

FIN FAN ACCESSORY (FF-100-XX) USER MANUAL



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Andrew Birt Consulting Ltd.
UK

This manual must be used in accordance with all applicable national laws. The manual shall be regarded as a part of the machine and shall be kept for reference until the final dismantling of the machine, as defined by applicable national law(s).

SPECIFICATIONS

Fin Fan Accessory Includes:

FF 101-84 Snout Assembly	Qty. 1
FF 102 Clamp Assembly	Qty. 2
FF103 Guide Assembly	Qty. 1
FF 104 ABX-2L Scaffold Mount	Qty. 1
FF 105 Retrofit Kit ABX-2L Adapter	Qty. 1

DESCRIPTION OF EQUIPMENT AND INTENDED USE

The StoneAge Fin Fan Accessory is a specifically engineered accessory for the Autobox ABX-2L heat exchanger tube cleaning system. The Fin Fan Accessory adapts the ABX-2L for easy mounting to a Fin Fan header box for efficient tube cleaning.

The included scaffold mount allows the ABX-2L to be attached to the catwalk railing—keeping hoses clear of the walkway for easy setup and operation. The Fin Fan Snout and Guide Assemblies provide anti-withdrawl protection, and precise tube pitch adjustment.

KEY FEATURES:

- Modular, lightweight, fully adjustable, easy to install, design
- Utilizes 2.5 in. (6.35 cm) box rail cut to custom lengths to accommodate any size Fin Fan face dimension
- Adjustable pitch for different tube arrangements.
- 30" adjustable clamps.
- Works with the ABX-2L Hose Tractor, CB-ABX Control Box, and LWP-500-V2 Light Weight Positioner

**CE DECLARATION OF INCORPORATION
OF PARTLY COMPLETED MACHINERY**

We: StoneAge, Inc. 466 South Skylane Drive Durango, CO 81303, USA
Declare that this "partly completed machinery" supplied with this declaration:
Equipment: Fin Fan Accessory
Model name: FF-100 is in accordance with the following Directives: and

- is designed and manufactured solely as a non-functional components to be incorporated into a machine requiring completion;
- must not be put into service within the European Community ("EC") until the final machinery into which it is to be incorporated has been declared in conformity with the Machinery Directive and all other applicable EC Directives; and
- is designed and manufactured to comply with the 2006/42/EC Essential Health and Safety Requirements of the Machinery Directives and the relevant parts of the following specifications:
EN ISO 12100:2010 Safety of machinery - General principles for design - Risk assessment and risk reduction

I hereby declare that the equipment named above has been tested and found to comply with the relevant sections of the above referenced specifications and directives.

Signed Andrew B. Birt. Date 03/11/2016

Andrew Birt
Independent Dealer Manager
StoneAge, Inc., Worcester, UK

The technical files for the Fin Fan Accessory (FF-100) and User Manuals are maintained at: StoneAge, Inc. 466 South Skylane Drive, Durango, CO 81303, USA



WARNING AND SAFETY INSTRUCTIONS

OPERATOR TRAINING

Managers, Supervisors, and Operators MUST be trained in Health and Safety Awareness of High-pressure Water Jetting and hold a copy of the Water Jetting Association (WJA) Code of Practice, or equivalent (see www.waterjetting.org.uk).

Operators MUST be trained to identify and understand all applicable standards for the equipment supplied. Operators should be trained in manual handling techniques to prevent bodily injury.

StoneAge has designed and manufactured this equipment considering all hazards associated with its operation. StoneAge assessed these risks and incorporated safety features in the design. StoneAge **WILL NOT** accept responsibility for the results of misuse.

IT IS THE RESPONSIBILITY OF THE INSTALLER/OPERATOR to conduct a job specific risk assessment prior to use. Job specific risk assessment MUST be repeated for each different set up, material, and location.

The risk assessment MUST conform to the Health and Safety at Work Act 1974 and other relevant Health and Safety legislation.

Operators MUST read, understand, and follow the Operational and Training Requirements (Section 7.0) of WJTA-IMCA's Recommended Practices For The Use Of High-pressure Waterjetting Equipment, or equivalent.

Operators MUST read, understand and follow the Warnings, Safety Information, Assembly, Installation, Connection, Operation, Transport, Handling, Storage, and Maintenance Instructions detailed in this manual.

The risk assessment MUST consider potential material or substance hazards including:

- Aerosols
- Biological and microbiological (viral or bacterial) agents
- Combustible materials
- Dusts
- Explosion
- Fibers
- Flammable substances
- Fluids
- Fumes
- Gases
- Mists
- Oxidizing Agents

PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Use of Personal Protective Equipment (PPE) is dependent on the working pressure of water and the cleaning application. Managers, Supervisors, and Operators MUST carry out a job specific risk assessment to define the exact requirements for PPE. See Protective Equipment for Personnel (Section 6) of WJTA-IMCA's Recommended Practices For The Use Of High-pressure Waterjetting Equipment for additional information.

Hygiene - Operators are advised to wash thoroughly after all waterjetting operations to remove any waterblast residue which may contain traces of harmful substances.

First aid provision - users MUST be provided with suitable first aid facilities at the operation site.

PPE may include:

- **Eye protection:** Full face visor
- **Foot protection:** Kevlar® brand or steel toe capped, waterproof, non-slip safety boots
- **Hand protection:** Waterproof gloves
- **Ear protection:** Ear protection for a minimum of 85 dBA
- **Head protection:** Hard hat that accepts a full face visor and ear protection
- **Body protection:** Multi-layer waterproof clothing approved for waterjetting
- **Hose protection:** Hose shroud
- **Respiratory protection:** May be required; refer to job specific risk assessment

WARNING

Operations with this equipment can be potentially hazardous. Caution MUST be exercised prior to and during machine and water jet tool use. Please read and follow all of these instructions, in addition to the guidelines in the WJTA Recommended Practices handbook, available online at www.wjta.org. Deviating from safety instructions and recommended practices can lead to severe injury and/or death.

- Do not exceed the maximum operating pressure specified for any component in a system.
- The immediate work area MUST be marked off to keep out untrained persons.
- Inspect the equipment for visible signs of deterioration, damage, and improper assembly. Do not operate if damaged, until repaired.
- Make sure all threaded connections are tight and free of leaks.
- Users of the Fin Fan Accessory MUST be trained and/or experienced in the use and application of high-pressure technology and cleaning, as well as all associated safety measures, according to the WJTA Recommended Practices for the use of High-pressure Waterjetting Equipment.
- An anti-withdrawal device (backout preventer) MUST be used at all times. The backout prevention device is the Hose Stop Collet located within the Fin Fan Snout Assembly. StoneAge offers several different size Hose Stop Collets. The Collet Size Reference guide is located on the Vertical Drive Assembly and in the Part Diagram section of this manual.
- The Control Box should be located in a safe location where the Operator has good visibility of the pipe and hose. The Fin Fan Accessory and Control Box MUST be supervised at all times and should never be left unattended.
- Always de-energize the system before servicing or replacing any parts. Failure to do so can result in severe injury and/or death.

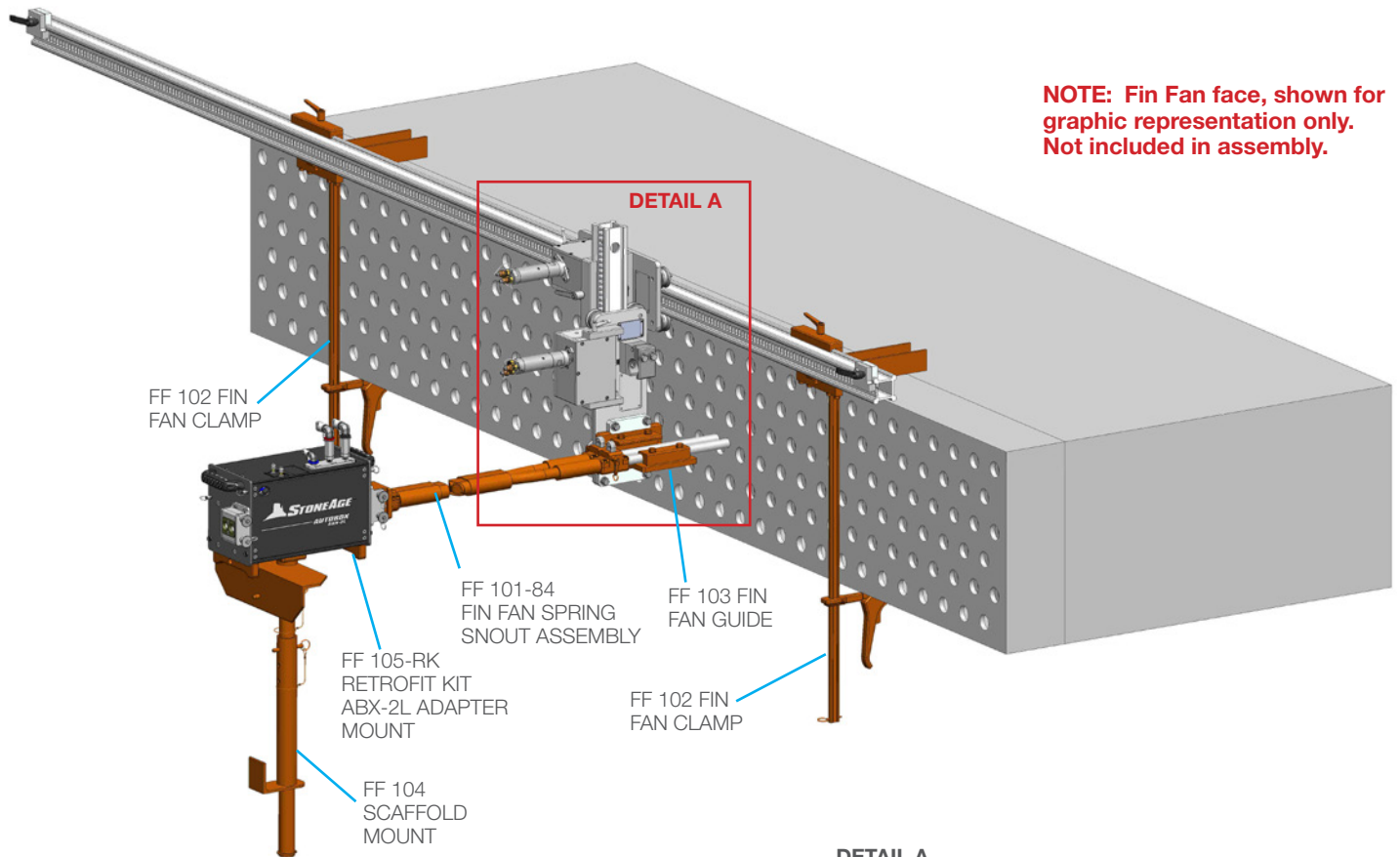
PRE-RUN SAFETY CHECK

Refer to WJTA-IMCA's, Recommended Practices For The Use Of High-pressure Waterjetting Equipment and/or The Water Jetting Association's, WJA Code of Practice for additional safety information.

- Complete a job specific risk assessment and act on the resulting actions.
- Adhere to all site specific safety procedures.
- Ensure the waterblasting zone is properly barricaded and that warning signs are posted.
- Ensure the work place is free of unnecessary objects (e.g. loose parts, hoses, tools).
- Ensure all Operators are using the correct Personal Protective Equipment (PPE).
- Check that the air hoses are properly connected and tight.
- Check all hoses and accessories for damage prior to use. Do not use damaged items. Only high quality hoses intended for waterblast applications should be used as high-pressure hoses.
- Check all high-pressure threaded connections for tightness.
- ****Ensure that a anti-withdrawal device (back-out preventer), and all other applicable safety devices are installed and set-up properly.****
- Test the Control Box before operating the Fin Fan Accessory with high-pressure water to verify the control valves move the hose in the intended direction, and that the dump valve and hose clamp are working properly.
- Ensure that Operators never connect, disconnect, or tighten hoses, adapters, or accessories with the high-pressure water pump unit running.
- Ensure no personnel are in the hydroblasting zone.

