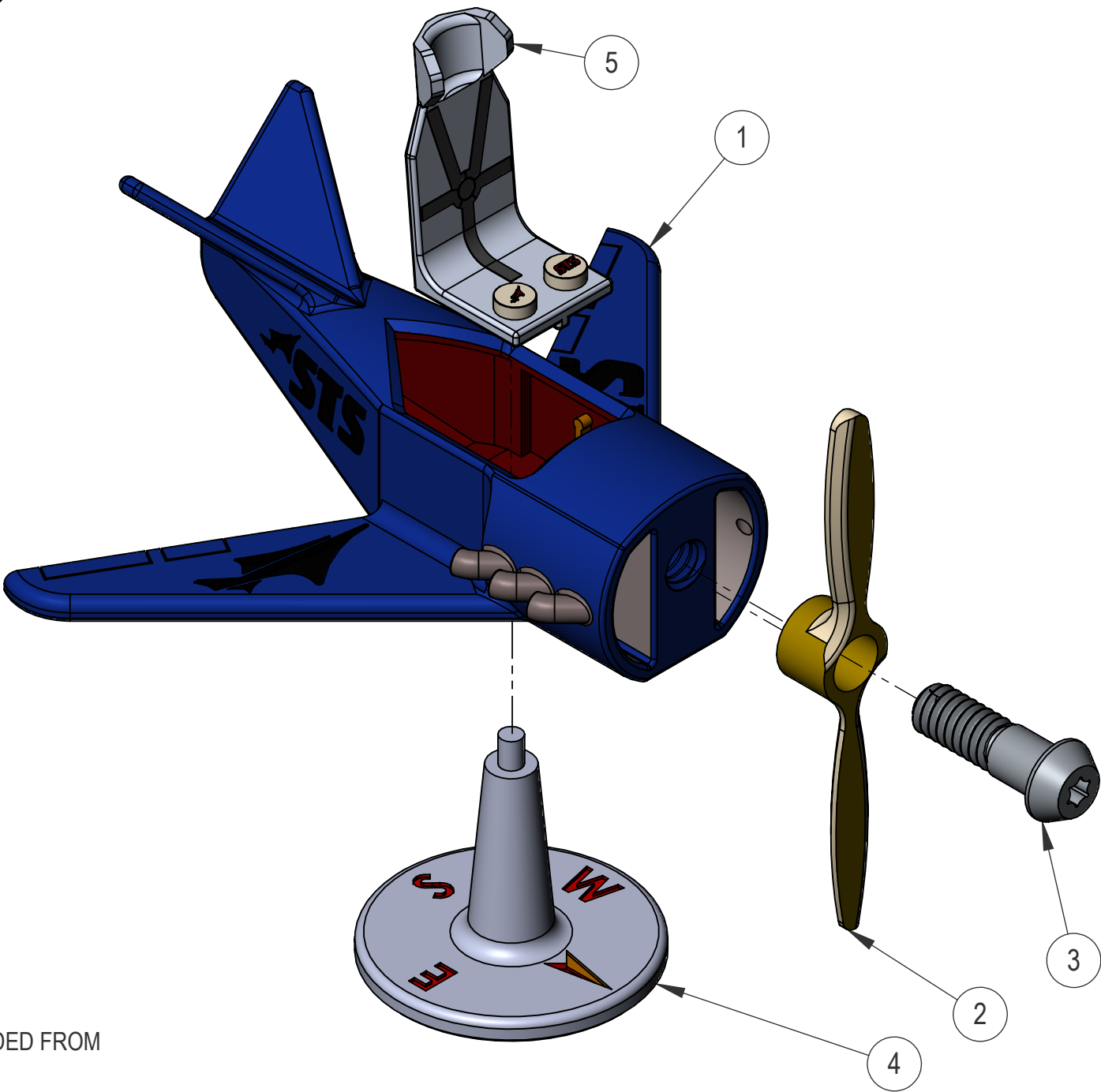
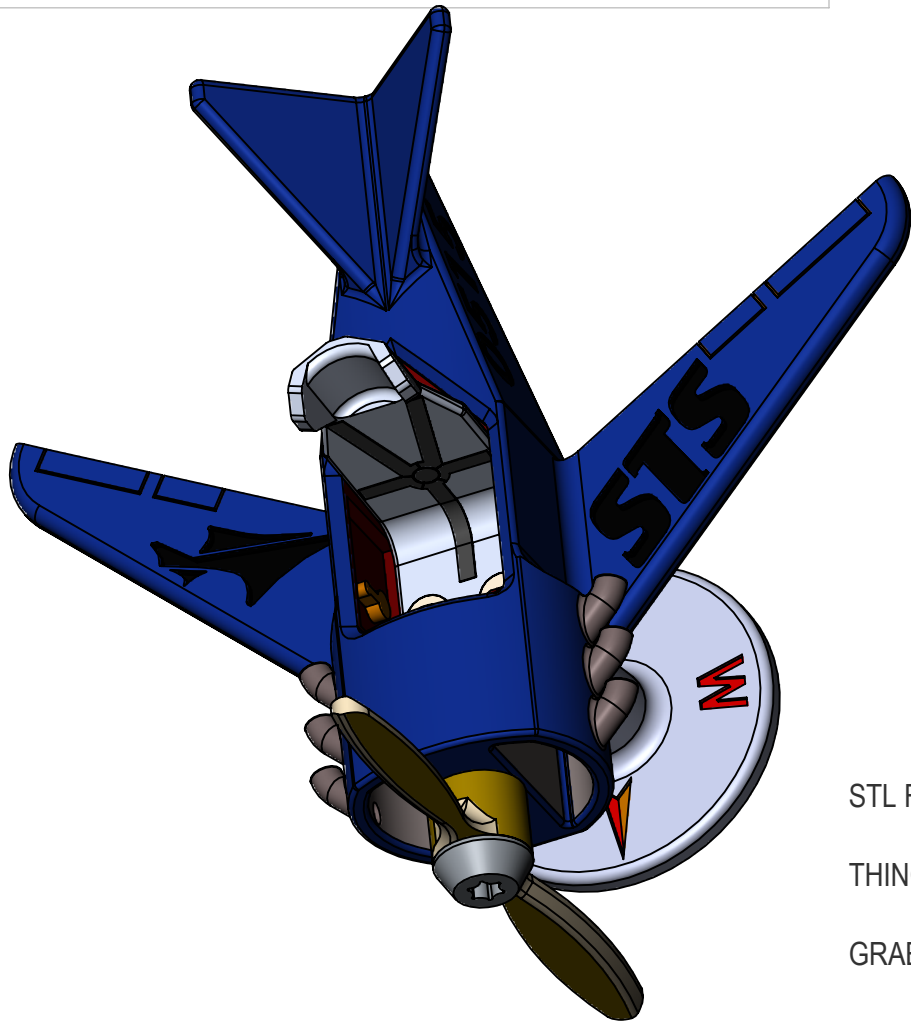


#BP-1 has been designed to offer a fun test of various additive equipment. Not only for FDM and SLA but for other fine detail machines as well. #BP-1 is intended to challenge not only Plastic machines, but Resin and Metal as required. These models test bed adhesion on both supported and non-supported models. The range of feature size and scope should present a challenge for many machines, but are very accomplishable when correctly tuned. The model's components and its assembled state demonstrate the benefits of designing to the 3D printing processes' strengths. We have incorporated many of the issues we see in calibrating our own machines in this easy to print and fun assembly.

