



# MANUAL: TSUNAMI & TSUNAMI RC MONITOR

See LIY-500 Remote Control (RC) Monitor Electrical Controls  
Supplemental Instructions For Use With Tsunami RC Models

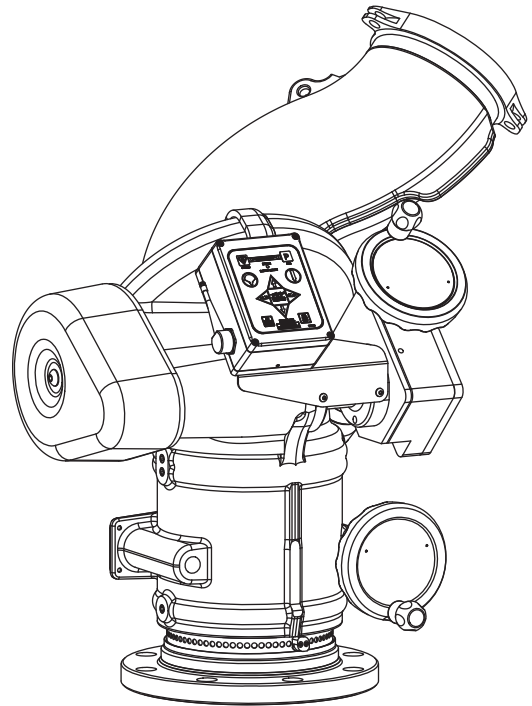
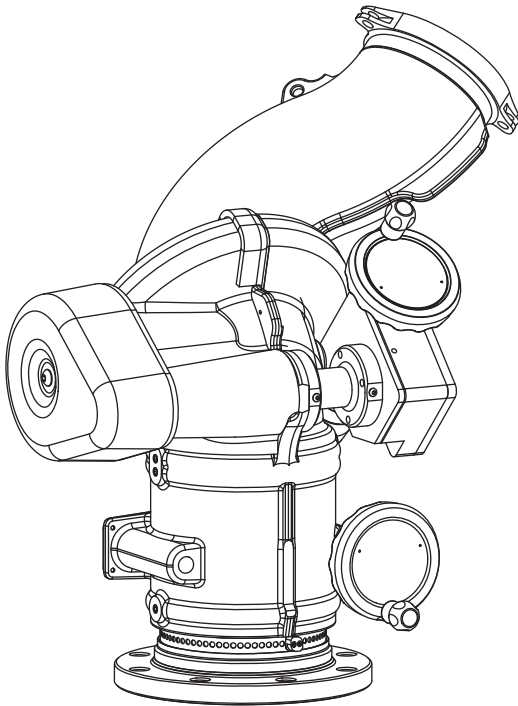
## INSTRUCTIONS FOR INSTALLATION, SAFE OPERATION AND MAINTENANCE

**⚠ DANGER**

Understand manual before use. Operation of this device without understanding the manual and receiving proper training is a misuse of this equipment. Obtain safety information at [tft.com/serial-number](http://tft.com/serial-number)

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RC Tsunami only; This manual is intended to be used in conjunction with MANUAL; RC Monitor Electrical Controls LIY-500 which covers installation, safe operation, and maintenance of electrical controls. Manual can be downloaded from [tft.com](http://tft.com).



See Section 3.1 for Flow/Pressure Operating Envelope

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3701 Innovation Way, Valparaiso, IN 46383-9327 USA  
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## DANGER

### PERSONAL RESPONSIBILITY CODE

The member companies of FEMSA that provide emergency response equipment and services want responders to know and understand the following:

1. Firefighting and Emergency Response are inherently dangerous activities requiring proper training in their hazards and the use of extreme caution at all times.
2. It is your responsibility to read and understand any user's instructions, including purpose and limitations, provided with any piece of equipment you may be called upon to use.
3. It is your responsibility to know that you have been properly trained in Firefighting and /or Emergency Response and in the use, precautions, and care of any equipment you may be called upon to use.
4. It is your responsibility to be in proper physical condition and to maintain the personal skill level required to operate any equipment you may be called upon to use.
5. It is your responsibility to know that your equipment is in operable condition and has been maintained in accordance with the manufacturer's instructions.
6. Failure to follow these guidelines may result in death, burns or other severe injury.







Fire and Emergency Manufacturers and Service Association  
P.O. Box 147, Lynnfield, MA 01940 • [www.FEMSA.org](http://www.FEMSA.org)

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## 1.0 MEANING OF SAFETY SIGNAL WORDS

A safety related message is identified by a safety alert symbol and a signal word to indicate the level of risk involved with a particular hazard. Per ANSI standard Z535.6-2011, the definitions of the four signal words are as follows:

	<b>DANGER</b> indicates a hazardous situation which, if not avoided, will result in death or serious injury.
	<b>WARNING</b> indicates a hazardous situation which, if not avoided, could result in death or serious injury.
	<b>CAUTION</b> indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.
	<b>NOTICE</b> is used to address practices not related to physical injury.

## 2.0 SAFETY

The operation of this monitor can be dangerous. The following must be observed at all times.

	<b>DANGER</b> The stream exiting a monitor is very powerful and capable of causing injury and property damage. Make sure the monitor is securely attached to the base and pointing in a safe direction before water to the monitor is turned on. Use care in directing the stream.
	<b>WARNING</b> Injury or death may occur by attempting to use a damaged monitor. Before using the monitor inspect it for damage resulting from: <ul style="list-style-type: none"><li>• Failure to drain monitor followed by exposure to freezing conditions</li><li>• Exposure of monitor to temperatures in excess of 160 degrees F</li><li>• Structural damage caused by over-pressurization</li><li>• Missing parts, physical abuse, exposure to severe chemicals</li><li>• Deformed or cracked flanges damaged as a result of improper installation<ul style="list-style-type: none"><li>- Excessive bolt torque</li><li>- Wrong tightening sequence</li></ul></li></ul>
	<b>WARNING</b> The RC monitor control boxes and motors are not rated as ignition proof, explosion proof, or intrinsically safe. Install in locations with adequate ventilation and no hazard of flammable vapor buildup.
	<b>WARNING</b> Injury can result from an inadequately supported monitor. The monitor mount must be capable of supporting 6000 lbs (3000 kg) of nozzle reaction force.
	<b>WARNING</b> The monitor may be damaged if frozen while containing sufficient amounts of water. Such damage may be difficult to detect visually and can lead to possible injury or death. Any time the monitor is subject to possible damage from freezing, it must be hydrostatically tested by qualified personnel before being considered safe for use.
	<b>WARNING</b> The electric Tsunami RC may be remotely operated. The electric drives are current limited but still produce enough force to cause injury. Keep hands and fingers away from pinch points on the monitor.
	<b>CAUTION</b> Do not use the manual override knobs while the electric controls are in operation. The electric drives produce enough torque to cause injury.
	<b>CAUTION</b> Maximum flow and pressure is shown in Figure 3.1.1 Operating Envelope. Damage or injury may result if the monitor is operated beyond these limits.
	<b>CAUTION</b> Use with salt water is permissible provided the monitor is thoroughly cleaned with fresh water after each use. The service life of the monitor may be shortened due to the effects of corrosion and is not covered under warranty.
	<b>NOTICE</b> Vehicle mounted monitor may be damaged by collision when passing under doorways and overhead obstructions. Stow monitor in it's lowest position before transporting it. Insure there is sufficient head room to safely pass these obstructions.

### 3.0 GENERAL INFORMATION

The Tsunami Monitor is a manually operated monitor designed for master stream flows. The construction of this TFT monitor consists of a hardcoat ANSI 356.0-T6 aluminum main waterway, silver powercoat finish inside and out, and 8" ANSI flange. Maximum operating pressure is 175 psi (12 bar) while flowing. Unique patented segmented waterway allows water to make very few turns as it travels through the monitor resulting in low friction loss and a far reaching effective stream. Elevation range is 90 degrees above horizontal to 10 degrees below. The manual model has 360 degree continuous horizontal rotation with field changeable stops at every 5 degrees either side of the center position. The RC model also has 320 degrees of horizontal rotation 160 degrees from center each way.

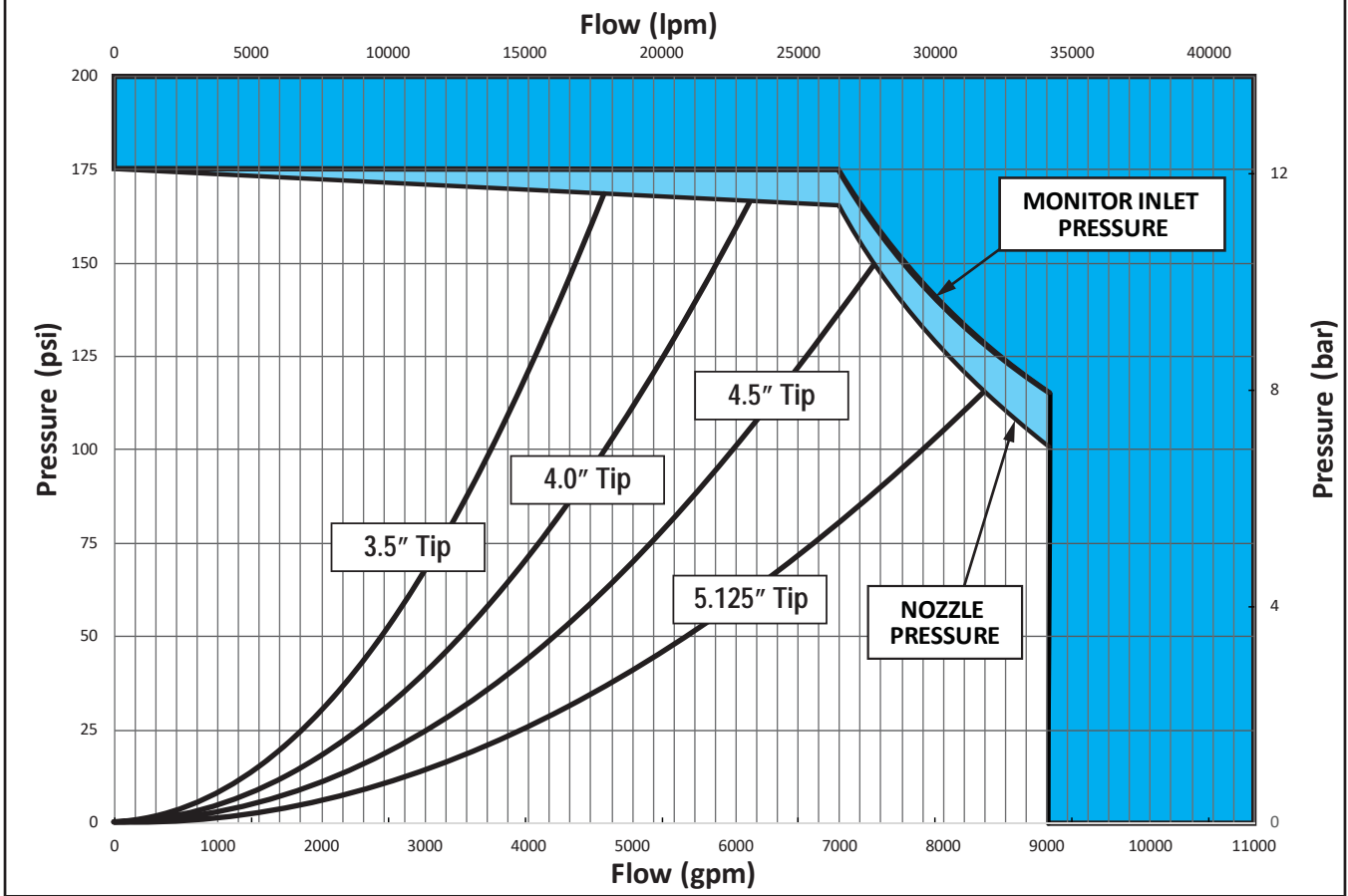
The Tsunami RC is an electric remote controlled monitor that has all the benefits of the Tsunami Manual Monitor with the addition of powered operation. Designed for auto sensing 12 VDC or 24 VDC operation. The Tsunami RC comes with a factory installed control panel mounted on the monitor for controlling horizontal rotation, elevation, nozzle pattern, park, oscillate, and auxiliary controls. The motor control circuits are factory installed on the monitor and use position encoders and current limiting to protect the drive train at the ends of travel. Unit comes with ultra-flexing robotics cable already wired to the monitor so installation effort is minimized. Power wire has only four conductors (two for power and two for communications) further easing installation effort. Knobs for manual override are provided on the horizontal rotation and elevation drive. TFT's nozzles plug into the factory installed nozzle power wire. Electric drives and control box are waterproof.

