



USER MANUALS AND PRODUCT INFORMATION

STONEAGE CONTACT INFORMATION

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FIRMWARE UPDATE INSTRUCTIONS

QUICK SYSTEM CONNECTION GUIDE

CONTROLLER FUNCTION & SCREEN MAP

TROUBLESHOOTING

ABXS-3L HOSE TRACTOR USER MANUAL

LWPS LIGHTWEIGHT POSITIONER USER MANUAL

CONTROLLER & POWER HUB USER MANUAL

Our global support teams are here to help.



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AUTO PACK ABXS - 3L PACKAGE CONTENTS



COLOR CODE CHART FOR MANUALS:

ABXS-3L USER MANUAL

CTRL & PHA USER MANUAL

LWPS-100 USER MANUAL

#	PART NUMBER AND DESCRIPTION	QTY
1	ABX 115-12 GUIDE TUBE, .459 ID	3
2	ABX 116-12 GUIDE TUBE, .546 ID	3
3	ABX 117-12 GUIDE TUBE, .674 ID	3
4	ABX 119-12 GUIDE TUBE, .745 ID	3
5	ABX 641 3 LANCE, MEDIUM PRESSURE Y-MANIFOLD & FITTINGS KIT	1
6	ABXS 628 SPARE PARTS KIT, 3LS AND LWPS W IPOD	1
7	ABXS-3L BELT TRACK DRIVE HOSE TRACTOR, SENTINEL	1
8	CBL E020F-1RB6PP CABLE FOR CONTROLLER	1
9	CBL E050F-1RB3RP POWER CABLE 50FT	1
10	CBL EA15F-1RB6PP-2PL10-1PL5 CABLE ASSY FOR ABXS TRACTOR	1

11	CTRL-100 CONTROLLER	1
12	GPT 071-3LS 3LS AND LWPS CHEST	1
13	GPT 108-S 3LS COLLET AND HOSE STOP KIT	1
14	GPT 310 TOOL BAG, 18IN	2
15	LWP 621 QUICK CLAMP KIT, 4 PCS	1
16	LWP 622 PLATE CLAMP KIT, 2 PCS	1
17	LWPS-100-6 LWP SENTINEL W RAILS	1
18	PH-A0302A00C20 POWER HUB	1
19	PHA 510-XX POWER SUPPLY 12V AC-DC	1
20	PHA 520 POWER SUPPLY 12V DC-DC	1

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#	PART NUMBER AND DESCRIPTION	QTY
1	ABX 641.1 3 LANCE, MEDIUM PRESSURE Y-MANIFOLD AND FITTING ASSY	1
2	AF 061-MP9 ADAPTER, 3/4 MALE MP TO 3/4 MALE TYPE M	3
3	AF 063-MP12 ADAPTER, 1.00 MALE TYPE M TO 3/4 MALE MP, 22k	2
4	AF 064-MP12 ADAPTER, 3/4 MALE MP X 1-5/16 MALE TYPE M, 22k	1
5	AF 070-MP9 GLAND, 9/16 MP	2
6	AF 076-MP9 PLUG, 9/16 MP	2
7	GPT 090 CASE, 11.25 X 7.5 X 3.75, FOAM, 10.25 X 6.5 X 2.125	1
8	PL 692 PL 692 Y-MANIFOLD AND FITTINGS KIT REFERENCE TRIFOLD	1

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#	PART NUMBER AND DESCRIPTION	ABXS 628 (W IPOD)	ABXS 628-NI (NO IPOD)
1	ABXS 150 LANCE POSITION SENSOR	1	1
2	ABXS 161 HOSE CRIMP AND HOSE STOP SENSOR PUCK	1	1
3	ABXS 611 SPARES FITTING KIT, PL	1	1
4	EE AC-IP-0001 IPOD TOUCH, RED, 32GB	1	-
5	EE AC-IP-0002 IPOD WATERPROOF CASE, BLACK	1	-
6	EE AC-IP-0003 IPOD USB CHARGER	1	-
7	GPT 022-187-B HEX KEY, .187IN, STANDARD L BALL END	1	1
8	GPT 024-T10 TORX DRIVER, T10	1	1
9	GPT 081 COLLET KIT CASE WITH PLAIN FOAM INSERTS	1	1
10	GPT 340.1.2 SPARE PARTS BOX FOAM LAYER 1	1	1
11	LWPS 130-K SPARE LWPS SENSOR ASSEMBLY	1	1

**G P T
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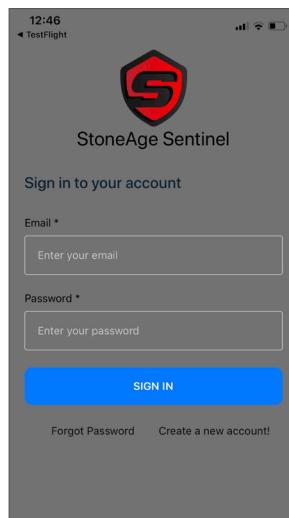


#	PART NUMBER AND DESCRIPTION	QTY.
1	ABX 171-297 HOSE STOP COLLET, .297	1
2	ABX 171-328 HOSE STOP COLLET, .328	1
3	ABX 171-406 HOSE STOP COLLET, .406	1
4	ABX 171-438 HOSE STOP COLLET, .438	1
5	ABX 171-460 HOSE STOP COLLET, .460	1
6	ABX 171-484 HOSE STOP COLLET, .484	1
7	ABX 171-516 HOSE STOP COLLET, .516	1
8	ABX 171-547 HOSE STOP COLLET, .547	1
9	ABX 171-594 HOSE STOP COLLET, .594	1
10	ABX 171-625 HOSE STOP COLLET, .625	1

11	GPT 023-140 HEX DRIVER, 9/64"	1
12	GPT 081COLLET KIT CASE WITH PLAIN FOAM INSERTS	1
13	GPT 300.2.2-001 FOAM, 2L/3L & CHS, LAYER 2, COLLET BOX SECTION	1
14	HSS 121-27-34 HOSE BEAK HOSE STOP ASSEMBLY, .27-.34	3
15	HSS 121-34-42 HOSE BEAK HOSE STOP ASSEMBLY, .34-.42	3
16	HSS 121-42-50 HOSE BEAK HOSE STOP ASSEMBLY, .42-.50	3
17	HSS 121-50-56 HOSE BEAK HOSE STOP ASSEMBLY, .50-.56	3
18	HSS 121-56-61 HOSE BEAK HOSE STOP ASSEMBLY, .56-.61 (LONG)	3
19	PL 684 COLLET and HOSE STOP REFERENCE TRIFOLD	1

UPDATING THE CONTROLLER FIRMWARE

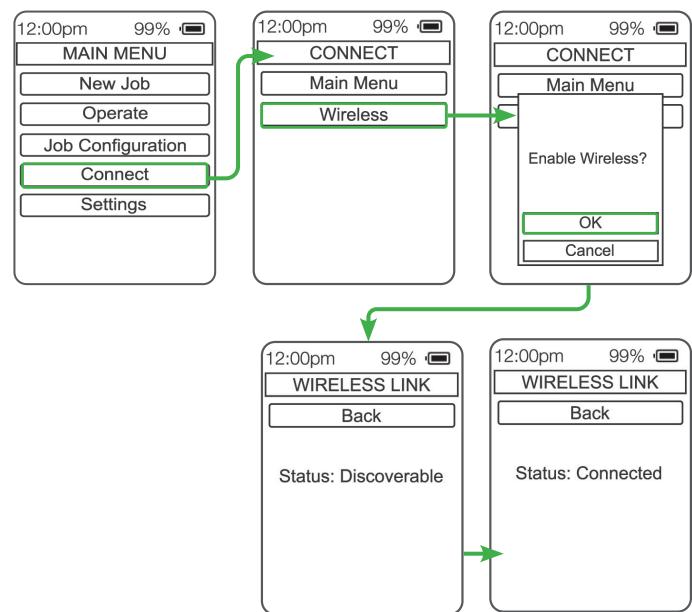
1. Ensure the **iPod touch®** is connected to the internet.
2. Sign in on the **iPod touch®**



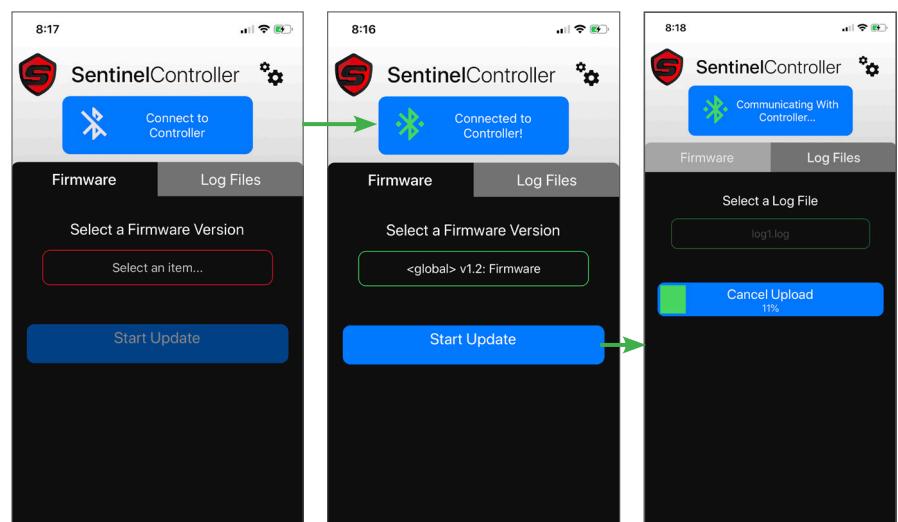
3. Turn on the Sentinel Controller
4. From the **Main Menu**, using the left joystick, scroll down and select **Connect**.
5. Select **Wireless** from the **Connect** menu.
6. Click **OK** on the **Enable Wireless?** pop-up.

If your Controller now says **Status: Discoverable**, the Controller is ready to connect to the iPod.

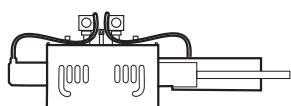
When the Controller says **Status: Connected**, it is connected to the Ipod.



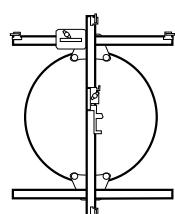
7. Click **Connect to Controller** button. The screen will say **Connecting** then **Connected**. The Bluetooth logo will turn green.
8. Select the **Firmware version** and **Start Update**.
9. When the update is complete, the Operator can return to the Controller.



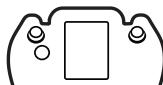
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ORGANIZE CABLE BUNDLES**SYSTEM CABLE BUNDLES**

**15 FT (4.5m) HOSE TRACTOR CABLE BUNDLE
(CBL EA15F-1RB6PP-2PL10-1PL5)**



**15 FT (4.5m) POSITIONER CABLE BUNDLE
(CBL EA15F-1RB6PP-2PL5)
2 BUNDLES REQUIRED**



**20 FT (6m) CONTROLLER CABLE
(CBL E020F-1RB6PP)**

POWER CABLES

The Power Hub can be connected using the 12v AC-DC or the 12v DC-DC supply. Both are available in US or EU versions.

**12V AC-DC US OR EU POWER SUPPLY
(PHA 510-XX)
FOR OUTLET**



OR

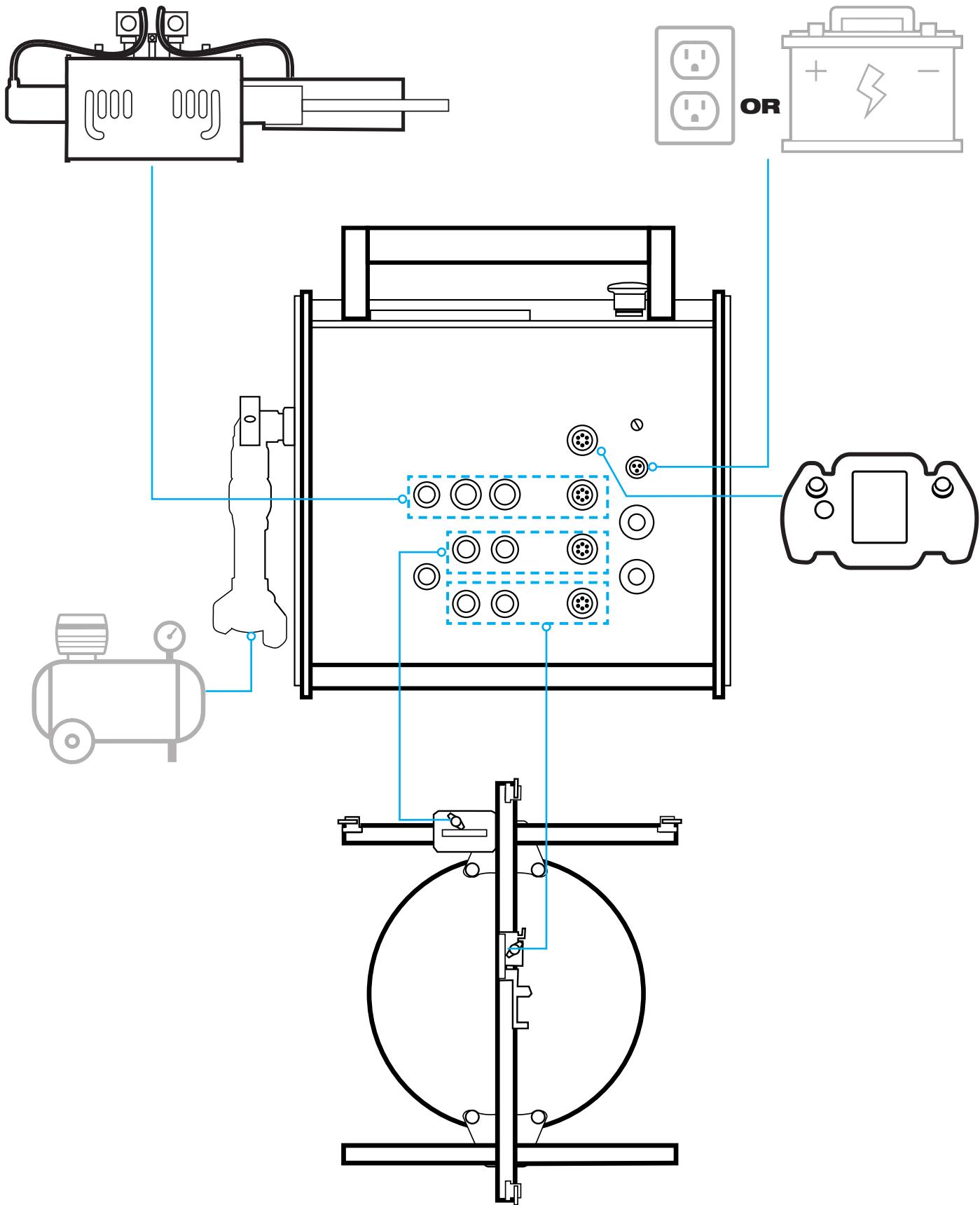


**12V DC-DC US OR EU POWER SUPPLY
(PHA 520)
FOR BATTERY**

**25 FT (7.6m) POWER CABLE EXTENSION
(CBL E025F-1RB3RRP)**

**OR
50 FT (15m) POWER CABLE EXTENSION
(CBL E050F-1RB3RRP)**





**CONTROLLER (CTRL-100)
FUNCTION OVERVIEW**

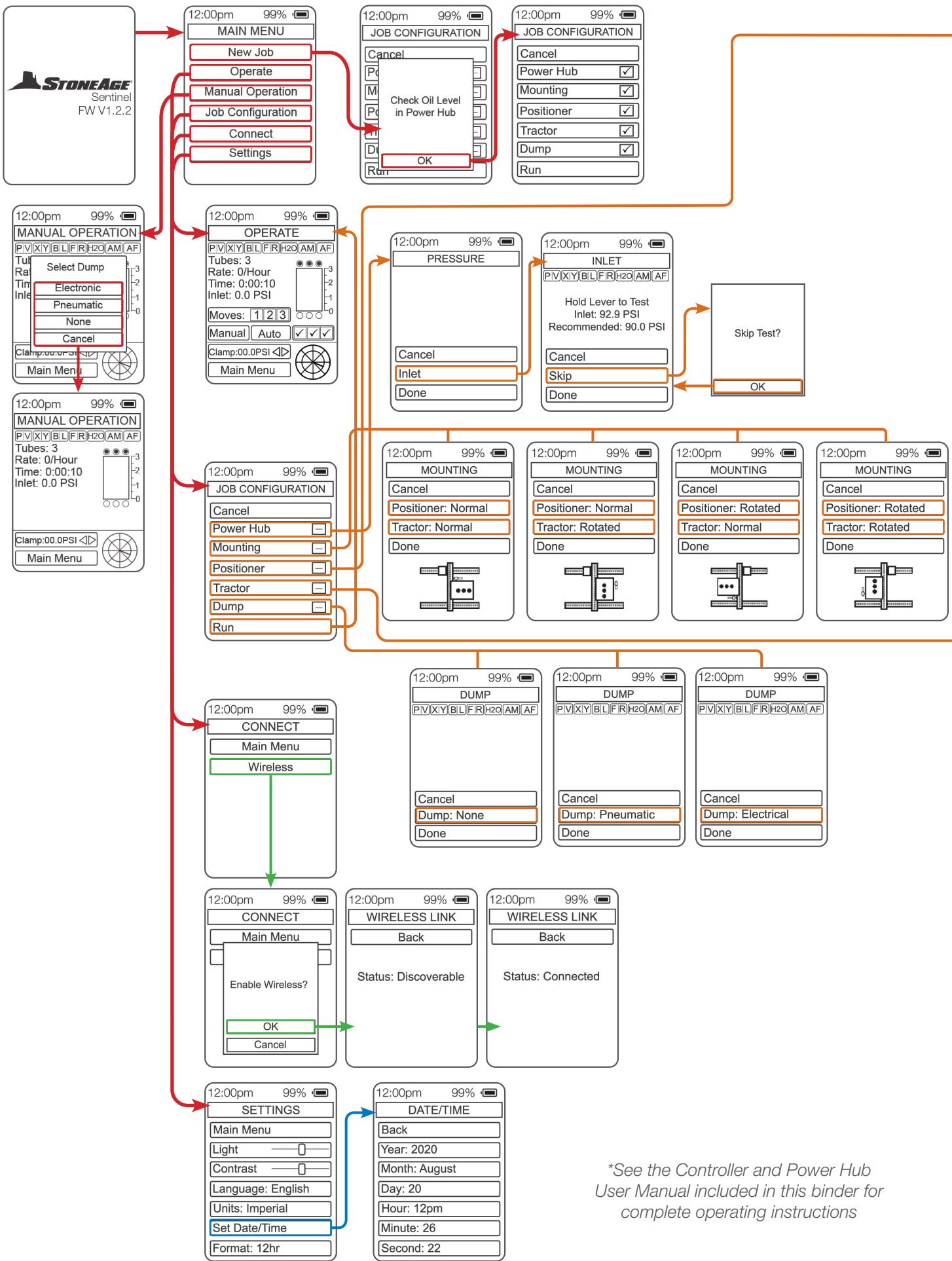
See the CTRL and PH User Manual included in this binder for complete instructions



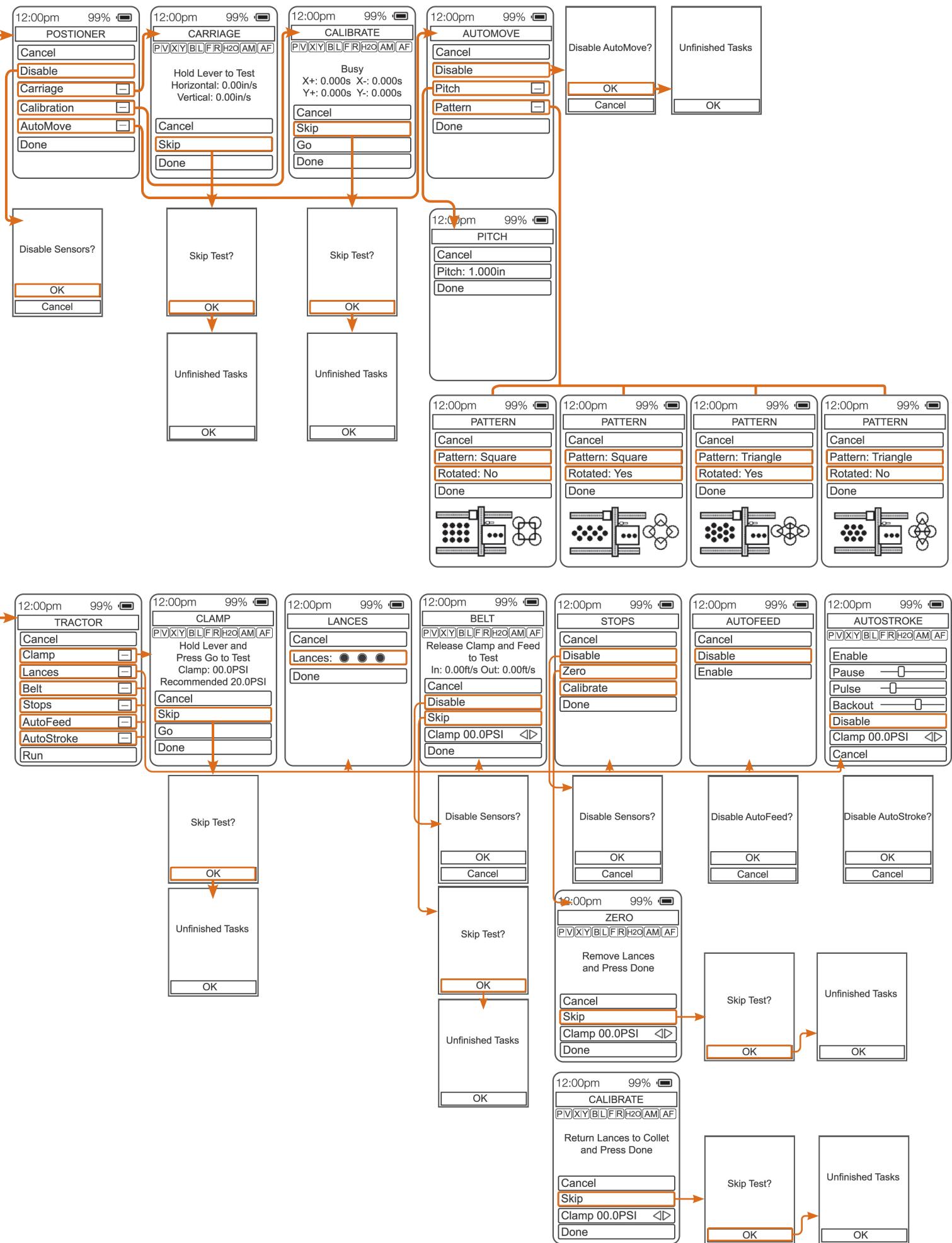
FRONT VIEW



BACK VIEW



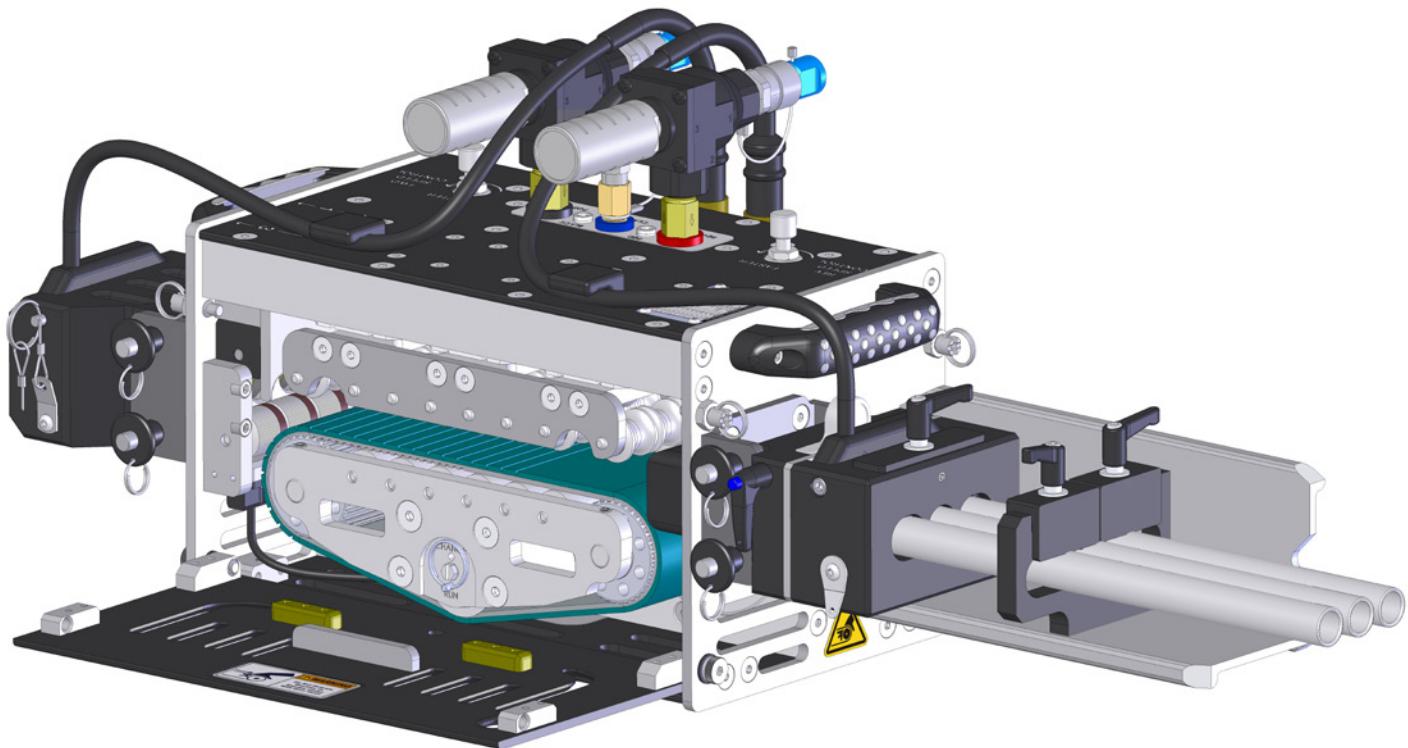
*See the Controller and Power Hub User Manual included in this binder for complete operating instructions



Problem	Resolution Steps
'PH Not Found' error message when the valve actuation lever is depressed	<ul style="list-style-type: none"> Verify all unused electrical connections on tractor and PH are capped such that they cannot get wet. If an electrical connector has gotten wet, blow the connection with compressed air and wipe with a clean dry rag to remove as much water as possible. Inspect electrical connectors to ensure they have not been damaged. Replace faulty sensor or cable. Note that if a replacement is not available, the component can be disconnected from the PH, and the operator can continue with a reduced functionality. For example, if a fault in the tractor subsystem results in loss of communication, the tractor can be disconnected from the PH and the operator will not be able to use AutoFeed, but will be able to continue to use AutoMove as long as the positioner sensors are still functional.
Cannot Maintain Air Pressure at Clamp Cylinders	<ul style="list-style-type: none"> Make sure the push to lock fitting at the tractor is fastened properly. The first click locks the hose into the fitting and the second click seals the connection.
Positioner moves the wrong distance when using AutoMove	<ul style="list-style-type: none"> Verify that the Mounting and Positioner/AutoMove settings match the type of tube face being cleaned. Go back to the setup menu and check the variables that affect the movement of the positioner; <ol style="list-style-type: none"> Pitch Pattern Rotated Pattern Rotated Tractor Rotated Positioner Number of Moves
Auto Stroke works intermittently or when it should not	<ul style="list-style-type: none"> Check the Lance Postion sensor that is used for AutoStoke. With the system completely de-energized, open the belt-side door of the tractor, the Lance Position sensor is located to the left of the belt. Check that the rollers and sensor are clear of debris and can rotate freely. Check that the magnet is connected to the roller.
Guide tubes are not always aligned with tubes after movement. This could occurs when using long guide tubes.	<ul style="list-style-type: none"> Make sure the umbilicals (system connections) and flex lances (HP hoses) are "free floating" when indexing. Make sure nothing is pulling sideways on the tractor. If using a Hose Containment device, make sure that the snout is not pulling on the tractor
Distance between tube face and guides is increasing	<ul style="list-style-type: none"> Make sure the Quick Release Clamp on the Vertical Carriage is securely tensioned to Guide Tube Assembly. When mounting the Guide Tube Assembly make sure to lift the backside of the Tractor a little bit, this will make sure the Guide Tube Assembly is completely parallel with the Vertical Carriage. Since most of the weight is behind the Vertical Carriage the Tractor and Guide Tube Assembly can be hanging in the Vertical Carriage but not completely secured. Always make sure before operating, to pull down on the Tractor with both hands and try to pull it back from the Lightweight Positioner and tilt the back of the Tractor upwards to make sure there is no play.
Difficulties getting the air hoses out of the push to connect fittings	<ul style="list-style-type: none"> To be sure all hoses are securely fastened to the push to lock fittings feel for two clicks. The first click locks the hose into the fitting and the second click seals the connection.
Difficulties in connecting the electrical connectors.	<ul style="list-style-type: none"> Using just a little bit of grease on the INSIDE of the ring will prevent corrosion and it will make the turning of the ring smooth and easy. Make sure there is a "click" when installing to ensure they are fully tightened and waterproof.



AUTOBOX® (ABXS-3L) HOSE TRACTOR *WITH SENTINEL TECHNOLOGY* USER MANUAL



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MANUFACTURER'S INFORMATION

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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).

Updated manuals can be downloaded at:
<https://www.stoneagetools.com/manuals>

DESCRIPTION OF EQUIPMENT AND INTENDED USE

The new AUTOBOX® ABXS-3L Hose Tractor design keeps all the same field proven features and adds integrated sensing technology.

The ABXS-3L Hose Tractor is designed to automatically feed lances and optimize cleaning with integrated, user-adjustable, speed controls. It also tracks lance position in the tube and detects and clears blockages. The Hose Tractor utilizes a heavy-duty synchronous belt with a durable polyurethane cover to control the rate at which the hoses and Banshee tools are advanced or retracted inside the tubes.

This Hose Tractor was developed for "Hands Free" heat exchanger tube cleaning applications. It is recommended it be used with the StoneAge® Banshee line of self-rotary waterblast tools.

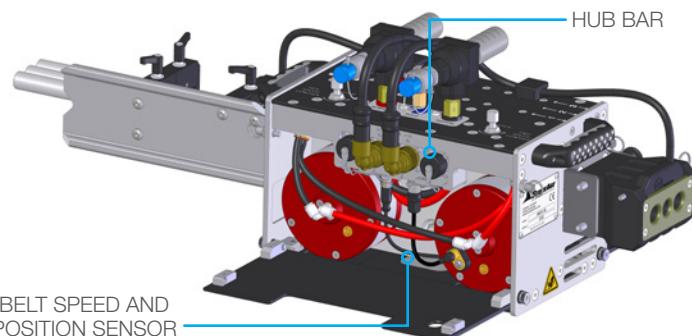
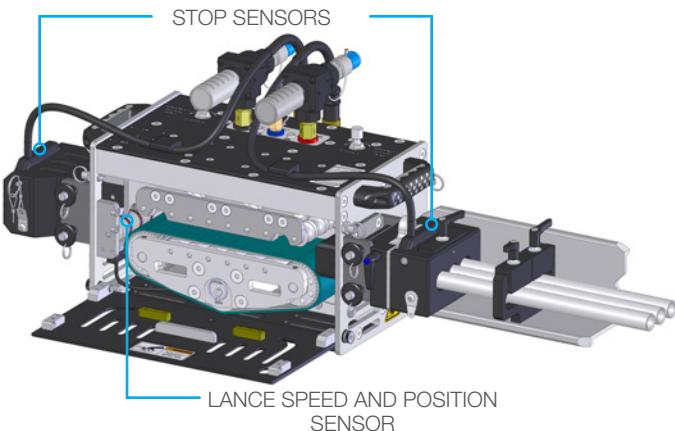
The ABXS-3L Hose Tractor was designed to accommodate up to three simultaneous flex lances ranging in size from 3/2 to 8/4 matched with the appropriate BN9.5, BN13, BN15, or BN18 size Banshee.

The guide assembly provides anti-withdrawal protection, and precise tube pitch adjustment.

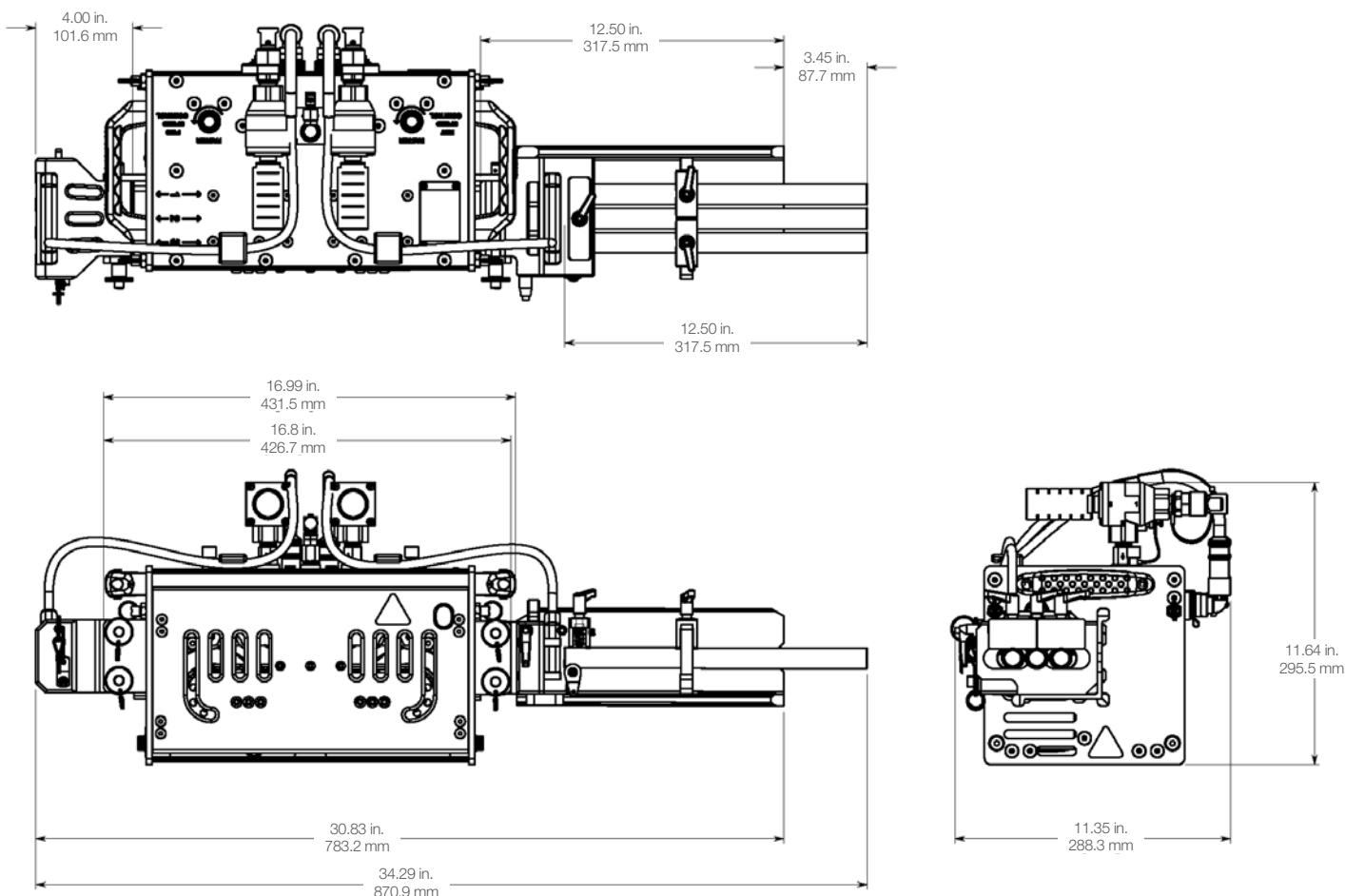
NEW FEATURES:

HOSE TRACTOR (ABXS-3L) WITH HOSE GUIDE (ABXS 160)

- Stop Sensors
 - Proprietary design
 - Reliably senses footballs and all hose crimps
 - Wear indicating rings
 - Replaceable 17-4 SS wear plate and anti-withdrawal collets
 - Contactless design
 - Easily removable sensor unit for maintenance and replacement
- Hub Bar
 - Integrated into ABXS frame Durable bayonet style external connectors Sealed and factory pressurized
- Lance Speed and Position Sensor
 - Independent suspension allows each lance to be detected separately
 - Flat knurled rollers for traction and accuracy
 - Pneumatic idlers pressurized from clamp circuit
 - Contactless magnetic sensor
 - Easily removable sensor unit for maintenance and replacement
- Belt Speed and Position Sensor
 - Heavy-duty sealed sensor
 - Integrated into air motor for durability
 - Single mounting screw, easily replaced



HOSE TRACTOR (ABXS-3L)		Imperial	Metric
Weight:	Without rear block, guide, and pins	52.6 lbs	24 kg
	With rear block, stop sensor, pins, NO GUIDE	56.4 lbs	26 kg
	Complete; with 3 guide tubes, collet, and, stop sensors	68.2 lbs	31 kg
Dimensions:	Tractor (only)	11.35 x 11.64 x 16.99 in.	288.3 x 295.5 x 431.5 mm
	Tractor with Hose Guide and 12 in. guide tubes	11.35 x 11.64 x 34.29 in	288.3 x 295.5 x 870.9 mm
Feed Rate: dependent upon application and hose size		0.3 - 3.0 ft/sec	8 - 914 mm/sec
Push/Pull Force		15 -150 lbs (5-75 lbs per lance)	7-68 kg (2-23 kg per lance)
System Air Consumption		50 cfm at 100 psi	1416 lpm at 6,8 bar
Manway Access:		18 in.	457 mm
HOSE GUIDE ASSEMBLY (ABXS 160)			
Weight:	With guide tubes and stop sensor, NO COLLET	11 lbs	5 kg
	Without collet or guide tubes, WITH STOP SENSOR	8 lbs	3.6 kg
Dimensions:		5.39 x 4.8 x 12.5 in.	137 x 122 x 317.5 mm
Pitch Adjustment Range (Dual)		5/8 - 5.0 in.	16 - 127 mm
Pitch Adjustment Range (Triple)		5/8 - 2.5 in.	16 - 64 mm
CONTROLLER (CTRL-100) AND POWER HUB (PH-A0302A00C20)		For detailed up to date information on these components. https://www.stoneagetools.com/assets/pdf/manuals	
LIGHTWEIGHT POSITIONER (LWPS-100-X)		For detailed up to date information on these components. https://www.stoneagetools.com/assets/pdf/manuals	





EC DECLARATION OF CONFORMITY

Manufacturer:

StoneAge Incorporated
466 South Skylane Drive
Durango, CO 81303
USA

Authorized Representative:

StoneAge Netherlands BV
Reedijk 7Q
3274 KE Heinenoord
Netherlands
Bob Van Wordragen, Operations Manager StoneAge NL

Declare that:

AutoBox® Hose Tractor (ABXS-3L)
for high pressure water cleaning of system parts.

Is compliant with the following Directives and Standards:

EU- Machinery Directive (2006/42/EC)

EU- RoHS Directive (2011/65/EU)

EN ISO 12100:2010 (E) Safety of machinery – General principles for design – Risk assessment and risk reduction

The Technical File for AutoBox® Hose Tractor (ABXS-3L) is maintained at:

StoneAge Incorporated, 466 South Skylane Drive, Durango, CO 81303, USA and was compiled by the Engineering Manager.
The Technical File is available through the Authorized Representative.

This Declaration of Conformity is issued under the exclusive responsibility of StoneAge Incorporated.



StoneAge Incorporated, Durango, CO, USA
Adam Markham, Director of Engineering and Technology

03/29/21
Date



CE



Regulatory Compliance and Safety Information for StoneAge Sentinel System USA & Canada Compliance

Manufacturer: StoneAge Incorporated
466 South Skylane Drive
Durango, CO 81303
US (866)-795-1586
www.stoneagetools.com

Declare that: Sentinel System Controller (CTRL-100)

Is compliant with the following:

FCC Part 15, Subpart B / ICES-003 Unintentional Emissions Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules and Industry Canada ICES-003. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with part 15 of the FCC rules and Industry Canada ICES-003. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Part 15, Subpart C / RSS-210 Intentional Emissions Interference Statement

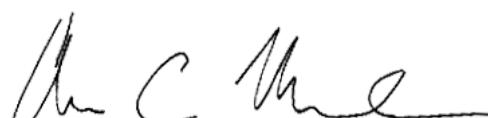
Compliance of this equipment is confirmed by the following certification numbers that are placed on the equipment:

Notice: The term "FCC ID:" and "IC" before the certification number signifies that FCC and Industry Canada technical specifications were met.

CONTAINS FCC ID: 2AX9D-SENT001

CONTAINS IC ID: 26898-SENT001

This Declaration of Conformity is issued under the exclusive responsibility of StoneAge Incorporated.



StoneAge Incorporated, Durango, CO, USA
Adam Markham, Director of Engineering and Technology

03/29/21
Date



RF Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

- The equipment should only be used or installed at locations where there is normally at least a 20cm separation between the antenna and all persons.
- This transmitter must not be co-located or operate in conjunction with any other antenna or transmitter.
- Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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® (ABXS-3L) Hose Tractor has the potential to cause serious injury if fingers, hair, or clothing become caught between the hose rollers or drive belts. Be sure to head the Hand Entanglement Roller Labels.

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 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

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 (6,8 bar). Never exceed 125 psi (8,6 bar) supply pressure. Exceeding 125 psi (8,6 bar) 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® (ABXS-3L) 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.
- The Lightweight Positioner must be securely fastened to the tube bundle, and the Guide Assembly and Tractor must be securely fastened to the Lightweight Positioner prior to operation.
- 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 Controller should be located in a safe location where the Operator has good visibility of the tool entering the exchanger tubes. The AUTOBOX® (ABXS-3L) Hose Tractor and Controller 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® (ABXS-3L) 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® (ABXS-3L) Hose Tractor lift with care to prevent bodily injury.
- Do not operate the AUTOBOX® (ABXS-3L) Hose Tractor while either side door is open.

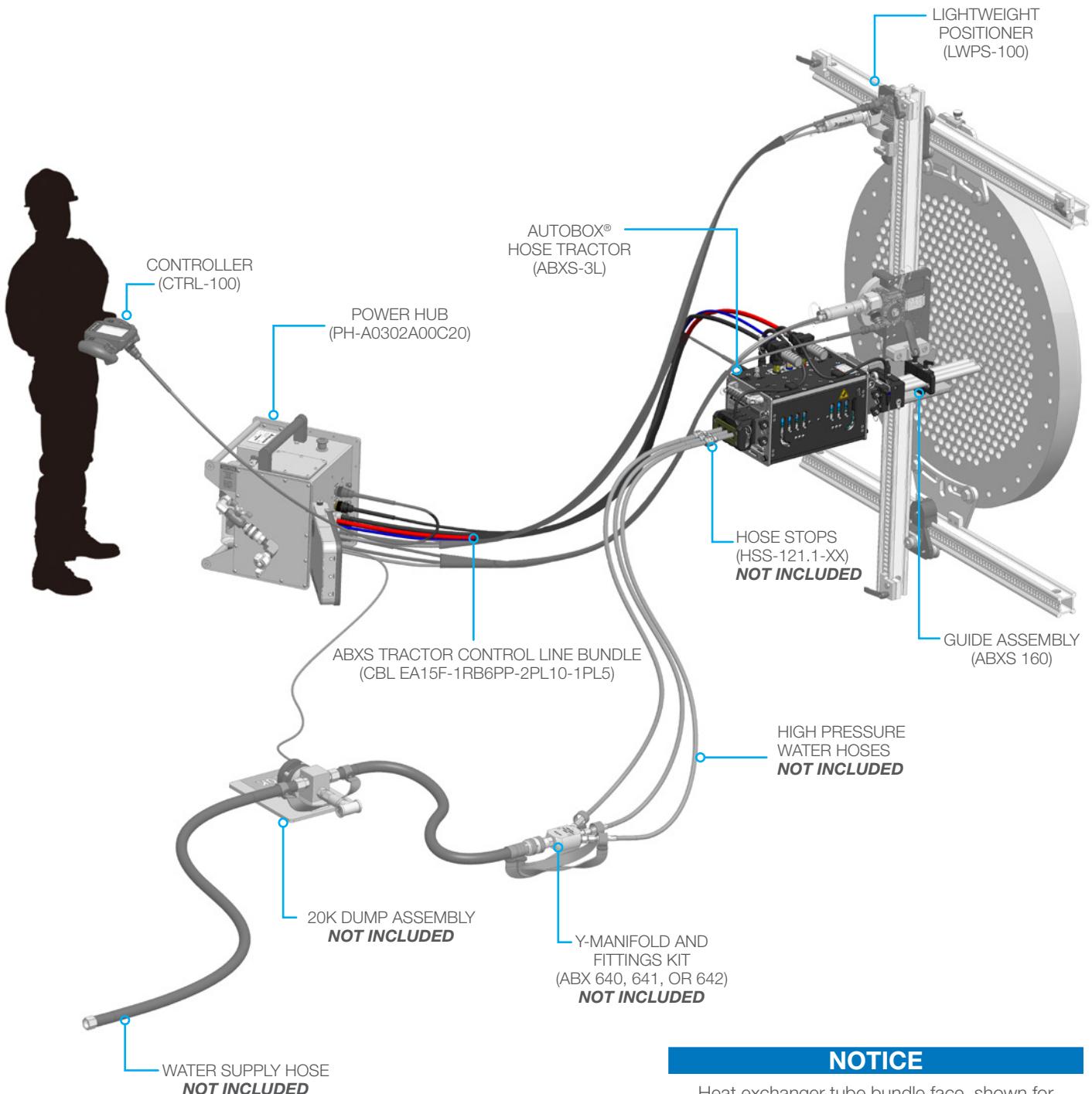
PRE-RUN SAFETY CHECK

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, lances, 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 the appropriate hose stop collet are installed and set up properly. They must be verified, secured, tested, and performance confirmed before operating at high pressure.*****
- Ensure the doors of the AUTOBOX® (ABXS-3L) Hose Tractor are closed and securely latched.
 - Test the Controller before operating the AUTOBOX® (ABXS-3L) 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.

FULL SYSTEM ASSEMBLY - OVERVIEW

AUTOBOX® (ABXS-3L) HOSE TRACTOR AND (ABXS 160) HOSE GUIDE SHOWN IN THE SYSTEM ASSEMBLY



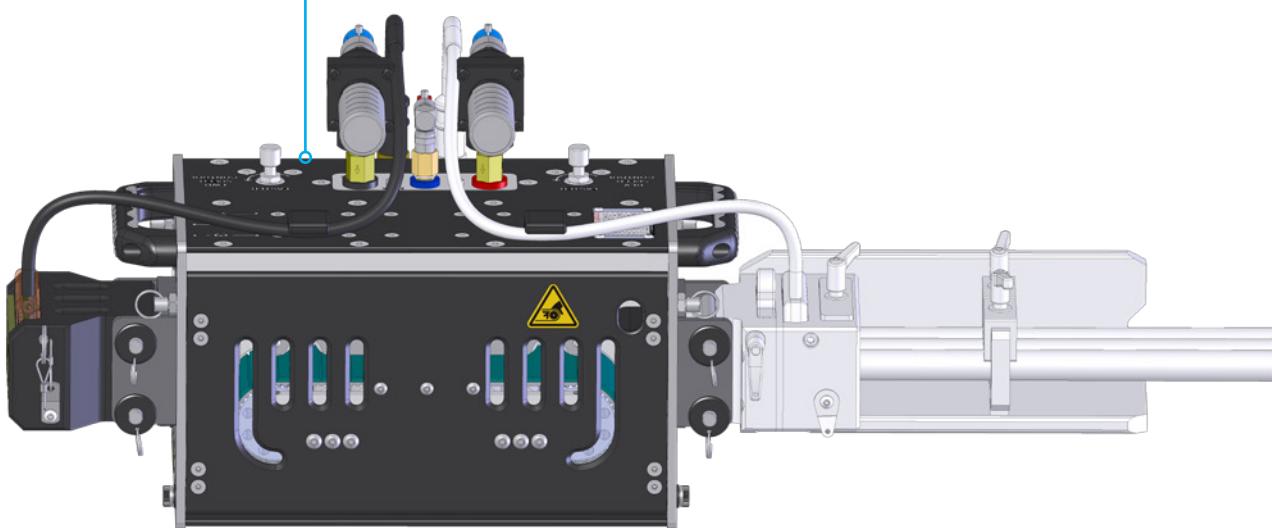
NOTICE

Heat exchanger tube bundle face, shown for graphic representation only. NOT included in assembly.

