



COMPASS AND COMPASS ACCESSORY PACKAGE

USER MANUALS AND PRODUCT INFORMATION

STONEAGE CONTACT INFORMATION

AUTOPACK COMPASS PACKAGE CONTENTS

COMPASS CONFINED SPACE ACCESSORY USER MANUAL

COMPASS POSITIONER USER MANUAL

PRODRIVE ABX-PRO USER MANUAL

Our global support teams are here to help.



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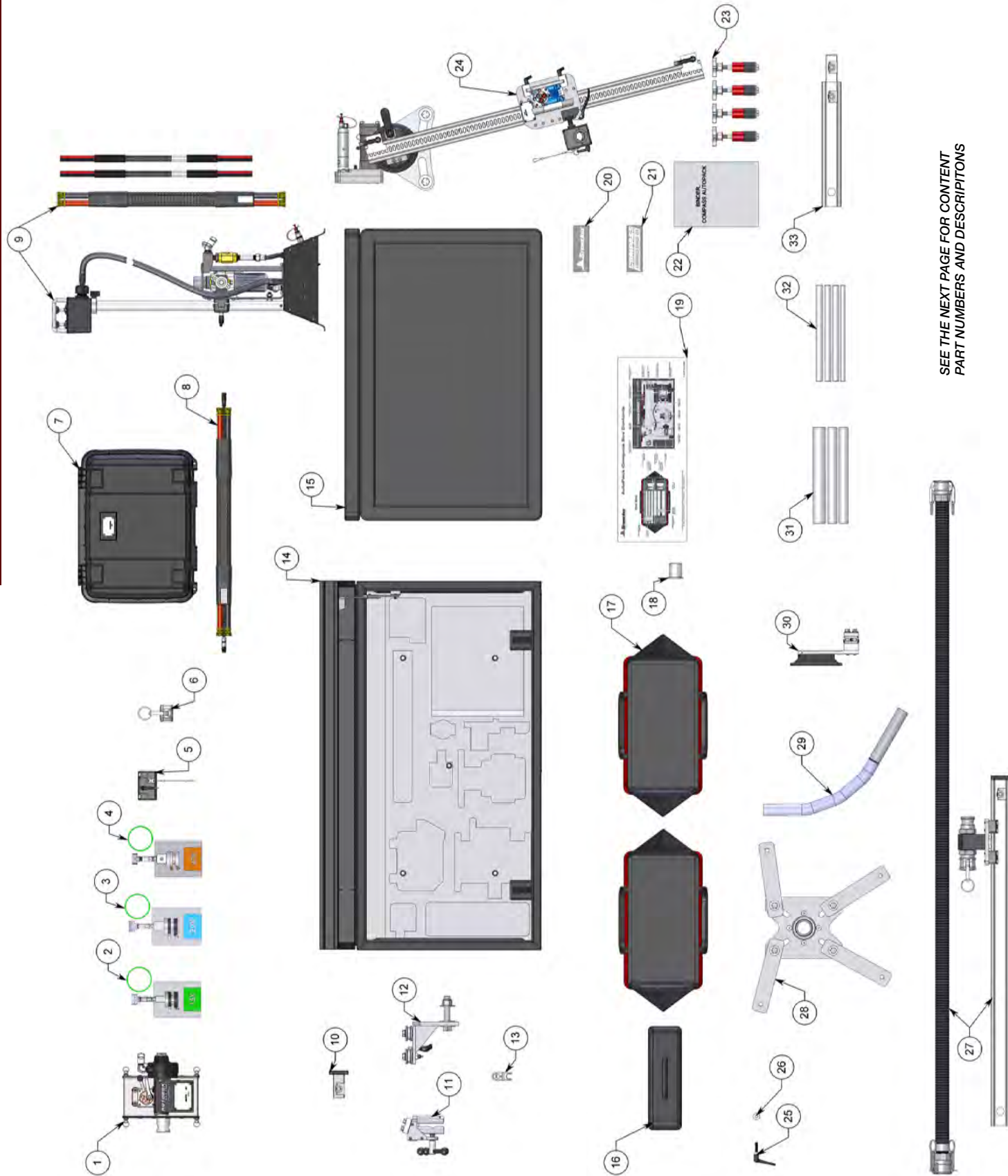
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UP-COMPASS-XX BOX CONTENTS



SEE THE NEXT PAGE FOR CONTENT
PART NUMBERS AND DESCRIPTIONS

FOLLOW THE COLOR CHART, TO FIND MORE INFORMATION ON EACH PART OR ASSEMBLY

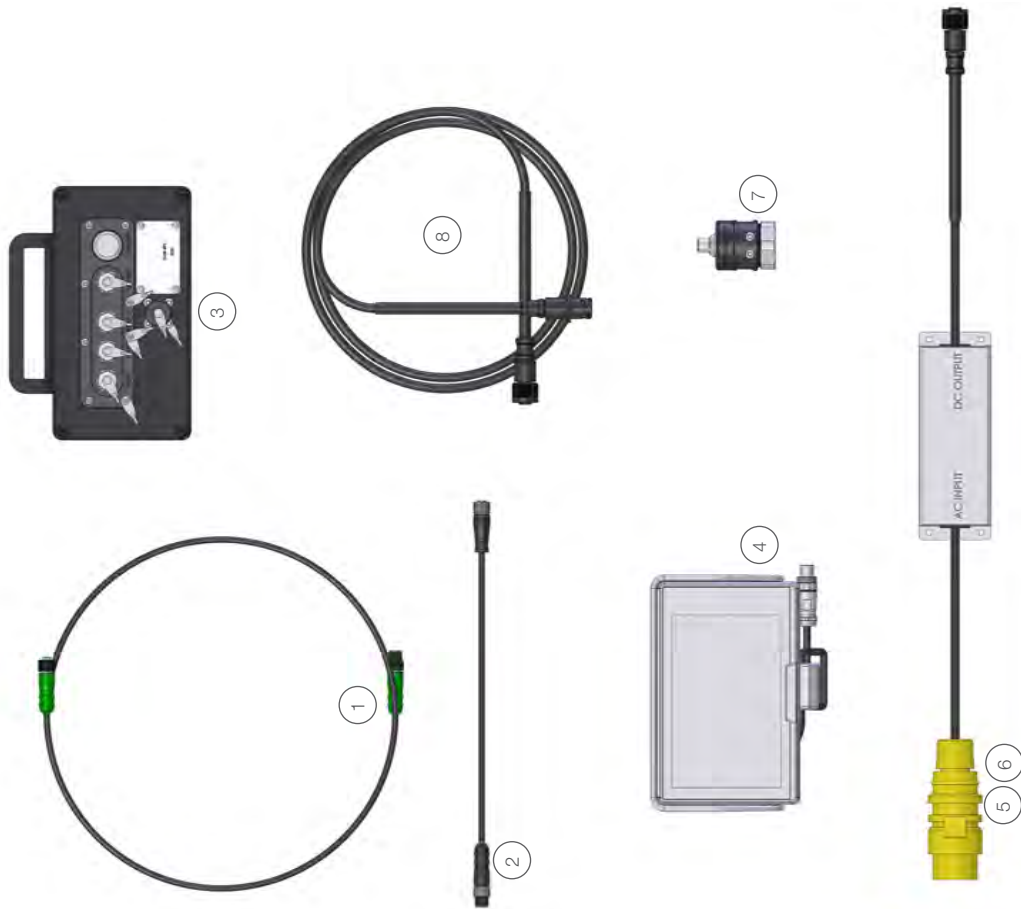
COMPASS CSK USER MANUAL

COMPASS PROP-300 USER MANUAL

PRODRIVE ABX-PRO-100 USER MANUAL

#	PART NUMBER AND DESCRIPTION	UP-COMPASS QTY.	UP-PROP- COMPASS QTY.	UP-PRO- COMPASS QTY.	UP-CSK- COMPASS QTY.	REQUIREMENT
1	ABX-PRO AUTOBOX PRODRIVE TRACTOR ASSEMBLY	1	-	-	-	YES
2	ACDA 61001007-K DUMP VALVE 15K, BASE PLATE, AIR FITTINGS AND HOSE	1	1	1	-	OPTION
3	ACDA 61020019-K DUMP VALVE 20K, BASE PLATE, AIR FITTINGS AND HOSE	1	1	1	-	OPTION
4	ACDA 61040006-K DUMP VALVE 40K, BASE PLATE, AIR FITTINGS AND HOSE	1	1	1	-	OPTION
5	BOP 030 COLLET BLOCK ASSEMBLY	1	-	-	-	YES
6	BOP 048 HOSE STOP ADAPTER, PRODRIVE	1	-	1	-	YES
7	CAM-COMPASS-?? ASSEMBLY, CAMERA W CASE	1	1	1	1	OPTION
8	CB 755-15-C HOSE BUNDLE WITH CABLE FOR DBP	1	-	1	-	OPTION
9	CB-PROP-P CONTROL BOX, PEDESTAL	1	1	1	1	YES
10	DBP 305 RAIL PLUG ASSY	1	1	1	-	YES
11	DBP 320 ICM TROLLEY CLAMP ASSY	1	1	1	1	OPTION
12	DBP 330 DELTA T TROLLEY CLAMP ASSY	1	1	1	1	OPTION
13	FF 121-??? HOSE STOP, COLLET STYLE, PLACE HOLDER	1	-	-	-	YES
14	GPT 070-PROP-001 AUTOPACK PRO POSITIONER CHEST	1	1	1	-	OPTION
15	GPT 092 POLY BOX, FOR CONFINED SPACE KIT	1	1	1	1	YES
16	GPT 106 PRODRIVE COLLET, ROLLER, HOSE STOP KIT	1	1	1	-	OPTION
17	GPT 310 TOOL BAG, 18IN	2	1	2	1	YES
18	LWP 560-56 HARDLINE COLLET, 9/16 LANCE	1	1	1	-	OPTION
19	PL 198-001 PLACARD, CONTENTS, AUTOPACK-COMPASS	1	1	1	-	OPTION
20	PL 212 DECAL, CONFINED SPACE KIT	1	1	1	1	YES
21	PL 213 DECAL, LOGO, CONFINED SPACE KIT	1	1	1	1	YES
22	PL 720 BINDER, COMPASS AUTOPACK	1	1	1	1	YES
23	PROP 187-??-K EXPANSION PLUG KIT	1	1	1	-	YES
24	PROP-300 PRO POSITIONER ASSY	1	-	1	-	YES
25	PROP 337 HANDLE, ADJUSTABLE M8	1	-	1	-	YES
26	PROP 339 WASHER, FLAT OVERSIZED M8	1	-	1	1	YES
27	PROP 420 RAIL FLANGE MOUNT ASSY	1	1	1	1	OPTION
28	PROP 430-001 SPIDER PLATE ASSY	1	1	1	1	YES
29	PROP 460-BN24 GUIDE WELDMENT BN24	1	1	1	1	YES
30	PROP 480 SHOTGUN MOUNT ASSY	1	1	1	1	OPTION
31	PROP 490-L GUIDE TUBE KIT, 12 INCH, BN24-BN33	1	1	1	1	OPTION
32	PROP 490-S GUIDE TUBE KIT, 12 INCH, BN9.5-BN18	1	1	1	-	YES
33	PROP 580-1.33-001 2.5" BOX RAIL EXTENSION KIT, SLOTTED, 1.33 FT	1	1	1	-	YES

CAM-COMPASS-XX CASE CONTENTS



#	CAM 400-XX PART NUMBER AND DESCRIPTION	US QTY	EU QTY
1	CAM 245 CAMERA CABLE	1	1
2	CAM 246 CAMERA CABLE 4 PIN 1 METER	1	1
3	CAM 401 ASSY, JUNCTION BOX	1	1
4	CAM 404 MONITOR ASSEMBLY	1	1
5	CAM 410-EU ASSY, AC POWER SUPPLY (EU)	-	1
6	CAM 410-US ASSY, AC POWER SUPPLY (US)	1	-
7	CAM 420 CAMERA HOUSING ASSEMBLY	1	1
8	CBL E050F-1RB3RP POWER CABLE 50ft	1	1



#	CAM COMPASS-XX PART NUMBER AND DESCRIPTION	US QTY	EU QTY
A	CAM 400-US ASSY, CAMERA (BASE) US (See diagram right for parts)	1	-
A	CAM 400-EU ASSY, CAMERA (BASE) EU (See diagram right for parts)	-	1
B	CAM 430 ASSEMBLY, CAMERA CASE	1	1
C	CAM 431 SERIAL NUMBER PLAQUE, SMALL	1	1
D	CB 468 MONITOR MOUNT ASSY	1	1
E	GR 125-AL- .313-.375-S RIVET, BLIND, SEALING, DOMED, ALUM, Ø.125, .313-.375 L	4	4
F	GRW 125-SS WASHER, RIVET .125 SS	4	4
G	PROP 440-24 CAMERA MOUNT ASSY FOR DBP	1	1

COMPASS[™] CONFINED SPACE KIT USER MANUAL

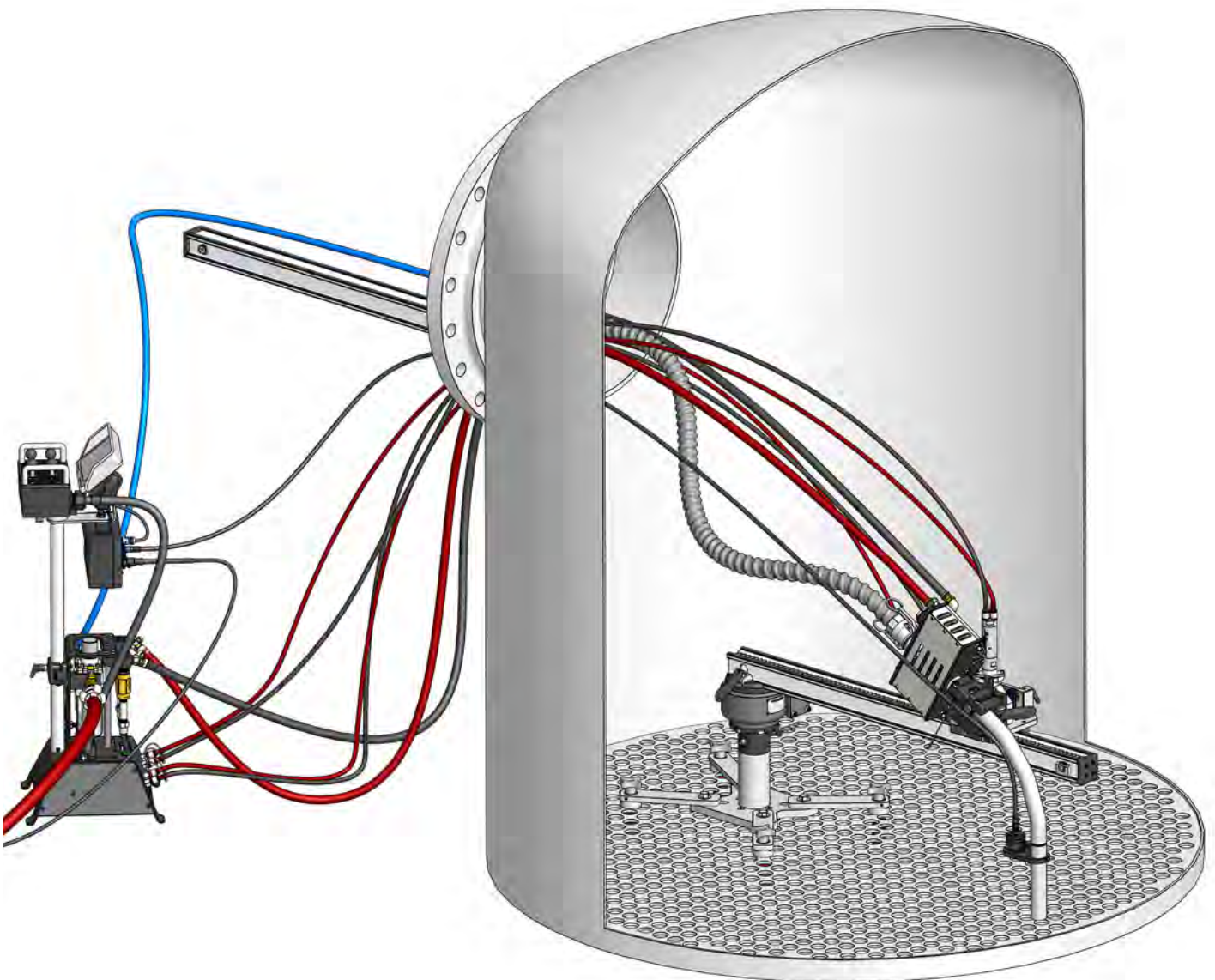


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ASSEMBLE THESE BEFORE
"POSITIONER SET-UP INSIDE
DOMED BUNDLE"

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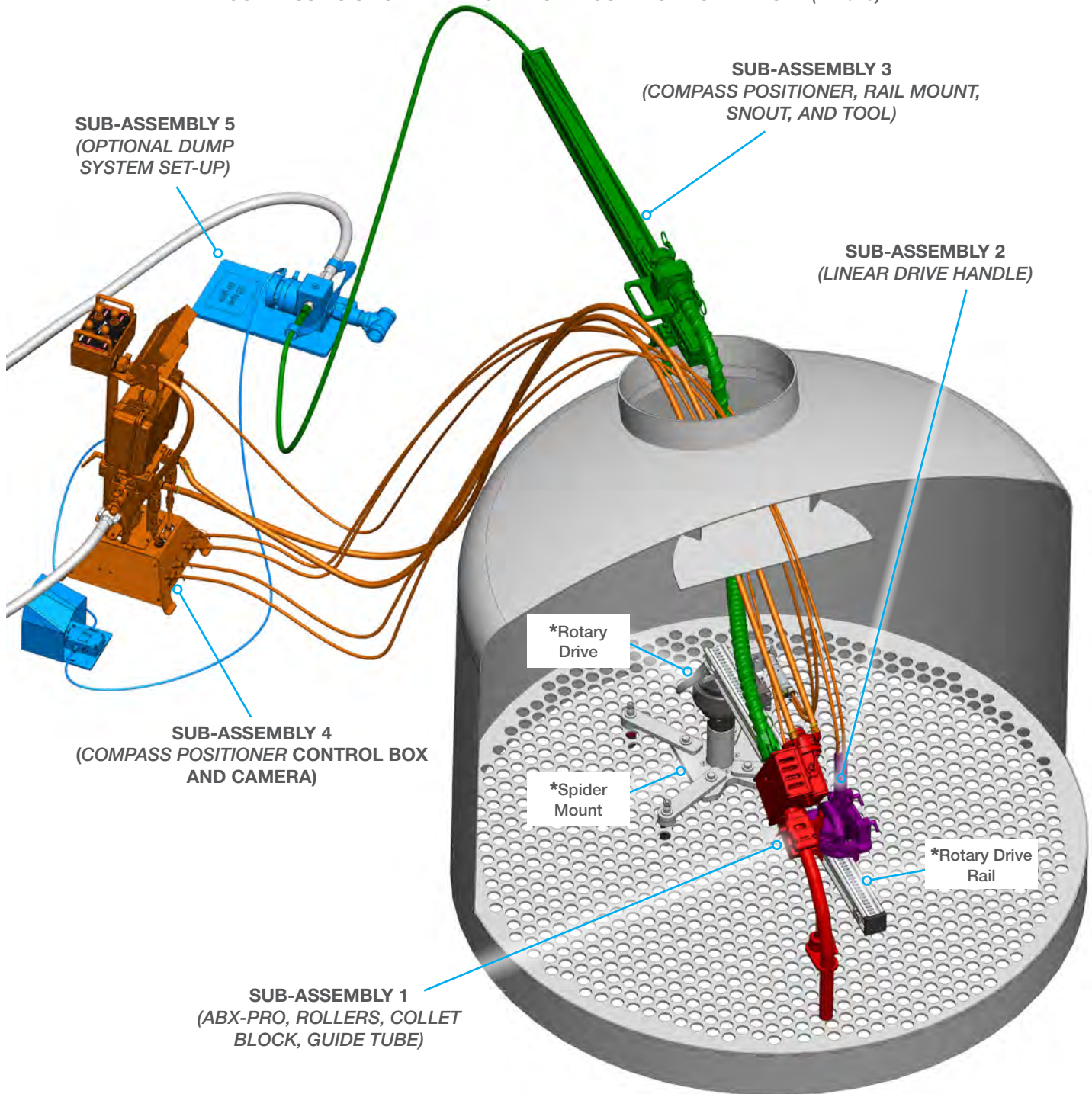
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SUB-ASSEMBLY COLOR CODE DIAGRAM

REVIEW THIS BEFORE STARTING ASSEMBLY:

THE FIVE COLOR CODED SUB-ASSEMBLIES NEED TO BE ASSEMBLED BEFORE CONNECTING EVERYTHING TO THE CONFINED SPACE ENVIRONMENT. THE COLORS ARE ASSOCIATED TO THEIR RESPECTIVE CHAPTERS IN THIS MANUAL. THE HOSE CONNECTIONS WILL BE MADE IN A LATER SECTIONS OF THIS MANUAL.

