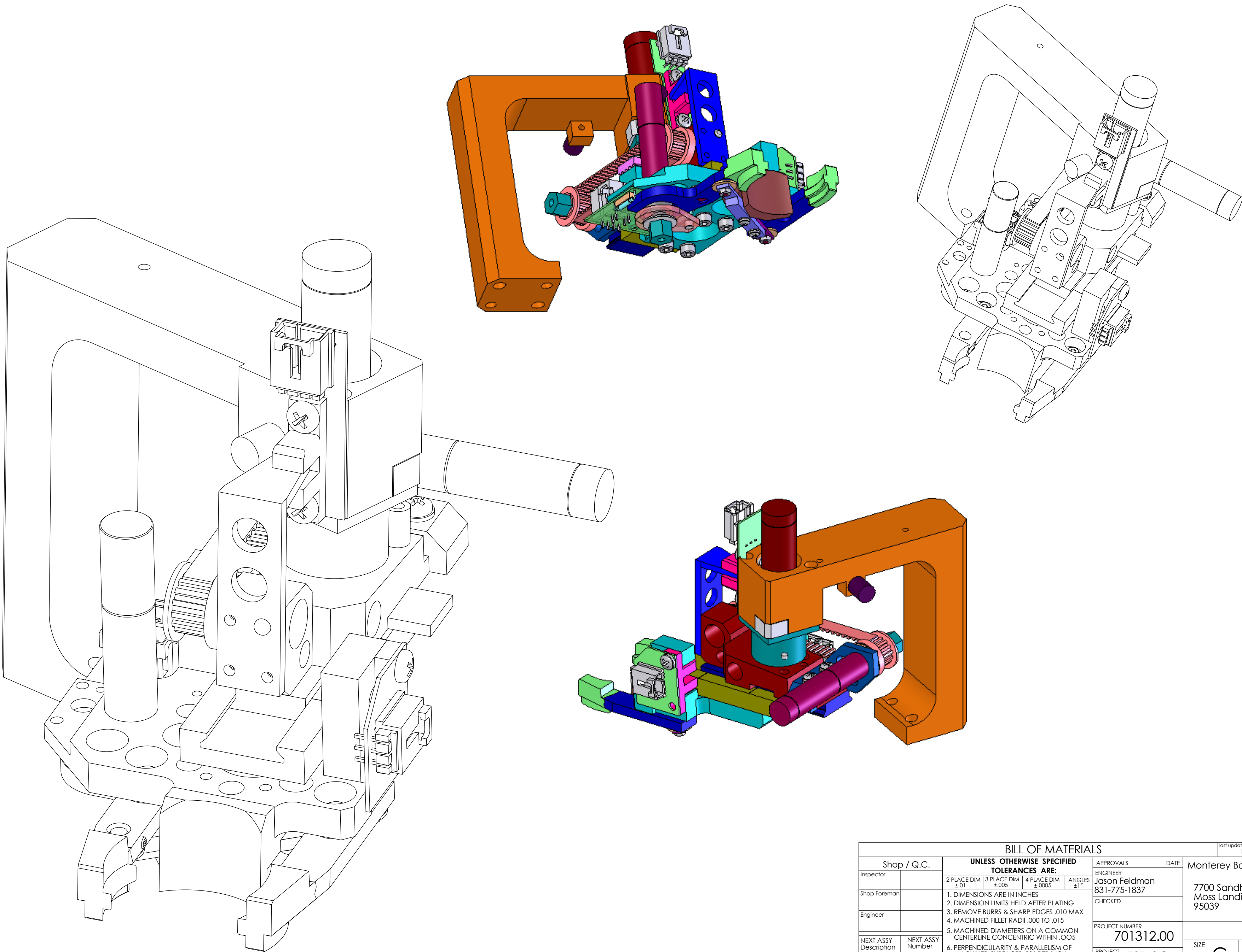


Manipulator - Assembly

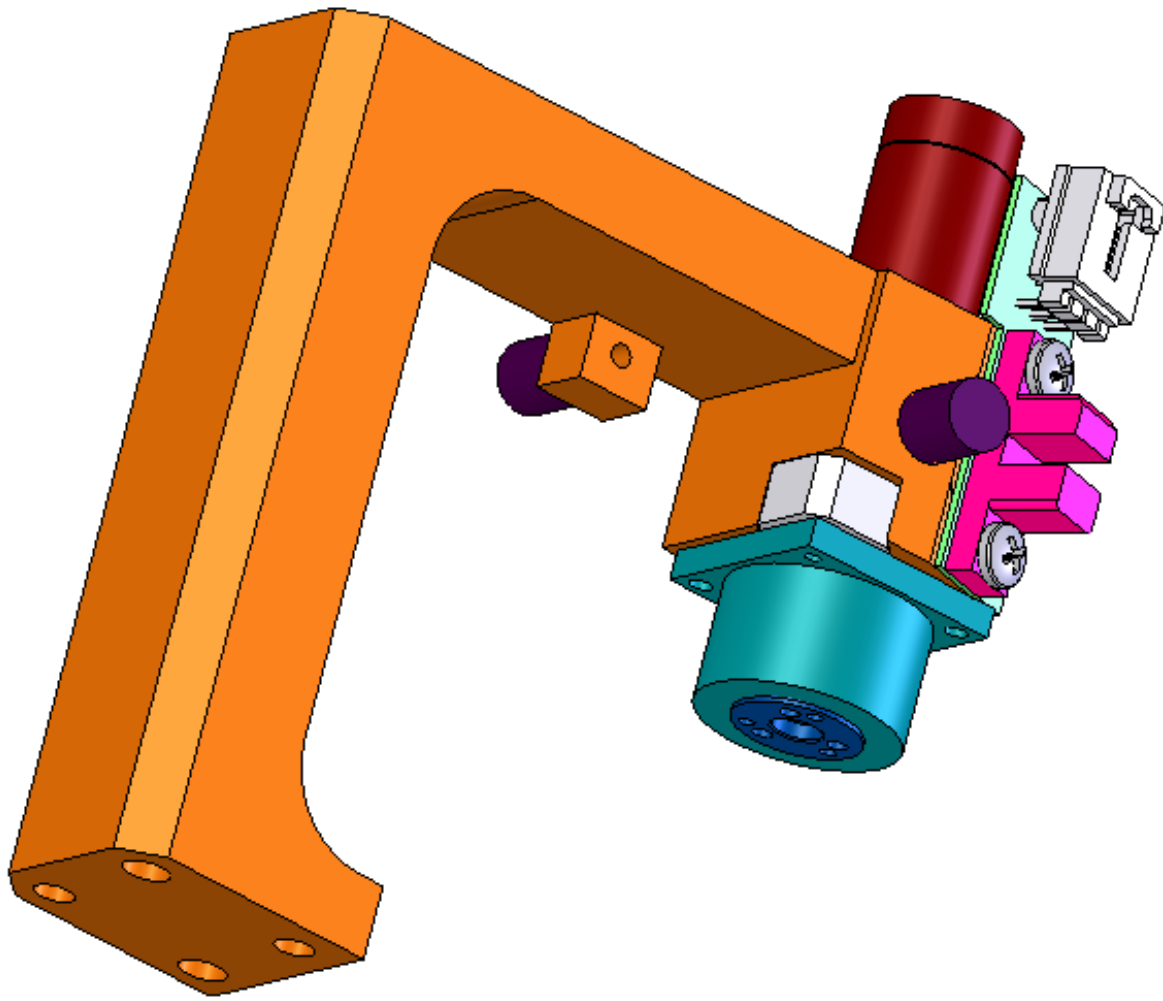
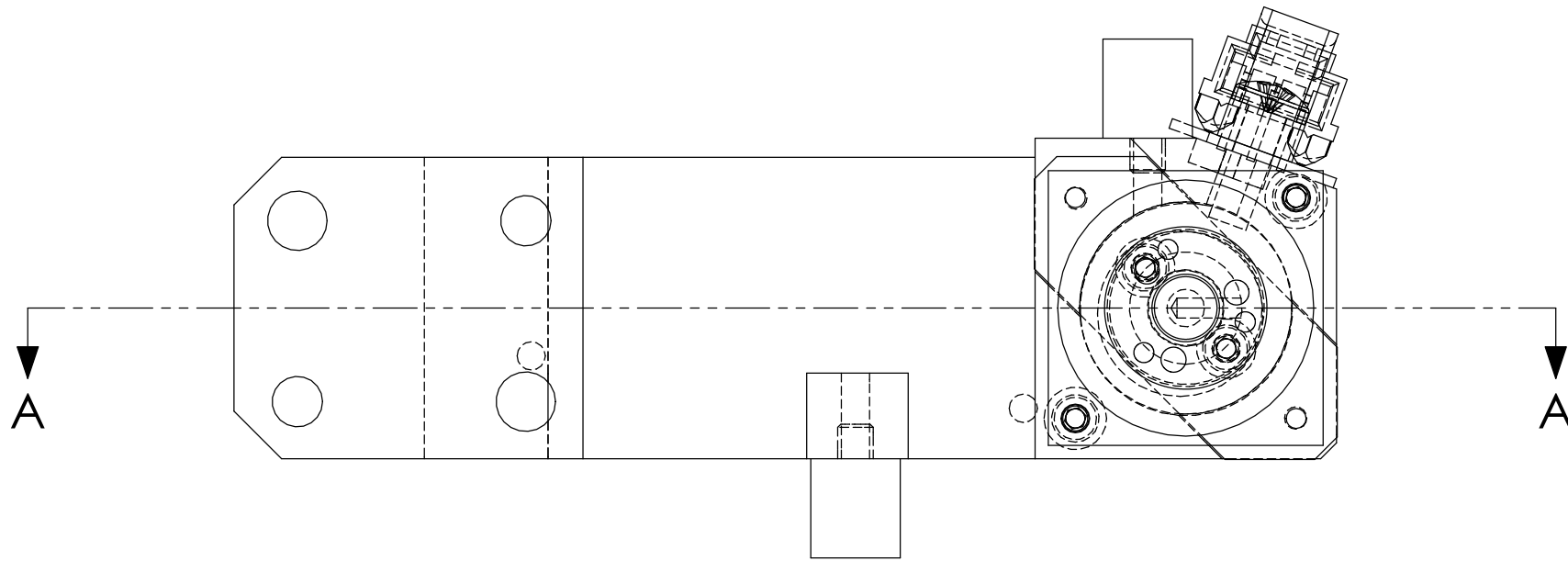


BILL OF MATERIALS					last updated on: Friday, February 10, 2006 8:42:04 AM	
Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:			APPROVALS DATE	
Inspector		2 PLACE DIM ±.01	3 PLACE DIM ±.005	4 PLACE DIM ±.0005	ENGINEER Jason Feldman 831-775-1837 CHECKED	Monterey Bay Aquarium Research Institute 7700 Sandholdt Road Moss Landing, CA 95039 
Shop Foreman		1. DIMENSIONS ARE IN INCHES 2. DIMENSION LIMITS HELD AFTER PLATING 3. REMOVE BURRS & SHARP EDGES .010 MAX 4. MACHINED FILLET RADII .000 TO .015				
Engineer		5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005				
NEXT ASSY Description	NEXT ASSY Number	6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .001 PER INCH. MAX .003 INCHES FOR SINGLE SURFACE.				
DO NOT SCALE DRAWING		7. SURFACE FINISH TO BE 32 MICRON UNLESS OTHERWISE SPECIFIED			PROJECT NUMBER 701312.00	manipulator
					PROJECT ESP 2G	SIZE C
						DWG. NO. 1002451
						REV. D
					CAD FILE: X:\701312 ESP 2G\SolidWorks files\internal structure (1002209)	
					SHEET 1 OF 19	

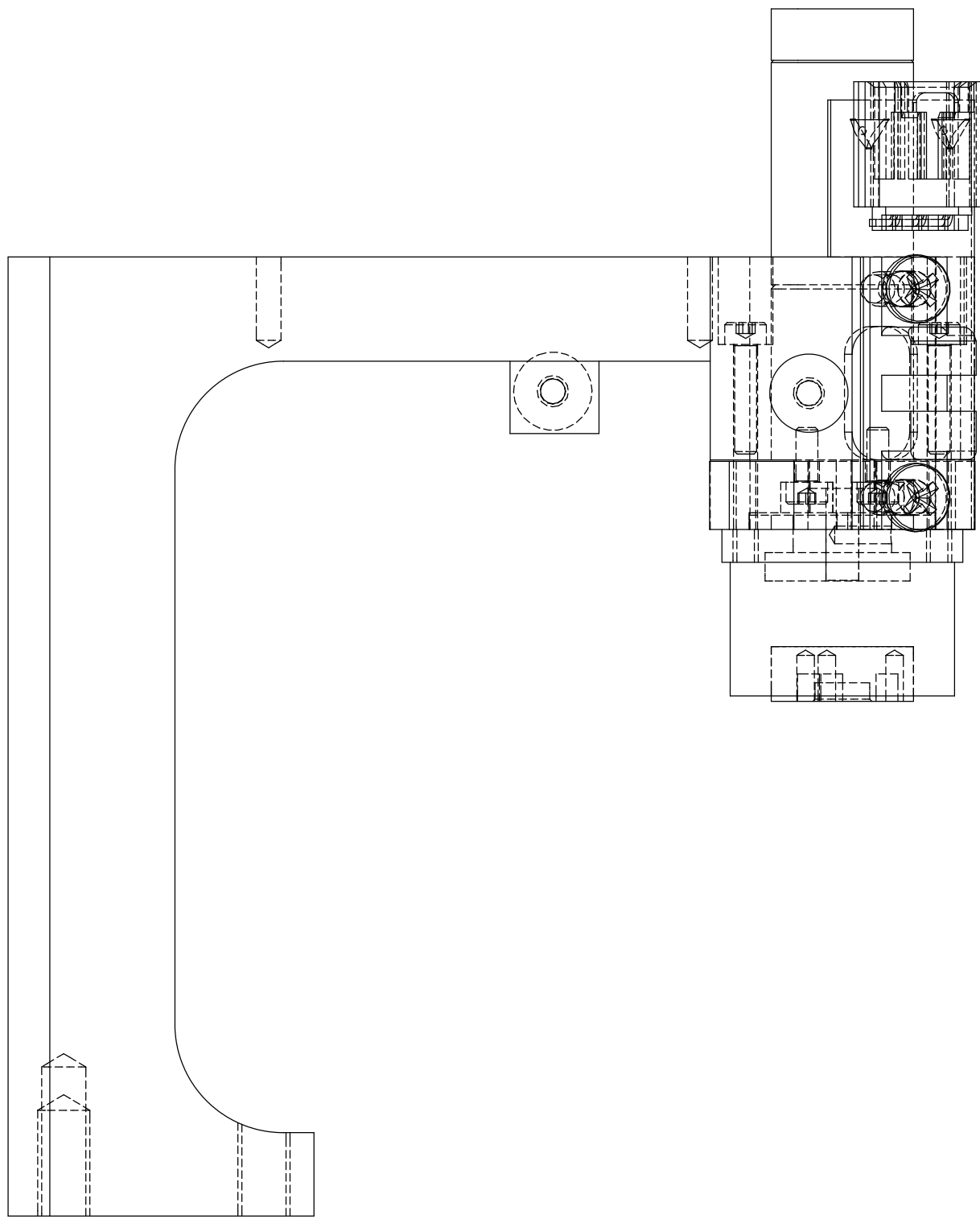
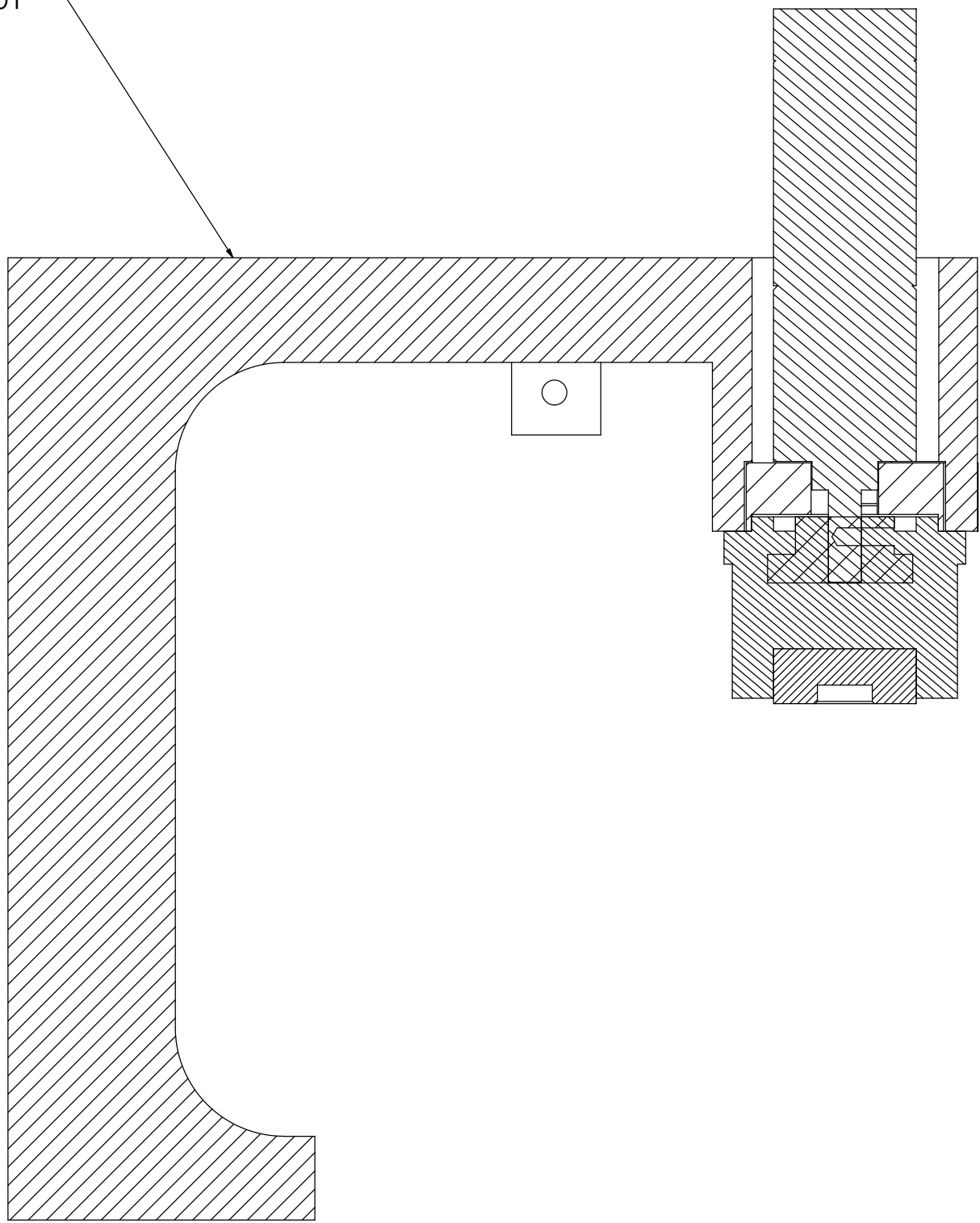


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MANIPULATOR MOUNT - assembly



1002451-01



SECTION A-A

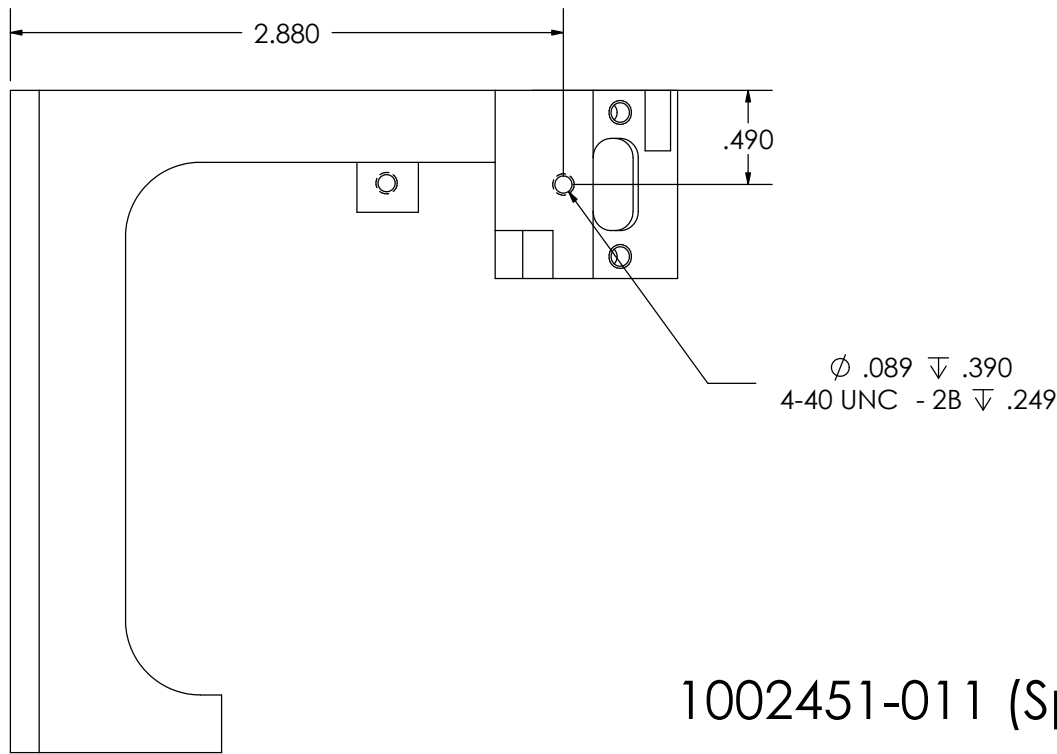
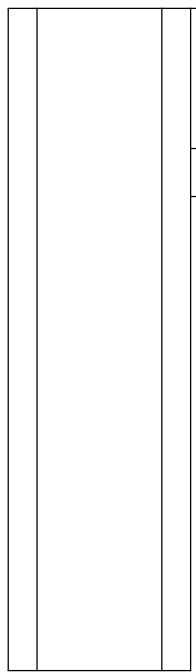
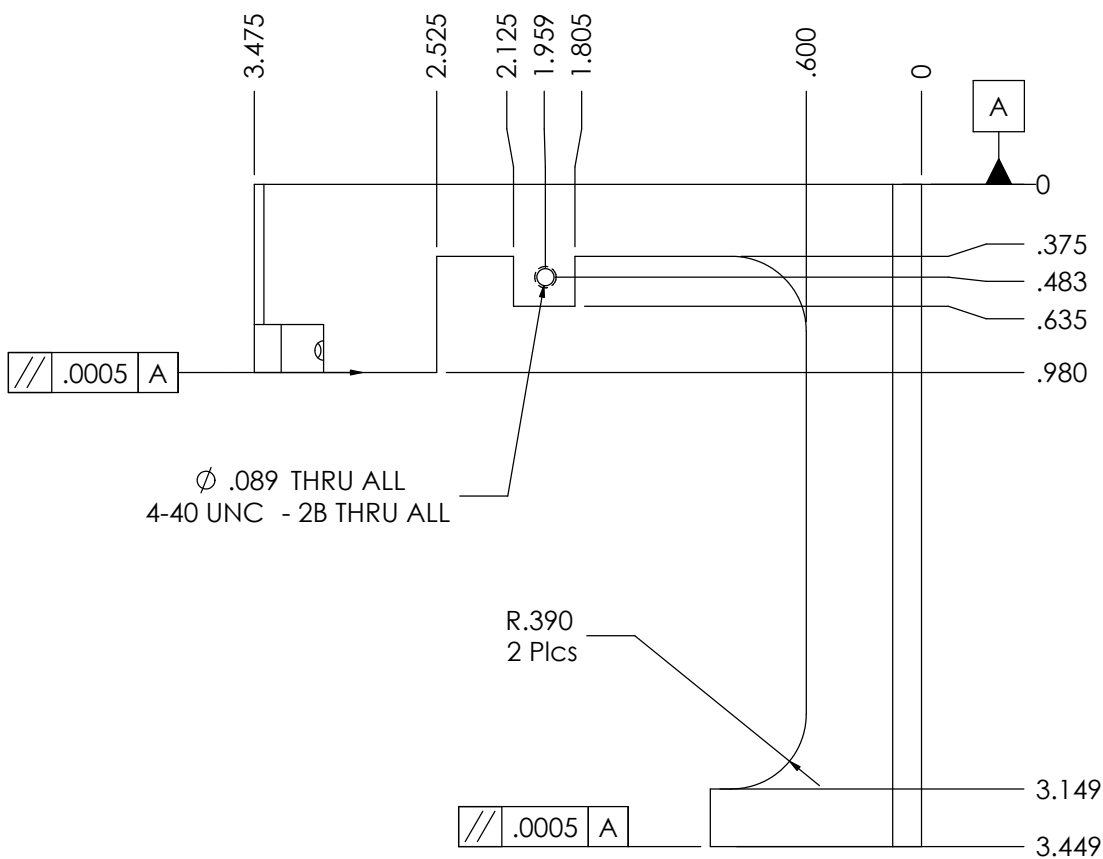
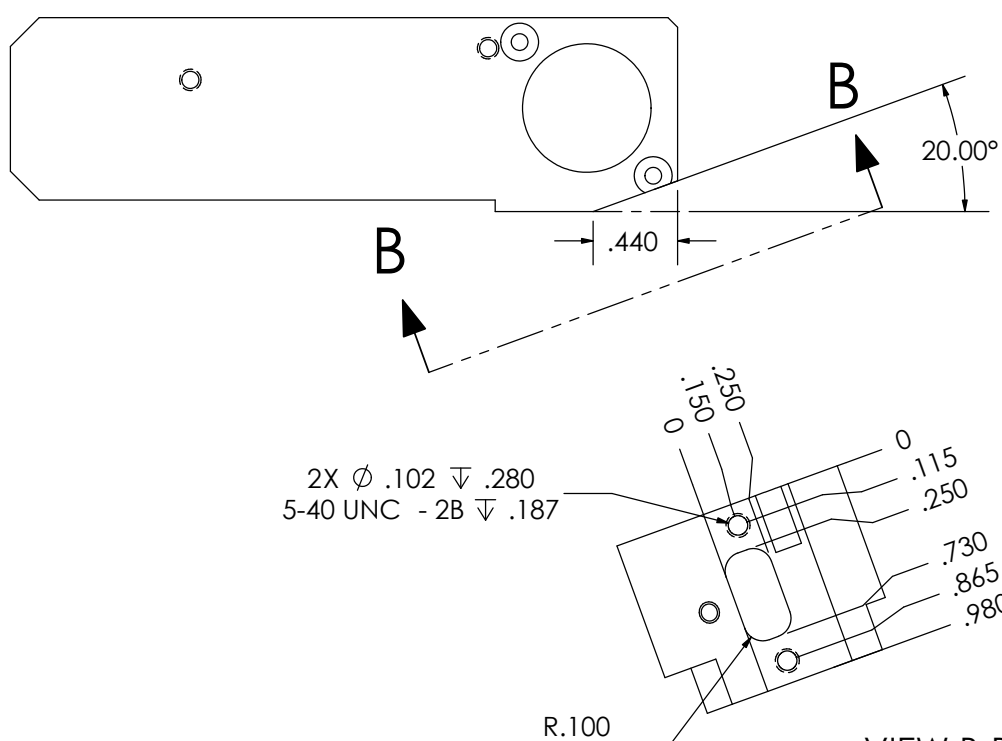
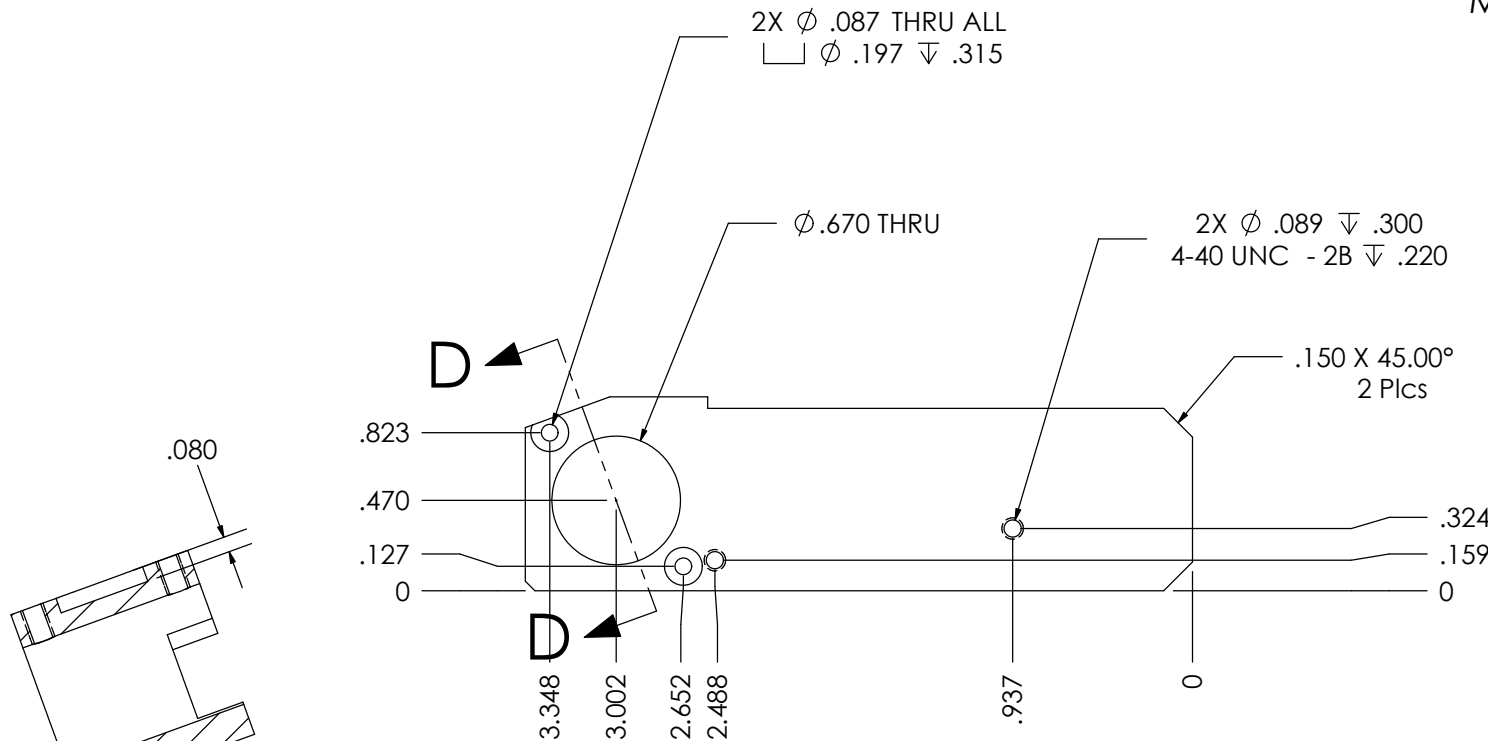
BILL OF MATERIALS					last updated on: Friday, February 10, 2006 8:42:04 AM	
Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:			APPROVALS DATE	
Inspector		2 PLACE DIM ±.01	3 PLACE DIM ±.005	4 PLACE DIM ±.0005	ANGLES ±1°	Monterey Bay Aquarium Research Institute 7700 Sandholdt Road Moss Landing, CA 95039 
Shop Foreman		1. DIMENSIONS ARE IN INCHES 2. DIMENSION LIMITS HELD AFTER PLATING 3. REMOVE BURRS & SHARP EDGES .010 MAX 4. MACHINED FILLET RADII .000 TO .015 5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005 6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .001 PER INCH. MAX. .003 INCHES FOR SINGLE SURFACE. 7. SURFACE FINISH TO BE 32 MICRON UNLESS OTHERWISE SPECIFIED				
Engineer						
NEXT ASSY Description	NEXT ASSY Number					
DO NOT SCALE DRAWING		PROJECT NUMBER 701312.00			manipulator	
		PROJECT ESP 2G			SIZE C	DWG. NO. 1002451
		CAD FILE: X:\701312 ESP 2G\SolidWorks files\internal structure (1002209)			REV. D	
					SHEET 2 OF 19	