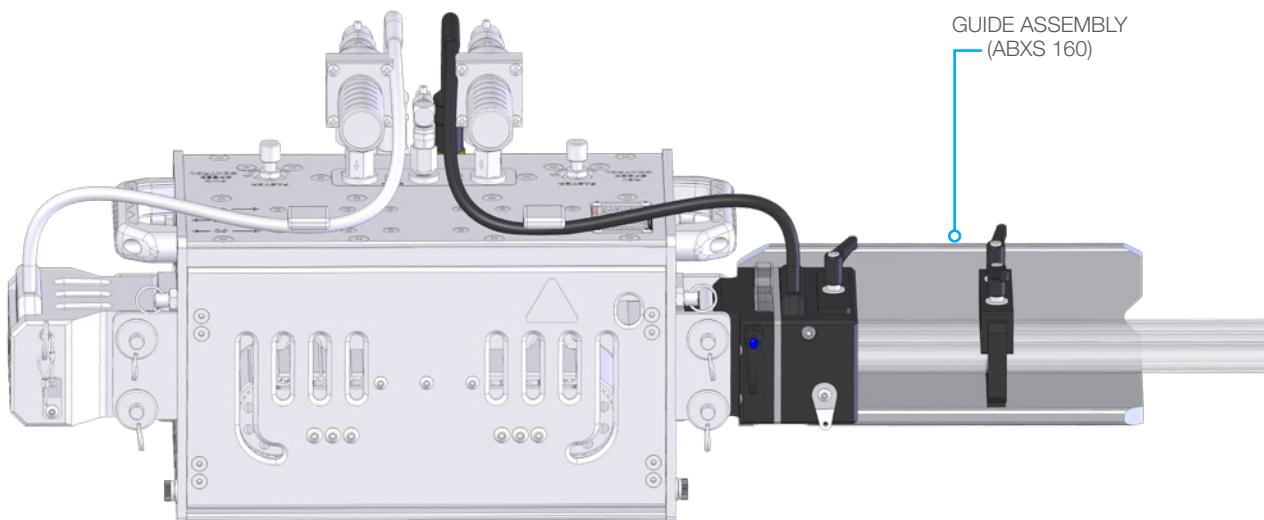
**AUTOBOX® (ABXS-3L) HOSE TRACTOR WITH
HOSE GUIDE AND CONTROL LINE BUNDLE**

AUTOBOX® HOSE TRACTOR
(ABXS-3L)

SEE THE PART DIAGRAM SECTION IN THIS MANUAL
FOR DETAILED PART INFORMATION



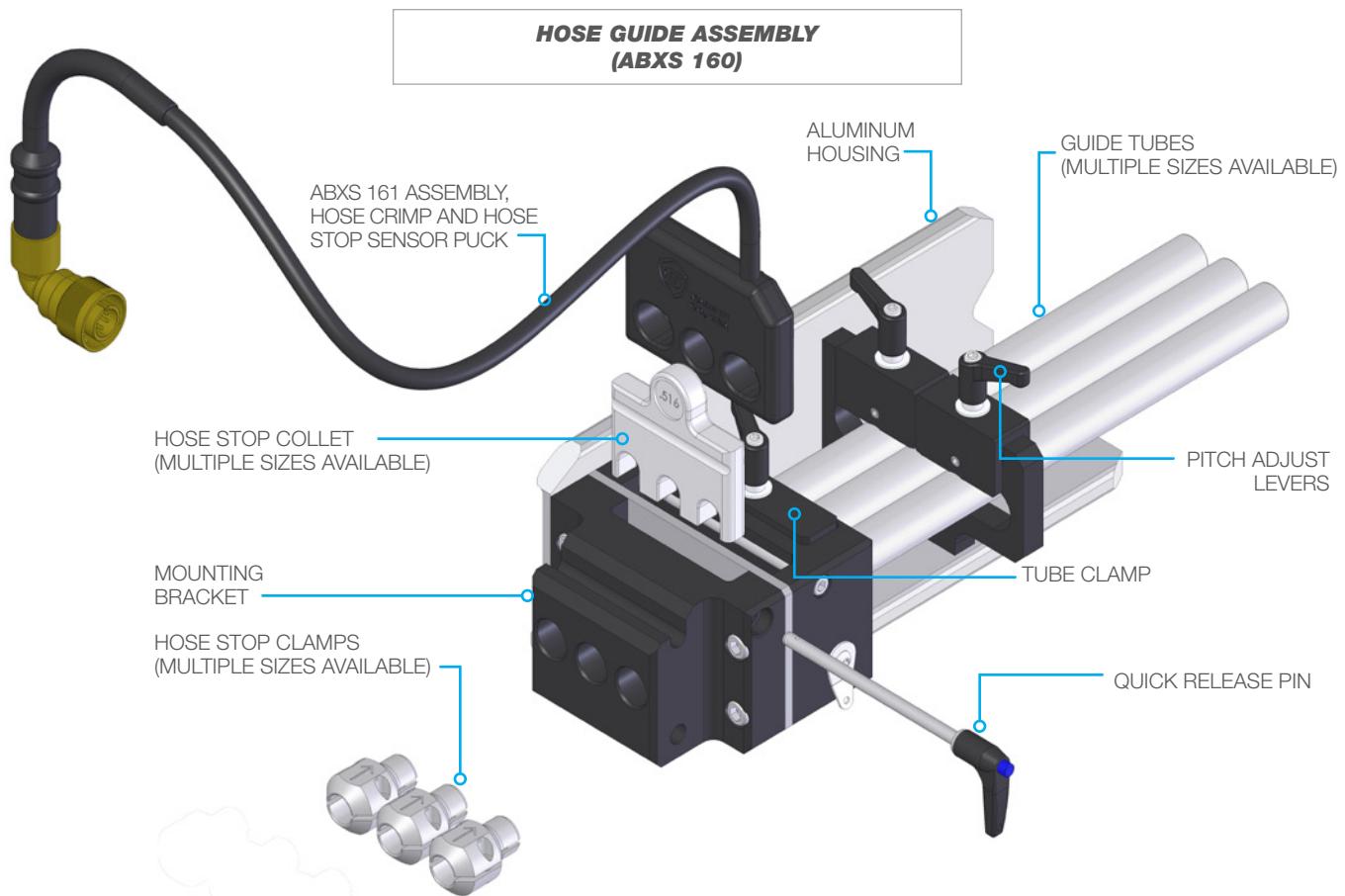
GUIDE ASSEMBLY
(ABXS 160)



15FT (4.5m) ABXS TRACTOR CONTROL LINE BUNDLE
(CBL EA15F-1RB6PP-2PL10-1PL5)



HOSE GUIDE ASSEMBLY (ABXS 160) - OVERVIEW



StoneAge (SA) PART NUMBER COLLET AND HOSE STOP REFERENCE CHART

HOSE O.D.	SPIR STAR	PARKER	COLLET SIZE	COLLET PART NUMBER	HOSE STOP SIZE	HOSE STOP PART NUMBER
.27-.41 in (7 mm - 10 mm)	3/2	2240D-02	.297 in. / 7.5 mm	ABX 171-297	.27-.34 / 7-9 mm	HSS 121-27-34
	3/4, 4/2	2240D-025, 2440D-02	.328 in. / 8.3 mm	ABX 171-328	.27-.34 / 7-9 mm	HSS 121-27-34
	3/6, 5/2	2240D-03	.406 in. / 10.3 mm	ABX 171-406	.34-.42 / 9-11 mm	HSS 121-34-42
.44-.50 in (11 mm - 13 mm)	4/4	2448D-025	.438 in. / 11.1 mm	ABX 171-438	.34-.42 / 9-11 mm	HSS 121-34-42
	4/6, 5/4		.460 in. / 11.7 mm	ABX 171-460	.42-.50 / 11-13 mm	HSS 121-42-50
	6/2	2240D-04, 2640D-025	.484 in. / 12.3 mm	ABX 171-484	.42-.50 / 11-13 mm	HSS 121-42-50
	6/4	2440D-04, 2740D-025	.516 in. / 13.1 mm	ABX 171-516	.50-.56 / 13-14 mm	HSS 121-50-56
.52-.61 in (13 mm - 16 mm)	5/6, 8/2	2240D-05, 2740D-03	.547 in. / 13.9 mm	ABX 171-547	.50-.56 / 13-14 mm	HSS 121-50-56
	5/6H, 8/4		.594 in. / 15.1 mm	ABX 171-594	.56-.61 / 14-16 mm	HSS 121-56-61
		2440D-05	.625 in. / 15.9 mm	ABX 171-625	.56-.61 / 14-16 mm	HSS 121-56-61

StoneAge (SA) PART NUMBER GUIDE TUBE REFERENCE CHART

GUIDE TUBE	BANSHEE	INSIDE DIAMETER, LENGTH
ABX 115-12	BN9.5	.459 in / 11.7 mm, 12.5 in. / 318 mm
ABX 115-36	BN9.5	.459 in / 11.7 mm, 36 in. / 914 mm
ABX 116-12	BN13	.546 in / 13.9 mm, 12.5 in. / 318 mm
ABX 116-36	BN13	.546 in / 13.9 mm, 36 in. / 914 mm
ABX 117-12	BN15	.674 in / 17.1 mm, 12.5 in. / 318 mm
ABX 117-36	BN15	.674 in / 17.1 mm, 36 in. / 914 mm
ABX 119-12	BN18	.745 in / 18.9 mm, 12.5 in. / 318 mm
ABX 119-36	BN18	.745 in / 18.9 mm, 36 in. / 914 mm

HOSE GUIDE ASSEMBLY

1. 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.

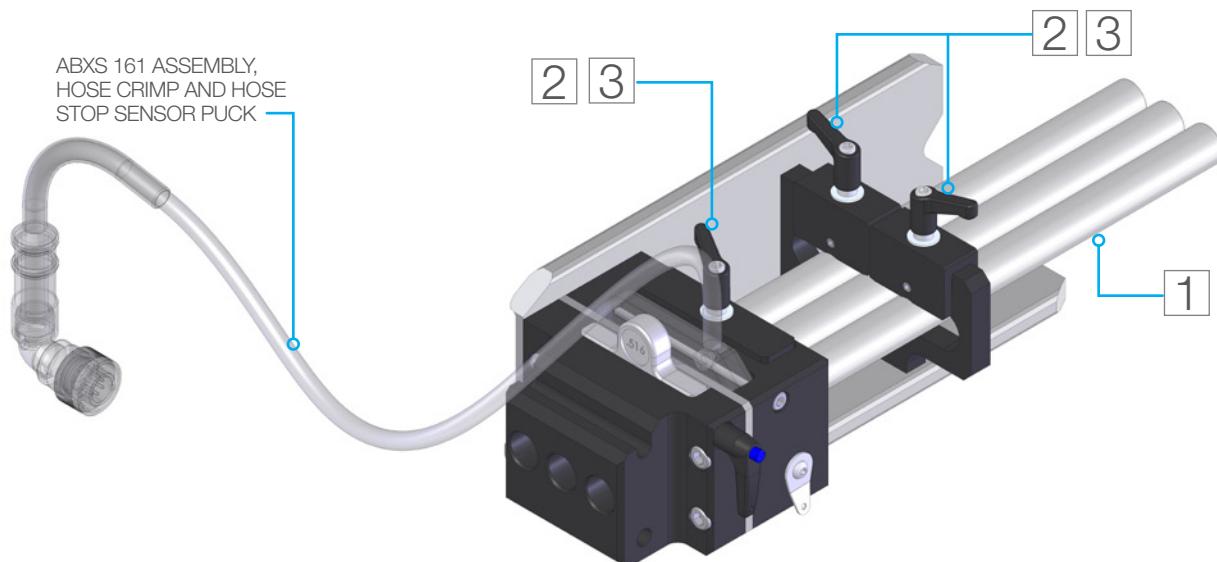
NOTICE

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

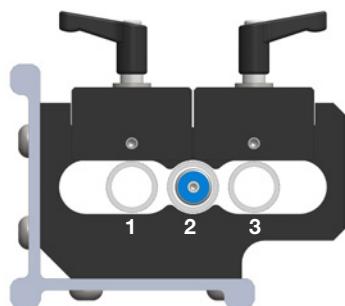
2. To remove the existing Guide Tubes, loosen the Tube Clamp Lever and the two Pitch Adjust Levers, located on top of the Guide Assembly. After selecting the appropriate Guide Tubes, install the Guide Tubes into the Guide Assembly.
3. Secure the Guide Tubes by tightening the Tube Clamp Lever and Pitch Adjust Levers, when the desired pitch has been set.
4. 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

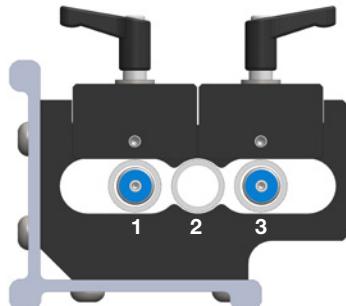
Appropriate size Collet selection is **CRITICAL** to ensuring proper backout prevention of the tool. Use the chart on the previous page to select the proper Collet and Hose Stop sizes per hose diameter. Always confirm backout prevention performance before operating the system at high pressure.

**1, 2, or 3 HOSE LOADING POSITIONS**

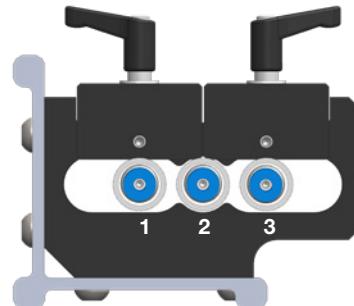
The AUTOBOX® (ABXS-3L) Hose Tractor can be used as a 1, 2, or 3 Lance tool. The diagrams below show which Guide Tubes to load for best performance. The numbered positions correspond with the indicator markings on the top of the Hose Tractor and the identifiers in the Controller interface.



SINGLE HOSE LOAD



DUAL HOSE LOAD



TRIPLE HOSE LOAD

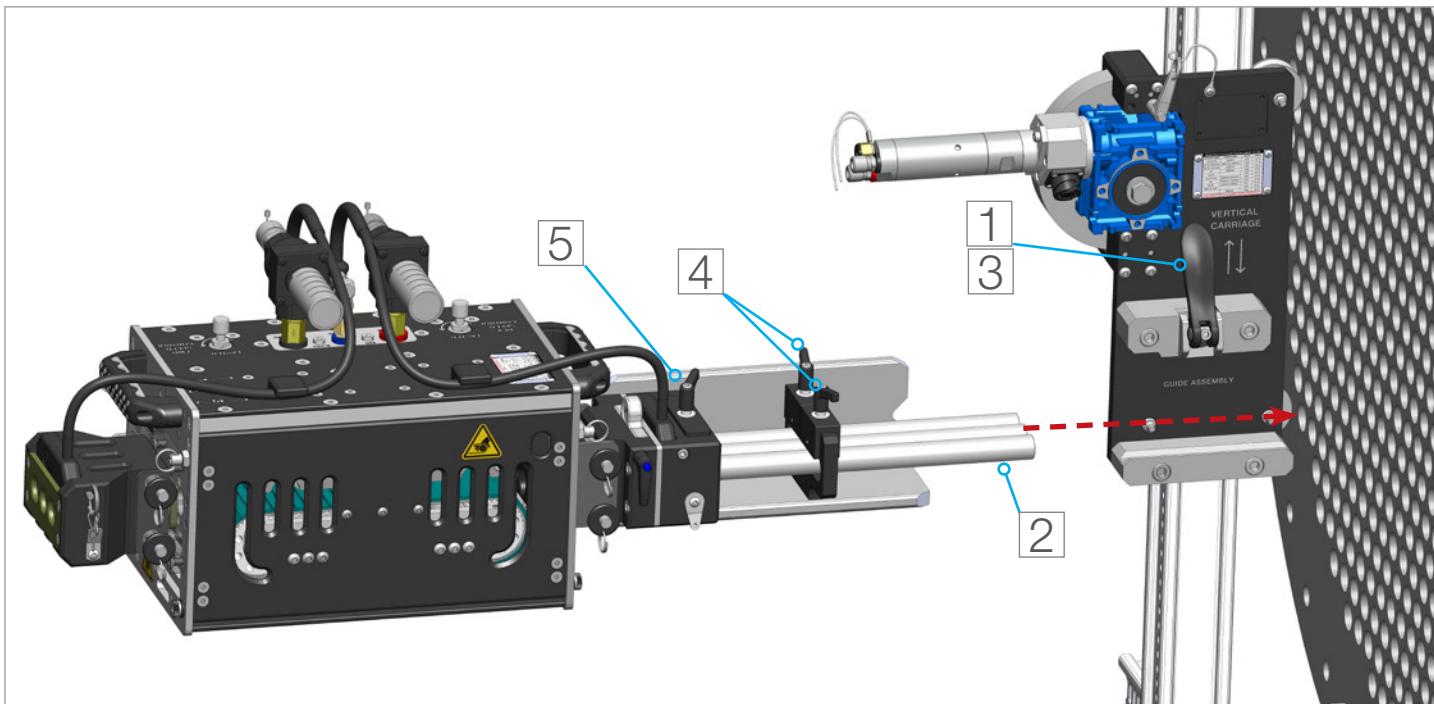
HOSE GUIDE ASSEMBLY TO LIGHTWEIGHT POSITIONER SET UP

ATTACH GUIDE ASSEMBLY TO LIGHTWEIGHT POSITIONER

1. Pull Quick Release Handle open and slide the Guide Tube Assembly onto the Vertical Carriage.
2. Adjust position until the Guide Tubes are approximately 1/2 in. (13 mm) away from the face of the heat exchanger.
3. Lock the Quick Release Handle in place when the mount is in position. Be sure to adjust the tension bolt if necessary. (See **Tech Tip** below)
4. Loosen the Pitch Adjustment Levers and adjust the guide tubes until they are in line with pitch of the tubes in the bundle.
5. Tighten Tube Clamp and Pitch Adjustment Levers until tubes are secured in position.

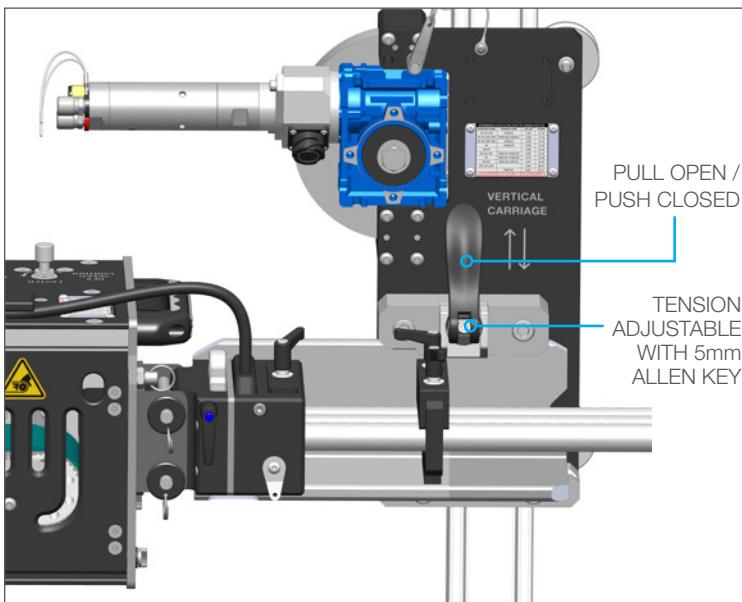
CAUTION

THE QUICK RELEASE HANDLE ON THE VERTICAL CARRIAGE MUST BE SECURELY FASTENED TO THE GUIDE TUBE ASSEMBLY



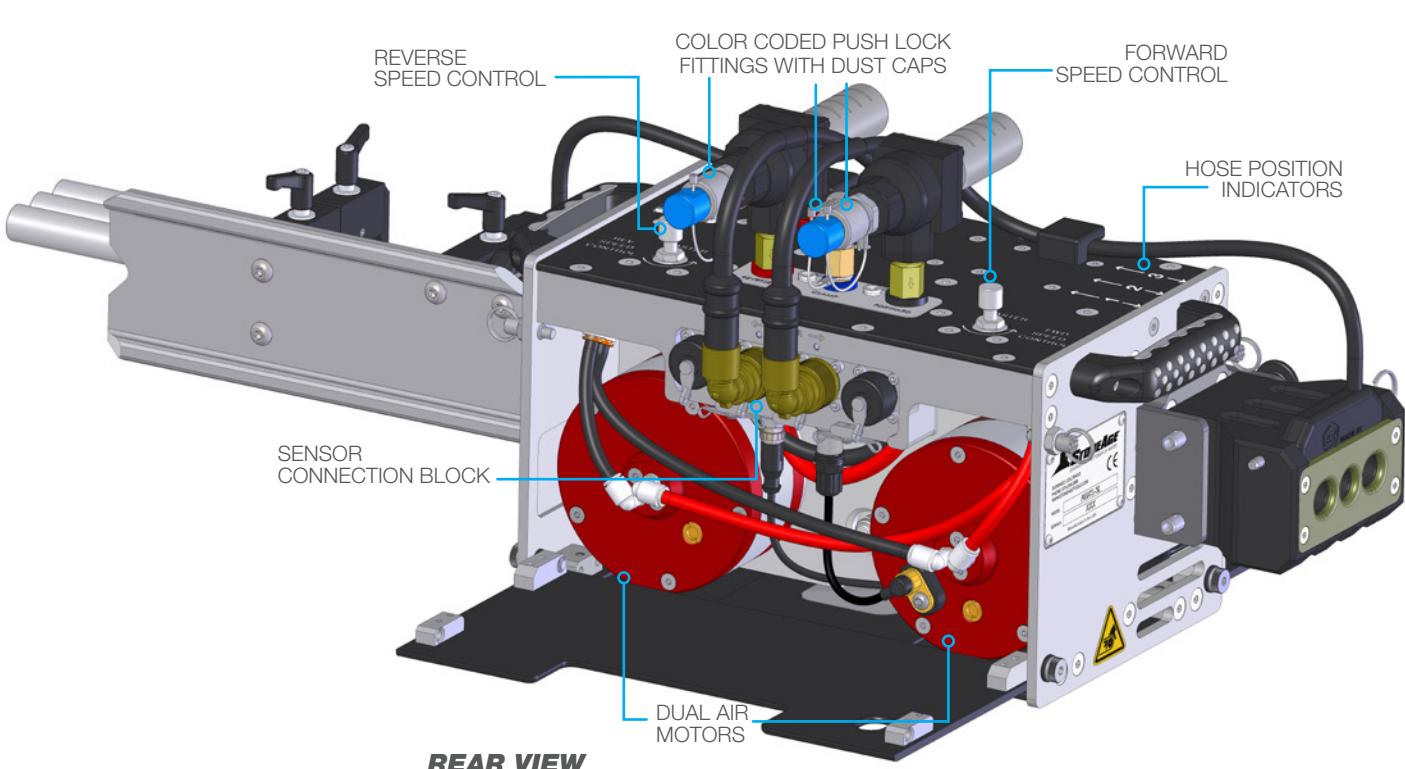
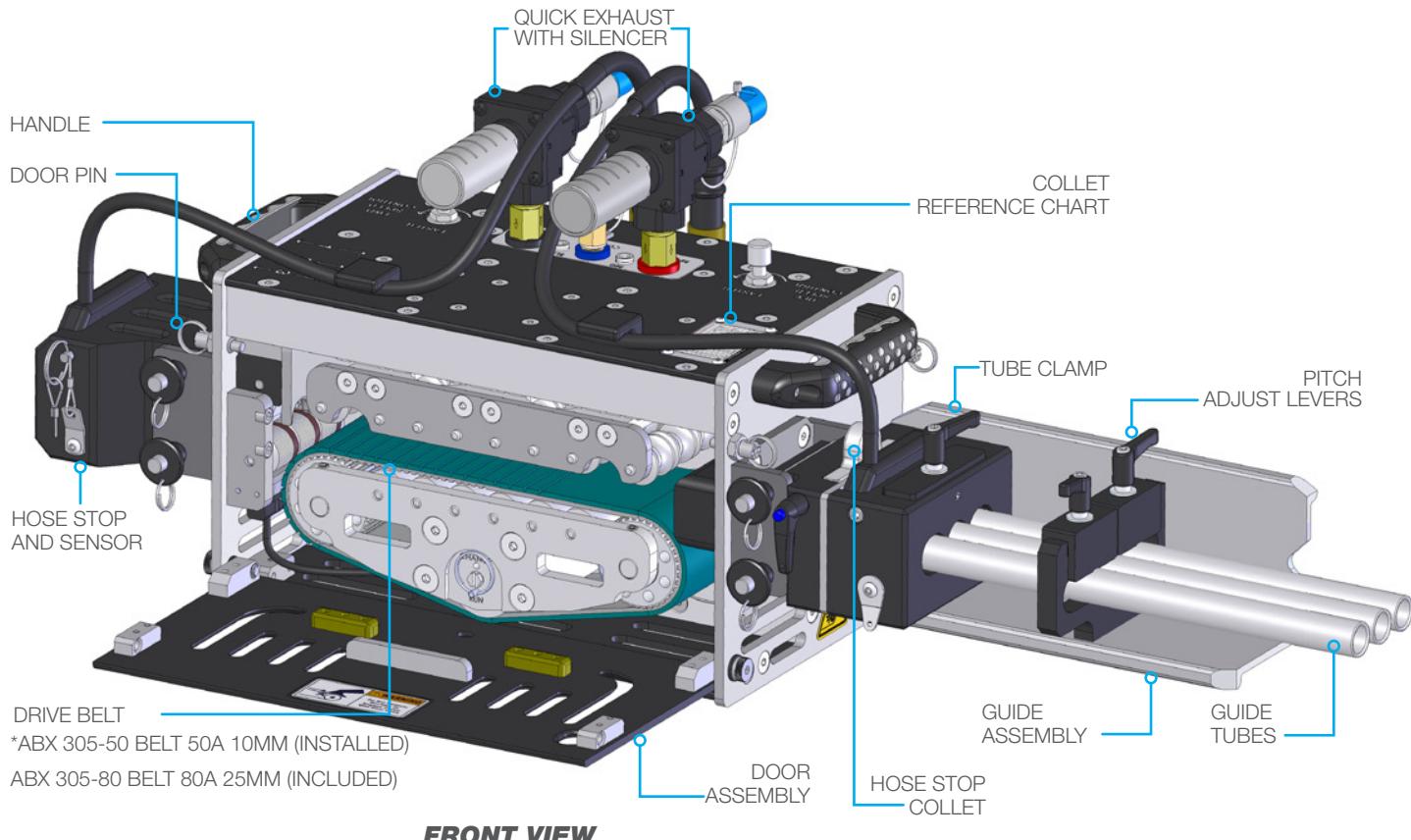
Tech Tip:

- When mounting the Guide Tube Assembly make sure to lift the backside of the Tractor a little bit, this will make sure the Guide Tube Assembly is completely parallel with the Vertical Carriage. Since most of the weight is behind the Vertical Carriage the Tractor and Guide Tube Assembly can be hanging in the Vertical Carriage but not completely secured properly.
- Always make sure before operating, to pull down on the Tractor with both hands and try to pull it back from the Lightweight Positioner and tilt the back of the Tractor upwards to make sure there is no play.



HOSE TRACTOR (ABXS-3L) - OVERVIEW

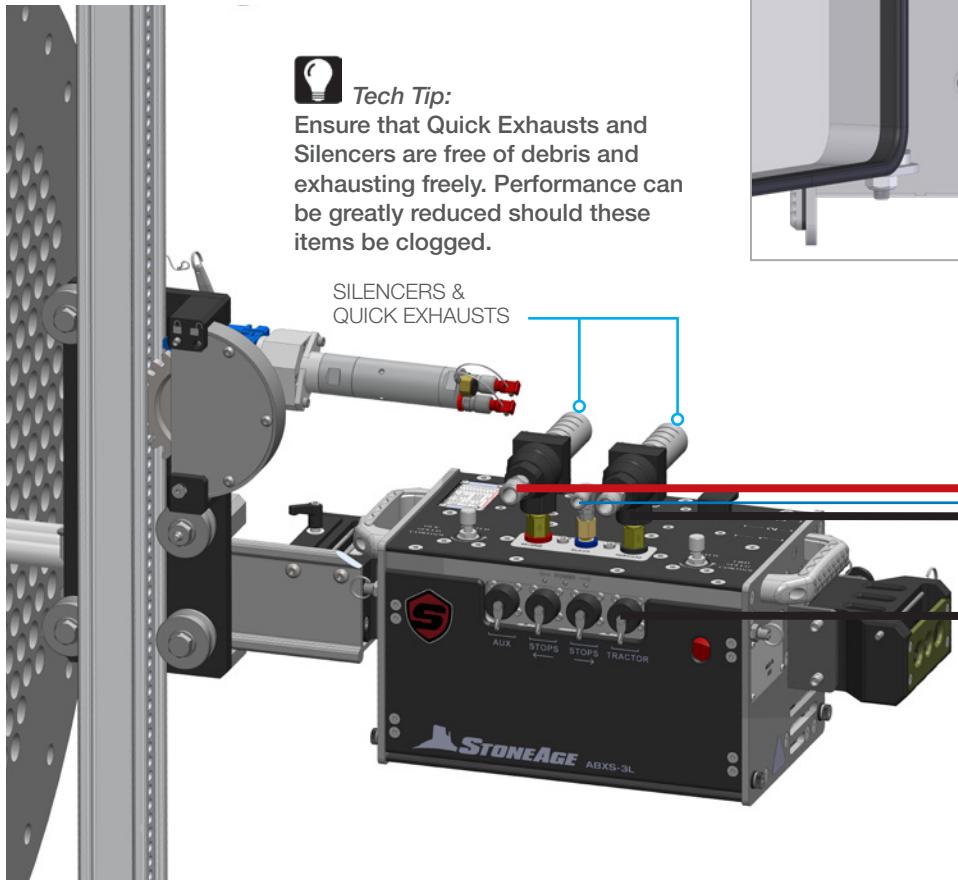
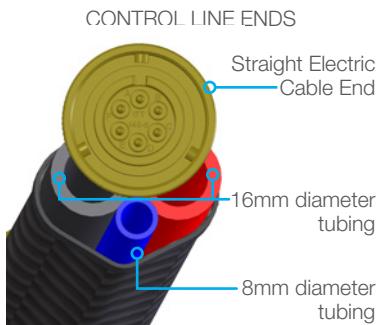
AUTOBOX® HOSE TRACTOR (ABXS-3L)



HOSE TRACTOR CONNECTIONS TO POWER HUB

PNEUMATIC SUPPLY LINE CONNECTIONS

1. Remove the dust caps from the fittings on the AUTOBOX® (ABXS-3L) Hose Tractor.
2. **Connect the Hose Bundle to the Power Hub**
Match the colored tubing to the corresponding color coded fittings under the "Tractor" label. Connect the Pot Plug to the receptacle marked "Tractor" and listen for a click. This ensures it is water tight.
3. **Blow out all Pneumatic Lines**
Turn the Main Air Supply on. Use the Controller to activate the Forward, Reverse, and Clamp functions. ***Use of dirty or contaminated pneumatic hoses will cause component damage and malfunction***



CONTROL LINE BUNDLE (CBL EA15F-1RB6PP-2PL10-1PL5)



4. **Connect hoses to the Hose Tractor**

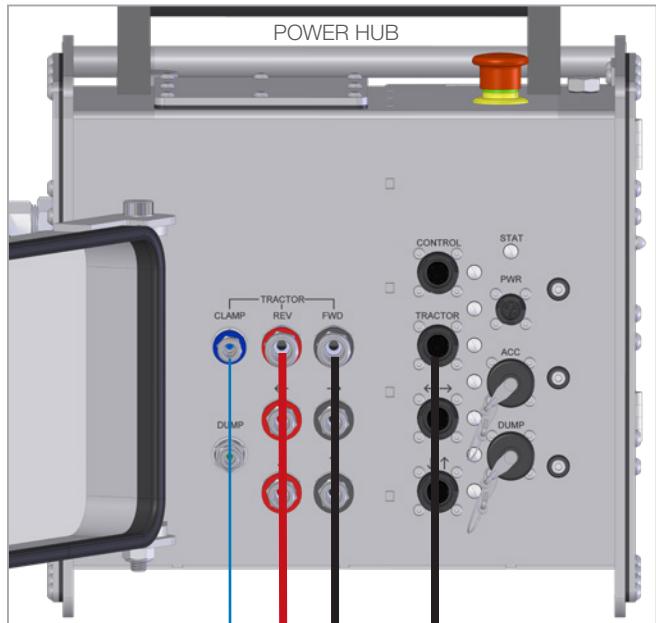
Match the colored tubing to the corresponding color coded fittings on top of the Hose Tractor. Connect the potted plug to the receptacle marked "Tractor" on the back of the Hose Tractor and listen for a click. This ensures it is water tight.

5. **Test the Controller** before operating the system with high pressure water to verify the control valves move the hoses and positioners in their intended directions, and that the dump valve is working properly.

NOTICE

For Detailed Instructions and Setup of the Controller and Power Hub Assemblies, see the Controller and Power User Manual.

<https://www.stoneagetools.com/assets/pdf/manuals/>



DOOR

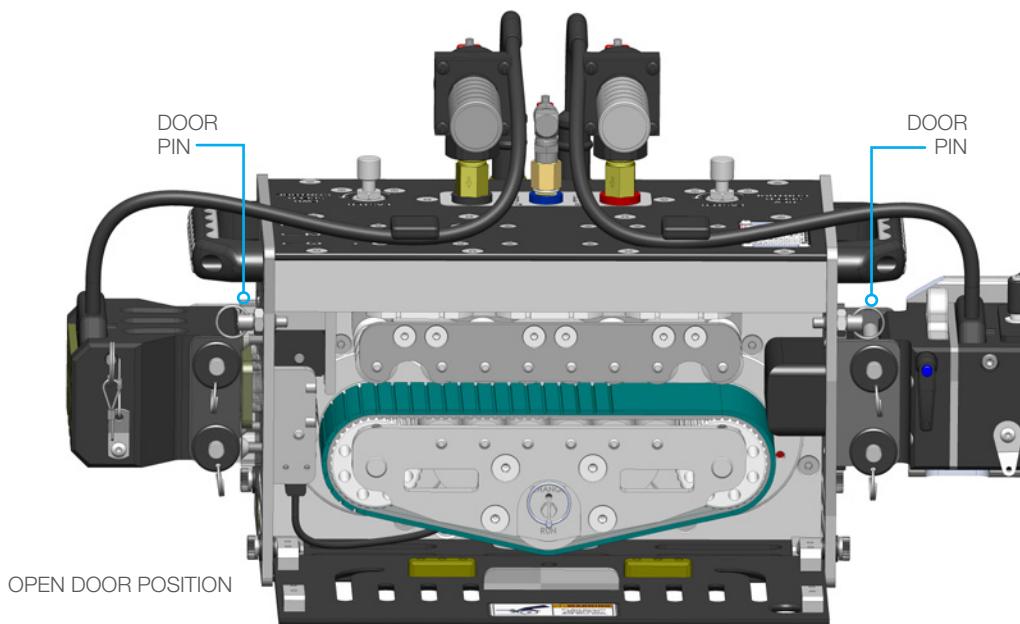
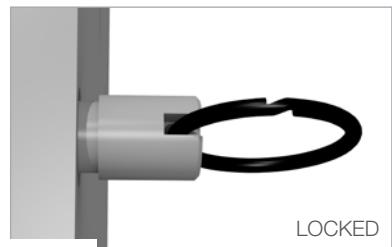
Always run the AUTOBOX® (ABXS-3L) Hose Tractor with the doors closed and locked.

DOOR PIN

The Door Pin is a spring plunger with a pull ring. To unlock the door, pull and twist the pull ring. To close and lock the door, pull and twist the pull ring, then release it into the groove of the pin. Verify the pin engages the door fully.

**CAUTION**

Make sure to lock both doors on each side of the Hose Tractor before operating AUTOBOX® (ABXS-3L) Hose Tractor.



CLOSED DOOR POSITION

HIGH PRESSURE HOSE LENGTH AND COLLET INSERTION

HIGH-PRESSURE HOSE

- The AUTOBOX® (ABXS-3L) 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 .74 in. (19 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.

NOTICE

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

- 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 hoses synchronized at full retract and full extend positions.
- HOSE LENGTHS** There are many varieties of tube bundles that will require additional hose length to be considered. This should be verified prior to ordering high pressure hose for each job. The calculation below determines the additional length necessary to keep the assembly from lifting off the ground during operation. Provide the tube bundle length and use the calculation below to determine the total hose length.

A (Tube Bundle Length in inches / mm) +

B (Total Length of components in inches / mm) +

C (Recommended Additional Connection Length in / mm)

=

D (Total required Length of hose in inches /mm)

EXAMPLE: The hose length equation for a 20ft (6096 mm) tube bundle with ABXS-3L, Hose Guide, and Lightweight Positioner would be as follows;

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

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

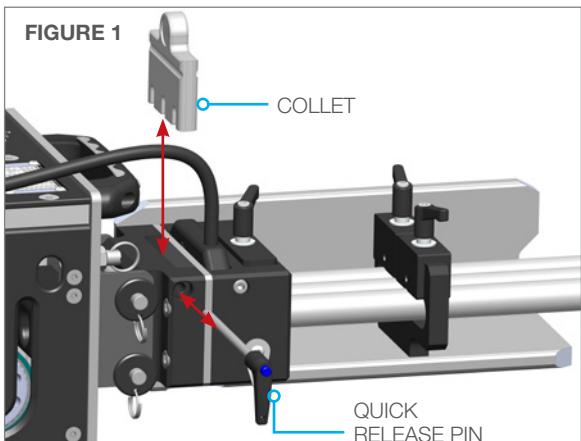
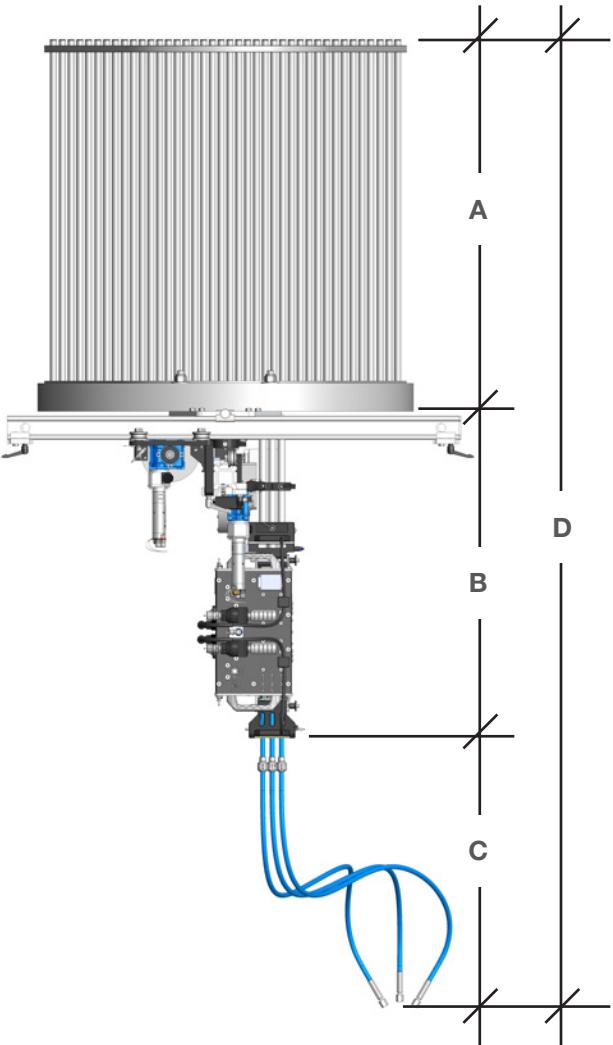
B (TOTAL COMPONENT LENGTH)	C (RECOMMENDED ADDITIONAL CONNECTION LENGTH)
ABX-3L-V2, Hose Guide, and Lightweight Positioner = 32.9 in / 836 mm	39 in / 991 mm

COLLET INSERTION

Remove Quick Release Pin and pull out existing Collet. Select the appropriate Collet size for the diameter of the hoses. (See the "Recommended Collets For Common Hose Sizes" plaque on the top plate of the AUTOBOX® (ABXS-3L) Hose Tractor.) (**Figure 1**)

⚠ 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 ABXS-3L Tractor or the side of the vertical carriage on the Lightweight Positioner.



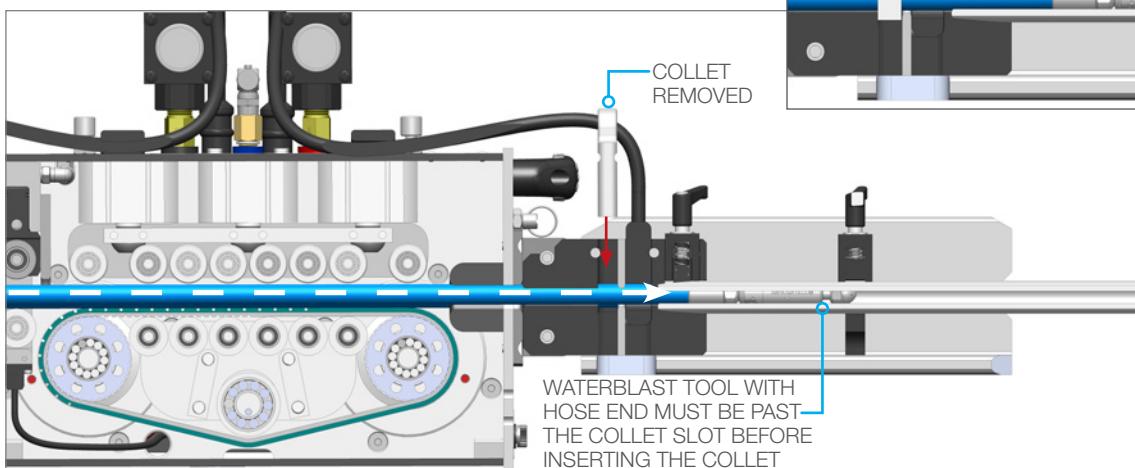
HOSE AND HOSE STOP INSTALLATION

HOSE AND HOSE STOP INSTALLATION

- The **HOSE CLAMP PRESSURE REGULATOR** on the Controller MUST BE TURNED TO ZERO pressure to make room for the hoses to be installed. Use the left Joystick on the Controller to highlight the Clamp Pressure setting. Then move the left Joystick left or right to decrease or increase the pressure.



- Insert the hoses, equipped with the waterblast tools, into the mounting bracket on the side of the AUTOBOX® (ABXS-3L) Hose Tractor until the engage the Drive Belt. Slightly increase the pressure on the **HOSE CLAMP PRESSURE REGULATOR** to extend the clamp rollers and clamp the hoses.
- When the waterjet tools pass the Collet slot, install the Collet and quick release pin.

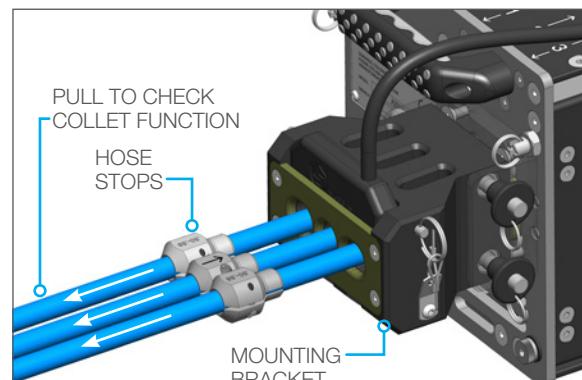
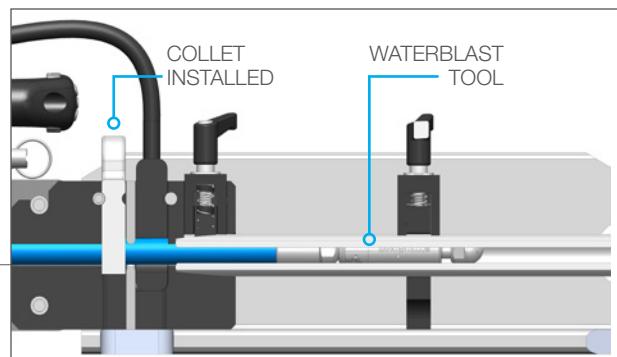
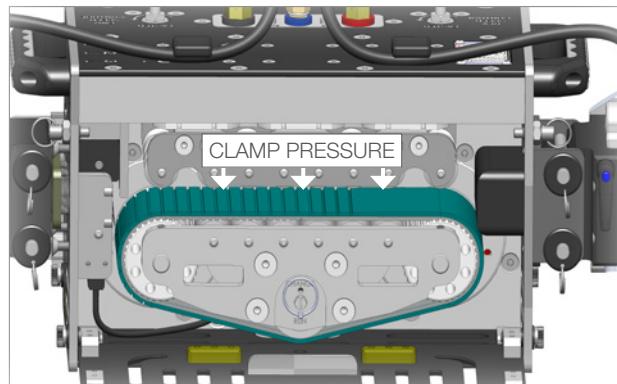


- Pull on the hoses from the back of the AUTOBOX® (ABXS-3L) Hose Tractor to ensure that the Collet does not allow the waterblast tool back out of the Guide or Hose Tractor.
- To install hose stops, drive waterblast tools through the exchanger until the tips are 1-2" (25-51 mm) past the end of the tube bundle. Loosely install the stop with the arrows pointing to the tractor, then push them toward the mounting bracket and tighten in place.

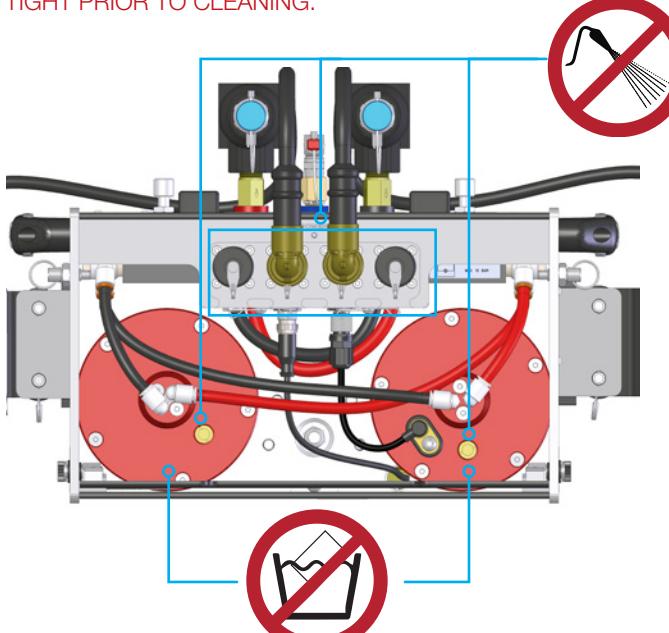
WARNING

Do not fully release the hose clamp (decreasing pressure to zero) during operation, or the AUTOBOX® (ABXS-3L) Hose Tractor will release the hose and may create a dangerous runaway hose condition, which can result in severe injury and/or death.

Crush Hazard. Keep hands, hair, and clothing clear of all moving parts. Contact with moving parts can result in severe injury.



HOSE TRACTOR (ABXS-3L) MAINTENANCE

Maintenance Item	Frequency	Maintenance Required
Drive Belt (See Belt Replacement instructions in this manual)	After each use	<p>The Belts are very durable and should last several hundred hours. However, it is recommended to inspect the Belt for wear and/or cracks at the completion of each job. Replacement is required when the Belt is damaged. If the performance of the belt is not functioning well for the conditions, try replacing it with the alternate durometer belt (included).</p> <p style="text-align: center;">NOTICE</p> <p>Operation with a severely damaged belt will result in excessive damage to the Idler rollers and drive sprockets.</p>
All components the hoses pass through	After each use	<p>Most wear parts are made from durable materials 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.</p>
FWD, REV, LFT, RGT, UP, DOWN fittings	After each use	<p>Apply a small amount of air tool oil directly into FWD, REV, LFT, RGT, UP, DOWN 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.</p> <p style="text-align: center;">NOTICE</p> <p>Do not add oil to the Clamp (CLP) fitting, as oil may accumulate in the air cylinders and prevent them from fully retracting.</p>
ABXS-3L (Inside)	After each use	<p>When storing the unit, use compressed air to blow out any residual debris and moisture. Use mild, soapy, low pressure, water to clean the machine in order to remove corrosive materials.</p> <p style="color: red; font-weight: bold;">DO NOT SPRAY WATER DIRECTLY AT OR SUBMERGE THE AIR MOTOR BREather PORTS OR ELECTRONIC COMPONENTS. MAKE SURE ALL DUST CAPS ARE IN PLACE AND ELECTRICAL SENSOR CONNECTIONS ARE TIGHT PRIOR TO CLEANING.</p> 

Contact StoneAge for Safety Data Sheets for material usage, a complete list of spare part numbers, and service instructions for the AUTOBOX® (ABXS-3L) Hose Tractor and Controller.

STORAGE, TRANSPORTATION, AND HANDLING

The AUTOBOX® (ABXS-3L) Hose Tractor should be stored upright in a job box between jobs. When moving the AUTOBOX®(ABXS-3L) Hose Tractor, lift with care to prevent bodily injury.