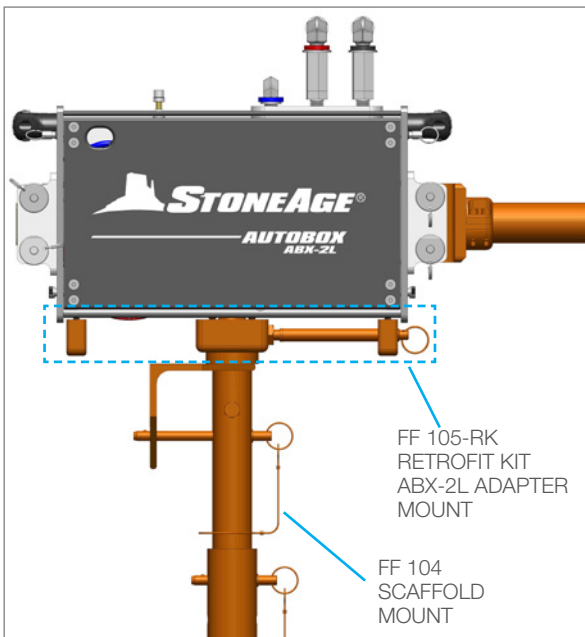
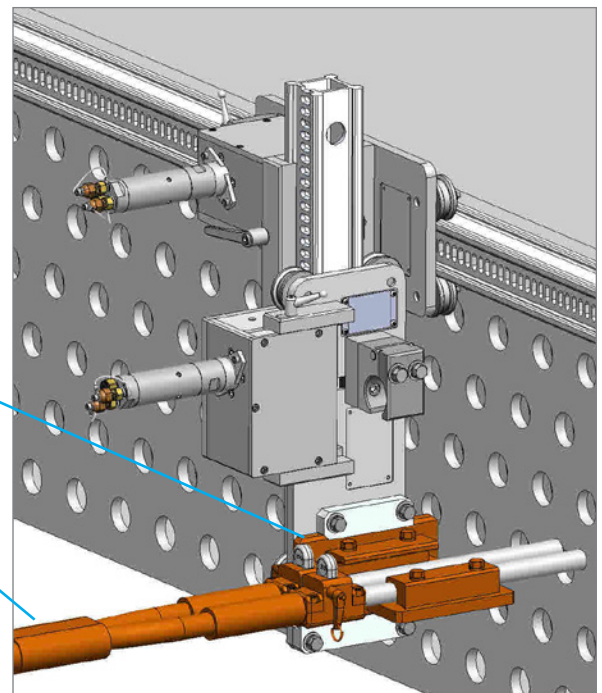
FIN FAN ACCESSORY

THE FIN FAN ACCESSORY PACKAGE IS DESIGNED TO WORK IN CONJUNCTION WITH THE STONEAGE® LIGHT WEIGHT POSITIONER (LWP-500-V2). THE HIGHLIGHTED PARTS SHOWN IN THIS DIAGRAM ARE INCLUDED IN THE FIN FAN ACCESSORY



NOTE: Fin Fan face, shown for graphic representation only. Not included in assembly.

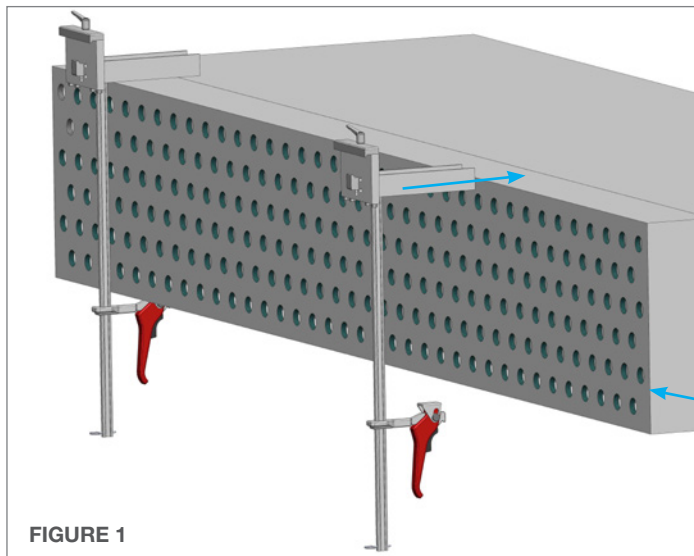
DETAIL A



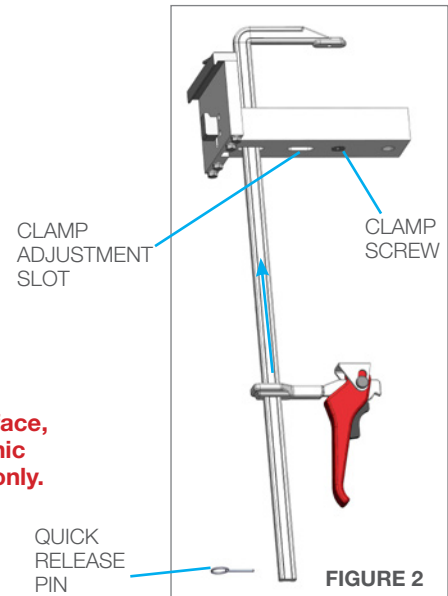
FIN FAN ACCESSORY SET-UP

FIN FAN ACCESSORY STEP BY STEP SET-UP

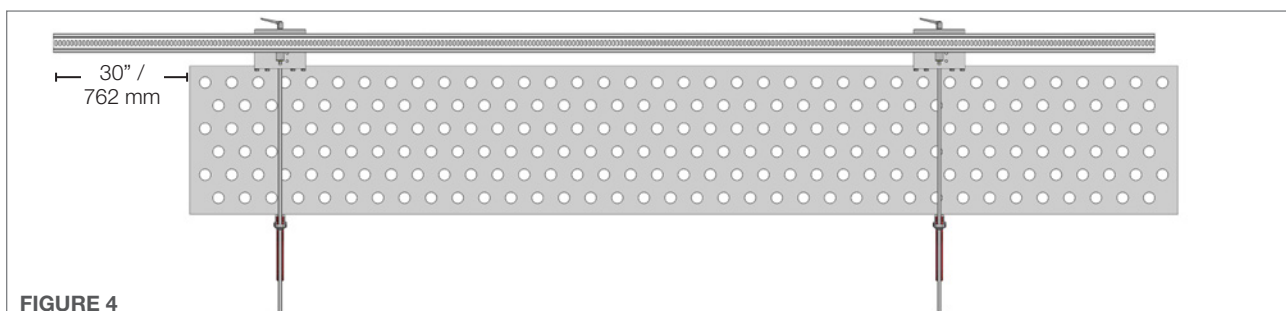
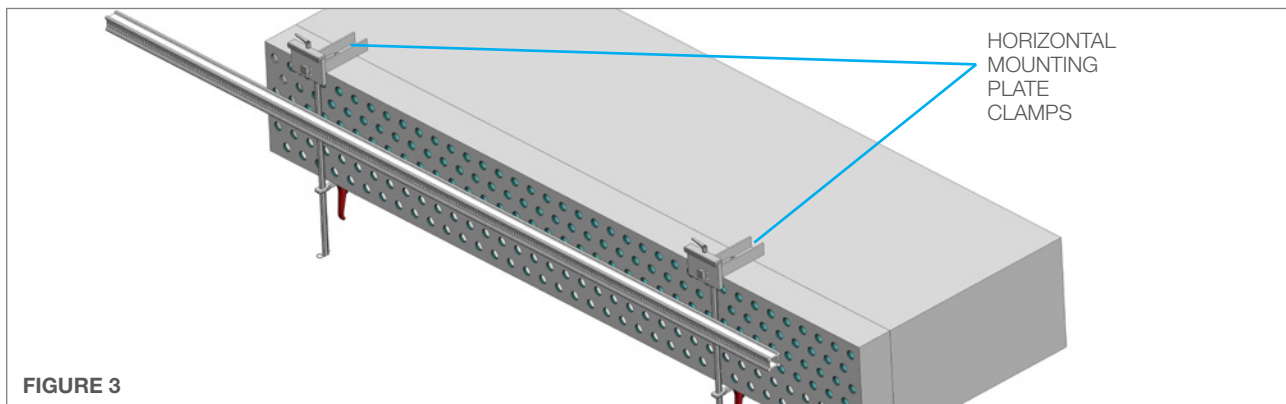
1. Mount the **Fin Fan Clamp Assemblies** to the tube bundle as shown. The Clamps should be as square to the bundle as possible. Ratchet the red Handle Assembly until tight. **(Figure 1)**
2. If more stand-off is needed from the face of the bundle, it is possible to adjust the Clamp by depressing the tang on the bottom of the vertical bar, sliding off the yellow Handle Assembly, unscrewing the Clamp from the Channel, and moving the Clamp to the open slot. Relocate the screw to the next position, tighten, and attach the red handle assembly. **(Figure 2)**



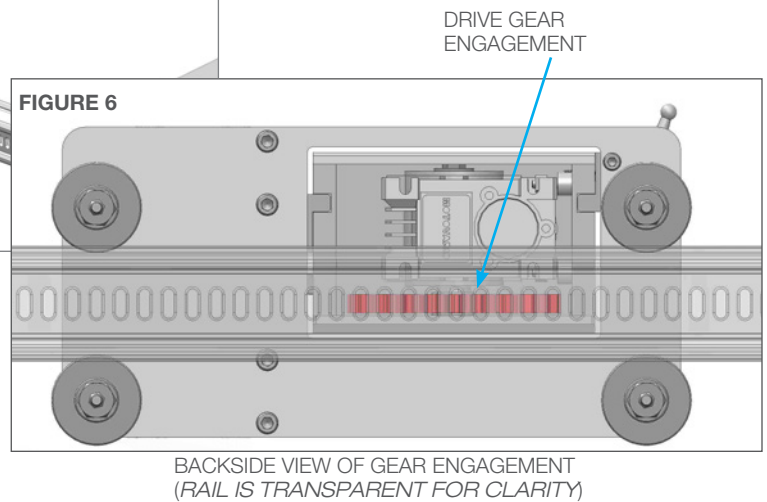
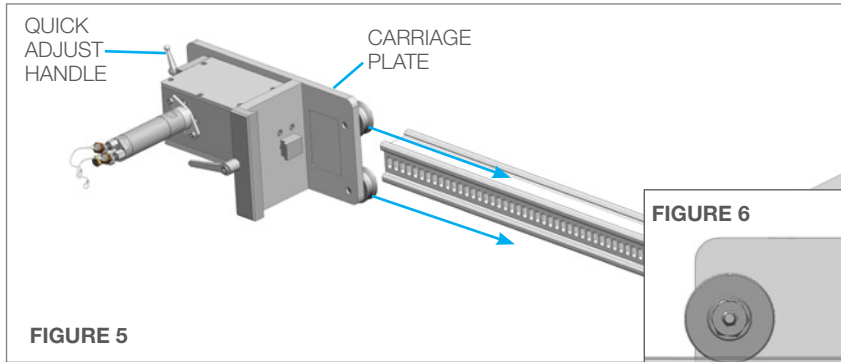
NOTE: Fin Fan face, shown for graphic representation only. Not included in assembly.