THE COMPASS POSITIONER AND CONTROL BOX PARTS AND ASSEMBLIES CAN BE FOUND IN THE COMPASS POSITIONER AND CB-PROP-P CONTROL BOX MANUAL (PL 675)



***INDIVIDUAL COMPONENTS
TO BE INSTALLED LATER IN
THE MAIN INSTALLATION**

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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

COMPASS CONFINED SPACE KIT (COMPASS-CSK)		Imperial	Metric
Weight	Spider Plate Mount	6 lbs	2.7 kg
Dimensions	Standard Slotted Rail	2.5 x 2.5 x 45 in.	64 x 64 x 1219 mm
	Slotted Rail with extension	2.5 x 2.5 x 61 in.	64 x 64 x 1549 mm
	Spider Plate Mount	11 x 7 x 4 in.	279 x 178 x 102 mm
	Usable Exchanger Diameter Range Options	60 , 69 , 84 in. <i>or</i> 96 in. with rail extension	1524 , 1753, 2134 mm <i>or</i> 2438 mm with rail extension
Power	Camera System	Input power requirements 100-240V AC 1.8A	
MONITOR AS PURCHASED			
Dimensions		7.6(w) x 4.9(h) x 1.9(d) inches	194(w) x 124(h) x 48(d)mm
Operating Temperature		-40°F ~ +158°F	-40°C ~ +70°C
TV System		NTSC/PAL	
Picture		7" TFT LCD colour monitor with on-screen display function	
Field of View		Top: 50°, Bottom: 60°, Left" 65°, Right: 65°	
Resolution		(800x3(RGB)x480)	
Power		12~24Vdc input	
Inputs		2 x camera	
<ul style="list-style-type: none">COMPASS POSITIONER & CB-PROP-PABX-PRO TRACTOR		For detailed up to date information on these components. https://www.stoneagetools.com/assets/pdf/manuals	

DESCRIPTION OF EQUIPMENT AND INTENDED USE

The Domed Bundle Accessory for the COMPASS Positioner can be vertically mounted to a variety of heat exchanger tube bundles and has pneumatic powered linear and rotary drives. It is intended to be used with AUTOBOX® (ABX-PRO) TRACTOR, Control Box (CB-PROP-P), and COMPASS Positioner (PROP-300).

The COMPASS Positioner has been designed to provide a lightweight, low cost, entry level, option for contractors just starting out with hands free waterblasting equipment.

KEY FEATURES:

- Modular system designed for portability and easy assembly
- Quick install with minimal tools
- Utilizes 2.5 in. (64 mm) aluminum slotted box rail
- Adjustable handles and Push-to-Connect air connections allow for quick adjustments.

EC DECLARATION OF CONFORMITY

Manufacturer:

StoneAge Incorporated
466 South Skyline Drive
Durango, CO 81303
USA

Authorized Representative:

StoneAge Netherlands BV
Reedijk 7Q
3274 KE Heinenoord
Netherlands
Sander de Korte, Customer Service Manager StoneAge NL

Declare that:

**Compass Confined Space Kit (CSK-COMPASS)
for high pressure water cleaning of system parts.**

Are 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 Compass Confined Space Kit (CSK-COMPASS) is maintained at:

StoneAge Incorporated, 466 South Skyline 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
Liz Mancuso, Director of Engineering

04/30/2022
Date



UK DECLARATION OF CONFORMITY

Manufacturer:

StoneAge Incorporated
466 South Skylane Drive
Durango, CO 81303
USA

Authorized Representative:

StoneAge UK
Unit 3
Crucible Business Park
Woodbury Lane
Norton
Worcester
Worcestershire, WR5 2DQ
United Kingdom
Steve Ellis, Managing Director StoneAge UK

Declare that:

**Compass Confined Space Kit (CSK-COMPASS)
for high pressure water cleaning of system parts.**

Are compliant with the following Statutory Requirements and Designated Standards:

S.I. 2008 No. 1597 (E) Safety of machinery – General principles for design – Risk assessment and risk reduction

The Technical File for Compass Confined Space Kit (CSK-COMPASS) is maintained at:

StoneAge Incorporated, 466 South Skylane Drive, Durango, CO 81303, USA and was compiled by the Engineering Manager.
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StoneAge Incorporated, Durango, CO, USA
Liz Mancuso, Director of Engineering

04/30/2022
Date

**UK
CA**



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
Sander de Korte, Customer Service Manager StoneAge NL

Declare that: Camera for Compass System (CAM-COMPASS-XX)
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)

EU- EMC Directive (2014/30/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

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.

The Technical File for Camera for Compass System (CAM-COMPASS-XX) 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.

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Authorized Representative:

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Worcestershire, WR5 2DQ
United Kingdom
Steve Ellis, Managing Director StoneAge UK

Declare that:

**Camera for Compass System (CAM-COMPASS-XX)
for high pressure water cleaning of system parts.**

Is compliant with the following Directives and Standards:

S.I. 2008:1597 - Supply of Machinery (Safety) Regulations 2008

S.I. 2012:3032 - Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

S.I. 2016:1091 - Electromagnetic Compatibility Regulations 2016

S.I. 2008:1597 Safety of machinery – General principles for design – Risk assessment and risk reduction

S.I. 2008:1597 Pneumatic Fluid Power – General rules and safety requirements for systems and components

S.I. 2016:1091 Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement

S.I. 2016:1091 Safety of machinery– Electrical equipment of machines

S.I. 2016:1091 Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for Electromagnetic Compatibility

The Technical File for Camera for Compass System (CAM-COMPASS-XX) is maintained at:

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StoneAge Incorporated, Durango, CO, USA
Liz Mancuso, Director of Engineering

04/30/2022
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 of the Water Jetting Association (WJA) Code of Practice, or equivalent (see www.waterjetting.org.uk).

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

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

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

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

Operators MUST read, understand, and follow the Operational and Training Requirements (Section 6.0) of WJTA-IMCA's, Industry Best Practices For The Use Of High-pressure Waterjetting Equipment, or equivalent.

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

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

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

PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Use of Personal Protective Equipment (PPE) is dependent on the working pressure of water and the cleaning application. Managers, Supervisors, and Operators MUST carry out a job specific risk assessment to define the exact requirements for PPE. See Personal Protective Equipment (Section 5) of WJTA-IMCA's, Industry Best Practices For The Use Of High-pressure Waterjetting Equipment for additional information.

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

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

PPE may include:

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

SAFETY LABEL DEFINITIONS

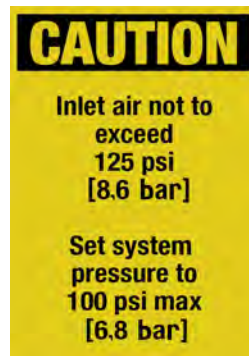
Replacement labels can be ordered through Stoneage®. See part diagrams for label locations and replace when necessary.

The COMPASS has the potential to cause serious injury if fingers, hair, or clothing become caught between the hose rollers of the ABX-PRO Tractor.

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



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

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 COMPASS Positioner COMPASS and accessories 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 top of the ABX-PRO Hose Tractor.
- The Control Box should be located in a safe location where the Operator has good visibility of the operation. The COMPASS Positioner COMPASS 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 COMPASS Positioner COMPASS and accessories, lift with care to prevent bodily injury.

HIGH-PRESSURE HOSE

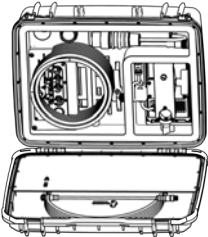

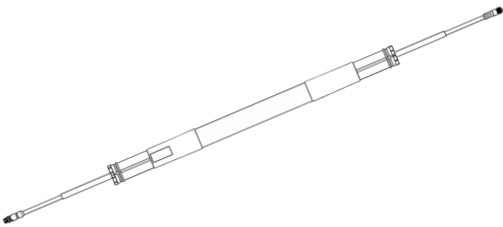
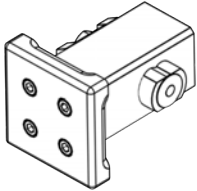
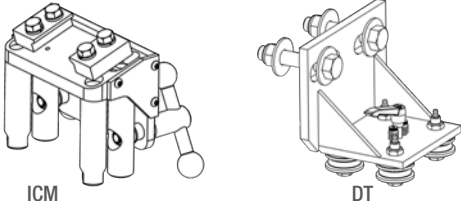
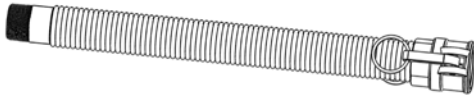
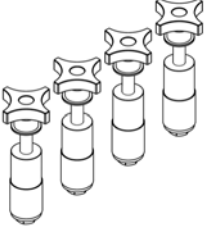
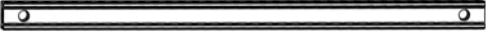

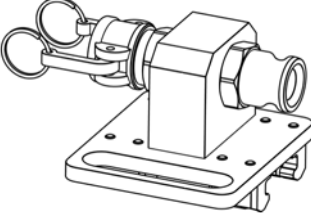
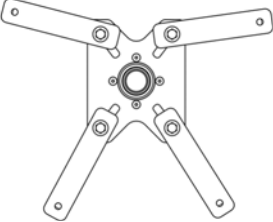
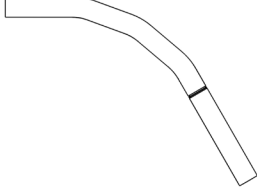
- The ABX-PRO Hose Tractor is designed to be used with Parker Pro-Lance® and/or Spir Star Blast-Pro® hose ends. Standard hose ends may not fit into Hose Tractor and/or Guide Tubes.
NOTE: MAXIMUM hose end diameter must NOT exceed .74 in. (19 mm)
- Only high quality hoses intended for waterblast applications should be used as high-pressure hoses. Pressure rating of high-pressure hoses **MUST NEVER** be exceeded.
- Do not use a shrouded hose or hose with a steel protective cover. This will cause severe damage to the Drive Rollers.
- 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.
- Always flush out hoses before attaching tools to keep particle debris from damaging the tool.

PRE-RUN SAFETY CHECK

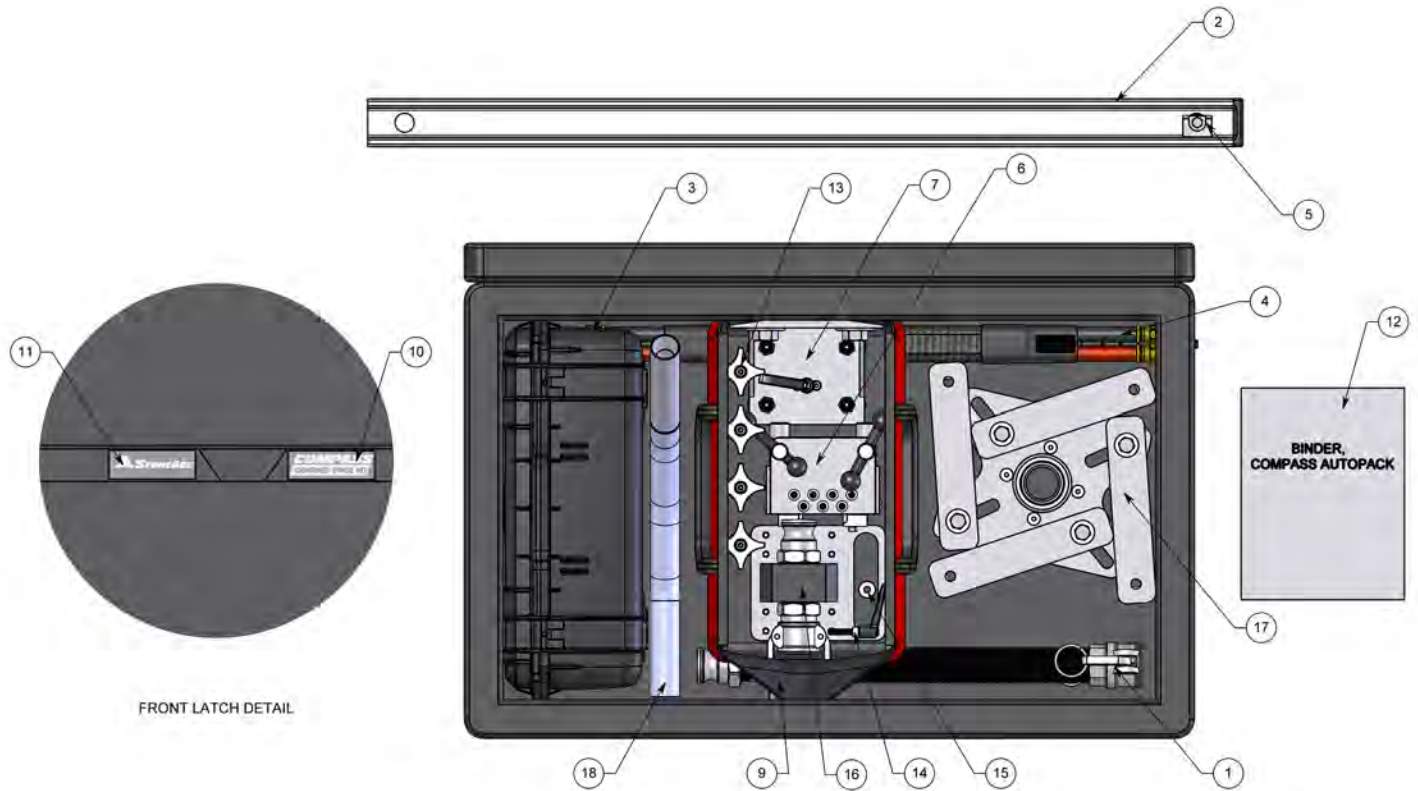
Refer to WJTA-IMCA's, Recommended Practices For The Use Of High-pressure Waterjetting Equipment and/or The Water Jetting Association's, WJA Code of Practice for additional safety information.

- 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. See the "Hose" section in this manual for more detail.
- Check all high-pressure threaded connections for tightness.
- ****Ensure that any anti-withdrawal devices (back-out preventers), whip checks (hose whips), and all other applicable safety devices are installed and set-up properly.****
- Ensure the doors of the ABX-PRO Hose Tractor are closed and securely latched.
- Test the Control Box before operating the system 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 inside the dome and/or hydroblasting zone.