#BP-1 should be a great little assistant in diagnosing any issues you may have including extrusion, layer adhesion, tolerance, warping and differences in material/machine accuracy.

We have provided a number of checks on the following drawings and recommended print orientation and material type. You know your machine and process the best though, so we've tried to model these in a way that they could be printed in a number of orientations to test any specific issues you may be seeing.




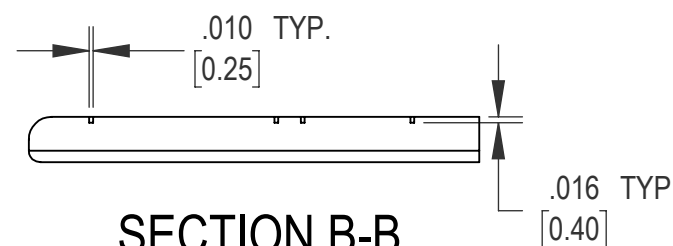
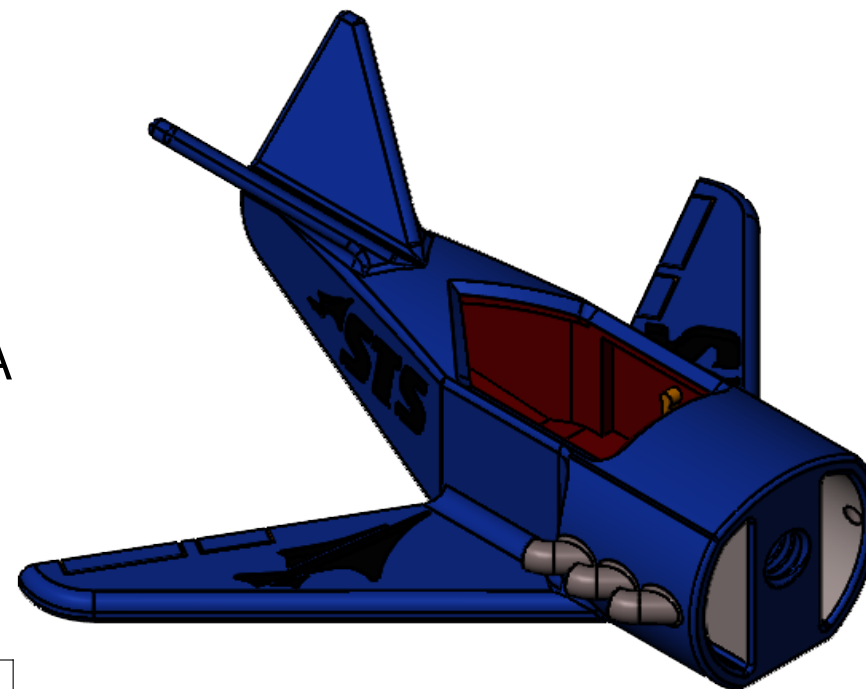
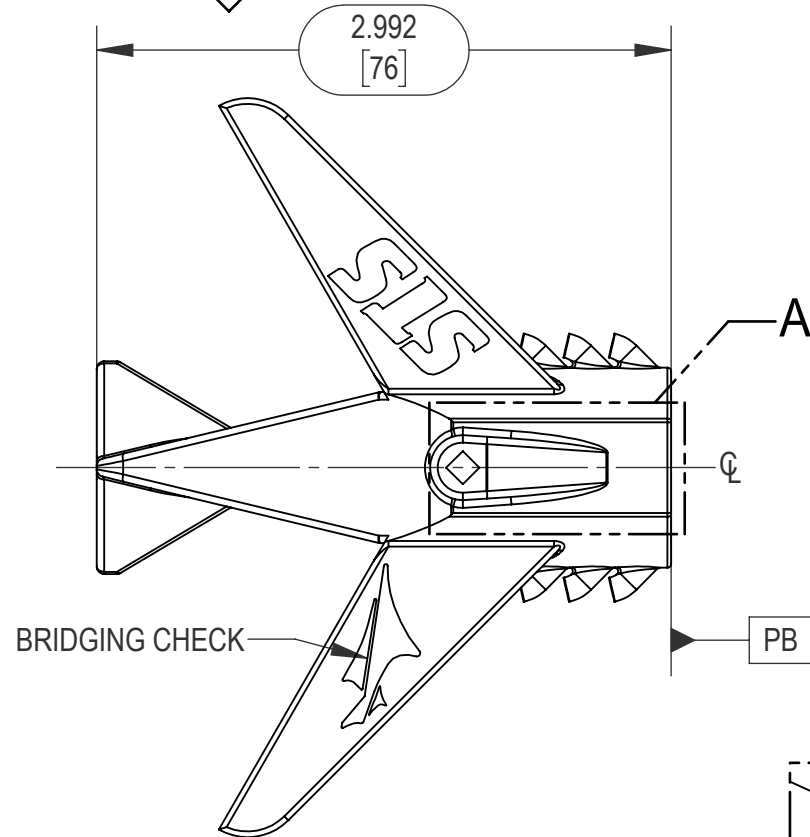
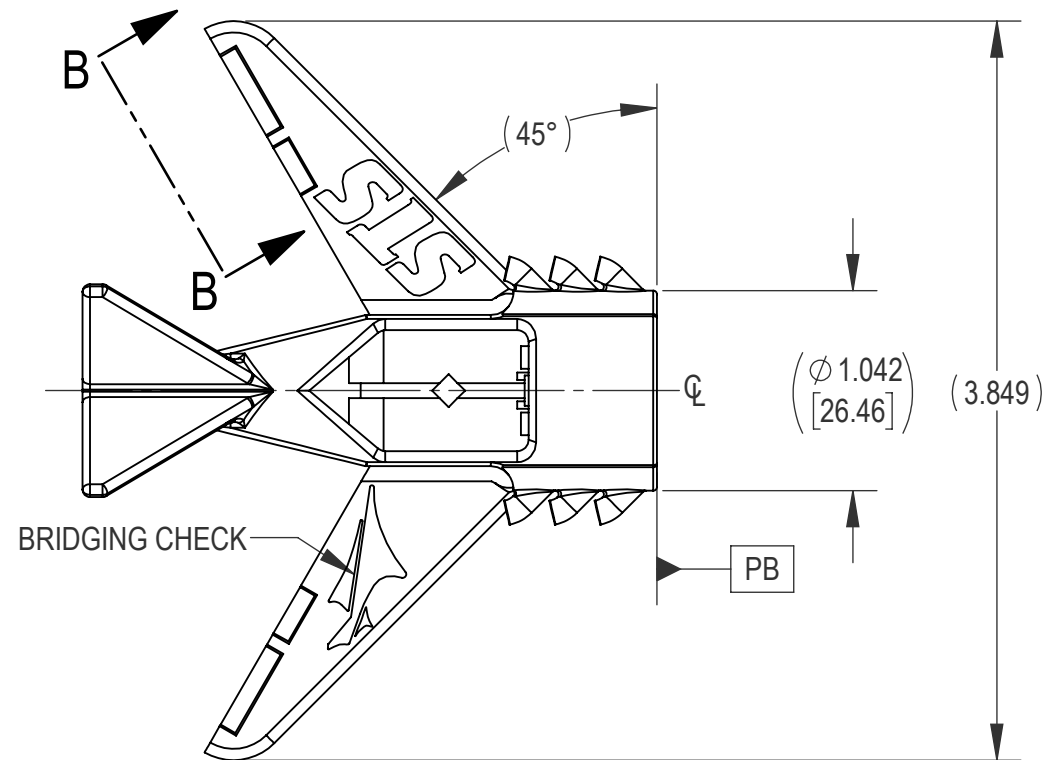
STL FILES CAN BE DOWNLOADED FROM