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1002451-001 MANIPULATOR MOUNT

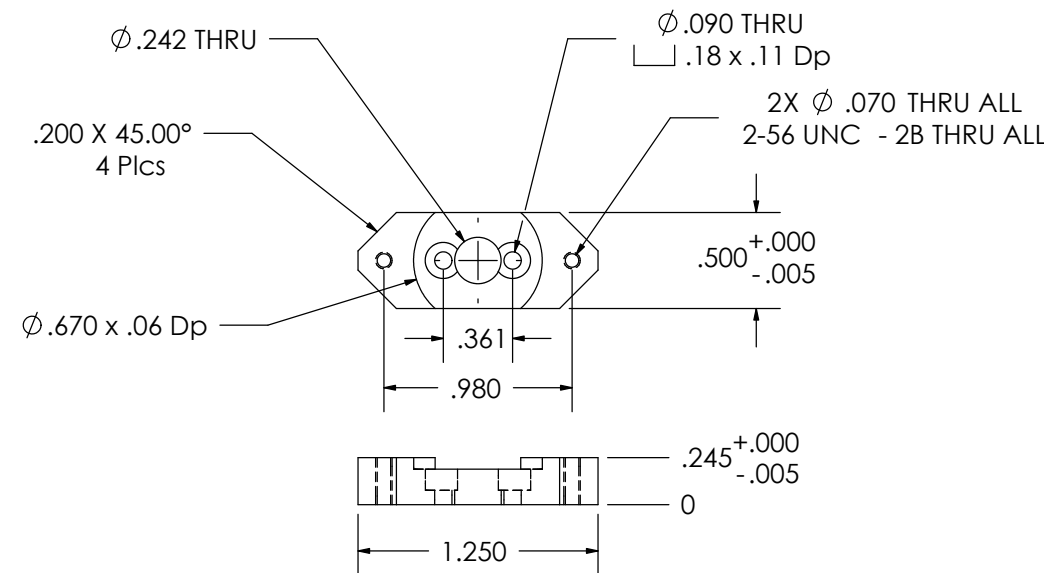
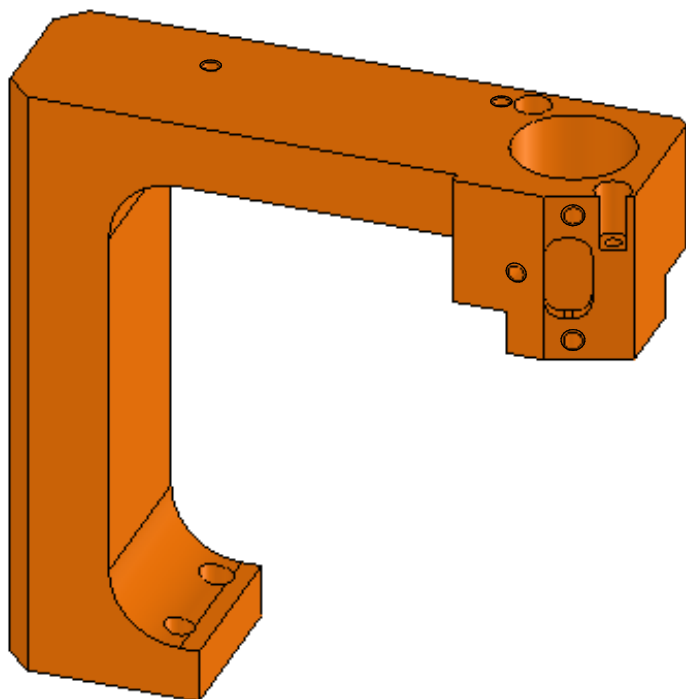
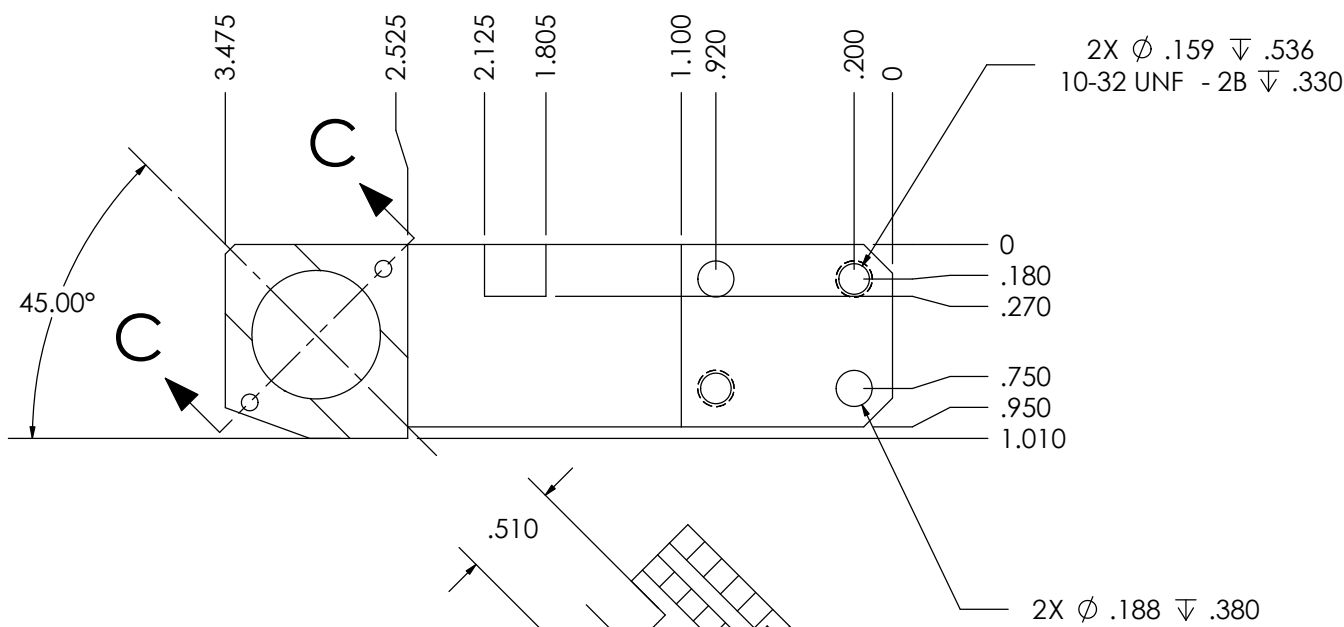
Material: 6061-T6

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
-	D	Through hole and slot for new mount scheme	02/09/06	-



1002451-011 (Spacer)

Material: 6061-T6



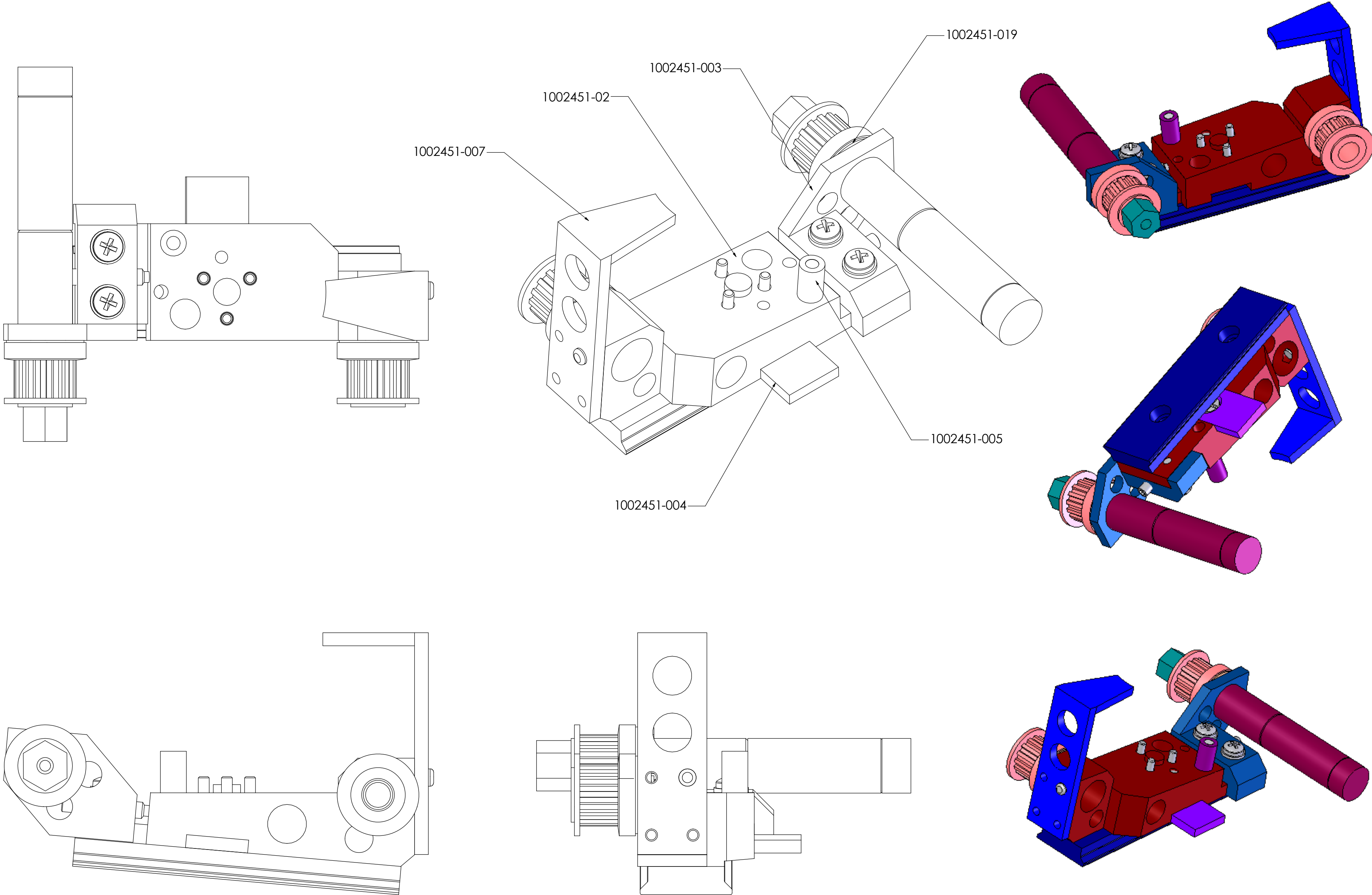
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2	1002451-011			1

Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:		APPROVALS	DATE
Inspector		2 PLACE DIM ±.01	3 PLACE DIM ±.005	4 PLACE DIM ±.0005	ANGLES ±1°
Shop Foreman		1. DIMENSIONS ARE IN INCHES		ENGINEER Jason Feldman 831-775-1837	
Engineer		2. DIMENSION LIMITS HELD AFTER PLATING		CHECKED	
NEXT ASSY Description		3. REMOVE BURRS & SHARP EDGES .010 MAX		PROJECT NUMBER 701312.00	
NEXT ASSY Number		4. MACHINED FILLET RADII .000 TO .015		PROJECT ESP 2G	
DO NOT SCALE DRAWING		5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005		SIZE C	
		6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .001 PER INCH. MAX. .003 INCHES FOR SINGLE SURFACE.		DWG. NO. 1002451	
		7. SURFACE FINISH TO BE 32 MICRON UNLESS OTHERWISE SPECIFIED		REV. D	

last updated on: Friday, February 10, 2006 8:42:04 AM	
Monterey Bay Aquarium Research Institute 7700 Sandholdt Road Moss Landing, CA 95039	
manipulator	
SHEET 3 OF 19	

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MANIPULATOR TOP - assembly

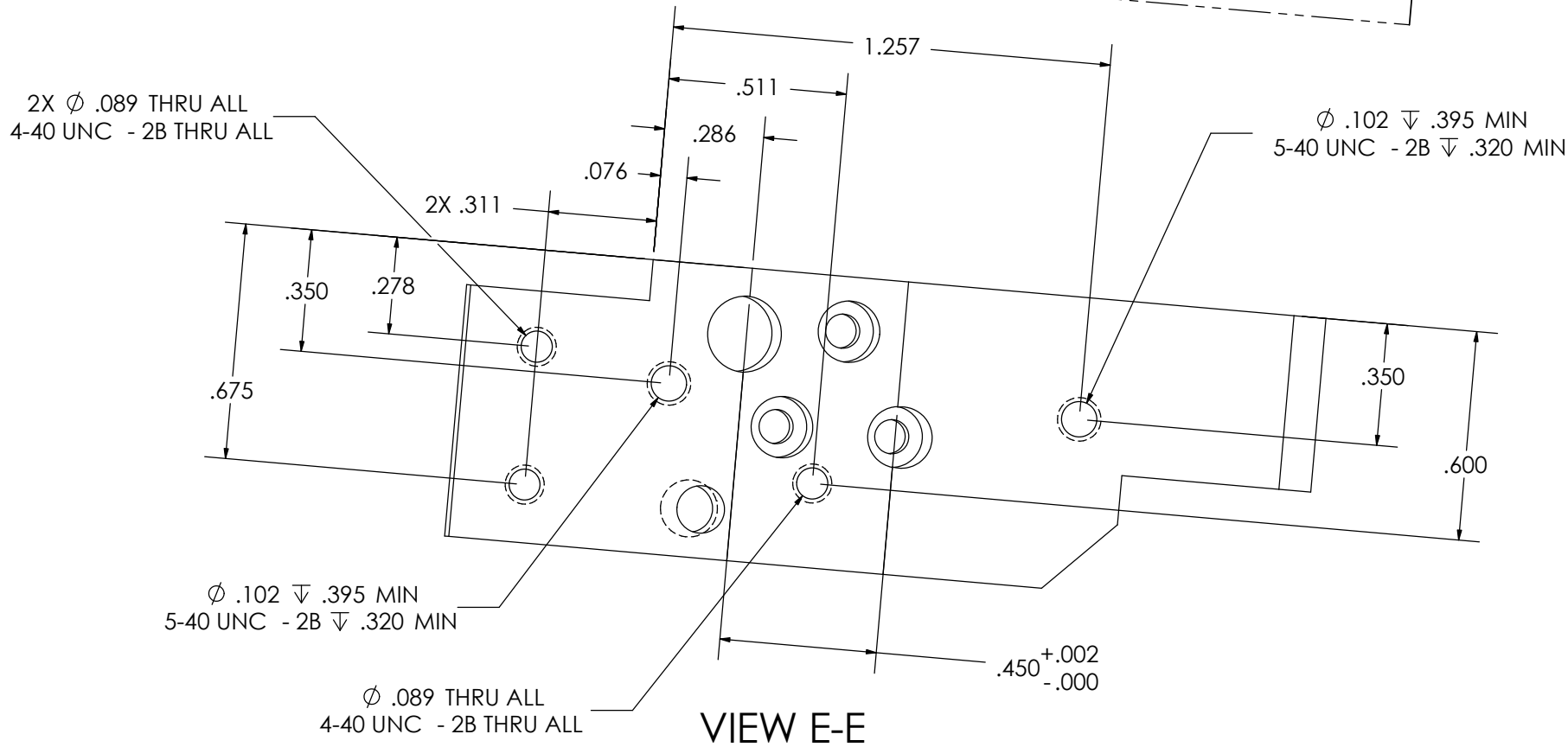
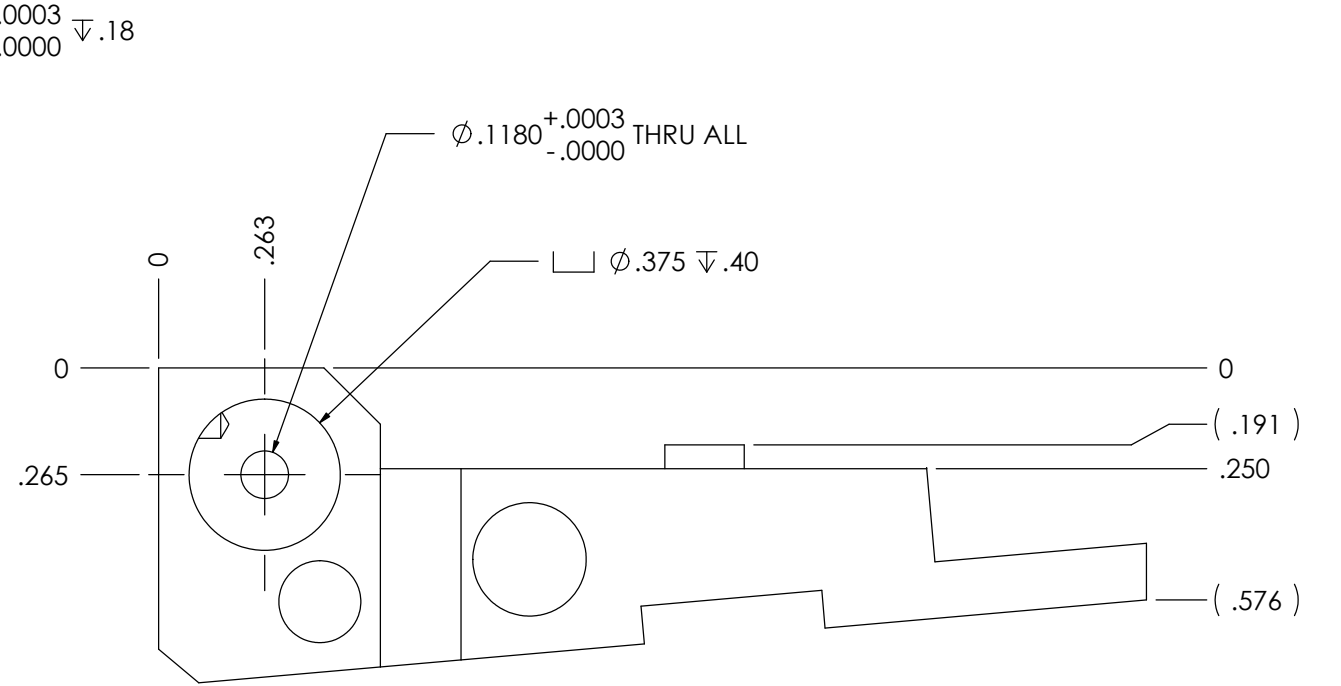
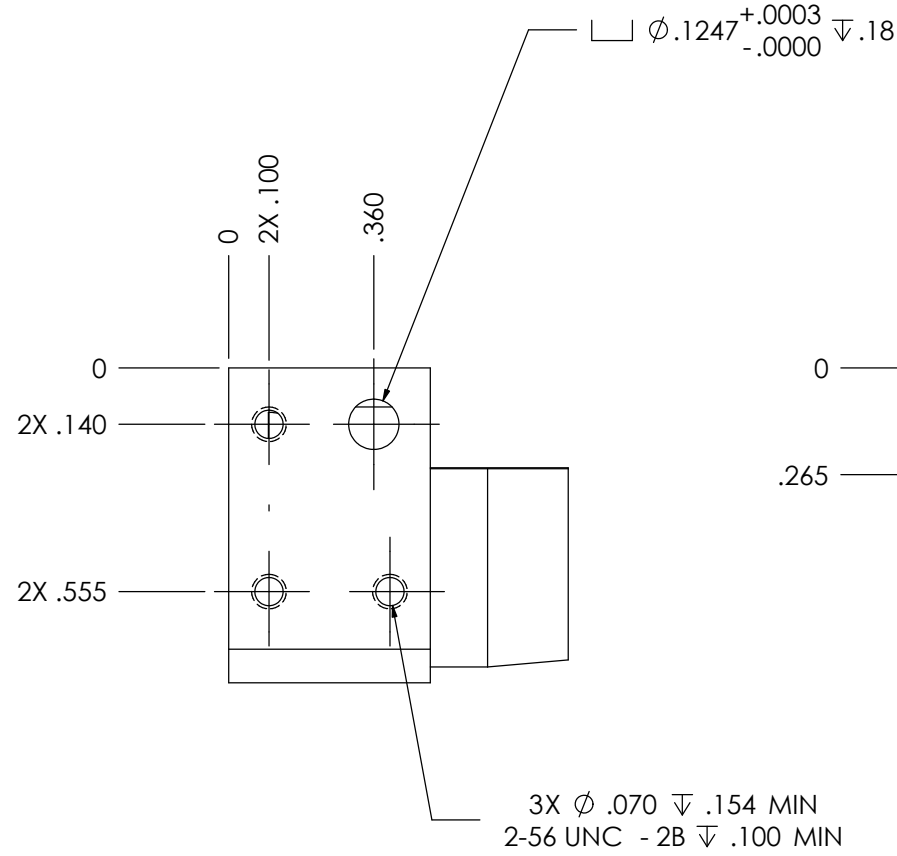
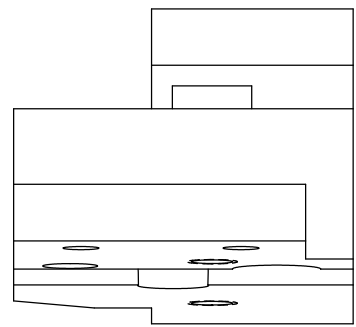
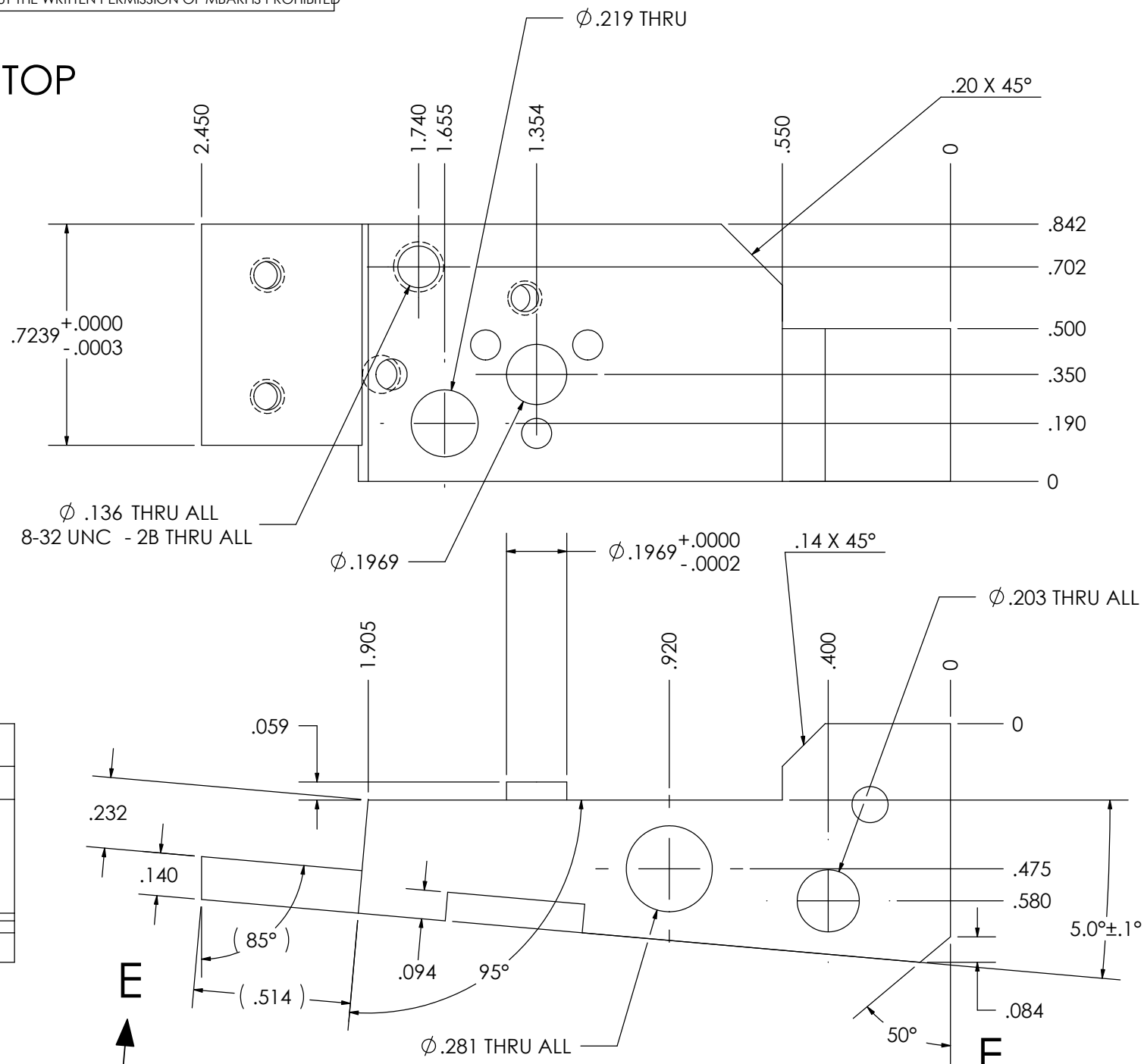


BILL OF MATERIALS						last updated on: Friday, February 10, 2006 8:42:04 AM	
Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:				APPROVALS DATE	
Inspector		2 PLACE DIM ±.01	3 PLACE DIM ±.005	4 PLACE DIM ±.0005	ANGLES ±1°	ENGINEER Jason Feldman 831-775-1837	
Shop Foreman		1. DIMENSIONS ARE IN INCHES 2. DIMENSION LIMITS HELD AFTER PLATING 3. REMOVE BURRS & SHARP EDGES .010 MAX 4. MACHINED FILLET RADII .000 TO .015 5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005 6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .001 PER INCH. MAX .003 INCHES FOR SINGLE SURFACE. 7. SURFACE FINISH TO BE 32 MICRON UNLESS OTHERWISE SPECIFIED				CHECKED	
Engineer						PROJECT NUMBER 701312.00	
NEXT ASSY Description	NEXT ASSY Number					PROJECT ESP 2G	
DO NOT SCALE DRAWING						CAD FILE: X:\701312 ESP 2G\SolidWorks files\internal structure (1002209)	
						Monterey Bay Aquarium Research Institute 7700 Sandholdt Road Moss Landing, CA 95039	
						manipulator	
						SIZE C	DWG. NO. 1002451
						REV. D	

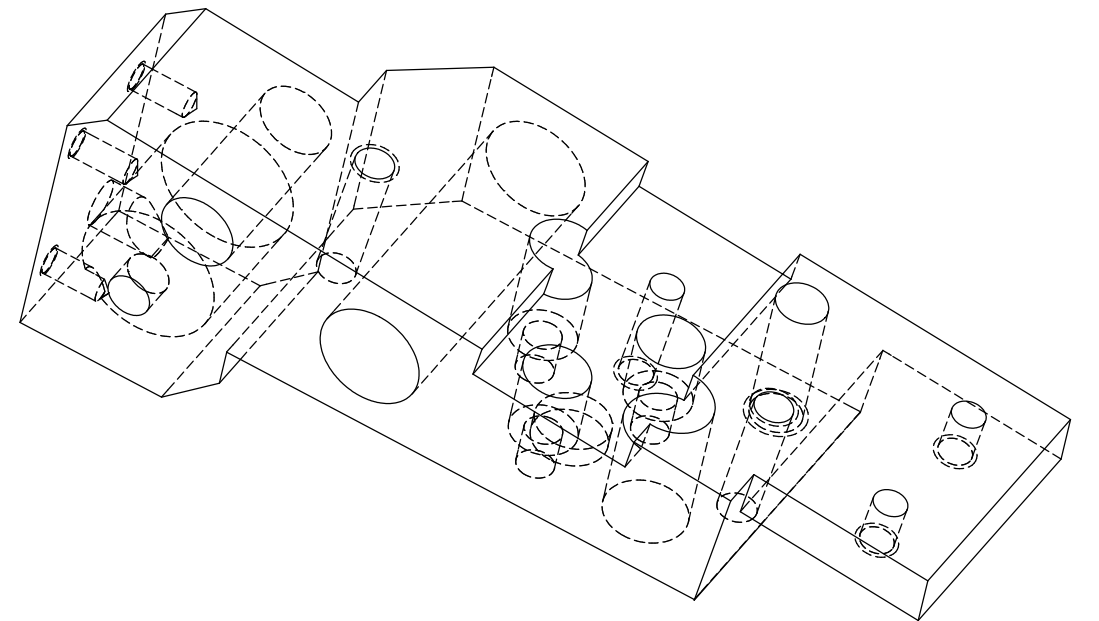
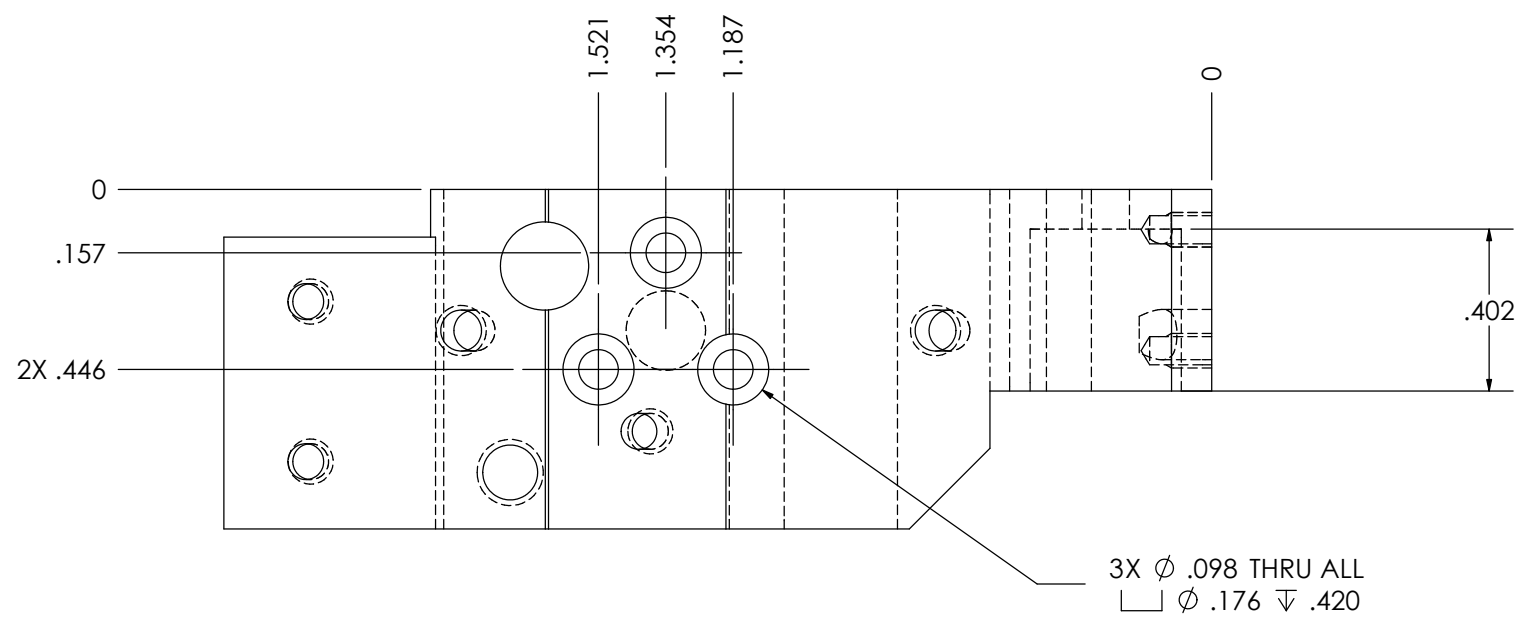