CONFINED SPACE KIT CONTENTS

	PART ID		PART ID
	CAM-COMPASS-XX CAMERA WITH CASE ASSEMBLY	 <i>**Parts in this kit are shown below</i>	PROP 420 RAIL FLANGE MOUNT ASSEMBLY
	CB 755-15-C PRODRIVE SUPPLY HOSE WITH CAMERA CABLE		** DBP 305 RAIL PLUG ASSEMBLY
 ICM DT	DBP 320 ICM TROLLEY CLAMP ASSEMBLY OR DBP 330 DELTA T TROLLEY CLAMP ASSEMBLY		** BOP 090-7-001-K 1.25 CORRUGATED SNOOT/CAMLOCK KIT
	PROP 187-XXX-K EXPANSION PLUG KIT		** BR 002-3.75-001 2.5" BOX RAIL EXTENSION
	PROP 337 ADJUSTABLE M8 HANDLE PROP 339 FLAT OVERSIZED M8 WASHER		** PROP 425 SNOOT CARRIAGE ASSEMBLY
	PROP 430-001 SPIDER PLATE ASSEMBLY	MORE DETAILED PART BREAKDOWNS CAN BE FOUND IN THE "PART DIAGRAM" SECTION OF THIS MANUAL	
	PROP 460-BN24 GUIDE WELDMENT BN24		

CSK-COMPASS COMPASS CONFINED SPACE KIT AUTOPACK



#	PART NUMBER	QTY
1	BOP 090-7-001-K SNOUT, CORRUGATED, 1.25 CAMLOCK KIT	1
2	BR 002-3.75-001 2.5" BOX RAIL EXTENSION	1
3	CAM-COMPASS-?? ASSEMBLY, CAMERA W CASE	1
4	CB 755-15-C HOSE BUNDLE WITH CABLE FOR DBP	1
5	DBP 305 RAIL PLUG ASSY	1
6	DBP 320 ICM TROLLEY CLAMP ASSY	1
7	DBP 330 DELTA T TROLLEY CLAMP ASSY	1
8	GPT 092 POLY BOX, FOR CONFINED SPACE KIT	1
9	GPT 310 TOOL BAG, 18IN	1

10	PL 212 DECAL, CONFINED SPACE KIT	1
11	PL 213 DECAL, LOGO, CONFINED SPACE KIT	1
12	PL 720 BINDER, COMPASS AUTOPACK	1
13	PROP 187-??-K EXPANSION PLUG KIT	1
14	PROP 337 HANDLE, ADJUSTABLE M8	1
15	PROP 339 WASHER, FLAT OVERSIZED M8	1
16	PROP 425 SNOUT CARRIAGE ASSEMBLY	1
17	PROP 430-001 SPIDER PLATE ASSY	1
18	PROP 460-BN24 GUIDE WELDMENT BN24	1

SUB-ASSEMBLY 1 (ABX-PRO, ROLLERS, COLLET BLOCK, AND GUIDE TUBE)

REMOVE ROLLERS IN ABX-PRO TRACTOR

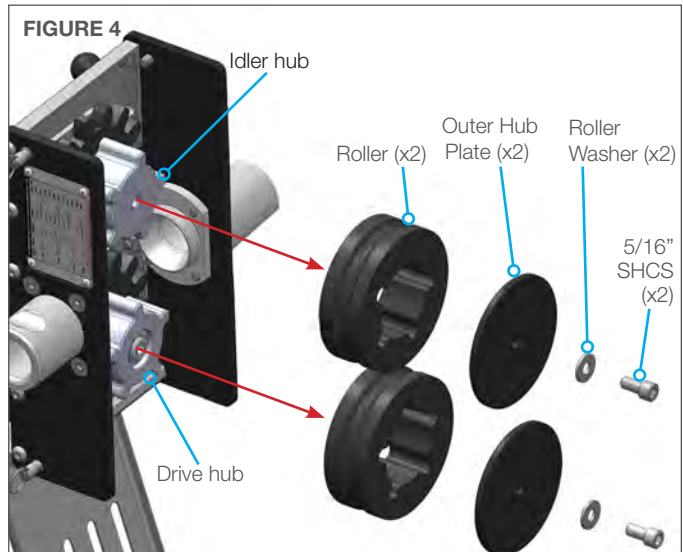
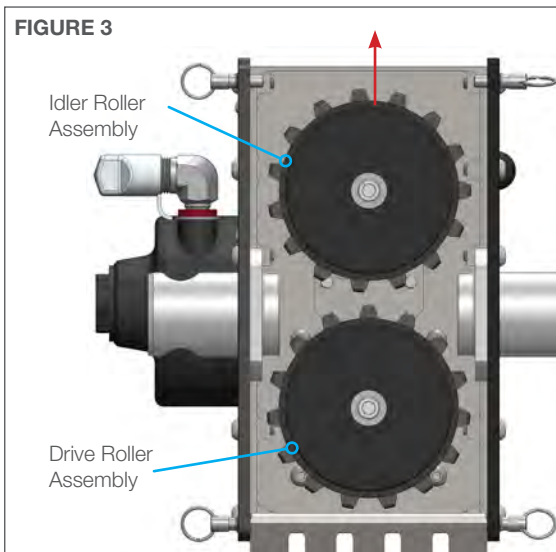
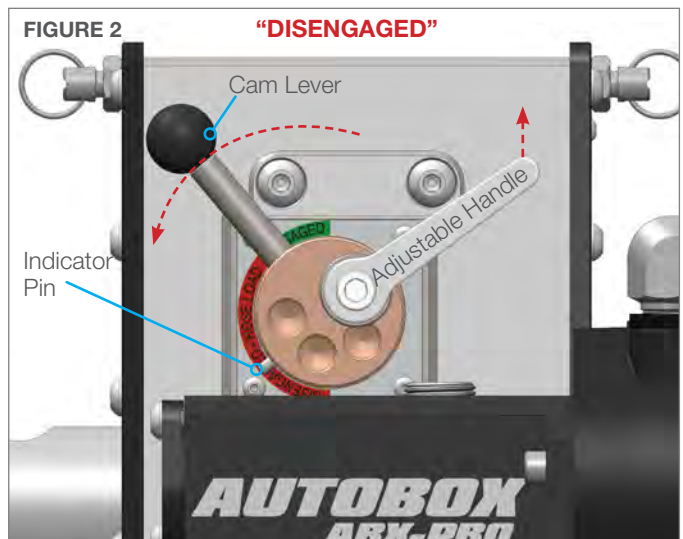
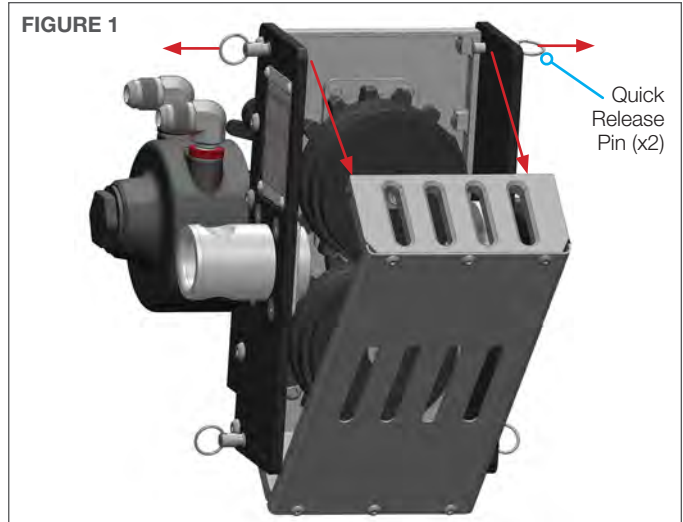
The standard roller size on the ABX-PRO Tractor is $\varnothing.46$ IN. The COMPASS accessory comes with a set of $\varnothing.54$ IN. replacement rollers to accommodate 8/4 hose.

The replacement rollers must be installed on the ABX-PRO Tractor before inserting it into the manway. This process will be typical for Poly Roller replacements on the ABX-PRO Tractor Assembly.

⚠ WARNING

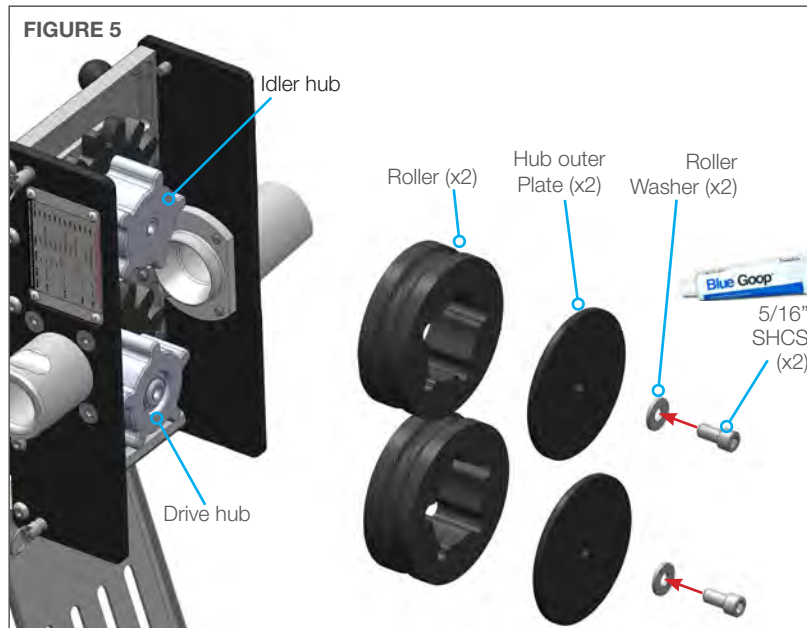
Always de-energize the system before servicing or replacing any parts. Failure to do so can result in severe injury and/or death. Keep hands, hair, and clothing clear of rotating parts.

1. Open the back cover of the ABX-PRO Tractor by pulling the top two Quick Release Pins in the outward direction. **(Figure 1)**
2. Push the Adjustable Handle in the counterclockwise direction to loosen the CAM Lever. Push the CAM Lever in the counterclockwise direction, moving the indicator pin to **"Disengaged"**. **(Figure 2)**
3. Loosening the Cam Lever opens up the space between the Roller Assemblies. **(Figure 3)**
4. Using a 1/4" Hex Key, remove the Screws, Roller Washers, Outer Hub Plates, and Rollers from the Idler and Drive Hubs. **(Figure 4)**

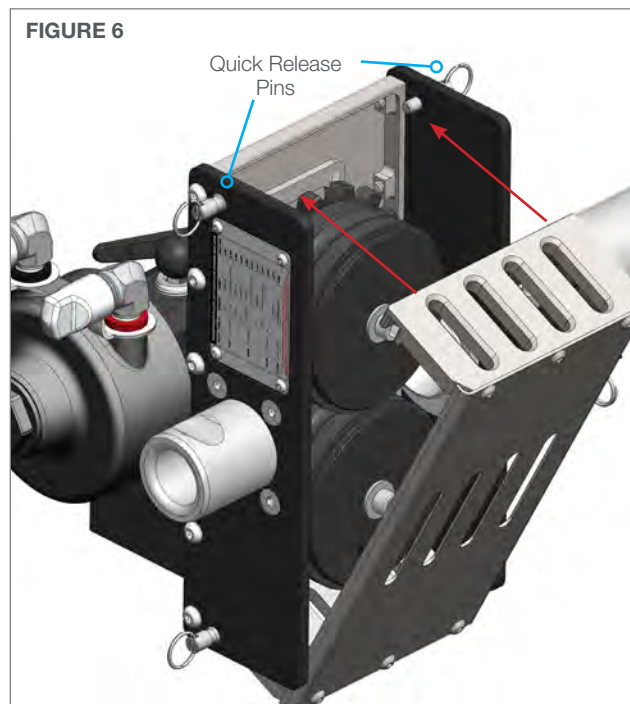


INSTALL ROLLERS IN ABX-PRO TRACTOR

1. Slide the PRO 174-54 Poly Rollers onto the Drive and Idler Hubs. Using a 1/4" Hex Key, fasten the Outer Hub Plates and Roller Washers onto the Rollers with two 5/16" socket head cap screws. Use anti-seize on the threads of the screws. **(Figure 5)**



2. Push the back cover up into the closed position and secure the two Quick Release Pins on the top of the ABX-PRO Tractor. **(Figure 6)**



SUB-ASSEMBLY 1 (ABX-PRO, ROLLERS, COLLET BLOCK, AND GUIDE TUBE)

INSTALL THE COLLET BLOCK ASSEMBLY

1. Remove the Slide Block with a 6mm hex key. Rotate it so that the end with the most distance from the screws is pointing down. Align the holes in the Slide Block with the holes in the Collet Block as shown in **(Figure 7)**. Fasten with the two screws that were removed.
2. Loosen the Collet Block Cap with a 1/4" hex key and slide the Collet Block onto ABX-PRO Tractor Guide into the until it comes to a stop. The Air Fittings on the ABX-PRO Tractor should be opposite the Collet Block and the Slide Block should be on the same side ABX-PRO label. **(Figure 8)**

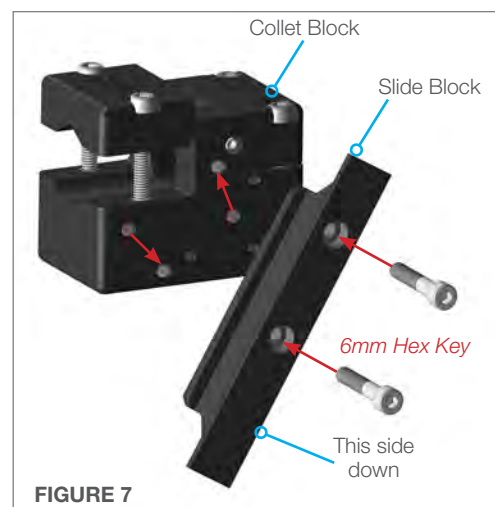


FIGURE 7

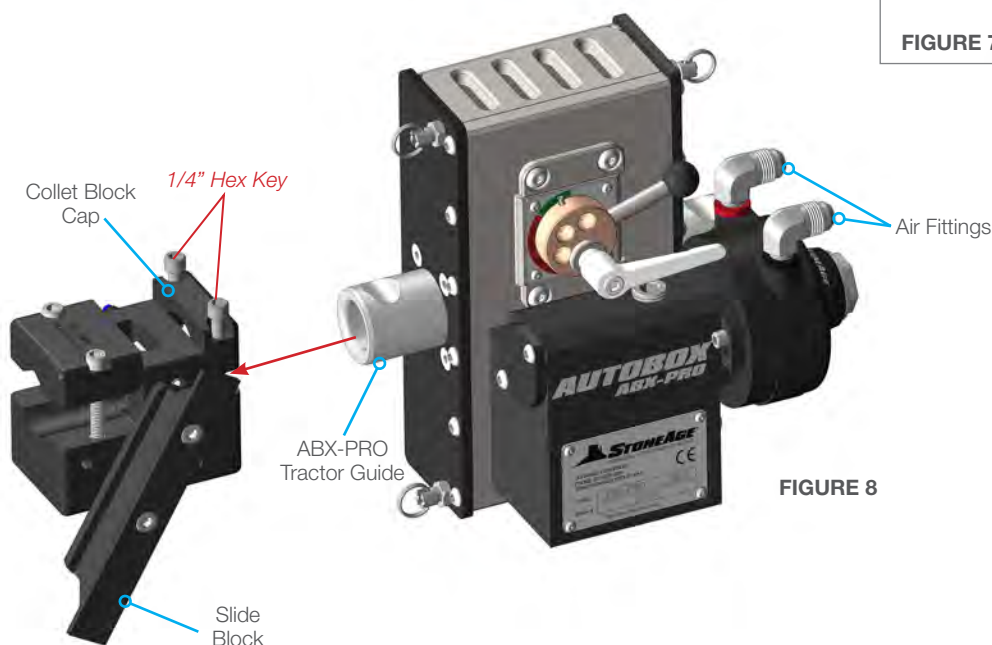


FIGURE 8

INSTALL THE ANGLED GUIDE TUBE

3. Loosen the Collet Block Cap with a 1/4" hex key and slide the Guide Tube into the Collet Block until it comes to a stop. Orient the Guide Tube as shown in **(Figure 9)** and tighten the screws on the Collet Block Cap when the Guide Tube is in place.

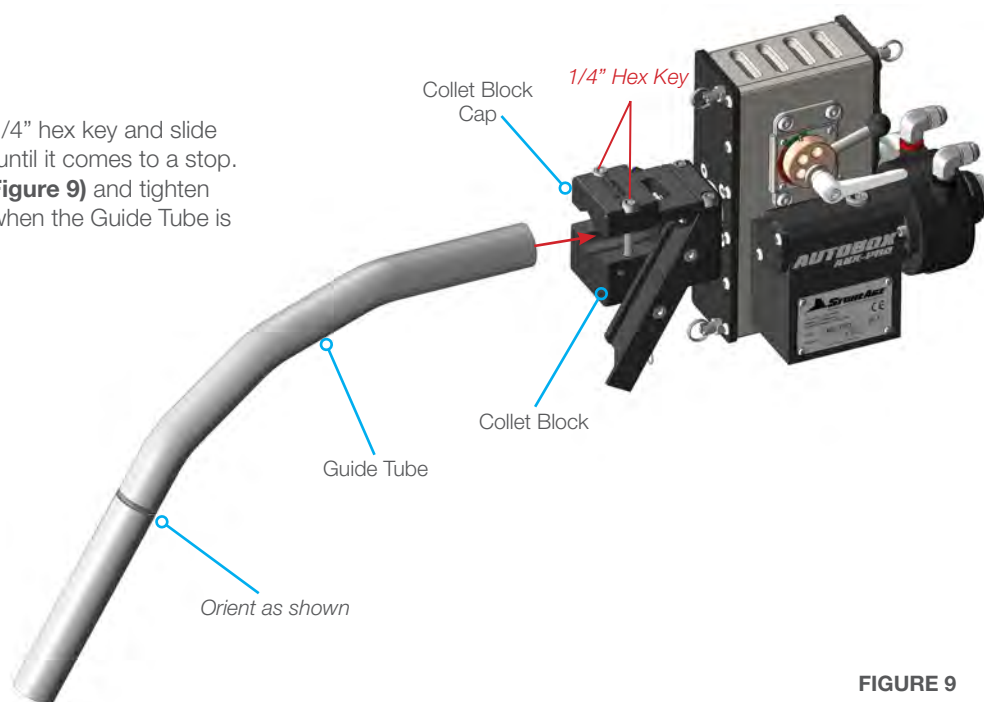


FIGURE 9

SUB-ASSEMBLY 1 (ABX-PRO, ROLLERS, COLLET BLOCK, AND GUIDE TUBE)

INSTALL THE CAMERA MOUNT ANGLED GUIDE TUBE

- Loosen the adjustable handle on the Camera Mount and slide it up the guide tube.
- Orient the Camera as shown and tighten the adjustable handle when in place. *The Camera has a wide viewing area, but may need to be repositioned on the Guide Tube after the whole assembly is complete. (Figure 10)*

Set This Assembly aside when complete.

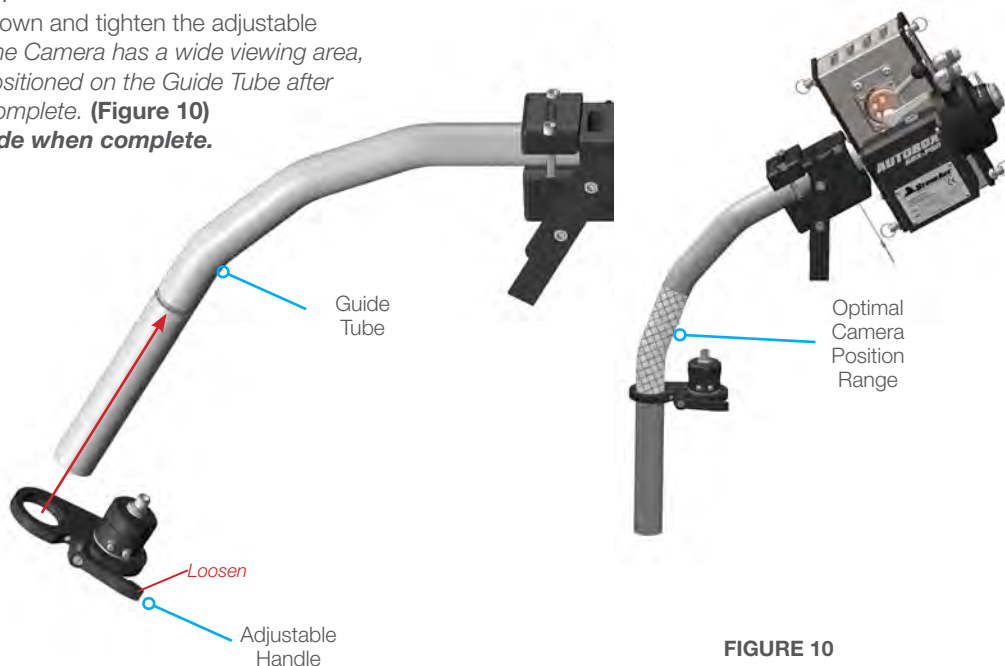


FIGURE 10

SUB-ASSEMBLY 2 (LINEAR DRIVE HANDLE)

REPLACE THE ADJUSTABLE HANDLE ON THE LINEAR DRIVE

- Remove the PROP 336 Handle Assembly with a 5mm Hex Wrench. **(Figure 11)**
- Lightly coat the threads of the PROP 337 Handle with Blue Goop® or other equivalent anti-seize.
- Install the PROP 339 Washer with PROP 337 Handle by hand screwing it into the clamp block until it is tight. **(Figure 12)**

Set This Assembly aside when complete.