### 3.1 MECHANICAL SPECIFICATIONS

	Manual		Remote Control	
	US	METRIC	US	METRIC
Weight	124 lbs	56.2 kg	169 lbs	76.6 kg
Min. Flow Area 8" Inlet	36.3 in <sup>2</sup>	234 cm <sup>2</sup>	36.3 in <sup>2</sup>	234 cm <sup>2</sup>
Max Flow	See Figure 3.1.1			
Max Operating Pressure	175 psi	12 bar	175 psi	12 bar
Materials Used	ANSI A356.0-T6 Aluminum, Stainless, HDPE			
Maximum Torque Elevation			350 ft•lbs	480 n•m
Maximum Torque Horizontal			110 ft•lbs	150 n•m
Speed Elevation			1.5 deg/sec	
Speed Horizontal			4.5 deg/sec	

\*See LIY-500 Remote Control (RC) Monitor Supplemental Instructions for electrical specifications.

# Tsunami Operating Envelope



3.5" smoothbore flows 3600 gpm (13800 l/min) at 100 psi (7 bar), K factor = 360  
 4.0" smoothbore flows 4700 gpm (18000 l/min) at 100 psi (7 bar), K factor = 470  
 4.5" smoothbore flows 6000 gpm (22800 l/min) at 100 psi (7 bar), K factor = 600  
 5.125" smoothbore flows 7800 gpm (29500 l/min) at 100 psi (7 bar), K factor = 780

Fig. 3.1.1  
 Tsunami Operating Envelope

### 3.2 PART IDENTIFICATION AND MODELS

The Tsunami Monitor comes in manual and electric remote controlled models. Manual models are available with handwheel control on both axes. Electric remote control models are available in a standard model (suitable for on top of pumpers).

