



AUTOBOX® (ABX-2L-V2-25) USER MANUAL

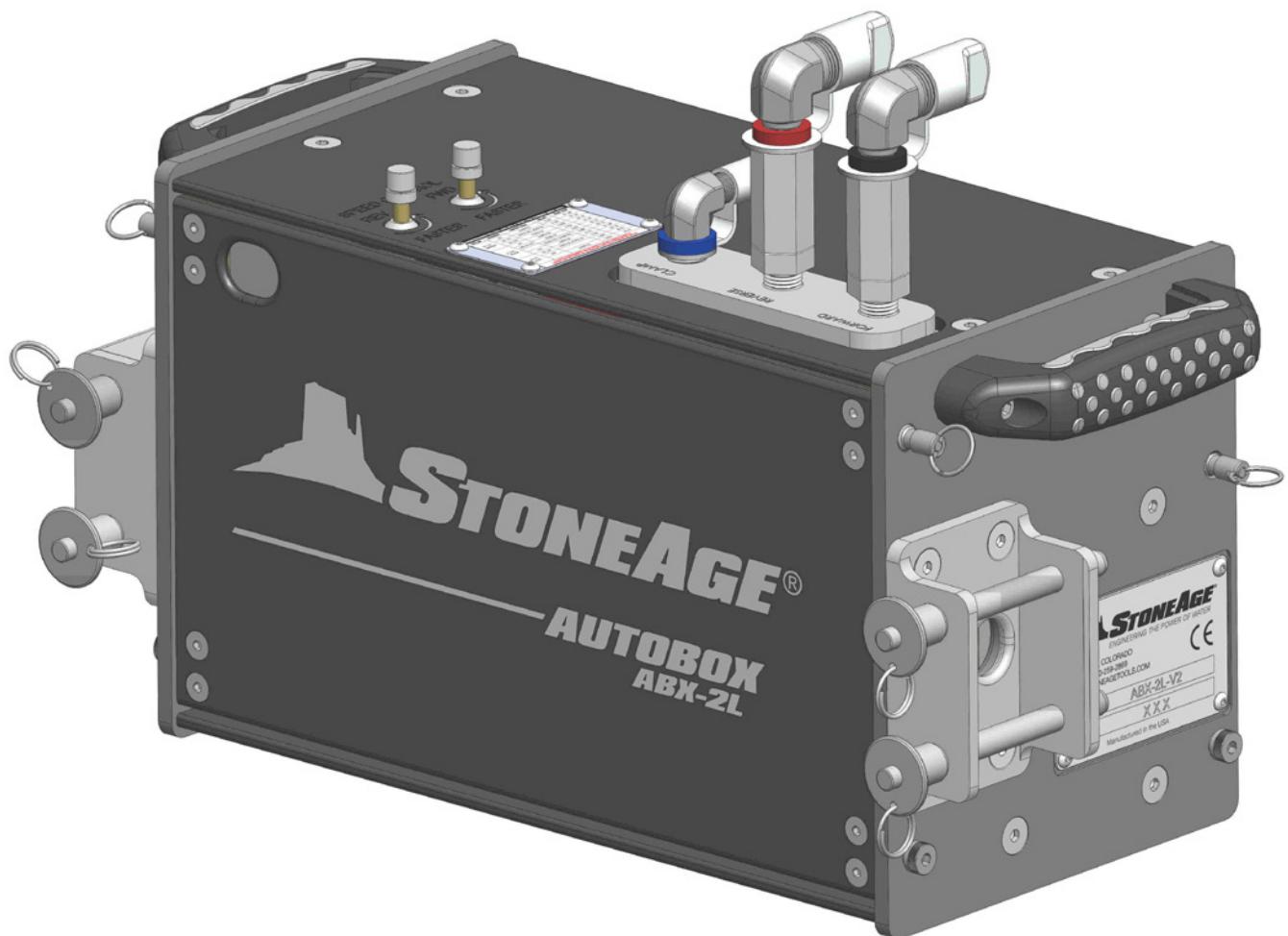


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UK

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

AUTOBOX® (ABX-2L-V2-25) Hose Tractor Weight:

AUTOBOX® (ABX-2L-V2-25) Hose Tractor Size:

Maximum Feed Rate:

Minimum Feed Rate:

Maximum Push/Pull Force:

Minimum Push/Pull Force:

Manway Access:

Lightweight Positioner Weight:

Hose Guide Assembly Weight:

Pitch Adjustment Range:

Control Box Weight:

Maximum Air Supply Pressure:

System Operating Pressure:

Recommended Operational Temperature Range:

42 lbs (19.05 kg) (AUTOBOX® (ABX-2L-V2-25) box only)

7.2 in. Wide x 8.3 in. Tall x 16.7 in. Long

(183 mm Wide x 211 mm Tall x 424 mm Long)

3.0 ft/sec (914 mm/sec)

0.2 ft/sec (61 mm/sec)

60 lbs (30 lbs per lance) (27.2 kg, 13.6 kg per lance)

10 lbs (5 lbs per lance) (4.5 kg), (2.25 kg per lance)

18 in. (457 mm)

120 lbs (54.4 kg)

(Includes 6ft rails, horiz., vert., and idler carriage, and 4 clamps)

6 lbs (2.7kg)

5/8-2½ in. (16 mm- 63 mm)

43 lbs (19.5 kg) (Includes Control Box, FRL, and stand)

125 psi (0.86 MPa)

100 psi (0.70 MPa)

-20 °F to 140 °F (-29 °C to 60 °C)

DESCRIPTION OF EQUIPMENT AND INTENDED USE

The AUTOBOX® (ABX-2L-V2-25) System consists of the AUTOBOX® (ABX-2L-V2-25) Hose Tractor, Control Box, Hose Guide Assembly, and Lightweight Positioner. This system was developed for "Hands Free" heat exchanger tube cleaning applications. It is recommended to be used with StoneAge's Banshee line of self-rotary waterblast tools.

The AUTOBOX® (ABX-2L-V2-25) System was designed to accommodate two simultaneous flex lances ranging in size from 3/2 to 8/4 matched with the appropriate BN9.5, BN13, BN15, or BN18 size Banshees.

The AUTOBOX® (ABX-2L-V2-25) Hose Tractor utilizes six synchronized drive rollers to control the rate at which the hose and Banshee tools are advanced or retracted within the exchanger tubes.

The Hose Guide Assembly provides anti-withdrawal protection, and precise tube pitch adjustment. The Lightweight Positioner can be mounted to a variety of heat exchanger tube bundles and has pneumatic powered horizontal and vertical drives.

The Control Box is small and lightweight with an emphasis on ergonomics. The AUTOBOX® (ABX-2L-V2-25) system was designed with simplicity, safety, lightweight components, durability, and reliability in mind. It can be easily carried to the job site and setup in minutes.

The AUTOBOX® (ABX-2L-V2-25) 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.

KEY FEATURES:

Lightweight Positioner

- Modular, lightweight design
- Quick install drive carriages
- Utilizes 2.5 in. (6 mm) box rail
- Stainless Steel air motors
- Variety of clamp and bolt-on attachment options are available

Hose Guide Assembly

- Compact and lightweight design
- Precise pitch adjustment
- Quick change guide tubes
- 17-4 SS hose stop collets

AUTOBOX® (ABX-2L-V2-25) Hose Tractor

- Six powered drive rollers ensure traction in all Operating conditions
- Quick change drive rollers (three sizes).
- Lightweight and compact design
- Can be used in dual or single lance applications
- Quick pin attachment to Hose Guide Assembly
- Hinged side doors for easy access to rollers and Drive components
- Independent forward/reverse speed controls

Control Box

- Small, lightweight, ergonomic design that includes a Portable stand and filter-regulator-lubricator assembly
- Tractor controls: forward/reverse hose feed and clamp pressure
- Positioner controls: left/right and up/down
- Pneumatic dump control switch



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

We: StoneAge, Inc. 466 South Skylan Drive Durango, CO 81303, USA

Declare that this "partly completed machinery" supplied with this declaration:

Equipment: AUTOBOX® Hose Tractor

Model name: ABX-2L-V2-25 Is in accordance with the following Directives: and

- is designed and manufactured solely as a non-functional component 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 _____ Date 03/17/2017

Andrew Birt

Independent Dealer Manager

StoneAge, Inc., Worcester, UK

The technical file for the AUTOBOX® Hose Tractor (ABX-2L-V2-25) User Manual is maintained at: StoneAge, Inc. 466 South Skylan 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 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.

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.

SAFETY LABEL DEFINITIONS

The AUTOBOX® (ABX-2L-V2-25) Hose Tractor has the potential to cause serious injury if fingers, hair, or clothing become caught between the hose rollers or drive belts.

DO NOT OPERATE WITH THE DOORS OPEN. ENSURE THAT ALL FOUR DOOR PINS ARE SECURED PRIOR TO OPERATION.



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 Water jetting 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.

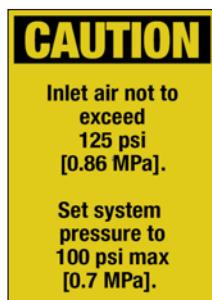
The risk assessment MUST consider potential material or substance hazards including:

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

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

Maximum operating air pressure is 100 psi (0.7 MPa). Never exceed 125 psi (0.86 MPa) supply pressure. Exceeding 125 psi (0.86 MPa) supply pressure may result in injury to the Operator and/or damage to the equipment.



WARNING AND SAFETY INSTRUCTIONS

⚠ 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.

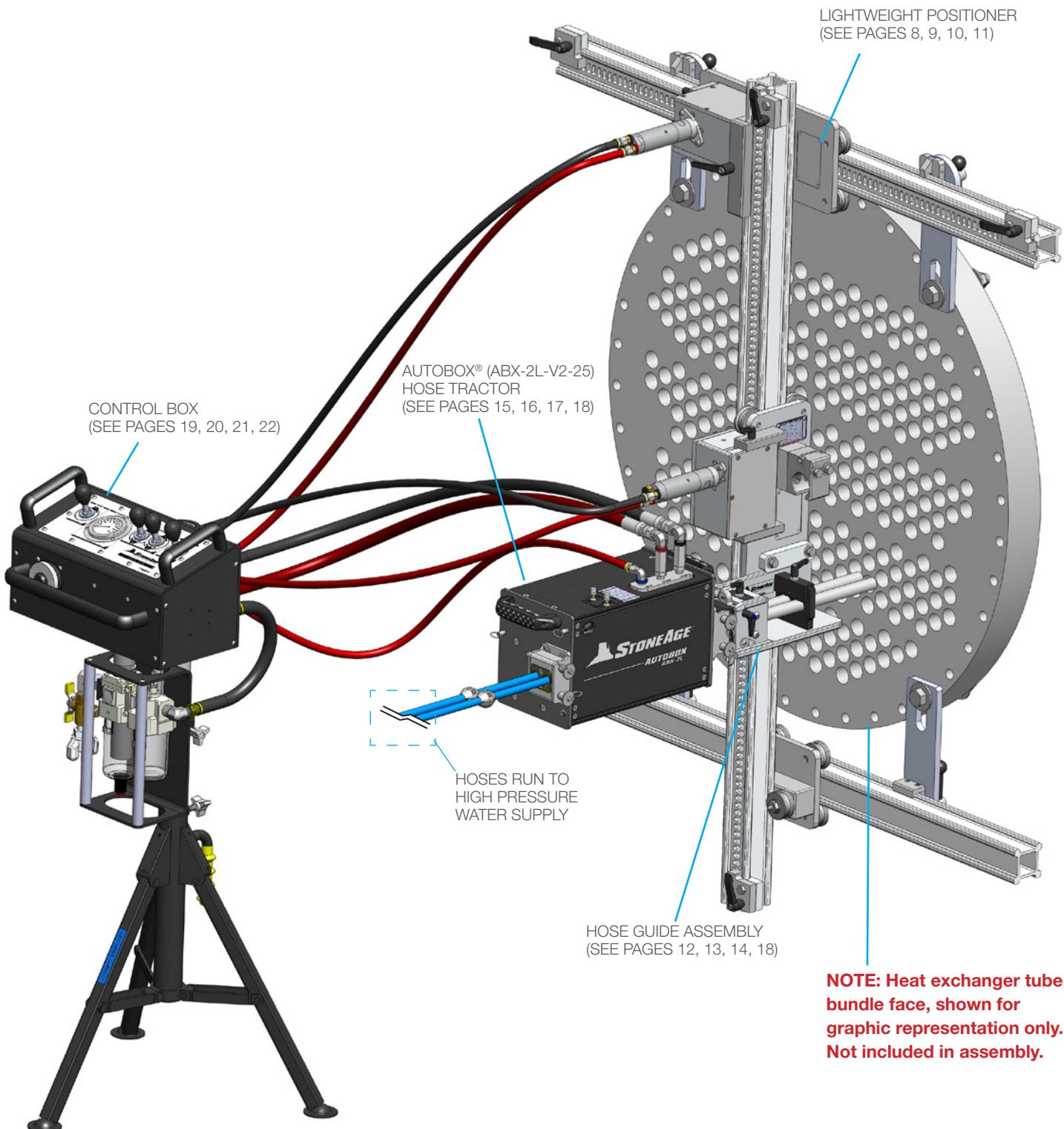
- Do not exceed the maximum operating pressure specified for any component in a system.
- The immediate work area MUST be marked off to keep out untrained persons.
- Inspect the equipment for visible signs of deterioration, damage, and improper assembly. Do not operate if damaged, until repaired.
- Make sure all threaded connections are tight and free of leaks.
- Users of the AUTOBOX® (ABX-2L-V2-25) Hose Tractor 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 Water jetting Equipment.
- An anti-withdrawal device (back-out preventer) MUST be used at all times. The back-out prevention device is the Hose Stop Collet located within the Hose Guide Assembly. StoneAge offers several different size Hose Stop Collets. The Collet Size Reference guide is located on the Hose Guide Assembly.
- The Control Box should be located in a safe location where the Operator has good visibility of the tool entering the exchanger tubes. The AUTOBOX® (ABX-2L-V2-25) Hose Tractor and Control Box MUST be supervised at all times and should never be left unattended.
- Do not fully release the hose clamp (decreasing pressure to zero) during operation, or the AUTOBOX® (ABX-2L-V2-25) Hose Tractor will release the hose and may create a dangerous runaway hose condition, which can result in severe injury and/or death.
- Always de-energize the system before opening the door to service or replace any parts. Failure to do so can result in severe injury and/or death.
- When moving the AUTOBOX® (ABX-2L-V2-25) Hose Tractor lift with care to prevent bodily injury.
- Do not operate the AUTOBOX® (ABX-2L-V2-25) Hose Tractor while either side door is open.

PRE-RUN SAFETY CHECK

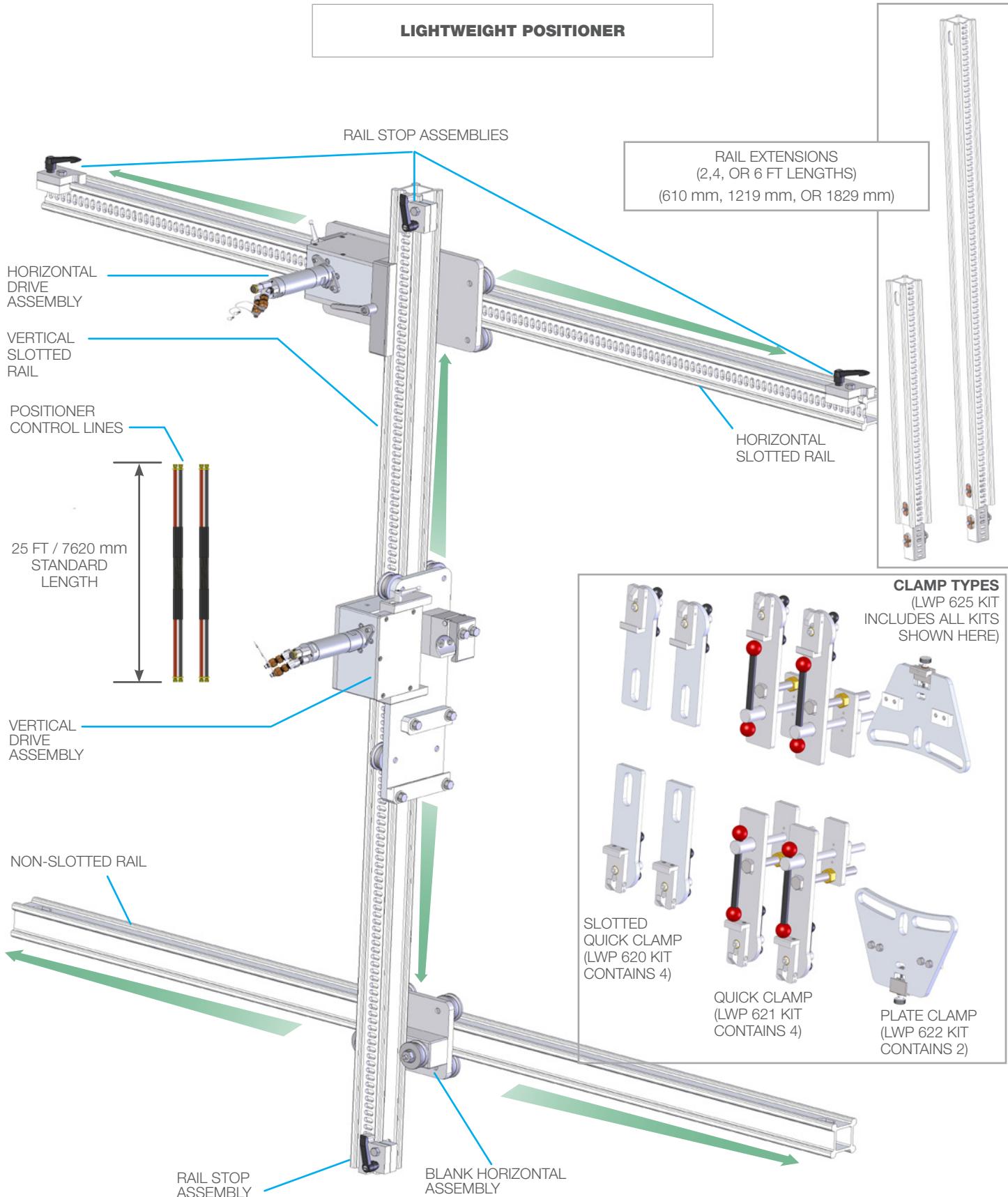
Refer to WJTA-IMCA's, Recommended Practices For The Use Of High pressure Waterjetting Equipment and/or The Water Jetting Association's, WJA Code of Practice for additional safety information.

- 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 an anti-withdrawal device (back-out preventer), whip checks (hose whips), and all other applicable safety devices are installed and set-up properly.**
- Ensure the doors of the AUTOBOX® (ABX-2L-V2-25) Hose Tractor are closed and securely latched.
- Test the Control Box before operating the AUTOBOX® (ABX-2L-V2-25) Hose Tractor with high pressure water to verify the control valves move the hose in the intended direction, and that the high pressure 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.

**AUTOBOX® (ABX-2L-V2-25) HOSE TRACTOR,
LIGHTWEIGHT POSITIONER, HOSE GUIDE ASSEMBLY,
AND CONTROL BOX**



LIGHTWEIGHT POSITIONER - OVERVIEW



LIGHTWEIGHT POSITIONER CLAMP SELECTION

CLAMP SELECTION

Is dependent upon the heat exchanger geometry, bolt holes, hole spacing, and flange accessibility.

QUICK CLAMPS

Use if heat exchanger flange provides a robust clamping surface or if flange holes are inaccessible. Align clamps on the surface of the flange to maximize flange engagement to clamps. (**Figure 2**)

SLOTTED QUICK AND PLATE CLAMPS

Use if heat exchanger flange has bolt holes that are easily accessible. Use quick clamps or plate clamps, depending on the spacing of the hole pattern. (**Figures 1 & 3**)

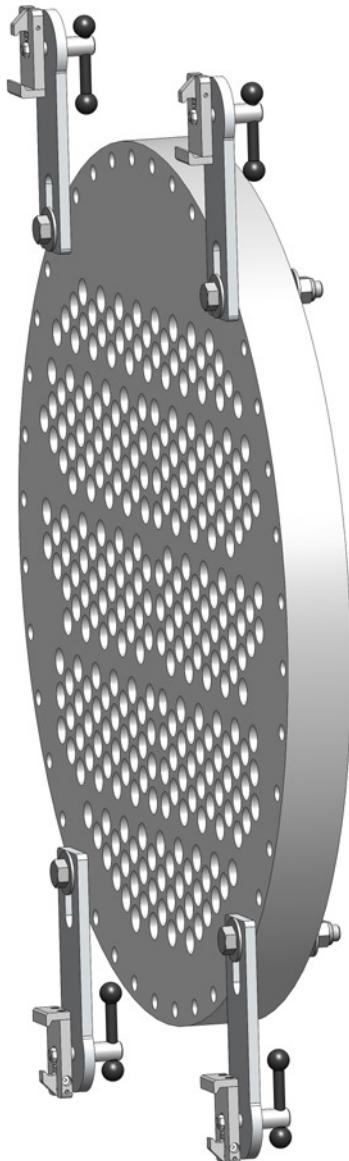


FIGURE 1

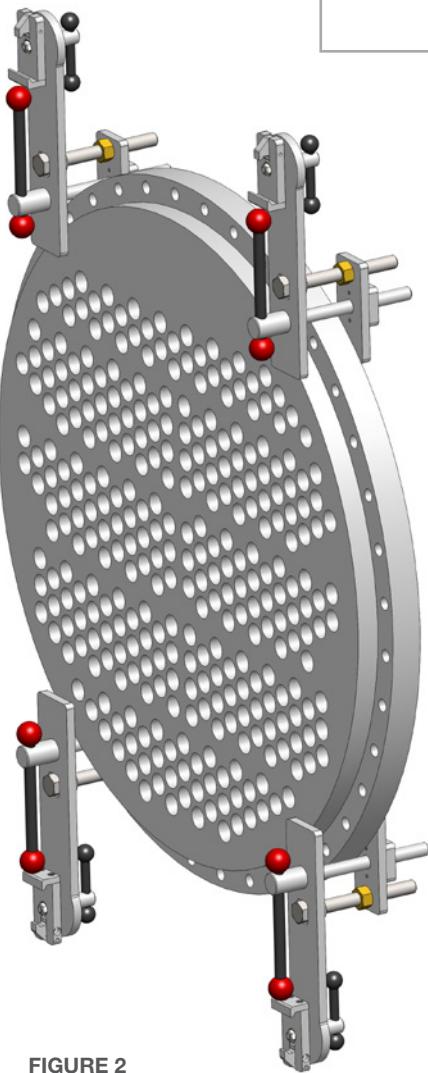


FIGURE 2

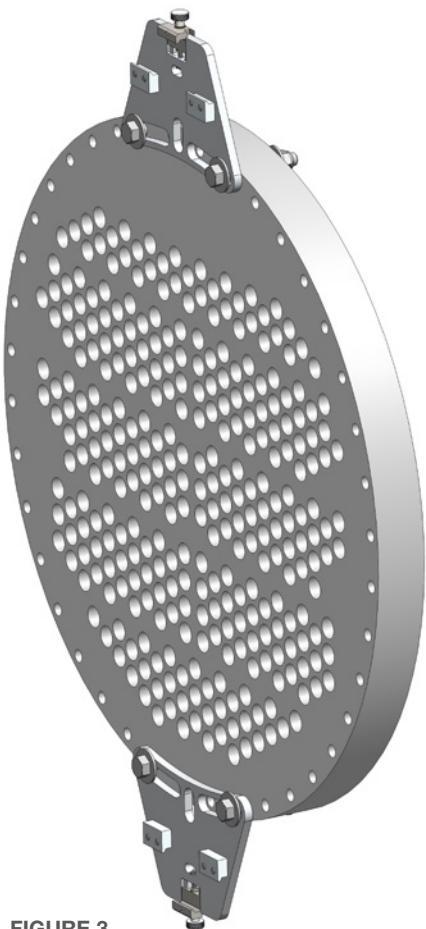
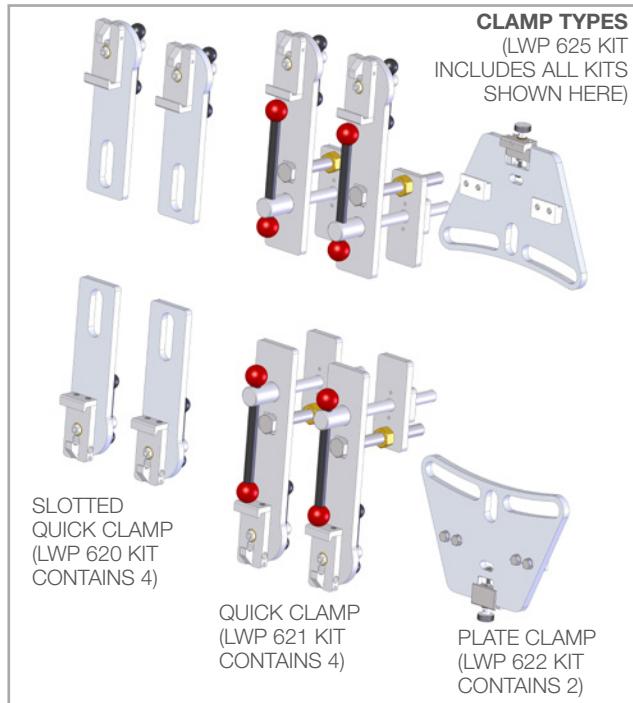


FIGURE 3



LIGHTWEIGHT POSITIONER SET-UP

LIGHTWEIGHT POSITIONER STEP BY STEP SET-UP

1. Mount the appropriate frame **Positioner Clamps** to the tube bundle as shown on the previous page. (Shown in Figure 1 with Slotted Quick Clamps) Positioner Clamps should be aligned horizontally with the direction of the tube rows. (**Figure 1**)

NOTE: Heat exchanger tube bundle face, shown for graphic representation only. Not included in assembly.

