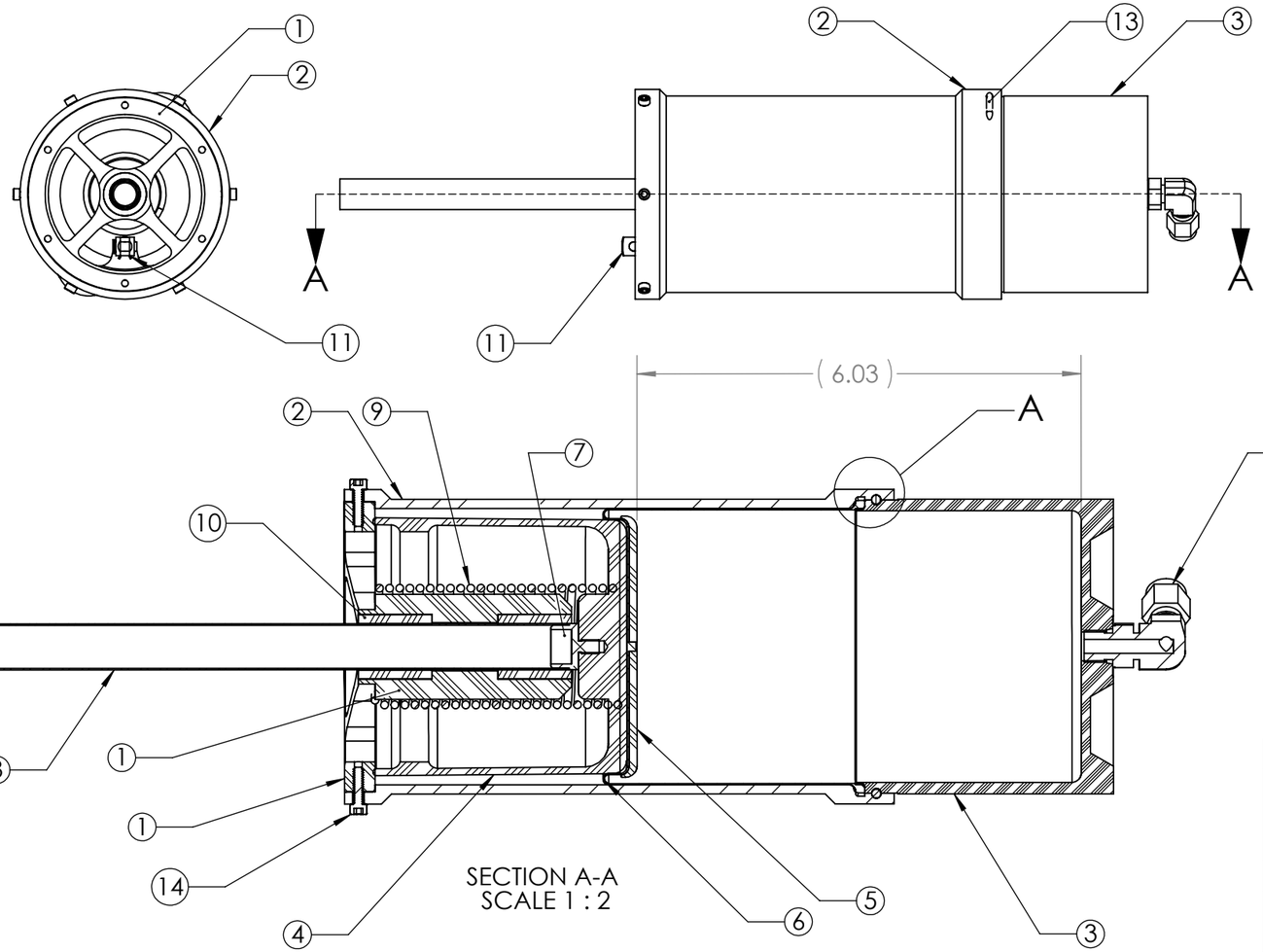
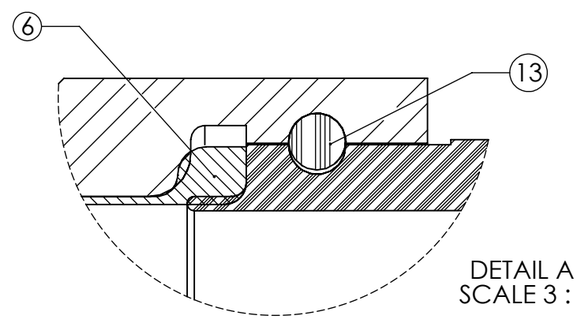
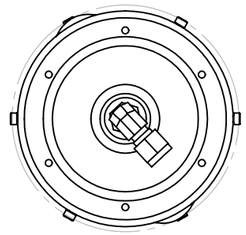
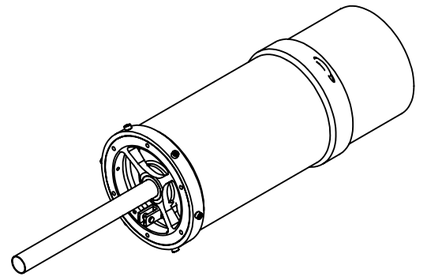
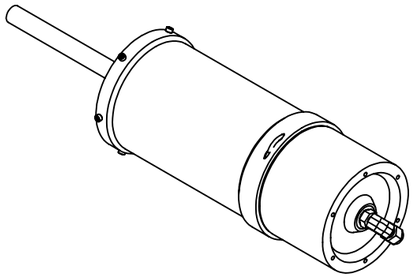
REVISIONS			
	INITIAL RELEASE	X/XX/01	J.E.