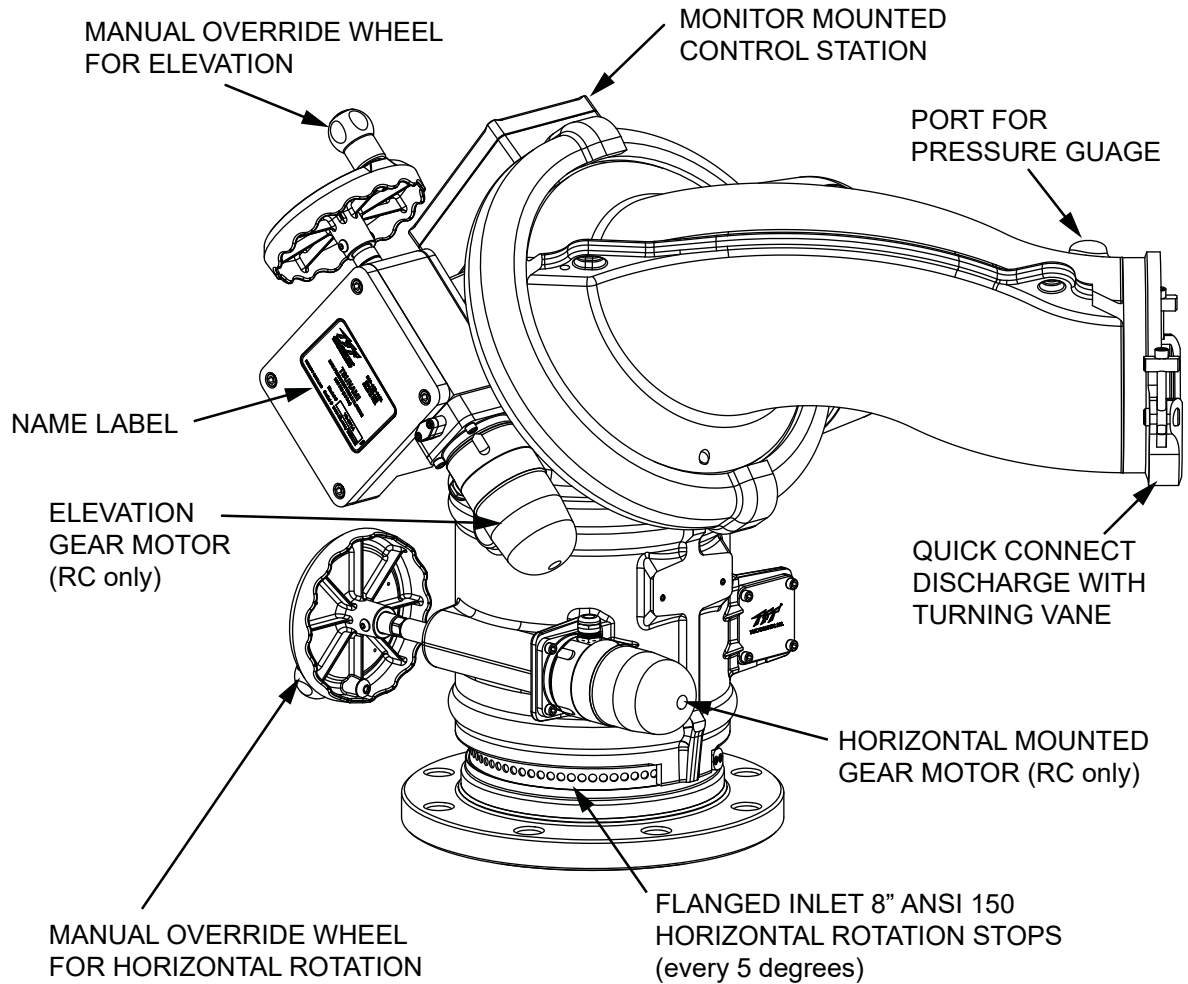


Figure 3.2  
Tsunami RC Monitor

### 3.3 OVERALL DIMENSIONS TSUNAMI MANUAL MONITOR

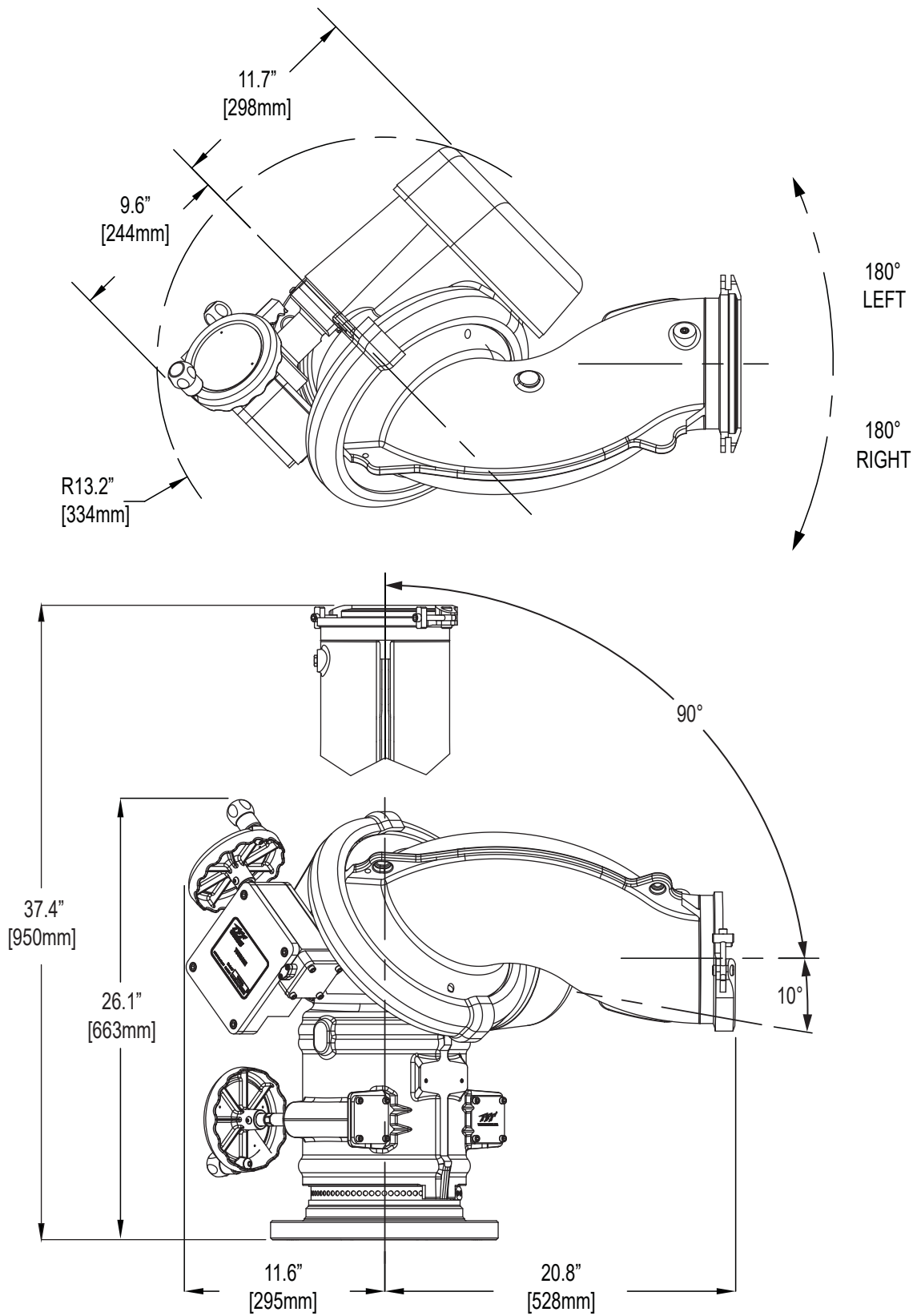


Figure 3.3  
Tsunami Manual Monitor



### 3.4 OVERALL DIMENSIONS TSUNAMI RC MONITOR

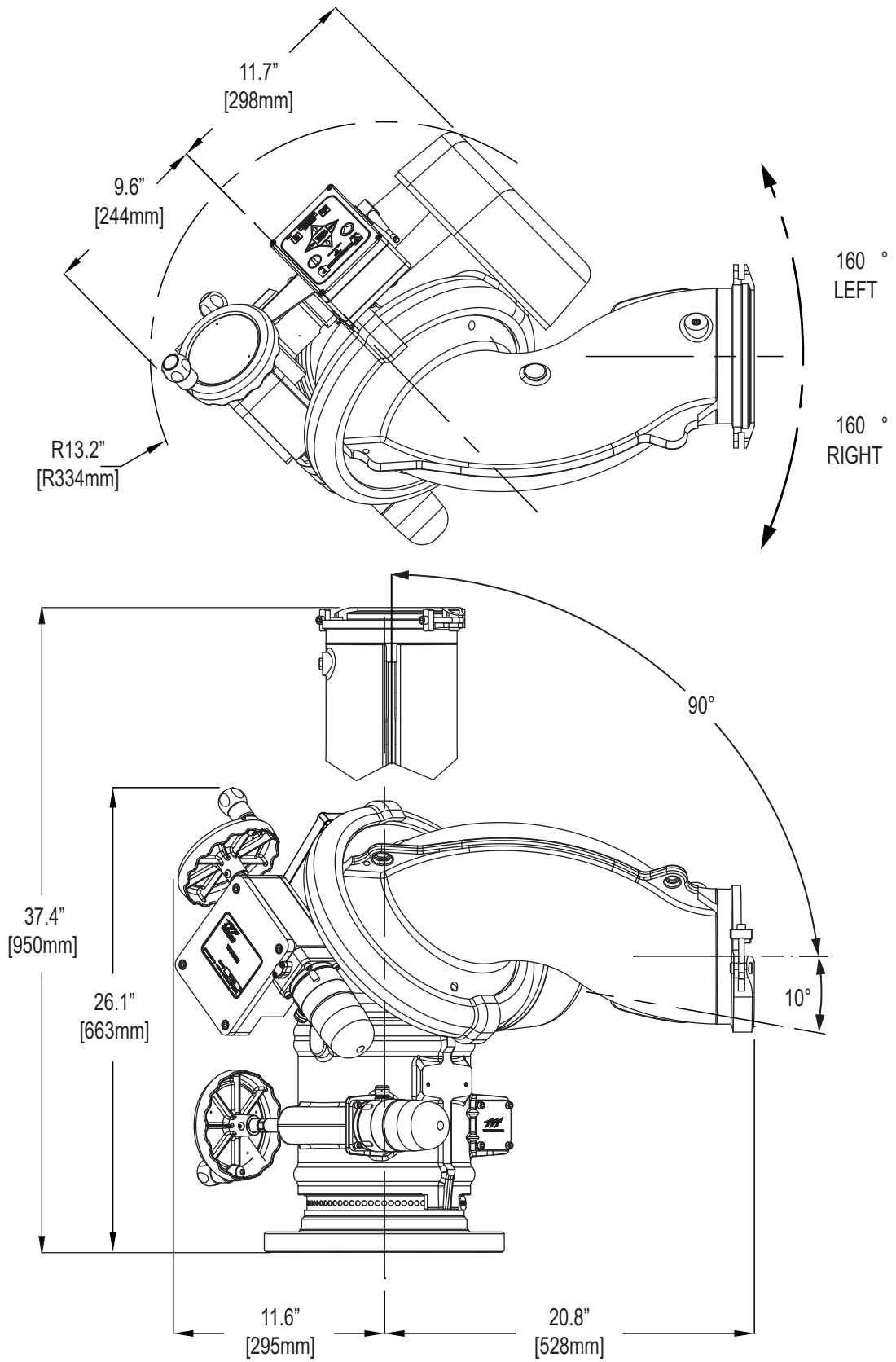


Figure 3.4  
Tsunami RC Monitor

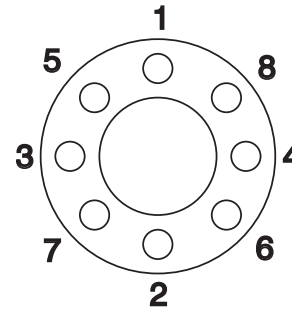
## 4.0 INSTALLATION

See Remote Control (RC) Monitor Electrical Controls Supplemental Instructions LIY-500.

### 4.1 STRUCTURAL REQUIREMENTS FOR MONITOR MOUNTING

The structure that the Tsunami Monitor is mounted to must withstand the internal pressure of the monitor as well as shear and bending forces due to nozzle reaction. Nozzle reaction can be as high as 6000 lbs (3000 kg).

For flanged connections the use of flat flanges without raised faces is recommended. Use a ring gasket as defined in ASME 16.21 or ISO 7483. Tighten flange bolts in an alternating sequence as shown in figure 4A. Tighten to 150-200 ft-lb (200-270 Newton-Meters).



Tighten sequentially  
each bolt three times.

Fig 4.1 Flange Bolt Tightening Sequence

FLANGE TYPE	OPT#	OUTSIDE DIAMETER		THICKNESS		BOLT HOLE CIRCLE		# OF BOLTS	SIZE OF BOLTS		TORQUE ON BOLTS	
		in	mm	in	mm	in	mm		in	mm	ft-lbs	N-m
8" ANSI 150 FLANGE	1	13.5	342.9	1.125	28.6	11.75	298.5	8	3/4	19.1	150-200	200-270

### **⚠ WARNING**

Injury can result from an inadequately supported monitor. The monitor mount must be capable of supporting the nozzle reaction force which can be as high as 6000 lbs (3000 kg). Flanges and pipe made from plastic are inadequate for monitor mounting and must not be used. Determine safe tipping moments before installing monitor on vehicles, wheeled trailers, or bases. Mobile installations may require additional restraint against sliding when necessary.

## 4.2 TRAVEL STOPS

### 4.2.1 HORIZONTAL ROTATION TRAVEL STOPS

The Remote Control Tsunami is limited to 320 degrees total horizontal rotation travel or 160 degrees from either side of a straight ahead position. Horizontal rotation travel stops may be installed in the monitor to limit travel as shown in figure 4.2.3. Horizontal travel stops can be set up in 5° increments from 0° to 160° left or right by removing the stop screw and re-installing the stops in desired positions. Apply a drop of Loctite 242 (blue) VSA-125 to the threads and tighten securely.

The range of horizontal rotation travel for the manual Tsunami monitor is continuous 360 degrees. If collision avoidance is desired then add horizontal travel stops to the manual monitor. The RC Tsunami has a horizontal rotational travel of 320 degrees.

#### **NOTICE**

**Power cord on RC Tsunami must be installed with adequate slack for full range of horizontal rotation.**

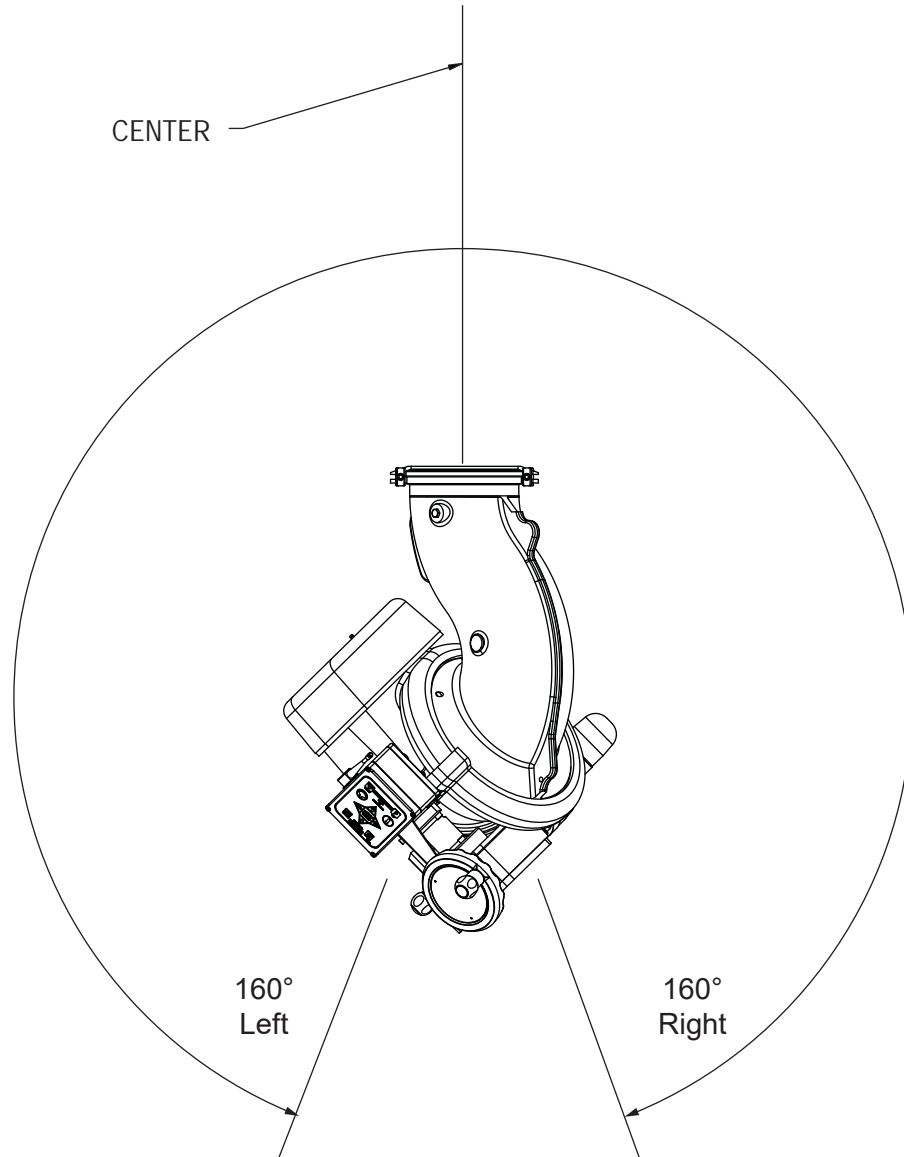


Fig 4.2.1  
Horizontal Rotation Travel Limits for Tsunami RC monitor.

## 4.2.2 ELEVATION TRAVEL STOPS

The range of elevation travel for the Tsunami Monitor is 90 degrees above horizontal to 10 degrees below zero. The elevation range may be changed in the field by using optional stop disks. Consult factory for disks and procedure.

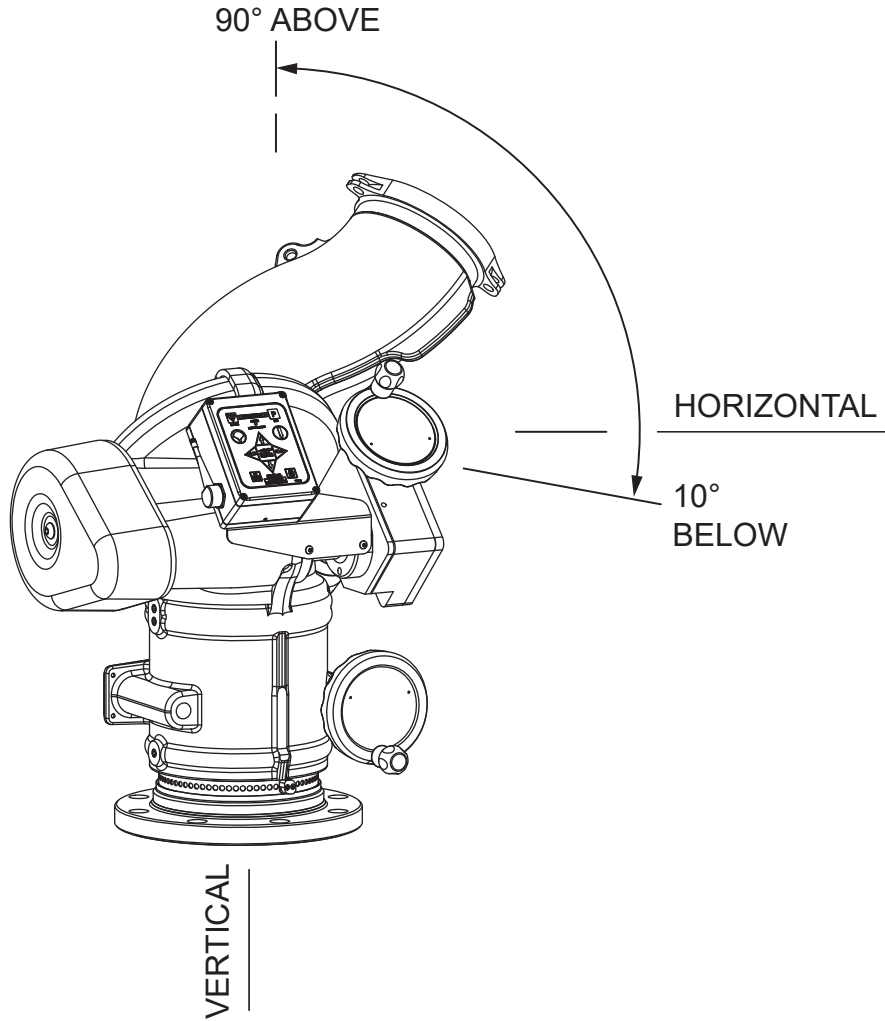


Fig 4.2.2  
Elevation Travel Limits

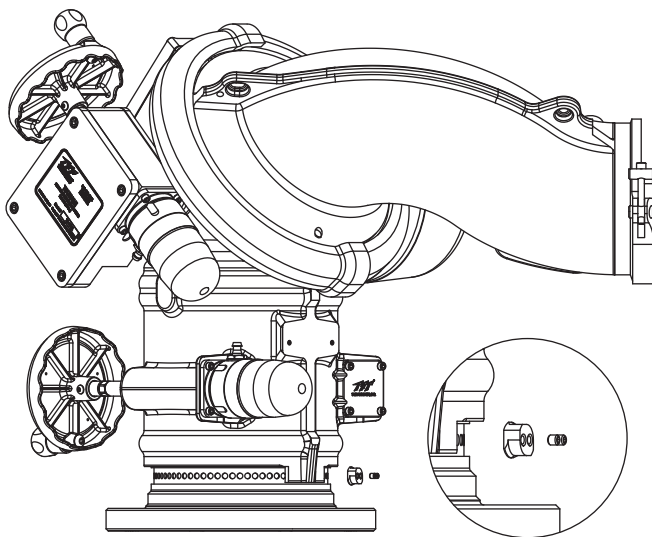
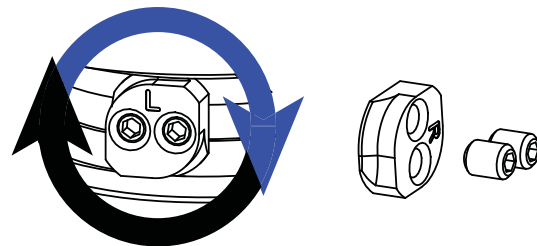


Fig 4.2.2B  
Elevation Travel Stop Locations



1. Rotate horizontal travel stop 90° one direction and insert into coupling track.
2. Rotate back to original position ensuring the letter is located at the top of the travel stop.
3. Rotate the monitor to the desired position, position the travel stop next to the Monitor's Stop Ear.
4. Tighten set screws to lock the travel stop position.

