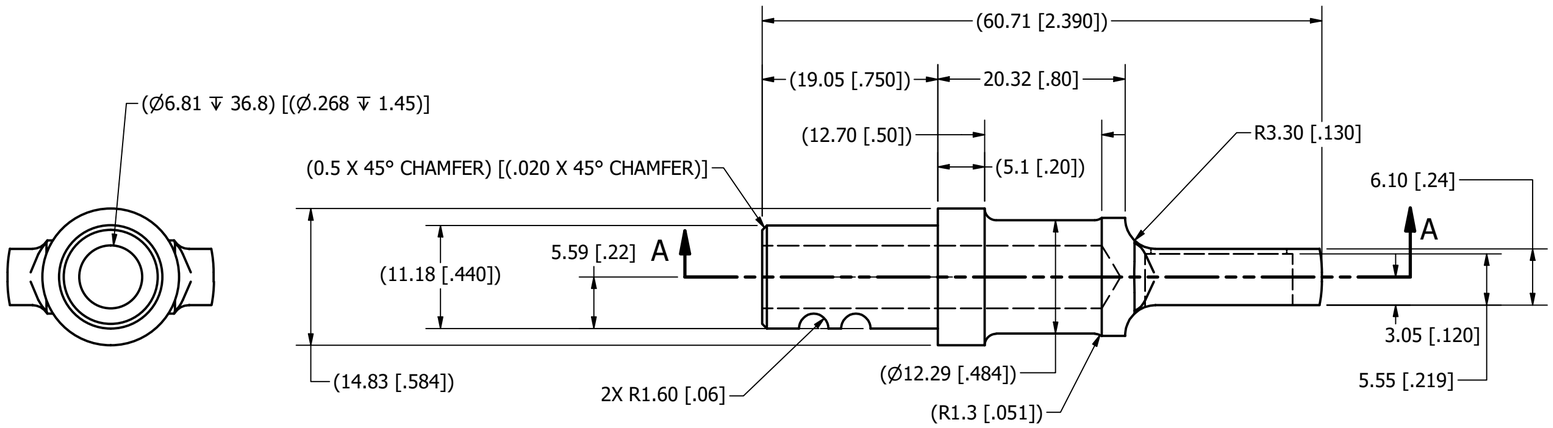
NOTES:
1. HEAT TREAT: H 900 (900° FOR 1 HOUR, AIR COOL R/C 40-48)
   (SEE NOTE FOR AREA TO CHECK HARDNESS)
2. MAKE FROM 17-4 PH STAINLESS STEEL.

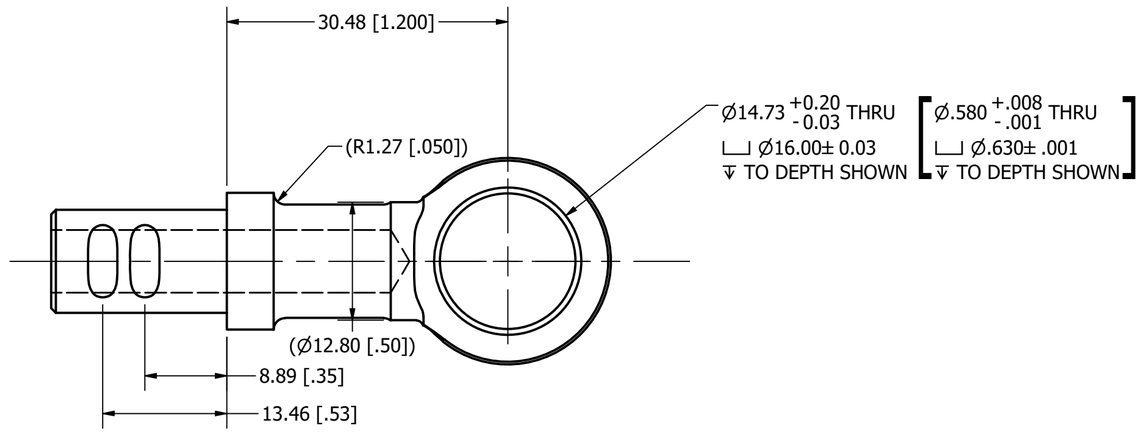
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	LATERAL STRUCTURAL REPLACEMENT THOR SD-3 CLAVICLE
MATERIAL: SEE NOTE #2	DRAWN: MJB 11/5/2012	
HEAT TREAT: SEE NOTE #1	CHECKED	SIZE: C; DRAWING NUMBER: AXSDM103; REV: H
FINISH: NONE	ENG: TORCH 8/29/2014	THIRD ANGLE PROJECTION; SCALE: 2 : 1; SHEET: 1 OF 1
	APPROVED	

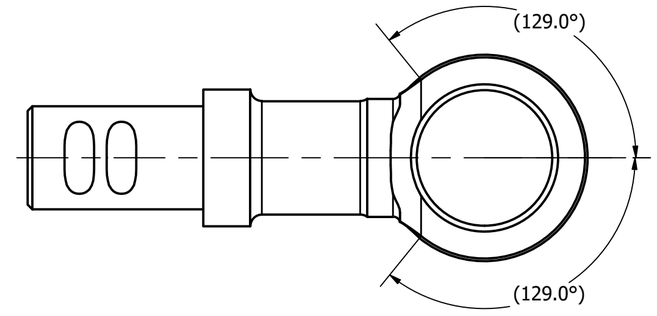
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	K	RELEASE FOR PRODUCTION	RAB	LB	3/14/2018

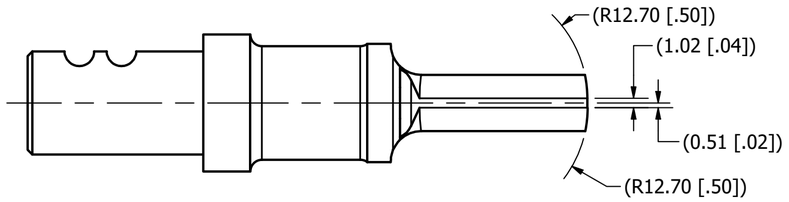
This design includes features covered by U.S. Patent No US9799234 (SD3 Shoulder Assembly), which is owned by Humanetics and its affiliated companies. No license is being granted to this patent and third parties are not authorized to make, use, sell, import, or export any products (physical or virtual) that practice the invention covered by this patent, or other patents owned by Humanetics. However, if a third party is interested in obtaining rights to the design, they are to contact Humanetics to discuss license terms.

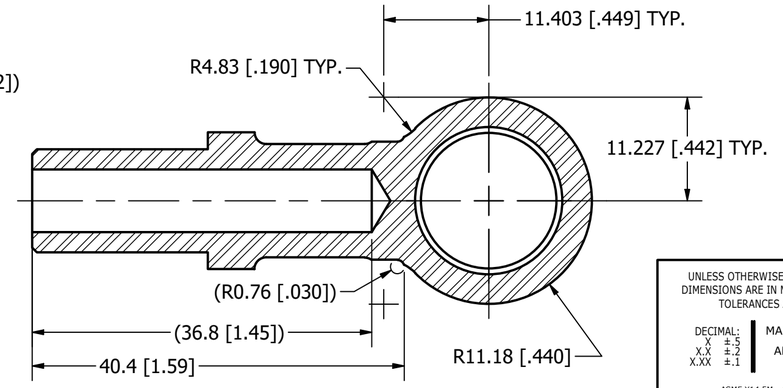












SECTION A-A
SCALE 2 : 1

NOTES:
1. HEAT TREAT: H 900 (900° FOR 1 HOUR, AIR COOL R/C 40-48)
   (SEE NOTE FOR AREA TO CHECK HARDNESS)
2. MAKE FROM 17-4 PH STAINLESS STEEL.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED √ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #2	CHECKED	
HEAT TREAT: SEE NOTE #1	ENG: TORCH	8/29/2014
FINISH: NONE	APPROVED	

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: MJB	10/28/2011

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

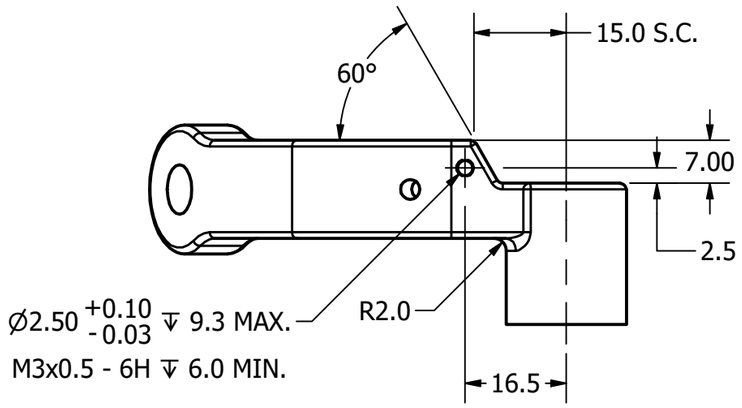
MEDIAL SENSOR STRUCTRUAL REPLACEMENT
THOR SD-3 CLAVICLE

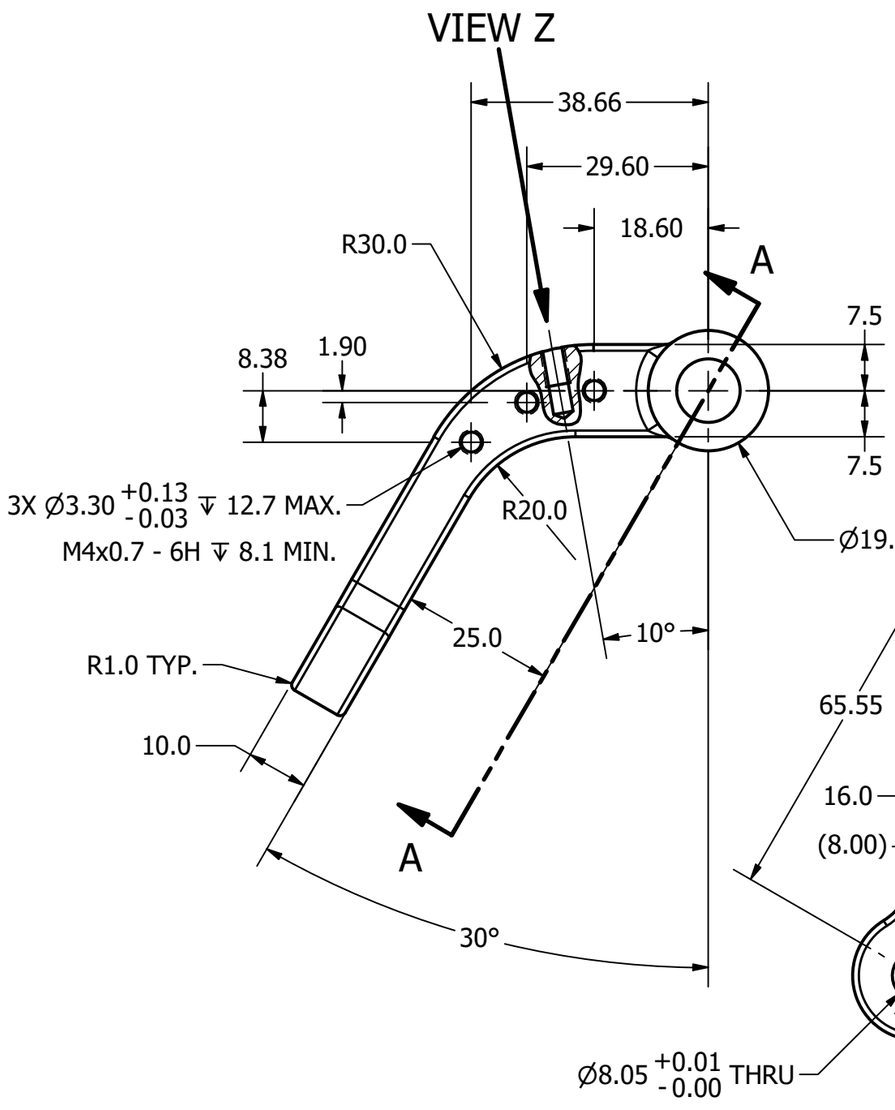
THIRD ANGLE PROJECTION

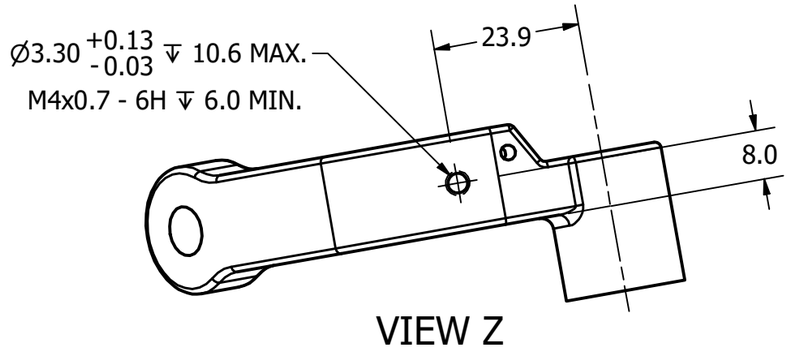
SIZE	DRAWING NUMBER	REV
C	AXSDM104	K

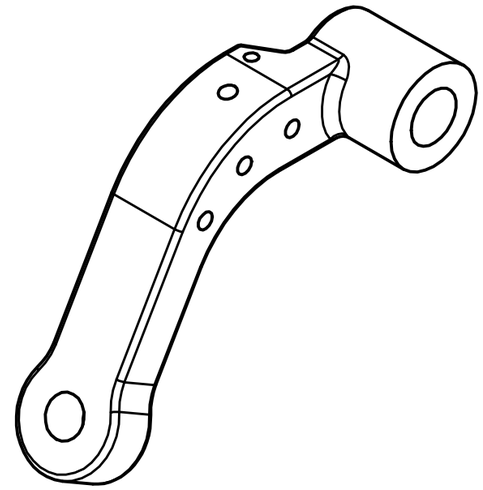
SCALE: 2 : 1 SHEET 1 OF 1

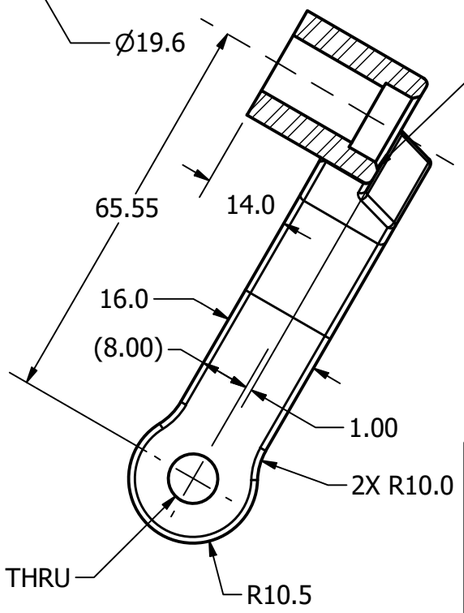
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	AB	JW	05/30/2019



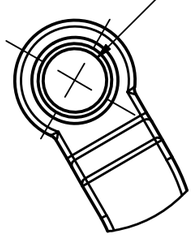








SECTION A-A



PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED √ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	3/31/2016
CHECKED	
ENG	
APPROVED	

MATERIAL: 4130 STEEL
HEAT TREAT: N/A
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

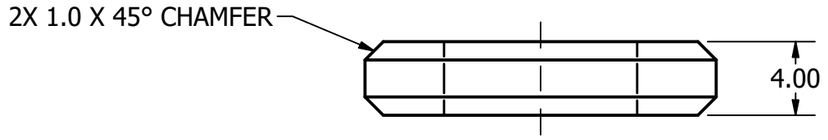
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

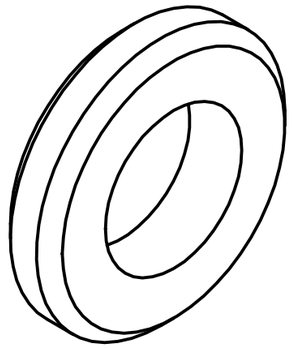
LOWER SCAPULA, RIGHT

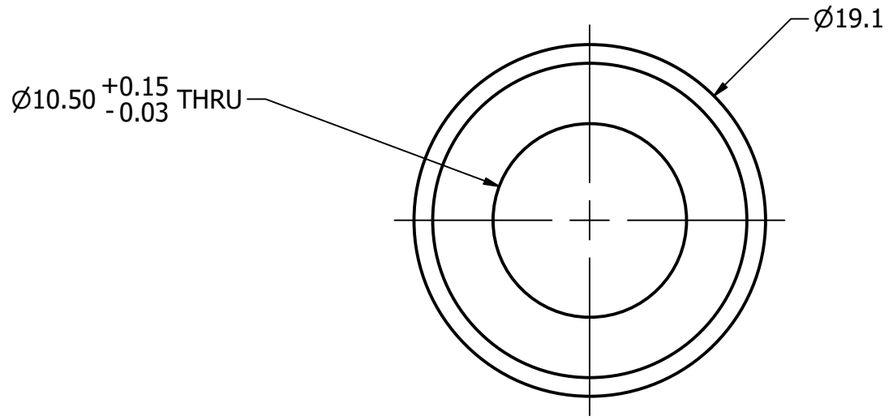
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-3505-2 | REV: 3
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	JH	JW	9/9/2016







PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: NYLON
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	3/29/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

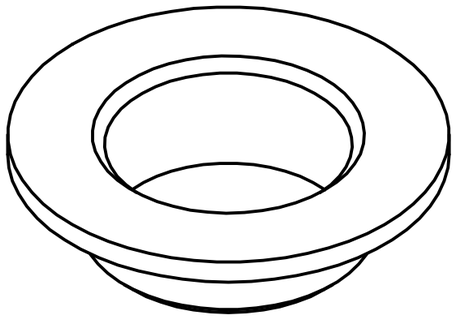
SPACER WASHER, M10, NYLON

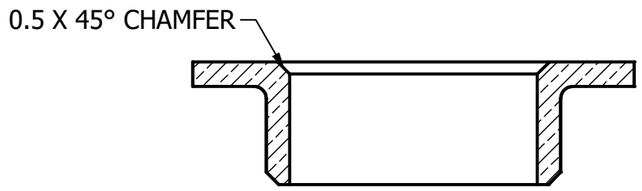
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-3534 | REV: 2

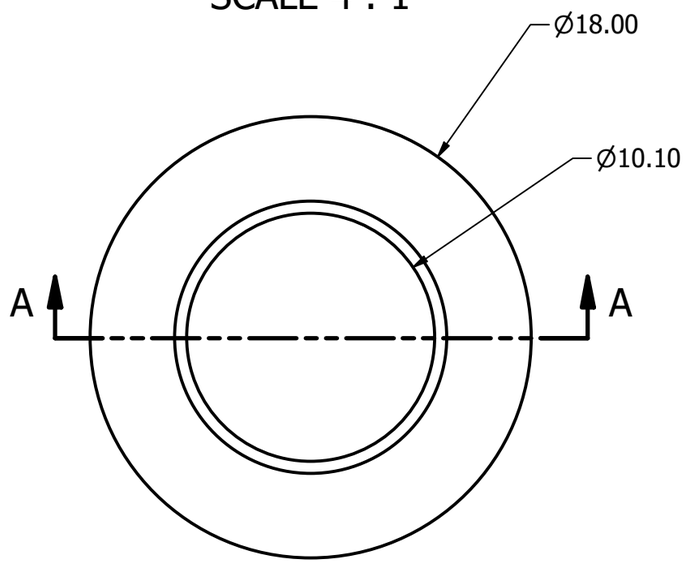
SCALE: 3 : 1 | SHEET: 1 OF 1

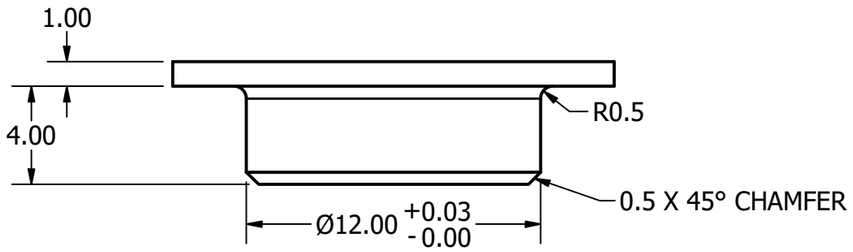
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	HEC	DJI	8/2/2022





SECTION A-A
SCALE 4 : 1





PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED √ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	hfenn	8/2/2022
CHECKED		
ENG	DJI	8/4/2022
APPROVED		

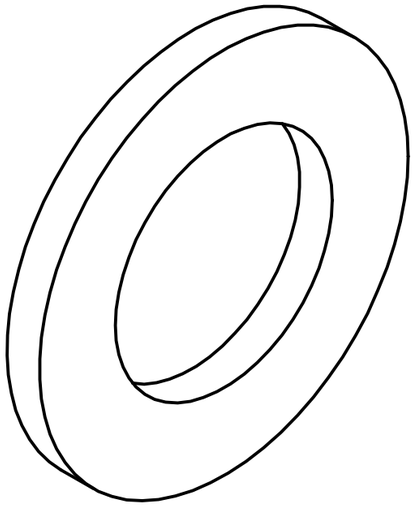
MATERIAL: BRONZE
HEAT TREAT: N/A
FINISH: N/A

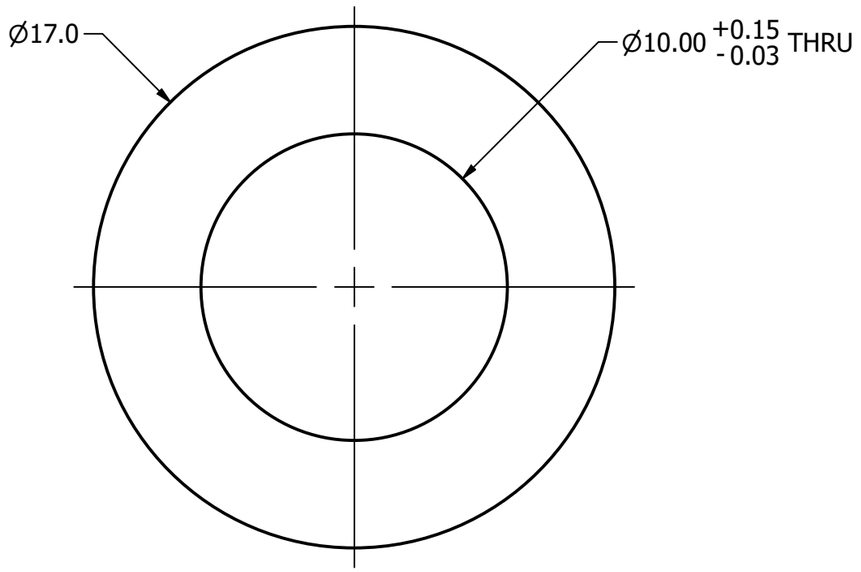
SCAPULA LINK BEARING
THOR-05F

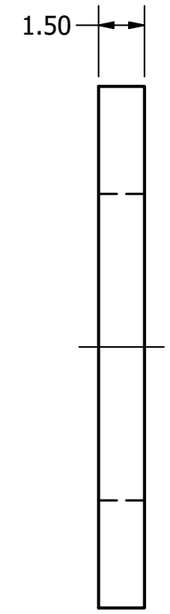
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-3583-A | REV: 1
SCALE: 4 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	HEC	8/24/2023







PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: CARBON FIBER
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: kstpierre	8/2/2019
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

FRICTION WASHER

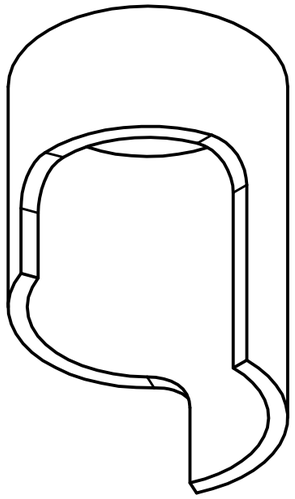
THOR-05F

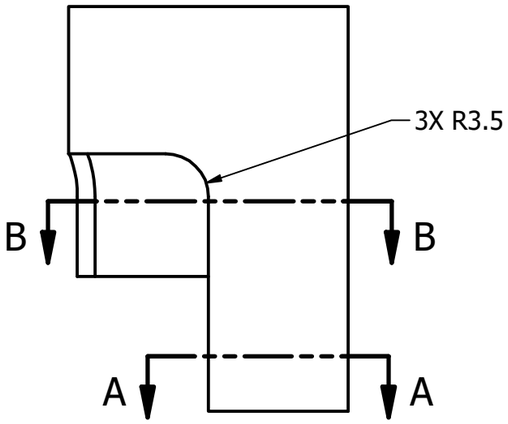
THIRD ANGLE PROJECTION

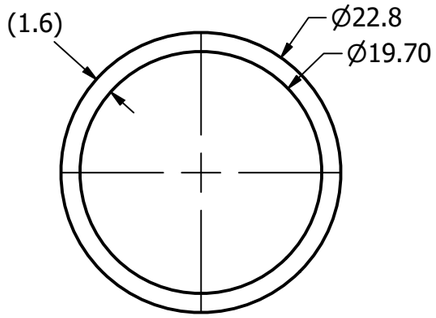
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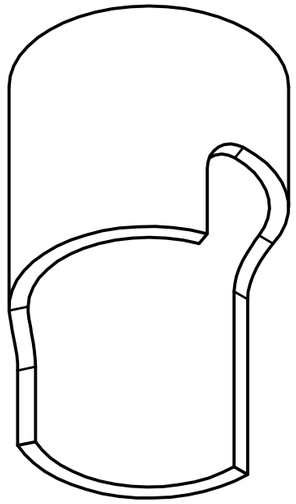
SCALE: 5 : 1 | SHEET: 1 OF 1

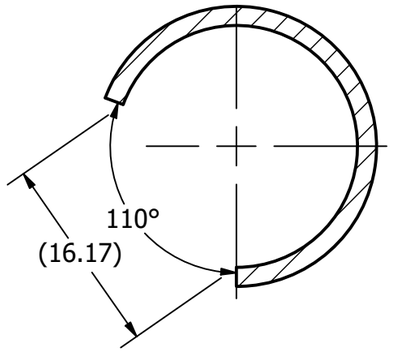
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	HF	DJI	12/1/2021



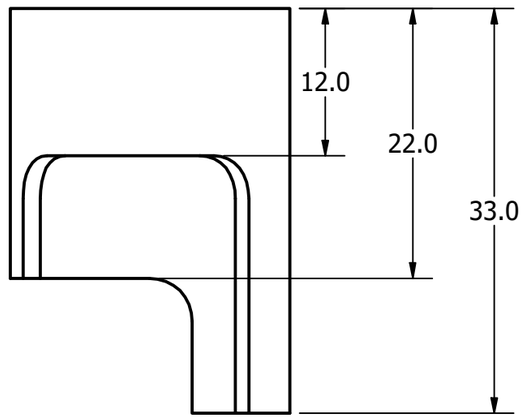


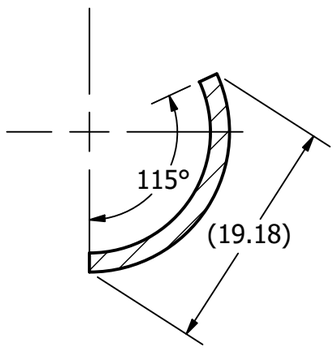






SECTION B-B
SCALE 2 : 1





SECTION A-A
SCALE 2 : 1

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN hfenn	12/1/2021
CHECKED	
ENG HF	12/1/2021
APPROVED	

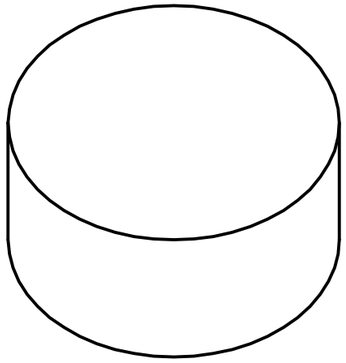
MATERIAL: 3D PRINTED NYLON
HEAT TREAT: N/A
FINISH: N/A

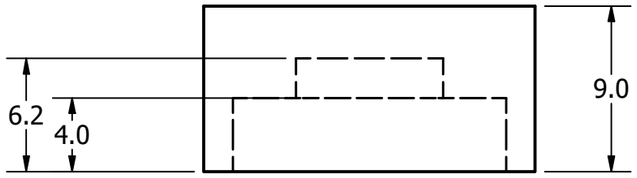
POSTERIOR LOWER SCAPULA COVER, RIGHT
THOR-05F

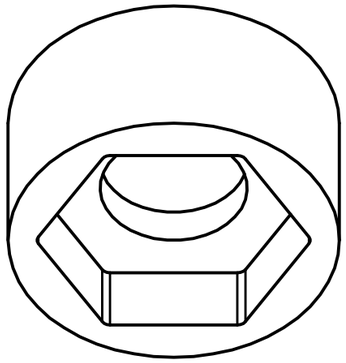
THIRD ANGLE PROJECTION

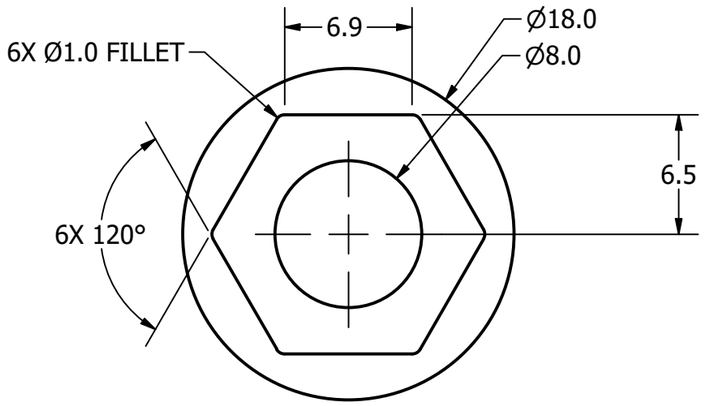
SIZE: A3 | DRAWING NUMBER: 474-3511-2 | REV: 1
SCALE: 2 : 1 | SHEET: 1 OF 1

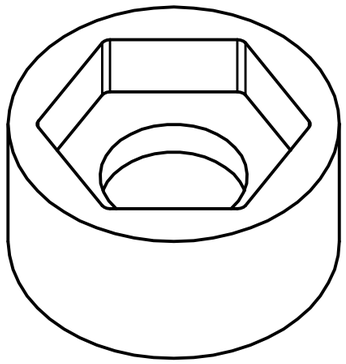
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	HF	HF	12/2/2021











UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ±.5, ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

PROTOTYPE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: hfenn	12/2/2021
CHECKED:	
ENG: HF	12/2/2021
APPROVED:	

MATERIAL: 3D PRINTED NYLON
HEAT TREAT: N/A
FINISH: N/A

MEDIAL LOWER SCAPULA CAP

THOR-05F

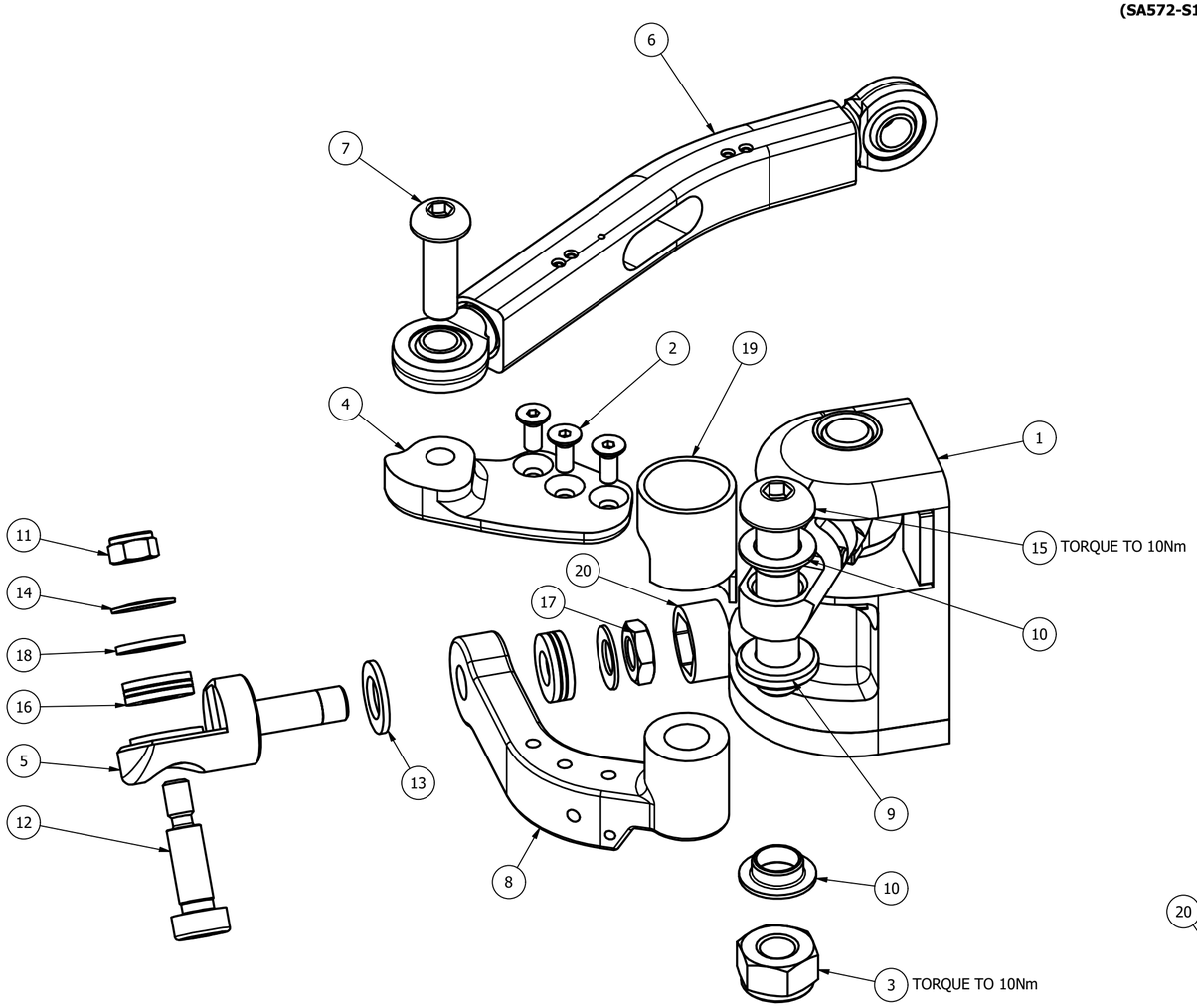
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-3512 | REV: 1

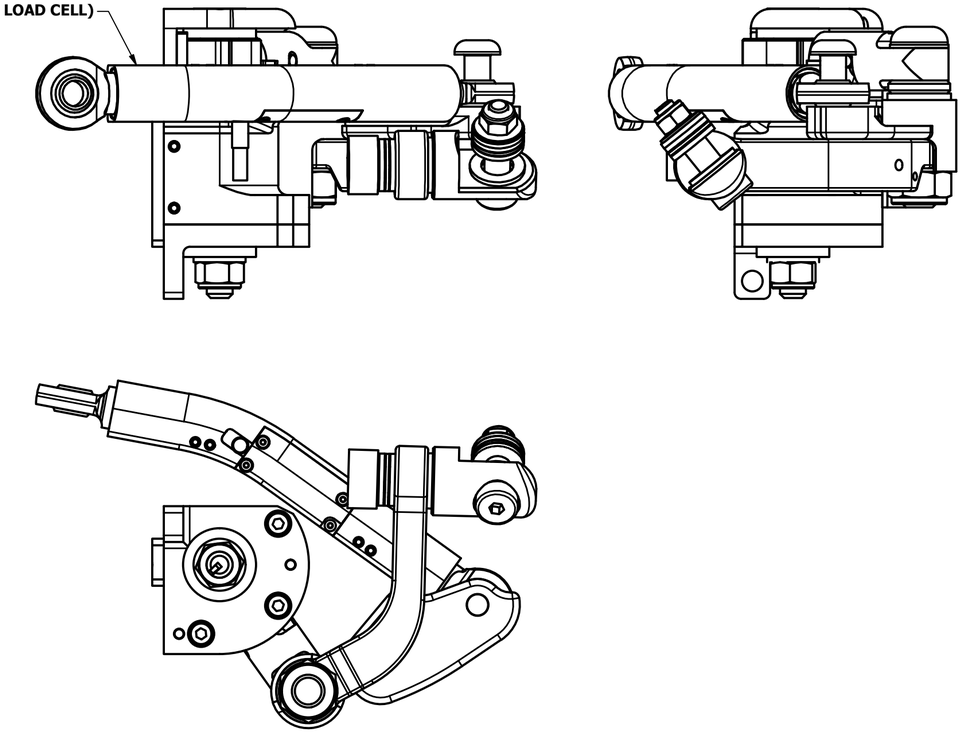
SCALE: 3 : 1 | SHEET: 1 OF 1

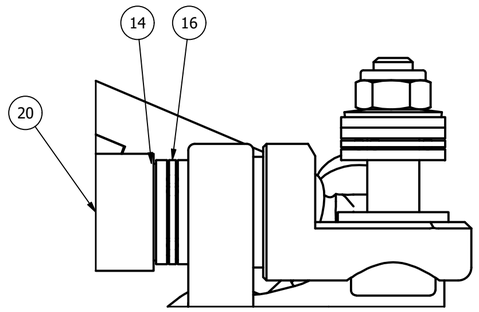
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	BK	HEC	8/24/2023

This design includes features covered by U.S. Patent Nos. 9,514,659 and 9,799,234 (upper arm assembly and shoulder assembly for crash test dummy), which is owned by Humanetics and its affiliated companies. No license is being granted to this patent and third parties are not authorized to make, use, sell, import, or export any products (physical or virtual) that practice the invention covered by this patent, or other patents owned by Humanetics. However, if a third party is interested in obtaining rights to the design, they are to contact Humanetics to discuss license terms.



SCALE 1 : 1





WASHER/BEARING VIEW
SCALE 1.5 : 1

ITEM	QTY	PART NUMBER	DESCRIPTION
20	1	474-3512	MEDIAL LOWER SCAPULA CAP
19	1	474-3511-1	POSTERIOR LOWER SCAPULA COVER, LEFT
18	1	5000123	M8 FLAT WASHER PLAIN ZINC
17	1	5001101	M8 X 1.25 HEX JAM NUT ZINC
16	2	5001520	BEARING, BALL THRUST, 8 X 16 X 5 THK.
15	1	5001405	M10 X 1.5 X 50 LG. BHCS SS
14	2	5001388	WASHER BELLEVILLE M8 (8.2 X 15 X 0.8)
13	2	474-3533	FRICTION WASHER
12	1	5001154	M8 X 20 LG. SHSS
11	1	5000093	M6 X 1 HEX LOCK NUT ZINC
10	2	474-3583-A	SCAPULA LINK BEARING
9	1	474-3534	SPACER WASHER, M10, NYLON
8	1	474-3505-1	LOWER SCAPULA, LEFT
7	1	5000255	M8 X 1.25 X 25 LG. BHCS
6	1	474-3508	CLAVICLE ASSEMBLY
5	1	483-3504	SHOULDER CLEVIS, THOR-05F
4	1	474-3506-1	UPPER SCAPULA, LEFT
3	1	5000149	M10 X 1.5 HEX LOCK NUT ZINC
2	3	5000023	M4 X 0.7 X 10 LG. FHCS
1	1	474-3524-1-A	SPINE-SHOULDER COUPLER ASSEMBLY, LEFT

PARTS LIST

NOTES:

1. U.S. PATENT NO. 9,799,234

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED SURFACE ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	7/20/2022
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

SHOULDER ASSEMBLY, LEFT

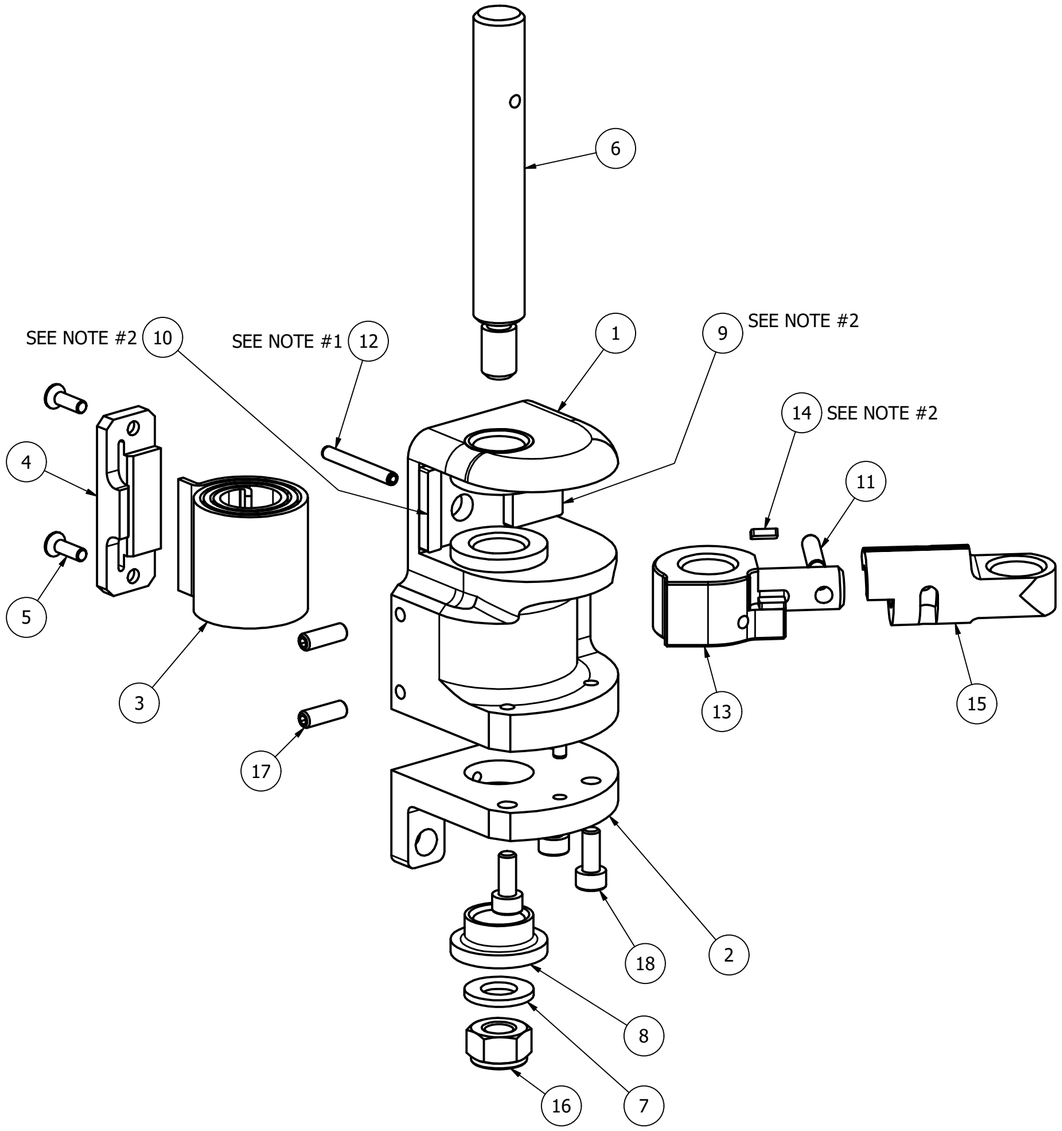
THOR-05F

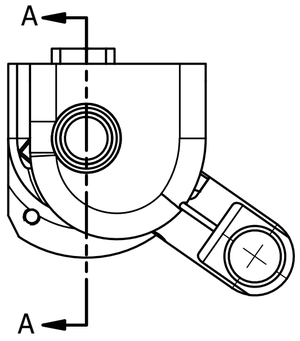
THIRD ANGLE PROJECTION

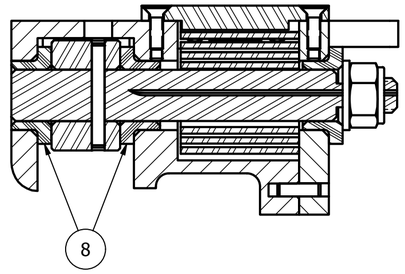
SIZE: A2 | DRAWING NUMBER: 474-3500-1-A | REV: 4

SCALE: .75 : 1 | SHEET: 1 OF 1

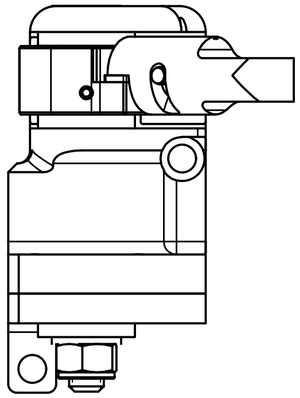
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	HF	7/15/2022







SECTION A-A



ITEM	QTY	PART NUMBER	DESCRIPTION
18	3	5000737	M4 X 0.7 X 10 LG. SHCS SS
17	2	5001813	M4 X 0.7 X 12 LG. SSSFP SS
16	1	5000318	M8 X 1.25 HEX LOCK NUT SS
15	1	474-3503-1	SCAPULA LINK, LEFT
14	2	474-3539	SCAPULA LINK BUMPER
13	1	474-3507-1	CLEVIS, LEFT SCAPULA LINK
12	1	5000140	M3 X 24 LG. ROLL PIN
11	1	5000815	M4 X 18 LG. DOWEL PIN
10	1	474-3558	FRONT SHOULDER STOP
9	1	474-3529	REAR SHOULDER STOP
8	3	474-3527	SHAFT SLEEVE
7	1	5000123	M8 FLAT WASHER PLAIN ZINC
6	1	474-3519	PIN, SPRING TENSION
5	2	5000203	M3 X 0.5 X 10 LG. FHCS
4	1	474-3526	SPRING RETAINER
3	1	474-3582	SPRING, SHOULDER
2	1	474-3502-1-A	SPINE-SHOULDER COUPLER, BOTTOM, LEFT
1	1	474-3501-1-A	SPINE-SHOULDER COUPLER, TOP, LEFT

PARTS LIST

NOTES:

1. SEE SHEET #2 FOR MACHINING INSTRUCTIONS FOR ROLL PIN HOLE.
2. SEE SHEET #2 FOR BONDING INSTRUCTIONS FOR PADS.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	N/A	
HEAT TREAT	N/A	
FINISH	N/A	

VEHICLE RESEARCH and TEST CENTER

APPROVALS		DATE
DRAWN	B. KIMES	7/20/2022
CHECKED		
ENG		
APPROVED		

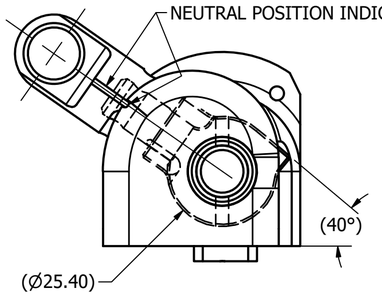
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

SPINE-SHOULDER COUPLER ASSEMBLY, LEFT
THOR-05F

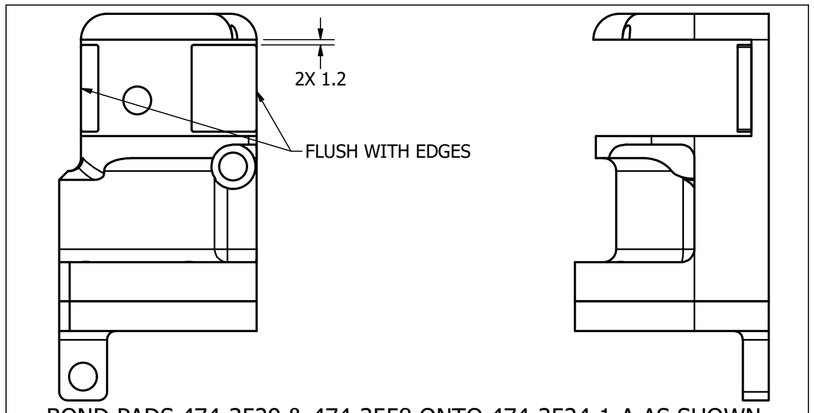
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A2	474-3524-1-A	2

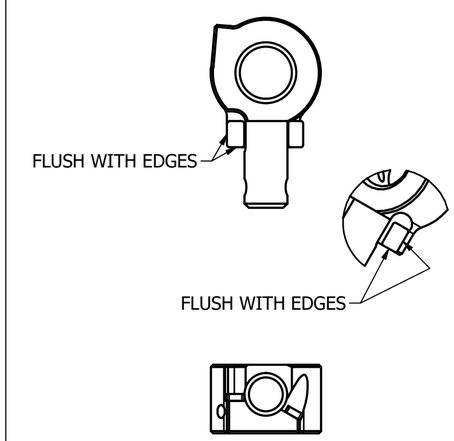
SCALE: 1 : 1 SHEET 1 OF 2



HOLE MACHINING FOR NEUTRAL POSITION



BOND PADS 474-3529 & 474-3558 ONTO 474-3524-1-A AS SHOWN



BOND PADS (2X) 474-3539 ONTO
474-3507-1 AS SHOWN.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	7/20/2022
CHECKED	
ENG	
APPROVED	

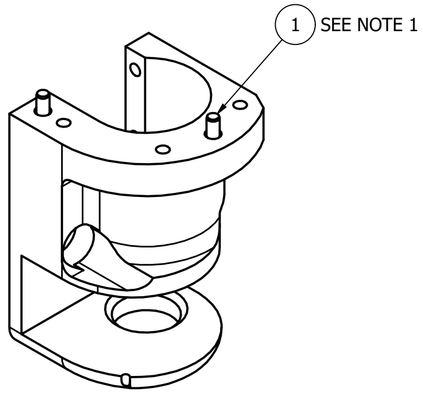
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

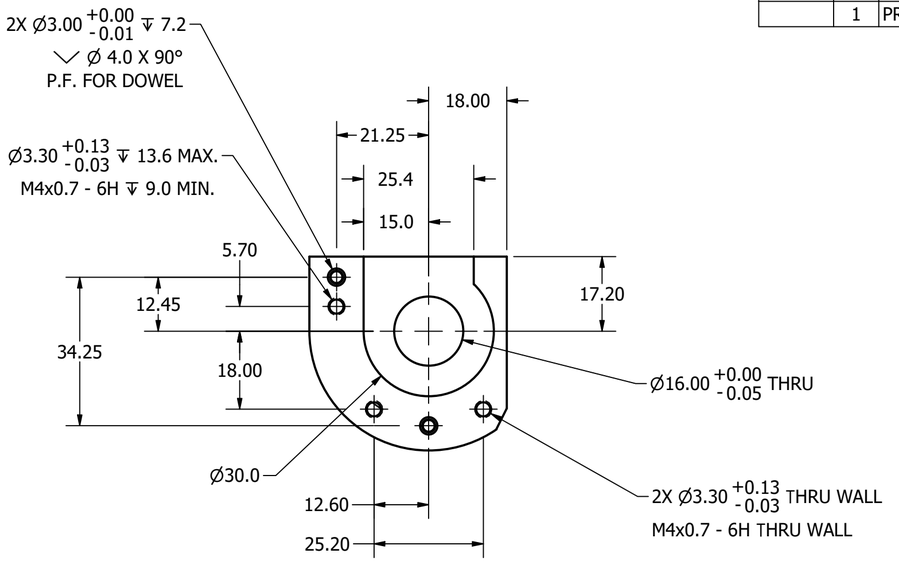
SPINE-SHOULDER COUPLER ASSEMBLY, LEFT
THOR-05F

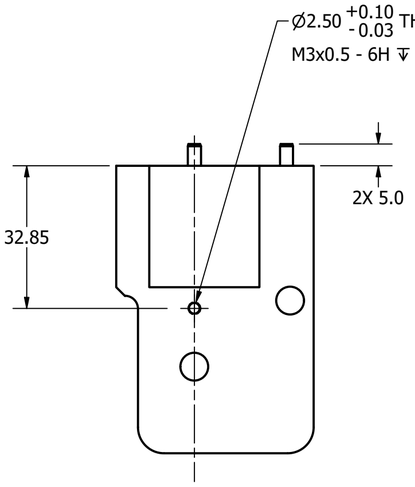
THIRD ANGLE PROJECTION

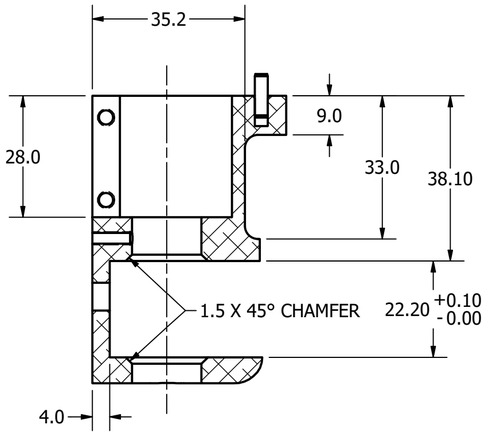
SIZE: A2 | DRAWING NUMBER: 474-3524-1-A | REV: 2
SCALE: 1 : 1 | SHEET: 2 OF 2

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	HF	7/15/2022

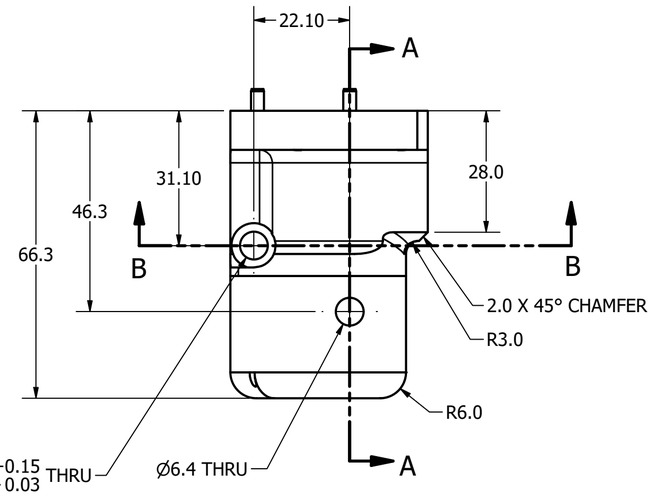




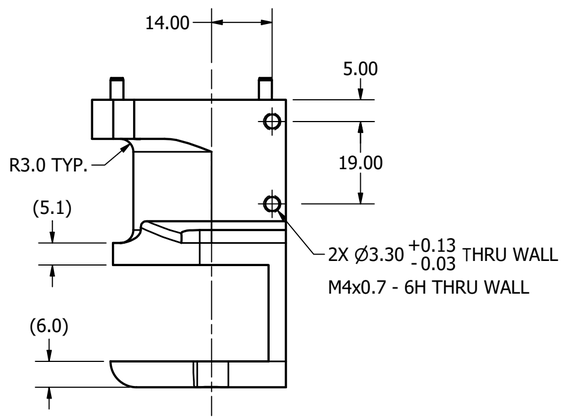


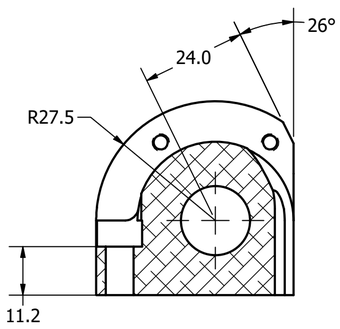


SECTION A-A

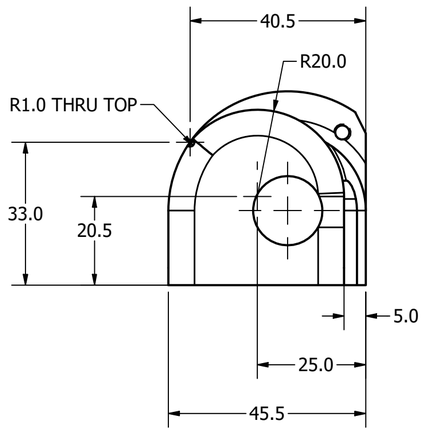


⌴ Ø10.40 +0.15 -0.03 ↧ AS SHOWN





SECTION B-B



NOTES:

1. INSTALL DOWEL PINS AFTER ANODIZE.

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	5000284	M3 X 10 LG. DOWEL PIN

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: rkimes	5/2/2022
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

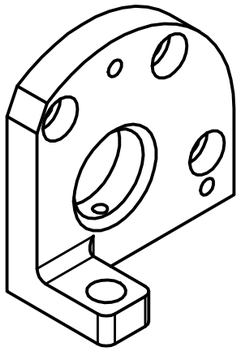
SPINE-SHOULDER COUPLER, TOP, LEFT

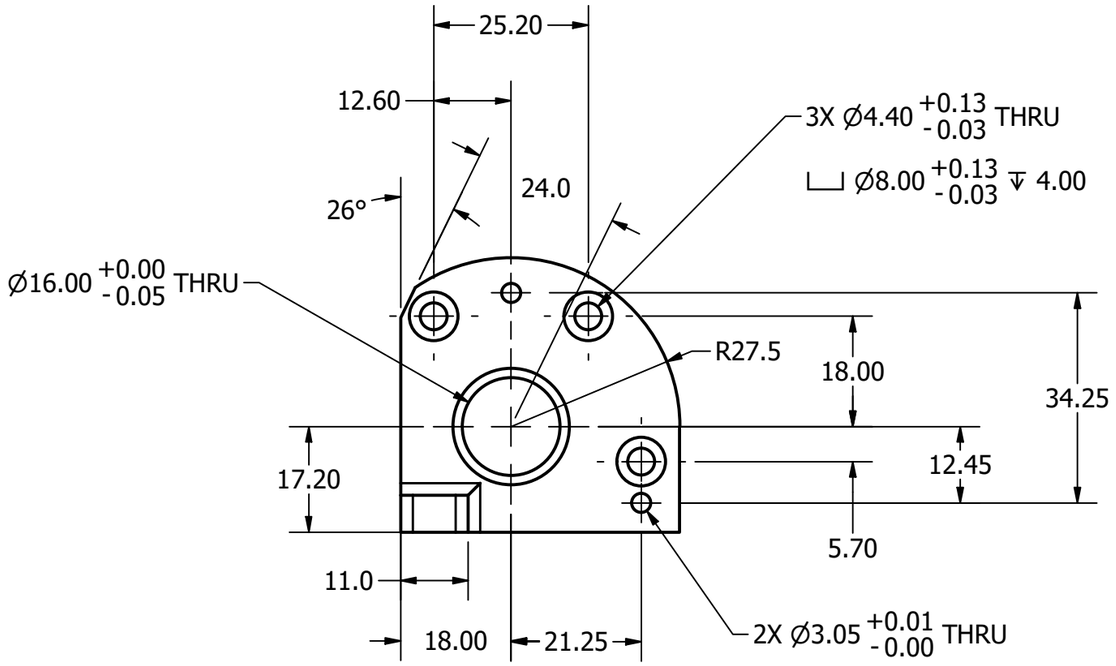
THIRD ANGLE PROJECTION

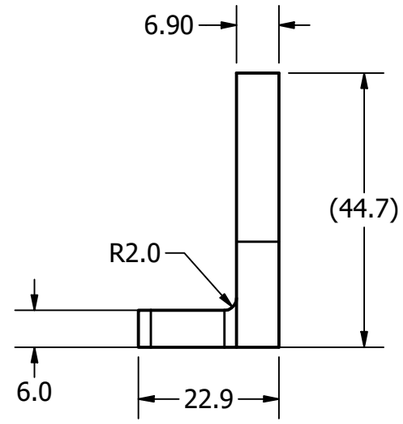
SIZE: A2 | DRAWING NUMBER: 474-3501-1-A | REV: 1

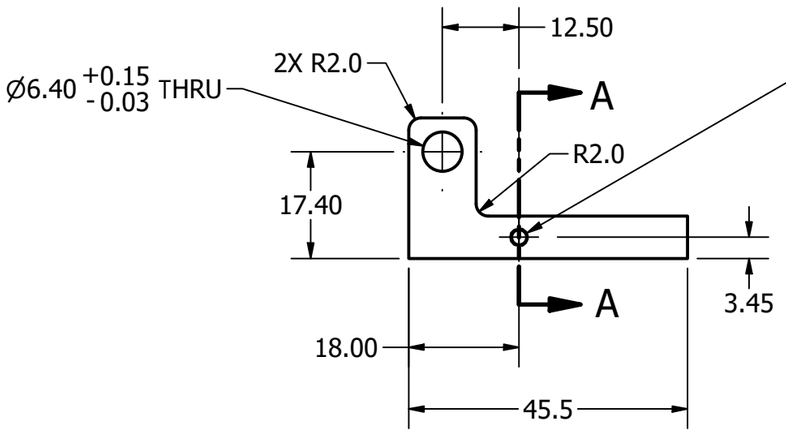
SCALE: 1 : 1 | SHEET: 1 OF 1

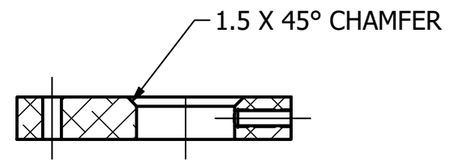
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	HF	5/5/2022











SECTION A-A

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

SPINE-SHOULDER COUPLER, BOTTOM, LEFT

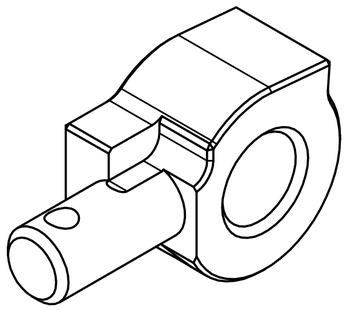
APPROVALS	DATE
DRAWN rkimes	5/5/2022
CHECKED	
ENG	
APPROVED	

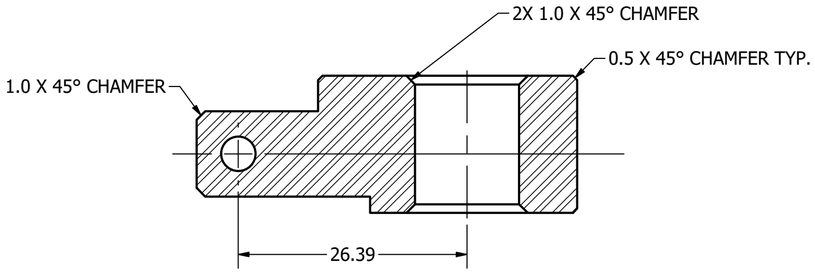
MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

THIRD ANGLE PROJECTION

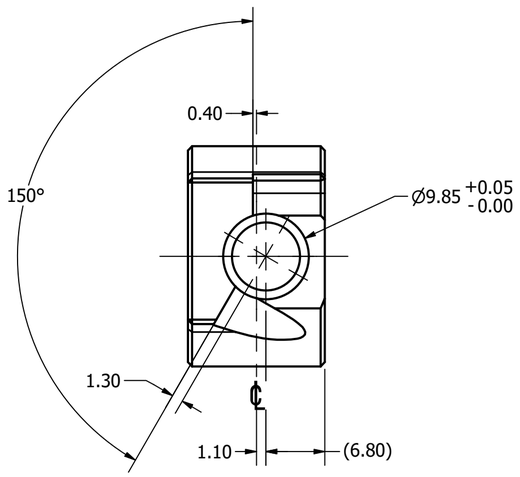
SIZE: A3 | DRAWING NUMBER: 474-3502-1-A | REV: 1
SCALE: 1 : 1 | SHEET: 1 OF 1

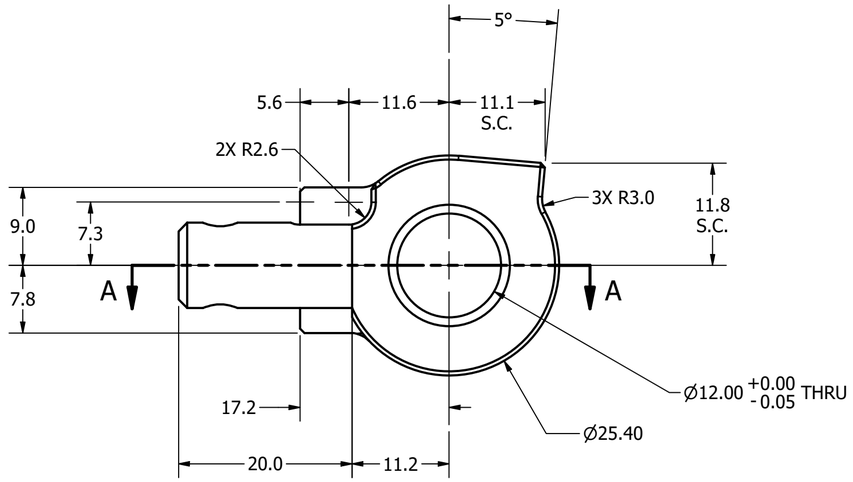
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	LKR	HF	10/20/2021

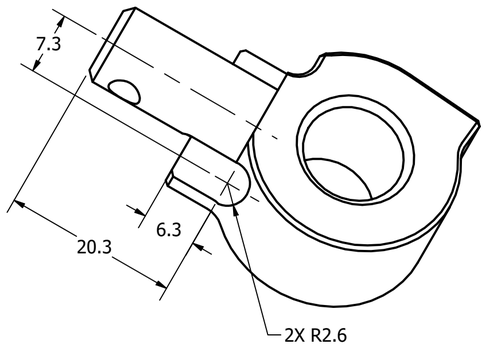


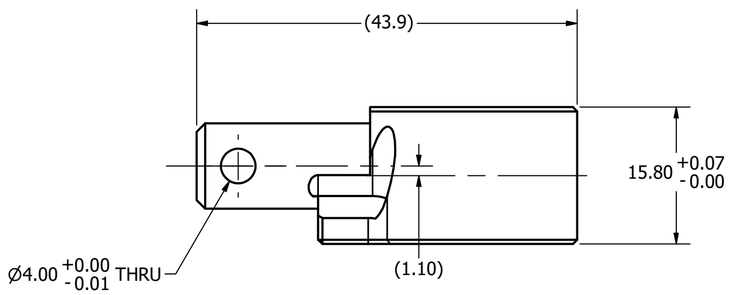


SECTION A-A









PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 4130 STEEL
HEAT TREAT: N/A
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	3/29/2016
CHECKED	
ENG: JW	3/28/2016
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

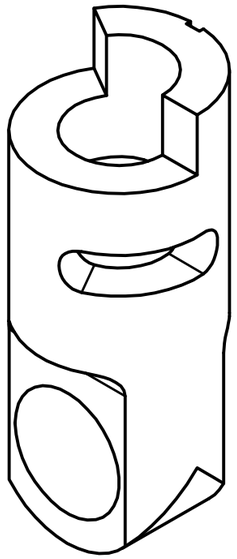
CLEVIS, LEFT SCAPULA LINK
THOR-05F

THIRD ANGLE PROJECTION

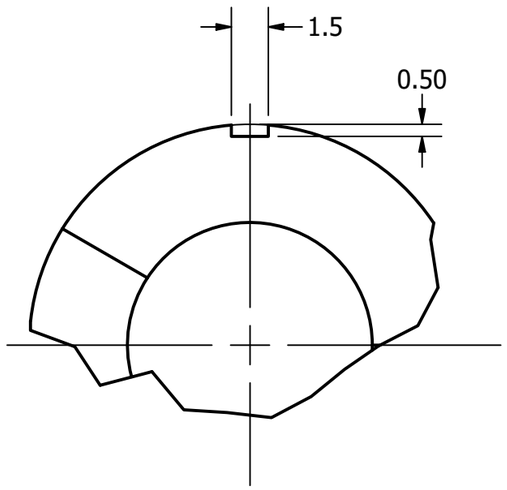
SIZE: A2 | DRAWING NUMBER: 474-3507-1 | REV: 3

SCALE: 2 : 1 | SHEET: 1 OF 1

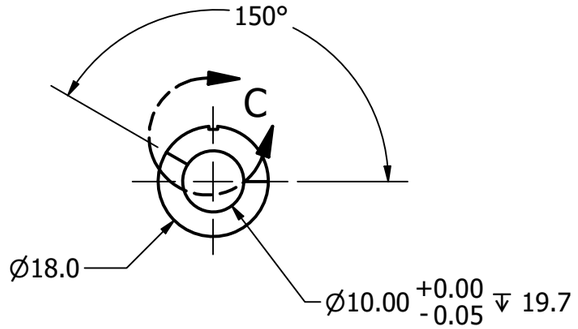
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	LKR	HF	10/21/2021

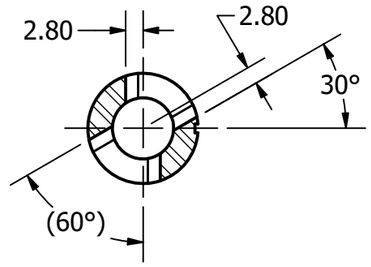


SCALE 2 : 1

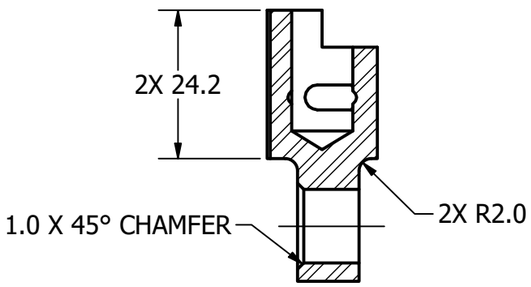


DETAIL C
SCALE 4 : 1

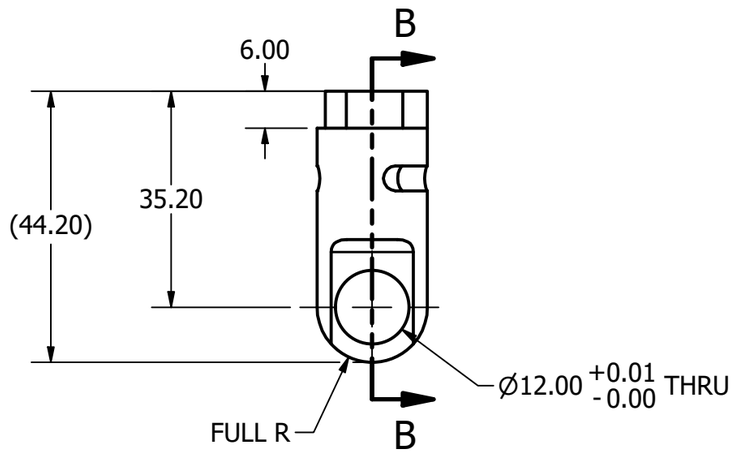


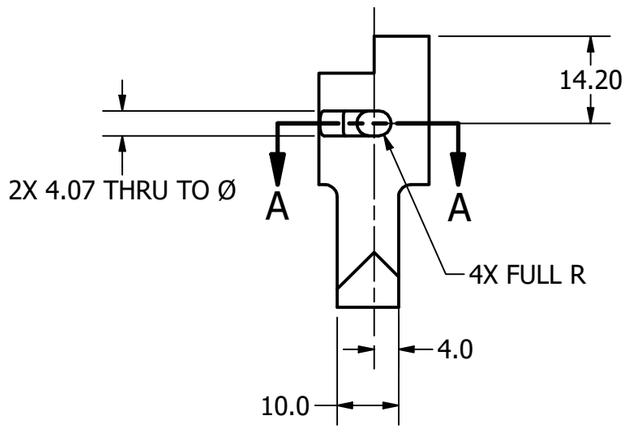


SECTION A-A



SECTION B-B





UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ±.5° | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

PROTOTYPE DRAWING

MATERIAL	HEAT TREAT	FINISH
4130 STEEL	N/A	0.008mm ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	3/31/2016
CHECKED:	
ENG: JW	3/20/2016
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

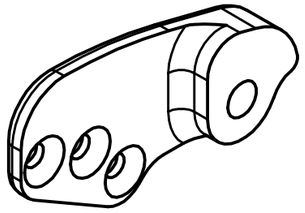
SCAPULA LINK, LEFT
THOR-05F

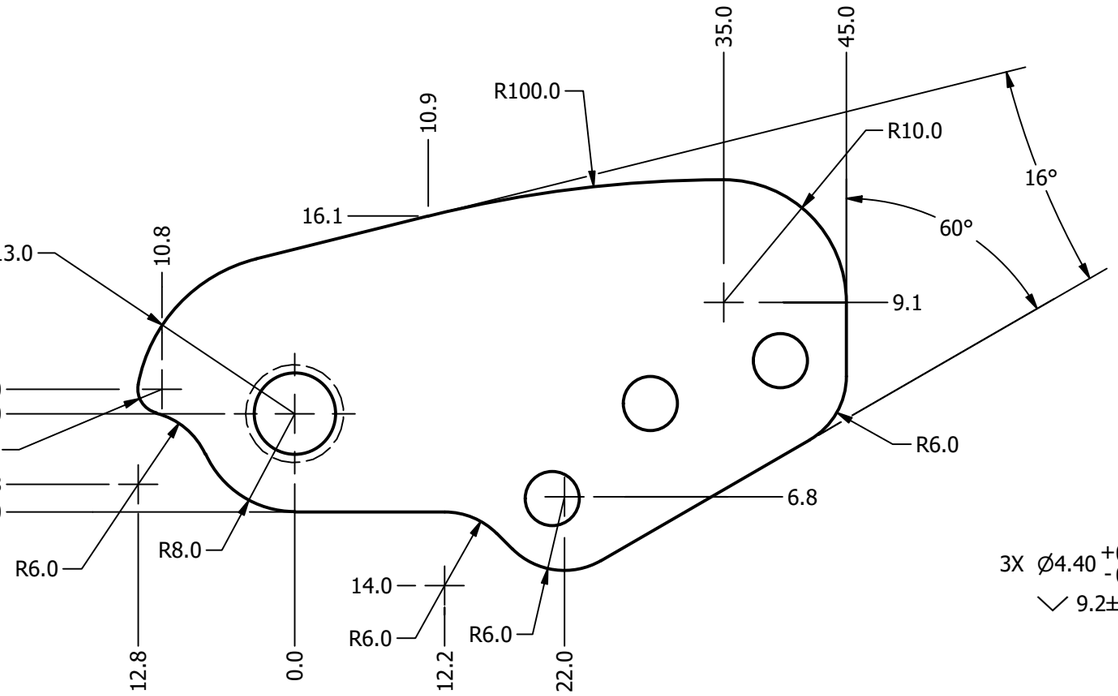
THIRD ANGLE PROJECTION

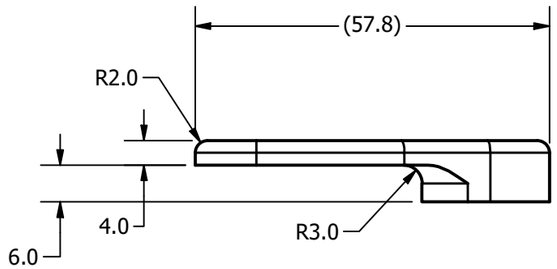
SIZE	DRAWING NUMBER	REV
A3	474-3503-1	4

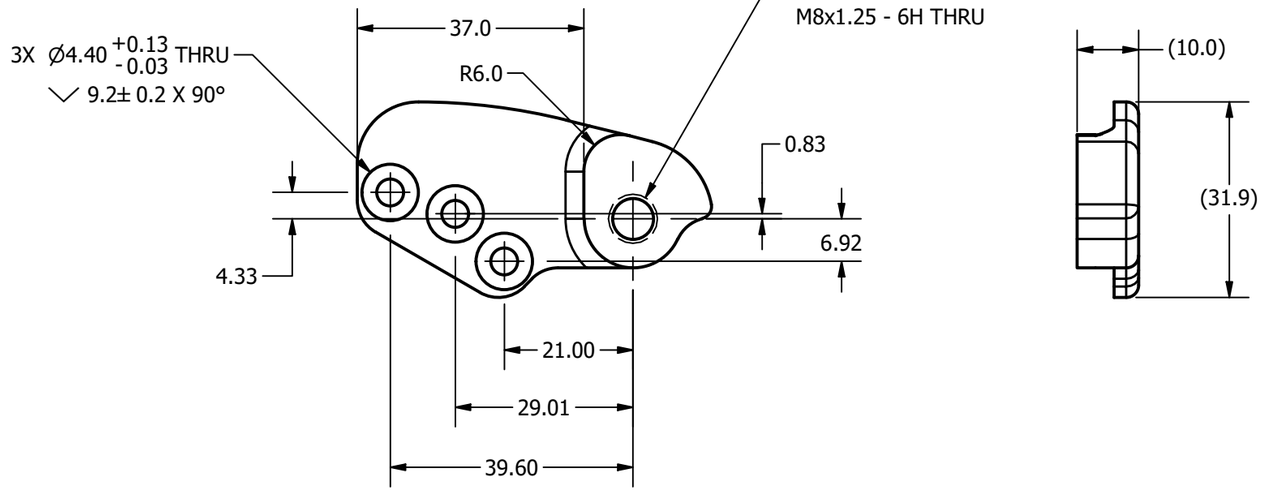
SCALE: 1 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	DJI	JW	11/3/2017









SCALE 2 : 1

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: disopi	3/24/2016
CHECKED:	
ENG:	
APPROVED:	

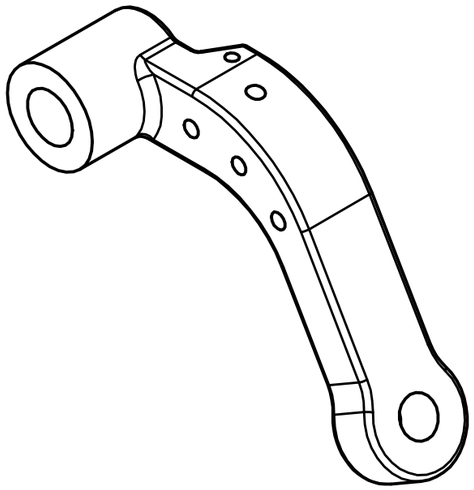
UPPER SCAPULA, LEFT

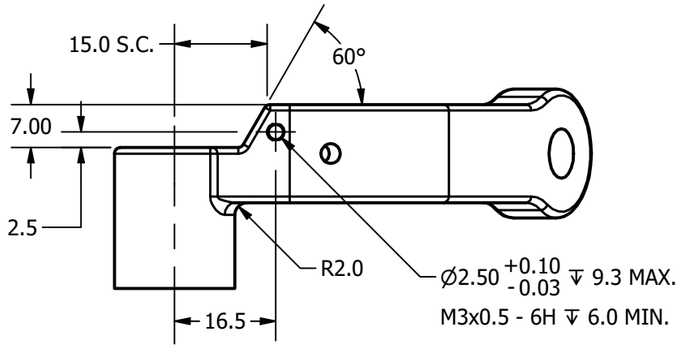
MATERIAL: 4140 STEEL
HEAT TREAT: Rc 44-48
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

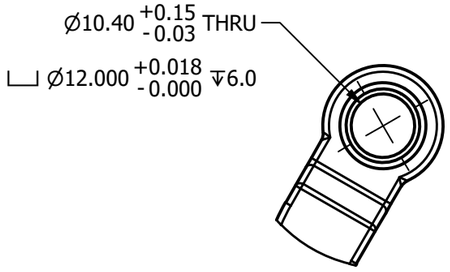
THIRD ANGLE PROJECTION

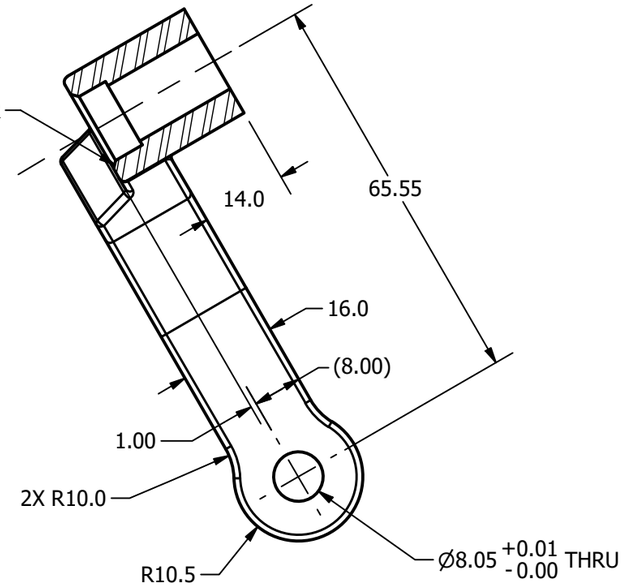
SIZE: A3 | DRAWING NUMBER: 474-3506-1 | REV: 1
SCALE: 1:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	AB	JW	05/30/2019

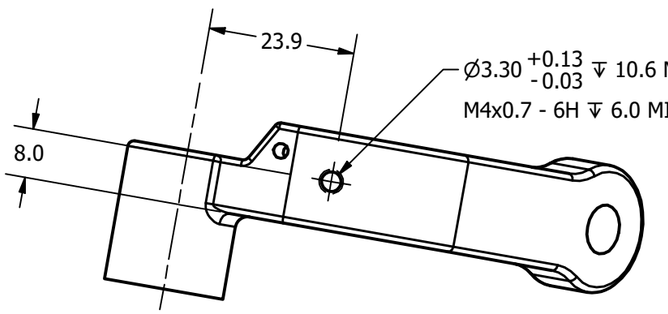




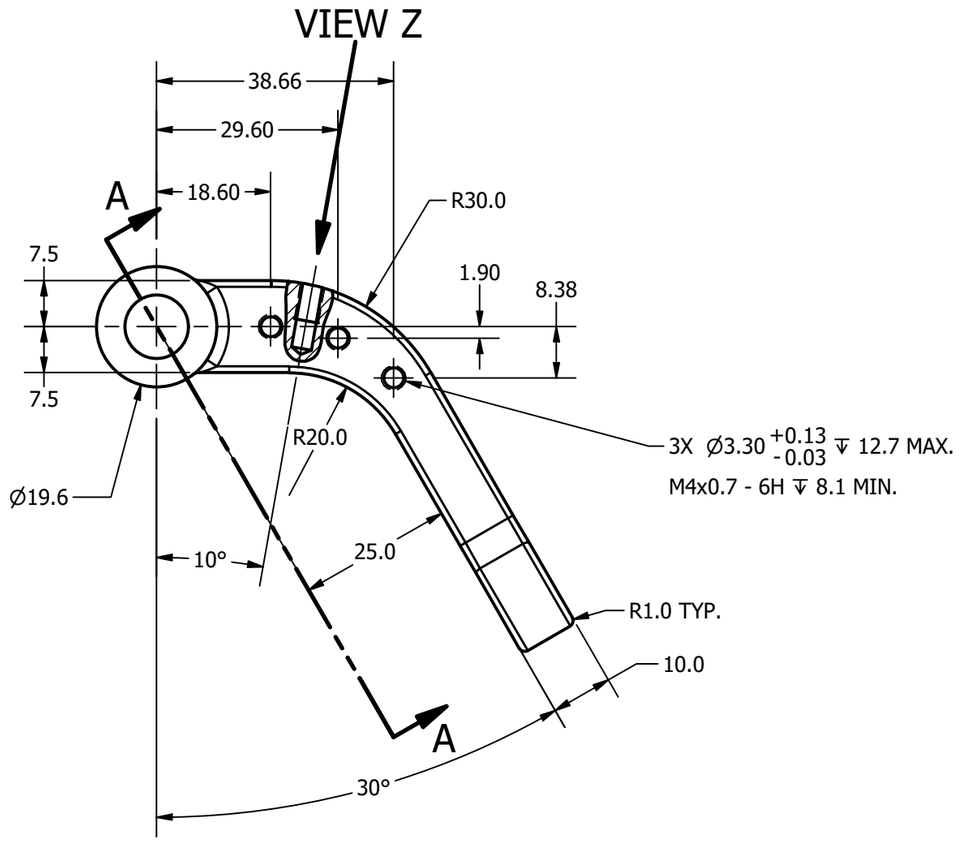




SECTION A-A



VIEW Z



PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 4130 STEEL
HEAT TREAT: N/A
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	3/31/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

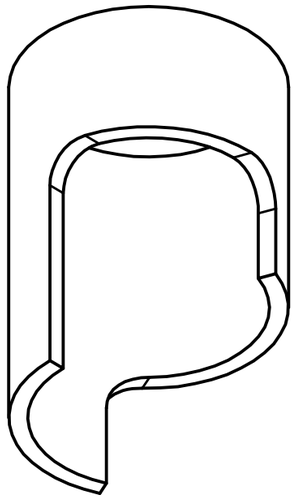
LOWER SCAPULA, LEFT

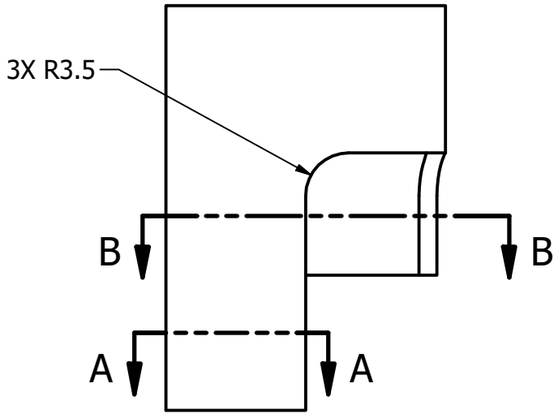
THIRD ANGLE PROJECTION

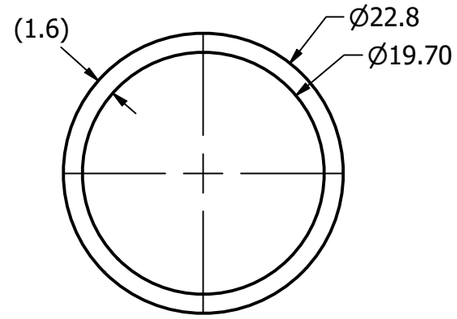
SIZE: A3 | DRAWING NUMBER: 474-3505-1 | REV: 3

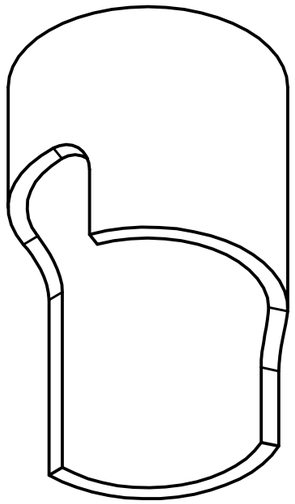
SCALE: 1 : 1 | SHEET: 1 OF 1

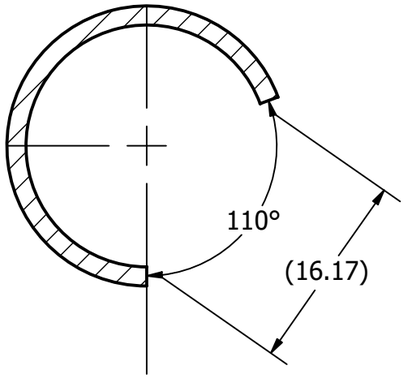
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	HF	DJI	12/1/2021



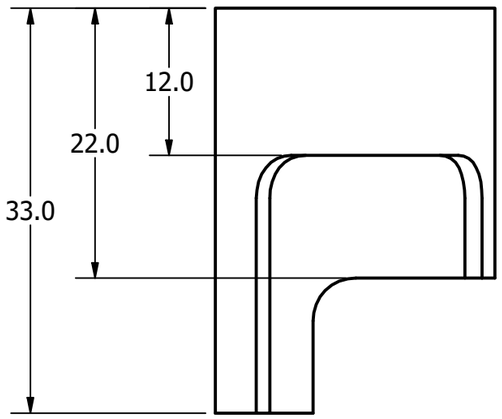


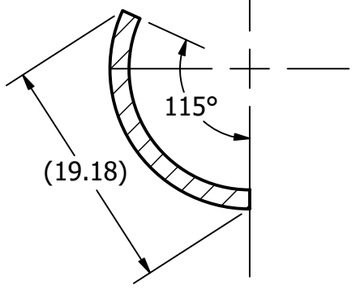






SECTION B-B
SCALE 2 : 1





SECTION A-A
SCALE 2 : 1

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 3D PRINTED NYLON
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: hfenn	11/29/2021
CHECKED:	
ENG: HF	11/29/2021
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

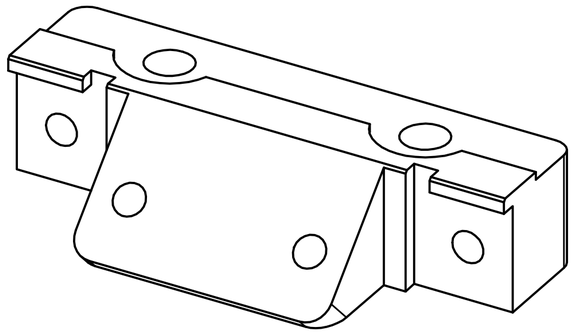
POSTERIOR LOWER SCAPULA COVER, LEFT
THOR-05F

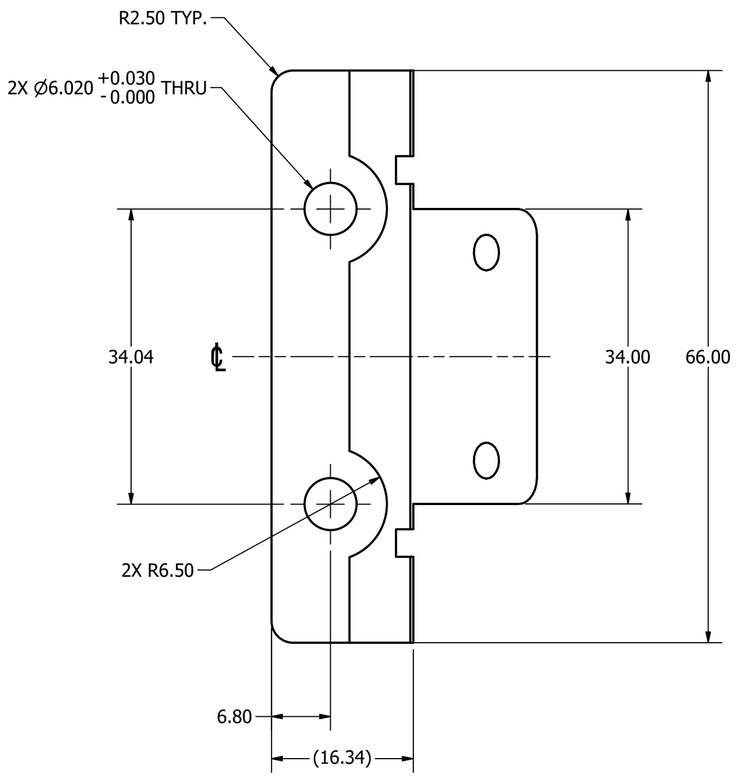
THIRD ANGLE PROJECTION

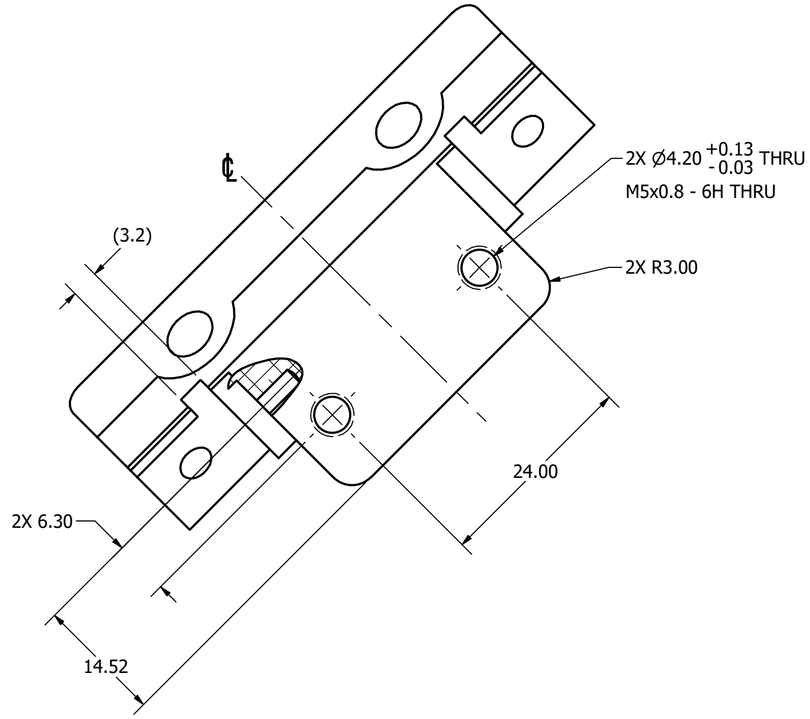
SIZE	DRAWING NUMBER	REV
A3	474-3511-1	1

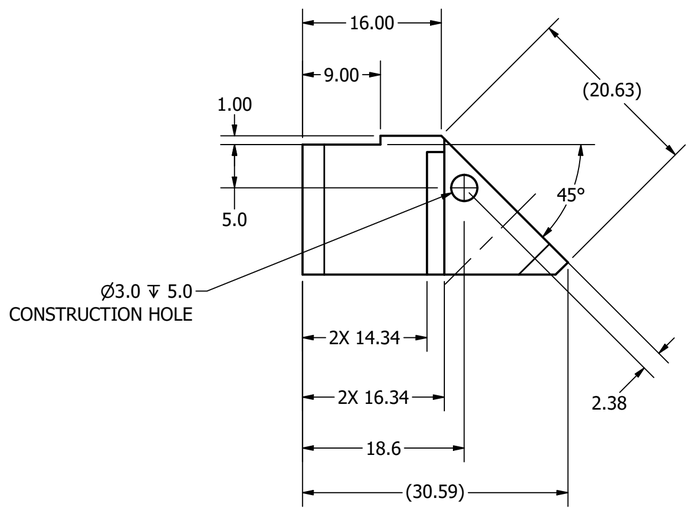
SCALE: 2 : 1
SHEET 1 OF 1

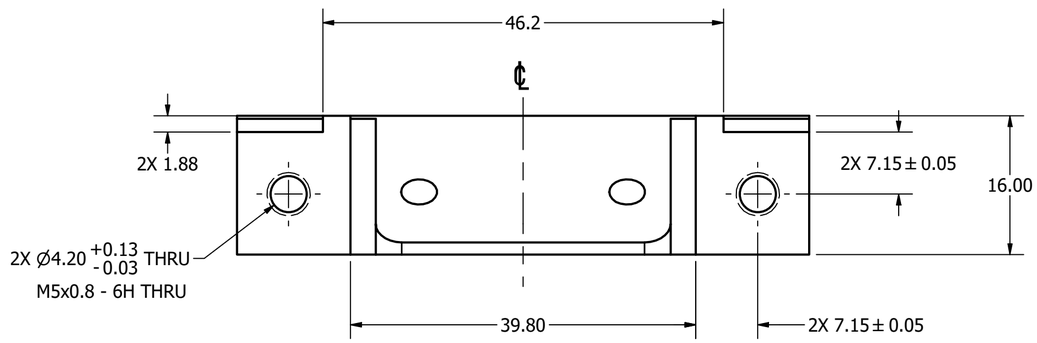
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	BLG	11/11/2022











NOTES:

1. DIMENSIONS ARE SYMMETRICAL ABOUT ℄ , UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. KIMES	11/11/2022
CHECKED	
ENG	
APPROVED	

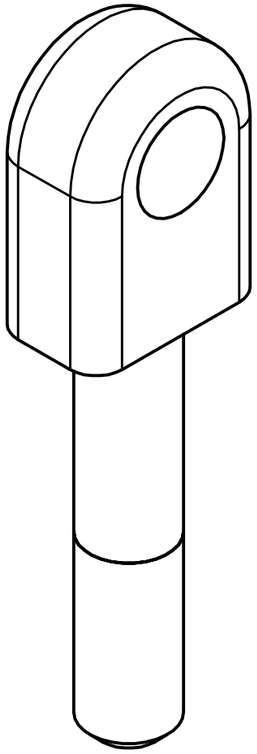
MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

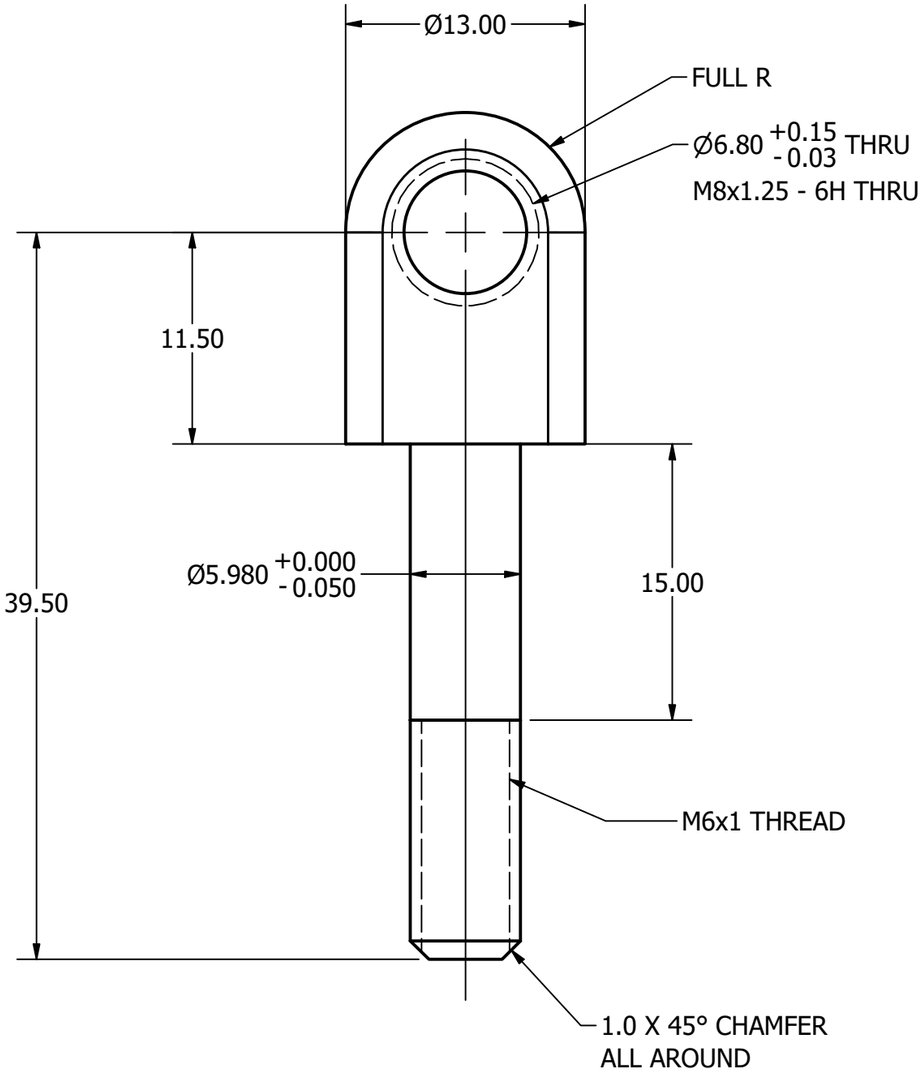
ADAPTOR, RIB 1 TO STERNUM
THOR-05F

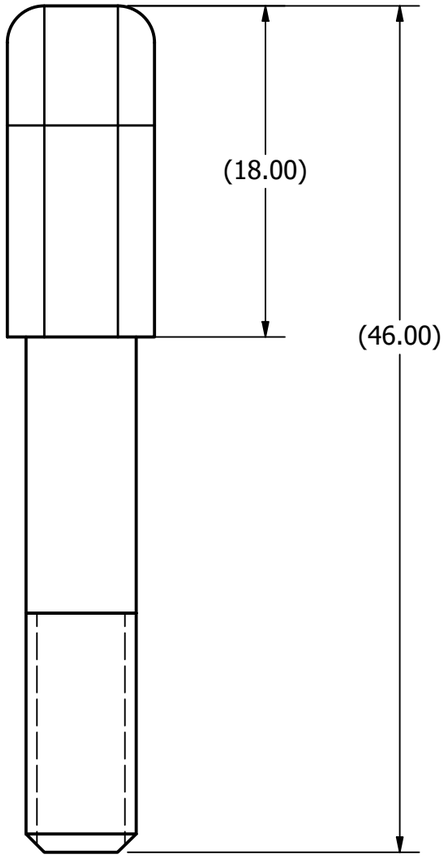
THIRD ANGLE PROJECTION

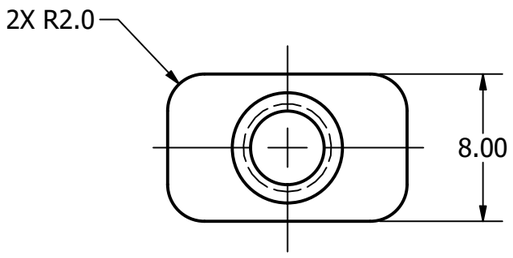
SIZE: A2 | DRAWING NUMBER: 474-3040-A | REV: 1
SCALE: 2 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	BLG	11/20/2022









PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

CLAVICLE-STERNUM ADAPTOR

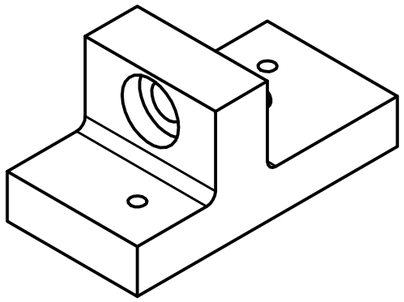
APPROVALS	DATE
DRAWN B. KIMES	11/11/2022
CHECKED	
ENG	
APPROVED	

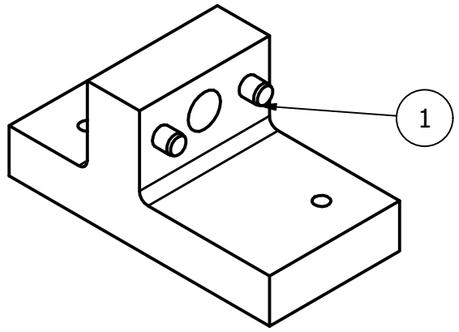
MATERIAL: 1018 STEEL
HEAT TREAT: N/A
FINISH: ELECTROLESS NICKEL PLATE 0.008mm MAX

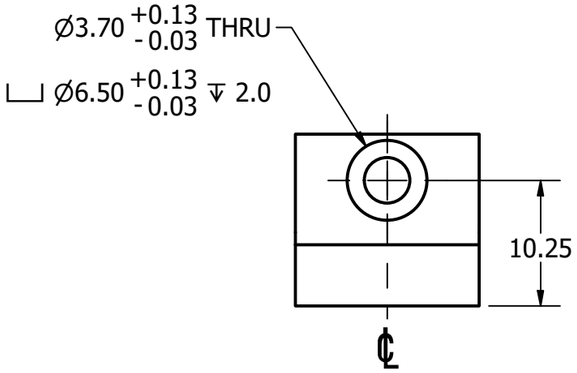
THIRD ANGLE PROJECTION

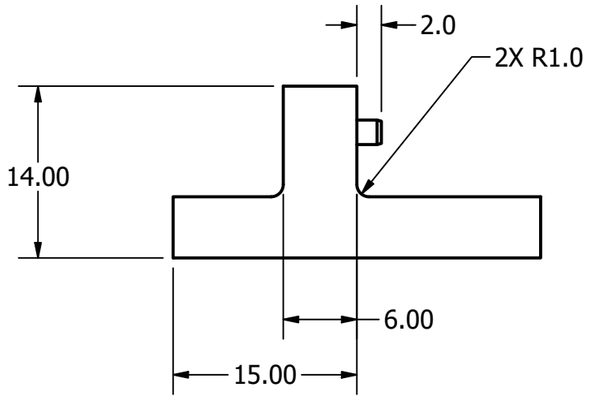
SIZE: A3 | DRAWING NUMBER: 474-3041-A | REV: 2
SCALE: 3: 1 | SHEET: 1 OF 1

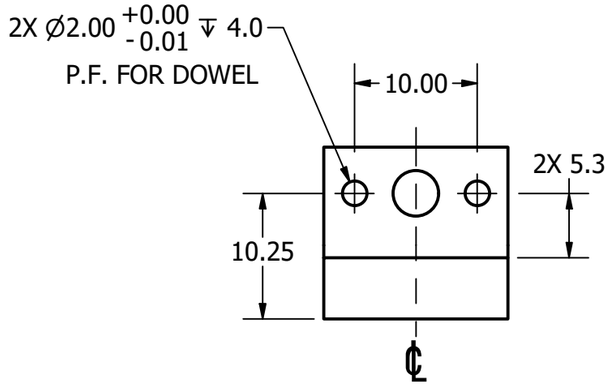
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	KMSP	KMSP	5/13/2021

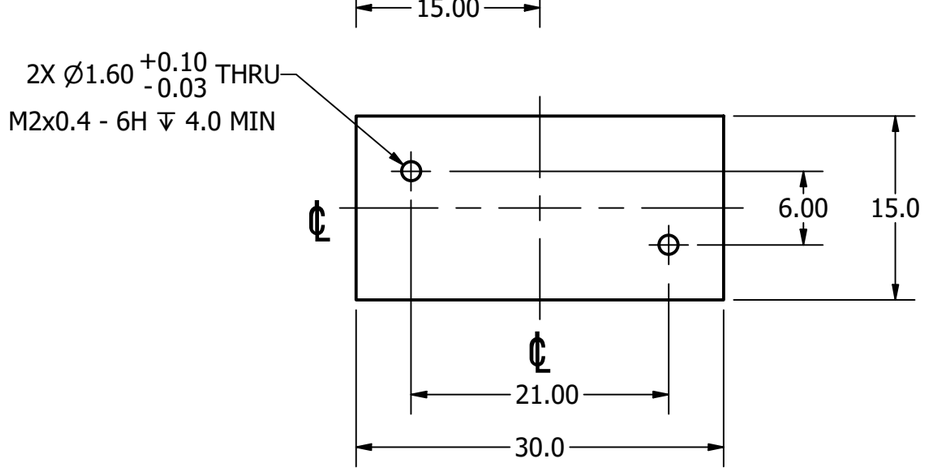












1	2	5000413	M2 X 6 LG. DOWEL PIN
ITEM	QTY	PART NUMBER	DESCRIPTION

PARTS LIST

NOTES:

1. DIMENSIONS ARE SYMMETRICAL ABOUT ℄, UNLESS NOTED OTHERWISE.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN kstpierre	5/13/2021
CHECKED	
ENG KMSP	5/13/2021
APPROVED	

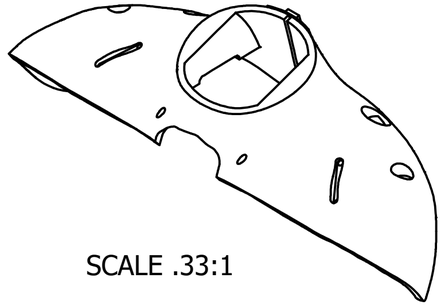
MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

TILT SENSOR MOUNT, THORAX
THOR-05F

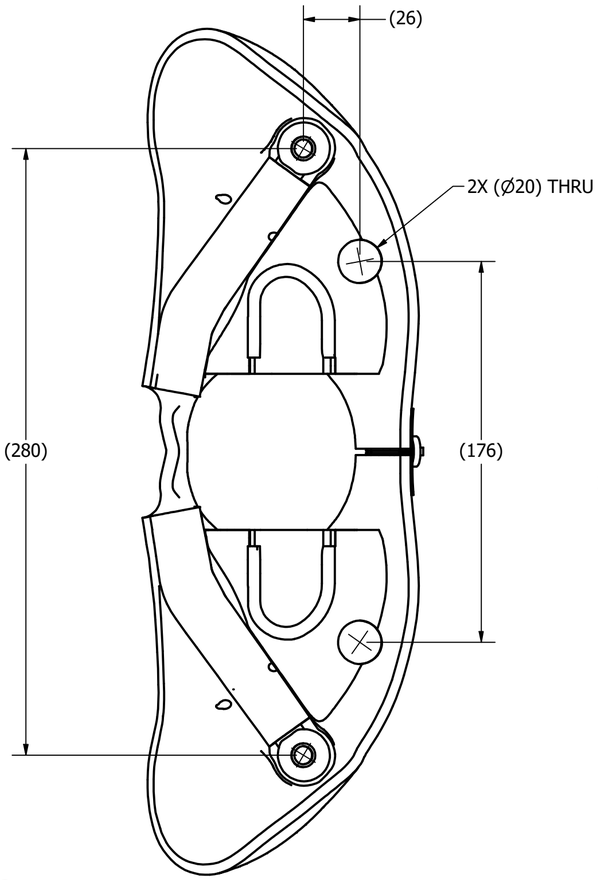
THIRD ANGLE PROJECTION

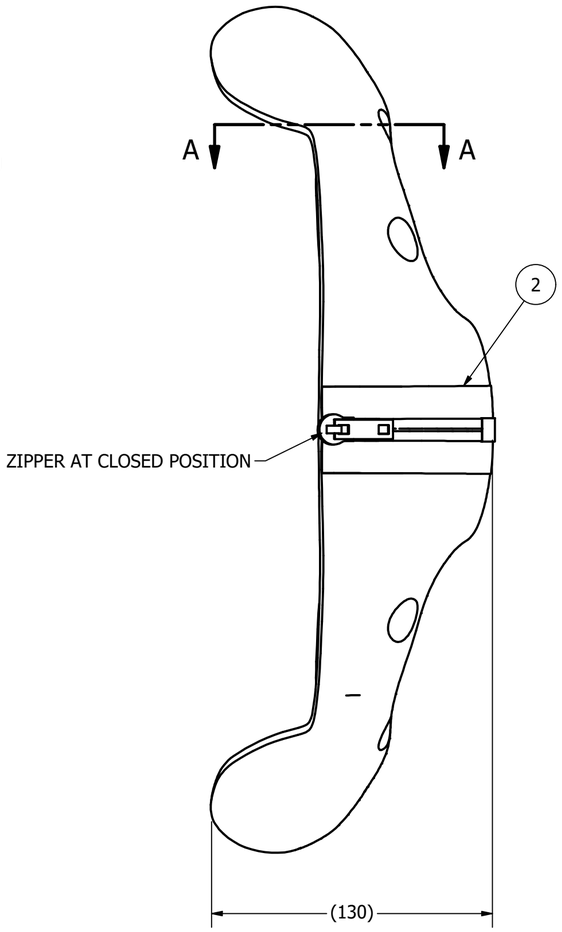
SIZE: A3 | DRAWING NUMBER: 474-3039 | REV: 1
SCALE: 2 : 1 | SHEET: 1 OF 1

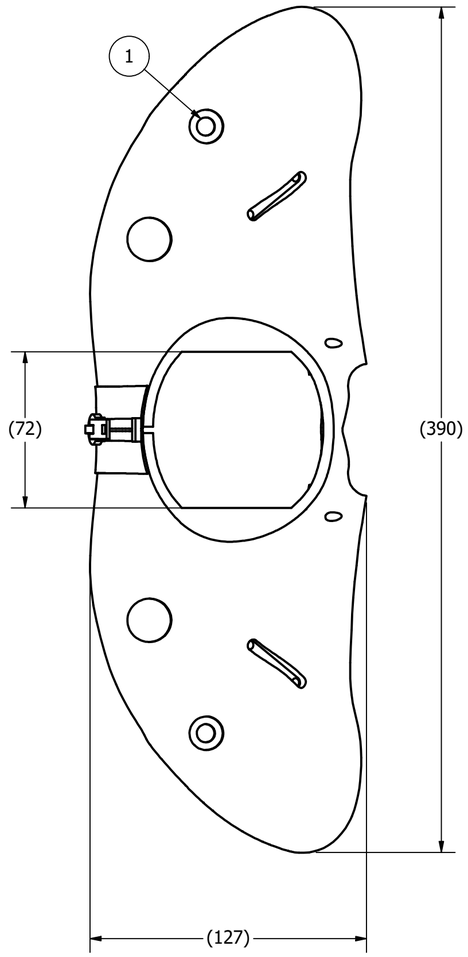
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	HEC	11/9/2022

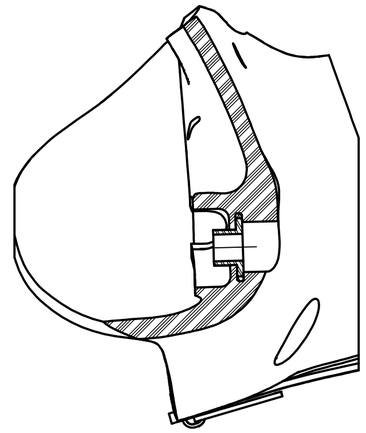


SCALE .33:1









SECTION A-A
.75:1
SEE NOTE 7

NOTES:
1. MATERIAL: THERMOSET PLASTIC
   COLOR: EURO BROWN
   DUROMETER: 72.5 ± 2.5 SHORE "A"

2. REMOVE ALL MOLD FLASHING

3. ALL MOLD DIMENSION TOLERANCE +1%/-2% BUT NO SMALLER THAN 0.5mm

4. NO SPLIT OR DEFECTS ARE ALLOWED IN THE MOLDING

5. BOND ZIPPER TO FLESH AS SHOWN

6. MASS 565 GRAMS ± 20 GRAMS

7. BEFORE INSTALLING INSERT, PRIME BOTH SIDES USING POLYMER ADHESIVE (OR EQUIVALENT).

   INSTALL INSERT WITH FLANGE ORIENTED TOWARDS TOP OF SHOULDER (AS SHOWN).

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	474-3536	ZIPPER ASSEMBLY, SHOULDER PAD
1	2	474-3581-A	SHOULDER FLESH INSERT

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	11/9/2022
CHECKED	
ENG	
APPROVED	

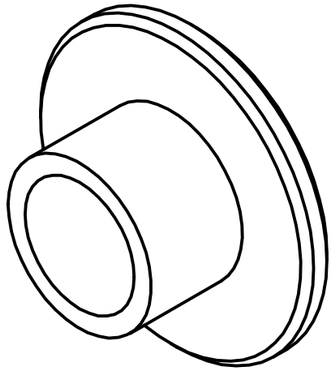
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

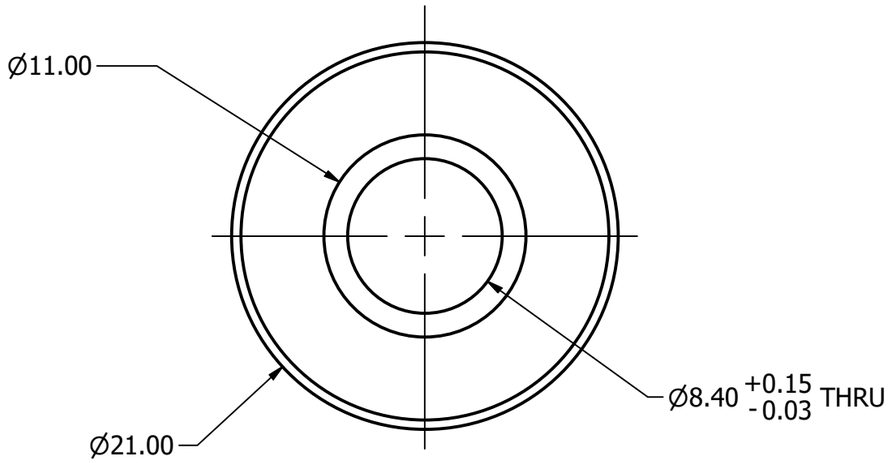
SHOULDER PAD
THOR-05F

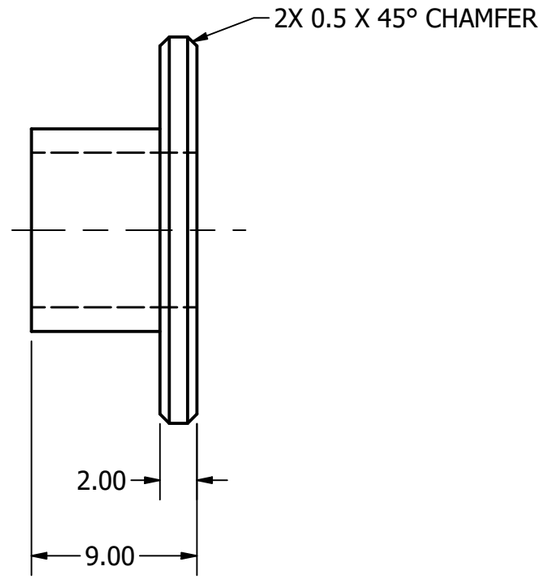
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-3559-A | REV: 1
SCALE: 1 / 2 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	BK	HEC	11/9/2022







PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

SHOULDER FLESH INSERT
THOR-05F

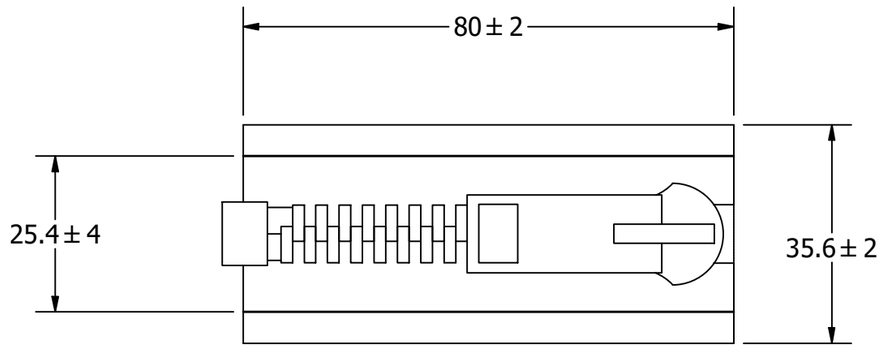
	APPROVALS	DATE
DRAWN	hfenn	1/6/2022
CHECKED		
ENG	DJI	1/6/2022
APPROVED		

MATERIAL: 1018 STEEL
HEAT TREAT: N/A
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-3581-A | REV: 3
SCALE: 3:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	SR	JW	1/22/2018



NOTES:

1. ALL BLACK #5 ZIPPER.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 125
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: J. MCINNIS	4/28/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

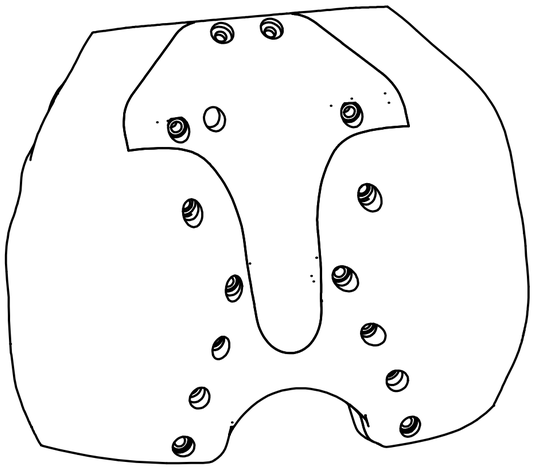
ZIPPER ASSEMBLY, SHOULDER PAD

THIRD ANGLE PROJECTION

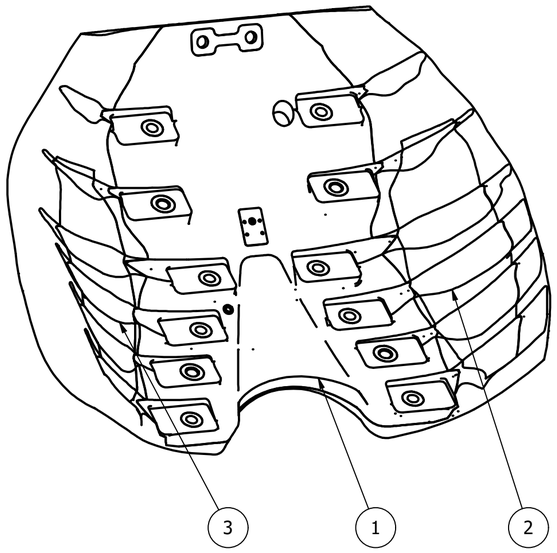
SIZE: A3 | DRAWING NUMBER: 474-3536 | REV: 3

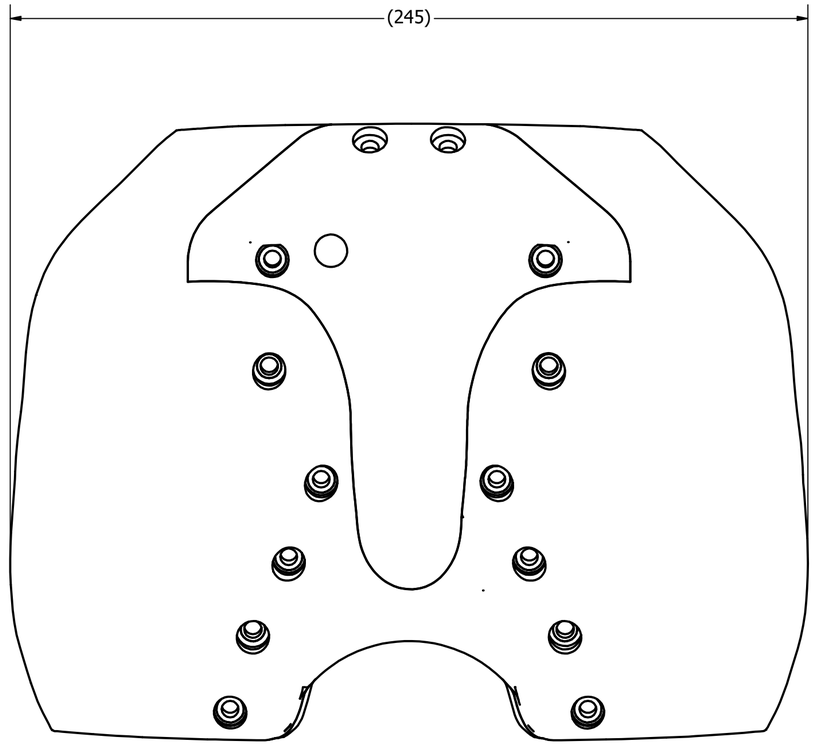
SCALE: | SHEET: 1 OF 1

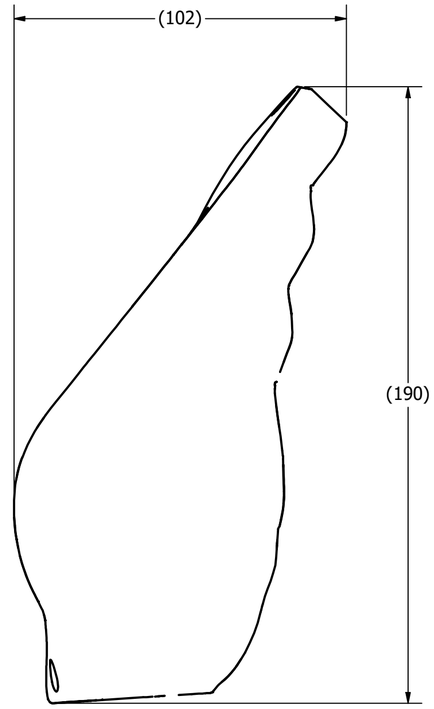
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	JW	2/14/2023



SCALE .5 : 1







NOTES:
1. MATERIAL: POLYURETHANE
   COLOR: EURO BROWN
   DUROMETER: 30 ±10 SHORE "A"
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE MOLDING
5. WEIGHT: 678 ± 20 g

ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	474-3735-1	FOAM, BREAST INSERT LEFT
2	1	474-3735-2	FOAM, BREAST INSERT RIGHT
1	1	474-3736-A	STERNUM ASSEMBLY, MOLDED

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	1/12/2023
CHECKED	
ENG	
APPROVED	

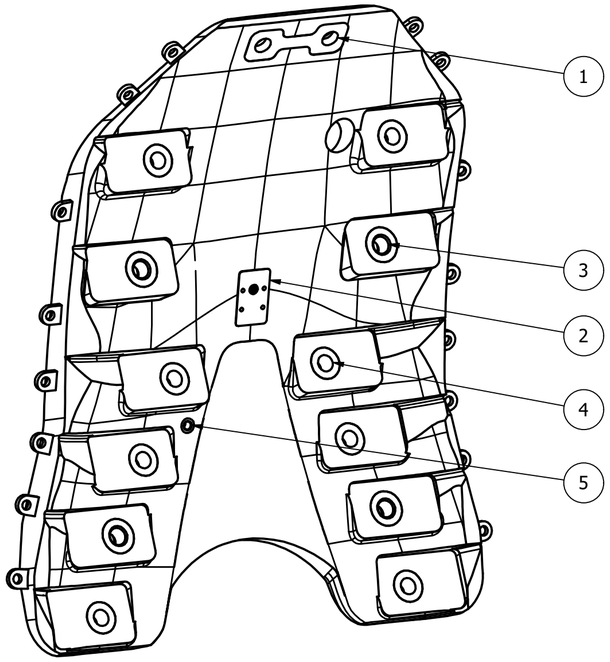
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

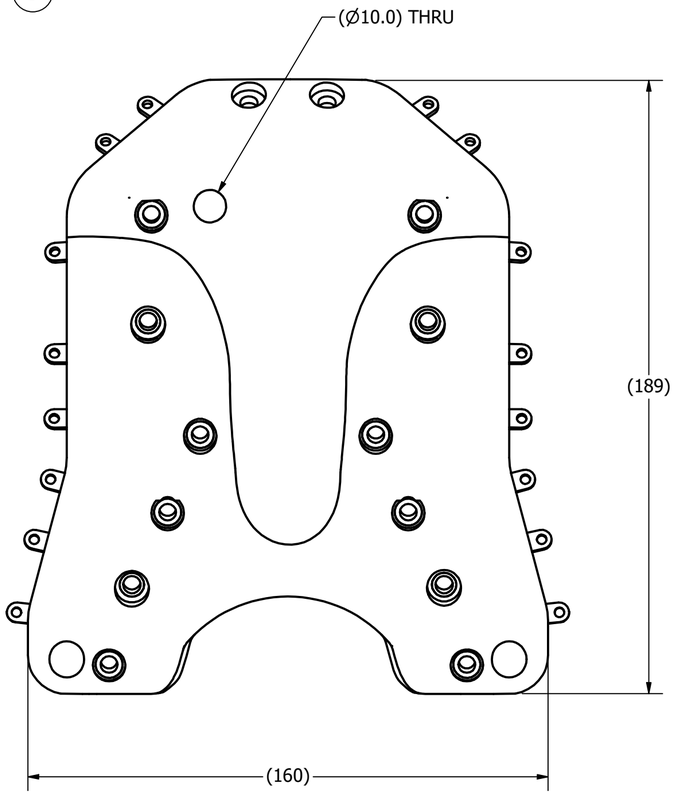
CHEST FLESH-STERNUM, MOLDED

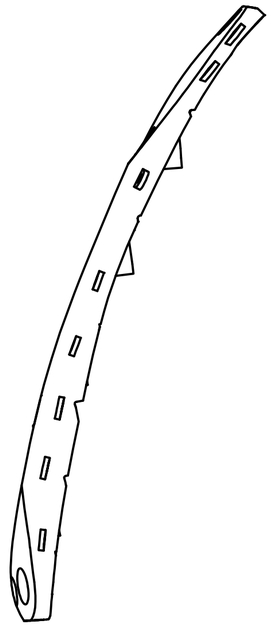
THIRD ANGLE PROJECTION

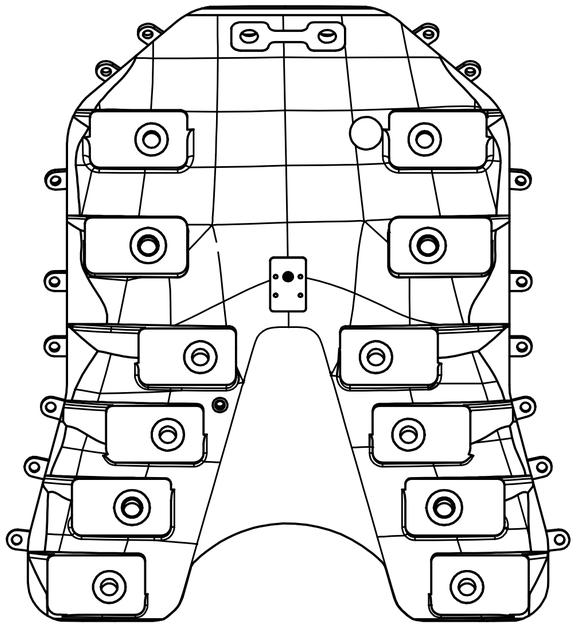
SIZE: A2 | DRAWING NUMBER: 474-3730-A | REV: 1
SCALE: .75:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	JW	3/8/2023









ITEM	QTY	PART NUMBER	DESCRIPTION
5	1	5000731	INSERT, THREADED INSERT M3x0.5x3.4 BRASS
4	8	474-3710	M5 MOLD INSERT, STERNUM
3	4	474-3701	T-INSERT, M5 THRU HOLE, RIB 2
2	1	474-3708	STERNUM ACCELEROMETER MOUNT
1	1	474-3704	INSERT, STERNUM

PARTS LIST

NOTES:

1. MATERIAL: THERMOSET PLASTIC
   COLOR: THERMOSET TAN
   DUROMETER: 70 ±10 SHORE "A"
2. REMOVE ALL MOLD FLASHING.
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm.
4. NO SPLIT OR DEFECTS ARE ALLOWED IN THE MOLDING.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	1/12/2023
CHECKED	
ENG	
APPROVED	

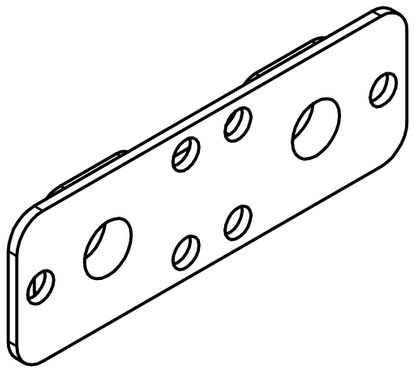
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

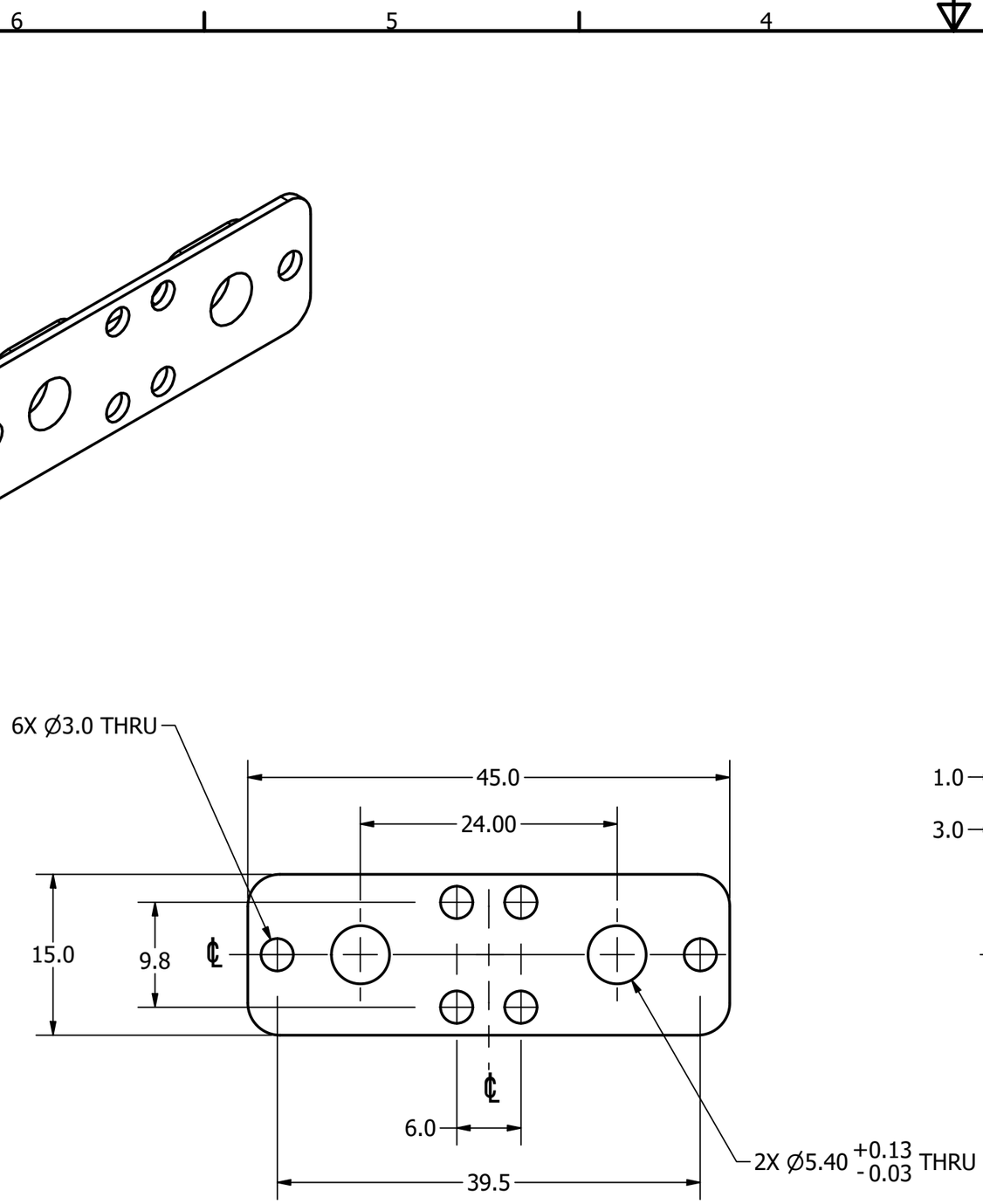
STERNUM ASSEMBLY, MOLDED

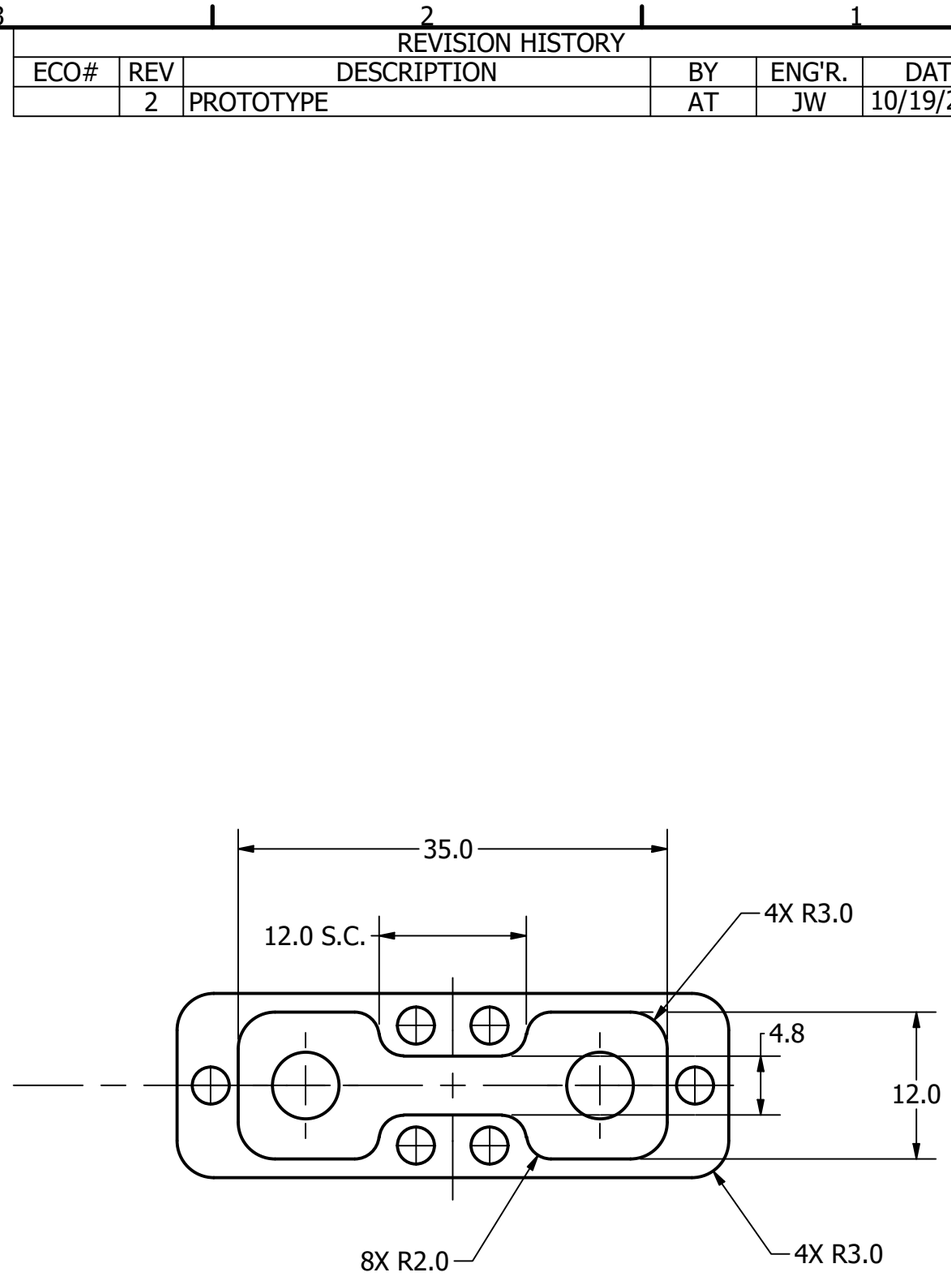
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-3736-A | REV: 2
SCALE: .75 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	AT	JW	10/19/2017







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 6061-T6 ALUMINUM
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	4/5/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

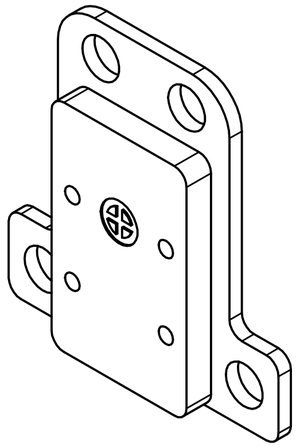
INSERT, STERNUM

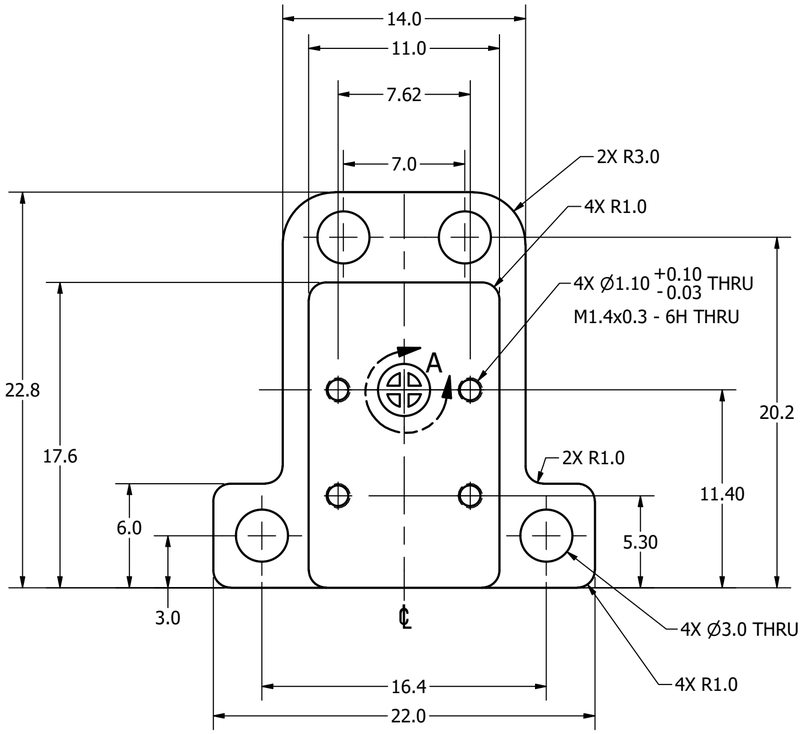
THIRD ANGLE PROJECTION

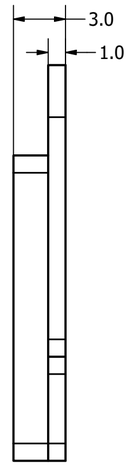
SIZE: A3 | DRAWING NUMBER: 474-3704 | REV: 2

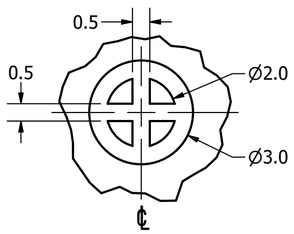
SCALE: 2:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	BK	HEC	1/18/2023









DETAIL A
SCALE 8 : 1
SEE NOTE 2

PROTOTYPE DRAWING

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. ENGRAVE 0.1MM DEEP AS SHOWN

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ✓ | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	4/29/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

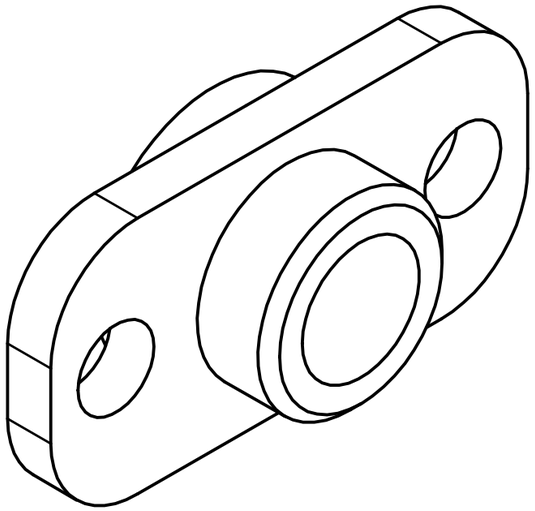
STERNUM ACCELEROMETER MOUNT

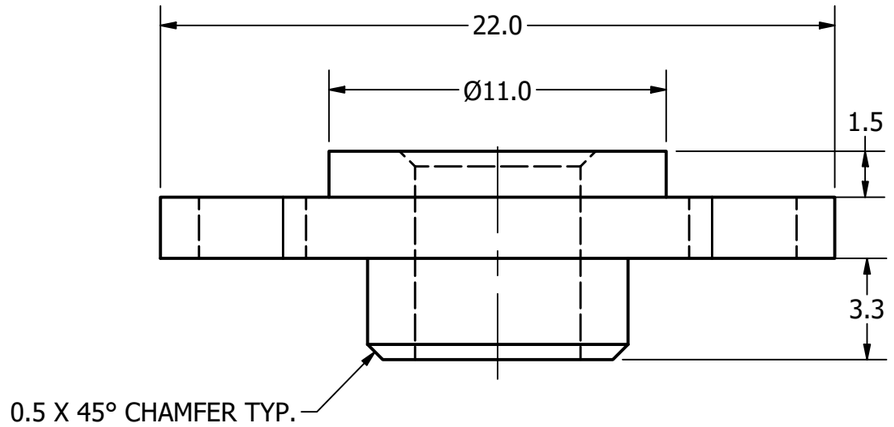
THIRD ANGLE PROJECTION

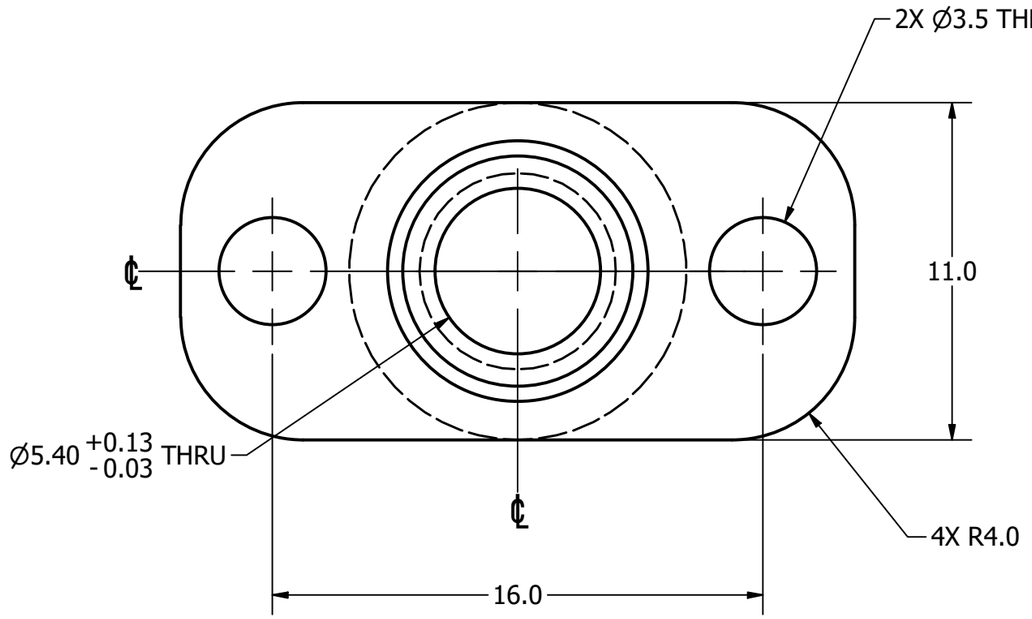
SIZE: A2 | DRAWING NUMBER: 474-3708 | REV: 4

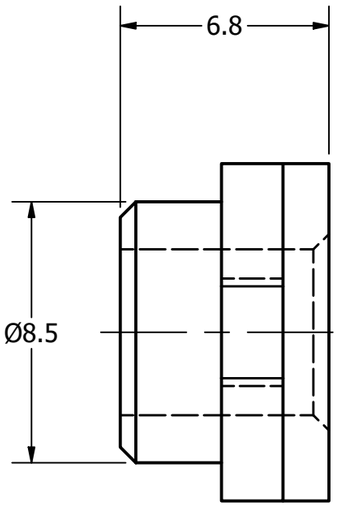
SCALE: 4 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	AT	JW	10/19/2017









NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

T-INSERT, M5 THRU HOLE, RIB 2

	APPROVALS	DATE
DRAWN	ghayden	4/6/2016
CHECKED		
ENG		
APPROVED		

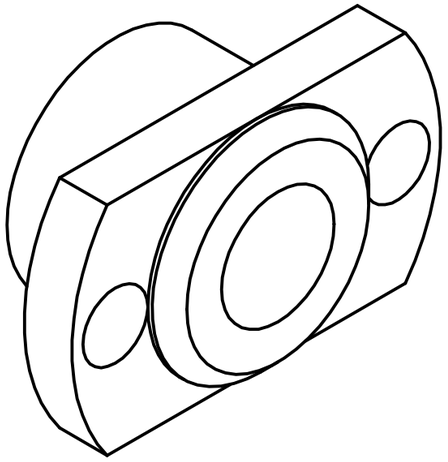
MATERIAL: 6061-T6 ALUMINUM
HEAT TREAT:
FINISH:

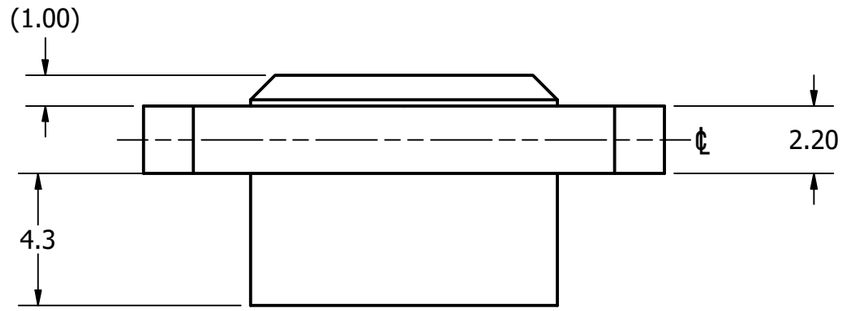
THIRD ANGLE PROJECTION

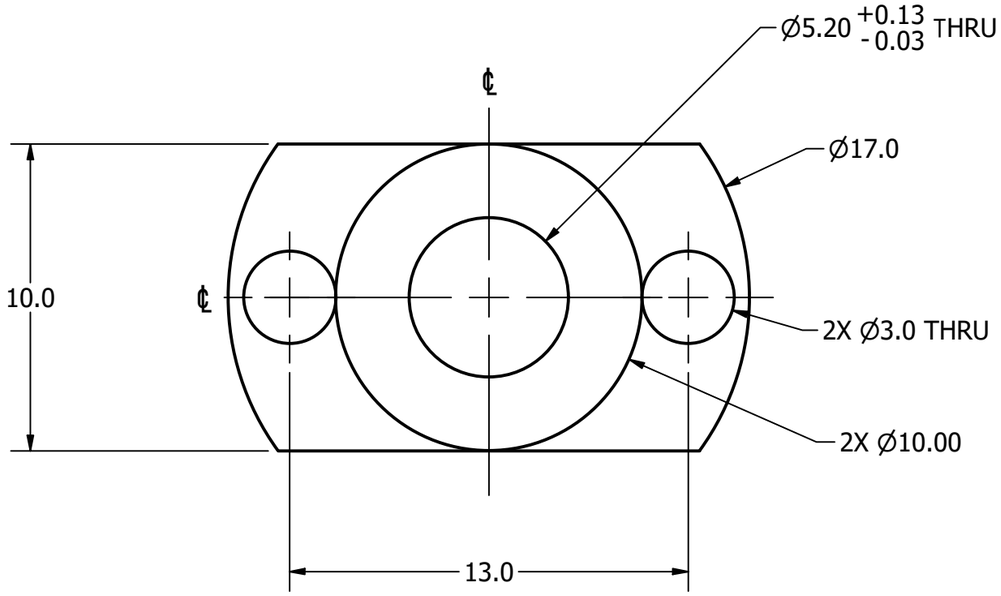
SIZE: A3 | DRAWING NUMBER: 474-3701 | REV: 2

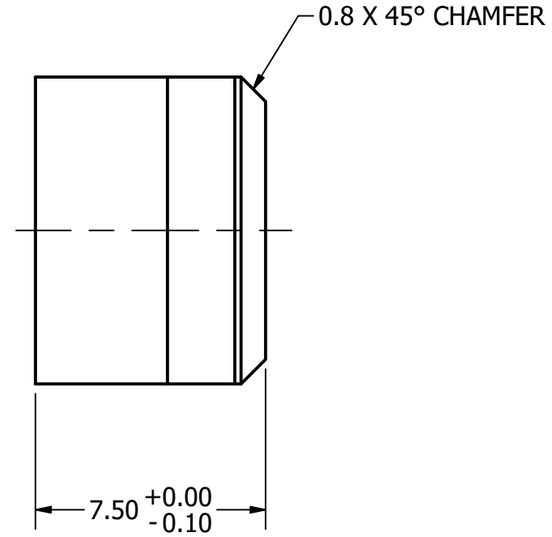
SCALE: 5 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	MJS	1/3/2023









NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: B. Kimes	8/9/2022
CHECKED	
ENG	
APPROVED	

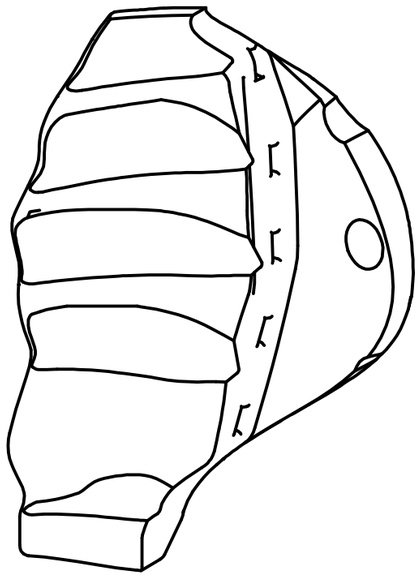
M5 MOLD INSERT, STERNUM

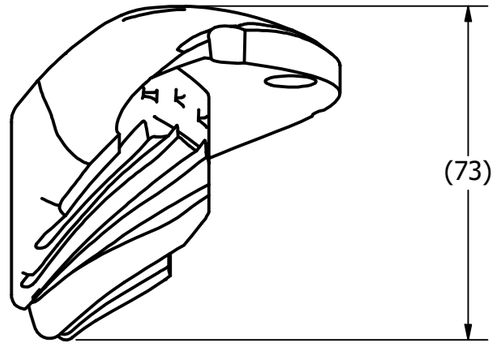
MATERIAL: 303 STAINLESS STEEL
HEAT TREAT: N/A
FINISH: N/A

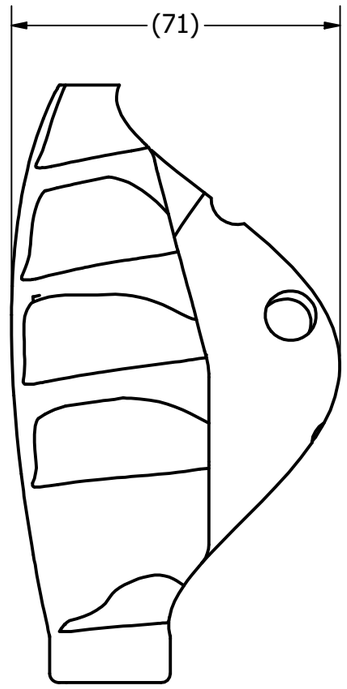
THIRD ANGLE PROJECTION

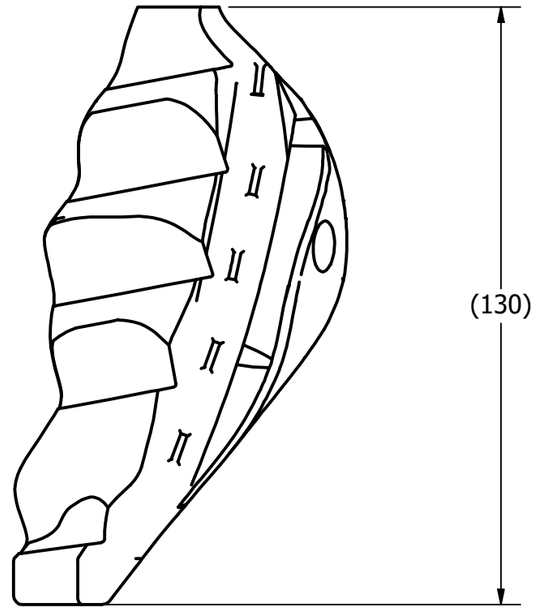
SIZE: A3 | DRAWING NUMBER: 474-3710 | REV: 2
SCALE: 5 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	BLG	11/30/2022









NOTES:
1. MATERIAL: URETHANE FOAM WITH 0.5 MAX POLYMER COATING
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-4%
   BUT NO SMALLER THAN 1mm
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE URETHANE MOLDING
5. WEIGHT: 34±10g

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: B. Kimes	8/31/2022
CHECKED	
ENG	
APPROVED	

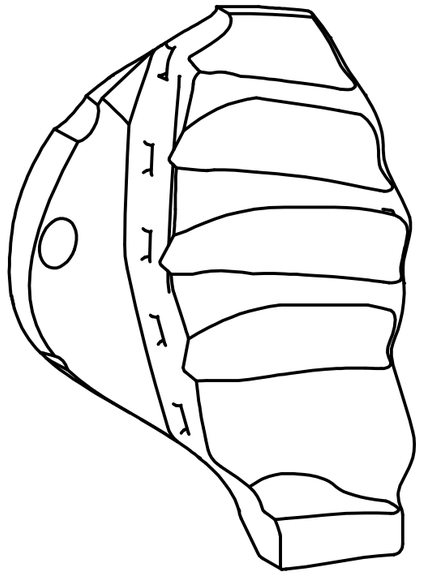
MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

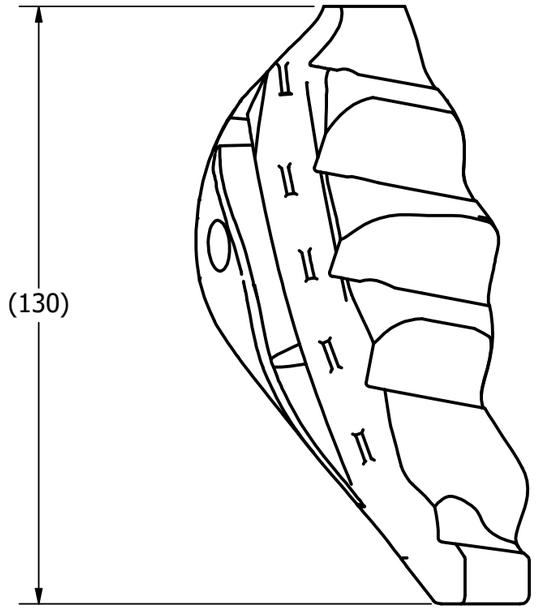
FOAM, BREAST INSERT RIGHT
THOR-05F

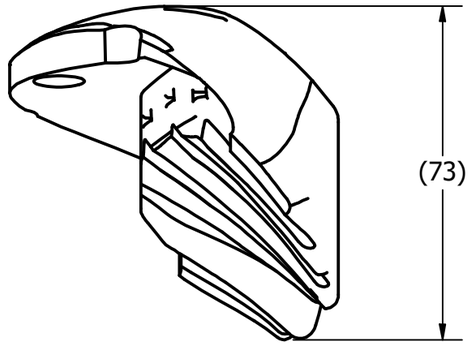
THIRD ANGLE PROJECTION

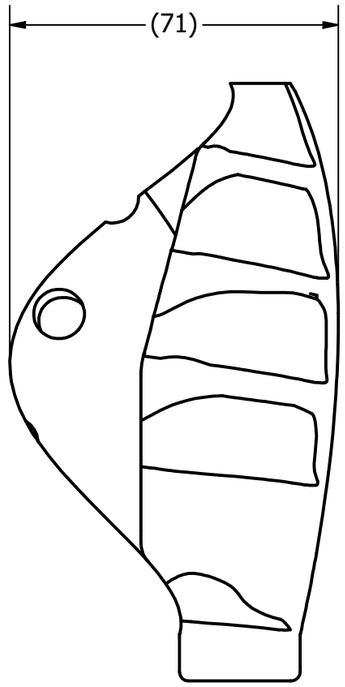
SIZE: A3 | DRAWING NUMBER: 474-3735-2 | REV: 2
SCALE: .75 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	BLG	11/30/2022









NOTES:
1. MATERIAL: URETHANE FOAM WITH 0.5 MAX POLYMER COATING
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-4%
   BUT NO SMALLER THAN 1mm
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE URETHANE MOLDING
5. WEIGHT: 34±10g

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: B. Kimes	8/31/2022
CHECKED	
ENG	
APPROVED	

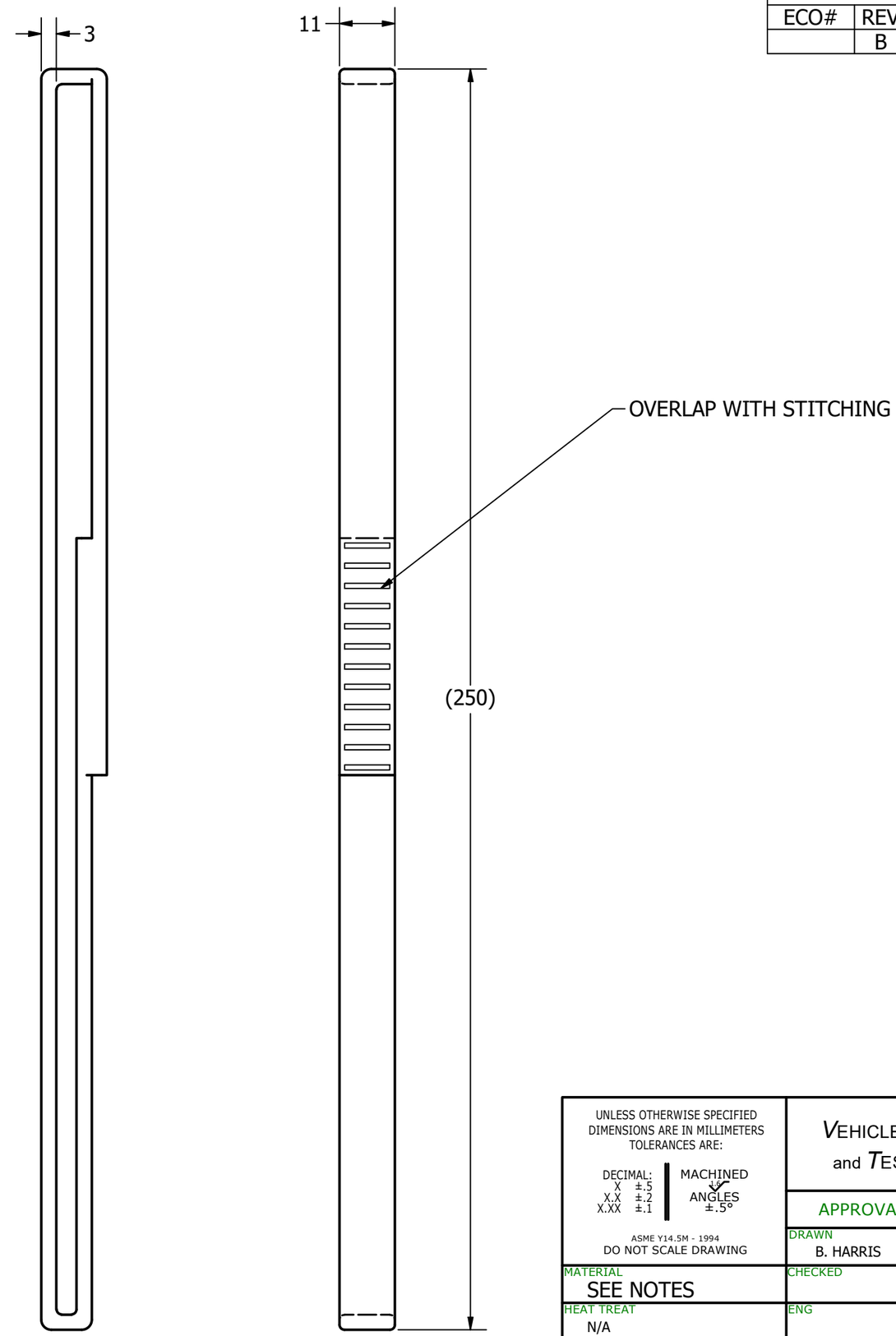
MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

FOAM, BREAST INSERT LEFT
THOR-05F

THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-3735-1 | REV: 2
SCALE: .75 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	B	RELEASE FOR PRODUCTION	BTH	BLB	7/20/2015



NOTES:
1. 11mm X 250mm OPEN SLING,
   15KN MINIMUM LOAD RATED

2. COLOR: BLUE/WHITE

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. HARRIS	5/22/2015
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

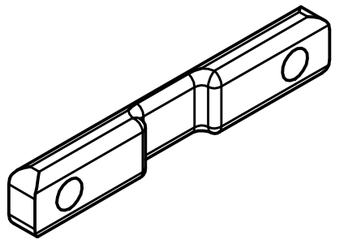
THOR LIFT STRAP THOR-05F,
THOR-50M

THIRD ANGLE PROJECTION

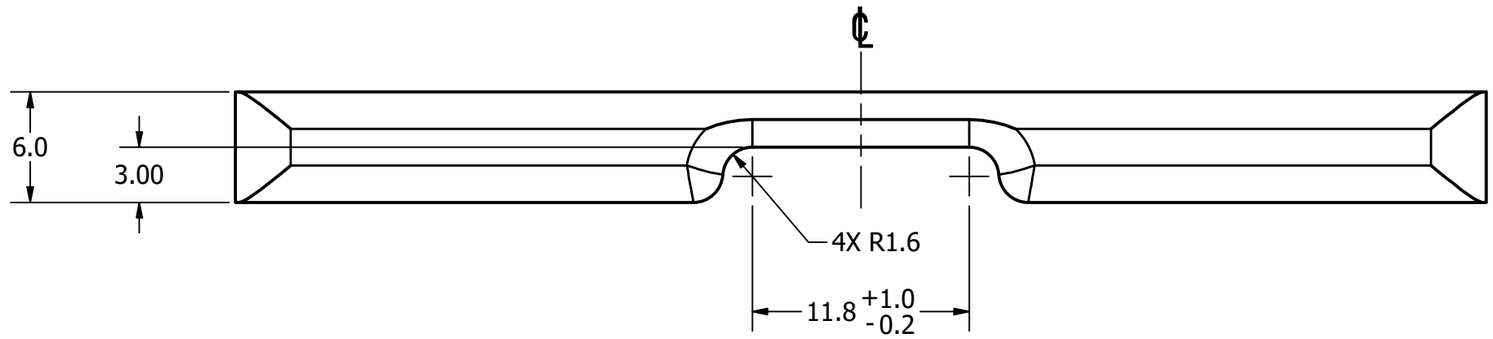
SIZE: A3 | DRAWING NUMBER: 472-3116 | REV: B

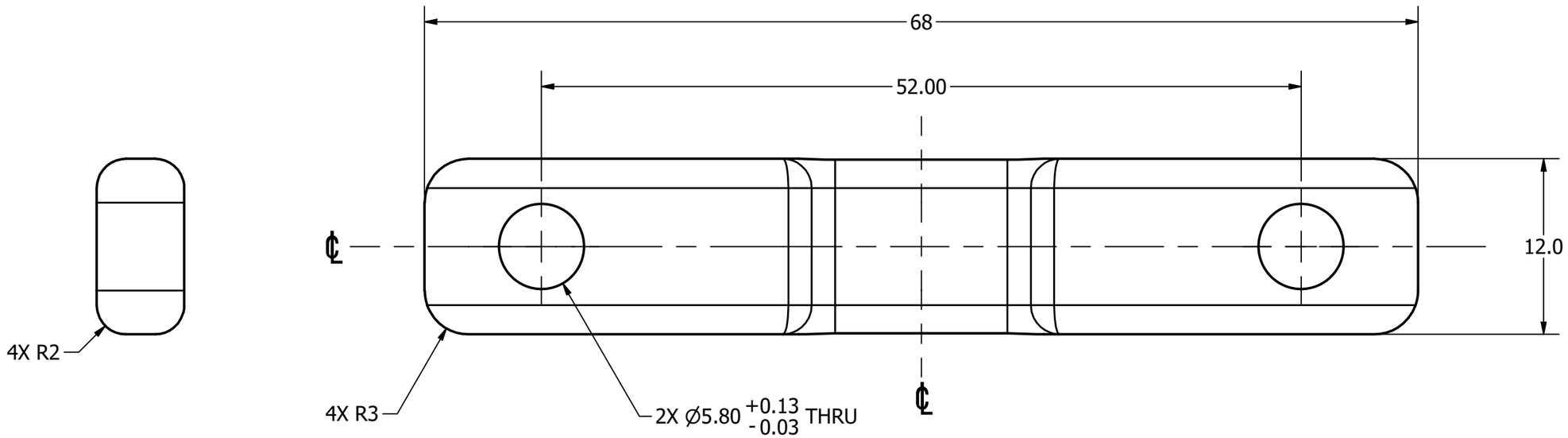
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	LKR	HF	10/20/2021



SCALE 1 : 1





NOTES:

1. DIMENSIONS ARE SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LIFTING STRAP BRACKET
THOR-05F

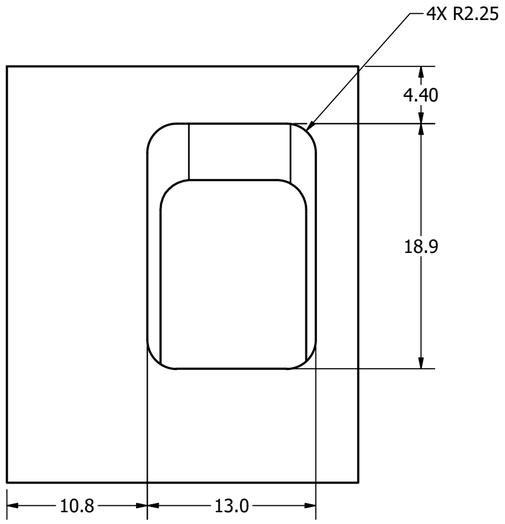
	APPROVALS	DATE
DRAWN	jgibbs	3/31/2017
CHECKED		
ENG	JW	4/18/2017
APPROVED		

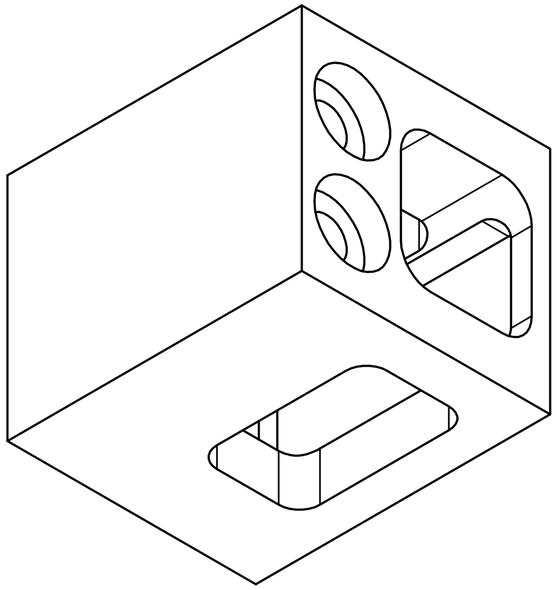
MATERIAL: 1018 STEEL
HEAT TREAT: N/A
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

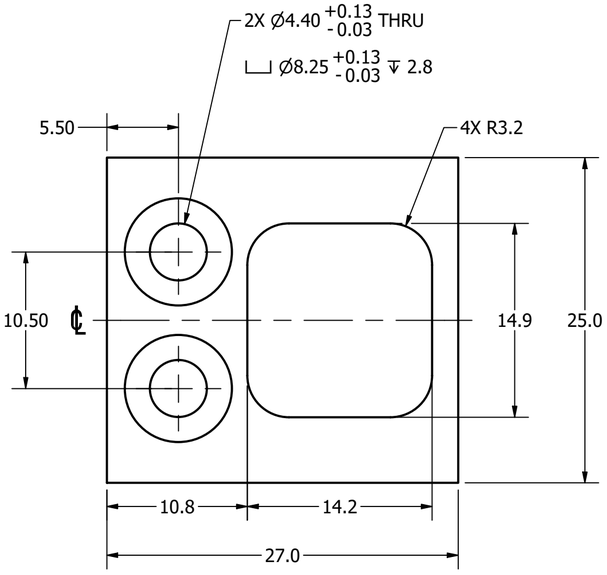
THIRD ANGLE PROJECTION

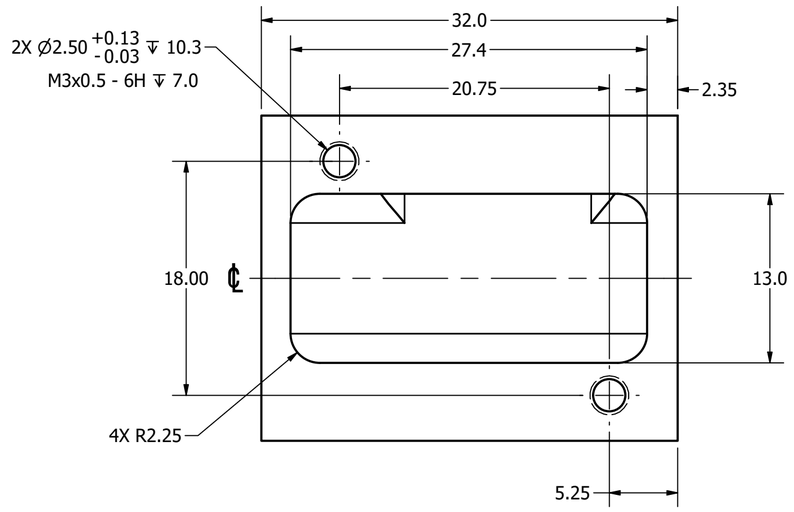
SIZE: A3 | DRAWING NUMBER: 474-3025 | REV: 2
SCALE: 3:1 | SHEET: 1 OF 1

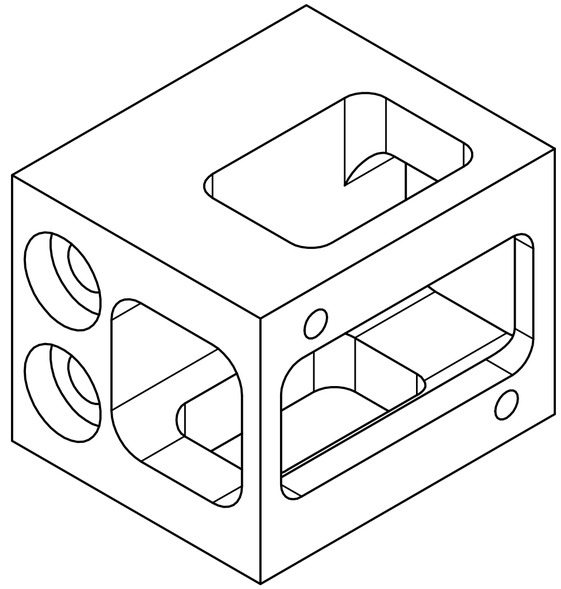
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	HF	HF	11/15/2021

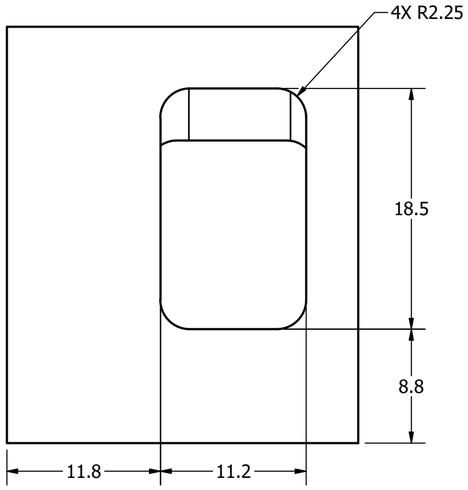












PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ✓ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

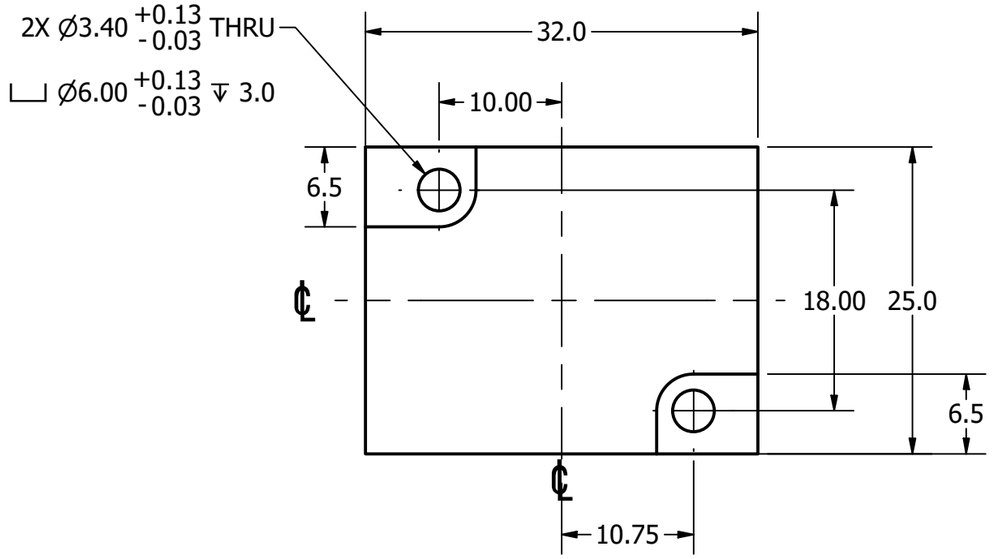
APPROVALS	DATE
DRAWN: hfenn	11/15/2021
CHECKED:	
ENG: HF	11/15/2021
APPROVED:	

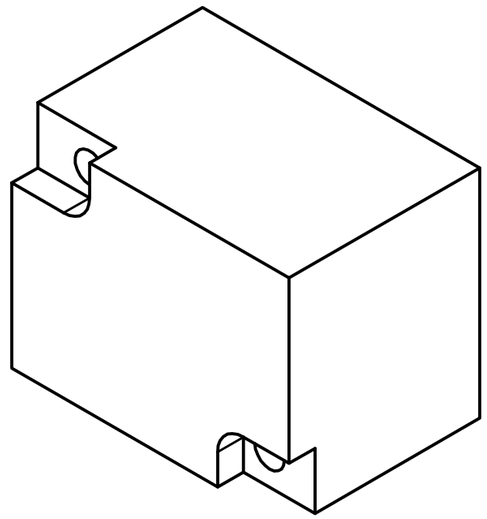
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

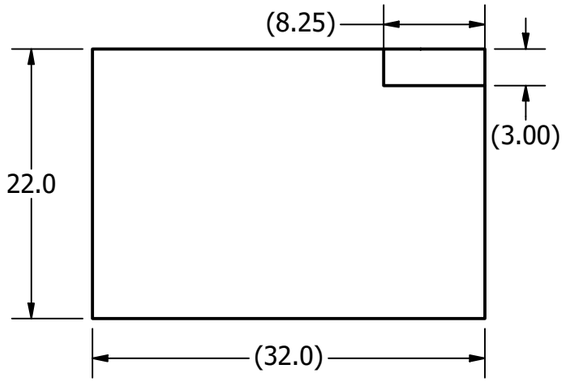
DAS MOUNTING BRACKET, THORAX
THOR-05F

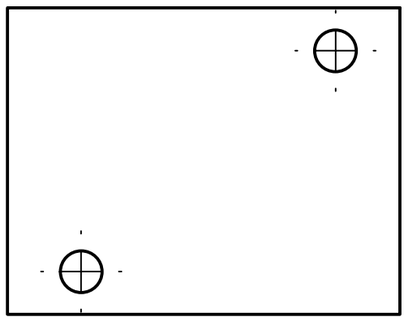
THIRD ANGLE PROJECTION
SIZE: A2
DRAWING NUMBER: 474-3001-A
REV: 1
SCALE: 3 : 1
SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	HF	HF	11/15/2021









PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN hfenn	11/15/2021
CHECKED	
ENG HF	11/15/2021
APPROVED	

MATERIAL: 1018 STEEL
HEAT TREAT: N/A
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

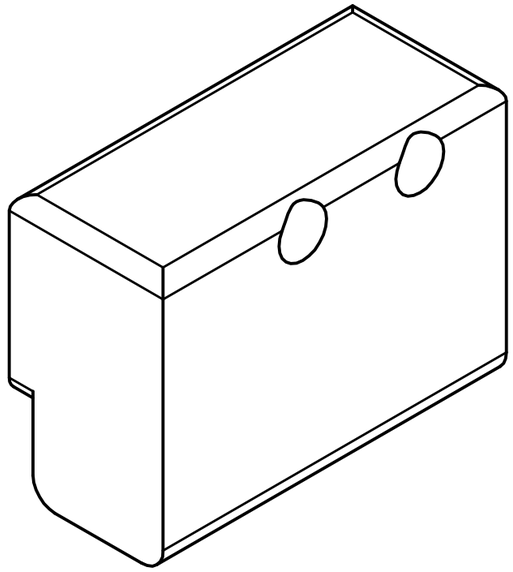
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

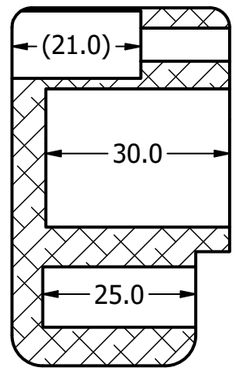
DAS STRUCTURAL REPLACEMENT
THOR-05F

THIRD ANGLE PROJECTION

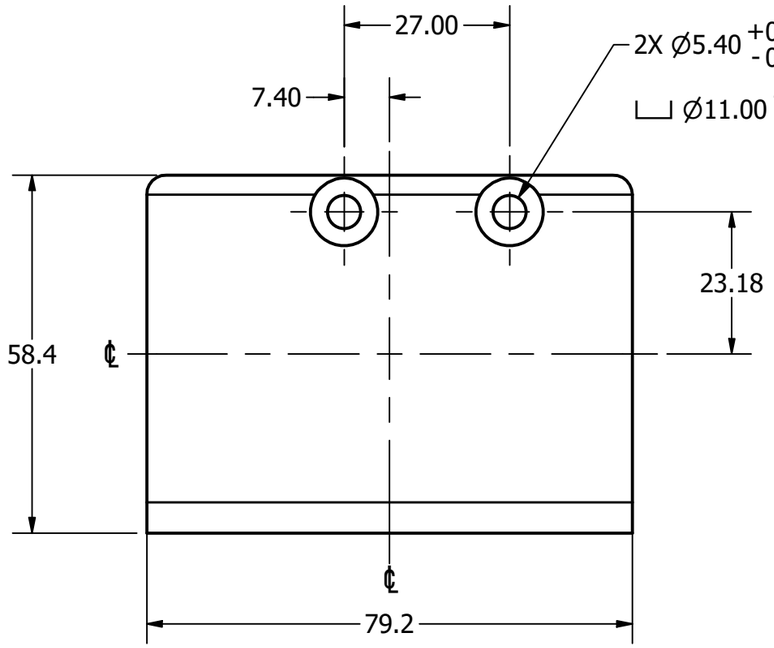
SIZE: A3 | DRAWING NUMBER: 474-3009-A | REV: 2
SCALE: 2 : 1 | SHEET: 1 OF 1

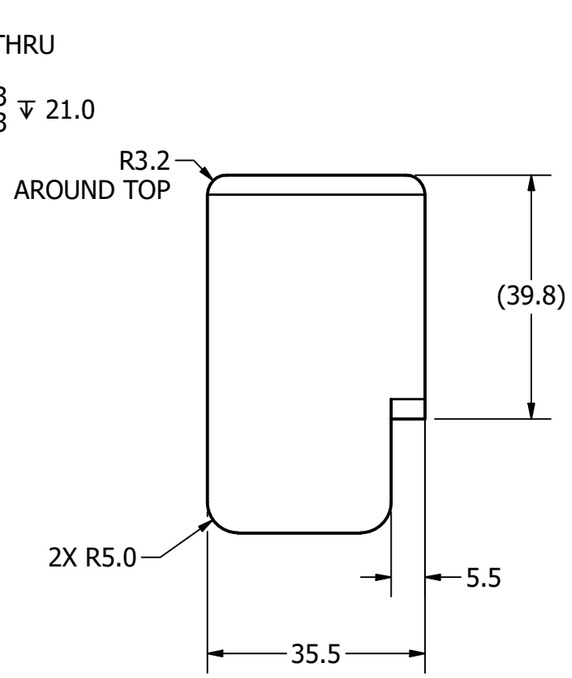
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	HEC	5/30/2023

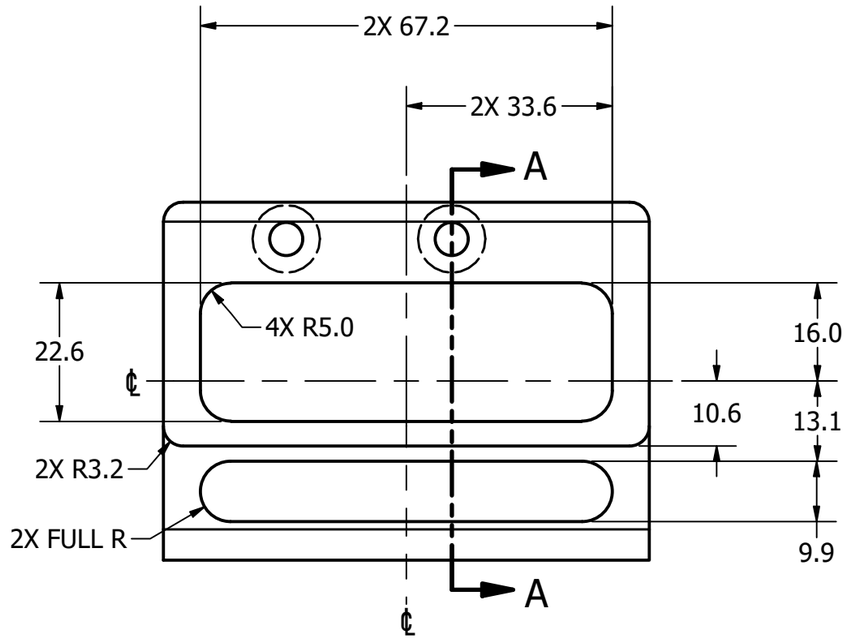




SECTION A-A







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	4/21/2023
CHECKED	
ENG	
APPROVED	

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LOWER SPINE BALLAST, LEFT

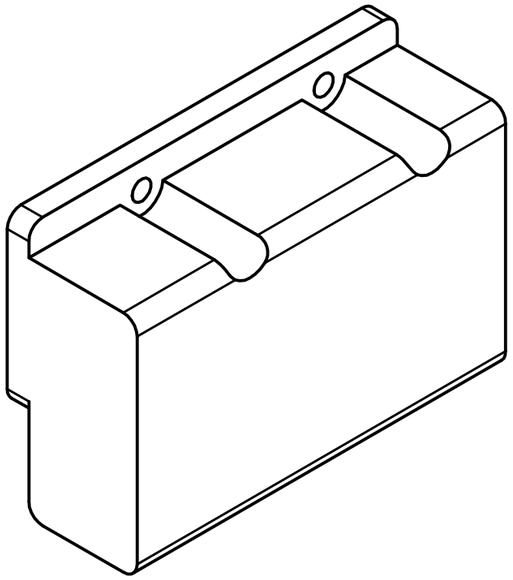
THOR-05F

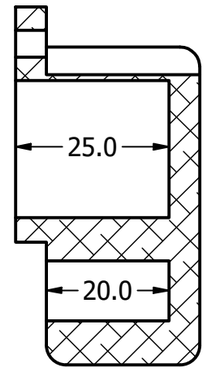
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A3	474-3002-1-A	2

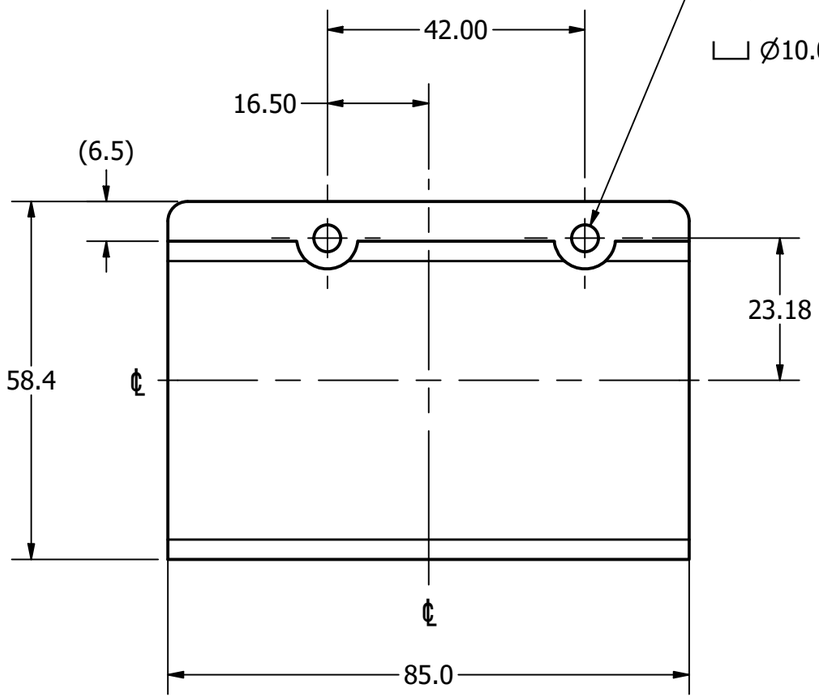
SCALE: 1 : 1 SHEET 1 OF 1

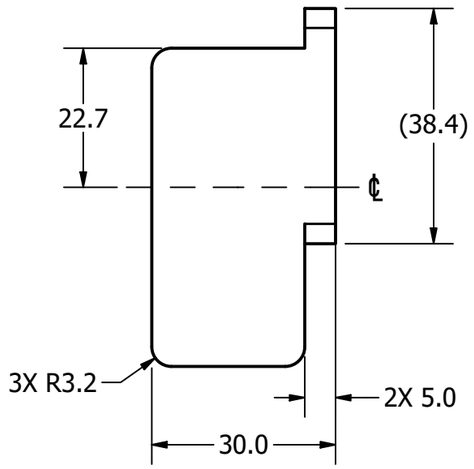
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	HEC	5/30/2023

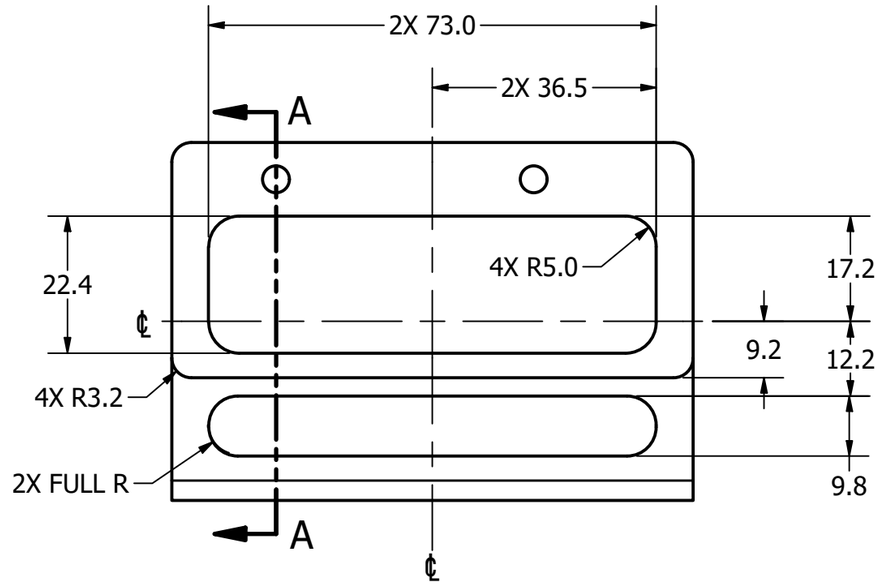




SECTION A-A







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	4/21/2023
CHECKED	
ENG	
APPROVED	

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

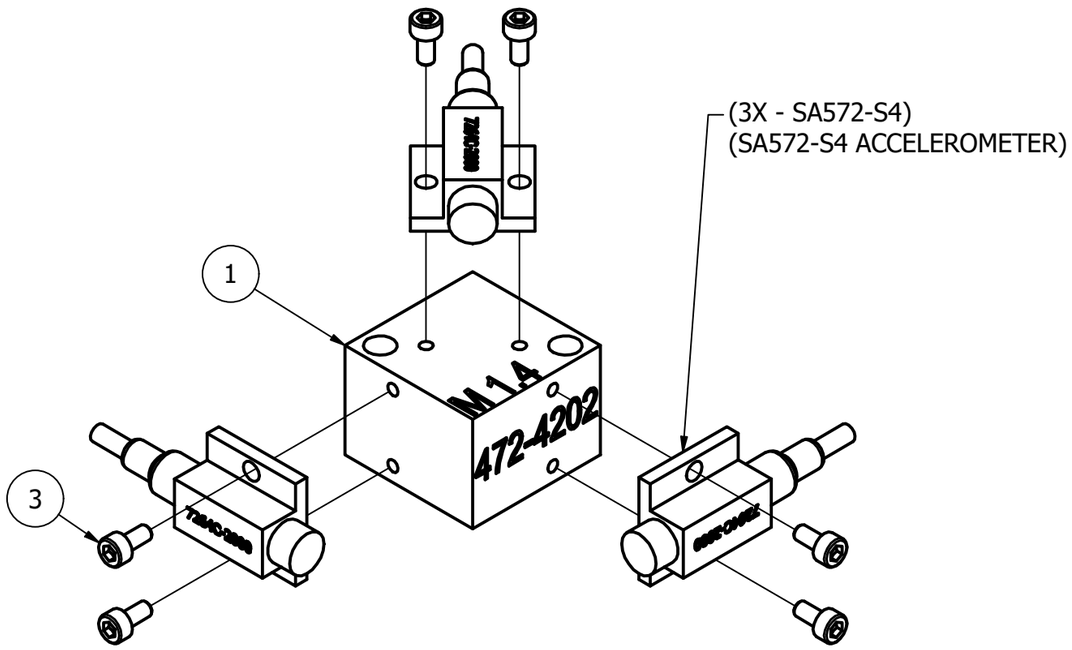
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LOWER SPINE BALLAST, RIGHT
THOR-05F

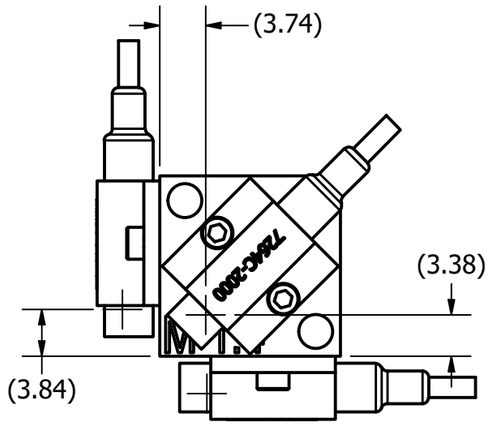
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-3002-2-A | REV: 2
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	DJI	DJI	6/13/2023

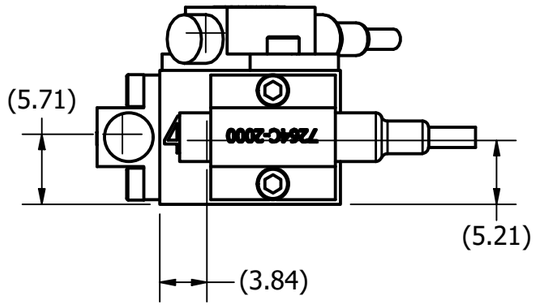


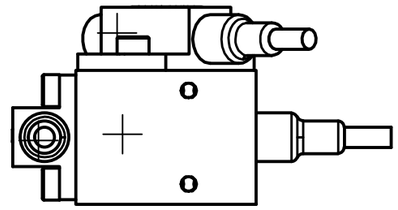
INSTRUMENT VIEW





SR VIEW





ITEM	QTY	PART NUMBER	DESCRIPTION
3	6	5000068	M1.4 X 0.3 X 3 LG. SHCS
1	2	472-4202	TRI-PACK BLOCK

PARTS LIST

NOTES:

1. 2X 472-4202 ARE SUPPLIED SO THAT ONE CAN BE USED FOR SR ASSEMBLY AND THE OTHER CAN BE USED FOR THE INSTRUMENTED ASSEMBLY.
2. 6X 5000068 ARE NOT NEEDED FOR SR ASSEMBLY AND WILL REMAIN ON THE INSTRUMENTED ASSEMBLY.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN J. MCINNIS	5/6/2016
CHECKED	
ENG JW	5/6/2016
APPROVED	

MATERIAL
HEAT TREAT
FINISH

KIT, 7264C, THOR-05F MID-SPINE

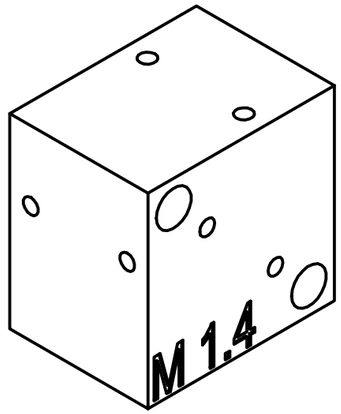
THOR-05F

THIRD ANGLE PROJECTION

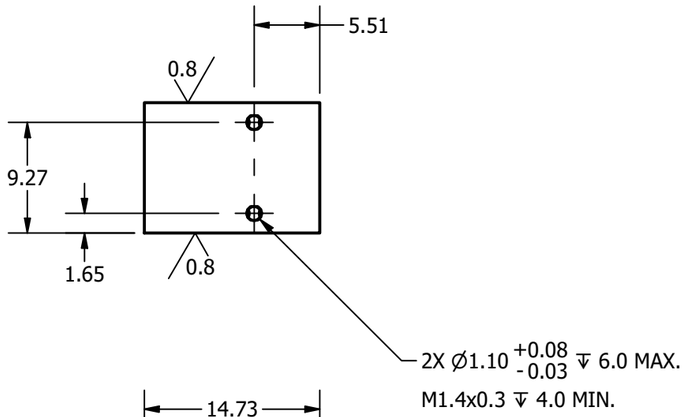
SIZE A3 | DRAWING NUMBER 474-3066 | REV 3

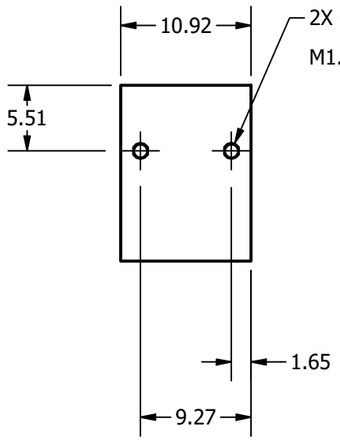
SCALE: 2 : 1 | SHEET 1 OF 1

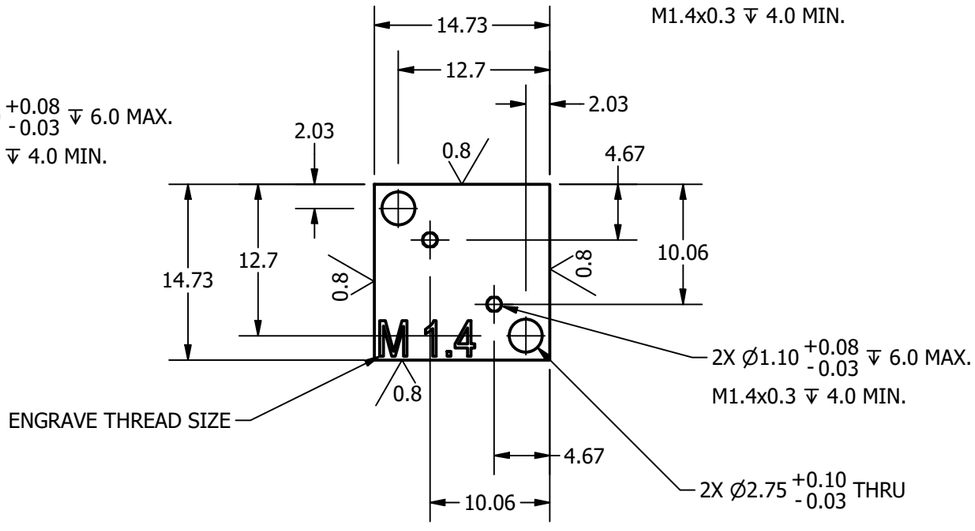
REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	D	RELEASE FOR PRODUCTION	4/19/2017	SKK

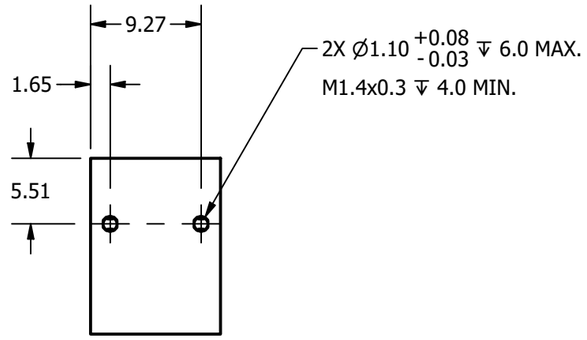


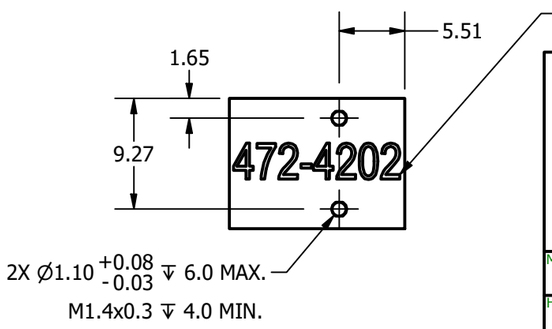
SCALE 3.000











UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Aluminum-7075-T6
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: KHS	9/1/2011
CHECKED:	
ENG:	
APPROVED:	

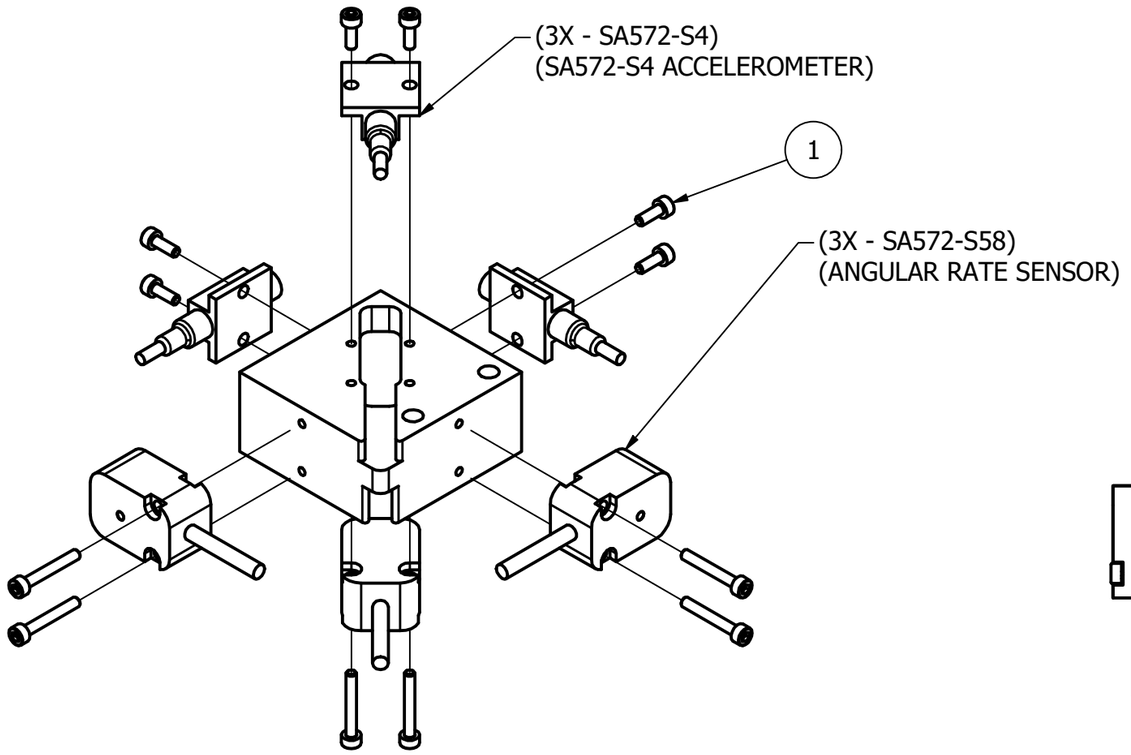
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

TRI-PACK BLOCK
THOR-05F, THOR-50M

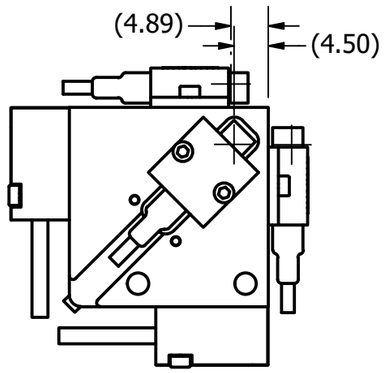
THIRD ANGLE PROJECTION

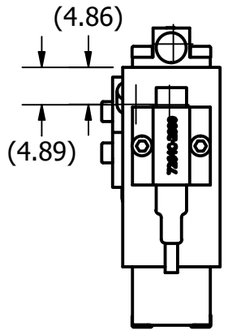
SIZE: B | DRAWING NUMBER: 472-4202 | REV: D
SCALE: 2 : 1 | SHEET: 1 OF 1

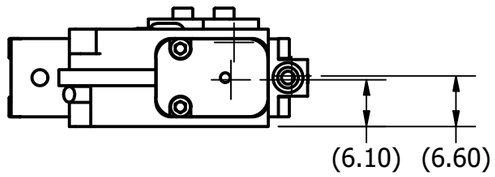
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	DJI	DJI	6/21/2023

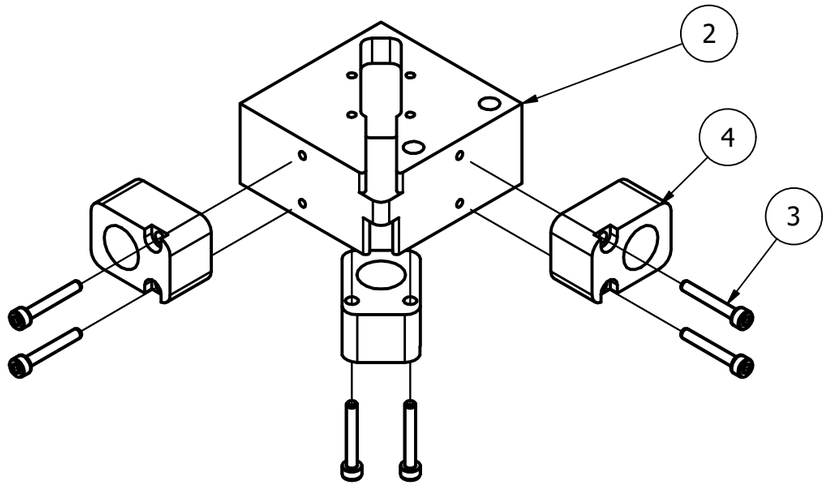


INSTRUMENTED VIEW









SR VIEW

NOTES:

1. 2X 474-3231 ARE SUPPLIED SO THAT ONE CAN BE USED FOR SR ASSEMBLY AND THE OTHER CAN BE USED FOR THE INSTRUMENTED ASSEMBLY.
2. 6X 5000912 ARE NOT NEEDED FOR SR ASSEMBLY AND WILL REMAIN ON THE INSTRUMENTED ASSEMBLY.