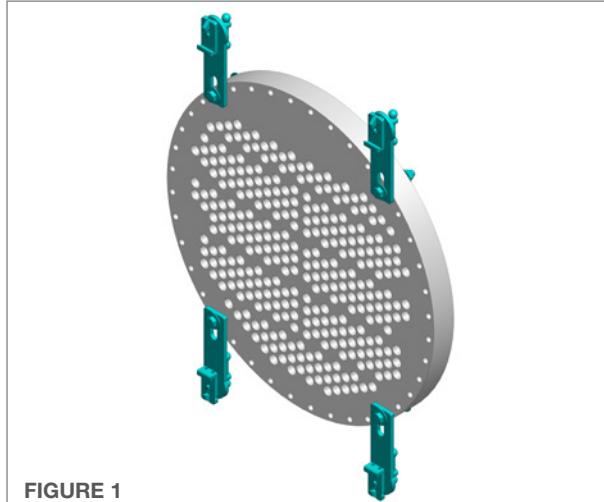


FIGURE 1

2. Insert the **Top Rail (slots facing out)** into the upper mounting brackets. If the rail is not closely aligned with the tube rows, loosen one of the upper mounting brackets and adjust until the top rail is parallel with the horizontal tube rows. Tighten the clamps securing the rail to the mounting brackets. Ensure upper mounting brackets are securely clamped or bolted to the tube bundle flange. (**Figure 2**)

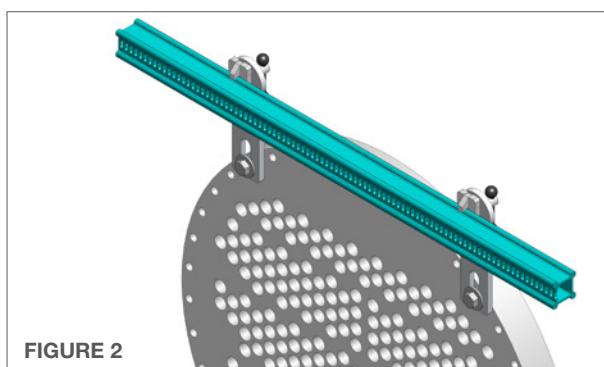


FIGURE 2

3. Insert the **Lower Rail (non-slotted)** into the lower mounting brackets. It is not critical that this rail is aligned as precisely as the top rail, but it should be close to parallel with the top rail for best performance. Tighten the clamps securing the rail to the mounting brackets. Ensure lower mounting brackets are securely clamped or bolted to the tube bundle flange. (**Figure 3**)

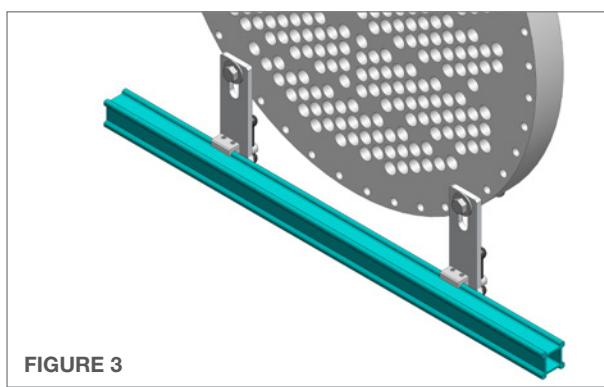


FIGURE 3

4. Loosen the **Quick Adjust Handle** and pull the gearbox away from the carriage plate. This will allow the **Horizontal Drive Carriage** to slide onto the rail without pneumatic power, to rotate the drive. Center the carriage on the top rail and push the gearbox back toward the carriage plate. This will engage the gear into the rail slots. Verify the gear is engaging the slots correctly and tighten the quick adjust handle. (**Figure 4**)

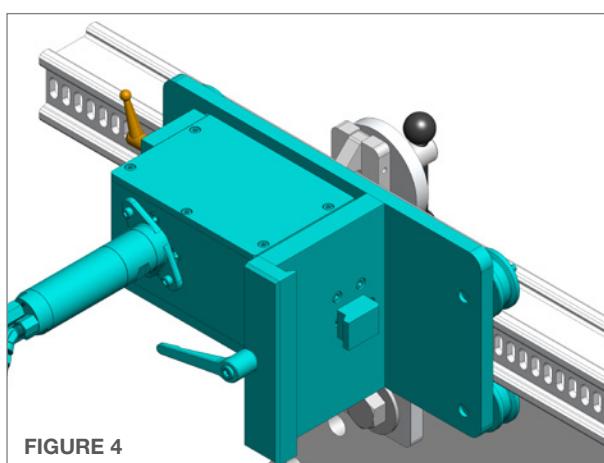


FIGURE 4

- Slide the **Idler Carriage** onto the Lower Non-Slotted Rail. (**Figure 5**)

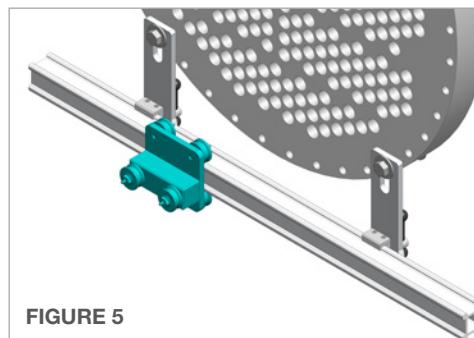


FIGURE 5

- Loosen the **Large Adjustable Handle** for the Vertical Rail Clamp. Align the Idler Carriage with the vertical rail clamp on the horizontal carriage. Install the **Vertical Rail** with **(slots facing out)** down through the horizontal carriage clamp and between the rollers on the idler carriage. Adjust the position of the vertical rail as required and secure the clamp on the horizontal carriage by tightening the large adjustable handle. (**Figure 6**)

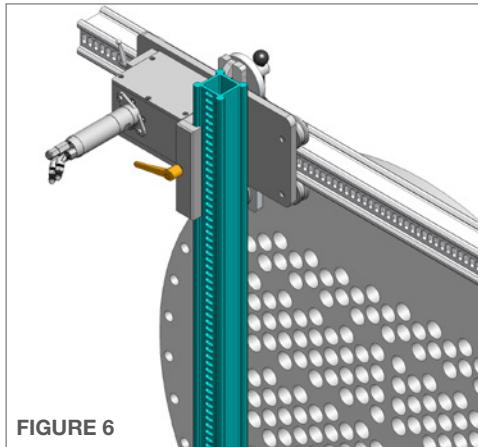


FIGURE 6

- Loosen the **Quick Adjust Handle** and pull the gearbox away from the carriage plate. This will allow the **Vertical Drive Carriage** to slide onto the rail without pneumatic power to rotate the drive. Center the carriage on the vertical rail and push the gearbox back toward the carriage plate. This will engage the gear into the rail slots. Verify the gear is engaging the slots correctly and tighten the quick adjust handle. (**Figure 7**)

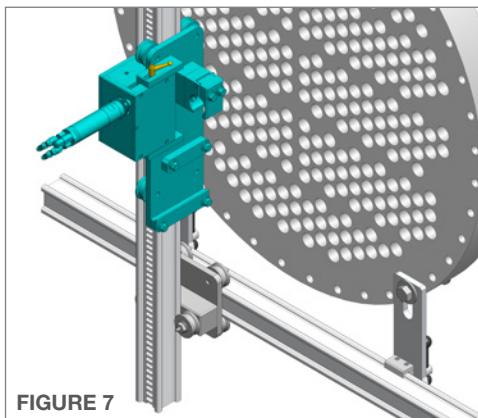


FIGURE 7

- Install the four **Rail Stops** at both ends of the top, slotted, horizontal rail, and both ends of the vertical slotted rail. (**Figure 8**)

NOTE: Verify the mounting brackets and rail clamps are securely tightened, and the drive carriages are securely engaged, and the adjustable handles are tightened.

Never loosen the vertical gearbox once the Hose Guide Assembly and tractor are installed, as it may result in the carriage falling vertically down. This may cause damage to the equipment and/or injury.

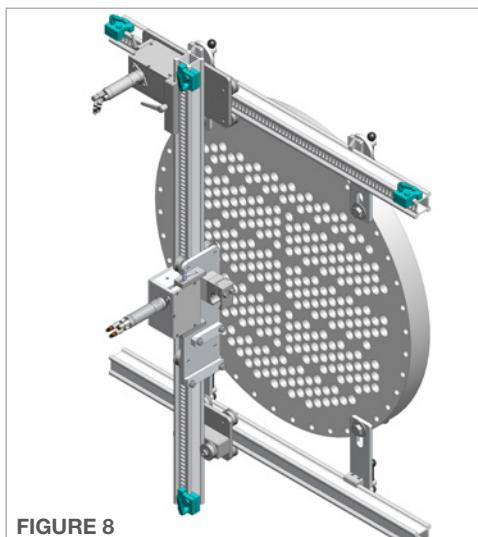
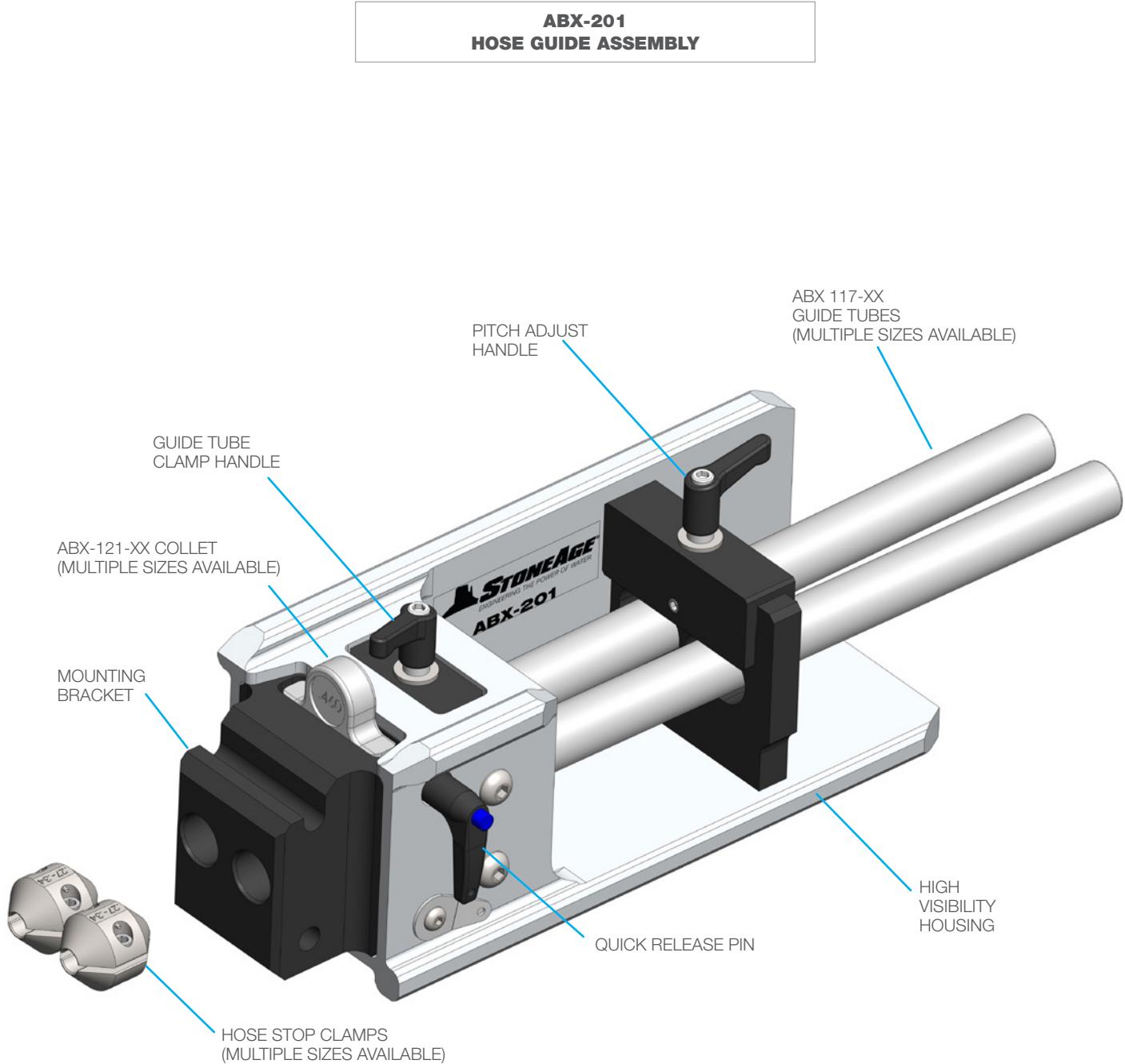


FIGURE 8

HOSE GUIDE ASSEMBLY - OVERVIEW



HOSE GUIDE ASSEMBLY

- Select the appropriate Guide Tube size and length for the application from the chart at the bottom of the previous page.
 - The length of the Guide Tubes for an exchanger bundle with no channel head is 12.5 in. (318 mm).
 - A deeper channel head will require extended Guide Tubes. The depth of the channel head added to the 12.5 in. (318 mm) length will give the desired tube length.
 - Longer guide tubes are available if required for use with channel heads.

NOTICE

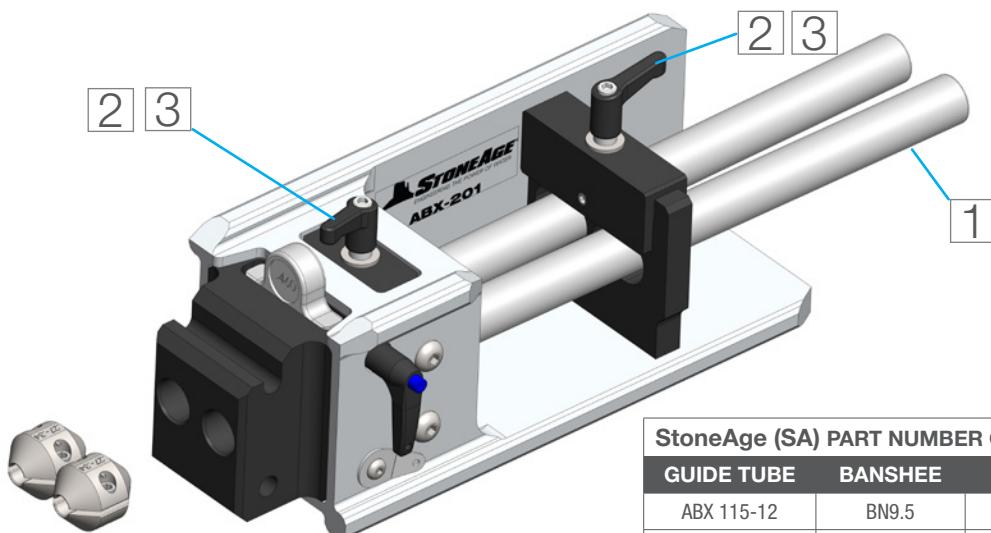
The Banshee tool should not have excessive clearance if the correct length Guide Tube is used.

- To remove the existing Guide Tubes, loosen the Tube Clamp Lever and the Pitch Adjust Lever, located on top of the Hose Guide Assembly. After selecting the appropriate Guide Tubes, install the Guide Tubes into the Hose Guide Assembly.
- Secure the Guide Tubes by tightening the Tube Clamp Lever and Pitch Adjust Lever, when the desired pitch has been set.
- Select the appropriate Collet and Hose Stops from the chart on the previous page and reserve them for future Hose and Collet installation instructions in this manual.

WARNING

Appropriate size Collet selection is **CRITICAL** to ensuring proper backout prevention of the tool.

ROLLER	HOSE O.D.	SPIR STAR	PARKER	COLLET SIZE	COLLET PART NUMBER	HOSE STOP SIZE	HOSE STOP PART NUMBER
Ø 0.94 IN. ORANGE	.27-.41 in (7 mm - 10 mm)	3/2	2240D-02	.297 in. / 8 mm	ABX 121-297	.27-.34 / 7-9 mm	HS 121-27-34
		3/4, 4/2	2240D-025, 2440D-02	.328 in. / 8 mm	ABX 121-328	.27-.34 / 7-9 mm	HS 121-27-34
		3/6, 5/2	2240D-03	.406 in. / 10 mm	ABX 121-406	.34-.42 / 9-11 mm	HS 121-34-42
Ø 1.85 IN. BLACK	.44-.50 in (11 mm - 13 mm)	4/4	2448D-025	.438 in. / 11 mm	ABX 121-438	.34-.42 / 9-11 mm	HS 121-34-42
		4/6, 5/4, 6/2	2240D-04	.460 in. / 12 mm	ABX 121-460	.42-.50 / 11-13 mm	HS 121-42-50
			2640D-025 2740D-025	.484 in. / 12 mm	ABX 121-484	.42-.50 / 11-13 mm	HS 121-42-50
		6/4	2440D-04	.516 in. / 13 mm	ABX 121-516	.50-.56 / 13-14 mm	HS 121-50-56
Ø 1.75 IN. BLUE	.52-.61 in (13 mm - 16 mm)	5/6, 8/2	2240D-05, 2740D-03	.547 in. / 14 mm	ABX 121-547	.50-.56 / 13-14 mm	HS 121-50-56
		8/4		.594 in. / 14 mm	ABX 121-594	.56-.61 / 14-16 mm	HS 121-56-61
			2440D-05	.625 in. / 15 mm	ABX 121-625	.56-.61 / 14-16 mm	HS 121-56-61



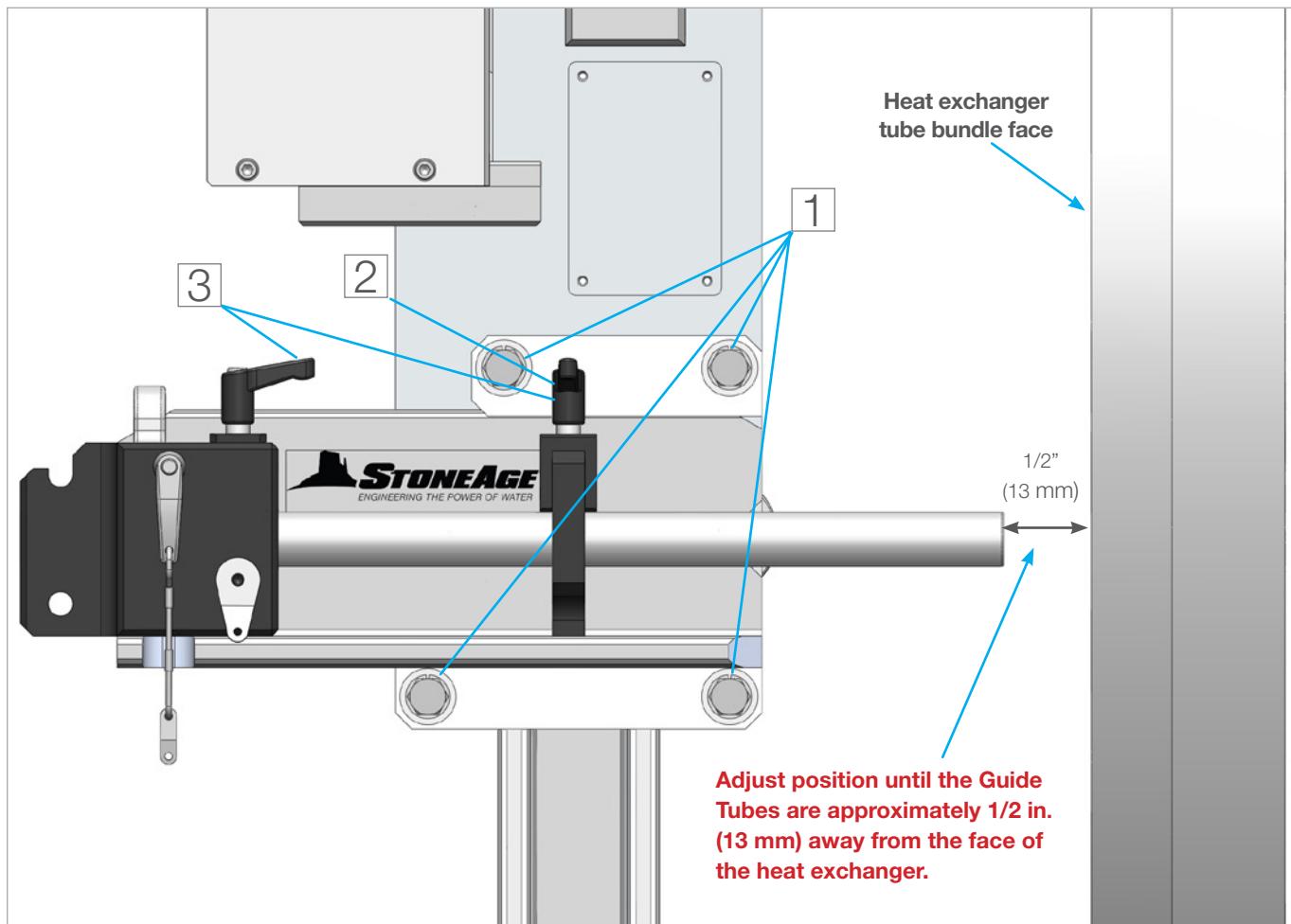
StoneAge (SA) PART NUMBER GUIDE TUBE REFERENCE CHART

GUIDE TUBE	BANSHEE	INSIDE DIAMETER, LENGTH
ABX 115-12	BN9.5	.459 in / 12 mm, 12.5 in. / 318 mm
ABX 115-36	BN9.5	.459 in / 12 mm, 36 in. / 914 mm
ABX 116-12	BN13	.546 in / 14 mm, 12.5 in. / 318 mm
ABX 116-36	BN13	.546 in / 14 mm, 36 in. / 914 mm
ABX 117-12	BN15	.674 in / 17 mm, 12.5 in. / 318 mm
ABX 117-36	BN15	.674 in / 17 mm, 36 in. / 914 mm
ABX 119-12	BN18	.745 in / 19 mm, 12.5 in. / 318 mm
ABX 119-36	BN18	.745 in / 19 mm, 36 in. / 914 mm

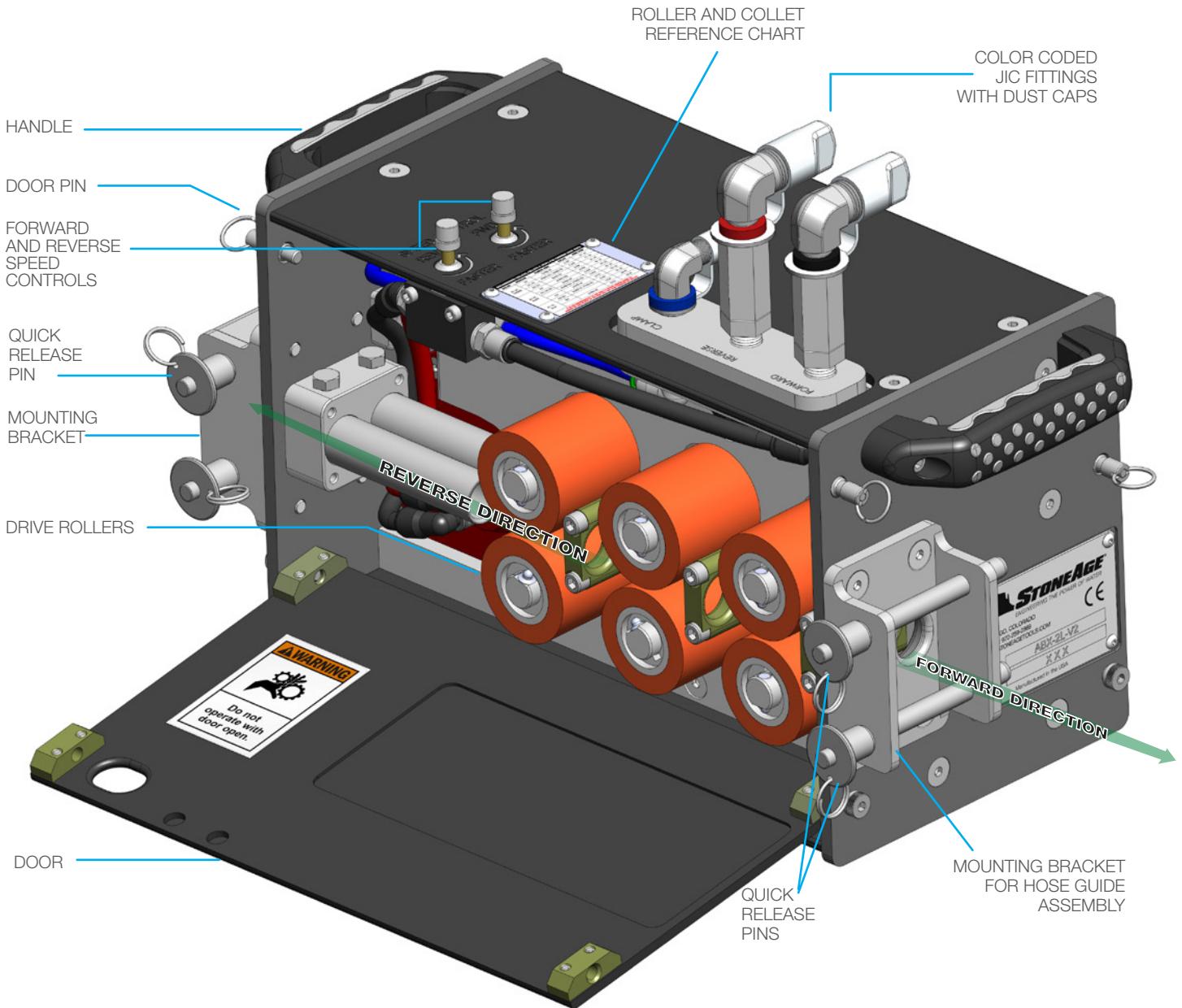
HOSE GUIDE ASSEMBLY TO LIGHTWEIGHT POSITIONER SET UP

ATTACH HOSE GUIDE ASSEMBLY TO LIGHTWEIGHT POSITIONER

1. Using a 9/16 in. wrench, loosen all four rail clamp bolts located on the vertical carriage. Install the Hose Guide Assembly into the rail clamps and adjust position until the Guide Tubes are approximately 1/2 in. (13 mm) away from the tube sheet face. Tighten the four rail clamp bolts.
2. Loosen the Pitch Adjustment Levers and adjust the guide tubes until they are in line with pitch of the tubes in the bundle.
3. Tighten Tube Clamp and Pitch Adjustment Levers until tubes are secured in position.