ITEM NO.	QTY.	Part_Number	DESCRIPTION	Revision	Vendor	MATERIAL
15	1	SS-400-2-4ST	1/4 Tube - SAE#4 Elbow		Swagelok	
14	6	92185A148	#6-32 x 1/2 Soc Hd Cap		McMaster-Carr	AISI 316
13	2	7889A44	Torpedo Lock, welding rod		McMaster-Carr	Polypropylene 1/8 x 5.875
12	1	90575A410	Fully Threaded Stud		McMaster-Carr	316 SS
11	1	#2447K110	Rod End #10-32		Mcmaster-Carr	Zinc Plated Steel
10	2	6377K61	Sleeve Bearing		McMaster-Carr	Rulon J
9	1	#4011	COMP. SPRING Open		Century Spring	Hard Drawn Wire
8	1	89785K849	Piston Shaft Tube		McMaster-Carr	316 S.S. (A213)
7	1	P-200624-08	Piston Shaft Tube End	B	MBARI	Aluminum 6061-T6
6	1	1A-375x375	Class 1A Diaphragm		Bellofram	Code #59 (Nitrile)
5	1	P-200643-08	Curved Lip Piston Retainer Plate		MBARI	ABS
4	1	P-200619-08	Bellofram Piston	B	MBARI	ABS -plus
3	1	P-200642-08	VB res. Cap	B	MBARI	POM Delrin Homopolymer
2	1	P-200591-08	Cylinder Body for VB	C	MBARI	POM Delrin Homopolymer
1	1	P-200652-09	Cylinder-End	C	MBARI	ABS

BILL OF MATERIALS

Shop / Q.C.	
Inspector	
Shop Foreman	
Engineer	
NEXT ASSY Description	NEXT ASSY Number
	A-200681-08
Application	

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:

1 PLACE DIM 1/16	2 PLACE DIM .02	3 PLACE DIM .005	ANGLES 1

1. DIMENSIONS ARE IN INCHES
2. DIMENSION LIMITS HELD AFTER PLATING.
3. REMOVE BURRS AND SHARP EDGES .015 MAX.
4. MACHINED FILLET RADII .0150-.030.
5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .OO5
6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .002 PER INCH, MAX .012 INCHES FOR SINGLE SURFACE.