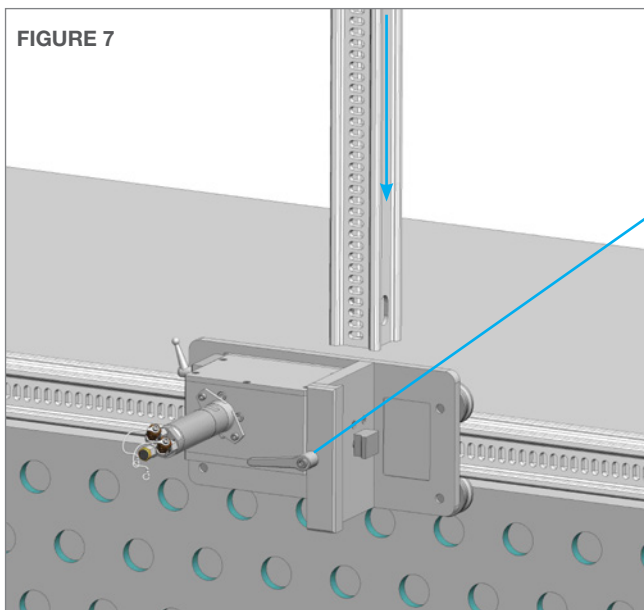
3. Loosen the Horizontal Mounting Plate Clamps and Slide the **Horizontal Rail (slots facing out)** in between the Clamp Finger and Rail Clamp. The **Horizontal Rail** should be ordered 30" (762 mm) longer than width of the tube bundle to provide complete coverage with a single installation. **(Figure 3)**
4. Position the **Horizontal Rail** so that it extends 30" (762 mm) beyond the tube bundle as shown in **(Figure 4)**. This is to allow the Carriage to travel far enough to reach the tubes located farthest to the left. Tighten the Clamps securing the rail to the Mounting Plates. **Horizontal Rail** longer than 150" (3810 mm) will require additional Horizontal Mounting Plate Clamps. spaced 75" (1905 mm) apart. Clamps spacing: Maximum spacing between clamps = 72" (1828 mm) Maximum spacing from end of rail = 50" (1270 mm)



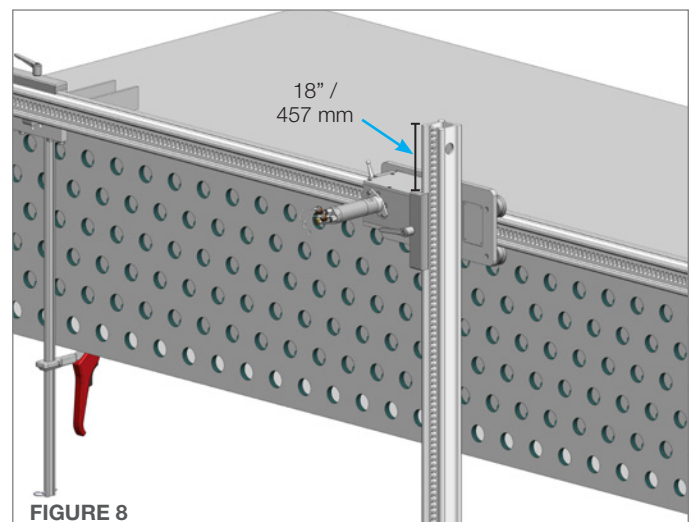
5. Loosen the Quick Adjust Handle and pull the gearbox away from the carriage plate. This will allow the **Horizontal Drive Carriage** to roll onto the rail without pneumatic power. **(Figure 5)**
6. Locate the Carriage on the rail and push the gearbox toward the rail to engage the drive gear into the rail slots. Verify the drive gear is engaging the slots correctly and retighten the adjustable handle. **(Figure 6)**



7. Loosen the Horizontal Mounting Plate Clamp. Install the **Vertical Rail** with **(slots facing out)** between the Clamp Finger and Rail Clamp. **(Figure 7)**
8. Position the **Vertical Rail** so that it is centered with the face of the tube bundle. The **Vertical Rail** should be ordered 18" (457 mm) taller than the height of the tube bundle so that it extends vertically beyond the tube bundle face. Secure the Horizontal Mounting Plate Clamp when the **Vertical Rail** is in position. **(Figure 8)**

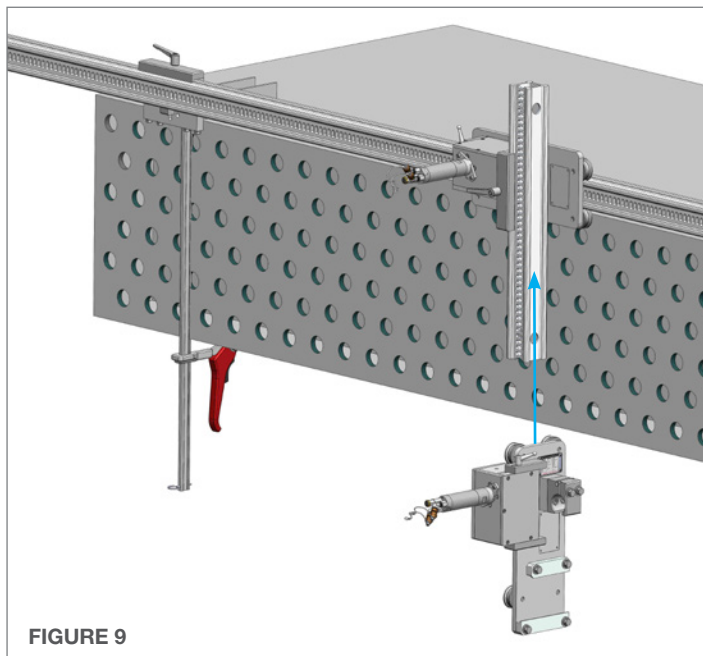


HORIZONTAL
MOUNTING
PLATE
CLAMP



FIN FAN ACCESSORY SET-UP

- Loosen the Quick Adjust Handle and pull the gearbox away from the carriage plate. This will allow the **Vertical Drive Carriage** to roll onto the rail without pneumatic power. **(Figure 9)**



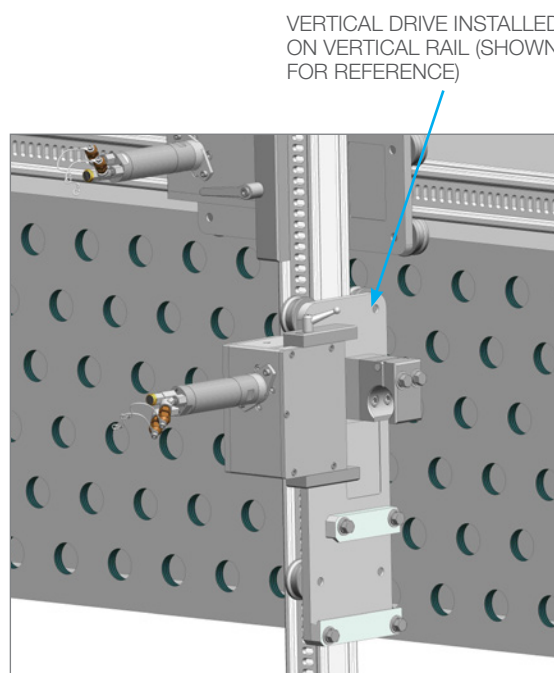
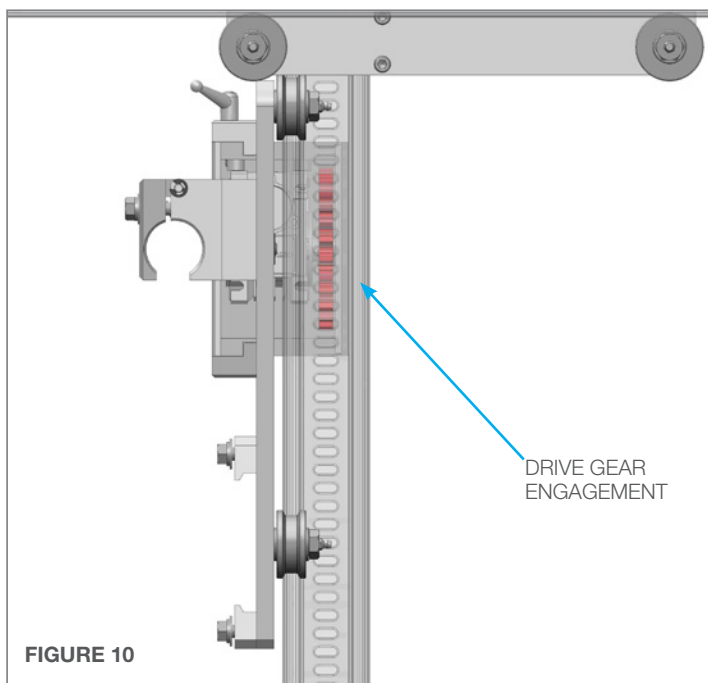
- Locate the Carriage on the rail and push the gearbox toward the rail to engage the drive gear into the rail slots. Verify the drive gear is engaging the slots correctly and retighten the adjustable handle. **(Figure 10)**

NOTICE

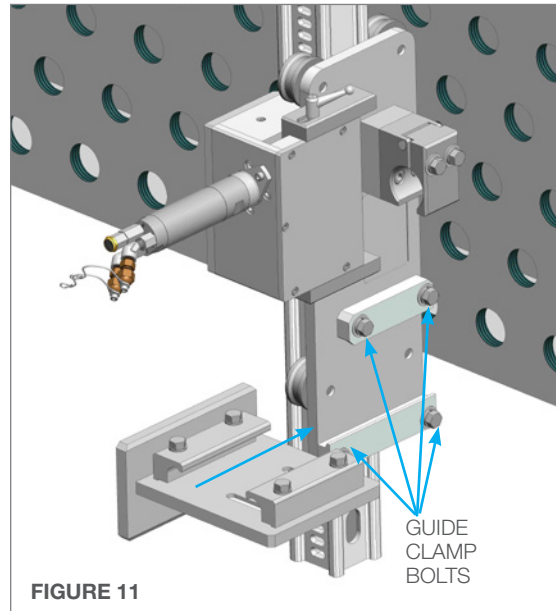
Verify the Mounting Plates are securely tightened. Verify both Drive Carriages are engaged with the rails and the Quick Adjust Handles are tightened.

⚠ WARNING

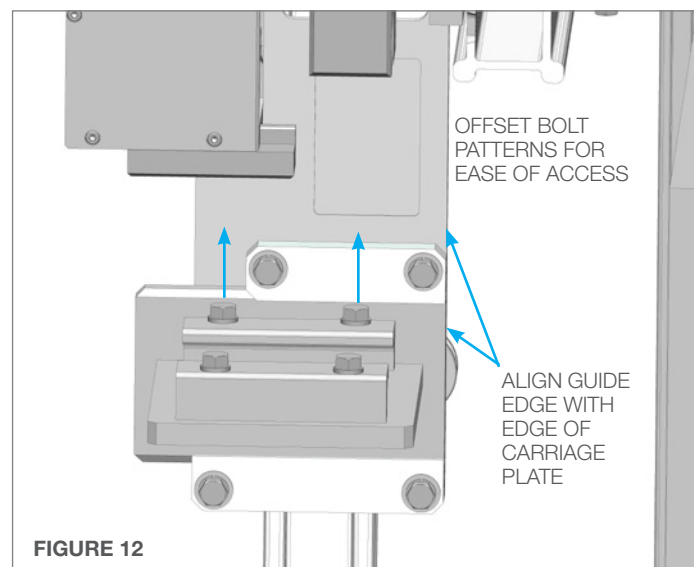
Never loosen the Vertical Drive once the Fin Fan Snout Assembly is installed, as it may result in the Carriage falling vertically down. This may cause damage and/or injury.



11. Using a 9/16 in. wrench, loosen all four Guide Clamp Bolts located on the Vertical Carriage. Install the **Guide Plate Assembly** into the Guide Clamps. (**Figure 11**)



12. Align the edge of the **Guide Plate Assembly** to the Edge of the Carriage Plate. This will offset both bolt patterns and allow for easier access when tightening the Guide Clamp Bolts. (**Figure 12**)



AUTOBOX® ABX-2L SCAFFOLD MOUNT RETROFIT KIT SET-UP

AUTOBOX® ABX-2L RETROFIT KIT BOTTOM PLATE CONVERSION

1. If the AUTOBOX® (ABX-2L) has a bottom plate without a center mounting hole, shown in **(Figure 1)**, it will need to be converted to the new plate. The new bottom plate is shown in **(Figure 1.1)**. If the AUTOBOX® (ABX-2L) has the mounting hole, it will need to be removed to install the Retrofit Kit.