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1002451-002 MANIPULATOR TOP



VIEW E-E



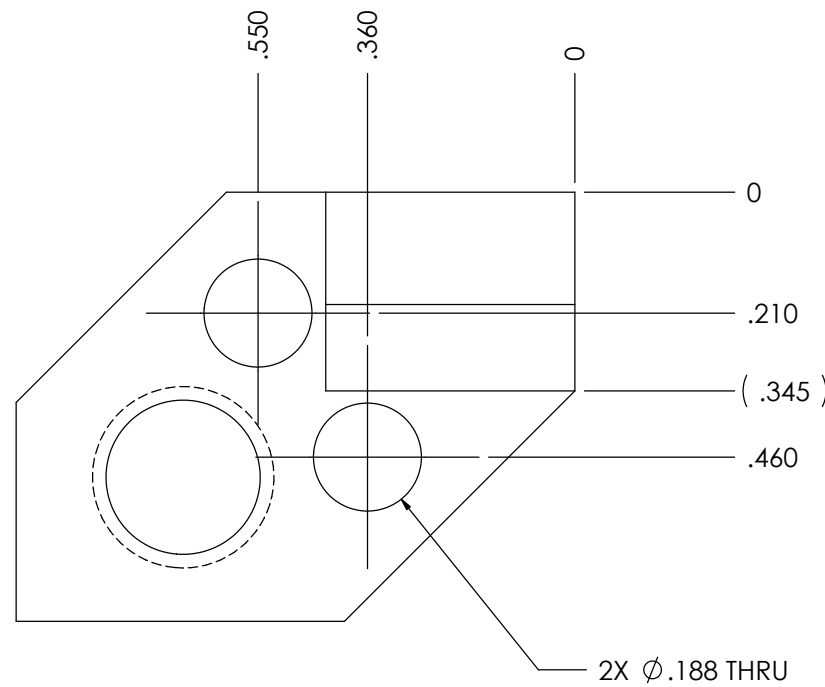
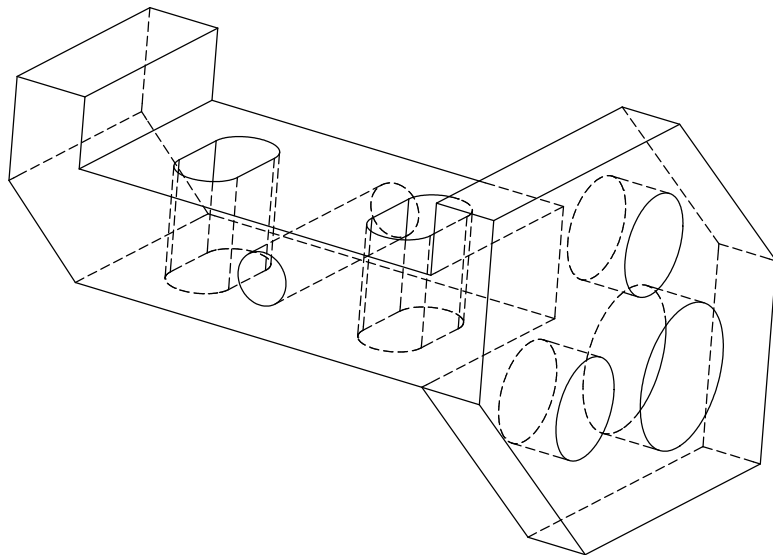
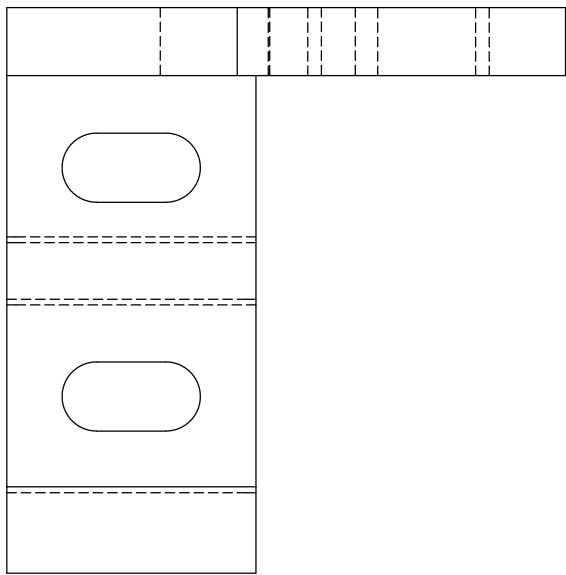
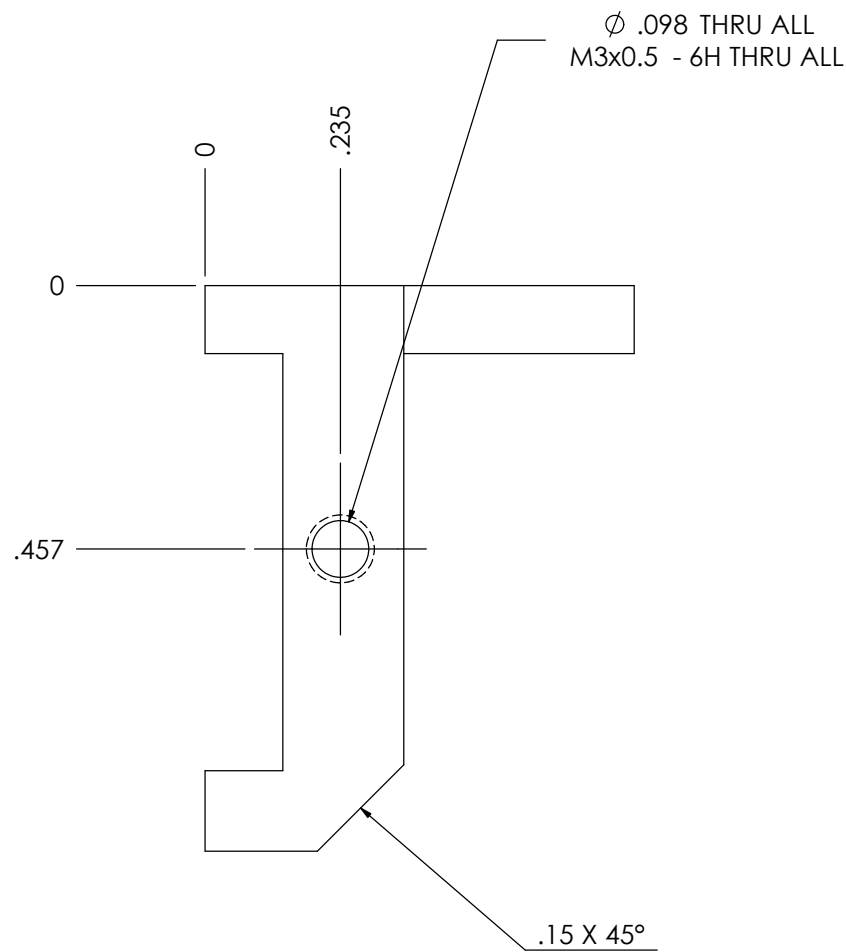
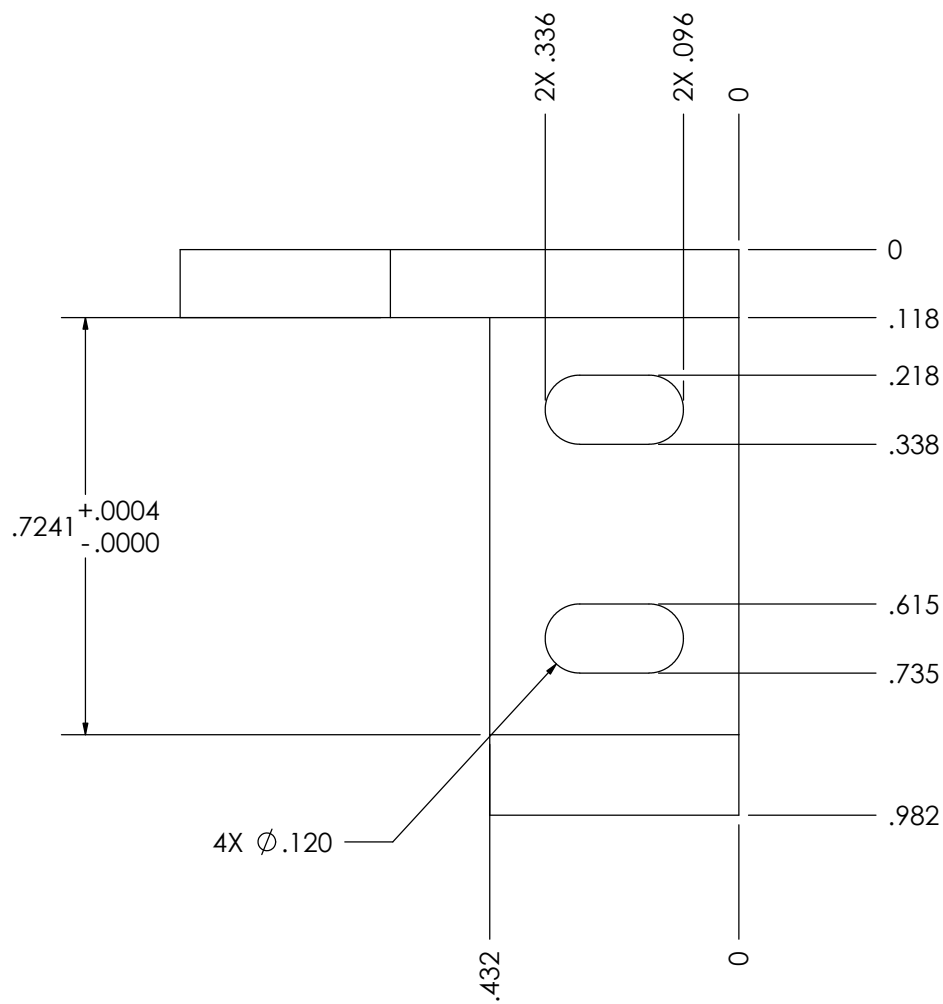
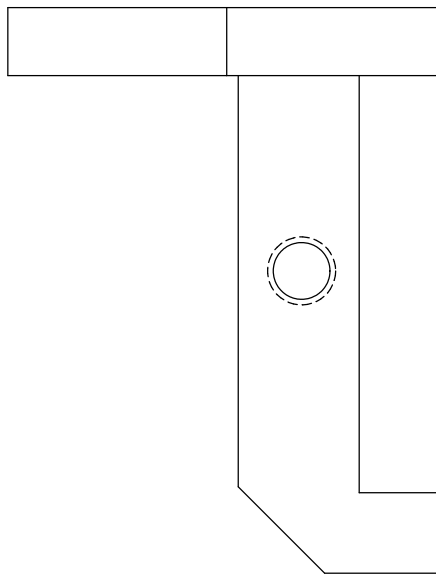
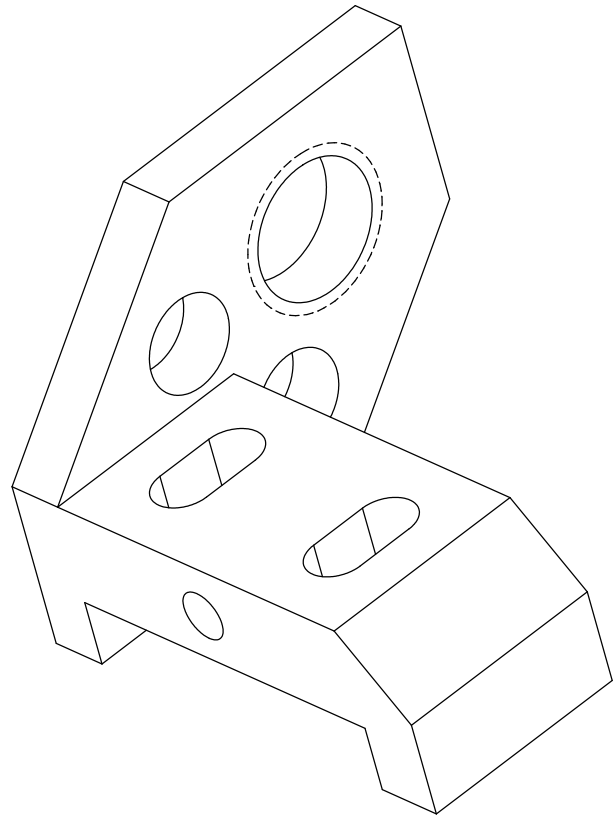
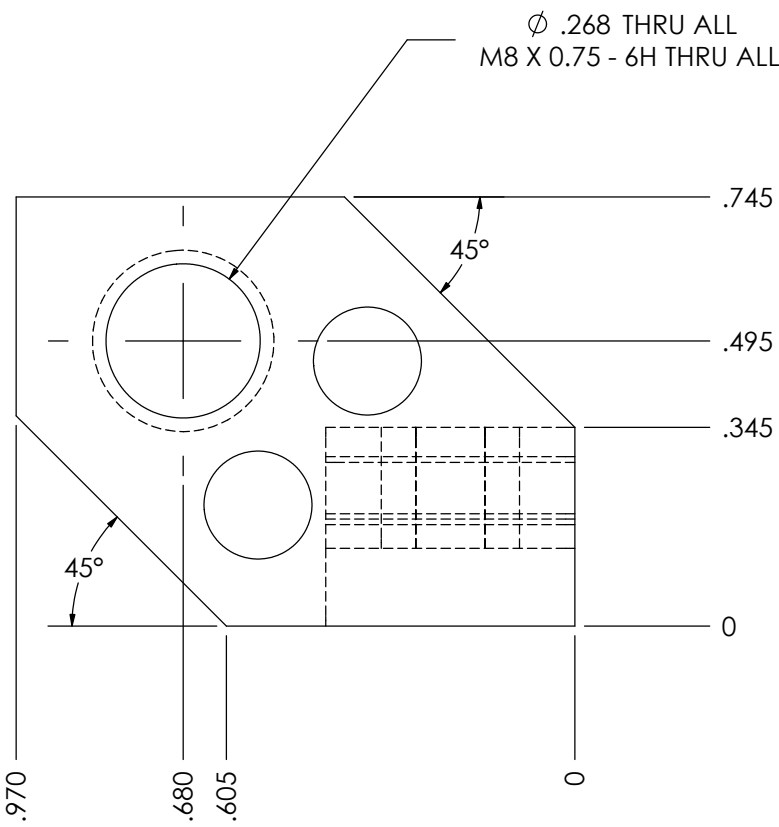
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
2	1002451-002	manipulator top	7075-T6 or -T651 Aluminum	1

BILL OF MATERIALS				last updated on: Friday, February 10, 2006 8:42:04 AM	
Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:		APPROVALS DATE	
Inspector		2 PLACE DIM ±.01 3 PLACE DIM ±.005 4 PLACE DIM ±.0005 ANGLES ±1°		ENGINEER Jason Feldman 831-775-1837	
Shop Foreman		1. DIMENSIONS ARE IN INCHES 2. DIMENSION LIMITS HELD AFTER PLATING 3. REMOVE BURRS & SHARP EDGES .010 MAX 4. MACHINED FILLET RADII .000 TO .015 5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005		CHECKED PROJECT NUMBER 701312.00	
Engineer		6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .001 PER INCH. MAX .003 INCHES FOR SINGLE SURFACE. 7. SURFACE FINISH TO BE 32 MICRON UNLESS OTHERWISE SPECIFIED		7700 Sandholdt Road Moss Landing, CA 95039	
NEXT ASSY Description	NEXT ASSY Number	PROJECT		SIZE C DWG. NO. 1002451	
DO NOT SCALE DRAWING		PROJECT		REV. D	
		CAD FILE: X:\701312 ESP 2G\SolidWorks files\internal structure (1002209)		SHEET 5 OF 19	



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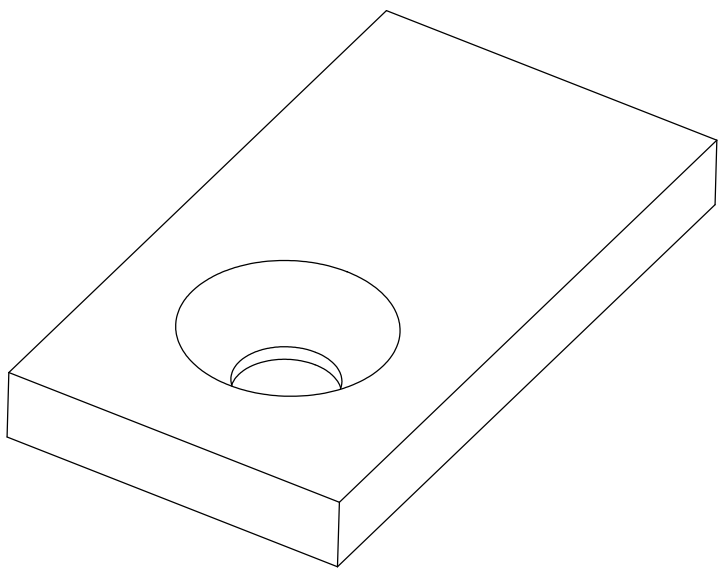
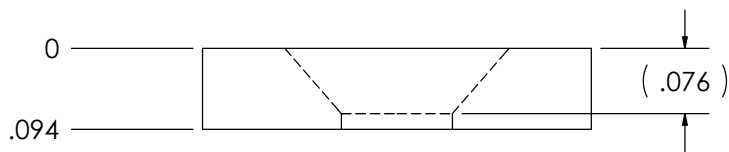
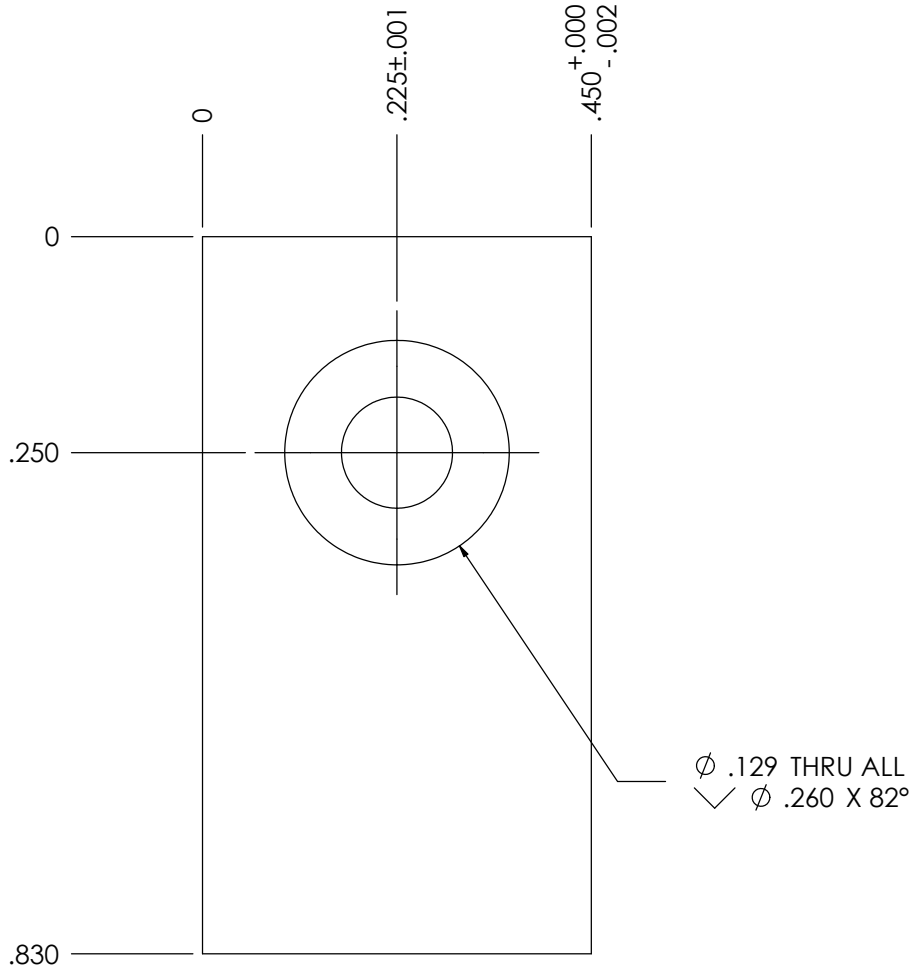
1002451-003
MANIPULATOR BELT TENSIONER



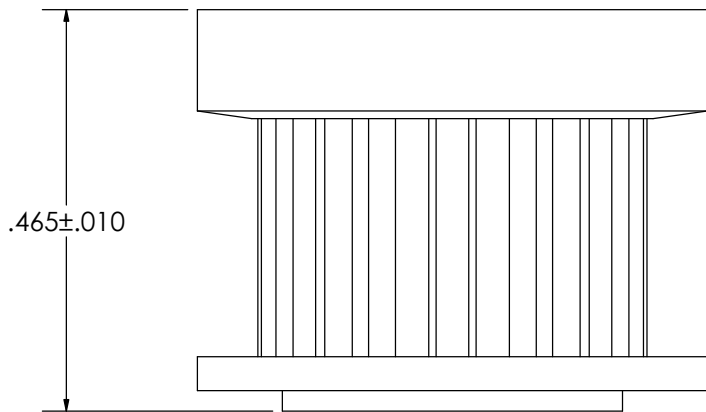
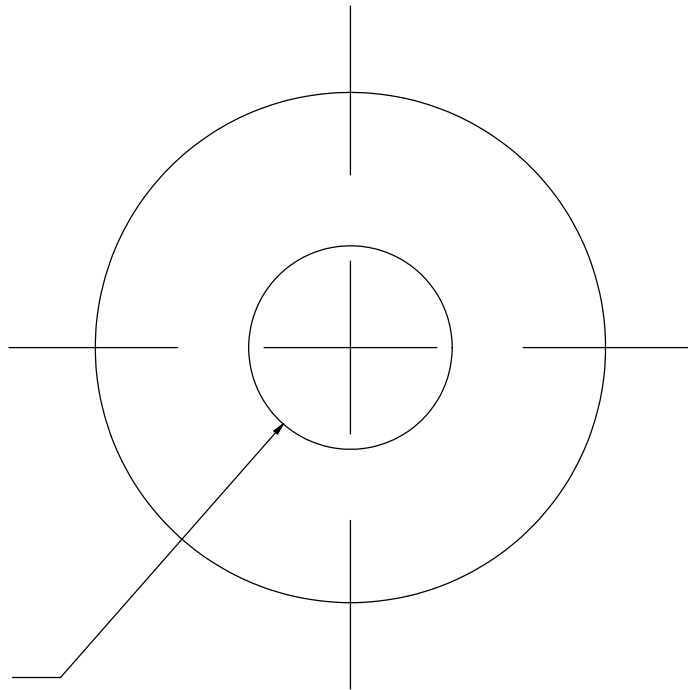
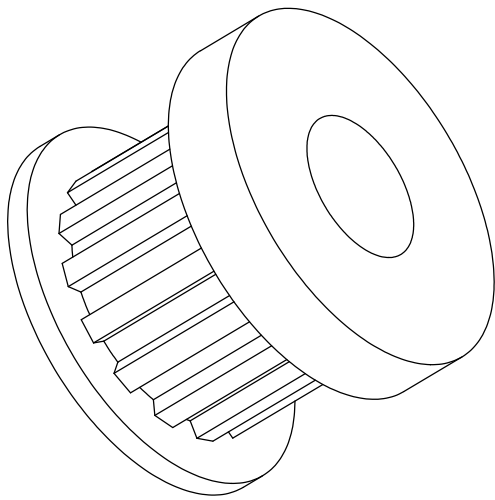
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3		1002451-003		manipulator belt tensioner		7075-T6 or -T651 Aluminum		1			
BILL OF MATERIALS							last updated on Friday, February 10, 2006 8:42:04 AM				
Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:			APPROVALS		DATE		Monterey Bay Aquarium Research Institute 7700 Sandholdt Road Moss Landing, CA 95039 		
Inspector		2 PLACE DIM ±.01	3 PLACE DIM ±.005	4 PLACE DIM ±.0005	ANGLES ±1°	ENGINEER Jason Feldman 831-775-1837					
Shop Foreman		1. DIMENSIONS ARE IN INCHES 2. DIMENSION LIMITS HELD AFTER PLATING 3. REMOVE BURRS & SHARP EDGES .010 MAX 4. MACHINED FILLET RADII .000 TO .015 5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005 6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .001 PER INCH. MAX .003 INCHES FOR SINGLE SURFACE. 7. SURFACE FINISH TO BE 32 MICRON UNLESS OTHERWISE SPECIFIED				CHECKED					
Engineer						PROJECT NUMBER 701312.00		manipulator			
NEXT ASSY Description	NEXT ASSY Number					PROJECT ESP 2G		SIZE C			DWG. NO. 1002451
DO NOT SCALE DRAWING						CAD FILE: X:\701312 ESP 2G\SolidWorks files\internal structure (1002209)		SHEET 6 OF 19			

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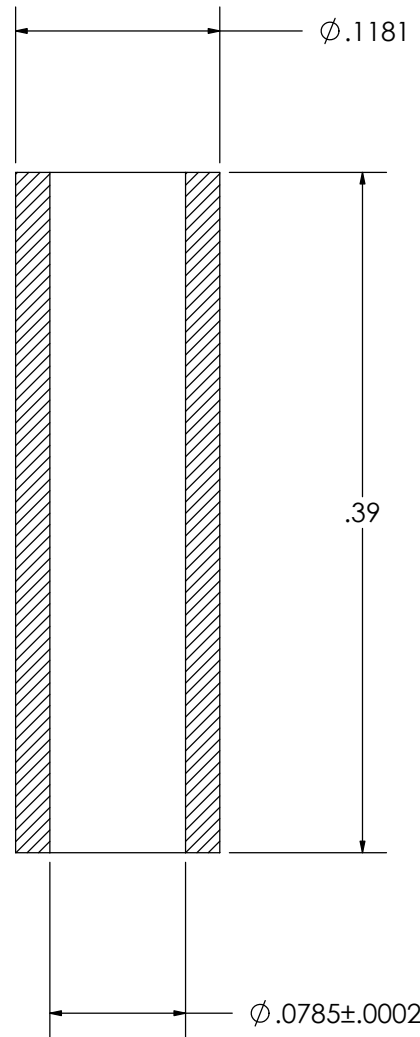
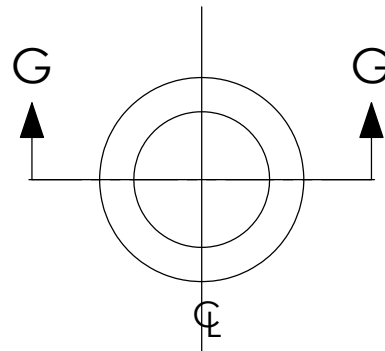
1002451-004
MANIPULATOR SLIDE HALL FLAG



Brecoflex T2.5X6-15
(modification)