AUTOBLOCK® (ABX-2L-V2-25) HOSE TRACTOR



PNEUMATIC SUPPLY LINE PACKAGE



ABX-2L HOSE TRACTOR - DOORS AND PINS

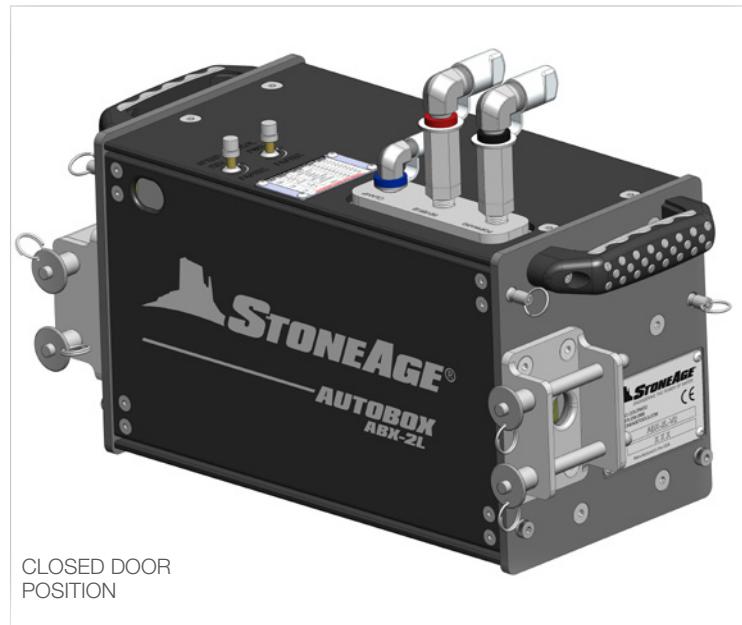
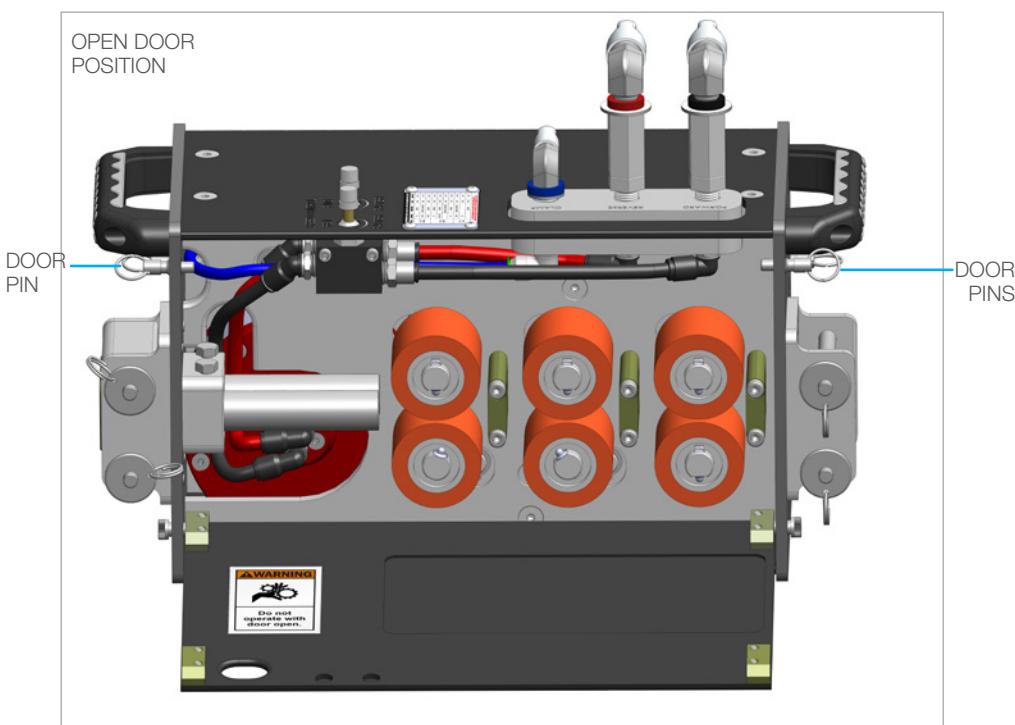
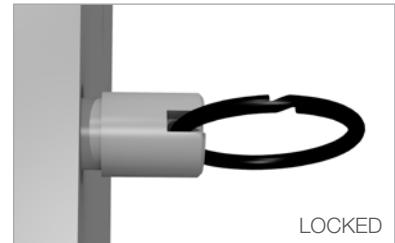
DOOR

Always run the AUTOBOX® (ABX-2L-V2-25) Hose Tractor with the doors closed and locked.

DOOR PIN

The Door Pin is a spring plunger with a pull ring. To unlock the door, pull and twist the pull ring, then release it so that it is no longer in the groove. Close the door by raising it into position. To lock the door, pull and twist the pull ring, then release it into the groove of the pin.

NOTE: Make sure to lock both doors on each side of the Hose Tractor before operating AUTOBOX® (ABX-2L-V2-25) Hose Tractor.



⚠ WARNING

Always de-energize the system before servicing or replacing any parts. Failure to do so can result in severe injury and/or death. Keep hands, hair, and clothing clear of rotating parts.

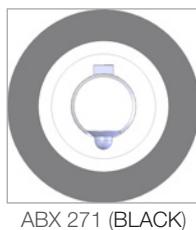
TO REPLACE THE DRIVE ROLLERS:

- Select the correct roller size for the particular hose being used:

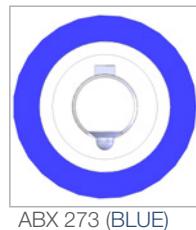
ROLLER	HOSE O.D.	SPIR STAR	PARKER	COLLET SIZE	COLLET PART NUMBER	HOSE STOP SIZE	HOSE STOP PART NUMBER
Ø 0.94 IN. ORANGE	.27-.41 in (7 mm - 10 mm)	3/2	2240D-02	.297 in. / 8 mm	ABX 121-297	.27-.34 / 7-9 mm	HS 121-27-34
		3/4, 4/2	2240D-025, 2440D-02	.328 in. / 8 mm	ABX 121-328	.27-.34 / 7-9 mm	HS 121-27-34
		3/6, 5/2	2240D-03	.406 in. / 10 mm	ABX 121-406	.34-.42 / 9-11 mm	HS 121-34-42
Ø 1.85 IN. BLACK	.44-.50 in (11 mm - 13 mm)	4/4	2448D-025	.438 in. / 11 mm	ABX 121-438	.34-.42 / 9-11 mm	HS 121-34-42
		4/6, 5/4, 6/2	2240D-04	.460 in. / 12 mm	ABX 121-460	.42-.50 / 11-13 mm	HS 121-42-50
			2640D-025 2740D-025	.484 in. / 12 mm	ABX 121-484	.42-.50 / 11-13 mm	HS 121-42-50
		6/4	2440D-04	.516 in. / 13 mm	ABX 121-516	.50-.56 / 13-14 mm	HS 121-50-56
Ø 1.75 IN. BLUE	.52-.61 in (13 mm - 16 mm)	5/6, 8/2	2240D-05, 2740D-03	.547 in. / 14 mm	ABX 121-547	.50-.56 / 13-14 mm	HS 121-50-56
		8/4		.594 in. / 14 mm	ABX 121-594	.56-.61 / 14-16 mm	HS 121-56-61
			2440D-05	.625 in. / 15 mm	ABX 121-625	.56-.61 / 14-16 mm	HS 121-56-61



ABX 272 (ORANGE)



ABX 271 (BLACK)



ABX 273 (BLUE)

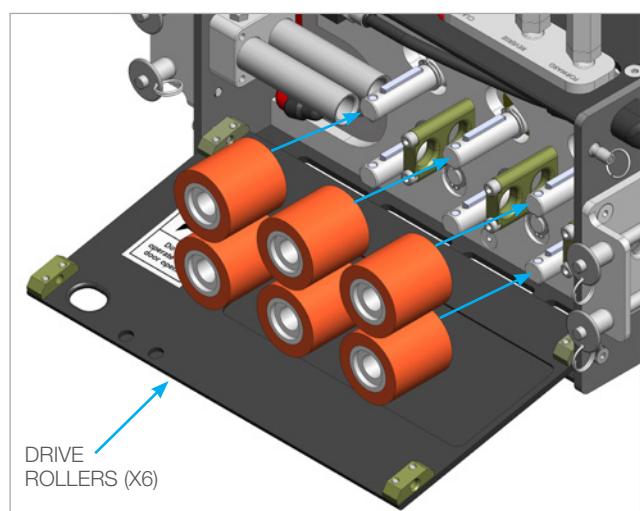
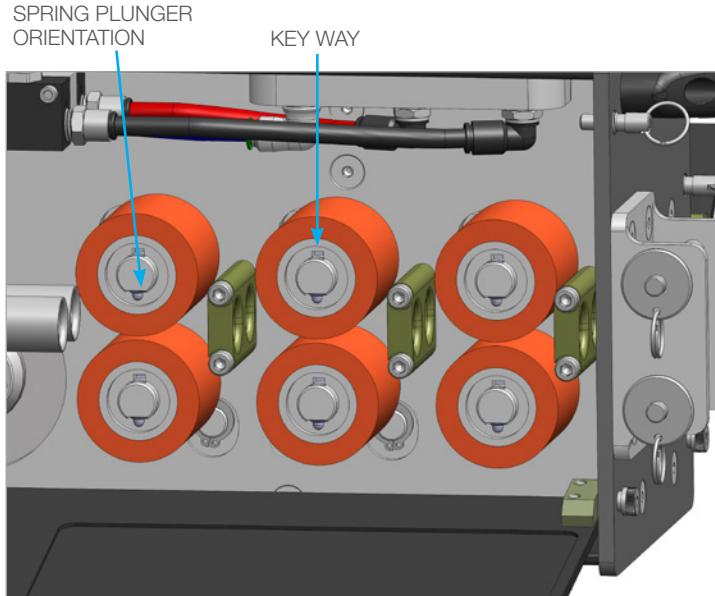
- Slowly run the Drive Rollers in order to orient the key ways of the Drive Rollers upward and the spring plungers downward.

NOTE: Rollers should be removed with the keyway facing up to prevent losing keys.

- Use a small common screwdriver or similar tool to depress the ball spring plunger, and pull the rollers straight out from the shafts.
- Prior to reinstalling the Drive Rollers onto the shafts, apply a liberal coat of Anti-seize to the shaft OD and keys. We recommend Mariners Choice Never-Seez®.
- Install the Drive Rollers by sliding into place until the spring plungers snap out.

NOTE: Drive Rollers should be installed with the keyway facing up to prevent losing keys.

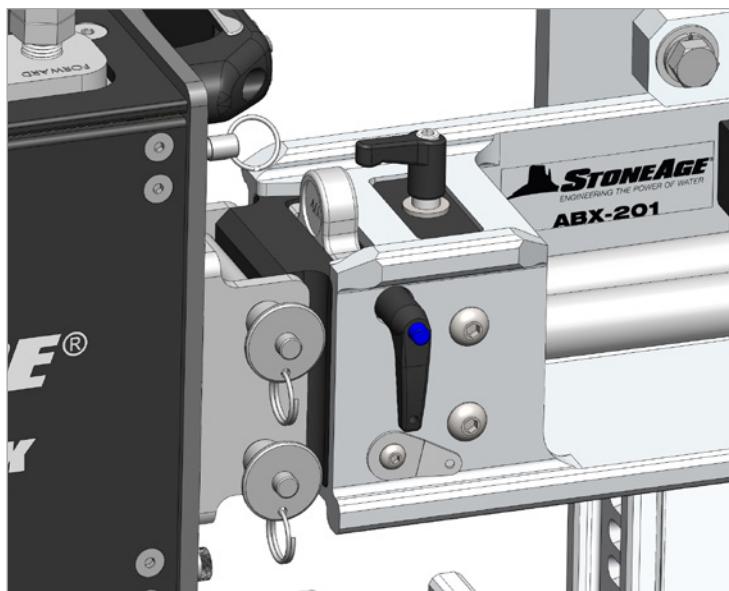
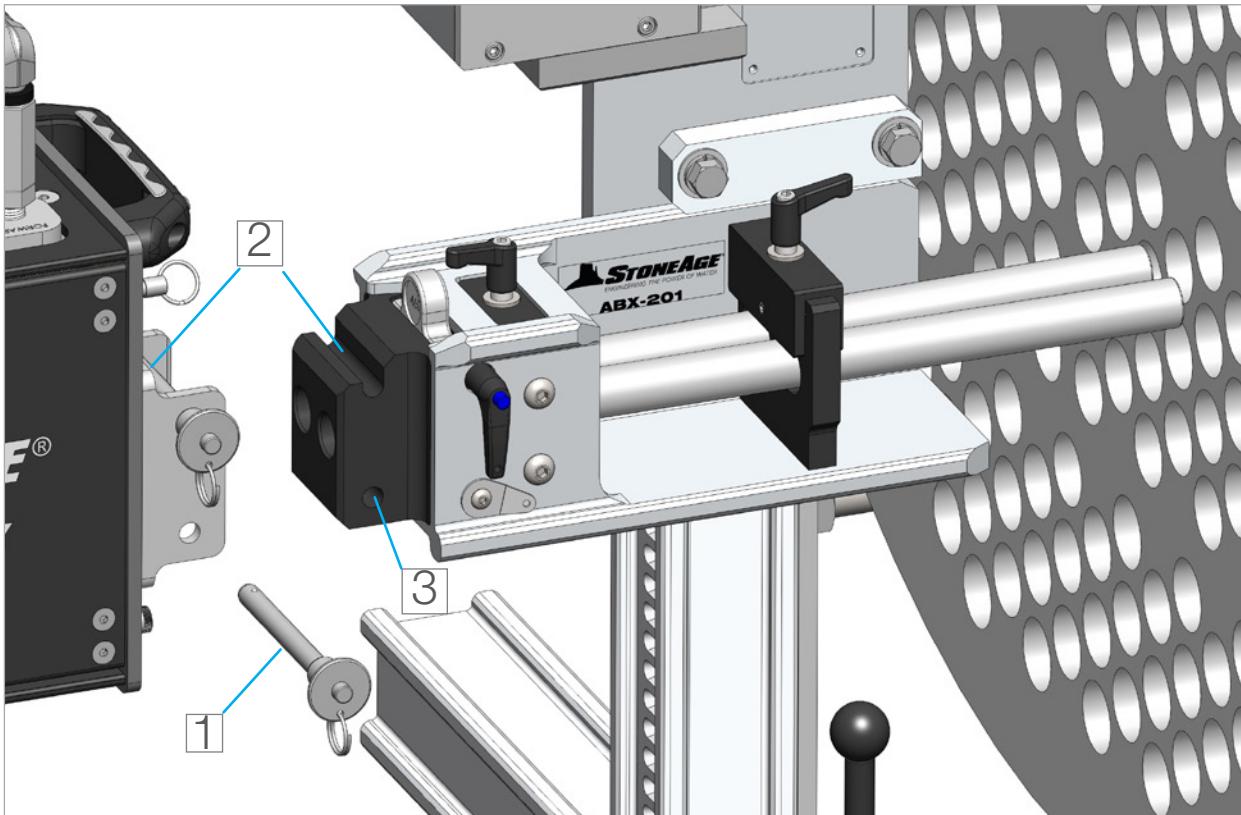
- Once the correct Drive rollers are installed, close and lock the doors. The Hose Tractor can now be installed onto the Hose Guide.



ABX-2L HOSE TRACTOR TO GUIDE ASSEMBLY

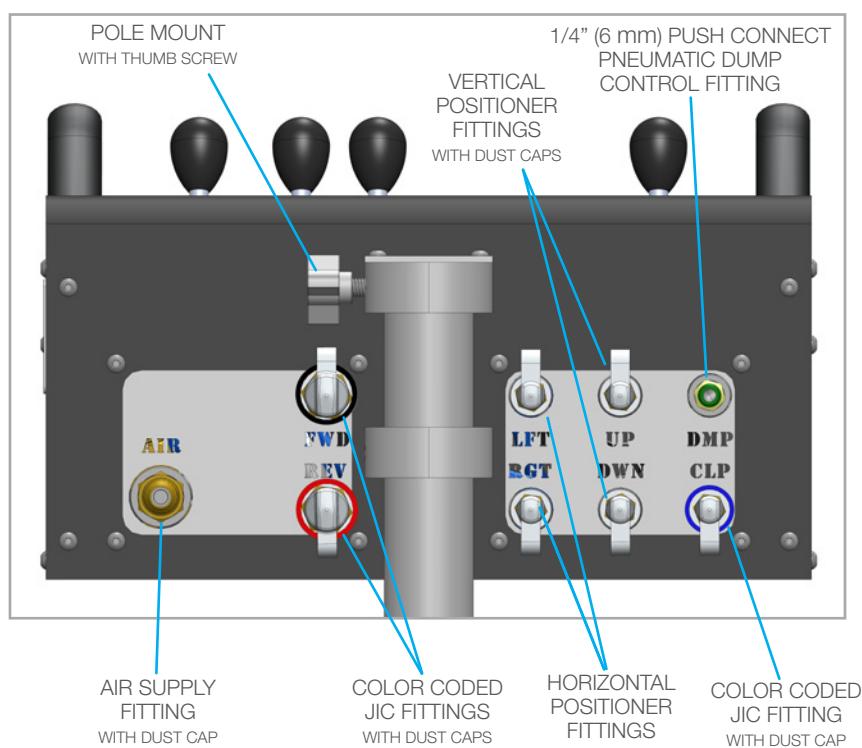
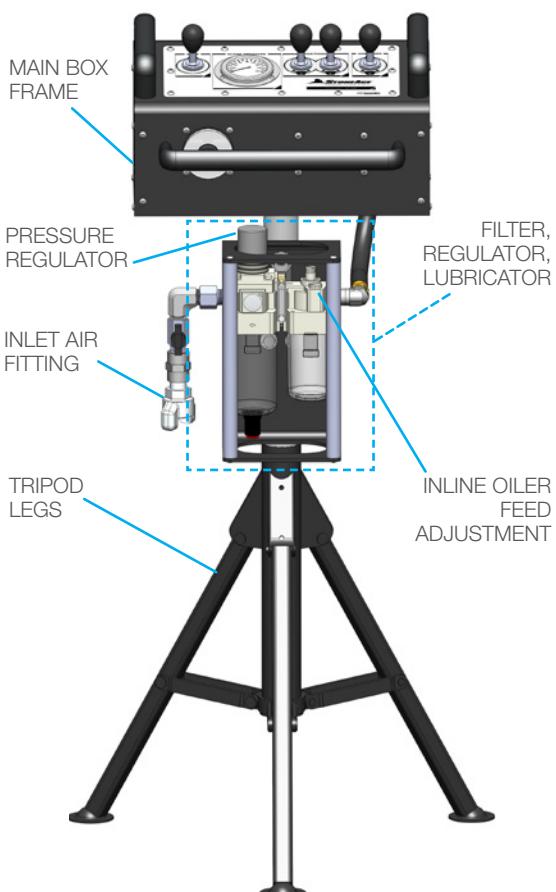
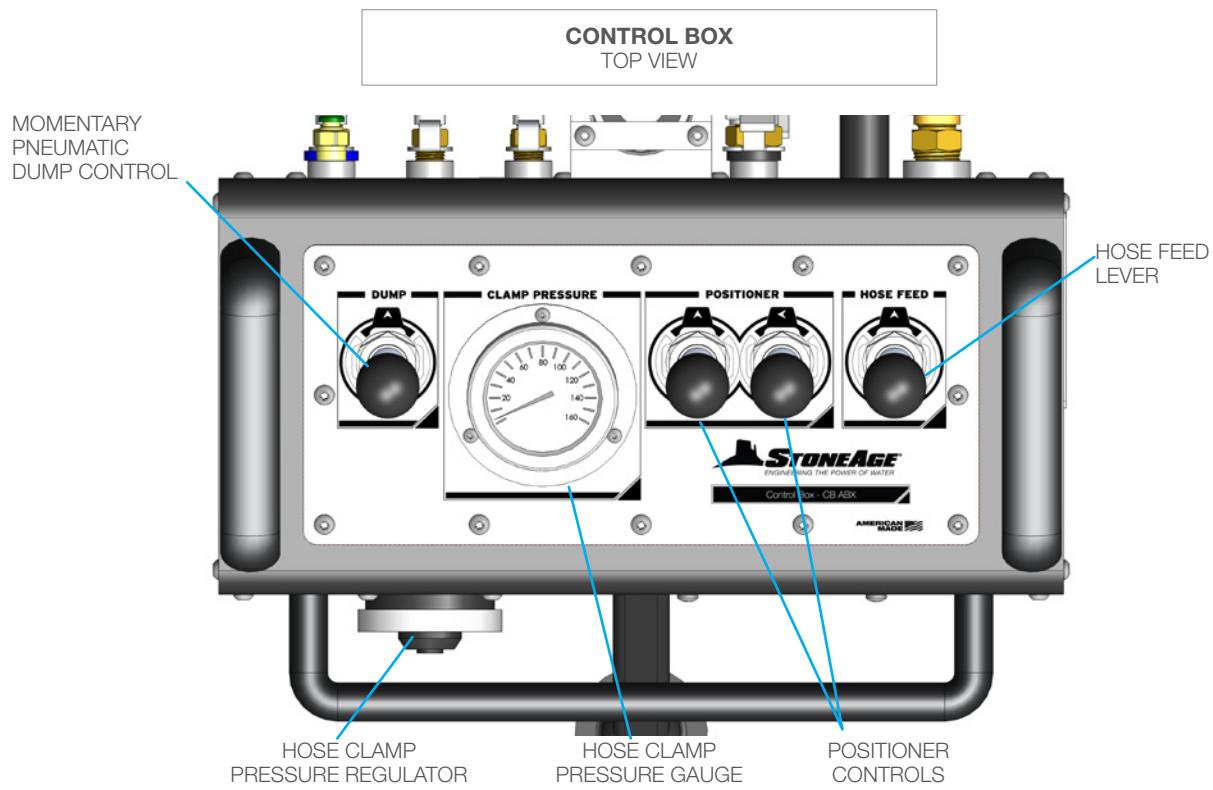
ATTACH AUTOBOX® (ABX-2L-V2-25) HOSE TRACTOR TO HOSE GUIDE ASSEMBLY

1. Remove the lower quick release pin from the AUTOBOX® (ABX-2L-V2-25) Hose Tractor.
2. Slide the mounting bracket over the block on the Hose Guide Assembly and lay the pin onto the top slot on the Hose Guide Assembly mounting block.
3. Install the lower pin through the mounting bracket on the Hose Tractor and the block on the Hose Guide Assembly.