ITEM	QTY	PART NUMBER	DESCRIPTION
4	3	477-3605	ARS S.R.
3	12	5000912	M1.4 X 0.3 X 10 LG. SHCS
2	2	474-3231	MOUNT, 7264C / ARS-1500
1	6	5000375	M1.4 X 0.3 X 4 LG. SHCS

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ±.5°, ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL

HEAT TREAT

FINISH

APPROVALS	DATE
DRAWN J. MCINNIS	5/9/2016
CHECKED	
ENG DJI	5/9/2016
APPROVED	

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

KIT, 7264C/ARS, THOR-05F LUMBAR

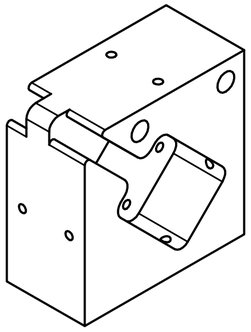
THOR-05F

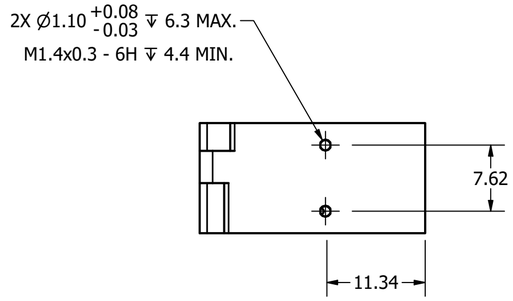
THIRD ANGLE PROJECTION

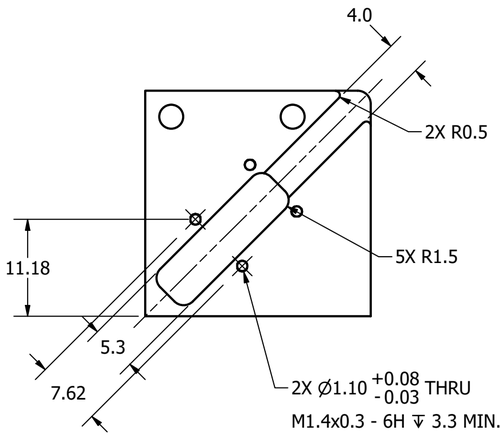
SIZE A3 | DRAWING NUMBER 474-3067 | REV 2

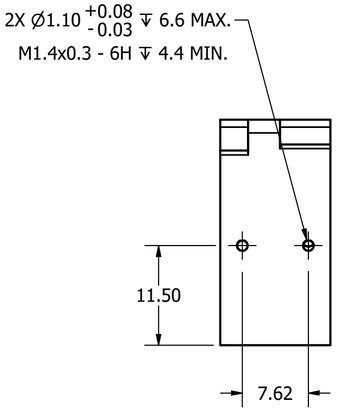
SCALE: 1.25 : 1 | SHEET 1 OF 1

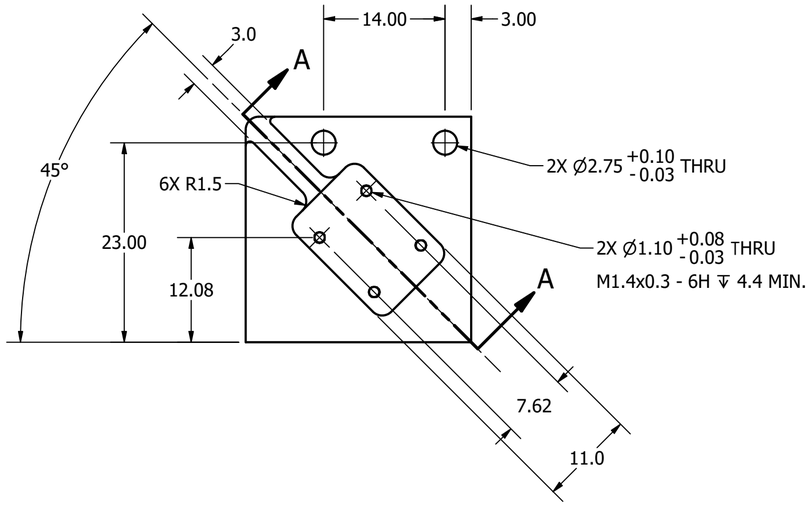
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	JH	JW	11/3/2017

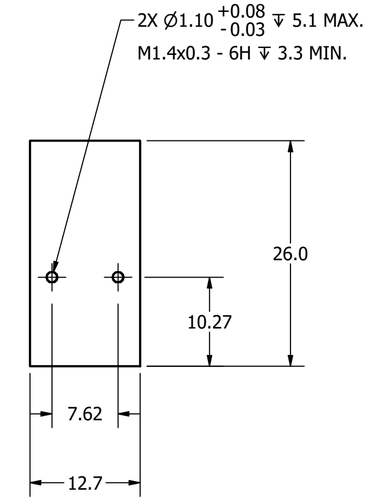


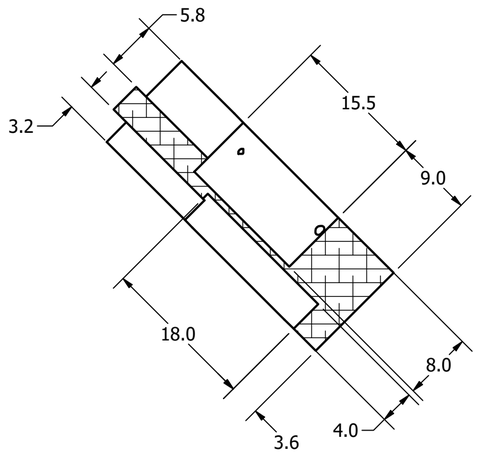




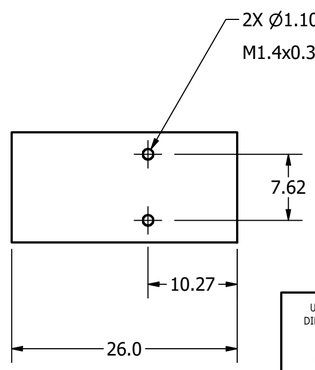








SECTION A-A



NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT:
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN jhaefner	3/28/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

MOUNT, 7264C / ARS-1500

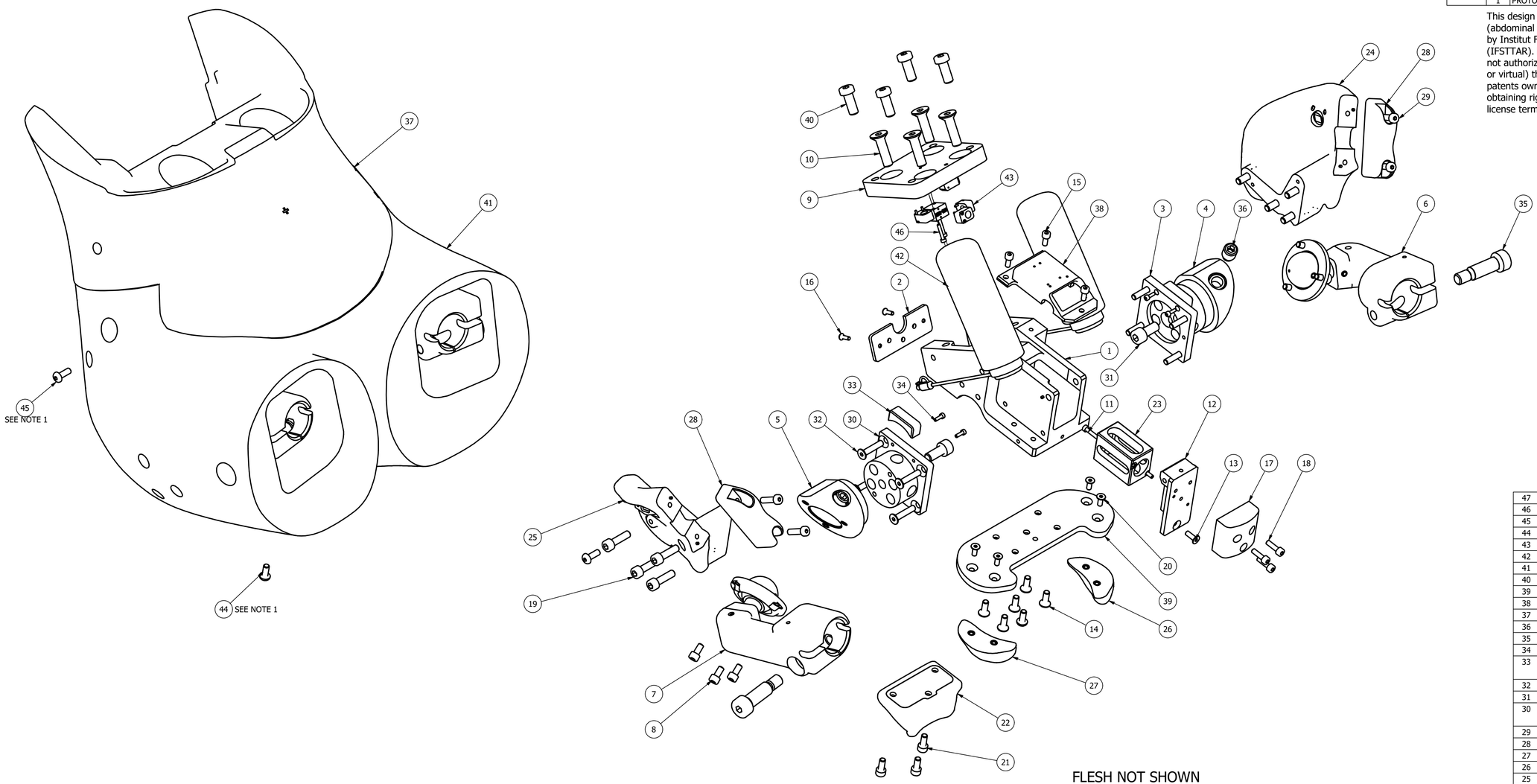
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-3231 | REV: 1

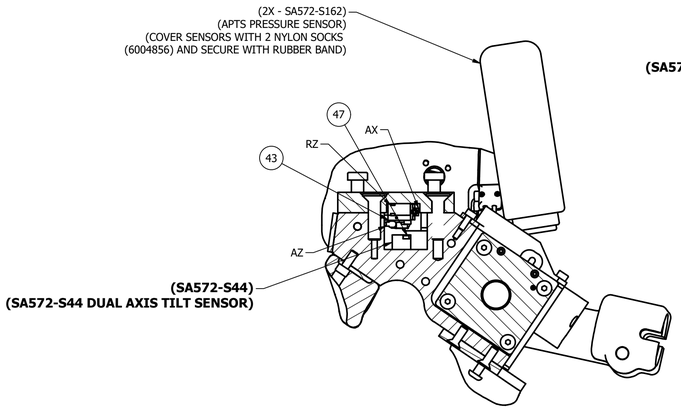
SCALE: 2:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	DJI	4/19/2023

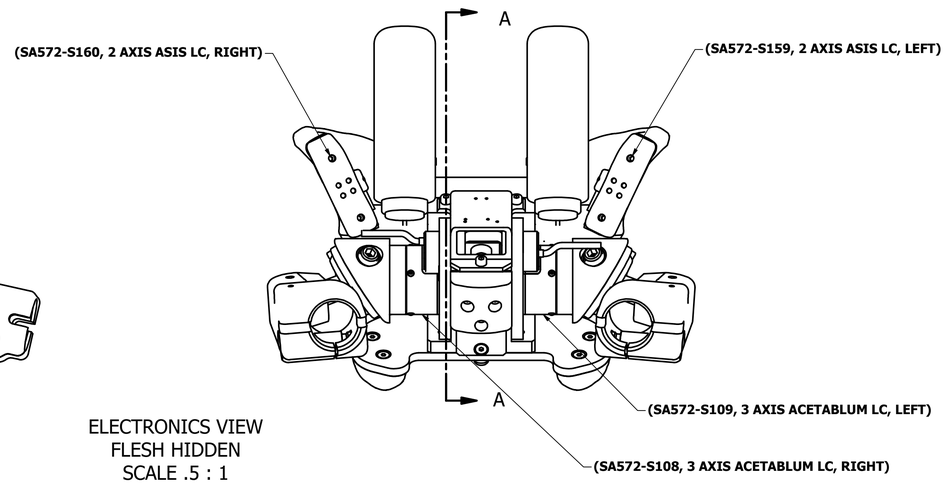
This design includes features covered by U.S. Patent No. 9,243,966 (abdominal pressure sensor for anthropomorphic dummy), which is owned by Institut Francais Des Sciences Et Technologies Des Transports (IFSTTAR). No license is being granted to this patent and third parties are not authorized to make, use, sell, import, or export any products (physical or virtual) that practice the invention covered by this patent, or other patents owned by IFSTTAR. However, if a third party is interested in obtaining rights to the design, they are to contact IFSTTAR to discuss license terms.



FLESH NOT SHOWN
SCALE .5 : 1



SECTION A-A



ELECTRONICS VIEW
FLESH HIDDEN
SCALE .5 : 1

NOTES:

1. THESE SCREWS SECURE THE PELVIS FLESH TO THE ASSEMBLED PELVIS BONES.

ITEM	QTY	PART NUMBER	DESCRIPTION
			PARTS LIST
47	2	5000215	M2 X 0.4 X 10 LG. SHCS
46	2	5001376	M2.5 X 0.45 X 14 LG. SHCS
45	2	5001411	M5 X 0.8 X 14 LG. BHCS
44	1	5000654	M5 X 0.8 X 12 LG. BHCS
43	1	474-4008	KIT, 7264C, THOR-05F PELVIS
42	1	476-3604	TILT SENSOR S.R.
41	1	474-4521-A	PELVIS FLESH, MOLDED ASSEMBLY
40	4	5001861	M8 X 1.25 X 20 LG. LHCS
39	1	474-4542-A	PLATE, ISCHIUM BONE MOUNT
38	1	474-4010	CABLE COVER, PELVIS
37	1	484-4305	ABDOMEN
36	2	474-4315	PELVIC PLUNGER ASSEMBLY
35	2	5000506	M12 X 30 LG. SHSS
34	4	5000458	M2.5 X 0.45 X 8 LG. SHCS
33	2	474-4007	STRUCTURAL REPLACEMENT, ACETABULUM LOAD CELL STRAIN RELIEF
32	8	5000394	M5 X 0.8 X 25 LG. FHCS
31	2	5000209	M8 X 1.25 X 18 LG. SHCS
30	1	474-4002-2	STRUCTURAL REPLACEMENT, RIGHT ACETABULAR LOAD CELL
29	4	5000297	M5 X 0.8 X 18 LG. LHCS
28	2	474-4547	STRUCTURAL REPLACEMENT, ASIS LOAD CELL
27	1	474-4545-2	ISCHIUM BONE, MOLDED, RIGHT
26	1	474-4545-1	ISCHIUM BONE, MOLDED, LEFT
25	1	474-4540-2-A	ILIAC WING, ASSY, RIGHT
24	1	474-4540-1-A	ILIAC WING, ASSY, LEFT
23	1	474-8206	DAS STRUCTURAL REPLACEMENT (6 BRIDGE)
22	1	474-4546	COCCYX, MOLDED
21	3	5000002	M5 X 0.8 X 12 LG. SHCS
20	4	5000023	M4 X 0.7 X 10 LG. FHCS
19	8	5000282	M6 X 1 X 22 LG. SHCS
18	3	5000459	M4 X 0.7 X 14 LG. SHCS
17	1	474-4544	PUBIC BONE
16	2	5000203	M3 X 0.5 X 10 LG. FHCS
15	3	5000151	M4 X 0.7 X 10 LG. SHCS
14	5	5000864	M5 X 0.8 X 14 LG. FHCS
13	1	5001086	M4 X 0.7 X 12 LG. FHCS
12	1	474-4005	DAS MOUNTING PLATE, PELVIS
11	2	5001053	M3 X 0.5 X 50 LG. SHCS
10	4	5000605	M8 X 1.25 X 30 LG. FHCS
9	1	474-4004	PLATE, UPPER TORSO TO PELVIS ADAPTOR
8	6	5000291	M5 X 0.8 X 10 LG. SHCS
7	1	474-4700-2	FEMUR ASSEMBLY, RIGHT
6	1	474-4700-1	FEMUR ASSEMBLY, LEFT
5	1	474-4003-2	FEMUR MOUNTING SOCKET, RIGHT
4	1	474-4003-1	FEMUR MOUNTING SOCKET, LEFT
3	1	474-4002-1	STRUCTURAL REPLACEMENT, LEFT ACETABULAR LOAD CELL
2	1	474-4001	COVER, REAR PELVIC INSTRUMENTATION
1	1	474-4541	PELVIC BONE, CENTER

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	3/31/2023
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PELVIS ASSEMBLY, THOR-05F

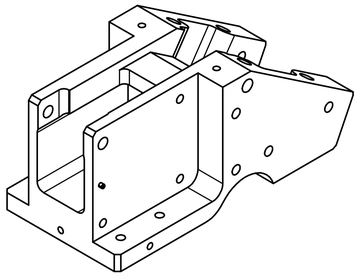
THOR-05F

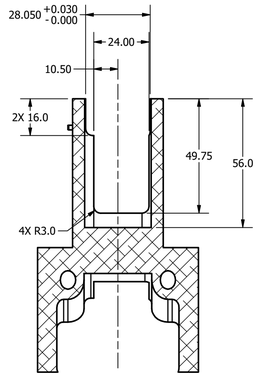
THIRD ANGLE PROJECTION

SIZE A1 | DRAWING NUMBER 474-4000-A | REV 1

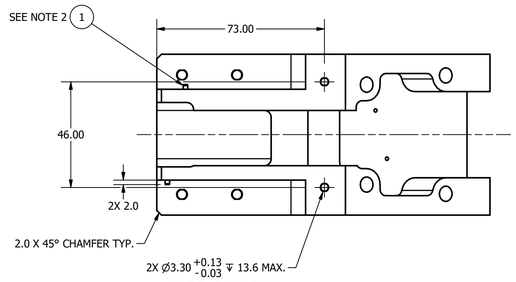
SCALE: .5 : 1 | SHEET 1 OF 1

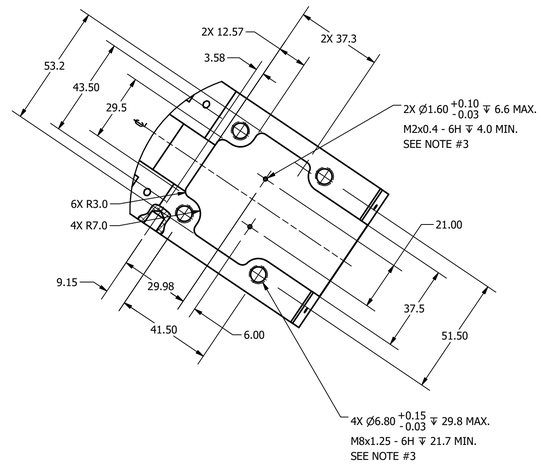
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	PROTOTYPE	AB	DJI	10/06/2021

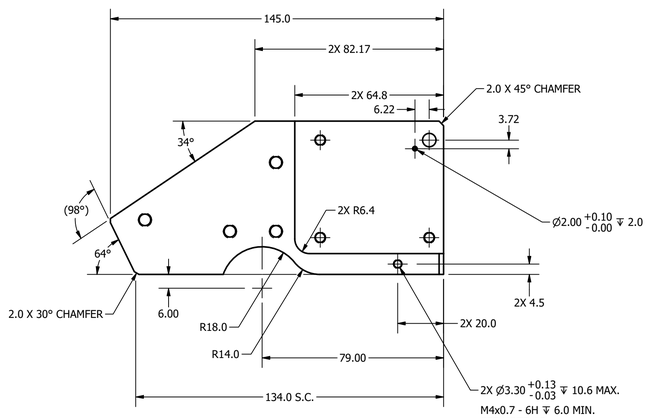


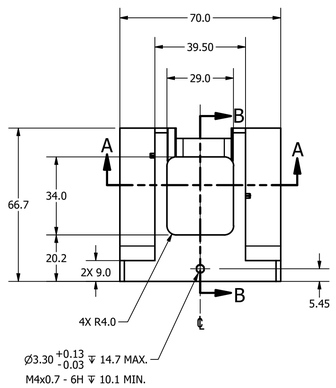


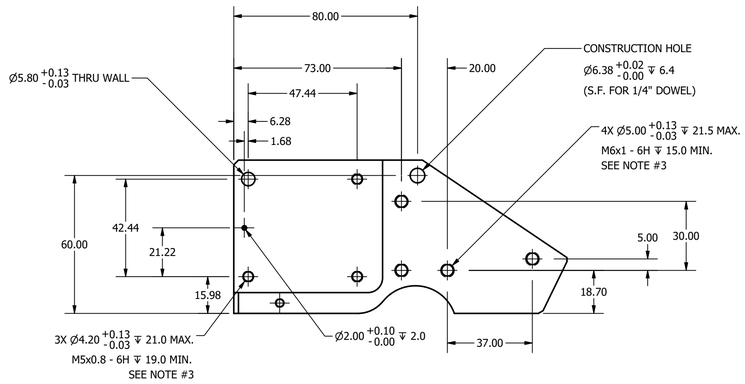
SECTION A-A

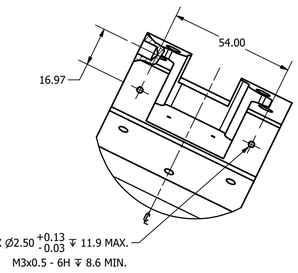


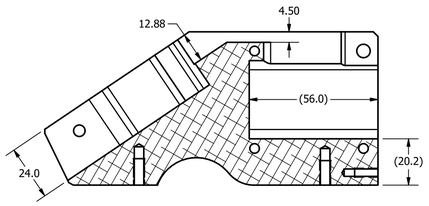




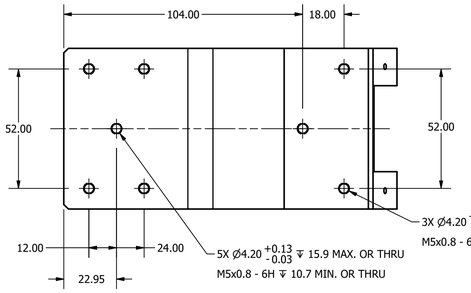








SECTION B-B



NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. INSTALL ROLL PIN 5000765 AFTER ANODIZE.
3. PLUG HOLES BEFORE ANODIZE.

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	5000765	M2 X 4 LG. ROLL PIN

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMALS: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: B. KIMES	3/31/2016
CHECKED:	
ENG: JW	3/31/2016
APPROVED:	

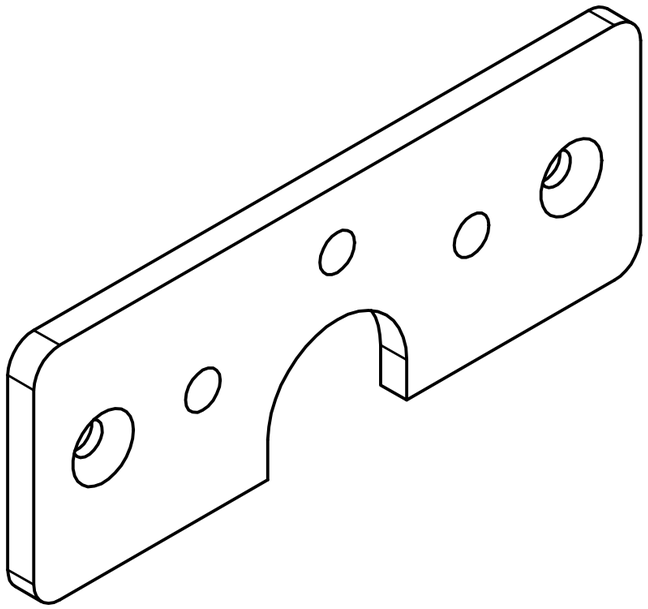
MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

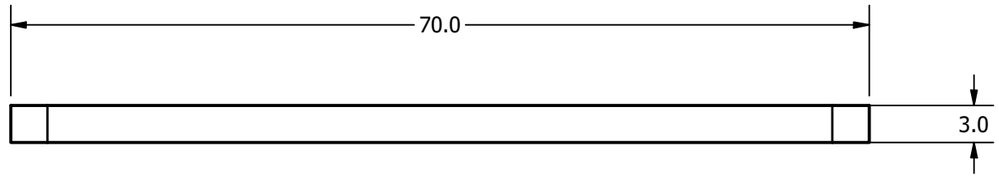
PELVIC BONE, CENTER
THOR-05F

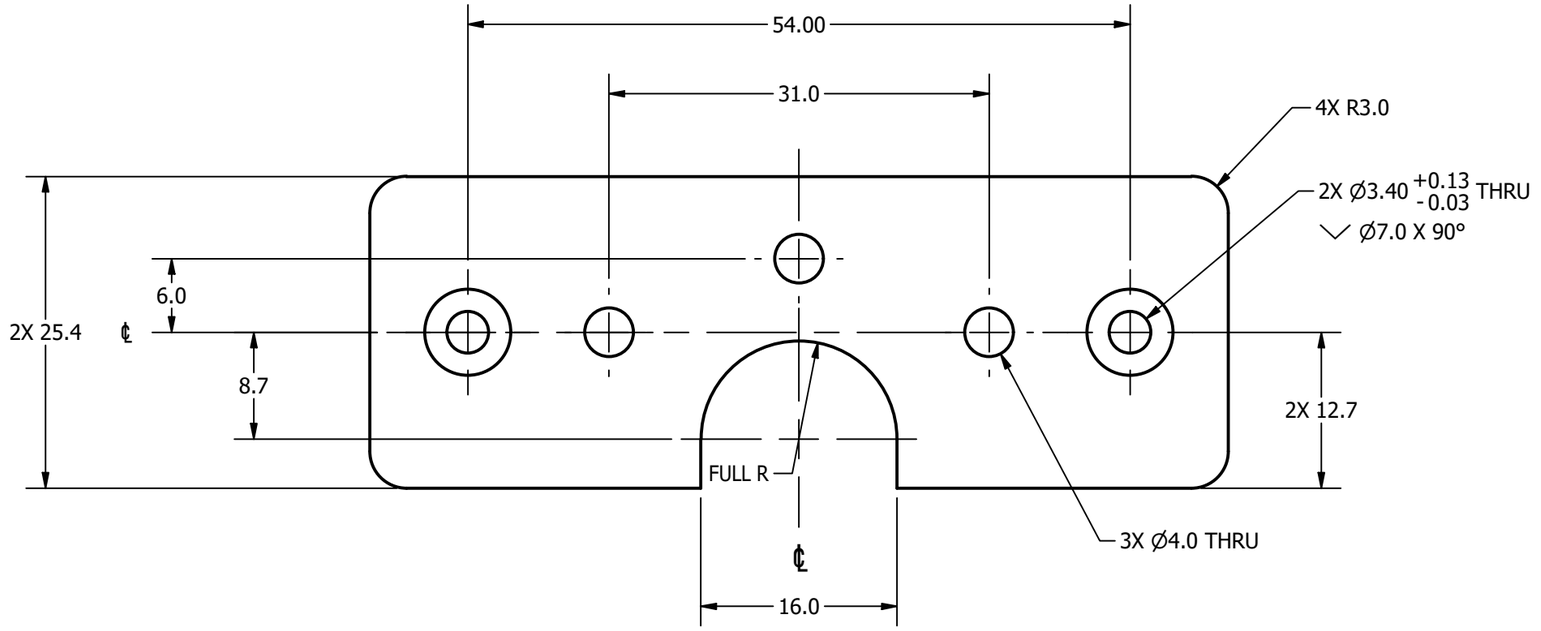
THIRD ANGLE PROJECTION

SIZE: A1 | DRAWING NUMBER: 474-4541 | REV: 5
SCALE: .75:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	SR	DJI	10/6/2021







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄ , UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED √ | ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	3/31/2016
CHECKED:	
ENG: JW	3/31/2016
APPROVED:	

MATERIAL: 6061-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

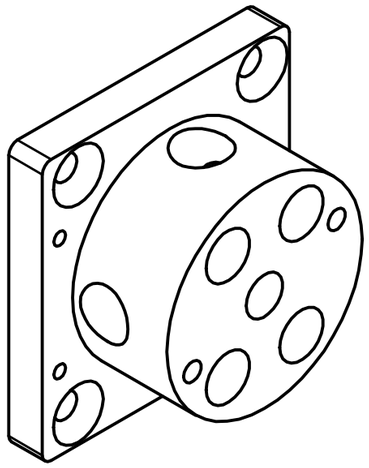
COVER, REAR PELVIC INSTRUMENTATION
THOR-05F

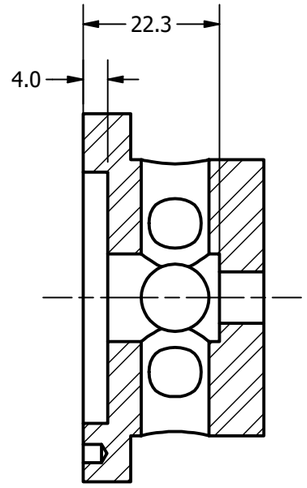
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A3	474-4001	2

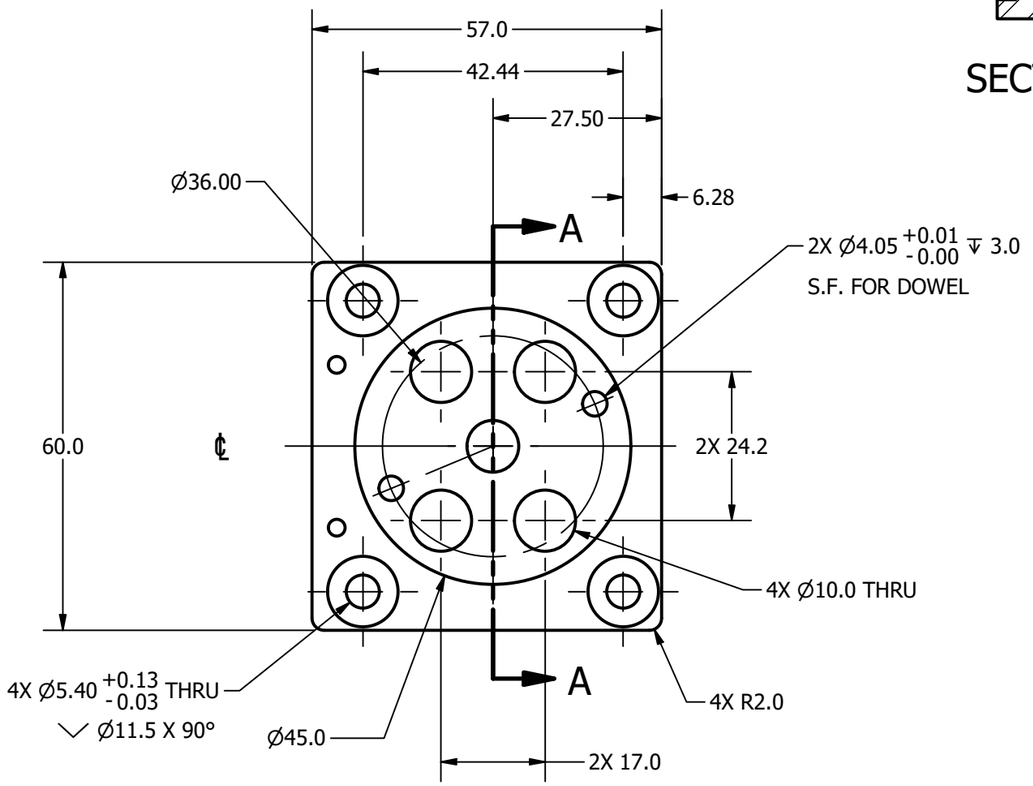
SCALE: 2 : 1
SHEET 1 OF 1

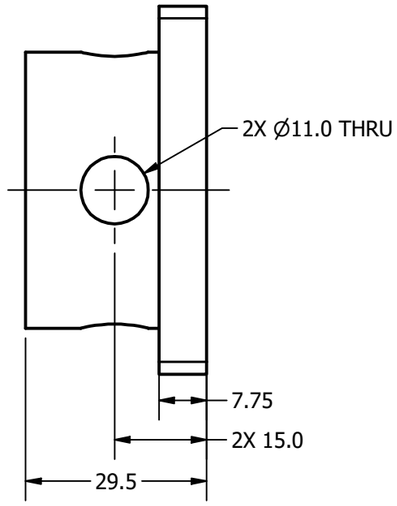
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	SR	DJI	10/6/2021

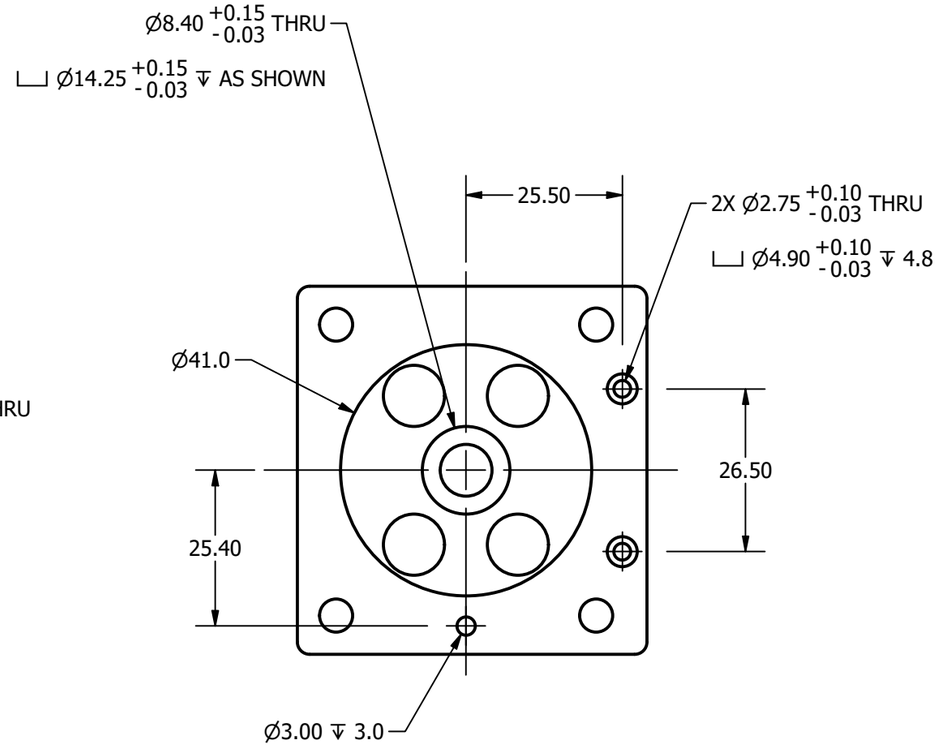




SECTION A-A







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

STRUCTURAL REPLACEMENT, LEFT ACETABULAR LOAD CELL THOR-05F

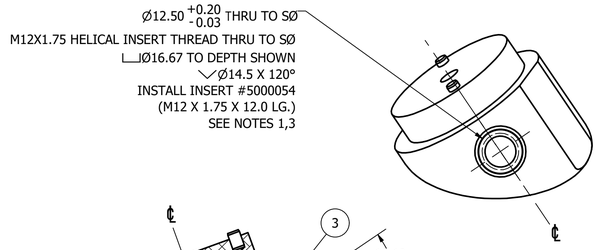
	APPROVALS	DATE
DRAWN	B. KIMES	3/30/2016
CHECKED		
ENG	JW	3/31/2016
APPROVED		

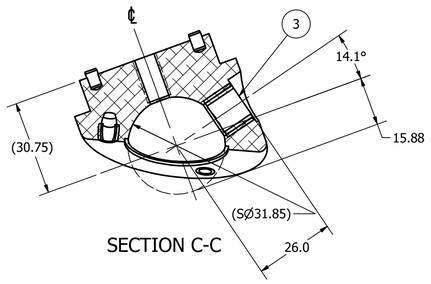
MATERIAL: 1018 STEEL
HEAT TREAT: N/A
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

THIRD ANGLE PROJECTION

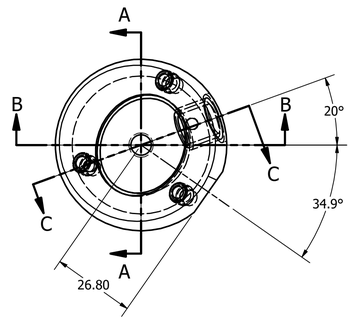
SIZE: A3 | DRAWING NUMBER: 474-4002-1 | REV: 2
SCALE: 1 : 1 | SHEET: 1 OF 1

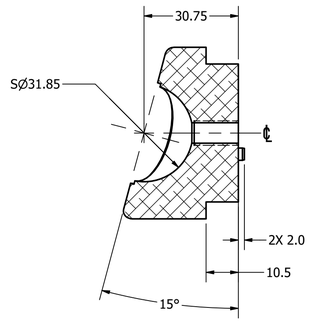
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	SR	DJI	10/6/2021



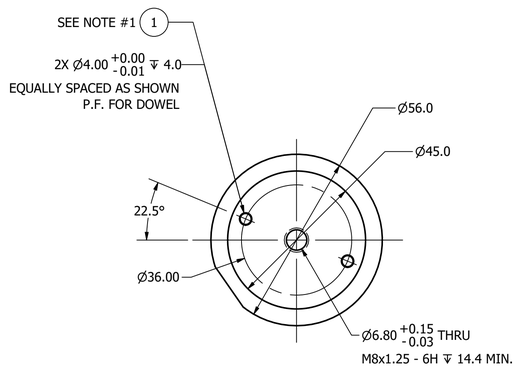


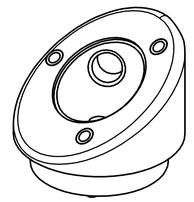
SECTION C-C

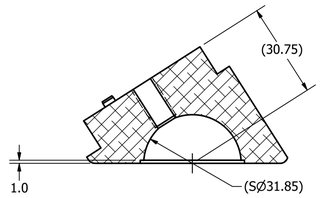




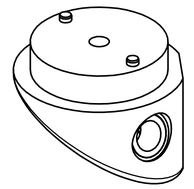
SECTION A-A

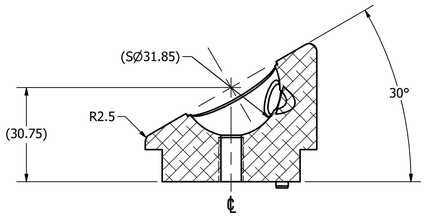




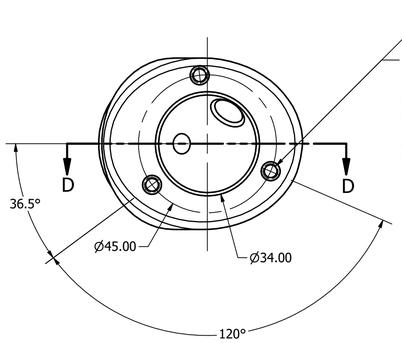


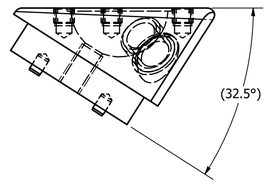
SECTION D-D





SECTION B-B





NOTES:

1. INSTALL DOWELS & HELICAL INSERT AFTER CLEAR ANODIZE.
2. REFER TO DRA IN 474-0000 SHT. 7 FOR THE REFERENCE SHAPE AND INFORMATION.
3. TRIM HELICAL INSERT LENGTH TO 10.5mm PRIOR TO INSTALLING IN HOLE.

ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	5000054	HELICAL INSERT, M12 X 1.75 X 12 LG.
2	3	5000351	HELICAL INSERT, M5 X .8 X 5
1	2	5000680	M4 X 6 LG. DOWEL PIN SS

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMALS: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT:
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: A. Barchock	4/5/2016
CHECKED:	
ENG: JW	3/31/2016
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

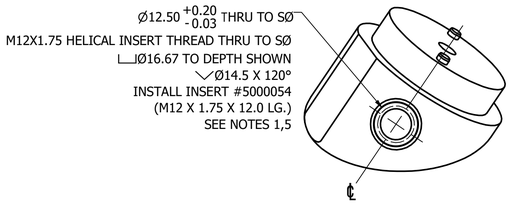
FEMUR MOUNTING SOCKET, LEFT

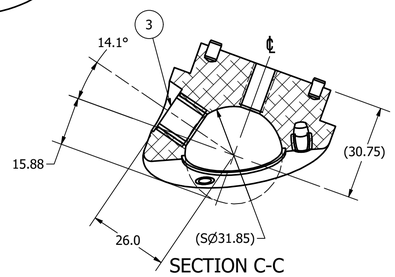
THIRD ANGLE PROJECTION

SIZE: A1 | DRAWING NUMBER: 474-4003-1 | REV: 4

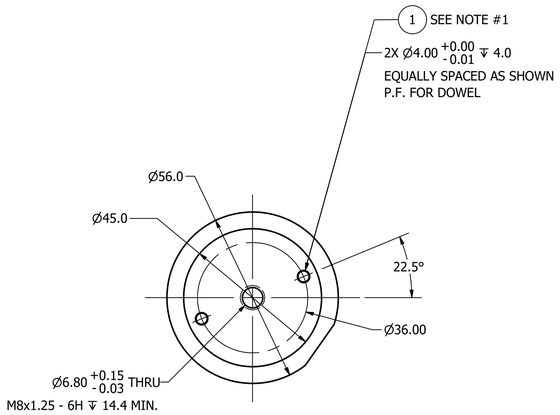
SCALE: 1 : 1 | SHEET: 1 OF 1

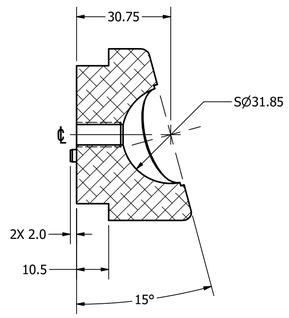
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	SR	DJI	10/6/2021



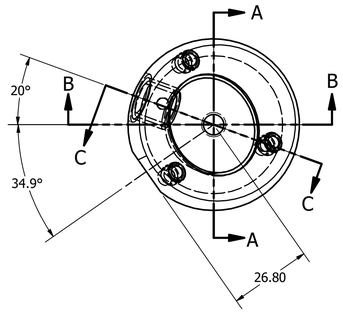


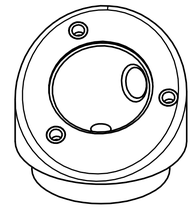
SECTION C-C

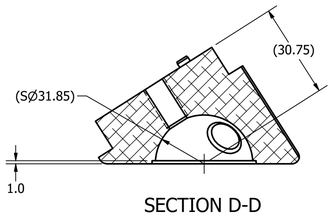




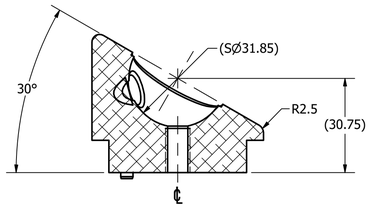
SECTION A-A



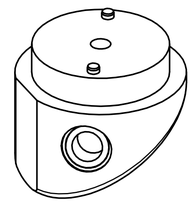


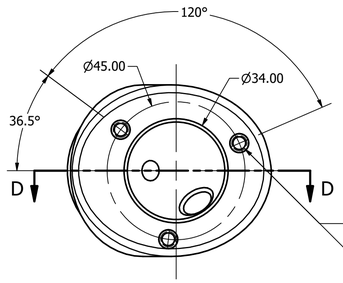


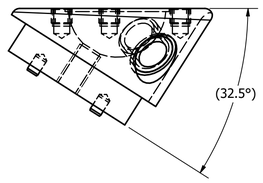
SECTION D-D



SECTION B-B







NOTES:

1. INSTALL DOWELS & HELICAL INSERT AFTER CLEAR ANODIZE.
2. REFER TO DRA IN 474-0000 SHT. 7 FOR THE REFERENCE SHAPE AND INFORMATION.
3. TRIM HELICAL INSERT LENGTH TO 10.5mm PRIOR TO INSTALLING IN HOLE.

ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	5000054	HELICAL INSERT, M12 X 1.75 X 12 LG.
2	3	5000351	HELICAL INSERT, M5 X .8 X 5
1	2	5000680	M4 X 6 LG. DOWEL PIN SS

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.1, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: A. Barchock	4/5/2016
CHECKED:	
ENG: JW	9/5/2016
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

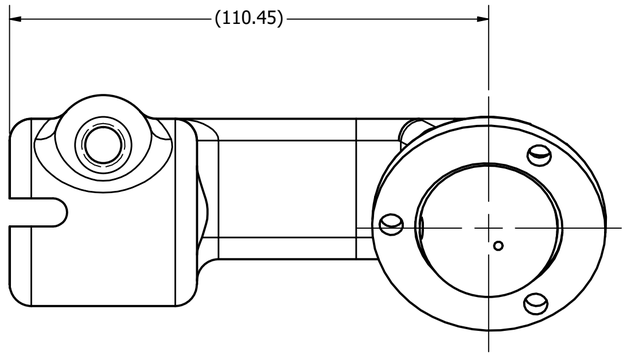
FEMUR MOUNTING SOCKET, RIGHT

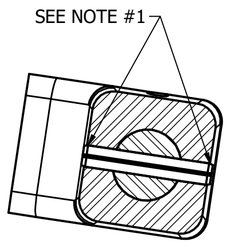
THIRD ANGLE PROJECTION

SIZE: A1 | DRAWING NUMBER: 474-4003-2 | REV: 4

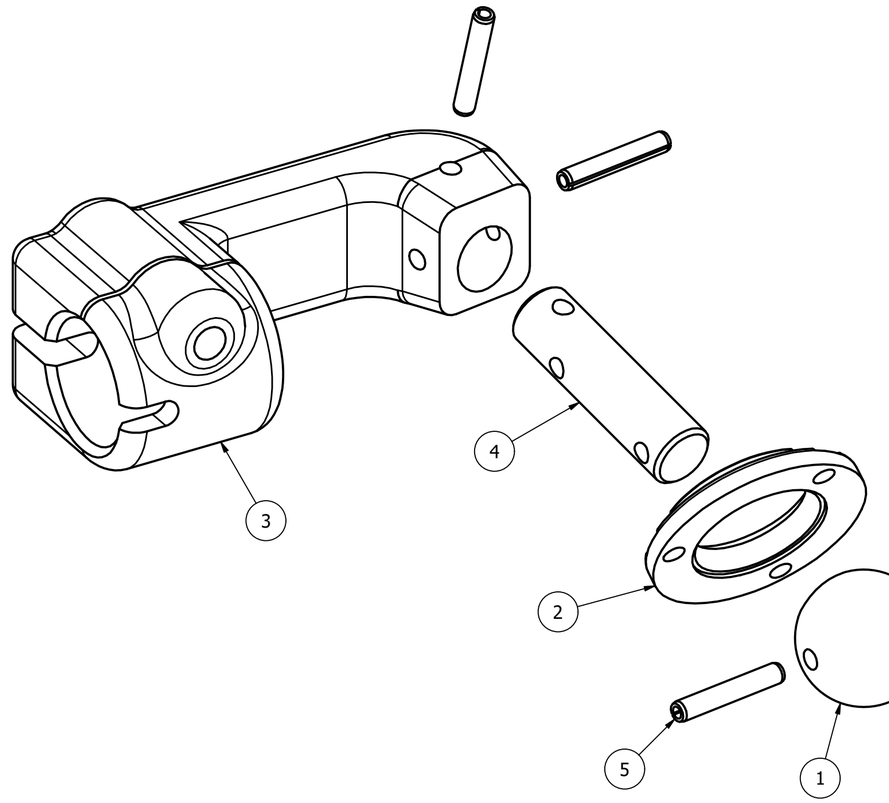
SCALE: 1 : 1 | SHEET: 1 OF 1

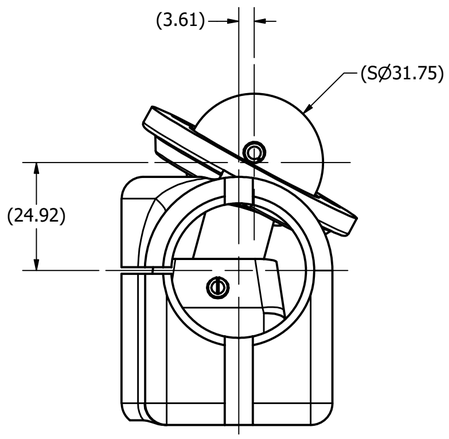
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	AB	KMSP	12/18/2019

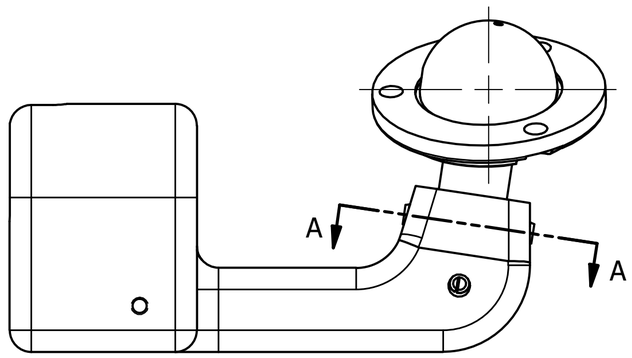




SECTION A-A







ITEM	QTY	PART NUMBER	DESCRIPTION
5	3	5000353	M5 X 30 LG. ROLL PIN SS
4	1	474-4704	FEMUR SHAFT
3	1	474-4703-1	FEMUR, LEFT
2	1	474-4702	FEMUR RETAINING FLANGE
1	1	474-4701	FEMUR BALL JOINT

PARTS LIST

NOTES:

1. INSTALL EQUALLY.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: A. Barchock	3/31/2016
CHECKED	
ENG: JW	3/31/2016
APPROVED	

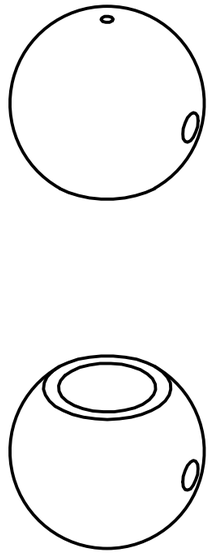
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

FEMUR ASSEMBLY, LEFT
THOR-05F

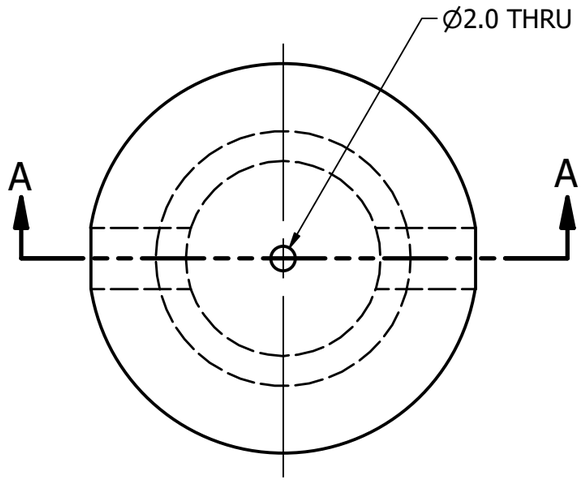
THIRD ANGLE PROJECTION

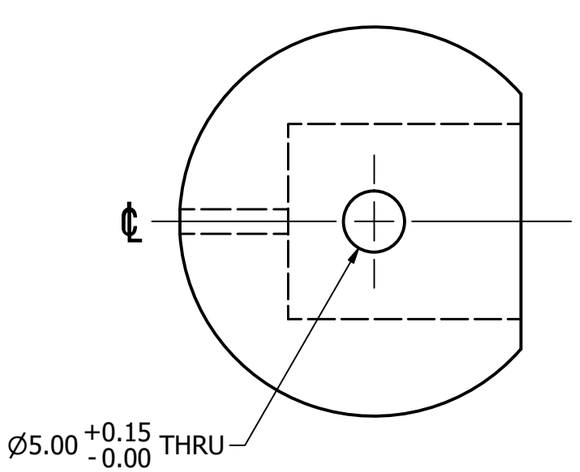
SIZE: A2 | DRAWING NUMBER: 474-4700-1 | REV: 2
SCALE: 1 : 1 | SHEET: 1 OF 1

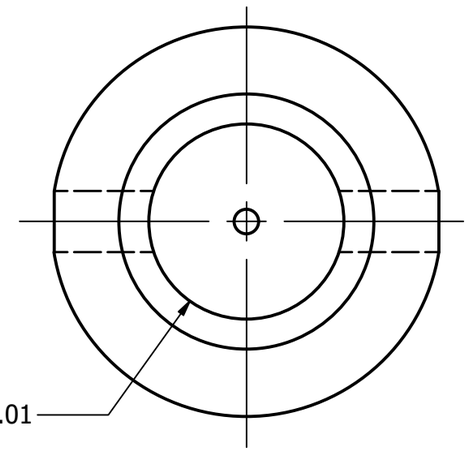
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	SR	DJI	10/7/2021

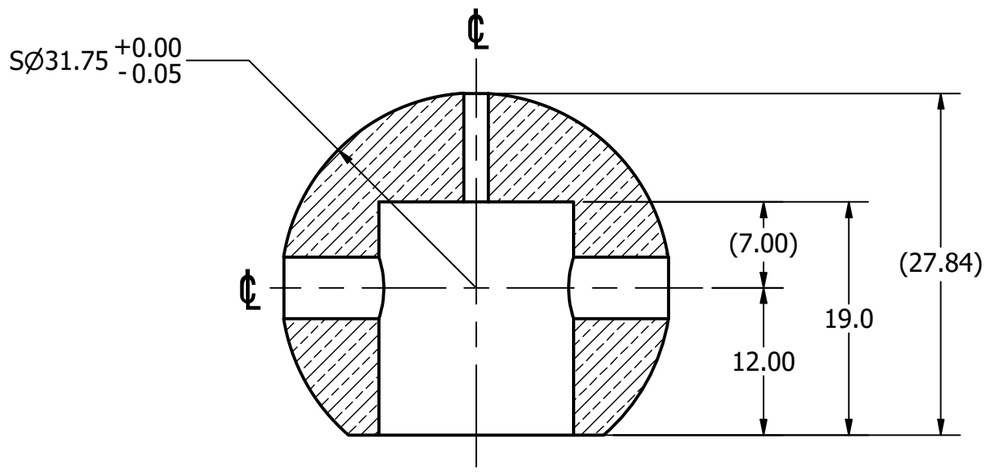


SCALE 1 : 1









SECTION A-A

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: ALUMINUM BRONZE (AMPCO-18)
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: A. Barchock	3/31/2016
CHECKED:	
ENG: JW	3/31/2016
APPROVED:	

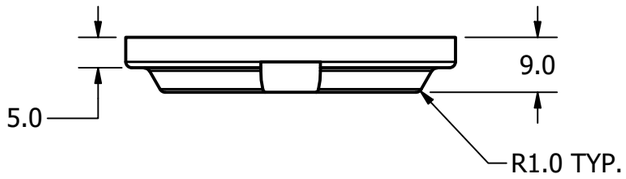
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

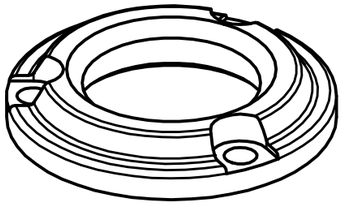
FEMUR BALL JOINT
THOR-05F

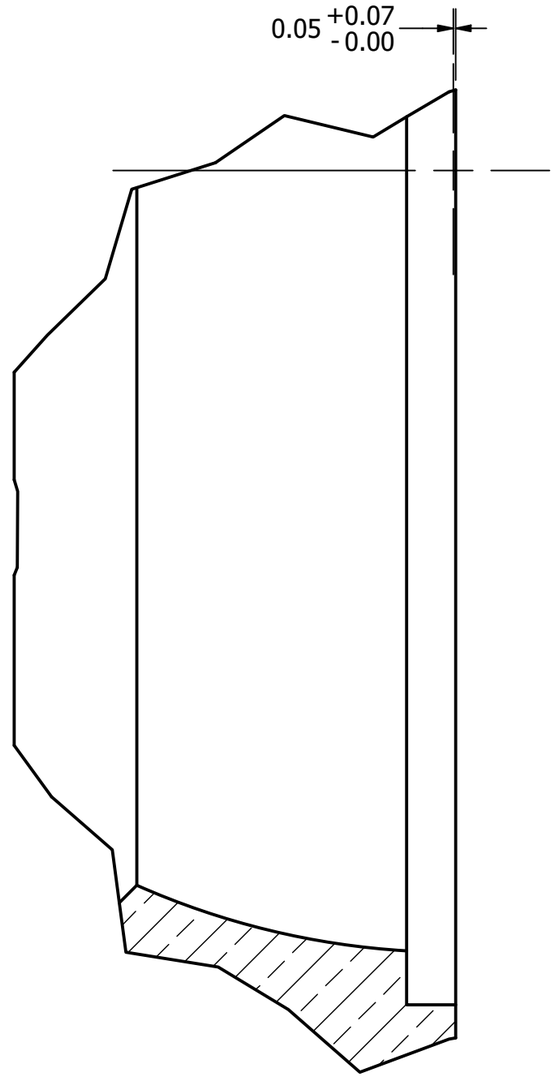
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-4701 | REV: 2
SCALE: 2 : 1 | SHEET: 1 OF 1

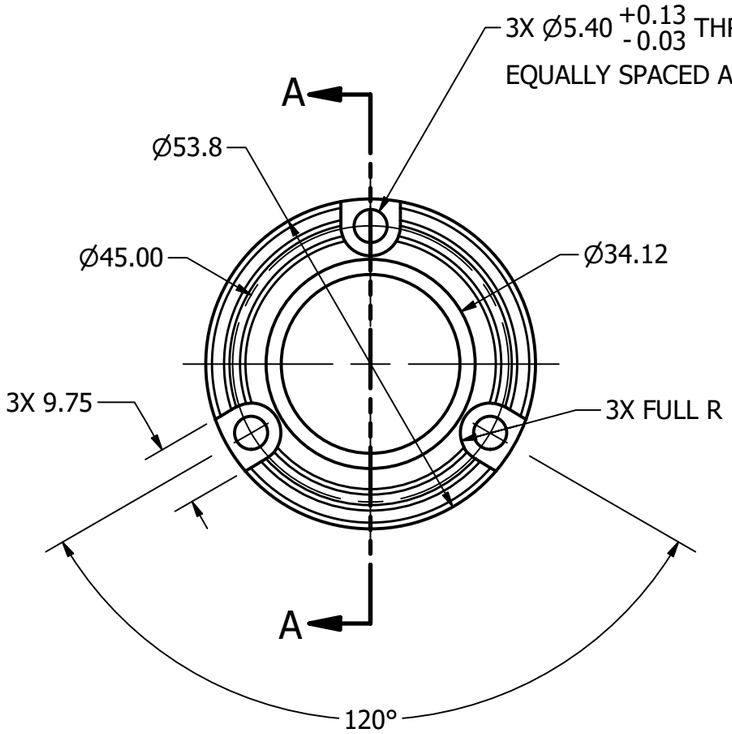
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	SR	JW	10/6/2021

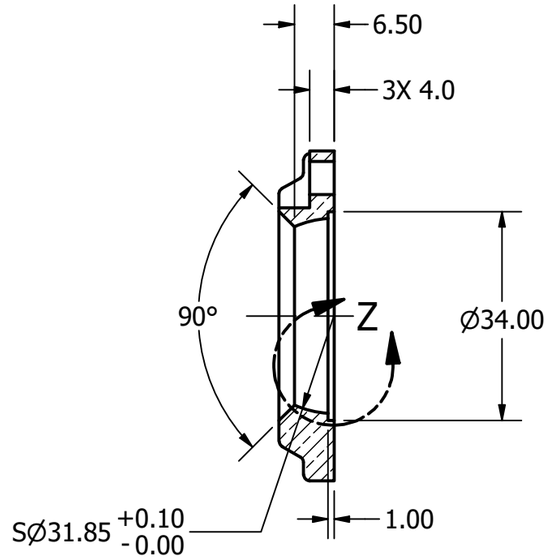






DETAIL Z
SCALE 8 : 1





SECTION A-A

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN A. Barchock	3/31/2016
CHECKED	
ENG JW	3/31/2016
APPROVED	

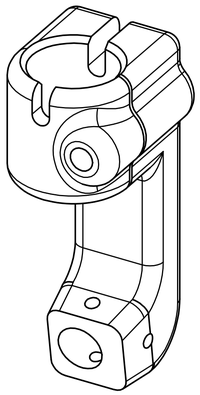
MATERIAL: BRONZE 863
HEAT TREAT: N/A
FINISH: N/A

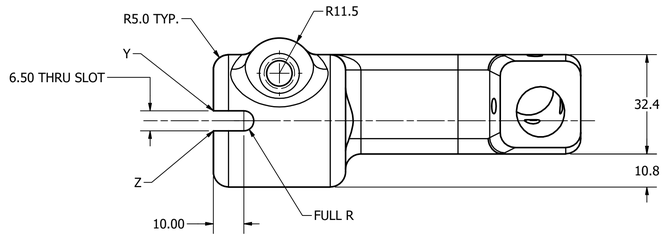
FEMUR RETAINING FLANGE
THOR-05F

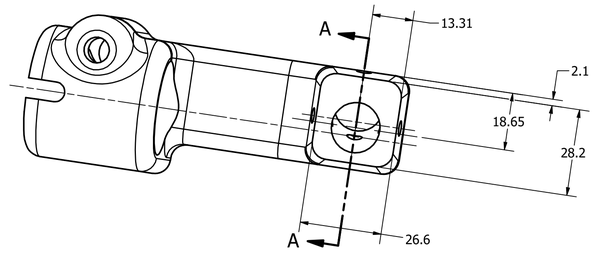
THIRD ANGLE PROJECTION

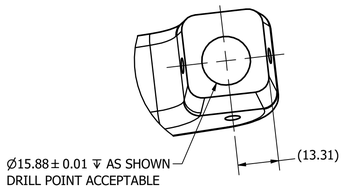
SIZE: A3 | DRAWING NUMBER: 474-4702 | REV: 2
SCALE: 1 : 1 | SHEET: 1 OF 1

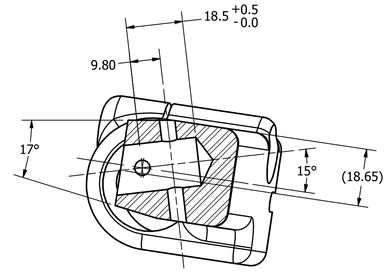
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	AB	JW	05/30/2019



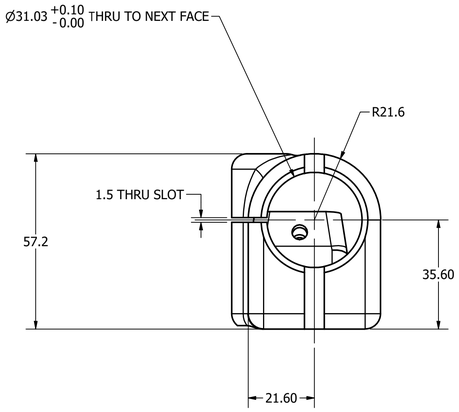


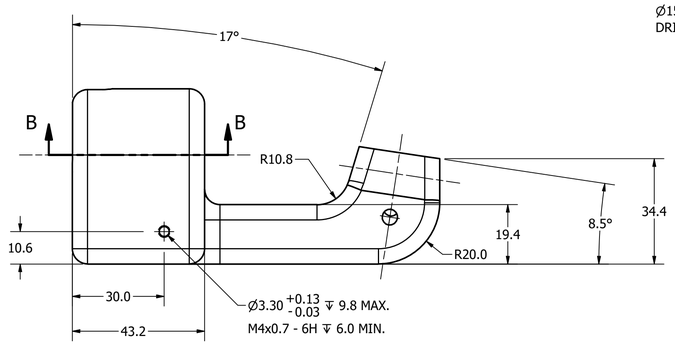


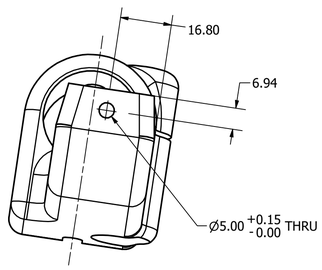


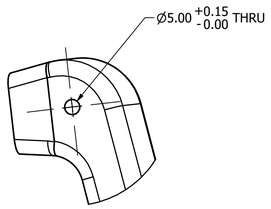


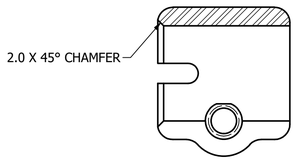
SECTION A-A



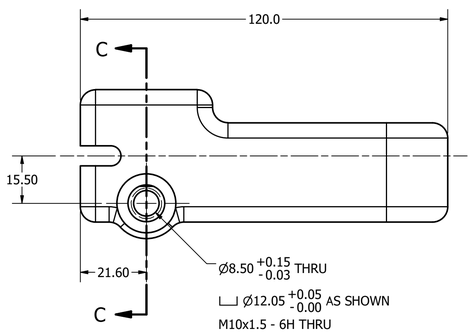


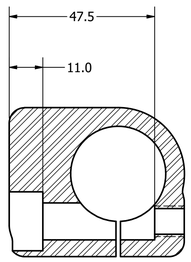






SECTION B-B





SECTION C-C

NOTES:

1. REFER TO DRA IN 474-0000 SHT. 7 FOR THE REFERENCE SHAPE AND INFORMATION.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	4140 STEEL
HEAT TREAT	N/A
FINISH	0.008mm ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: A. Barchock	3/31/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

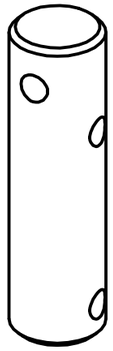
FEMUR, LEFT

THIRD ANGLE PROJECTION

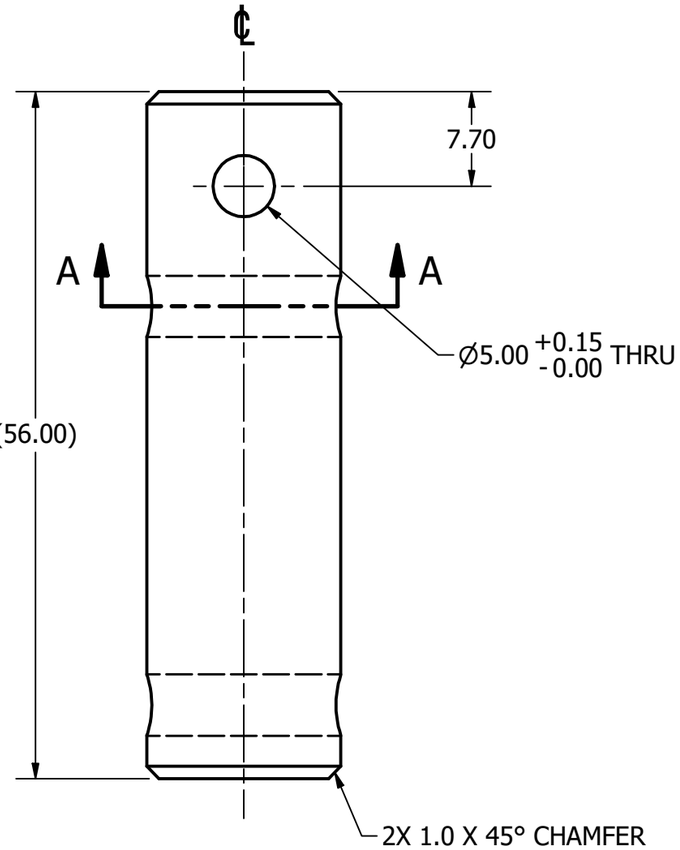
SIZE A1 | DRAWING NUMBER 474-4703-1 | REV 2

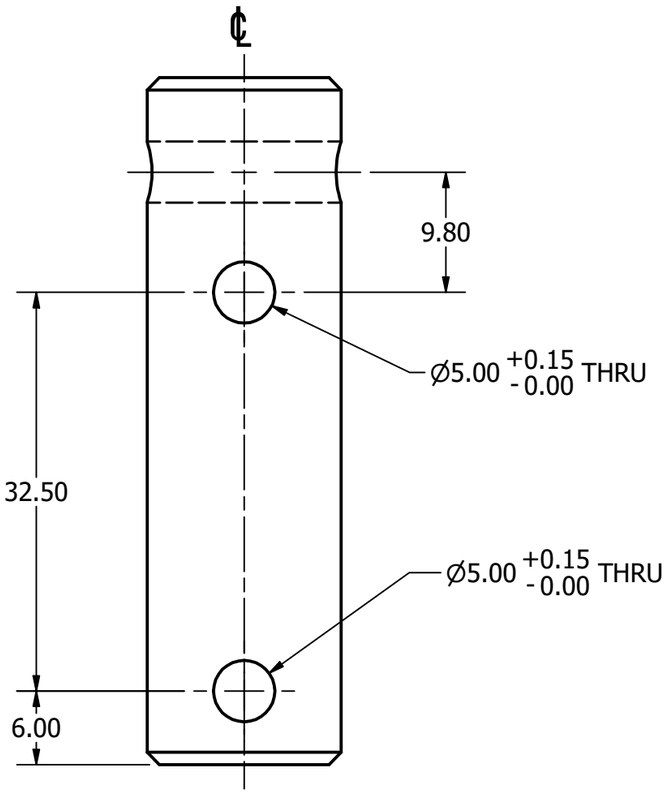
SCALE: 1 : 1 | SHEET 1 OF 1

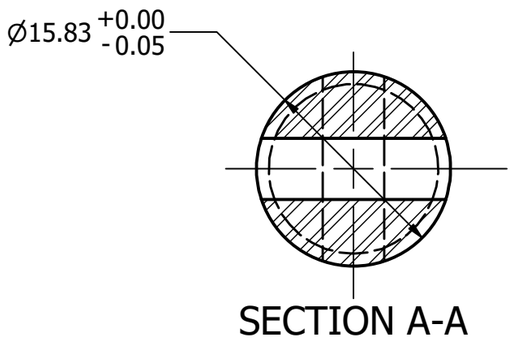
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	SR	DJI	10/7/2021



SCALE 1 : 1







SECTION A-A

NOTES:

1. MATERIAL: 4140 TURNED GROUND AND POLISHED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES	CHECKED	
HEAT TREAT: Rc 28-32	ENG: JW	3/31/2016
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE	APPROVED	

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: A. Barchock	3/31/2016

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

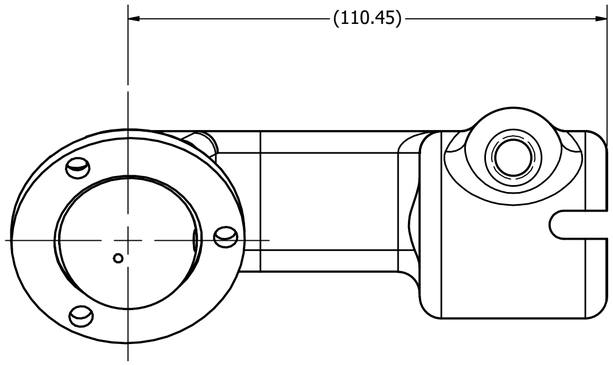
FEMUR SHAFT
THOR-05F

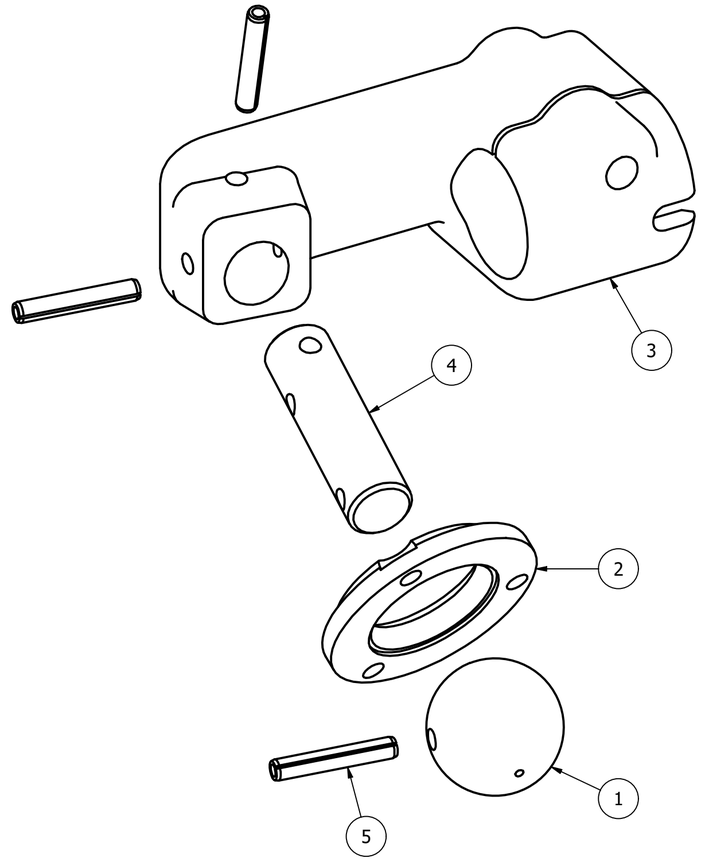
THIRD ANGLE PROJECTION

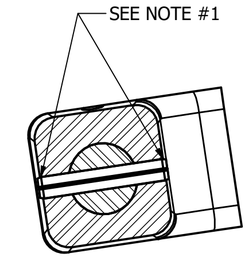
SIZE	DRAWING NUMBER	REV
A3	474-4704	3

SCALE: 2 : 1 | SHEET: 1 OF 1

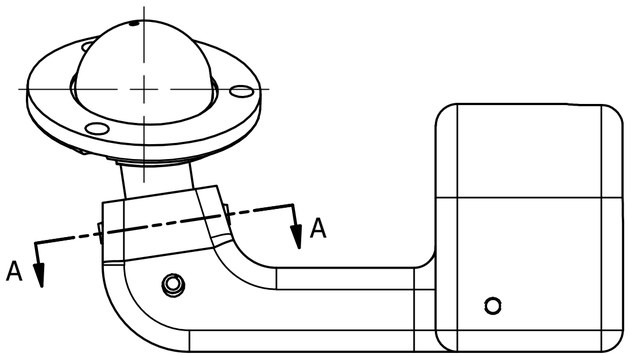
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	AB	KMSP	12/18/2019

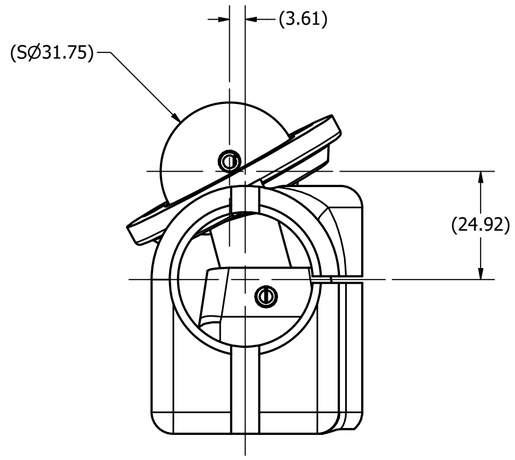






SECTION A-A





ITEM	QTY	PART NUMBER	DESCRIPTION
5	3	5000353	M5 X 30 LG. ROLL PIN SS
4	1	474-4704	FEMUR SHAFT
3	1	474-4703-2	FEMUR, RIGHT
2	1	474-4702	FEMUR RETAINING FLANGE
1	1	474-4701	FEMUR BALL JOINT

PARTS LIST

NOTES:

1. INSTALL EQUALLY

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: A. Barchock	3/31/2016
CHECKED:	
ENG: JW	12/19/2019
APPROVED:	

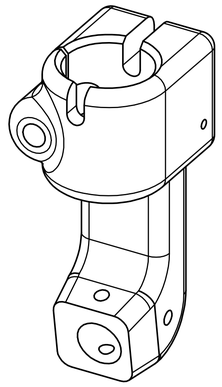
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

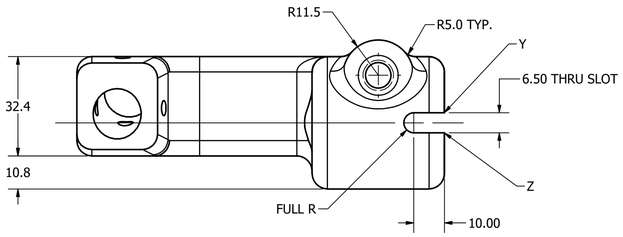
FEMUR ASSEMBLY, RIGHT
THOR-05F

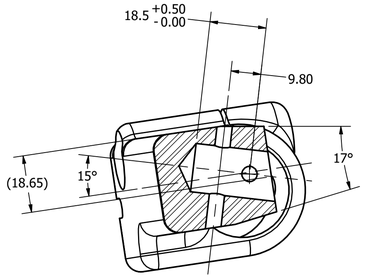
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-4700-2 | REV: 2
SCALE: 1 : 1 | SHEET: 1 OF 1

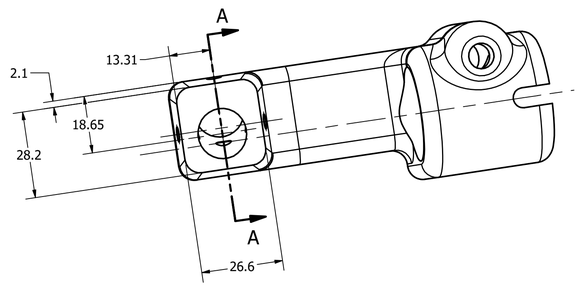
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	AB	JW	05/30/2019

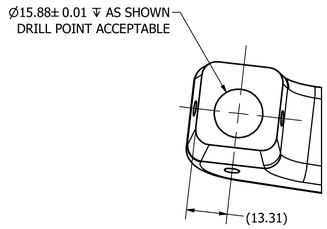


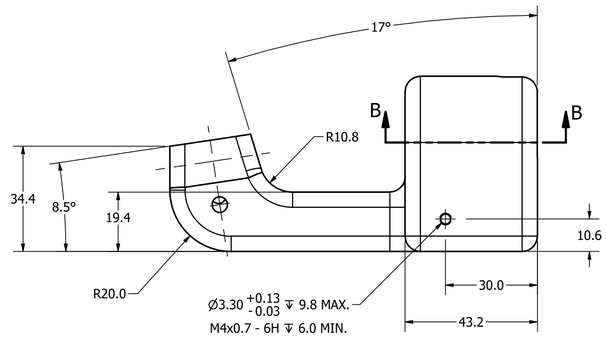


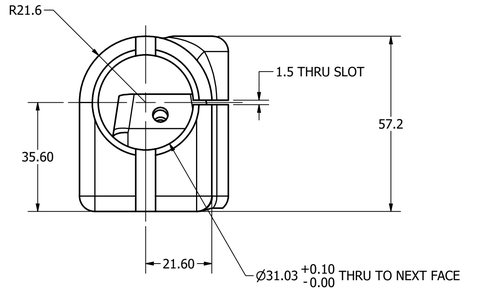


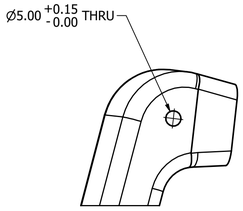
SECTION A-A

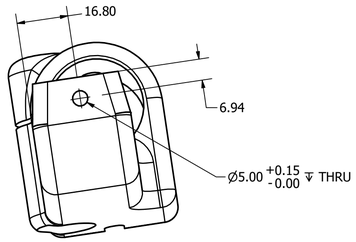


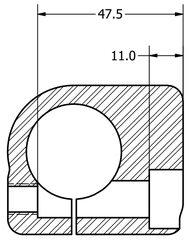




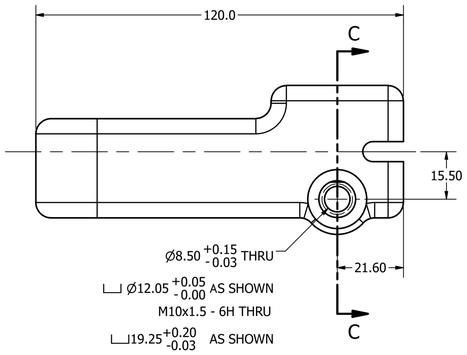




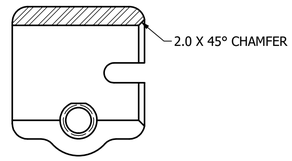




SECTION C-C



⌴ Ø12.05 +0.05 -0.00 AS SHOWN
M10x1.5 - 6H THRU
⌴ 19.25 +0.20 -0.03 AS SHOWN



SECTION B-B

NOTES:

1. REFER TO DRA IN 474-0000 SHT. 7 FOR THE REFERENCE SHAPE AND INFORMATION.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.3, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 4140 STEEL
HEAT TREAT: N/A
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: A. Barchock	4/1/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

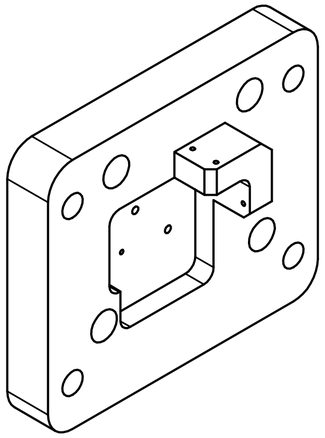
FEMUR, RIGHT

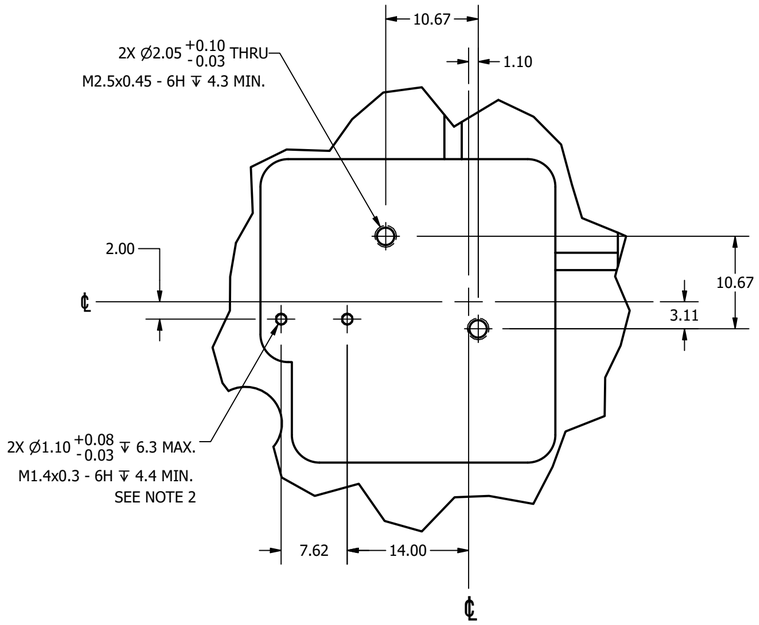
THIRD ANGLE PROJECTION

SIZE: A1 | DRAWING NUMBER: 474-4703-2 | REV: 2

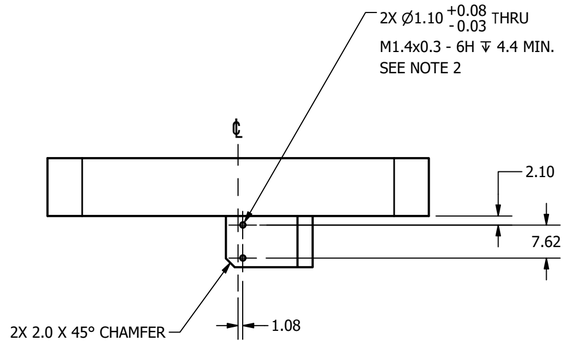
SCALE: 1 : 1 | SHEET: 1 OF 1

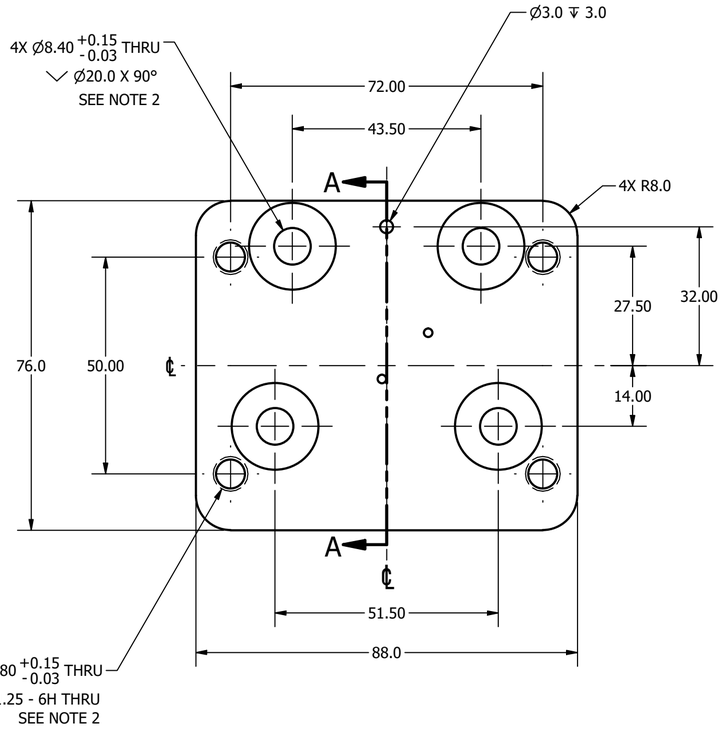
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	SR	JW	10/6/2021

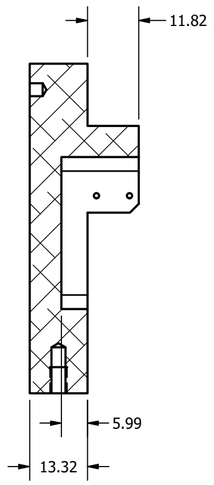




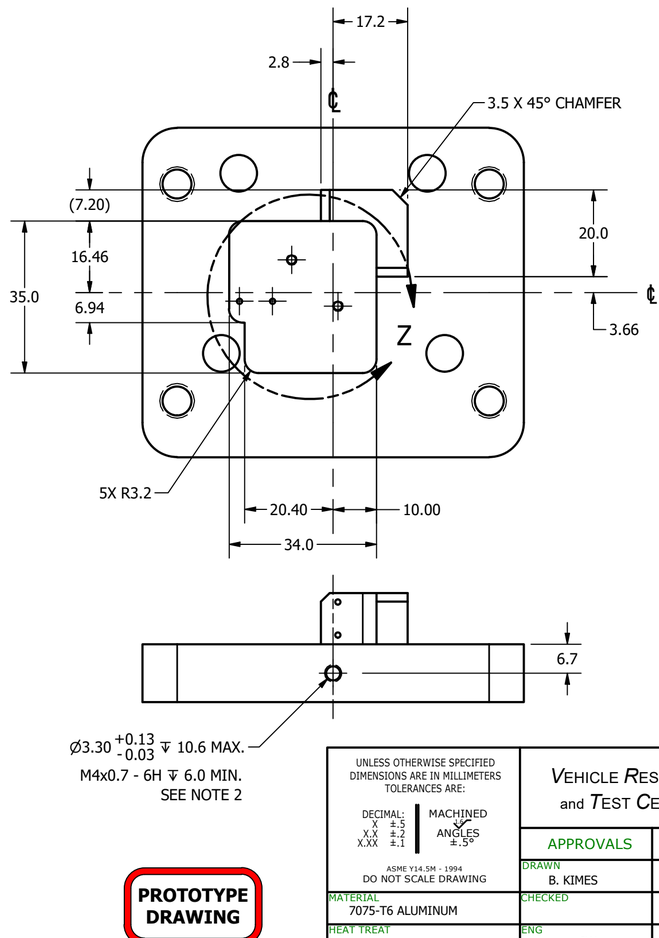
DETAIL Z
SCALE 2 : 1

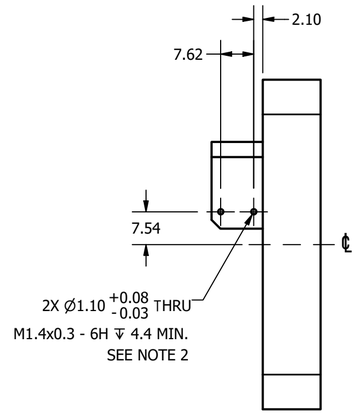






SECTION A-A





NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

2. PLUG HOLES BEFORE ANODIZE.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

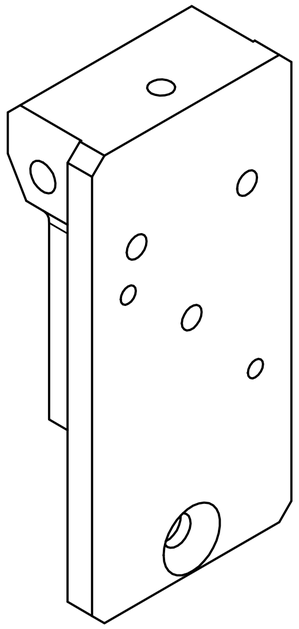
APPROVALS	DATE
DRAWN: B. KIMES	3/31/2016
CHECKED	
ENG: JW	3/31/2016
APPROVED	

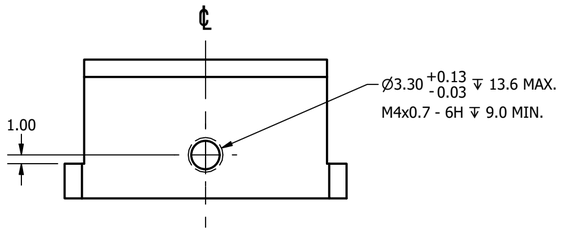
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

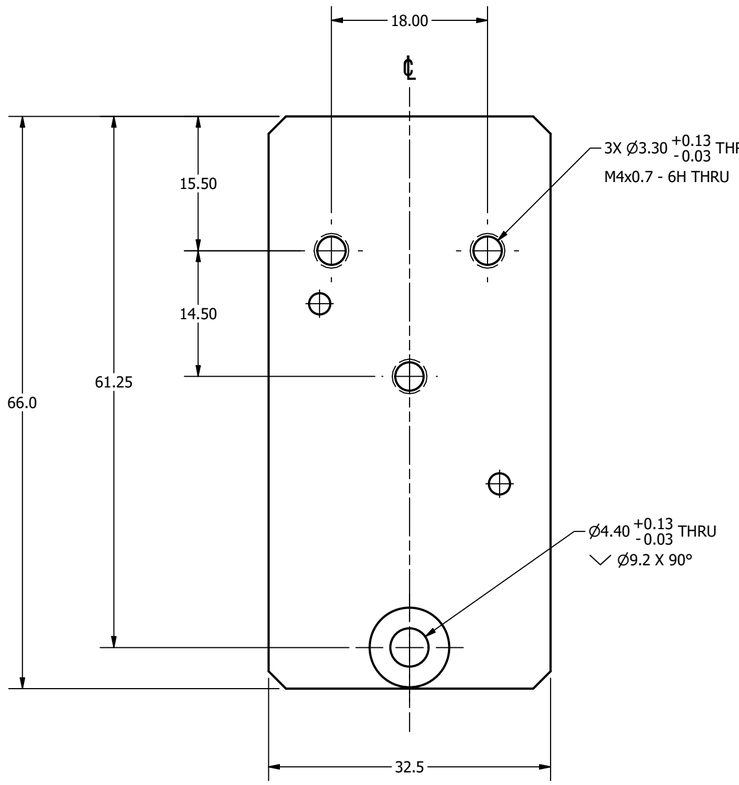
PLATE, UPPER TORSO TO PELVIS ADAPTOR
THOR-05F

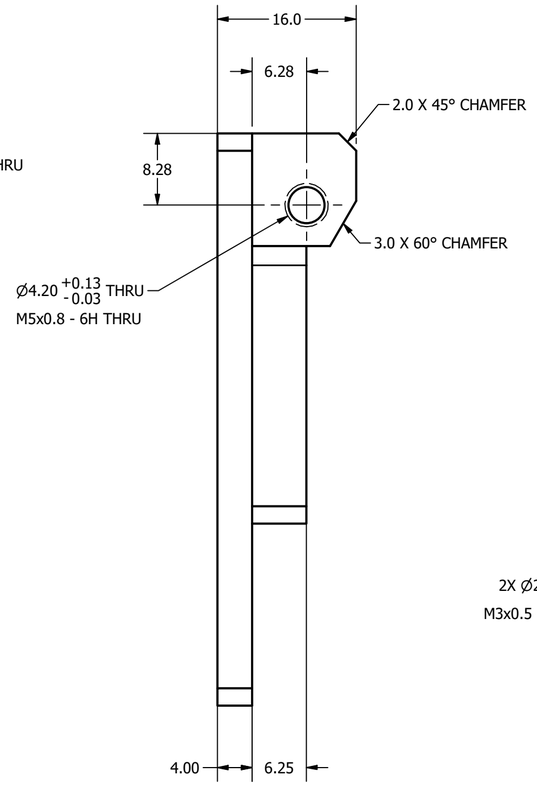
THIRD ANGLE PROJECTION
SIZE: A2
DRAWING NUMBER: 474-4004
REV: 3
SCALE: 1 : 1
SHEET: 1 OF 1

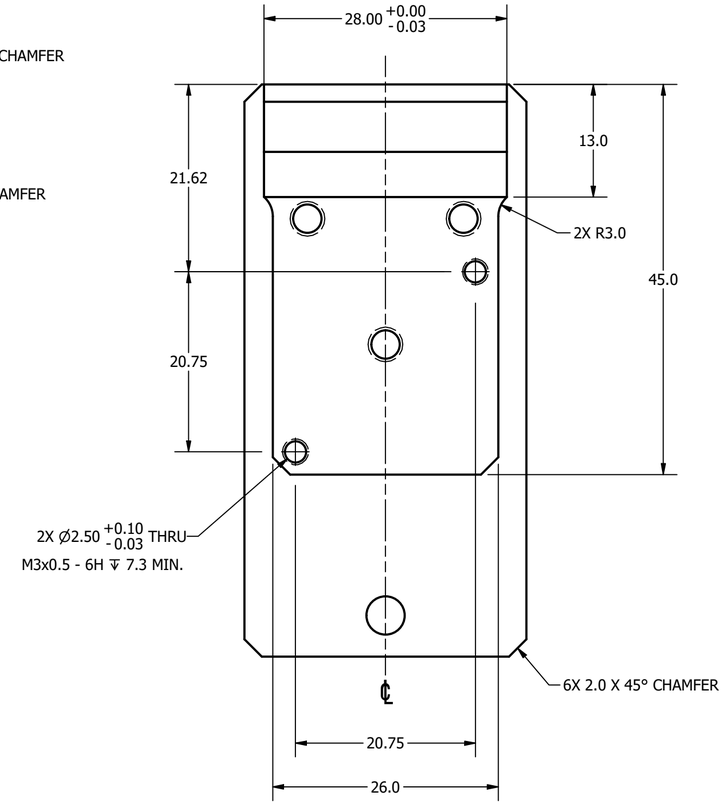
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	SR	JW	10/6/2021











NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	3/30/2016
CHECKED:	
ENG: JW	3/31/2016
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

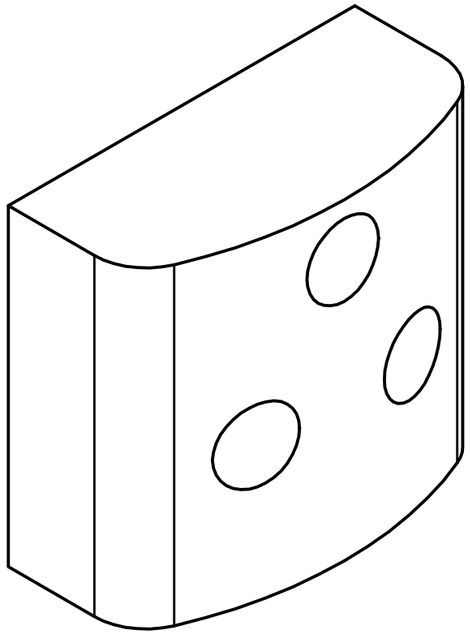
DAS MOUNTING PLATE, PELVIS
THOR-05F

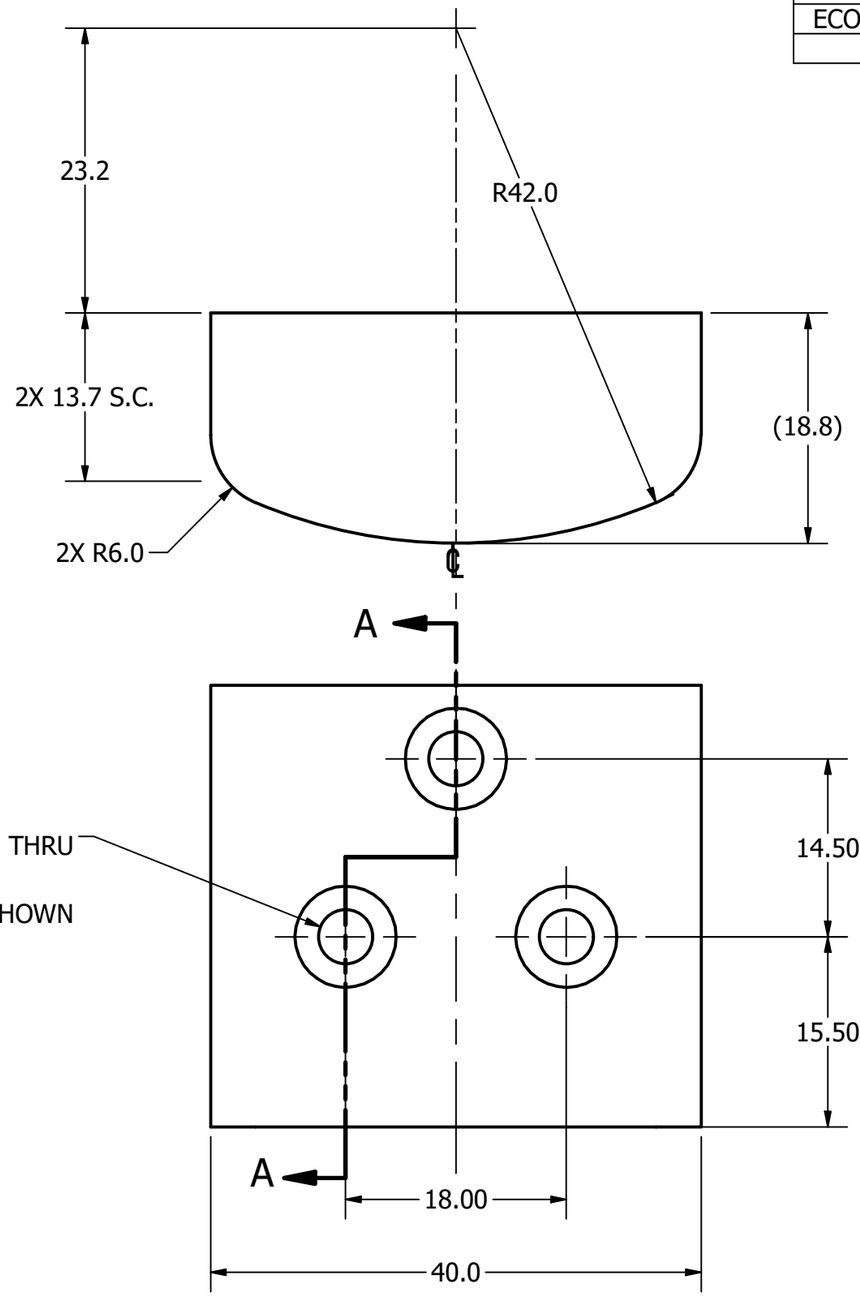
THIRD ANGLE PROJECTION

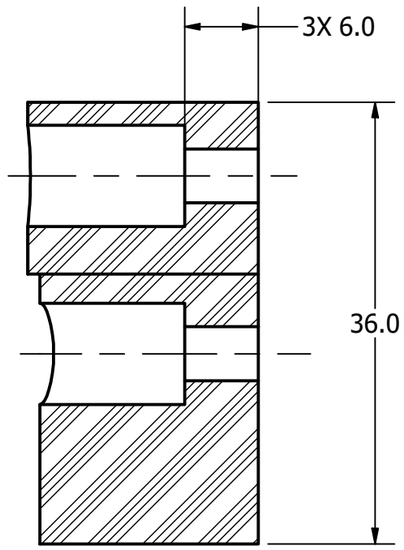
SIZE	DRAWING NUMBER	REV
A2	474-4005	2

SCALE: 2 : 1
SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	SR	DJI	10/7/2021







SECTION A-A

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ↓ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	3/30/2016
CHECKED	
ENG JW	3/30/2016
APPROVED	

MATERIAL: ACETAL RESIN BLACK
HEAT TREAT: N/A
FINISH: N/A

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

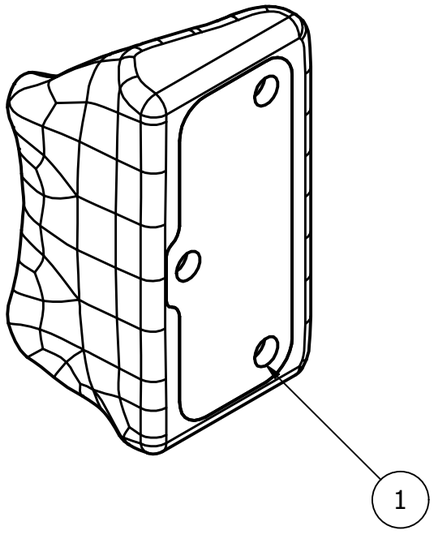
PUBIC BONE
THOR-05F

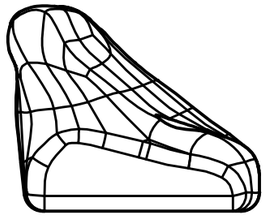
THIRD ANGLE PROJECTION

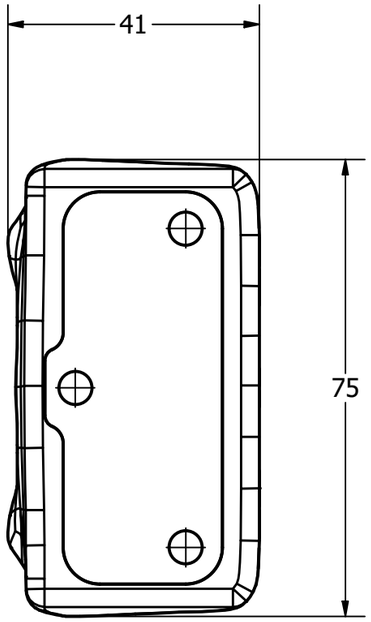
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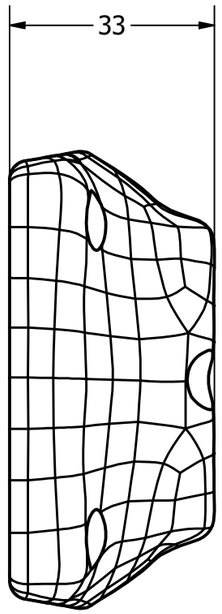
SCALE: 2 : 1
SHEET 1 OF 1

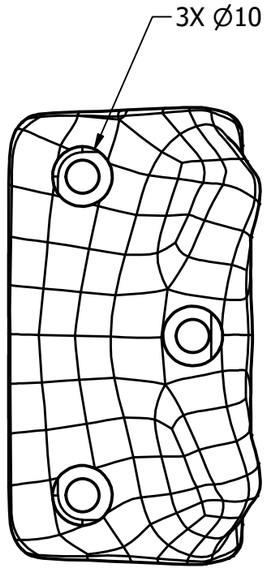
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	GCH	JW	11/6/17











NOTES:

1. MATERIAL: POLYURETHANE
   COLOR: EURO BROWN
   DUROMETER: 70±5 SHORE "D"

2. REMOVE ALL MOLD FLASHING

3. ALL MOLD DIMENSION TOLERANCE +1%/-2% BUT NO SMALLER THAN 0.5mm

4. NO SPLIT OR DEFECTS ARE ALLOWED IN THE URETHANE MOLDING

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-4543	PLATE, COCCYX MOUNT

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

COCCYX, MOLDED

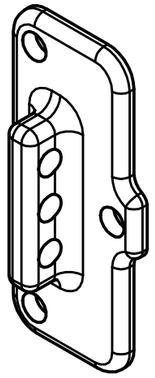
	APPROVALS	DATE
DRAWN	ghayden	11/6/2017
CHECKED		
ENG		
APPROVED		

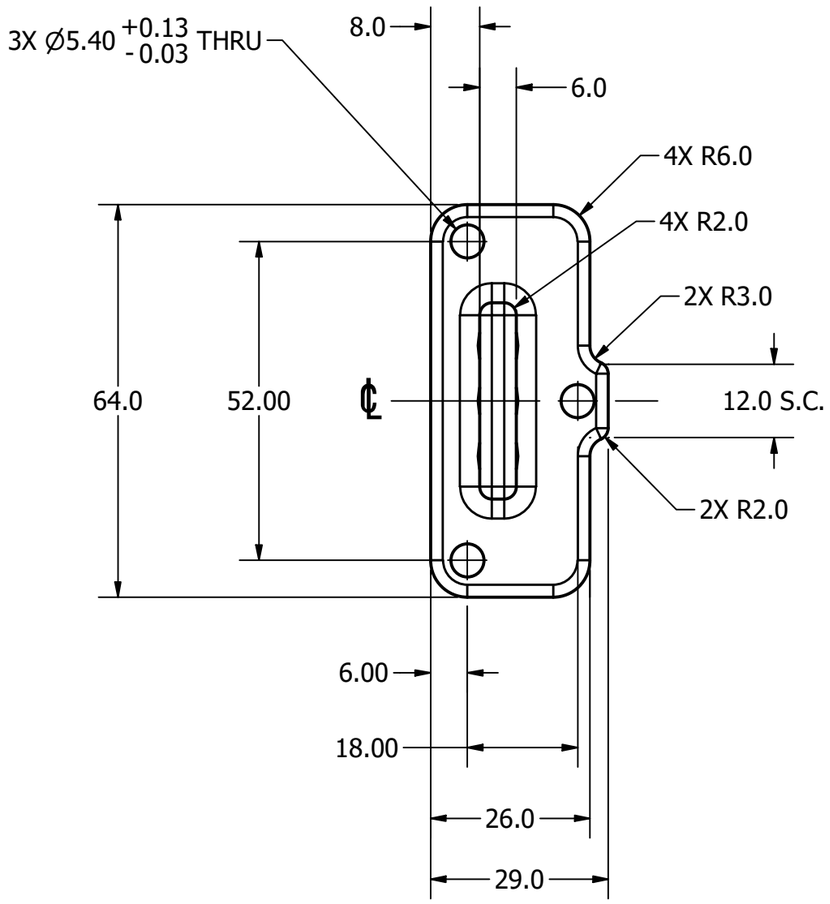
MATERIAL: SEE NOTE #1
HEAT TREAT:
FINISH:

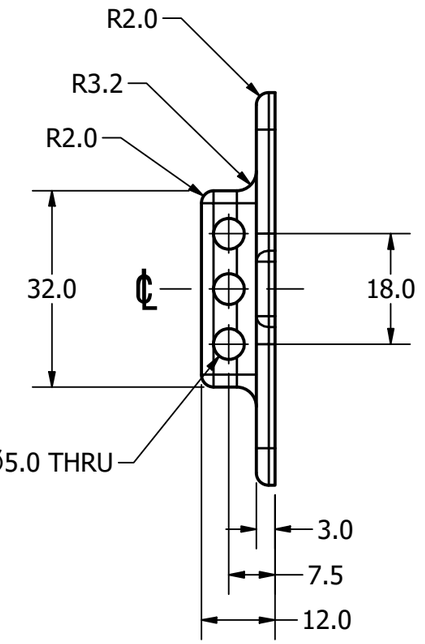
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-4546 | REV: 1
SCALE: 1:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	SR	JW	10/7/2021







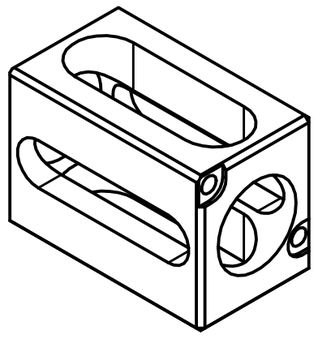
NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

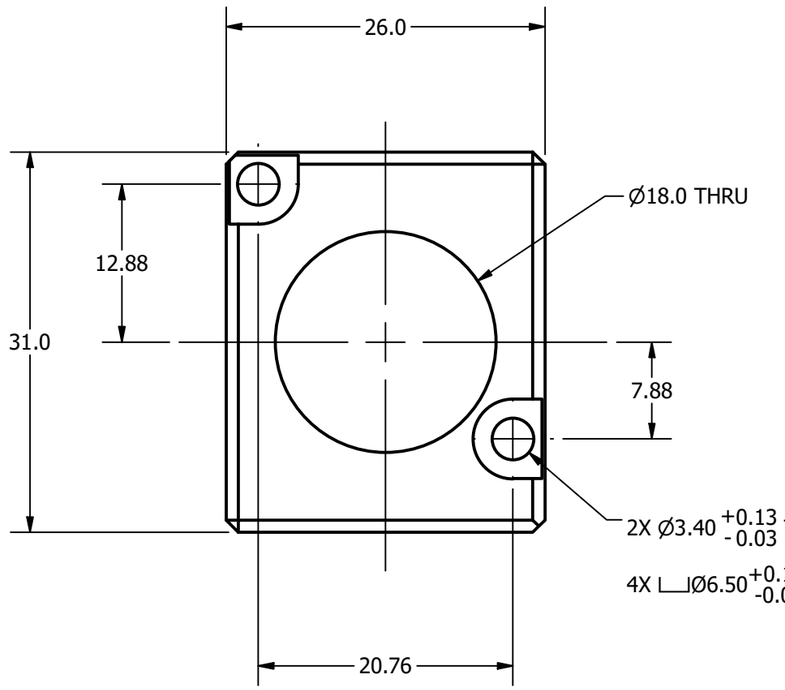
PROTOTYPE DRAWING

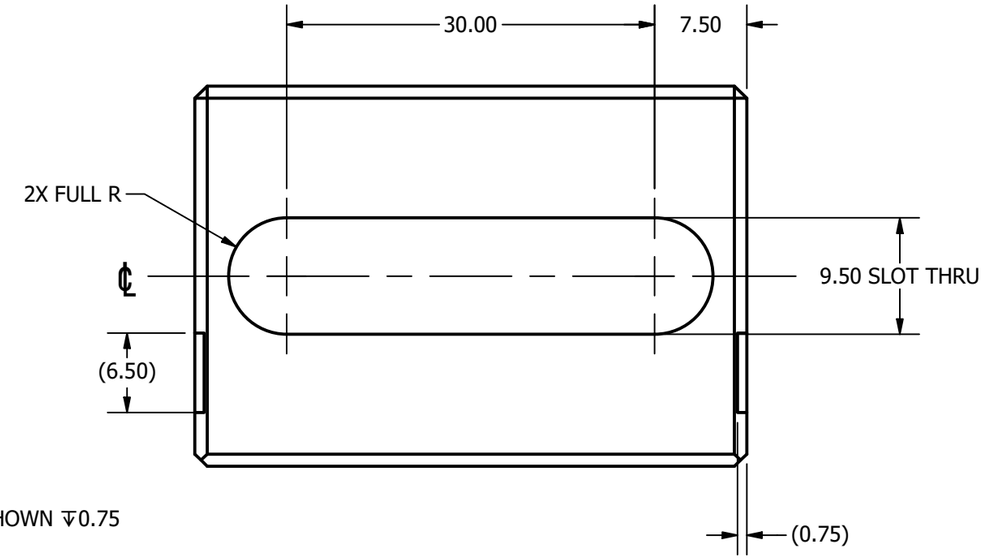
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	PLATE, COCCYX MOUNT THOR-05F
MATERIAL: 7075-T6 ALUMINUM	DRAWN: disopi 4/1/2016	
HEAT TREAT: N/A	CHECKED:	SIZE: A3 DRAWING NUMBER: 474-4543 REV: 2
FINISH: CLEAR ANODIZE	ENG: JW 4/18/2016	THIRD ANGLE PROJECTION
	APPROVED:	SCALE: 1 : 1 SHEET: 1 OF 1

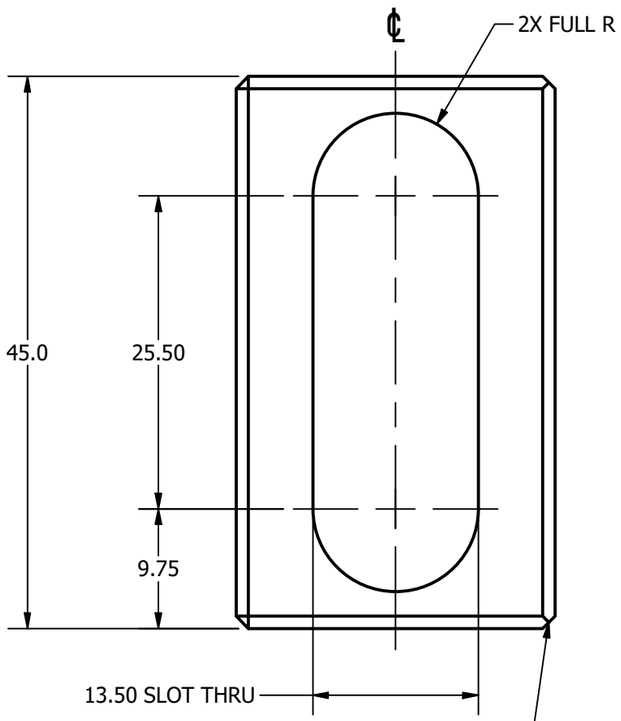
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	GCH		5/5/2016



SCALE 1 : 1







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED
2. MASS = 106 grams ± 8.5 grams

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DAS STRUCTURAL REPLACEMENT (6 BRIDGE)

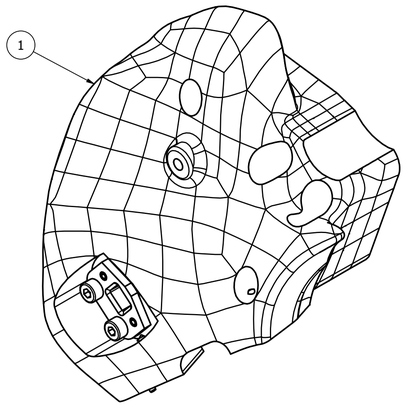
APPROVALS	DATE
DRAWN: B. KIMES	3/30/2016
CHECKED	
ENG	
APPROVED	

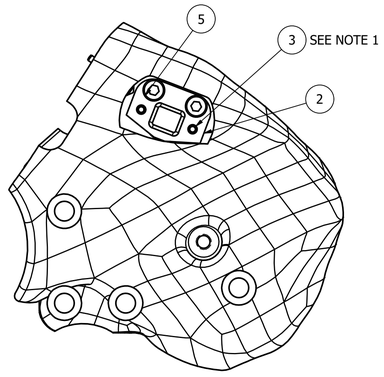
MATERIAL: 1018 STEEL
HEAT TREAT:
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

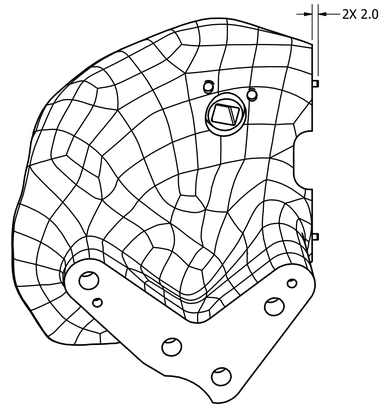
THIRD ANGLE PROJECTION

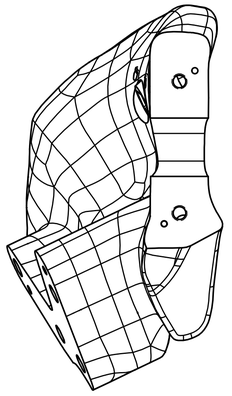
SIZE: A3 | DRAWING NUMBER: 474-8206 | REV: 2
SCALE: 2 : 1 | SHEET: 1 OF 1

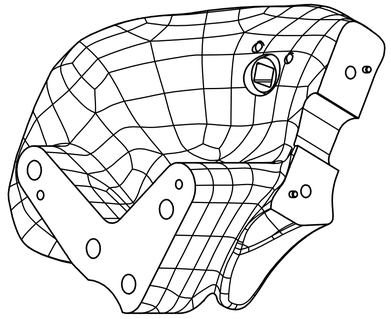
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	DJI	3/29/2023

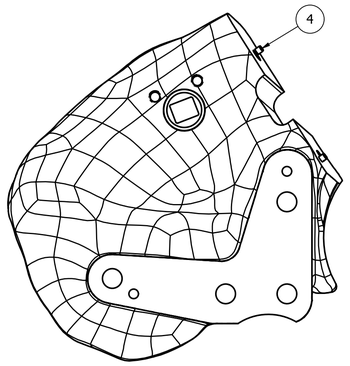


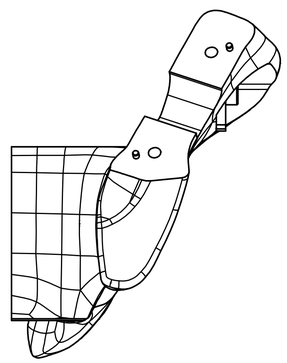












ITEM	QTY	PART NUMBER	DESCRIPTION
5	2	5000152	M4 X 0.7 X 12 LG. SHCS
4	2	5001380	M2 X 5 LG. DOWEL PIN
3	2	5000196	M3 X 14 LG. ROLL PIN SS
2	1	474-4549-A	H-POINT TOOL SOCKET
1	1	474-4538-1-A	ILIAC WING, MACHINED, LEFT

PARTS LIST

NOTES:

1. ASSEMBLE ROLL PIN 5000196 INTO 474-4549-A THEN ENGAGE PINS INTO HOLES ON ILLIAC WING. AFTER PINS ARE ENGAGED INTO HOLES, PRESS FIT 474-4549-A FLUSH TO SURFACE.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMALS: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED VC ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	3/29/2023
CHECKED:	
ENG: DJI	
APPROVED:	

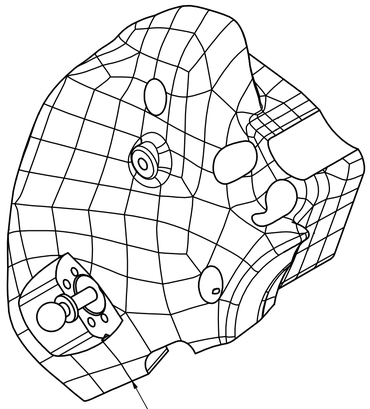
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

ILIAC WING, ASSY, LEFT
THOR-05F

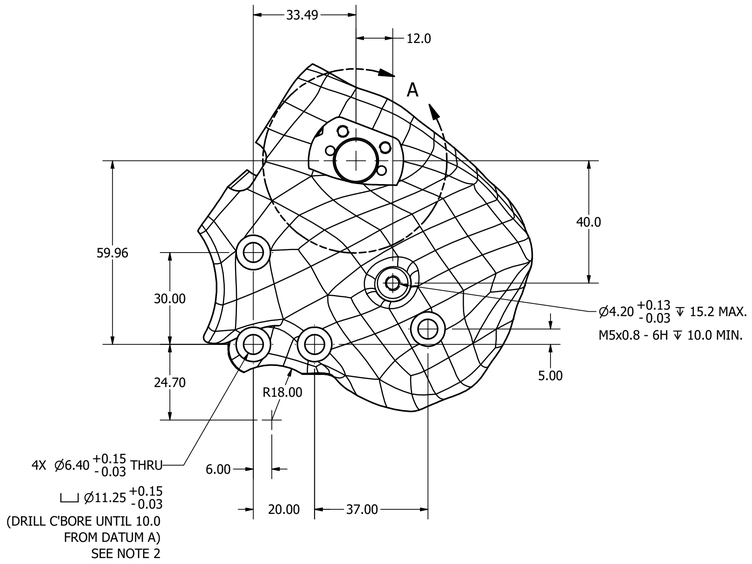
THIRD ANGLE PROJECTION

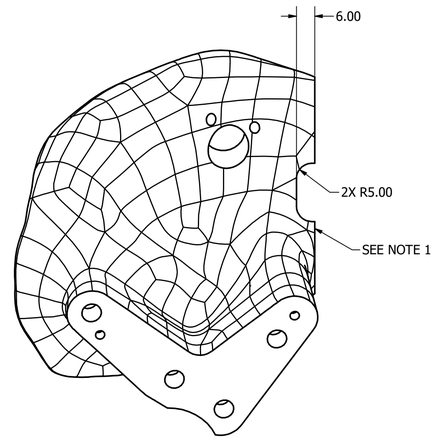
SIZE: A1 | DRAWING NUMBER: 474-4540-1-A | REV: 1
SCALE: 1 : 1 | SHEET: 1 OF 1

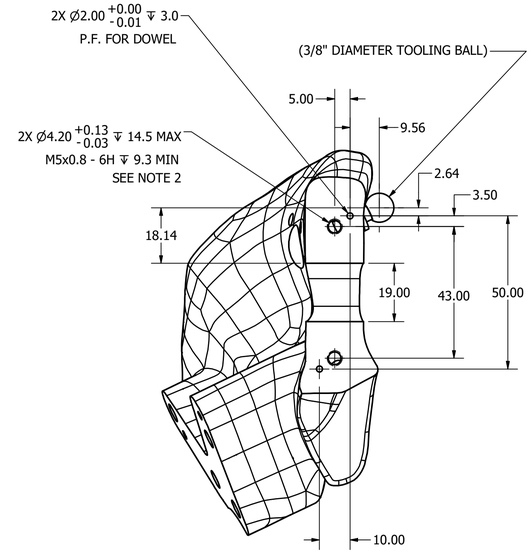
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	DJI	3/29/2023

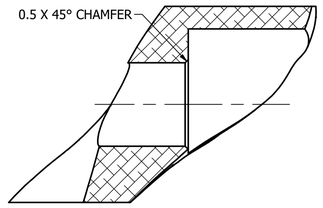


REFER TO DRA IN 474-0000 SHT. 7
FOR THE REFERENCE SHAPE AND
INFORMATION.

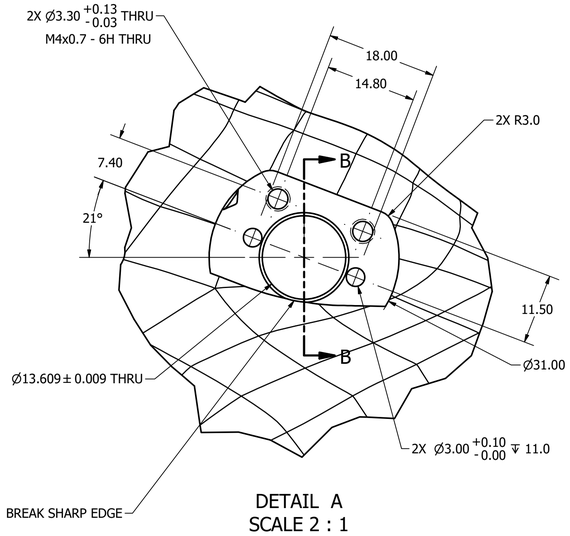




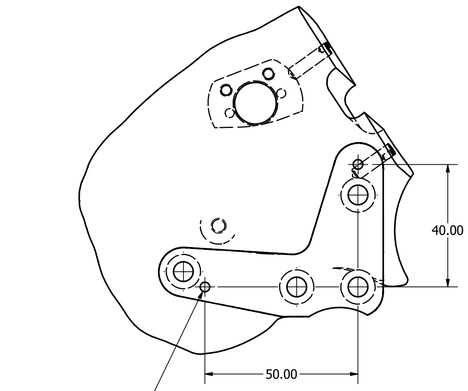


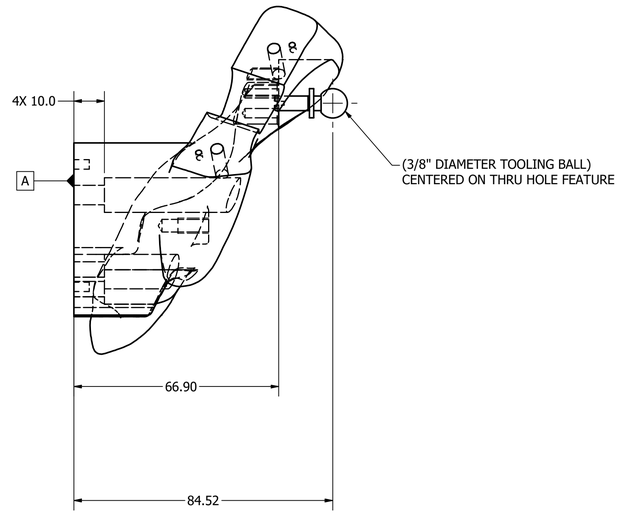


SECTION B-B
SCALE 2 : 1



DETAIL A
SCALE 2 : 1





NOTES:

1. SEE SHEET 2 FOR COMPOUND ANGLE SETUP.
2. PLUG HOLES BEFORE ANODIZE.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.3, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	3/29/2023
CHECKED:	
ENG: DJI	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

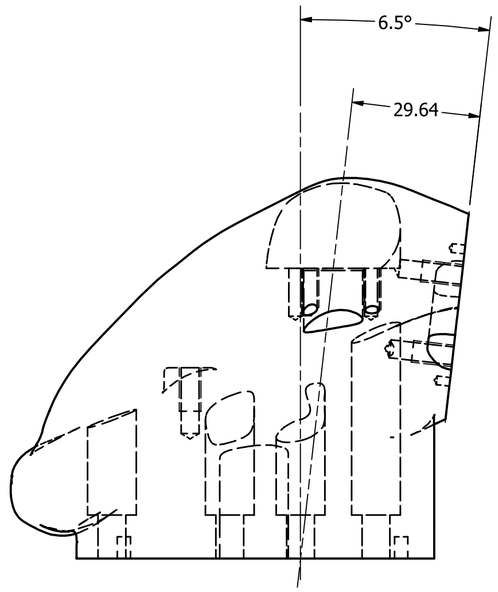
ILIAC WING, MACHINED, LEFT

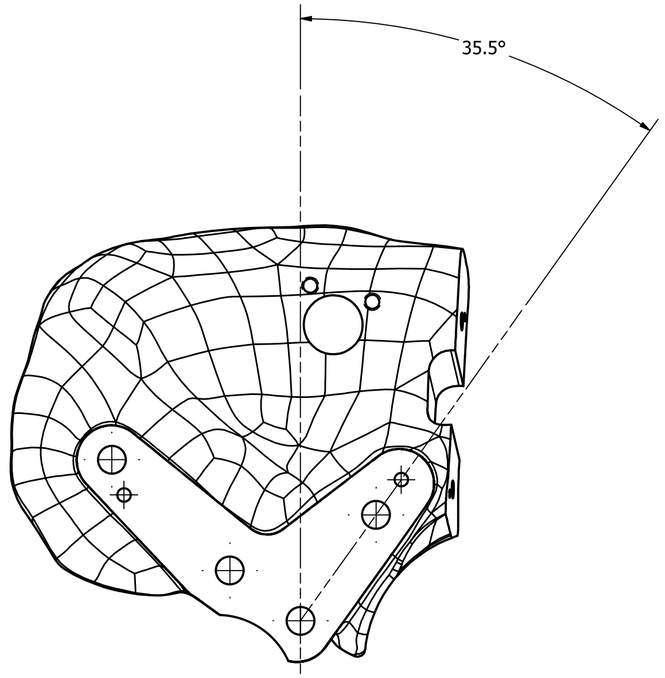
THOR-05F

THIRD ANGLE PROJECTION

SIZE: A1 | DRAWING NUMBER: 474-4538-1-A | REV: 1

SCALE: 1 : 1 | SHEET: 1 OF 2





FOR COMPOUND SETUP

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	3/29/2023
CHECKED:	
ENG: DJI	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

ILIAC WING, MACHINED, LEFT

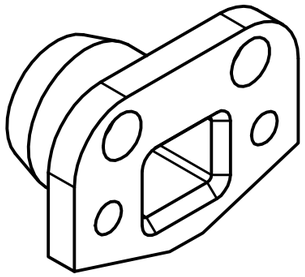
THOR-05F

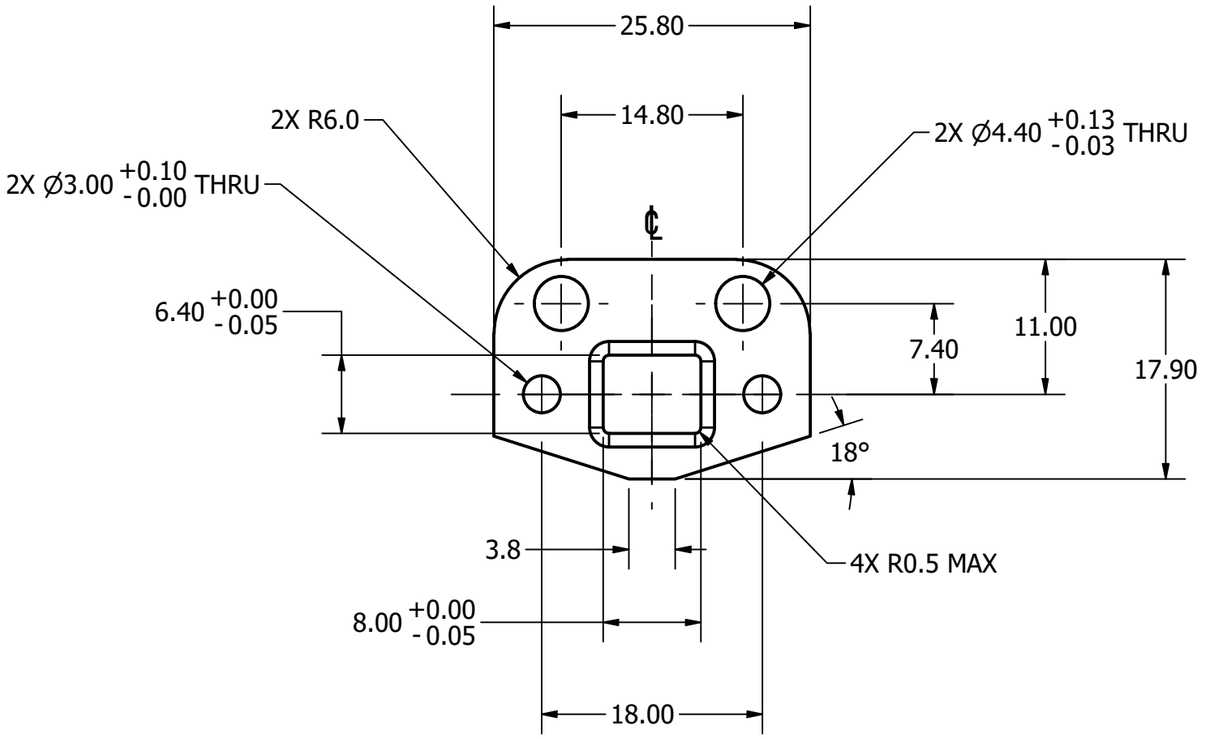
THIRD ANGLE PROJECTION

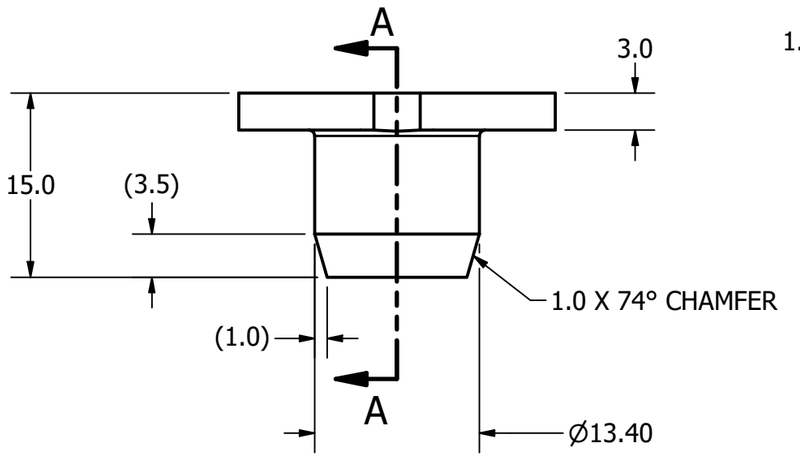
SIZE: A2 | DRAWING NUMBER: 474-4538-1-A | REV: 1

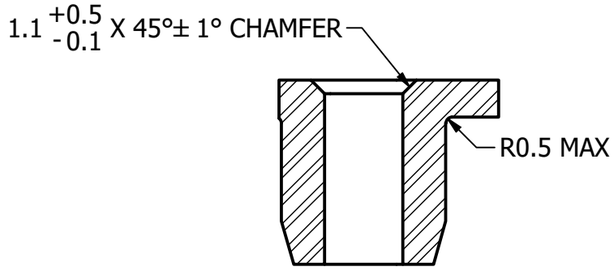
SCALE: 1 : 1 | SHEET: 2 OF 2

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	DJI	3/10/2023









SECTION A-A

NOTES:

1. DIMMESIONS SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED √C | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 440C STAINLESS STEEL
HEAT TREAT: Rc 50-55
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	3/10/2023
CHECKED	
ENG	
APPROVED	

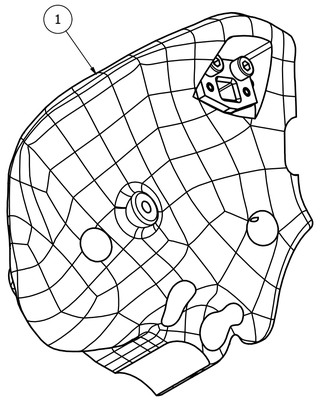
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

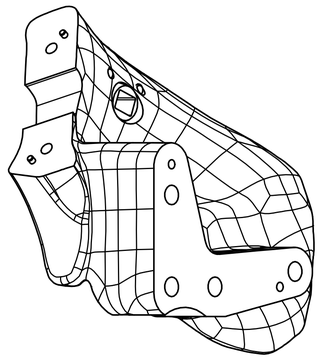
H-POINT TOOL SOCKET
THOR-05F

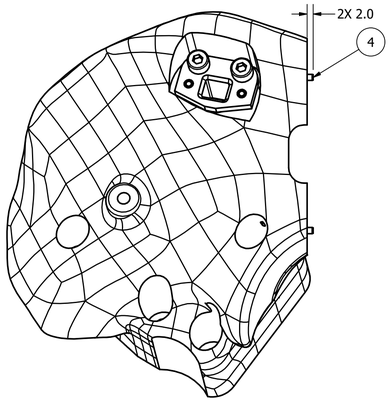
THIRD ANGLE PROJECTION

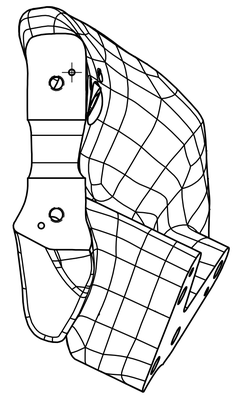
SIZE: A3 | DRAWING NUMBER: 474-4549-A | REV: 1
SCALE: 2 : 1 | SHEET: 1 OF 1

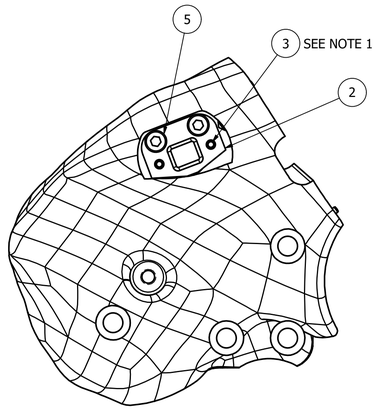
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	DJI	3/29/2023

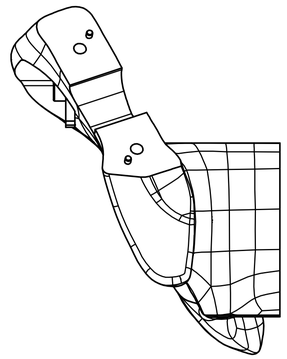












ITEM	QTY	PART NUMBER	DESCRIPTION
5	2	5000152	M4 X 0.7 X 12 LG. SHCS
4	2	5001380	M2 X 5 LG. DOWEL PIN
3	2	5000196	M3 X 14 LG. ROLL PIN SS
2	1	474-4549-A	H-POINT TOOL SOCKET
1	1	474-4538-2-A	ILIAC WING, MACHINED, RIGHT

PARTS LIST

NOTES:

1. ASSEMBLE ROLL PIN 5000196 INTO 474-4549-A THEN ENGAGE PINS INTO HOLES ON ILLIAC WING. AFTER PINS ARE ENGAGED INTO HOLES, PRESS FIT 474-4549-A FLUSH TO SURFACE.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	B. KIMES	3/29/2023
MATERIAL		
CHECKED		
HEAT TREAT	N/A	
ENG	DJI	
FINISH	N/A	
APPROVED		

ILIAC WING, ASSY, RIGHT

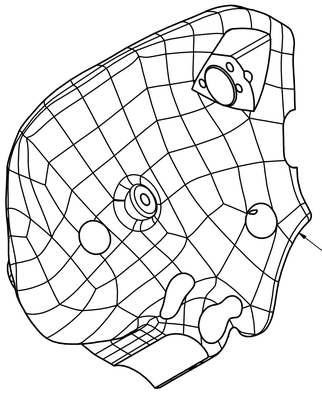
THOR-05F

THIRD ANGLE PROJECTION

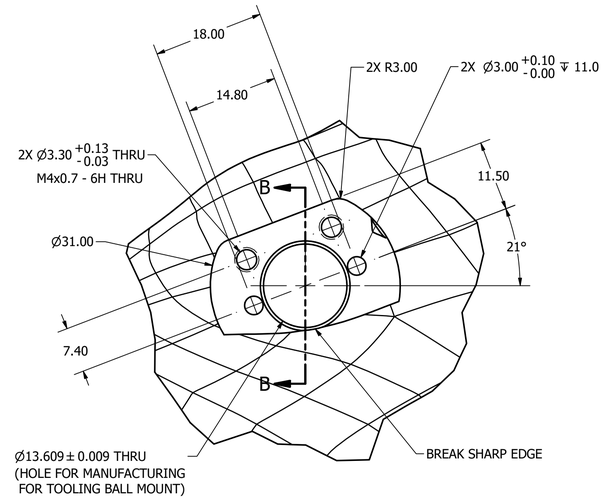
SIZE A1 | DRAWING NUMBER 474-4540-2-A | REV 1

SCALE: 1 : 1 | SHEET 1 OF 1

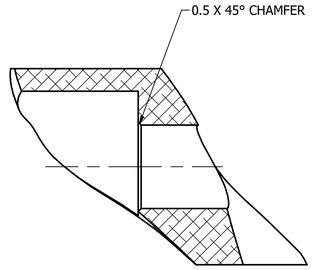
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	DJI	3/29/2023



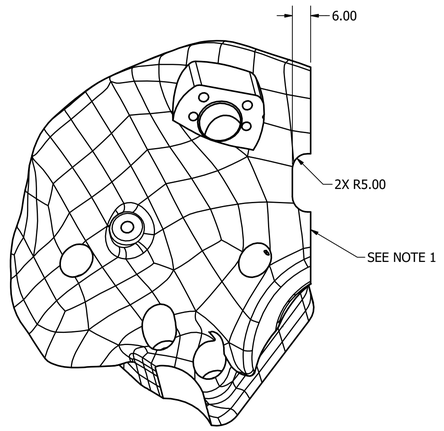
REFER TO DRA IN 474-0000 SHT. 7 FOR THE REFERENCE SHAPE AND INFORMATION.

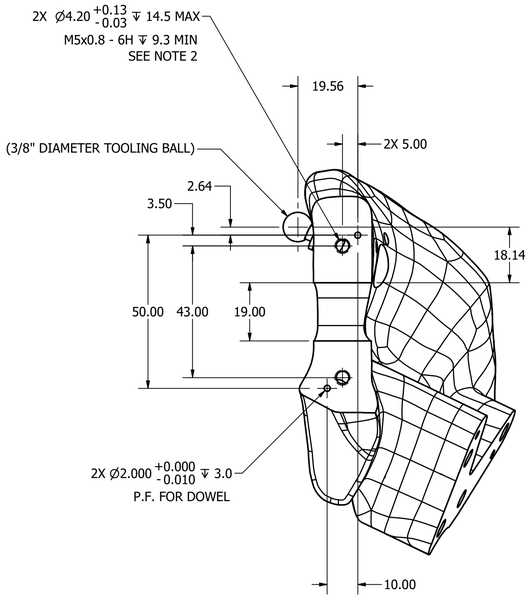


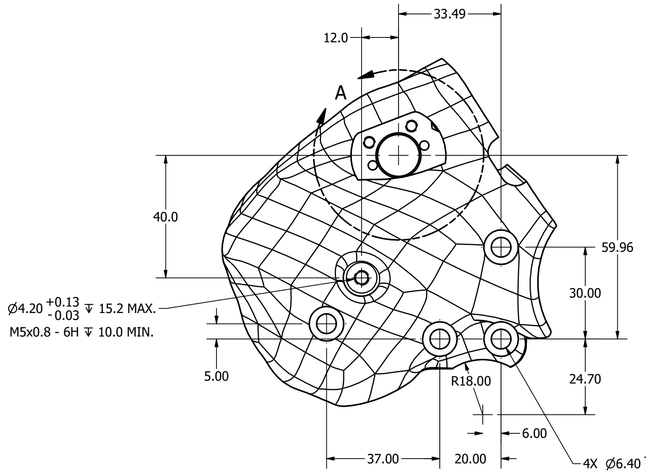
DETAIL A
SCALE 2 : 1

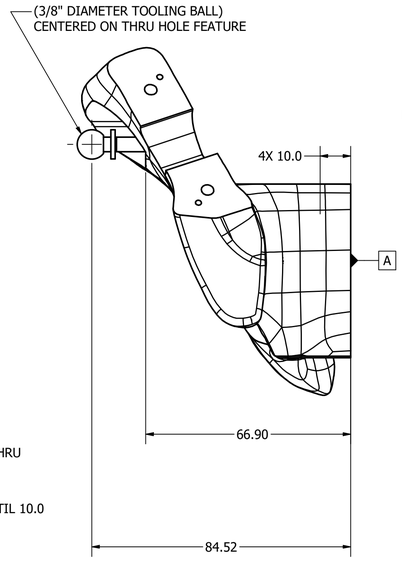


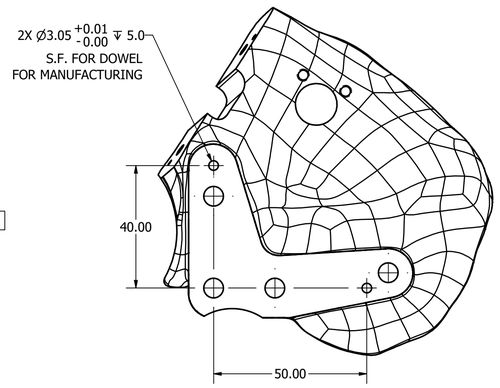
SECTION B-B
SCALE 2 : 1









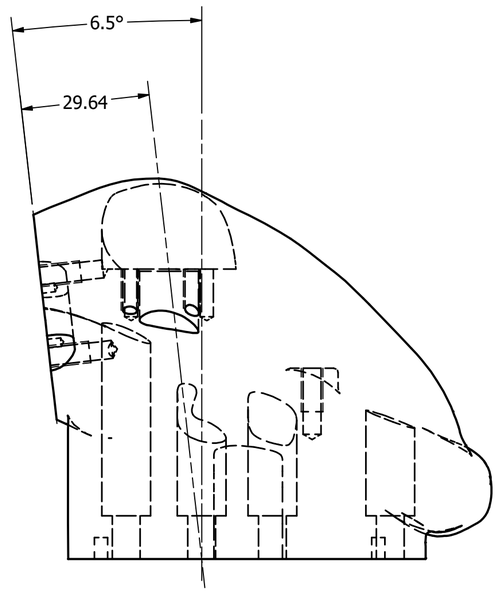


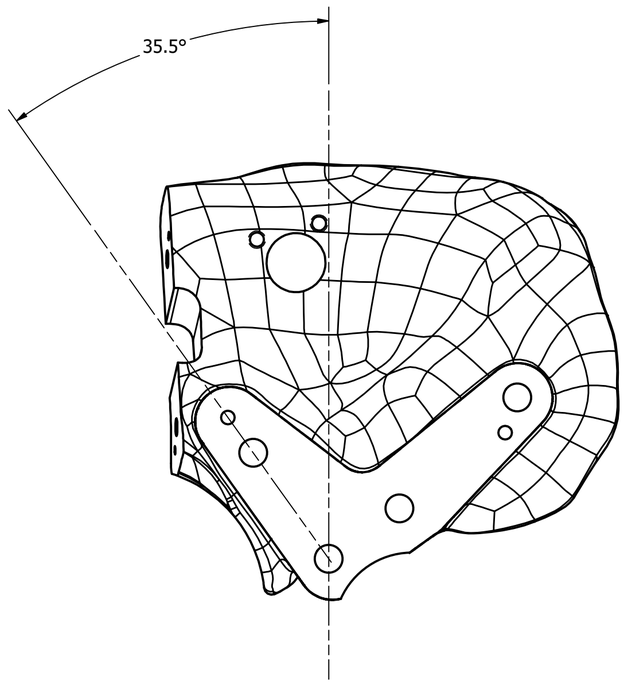
NOTES:

1. SEE SHEET 2 FOR COMPOUND ANGLE SETUP.
2. PLUG HOLES BEFORE ANODIZE.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMALS X ±.5, X.X ±.2, X.XX ±.1 / MACHINED ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	ILIAC WING, MACHINED, RIGHT THOR-05F
MATERIAL: 7075-T6 ALUMINUM	DRAWN: B. KIMES 3/29/2023	SIZE: A1 DRAWING NUMBER: 474-4538-2-A REV: 1
HEAT TREAT: N/A	CHECKED	
FINISH: CLEAR ANODIZE	ENG: DJI	SCALE: 1 : 1 SHEET: 1 OF 2
THIRD ANGLE PROJECTION	APPROVED	





FOR COMPOUND SETUP

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	3/29/2023
CHECKED	
ENG: DJI	
APPROVED	

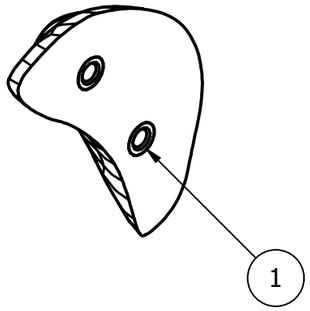
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

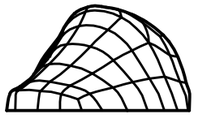
ILIAC WING, MACHINED, RIGHT
THOR-05F

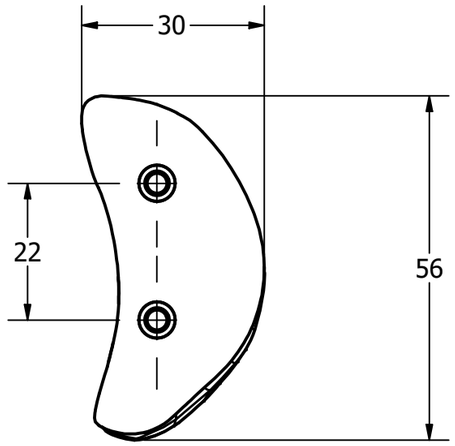
THIRD ANGLE PROJECTION

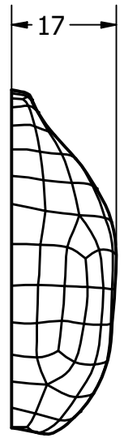
SIZE: A2 | DRAWING NUMBER: 474-4538-2-A | REV: 1
SCALE: 1 : 1 | SHEET: 2 OF 2

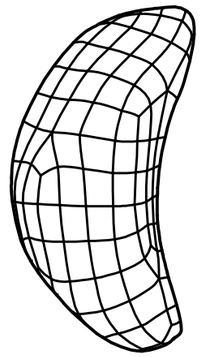
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	GCH	JW	11/6/17











1	2	5001283	INSERT, M4 X 0.7, BRASS
ITEM	QTY	PART NUMBER	DESCRIPTION

PARTS LIST

NOTES:

1. MATERIAL: POLYURETHANE
   COLOR: EURO BROWN
   DUROMETER: 70±5 SHORE "D"
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-2% BUT NO SMALLER THAN 0.5mm
4. NO SPLIT OR DEFECTS ARE ALLOWED IN THE URETHANE MOLDING

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN ghayden	11/6/2017
CHECKED	
ENG	
APPROVED	

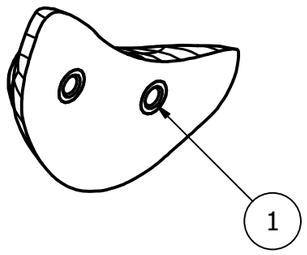
MATERIAL: SEE NOTE #1
HEAT TREAT:
FINISH:

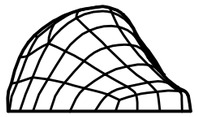
ISCHIUM BONE, MOLDED, LEFT

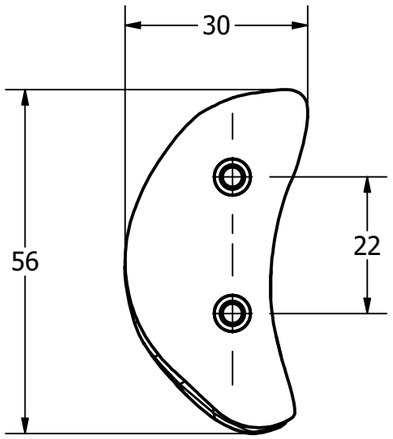
THIRD ANGLE PROJECTION

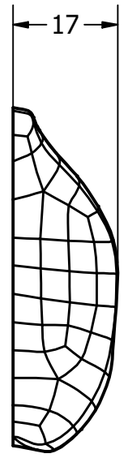
SIZE A3 | DRAWING NUMBER 474-4545-1 | REV 1
SCALE: 1:1 | SHEET 1 OF 1

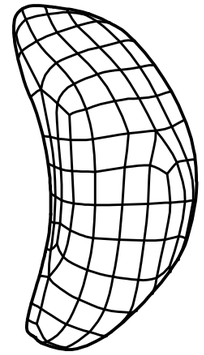
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	GCH	JW	11/6/2017











1	2	5001283	INSERT, M4 X 0.7, BRASS
ITEM	QTY	PART NUMBER	DESCRIPTION

PARTS LIST

NOTES:

1. MATERIAL: POLYURETHANE
   COLOR: EURO BROWN
   DUROMETER: 70±5 SHORE "D"

2. REMOVE ALL MOLD FLASHING

3. ALL MOLD DIMENSION TOLERANCE +1%/-2% BUT NO SMALLER THAN 0.5mm

4. NO SPLIT OR DEFECTS ARE ALLOWED IN THE URETHANE MOLDING

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN ghayden	11/6/2017
CHECKED	
ENG	
APPROVED	

MATERIAL: SEE NOTE #1
HEAT TREAT:
FINISH:

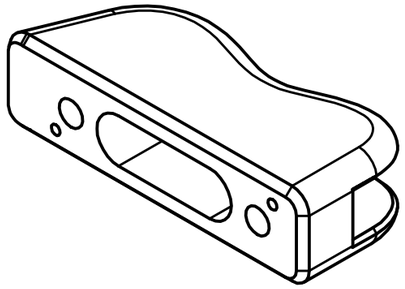
ISCHIUM BONE, MOLDED, RIGHT

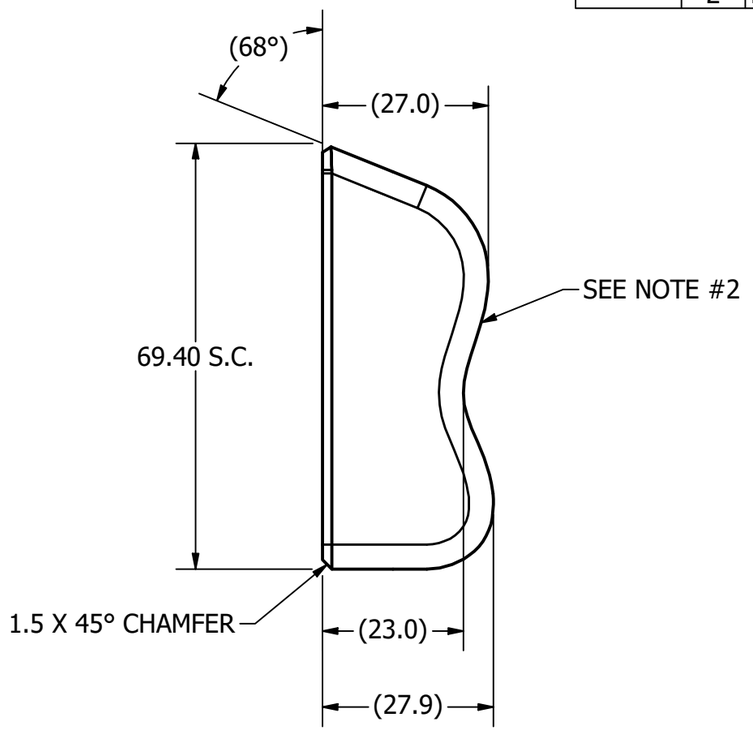
THIRD ANGLE PROJECTION

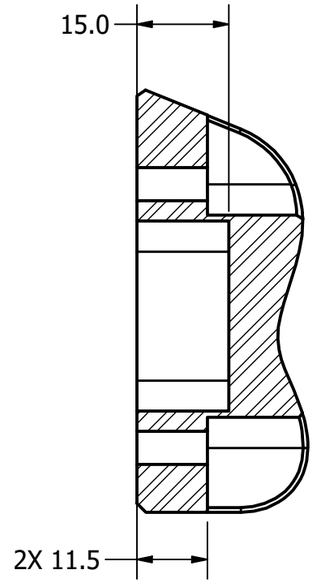
SIZE: A3 | DRAWING NUMBER: 474-4545-2 | REV: 1

SCALE: 1:1 | SHEET: 1 OF 1

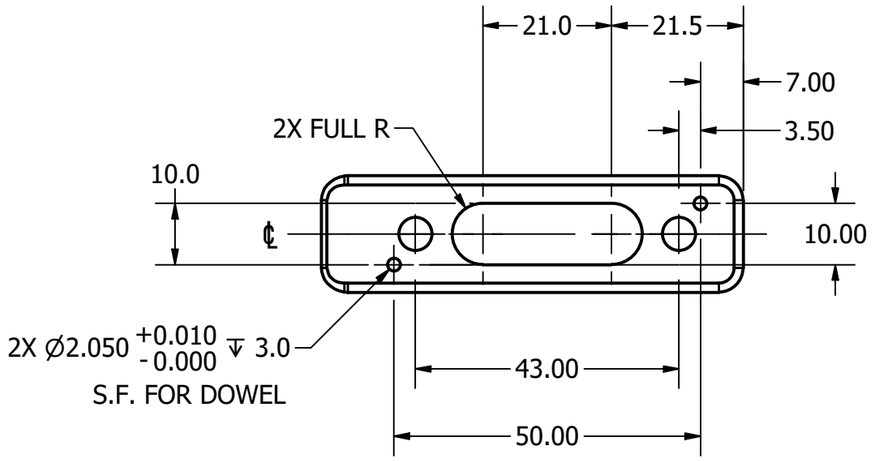
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	SR	JW	10/7/2021

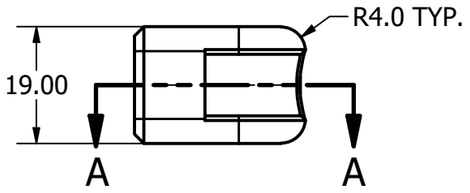


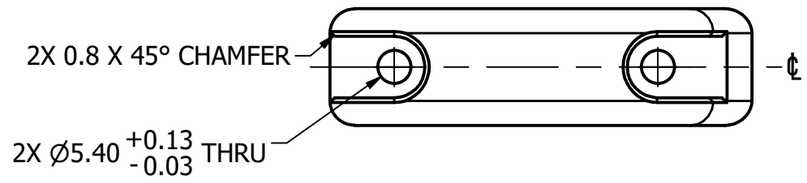




SECTION A-A







10.00 +0.13 -0.03 AS SHOWN

⊽ AS SHOWN IN A-A

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE SPECIFIED.

2. REFER TO DRA IN 474-0000 SHT. 7 FOR THE REFERENCE SHAPE AND INFORMATION.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN ghayden	4/4/2016
CHECKED	
ENG JW	9/4/2016
APPROVED	

MATERIAL: 1018 STEEL
HEAT TREAT: N/A
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

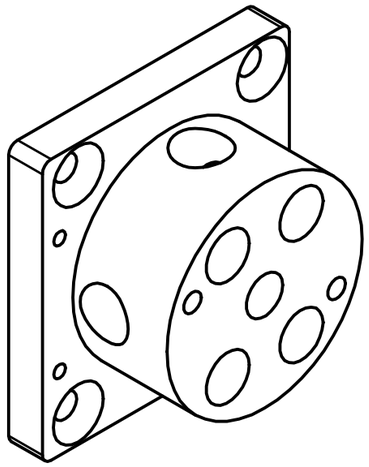
STRUCTURAL REPLACEMENT, ASIS LOAD CELL
THOR-05F

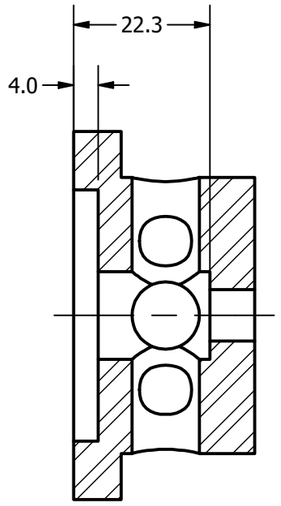
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-4547 | REV: 2

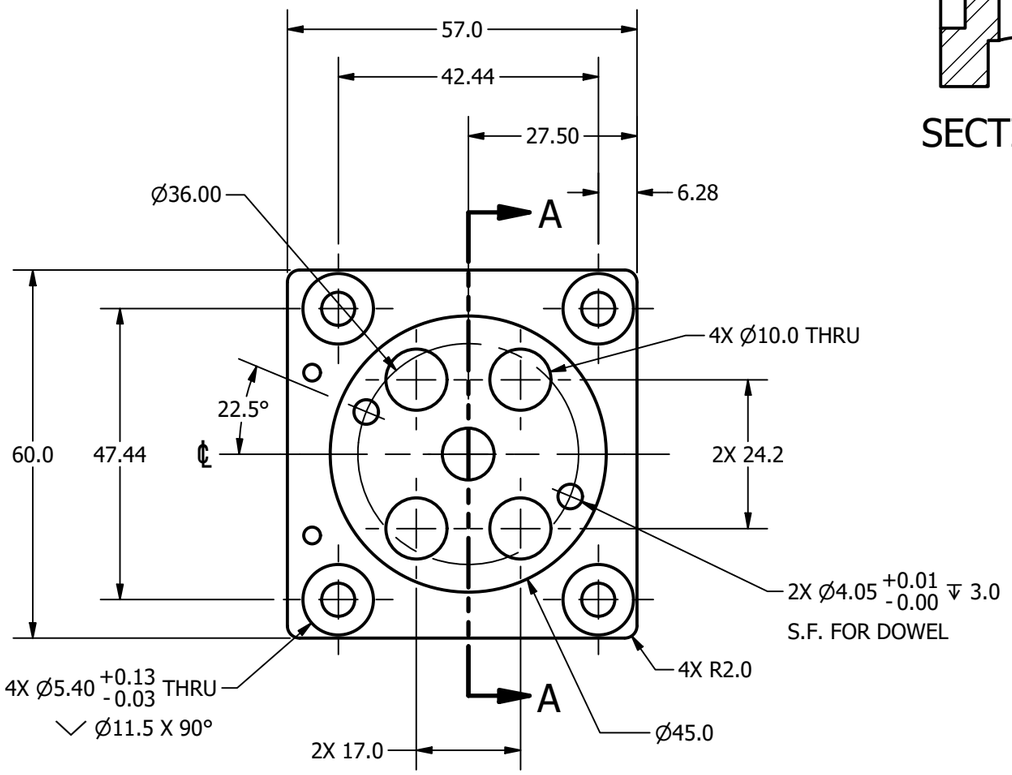
SCALE: 1 : 1 | SHEET: 1 OF 1

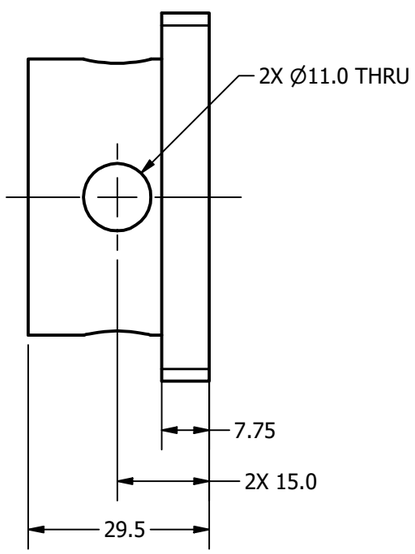
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	SR	DJI	10/6/2021

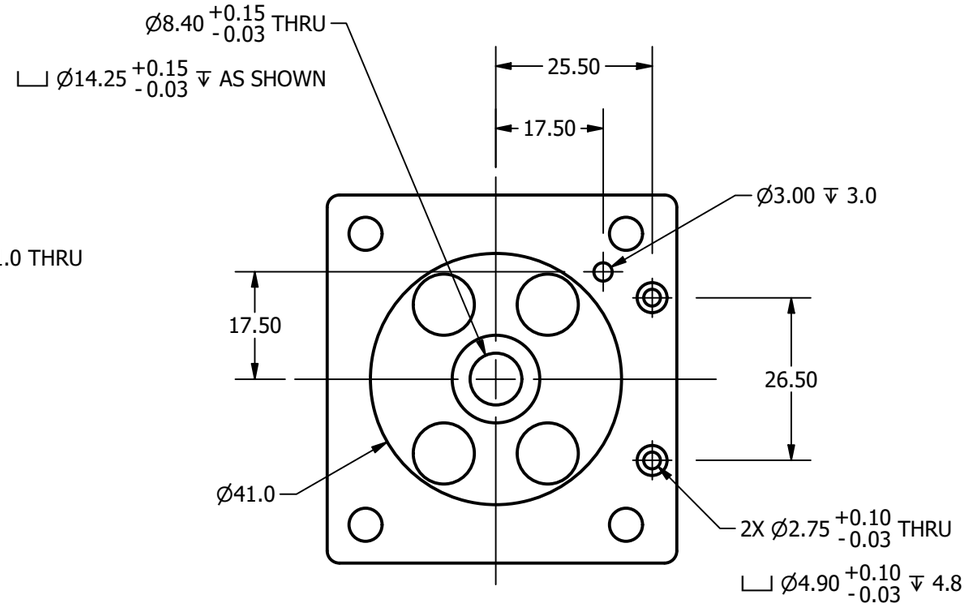




SECTION A-A







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	3/31/2016
CHECKED	
ENG JW	3/30/2016
APPROVED	

MATERIAL: 1018 STEEL
HEAT TREAT: N/A
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

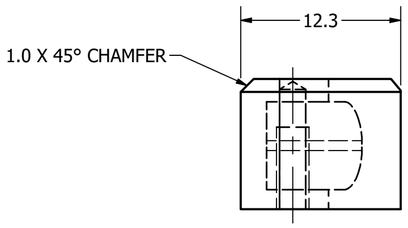
STRUCTURAL REPLACEMENT, RIGHT ACETABULAR LOAD CELL
THOR-05F

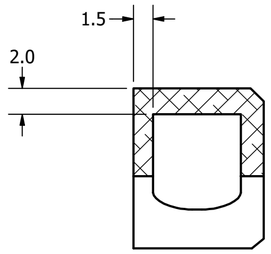
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A3	474-4002-2	2

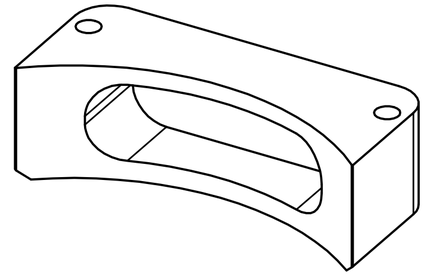
SCALE: 1 : 1
SHEET 1 OF 1

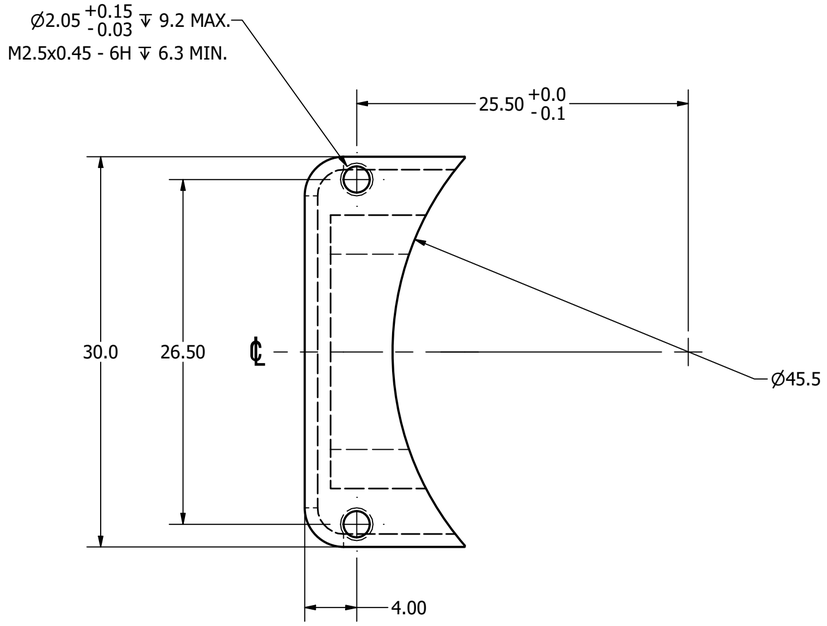
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	SR	DJI	10/6/2021

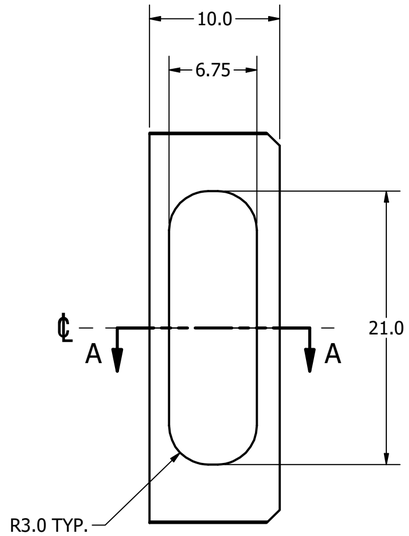




SECTION A-A







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	4/4/2016
CHECKED:	
ENG: JW	3/31/2016
APPROVED:	

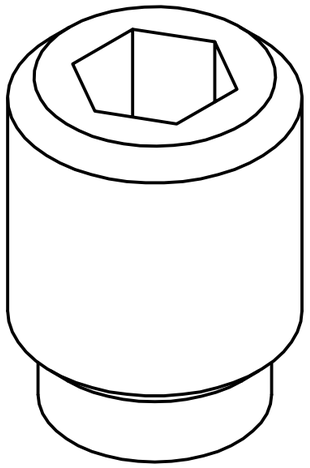
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

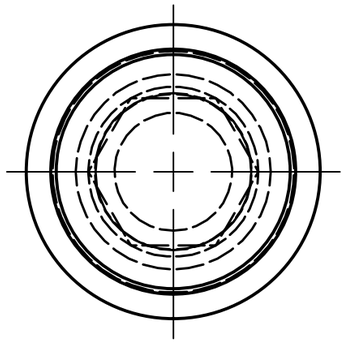
STRUCTURAL REPLACEMENT, ACETABULUM LOAD CELL STRAIN RELIEF
THOR-05F

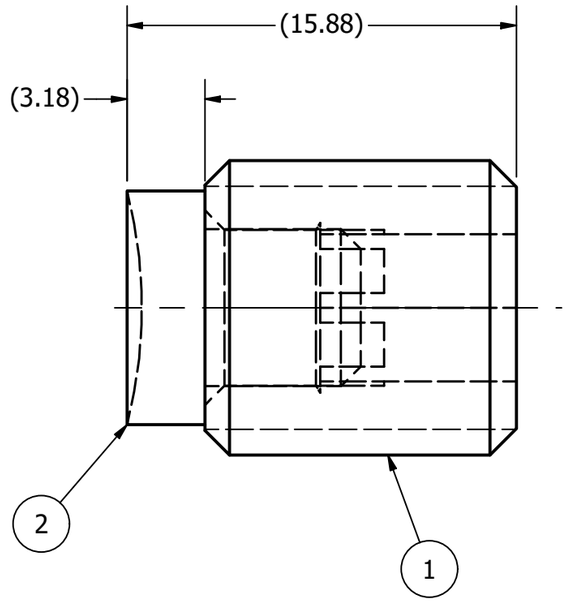
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-4007 | REV: 2
SCALE: 3 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	JPM		1/10/18







ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	474-4316	FRICTION INSERT
1	1	474-4317	PELVIC PLUNGER SET SCREW, MODIFIED

PARTS LIST

NOTES:

1. BOND ITEM 2 TO ITEM 1.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PELVIC PLUNGER ASSEMBLY

	APPROVALS	DATE
DRAWN	J. MCINNIS	11/29/2017
CHECKED		
ENG		
APPROVED		

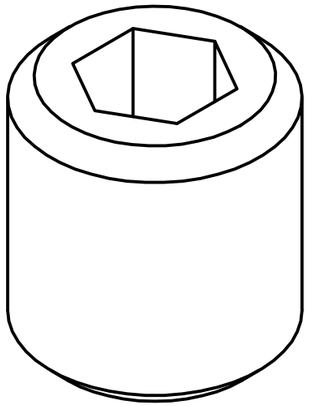
MATERIAL
HEAT TREAT
FINISH

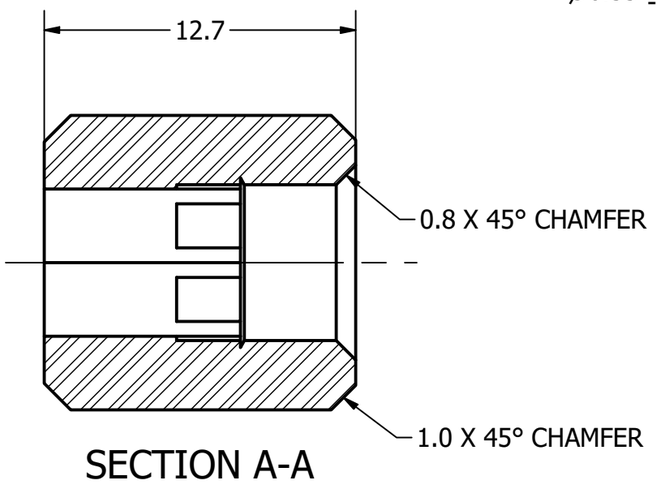
THIRD ANGLE PROJECTION

SIZE A3 | DRAWING NUMBER 474-4315 | REV 2

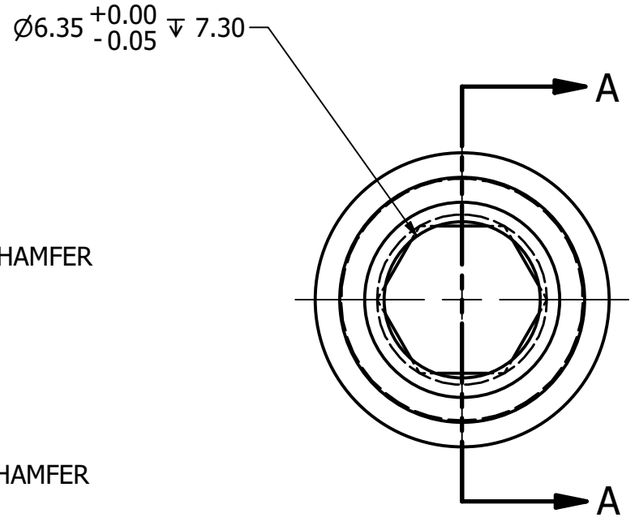
SCALE: 4 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	JPM		1/10/18





SECTION A-A



NOTES:

1. MODIFY PART #5001499 AS SHOWN.
   (M12 X 1.75 X 16LG SSSCP)

2. ANNEAL AND BLACK ZINC AFTER MODIFICATIONS.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN J. MCINNIS	11/27/2017
CHECKED	
ENG	
APPROVED	

MATERIAL: SEE NOTES
HEAT TREAT: SEE NOTES
FINISH: SEE NOTES

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

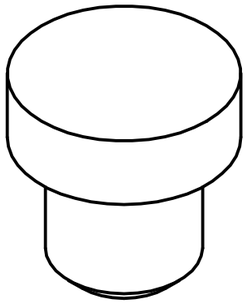
PELVIC PLUNGER SET SCREW, MODIFIED

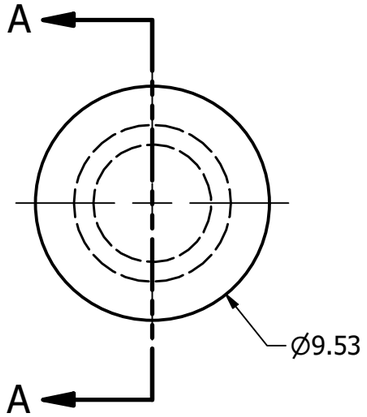
THIRD ANGLE PROJECTION

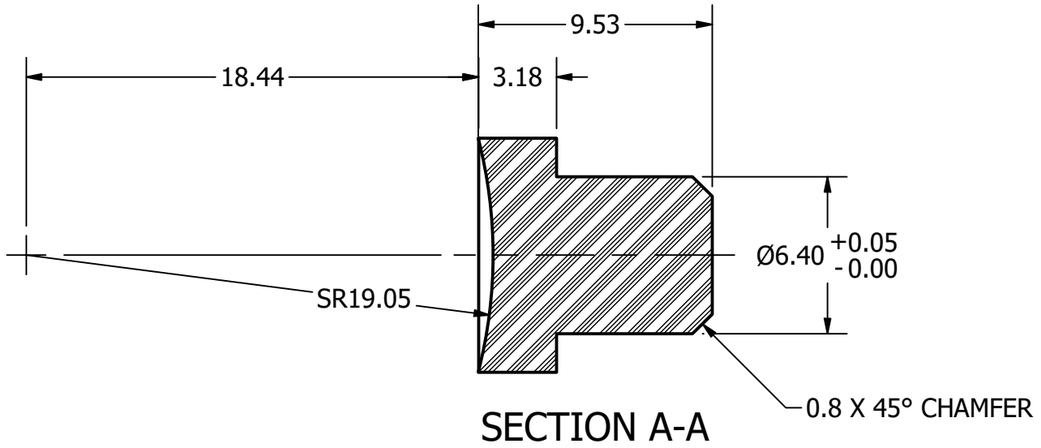
SIZE	DRAWING NUMBER	REV
A3	474-4317	2

SCALE: 4 : 1
SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	JPM		12/14/17





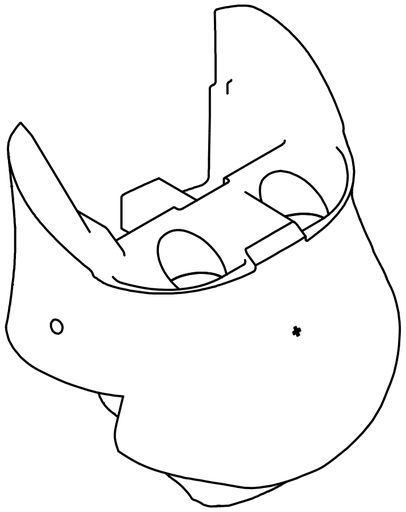


SECTION A-A

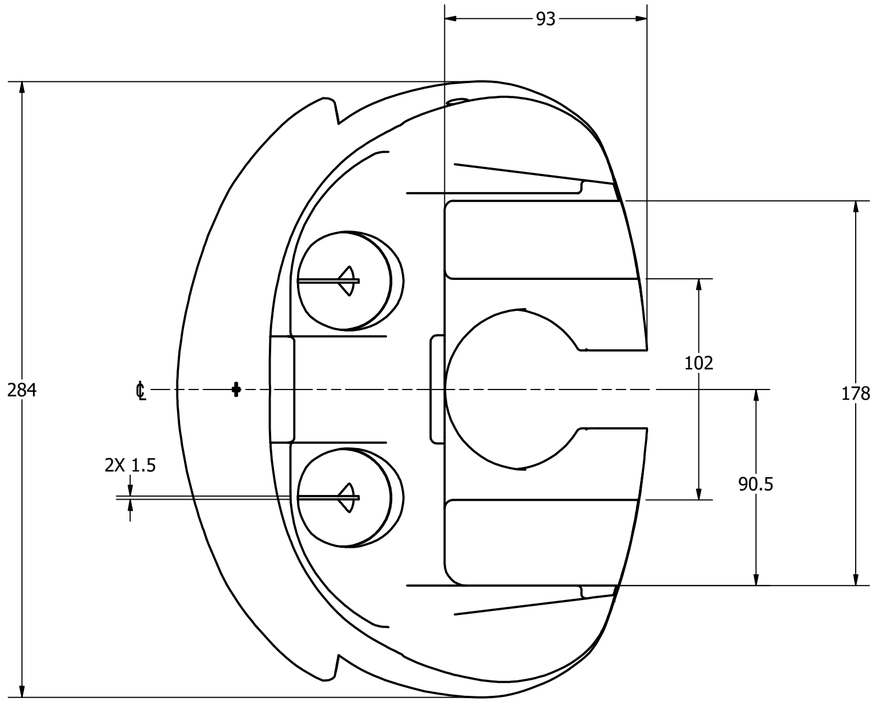
PROTOTYPE DRAWING

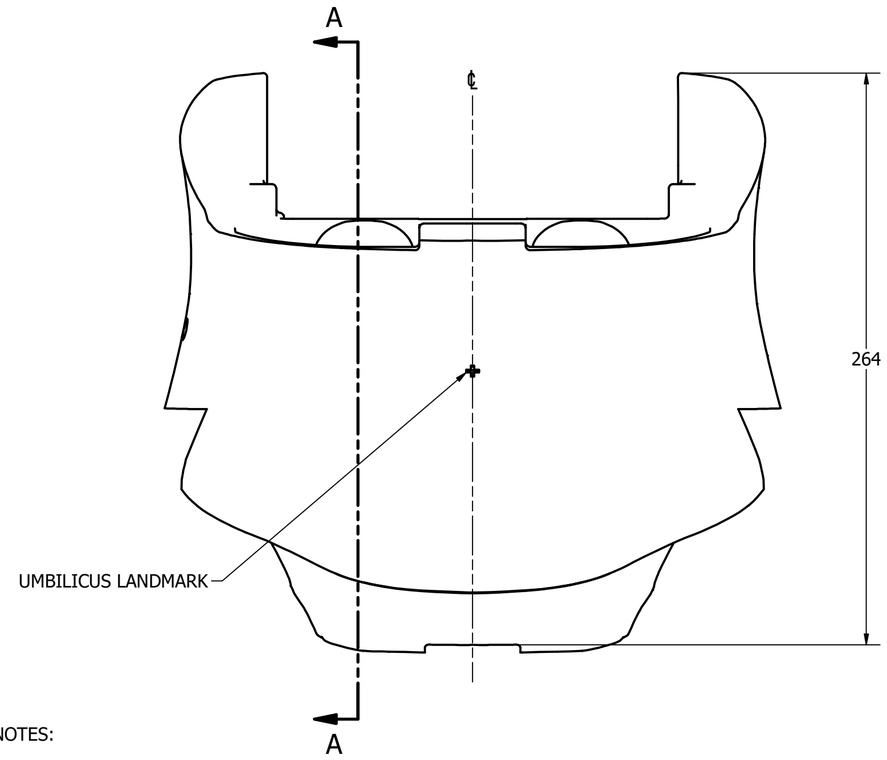
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 MACHINED √, ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	FRICTION INSERT
DRAWN: J. MCINNIS — 12/14/2017		
MATERIAL: ACETAL RESIN, WHITE	CHECKED	THIRD ANGLE PROJECTION
HEAT TREAT	ENG	SIZE: A3 — DRAWING NUMBER: 474-4316 — REV: 1
FINISH	APPROVED	SCALE: 4:1 — SHEET: 1 OF 1

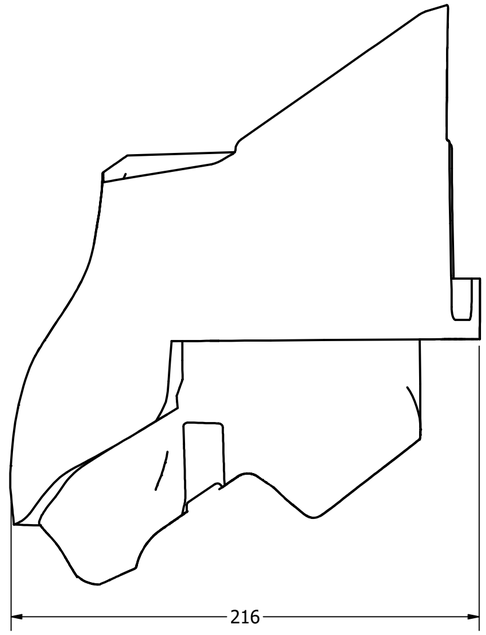
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	BK	HEC	4/21/2023

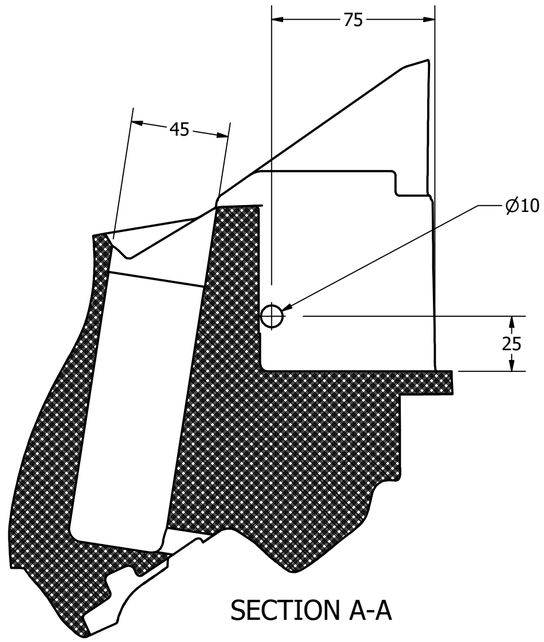


SCALE 1 / 3









SECTION A-A

NOTES:

1. MATERIAL: POLYURETHANE
   COLOR: EURO BROWN
2. REMOVE ALL MOLD FLASHING.
3. ALL MOLD DIMENSION TOLERANCE +1%/-2% BUT NO SMALLER THAN 0.5mm.
4. MASS: 700±30g

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

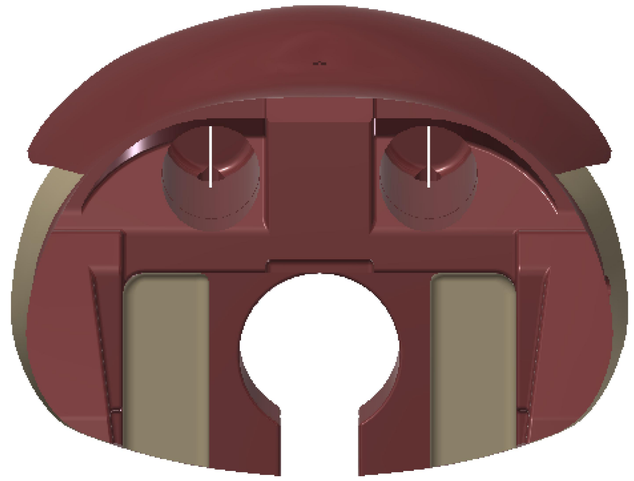
APPROVALS	DATE
DRAWN: B. Kimes	3/28/2019
CHECKED:	
ENG: MJS	3/28/2019
APPROVED:	

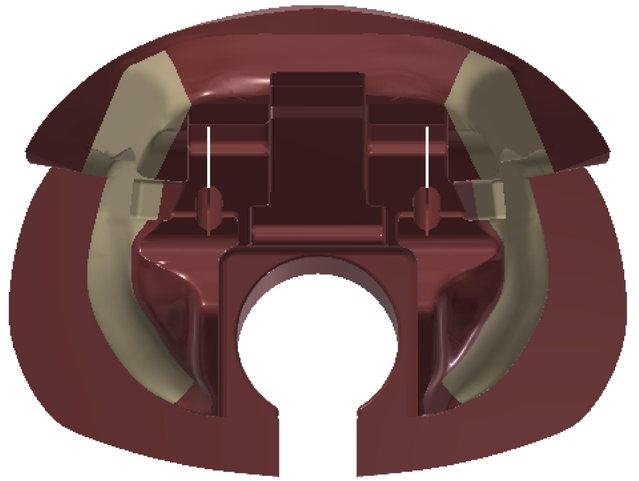
THIRD ANGLE PROJECTION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

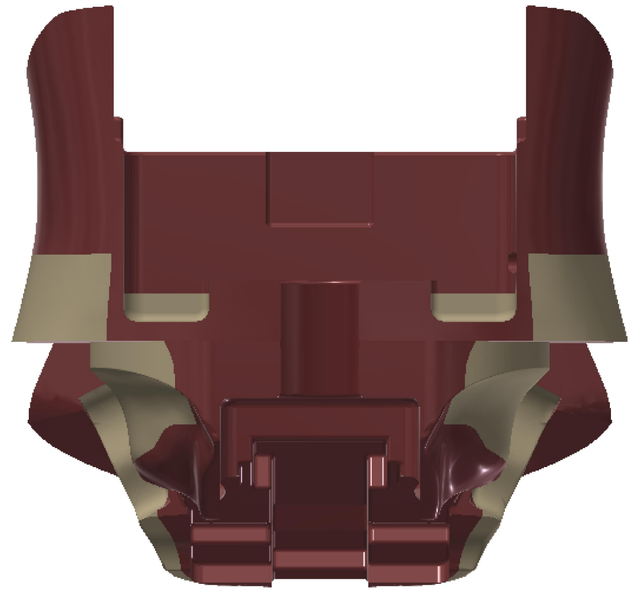
ABDOMEN
THOR-05F

SIZE: A2 | DRAWING NUMBER: 484-4305 | REV: 4
SCALE: .5 : 1 | SHEET: 1 OF 2











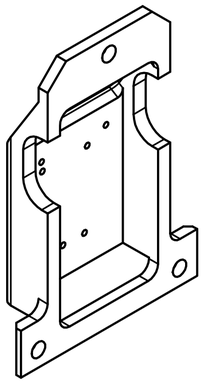
NOTES:

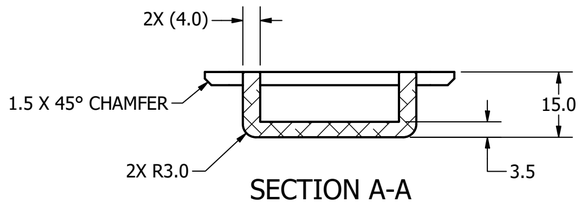
1. THIS SHEET IS FOR REFERENCE ONLY.