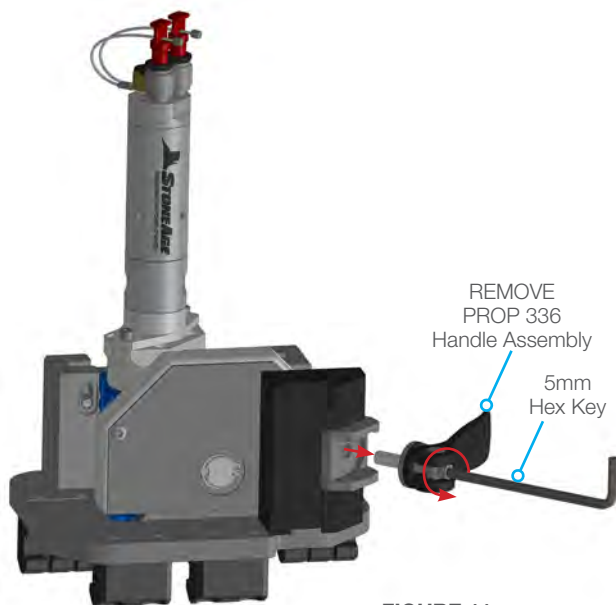


FIGURE 11

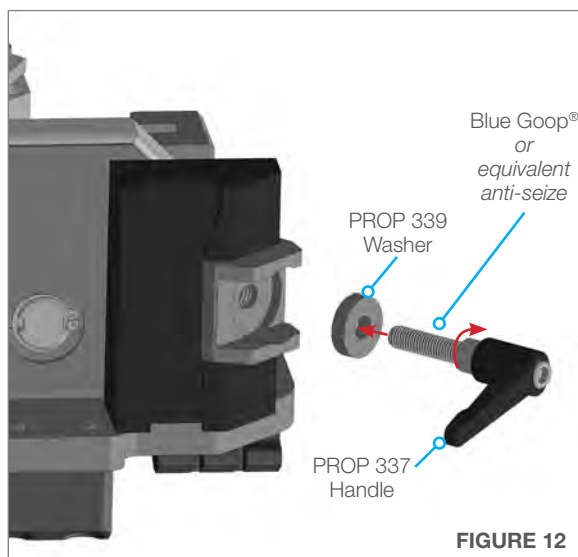


FIGURE 12

SUB-ASSEMBLY 3 (RAIL MOUNT, SNOOT, AND HIGH PRESSURE HOSE)

LOAD THE HIGH-PRESSURE HOSE INTO THE SNOOT ON THE RAIL MOUNT

Before installing High-Pressure hose, please be sure to review the “HIGH-PRESSURE HOSE” information in the “WARNING AND SAFETY INSTRUCTIONS” section of this manual. Always flush out hoses before attaching tools to keep particle debris from damaging the tool.

1. Lay the Rail Mount, Snout, and High Pressure Hose on the floor.
2. Insert the High Pressure Hose into the Camlock on the Snout Carriage and through the entire Snout. **(Figure 13)**
3. Leave enough hose slack coming out of the end of the Snout to continue to push the end of the hose through the ABX-PRO Tractor and into the Guide Tube later in the assembly. **(Figure 13)**
4. Connect the Female, Threaded, Camlock end of the Snout to the Male end of the Snout Carriage. **(Figure 13)**
5. Install the Hose Stop on the hose behind the Snout Carriage. It will be adjusted into the proper location after the system is operational. **(Figure 13)**

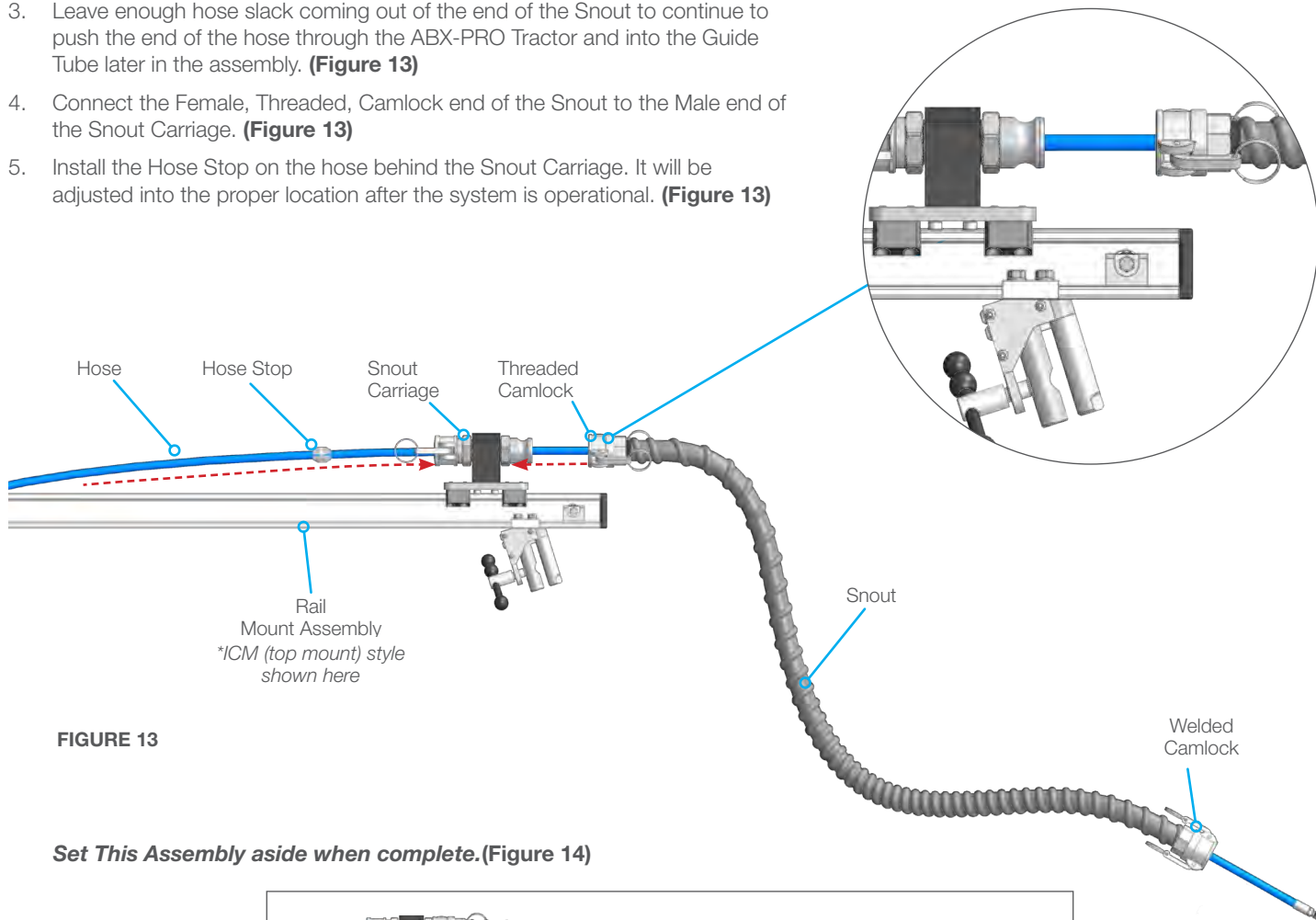
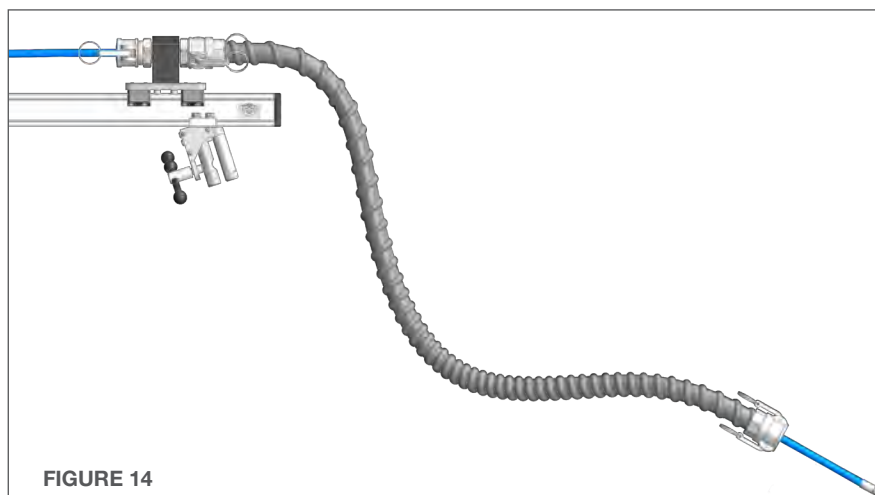


FIGURE 13

Set This Assembly aside when complete. (Figure 14)



CONNECT THE PNEUMATIC LINES TO THE CONTROL BOX

1. Organize the supplied Air Line Umbilicals. **(Figure 15)**



FIGURE 15

2. Connect the customer supplied, Main Air Supply line (Chicago Style Fitting) to the Control Box. **(Figure 16)**
3. Connect the color coded 3/8\" Tubing to their respective push connect fittings, located above the \"ROTARY\" and \"LINEAR\" labels on the base of the Control Box. **(Figure 16)**
4. Turn the Air Valve **ON** and operate the \"Linear\" and \"Rotary\" levers on the control box to blow out the 3/8\" Tubing lines. **(Figures 16 & 17)**
5. Hand fasten the color coded 1/2\" Pneumatic Hoses to the Color Coded JIC Fittings on the Control Box. Then tighten with a 7/8\" wrench. **(Figure 17)**
6. Operate the \"Feed\" lever on the control box to blow out the 1/2\" Pneumatic Hoses. **(Figure 17)**

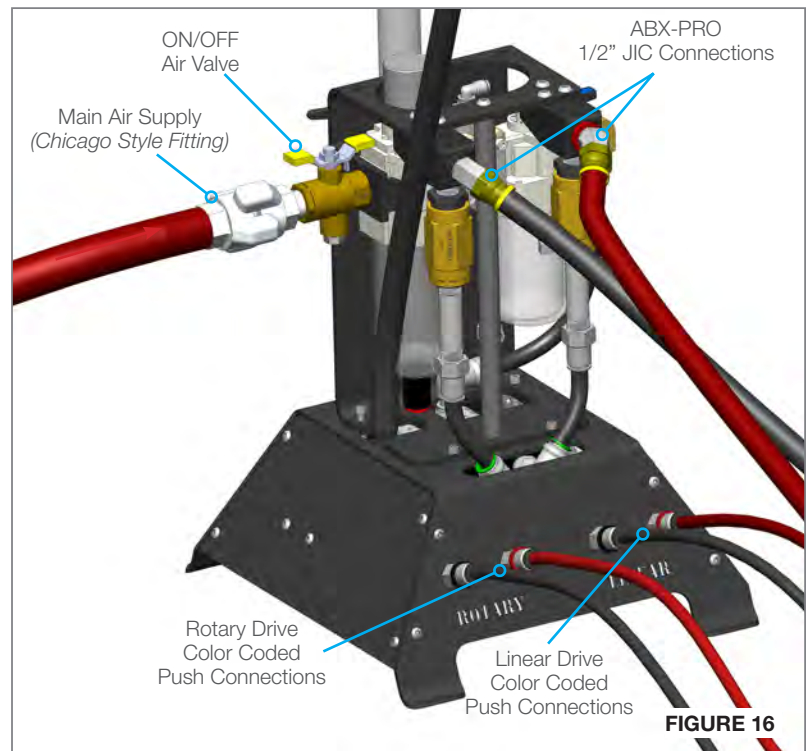


FIGURE 16

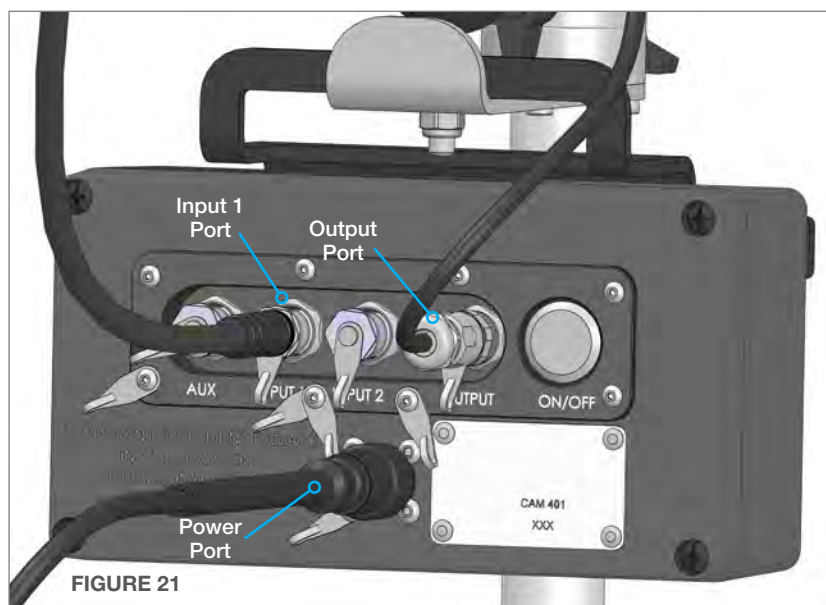
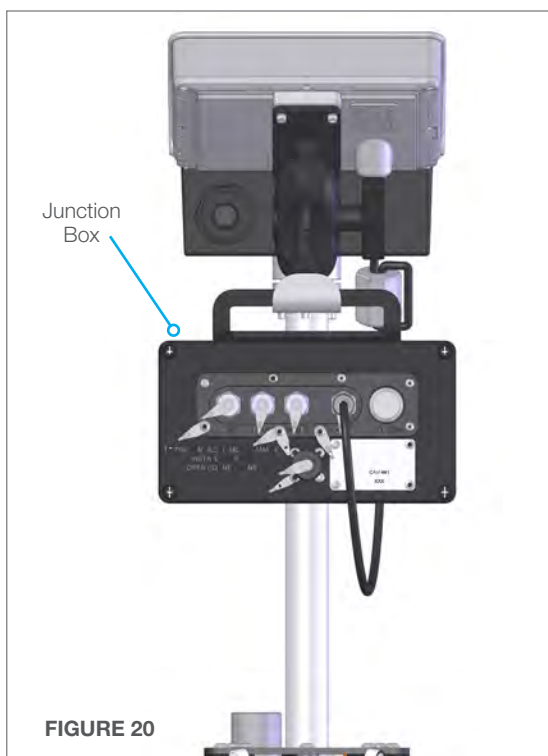
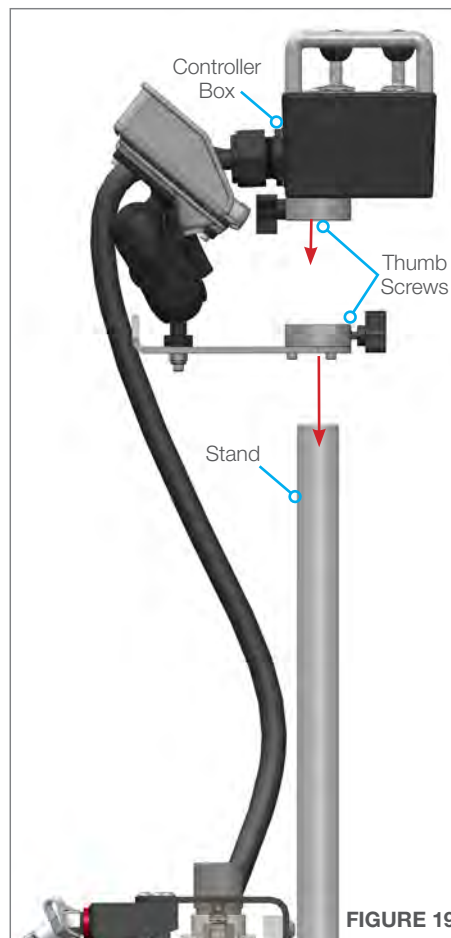
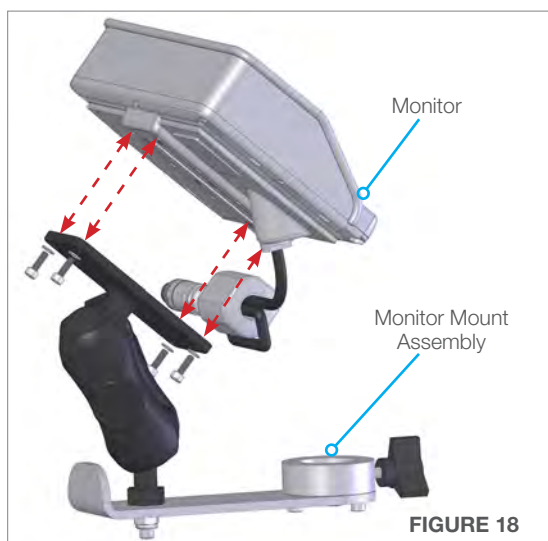


FIGURE 17

SUB-ASSEMBLY 4 (CONTROL BOX AND CAMERA)

CONNECT THE MONITOR MOUNT, MONITOR AND JUNCTION BOX TO THE CONTROL BOX

1. Attach the Monitor to the Monitor Mount Assembly with the supplied screws and washers as shown in **(Figure 18)**.
2. Loosen the thumb screws on the Controller Box and Monitor Mount. Remove the Controller Box from the stand and slide the Monitor Mount on. **(Figure 19)** Return the Controller Box to the Stand and tighten the Thumb Screw. The Monitor Mount collar should sit just under the Controller Box Collar.
3. Hang the Junction Box by the handle from the Monitor Mount **(Figure 20)**
4. Plug the cable coming from the Monitor into the "OUTPUT" port and the Camera Cable into the "INPUT 1" port on the side of the Junction Box **(Figure 21)** *INPUT 2 would be for an additional camera.*



OPTIONAL PNEUMATIC DUMP CONTROL CONNECTIONS

StoneAge recommends the use of a dump valve or an operator actuated pressure relief, for all waterblasting operations. We offer a variety of dump valve options. The included Control Box has a Hand Controlled Dump Lever on the Control Panel. A Foot Dump can be used instead of the Hand Control. See the respective connection diagrams below for either option.