The tractor is now securely mounted to the Hose Guide Assembly

CONTROL BOX - OVERVIEW

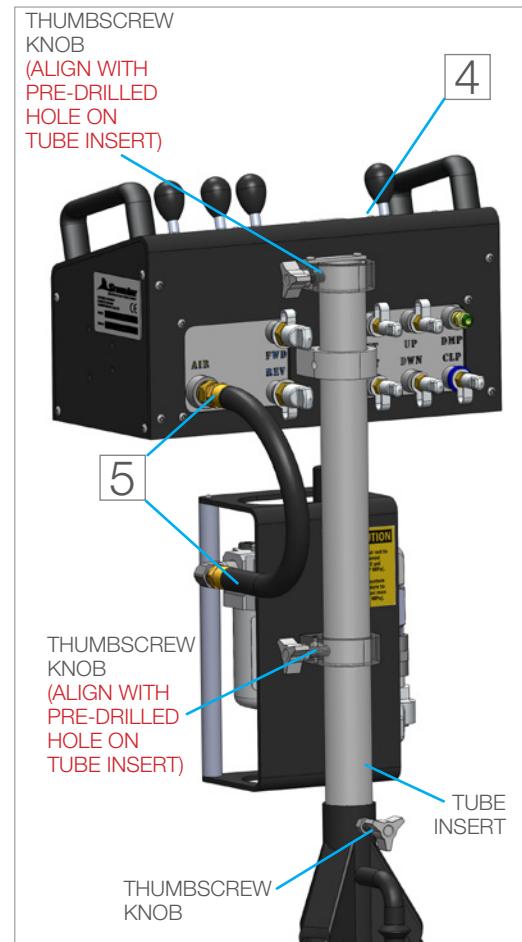
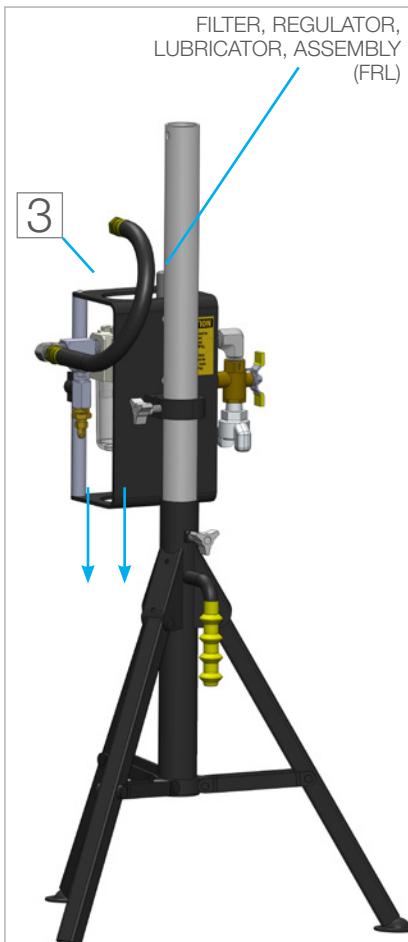
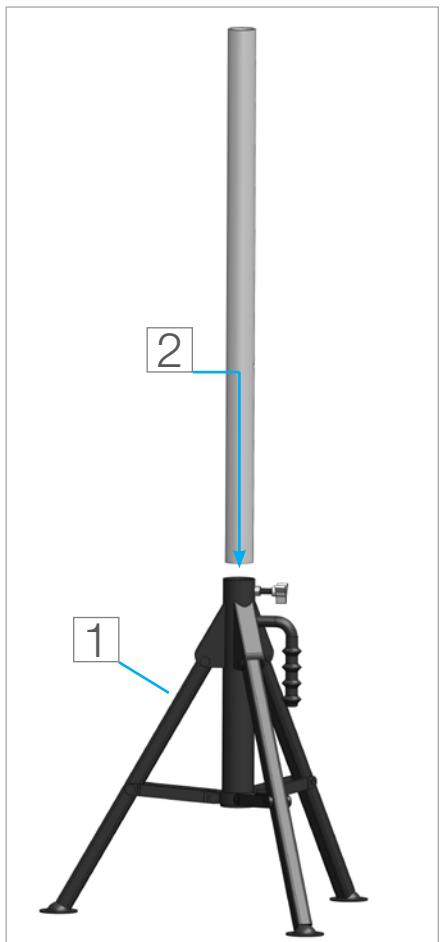


CONTROL BOX SET-UP

ASSEMBLE CONTROL BOX, FRL, AND TRIPOD BASE

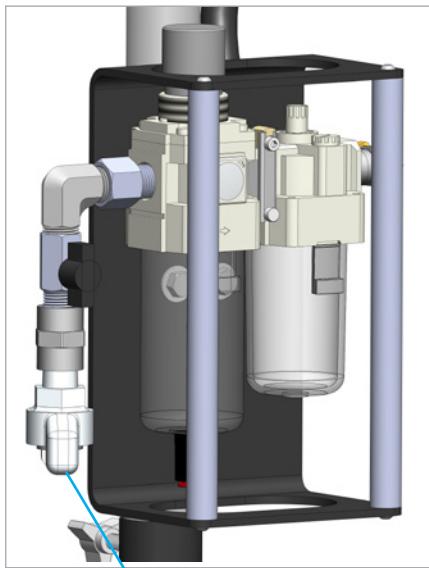
1. Setup the tripod base in a location with good visibility to the bundle face, but at a safe distance away from waterblast zone.
2. Slide the vertical tube into the tripod base. Secure with the supplied thumbscrew knob. Note: The vertical tube has a hole through one wall that the thumbscrew must engage.
3. Slide the Filter, Regulator, Lubricator (FRL) assembly over the vertical tube down to the tripod base. Secure with the supplied thumbscrew knob.
4. Slide the Control Box over the vertical tube. The Control Box has a stop that keeps it located at the top of the vertical tube. Secure with the supplied thumbscrew knob.
5. Install and tighten the short 1/2 in. (13 mm) I.D. hose between the FRL and the Control Box.

Note: The vertical tube has a hole through one wall that the thumbscrew must engage.



AIR SUPPLY AND LUBRICATOR SETTING

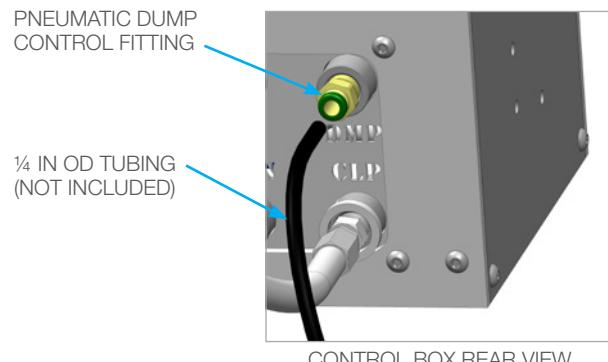
1. The Control Box is supplied with a twist claw style inlet coupling (Chicago style) located on the side of the FRL Assembly. Connect a compatible compressed air line (not included) according to the Manufacturer's instructions. If another pneumatic connection is preferred, this fitting can be removed and any male 1/2 in (13 mm) NPT fitting may be used.
2. Using the regulator adjust the operating air pressure to 100 psi (0.7 MPa) for the application.

**AIR SUPPLY FITTING**

A universal **AIR SUPPLY FITTING** (Chicago style) is located on the FRL. Connect a compatible compressed air line (not included) according to the Manufacturer's instructions. If another pneumatic connection is preferred, this fitting can be removed and any male 1/2 in (13 mm) NPT fitting may be used.

PNEUMATIC DUMP CONTROL FITTING AND LINE

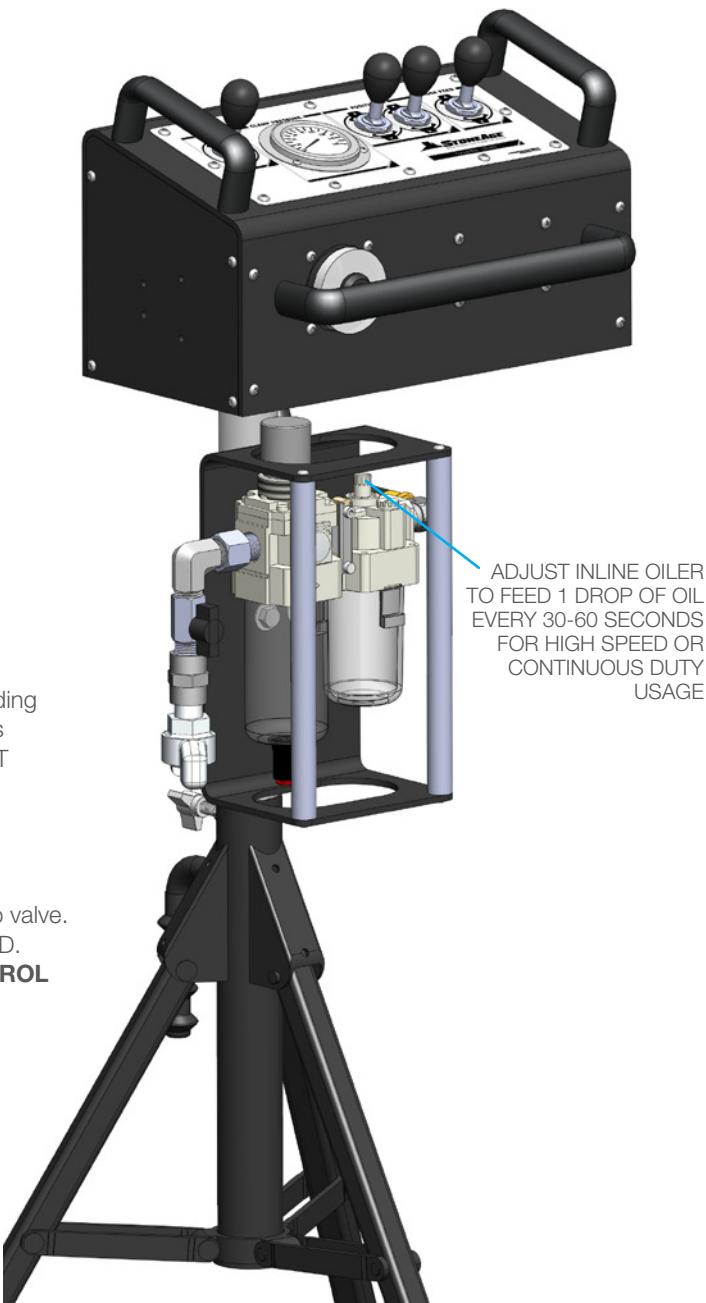
A **MOMENTARY PNEUMATIC DUMP CONTROL** is located on the Control Box panel and can be set up to control an air actuated dump valve. To utilize the toggle, the end user will need to install 1/4 in. (6 mm) O.D. nylon tubing (not included) between the **PNEUMATIC DUMP CONTROL FITTING** and the pneumatic dump valve.



CONTROL BOX REAR VIEW

WARNING

Maximum operating air pressure is 100 psi (0.7 MPa). Never exceed 125 psi (0.86 MPa) supply pressure. Exceeding 125 psi (0.86 MPa) supply pressure may result in injury to the Operator and/or damage to the equipment.



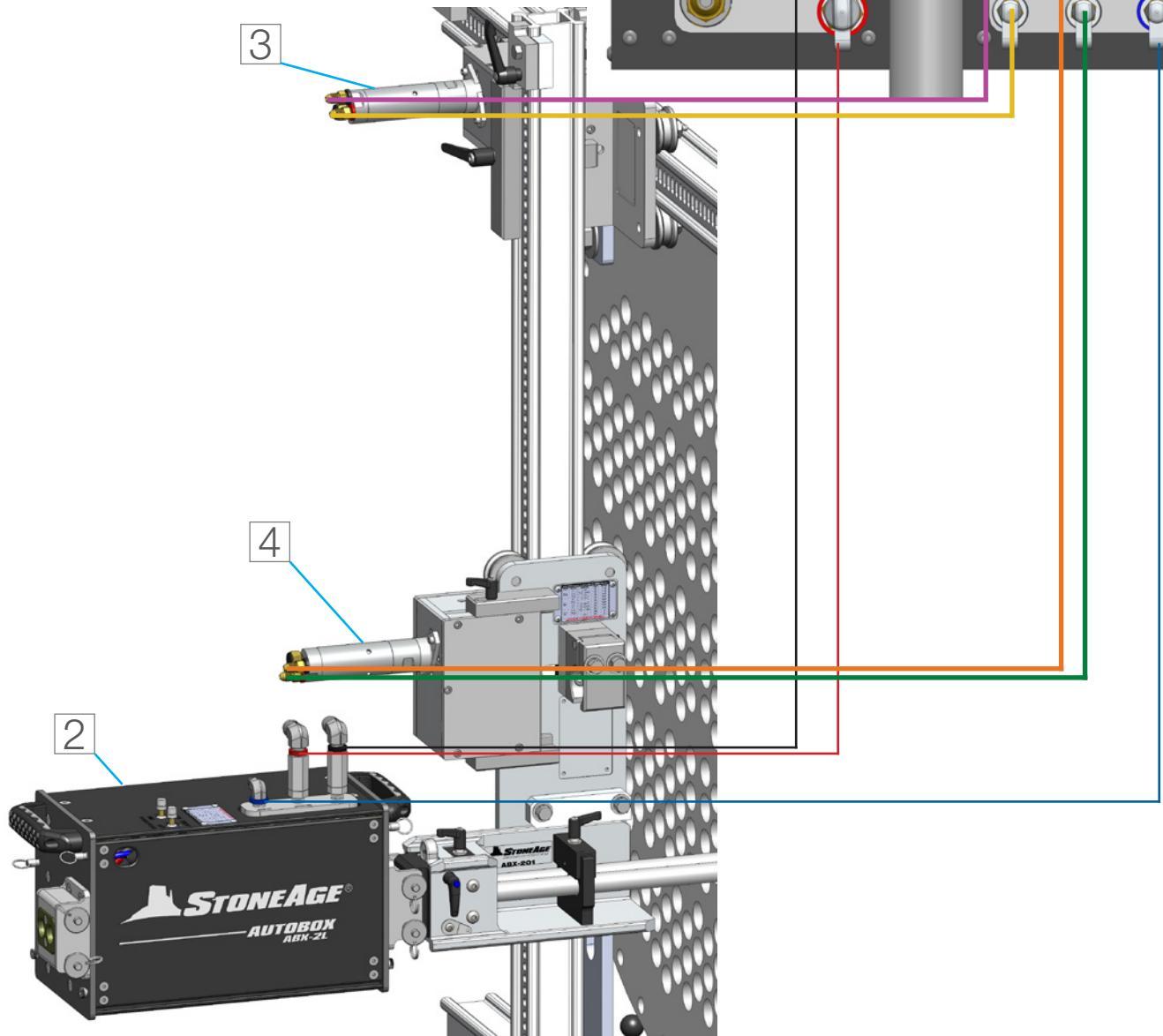
CONTROL BOX TO AUTOBOX® (ABX-2L-V2-25) HOSE TRACTOR ASSEMBLY

PNEUMATIC SUPPLY LINE CONNECTIONS

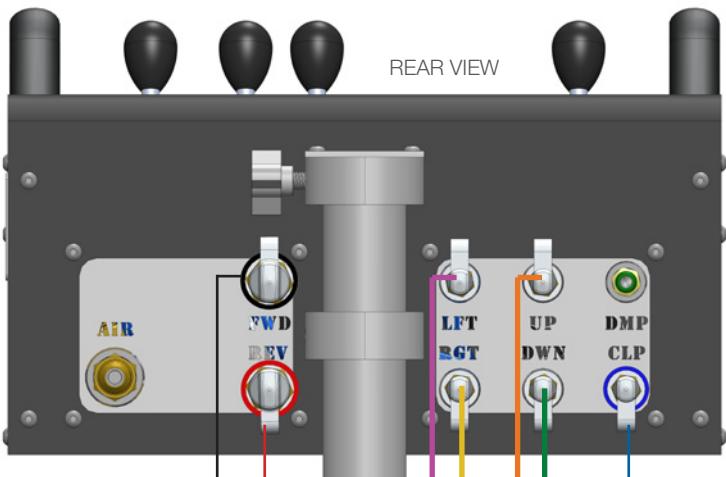
1. Remove the dust caps from the Joint Industry Council (JIC) fittings of the Control Box and the AUTOBOX® (ABX-2L-V2) Hose Tractor.
2. Connect the AUTOBOX® (ABX-2L-V2) Hose Tractor to the Control Box with two 1/2 in. (13 mm) JIC hoses and one 1/4 in. (6 mm) JIC hose. Verify the Control Box rotates the rollers in the appropriate direction and that the clamp functions correctly.
3. Connect the horizontal positioner drive air motor to the Control Box with two 1/4 in. (6 mm) JIC hoses. Verify the Control Box moves the horizontal carriage in the appropriate direction.



Note: The 4 Positioner control lines are not color coded. Colors are shown in manual for clarity.

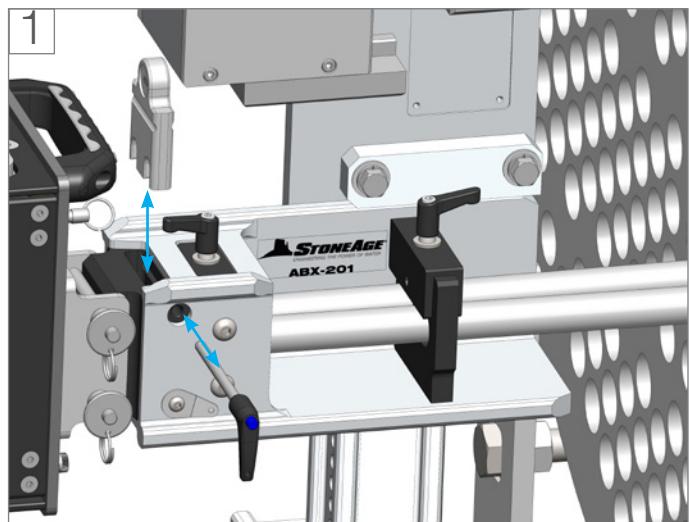


4. Connect the vertical positioner drive air motor to the Control Box with two 1/4 in. (6 mm) JIC hoses. Verify the Control Box moves the vertical carriage in the appropriate direction.
5. Test the Control Box before operating the AUTOBOX® (ABX-2L-V2) Hose Tractor with high pressure water to verify the control valves move the hose in the intended direction, and that the dump valve is working properly.



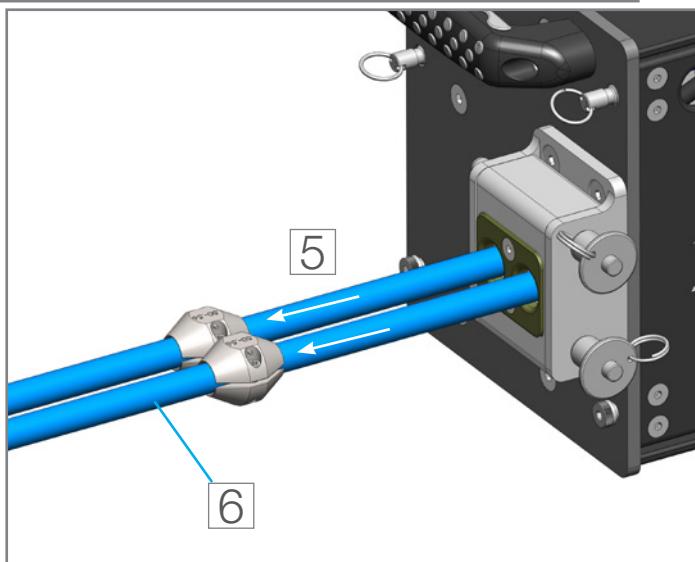
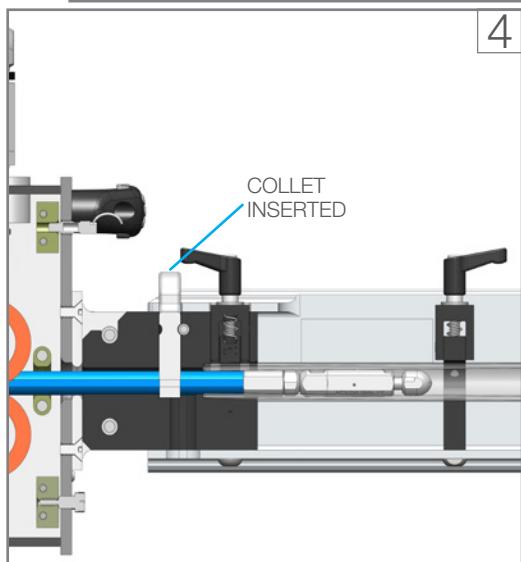
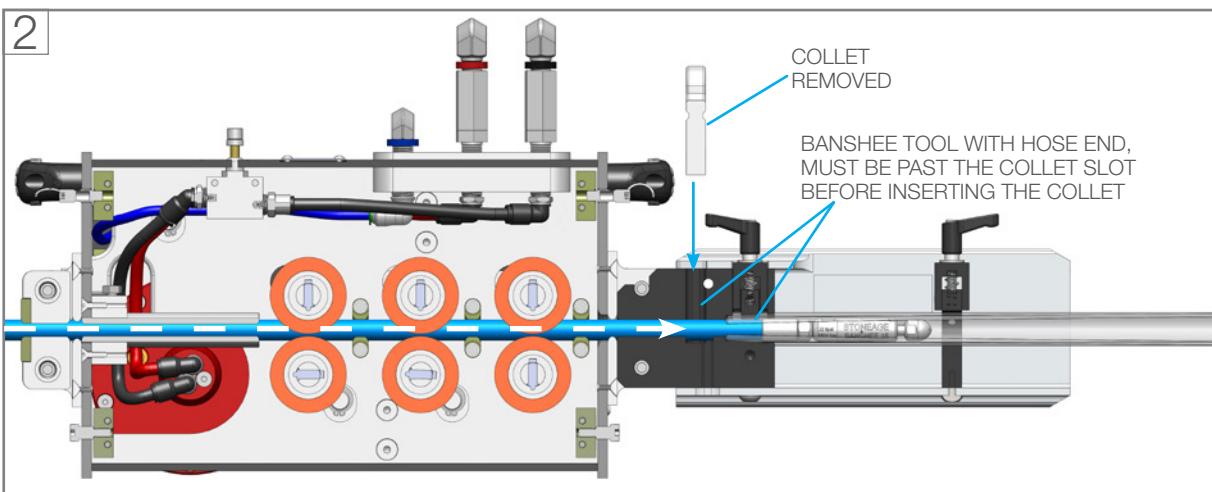
COLLET INSERTION, HOSE, AND HOSE STOP INSTALLATION

1. Remove Quick Release Pin and pull out existing Collet.
2. Insert Banshee tool on hose through the AUTOBOX® (ABX-2L-V2-25) Hose Tractor, and hose Hose Guide Assembly. Be sure that the Banshee tool and hose end pass the location of the Collet.
3. Select the appropriate Collet size for the diameter of the hoses. (See "Recommended Collets For Common Hose Sizes" plaque on the top plate of the ABX-2L-V2 Tractor or the side of the vertical carriage on the Lightweight Positioner.)
4. Install the Collet and quick release pin.
5. Pull on the hoses from the back of the AUTOBOX® (ABX-2L-V2-25) Hose Tractor to ensure that the Collet does not allow the Banshee to back out of the Guide or Hose Tractor.
6. To install hose stops, push tool through until the tips are 1-2" (25-51 mm) past the end of the tube bundle. Loosely install the stop, then push toward the mounting bracket and tighten in place.