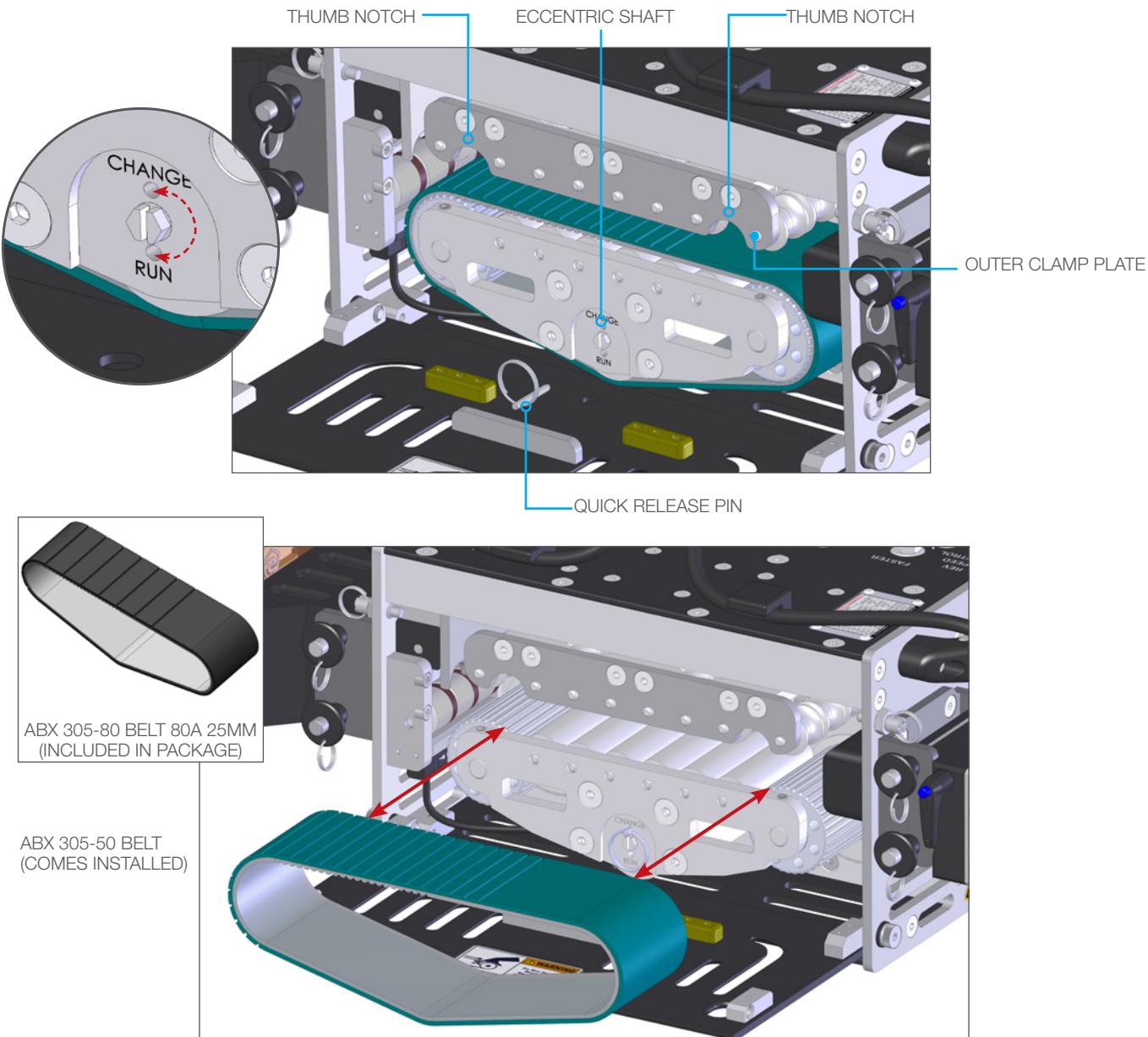
⚠ WARNING

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.

TECH TIP: If the performance of the belt is not functioning well for the conditions, try replacing it with the included alternate durometer belt.

TO REPLACE THE BELT:

1. Pull out the Quick Release Pin on the front of the ABX 310 Belt Track Drive Assembly.
2. Use a flat head screwdriver to rotate the Eccentric Shaft 180° in either direction. This will release tension on the Drive Belt Assembly.
3. Install pin into the "CHANGE" position so it does not get misplaced, and to ensure the tension idler is in the correct position before removing the belt.
4. Place thumbs on the top of the belt into the notches of the Outer Clamp Plate. Place fingers under the Drive Belt and light squeeze in the shape of the tensioned Drive Belt. Then pull the Drive Belt out from the ABXS-3L Tractor.
5. Slide the old Drive Belt off and discard. Slide the new Drive Belt on in a similar manner.
6. Rotate the Eccentric Shaft 180° in either direction to properly tension the Drive Belt.
7. Move the Quick Release Pin to the "RUN" position.

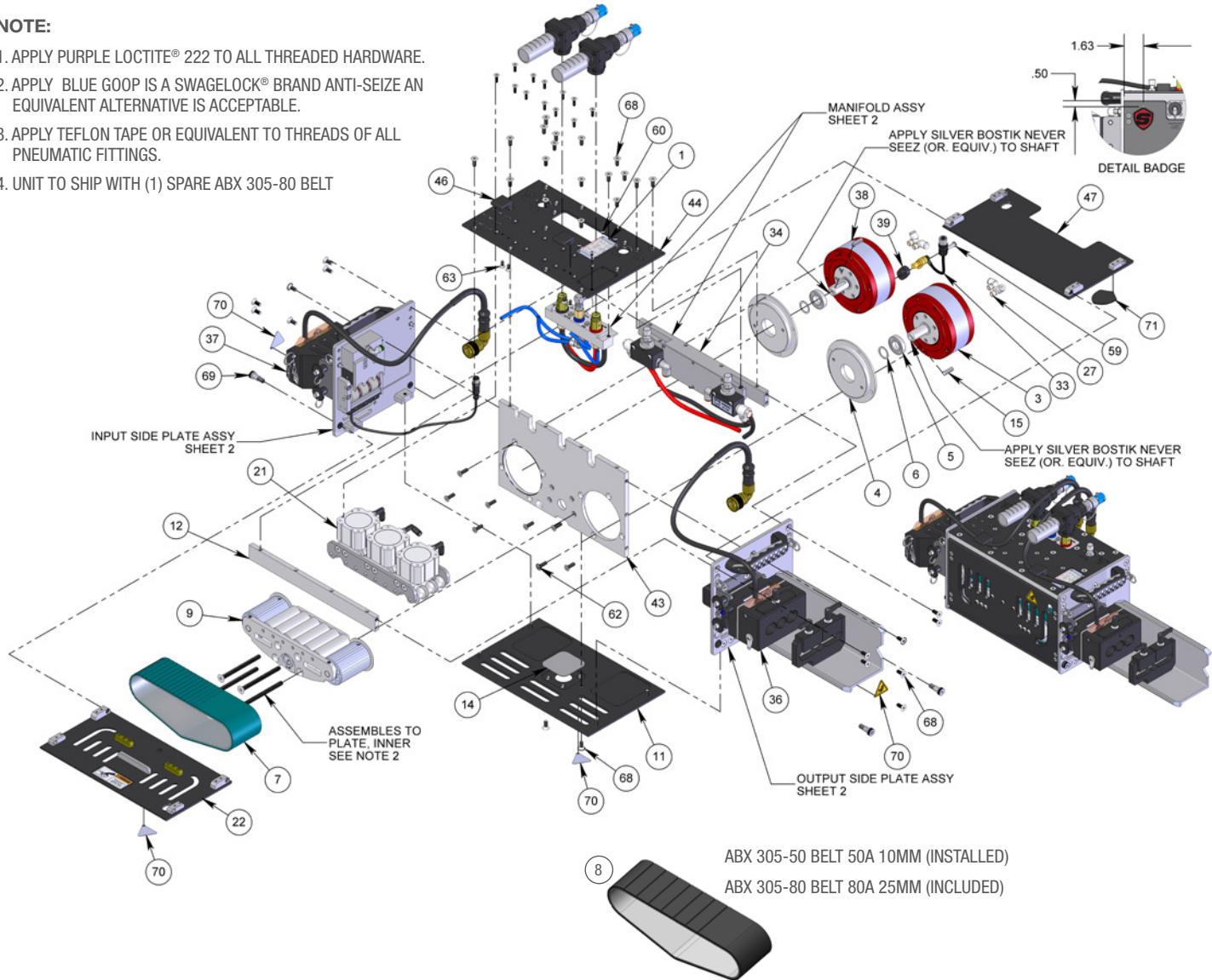


PART DIAGRAM

AUTOBOX® (ABXS-3L) HOSE TRACTOR

NOTE:

1. APPLY PURPLE LOCTITE® 222 TO ALL THREADED HARDWARE.
2. APPLY BLUE GOOP IS A SWAGELOCK® BRAND ANTI-SEIZE AN EQUIVALENT ALTERNATIVE IS ACCEPTABLE.
3. APPLY TEFLON TAPE OR EQUIVALENT TO THREADS OF ALL PNEUMATIC FITTINGS.
4. UNIT TO SHIP WITH (1) SPARE ABX 305-80 BELT

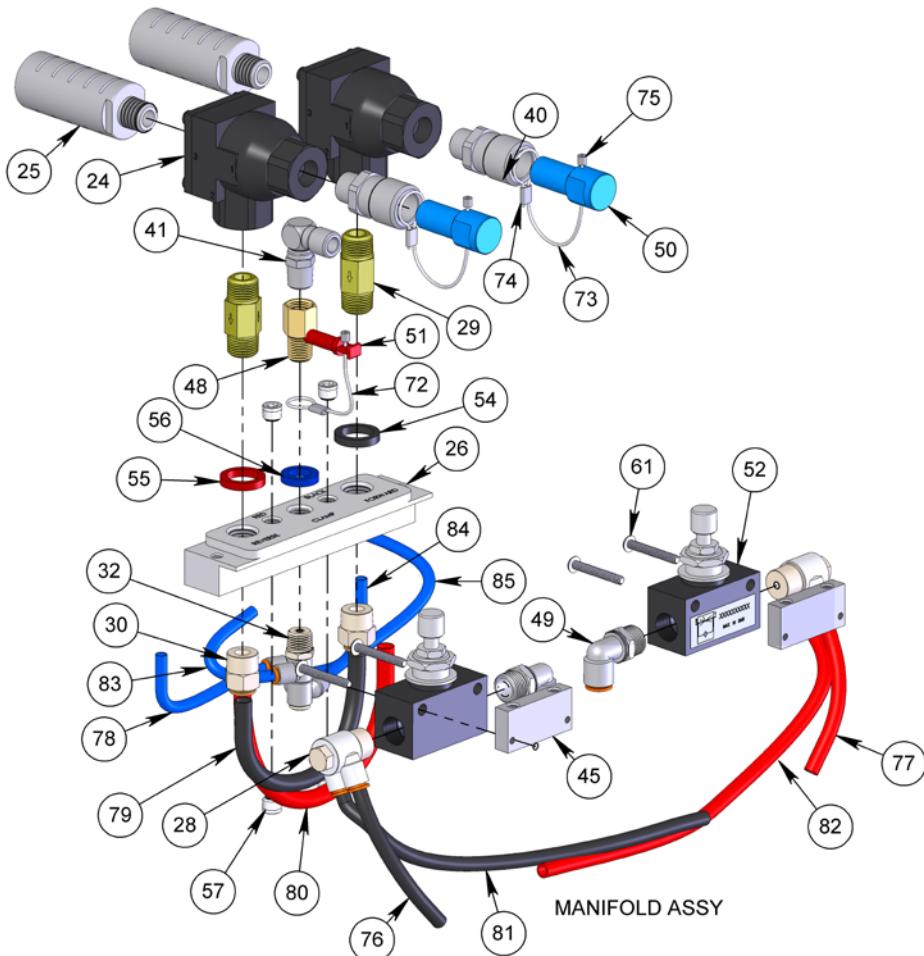


#	PART NUMBER	QTY
1	ABX 139 COLLET REFERENCE PLATE	1
3	ABX 250 AIR MOTOR, GLOBE	1
4	ABX 252 PLATE, AIR MOTOR BEARING	2
5	ABX 257 MOTOR BEARING 19MM X 37MM X 9MM	2
6	ABX 258 SHIM WASHER	4
7	ABX 305-50 BELT, 50A 10MM SIBE	1
8	ABX 305-80 BELT, 80A 25MM SIBE	1
9	ABX 310-001 BELT TRACK DRIVE ASSY BOTTOM	1
11	ABX 343 PLATE, BOTTOM	1
12	ABX 345 STIFFENER, TOP PLATE	1
14	ABX 348 COVER	1

15	ABX 353 KEY, MODIFIED	2
21	ABX 360-001 BELT TRACK DRIVE ASSY TOP	1
22	ABX 370-001 DOOR ASSY	1
27	ABX 391 FTG, ELBOW SWIVEL 90 BSPT2M PL8MMF	4
33	ABXS 105 SENSOR ASSY, SPEED AND DIRECTION	1
34	ABXS 110 ASSY, CONNECTOR BAR	1
36	ABXS 160 GUIDE ASSEMBLY, 3L SENTINEL	1
37	ABXS 180 ASSY, HOSE STOP	1
38	ABXS 251 AIR MOTOR, GLOBE	1
39	ABXS 252 PLATE, SPACER	1
43	ABXS 340 PLATE, INNER	1

44	ABXS 344 PLATE, TOP	1
46	ABXS 349 BLOCK, CABLE CLAMP	2
47	ABXS 380 ASSY, GUARD	1
59	GSB 3M6-12-1.0 BHCS M6X1.0 X 12 SS	1
60	GSB 313-0075 BHCS 6-32 X .19 SS	8
62	GSF 3M6-20-1.00 FHCS M6X1.00 X 20 SS	8
63	GSF 319-02 FHCS 10-24 X .50 SS	4
68	GSF 325-025 FHCS .25-20 X .62 SS	46
69	GSSH 0375-0500-SS SHOULDER SCREW .375 X .500 .31-18 SS	4
70	PL 162 WARNING DECAL, PINCH POINT	4
71	PL 300-2 PIDPLATES S-BADGE, 2 IN., COLOR	1

**AUTOBOX® (ABXS-3L) HOSE TRACTOR
MANIFOLD ASSEMBLY**

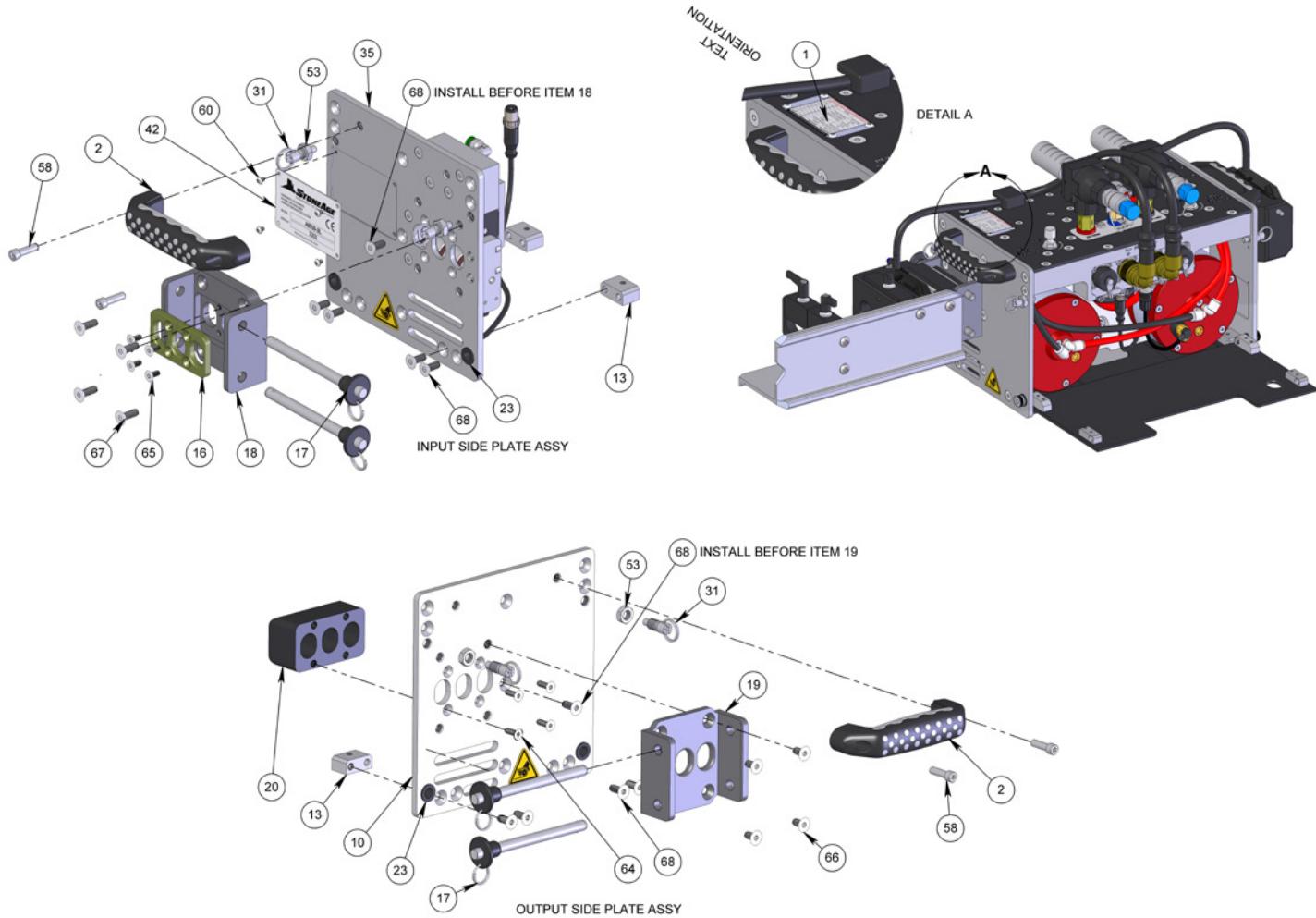


#	PART NUMBER	QTY
24	ABX 382 QUICK EXHAUST VALVE, P6	2
25	ABX 383 SILENCER, P6	2
26	ABX 386 AIR MANIFOLD	1
28	ABX 392 FTG, MANIFOLD 90 P6M 2XPL5	2
29	ABX 394 FTG, INLINE FILTER P6M P6M	2
30	ABX 397 FTG, ADAPTER P6M PL6	2
32	ABXS 102 FTG, MANIFOLD 90 P4M 4XPL4	1
40	ABXS 270 FTG, ADAPTER P6M PL10 EISELE	2
41	ABXS 274 FTG, ELBOW SWIVEL 90 P4M PL5 EISELE	1
45	ABXS 346 PLATE, FLOW CONTROL	2
48	AST 280 FTG, ADAPTER P4M P4F	1
49	CB 352 FTG, ELBOW SWIVEL 90 P6M PL6	2
50	CB 474 FTG, STEM PLUG PL10 MODIFIED	2
51	CB 499 FTG, STEM PLUG PL5 MODIFIED	1
52	CB 528 FLOW CONTROL VALVE, P6	2
54	GP 011-BK ID WASHER, RUBBER, MED, BLACK	1
55	GP 011-R ID WASHER, RUBBER, MED, RED	1

56	GP 013-B ID WASHER, RUBBER, SMALL, BLUE	1
57	GP 025-P2SS HEX SOCKET PLUG, 1/8 NPT, SS	4
61	GSB 319-055 BHCS 10-24 X 1.38 SS	4
72	SRT 209.1.1 WIRE ROPE FOR ABXS PL5 (CUT TO 5.25IN)	1
73	SRT 209.1.1 WIRE ROPE FOR ABXS PL10 (CUT TO 6.75IN)	2
74	SRT 209.1.3 ALUMINUM SLEEVE	3
75	SRT 209.1.4 ALUMINUM STOP SLEEVE	3
76	TUBE 1 M8 BK GPTB 8MM-PUR95A-BK	1
77	TUBE 1 M8 RD GPTB 8MM-PUR95A-RD	1
78	TUBE 1 PL4 BL GPTB 0250-PUR95A-BL	1
79	TUBE 1 PL6 BK GPTB 0375-PUR95A-BK	1
80	TUBE 1 PL6 RD GPTB 0375-PUR95A-RD	1
81	TUBE 2 M8 BK GPTB 8MM-PUR95A-BK	1
82	TUBE 2 M8 RD GPTB 8MM-PUR95A-RD	1
83	TUBE 2 PL4 BL GPTB 0250-PUR95A-BL	1
84	TUBE 3 PL4 BL GPTB 0250-PUR95A-BL	1
85	TUBE 4 PL4 BL GPTB 0250-PUR95A-BL	1

PART DIAGRAM

AUTOBOX® (ABXS-3L) HOSE TRACTOR
INSIDE AND OUTSIDE PLATE ASSEMBLIES

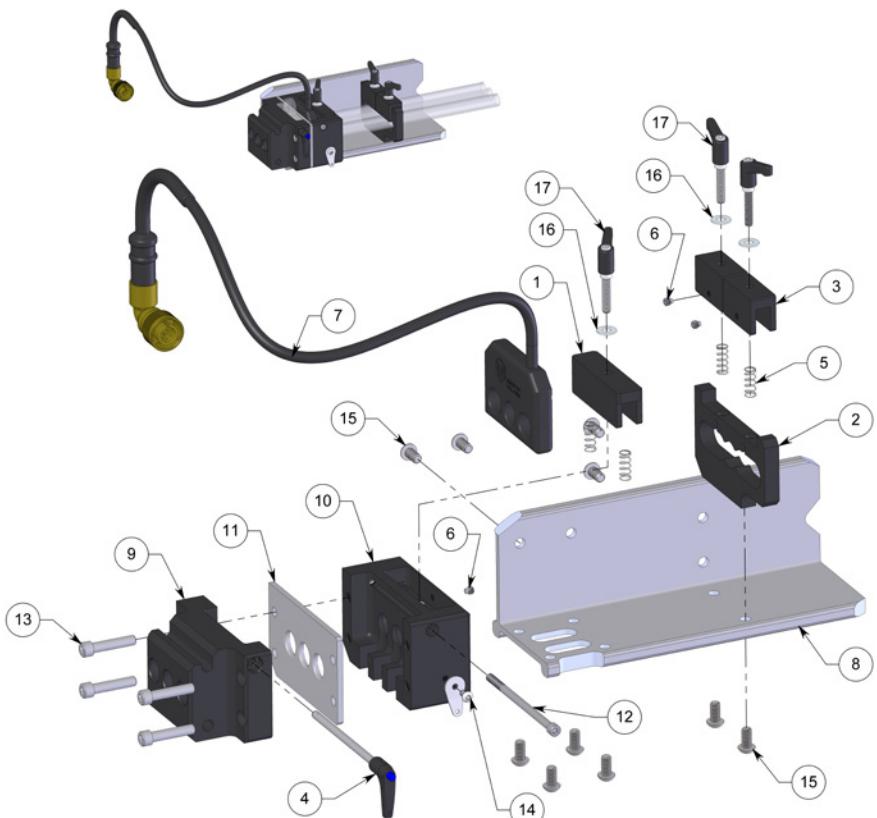


#	PART NUMBER	QTY
2	ABX 215 PULL HANDLE GREY	2
10	ABX 342 SIDE PLATE OUTLET	1
13	ABX 347 BLOCK, SUPPORT	4
16	ABX 355 HOSE GUIDE PLATE INNER	1
17	ABX 356 QUICK PIN 17-4 SS .38 X 3.75	4
18	ABX 357 MOUNTING BRACKET, INLET	1
19	ABX 358 MOUNTING BRACKET, OUTLET	1
20	ABX 359 HOSE GUIDE BLOCK, INNER	1
23	ABX 375 BUSHING, PECK .375 ID X .375 LG	4
30	ABX 397 FTG, ADAPTER P6M PL6	2

31	ABX 566-001 SPRING PLUNGER ASSY	4
35	ABXS 130 INLET PLATE ASSY WITH LPS	1
42	ABXS 303 PLATE, SERIAL CE	1
53	GN 337-HJ NUT, HEX JAM .37-16 SS	4
58	GS 325-035 SHCS .25-20 X .88 SS	4
59	GSB 3M6-12-1.0 BHCS M6X1.0 X 12 SS	1
64	GSF 319-025 FHCS 10-24 X .62 SS	16
65	GSF 319-0175 FHCS 10-24 X .44 SS	4
66	GSF 325-02 FHCS .25-20 X .50 SS	4
67	GSF 325-03 FHCS .25-20 X .75 SS	4
68	GSF 325-025 FHCS .25-20 X .62 SS	46

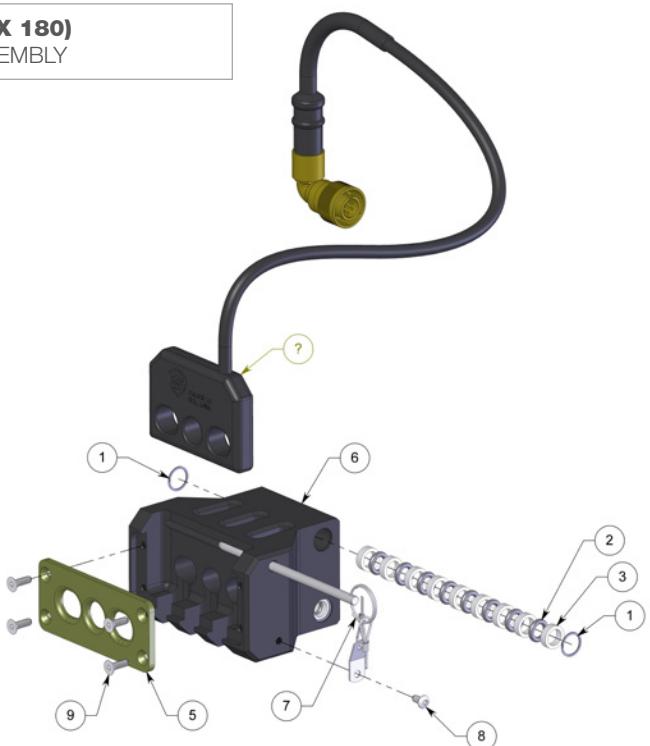
AUTOBOX® (ABX 160)
GUIDE ASSEMBLY

#	PART NUMBER	QTY
1	ABX 177 REAR CLAMP CHANNEL	1
2	ABX 178 PITCH CLAMP PLATE	1
3	ABX 179 PITCH CLAMP CHANNEL, HALF	2
4	ABX 181 PIN, QR, .250 DIA X 4.00 L, WITH LANYARD	1
5	ABX 182 SPRING, COMPRESSION	4
6	ABX 183 SCREW, SET, EXTENDED POINT	3
7	ABXS 161 ASSY, HOSE CRIMP AND HOSE STOP SENSOR PUCK	1
8	ABXS 175 BOX SECTION, SENTINEL	1
9	ABXS 176 SPLIT COLLET BLOCK, TRACTOR SIDE	1
10	ABXS 177 SPLIT COLLET BLOCK, GUIDE TUBE SIDE	1
11	ABXS 178 DIVIDER PLATE .1875	1
12	GS 325-18 SHCS .25-20 X 4.50 SS	1
13	GS 331-06 SHCS .31-18 X 1.50 SS	4
14	GSB 319-015 BHCS 10-24 X .38 SS	1
15	GSB 331-025 BHCS .31-18 X .62 SS	10
16	GW 325-F WASHER, FLAT .25 SS	3
17	SRT 557 ADJUSTABLE HANDLE .25-20 X 1.19	3



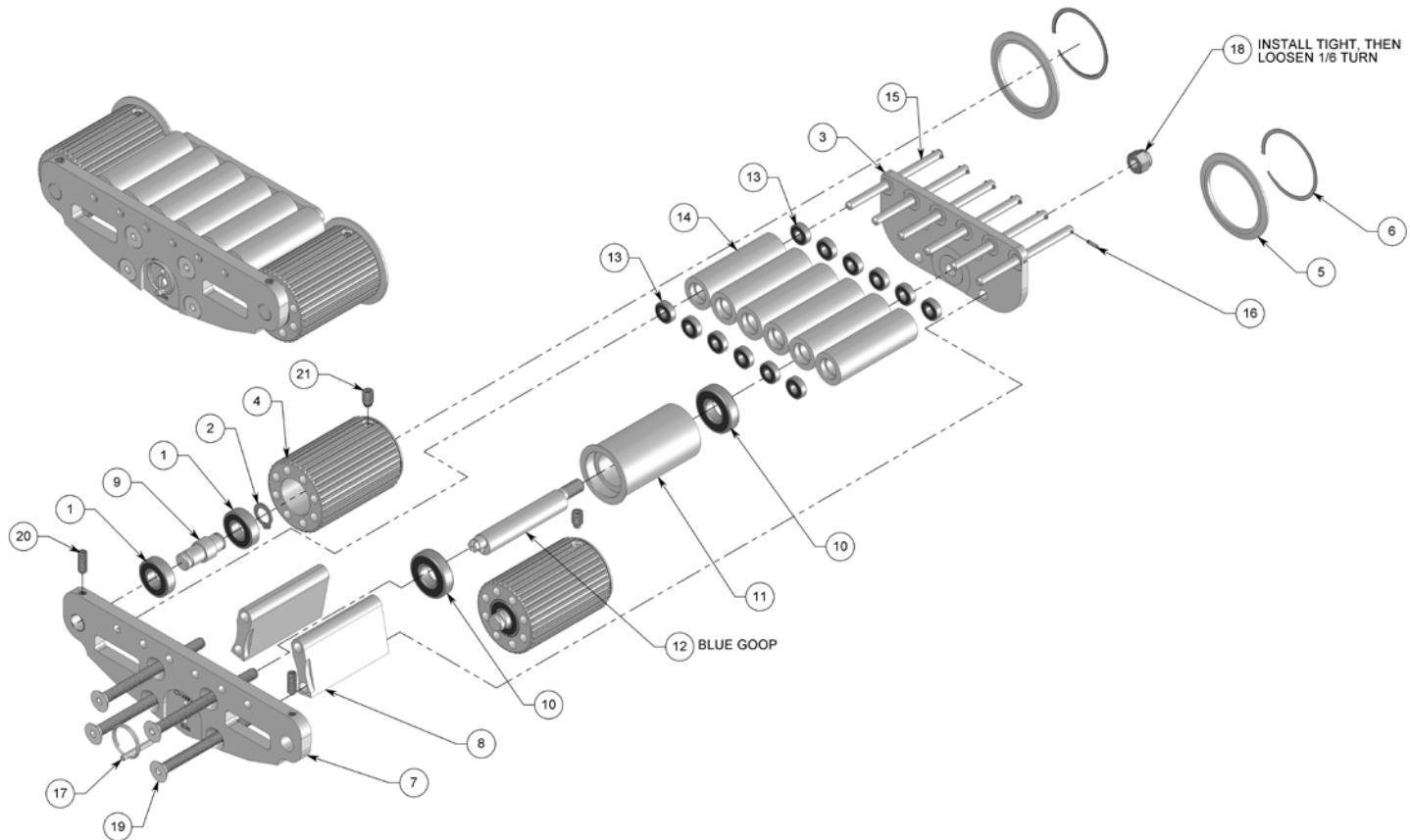
AUTOBOX® (ABX 180)
HOSE STOP ASSEMBLY

#	PART NUMBER	QTY
1	ABX 230 RING, SPIRAL INTERNAL RETAINER SS (BORE Ø 0.625 X .035 THICK)	4
2	ABX 294 ORING, SHOCK ABSORBING	16
3	ABX 352 SPACER, O-RING	18
4	ABXS 161 ASSY, HOSE CRIMP AND HOSE STOP SENSOR PUCK	1
5	ABXS 183 PLATE, FACE	1
6	ABXS 186 BLOCK, HOSE STOP	1
7	ABXS 187 QUICK RELEASE PIN W LANYARD	1
8	GSB 319-015 BHCS 10-24 X .38 SS	1
9	GSF 319-025 FHCS 10-24 X .62 SS	4



PART DIAGRAM

AUTOBOX® (ABX 310-001)
BELT TRACK DRIVE ASSEMBLY

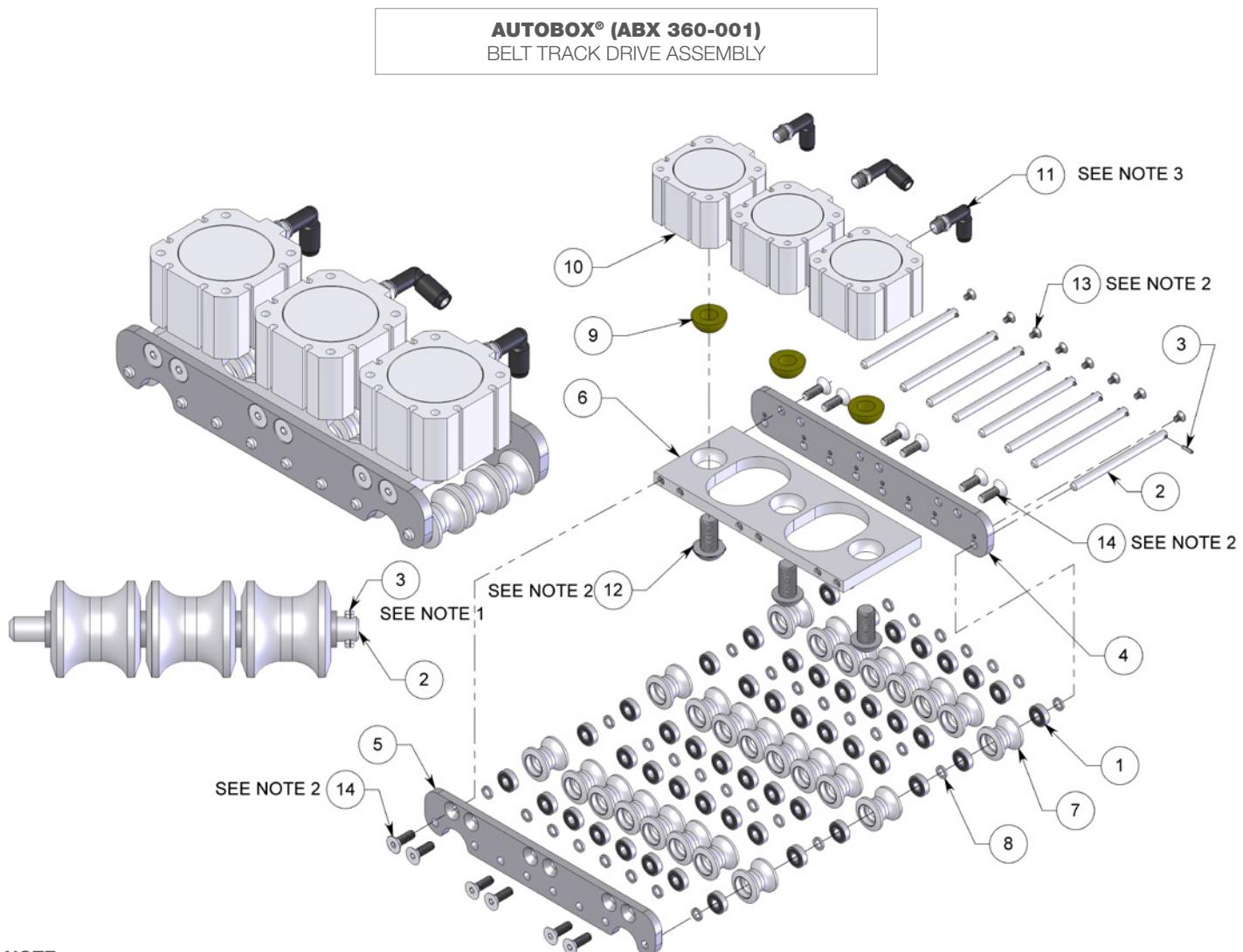


NOTE:

1. APPLY BLUE LOCTITE® 242 TO ALL THREADED HARDWARE.
2. BLUE GOOP IS A SWAGELOCK® BRAND ANTI-SEIZE AN EQUIVALENT ALTERNATIVE IS ACCEPTABLE.

#	PART NUMBER	QTY.
1	ABX 228 BEARING .500 ID X 1.125 OD SEALED PERMALUBE	4
2	ABX 267 RETAINING RING, SL EXTERNAL SS	2
3	ABX 311-001 PLATE, BELT INNER	1
4	ABX 314 DRIVE SPROCKET 36T-AT5	2
5	ABX 315 SPROCKET FLANGE	2
6	ABX 316 RETAINING RING, FLANGE 2.00 EXT LIGHT DUTY	2
7	ABX 317-001 PLATE, SIDE	1
8	ABX 318 BLOCK, BELT DRIVE	2
9	ABX 320 STUB SHAFT, DRIVE ROLLER	2
10	ABX 322 BEARING R10, PERMALUBE	2

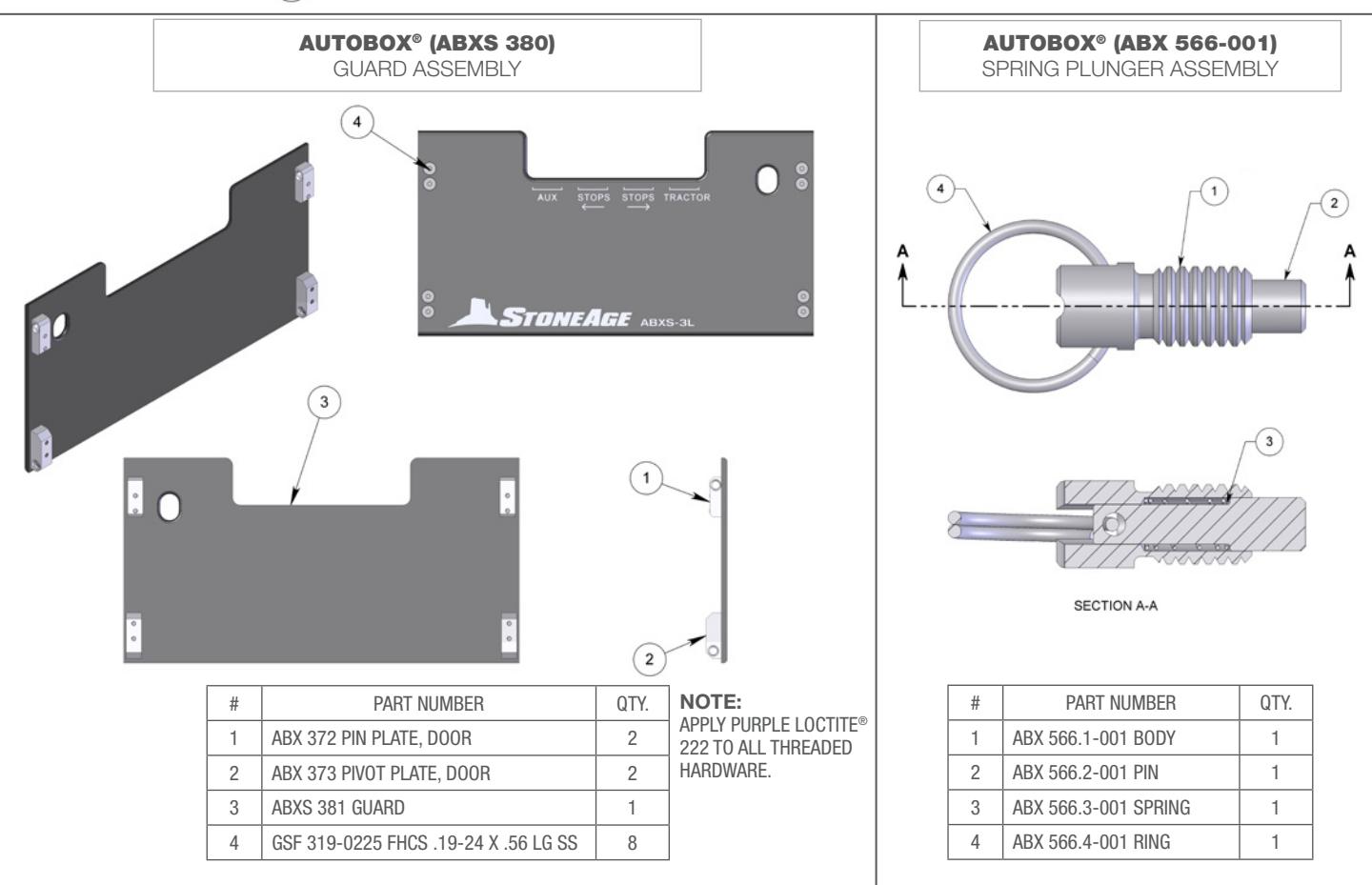
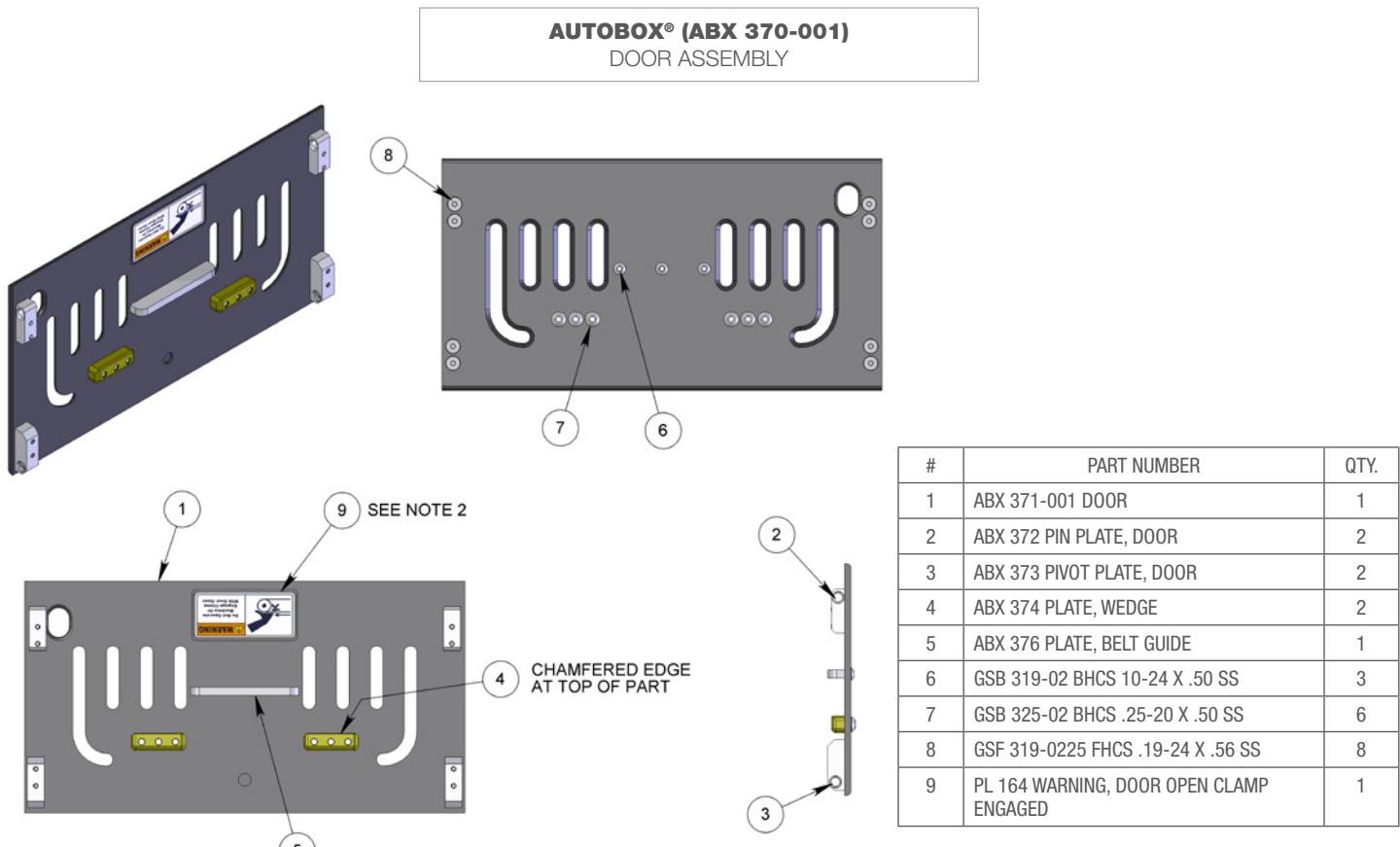
11	ABX 323 IDLER, TENSIONING	1
12	ABX 324 ECCENTRIC SHAFT	1
13	ABX 326 R4 PERMA LUBE BEARING	12
14	ABX 327 ROLLER, BELT	6
15	ABX 330 SHAFT, IDLER	6
16	ABX 332 SPRING PIN, .094 X .375	6
17	ABX 333 QUICK RELEASE PIN .156 X .8 LG	1
18	GN 337-L NYLOK NUT SS	1
19	GSS 331-16 FHCS .31-18 X 4.00 SS	4
20	GSS 325-20-75CO SET SCREW, CONE PT SS	2
21	GSS 331-18-50DP SET SCREW, DOG PT SS	2

**NOTE:**

1. CENTER PIN WHEN INSTALLING SHAFT
2. APPLY BLUE LOCTITE® 242 TO ALL THREADED HARDWARE.
3. APPLY TEFLON TAPE OR EQUIVALENT TO THREADS OF ALL PNEUMATIC FITTINGS.