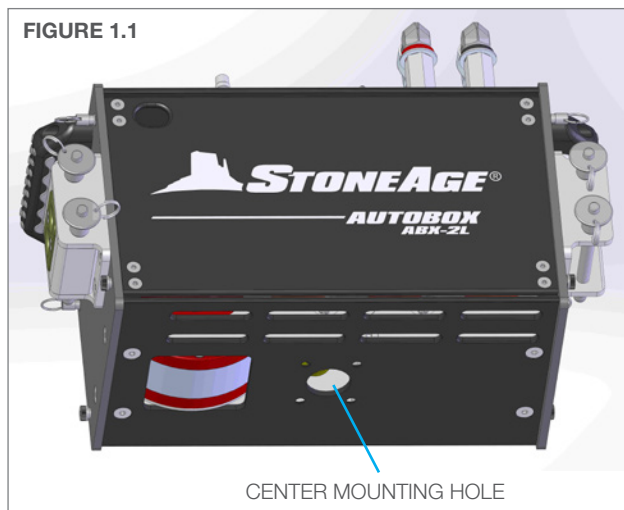
ORIGINAL BOTTOM PLATE

FIGURE 1



NEW BOTTOM PLATE

FIGURE 1.1



2. Remove the bottom plate and discard the four 1/4" flat head cap screws. **(Figure 2)**
3. Fasten the Center Pivot Mount to the Bottom Plate with the mounting hole with four 1/4" x 5/8" flat head cap screws. Fasten the Foot Blocks and Bottom Plate to the AUTOBOX® (ABX-2L) with the 1/4" x 1 1/4" flat head cap screws. **(Figure 3)**

FIGURE 2

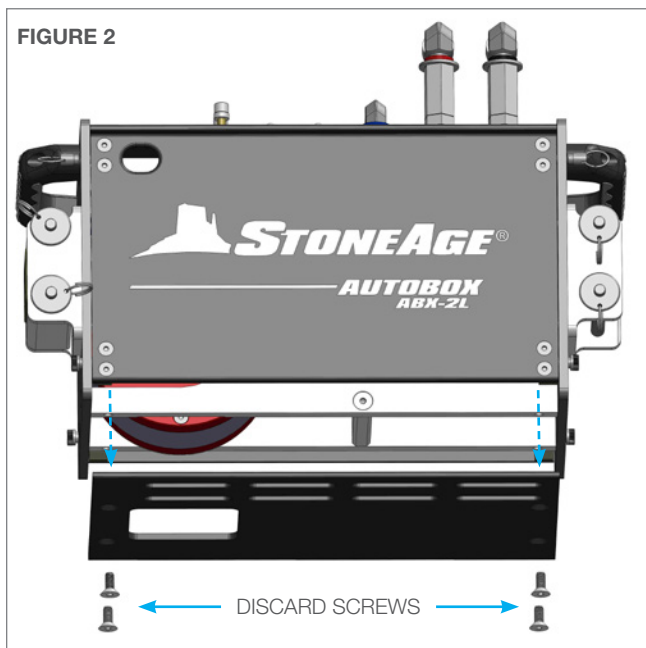
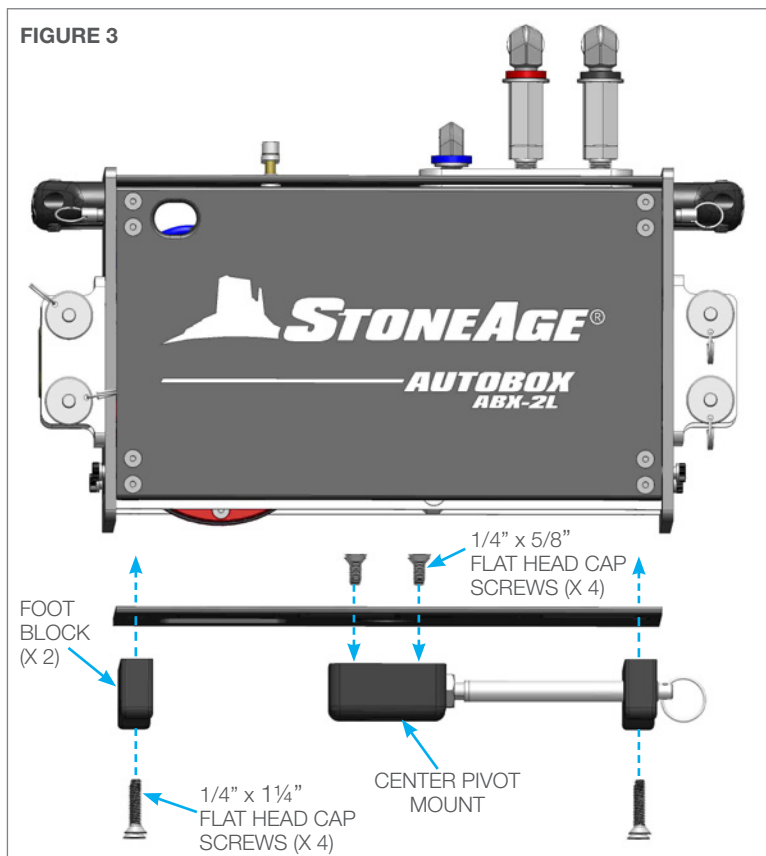


FIGURE 3



SCAFFOLD MOUNT TO AUTOBOX® ABX-2L

4. Attach Scaffold Mount to scaffold railing before attaching AUTOBOX® (ABX-2L). Ensure the adjustable extension is positioned so that the mount is tight to the rails. Set the AUTOBOX® (ABX-2L) on the Scaffold Mount, so that the Center Hole Mount is over the pivot end of the Scaffold Mount. Pull the Quick Pin on the Retrofit Kit out and release is when it is in position with a desired notch on the Scaffold Mount. **(Figure 4)**
5. Remove the Quick Release Pins from the ABX-2L Hose Tractor Mounting Bracket. Slide the **Fin Fan Spring Snout Block** into the Mounting Bracket on the ABX-2L Hose Tractor. Install the Quick Release Pins through the Mounting Bracket on the Hose Tractor and the Block on the Fin Fan Spring Snout Assembly. **(Figure 5)**

FIGURE 4

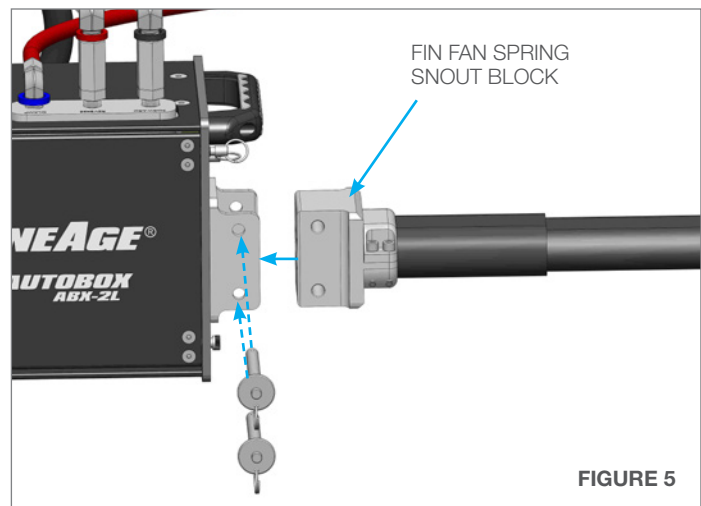
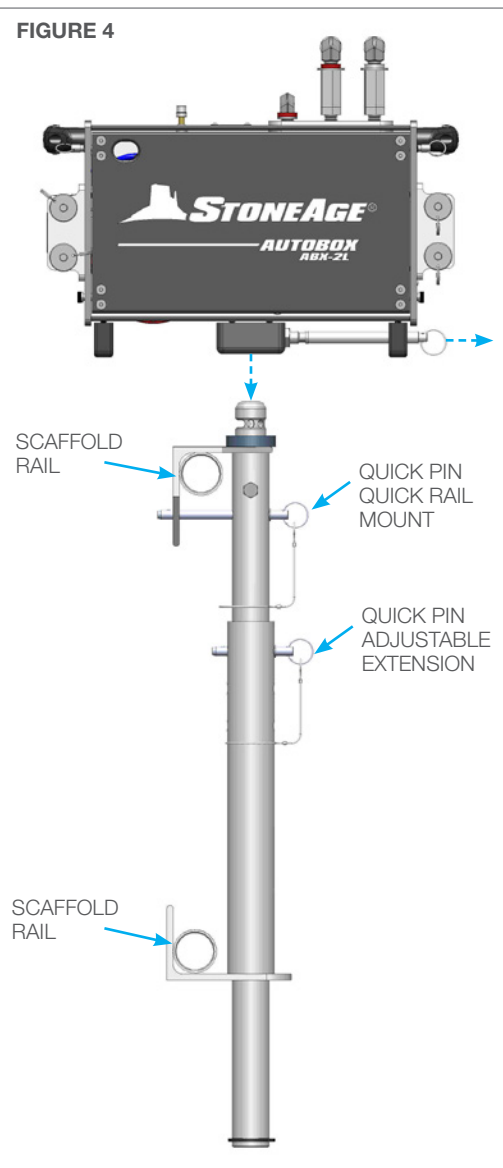


FIGURE 5

FIN FAN ACCESSORY SET-UP

- 14. Install the Banshee tools (NOT INCLUDED IN Fin Fan Accessory) on the end of the High Pressure Hose Fittings before running the hoses through the ABX-2L Hose Tractor and the Fin Fan Snout Assembly. This will protect the threads on the Hose Ends. Assuming the ABX-2L Hose Tractor and Control Box are connected to an air supply, remove the Quick Release Pins and Hose Stop Collets as shown in (Figure 14), and run the hoses through the Fin Fan Snout Assembly until the Banshee tools exit the Hose Guide Tubes.
- 15. Replace the Hose Stop Collets and Quick Release Pins. (Figure 15)



FIGURE 14

WARNING

Appropriate size Collet selection is **CRITICAL** to ensuring proper backout prevention of the tool. See "RECOMMENDED COLLETS FOR COMMON HOSE SIZES" plate, attached to ABX-2L Assembly.

RECOMMENDED COLLETS FOR COMMON HOSE SIZES		
COLLET SIZE	SPIR STAR	PARKER
0.297	3/2	2240D-02
0.328	3/4, 4/2	2240D-025, 2440D-02
0.406	5/2, 3/6	2240D-03
0.438	4/4	2448D-025
0.460	4/6, 5/4, 6/2	2240D-04
0.484		2640D-025
0.516	6/4	2440D-04
0.547	5/6, 8/2	2240D-05, 2740D-03
0.594	8/4	
0.625		2440D-05

It is the responsibility of the user to select proper sizing to assure the end sleeve of the hose will not pass through collet.

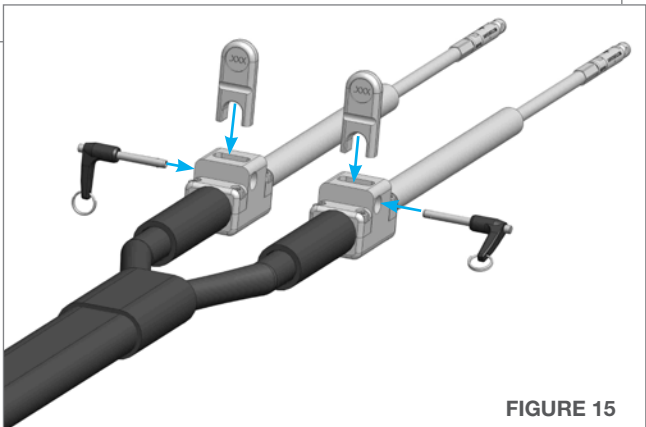


FIGURE 15

NOTICE

Extension nipples and slimline couplers are recommended on the end of the hoses to easily bridge the gap in the header. The Banshee tools, recommended extension nipples, and slimline couplers are NOT included in the Fin Fan Accessory. (Figure 14.5)
If using BN18s, StoneAge offers a reduced O.D. Slimline Coupler for use with standard Guide Tubes.