DO NOT SCALE DRAWING

APPROVALS	DATE
DRAWN J. ERICKSON	12/16/08
ENGINEER J. ERICKSON	12/16/08
CHECKED J.S.	10/26/17
PROJECT NO.	900739
PROJECT	LRAUV
WEIGHT	2.28 lb.

Monterey Bay Aquarium Research Institute
MBARI
7700 Sandholdt RD.
Moss Landing, CA 95039
PH: (831) 775-1700

TETHYS - LRAUV
VB-Reservoir

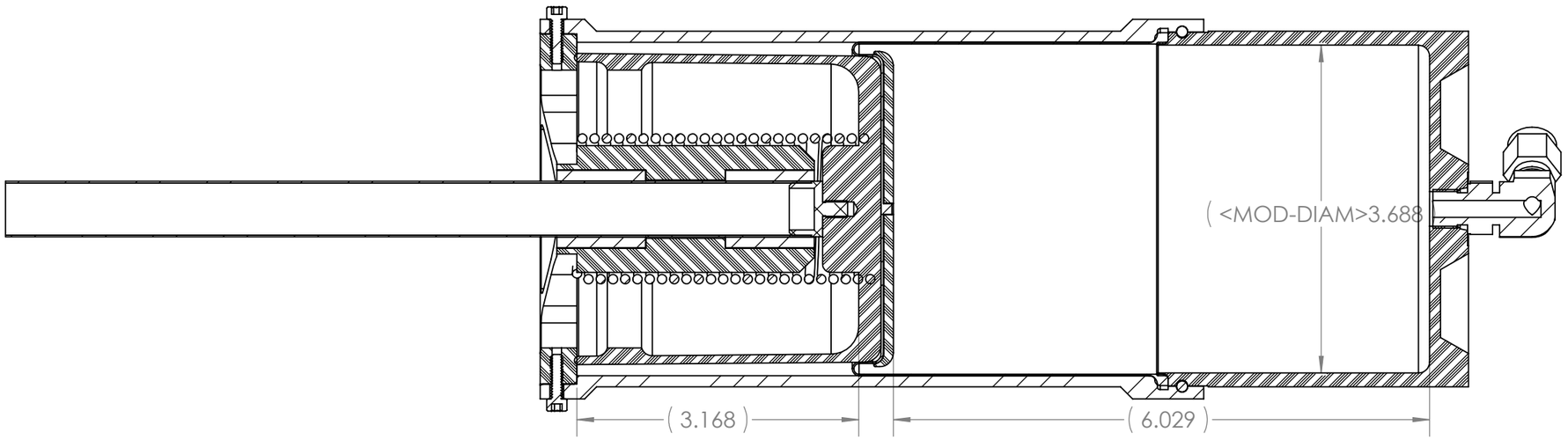
SIZE	DWG. NO.	REV.
B	A-200620-08.DWG	

SCALE 1:8 | CAD FILE: MECH ENG ON TORNADO | SHEET 1 OF 3

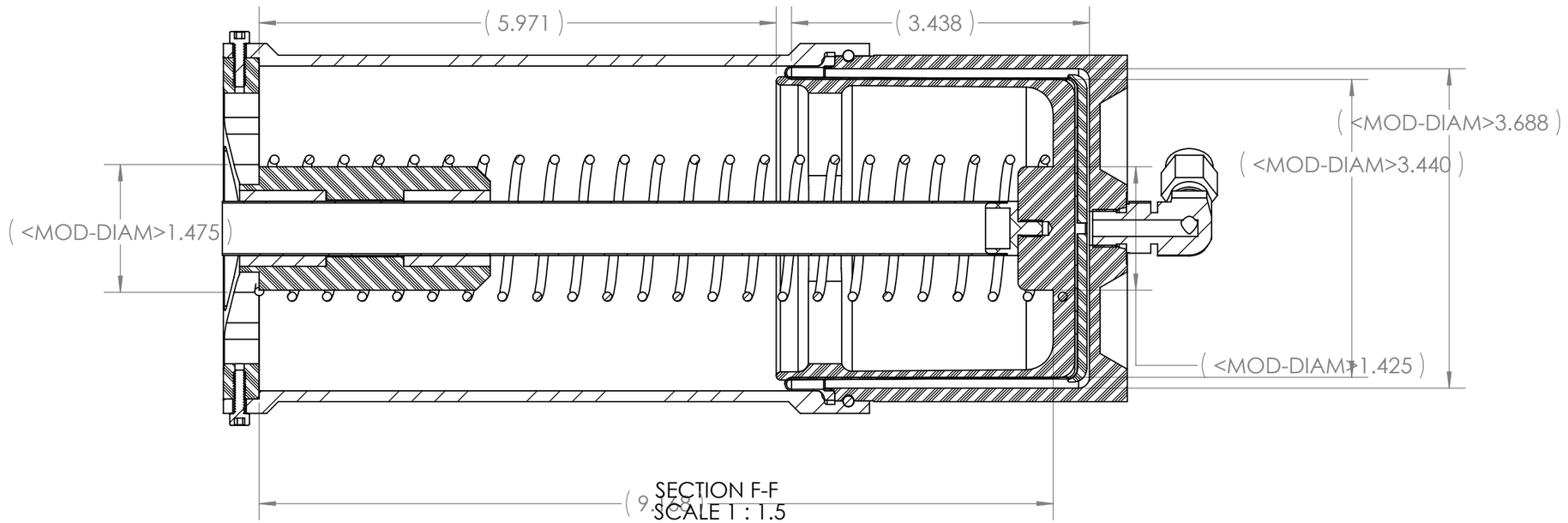
7. PROJECT LIBRARY:\900739.LRAUV\Project.Drawings\Project.ME.Dwgs\LRAUV\Buoyancy Engine

NOTES: (CONT. FROM TITLE BLOCK)

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
	INITIAL RELEASE	X/XX/00	J.E.



SECTION E-E
SCALE 1 : 1.5



SECTION F-F
SCALE 1 : 1.5

vol. = (pi/4)*(3.688^2 - 3.440^2)*3.438 = 4.773 in^3 *(16.387064) = 78.22 cm^3

VOL. = (pi/4)*(3.688^2)*6.029 = 64.405 in^3 * (16.387064) = 1055.41 cm^3

NOTES: (CONT. FROM TITLE BLOCK)

Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:	APPROVALS DATE
Inspector		1 PLACE DIM 1/16 · 2 PLACE DIM .02 · 3 PLACE DIM .005 · ANGLES 1	DRAWN J. ERICKSON X/XX/00
Shop Foreman		1. DIMENSIONS ARE IN INCHES	ENGINEER J. ERICKSON X/XX/00
Engineer		2. DIMENSION LIMITS HELD AFTER PLATING.	CHECKED
NEXT ASSY Description	NEXT ASSY Number	3. REMOVE BURRS AND SHARP EDGES .015 MAX.	PROJECT NO. 900739
		4. MACHINED FILLET RADII .0150-.030.	PROJECT LRAUV
Application		5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005	WEIGHT 2.28 lb.
		6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .002 PER INCH, MAX .012 INCHES FOR SINGLE SURFACE.	
		DO NOT SCALE DRAWING	

Monterey Bay Aquarium Research Institute
MBARI
7700 Sandholdt RD.
Moss Landing, CA 95039
PH: (831) 775-1700

TETHYS - LRAUV
VB-Reservoir

SIZE	DWG. NO.	REV.
B	A-200620-08.DWG	

SCALE 1:8 · CAD FILE: MECH ENG ON TORNADO · SHEET 2 OF 3

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
	INITIAL RELEASE	X/XX/00	J.E.