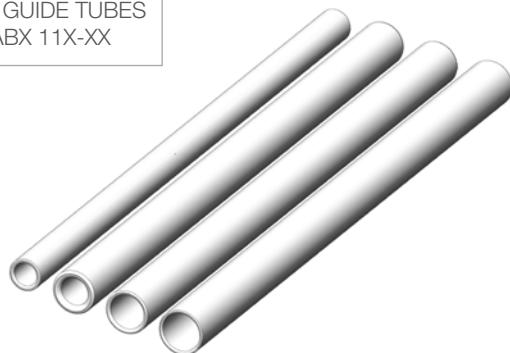
#	PART NUMBER	QTY.
1	ABX 326 R4 PERMA LUBE BEARING	48
2	ABX 330 SHAFT, IDLER	8
3	ABX 332 SPRING PIN, .094 X .375	8
4	ABX 361 PLATE, CLAMP INSIDE	1
5	ABX 362 PLATE, CLAMP OUTSIDE	1
6	ABX 364-001 PLATE, CLAMP	1
7	ABX 366 ROLLER, HOSE	24
8	ABX 367 SHIM WASHER	32
9	ABX 377 SPHERICAL BALL	3
10	ABX 385 SMC AIR CYL NCQ8A200-062S	3
11	ABX 387 FTG, ELBOW SWIVEL LONG 90 P2M PL4	3
12	GSB 350-04 BHCS .50-13 X 1.00 SS	3
13	GSF 316-01 FHCS .16-32 X .25 SS	8
14	GSF 325-03 FHCS .25-20 X .75 SS	12

PART DIAGRAM



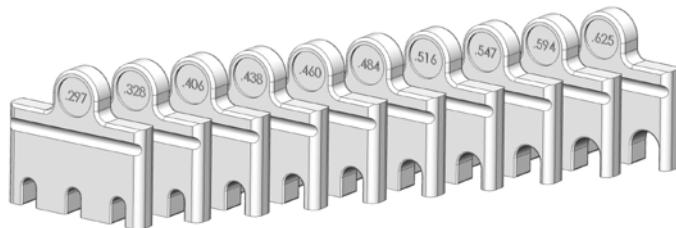
AUTOBOX® ABXS-3L HOSE GUIDE ASSEMBLY ACCESSORIES
GUIDE TUBES, COLLETS, ANTI-TWIST CLAMPS AND HOSE STOPS

ABX GUIDE TUBES
ABX 11X-XX



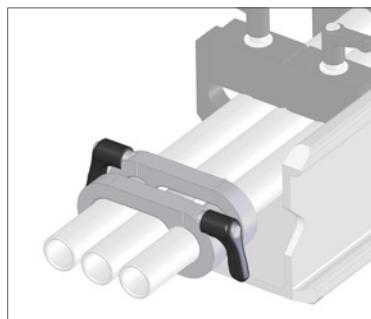
StoneAge (SA) PART NUMBER GUIDE TUBE REFERENCE CHART			
GUIDE TUBE	BANSHEE	INSIDE DIAMETER, LENGTH	QTY
ABX 115-12	BN9.5	.459 in / 12 mm, 12.5 in. / 318 mm	3
ABX 115-36	BN9.5	.459 in / 12 mm, 36 in. / 914 mm	3
ABX 116-12	BN13	.546 in / 14 mm, 12.5 in. / 318 mm	3
ABX 116-36	BN13	.546 in / 14 mm, 36 in. / 914 mm	3
ABX 117-12	BN15	.674 in / 17 mm, 12.5 in. / 318 mm	3
ABX 117-36	BN15	.674 in / 17 mm, 36 in. / 914 mm	3
ABX 119-12	BN18	.745 in / 19 mm, 12.5 in. / 318 mm	3
ABX 119-36	BN18	.745 in / 19 mm, 36 in. / 914 mm	3

HOSE STOP COLLETS
ABX 171-XX



StoneAge (SA) PART NUMBER COLLET REFERENCE CHART		
PART NUMBER	DESCRIPTION	QTY
ABX 171-297	HOSE STOP COLLET .297 in. / 8 mm	1
ABX 171-328	HOSE STOP COLLET .328 in. / 8 mm	1
ABX 171-406	HOSE STOP COLLET .406 in. / 10 mm	1
ABX 171-438	HOSE STOP COLLET .438 in. / 11 mm	1
ABX 171-460	HOSE STOP COLLET .460 in. / 12 mm	1
ABX 171-484	HOSE STOP COLLET .484 in. / 12 mm	1
ABX 171-516	HOSE STOP COLLET .516 in. / 13 mm	1
ABX 171-547	HOSE STOP COLLET .547 in. / 14 mm	1
ABX 171-594	HOSE STOP COLLET .594 in. / 15 mm	1
ABX 171-625	HOSE STOP COLLET .625 in. / 16 mm	1

GUIDE TUBE
ANTI-TWIST CLAMPS
ABX 140-XX



StoneAge (SA) PART NUMBER ANTI-TWIST CLAMP REFERENCE CHART

PART NUMBER	DESCRIPTION	QTY
ABX 140-625	GUIDE TUBE ANTI-TWIST CLAMP .625	2
ABX 140-840	GUIDE TUBE ANTI-TWIST CLAMP .840	2
ABX 140-875	GUIDE TUBE ANTI-TWIST CLAMP .875	2

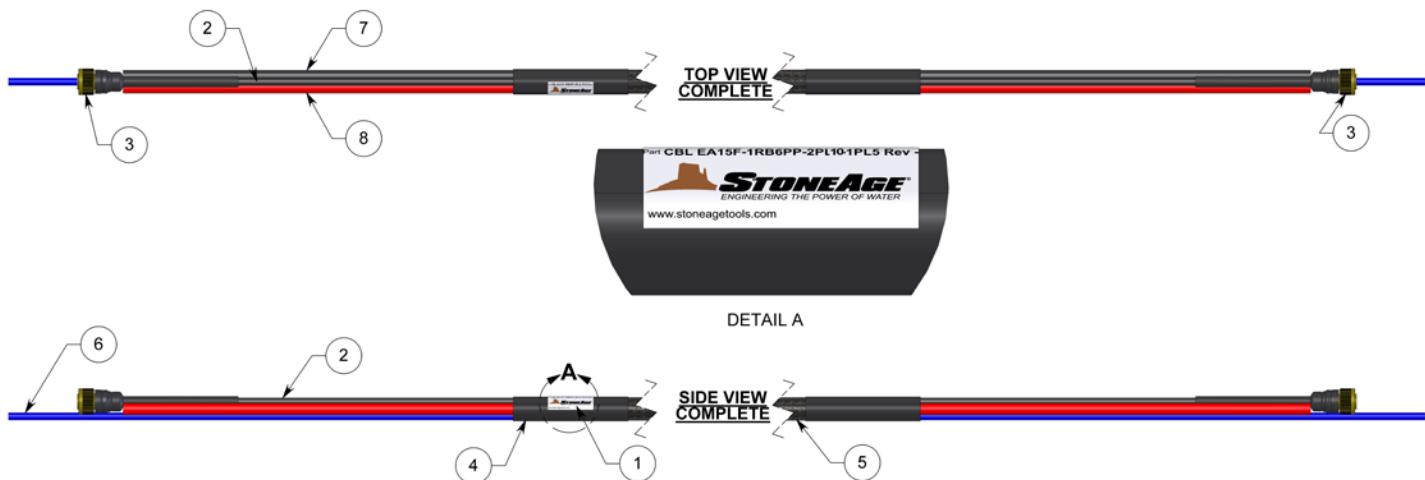
HOSE STOP CLAMPS
HS 121-XX-XX



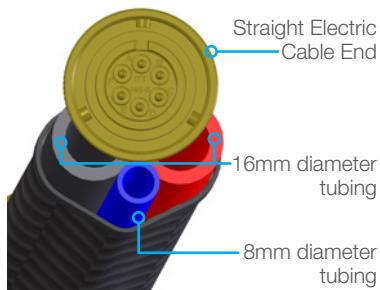
StoneAge (SA) PART NUMBER HOSE STOP REFERENCE CHART		
PART NUMBER	DESCRIPTION	QTY
HSS 121-27-34	HOSE STOP CLAMP ASSEMBLY, .27-34	3
HSS 121-34-42	HOSE STOP CLAMP ASSEMBLY, .34-42	3
HSS 121-42-50	HOSE STOP CLAMP ASSEMBLY, .42-.50	3
HSS 121-50-56	HOSE STOP CLAMP ASSEMBLY, .50-56	3
HSS 121-56-61	HOSE STOP CLAMP ASSEMBLY, .56-61	3

PART DIAGRAM

AUTOBOX® (CBL EA15F-1RB6PP-2PL10-1PL5)
15FT ABXS TRACTOR CABLE ASSEMBLY



CONTROL LINE ENDS



#	PART NUMBER / DESCRIPTION	QTY	OAL EACH
1	CBL EA15F-1RB6PP-2PL10-1PL5.1 LABEL	1	
2	EA15F.1 WIRE, 1X4 PAIR, 24 (7/32 AWG COPPER ALLOY, .011" POLYPLEFIN	1	15'
3	EE CN-RB-PF6PS-14S-0001 PLUG, POT AND HEATSHRINK ENDBELL	2	
4	GPHS 1100-OLE-A-BK HEAT SHRINK, 1.1" ID , BLACK	2	5"
5	GPSL 0750-NYL-G-BK HOSE BUNDLE SLEEVE	1	11'-5"
6	GPTB 8MM6-PUR95A-BL 8MM OD X 6MM ID URETHANE TUBING, BLUE	1	15'-6"
7	GPTB 16MM11-PUR95A-BK 16MM OD X 11MM ID URETHANE TUBING, BLACK	1	14'-8"
8	GPTB 0500-PUR95A-RD 16MM OD X 11MM ID URETHANE TUBING, RED	1	14'-8"

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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>

WARRANTY INFORMATION

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.

NOTES

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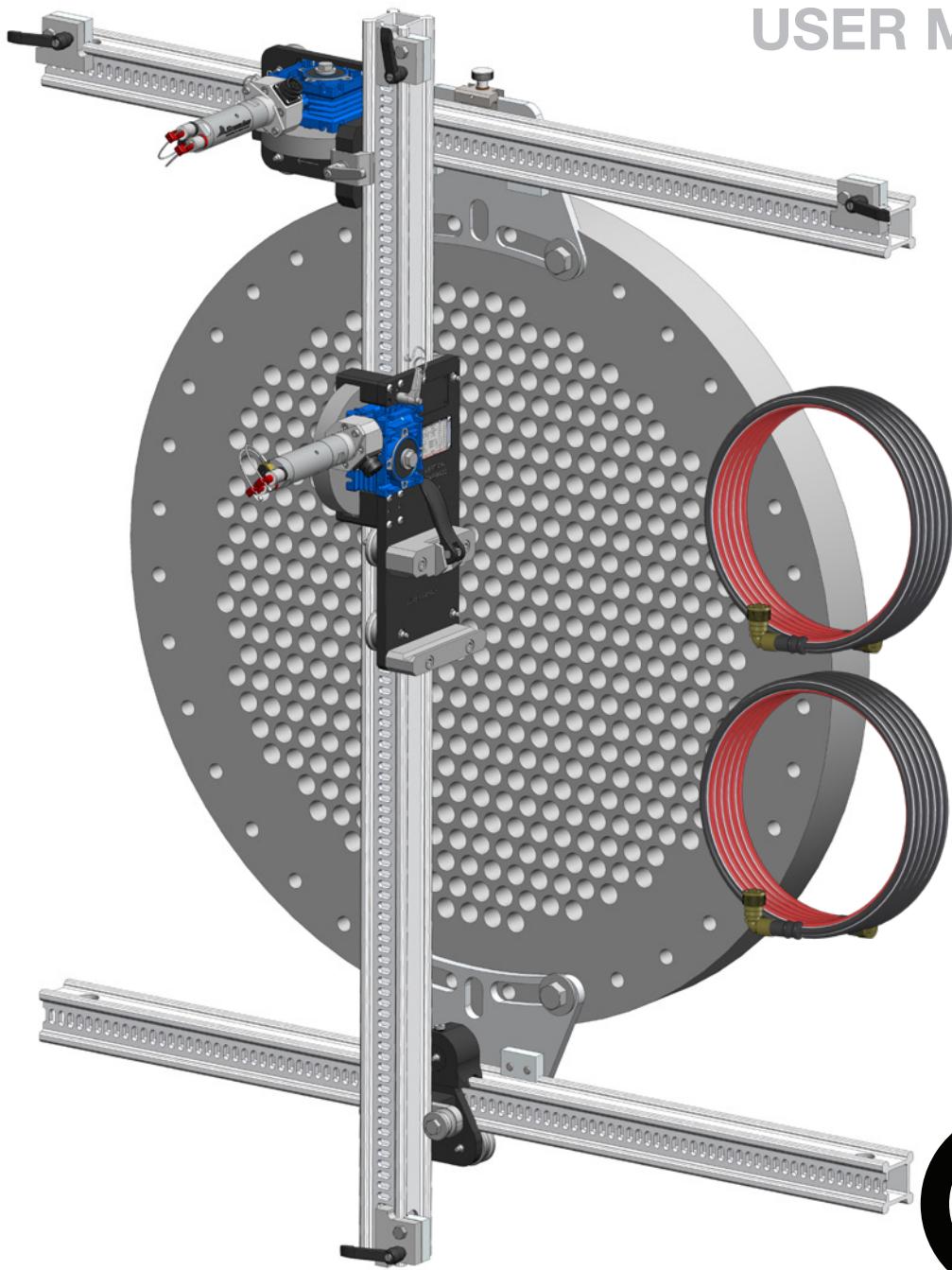


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LIGHTWEIGHT POSITIONER (LWPS-100-X) USER MANUAL



PL 690 REV B
(03/2021)

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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).

Updated manuals can be downloaded at:
<https://www.stoneagetools.com/manuals>

SPECIFICATIONS		
	Imperial	Metric
Full Positioner Weight	120 lbs	54.4 kg
Vertical Carriage Weight	17 lbs	7.7 kg
Horizontal Carriage Weight	15.4 lbs	7 kg
Idler Carriage Weight	4.4 lbs	2 kg
Dimensions without extensions	6 x 6 ft	1829 x 1829 mm
Cleaning Window Dimensions for 6ft Rail Configuration	<i>See diagram below table</i>	
Optional Rail Extension lengths	2, 4, and 6 ft	607, 1219, and 1829 mm

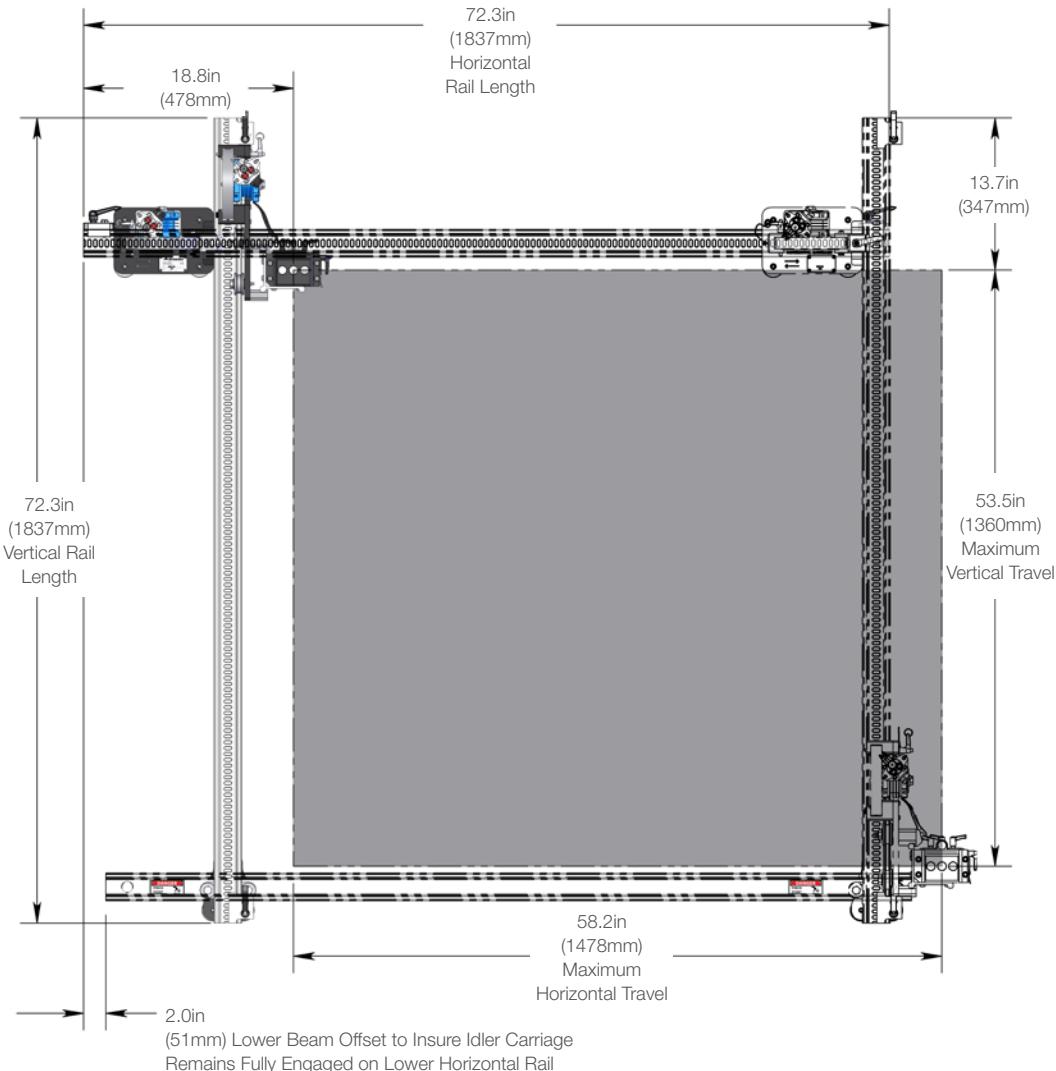
DESCRIPTION OF EQUIPMENT AND INTENDED USE

The Lightweight Positioner can be mounted to a variety of heat exchanger tube bundles and has pneumatic powered horizontal and vertical drives. It is intended to be used with these AUTOBOX® Hose Tractors;

- ABXS-3L (3 Lance with Sentinel Technology)
- ABX-3L (3 Lance)
- ABX-2L-B (2 Lance Belt Drive)
- ABX-PRO (Single Lance)

KEY FEATURES:

- Better positioning accuracy - reduced backlash and clearance across the system
- Completely tool free setup and operation
- Drives locked in place by a pin for visual confirmation of engagement
- Highly accurate position encoding
- Reduced component size and weight
- Larger usable window size
- Push-to-Connect fittings
- Metric hardware and tube sizes
- Sensor can be replaced in minutes
- Same sensor used in both drives
- Carriages are interchangeable with LWP-500
- Rail scraper on idler carriage
- Utilizes field proven stainless steel air motors





EC DECLARATION OF CONFORMITY

Manufacturer:

StoneAge Incorporated
466 South Skylane Drive
Durango, CO 81303
USA

Authorized Representative:

StoneAge Europe
Reedijk 7Q
3274 KE Heinenoord
Netherlands
Bob Van Wordragen, Operations Manager StoneAge NL

Declare that:

Light Weight Positioner (LWPS-100-X)
for mounting and positioning hose tractors to heat exchangers.

Is compliant with the following Directives and Standards:

EU- Machinery Directive (2006/42/EC)

EU- RoHS Directive (2011/65/EU)

EN ISO 12100:2010 (E) Safety of machinery – General principles for design – Risk assessment and risk reduction

The Technical File for Light Weight Positioner (LWPS-100-X) is maintained at: StoneAge Incorporated, 466 South Skylane Drive, Durango, CO 81303, USA and was compiled by the Director of Engineering and Technology. The Technical File is available through the Authorized Representative.

This Declaration of Conformity is issued under the exclusive responsibility of StoneAge Incorporated.



StoneAge Incorporated, Durango, CO, USA
Adam Markham, Director of Engineering and Technology

03/29/21

Date





Regulatory Compliance and Safety Information for StoneAge Sentinel System USA & Canada Compliance

Manufacturer:

StoneAge Incorporated
466 South Skylane Drive
Durango, CO 81303
US (866)-795-1586
www.stoneagetools.com

Declare that:

Sentinel System (SENT001)

Is compliant with the following:

FCC Part 15, Subpart B / ICES-003 Unintentional Emissions Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules and Industry Canada ICES-003. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with part 15 of the FCC rules and Industry Canada ICES-003. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Part 15, Subpart C / RSS-210 Intentional Emissions Interference Statement

Compliance of this equipment is confirmed by the following certification numbers that are placed on the equipment:

Notice: The term "FCC ID:" and "IC" before the certification number signifies that FCC and Industry Canada technical specifications were met.

FCC ID: 2AX9D-SENT001

IC ID: 26898-SENT001

This Declaration of Conformity is issued under the exclusive responsibility of StoneAge Incorporated.

StoneAge Incorporated, Durango, CO, USA
Adam Markham, Director of Engineering and Technology

03/29/21
Date



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 DEFINITION

The Lightweight Positioner (LWPS-100-X) has the potential to cause serious injury if fingers, hair, or clothing become caught between the rollers and the rails.

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

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 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 Lightweight Positioner (LWPS-100-X) 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 (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 pipe and hose. The Lightweight Positioner (LWPS-100-X) 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.
- When moving the Lightweight Positioner (LWPS-100-X) lift with care to prevent bodily injury.

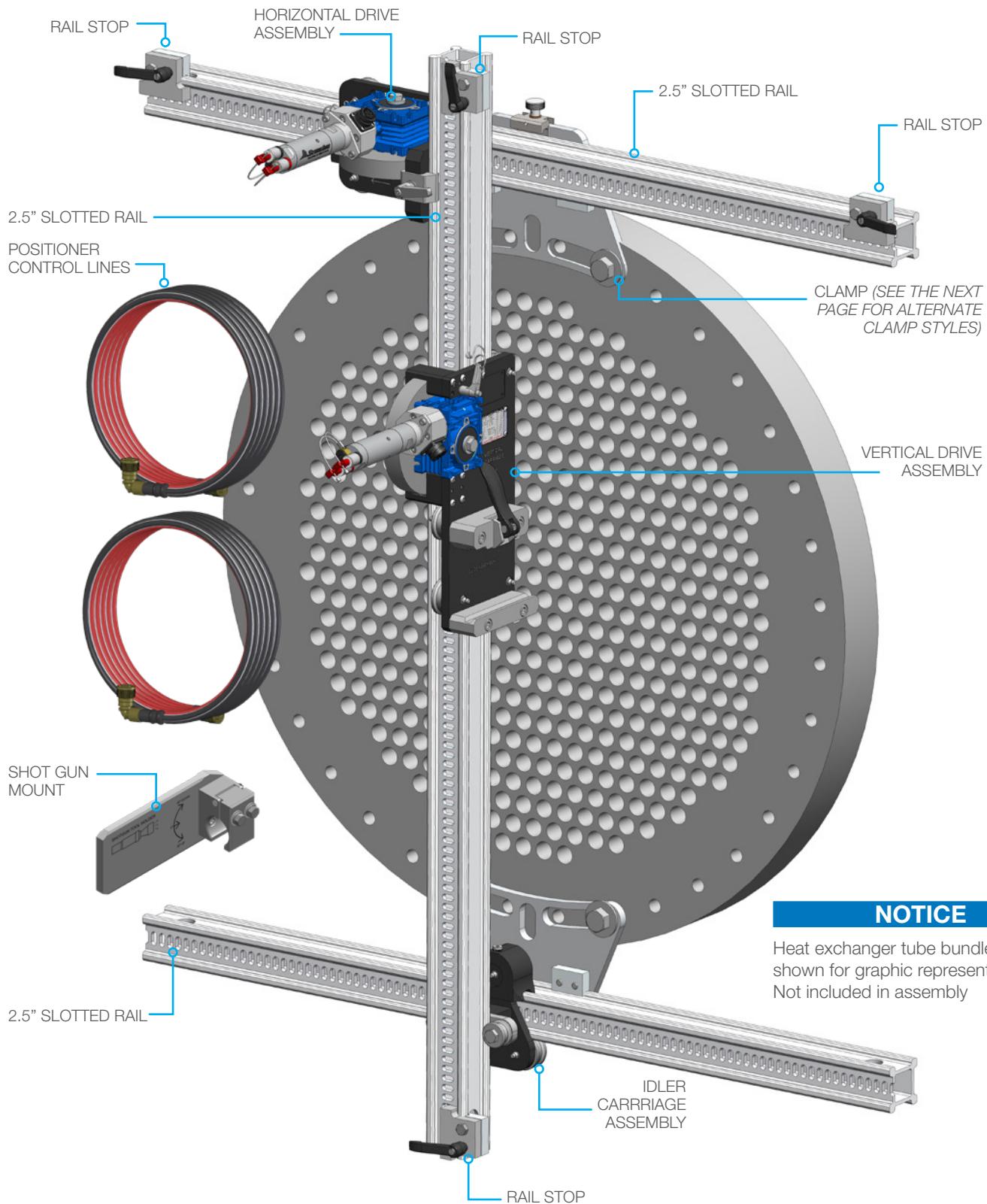
PRE-RUN SAFETY CHECK

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), whip checks (hose whips), and all other applicable safety devices are installed and set-up properly.****
- Ensure the doors of the Lightweight Positioner (LWPS-100-X) are closed and securely latched.
- Test the Control Box before operating the Lightweight Positioner (LWPS-100-X) 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.

SYSTEM ASSEMBLY - OVERVIEW

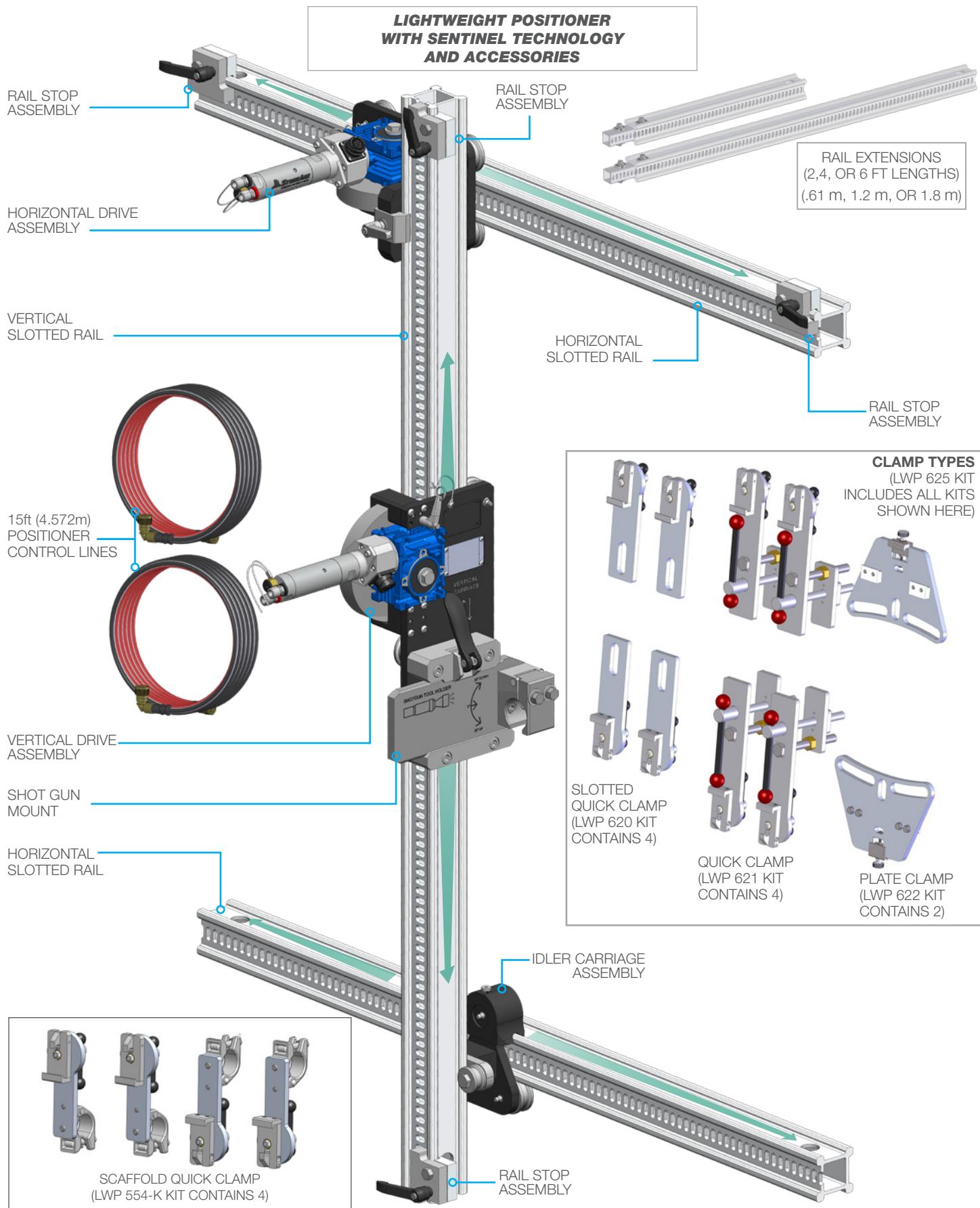
LIGHTWEIGHT POSITIONER ASSEMBLY (LWPS-100-X)



NOTICE

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

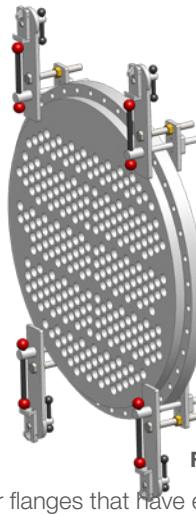
LIGHTWEIGHT POSITIONER - OVERVIEW



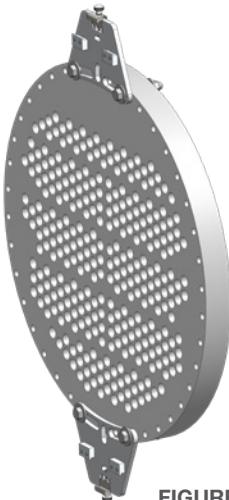
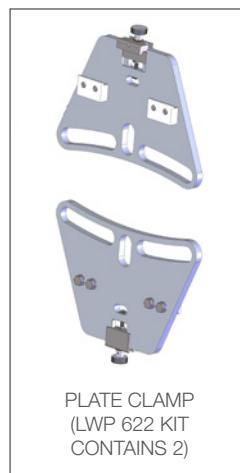
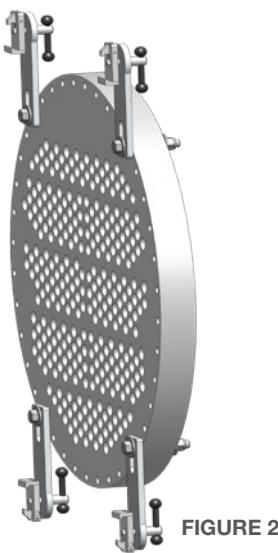
LIGHTWEIGHT POSITIONER CLAMP STYLES

CLAMP SELECTION is dependent upon the heat exchanger geometry, bolt holes, hole spacing, and flange accessibility.

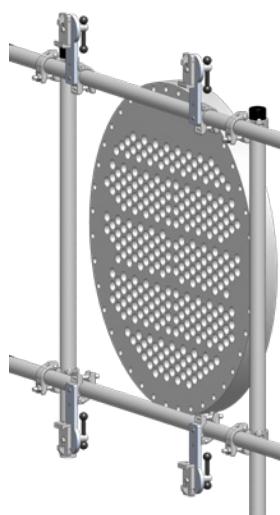
QUICK CLAMPS (LWP 518) are for use with heat exchanger flanges that provide a robust clamping surface or if flange holes are inaccessible. Align clamps on the surface of the flange to maximize flange engagement to clamps. (Figure 1)



SLOTTED QUICK (LWP 552) AND PLATE CLAMPS (LWP 519) are for use with heat exchanger flanges that have easily accessible bolt holes. Use quick clamps or plate clamps, depending on the spacing of the hole pattern. (Figures 1 & 3)



SCAFFOLD QUICK CLAMPS (LWP 554) are for use with scaffolding in situations where they may be no way to clamp directly onto the heat exchanger. (Figure 4)



LIGHTWEIGHT POSITIONER STEP BY STEP SET-UP

NOTICE

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

1. Mount the appropriate frame **Positioner Clamps** to the tube bundle as shown in Figure 1. (Shown with Plate Clamps) Positioner Clamps should be Parallel to the direction of the tube rows. (**Figure 1**)

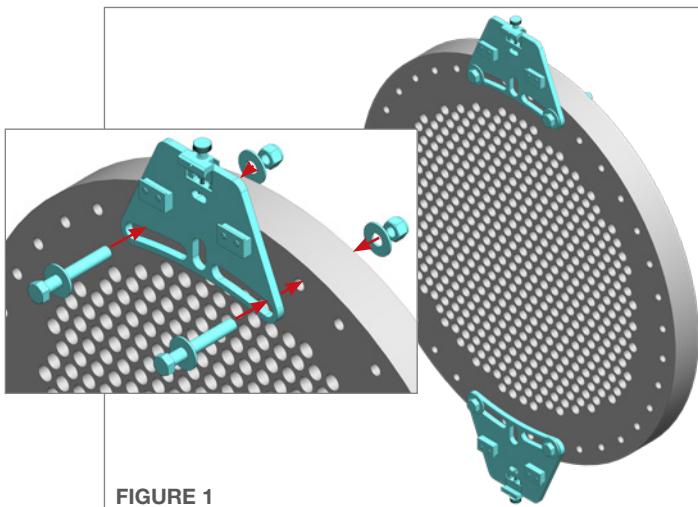


FIGURE 1

2. Loosen the **Rail Clamp Tensioner** on the top **Positioner Clamp** and insert the **Top Rail (slots facing out)** into the upper rail clamps. Tighten the **Rail Clamp Tensioner** securing the rail to the **Positioner Clamp**. Check Rail Clamp bolts to ensure they are secured to the tube bundle flange. (**Figure 2**)

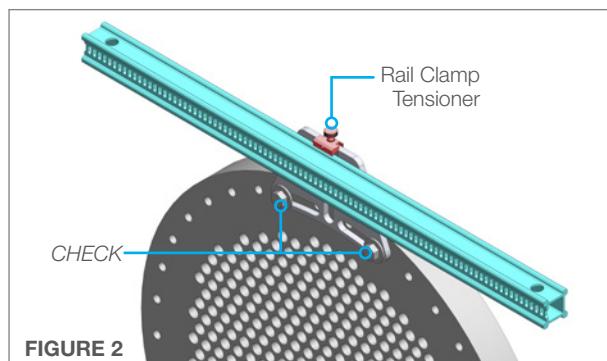


FIGURE 2

3. Loosen the **Rail Clamp Tensioner** on the bottom **Positioner Clamp** and insert the **Lower Rail** into the lower rail clamps. 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 **Rail Clamp Tensioner** securing the rail to the **Positioner Clamp**. Check Rail Clamp bolts to ensure they are secured to the tube bundle flange. (**Figure 3**)

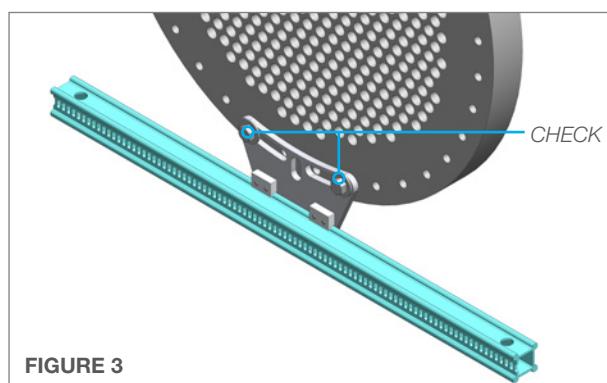


FIGURE 3

4. Remove the **Quick Release Pin** from the *locked* position, pull back on the air motor to lift the gear, and insert the **Quick Release Pin** into the *unlocked* position. This will allow the **Horizontal Drive Carriage** to slide onto the rail without pneumatic power. Center the carriage on the top rail, pull out the **Quick Release Pin**, let the gear drop into place and verify the gear is engaging the slotted rail correctly. Replace the **Quick Release Pin** into the *locked* position. (**Figures 4 & 5**)

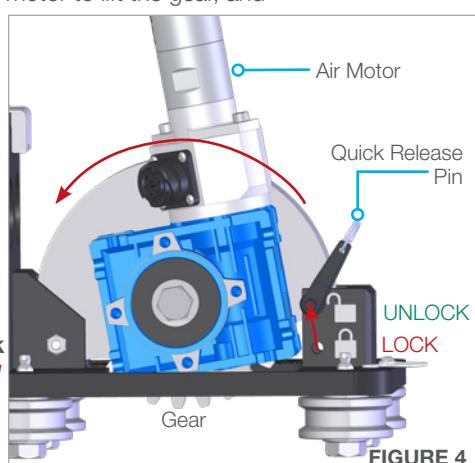


FIGURE 4

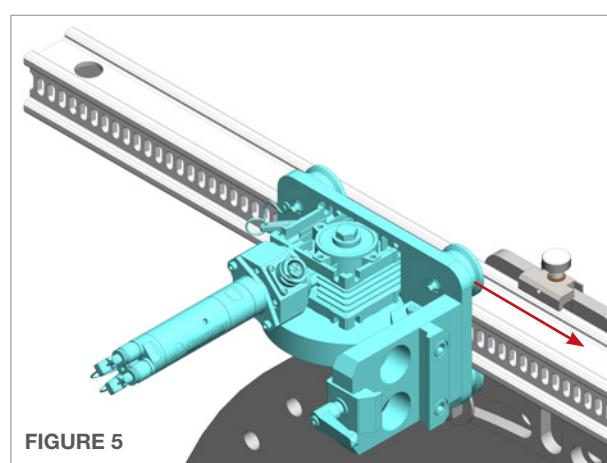


FIGURE 5

LIGHTWEIGHT POSITIONER SET-UP

- Angle the **Idler Carriage** as shown to allow the Idler Carriage to engage with the lower rail properly. Rotate it back to the vertical position and slide it towards the lower Rail Clamp. (**Figure 6**)



TECH TIP:

The rail scraper is spring loaded to fit closely against the rail to remove debris ahead of the idler roller. Pulling up on the rail scraper or tilting the idler carriage during installation will increase clearance and simplify installation.

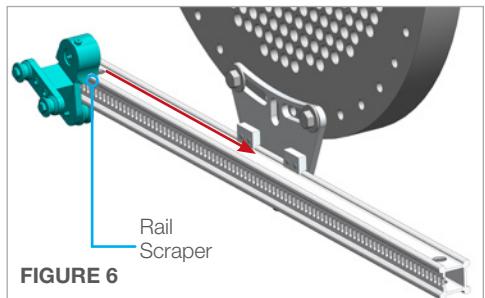


FIGURE 6

- Loosen the **Rail Clamp Handle** on the Horizontal Drive. Align the Idler Carriage on the lower rail so the Vertical Rail can slide into it. Slide the **Vertical Rail** with **(slots facing out)** down through the Horizontal Drive clamp and between the rollers on the idler carriage. Adjust the position of the vertical rail as required and secure the rail in place by tightening the **Rail Clamp Handle** on the Horizontal Drive. (**Figure 7**)

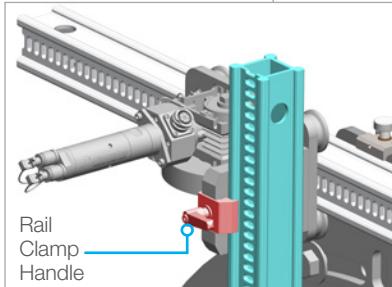


FIGURE 7

- Remove the **Quick Release Pin** from the *locked* position, pull back on the air motor to lift the gear, and insert the **Quick Release Pin** into the *unlocked* position. This will allow the **Vertical Drive Carriage** to slide onto the rail without pneumatic power. Center the carriage on the vertical rail, pull out the **Quick Release Pin**, let the gear drop into place and verify the gear is engaging the slotted rail correctly. Replace the **Quick Release Pin** into the *locked* position. (**Figures 8 & 9**)

CAUTION

Verify the Positioner Clamps and Rail Clamps are securely fastened and both drive carriages are securely engaged and the pinned in the locked position.

Never unlock the vertical drive once the guide assembly and tractor are installed, as it may result in the carriage slipping down the vertical rail and may cause damage and/or injury.

- Loosen the handles on the four **Rail Stops** and slide one onto both ends of the top horizontal rail and both ends of the vertical rail. Rotate all the handles so they face away from Horizontal and Vertical Drives (as shown) and ensure that they are securely fastened. (**Figure 10**)

WARNING

Failure to secure the Rail Clamps could result in the carriages driving off the rails. This will create a hazardous situation which, if not avoided, **could** result in death or serious injury.

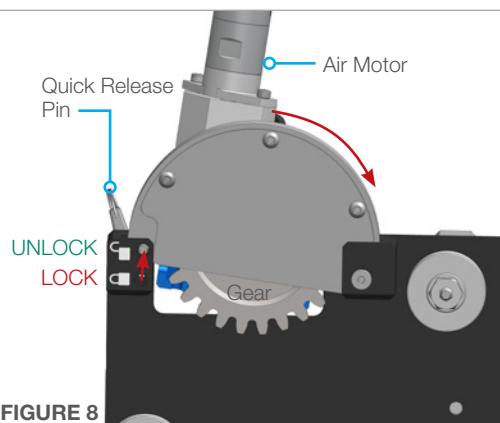


FIGURE 8

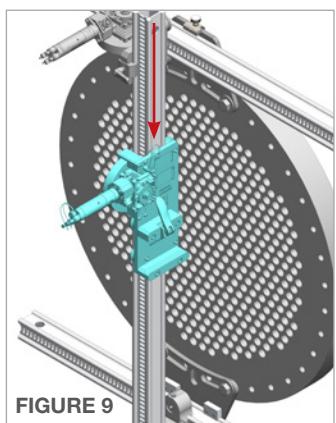


FIGURE 9

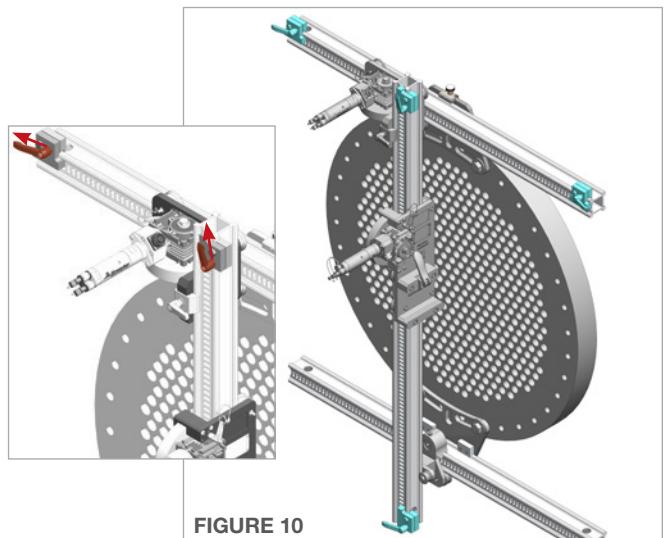


FIGURE 10

LIGHTWEIGHT POSITIONER CONNECTIONS TO THE POWER HUB

CONTROL LINE CONNECTIONS

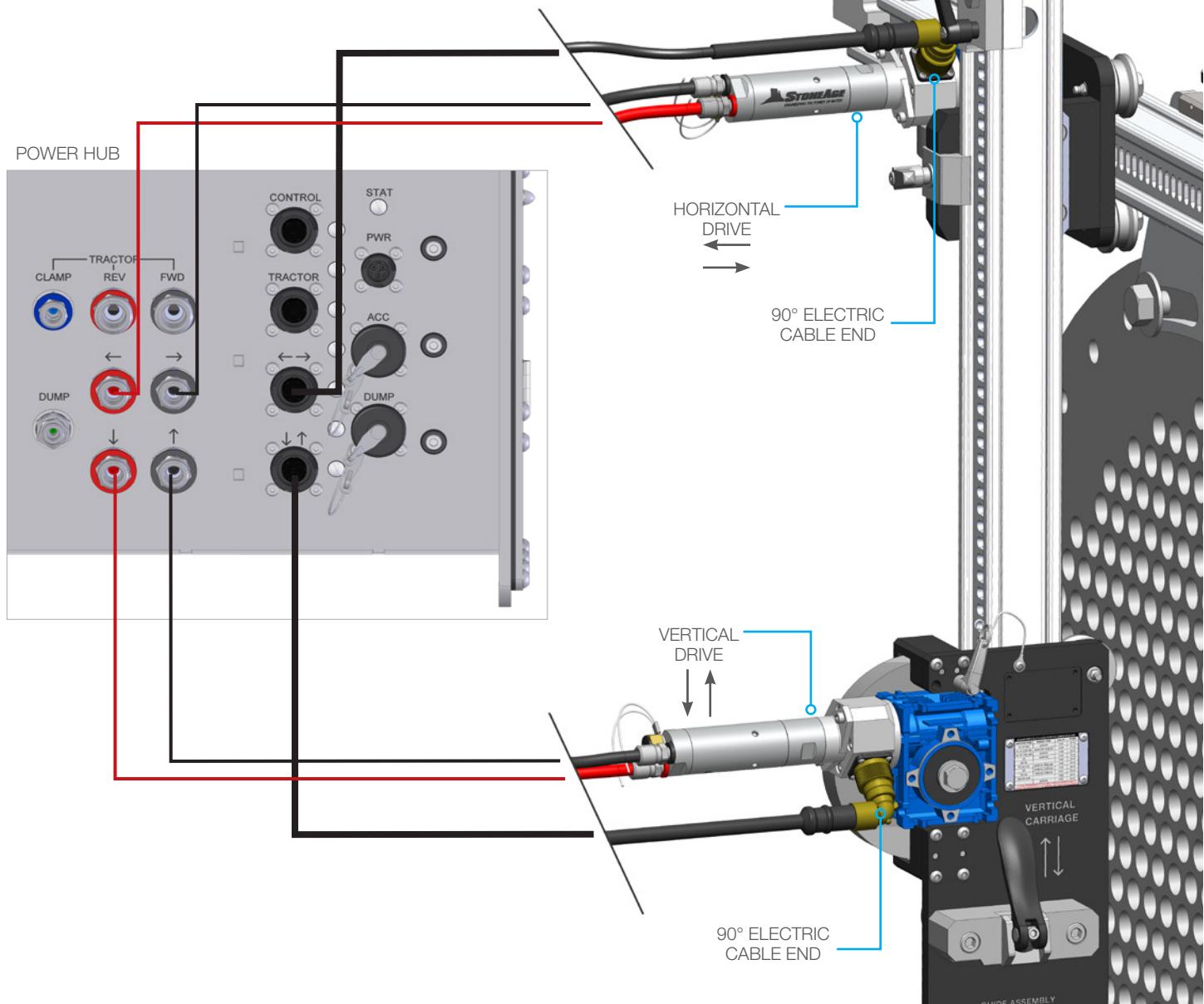
1. Remove the dust caps from all fittings of the Horizontal and Vertical Drives.
2. **Connect control lines to the front of the Power Hub**
 - Two Straight Electric Cable Ends (↓ ↑ , ← →)
 - Two 8mm diameter tubing for the Horizontal Drive (← →)
 - Two 8mm diameter tubing for the Vertical Drive. (↓ ↑)
3. **Blow out all control lines. Use of dirty or contaminated pneumatic hoses will cause component damage and malfunction**

4. Connect control lines to the Horizontal Drive

- Connect the two 8mm diameter tubing from the Power Hub (← →) to the corresponding color coded fittings on the Horizontal Drive.
- Connect the 90° Pot Plug from the Power Hub (← →) to the receptacle on the sensor.

5. Connect control lines to the Vertical Drive

- Connect the two 8mm diameter tubing from the Power Hub (↓ ↑) to the corresponding color coded fittings on the Vertical Drive.
- Connect the 90° Pot Plug from the Power Hub (↓ ↑) to the receptacle on the sensor.

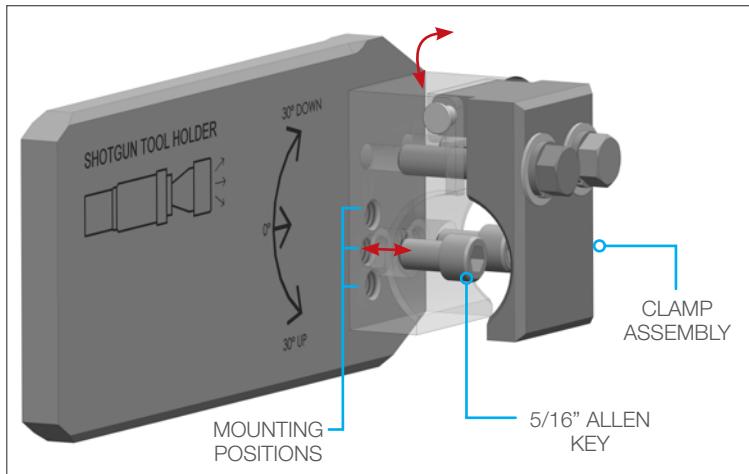


SHOTGUN MOUNT INSTALLATION

INSTALL SHOTGUN MOUNT (FOR USE WITH BARRACUDA OR SPITFIRE TOOL)

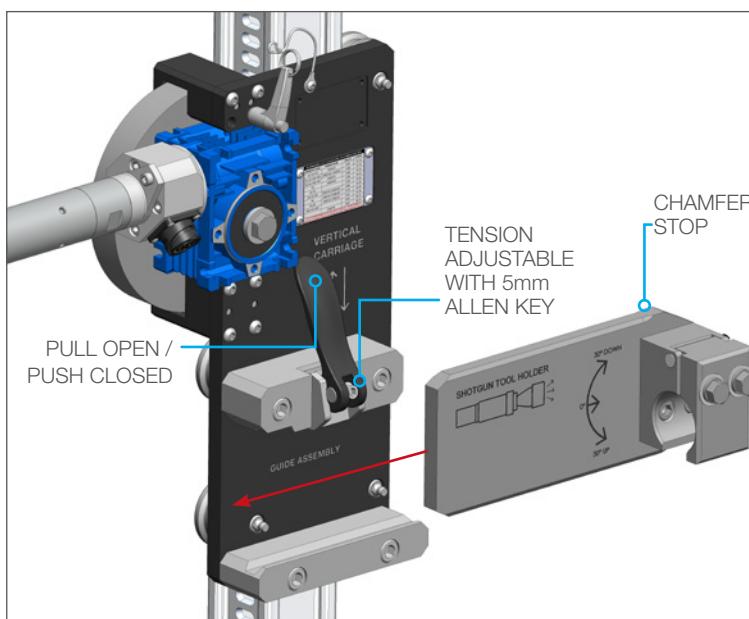
1. Set the desired Clamp Angle.

- The Clamp Assembly on the Shotgun Mount can be rotated 30° Up or Down by removing the two SHCS Screws with a 5/16" Allen Key, rotating the Clamp into the desired position, and fastening the Screws in the desired location.
- Make sure these screws are tightened before operation.**



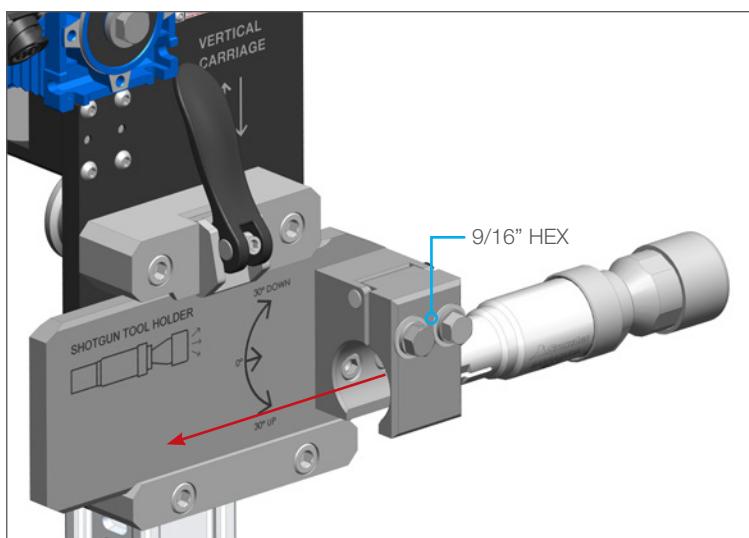
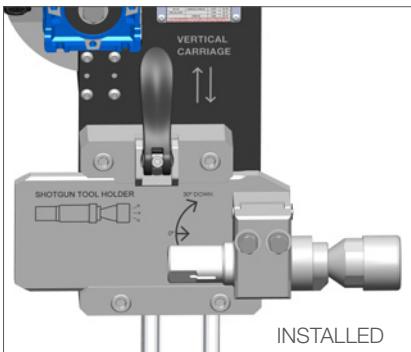
2. Install Shotgun Mount onto the Vertical Carriage.