PROTOTYPE DRAWING

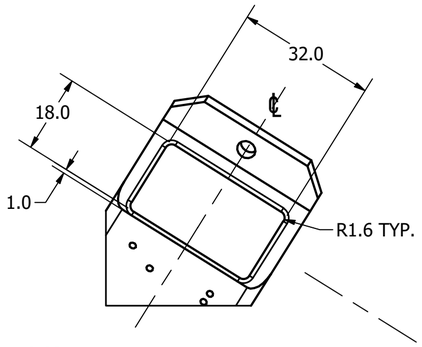
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED ANGLES ±.5°	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ASME Y14.5M - 1994 DO NOT SCALE DRAWING	APPROVALS / DATE	ABDOMEN
MATERIAL: SEE NOTES	DRAWN: B. Kimes 3/28/2019	THOR-05F
HEAT TREAT: N/A	CHECKED	SIZE: A2 · DRAWING NUMBER: 484-4305 · REV: 4
FINISH: N/A	ENG: MJS 3/28/2019	THIRD ANGLE PROJECTION · SCALE: .5 : 1 · SHEET: 2 OF 2
	APPROVED	

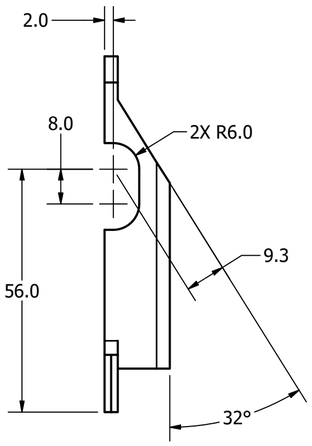
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	BK	MJS	12/6/2023

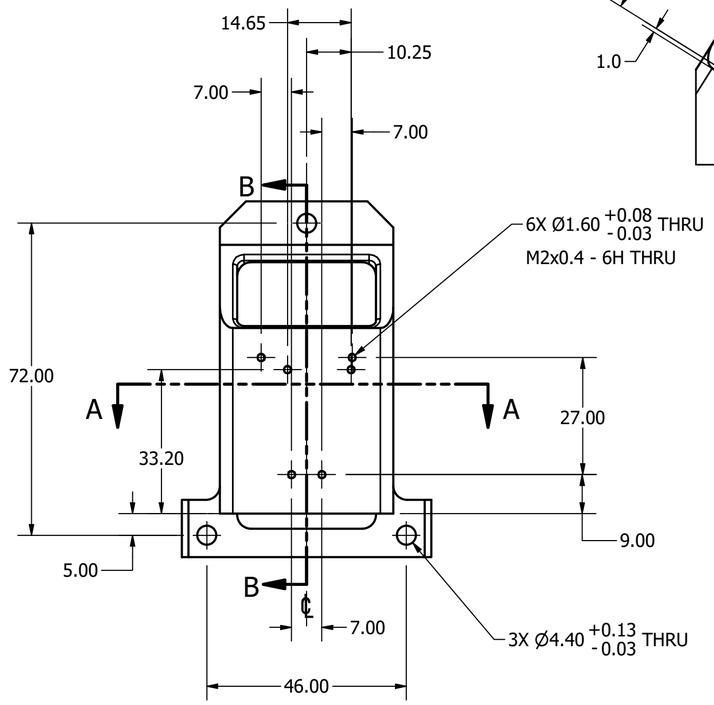


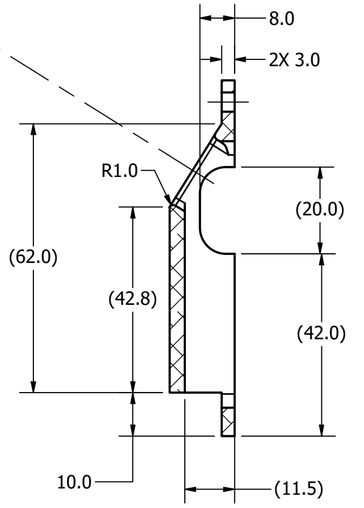


SECTION A-A
SCALE 1 : 1

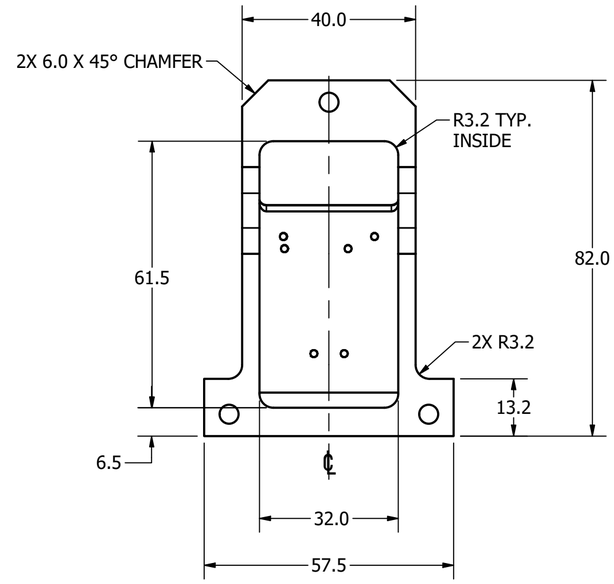








SECTION B-B
SCALE 1 : 1



NOTES:

1. DIMENSIONS ARE SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT:
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

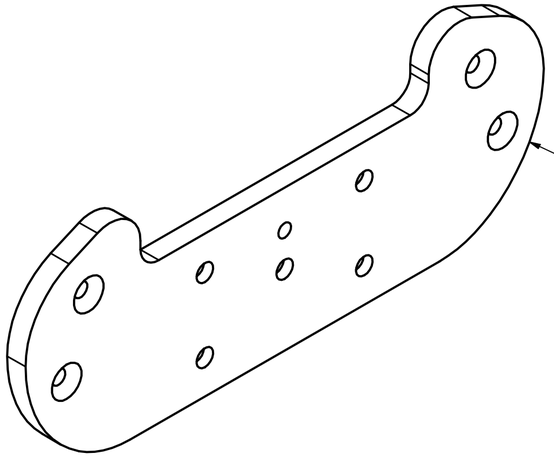
APPROVALS	DATE
DRAWN: skantola	5/11/2020
CHECKED:	
ENG: MJS	5/11/2020
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

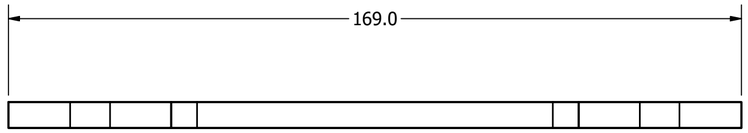
CABLE COVER, PELVIS
THOR-05F

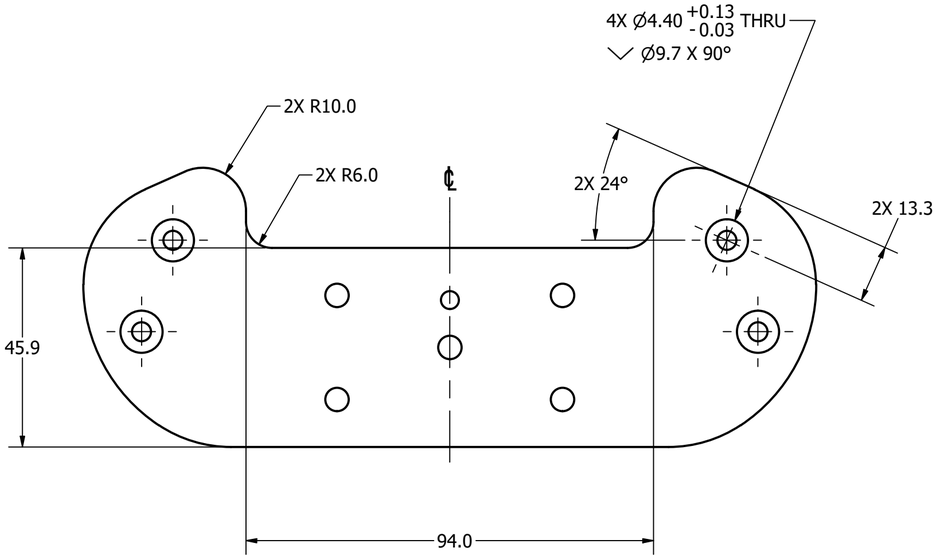
THIRD ANGLE PROJECTION
SIZE: A2 | DRAWING NUMBER: 474-4010 | REV: 3
SCALE: 1 : 1 | SHEET: 1 OF 1

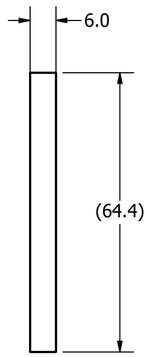
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	DJI	3/29/2023

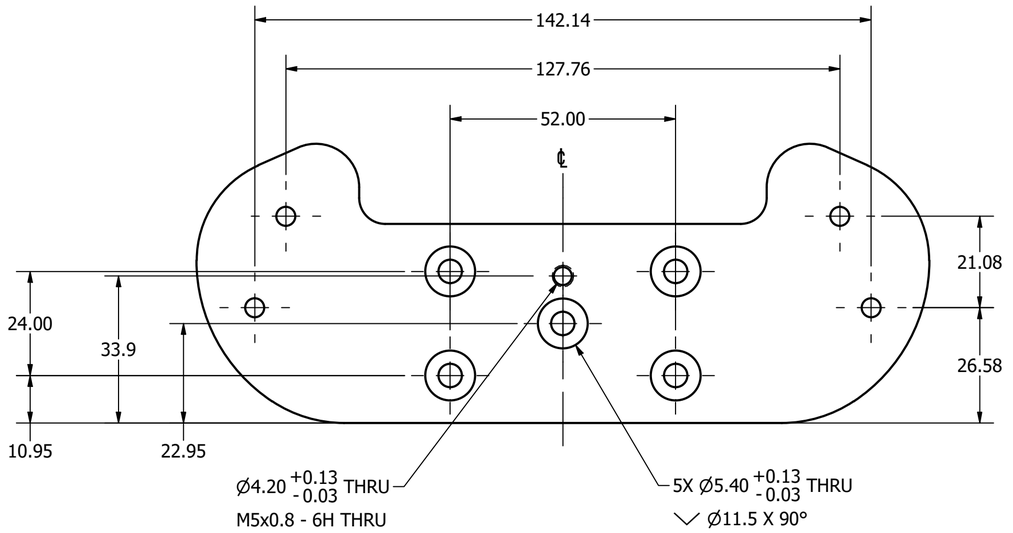


REFER TO DRA IN 474-0000 SHT. 7 FOR
THE REFERENCE SHAPE AND INFORMATION.









NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	B. KIMES	3/29/2023
CHECKED		
ENG		
APPROVED		

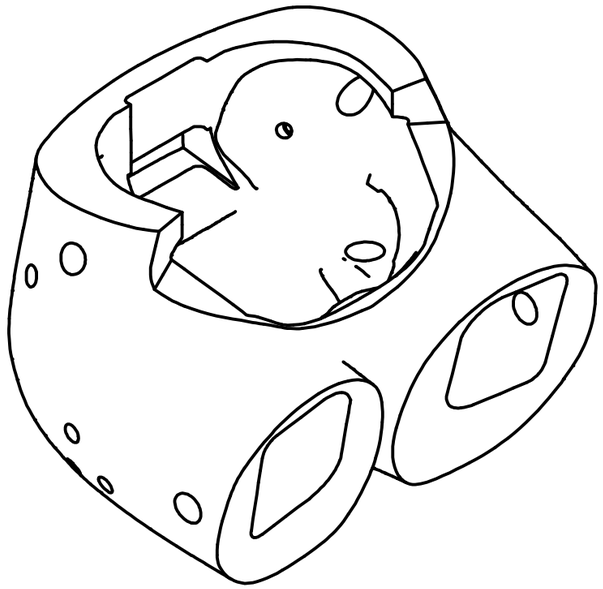
MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

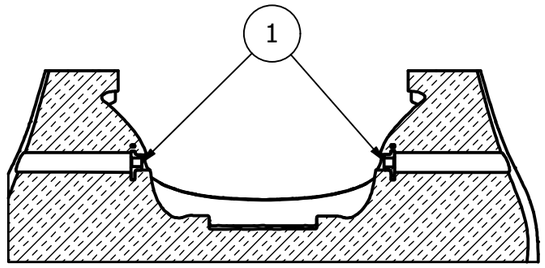
PLATE, ISCHIUM BONE MOUNT
THOR-05F

THIRD ANGLE PROJECTION

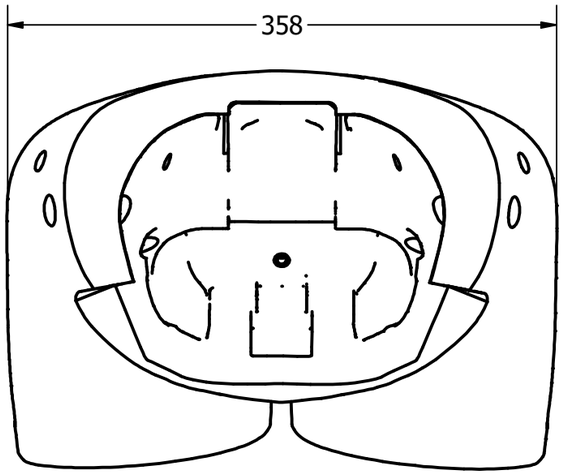
SIZE: A2 | DRAWING NUMBER: 474-4542-A | REV: 1
SCALE: 1 : 1 | SHEET: 1 OF 1

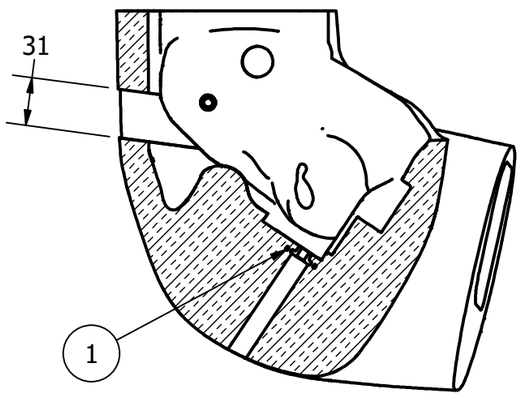
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	DJI	3/29/2023



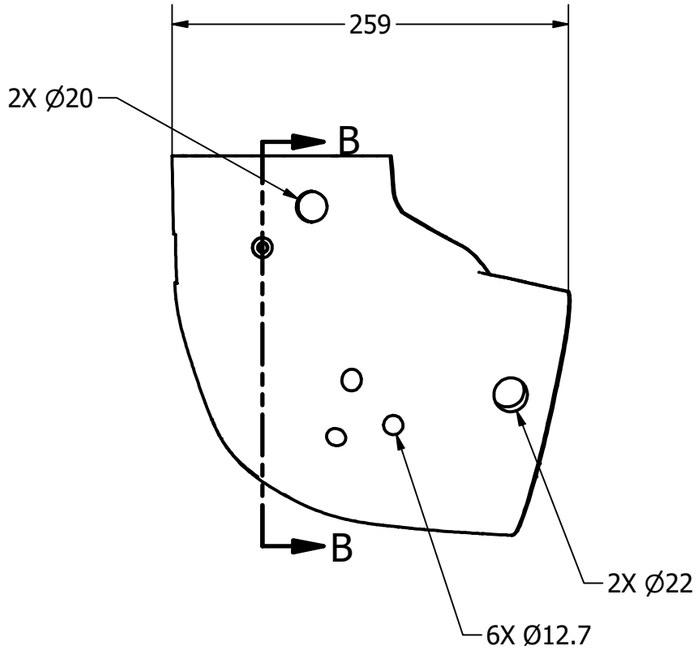


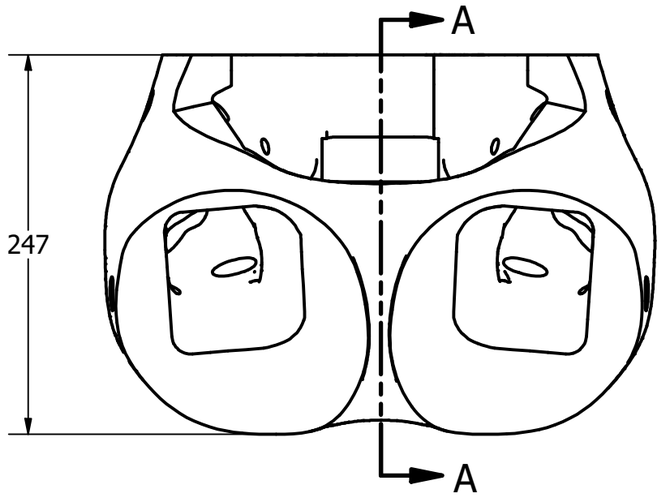
SECTION B-B





SECTION A-A





ITEM	QTY	PART NUMBER	DESCRIPTION
1	3	474-4522-A	PELVIC FLESH SCREW INSERT

PARTS LIST

NOTES:

1. MATERIAL: PVC
   COLOR: EURO BROWN
   DUROMETER: 45±5 SHORE A
   FILLED WITH POLYURETHANE EXPANDABLE FOAM

2. REMOVE ALL MOLD FLASHING

3. ALL MOLD DIMENSION TOLERANCE +1%/-2% BUT NO SMALLER THAN 0.5mm

4. MOLDED PART WEIGHT: 3315 GRAMS ± 170 GRAMS

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ±1° | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	3/29/2023
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PELVIS FLESH, MOLDED ASSEMBLY

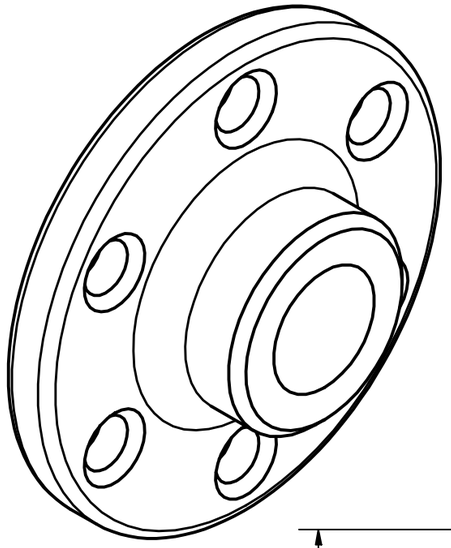
THOR-05F

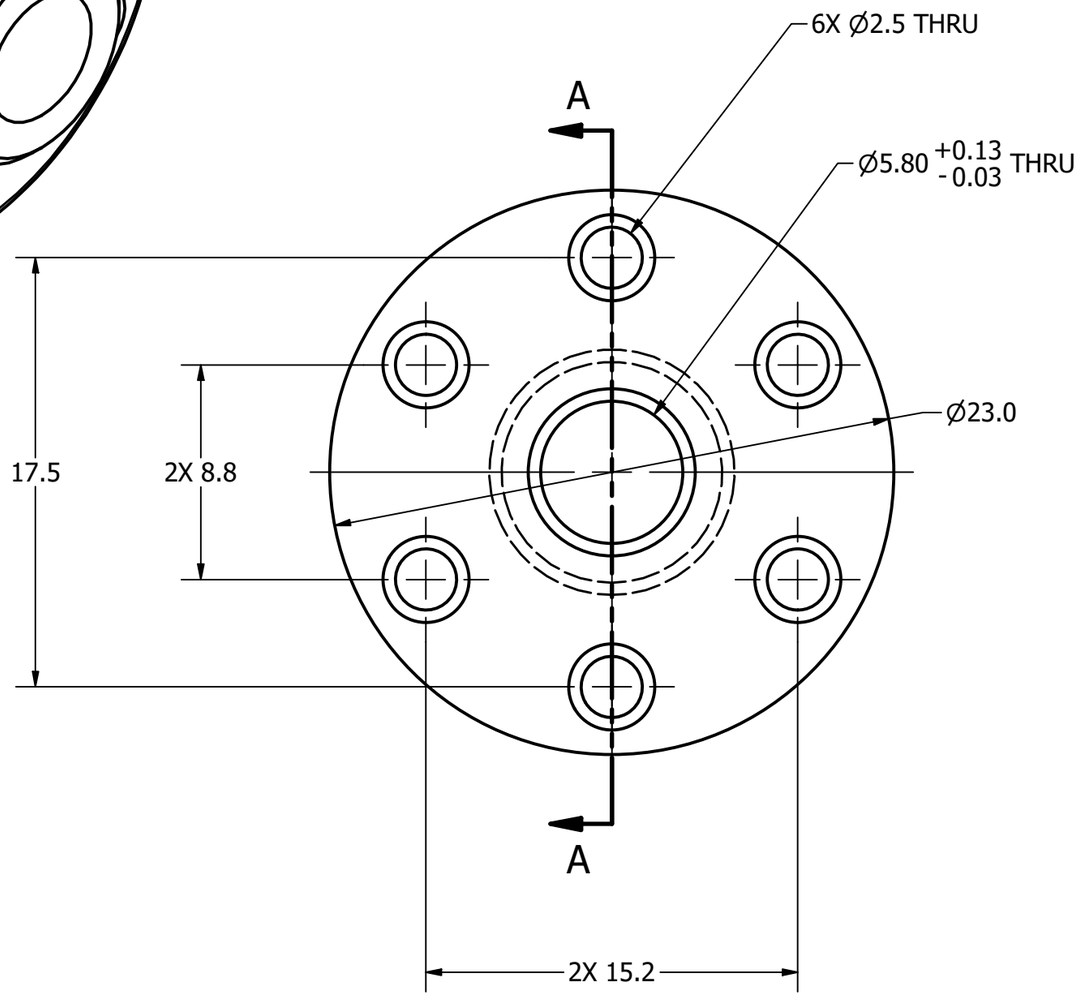
THIRD ANGLE PROJECTION

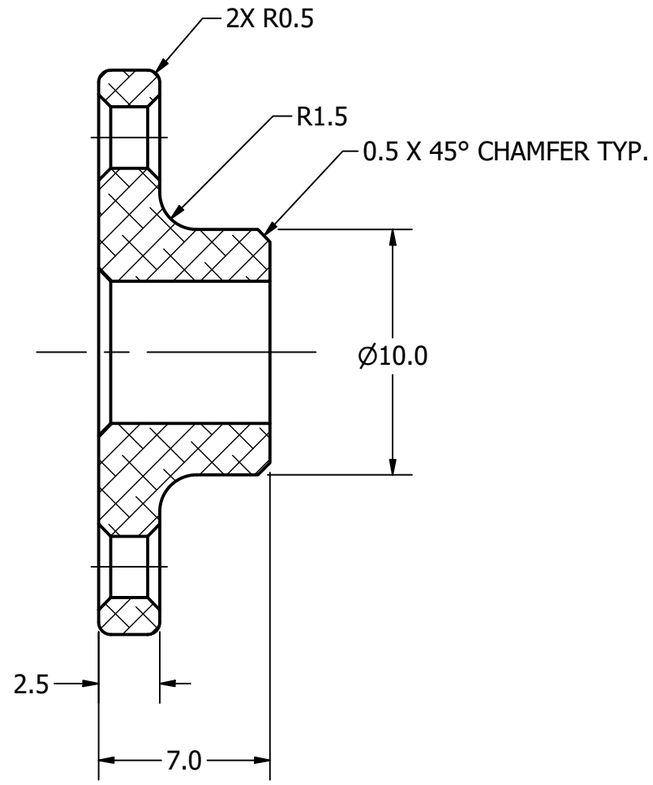
SIZE: A3 | DRAWING NUMBER: 474-4521-A | REV: 1

SCALE: 1 / 4 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	DJI	3/29/2023







SECTION A-A

NOTES:

1. SURFACE FINISH 3.2 ON OUTSIDE SURFACES.

2. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. KIMES	3/29/2023
CHECKED	
ENG DJI	
APPROVED	

PELVIC FLESH SCREW INSERT

THOR AV

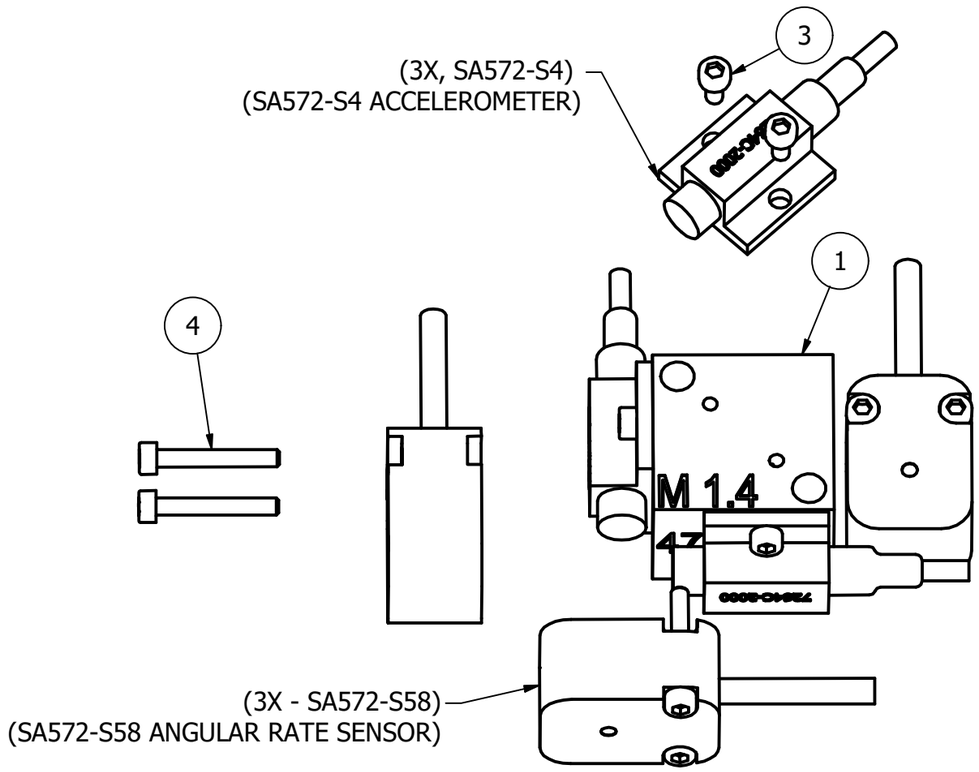
MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

THIRD ANGLE PROJECTION

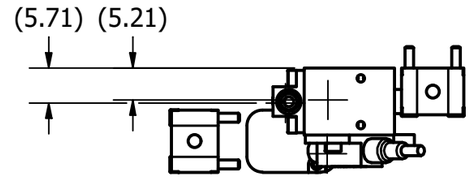
SIZE: A3 | DRAWING NUMBER: 474-4522-A | REV: 1

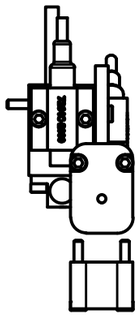
SCALE: 4 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	DJI	DJI	3/29/2023

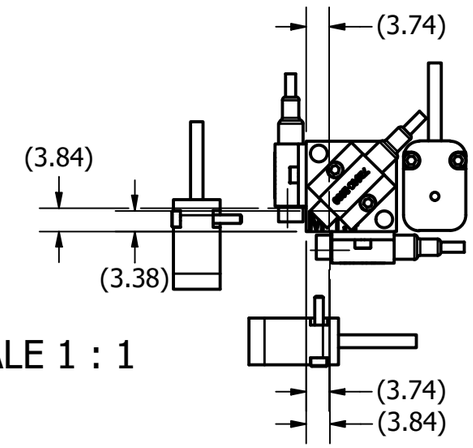


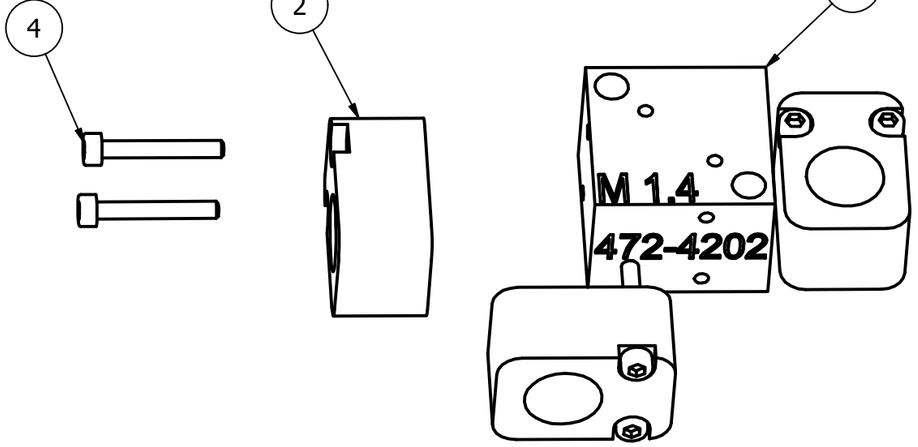
INSTRUMENT VIEW





SCALE 1 : 1





SR VIEW

ITEM	QTY	PART NUMBER	DESCRIPTION
4	6	5000912	M1.4 X 0.3 X 10 LG. SHCS
3	6	5000068	M1.4 X 0.3 X 3 LG. SHCS
2	3	477-3605	ARS S.R.
1	2	472-4202	TRI-PACK BLOCK

PARTS LIST

NOTES:

1. 2X 472-4202 ARE SUPPLIED SO THAT ONE CAN BE USED FOR SR ASSEMBLY AND THE OTHER CAN BE USED FOR THE INSTRUMENTED ASSEMBLY.
2. 6X 5000068 ARE NOT NEEDED FOR SR ASSEMBLY AND WILL REMAIN ON THE INSTRUMENTED ASSEMBLY.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN J. MCINNIS	5/9/2016
CHECKED	
ENG JW	5/9/2016
APPROVED	

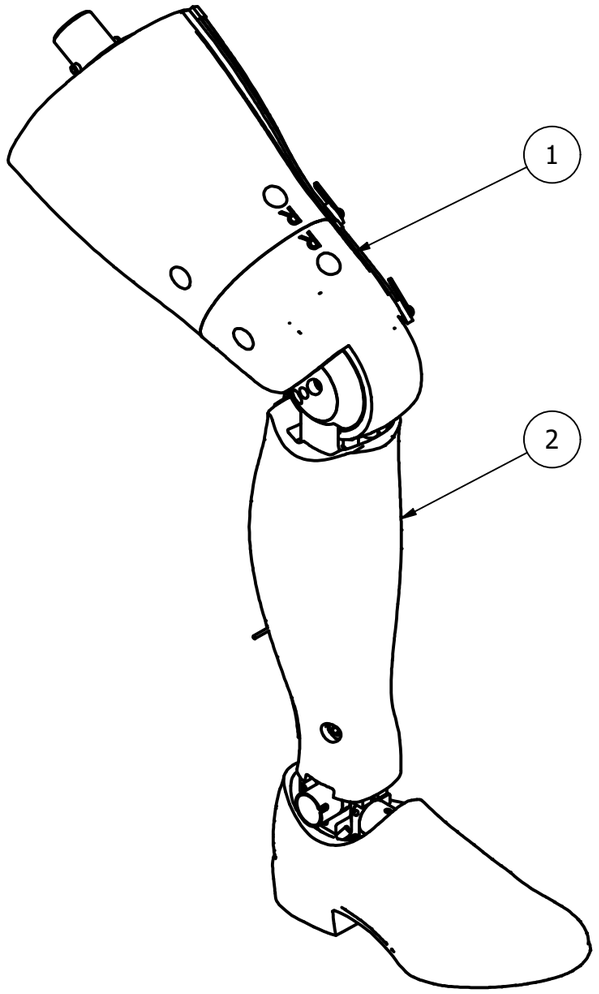
MATERIAL
HEAT TREAT
FINISH

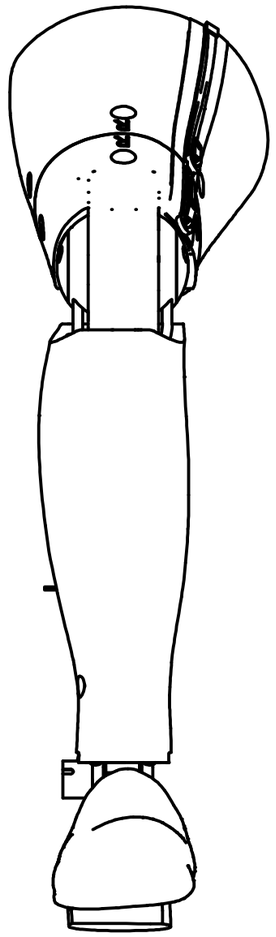
KIT, 7264C, THOR-05F PELVIS
THOR-05F

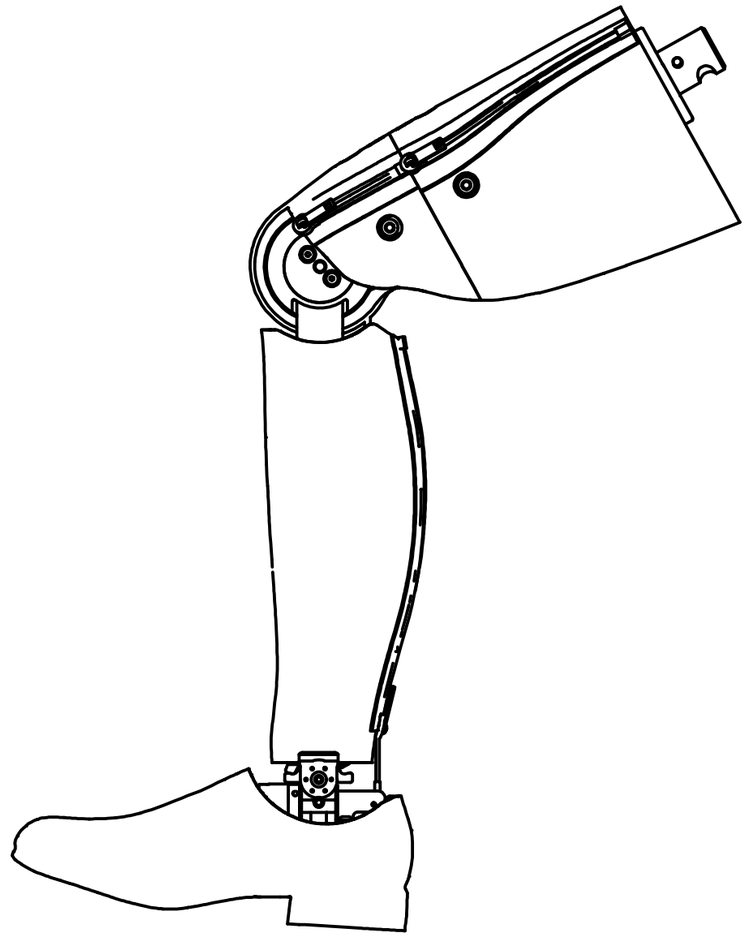
THIRD ANGLE PROJECTION

SIZE A3 | DRAWING NUMBER 474-4008 | REV 3
SCALE: 2 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	HEC	4/27/2023







ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-5100-2-A	UPPER LEG ASSEMBLY, RIGHT
2	1	474-5500-2	LOWER LEG ASSEMBLY, RIGHT

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. KIMES	4/27/2023
CHECKED	
ENG	
APPROVED	

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

LEG ASSEMBLY, RIGHT

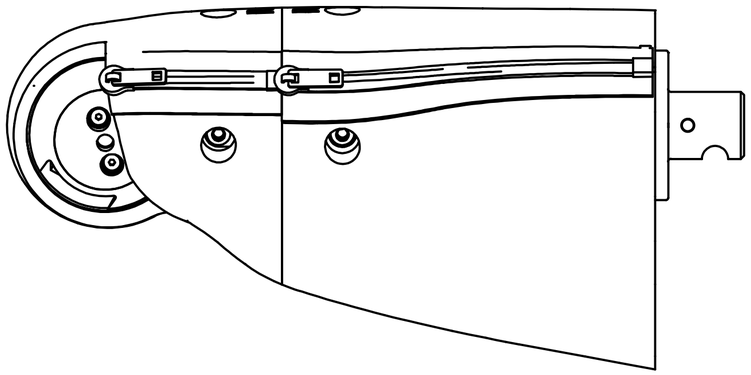
THOR 05F

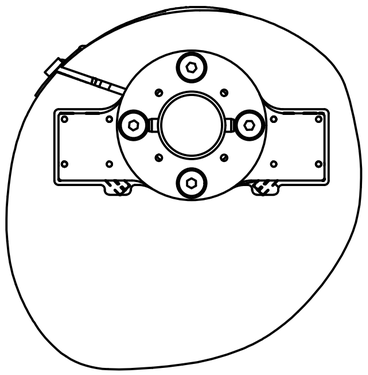
THIRD ANGLE PROJECTION

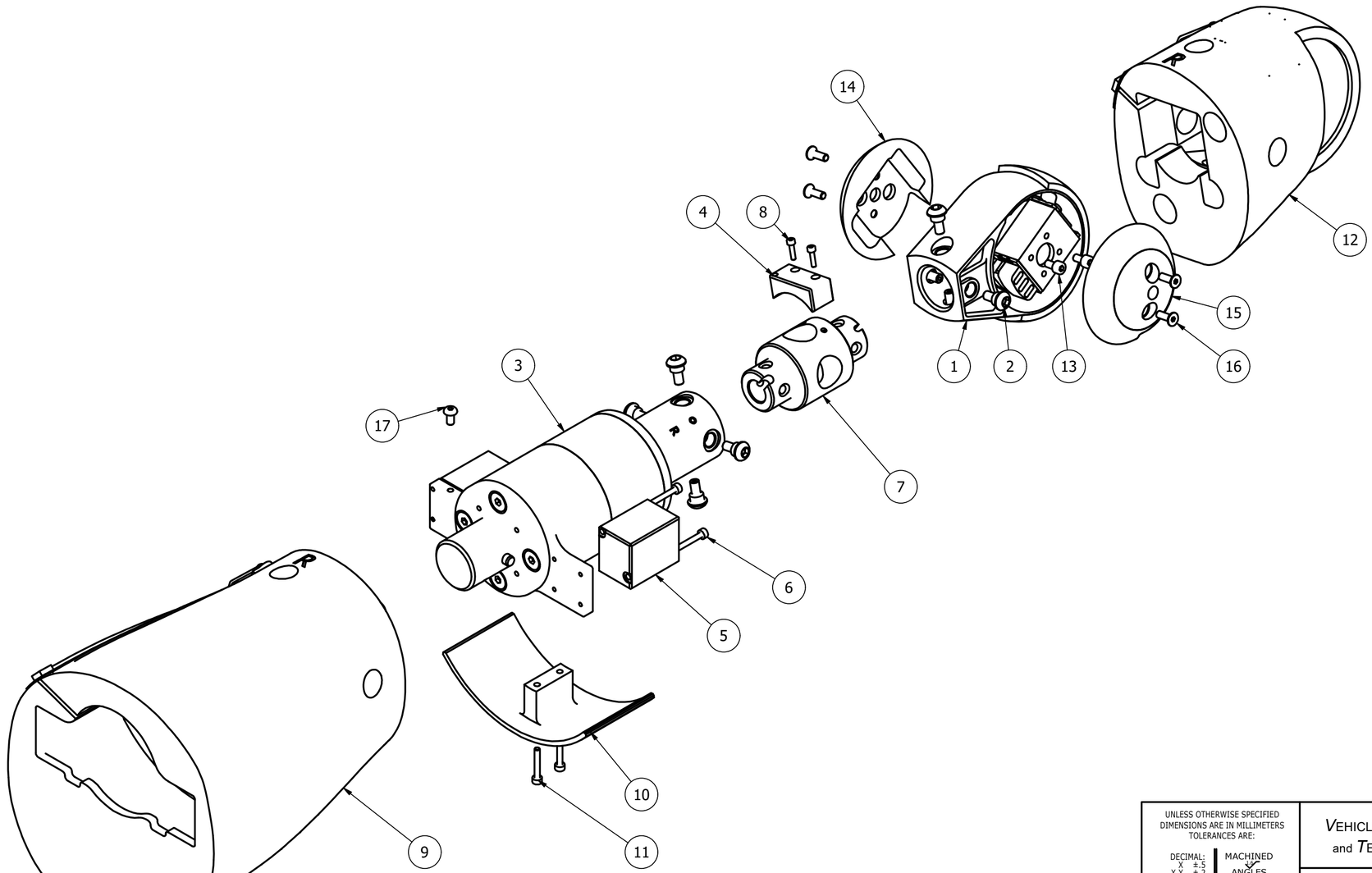
SIZE: A3 | DRAWING NUMBER: 474-5000-2-A | REV: 2

SCALE: .25 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	HEC	7/21/2023







ITEM	QTY	PART NUMBER	DESCRIPTION
17	1	5000103	M4 X 0.7 X 8 LG. BHCS
16	4	5001086	M4 X 0.7 X 12 LG. FHCS
15	1	474-5301-2-A	KNEE COVER, INBOARD / OUTBOARD
14	1	474-5301-1-A	KNEE COVER, INBOARD / OUTBOARD
13	4	5000989	M4 X 0.7 X 8 LG. SHCS
12	1	474-5321-2	KNEE FLESH, RIGHT
11	2	5000312	M3 X 0.5 X 20 LG. SHCS
10	1	474-5107	CABLE CONNECTOR GUARD
9	1	474-5122-2	UPPER LEG FLESH, RIGHT
8	2	5000456	M2.5 X 0.45 X 10 LG. SHCS
7	1	474-5101	STRUCTURAL REPLACEMENT, FEMUR LOAD CELL
6	4	5000679	M3 X 0.5 X 45 LG. SHCS SS
5	2	474-8205	DAS STRUCTURAL REPLACEMENT (5 BRIDGE)
4	1	474-5102	STRUCTURAL REPLACEMENT, FEMUR LOAD CELL STRAIN RELIEF
3	1	474-5160-2	FEMUR ASSEMBLY, RIGHT
2	8	W50-61042	MODIFIED BHSS M6 THREAD
1	1	474-5400	KNEE ASSEMBLY

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/14/2023
CHECKED	
ENG	7/21/2023
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

UPPER LEG ASSEMBLY, RIGHT

THOR-05F

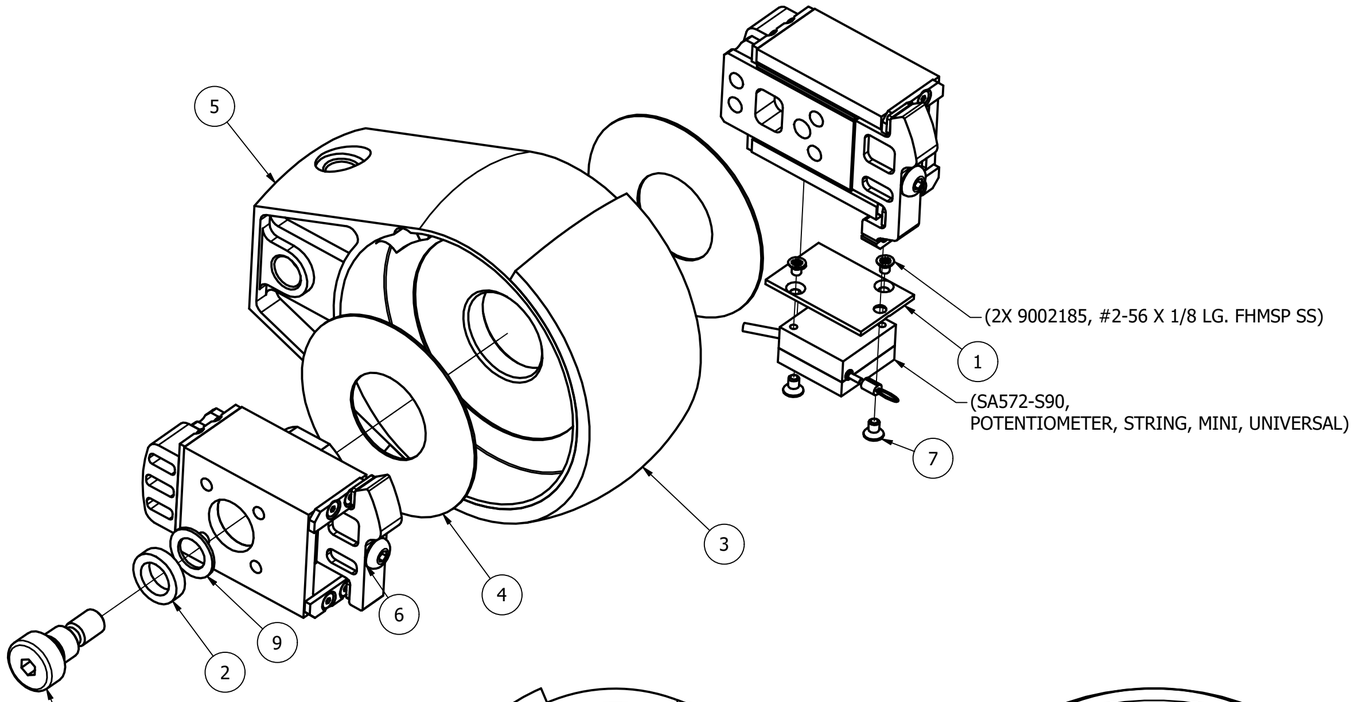
THIRD ANGLE PROJECTION

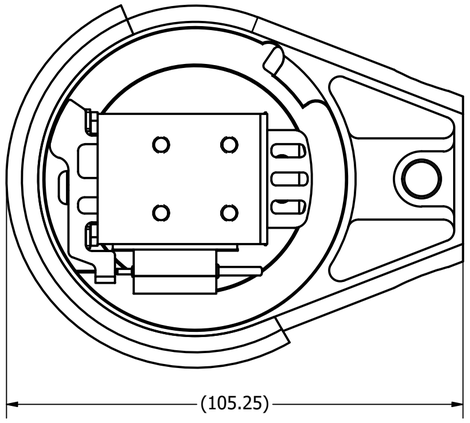
SIZE: A2 | DRAWING NUMBER: 474-5100-2-A | REV: 1

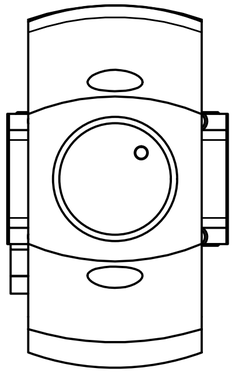
SCALE: .5:1 | SHEET: 1 OF 1

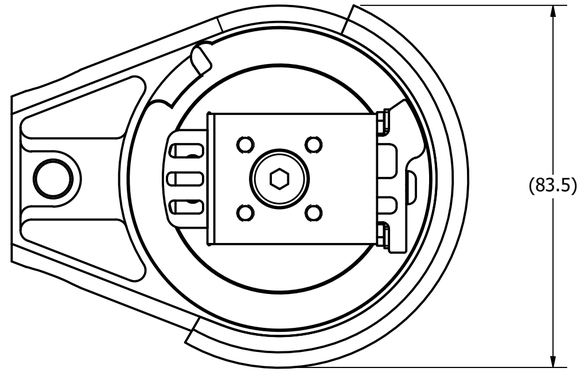
PROTOTYPE DRAWING

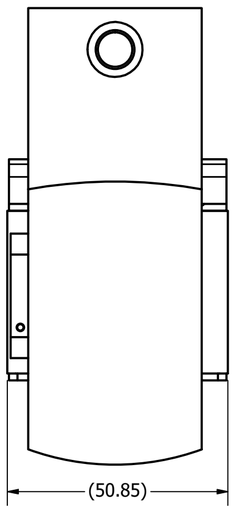
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	DJI	6/15/2023











ITEM	QTY	PART NUMBER	DESCRIPTION
9	1	9004093	5/16 FLAT WASHER PTFE - A
8	1	5001332	M8 X 8 LG. SHSS
7	2	5001866	M2.5 X 0.45 X 4 LG. FHMSP ZINC
6	1	474-5420	KNEE SLIDER ASSEMBLY
5	1	474-5410	KNEE CAP
4	2	474-5401	CARBON FIBER WASHER, KNEE
3	1	474-5340	KNEE INSERT
2	1	474-5316	KNEE COMPRESSION WASHER
1	1	472-5305	PLATE, MOUNT

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN ghayden	8/21/2020
CHECKED	
ENG DJI	8/21/2020
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

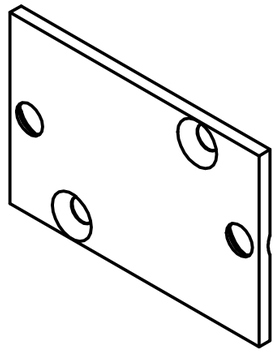
KNEE ASSEMBLY
THOR-05F

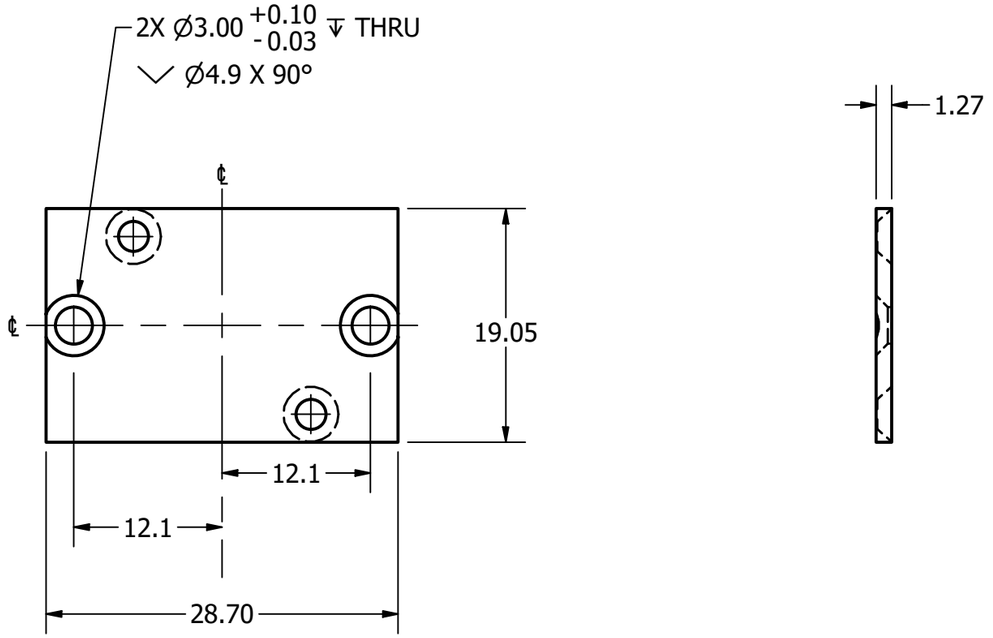
THIRD ANGLE PROJECTION

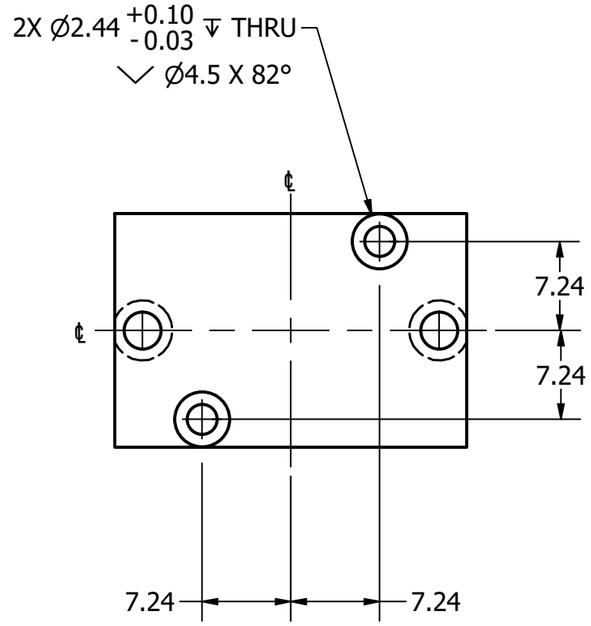
SIZE A2 | DRAWING NUMBER 474-5400 | REV 2

SCALE: 1 : 1 | SHEET 1 OF 1

REVISION HISTORY				
ECO #	REV	DESCRIPTION	DATE	BY
	D	RELEASE FOR PRODUCTION	5/13/2014	JQG







UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Aluminum-6061-T6
HEAT TREAT:
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN KSG	8/17/2011
CHECKED	
ENG KSG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

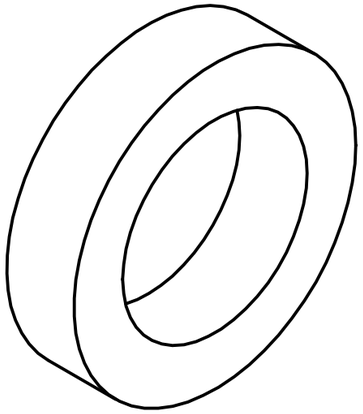
PLATE, MOUNT

THIRD ANGLE PROJECTION

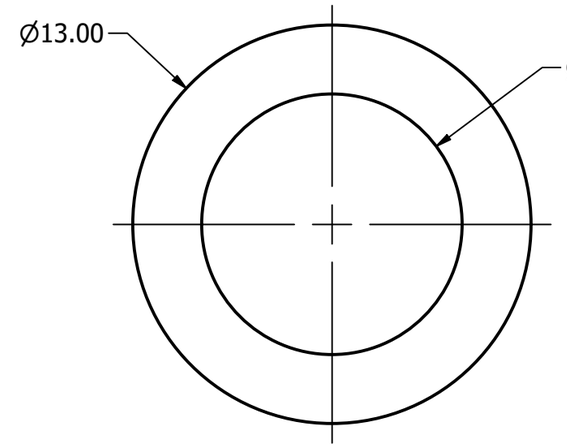
SIZE: A3 | DRAWING NUMBER: 472-5305 | REV: D

SCALE: 2 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	AB	JW	04/24/2018







NOTES:
1. MATERIAL: URETHANE
   DUROMETER: 95 ±5 SHORE "A"

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED √
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	4/11/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

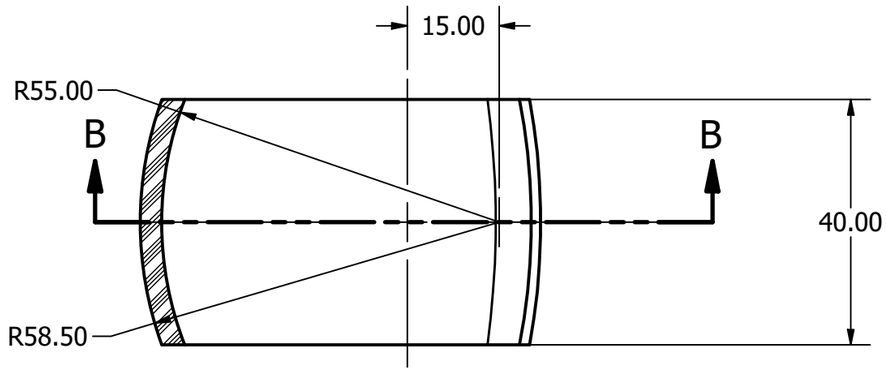
KNEE COMPRESSION WASHER

THIRD ANGLE PROJECTION

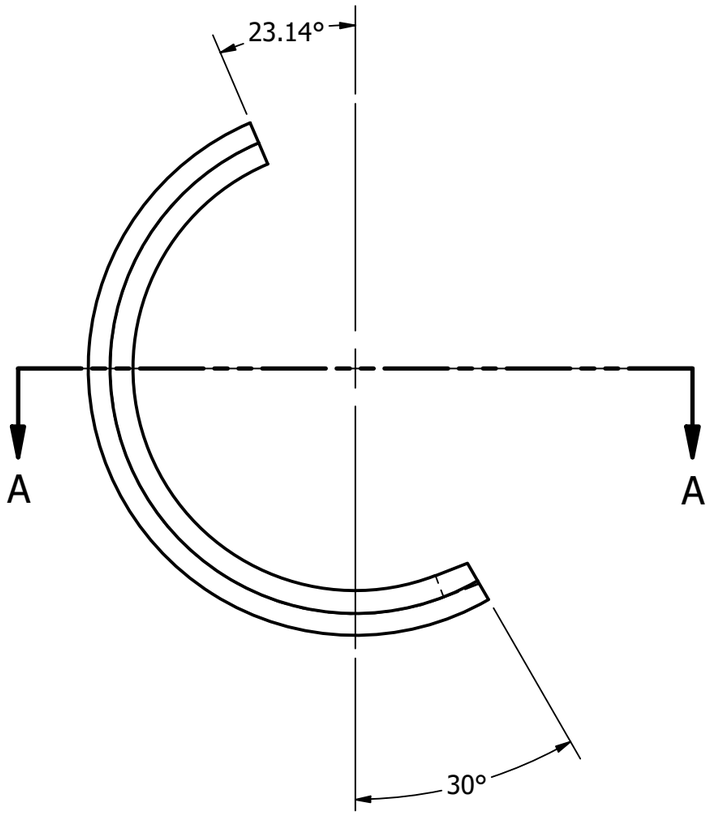
SIZE: A3 | DRAWING NUMBER: 474-5316 | REV: 3

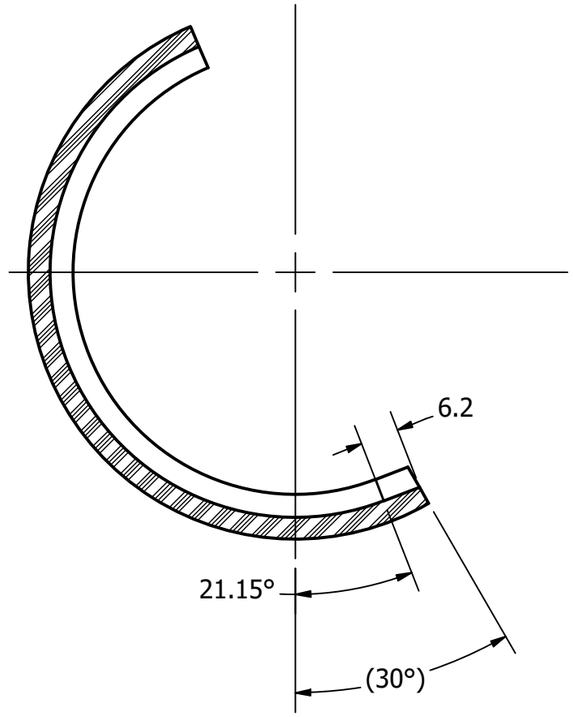
SCALE: 5 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	JPM		10/17/16

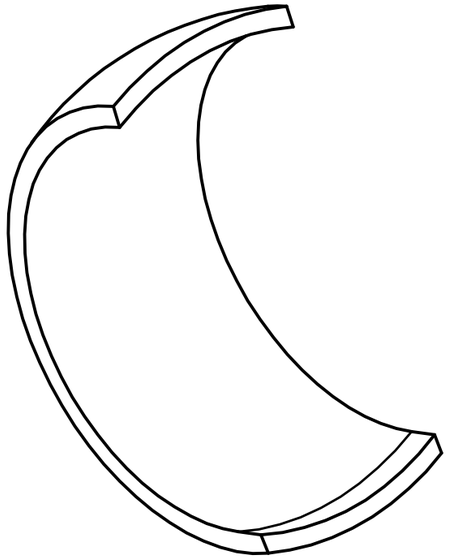


SECTION A-A





SECTION B-B



NOTES:
1. MATERIAL: BUTYL RUBBER
   COLOR: BLACK
   DUROMETER: 45 ±10 SHORE "A"
2. REMOVE ALL MOLD FLASHING.
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm.
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE RUBBER MOLDING.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED √ | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT:
FINISH:

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

APPROVALS	DATE
DRAWN: J. MCINNIS	4/11/2016
CHECKED:	
ENG:	
APPROVED:	

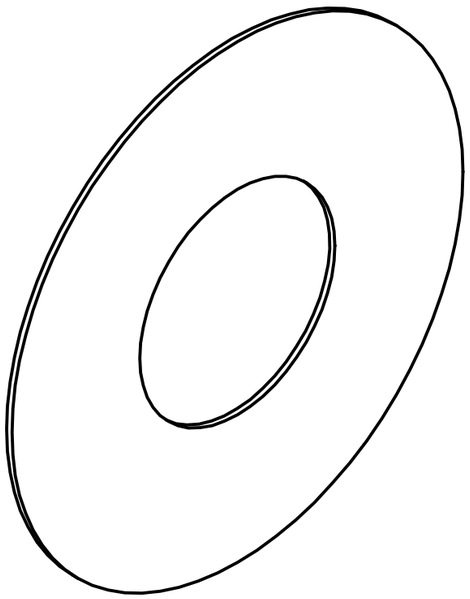
THIRD ANGLE PROJECTION

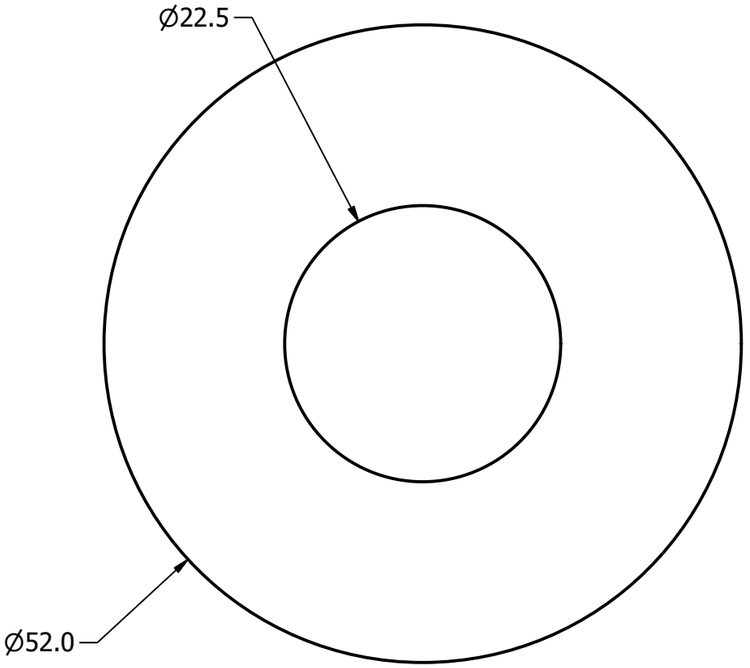
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

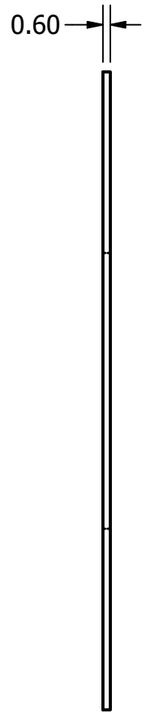
KNEE INSERT

SIZE: A3 | DRAWING NUMBER: 474-5340 | REV: 2
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	DJI	DJI	9/1/2022







NOTES:

1. MAKE FROM FIBERGLASS REINFORCED CARBON FIBER.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	8/19/2020
CHECKED:	
ENG: DJI	8/19/2020
APPROVED:	

MATERIAL: SEE NOTES
HEAT TREAT: N/A
FINISH: N/A

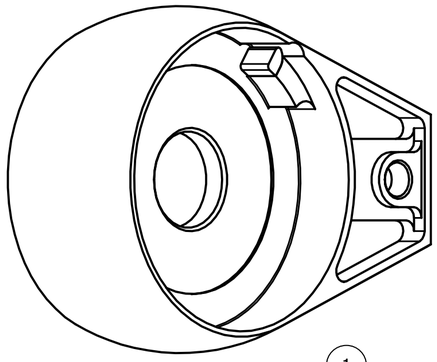
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

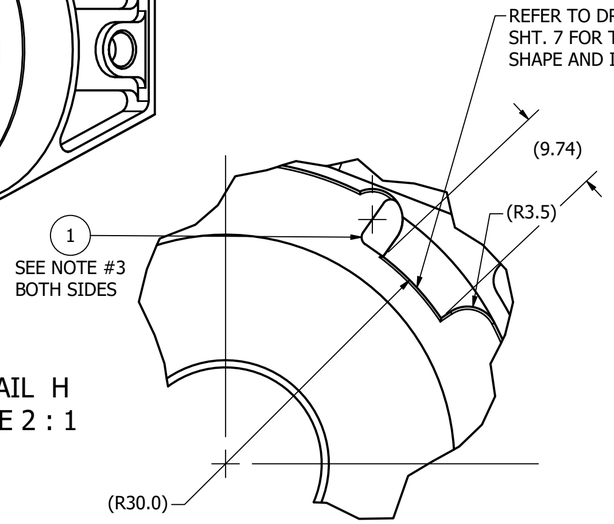
CARBON FIBER WASHER, KNEE

THIRD ANGLE PROJECTION

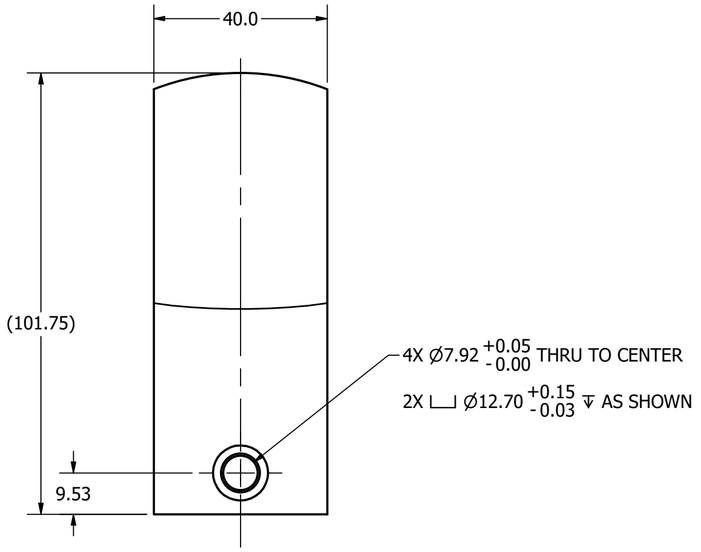
SIZE: A3 | DRAWING NUMBER: 474-5401 | REV: 1
SCALE: 2 : 1 | SHEET: 1 OF 1

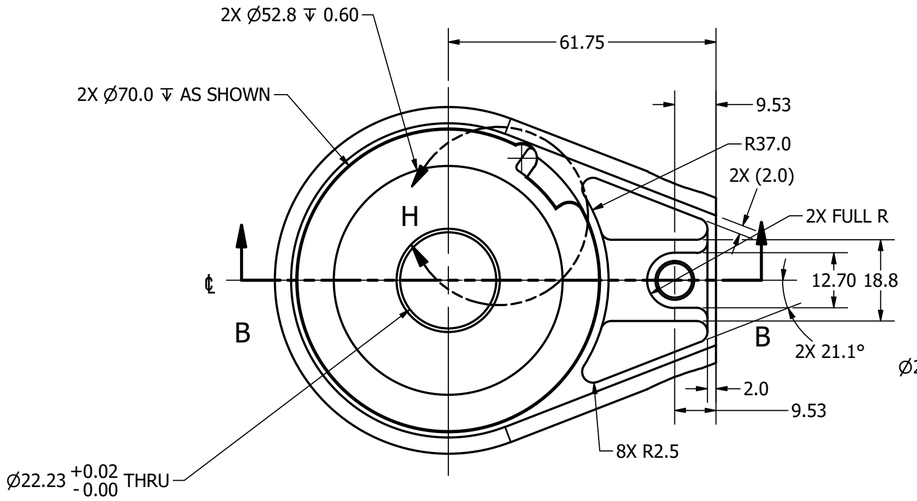
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	DJI	DJI	2/23/2023

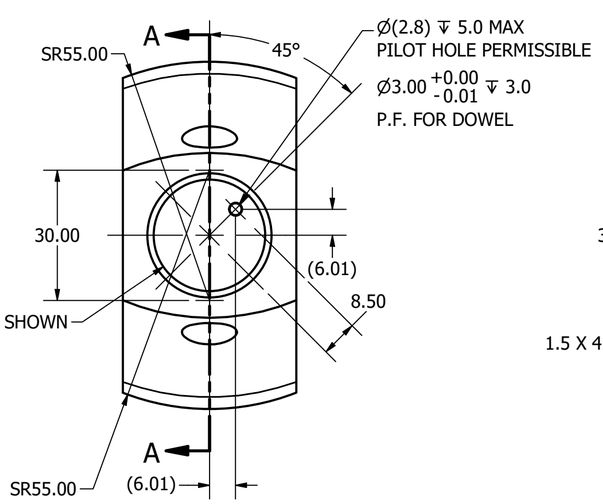


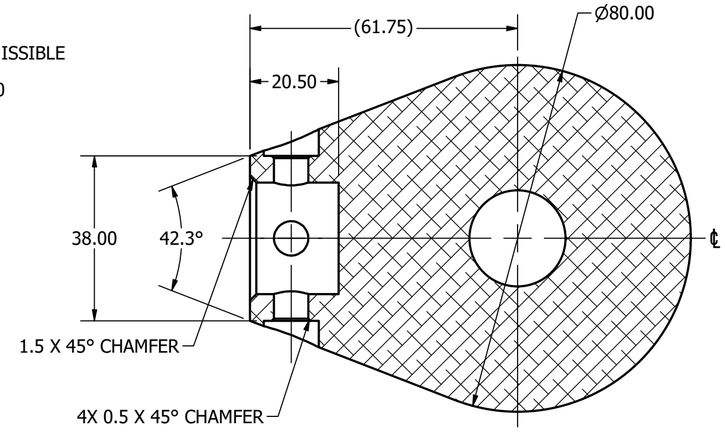


DETAIL H
SCALE 2 : 1

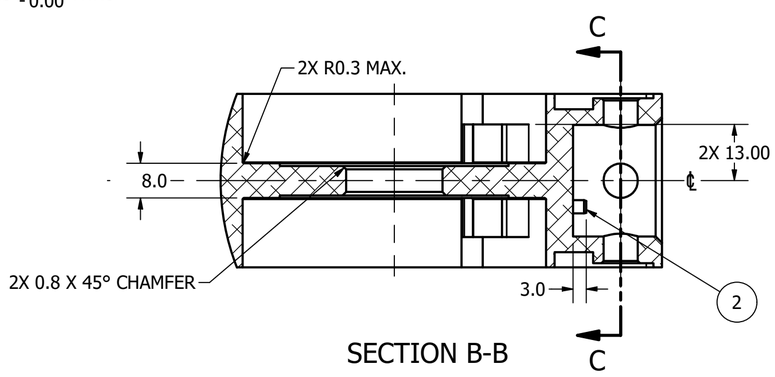




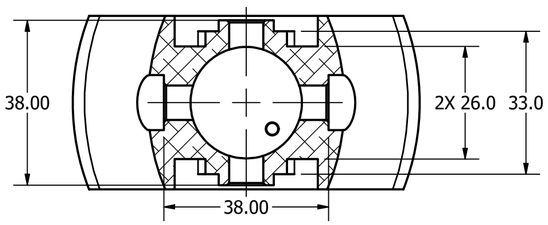




SECTION A-A



SECTION B-B



SECTION C-C
SCALE 1 : 1

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. INSTALL DOWEL PIN AS SHOWN AFTER HARDCOAT.
3. BOND BUMPER IN PLACE AS SHOWN USING INSTANT ADHESIVE AFTER HARDCOAT.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	5000385	M3 X 6 LG. DOWEL PIN
1	2	474-5413	KNEE ROTATION STOP, RUBBER

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: HARDCOAT ANODIZE

VEHICLE RESEARCH and TEST CENTER

	APPROVALS	DATE
DRAWN	B. KIMES	8/21/2020
CHECKED		
ENG	DJI	8/21/2020
APPROVED		

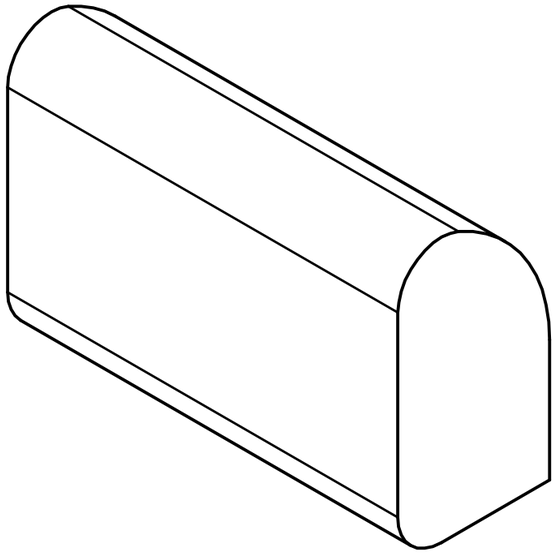
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

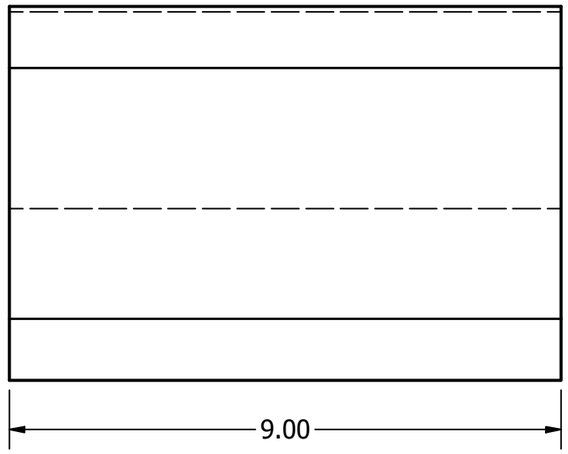
KNEE CAP

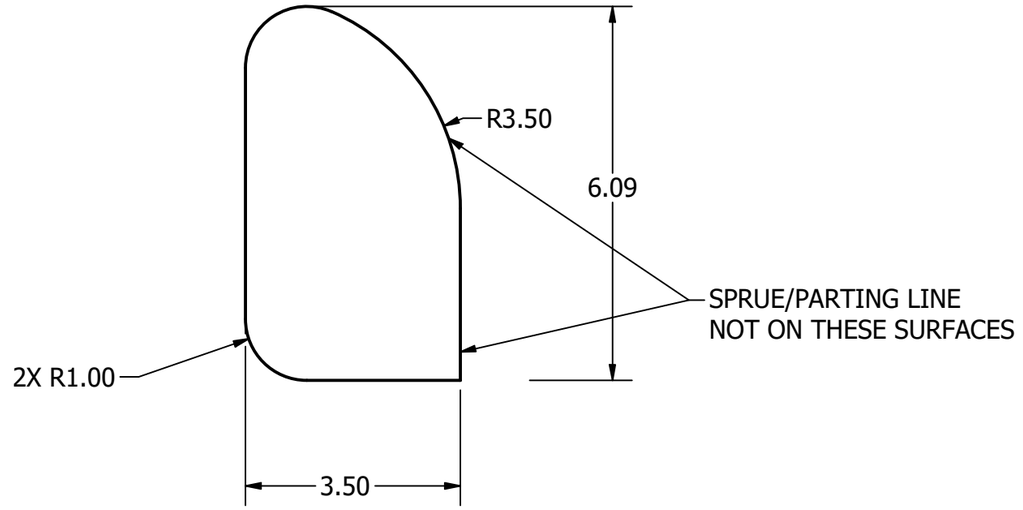
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-5410 | REV: 2
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	DJI	DJI	9/21/2022







NOTES:
1. MATERIAL: NATURAL RUBBER
   COLOR: BLACK
   DUROMETER: 70 ±10 SHORE "A"
2. REMOVE ALL MOLD FLASHING
3. ALL MOULD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE RUBBER MOLDING

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED √ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

KNEE ROTATION STOP, RUBBER

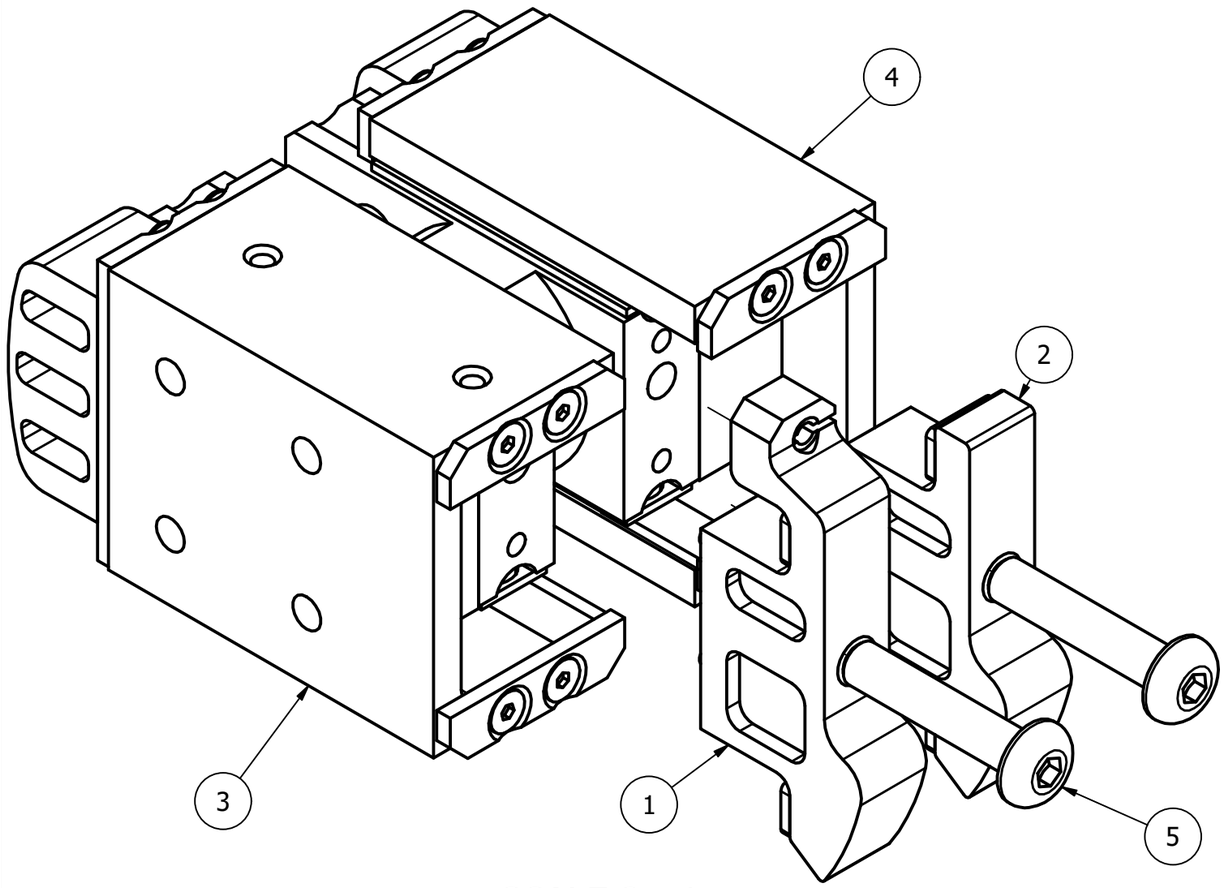
	APPROVALS	DATE
DRAWN	disopi	9/21/2022
CHECKED		
ENG	DJI	9/21/2022
APPROVED		

MATERIAL: SEE NOTE #1
HEAT TREAT:
FINISH:

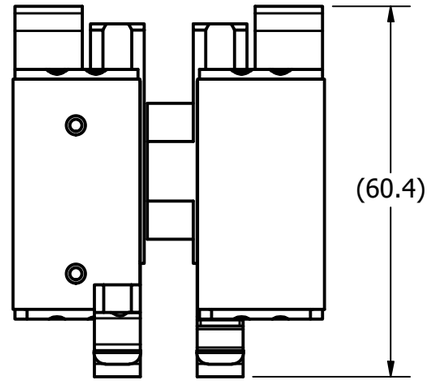
THIRD ANGLE PROJECTION

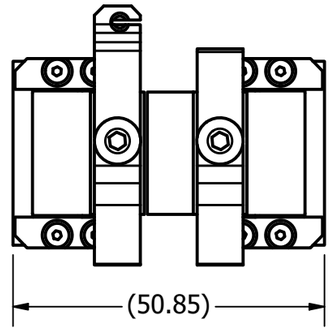
SIZE: A3 | DRAWING NUMBER: 474-5413 | REV: 1
SCALE: 10 : 1 | SHEET: 1 OF 1

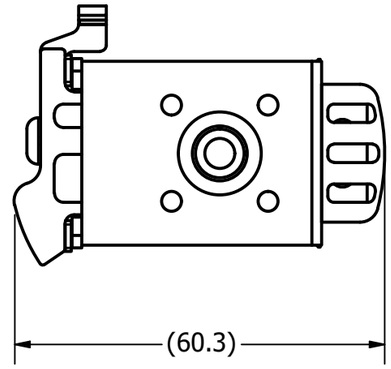
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	DJI	DJI	11/18/2022



SCALE 2 : 1







ITEM	QTY	PART NUMBER	DESCRIPTION
5	2	5000007	M4 X 0.7 X 20 LG. BHCS
4	1	474-5425	KNEE SLIDER, RIGHT, ASS'Y
3	1	474-5421	KNEE SLIDER, LEFT, ASS'Y
2	1	474-5405	KNEE ROTATION STOP, NO POT
1	1	474-5404	KNEE ROTATION STOP, POT

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ±
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

KNEE SLIDER ASSEMBLY

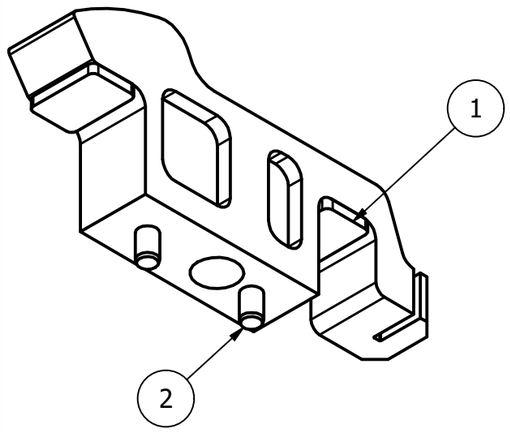
	APPROVALS	DATE
DRAWN	B. KIMES	8/19/2020
CHECKED		
ENG	DJI	8/19/2020
APPROVED		

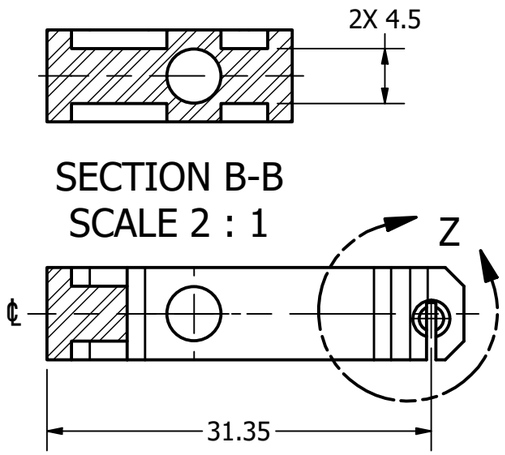
MATERIAL
HEAT TREAT
FINISH

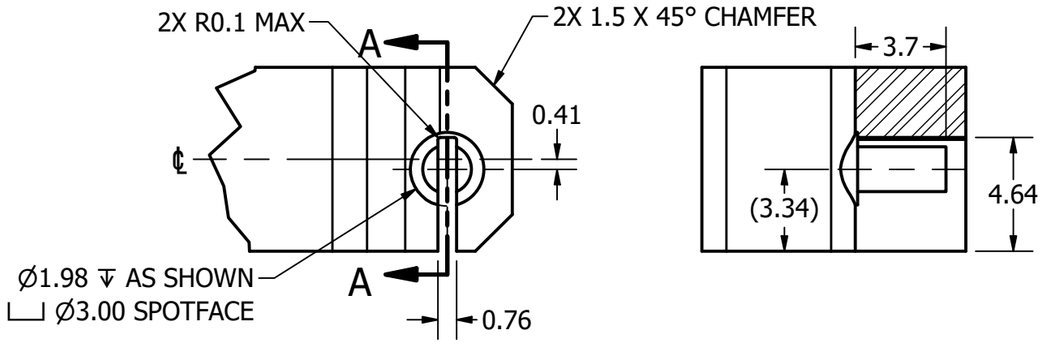
THIRD ANGLE PROJECTION

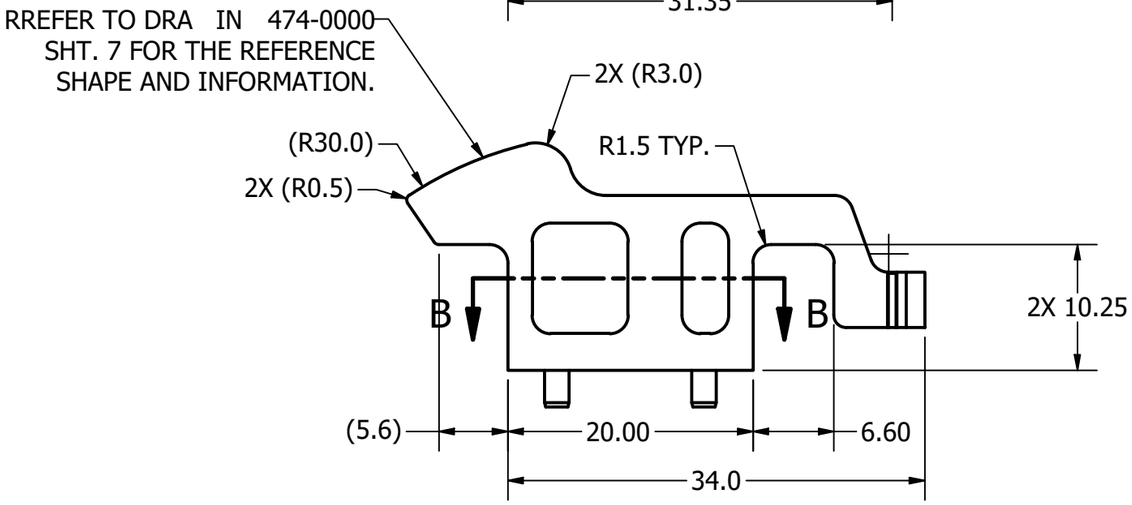
SIZE A3 | DRAWING NUMBER 474-5420 | REV 2
SCALE: 2 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	DJI	DJI	11/18/2022

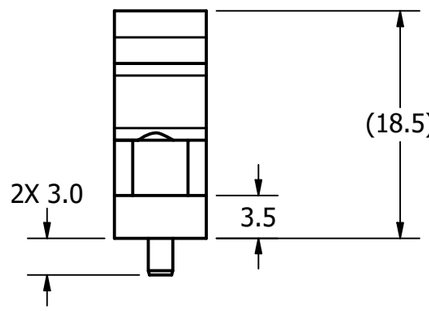


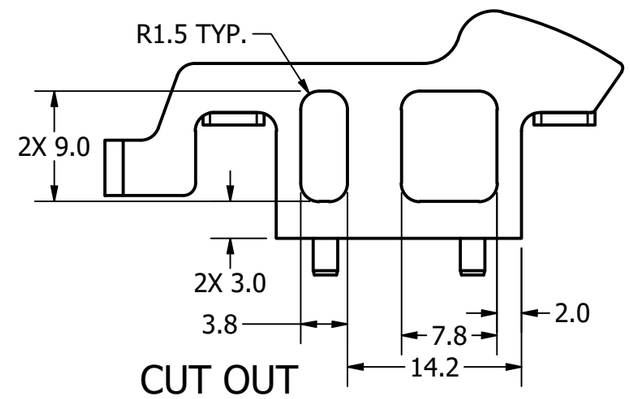




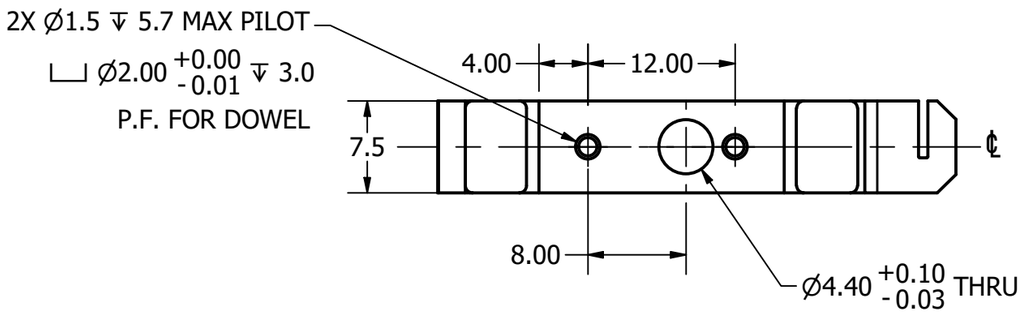


474-5407 HIDDEN
FOR CLARITY





CUT OUT
BOTH SIDES



ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	5000413	M2 X 6 LG. DOWEL PIN
1	2	474-5407	KNEE SLIDER RECOIL BUMPER

PARTS LIST

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. BOND 2X 474-5407 INTO PLACE AS SHOWN USING INSTANT ADHESIVE.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 416 STAINLESS STEEL
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	8/12/2020
CHECKED	
ENG: DJI	8/19/2020
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

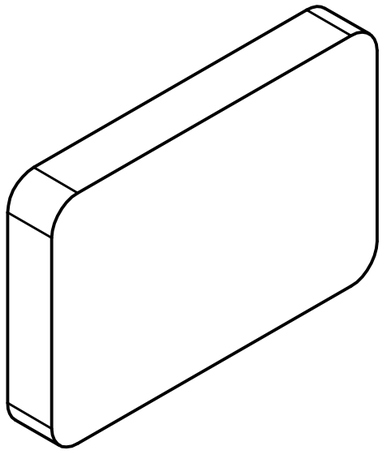
KNEE ROTATION STOP, POT

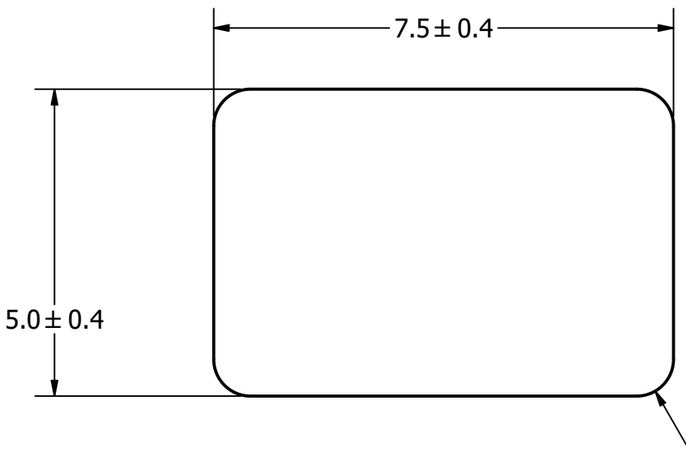
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-5404 | REV: 2

SCALE: 2 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	DJI	DJI	2/23/2022







NOTES:
1. COLOR: BLACK
   DUROMETER: 50±10 SHORE "A"

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: NEOPRENE RUBBER
HEAT TREAT:
FINISH:

APPROVALS	DATE
DRAWN: B. KIMES	8/24/2022
CHECKED:	
ENG: DJI	8/24/2022
APPROVED:	

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

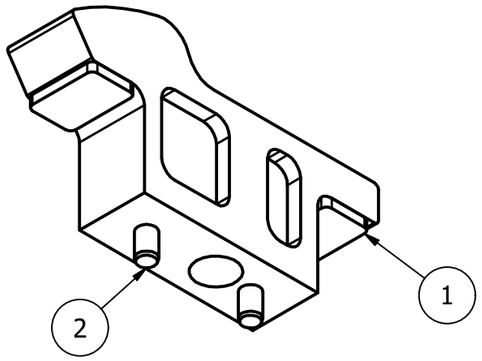
KNEE SLIDER RECOIL BUMPER

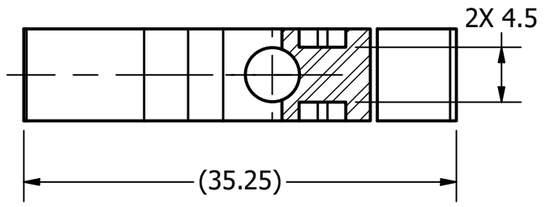
THIRD ANGLE PROJECTION

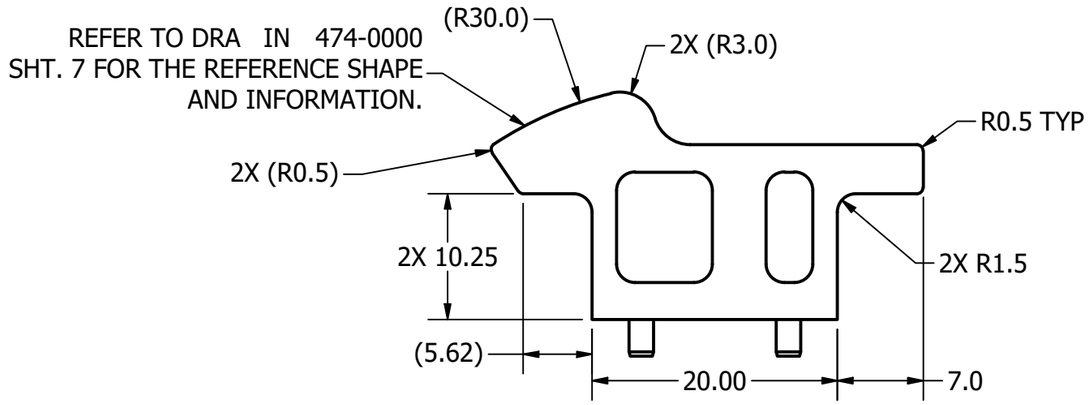
SIZE: A3 | DRAWING NUMBER: 474-5407 | REV: 3

SCALE: 10 : 1 | SHEET: 1 OF 1

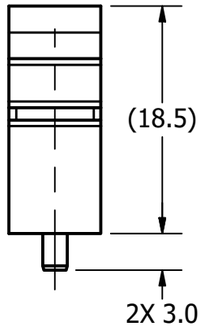
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	DJI	DJI	11/18/2022

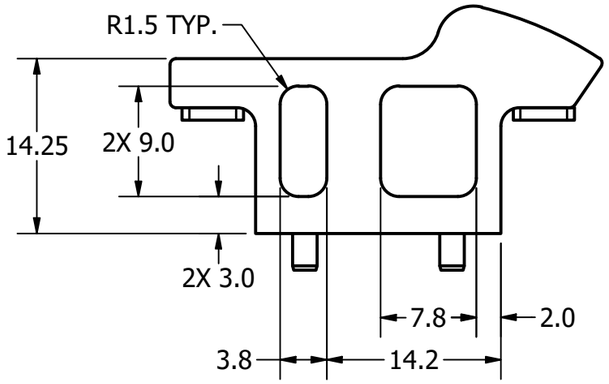




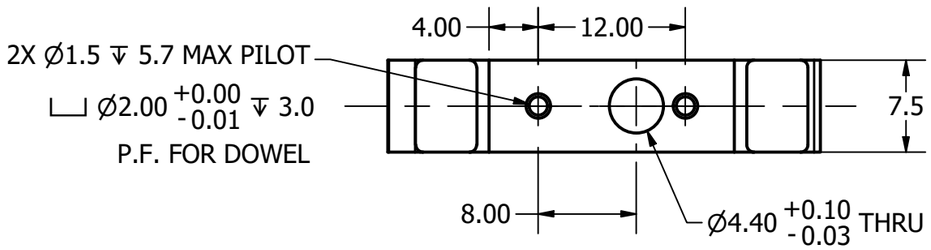


474-5407 HIDDEN
FOR CLARITY





CUT OUT
BOTH SIDES



ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	5000413	M2 X 6 LG. DOWEL PIN
1	2	474-5407	KNEE SLIDER RECOIL BUMPER

PARTS LIST

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

2. BOND 474-5407 INTO PLACE AS SHOWN USING INSTANT ADHESIVE.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 416 STAINLESS STEEL
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	8/19/2020
CHECKED:	
ENG: DJI	8/19/2020
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

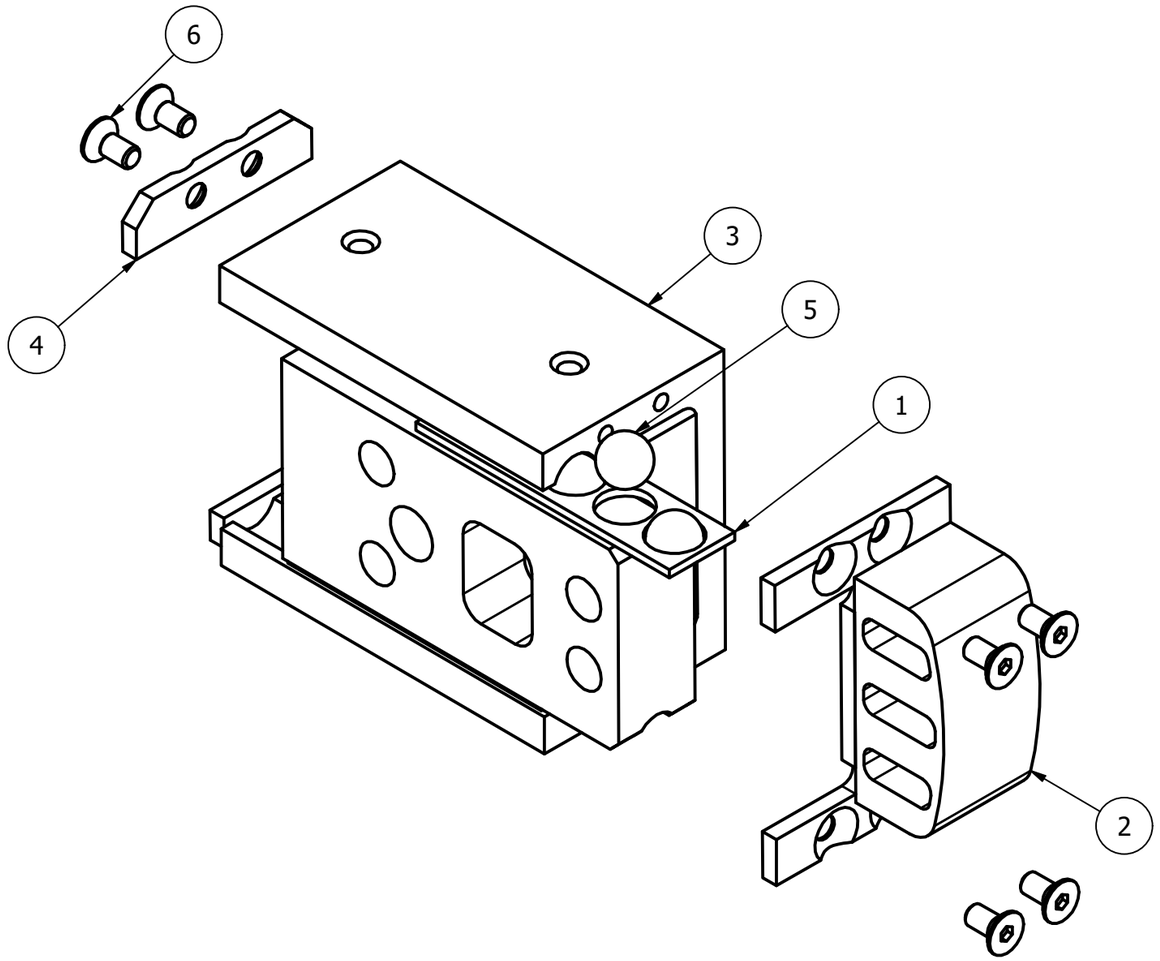
KNEE ROTATION STOP, NO POT

THIRD ANGLE PROJECTION

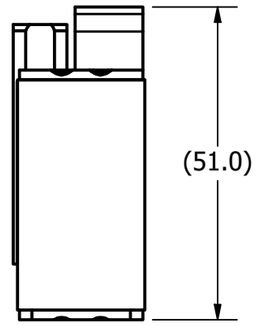
SIZE: A3 | DRAWING NUMBER: 474-5405 | REV: 2

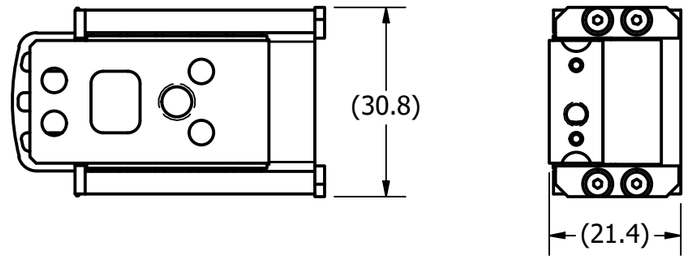
SCALE: 2 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	BK	DJI	6/15/2023



SCALE 2 : 1





ITEM	QTY	PART NUMBER	DESCRIPTION
6	8	5000595	M2 X 0.4 X 4 LG. FHCS
5	10	EX593-19-DN	BALL 3/16" DIA.
4	2	474-5429	KNEE SLIDER BALL RETAINER
3	1	474-5422	KNEE SLIDER, LEFT, MOLDED ASS'Y
2	1	474-5415	KNEE SLIDER BUMPER ASSEMBLY
1	2	474-5394	BALL BEARING SEPERATOR

PARTS LIST

NOTES:

1. GREASE BALL BEARINGS.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	8/17/2020
CHECKED	
ENG DJI	8/17/2020
APPROVED	

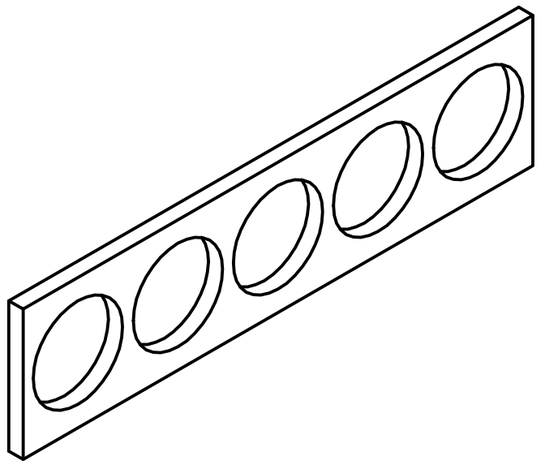
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

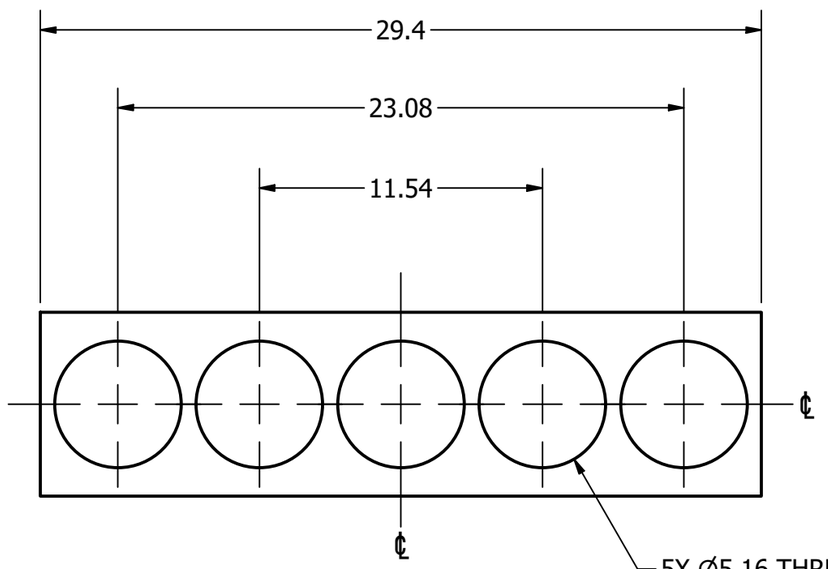
KNEE SLIDER, LEFT, ASS'Y
THOR-05F

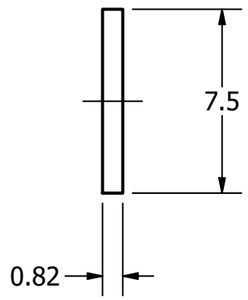
THIRD ANGLE PROJECTION

SIZE A3 | DRAWING NUMBER 474-5421 | REV 3
SCALE: 1 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	BK	JW	4/12/2016







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED √ ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	4/12/2016
CHECKED	
ENG	
APPROVED	

MATERIAL: PHOSPHOR BRONZE
HEAT TREAT:
FINISH:

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

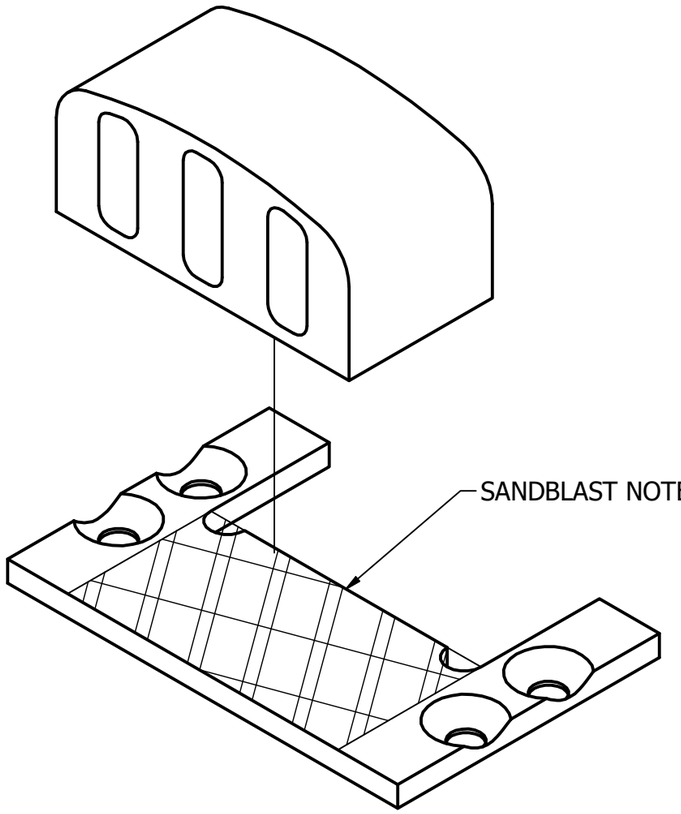
BALL BEARING SEPERATOR

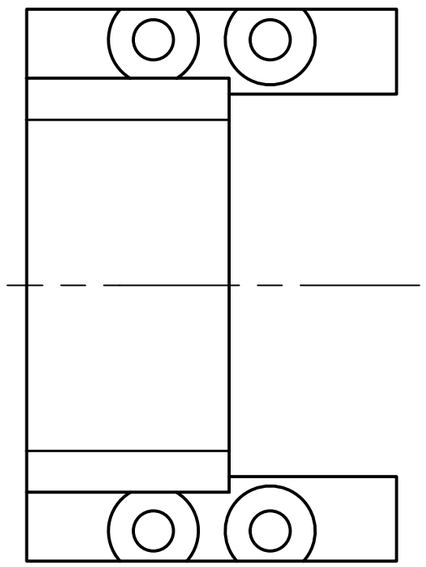
THIRD ANGLE PROJECTION

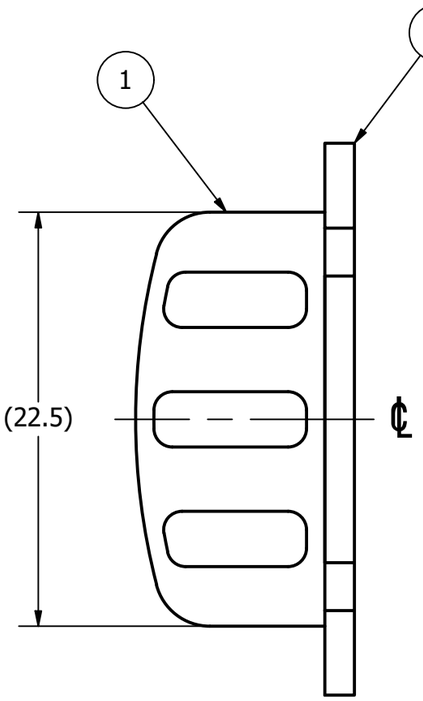
SIZE: A3 | DRAWING NUMBER: 474-5394 | REV: 1

SCALE: 4:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	DJI	DJI	9/6/2022







ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	474-5416	KNEE SLIDER BUMPER MOUNT
1	1	474-5390	KNEE SLIDER BUMPER

PARTS LIST

NOTES:

1. BOND ITEM 1 TO ITEM 2, AS SHOWN, USING CYANOACRYLATE OR EQUIVALENT.

2. DIMENSIONS ARE SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED √ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

KNEE SLIDER BUMPER ASSEMBLY

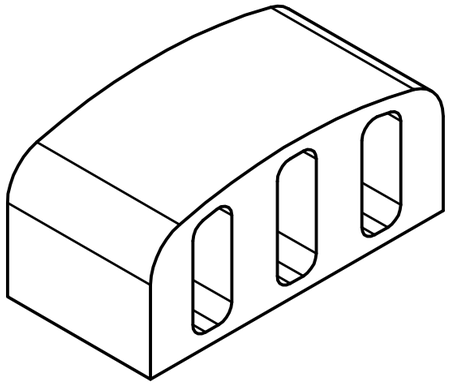
	APPROVALS	DATE
DRAWN	disopi	8/17/2020
MATERIAL	CHECKED	
HEAT TREAT	ENG: DJI	8/17/2020
FINISH	APPROVED	

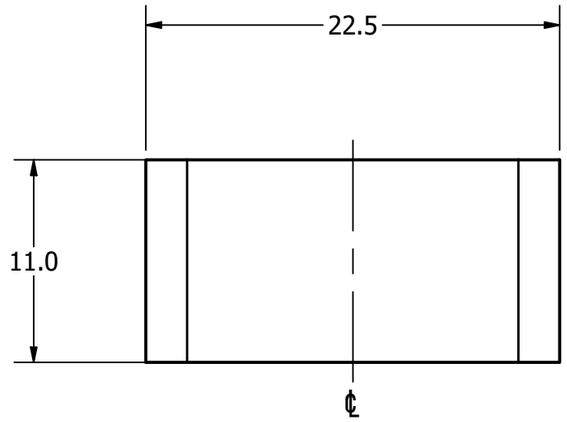
THIRD ANGLE PROJECTION

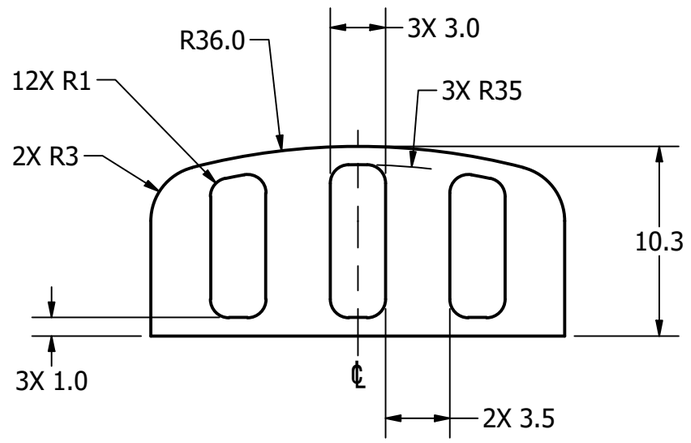
SIZE A3 | DRAWING NUMBER 474-5415 | REV 1

SCALE: 3 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	BK	DJI	5/4/2023







NOTES:

1. MATERIAL: MCBA
   STIFFNESS CAN BE ADJUSTED TO MEET DYNAMIC TEST CORRIDORS
2. REMOVE ALL MOLD FLASHING.
3. ALL MOLD DIMENSION TOLERANCE +1%/-2% BUT NO SMALLER THAN 0.5mm.
4. NO SPLIT OR DEFECTS ARE ALLOWED IN THE POLYURETHANE MOLDING.
5. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/12/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

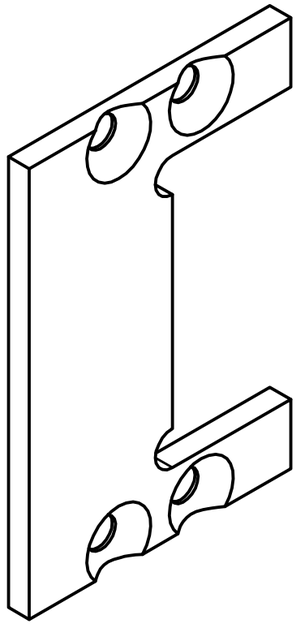
KNEE SLIDER BUMPER

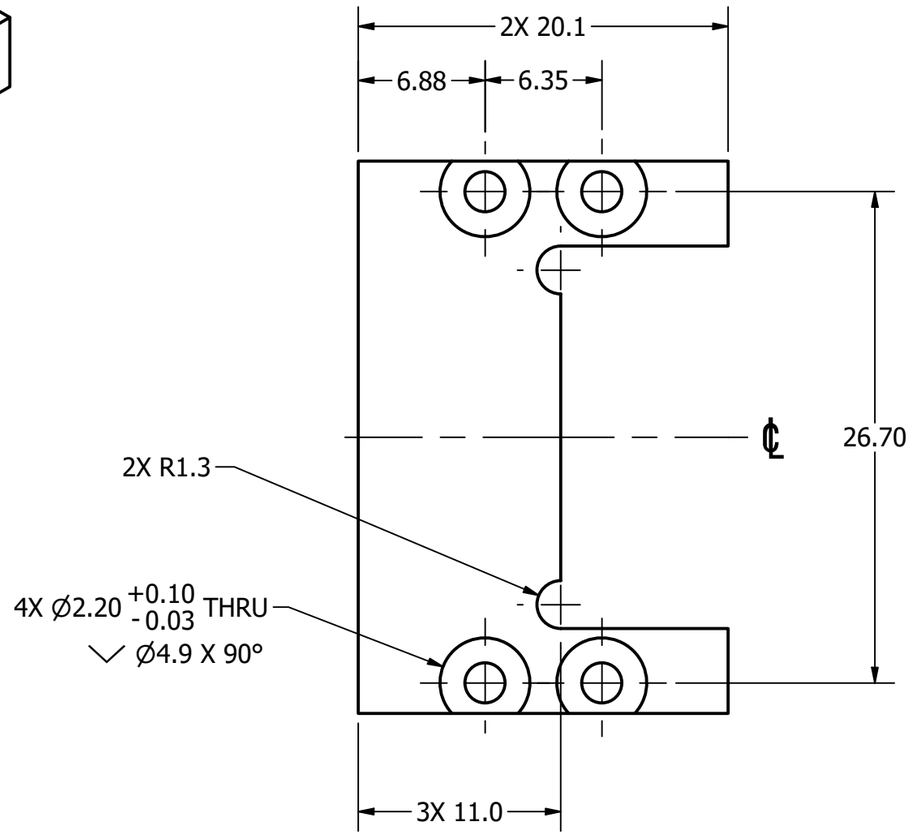
THIRD ANGLE PROJECTION

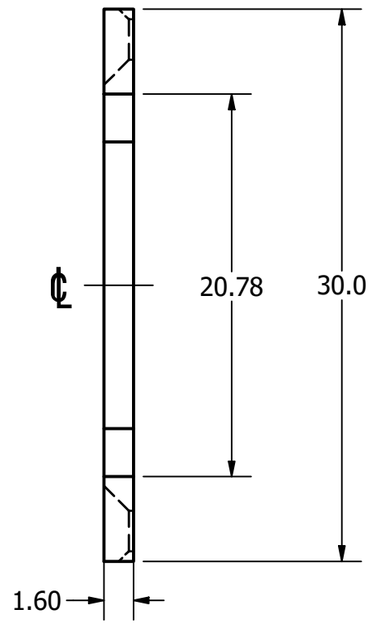
SIZE: A3 | DRAWING NUMBER: 474-5390 | REV: 4

SCALE: 3 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	DJI	DJI	9/6/2022







NOTES:

1. DIMENSIONS ARE SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	8/17/2020
CHECKED:	
ENG: DJI	8/17/2020
APPROVED:	

MATERIAL: 4140 STEEL
HEAT TREAT: N/A
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

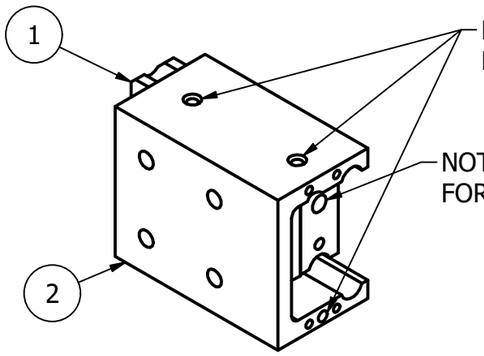
KNEE SLIDER BUMPER MOUNT

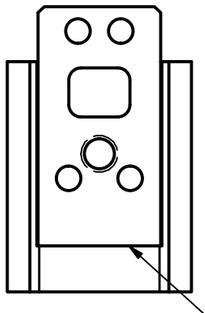
THIRD ANGLE PROJECTION

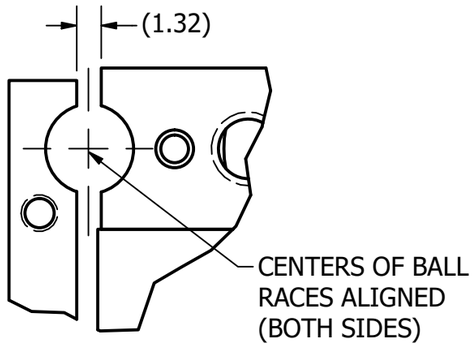
SIZE	DRAWING NUMBER	REV
A3	474-5416	1

SCALE: 3 : 1
SHEET 1 OF 1

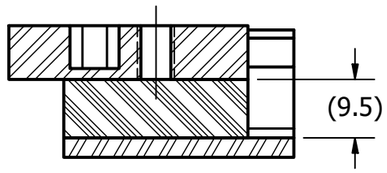
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	BK	DJI	5/11/2023



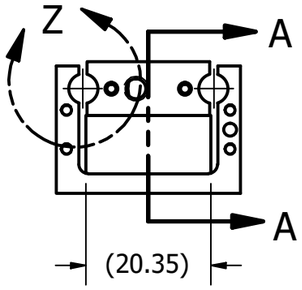




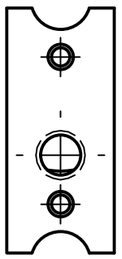
DETAIL Z
SCALE 3 : 1

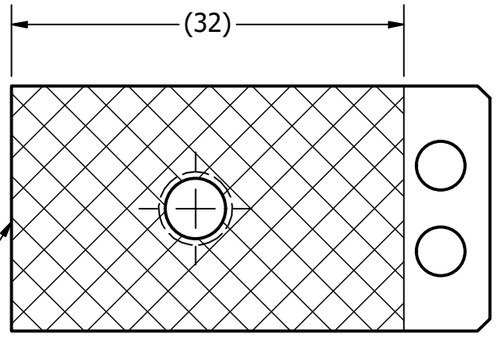


SECTION A-A



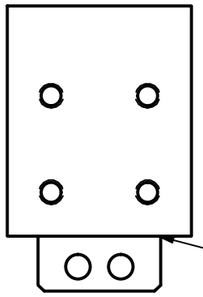






DETAIL VIEW OF 474-5424
SCALE 2 : 1

PREPARE SURFACE SHOWN REPRESENTED BY HATCHED AREA
FOR BONDING RUBBER TO 474-5424



NOTES:

1. MATERIAL: NATURAL RUBBER
   COLOR: BLACK
   DUROMETER: 43±10 SHORE "A"

2. ADJUST DUROMETER FOR DYNAMIC PERFORMANCE.

3. REMOVE ALL MOLD FLASHING.

4. NO SPLIT OR DEFECTS ARE ALLOWED IN THE RUBBER MOLDING.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	474-5423	KNEE SLIDER, LEFT, OUTBOARD RACE
1	1	474-5424	KNEE SLIDER, LEFT, INBOARD RACE

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: B. KIMES	8/17/2020
CHECKED:	
ENG: DJI	8/17/2020
APPROVED:	

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH: URETHANE SPRAY

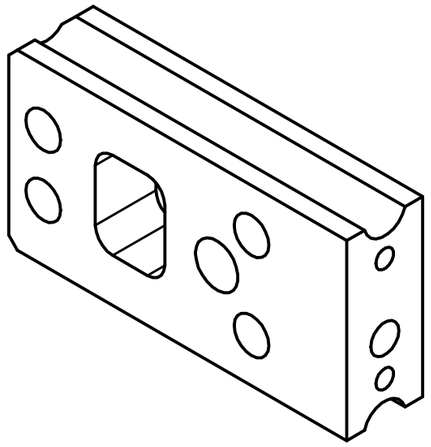
KNEE SLIDER, LEFT, MOLDED ASS'Y
THOR-05F

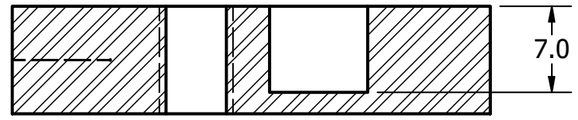
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A3	474-5422	3

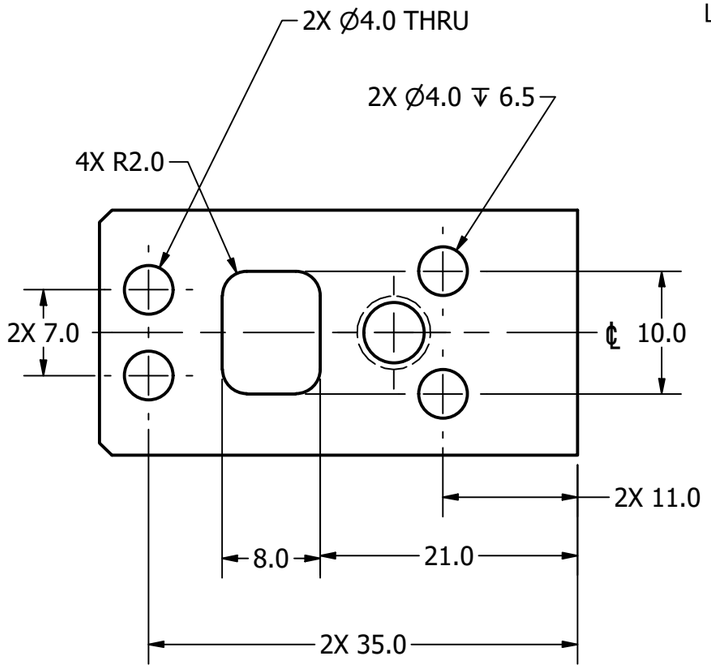
SCALE: 1 : 1
SHEET 1 OF 1

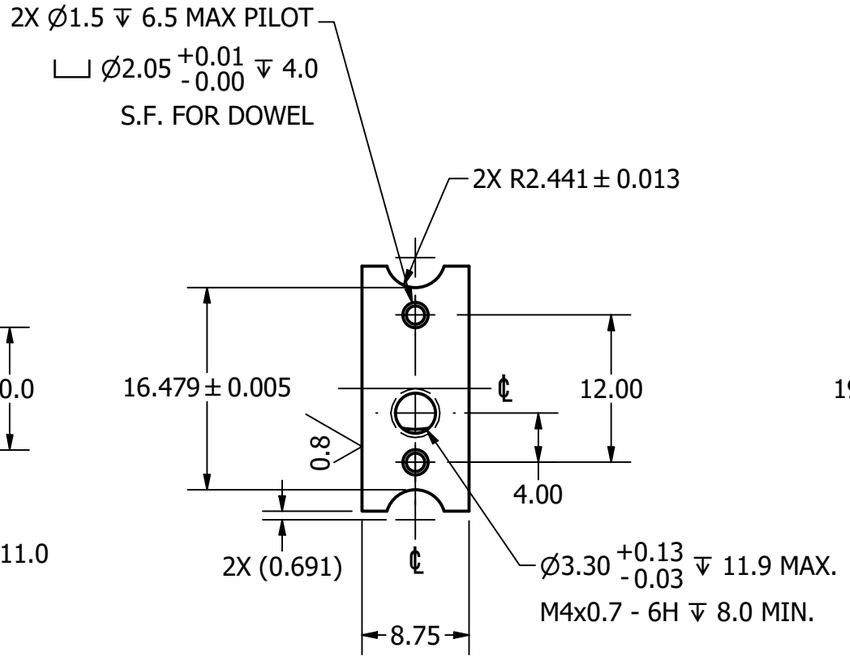
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	DJI	DJI	11/18/2022

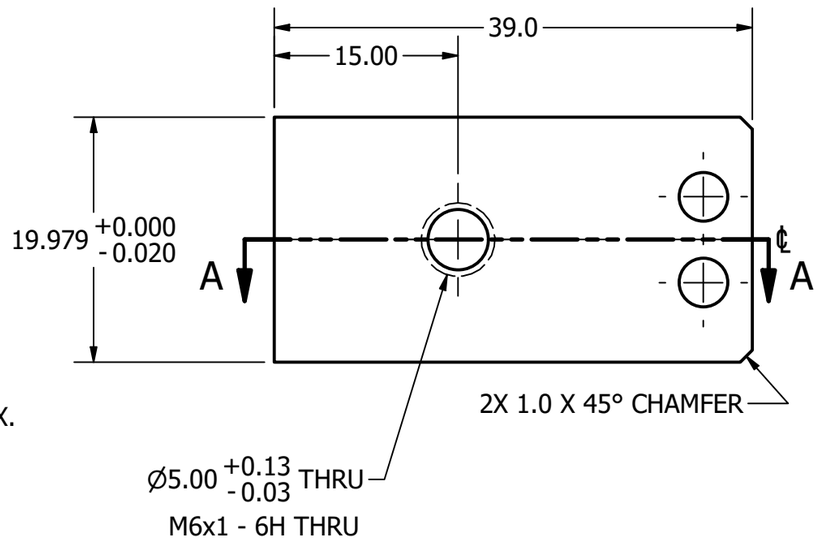




SECTION A-A
SCALE 2 : 1







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

2. HEAT TREAT:
   - MASK ENTIRE PART EXCEPT THE PATHWAYS
   - CARBURIZE PART @ 1700°F FOR 6 HOURS
   - FURNACE COOL, DO NOT QUENCH
   - REHARDEN @ 1520°F AND OIL QUENCH
   - TEMPER @ 350°F FOR 2 HOURS
   - SURFACE HARDNESS IN PATHWAYS SHOULD BE Rc 60-65

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 4140 STEEL
HEAT TREAT: SEE NOTE #2
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

	APPROVALS	DATE
DRAWN	B. KIMES	8/18/2020
CHECKED		
ENG	DJI	8/17/2020
APPROVED		

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

KNEE SLIDER, LEFT, INBOARD RACE

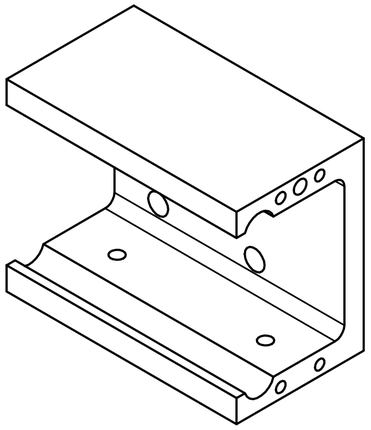
THOR-05F

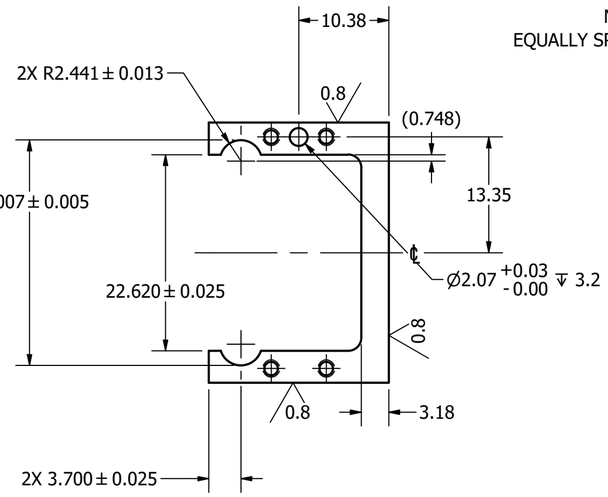
THIRD ANGLE PROJECTION

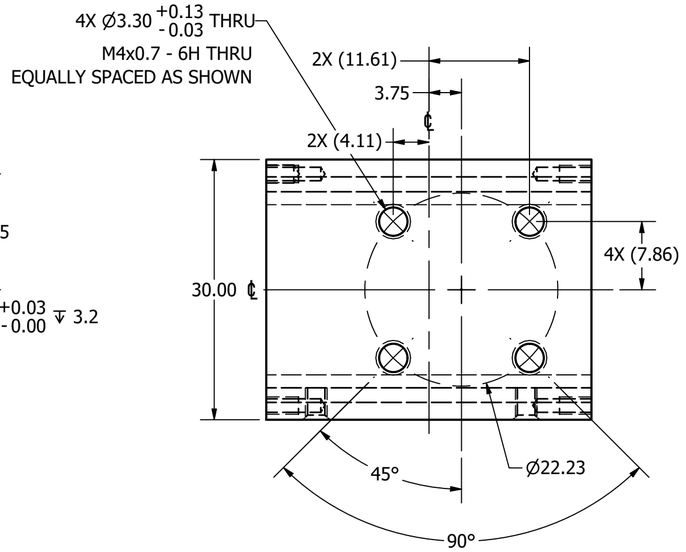
SIZE: A3 | DRAWING NUMBER: 474-5424 | REV: 2

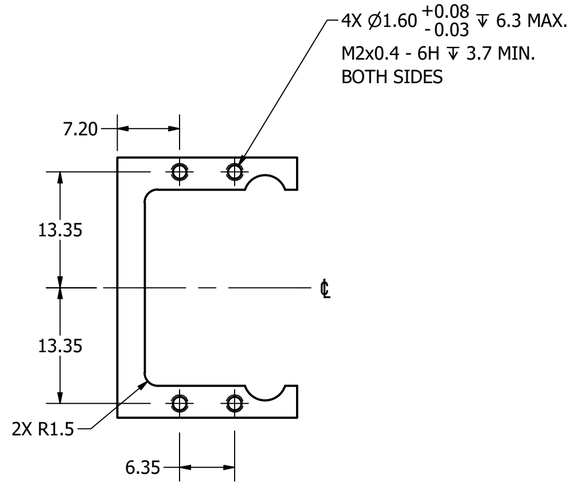
SCALE: 2 : 1 | SHEET: 1 OF 1

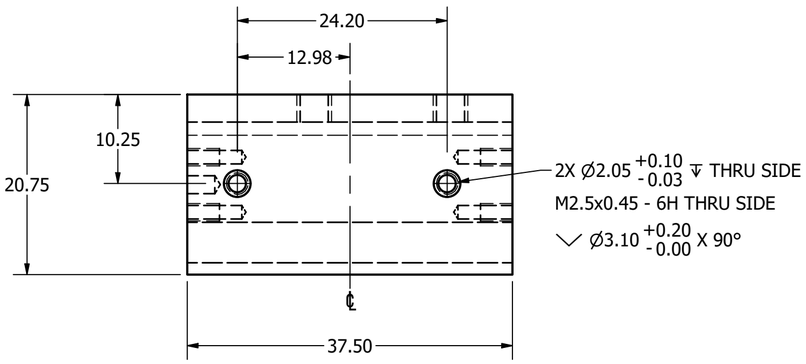
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	DJI	DJI	11/18/2022











NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

2. HEAT TREAT:
   - MASK ENTIRE PART EXCEPT THE PATHWAYS
   - CARBURIZE PART @ 1700°F FOR 6 HOURS
   - FURNACE COOL, DO NOT QUENCH
   - REHARDEN @ 1520°F AND OIL QUENCH
   - TEMPER @ 350°F FOR 2 HOURS
   - SURFACE HARDNESS IN PATHWAYS SHOULD BE Rc 60-65

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 4140 STEEL
HEAT TREAT: SEE NOTE #2
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	8/17/2020
CHECKED	
ENG: DJI	8/17/2020
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

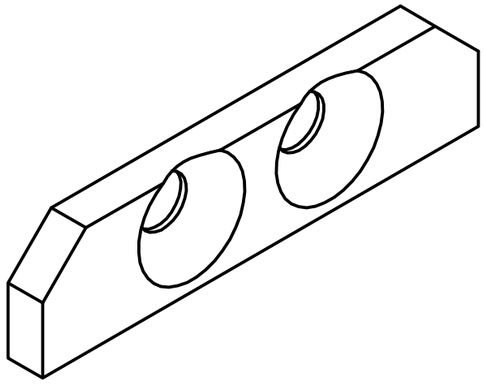
KNEE SLIDER, LEFT, OUTBOARD RACE
THOR-05F

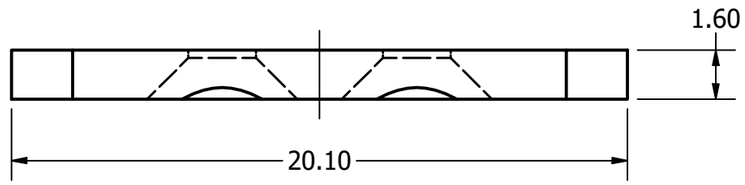
THIRD ANGLE PROJECTION

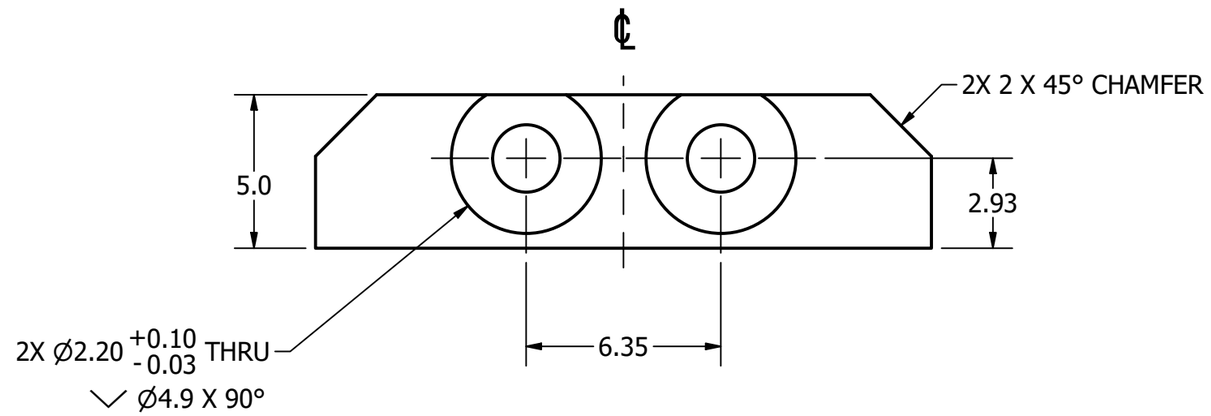
SIZE	DRAWING NUMBER	REV
A2	474-5423	2

SCALE: 2 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	DJI	DJI	9/20/2022







UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

PROTOTYPE DRAWING

MATERIAL: 1018 STEEL
HEAT TREAT: N/A
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	8/17/2020
CHECKED:	
ENG: DJI	8/17/2020
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

KNEE SLIDER BALL RETAINER

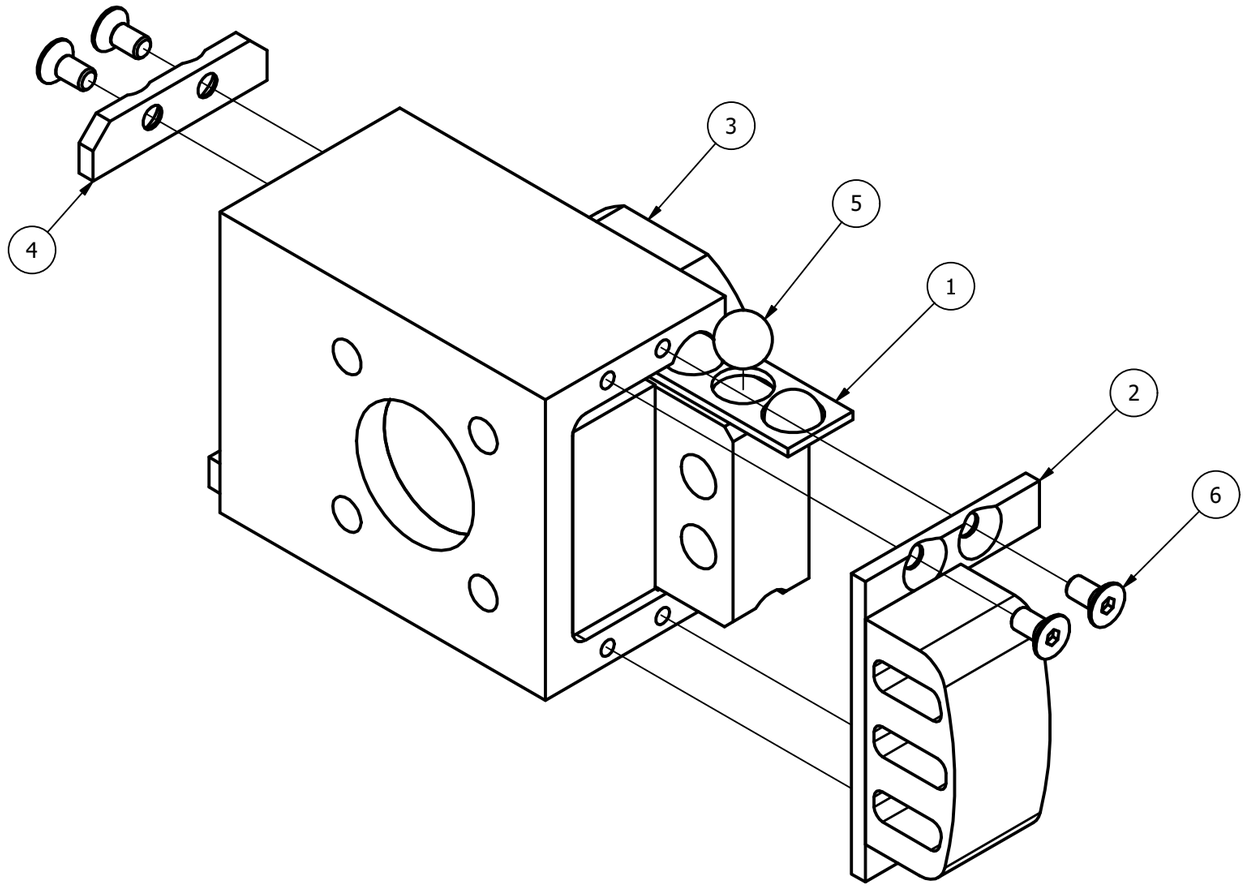
THOR-05F

THIRD ANGLE PROJECTION

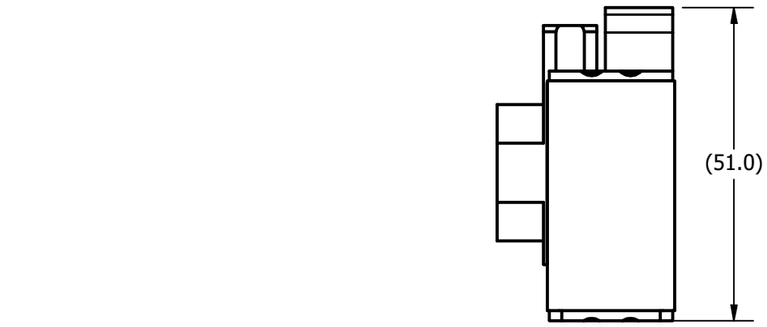
SIZE: A3 | DRAWING NUMBER: 474-5429 | REV: 1

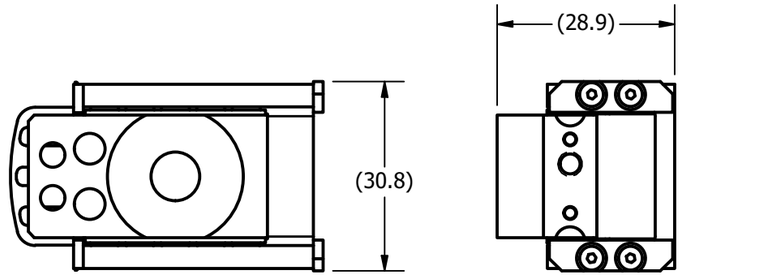
SCALE: 5 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	BK	DJI	6/15/2023



SCALE 2 : 1





ITEM	QTY	PART NUMBER	DESCRIPTION
6	8	5000595	M2 X 0.4 X 4 LG. FHCS
5	10	EX593-19-DN	BALL 3/16" DIA.
4	2	474-5429	KNEE SLIDER BALL RETAINER
3	1	474-5426	KNEE SLIDER, RIGHT, MOLDED ASS'Y
2	1	474-5415	KNEE SLIDER BUMPER ASSEMBLY
1	2	474-5394	BALL BEARING SEPERATOR

PARTS LIST

NOTES:

1. GREASE BALL BEARINGS.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. KIMES	8/19/2020
CHECKED	
ENG DJI	8/19/2020
APPROVED	

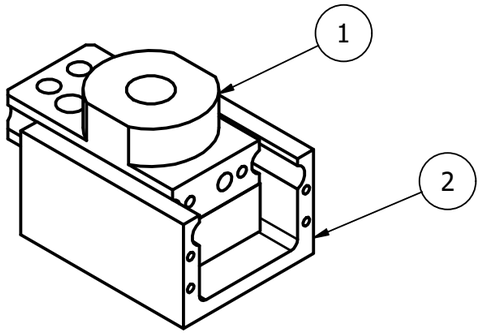
MATERIAL
HEAT TREAT
FINISH

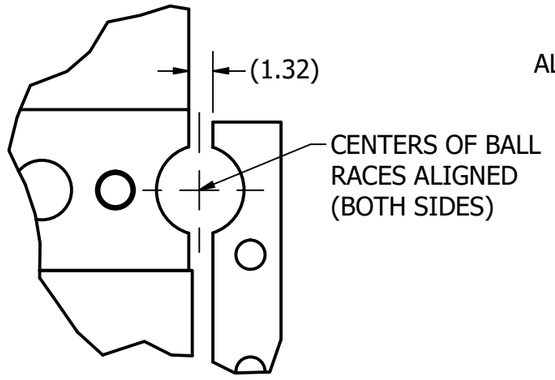
KNEE SLIDER, RIGHT, ASS'Y
THOR-05F

THIRD ANGLE PROJECTION

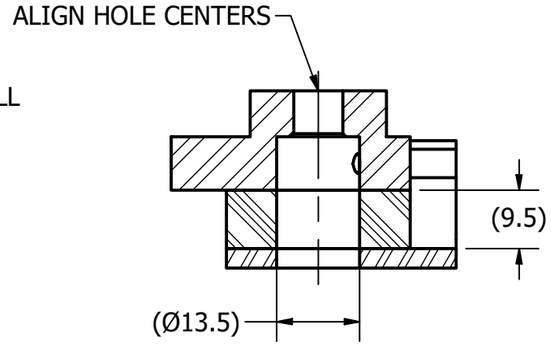
SIZE A3 | DRAWING NUMBER 474-5425 | REV 3
SCALE: 1 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	BK	DJI	5/11/2023

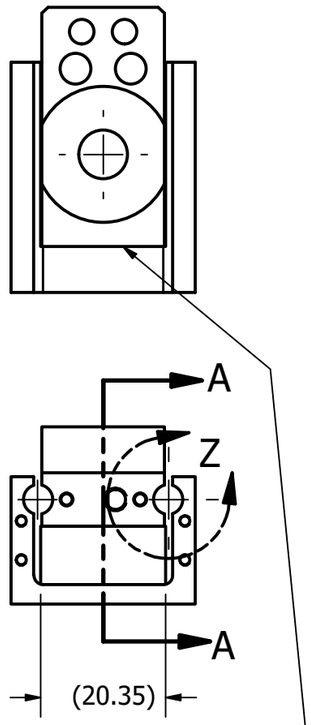


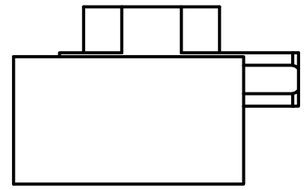


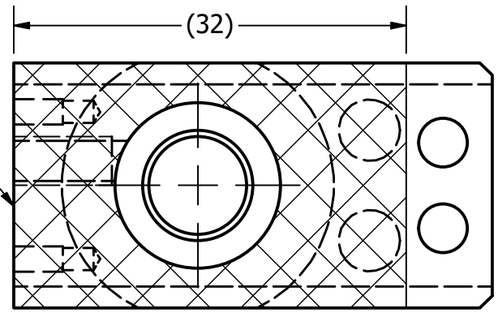
DETAIL Z
SCALE 3 : 1



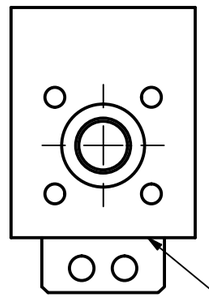
SECTION A-A







DETAIL VIEW OF 474-5428
SCALE 2 : 1



ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	474-5427	KNEE SLIDER, RIGHT, OUTBOARD RACE
1	1	474-5428	KNEE SLIDER, RIGHT, INBOARD RACE

PARTS LIST

NOTES:

1. MATERIAL: NATURAL RUBBER
   COLOR: BLACK
   DUROMETER: 43±10 SHORE "A"
2. ADJUST DUROMETER FOR DYNAMIC PERFORMANCE.
3. REMOVE ALL MOLD FLASHING.
4. NO SPLIT OR DEFECTS ARE ALLOWED IN THE RUBBER MOLDING.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	B. KIMES	8/18/2020
CHECKED		
ENG	DJI	8/18/2020
APPROVED		

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH: URETHANE SPRAY

KNEE SLIDER, RIGHT, MOLDED ASS'Y

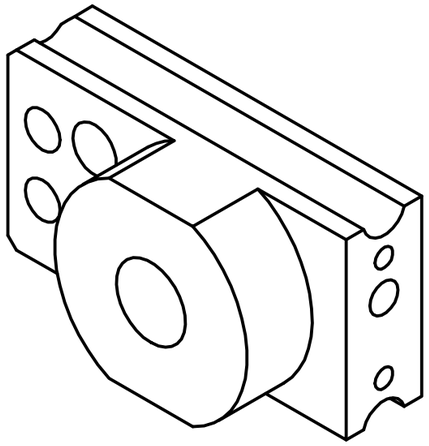
THOR-05F

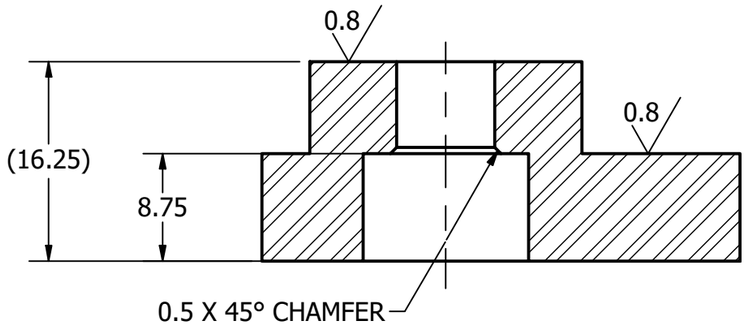
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-5426 | REV: 3

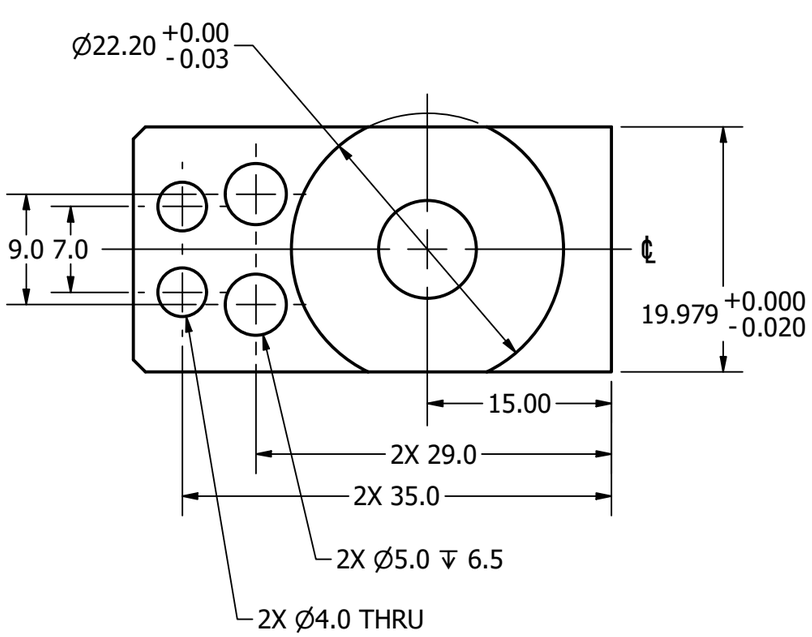
SCALE: 1 : 1 | SHEET: 1 OF 1

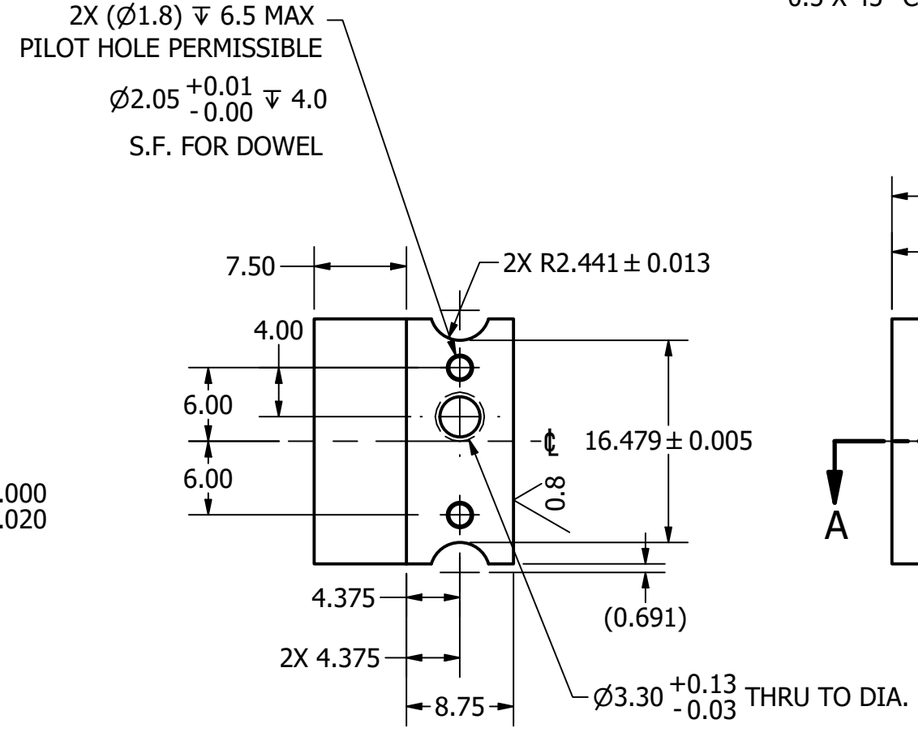
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	DJI	DJI	2/23/2022

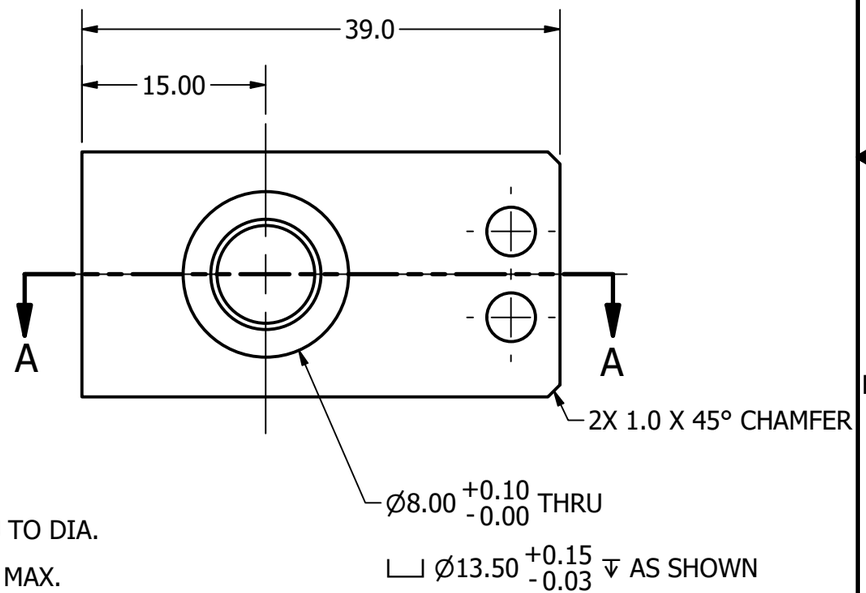




SECTION A-A







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

2. HEAT TREAT:
   - MASK ENTIRE PART EXCEPT THE PATHWAYS
   - CARBURIZE PART @ 1700°F FOR 6 HOURS
   - FURNACE COOL, DO NOT QUENCH
   - REHARDEN @ 1520°F AND OIL QUENCH
   - TEMPER @ 350°F FOR 2 HOURS
   - SURFACE HARDNESS IN PATHWAYS SHOULD BE Rc 60-65

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

	APPROVALS	DATE
DRAWN	B. KIMES	8/21/2020
CHECKED		
ENG	DJI	8/18/2020
APPROVED		

MATERIAL: 4140 STEEL
HEAT TREAT: SEE NOTES
FINISH: N/A

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

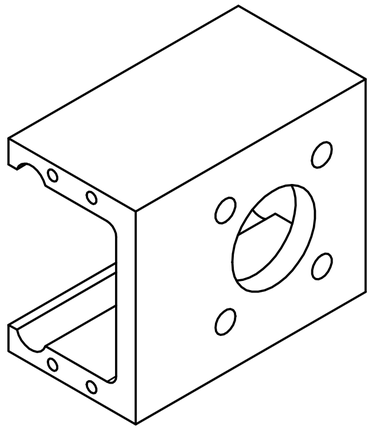
KNEE SLIDER, RIGHT, INBOARD RACE
THOR-05F

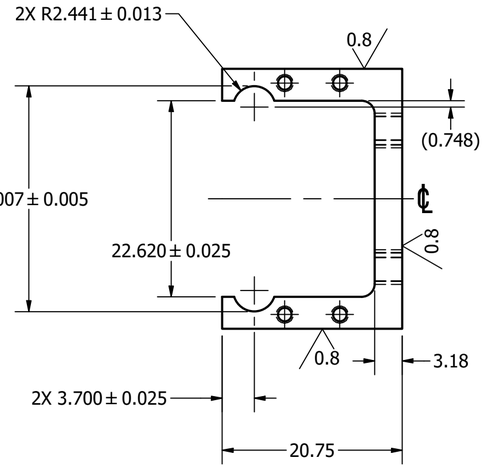
THIRD ANGLE PROJECTION

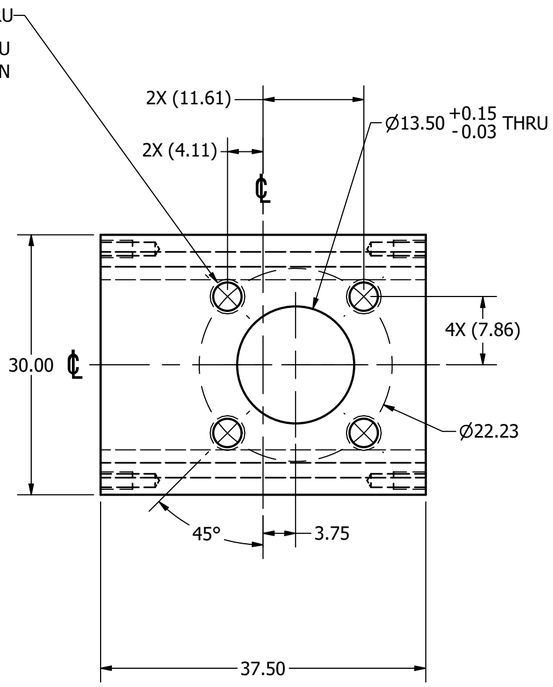
SIZE	DRAWING NUMBER	REV
A3	474-5428	3

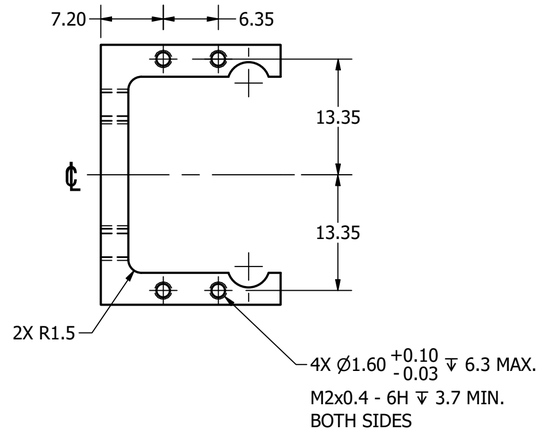
SCALE: 2 : 1
SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	DJI	DJI	11/18/2022









NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

2. HEAT TREAT:
   - MASK ENTIRE PART EXCEPT THE PATHWAYS
   - CARBURIZE PART @ 1700°F FOR 6 HOURS
   - FURNACE COOL, DO NOT QUENCH
   - REHARDEN @ 1520°F AND OIL QUENCH
   - TEMPER @ 350°F FOR 2 HOURS
   - SURFACE HARDNESS IN PATHWAYS SHOULD BE Rc 60-65

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ⩛ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 4140 STEEL
HEAT TREAT: SEE NOTE #2
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

	APPROVALS	DATE
DRAWN	B. KIMES	8/18/2020
CHECKED		
ENG	DJI	8/18/2020
APPROVED		

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

KNEE SLIDER, RIGHT, OUTBOARD RACE

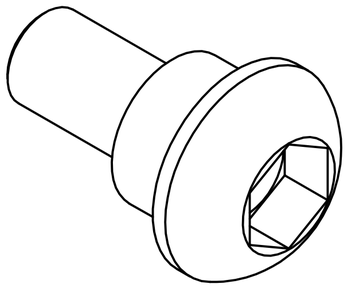
THOR-05F

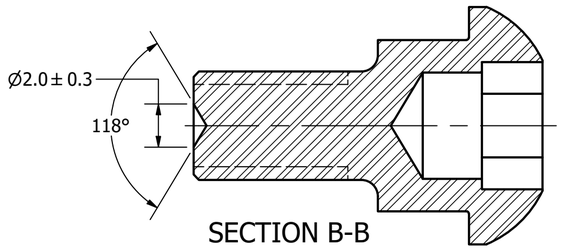
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-5427 | REV: 2

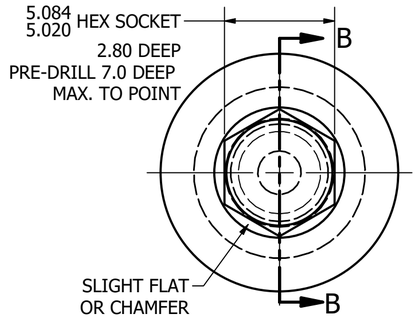
SCALE: 2 : 1 | SHEET: 1 OF 1

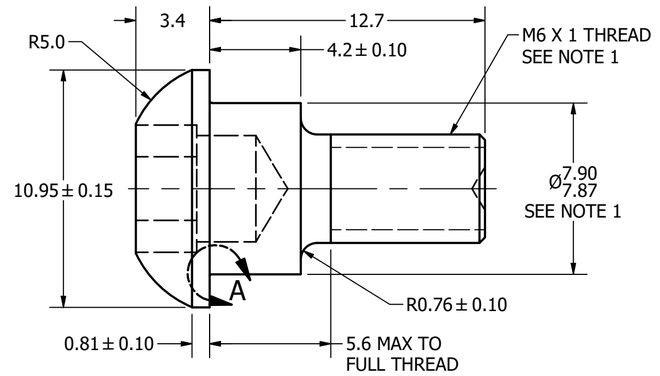
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	F	RELEASE FOR PRODUCTION	CJT	SKK	5/11/2017

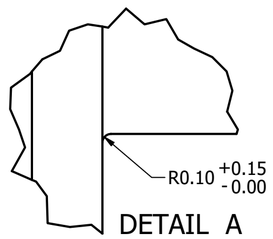




SECTION B-B
SCALE 5 : 1







DETAIL A
SCALE 20 : 1

NOTES:

1. SHOULDER TO BE CONCENTRIC TO AXIS OF THREAD
WITHIN 0.02 MM TOTAL INDICATOR READING.

2. REMOVE ALL BURRS AND BREAK SHARP EDGES.

3. MATERIAL: ALLOY STEEL PER ASTM A574 (OPTIONAL ETD 150 PER AISI/SAE 4100)
MINIMUM TENSILE STRENGTH 140,000 PSI.

4. FINISH: 0.002 - 0.008 ZINC PER SIDE, AFTER ZINC PLATING CHECK HARDNESS,

5. MECHANICAL: TEST PARTS FOR TENSILE STRENGTH PER ASTM F606/F606M-16 BOTH BEFORE & AFTER PLATING,
TO ENSURE NO HYDROGEN EMBRITTLEMENT, PARTS MUST BE ABOVE 140,000 PSI ON BOTH TESTS.

6. DIMENSONAL LIMITS AND THREAD SIZES APPLY AFTER FINISH.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #3
HEAT TREAT: SEE NOTE #4
FINISH: SEE NOTE #4

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: gbrock	1/14/2013
CHECKED:	
ENG: JWANG	5/24/2005
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

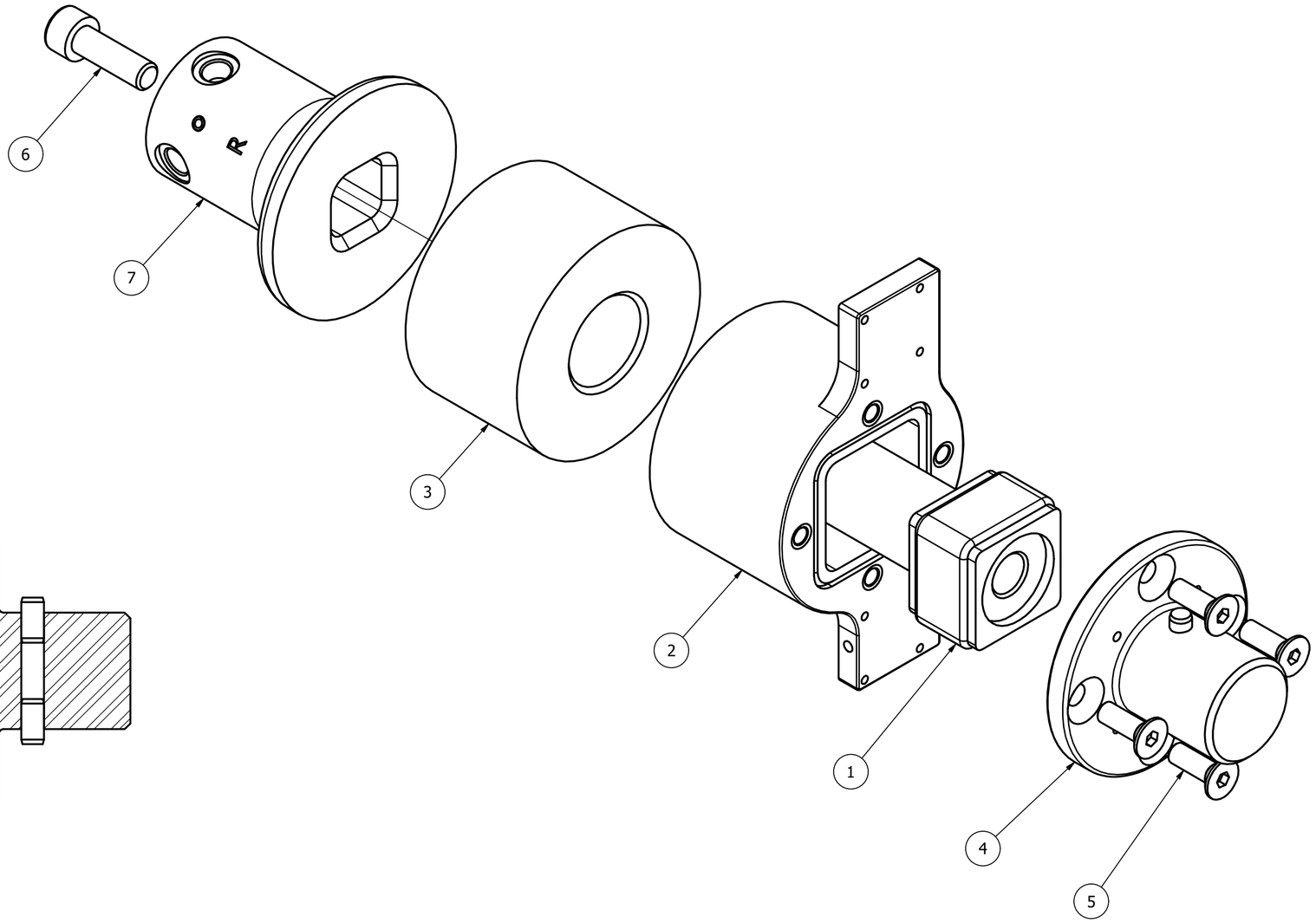
MODIFIED BHSS M6 THREAD
METRIC TIBIA LOAD CELLS

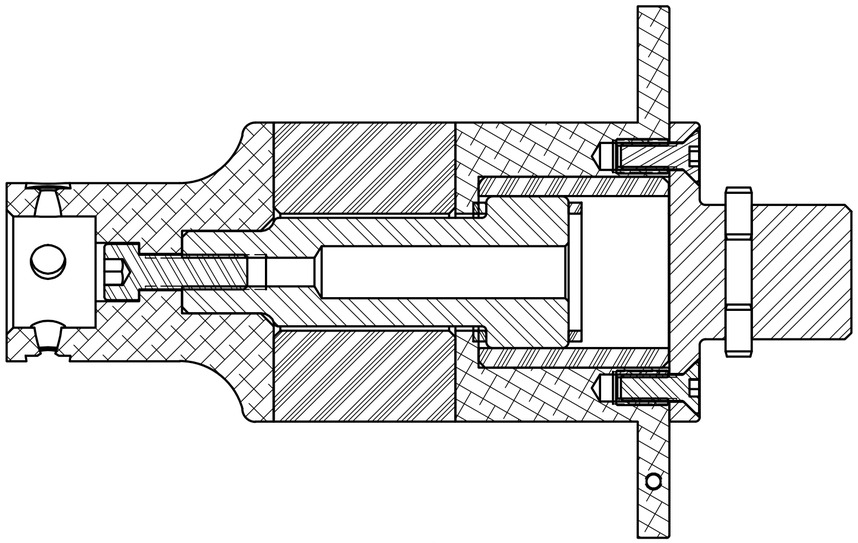
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A2	W50-61042	F

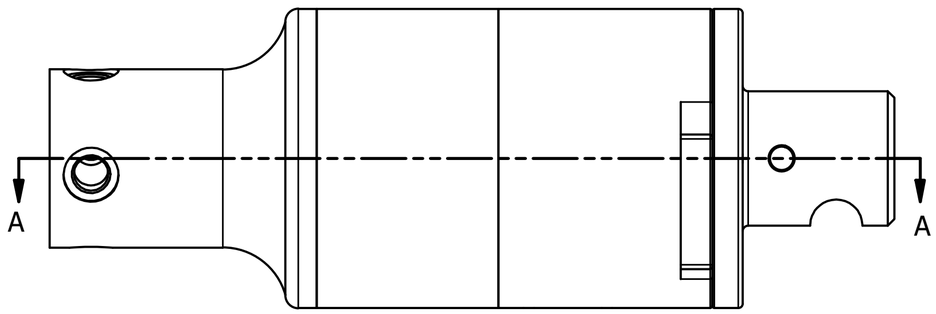
SCALE: 5 : 1 | SHEET 1 OF 1

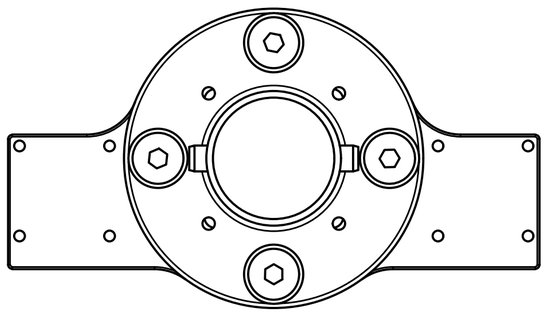
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	BK	DI	7/14/2021





SECTION A-A





ITEM	QTY	PART NUMBER	DESCRIPTION
7	1	474-5173-2	FEMUR END CAP, RIGHT
6	1	5000037	M8 X 1.25 X 25 LG. SHCS
5	4	5000108	M6 X 1 X 18 LG. FHCS
4	1	474-5161	FEMUR ATTACHMENT PLATE
3	1	474-5172	FEMUR RUBBER
2	1	474-5164	FEMUR BRUSHING ASSEMBLY
1	1	474-5166	FEMUR PLUNGER ASSEMBLY

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∨ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

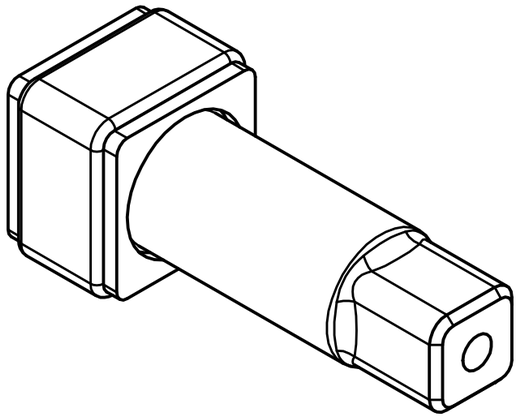
APPROVALS	DATE
DRAWN B. KIMES	4/8/2016
CHECKED	
ENG	
APPROVED	

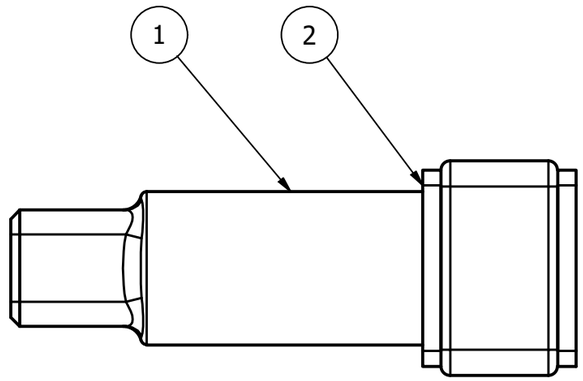
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

FEMUR ASSEMBLY, RIGHT
THOR-05

THIRD ANGLE PROJECTION
SIZE A2 | DRAWING NUMBER 474-5160-2 | REV 3
SCALE: 1 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	SR	JW	1/23/2018





ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-5171	FEMUR PLUNGER
2	2	474-5167	END STOP

PARTS LIST

NOTES:

1. BOND (2X) ITEM 2 TO ITEM 1

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ±1°
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. KIMES	4/7/2016
CHECKED	
ENG	
APPROVED	

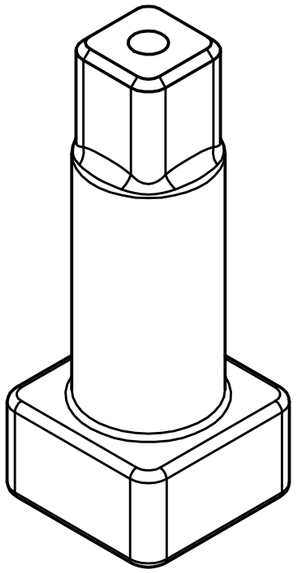
MATERIAL
HEAT TREAT
FINISH

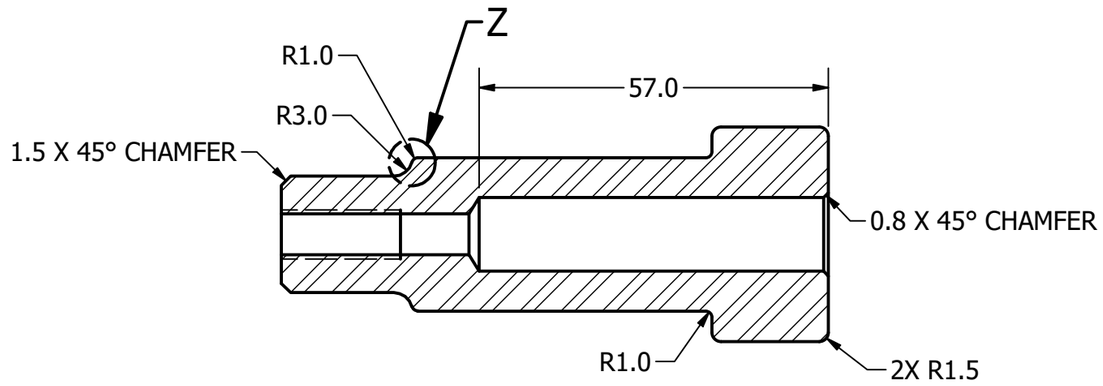
FEMUR PLUNGER ASSEMBLY

THIRD ANGLE PROJECTION

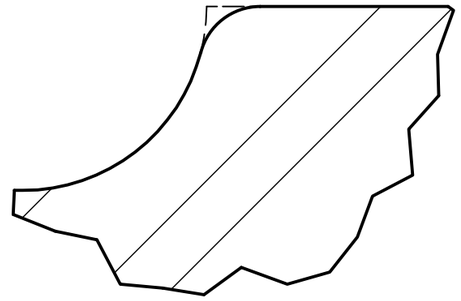
SIZE A3 | DRAWING NUMBER 474-5166 | REV 2
SCALE: 1 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	DI	7/14/2021

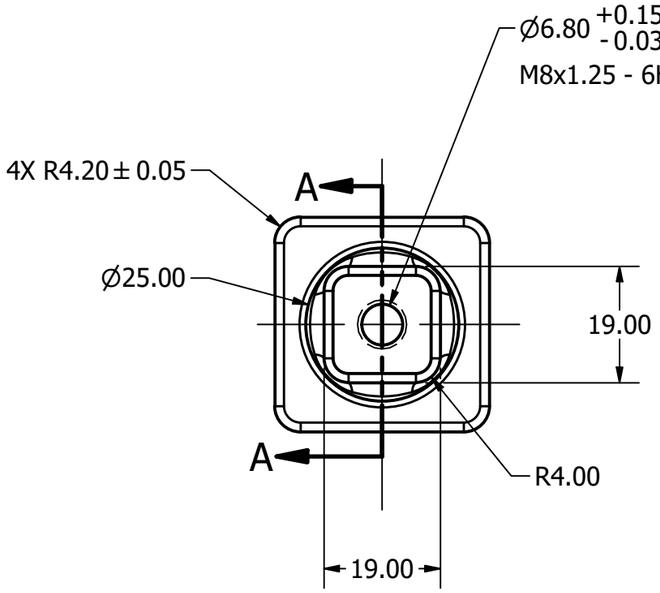


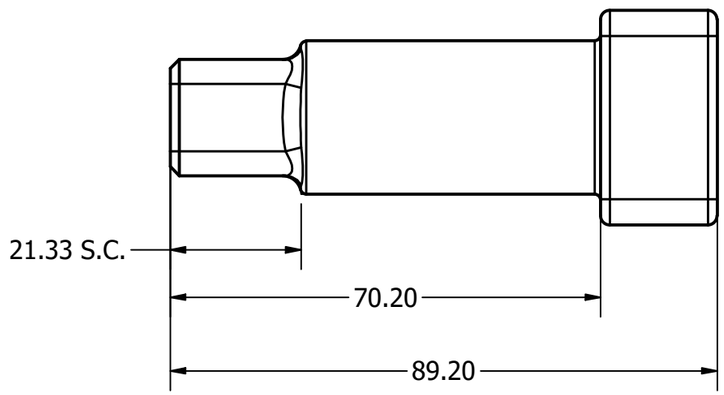


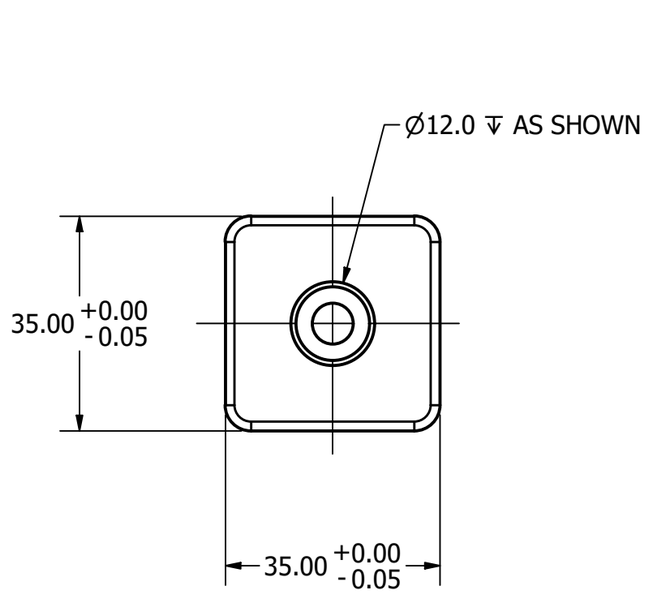
SECTION A-A



DETAIL Z
SCALE 10 : 1







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED √ | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 4140 STEEL
HEAT TREAT: RC 44-48
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/7/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

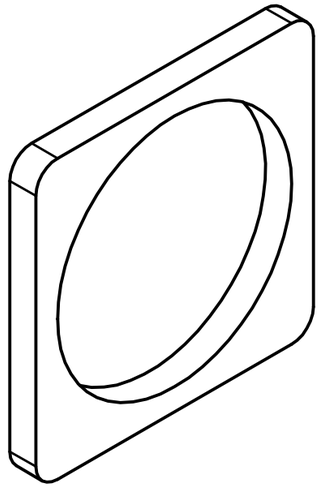
FEMUR PLUNGER

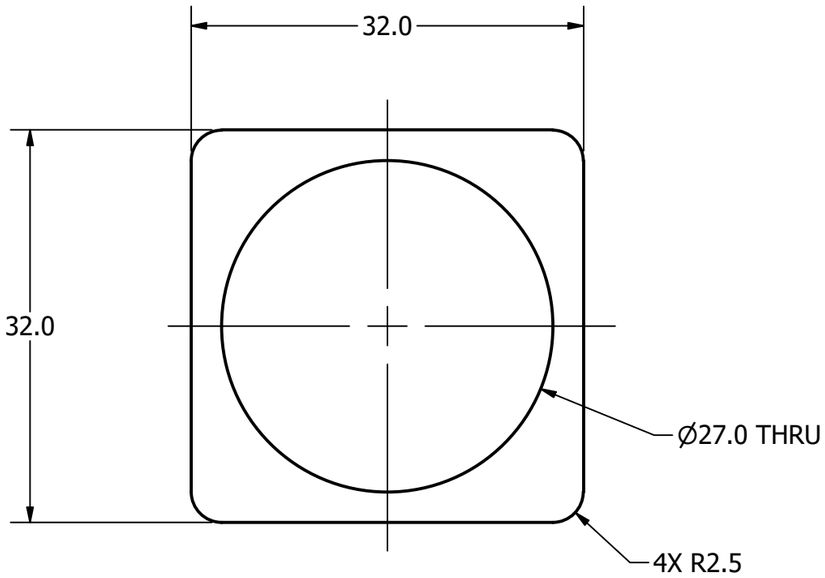
THIRD ANGLE PROJECTION

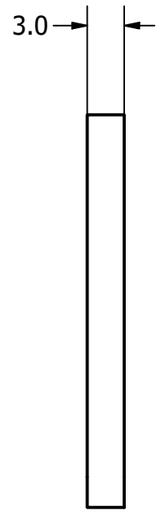
SIZE	DRAWING NUMBER	REV
A3	474-5171	2

SCALE: 1 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	JW	11/14/2017







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 125 | ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: URETHANE 80A
HEAT TREAT:
FINISH:

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/7/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

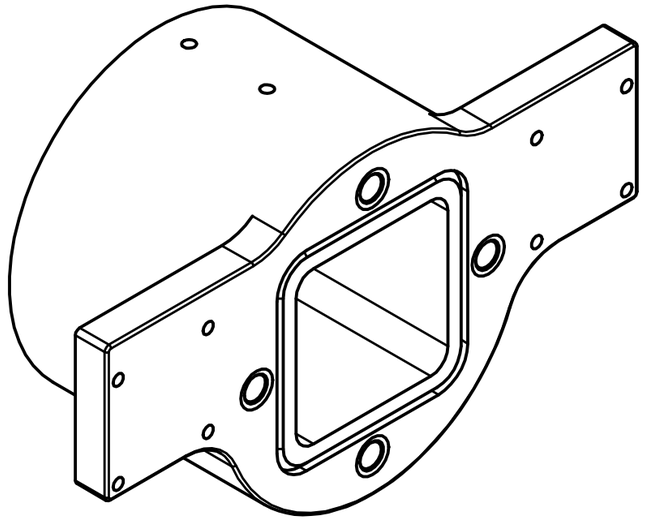
END STOP

THIRD ANGLE PROJECTION

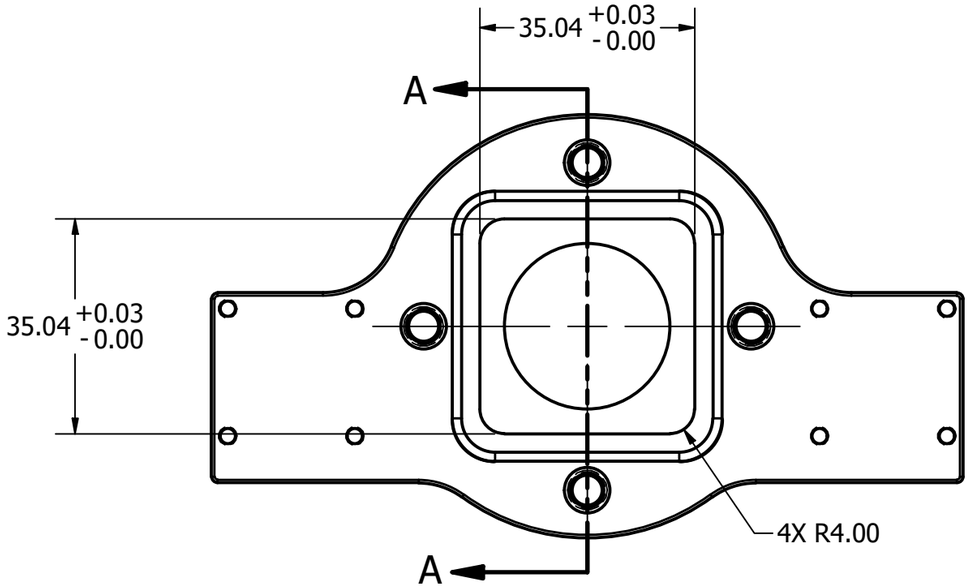
SIZE: A3 | DRAWING NUMBER: 474-5167 | REV: 1

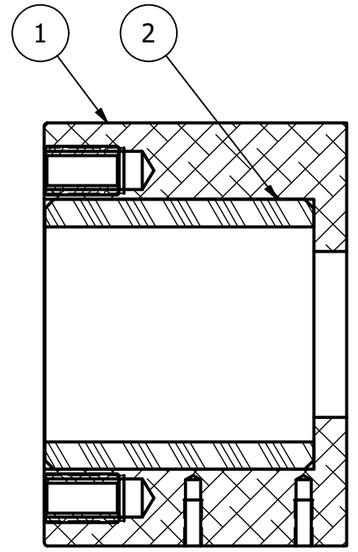
SCALE: 2:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	SR	JW	1/23/2018









SECTION A-A

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	474-5163	FEMUR BUSHING
1	1	474-5165	FEMUR CUP

PARTS LIST

NOTES:

1. PRESS 474-5163 INTO 474-5165 BOND ITEM 1 TO ITEM 2 THEN MACHINE AS SHOWN.
2. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. KIMES	4/7/2016
MATERIAL	
CHECKED	
HEAT TREAT	
ENG	
FINISH	
APPROVED	

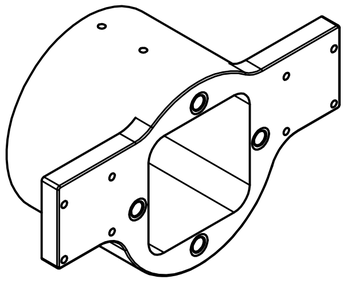
FEMUR BRUSHING ASSEMBLY

THIRD ANGLE PROJECTION

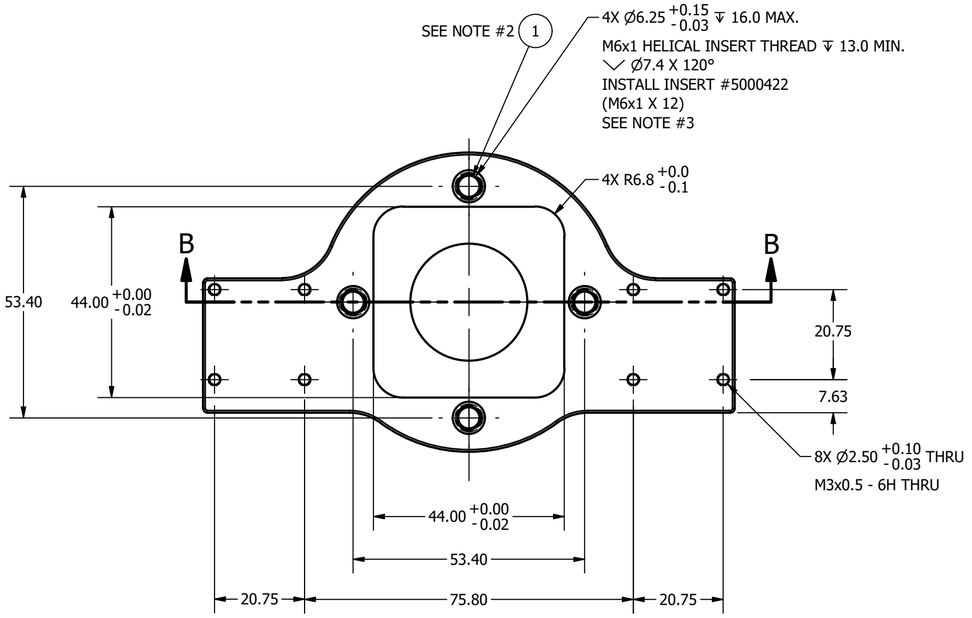
SIZE A3 | DRAWING NUMBER 474-5164 | REV 2

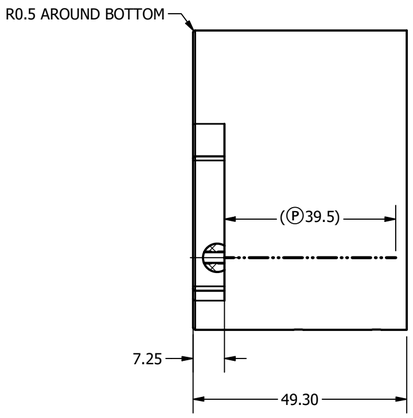
SCALE: 1 : 1 | SHEET 1 OF 1

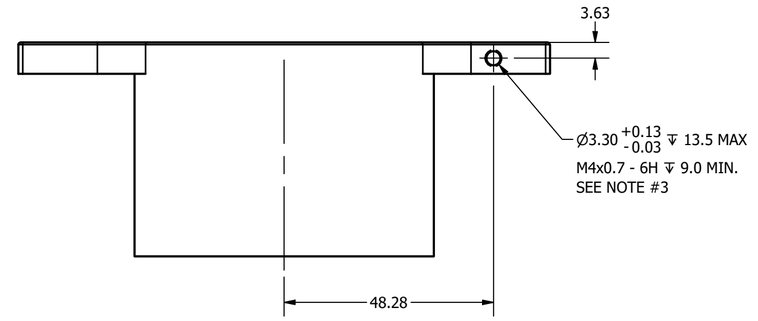
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	PROTOTYPE	HF	JW	9/22/2021

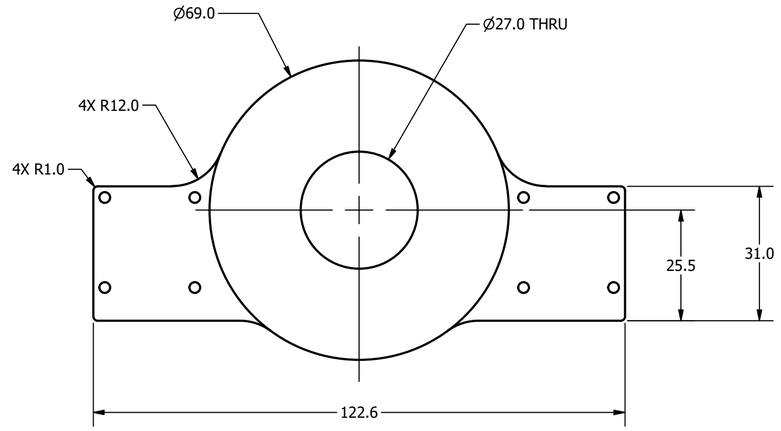


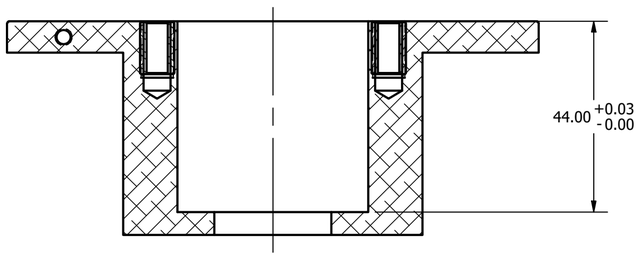
SCALE .75:1



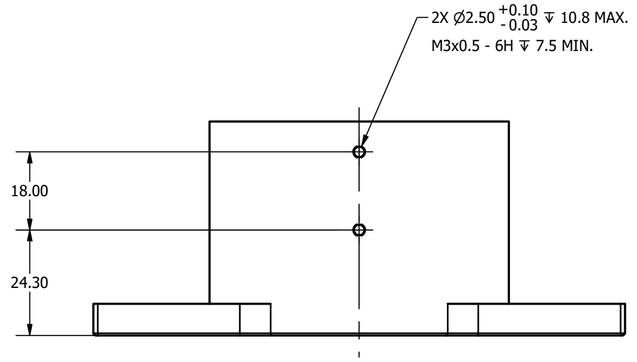








SECTION B-B



ITEM	QTY	PART NUMBER	DESCRIPTION
1	4	5000422	HELICAL INSERT, M6 X 1 X 12

PARTS LIST

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. INSTALL HELICAL INSERTS AFTER ANODIZE.
3. PLUG HOLES BEFORE ANODIZE.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

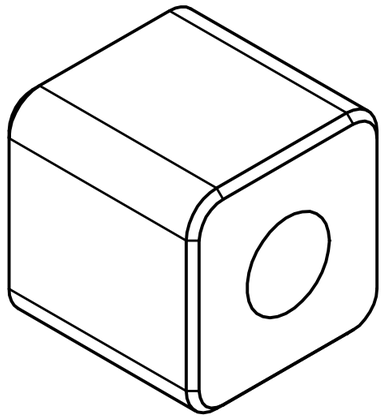
APPROVALS	DATE
DRAWN: B. KIMES	4/7/2016
CHECKED:	
ENG: JW	4/7/2016
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

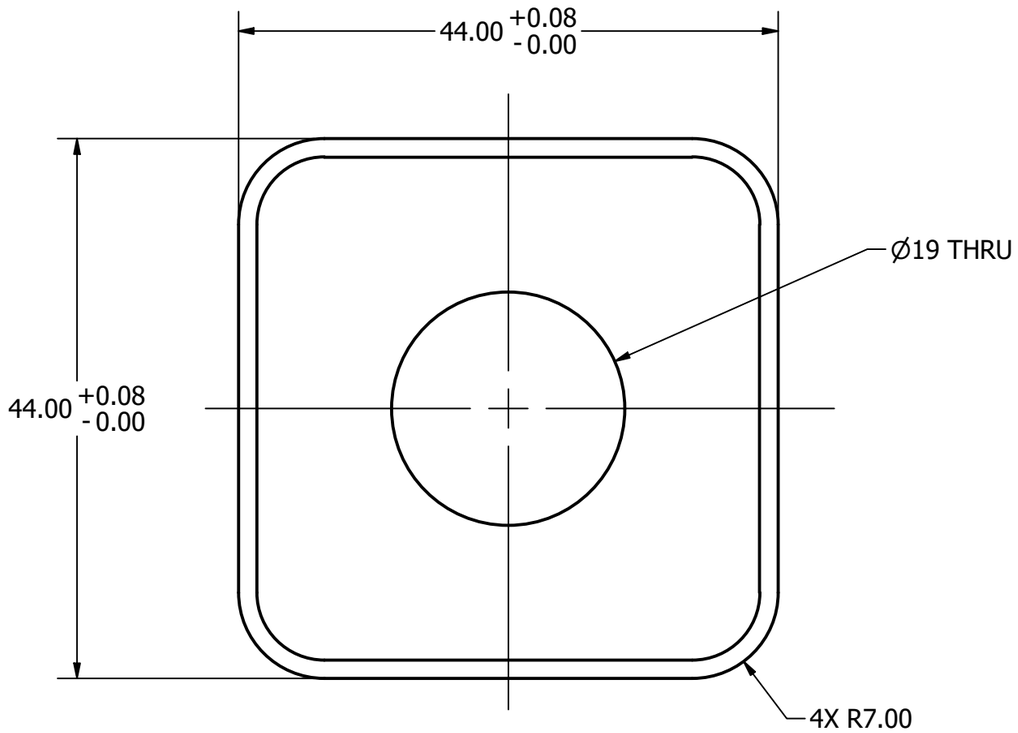
FEMUR CUP
THOR-05F

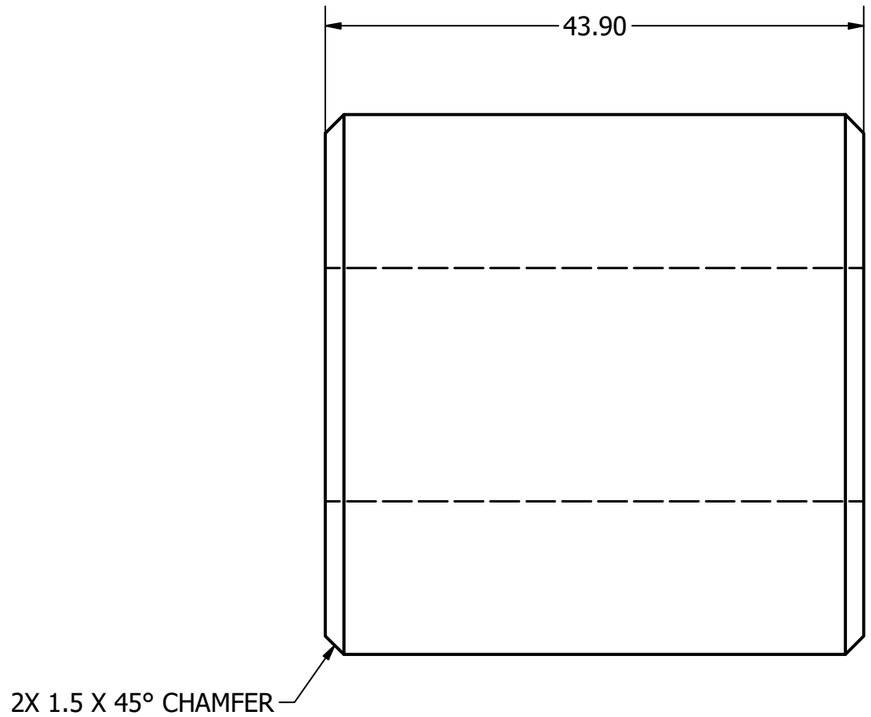
THIRD ANGLE PROJECTION
SIZE: A2
DRAWING NUMBER: 474-5165
REV: 5
SCALE: 1 : 1
SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	KMSP	KMSP	3/19/2020