⚠️ WARNING

Appropriate size Collet selection is **CRITICAL** to ensuring proper anti-withdrawal prevention of the tool. See "Recommended Collets For Common Hose Sizes" plaque on the top plate of the ABX-2L-V2 Tractor or the side of the vertical carriage on the Lightweight Positioner.



OPERATION

CONTROL PANEL FUNCTIONS

HOSE FEED LEVER-

- The **HOSE FEED LEVER** will move the hose in the forward (feeding) and reverse (retracting) directions. The **OFF** position is at the spring centered middle position and will stop the Drive Rollers from turning. The speed controls are located on the AUTOBOX® (ABX-2L-V2-25) Hose Tractor. Speed is independently adjustable for Forward/Reverse. Minimum speed is .2ft/sec (6 cm/sec). Maximum speed is 3.0ft/sec (914 mm/sec).

POSITIONER CONTROLS-

- UP/DOWN** will move the PRODRIVE Tractor (ABX-PRO) up and down the tube face bundle. Push forward to move the assembly UP, release to STOP the motion, push down to move the assembly down.
- LEFT/RIGHT** will move the PRODRIVE Tractor (ABX-PRO) from side to side along the tube face bundle. Push left to move the assembly to the LEFT, release the lever to STOP the motion, push RIGHT to move the assembly to the right.

MOMENTARY PNEUMATIC DUMP CONTROL-

- To use the **DUMP CONTROL**, hold it in the FORWARD position to route the high-pressure water to the tool. Release the knob to divert the high-pressure water away from the tool.
- To de-energize the system, release the **HOSE FEED LEVER** and release the **MOMENTARY PNEUMATIC DUMP CONTROL**. This will stop the Drive Rollers from moving and reroute the high-pressure water away from the AUTOBOX® (ABX-2L-V2-25) Hose Tractor.

TEST RUN PROCEDURE

- Perform the **PRE-RUN SAFETY CHECK (SEE PAGE 6)**.
- Ensure appropriate Collet is installed and hose clamp pressure is set at 20-30psi (.14-.20 MPa)
- Operate the high-pressure hose and waterjet tool at full pressure to test the clamp force. Proper clamp force will provide good control of the hose in forward and reverse directions.
- Adjust the hose feed speed controls. Proper forward and reverse speeds will vary, depending on the type of material being removed and the tube size. Adjustment of the hose feed speed controls may be necessary during operation in order to optimize cleaning and overall productivity.
- Operate the high-pressure water at full pressure and use the **MOMENTARY PNEUMATIC DUMP CONTROL** to verify that the dump valve is working properly.

RUN PROCEDURE

- After assembling and verifying, the AUTOBOX® (ABX-2L-V2-25) Hose Tractor system is ready for operation.
- Once all hose connections have been secured and verified, it is recommended to flush the hoses and verify the dump valve is working properly before installing the Banshee tools.
- After flushing the hoses, install the Banshee tools and insert both tools into the back of the AUTOBOX® (ABX-2L-V2-25) Hose Tractor. It may be necessary to twist the hoses slightly as the tools and hose ends are manually pushed through the Drive Rollers.
- Once the Banshees are inside the Guide Tubes, install the Collet (anti-withdrawal protection). **The appropriate Collet must be verified, installed, secured, tested, and performance confirmed before operating at high pressure.**
- Adjust the clamp pressure to 20-30 psi. (.14-.20 MPa). Align the Guide Tubes with an open set of tubes in the heat exchanger bundle.
- Feed forward and advance the hoses into the tube bundle at low pressure and wait for the tools to exit the far side of the heat exchanger.
- Set the forward hose stops in the desired position to ensure the entire tube is cleaned, but that the hose crimp does not fully exit the tube.
- Retract the hoses into the Guide Tubes.
- Close the dump and gradually increase the pump to the desired operating pressure.
- Feed forward and advance the hoses into the tube bundle. Dump and make any desired changes to forward and/or reverse operating speeds.
- If the Drive Rollers are slipping excessively, increase the clamp pressure. It is recommended to operate the clamp pressure as low as possible without excessive slippage. Optimal clamp pressure is achieved when the Drive Rollers slip ½ to 1 full rotation after hitting the hose stops (forward) or the Collet engages the hose crimp (reverse). It is recommended to use hose supplied with the secondary crimp so the (anti-withdrawal protection) Collet does not impact the pressure containing crimp.
- Operate the left/right and up/down positioner functions to begin high pressure cleaning at the preferred location on the tube bundle.
- Always align the Guide Tubes as closely as possible with the heat exchanger tubes before advancing the hoses
- When operating the AUTOBOX® (ABX-2L-V2-25), an obstacle or restriction within a heat exchanger tube may be encountered. When this occurs, the AUTOBOX® (ABX-2L-V2-25) is designed to slow and stall the air drive motor, stopping the advancement of the hose, lance, and Banshee tool. The operator should stop forward feed and reverse the lance feed direction, backing the tool away from the obstruction. Repeat the back and forth operation, until the resistance or obstruction is cleared via the cleaning action of Banshee tool at the end of the hose. The AUTOBOX® (ABX-2L-V2-25) is not designed for Drive Roller slip. If slippage occurs, gradually increase the clamp force using the **HOSE CLAMP PRESSURE REGULATOR** on the Control Box.

HIGH-PRESSURE HOSE

- The AUTOBOX® (ABX-2L-V2-25) Hose Tractor is designed to be used with Parker Pro-Lance® and/or Spir Star Blast-Pro® hose ends. Standard hose ends may not fit into Hose Tractor and/or Guide Tubes. **Note: MAXIMUM hose end diameter must NOT exceed .71 in. (18 mm)**
- Only high quality hoses intended for waterblast applications should be used as high-pressure hoses. Pressure rating of high-pressure hoses MUST NEVER be exceeded.
- Verify that the high-pressure hose is properly installed in the back-out preventer. Operate the high-pressure hose and waterjet tool at full pressure to test the clamp force. Proper clamp force will provide good control of the hose in forward and reverse directions, and keep the hose running through the Drive Rollers.
- The AUTOBOX® (ABX-2L-V2-25) Hose Tractor MUST be supervised at all times.
- HOSE LENGTHS** The ABX-2L-V2 has a variety of accessories that will require additional hose length to be considered in addition to the tube bundle length. This should be verified prior to ordering high pressure hose for each job. The chart below shows the actual length of each configuration and recommended additional length necessary to keep the assembly from lifting off the ground during operation. Provide the tube bundle length and use the chart to follow the calculation below to determine the total hose length.

(Tube Bundle Length, in./mm) + (Actual Length of Configuration, in./mm) + (Recommended Additional Connection Length, in./mm)

- Total Hose Length in /mm

ACCESSORY CONFIGURATIONS	ACTUAL LENGTH OF CONFIGURATION	RECOMMENDED ADDITIONAL CONNECTION LENGTH
ABX-2L, Hose Guide, and Lightweight Positioner	32.9 in / 836 mm	39 in / 991 mm
ABX-2L, Hose Guide, Lightweight Positioner, and HCS	145.0 in / 3683 mm	39 in / 991 mm
ABX-2L, Fin Fan Guide, Fin Fan Snout	128.5 in / 3264 mm	39 in / 991 mm
ABX-2L, Fin Fan Guide, Fin Fan Snout, and HCS	240.6 in / 6111 mm	39 in / 991 mm

Example: The hose length equation for a 20ft (6096 mm) tube bundle with ABX-2L, Hose Guide, and Lightweight Positioner would be;

STANDARD:

(20ft x 12 in/ft) + 32.9 in + 39 in = **311.9 in.**

METRIC:

6096 mm + 836 mm + 991 mm = **7922 mm**

NOTICE

Do not use a shrouded hose or hose with a steel protective cover. This will cause severe damage to the Drive Rollers.

- Open the door to install the high-pressure hose. The **HOSE CLAMP PRESSURE REGULATOR** on the Control Box MUST be turned to zero pressure to open the Drive Rollers for easy hose installation. Insert the hose, equipped with the waterjet tool, between the Drive Rollers. Increase the pressure on the **HOSE CLAMP PRESSURE REGULATOR** to extend the clamp rollers and clamp the hose. Close and lock the door before operating the AUTOBOX® (ABX-2L-V2-25) Hose Tractor.

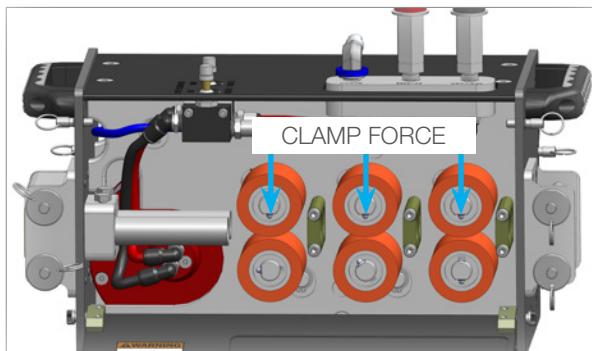
Test the Control Box before operating the AUTOBOX® (ABX-2L-V2-25) Hose Tractor with high-pressure water to verify the control valves move the hose in the intended direction, and that the dump valve is working properly.

HOSE CLAMP

- The Drive Rollers are controlled by turning the **HOSE CLAMP PRESSURE REGULATOR**. Use the **HOSE CLAMP PRESSURE GAUGE** to record desired pressure for future use. Clamp force will not damage hoses. Proper clamp force will provide good control of the hose in forward and reverse directions, and will keep the hose running through the Drive Rollers.

⚠ WARNING

Do not fully release the hose clamp (decreasing pressure to zero) during operation, or the AUTOBOX® (ABX-2L-V2-25) Hose Tractor will release the hose and may create a dangerous runaway hose condition, which can result in severe injury and/or death.



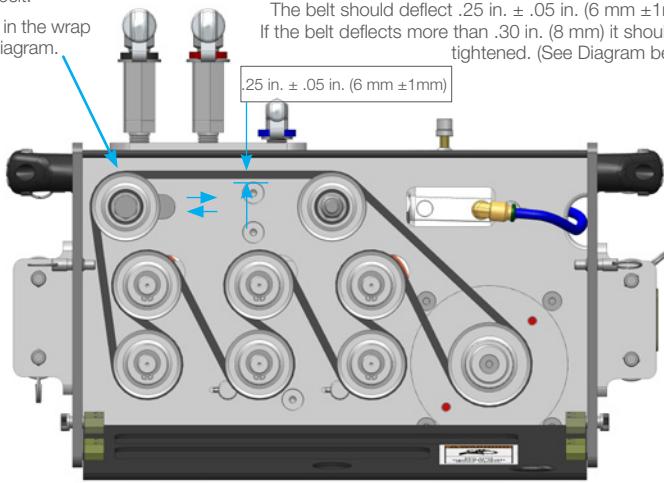
MAINTENANCE

Maintenance Item	Frequency	Maintenance Required
Forward, reverse, and clamp fittings	Before each use	Inspect threads on fittings for wear or damage.
Forward and reverse fittings	After each use	Apply a small amount of air tool oil directly into the forward and reverse 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 three fittings to keep moisture and dirt out.
		NOTICE
		Do not add oil to the clamp fitting, as oil may accumulate in the air cylinders and prevent them from fully retracting.
Drive Rollers	After each use	The Drive Rollers are very durable and should last several hundred hours. However, it is recommended to inspect all Drive Rollers for wear and/or cracks at the completion of each job. Replacement is required when wear begins to affect the hose feed in forward or reverse, or when it affects the hose alignment. It is recommended to replace all six Drive Rollers at the same time to maintain optimal performance.
Belt	After each use	Check and adjust belt tension with the Rollers in the MAX open position. It may be necessary to install a hose or other material to hold the rollers open. NOTE: Do not use any materials with sharp edges, as they will damage the rollers. To inspect press down between the two idlers with 5 lbs of force on the belt. The belt should deflect .25 in. ± .05 in. (6 mm ±1mm). If the belt deflects more than .30 in. (8 mm) it should be tightened. (See Diagram below)
		NOTICE
		Do not use any materials with sharp edges to hold the Drive.
All components the hoses pass through	After each use	Most wear parts are made from 17-4 PH stainless steel and should have a very long life. However, as wear occurs the rounded edges could become sharp and damage hoses. Any components showing excessive wear should be replaced.
Clamp Sticking	Intermittent	Remove the top plate and remove any debris from between the inner plates. DO NOT USE high-pressure water.

Contact StoneAge for Safety Data Sheets for material usage, a complete list of spare part numbers, and service instructions for the AUTOBOX® (ABX-2L-V2-25) Hose Tractor and Control Box.

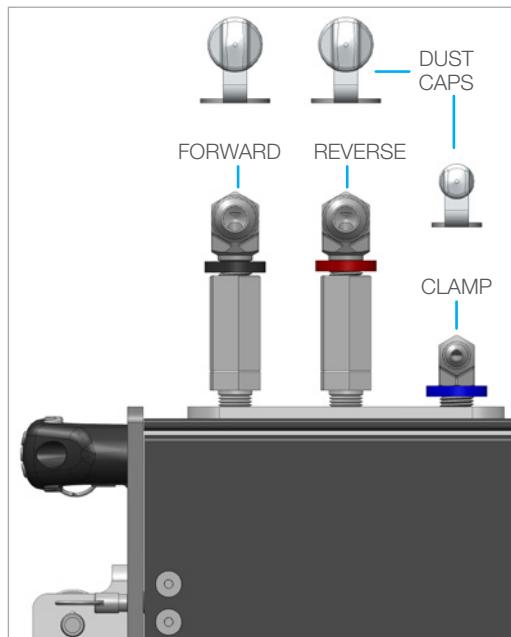
TO REPLACE THE BELT:

- Using a 9/16" Socket, loosen the hex head bolt and slide the idler sprocket to the right.
- Remove the worn belt.
- Install the new belt in the wrap pattern shown in diagram.



SETTING TENSION:

Adjust belt tension with the Drive Rollers in the MAX open position. It may be necessary to install a hose or other material to hold the rollers open. To inspect press down between the two idlers with 5 lbs of force on the belt. The belt should deflect .25 in. ± .05 in. (6 mm ±1mm). If the belt deflects more than .30 in. (8 mm) it should be tightened. (See Diagram below)

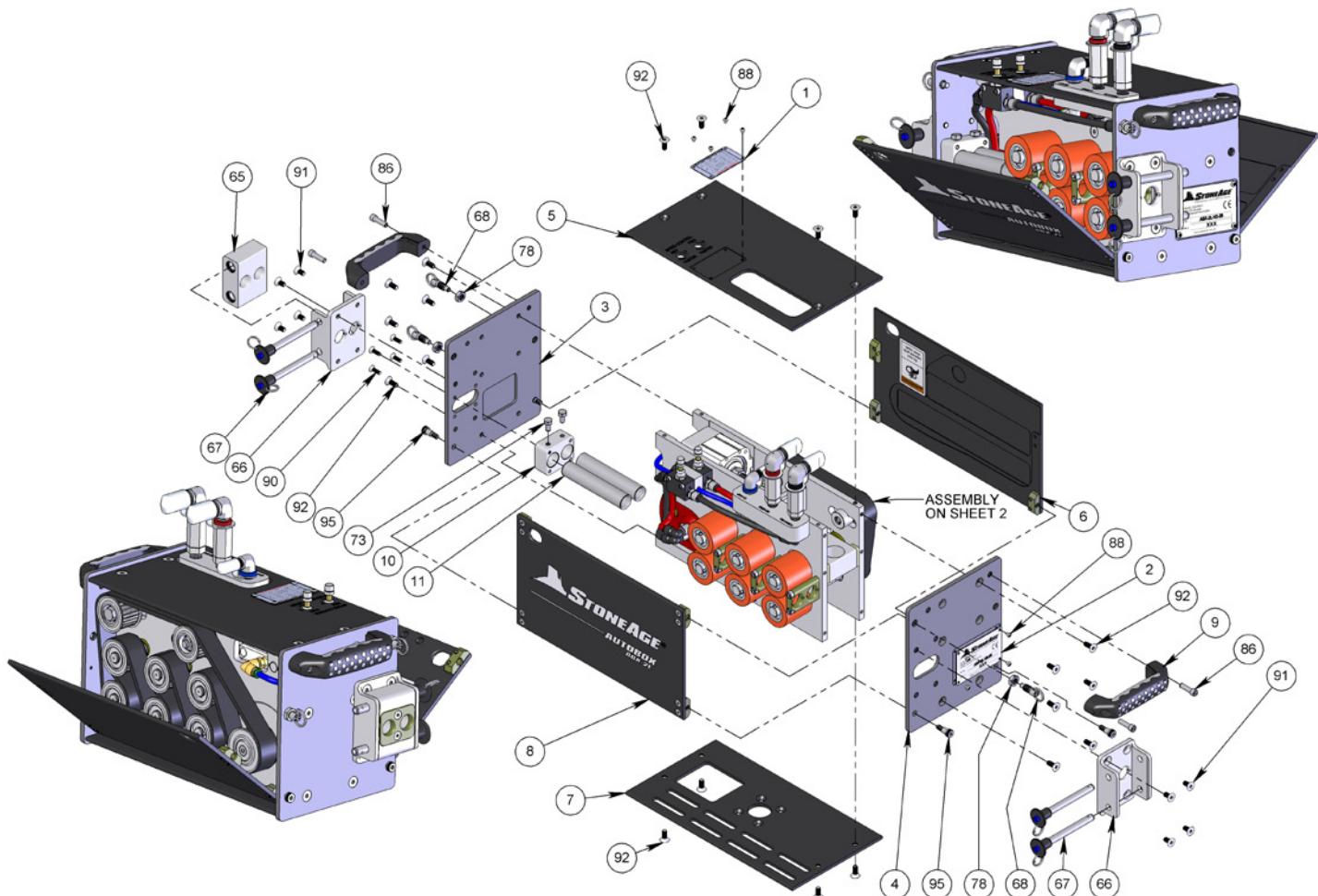


STORAGE, TRANSPORTATION, AND HANDLING

The AUTOBOX® (ABX-2L-V2-25) Hose Tractor is shipped in a custom wooden crate and should be stored upright in the same crate between jobs. When moving the AUTOBOX®(ABX-2L-V2-25) Hose Tractor, lift with care to prevent bodily injury.

When storing the unit, use compressed air to blow out the air lines to remove debris and moisture. Use mild soapy water to clean the machine in order to remove corrosive materials. Apply a small amount of air tool oil directly into the forward and reverse 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 three fittings to keep moisture and dirt out.

AUTOBOX® (ABX-2L-V2-25)
 HOSE TRACTOR WITH 25MM BELT ASSEMBLY
 CONTINUED ON NEXT TWO PAGES



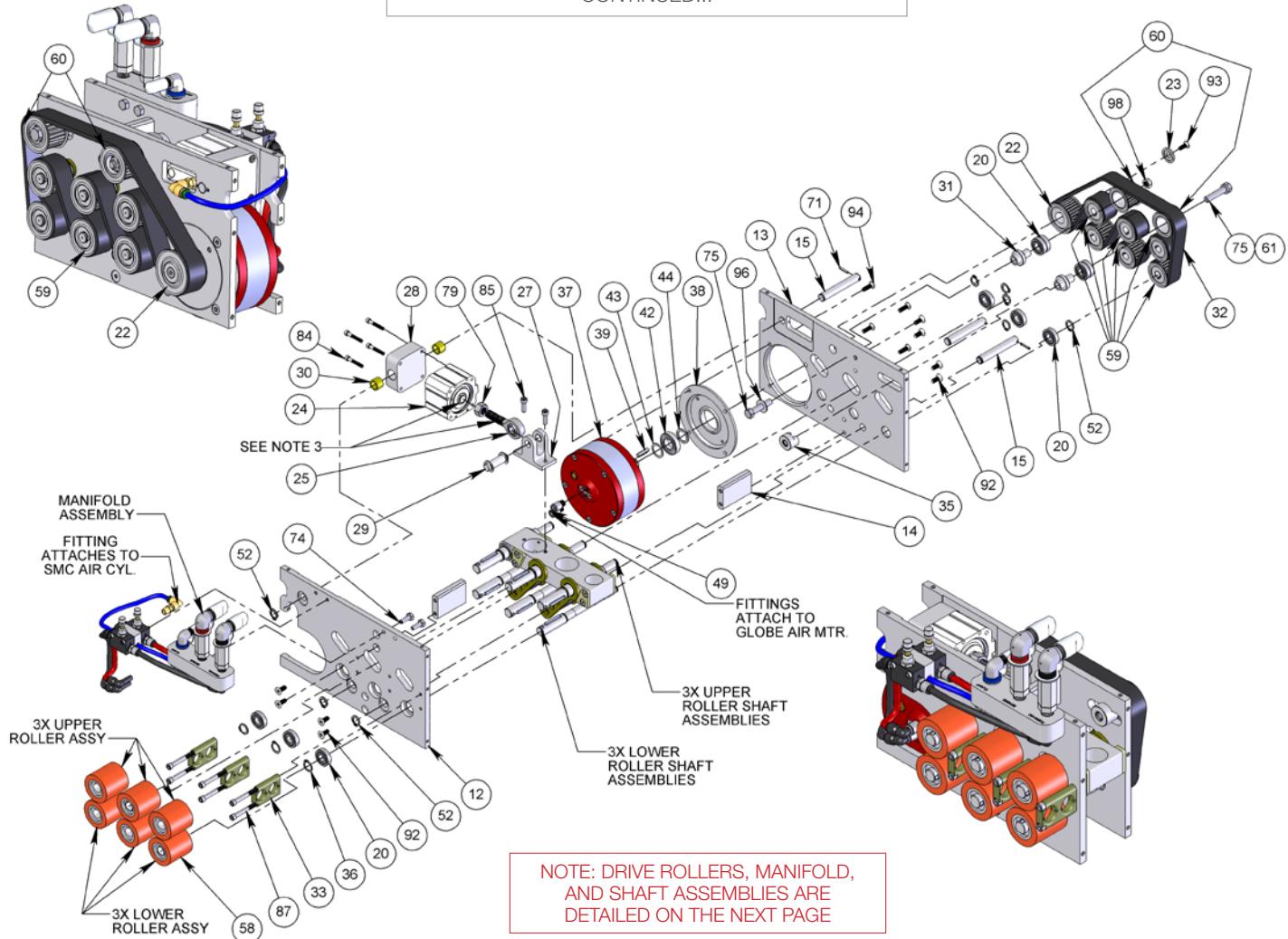
#	PART NUMBER	QTY.
1	ABX 139-001 COLLET REFERENCE PLATE	1
2	ABX 202 CE SERIAL PLATE 25MM	1
3	ABX 205 SIDE PLATE INLET	1
4	ABX 206 SIDE PLATE OUTLET	1
5	ABX 207 PLATE, TOP	1
6	ABX 208-001 GUARD, BACK ASSY	1
7	ABX 210 PLATE, BOTTOM	1
8	ABX 211 DOOR ASSY	1

9	ABX 215 PULL HANDLE RUBBER GRIP GREY	2
10	ABX 217 HOSE GUIDE PLATE, INNER	1
11	ABX 218-001 WEAR RING	2
65	ABX 290 REAR MOUNT INSIDE ASSEMBLY	1
66	ABX 291-001 MOUNTING BRACKET	2
67	ABX 298 QUICK PIN 17-4 SS .38 X 3.0	4
68	ABX 566-001 SPRING PLUNGER ASSY	3
73	GB 325-02 BOLT, HEX .25-20 X .50 SS	2

78	GN 337-HJ HEX JAM NUT SS	3
86	GS 325-035 SHCS .25-20 X .088 SS	4
88	GSB 313-0075 BHCS 6-32 X .188 LG SS	8
90	GSF 319-025 FHCS .19-24 X .63 LG SS	4
91	GSF 325-02 FHCS .25-20 X .50 LG SS	8
92	GSF 325-025 FHCS .25-20 X .63 LG SS	28
95	GSSH 0312-0375-SS SHOULDER SCREW	4

PARTS DIAGRAM

AUTOBOX® (ABX-2L-V2-25) HOSE TRACTOR CONTINUED...