1002451-006
MANIPULATOR BORE REDUCER



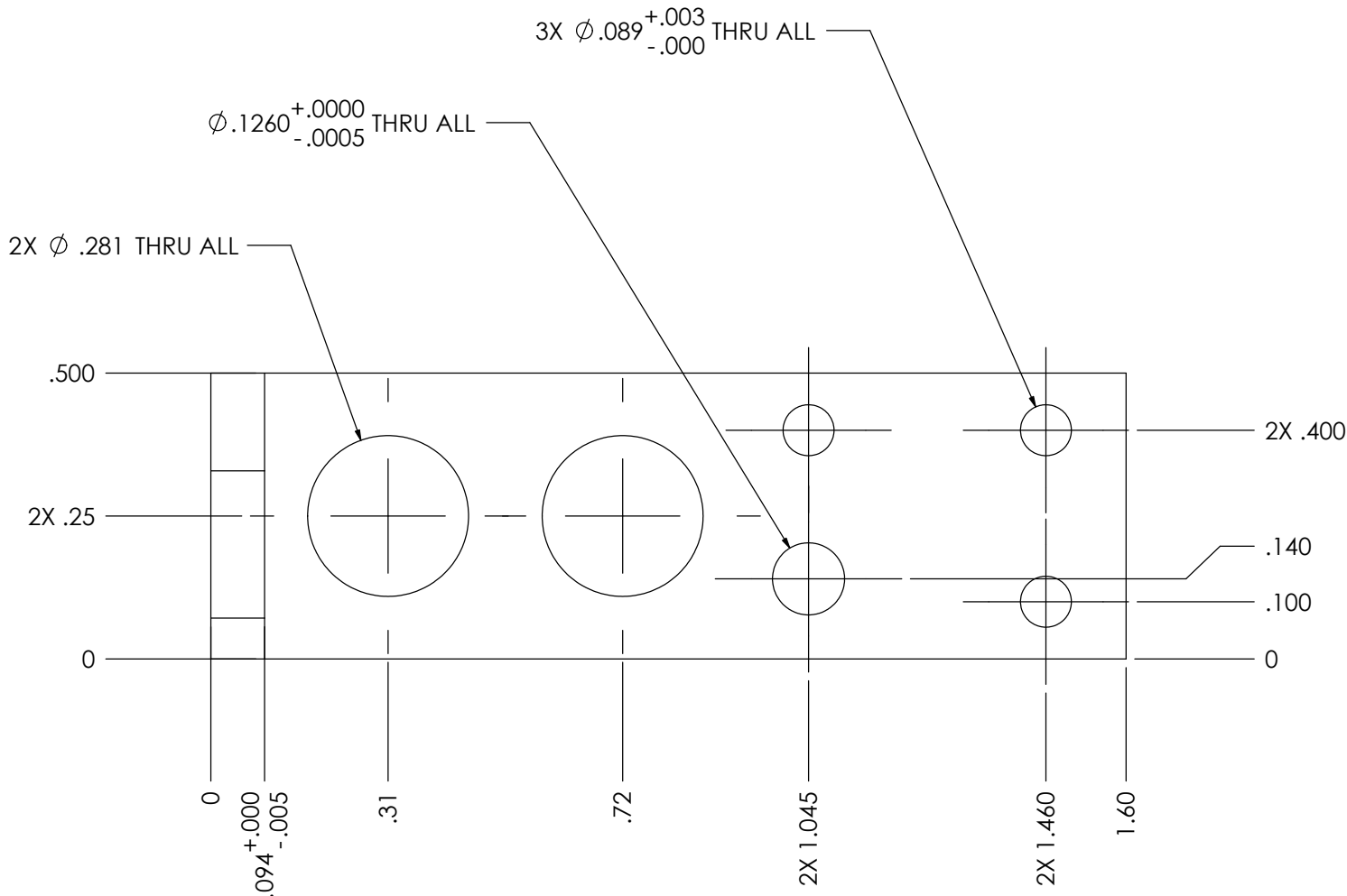
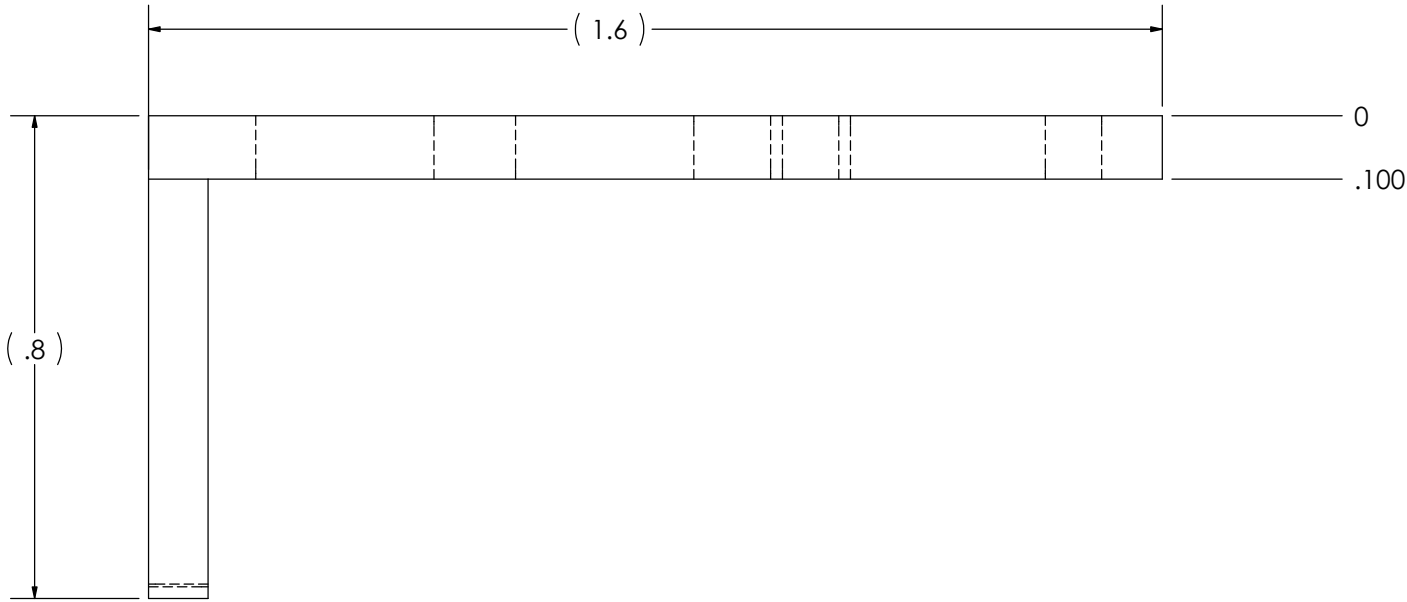
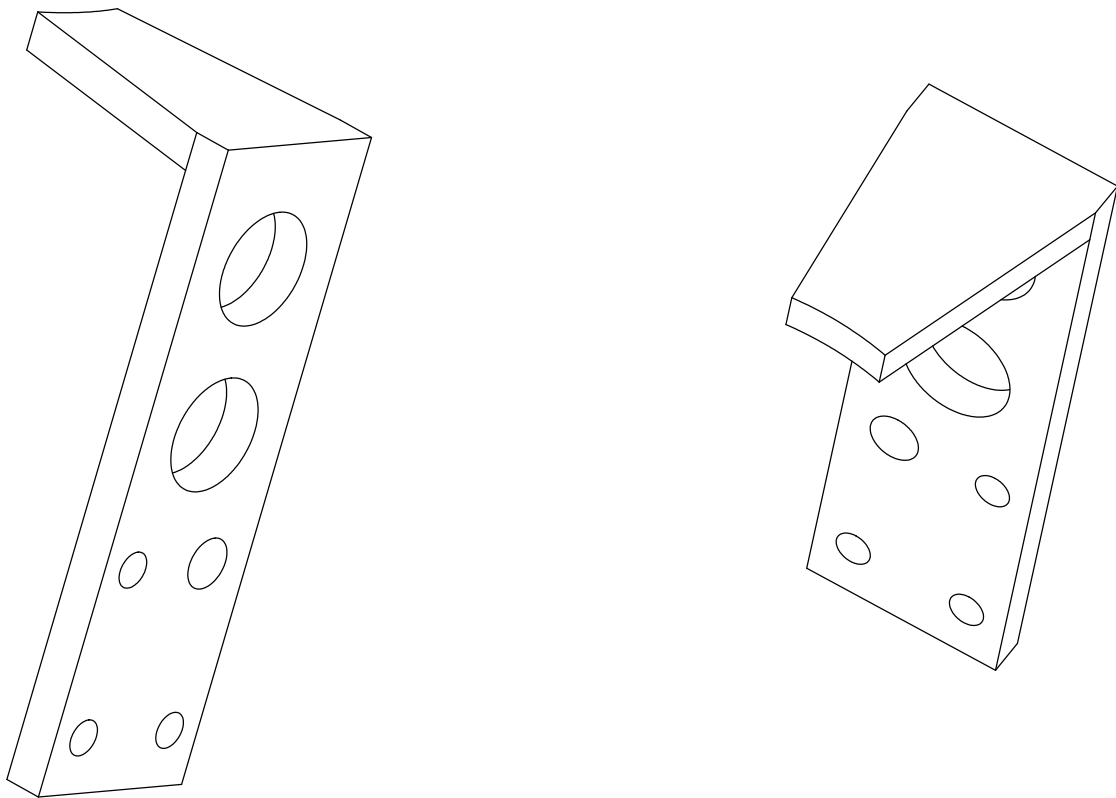
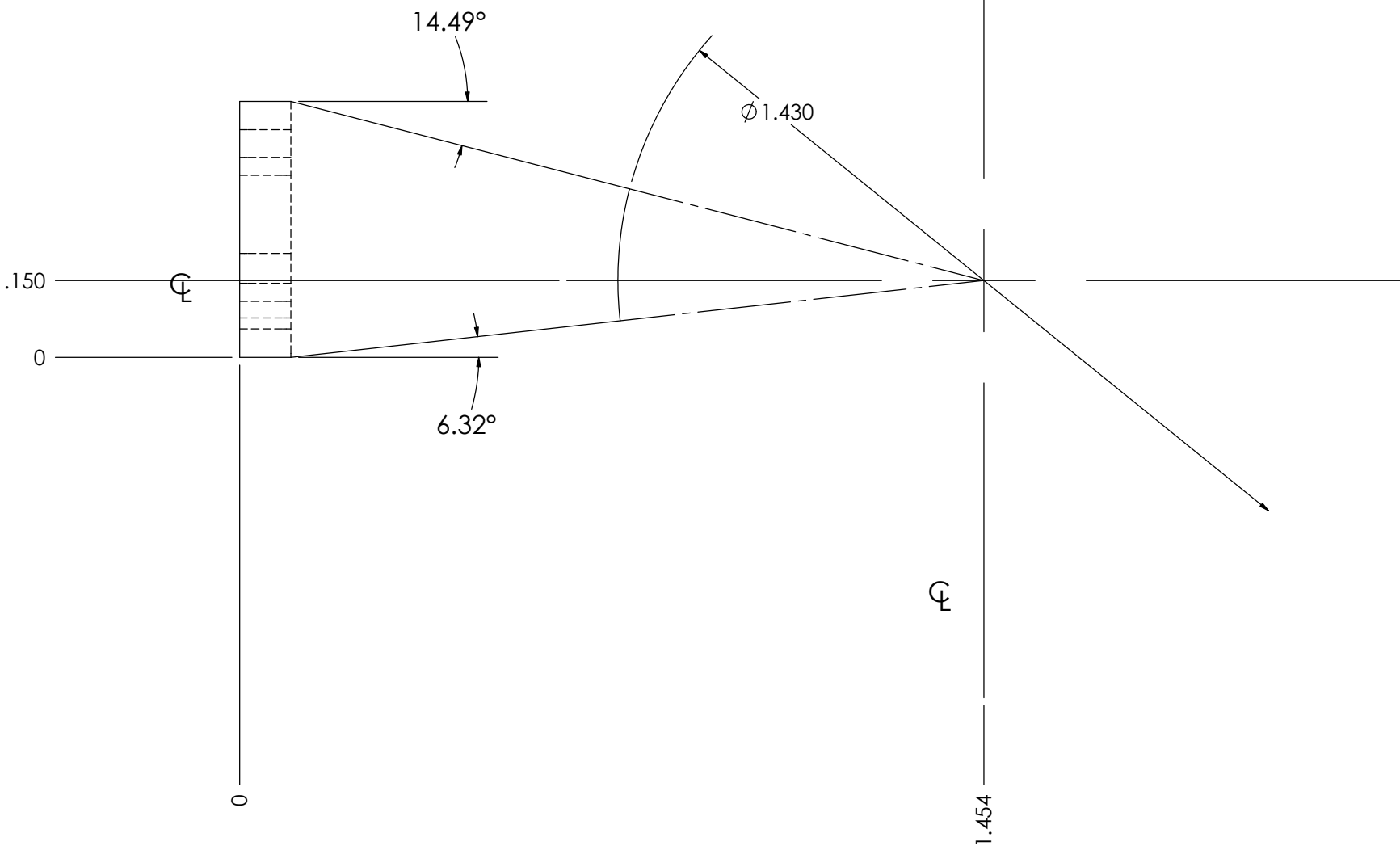
SECTION G-G

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
4	1002451-004	manipulator slide flag	430-F Stainless steel	1
6	1002451-006	manipulator bore reducer	Brass	3

BILL OF MATERIALS				last updated on: Friday, February 10, 2006 8:42:04 AM	
Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:		APPROVALS DATE	Monterey Bay Aquarium Research Institute 7700 Sandholdt Road Moss Landing, CA 95039 
Inspector		2 PLACE DIM ±.01	3 PLACE DIM ±.005	ENGINEER Jason Feldman 831-775-1837	
Shop Foreman		1. DIMENSIONS ARE IN INCHES 2. DIMENSION LIMITS HELD AFTER PLATING 3. REMOVE BURRS & SHARP EDGES .010 MAX 4. MACHINED FILLET RADII .000 TO .015		CHECKED	
Engineer		5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005			
NEXT ASSY Description		6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .001 PER INCH. MAX .003 INCHES FOR SINGLE SURFACE.		PROJECT NUMBER 701312.00	
NEXT ASSY Number		7. SURFACE FINISH TO BE 32 MICRON UNLESS OTHERWISE SPECIFIED		PROJECT ESP 2G	
DO NOT SCALE DRAWING				SIZE C	
				DWG. NO. 1002451	
				REV. D	
CAD FILE: X:\701312 ESP 2G\SolidWorks files\internal structure (1002209)				SHEET 7 OF 19	

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1002451-007
MANIPULATOR MAIN HALL FLAG



ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
7	1002451-007	manipulator main hall flag	430-F Stainless Steel	1
BILL OF MATERIALS			last updated on: Friday, February 10, 2006 8:42:04 AM	
Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:		
Inspector		2 PLACE DIM ±.01	3 PLACE DIM ±.005	4 PLACE DIM ±.0005
Shop Foreman		ANGLES ±1°	APPROVALS DATE	
Engineer		ENGINEER Jason Feldman 831-775-1837		
		CHECKED		
		PROJECT NUMBER 701312.00		
NEXT ASSY Description	NEXT ASSY Number	PROJECT ESP 2G		
		SIZE C		
		DWG. NO. 1002451		
		REV. D		
DO NOT SCALE DRAWING		CAD FILE: X:\701312 ESP 2G\SolidWorks files\internal structure (1002209)		

Monterey Bay Aquarium Research Institute

7700 Sandholdt Road
Moss Landing, CA
95039

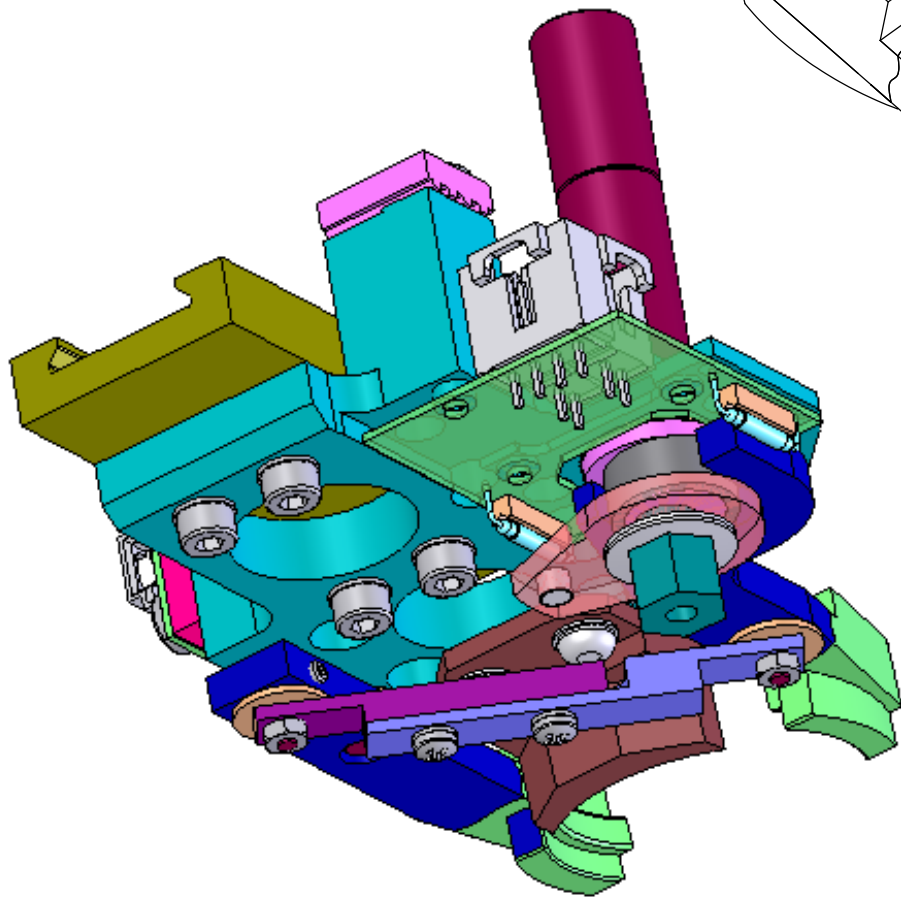
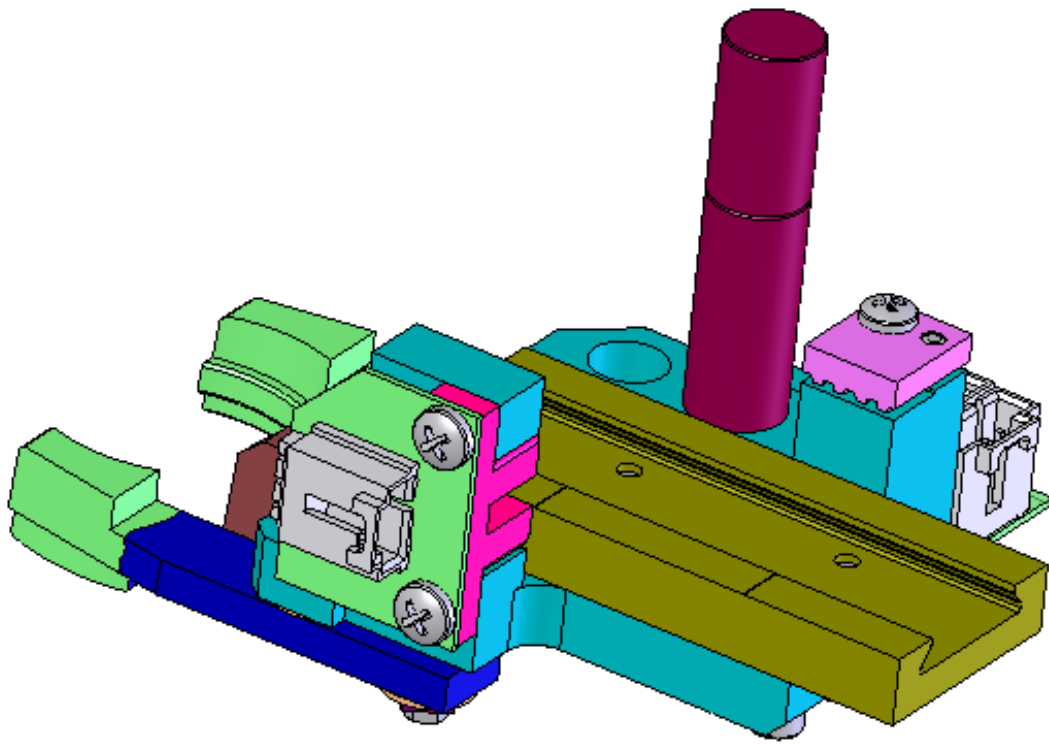
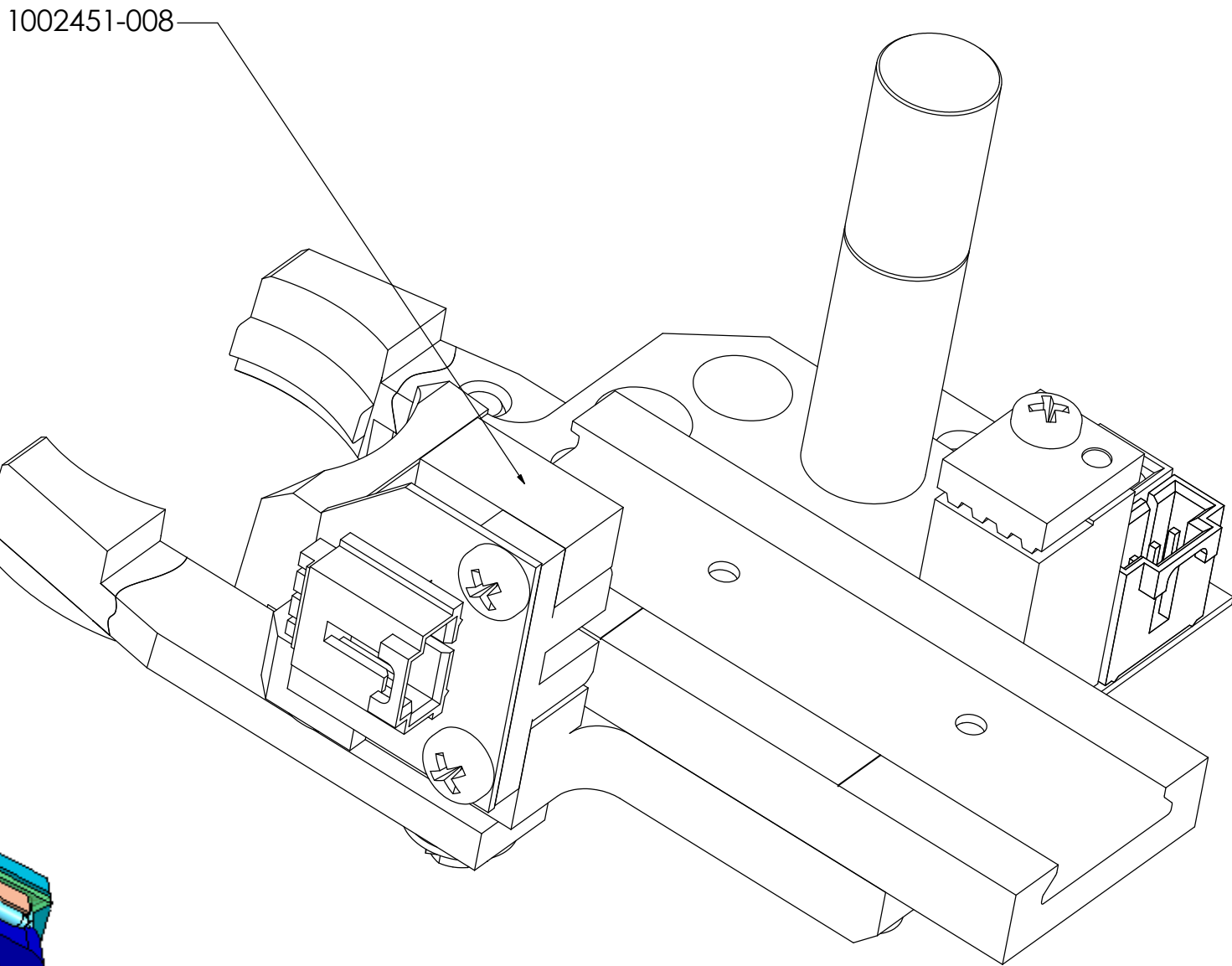
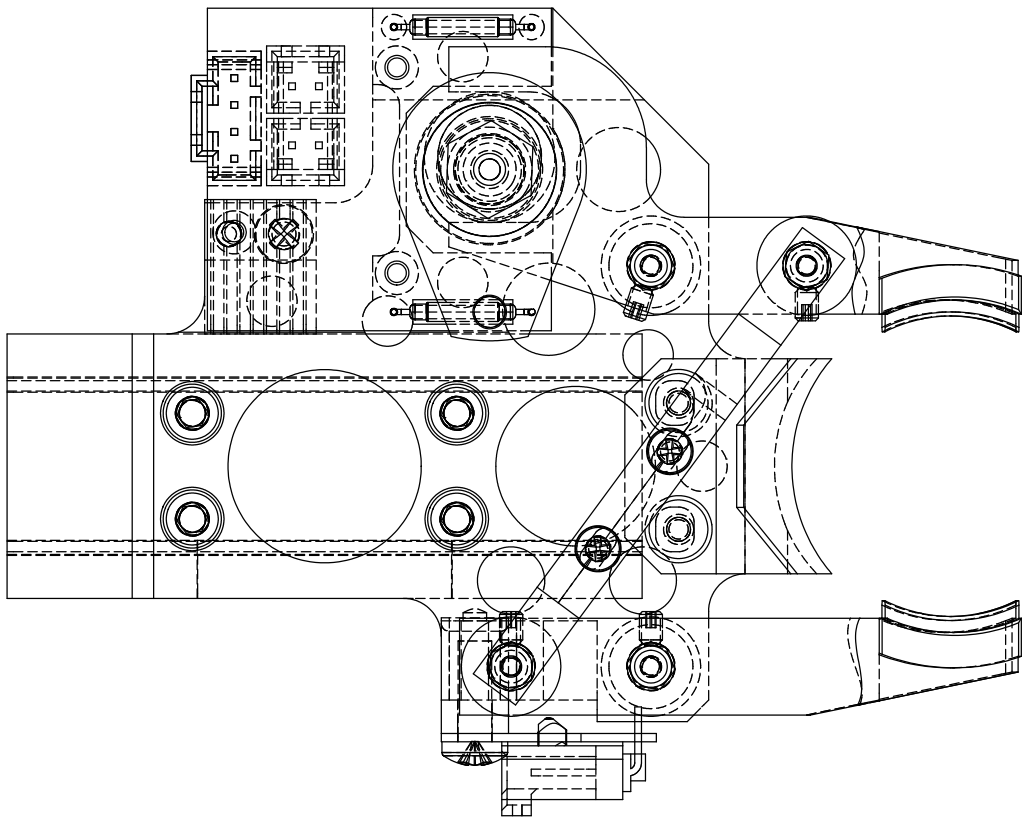
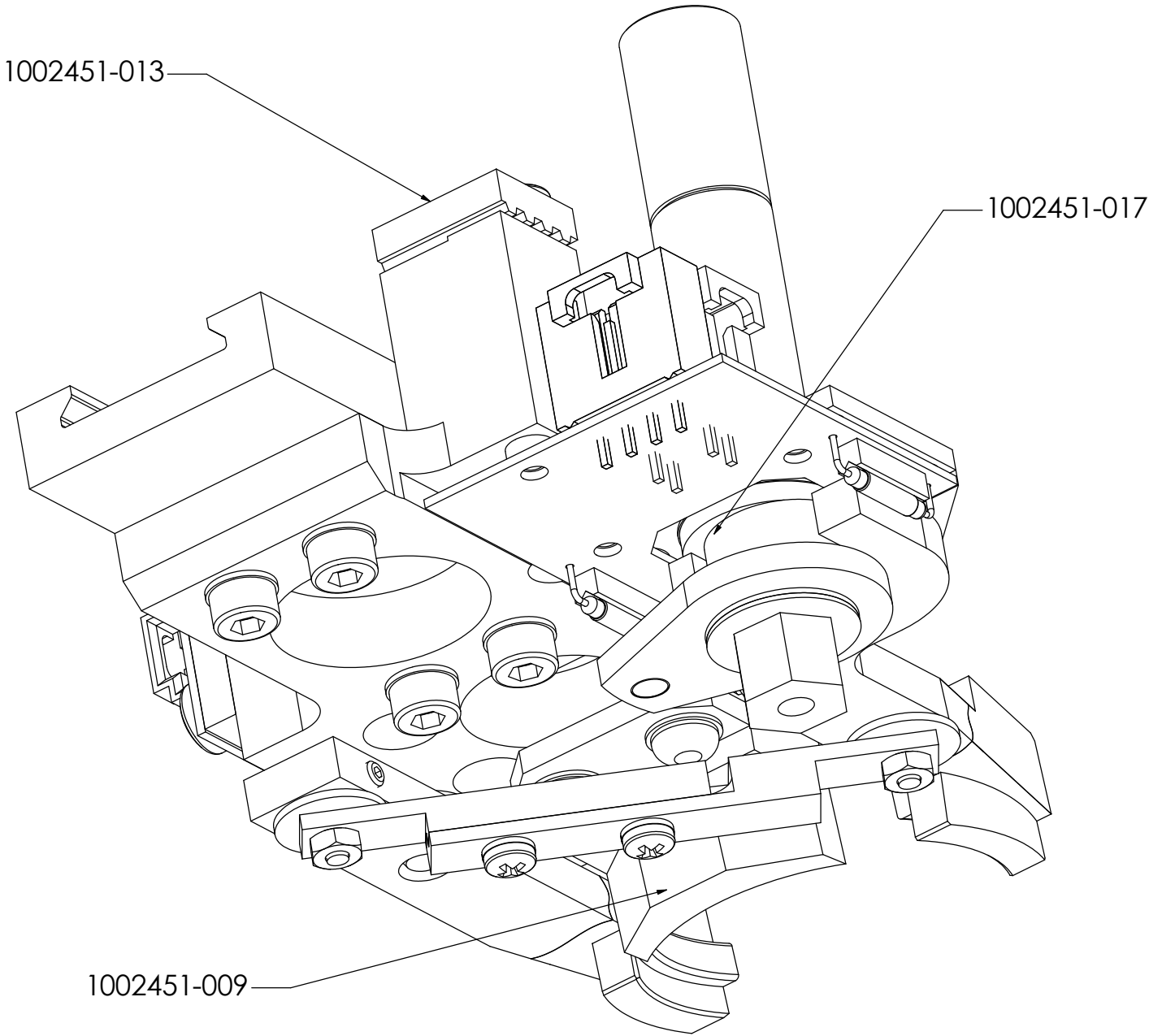
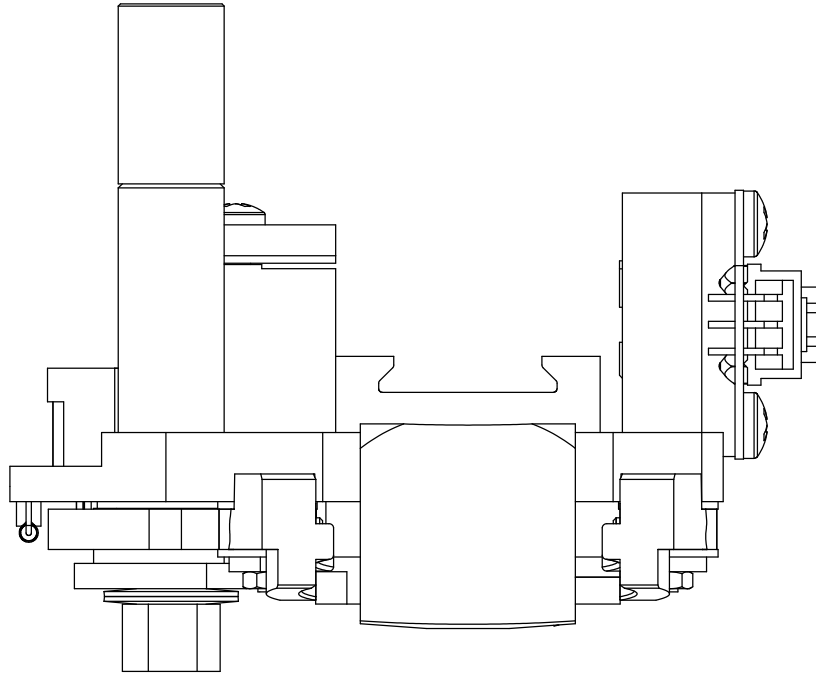
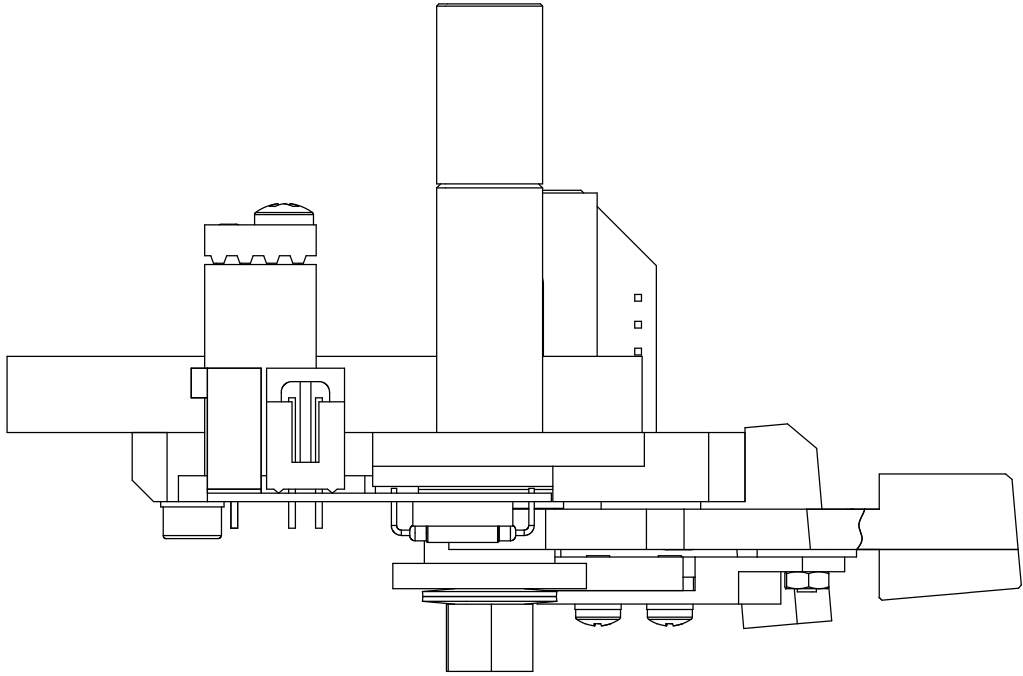