BONDING DIAPHRAM(6)--3M 5200 OR LOCTITE CONTACT ADHESIVE (FASTER)
SMEAR A LIGHT COAT OVER TOP OF PISTON(4) AND BOTTOM SURFACE OF RETAINER PLATE(5)
AVOID EDGESOF BOTH SO BELLOFRAM IS FREE TO MOVE. ALLOW TO CURE BEFORE ASS'Y

PISTON TRAVEL CALIBRATION--MARK MAX AND MIN INDELIBLE INK ON PISTON TUBE(8)
THIS IS IMPORTANT TO PRECLUDE DAMAGE AND LEAKS WHEN COMMISIONING VEHICLE
PISTON TRAVEL PARAMETERS SHOULD BE SET 0.1" (~50CC) INSIDE OF THE MAX AND MIN

CUT #8 SHAFT TO 9.06", CUT #9 SPRING TO 15" FREE LENGTH

SAND 2 X # 10 BUSHINGS AND #8 SHAFT TILL SLIDES SMOOTHLY

ATTACH STRING POT END TO #11 ROD END (WITH STR POT ADJUSTER) PRIOR TO ASS'Y #1. STRING POT LINE SHOULD BE ALIGNED WITH VERT. MOUNT HOLE THRU GAP IN #1 CYL END.

ASSEMBLY SEQUENCE-SUGGESTED
1. BOND DIAPHRAM TO PISTON AND CAP--ABOVE
2. CLEAN AND USE A LIGHT OIL ON WET SIDE DIAPH. SO IT ROLLS EASILY ON ITSELF DURING INITIAL ASS'Y
3. PLACE PISTON/DIAPH ASS'Y INTO CYL., COMPRESSING CAP INTO CYL., SLIDE IN **4 X 2.5**" TORPEDO LOCKS, (LARGE CLAMP HELPS)
4. RETRACT PISTON ATTACH STRINGE POT TO #11, ABOVE
5. BOND #8 TO #7, INSTANT ADHESIVE, INSTALL
6. INSTALL 2 X #10 BUSHING/BEARINGS INTO #1D CYL END
7. PUSH PISTON TO TOP, NOTING SMOOTH TRAVEL,
8. INSTALL SPRING, SLIDE #1 CYL END INTO POSITION, NOTING STRAIGHT PULL FOR STR POT WIRE,
9. COMPRESS INTO PROPER POSITION, 6 X 6-32

NOTES: (CONT. FROM TITLE BLOCK)

ITEM NO.	QTY.	PART NO.	DESCRIPTION	VENDOR	MATERIAL SPECIFICATION

BILL OF MATERIALS

Shop / Q.C.	UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:	APPROVALS DATE	Monterey Bay Aquarium Research Institute
Inspector	1 PLACE DIM 1/16 · 2 PLACE DIM .02 · 3 PLACE DIM .005 · ANGLES 1	DRAWN J. ERICKSON	**MBARI**
Shop Foreman	1. DIMENSIONS ARE IN INCHES	ENGINEER J. ERICKSON	**7700 Sandholdt RD.**
Engineer	2. DIMENSION LIMITS HELD AFTER PLATING.	CHECKED	**Moss Landing, CA 95039**
	3. REMOVE BURRS AND SHARP EDGES .015 MAX.	PROJECT NO. 900739	**PH: (831) 775-1700**
NEXT ASSY Description / NEXT ASSY Number	4. MACHINED FILLET RADII .0150-.030.	PROJECT LRAUV	TETHYS - LRAUV
	5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005		VB-Reservoir ASSEMBLY NOTES
	6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .002 PER INCH, MAX .012 INCHES FOR SINGLE SURFACE.		SIZE B · DWG. NO. .DWG · REV.
Application	DO NOT SCALE DRAWING	WEIGHT lb.	SCALE 1:8 · CAD FILE: MECH ENG ON TORNADO · SHEET 3 OF 3