THINGIVERSE: [thingiverse.com/thing:5210647](https://www.thingiverse.com/thing/5210647)

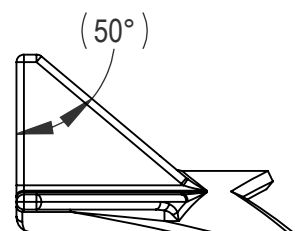
GRABCAD: grabcad.com/library/bp-1-1

ITEM	PART NUMBER	USE
1	202201141346	BRIDGING, ENGRAVING, THREADS
2	202201141348	WARPING OF THIN LONG FEATURES
3	202201141347	THREADS, TOOL INTERFACES
4	202201141349	SMALL DIAMETER ACCURACY
5	202201141345	HIGH PRECISION, LOW CLEARANCE, & SMALL DETAILS

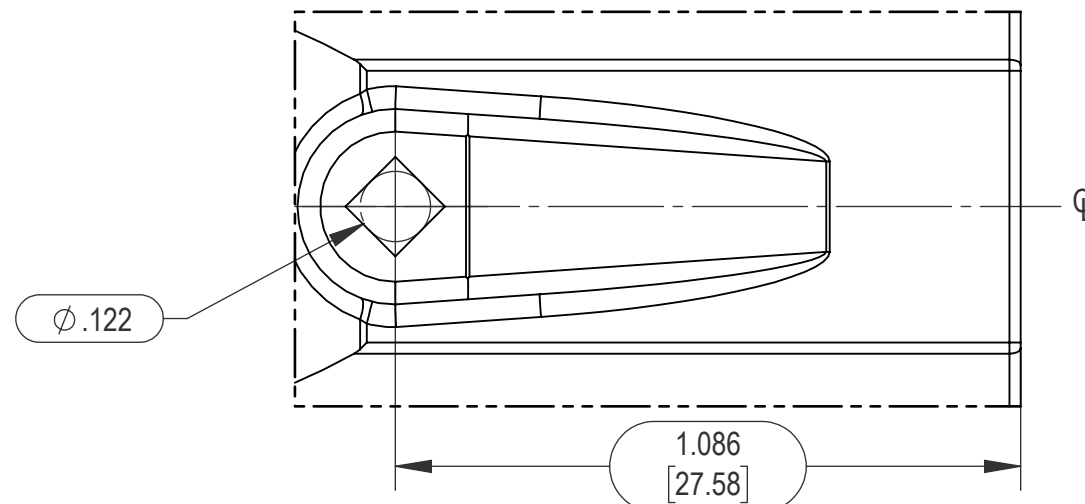
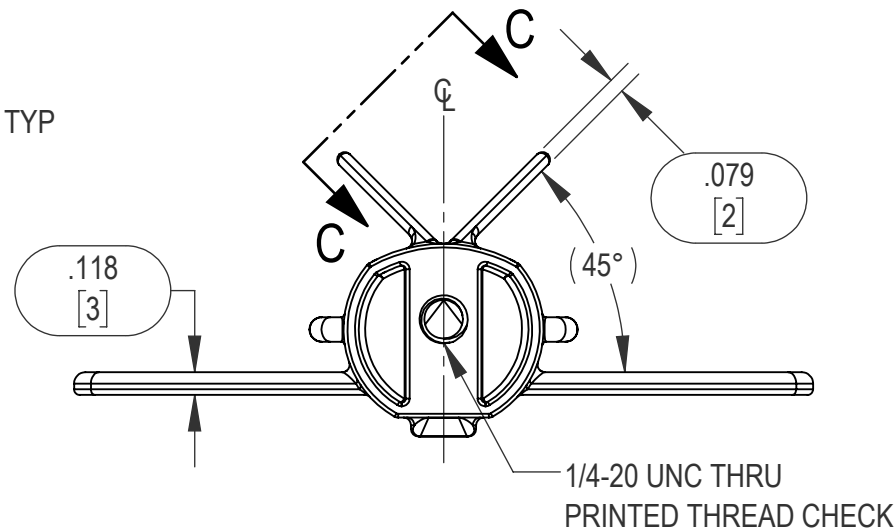
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: DECIMALS ANGLES 0.0 ± 0.1 0.00 ± 0.01 0.000 ± 0.005 INCHES [MM] MATERIAL:SEE PART DWG		APPROVALS	DATE	 THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF STS TECHNICAL SERVICES. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF STS TECHNICAL SERVICES IS PROHIBITED.	
		DRAWN BY: RJN	11/10/21		
		CHECKED BY: BMH	01/12/'22	TITLE BP - 1 BENCHMARK PART - ONE	
		APPROVED BY: TJK	01/14/22	SIZE B	REV. 0
		DWG. NO. 202201141344		TOTAL VOLUME 23539.65mm³	
		SCALE 3:2		SHEET 1 OF 1	