FOOT CONTROLLED DUMP CONNECTION (Figure 28)

1. Install the hose with the female JIC ends between the Ball Valve with the male 90° JIC Fitting located on the side of the Control Box and the fitting marked "SUPPLY" on the Foot Dump Valve Control.
2. Install the 1/4 in. (6 mm) O.D. Poly Tubing between the fitting on the Pneumatic Dump Valve Assembly and the fitting marked "DUMP" on the Foot Dump Valve Control.
3. Install the Main Water Supply and Flex Lance Hose onto the Pneumatic Dump Valve Assembly. Be sure to use the appropriate anti-seize, thread lubricant, and/or pipe tape as recommended in the StoneAge Tool Fittings and Accessories Catalog at the link below.

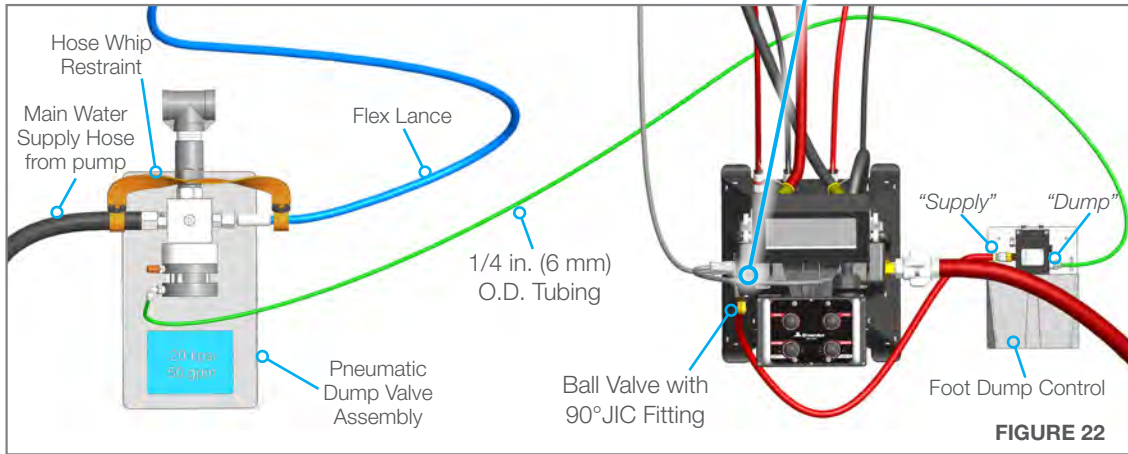


FIGURE 22

HAND CONTROLLED DUMP CONNECTION (Figure 29)

1. Install the 1/4 in. (6 mm) O.D. Tubing between the Push Connect Fitting located on the back of the Control Box and the Push Connect Fitting on the Pneumatic Dump Valve Assembly.
2. Install the Main Water Supply and Flex Lance Hose onto the Pneumatic Dump Valve Assembly. Be sure to use the appropriate anti-seize, thread lubricant, and/or pipe tape as recommended in the StoneAge Waterblast Catalog.

https://stoneagetools.com/assets/pdf/catalogs/waterblast_2020/2020_Waterblast_Catalog_web_spreads.pdf

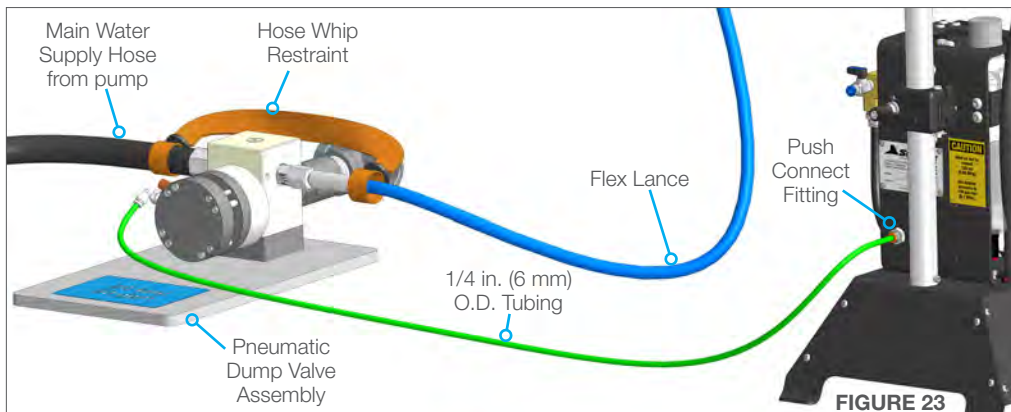


FIGURE 23

WARNING

Always use Hose Whip Restraints. Failure to do so can result in severe injury and/or death. It is the responsibility of the user to properly install the Hose Whip Restraints. Never exceed safe working load. Follow manufacturer's recommendations and ratings.

DANGER

Keep dump connections neat and out of the foot path. Pinching the dump connections will cause the dump valve to function incorrectly, possibly leading operator injury or death.

COMPASS Positioner ATTACHMENT TO DOMED BUNDLE

POSITIONER STEP BY STEP SET-UP INSIDE THE DOMED BUNDLE



TECH TIP:

It is highly recommended to put five necessary tools in a tote for the installer to take inside the dome.

- Tape Measure
- 1/2" Ratcheting Socket Wrench
- 3/4" Ratcheting Open-End Box Wrench (QTY. 2)
- Wrenches specific to the Banshee for installation of the tool on lance.

INSTALL SPIDER PLATE ONTO TUBE FACE

1. Loosen the four bolts on the legs of the Spider Plate Assembly with a 3/4" Ratcheting Open-End Box Wrench, so the legs are free to slide in the slots of the Hub Plate but do not come off. **(Figure 24)**
2. Loosen the Expansion Plugs (x4) on each leg with the adjustable knobs. **(Figure 24)**

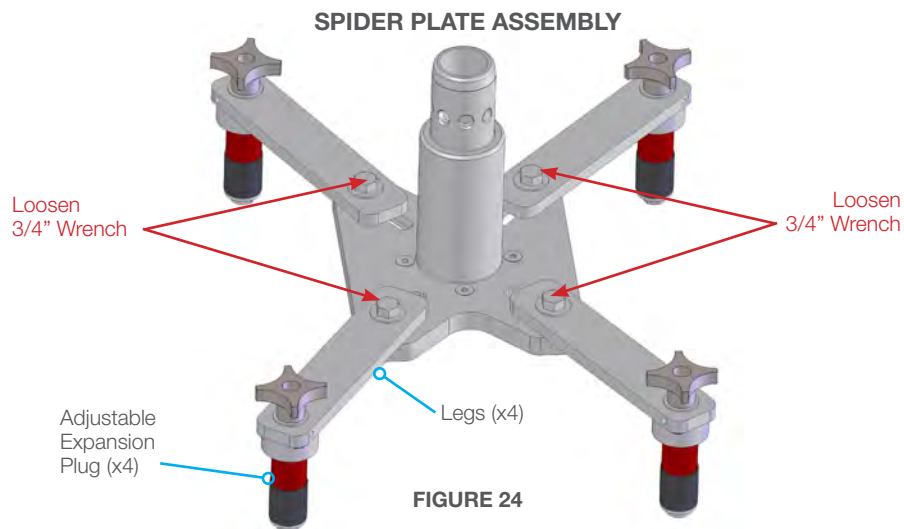


FIGURE 24

3. Hand the Spider Plate Assembly through the Manway to someone positioned inside the Domed Bundle. **(Figures 25 & 26)**

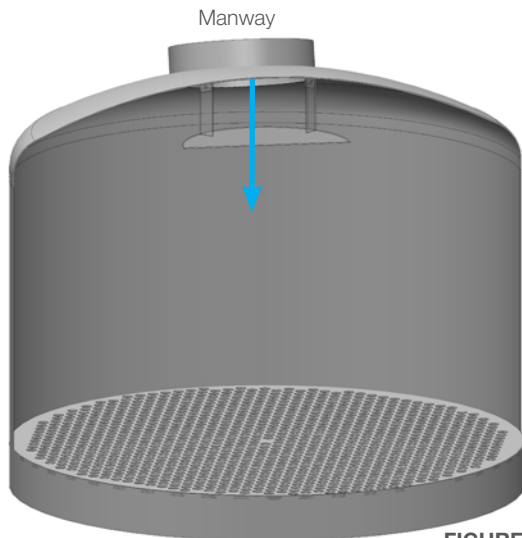


FIGURE 25

TOP MOUNT DOMED BUNDLE



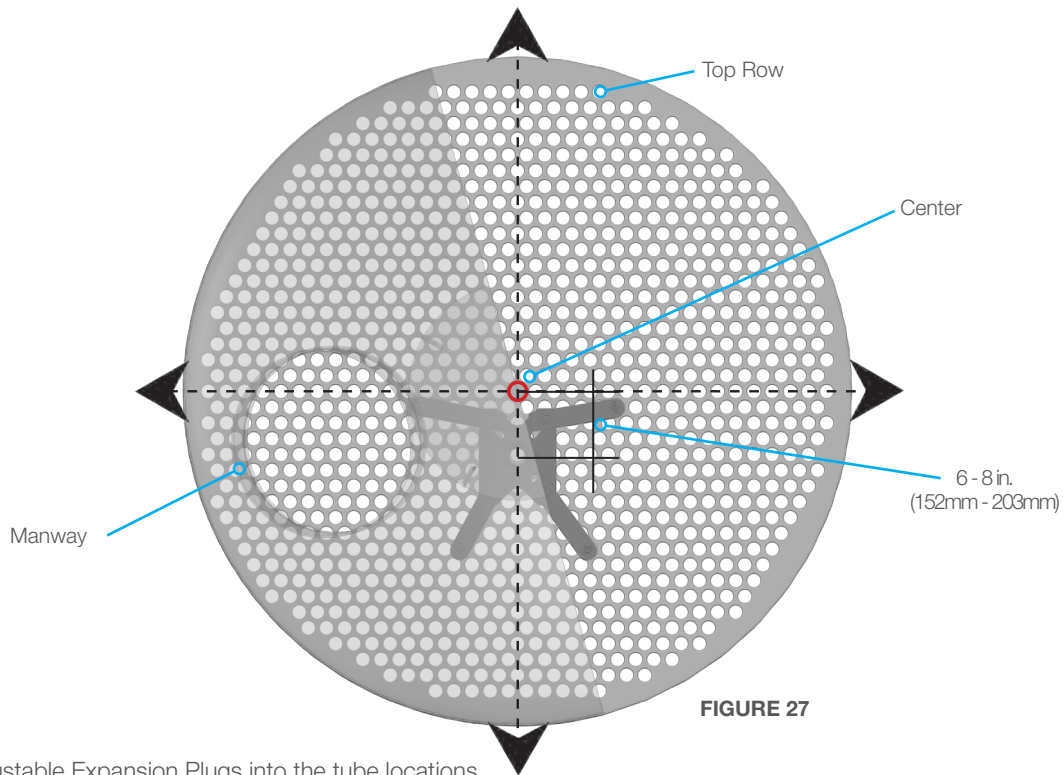
FIGURE 26

SIDE MOUNT DOMED BUNDLE

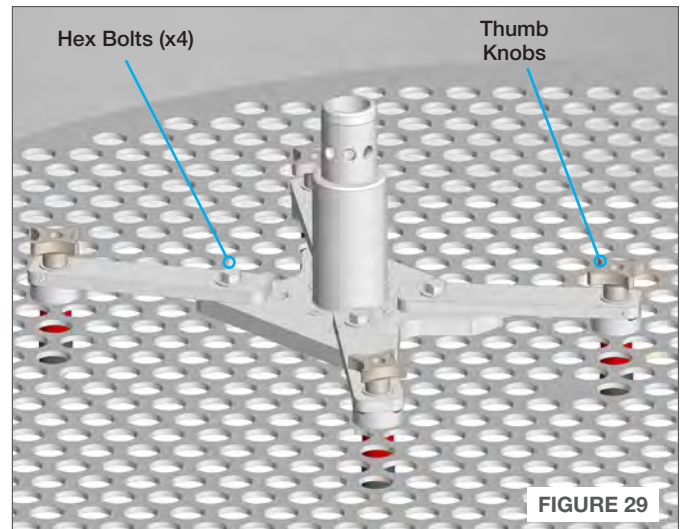
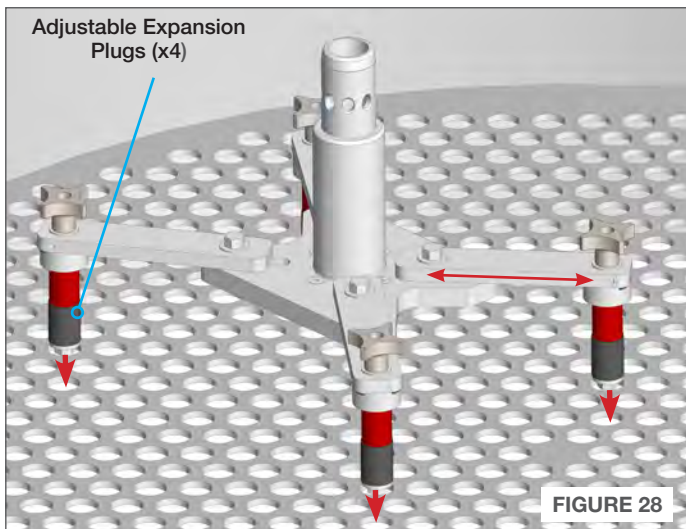
⚠ WARNING

The first four exchanger tubes the Expansion Plugs will be inserted into must be free of debris. Follow all workplace safety procedures and utilize appropriate PPE when cleaning out the exchanger tubes prior to plug installation to avoid injury.

4. Locate the center of the tube face. If there is no center identifier, use a tape measure to locate and mark center. **(Figure 27)**



5. Insert the Adjustable Expansion Plugs into the tube locations that will allow the Spider Plate to be positioned on the tube face as shown. **(Figures 27 & 28)**
6. When the Spider Plate is located as shown, tighten the 4 Hex Bolts on the legs with a 3/4 in. Wrench. Then tighten the Thumb Knobs until the plate feels secured in place and does not lift up. **(Figure 29)**
7. There are set-up reference dimensions in the "Set-Up Dimensions for 69 in. (1753mm) Tube Face" section in this manual. **(Figures 40-43)**



COMPASS Positioner ATTACHMENT TO TUBE BUNDLE

INSTALL ROTARY DRIVE AND DRIVE RAIL ONTO SPIDER PLATE

8. Hand the Rotary Drive and Drive Rail through the manway to the person positioned inside the Domed Bundle.
9. Unlock the Rail Clamp Handle on the Rotary Drive and slide the Drive rail into the Rail Clamp. Push the Handle down to lock the Rail in place. **(Figure 30)**



TECH TIP:

Be sure to face the slotted side of the rail up toward the top of the dome to allow the Linear Drive to line up properly in the steps to follow.

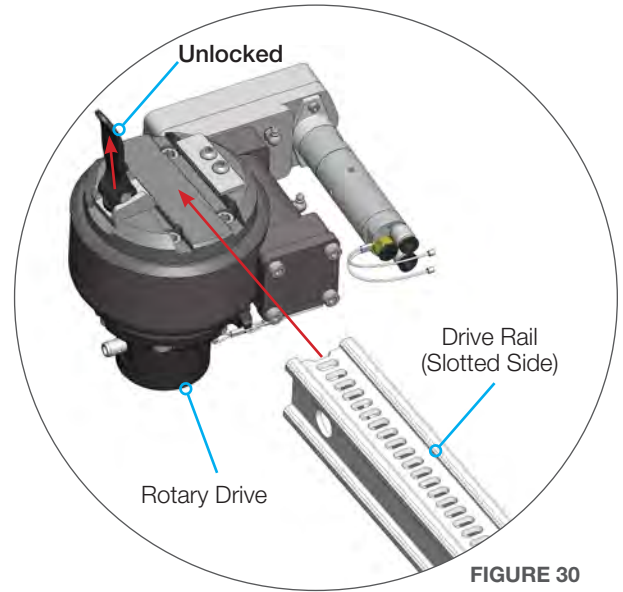
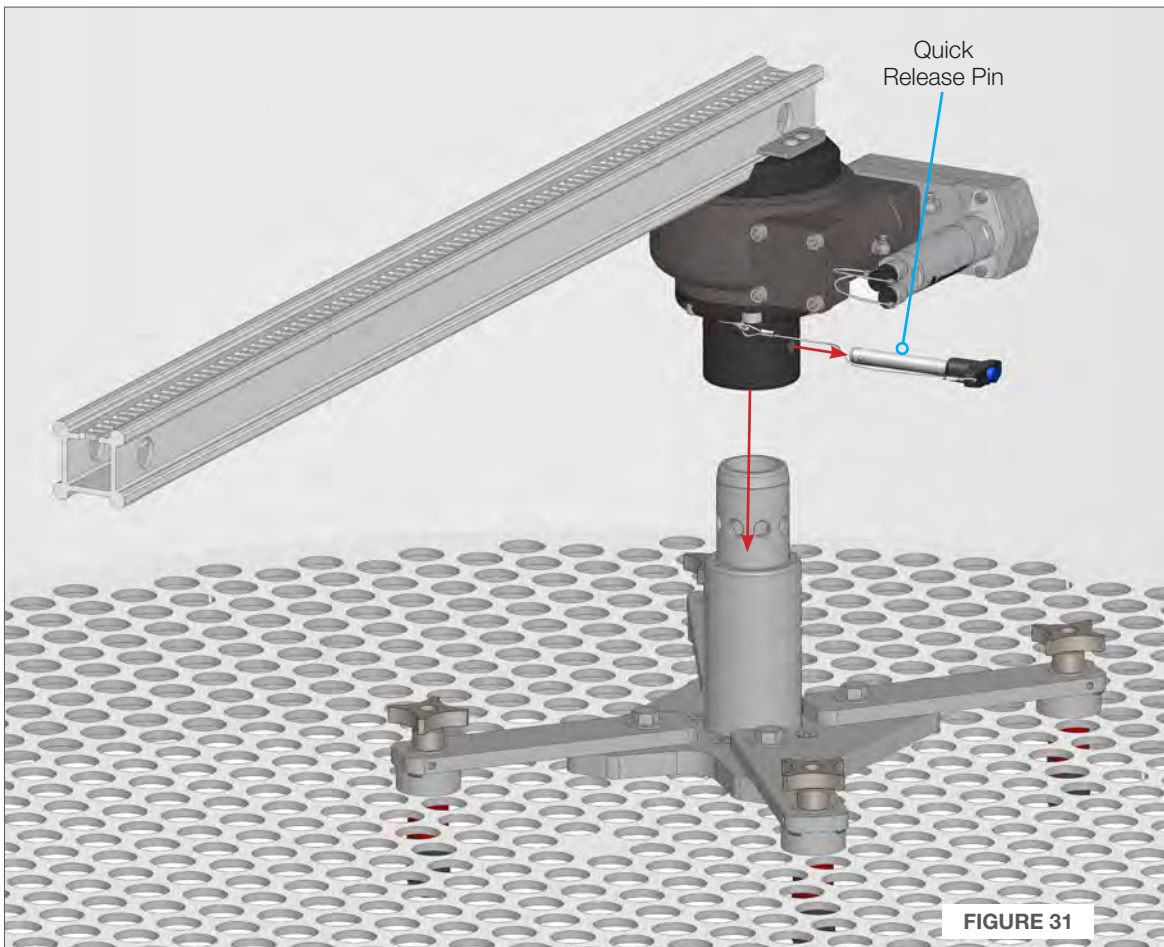


FIGURE 30

10. Remove the Quick Release Pin from the Rotary Drive and slide the Rotary Coupling over the Spider Plate Mounting Shaft. **(Figure 31)**
11. DO NOT replace the Quick Release Pin until the Positioner is located in the desired position.