SCALE 1 : 1





NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	4/7/2016
CHECKED	
ENG JW	4/7/2016
APPROVED	

MATERIAL: PTFE: WHITE
HEAT TREAT: N/A
FINISH: N/A

DEPARTMENT OF TRANSPORTATION · UNITED STATES OF AMERICA

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

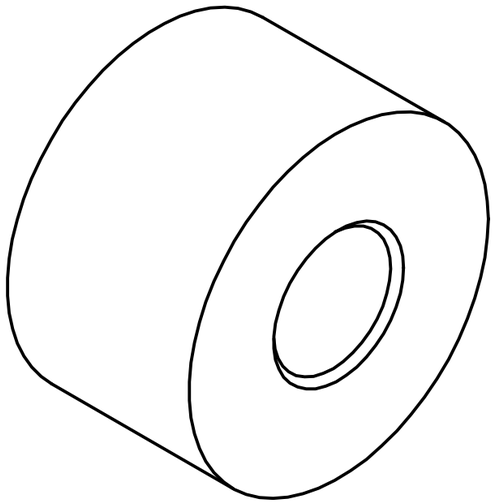
FEMUR BUSHING
THOR-05F

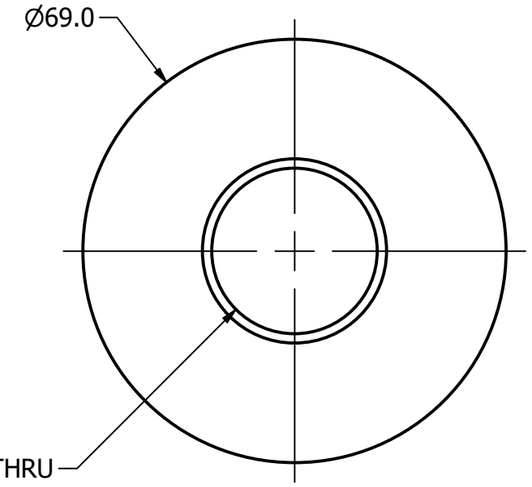
THIRD ANGLE PROJECTION

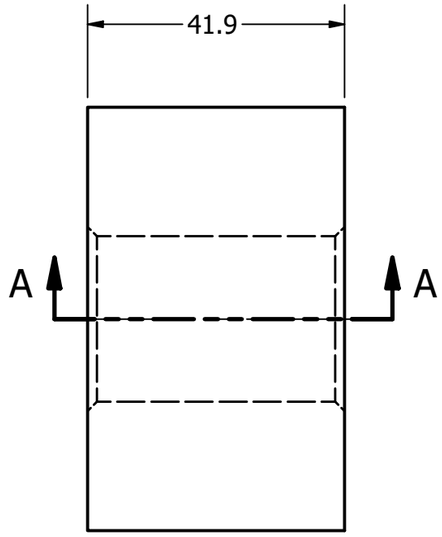
SIZE	DRAWING NUMBER	REV
A3	474-5163	3

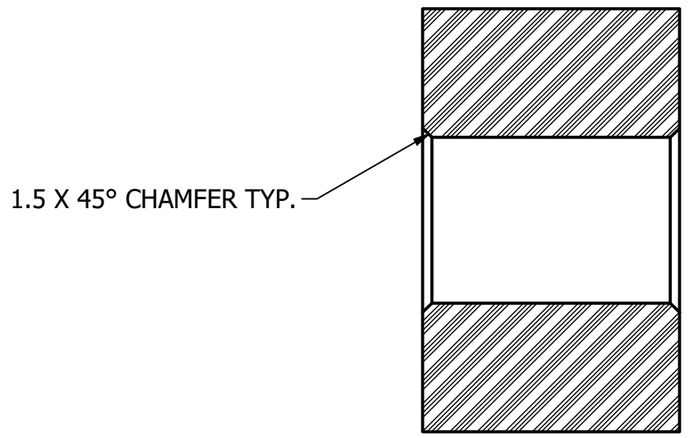
SCALE: 2 : 1
SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	DJI	DJI	1/13/2020









SECTION A-A

NOTES:

1. MATERIAL: NATURAL RUBBER
   COLOR: BLACK
   DUROMETER: 60 ±10 SHORE "A"
   ADJUST TO MEET DYNAMIC PERFORMANCE

2. REMOVE ALL MOLD FLASHING

3. MOLD DIMENSION TOLERANCE +1%/-2% BUT NO SMALLER THAN 0.5mm

4. NO SPLIT OR DEFECTS ARE ALLOWED IN THE RUBBER MOLDING

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED √ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

APPROVALS	DATE
DRAWN: disopi	1/13/2020
CHECKED:	
ENG: DJI	1/7/2020
APPROVED:	

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

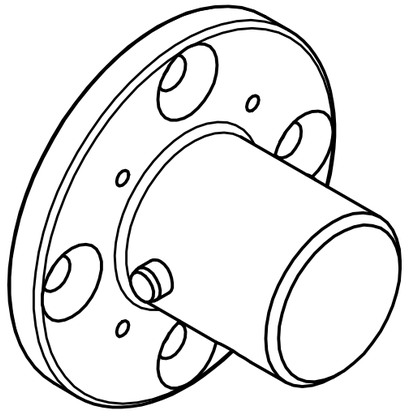
FEMUR RUBBER

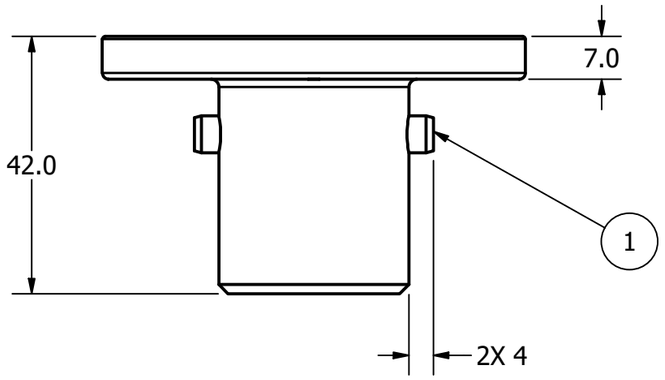
THIRD ANGLE PROJECTION

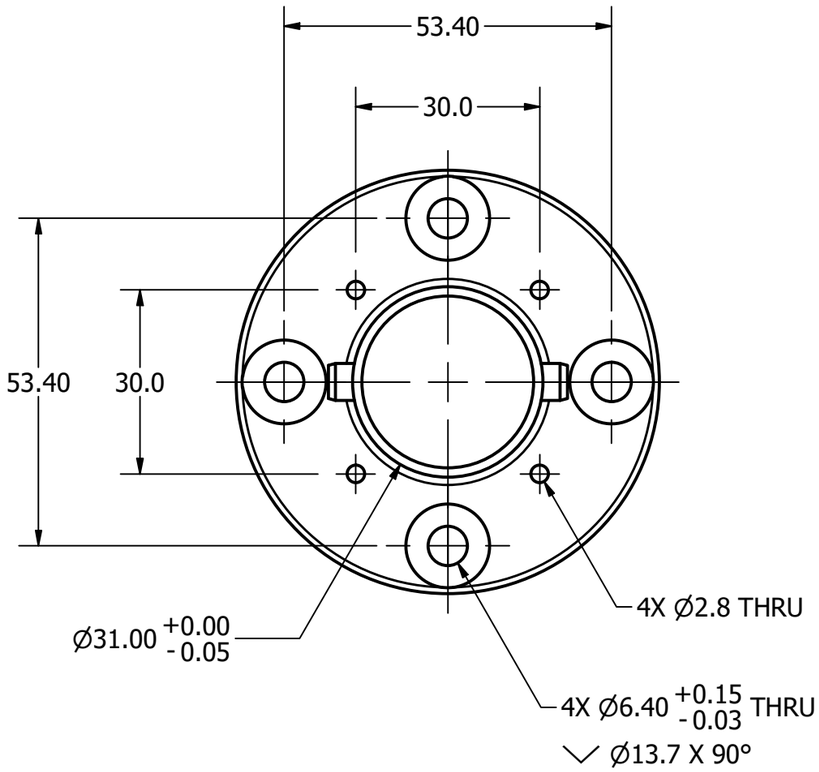
SIZE: A3 | DRAWING NUMBER: 474-5172 | REV: 1

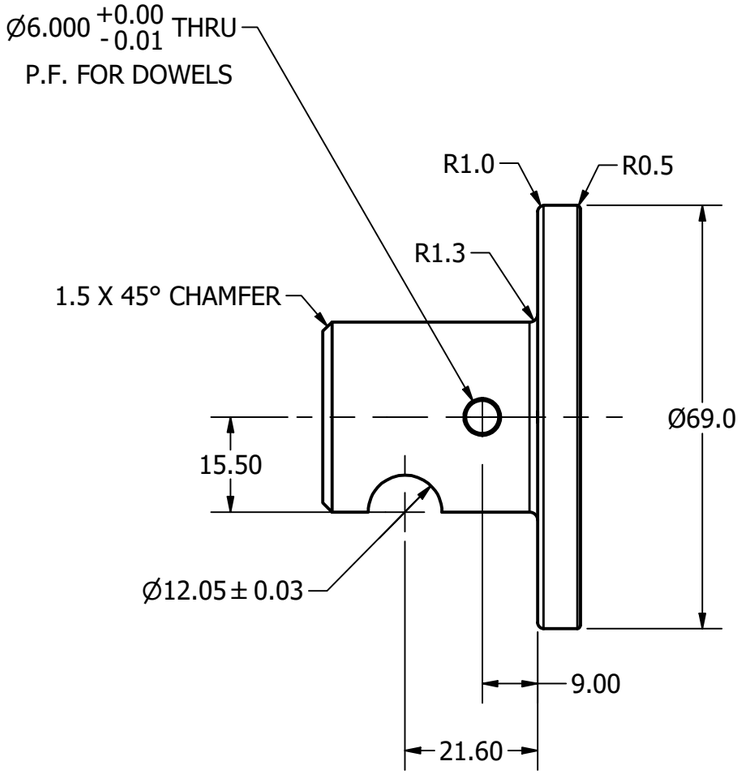
SCALE: 1:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	HF	JW	10/8/2021









ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	5000433	M6 X 12 LG. DOWEL PIN

PARTS LIST

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. INSTALL DOWEL PINS AFTER PLATING.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 4140 STEEL
HEAT TREAT: N/A
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/8/2016
CHECKED:	
ENG: JW	4/8/2016
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

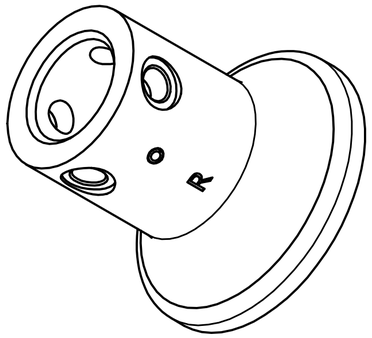
FEMUR ATTACHMENT PLATE
THOR-05F

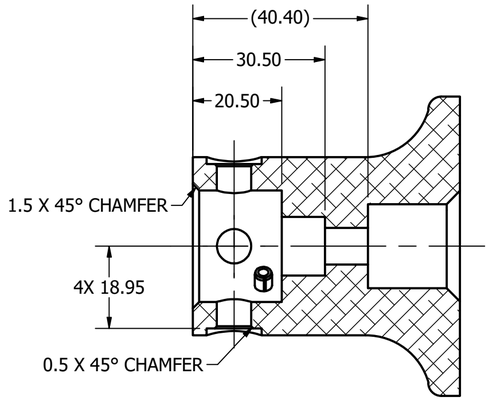
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A3	474-5161	3

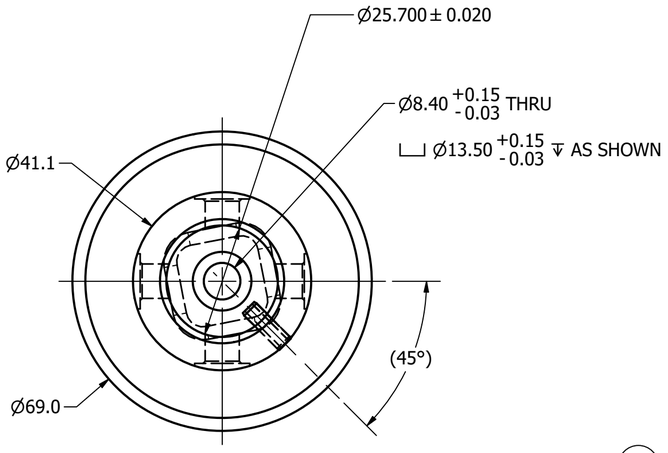
SCALE: 1 : 1
SHEET: 1 OF 1

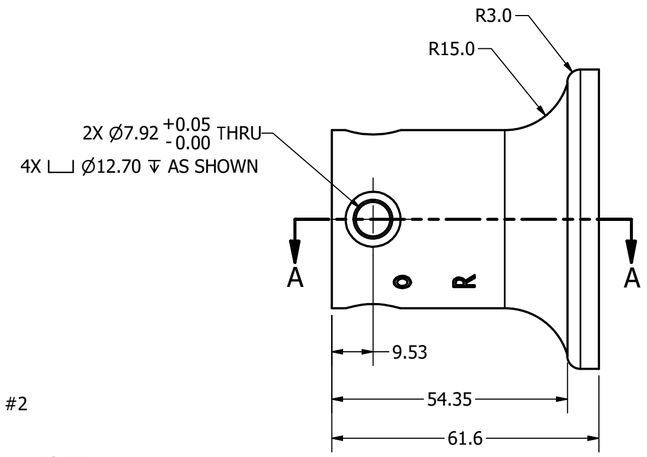
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	DI	7/14/2021

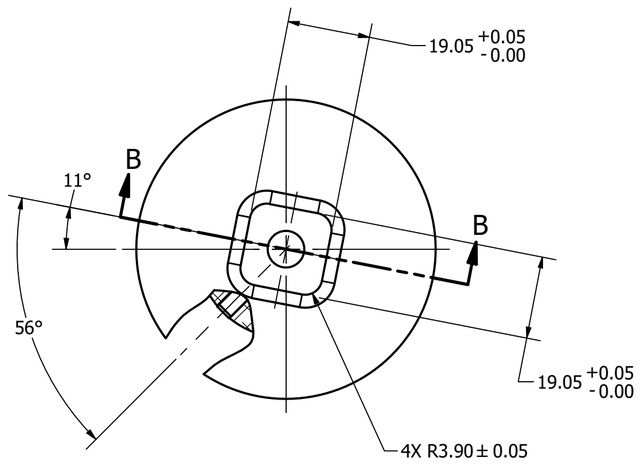


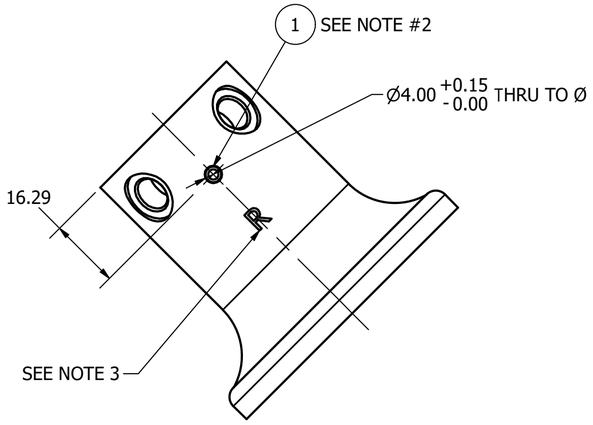


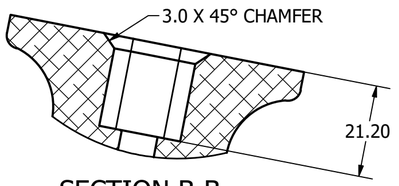
SECTION A-A











SECTION B-B

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5000205	M4 X 12 LG. ROLL PIN SS

PARTS LIST

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. INSTALL ROLL PIN FLUSH TO OUTSIDE SURFACE AFTER ANODIZE.
3. ENGRAVE "R" PER SHOWN

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/7/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

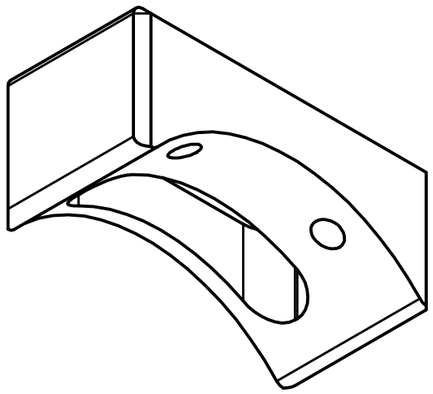
FEMUR END CAP, RIGHT

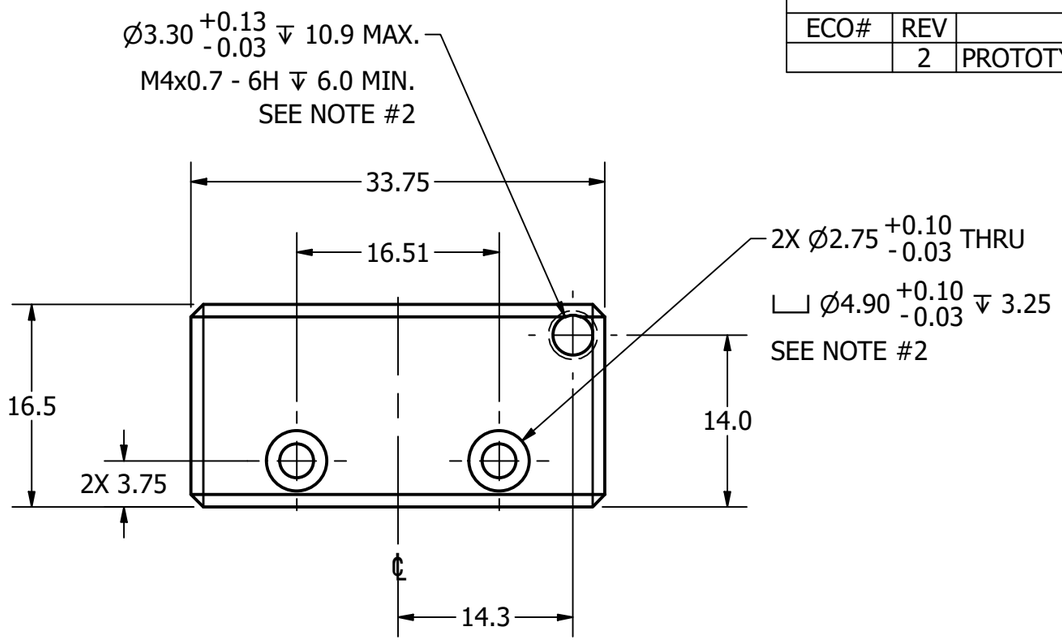
THIRD ANGLE PROJECTION

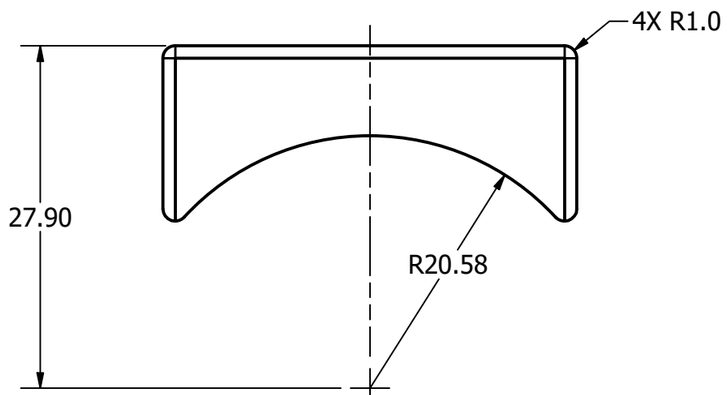
SIZE: A2 | DRAWING NUMBER: 474-5173-2 | REV: 1

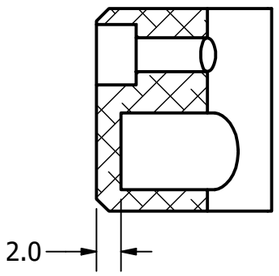
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	AB	JW	06/19/2019

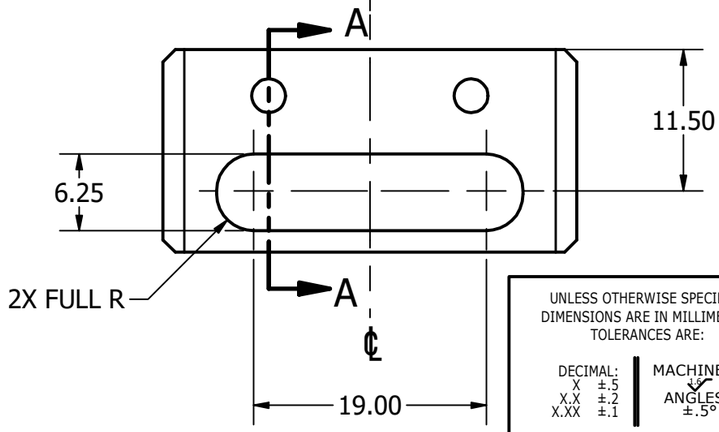








SECTION A-A



NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. PLUG HOLES BEFORE ANODIZE.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED √ | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 2024-T4 ALUMINUM	CHECKED	
HEAT TREAT: N/A	ENG	
FINISH: CLEAR ANODIZE	APPROVED	

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/11/2016

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

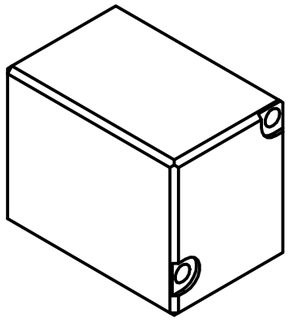
STRUCTURAL REPLACEMENT, FEMUR LOAD CELL STAIN RELIEF

THIRD ANGLE PROJECTION

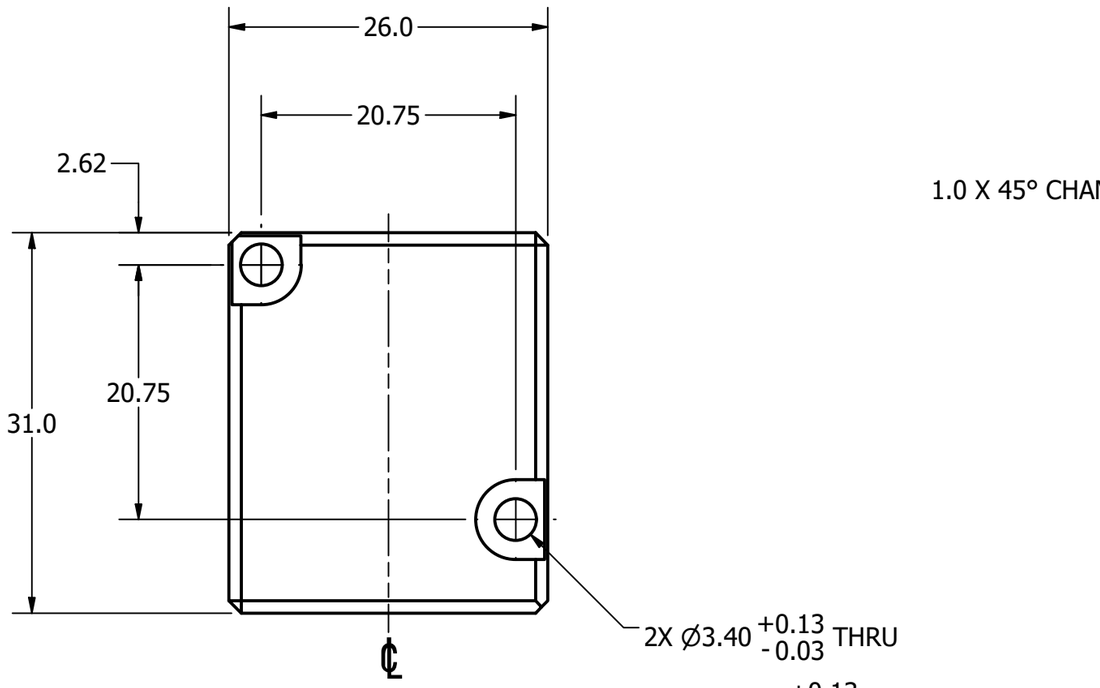
SIZE	DRAWING NUMBER	REV
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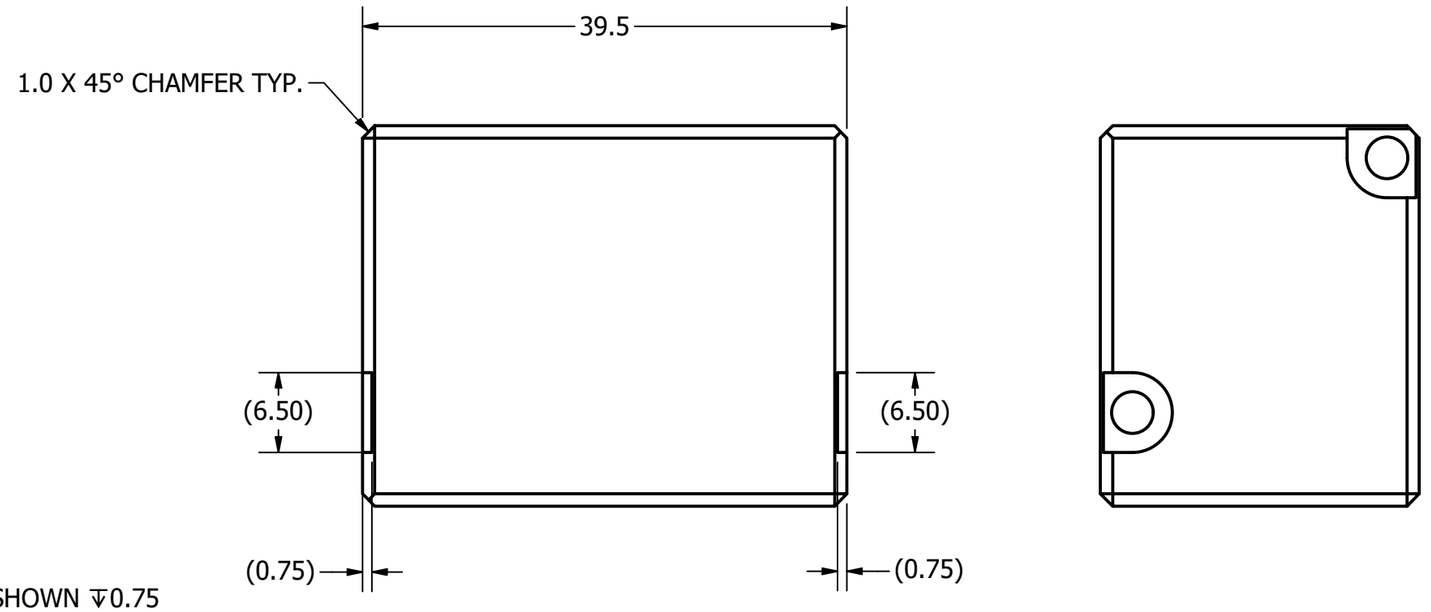
SCALE: 2 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	DI	10/19/2021



SCALE 1 : 1





NOTES:

1. DIMENSIONS ARE SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

2. MASS = 87± 7.5 grams

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT:
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	4/8/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

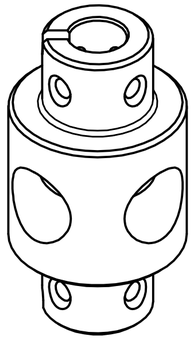
DAS STRUCTURAL REPLACEMENT (5 BRIDGE)

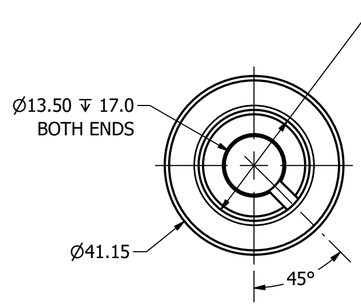
THIRD ANGLE PROJECTION

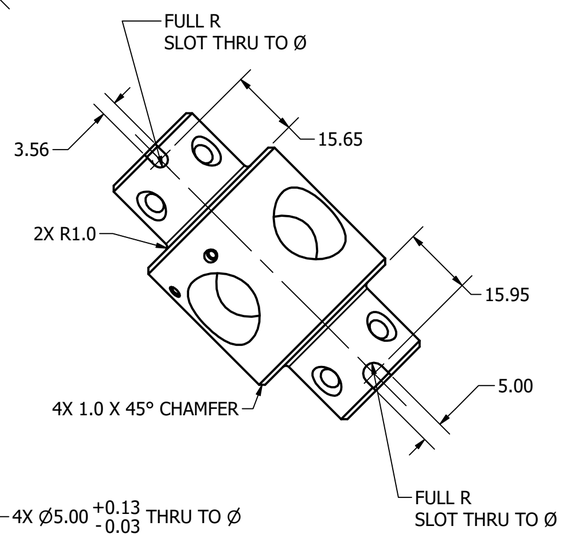
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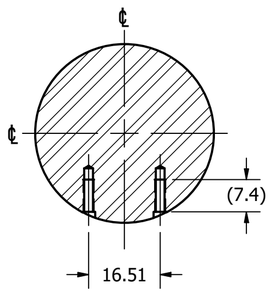
SCALE: 2 : 1 SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	GCH		1/13/2017

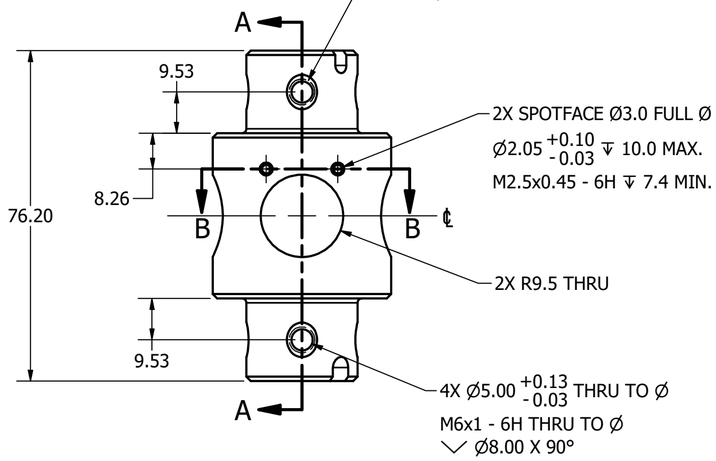


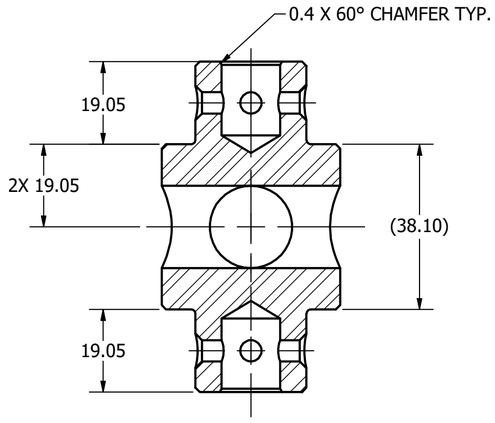




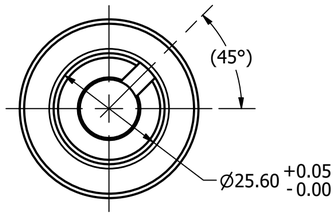


SECTION B-B





SECTION A-A



NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄ , UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 1018 STEEL
HEAT TREAT:
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/8/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

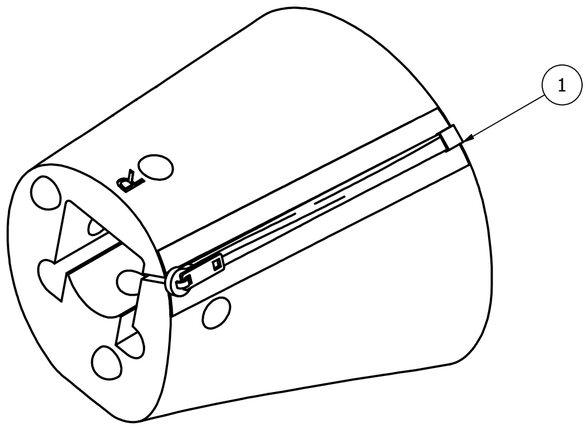
STRUCTURAL REPLACEMENT, FEMUR LOAD CELL

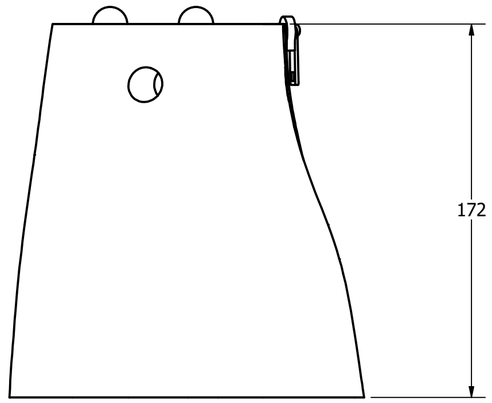
THIRD ANGLE PROJECTION

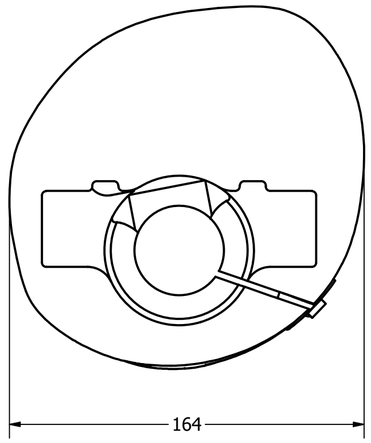
SIZE: A2 | DRAWING NUMBER: 474-5101 | REV: 2

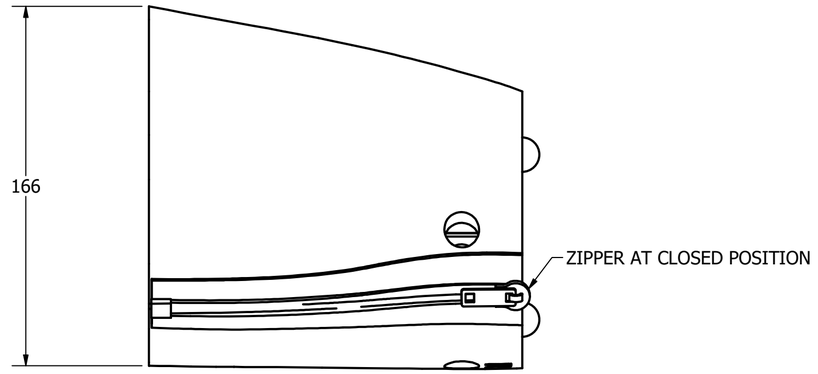
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	SKR	HF	02/21/2022









NOTES:

1. MATERIAL: PVC
   COLOR: EURO BROWN
   DUROMETER: 45±5 SHORE A
   FILLED WITH POLYURETHANE EXPANDABLE FOAM

2. REMOVE ALL MOLD FLASHING

3. ALL MOLD DIMENSION TOLERANCE +1%/-2% BUT NO SMALLER THAN 0.5mm

4. BOND ZIPPER TO FLESH AS SHOWN.

5. WEIGHT: 1270 GRAMS ± 30 GRAMS

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-5121	ZIPPER ASSEMBLY, UPPER LEG

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: A. Barchock	4/11/2016
CHECKED:	
ENG: KMSP	11/20/2019
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

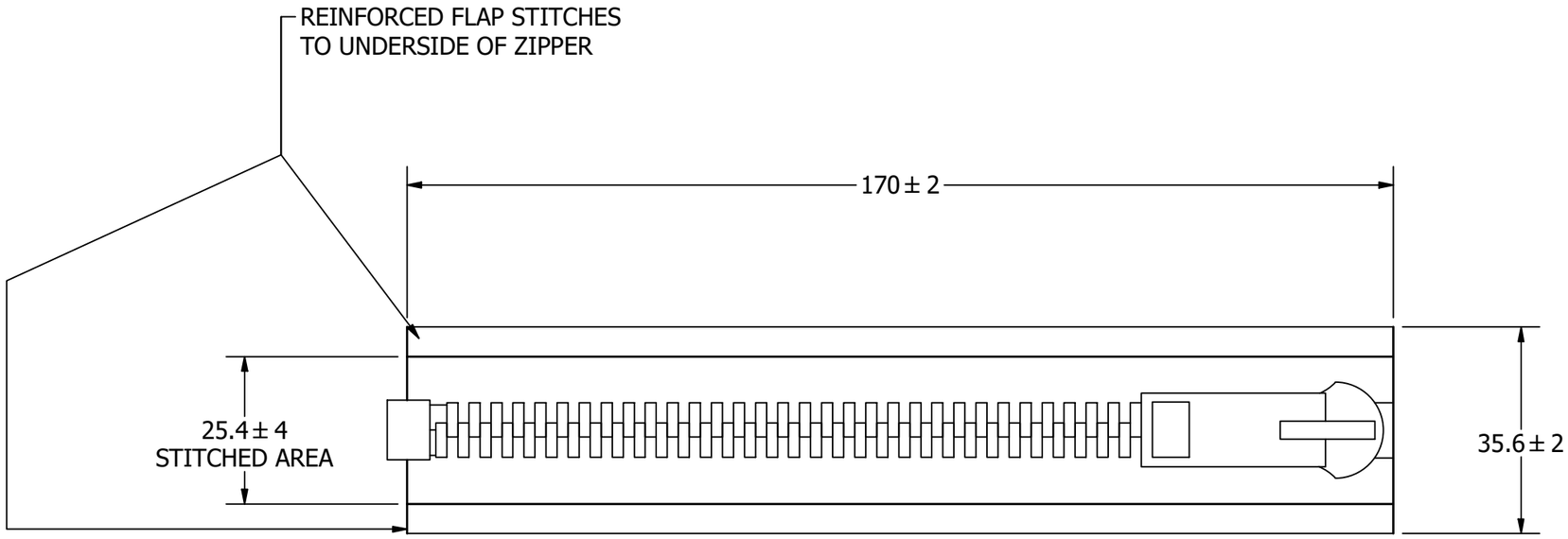
UPPER LEG FLESH, RIGHT

THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-5122-2 | REV: 4

SCALE: .5:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	PROTOTYPE	AB	JW	11/13/2018



NOTES:

1. ALL BLACK #5 ZIPPER

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

ZIPPER ASSEMBLY, UPPER LEG

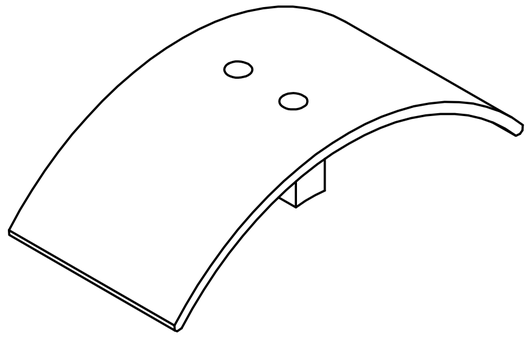
APPROVALS	DATE
DRAWN J. MCINNIS	4/8/2016
CHECKED	
ENG	
APPROVED	

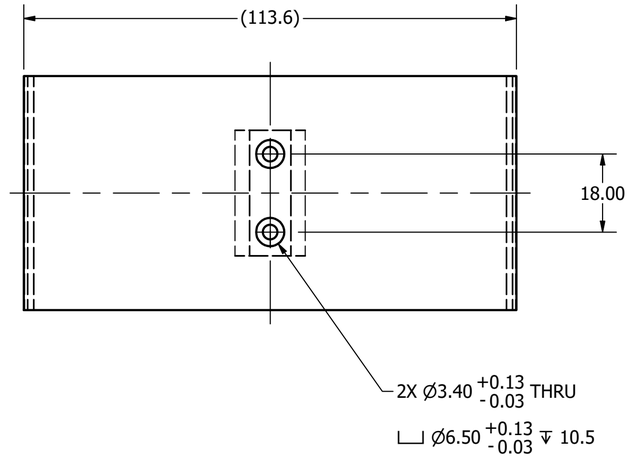
MATERIAL: SEE NOTES
HEAT TREAT: N/A
FINISH: N/A

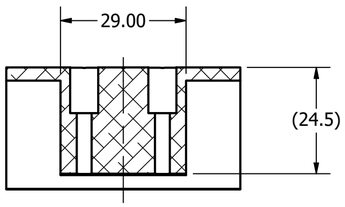
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-5121 | REV: 5
SCALE: 1:1 | SHEET: 1 OF 1

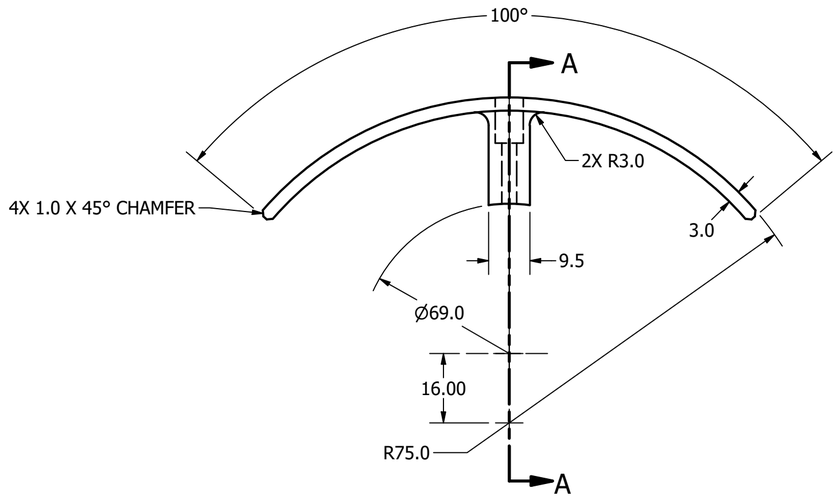
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	HF	JW	9/22/2021

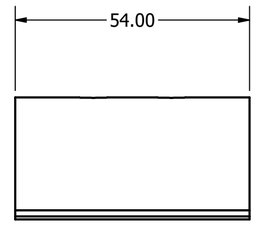






SECTION A-A





NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	4/11/2016
CHECKED:	
ENG: JW	4/11/2016
APPROVED:	

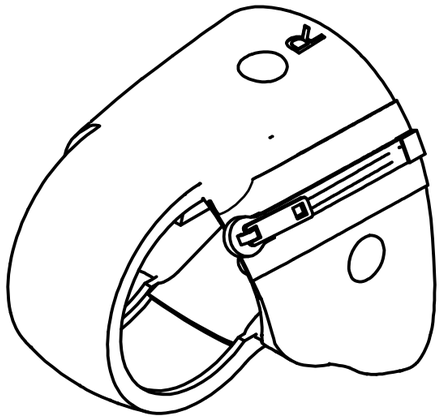
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

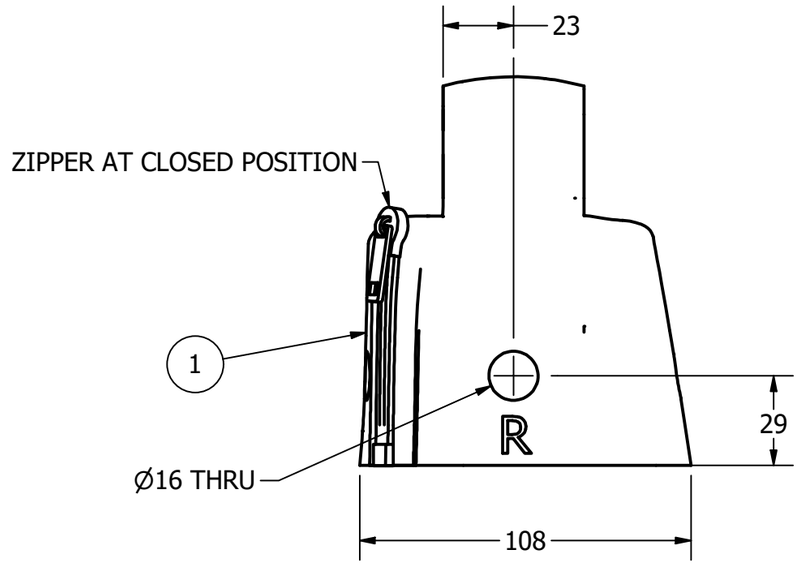
CABLE CONNECTOR GUARD
THOR-05F

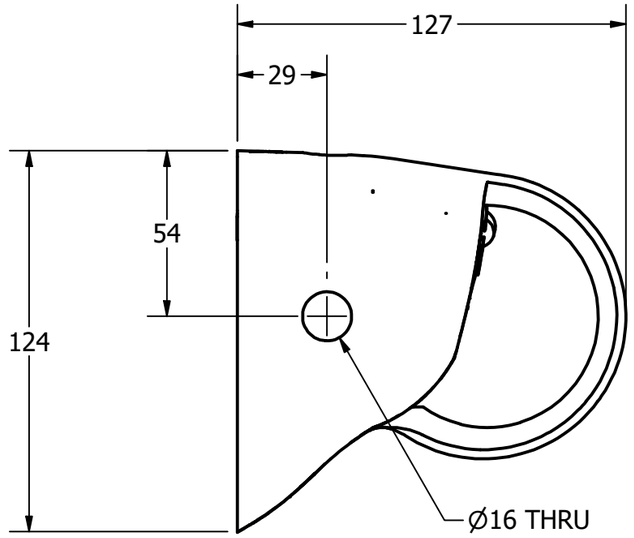
THIRD ANGLE PROJECTION

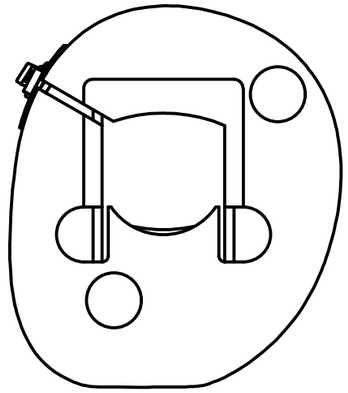
SIZE: A2 | DRAWING NUMBER: 474-5107 | REV: 2
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	SKR	HF	02/09/2022









NOTES:

1. MATERIAL: PVC
   COLOR: EURO BROWN
   DUROMETER: 45±10 SHORE A
   FILLED WITH PU ELASTOMER & FOAM
2. REMOVE ALL MOLD FLASHING

3. ALL MOLD DIMENSION TOLERANCE +1%/-2% BUT NO SMALLER THAN 0.5mm

4. BOND ZIPPER TO FLESH AS SHOWN.

5. WEIGHT: TBD

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-5324	ZIPPER ASSEMBLY, KNEE

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: A. Barchock	4/11/2016
CHECKED	
ENG: KMSP	11/20/2019
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

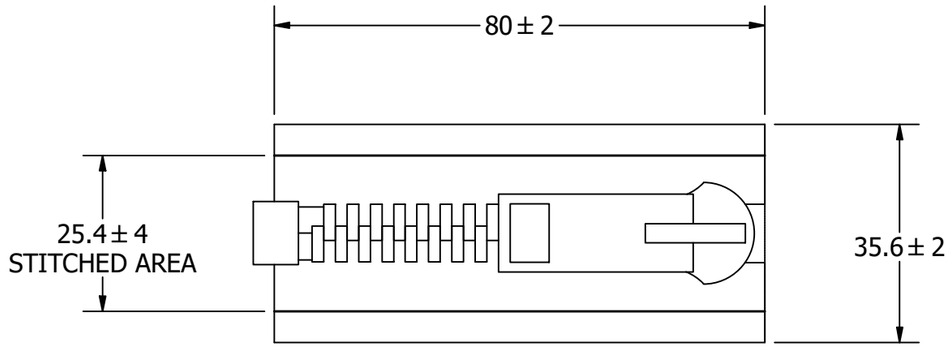
KNEE FLESH, RIGHT

THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-5321-2 | REV: 2

SCALE: .5:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	PROTOTYPE	AB	JW	11/13/2018



NOTES:

1. ALL BLACK #5 ZIPPER

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	J. MCINNIS	4/8/2016
CHECKED		
ENG		
APPROVED		

MATERIAL: SEE NOTES
HEAT TREAT: N/A
FINISH: N/A

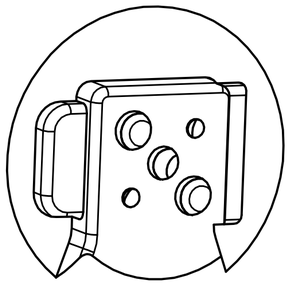
ZIPPER ASSEMBLY, KNEE

THIRD ANGLE PROJECTION

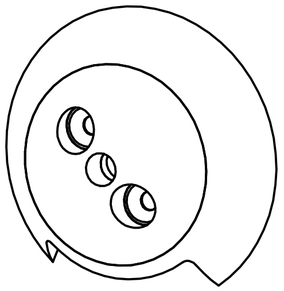
SIZE: A3 | DRAWING NUMBER: 474-5324 | REV: 5

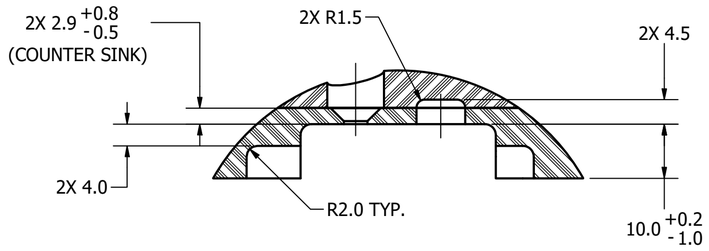
SCALE: 1:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	IH	MJS	10/27/2023

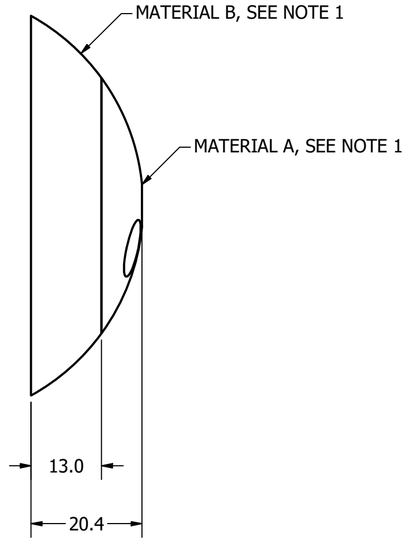


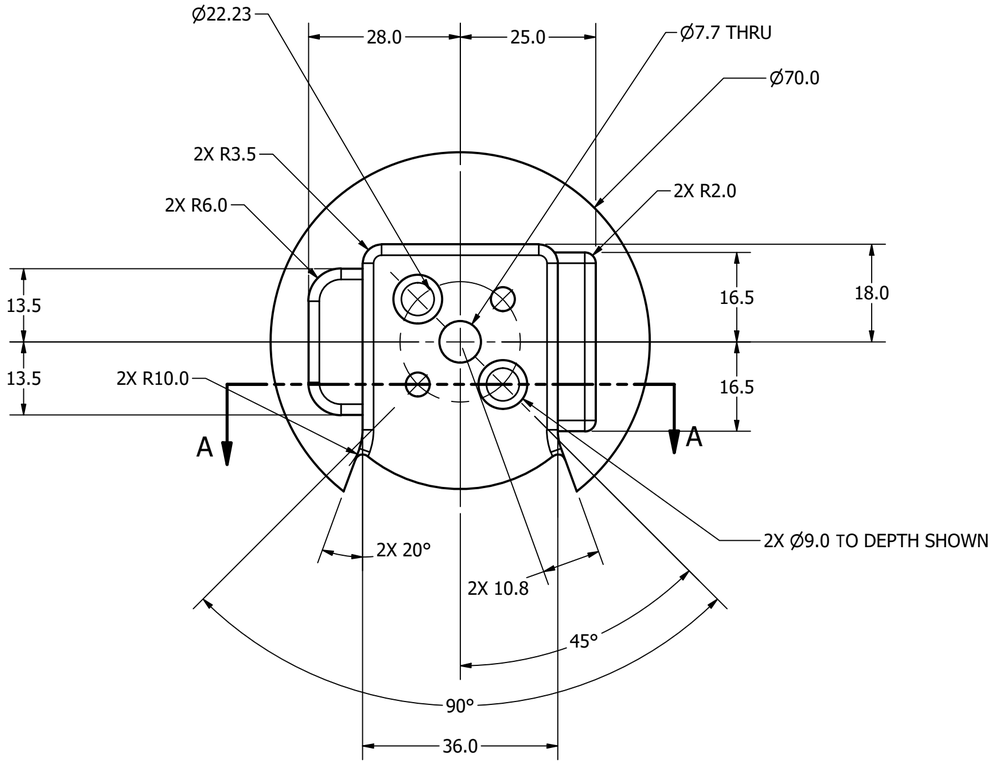
SCALE 1 : 1

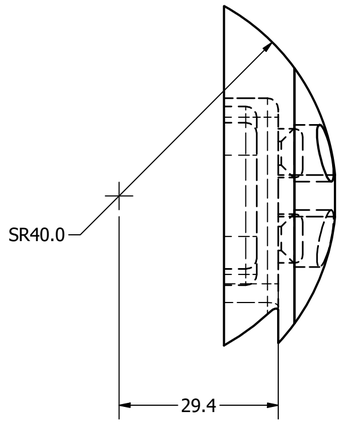


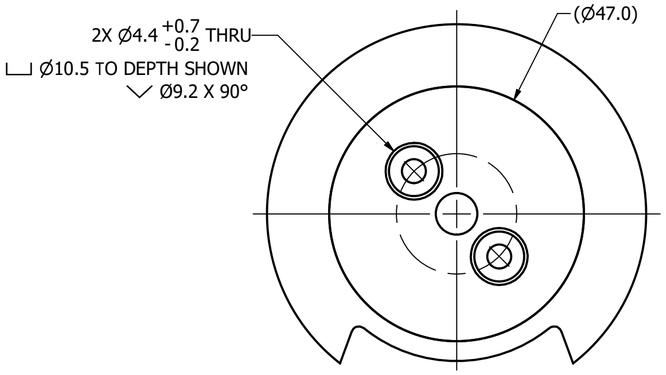


SECTION A-A









NOTES:

1. MATERIAL A: POLYURETHANE 25± 10 SHORE "A"
   COLOR: BLACK
   MATERIAL B: URETHANE 65±5 SHORE "D"
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-2% BUT NO SMALLER THAN 0.5mm
4. NO SPLIT OR DEFECTS ARE ALLOWED IN THE URETHANE MOLDING

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

KNEE COVER, INBOARD / OUTBOARD
THOR-05F

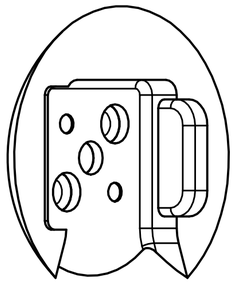
	APPROVALS	DATE
DRAWN	hcheco	7/11/2023
CHECKED		
ENG	disopi	7/11/2023
APPROVED		

MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

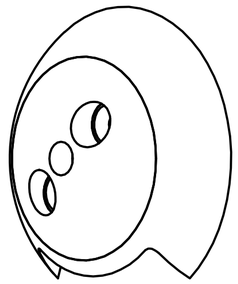
THIRD ANGLE PROJECTION

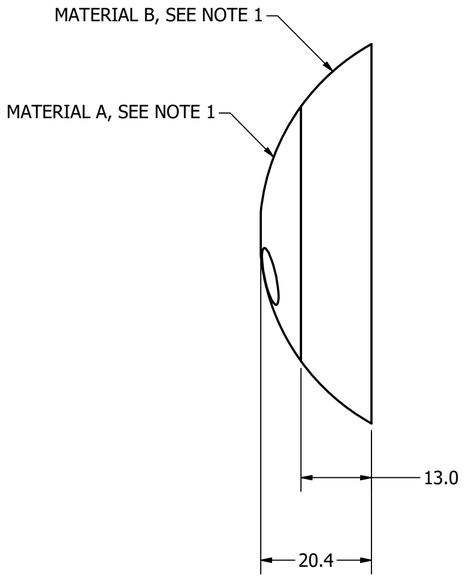
SIZE: A2 | DRAWING NUMBER: 474-5301-1-A | REV: 3
SCALE: 1.25 : 1 | SHEET: 1 OF 1

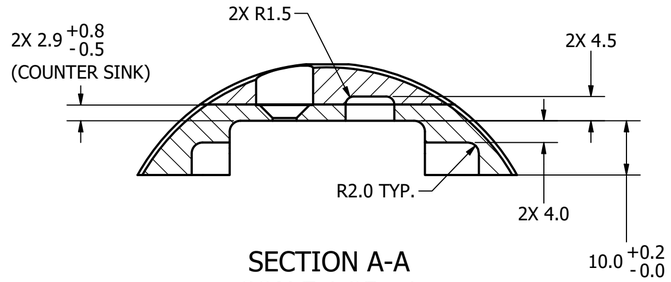
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	IH	MJS	10/27/2023



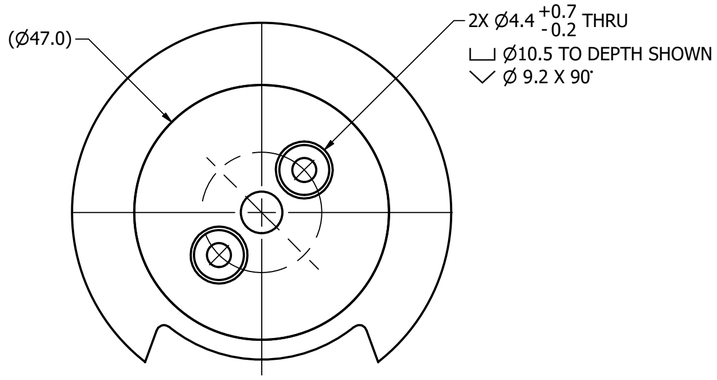
SCALE 1 : 1

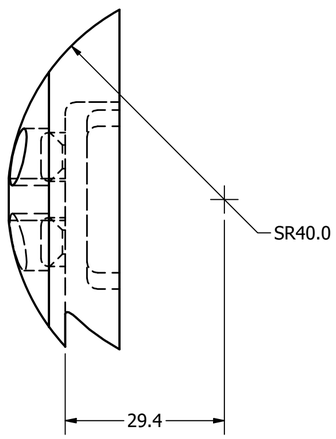


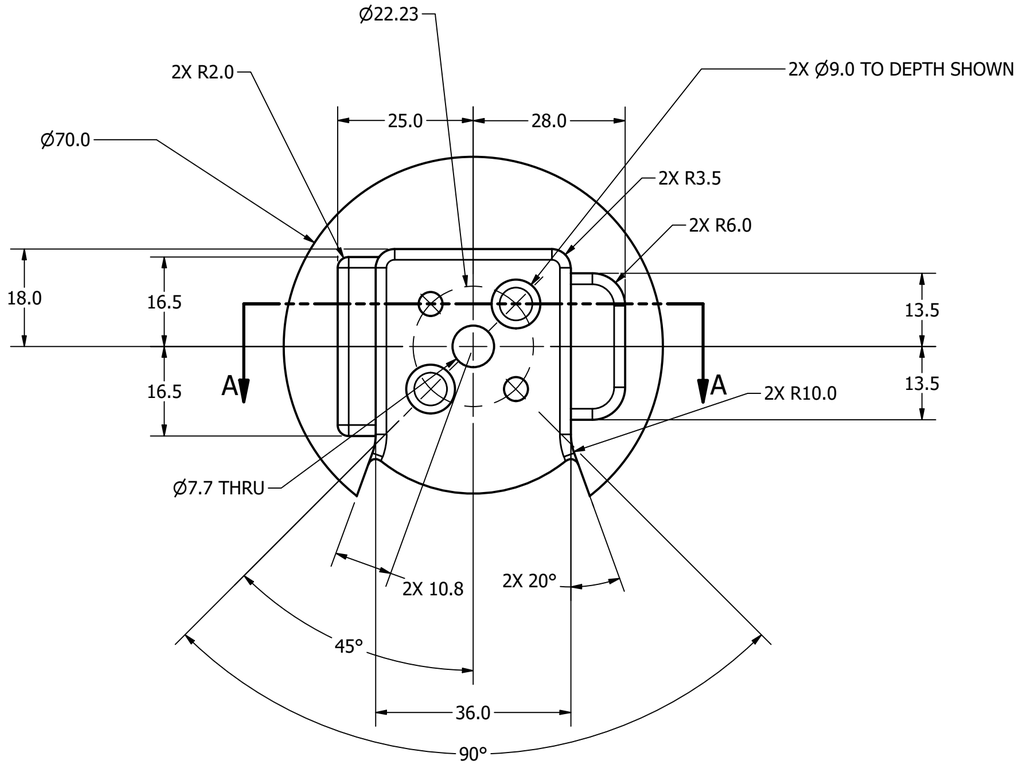




SECTION A-A
SCALE 1.25 : 1







NOTES:

1. MATERIAL A: POLYURETHANE 25± 10 SHORE "A"
   COLOR: BLACK
   MATERIAL B: URETHANE 65±5 SHORE "D"
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-2% BUT NO SMALLER THAN 0.5mm
4. NO SPLIT OR DEFECTS ARE ALLOWED IN THE URETHANE MOLDING

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN hcheco	7/11/2023
CHECKED	
ENG disopi	7/11/2023
APPROVED	

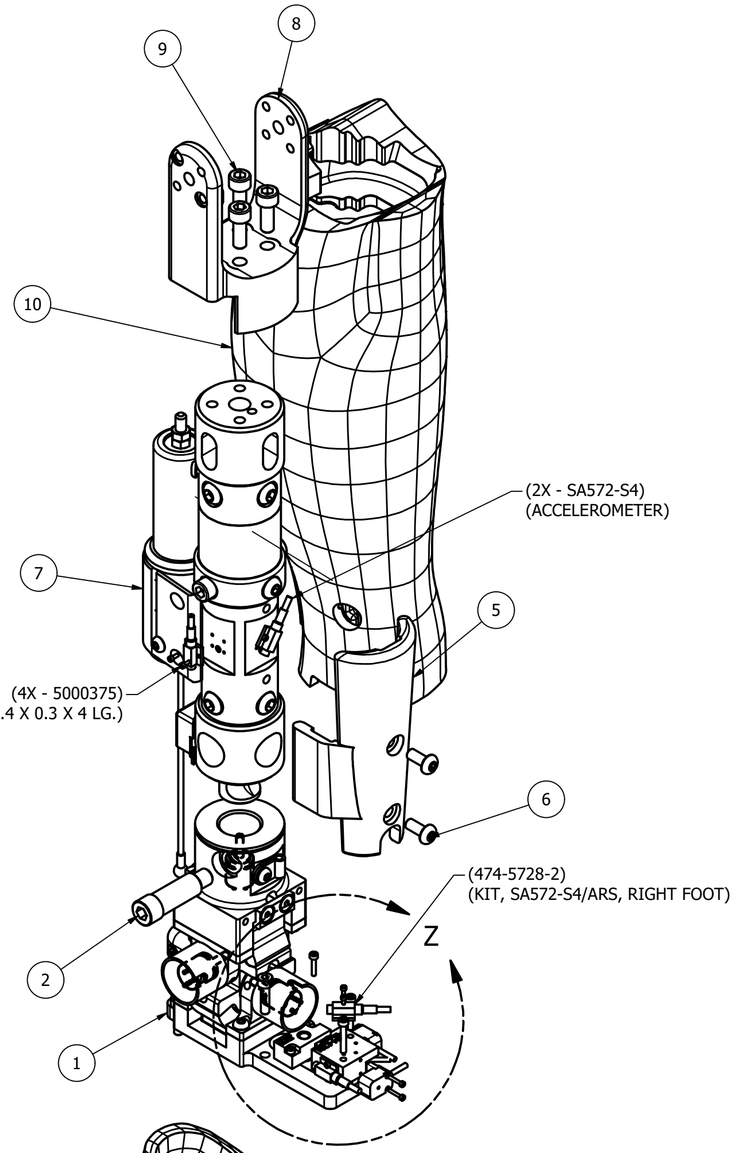
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

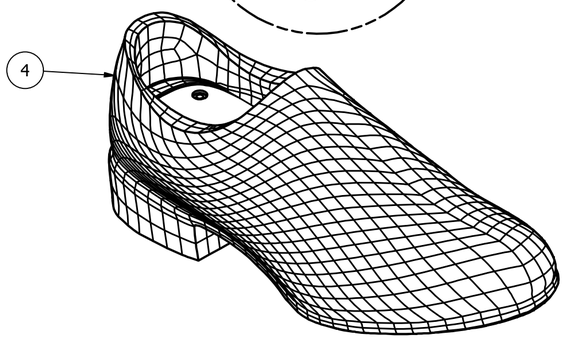
KNEE COVER, INBOARD / OUTBOARD
THOR-05F

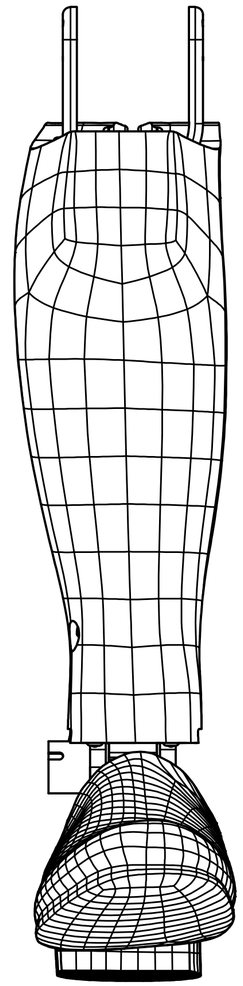
THIRD ANGLE PROJECTION

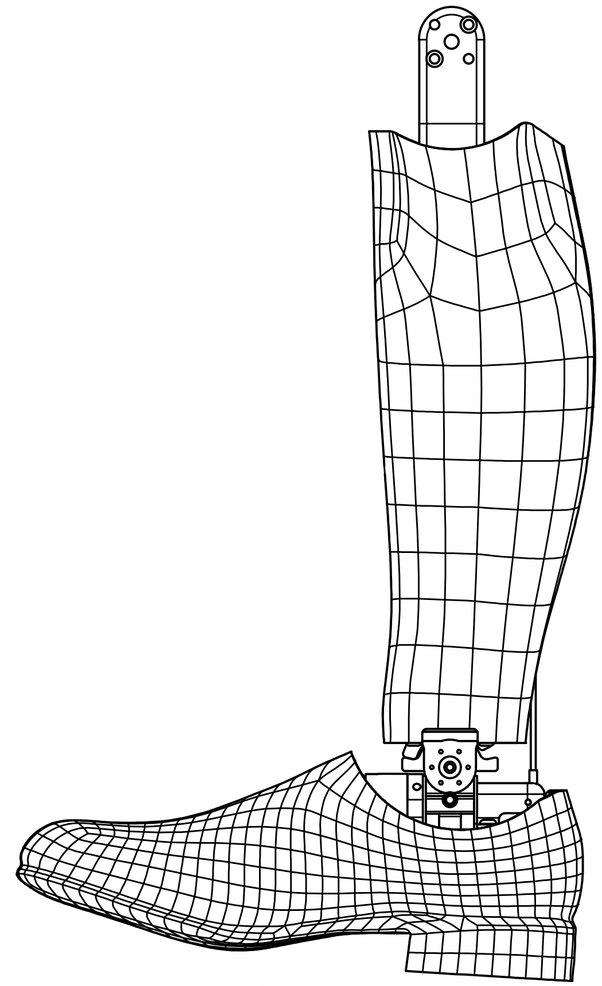
SIZE: A2 | DRAWING NUMBER: 474-5301-2-A | REV: 3
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	6	PROTOTYPE	HF	DJI	12/21/2020

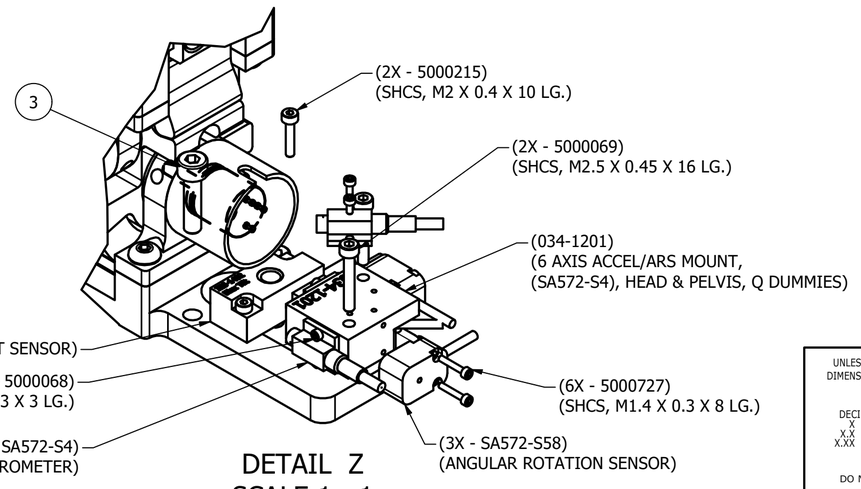








FLESH HIDDEN



DETAIL Z
SCALE 1 : 1

ITEM	QTY	PART NUMBER	DESCRIPTION
10	1	483-5521-2	LOWER LEG FLESH (RIBBED), RIGHT
9	4	5000081	M6 X 1 X 16 LG. SHCS
8	1	474-5517-2	KNEE CLEVIS, RIGHT
7	1	474-5507-2	TIBIA ASSEMBLY, RIGHT
6	2	5000654	M5 X 0.8 X 12 LG. BHCS
5	1	474-5518-2	SHIN GUARD, MOLDED, RIGHT
4	1	474-5903-2	MOLDED SHOE ASSEMBLY, RIGHT
3	4	5000025	M4 X 0.7 X 16 LG. SHCS
2	1	472-7563	BOLT & SLEEVE ASSEMBLY-ANKLE
1	1	474-5800-2	ANKLE ASSEMBLY, RIGHT

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/14/2016
CHECKED	
ENG: DJI	2/15/2022
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

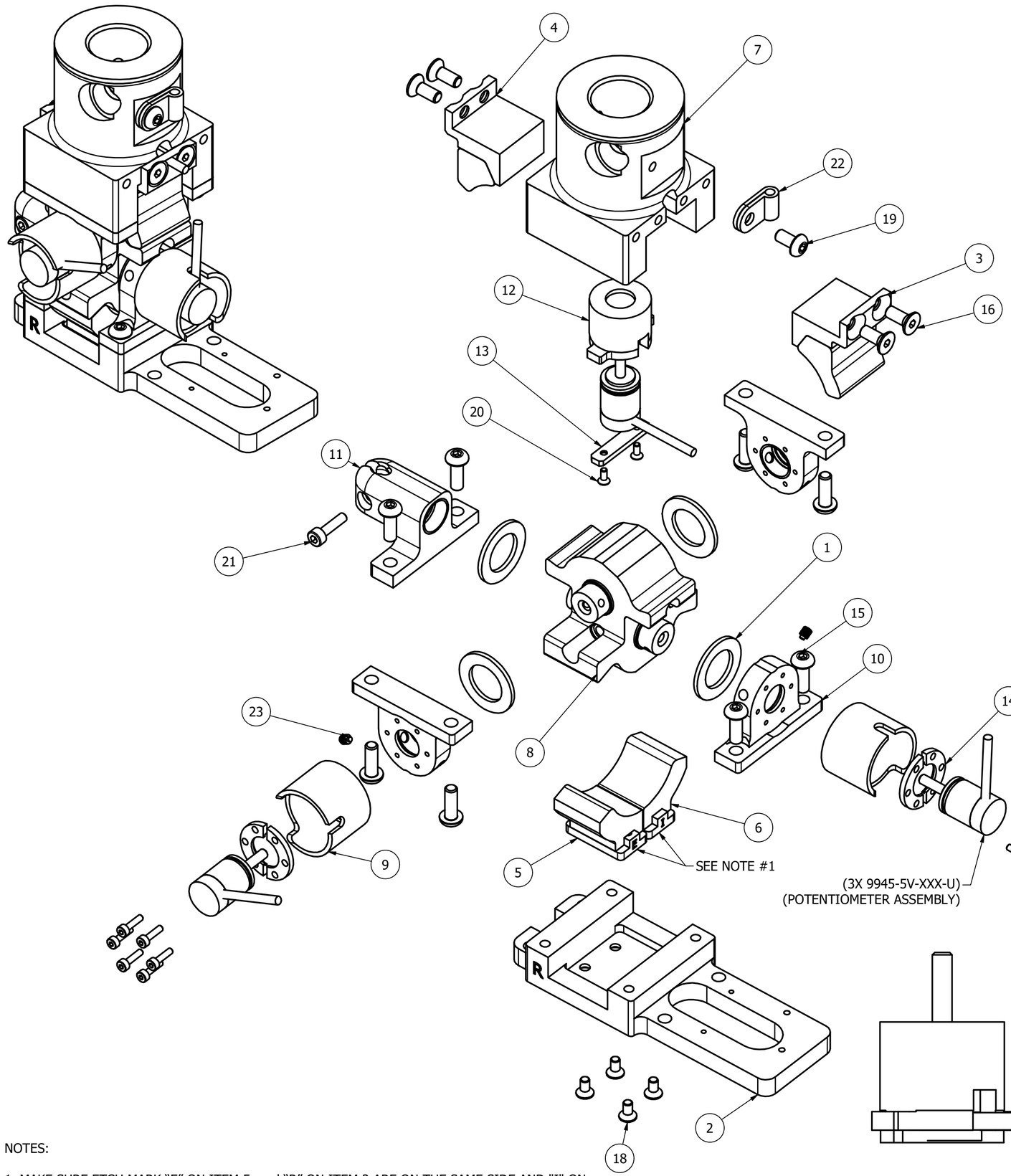
LOWER LEG ASSEMBLY, RIGHT

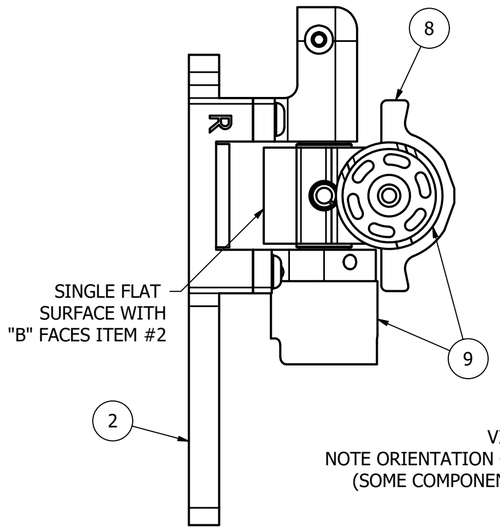
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-5500-2 | REV: 6
SCALE: 1 / 2 | SHEET: 1 OF 1

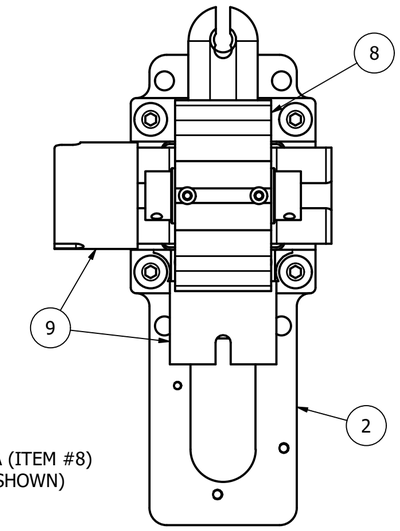
PROTOTYPE DRAWING

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	RELEASE TO PROTOTYPE	TM	DJI	05/16/2025





VIEW A
NOTE ORIENTATION OF 474-5824-A (ITEM #8)
(SOME COMPONENTS ARE NOT SHOWN)

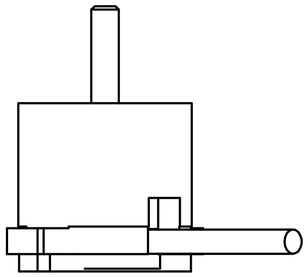


ITEM	QTY	PART NUMBER	DESCRIPTION
23	2	9010447	M3 X 0.5 X 3 LG. SSSNP
22	1	9005135	CLAMP, NYLON LOOP
21	1	5001103	M3 X 0.5 X 12 LG. SHCS
20	2	5000753	M2 X 0.4 X 5 LG. FHCS
19	1	5000103	M4 X 0.7 X 8 LG. BHCS
18	4	5000098	M3 X 0.5 X 6 LG. FHCS
17	12	5000083	M2 X 0.4 X 8 LG. SHCS
16	4	5000023	M4 X 0.7 X 10 LG. FHCS
15	8	5000005	M4 X 0.7 X 12 LG. BHCS
14	2	472-7581	POTENTIOMETER CLAMP
13	1	474-5832	POTENTIOMETER CLAMP
12	1	474-5831	POTENTIOMETER INNER MOUNT
11	1	474-5828	ACHILLES CABLE RETAINER
10	3	474-5826	PLATE, ANKLE BUSHING
9	2	483-5825	POTENTIOMETER CAP
8	1	474-5824-A	ANKLE CENTER BLOCK ASSEMBLY
7	1	474-5820-2	UPPER ANKLE ADAPTOR, RIGHT
6	1	474-5816-A	INVERSION STOP ASSEMBLY
5	1	474-5813-A	EVERSION STOP ASSEMBLY
4	1	474-5810	PLANTAR STOP ASSEMBLY
3	1	474-5807	DORSI STOP ASSEMBLY
2	1	474-5806-2	LOWER ANKLE PLATE, RIGHT
1	4	474-5720	ANKLE THRUST WASHER

PARTS LIST

NOTES:

1. MAKE SURE ETCH MARK "E" ON ITEM 5 and "R" ON ITEM 2 ARE ON THE SAME SIDE AND "I" ON ITEM 6 IS ON THE OPPOSITE SIDE DURING ASSEMBLY.



VIEW B
ASSEMBLY OF Z POT
SCALE 2:1

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	HEAT TREAT	FINISH
N/A	N/A	N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN akulal	4/3/2025
CHECKED	
ENG disopi	4/3/2025
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

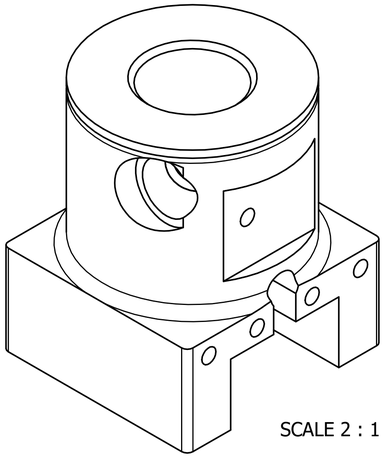
ANKLE ASSEMBLY, RIGHT
THOR-05F

THIRD ANGLE PROJECTION

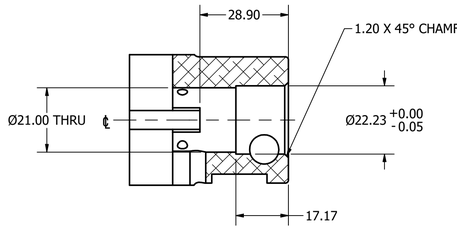
SIZE	DRAWING NUMBER	REV
A2	474-5800-2-B	2

SCALE: 1 : 1 | SHEET 1 OF 1

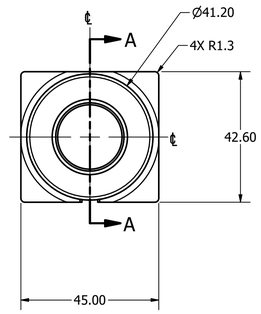
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	RELEASE FOR PROTOTYPE	HF	JW	10/8/2021

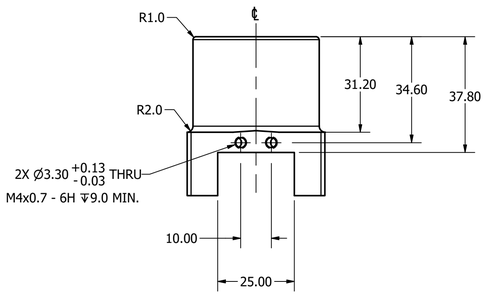


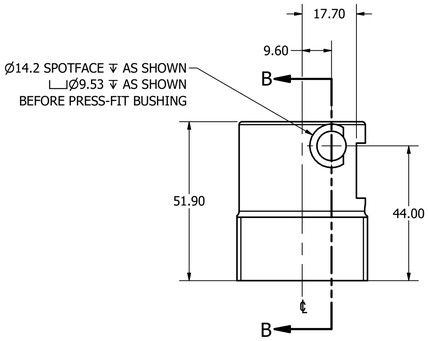
SCALE 2 : 1

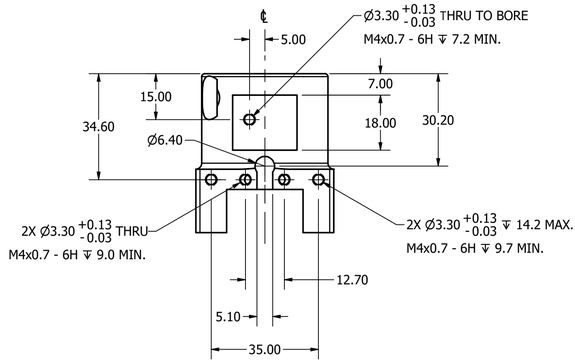


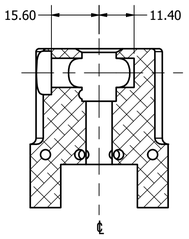
SECTION A-A





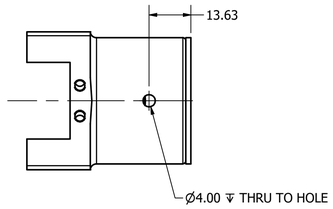


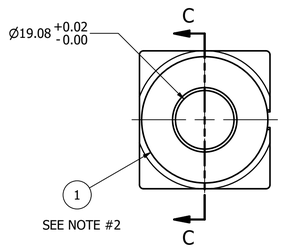


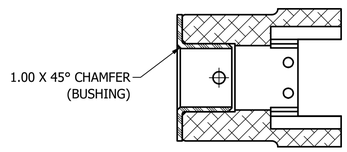


SECTION B-B

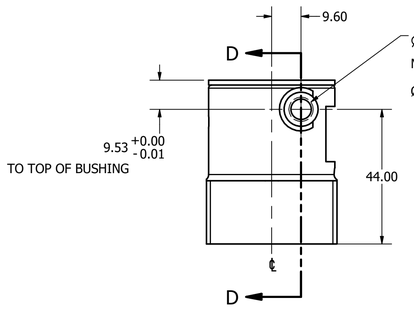
AFTER PRESS FIT BUSHING

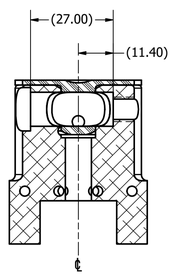




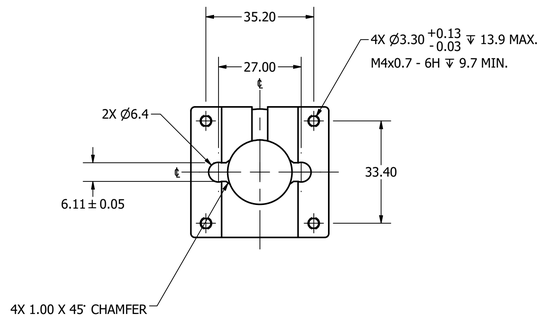


SECTION C-C





SECTION D-D



NOTES:

1. DIMENSIONS ARE SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

2. INSTALL THRUST BUSHING 474-5707 AFTER ANODIZE WITH EPOXY ADHESIVE OR EQUIVALENT.

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-5707	THRUST BUSHING

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.1, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN A.TOMICH	7/10/2017
CHECKED	
ENG JW	7/10/2017
APPROVED	

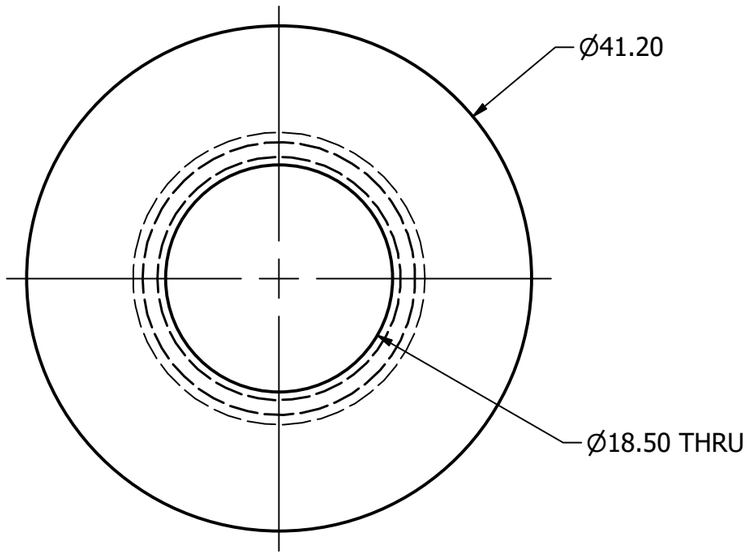
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

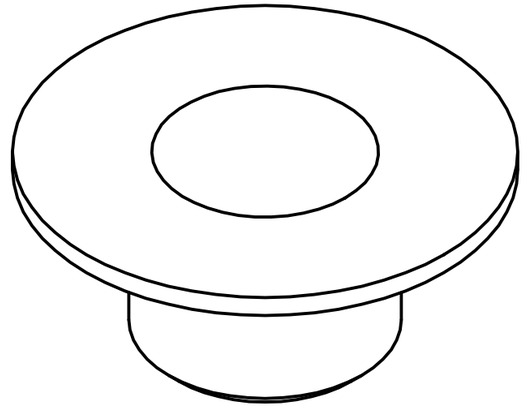
UPPER ANKLE ADAPTOR, RIGHT
THOR-05F

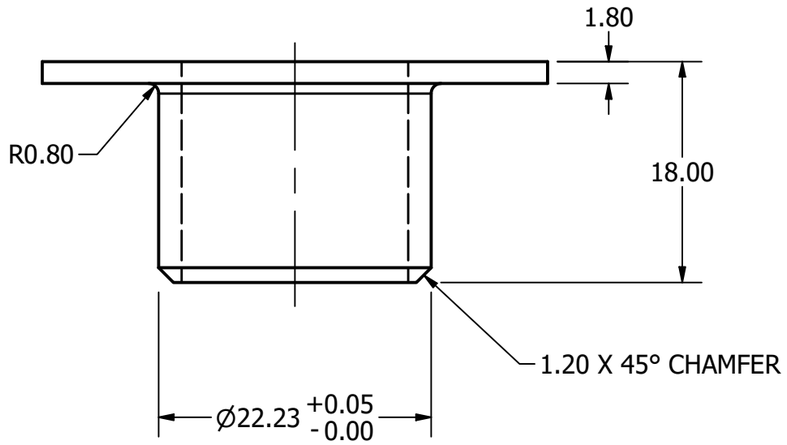
THIRD ANGLE PROJECTION

SIZE A1 | DRAWING NUMBER 474-5820-2 | REV 5
SCALE: 1 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	JPM		4/11/16







NOTES:

1.MATERIAL: ACETAL RESIN, WHITE OR EQUIVALENT.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN J. MCINNIS	4/11/2016
CHECKED	
ENG	
APPROVED	

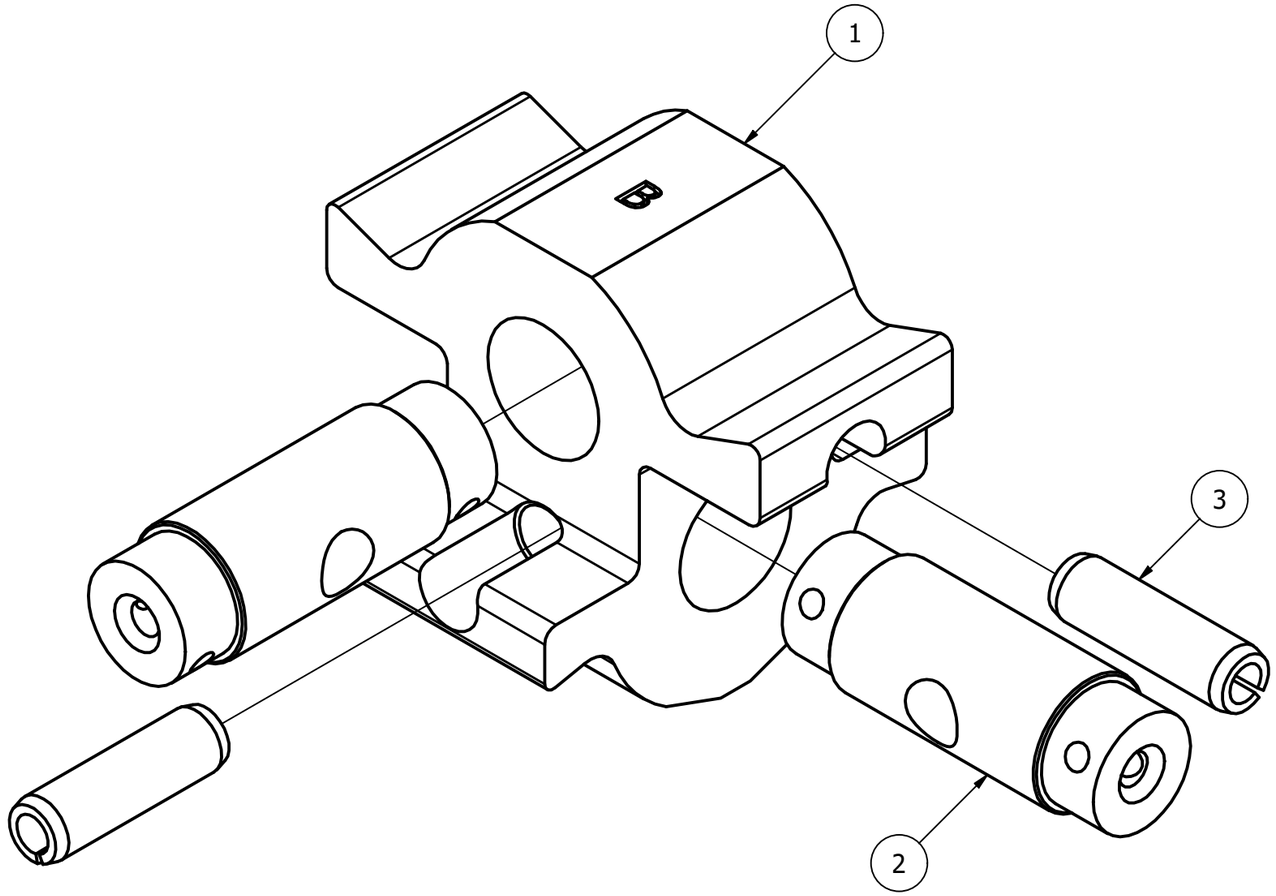
MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

THIRD ANGLE PROJECTION

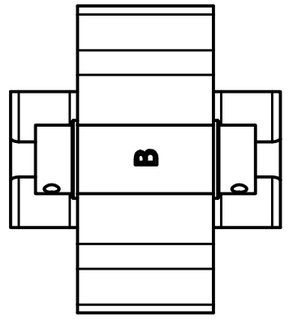
THRUST BUSHING

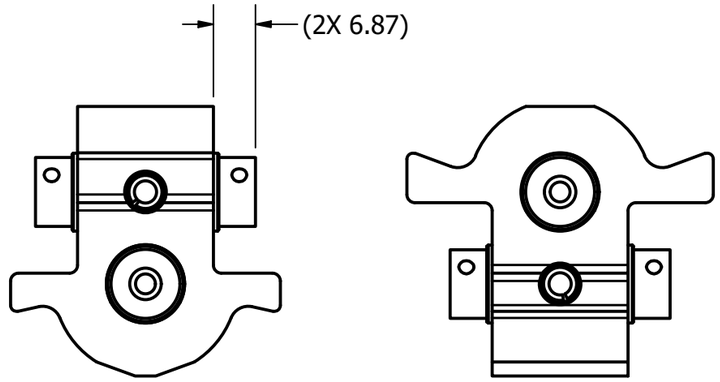
SIZE A3 | DRAWING NUMBER 474-5707 | REV 1
SCALE: 2:1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE TO PROTOTYPE	ANK	DJI	03/28/2025



SCALE 2 : 1





ITEM	QTY	PART NUMBER	DESCRIPTION
3	2	5000822	M6 X 20 LG. ROLL PIN
2	2	474-5823	ANKLE TORQUE SHAFT
1	1	474-5804-A	ANKLE CENTER BLOCK

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	akulal	3/28/2025
CHECKED		
ENG	disopi	3/28/2025
APPROVED		

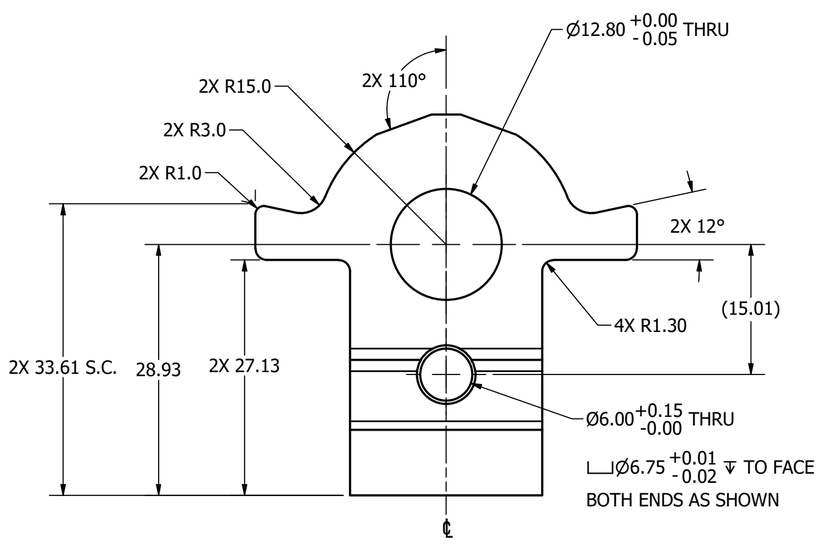
MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

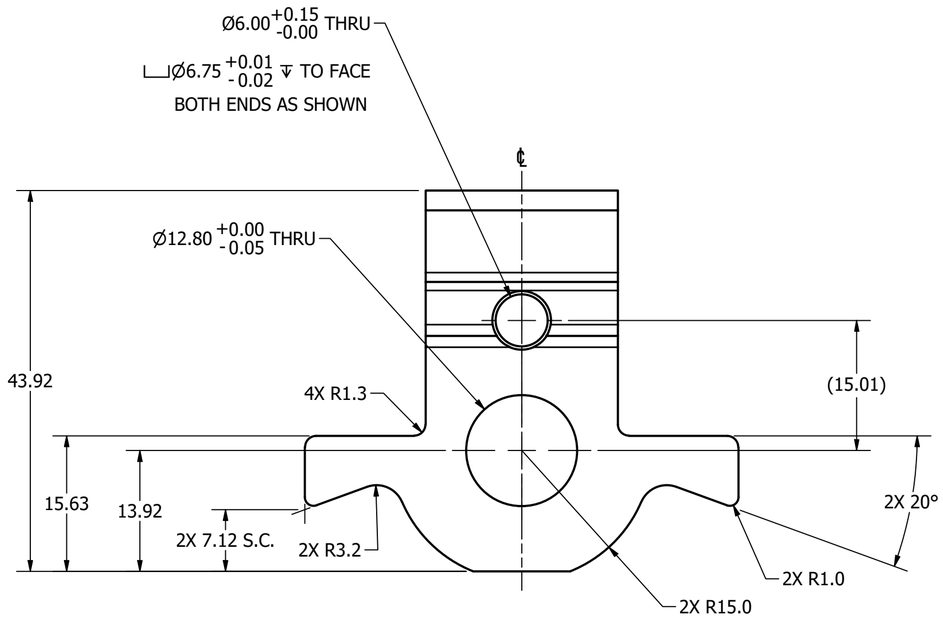
ANKLE CENTER BLOCK ASSEMBLY
THOR-05F

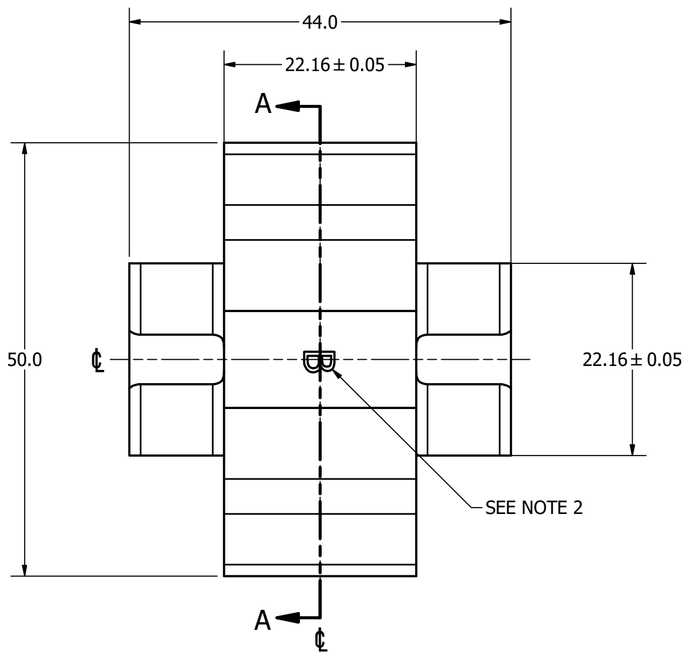
THIRD ANGLE PROJECTION

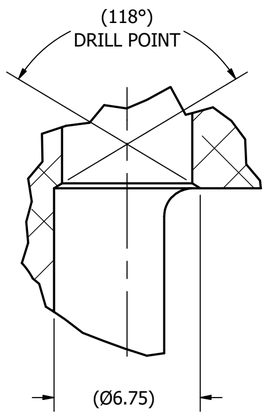
SIZE: A3 | DRAWING NUMBER: 474-5824-A | REV: 1
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE TO PROTOTYPE	ANK	DJI	03/28/2025

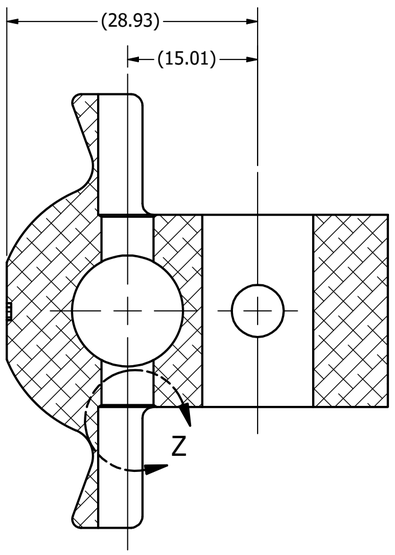




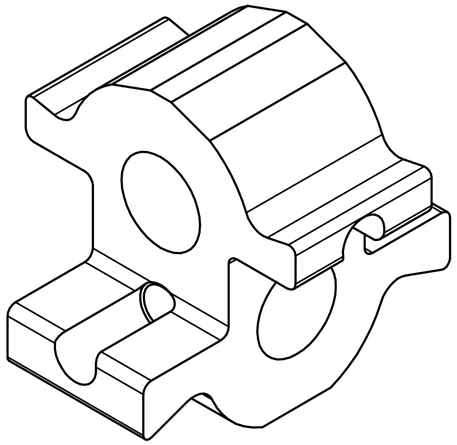




DETAIL Z
4 PLACES
SCALE 5 : 1



SECTION A-A



NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. STAMP OR ETCH TEXT 5mm TALL WHERE SHOWN.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 6061-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: akulal	3/28/2025
CHECKED:	
ENG: disopi	3/28/2025
APPROVED:	

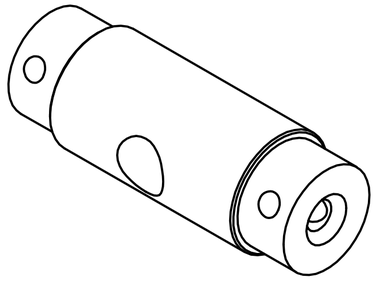
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

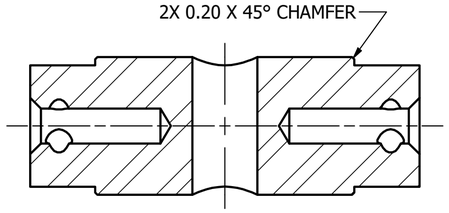
ANKLE CENTER BLOCK
THOR-05F

THIRD ANGLE PROJECTION

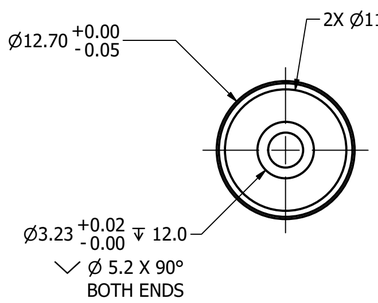
SIZE: A2 | DRAWING NUMBER: 474-5804-A | REV: 1
SCALE: 2 : 1 | SHEET: 1 OF 1

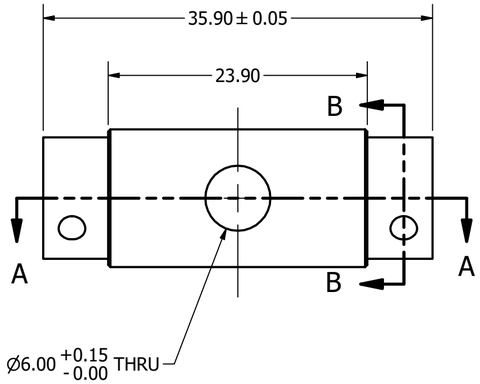
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	HF	JW	9/23/2021

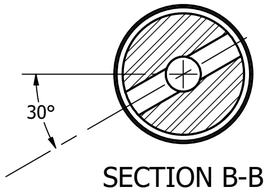




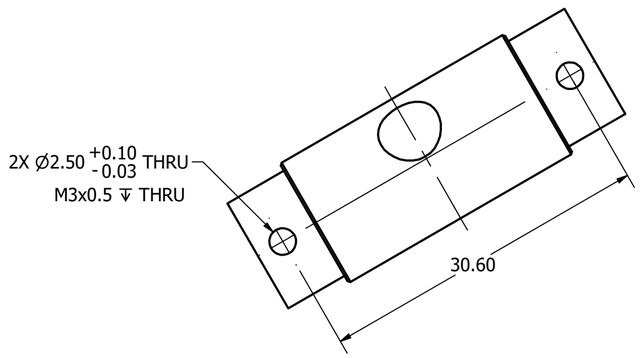
SECTION A-A







SECTION B-B



NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ✓ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 440C STAINLESS STEEL
HEAT TREAT: Rc 57-61
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN A.TOMICH	7/10/2017
CHECKED	
ENG JW	7/10/2017
APPROVED	

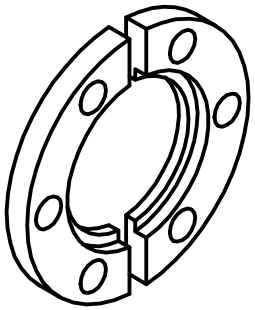
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

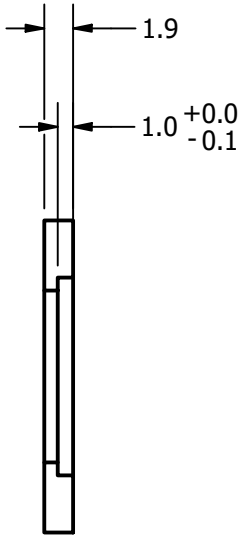
ANKLE TORQUE SHAFT
THOR 5-F

THIRD ANGLE PROJECTION

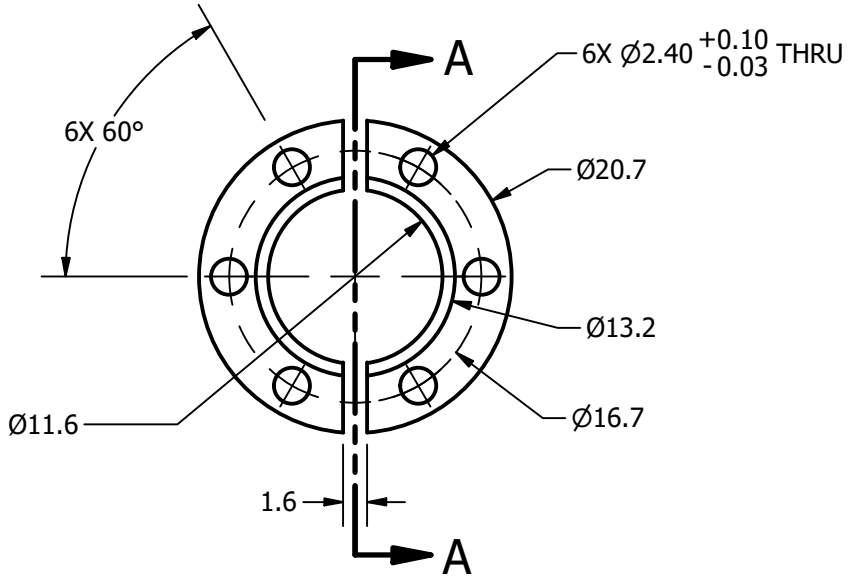
SIZE: A2 | DRAWING NUMBER: 474-5823 | REV: 2
SCALE: 2.5 : 1 | SHEET: 1 OF 1

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	RELEASE FOR PRODUCTION	3/14/2014	BK





SECTION A-A
SCALE 2 : 1



NOTES:
1. BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ±.5
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B.WADE	7/11/2016
CHECKED	
ENG	
APPROVED	

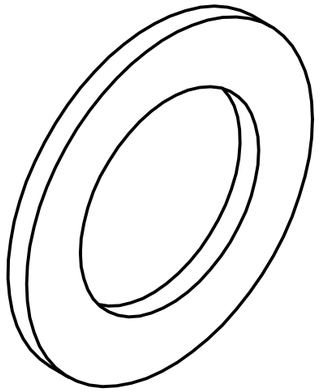
MATERIAL: Aluminum-6061-T6
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

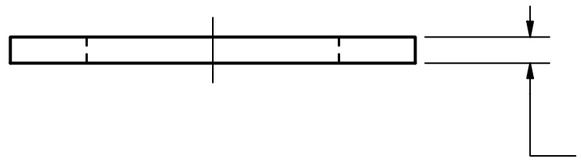
POTENTIOMETER CLAMP
THOR-05F, THOR-50M

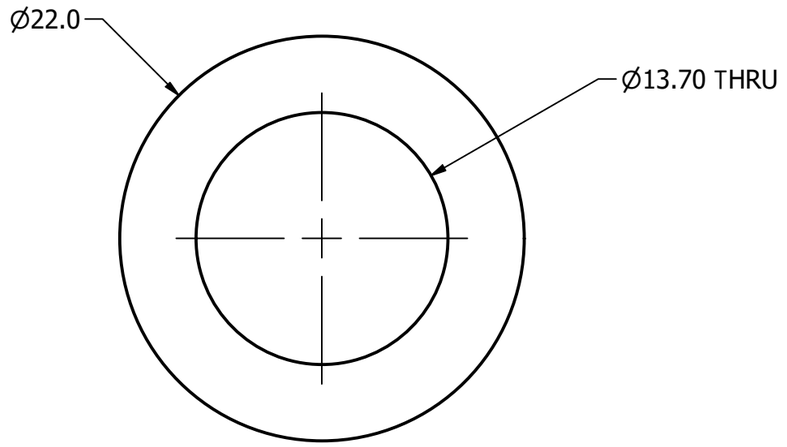
THIRD ANGLE PROJECTION

SIZE: A4 | DRAWING NUMBER: 472-7581 | REV: A
SCALE: 2:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	JH		11/16/2017







PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Nylon-6/6	CHECKED	
HEAT TREAT: N/A	ENG	
FINISH: N/A	APPROVED	

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: jhaefner	4/12/2016

DEPARTMENT OF TRANSPORTATION — UNITED STATES OF AMERICA

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

ANKLE THRUST WASHER

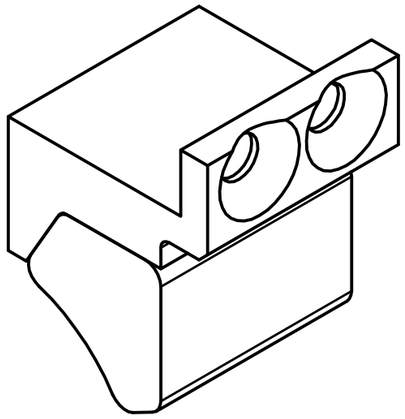
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A3	474-5720	1

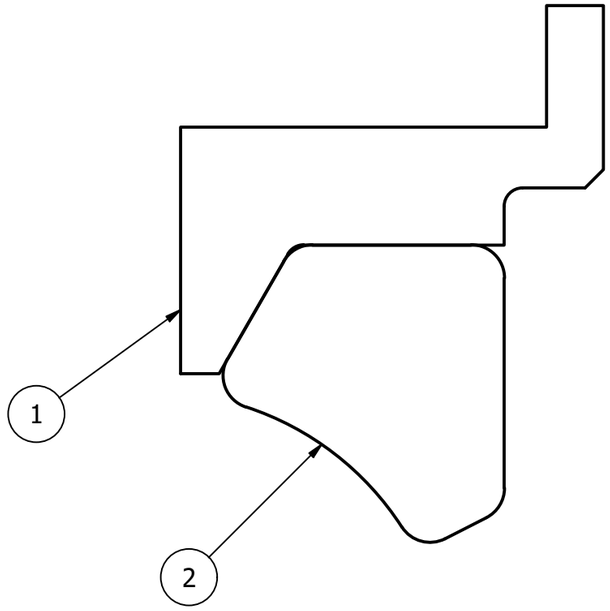
SCALE: 3:1

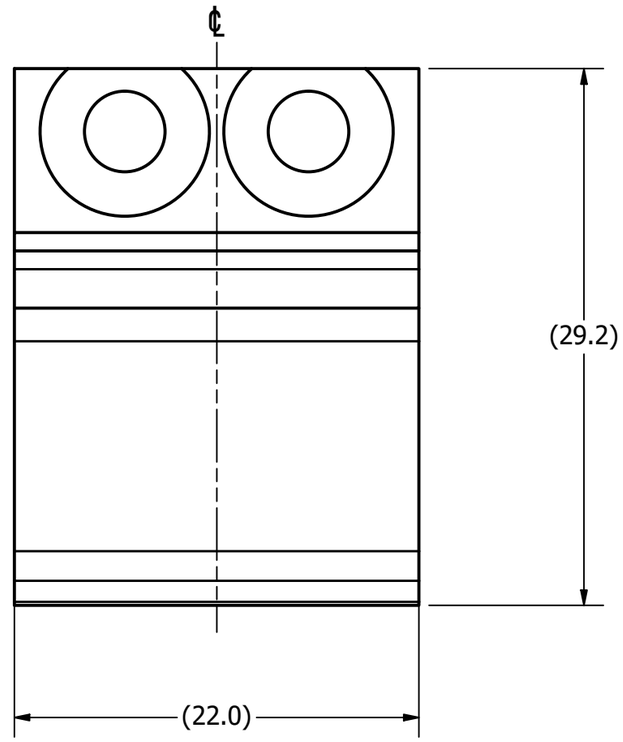
SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	SR	JW	1/23/2018



SCALE 2 : 1





ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	474-5812	PLANTAR STOP
1	1	474-5811	PLANTAR STOP BRACKET

PARTS LIST

NOTES:

1. BOND PARTS ITH OCTITE 411 OR E UI A ENT.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PLANTAR STOP ASSEMBLY

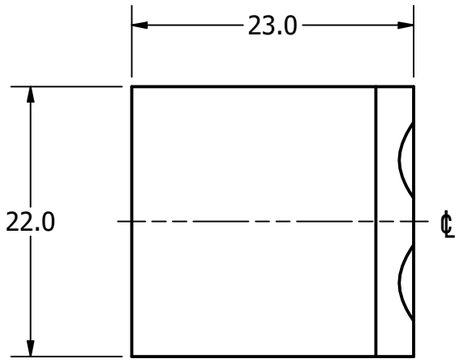
	APPROVALS	DATE
DRAWN	J. MCINNIS	8/9/2016
MATERIAL		
CHECKED		
HEAT TREAT		
ENG		
FINISH		
APPROVED		

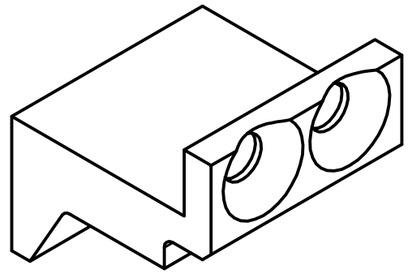
THIRD ANGLE PROJECTION

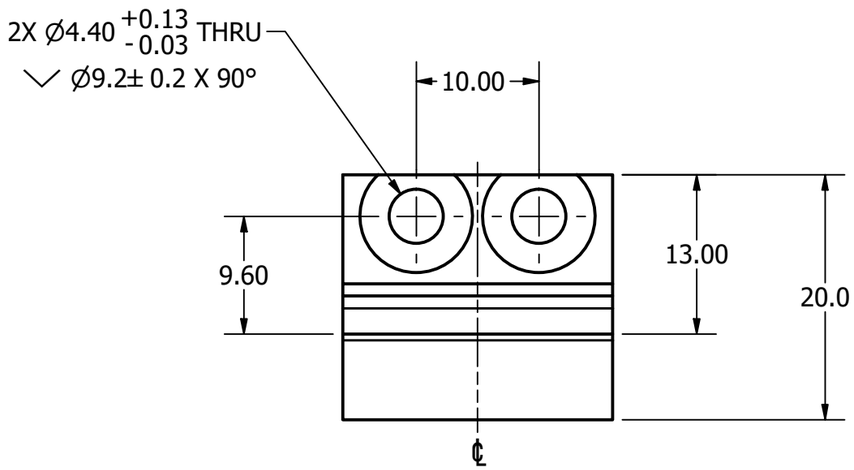
SIZE A3 | DRAWING NUMBER 474-5810 | REV 2

SCALE: 3 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	JPM	JW	10/19/16







NOTES:

1. DIMENSIONS ARE SYMMETRIC ABOUT ℄, UNLESS OTHERWISE SPECIFIED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ✓
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 6061-T6 ALUMINUM
HEAT TREAT:
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: J. MCINNIS	10/10/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

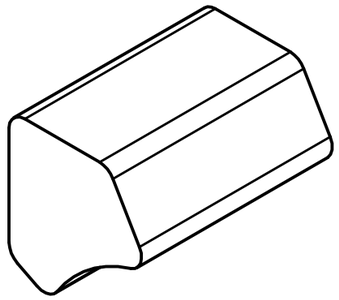
PLANTAR STOP BRACKET

THIRD ANGLE PROJECTION

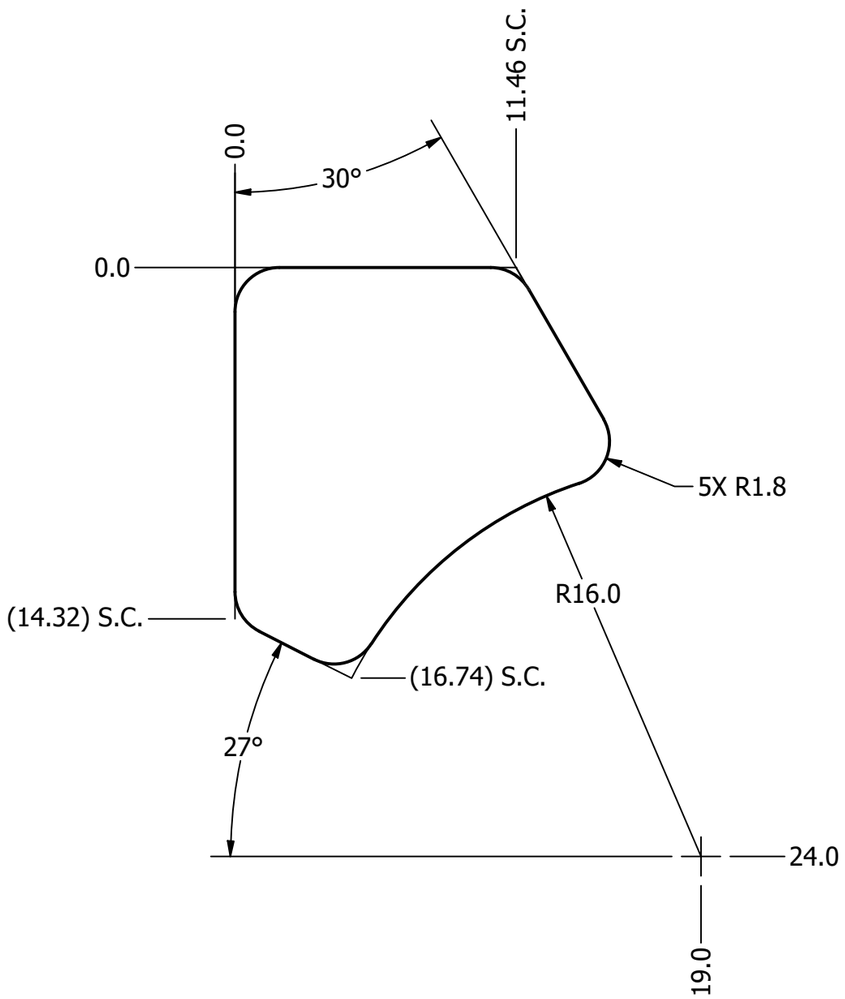
SIZE: A3 | DRAWING NUMBER: 474-5811 | REV: 1

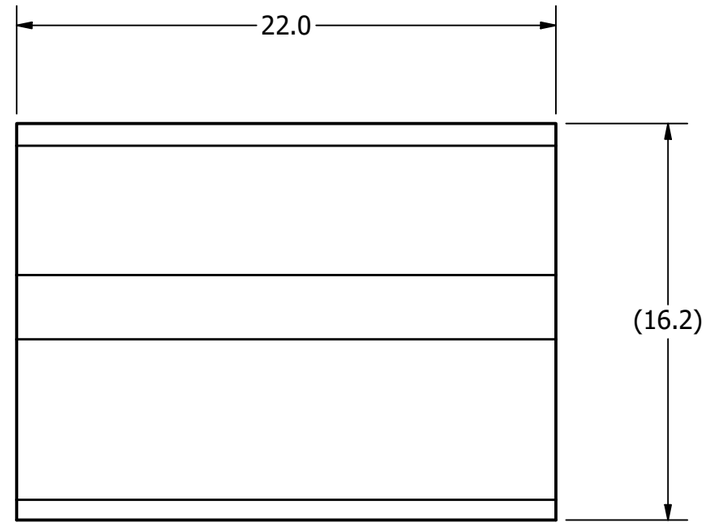
SCALE: 2:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	AB	JW	03/16/2018



SCALE 2 : 1





NOTES:

1. MATERIAL: NATURAL RUBBER
   COLOR: BLACK
   DUROMETER: 81 ± 10 SHORE "A"
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm, UNLESS OTHERWISE NOTED.
4. NO SPLIT OR DEFECTS ARE ALLOWED IN THE RUBBER MOLDING
5. ALL SPECIFICATIONS MAY BE SUPERCEDED BY DYNAMIC RESULTS

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN J. MCINNIS	8/9/2016
CHECKED	
ENG	
APPROVED	

THIRD ANGLE PROJECTION

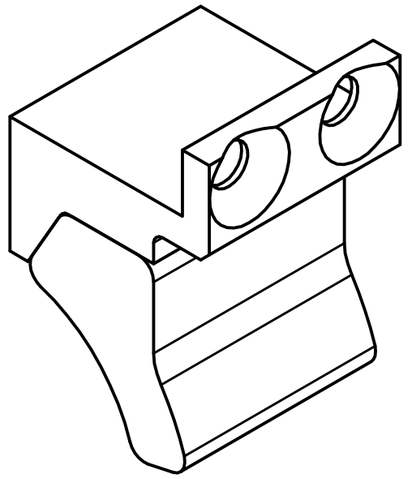
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PLANTAR STOP

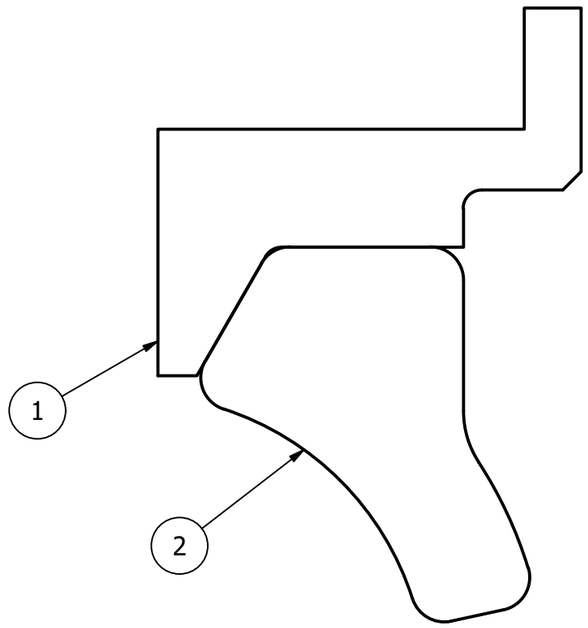
SIZE	DRAWING NUMBER	REV
A3	474-5812	2

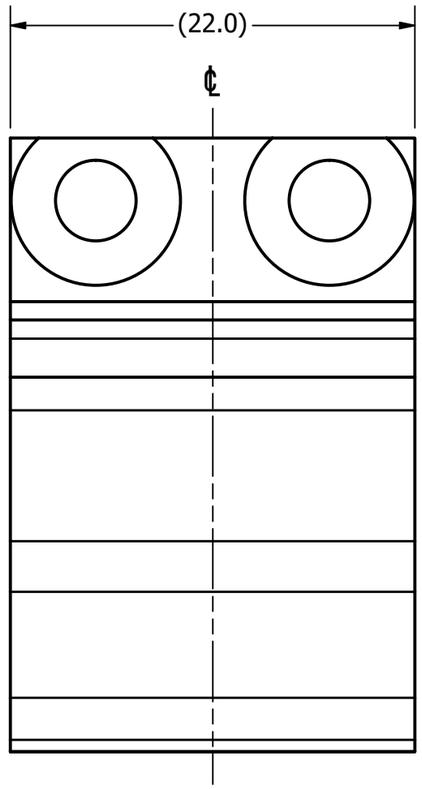
SCALE: 4 : 1 SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	SR	JW	1/23/2018



SCALE 2 : 1





ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	474-5809	DORSI STOP
1	1	474-5808	DORSI STOP BRACKET

PARTS LIST

NOTES:

1. OND PARTS ITH OCTITE 411 OR E UI A ENT.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	10/19/2016
CHECKED	
ENG	
APPROVED	

MATERIAL
HEAT TREAT
FINISH

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

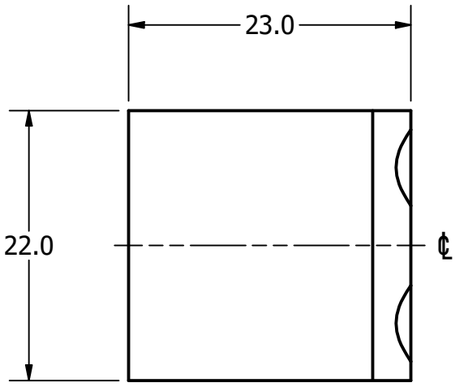
DORSI STOP ASSEMBLY

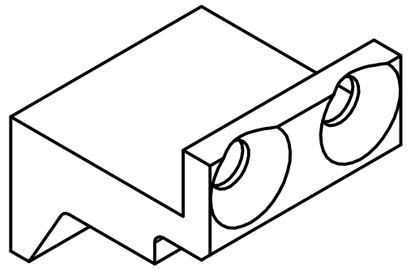
THIRD ANGLE PROJECTION

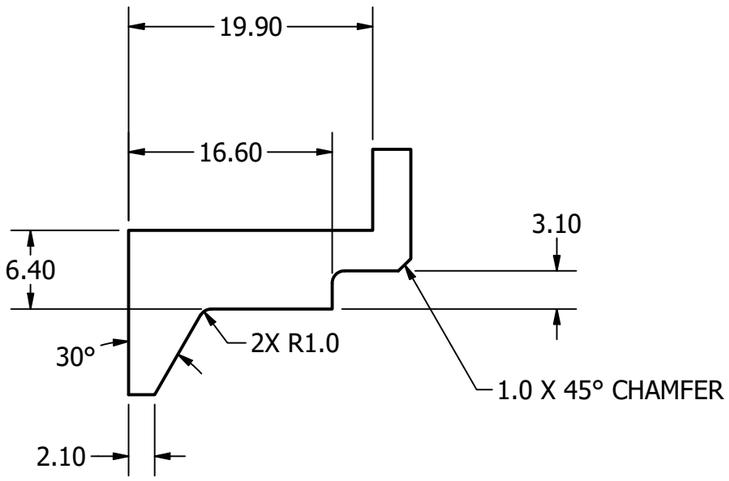
SIZE A3 | DRAWING NUMBER 474-5807 | REV 3

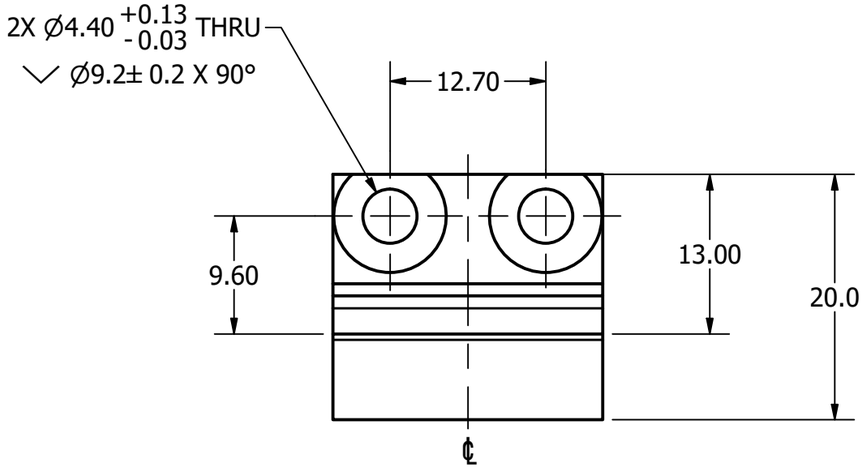
SCALE: 3 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	GCH		2/16/2017









PROTOTYPE DRAWING

NOTES:

1. DIMENSIONS ARE SYMMETRIC ABOUT ℄, UNLESS OTHERWISE SPECIFIED

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN J. MCINNIS	8/9/2016
CHECKED	
ENG	
APPROVED	

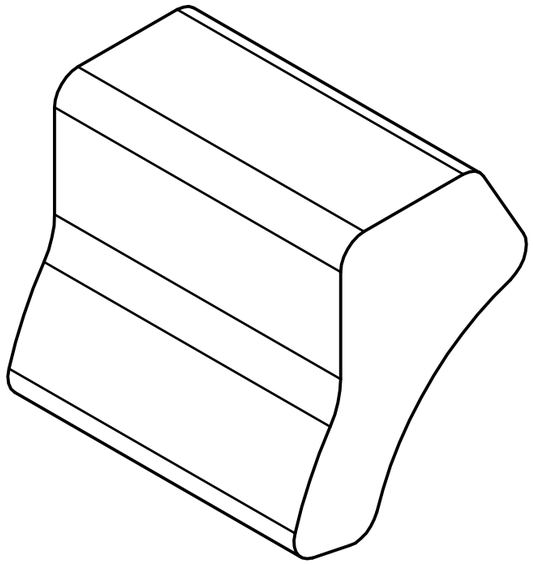
DORSI STOP BRACKET

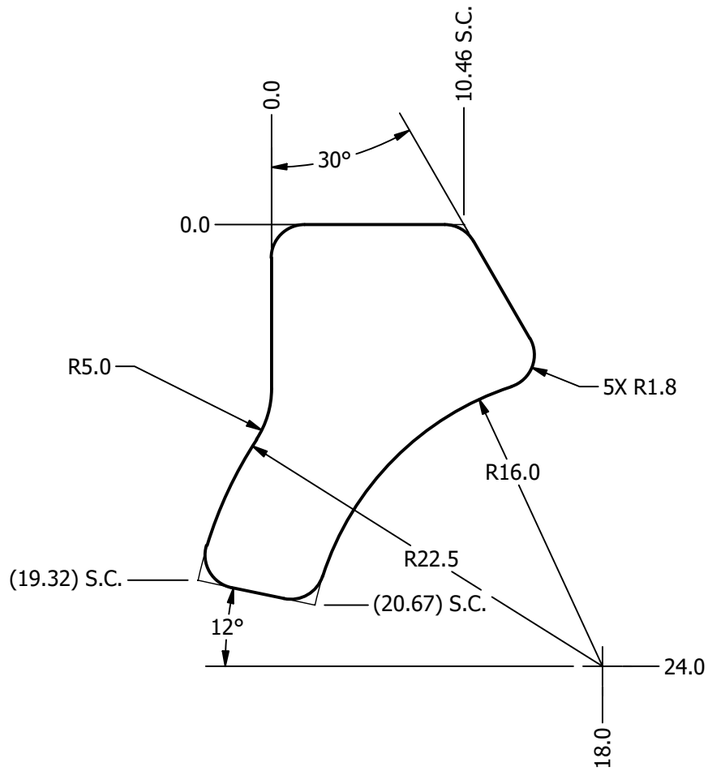
MATERIAL: 6061-T6 ALUMINUM
HEAT TREAT:
FINISH: CLEAR ANODIZE

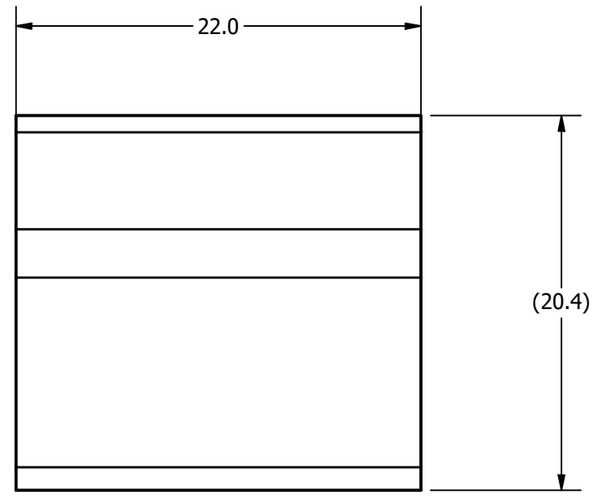
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-5808 | REV: 2
SCALE: 2 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	TM	DJI	01/11/2023







NOTES:

1. MATERIAL: NATURAL RUBBER
   COLOR: BLACK
   DUROMETER: 81±10 SHORE "A"

2. REMOVE ALL MOLD FLASHING

3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm, UNLESS OTHERWISE NOTED.

4. NO SPLIT OR DEFECTS ARE ALLOWED IN THE RUBBER MOLDING

5. ALL SPECIFICATIONS MAY BE SUPERCEDED BY DYNAMIC RESULTS

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ✓
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	B. KIMES	10/19/2016
CHECKED		
ENG	JW	10/19/2016
APPROVED		

DORSI STOP
THOR-05F

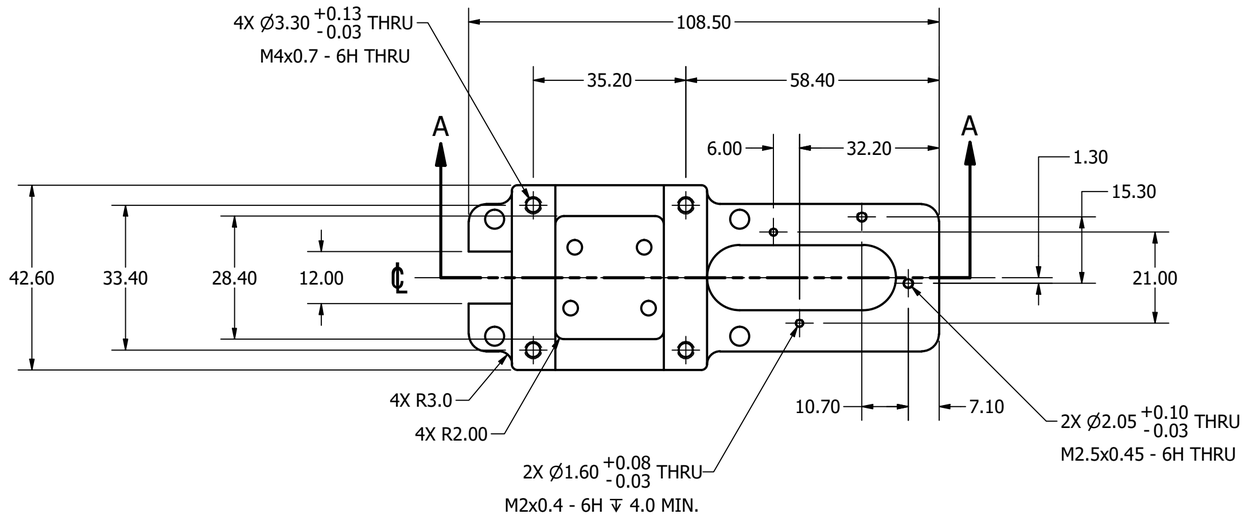
MATERIAL	HEAT TREAT	FINISH
SEE NOTE #1	N/A	N/A

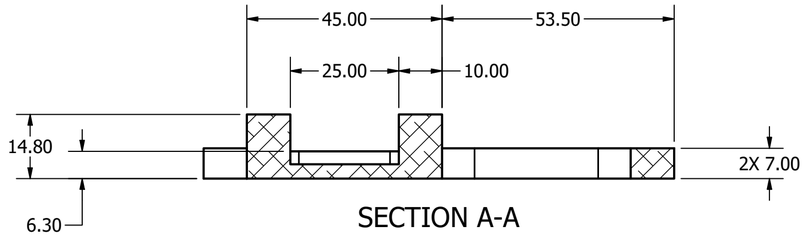
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A3	474-5809	4

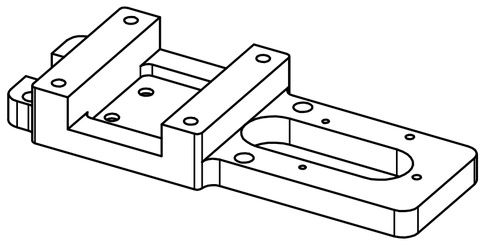
SCALE:	SHEET
3 : 1	1 OF 1

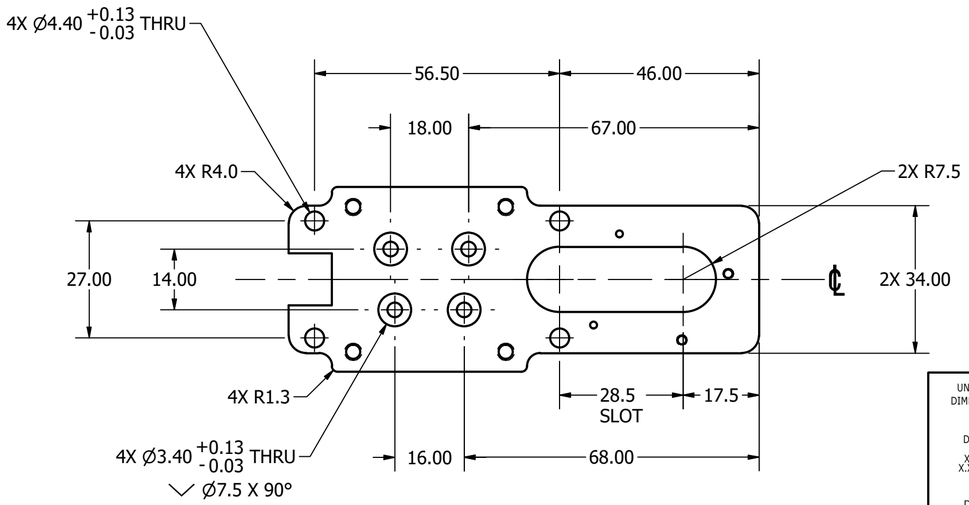
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	JPM	DJI	11/9/2022





SECTION A-A





NOTES:

1. DIMENSIONS SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: A. Barchock	10/25/2016
CHECKED:	
ENG: JW	10/25/2016
APPROVED:	

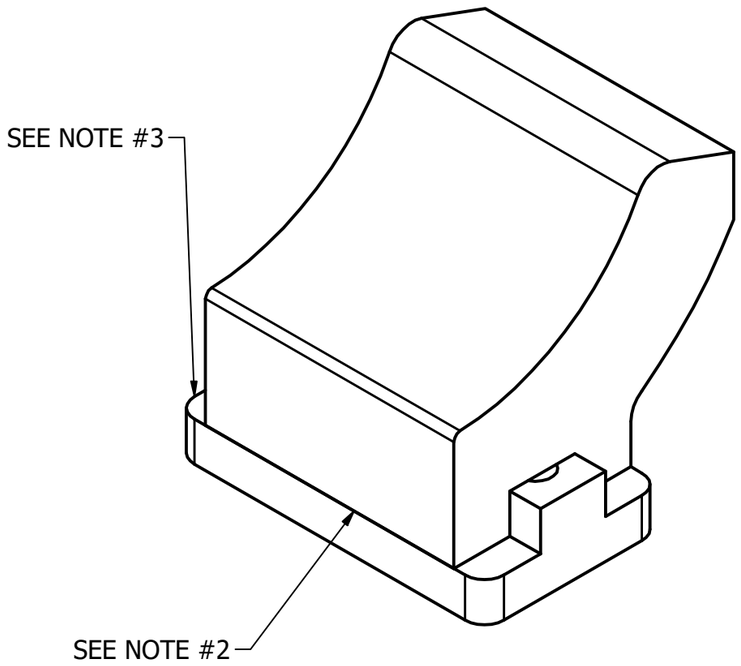
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

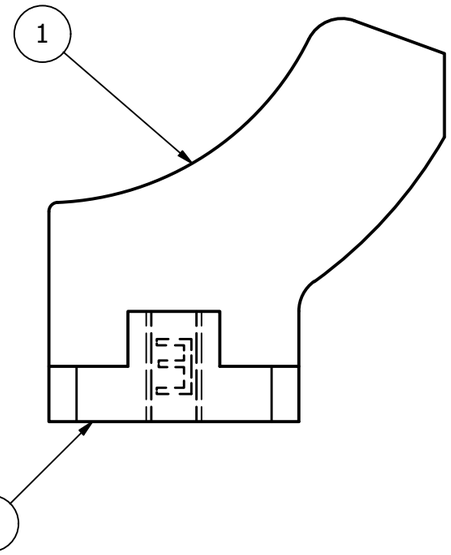
LOWER ANKLE PLATE, RIGHT
THOR-05F

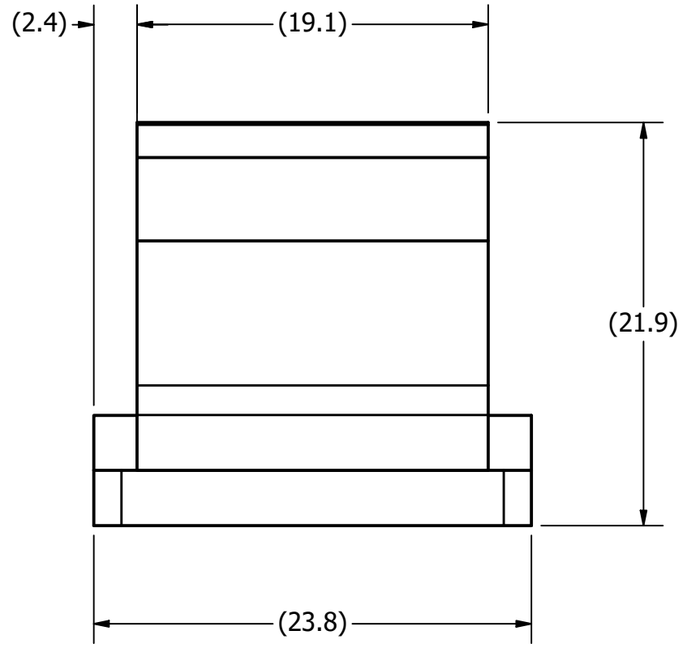
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-5806-2 | REV: 3
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE TO PROTOTYPE	ANK	DJI	03/28/2025







ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	474-5814-A	EVERSION STOP BRACKET
1	1	474-5815-A	INVERSION EVERSION STOP

PARTS LIST

NOTES:

1. BOND PARTS WITH EPOXY ADHESIVE OR EQUIVALENT.
2. CENTER RUBBER STOP ON BRACKET
3. "E" MARK ON THIS SIDE

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	akulal	3/28/2025
CHECKED		
ENG	disopi	3/28/2025
APPROVED		

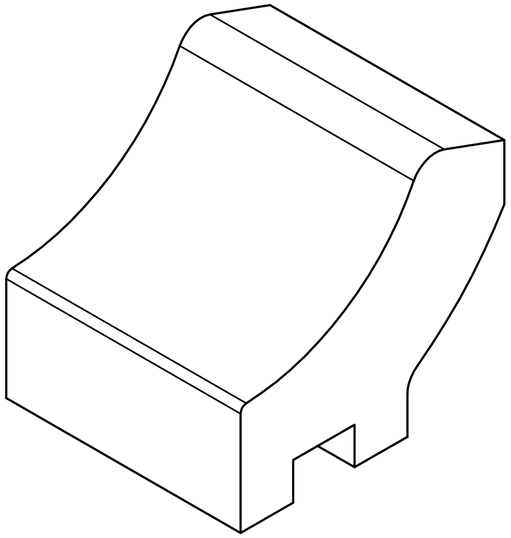
MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

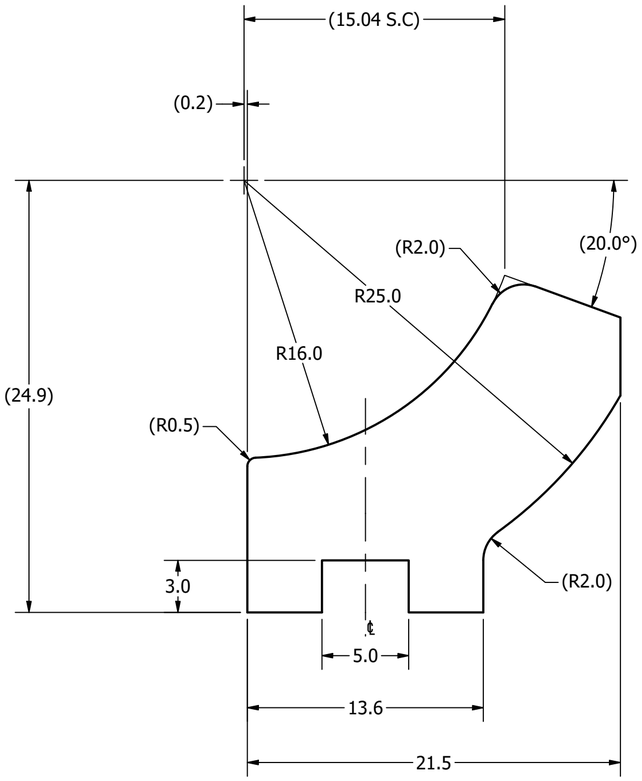
EVERSION STOP ASSEMBLY
THOR-05F

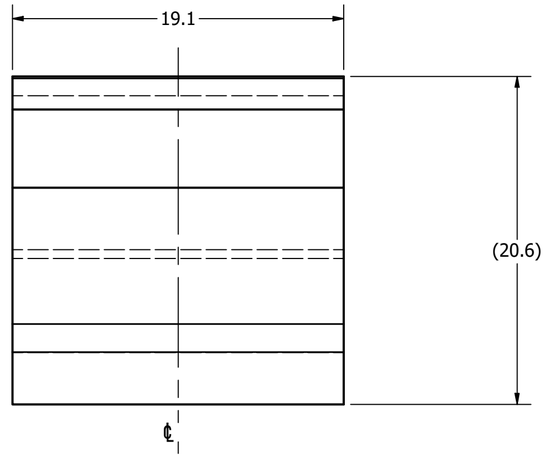
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-5813-A | REV: 1
SCALE: 3 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE TO PROTOTYPE	ANK	DJI	03/27/2025







NOTES:
1. MATERIAL: POLYURETHANE RUBBER 70A DUROMETER
   COLOR: BLACK
2. REMOVE ALL MOLD FLASHING.
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm, UNLESS OTHERWISE NOTED.
4. NO SPLIT OR DEFECTS ARE ALLOWED IN THE RUBBER MOLDING.
5. ALL SPECIFICATIONS MAY BE SUPERCEDED BY DYNAMIC RESULTS.
6. DIMENSIONS ARE SYMMETRICAL ABOUT ℄, UNLESS OTHERWISE SPECIFIED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: akulal	3/27/2025
CHECKED:	
ENG: disopi	3/27/2025
APPROVED:	

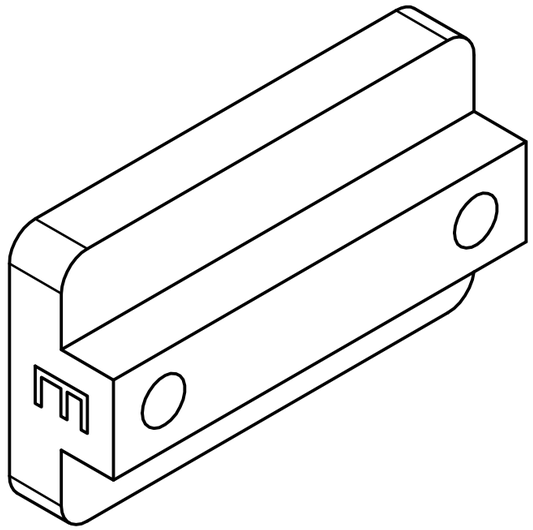
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

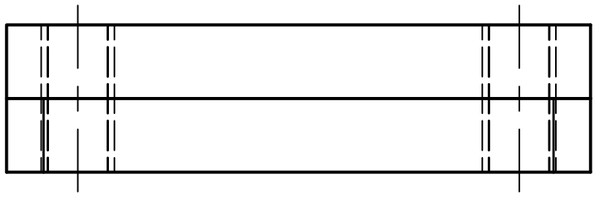
INVERSION EVERSION STOP
THOR-05F

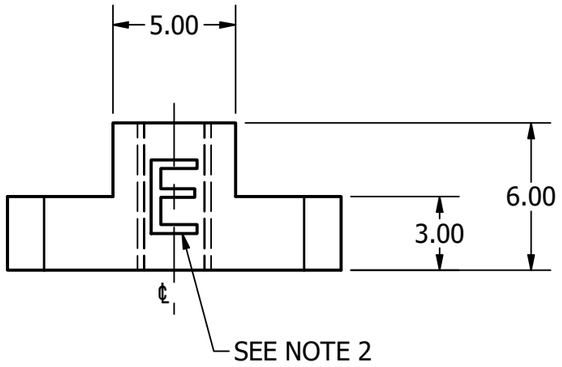
THIRD ANGLE PROJECTION

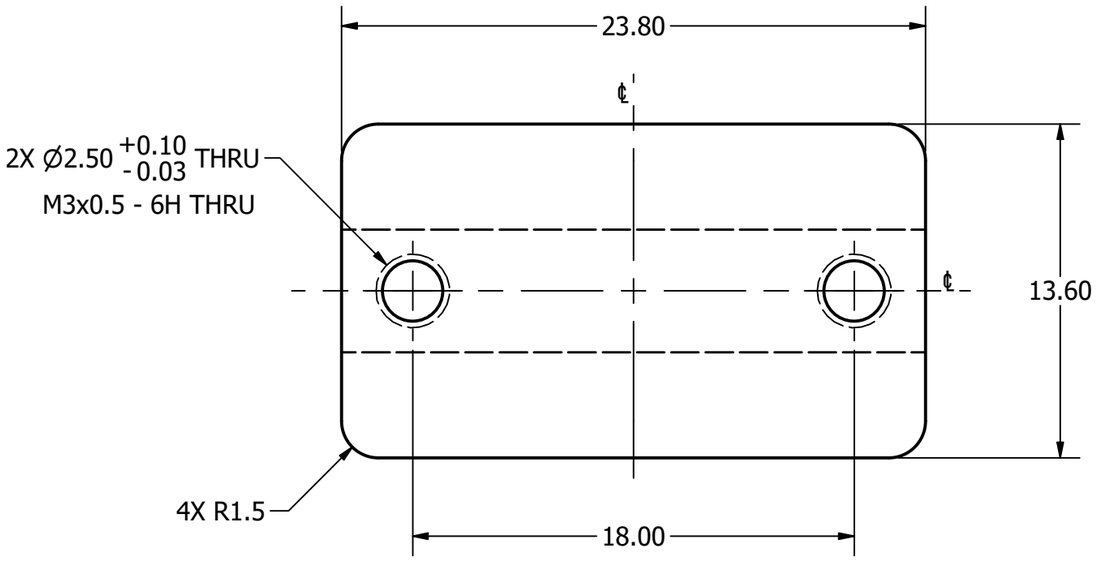
SIZE: A2 | DRAWING NUMBER: 474-5815-A | REV: 1
SCALE: 4 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE TO PROTOTYPE	ANK	DJI	03/28/2025









NOTES:

1. DIMENSIONS ARE SYMMETRICAL ABOUT ℄, UNLESS OTHERWISE SPECIFIED.
2. STAMP OR ETCH TEXT 3mm TALL WHERE SHOWN.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM	CHECKED	
HEAT TREAT: N/A	ENG: disopi	3/28/2025
FINISH: CLEAR ANODIZE	APPROVED	

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: akulal	3/28/2025

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

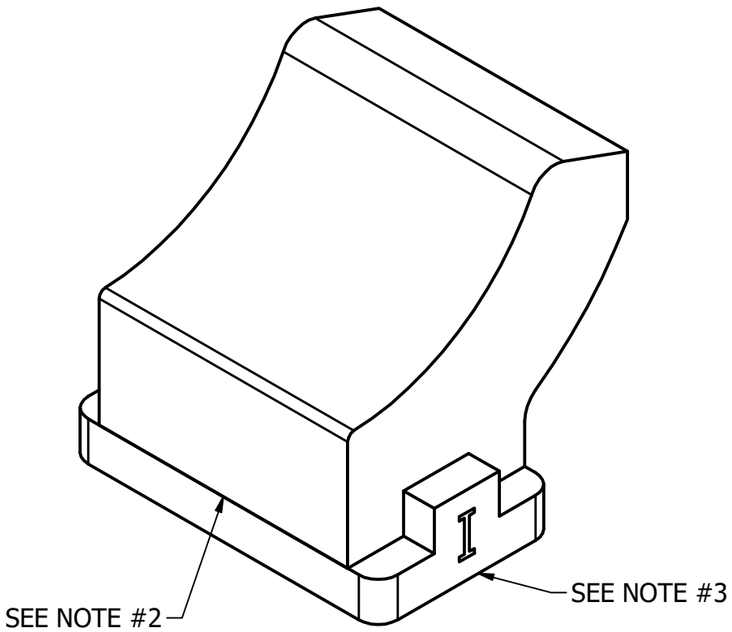
EVERSION STOP BRACKET
THOR-05F

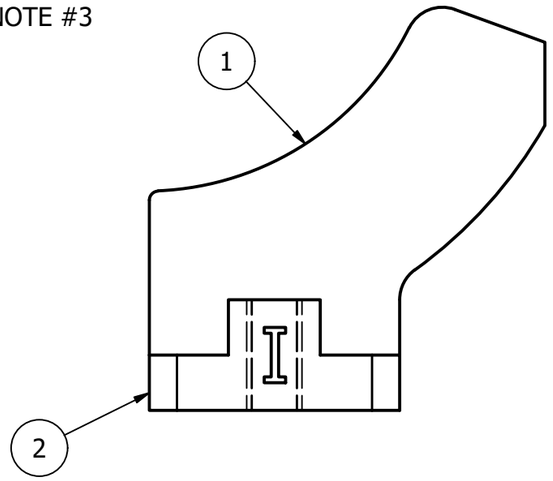
THIRD ANGLE PROJECTION

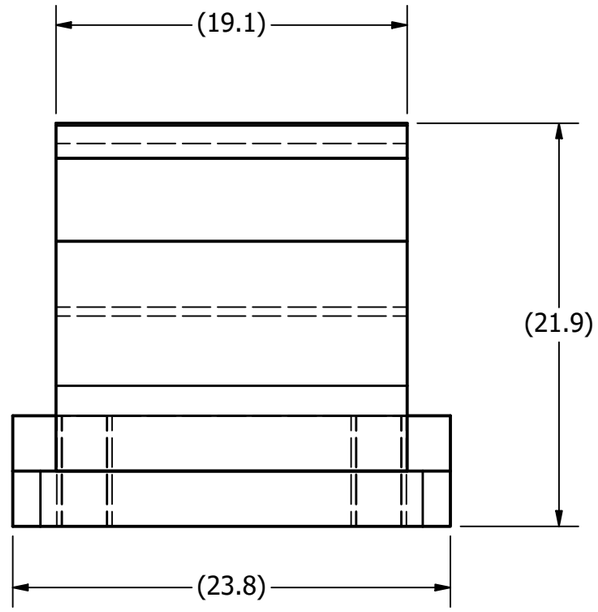
SIZE	DRAWING NUMBER	REV
A3	474-5814-A	1

SCALE: 4 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE TO PROTOTYPE	ANK	DJI	3/27/2025







ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	474-5817-A	INVERSION STOP BRACKET
1	1	474-5815-A	INVERSION EVERSION STOP

PARTS LIST

NOTES:

1. BOND PARTS WITH EPOXY ADHESIVE OR EQUIVALENT.
2. CENTER RUBBER STOP ON BRACKET.
3. "I" MARK ON THIS SIDE

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN akulal	3/27/2025
CHECKED	
ENG disopi	3/27/2025
APPROVED	

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

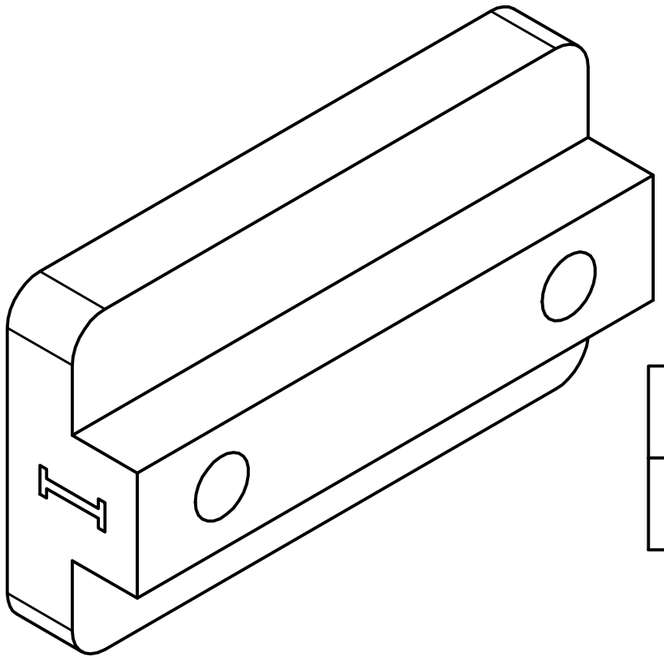
INVERSION STOP ASSEMBLY
THOR-05F

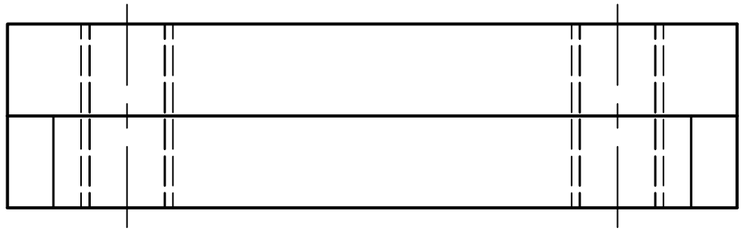
THIRD ANGLE PROJECTION

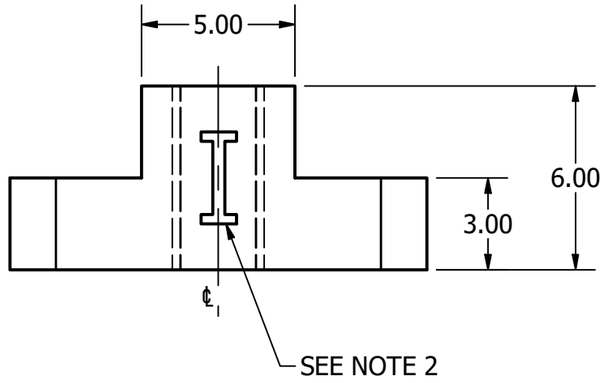
SIZE: A3 | DRAWING NUMBER: 474-5816-A | REV: 1

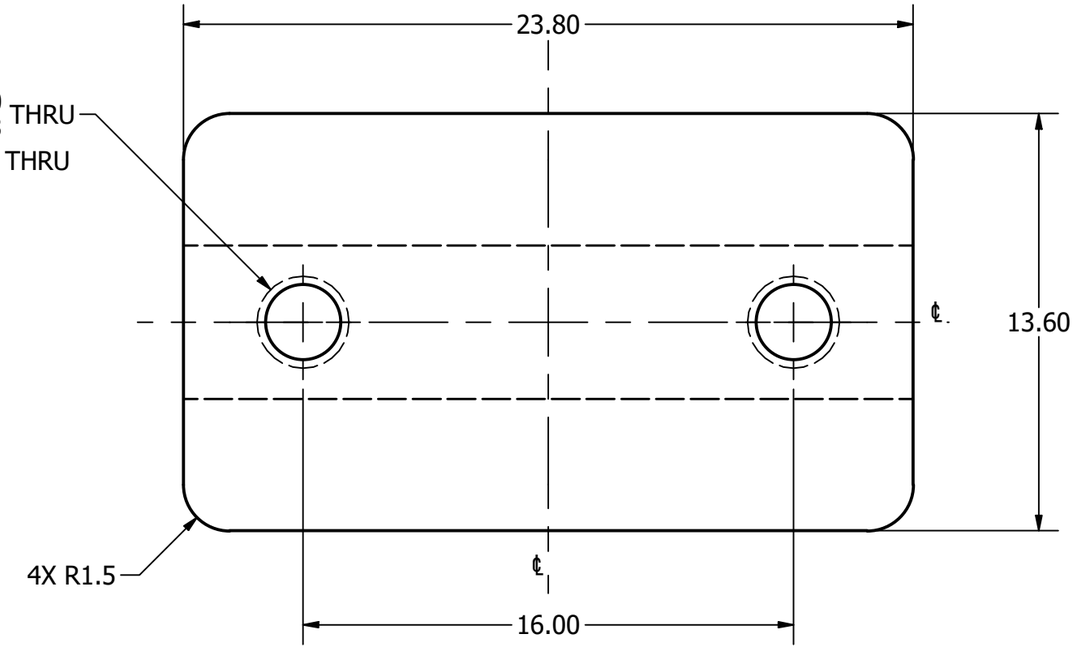
SCALE: 3 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	ENG'R.	CHECK	DATE
	1	RELEASE TO PROTOTYPE	ANK	DJI	03/27/2025









NOTES:

1. DIMENSIONS ARE SYMMETRICAL ABOUT ℄, UNLESS OTHERWISE SPECIFIED.
2. STAMP OR ETCH TEXT 3mm TALL WHERE SHOWN.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN akulal	3/27/2025
CHECKED	
ENG disopi	3/27/2025
APPROVED	

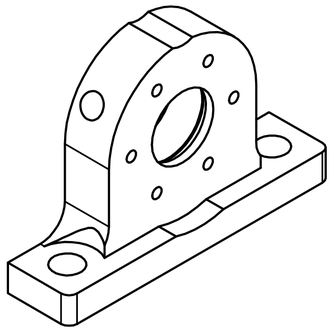
MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

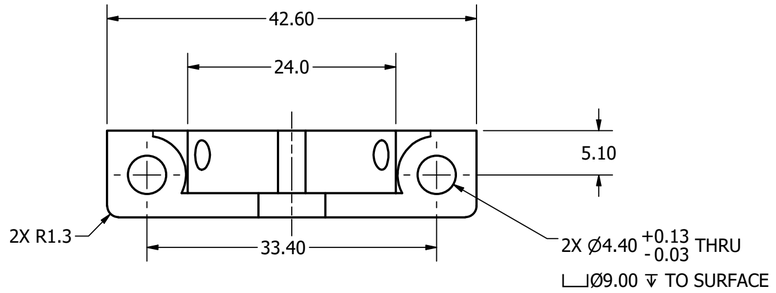
INVERSION STOP BRACKET
THOR-05F

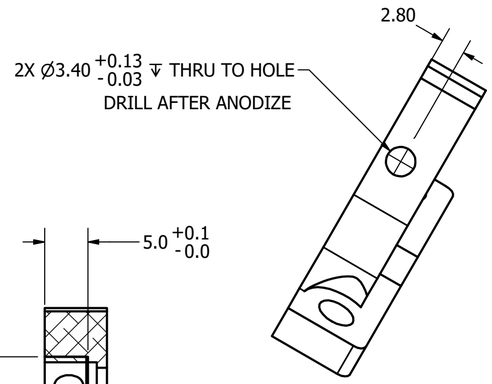
THIRD ANGLE PROJECTION

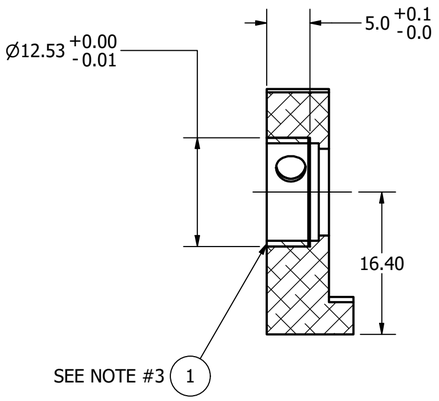
SIZE: A3 | DRAWING NUMBER: 474-5817-A | REV: 1
SCALE: 5 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	PROTOTYPE	HF	JW	9/23/2021

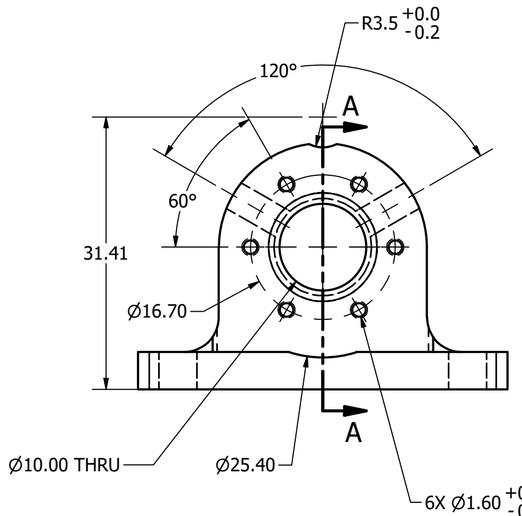


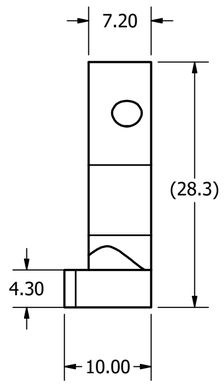


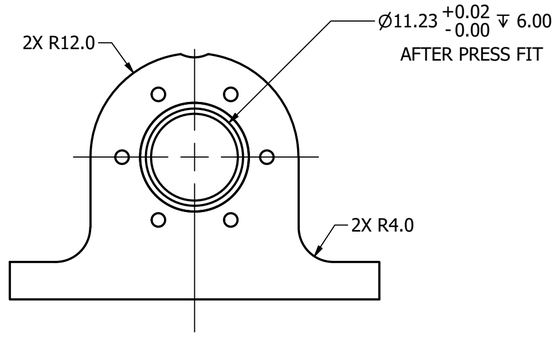




SECTION A-A







6X Ø1.60 +0.08 -0.03 THRU
M2x0.4 - 6H ↧ 5.8 MIN.
EQUI-SPACED ON B.C. AS SHOWN

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. PRESS IN BEARING 474-5827 AFTER ANODIZE.
3. INSTALL BEARING FLUSH TO BOTTOM SURFACE OF HOLE, AS SHOWN.

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-5827	SLEEVE BEARING

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN A.TOMICH	7/7/2017
CHECKED	
ENG JW	7/7/2017
APPROVED	

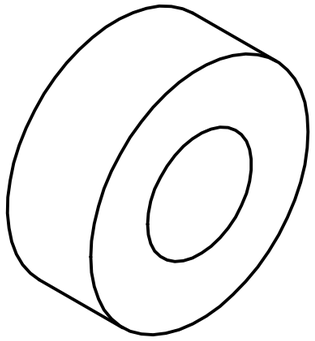
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

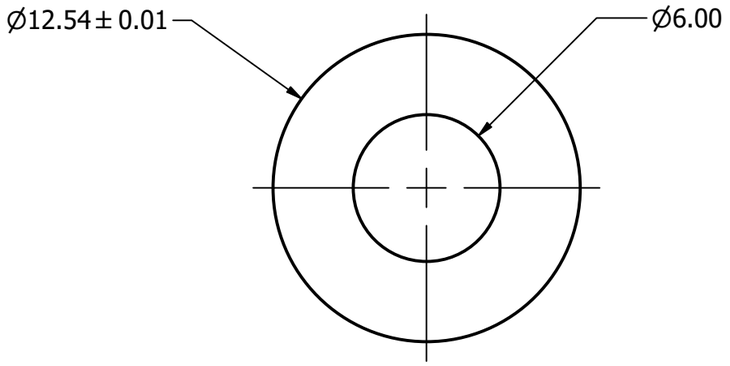
PLATE, ANKLE BUSHING
THOR-05F

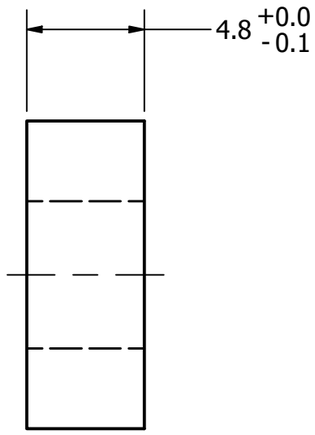
THIRD ANGLE PROJECTION

SIZE A2 | DRAWING NUMBER 474-5826 | REV 5
SCALE: 2 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	AB	JW	08/31/2017







PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: atomich	7/7/2017
CHECKED	
ENG	
APPROVED	

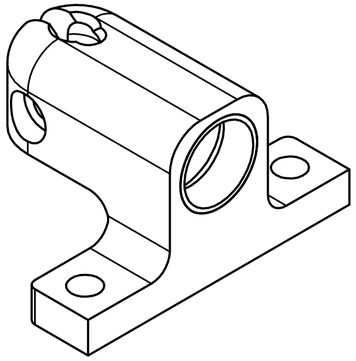
MATERIAL: Bronze, Soft Tin
HEAT TREAT
FINISH

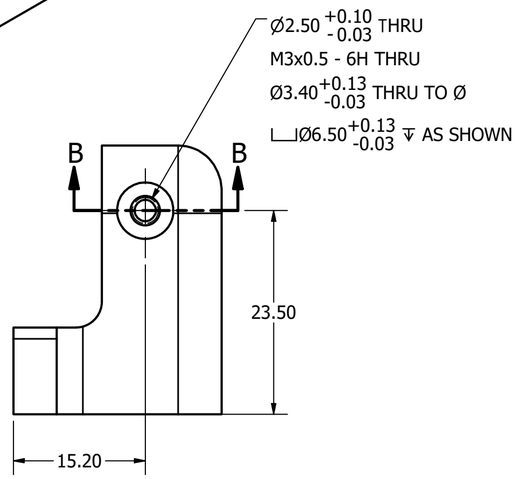
SLEEVE BEARING
THOR-05F

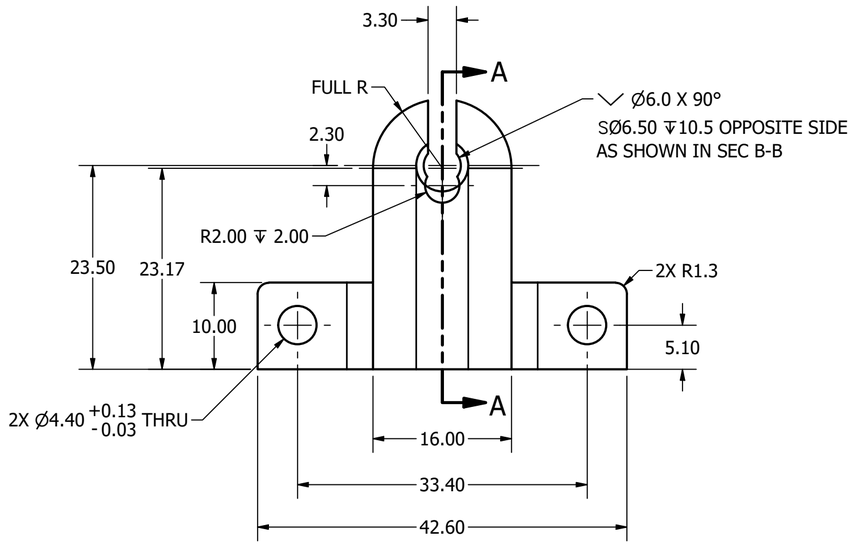
THIRD ANGLE PROJECTION

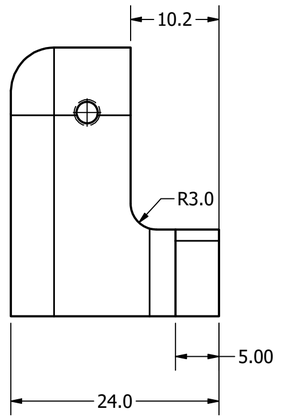
SIZE: A3 | DRAWING NUMBER: 474-5827 | REV: 2
SCALE: 4 : 1 | SHEET: 1 OF 1

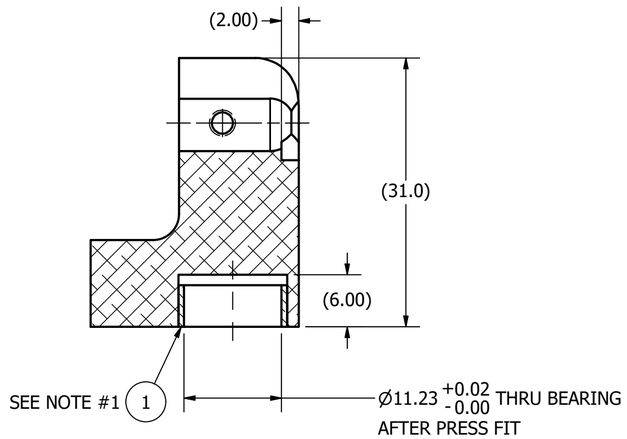
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	HF	JW	9/23/2021



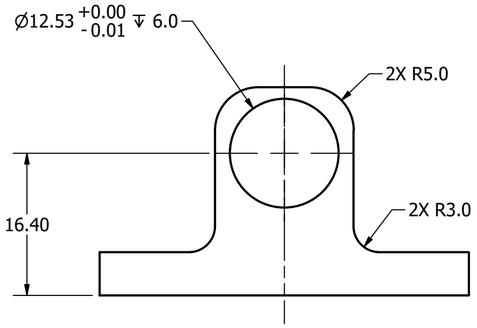




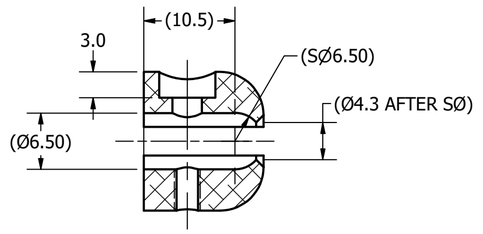




SECTION A-A



BEARING NOT SHOWN



SECTION B-B

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-5827	SLEEVE BEARING

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	A.TOMICH	7/7/2017
CHECKED		
ENG	JW	7/7/2017
APPROVED		

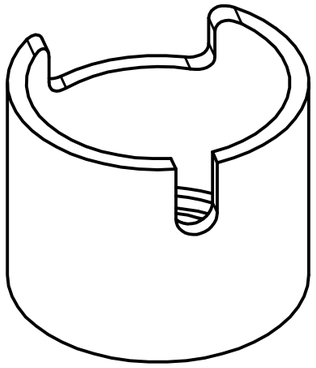
MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

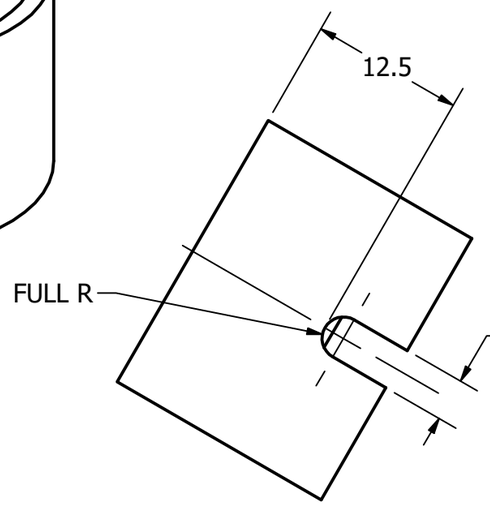
ACHILLES CABLE RETAINER
THOR-05F

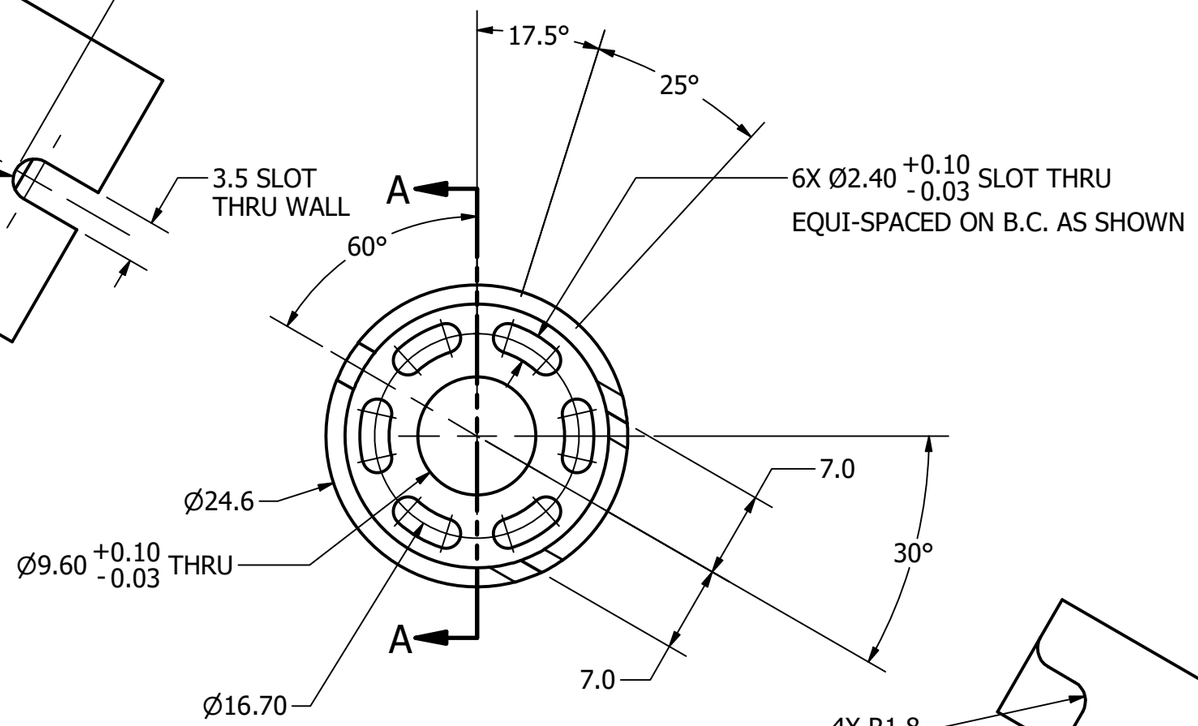
THIRD ANGLE PROJECTION

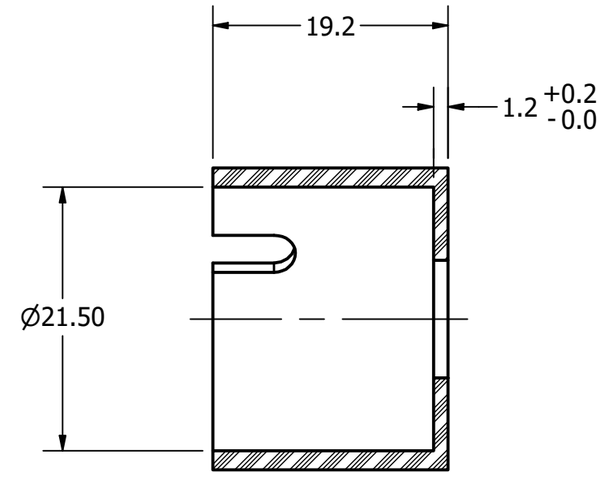
SIZE: A2 | DRAWING NUMBER: 474-5828 | REV: 4
SCALE: 2 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	SKK	MJS	2/7/2022

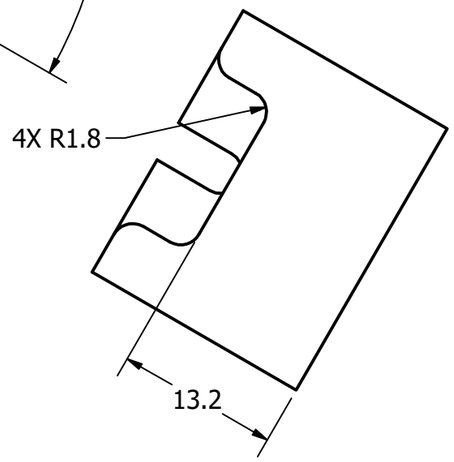








SECTION A-A



NOTES:

1. PART MADE OF 3D PRINTED N ON.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	skantola	2/7/2022
CHECKED		
ENG	MJS	2/7/2022
APPROVED		

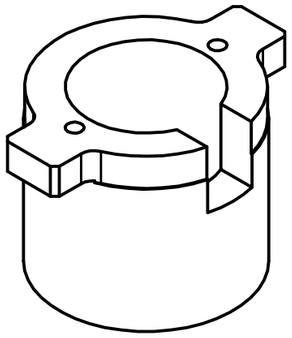
MATERIAL: SEE NOTE 1
HEAT TREAT: N/A
FINISH: N/A

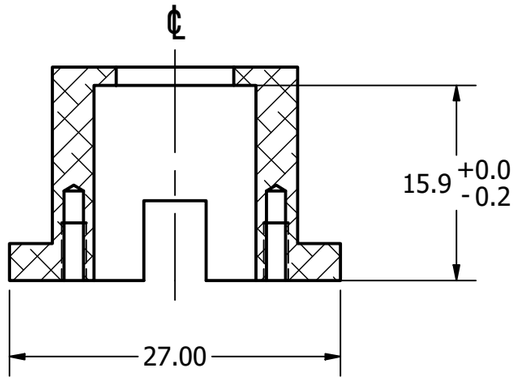
POTENTIOMETER CAP
THOR-05F ADM/DTI

THIRD ANGLE PROJECTION

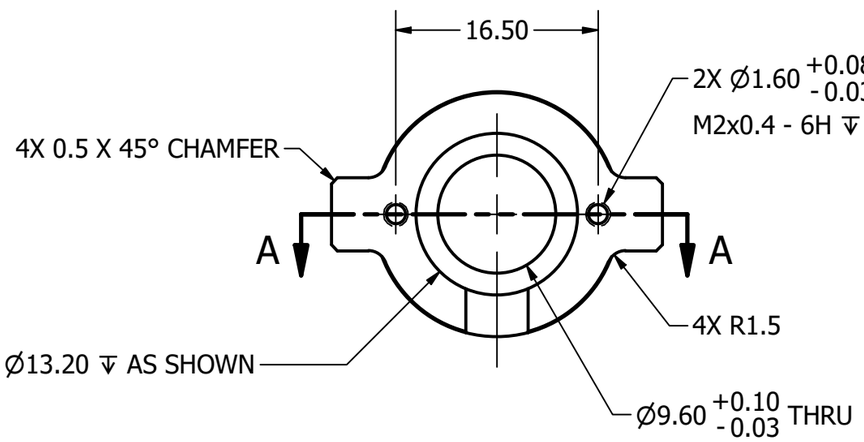
SIZE: A3 | DRAWING NUMBER: 483-5825 | REV: 1
SCALE: 2:1 | SHEET: 1 OF 1

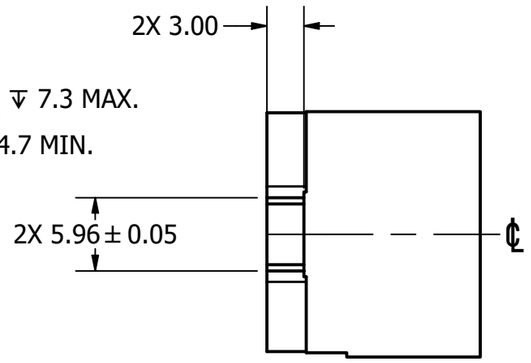
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	RELEASE FOR PROTOTYPE	AB	KMSP	01/13/2020

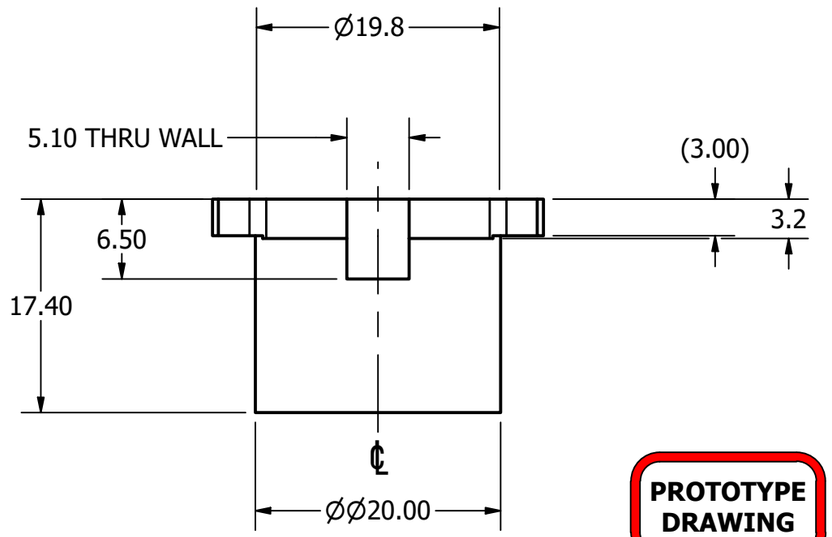




SECTION A-A







PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	10/31/2017
CHECKED:	
ENG: JW	10/31/2017
APPROVED:	

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

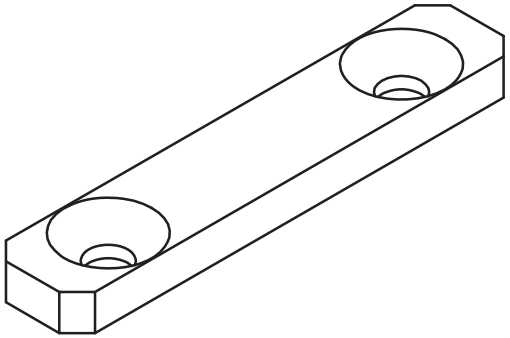
POTENTIOMETER INNER MOUNT
THOR-05F

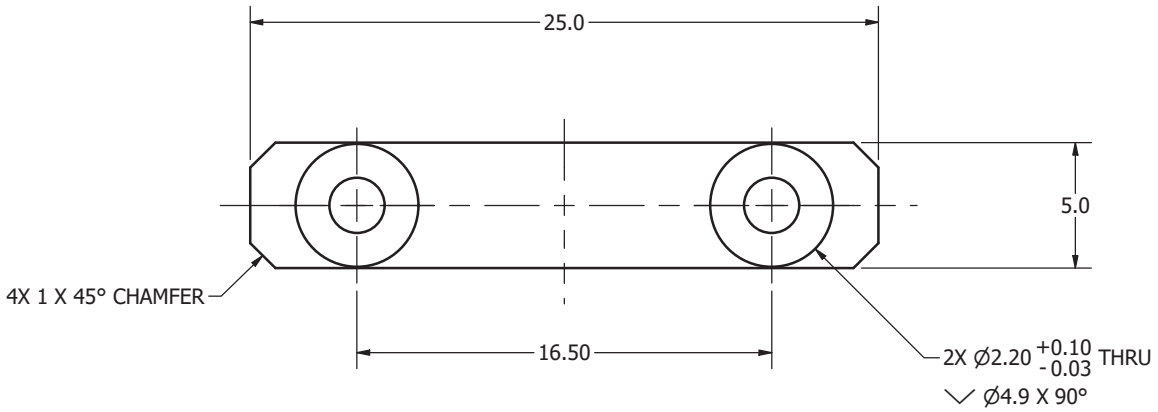
THIRD ANGLE PROJECTION

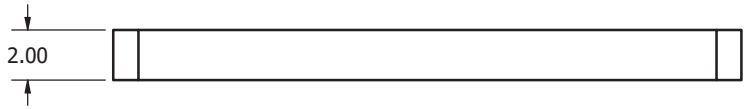
SIZE	DRAWING NUMBER	REV
A3	474-5831	3

SCALE: 2:1 SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	BK	JW	10/31/2017







UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT:
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	10/31/2017
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

POTENTIOMETER CLAMP

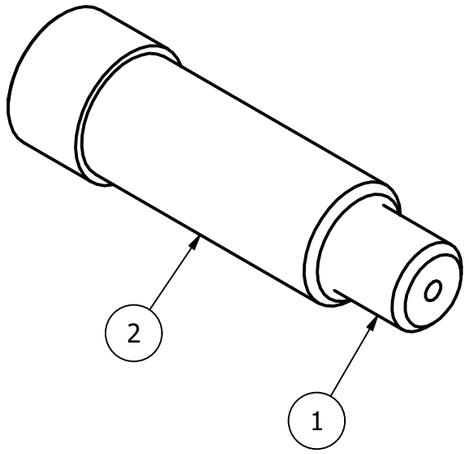
THIRD ANGLE PROJECTION

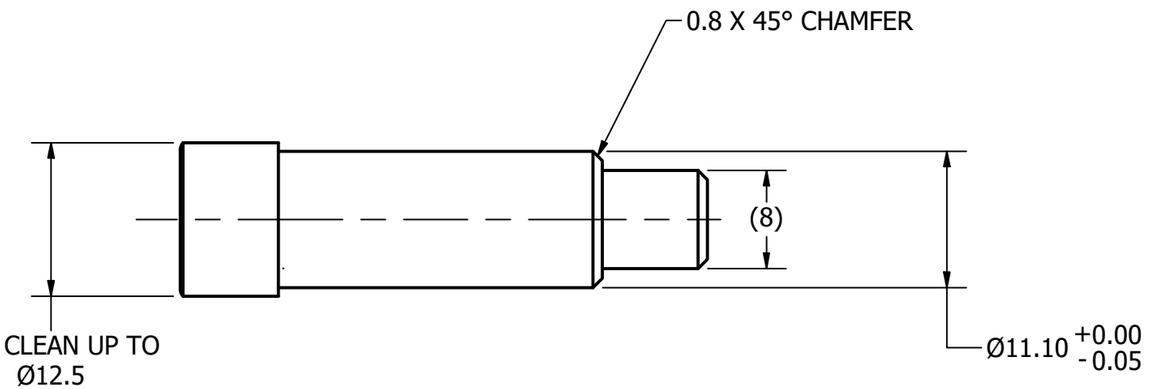
SIZE: A3 | DRAWING NUMBER: 474-5832 | REV: 1

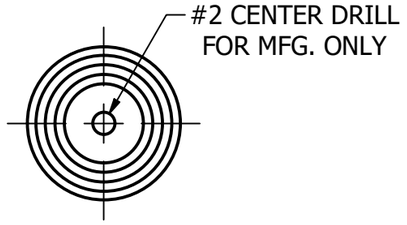
SCALE: 5:1 | SHEET: 1 OF 1

PRELIMINARY DRAWING

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	E	RELEASE FOR PRODUCTION	3/13/2014	BK







NOTES:
1. BREAK ALL SHARP EDGES.
2. REMOVE OIL FROM ITEM 2 WITH SOLVENT.
3 APPLY THREAD LOCKER TO THREADS AND ASSEMBLE ITEMS 1 & 2.
4 MACHINE OD AND CHAMFER AS NOTED.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-7564	SLEEVE, BOLT - ANKLE
1	1	5000304	M8 X 1.25 X 35 LG. SHCS SS

Parts List

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B.WADE	7/11/2016
CHECKED	
ENG	
APPROVED	

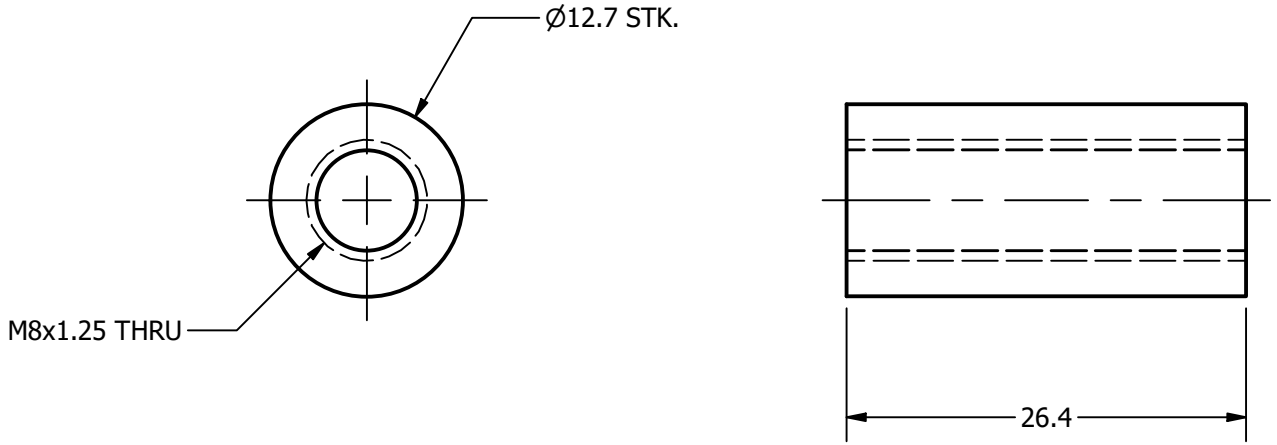
MATERIAL
HEAT TREAT: N/A
FINISH: N/A

BOLT & SLEEVE ASSEMBLY-ANKLE
THOR-05F, THOR-50M

THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 472-7563 | REV: E
SCALE: 2:1 | SHEET: 1 OF 1

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	E	RELEASE FOR PRODUCTION	3/14/2014	BK



NOTES:
1. BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ±.5
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B.WADE	7/11/2016
CHECKED	
ENG	
APPROVED	

MATERIAL: Acetal Resin, White
HEAT TREAT: N/A
FINISH: N/A

SLEEVE, BOLT - ANKLE

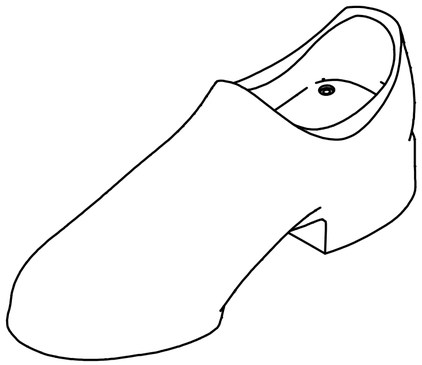
THOR-05F, THOR-50M

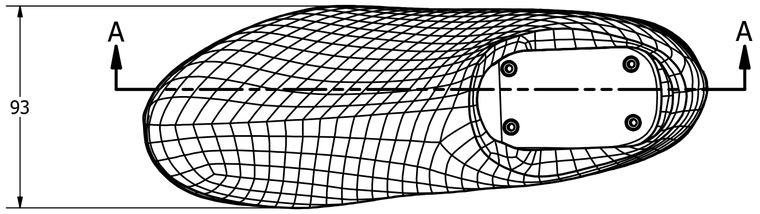
THIRD ANGLE PROJECTION

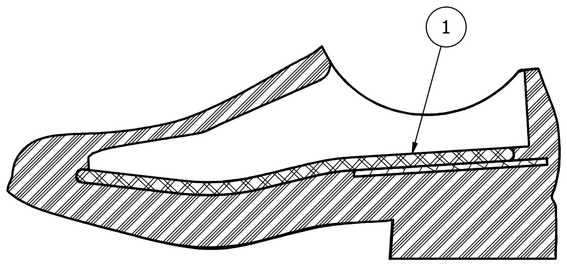
SIZE: A4 | DRAWING NUMBER: 472-7564 | REV: E

SCALE: 2:1 | SHEET: 1 OF 1

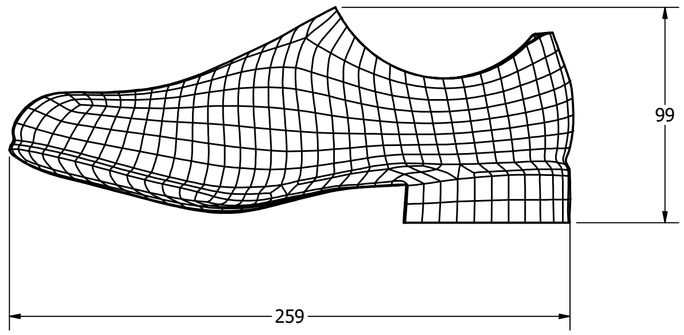
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	8	PROTOTYPE	TM	DJI	01/11/2023







SECTION A-A



NOTES:

1. MATERIAL: THERMOSET PLASTIC
   COLOR: BLACK
   DUROMETER: 70-75 SHORE "A" CAN BE ADJUSTED TO MEET THE PERFORMANCE REQUIREMENT

2. REMOVE ALL MOLD FLASHING.

3. ALL MOLD DIMENSION TOLERANCE +1%/-2% BUT NO SMALLER THAN 0.5mm.

4. NO SPLIT OR DEFECTS ARE ALLOWED IN THE MOLDING.

5. WEIGHT: 995 ± 10 GRAMS

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-5906-2	LAMINATED SOLE PLATE ASSY, RIGHT

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/13/2016
CHECKED:	
ENG: JW	4/13/2016
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

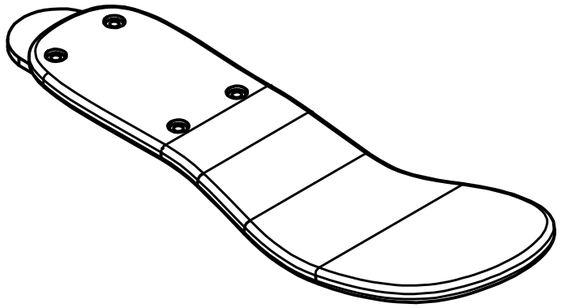
MOLDED SHOE ASSEMBLY, RIGHT
THOR-05F

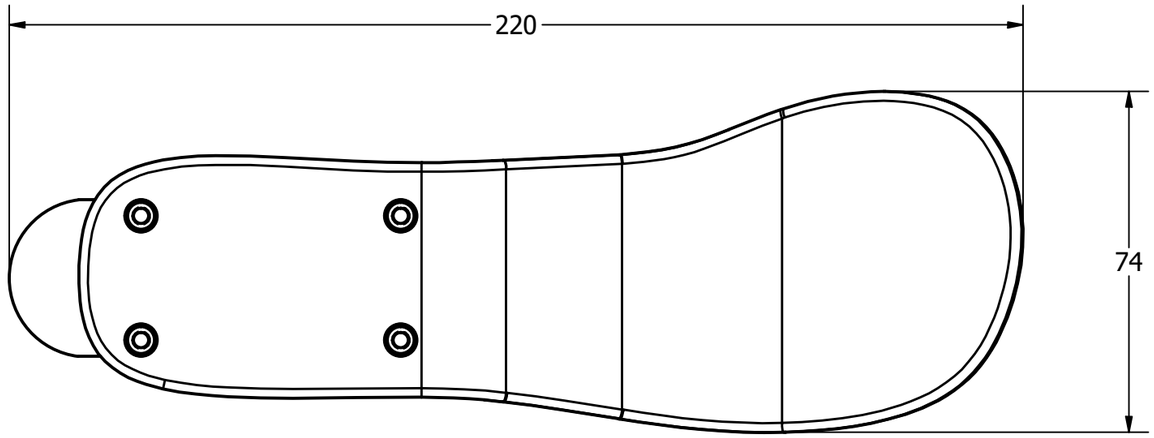
THIRD ANGLE PROJECTION

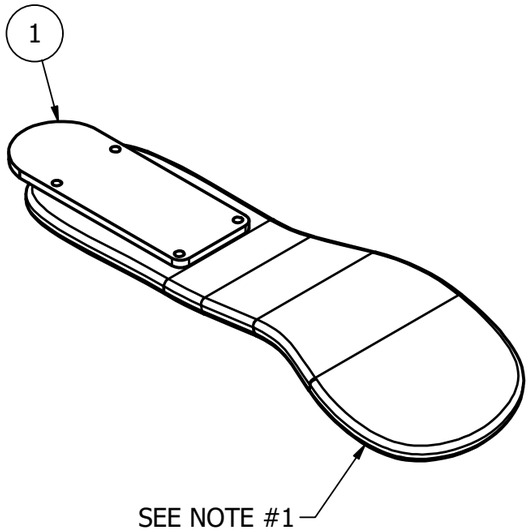
SIZE: A2 | DRAWING NUMBER: 474-5903-2 | REV: 8

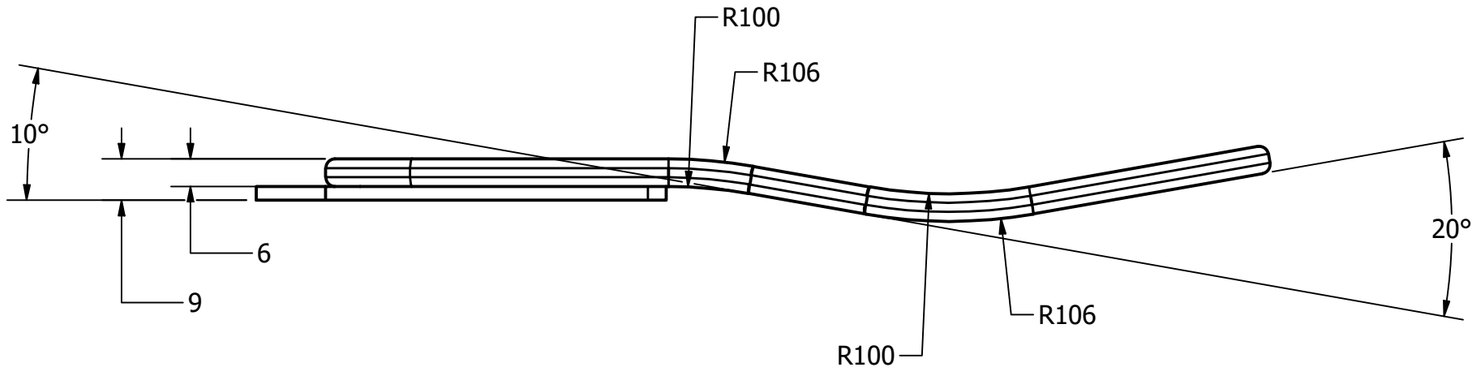
SCALE: 0.5 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	AB	JW	10/04/2017









NOTES:

1. CARBON FIBER LAMINATES

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-5902	BACKING PLATE, SOLE PLATE

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN A. Barchock	10/4/2017
CHECKED	
ENG	
APPROVED	

MATERIAL

HEAT TREAT

FINISH

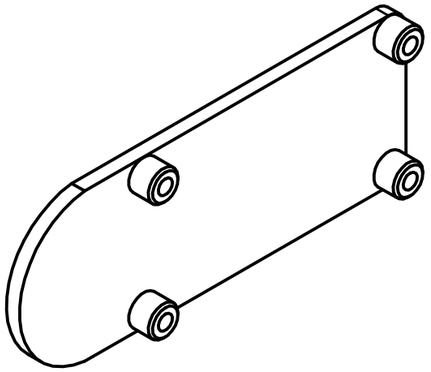
LAMINATED SOLE PLATE ASSY, RIGHT

THIRD ANGLE PROJECTION

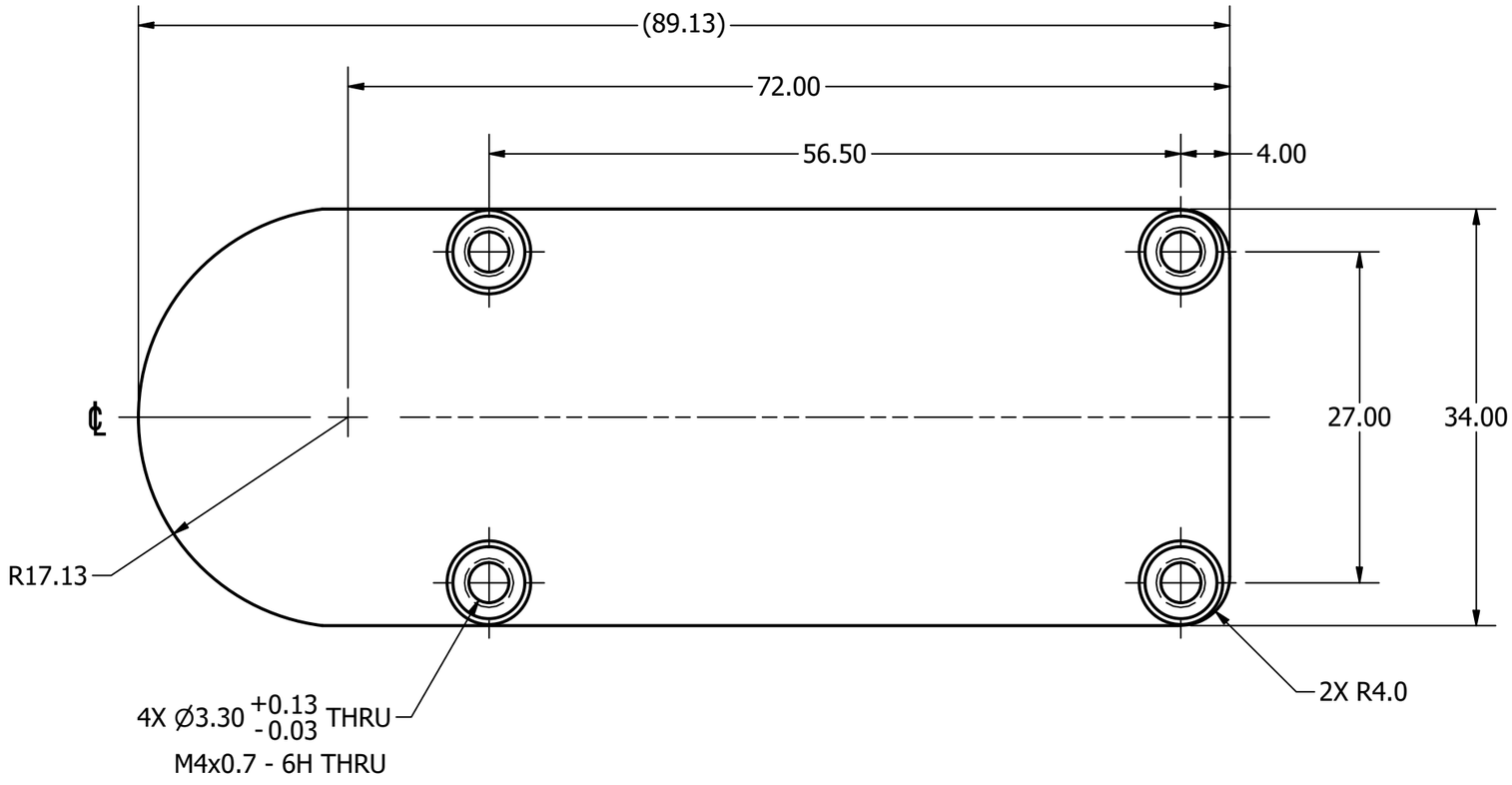
SIZE A3 | DRAWING NUMBER 474-5906-2 | REV 1

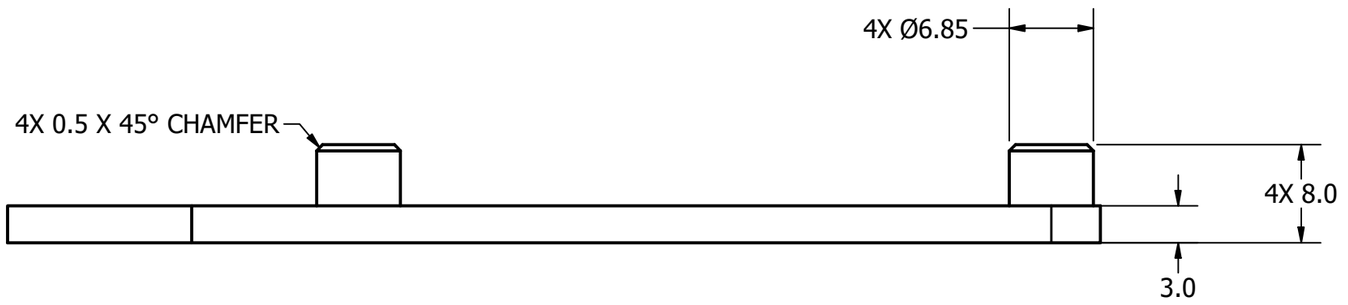
SCALE: .75:1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	HF	JW	9/22/2021



SCALE 1 : 1





NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄ , UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/13/2016
CHECKED:	
ENG: JW	4/13/2016
APPROVED:	

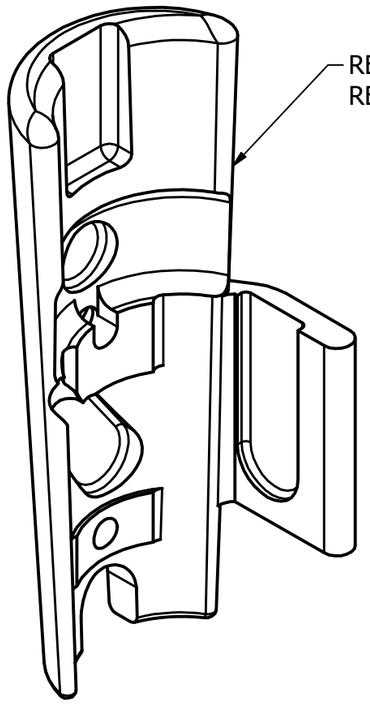
THIRD ANGLE PROJECTION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

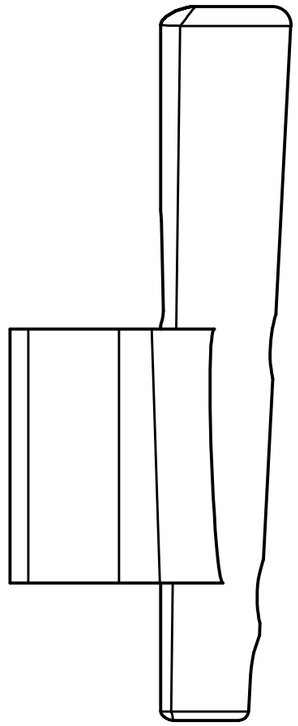
BACKING PLATE, SOLE PLATE
THOR-05F

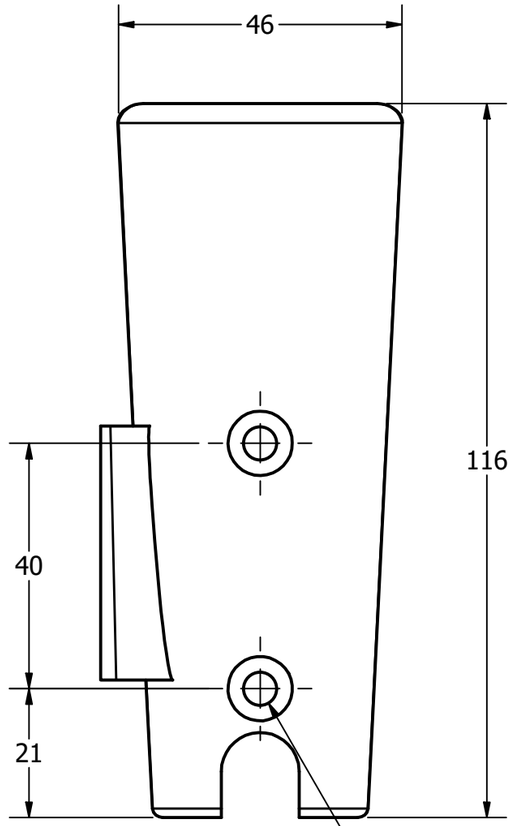
SIZE: A3 | DRAWING NUMBER: 474-5902 | REV: 4
SCALE: 2 : 1 | SHEET: 1 OF 1

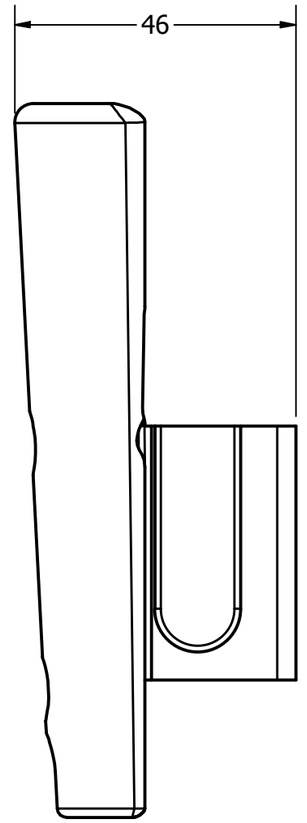
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	JW	11/16/2017

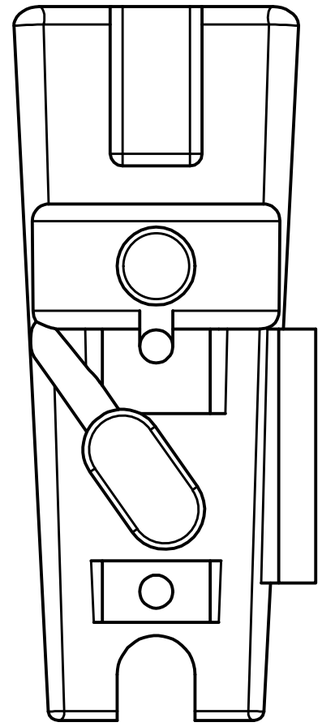


REFER TO DRA IN 474-0000 SHT. 7 FOR THE REFERENCE SHAPE AND INFORMATION.