### 4.3 NOZZLE INSTALLATION

To install nozzle, position the monitor as shown in figure 4.3. Insert the nozzle into the quick connect on the monitor. Then, latch the two products together by tightening the latch pin screws. Tighten to 11 lb-ft.

**CAUTION** The nozzle connection must match the connection of the Tsunami monitor in both size and type. Mismatched or damaged connections may cause the nozzle to leak or uncouple under pressure and could cause injury.

**CAUTION** Do not connect aluminum to brass or brass to aluminum. Dissimilar metals coupled together can cause galvanic corrosion that will freeze the threaded joint or cause complete loss of thread engagement. If dissimilar metals must be coupled together, the effects of corrosion can be greatly delayed by various coatings on the metal such as powder paint, hard anodizing, or silicone grease.

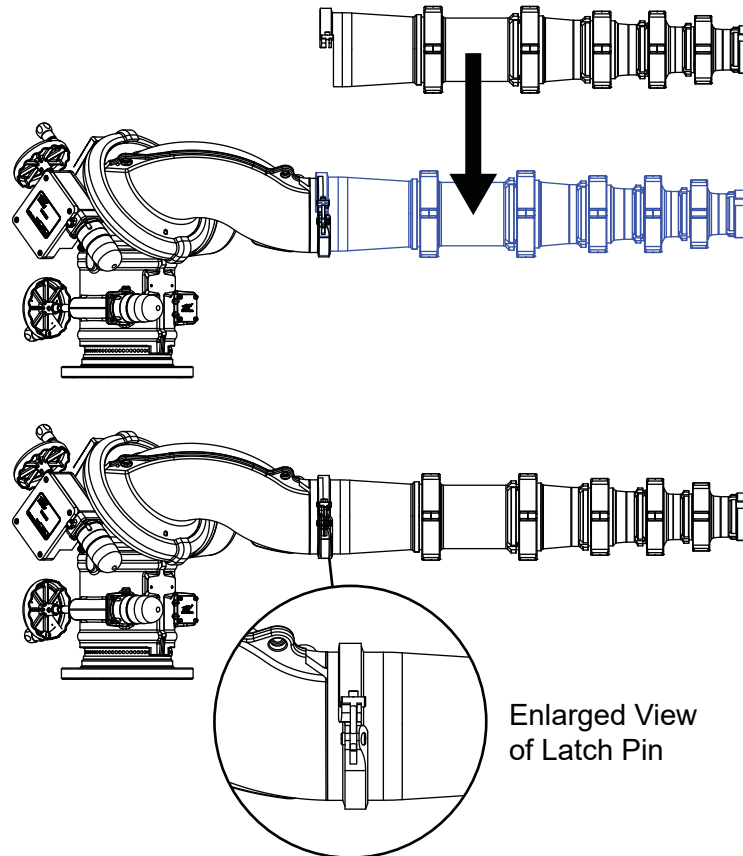


Figure 4.3  
Nozzle Installation

### 4.4 PRESSURE GAUGE PORT

There is a 1/4" NPT female threaded hole on the elbow of the monitor. The hole is plugged from the factory. If a pressure gauge is desired, unscrew the plug (using a 9/16" socket) and install the gauge using pipe sealant.

### 4.5 DRAIN

There is no drain on the Tsunami Monitor itself. A drain valve should be installed on the monitor's inlet piping.

## **5.0 OPERATION**

### **5.1 HORIZONTAL ROTATION CONTROL**

A handwheel controls the monitor's horizontal rotation direction. Clockwise rotation of the handwheel moves the monitor to the left and counter-clockwise rotation to the right. Approximately 28 turns of the handwheel will give a 90 degree change in horizontal rotation direction.

### **5.2 ELEVATION CONTROL**

A handwheel controls the monitor's elevation direction. Clockwise rotation of the handwheel raises the elevation and counter-clockwise lowers it. About 37 turns of the handwheel will give the complete 100 degree elevation travel range of the monitor.

Manual monitors will require small corrections to the horizontal axis to keep the monitor pointing in a constant horizontal direction, due to the shallow angled waterway. The shallow angled waterway is key to the Tsunami's excellent pressure loss performance.

RC monitors will electronically synchronize the horizontal axis to move in combination with the vertical axis to keep the monitor pointing in a constant horizontal direction.

### **5.3 RECOMMENDED PARK POSITION**

For vehicle mounted applications, it is recommended that the monitor be parked in a position such that the monitor's nozzle rests against a bracket or support surface. If a support surface is not available, run the elevation against one of its travel stops to take some of the backlash out of the gear drive. This will minimize bouncing of the nozzle when the apparatus is traveling. Always be sure the monitor is properly parked before moving the truck and know the overall height to avoid damage from overhead obstructions such as doors or bridges.

See LIY-500 for information on programming PARK position.

## 6.0 FLOWS AND PRESSURES

### 6.1 STACKED TIPS FLOW AND REACH

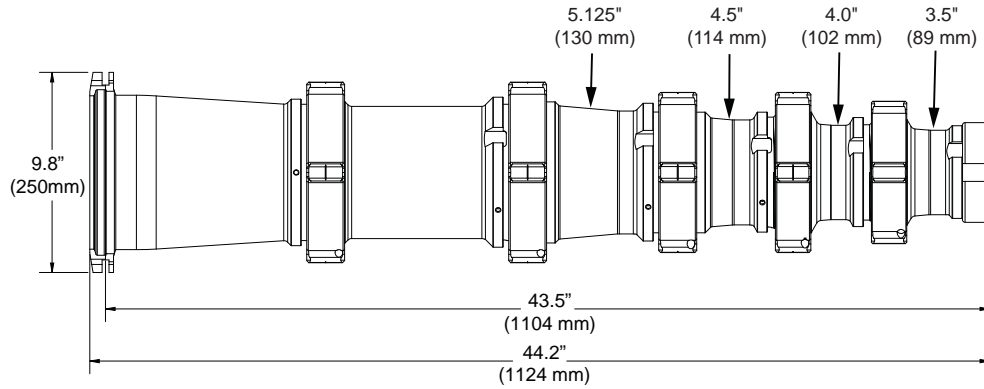
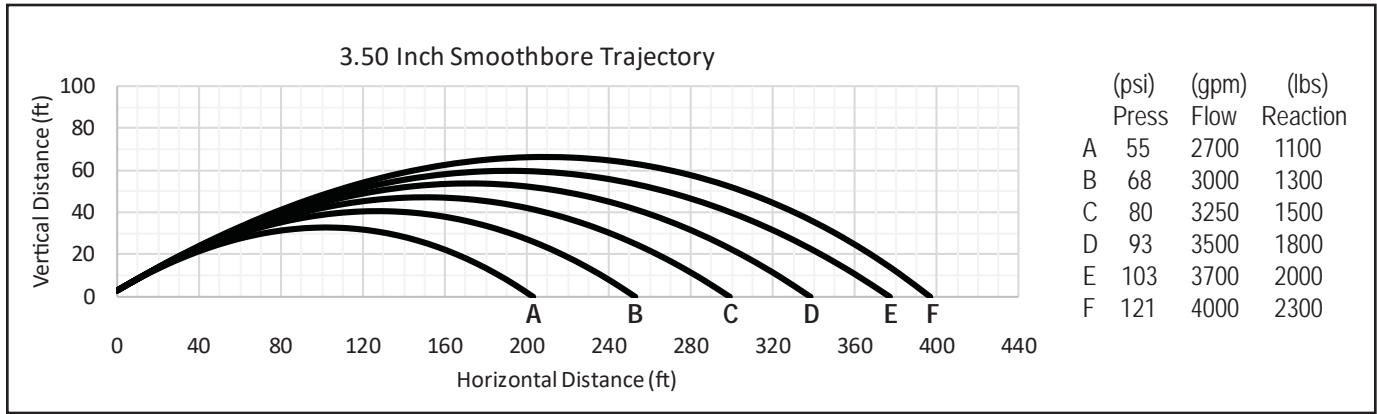


Fig 6.1A  
Stacked Tip Model YST-4NN

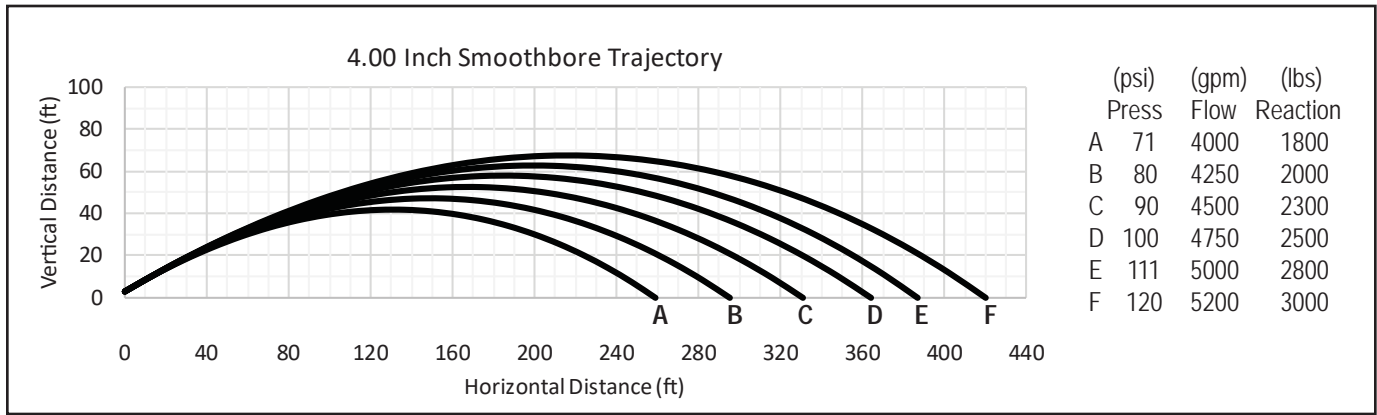
Nozzle Diameter (inches)	Nozzle Pressure (PSI)							
	50		60		80		100	
	Flow GPM	Reaction lbf	Flow GPM	Reaction lbf	Flow GPM	Reaction lbf	Flow GPM	Reaction lbf
3.5	2570	960	2820	1160	3260	1540	3640	1930
4	3360	1260	3680	1510	4250	2010	4750	2510
4.5	4250	1590	4660	1910	5380	2550	6020	3180
5.125	5520	2060	6040	2470	6980	3300	7800	4130

Nozzle Diameter (mm)	Nozzle Pressure (BAR)							
	3.5		4.1		5.5		7	
	Flow GPM	Reaction lbf	Flow GPM	Reaction lbf	Flow GPM	Reaction lbf	Flow GPM	Reaction lbf
90	9730	440	10670	530	12340	700	13780	880
100	12720	570	13930	690	16090	910	17980	1140
115	16090	720	17640	870	20360	1160	22790	1450
130	20890	940	22860	1120	26420	1500	29520	1880