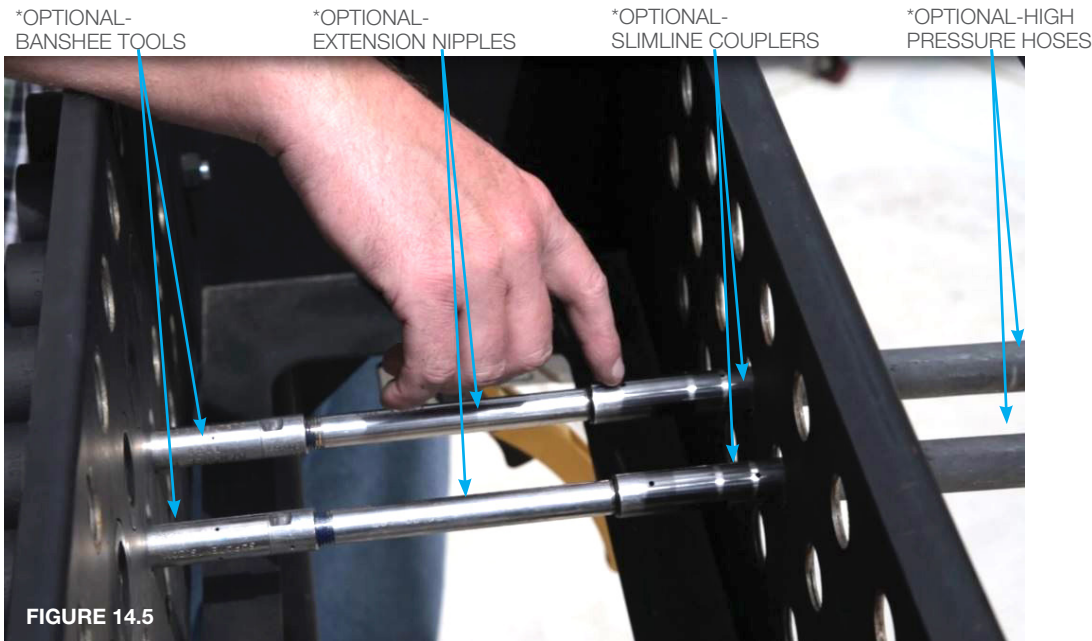
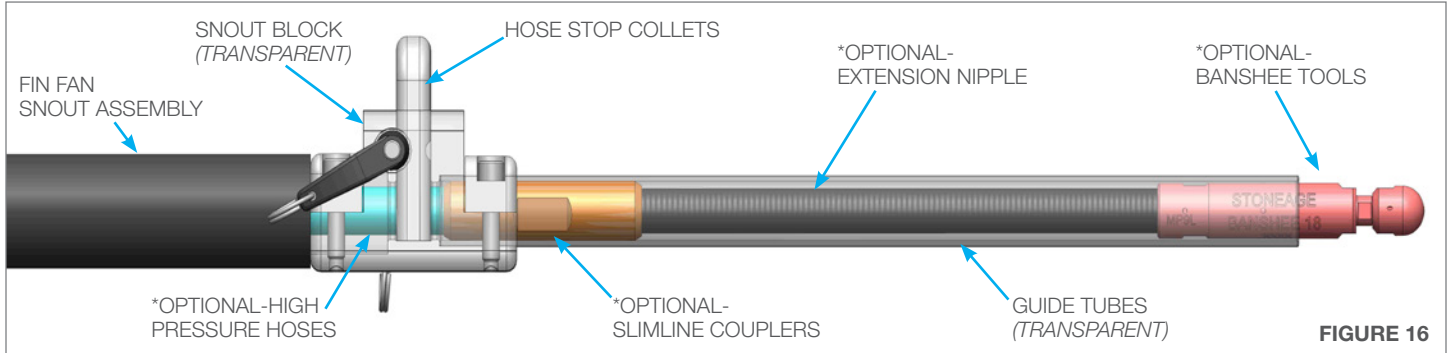


FIGURE 14.5

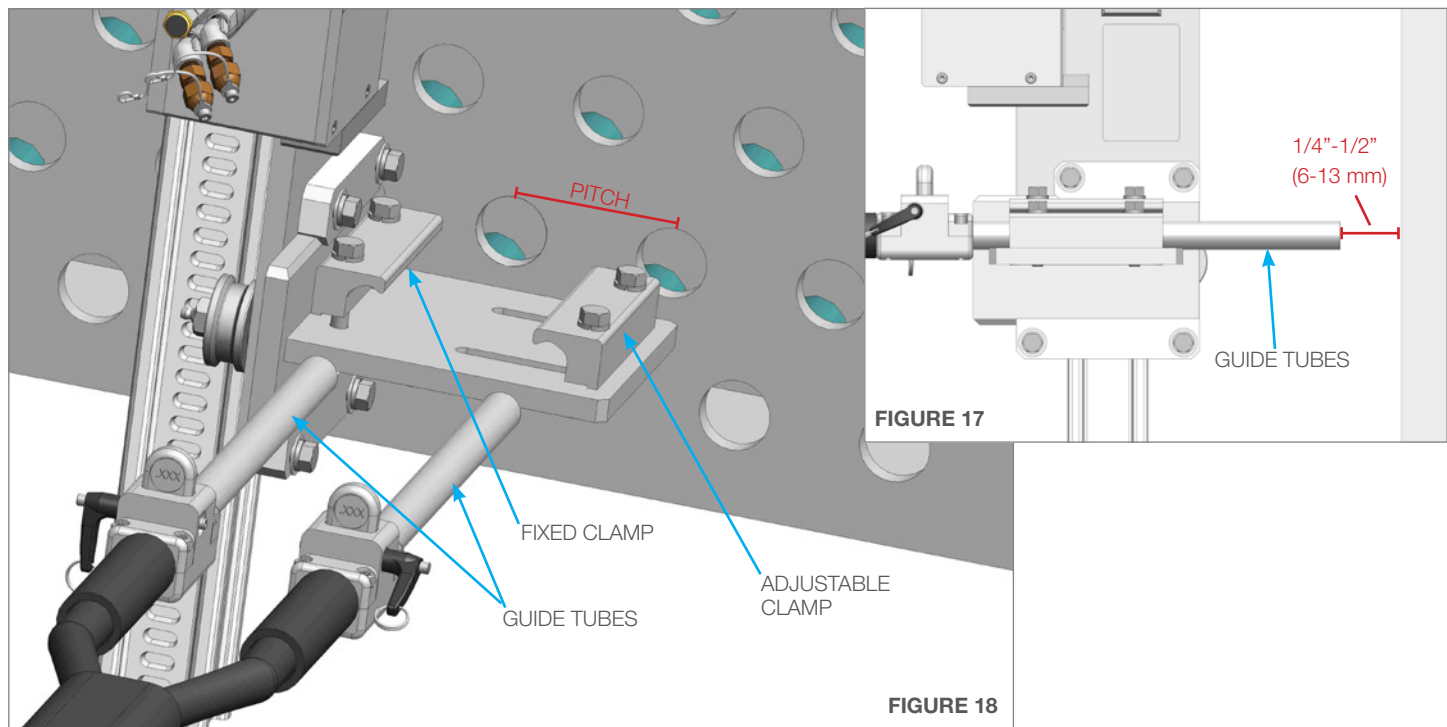
16. The Snout Block and Guide Tubes are transparent in **(Figure 16)** to illustrate how the Hose Stop Collets act as back out prevention devices.

⚠ WARNING

Test the back out prevention by retracting the Banshee tools into the Guide Tubes. The Hose Stop Collets should prevent the Hose Crimp from moving back into the Fin Fan Snout Assembly. The proper selection and installation of the Hose Stop Collets is critical to preventing the back out of the tools.



17. Install **Guide Tubes** simultaneously, but secure the left **Guide Tube** into the Fixed Clamp on the Guide Plate first. The **Guide Tubes** should be set $1/4''-1/2''$ (6 - 13 mm) away from the face of the tube bundle **(Figure 17)**.
18. Install the right **Guide Tube** into the Adjustable Clamp next and adjust the pitch. The pitch can be set between $1-3/4''$ (44 mm) and $4''$ (102 mm) by sliding the Adjustable Clamp in or out and tightening in the desired position **(Figure 18)**.



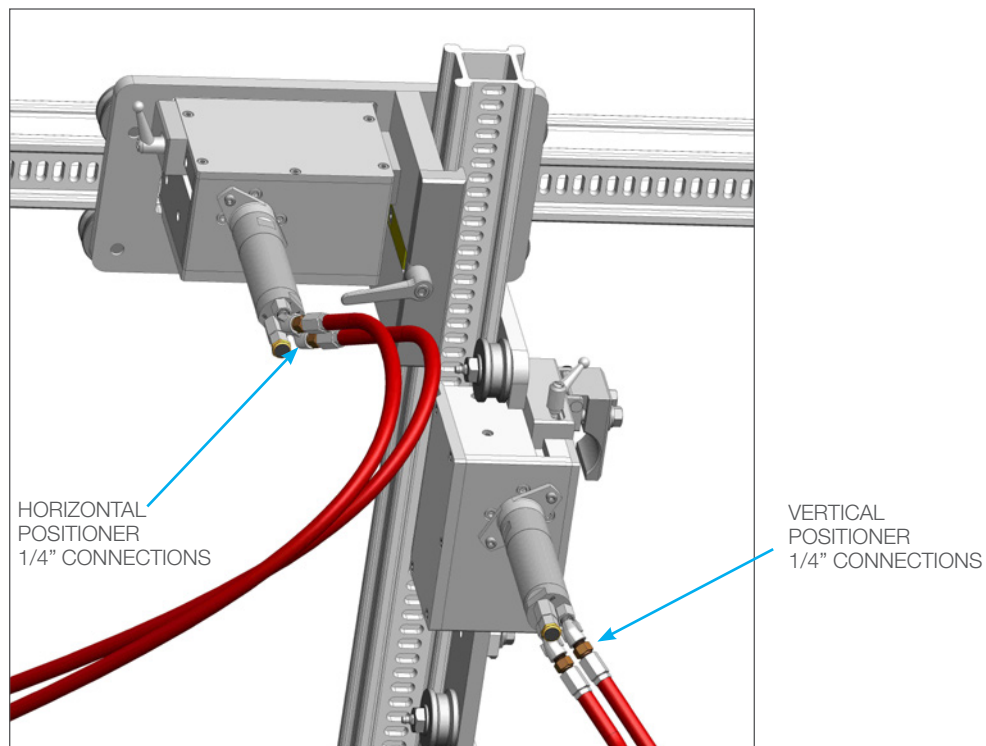
FIN FAN ACCESSORY SET-UP

PNEUMATIC SUPPLY LINE CONNECTIONS

19. Verify the ABX-2L Hose Tractor is connected to the Control Box with two 1/2 in. (13 mm) JIC hoses and one 1/4 in. (6 mm) JIC hose.

Remove the dust caps from the Joint Industry Council (JIC) fittings of the Control Box and the Vertical and Horizontal Positioners.

Connect the Vertical and Horizontal Positioners to the Control Box with two each, 1/4 in. (6 mm) JIC hoses. Verify the Control Box moves the both the Vertical and Horizontal Carriages in the appropriate directions.



OPERATION

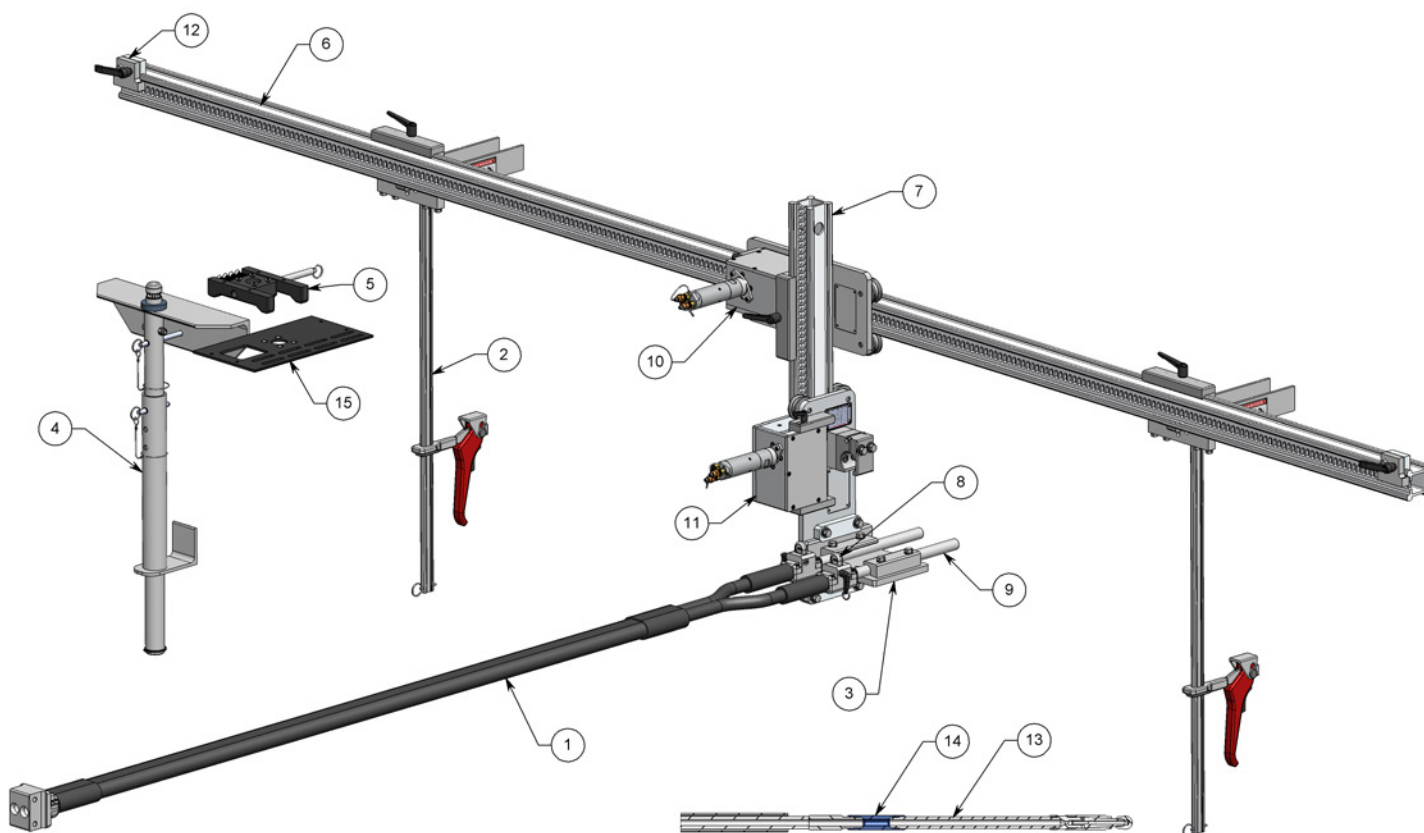
Reference your ABX-2L User Manual for additional operating instructions