SECTION B-B
SCALE 2 : 1




SECTION C-C

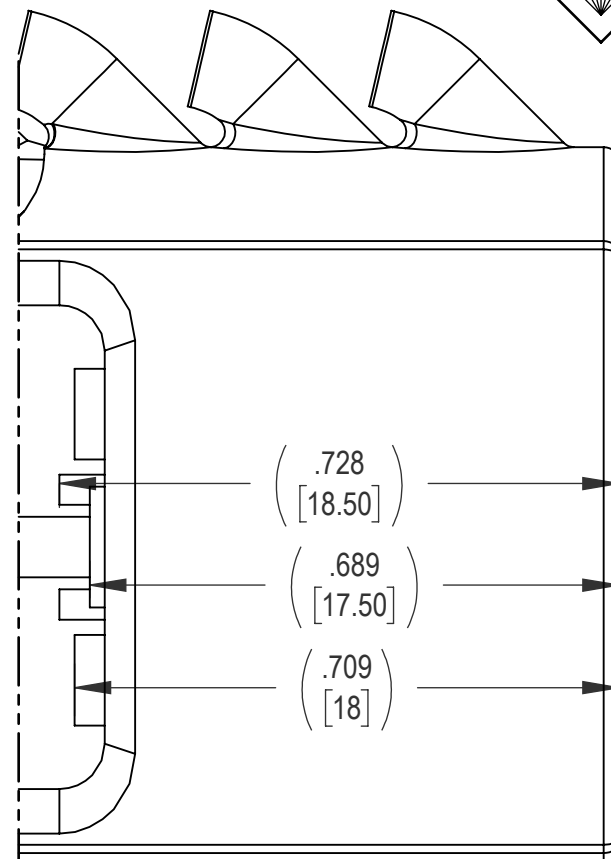
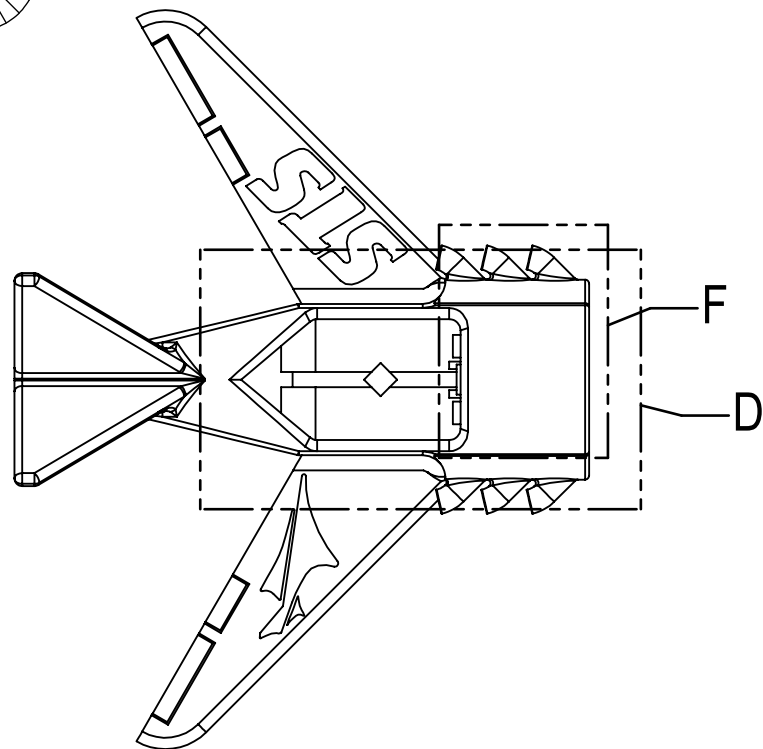


DETAIL A
SCALE 3 : 1

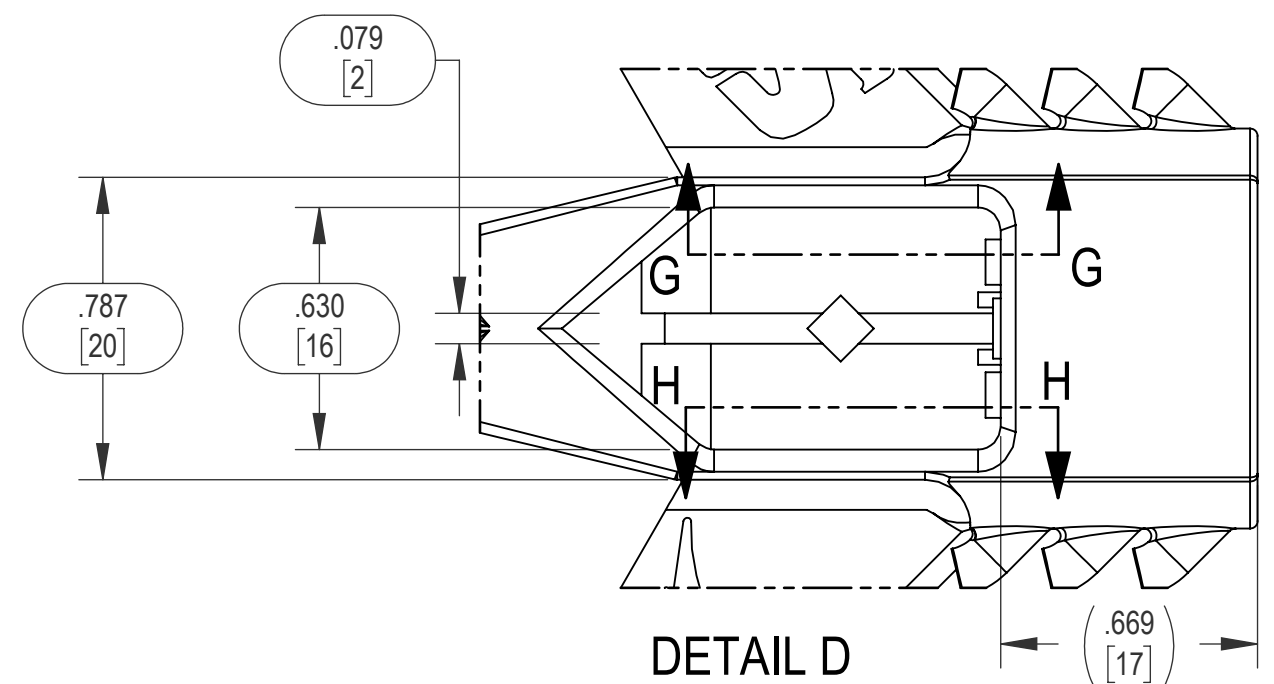
NOTE:
FOR ALL NON-DIMENSIONED
FEATURES USE CAD AS MASTER

RECOMMENDED PRINT SETTINGS		
PROCESS	LAYER HEIGHT	INFILL
FFF	0.1MM	40% GYROID
METAL FFF	0.125MM	
SLA	0.025MM	
PB DATUM REPRESENTS PRINT BED		

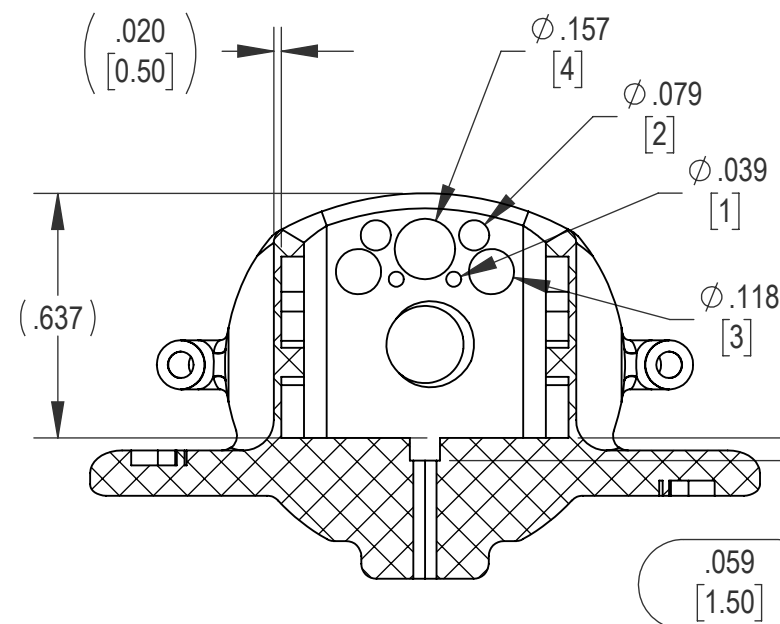
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		APPROVALS	DATE	 THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF STS TECHNICAL SERVICES. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF STS TECHNICAL SERVICES IS PROHIBITED.	
DECIMALS	ANGLES	DRAWN BY: RJN	11/05/21		
0.0 ± 0.1		CHECKED BY: BMH	01/12/22	TITLE BP-1 FUSELAGE	
0.00 ± 0.01	± 30°	APPROVED BY: TJK	01/14/22		
0.000 ± 0.005		MATERIAL: 3D PRINTED		SIZE B	DWG. NO. 202201141346
				SCALE 1:1	REV. 0
				VOLUME 16638.84 mm ³	SHEET 1 OF 2