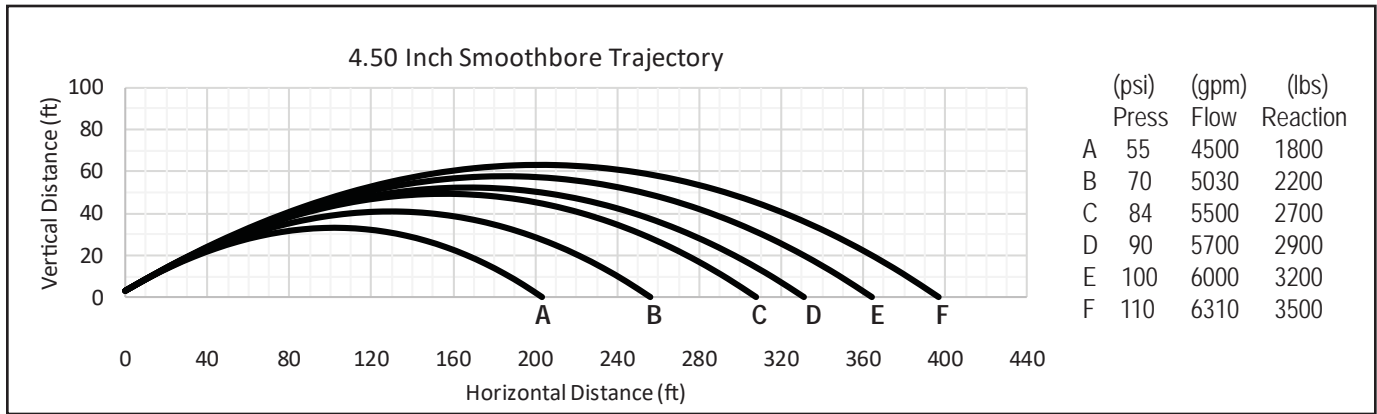
Fig 6.1B  
Stacked Tip Flow Table



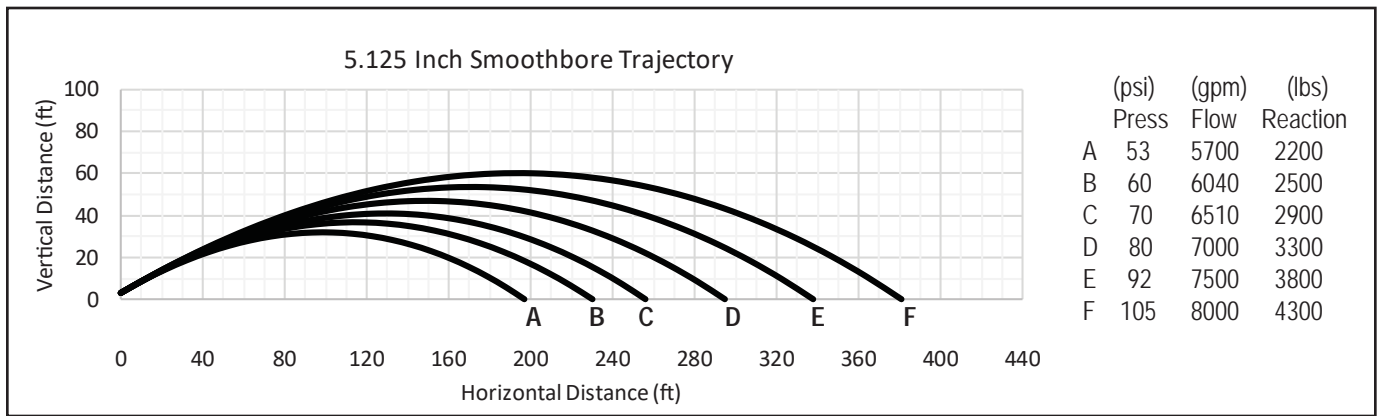
3.50 Smoothbore Trajectory



4.00 Smoothbore Trajectory

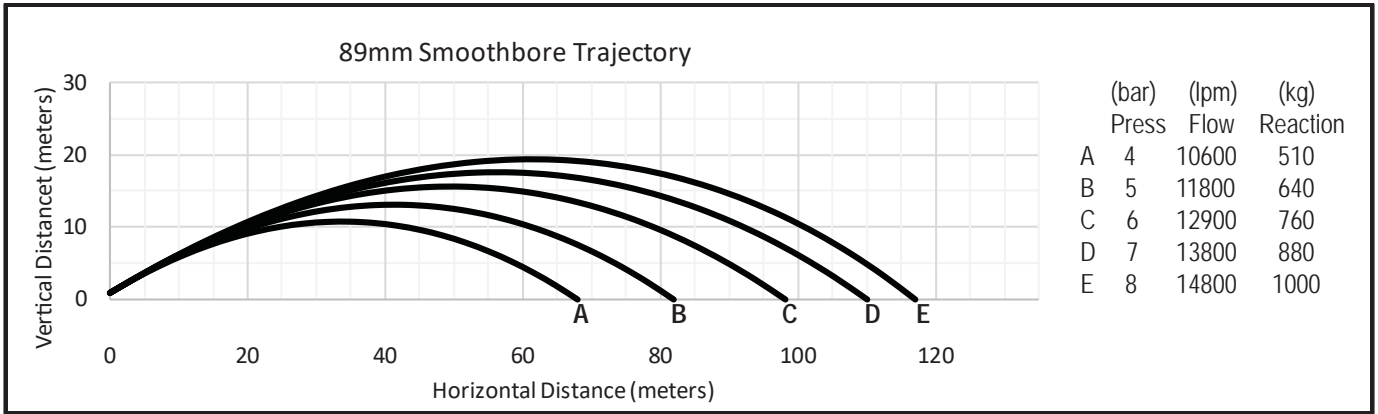


4.50 Smoothbore Trajectory

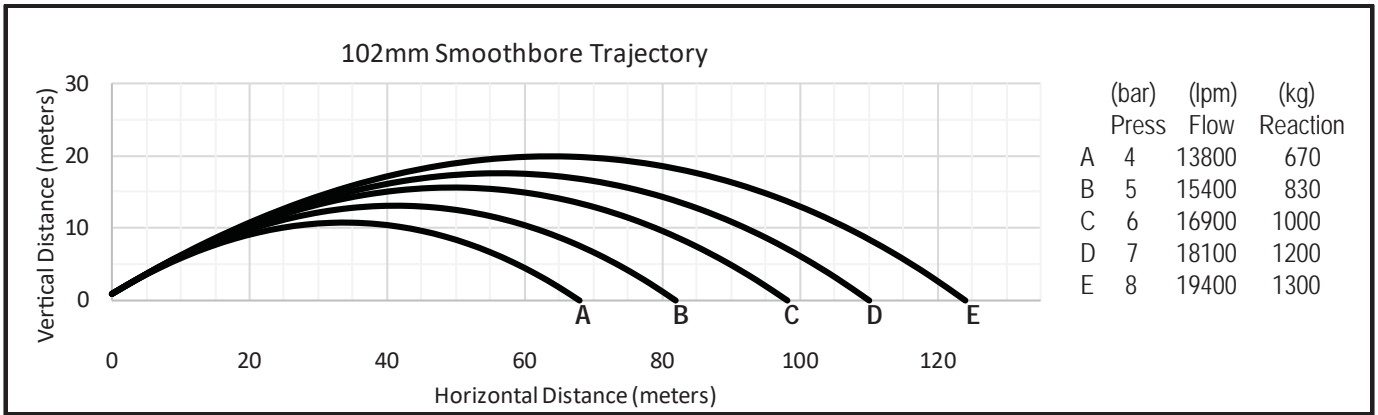


5.125 Smoothbore Trajectory

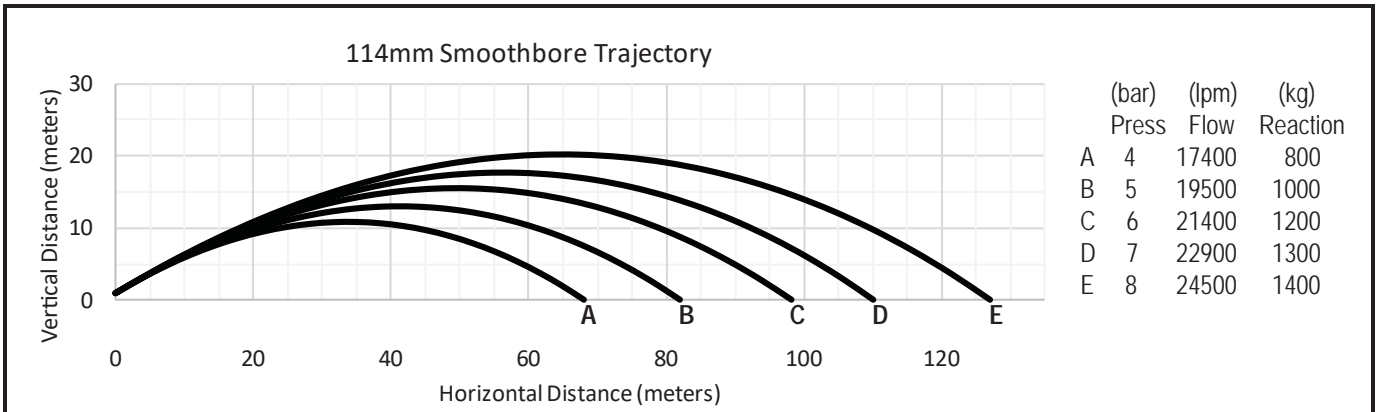




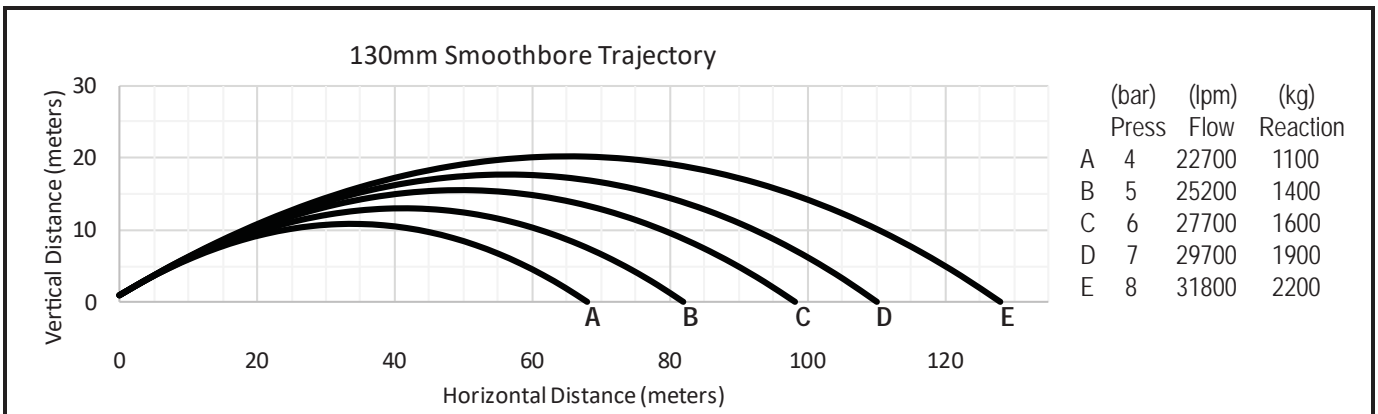
89mm Smoothbore Trajectory



102mm Smoothbore Trajectory

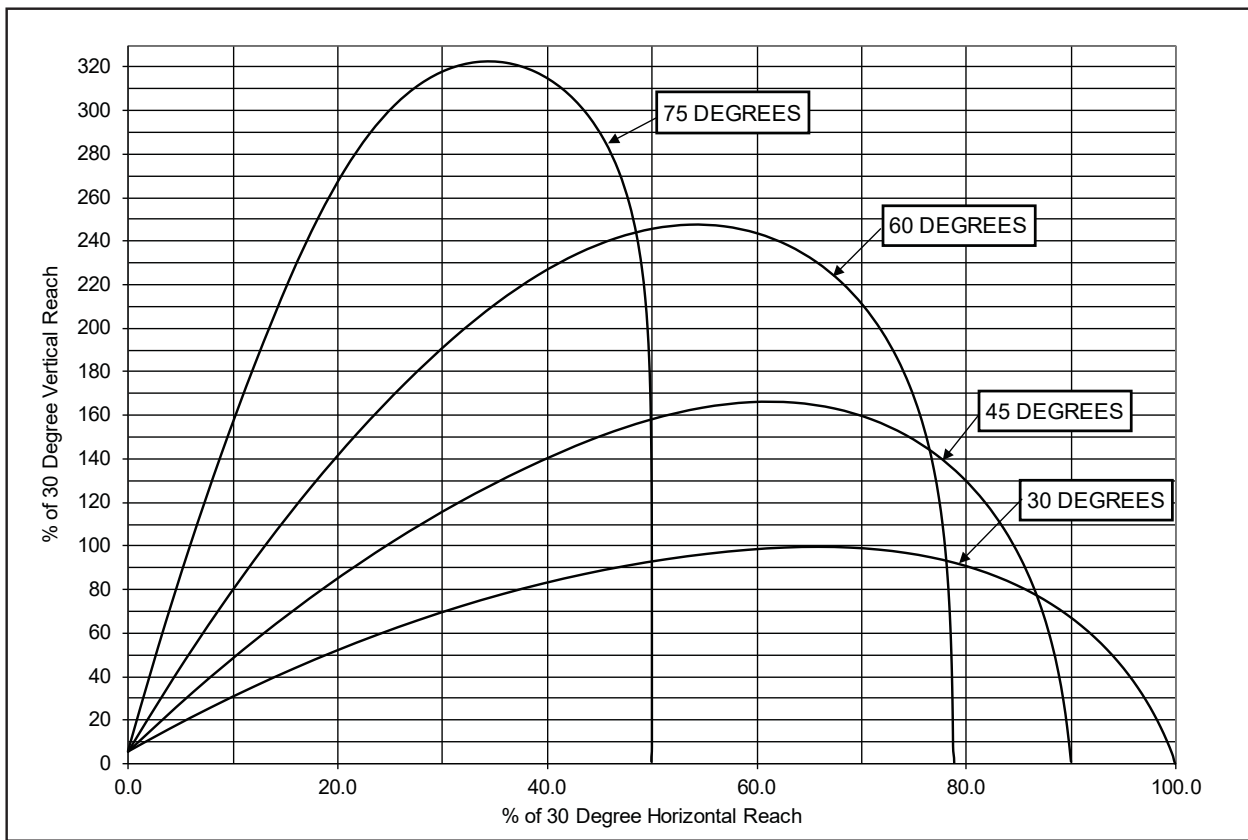