INSTALL LINEAR DRIVE AND RAIL PLUG ON DRIVE RAIL

12. Hand the Linear Drive through the manway to the person positioned inside the dome.
13. Rotate both Adjustable Handles on the Linear Drive up to retract the Drive Gear and allow the Linear Drive to slide along the Drive Rail. **(Figure 32)**
14. Orient the Adjustable Handles of the Linear Drive to the opposite side of the Rotary Drive Clamp Handle. **(Figure 33)**
15. Slide the Linear Drive onto the rail and rotate both Adjustable Handles down to engage the gear. Sliding it back and forth on the rail can help drop it into the slots. **(Figure 33)**
16. Slide a Rail Stop onto the opposite end of the rail and orient the Handle so it faces away from the Linear Drive. **(Figure 33)**
17. Separate the Wedge Bolt from the Rail Plug with a 1/2" Ratcheting Socket Wrench. **(Figure 34)**
18. Insert the Rail Plug into the end of the Drive Rail opposite the Rotary Drive. Insert the Wedge Bolt through the Rail and Rail Plug then tighten the Wedge Bolt with a 1/2" Ratcheting Socket Wrench **(Figure 34)**

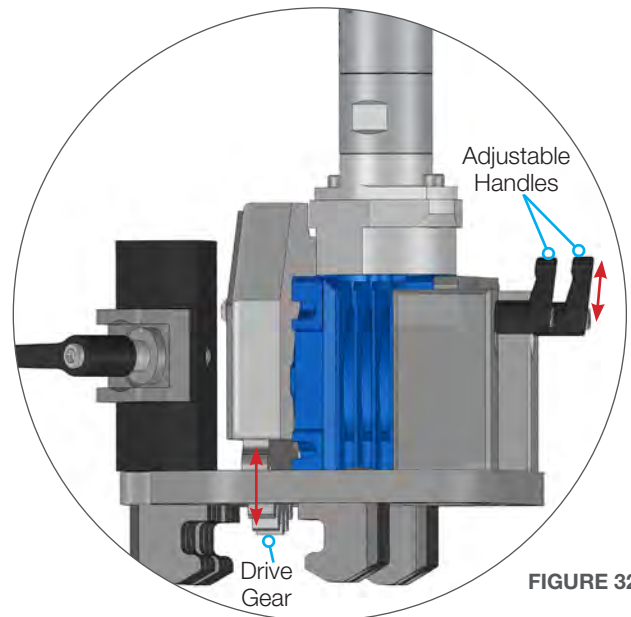


FIGURE 32



TECH TIP:

Make sure the Wedge Bolt is oriented as shown in **(Figure 34)**. If it is installed upside down it will obstruct the path of the Linear Drive.

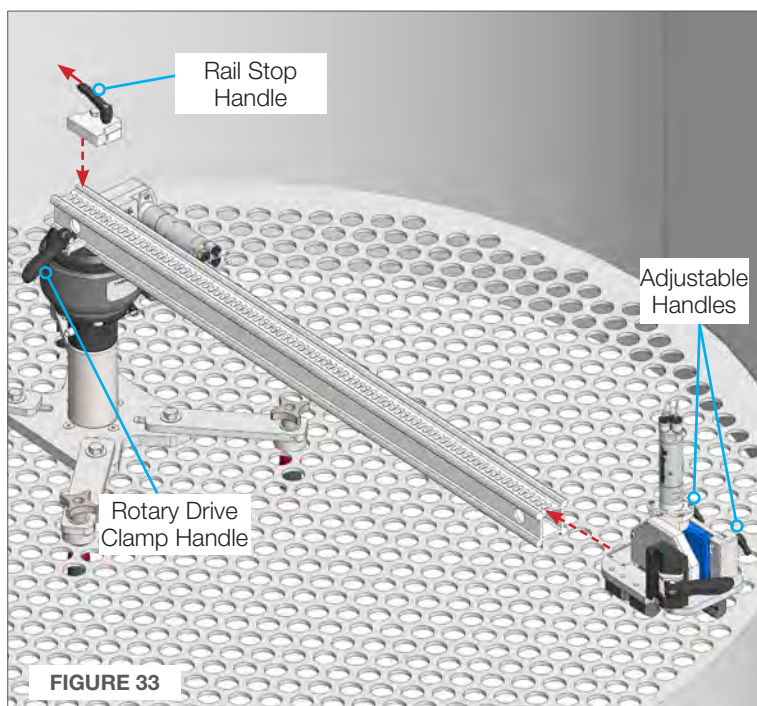


FIGURE 33

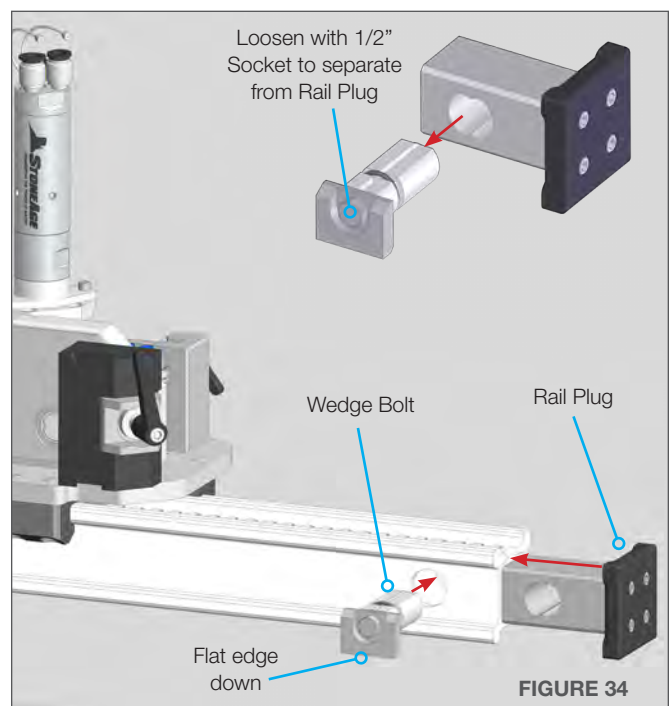


FIGURE 34

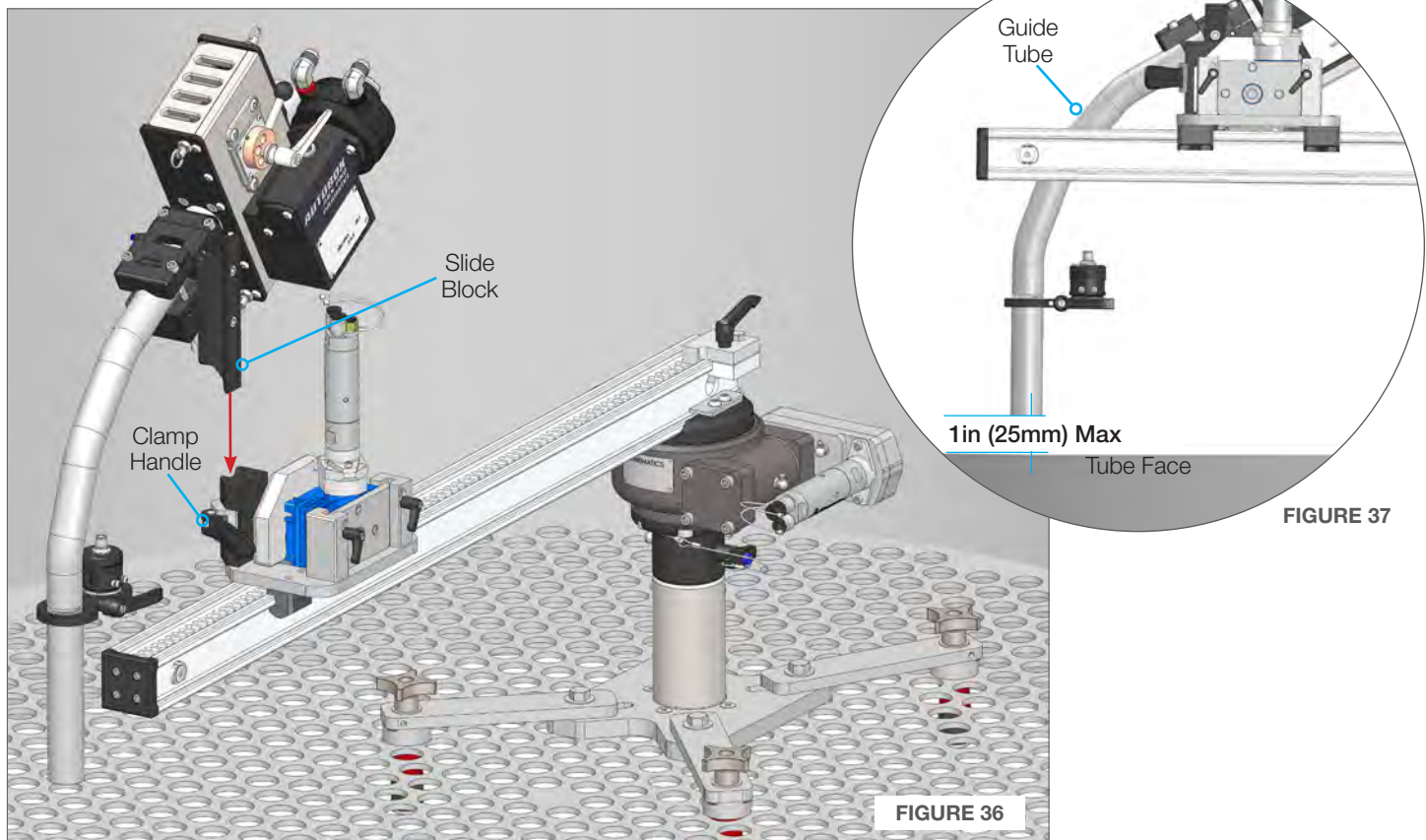
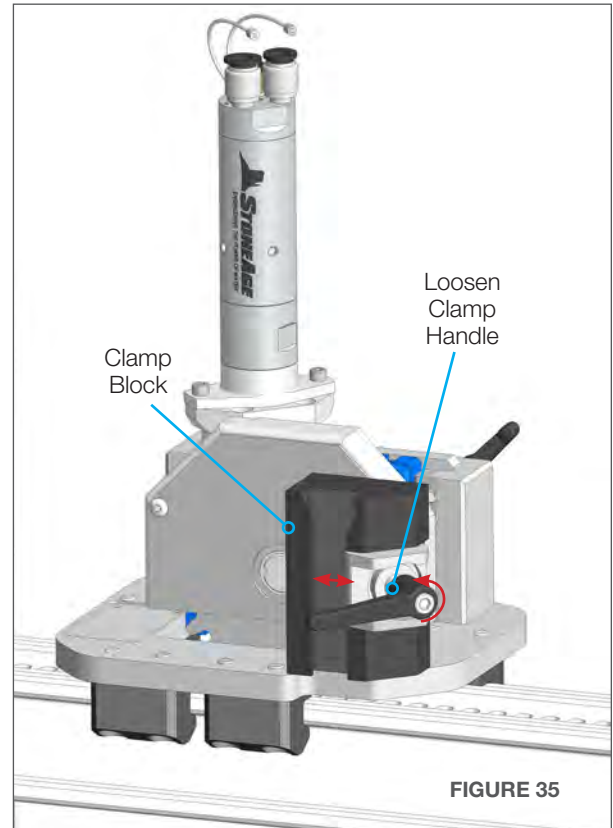
COMPASS Positioner ATTACHMENT TO DOMED BUNDLE

INSTALL SUB-ASSEMBLY 1 ON THE LINEAR DRIVE

⚠ CAUTION

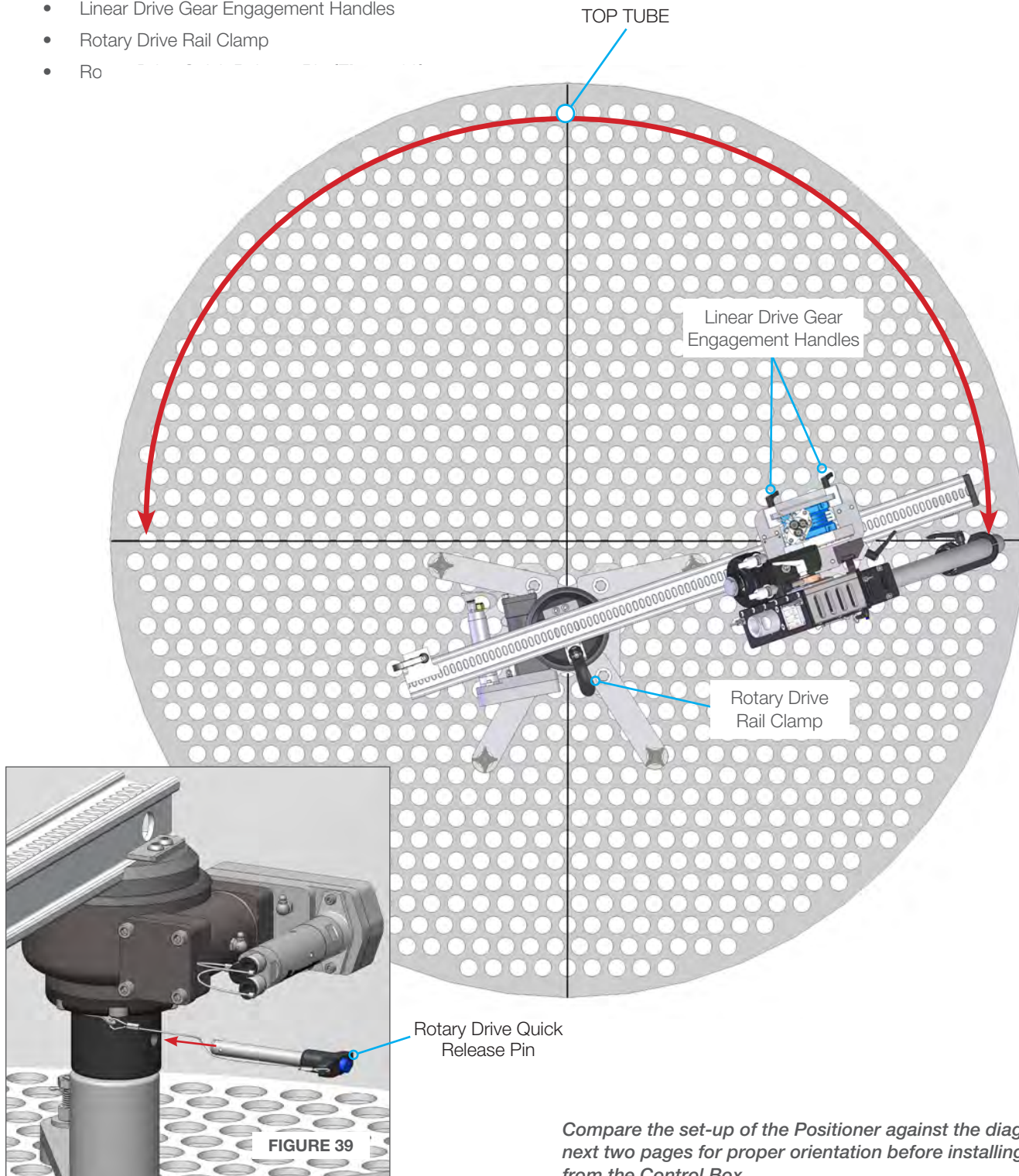
The ABX-PRO, Guide Tube, Collet Block, sub-assembly is heavy.
Use caution when handing it through the manway.

19. Hand Sub-Assembly 1 through the manway to the person positioned inside the Domed Bundle.
20. Loosen the Clamp Block on the Linear Drive by pulling the Clamp Handle out and rotating it counterclockwise. **(Figure 35)**
21. Insert the Slide Block on the ABX-PRO sub-assembly into the clamp on the Linear Drive. **(Figure 36)**
22. The end of the Guide tube should be 1in (25mm) or less, from the Tube Face. This is to avoid dragging on the surface of the Tube Face. **(Figure 37)**
23. Tighten the Clamp Handle on the Linear Drive when the Guide Tube is set the proper distance off the tube face. **(Figure 36)**



SET THE DRIVE RAIL AND LINEAR DRIVE IN PLACE

24. Before locking the Positioner in place, be sure that the Guide Tube can swing in the direction shown below without hitting the walls and the Linear Drive has enough stroke to reach the Top Tube. **(Figure 38)**
25. Once it has been determined that the Linear Drive has enough stroke and the Guide Tube will not hit the wall during operation, lock down the following;
 - Linear Drive Gear Engagement Handles
 - Rotary Drive Rail Clamp
 - Ro



Compare the set-up of the Positioner against the diagrams in the next two pages for proper orientation before installing air hoses from the Control Box.

SET-UP DIMENSIONS FOR 69 INCH (1753mm) TUBE FACE

TOP AND CENTER INSTALLATION DIMENSIONS

These four images are set-up dimensions to allow the Positioner system to clean the TOP, CENTER, LEFT, and RIGHT areas of the tube face without hitting the walls. These dimensional diagrams are for a 69in. (1753mm) tube face.