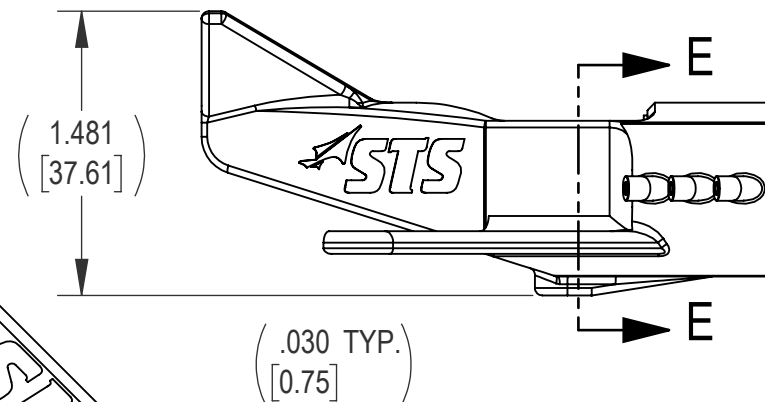
DETAIL F
SCALE 4 : 1



DETAIL D
SCALE 2 : 1

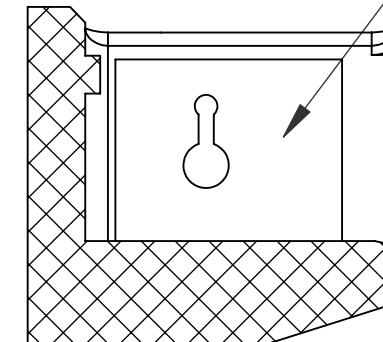


SECTION E-E
SCALE 2 : 1

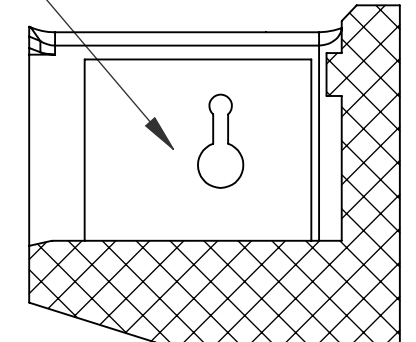


SECTION J-J

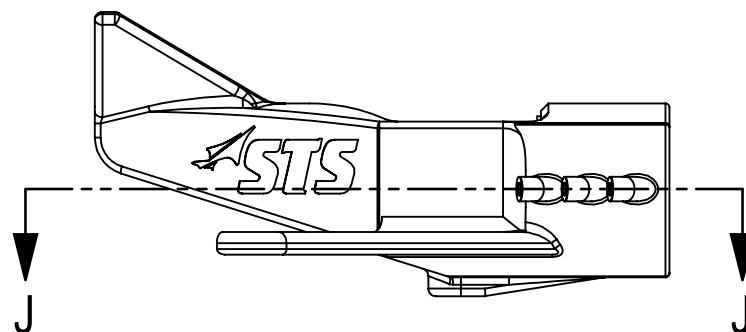
BRIDGING AND
THIN-WALL CHECK
PRINT WITHOUT SUPPORT




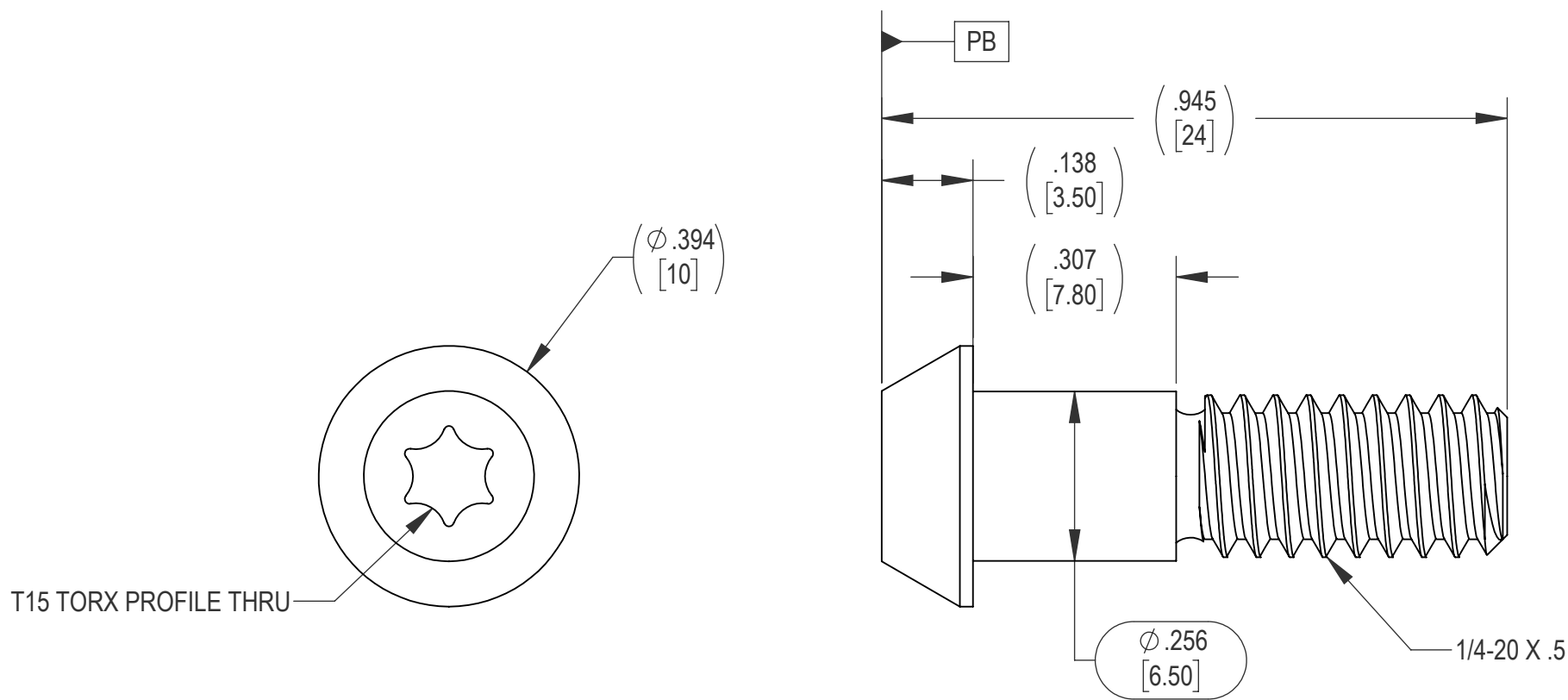
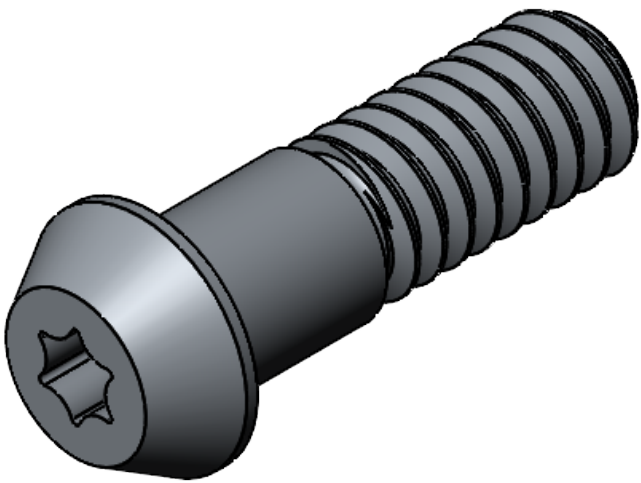
SECTION H-H
SCALE 2 : 1