NOTES:

1. MATERIAL: POLYURETHANE
   COLOR: BLACK
   DUROMETER: 84±5 SHORE "D"

2. REMOVE ALL MOLD FLASHING.

3. ALL MOLD DIMENSION TOLERANCE +1%/-2% BUT NO SMALLER THAN 0.5mm.

4. NO SPLIT OR DEFECTS ARE ALLOWED IN THE URETHANE MOLDING.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/12/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

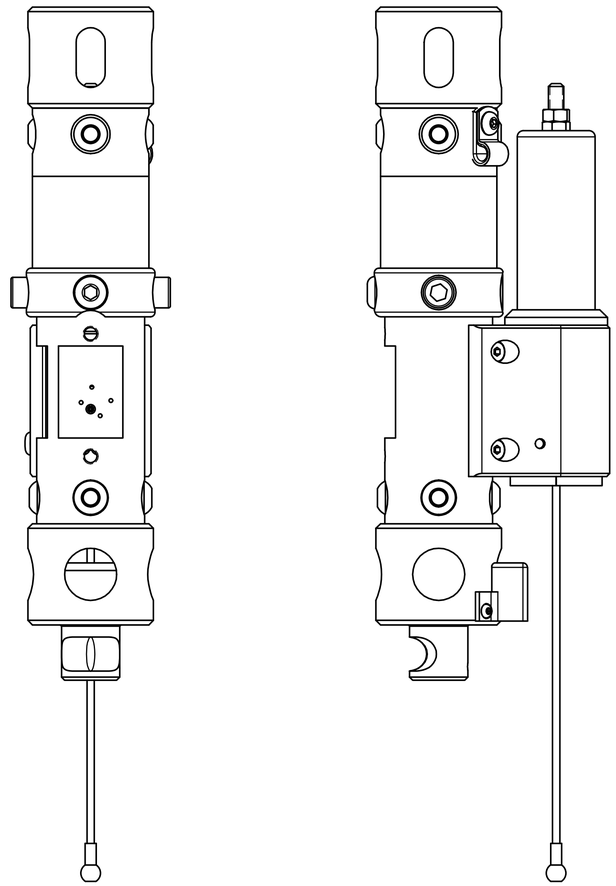
SHIN GUARD, MOLDED, RIGHT

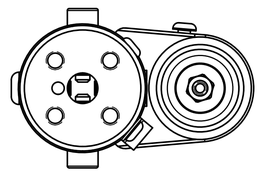
THIRD ANGLE PROJECTION

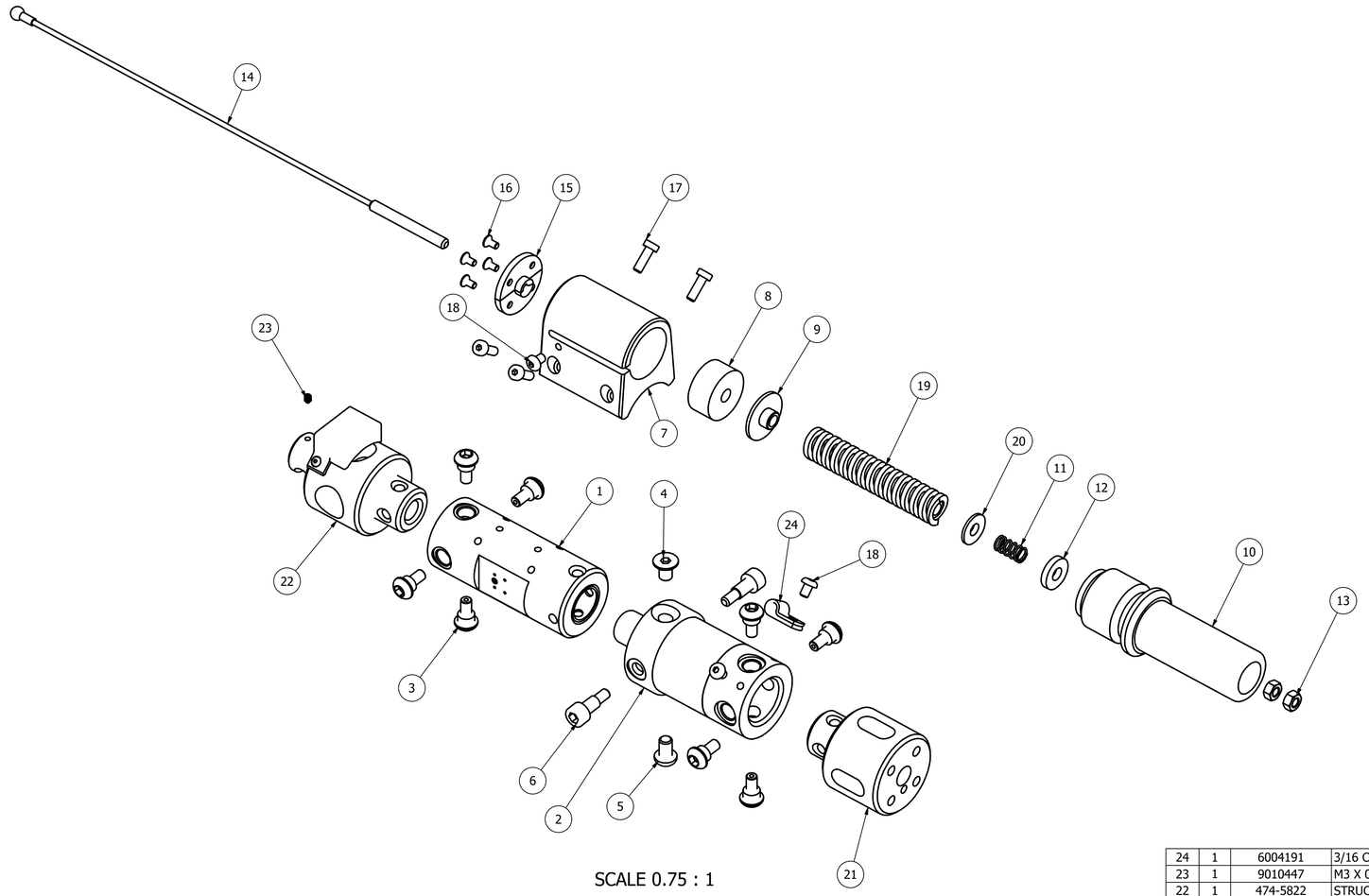
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A3	474-5518-2	1

SCALE: 1:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	PROTOTYPE	NRP	KMSP	3/22/2019







SCALE 0.75 : 1

ITEM	QTY	PART NUMBER	DESCRIPTION
24	1	6004191	3/16 CABLE CLAMP
23	1	9010447	M3 X 0.5 X 3 LG. SSSNP
22	1	474-5822	STRUCTURAL REPLACEMENT, LOWER TIBIA LOAD CELL ASS'Y
21	1	474-5550	STRUCTURAL REPLACEMENT, UPPER TIBIA LOAD CELL
20	1	474-2322	SPRING BUSHING
19	1	474-5523	SPRING ASSEMBLY, ACHILLES
18	3	5001075	M4 X 0.7 X 6 LG. BHCS
17	4	5001054	M4 X 0.7 X 12 LG. LHCS
16	4	5000098	M3 X 0.5 X 6 LG. FHCS
15	2	474-5531	ACHILLES CABLE EYELET GUIDE
14	1	474-5530	ACHILLES CABLE
13	2	5000515	M5 X 0.8 HEX NUT ZINC
12	1	474-5529	PRIMARY LOAD WASHER
11	1	6005232	SPRING COMPRESSION .295 X .032 X .551 SS
10	1	474-5525	UPPER ACHILLES SPRING HOUSING
9	1	474-5526	SPRING CAP, BOTTOM
8	1	472-7359	MOCK ACHILLES LOAD CELL
7	1	474-5504	LOWER ACHILLES SPRING HOUSING
6	2	474-5512	TIBIA PLUNGER PIN, MODIFIED M6 SHCS
5	1	5000891	M6 X 1 X 10 LG. BHCS
4	1	5000204	M6 X 1 X 10 LG. FHCS
3	8	W50-61042	MODIFIED BHSS M6 THREAD
2	1	474-5508	TIBIA COMPLIANT ELEMENT ASSEMBLY
1	1	474-5540-2	LOWER TIBIA SHAFT, RIGHT

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.1, X.XX ±.1 | MACHINED 4/C ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: jhaefner	4/12/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

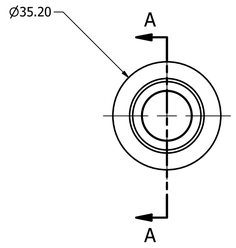
TIBIA ASSEMBLY, RIGHT

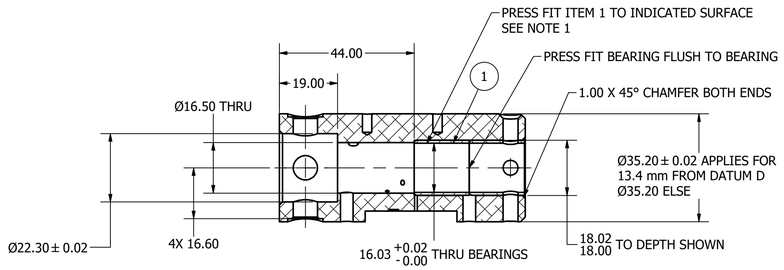
THIRD ANGLE PROJECTION

SIZE: A1 | DRAWING NUMBER: 474-5507-2 | REV: 5

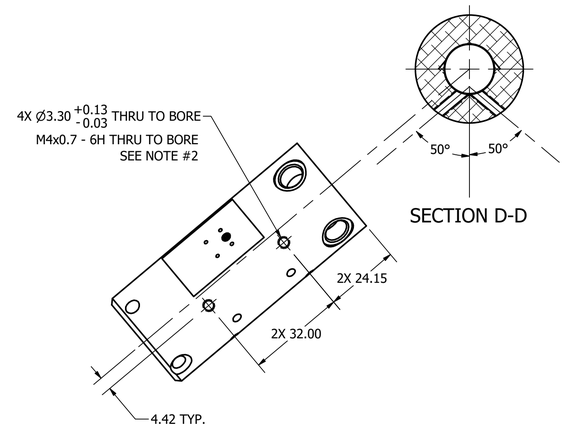
SCALE: 1 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	PROTOTYPE	HF	JW	10/7/2021

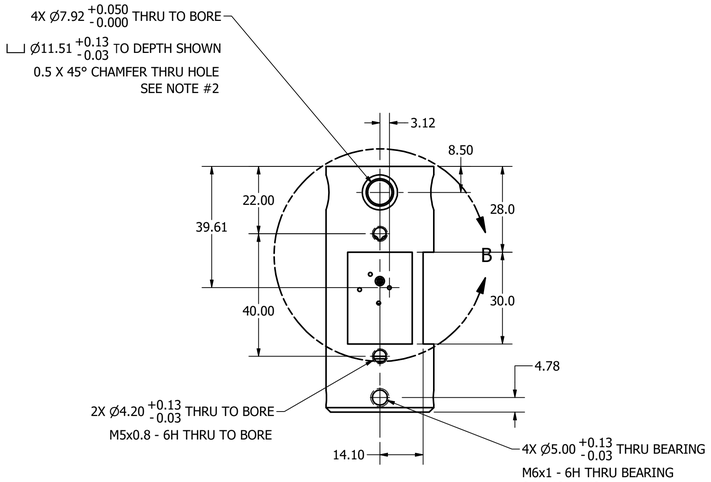


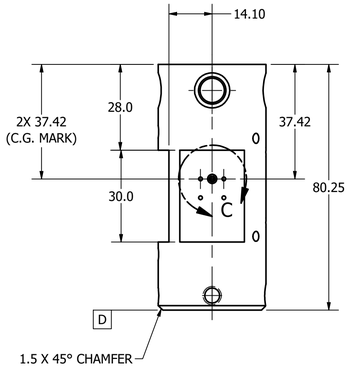


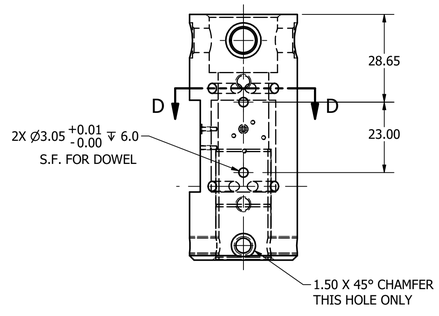
SECTION A-A

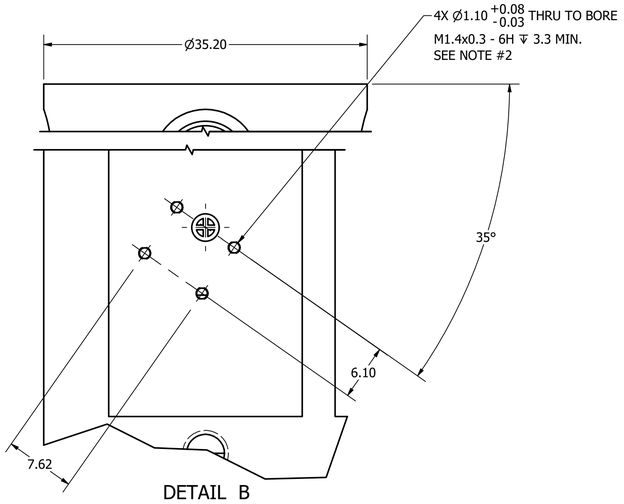


SECTION D-D

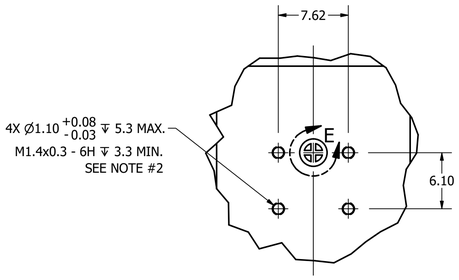




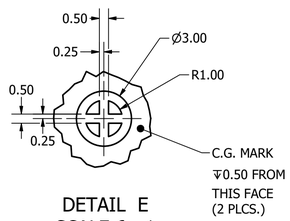




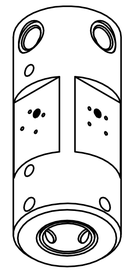
DETAIL B
SCALE 3 : 1



DETAIL C
SCALE 3 : 1



DETAIL E
SCALE 6 : 1



ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	6005238	BEARING, SLEEVE, 18mm OD X 14mm ID X 18mm LG (JSM-1418-18)

PARTS LIST

NOTES:

1. INSTALL SLEEVE BEARINGS AFTER ANODIZE.
2. PLUG HOLES BEFORE ANODIZE.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	4/8/2016
CHECKED:	
ENG: JW	4/8/2016
APPROVED:	

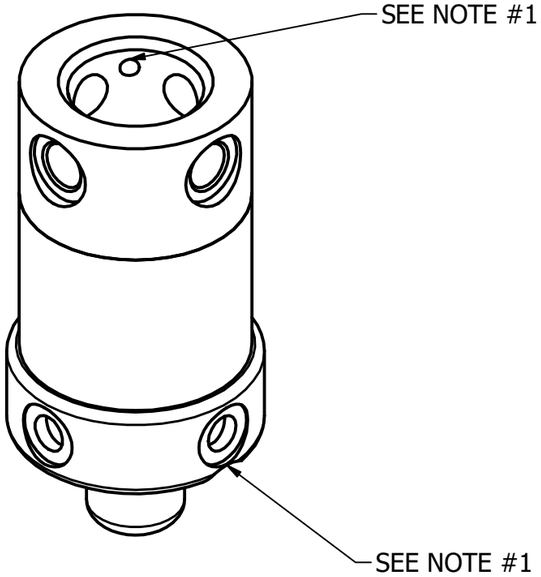
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

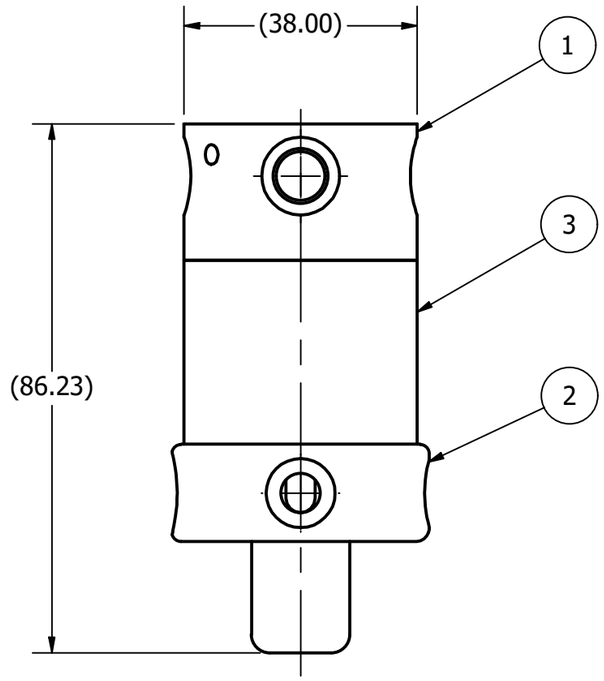
LOWER TIBIA SHAFT, RIGHT
THOR-05F

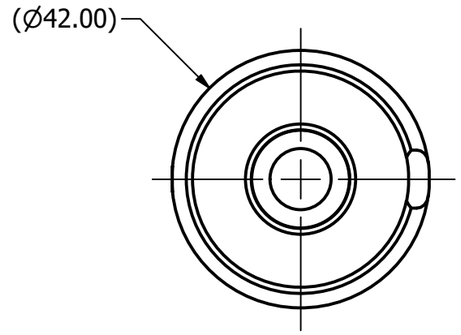
THIRD ANGLE PROJECTION

SIZE: A1 | DRAWING NUMBER: 474-5540-2 | REV: 5
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	SR	JW	1/23/2018







ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	474-5511	TIBIA COMPLIANT ELEMENT BUSHING
2	1	474-5510	TIBIA COMPLIANT ELEMENT FLANGE
1	1	474-5509	TIBIA COMPLIANT ELEMENT PLUNGER

PARTS LIST

NOTES:

1. BOND ASSEMBLY. HOLES IN ITEM 1 MUST HAVE SAME ANGULAR ORIENTATION ABOUT CENTER AXIS AS HOLES IN ITEM 2. USE FEATURES FOR ORIENTATION REF.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: disopi	4/8/2016
MATERIAL	
CHECKED	
HEAT TREAT	
ENG	
FINISH	
APPROVED	

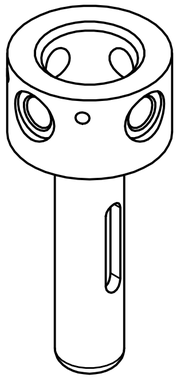
TIBIA COMPLIANT ELEMENT ASSEMBLY

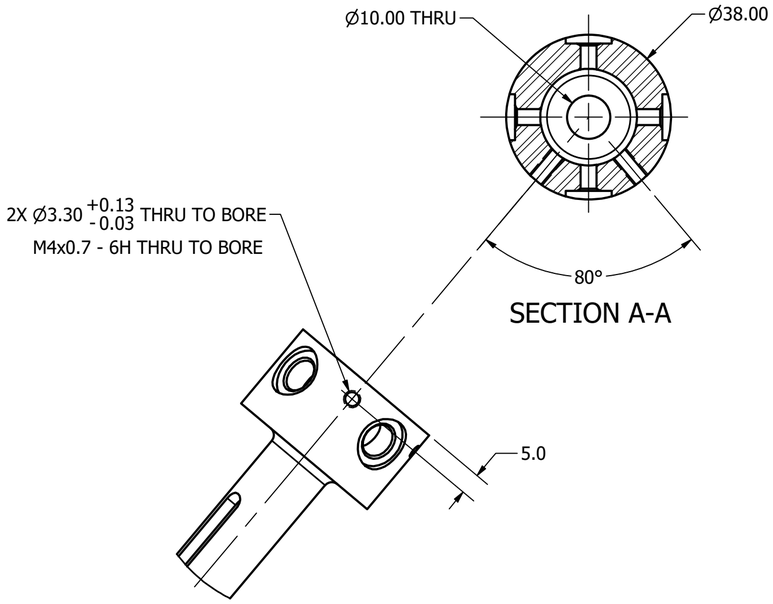
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-5508 | REV: 4

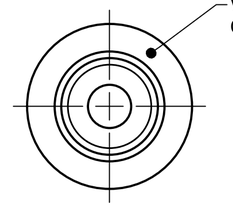
SCALE: 1 : 1 | SHEET: 1 OF 1

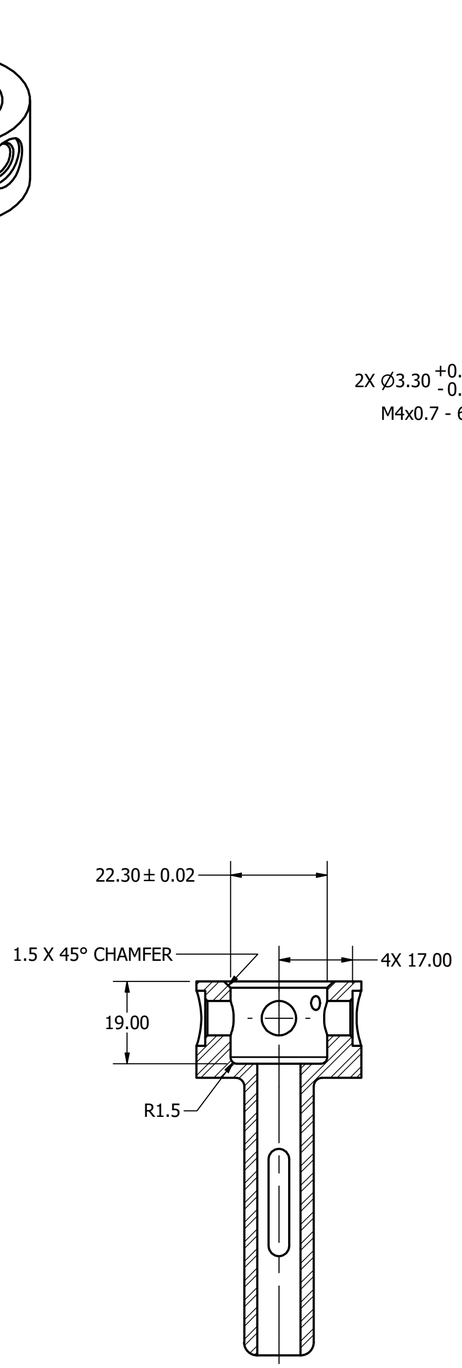
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	HF	DJI	10/7/2021



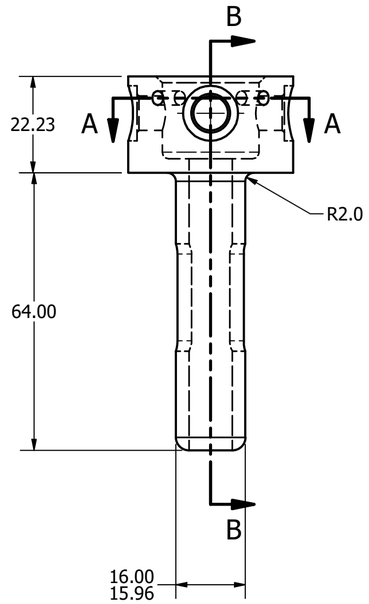


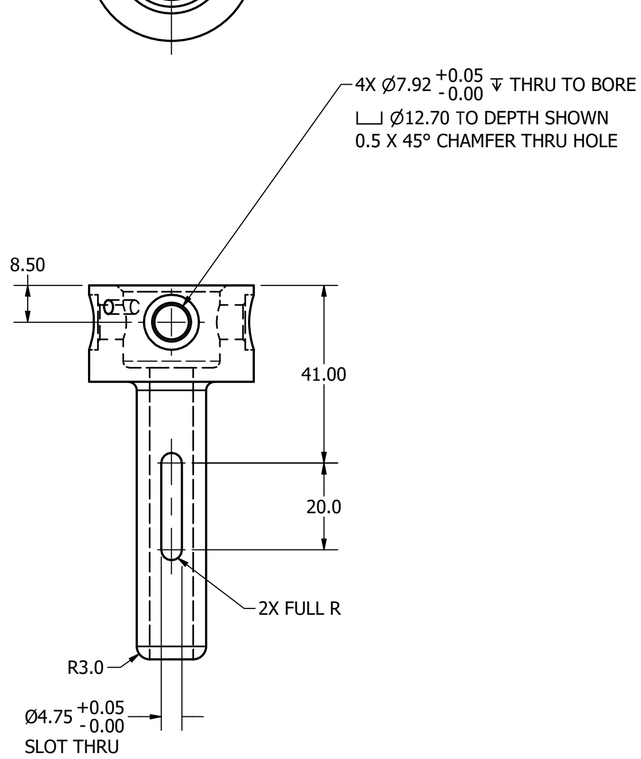
SECTION A-A





SECTION B-B





UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 440C STAINLESS STEEL
HEAT TREAT: Rc 52-62
FINISH: N/A

PROTOTYPE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	4/8/2016
CHECKED:	
ENG: JW	4/8/2016
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

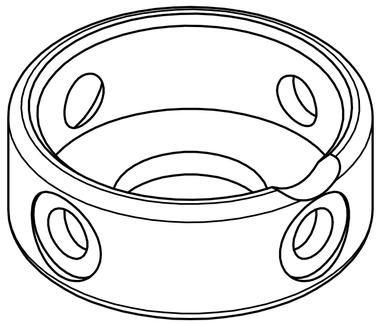
TIBIA COMPLIANT ELEMENT PLUNGER
THOR-05F

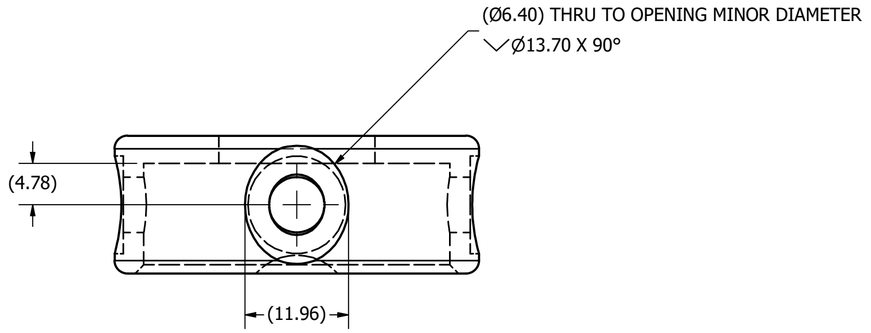
THIRD ANGLE PROJECTION

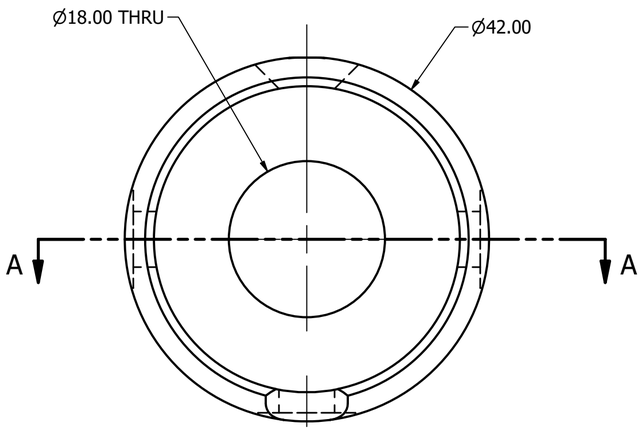
SIZE	DRAWING NUMBER	REV
A2	474-5509	4

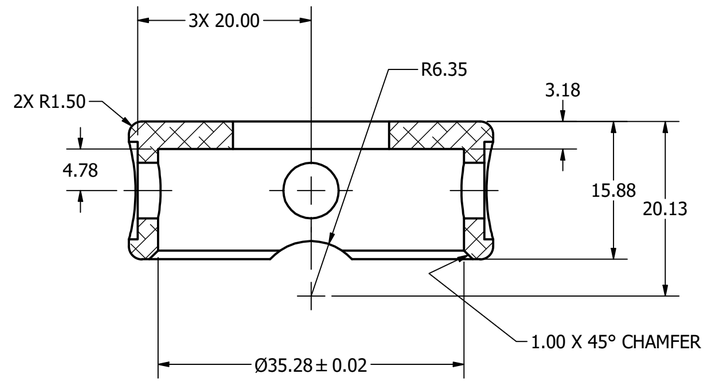
SCALE: 1 : 1 SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	HF	JW	10/7/2021

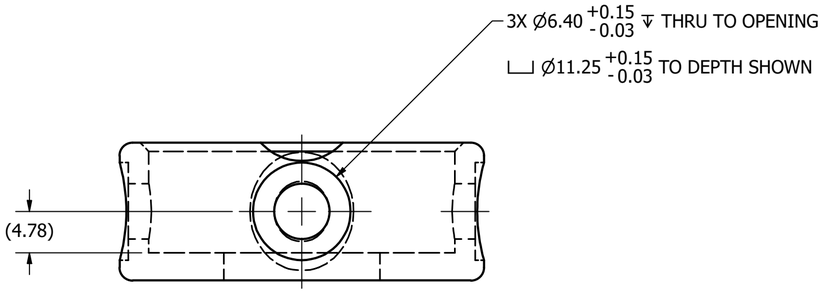








SECTION A-A



PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 6061-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	4/7/2016
CHECKED:	
ENG: JW	4/7/2016
APPROVED:	

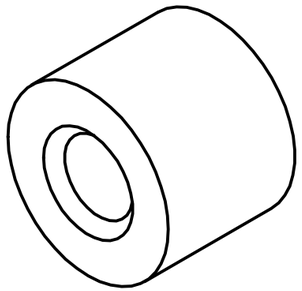
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

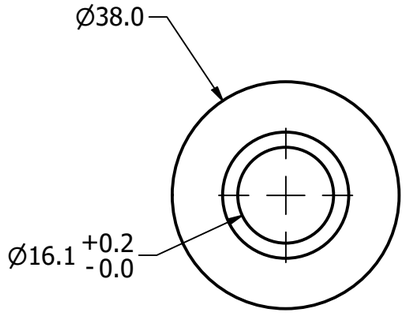
TIBIA COMPLIANT ELEMENT FLANGE
THOR-05F

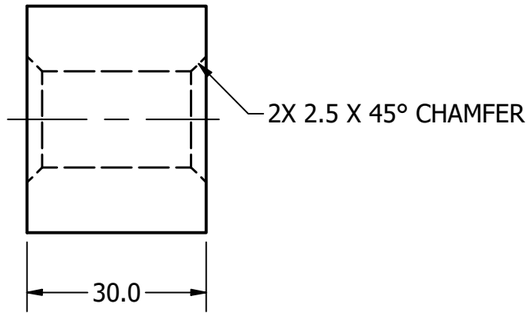
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-5510 | REV: 3
SCALE: 2 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	AB	JW	03/16/2018







NOTES:
1. MATERIAL: NATURAL RUBBER
   COLOR: BLACK
   DUROMETER: 41 ±10 SHORE "A"
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm, UNLESS OTHERWISE NOTED.
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE RUBBER MOLDING
5. ALL SPECIFICATIONS MAY BE SUPERCEDED BY DYNAMIC TEST RESULTS.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED 1.6 | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1	CHECKED	
HEAT TREAT: N/A	ENG	
FINISH: N/A	APPROVED	

*V*EHICLE *R*ESEARCH and *T*EST *C*ENTER

APPROVALS	DATE
DRAWN: disopi	4/7/2016

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

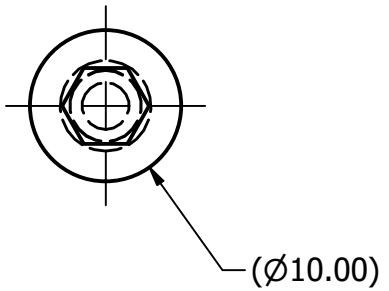
TIBIA COMPLIANT ELEMENT BUSHING

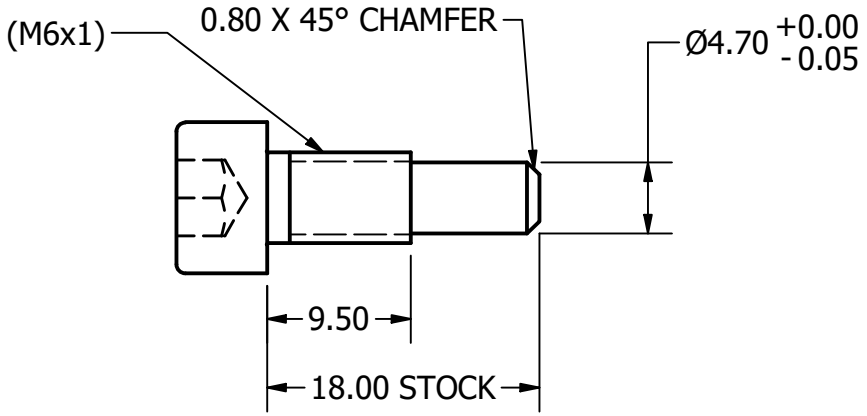
THIRD ANGLE PROJECTION

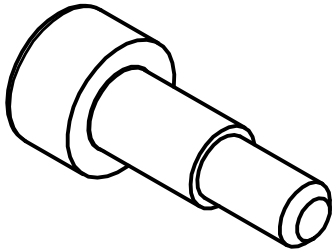
SIZE	DRAWING NUMBER	REV
B	474-5511	3

SCALE: 1 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	SR	JW	1/23/2018







NOTES:

1. MODIFY PART #5000285 AS SHOWN
   (M6 X 1 X 18 SHCS)

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: disopi	4/8/2016
CHECKED	
ENG	
APPROVED	

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

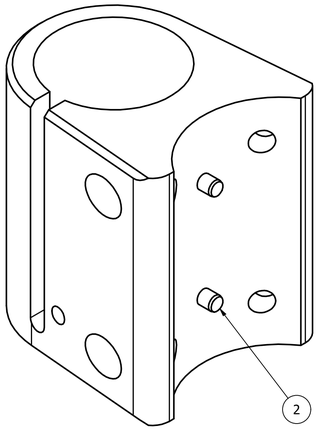
TIBIA PLUNGER PIN, MODIFIED M6 SHCS

THIRD ANGLE PROJECTION

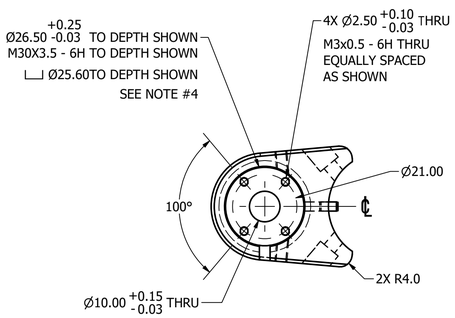
SIZE: A4 | DRAWING NUMBER: 474-5512 | REV: 2

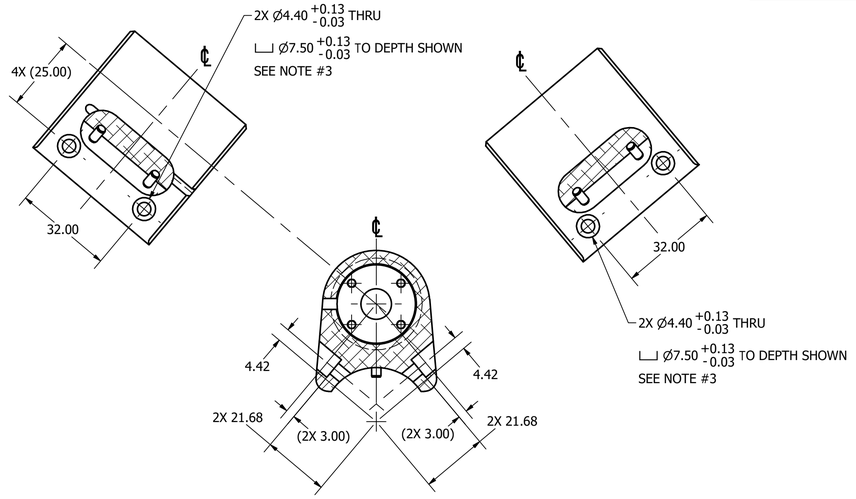
SCALE: 2 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	IH	MJS	12/1/2022

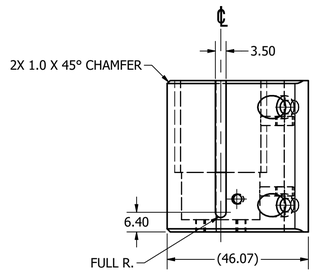


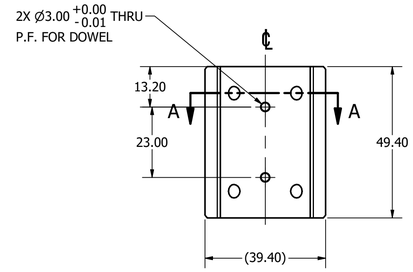
SCALE 2: 1

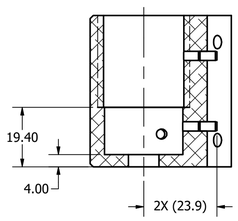




SECTION A-A







SECTION B-B

NOTES:

1. ALL DIMENSIONS SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE NOTED.
2. INSTALL DOWEL PINS AFTER ANODIZE.
3. PLUG HOLES BEFORE ANODIZE.
4. PLUG HOLES, C'BORE FLATS BEFORE ANODIZE.
   M30 THREAD CANNOT BE PLUGGED, RE-TAP AFTER ANODIZE.

ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	5000385	M3 X 6 LG. DOWEL PIN

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMALS: X ±.2, X.X ±.1, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

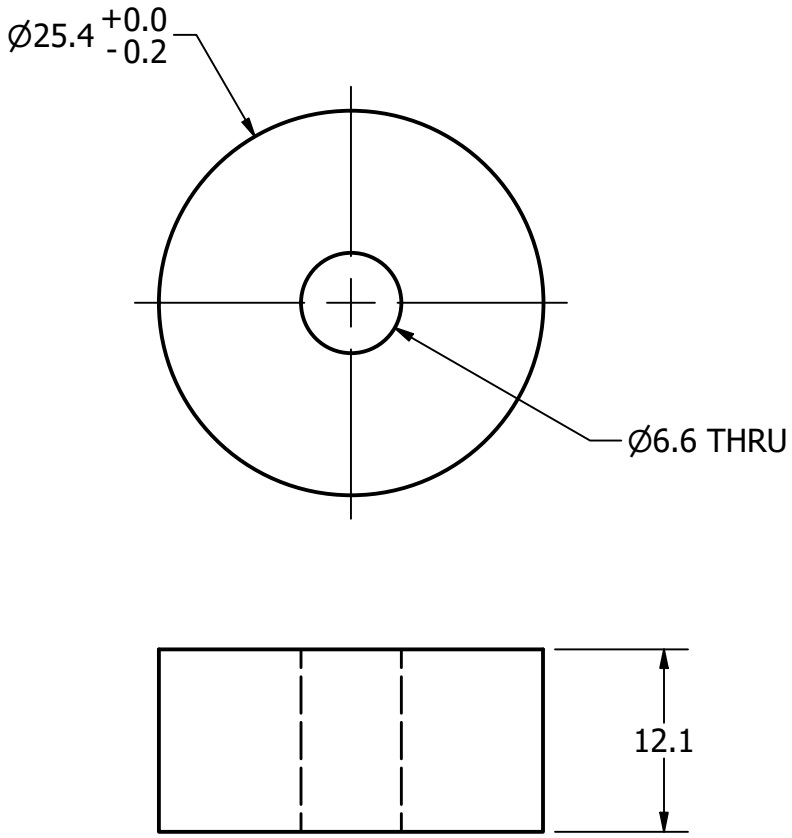
APPROVALS	DATE
DRAWN: Jhaefner	4/8/2016
CHECKED:	
ENG: JW	4/8/2014
APPROVED:	

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

LOWER ACHILLES SPRING HOUSING
THOR-05F

THIRD ANGLE PROJECTION
SIZE: A1 | DRAWING NUMBER: 474-5504 | REV: 4
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	H	RELEASE FOR PRODUCTION	3/13/2014	BK



NOTES:
1. BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ±5, ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Aluminum-6061-T6
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B.WADE	12/1/2008
CHECKED	
ENG	
APPROVED	

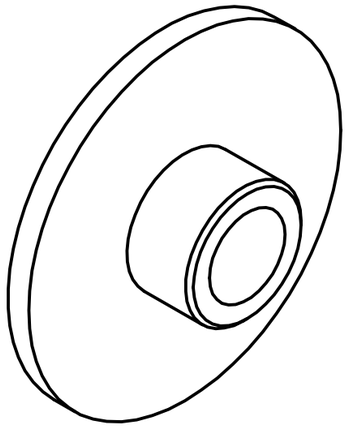
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

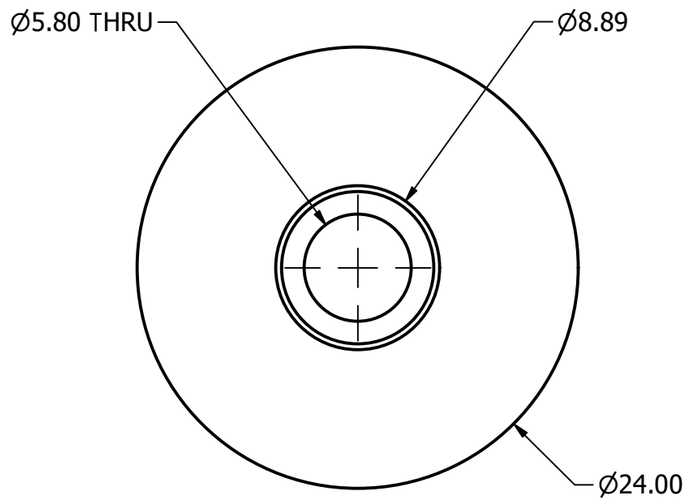
MOCK ACHILLES LOAD CELL
THOR-05F, THOR-50M

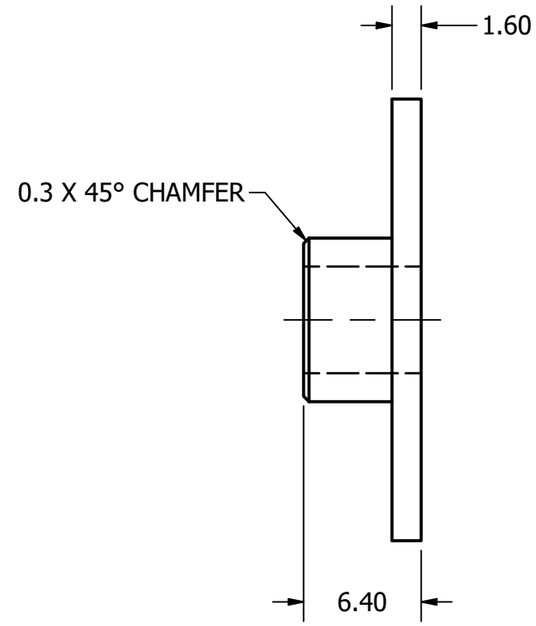
THIRD ANGLE PROJECTION

SIZE: A4 | DRAWING NUMBER: 472-7359 | REV: H
SCALE: 2:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	JH		11/16/2017







PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: jhaefner	4/8/2016
CHECKED	
ENG	
APPROVED	

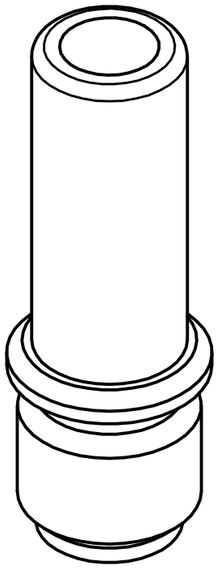
SPRING CAP, BOTTOM

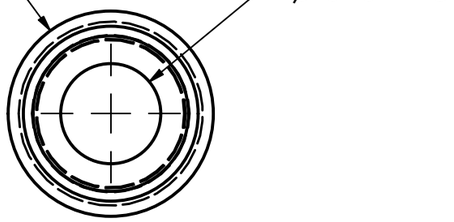
MATERIAL: 440C STAINLESS STEEL
HEAT TREAT: Rc57±5
FINISH: N/A

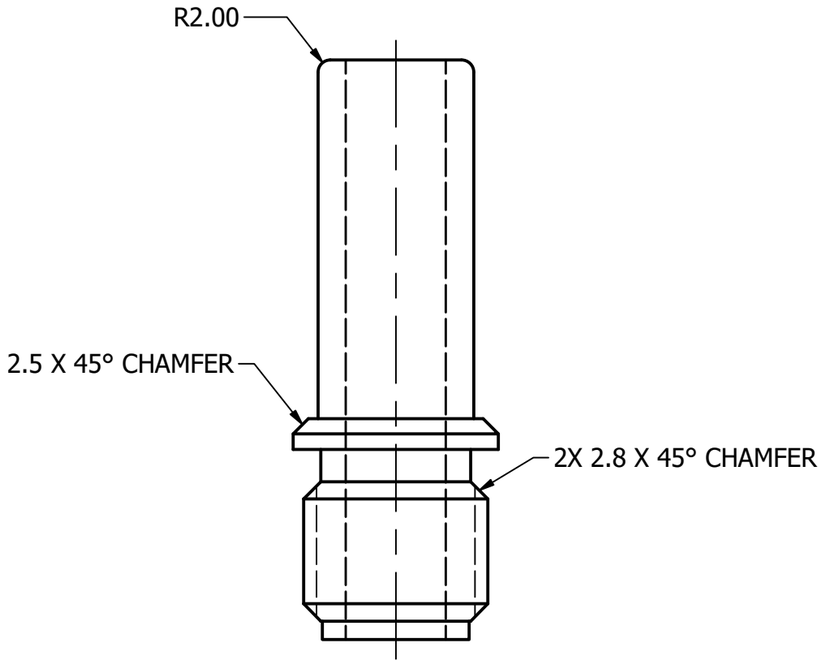
THIRD ANGLE PROJECTION

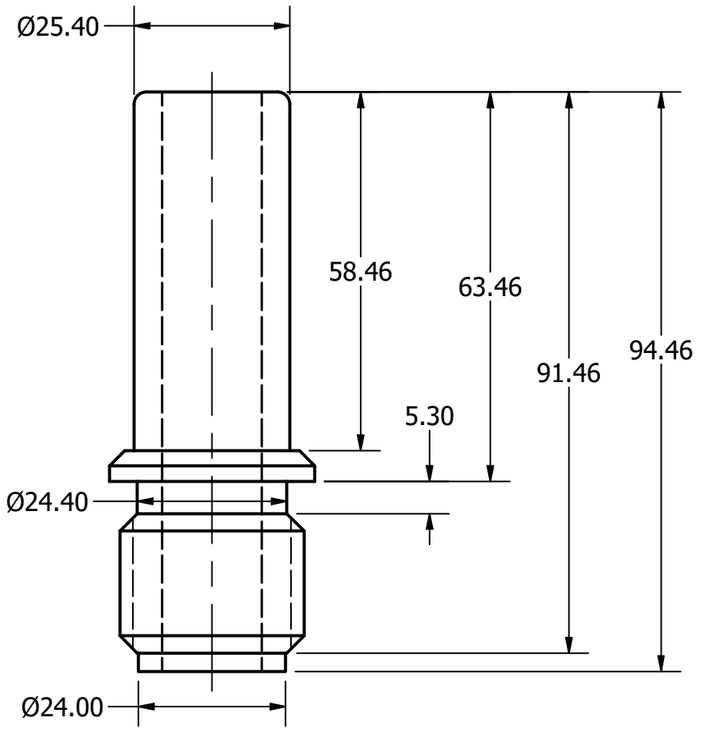
SIZE: A3 | DRAWING NUMBER: 474-5526 | REV: 1
SCALE: 3:1 | SHEET: 1 OF 1

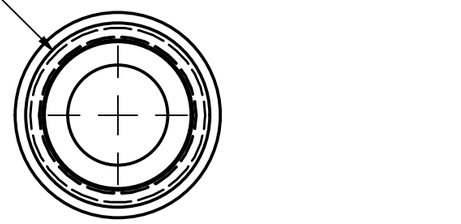
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	JH		11/16/2017











PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 6061-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: jhaefner	4/11/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

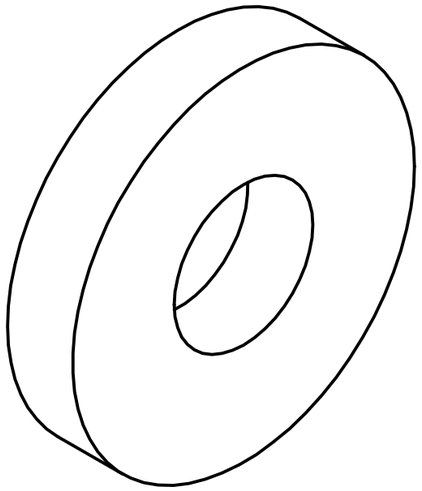
UPPER ACHILLES SPRING HOUSING

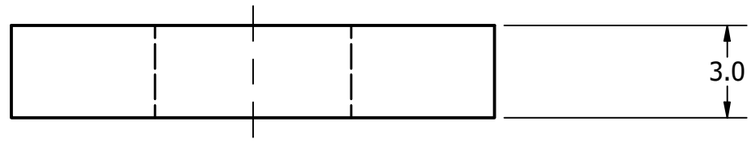
THIRD ANGLE PROJECTION

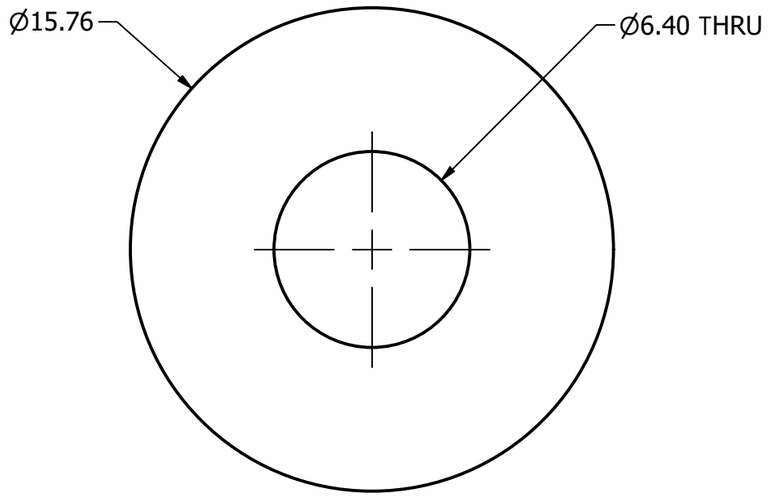
SIZE	DRAWING NUMBER	REV
A3	474-5525	1

SCALE: 1:1 SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	JH		11/16/2017







NOTES:

1. MATERIAL: ACETAL RESIN, WHITE OR EQUIVALENT.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED $\sqrt{}$
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES	CHECKED	
HEAT TREAT: N/A	ENG	
FINISH: N/A	APPROVED	

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: jhaefner	4/11/2016

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PRIMARY LOAD WASHER

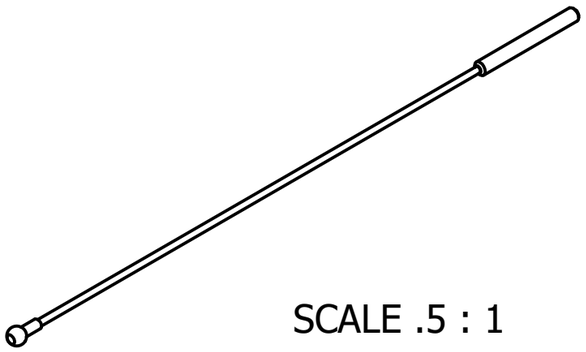
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A3	474-5529	1

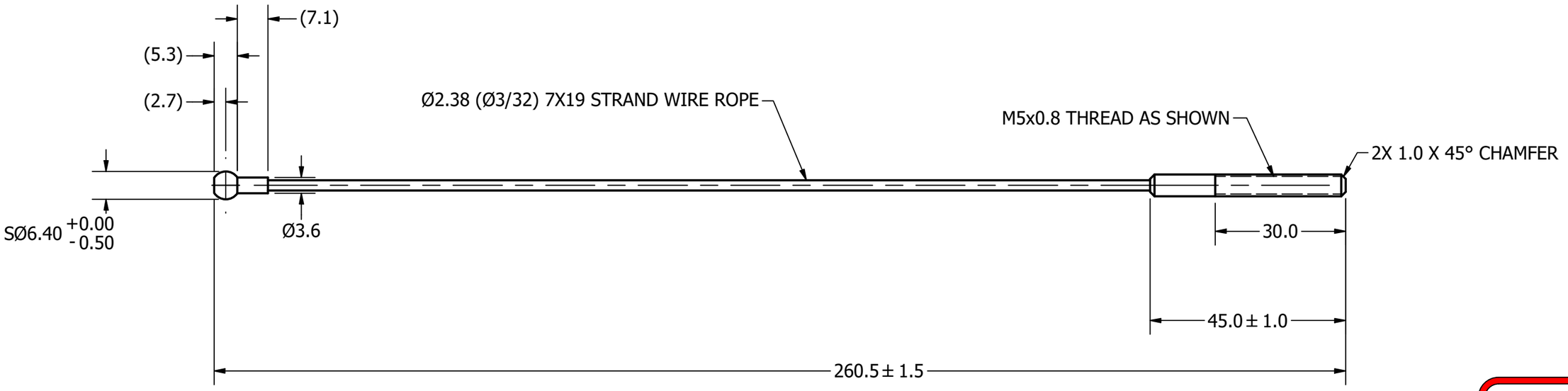
SCALE: 5:1

SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	AB	JW	04/24/2018



SCALE .5 : 1



PROTOTYPE DRAWING

NOTES:

1. DIMENSIONS SHOWN ARE AFTER SWAGING AND MACHINING.
2. TENSILE STRENGTH OF CABLE ASSEMBLY: 920LBS.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	jhaefner	4/11/2016
CHECKED		
ENG		
APPROVED		
MATERIAL		
HEAT TREAT		
FINISH		

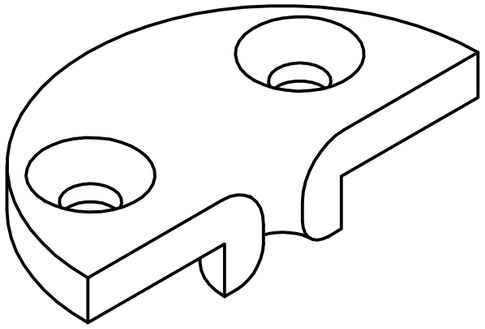
ACHILLES CABLE

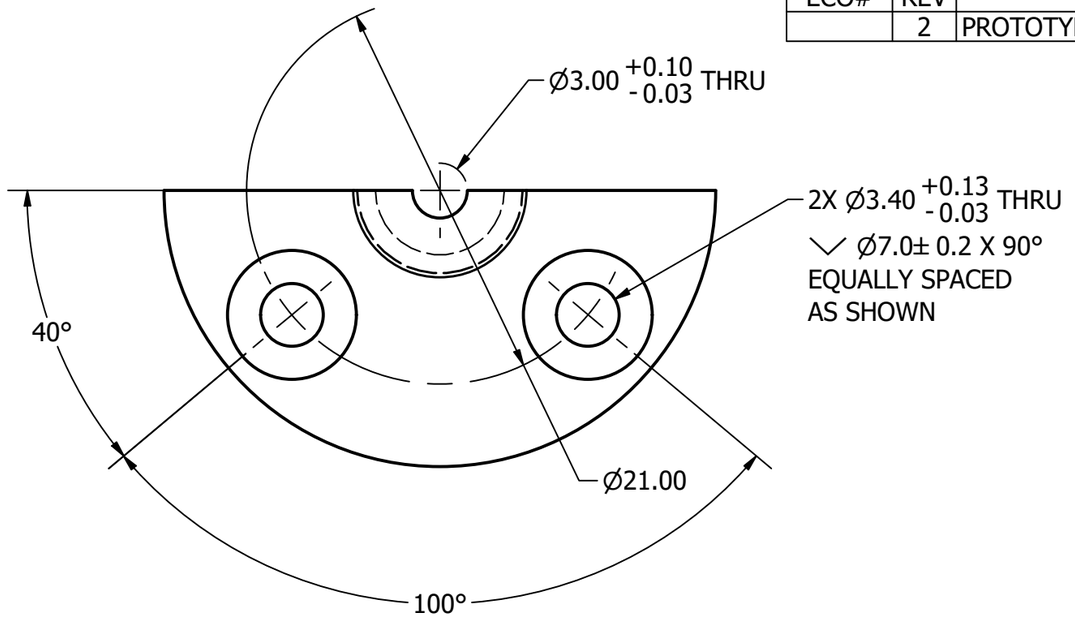
THIRD ANGLE PROJECTION

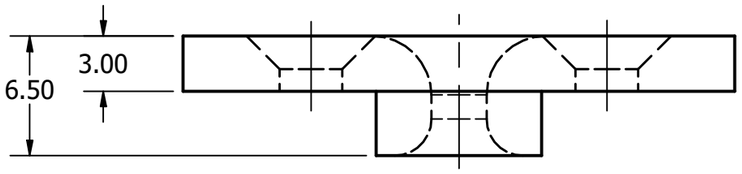
SIZE	DRAWING NUMBER	REV
A3	474-5530	4

SCALE: 1:1 SHEET 1 OF 1

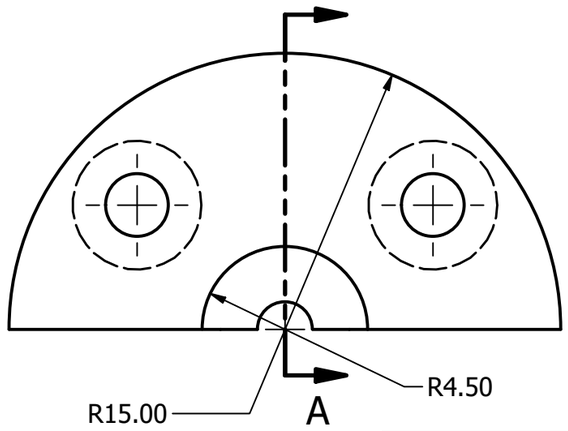
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	HF	JW	10/7/2021

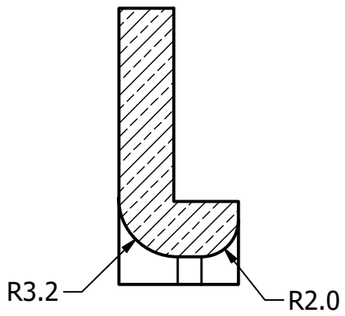






A





SECTION A-A

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

PROTOTYPE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: jhaefner	4/11/2016
CHECKED:	
ENG: JW	4/11/2016
APPROVED:	

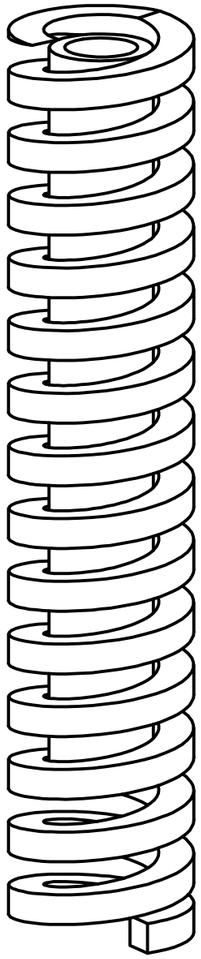
MATERIAL: ALUMINUM BRONZE
HEAT TREAT: N/A
FINISH: N/A

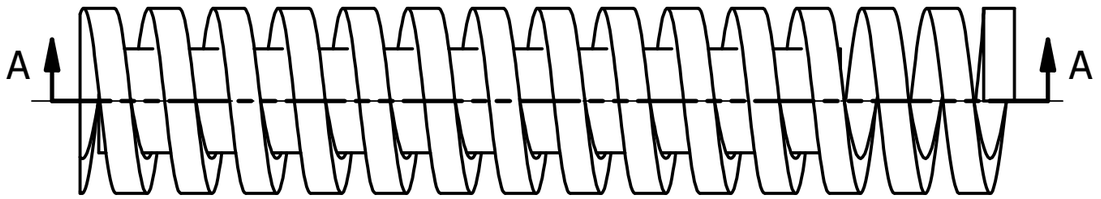
ACHILLES CABLE EYELET GUIDE
THOR-05F

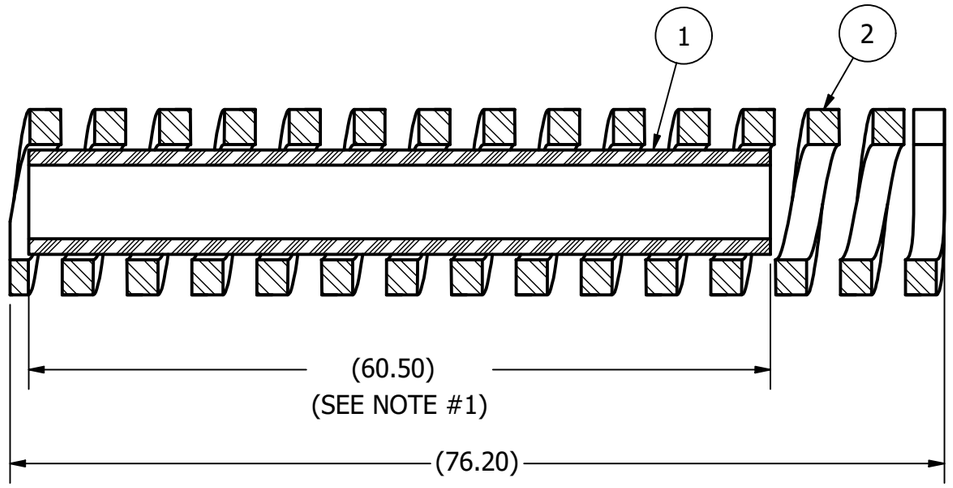
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-5531 | REV: 2
SCALE: 3: 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	AB	BLG	09/04/2018







SECTION A-A

ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	474-2925	SPRING, FRONT
1	1	474-5513	ACHILLES SPRING DAMPING TUBE

PARTS LIST

NOTES:

1. LENGTH OF RUBBER ELEMENT MAY BE ADJUSTED TO MEET PERFORMANCE REQUIREMENTS.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN A. Barchock	9/4/2018
CHECKED	
ENG	
APPROVED	

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

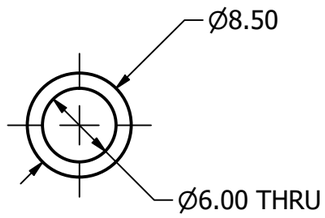
SPRING ASSEMBLY, ACHILLES

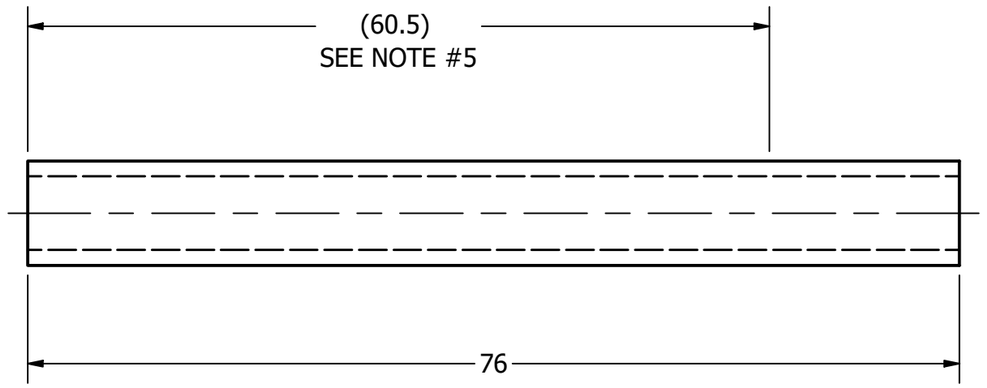
THIRD ANGLE PROJECTION

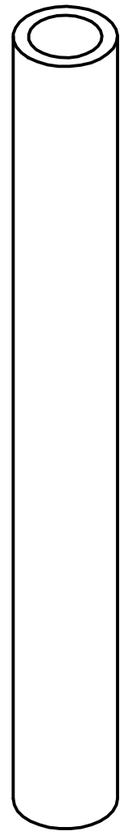
SIZE: A3 | DRAWING NUMBER: 474-5523 | REV: 1

SCALE: 2:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	JH		4/11/2016







NOTES:
1. MATERIAL: NEOPRENE RUBBER
   COLOR: BLACK
   DUROMETER: 60 ±10 SHORE "A"
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE RUBBER MOLDING
5. CUT TO 60.5mm. IT CAN BE ADJUSTED TO MEET THE
   PERFORMANCE REQUIREMENTS.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

ACHILLES SPRING DAMPING TUBE

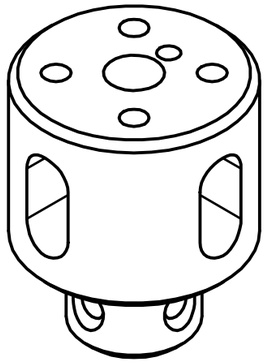
	APPROVALS	DATE
DRAWN	jhaefner	4/11/2016
CHECKED		
ENG		
APPROVED		

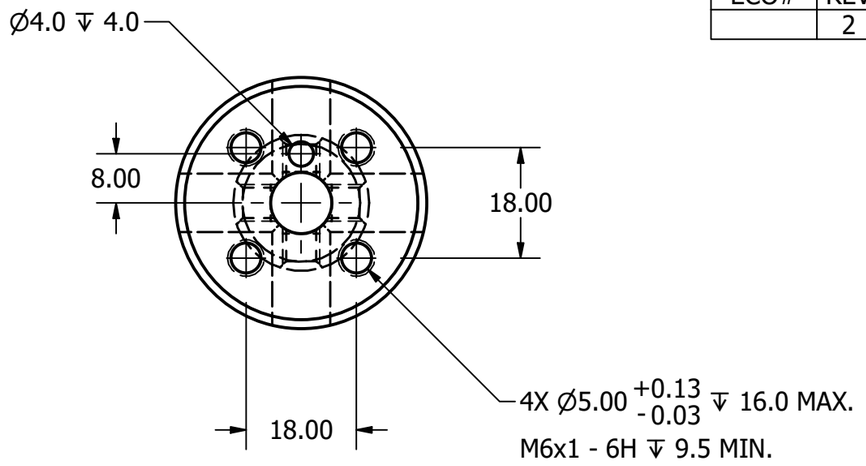
MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

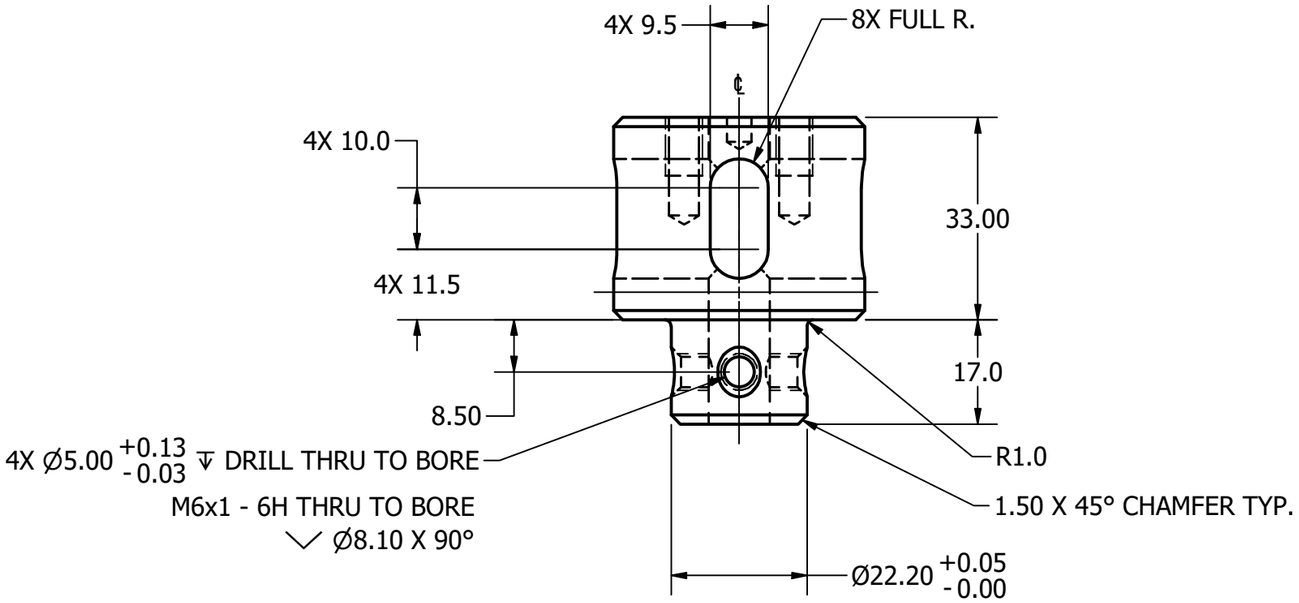
THIRD ANGLE PROJECTION

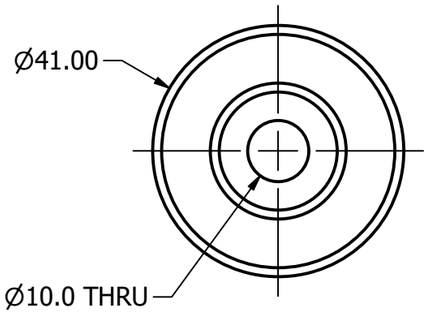
SIZE: A3 | DRAWING NUMBER: 474-5513 | REV: 1
SCALE: 5:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	HF	JW	10/8/2021









PROTOTYPE DRAWING

NOTES:

1. DIMENSIONS ARE SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE NOTED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED √ | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 4140 STEEL
HEAT TREAT: N/A
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	8/25/2017
CHECKED:	
ENG: JW	8/25/2017
APPROVED:	

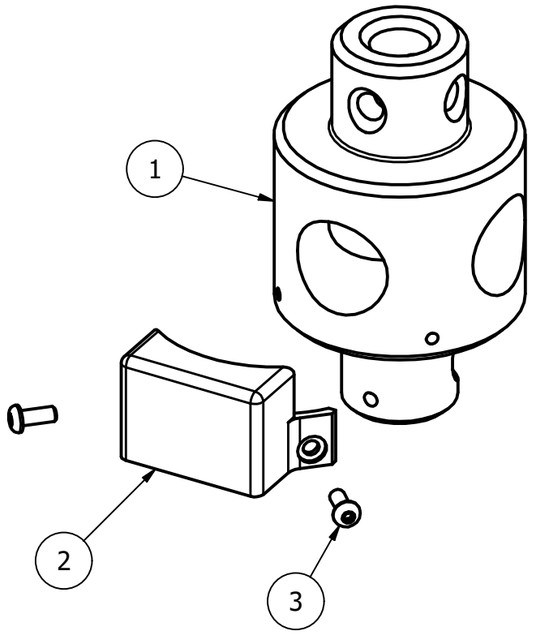
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

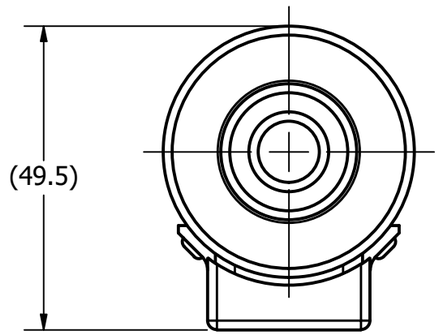
STRUCTURAL REPLACEMENT, UPPER TIBIA LOAD CELL
THOR-05F

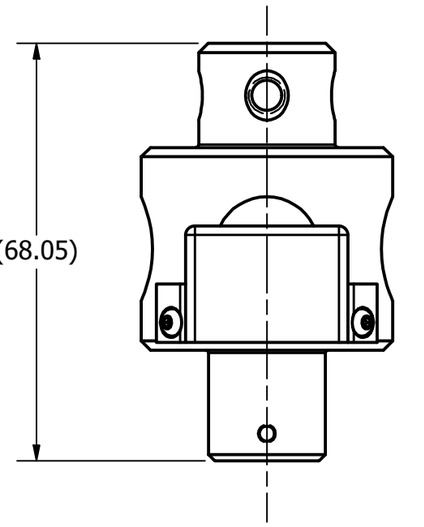
THIRD ANGLE PROJECTION

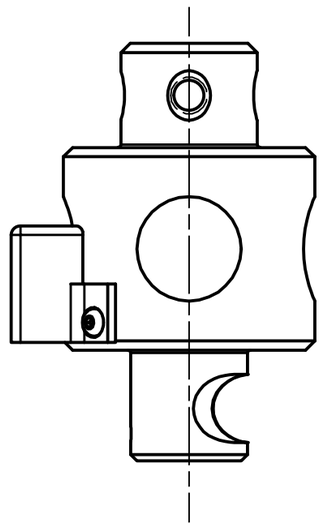
SIZE: A3 | DRAWING NUMBER: 474-5550 | REV: 2
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	AB	JW	08/29/2017









ITEM	QTY	PART NUMBER	DESCRIPTION
3	2	5000244	M2.5 X 0.45 X 6 LG. BHCS
2	1	474-5829	STRUCTURAL REPLACEMENT, LOWER TIBIA LOAD CELL STRAIN RELIEF
1	1	474-5821	STRUCTURAL REPLACEMENT, LOWER TIBIA LOAD CELL

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ±.5° | ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN A.TOMICH	7/10/2017
MATERIAL	
CHECKED	
HEAT TREAT	
ENG	
FINISH	
APPROVED	

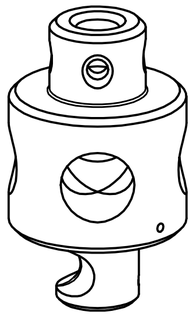
STRUCTURAL REPLACEMENT, LOWER TIBIA LOAD CELL ASS'Y
THOR-05F

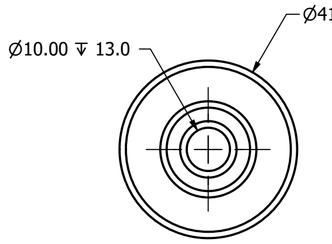
THIRD ANGLE PROJECTION

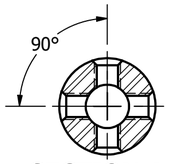
SIZE	DRAWING NUMBER	REV
A3	474-5822	2

SCALE: 1 : 1 | SHEET 1 OF 1

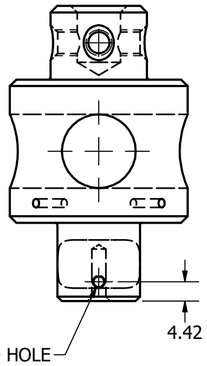
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	HF	JW	10/8/2021

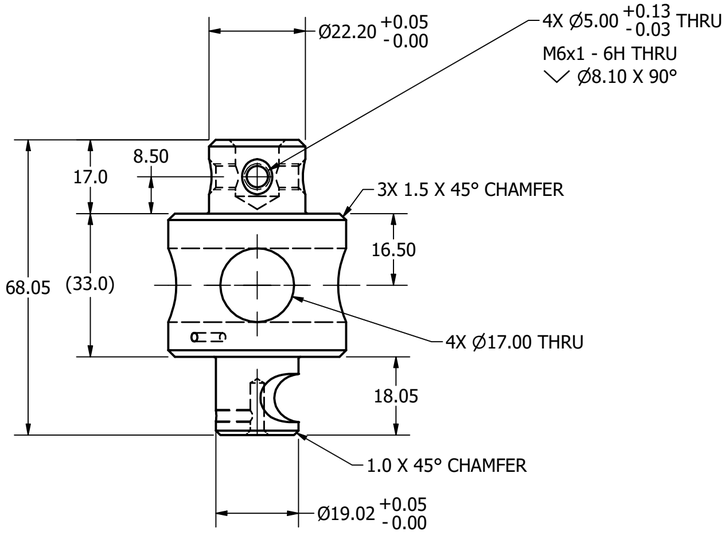


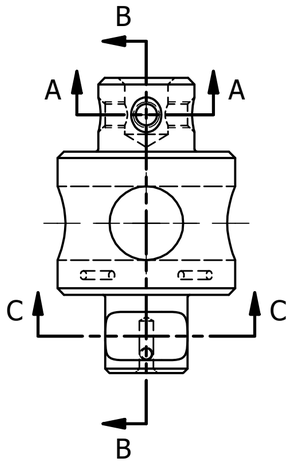


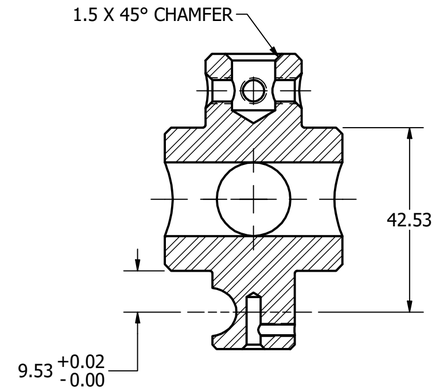


SECTION A-A

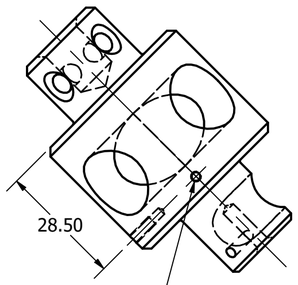


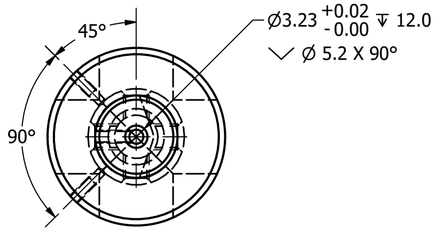


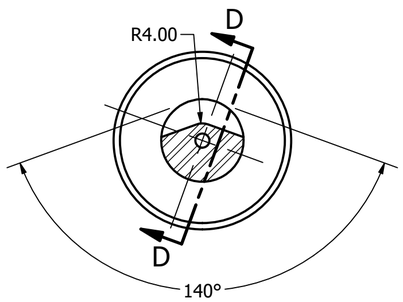




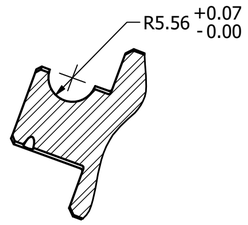
SECTION B-B







SECTION C-C



SECTION D-D

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 4140 STEEL
HEAT TREAT: N/A
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: atomich	7/10/2017
CHECKED:	
ENG: JW	7/10/2017
APPROVED:	

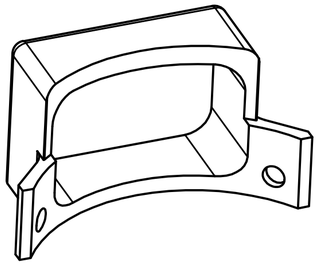
THIRD ANGLE PROJECTION

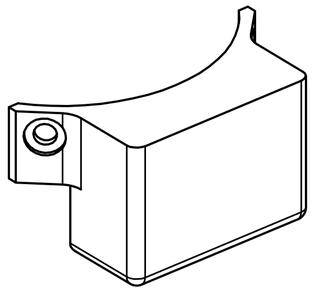
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

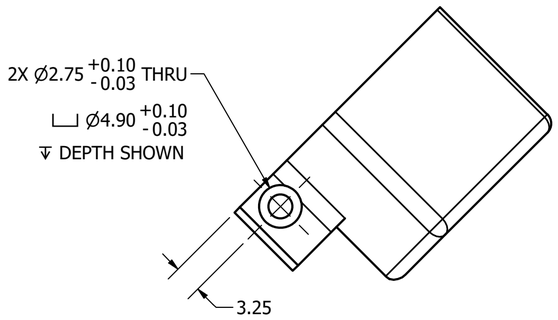
STRUCTURAL REPLACEMENT, LOWER TIBIA LOAD CELL
THOR-05F

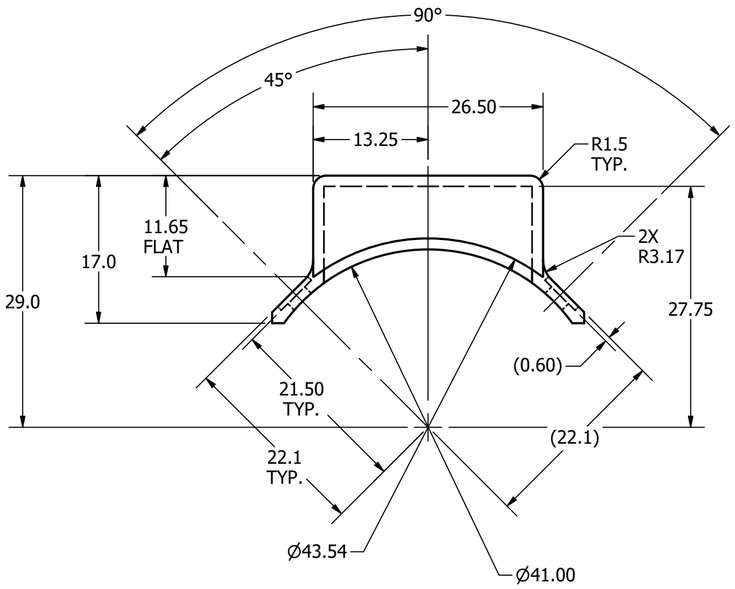
SIZE: A2 | DRAWING NUMBER: 474-5821 | REV: 3
SCALE: 1 : 1 | SHEET: 1 OF 1

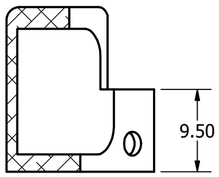
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	AB	JW	08/24/2017



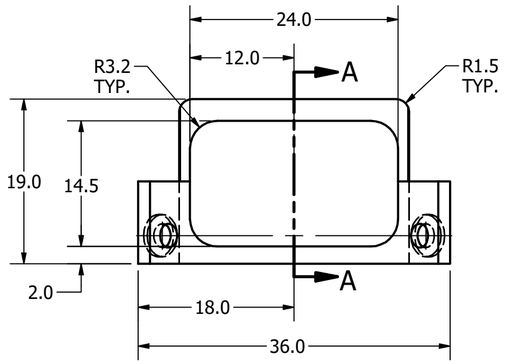








SECTION A-A



PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 6061-T6 ALUMINUM
HEAT TREAT:
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: A. Barchock	8/24/2017
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

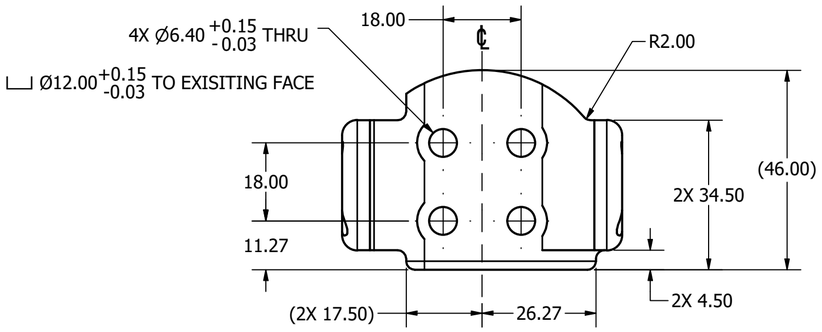
STRUCTURAL REPLACEMENT, LOWER TIBIA LOAD CELL STRAIN RELIEF

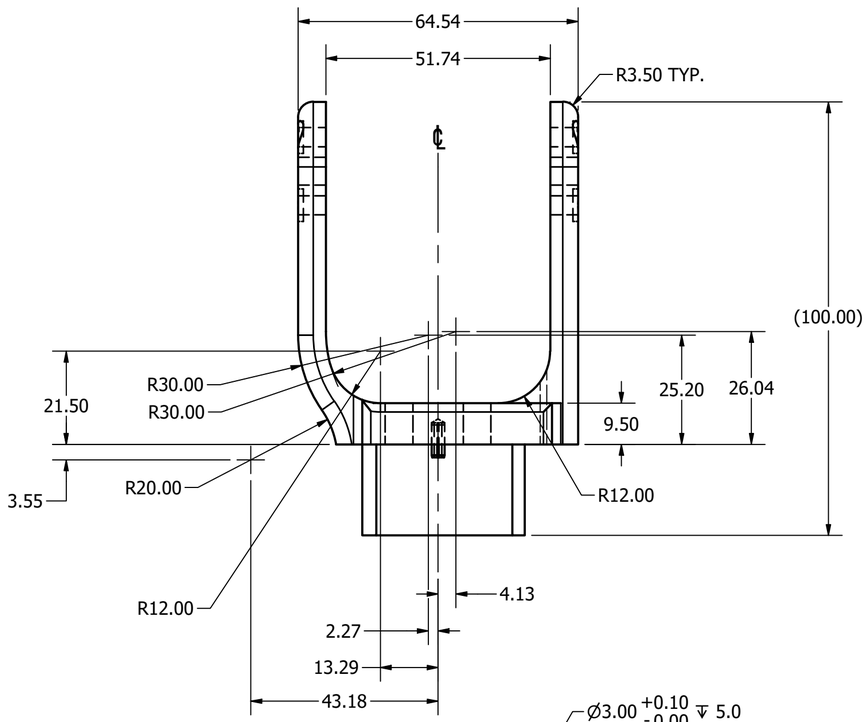
THIRD ANGLE PROJECTION

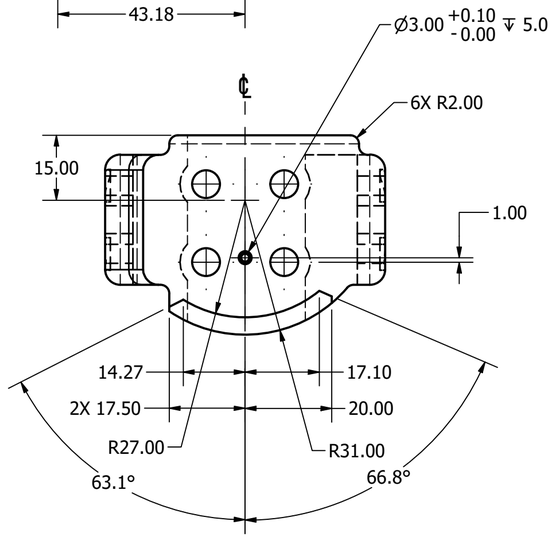
SIZE: A2 | DRAWING NUMBER: 474-5829 | REV: 1

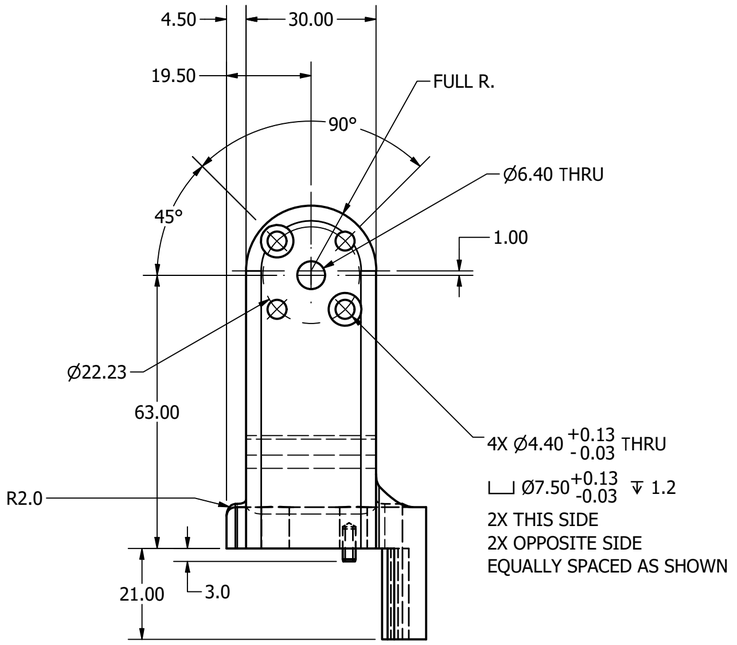
SCALE: 2 : 1 | SHEET: 1 OF 1

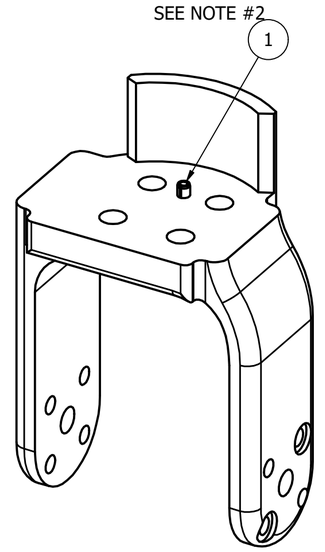
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	HF	DJI	12/21/2021

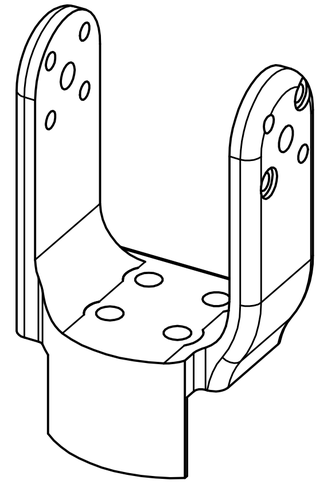












NOTES:

1. DIMENSIONS ARE SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE NOTED.
2. INSTALL ROLL PIN AFTER ANODIZE.

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5000195	M3 X 8 LG. ROLL PIN SS

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

KNEE CLEVIS, RIGHT

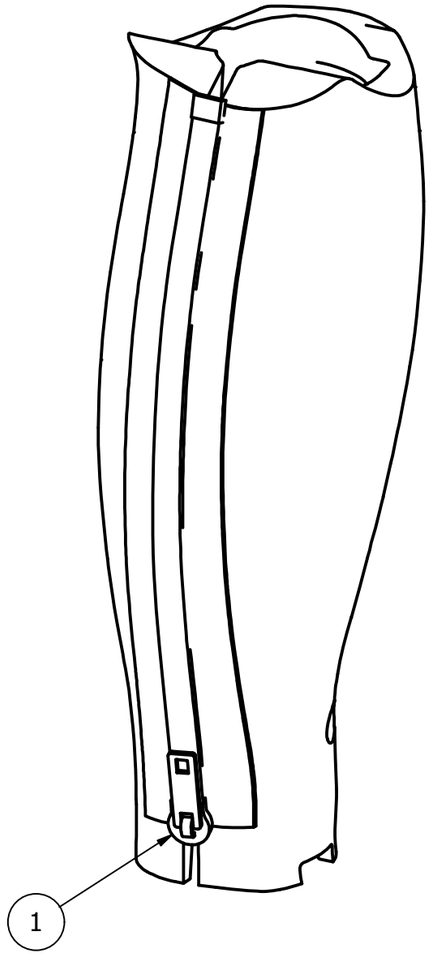
APPROVALS	DATE
DRAWN: disopi	4/12/2016
CHECKED	
ENG	
APPROVED	

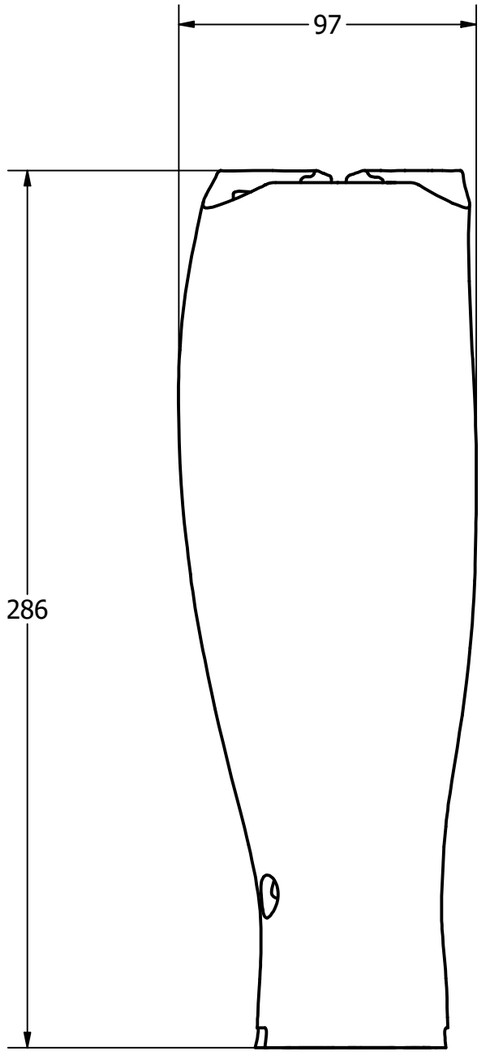
MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-5517-2 | REV: 2
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	PROTOTYPE	HEC	DJI	8/22/2023







NOTES:

1. MATERIAL: SKIN: PVC
   COLOR: EURO BROWN

2. REMOVE ALL MOLD FLASHING

3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm, UNLESS OTHERWISE NOTED.

4. GLUE ZIPPER ASSEMBLY TO FLESH AS SHOWN.

5. WEIGHT: TBD

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-5521	ZIPPER ASSEMBLY, LOWER LEG

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 125
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	7/31/2020
CHECKED	
ENG	
APPROVED	

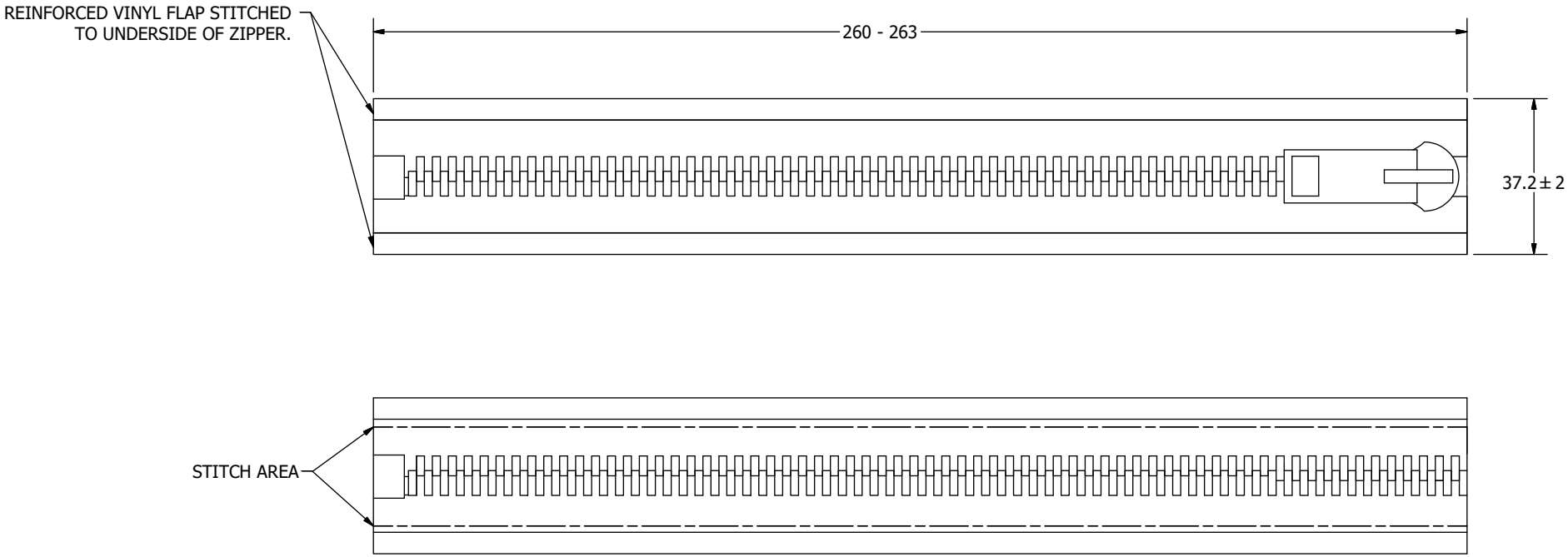
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

LOWER LEG FLESH (RIBBED), RIGHT
THOR-05F

THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 483-5521-2 | REV: 5
SCALE: 1/2 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	AT	JW	7/10/2017



NOTES:

1. ALL BLACK #5 ZIPPER, 11 INCHES LONG.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: J. MCINNIS	4/8/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

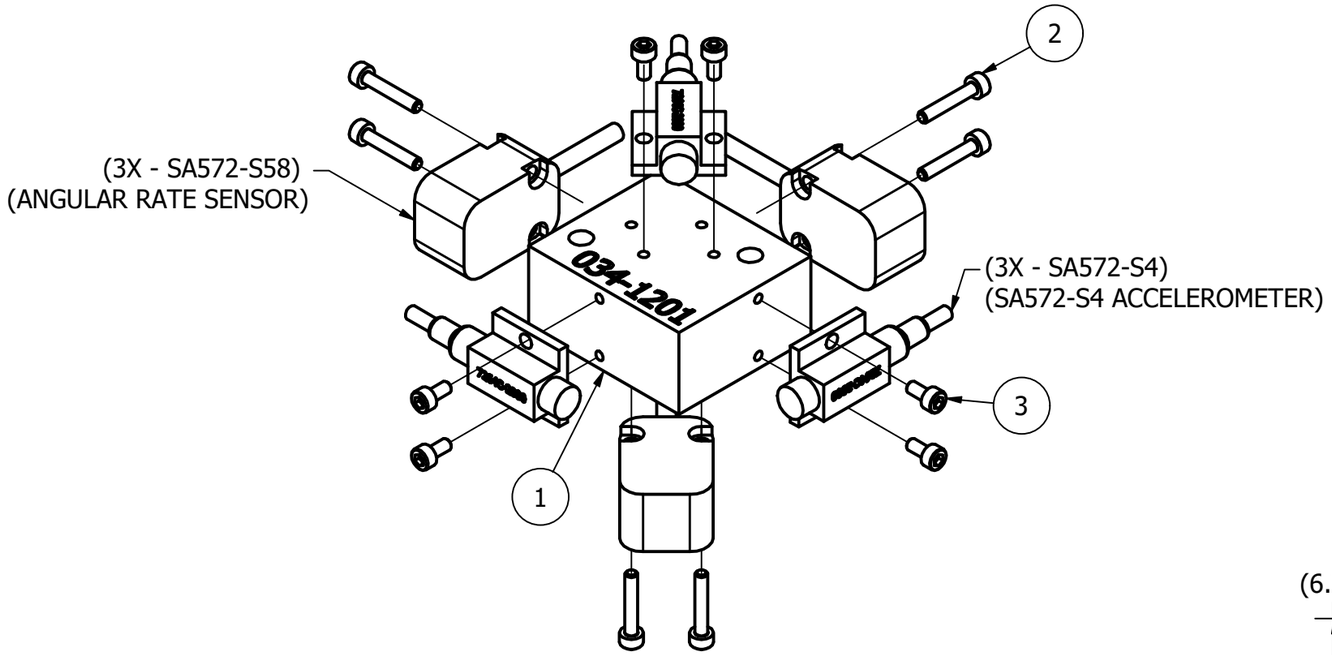
ZIPPER ASSEMBLY, LOWER LEG

THIRD ANGLE PROJECTION

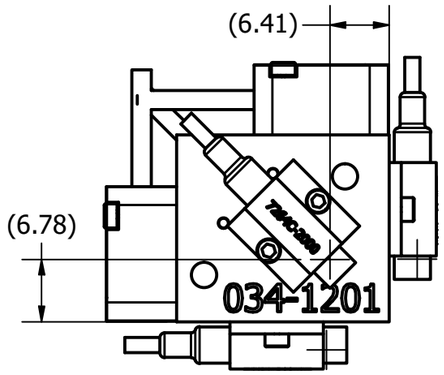
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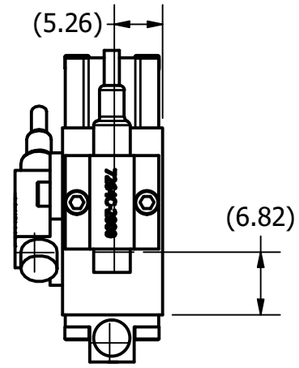
SCALE: | SHEET: 1 OF 1

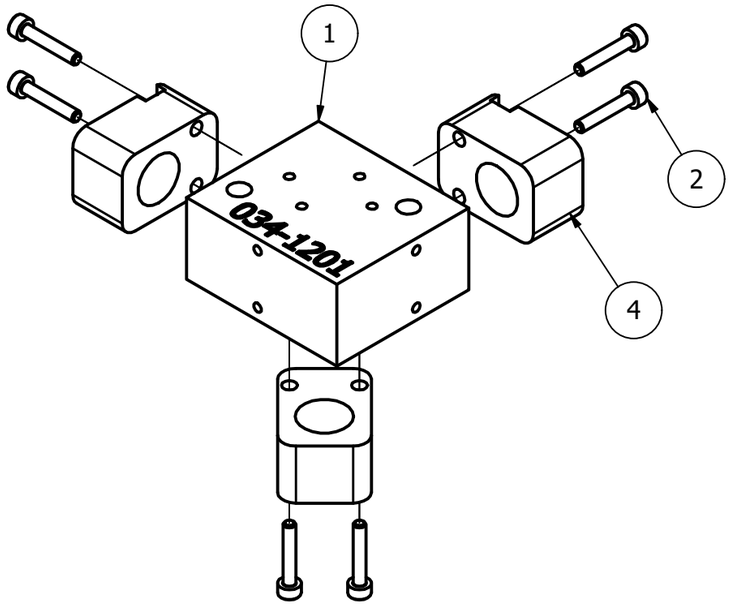
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	DJI	DJI	8/8/2023



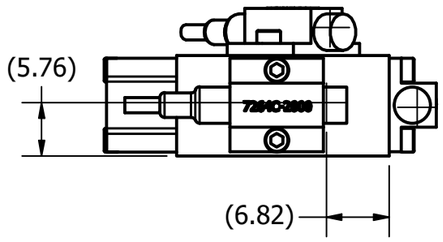
INSTRUMENT VIEW







SR VIEW



NOTES:

1. 2X 034-1201 ARE SUPPLIED SO THAT ONE CAN BE USED FOR SR ASSEMBLY AND THE OTHER CAN BE USED FOR THE INSTRUMENTED ASSEMBLY.
2. 6X 5000068 ARE NOT NEEDED FOR SR ASSEMBLY AND WILL REMAIN ON THE INSTRUMENTED ASSEMBLY.

ITEM	QTY	PART NUMBER	DESCRIPTION
4	3	477-3605	ARS S.R.
3	6	5000068	M1.4 X 0.3 X 3 LG. SHCS
2	12	5000727	M1.4 X 0.3 X 8 LG. SHCS
1	2	034-1201	6 AXIS ACCEL/ARS MOUNT

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN jhaefner	5/17/2016
CHECKED	
ENG DJI	5/17/2016
APPROVED	

MATERIAL
HEAT TREAT
FINISH

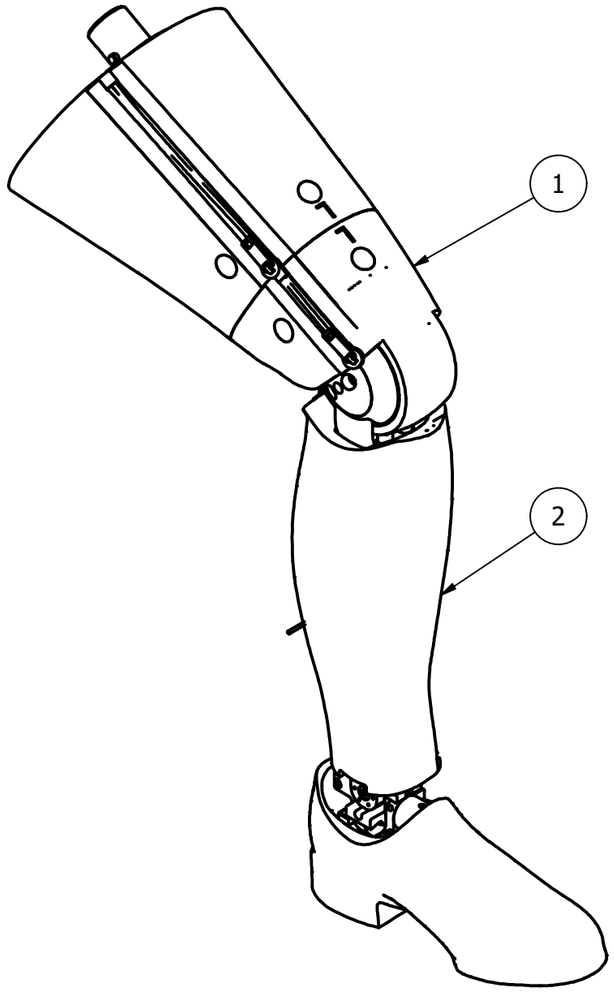
KIT, 7264C/ARS, RIGHT FOOT

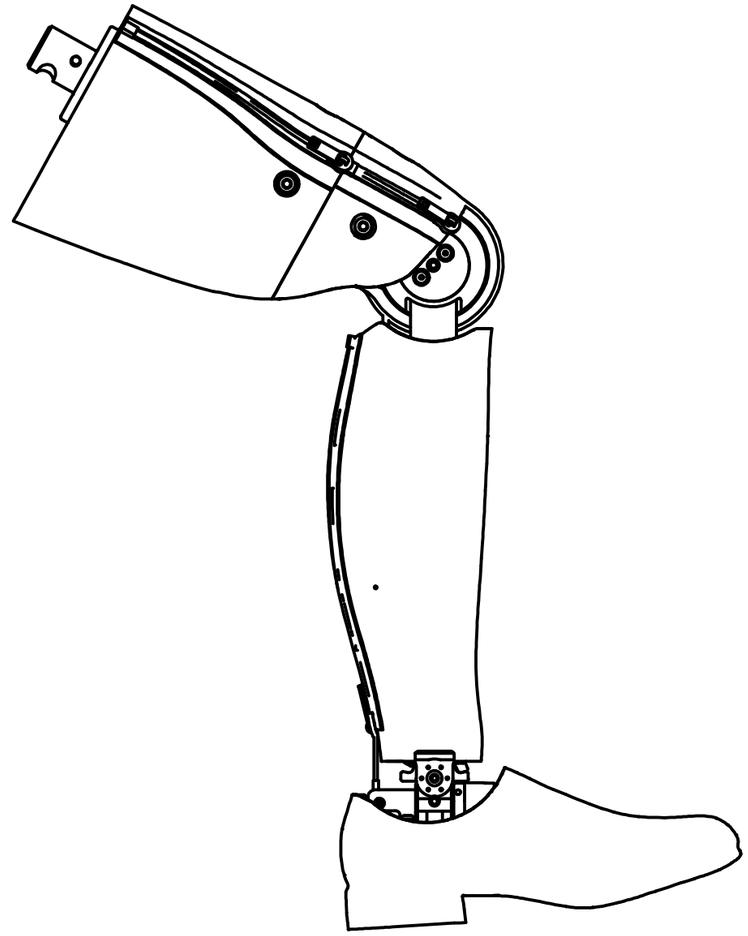
THOR-05F

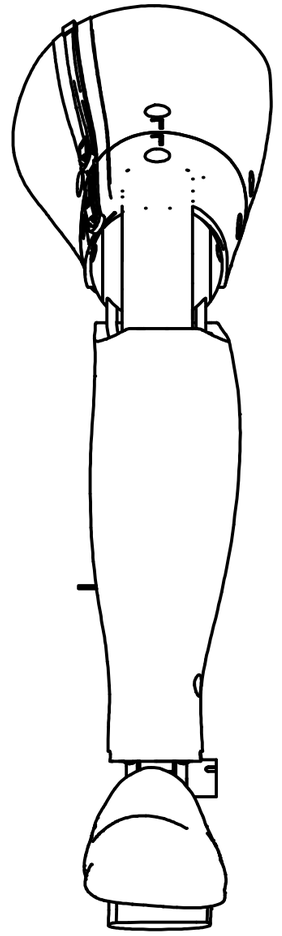
THIRD ANGLE PROJECTION

SIZE A3 | DRAWING NUMBER 474-5728-2 | REV 3
SCALE: 1.5 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	HEC	4/27/2023







ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	474-5500-1	LOWER LEG ASSEMBLY, LEFT
1	1	474-5100-1-A	UPPER LEG ASSEMBLY, LEFT

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	B. KIMES	4/27/2023
CHECKED		
ENG		
APPROVED		

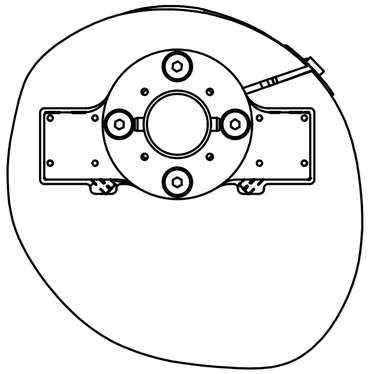
MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

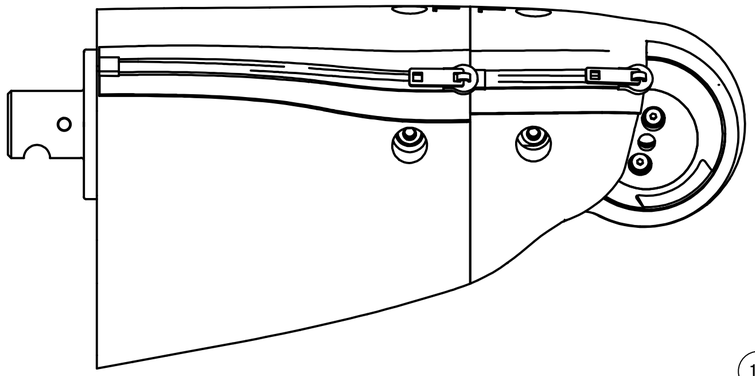
LEG ASSEMBLY, LEFT
THOR 05F

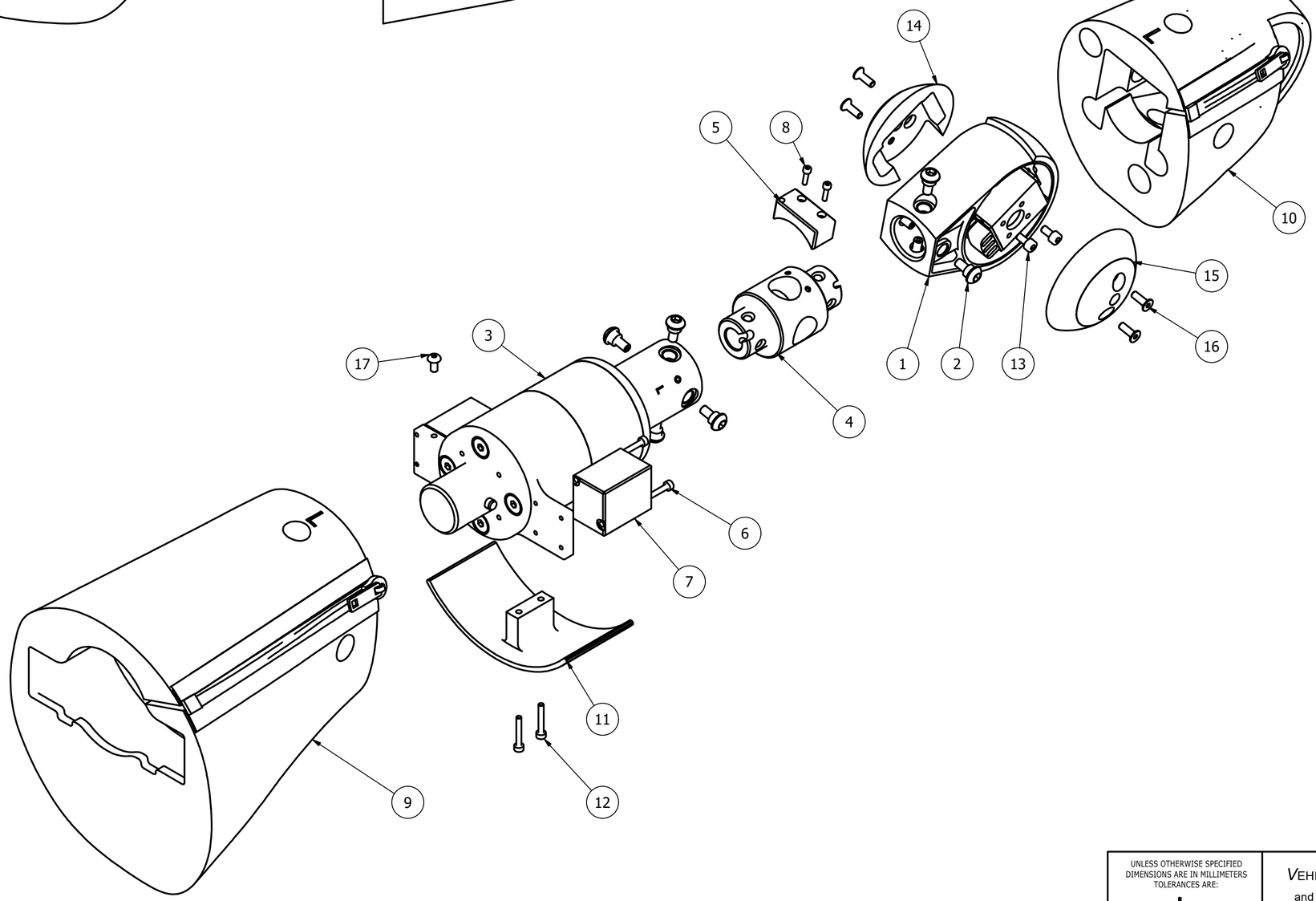
THIRD ANGLE PROJECTION

SIZE: A3
DRAWING NUMBER: 474-5000-1-A
REV: 2
SCALE: .25 : 1
SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	HEC	7/21/2023







ITEM	QTY	PART NUMBER	DESCRIPTION
17	1	5000103	M4 X 0.7 X 8 LG. BHCS
16	4	5001086	M4 X 0.7 X 12 LG. FHCS
15	1	474-5301-2-A	KNEE COVER, INBOARD / OUTBOARD
14	1	474-5301-1-A	KNEE COVER, INBOARD / OUTBOARD
13	4	5000989	M4 X 0.7 X 8 LG. SHCS
12	2	5000312	M3 X 0.5 X 20 LG. SHCS
11	1	474-5107	CABLE CONNECTOR GUARD
10	1	474-5321-1	KNEE FLESH, LEFT
9	1	474-5122-1	UPPER LEG FLESH, LEFT
8	2	5000456	M2.5 X 0.45 X 10 LG. SHCS
7	2	474-8205	DAS STRUCTURAL REPLACEMENT (5 BRIDGE)
6	4	5000679	M3 X 0.5 X 45 LG. SHCS SS
5	1	474-5102	STRUCTURAL REPLACEMENT, FEMUR LOAD CELL STRAIN RELIEF
4	1	474-5101	STRUCTURAL REPLACEMENT, FEMUR LOAD CELL
3	1	474-5160-1	FEMUR ASSEMBLY, LEFT
2	8	W50-61042	MODIFIED BHSS M6 THREAD
1	1	474-5400	KNEE ASSEMBLY

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	HEAT TREAT	FINISH
N/A	N/A	N/A

APPROVALS	DATE
DRAWN: B. KIMES	4/14/2023
CHECKED	
ENG	
APPROVED	

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

UPPER LEG ASSEMBLY, LEFT

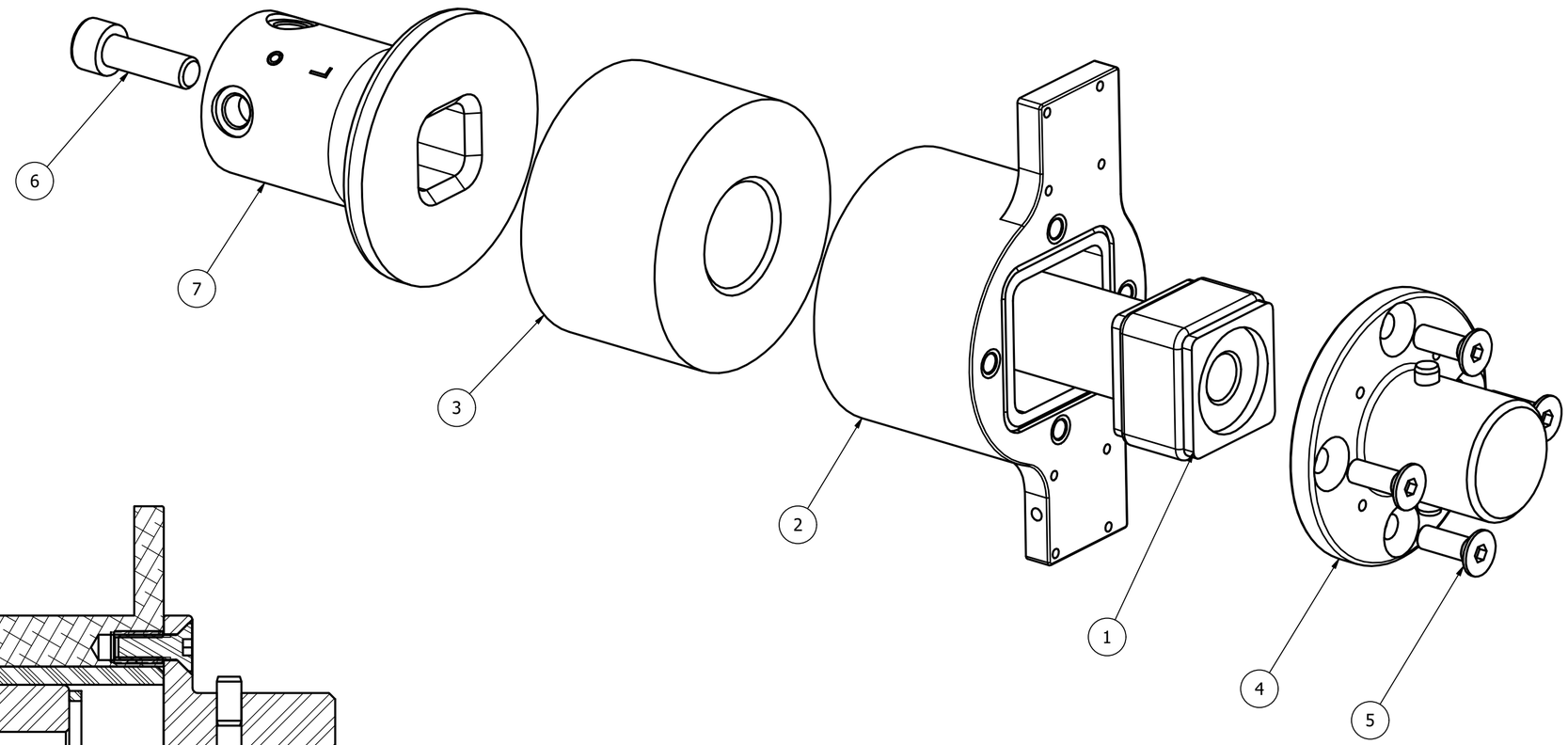
THOR-05F

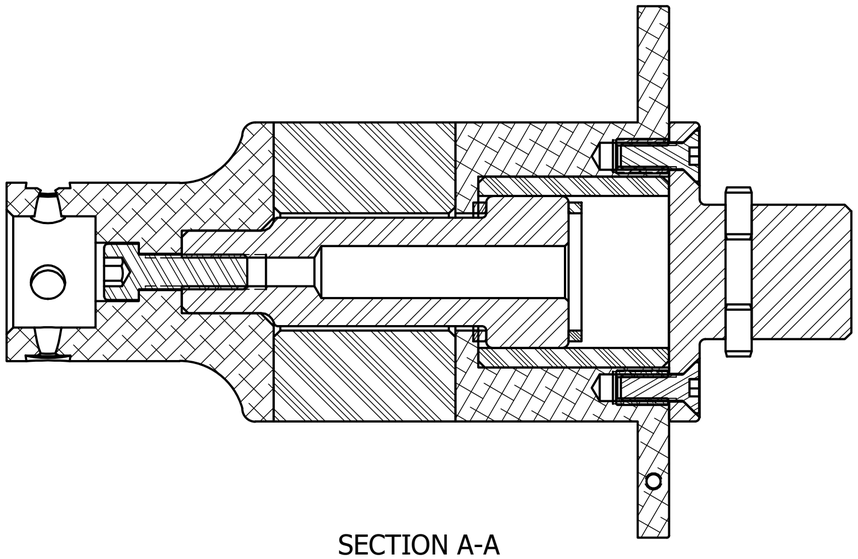
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
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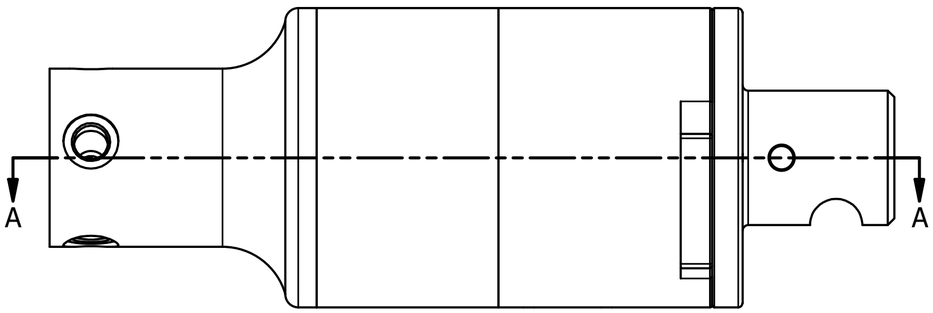
SCALE: .5:1 SHEET 1 OF 1

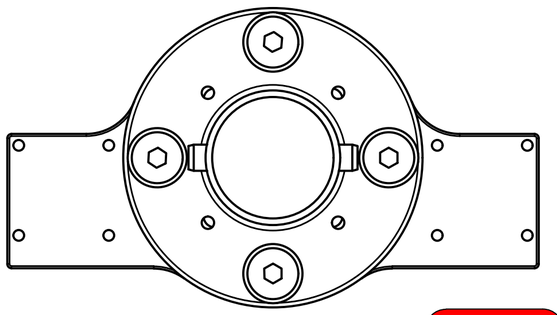
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	BK	DI	7/14/2021





SECTION A-A





ITEM	QTY	PART NUMBER	DESCRIPTION
7	1	474-5173-1	FEMUR END CAP, LEFT
6	1	5000037	M8 X 1.25 X 25 LG. SHCS
5	4	5000108	M6 X 1 X 18 LG. FHCS
4	1	474-5161	FEMUR ATTACHMENT PLATE
3	1	474-5172	FEMUR RUBBER
2	1	474-5164	FEMUR BRUSHING ASSEMBLY
1	1	474-5166	FEMUR PLUNGER ASSEMBLY

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

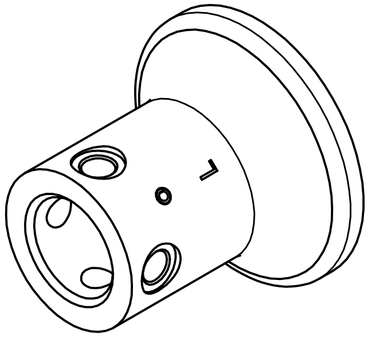
	APPROVALS	DATE
DRAWN	B. KIMES	4/8/2016
CHECKED		
ENG		
APPROVED		
MATERIAL		
HEAT TREAT		
FINISH		

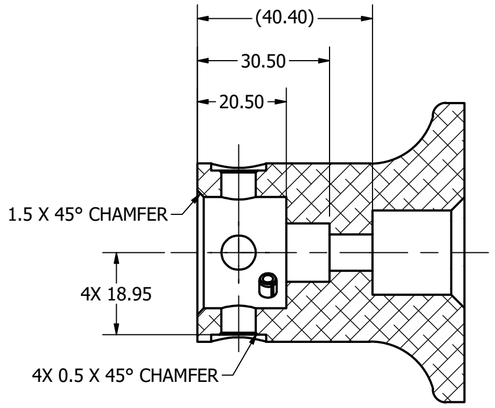
FEMUR ASSEMBLY, LEFT
THOR-05

THIRD ANGLE PROJECTION

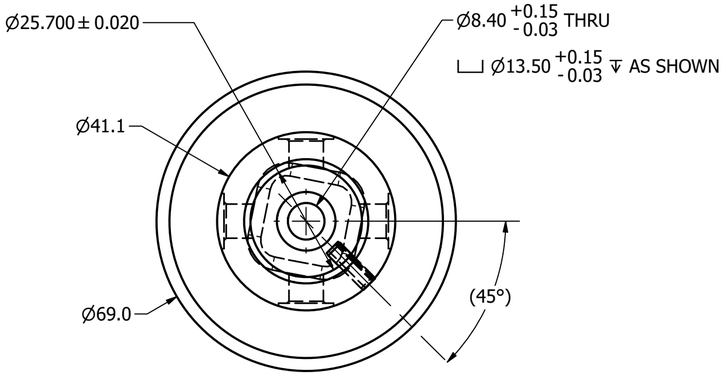
SIZE A2 | DRAWING NUMBER 474-5160-1 | REV 3
SCALE: 1 : 1 | SHEET 1 OF 1

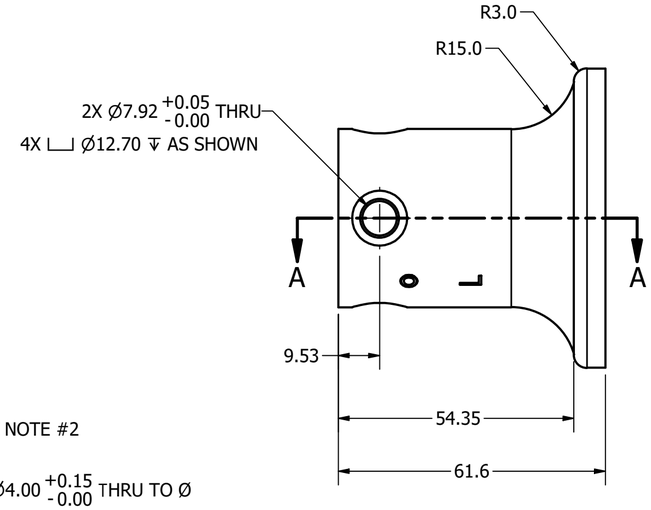
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	DI	7/14/2021

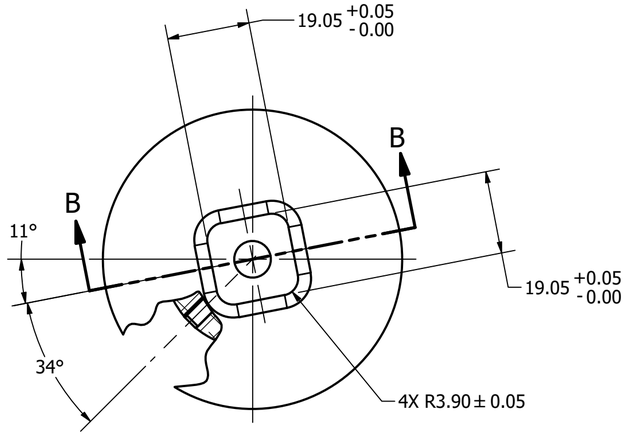


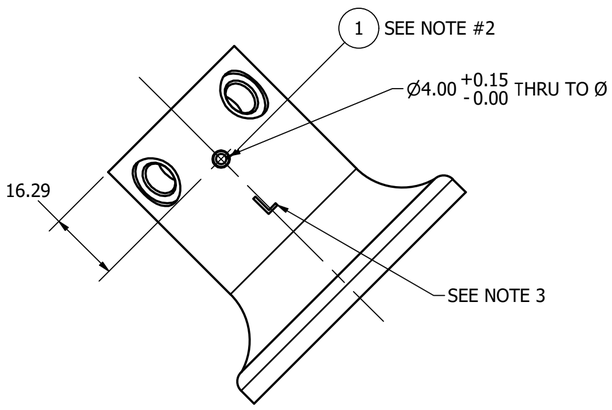


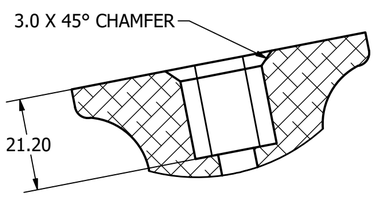
SECTION A-A











SECTION B-B

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5000205	M4 X 12 LG. ROLL PIN SS

PARTS LIST

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. INSTALL ROLL PIN FLUSH TO OUTSIDE SUFACE AFTER ANODIZE.
3. ENGRAVE "L" AS SHOWN

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. KIMES	7/14/2021
CHECKED	
ENG	
APPROVED	

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

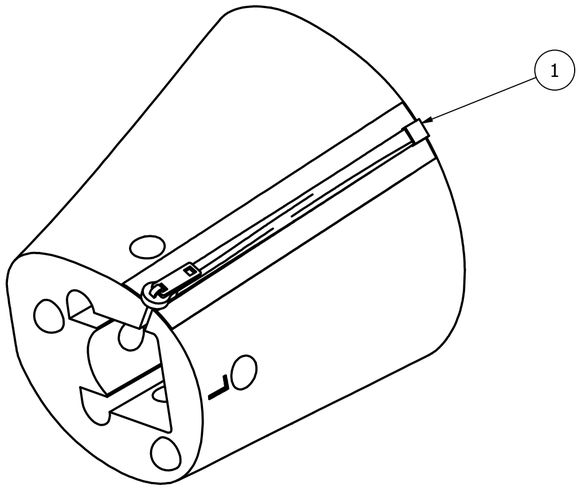
FEMUR END CAP, LEFT

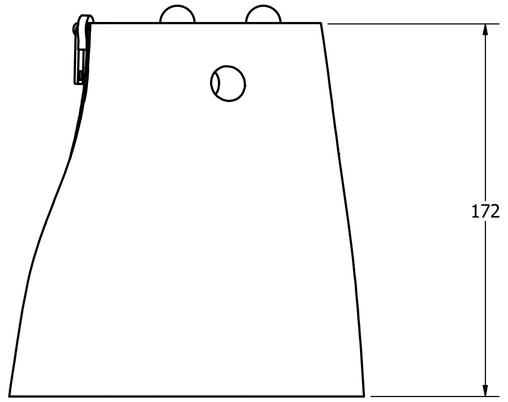
THIRD ANGLE PROJECTION

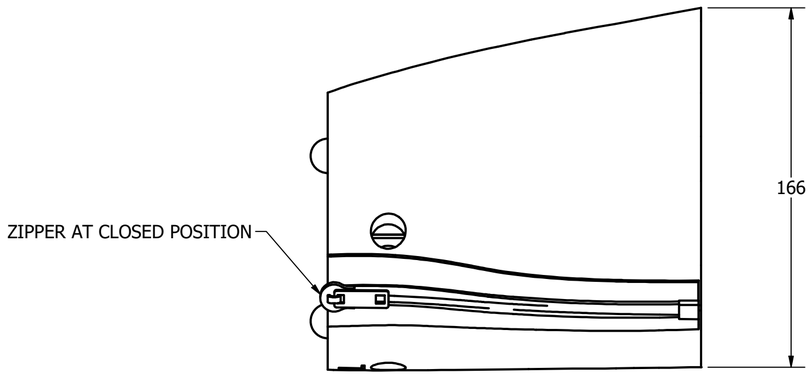
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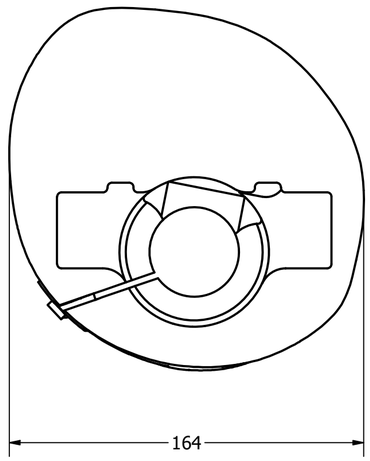
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	SKR	HF	02/21/2022









NOTES:

1. MATERIAL: PVC
   COLOR: EURO BROWN
   DUROMETER: 45±5 SHORE A
   FILLED WITH POLYURETHANE EXPANDABLE FOAM

2. REMOVE ALL MOLD FLASHING

3. ALL MOLD DIMENSION TOLERANCE +1%/-2% BUT NO SMALLER THAN 0.5mm

4. BOND ZIPPER TO FLESH AS SHOWN.

5. WEIGHT: 1270 GRAMS ± 30 GRAMS

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-5121	ZIPPER ASSEMBLY, UPPER LEG

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: A. Barchock	4/11/2016
CHECKED:	
ENG: KMSP	11/20/2019
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

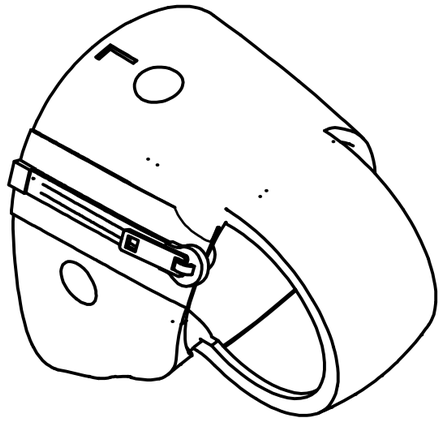
UPPER LEG FLESH, LEFT

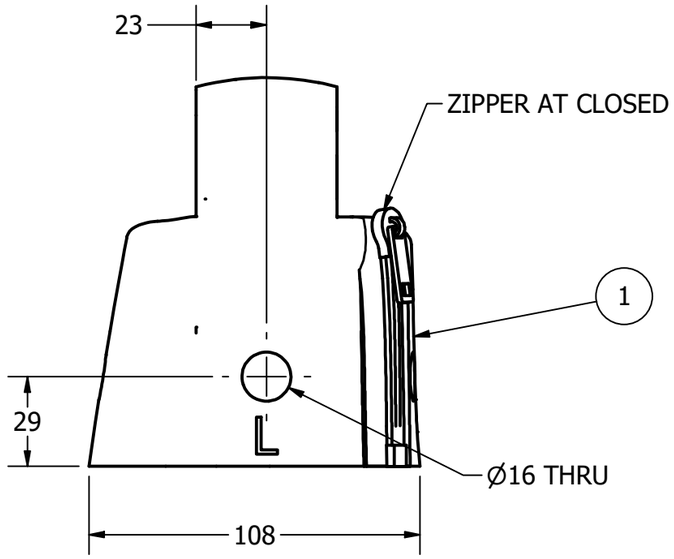
THIRD ANGLE PROJECTION

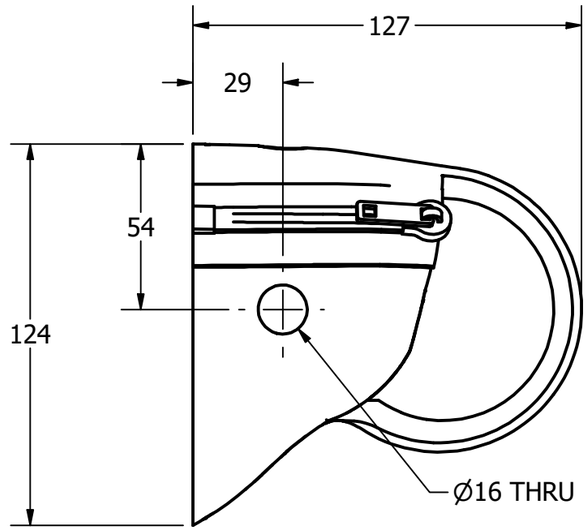
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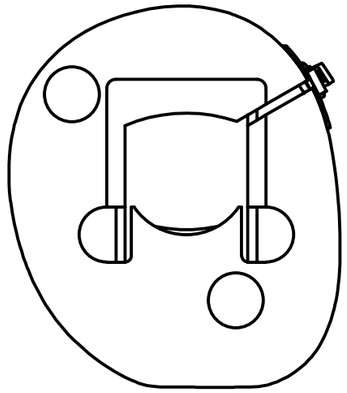
SCALE: .5:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	SKR	HF	02/09/2022









NOTES:

1. MATERIAL: PVC
   COLOR: EURO BROWN
   DUROMETER: 45±10 SHORE A
   FILLED WITH PU ELASTOMER & FOAM

2. REMOVE ALL MOLD FLASHING

3. ALL MOLD DIMENSION TOLERANCE +1%/-2% BUT NO SMALLER THAN 0.5mm

4. BOND ZIPPER TO FLESH AS SHOWN.

5. WEIGHT: TBD

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-5324	ZIPPER ASSEMBLY, KNEE

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

KNEE FLESH, LEFT

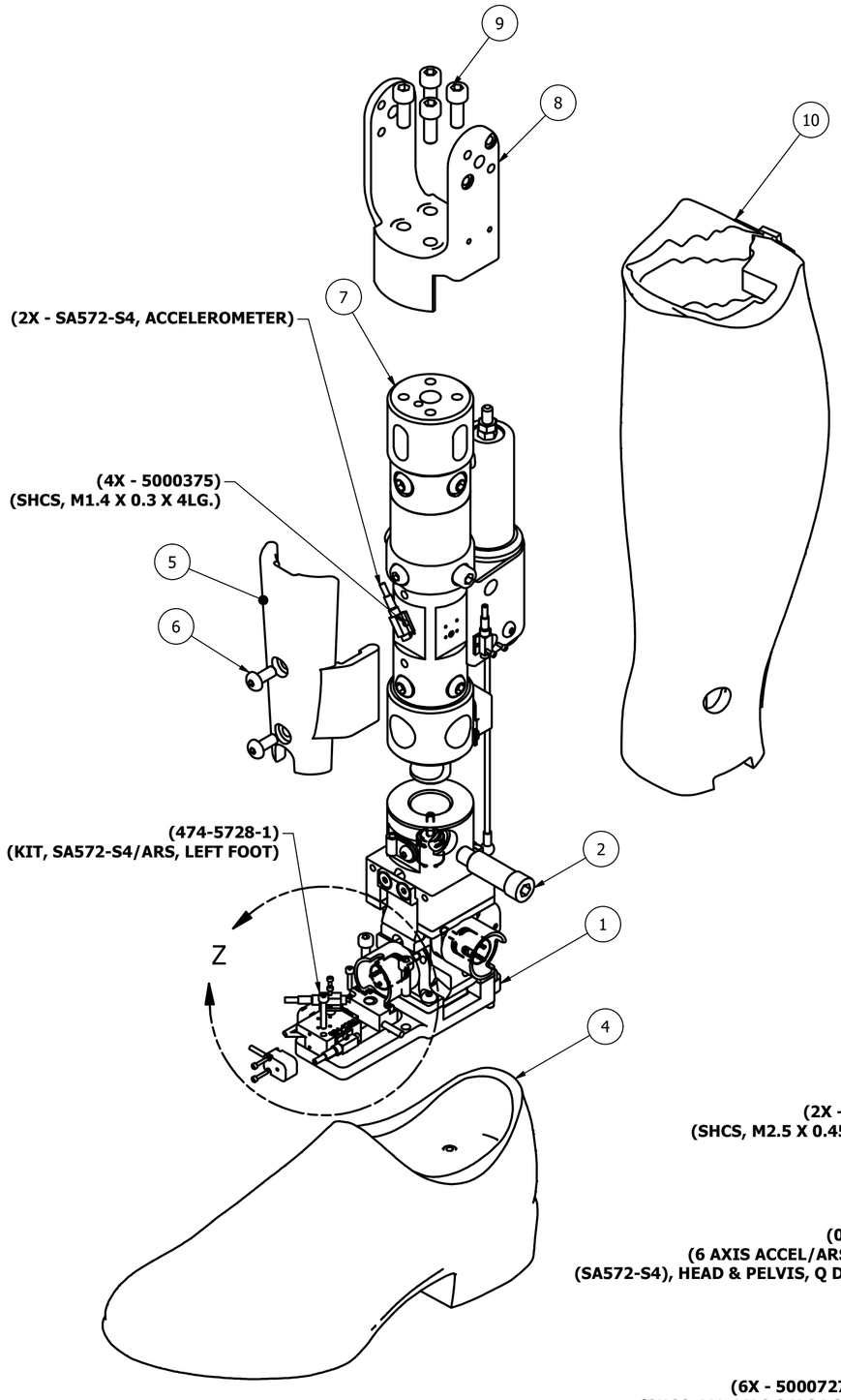
	APPROVALS	DATE
DRAWN	A. Barchock	4/11/2016
CHECKED		
ENG	KMSP	11/20/2019
APPROVED		

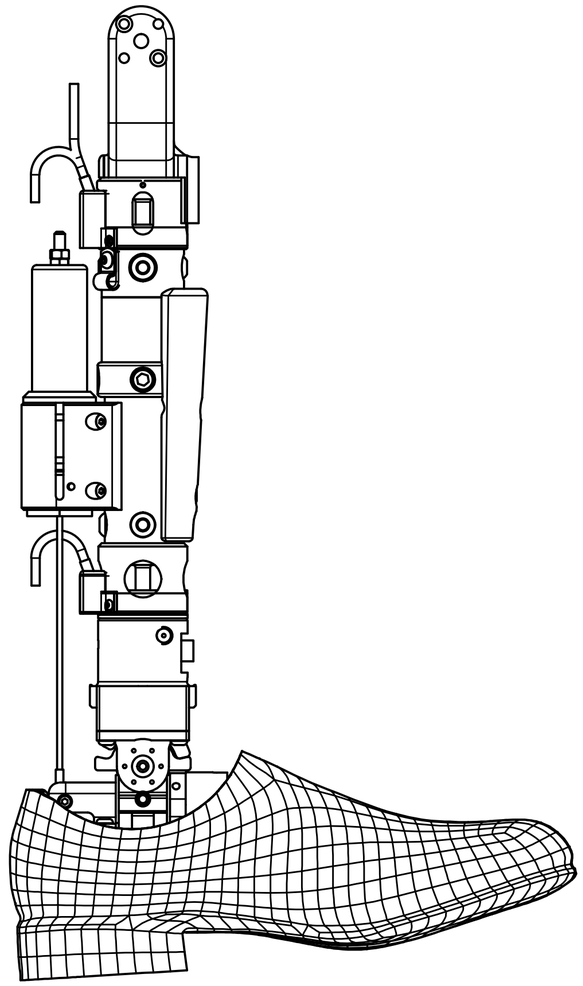
MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

THIRD ANGLE PROJECTION

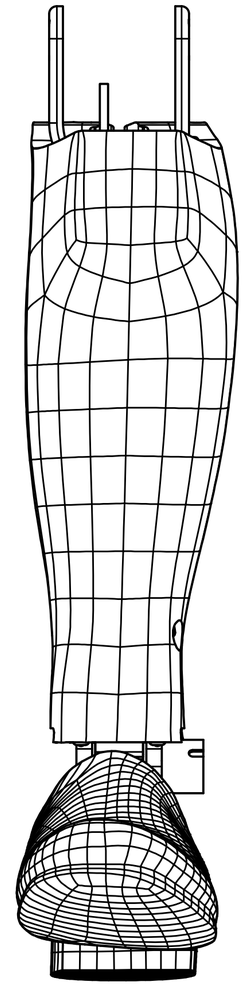
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SCALE: .5:1 | SHEET: 1 OF 1

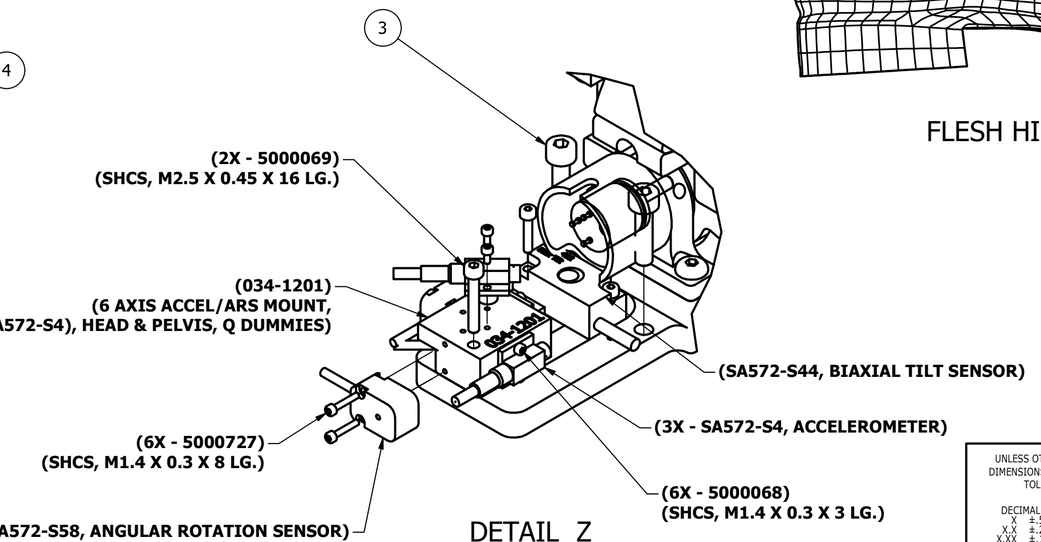
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	6	PROTOTYPE	HF	DJI	12/21/2021





FLESH HIDDEN





DETAIL Z
SCALE 1 : 1

ITEM	QTY	PART NUMBER	DESCRIPTION
10	1	483-5521-1	LOWER LEG FLESH (RIBBED), LEFT
9	4	5000081	M6 X 1 X 16 LG. SHCS
8	1	474-5517-1	KNEE CLEVIS, LEFT
7	1	474-5507-1	TIBIA ASSEMBLY, LEFT
6	2	5000654	M5 X 0.8 X 12 LG. BHCS
5	1	474-5518-1	SHIN GUARD, MOLDED, LEFT
4	1	474-5903-1	MOLDED SHOE ASSEMBLY, LEFT
3	4	5000025	M4 X 0.7 X 16 LG. SHCS
2	1	472-7563	BOLT & SLEEVE ASSEMBLY-ANKLE
1	1	474-5800-1	ANKLE ASSEMBLY, LEFT

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ✓ | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	4/14/2016
CHECKED	
ENG	
APPROVED	

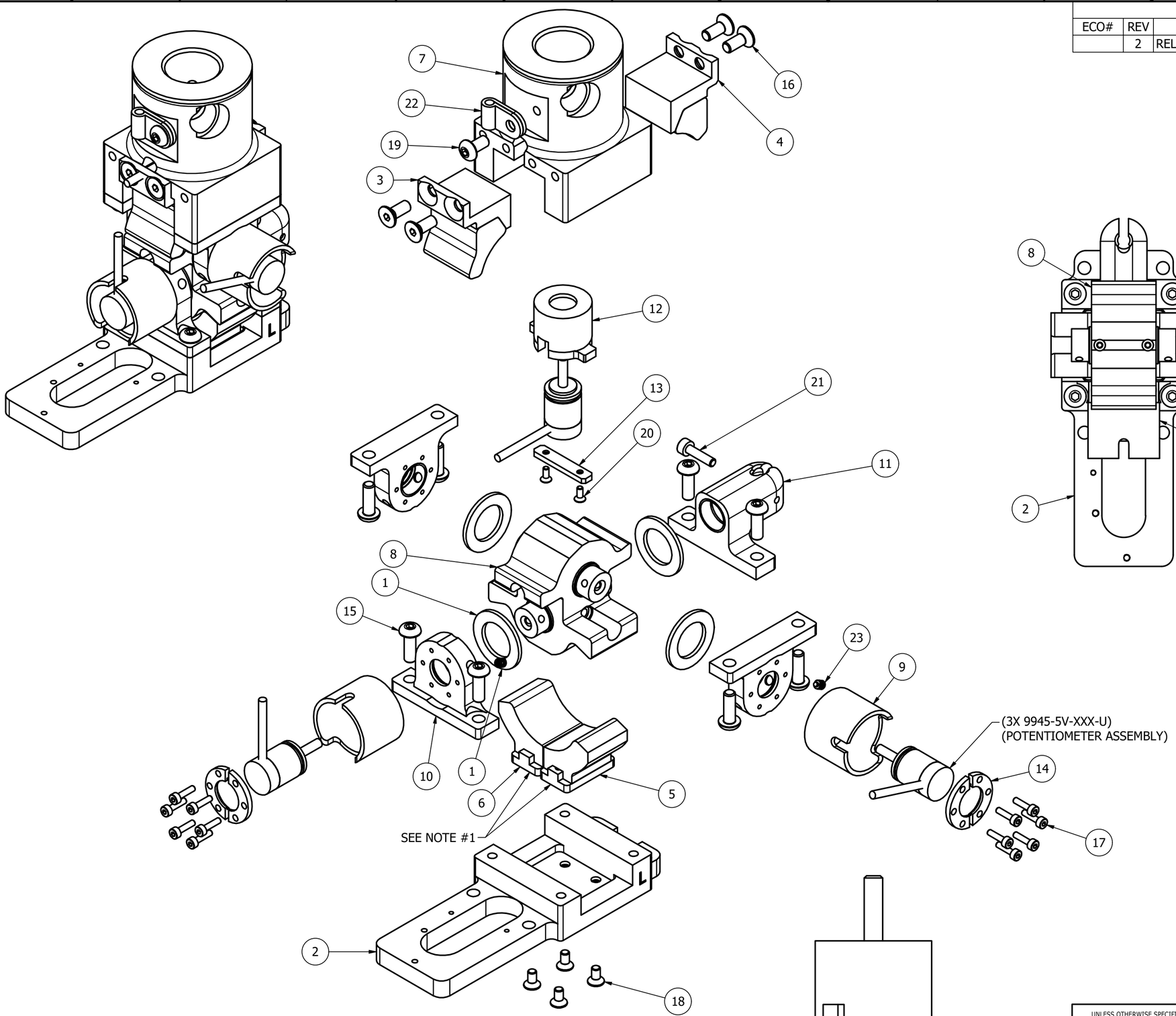
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

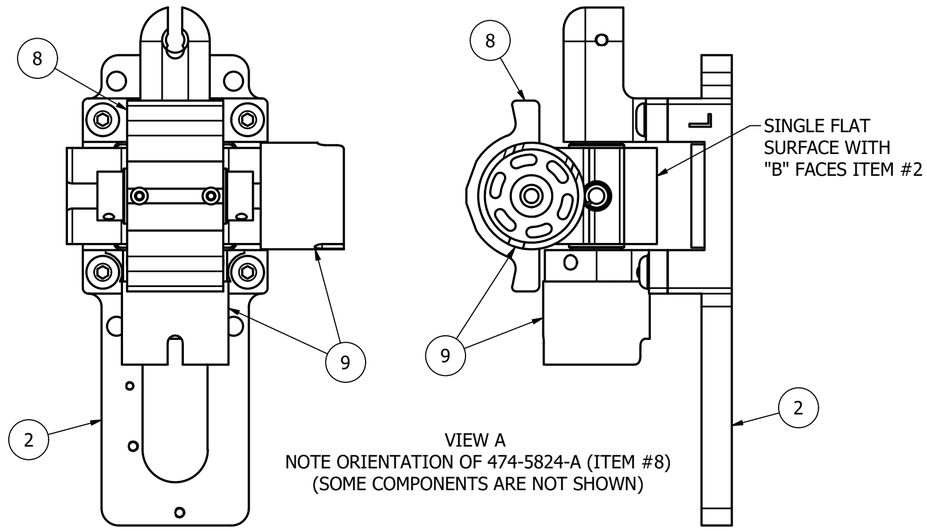
LOWER LEG ASSEMBLY, LEFT

THIRD ANGLE PROJECTION

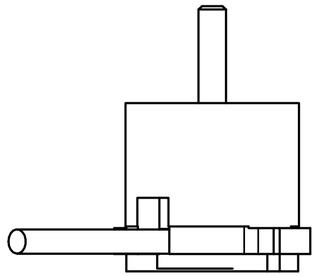
SIZE A2 | DRAWING NUMBER 474-5500-1 | REV 6
SCALE: 1:2 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	RELEASE TO PROTOTYPE	TM	DJI	05/16/2025





VIEW A
NOTE ORIENTATION OF 474-5824-A (ITEM #8)
(SOME COMPONENTS ARE NOT SHOWN)



VIEW B
ASSEMBLY OF Z POT
SCALE 2:1

ITEM	QTY	PART NUMBER	DESCRIPTION
23	2	9010447	M3 X 0.5 X 3 LG. SSSNP
22	1	9005135	CLAMP, NYLON LOOP
21	1	5001103	M3 X 0.5 X 12 LG. SHCS
20	2	5000753	M2 X 0.4 X 5 LG. FHCS
19	1	5000103	M4 X 0.7 X 8 LG. BHCS
18	4	5000098	M3 X 0.5 X 6 LG. FHCS
17	12	5000083	M2 X 0.4 X 8 LG. SHCS
16	4	5000023	M4 X 0.7 X 10 LG. FHCS
15	8	5000005	M4 X 0.7 X 12 LG. BHCS
14	2	472-7581	POTENTIOMETER CLAMP
13	1	474-5832	POTENTIOMETER CLAMP
12	1	474-5831	POTENTIOMETER INNER MOUNT
11	1	474-5828	ACHILLES CABLE RETAINER
10	3	474-5826	PLATE, ANKLE BUSHING
9	2	483-5825	POTENTIOMETER CAP
8	1	474-5824-A	ANKLE CENTER BLOCK ASSEMBLY
7	1	474-5820-1	UPPER ANKLE ADAPTOR, LEFT
6	1	474-5816-A	INVERSION STOP ASSEMBLY
5	1	474-5813-A	EVERSION STOP ASSEMBLY
4	1	474-5810	PLANTAR STOP ASSEMBLY
3	1	474-5807	DORSI STOP ASSEMBLY
2	1	474-5806-1	LOWER ANKLE PLATE, LEFT
1	4	474-5720	ANKLE THRUST WASHER

PARTS LIST

NOTES:

1. MAKE SURE ETCH MARK "E" ON ITEM 5 and "L" ON ITEM 2 ARE ON THE SAME SIDE AND "I" ON ITEM 6 IS ON THE OPPOSITE SIDE DURING ASSEMBLY.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: akulal	4/3/2025
CHECKED:	
ENG: disopi	4/3/2025
APPROVED:	

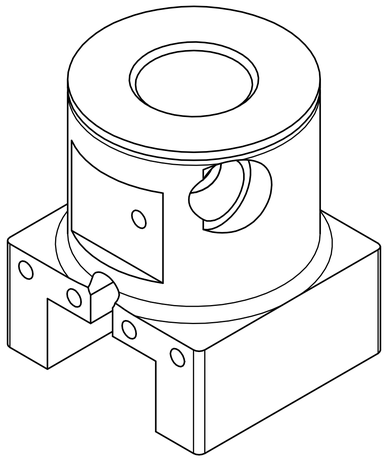
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

ANKLE ASSEMBLY, LEFT
THOR-05F

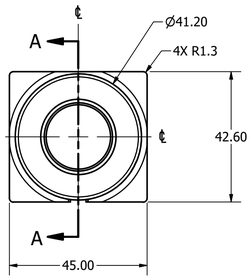
THIRD ANGLE PROJECTION

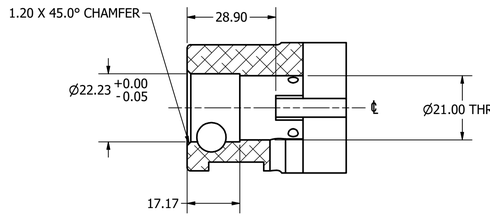
SIZE: A2 | DRAWING NUMBER: 474-5800-1-B | REV: 2
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	RELEASE FOR PROTOTYPE	HF	JW	9/23/2021

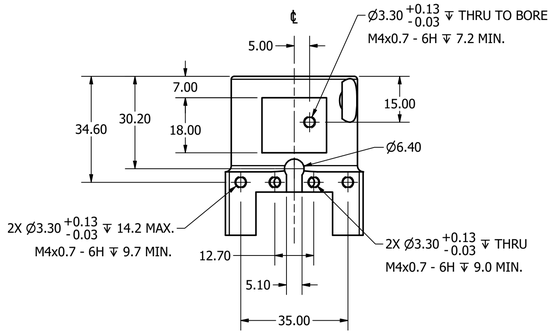


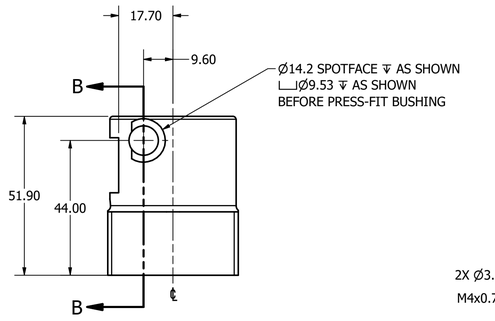
SCALE 2 : 1

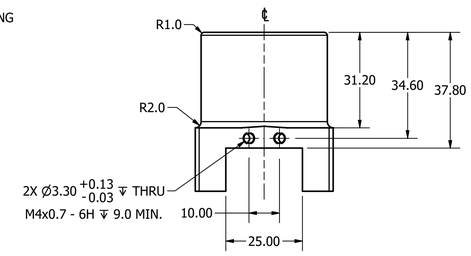


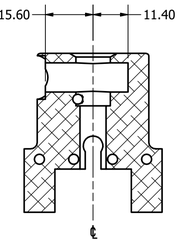


SECTION A-A

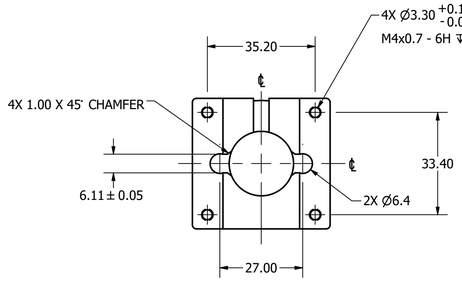




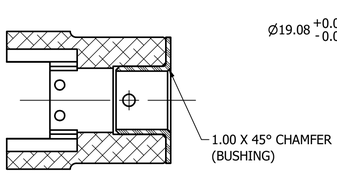




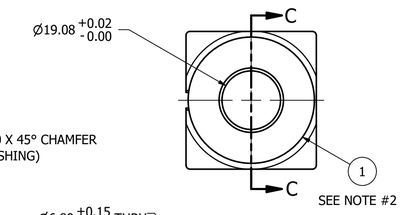
SECTION B-B

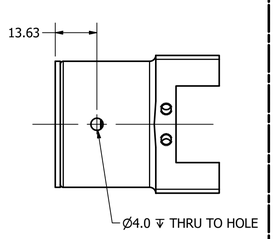


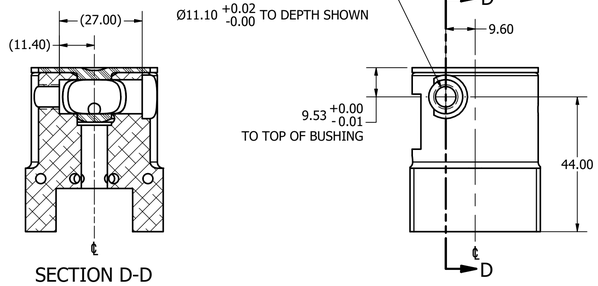
AFTER PRESS FIT BUSHING



SECTION C-C







SECTION D-D

NOTES:

1. DIMENSIONS ARE SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

2. INSTALL THRUST BUSHING 474-5707 AFTER ANODIZE WITH EPOXY ADHESIVE OR EQUIVALENT.

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-5707	THRUST BUSHING

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.3, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: A.TOMICH	7/10/2017
CHECKED:	
ENG: JW	7/10/2017
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

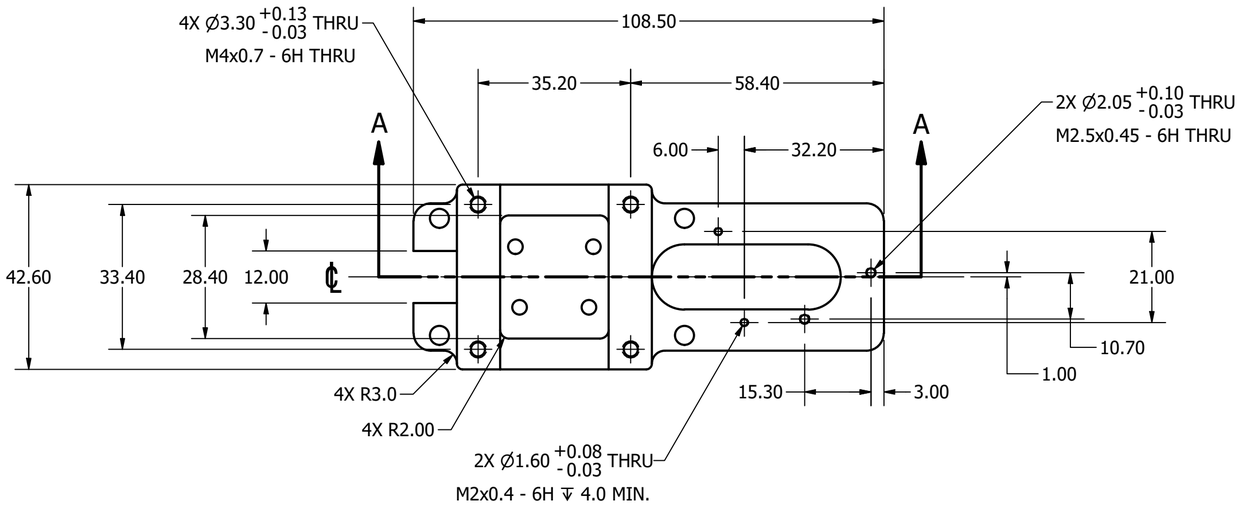
UPPER ANKLE ADAPTOR, LEFT
THOR-05F

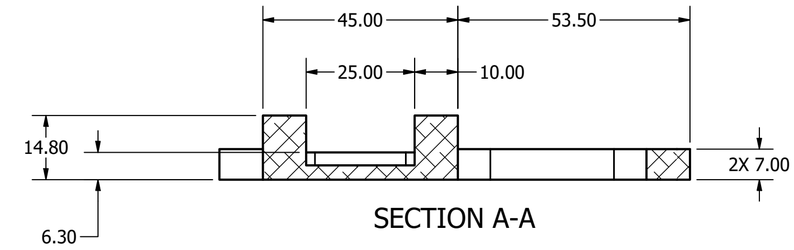
THIRD ANGLE PROJECTION

SIZE: A1 | DRAWING NUMBER: 474-5820-1 | REV: 5

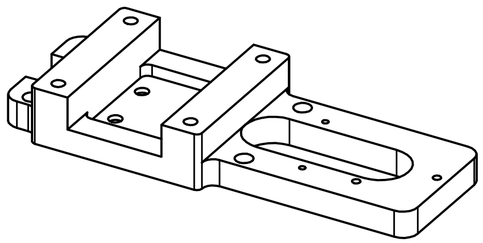
SCALE: 1:1 | SHEET: 1 OF 1

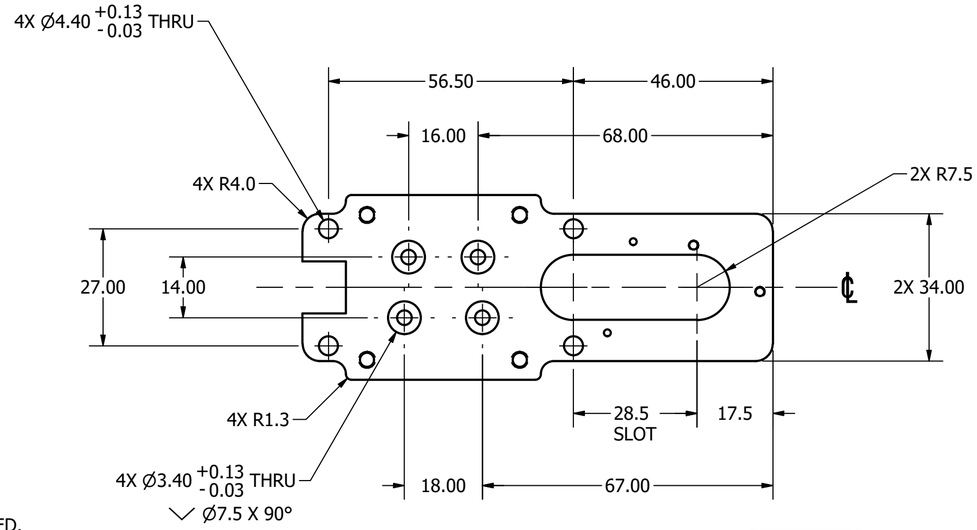
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	JPM	DJI	11/9/2022





SECTION A-A





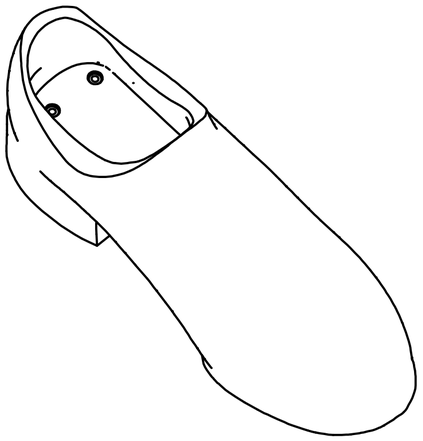
NOTES:

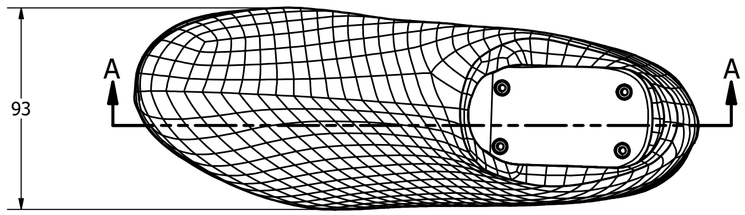
1. DIMENSIONS SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE NOTED.

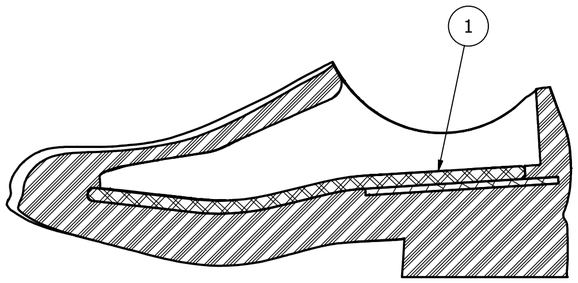
PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED ∨ ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	LOWER ANKLE PLATE, LEFT THOR-05F
MATERIAL 7075-T6 ALUMINUM	DRAWN A. Barchock 10/24/2016	
HEAT TREAT N/A	CHECKED	SIZE A2 · DRAWING NUMBER 474-5806-1 · REV 3
FINISH CLEAR ANODIZE	ENG JW 10/23/2016	THIRD ANGLE PROJECTION · SCALE: 1:1 · SHEET 1 OF 1
	APPROVED	

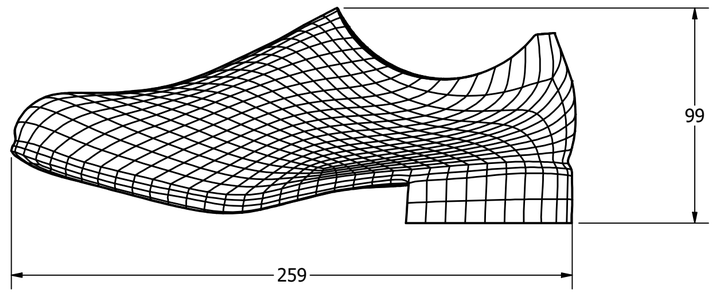
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	8	PROTOTYPE	TM	DJI	01/11/2023







SECTION A-A



NOTES:

1. MATERIAL: THERMOSET PLASTIC
   COLOR: BLACK
   DUROMETER: 72 2.5 SHORE "A" CAN BE ADJUSTED TO MEET THE PERFORMANCE REQUIREMENT

2. REMOVE ALL MOLD FLASHING.

3. ALL MOLD DIMENSION TOLERANCE +1%/-2% BUT NO SMALLER THAN 0.5mm.

4. NO SPLIT OR DEFECTS ARE ALLOWED IN THE MOLDING.

5. WEIGHT: 995 ± 10 GRAMS

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-5906-1	LAMINATED SOLE PLATE ASSY, LEFT

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/13/2016
CHECKED	
ENG: JW	4/13/2016
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

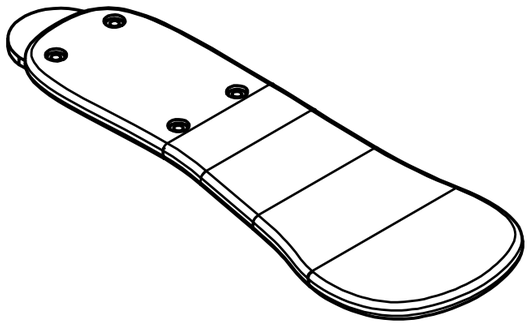
MOLDED SHOE ASSEMBLY, LEFT
THOR-05F

THIRD ANGLE PROJECTION

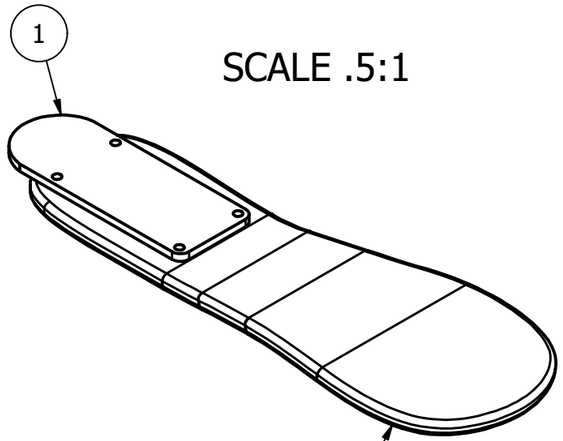
SIZE: A2 | DRAWING NUMBER: 474-5903-1 | REV: 8

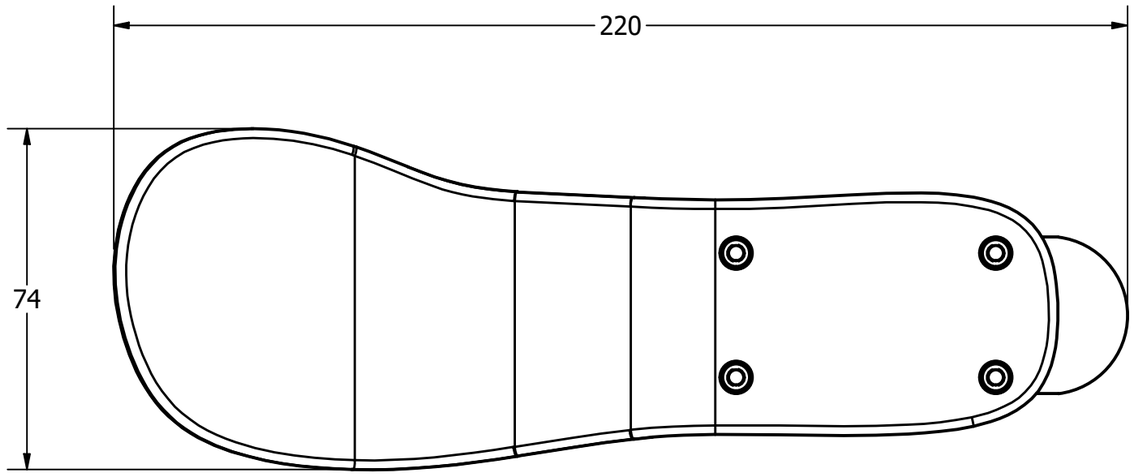
SCALE: 0.5 : 1 | SHEET: 1 OF 1

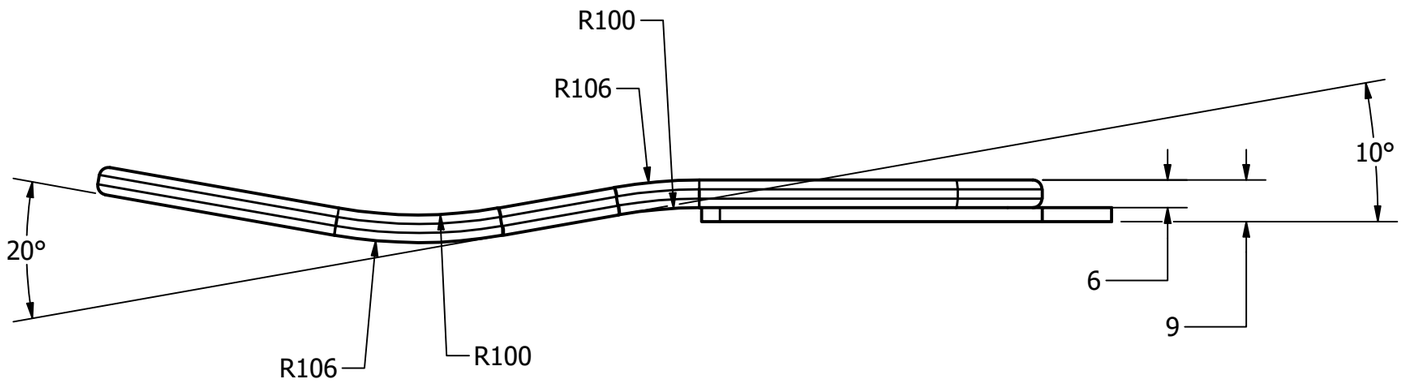
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	AB	JW	10/04/2017



SCALE .5:1







ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-5902	BACKING PLATE, SOLE PLATE

PARTS LIST

NOTES:

1. CARBON FIBER LAMINATES

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: A. Barchock	10/4/2017
CHECKED	
ENG	
APPROVED	

MATERIAL
HEAT TREAT
FINISH

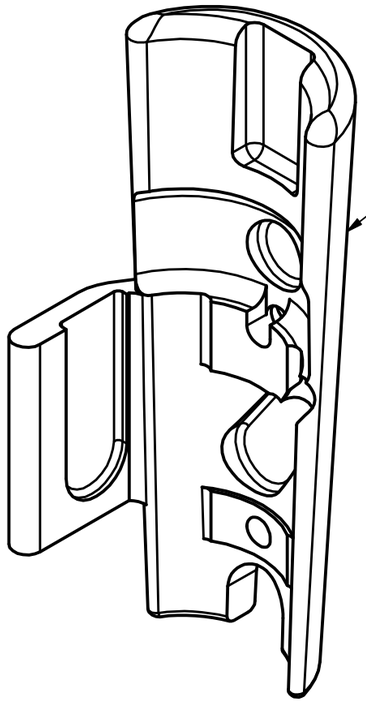
LAMINATED SOLE PLATE ASSY, LEFT

THIRD ANGLE PROJECTION

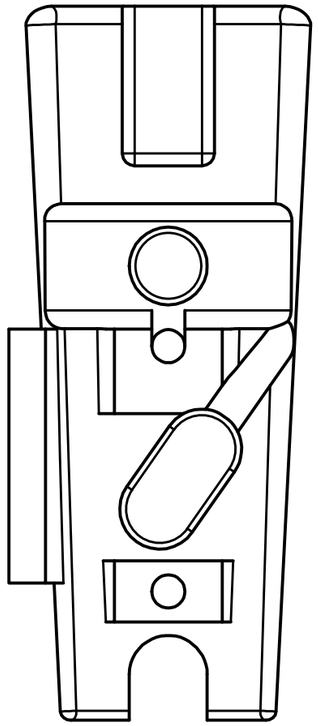
SIZE: A3 | DRAWING NUMBER: 474-5906-1 | REV: 1

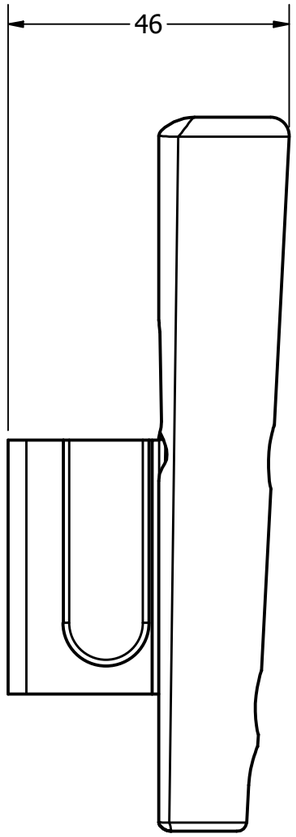
SCALE: .75:1 | SHEET: 1 OF 1

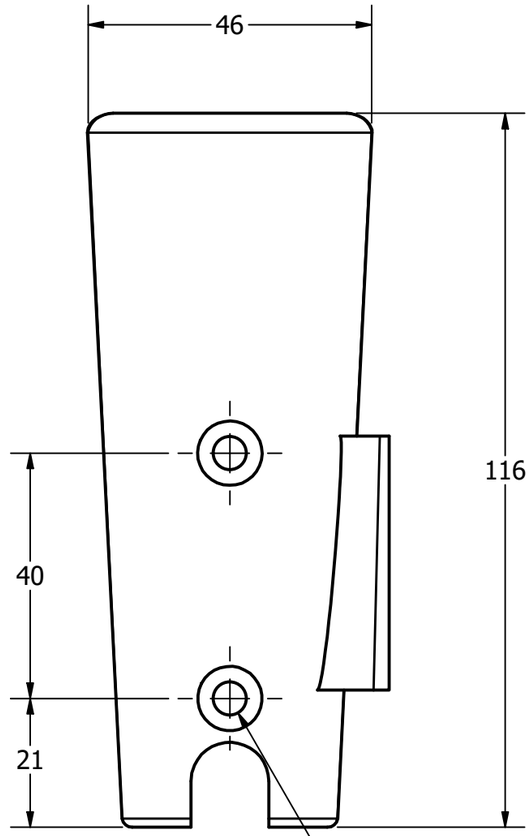
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	JW	11/16/2017

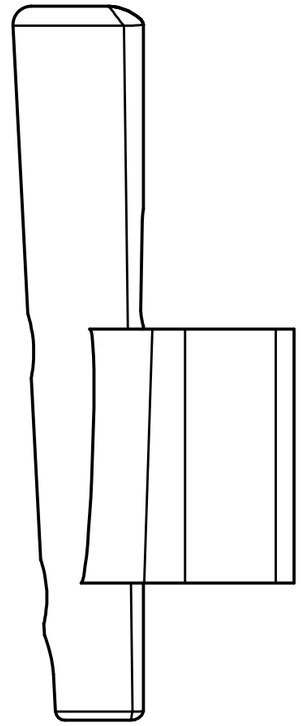


REFER TO DRA IN 474-0000 SHT. 7 FOR THE REFERENCE SHAPE AND INFORMATION.