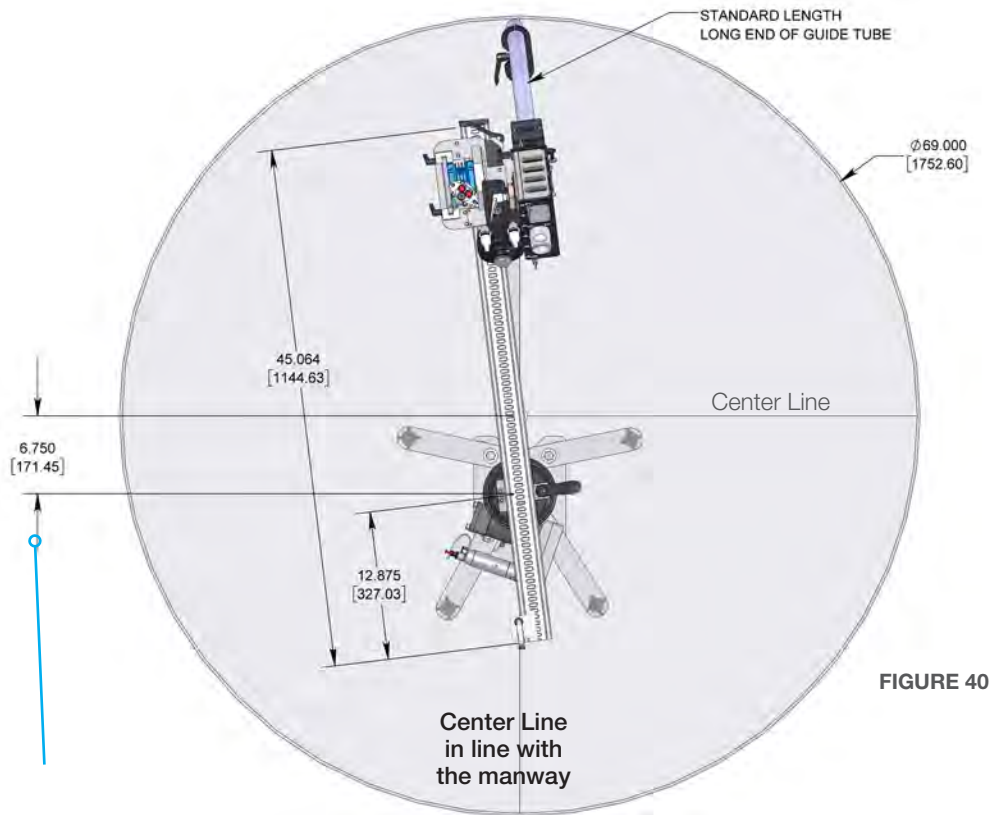


FIGURE 40

This is an approximate measurement and can be anywhere between 6-8 inches

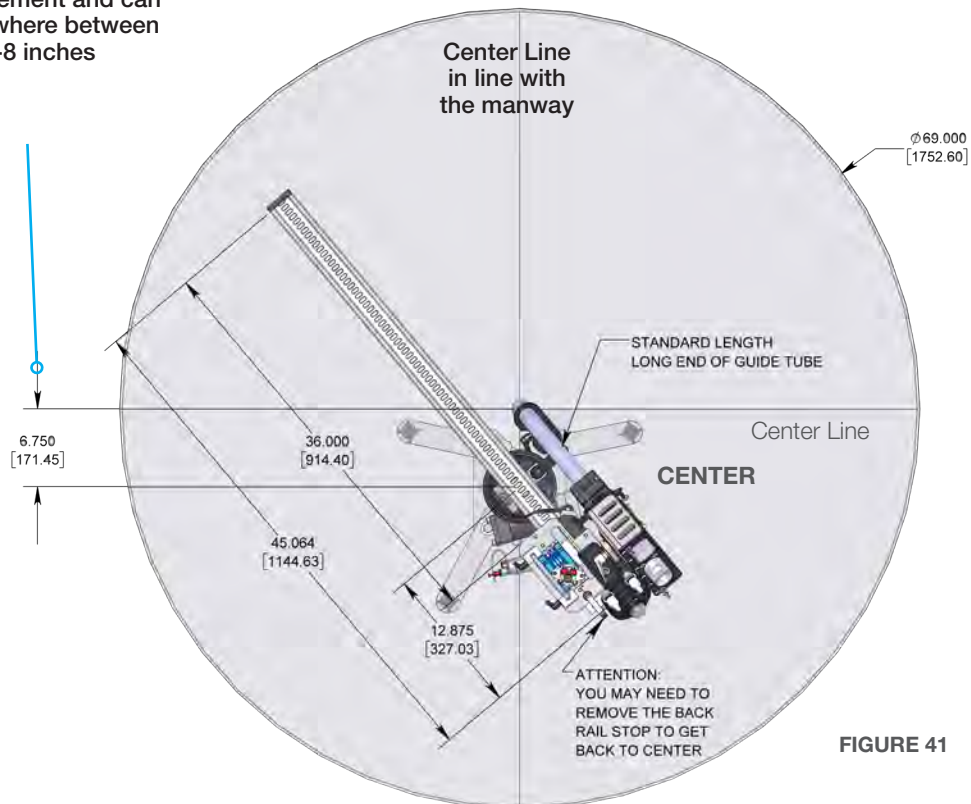


FIGURE 41

SET-UP DIMENSIONS FOR 69 INCH (1753mm) TUBE FACE

LEFT AND RIGHT INSTALLATION DIMENSIONS

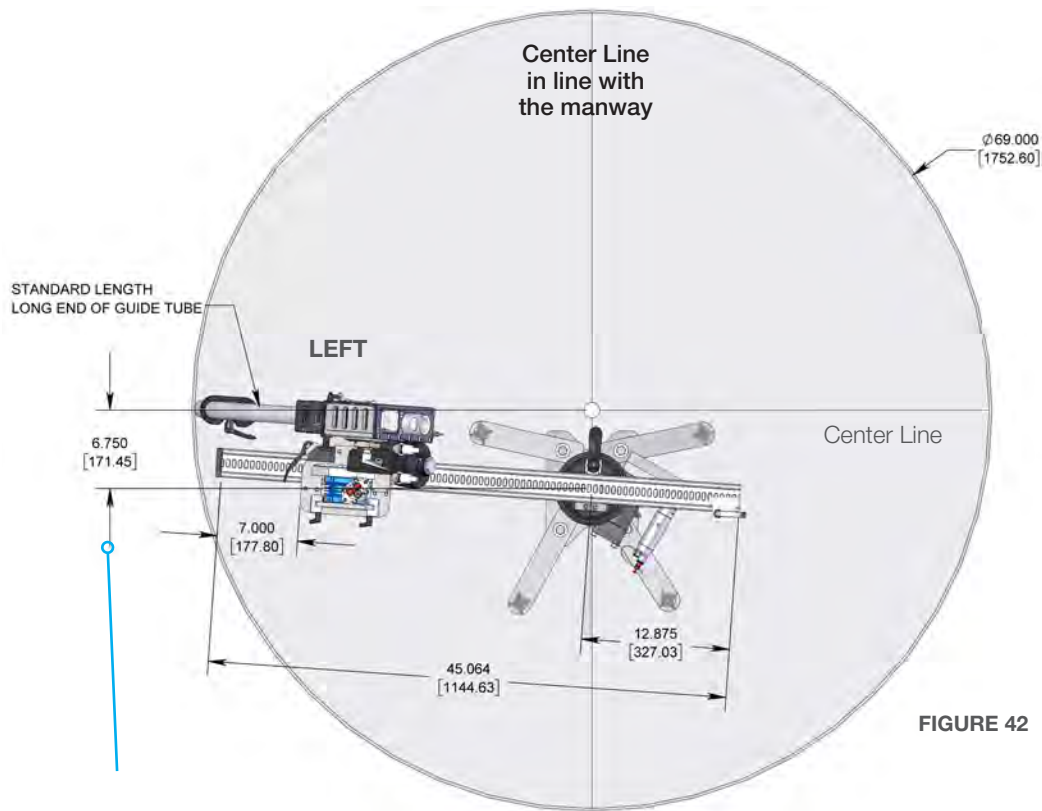


FIGURE 42

This is an approximate measurement and can be anywhere between 6-8 inches

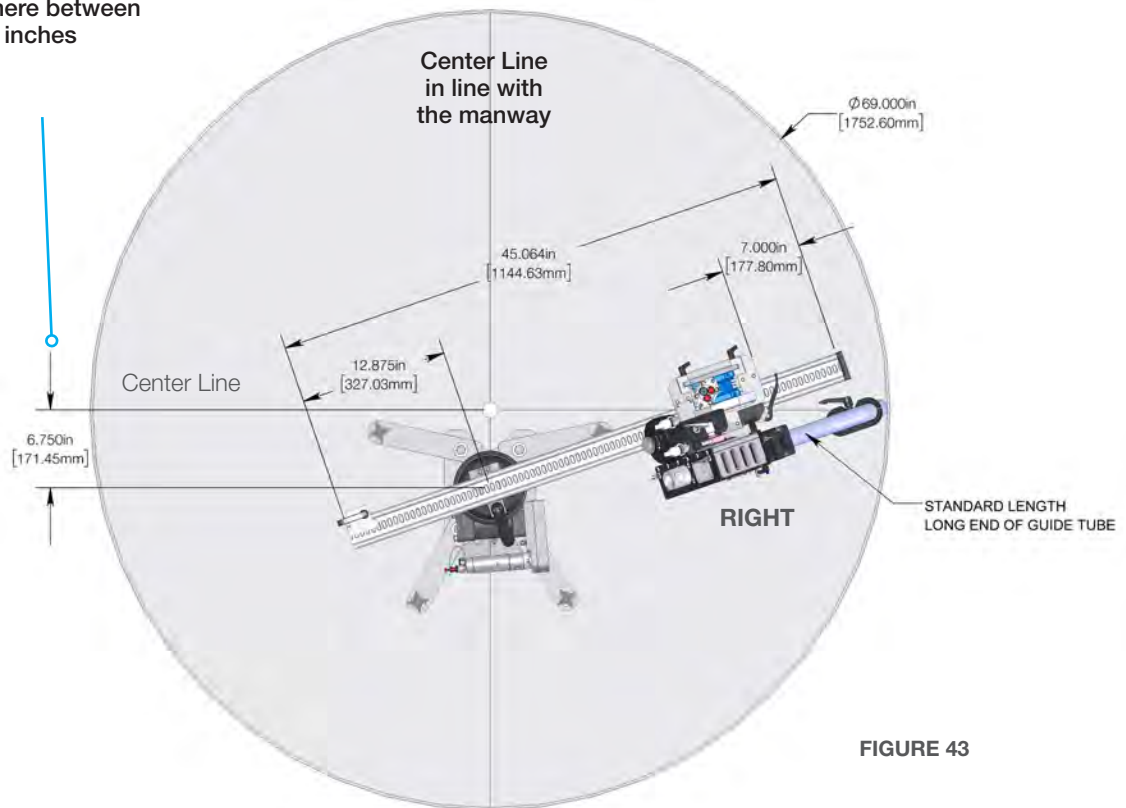


FIGURE 43

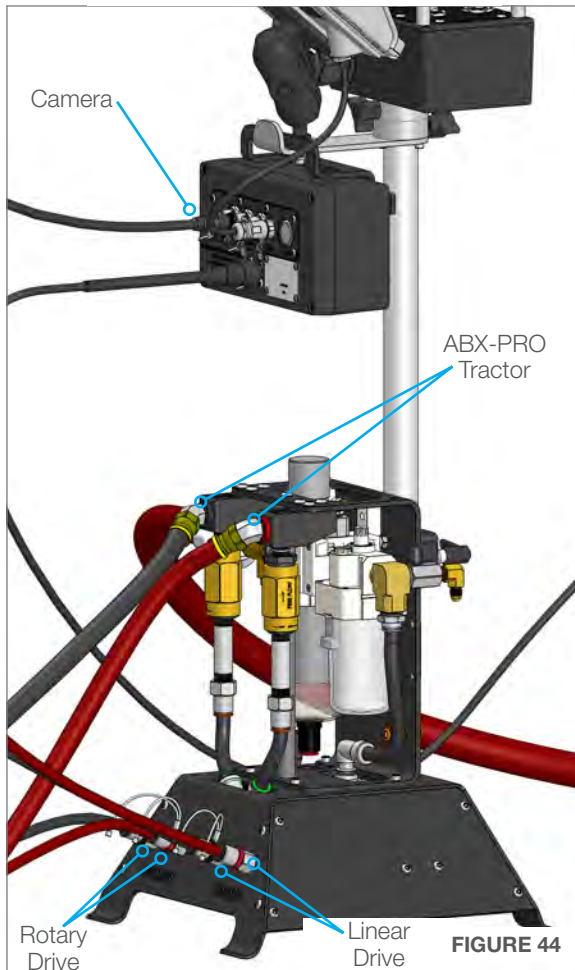
CONTROL BOX CONNECTIONS TO POSITIONER

PNEUMATIC SUPPLY LINE CONNECTION FROM CONTROL BOX TO POSITIONER

All the pneumatic supply lines should have been connected to the Control Box. If not please go back to the "Sub-Assembly 4 (Control Box and Camera)" section of this manual.

1. Turn ON the main air supply line to the Control Box and blow out all lines to clear debris before connecting the COMPASS Positioner. Turn the Air Supply OFF when air lines are blown out.

Control Box Connections



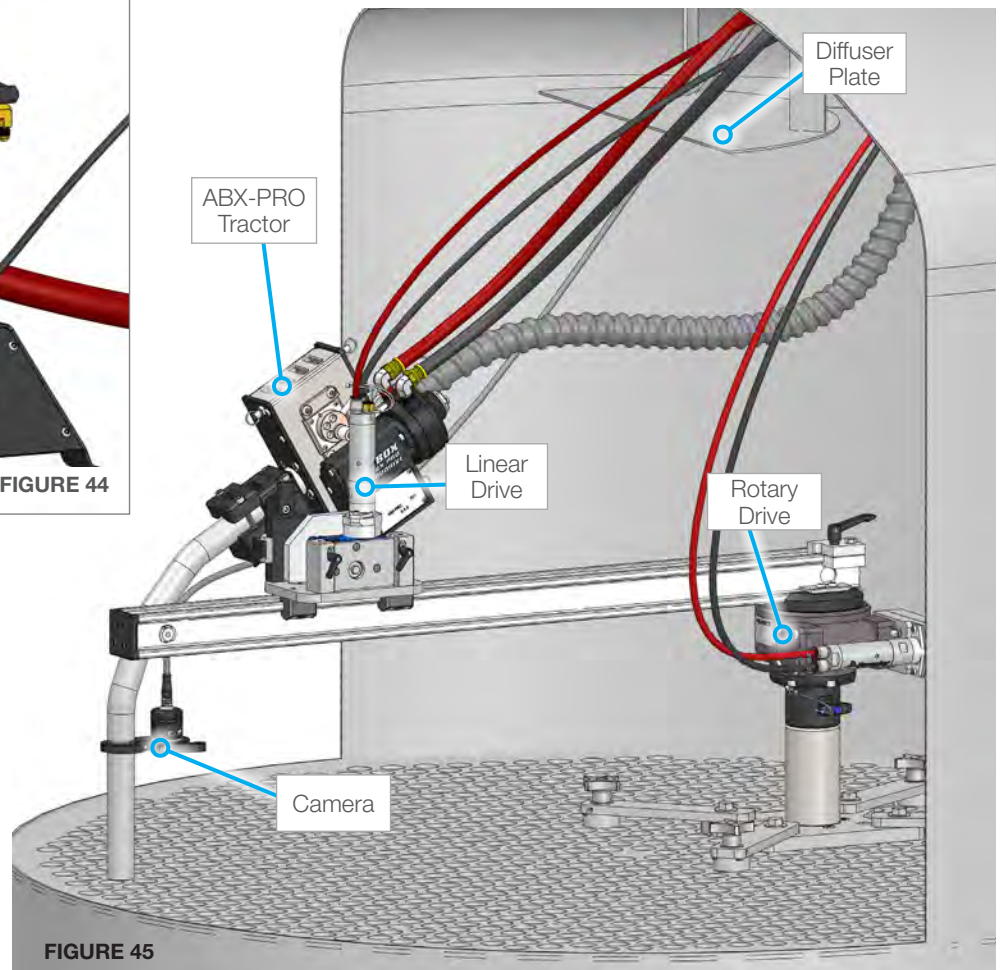
2. Feed one pair of supply lines at a time through the manway to avoid confusion. If there is a diffuser plate in the dome, feed the hoses above it and it will keep them out of the way of the positioner. **See the connection diagrams below. (Figures 44 & 45)**
3. The Camera connection is in the hose bundle with the 1/2" JIC connections for the ABX-PRO Tractor.



TECH TIP:

Don't worry about the positions of the red and black tubing on the air motors. This can be switched at the control box if the drive directions do not feel correct.

Positioner Connections



TOP AND SIDE RAIL MOUNTS AND SNOOT INSTALLATIONS

The Top and Side Rail Mounts are similar except for the manway Trolley Clamp Assemblies. The Top Rail Mount is designed to mount at an angle from the top of the dome. The Side Mount is designed to be bolted directly to the flange on the side of the dome.

⚠ CAUTION

The Rail Mount Assembly is designed to support the Snout Carriage and Snout only.

DO NOT lean on the Rail Mount as this could result in minor or moderate injury.

To install the Top Rail Mount to the manway:

1. Correct placement of the Rail Mount in relation to the Linear Drive Rail should be more or less Perpendicular. This position helps relieve stress on the Snout and allows the hose to travel more freely. **(Figure 46)**
2. Center the manway flange between the Fingers of the Trolley Clamp and loosely tighten with the Twist Knobs. **(Figure 47)**
Do not insert the Snout into the dome until the Trolley Clamp is secured in place.
3. Make sure the Rail Mount is close to level to the floor, then securely tighten the Twist Knobs on the Trolley Clamp. If the Rail Mount comes loose it could cause damage to other components. **(Figure 48)**
4. Insert the Snout Assembly into the dome.

The next page contains instructions on how to install the Side Rail Mount. Skip this page and go to the "High Pressure Hose and Snout Installation" section if the Top Mount is installed.