SECTION G-G
SCALE 2 : 1




UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		APPROVALS DRAWN BY: RJN	DATE 11/05/21	 THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF STS TECHNICAL SERVICES. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF STS TECHNICAL SERVICES IS PROHIBITED.	
DECIMALS	ANGLES	CHECKED BY: BMH	01/12/22		
0.0 ± 0.1		APPROVED BY: TJK	01/14/22	TITLE BP-1 FUSELAGE	
0.00 ± 0.01	± 30°	MATERIAL: 3D PRINTED		SIZE B	DWG. NO. 202201141346
0.000 ± 0.005				SCALE 1:1	REV. 0
				VOLUME 16638.84 mm3	SHEET 2 OF 2

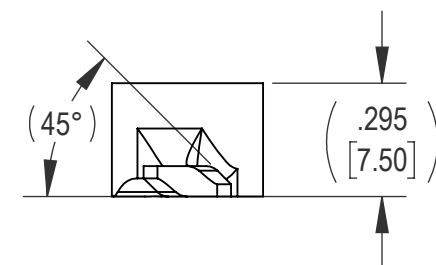
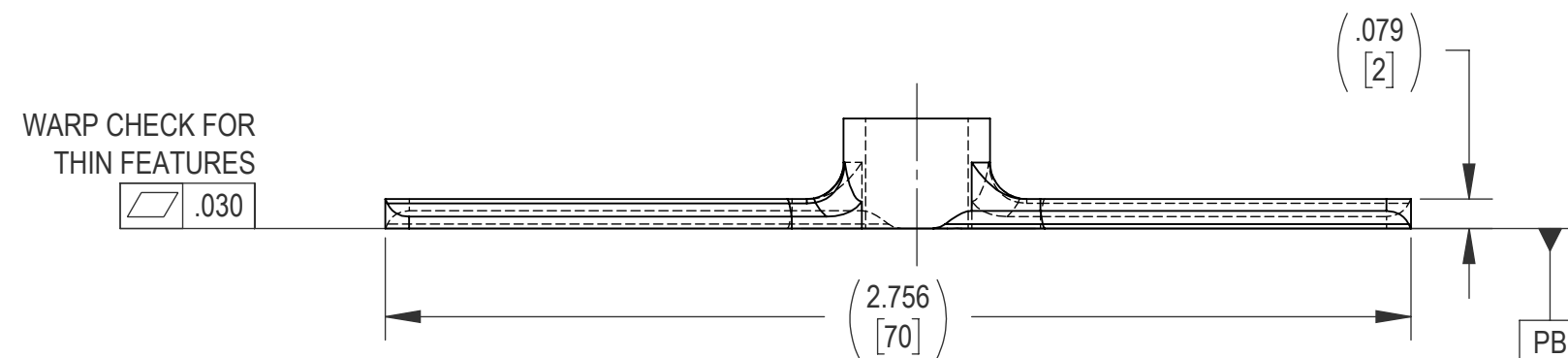
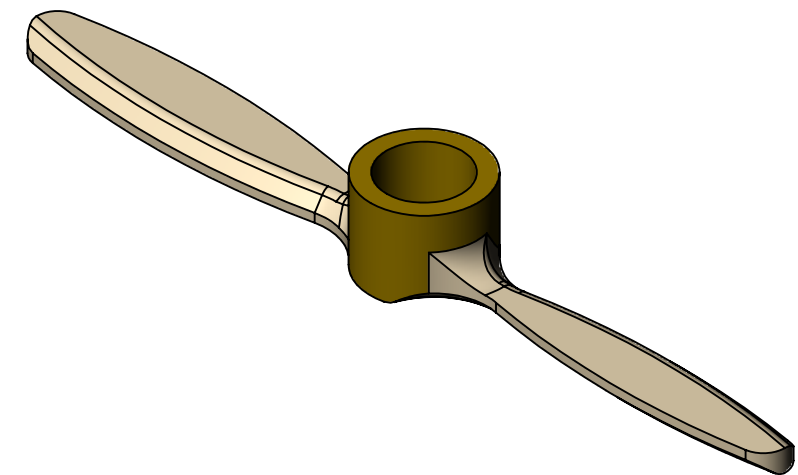
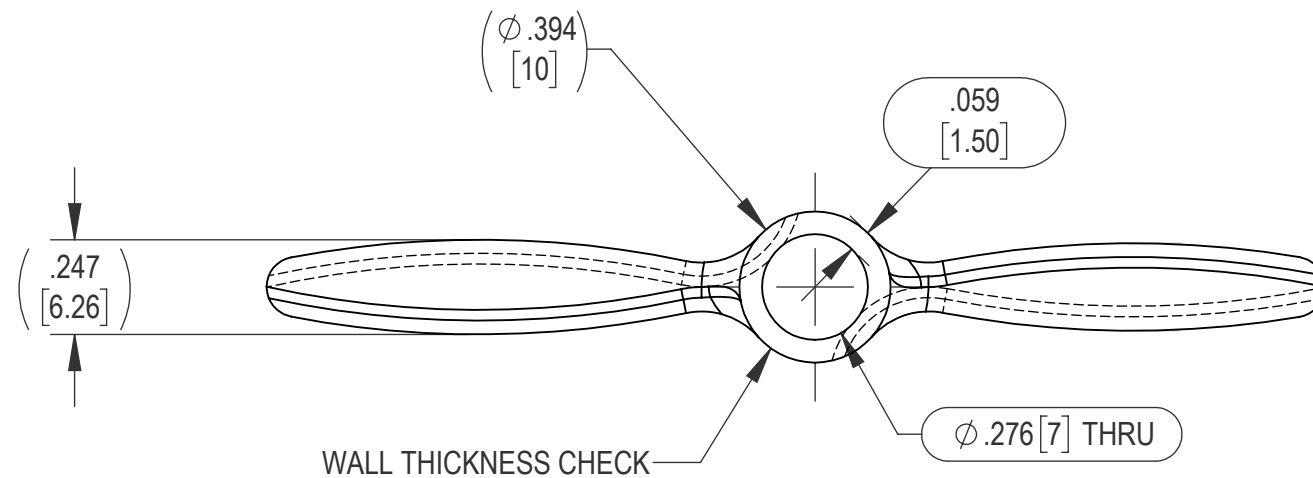