NOTES:

1. MATERIAL: POLYURETHANE
   COLOR: BLACK
   DUROMETER: 84±5 SHORE "D"

2. REMOVE ALL MOLD FLASHING.

3. ALL MOLD DIMENSION TOLERANCE +1%/-2% BUT NO SMALLER THAN 0.5mm.

4. NO SPLIT OR DEFECTS ARE ALLOWED IN THE URETHANE MOLDING.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED √ ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

SHIN GUARD, MOLDED, LEFT

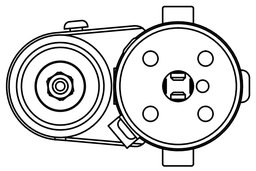
	APPROVALS	DATE
DRAWN	B. KIMES	4/13/2016
CHECKED		
ENG		
APPROVED		

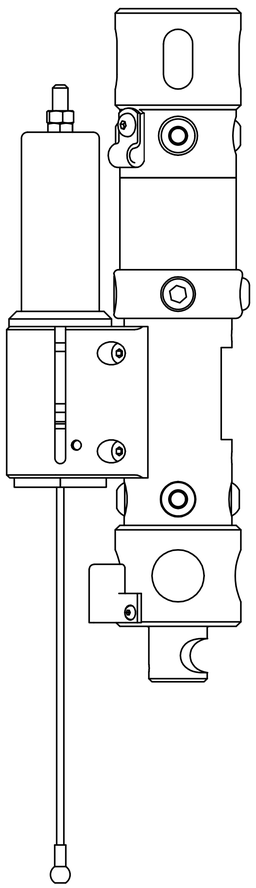
MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

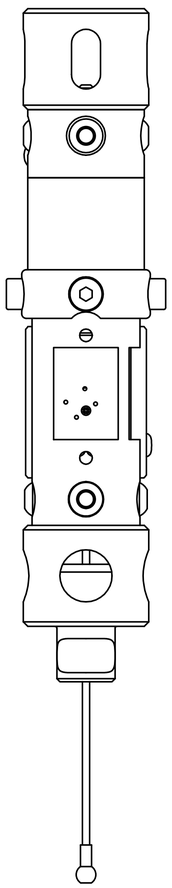
THIRD ANGLE PROJECTION

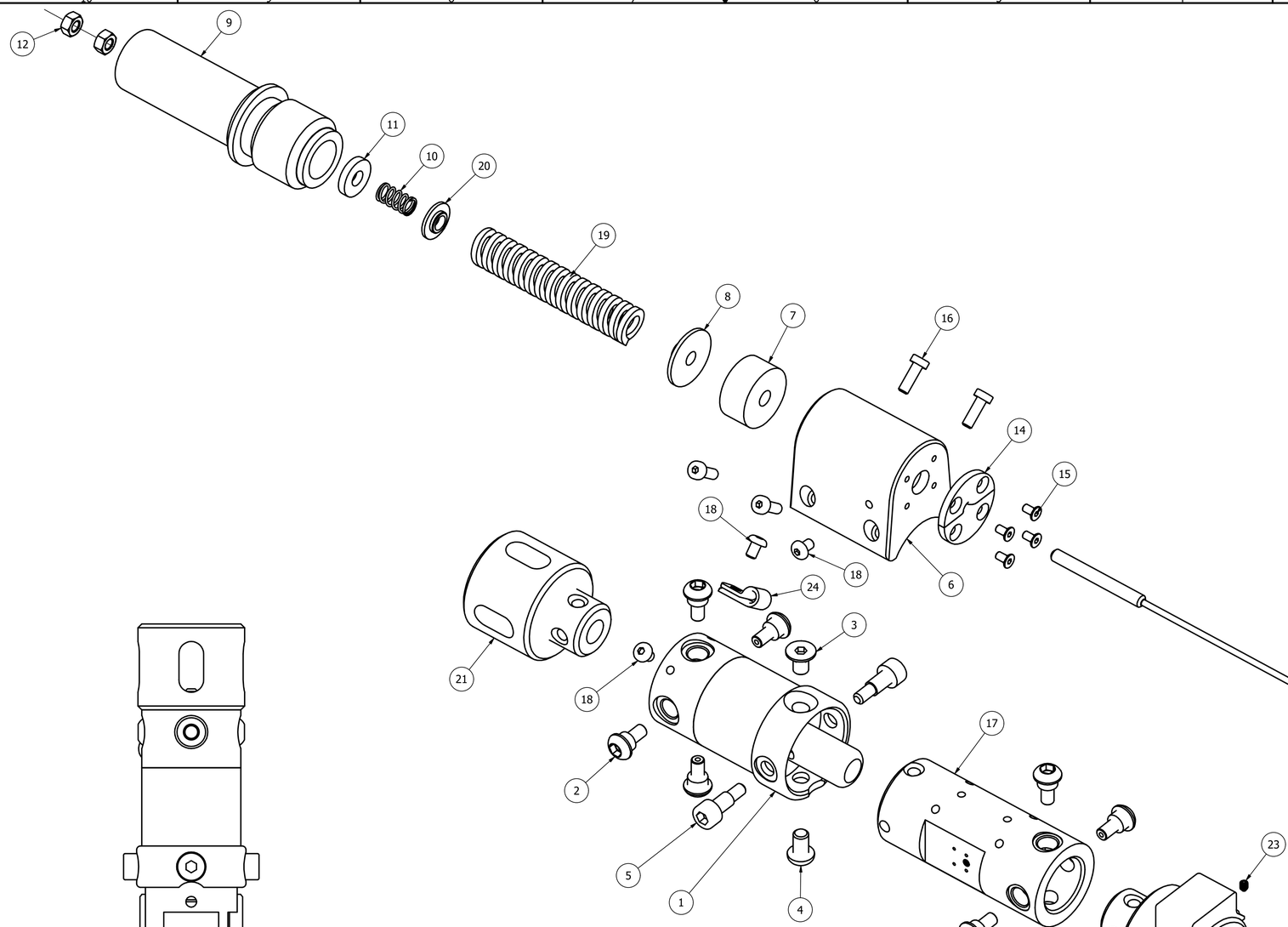
SIZE: A3 | DRAWING NUMBER: 474-5518-1 | REV: 1
SCALE: 1:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	PROTOTYPE	NRP	KMSP	3/26/2019









ITEM	QTY	PART NUMBER	DESCRIPTION
24	1	6004191	3/16 CABLE CLAMP
23	1	9010447	M3 X 0.5 X 3 LG. SSSNP
22	1	474-5822	STRUCTURAL REPLACEMENT, LOWER TIBIA LOAD CELL ASS'Y
21	1	474-5550	STRUCTURAL REPLACEMENT, UPPER TIBIA LOAD CELL
20	1	474-2322	SPRING BUSHING
19	1	474-5523	SPRING ASSEMBLY, ACHILLES
18	3	5001075	M4 X 0.7 X 6 LG. BHCS
17	1	474-5540-1	LOWER TIBIA SHAFT, LEFT
16	4	5001054	M4 X 0.7 X 12 LG. LHCS
15	4	5000098	M3 X 0.5 X 6 LG. FHCS
14	2	474-5531	ACHILLES CABLE EYELET GUIDE
13	1	474-5530	ACHILLES CABLE
12	2	5000515	M5 X 0.8 HEX NUT ZINC
11	1	474-5529	PRIMARY LOAD WASHER
10	1	6005232	SPRING COMPRESSION .295 X .032 X .551 SS
9	1	474-5525	UPPER ACHILLES SPRING HOUSING
8	1	474-5526	SPRING CAP, BOTTOM
7	1	472-7359	MOCK ACHILLES LOAD CELL
6	1	474-5504	LOWER ACHILLES SPRING HOUSING
5	2	474-5512	TIBIA PLUNGER PIN, MODIFIED M6 SHCS
4	1	5000891	M6 X 1 X 10 LG. BHCS
3	1	5000204	M6 X 1 X 10 LG. FHCS
2	8	W50-61042	MODIFIED BHSS M6 THREAD
1	1	474-5508	TIBIA COMPLIANT ELEMENT ASSEMBLY

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

PROTOTYPE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN jhaefner	4/11/2016
CHECKED	
ENG	
APPROVED	

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

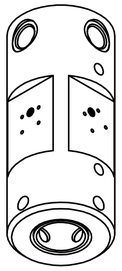
TIBIA ASSEMBLY, LEFT

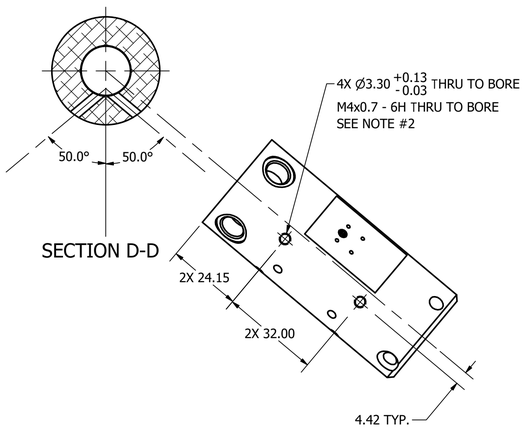
THIRD ANGLE PROJECTION

SIZE: A1 | DRAWING NUMBER: 474-5507-1 | REV: 5

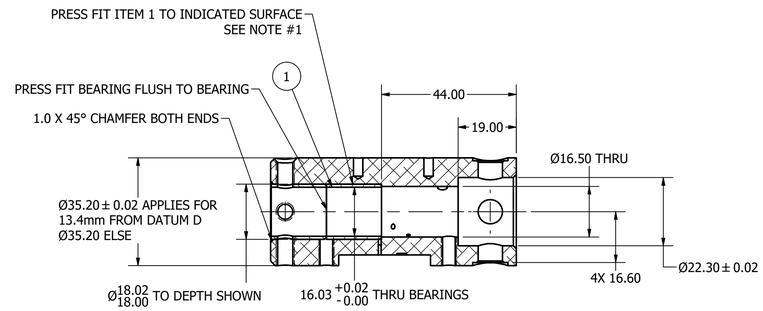
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	PROTOTYPE	HF	JW	10/7/2021

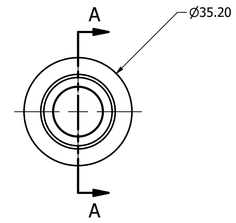


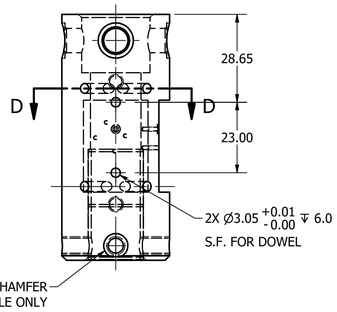


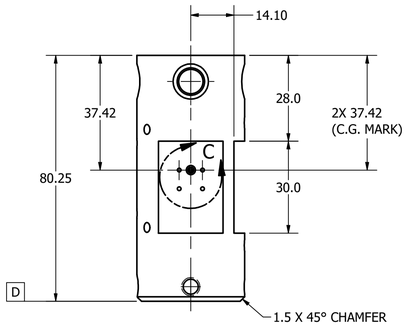
SECTION D-D

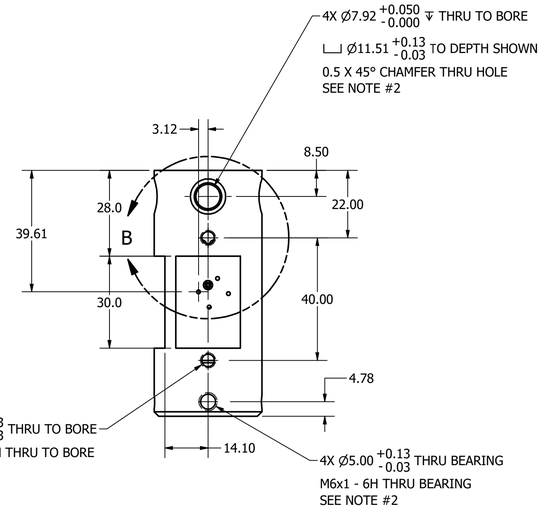


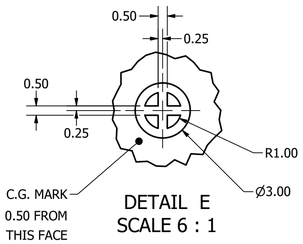
SECTION A-A



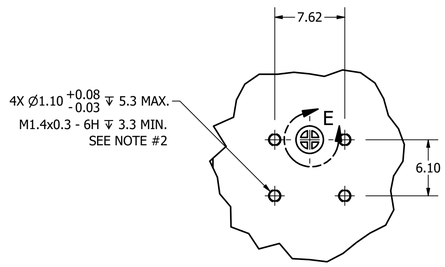




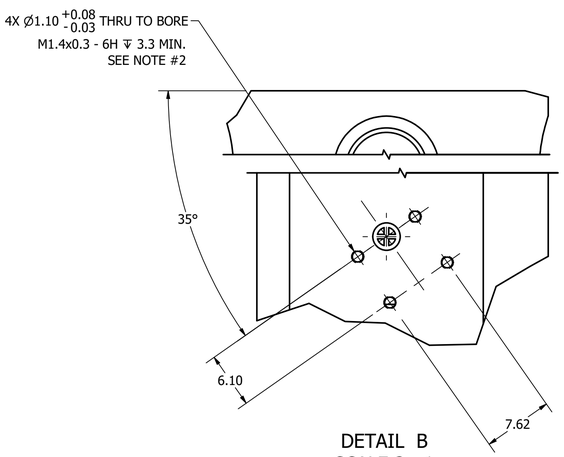




DETAIL E
SCALE 6 : 1



DETAIL C
SCALE 3 : 1



DETAIL B
SCALE 3 : 1

NOTES:

1. INSTALL SLEEVE BEARINGS AFTER ANODIZE.
2. PLUG HOLES BEFORE ANODIZE.

ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	6005238	BEARING, SLEEVE, 18mm OD X 14mm ID X 18mm LG (JSM-1418-18)

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.2, X.X ±.1, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

APPROVALS	DATE
DRAWN disopi	4/8/2016
CHECKED	
ENG JW	4/8/2016
APPROVED	

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

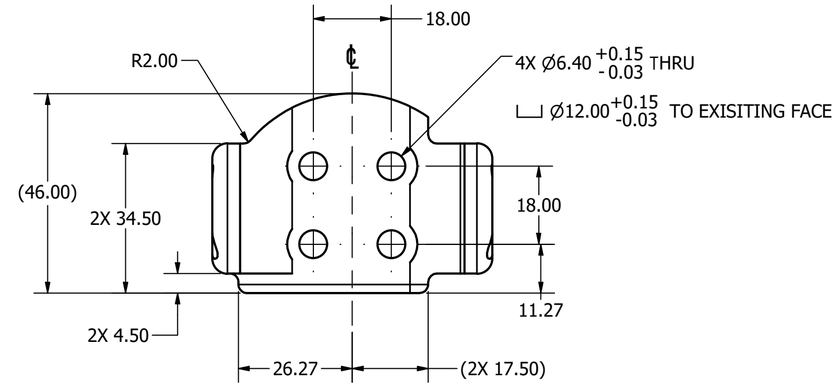
VEHICLE RESEARCH and TEST CENTER

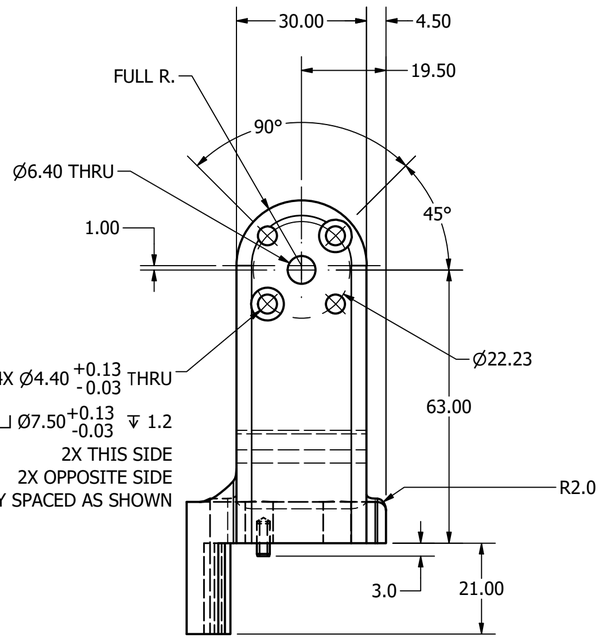
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

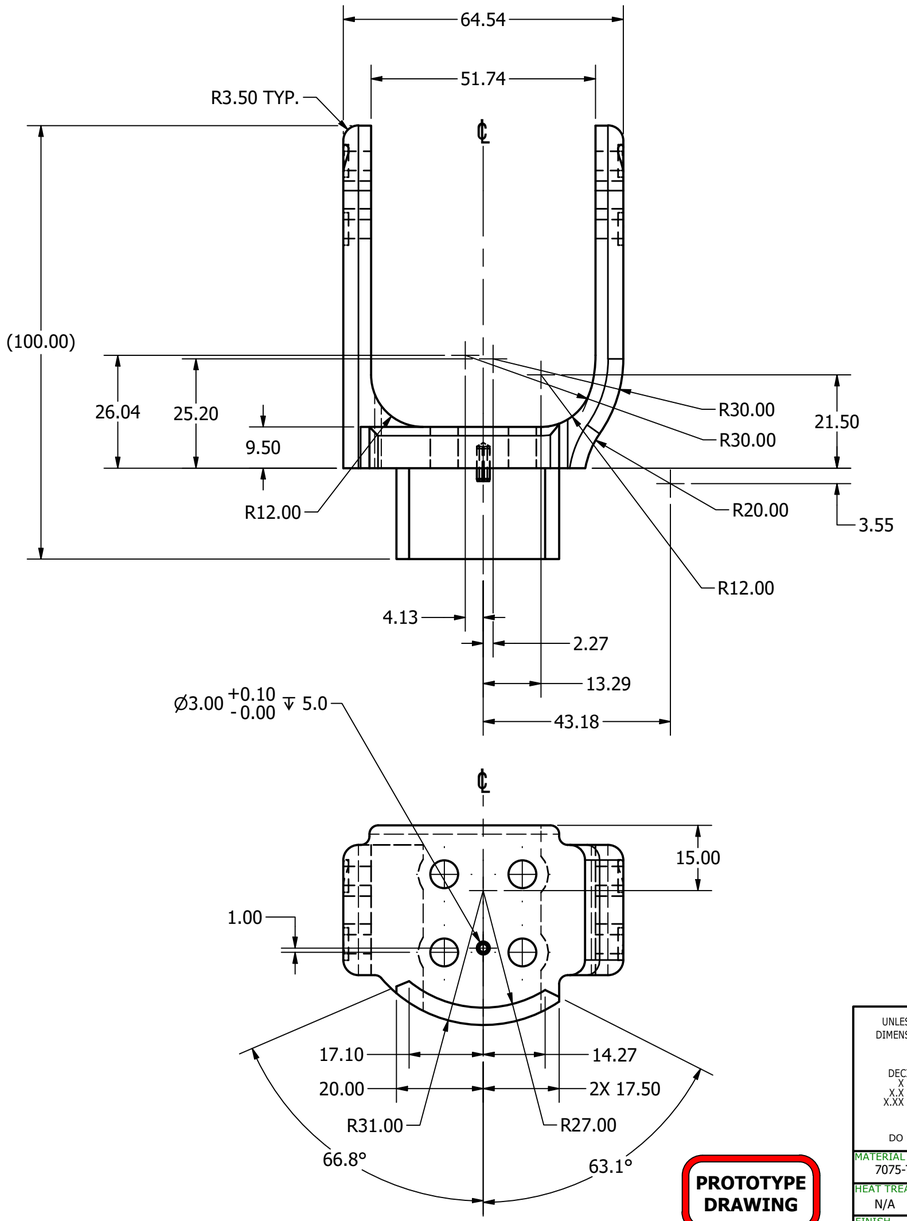
LOWER TIBIA SHAFT, LEFT
THOR-05F

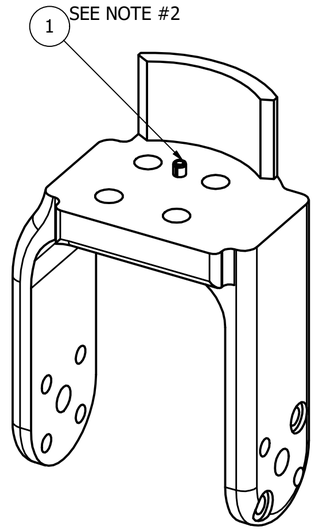
SIZE A1 | DRAWING NUMBER 474-5540-1 | REV 5
THIRD ANGLE PROJECTION | SCALE: 1 : 1 | SHEET 1 OF 1

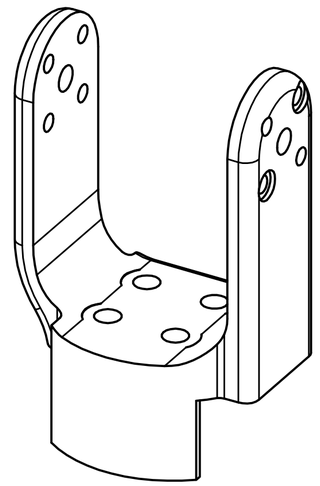
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	HF	DJI	12/21/2021











NOTES:

1. DIMENSIONS ARE SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE NOTED.
2. INSTALL ROLL PIN AFTER ANODIZE.

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5000195	M3 X 8 LG. ROLL PIN SS

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ✓ | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

APPROVALS	DATE
DRAWN: disopi	4/12/2016
CHECKED	
ENG	
APPROVED	

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

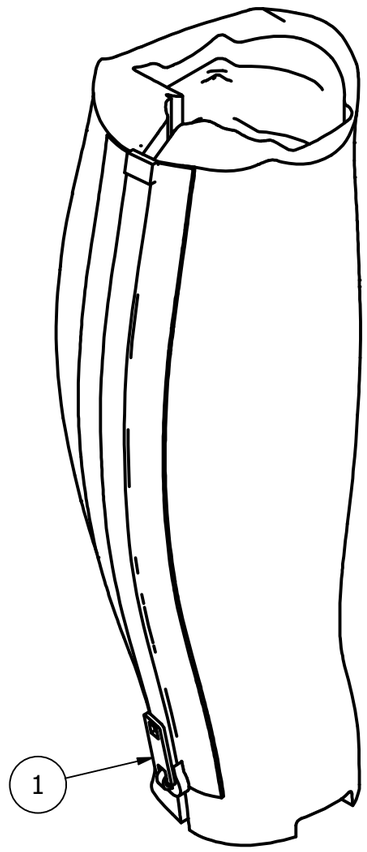
KNEE CLEVIS, LEFT

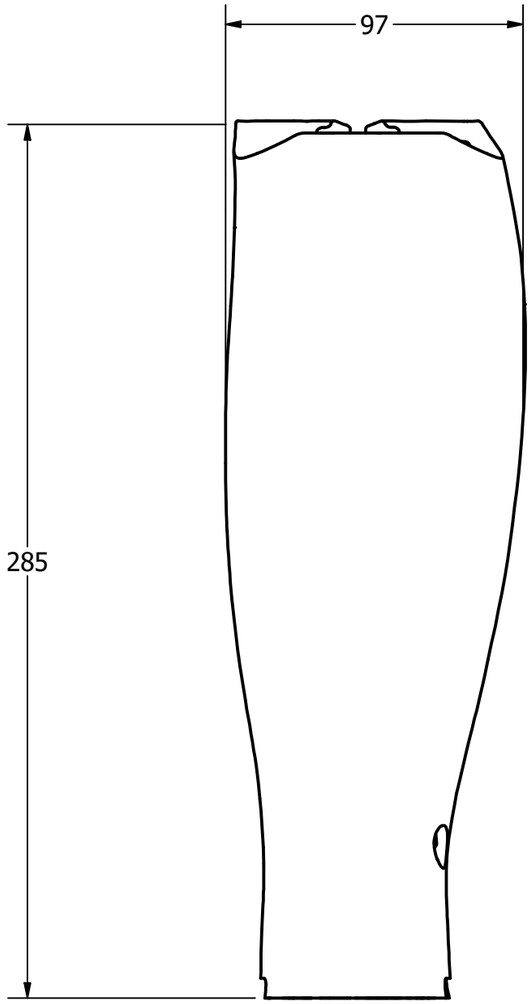
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-5517-1 | REV: 2

SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	PROTOTYPE	HEC	DJI	8/22/2023







NOTES:

1. MATERIAL: SKIN: PVC
   COLOR: EURO BROWN

2. REMOVE ALL MOLD FLASHING

3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm, UNLESS OTHERWISE NOTED.

4. GLUE ZIPPER ASSEMBLY TO FLESH AS SHOWN.

5. WEIGHT: TBD

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-5521	ZIPPER ASSEMBLY, LOWER LEG

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. KIMES	7/31/2020
CHECKED	
ENG	
APPROVED	

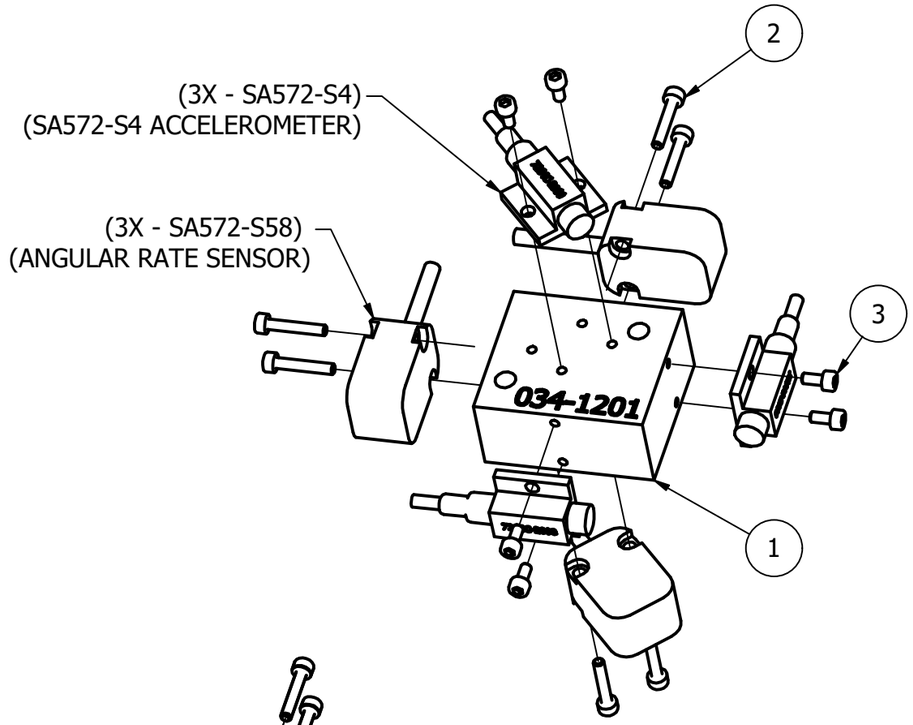
MATERIAL: SEE NOTES
HEAT TREAT: N/A
FINISH: N/A

LOWER LEG FLESH (RIBBED), LEFT
THOR-05F

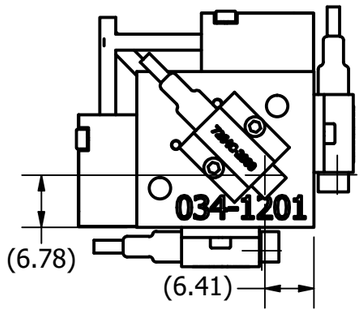
THIRD ANGLE PROJECTION

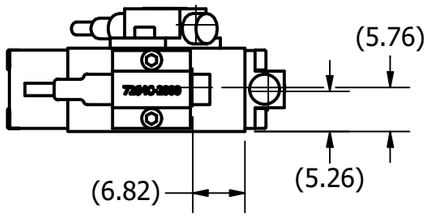
SIZE: A3 | DRAWING NUMBER: 483-5521-1 | REV: 5
SCALE: .5:1 | SHEET: 1 OF 1

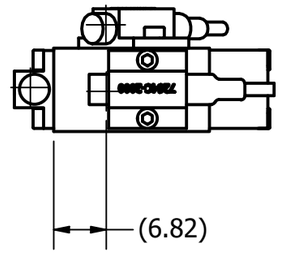
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	DJI	DJI	8/8/2023

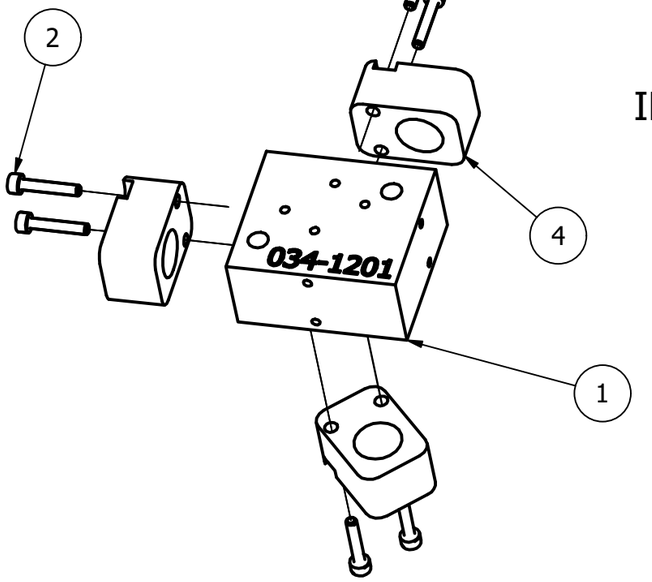


INSTRUMENTED VIEW









SR VIEW

NOTES:

1. 2X 034-1201 ARE SUPPLIED SO THAT ONE CAN BE USED FOR SR ASSEMBLY AND THE OTHER CAN BE USED FOR THE INSTRUMENTED ASSEMBLY.
2. 6X 5000068 ARE NOT NEEDED FOR SR ASSEMBLY AND WILL REMAIN ON THE INSTRUMENTED ASSEMBLY.

ITEM	QTY	PART NUMBER	DESCRIPTION
4	3	477-3605	ARS S.R.
3	6	5000068	M1.4 X 0.3 X 3 LG. SHCS
2	12	5000727	M1.4 X 0.3 X 8 LG. SHCS
1	2	034-1201	6 AXIS ACCEL/ARS MOUNT

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN jhaefner	5/16/2016
CHECKED	
ENG DJI	8/8/2023
APPROVED	

MATERIAL
HEAT TREAT
FINISH

KIT, 7264C/ARS, LEFT FOOT

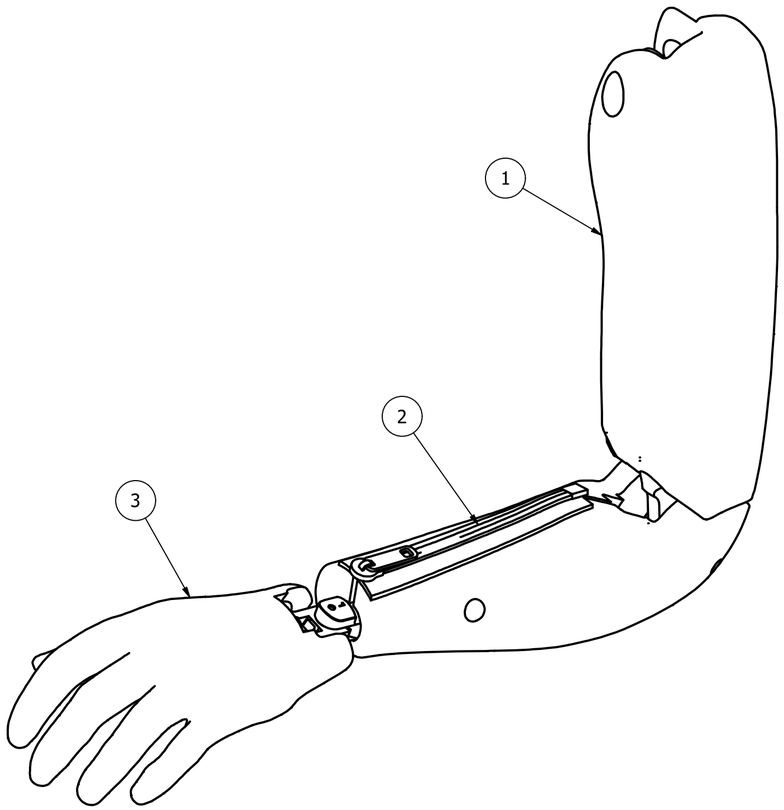
THOR-05F

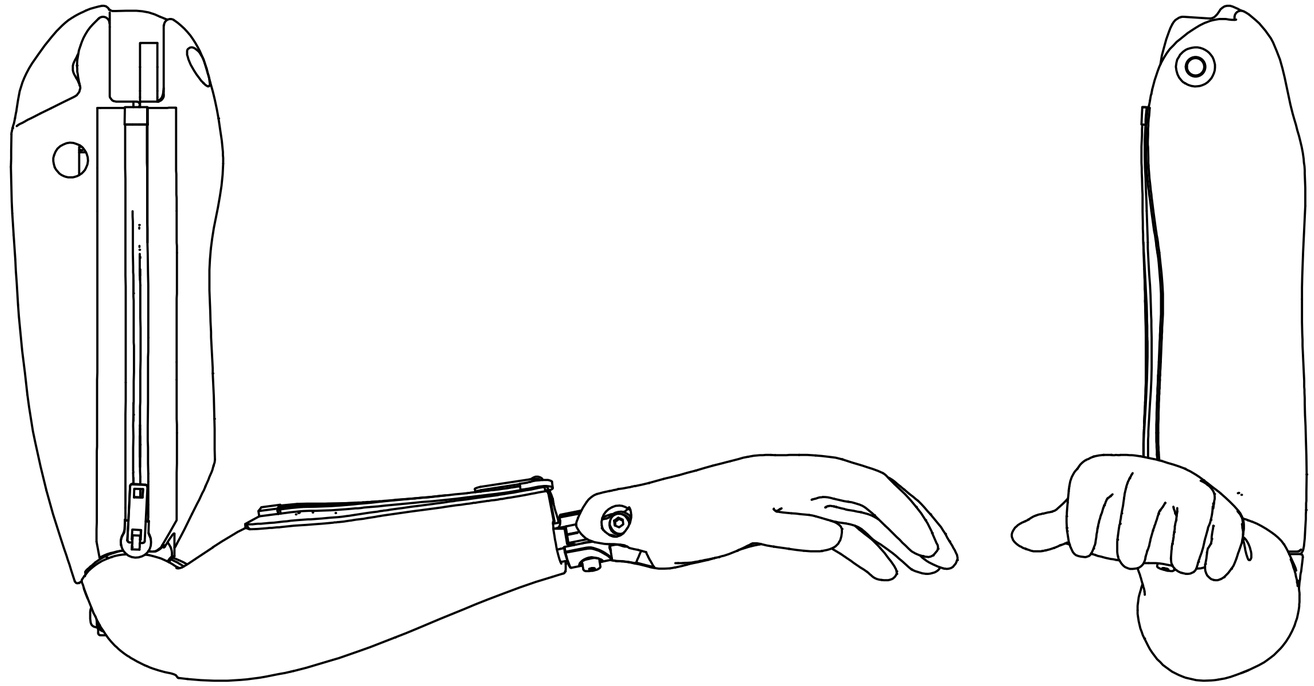
THIRD ANGLE PROJECTION

SIZE A3 | DRAWING NUMBER 474-5728-1 | REV 3

SCALE: 1.25 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	HEC	8/3/2023





ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	474-6900-1	HAND, MOLDED, LEFT
2	1	474-6500-1	LOWER ARM ASSEMBLY, LEFT
1	1	484-6100-1	UPPER ARM ASSEMBLY, LEFT

PARTS LIST

This design includes features covered by U.S. Patent Nos. 9,514,659 and 9,799,234 (upper arm assembly and shoulder assembly for crash test dummy), which is owned by Humanetics and its affiliated companies. No license is being granted to this patent and third parties are not authorized to make, use, sell, import, or export any products (physical or virtual) that practice the invention covered by this patent, or other patents owned by Humanetics. However, if a third party is interested in obtaining rights to the design, they are to contact Humanetics to discuss license terms.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: B. KIMES	4/28/2023
CHECKED	
ENG	
APPROVED	

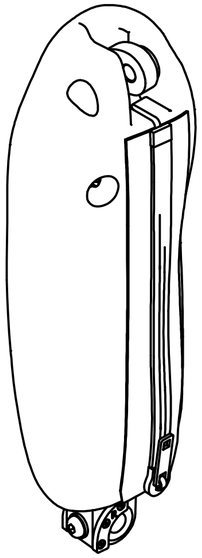
MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

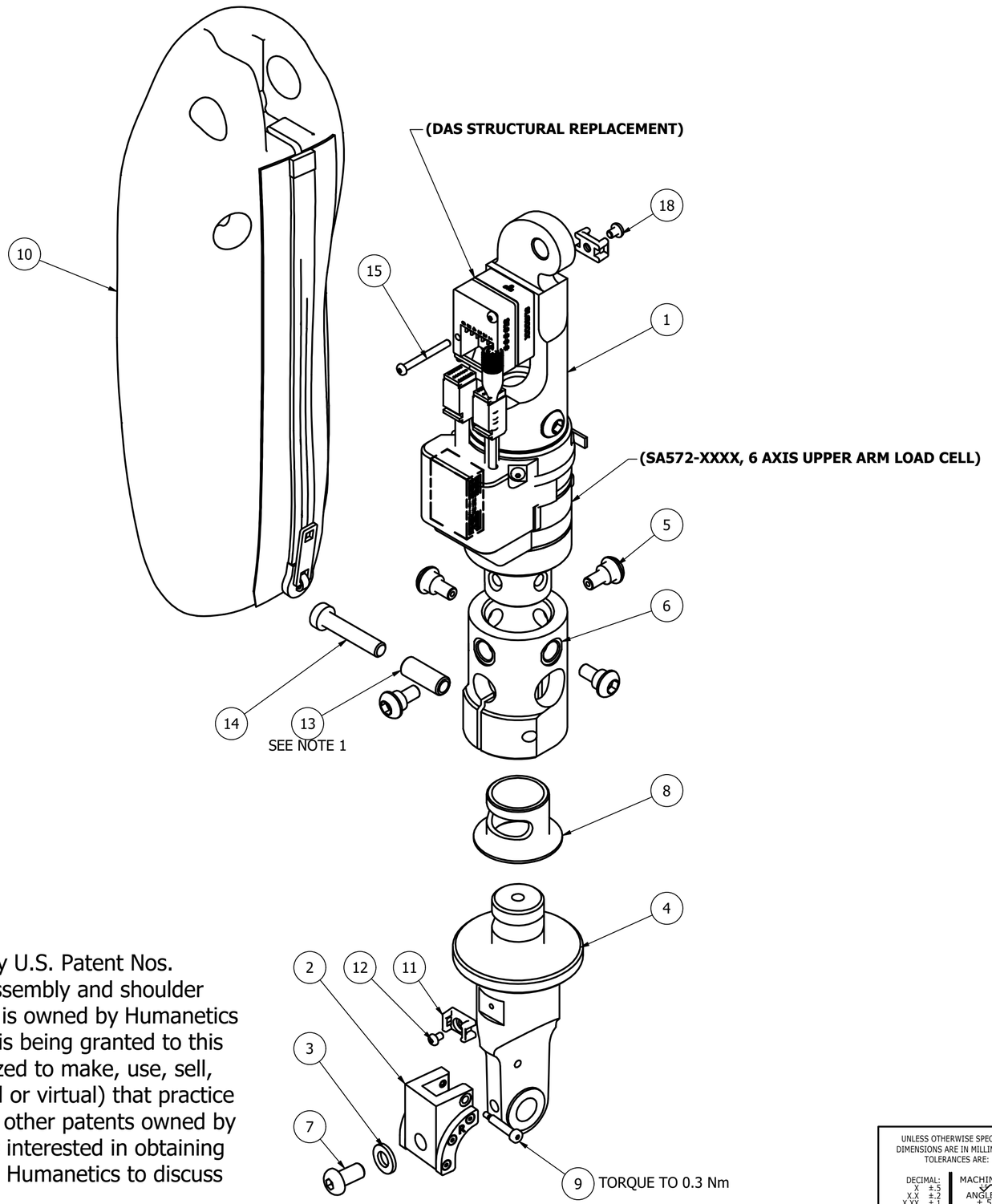
LEFT ARM ASSEMBLY
THOR 05F

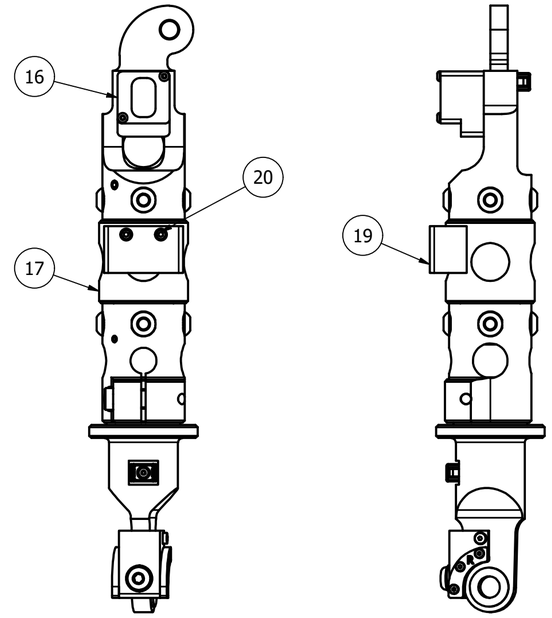
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-6000-1-A | REV: 1
SCALE: .5 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	MJS	8/9/2023







STRUCTURAL REPLACEMENT VIEW
FLESH HIDDEN

ITEM	QTY	PART NUMBER	DESCRIPTION
20	2	5000456	M2.5 X 0.45 X 10 LG. SHCS
19	1	484-6113	S.R., STRAIN RELIEF
18	1	5001067	M3 X 0.5 X 4 LG. BHCS
17	1	484-6106	S.R., UPPER ARM L.C.
16	1	481-3602	DAS AND INTERFACE/6DOF S.R.
15	2	5001325	M2.5 X 0.45 X 25 LG. BHCS
14	1	5001443	M6 X 1 X 30 LG. LHCS
13	1	474-6111	SLEEVE, ARM BOLT
12	1	5001305	M2.5 X 0.45 X 4 LG. BHCS
11	2	6002036	CABLE TIE MOUNT, #4 SCREW
10	1	484-6120-1	UPPER ARM FLESH, LEFT
9	1	5001372	3 X 14 LG. PREC. SHSS SS
8	1	474-6121	ARM ROTATION BRUSHING
7	1	5000356	M6 X 1 X 12 LG. BHCS
6	1	484-6112	UPPER ARM LOAD CELL ADAPTER
5	8	W50-61042	MODIFIED BHSS M6 THREAD
4	1	474-6115-1	DISTAL UPPER ARM TUBE ASSEMBLY, LEFT
3	1	6003562	M6 FLAT WASHER PLAIN NYLON
2	1	474-6116-A	ELBOW FRICTION PLATE ASSY
1	1	484-6110-1	DISTAL UPPER ARM TUBE, LEFT

PARTS LIST

This design includes features covered by U.S. Patent Nos. 9,514,659 and 9,799,234 (upper arm assembly and shoulder assembly for crash test dummy), which is owned by Humanetics and its affiliated companies. No license is being granted to this patent and third parties are not authorized to make, use, sell, import, or export any products (physical or virtual) that practice the invention covered by this patent, or other patents owned by Humanetics. However, if a third party is interested in obtaining rights to the design, they are to contact Humanetics to discuss license terms.

NOTES:

1. BOND 5001443 TO 474-6111

SCALE .75 : 1

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. Kimes	5/10/2019
CHECKED	
ENG	
APPROVED	

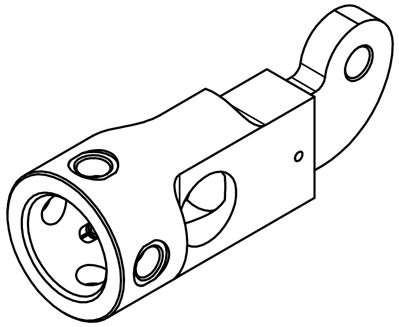
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

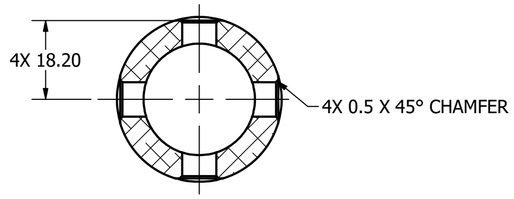
UPPER ARM ASSEMBLY, LEFT
THOR-05F

THIRD ANGLE PROJECTION

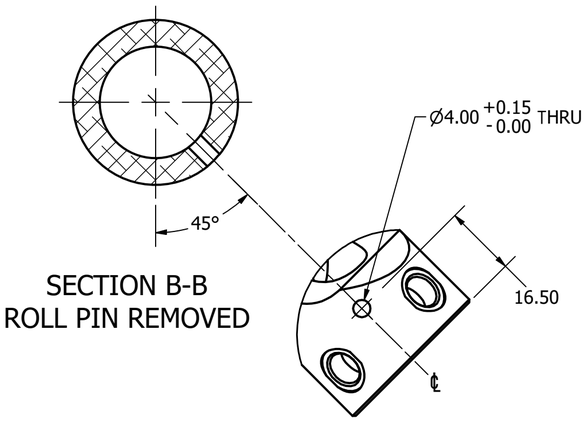
SIZE: A2 | DRAWING NUMBER: 484-6100-1 | REV: 2
SCALE: .5:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	MJS	5/9/2019

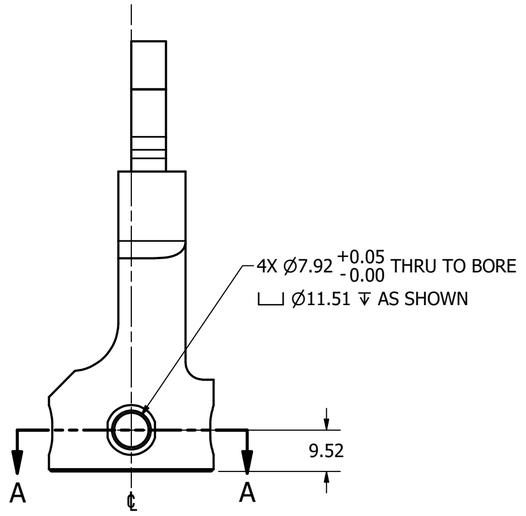


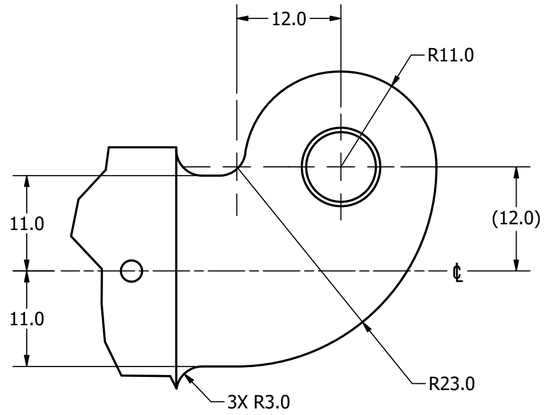


SECTION A-A

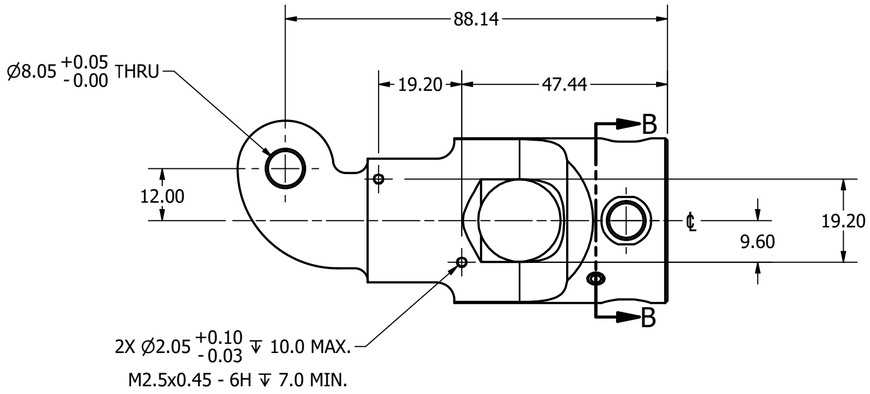


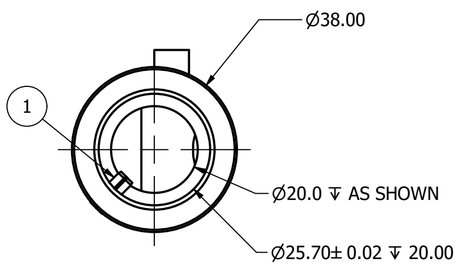
SECTION B-B
ROLL PIN REMOVED

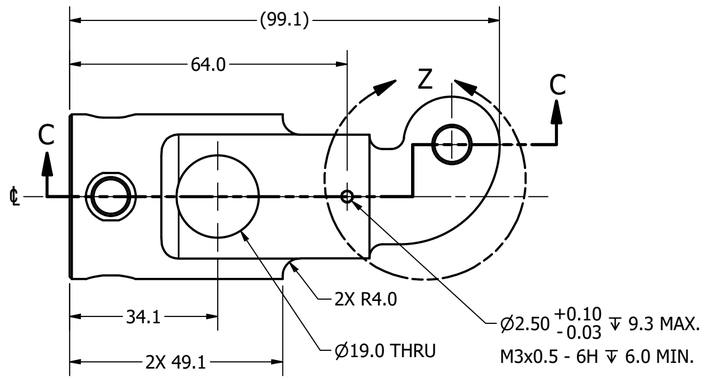


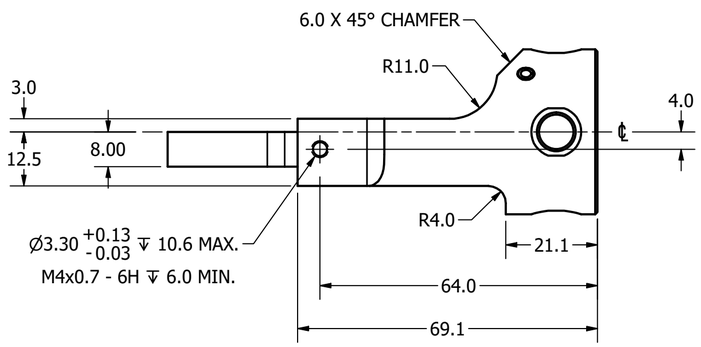


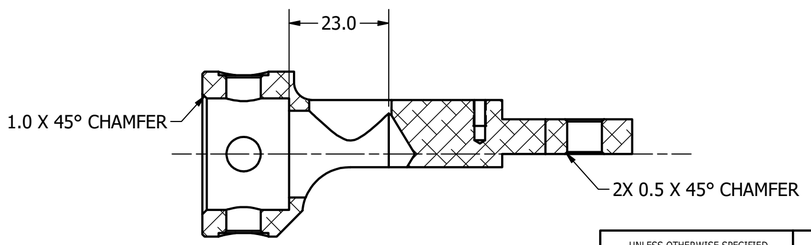
DETAIL Z
SCALE 2 : 1











SECTION C-C

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5000182	M4 X 10 LG. ROLL PIN

PARTS LIST

NOTES:
1. INSTALL ROLL PIN FLUSH OR BELOW OUTER SURFACE AFTER PLATING.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: 0.008 ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	5/9/2019
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DISTAL UPPER ARM TUBE, LEFT

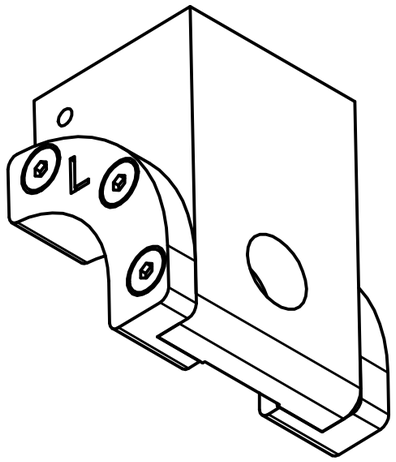
THOR-05F

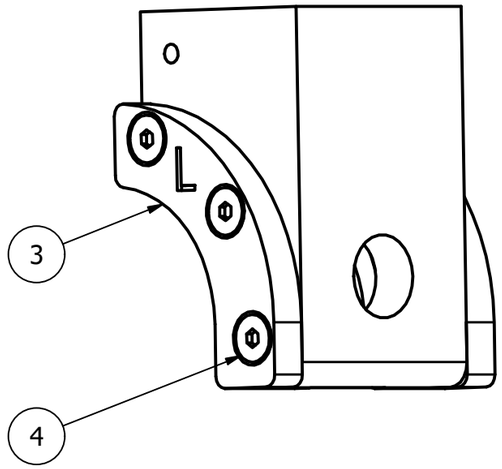
THIRD ANGLE PROJECTION

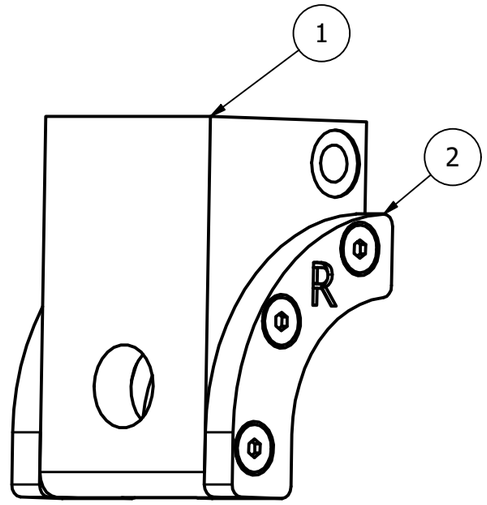
SIZE: A2 | DRAWING NUMBER: 484-6110-1 | REV: 1

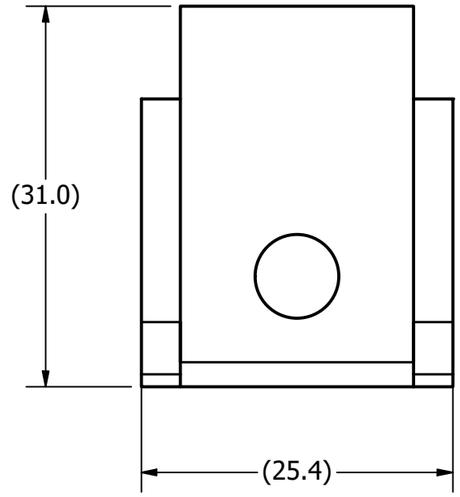
SCALE: 1:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	HEC	4/19/2023









ITEM	QTY	PART NUMBER	DESCRIPTION
4	6	5000469	M2 X 0.4 X 6 LG. FHCS
3	1	474-6123-1-A	ELBOW FRICTION PLATE, LEFT
2	1	474-6123-2-A	ELBOW FRICTION PLATE, RIGHT
1	1	474-6124-A	ELBOW FRICTION PLATE, MAIN

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	hfenn	8/16/2022
CHECKED		
ENG	hfenn	8/16/2022
APPROVED		

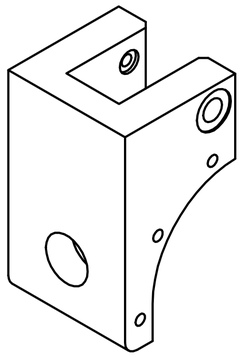
MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

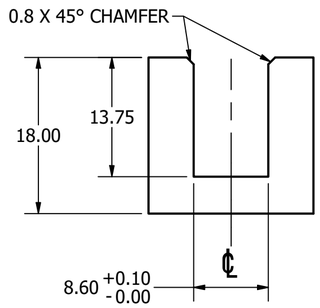
ELBOW FRICTION PLATE ASSY
THOR-05F

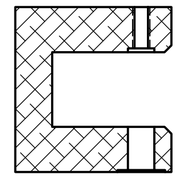
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-6116-A | REV: 2
SCALE: 2 : 1 | SHEET: 1 OF 1

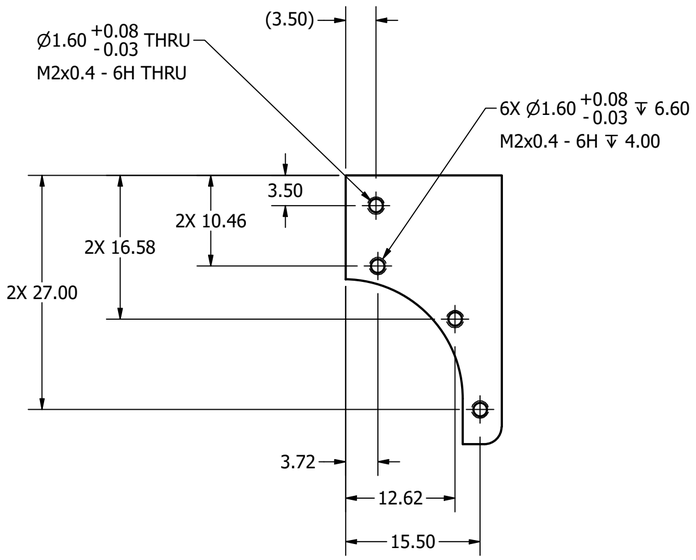
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	HEC	4/19/2023

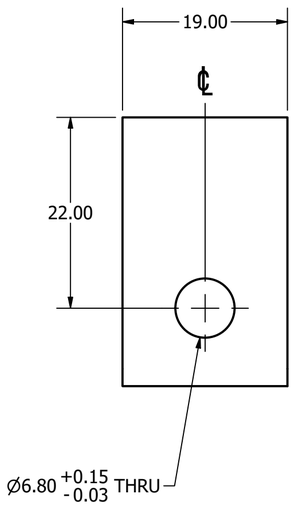


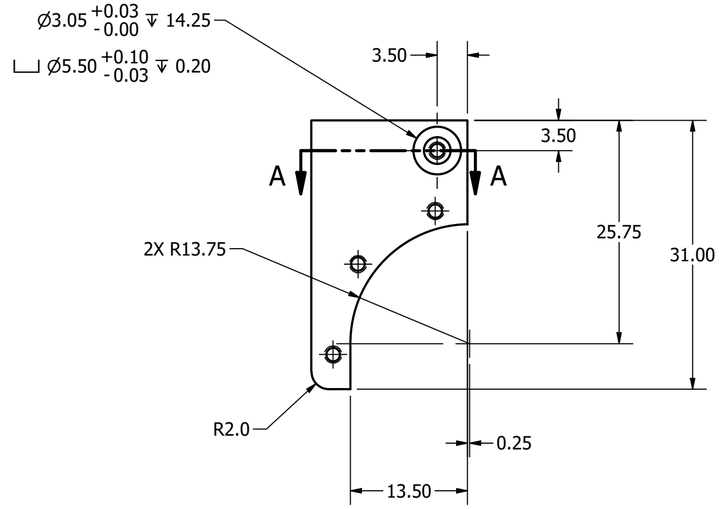




SECTION A-A
SCALE 2 : 1







NOTES:

1. ALL DIMENSIONS ARE SYMMETRICAL ABOUT ℄, UNLESS OTHERWISE SPECIFIED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: hfenn	8/16/2022
CHECKED:	
ENG: hfenn	8/16/2022
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

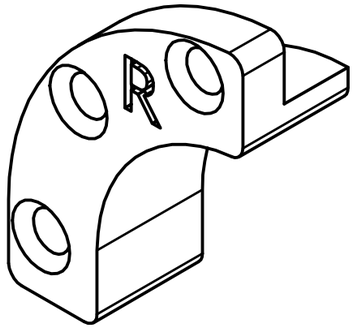
ELBOW FRICTION PLATE, MAIN
THOR-05F

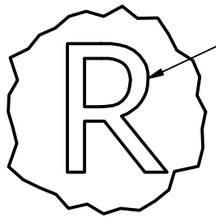
THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A2	474-6124-A	2

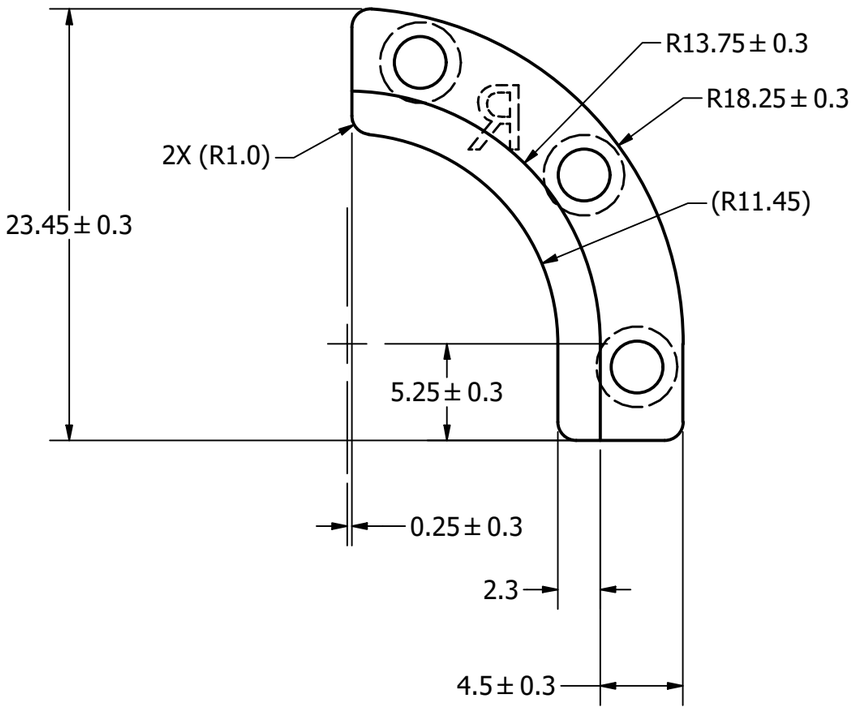
SCALE: 2 : 1 | SHEET 1 OF 1

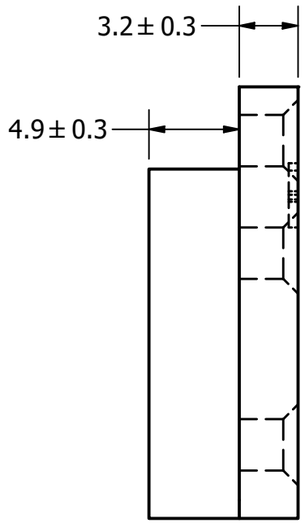
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	HEC	DJI	8/18/2022

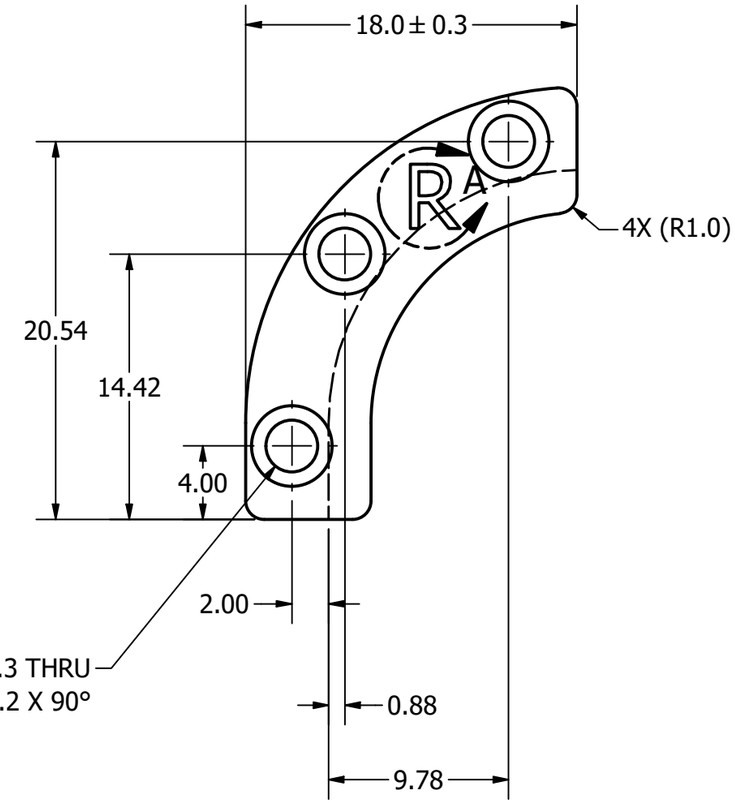




DETAIL A
SCALE 6 : 1







NOTES:
1. MATERIAL: 3D PRINTED NYLON
   COLOR: BLACK
2. "R" PRINTED 0.5MM DEEP.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: hfenn	8/18/2022
CHECKED:	
ENG: hfenn	8/18/2022
APPROVED:	

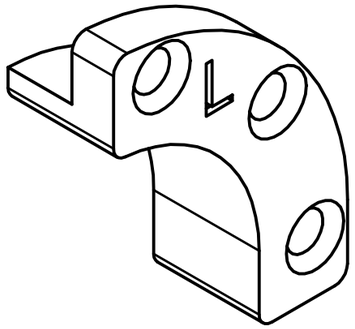
MATERIAL: SEE NOTE 1
HEAT TREAT: N/A
FINISH: N/A

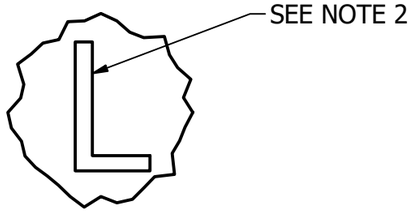
ELBOW FRICTION PLATE, RIGHT
THOR-05F

THIRD ANGLE PROJECTION

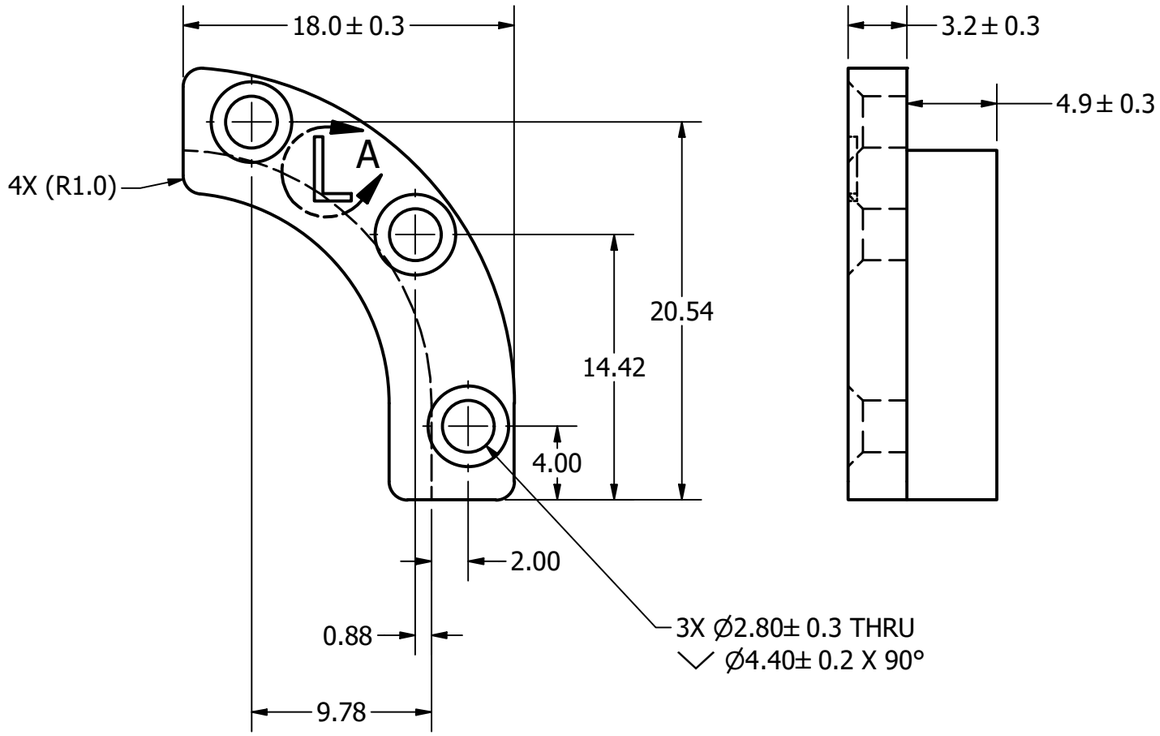
SIZE: A3 | DRAWING NUMBER: 474-6123-2-A | REV: 1
SCALE: 3 : 1 | SHEET: 1 OF 1

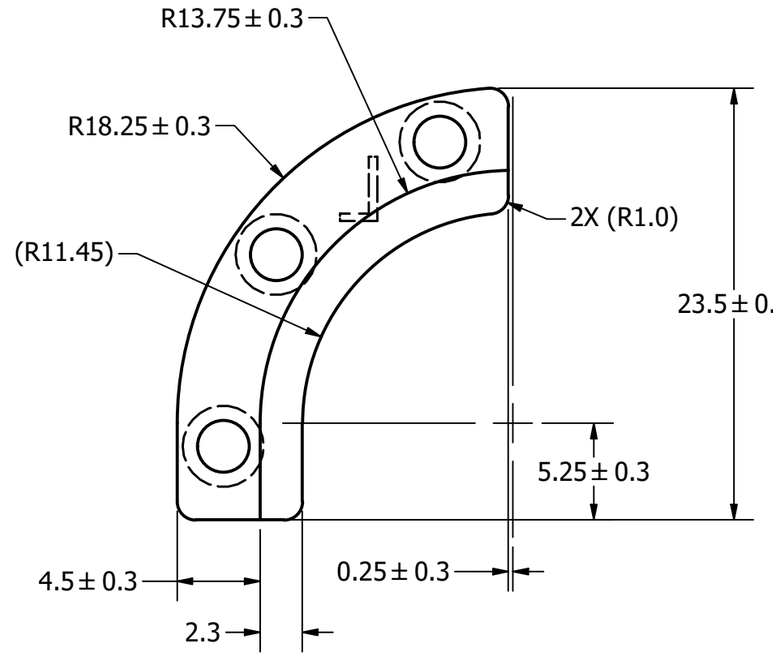
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	HEC	DJI	8/17/2022





DETAIL A
SCALE 6 : 1





NOTES:
1. MATERIAL: 3D PRINTED NYLON
   COLOR: BLACK
2. "L" PRINTED 0.5MM DEEP.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN hfenn	8/17/2022
CHECKED	
ENG hfenn	8/18/2022
APPROVED	

MATERIAL: SEE NOTE 1
HEAT TREAT: N/A
FINISH: N/A

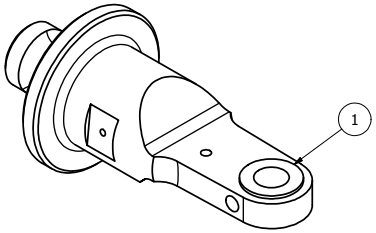
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

ELBOW FRICTION PLATE, LEFT
THOR-05F

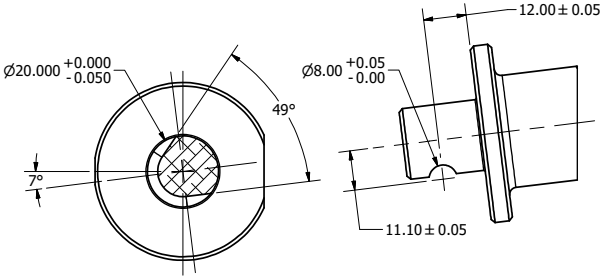
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-6123-1-A | REV: 1
SCALE: 3 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	RELEASE FOR PROTOTYPE	AB	JW	04/20/2017



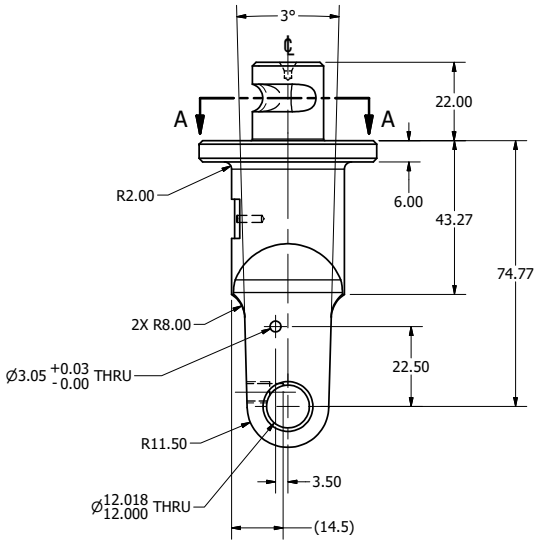
SEE NOTE 1

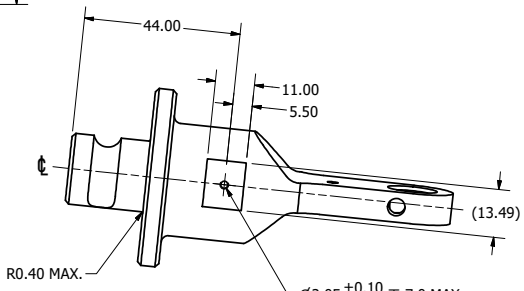


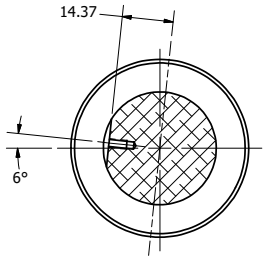
SECTION A-A



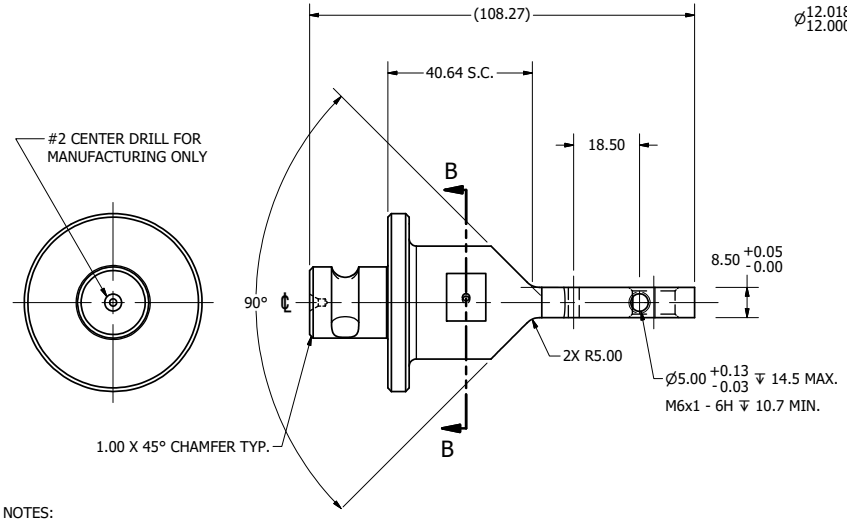
SECTION C-C

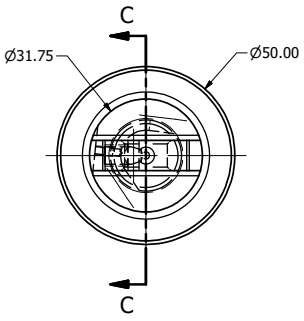






SECTION B-B





NOTES:

1. INSTALL BEARING AFTER ANODIZE.
2. UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE SYMMETRICAL ABOUT ℄.

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6004600	BEARING, FLANGE, 12mm OD X 10mm ID X 9mm LG

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT:
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	3/1/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

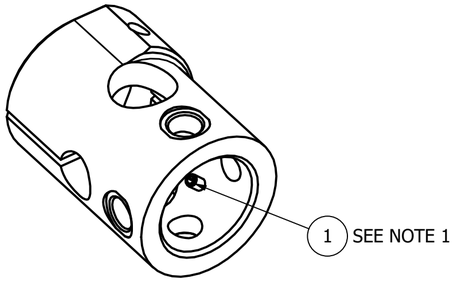
DISTAL UPPER ARM TUBE ASSEMBLY, LEFT

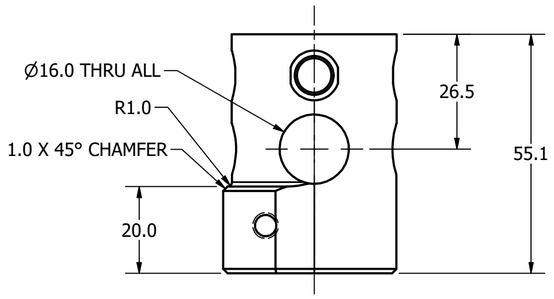
THIRD ANGLE PROJECTION

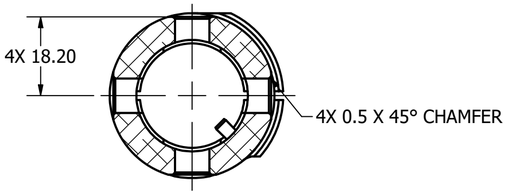
SIZE: A2 | DRAWING NUMBER: 474-6115-1 | REV: 3

SCALE: 1 : 1 | SHEET: 1 OF 1

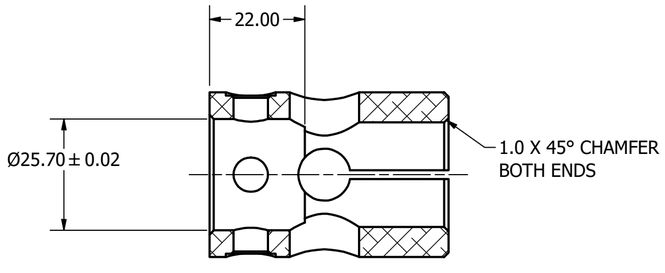
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	MJS	5/10/2019



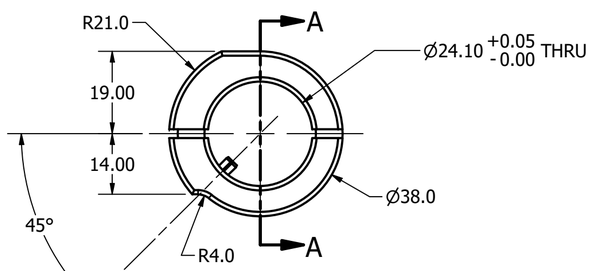


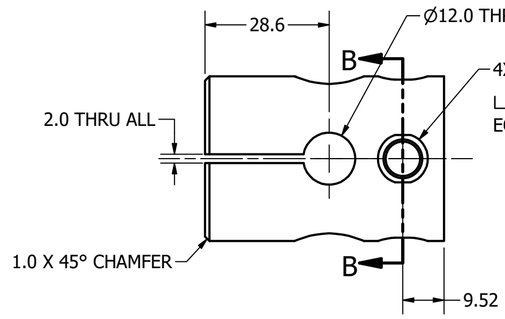


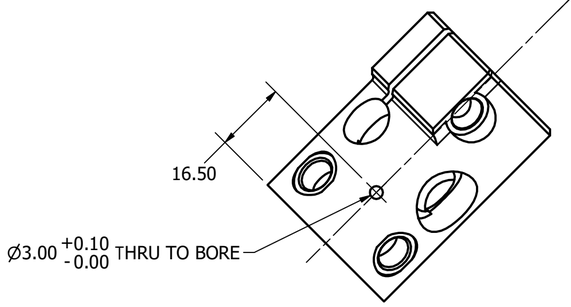
SECTION B-B



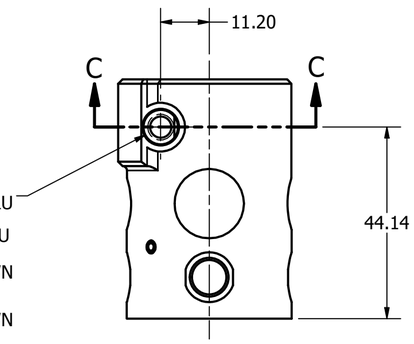
SECTION A-A

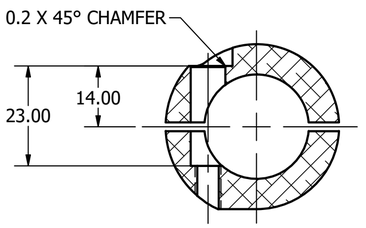






ROLL PIN HIDDEN





SECTION C-C

NOTES:

1. INSTALL FLUSH OR BELOW OUTSIDE SURFACE AFTER ANODIZE.

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5000199	M3 X 10 LG. ROLL PIN SS

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	5/10/2019
CHECKED	
ENG	
APPROVED	

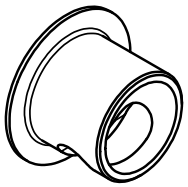
THIRD ANGLE PROJECTION

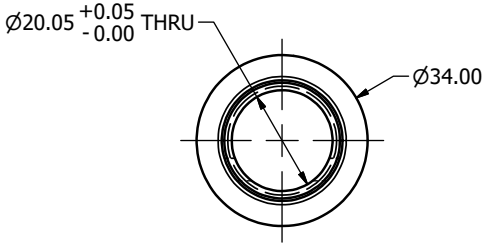
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

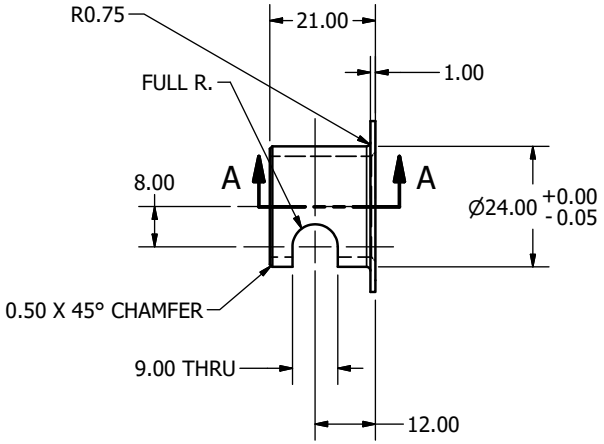
UPPER ARM LOAD CELL ADAPTER
THOR-05F

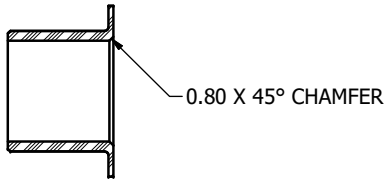
SIZE: A2 | DRAWING NUMBER: 484-6112 | REV: 1
SCALE: 1:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	RELEASE FOR PROTOTYPE	GCH		1/12/2017









SECTION A-A

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Acetal Resin, Black
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN ghayden	2/25/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

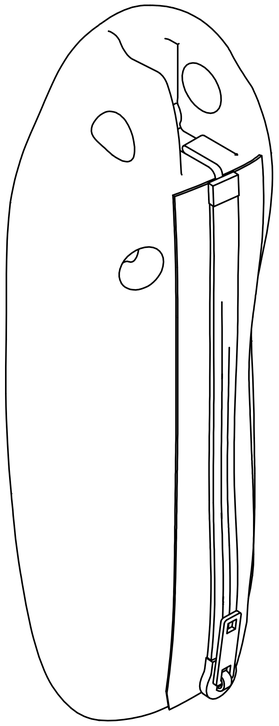
ARM ROTATION BRUSHING

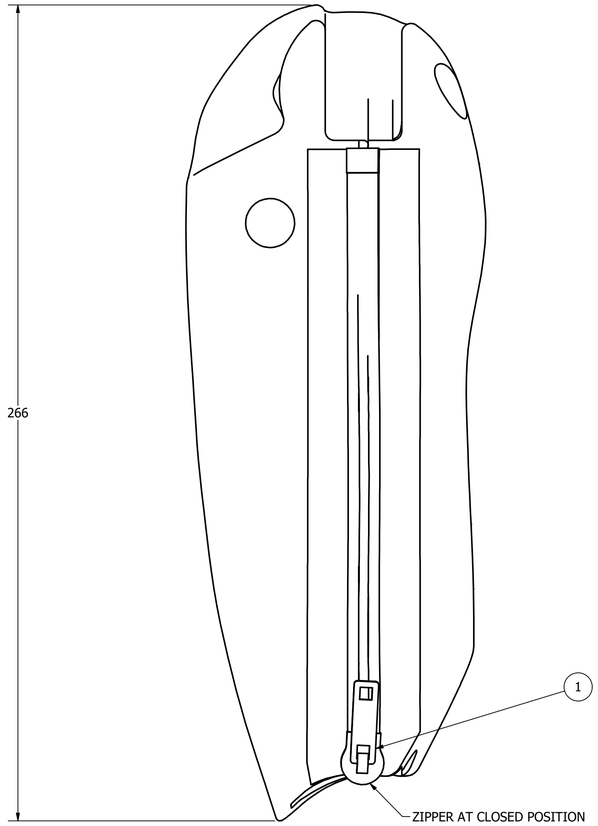
THIRD ANGLE PROJECTION

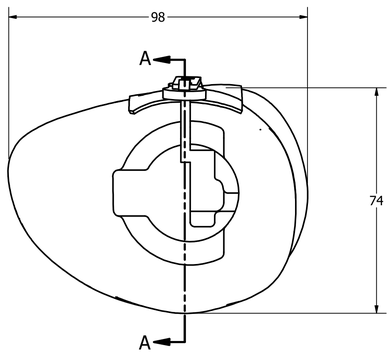
SIZE: A3 | DRAWING NUMBER: 474-6121 | REV: 2

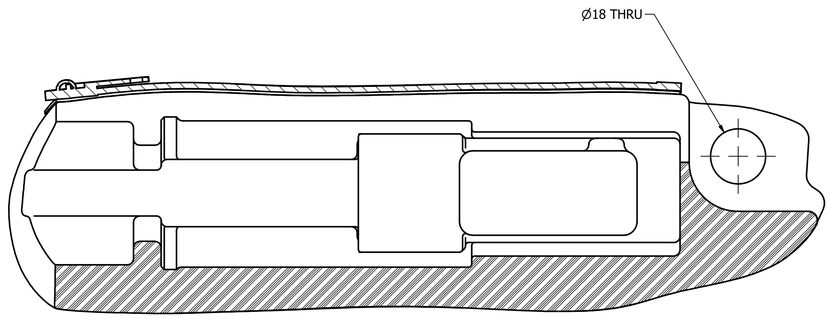
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	AB	MJS	09/22/2022









SECTION A-A

NOTES:

1. MATERIAL: PVC, 52EB
   COLOR: EURO BROWN
   DUROMETER: 30±5 SHORE A

2. REMOVE ALL MOLD FLASHING

3. ALL MOLD DIMENSION TOLERANCE +1%/-4% BUT NO SMALLER THAN 1mm

4. WEIGHT: 435±22g

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-6122	ZIPPER ASSEMBLY, UPPER ARM

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMALS: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: B. KIMES	5/10/2019
CHECKED	
ENG	
APPROVED	

MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

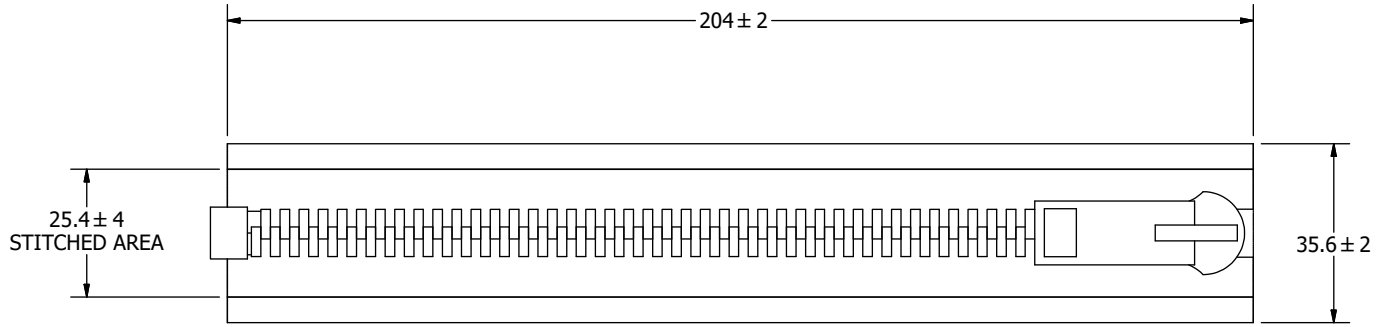
UPPER ARM FLESH, LEFT

THIRD ANGLE PROJECTION

SIZE: A1 | DRAWING NUMBER: 484-6120-1 | REV: 3

SCALE: 1:1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	RELEASE FOR PROTOTYPE	AB	JW	11/13/2018



NOTES:

1. ALL BLACK #5 ZIPPER

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: jmcinnis	3/2/2016
CHECKED:	
ENG:	
APPROVED:	

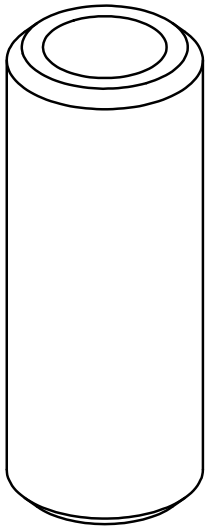
THIRD ANGLE PROJECTION

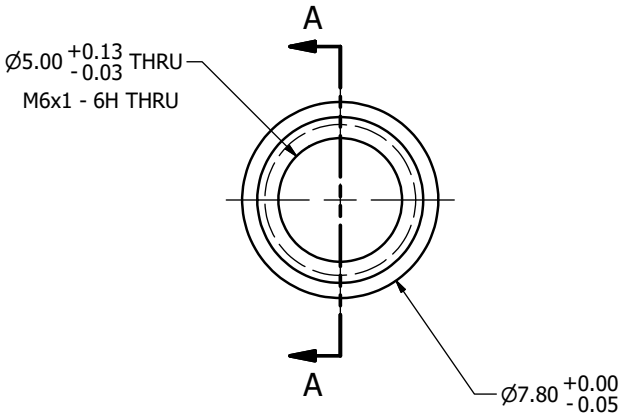
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

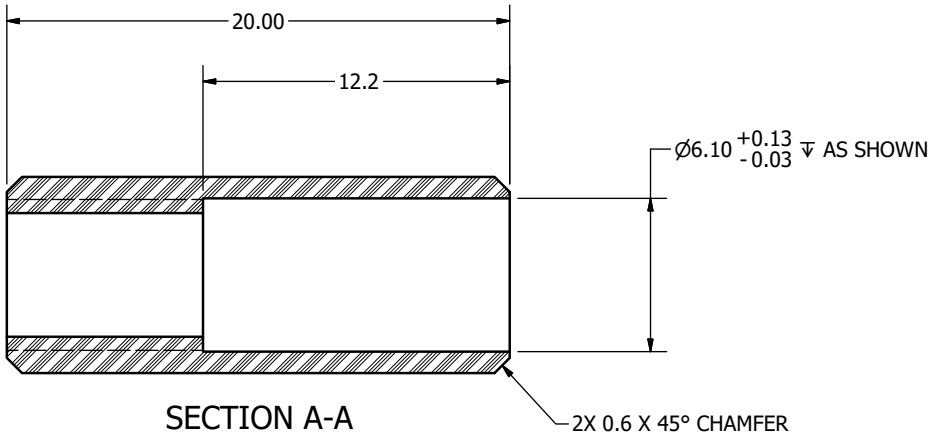
ZIPPER ASSEMBLY, UPPER ARM

SIZE: A3 | DRAWING NUMBER: 474-6122 | REV: 5
SCALE:
SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	RELEASE FOR PROTOTYPE	AB	KMSP	11/29/2018







SECTION A-A

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Acetal Resin, White
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	2/25/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

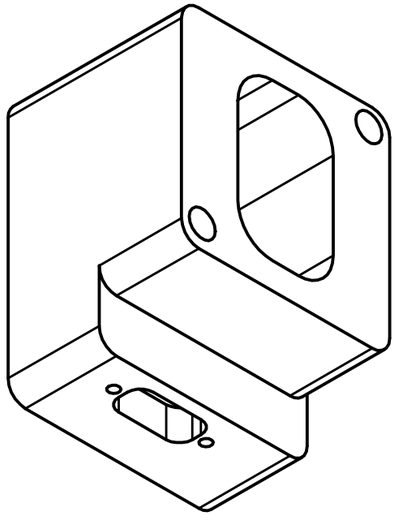
SLEEVE, ARM BOLT

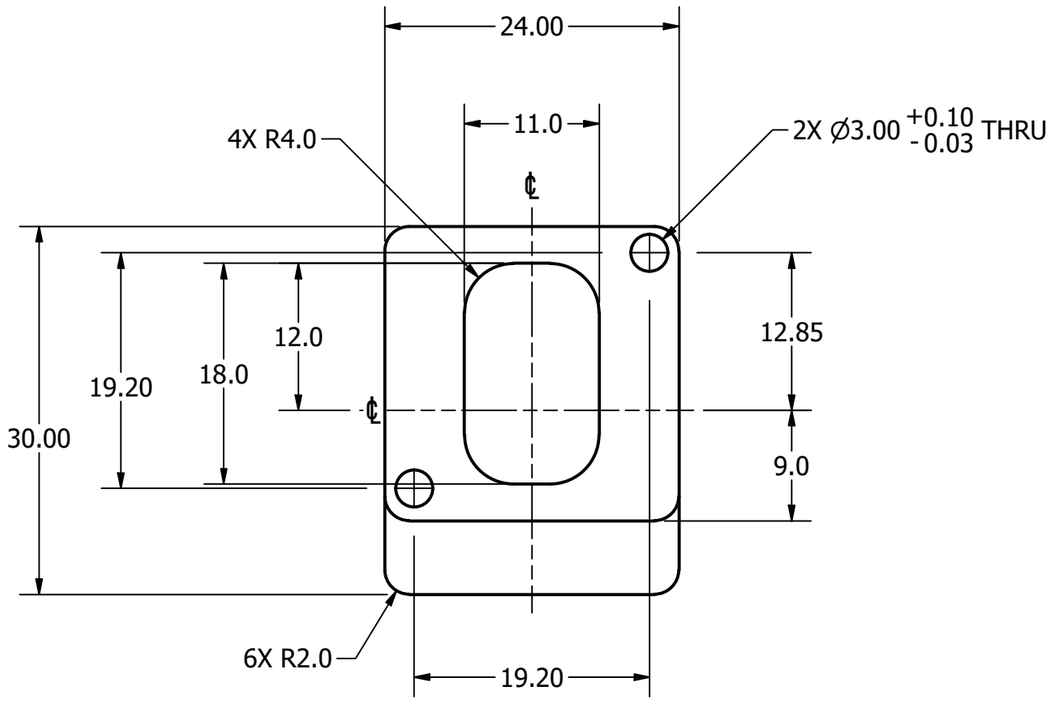
THIRD ANGLE PROJECTION

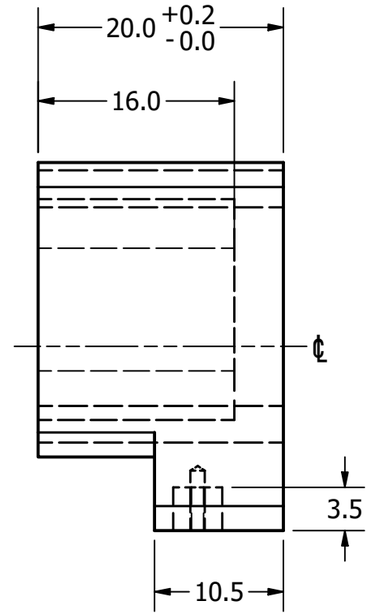
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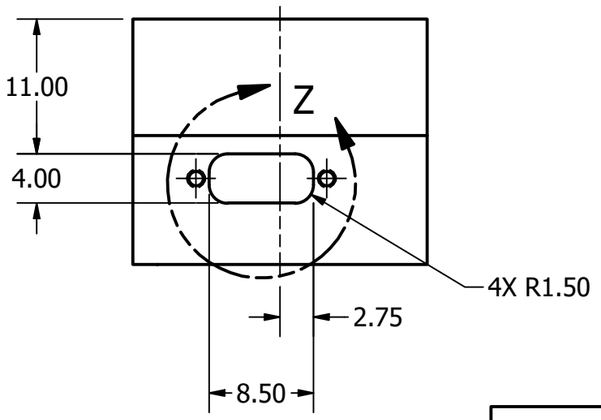
SCALE: 5:1 | SHEET: 1 OF 1

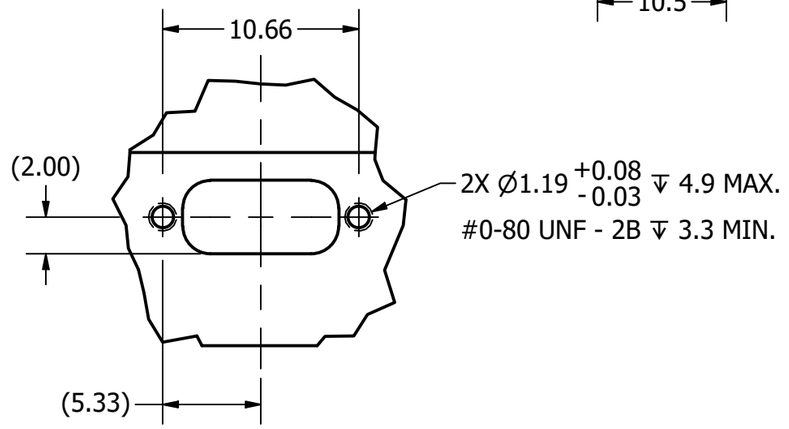
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	A	RELEASE TO PRODUCTION	BK	MJS	11/18/2019











DETAIL Z
SCALE 3 : 1

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.
2. S.R. WEIGHT APPROX. 27g (ADJUST 16.0 POCKET DEPTH IF NEEDED)

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	7075-T6 ALUMINUM	
HEAT TREAT	N/A	
FINISH	CLEAR ANODIZE	

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	7/9/2018
CHECKED	
ENG AJB	7/9/2018
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DAS AND INTERFACE/6DOF S.R.

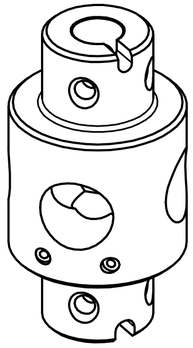
THOR-05F

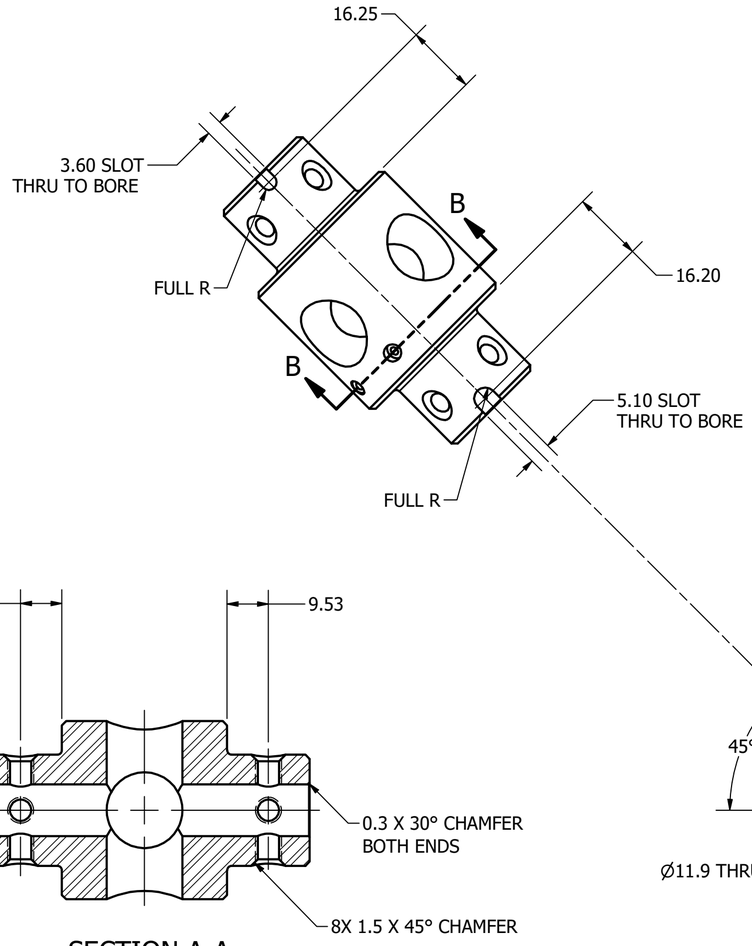
THIRD ANGLE PROJECTION

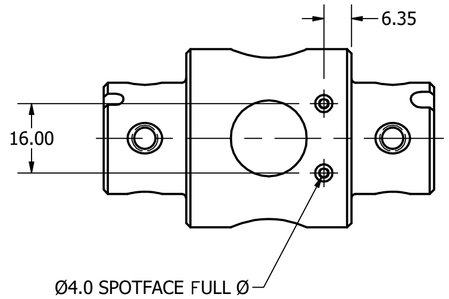
SIZE	DRAWING NUMBER	REV
A3	481-3602	A

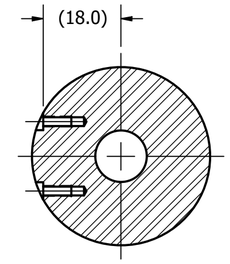
SCALE: 2 : 1 SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	SKK	MJS	11/22/2019

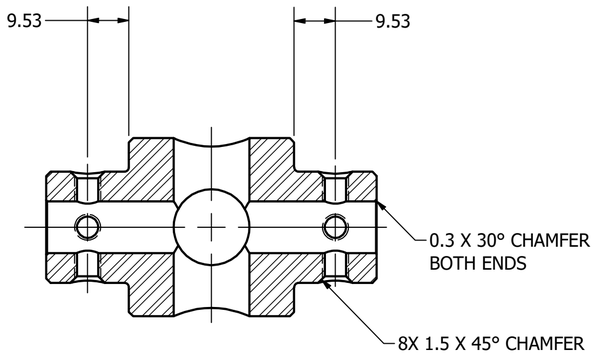




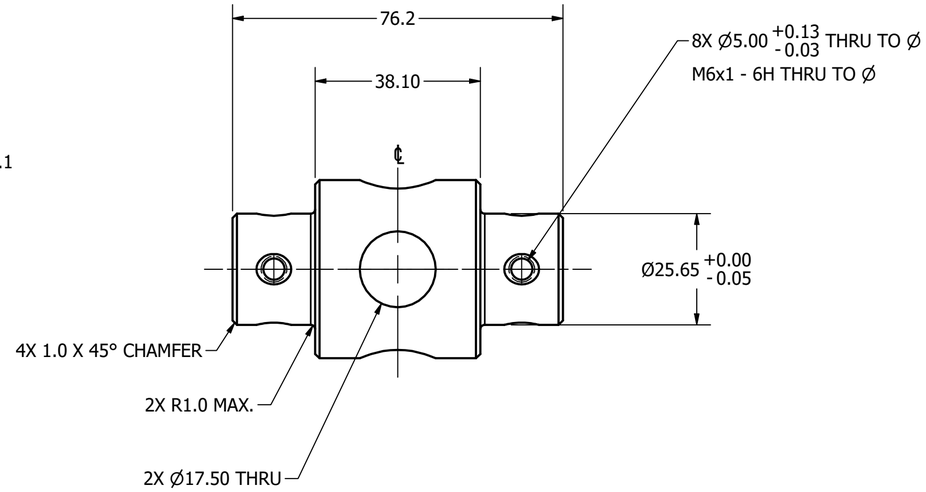




SECTION B-B



SECTION A-A



NOTES:

1. DIMENSIONS ARE SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 1018 STEEL
HEAT TREAT: N/A
FINISH: 0.008 ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	5/10/2019
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

S.R., UPPER ARM L.C.

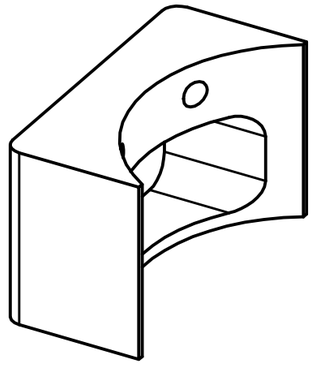
THOR-05F

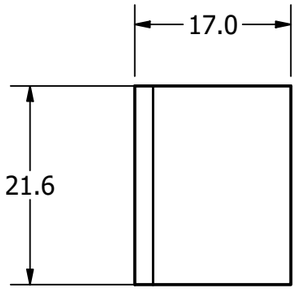
THIRD ANGLE PROJECTION

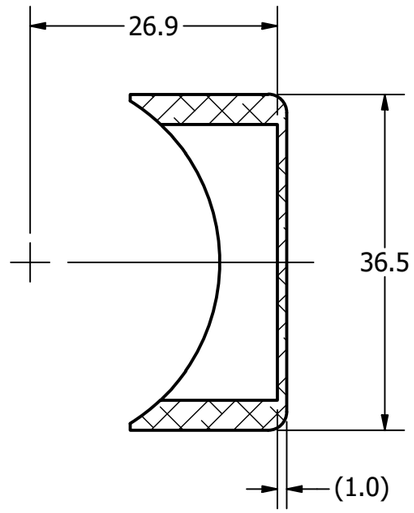
SIZE: A2 | DRAWING NUMBER: 484-6106 | REV: 2

SCALE: 1 : 1 | SHEET: 1 OF 1

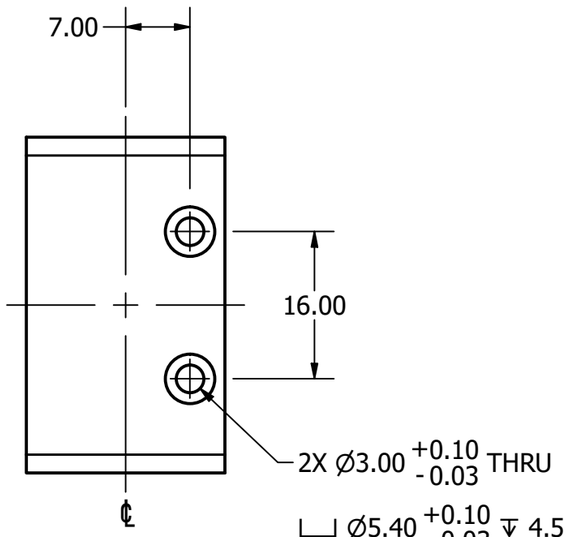
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	MJS	5/10/2019

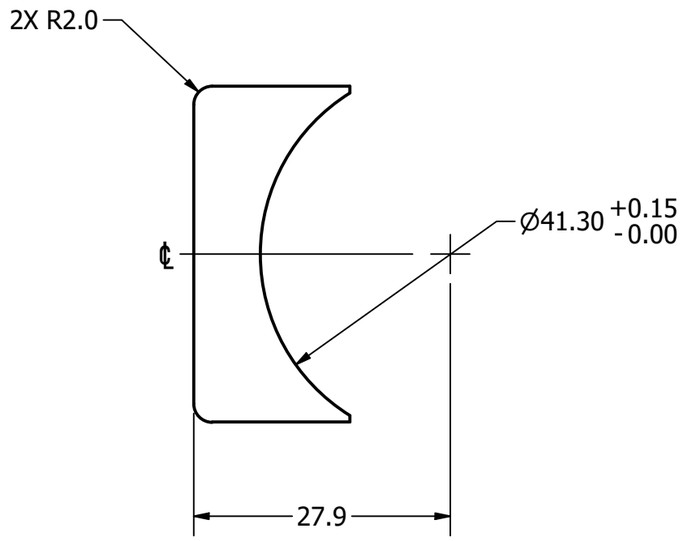


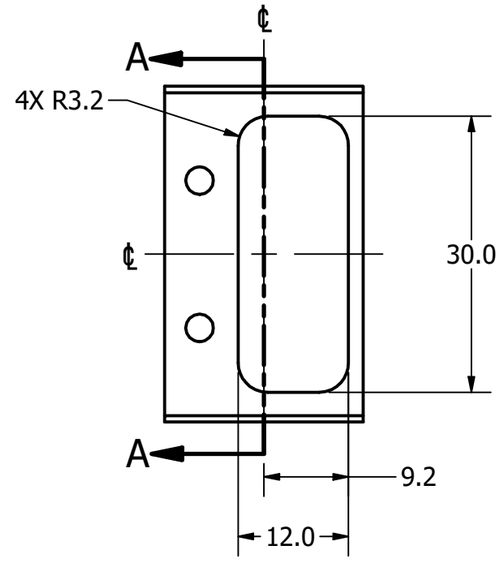




SECTION A-A







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	5/10/2019
CHECKED	
ENG MJS	6/4/2019
APPROVED	

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

THIRD ANGLE PROJECTION

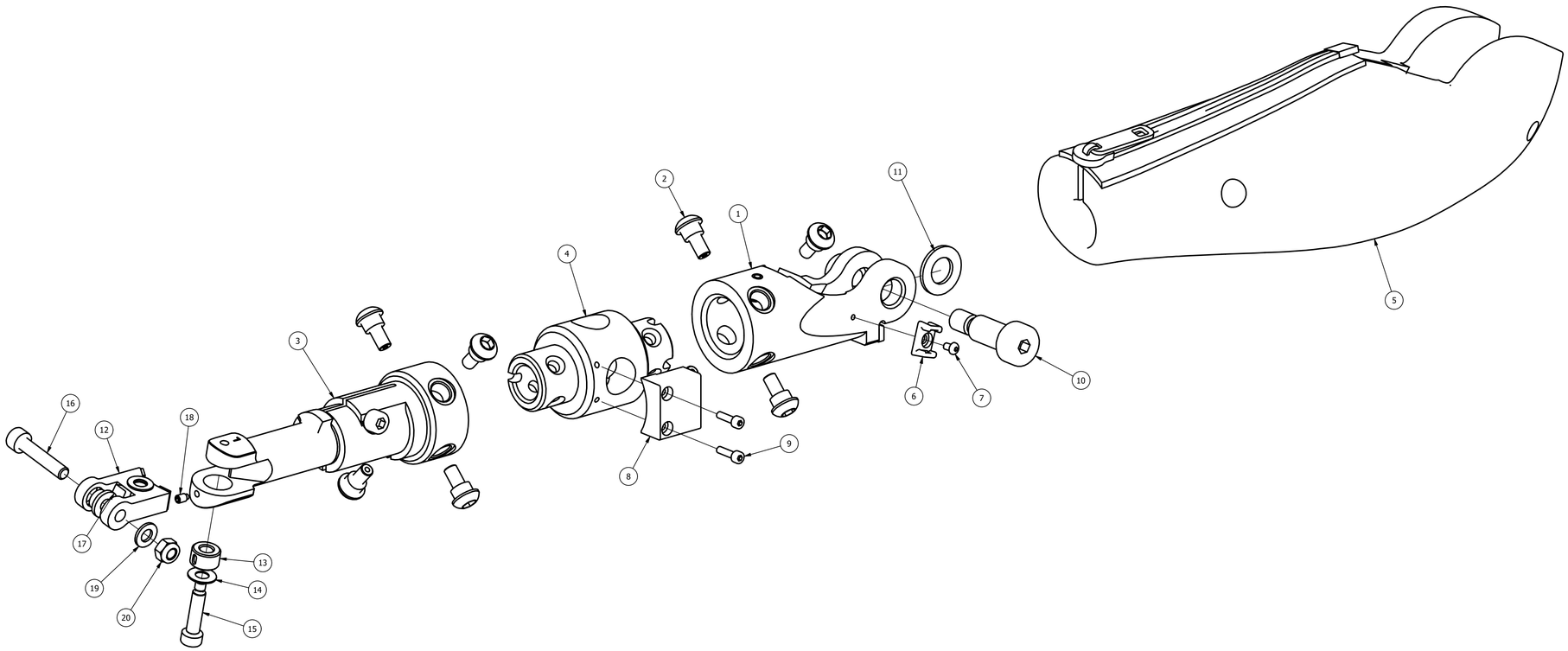
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

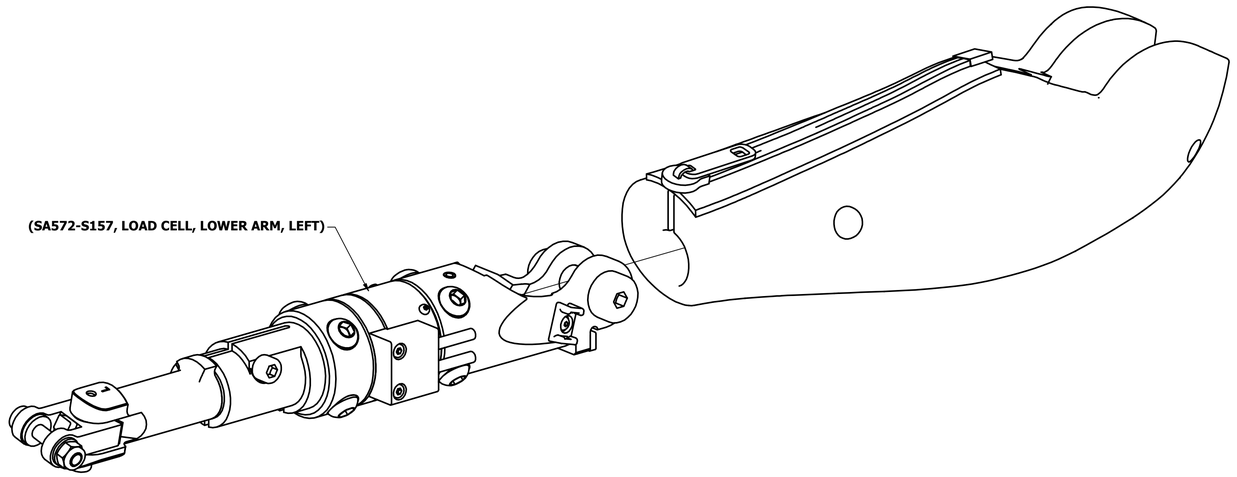
S.R., STRAIN RELIEF
THOR-05F

SIZE	DRAWING NUMBER	REV
A3	484-6113	1

SCALE: 1.5 : 1
SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	7	PROTOTYPE	BK	DJI	6/21/2023





INSTRUMENTED VIEW

ITEM	QTY	PART NUMBER	DESCRIPTION
20	1	5000522	M5 X 0.8 HEX LOCK NUT ZINC
19	1	5000566	M5 FLAT WASHER PLAIN ZINC
18	1	5001799	M3 X 0.5 X 5 LG. SSSDP
17	1	6004820	BEARING, FLANGED 8mm OD X 5mm ID X 5mm LG
16	1	5000721	M5 X 0.8 X 25 LG. SHCS
15	1	5001483	M5 X 18 LG. SHSS SS
14	1	5001374	M5 WAVE WASHER SS
13	1	474-6705-A	WRIST INSERT
12	1	474-6717-1	WRIST ROTATOR CLEVIS, LEFT
11	1	474-6502	WASHER, UPPER-LOWER ARM
10	1	5001162	M10 X 20 LG. SHSS
9	2	5000456	M2.5 X 0.45 X 10 LG. SHCS
8	1	474-6113	STRUCTURAL REPLACEMENT, CONNECTOR BLOCK
7	1	5001305	M2.5 X 0.45 X 4 LG. BHCS
6	1	6002036	CABLE TIE MOUNT, #4 SCREW
5	1	474-6525-1	LOWER ARM FLESH, LEFT
4	1	474-6106	STRUCTURAL REPLACEMENT, UPPER-LOWER ARM LOAD CELL
3	1	474-6700-1	LOWER ARM AND WRIST ASSEMBLY, LEFT
2	8	W50-61042	MODIFIED BHSS M6 THREAD
1	1	474-6501-1	PROXIMAL LOWER ARM TUBE, LEFT

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: A. Barchock	5/6/2016
MATERIAL	
CHECKED	
HEAT TREAT	
ENG	
FINISH	
APPROVED	

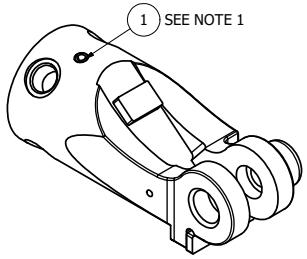
LOWER ARM ASSEMBLY, LEFT
THOR-05F

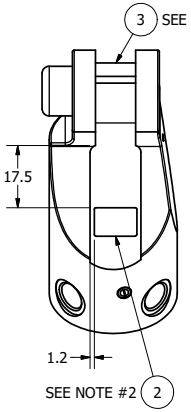
THIRD ANGLE PROJECTION

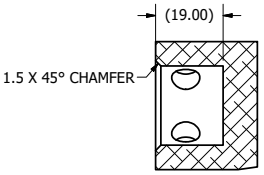
SIZE: A1 | DRAWING NUMBER: 474-6500-1 | REV: 7

SCALE: 1:1 | SHEET: 1 OF 1

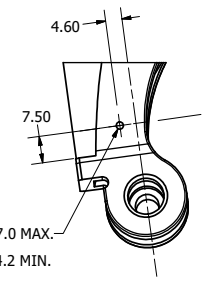
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	RELEASE FOR PROTOTYPE	AB	JW	03/10/2017

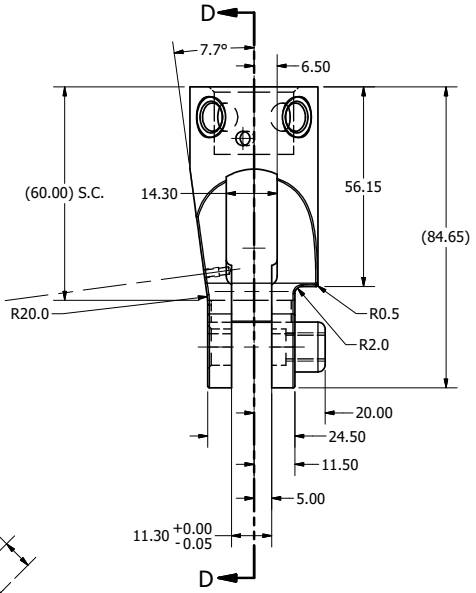


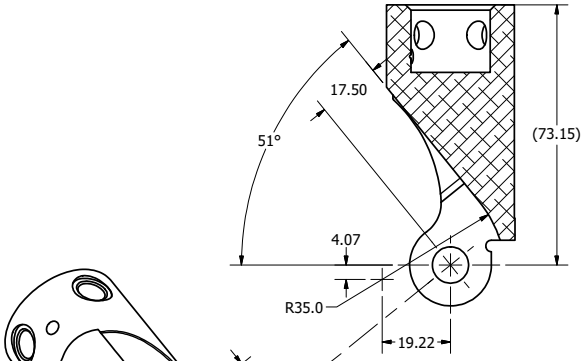


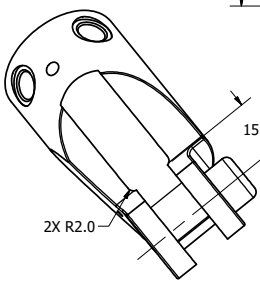


SECTION B-B

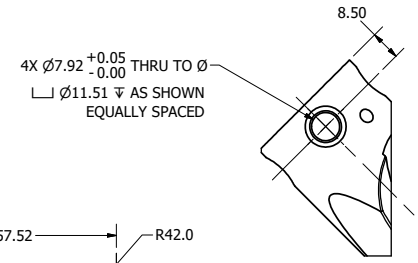


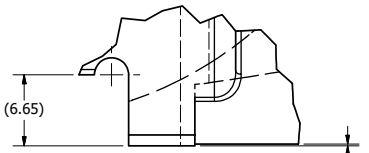




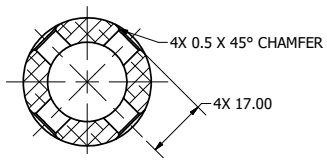


SECTION D-D

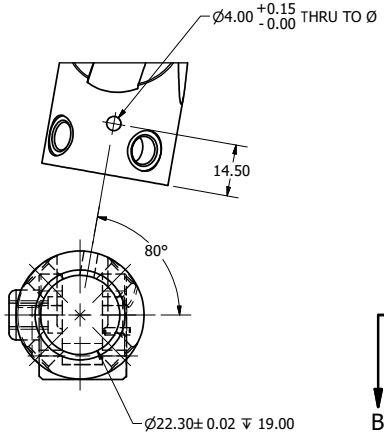


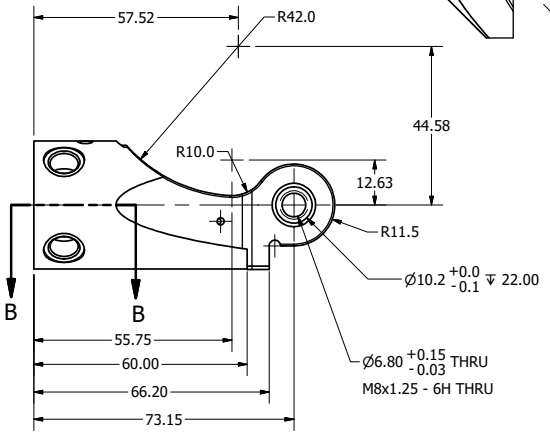


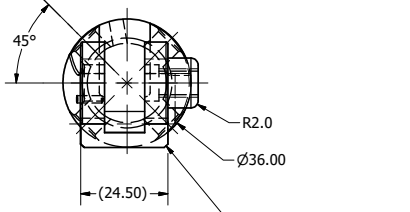
DETAIL E
SCALE 3 : 1

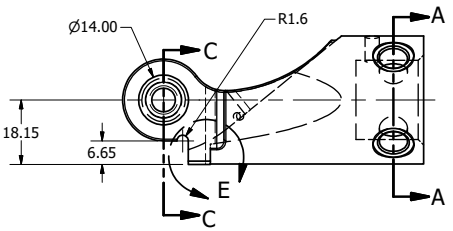


SECTION A-A



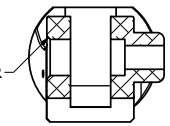






ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	474-6558	ELBOW EXTENSION BUMPER
2	1	474-6559	ELBOW FLEXION BUMPER
1	1	5000182	M4 X 10 LG. ROLL PIN

PARTS LIST



SECTION C-C

NOTES:

1. INSTALL FLUSH TO OUTSIDE SURFACE AFTER ANODIZE.
2. PREPARE FACES AND ATTACH BUMPERS WITH ADHESIVE WHERE SHOWN.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT:
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	3/9/2016
CHECKED:	
ENG:	
APPROVED:	

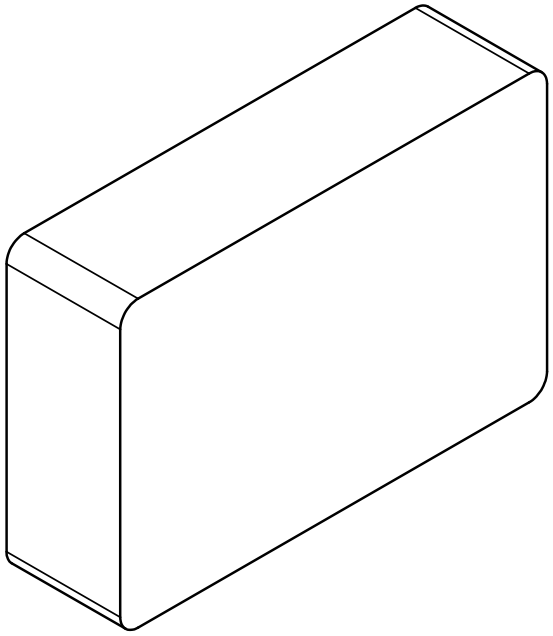
THIRD ANGLE PROJECTION

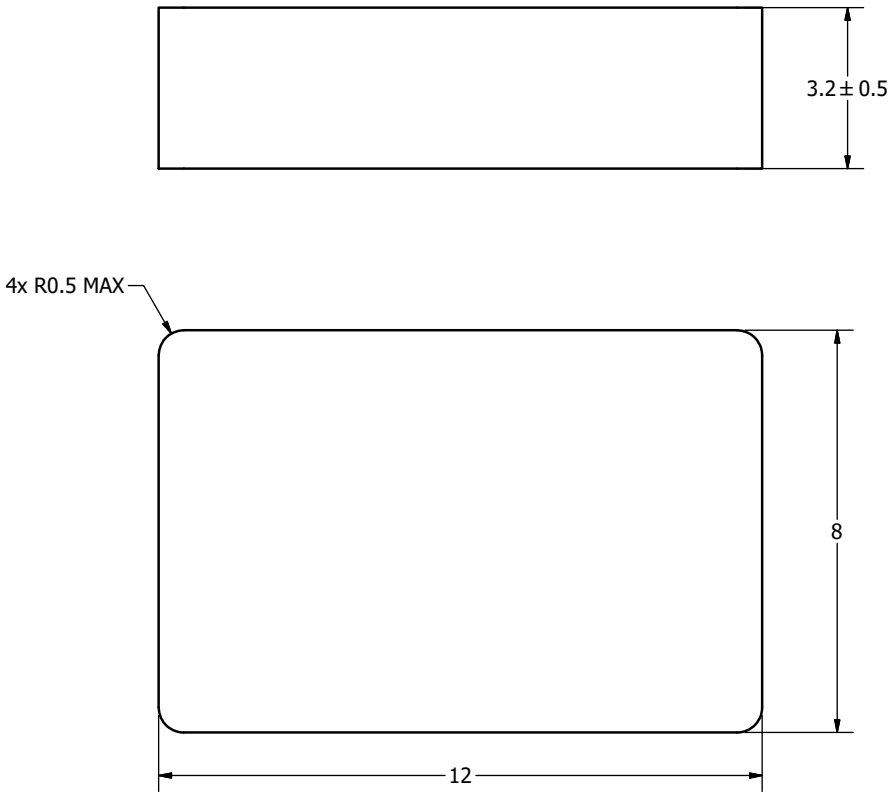
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

PROXIMAL LOWER ARM TUBE, LEFT

SIZE: A2 | DRAWING NUMBER: 474-6501-1 | REV: 2
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	RELEASE FOR PROTOTYPE	KMSP	KMSP	1/24/2018





NOTES:

1. MATERIAL: NATURAL RUBBER
   COLOR: BLACK
   DUROMETER: 55 ±10 SHORE "A"
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE
   +1%/-2% BUT NO SMALLER THAN 0.5mm.
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE RUBBER MOLDING

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	2/25/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

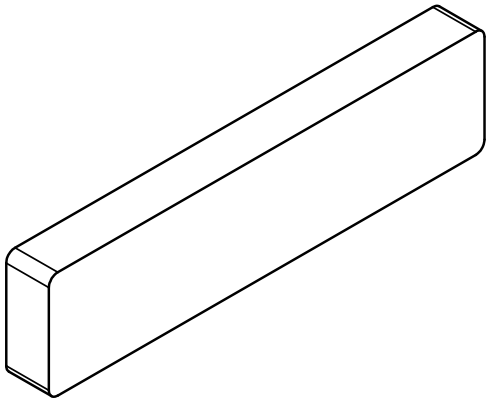
ELBOW FLEXION BUMPER

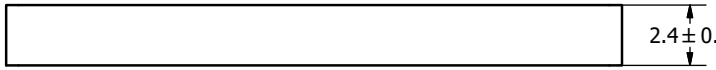
THIRD ANGLE PROJECTION

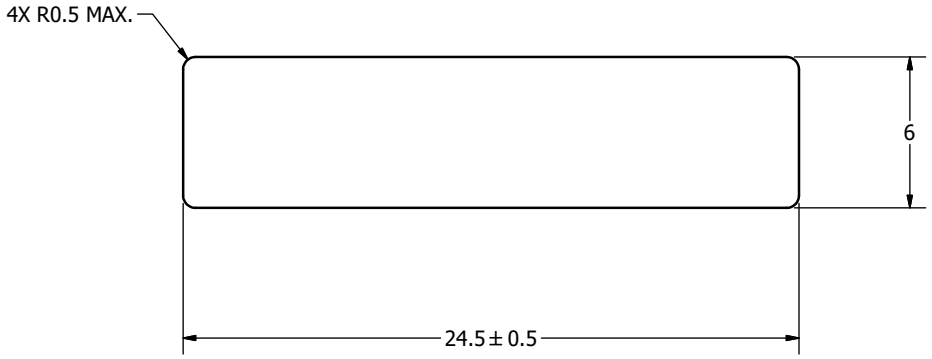
SIZE: A3 | DRAWING NUMBER: 474-6559 | REV: 2

SCALE: 10 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	RELEASE FOR PROTOTYPE	KMSP	KMSP	1/24/2018







NOTES:
1. MATERIAL: NATURAL RUBBER
   COLOR: BLACK
   DUROMETER: 55 ±10 SHORE "A"
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE
   +1%/-2% BUT NO SMALLER
   THAN 0.5mm.
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE RUBBER MOLDING.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	2/25/2016
CHECKED:	
ENG:	
APPROVED:	

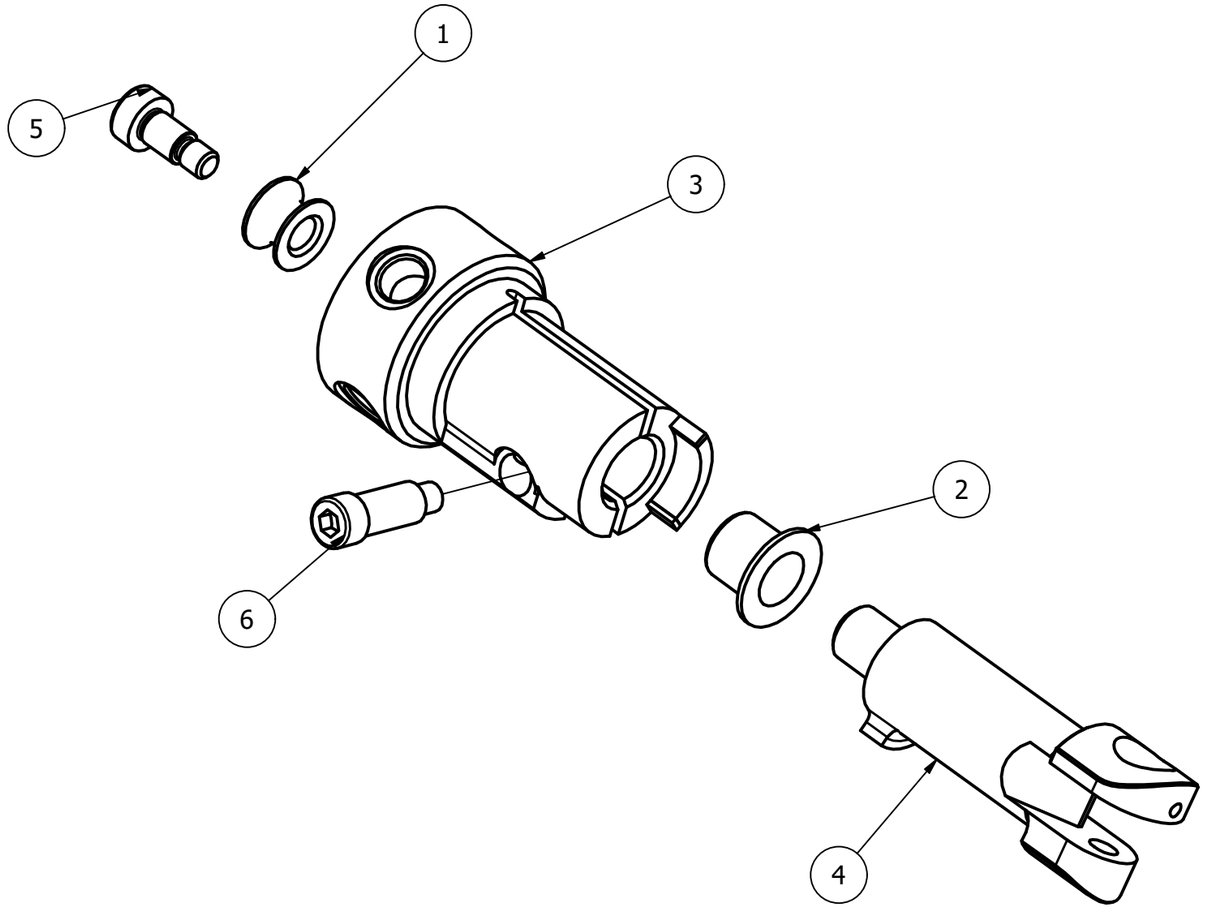
THIRD ANGLE PROJECTION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

ELBOW EXTENSION BUMPER

SIZE: A3 | DRAWING NUMBER: 474-6558 | REV: 2
SCALE: 5 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	7	RELEASE FOR PROTOTYPE	DJI	DJI	10/4/2021



ITEM	QTY	PART NUMBER	DESCRIPTION
6	1	474-6704	DISTAL LOWER ARM BOLT ASSEMBLY
5	1	5000922	M6 X 8 LG. SHSS SS
4	1	474-6712-1-A	WRIST INSERT, LEFT
3	1	474-6701-1	DISTAL LOWER ARM TUBE, LEFT
2	1	6004601	BEARING, FLANGE, 12mm OD X 10mm ID X 12mm LG
1	1	474-6553	WRIST ROTATION GUIDE

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

PROTOTYPE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN ghayden	3/7/2016
CHECKED	
ENG	
APPROVED	

MATERIAL
HEAT TREAT
FINISH

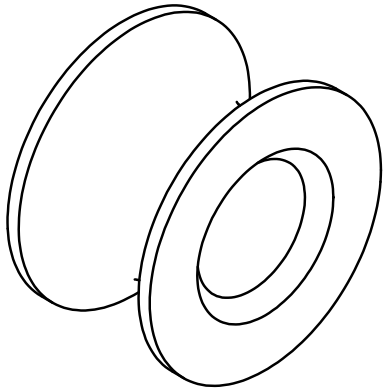
LOWER ARM AND WRIST ASSEMBLY, LEFT
THOR-05F

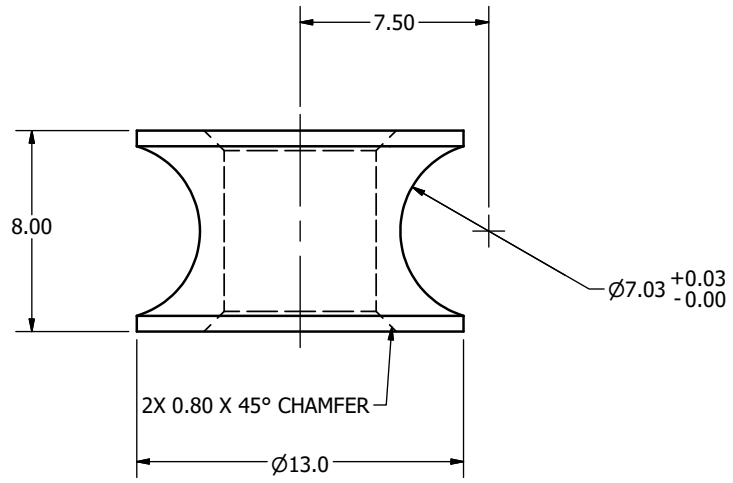
THIRD ANGLE PROJECTION

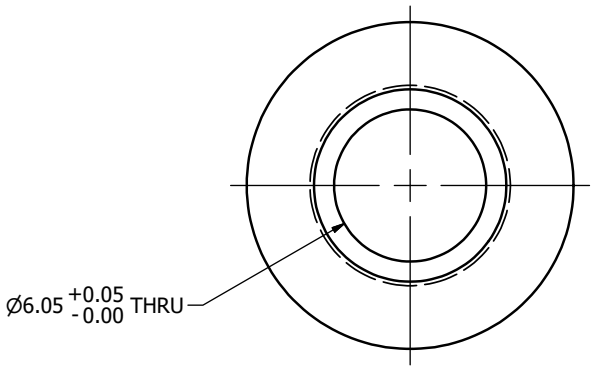
SIZE A3 | DRAWING NUMBER 474-6700-1 | REV 7

SCALE: 1 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	GCH		11/13/2017







UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN ghayden	2/26/2016
CHECKED	
ENG	
APPROVED	

MATERIAL: 304 STAINLESS STEEL
HEAT TREAT:
FINISH:

PROTOTYPE DRAWING

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

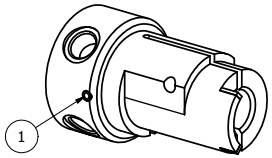
WRIST ROTATION GUIDE

THIRD ANGLE PROJECTION

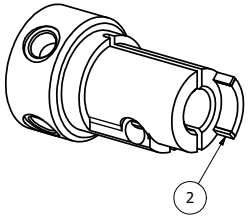
SIZE: A3 | DRAWING NUMBER: 474-6553 | REV: 1

SCALE: 5:1 | SHEET: 1 OF 1

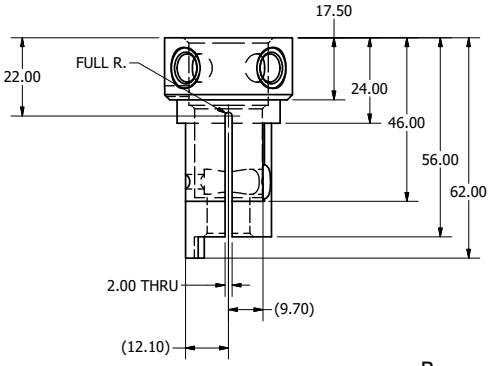
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	RELEASE FOR PROTOTYPE	AB	JW	03/10/2017

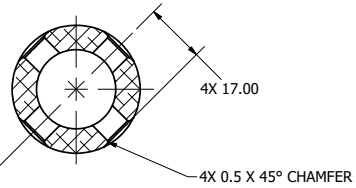


SEE NOTE #1

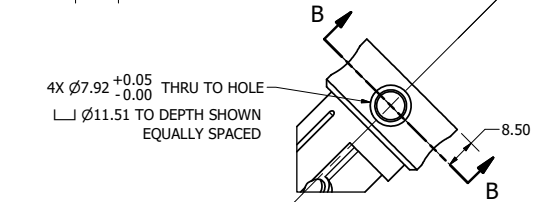


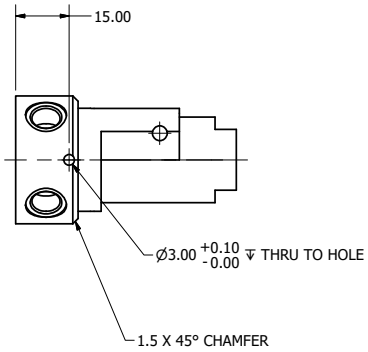
SEE NOTE #2

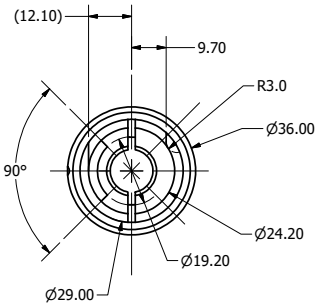


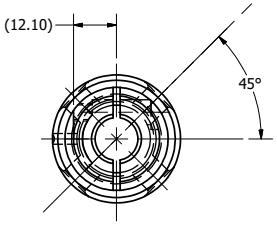


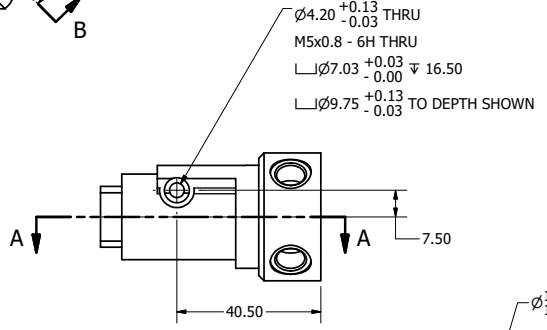
SECTION B-B

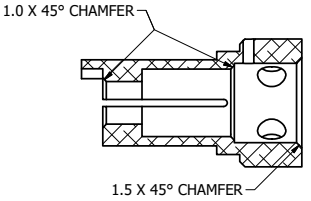


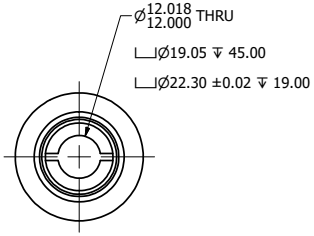












SECTION A-A

ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	474-6557	WRIST ROTATION BUMPER
1	1	5000199	M3 X 10 LG. ROLL PIN SS

PARTS LIST

NOTES:

1. INSTALL FLUSH TO OUTSIDE SURFACE AFTER ANODIZE.
2. BOND 474-6557 TO SURFACE AS SHOWN.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT:
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	3/9/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

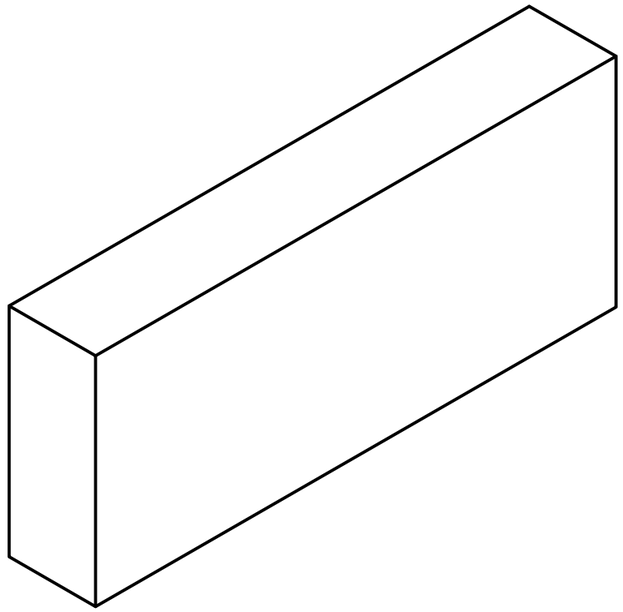
DISTAL LOWER ARM TUBE, LEFT

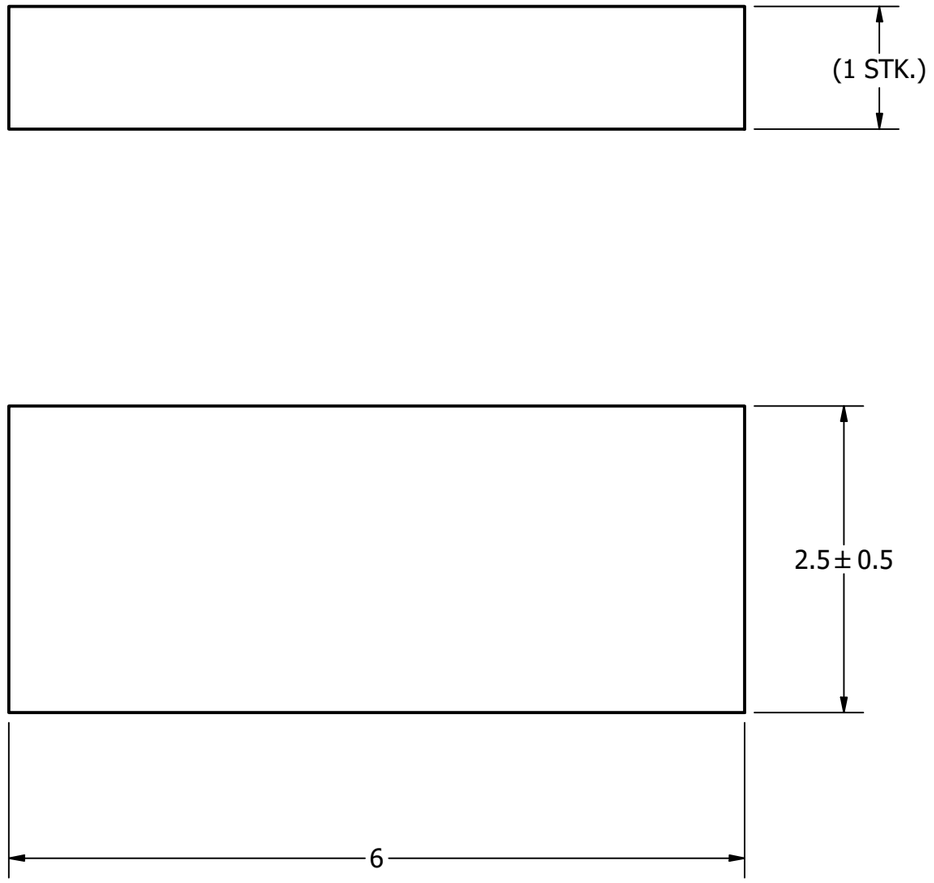
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-6701-1 | REV: 2

SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	GCH		11/13/2017





NOTES:

1. MATERIAL: 1mm THICK NEOPRENE RUBBER
   COLOR: BLACK
   DUROMETER: 60 ±10 SHORE "A"

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED √ | ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES	CHECKED	
HEAT TREAT	ENG	
FINISH	APPROVED	

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	2/25/2017

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

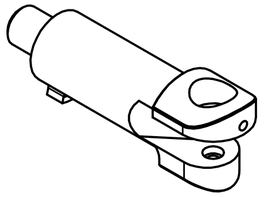
WRIST ROTATION BUMPER

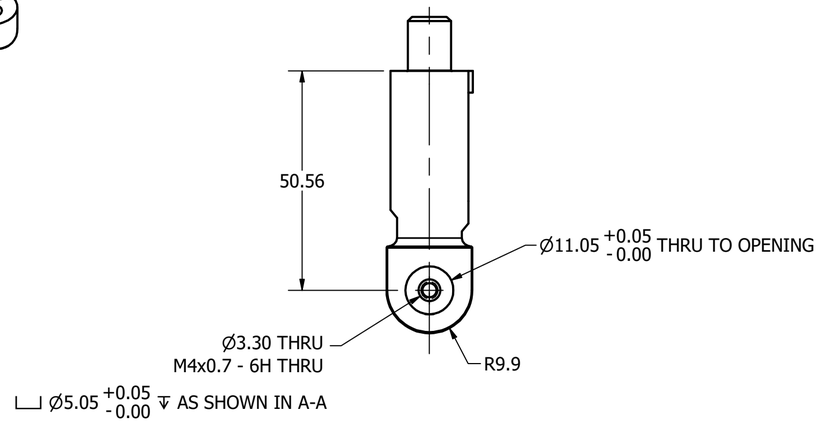
THIRD ANGLE PROJECTION

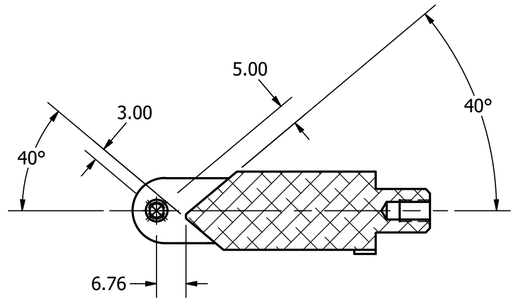
SIZE	DRAWING NUMBER	REV
A3	474-6557	1

SCALE: 20:1 | SHEET 1 OF 1

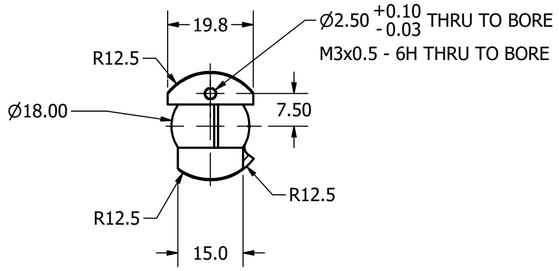
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	RELEASE FOR PROTOTYPE	AB	DJI	08/10/2022

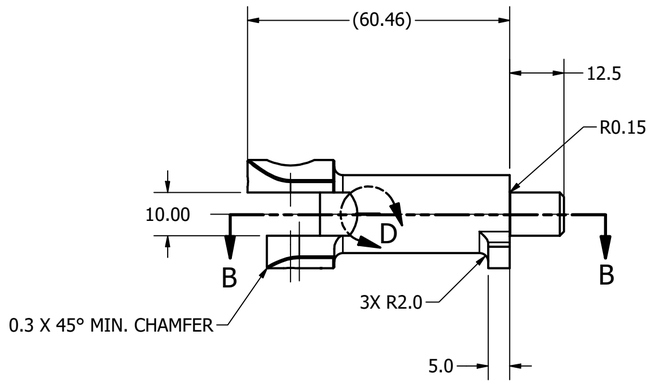


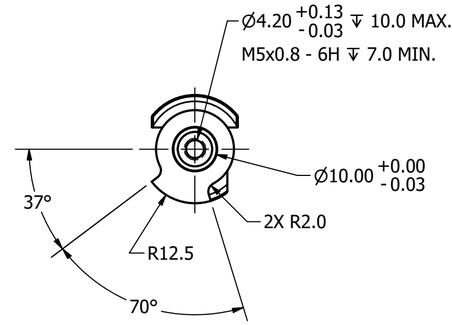


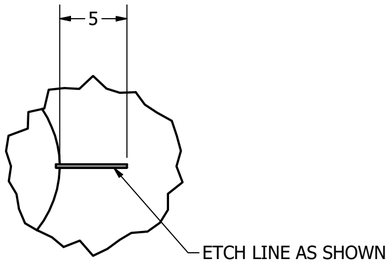


SECTION B-B

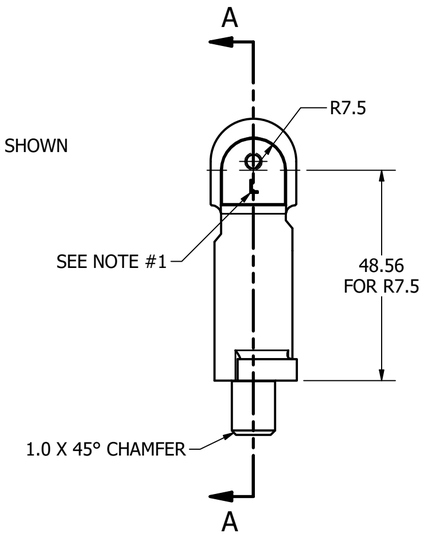


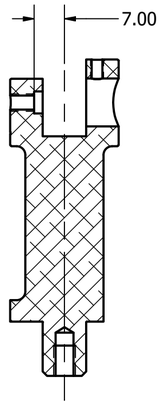






DETAIL D
SCALE 3 : 1





SECTION A-A

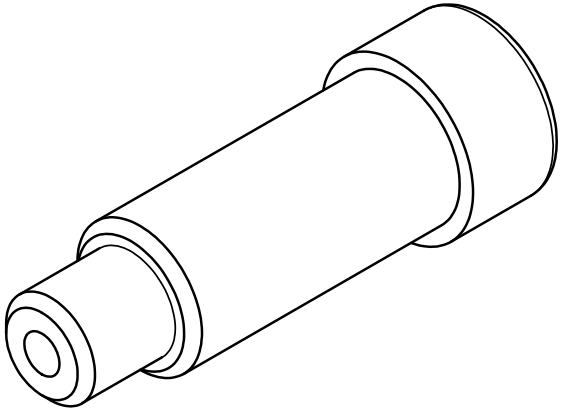
NOTES:

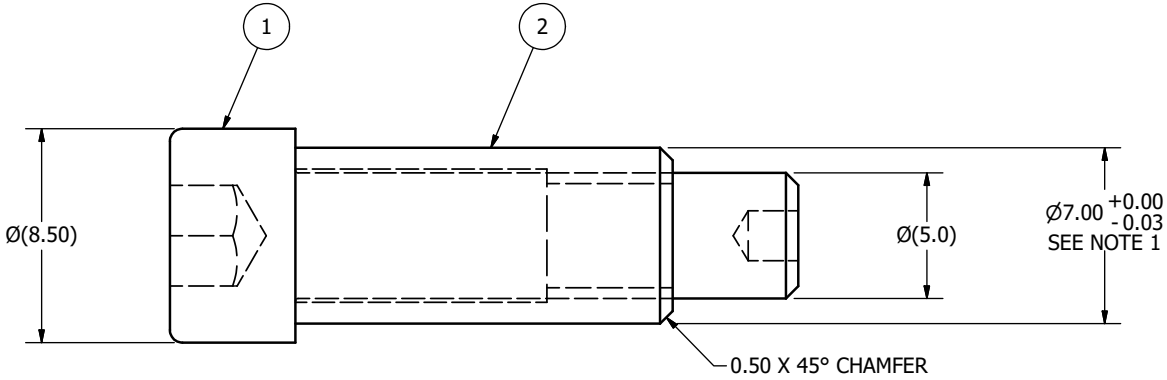
1. STAMP OR ETCH 3mm CHARACTER AS SHOWN.

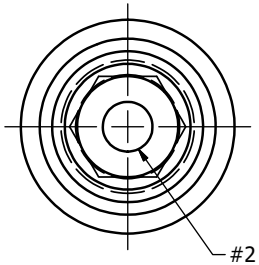
PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1; MACHINED ANGLES ±.5°. ASME Y14.5M - 1994. DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	WRIST INSERT, LEFT
MATERIAL: 7075-T6 ALUMINUM	DRAWN: disopi	3/22/2019	
HEAT TREAT: N/A	CHECKED		SIZE: A2 · DRAWING NUMBER: 474-6712-1-A · REV: 4
FINISH: CLEAR ANODIZE	ENG: DJI	3/22/2019	THIRD ANGLE PROJECTION · SCALE: 1 : 1 · SHEET: 1 OF 1
	APPROVED		

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	RELEASE FOR PROTOTYPE	GCH		1/31/2017







ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	474-6703	SLEEVE
1	1	5000371	M5 X 0.8 X 20 LG. SHCS

PARTS LIST

NOTES:

1. MACHINE Ø7.00 AFTER USING THREAD LOCKER TO BOND ITEM 2 (474-6703) TO ITEM 1 (5000371)

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN ghayden	2/25/2016
CHECKED	
ENG	
APPROVED	

MATERIAL
HEAT TREAT
FINISH

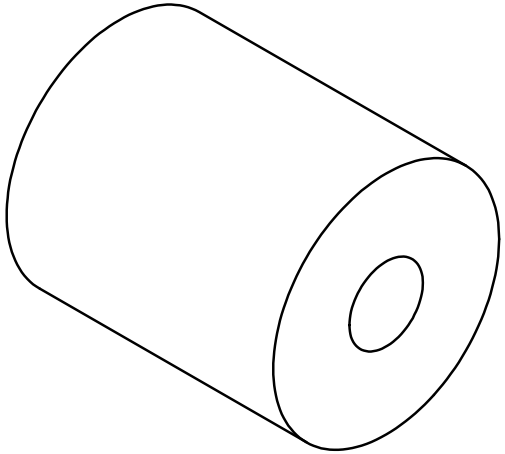
DISTAL LOWER ARM BOLT ASSEMBLY

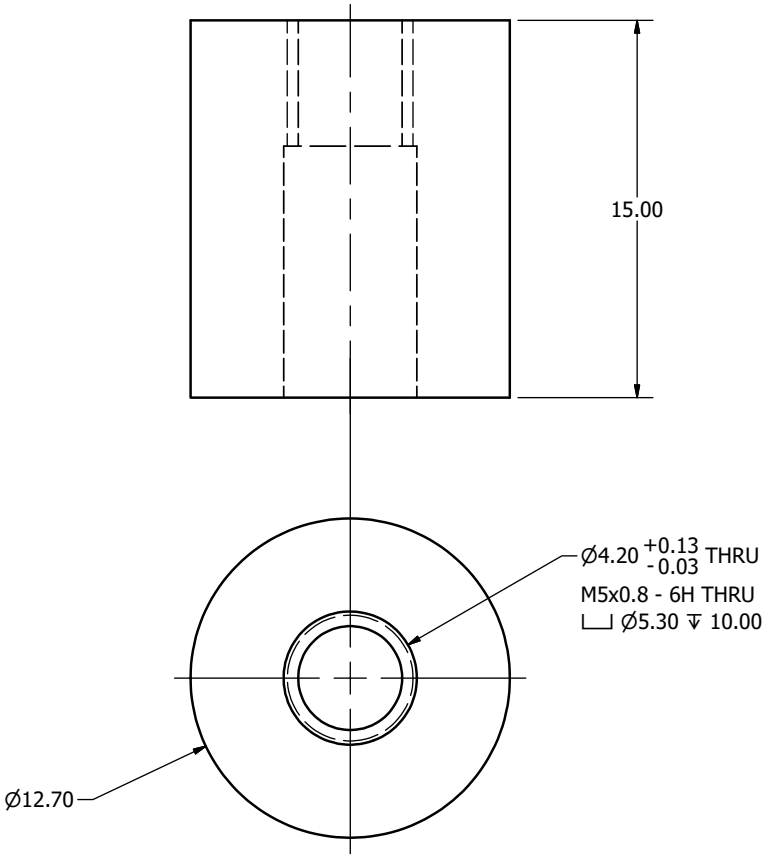
THIRD ANGLE PROJECTION

SIZE A3 | DRAWING NUMBER 474-6704 | REV 2

SCALE: 5 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	GCH		2/25/2016





UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

PROTOTYPE DRAWING

MATERIAL	HEAT TREAT	FINISH
ACETAL RESIN, WHITE		

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN ghayden	2/25/2016
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

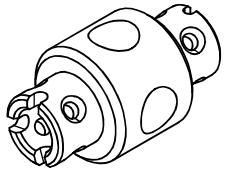
SLEEVE

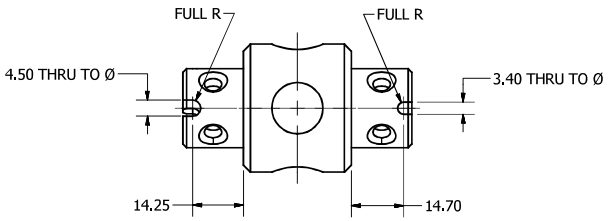
THIRD ANGLE PROJECTION

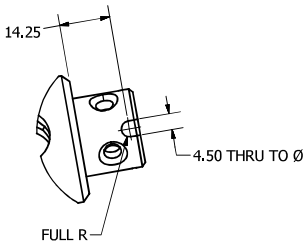
SIZE A3 | DRAWING NUMBER 474-6703 | REV 1

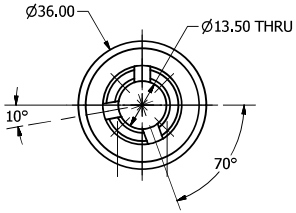
SCALE: 5:1 | SHEET 1 OF 1

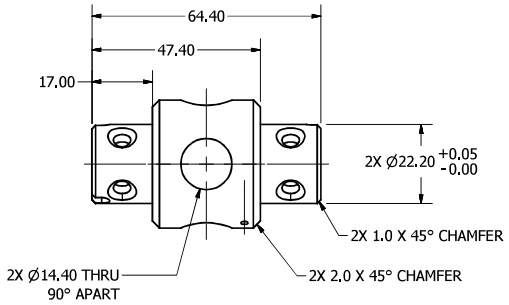
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	GCH		11/13/17

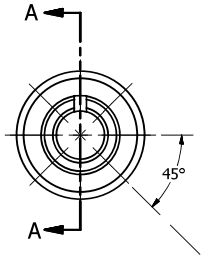


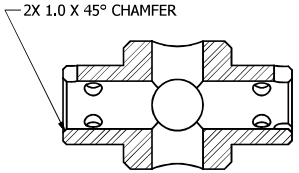




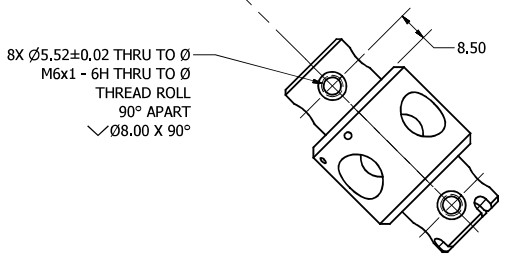


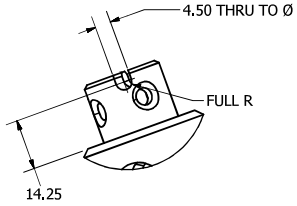


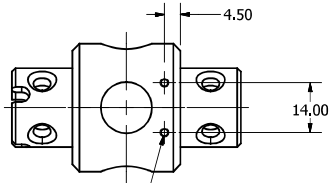




SECTION A-A







2X Ø2.05 +0.10 -0.03 ↧ 9.6 MAX.
M2.5x0.45 - 6H ↧ 7.0 MIN.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±1.0, X.X ±0.1, X.XX ±0.05
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 1018 STEEL
HEAT TREAT:
FINISH: 0,008mm ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	11/13/2017
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

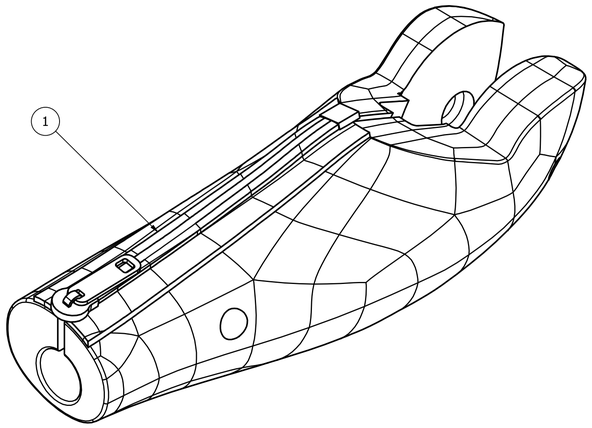
STRUCTURAL REPLACEMENT, UPPER-LOWER ARM LOAD CELL

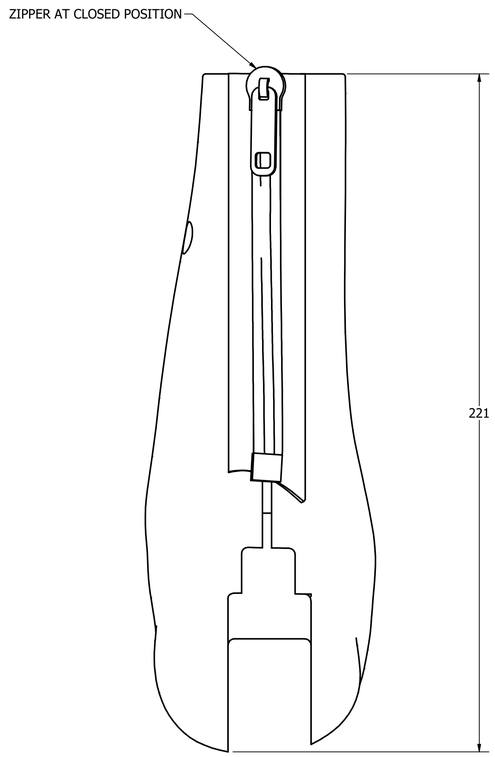
THIRD ANGLE PROJECTION

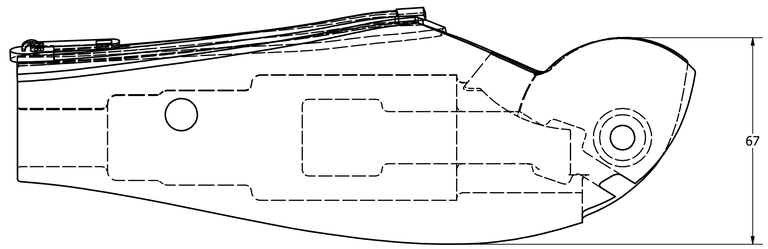
SIZE: A2 | DRAWING NUMBER: 474-6106 | REV: 1

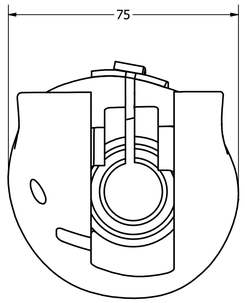
SCALE: 1:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	RELEASE FOR PROTOTYPE	AB	DJI	09/16/2022









NOTES:
1. MATERIAL: PVC
   COLOR: EURO BROWN
   DUROMETER: 55 ±10 SHORE "A"
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-4%
   BUT NO TOLERANCE SMALLER THAN 1mm
4. WEIGHT: 350±25g

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-6521	ZIPPER ASSEMBLY, LOWER ARM

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN srice	9/7/2021
CHECKED	
ENG DJI	9/14/2021
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

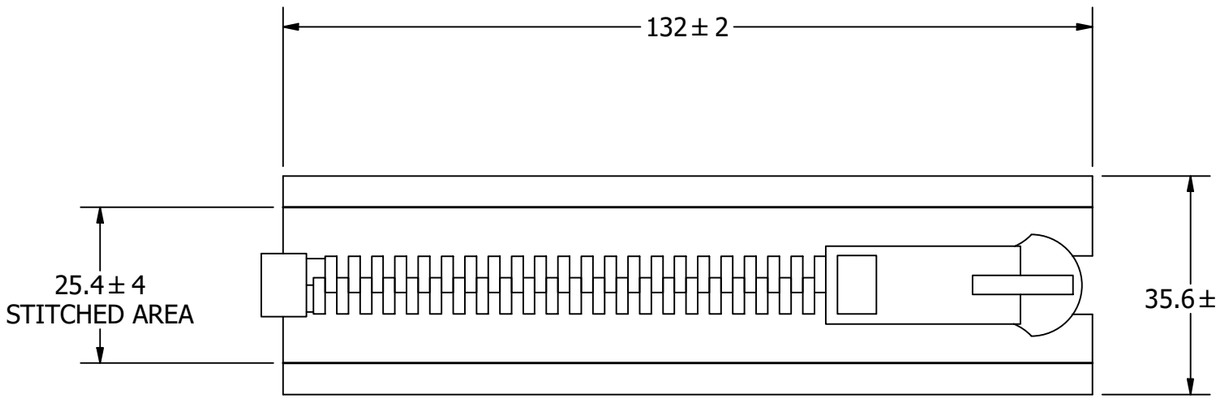
LOWER ARM FLESH, LEFT

THIRD ANGLE PROJECTION

SIZE A1 | DRAWING NUMBER 474-6525-1 | REV 2

SCALE: 1 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	6	RELEASE FOR PROTOTYPE	AB	JW	09/21/2022



NOTES:

1. ALL BLACK #5 ZIPPER

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

APPROVALS	DATE
DRAWN: jmcinnis	3/8/2016
CHECKED:	
ENG:	
APPROVED:	

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

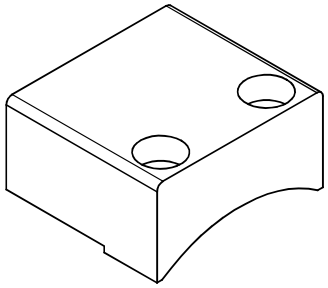
ZIPPER ASSEMBLY, LOWER ARM

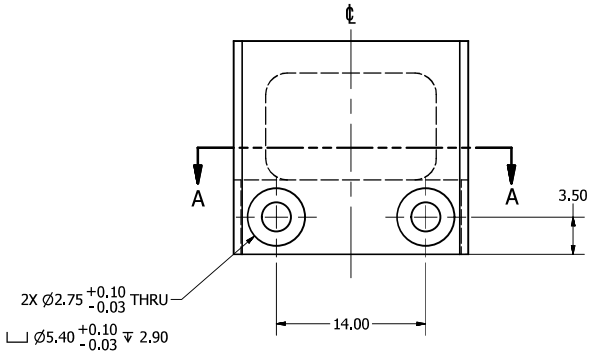
THIRD ANGLE PROJECTION

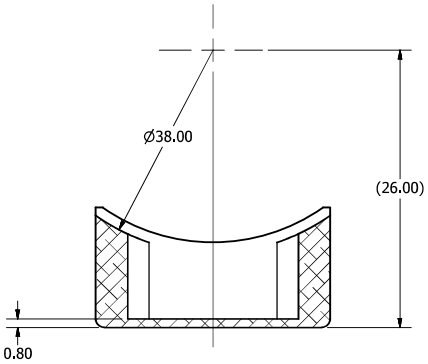
SIZE: A3 | DRAWING NUMBER: 474-6521 | REV: 6

SCALE: | SHEET: 1 OF 1

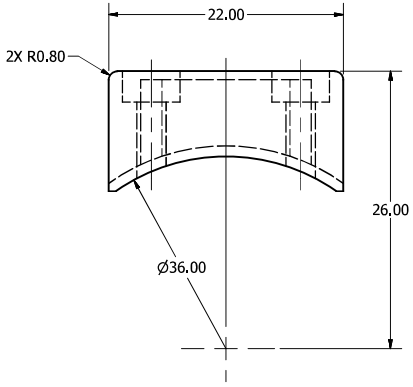
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	GCH		11/14/17

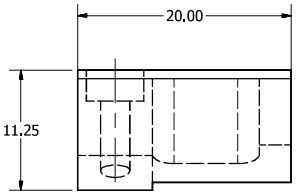


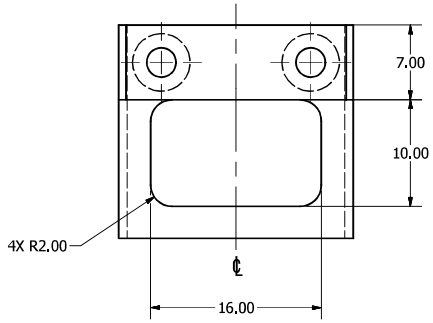




SECTION A-A







NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄ , UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±1.0, X.X ±0.1, X.XX ±0.05
MACHINED ANGLES ±1.50°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 6061-T6 ALUMINUM
HEAT TREAT:
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	11/13/2017
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

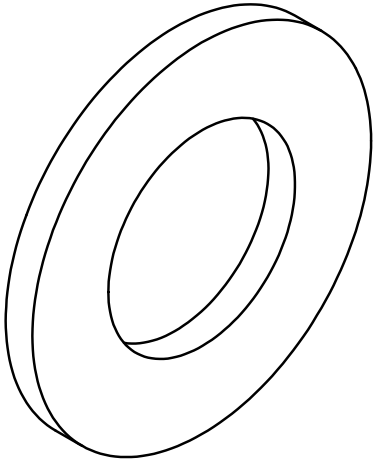
STRUCTURAL REPLACEMENT, CONNECTOR BLOCK

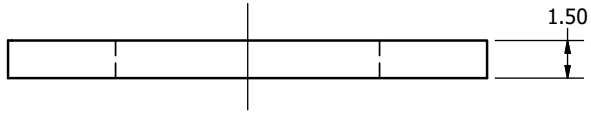
THIRD ANGLE PROJECTION

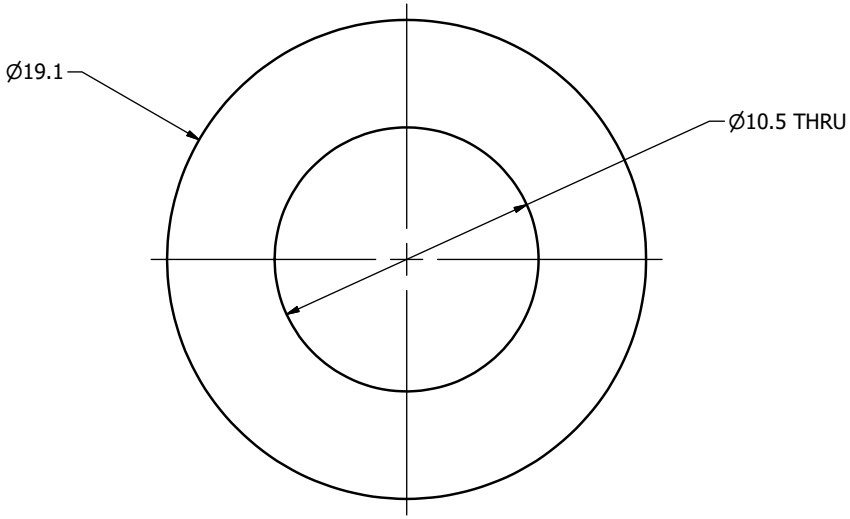
SIZE: A2 | DRAWING NUMBER: 474-6113 | REV: 1

SCALE: 3:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	GCH		11/13/2017







PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN ghayden	2/26/2016
CHECKED	
ENG	
APPROVED	

MATERIAL: TEFLON
HEAT TREAT:
FINISH:

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

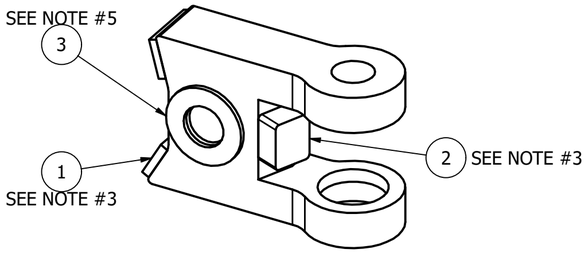
WASHER, UPPER-LOWER ARM

THIRD ANGLE PROJECTION

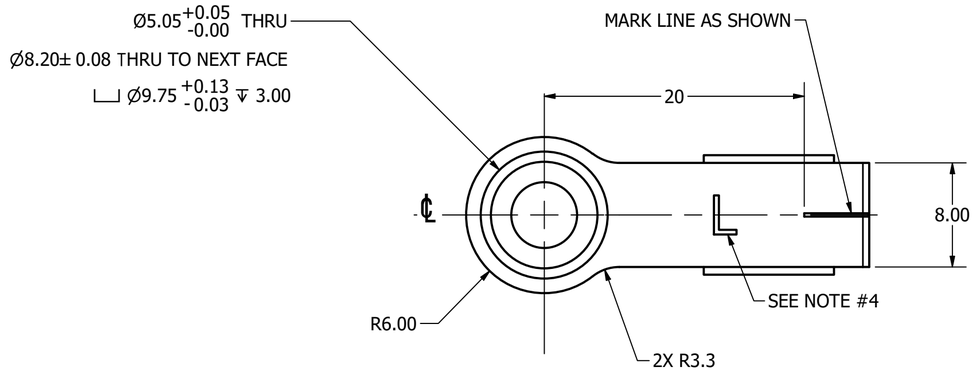
SIZE	DRAWING NUMBER	REV
A3	474-6502	1

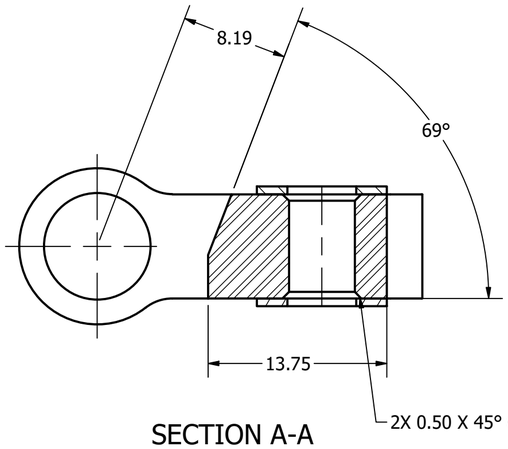
SCALE: 5:1 SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	BK	DJI	6/21/2023

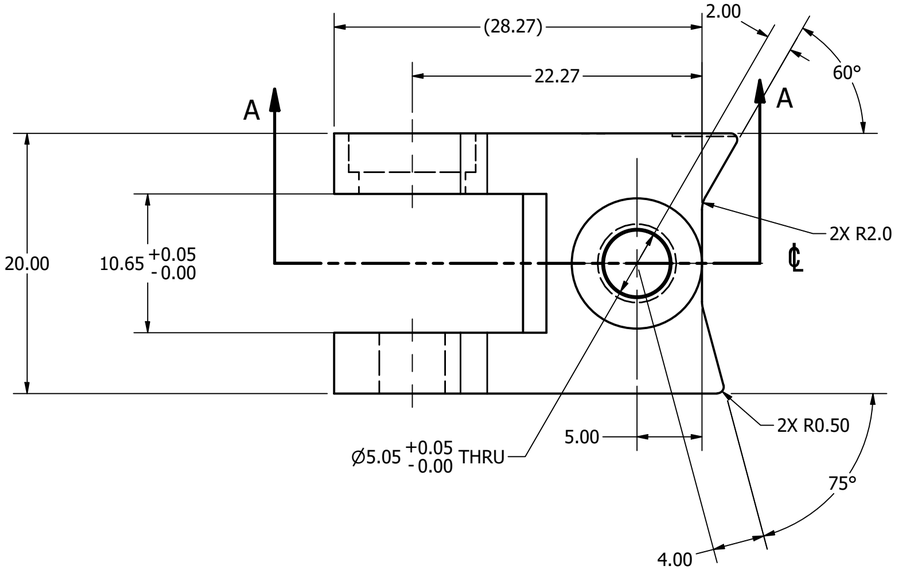


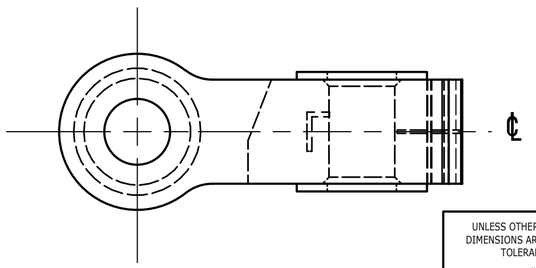
SCALE 2 : 1





SECTION A-A





NOTES:

1. DIMENSIONS ARE SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE SPECIFIED.
2. BUMPERS REMOVED FROM SOME VIEWS FOR CLARITY.
3. PREP FACES & ATTACH BUMPERS WITH ADHESIVE, CENTRAL TO ATTACHMENT FACES, AFTER PLATING.
4. STAMP OR ETCH 3mm CHARACTER AS SHOWN.
5. PREP FACES & ATTACH WASHERS WITH ADHESIVE, CENTRAL TO HOLES, AFTER PLATING.

ITEM	QTY	PART NUMBER	DESCRIPTION
3	2	474-6706-A	WRIST WASHER
2	1	474-6723	WRIST BUMPER - EXTENSION
1	2	474-6721	WRIST BUMPER - RADIUS

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 4140 STEEL
HEAT TREAT: Rc 28-32
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

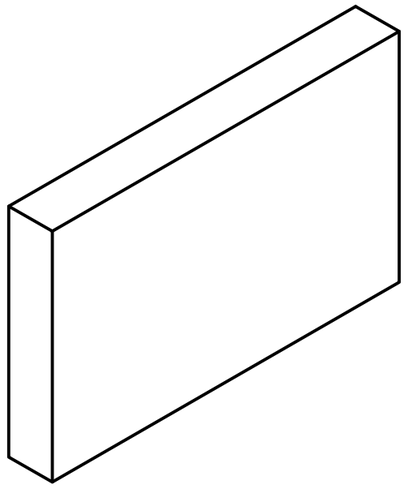
APPROVALS	DATE
DRAWN: disopi	3/25/2019
CHECKED:	
ENG: DJI	3/25/2019
APPROVED:	

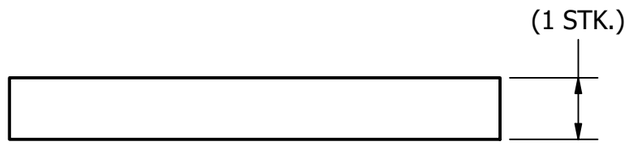
DEPARTMENT OF TRANSPORTATION UNITED STATES OF AMERICA
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

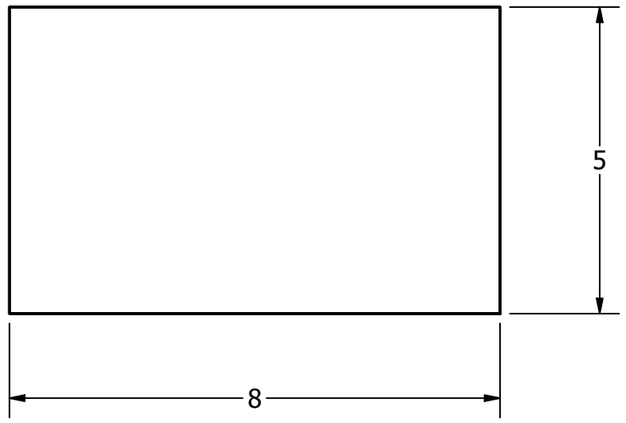
WRIST ROTATOR CLEVIS, LEFT
THOR-05F

THIRD ANGLE PROJECTION
SIZE: A2
DRAWING NUMBER: 474-6717-1
REV: 3
SCALE: 3 : 1
SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE TO PROTOTYPE	GCH		2/25/2016







NOTES:

1. MATERIAL: 1mm THICK NEOPRENE RUBBER
   COLOR: BLACK
   DUROMETER: 60 ±10 SHORE "A"

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ±.5 | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	2/25/2016
CHECKED:	
ENG:	
APPROVED:	

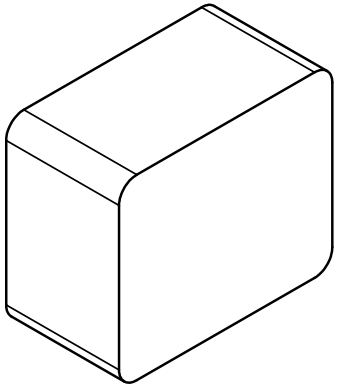
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

WRIST BUMPER - RADIUS

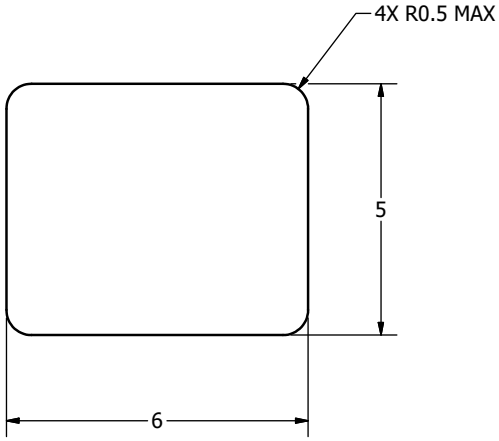
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-6721 | REV: 1
SCALE: 10:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	RELEASE FOR PROTOTYPE	IH	JG	5/14/2018







NOTES:

1. MATERIAL: NATURAL RUBBER
   COLOR: BLACK
   DUROMETER: 55 ±10 SHORE "A"
2. REMOVE ALL MOLD FLASHING
3. ALL MOULD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE RUBBER MOLDING

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	2/25/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

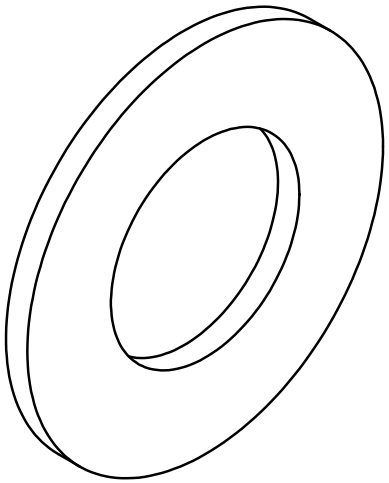
WRIST BUMPER - EXTENSION

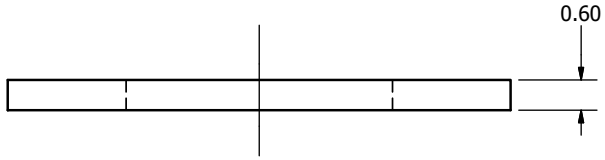
THIRD ANGLE PROJECTION

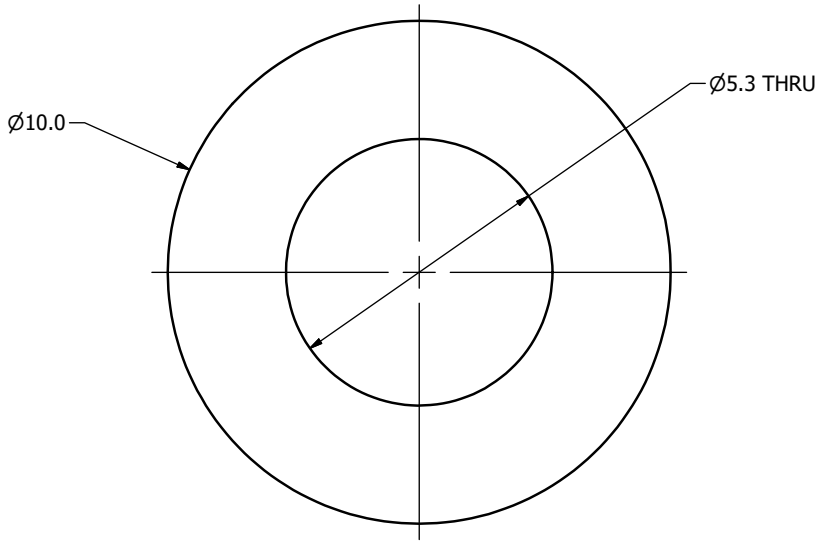
SIZE: A3 | DRAWING NUMBER: 474-6723 | REV: 2

SCALE: 10:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	DJI	DJI	8/4/2021







NOTES:

1. MAKE FROM CARBON FIBER WEAVE

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTES
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	8/4/2021
CHECKED:	
ENG: DJI	7/23/2021
APPROVED:	

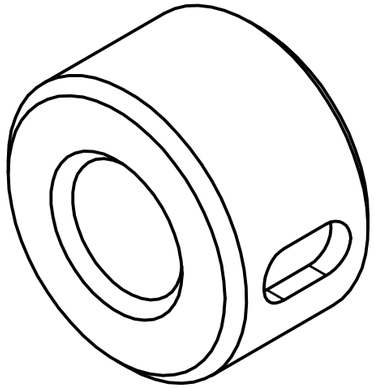
THIRD ANGLE PROJECTION

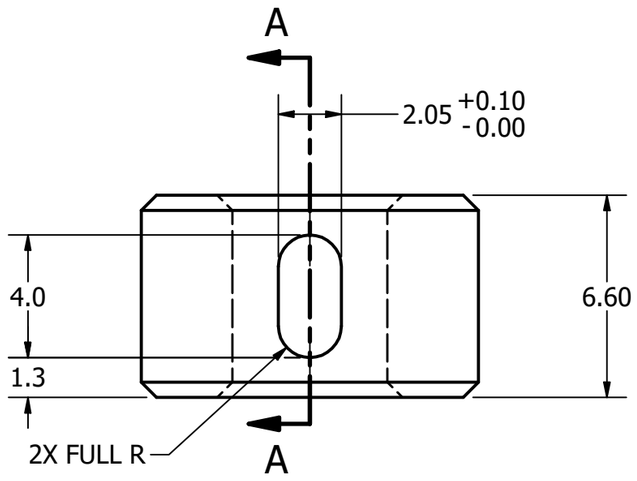
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

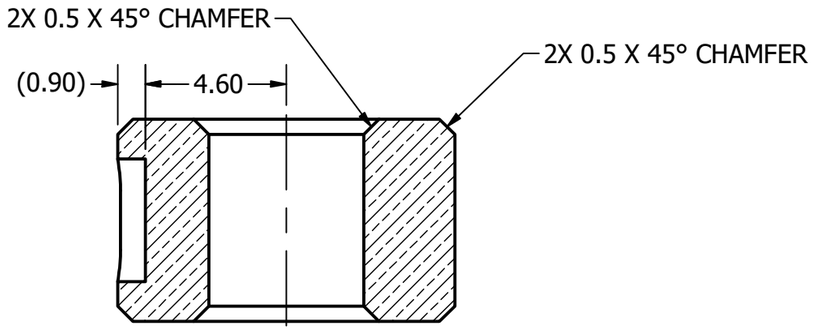
WRIST WASHER

SIZE: A3 | DRAWING NUMBER: 474-6706-A | REV: 1
SCALE: 10 : 1 | SHEET: 1 OF 1

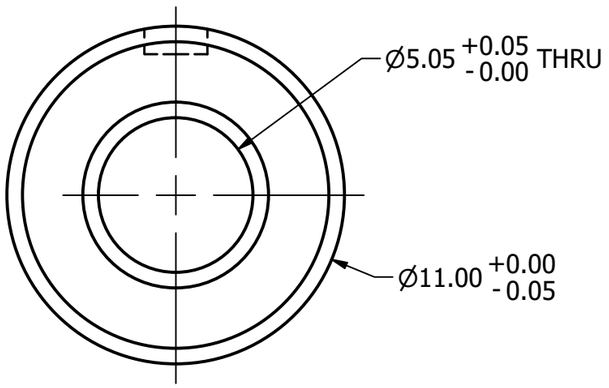
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	DJI	DJI	7/23/2021







SECTION A-A



PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: Brass, Soft Yellow	CHECKED	
HEAT TREAT	ENG: DJI	7/23/2021
FINISH	APPROVED	

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	2/25/2016

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

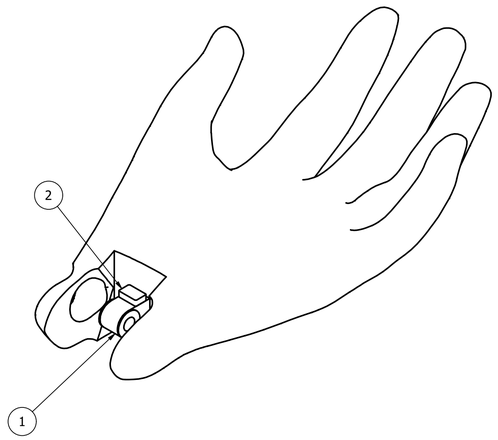
WRIST INSERT

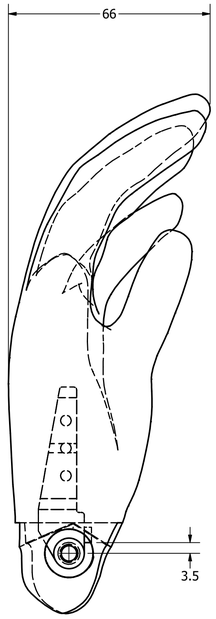
THIRD ANGLE PROJECTION

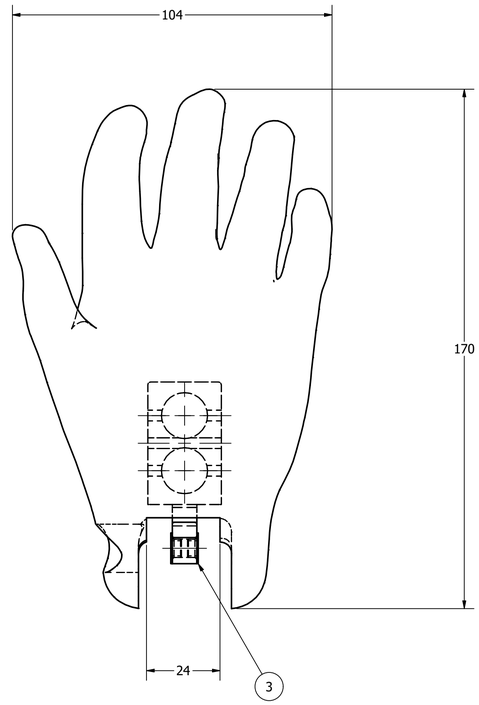
SIZE	DRAWING NUMBER	REV
A3	474-6705-A	1

SCALE: 5:1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	RELEASE FOR PROTOTYPE	AB	JW	03/10/2017







NOTES:

1. MATERIAL: POLYURETHANE
   COLOR: EURO BROWN
   DUROMETER: 50 ±5 SHORE "A"
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm
4. BOND ITEM 2 TO ITEM 1 WHERE SHOWN
5. WEIGHT: 262 GRAMS ± 8 GRAMS

ITEM	QTY	PART NUMBER	DESCRIPTION
3	2	6004819	BEARING, FLANGED 6mm OD X 5mm ID X 3.5mm LG
2	1	474-6901	WRIST BUMPER
1	1	474-6912	HAND BONE

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	SEE NOTE #1	
HEAT TREAT		
FINISH		

APPROVALS	DATE
DRAWN ghayden	3/1/2016
CHECKED	
ENG	
APPROVED	

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

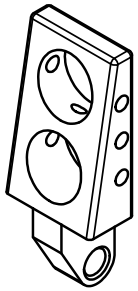
HAND, MOLDED, LEFT

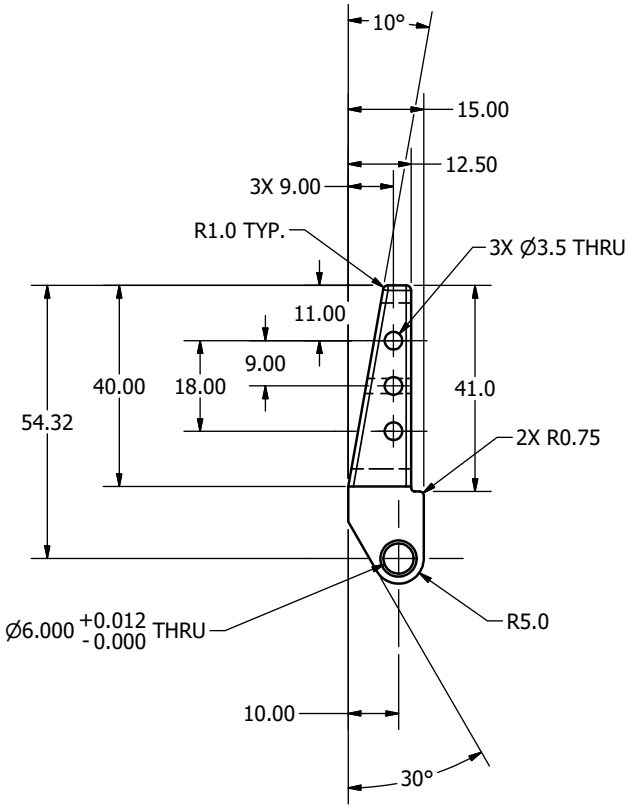
THIRD ANGLE PROJECTION

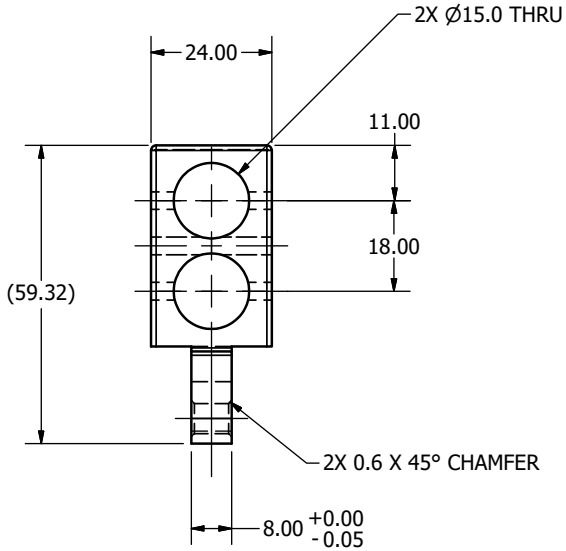
SIZE A1 | DRAWING NUMBER 474-6900-1 | REV 2

SCALE: 1 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	RELEASE FOR PROTOTYPE	HF	DJI	1/21/2022







NOTES:

1. UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE SYMMETRICAL ABOUT ℄

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 6061-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	2/29/2016
CHECKED	
ENG: JW	2/8/2016
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

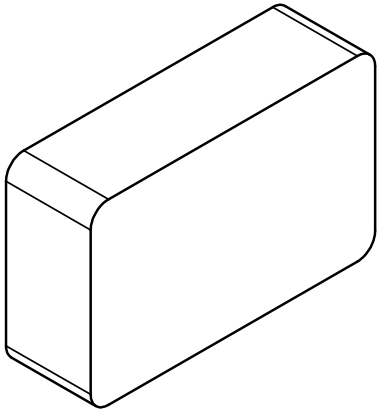
HAND BONE

THIRD ANGLE PROJECTION

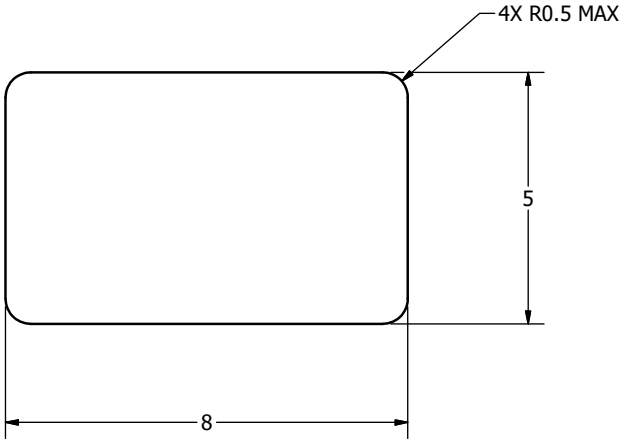
SIZE: A3 | DRAWING NUMBER: 474-6912 | REV: 3

SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	RELEASE FOR PROTOTYPE	IH	JG	5/14/2018







NOTES:

1. MATERIAL: NATURAL RUBBER
   COLOR: BLACK
   DUROMETER: 55 ±10 SHORE "A"
2. REMOVE ALL MOLD FLASHING
3. ALL MOULD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm
4. NO SPLIT OR DEFECTS ARE ALLOWED
   IN THE RUBBER MOLDING

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	2/25/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

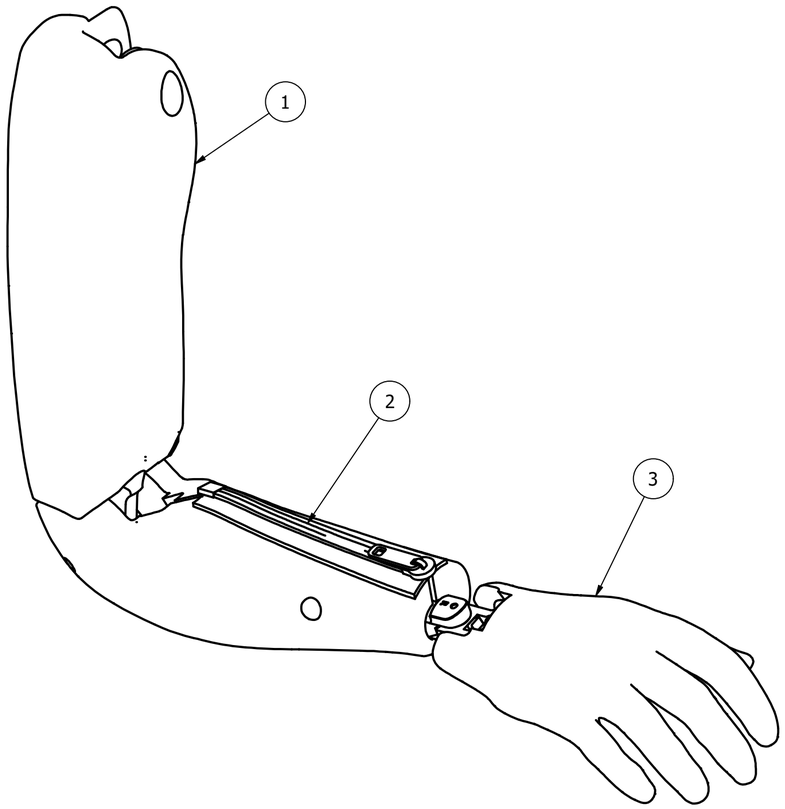
WRIST BUMPER

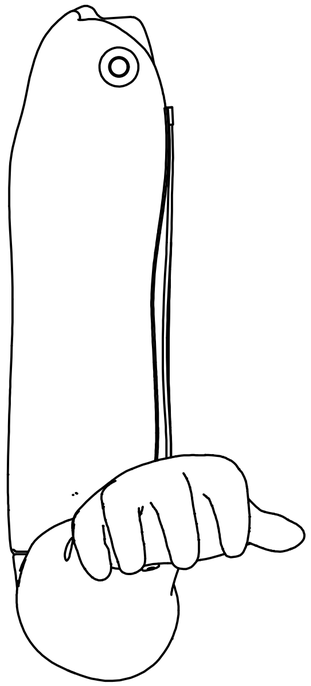
THIRD ANGLE PROJECTION

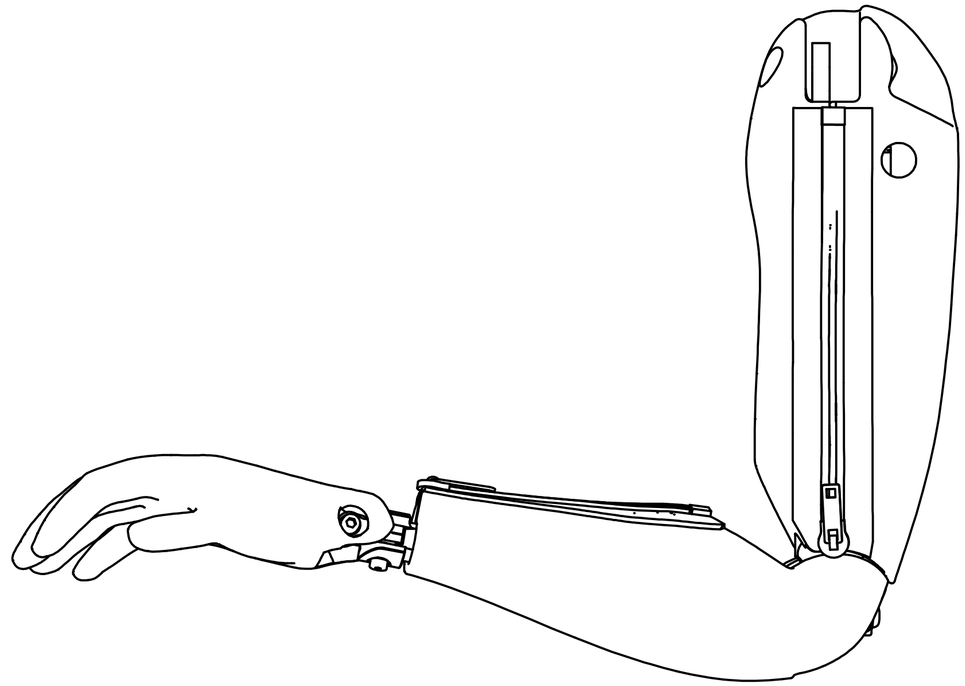
SIZE: A3 | DRAWING NUMBER: 474-6901 | REV: 2

SCALE: 10:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	HEC	8/3/2023







ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	474-6900-2	HAND, MOLDED, RIGHT
2	1	474-6500-2	LOWER ARM ASSEMBLY, RIGHT
1	1	484-6100-2	UPPER ARM ASSEMBLY, RIGHT

PARTS LIST

This design includes features covered by U.S. Patent Nos. 9,514,659 and 9,799,234 (upper arm assembly and shoulder assembly for crash test dummy), which is owned by Humanetics and its affiliated companies. No license is being granted to this patent and third parties are not authorized to make, use, sell, import, or export any products (physical or virtual) that practice the invention covered by this patent, or other patents owned by Humanetics. However, if a third party is interested in obtaining rights to the design, they are to contact Humanetics to discuss license terms.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	4/28/2023
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

RIGHT ARM ASSEMBLY

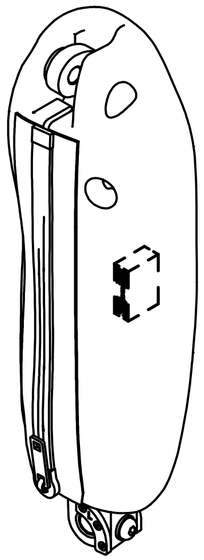
THOR 05F

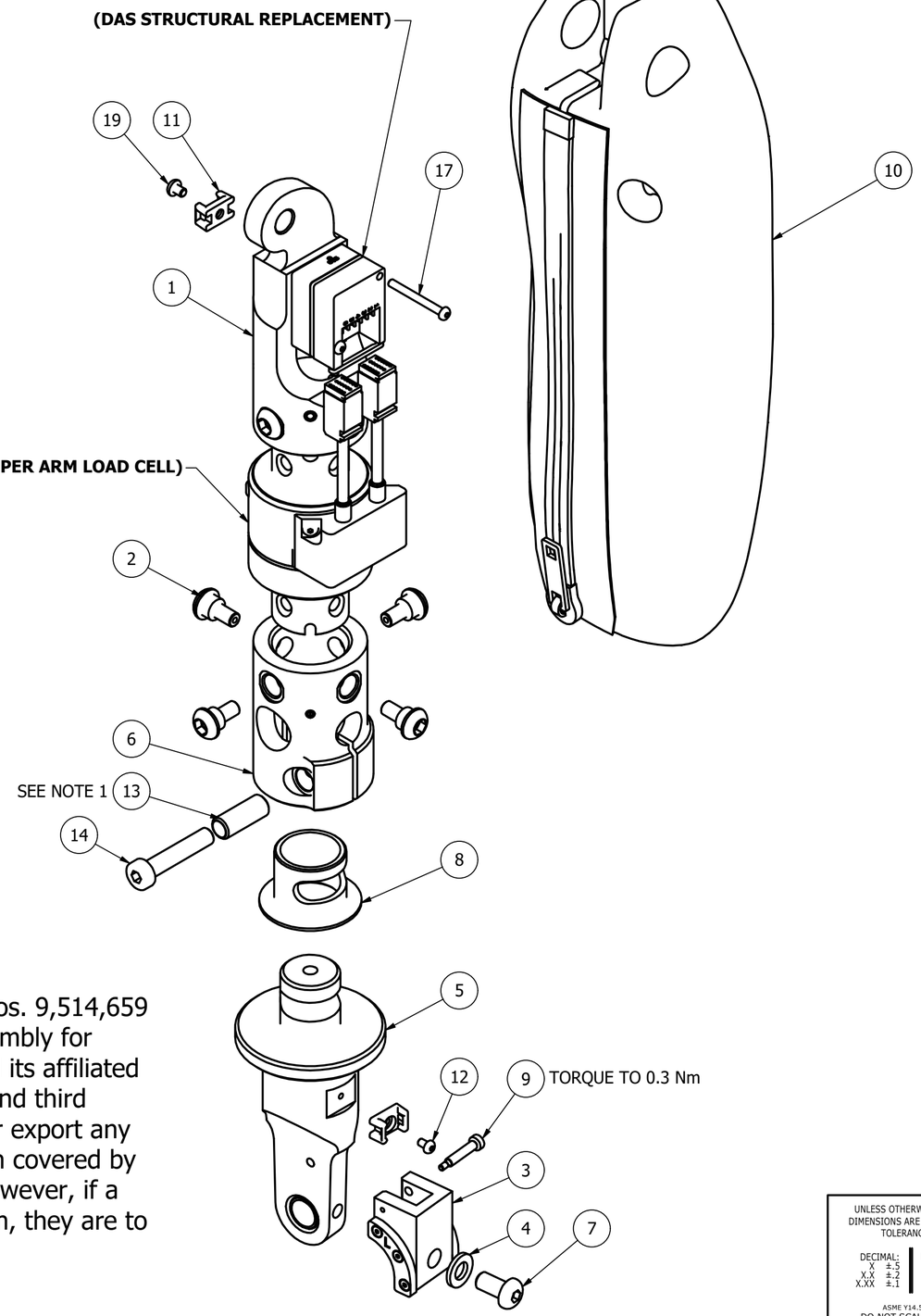
THIRD ANGLE PROJECTION

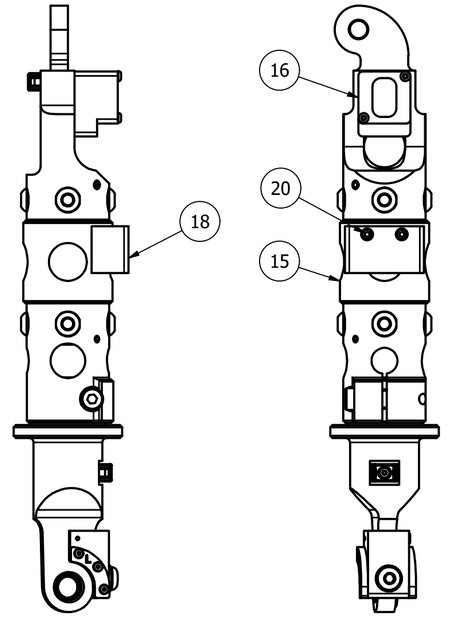
SIZE: A2 | DRAWING NUMBER: 474-6000-2-A | REV: 1

SCALE: .5 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	BK	MJS	8/9/2023







STRUCTURAL REPLACEMENT VIEW
FLESH HIDDEN
SCALE .5:1

ITEM	QTY	PART NUMBER	DESCRIPTION
20	2	5000456	M2.5 X 0.45 X 10 LG. SHCS
19	1	5001067	M3 X 0.5 X 4 LG. BHCS
18	1	484-6113	S.R., STRAIN RELIEF
17	2	5001325	M2.5 X 0.45 X 25 LG. BHCS
16	1	481-3602	DAS AND INTERFACE/6DOF S.R.
15	1	484-6106	S.R., UPPER ARM L.C.
14	1	5001443	M6 X 1 X 30 LG. LHCS
13	1	474-6111	SLEEVE, ARM BOLT
12	1	5001305	M2.5 X 0.45 X 4 LG. BHCS
11	2	6002036	CABLE TIE MOUNT, #4 SCREW
10	1	484-6120-2	UPPER ARM FLESH, RIGHT
9	1	5001372	3 X 14 LG. PREC. SHSS SS
8	1	474-6121	ARM ROTATION BRUSHING
7	1	5000356	M6 X 1 X 12 LG. BHCS
6	1	484-6112	UPPER ARM LOAD CELL ADAPTER
5	1	474-6115-2	DISTAL UPPER ARM TUBE ASSEMBLY, RIGHT
4	1	6003562	M6 FLAT WASHER PLAIN NYLON
3	1	474-6116-A	ELBOW FRICTION PLATE ASSY
2	8	W50-61042	MODIFIED BHSS M6 THREAD
1	1	484-6110-2	DISTAL UPPER ARM TUBE, RIGHT

PARTS LIST

This design includes features covered by U.S. Patent Nos. 9,514,659 and 9,799,234 (upper arm assembly and shoulder assembly for crash test dummy), which is owned by Humanetics and its affiliated companies. No license is being granted to this patent and third parties are not authorized to make, use, sell, import, or export any products (physical or virtual) that practice the invention covered by this patent, or other patents owned by Humanetics. However, if a third party is interested in obtaining rights to the design, they are to contact Humanetics to discuss license terms.