- Pull to open the Clamp Handle on the Vertical Carriage and slide the Shotgun Mount in back to front.
- The mount will stop when it reaches the chamfers at the front. This is a safety feature.
- Lock the Clamp Handle in place when the mount is in position.
- Be sure to adjust the tension bolt if necessary



3. Fasten the Shotgun tool in the Clamp.

- Loosen the two Hex Bolts on the Clamp with a 9/16" Hex Wrench.
- Slide the tool in back to front and securely tighten the Hex Bolts.



Maintenance Item	Frequency	Maintenance Required
Forward, reverse, and clamp fittings	Before each use	Inspect threads for wear or damage.
Carriage rollers	Every 100 Hours of use	Lubricate Zerks on all Carriage Rollers using any multipurpose NLGI 2 grease.
Vertical and Horizontal Rails	As Needed	Inspect for wear that would allow Carriage Rollers to slip off. Replace Rail as needed.
Quick Release Handles	When loose or too tight	5mm hex to tighten. When it's set correctly it should take 15-20lbs of force to close the lever

Contact StoneAge for Safety Data Sheets for material usage, a complete list of spare part numbers, and service instructions for the Lightweight Positioner.

STORAGE, TRANSPORTATION, AND HANDLING

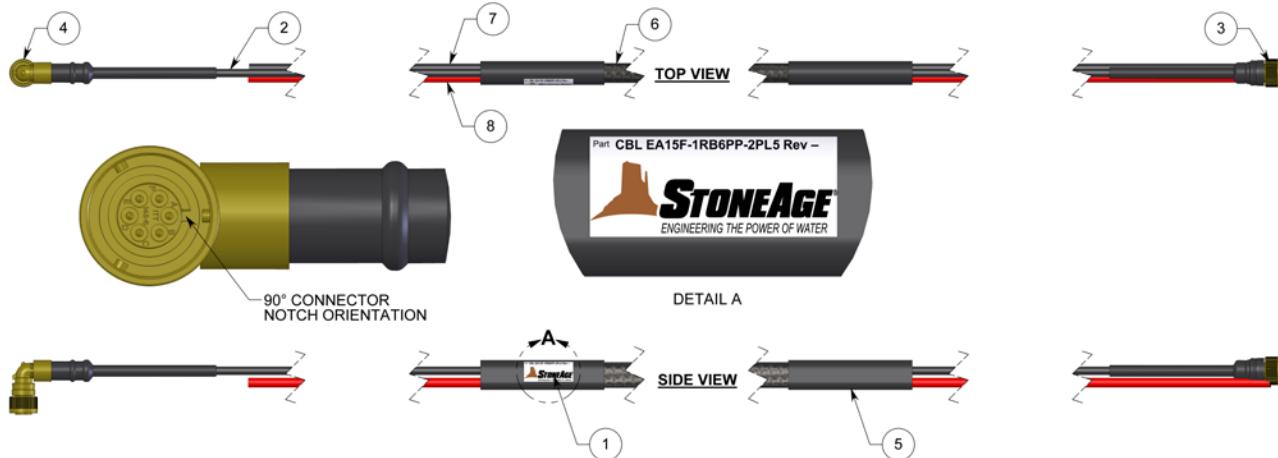
Return the plugs into all push connect fittings to keep water away from the connectors during cleaning. Use mild soapy water to clean the machine in order to remove corrosive materials. Before storing the unit, use compressed air to lightly blow off debris and moisture. Apply a small amount of air tool 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.

**DO NOT SPRAY WATER DIRECTLY AT OR SUBMERGE THE AIR MOTOR BREather PORTS OR ELECTRONIC COMPONENTS.
MAKE SURE ALL DUST CAPS ARE IN PLACE AND ELECTRICAL SENSOR CONNECTIONS ARE TIGHT PRIOR TO CLEANING.**

The Lightweight POSITIONER (LWPS-100-X), can be broken down into smaller components that should be stored in a clean and dry area.

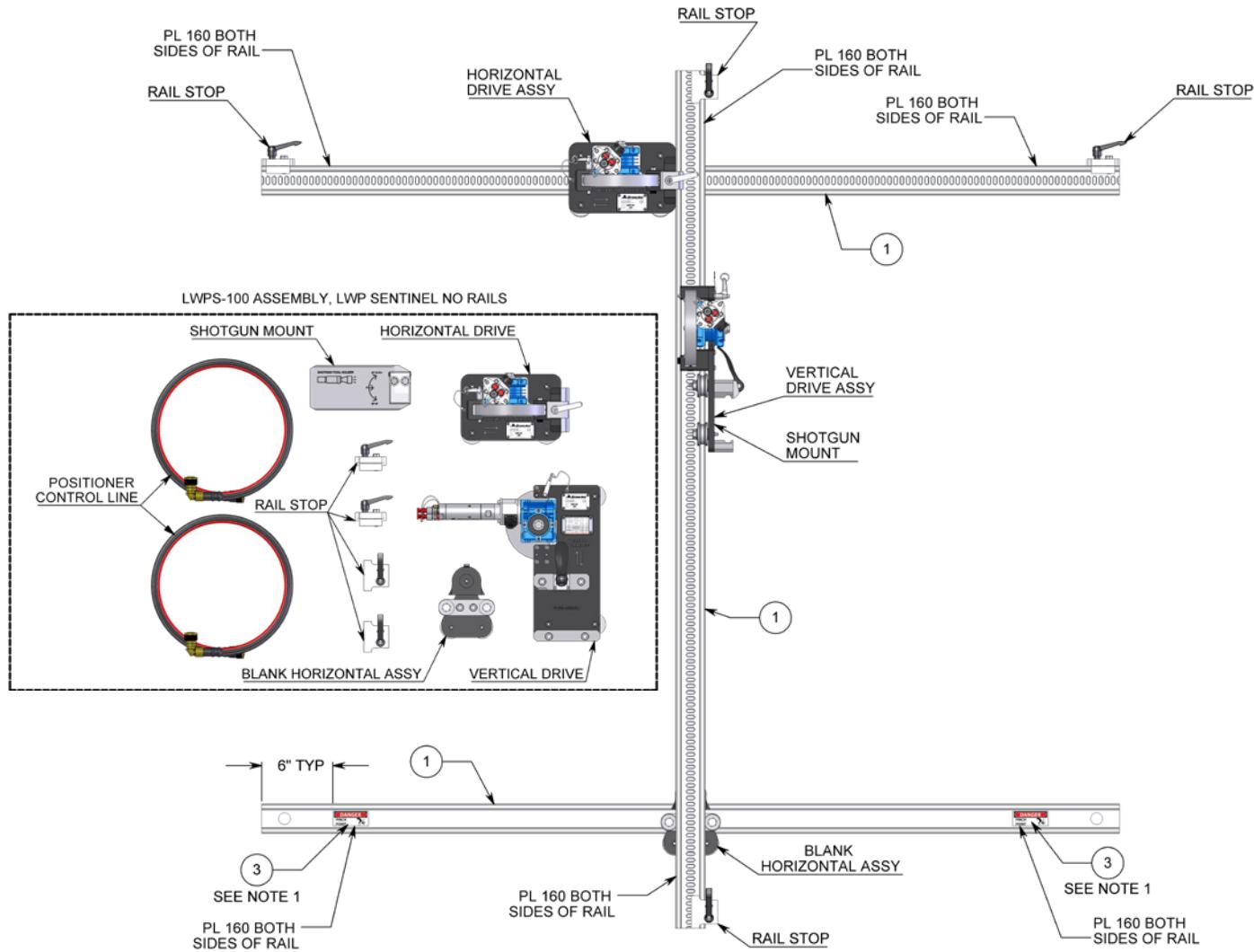
PARTS DIAGRAM

**LIGHTWEIGHT POSITIONER
(CBL EA15F-1RB6PP-2LPL5)**
POSITIONER CONTROL LINE ASSEMBLY



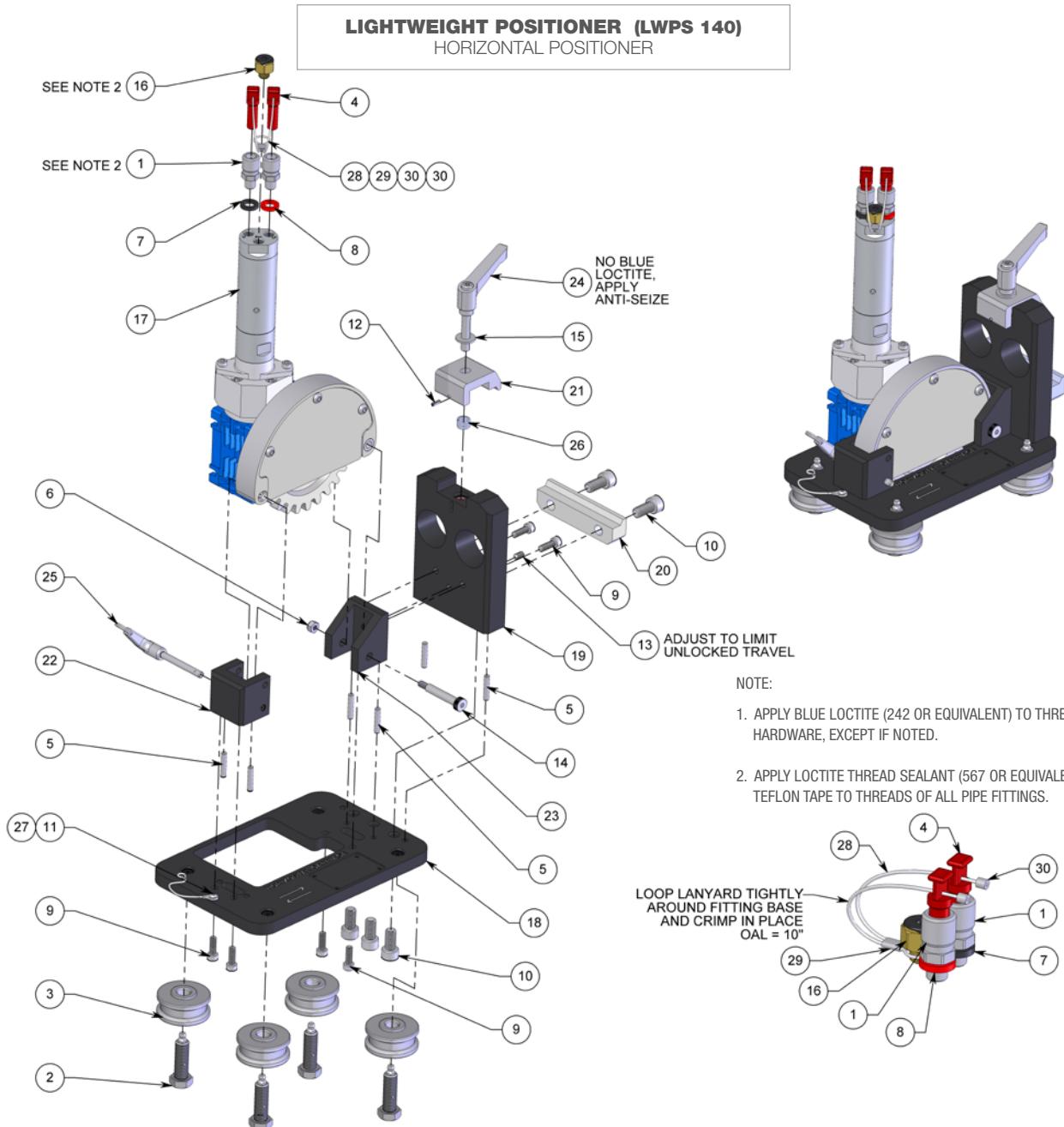
#	PART NUMBER	QTY	OAL EACH
1	CBL EA15F-1RB6PP-2LPL6.1 LABEL	1	
2	CBL EA15F.1 WIRE, 1X4 PAIR, 24 (7/32 AWG COPPER ALLOY, .011" POLYPLEFIN	1	15'-0"
3	EE CN-RB-PF6PS-14S-0001 PLUG, POT AND HEATSHRINK ENDBELL	1	
4	EE CN-RB-PF6PS-14S-90-0001 PLUG, 90 DEG POT AND HEATSHRINK ENDBELL	1	
5	GPHS 1100-OLE-A-BK HEAT SHRINK, 1.1" ID , BLACK	2	5"
6	GPSL 0750-NYL-G-BK HOSE BUNDLE SLEEVE	1	11'-4"
7	GPTB 8MM6-PUR95A-BK 8MM OD X 6MM ID URETHANE TUBING, BLACK	1	14'-2"
8	GPTB 8MM6-PUR95A-RD 8MM OD X 6MM ID URETHANE TUBING, RED	1	14'-2"

PIN	WIRE	
A	BROWN / BROWN WHITE	12V
B	GREEN WHITE	485-B
C	GREEN	485-A
D	BLUE / BLUE WHITE	GND
E	ORANGE	SFT-A
F	ORANGE WHITE	SFT-B

**LIGHTWEIGHT POSITIONER ASSEMBLY
(LWPS-100-X)**


#	PART NUMBER	QTY
1	BU 002-6-001 2.5" BOX RAIL EXTRUSION, SLOTTED	3
2	LWPS-100 ASSEMBLY, LWP SENTINEL NO RAILS	1
3	PL 160 WARNING PINCH POINT 1.25 X 3.0 DECAL	12

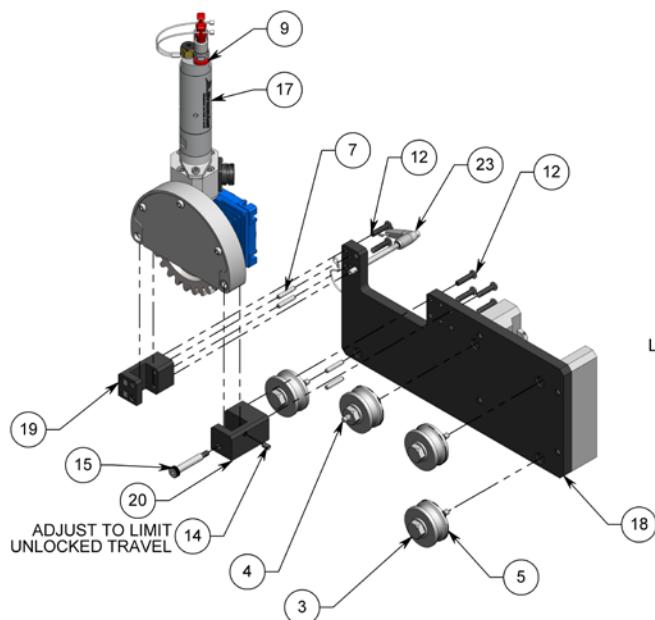
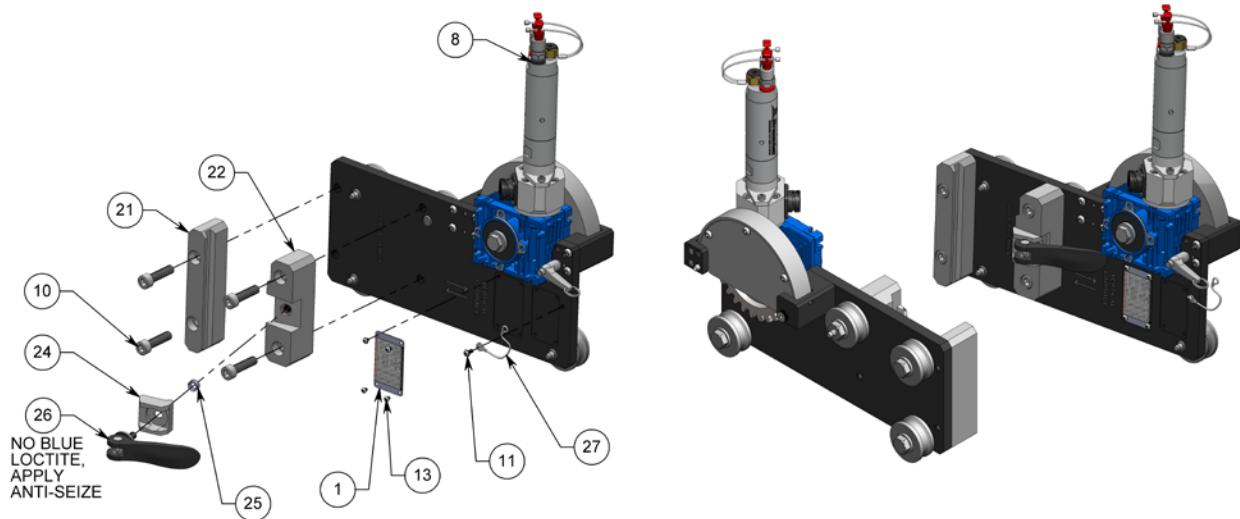
PARTS DIAGRAM



#	PART NUMBER	QTY
1	ABXS 271 FTG, ADAPTER P2M PL6 EISELE	2
2	BR 051-1.5-0 AXLE-ZERK	4
3	BR 055-SS ROLLER ASSY	4
4	CB 499 FTG, STEM PLUG PL5 MODIFIED	2
5	GDP 3M5-26 PIN, DOWEL M5 X 26 SS	6
6	GN 3M6-1.0-L NUT, NYLOK M6X1.0 SS	1
7	GP 014-BK ID WASHER, RUBBER, EXTRA SMALL, BLACK	1
8	GP 014-R ID WASHER, RUBBER, EXTRA SMALL, RED	1
9	GS 3M6-18-1.0 SHCS M6X1.0 X 18 SS	6

10	GS 3M10-20-1.5 SHCS M10X1.5 X 20 SS	5
11	GSB 3M4-10-0.7 BHCS M4X0.7 X10 SS	1
12	GSP 3M3-10 SLOTTED SPRING PIN M3 X 10 SS	1
13	GSS 3M6-1.0-10CU SET SCREW, CUP PT M6X1.0 X 10 SS	1
14	GSSH M8-40-SS SHOULDER SCREW M8 X 40 SS	1
15	GW 525-F WASHER, FLAT .25	1
16	LWP 557 FTG, EXHAUST PROTECTOR P2M	1
17	LWPS 110 ASSY, GEAR DRIVE	1
18	LWPS 141 PLATE, HORIZONTAL CARRIAGE	1
19	LWPS 143 PLATE, RAIL BASE	1

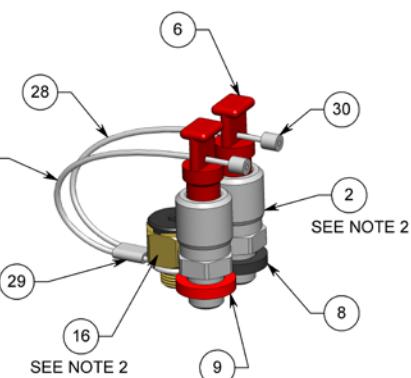
20	LWPS 144 CLAMP, RAIL	1
21	LWPS 145 JAW, ADJUSTABLE CLAMP	1
22	LWPS 148 MOUNT, HORIZONTAL GEAR LEFT	1
23	LWPS 149 MOUNT, HORIZONTAL GEAR RIGHT	1
24	LWPS 151 LEVER, HAND SS	1
25	LWPS 152 PIN, QUICK-RELEASE .25 X 1.75	1
26	PROP 335 SPRING, COMPRESSION	1
27	SRT 209.1 LANYARD ASSY (CUT TO LENGTH)	1
28	SRT 209.1.1 WIRE ROPE FOR LWPS (CUT TO LENGTH)	1
29	SRT 209.1.3 ALUMINUM SLEEVE	1
30	SRT 209.1.4 ALUMINUM STOP SLEEVE	2

LIGHTWEIGHT POSITIONER (LWPS 160)
 VERTICAL POSITIONER


NOTE:
 1. APPLY BLUE LOCTITE (242 OR EQUIVALENT) TO THREADS OF ALL HARDWARE, EXCEPT IF NOTED.

2. APPLY LOCTITE THREAD SEALANT (567 OR EQUIVALENT) AND / OR TEFLON TAPE TO THREADS OF ALL PIPE FITTINGS.

LOOP LANYARD TIGHTLY
AROUND FITTING BASE
AND CRIMP IN PLACE
OAL = 10"



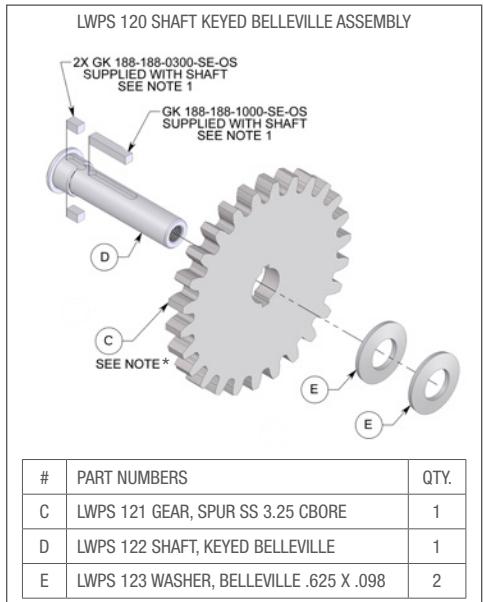
#	PART NUMBER	QTY
1	ABX 139 COLLET REFERENCE PLATE	1
2	ABXS 271 FTG, ADAPTER P2M PL6 EISELE	2
3	BR 051-1.5-0 AXLE-ZERK	
4	BR 052-1.5 AXLE-ZERK	1
5	BR 055-SS ROLLER ASSY	4
6	CB 499 FTG, STEM PLUG PL5 MODIFIED	2
7	GDP 3M5-26 PIN, DOWEL M5 X 26 SS	4
8	GP 014-BK ID WASHER, RUBBER, EXTRA SMALL, BLACK	1
9	GP 014-R ID WASHER, RUBBER, EXTRA SMALL, RED	1

10	GS 3M10-40-1.5 SHCS M10X1.5 X 40 SS	4
11	GSB 3M4-10-0.7 BHCS M4X0.7 X10 SS	1
12	GSB 3M6-25-1.0 BHCS M6X1.0 X 25 SS	6
13	GSB 313-0075 BHCS 6-32 X .19 SS	4
14	GSS 3M6-1.0-10CU SET SCREW, CUP PT M6X1.0 X 10 SS	1
15	GSSH M8-40-SS SHOULDER SCREW M8 X 40 SS	1
16	LWP 557 FTG, EXHAUST PROTECTOR P2M	1
17	LWPS 110 ASSY, GEAR DRIVE	1
18	LWPS 161 PLATE, VERTICAL CARRIAGE	1
19	LWPS 163 MOUNT, VERTICAL GEAR LEFT	1

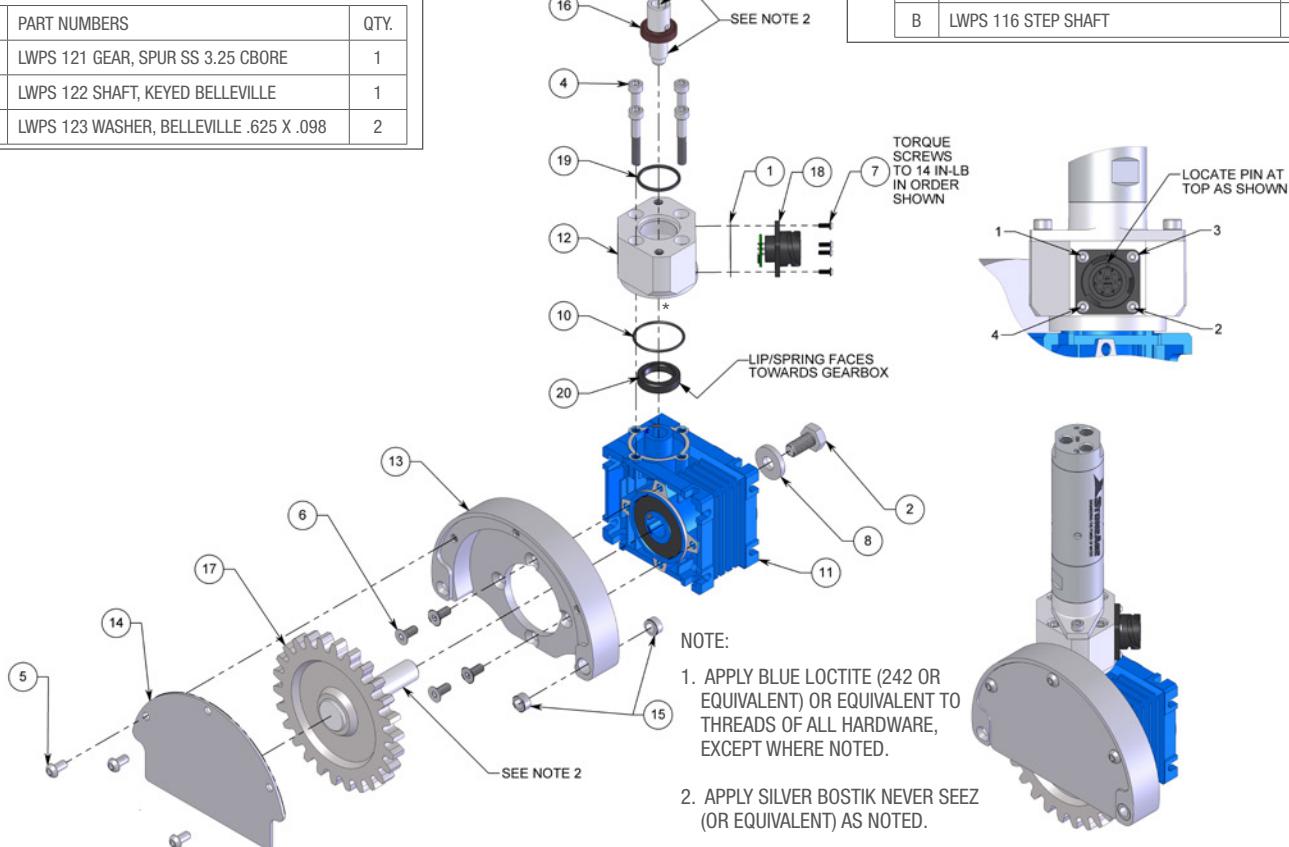
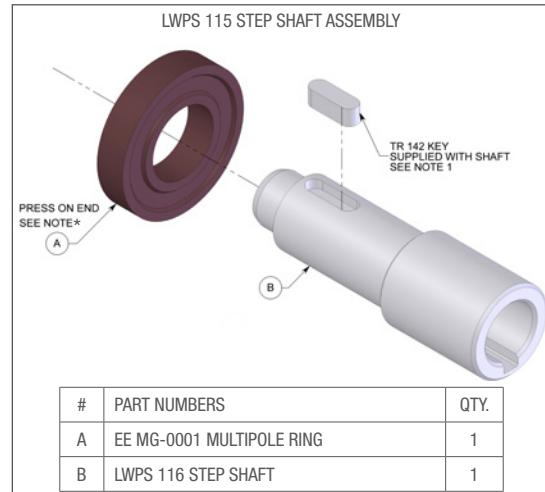
20	LWPS 164 MOUNT, VERTICAL GEAR RIGHT	1
21	LWPS 166 CLAMP, LOWER RAIL	1
22	LWPS 167 CLAMP, UPPER RAIL	1
23	LWPS 171 PIN, QUICK-RELEASE .25X2.75	1
24	PROP 334 TAB, CLAMP	1
25	PROP 335 SPRING, COMPRESSION	1
26	PROP 336 HANDLE ASSY	1
27	SRT 209.1 LANYARD ASSY (CUT TO LENGTH)	1
28	SRT 209.1.1 WIRE ROPE FOR LWPS (CUT TO LENGTH)	1
29	SRT 209.1.3 ALUMINUM SLEEVE	1
30	SRT 209.1.4 ALUMINUM STOP SLEEVE	2

PARTS DIAGRAM

LIGHTWEIGHT POSITIONER (LWP 503) MOTOVARIO DRIVE ASSEMBLY



* APPLY LOCTITE RETAINING COMPOUND (680 OR EQUIVALENT) TO COMPONENTS AS NOTED. BE SURE AND SET MAGNET BEFORE KEY. BE SURE TO SET KEY AND MAGNET COMPLETELY AND SECURELY WHILE LETTING LOCTITE CURE FOR 5 HRS. WIPE EXCESS LOCTITE (ESPECIALLY SHAFT).

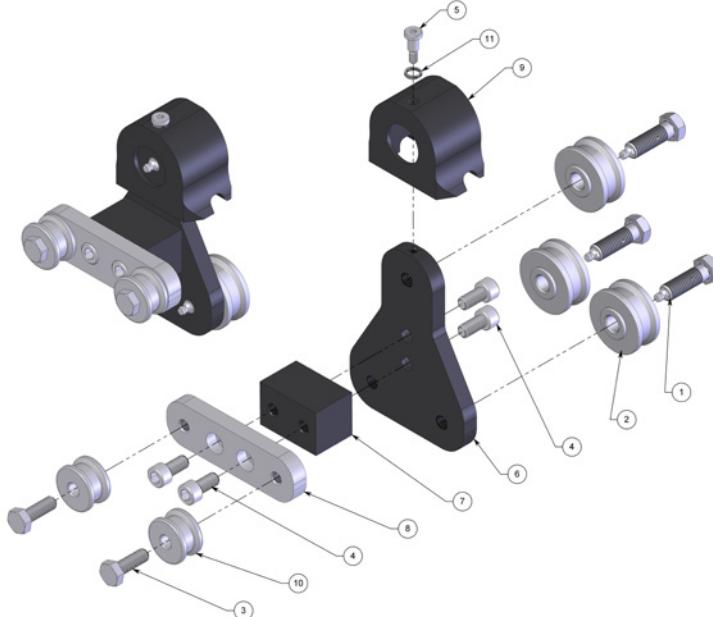


#	PART NUMBER	QTY
1	EE CN-RB-G-14S-F-AX GASKET, CONNECTOR	1
2	GB 3M10-20-1.25 BOLT, HEX M10x1.25 x 20 SS	1
3	GS 3M5-14-0.8 SHCS M5x0.8 x14 SS	2
4	GS 3M6-40-1.0 SHCS M6x1.0 x 40 SS	4
5	GSB 3M6-12-1.0 BHCS M6x1.0 x 12 SS	3
6	GSF 3M6-14-1.00 FHCS M6x1.00 x 14 SS	4

7	GTB 3M3-8-0.5 BHTS M3x0.5 x 8 Torx SS	4
8	GW 3M10-F WASHER, FLAT M10x4mm	1
9	LWP 520-001 AIR MOTOR, SS, W/ FLANGE, LUBE FREE	1
10	LWP 538 O-RING	1
11	LWP 550 MOTOVARIO GEARBOX	1
12	LWPS 111 HUB, ENCODER MOTOR MOUNT	1
13	LWPS 112 PLATE, DRIVE SPROCKET	1

14	LWPS 113 COVER, GEAR	1
15	LWPS 114 SLEEVE BEARING, OIL-IMPREGNATED	2
16	LWPS 115 ASSY, STEP SHAFT	1
17	LWPS 120 ASSY, SHAFT KEYED BELLEVILLE	1
18	LWPS 130 ASSY, LWPS SENSOR BOARD	1
19	LWPS 133 O-RING, DOUBLE SEAL X-PROFILE	1
20	SL 010 SEAL	1

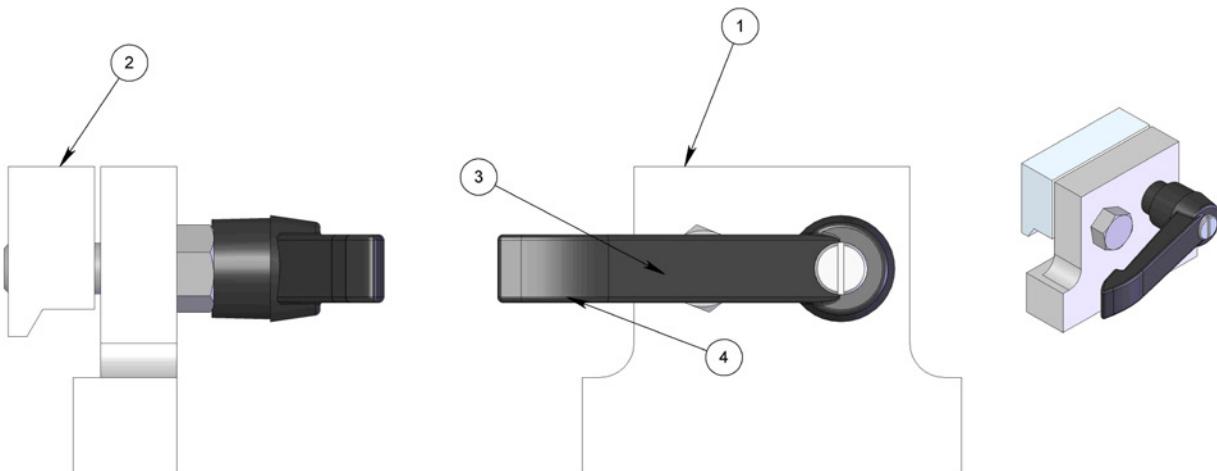
LIGHTWEIGHT POSITIONER (LWPS 180)
BLANK HORIZONTAL ASSEMBLY



#	PART NUMBER	QTY
1	BR 051-1.5-0 AXLE-ZERK	3
2	BR 055-SS ROLLER ASSY	3
3	GB 3M10-30-1.5 BOLT, HEX M10x1.5 X 30 SS	2
4	GS 3M10-20-1.5 SHCS M10x1.5 x 20 SS	4
5	GSSH M8-12-SS SHOULDER SCREW M8 X 12 SS	1

6	LWPS 181 PLATE, IDLER CARRIAGE	1
7	LWPS 182 BLOCK, SPACER	1
8	LWPS 183 PLATE, GUIDE	1
9	LWPS 185 SCRAPER, RAIL	1
10	LWPS 186 STUD, VERTICAL RAIL GUIDE	2
11	LWPS 188 SPRING, WAVE	1

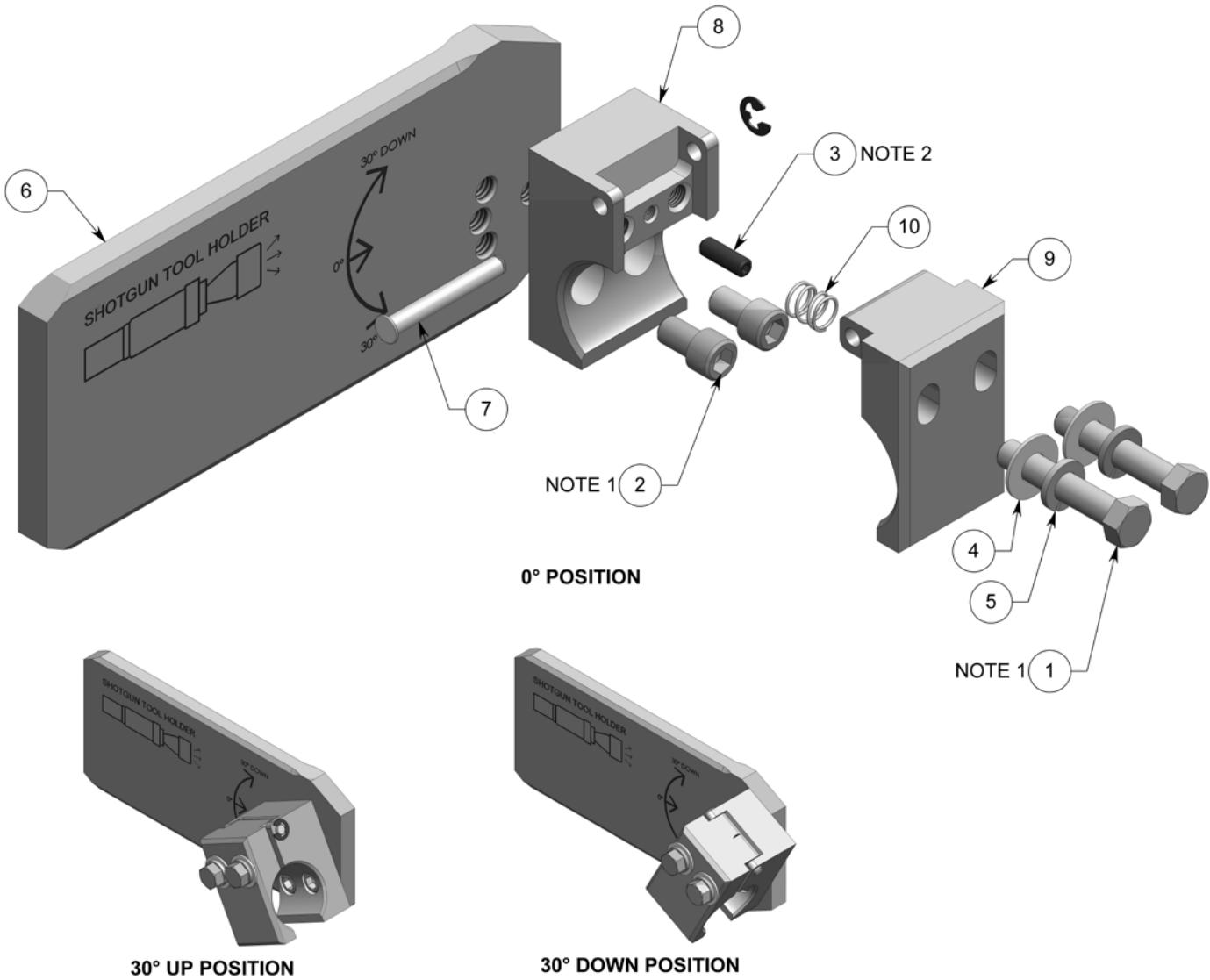
LIGHTWEIGHT POSITIONER (BU 152)
RAIL STOP ASSEMBLY



#	PART NUMBER	QTY.
1	BU 149 PLATE, RAIL STOP	1
2	BR 060 RAIL CLAMP	1
3	GB 537-05 BOLT, HEX .37-16 X 1.25	1
4	BU 151 HANDLE	1

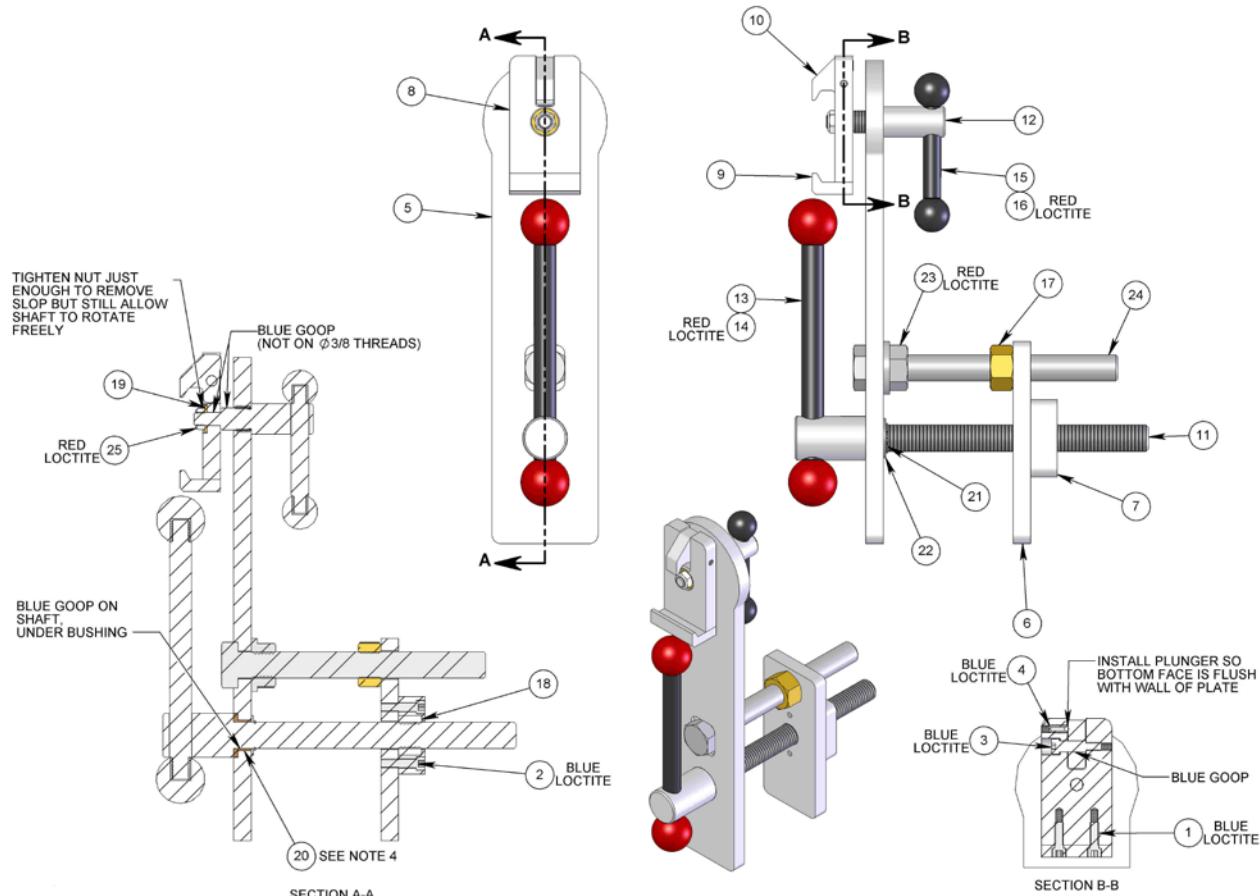
PARTS DIAGRAM

LIGHTWEIGHT POSITIONER (LWPS 220)
SHOT GUN MOUNT ASSEMBLY



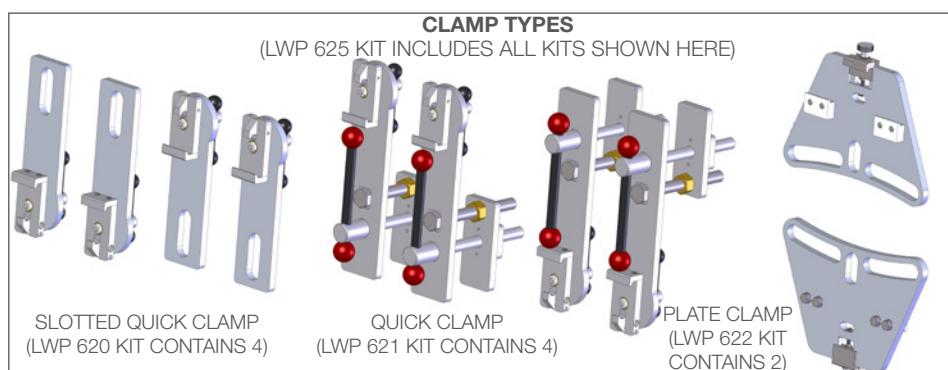
#	PART NUMBER	QTY
1	GB 337-08 BOLT, HEX .37-16 X 2.00 SS	2
2	GS 337-025 SHCS .37-16 X .62 SS	2
3	GSS 525-20-75CU SET SCREW, CUP PT .25-20 X .75	1
4	GW 337-F WASHER, FLAT .37 SS	2
5	GW 337-L WASHER, LOCK .37 SS	2
6	LWPS 221 MOUNT, SHOTGUN	1
7	SRT 579 CLEVIS PIN, SS WITH E-RING	1
8	SRT 582 VERTICAL BOTTOM PIPE CLAMP	1
9	SRT 583 VERTICAL TOP PIPE CLAMP	1
10	SRT 586 SMALL CLAMP SPRING	1

LIGHTWEIGHT POSITIONER (LWP 518)
SLOTTED QUICK CLAMP ASSEMBLY



NOTE:

1. BLUE GOOP IS A SWAGELOK BRAND ANTI-SEIZE. AN EQUIVALENT ALTERNATIVE IS ACCEPTABLE.
2. BLUE LOCTITE: PN: 242 OR EQUIVALENT
3. RED LOCTITE: PN: 262 OR EQUIVALENT
4. IF SHAFT DOES NOT SLIDE THROUGH BUSHING EASILY, REAM BUSHING ID TO SHAFT OD +.005/.001.