SHEET 8 OF 19

Monterey Bay Aquarium Research Institute
7700 Sandholdt Road
Moss Landing, CA 95039



MANIPULATOR BOTTOM - assembly



BILL OF MATERIALS					last updated on: Friday, February 10, 2006 8:42:04 AM		
Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:			APPROVALS DATE		
Inspector		2 PLACE DIM ±.01	3 PLACE DIM ±.005	4 PLACE DIM ±.0005	ENGINEER Jason Feldman 831-775-1837	Monterey Bay Aquarium Research Institute 7700 Sandholdt Road Moss Landing, CA 95039	
Shop Foreman		ANGLES ±1°					
Engineer		1. DIMENSIONS ARE IN INCHES 2. DIMENSION LIMITS HELD AFTER PLATING 3. REMOVE BURRS & SHARP EDGES .010 MAX 4. MACHINED FILLET RADII .000 TO .015 5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005					
NEXT ASSY Description	NEXT ASSY Number	6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .001 PER INCH. MAX .003 INCHES FOR SINGLE SURFACE. 7. SURFACE FINISH TO BE 32 MICRON UNLESS OTHERWISE SPECIFIED			PROJECT NUMBER 701312.00		manipulator
					PROJECT ESP 2G		
DO NOT SCALE DRAWING					CAD FILE: X:\701312 ESP 2G\SolidWorks files\internal structure (1002209)		DWG. NO. 1002451
						REV. D	
					SHEET 9 OF 19		



1002451-009
MANIPULATOR PUCK RETAINER

16

L

L

R.06 TYPICAL

2X .200

.082

.248

.248

.082

2X .143

VIEW L-L

$\varnothing 1.225^{+.005}_{-.000}$

2X 39°

0

(.247)

CL

(.553)

.800

CL

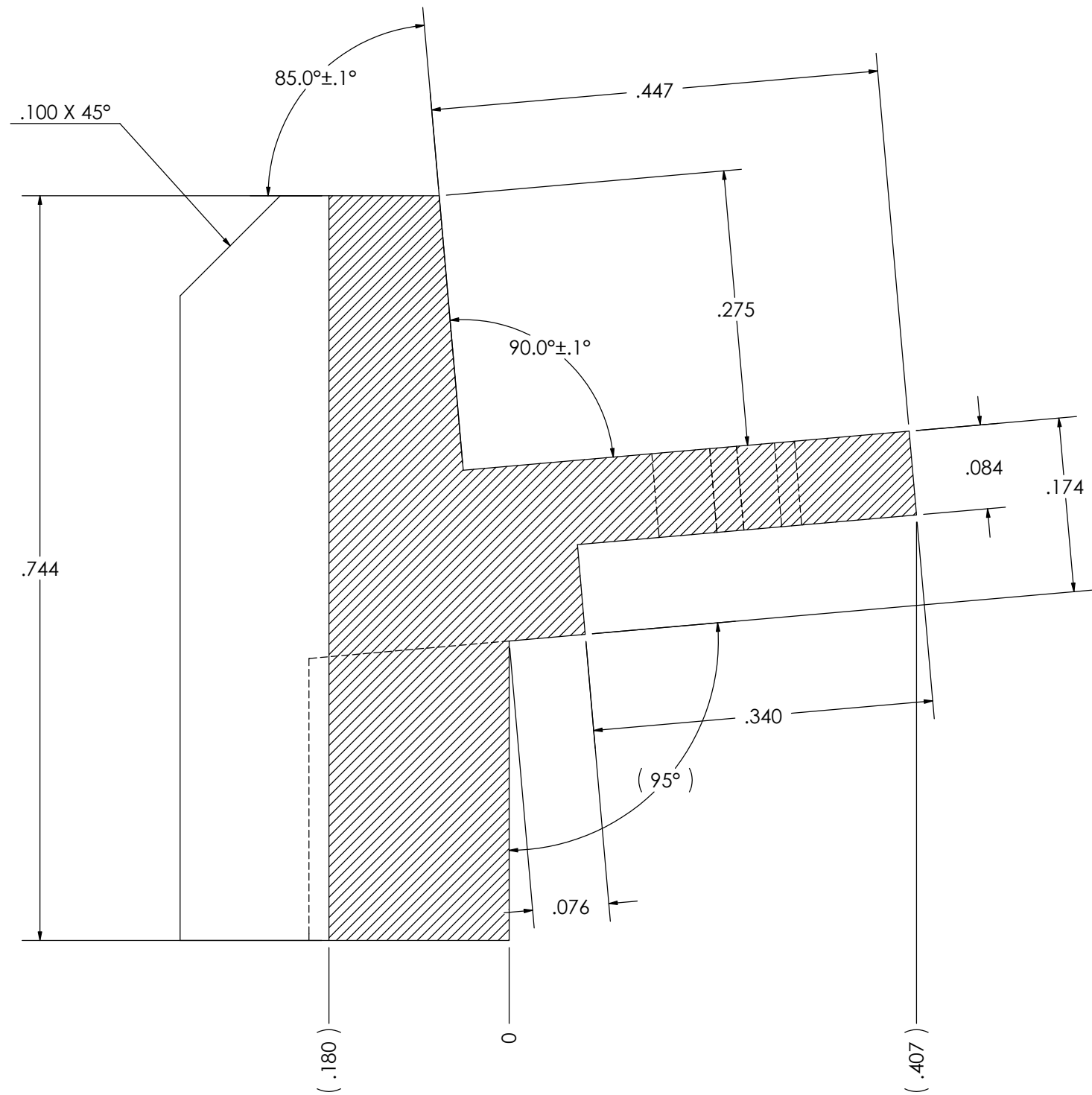
.793

(.329)

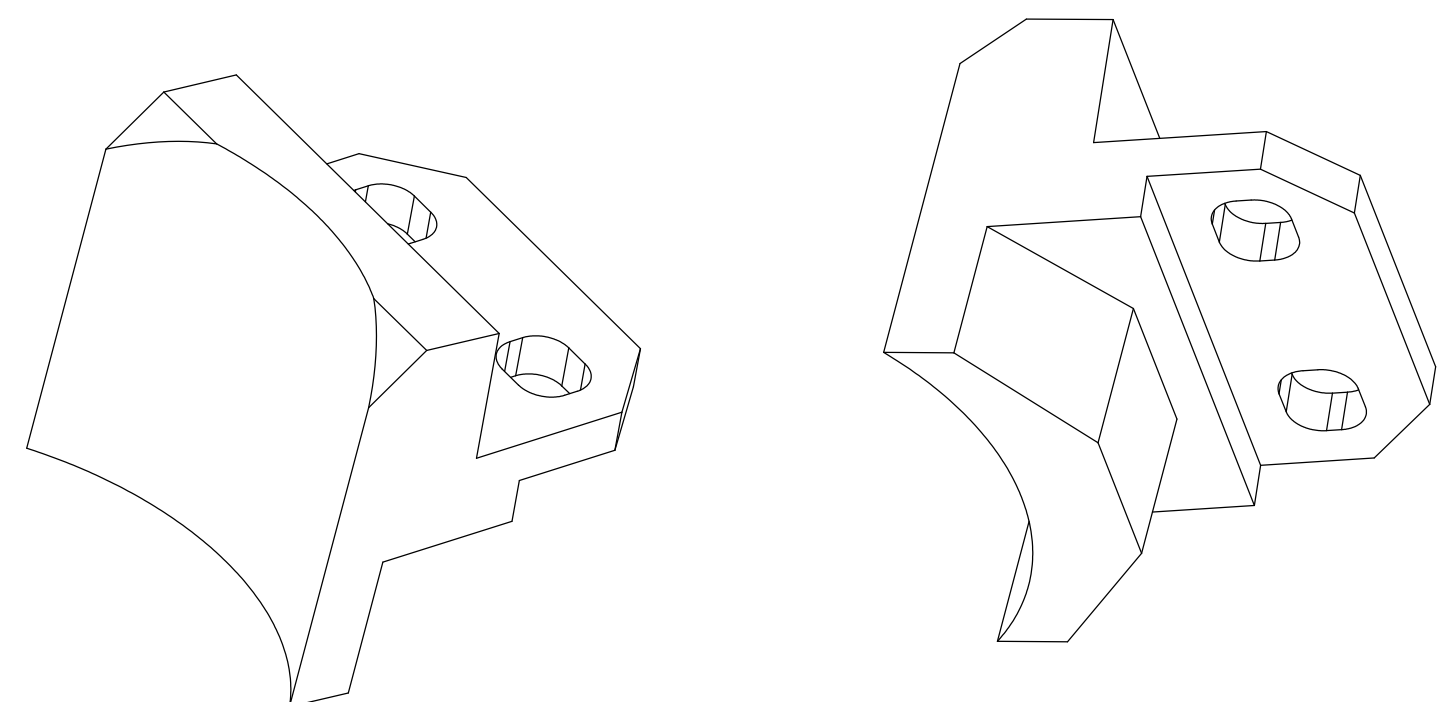
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(.415)



SECTION M-M



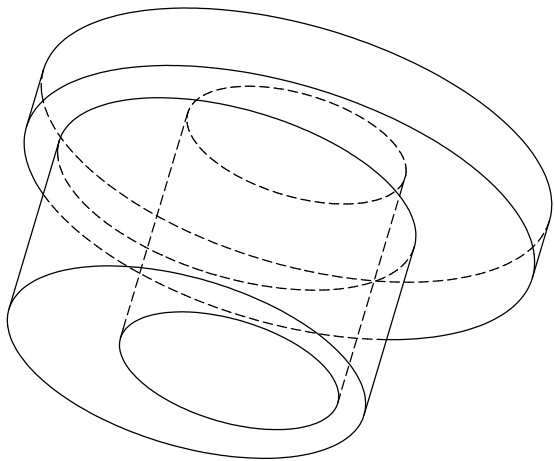
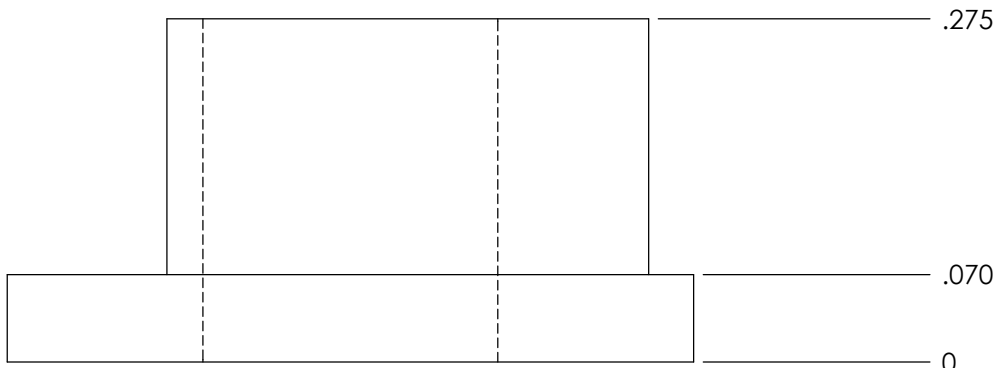
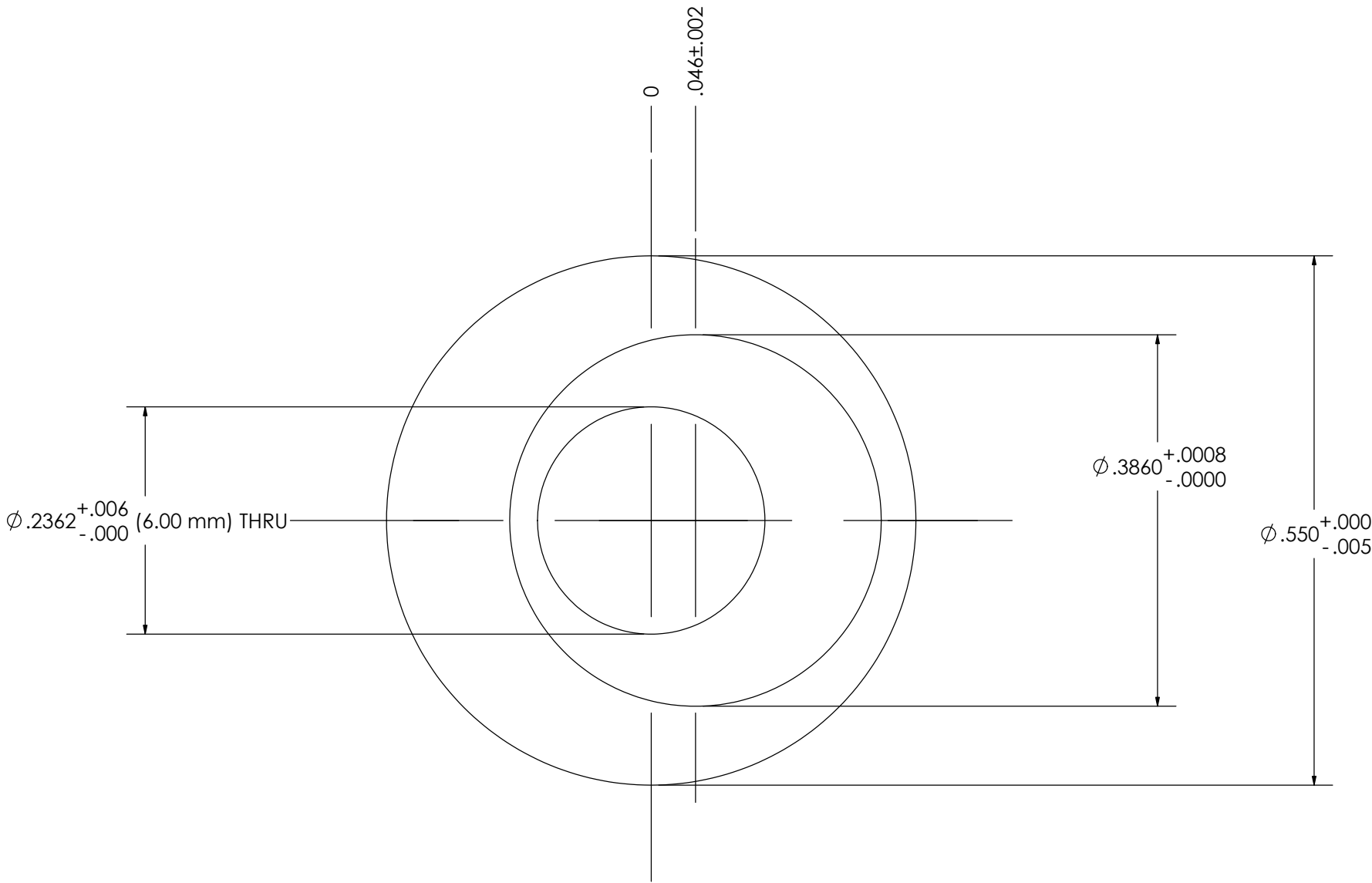
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
9	1002451-009	manipulator puck retainer	Delrin AF (Teflon filled)	2

BILL OF MATERIALS				last updated on: Friday, February 10, 2006 8:42:04 AM	
Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:		APPROVALS DATE	
Inspector		2 PLACE DIM ±.01	3 PLACE DIM ±.005	4 PLACE DIM ±.0005	ANGLES ±1°
Shop Foreman		1. DIMENSIONS ARE IN INCHES 2. DIMENSION LIMITS HELD AFTER PLATING 3. REMOVE BURRS & SHARP EDGES .010 MAX 4. MACHINED FILLET RADII .000 TO .015 5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005 6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .001 PER INCH. MAX .003 INCHES FOR SINGLE SURFACE. 7. SURFACE FINISH TO BE 32 MICRON UNLESS OTHERWISE SPECIFIED			
Engineer		CHECKED			
NEXT ASSY Description	NEXT ASSY Number	PROJECT NUMBER 701312.00		PROJECT ESP 2G	
DO NOT SCALE DRAWING		PROJECT ESP 2G		SIZE C	DWG. NO. 1002451
		CAD FILE: X:\701312 ESP 2G\SolidWorks files\internal structure (1002209)		REV. D	
				SHEET 11 OF 19	

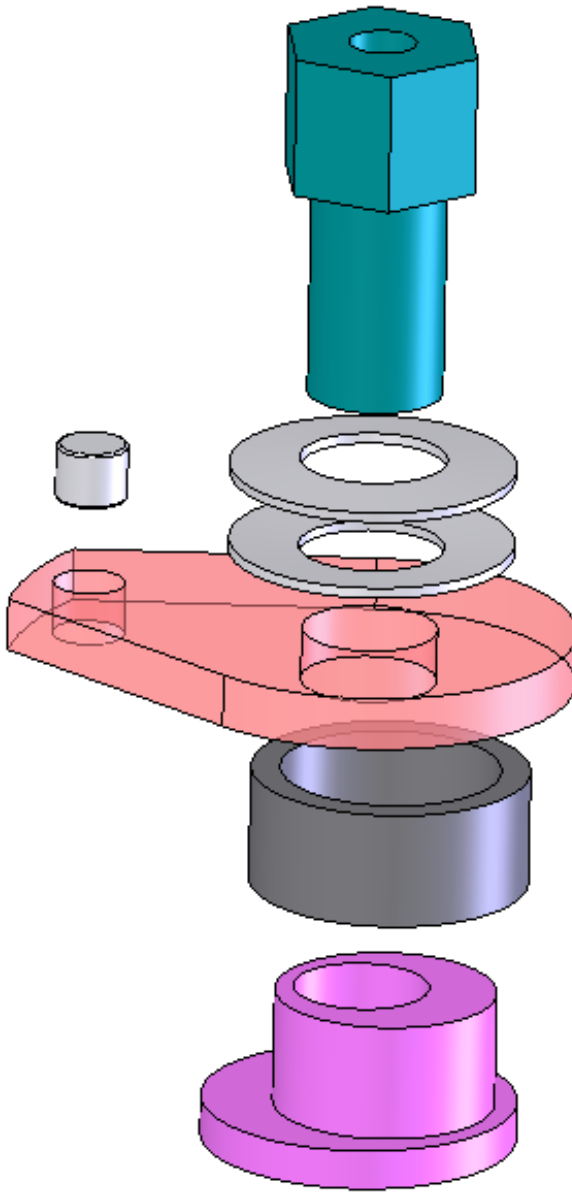
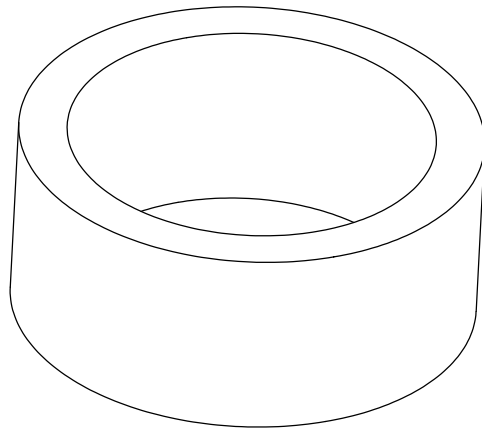
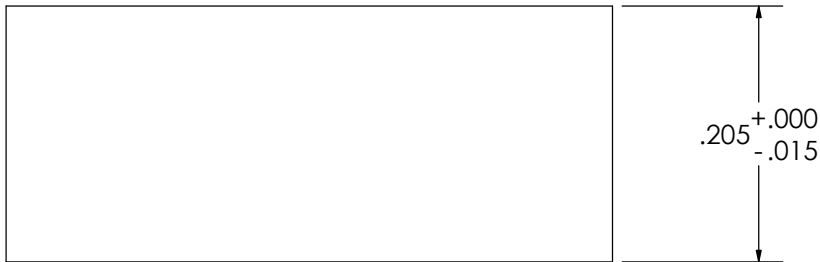
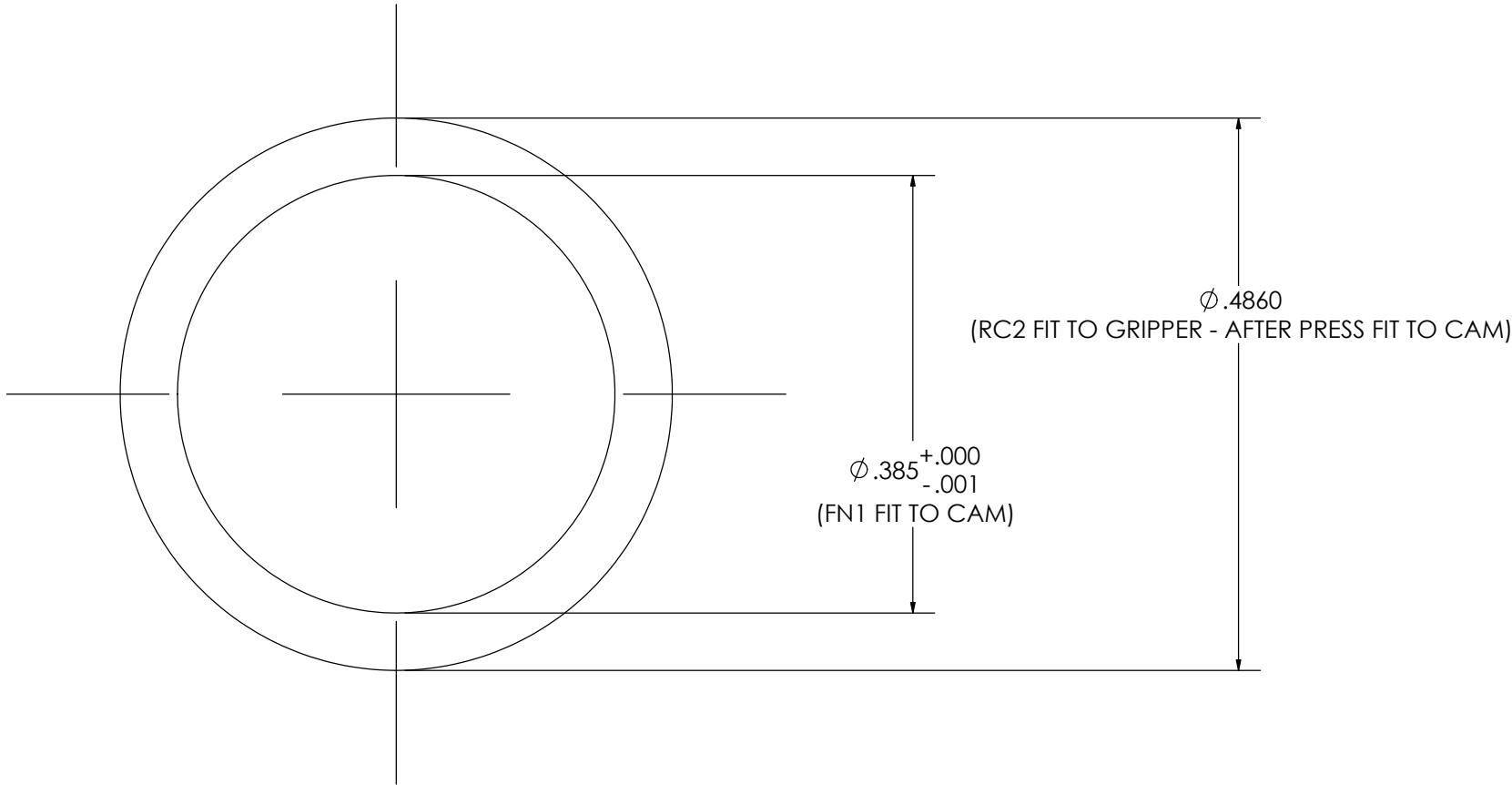
Monterey Bay Aquarium Research Institute	
ENGINEER Jason Feldman 831-775-1837	
7700 Sandholdt Road Moss Landing, CA 95039	
	