T15 TORX PROFILE THRU

NOTE:
FOR ALL NON-DIMENSIONED
FEATURES USE CAD AS MASTER

RECOMMENDED PRINT SETTINGS		
PROCESS	LAYER HEIGHT	INFILL
FFF	0.1MM	100%
METAL FFF	0.125MM	
SLA	0.025MM	
PB DATUM REPRESENTS PRINT BED		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: DECIMALS ANGLES 0.0 ± 0.1 0.00 ± 0.01 0.000 ± 0.005 INCHES [MM] MATERIAL: 18-8 Stainless		APPROVALS	DATE	 THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF STS TECHNICAL SERVICES. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF STS TECHNICAL SERVICES IS PROHIBITED.	
		DRAWN BY: RJN	11/23/21		
		CHECKED BY: BMH	01/12/'22	TITLE BP-1 PROP SCREW	
		APPROVED BY: TJK	01/14/22		
		SIZE B	DWG. NO.	202201141347	REV. 0
		SCALE 4:1	VOLUME	563.40mm ³	SHEET 1 OF 1



NOTE:
FOR ALL NON-DIMENSIONED
FEATURES USE CAD AS MASTER

RECOMMENDED PRINT SETTINGS		
PROCESS	LAYER HEIGHT	INFILL
FFF	0.1MM	37% TRIANGULAR
METAL FFF	0.125MM	37% TRIANGULAR
SLA	0.025MM	
PB DATUM REPRESENTS PRINT BED		

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

DECIMALS	ANGLES
0.0 ± 0.1	
0.00 ± 0.01	± 30°
0.000 ± 0.005	

INCHES [MM]

MATERIAL: 3D PRINTED

APPROVALS

DRAWN BY:
RJN

CHECKED BY:
BMH

APPROVED BY:
TJK

DATE

11/05/21

01/12/22

01/14/22



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TITLE

BP-1 PROPELLER

SIZE
B

DWG. NO.

202201141348

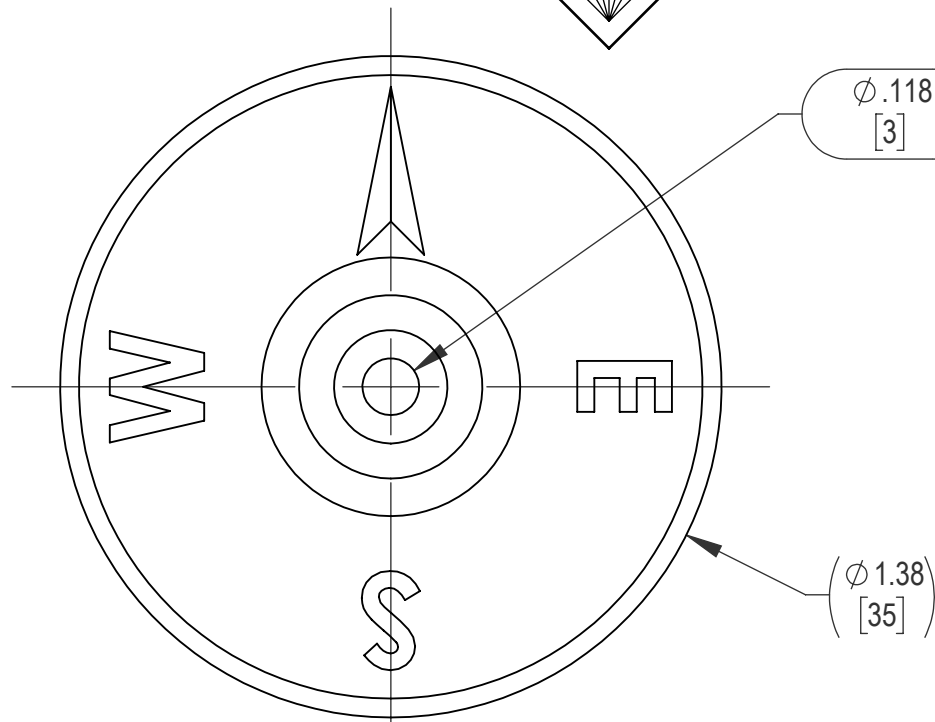
REV.
0

SCALE 2:1

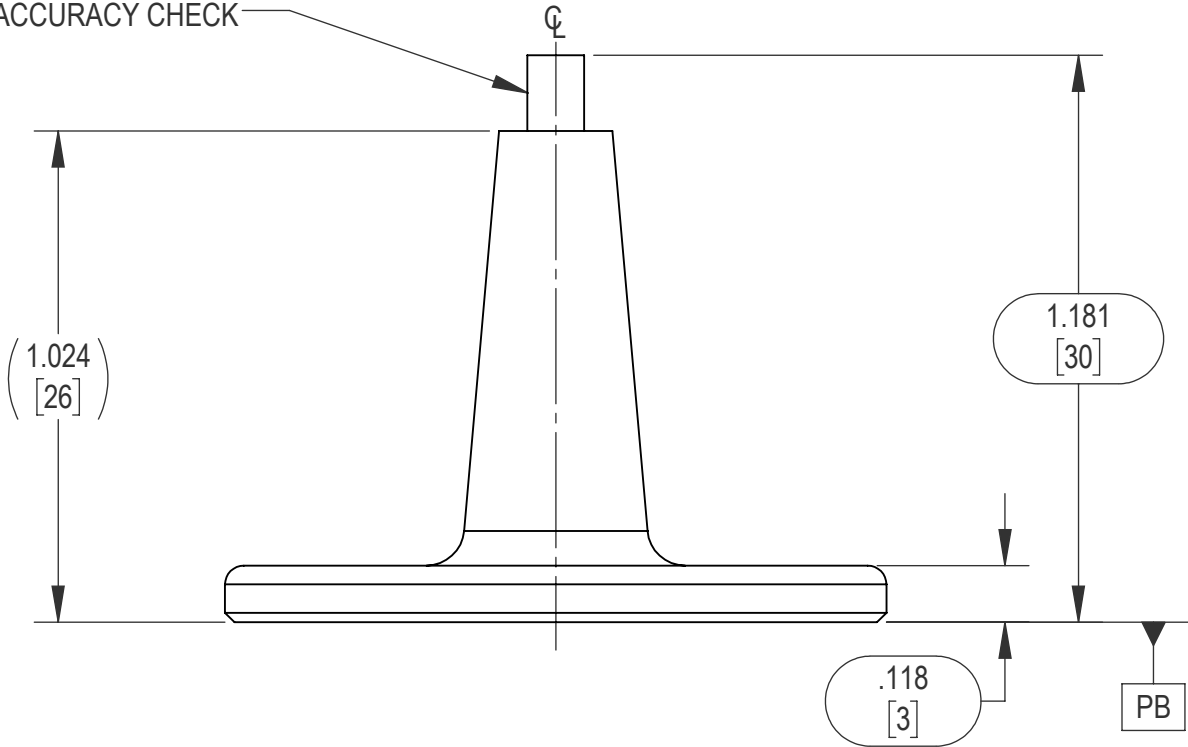
VOLUME

812.85 mm³

SHEET 1 OF 1



SMALL DIAMETER
ACCURACY CHECK



NOTE:
FOR ALL NON-DIMENSIONED
FEATURES USE CAD AS MASTER

RECOMMENDED PRINT SETTINGS		
PROCESS	LAYER HEIGHT	INFILL
FFF	0.1MM	37% TRIANGULAR
METAL FFF	0.125MM	37% TRIANGULAR
SLA	0.025MM	
PB DATUM REPRESENTS PRINT BED		

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

DECIMALS ANGLES
0.0 ± 0.1
0.00 ± 0.01
0.000 ± 0.005 ± 30°

INCHES [MM]

MATERIAL: 3D PRINTED

APPROVALS

DRAWN BY:
RJN

CHECKED BY:
BMH

APPROVED BY:
TJK

DATE

11/05/21

01/12/22

01/13/22



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WHOLE WITHOUT THE WRITTEN PERMISSION OF STS
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TITLE

BP-1 BASE

SIZE
B

DWG. NO.