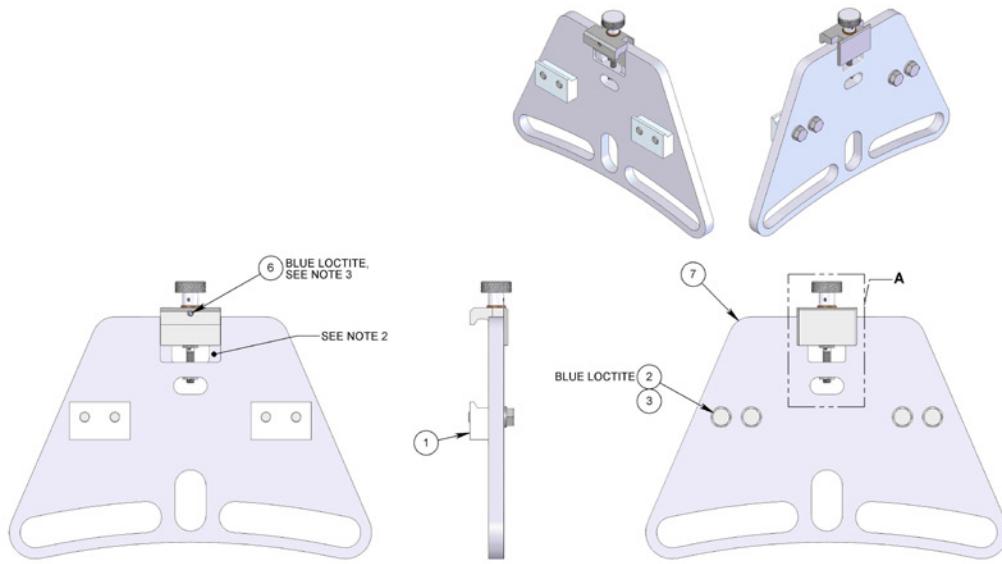
#	PART NUMBER	QTY.
1	GS 325-03 SCREW, SHC, STAINLESS, 114-20 UNC X 0.750L	2
2	GS 325-04 SCREW, SHC, STAINLESS, 114-20 UNC X 1.000L	2
3	GSSH 0312-0750-SS SHOULDER SCREW	1
4	LWP 517 BALL NOSE SPRING PLUNGER	1
5	LWP 521 QUICK CLAMP BASE PLATE	1
6	LWP 522 FLANGE CLAMP PLATE	1
7	LWP 523 NUT CAP	1

8	LWP 524 RAIL CLAMP PLATE	1
9	LWP 525 STATIC RAIL CLAMP	1
10	LWP 526 QUICK RAIL CLAMP FINGER	1
11	LWP 527 FLANGE CLAMP SCREW	1
12	LWP 528 RAIL CLAMP SHAFT	1
13	LWP 529 FLANGE CLAMP LEVER	1
14	LWP 530 FLANGE CLAMP KNOB	2
15	LWP 531 RAIL CLAMP LEVER	1
16	LWP 532 RAIL CLAMP KNOB	2
17	LWP 533 NUT, BRASS, 3/4-10	1

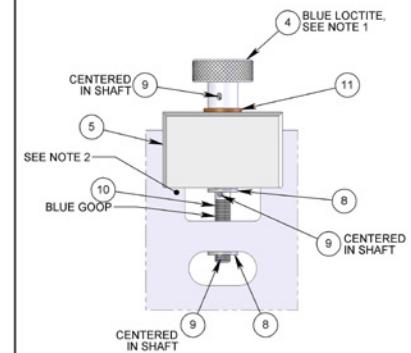
18	LWP 534 NUT, SQUARE, 3/4-10	1
19	LWP 535 THRUST WASHER	1
20	LWP 545 FLANGED BUSHING	1
21	SRT 537 RETAINING RING	1
22	LWP 547 SHIM	1
23	LWP 548 FLANGED NUT	1
24	LWP 555 BOLT, 3/4-10 X 7.00L, FULLY THREADED	1
25	SRT 333 NYLOCK HEX JAM NUT SS THIN	1

PARTS DIAGRAM

LIGHTWEIGHT POSITIONER (LWP 519) PLATE CLAMP ASSEMBLY



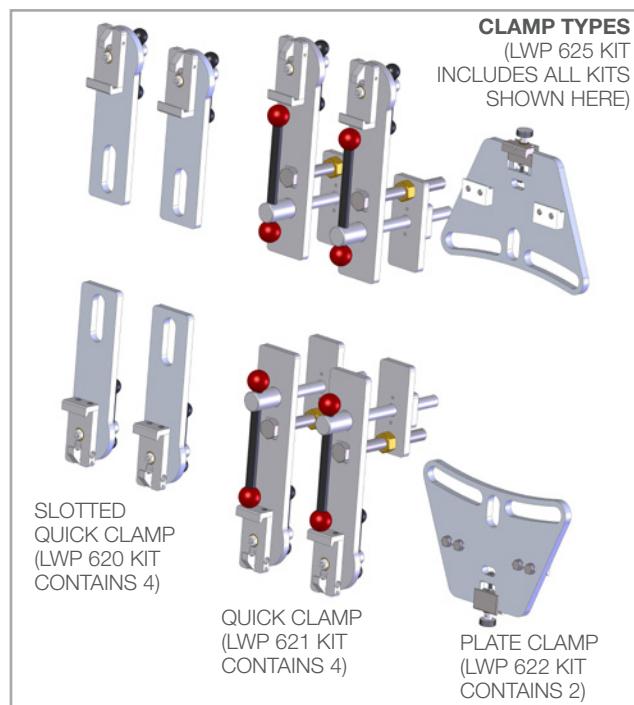
ALSO SOLD AS LWP 623 PLATE CLAMP SCREW ASSEMBLY KIT

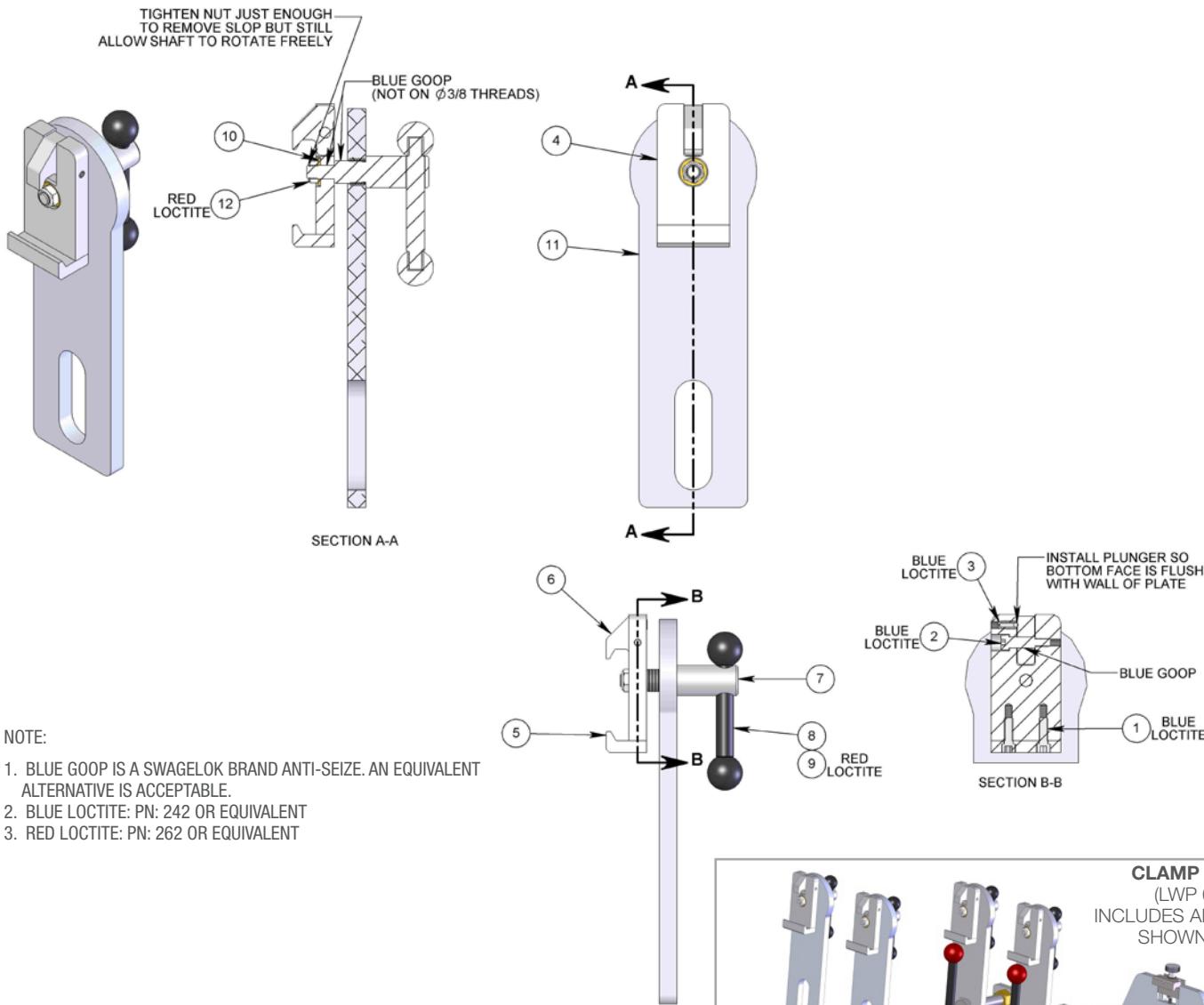


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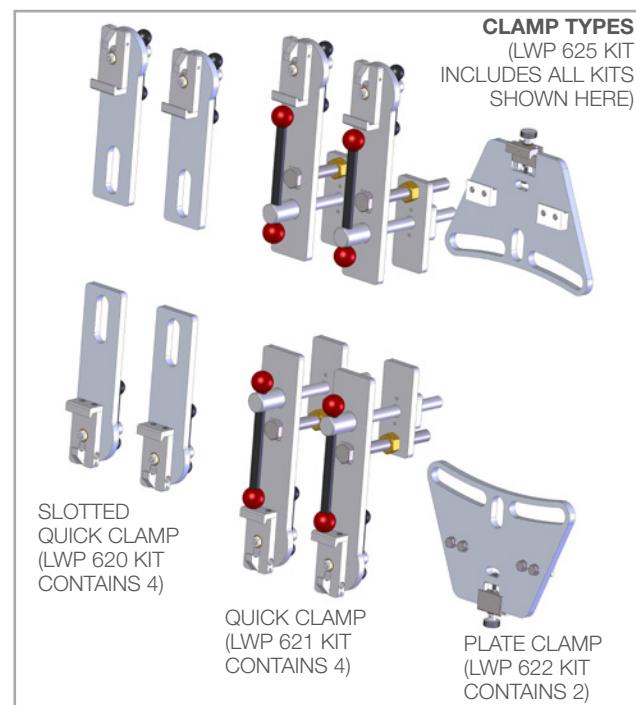
1. BEFORE INSTALLING KNOB, INSTALL MIDDLE SPRING PIN & ADJACENT FLAT WASHER. APPLY A THIN LAYER OF GENERAL PURPOSE GREASE TO UNTHEADED SECTION OF SHAFT THEN INSTALL SHAFT UP THROUGH SLIDE CLAMP. THREAD KNOB ON SHAFT AS FAR AS POSSIBLE WHILE STILL ALLOWING SHAFT TO FREELY ROTATE, THEN BACK OFF TO FIRST SPOT FOR SPRING PIN INSTALLATION.
2. APPLY A THIN LAYER OF GENERAL PURPOSE GREASE TO ALL SURFACES OF PLATE THAT CLAMP WILL SLIDE ON.
3. THREAD PLUNGER IN SO BALL ENGAGES DETENTS IN SHAFT.
DO NOT ALLOW BODY OF PLUNGER TO TOUCH SHAFT.
4. BLUE GOOP IS A SWAGELOK BRAND ANTI-SEIZE. AN EQUIVALENT ALTERNATIVE IS ACCEPTABLE.
5. BLUE LOCTITE: PN: 242 OR EQUIVALENT

#	PART NUMBER	QTY.
1	BR 060 RAIL CLAMP	2
2	GB 337-05 BOLT, HEX HEAD, STAINLESS, 3/8-16 UNC X 1.250L	4
3	GW 337-L WASHER, LOCK, 3/8", STAINLESS	4
4	LWP 536 MODIFIED KNOB	1
5	LWP 537 SLIDE CLAMP	1
6	LWP 539 BALL NOSE SPRING PLUNGER	1
7	LWP 540 PLATE CLAMP BASE PLATE	1
8	LWP 541 FLAT WASHER	2
9	LWP 543 SPRING PIN	3
10	LWP 544 CLAMP SHAFT	1
11	LWP 549 BRONZE THRUST BUSHING	1



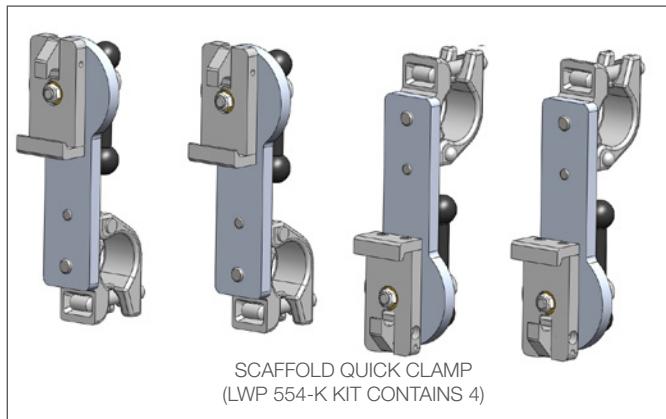
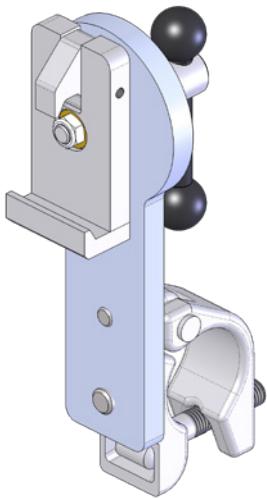
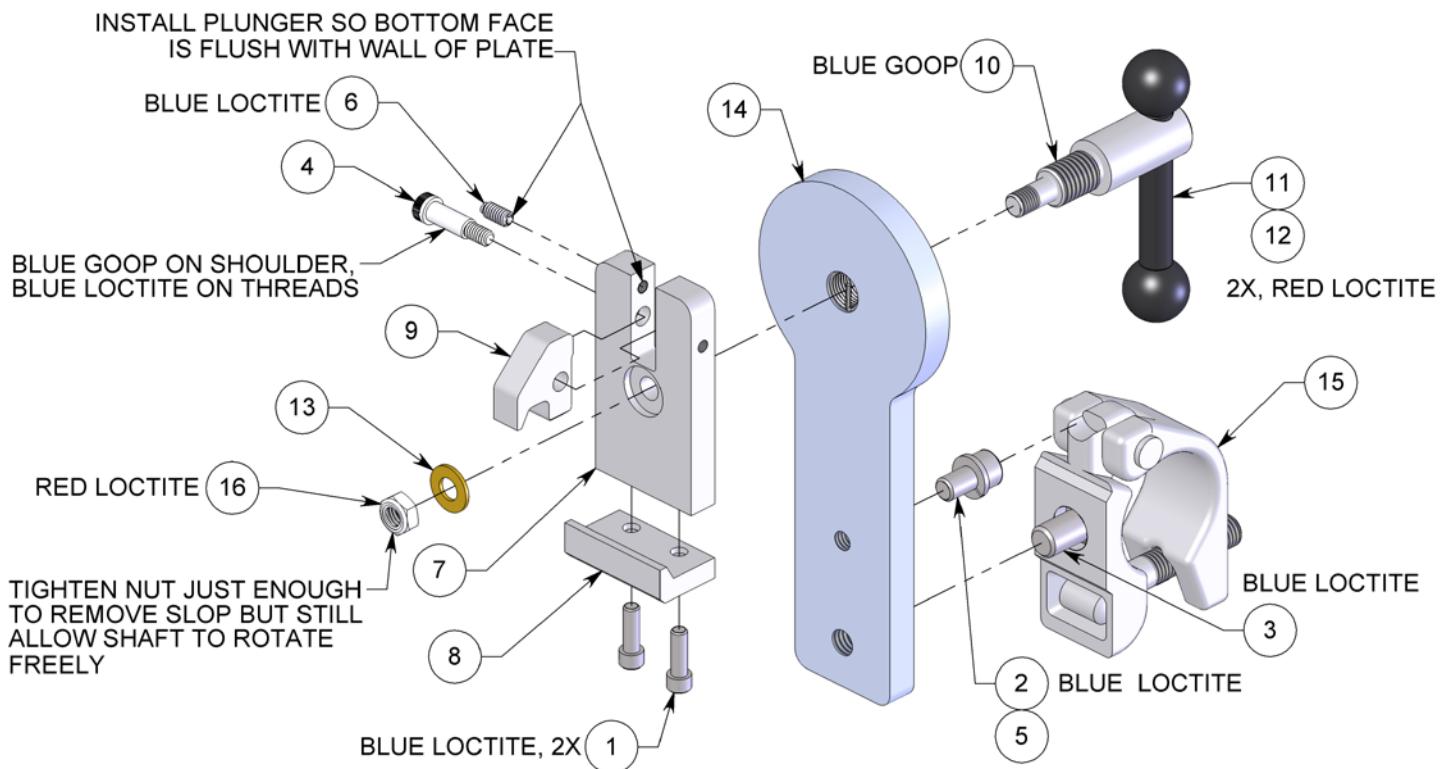
LIGHTWEIGHT POSITIONER (LWP 552)
 SLOTTED QUICK CLAMP ASSEMBLY


#	PART NUMBER	QTY.
1	GS 325-03 SCREW, SHC, STAINLESS, 114-20 UNC X 0.750L	2
2	GSSH 0312-0750-SS SHOULDER SCREW	1
3	LWP 517 BALL NOSE SPRING PLUNGER	1
4	LWP 524 RAIL CLAMP PLATE	1
5	LWP 525 STATIC RAIL CLAMP	1
6	LWP 526 QUICK RAIL CLAMP FINGER	1
7	LWP 528 RAIL CLAMP SHAFT	1
8	LWP 531 RAIL CLAMP LEVER	1
9	LWP 532 RAIL CLAMP KNOB	2
10	LWP 535 THRUST WASHER	1
11	LWP 551 SLOTTED QUICK CLAMP BASE PLATE	1
12	SRT 333 NYLOCK HEX JAM NUT SS THIN	1



PARTS DIAGRAM

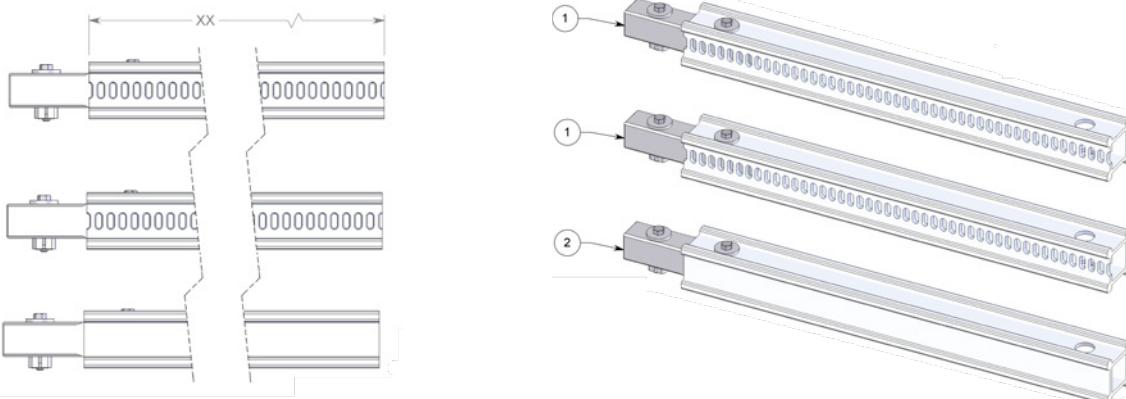
LIGHTWEIGHT POSITIONER (LWP 554)
SCAFFOLD QUICK CLAMP ASSEMBLY



#	PART NUMBER	QTY
1	GS 325-03 SCREW, SHC, STAINLESS, 114-20 UNC X 0.750L	2
2	GS 337-025 SCREW, SHC, STAINLESS, 318-16 UNC X 0.625L	1
3	GSF 350-04 SCREW, FHSC, STAINLESS, 112-13 UNC X 1.000L	1
4	GSSH 0312-0750-SS SHOULDER SCREW, 5/16 DIA, 3/4 L, SS	1
5	GW 337-L WASHER, LOCK, 3/8", STAINLESS	1
6	LWP 517 BALL NOSE SPRING PLUNGER	1
7	LWP 524 RAIL CLAMP PLATE	1
8	LWP 525 STATIC RAIL CLAMP	1

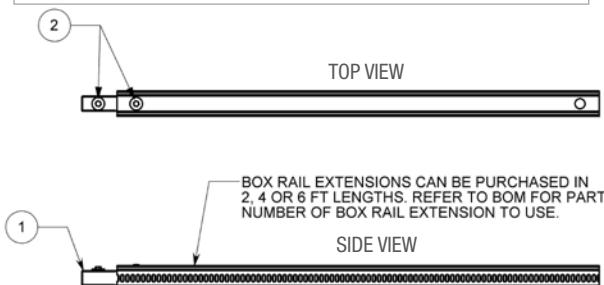
9	LWP 526 QUICK RAIL CLAMP FINGER	1
10	LWP 528 RAIL CLAMP SHAFT	1
11	LWP 531 RAIL CLAMP LEVER	1
12	LWP 532 RAIL CLAMP KNOB	2
13	LWP 535 THRUST WASHER	1
14	LWP 553 SCAFFOLD QUICK CLAMP BASE PLATE	1
15	LWP 559 MODIFIED SCAFFOLD CLAMP	1
16	SRT 333 NYLOCK HEX JAM NUT SS THIN	1

LIGHTWEIGHT POSITIONER (LWP 582-XX-V2)
COMPLETE WINDOW, 2.5IN. BOX RAIL EXTENSION KIT



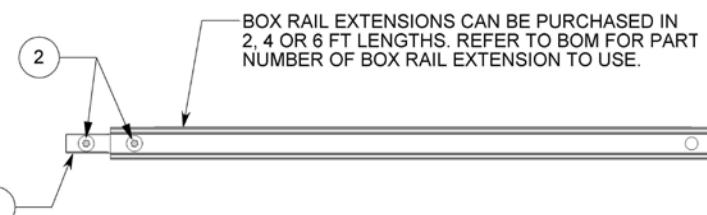
#	PART NUMBER	2FT/QTY.	4FT/QTY.	6FT/QTY.
1	LWP 580-XX-001 2.5IN BOX RAIL EXTENSION KIT, SLOTTED (CAN BE PURCHASED SEPARATELY SEE BELOW)	2	2	2
2	LWP 581-XX-001 2.5IN BOX RAIL EXTENSION KIT (CAN BE PURCHASED SEPARATELY SEE BELOW)	1	1	1

LIGHTWEIGHT POSITIONER (LWP 580-XX-001)
2.5IN. BOX RAIL EXTENSION KIT, SLOTTED



#	PART NUMBER	DESCRIPTION	LWP 580-2 QTY.	LWP 580-4 QTY.	LWP 580-6 QTY.
1	BR 006-2.5-001	2.5" SPLICE TUBE	1	1	1
2	BR 008-2.5-001	2.5" WEDGE BOLT ASSEMBLY	2	2	2
3	BU 002-2-001	2.5" BOX RAIL EXTENSION	1	-	-
4	BU 002-4-001	2.5" BOX RAIL EXTENSION	-	1	-
5	BU 002-6-001	2.5" BOX RAIL EXTENSION	-	-	1

LIGHTWEIGHT POSITIONER (LWP 581-XX-001)
2.5IN. BOX RAIL EXTENSION KIT, NOT SLOTTED



#	PART NUMBER	DESCRIPTION	LWP 581-2 QTY.	LWP 581-4 QTY.	LWP 581-6 QTY.
1	BR 006-2.5-001	2.5" SPLICE TUBE	1	1	1
2	BR 008-2.5-001	2.5" WEDGE BOLT ASSEMBLY	2	2	2
3	BR 002-02-001	2.5" BOX RAIL EXTENSION	1	-	-
4	BR 002-04-001	2.5" BOX RAIL EXTENSION	-	1	-
5	BR 002-06-001	2.5" BOX RAIL EXTENSION	-	-	1

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>

WARRANTY INFORMATION

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.

NOTES

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1-866-795-1586 • www.STONEAGETOOLS.com

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CONTROLLER (CTRL-100) WITH POWER HUB (PH-A0302A00C20)

USER MANUAL



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3274 KE Heinenoord
Netherlands
(+31) (0) 85 902 73 70
sales-NL@stoneagetools.com

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).

Updated manuals can be downloaded at:
<https://www.stoneagetools.com/manuals>

SPECIFICATIONS		
CONTROLLER (CTRL-100)	Imperial	Metric
Weight	1.45 lbs	.66 kg
Dimensions	8.875 x 2.75 x 5.188 in.	225 x 70 x 132 mm
POWER HUB (PH-A0302A00C20)		
Weight:	37 lbs	16.8 kg
Dimensions	16.1x14.53x15.12 in	409 x 369 x 384 mm
Power supply	12V AC-DC US OR EU (Outlet) or 12V DC-DC US OR EU (Battery)	
Maximum Air Consumption:	50 cfm at 100 psi	1416 lpm at 6,8 bar
Maximum Air Supply Pressure:	125 psi	8,6 bar
System Air Consumption	100 psi	6,8 bar
Recommended Operational Temperature Range:	20 ° to 140 °F Do not exceed 160 °F	-6 ° to 60 °C Do not exceed 71 °C

DESCRIPTION OF EQUIPMENT AND INTENDED USE

The CTRL-100 Controller is designed to function with the ABXS-3L Hose Tractor and it's integrated sensing technology. The Controller is small, lightweight, and intuitive in it's operation. There is an emphasis on ergonomic design for operators wearing PPE. The Controller is designed to withstand harsh job conditions and collects job performance data.

The PH-A0302A00C20 Power Hub is a centralized Power Hub for electric-air conversion. It Seamlessly drives air motors in the tractor and positioner. It is rugged and lightweight and compatible with all pumps

KEY FEATURES:

Controller (CTRL-100)

- Optimized for use while standing: Angled screen puts wrists in natural position
- Video game inspired design and operable with gloves
- Thumbs operate joysticks, Index fingers operate trigger buttons, and Left fingers grip Deadman lever

Power Hub (PH-A0302A00C20)

- Sealed and Separated Design: Electronics Side & Pneumatic Side
- Purpose Built Enclosure: Seam welded aluminum
- E-Stop: Cuts supply power
- Door: Covers fittings and connectors, eliminates caps and plugs
- Controller Storage: Location for controller, prevent damage
- Valve Access Hatch: Easier troubleshooting/ service of valves
- Integrated FRL: Aid in valve pack and air motor life
- Quick Connect on Air Supply: Change and easy access to supply hose fitting
- Wireless Capable: Upgrade kit ready when
- Bulkhead NPT fittings: externally change damaged PTC fittings
- Short Circuit Protection: On all supply side connections, automatically resets



EU DECLARATION OF CONFORMITY

Manufacturer:

StoneAge Incorporated
466 South Skylane Drive
Durango, CO 81303
USA

Authorized Representative:

StoneAge Netherlands BV
Reedijk 7Q
3274 KE Heinenoord
Netherlands
Bob Van Wordragen, Operations Manager StoneAge NL

Declare that:

Sentinel System Controller (CTRL-100)
for the operation of high pressure water cleaning of system parts

Is compliant with the following Directives and Standards:

EU- Machinery Directive (2006/42/EC)

EU- RoHS Directive (2011/65/EU)

EU- EMC Directive (2014/30/EU)

EU- Radio Directive (2014/53/EU)

EN ISO 12100:2010 (e) Safety of machinery – General principles for design – Risk assessment and risk reduction

EN ISO 4414:2010 (en) Pneumatic Fluid Power – General rules and safety requirements for systems and components

EN 55011:2009 Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement

EN 60204-1:2018 Safety of machinery– Electrical equipment of machines

ETSI EN 300 328 V2.2.1 (2019-04) Wideband transmission systems Data transmission equipment operating in the 2,4 GHz band;
Harmonised Standard for access to radio spectrum

ETSI EN 301 489-1 V2.2.3 (2019-11) Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for Electromagnetic Compatibility

MISRA - C and C++ Coding Standards (MISRA C:1998, MISRA C:2004, and MISRA C:2012)

The Technical File for Sentinel System Controller (CTRL-100) is maintained at:

StoneAge Incorporated, 466 South Skylane Drive, Durango, CO 81303, USA and was compiled by the Engineering Manager.
The Technical File is available through the Authorized Representative.

This Declaration of Conformity is issued under the exclusive responsibility of StoneAge Incorporated.

StoneAge Incorporated, Durango, CO, USA
Adam Markham, Director of Engineering and Technology

03/29/21
Date





EC DECLARATION OF CONFORMITY

Manufacturer:

StoneAge Incorporated
466 South Skylane Drive
Durango, CO 81303
USA

Authorized Representative:

StoneAge Netherlands BV
Reedijk 7Q
3274 KE Heinenoord
Netherlands
Bob Van Wordragen, Operations Manager StoneAge NL

Declare that:

Power Hub (PH-A0302A00C20)
for high pressure water cleaning of system parts.

Is compliant with the following Directives and Standards:

Directive 2006/42/EC (Machinery Directive)

EN ISO 12100:2010 (E) Safety of machinery – General principles for design – Risk assessment and risk reduction

The Technical File for the Power Hub (PH-A0302A00C20) is maintained at:

StoneAge Incorporated, 466 South Skylane Drive, Durango, CO 81303, USA and was compiled by the Engineering Manager.
The Technical File is available through the Authorized Representative.

This Declaration of Conformity is issued under the exclusive responsibility of StoneAge Incorporated.

StoneAge Incorporated, Durango, CO, USA
Adam Markham, Director of Engineering and Technology

03/29/2021

Date





Regulatory Compliance and Safety Information for StoneAge Sentinel System USA & Canada Compliance

Manufacturer: StoneAge Incorporated
466 South Skylane Drive
Durango, CO 81303
US (866)-795-1586
www.stoneagetools.com

Declare that: Sentinel System (SENT001)

Is compliant with the following:

FCC Part 15, Subpart B / ICES-003 Unintentional Emissions Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules and Industry Canada ICES-003. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with part 15 of the FCC rules and Industry Canada ICES-003. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Part 15, Subpart C / RSS-210 Intentional Emissions Interference Statement

Compliance of this equipment is confirmed by the following certification numbers that are placed on the equipment:

Notice: The term "FCC ID:" and "IC" before the certification number signifies that FCC and Industry Canada technical specifications were met.

FCC ID: 2AX9D-SENT001

IC ID: 26898-SENT001

This Declaration of Conformity is issued under the exclusive responsibility of StoneAge Incorporated.

StoneAge Incorporated, Durango, CO, USA
Adam Markham, Director of Engineering and Technology

03/29/21
Date



Regulatory Compliance and Safety Information for StoneAge Sentinel System USA & Canada Compliance

Manufacturer:

StoneAge Incorporated
466 South Skylane Drive
Durango, CO 81303
US (866)-795-1586
www.stoneagetools.com

Declare that:

Sentinel System Controller (CTRL-100)

Is compliant with the following:

FCC Part 15, Subpart B / ICES-003 Unintentional Emissions Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules and Industry Canada ICES-003. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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FCC Part 15, Subpart C / RSS-210 Intentional Emissions Interference Statement

Compliance of this equipment is confirmed by the following certification numbers that are placed on the equipment:

Notice: The term "FCC ID:" and "IC" before the certification number signifies that FCC and Industry Canada technical specifications were met.

CONTAINS FCC ID: 2AX9D-SENT001

CONTAINS IC ID: 26898-SENT001

This Declaration of Conformity is issued under the exclusive responsibility of StoneAge Incorporated.

StoneAge Incorporated, Durango, CO, USA
Adam Markham, Director of Engineering and Technology

03/29/21
Date



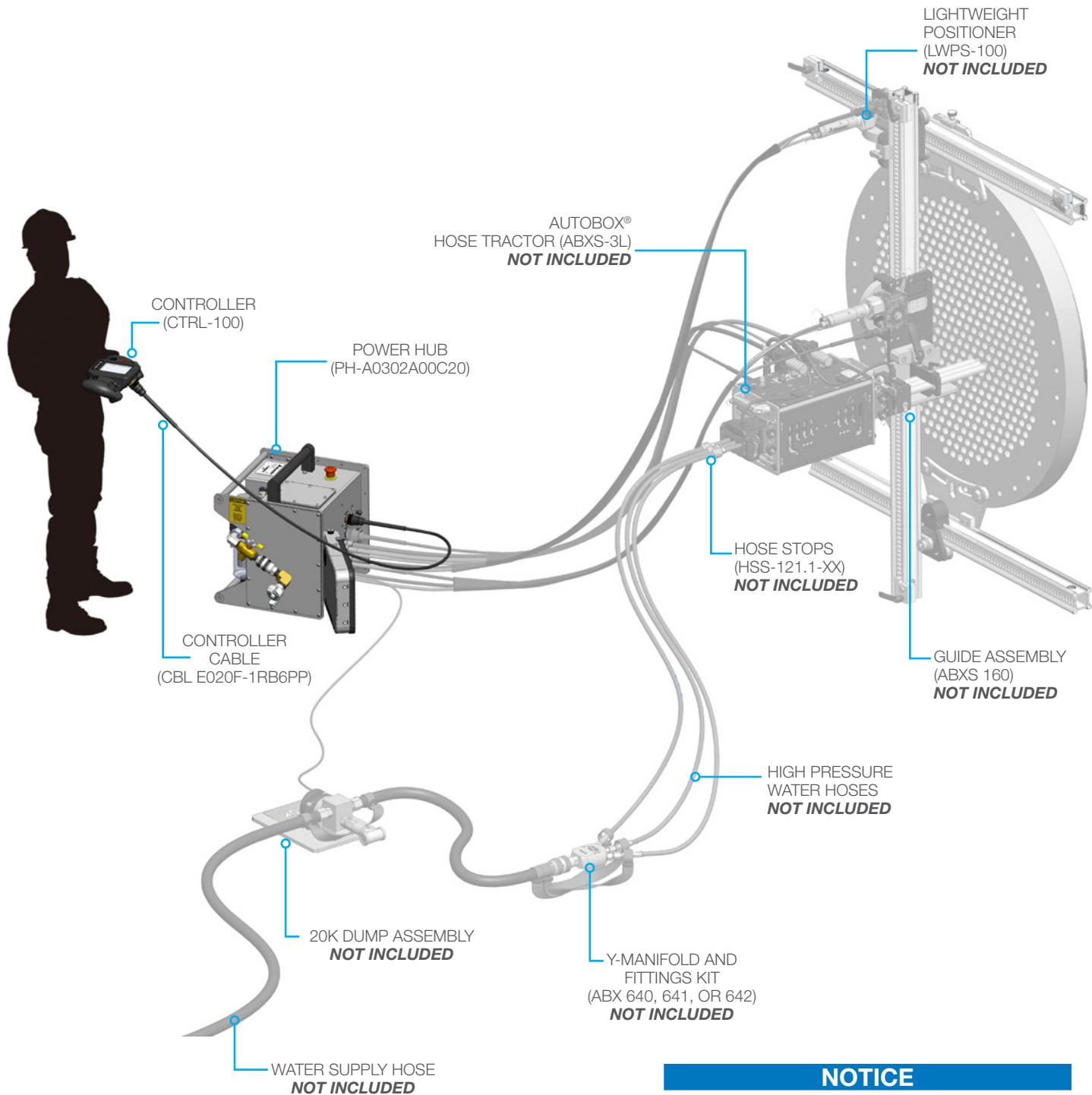
RF Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

- The equipment should only be used or installed at locations where there is normally at least a 20cm separation between the antenna and all persons.
- This transmitter must not be co-located or operation in conjunction with any other antenna or transmitter.
- Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

FULL SYSTEM ASSEMBLY - OVERVIEW

CONTROLLER (CTRL-100) AND POWER HUB (PH-A0302A00C20) SHOWN IN THE SYSTEM ASSEMBLY



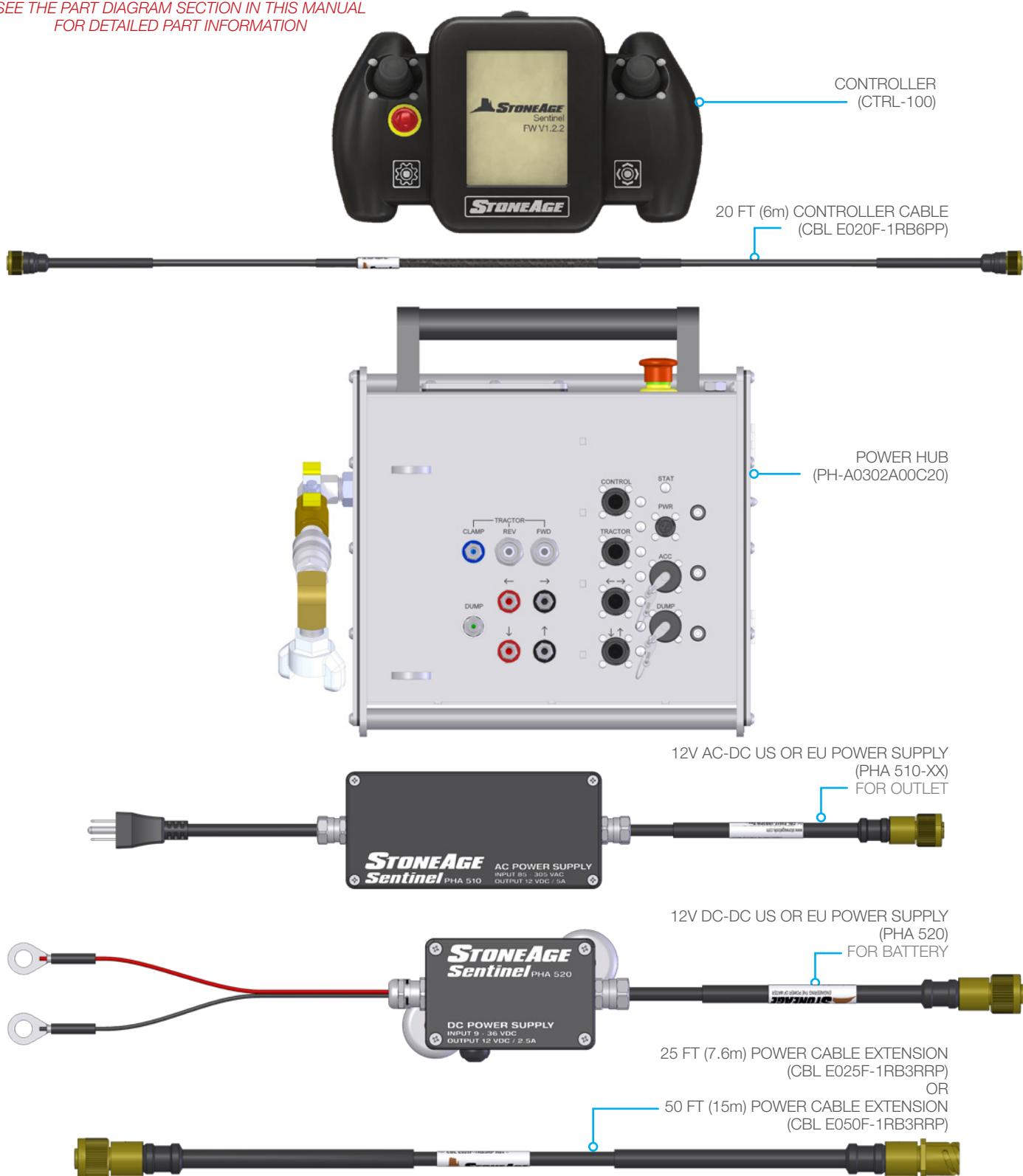
NOTICE

Heat exchanger tube bundle face, shown for graphic representation only. NOT included in assembly.

CONTROLLER AND POWER HUB - OVERVIEW

CONTROLLER (CTRL-100) AND POWER HUB (PH-A0302A00C20) WITH POWER CONNECTORS

**SEE THE PART DIAGRAM SECTION IN THIS MANUAL
FOR DETAILED PART INFORMATION**



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.

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 water jetting
- **Hose protection:** Hose shroud
- **Respiratory protection:** May be required; refer to job specific risk assessment

PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

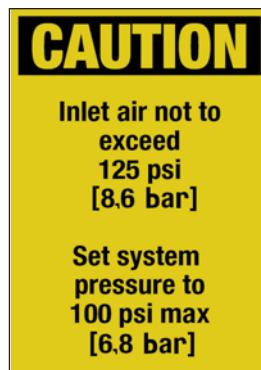
Use of Personal Protective Equipment (PPE) is dependent on the working pressure of water and the cleaning application. Managers, Supervisors, and Operators MUST carry out a job specific risk assessment to define the exact requirements for PPE. See Protective Equipment for Personnel (Section 6) of WJTA-IMCA's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

Hygiene - Operators are advised to wash thoroughly after all water jetting 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

Maximum operating air pressure is 100 psi (6,8 bar). Never exceed 125 psi (8,6 bar) supply pressure. Exceeding 125 psi (8,6 bar) 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 until repaired. Make sure all threaded connections are tight and free of leaks.
- Users of the Controller and Power Hub 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.
- The Controller and Power Hub should be located in a safe location where the operator has good visibility of the exchanger and Hose Tractor. The AUTOBOX® ABXS-3L 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 ABXS-3L 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 performing service or replacing any parts. Failure to do so can result in severe injury and/or death.
- When moving any components within the ABXS-3L and Control System, lift with care to prevent bodily injury.

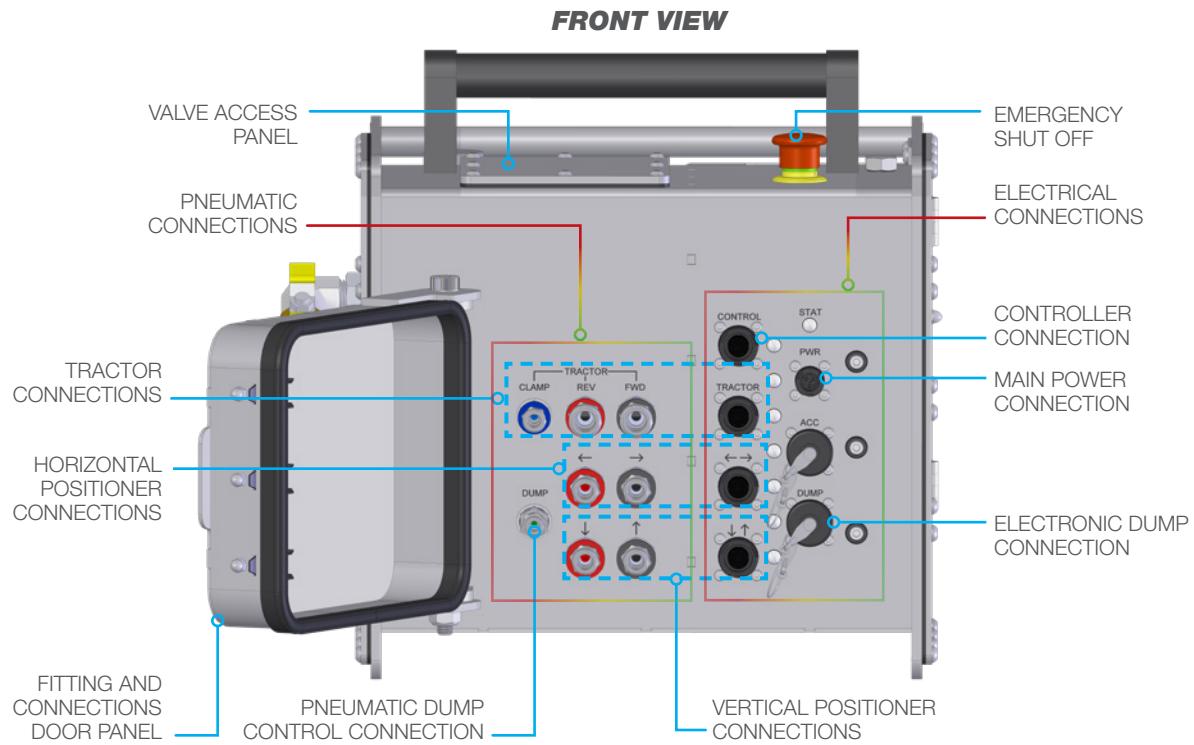
PRE-RUN SAFETY CHECK

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

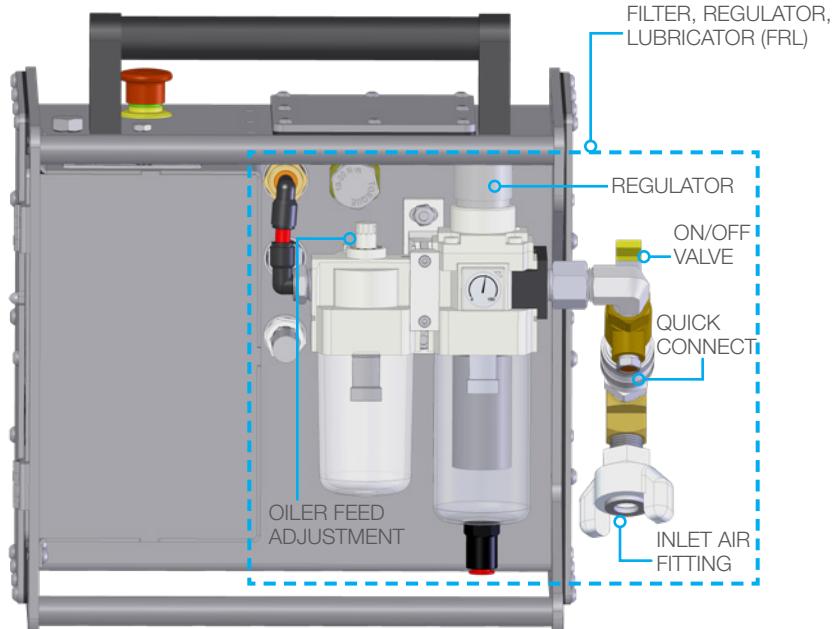
- Complete a job specific risk assessment and act on the resulting actions.
- Ensure the waterblasting zone is properly barricaded and that warning signs are posted.
- Adhere to all site safety procedures.
- Ensure no personnel are in the waterblasting zone.
- Ensure the work place is free of unnecessary objects (e.g. loose parts, hoses, tools).
- Ensure all operators are using the correct Personal Protective Equipment (PPE).
- 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.
- 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.
- Ensure that operators never connect, disconnect, or tighten hoses, adapters, or accessories with the high-pressure water pump unit running.
- Test the Control Box before operating with high-pressure water to verify the control valves move the hose in the intended direction, and that the dump valve is working properly.
- Check all threaded air fitting connections for tightness.

POWER HUB - OVERVIEW

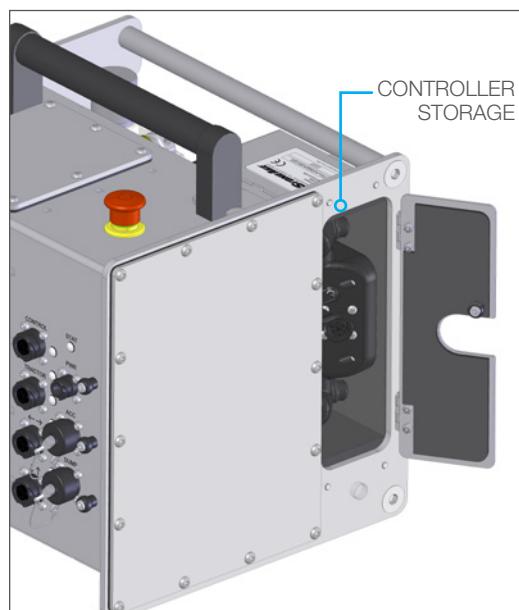
POWER HUB (PH-A0302A00C20)
FUNCTION OVERVIEW
 (NOT INCLUDED WITH ABXS-3L TRACTOR)



BACK VIEW



SIDE VIEW

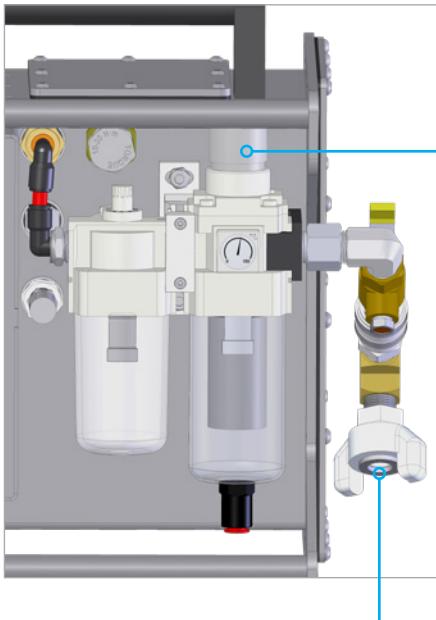


AIR SUPPLY AND LUBRICATOR SETTING

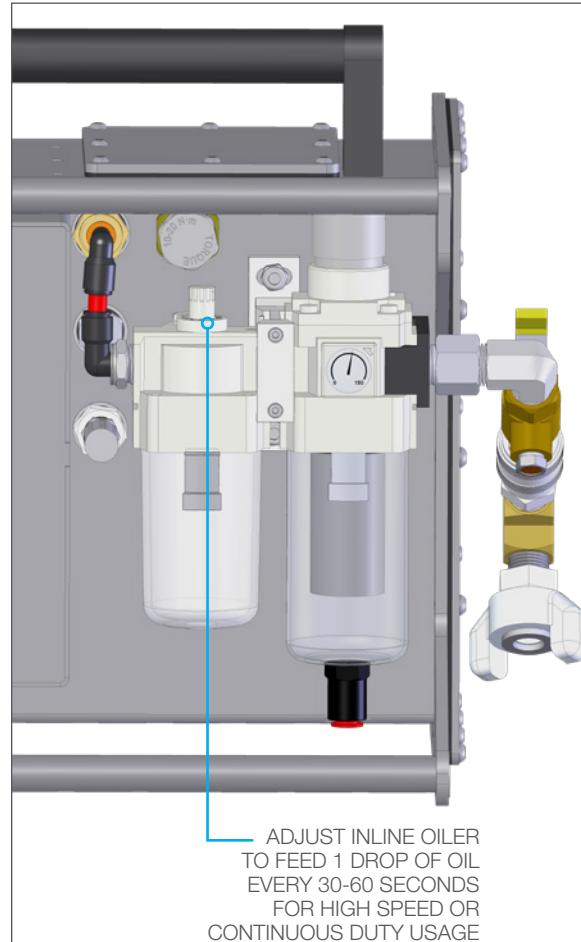
1. The Controller is supplied with a twist claw style inlet coupling (Chicago style) located on the side of the FRL Assembly. Connect a compatible compressed air line (not included) according to the Manufacturer's instructions.
2. Using the regulator adjust the operating air pressure to 100 psi (6,8 bar) for the application.

WARNING

Maximum operating air pressure is 100 psi (6,8 bar). Never exceed 125 psi (8,6 bar) supply pressure. Exceeding 125 psi (8,6 bar) supply pressure may result in injury to the Operator and/or damage to the equipment.



REGULATOR
ADJUSTING KNOB



ADJUST INLINE OILER
TO FEED 1 DROP OF OIL
EVERY 30-60 SECONDS
FOR HIGH SPEED OR
CONTINUOUS DUTY USAGE

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.

PNEUMATIC DUMP CONTROL FITTING AND LINE

A **MOMENTARY PNEUMATIC DUMP CONTROL** is located on the Controller 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. O.D. tubing (not included) between the **PNEUMATIC DUMP CONTROL FITTING** and the pneumatic dump valve.



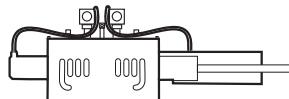
PNEUMATIC DUMP
CONTROL FITTING

1/4 IN OD TUBING
(NOT INCLUDED)

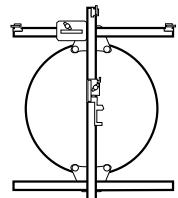
POWER HUB FRONT VIEW

SYSTEM CABLE CONNECTORS AND CABLE BUNDLES

SYSTEM CABLE BUNDLES

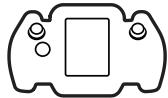


15 FT (4.5m) HOSE TRACTOR CABLE BUNDLE
(CBL EA15F-1RB6PP-2PL10-1PL5)



15 FT (4.5m) POSITIONER CABLE BUNDLE
(CBL EA15F-1RB6PP-2PL5)
2 BUNDLES REQUIRED

90° TO POSITIONER



20 FT (6m) CONTROLLER CABLE
(CBL E020F-1RB6PP)

POWER CABLES

The Power Hub can be connected using the 12v AC-DC or the 12v DC-DC supply. Both are available in US or EU versions.