manipulator	

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1002451-010
MANIPULATOR CAM



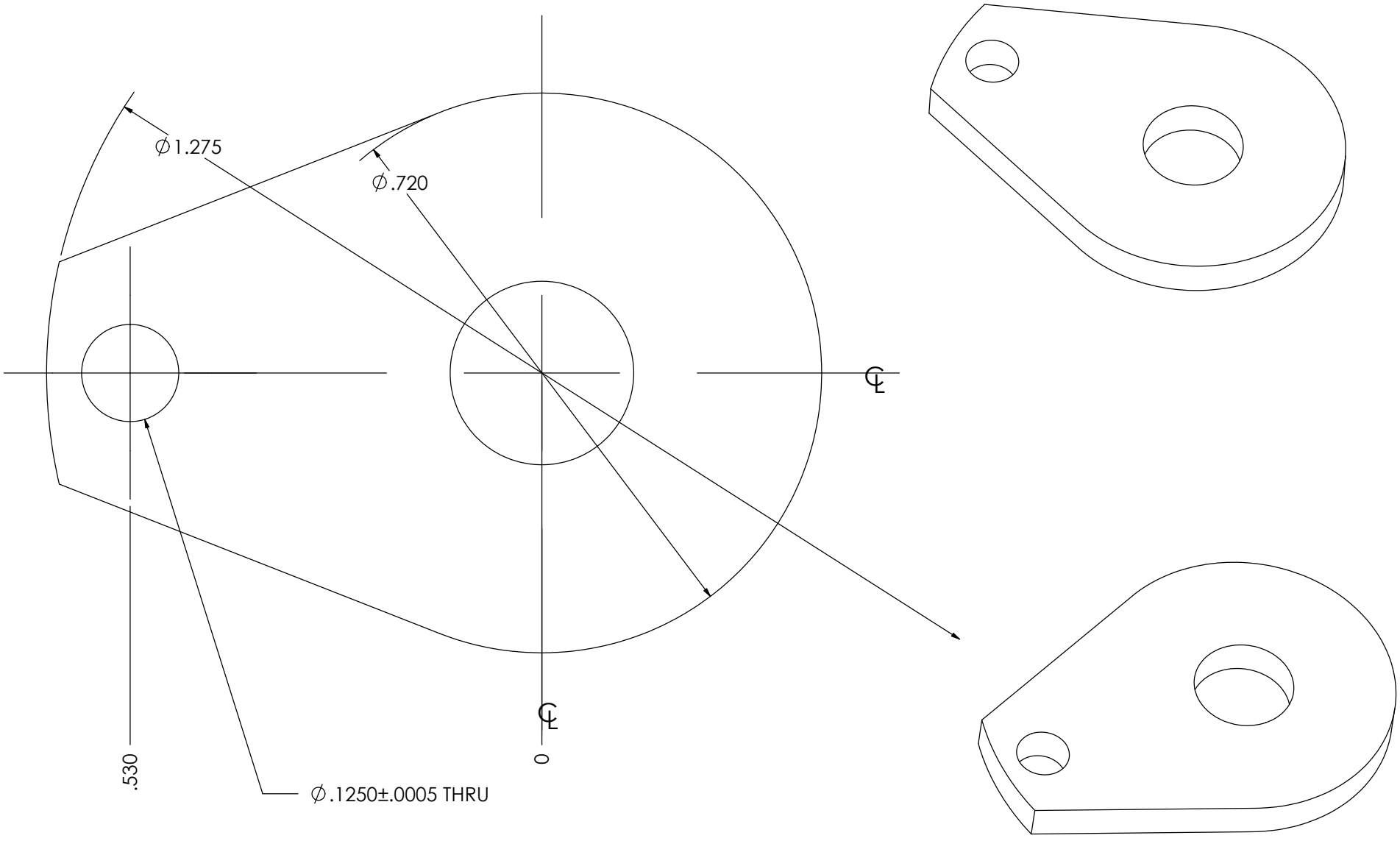
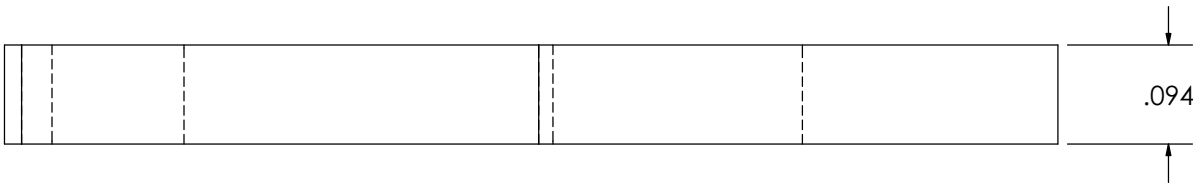
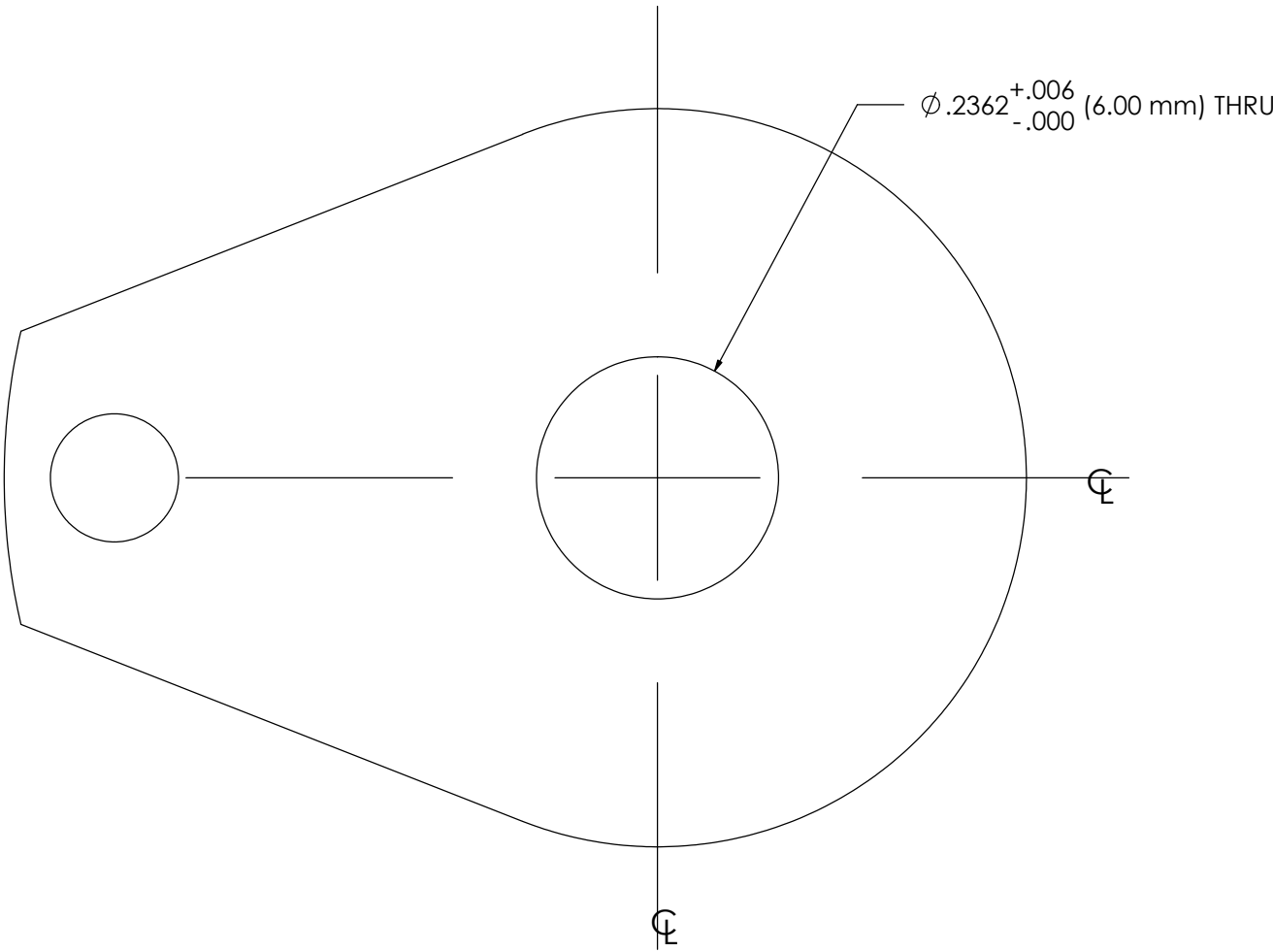
1002451-021
CAM TIRE



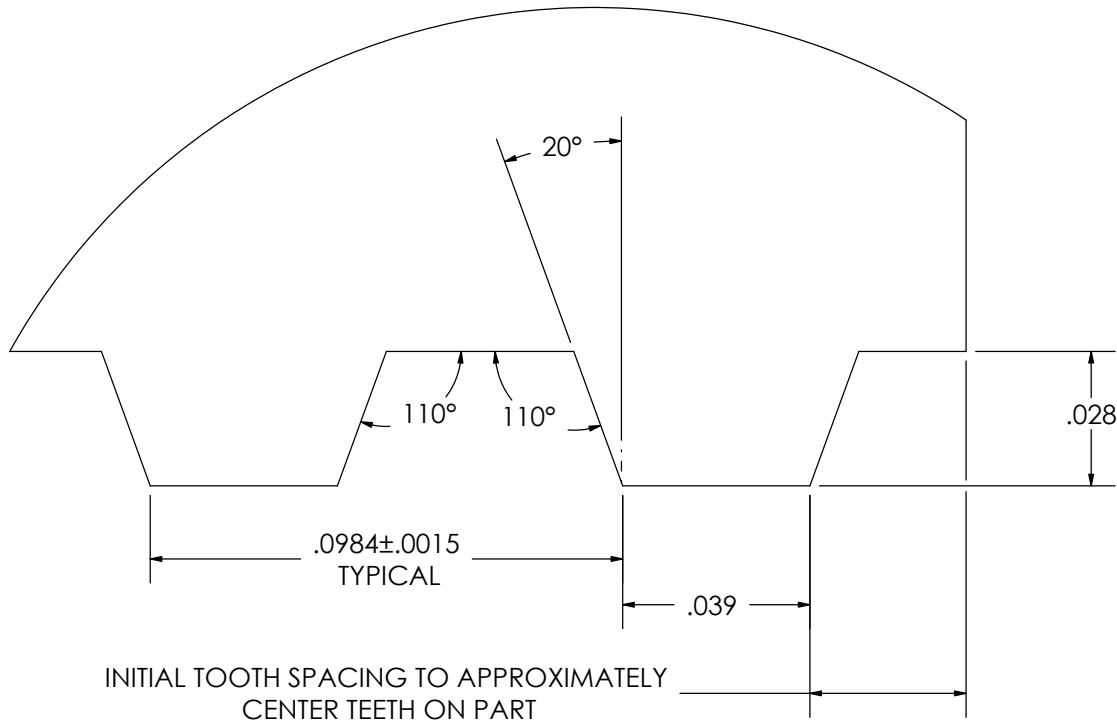
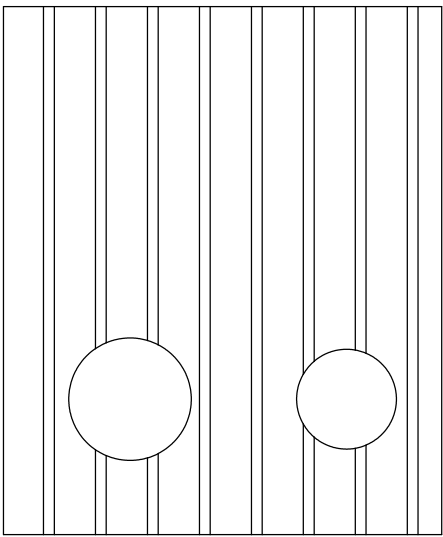
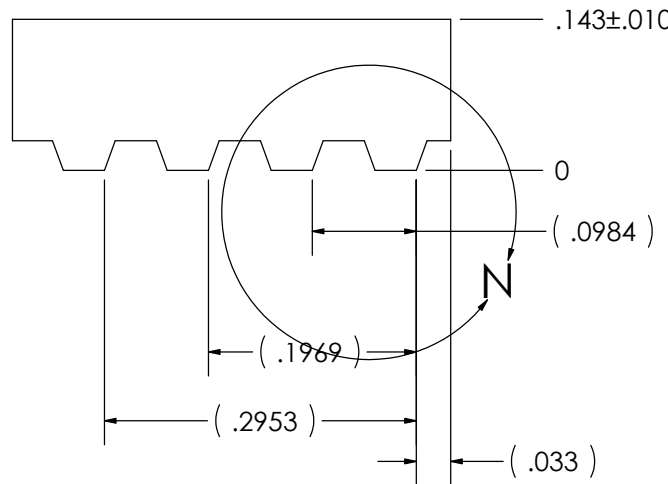
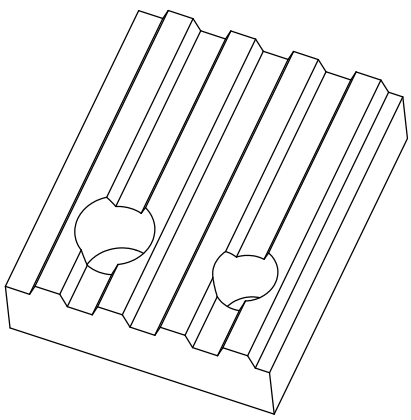
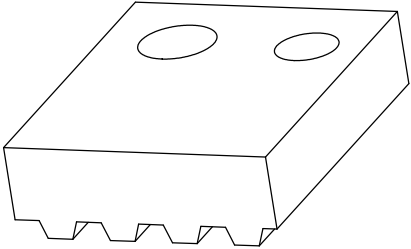
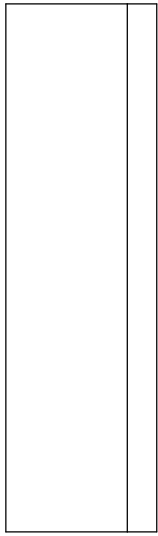
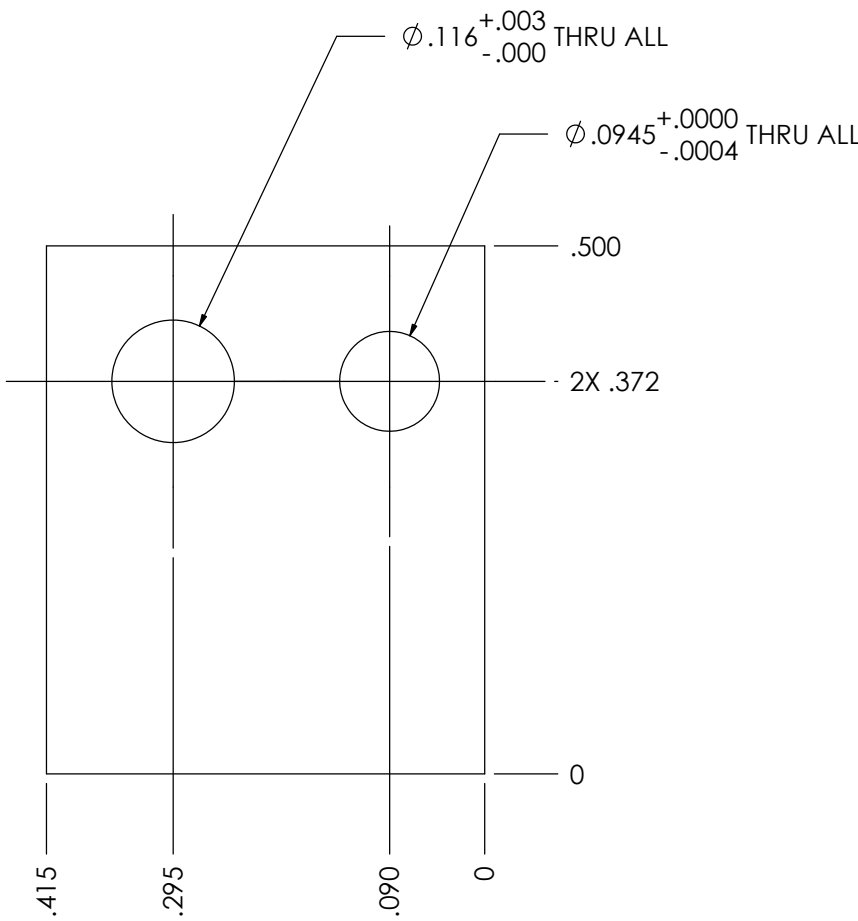
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
10	1002451-010	manipulator CAM	Stainless Steel	1
21	1002451-021	CAM TIRE	Vespel SP-21	1

Shop / Q.C.			UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:		APPROVALS		DATE		last updated on: Friday, February 10, 2006 8:42:04 AM	
Inspector			2 PLACE DIM ±.01	3 PLACE DIM ±.005	4 PLACE DIM ±.0005	ANGLES ±1°	ENGINEER Jason Feldman 831-775-1837		Monterey Bay Aquarium Research Institute	
Shop Foreman			1. DIMENSIONS ARE IN INCHES 2. DIMENSION LIMITS HELD AFTER PLATING 3. REMOVE BURRS & SHARP EDGES .010 MAX 4. MACHINED FILLET RADII .000 TO .015 5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005 6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .001 PER INCH. MAX .003 INCHES FOR SINGLE SURFACE. 7. SURFACE FINISH TO BE 32 MICRON UNLESS OTHERWISE SPECIFIED				CHECKED		7700 Sandholdt Road Moss Landing, CA 95039	
Engineer							PROJECT NUMBER 701312.00		manipulator	
NEXT ASSY Description		NEXT ASSY Number					PROJECT ESP 2G		SIZE C	
DO NOT SCALE DRAWING							DWG. NO. 1002451		REV. D	
							CAD FILE: X:\701312 ESP 2G\SolidWorks files\internal structure (1002209)		SHEET 12 OF 19	

1002451-012
MANIPULATOR REED WHEEL



1002451-013
MANIPULATOR BELT CLAMP



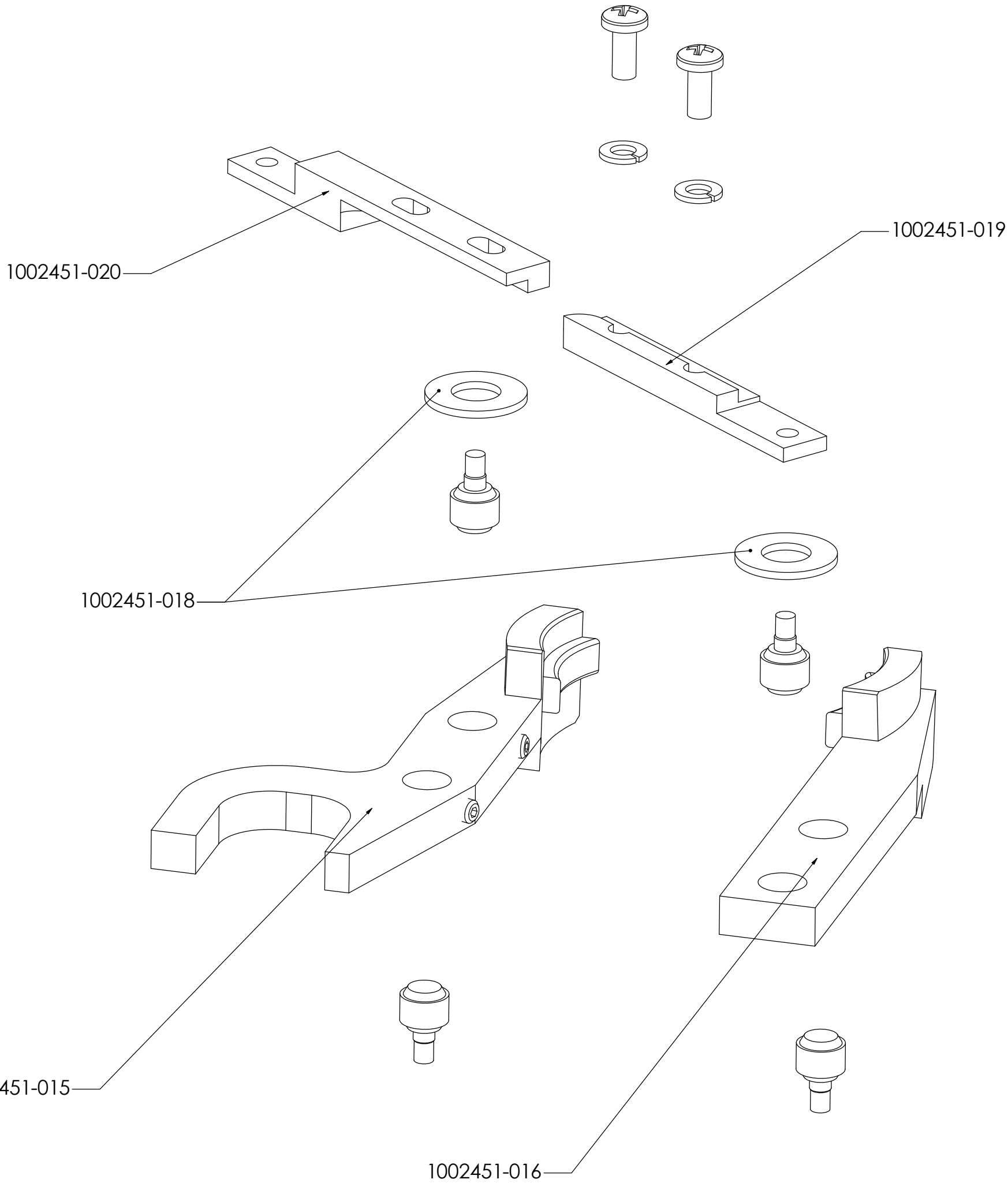
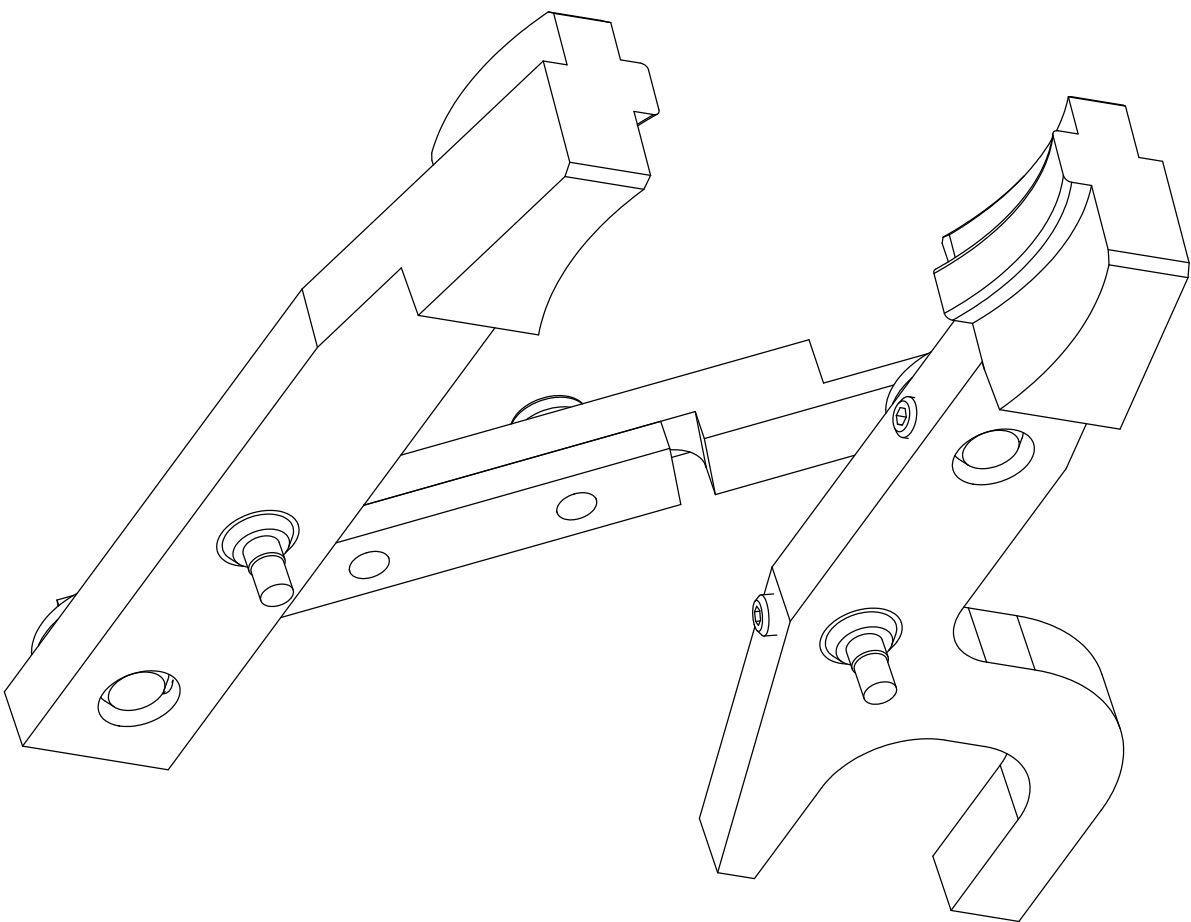
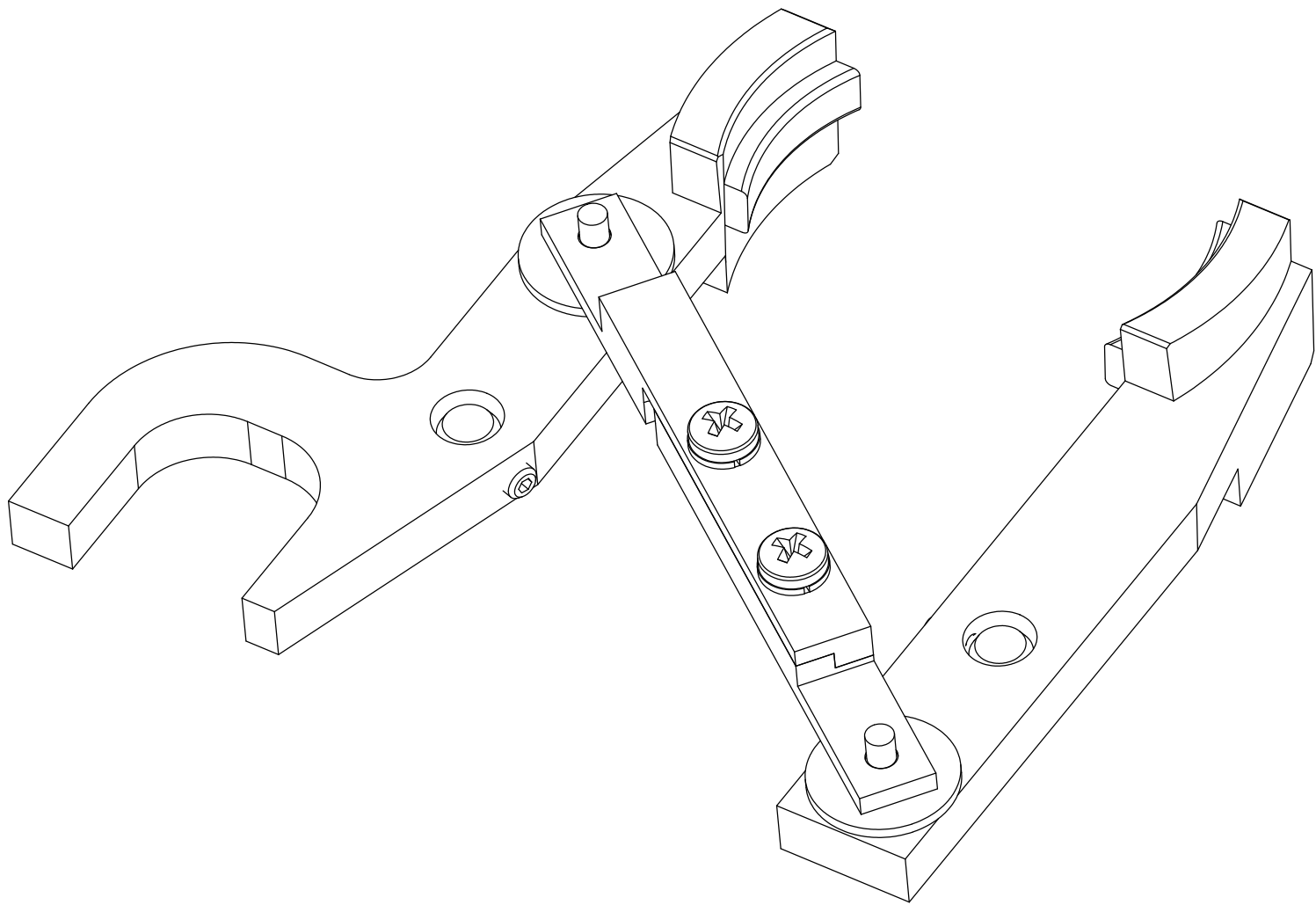
DETAIL N

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
12	1002451-012	manipulator reed wheel	7075-T6 or -T651 Aluminum	1
13	1002451-013	manipulator belt clamp	Brass	2

BILL OF MATERIALS					last updated on: Friday, February 10, 2006 8:42:04 AM	
Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:		APPROVALS	DATE	Monterey Bay Aquarium Research Institute 7700 Sandholdt Road Moss Landing, CA 95039 
Inspector		2 PLACE DIM ±.01	3 PLACE DIM ±.005	4 PLACE DIM ±.0005	ANGLES ±1°	
Shop Foreman		1. DIMENSIONS ARE IN INCHES 2. DIMENSION LIMITS HELD AFTER PLATING 3. REMOVE BURRS & SHARP EDGES .010 MAX 4. MACHINED FILLET RADII .000 TO .015				
Engineer		5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005 6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .001 PER INCH. MAX .003 INCHES FOR SINGLE SURFACE. 7. SURFACE FINISH TO BE 32 MICRON UNLESS OTHERWISE SPECIFIED				
NEXT ASSY Description	NEXT ASSY Number	PROJECT NUMBER 701312.00				
		PROJECT		ESP 2G	SIZE C	manipulator
					DWG. NO.	1002451
						REV. D
DO NOT SCALE DRAWING		CAD FILE: X:\701312 ESP 2G\SolidWorks files\internal structure (1002209) SHEET 13 OF 19				

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MANIPULATOR GRIPPER - assembly



BILL OF MATERIALS					last updated on: Friday, February 10, 2006 8:42:04 AM			
Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:			APPROVALS	DATE	Monterey Bay Aquarium Research Institute	
Inspector		2 PLACE DIM ±.01	3 PLACE DIM ±.005	4 PLACE DIM ±.0005	ENGINEER Jason Feldman 831-775-1837		7700 Sandholdt Road Moss Landing, CA 95039	
Shop Foreman		1. DIMENSIONS ARE IN INCHES 2. DIMENSION LIMITS HELD AFTER PLATING 3. REMOVE BURRS & SHARP EDGES .010 MAX 4. MACHINED FILLET RADII .000 TO .015 5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005			CHECKED			
Engineer					PROJECT NUMBER 701312.00	manipulator		
NEXT ASSY Description	NEXT ASSY Number	6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .001 PER INCH. MAX .003 INCHES FOR SINGLE SURFACE. 7. SURFACE FINISH TO BE 32 MICRON UNLESS OTHERWISE SPECIFIED			PROJECT ESP 2G	SIZE C	DWG. NO. 1002451	REV. D
DO NOT SCALE DRAWING					CAD FILE: X:\701312 ESP 2G\SolidWorks files\internal structure (1002209)			