STORAGE, TRANSPORTATION, AND HANDLING

Use mild soapy water to clean the accessory components in order to remove corrosive materials. Before storing the kit, use compressed air to blow off debris and moisture. Apply a small amount of air tool oil directly into the Horizontal and Vertical Drive fittings. Then, briefly operate the controls at slow speed for a short duration in each direction to coat the interior parts of the motor. Install the dust caps onto all fittings to keep moisture and dirt out.

The Fin Fan Accessory, can be broken down into smaller components that should be stored in a clean and dry area.

FIN FAN ACCESSORY (FF-100)
FIN FAN ASSEMBLY



FIN FAN ACCESSORY FF-100		
#	PART NUMBER	QTY.
1	FF 101-XX FIN FAN SPRING SNOUT ASSY	1
2	FF 102 FIN FAN CLAMP ASSY	2
3	FF 103 FIN FAN GUIDE ASSY	1
4	FF 104 ABX-2L SCAFFOLD MOUNT ASSY	1
5	FF 105-RK RETROFIT KIT	1
	FF 105-ERK EXTENDED RETROFIT KIT	

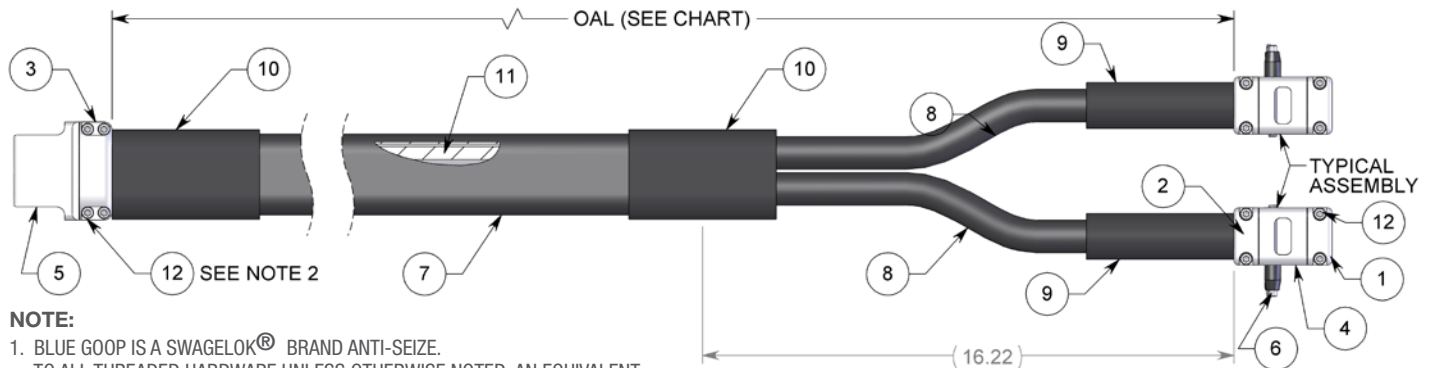
SELECTABLE LINE ITEMS		
#	PART NUMBER	QTY.
6	BU 002.1-XX HORIZONTAL DRIVE RAIL (FIN FAN BUNDLE WIDTH PLUS 30 INCHES)	1
7	BU 002-XX-001 VERTICAL DRIVE RAIL (FIN FAN BUNDLE HEIGHT PLUS 18 INCHES)	1
8	FF 121-XXX HOSE STOP COLLET SINGLE, .XXX	2
9	ABX 116-XX GUIDE TUBE, .546 ID / 14 mm	2
	ABX 117-XX GUIDE TUBE, .674 ID / 17 mm	
	ABX 119-XX GUIDE TUBE, .745 ID / 19 mm	

OPTIONAL ITEMS		
#	PART NUMBER	QTY.
10	**LWP 501 HORIZONTAL DRIVE ASSY	1
11	**LWP 502 VERTICAL DRIVE ASSY	1
12	**BU 152 RAIL STOP ASSY	2
13	SA 567-MP9LMP9L-XX NIPPLE	2
	SA 567-MP9RMP9R-XX NIPPLE	
14	AF 073-MP9LMP9L-XSL COUPLING	2
	AF 073-MP9RMP9R-XSL COUPLING	
15	ABX 210 PLATE, BOTTOM	1

**OPTIONAL ITEMS ARE STANDARD PARTS FROM THE LIGHT WEIGHT POSITIONER (LWP-500).

PARTS DIAGRAM

FIN FAN ACCESSORY (FF 101-XX) FIN FAN SPRING SNOOT ASSY



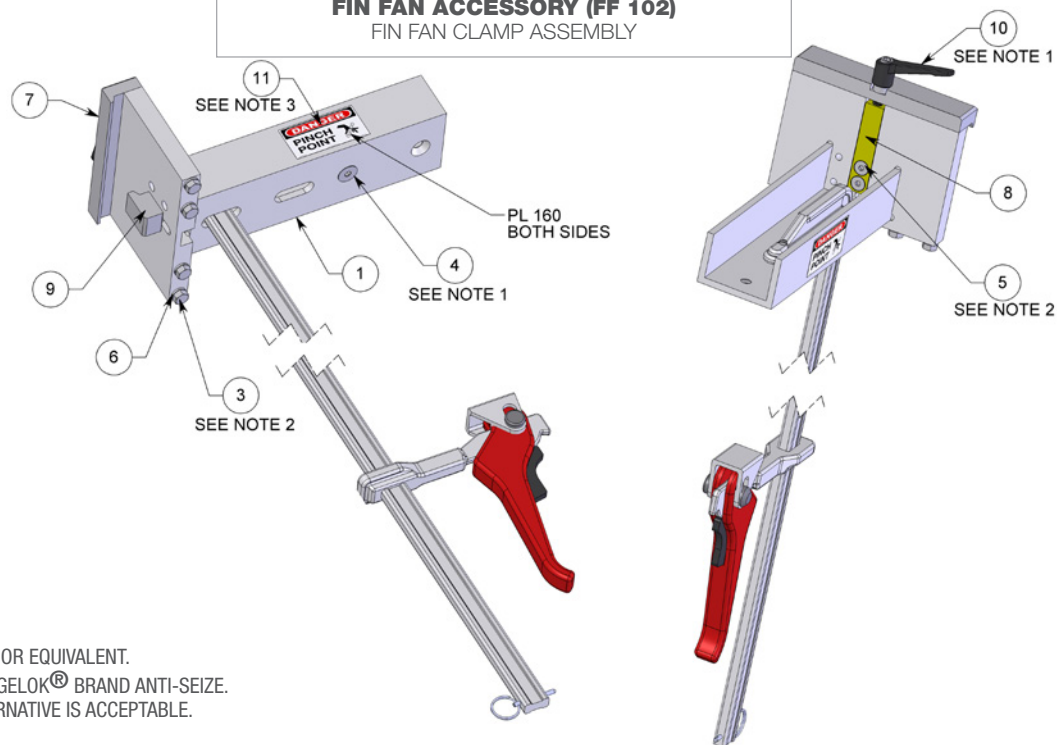
NOTE:

1. BLUE GOOP IS A SWAGelok® BRAND ANTI-SEIZE. TO ALL THREADED HARDWARE UNLESS OTHERWISE NOTED. AN EQUIVALENT ALTERNATIVE IS ACCEPTABLE.
2. BLUE LOCTITE 242® OR EQUIVALENT.

#	PART NUMBER	QTY	84 IN SNOOT
1	FF 111 CAP, SNOOT BLOCK GUIDE TUBE	2	
2	FF 112 CAP, SNOOT BLOCK SPRING	2	
3	FF 113 CAP, SNOOT BRACKET	1	
4	FF 115 SNOOT BLOCK, FIN FAN	2	
5	FF 116 MOUNTING BRACKET INSIDE, SNOOT	1	
6	FF 131 QUICK RELEASE PIN .25X 1.25	2	

7	FF 132-66 FABRIC HEAT SHRINK TUBING, LG	1	66 IN
8	FF 133 FABRIC HEAT SHRINK, SM	2	18 IN
9	FF 135 HEAVY DUTY SHRINK WRAP, 1.50 BEFORE	2	4.5 IN
10	FF 136 HEAVY DUTY SHRINK WRAP, 2.00 BEFORE	2	4.5 IN
11	FF 159-84 FLAT WIRE SPRING, SNOOT	2	
12	GS 325-04 SHCS .25-20 X 1.00 SS (BC 053)	12	

FIN FAN ACCESSORY (FF 102) FIN FAN CLAMP ASSEMBLY

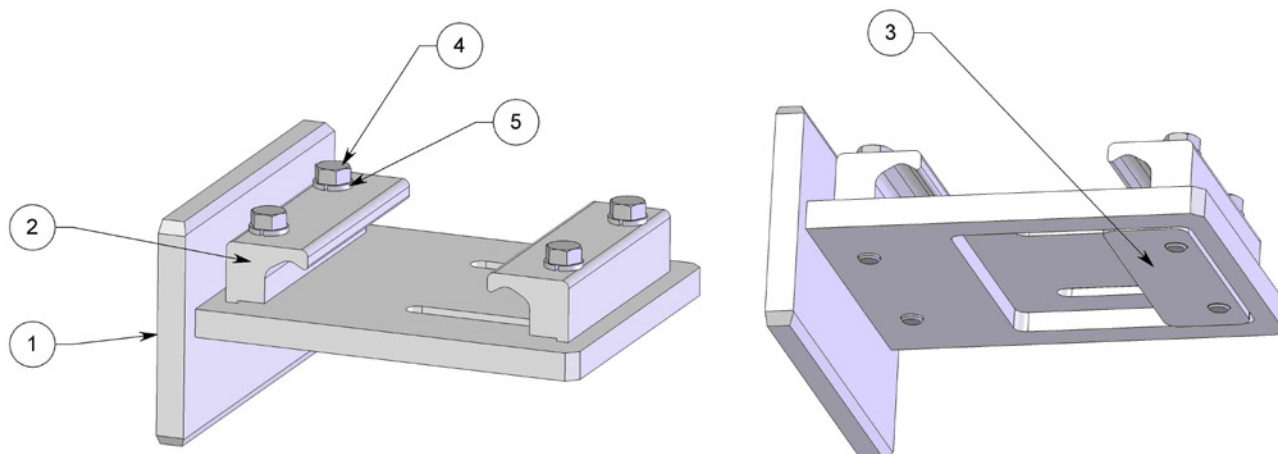


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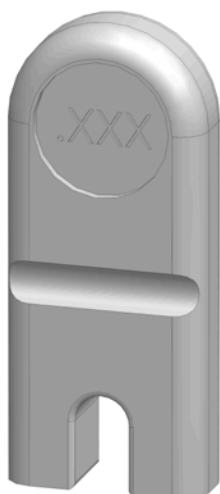
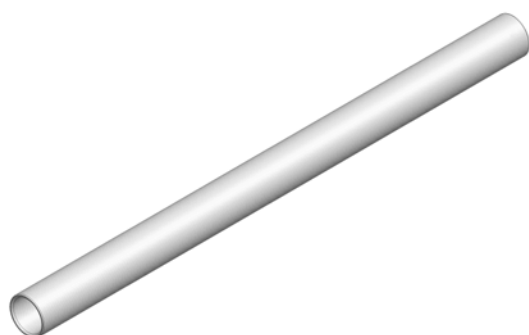
1. BLUE LOCTITE 242® OR EQUIVALENT.
2. BLUE GOOP IS A SWAGelok® BRAND ANTI-SEIZE. AN EQUIVALENT ALTERNATIVE IS ACCEPTABLE.