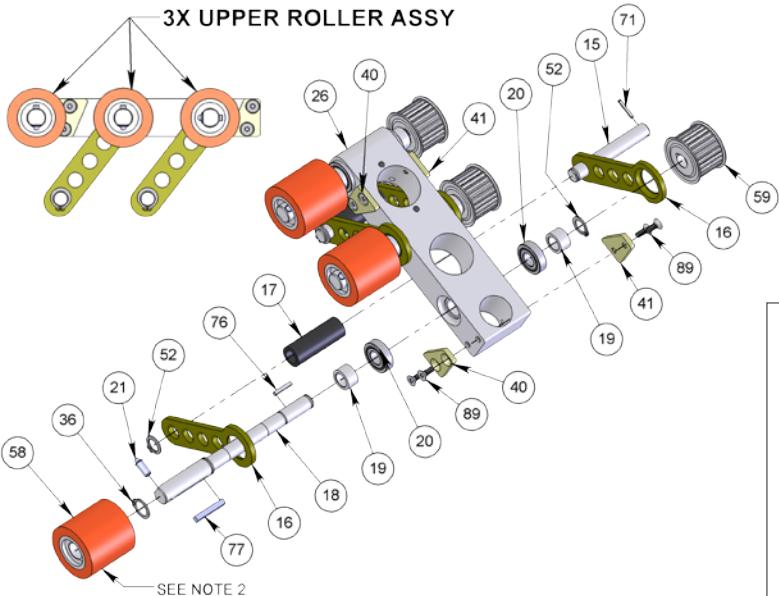
#	PART NUMBER	QTY.
12	ABX 220 PLATE, OUTER	1
13	ABX 221 PLATE, INNER	1
14	ABX 222 PLATE, STIFFENER	2
15	ABX 223 SHAFT, LINK	3
20	ABX 228 BEARING .500 ID X 1.125 OD SEALED PERMALUBE	16
22	ABX 231-001 DRIVE ALUMINUM SPROCKET 32T	1
23	ABX 232 CAP, AIR MOTOR SHAFT	1
24	ABX 233 CYLINDER, SMC	1
25	ABX 234 ROD END	1
27	ABX 236 PLATE, AIR CYLINDER CLEVIS	1
28	ABX 237 CYLINDER PIVOT PLATE	1
29	ABX 238 HEADLESS CLEVIS PIN .50 OD X 1.25 SS	1
30	ABX 239 SLEEVE BEARING .500 ID X .6875 OD	2
31	ABX 240-001 SHAFT, IDLER SPROCKET	2

32	ABX 242-001 DRIVE BELT, 25MM	1
33	ABX 243-001 HOSE GUIDE BLOCK	3
35	ABX 248 IDLER NUT	1
36	ABX 249 RETAINING RING, HD EXT SS	6
37	ABX 250 AIR MOTOR, GLOBE	1
38	ABX 252 PLATE, AIR MOTOR BEARING	1
39	ABX 253 STEP KEY	1
42	ABX 257 BEARING 19MM X 37MM X 9MM	1
43	ABX 258 SHIM WASHER	1
44	ABX 258-001 SHIM WASHER	1
49	ABX 263 FTG, PL8MMF TO P4M BSPT STRAIGHT ADAPTER	2
52	ABX 267 RETAINING RING, SL EXTERNAL SS	9
58	ABX 272 DRIVE ROLLER, 70A SMALL HOSE	6
59	ABX 280-001 ROLLER ALUMINUM SPROCKET 26T	6

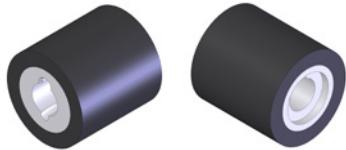
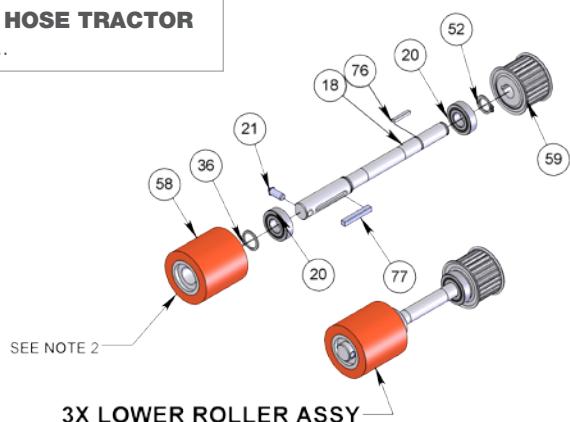
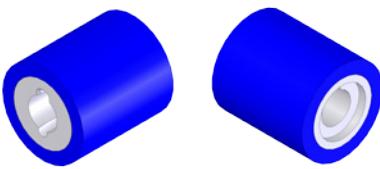
60	ABX 281-001 IDLER ALUMINUM SPROCKET 26T	2
61	ABX 282 SPACER	1
71	BRLM 191 SPRING PIN, .125 X .75	3
74	GB 325-03 BOLT, HEX .25-20 X .75 SS	2
75	GB 337-07 BOLT, HEX .37-16 X 1.75 SS	2
79	GN 350-H-20 HEX NUT SS	1
84	GS 319-05 SHCS .19-24 X 1.25 SS	4
85	GS 325-03 SHCS .25-20 X .75 SS (TB 050)	2
87	GS 325-09 SHCS .25-20 X 2.25 SS	6
92	GSF 325-025 FHCS .25-20 X .63 LG SS	28
93	GSF 3M6-16-1.00 FHCS M6X1.00X16 SS	1
94	GSF 3M6-20-1.00 FHCS M6X1.00X20 SS	4
96	GW 337-F FLAT WASHER SS	1
98	SRT 333 NYLOCK NUT SS THIN	1

AUTOBOX® (ABX-2L-V2-25) HOSE TRACTOR
 CONTINUED...

3X UPPER ROLLER ASSY

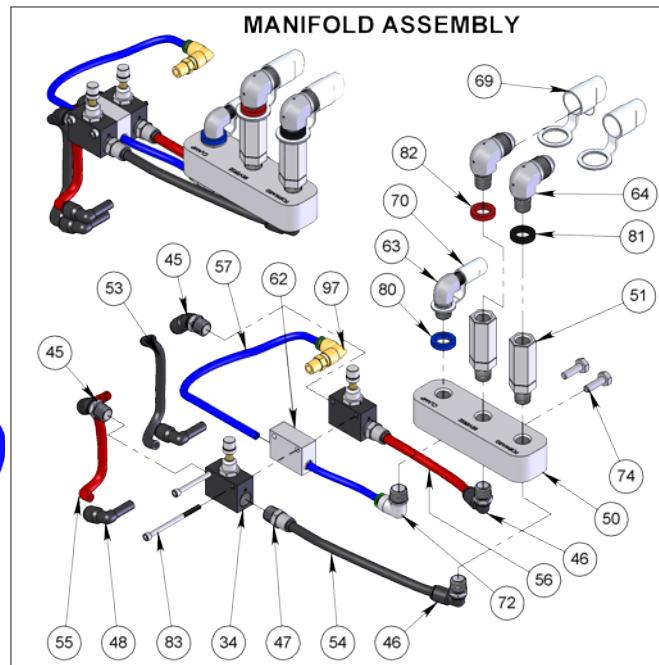


3X LOWER ROLLER ASSY


 ABX 271 (DARK GRAY/BLACK)
 ROLLERS ARE INCLUDED IN THE
 AUTOBOX® (ABX-2L-EPP-001)
 EXTRA PARTS PACKAGE

 ABX 273 (BLUE ROLLERS)
 ROLLERS ARE INCLUDED IN THE
 AUTOBOX® (ABX-2L-EPP-001)
 EXTRA PARTS PACKAGE

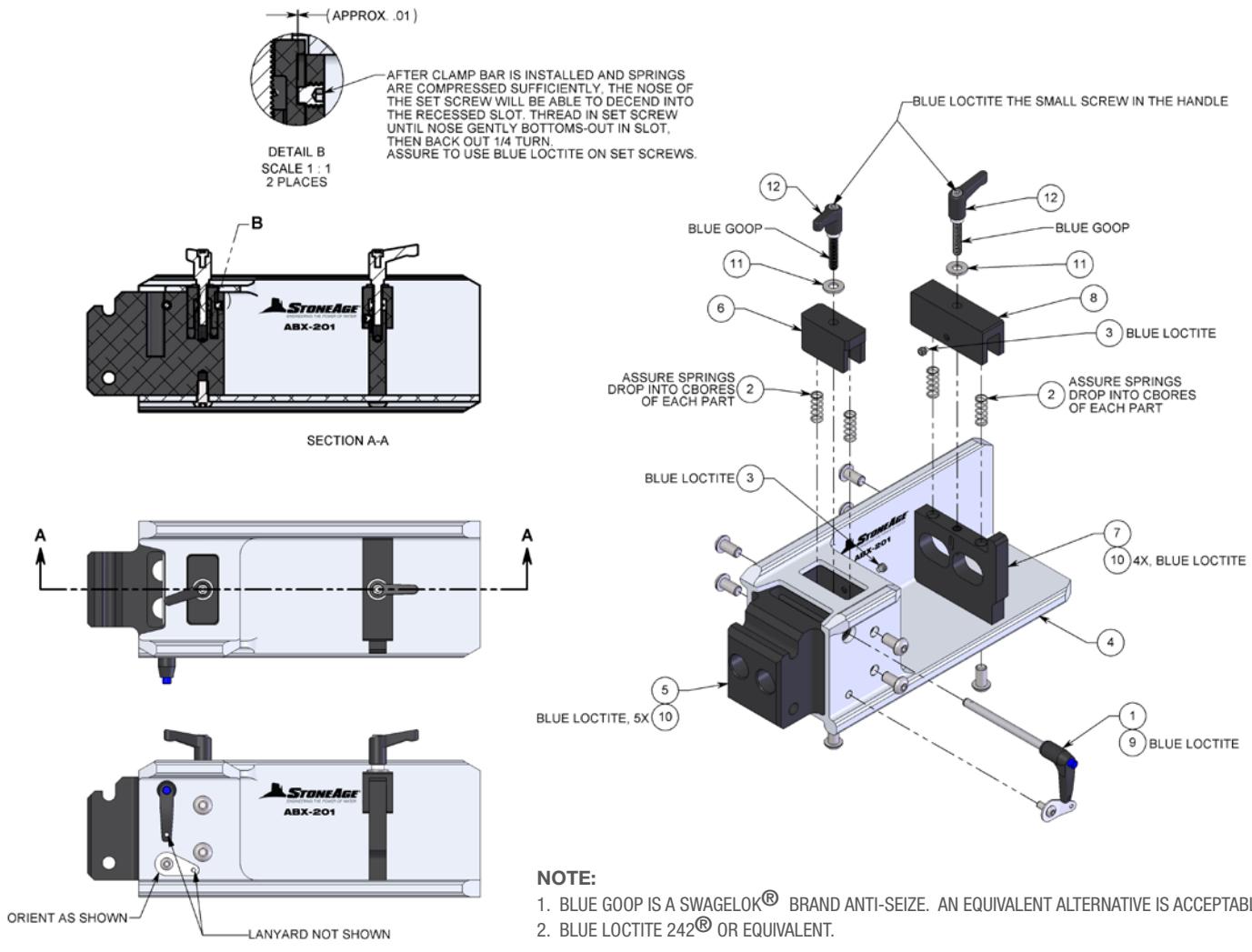
#	PART NUMBER	QTY.
15	ABX 223 SHAFT, LINK	3
16	ABX 224 LINK BAR	4
17	ABX 225 SPACER, LINK	2
18	ABX 226 SHAFT, DRIVE ROLLER	6
19	ABX 227 SPACER, TOP SHAFT	6
20	ABX 228 BEARING .500 ID X 1.125 OD SEALED PERMALUBE	16
21	ABX 229 BALL PLUNGER	6
26	ABX 235 PLATE, BEARING	1
34	ABX 247 FLOW CONTROL VALVE MASC200-08	2
36	ABX 249 RETAINING RING, HD EXT SS	6
40	ABX 255 PAD, BEARING PLATE RH	2
41	ABX 256 PAD, BEARING PLATE LH	2
45	ABX 259 FTG, ELBOW P4M X PL5F 45° ELBOW	2
46	ABX 260 FTG, P4M X PL8MMF 90° ELBOW	2

47	ABX 261 FTG, PL8MMF TO P4M STRAIGHT ADAPTER	2
48	ABX 262 FTG PL8MMF X PL8MMF 90° ELBOW	2
50	ABX 265 AIR MANIFOLD	1
51	ABX 266 FILTER, .25 NPT	2
52	ABX 267 RETAINING RING, SL EXTERNAL SS	9
53	ABX 268-BK-1 BLACK TUBE 8MM AIR MOTOR FWD	1
54	ABX 268-BK-2 BLACK TUBE 8MM AIR MOTOR FWD	1
55	ABX 268-R-1 RED TUBE 8MM AIR MOTOR REV	1
56	ABX 268-R-2 RED TUBE 8MM AIR MOTOR REV	1
57	ABX 270-B-1 CLAMP TUBE .25 OD	1
58	ABX 272 DRIVE ROLLER, 70A SMALL HOSE	6
59	ABX 280-001 ROLLER ALUMINUM SPROCKET 26T	6



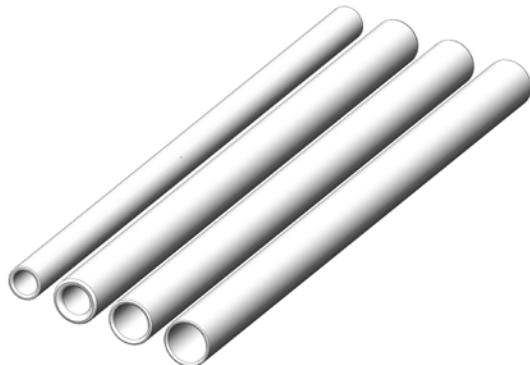
PARTS DIAGRAM

AUTOBOX® (ABX-201) HOSE GUIDE ASSEMBLY
MAIN ASSEMBLY PARTS GUIDE



#	PART NUMBER	QTY
1	ABX 130-001QUICK-RELEASE PIN, .250DIA, 3.00L, WITH 6" LANYARD	1
2	ABX 182 SPRING, COMPRESSION	4
3	ABX 183 SCREW, SET, EXTENDED POINT	2
4	ABX 184 BOX SECTION, 2L, HIGH-VISIBILITY	1
5	ABX 185 GUIDE MOUNTING BLOCK, CLAMPING, 2L	1
6	ABX 186 REAR CLAMP CHANNEL, 2L	1
7	ABX 187 PITCH CLAMP PLATE, 2L	1
8	ABX 188 PITCH CLAMP CHANNEL, 2L	1
9	GSB 319-02 SCREW, BHSC, #10-24 UNC X 0.500L	1
10	GSB 331-025 SCREW, BHSC, 5116-18 UNC X 0.625L	9
11	GW 325-F WASHER, FLAT, 1/4", STAINLESS	2
12	SRT 557 ADJUSTABLE HANDLE .25-20 X 1.19	2

**AUTOBOX® HOSE GUIDE ASSEMBLY
ACCESSORIES**
GUIDE TUBES, COLLETS, AND HOSE STOPS



StoneAge (SA) PART NUMBER GUIDE TUBE REFERENCE CHART			
GUIDE TUBE	BANSHEE	INSIDE DIAMETER, LENGTH	QTY
ABX 115-12	BN9.5	.459 in / 12 mm, 12.5 in. / 318 mm	2
ABX 115-36	BN9.5	.459 in / 12 mm, 36 in. / 914 mm	2
ABX 116-12	BN13	.546 in / 14 mm, 12.5 in. / 318 mm	2
ABX 116-36	BN13	.546 in / 14 mm, 36 in. / 914 mm	2
ABX 117-12	BN15	.674 in / 17 mm, 12.5 in. / 318 mm	2
ABX 117-36	BN15	.674 in / 17 mm, 36 in. / 914 mm	2
ABX 119-12	BN18	.745 in / 19 mm, 12.5 in. / 318 mm	2
ABX 119-36	BN18	.745 in / 19 mm, 36 in. / 914 mm	2



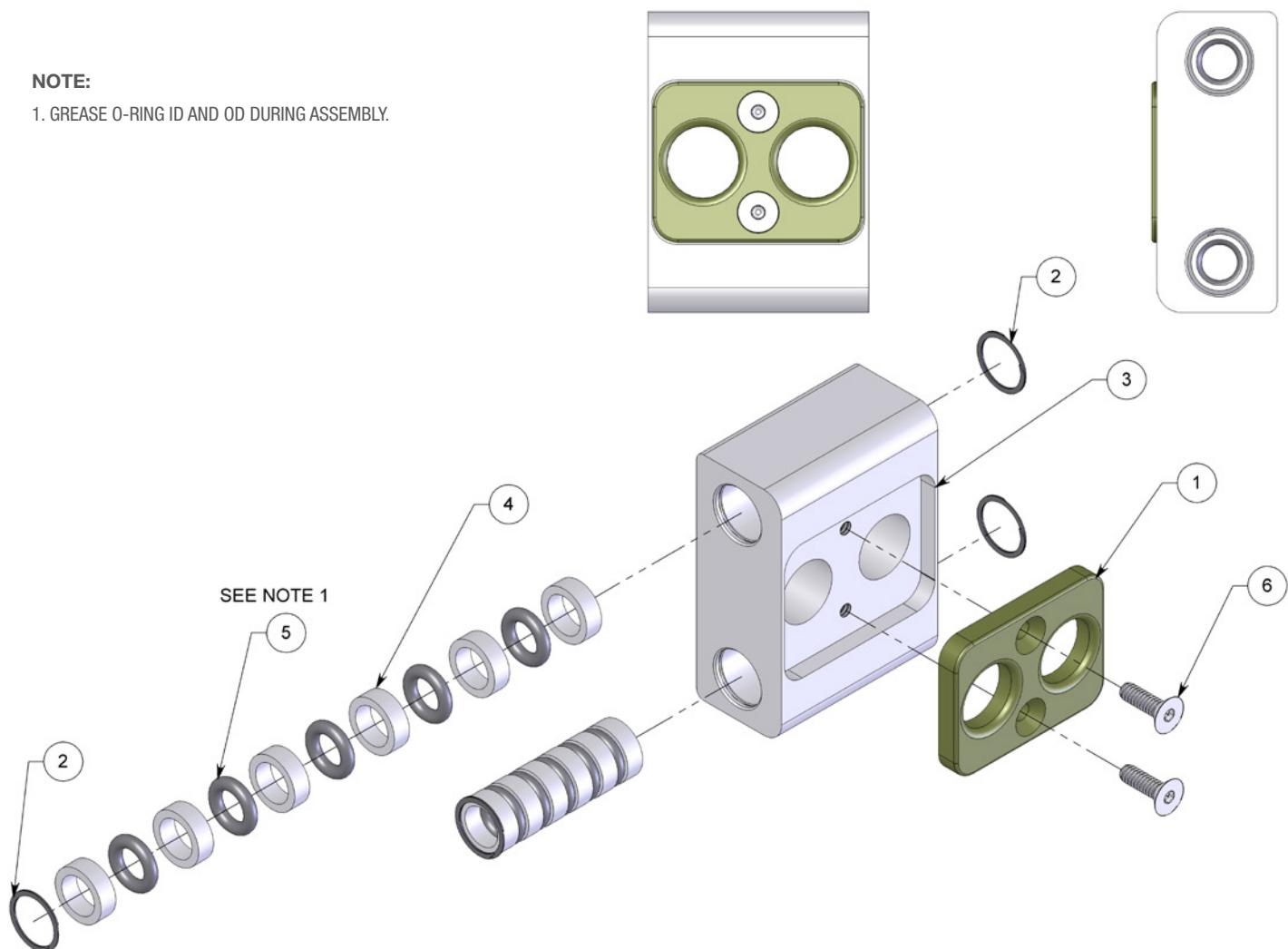
StoneAge (SA) PART NUMBER COLLET REFERENCE CHART		
PART NUMBER	DESCRIPTION	QTY
ABX 121-297	HOSE STOP COLLET .297 in. / 8 mm	1
ABX 121-328	HOSE STOP COLLET .328 in. / 8 mm	1
ABX 121-406	HOSE STOP COLLET .406 in. / 10 mm	1
ABX 121-438	HOSE STOP COLLET .438 in. / 11 mm	1
ABX 121-460	HOSE STOP COLLET .460 in. / 12 mm	1
ABX 121-484	HOSE STOP COLLET .484 in. / 12 mm	1
ABX 121-516	HOSE STOP COLLET .516 in. / 13 mm	1
ABX 121-547	HOSE STOP COLLET .547 in. / 14 mm	1
ABX 121-594	HOSE STOP COLLET .594 in. / 15 mm	1
ABX 121-625	HOSE STOP COLLET .625 in. / 16 mm	1



StoneAge (SA) PART NUMBER HOSE STOP REFERENCE CHART		
PART NUMBER	DESCRIPTION	QTY
HS 121-27-34	HOSE STOP CLAMP ASSEMBLY, .27-34	2
HS 121-34-42	HOSE STOP CLAMP ASSEMBLY, .34-42	2
HS 121-42-50	HOSE STOP CLAMP ASSEMBLY, .42-50	2
HS 121-50-56	HOSE STOP CLAMP ASSEMBLY, .50-56	2
HS 121-56-61	HOSE STOP CLAMP ASSEMBLY, .56-61	2

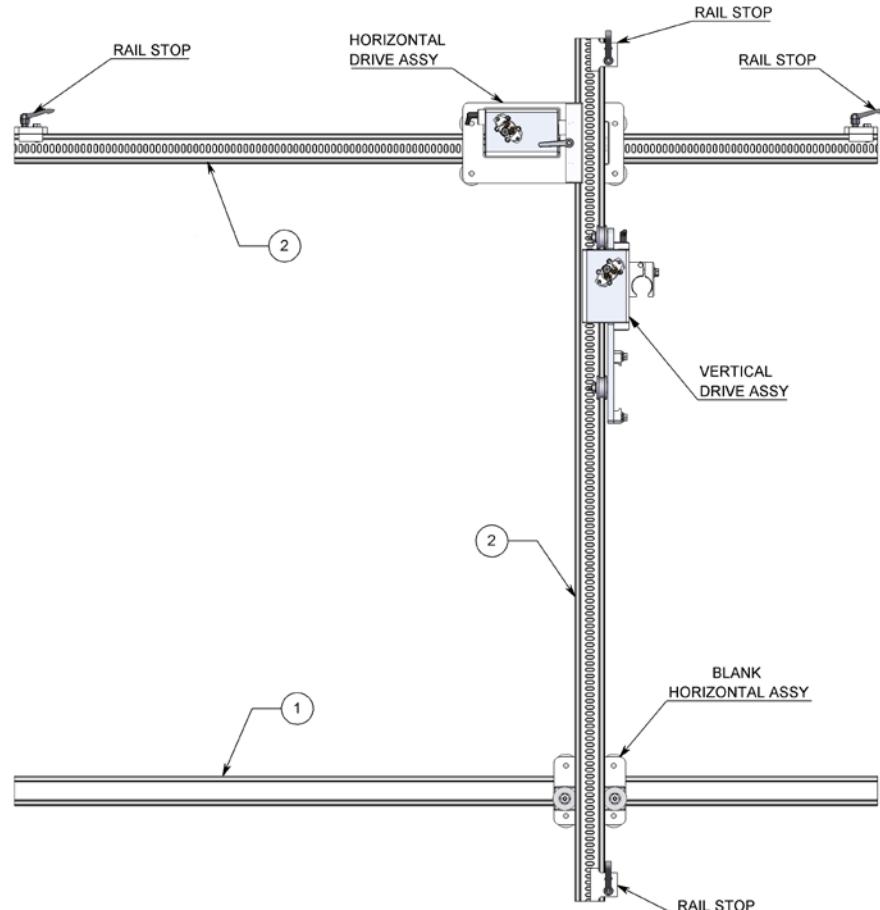
PARTS DIAGRAM

ABX 290 REAR MOUNT ASSEMBLY



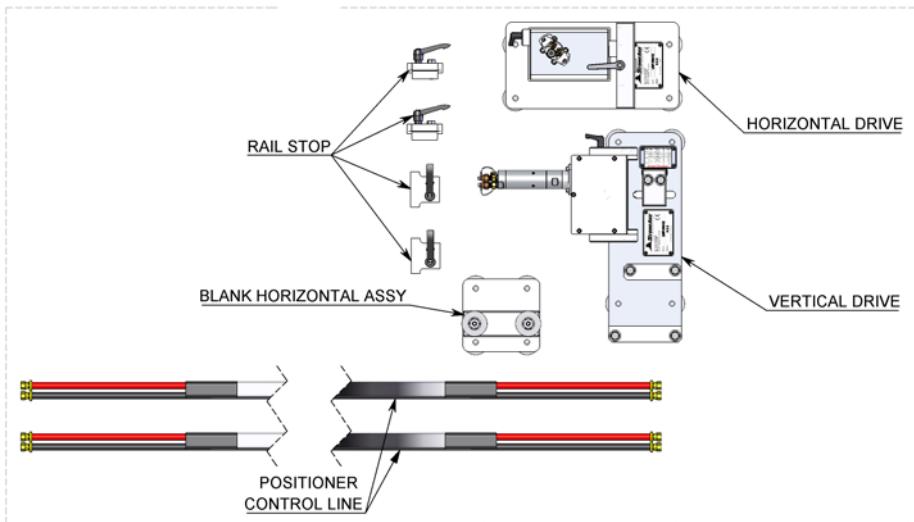
#	PART NUMBER	QTY
1	ABX 216-001 HOSE GUIDE PLATE, OUTER	1
2	ABX 230 SPIRAL INTERNAL RETAINING RING, .625 BORE, SS	4
3	ABX 292-001 REAR MOUNTING BRACKET, INSIDE	1
4	ABX 293 SPACER, ORING	12
5	ABX 294 ORING, SHOCK ABSORBER	10
6	GSF 319-025 FHCS .19-24 X .63 Lg SS	2