114mm Smoothbore Trajectory



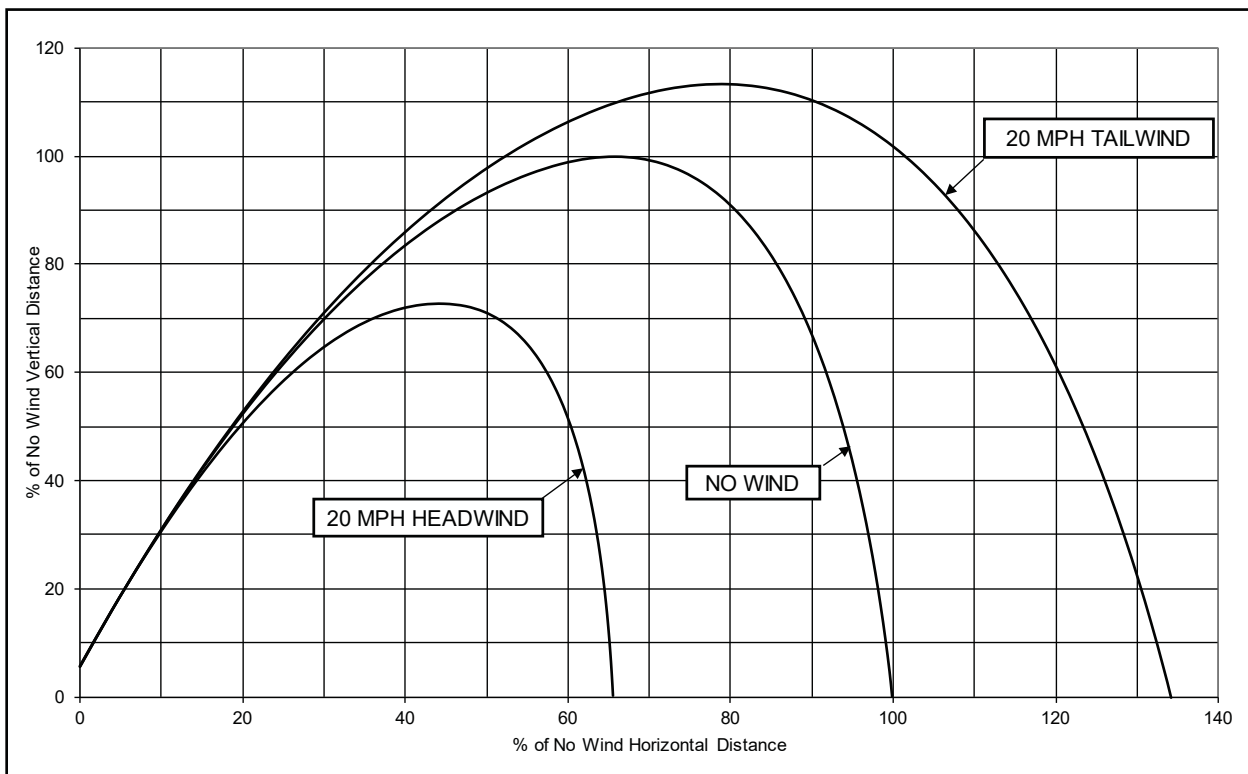
130mm Smoothbore Trajectory

This graph is approximate only. Critical applications should be tested in actual conditions to verify adequate reach.



Effects of Elevation on Reach

This graph shows approximately how a moderate wind can affect stream reach.



Effects of Wind on Reach

## 6.2 TSUNAMI FRICTION LOSS

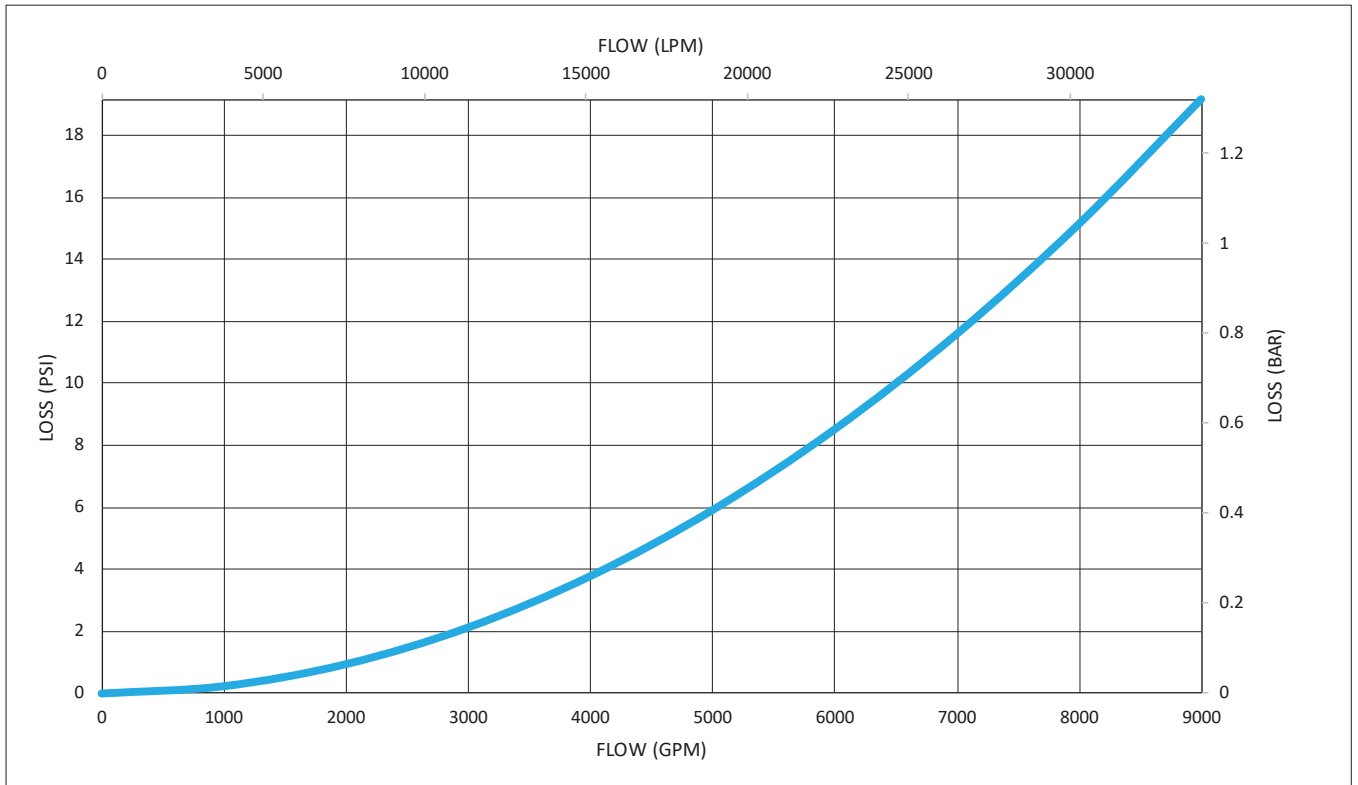
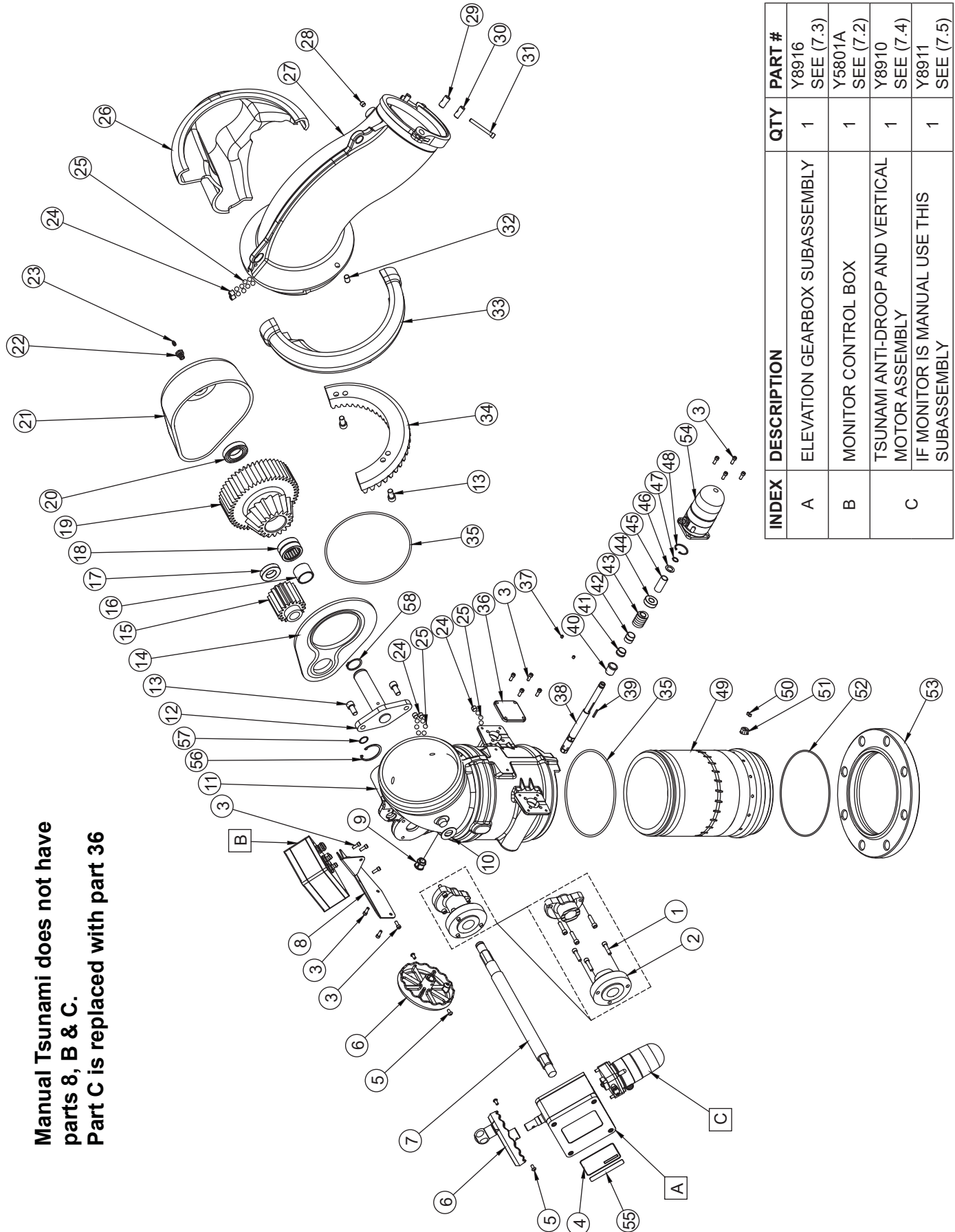