41002451-015
GRIPPER WITH CAM

F

E

D

C

B

A

F

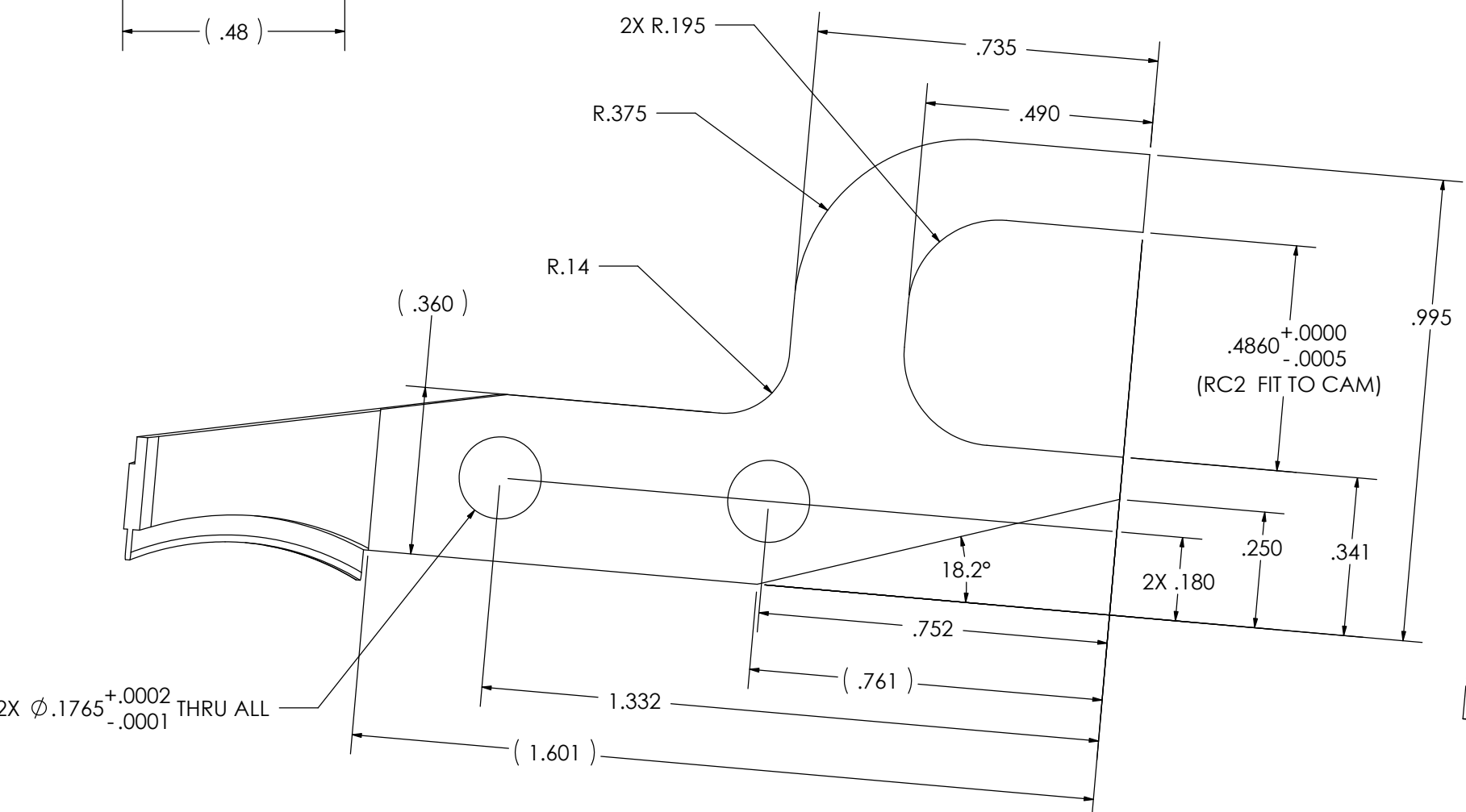
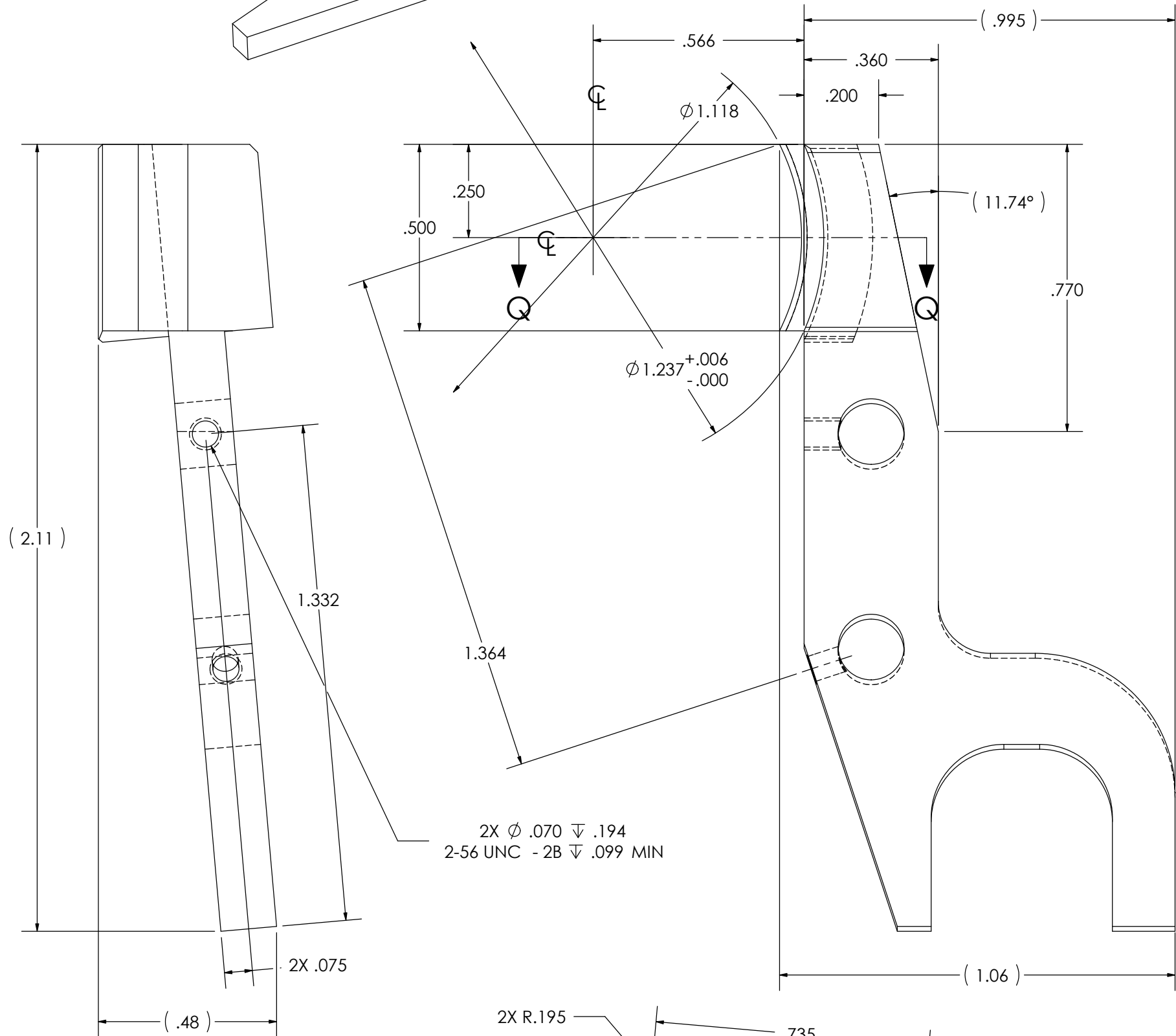
E

D

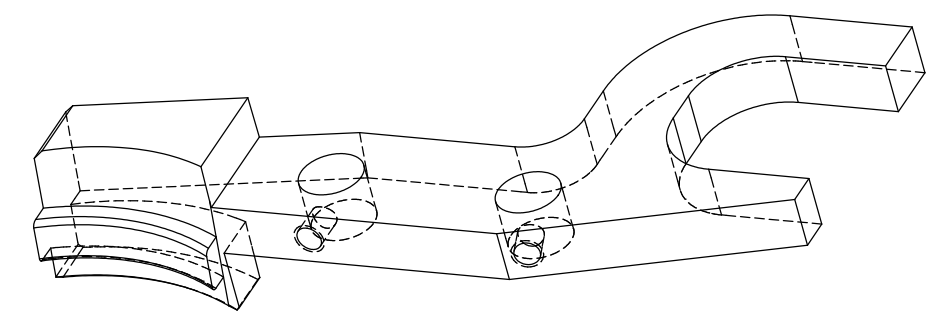
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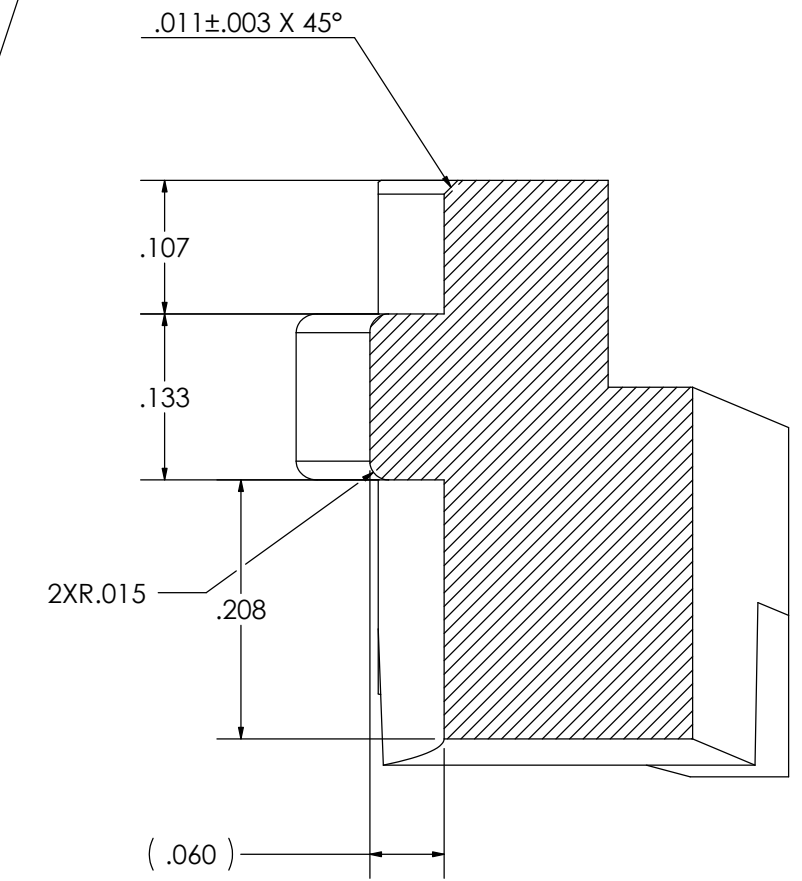
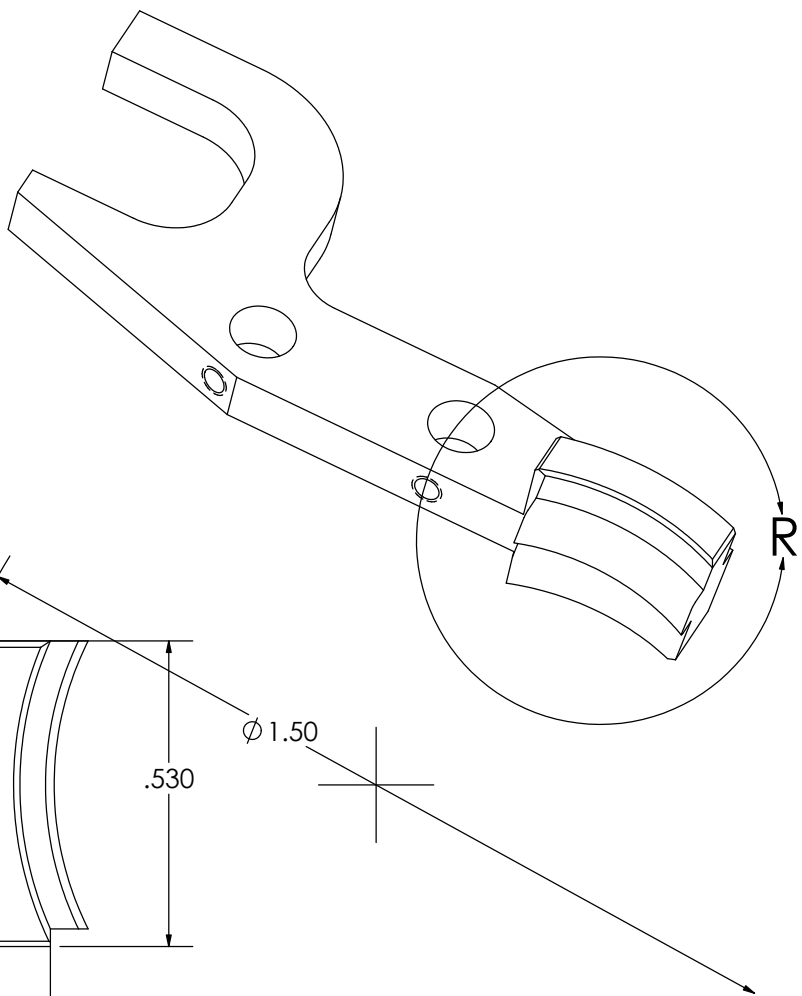
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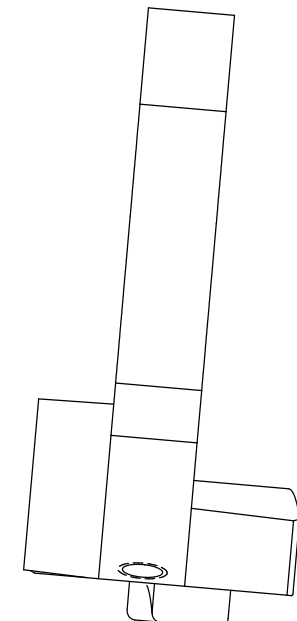
VIEW P-P



DETAIL R



SECTION Q-Q



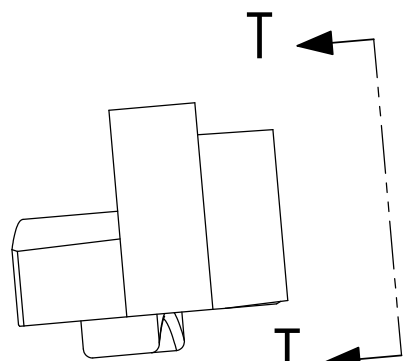
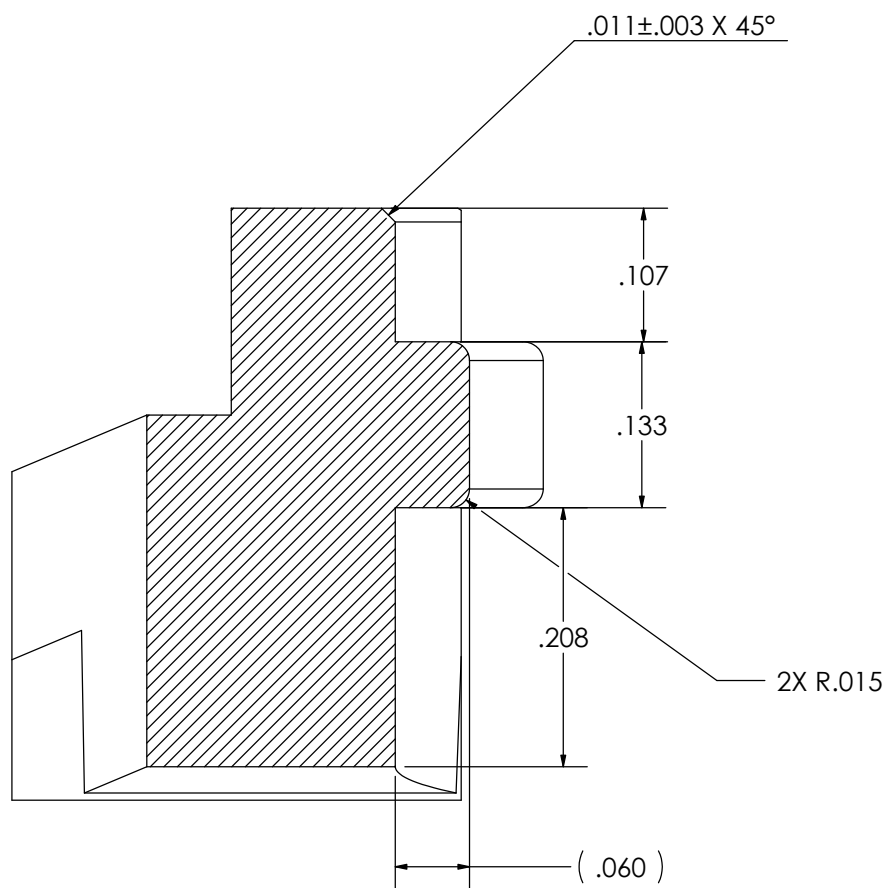
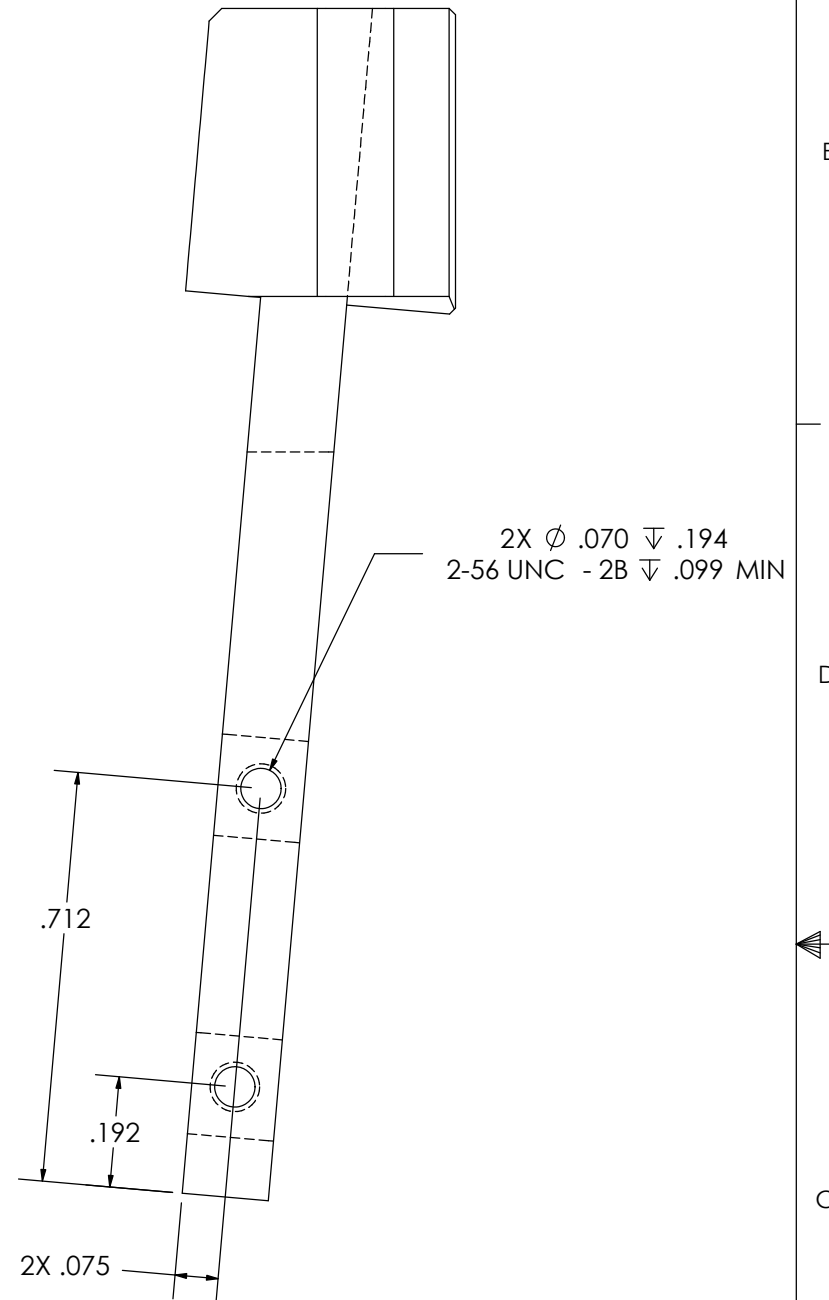
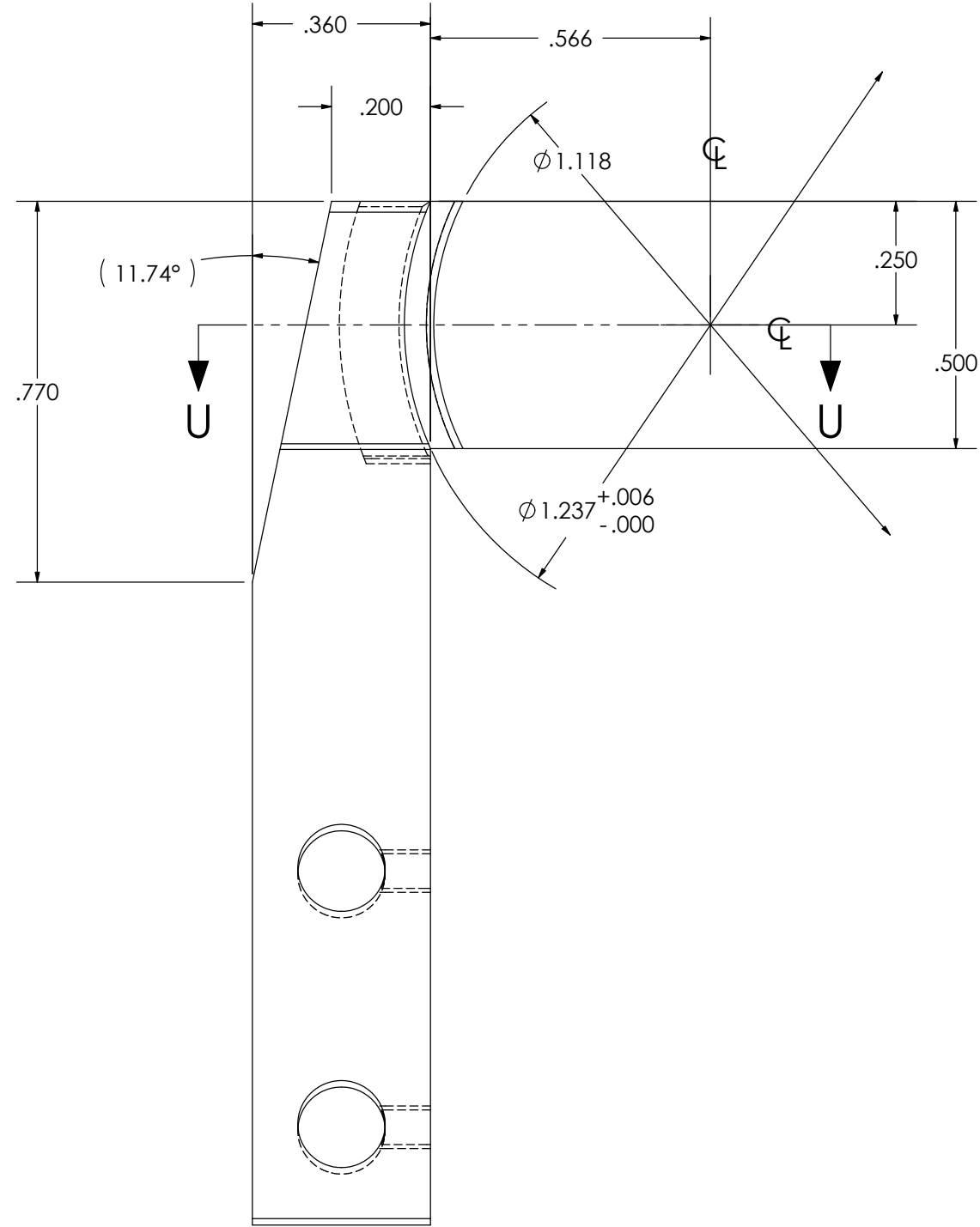
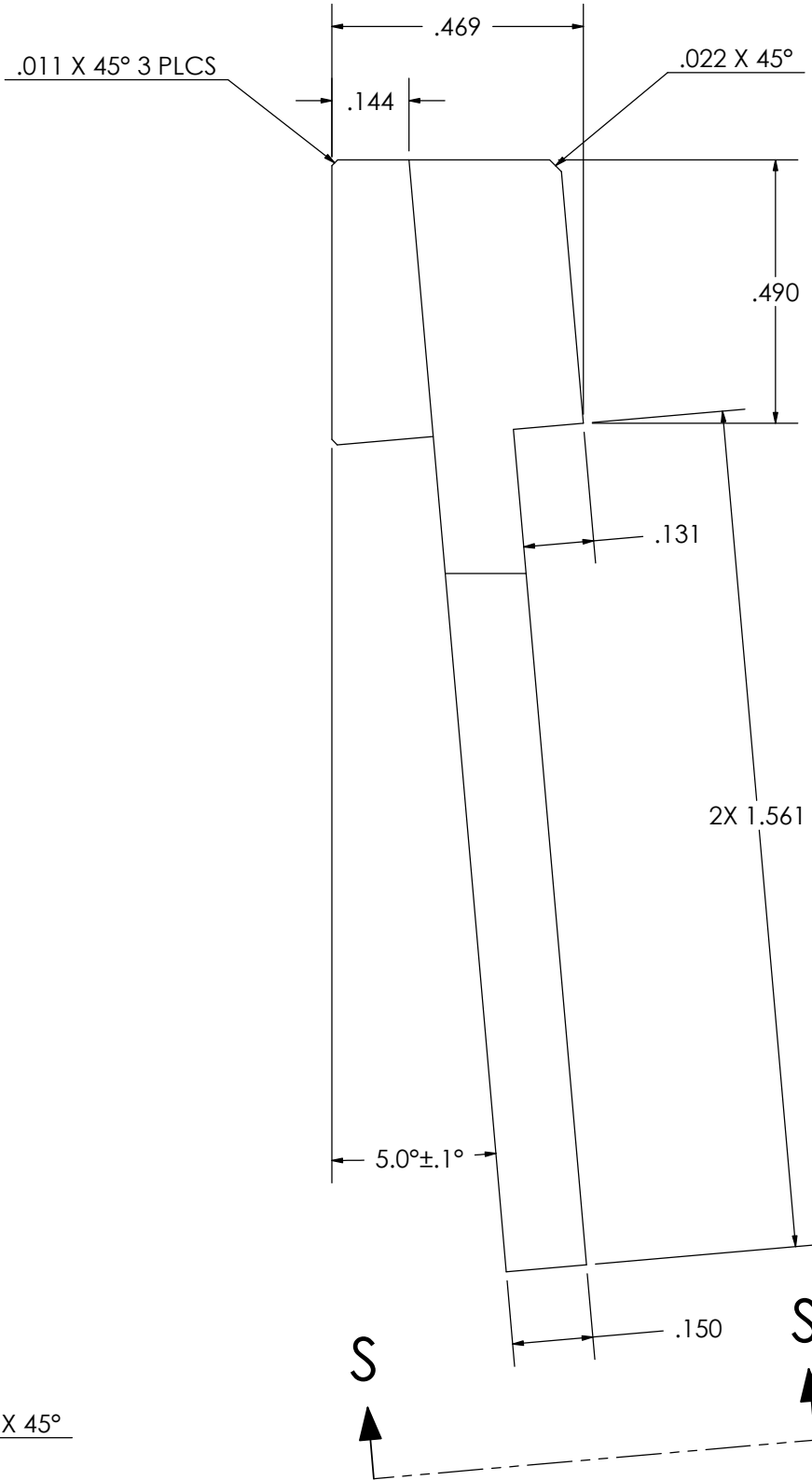
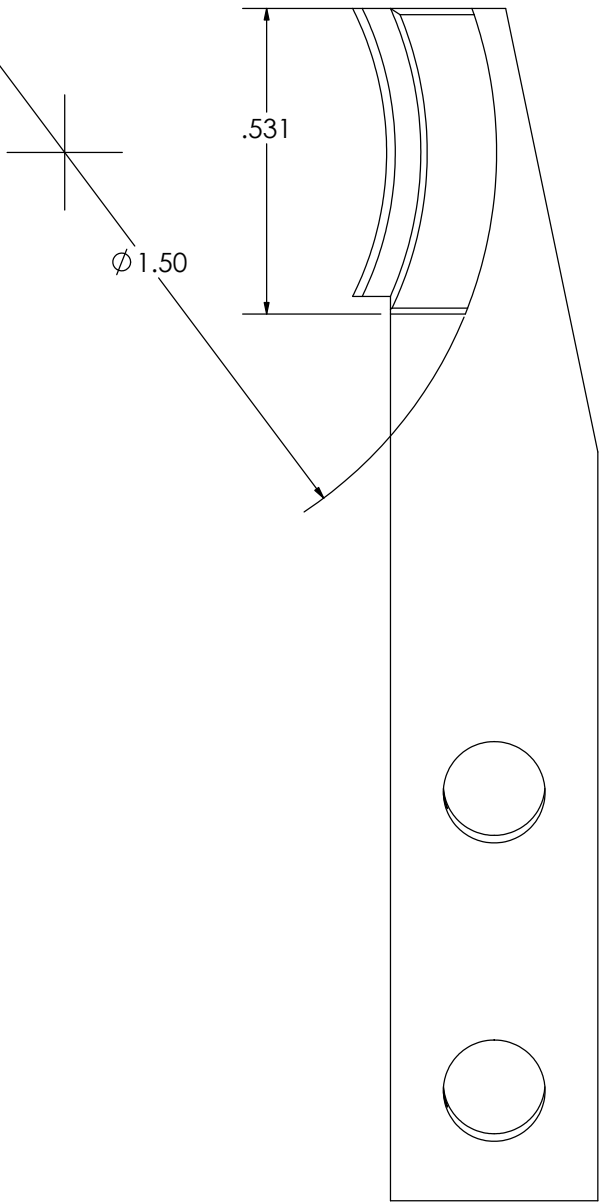
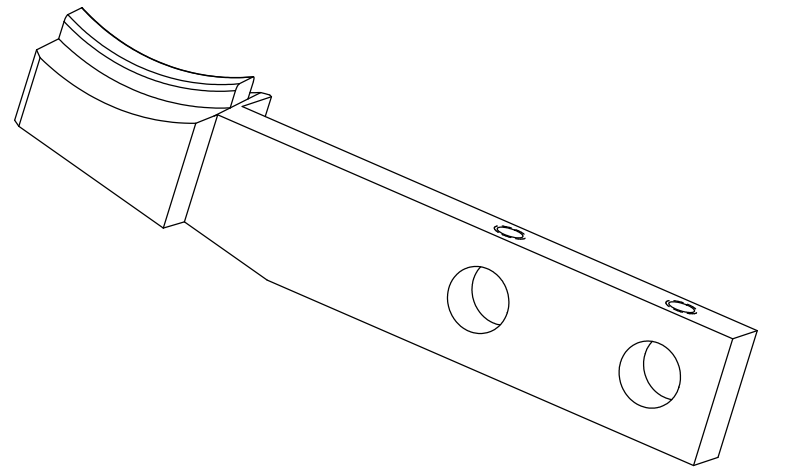
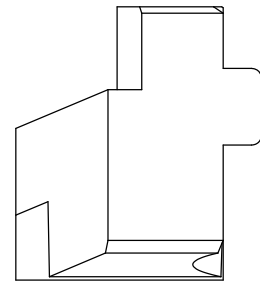
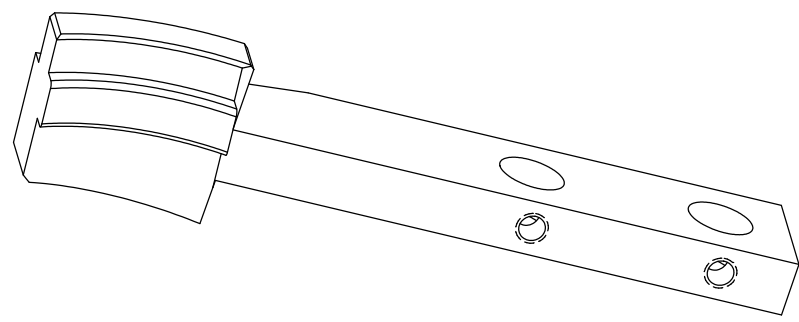
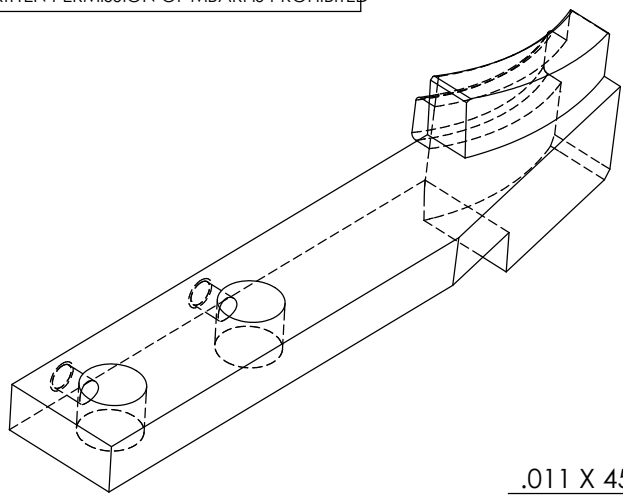
VIEW O-O