**LIGHTWEIGHT POSITIONER ASSEMBLY
(LWP-500-XX-V2)**
NOT INCLUDED IN PACKAGE

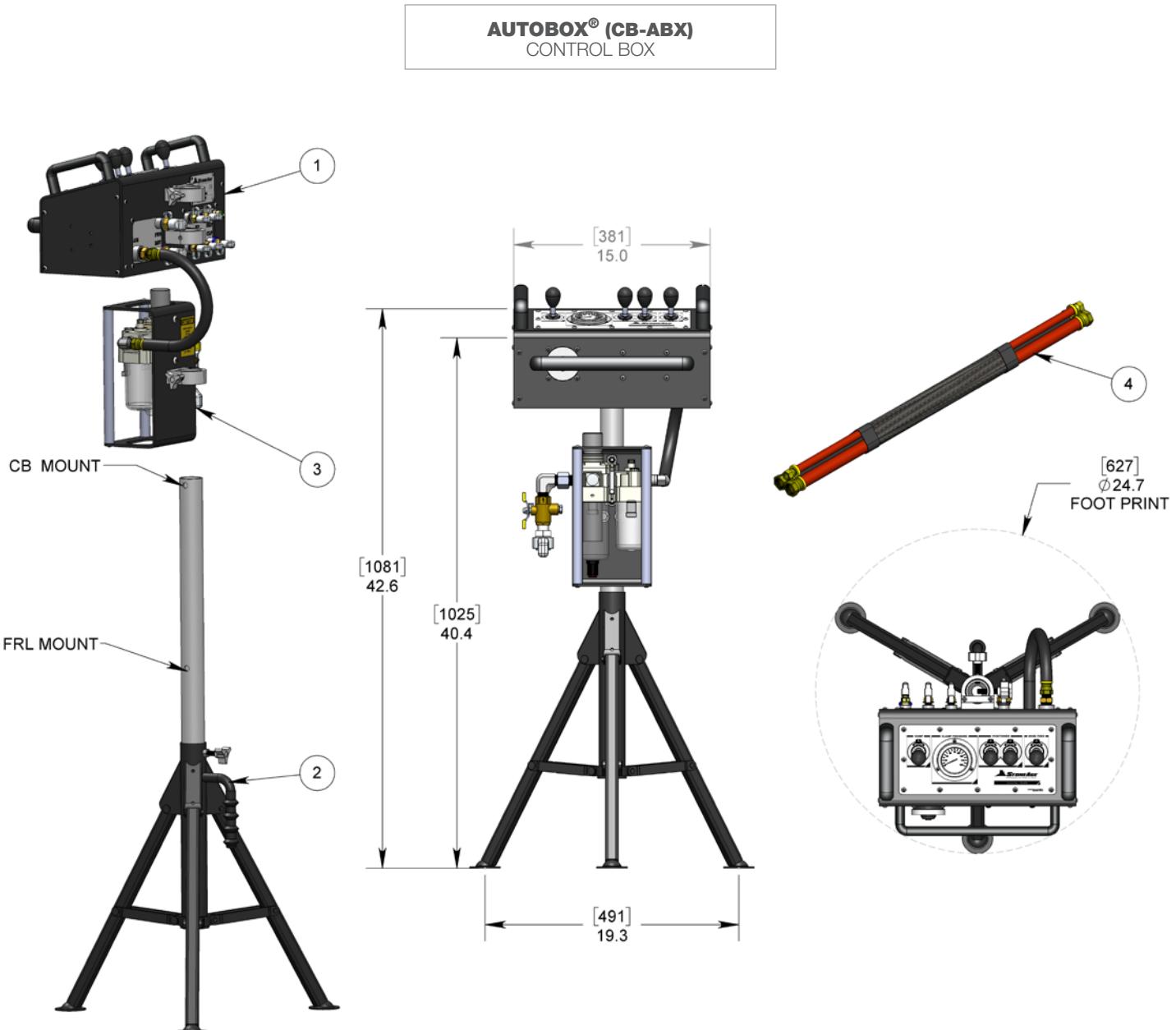


#	PART NUMBER	QTY
1	BR 002-XX-001 2.5 BOX RAIL EXTRUSION	1
2	BU 002-XX-001 2.5 BOX RAIL EXTRUSION, SLOTTED	2
3	LWP-500.1 LIGHTWEIGHT POSITIONER PARTS	1

LWP-500.1 LIGHTWEIGHT POSITIONER PARTS



PARTS DIAGRAM

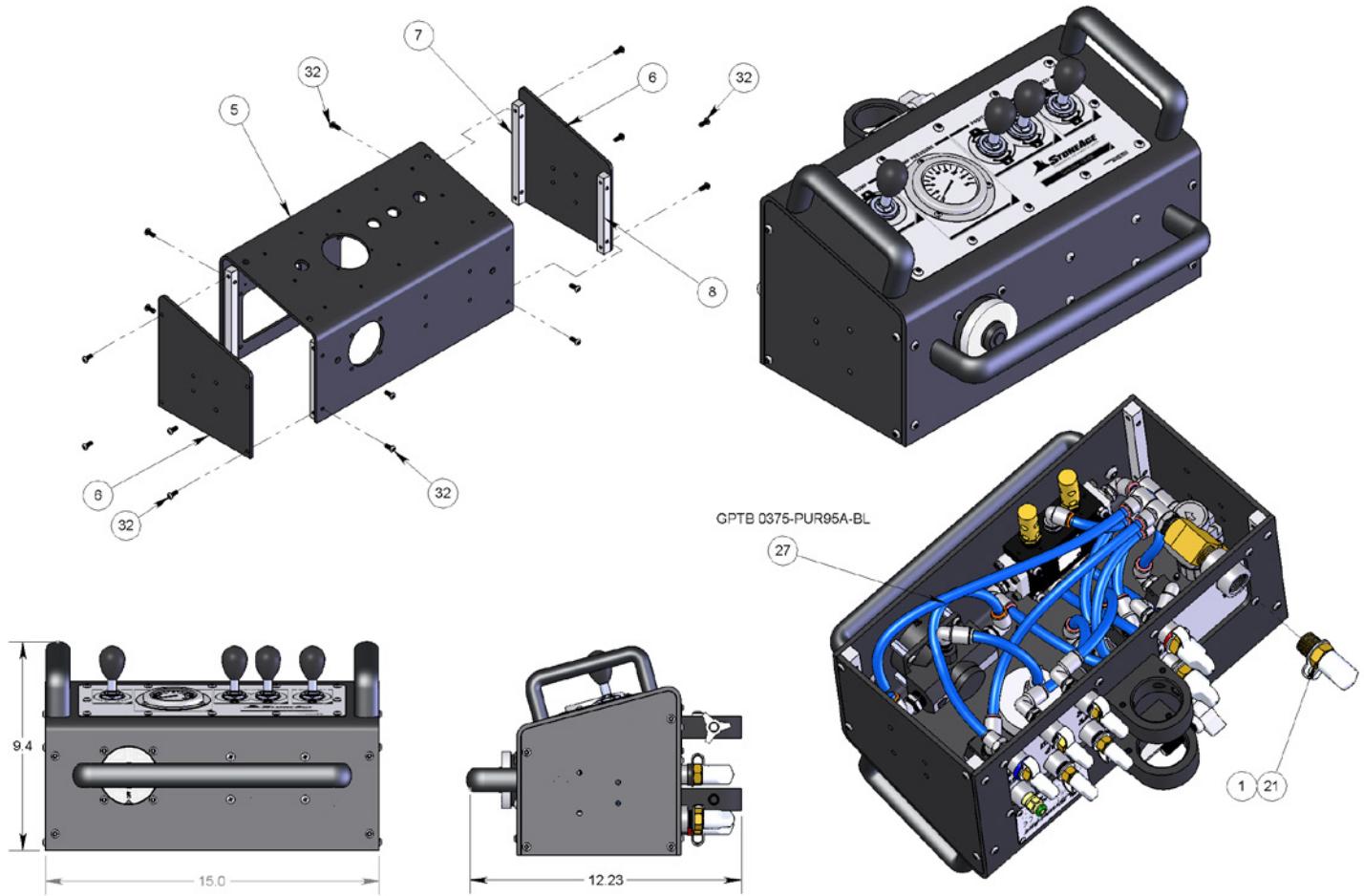


NOTES:

1. ASSEMBLY REFERENCE DIMENSION SHOWN (MM) / INCHES.

#	PART NUMBER	QTY.
1	CB 300 CONTROL BOX ASSEMBLY	1
2	CB 301 CB STAND ASSEMBLY	1
3	CB 310 FRL ASSEMBLY	1
4	CB 370-25 ABX HOSE BUNDLE ASSEMBLY	1

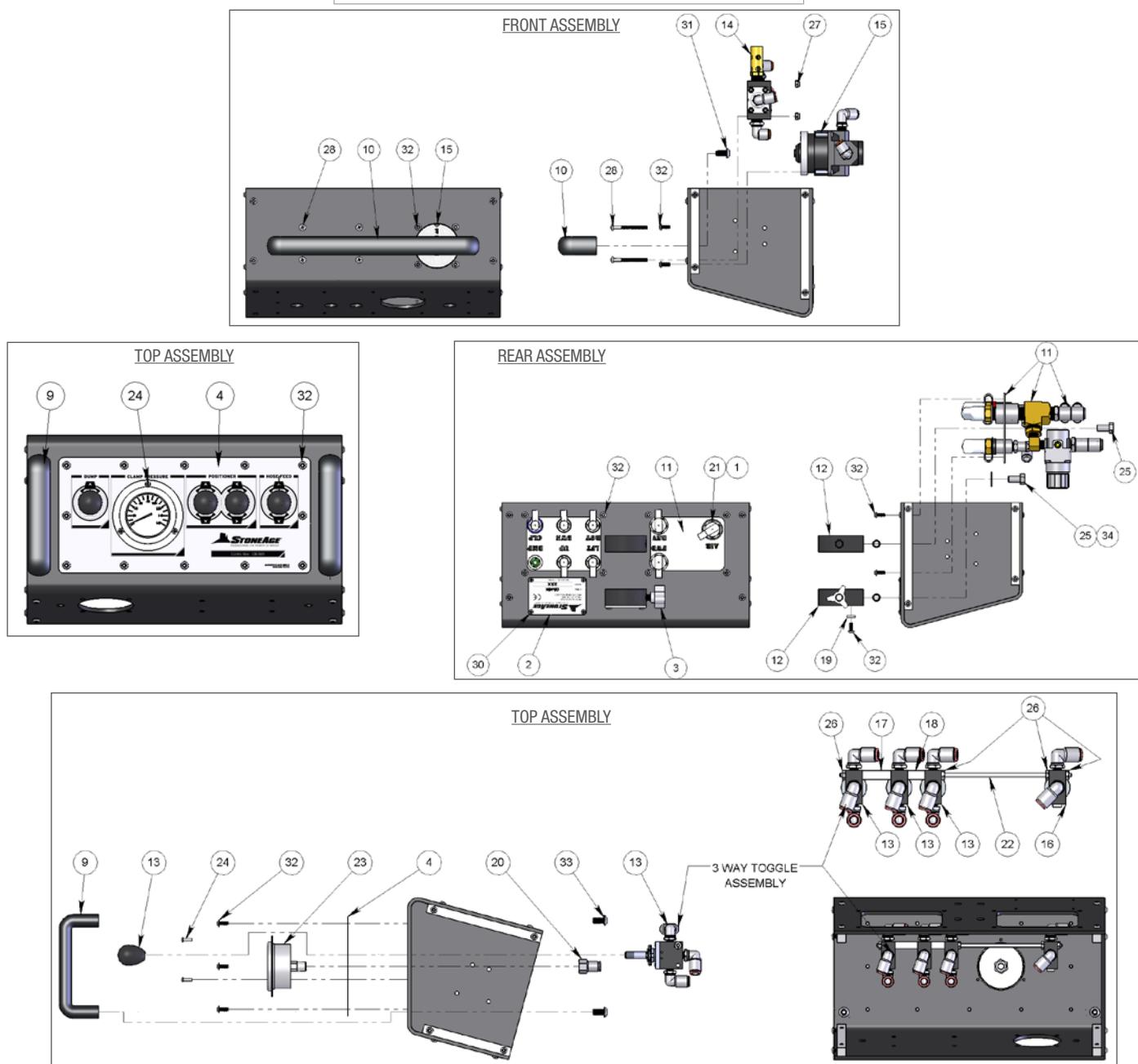
**AUTOBOX® (CB 300)
CONTROL BOX ASSEMBLY**
(CONTINUED ON NEXT PAGE)



#	PART NUMBER	QTY.
1	BR 167 DUST CAP	1
5	CB 321 CB FRAME	1
6	CB 322 SIDE PLATE	2
7	CB 323 BRACE REAR	2
8	CB 324 BRACE FRONT	2
21	CB 355 FTG P8J8 BRASS MALE TO MALE	1
32	GTB 319-02-32 BHTS .19-32 X .50 LG TORX-SS	42

PARTS DIAGRAM

**AUTOBOX® (CB 300)
CONTROL BOX ASSEMBLY (CONTINUED)**



#	PART NUMBER	QTY.
1	BR 167 DUST CAP	1
2	CB 304-001 CE SERIAL PLATE	1
3	CB 314 3-LOBE KNOB	1
4	CB 320 GRAPHIC OVERLAY	1
9	CB 325 HANDLE TOP	2
10	CB 326 HANDLE FRONT	1
11	CB 327-001 COUPLER PLATE, REAR ASSEMBLY	1
12	CB 328-001 POLE MOUNT	2
13	CB 333-HD PNEUM3WAYASSY	3

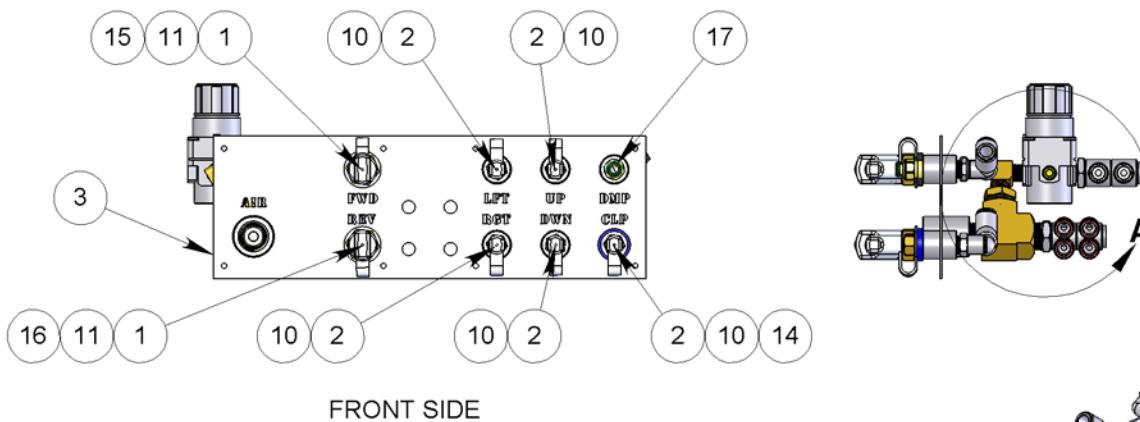
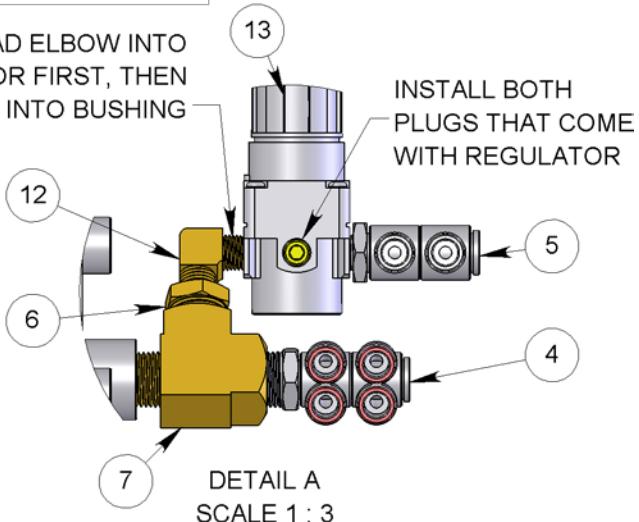
14	CB 334 RY3 AAA PILOTED SPOUL VALVE ASSY	1
15	CB 335 REG ASSY	1
16	CB 337-HD PNEUM3WAYASSY - DUMP	1
17	CB 344 SPACER #10 1-1_4LONG	1
18	CB 345 SPACER #10 3_4LONG	1
19	CB 347 CAP PLATE	1
20	CB 349 FTG P4F PL6 STRAIGHT	1
21	CB 355 FTG P8J8 BRASS MALE TO MALE	1
22	CB 361 10-24 THREADED ROD	1
23	CB 548-SS GAUGE	1
24	CB 554 BSHCS .138-32 X .50 SS	3

25	GB 337-03 BOLT, HEX .37-16 X .75 SS	4
26	GN 319-H HEX NUT SS	4
27	GN 319-L NYLOK NUT SS (HC 025.1)	4
28	GPH 319-08 PHPMS 10-24 X 2.00 SS	4
30	GSB 313-0075 BHCS 6-32 X .188 LG SS	4
31	GSB 3M8-16-1.25 BHCS M8X1.25 X 16 SS	2
32	GTB 319-02-32 BHTS .19-32 X .50 LG TORX-SS	42
33	GTB 331-025 BHTS .31-18 X .63 LG TORX-SS	4
34	GW 337-F FLAT WASHER SS	2

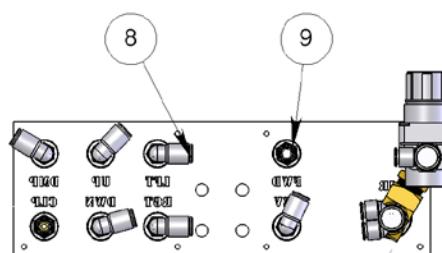
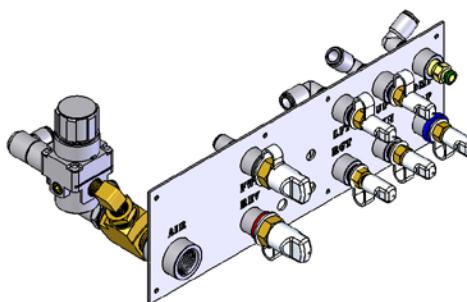
AUTOBOX® (CB 327-001)

COUPLER PLATE, REAR ASSEMBLY

THREAD ELBOW INTO
REGULATOR FIRST, THEN
THREAD INTO BUSHING



#	PART NUMBER	QTY.
1	BR 167 DUST CAP	2
2	BR 168 DUST CAP, J4	5
3	CB 327.1-001 COUPLER PLATE, REAR WELDMENT	1
4	CB 330 P8PL6 4-WAY MANIFOLD	1
5	CB 339 P4P6 MANIFOLD 2-WAY	1
6	CB 343 FTG P8P4 BUSHING	1
7	CB 346 FTG P8 T-FITTING	1
8	CB 351 FTG P4PL6 SWIVEL ELBOW	6
9	CB 354 FTG P4PL6 STRAIGHT	2
10	CB 356 FTG P4J4 BRASS MALE TO MALE	5
11	CB 357 FTG P4J8 BRASS MALE TO MALE	2
12	CB 365 FTG P4P4 ELBOW	1
13	CB 704 PRESSURE REGULATOR, 60 PSI	1
14	GP 011-B BLUE ID BAND MED	1
15	GP 011-BK BLACK ID BAND MED	1
16	GP 011-R RED ID BAND MED	1
17	SM 309 FITTING, BUSHING P4M PL4	1



BACK SIDE

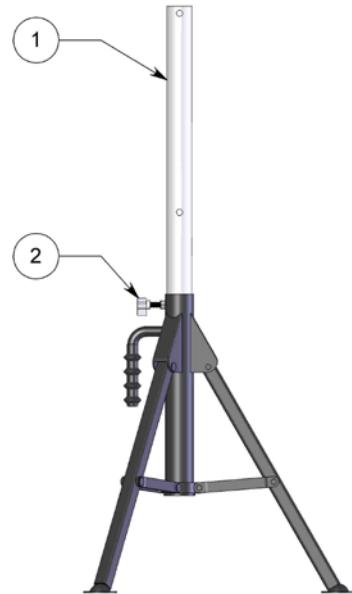
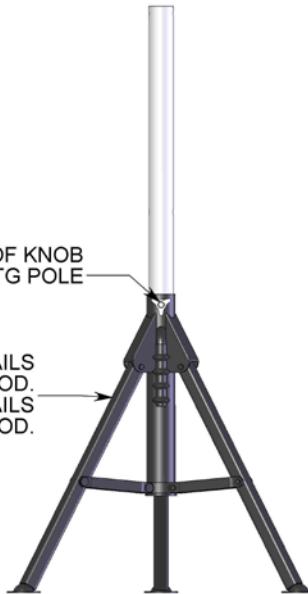
30°
NOMINAL

PARTS DIAGRAM



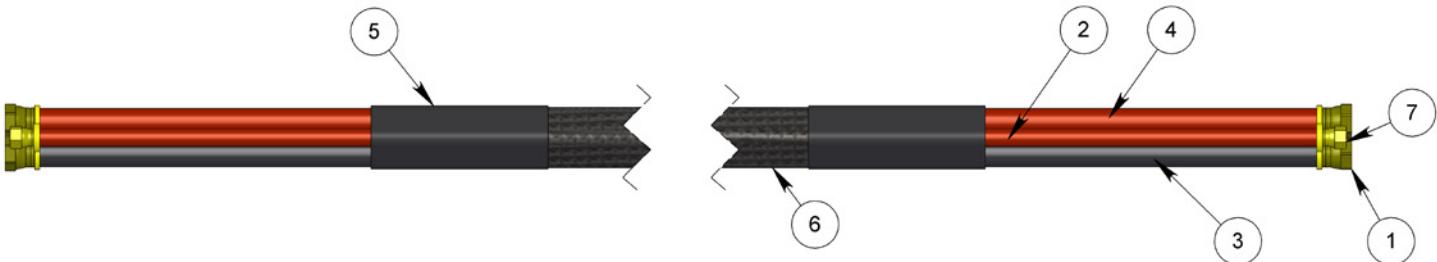
AUTOBOX® (CB 301)
CB STAND ASSEMBLY

ALIGN THREADS OF KNOB
THRU HOLE IN MTG POLE
SEE NOTE 1 FOR DETAILS
ON OBTAINING TRIPOD.
SEE SHEET 2 FOR DETAILS
ON MODIFYING TRIPOD.