202201141349

REV.
0

SCALE

5:2

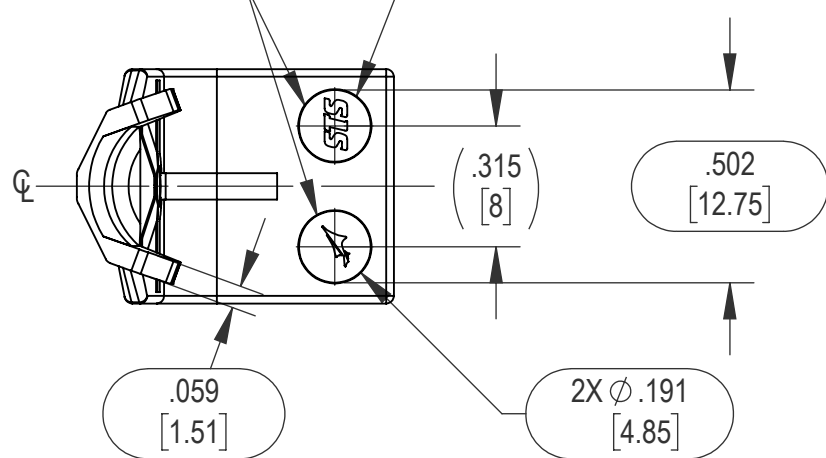
VOLUME

4064.37 mm³

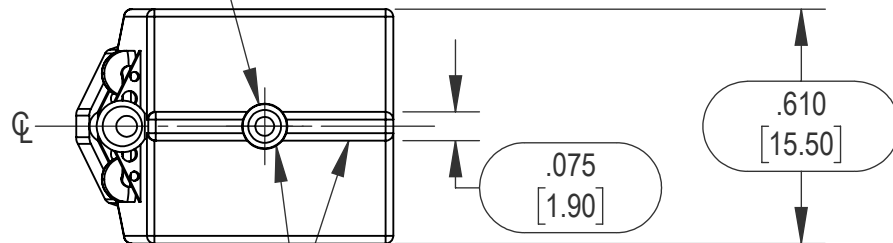
SHEET 1 OF 1

LOCATIONAL ACCURACY CHECK

DIAMETER ACCURACY CHECK

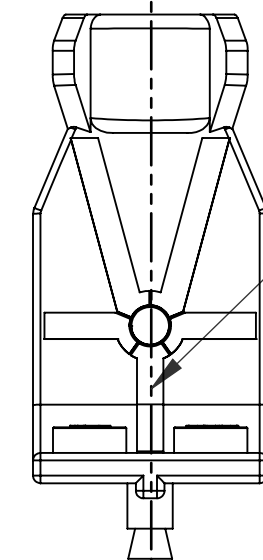


ϕ .118 [3]



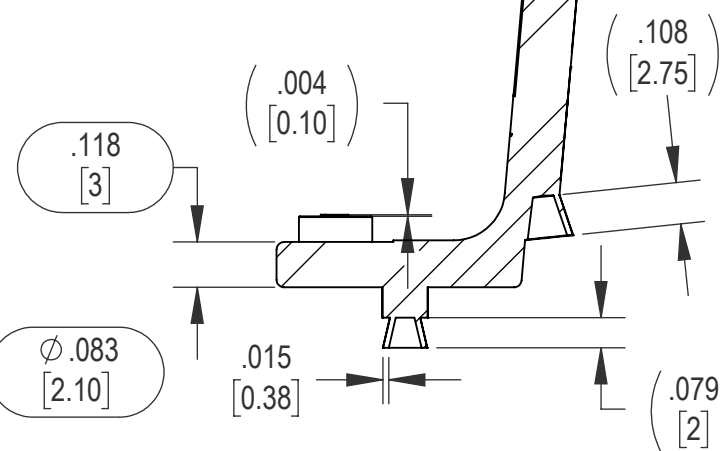
TIGHT CLEARANCE CHECK

B



THIN WALL CHECK

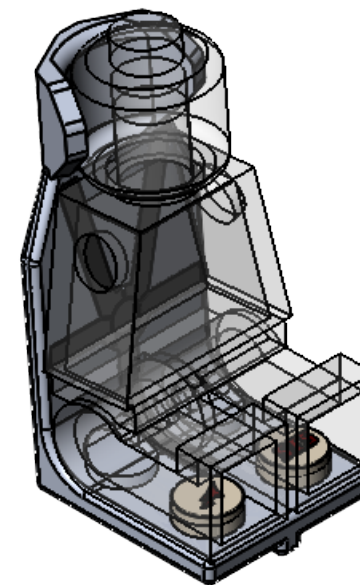
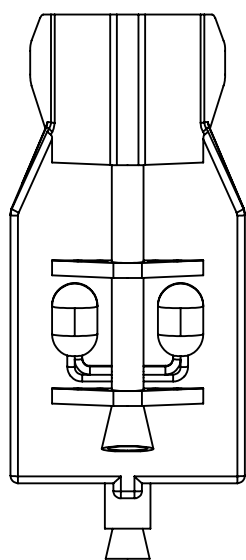
TINY DETAIL CHECK



SECTION B-B

SECTION A-A
SCALE 4 : 1

.059 [1.50]



NOTE:
FOR ALL NON-DIMENSIONED FEATURES USE CAD AS MASTER

RECOMMENDED PRINT SETTINGS	
PROCESS	LAYER HEIGHT
SLA	0.025MM
PB DATUM REPRESENTS PRINT BED	


UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

DECIMALS ANGLES
0.0 \pm 0.1
0.00 \pm 0.01
0.000 \pm 0.005 \pm 30°

INCHES [MM]

MATERIAL: SLA 3D PRINT

APPROVALS	DATE
DRAWN BY: RJN	11/11/21
CHECKED BY: BMH	12/13/21
APPROVED BY: TJK	01/14/22

 STS Technical Design		THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF STS TECHNICAL SERVICES. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF STS TECHNICAL SERVICES IS PROHIBITED.	
TITLE BP-1 EJECTION SEAT			
SIZE B	DWG. NO. 202201141345		REV. 0
SCALE 2:1	VOLUME 1460.19 mm ³		SHEET 1 OF 1