12V AC-DC US OR EU POWER SUPPLY
(PHA 510-XX)
FOR OUTLET

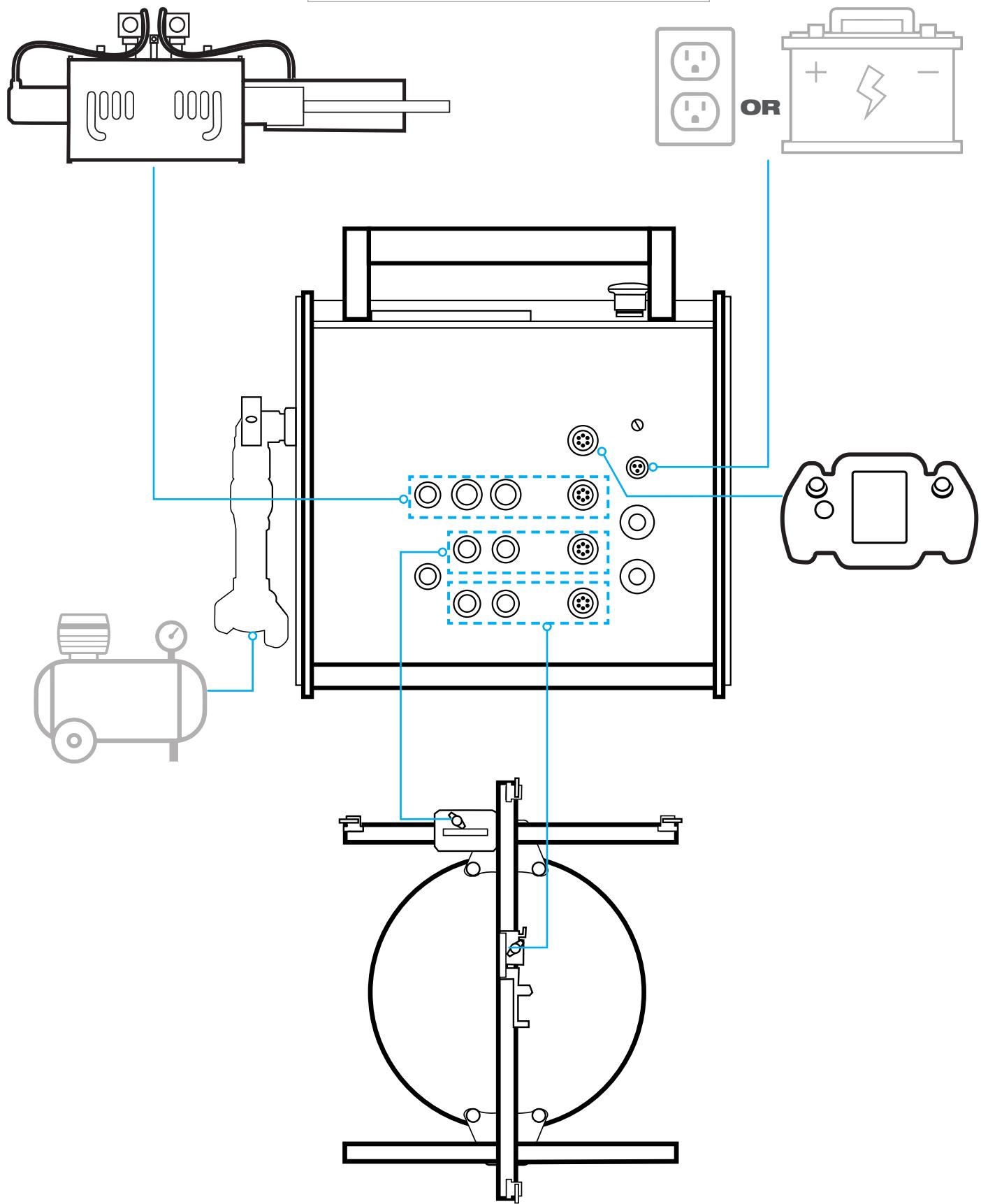


25 FT (7.6m) POWER CABLE EXTENSION
(CBL E025F-1RB3RRP)

OR
50 FT (15m) POWER CABLE EXTENSION
(CBL E050F-1RB3RRP)

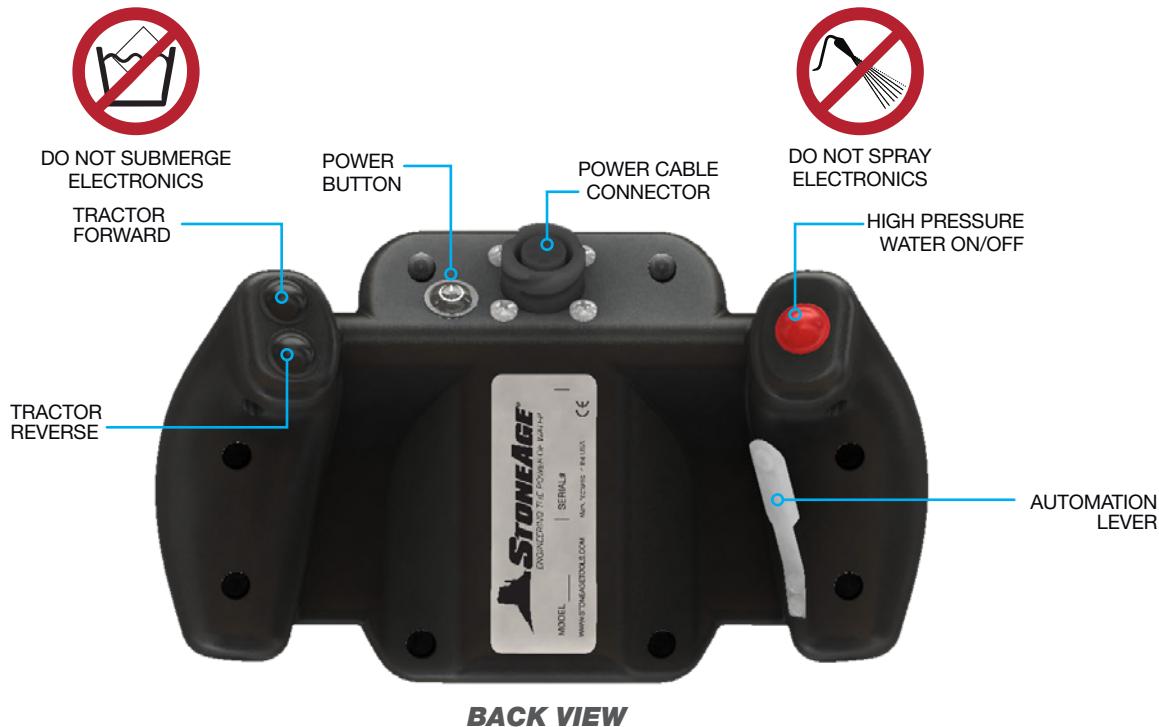


SYSTEM CONNECTION OVERVIEW



CONTROLLER - OVERVIEW

CONTROLLER (CTRL-100) FUNCTION OVERVIEW



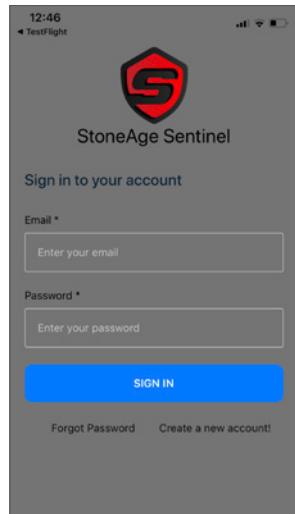
20FT (6m) CONTROLLER CABLE (CBL E020F-1RB6PP REV-)



UPDATING THE CONTROLLER FIRMWARE

UPDATING THE CONTROLLER FIRMWARE

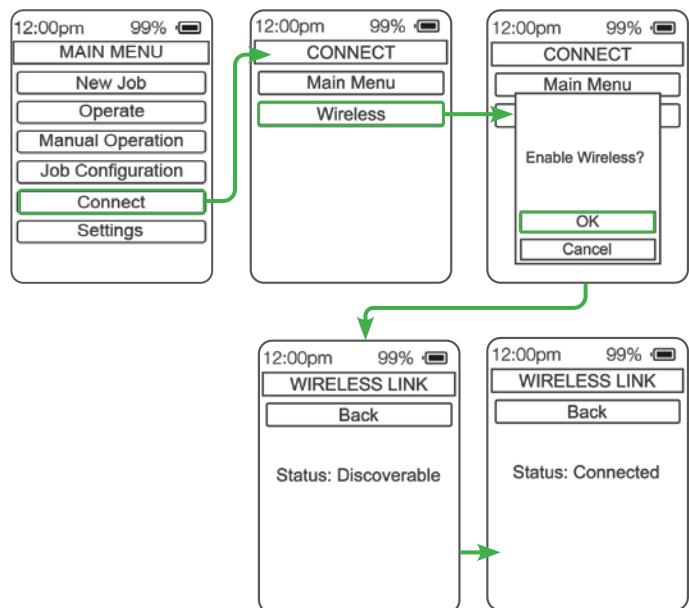
1. Ensure the **iPod touch®** is connected to the Internet.
2. Sign in on the **iPod touch®**



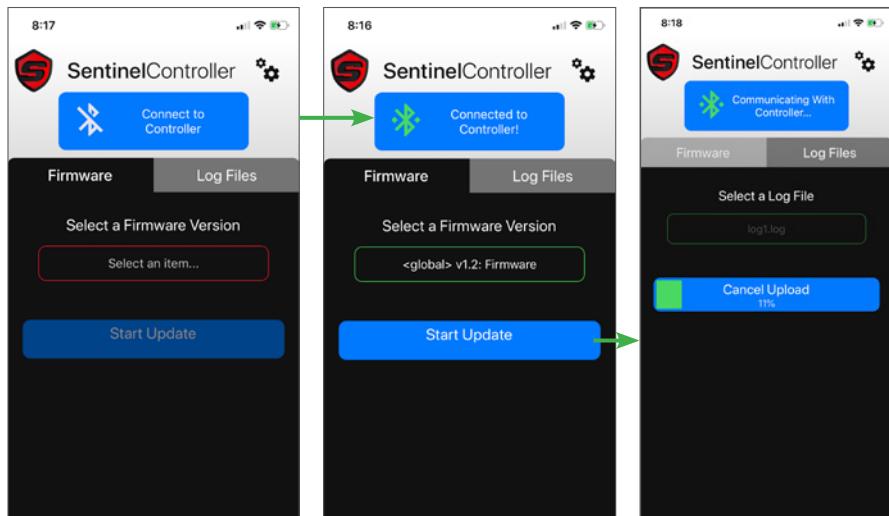
3. Turn on the Sentinel Controller
4. From the **Main Menu**, using the left joystick, scroll down and select **Connect**.
5. Select **Wireless** from the **Connect** menu.
6. Click **OK** on the **Enable Wireless** pop-up.

If your Controller now says **Status: Discoverable**, the Controller is ready to connect to the iPod.

When the Controller says **Status: Connected**, it is connected to the Ipod.



7. Click **Connect to Controller** button. The screen will say **Connecting** then **Connected**. The Bluetooth logo will turn green.
8. Select the **Firmware version** and **Start Update**.
9. When the update is complete, the Operator can return to the Controller.

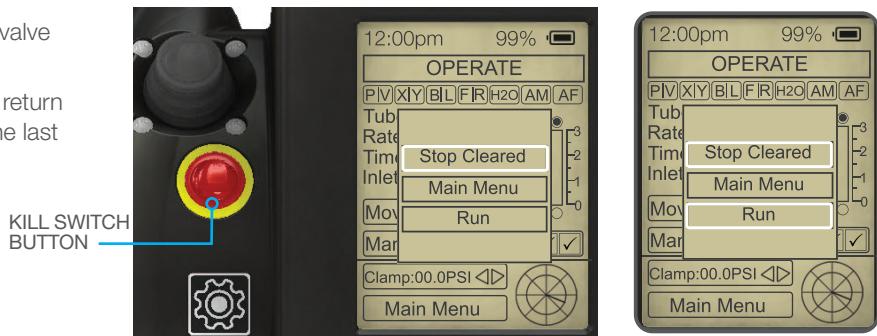


iPod touch® ia a trademark of Apple Inc., registered in the U.S. and other countries

OPERATION

SAFETY FEATURE

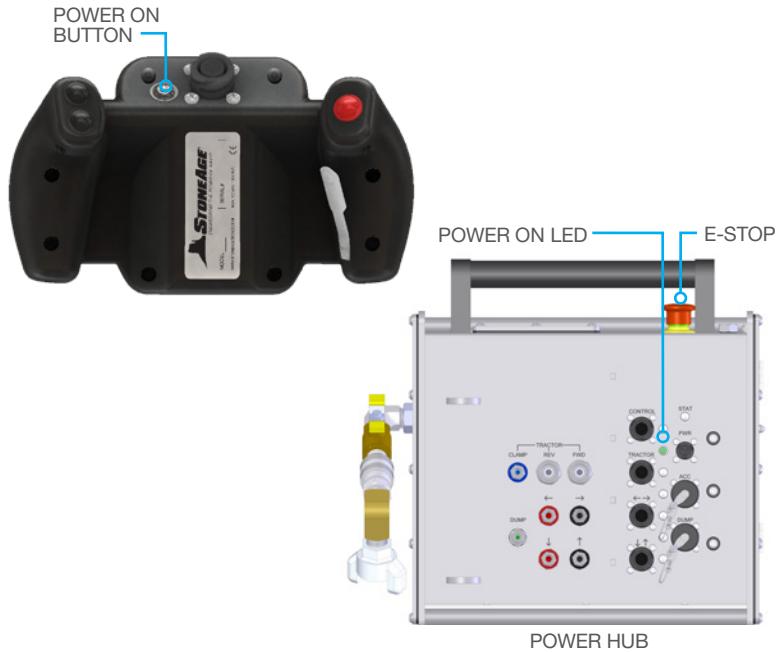
1. The KILL SWITCH directly cuts power to the valve pack in the Power Hub.
2. Use the center button on the Left Joystick to return to the main menu, or select Run to resume the last operation.



POWERING ON

These instructions assume that all connections have been made between the Power Hub, Lightweight Positioner, Autobox Tractor, and Hand Held Controller. It also assumes that the Power Hub has been plugged in and it has been hooked up to an air supply. The Power Hub can be connected to US and European power (50-60Hz 90-260vac) with AC supply or 10-14 VDC with the DC power supply. Connect directly to a battery on the pump or air compressor.

1. Release the E-STOP on the Power Hub.
2. Look for the LED power lights to come on to verify the Power Hub is operational.
3. Press the ON Button on the Controller.
4. The StoneAge logo will appear then change to the MAIN MENU.



MAIN MENU

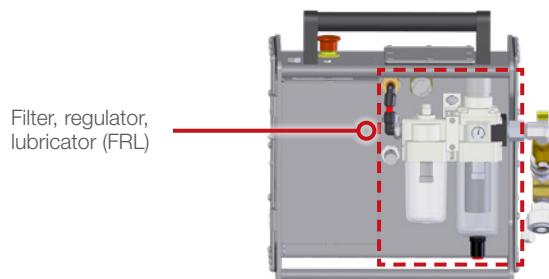
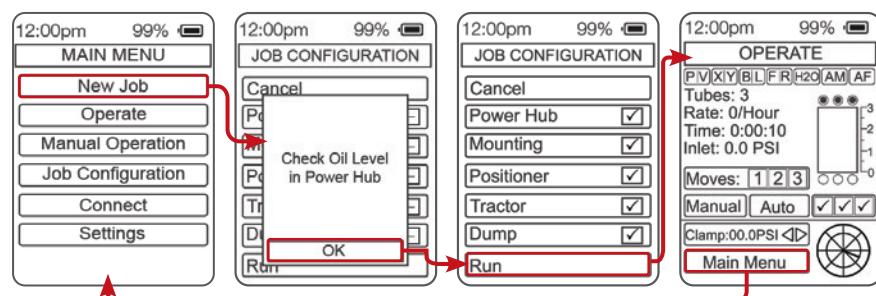
- The MAIN MENU will come up first. From the MAIN MENU, you can select any of the sub menus with the left Joystick, by scrolling and pressing down on the Joystick. This will ask you to verify the Lubricant Level in the Power Hub
- **New Job** assumes the **Job Configuration task list** has been completed.
- **Operate** will take the user directly into operation mode and assumes the **Job Configuration task list** has been completed.
- **Job Configuration** is the menu that allows the user to set up and test the system components prior to operation.
- **Connect** allows a bluetooth connection for updating the Firmware of the unit.
- **Settings** is the menu for user preferences; Back light, Contrast, Language, Units of measure, Date/Time, Hour Format



NEW JOB

From the Main Menu select **New Job**. The following instruction assumes that the **Job Configuration** has been completed. The **Job Configuration** is complete when all tests have been completed and the boxes all have check marks. If any of the boxes have a dash mark, it indicates that the set-up for that item has been skipped/unfinished. If the **Job Configuration** has not been completed, skip ahead to the **Job Configuration** section for a complete instruction.

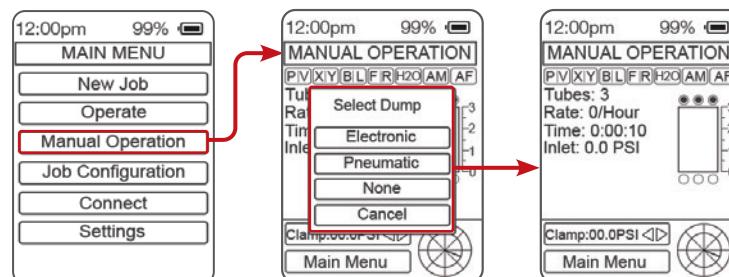
1. Select **New Job** and the “Check Oil Level in Power Hub” pop-up will come up to remind the user to check the lubricant level in FRL (Filter, Regulator, Lubricator) on the Power Hub before every job.
2. Clicking **OK** on the pop-up, returns to the **Job Configuration** screen.
3. Selecting **Run** on the **Job Configuration** screen takes the user to the **Operate** screen.



MANUAL OPERATION

Manual Operation will allow the user to run the system in full manual mode. There are no automatic functions on the screen as on the **Operate** screen. This is useful when not using the Sentinel Sensors.

1. Select the type of dump or none and the **Manual Operation** screen will come up. See the screen descriptions in the **Operate** section below.



OPERATE

Operate is the main interface that the Operator will use to run the system

1. The **Operate** screen can be accessed from the **Main Menu** or from **Run** at the bottom of **Job Configuration** or **Tractor** screen.
2. Use the left joystick to scroll to then push it down to select and deselect.
3. The **Automation Lever** on the back of the Controller must be held in to operate the system.



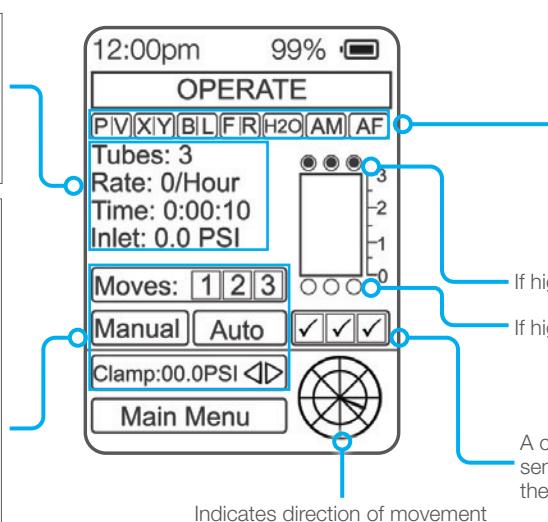
Tubes = How many have been cleaned
Rate = Tubes cleaned per hour
Time = How long the job has been running
Inlet = Air Pressure

Moves = Quantity of tubes moved in an automatic move

Manual = Allows user to move lances manually

Auto = Moves selected amount of tubes. Nudging the right joystick will allow the Operator to make micro moves in any direction.

Clamp = Amount of downward pressure placed on the hoses inside the tractor



PV= Power Hub/Valve
XY= X Positioner/Y Positioner
BL= Belt/Lance
FR= Forward/Reverse
H2O= Water
AM= AutoMove
AF= AutoFeed

*If the indicator box is blank, check the connections.

If highlighted, Lances are retracted

If highlighted, Lances are in the tubes

A check mark indicates the stop sensor is active. If there is an “X” in the box, the stop sensor is inactive

OPERATION

OPERATION

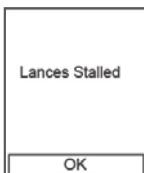
The **CLAMP** function controls the drive belt traction. It is recommended to operate the clamp pressure as low as possible without excessive slippage. Optimal clamp pressure is achieved when the Drive Belt slips at a slow rate of speed after hitting the hose stops (forward) or the Collet engages the hose crimp (reverse). It is recommended to use hoses supplied with the secondary crimp so the (anti-withdrawal protection) Collet does not impact the pressure containing crimp. 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 Belt. Proper clamp force will also increase the life of the Drive Belt and High Pressure Hoses.

CLAMP PRESSURE MUST NOT EXCEED;

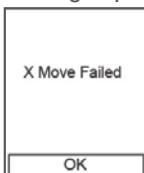
100 PSI for 3 Hoses, 66 PSI for 2 Hoses, and 33 PSI for 1 Hose

1. Hold the **Automation Lever** in and use the left Joystick to set the Clamp PSI.
2. In **Manual** mode, center on the first set of tubes to be cleaned, select the number of **Moves**, then select **Auto** mode.
3. Hold the **Automation Lever** in and test the **High Pressure water On/OFF** button
4. Press the **Tractor Forward** button to feed the lances into the first 3 tubes for at least 1 second, then withdraw them using the **Tractor Reverse** button. This will record 3 tubes in the "Tube Count."
5. Tap the right Joystick in the direction of the next tubes to be cleaned and it will automatically advance the number of "Moves" selected on the screen.
6. Continue to move 3 and clean 3 until either the end of the row is reached or there is a different number of moves left to complete the row. If there is a different number of moves, as in this case. Change the **Moves** to the number that is needed to complete the row. In this case, it is 2.
7. Tap the right Joystick to the last tubes and finish cleaning the row.
8. Tap the right Joystick up or down to move to a new row of the tubes. The positioner will automatically move up, down, or diagonal by the same Pitch that it moved in the horizontal direction.
9. For the triangle pattern, tap the joystick up or down in the diagonal direction and straight up and down for square.
10. Repeat the horizontal row cleaning method until complete.

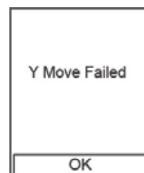
Potential Warning Pop up Screens



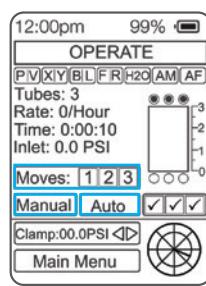
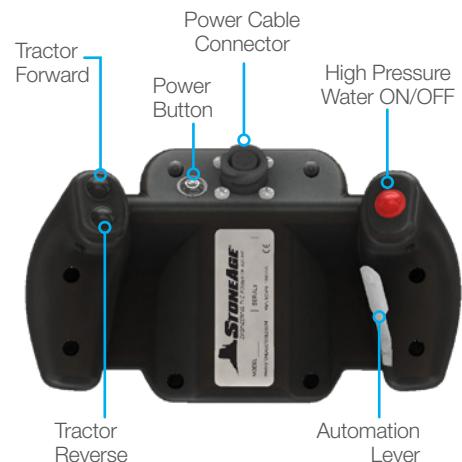
Lances are against an obstruction
OK



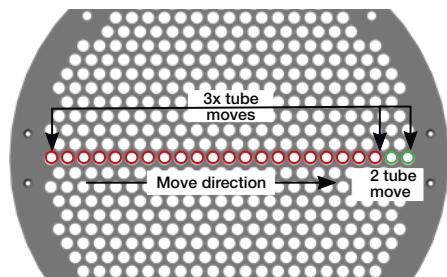
X Carriage has hit a rail stop
OK



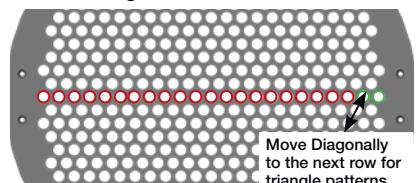
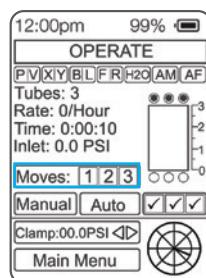
Y Carriage has hit a rail stop
OK



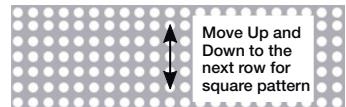
Triangle Pattern Tube Face



Triangle Pattern Tube Face



Square Pattern Tube Face

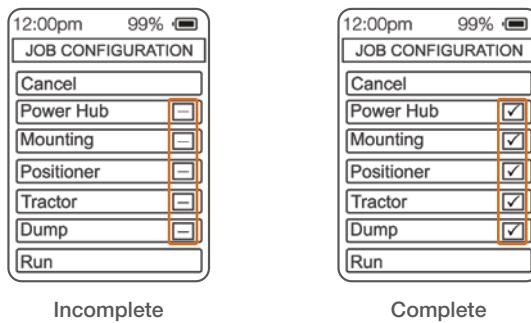


JOB CONFIGURATION

Job Configuration is the base menu for setting job parameters and testing each segment of the system.

The boxes on the right side of **Job Configuration** have a dash mark that indicates that the set-up for that item has been skipped/unfinished. **Job Configuration** is complete when all boxes have check marks.

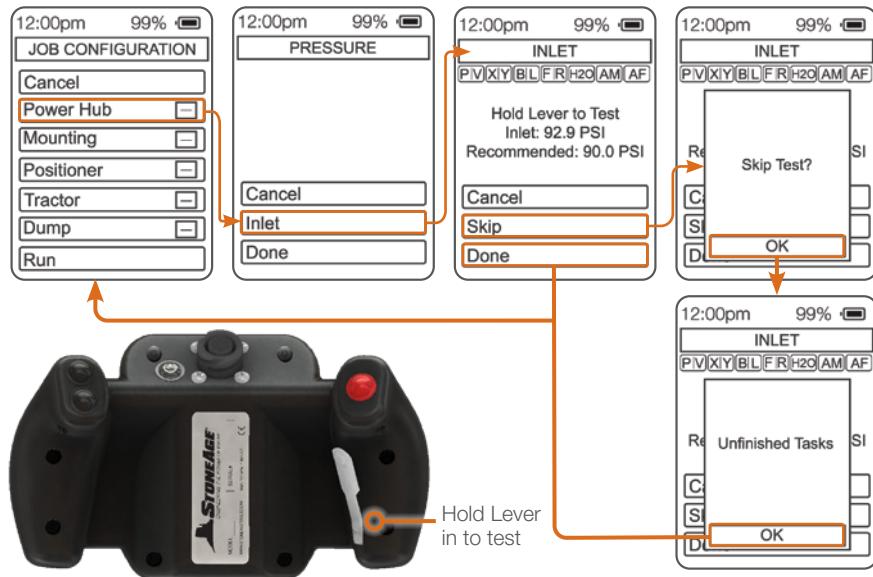
The following instructions will go through each configuration task in the **Job Configuration** menu in consecutive order.



JOB CONFIGURATION - POWER HUB

Power Hub tests the system for recommended inlet pressure.

1. Use the left joystick to scroll to **Power Hub**, then push down on it to select.
2. Scroll down and select **Inlet**.
3. Hold the Automation Lever in to test and select **Done** when the test is complete to return to the **Job Configuration** screen.
4. If the Operator selects **Skip** on any system test, the **Unfinished Tasks** screen will pop up. Click **OK** will return to the **Job Configuration** screen. A dash mark will remain in the box to the right of **Power Hub**. This is the process for any of the tests that are skipped/unfinished.
5. Scroll down to the next selection to continue **Job Configuration** setup.

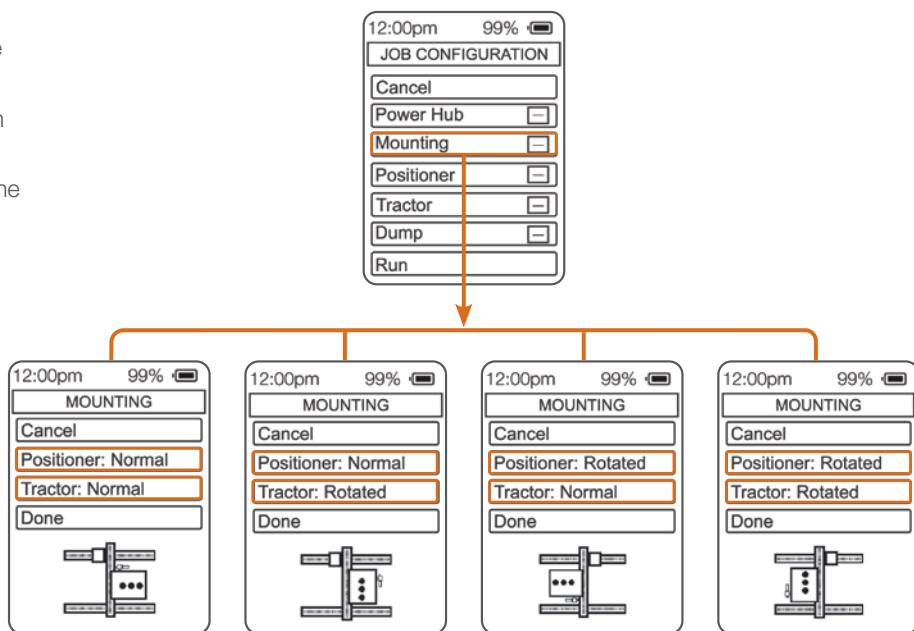


JOB CONFIGURATION - MOUNTING

The **Mounting** setup screen configures both the **Tractor** and **Positioner** mounting positions. See the table for possible mounting combinations.

1. Use the left joystick to scroll to **Mounting**, then push down on it to select.
2. Scroll down and select **Positioner**, then use the left joystick to select **Normal** or **Rotated**.
3. Repeat the process to select the **Tractor** position.
4. When the **Positioner** and **Tractor** have been set, select **Done** to return to the **Job Configuration** menu.

Mounting Configurations	
Positioner	Tractor
Normal	Normal
Normal	Rotated
Rotated	Normal
Rotated	Rotated



OPERATION

JOB CONFIGURATION - DETERMINE PITCH AND PATTERN

(DO THIS BEFORE CONFIGURING THE AUTOMOVE FUNCTION)

Before operating the Sentinel System, the operator needs a measurement of the tube pitch and a determination tube pattern type (triangle or square). This is required to properly set up the AutoMove function.

1. To manually measure the tube pitch we recommend the use of digital calipers for the most accurate measurement. The use of a tape measure or ruler will also work.

2. There are a variety of ways to measure pitch;

Measure two tubes Center to Center or Edge to Edge. The example to the right would be 1.5 inches.

3. For higher precision;

Measure across full row of tubes (or choose ten or whatever)

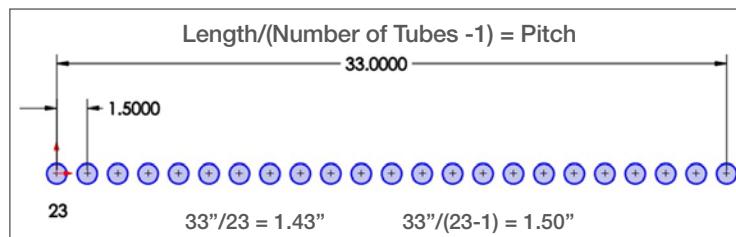
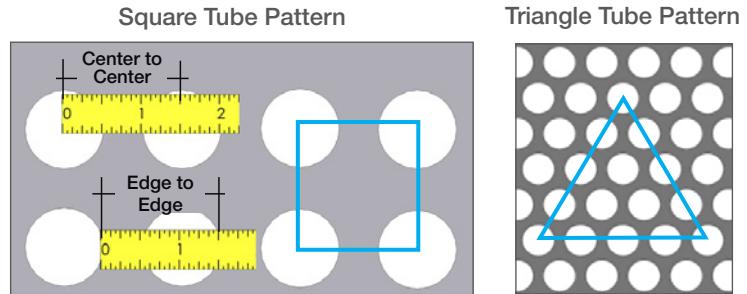
Count the number of tubes

Divide the Measurement by the number of tubes – 1

Length/(Number of Tubes -1) = Pitch

The more samples that are taken and averaged, the more precise the Pitch measurement.

4. The tube patterns on the diagrams to the right are indicated in blue. The Square and Triangle are shown but there are also Rotated Square and Rotated Triangle patterns to choose from. See the pattern chart on the next page for a complete list of pattern options.



JOB CONFIGURATION - POSITIONER

The **Positioner** setup menu displays the following functions:

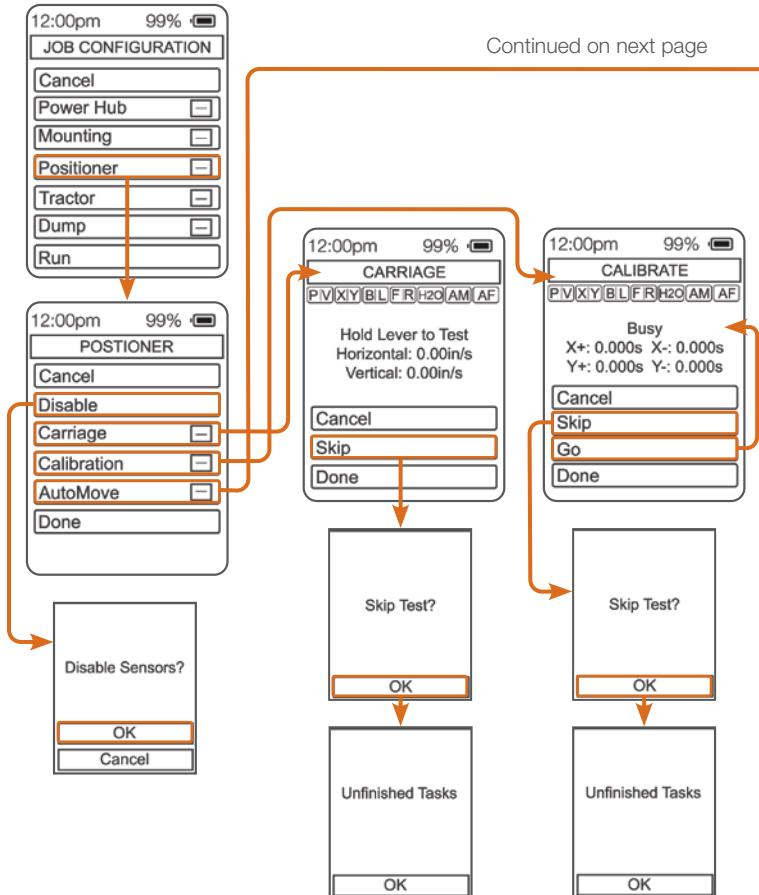
- Disable Positioner sensors
- Test the Positioner Carriages
- Calibration of the X/Y movement
- AutoMove setup for pitch and tube patterns

If the Operator selects **Skip** on any system test, the Unfinished Tasks screen will pop up. Clicking **OK** will return to the

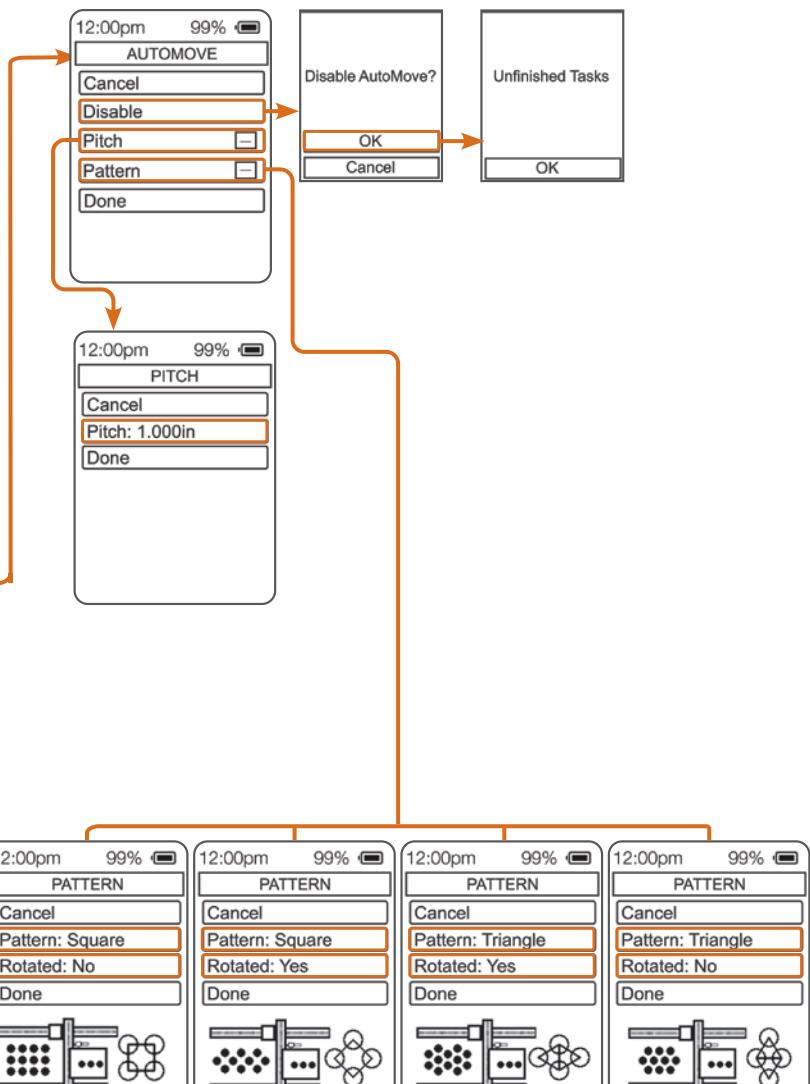
Positioner screen. A dash mark will remain in the box to the right of skipped item indicating that it has not been tested. This is the process for any of the tests that are skipped/unfinished.

1. If the Operator chooses **Disable**, the Positioner sensors will be turned off.
2. To test the Carriage, use the left joystick to scroll to **Carriage**, then push down on it to select. Hold the Automation Lever in to test. Select **Done** when the test is complete. To skip the test and leave the task unfinished, select **Skip** and select **Ok**, the select **Ok** on the Unfinished Task pop up.
3. Scroll down and select **Calibration**. Hold the Automation Lever in and select **Go** to test. Select **Done** when the test is complete. To skip the test and leave the task unfinished, select **Skip** and select **Ok**, the select **Ok** on the Unfinished Task pop up.

Continued on next page



4. Scroll down and select **AutoMove**. If the Operator chooses **Disable**, AutoMove will be turned off.
5. From the **AutoMove** menu, scroll down and select **Pitch**. This is where the **Pitch measurement** described on the previous page will be entered. Move the left joystick side to side to increase or reduce the number, then click **Done** to return to the **AutoMove** menu.
6. Scroll down and select **Pattern**. Move the left joystick side to side to select Square or Triangle, then scroll down to select Rotated Yes or No. Select **Done** to return to the **AutoMove** menu.
7. When the **Pitch** and **Pattern** have been set, select **Done** to return to the **AutoMove** menu and select **Done** again to return to the **Positioner** menu.
8. If all settings in the **Positioner** menu are complete, select **Done** to return to the **Job Configuration** screen to begin the **Tractor** configuration.



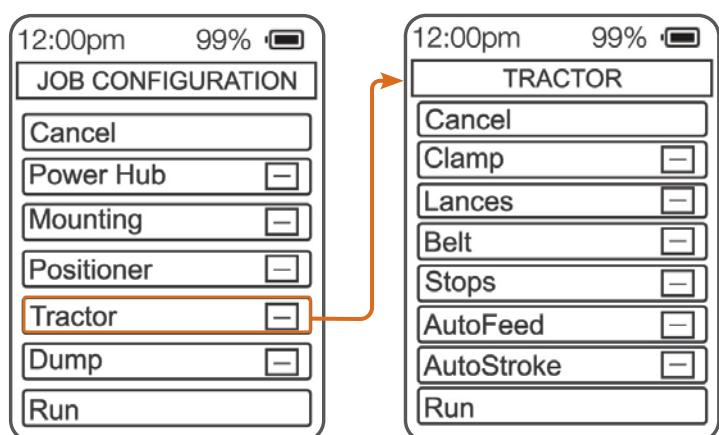
Pattern Configurations		
Pattern	Rotated	Screen Icon
Square	No	
Square	Yes	
Traingle	No	
Traingle	Yes	

JOB CONFIGURATION - TRACTOR

The **Tractor** setup menu displays the following functions;

- Clamp pressure testing
- Number of Lances
- Belt feed speed testing and clamp pressure setting
- Hose Stop sensor testing and calibration
- AutoFeed enable/disable
- AutoStroke enable/disable and preference settings

If the Operator selects **Skip** on any system test, the **Unfinished Tasks** screen will pop up. Clicking **OK** will return to the **Tractor** screen. A dash mark will remain in the box to the right of skipped item indicating that it has not been tested. This is the process for any of the tests that are skipped/unfinished.



OPERATION

JOB CONFIGURATION - TRACTOR CONTINUED...

The **Tractor** setup menu displays the following functions:

- Clamp pressure testing
- Number of Lances
- Belt feed speed testing and clamp pressure setting
- Hose Stop sensor testing and calibration
- AutoFeed enable/disable
- AutoStroke enable/disable and preference settings

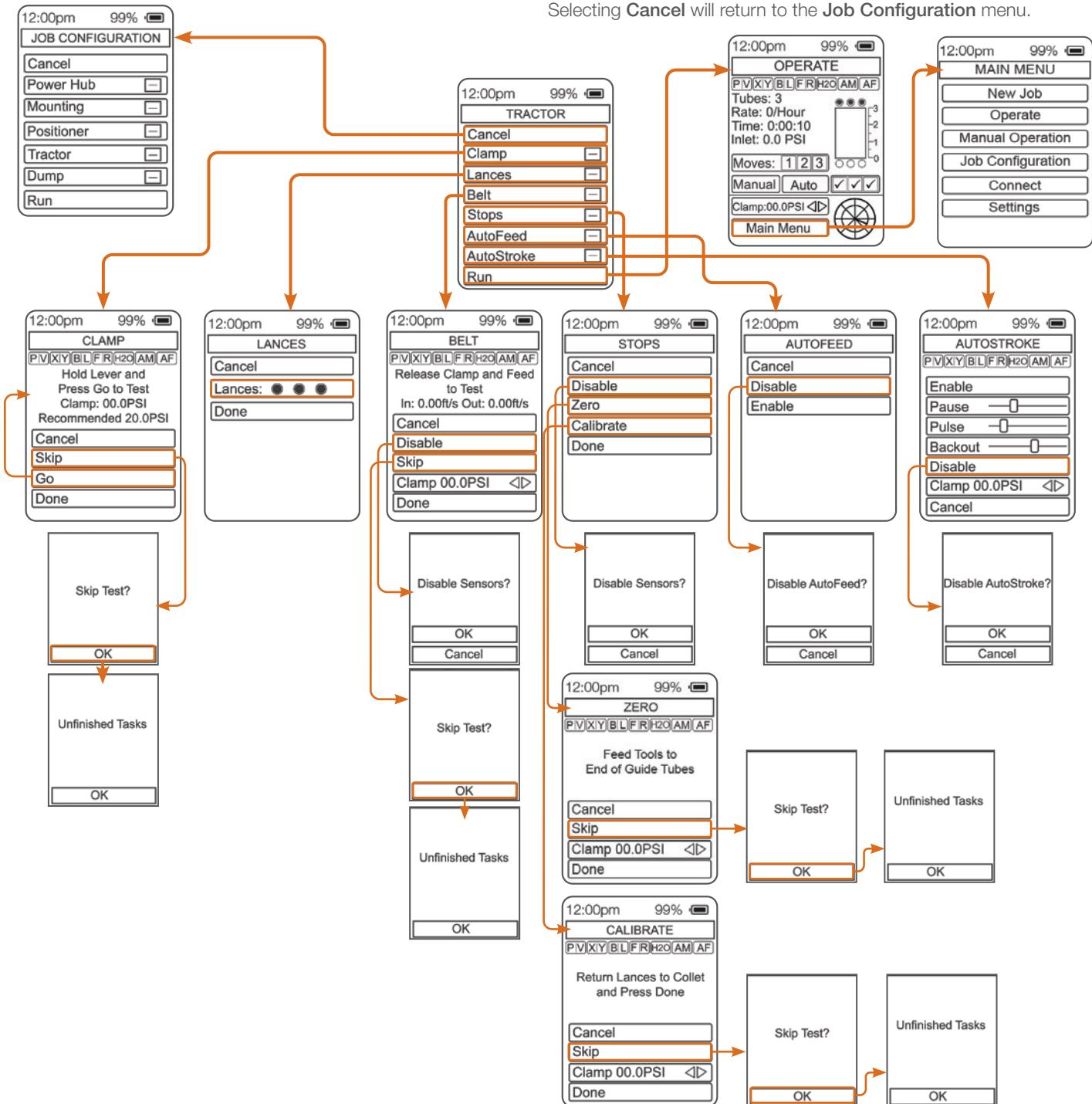
If the Operator selects **Skip or Disable** on any system test, the Unfinished Tasks screen will pop up. Clicking **OK** or **Done** will return to the **Tractor** menu. A dash mark will remain in the box to the right of skipped or disabled item indicating that it has not been tested or enabled. This is the process for any of the tests that are skipped/unfinished.

Work down the Tractor menu until all tests are complete. Each test screen will instruct the Operator as to how perform the test.

CLAMP PRESSURE MUST NOT EXCEED;
100 PSI for 3 Hoses, 66 PSI for 2 Hoses, and 33 PSI for 1 Hose

Selecting **Run** will take the Operator to the Operate screen.

Selecting **Cancel** will return to the **Job Configuration** menu.



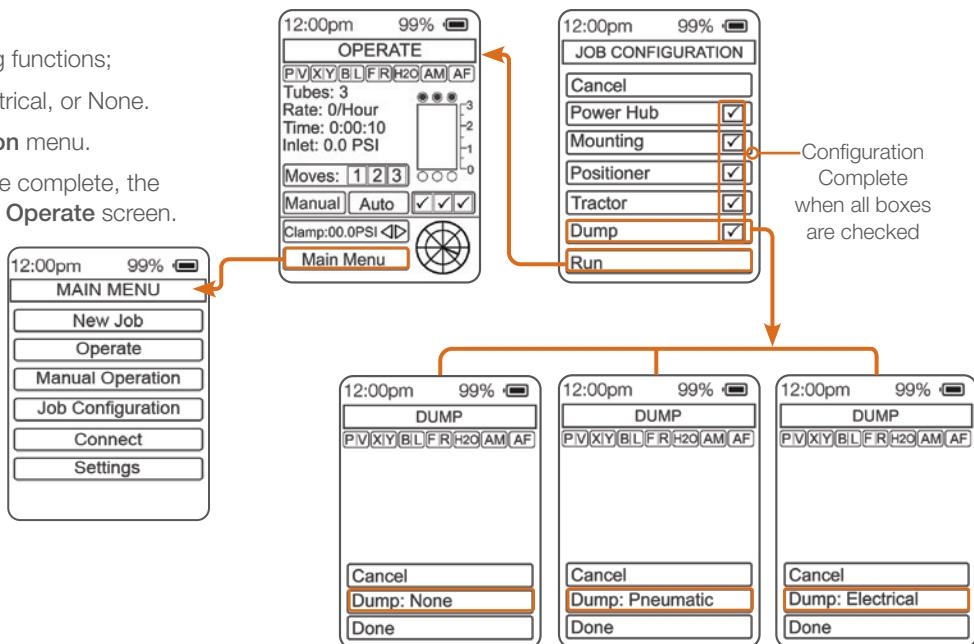
JOB CONFIGURATION - DUMP

The Dump setup menu displays the following functions;

- Select type of dump, Pneumatic, Electrical, or None.

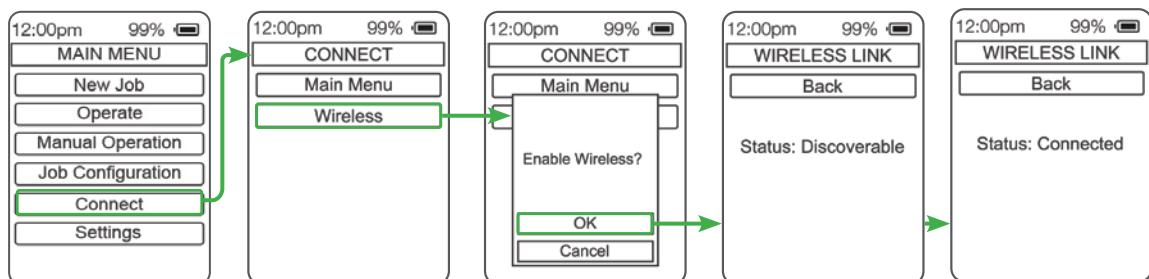
Click **Done** to return to the **Job Configuration** menu.

If all tasks in the **Job Configuration** menu are complete, the Operator can select **Run** to go directly to the **Operate** screen.