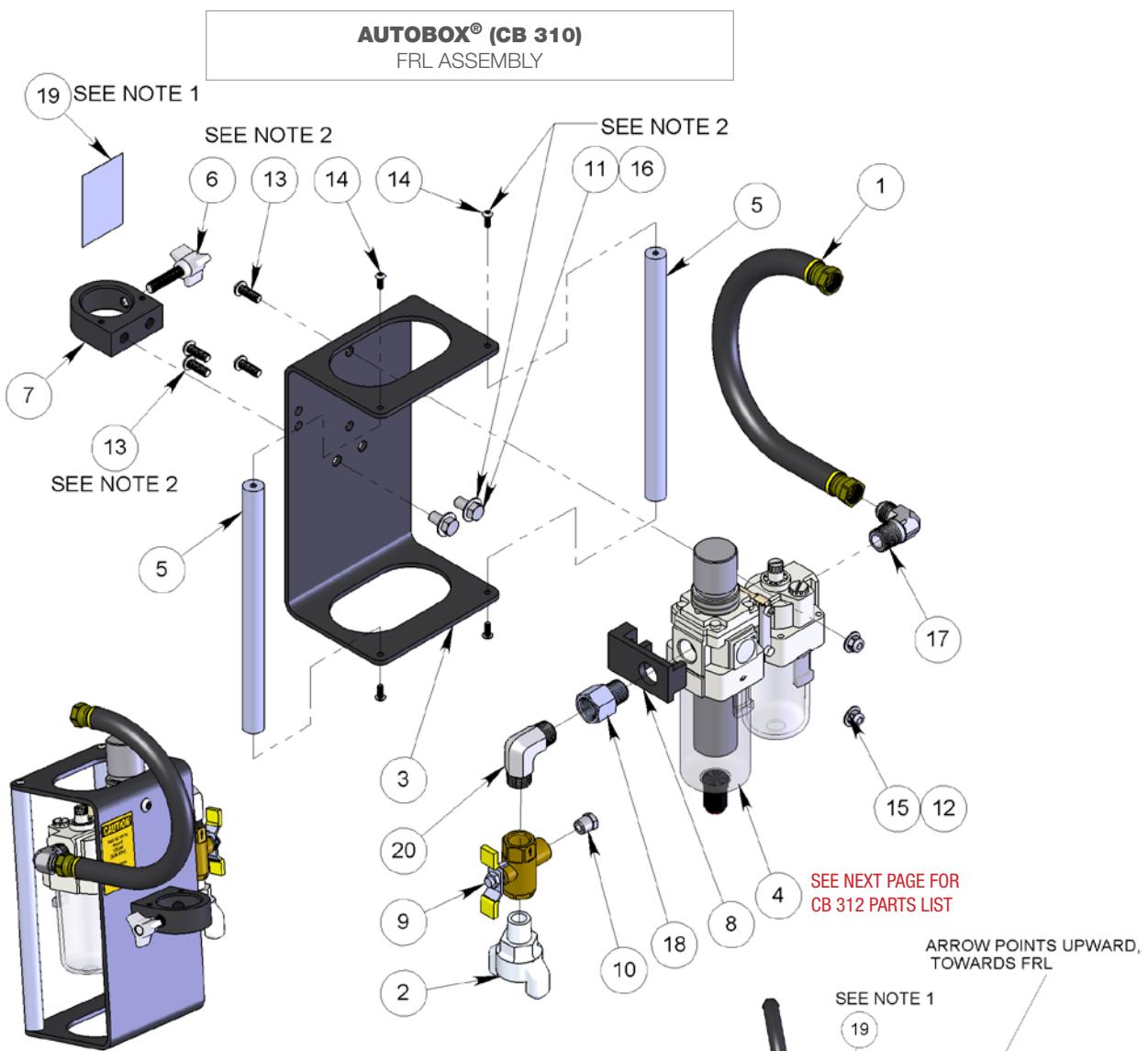


#	PART NUMBER	QTY.
1	CB 303 MTG POLE	1
2	CB 314 3-LOBE KNOB	1

AUTOBOX® (CB 370-25)
CONTROL LINE ASSEMBLY



#	PART NUMBER	QTY.	UNITS
1	GP 053 1/2" PUSH-ON BRASS HOSE FITTING 1/2" JIC	4	
2	GPHO 0250-RUB-RD 1/4" ID X 1/2" OD PUSH-ON AIR HOSE, BUNA-N/PVC, 250 PSI, RED	1	25'
3	GPHO 0500-RUB-BK 1/2" ID X 3/4" OD PUSH-ON AIR HOSE, BUNA-N/PVC, 250 PSI, BLACK	1	25'
4	GPHO 0500-RUB-RD 1/2" ID X 3/4" OD PUSH-ON AIR HOSE, BUNA-N/PVC, 250 PSI, RED	1	25'
5	GPHS 2000-OLE-A-BK 2.00 DIA HEAVY DUTY MOISTURE SEAL HEAT-SHRINK	2	5"
6	GPSL 1750-NYL-G-BK 1.75 DIA BRAIDED EXPANDABLE HEAVY DUTY NYLON	1	24'
7	SRT 122 1/4" PUSH-ON BRASS HOSE FITTING 1/4" JIC	2	



NOTES:

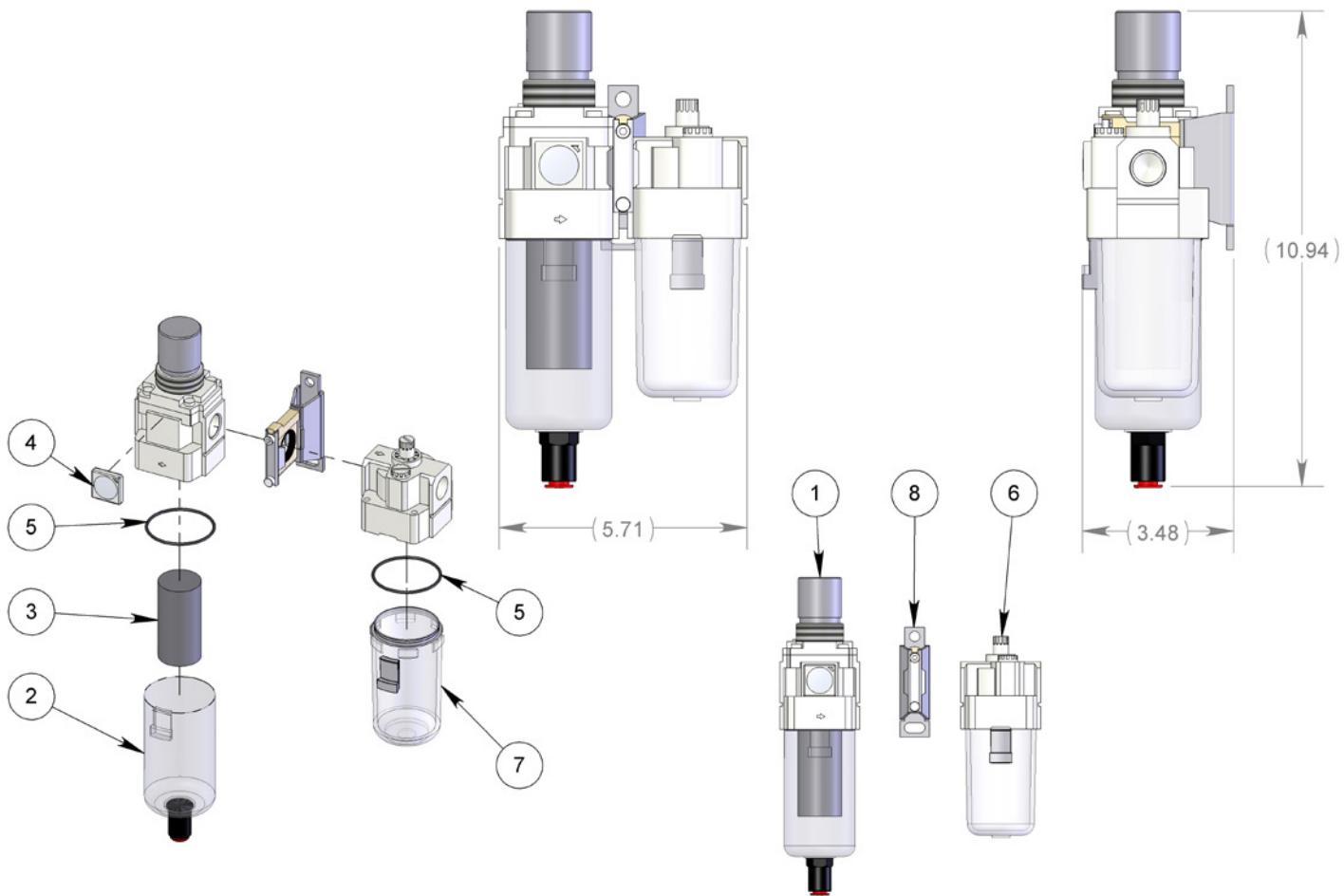
- CLEAN ALL DEBRIS & OILS BEFORE INSTALLING. INSTALL AT APPROXIMATE ORIENTATION AND LOCATION & AT ROOM TEMP.
- APPLY BLUE LOCTITE (PN: 242 OR EQUIVALENT) TO ALL STRAIGHT THREADED FASTENERS.
- APPLY THREAD SEALANT (LOCTITE 567 OR EQUIVALENT) TO ALL TAPERED THREADS.
- ADD BLUE GOOP WHICH IS A SWAGELOK BRAN ANTI-SEIZE TO ALL OTHER THREADED HARDWARE OR AN EQUIVALENT ALTERNATIVE IS ACCEPTABLE.

#	PART NUMBER	QTY.
1	CB 052-14 HOSE ASSY (FOR CB ABX)	1
2	CB 114 INLET FITTING	1
3	CB 311 FRL FRAME	1
4	CB 312 GEN3 FILTER-REGULATOR-LUBRICATOR WITH GEN2 CLAMP	1
5	CB 313 ROD	2
6	CB 314 3-LOBE KNOB	1
7	CB 328-001 POLE MOUNT	1
8	CB 395 FRL BRACKET	1
9	CB 792 VALVE, AUTODRAIN, P8	1
10	CB 793 BREATHER, SINTERED BRONZE, P4	1

11	GB 337-03 BOLT, HEX .37-16 X .75 SS	2
12	GN 331-L NYLOK NUT SS	2
13	GSB 331-035 BHCS .31-18 X .88 LG SS	4
14	GTB 319-02-32 BHTS .19-32 X .50 LG TORX-SS	4
15	GW 331-F FLAT WASHER SS	2
16	GW 337-F FLAT WASHER SS	2
17	HRS 573 FITTING 90 DEG P8J8	1
18	ML 077-P8 BUSHING	1
19	PL 156-125 CAUTION INLET AIR, 125PSI MAX	1
20	SBT 292.1 FTG 90° ELBOW P8MP8M	1

PARTS DIAGRAM

AUTOBOX® (CB 312)
GEN 3 FILTER, REGULATOR, LUBRICATOR WITH GEN 2 CLAMP



NOTICE

REV A

THE ORIGINAL SMC AC40A-N04DE-Z HAS BECOME OBSOLETE AND REPLACED WITH SMC AC40A-N04DE-Z-B. IT IS COMPLETELY INTERCHANGEABLE.

REV B

THE GEN3 CLAMPS IN THE SMC AC40A-N04DE-Z-B ASSEMBLIES WERE FAILING. THE AAP1378 ASSY USES THE GEN2 CLAMP. IT IS COMPLETELY INTERCHANGEABLE.

#	PART NUMBER	QTY.
1	CB 312.1 FILTER REGULATOR ASSEMBLY	1
2	CB 312.1.1 FILTER REGULATOR BOWL	1
3	CB 312.1.6 FILTER	1
4	CB 312.1.7 GAUGE WITH LENS	1
5	CB 312.1.8 ORING	2
6	CB 312.2 LUBRICATOR ASSEMBLY	1
7	CB 312.2.2 LUBRICATOR BOWL	1
8	CB 312.3 SPACER WITH BRACKET	1

**1****LWP-500 POSITIONER**

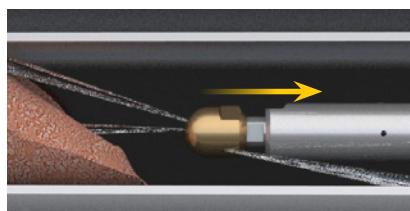
- With its multiple mounting options, the LWP-100 positioner can adapt to almost any heat exchanger.
- Two high-powered pneumatic motors provide fast, precise positioning.
- Entire unit can be set up and operated with a single operator and minimal hand tools.
- Anodized aluminum rails provide maximum chemical and corrosion resistance.

**2****AST-200 AUTOSTROKE – AUTOMATIC BLOCKAGE SENSOR**

- Maximizes head life and cleaning efficiency by automatically detecting blockages and methodically working through the obstruction
- Easily installs in-line to your pneumatic lines.
- The perfect complement to your ABX-2L system.



HEAD CONTACTS BLOCKAGE AND STOPS ROTATING



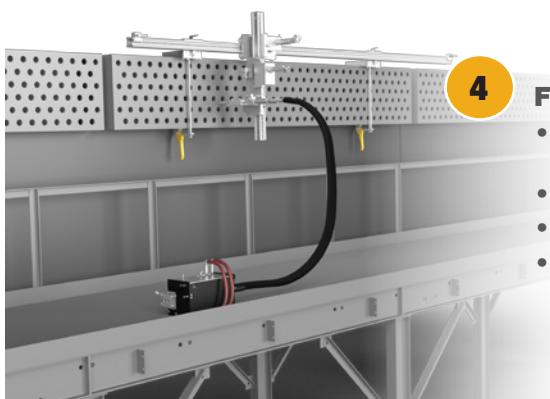
AUTOSTROKE 'SENSES' BLOCKAGE AND PULLS HOSE BACK SLIGHTLY TO REGAIN HEAD ROTATION



HEAD REGAINS NORMAL ROTATION AND HOSE FEED CONTINUES

**3****HCS-2L – HOSE CONTAINMENT**

- Holds up to 100 ft (30 m) of hose.
- Built-in backout prevention for improved job site safety.
- Keeps job site clear of trip hazards.
- Helps manage hoses for easy transport and storage.
- Greatly extends hose life.

**4****FIN-FAN ATTACHMENT**

- Allows the ABX-2L to be operated in confined walkways to access Fin-Fan exchangers.
- Adjustable pitch.
- Customized lengths available.
- Scaffold attachment available.

TERMS AND CONDITIONS

1. Acceptance of Terms and Conditions. Receipt of these Terms and Conditions of Sale ("Terms and Conditions") shall operate as the acceptance by StoneAge, Inc. ("Seller") of the order submitted by the purchaser ("Buyer"). Such acceptance is made expressly conditional on assent by Buyer to these Terms and Conditions. Such assent shall be deemed to have been given unless written notice of objection to any of these 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 Buyer with prompt and efficient service. However, to individually negotiate the terms of each sales contract would substantially impair Seller's ability to provide such service. Accordingly, the product(s) furnished by Seller are sold only according to the terms and conditions stated herein and with the terms and conditions stated in any effective StoneAge Dealer Agreement or StoneAge Reseller Agreement, if applicable. Notwithstanding any terms and conditions on Buyer's order, Seller's performance of any contract is expressly made conditional on Buyer's agreement to these Terms and Conditions 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.

2. Payment/Prices. Unless other arrangements have been made in writing between Seller and Buyer, payment for the product(s) shall be made upon receipt of invoice. The prices shown on the face hereof are those currently in effect. Prices invoiced shall be per pricelist 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 the product(s), and the collection of which Seller is or may be responsible to provide to any governmental authority, unless acceptable exemption certificates are provided by Buyer in accordance with applicable 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 product(s) being purchased, whether now in effect or hereafter imposed by any governmental authority, foreign or domestic.

3. Warranty. SELLER MAKES NO WARRANTIES OR REPRESENTATIONS AS TO THE PERFORMANCE OF ANY PRODUCT EXCEPT AS SET FORTH IN THE STONEAGE LIMITED WARRANTY PROVIDED WITH THE PRODUCT.

4. 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. The proposed shipment date is an estimate. Seller will notify Buyer promptly of any material delay and will specify the revised delivery date as soon as practicable. 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).

All product(s) will be shipped F.O.B. point of origin, unless specifically agreed otherwise, and Buyer shall pay all shipping costs and insurance costs from that point. Seller, in its sole discretion, will determine and arrange the means and manner of transportation of the product(s). Buyer shall bear all risk of loss commencing with the shipment or distribution of the product(s) from Seller's warehouse. Order shortages or errors must be reported within fifteen (15) business days from receipt of shipment to secure adjustment. No product(s) may be returned without securing written approval from Seller.

5. Modification. These Terms and Conditions are intended by Seller and Buyer to constitute a final, complete and exclusive expression of agreement relating to the subject matter hereof and cannot be supplemented or amended without Seller's prior written approval.

6. Omission. Seller's waiver of any breach or Seller's failure to enforce any of these 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 hereof.

7. Severability. If any provision of these Terms and Conditions is held to be invalid or unenforceable, such invalidity or unenforceability shall not affect the validity or enforceability of the other portions hereof.

8. Disputes. Seller and Buyer shall attempt in good faith to promptly resolve any dispute arising under these Terms and Conditions by negotiations between representatives who have authority to settle the controversy. If unsuccessful, Seller and Buyer 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 Seller and Buyer.

9. Governing Law. 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.

10. Jurisdiction and Venue. Seller and Buyer agree that the state or federal courts located within the City and County of Denver, Colorado shall have sole and exclusive jurisdiction over any litigation concerning any dispute arising under these Terms and Conditions not otherwise resolved pursuant to Section 9 as well as any alleged defects of any Products or damages sustained as a result of such alleged defects. Seller and Buyer further agree that should any litigation be commenced in connection with such a dispute, it shall only be commenced in such courts. Seller and Buyer agree to the exclusive jurisdiction of such courts and neither will raise any objection to the jurisdiction and venue of such courts, including as a result of inconvenience.

11. Attorney's Fees. 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 mediation.

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>

STONEAGE TERMS AND WARRANTY

View StoneAge's Terms and Warranty Conditions online.

<http://www.stoneagetoools.com/terms>

<http://www.stoneagetoools.com/warranty>

Warranties set forth herein extend only to End-Users, meaning customers acquiring, or that have previously acquired, a product manufactured by StoneAge ("Product") for their own use and not for resale, either directly from StoneAge Inc. ("StoneAge") or from a StoneAge Authorized Dealer or Reseller ("Dealer"). No warranty of any kind or nature is made by StoneAge beyond those expressly stated herein.

1. LIMITED WARRANTY PERIOD. Subject to the limitations and conditions hereinafter set forth, StoneAge warrants its Product to be free from defects in workmanship and material for a period of one (1) year from the date of purchase by the End-User, provided that the end of the limited warranty period shall not be later than eighteen (18) months from the date of shipment of the Product to the Dealer or the End-User by StoneAge ("Limited Warranty Period"). All replacement parts which are furnished under this Limited Warranty and properly installed shall be warranted to the same extent as the original Product under this Limited Warranty if, and only if, the original parts were found to be defective within the original Limited Warranty Period covering the original Product. Replacement parts are warranted for the remainder of the original Limited Warranty Period. This Limited Warranty does not cover any component part of any Product not manufactured by StoneAge. Any such component part is subject exclusively to the component manufacturer's warranty terms and conditions.

2. LIMITED WARRANTY COVERAGE. StoneAge's sole obligation under this Limited Warranty shall be, at StoneAge's option and upon StoneAge's inspection, to repair, replace or issue a credit for any Product which is determined by StoneAge to be defective in material or workmanship. StoneAge reserves the right to examine the alleged defective Product to determine whether this Limited Warranty is applicable, and final determination of limited warranty coverage lies solely with StoneAge. No statement or recommendation made by a StoneAge representative, Dealer or agent to End-User shall constitute a warranty by StoneAge or a waiver or modification to any of the provisions hereof or create any liability for StoneAge.

3. WARRANTY SERVICE PROVIDERS. Service and repair of the Product is to be performed only by StoneAge authorized service representatives, including Dealers who are authorized repair centers, with StoneAge approved parts. Information about StoneAge authorized service representatives can be obtained through the StoneAge website at www.stoneagetools.com/ service. Unauthorized service, repair or modification of the Product or use of parts not approved by StoneAge will void this Limited Warranty. StoneAge reserves the right to change or improve the material and design of the Product at any time without notice to End-User, and StoneAge is not obligated to make the same improvements during warranty service to any Product previously manufactured.

4. WARRANTY EXCLUSIONS. This Limited Warranty does not cover, and StoneAge shall not be responsible for the following, or damage caused by the following: (1) any Product that has been altered or modified in any way not approved by StoneAge in advance in writing; (2) any Product that has been operated under more severe conditions or beyond the rated capacity specified for that Product; (3) depreciation or damage caused by normal wear and tear, failure to follow operation or installation instructions, misuse, negligence or lack of proper protection during storage; (4) exposure to fire, moisture, water intrusion, electrical stress, insects, explosions, extraordinary weather and/or environmental conditions including, but not limited to lightning, natural disasters, storms, windstorms, hail, earthquakes, acts of God or any other force majeure event; (5) damage to any Product caused by any attempt to repair, replace, or service the Product by persons other than StoneAge authorized service representatives; (6) costs of normal maintenance parts and services; (7) damage sustained during unloading, shipment or transit of the Product; or (8) failure to perform the recommended periodic maintenance procedures listed in the Operator's Manual accompanying the Product.

5. REQUIRED WARRANTY PROCEDURES. To be eligible for warranty service, the End-User must: (1) report the Product defect to the entity where the Product was purchased (i.e. StoneAge or the Dealer) within the Limited Warranty Period specified in this Limited Warranty; (2) submit the original invoice to establish ownership and date of purchase; and (3) make the Product available to a StoneAge authorized service representative for inspection to

determine eligibility for coverage under this Limited Warranty. This Limited Warranty shall not extend to any person or entity who fails to provide proof of original purchase from StoneAge or a Dealer. No Product may be returned for credit or adjustment without prior written permission from StoneAge.

6. DISCLAIMER OF IMPLIED WARRANTIES AND OTHER REMEDIES. EXCEPT AS EXPRESSLY STATED HEREIN (AND TO THE FULLEST EXTENT ALLOWED UNDER APPLICABLE LAW), STONEAGE HEREBY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND ANY AND ALL WARRANTIES, REPRESENTATIONS OR PROMISES AS TO THE QUALITY, PERFORMANCE OR FREEDOM FROM DEFECT OF THE PRODUCT COVERED BY THIS LIMITED WARRANTY. STONEAGE FURTHER DISCLAIMS ALL IMPLIED INDEMNITIES.

7. LIMITATION OF LIABILITY. End-User specifically acknowledges that the Product may be operated at high speeds and/or pressures, and that as such it may be inherently dangerous if not used correctly. End-User shall familiarize itself with all operation materials provided by StoneAge and shall at all times use and require its agents, employees and contractors to use all necessary and appropriate safety devices, guards and proper safe operating procedures. In no event shall StoneAge be responsible for any injuries to persons or property caused directly or indirectly by the operation of the Product if End-User or any agent, employee, or contractor of End-User: (1) fails to use all necessary and appropriate safety devices, guards and proper safe operating procedures; (2) fails to maintain in good working order such safety devices and guards; (3) alters or modifies the Product in any way not approved by StoneAge in advance in writing; (4) allows the Product to be operated under more severe conditions or beyond the rated capacity specified for the Product; or (5) otherwise negligently operates the Product. End-User shall indemnify and hold StoneAge harmless from any and all liability or obligation incurred by or against StoneAge, including costs and attorneys' fees, to or by any person so injured.

TO THE FULL EXTENT ALLOWED BY APPLICABLE LAW, STONEAGE SHALL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR PUNITIVE DAMAGES (INCLUDING WITHOUT LIMITATION, LOSS OF PROFITS, LOSS OF GOODWILL, DIMINUTION OF VALUE, WORK STOPPAGE, INTERRUPTION OF BUSINESS, RENTAL OF SUBSTITUTE PRODUCT, OR OTHER COMMERCIAL LOSS EVEN TO THE EXTENT SUCH DAMAGES WOULD CONSTITUTE DIRECT DAMAGES), WITH RESPECT TO THE COVERED STONEAGE PRODUCT, OR OTHERWISE IN CONNECTION WITH THIS LIMITED WARRANTY, REGARDLESS OF WHETHER STONEAGE HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

IT IS UNDERSTOOD THAT STONEAGE'S LIABILITY, WHETHER IN CONTRACT, IN TORT, UNDER ANY WARRANTY, IN NEGLIGENCE, OR OTHERWISE SHALL NOT EXCEED THE AMOUNT OF THE PURCHASE PRICE PAID BY THE END-USER FOR THE PRODUCT. STONEAGE'S MAXIMUM LIABILITY SHALL NOT EXCEED, AND END-USER'S REMEDY IS LIMITED TO EITHER (1) REPAIR OR REPLACEMENT OF THE DEFECTIVE WORKMANSHIP OR MATERIAL OR, AT STONEAGE'S OPTION, (2) REFUND OF THE PURCHASE PRICE, OR (3) ISSUANCE OF A CREDIT FOR THE PURCHASE PRICE, AND SUCH REMEDIES SHALL BE END-USER'S ENTIRE AND EXCLUSIVE REMEDY.

YOU, THE END-USER, UNDERSTAND AND EXPRESSLY AGREE THAT THE FOREGOING LIMITATIONS ON LIABILITY ARE PART OF THE CONSIDERATION IN THE PRICE OF THE STONEAGE PRODUCT YOU PURCHASED.

Some jurisdictions do not allow the limitation or exclusion of liability for certain damages, so the above limitations and exclusions may not apply to you. This Limited Warranty gives you specific legal rights, and you may also have other rights which vary from jurisdiction to jurisdiction. If any provisions of this Limited Warranty is held to be invalid or unenforceable, such invalidity or unenforceability shall not affect the validity or enforceability of the other portions hereof.



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