NOTES:

1. BOND 5001443 TO 474-6111

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. Kimes	5/13/2019
CHECKED	
ENG	
APPROVED	

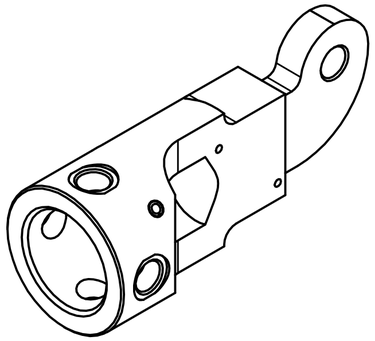
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

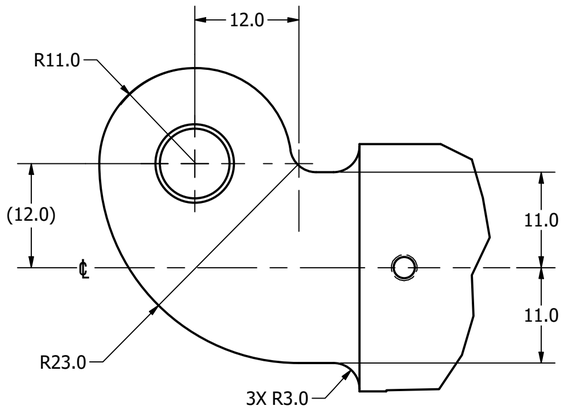
UPPER ARM ASSEMBLY, RIGHT
THOR-05F

THIRD ANGLE PROJECTION

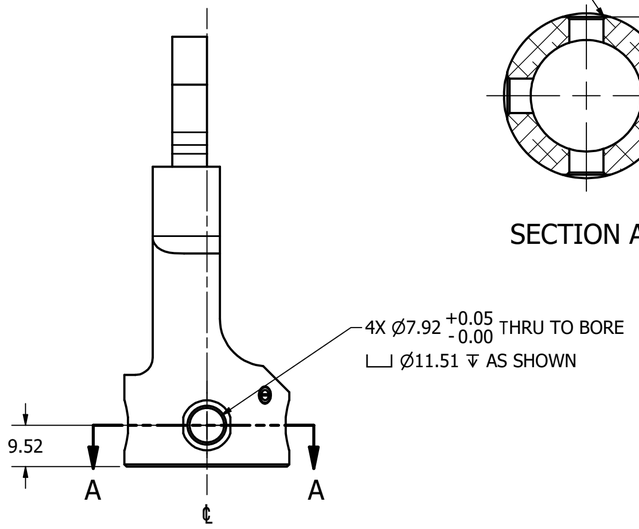
SIZE: A2 | DRAWING NUMBER: 484-6100-2 | REV: 2
SCALE: .75 : 1 | SHEET: 1 OF 1

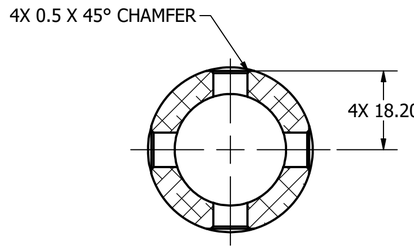
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	MJS	5/9/2019



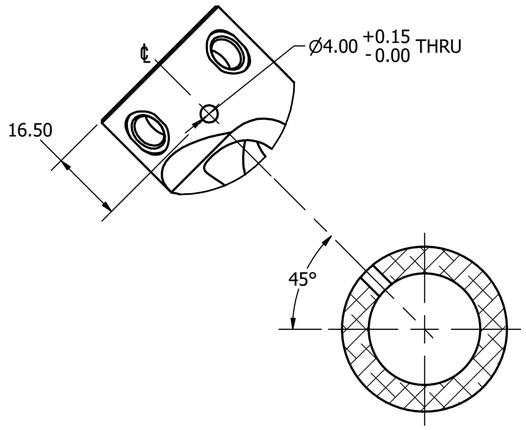


DETAIL Z
SCALE 2 : 1

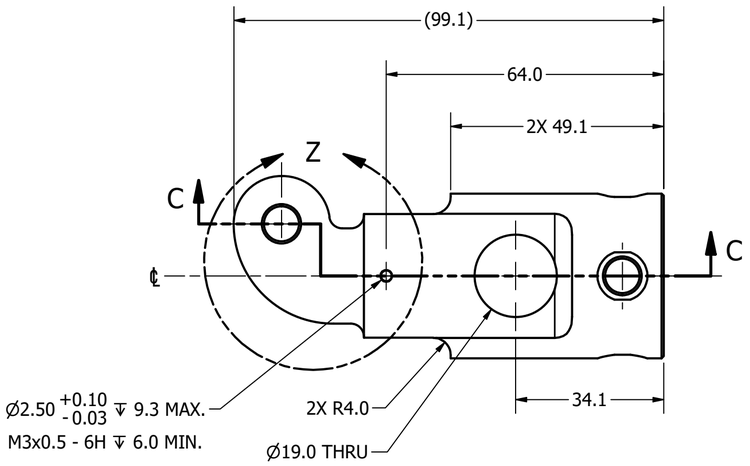


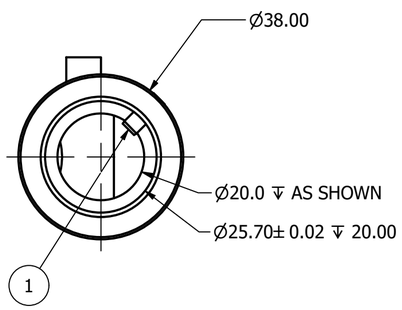


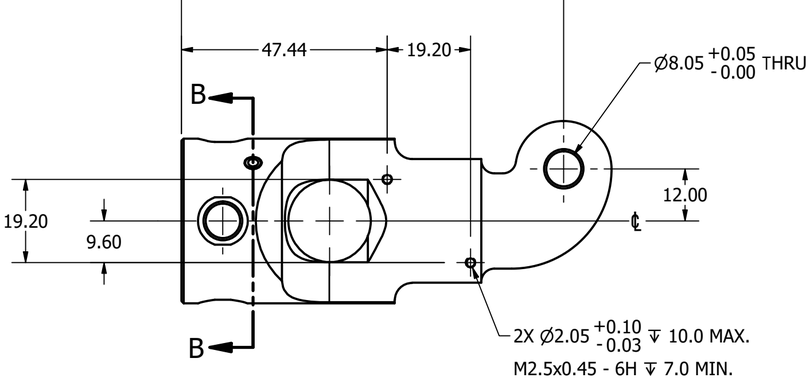
SECTION A-A

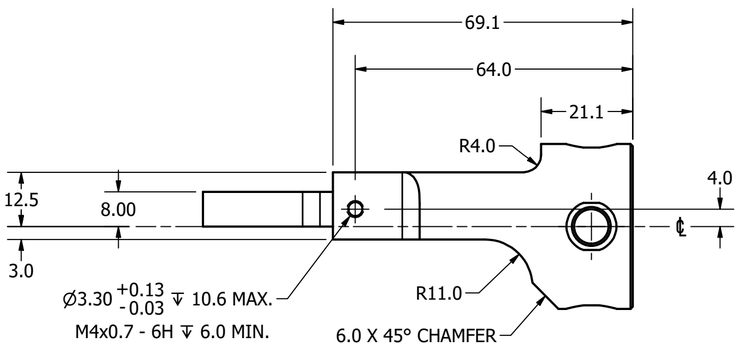


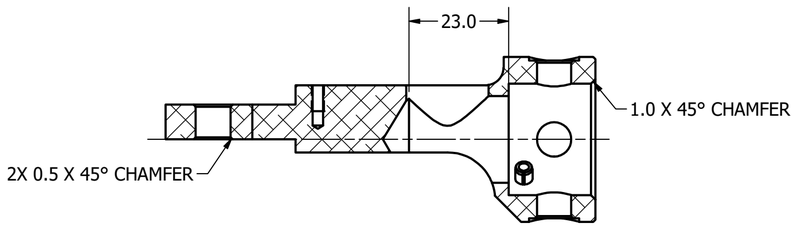
SECTION B-B
ROLL PIN REMOVED











SECTION C-C

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5000182	M4 X 10 LG. ROLL PIN

PARTS LIST

NOTES:
1. INSTALL ROLL PIN FLUSH OR BELOW OUTER SURFACE AFTER PLATING.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: 0.008 ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	5/9/2019
CHECKED	
ENG	
APPROVED	

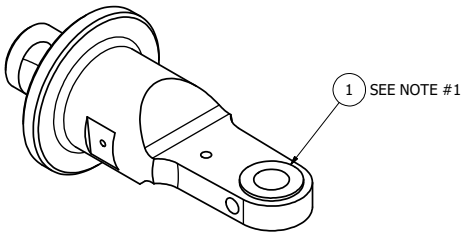
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

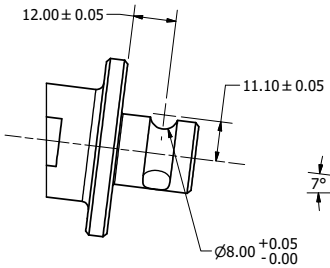
DISTAL UPPER ARM TUBE, RIGHT
THOR-05F

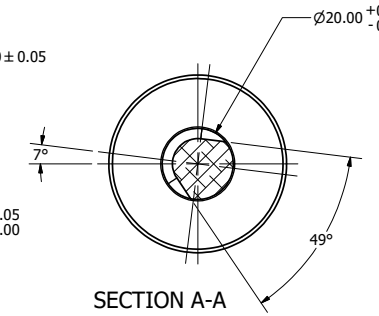
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 484-6110-2 | REV: 1
SCALE: 1:1 | SHEET: 1 OF 1

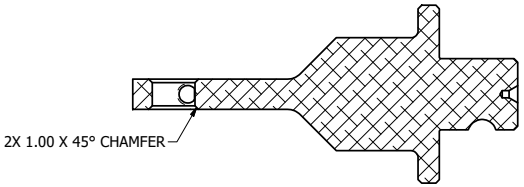
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	AB	JW	11/15/17



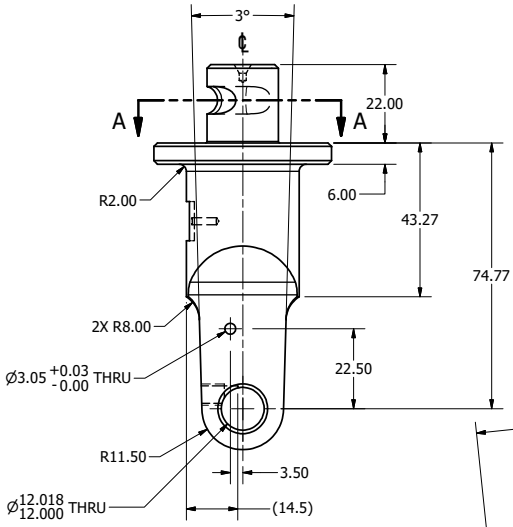


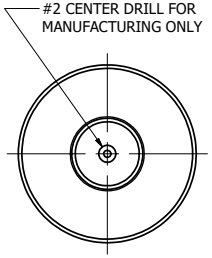


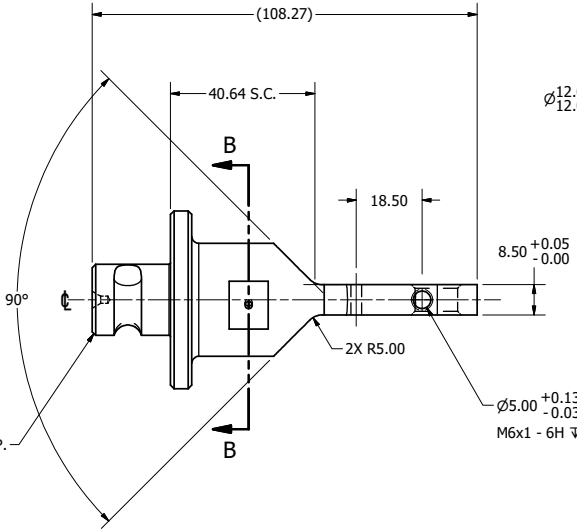
SECTION A-A

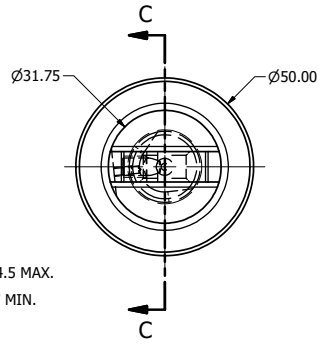


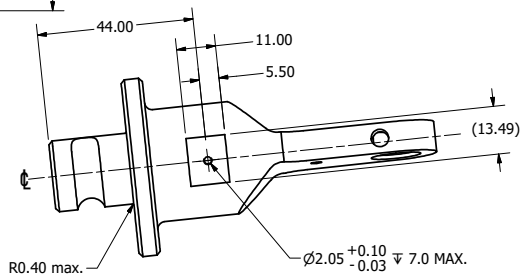
SECTION C-C

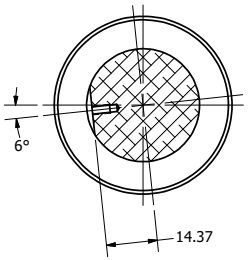












SECTION B-B

NOTES:

1. INSTALL BEARING AFTER ANODIZE.
2. DIMENSIONS ARE SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6004600	BEARING, FLANGE, 12mm OD X 10mm ID X 9mm LG

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT:
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: A. Barchock	11/13/2017
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

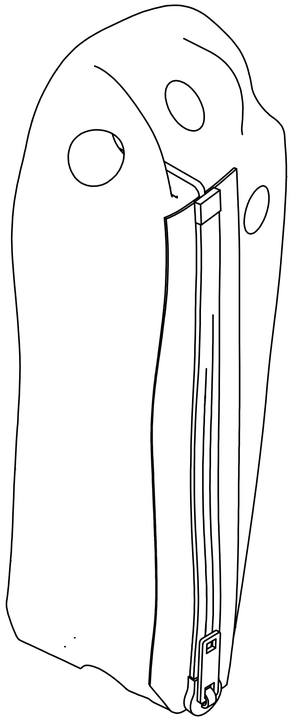
DISTAL UPPER ARM TUBE ASSEMBLY, RIGHT

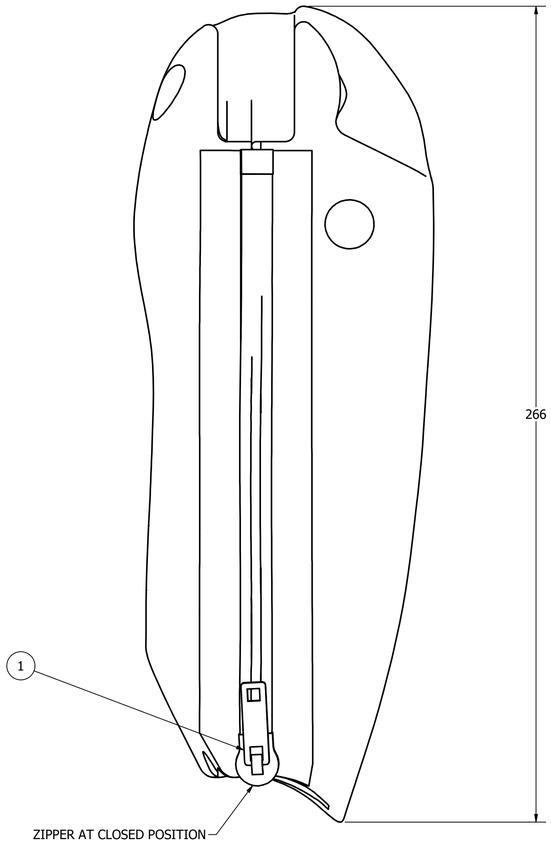
THIRD ANGLE PROJECTION

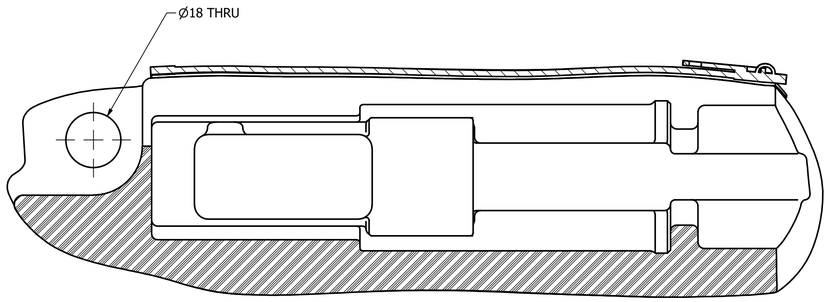
SIZE: A2 | DRAWING NUMBER: 474-6115-2 | REV: 1

SCALE: 1:1 | SHEET: 1 OF 1

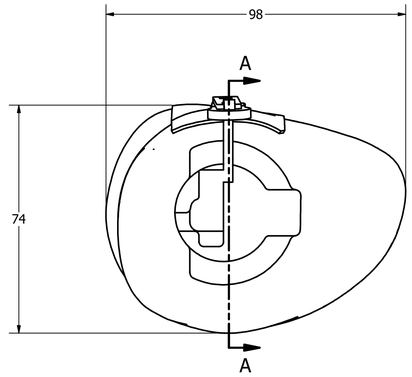
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	AB	MJS	09/22/2022







SECTION A-A



NOTES:

1. MATERIAL: PVC
   COLOR: EURO BROWN
   DUROMETER: 30±5 SHORE A

2. REMOVE ALL MOLD FLASHING

3. ALL MOLD DIMENSION TOLERANCE +1%/-4% BUT NO SMALLER THAN 1mm

4. WEIGHT: 435±22g

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-6122	ZIPPER ASSEMBLY, UPPER ARM

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.1, X.X ±.1, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	5/10/2019
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

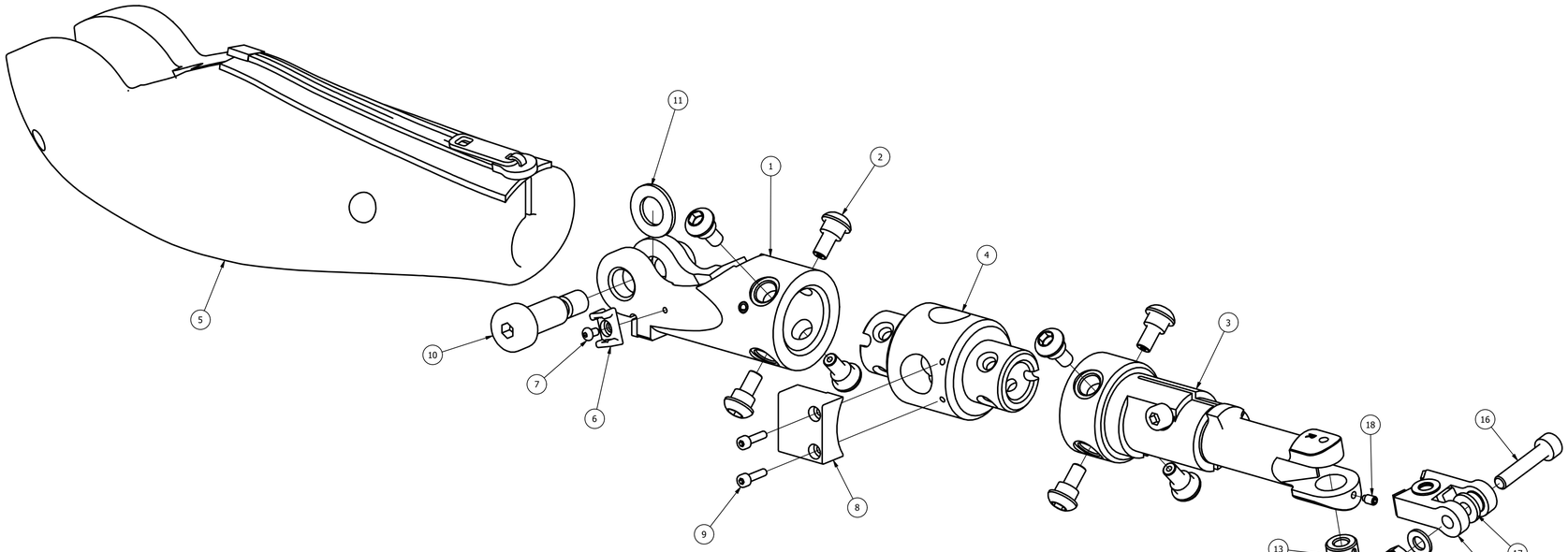
UPPER ARM FLESH, RIGHT

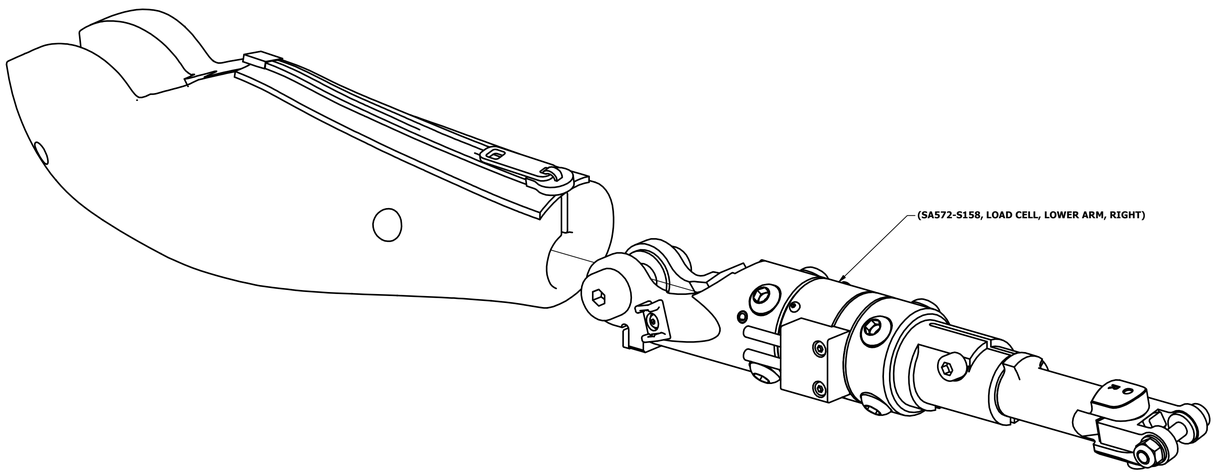
THIRD ANGLE PROJECTION

SIZE: A1 | DRAWING NUMBER: 484-6120-2 | REV: 3

SCALE: 1:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	7	PROTOTYPE	BK	DJI	6/21/2023





INSTRUMENTED VIEW

ITEM	QTY	PART NUMBER	DESCRIPTION
20	1	5000522	M5 X 0.8 HEX LOCK NUT ZINC
19	1	5000566	M5 FLAT WASHER PLAIN ZINC
18	1	5001799	M3 X 0.5 X 5 LG. SSSDP
17	1	6004820	BEARING, FLANGED 8mm OD X 5mm ID X 5mm LG
16	1	5000721	M5 X 0.8 X 25 LG. SHCS
15	1	5001483	M5 X 18 LG. SHSS SS
14	1	5001374	M5 WAVE WASHER SS
13	1	474-6705-A	WRIST INSERT
12	1	474-6717-2	WRIST ROTATOR CLEVIS, RIGHT
11	1	474-6502	WASHER, UPPER-LOWER ARM
10	1	5001162	M10 X 20 LG. SHSS
9	2	5000456	M2.5 X 0.45 X 10 LG. SHCS
8	1	474-6113	STRUCTURAL REPLACEMENT, CONNECTOR BLOCK
7	1	5001305	M2.5 X 0.45 X 4 LG. BHCS
6	1	6002036	CABLE TIE MOUNT, #4 SCREW
5	1	474-6525-2	LOWER ARM FLESH, RIGHT
4	1	474-6106	STRUCTURAL REPLACEMENT, UPPER-LOWER ARM LOAD CELL
3	1	474-6700-2	LOWER ARM AND WRIST ASSEMBLY, RIGHT
2	8	W50-61042	MODIFIED BHSS M6 THREAD
1	1	474-6501-2	PROXIMAL LOWER ARM TUBE, RIGHT

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.1, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: A. Barchock	5/6/2016
CHECKED	
ENG	
APPROVED	

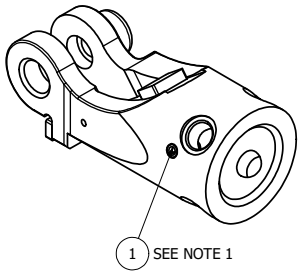
MATERIAL
HEAT TREAT
FINISH

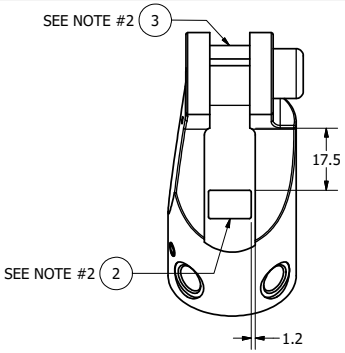
LOWER ARM ASSEMBLY, RIGHT
THOR-05F

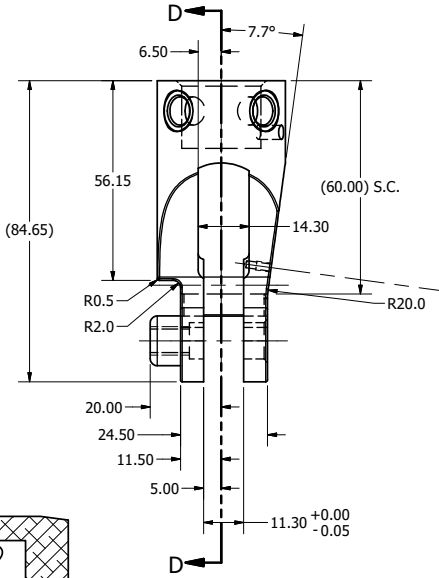
THIRD ANGLE PROJECTION

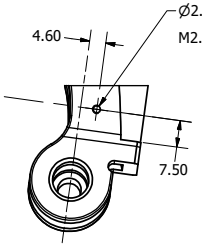
SIZE: A1 | DRAWING NUMBER: 474-6500-2 | REV: 7
SCALE: 1:1 | SHEET: 1 OF 1

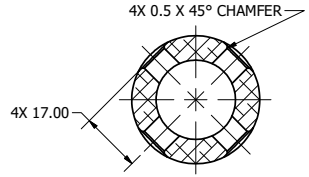
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	RELEASE FOR PROTOTYPE	RM	HEC	09/06/2022



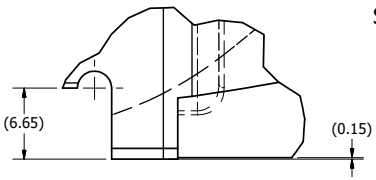




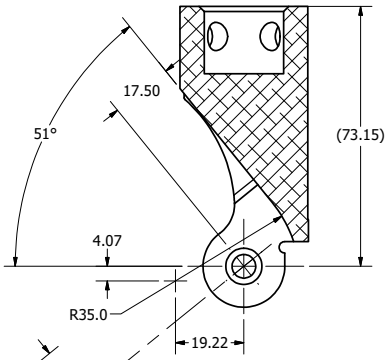




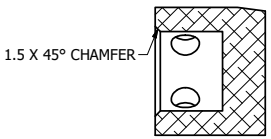
SECTION A-A



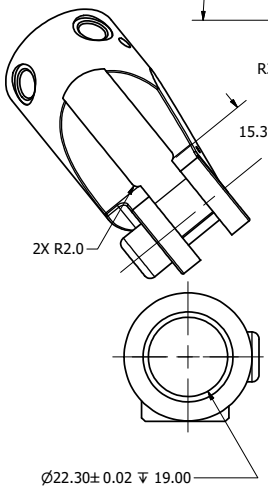
DETAIL E
SCALE 3 : 1

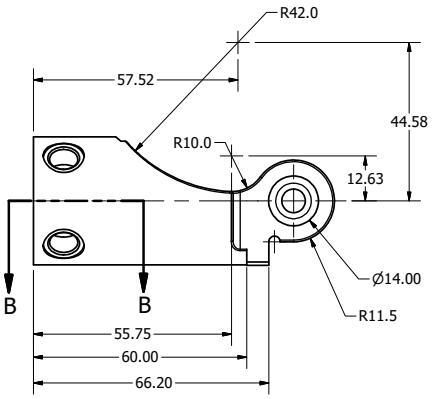


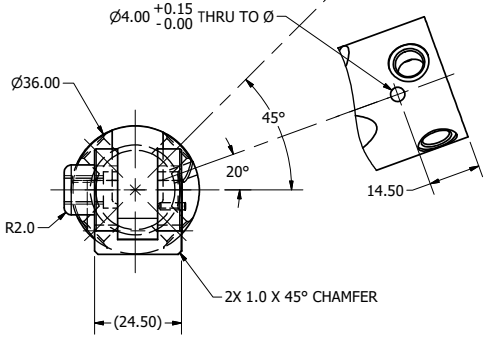
SECTION D-D

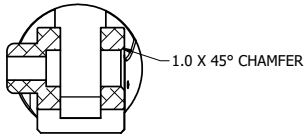


SECTION B-B

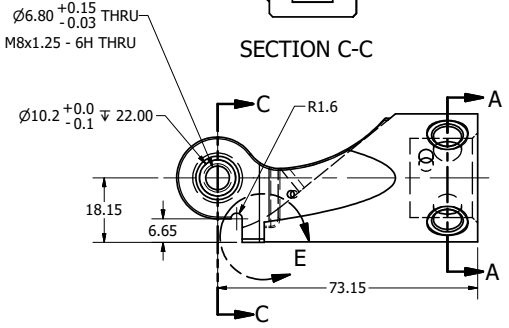








SECTION C-C



ITEM	QTY	PART NUMBER	DESCRIPTION
3	1	474-6558	ELBOW EXTENSION BUMPER
2	1	474-6559	ELBOW FLEXION BUMPER
1	1	5000182	M4 X 10 LG. ROLL PIN

PARTS LIST

NOTES:

1. INSTALL FLUSH TO OUTSIDE SURFACE AFTER ANODIZE.
2. PREPARE FACES AND ATTACH BUMPERS WITH ADHESIVE WHERE SHOWN.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN ghayden	3/9/2016
CHECKED	
ENG JW	3/8/2016
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

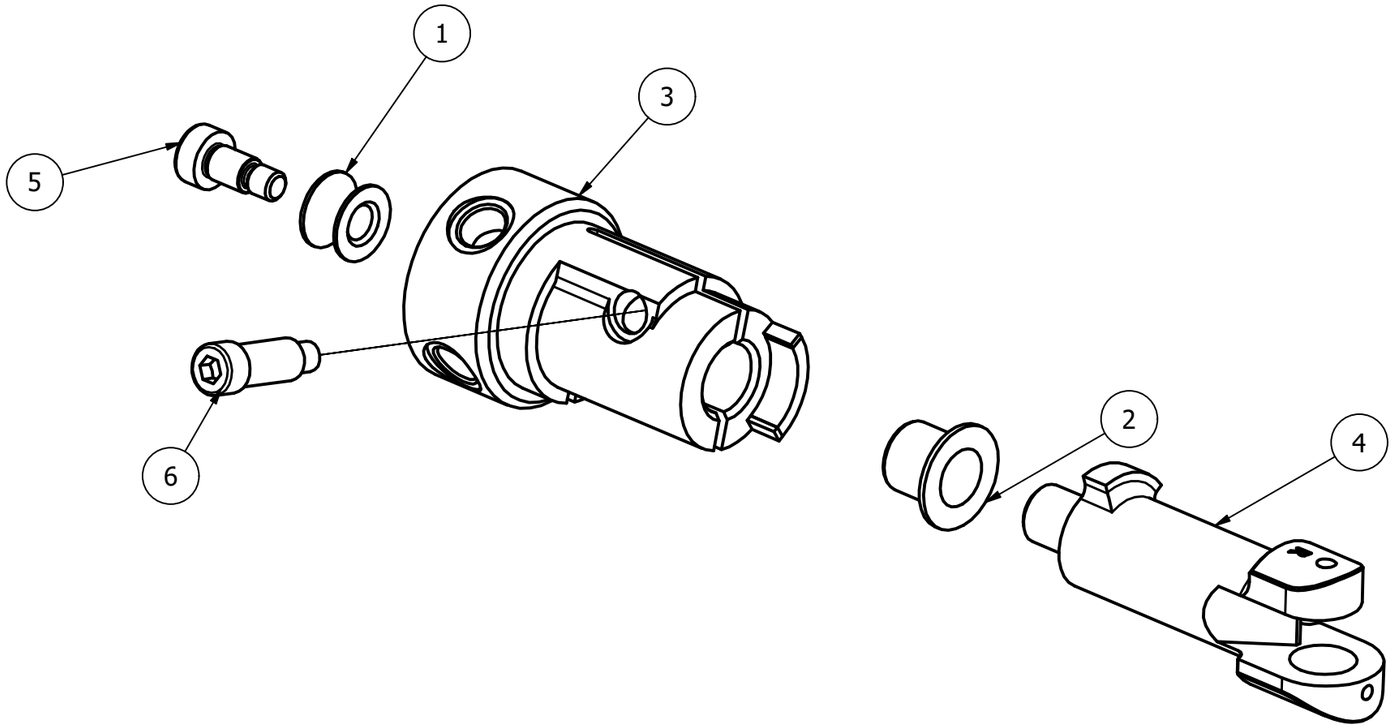
PROXIMAL LOWER ARM TUBE, RIGHT

THIRD ANGLE PROJECTION

SIZE A2 | DRAWING NUMBER 474-6501-2 | REV 3

SCALE: 1 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	7	RELEASE FOR PROTOTYPE	DJI	DJI	10/4/2021



ITEM	QTY	PART NUMBER	DESCRIPTION
6	1	474-6704	DISTAL LOWER ARM BOLT ASSEMBLY
5	1	5000922	M6 X 8 LG. SHSS SS
4	1	474-6712-2-A	WRIST INSERT, RIGHT
3	1	474-6701-2	DISTAL LOWER ARM TUBE, RIGHT
2	1	6004601	BEARING, FLANGE, 12mm OD X 10mm ID X 12mm LG
1	1	474-6553	WRIST ROTATION GUIDE

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN ghayden	3/7/2016
CHECKED	
ENG	
APPROVED	

MATERIAL
HEAT TREAT
FINISH

LOWER ARM AND WRIST ASSEMBLY, RIGHT

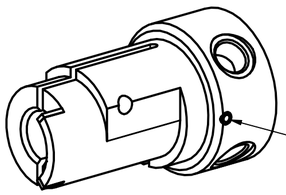
THOR-05F

THIRD ANGLE PROJECTION

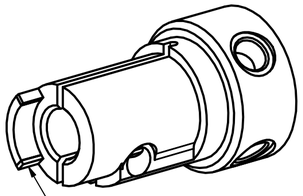
SIZE A3 | DRAWING NUMBER 474-6700-2 | REV 7

SCALE: 1 : 1 | SHEET 1 OF 1

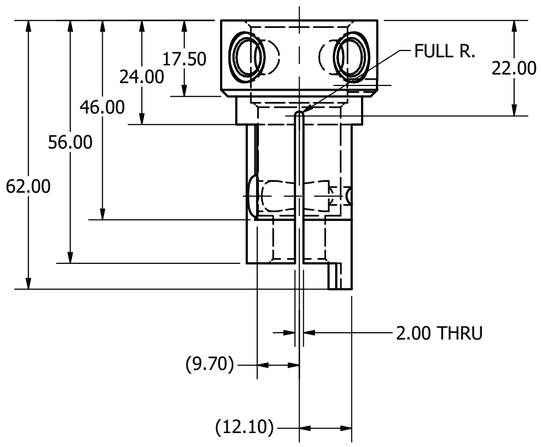
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	RELEASE FOR PROTOTYPE	AB	JW	03/10/2017

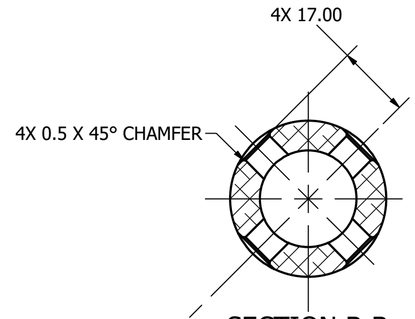


1 SEE NOTE #1

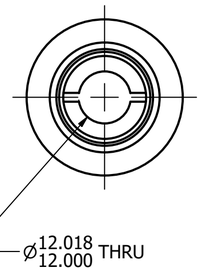


SEE NOTE #2 2





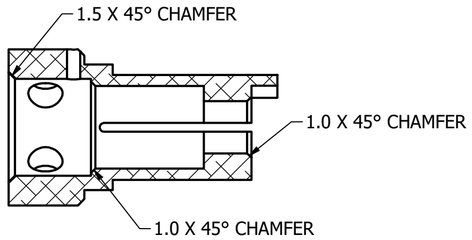
SECTION B-B



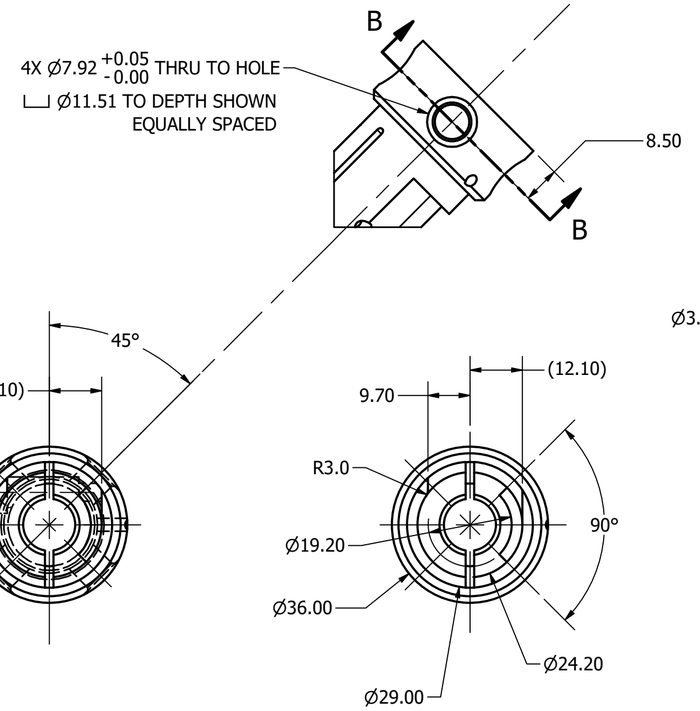
Ø12.018 / 12.000 THRU

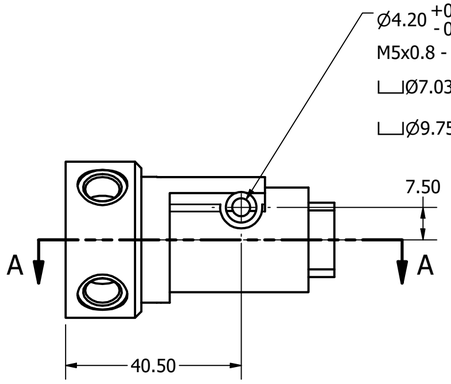
⌴ Ø19.05 ↧ 45.00

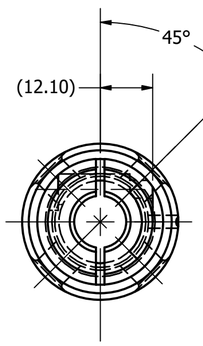
⌴ Ø22.30 ±0.02 ↧ 19.00

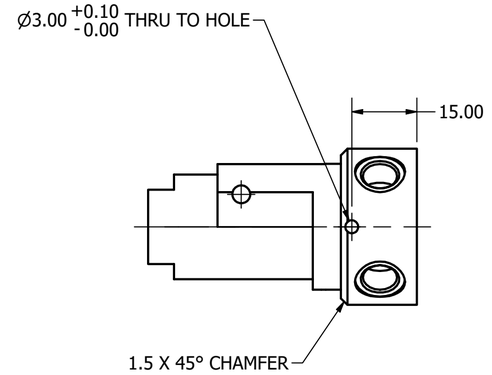


SECTION A-A









ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	474-6557	WRIST ROTATION BUMPER
1	1	5000199	M3 X 10 LG. ROLL PIN SS

PARTS LIST

NOTES:

1. INSTALL FLUSH TO OUTSIDE SURFACE AFTER ANODIZE.
2. BOND 474-6557 TO SURFACE AS SHOWN.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075 T-6 ALUMINUM
HEAT TREAT:
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	3/10/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

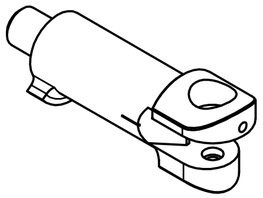
DISTAL LOWER ARM TUBE, RIGHT

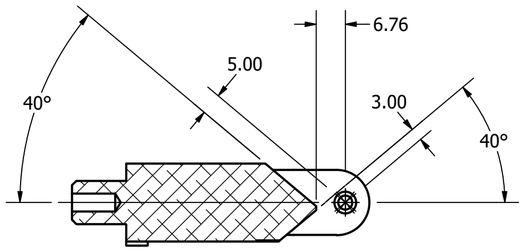
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-6701-2 | REV: 3

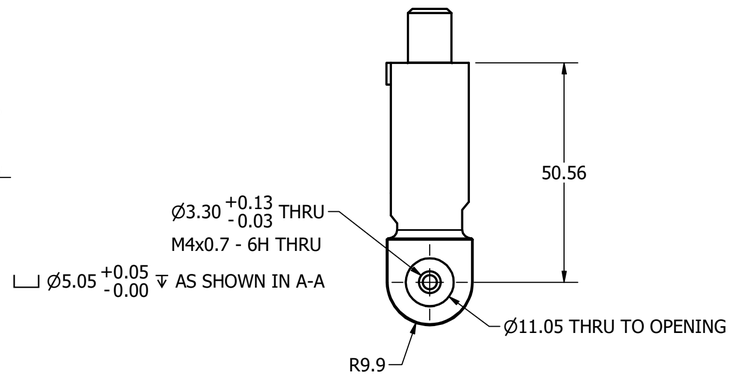
SCALE: 1 : 1 | SHEET: 1 OF 1

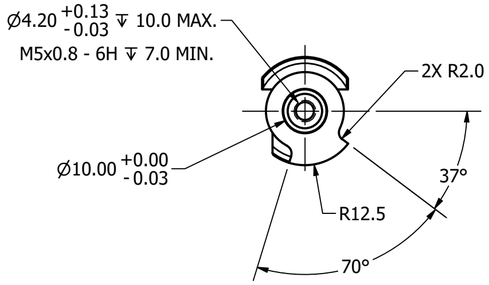
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	RELEASE FOR PROTOTYPE	AB	DJI	08/11/2022

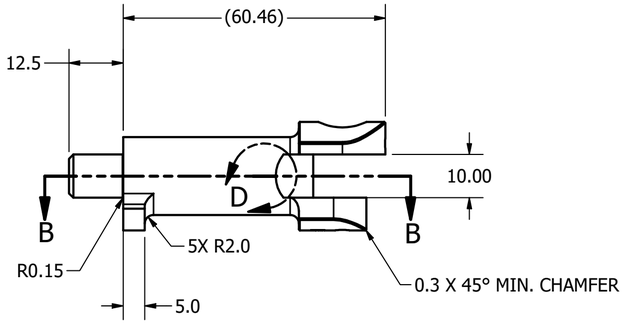


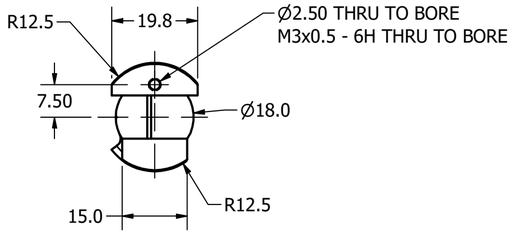


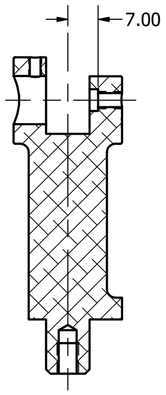
SECTION B-B



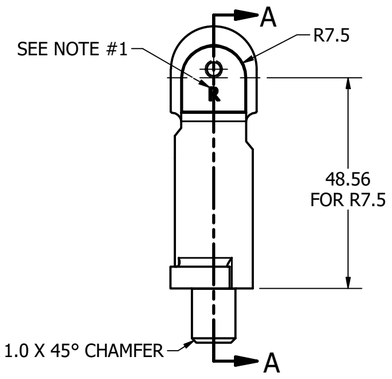


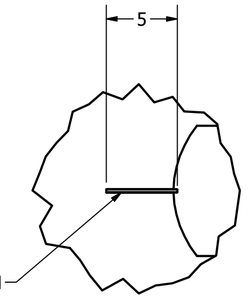






SECTION A-A





DETAIL D
SCALE 3 : 1

NOTES:

1. STAMP OR ETCH 3mm CHARACTER AS SHOWN.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	3/22/2019
CHECKED:	
ENG: DJI	3/22/2019
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

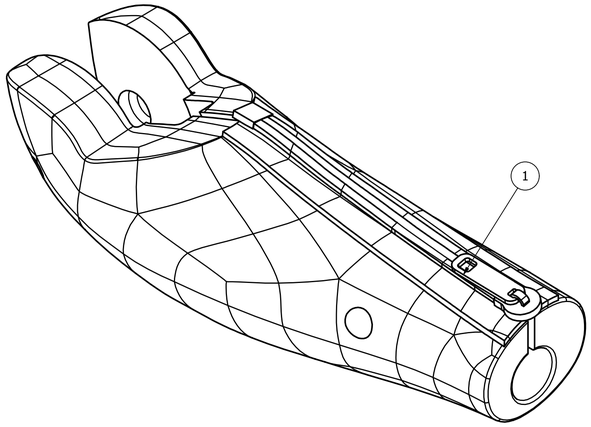
WRIST INSERT, RIGHT

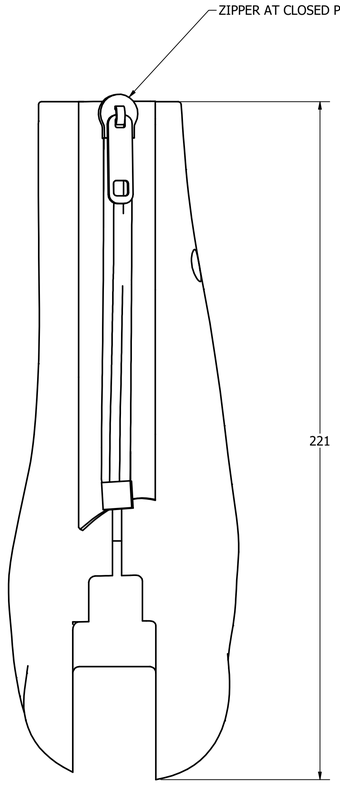
THIRD ANGLE PROJECTION

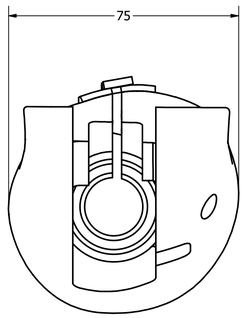
SIZE: A2 | DRAWING NUMBER: 474-6712-2-A | REV: 4

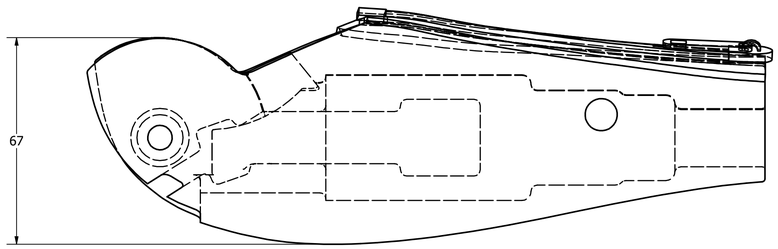
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	RELEASE FOR PROTOTYPE	AB	DJI	09/16/2022









NOTES:
1. MATERIAL: PVC
   COLOR: EURO BROWN
   DUROMETER: 55 ±10 SHORE "A"
2. REMOVE ALL MOLD FLASHING
3. ALL MOULD DIMENSION TOLERANCE +1%/-4%
   BUT NO TOLERANCE SMALLER THAN 1mm
4. WEIGHT: 350±25g

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-6521-2	ZIPPER ASSEMBLY, LOWER ARM

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMALS: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN srice	9/7/2021
CHECKED	
ENG DJI	9/14/2021
APPROVED	

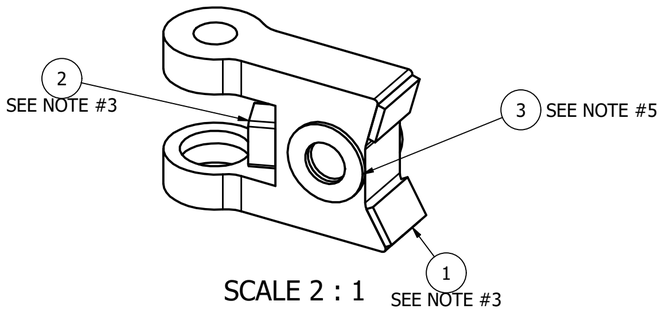
MATERIAL: SEE NOTE #1
HEAT TREAT: N/A
FINISH: N/A

LOWER ARM FLESH, RIGHT

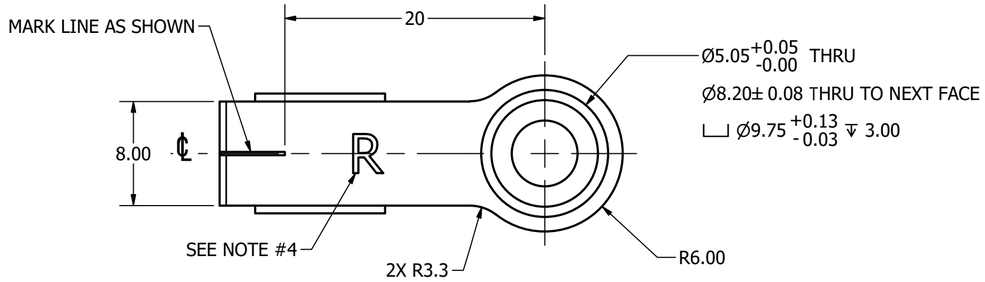
THIRD ANGLE PROJECTION

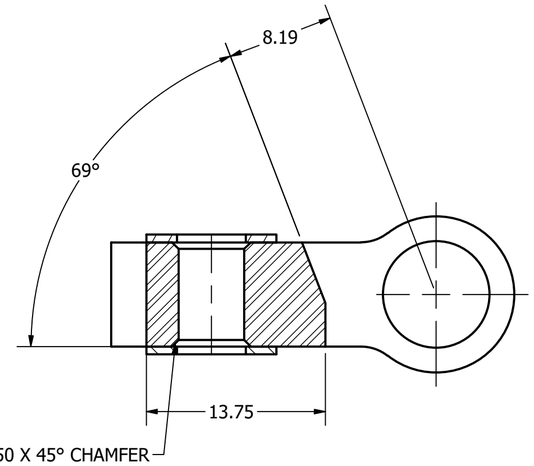
SIZE: A1 | DRAWING NUMBER: 474-6525-2 | REV: 2
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	PROTOTYPE	BK	DJI	6/21/2023

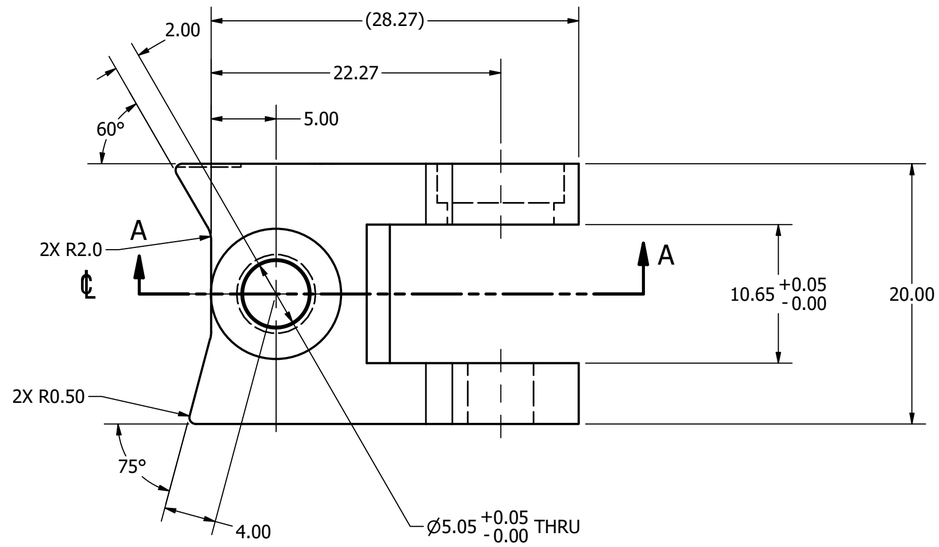


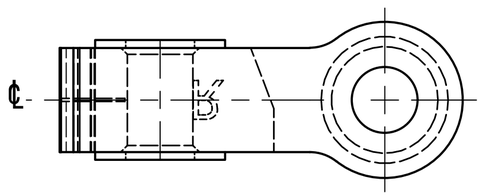
SCALE 2 : 1





SECTION A-A





NOTES:

1. DIMENSIONS ARE SYMMETRICAL ABOUT ℄ UNLESS OTHERWISE SPECIFIED.
2. BUMPERS REMOVED FROM SOME VIEWS FOR CLARITY.
3. PREP FACES & ATTACH BUMPERS WITH ADHESIVE CENTRAL TO ATTACHMENT FACES AFTER PLATING.
4. STAMP OR ETCH 3mm CHARACTER AS SHOWN.
5. PREP FACES & ATTACH WASHERS WITH ADHESIVE, CENTRAL TO HOLES, AFTER PLATING.

ITEM	QTY	PART NUMBER	DESCRIPTION
3	2	474-6706-A	WRIST WASHER
2	1	474-6723	WRIST BUMPER - EXTENSION
1	2	474-6721	WRIST BUMPER - RADIUS

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 4140 STEEL
HEAT TREAT: Rc 28-32
FINISH: 0.008mm ELECTROLESS NICKEL PLATE PER SIDE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	3/25/2019
CHECKED:	
ENG: DJI	3/25/2019
APPROVED:	

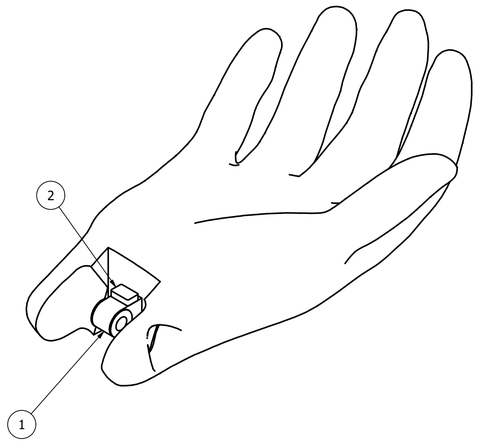
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

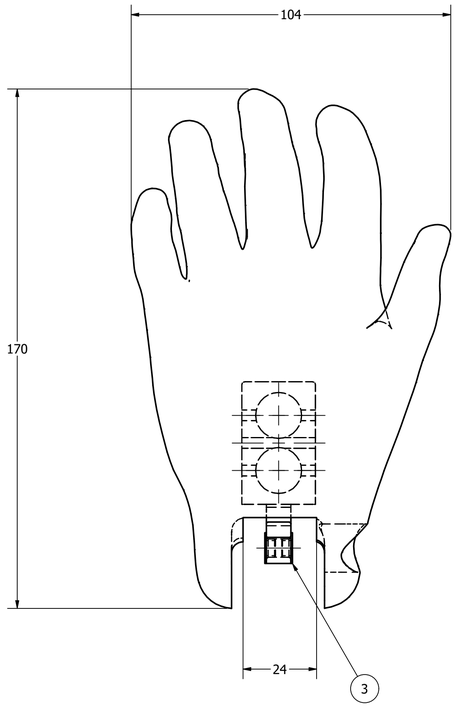
WRIST ROTATOR CLEVIS, RIGHT
THOR-05F

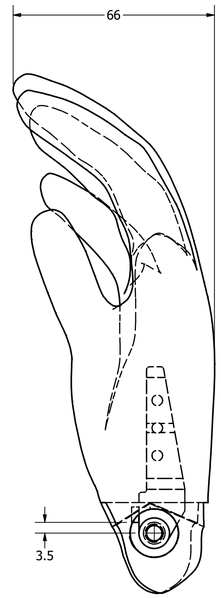
THIRD ANGLE PROJECTION

SIZE: A2 | DRAWING NUMBER: 474-6717-2 | REV: 3
SCALE: 2 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	RELEASE FOR PROTOTYPE	AB	JW	03/10/2017







NOTES:

1. MATERIAL: POLYURETHANE
   COLOR: EURO BROWN
   DUROMETER: 50 ±5 SHORE "A"
2. REMOVE ALL MOLD FLASHING
3. ALL MOLD DIMENSION TOLERANCE +1%/-2%
   BUT NO SMALLER THAN 0.5mm
4. BOND ITEM 2 TO ITEM 1 WHERE SHOWN
5. WEIGHT: 262 GRAMS ± 8 GRAMS

ITEM	QTY	PART NUMBER	DESCRIPTION
3	2	6004819	BEARING, FLANGED 6mm OD X 5mm ID X 3.5mm LG
2	1	474-6901	WRIST BUMPER
1	1	474-6912	HAND BONE

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMALS: X ±.1, X.X ±.2, X.XX ±.1
MACHINED ∠C ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE #1
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: ghayden	3/1/2016
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

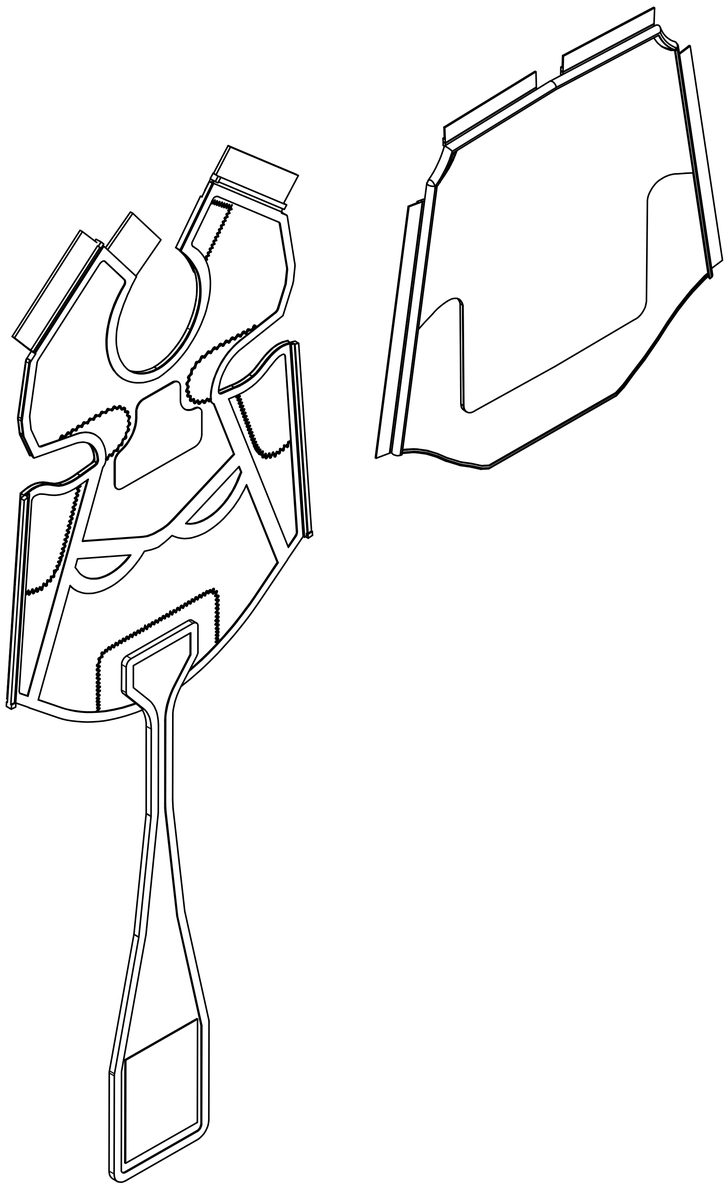
HAND, MOLDED, RIGHT

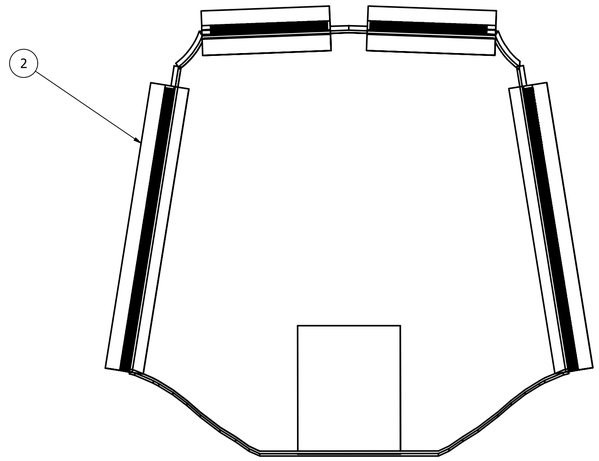
THIRD ANGLE PROJECTION

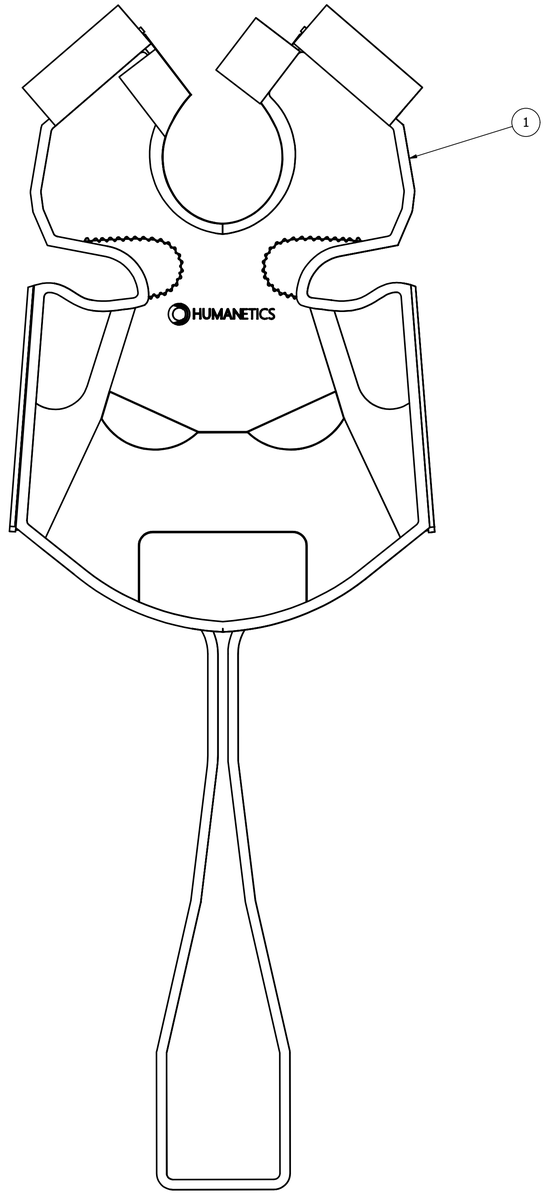
SIZE: A1 | DRAWING NUMBER: 474-6900-2 | REV: 2

SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	HEC	3/27/2023







ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	474-3910	BACK PANEL ASSEMBLY
1	1	474-3950	FRONT BODY ASSEMBLY

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	3/21/2023
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

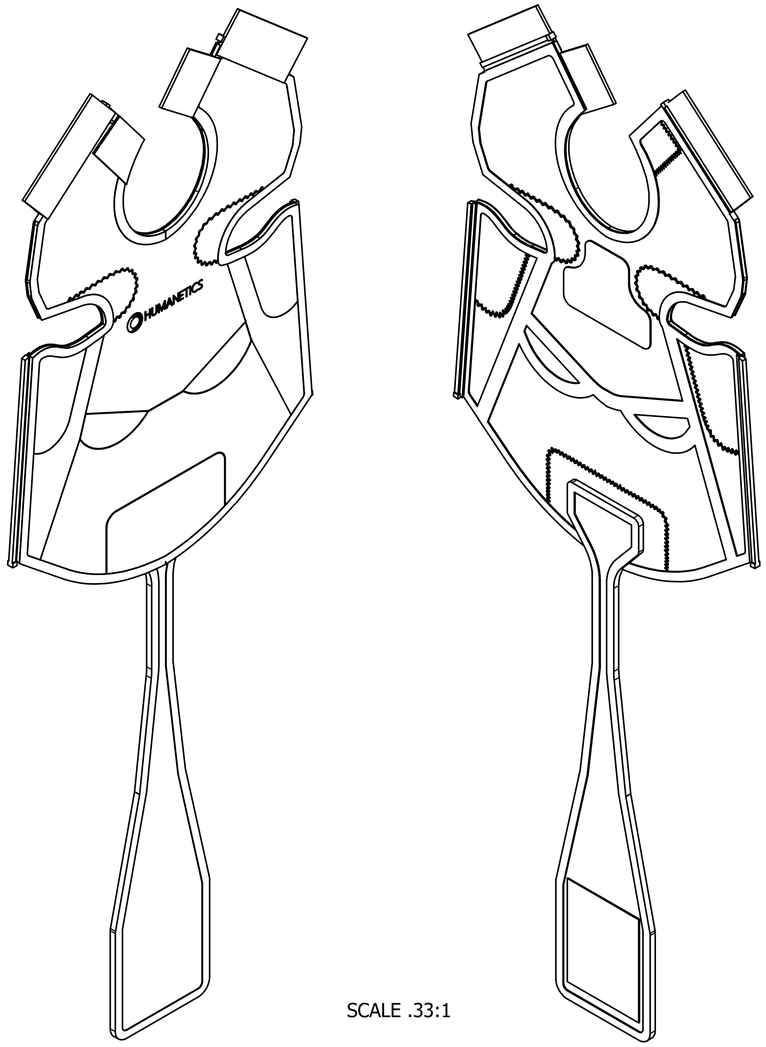
JACKET ASSEMBLY, THOR-05F

THIRD ANGLE PROJECTION

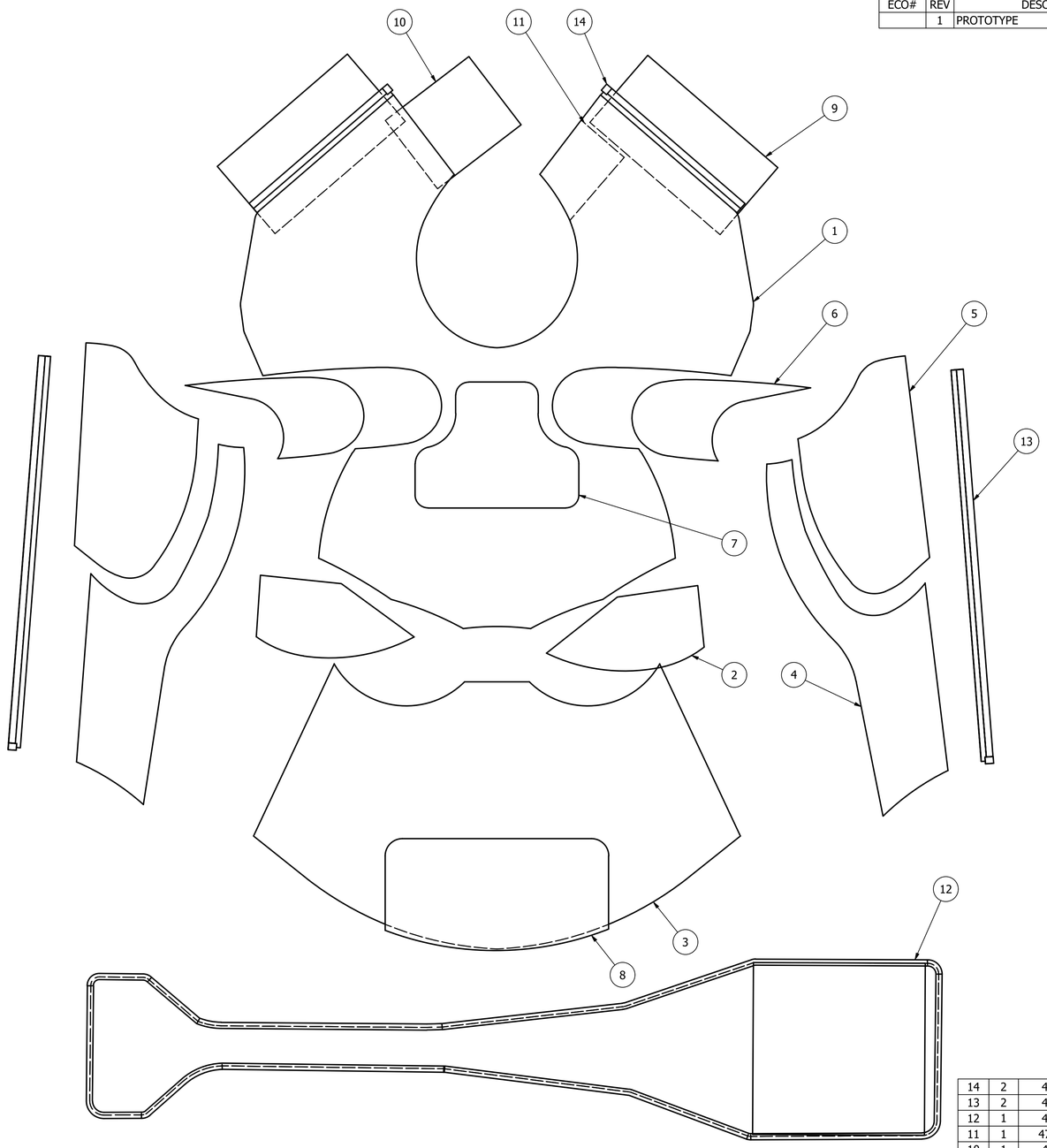
SIZE: A1 | DRAWING NUMBER: 474-3900-A | REV: 1

SCALE: .33:1 | SHEET: 1 OF 1

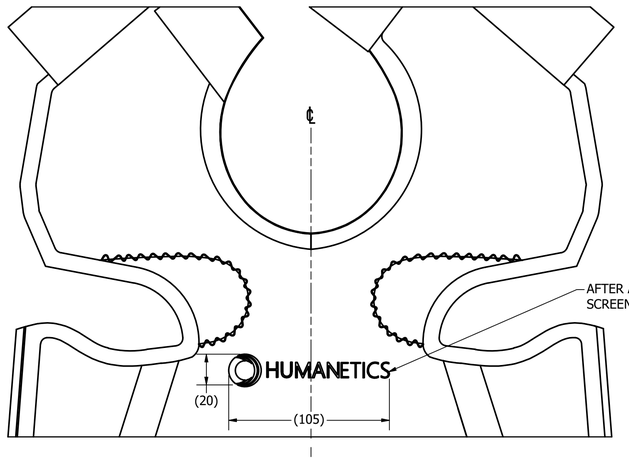
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	HEC	3/21/2023



SCALE .33:1



SEE PAGE 2 FOR SEWN PANELS
SCALE .5 : 1



LOGO
SCALE .5 : 1

ITEM	QTY	PART NUMBER	DESCRIPTION
14	2	474-3823	SHOULDER ZIPPER, PIN AND STOP
13	2	474-3925	SIDE ZIPPER, PIN AND STOP
12	1	474-3810	STRAP
11	1	474-3833B	LOOP VELCRO FOR NECK FLAP
10	1	474-3833	FLAP FOR NECK
9	2	474-3834	HOOK FOR SHOULDERS
8	2	474-3831C	CORDURA STRAP REINFORCEMENT
7	1	474-3830B	REINFORCEMENT PAD
6	2	474-3951	SHOULDER ARM STRETCH
5	2	474-3900-W-A	SIDE PAD
4	2	474-3900-V-A	SIDE PANEL
3	1	474-3900-Z-A	BODY PANEL FRONT, LOWER
2	2	474-3900-X-A	BREAST PANEL
1	1	474-3900-Y-A	BODY PANEL, FRONT, TOP

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMALS: X ±.1, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

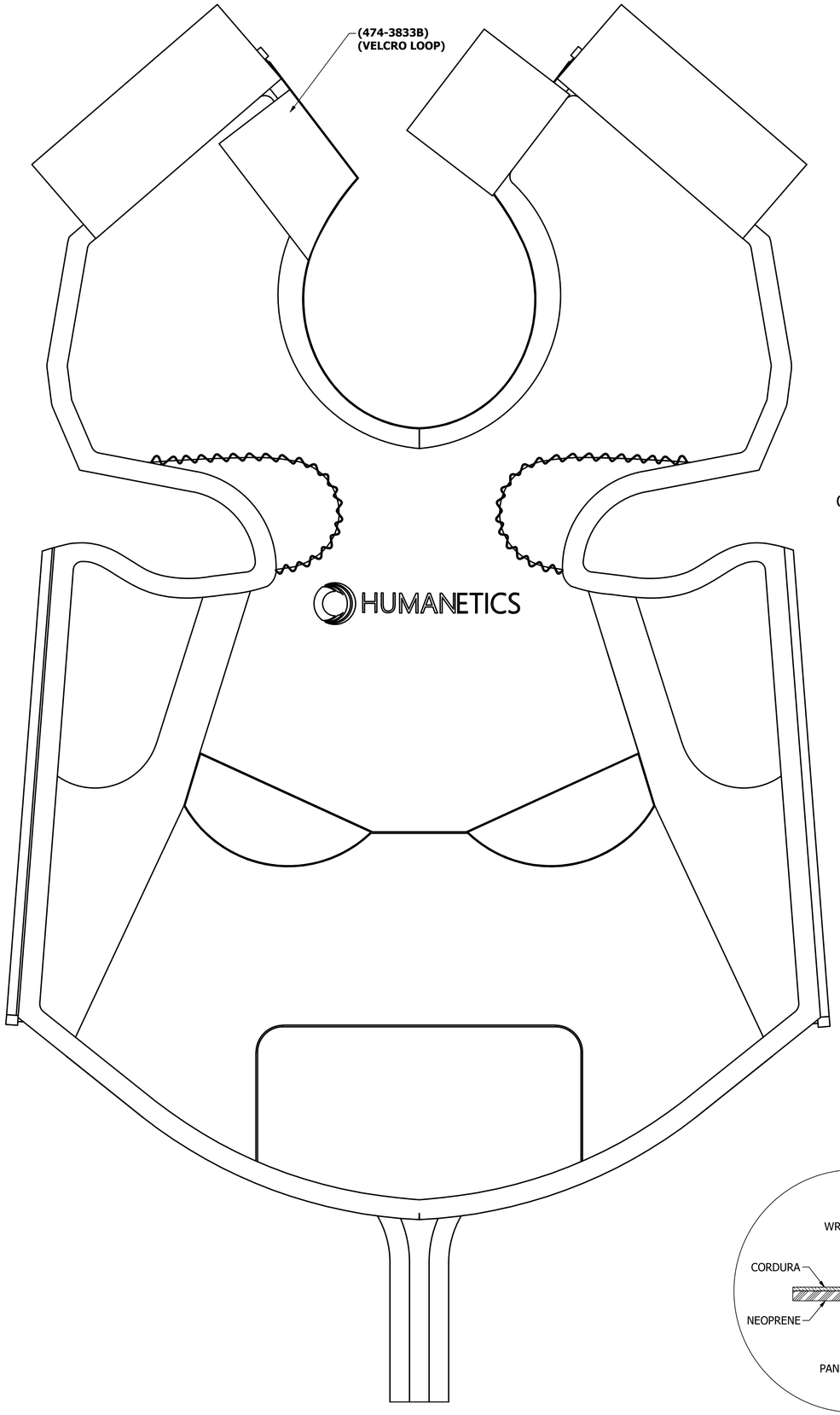
VEHICLE RESEARCH and TEST CENTER

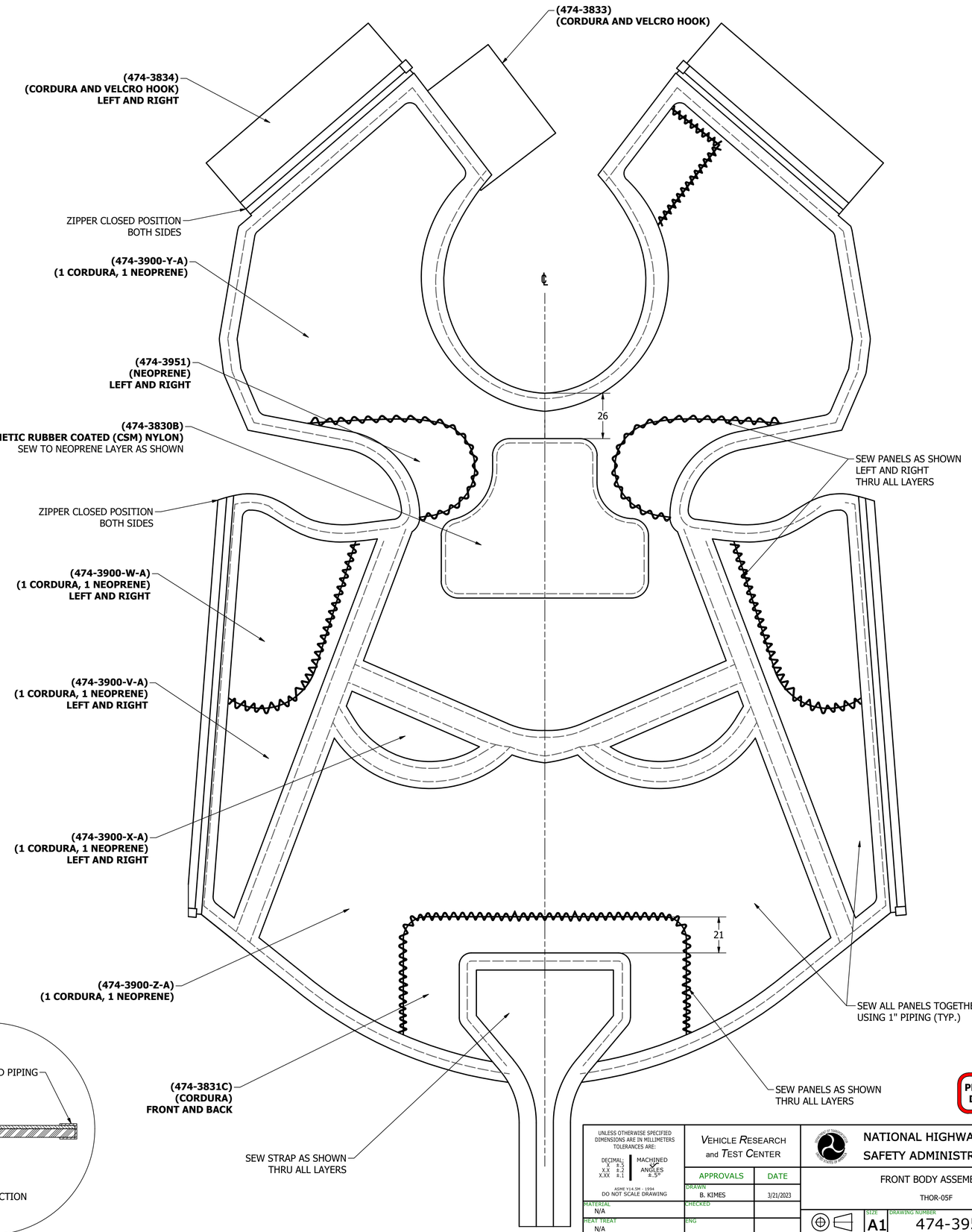
APPROVALS	DATE
DRAWN: B. KIMES	3/21/2023
CHECKED	
ENG	
APPROVED	

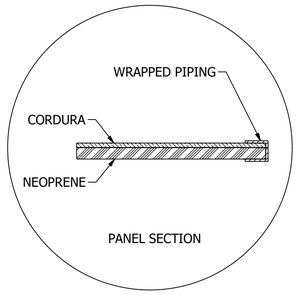
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

FRONT BODY ASSEMBLY
THOR-05F

THIRD ANGLE PROJECTION
SIZE: A1 | DRAWING NUMBER: 474-3950 | REV: 1
SCALE: .5 : 1 | SHEET: 1 OF 6







PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.3, X.X ±.2, X.XX ±.1
MACHINED ∠S ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

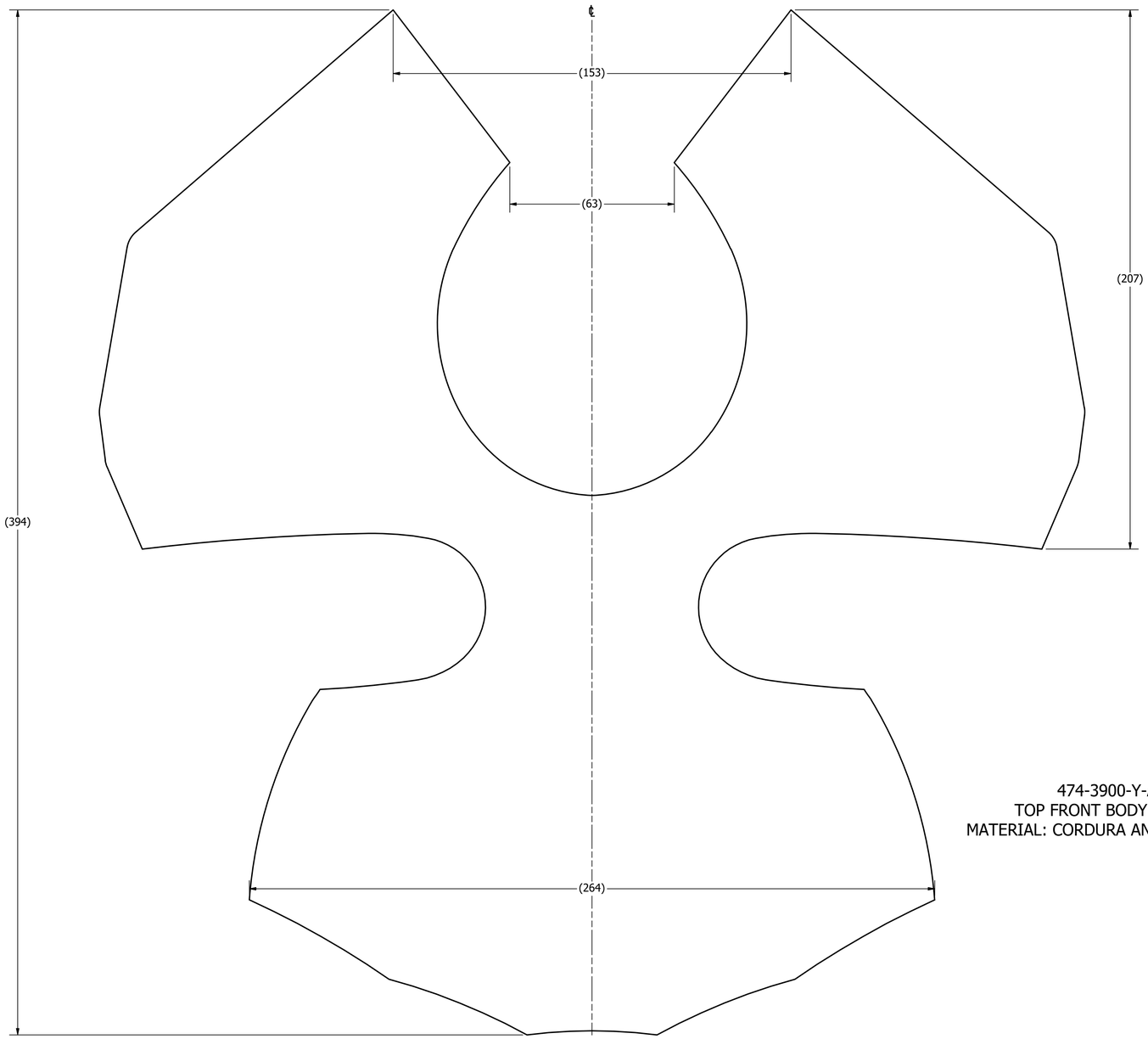
VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: B. KIMES	3/21/2023
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

FRONT BODY ASSEMBLY
THOR-05F

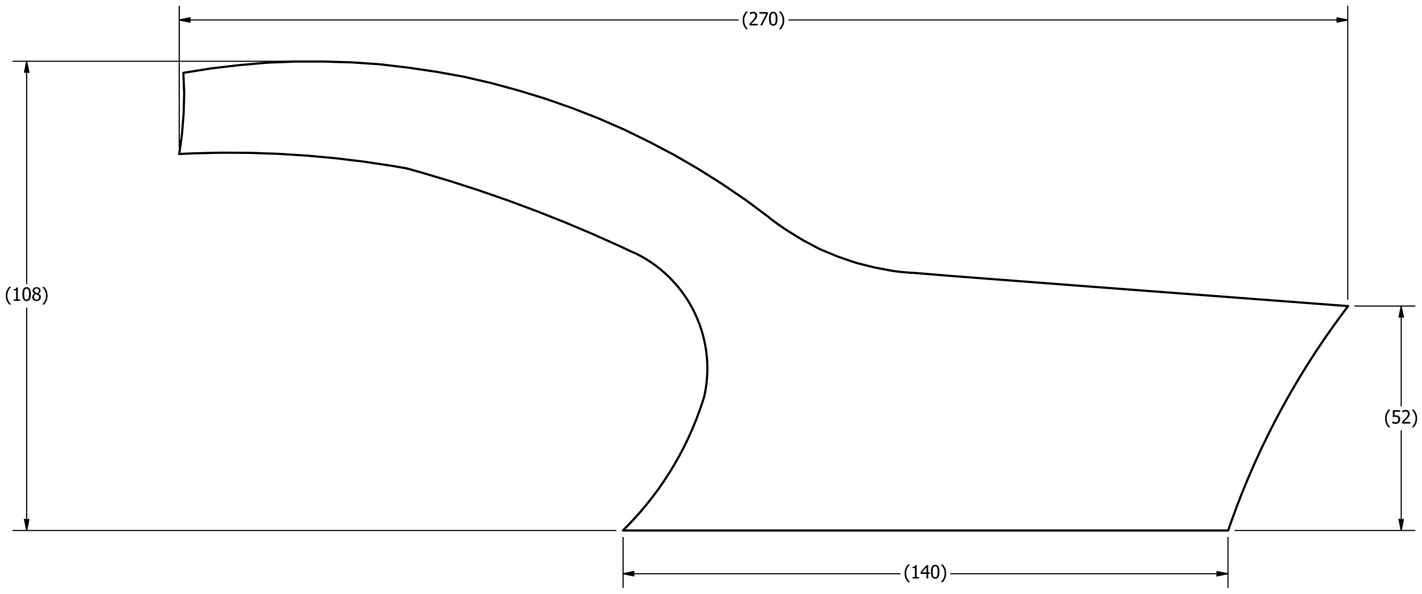
THIRD ANGLE PROJECTION
SIZE: A1
DRAWING NUMBER: 474-3950
REV: 1
SCALE: .75 : 1
SHEET: 2 OF 6



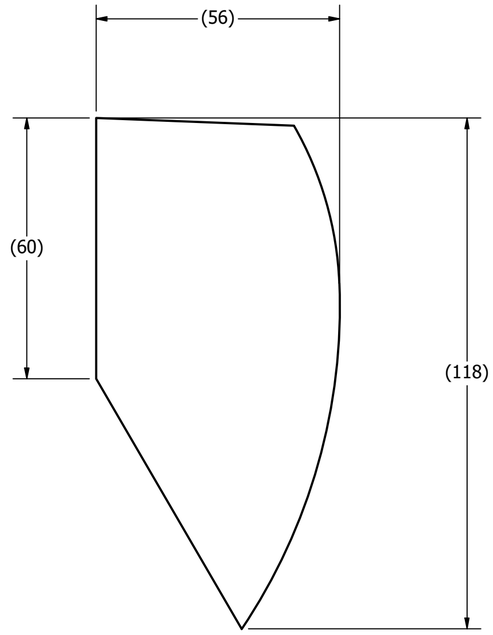
474-3900-Y-A
TOP FRONT BODY PANEL
MATERIAL: CORDURA AND NEOPRENE

PROTOTYPE DRAWING

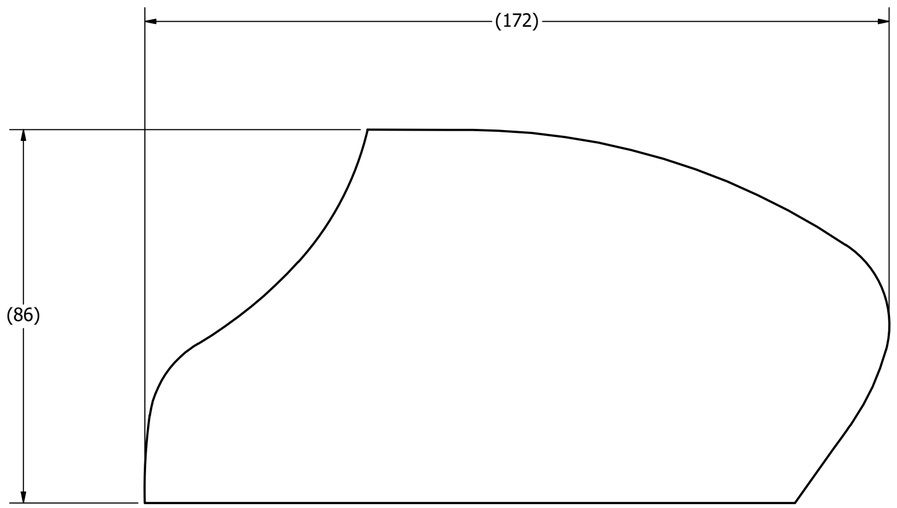
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMALS X ±.5 X.X ±.2 X.XX ±.1 | MACHINED ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	BODY PANEL, FRONT, TOP
	DRAWN B. KIMES 3/21/2023	THOR-05F
MATERIAL N/A	CHECKED	
HEAT TREAT N/A	ENG	THIRD ANGLE PROJECTION
FINISH N/A	APPROVED	SIZE A1 · DRAWING NUMBER 474-3950 · REV 1 · SCALE: 1 : 1 · SHEET 3 OF 6



474-3900-V-A (L& R)
SIDE PANEL
MATERIAL: NEPOPRENE



474-3900-X-A (L & R)
BREAST PANEL
MATERIAL: CORDURA AND NEOPRENE



474-3900-W-A (L &R)
SIDE PAD
MATERIAL: CORDURA AND NEOPRENE

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

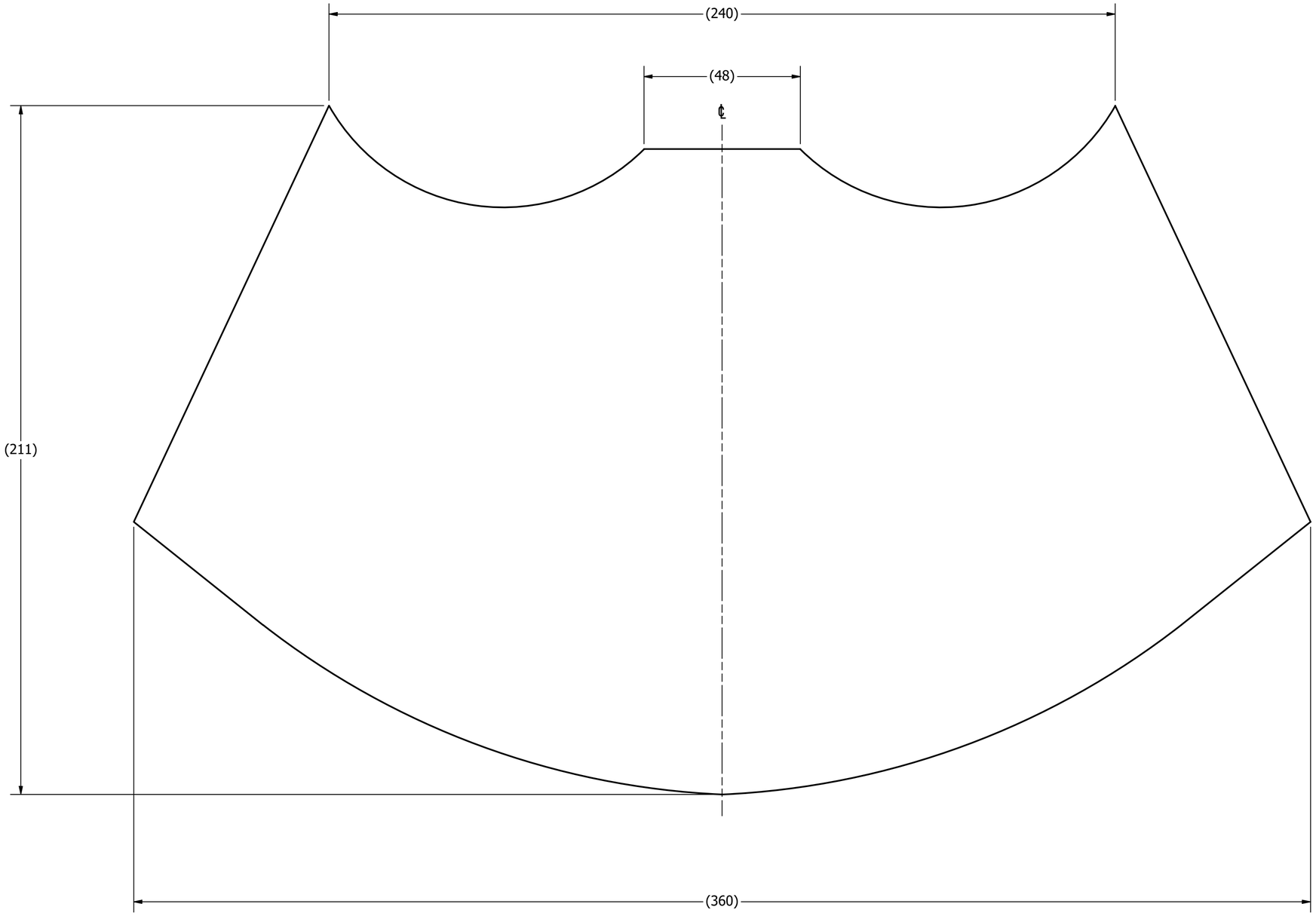
VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN B. KIMES	3/21/2023
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

SIDE PANEL
THOR-05F

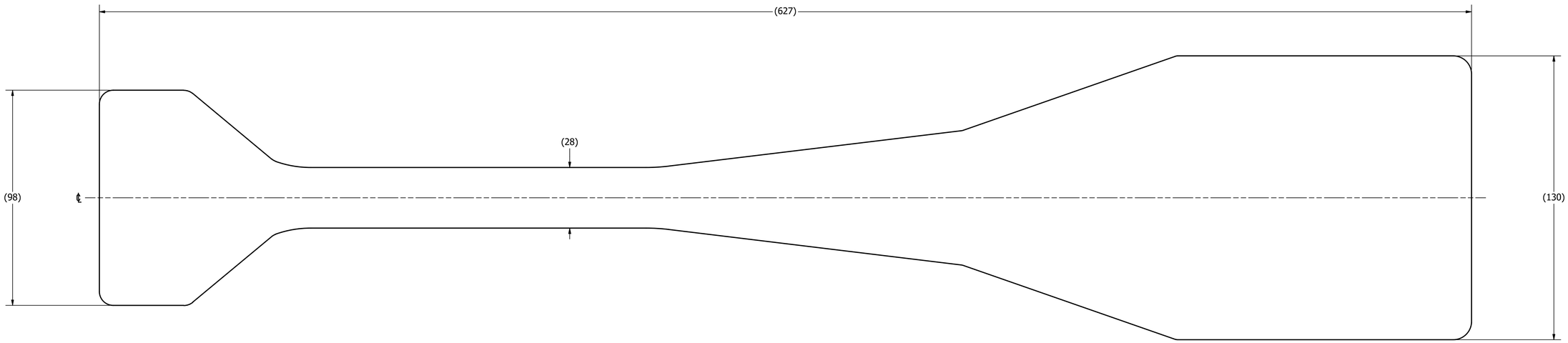
THIRD ANGLE PROJECTION
SIZE: A2 | DRAWING NUMBER: 474-3950 | REV: 1
SCALE: 1 : 1 | SHEET: 4 OF 6



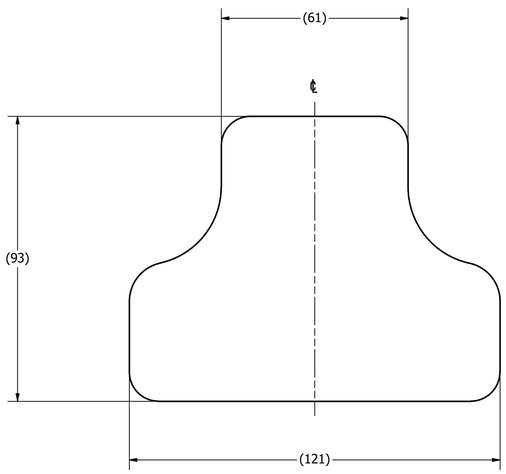
PROTOTYPE DRAWING

474-3900-Z-A
LOWER FRONT BODY PANEL
MATERIAL: CORDURA AND NEOPRENE

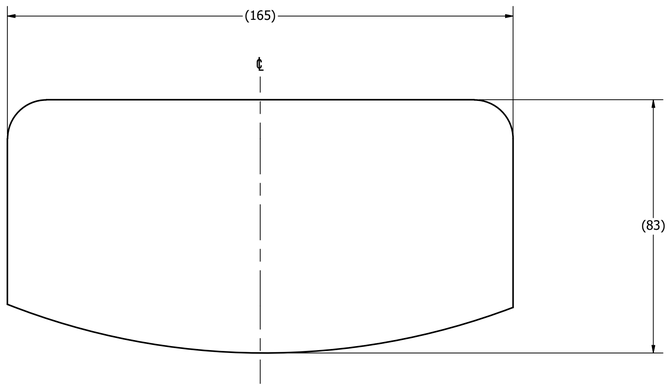
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER		NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS	DATE	BODY PANEL FRONT, LOWER THOR-05F
MATERIAL N/A	DRAWN B. KIMES	3/21/2023	
HEAT TREAT N/A	CHECKED		SIZE A2 | DRAWING NUMBER 474-3950 | REV 1
FINISH N/A	ENG		THIRD ANGLE PROJECTION | SCALE: 1 : 1 | SHEET 5 OF 6
	APPROVED		



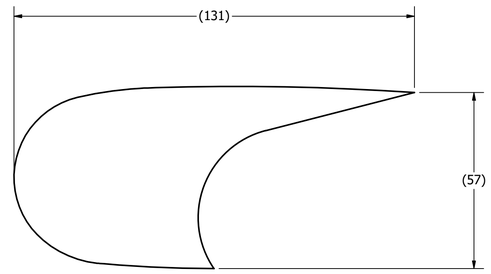
474-3810
STRAP
MATERIAL: CORDURA AND NEOPRENE



474-3830B
REINFORCEMENT PAD
MATERIAL: SYTHETIC RUBBER COATED (CSM) NYLON



474-3831C
CORDURA STRAP REINFORCEMENT
MATERIAL: CORDURA



474-3951
SHOULDER ARM STRETCH PANEL
MATERIAL: NEOPRENE

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.1, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

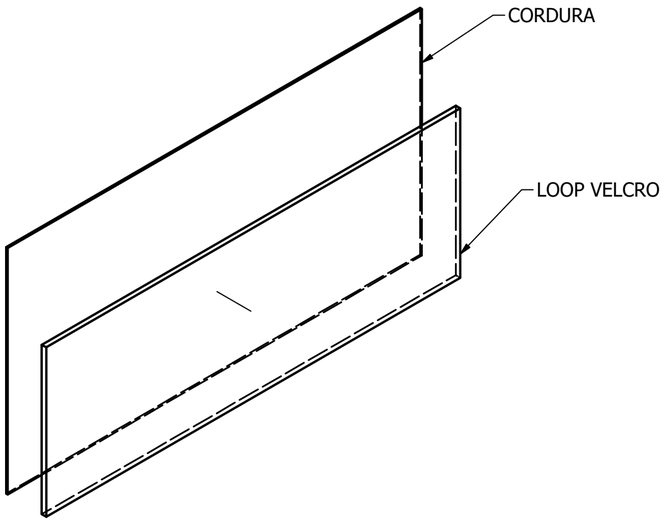
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DRAWN: B. KIMES	3/21/2023
CHECKED	
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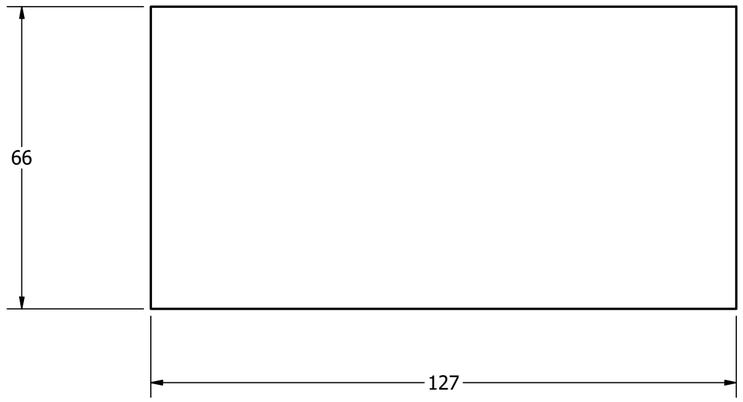
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

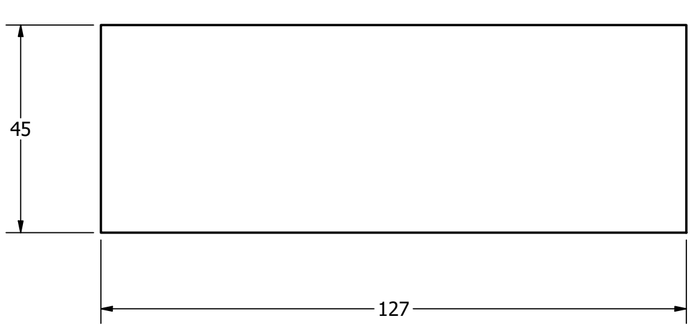
CORDURA, JACKET STRAP
THOR-05F

THIRD ANGLE PROJECTION
SIZE: A1 | DRAWING NUMBER: 474-3950 | REV: 1
SCALE: 1 : 1 | SHEET: 6 OF 6

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	AT	JW	5/2/2017







NOTES:

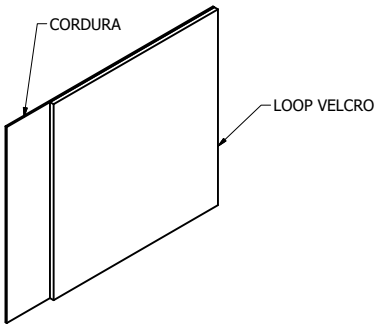
1. MATERIAL STACK: 1. CORDURA
   2. LOOP VELCRO

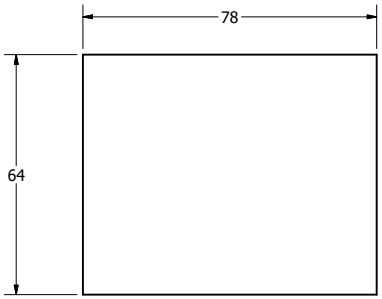
2. ± 3mm APPLY TO ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED.

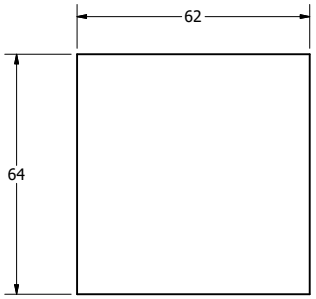
PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE: DECIMAL; X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5° ASME Y14.5M - 1994 DO NOT SCALE DRAWING	VEHICLE RESEARCH and TEST CENTER	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
	APPROVALS / DATE	HOOK FOR SHOULDERS
DRAWN: atomich	5/2/2017	THOR-05F JACKET
MATERIAL: SEE NOTE 1	CHECKED	THIRD ANGLE PROJECTION
HEAT TREAT	ENG	SIZE: C · DRAWING NUMBER: 474-3834 · REV: 1
FINISH	APPROVED	SCALE: 1:1 · SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE TO PROTOTYPE	AT	JW	5/2/2017







NOTES:

1. MATERIAL STACK: 1. CORDURA
   2. LOOP VELCRO

2. ± 3mm APPLY TO ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE 1
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: atomich	5/2/2017
CHECKED:	
ENG:	
APPROVED:	

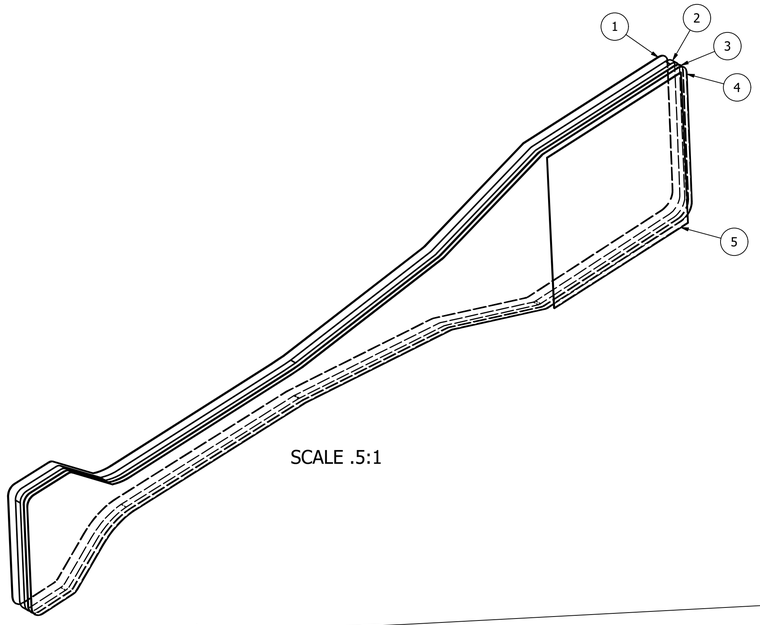
THIRD ANGLE PROJECTION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

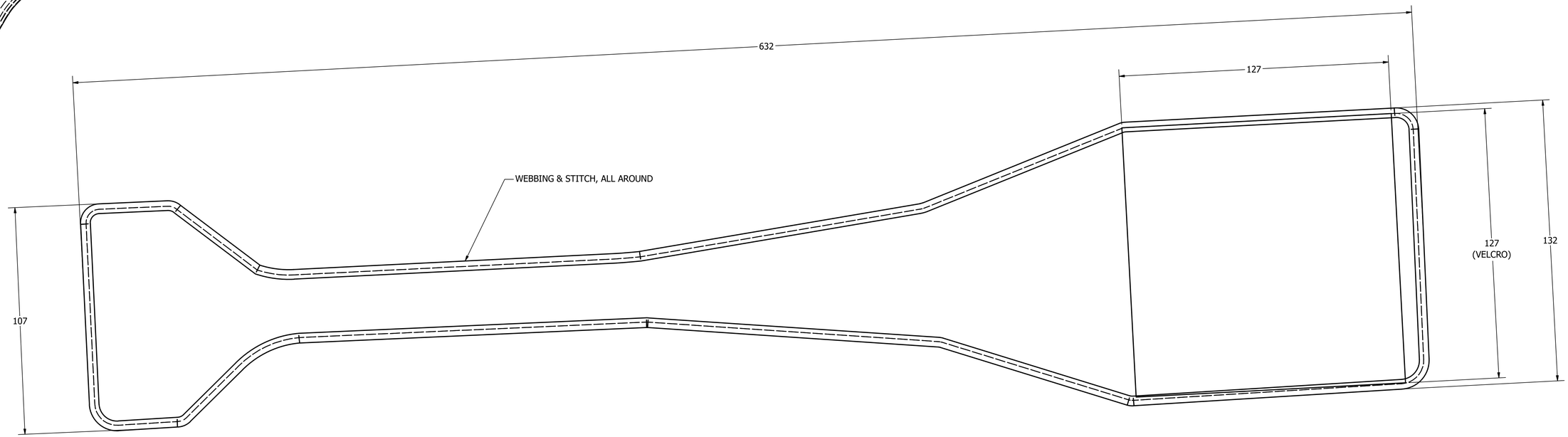
FLAP FOR NECK

SIZE: C | DRAWING NUMBER: 474-3833 | REV: 1
SCALE: 1:1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	AT	JW	11/3/2017



SCALE .5:1



NOTES:

1. MATERIAL STACKING ORDER:
   1. CORDURA CANVAS
   2. NEOPRENE FOAM 5mm THICK
   3. VINYL
   4. CORDURA CANVAS
   5. LOOP VELCRO

2. ± 3MM APPLY TO ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ✓ | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE 1
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: atomich	5/1/2017
CHECKED:	
ENG:	
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

STRAP

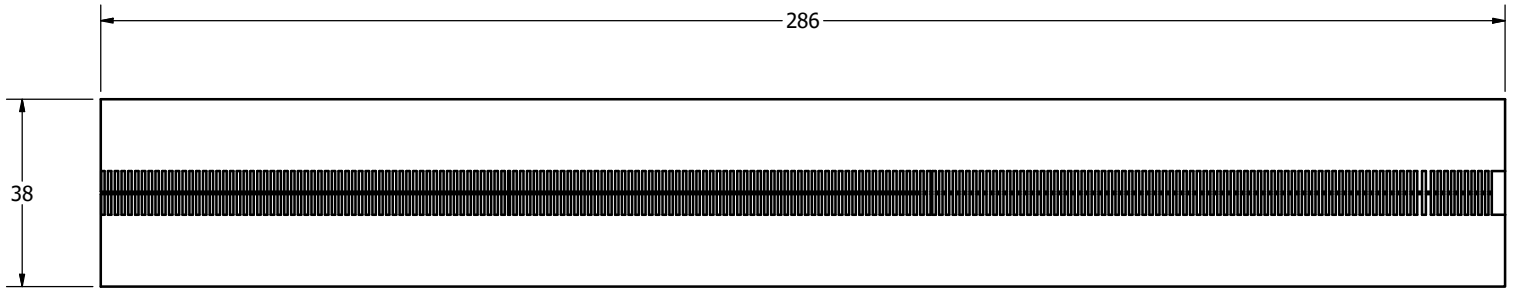
THOR-05F JACKET

THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
D	474-3810	1

SCALE: 1:1 SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	KMSP	KMSP	8/13/2019



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

PROTOTYPE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN kstpierre	8/13/2019
CHECKED	
ENG KMSP	8/20/2019
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

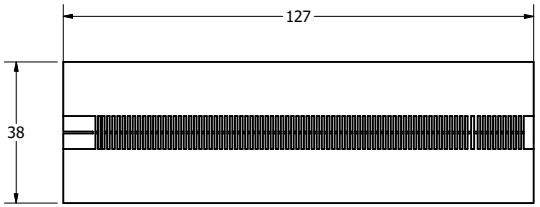
ZIPPER SIDES 11.25"

THIRD ANGLE PROJECTION

SIZE A3 | DRAWING NUMBER 474-3925 | REV 1

SCALE: 1 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	AT	JW	5/3/2017



NOTES:

1. ± 3mm APPY TO ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 3C ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	atomich	5/3/2017
CHECKED		
ENG		
APPROVED		
MATERIAL		
HEAT TREAT		
FINISH		

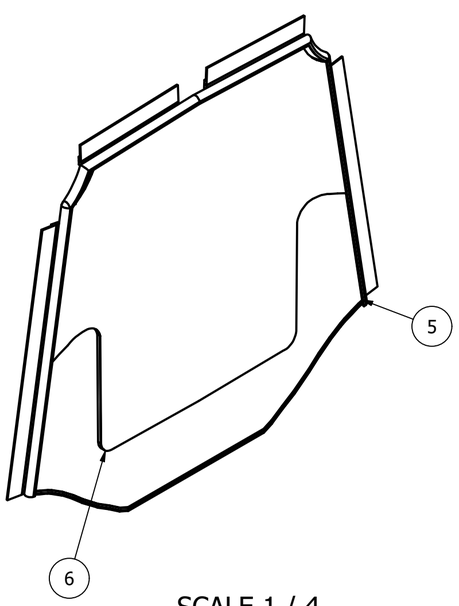
ZIPPER SHOULDER 5"

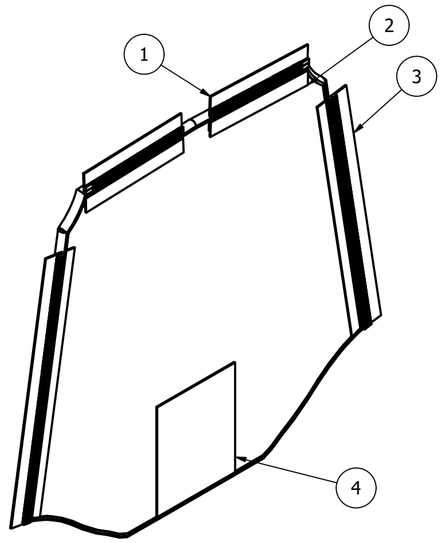
THIRD ANGLE PROJECTION

SIZE C | DRAWING NUMBER 474-3823 | REV 1

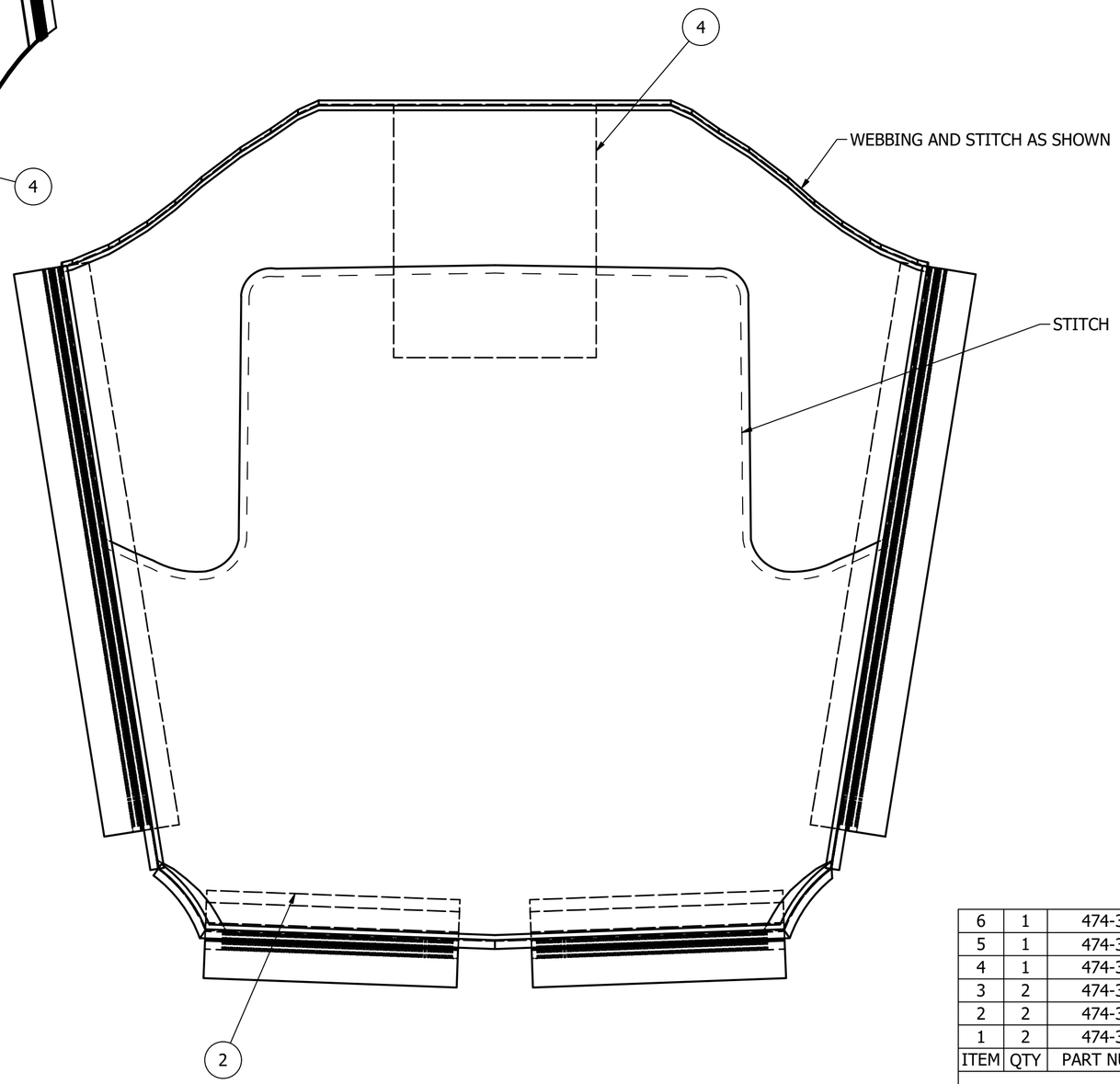
SCALE: 1:1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	KMSP	KMSP	8/15/2019





SCALE 1 / 4



ITEM	QTY	PART NUMBER	DESCRIPTION
6	1	474-3912	BACK PAD
5	1	474-3911	BACK PANEL
4	1	474-3926	VELCRO BACK, BOTTOM LOOP, 4"
3	2	474-3925	ZIPPER SIDES 11.25"
2	2	474-3824	VELCRO FRONT SHOULDER HOOK
1	2	474-3823	ZIPPER SHOULDER 5"

PARTS LIST

NOTES:
1. ALL PARTS ARE STITCHED TOGETHER AS SHOWN.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN kstpierre	8/15/2019
CHECKED	
ENG KMSP	8/20/2019
APPROVED	

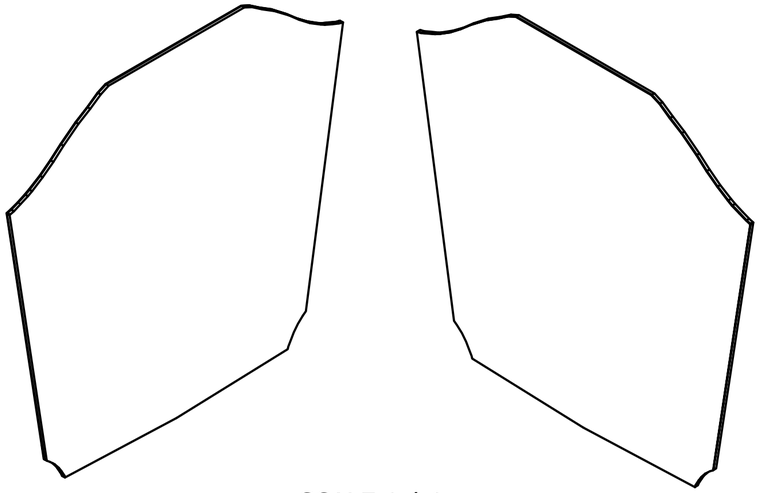
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

BACK PANEL ASSEMBLY
THOR-05F JACKET

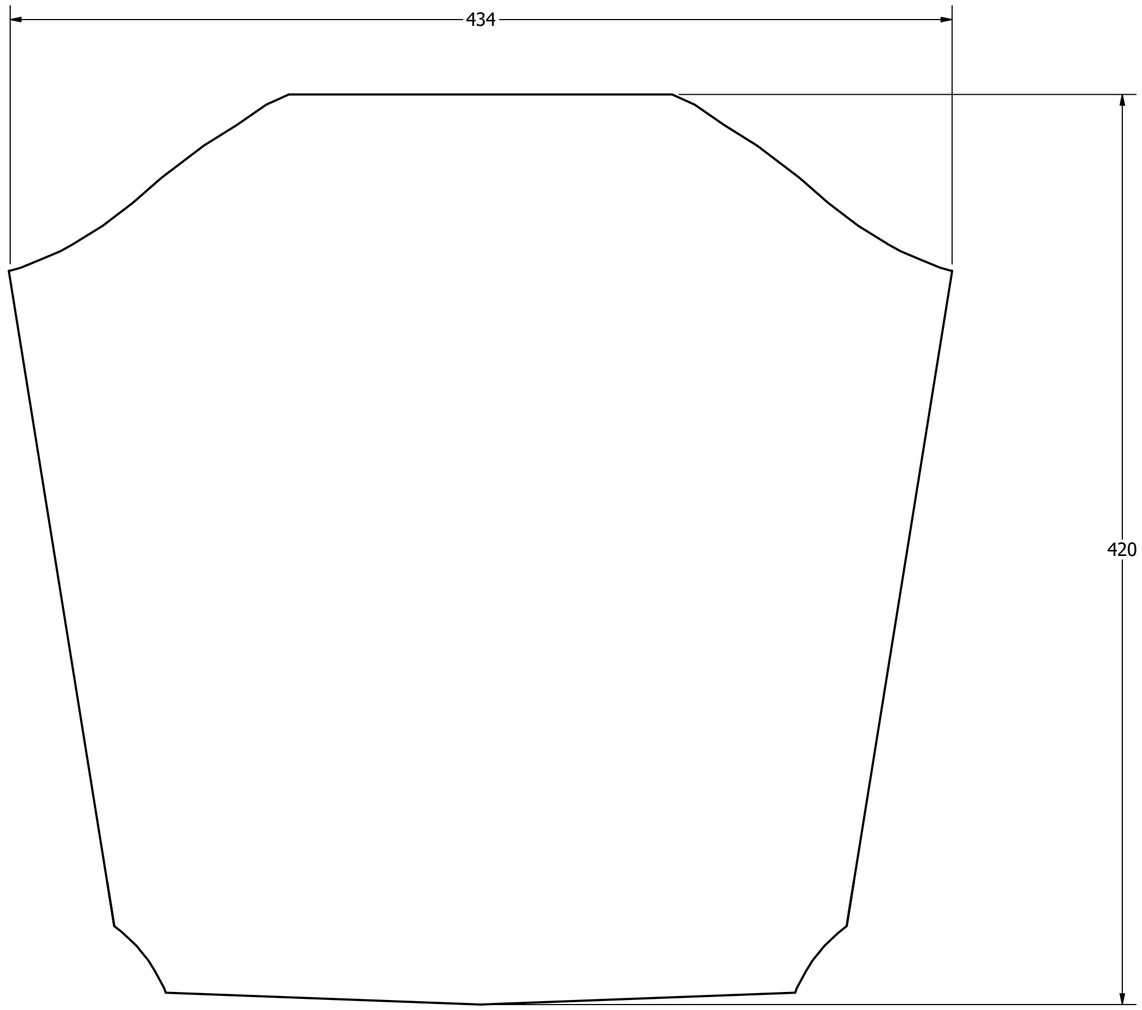
THIRD ANGLE PROJECTION

SIZE A2 | DRAWING NUMBER 474-3910 | REV 1
SCALE: 1 / 2 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	KMSP	KMSP	8/15/2019



SCALE 1 / 4



NOTES:
1. MATERIALS STACKING ORDER: CORDURA CANVAS
NEOPRENE FOAM 5mm THICK
2. ± 3mm APPLY TO ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE 1
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: kstpierre	8/15/2019
CHECKED:	
ENG: KMSP	8/20/2019
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

BACK PANEL

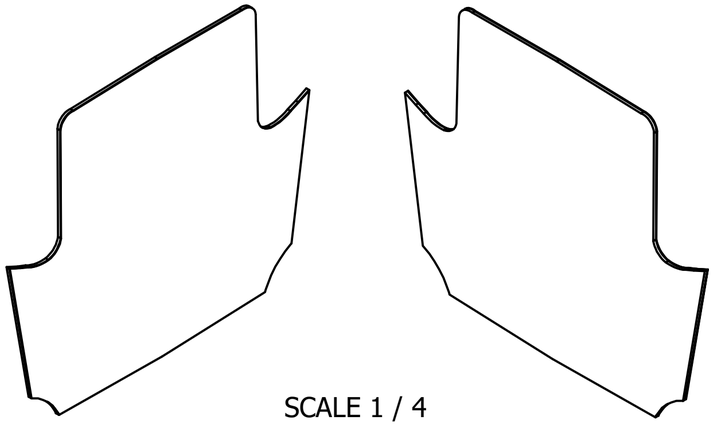
THOR-05F JACKET

THIRD ANGLE PROJECTION

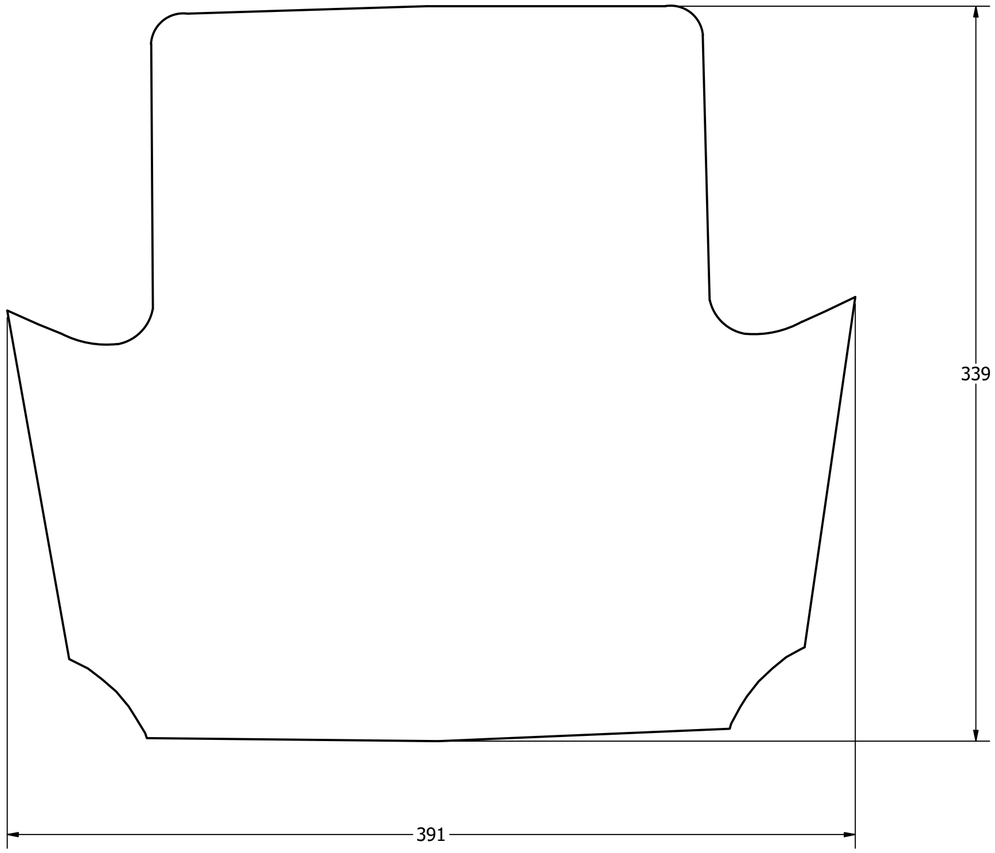
SIZE: A2 | DRAWING NUMBER: 474-3911 | REV: 1

SCALE: 1 / 2 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	RELEASE FOR PROTOTYPE	KMSP	KMSP	8/15/2019



SCALE 1 / 4



NOTES:
1. MATERIALS STACKING ORDER: CORDURA CANVAS
NEOPRENE FOAM 5mm THICK
2. ± 3mm APPLY TO ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: SEE NOTE 1
HEAT TREAT:
FINISH:

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: kstpierre	8/15/2019
CHECKED:	
ENG: KMSP	8/20/2019
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

BACK PAD
THOR-05F JACKET

THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
A2	474-3912	1

SCALE: 1 / 2 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	HEC	5/3/2023

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	474-8510-A	H-POINT TOOL, ASSEMBLY
2	2	5000093	M6 x 1 LOCK NUT (SEE NOTE 1)
3	2	5000486	M8 x 1.25 LOCK NUT (SEE NOTE 1)

NOTES:

1. ADDITIONAL LOCK NUTS FOR THE SHOULDERS.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL:
X ±.5
X.X ±.2
X.XX ±.1

MACHINED ±.5
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B. KIMES	5/3/2023
MATERIAL	
CHECKED	
HEAT TREAT	
ENG	
FINISH	
APPROVED	

THOR-05F TOOL KIT

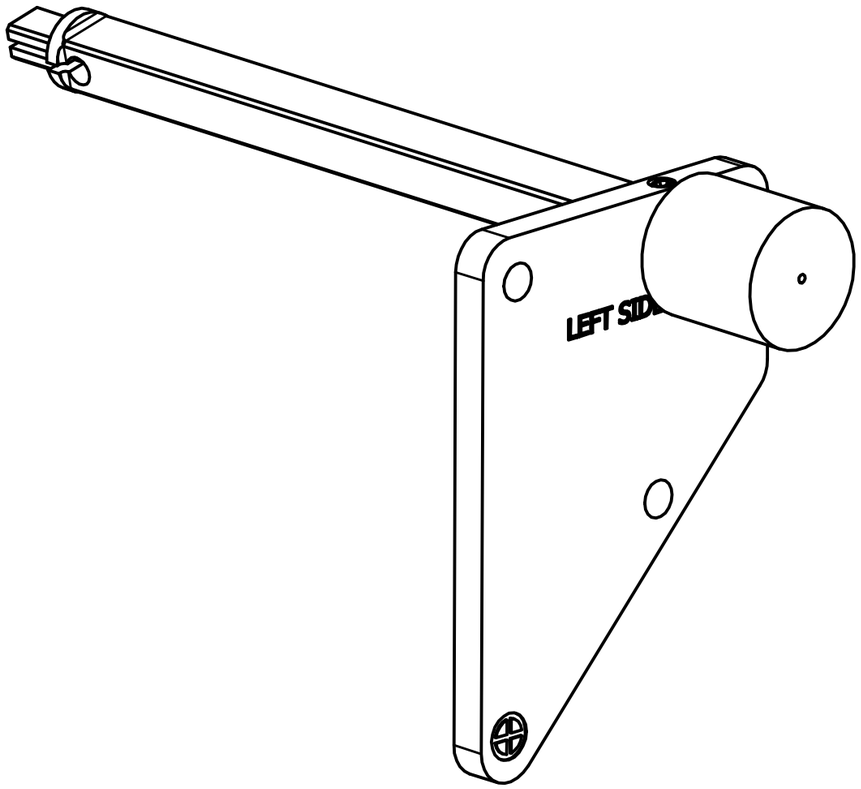
THIRD ANGLE PROJECTION

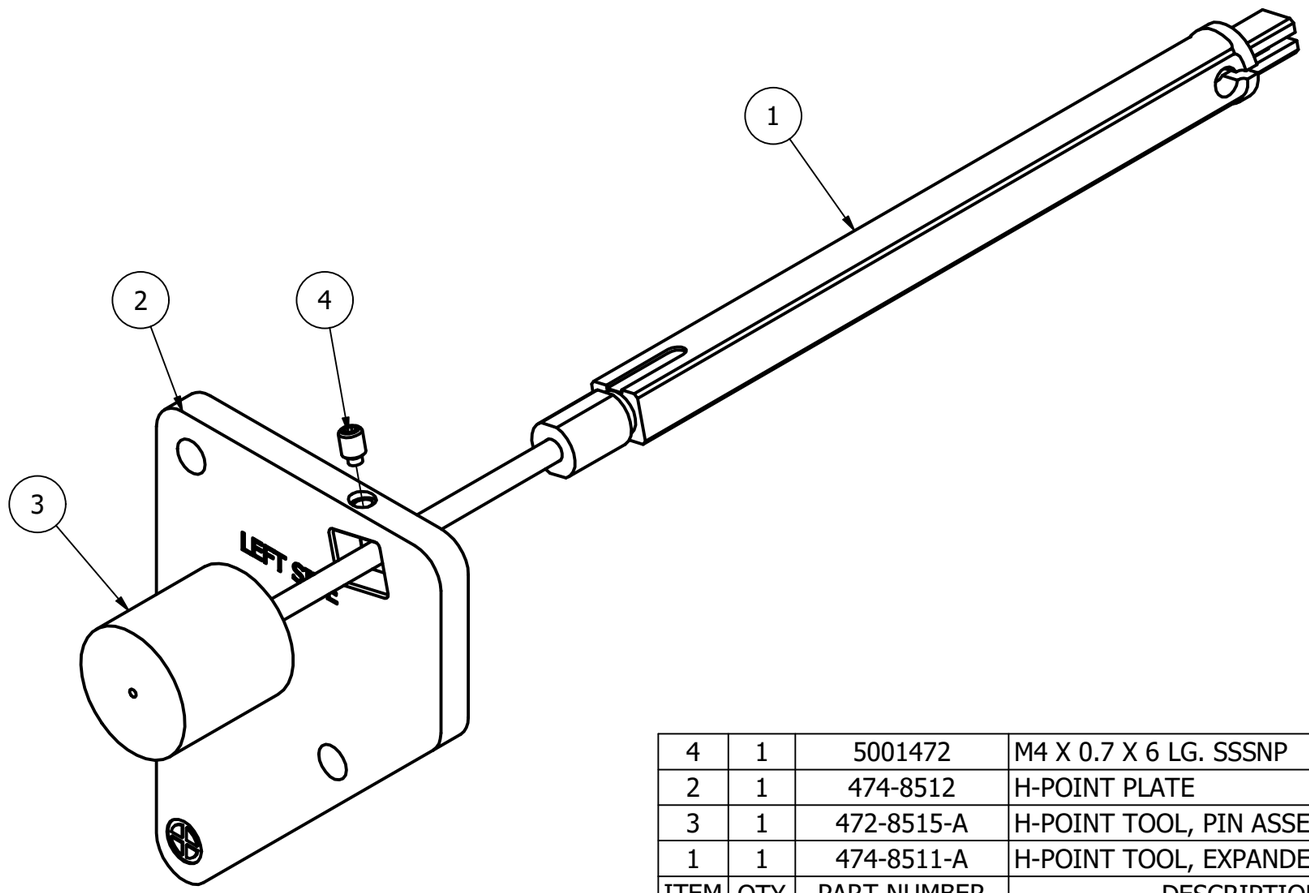
SIZE A3 | DRAWING NUMBER 474-TOOLKIT-A | REV 1

SCALE:

SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	DJI	3/21/2023





ITEM	QTY	PART NUMBER	DESCRIPTION
4	1	5001472	M4 X 0.7 X 6 LG. SSSNP
2	1	474-8512	H-POINT PLATE
3	1	472-8515-A	H-POINT TOOL, PIN ASSEMBLY
1	1	474-8511-A	H-POINT TOOL, EXPANDER

PARTS LIST

NOTES:
1. ASSEMBLED FOR LEFT SIDE.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

H-POINT TOOL, ASSEMBLY

APPROVALS	DATE
DRAWN: B. KIMES	3/21/2023
CHECKED	
ENG	
APPROVED	

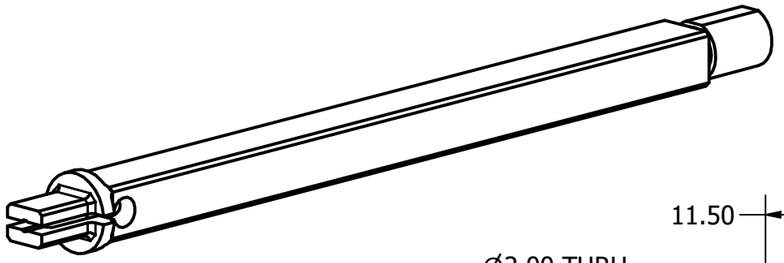
MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

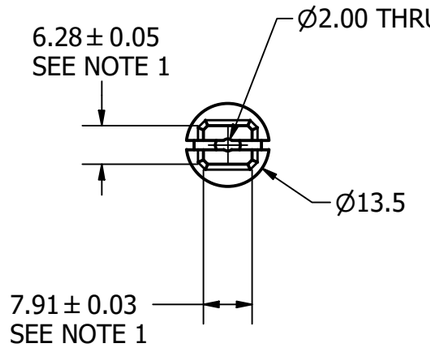
THIRD ANGLE PROJECTION

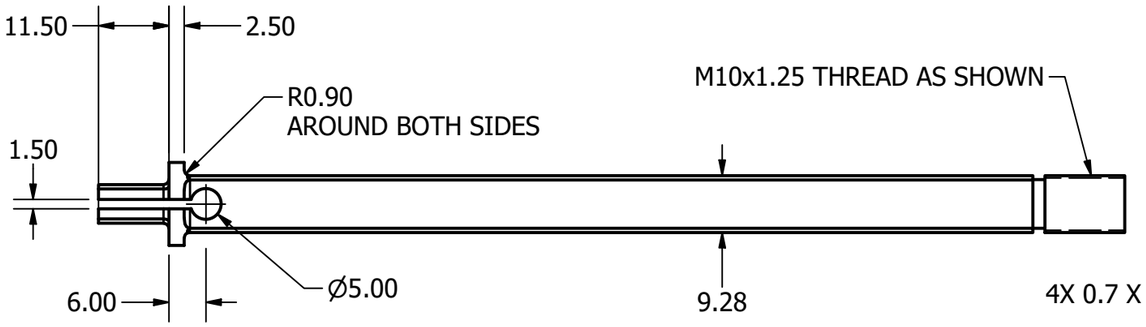
SIZE: A3 | DRAWING NUMBER: 474-8510-A | REV: 1

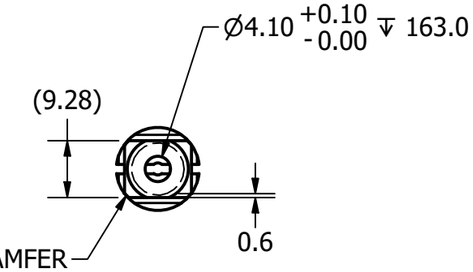
SCALE: 1:1 | SHEET: 1 OF 1

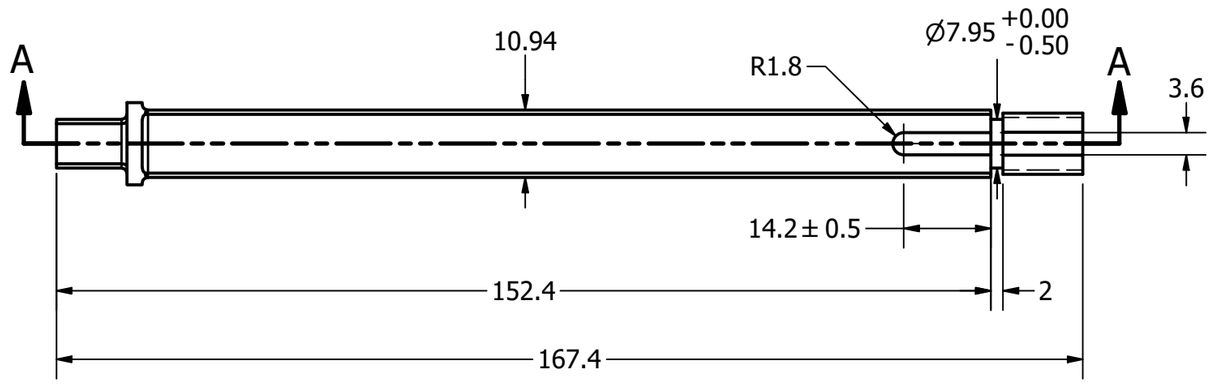
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	DJI	3/10/2023

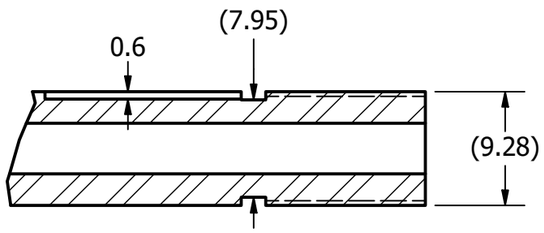




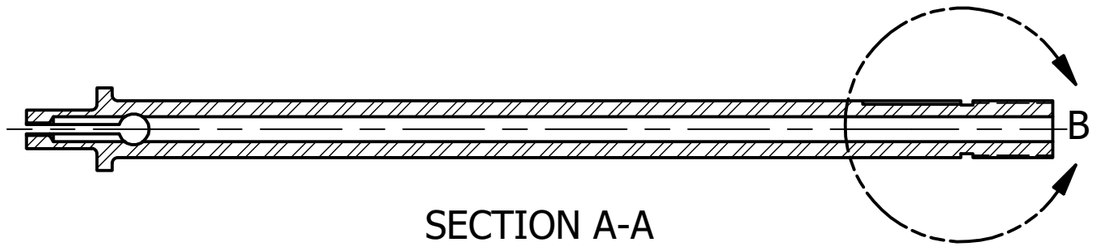








DETAIL B
SCALE 2 : 1



SECTION A-A

PROTOTYPE DRAWING

NOTES:

1. APPLY OUTSIDE SURFACE TOLERANCES FROM END OF PART TO SHOULDER AND IN AREA WITH 3.6mm CUTOUT DIMENSIONS ARE ± 0.2mm IN CENTER AREA

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED √
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 303 STAINLESS STEEL
HEAT TREAT: Rc 35-40
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: disopi	3/10/2023
CHECKED	
ENG	
APPROVED	

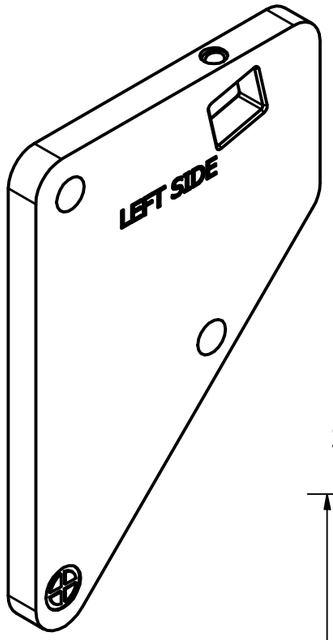
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

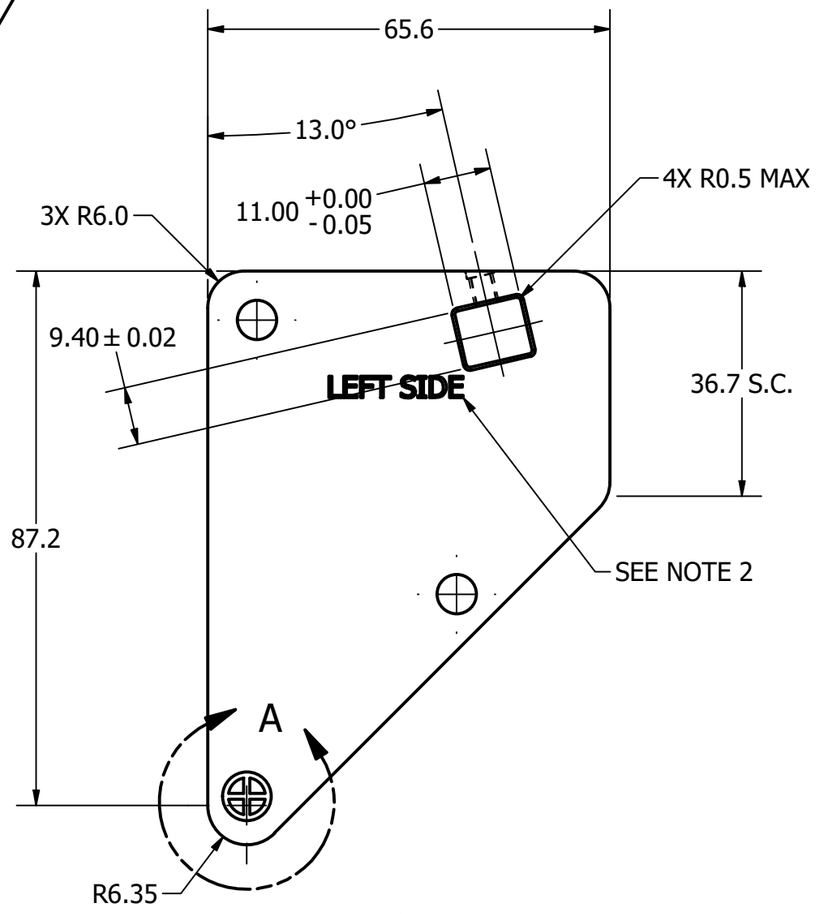
H-POINT TOOL, EXPANDER
THOR-05F

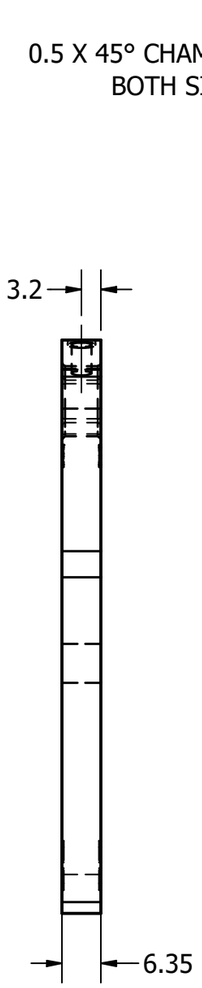
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-8511-A | REV: 1
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	KMSP	KMSP	12/7/2018

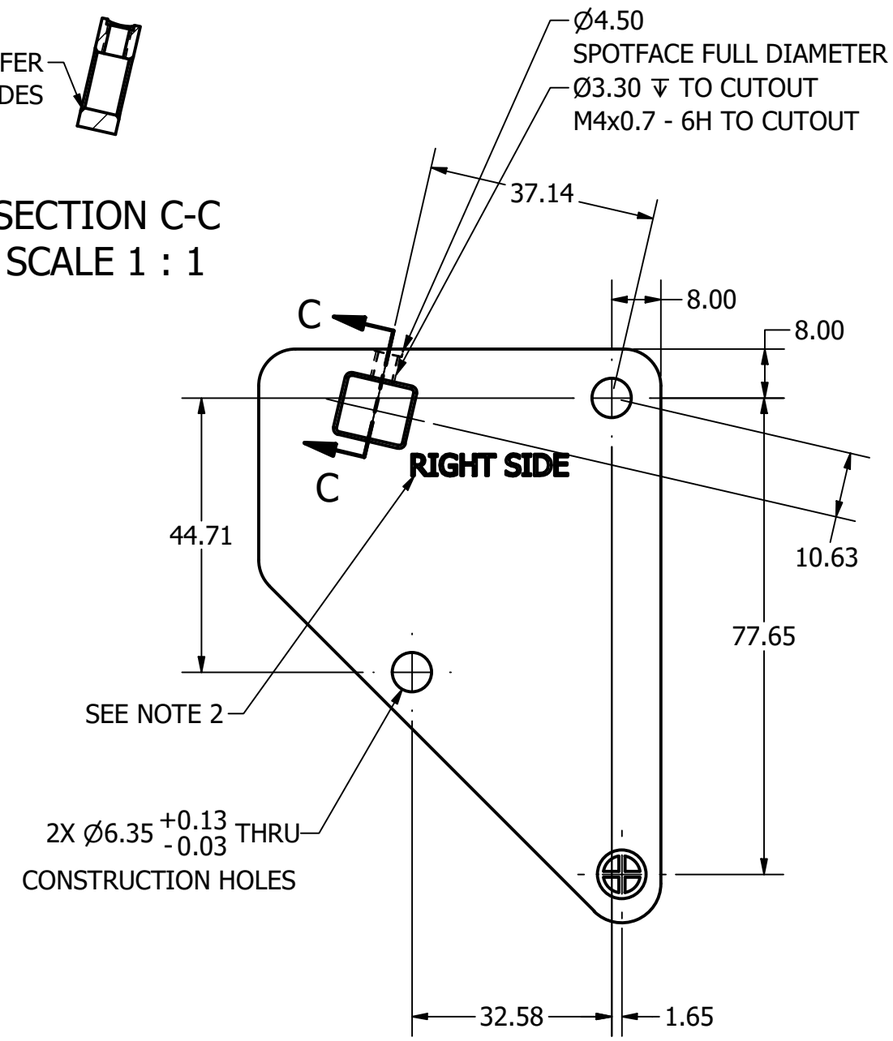


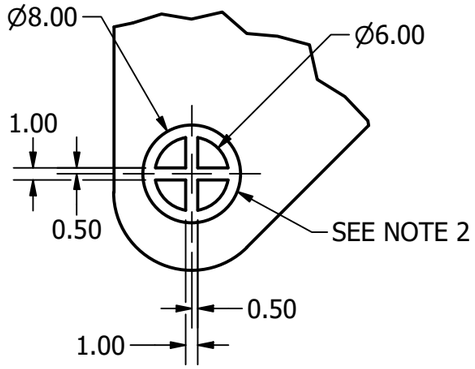






SECTION C-C
SCALE 1 : 1





DETAIL A
SCALE 2 : 1

PROTOTYPE DRAWING

NOTES:

1. DIMMENSIONS ARE SYMMETRICAL ABOUT ℄
   UNLESS OTHERWISE NOTED.
2. ENGRAVE PLATE WHERE SHOWN 0.1mm DEEP.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

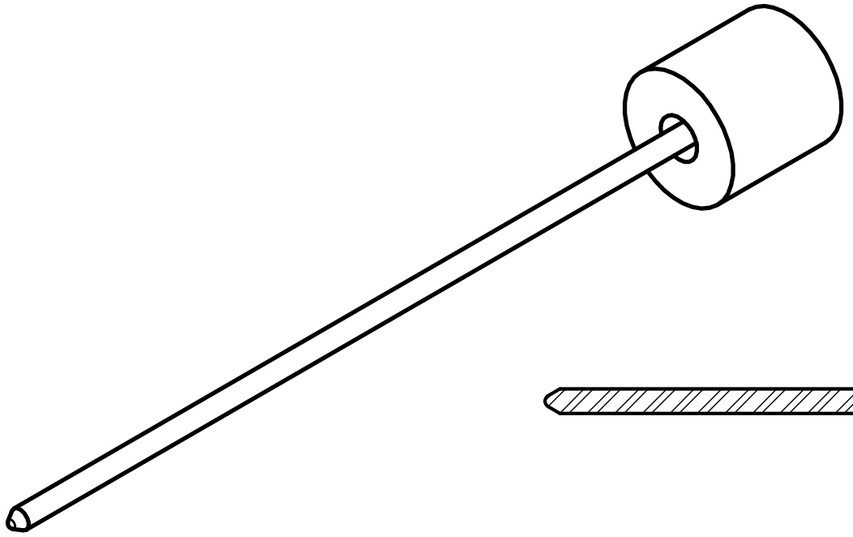
APPROVALS	DATE
DRAWN: kstpierre	12/7/2018
CHECKED:	
ENG:	
APPROVED:	

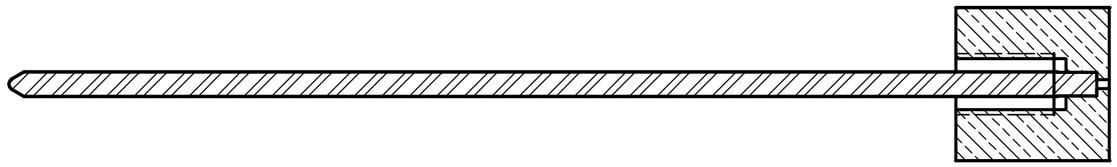
MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

H-POINT PLATE

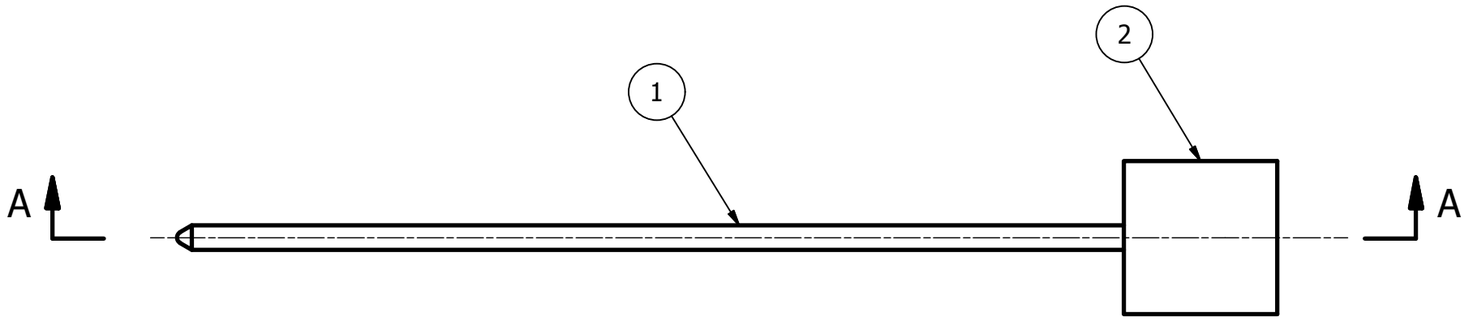
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-8512 | REV: 1
SCALE:
SHEET: 1 OF 1





SECTION A-A



ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	472-8514-A	H-POINT TOOL, ENDCAP
1	1	472-8513-A	H-POINT TOOL, PIN

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED 1.6
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT
FINISH

VEHICLE ***R***ESEARCH and ***T***EST ***C***ENTER

APPROVALS	DATE
DRAWN Dave Walker	2/15/2017
CHECKED	
ENG	
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

H-POINT TOOL, PIN ASSEMBLY

THOR-05F, THOR-50M

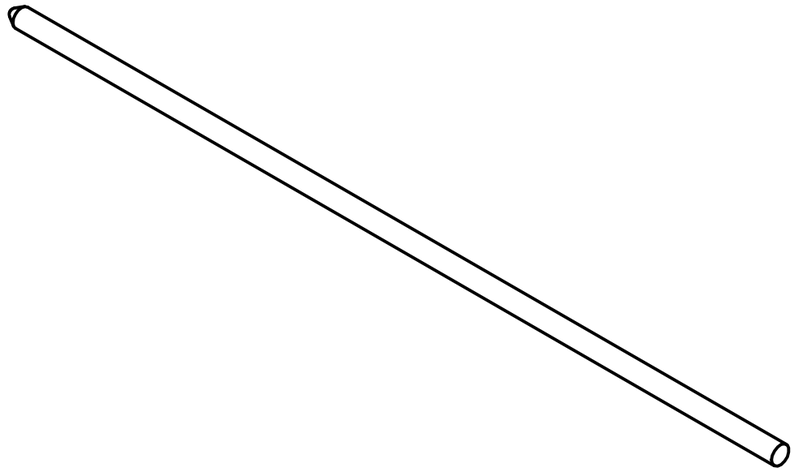
THIRD ANGLE PROJECTION

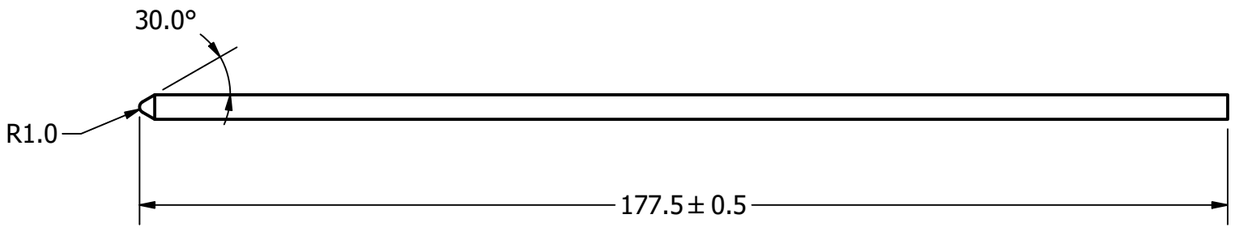
SIZE **A3** | DRAWING NUMBER 472-8515-A | REV

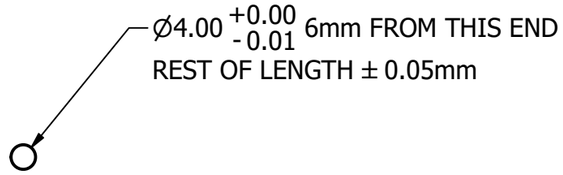
SCALE: 1 : 1 | SHEET 1 OF 1

472-8515-A.iam

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	B	RELEASE FOR PRODUCTION	JQG	JQG	11/9/2016







UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN jgibbs	11/9/2016
CHECKED	
ENG	
APPROVED	

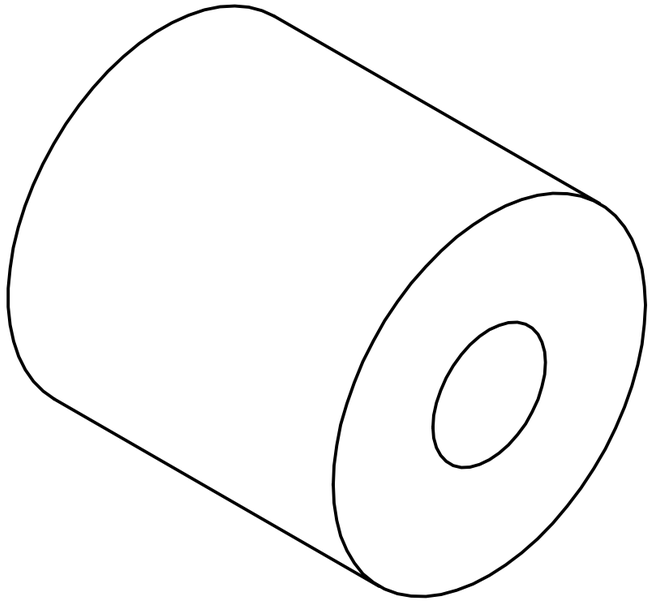
MATERIAL: Carbon Steel
HEAT TREAT: ROCKWELL 59C +/-5
FINISH: N/A

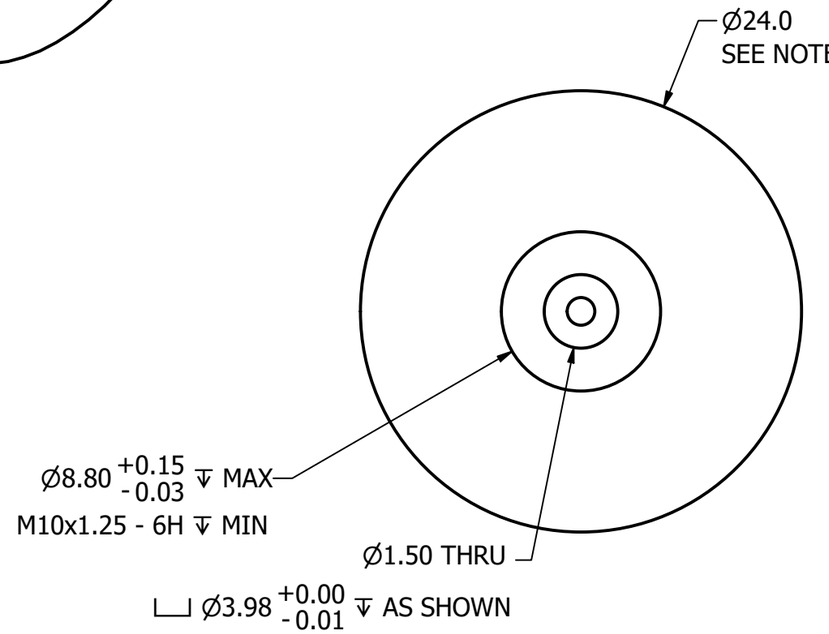
H-POINT TOOL, PIN

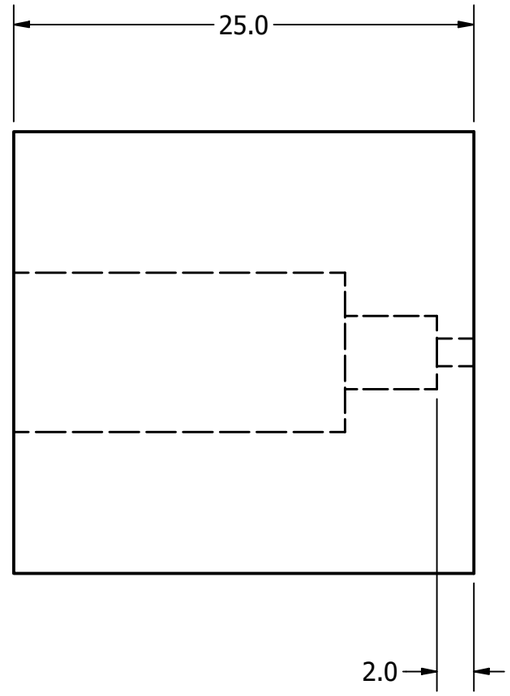
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 472-8513-A | REV: B
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	A	RELEASE TO PRODUCTION	JQG	JQG	11/16/2016







NOTES:

1. KNURL OUTSIDE SURFACE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN jgibbs	11/09/2016
CHECKED	
ENG	
APPROVED	

MATERIAL: Brass, Soft Yellow
HEAT TREAT: N/A
FINISH: N/A

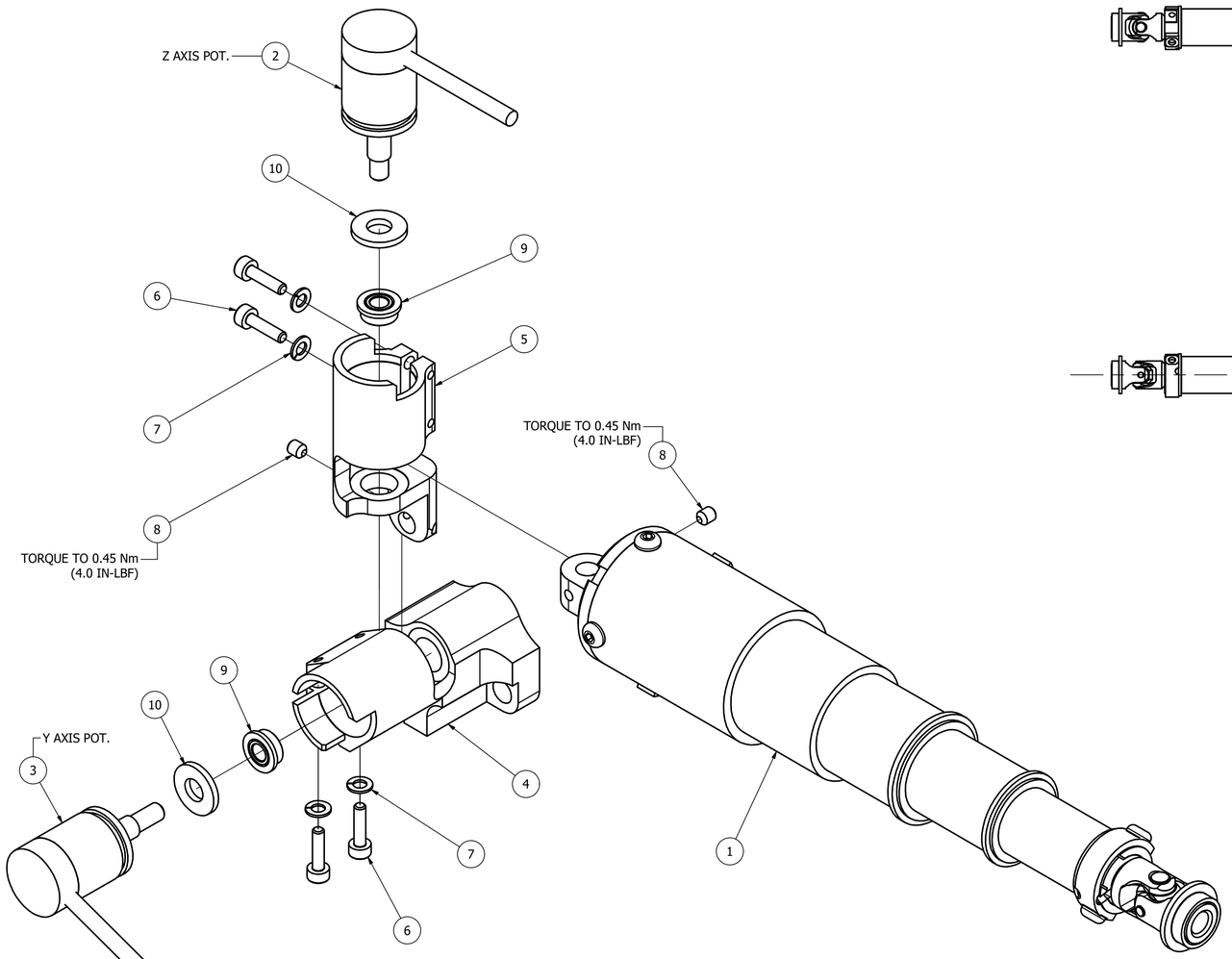
H-POINT TOOL, ENDCAP

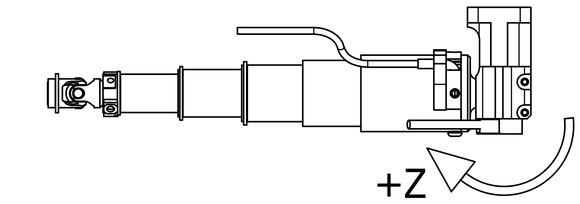
THIRD ANGLE PROJECTION

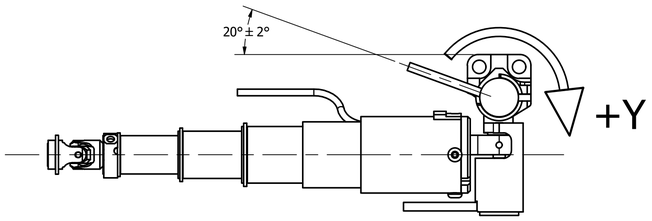
SIZE: A3 | DRAWING NUMBER: 472-8514-A | REV: A
SCALE: 3 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	PROTOTYPE	JSD	LB	8/4/2023

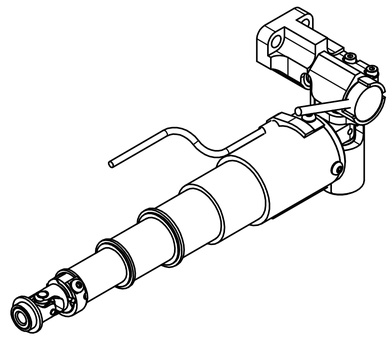
PART NUMBER TABLE			
ASSEMBLY NO.	SENSORS USED	CABLE LENGTH "XXX"	DAS LOCATION
474-3550-A	SA572-S122 SA572-S167 SA572-S168	30 FT [9144 mm]	EXTERNAL







SOME COMPONENTS
HIDDEN FOR CLARITY



ITEM	QTY	PART NUMBER	DESCRIPTION
10	2	9004096	#6 FLAT WASHER NYLON 0.170 X 0.375 X 0.045
9	2	9002201	FLANGE BEARING (1/4" O.D. x 1/8" I.D.)
8	2	5001359	M2.5 X 0.45 X 3 LG. SSSCP NYLOK
7	4	5001216	M2 SPLIT LOCK WASHER SS
6	4	5000083	M2 X 0.4 X 8 LG. SHCS
5	1	474-3756	IR-TRACC ARM MOUNTING BRACKET, UL/LR
4	1	474-3754-1	IR-TRACC BASE, UPPER LEFT
3	1	SA572-S168	POTENTIOMETER ASSEMBLY, Y-AXIS
2	1	SA572-S167	POTENTIOMETER ASSEMBLY, Z-AXIS
1	1	SA572-S122	IR-TRACC, UPPER

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMALS X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: —
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: skantola	10/18/2022
CHECKED:	
ENG: MJS	10/18/2022
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

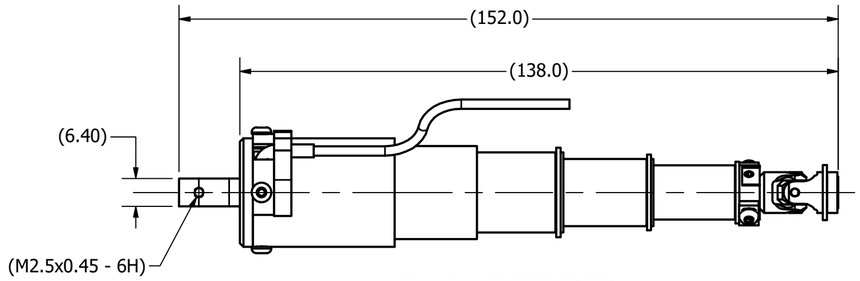
3D IR-TRACC ASSEMBLY, UPPER LEFT

THOR-05F UPPER TORSO

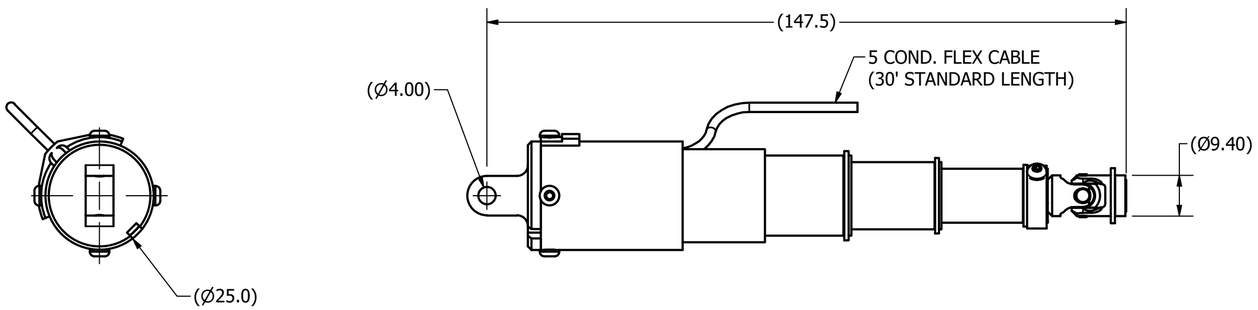
THIRD ANGLE PROJECTION

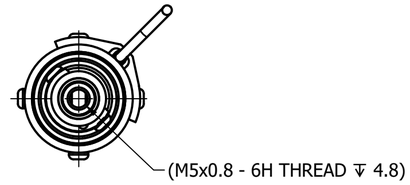
SIZE: A1 | DRAWING NUMBER: 474-3550-A | REV: 5
SCALE: 1 : 1 | SHEET: 1 OF 1

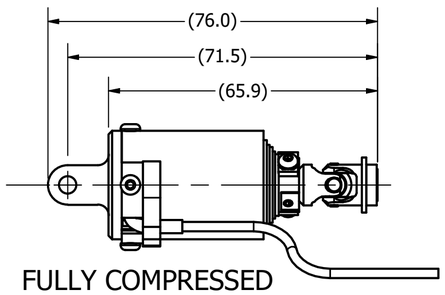
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	JSD	TORCH	7/15/2023



FULLY EXTENDED







FULLY COMPRESSED

WIRE ASSIGNMENTS	
WIRE COLOR	FUNCTION
RED	+EXCITATION
GREEN	+SIGNAL
WHITE	-SIGNAL
BLACK	-EXCITATION
ORANGE	CHANNEL ID

PROTOTYPE DRAWING

NOTES:
1. THIS IS A NON-LINEAR SENSOR. SEE OTHER DOCUMENTATION FOR LINEARIZATION DETAILS.