Fig 6.2  
Tsunami Monitor Friction Loss

## 7.0 TSUNAMI DRAWING & PARTS LISTS

### 7.1 MANUAL & RC TSUNAMI

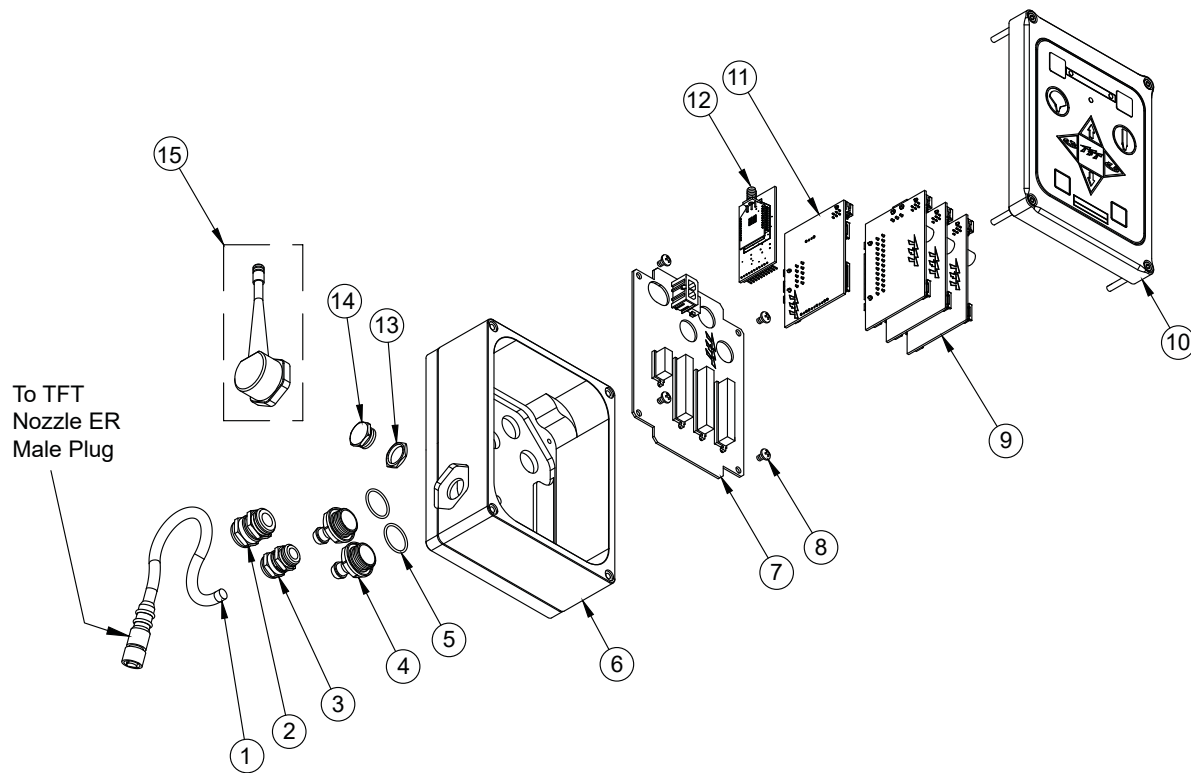


**Manual Tsunami does not have parts 8, B & C. Part C is replaced with part 36**

INDEX	DESCRIPTION	QTY	PART #
A	ELEVATION GEARBOX SUBASSEMBLY	1	Y8916 SEE (7.3)
B	MONITOR CONTROL BOX	1	Y5801A SEE (7.2)
C	TSUNAMI ANTI-DROOP AND VERTICAL MOTOR ASSEMBLY IF MONITOR IS MANUAL USE THIS SUBASSEMBLY	1	Y8910 SEE (7.4)
		1	Y8911 SEE (7.5)

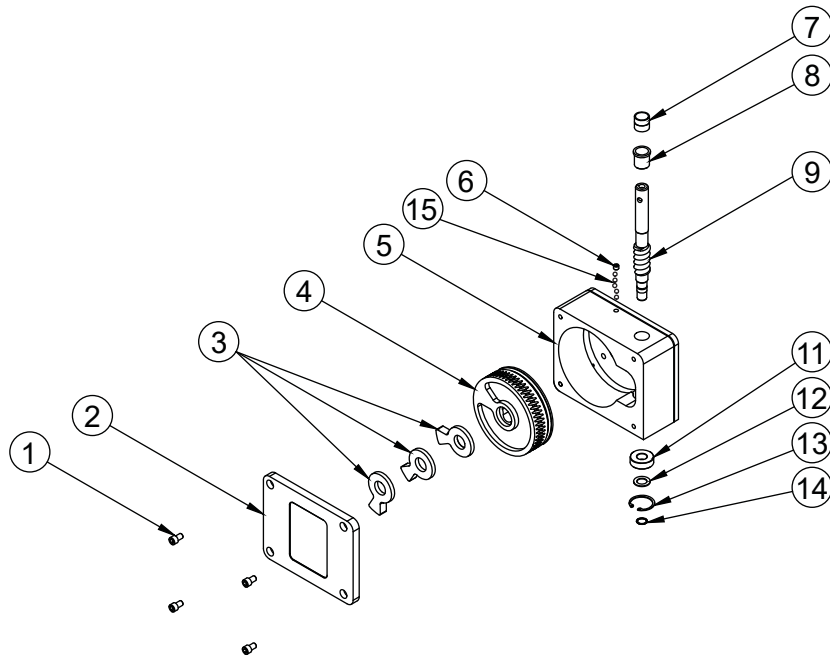
INDEX	DESCRIPTION	QTY	PART #
1	3/8-16 X 1 1/4 SOCKET HEAD CAP SCREW	6	VT37-16SH1.2
2	WORM SPOOL	1	Y8132
3	1/4-28 X 5/8 SOCKET HEAD CAP SCREW	14	VT25-28SH625
4	NAME LABEL: TSUNAMI RC	1	Y8190
5	1/4-20 X 1/2 BUTTON HEAD CAP SCREW	4	VT25-20BH500
6	ELEVATION HANDWHEEL SUBASSEMBLY	2	Y4941
7	WORM SHAFT	1	Y8140
8	ELECTRIC BOX BRACKET	1	Y8115
9	DRIVE SHAFT PLUG	1	Y8165
10	BELLEVILLE SPRING	1	AY325
11	LOWER SEGMENT	1	Y8110
12	DUAL GEAR SHAFT	1	Y8120
13	1/2-20 X 1.0 SOCKET HEAD CAP SCREW	4	VT50-20SH1.0
14	GEAR COVER INTERFACE	1	Y8172
15	PINION	1	Y8144
16	NEEDLE BEARING SHAFT LINER	1	Y8124
17	ROLLER BEARING	1	Y8142
18	NEEDLE BEARING	1	Y8121
19	DUAL GEAR	1	Y8122
20	DEEP GROOVE ROLLER BEARING	1	Y8123
21	GEAR COVER	1	Y8173
22	BALL PORT PLUG	1	Y4155
23	GREASE FITTING 1/4-28	1	VT25-28ZERK
24	1/2-20 X 1/2 SOCKET SET SCREW CUP POINT	5	VT50-20SS500
25	BALL 7/16" TORLON	320	VB437TO
26	RIGHT SHROUD	1	Y8170
27	UPPER SEGMENT	1	Y8310
28	1/4"NPT HEX HEAD PLUG	1	VFHP2M
29	CONNECTION LOWER BARREL	2	Y8332
30	CONNECTION UPPER BARREL	2	Y8331
31	5/16-18 X 2-3/4 SOCKET HEAD CAP	2	VT31-18SH2.7
32	1/2 X 3/4 DOWEL PIN	2	VP500X.75
33	LEFT SHROUD	1	Y8171
34	BEVEL GEAR	1	Y8320
35	O-RING-372	2	VO-372
36	COVER PLATE	1	Y4164
37	1/4-28 X 1/4 SOCKET SET SCREW	2	VT25-28SS250
38	SHAFT	1	Y8160
39	KEY	1	X225
40	HEADED BUSHING	1	Y4141
41	SHORT HEADED BUSHING	1	XGE634
42	THIN BUSHING FOR SEALED GEARBOX	1	A1527
43	12 DP WORM	1	X220
44	BEARING	1	VM4252
45	SPACER LONG	1	Y4151
46	WASHER .97 OD X .595 ID X .048 THICK	1	VW97X595-048
47	WSM-56-S02 SMALLEY RING	1	VR4365
48	SNAP RING	1	VR4220
49	BASE	1	Y8000
50	1/4-20 X 1/2 SOCKET SET SCREW CUP POINT	4	VT25-20SS500
51	TRAVEL STOP	2	Y8002
52	O-RING-269	1	VO-269
53	8" ANSI 150 FLANGE	1	Y8010
54	GEAR MOTOR: MONITOR - SUBASSEMBLY IF MONITOR IS MANUAL REPLACE WITH #36	1	Y4950A SEE (7.4) Y4164 SEE (7.4)
55	WARNING LABEL	1	ZB1069
56	RETAINING RING 2-1/8"	1	VR4351
57	WSM-87-S02 SMALLEY RING	1	VR4352
58	RETAINING RING 101/2"	1	VR4325

## 7.2 CONTROL BOX SUBASSEMBLY (RC Model Only)



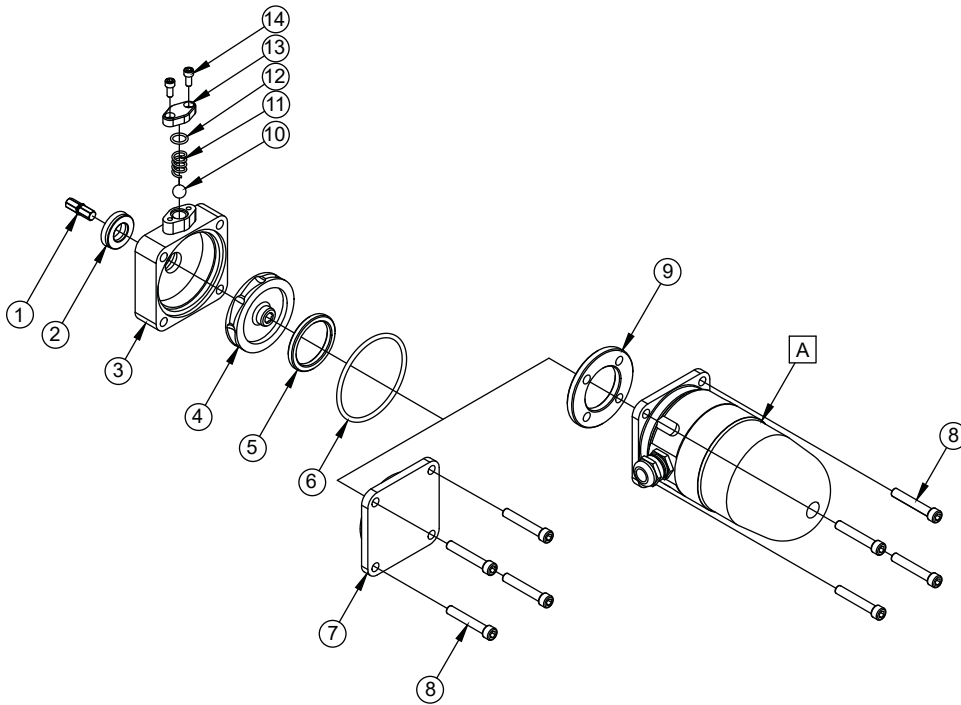
INDEX	DESCRIPTION	QTY	PART #
1	CABLE - 6 POLE FEMALE PLUG	21" or 28" TOTAL LENGTH USED	Y5475
	FOR TSUNAMI RC NOZZLE CONNECTION	16" or 23" EXPOSED CABLE (NOT INCLUDING PLUG)	
2	PG11 STRAIN RELIEF	1	Y5205A
3	PG9 STRAIN RELIEF	1	Y5245A
4	CONDUIT FITTING	2	Y5213
5	O-RING-018	2	VO-018
6	ENCLOSURE BOX	1	Y5116B
7	MAIN BOARD	1	Y5105
8	M4-0.7 X 6MM PHILLIPS HEAD SCREW	4	VTM4-0.7PH6
9	MOTOR CONTROL BOARD	3	Y5801-LID
10	MONITOR CONTROL BOX SHELL - SUBASSEMBLY	1	Y5801-A
11	COMMUNICATION BOARD	1	Y5110-B
*12	RADIO + ADAPTER XBEE TO XSTREAM 900 MHZ RADIO	1	Y5891
	RADIO + ADAPTER XBEE TO XSTREAM 2.4 GHZ RADIO		Y5893
13	PG9 LOCKNUT	1	Y5246
14	PG9 HEX PLUG	1	Y5248
*15	900/920 MHZ ANTENNA W/FITTING & CONN. SUBASSY.	1	Y5897
	2.4 GHZ ANTENNA ADAPTER W/CONN. SUBASSY.		Y5898
* - OPTIONAL			