#	PART NUMBER	QTY.
1	FF 122 CLAMP WELDMENT	1
2	FF 123 MODIFIED CLAMP, FIN FAN HEADER	1
3	GB 331-20 BOLT, HEX .31-18 X 5.00 SS	4
4	GSF 337-03 FHCS .37-16 X .75 LG SS	1
5	GSSH 0375-0500-SS SHOULDER SCREW	2

6	GW 331-L LOCK WASHER SS	4
7	SRT 549 HORIZONTAL RAIL CLAMP	1
8	SRT 551 CLAMP FINGER	1
9	SRT 552 ADJUSTABLE RAIL CLAMP	1
10	SRT 556 ADJUSTABLE HANDLE .38-16 X 1.56 SS	1
11	PL 160 PINCH POINT 1.5X3.0 DECAL	2

FIN FAN ACCESSORY (FF 103)
 FIN FAN GUIDE ASSEMBLY


#	PART NUMBER	QTY.
1	FF 138 ABX 2L GUIDE WELDMENT	1
2	FF 139 GUIDE TUBE CLAMP	2
3	FF 140 PLATE, THREADED	1
4	GB 337-07 BOLT, HEX .37-16 X 1.75 SS	4
5	GW 337-L LOCK WASHER SS	4

GUIDE TUBE AND COLLET REFERENCE CHARTS

StoneAge PART NUMBER GUIDE TUBE REFERENCE CHART

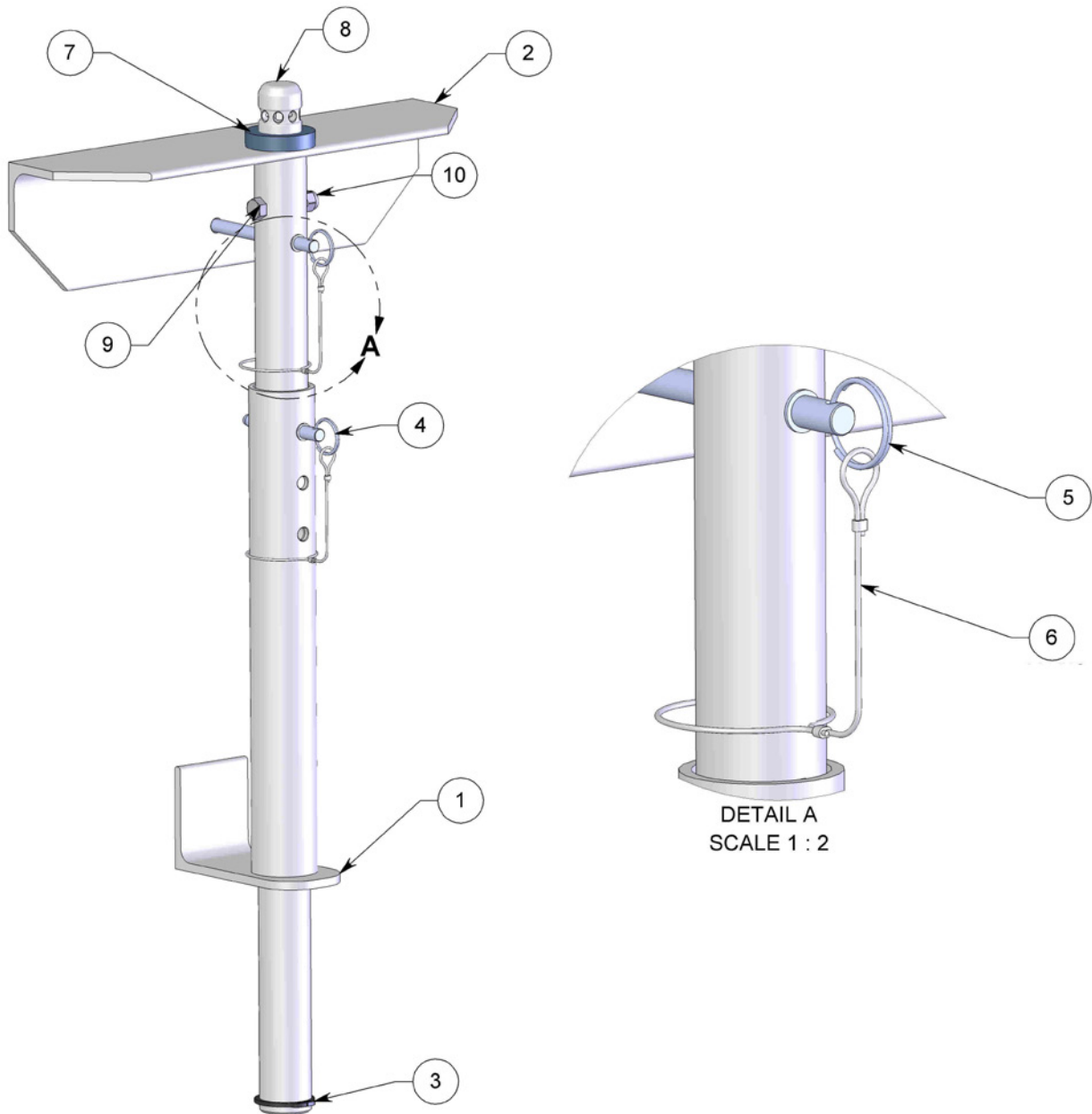
SA PART NUMBER	BANSHEE	TUBE INTERIOR DIAMETER	TUBE LENGTH
ABX 115-12	BN9.5	0.459 in. / 12 mm	12.5 in. / 316 mm
ABX 115-36	BN9.5	0.459 in. / 12 mm	36 in. / 914 mm
ABX 116-12	BN13	0.546 in. / 14 mm	12.5 in. / 316 mm
ABX 116-36	BN13	0.546 in. / 14 mm	36 in. / 914 mm
ABX 117-12	BN15	0.674 in. / 17 mm	12.5 in. / 316 mm
ABX 117-36	BN15	0.674 in. / 17 mm	36 in. / 914 mm
ABX 119-12	BN18	0.745 in. / 19 mm	12.5 in. / 316 mm
ABX 119-36	BN18	0.745 in. / 19 mm	36 in. / 914 mm

StoneAge COLLET REFERENCE CHART

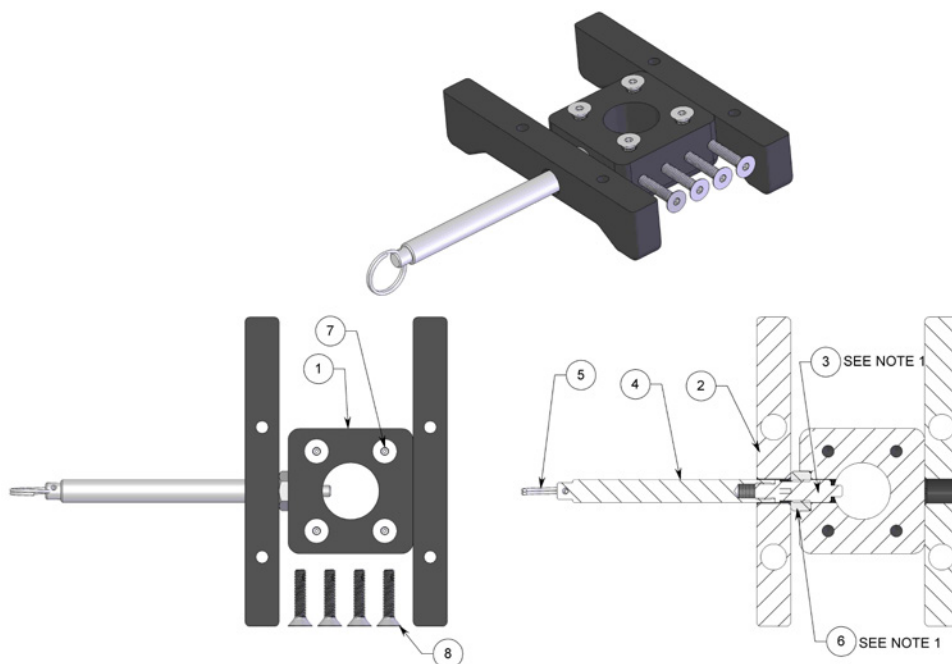
SA PART NUMBER	COLLET SIZE	SPIR STAR	PARKER
FF 121-297	0.297 in. / 8 mm	3/2	2240D-02
FF 121-328	0.328 in. / 8 mm	3/4, 4/2	2240D-025, 2240D-02
FF 121-406	0.406 in. / 10 mm	5/2, 3/6	2240D-03
FF 121-438	0.438 in. / 11 mm	4/4	2448D-25
FF 121-460	0.460 in. / 12 mm	4/6, 5/4, 6/2	2240D-04
FF 121-484	0.484 in. / 12 mm		2640D-25
FF 121-516	0.516 in. / 13 mm	6/4	2440D-04
FF 121-547	0.547 in. / 14 mm	5/6, 8/2	2240D-05, 2740D-03
FF 121-594	0.594 in. / 15 mm	8/4	
FF 121-625	0.625 in. / 16 mm		2240D-05

PARTS DIAGRAM

FIN FAN ACCESSORY (FF 104) ABX-2L SCAFFOLD MOUNT ASSEMBLY

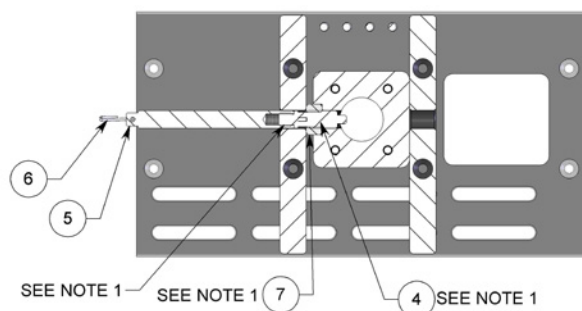


#	PART NUMBER	QTY.
1	FF 141 LOWER SCAFFOLD BRACKET WELDMENT	1
2	FF 142 POST WELDMENT	1
3	FF 143 RETAINING RING, HD EXTERNAL 1.50	1
4	FF 144 QUICK RELEASE PIN, SS 2.00	1
5	FF 145 QUICK RELEASE PIN, SS 4.00	1
6	FF 146 LANYARD ASSY	2
7	FF 147 THRUST WASHER	1
8	FF 148 TRACTOR PIVOT STUD	1
9	GB 537-08 BOLT, HEX .37-16 X 2.00	1
10	GN 537-L NYLOK NUT	1