**CONNECT**

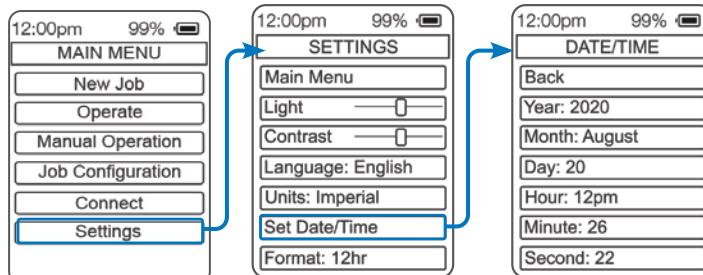
The **Connect** menu allows the user to turn on the wireless function on the Controller and allow the unit to be discoverable.

This function is used when updating Firmware. See "Firmware Update Instructions" for more information.

**SETTINGS**

Settings is the menu that allows the Operator to set up user preferences;

- Back light
- Contrast
- Language
- Units of measure
- Date/Time
- Hour Format



CONTROLLER AND POWER HUB MAINTENANCE

Maintenance Item	Frequency	Maintenance Required
POWER HUB Lubricant level of Filter, Regulator, Lubricator	Before each use and After EVERY 8 HOURS OF USE	For average conditions, the use of high quality SAE #10 (S.U.V. 150-200 SEC @ 100°F) oil is recommended. Other lubricants, as specified by the maker of the equipment to be lubricated, may be used if not heavier than SAE #40 (S.U.V. 800 SEC @100°F). <i>The oil level is never allowed below end of tube in the bowl</i>
POWER HUB Lubricant level of Filter, Regulator, Lubricator	Cessation of oil dripping through the sight dome	If both air and oil are kept clean, and the oil level is never allowed below end of tube in the bowl, the lubricator should provide long periods of unattended service. Cessation of oil dripping through the sight dome, irrespective of knob adjustment, is an indication that cleaning is necessary. To clean, it is not necessary to remove lubricator from the line. De-pressure and disassemble. In most instances, cleaning is needed only in the oil metering area. Pull off adjusting knob, unscrew sight dome assembly, remove inner drip spout and clean with household soap. PLASTIC BOWLS AND SIGHT DOME MUST BE CLEANED WITH HOUSEHOLD SOAP ONLY.
POWER HUB Lubricant level of Filter, Regulator, Lubricator	Intermittent Adjustments	The adjustment knob is factory set so that, when turned fully clockwise, no oil is delivered to the venturi for atomization, and the equipment is not being lubricated. To adjust the oil drip rate, turn on the air, start flow and set knob to obtain the desired drip rate, which is visible through the sight dome. As a start, one to two drops per minute is suggested, correct lubrication is a matter of experience and demand. Clockwise rotation of knob decreases oil feed rate. To check lubrication, hold thumbnail or a mirror near the equipment exhaust. A heavy film indicates over-lubrication and the drip rate should be reduced by turning knob to a lower setting.
CONTROLLER Battery	Every 6 months	Charge the battery every 6 months to prevent battery damage.
CONTROLLER Buttons and Joysticks	When damaged	Replace buttons and joysticks when they are damaged. This is to prevent water or humidity from damaging the electrical components inside the Controller.
ALL ELECTRONIC SYSTEM COMPONENTS	Always	DO NOT SPRAY WATER DIRECTLY AT OR SUBMERGE THE CONTROLLER OR ANY ELECTRONIC COMPONENTS. MAKE SURE ALL DUST CAPS ARE IN PLACE AND ELECTRICAL SENSOR CONNECTIONS ARE TIGHT PRIOR TO CLEANING.

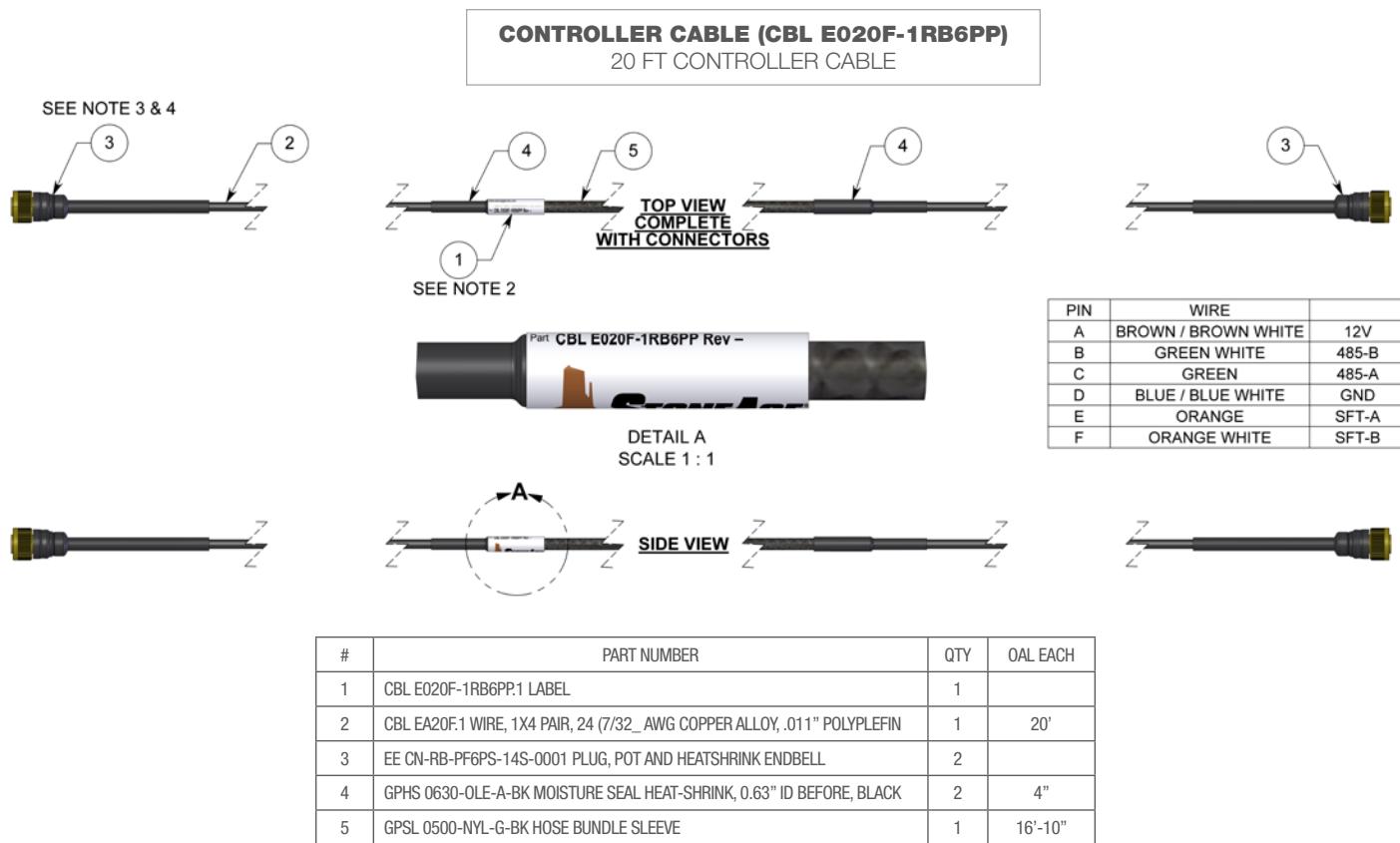


Contact StoneAge for Safety Data Sheets for material usage, a complete list of spare part numbers, and service instructions for the POWER HUB (PH-A0302A00C20) and Controller (CTRL-100)

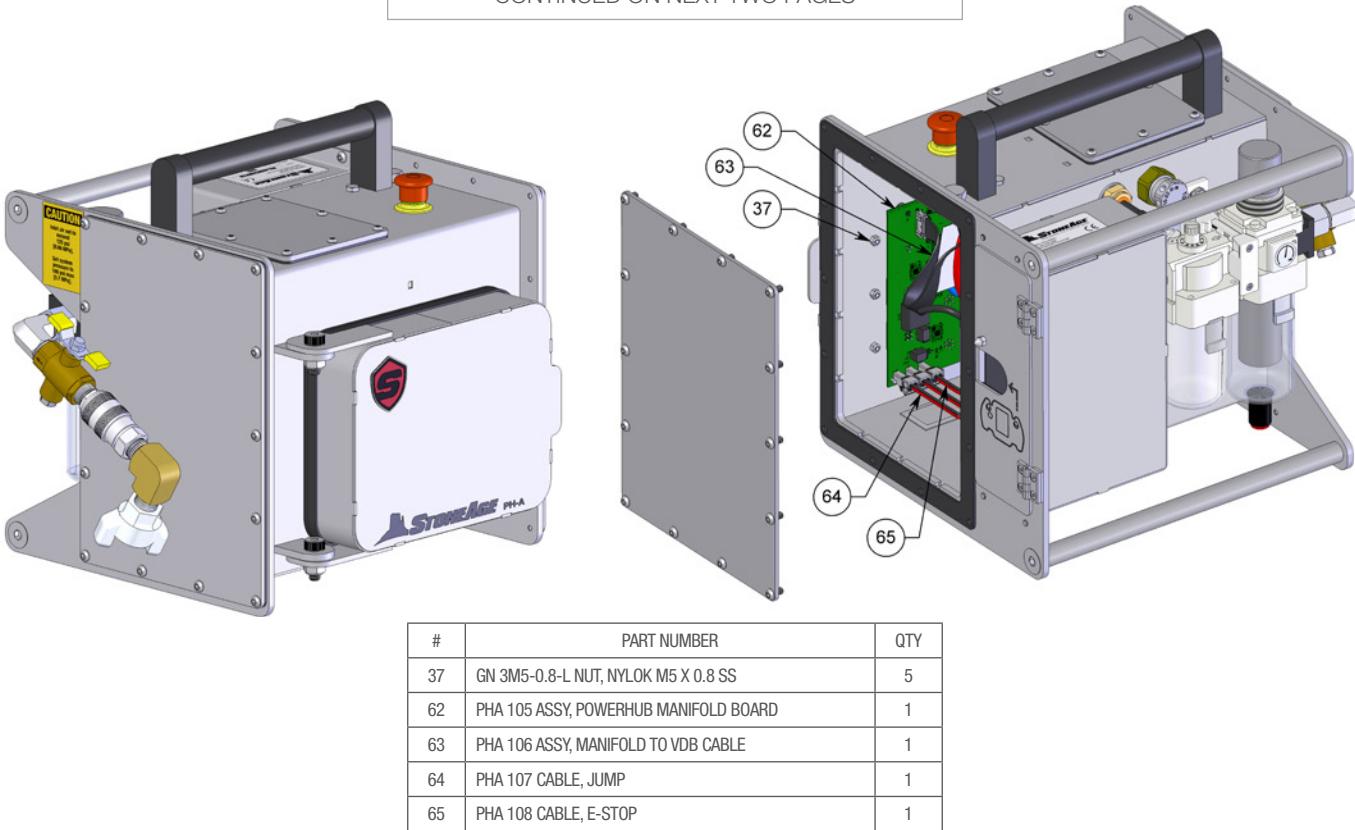
STORAGE, TRANSPORTATION, AND HANDLING

Before storing the Controller or Power Hub, wash with a sponge and warm soapy water, then let air dry. Do NOT pressure wash components. Treat the Controller like a cell phone. Extended storage should be maintained in moderate temperatures, between 40F and 80F.

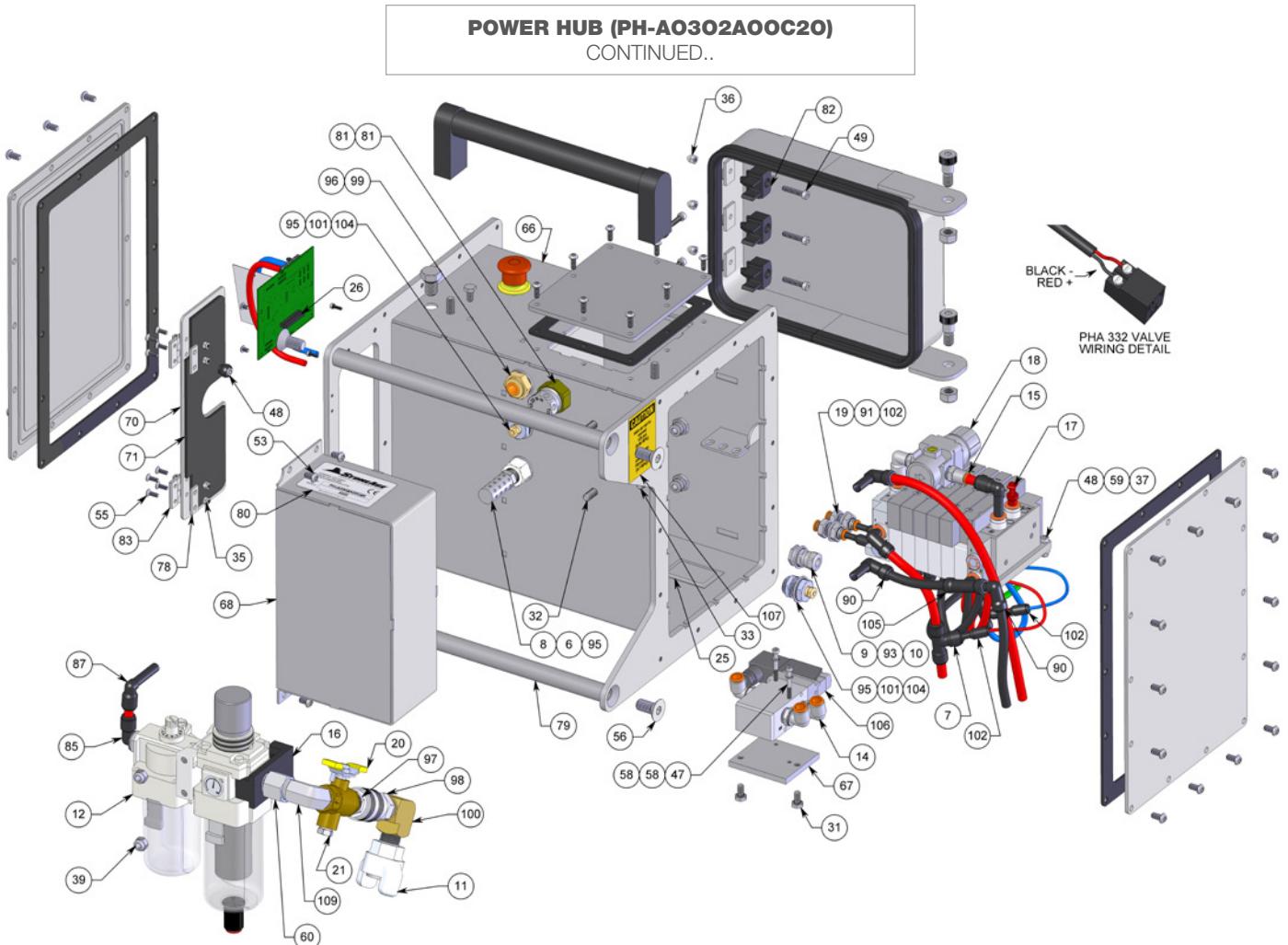
PART DIAGRAM



POWER HUB (PH-A0302AOOC20)
CONTINUED ON NEXT TWO PAGES



PART DIAGRAM

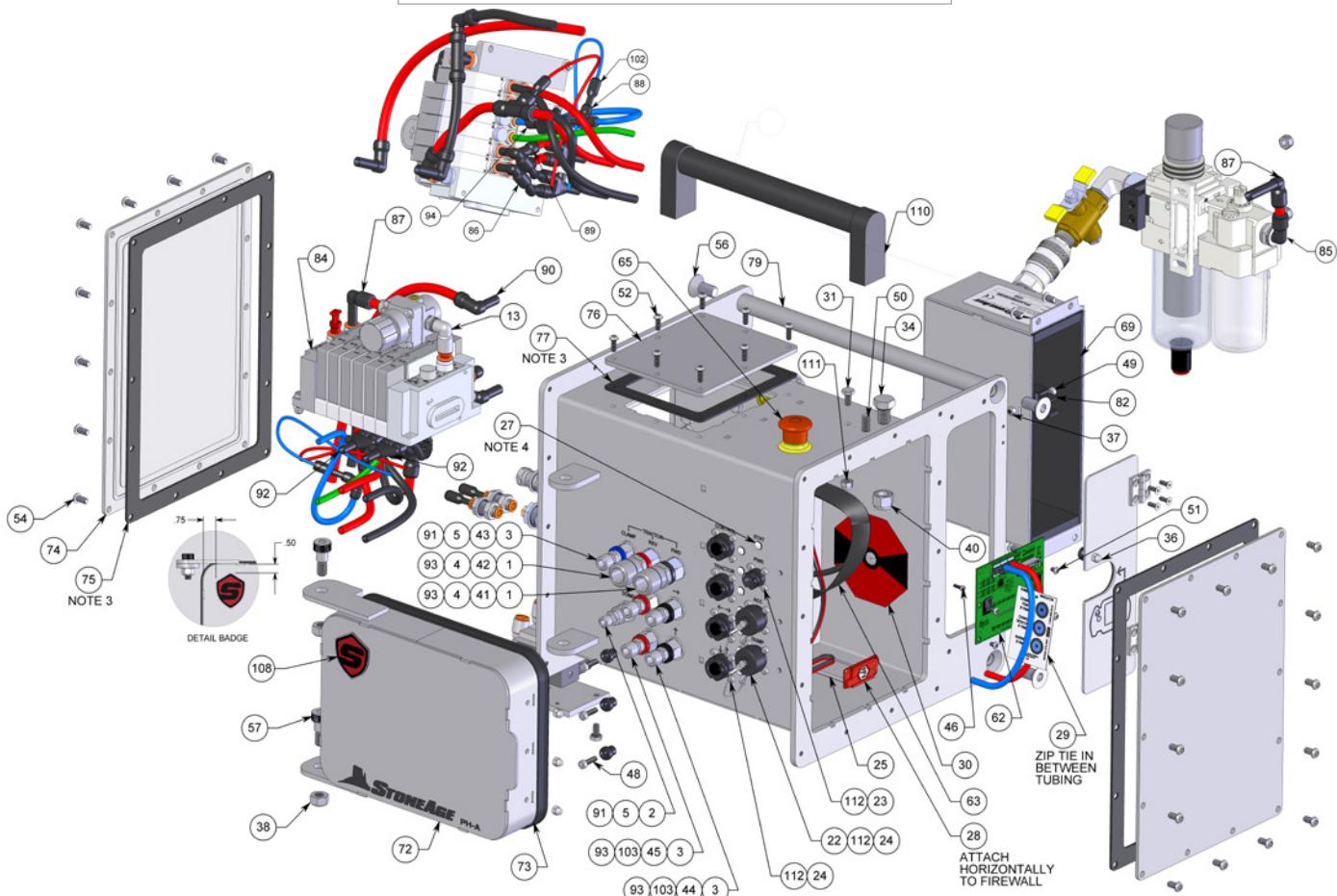


#	PART NUMBER	QTY
6	AST 229 FTG, BULKHEAD ADAPTER P6F PL6	1
7	AST 328 FTG, TEE REDUCING PL8 PL4	1
8	BR 154 MUFFLER P6	1
9	CAM 211-001 CABLE GLAND BULKHEAD	1
10	CAM 271 JAM NUT M16	1
11	CB 114 INLET FITTING W/ PIN	1
12	CB 312-OPP OPPOSITE GEN3 FRL WITH Y400T-D BRACKET	1
14	CB 352 FTG, ELBOW SWIVEL 90 P6M PL6	3
15	CB 354 FTG, ADAPTER P4M PL6	1
16	CB 395 FRL BRACKET	1
17	CB 481.1 FTG, STEM PLUG PL6	1
18	CB 778 PRESSURE REGULATOR, 70 PSI	1
19	CB 790 FTG, BULKHEAD UNION PL4 PL4	2
20	CB 792 VALVE, AUTODRAIN, P8	1
21	DB 026 BREATHER, SINTERED BRONZE, P4	1
25	EE DZ-0.25-0001 DESICCANT BAG .250Z 1.5 X 2.12	4
26	EE HD-MXMG-RM34S-00 HEADER, RECEPTACLE	1
31	GB 325-02-SEAL BOLT, HEX SEALING .25-20 X .50 SS	3
32	GB 331-03-SEAL BOLT, HEX SEALING .31-18 X .75 SS	2
33	GB 331-025-SEAL BOLT, HEX SEALING .31-18 X .62 SS	2

35	GN 3M4-0.7-L NUT, NYLOK M4X0.7 SS	4	80	PHA 165 PLATE, SERIAL CE	1
36	GN 3M5-0.8-A NUT, ACORN M5X0.8 SS	4	81	PHA 170 ASSY, OVERPRESSURE PROTECTION, 15 PSI	1
37	GN 3M5-0.8-L NUT, NYLOK M5X0.8 SS	5	82	PHA 210 DOOR LOCK	4
39	GN 331-L NUT, NYLOK .31-18 SS	2	83	PHA 215 HINGE	2
47	GS 3M4-40-0.7 SHCS M4X0.7 X 40 SS	2	85	PHA 305 FTG, ELBOW SWIVEL 90 P8M PL6	1
48	GS 3M5-18-0.8 SHCS M5X0.8 X 18 SS	5	87	PHA 308 FTG, STEM ELBOW LONG 90 PL6M PL6F	2
49	GS 3M5-25-0.8 SHCS M5X0.8 X 25 SS	4	90	PHA 312 FTG, STEM ELBOW 90 PL6M PL6F	4
53	GSB 3M6-10-1.0 BHCS M6-1.0 X 10 SS	4	91	PHA 314 FTG, DOWTY WASHER 14X22X1.5	4
55	GSF 3M4-12-0.7 FHCS M4X0.7 X 12 SS	8	93	PHA 316 FTG, DOWTY WASHER 16X24X1.5	7
56	GSF 3M12-25-1.7 FHCS M12X1.75 X 25 SS	4	95	PHA 320 FTG, DOWTY WASHER 20X28X1.5	3
58	GW 3M4-L WASHER, LOCK M4	4	96	PHA 322 FTG, DOWTY WASHER 22X30X2	1
59	GW 319-F WASHER, FLAT #10 SS	1	97	PHA 323 FTG, QD PLUG .50IN P8M	1
60	ML 077-P8 BUSHING P8M P8F	1	98	PHA 324 FTG, QD SOCKET .50IN P8M	1
61	PHA 103 ASSY, VALVE DRIVER BOARD	1	99	PHA 325 FTG, BULKHEAD UNION PL6	1
66	PHA 110 WELDMENT, BOX	1	100	PHA 326 FTG, ELBOW 90 P8F P8F	1
67	PHA 111 PLATE, VALVE MOUNT	1	101	PHA 327 FTG, BULKHEAD COUPLING P2F BRASS	2
68	PHA 120 WELDMENT, CONTROLLER BOX	1	102	PHA 328 FTG, STEM ADAPTER PL4M PL2F	4
69	PHA 125 ASSY, CONTROLLER BOX FOAM	1	104	PHA 330 RELIEF VENT, P2 5PSI	2
70	PHA 130 DOOR, CONTROLLER	1	105	PHA 331 FTG, STEM TEE INLINE PL6	1
71	PHA 131 FOAM, CONTROLLER DOOR	1	107	PL 156-125 CAUTION INLET AIR, 125 MAX	1
78	PHA 155 SPACER, HINGE	2	109	SBT 292.1 FTG, ELBOW 90 P8M P8M	1
79	PHA 160 GUARD, ROD	2			

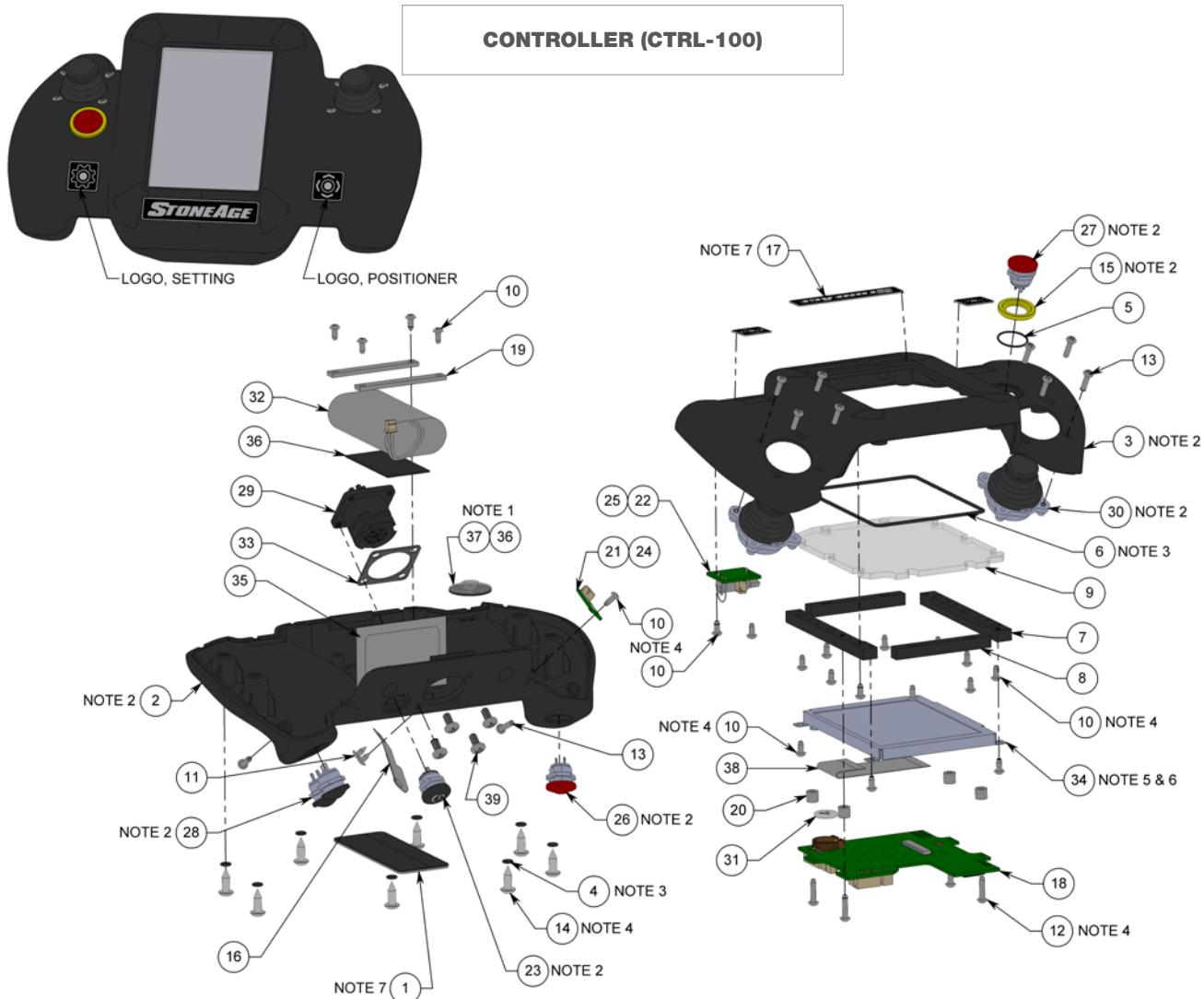
POWER HUB (PH-A0302AOOC20)

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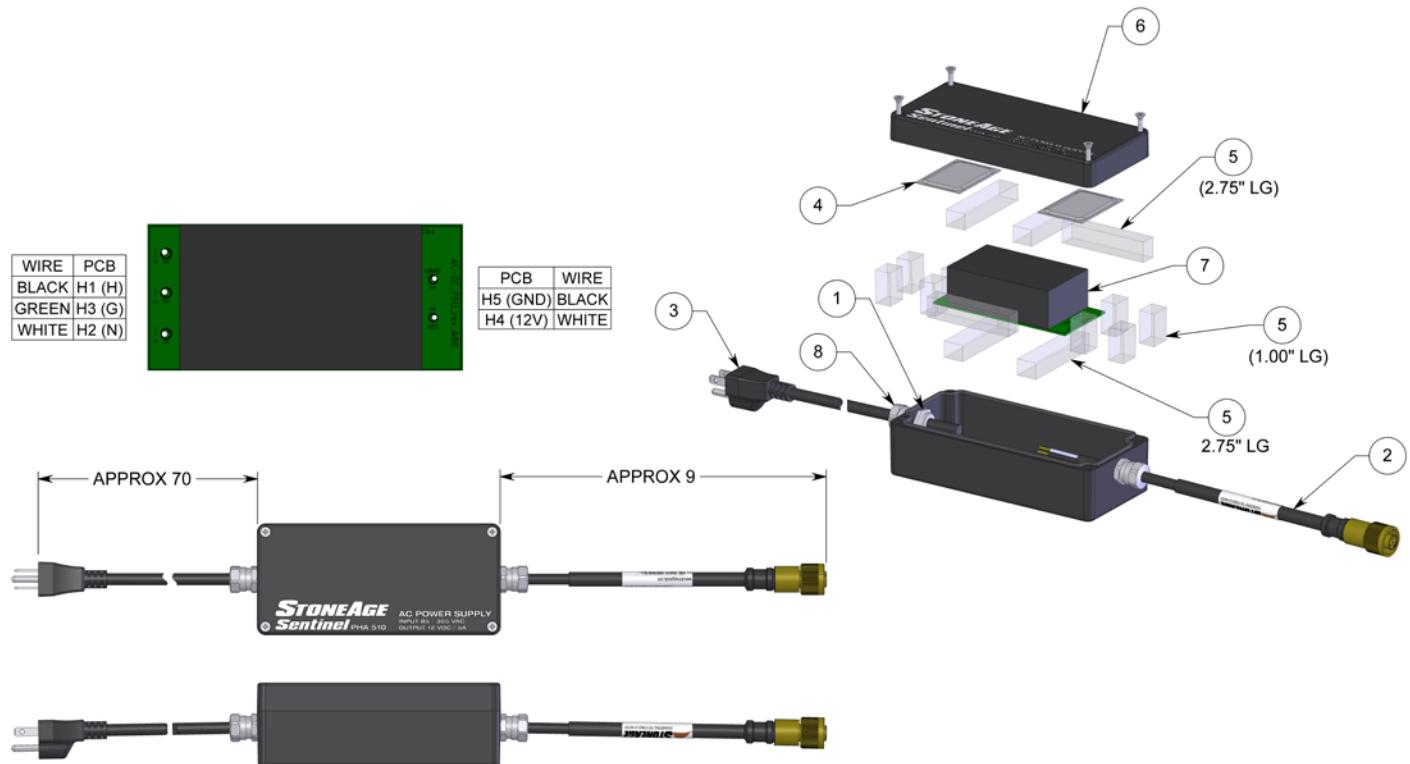
#	PART NUMBER	QTY	42	GP 011-R ID WASHER, RUBBER, MED, RED	1	75	PHA 151 GASKET, LID	2
1	ABXS 270 FTG, ADAPTER P6M PL10 EISELE	2	43	GP 013-B ID WASHER, RUBBER, SMALL, BLUE	1	76	PHA 153 LID, VALVE ACCESS	1
2	ABXS 272FTG, ADAPTER P4M PL4 EISELE	1	44	GP 013-BK ID WASHER, RUBBER, SMALL, BLACK	2	77	PHA 154 GASKET, VALVE ACCESS LID	1
3	ABXS 273 FTG, ADAPTER P4M PL5 EISELE	5	45	GP 013-R ID WASHER, RUBBER, SMALL, RED	2	79	PHA 160 GUARD, ROD	2
4	AST 220 FTG, BULKHEAD ADAPTER P6F PL5	2	46	GS 3M3-10-0.5-SEAL SHCS, SEALING M3X0.5 X10 SS	2	82	PHA 210 DOOR LOCK	4
5	AST 221 FTG, BULKHEAD ADAPTER P4F PL4	2	48	GS 3M5-18-0.8 SHCS M5X0.8 X 18 SS	5	84	PHA 220 SMC VALVE PACK	1
13	CB 351 FTG, ELBOW SWIVEL 90 P4M PL6	1	49	GS 3M5-25-0.8 SHCS M5X0.8 X 25 SS	4	85	PHA 305 FTG, ELBOW SWIVEL 90 P8M PL6	1
22	EE CN-RB-CF-14S CAP, RECEPTACLE W LANYARD	2	50	GS 3M8-20-1.25-SEAL SHCS, SEALING M8X1.25X20 SS	2	86	PHA 306 FTG, STEM ELBOW LONG 90 PL5M PL5F	2
23	EE CN-RB-G-10SL-R-RB GASKET, 10SL REAR MOUNT	1	51	GSB 3M4-6-0.7 BHCS M4X0.7 X 6 SS	4	87	PHA 308 FTG, STEM ELBOW LONG 90 PL6M PL6F	2
24	EE CN-RB-G-14S-R-RB GASKET, 14S REAR MOUNT	6	52	GSB 3M5-14-0.8-SEAL BHCS, SEALING M5X0.8 X 14 SS	8	88	PHA 310 FTG, STEM TEE PL4M 2XPL4	1
25	EE DZ-025-0001 DESICCANT BAG .25OZ 1.5 X 2.12	4	53	GSB 3M6-10-1.0 BHCS M6-1.0 X 10 SS	4	89	PHA 311 FTG, STEM ELBOW 90 PL5M PL5F	2
27	EE LT-LP-0001 LIGHT PIPE W LOCKWASHER AND NUT	8	54	GSB 3M6-12-1.0 BHCS M6X1.0 X 12 SS	28	90	PHA 312 FTG, STEM ELBOW 90 PL6M PL6F	4
28	EE SR-DNT-0001 DROP-N-TELL, 100G RESETTABLE	1	56	GSF 3M12-25-1.75FHCS M12X1.75 X 25 SS	4	91	PHA 314 FTG, DOWTY WASHER 14X22X1.5	4
29	EE SR-HMD-0001 HUMIDITY INDICATOR	1	57	GSSH M12-12-SS SHOULDER SCREW M12X12 SS	2	92	PHA 315 FTG, STEM WYE PL5	2
30	EE SR-SHD-0001 SHOCKDOT, 50G	1	62	PHA 105 ASSY, POWERHUB MANIFOLD BOARD	1	93	PHA 316 FTG, DOWTY WASHER 16X24X1.5	7
31	GB 325-02-SEAL BOLT, HEX SEALING .25-20 X .50 SS	3	63	PHA 106 ASSY, MANIFOLD TO VDB CABLE	1	94	PHA 317 VALVE, FLOW CONTROL PL4	1
34	GB 350-03-SEAL BOLT, HEX SEALING .50-13 X .75 SS	1	69	PHA 125 ASSY, CONTROLLER BOX FOAM	1	102	PHA 328 FTG, STEM ADAPTER PL4M PL2F	4
36	GN 3M5-0.8-A NUT, ACORN M5X0.8 SS	4	70	PHA 130 DOOR, CONTROLLER	1	103	PHA 329 FTG, BULKHEAD P4F PL5	4
37	GN 3M5-0.8-L NUT, NYLOK M5X0.8 SS	5	71	PHA 131 FOAM, CONTROLLER DOOR	1	108	PL 300-2 PIDPLATES S-BADGE, 2 IN., COLOR	1
38	GN 3M10-1.5-L NUT, NYLOK M10X1.5 SS	2	72	PHA 140 WELDMENT, DOOR	1	110	SRT 423 PULL HANDLE	1
40	GN 350-L NUT, NYLOK .50-13 SS	1	73	PHA 145 GASKET, DOOR	1	111	TB 044.1 NUT, NYLOK .25-20 SS	1
41	GP 011-BK ID WASHER, RUBBER, MED, BLACK	1	74	PHA 150 LID, BOX ENDS	2	112	TR130 236 SHCS M4X0.7 X 8 LG	28

PART DIAGRAM



#	PART NUMBER	QTY
1	CTRL 102 ASSEMBLY, CE SERIAL PLAQUE W TAPE	1
2	CTRL 110-L HOUSING, CONTROLLER LOWER (IX BUTTONS)	1
3	CTRL 110-U HOUSING, CONTROLLER UPPER (IX BUTTONS)	1
4	CTRL 112 O-RING 1.2MM X 3.5MM 70DUR NBR	8
5	CTRL 114 O-RING 1MM X15MM 50DUR NBR	1
6	CTRL 115 O-RING, LENS	1
7	CTRL 117 BRACKET, SCREEN LONG SIDE, NO DRAFT	2
8	CTRL 118 BRACKET, SCREEN SHORT SIDE, NO DRAFT	2
9	CTRL 120 INSERT, ACRYLIC SCREEN	1
10	CTRL 121 SCREW, COARSE THD, N04 X .25LG SS BLUNT	21
11	CTRL 122 SCREW, COARSE THD, N04 X .25LG SS TRUSS HEAD, SHARP	2
12	CTRL 123 SCREW, COARSE THD, N04 X .50LG SS BLUNT	4
13	CTRL 124 SCREW, COARSE THD, N04 X .50LG SS SEALING, BLUNT	10
14	CTRL 125 SCREW, COARSE THD, N08 X .50LG SS TAMPER RESISTANT	8
15	CTRL 127 RING, KILL SWITCH, IX	1
16	CTRL 130 ASSY, DEADMAN LEVER W MAGNET	1
17	CTRL 135 LOGO SET, CONTROLLER	1
18	CTRL 140 ASSY, CONTROLLER BASE BOARD	1
19	CTRL 143 STRAP, BATTERY	2
20	CTRL 144 SPACER, NYLON	4
21	CTRL 150 ASSY, DEADMAN BOARD	1
22	CTRL 160 ASSY, HAPTIC FEEDBACK BOARD	1
23	CTRL 171 ASSY, POWER BUTTON W CABLE	1
24	CTRL 172 ASSY, DEADMAN CABLE	1
25	CTRL 173 ASSY, HAPTIC FEEDBACK CABLE	1
26	CTRL 174 ASSY, DUMP BUTTON W CABLE	1
27	CTRL 175 ASSY, KILL SWITCH W CABLE	1
28	CTRL 176 ASSY, FWD REV BUTTON W CABLE	2
29	CTRL 178 ASSY, POWER CONNECTOR W CABLE	1
30	CTRL 179 ASSY, THUMBSTICK W CABLE	2
31	EE BT-CC-3.0-0001 BATTERY, LITHIUM 3V	1
32	EE BT-SP-7.2-0001 BATTERY PACK, 2X18650 7.2V 2.6AH	1
33	EE CN-RB-G-14S-R-AX GASKET, 14S REAR MOUNT, ALU-FLEX	1
34	EE DS-0001 SCREEN, DISPLAY 4.0IN LCD	1
35	EE DZ-0.25-0001 DESICCANT BAG .25OZ 1.5 X 2.12	1
36	EE GF-TP-0001 TAPE, DOUBLE SIDED EXTREME MOUNTING 1IN	1
37	EE SR-SHD-0001 SHOCKDOT, 50G	1
38	EE WR-003I-22-1MM-0001 RIBBON CABLE, SCREEN TO BASEBOARD	1
39	GPPH 3M4-8-0.7-SEAL PAN HD PHILLIPS MACH SCREW, SEALING M4X0.7 X 8 SS	4

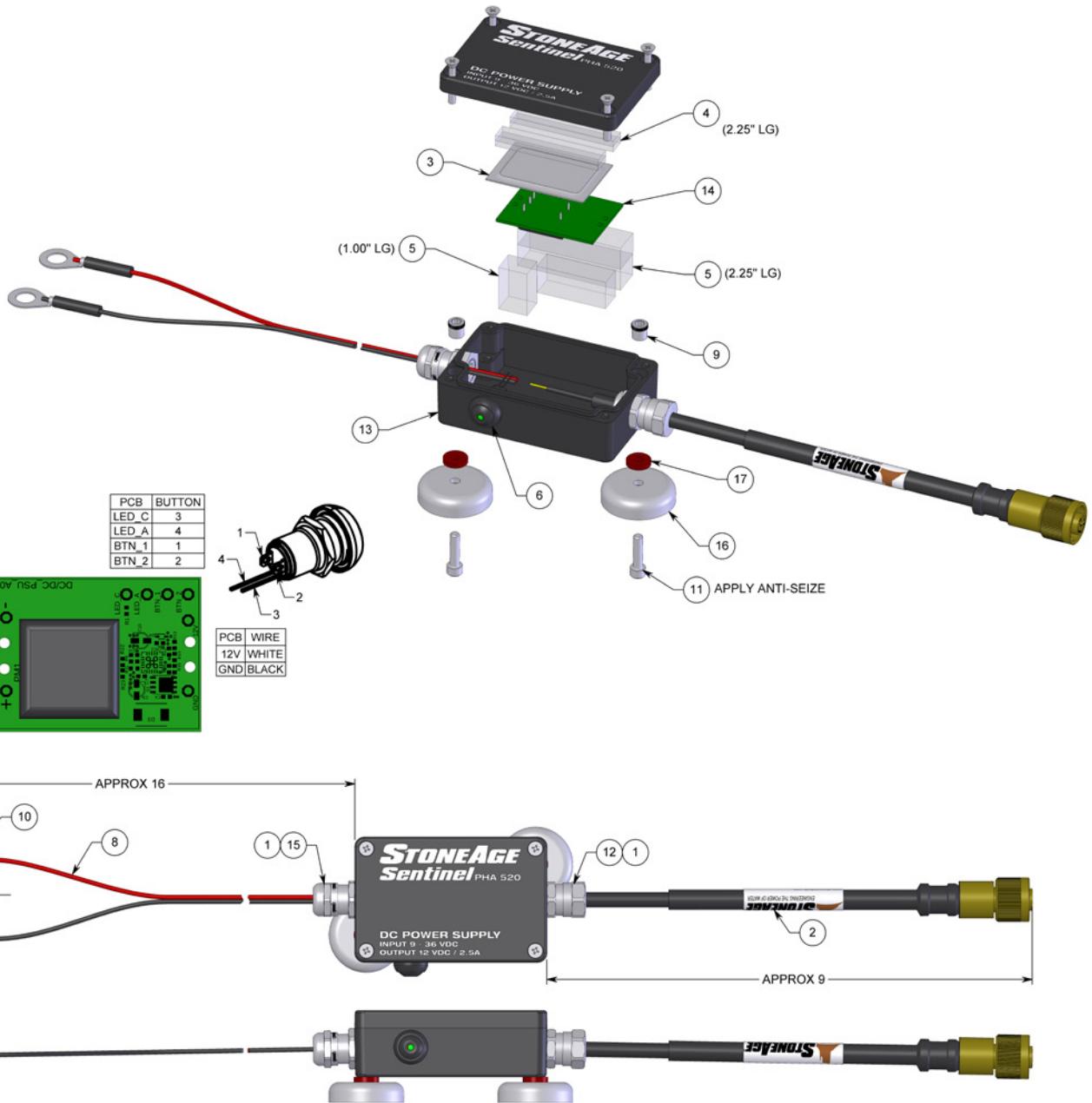
POWER SUPPLY (PHA 510-XX)
12V AC-DC US OR EU POWER SUPPLY



#	PART NUMBER	-US	-EU
1	CAM 271 JAM NUT M16	2	2
2	CBL E001F-1RB3PW CABLE ASSY, POWER BRICK OUTPUT	1	1
3	CBL E006F-1N5153PW POWER CORD, WALL PLUG US (NEMA 5-15)	1	-
	CBL E008F-1CEE773PW POWER CORD, WALL PLUG EU (CEE 7/7)	-	1
4	EE DZ-0.25-0001 DESICCANT BAG .25OZ 1.5 X 2.12	2	2
5	EE GF-FM-0002 FOAM SUPPORT, PE, ADHESIVE BACKED .625W X .500W	14	14
6	PHA 511 BOX ENCLOSURE, AC	1	1
7	PHA 512 ASSY, PCBA POWER SUPPLY AC	1	1
8	PHA 515 FTG, BULKHEAD CABLE GLAND 6-8MM	2	2

PART DIAGRAM

POWER SUPPLY (PHA 520)
12V DC-DC US OR EU POWER SUPPLY

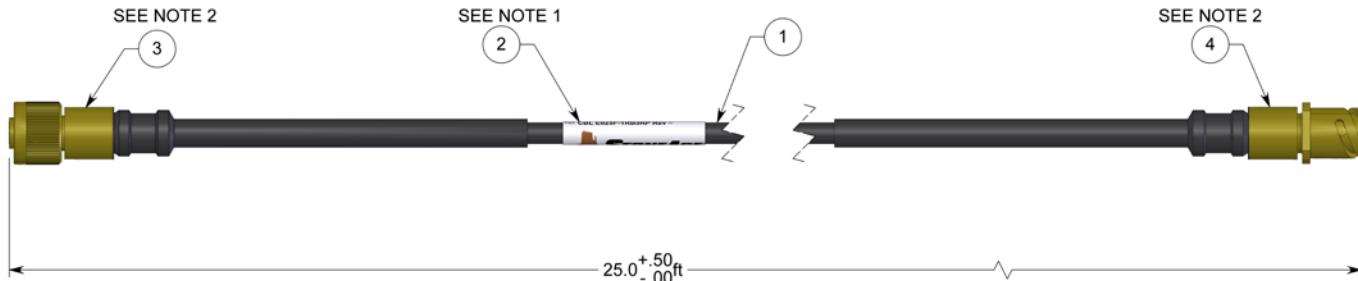


#	PART NUMBER	QTY
1	CAM 271 JAM NUT M16	2
2	CBL E001F-1RB3PW CABLE ASSY, POWER BRICK OUTPUT	1
3	EE DZ-0.25-0001 DESICCANT BAG .25OZ 1.5 X 2.12	1
4	EE GF-FM-0001 FOAM SUPPORT, PE, ADHESIVE BACKED .375W X .125W	4
5	EE GF-FM-0002 FOAM SUPPORT, PE, ADHESIVE BACKED .625W X .500W	4
6	EE SW-PB-0005 POWER BUTTON, BLUETOOTH	1
7	EE TL-RG-0001 CONN RING, CIRC M10 (14-18AWG)	2
8	EE WR-005M-02-18G EE CABLE 2 COND 18AWG FOR DC	1

9	GN 319-IN NUT, INSERT 10-24 SS	2
10	GPHS 0190-OLE-A-BK HEAT SHRINK, MOISTURE SEAL .190 ID (BLACK)	2
11	GS 319-03 SHCS 10-24 X .75 SS	2
12	PHA 515 FTG, BULKHEAD CABLE GLAND 6-8MM	1
13	PHA 521 BOX, ENCLOSURE DC	1
14	PHA 522 ASSY, DC PCB	1
15	PHA 523 FTG, BULKHEAD CABLE GLAND 2X3MM	1
16	PHA 525 MAGNET CUP, 1.5 OD	2
17	PHA 526 SEALING WASHER, SILICONE RUBBER	2

POWER CABLE (CBL E025F-1RB3RRP)
25 FT POWER CABLE

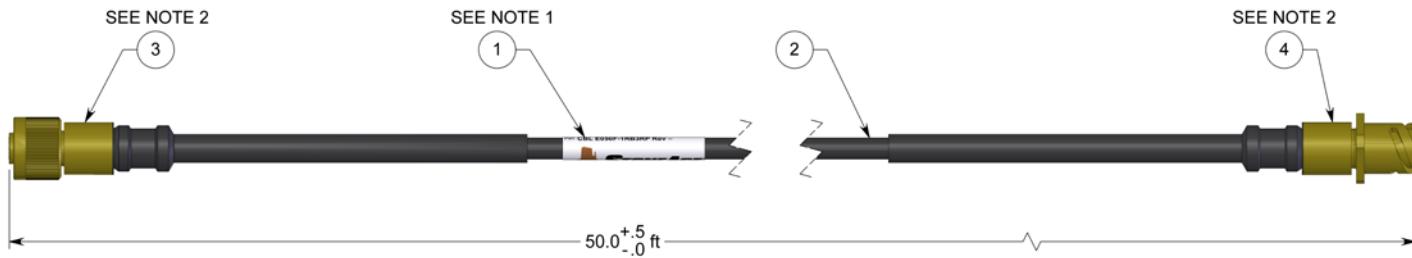
PIN	WIRE
A	BLACK
B	NONE
C	WHITE



#	PART NUMBER	QTY
1	CBL E025F.1 WIRE	1
2	CBL E025F-1RB3RP.1 LABEL	1
3	EE CN-RB-PF3SS-10SL PLUG, POT AND HEATSHRINK ENDBELL	1
4	EE CN-RB-RM3PS-10SL RECEPTACLE, POT AND HEATSHRINK ENDBELL	1

POWER CABLE (CBL E050F-1RB3RRP)
50 FT POWER CABLE

PIN	WIRE
A	BLACK
B	NONE
C	WHITE



#	PART NUMBER	QTY
1	CBL E050F-1RB3RP.1 LABEL	1
2	CBL E050F.1 WIRE	1
3	EE CN-RB-PF3SS-10SL PLUG, POT AND HEATSHRINK ENDBELL	1
4	EE CN-RB-RM3PS-10SL RECEPTACLE, POT AND HEATSHRINK ENDBELL	1

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.

WARRANTY INFORMATION

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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