### 7.3 ELEVATION GEARBOX SUBASSEMBLY



INDEX	DESCRIPTION	QTY	PART #
1	5/16-18 X 5/8 SOCKET HEAD CAP SCREW	4	VT31-18SH625
2	WORM COVER	1	Y8130
3	ELEVATION STOPS	3	Y8180
4	WORM WHEEL	1	Y8141
5	WORM HOUSING	1	Y8131
6	5/16-18 X 1/4 SOCKET SET SCREW CUP POINT	1	VT31-18SS250
7	THIN BUSHING FOR SEALED GEARBOX	1	A1527
8	HEADED BUSHING	1	Y4141
9	WORM GEAR	1	Y8145
11	BEARING	1	VM4252
12	WASHER	1	VW97X595-048
13	SNAP RING	1	VR4220
14	WSM-56-S02 SMALLEY RING	1	VR4365
15	1/4 SS Balls	62	V2125

## 7.4 ANTI-BACK DRIVE



INDEX	DESCRIPTION	QTY	PART #
1	ANTI-DROOP HEX	1	Y4672
2	CUP SEAL	1	Y4620
3	ANTI-DROOP HOUSING	1	Y4670
4	ANTI-DROOP DETENT	1	Y4673
5	BUSHING	1	AY324
6	O-RING-230	1	VO-230
7	ANTI-DROOP COVER	1	Y4675
8	1/4-28 X 1-1/2 SOCKET HEAD CAP SCREW	4	VT25-28SH1.5
9	ANTI-DROOP RING	1	Y4674
10	BALL 3/8" - TORLON	1	VB375TO
11	DETENT SPRING	1	XX655
12	O-RING-012	1	VO-012
13	ANTI-DROOP SMALL COVER	1	Y4671
14	8-32 X 3/8 SOCKET HEAD CAP SCREW	2	VT08-32SH375
A	GEAR MOTOR	1	Y4950 SEE (7.4)



## 8.0 WARRANTY

Task Force Tips LLC, 3701 Innovation Way, Valparaiso, Indiana 46383-9327 USA ("TFT") warrants to the original purchaser of its Tsunami and Tsunami RC Monitor ("equipment"), and to anyone to whom it is transferred, that the equipment shall be free from defects in material and workmanship during the five (5) year period from the date of purchase.

TFT's obligation under this warranty is specifically limited to replacing or repairing the equipment (or its parts) which are shown by TFT's examination to be in a defective condition attributable to TFT. To qualify for this limited warranty, the claimant must return the equipment to TFT, at 3701 Innovation Way, Valparaiso, Indiana 46383-9327 USA, within a reasonable time after discovery of the defect. TFT will examine the equipment. If TFT determines that there is a defect attributable to it, it will correct the problem within a reasonable time. If the equipment is covered by this limited warranty, TFT will assume the expenses of repair.

If any defect attributable to TFT under this limited warranty cannot be reasonably cured by repair or replacement, TFT may elect to refund the purchase price of the equipment, less reasonable depreciation, in complete discharge of its obligations under this limited warranty. If TFT makes this election, claimant shall return the equipment to TFT free and clear of any liens and encumbrances.

This is a limited warranty. The original purchaser of the equipment, any person to whom it is transferred, and any person who is an intended or unintended beneficiary of the equipment, shall not be entitled to recover from TFT any consequential or incidental damages for injury to person and/or property resulting from any defective equipment manufactured or assembled by TFT. It is agreed and understood that the price stated for the equipment is in part consideration for limiting TFT's liability. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above may not apply to you.

TFT shall have no obligation under this limited warranty if the equipment is, or has been, misused or neglected (including failure to provide reasonable maintenance) or if there have been accidents to the equipment or if it has been repaired or altered by someone else.

THIS IS A LIMITED EXPRESS WARRANTY ONLY. TFT EXPRESSLY DISCLAIMS WITH RESPECT TO THE EQUIPMENT ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND ALL IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE. THERE IS NO WARRANTY OF ANY NATURE MADE BY TFT BEYOND THAT STATED IN THE DOCUMENT.

This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

## 9.0 MAINTENANCE AND INSPECTION

The Tsunami Monitor requires little maintenance. The monitor should be kept clean and free of dirt. All controls should be checked for freedom of movement and proper operation before each use. Any inoperable or damaged parts should be repaired or replaced immediately.

Do not physically move the Tsunami RC Monitor with the power off.

Use with saltwater is permissible provided monitor is thoroughly cleaned with fresh water after each use. The service life of the monitor may be shortened due to the effects of corrosion and is not covered under warranty

**CAUTION** Any alterations to the monitor and its markings could diminish safety and constitutes a misuse of this product.

### 9.1 LUBRICATION

The Tsunami monitor generally should not require greasing. In the event that the operation becomes stiff grease may be applied to the elevation worm gear. See figures 9.1 for grease port location. Use medium viscosity automotive chassis grease. Apply only enough grease to restore normal operation. If normal operation is not restored by greasing, inspect for other causes of stiff operation.

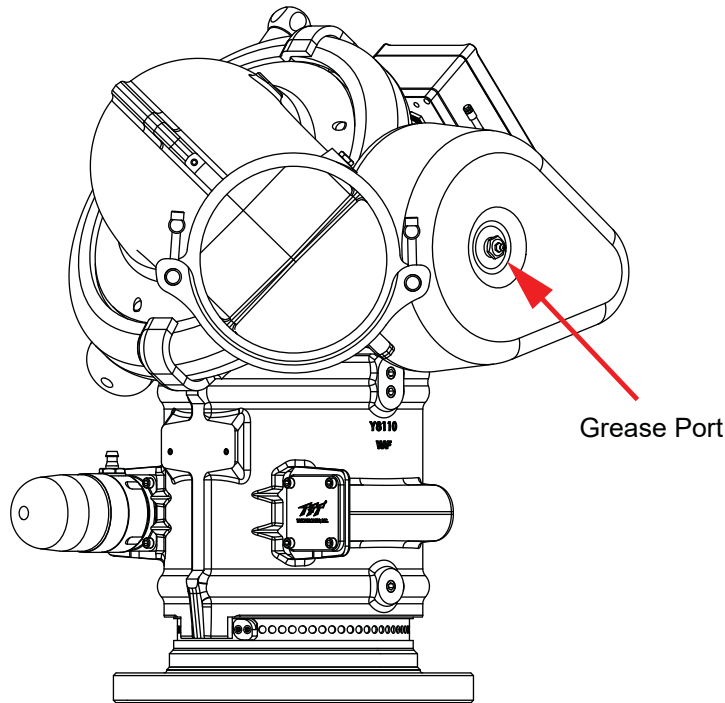


Fig 9.1  
Location of Grease Port for Elevation Worm Gear

### 9.2 TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	REMEDY
Leaks	Debris or damage in seal area	Clean out debris or replace damaged parts
Elevation Binding	Debris or damage to elevation drive parts	Clean out debris or replace damaged parts
	Lack of lubricant	Grease, see section 9.1
Horizontal Rotation Binding	Debris or damage to horizontal drive parts	Clean out debris or replace damaged parts
	Lack of lubricant	Grease, see section 9.1

### 9.3 SERVICE TESTING

In accordance with NFPA 1962 (2013), monitors must be tested a minimum of annually. Monitors failing any part of this test must be removed from service, repaired and retested upon completion of the repair.

### 9.4 HYDRAULIC TEST

1. *The appliance being tested shall be positioned in a protective device or cover capable of holding the appliance and tested to a minimum hydrostatic pressure of 300 psi (20.7 bar or 2070 kPa).*
2. *Test caps capable of withstanding the required hydrostatic pressure shall be attached to openings, and a device capable of exerting the required hydrostatic pressure shall be attached to the appliance.*
3. *Appliances with relief valves shall have the relief valve outlet blanked off or otherwise closed during the test.*
4. *All air shall be bled from the system.*
5. *The gauge pressure shall be increased by 50 psi (3.45 bar or 345 kPa) increments and held for 30 seconds at each pressure up to the maximum pressure for which the appliance is being tested and held for 1 minute without leakage.*

### 9.5 RECORDS

*A record of testing and repairs must be maintained from the time the monitor is purchased until it is discarded. Each TFT monitor is engraved with a unique serial number which, if so desired, can be used to identify monitor for documentation purposes.*

*The following information, if applicable, must be included on the test record for each monitor:*

1. *Assigned identification number*
2. *Manufacturer*
3. *Product or model designation*
4. *Vendor*
5. *Warranty*
6. *Hose connection size*
7. *Maximum operating pressure*
8. *Flow rate or range*
9. *Date received and date put in service*
10. *Date of each service test and service test results*
11. *Damage and repairs, including who made the repairs and the cost of repair parts*
12. *Reason removed from service*

*NFPA 1962: Standard for the care, use, inspection, service testing, and replacement of fire hose, couplings, nozzles and fire hose appliances. (2013 ed., Section 6.4.4). Quincy, MA: National Fire Protection Agency.*

### 9.6 REPAIR

Factory service is available with repair time seldom exceeding one day in our facility. Factory serviced appliances are repaired by experienced technicians to original specifications, fully tested and promptly returned.

Repair parts and service procedures are available for those wishing to perform their own repairs. Task Force Tips assumes no liability for damage to equipment or injury to personnel that is a result of user service.

***For additional information on care, maintenance and testing, refer to: NFPA 1962: Standard for the Care, Use, Inspection, Service Testing, and Replacement of Fire Hose, Couplings, Nozzles, and Fire Hose Appliances, 2013 Edition***

### 9.7 ANSWERS TO YOUR QUESTIONS

We appreciate the opportunity of serving you and making your job easier. If you have any problems or questions, our toll-free "Hydraulics Hotline", 800-348-2686, is normally available to you 24 hours a day, 7 days a week.

## 10.0 INSPECTION CHECKLIST

### BEFORE EACH USE, appliances must be inspected to this checklist:

- All valves (if so equipped) open and close fully and smoothly
- Waterway is clear of obstructions
- There is no damage to any thread or other connection
- All locks and hold-down devices work properly
- The pressure setting on the relief valve (if so equipped) is set correctly
- Gaskets are in good repair
- There is no obvious damage such as missing, broken or loose parts
- There is no damage to the appliance that could impair safe operation (e.g. dents, cracks, corrosion, or other defects)
- All swiveling elements rotate freely
- Nozzle is securely attached
- Monitor is pointed in a safe direction

### BEFORE BEING PLACED BACK IN SERVICE, appliances must be inspected to this list:

- All valves open and close smoothly and fully
- The waterway is clear of obstructions
- There is no damage to any thread or other type connection
- The pressure setting of the relief valve, if any, is set correctly
- All locks and hold-down devices work properly
- Internal gaskets are in accordance with NFPA 1962 (2013) Section 7.2
- There is no damage to the appliance that could impair safe operation (e.g. dents, cracks, corrosion, or other defects)
- All swiveling connections rotate freely
- There are no missing parts or components
- The marking for maximum operating pressure is visible
- There are no missing, broken, or worn lugs on couplings

*NFPA 1962: Standard for the care, use, inspection, service testing, and replacement of fire hose, couplings, nozzles and fire hose appliances. (2013 ed., Section 6.2.1). Quincy, MA: National Fire Protection Agency.*



### **WARNING**

Any appliance failing any part of the inspection checklist is unsafe and must have the problem corrected before use. Operating a appliance that fails any of the above inspections is a misuse of this equipment.