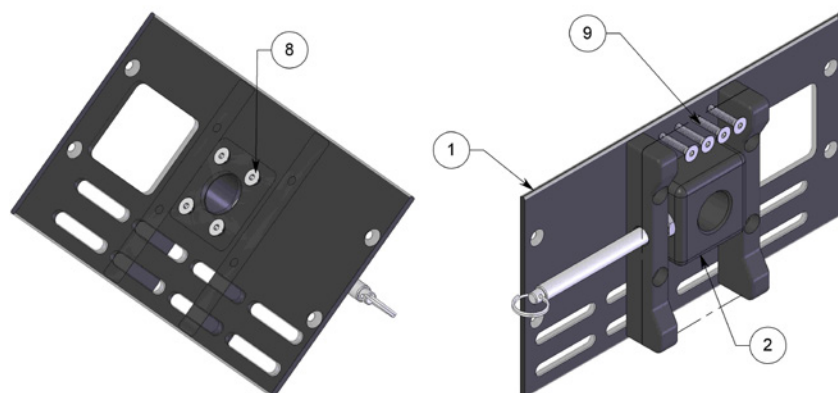
FIN FAN ACCESSORY (FF 105-RK)
 ABX-2L RETROFIT KIT
**NOTE:**

1. BLUE LOCTITE 242® OR EQUIVALENT.

#	PART NUMBER	QTY.
1	FF 149 PIVOT BLOCK	1
2	FF 150 BLOCK FOOT	2
3	FF 151 SPRING PLUNGER	1
4	FF 152 EXTENSION STUD	1
5	FF 153 SPLIT RING	1
6	GN 550-H HEX NUT	1
7	GSF 325-025 FHCS .25-20 X .63 LG SS	4
8	GSF 325-05 FHCS .25-20 X 1.25 LG SS THREADLOCKING	4

FIN FAN ACCESSORY (FF 105-ERK)
 ABX-2L RETROFIT KIT
**NOTE:**

1. BLUE LOCTITE 242® OR EQUIVALENT.



#	PART NUMBER	QTY.
1	ABX 210 PLATE, BOTTOM	1
2	FF 149 PIVOT BLOCK	1
3	FF 150 BLOCK FOOT	2
4	FF 151 SPRING PLUNGER	1
5	FF 152 EXTENSION STUD	1
6	FF 153 SPLIT RING	1
7	GN 550-H HEX NUT	1
8	GSF 325-025 FHCS .25-20 X .63 LG SS	4
9	GSF 325-05 FHCS .25-20 X 1.25 LG SS THREADLOCKING	4

TERMS AND CONDITIONS

1. Acceptance of Terms and Conditions. These Terms and Conditions shall operate as Seller's acceptance of Buyer's purchase order, and such acceptance is made expressly conditional on assent by Buyer to the Terms and Conditions. Such assent shall be deemed to have been given unless written notice of objection to any of such Terms and Conditions (including inconsistencies between Buyer's purchase order and this acceptance) is given by Buyer to Seller promptly on receipt hereof.

Seller desires to provide its Buyer with prompt and efficient service. However, to negotiate individually the terms of each sales contract would substantially impair Seller's ability to provide such service. Accordingly, products furnished and services rendered by Seller are sold only on the Terms and Conditions stated herein. Notwithstanding any Terms or Conditions on Buyer's order, Seller's performance of any contract is expressly made conditional on Buyer's agreement to Seller's Terms and Conditions of sale unless otherwise specifically agreed to in writing by Seller. In the absence of such agreement, commencement of performance, shipment and/or delivery shall be for Buyer's convenience only and shall not be deemed or construed to be an acceptance of Buyer's Terms and Conditions. PRODUCTS SOLD BY SELLER ARE DESIGNED AND INTENDED TO BE USED AT HIGH PRESSURES AND SPEEDS, AND MAY BE DANGEROUS IF OPERATED IMPROPERLY OR WITHOUT THE USE OF APPROPRIATE SAFETY DEVICES AND GUARDS. BUYER IS CAUTIONED TO CAREFULLY READ AND UNDERSTAND THESE TERMS AND CONDITIONS, AS THEY HAVE IMPORTANT LEGAL CONSEQUENCES.

2. Payment/Prices. Unless other arrangements have been made in writing between Seller and Buyer, payment for product delivered shall be made upon receipt of invoice. The prices shown on the face hereof are those currently in effect. Prices invoiced shall be per price list in effect at the time of shipment. Prices are subject to increase for inclusion of any and all taxes which are applicable and which arise from the sale, delivery or use of Seller's products or services and for the collection of which Seller is or may be responsible to any governmental authority unless acceptable exemption certificates are provided by Buyer in accordance with law. Buyer shall pay all charges for transportation and delivery and all excise, order, occupation, use or similar taxes, duties, levies, charges or surcharges applicable to the equipment or services being purchased, whether now in effect or hereafter imposed by any governmental authority, foreign or domestic.

3. Warranty. Subject to the limitations and conditions hereinafter set forth, Seller warrants to the original Buyer that its products are free from defects in workmanship and material for a period of one (1) year from shipment date. Seller's obligation under this warranty shall be limited to repairing, replacing or issuing a credit for, at Seller's option, any products or services it finds to be defective in material or workmanship. In no event shall Seller be liable for any incidental, consequential or indirect damages of any kind. THIS WARRANTY SHALL BE IN LIEU OF ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY FOR MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. No statement or recommendation made by Seller or its representative to Buyer or User shall constitute a warranty by Seller or a waiver or modification to any of the provisions hereof or create any liability for Seller. All warranty claims are subject to the exclusions and limitations set forth below:

a. The warranty shall not apply if the product or service (1) has been subject to misuse, negligence or accident; (2) has not been installed or operated in accordance with Seller's recommendations; (3) has been operated under more severe conditions than those specified for the particular product or service; (4) has been operated beyond the rated capacity of the product; or (5) has been repaired or altered outside Seller's facilities or in any way so as, in Seller's judgment, to affect its stability or reliability.

b. Products that Seller furnishes, but does not manufacture, carry only the warranty of the Manufacturer of such products. Where other Manufacturers' or Suppliers' products used in Seller's products or services prove defective, Seller's liability shall exist only to the extent that Seller is able to recover from such Manufacturers or Suppliers for such defects.

c. Any warranty granted by Seller to the Buyer shall be deemed void if any goods covered by such warranty are used for any purpose not recommended or permitted. In addition, the Buyer shall indemnify Seller and hold Seller harmless from and against any and all claims, damages, losses, costs, expenses and other liability of whatever nature that Seller suffers or incurs by reason of any such unintended use.

d. Notice of defective product or service must be given in writing to Seller by Buyer or User within fifteen (15) business days following receipt of goods. Buyer or User shall keep such products or services in an unaltered condition for examination by Seller's representative. No goods may be returned for credit or adjustment without prior written permission from Seller.

4. Product Liability. Buyer specifically acknowledges that the products being purchased may be operated at high speeds and/or pressures, and that as such they may be inherently dangerous if not used correctly. Buyer shall be solely responsible for the safe operation of the products at all times and for determining the safety devices and guards that may be required for the safe operation of the products. Buyer shall undertake to specify and order all safety devices and guards necessary for the safe operation of the equipment covered. All safety devices and guards offered in Seller's quotations are recommended for purchase. Seller may provide necessary safety devices and guards not offered in this quotation at an extra price in accordance with the specifications of Buyer. Buyer shall at all times use and require its contractors to use all necessary and appropriate safety devices, guards and proper safe operating procedures. Buyer shall ensure that proper Operator training is provided. Buyer shall not remove or modify any such devices, guards or warning signs and shall insist on safe operating practices on the part of its personnel. In no event shall Seller be responsible for any injuries to persons or property caused by defects in any equipment, including by way of illustration and not limitation, any pumps, compressors, fittings, connections, components, piping or hoses up to the point that same are connected to the product. Buyer agrees to indemnify and to save Seller harmless from any and all liability or obligation incurred by or against Seller, including costs and attorneys' fees, to or by any persons injured directly or indirectly in the operation of the equipment furnished under the following conditions:

- a. if Buyer fails to purchase and use necessary and appropriate safety devices and guards as determined and/or recommended by Seller;
- b. if Buyer fails to maintain in good working order such safety devices and guards as are purchased from Seller;
- c. if Buyer adds, omits, repairs, modifies, replaces or substitutes any components on the equipment without permission from Seller;
- d. if Buyer exceeds at any time the maximum safe loads, pressures or speeds recommended by Seller for the equipment furnished hereunder without the specific written consent of Seller; or
- e. if Buyer otherwise fails to operate the product or equipment in accordance with Seller's printed instructions or otherwise negligently operates the equipment.

5. Delivery. Seller is not obligated to make delivery by a specified date, but will always use its best efforts to make delivery within the time requested. All deliveries are based on F.O.B. Seller's factory, unless specifically agreed otherwise, and Buyer shall pay all shipping costs and insurance from that point. Seller, in its sole discretion, will determine and arrange the means and manner of transportation of the products. Responsibility of Seller shall cease and Buyer assumes all risk of loss or damages upon Seller's delivery to and receipt by a common carrier. Carriers shall be responsible for goods lost or damaged in transit and Buyer shall immediately notify the carrier in writing of such loss or damage. At Buyer's request Seller will offer its assistance. THE PROPOSED SHIPMENT DATE IS AN ESTIMATE. UNDER NO CIRCUMSTANCES SHALL SELLER HAVE ANY LIABILITY WHATSOEVER FOR LOSS OF USE OR FOR ANY DIRECT OR CONSEQUENTIAL DAMAGES RESULTING FROM DELAY REGARDLESS OF THE REASON(S). Shortages or errors must be reported within fifteen (15) business days from receipt of shipment to secure adjustment. No merchandise may be returned without securing written approval from Seller. Seller will notify Buyer promptly of any material delay and will specify the revised delivery date as soon as practicable. Seller shall not be liable for any delay in delivery or performance, or for any failure to manufacture, deliver or perform due to (a) any cause beyond its reasonable control; (b) any act of God, act of Buyer, act of civil or military authority, governmental priority, strike or other labor disturbance, flood, epidemic, war, riot, delay in transportation or car shortage; or (c) inability on account of any cause beyond the reasonable control of Seller to obtain necessary materials, components, services or facilities. In the event of any such delay, the date of delivery or of performance shall be extended for a period equal to the time lost by reason of the delay.

6. Technical Advice. All technical advice, recommendations and services of Seller are intended for use by persons having adequate skill, at their own risk, and Seller assumes no responsibility, and Buyer hereby waives all claims against Seller, for results obtained or damages incurred from the use of Seller's advice, recommendations and services.

7. Modification. These Terms and Conditions are intended by Seller and Buyer to constitute a final, complete and exclusive expression of agreement and cannot be supplemented or amended without Seller's prior written approval. Seller's waiver of any breach, or failure to enforce any of the Terms and Conditions at any time, shall not in any way affect,

limit or waive Seller's right thereafter to enforce and compel strict compliance with every Term and Condition thereof. If any provisions of these Terms and Conditions are held to be invalid or unenforceable, such invalidity or unenforceability shall not affect the validity or enforceability of the other portions hereof.

8. Disputes. Buyer and Seller shall attempt in good faith promptly to resolve any dispute arising under these Terms and Conditions by negotiations between representatives who have authority to settle the controversy. If unsuccessful, Buyer and Seller shall further attempt in good faith to settle the dispute by nonbinding third-party mediation, with fees and expenses of such mediation apportioned equally to each side. Any dispute not so resolved by negotiation or mediation may then be submitted to a court of competent jurisdiction in accordance with the terms hereof. These procedures are the exclusive procedures for the resolution of all such disputes between the parties. All sales, agreements for sale, offers to sell, proposals, acknowledgments and contracts of sale, including, but not limited to, purchase orders accepted by Seller, shall be considered a contract under the laws of the State of Colorado and the rights and duties of all persons, and the construction and effect of all provisions hereof shall be governed by and construed according to the laws of such state. A state or federal court located within the State of Colorado shall have sole and exclusive jurisdiction over any litigation concerning any such matters as well as any alleged defects of any products or equipment covered thereby or damages sustained as a result of such alleged defects. If any litigation is commenced between Seller and Buyer, or their personal representatives, concerning any provision hereof, the party prevailing in the litigation shall be entitled, in addition to such other relief that is granted, to a reasonable sum as and for their attorneys' fees and costs in such litigation or arbitration.

STONEAGE TRADEMARK LIST

View the list of StoneAge's trademarks and service marks and learn how the trademarks should be used. Use of StoneAge trademarks may be prohibited, unless expressly authorized.

<http://www.StoneAgetools.com/trademark-list/>

STONEAGE PATENT DATA

View the list of StoneAge's current U.S. patent numbers and descriptions.

<http://www.sapatents.com>



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