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
15	1002451-015	Gripper - actuated	Aluminum 7075 T-6	2
BILL OF MATERIALS				
Shop / Q.C.		APPROVALS DATE		
Inspector		ENGINEER Jason Feldman 831-775-1837		
Shop Foreman		CHECKED		
Engineer		PROJECT NUMBER 701312.00		
NEXT ASSY Description	NEXT ASSY Number	PROJECT ESP 2G		
DO NOT SCALE DRAWING		CAD FILE: X:\701312 ESP 2G\SolidWorks files\Internal structure (1002209)		
		SHEET 15 OF 19		

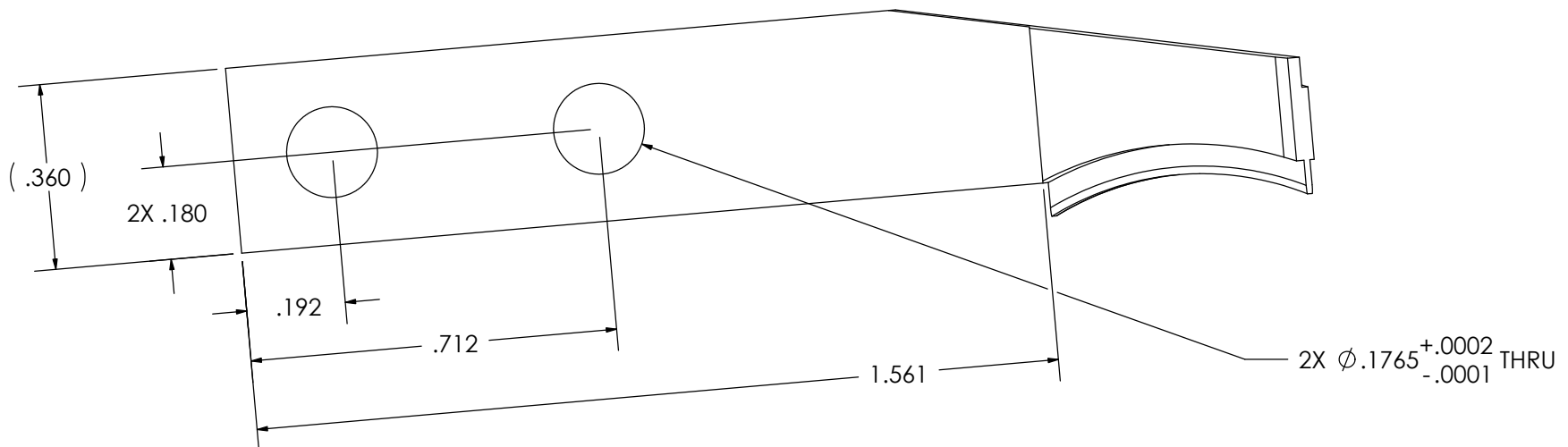


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41002451-016
GRIPPER SIMPLE



VIEW S-S

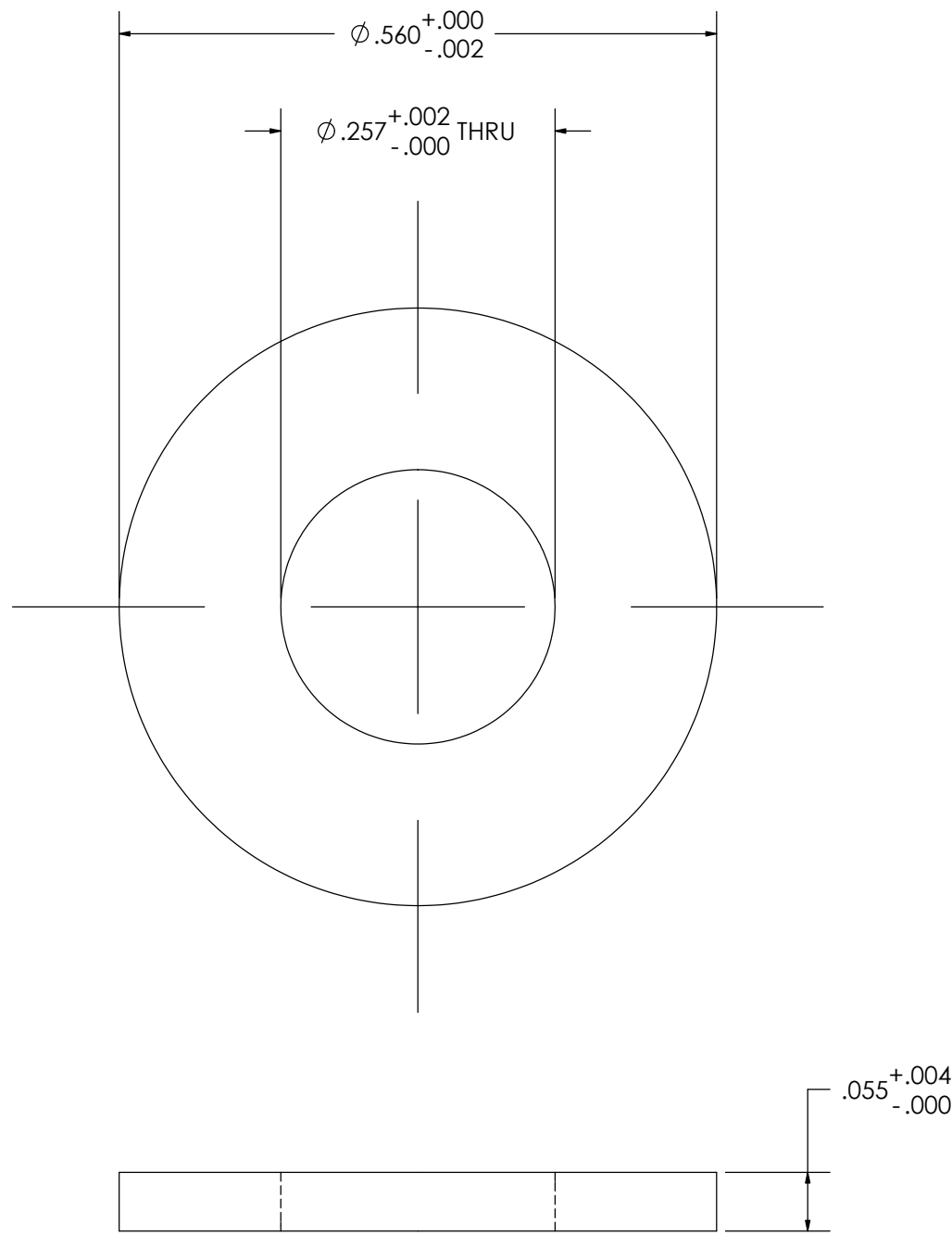


VIEW T-T

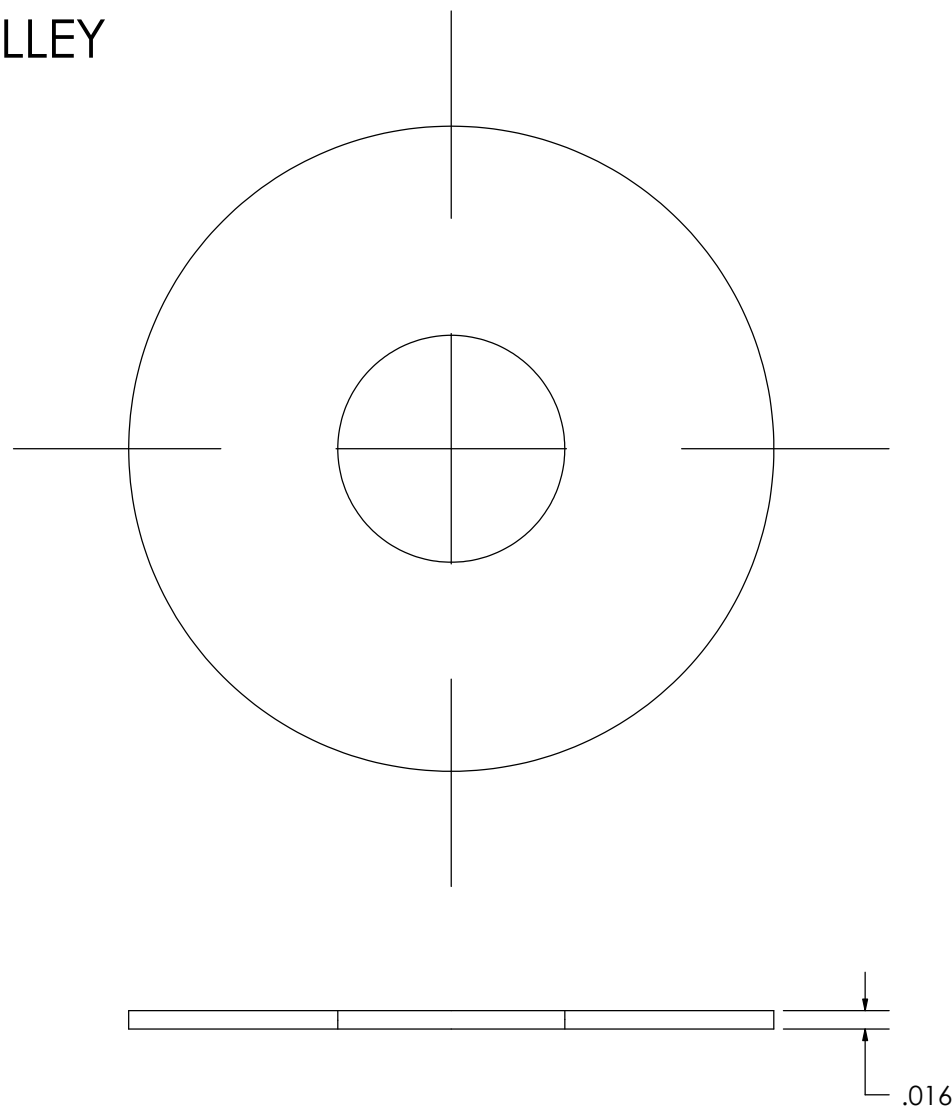
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
16	1002451-016	Gripper - driven	Aluminum 7075 T-6	2
BILL OF MATERIALS				
Shop / Q.C.		APPROVALS		
Inspector		ENGINEER	Monterey Bay Aquarium Research Institute	
Shop Foreman		831-775-1837	7700 Sandholdt Road	
Engineer		CHECKED	Moss Landing, CA	
NEXT ASSY Description	NEXT ASSY Number	PROJECT NUMBER	SIZE	REV.
		701312.00	C	D
DO NOT SCALE DRAWING		PROJECT	DWG. NO.	
		ESP 2G	1002451	
CAD FILE: X:\701312 ESP 2G\SolidWorks files\internal structure (1002209) SHEET 16 OF 19				

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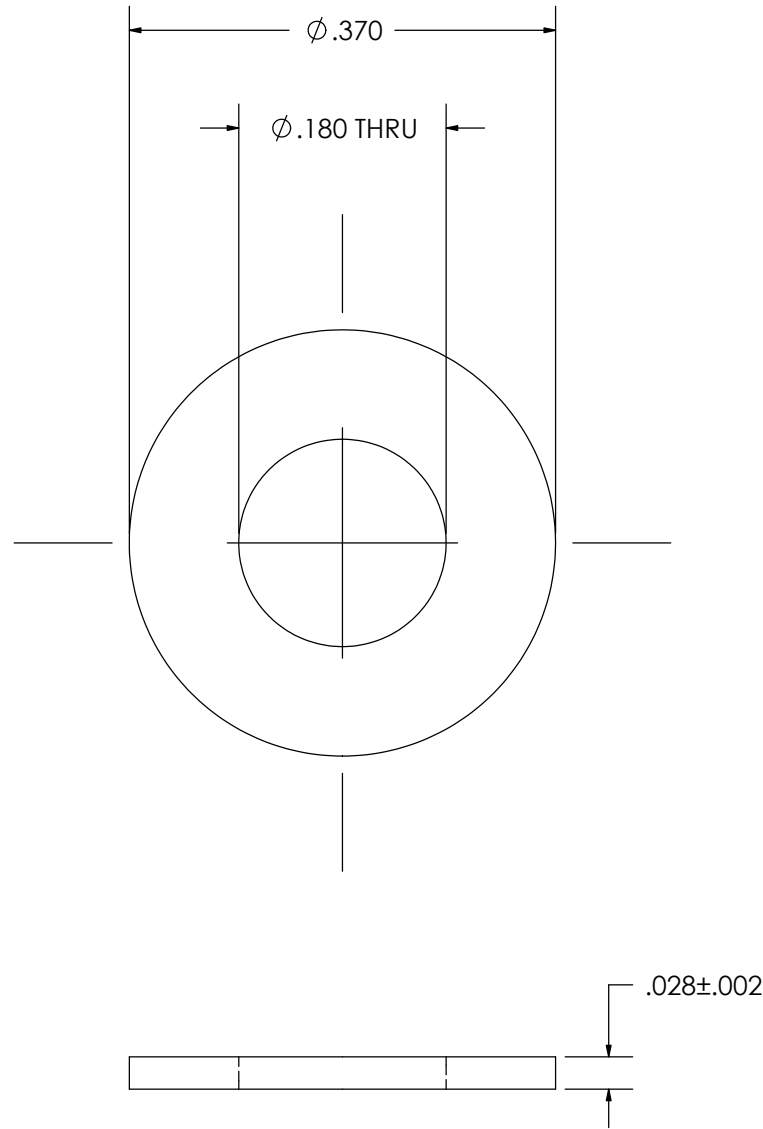
1002451-017
SPACER - CAM



1002451-005
SPACER - TIMING PULLEY



1002451-018
SPACER - GRIPPER



ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
17	1002451-017	Spacer - cam	Vespel SP-21	2
18	1002451-018	Spacer - gripper	Vespel S-21	4
19	1002451-005	Spacer - timing pulley	Vespel SP-21	3

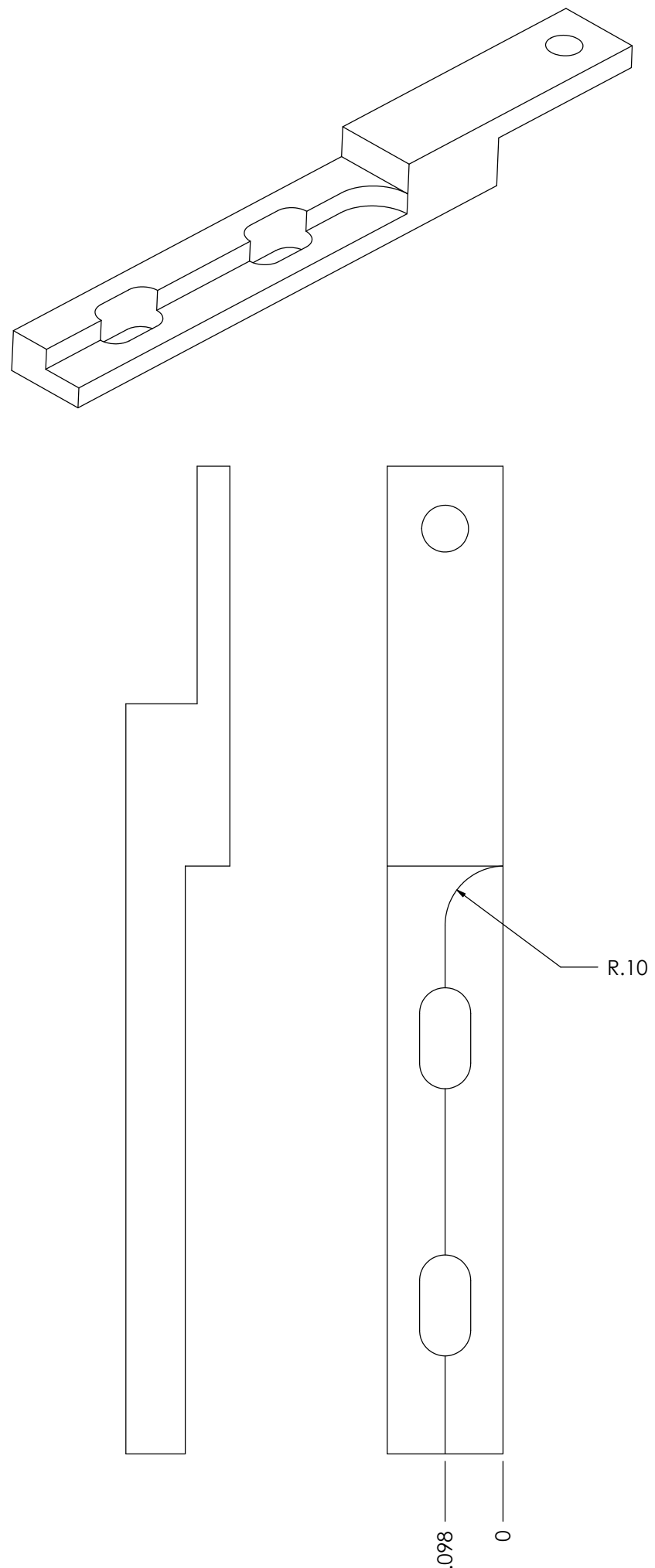
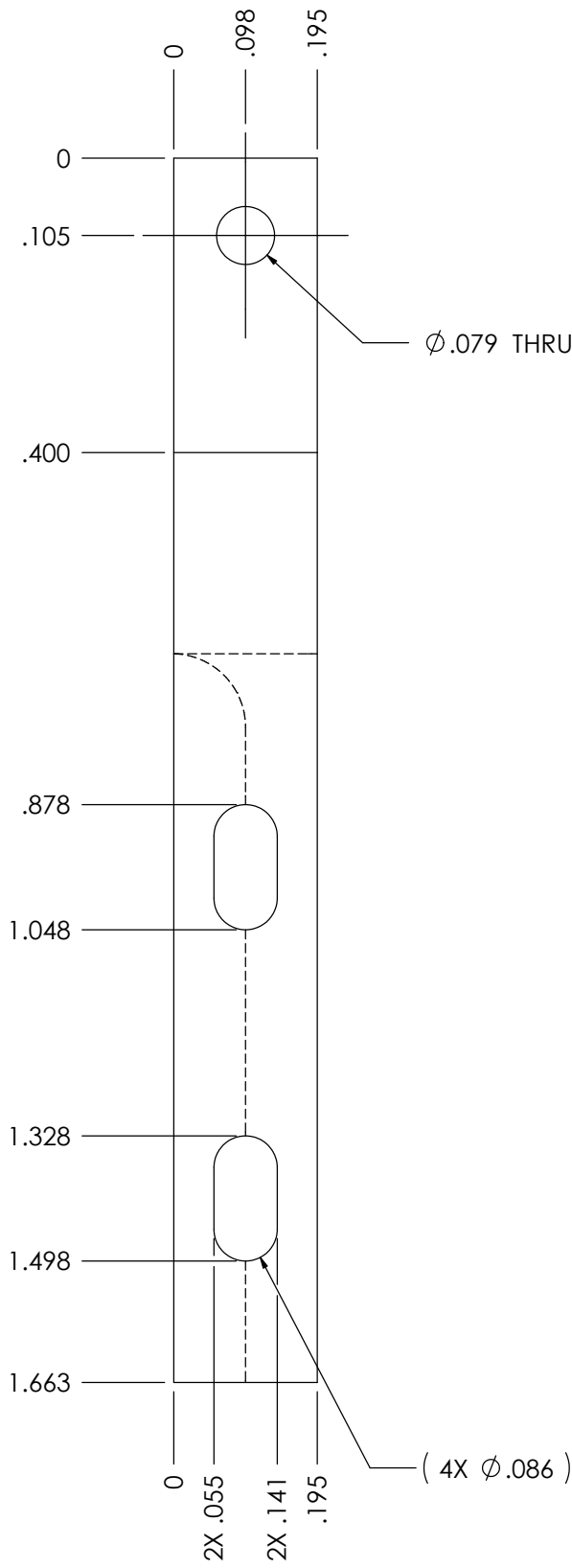
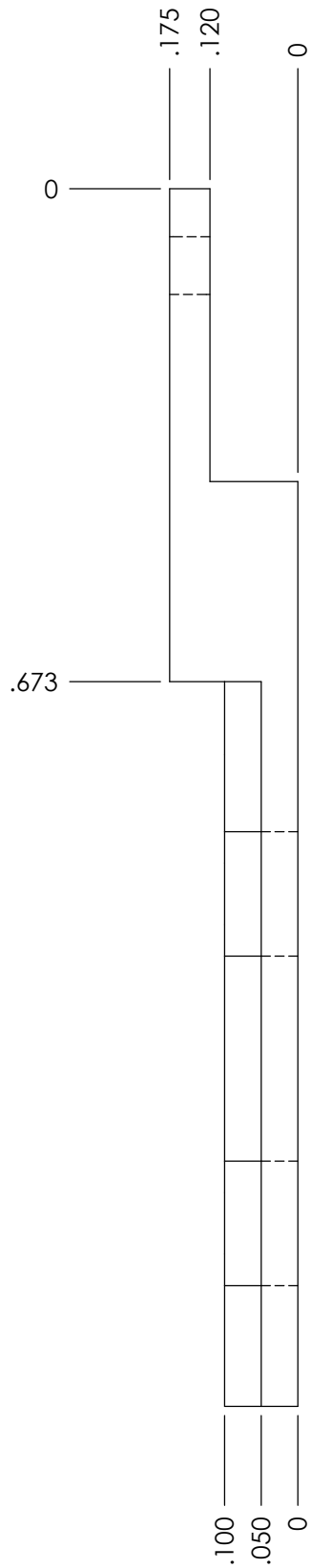
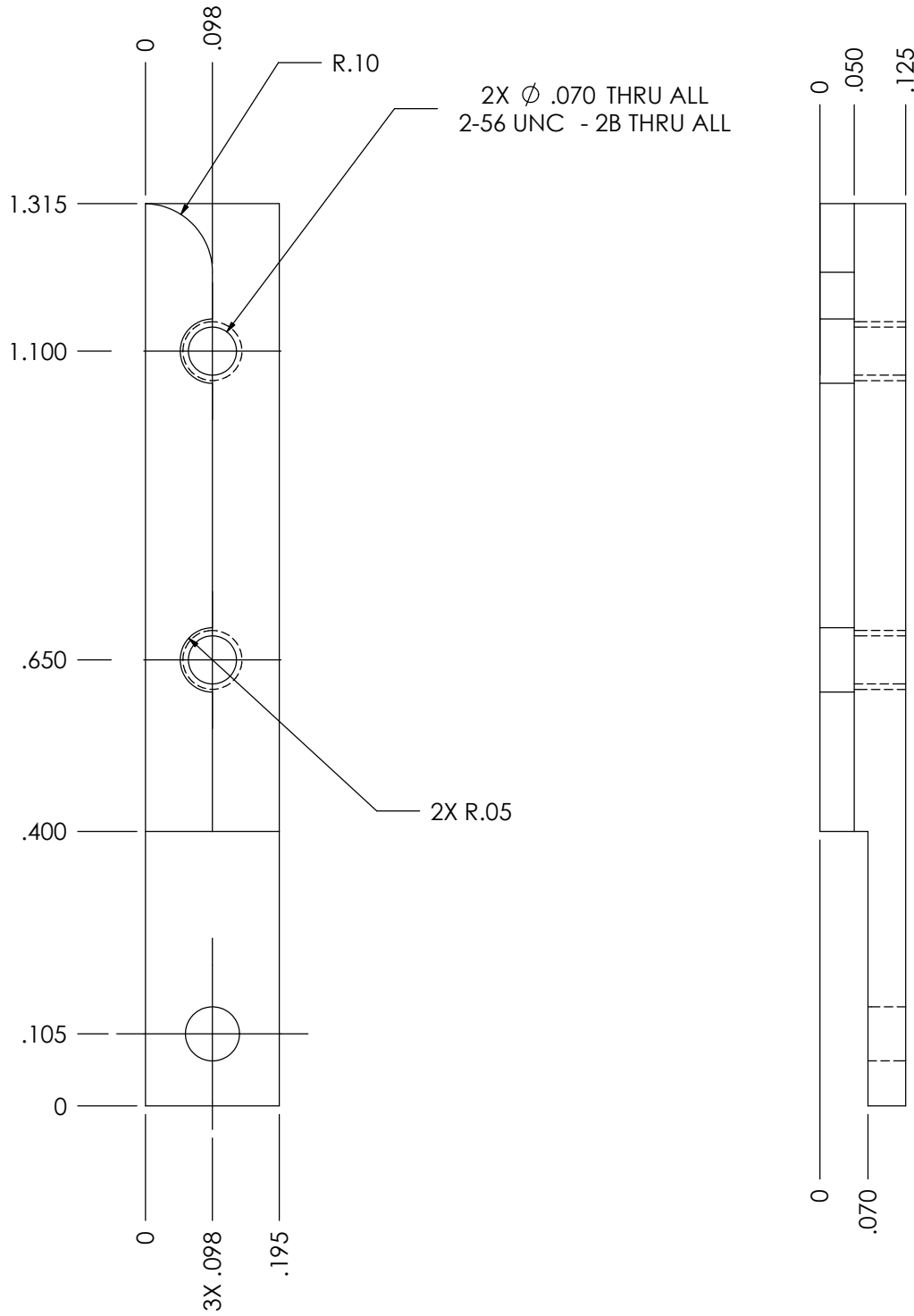
BILL OF MATERIALS					last updated on: Friday, February 10, 2006 8:42:04 AM		
Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:			APPROVALS	DATE	
Inspector		2 PLACE DIM ±.01	3 PLACE DIM ±.005	4 PLACE DIM ±.0005	ENGINEER Jason Feldman 831-775-1837 CHECKED	Monterey Bay Aquarium Research Institute 7700 Sandholdt Road Moss Landing, CA 95039	
Shop Foreman		1. DIMENSIONS ARE IN INCHES 2. DIMENSION LIMITS HELD AFTER PLATING 3. REMOVE BURRS & SHARP EDGES .010 MAX 4. MACHINED FILLET RADII .000 TO .015 5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005 6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .001 PER INCH. MAX .003 INCHES FOR SINGLE SURFACE. 7. SURFACE FINISH TO BE 32 MICRON UNLESS OTHERWISE SPECIFIED					manipulator
Engineer							
NEXT ASSY Description	NEXT ASSY Number	PROJECT NUMBER 701312.00			SIZE	DWG. NO.	
		PROJECT ESP 2G			C	1002451	
DO NOT SCALE DRAWING		CAD FILE: X:\701312 ESP 2G\SolidWorks files\internal structure (1002209)			REV. D		
					SHEET 17 OF 19		

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1002451-019
GRIPPER LINK TAPPED

1002451-020
GRIPPER LINK SLOTTED

DETAIL V



ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
19	1002451-019	gripper link (tapped)	Stainless Steel	2
20	1002451-020	gripper link (slot)	Stainless Steel	2

BILL OF MATERIALS					last updated on: Friday, February 10, 2006 8:42:04 AM	
Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:			APPROVALS DATE	
Inspector		2 PLACE DIM ±.01	3 PLACE DIM ±.005	4 PLACE DIM ±.0005	ENGINEER Jason Feldman 831-775-1837 CHECKED	Monterey Bay Aquarium Research Institute 7700 Sandholdt Road Moss Landing, CA 95039
Shop Foreman		1. DIMENSIONS ARE IN INCHES 2. DIMENSION LIMITS HELD AFTER PLATING 3. REMOVE BURRS & SHARP EDGES .010 MAX 4. MACHINED FILLET RADII .000 TO .015				
Engineer		5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005				
NEXT ASSY Description	NEXT ASSY Number	6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .001 PER INCH. MAX .003 INCHES FOR SINGLE SURFACE.			PROJECT NUMBER 900312.00	manipulator
		7. SURFACE FINISH TO BE 32 MICRON UNLESS OTHERWISE SPECIFIED			PROJECT ESP 2G	
DO NOT SCALE DRAWING					SIZE C	DWG. NO. 1002451
					REV. D	
CAD FILE: X:\701312 ESP 2G\SolidWorks files\internal structure (1002209)					SHEET 18 OF 19	

NOTES FOR MAGNAPLATE HCR PROCESSING
SURFACE GROWTH TO BE .0005" to .0010"
(TOTAL COATING THICKNESS .0010" to .0020")

NO MAGNAPLATE HCR IN BLUE AREAS

MAGNAPLATE HCR GREEN AREAS ONLY

FRINGE AREA NON-CRITICAL
(OK for plating to extend slightly
into non-plated area)

MBARI part number: 1002451-015

MBARI part number: 1002451-016

BILL OF MATERIALS				last updated on: Friday, February 10, 2006 8:42:04 AM	
Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:		APPROVALS DATE	
Inspector		2 PLACE DIM ±.01	3 PLACE DIM ±.005	ENGINEER Jason Feldman 831-775-1837	Monterey Bay Aquarium Research Institute 7700 Sandholdt Road Moss Landing, CA 95039
Shop Foreman		4 PLACE DIM ±.0005	ANGLES ±1°		
Engineer		1. DIMENSIONS ARE IN INCHES 2. DIMENSION LIMITS HELD AFTER PLATING 3. REMOVE BURRS & SHARP EDGES .010 MAX 4. MACHINED FILLET RADII .000 TO .015 5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005		CHECKED	manipulator
NEXT ASSY Description	NEXT ASSY Number	6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .001 PER INCH. MAX .003 INCHES FOR SINGLE SURFACE. 7. SURFACE FINISH TO BE 32 MICRON UNLESS OTHERWISE SPECIFIED		PROJECT NUMBER 701312.00	
DO NOT SCALE DRAWING		PROJECT ESP 2G		SIZE C	DWG. NO. 1002451
		CAD FILE: X:\701312 ESP 2G\SolidWorks files\internal structure (1002209)		REV. D	
				SHEET 19 OF 19	