LINEARITY SPECIFICATIONS	
MAXIMUM DISPLACEMENT RANGE	65 mm
IR-TRACC LINEARITY	2% F.S.
MAXIMUM ERROR (FROM TUBES IN AND TUBES OUT POSITION)	2% F.S.
MAXIMUM ERROR (DUE TO CROSS-TALK FROM FORCED LATERAL DISPLACEMENT)	±3% F.S.
ELECTRICAL SPECIFICATIONS	
INPUT VOLTAGE	5 VDC @ 20 mA
OUTPUT VOLTAGE FULLY EXTENDED	50 - 70 mV
OUTPUT VOLTAGE FULLY COMPRESSED	0.7 - 1.7 V

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: skantola	10/18/2022
CHECKED	
ENG: MJS	10/18/2022
APPROVED	

THIRD ANGLE PROJECTION

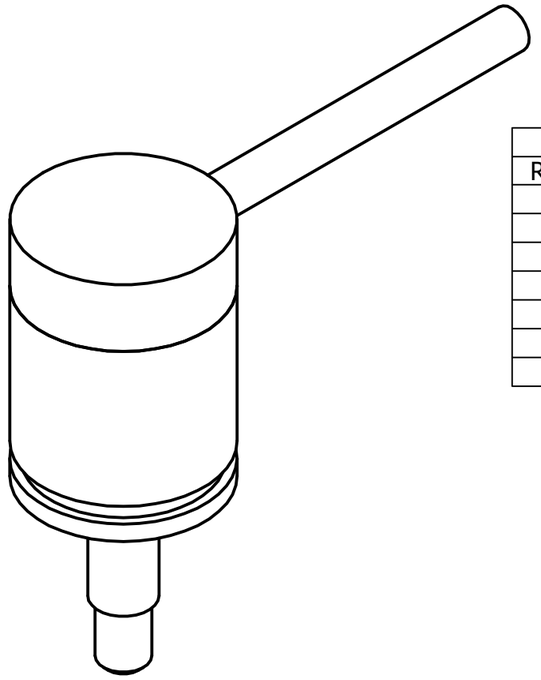
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

IR-TRACC, LOWER, THOR-05F

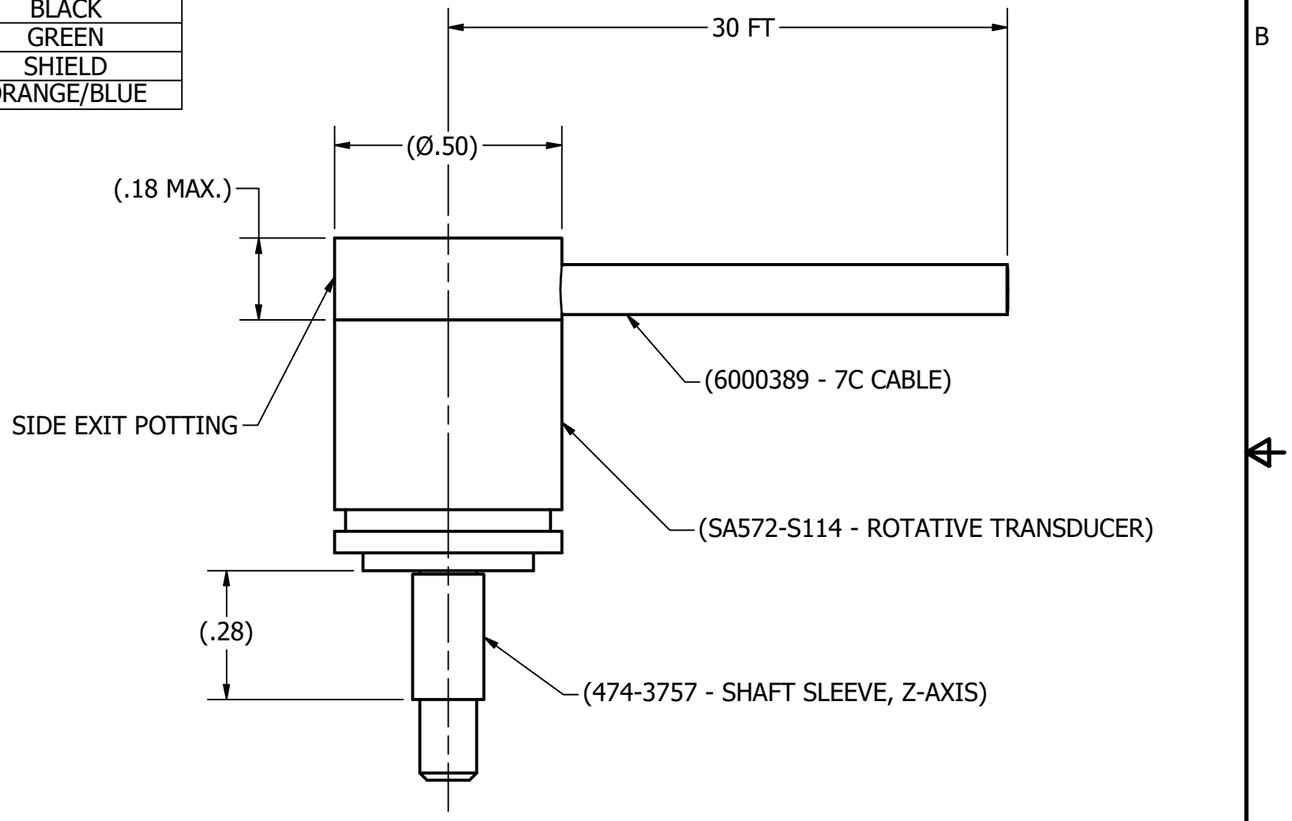
THOR-05F

SIZE: A2 | DRAWING NUMBER: SA572-S122 | REV: 2
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	SKK	MJS	10/25/2022



POTENTIOMETER WIRING			
ROTARY PIN #	FUNCTION	SOURCE	WIRE COLOR
1	+EXC	CABLE	RED
1	BR. COMP.	RESISTOR	GREEN
2	+SIG	CABLE	YELLOW
3	-EXC	CABLE	BLACK
3	BR. COMP	RESISTOR	GREEN
-	GROUND	CABLE	SHIELD
-	-SIG	RESISTOR/CABLE	ORANGE/BLUE



SPECIFICATIONS:

ELECTRICAL

THEORETICAL ELECTRICAL ANGLE (TEA)	(AEA) -2°
INDEPENDENT LINEARITY (OVER TEA)	<=±0.25%
ACTUAL ELECTRICAL ANGLE (AEA)	330° ±5°
OHMIC VALUE (RT)	1kΩ
OHMIC VALUE TOLERANCE @ 20°C	±10%
OUTPUT SMOOTHNESS	<=0.05%
END VOLTAGE	<=0.2%
OUTPUT RANGE	±100mV
NOMINAL EXCITATION	10V

MECHANICAL

MECHANICAL ANGLE (MA)	360° CONTINUOUS
SHAFT GUIDE	BALL BEARING
STARTING TORQUE (N.cm)	<=0.2
WEIGHT (g)	5±2
MOMENT OF INERTIA (g cm²)	<=0.5

PERFORMANCE

TEMPERATURE RANGE	-55°C TO 125°C
SPEED ROTATION (RPM)	600

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
DECIMAL: .X ±.1, .XX ±.01, .XXX ±.005, .XXXX ±.0005
MACHINED ANGLES ±.5° FRACTIONS ±1/64
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	skantola	10/25/2022
CHECKED		
ENG	MJS	10/25/2022
APPROVED		
MATERIAL		
HEAT TREAT	N/A	
FINISH	N/A	

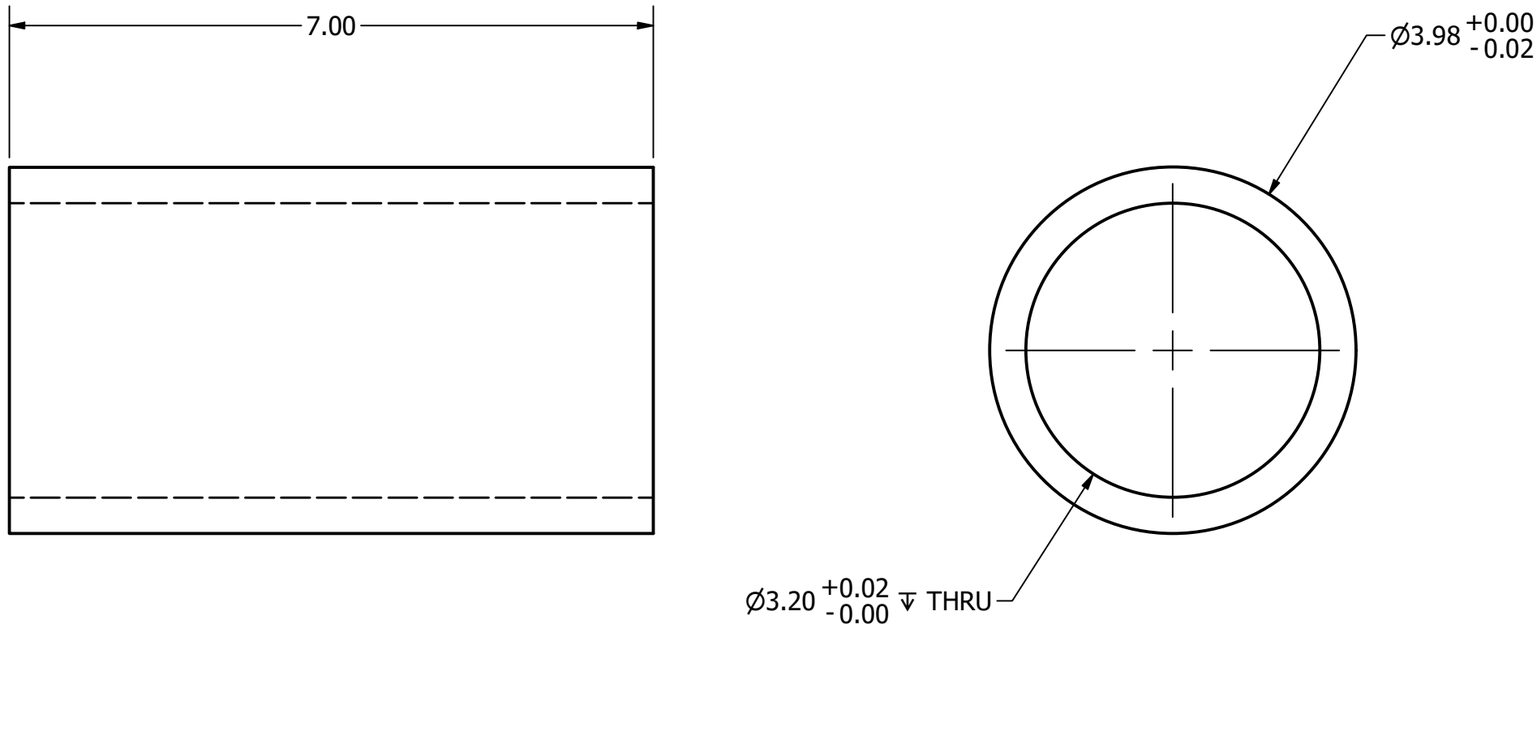
POTENTIOMETER ASSEMBLY, Z-AXIS

THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
B	SA572-S167	1

SCALE: 3 : 1 SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	SKK	MJS	4/25/2022



PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED √ ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

SHAFT SLEEVE, Z-AXIS

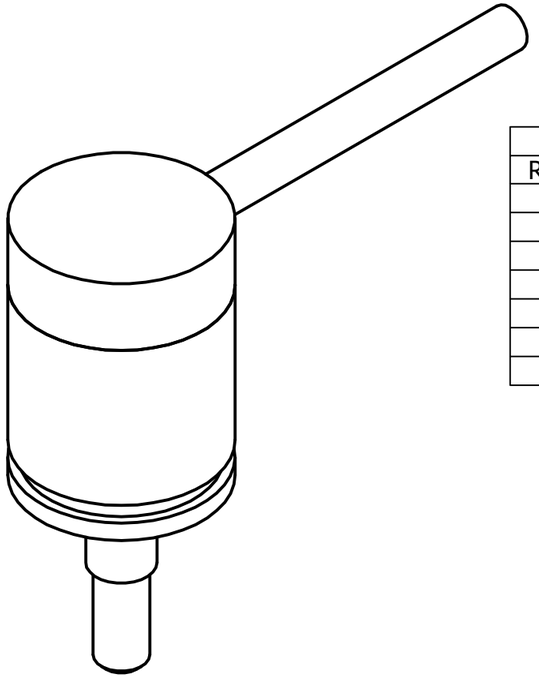
	APPROVALS	DATE
DRAWN	skantola	4/25/2022
CHECKED		
ENG	MJS	4/25/2022
APPROVED		

MATERIAL: 6061-O ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

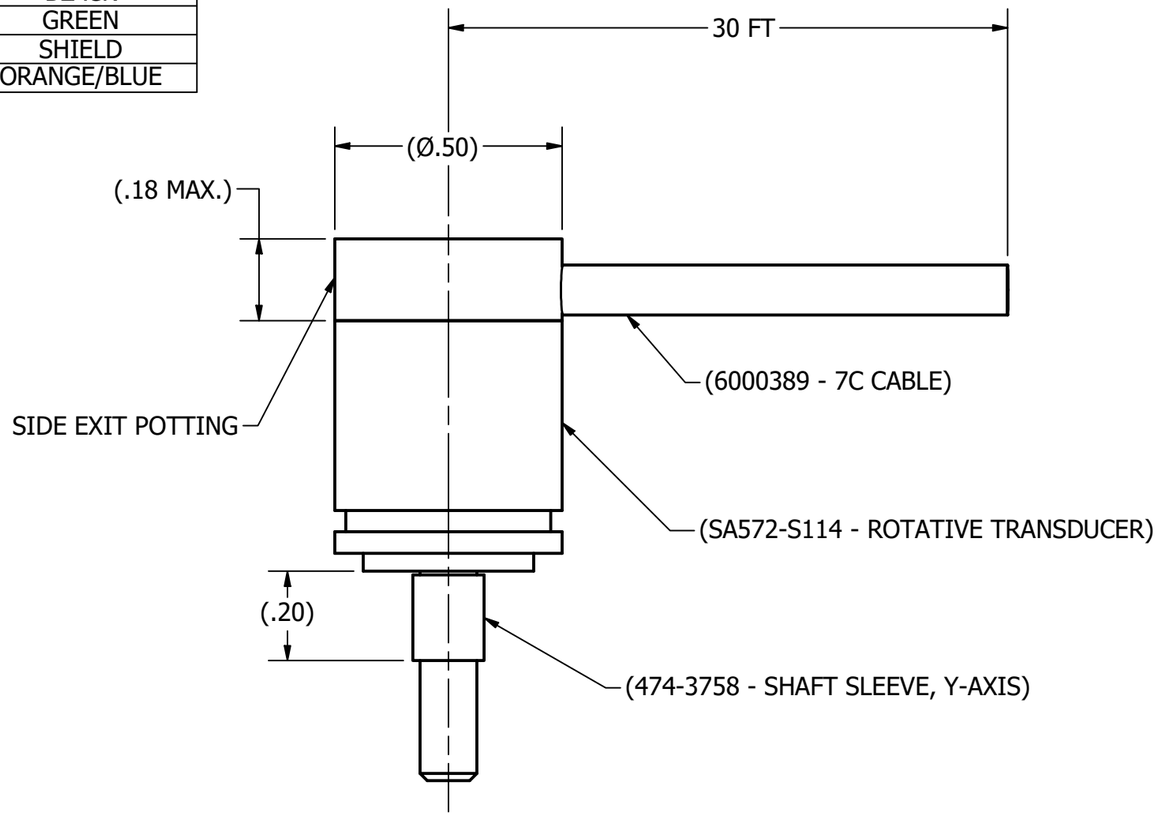
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-3757 | REV: 1
SCALE: 15 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	SKK	MJS	10/25/2022



POTENTIOMETER WIRING			
ROTARY PIN #	FUNCTION	SOURCE	WIRE COLOR
1	+EXC	CABLE	RED
1	BR. COMP.	RESISTOR	GREEN
2	+SIG	CABLE	YELLOW
3	-EXC	CABLE	BLACK
3	BR. COMP	RESISTOR	GREEN
-	GROUND	CABLE	SHIELD
-	-SIG	RESISTOR/CABLE	ORANGE/BLUE



SPECIFICATIONS:

ELECTRICAL

THEORETICAL ELECTRICAL ANGLE (TEA)	(AEA) -2°
INDEPENDENT LINEARITY (OVER TEA)	<=±0.25%
ACTUAL ELECTRICAL ANGLE (AEA)	330° ±5°
OHMIC VALUE (RT)	1kΩ
OHMIC VALUE TOLERANCE @ 20°C	±10%
OUTPUT SMOOTHNESS	<=0.05%
END VOLTAGE	<=0.2%
OUTPUT RANGE	±100mV
NOMINAL EXCITATION	10V

MECHANICAL

MECHANICAL ANGLE (MA)	360° CONTINUOUS
SHAFT GUIDE	BALL BEARING
STARTING TORQUE (N.cm)	<=0.2
WEIGHT (g)	5±2
MOMENT OF INERTIA (g cm²)	<=0.5

PERFORMANCE

TEMPERATURE RANGE	-55°C TO 125°C
SPEED ROTATION (RPM)	600

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
DECIMAL: .X ±.1, .XX ±.01, .XXX ±.005, .XXXX ±.0005
MACHINED 63
ANGLES ±.5°
FRACTIONS ±1/64
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: skantola	10/25/2022
CHECKED:	
ENG: MJS	10/25/2022
APPROVED:	

MATERIAL: | HEAT TREAT: N/A | FINISH: N/A

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

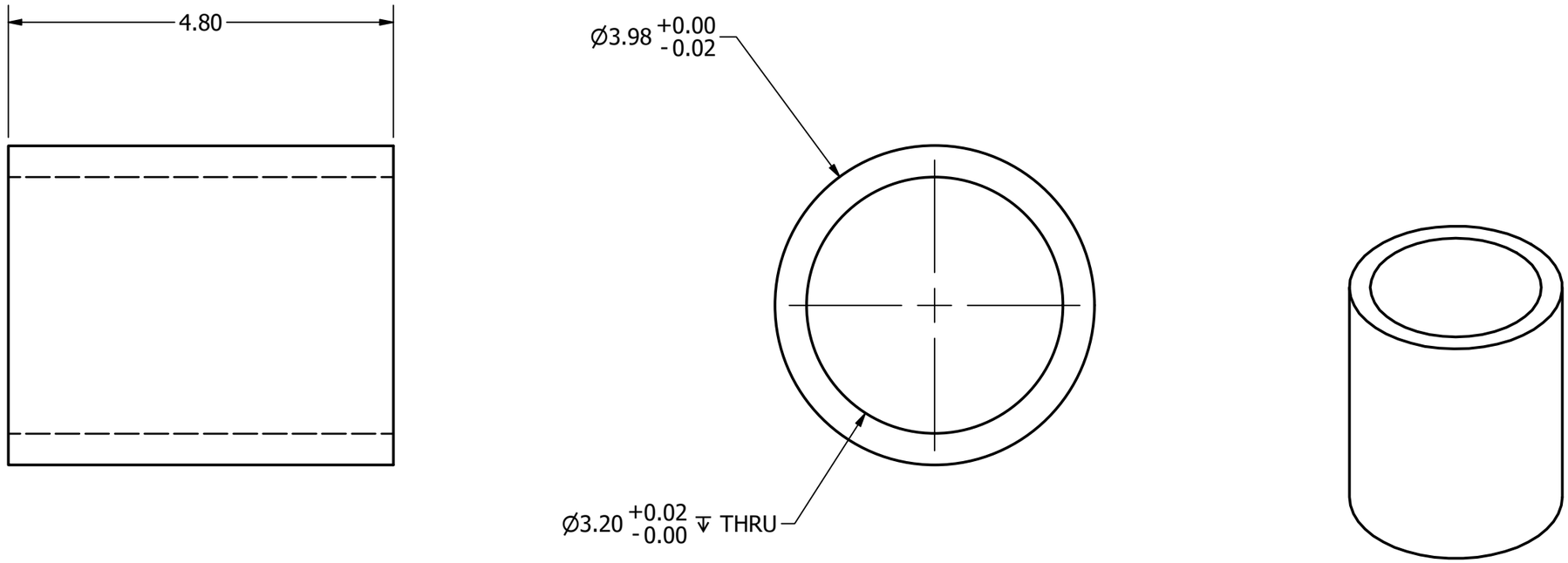
POTENTIOMETER ASSEMBLY, Y-AXIS

THIRD ANGLE PROJECTION

SIZE	DRAWING NUMBER	REV
B	SA572-S168	1

SCALE: 3 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	SKK	MJS	4/25/2022



PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 6061-O ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: skantola	4/25/2022
CHECKED:	
ENG: MJS	4/25/2022
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

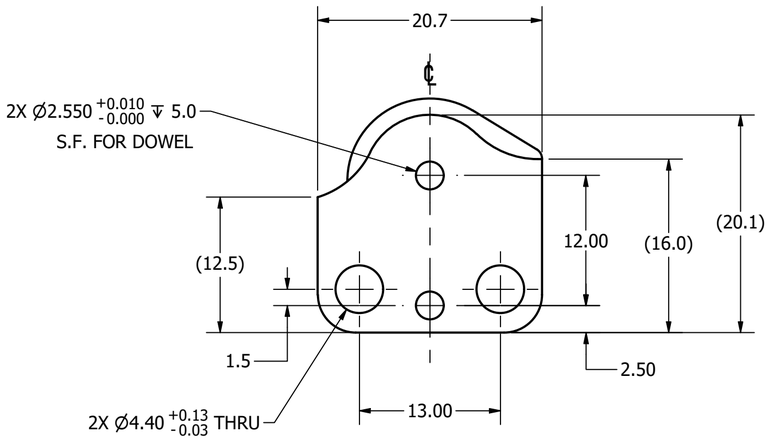
SHAFT SLEEVE, Y-AXIS

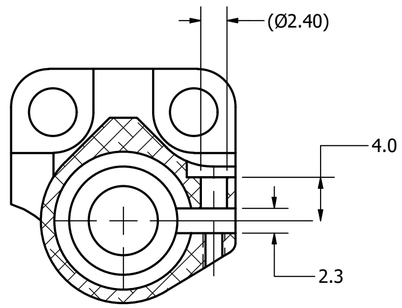
THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: 474-3758 | REV: 1

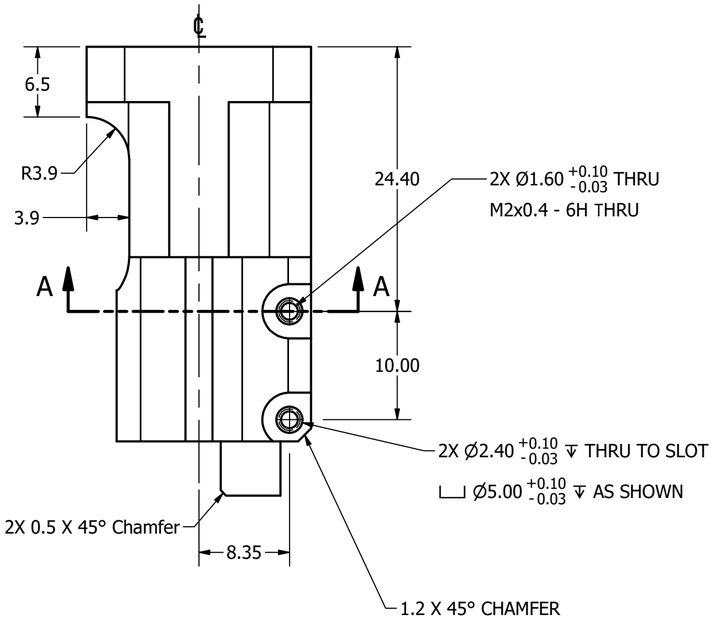
SCALE: 15 : 1 | SHEET: 1 OF 1

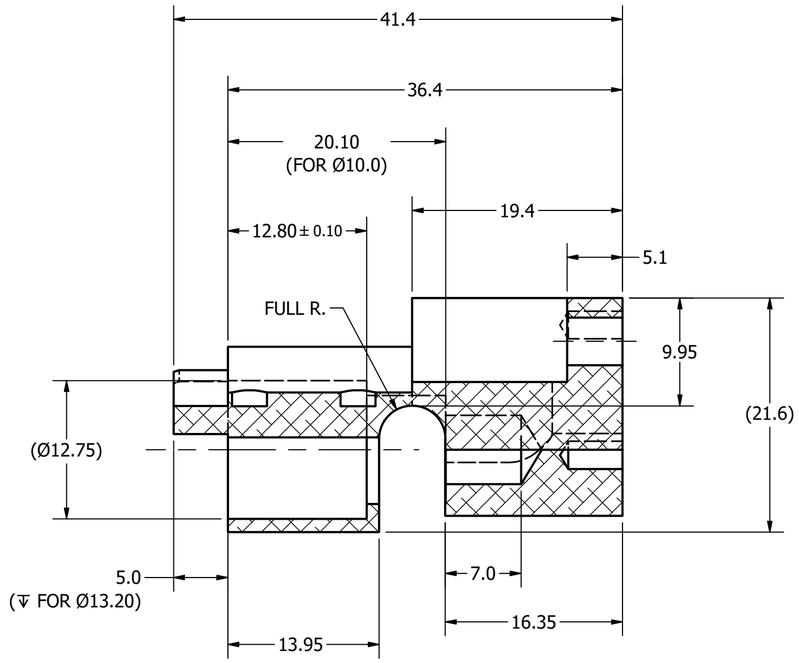
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	SKK	MJS	1/15/2024

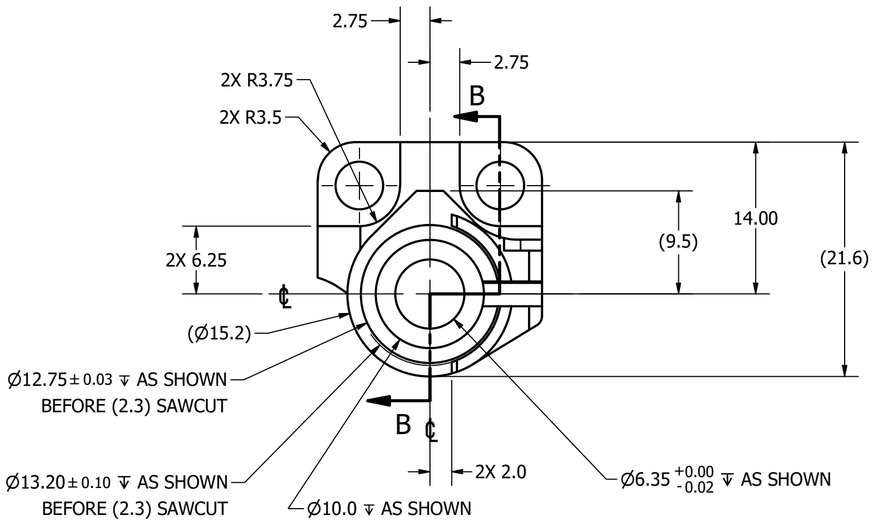




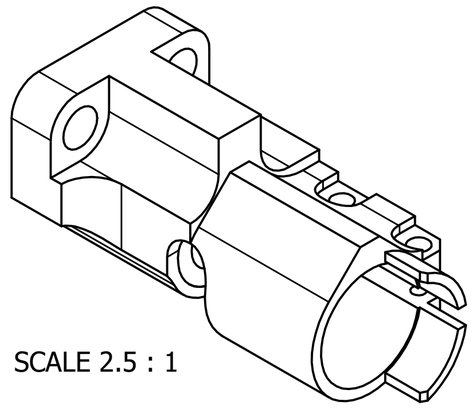
SECTION A-A
SCALE 2.5 : 1







SECTION B-B
SCALE 2.5 : 1



SCALE 2.5 : 1

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ∠ ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	7075-T6 ALUMINUM	
HEAT TREAT	N/A	
FINISH	CLEAR ANODIZE	

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: skantola	11/10/2021
CHECKED:	
ENG: MJS	11/10/2021
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

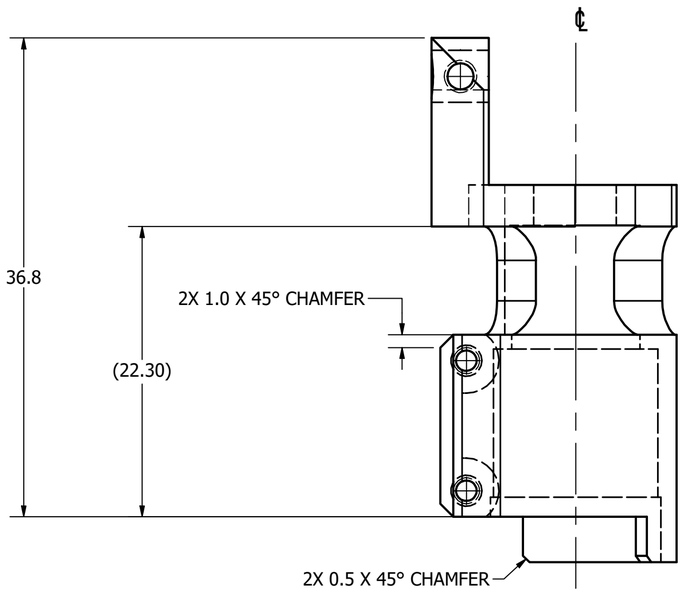
IR-TRACC BASE, UPPER LEFT
THOR-05F

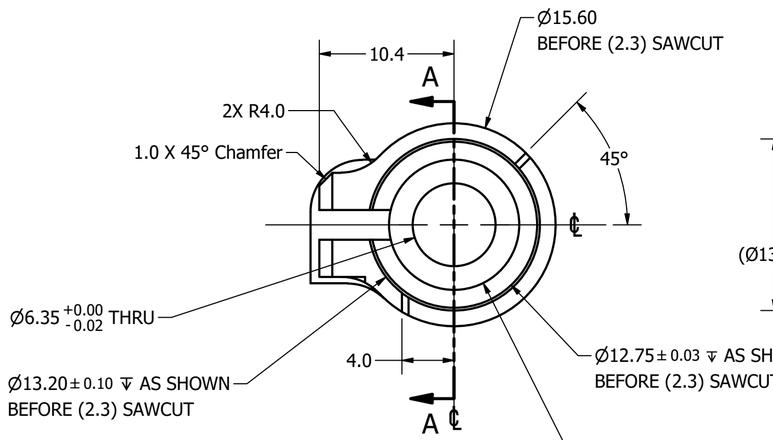
THIRD ANGLE PROJECTION

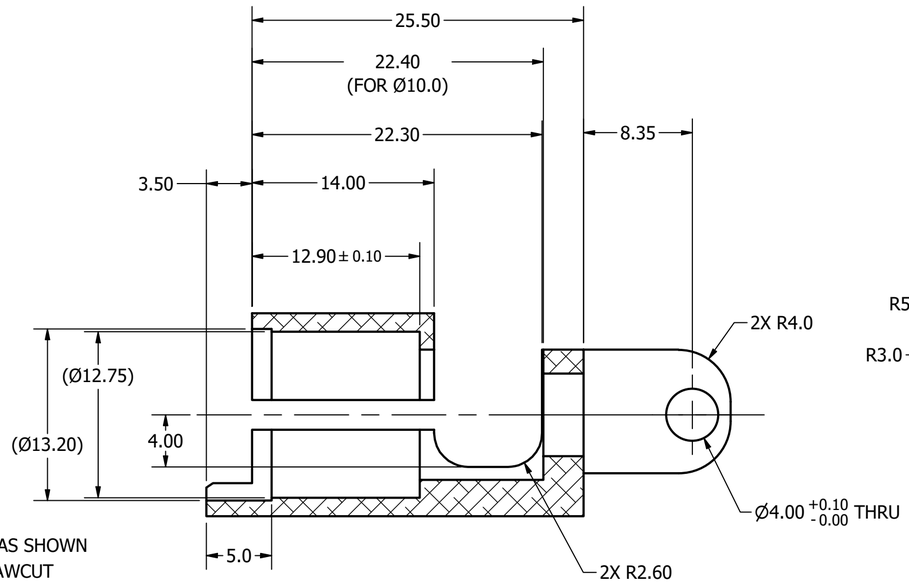
SIZE	DRAWING NUMBER	REV
A2	474-3754-1	4

SCALE:	SHEET
2.5 : 1	1 OF 1

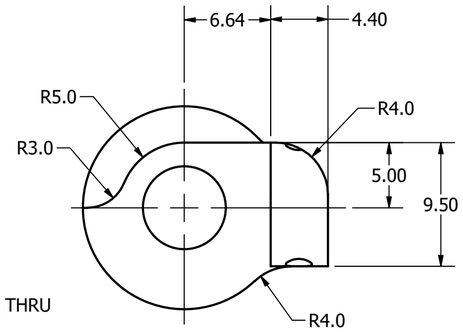
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	6	PROTOTYPE	JSD	SKK	5/31/2024

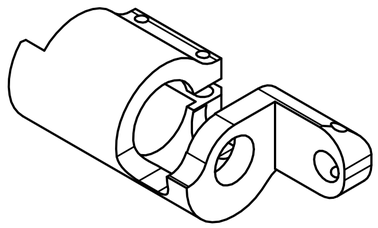




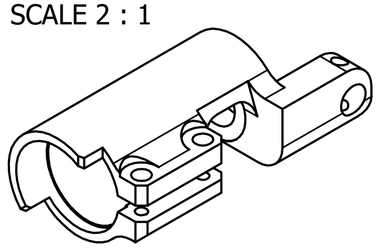


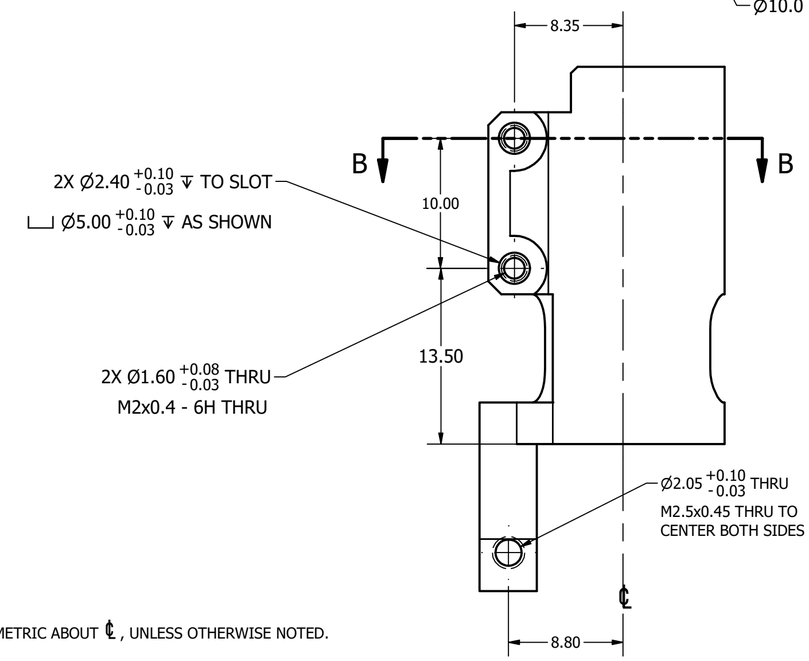
SECTION A-A
SCALE 3 : 1

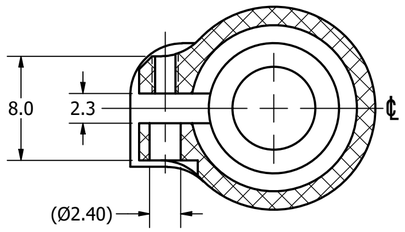




SCALE 2 : 1







SECTION B-B
SCALE 3 : 1

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL	7075-T6 ALUMINUM	
HEAT TREAT	N/A	
FINISH	CLEAR ANODIZE	

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: skantola	11/10/2021
CHECKED:	
ENG: MJS	11/10/2021
APPROVED:	

IR-TRACC ARM MOUNTING BRACKET, UL/LR
THOR-05F

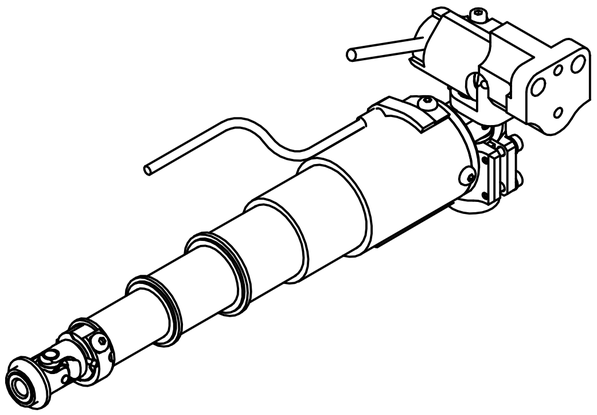
THIRD ANGLE PROJECTION

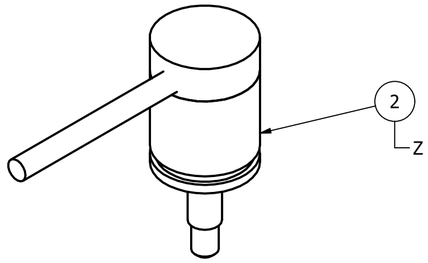
SIZE: A2 | DRAWING NUMBER: 474-3756 | REV: 6

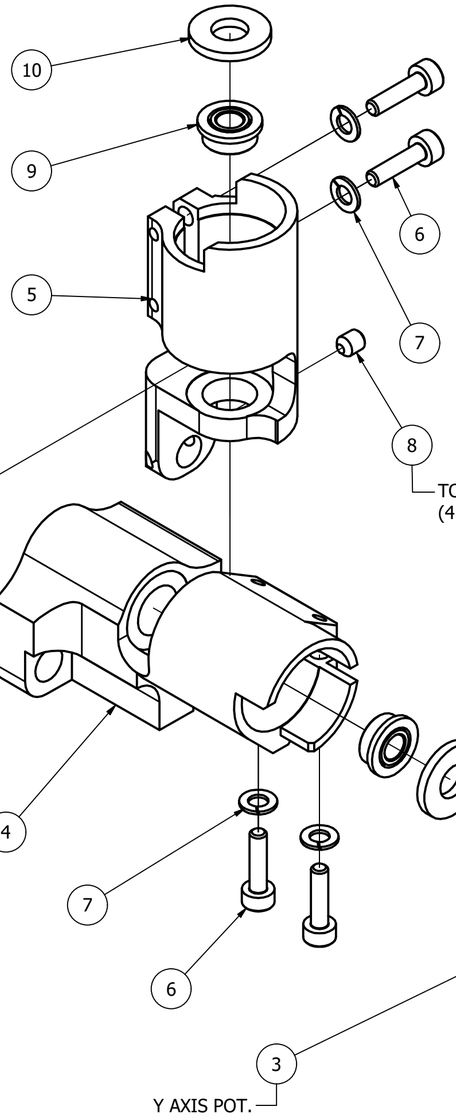
SCALE: 3 : 1 | SHEET: 1 OF 1

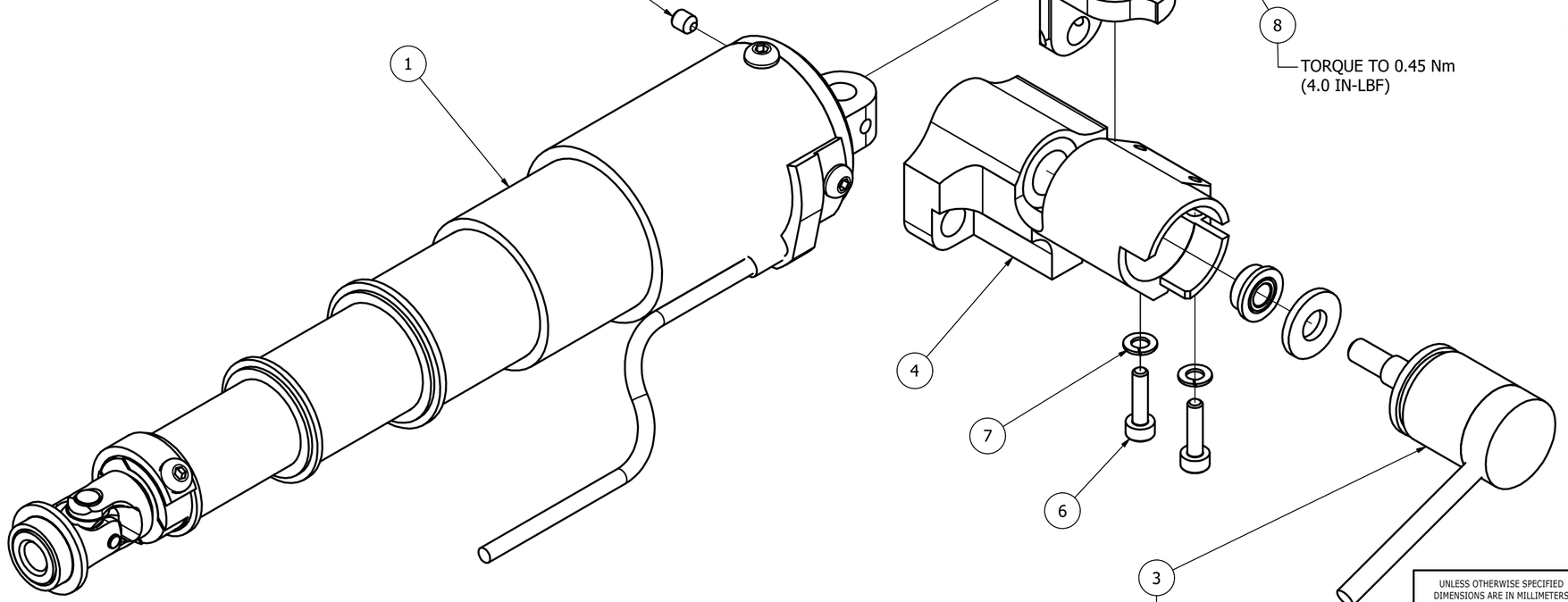
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	PROTOTYPE	JSD	LB	8/4/2023

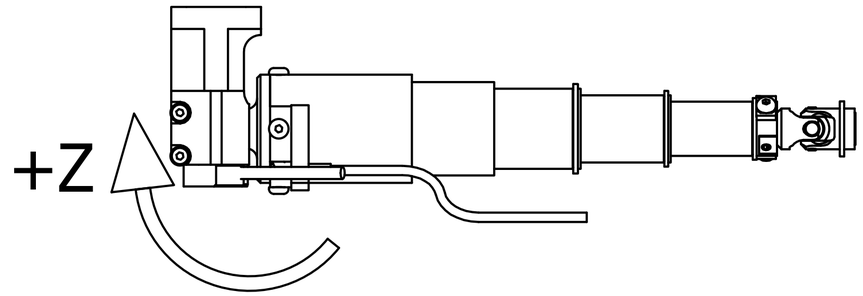
PART NUMBER TABLE			
ASSEMBLY NO.	SENSORS USED	CABLE LENGTH "XXX"	DAS LOCATION
474-3560-A	SA572-S122 SA572-S167 SA572-S168	30 FT [9144 mm]	EXTERNAL

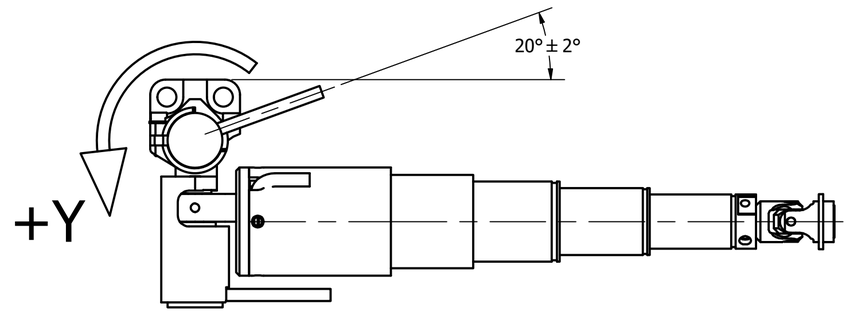












SOME COMPONENTS
HIDDEN FOR CLARITY

ITEM	QTY	PART NUMBER	DESCRIPTION
10	2	9004096	#6 FLAT WASHER NYLON 0.170 X 0.375 X 0.045
9	2	9002201	FLANGE BEARING (1/4" O.D. x 1/8" I.D.)
8	2	5001359	M2.5 X 0.45 X 3 LG. SSSCP NYLOK
7	4	5001216	M2 SPLIT LOCK WASHER SS
6	4	5000083	M2 X 0.4 X 8 LG. SHCS
5	1	474-3755	IR-TRACC ARM MOUNTING BRACKET, UR/LL
4	1	474-3754-2	IR-TRACC BASE, UPPER RIGHT
3	1	SA572-S168	POTENTIOMETER ASSEMBLY, Y-AXIS
2	1	SA572-S167	POTENTIOMETER ASSEMBLY, Z-AXIS
1	1	SA572-S122	IR-TRACC, UPPER

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: skantola	10/18/2022
CHECKED	
ENG: MJS	10/18/2022
APPROVED	

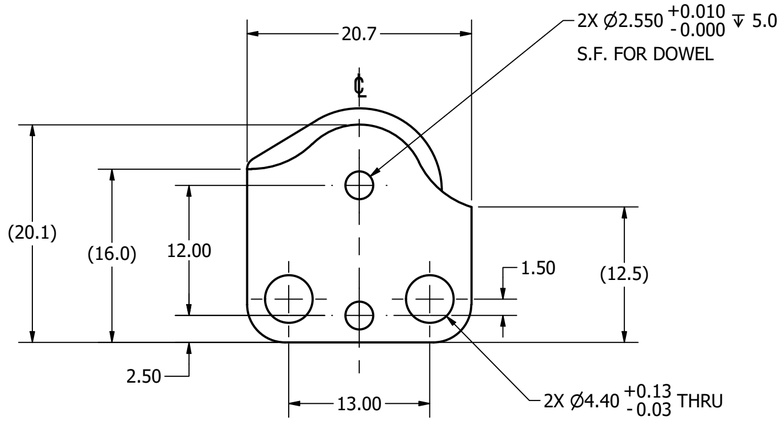
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

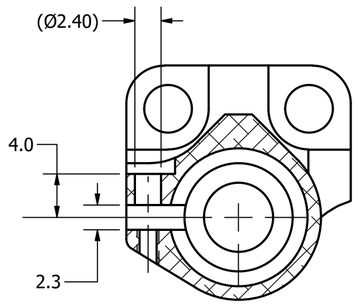
3D IR-TRACC ASSEMBLY, UPPER RIGHT

THOR-05F UPPER TORSO

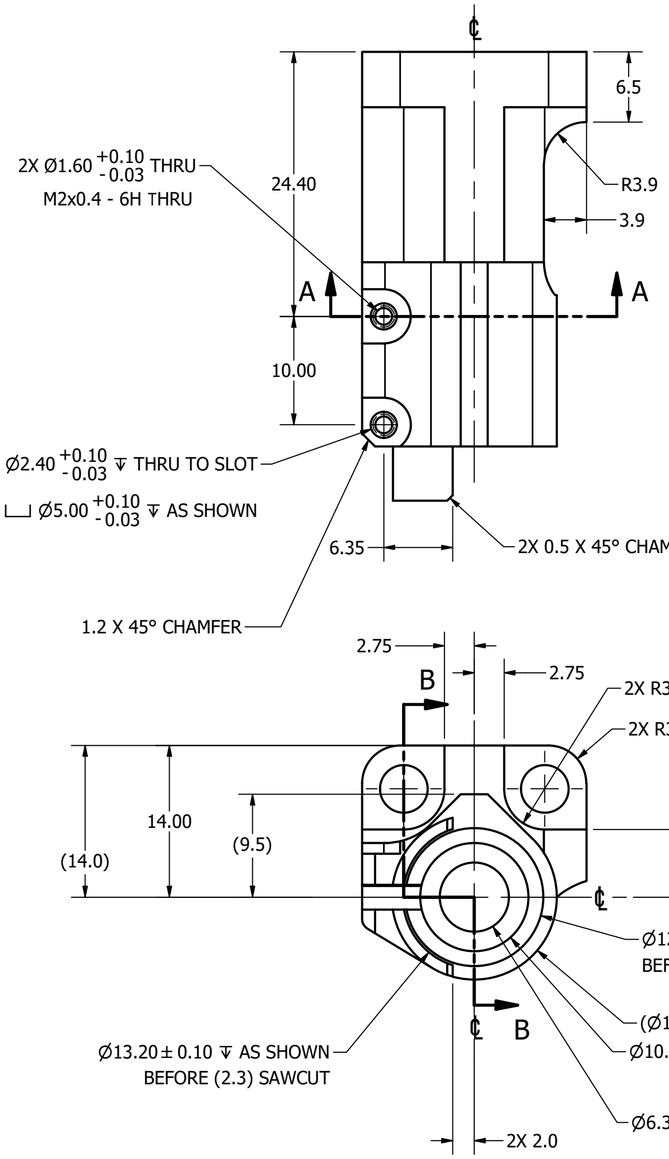
THIRD ANGLE PROJECTION | SIZE: A2 | DRAWING NUMBER: 474-3560-A | REV: 5 | SCALE: 1 : 1 | SHEET: 1 OF 1

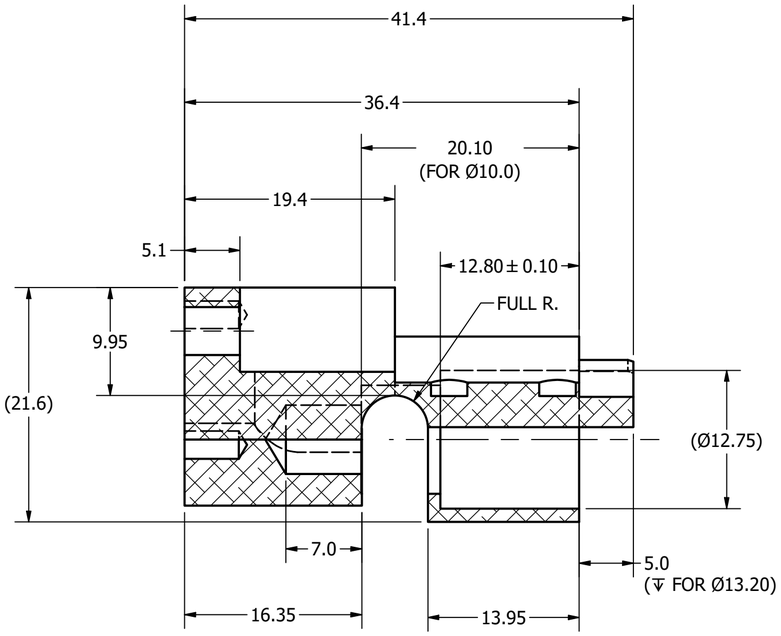
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	4	PROTOTYPE	SKK	MJS	1/15/2024

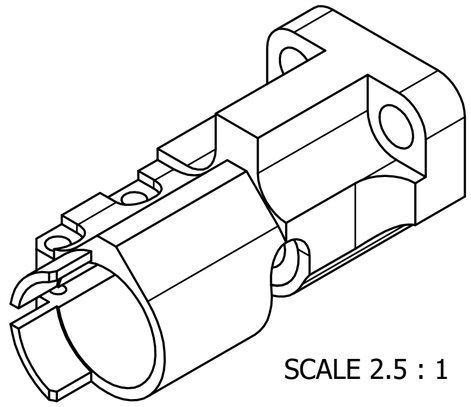




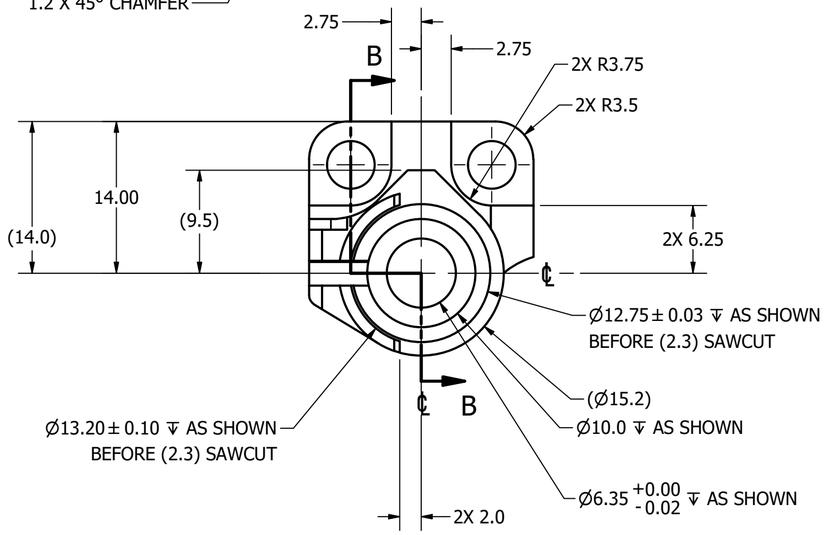
SECTION A-A
SCALE 2.5 : 1







SCALE 2.5 : 1



SECTION B-B
SCALE 2.5 : 1

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: skantola	11/11/2021
CHECKED:	
ENG: MJS	11/11/2021
APPROVED:	

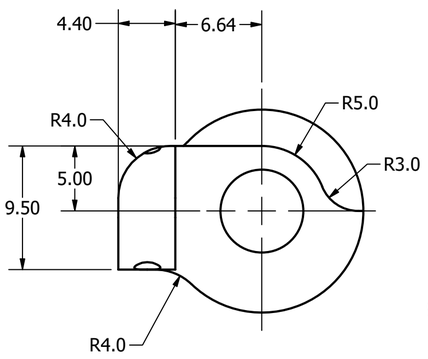
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

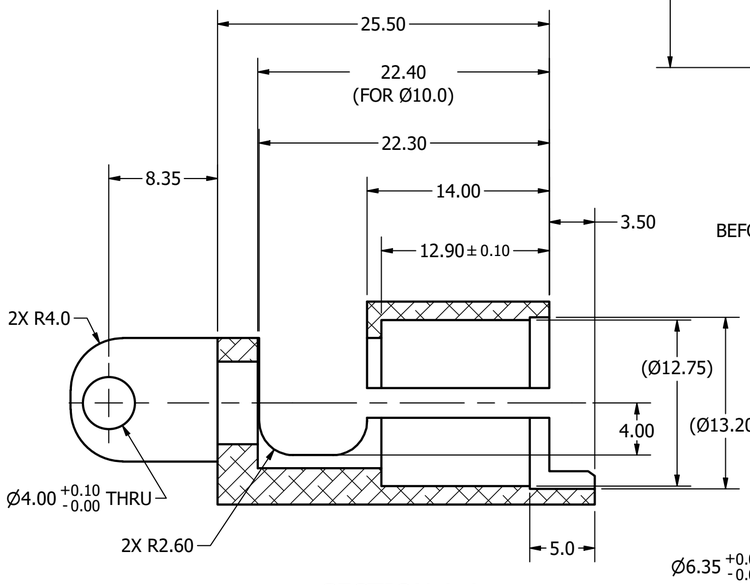
IR-TRACC BASE, UPPER RIGHT
THOR-05F

THIRD ANGLE PROJECTION

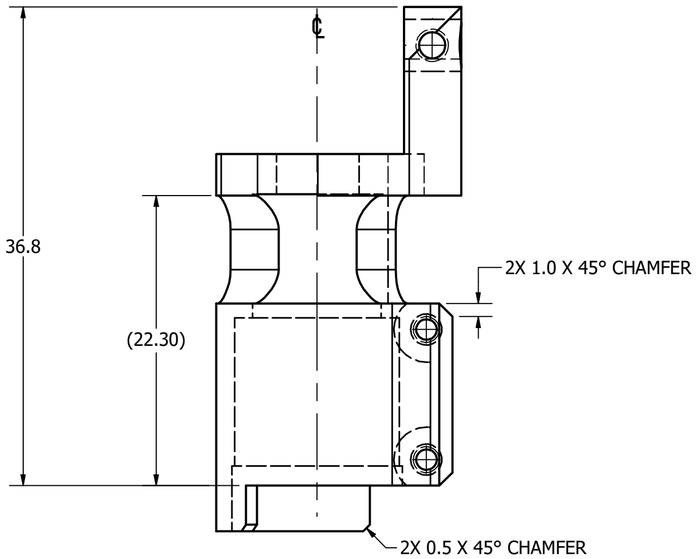
SIZE: A2 | DRAWING NUMBER: 474-3754-2 | REV: 4
SCALE: 2.5 : 1 | SHEET: 1 OF 1

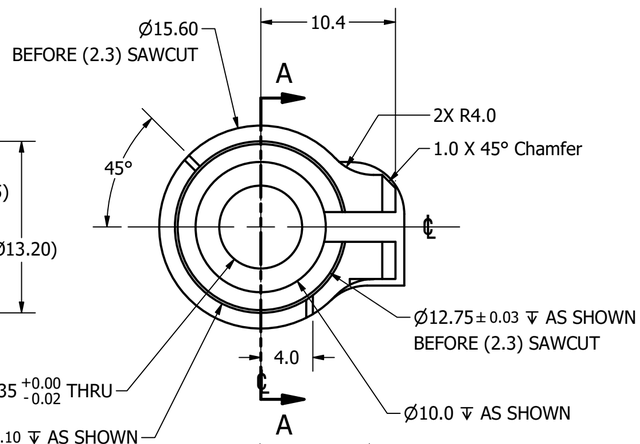
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	6	PROTOTYPE	JSD	SKK	5/31/2024

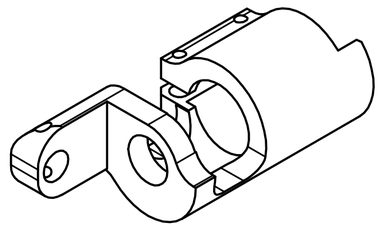


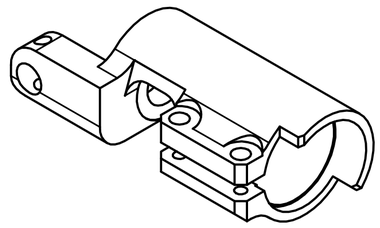


SECTION A-A
SCALE 3 : 1

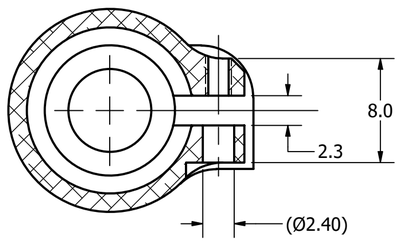




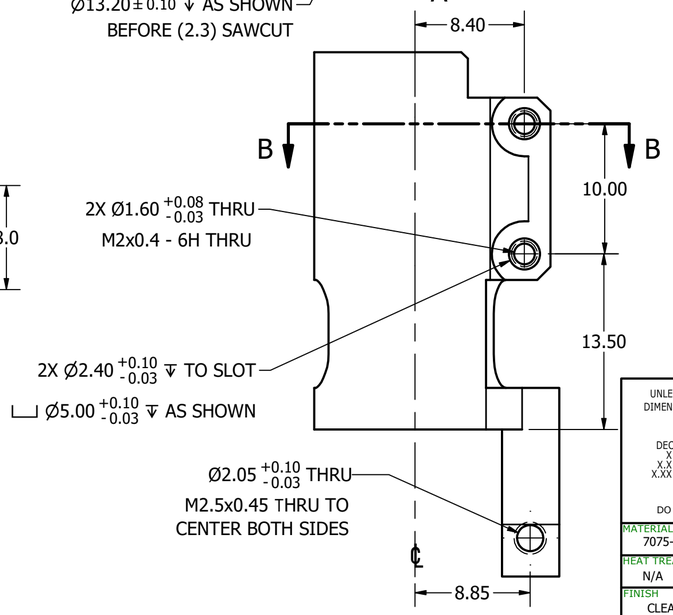




SCALE 2 : 1



SECTION B-B
SCALE 3 : 1



PROTOTYPE DRAWING

NOTES:

1. DIMENSIONS SYMMETRIC ABOUT ℄, UNLESS OTHERWISE NOTED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: skantola	11/11/2021
CHECKED:	
ENG: MJS	11/11/2021
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

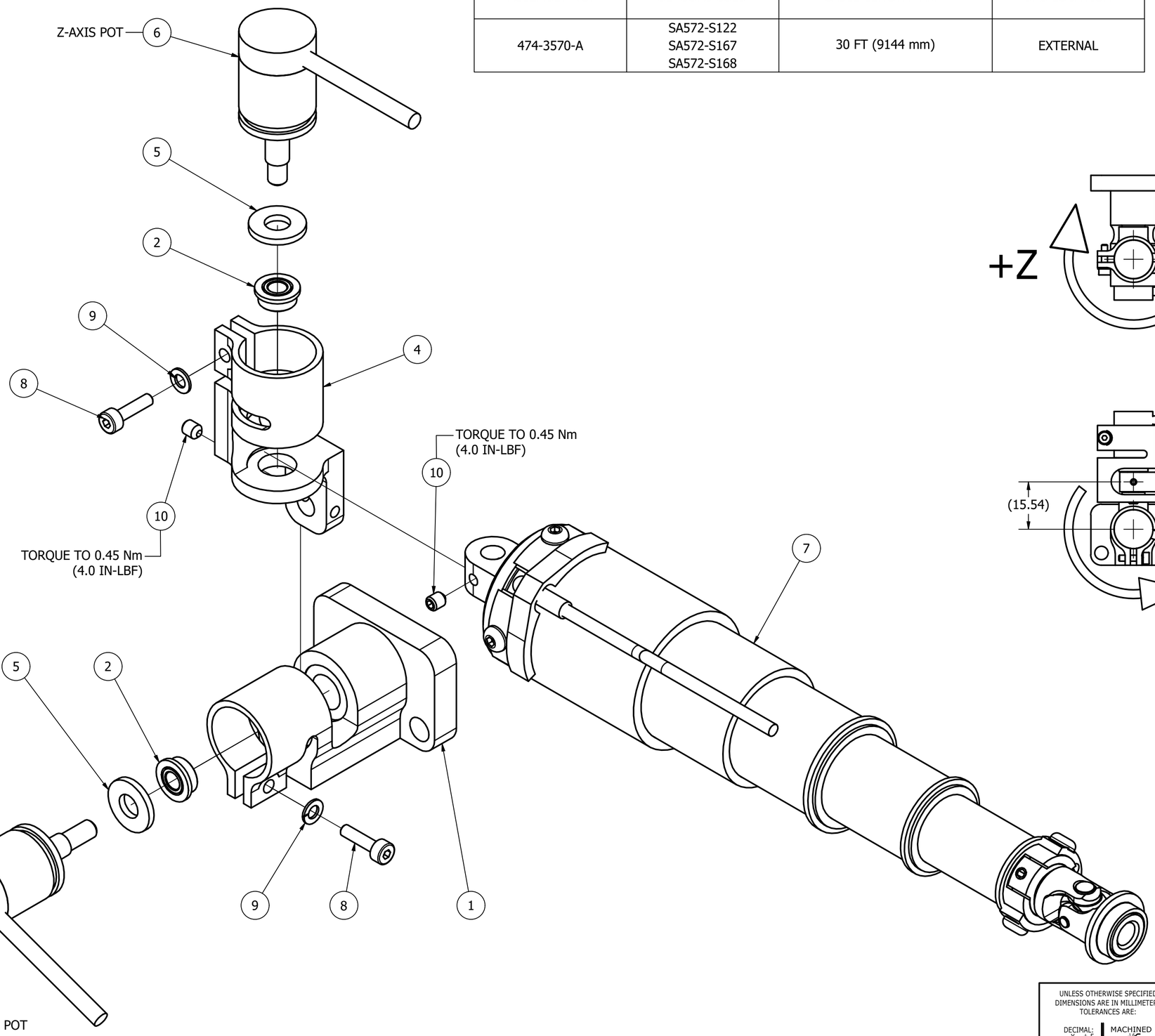
IR-TRACC ARM MOUNTING BRACKET, UR/LL
THOR-05F

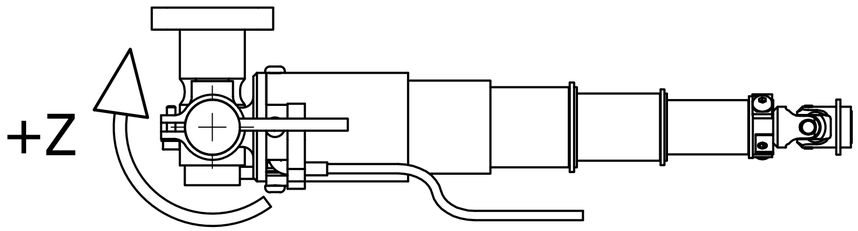
THIRD ANGLE PROJECTION

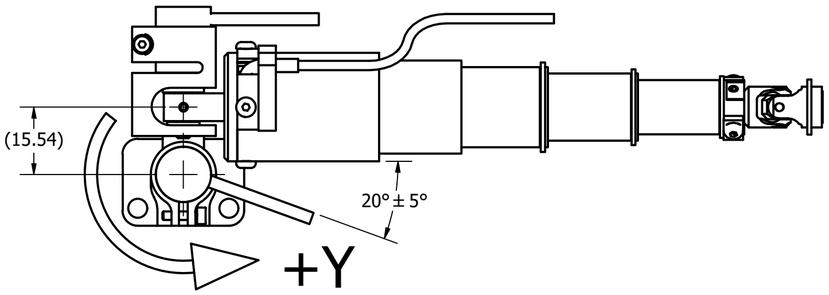
SIZE: A2 | DRAWING NUMBER: 474-3755 | REV: 6
SCALE: 3 : 1 | SHEET: 1 OF 1

PART NUMBER TABLE			
ASSEMBLY NO.	SENSORS USED	CABLE LENGTH "XXX"	DAS LOCATION
474-3570-A	SA572-S122 SA572-S167 SA572-S168	30 FT (9144 mm)	EXTERNAL

REVISION HISTORY					
ECO#	REV	DESCRIPTION	ENG'R.	CHECK	DATE
	1	PROTOTYPE	JSD	TORCH	4/4/2024







ITEM	QTY	PART NUMBER	DESCRIPTION
10	2	5001359	M2.5 X 0.45 X 3 LG. SSSCP NYLOK
9	2	5001216	M2 SPLIT LOCK WASHER SS
8	2	5000083	M2 X 0.4 X 8 LG. SHCS
7	1	SA572-S122	IR-TRACC, LOWER, THOR-05F
6	1	SA572-S167	POTENTIOMETER ASSEMBLY, Z-AXIS
5	2	9004096	#6 FLAT WASHER NYLON 0.170 X 0.375 X 0.045
4	1	474-3763-2	IR-TRACC ARM MOUNTING BRACKET, LOWER RIGHT
3	1	SA572-S168	POTENTIOMETER ASSEMBLY, Y-AXIS
2	2	9002201	FLANGE BEARING (1/4" O.D. x 1/8" I.D.)
1	1	474-3762	IR-TRACC BASE, LOWER LEFT & RIGHT

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: JSD	4/4/2024
CHECKED	
ENG: TORCH	4/4/2024
APPROVED	

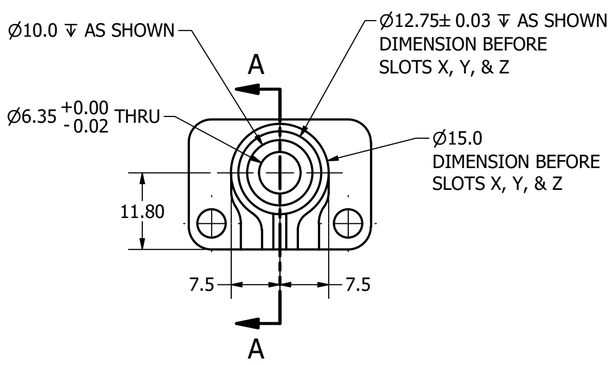
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

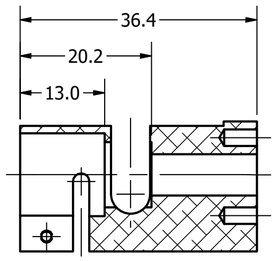
IR-TRACC ASS'Y, THOR-05F LR (UMBILICAL)

THIRD ANGLE PROJECTION

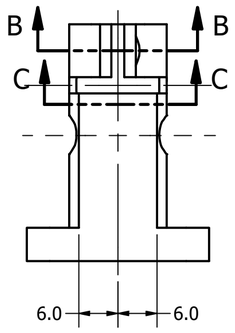
SIZE: A2 | DRAWING NUMBER: 474-3570-A | REV: 1
SCALE: 2 : 1 | SHEET: 1 OF 1

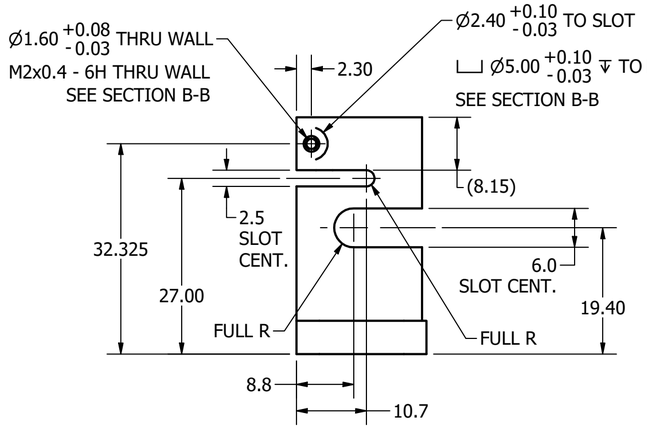
REVISION HISTORY					
ECO#	REV	DESCRIPTION	ENG'R.	CHECK	DATE
	1	RELEASE FOR PROTOTYPE	JSD	DJI	6/19/2024

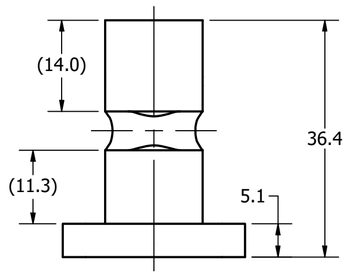


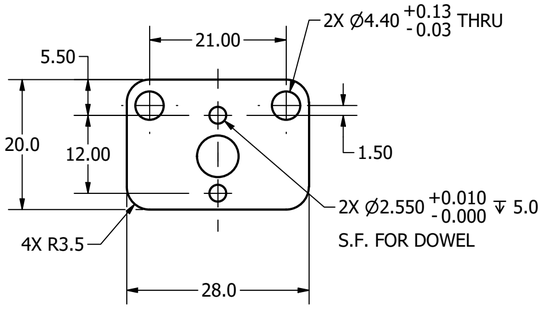


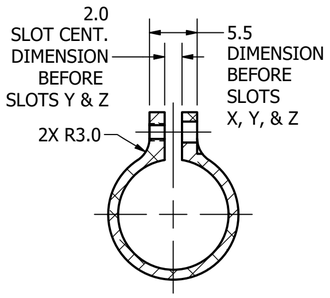
SECTION A-A
SCALE 1.5 : 1



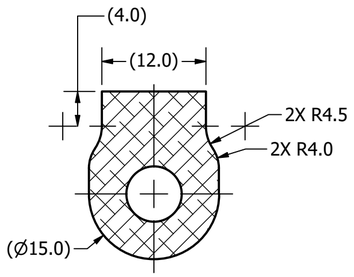




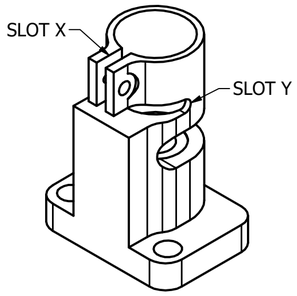


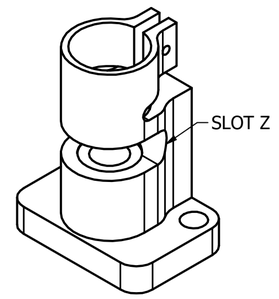


SECTION B-B
SCALE 2 : 1



SECTION C-C
SCALE 2 : 1





NOTES:
1. ALL DIMENSIONS ARE SYMMETRICAL ABOUT CENTERLINE, UNLESS NOTED OTHERWISE.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: JSD	6/19/2024
CHECKED:	
ENG: DJI	6/19/2024
APPROVED:	

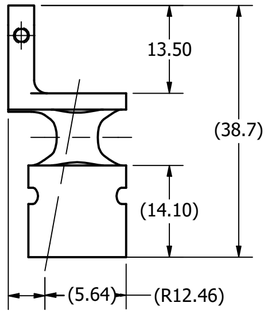
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

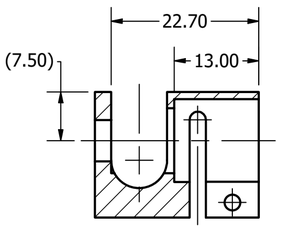
IR-TRACC BASE, LOWER LEFT & RIGHT

THIRD ANGLE PROJECTION

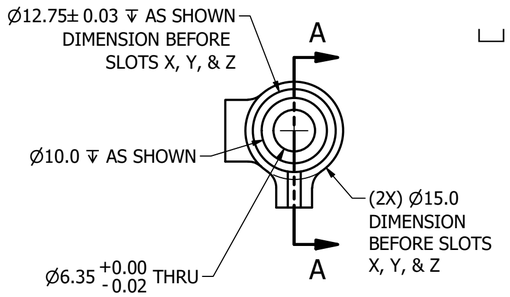
SIZE: A2 | DRAWING NUMBER: 474-3762 | REV: 1
SCALE: 1.5 : 1 | SHEET: 1 OF 1

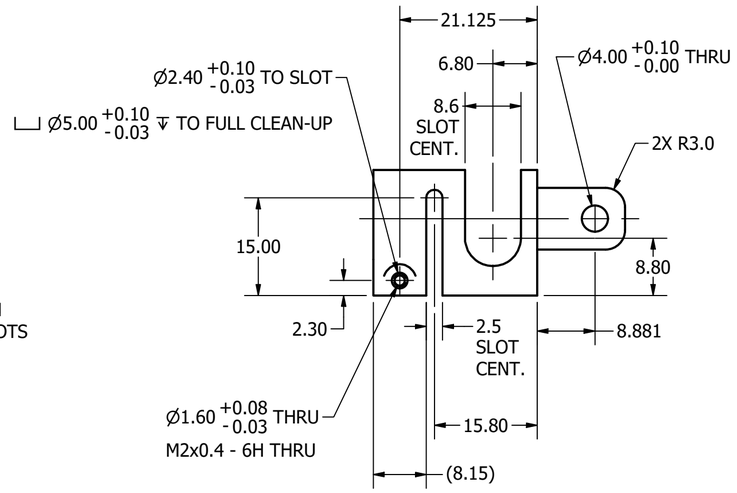
REVISION HISTORY					
ECO#	REV	DESCRIPTION	ENG'R.	CHECK	DATE
	1	RELEASE FOR PRODUCTION	JSD	DJI	6/19/2024

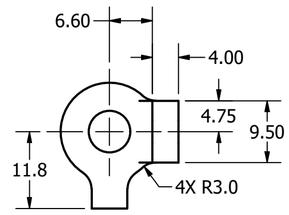


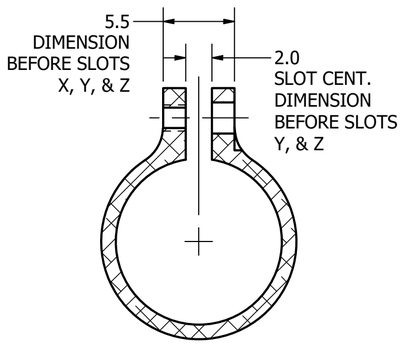


SECTION A-A

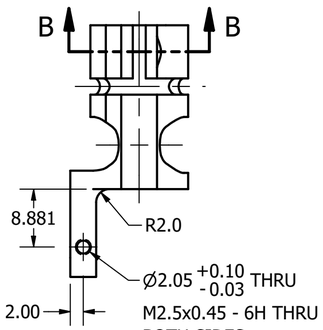


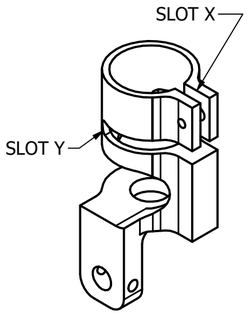


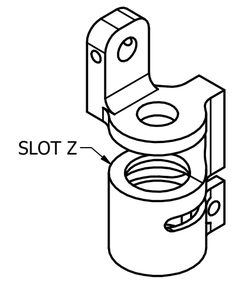




SECTION B-B
SCALE 3 : 1







PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

IR-TRACC ARM MOUNTING BRACKET, LOWER RIGHT

	APPROVALS	DATE
DRAWN	JSD	6/19/2024
CHECKED		
ENG	DJI	6/19/2024
APPROVED		

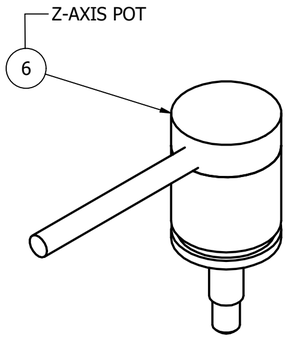
MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

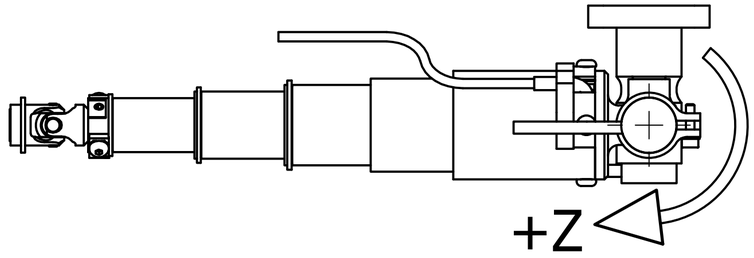
THIRD ANGLE PROJECTION

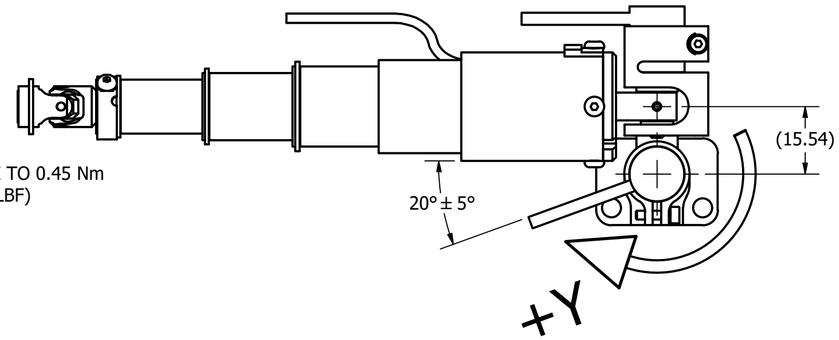
SIZE: A2 | DRAWING NUMBER: 474-3763-2 | REV: 1
SCALE: 1.5 : 1 | SHEET: 1 OF 1

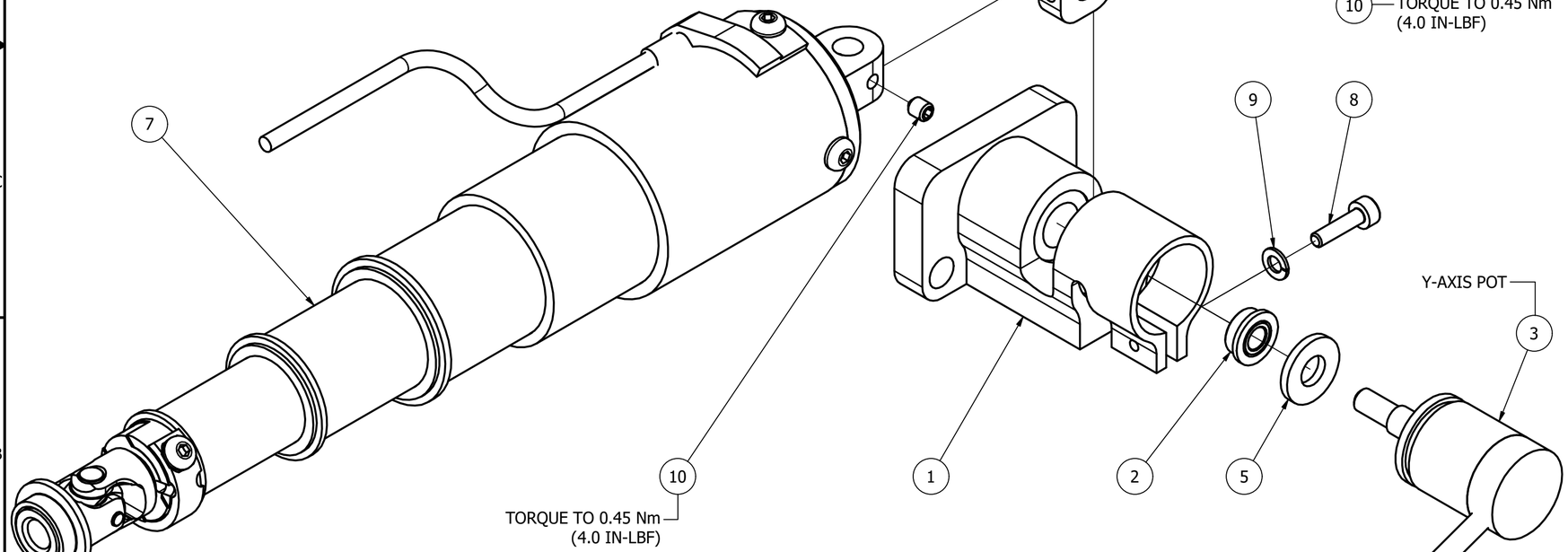
PART NUMBER TABLE			
ASSEMBLY NO.	SENSORS USED	CABLE LENGTH "XXX"	DAS LOCATION
474-3580-A	SA572-S122 SA572-S167 SA572-S168	30 FT (9144 mm)	EXTERNAL

REVISION HISTORY					
ECO#	REV	DESCRIPTION	ENG'R.	CHECK	DATE
	1	PROTOTYPE	JSD	TORCH	4/4/2024









ITEM	QTY	PART NUMBER	DESCRIPTION
10	2	5001359	M2.5 X 0.45 X 3 LG. SSSCP NYLOK
9	2	5001216	M2 SPLIT LOCK WASHER SS
8	2	5000083	M2 X 0.4 X 8 LG. SHCS
7	1	SA572-S122	IR-TRACC, LOWER, THOR-05F
6	1	SA572-S167	POTENTIOMETER ASSEMBLY, Z-AXIS
5	2	9004096	#6 FLAT WASHER NYLON 0.170 X 0.375 X 0.045
4	1	474-3763-1	IR-TRACC ARM MOUNTING BRACKET, LOWER LEFT
3	1	SA572-S168	POTENTIOMETER ASSEMBLY, Y-AXIS
2	2	9002201	FLANGE BEARING (1/4" O.D. x 1/8" I.D.)
1	1	474-3762	IR-TRACC BASE, LOWER LEFT & RIGHT

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ✓ | ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

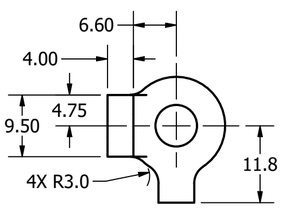
IR-TRACC ASS'Y, THOR-05F LL (UMBILICAL)

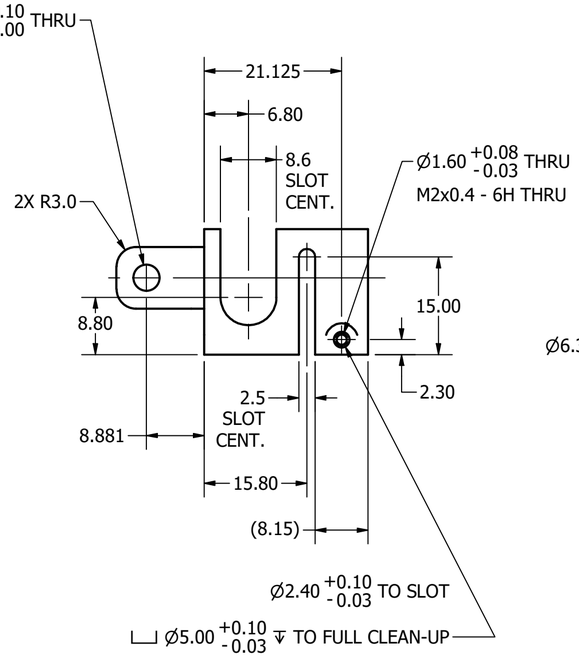
APPROVALS	DATE
DRAWN JSD	4/4/2024
MATERIAL	CHECKED
HEAT TREAT N/A	ENG TORCH 4/4/2024
FINISH N/A	APPROVED

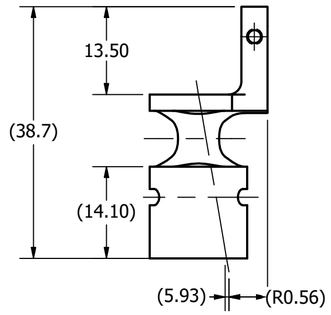
THIRD ANGLE PROJECTION

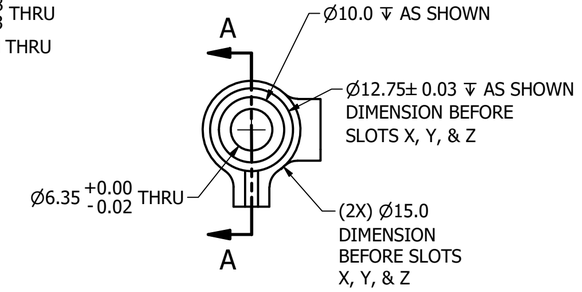
SIZE A2 | DRAWING NUMBER 474-3580-A | REV 1
SCALE: 2 : 1 | SHEET 1 OF 1

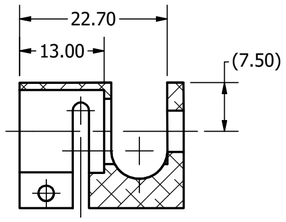
REVISION HISTORY					
ECO#	REV	DESCRIPTION	ENG'R.	CHECK	DATE
	1	RELEASE FOR PROTOTYPE	JSD	DJI	6/19/2024



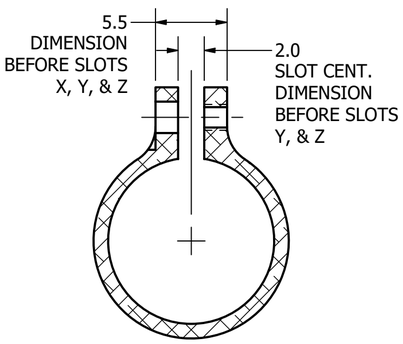




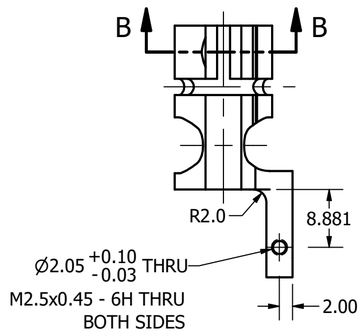


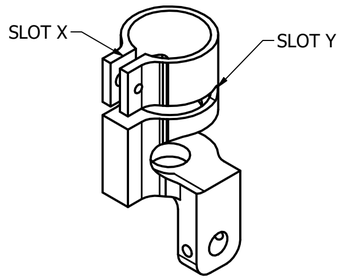


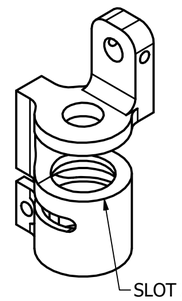
SECTION A-A



SECTION B-B
SCALE 3 : 1







PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: 7075-T6 ALUMINUM
HEAT TREAT: N/A
FINISH: CLEAR ANODIZE

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN JSD	6/19/2024
CHECKED	
ENG DJI	6/19/2024
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

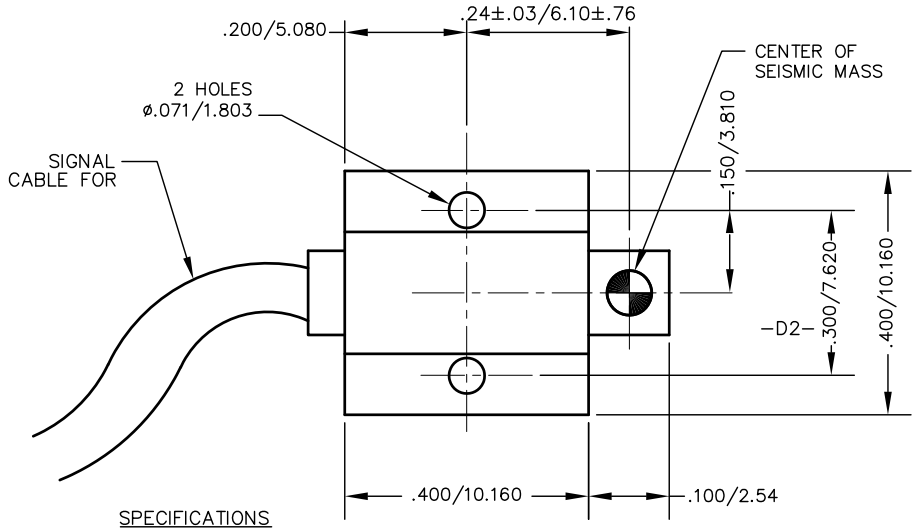
IR-TRACC ARM MOUNTING BRACKET, LOWER LEFT

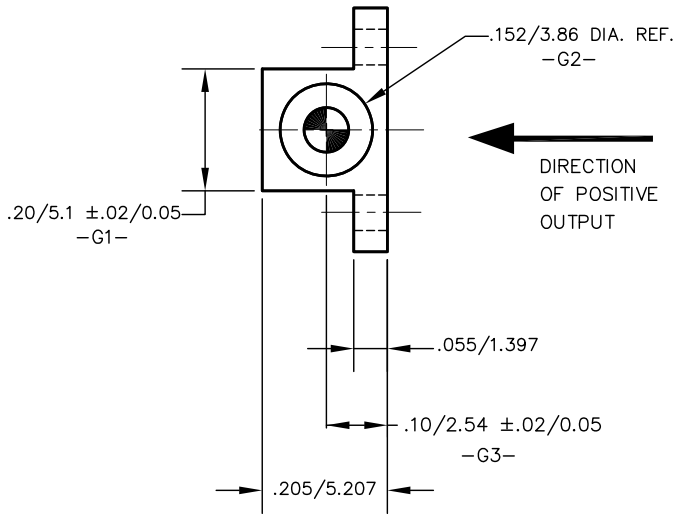
THIRD ANGLE PROJECTION

SIZE A2 | DRAWING NUMBER 474-3763-1 | REV 1

SCALE: 1.5 : 1 | SHEET 1 OF 1

REVISION RECORD			
ITEM NO.	BY	DATE	DESCRIPTION
–G1–	DMW	10/3/2017	DIMENSION .20/5.0 ++P.02/0.05 WAS .02/0.05
–G2–			DIMENSION .152/3.86 DIA. REF. WAS .152/3.86 DIA.
–G3–			DIMENSION .10/2.54 ±.02/0.05 WAS .10/2.54
–G4–			SENSITIVITY WAS .20 mV/g MIN.
–G5–			DAMPING RATIO WAS UNDAMPED (.005)
–G6–			NON–LINEARITY & HYSTERESIS WAS ±2% MAX.
–G7–			ZERO OFFSET WAS ±25 mV
–G8–			EXCITATION WAS 10V DC
–G9–			THERMAL SENSITIVITY SHIFT WAS THERMAL SENSITIVITY –5% Typ. AT 0° F TO 150° F
–G10–			ADDED THERMAL ZERO SHIFT
–G11–			TEMPERATURE EXPOSURE – OPERATING 0° F TO +150° F [–18° C TO +66° C]
–G12–			MASS ≤1.4 GRAM (WITHOUT CABLE) WAS WEIGHT 1 gram (WITHOUT CABLE)





SPECIFICATIONS

	RANGE	±2000 g
–G4–	SENSITIVITY	0.20 mV/g TYP. AT 100Hz, 10g PEAK AT 10Vdc
	MOUNTED RESONANCE FREQUENCY	22,000 Hz.
	SIGNAL OUTPUT MUST BE COMPATIBLE AND RECORDABLE IN A DATA CHANNEL AS DEFINED BY SAE J211	
–G5–	DAMPING RATIO	0.005
	TRANSVERSE SENSITIVITY	±1% MAX.
–G6–	NON–LINEARITY & HYSTERESIS	±2% MAX.OF READING, TO FULL RANGE
–G7–	ZERO OFFSET	50 mV MAX.
–G8–	EXCITATION	2 to 10 Vdc
–G9–	THERMAL SENSITIVITY SHIFT	MAX. –0.10%/°C TYP. FROM 0°F TO +150° F
–G10–	THERMAL ZERO SHIFT	FROM 0° F TO +150°(–18°C TO +66°C), REF. 75° F (24°C)
–G11–	TEMPERATURE EXPOSURE OPERATING	0° F TO +150° F [–18° C TO +66° C]
–G12–	MASS	≤1.4 GRAM (WITHOUT CABLES)
	HUMIDITY	SEALED

UNITS ARE in/mm

TOLERANCES ARE: *

DECIMALS ANGLES
.X ±0.1/2.5 + 0.5°
.XX ±0.01/.25
.XXX ±0.005/.127
* unless otherwise noted

MATERIAL:

SCALE NONE

APPROVALS	DATE
DRAWN GTE	3/5/98
CHECKED	
ENG J MoF H.P.	

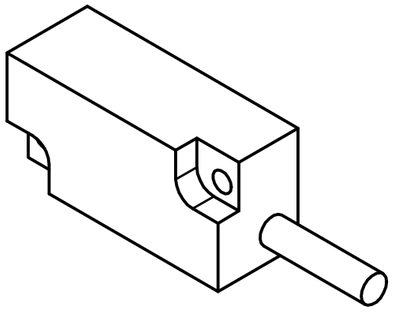
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

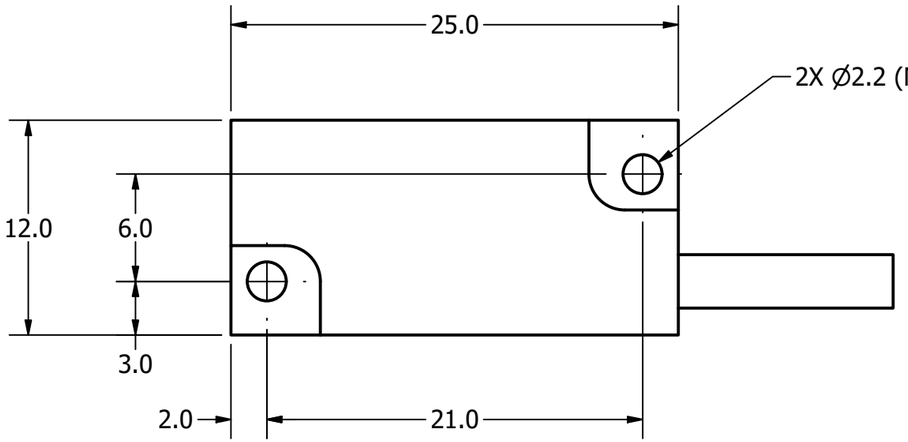
UNIAXIAL PIEZORESISTIVE ACCELEROMETER

HYBRID III DUMMY FAMILY

SIZE	DRAWING NUMBER	REV
A	SA572–S4	G

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	A	SPEC RELEASE	BK	JW	5/13/2013





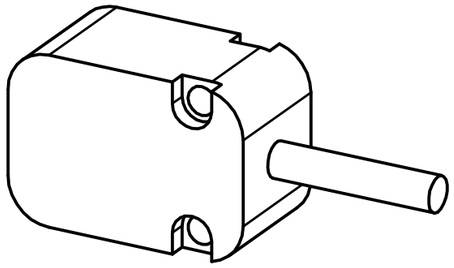


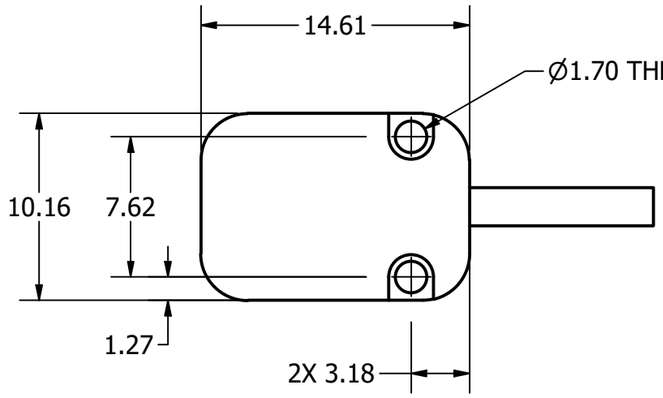
TILT SENSOR SPECIFICATIONS:

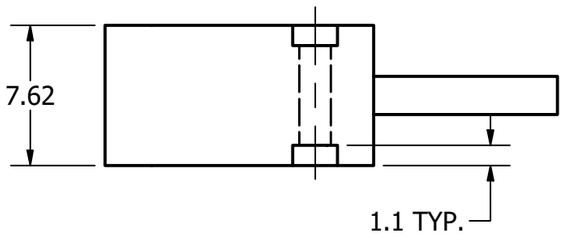
MASS:5g
RANGE: ±80°
RESOLUTION: 0.1°
ACCURACY: ±0.5°
SUPPLY VOLTAGE 5 V
POWER CONSUMPTION: 6 mA

DO NOT SCALE DRAWING THIRD ANGLE PROJECTION	TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS DECIMALS X ± 0.5, X.X ± 0.2, X.XX ± 0.1, X.XXX ± 0.01 ANGLES ± 0.5 FINISH √ REMOVE ALL BURRS & SHARP EDGES	NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
PROJECT NO.:		DESCRIPTION: TILT SENSOR, DUAL AXIS
MATERIAL:	DRAWN BY: B. Kimes — DATE: 11/29/2012	
HEAT TREAT:	CHECKED BY: — DATE:	SIZE: B — SHEET: 1 OF 1 — DRAWING NO.: SA572-S44 — REV: A
FINISH:		SCALE: 3.000

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	A	RELEASE TO PRODUCTION	AJB	AJB	7/7/2014







SPECIFICATIONS:

MASS: 3g
RANGE: ±18000 DEG/SEC
BANDWIDTH: 0-2000 Hz
NOISE: <0.35% OF FULL SCALE OVER RATED BANDWIDTH
EXCITATION: 4.9-14.0 VDC
CURRENT: 4mA NOMINAL
ZERO OUTPUT: ±200mV
FULL SCALE OUTPUT: ±2V NOMINAL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: abastian	7/7/2014
CHECKED:	
ENG: AJB	7/8/2014
APPROVED:	

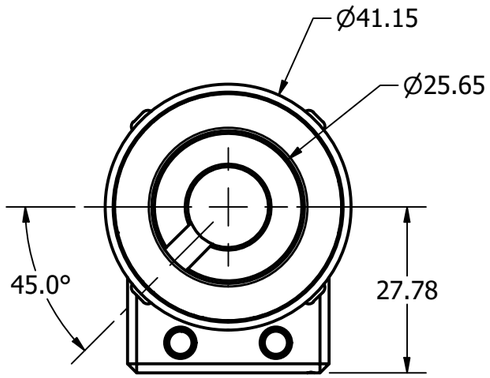
MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

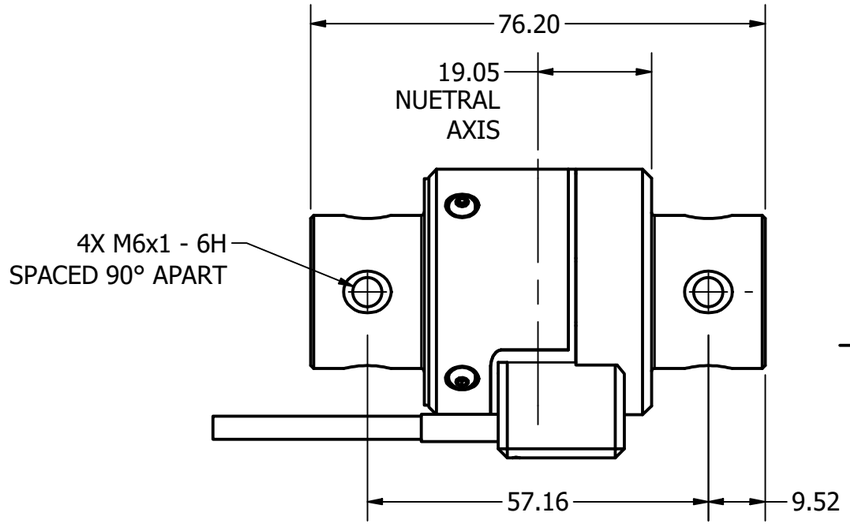
ANGULAR RATE SENSOR-18K

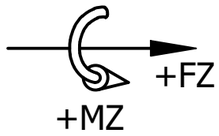
THIRD ANGLE PROJECTION

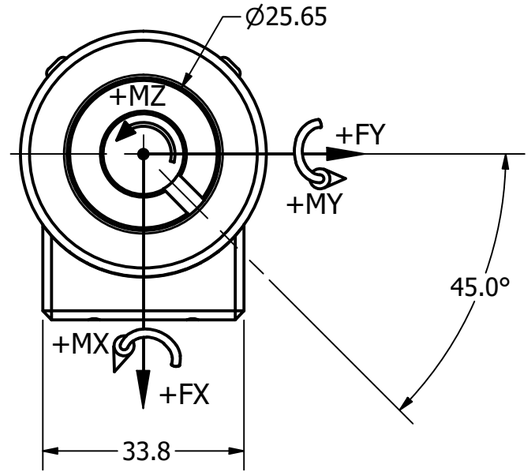
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SCALE: 3 : 1 | SHEET: 1 OF 1

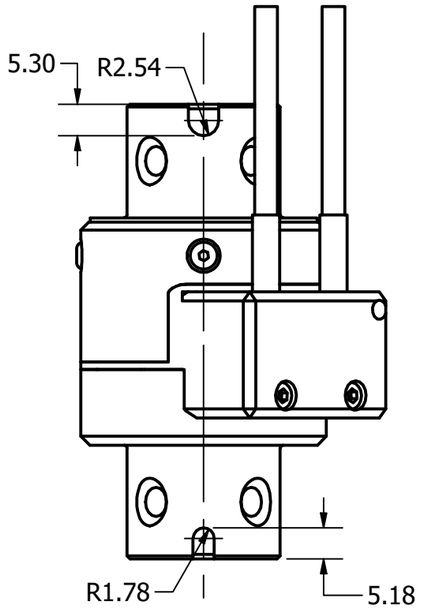
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	A	RELEASE FOR PRODUCTION	TM	KMS	10/19/2022

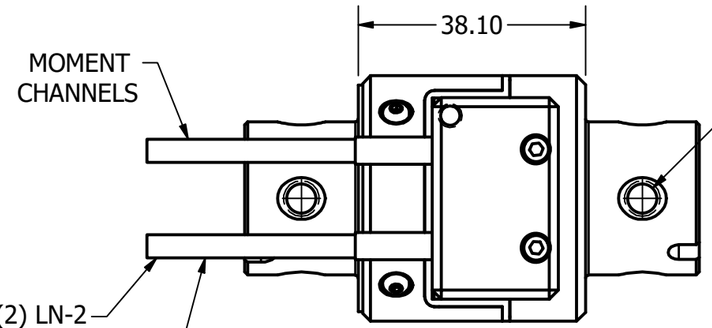


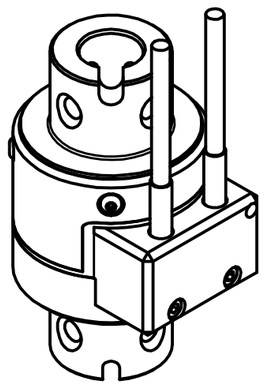












SPECIFICATIONS				
AXIS	CAPACITY (METRIC)	CAPACITY (ENGLISH)	OUTPUT	BRIDGE RESISTANCE
FX	9 kN	2,023 LBF	1.8 mV/V	350 OHMS
FY	9 kN	2,023 LBF	1.8 mV/V	350 OHMS
FZ	13.5 kN	3,035 LBF	1.1 mV/V	700 OHMS
MX	225 Nm	1991 IN-LBF	1.9 mV/V	350 OHMS
MY	225 Nm	1991 IN-LBF	1.9 mV/V	350 OHMS
MZ	170 Nm	1,505 IN-LBF	2.6 mV/V	700 OHMS

NON-LINEARITY	< 1% OF FULL SCALE
HYSTERESIS	< 1% OF FULL SCALE
CROSSTALK	< 5% OF FULL SCALE
EXCITATION	10 VDC NOMINAL, 15 VDC MAX.
POLARITY	CONFORMS TO S.A.E. J-211
MASS	385g [0.848 LBS] LESS CABLES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: L. BENFANT	10/15/2015
CHECKED	
ENG: L. BENFANT	10/15/2015
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

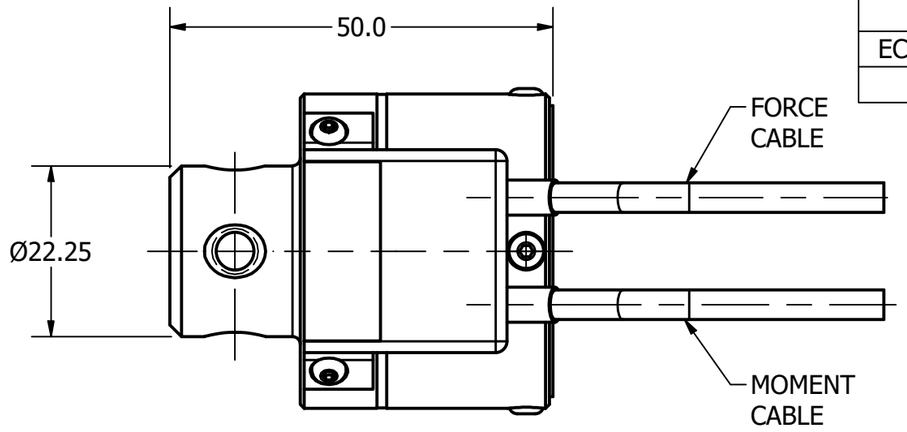
6X FEMUR LOAD CELL, THOR-05F
THOR-05F ATD

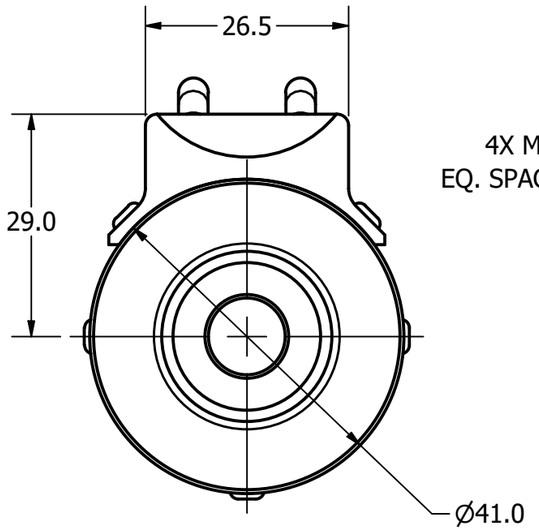
THIRD ANGLE PROJECTION

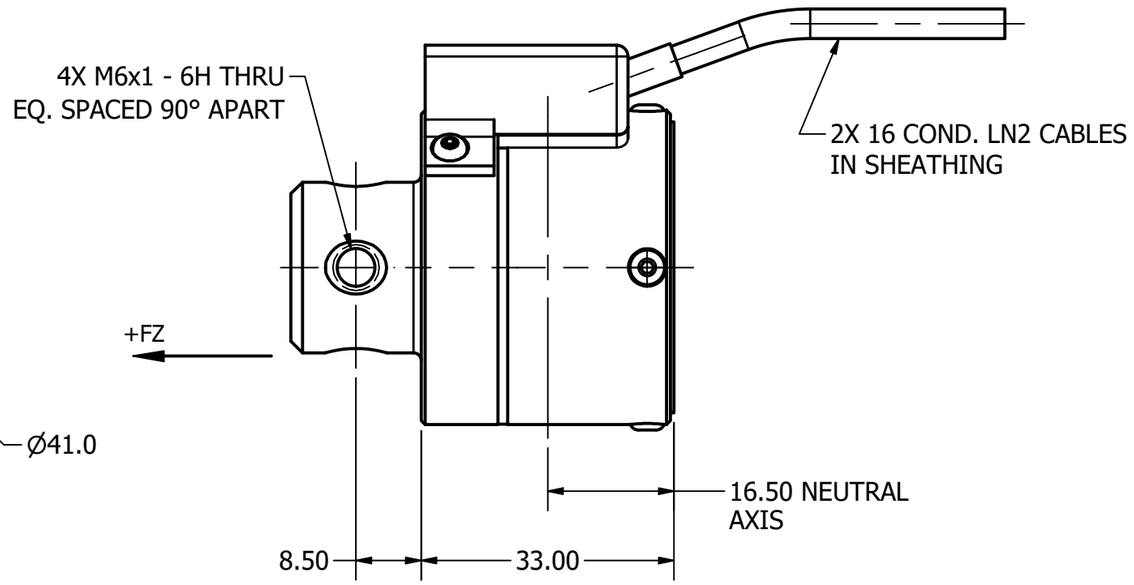
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B	SA572-S63	A

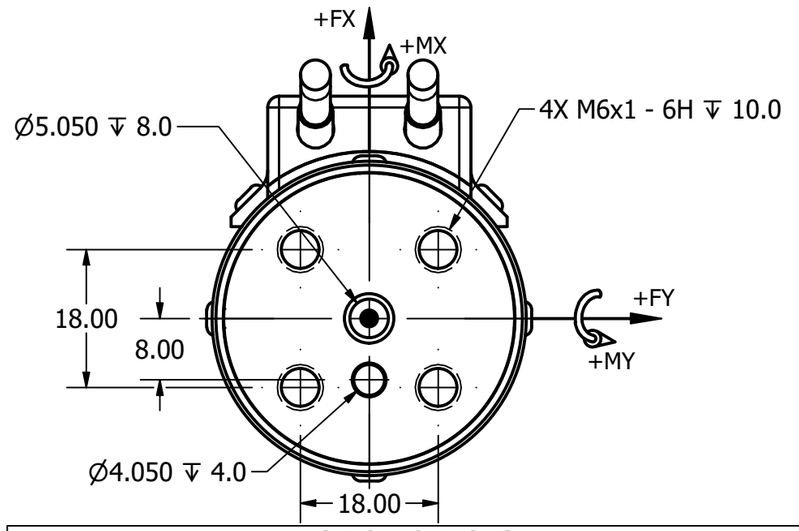
SCALE: 1 : 1 | SHEET: 1 OF 1

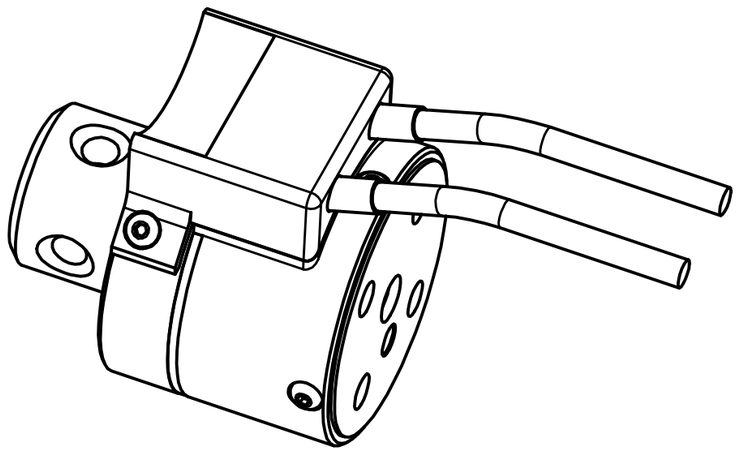
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	A	RELEASE FOR PRODUCTION	TM	KMS	10/27/2022











SPECIFICATIONS				
CH.	CAPACITY (METRIC)	CAPACITY (ENGLISH)	OUTPUT	BRIDGE RESISTANCE
FX	10.00 kN	2248.09 LBF	1.5 mV/V	350 OHMS
FY	10.00 kN	2248.09 LBF	1.5 mV/V	350 OHMS
FZ	12.00 kN	2697.71 LBF	1.0 mV/V	700 OHMS
MX	340.00 Nm	3009.25 IN-LBF	2.6 mV/V	350 OHMS
MY	340.00 Nm	3009.25 IN-LBF	2.6 mV/V	350 OHMS

NON-LINEARITY	< 1% OF FULL SCALE
HYSTERESIS	< 1% OF FULL SCALE
CROSSTALK	< 5% OF FULL SCALE
EXCITATION	10 VDC NOMINAL 15 VDC MAX.
POLARITY	CONFORMS TO SAE J-211
MASS	230 g (.51 LB) LESS CABLES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN CJT	4/5/2017
CHECKED	
ENG TORCH	4/5/2017
APPROVED	

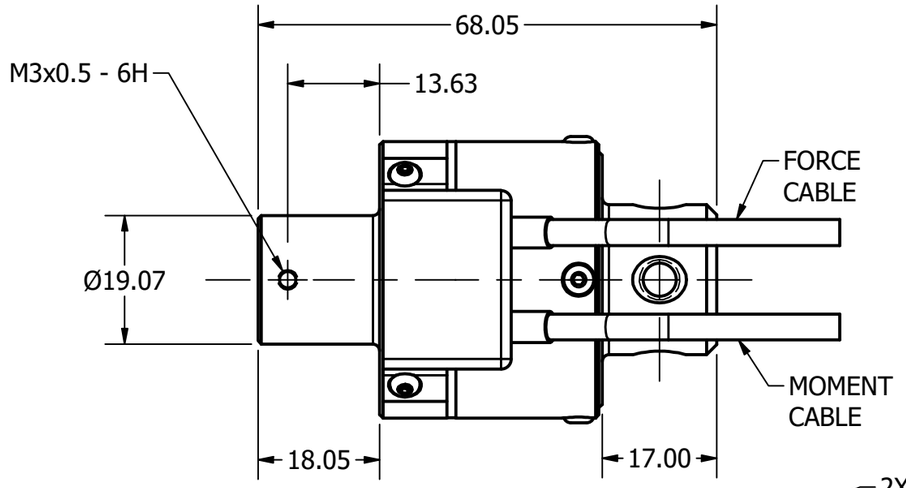
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HEAT TREAT: N/A
FINISH: N/A

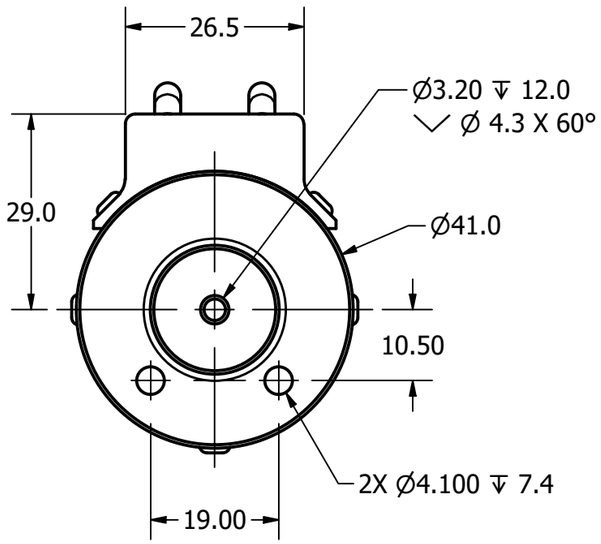
5X UPPER TIBIA LOAD CELL
THOR-05F ATD

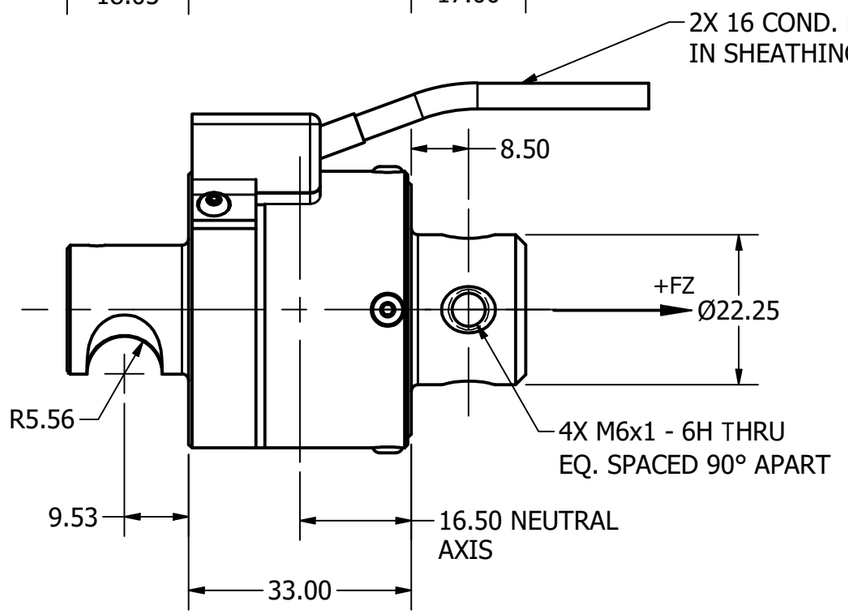
THIRD ANGLE PROJECTION

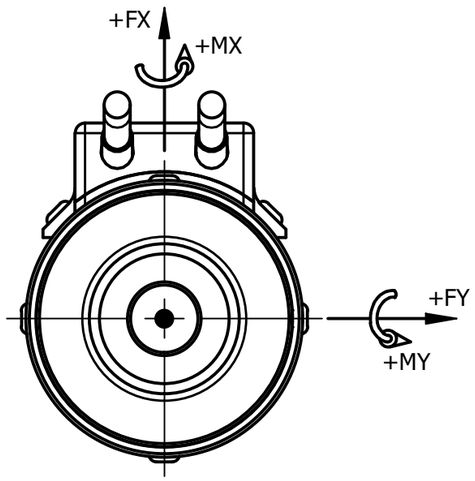
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SCALE: 1.25 : 1 | SHEET: 1 OF 1

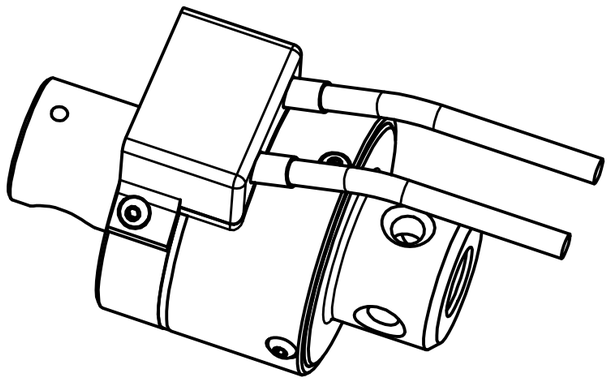
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	A	RELEASE FOR PRODUCTION	TM	KMS	10/27/2022











SPECIFICATIONS				
AXIS	CAPACITY (METRIC)	CAPACITY (ENGLISH)	OUTPUT	BRIDGE RESISTANCE
FX	10.00 kN	2248.09 LBF	1.5 mV/V	350 OHMS
FY	10.00 kN	2248.09 LBF	1.5 mV/V	350 OHMS
FZ	12.00 kN	2697.71 LBF	1.1 mV/V	700 OHMS
MX	340.00 Nm	3009.25 IN-LBF	2.6 mV/V	350 OHMS
MY	340.00 Nm	3009.25 IN-LBF	2.6 mV/V	350 OHMS

NON-LINEARITY	< 1% OF FULL SCALE
HYSTERESIS	< 1% OF FULL SCALE
CROSSTALK	< 5% OF FULL SCALE
EXCITATION	10 VDC NOMINAL 15 VDC MAX.
POLARITY	CONFORMS TO SAE J-211
MASS	300 g (.66 LB) LESS CABLES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN: CJT	4/19/2017
CHECKED:	
ENG: TORCH	4/19/2017
APPROVED:	

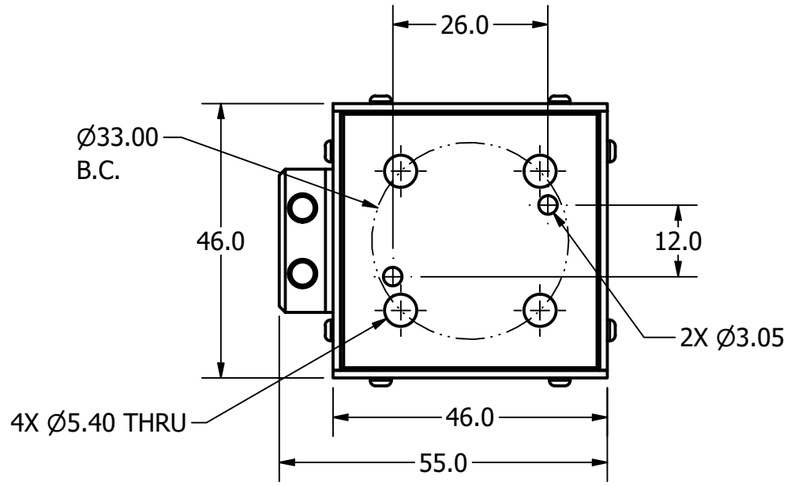
MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

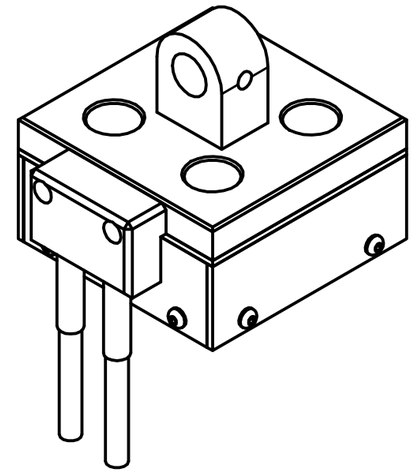
5X LOWER TIBIA LOAD CELL
THOR-05F ATD

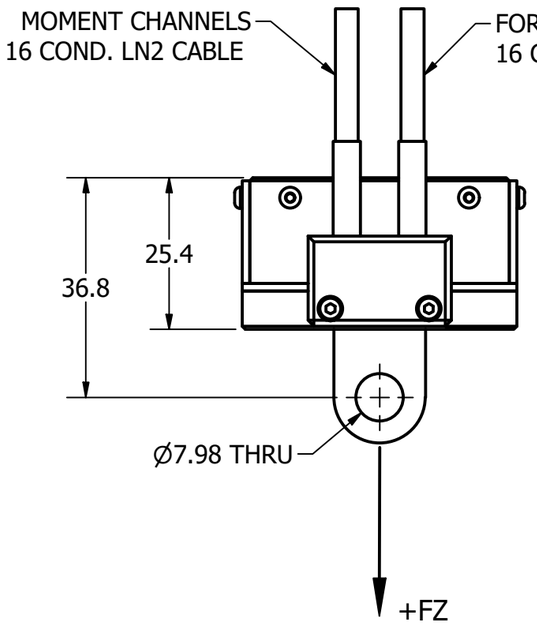
THIRD ANGLE PROJECTION

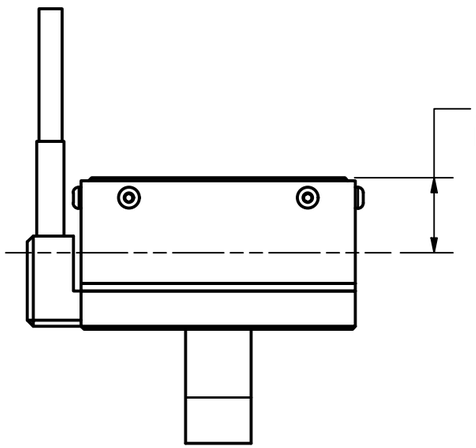
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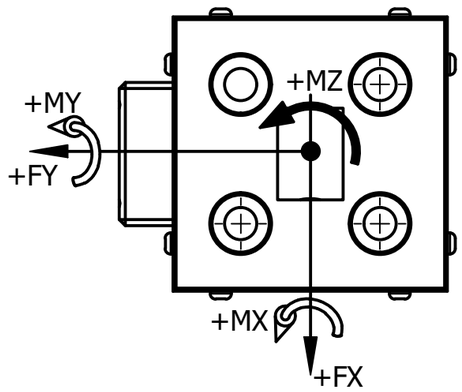
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	A	RELEASE FOR PRODUCTION	TM	KMS	10/31/2022











SPECIFICATIONS				
AXIS	CAPACITY (METRIC)	CAPACITY (ENGLISH)	OUTPUT	BRIDGE RESISTANCE
FX	6.7 kN	1506.2 LBF	2.4 mV/V	350 OHMS
FY	6.7 kN	1506.2 LBF	2.4 mV/V	350 OHMS
FZ	10.0 kN	2248.1 LBF	1.1 mV/V	700 OHMS
MX	210 Nm	1858.6 IN-LBF	1.9 mV/V	350 OHMS
MY	210 Nm	1858.6 IN-LBF	1.9 mV/V	350 OHMS
MZ	135 Nm	1194.8 IN-LBF	2.0 mV/V	700 OHMS

NON-LINEARITY	< 1% OF FULL SCALE
HYSTERESIS	< 1% OF FULL SCALE
CROSSTALK	< 5% OF FULL SCALE
EXCITATION	10 VDC NOMINAL, 15 VDC MAX.
POLARITY	CONFORMS TO SAE J-211
MASS	231g (0.5 LBS) LESS CABLES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN L. BENFANT	5/26/2016
CHECKED	
ENG L. BENFANT	5/26/2016
APPROVED	

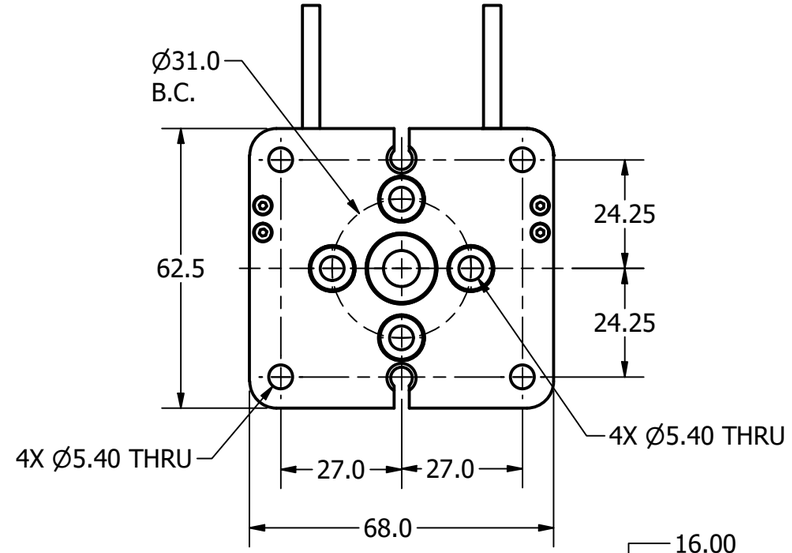
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

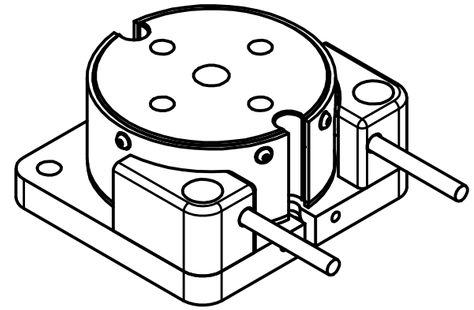
6X UPPER NECK LOAD CELL, NHTSA
THOR-05F ATD

THIRD ANGLE PROJECTION

SIZE: B | DRAWING NUMBER: SA572-S105 | REV: A
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	A	RELEASE FOR PRODUCTION	TM	KMS	10/14/2022





SPECIFICATIONS				
CH.	CAPACITY (METRIC)	CAPACITY (ENGLISH)	OUTPUT	BRIDGE RESISTANCE
Fx	10 kN	2248.1 LBF	2.3 mV/V	350 OHMS
Fy	10 kN	2248.1 LBF	2.3 mV/V	350 OHMS
Fz	12 kN	2697.7 LBF	1.1 mV/V	700 OHMS
Mx	300 Nm	2655.2 IN-LBF	1.4 mV/V	700 OHMS
My	300 Nm	2655.2 IN-LBF	1.4 mV/V	700 OHMS
Mz	200 Nm	1770.1 IN-LBF	1.5 mV/V	350 OHMS

NON-LINEARITY	< 1% OF FULL SCALE
HYSTERESIS	< 1% OF FULL SCALE
CROSSTALK	< 5% OF FULL SCALE
EXCITATION	10 VDC NOMINAL, 15 VDC MAX.
POLARITY	CONFORMS TO S.A.E. J-211
MASS	396g (0.87 LBS) LESS CABLES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN: L. BENFANT	5/9/2016
CHECKED:	
ENG: RAB	5/9/2016
APPROVED:	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

6X LOWER NECK, THOR-05F

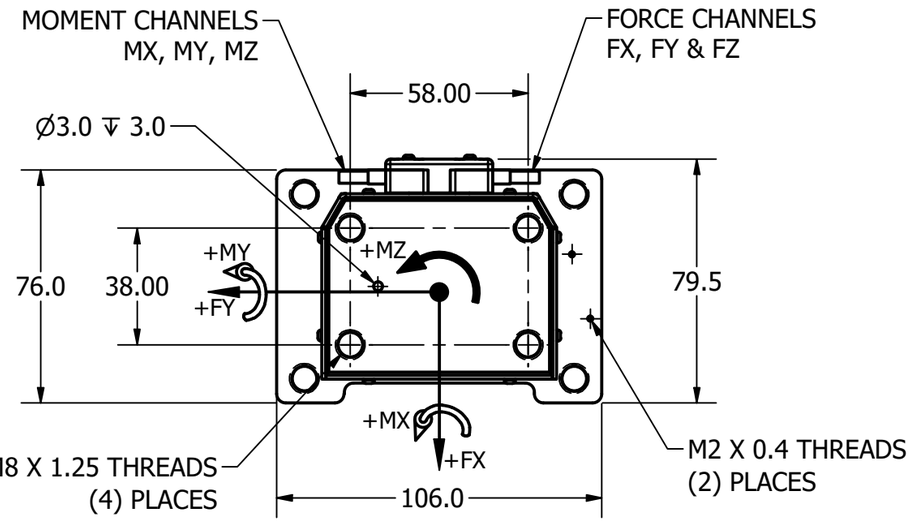
THOR-05F ATD

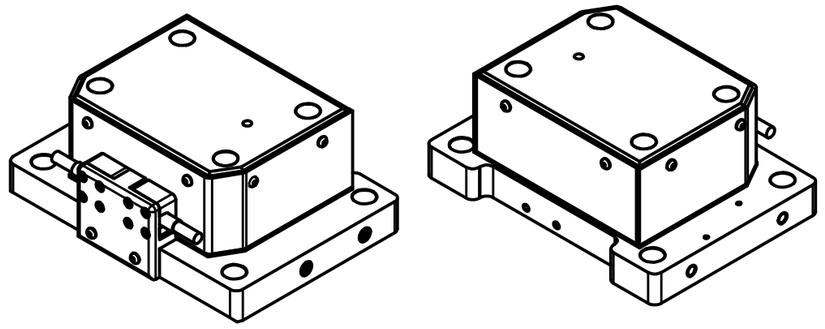
THIRD ANGLE PROJECTION

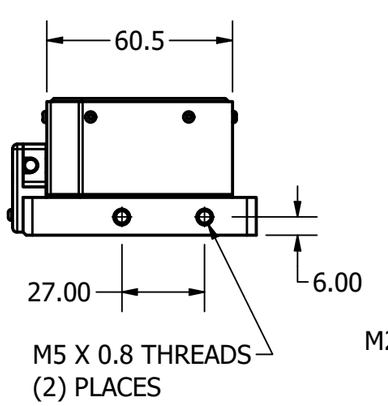
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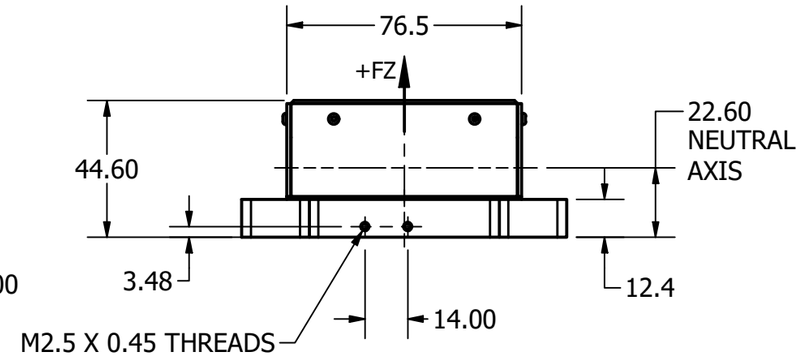
SCALE: 0.75 : 1 | SHEET: 1 OF 1

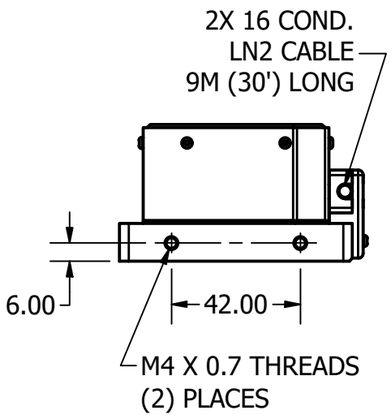
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	2	PROTOTYPE	TORCH	MCR	4/25/2023





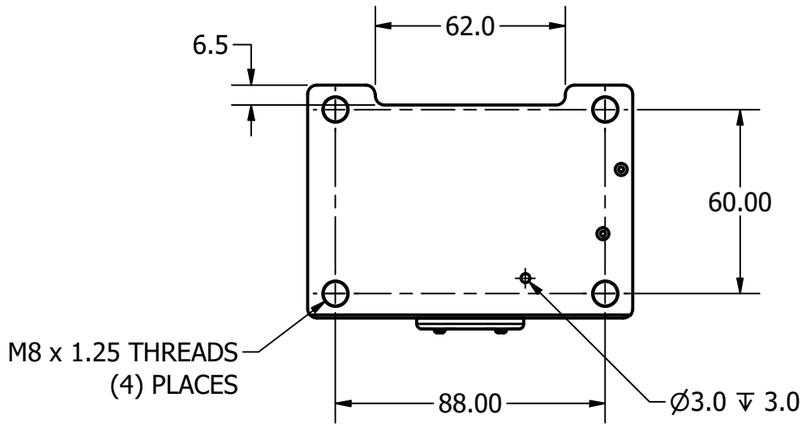






SPECIFICATIONS				
AXIS	CAPACITY (METRIC)	CAPACITY (ENGLISH)	OUTPUT	BRIDGE RESISTANCE
FX	13 kN	2922.5 LBF	2.0 mV/V	350 OHMS
FY	13 kN	2922.5 LBF	2.0 mV/V	350 OHMS
FZ	13 kN	2922.5 LBF	1.1 mV/V	700 OHMS
MX	400 Nm	3540.3 IN-LBF	1.5 mV/V	700 OHMS
MY	400 Nm	3540.3 IN-LBF	1.5 mV/V	700 OHMS
MZ	280 Nm	2478.2 IN-LBF	1.4 mV/V	350 OHMS

NON-LINEARITY	< 1% OF FULL SCALE
HYSTERESIS	< 1% OF FULL SCALE
CROSSTALK	< 5% OF FULL SCALE
EXCITATION	10 VDC NOMINAL, 15 VDC MAX.
POLARITY	CONFORMS TO SAE J-211
MASS	470 g (1.0 LBS) LESS CABLES



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN L. BENFANT	8/4/2022
CHECKED	
ENG JSD	8/4/2022
APPROVED	

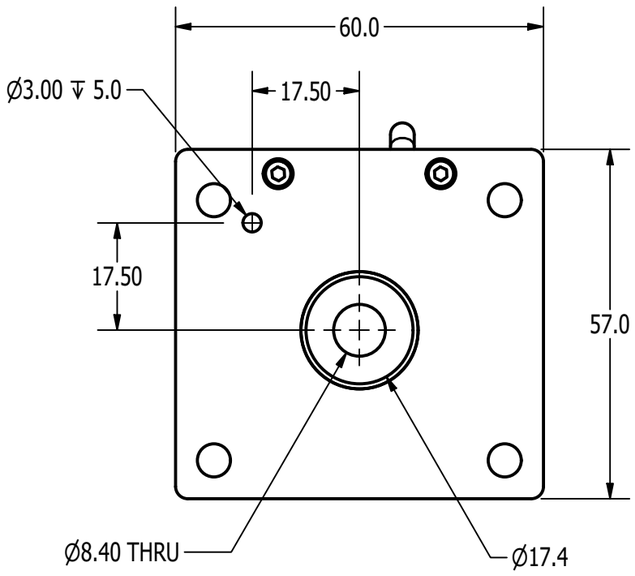
MATERIAL N/A
HEAT TREAT N/A
FINISH N/A

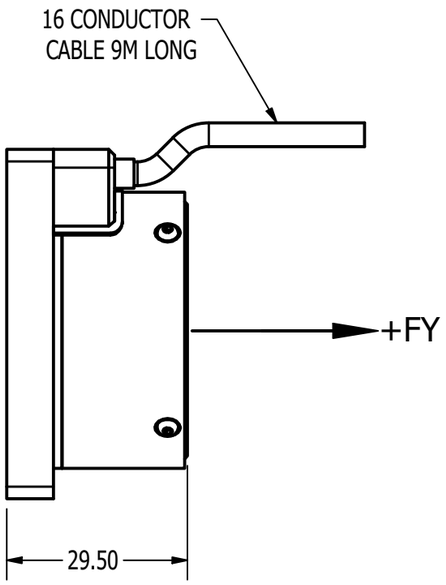
6X THORACIC SPINE LOAD CELL
THOR-05F ATD

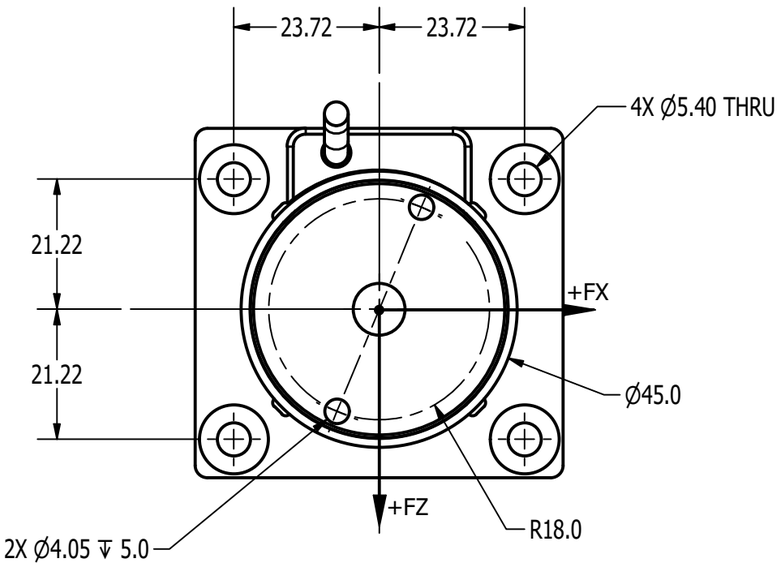
THIRD ANGLE PROJECTION

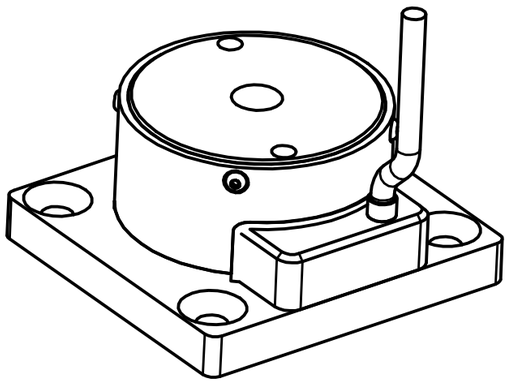
SIZE A3 | DRAWING NUMBER SA572-S107 | REV 2
SCALE: .5 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	A	RELEASE FOR PRODUCTION	TM	KMS	10/17/2022









SPECIFICATIONS				
AXIS	CAPACITY (METRIC)	CAPACITY (ENGLISH)	OUTPUT	BRIDGE RESISTANCE
FX	13.00 kN	2922.5 LBF	2.8 mV/V	350 OHMS
FY	10.00 kN	2248.1 LBF	0.9 mV/V	700 OHMS
FZ	9.00 kN	2023.3 LBF	1.9 mV/V	350 OHMS

NON-LINEARITY	< 1% OF FULL SCALE
HYSTERESIS	< 1% OF FULL SCALE
CROSSTALK	< 5% OF FULL SCALE
EXCITATION	10 VDC NOMINAL 15 VDC MAX.
POLARITY	CONFORMS TO SAE J-211
MASS	299g (.66 LB) LESS CABLE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

	APPROVALS	DATE
DRAWN	L. BENFANT	4/1/2016
CHECKED		
ENG	L. BENFANT	4/1/2016
APPROVED		

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

3X ACETABULUM RIGHT

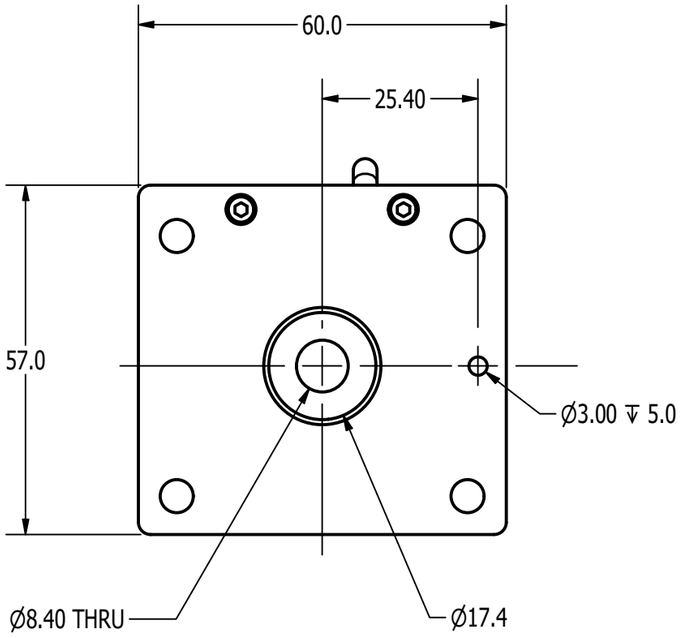
THOR-05F

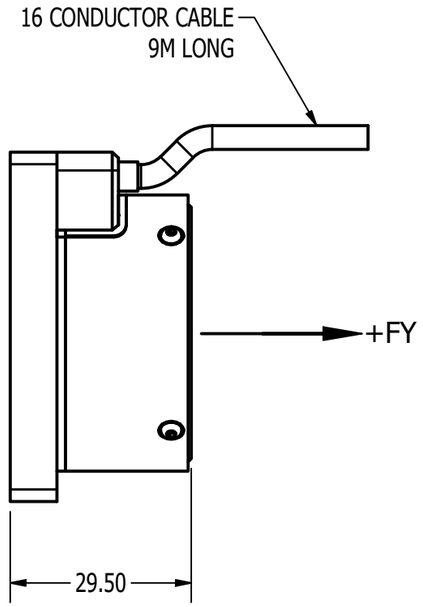
THIRD ANGLE PROJECTION

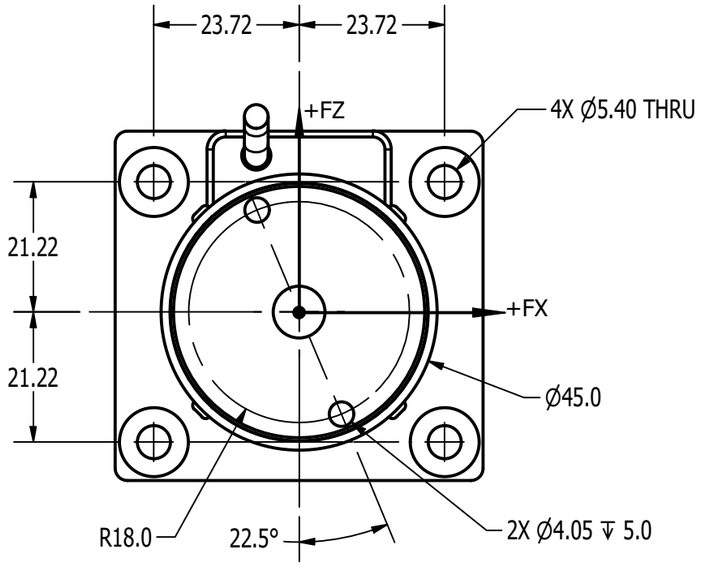
SIZE: A3 | DRAWING NUMBER: SA572-S108 | REV: A

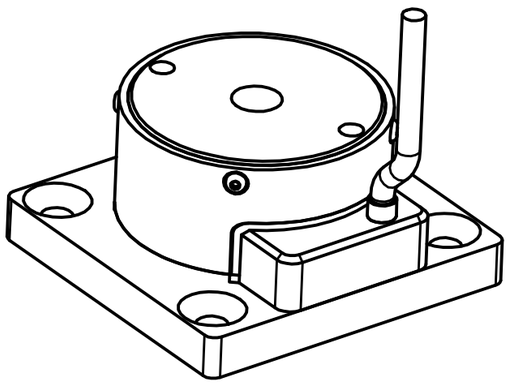
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	A	RELEASE FOR PRODUCTION	TM	VP	10/17/2022









SPECIFICATIONS				
AXIS	CAPACITY (METRIC)	CAPACITY (ENGLISH)	OUTPUT	BRIDGE RESISTANCE
FX	13.00 kN	2922.5 LBF	2.8 mV/V	350 OHMS
FY	10.00 kN	2248.1 LBF	0.9 mV/V	700 OHMS
FZ	9.00 kN	2023.3 LBF	1.9 mV/V	350 OHMS
NON-LINEARITY	< 1% OF FULL SCALE			
HYSTERESIS	< 1% OF FULL SCALE			
CROSSTALK	< 5% OF FULL SCALE			
EXCITATION	10 VDC NOMINAL 15 VDC MAX.			
POLARITY	CONFORMS TO SAE J-211			
MASS	299g (.66 LB) LESS CABLE			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ±.5
ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN L. BENFANT	2/10/2016
CHECKED	
ENG L. BENFANT	2/10/2016
APPROVED	

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

3X ACETABULUM LEFT

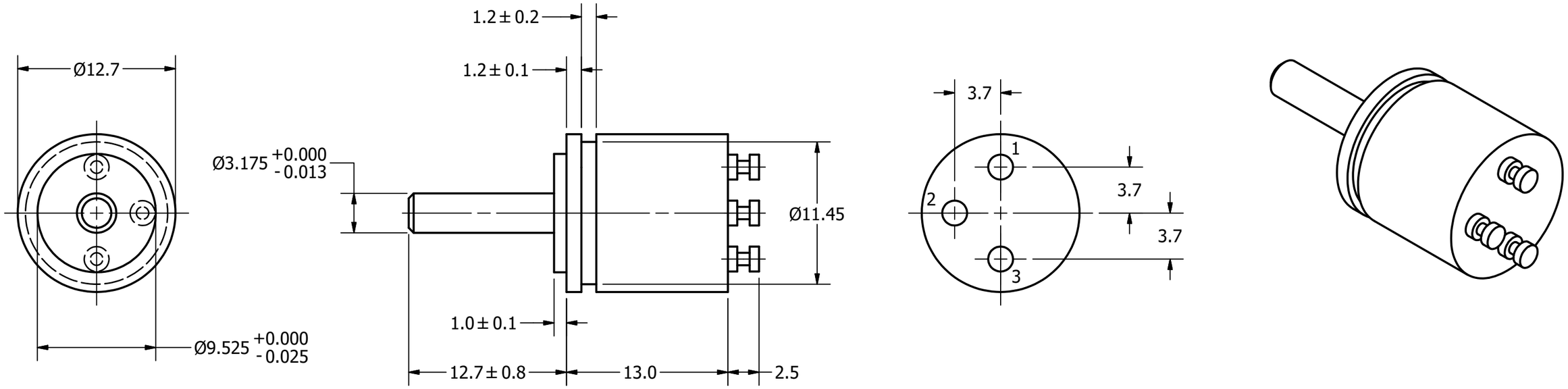
THOR-05F

THIRD ANGLE PROJECTION

SIZE: A3 | DRAWING NUMBER: SA572-S109 | REV: A

SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY				
ECO	REV	DESCRIPTION	DATE	BY
	A	INDEPENDENT LINEARITY (TEA) WAS ±0.25%	9/17/2015	DW



SPECIFICATIONS

SHAFT GUIDING:	BALL BEARINGS
A INDEPENDENT LINEARITY (TEA):	±0.5%
OHMIC VALUES:	1000 OHMS
ACTUAL ELECTRICAL ANGLE 330°:	±5%
MAXIMUM POWER RATING @ 70°C:	0.2 WATTS
WEIGHT:	5±2g (LESS CABLES)
OPERATING TEMPERATURE RANGE:	-55°C TO +125°C
MAXIMUM SPEED ROTATION:	600

PIN DESIGNATION

1 = -EXCITATION
2 = +SIGNAL
3 = +EXCITATION

REFERENCE: VISHAY SFERNICE #ECO-50-ESC-102

UNLESS OTHERWISE SPECIFIED:
ALL MACHINED SURFACES 1.60 OR BETTER.

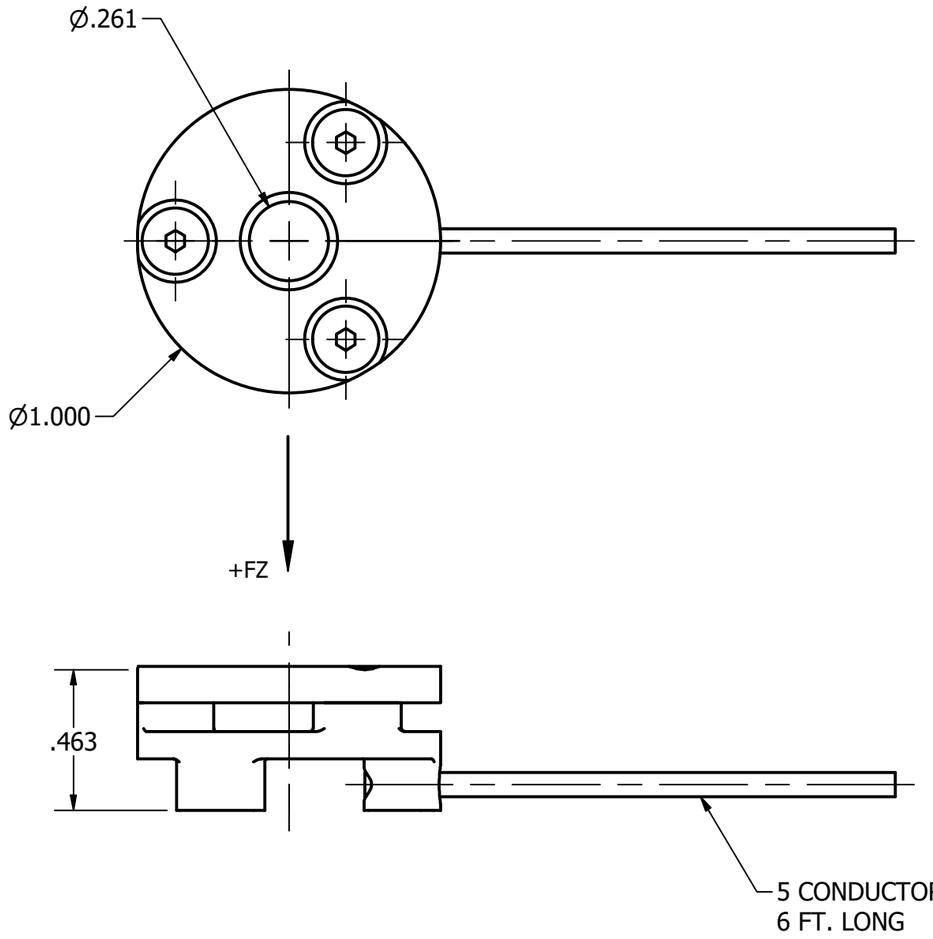
PARTS LIST

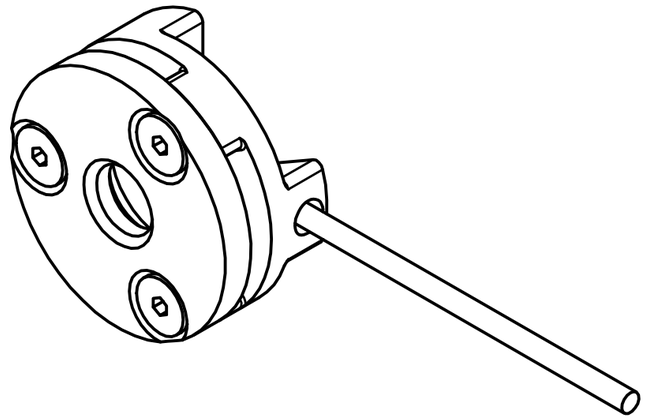
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES
ANGLES ±.5°
DECIMALS
X ±1 mm
X.X ±0.1 mm
* DO NOT SCALE DRAWING *
THIRD ANGLE PROJECTION

ENGINEERED: C Torchala	DATE: 4/21/2010	MATERIAL:	DEPARTMENT OF TRANSPORTATION NHTSA
DRAWN: C Torchala	DATE: 6/15/2010	FINISH:	
CHECKED: M Salloum	DATE: 8/10/2010	HEAT TREAT:	
DEBUR AND BREAK ALL SHARP EDGES		QTY./ASSEMBLY: 2	DRAWING TITLE: ROTARY POTENTIOMETER
SCALE: 3 : 1	SIZE: A3	REVISION: A	QTY./DUMMY: 4
DRAWING NUMBER: SA572-S114			Page: 1 of 1

SA572-S114.ipt

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	C	RELEASE FOR PRODUCTION	SKR	TORCH	12/14/2018





SPECIFICATIONS				
AXIS	CAPACITY (ENGLISH)	CAPACITY (METRIC)	OUTPUT	BRIDGE RESISTANCE
FZ	1000 LBF	4.45 kN	1.2 mV/V	360 OHMS
NON-LINEARITY	< 1% OF FULL SCALE			
HYSTERESIS	< 1% OF FULL SCALE			
EXCITATION	10 VDC NOMINAL, 15 VDC MAX.			
POLARITY	CONFORMS TO SAE J-211			
MASS	23g (.05 LBS) LESS CABLE			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

DECIMAL: .X ±.1, .XX ±.01, .XXX ±.005, .XXXX ±.0005
MACHINED 63
ANGLES ±.5°
FRACTIONS ±1/64

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN abastian	5/14/2015
CHECKED	
ENG lbenfant	5/22/2015
APPROVED	

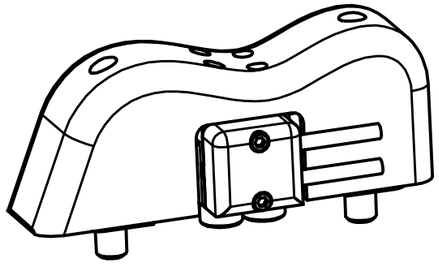
MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

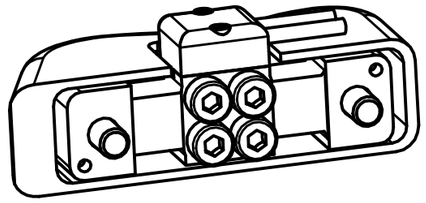
1X ACHILLIES LOAD CELL
THOR (METRIC) ATD

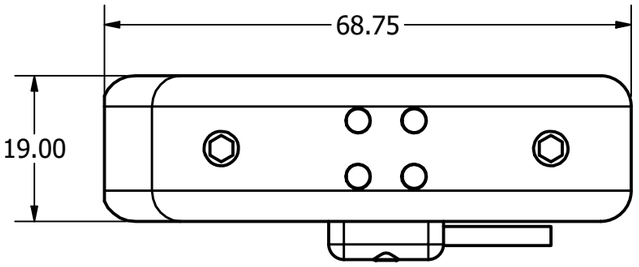
THIRD ANGLE PROJECTION

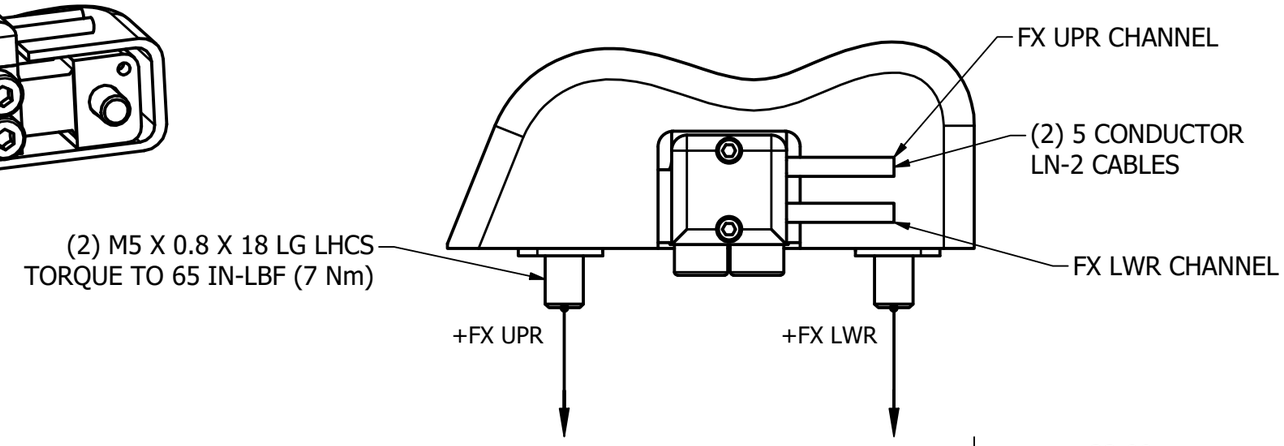
SIZE: B
DRAWING NUMBER: SA572-S126
REV: C
SCALE: 2 : 1
SHEET: 1 OF 1

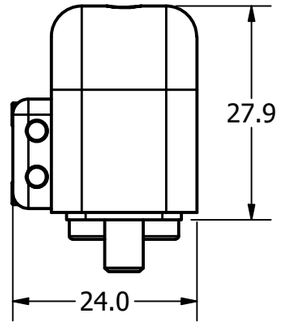
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	UPDATED TO A NEW LOAD CELL DESIGN	LBENFANT	JSD	4/19/2022











SPECIFICATIONS				
AXIS	CAPACITY (METRIC)	CAPACITY (ENGLISH)	OUTPUT	BRIDGE RESISTANCE
FX UPR	6.50 kN	1461.33 LBF	2.6 mV/V	175 OHM
FX LWR	6.50 kN	1461.33 LBF	2.6 mV/V	175 OHM

NON-LINEARITY	< 1% OF FULL SCALE
HYSTERESIS	< 1 % OF FULL SCALE
CROSSTALK	SEE NOTE 1
EXCITATION	10 VDC NOMINAL, 15 VDC MAXIMUM
POLARITY	CONFORMS TO SAE J-211
MASS	175 g (.385 LBS) LESS CABLES

THE IH-13060J LEFT ASIS LOAD CELL IS DESIGNED TO PROVIDE A MEASUREMENT OF VERTICAL LOCATION, AND A MAGNITUDE LAP BELT FX FORCE APPLIED ON THE POSTERIOR OF THE ILIAC WING. THE SUM OF THE FX UPR AND FX LWR FORCES IS EQUAL TO THE TOTAL FX FORCE. THE DIFFERENCE BETWEEN THE FORCES OF THE TWO CHANNELS DIVIDED BY THEIR SUM, IS PROPORTIONAL TO THE LOCATION (D) OF THE LOAD RELATIVE TO THE ASIS HORIZONTAL CENTERLINE AND IS PROVIDED BY THE FOLLOWING EQUATIONS. POSITIVE D INDICATES LAP BELT MOVED UPWARD ON THE ILIAC WING.

D (MM) ={(FXUPR - FXLWR) / (FXUPR + FXLWR)} *15.471

NOTES:
1. CROSSTALK SHOWN ON CALIBRATION CERTIFICATES MAY BE APPROXIMATELY100% BASED UPON CALIBRATION METHOD

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN L. BENFANT	4/19/2022
CHECKED	
ENG JSD	4/19/2022
APPROVED	

MATERIAL: NONE
HEAT TREAT: NONE
FINISH: NONE

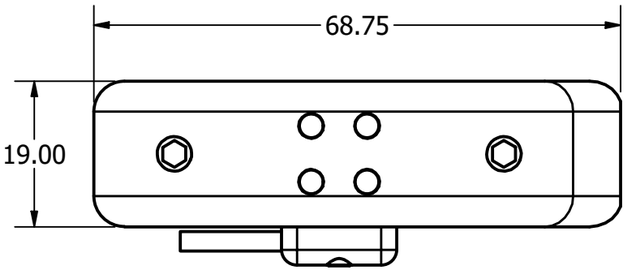
2X ASIS LOAD CELL, LEFT
THOR-05F ATD

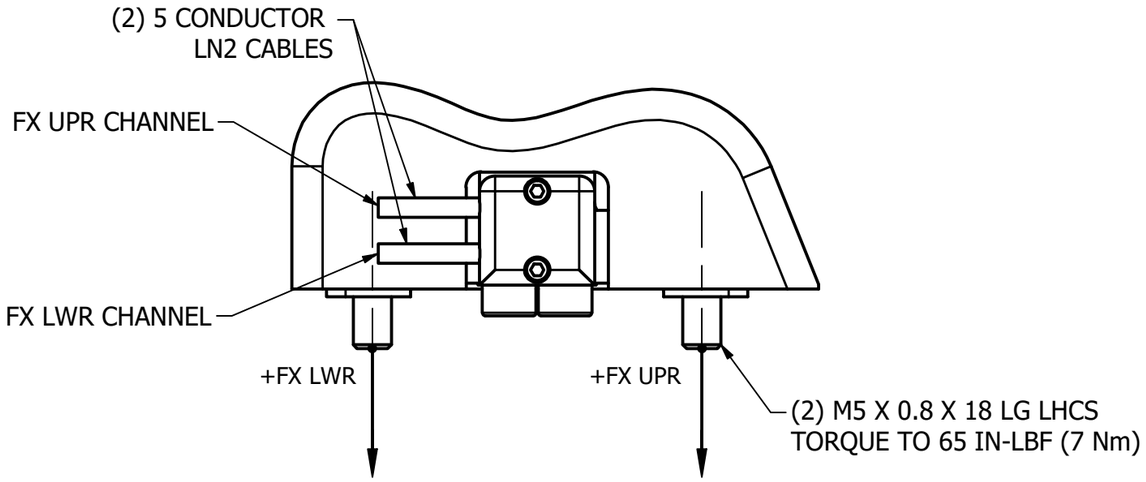
THIRD ANGLE PROJECTION

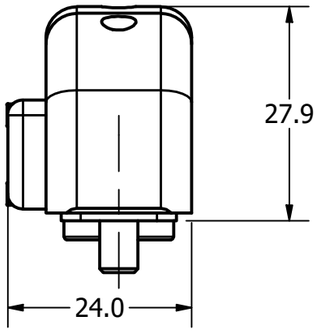
SIZE	DRAWING NUMBER	REV
A3	SA572-S159	3

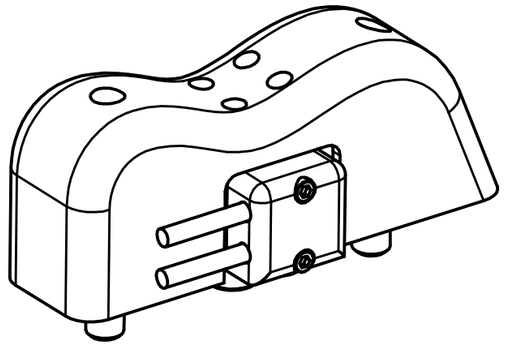
SCALE: 1.25 : 1
SHEET 1 OF 1

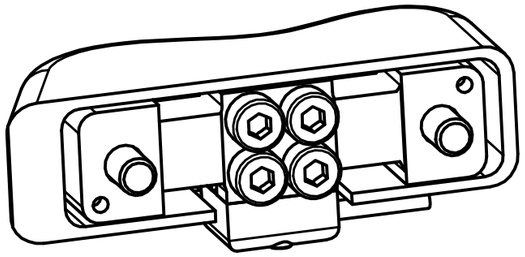
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	3	UPDATED TO A NEW LOAD CELL DESIGN	LBENFANT	JSD	4/21/2022

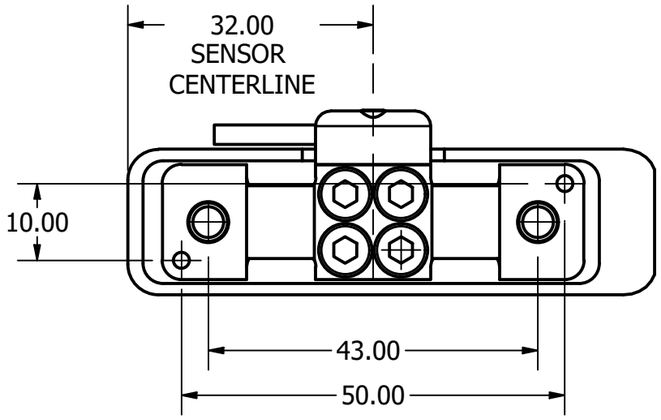












THE IH-13070J LEFT ASIS LOAD CELL IS DESIGNED TO PROVIDE A MEASUREMENT OF VERTICAL LOCATION, AND A MAGNITUDE LAP BELT FX FORCE APPLIED ON THE POSTERIOR OF THE ILIAC WING. THE SUM OF THE FX UPR AND FX LWR FORCES IS EQUAL TO THE TOTAL FX FORCE. THE DIFFERENCE BETWEEN THE FORCES OF THE TWO CHANNELS DIVIDED BY THEIR SUM, IS PROPORTIONAL TO THE LOCATION (D) OF THE LOAD RELATIVE TO THE ASIS HORIZONTAL CENTERLINE AND IS PROVIDED BY THE FOLLOWING EQUATIONS:

D (MM)={(FXUPR - FXLWR) / (FXUPR + FXLWR)} *15.471

NOTES:
1. CROSSTALK SHOWN ON CALIBRATION CERTIFICATES MAY BE APPROXIMATELY100% BASED UPON CALIBRATION METHOD

SPECIFICATIONS				
AXIS	CAPACITY (METRIC)	CAPACITY (ENGLISH)	OUTPUT	BRIDGE RESISTANCE
FX UPR	6.50 kN	1461.33 LBF	2.6 mV/V	175 OHM
FX LWR	6.50 kN	1461.33 LBF	2.6 mV/V	175 OHM
NON-LINEARITY	<1.0% OF FULL SCALE			
HYSTERESIS	<1.0% OF FULL SCALE			
EXCITATION	10V DC NOMINAL, 15V DC MAXIMUM			
CROSSTALK	SEE NOTE 1			
POLARITY	CONFORMS TO SAE J-211			
MASS	175 g (.385 LBS) LESS CABLES			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN L. BENFANT	4/21/2022
CHECKED	
ENG JSD	4/21/2022
APPROVED	

MATERIAL N/A
HEAT TREAT N/A
FINISH N/A

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

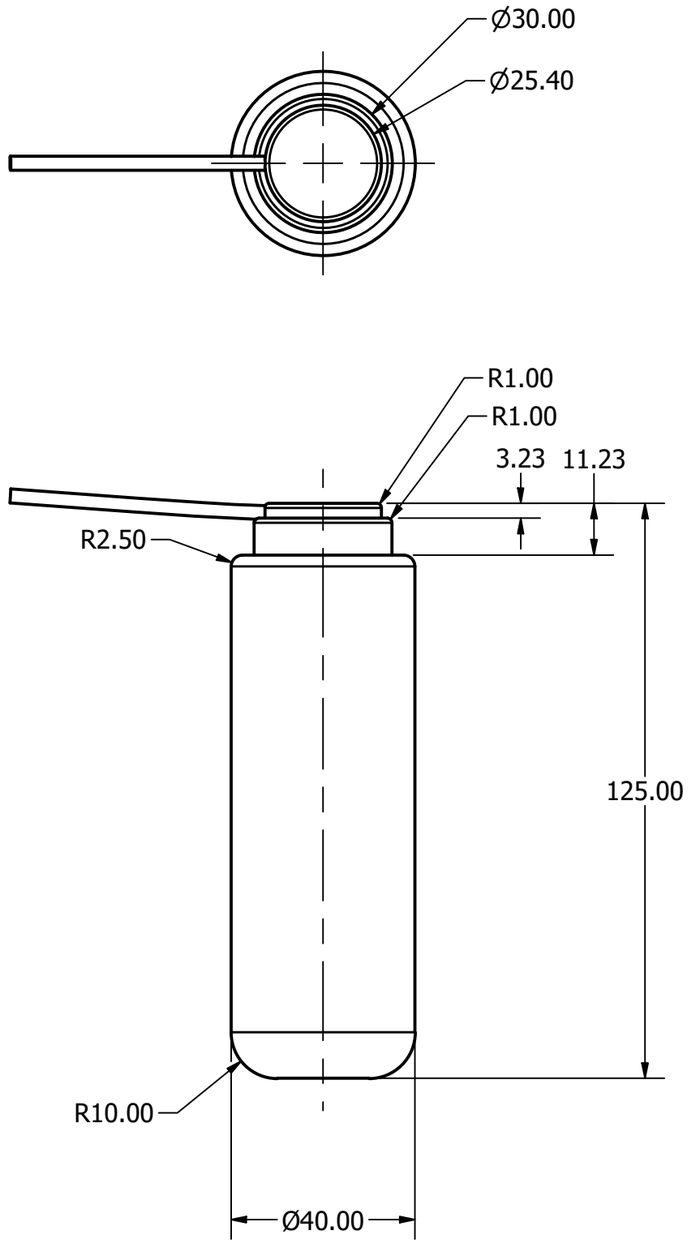
LOAD CELL, ASIS, RIGHT
THOR-05F ATD

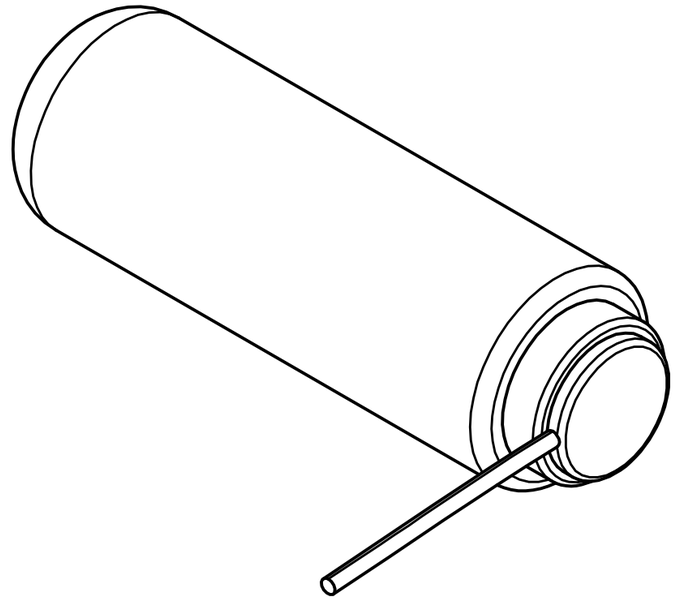
THIRD ANGLE PROJECTION

SIZE A3 | DRAWING NUMBER SA572-S160 | REV 3
SCALE: 1.25 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	AKM	AKM	7/5/2018

This design includes features covered by U.S. Patent No. 9,243,966 (abdominal pressure sensor for anthropomorphic dummy), which is owned by Institut Francais Des Sciences Et Technologies Des Transports (IFSTTAR). No license is being granted to this patent and third parties are not authorized to make, use, sell, import, or export any products (physical or virtual) that practice the invention covered by this patent, or other patents owned by IFSTTAR. However, if a third party is interested in obtaining rights to the design, they are to contact IFSTTAR to discuss license terms.





SPECIFICATIONS:

MASS: 160 ± 10 g
RANGE: 10 bar
NOISE: 0.35% OF FULL SCALE
EXCITATION: 2.5 - 10 VDC
OUTPUT SENSITIVITY: 14 mV/V/bar

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APTS SENSOR - THOR-05F

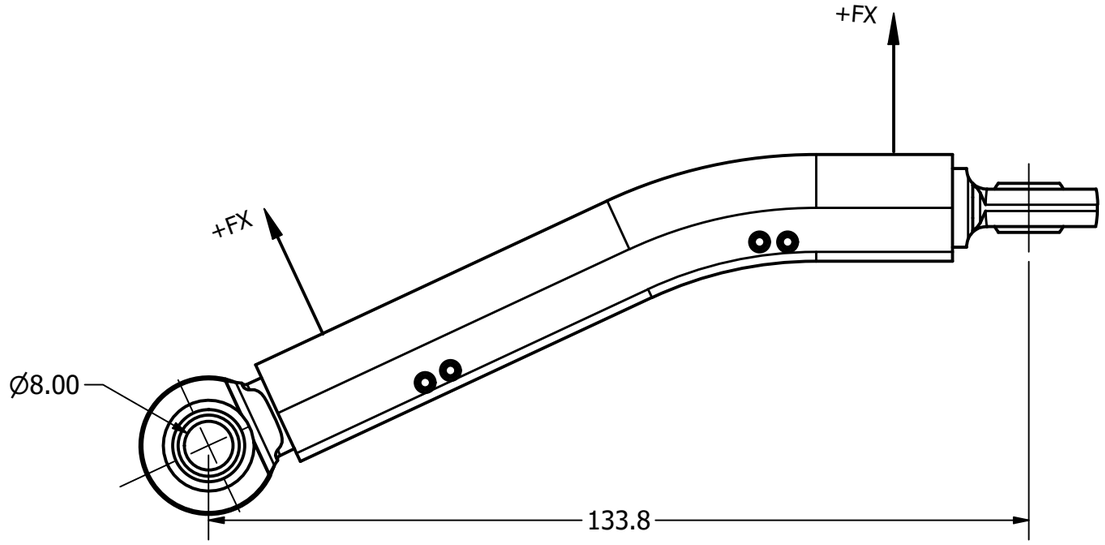
	APPROVALS	DATE
DRAWN	AKM	7/5/2018
CHECKED		
ENG	AKM	7/5/2018
APPROVED		

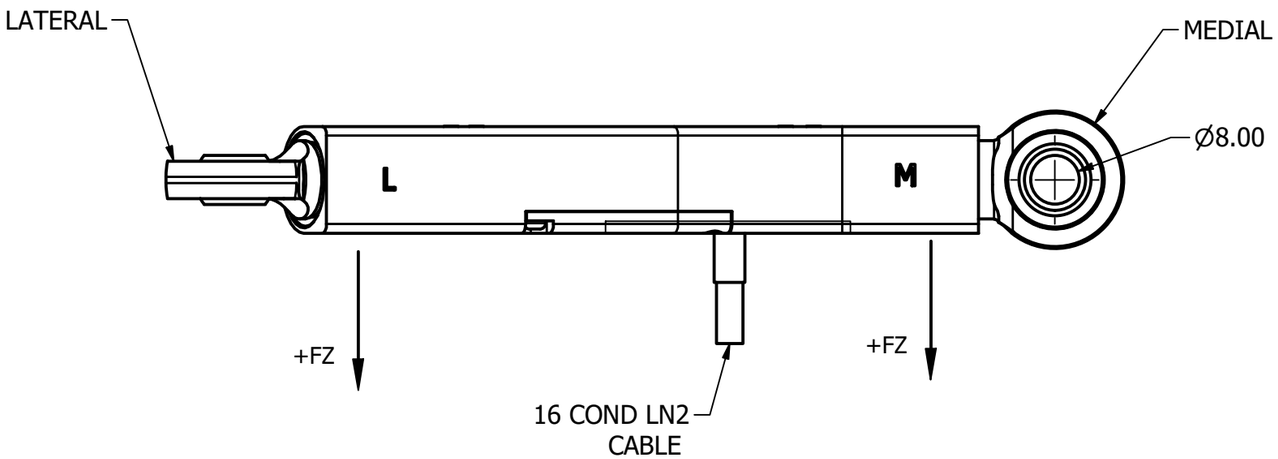
MATERIAL: PRESSURE SENSOR
HEAT TREAT: N/A
FINISH: N/A

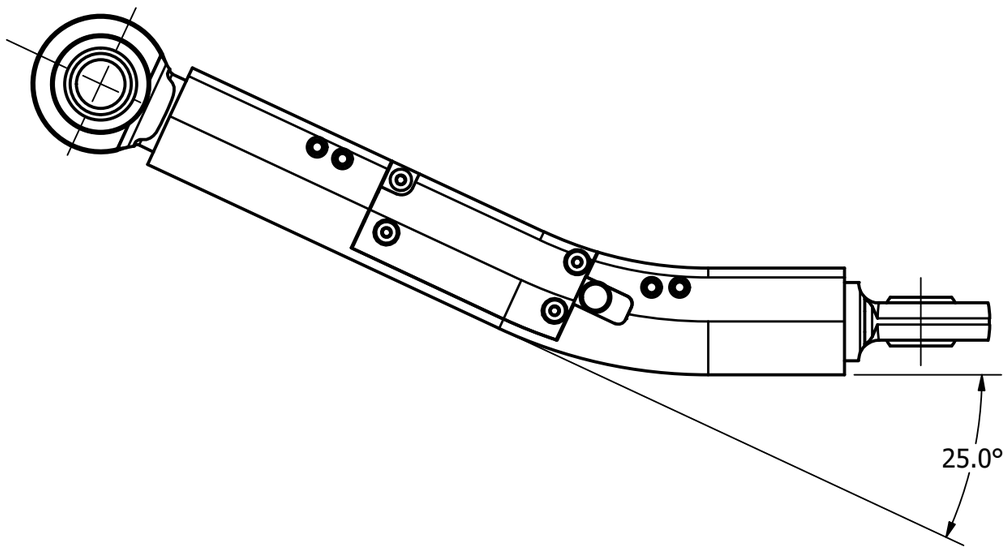
THIRD ANGLE PROJECTION

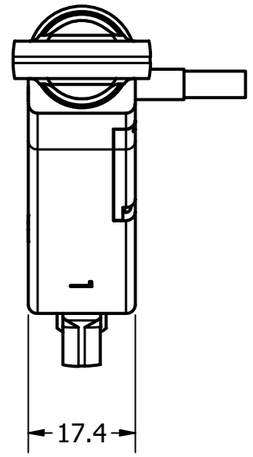
SIZE: A3 | DRAWING NUMBER: SA572-S162 | REV: 1
SCALE:
SHEET: 1 OF 1

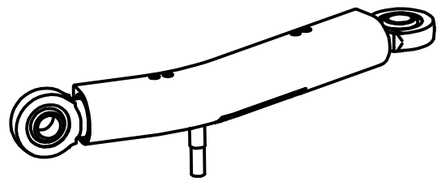
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	A	RELEASE FOR PRODUCTION	TM	KMS	10/27/2022











SCALE 0.5 : 1

SPECIFICATIONS (MEDIAL)				
CH.	CAPACITY (METRIC)	CAPACITY (ENGLISH)	OUTPUT	BRIDGE RESISTANCE
FX	2.00 kN	450 LBS.	1.0 mV/V	350 OHMS
FZ	2.00 kN	450 LBS.	1.0 mV/V	350 OHMS
SPECIFICATIONS (LATERAL)				
CH.	CAPACITY (METRIC)	CAPACITY (ENGLISH)	OUTPUT	BRIDGE RESISTANCE
FX	2.00 kN	450 LBS.	1.0 mV/V	350 OHMS
FZ	2.00 kN	450 LBS.	1.0 mV/V	350 OHMS

NON-LINEARITY	< 1% OF FULL SCALE
HYSTERESIS	< 1% OF FULL SCALE
CROSSTALK	< 5% OF FULL SCALE
EXCITATION	10 VDC NOMINAL 15 VDC MAX.
POLARITY	CONFORMS TO S.A.E. J-211
MASS	219 g (.48 LBS) LESS CABLE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

APPROVALS	DATE
DRAWN L. BENFANT	7/1/2016
CHECKED	
ENG L. BENFANT	7/1/2016
APPROVED	

MATERIAL
HEAT TREAT: NONE
FINISH: NONE

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

4X CLAVICLE LOAD CELL, LEFT

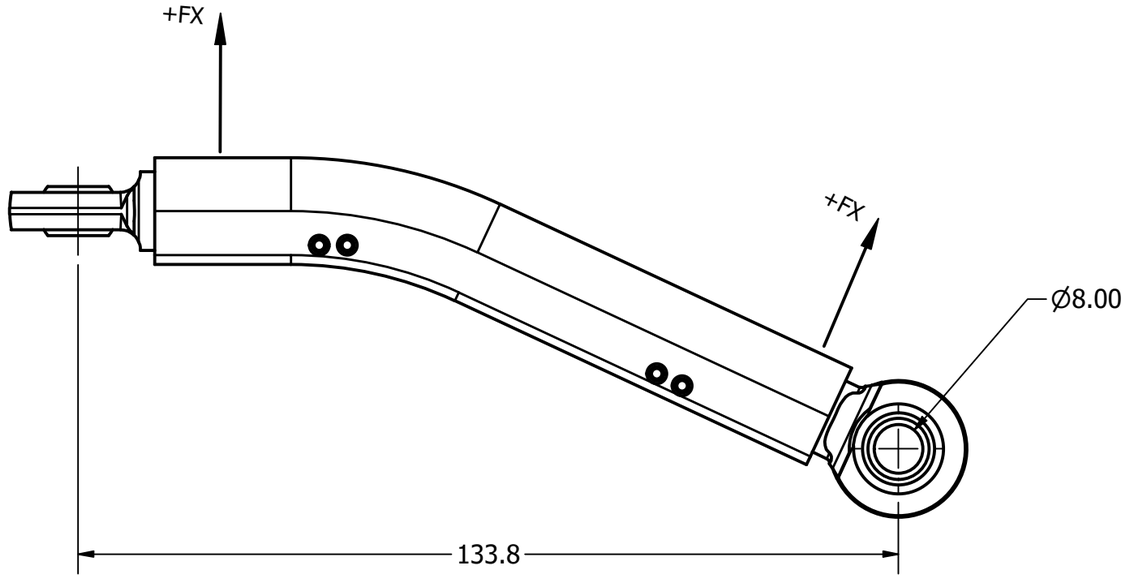
THOR-05F ATD

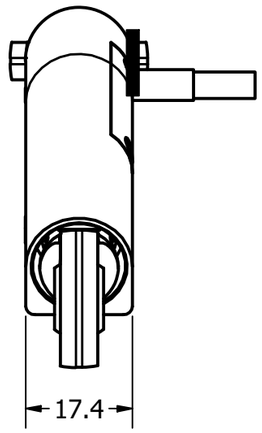
THIRD ANGLE PROJECTION

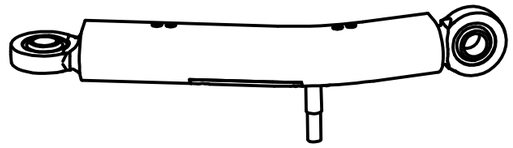
SIZE: A3 | DRAWING NUMBER: SA572-S165 | REV: A

SCALE: 1 : 1 | SHEET: 1 OF 1

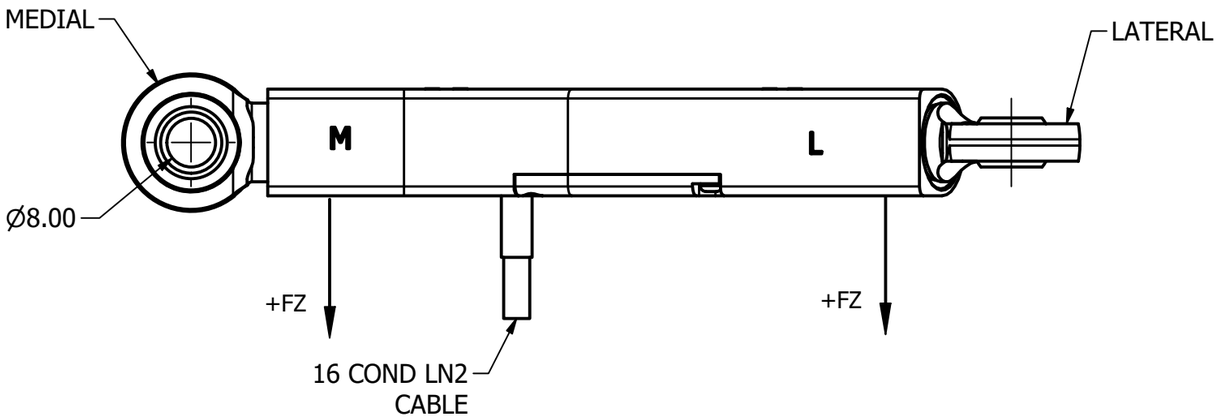
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	A	RELEASE FOR PRODUCTION	TM	KMS	10/27/2022

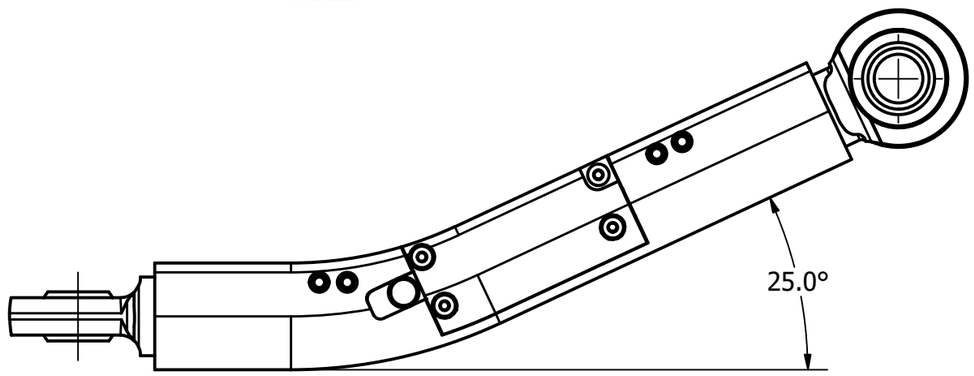






SCALE 0.5 : 1





SPECIFICATIONS (MEDIAL)				
CH.	CAPACITY (METRIC)	CAPACITY (ENGLISH)	OUTPUT	BRIDGE RESISTANCE
FX	2.00 kN	450 LBS.	1.0 mV/V	350 OHMS
FZ	2.00 kN	450 LBS.	1.0 mV/V	350 OHMS
SPECIFICATIONS (LATERAL)				
CH.	CAPACITY (METRIC)	CAPACITY (ENGLISH)	OUTPUT	BRIDGE RESISTANCE
FX	2.00 kN	450 LBS.	1.0 mV/V	350 OHMS
FZ	2.00 kN	450 LBS.	1.0 mV/V	350 OHMS

NON-LINEARITY	< 1% OF FULL SCALE
HYSTERESIS	< 1% OF FULL SCALE
CROSSTALK	< 5% OF FULL SCALE
EXCITATION	10 VDC NOMINAL 15 VDC MAX.
POLARITY	CONFORMS TO S.A.E. J-211
MASS	219 g (.48 LBS) LESS CABLE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN L. BENFANT	7/11/2016
CHECKED	
ENG L. BENFANT	7/11/2016
APPROVED	

MATERIAL: N/A
HEAT TREAT: N/A
FINISH: N/A

4X CLAVICLE LOAD CELL, RIGHT

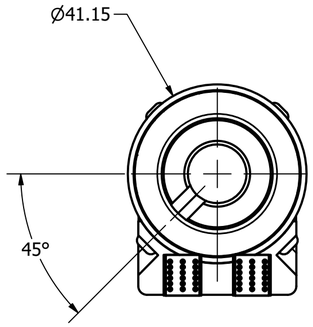
THOR-05F ATD

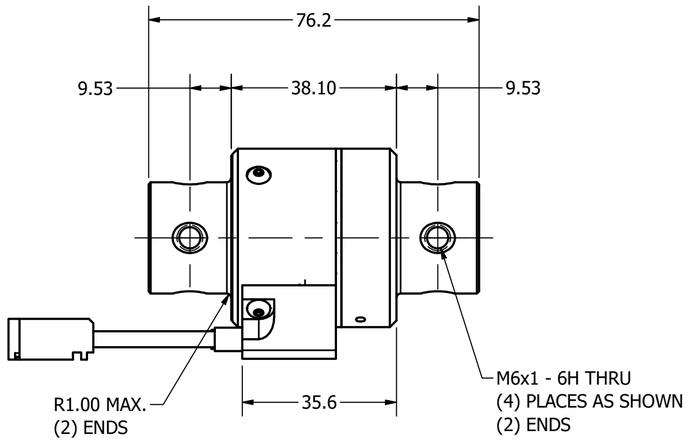
THIRD ANGLE PROJECTION

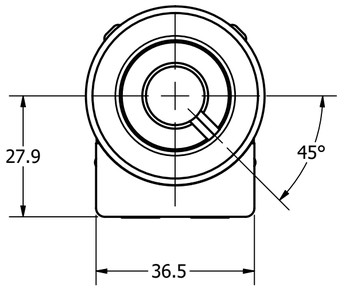
SIZE: A3 | DRAWING NUMBER: SA572-S166 | REV: A

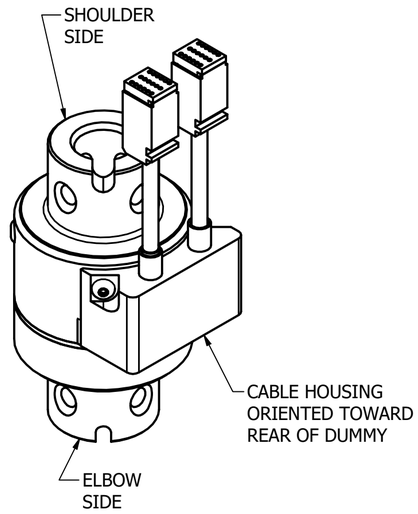
SCALE: 1 : 1 | SHEET: 1 OF 1

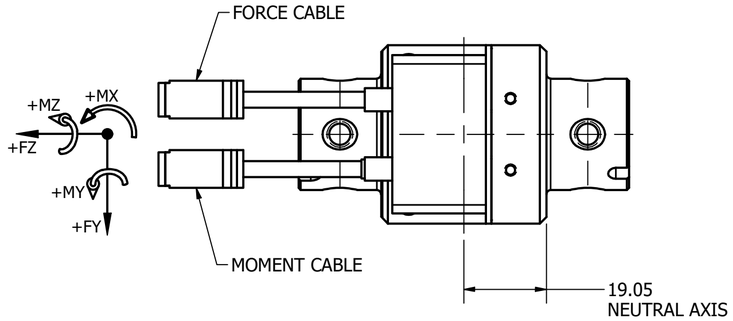
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	SKK	TORCH	6/3/2019

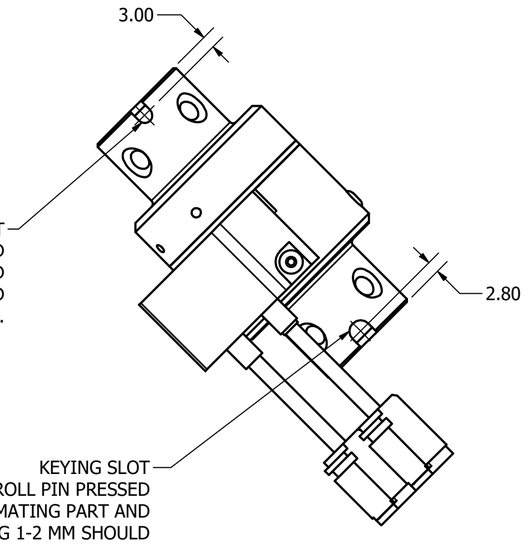




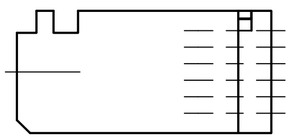


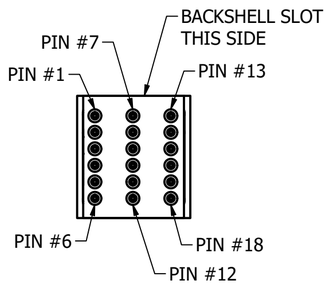






18 PIN CONNECTOR		
PIN	CHANNEL	FUNCTION
1	FX, MX	+EXC
2	FX, MX	+SIG
3	FX, MX	-SIG
4	FX, MX	-EXC
5	FX, MX	-ID/SHIELD
6	FX, MX	+ID
7	FY, MY	+EXC
8	FY, MY	+SIG
9	FY, MY	-SIG
10	FY, MY	-EXC
11	FY, MY	-ID/SHIELD
12	FY, MY	+ID
13	FZ, MZ	+EXC
14	FZ, MZ	+SIG
15	FZ, MZ	-SIG
16	FZ, MZ	-EXC
17	FZ, MZ	-ID/SHIELD
18	FZ, MZ	+ID





18 PIN CONNECTOR
CONNECTOR FACE VIEW
SCALE 3 : 1

SPECIFICATIONS				
AXIS	CAPACITY (METRIC)	CAPACITY (ENGLISH)	OUTPUT	BRIDGE RESISTANCE
FX	9.00 kN	2023.28 LBF	1.7 mV/V	350 OHMS
FY	9.00 kN	2023.28 LBF	1.7 mV/V	350 OHMS
FZ	13.50 kN	3034.92 LBF	1.1 mV/V	700 OHMS
MX	225.00 Nm	1991.42 IN-LBF	1.9 mV/V	350 OHMS
MY	225.00 Nm	1991.42 IN-LBF	1.9 mV/V	350 OHMS
MZ	170.00 Nm	1504.63 IN-LBF	2.5 mV/V	700 OHMS
NON-LINEARITY	< 1% OF FULL SCALE			
HYSTERESIS	< 1% OF FULL SCALE			
CROSSTALK	< 5% OF FULL SCALE			
EXCITATION	10 VDC NOMINAL, 15 VDC MAX.			
POLARITY	CONFORMS TO SAE J-211			
MASS	385g [0.85 LBS] LESS CABLES			

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1 | MACHINED ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

MATERIAL
HEAT TREAT: N/A
FINISH: N/A

VEHICLE RESEARCH and TEST CENTER

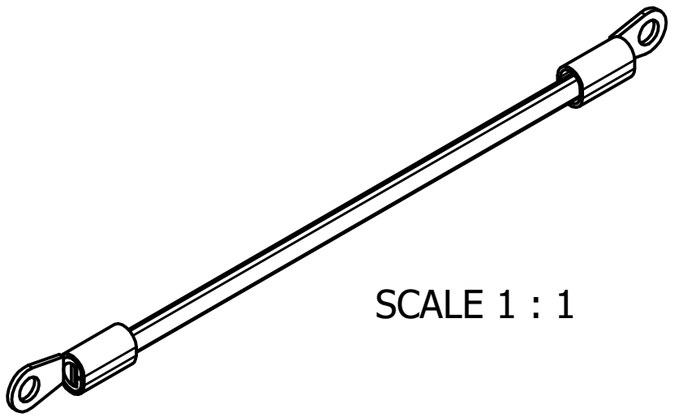
APPROVALS	DATE
DRAWN: skantola	5/8/2019
CHECKED	
ENG: MJS	5/8/2019
APPROVED	

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

6X UPPER ARM
THOR-05F

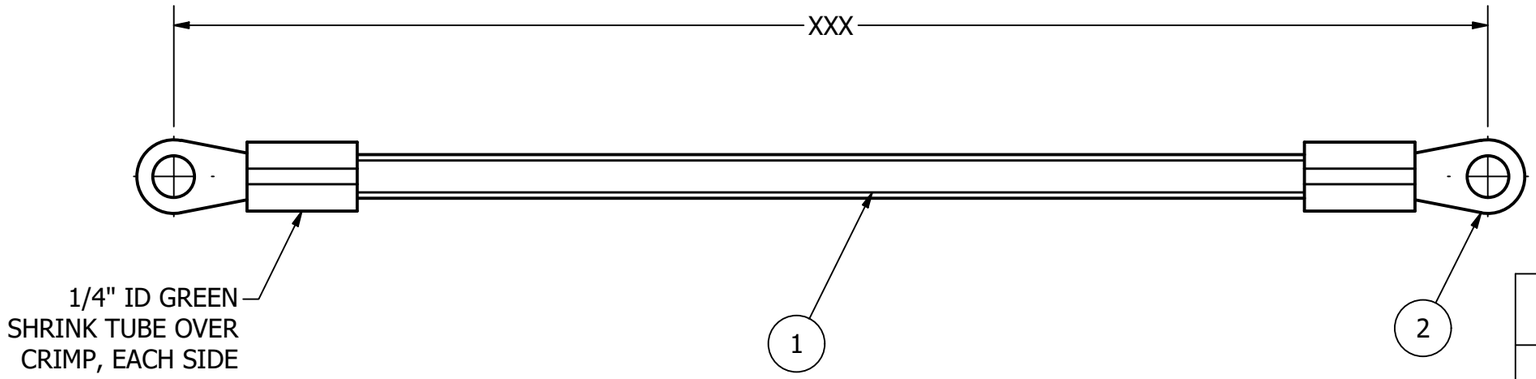
THIRD ANGLE PROJECTION
SIZE: A2 | DRAWING NUMBER: SA572-XXXX | REV: 1
SCALE: 1 : 1 | SHEET: 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	5	PROTOTYPE	SKK	MJS	1/21/2025



SCALE 1 : 1

PART #	LENGTH "XXX" (mm)	LOCATION ON 474-0000	LOCATION ON 483-0000	LOCATION ON 484-0000
474-8700-110	110 +10/-0	LOWER LEG/TORSO	-	LOWER LEG/TORSO
474-8700-150	150 +10/-0	-	-	DISTRIBUTOR TO LUMBAR
474-8700-175	175 +10/-0	LUMBAR/CHEST	CHEST	LUMBAR/CHEST
474-8700-210	210 +10/-0	FEMUR/PELVIS	FEMUR/PELVIS, LOWER LEG/TORSO, LUMBAR	UPPER LEG, FEMUR/PELVIS
474-8700-230	230 +10/-0	HEAD/NECK, UPPER LEG, TIBIA/KNEE	HEAD/NECK, FEMUR, TIBIA/KNEE	HEAD/NECK, TIBIA/KNEE
474-8700-400	400 +20/-0	-	-	-
474-8700-3000	3000 ± 20	EXIT	EXIT	EXIT



ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	6002978	METRIC RING TERMINAL M4 NON-INSULATED
1	XXX	6004496	17 AWG TINNED COPPER FLAT BRAID, BLACK PVC INSULATED

PARTS LIST

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

GROUND CABLE - M4 TO M4

	APPROVALS	DATE
DRAWN	B.KIMES	5/30/2019
CHECKED		
ENG	MJS	5/30/2019
APPROVED		

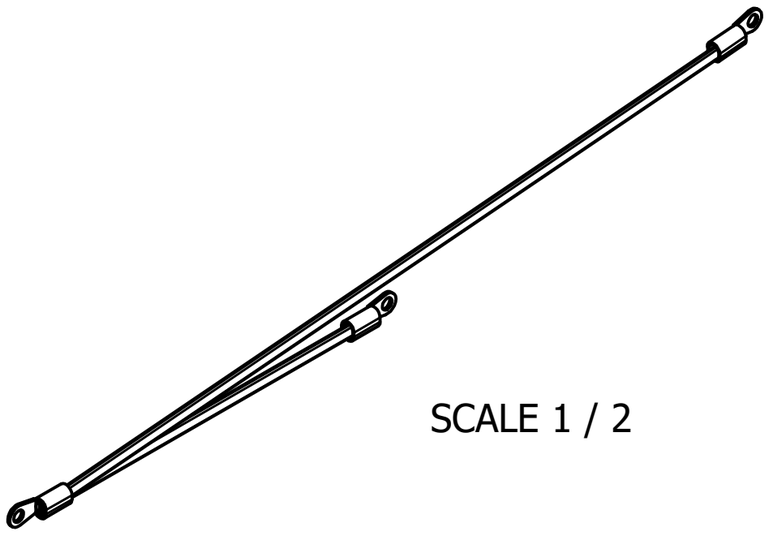
MATERIAL
HEAT TREAT
FINISH

THIRD ANGLE PROJECTION

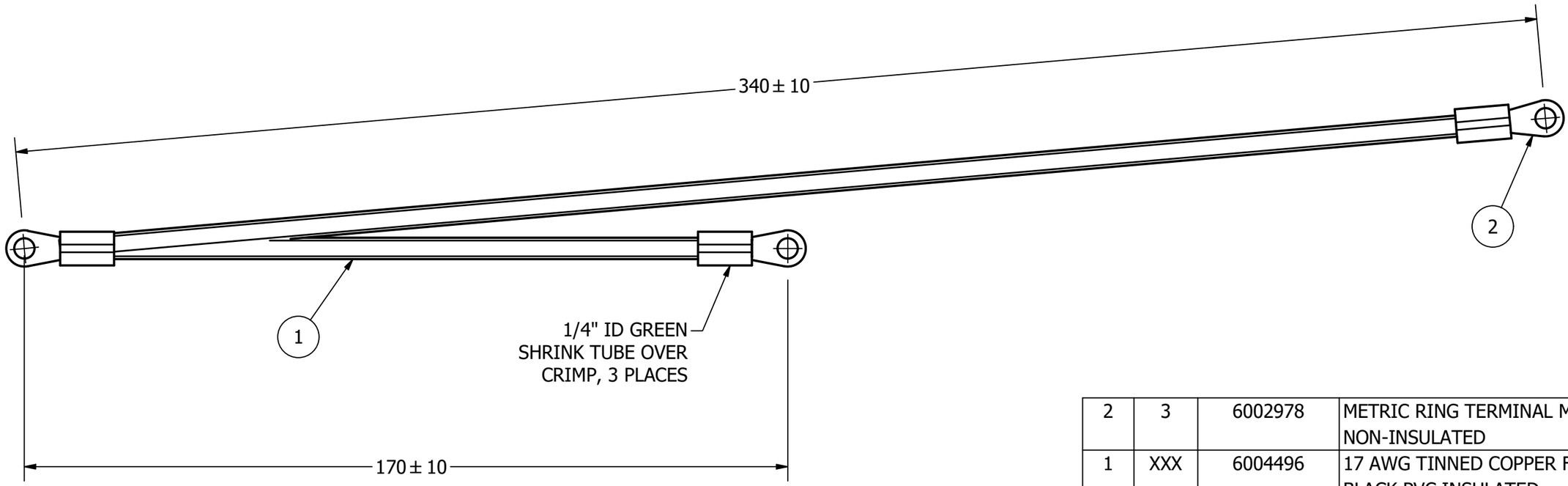
SIZE A3 | DRAWING NUMBER 474-8700-XXX | REV 5

SCALE: 1.5 : 1 | SHEET 1 OF 1

REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	MJS	5/30/2019



SCALE 1 / 2



ITEM	QTY	PART NUMBER	DESCRIPTION
2	3	6002978	METRIC RING TERMINAL M4 NON-INSULATED
1	XXX	6004496	17 AWG TINNED COPPER FLAT BRAID, BLACK PVC INSULATED

PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:

DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED ANGLES ±.5°

ASME Y14.5M - 1994
DO NOT SCALE DRAWING

PROTOTYPE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

GROUND CABLE, SHOULDER/ARM/SPINE

APPROVALS	DATE
DRAWN: B. KIMES	5/11/2016
CHECKED:	
ENG: MJS	6/5/2019
APPROVED:	

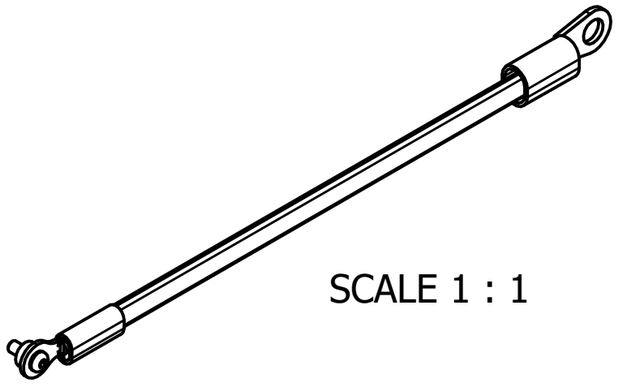
MATERIAL
HEAT TREAT
FINISH

THIRD ANGLE PROJECTION

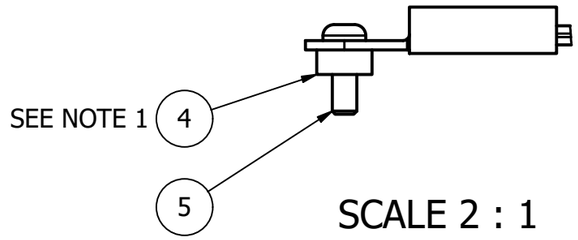
SIZE: A3 | DRAWING NUMBER: 474-8701 | REV: 1

SCALE: 1 : 1 | SHEET: 1 OF 1

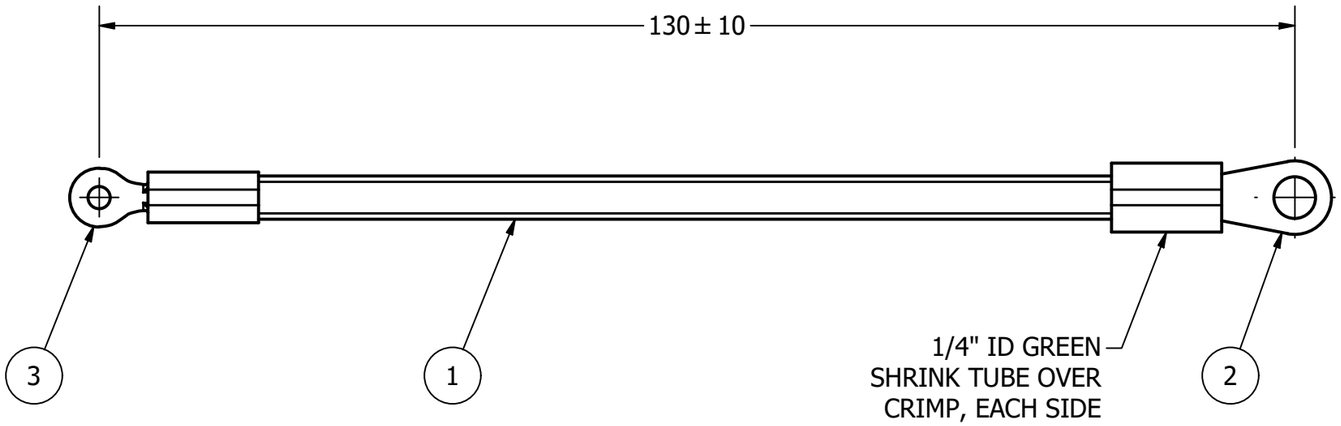
REVISION HISTORY					
ECO#	REV	DESCRIPTION	BY	ENG'R.	DATE
	1	PROTOTYPE	BK	MJS	5/30/2019



SCALE 1 : 1



SCALE 2 : 1



ITEM	QTY	PART NUMBER	DESCRIPTION
5	1	5000468	M2 X 0.4 X 6 LG. BHCS
4	1	6005801	SPACER, M2.5 X 2 S.S.
3	1	6005284	TERMINAL RING AWG 14 #2 M2 NON-INS
2	1	6002978	METRIC RING TERMINAL M4 NON-INSULATED
1	0.3m	6004496	17 AWG TINNED COPPER FLAT BRAID, BLACK PVC INSULATED

PARTS LIST

NOTES:

1. DO NOT USE THE SPACER WHEN STRUCTURAL REPLACEMENTS ARE INSTALLED. USE ON LOAD CELL ONLY.

PROTOTYPE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS
TOLERANCES ARE:
DECIMAL: X ±.5, X.X ±.2, X.XX ±.1
MACHINED
ANGLES ±.5°
ASME Y14.5M - 1994
DO NOT SCALE DRAWING

VEHICLE RESEARCH and TEST CENTER

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

APPROVALS	DATE
DRAWN B.KIMES	5/30/2019
MATERIAL	CHECKED	
HEAT TREAT	ENG MJS	5/30/2019
FINISH	APPROVED	

GROUND CABLE, CLAVICLE

THIRD ANGLE PROJECTION

SIZE A3 | DRAWING NUMBER 474-8702 | REV 1

SCALE: 1.5 : 1 | SHEET 1 OF 1