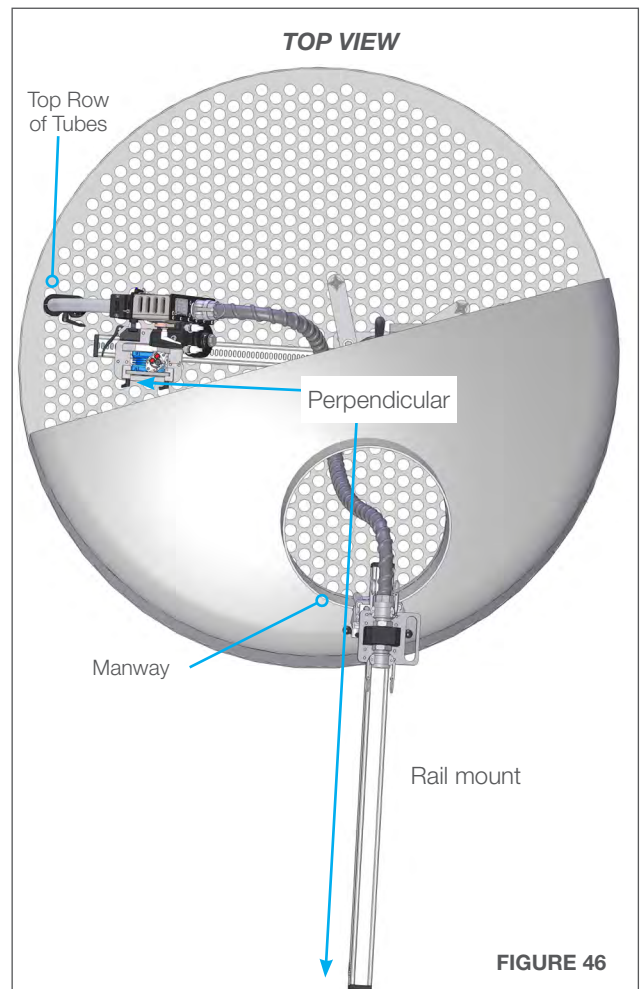


FIGURE 46

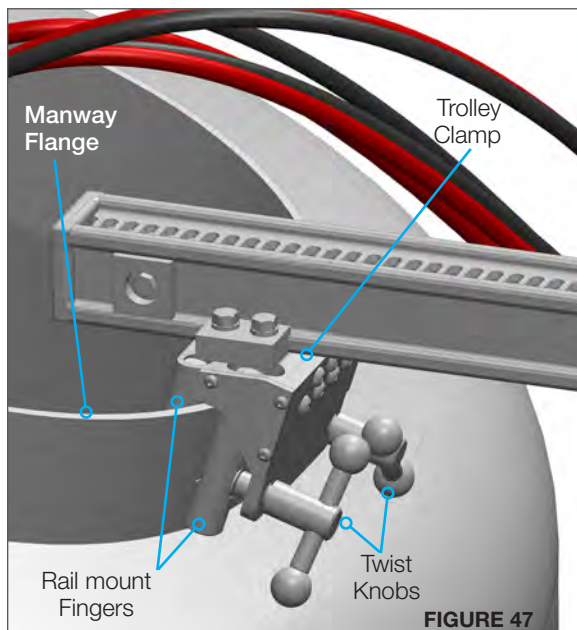


FIGURE 47



TECH TIP:

The Rail Mount may need to be adjusted so that it puts the least amount of lateral bend or stress on the Snout.

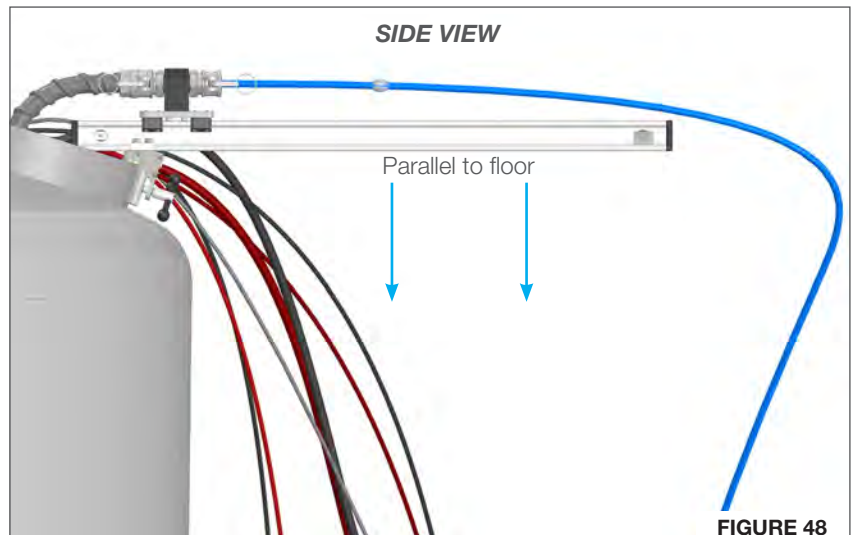
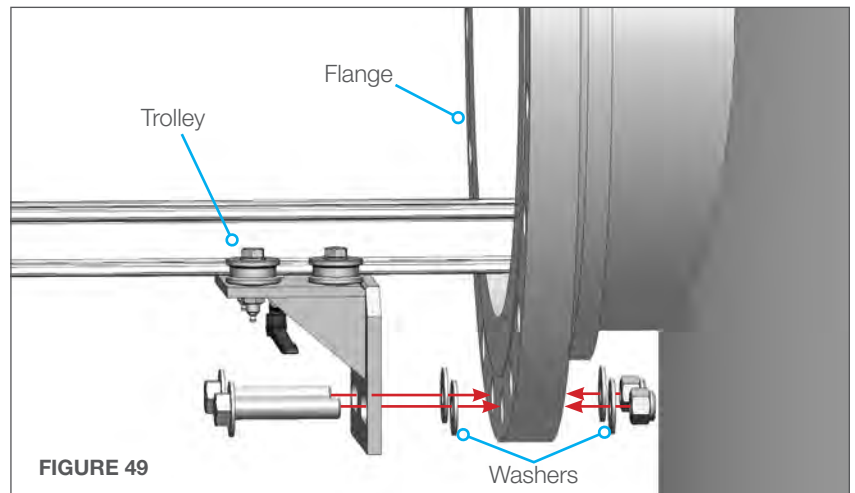


FIGURE 48

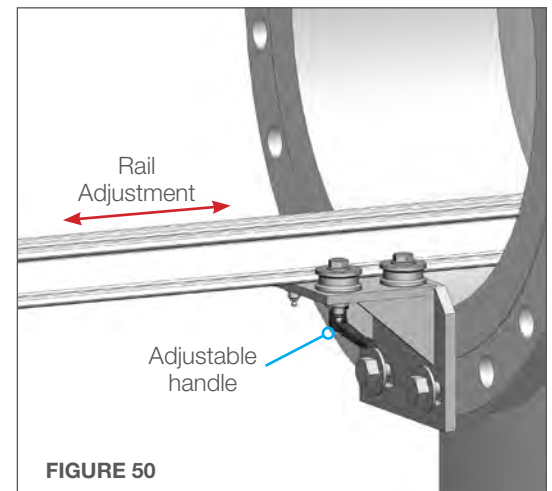
OPTIONAL DBP 330 SIDE RAIL MOUNT INSTALLATION

To install to the Side Rail Mount to the manway:

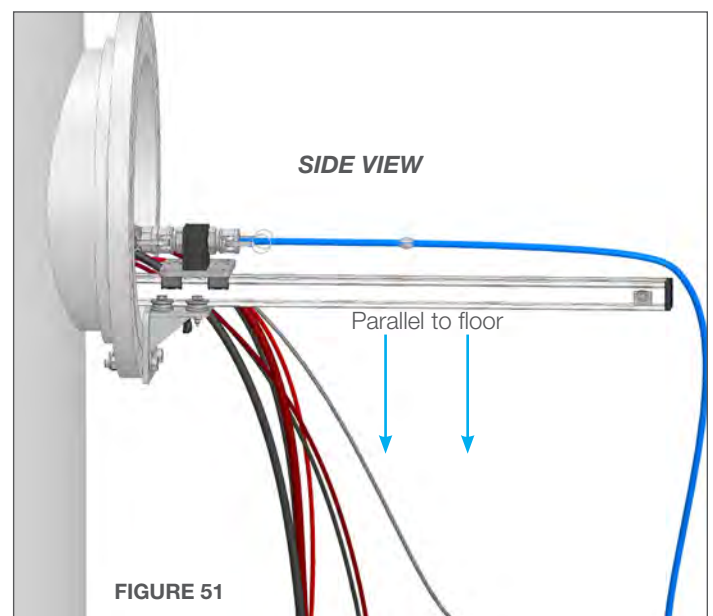
1. Fasten the Trolley at the six O'Clock position on the flange of the Manway. Use two 3/4" x 4" Hex Bolts, four 3/4" flat washers and two 3/4" Lock Nuts. Install one set of washers on either side of the flange as shown in **(Figure 49)**.



2. Loosening the Adjustable Handle on the Trolley will allow for adjustment of the Rail in and out of the dome. **(Figure 50)**



3. Make sure the Trolley Clamp is securely fastened. If the Rail Mount comes loose it could cause damage to other components. **(Figure 51)**
4. Insert the Snout Assembly with Hose and Tool into the dome.



The next page contains instructions on how to install the Snout and Hose on the ABX-PRO into the Guide Tube.

LOAD THE HOSE INTO THE ABX-PRO TRACTOR AND GUIDE TUBE/COLLET BLOCK

1. To load the hose, push up to release the Adjustable Handle and rotate the Cam Lever counterclockwise until the Indicator Pin is in the **"Disengaged"** position. This opens up the space between the rollers in the ABX-PRO Tractor. **(Figure 52)**

DO NOT CONNECT THE SNOOT TO THE ABX-PRO TRACTOR UNTIL THE HOSE END COMES OUT THE END OF THE GUIDE TUBE.
2. Remove the Collet from the Block and feed the end of the hose into and through the rollers of the ABX-PRO Tractor until it comes out the end of the Guide Tube. **(Figure 53)**
3. After the hose end is through the Guide Tube, insert the Collet back into the Block. Pull open the ring tabs on the Camlock end of the Snout, slide it over the ABX-PRO guide, and push the ring tabs back down on the Camlock to secure in place. **(Figure 53)**

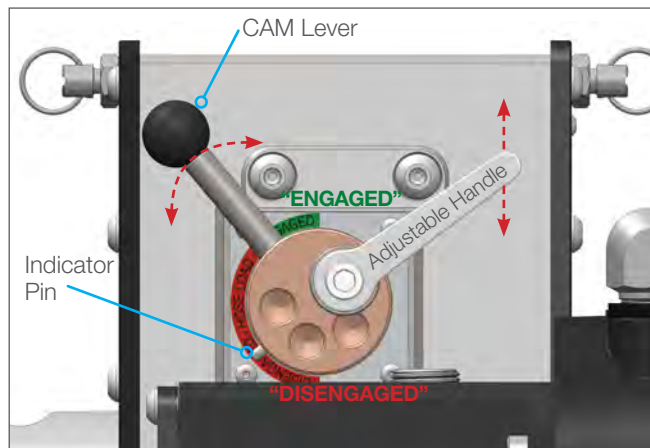


FIGURE 52

INSTALL THE BANSHEE ON THE END OF THE HOSE

1. Loosen the Collet Block Cap and rotate the Guide Tube 90° to Install Banshee Tool onto the High-Pressure Hose. Rotate the Guide Tube back so that the Tool is facing the tube face. **(Figures 54 & 55)**
2. Rotate the Cam Lever clockwise to the **"Engaged"** position to tighten the Idler Roller down onto the hose. There should be a slow slip on the hose. If the slip is too tight or loose, move the CAM Lever off until a slow slip is obtained. Once the slip level is achieved, push down on the Adjustable Handle to secure in place. **(Figure 52)**

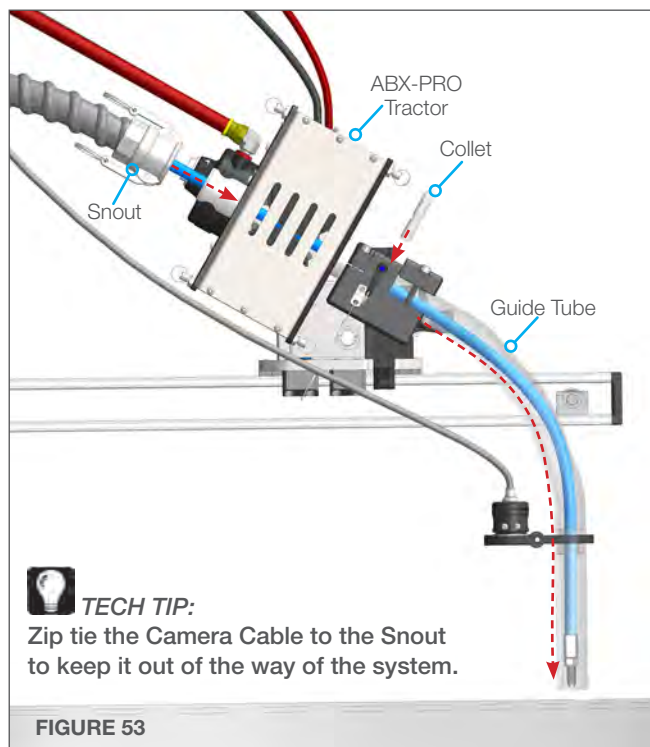


FIGURE 53

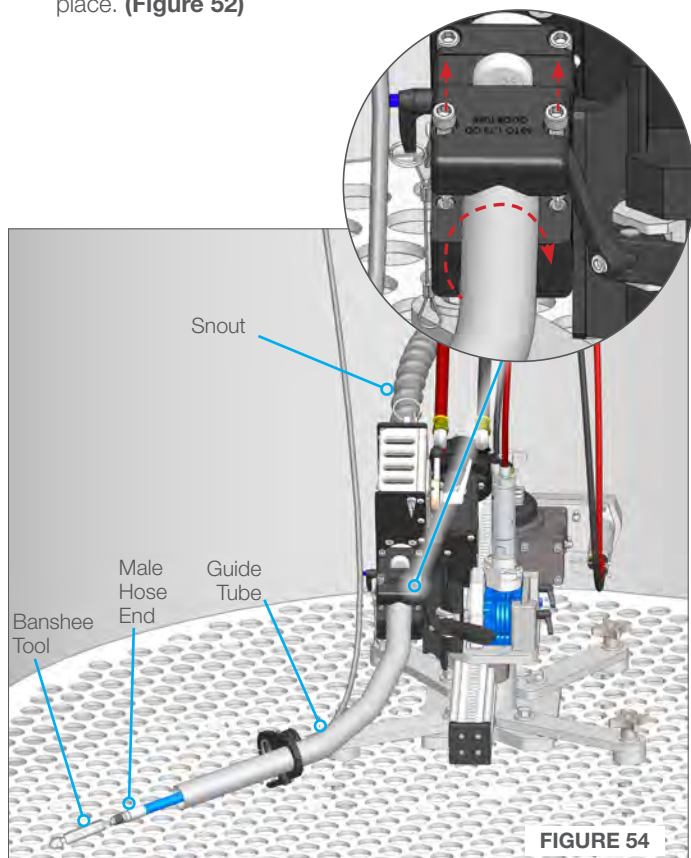


FIGURE 54

NOTICE

DO NOT USE A PIPE WRENCH OR PLIERS WITH TEETH

This can crush and crack the hardened steel body, leading to tool breakage during operation.

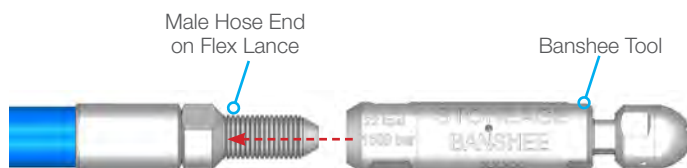


FIGURE 55

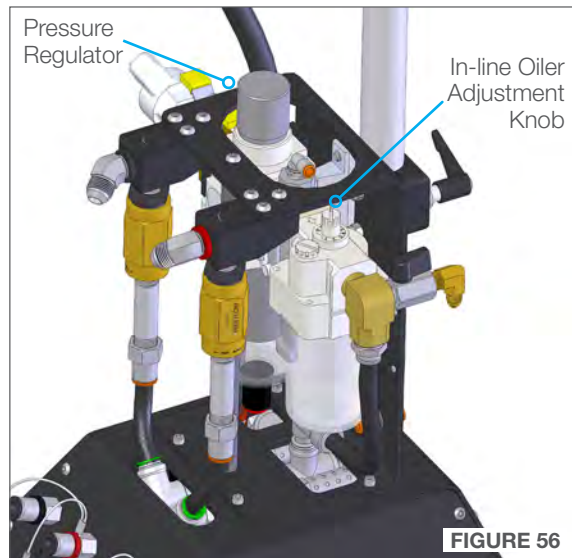
OPERATION

CONTROL BOX SETTINGS

1. Using the Pressure Regulator on the FRL, adjust the operating pressure to 100 psi (6,8 bar) for the application. **(Figure 56)**
2. Adjust in-line oiler to feed 1 drop of oil every 30-60 seconds for high speed or continuous duty usage. **(Figure 56)**

⚠ WARNING

Maximum operating 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.



CONTROL PANEL OPERATION

The Control Box consists of a base unit with a tethered Remote Box to allow the operator to easily move around if desired. There are four levers on the Remote Box: **DUMP**, **FEED**, **LINEAR**, and **ROTARY**. The levers are spring loaded to return to the center, **OFF** position.

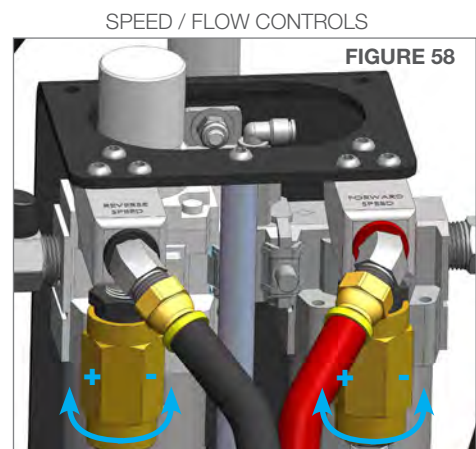
The **DUMP** lever, when pushed forward, provides air to the 1/4" push-connect fitting that is intended to supply air to a pneumatic dump valve to divert high-pressure water to the tool.

When the **FEED** lever is pushed forward, it drives the flex lance and tool forward into the pipe. When the **FEED** lever is pulled backward, it retracts the flex lance and tool from the pipe.

Forward and Reverse **FEED SPEED** can be adjusted independently using the brass colored flow control valves on the base of the control box. The Forward and Reverse directions are labeled. Rotate the flow controls in the clockwise direction to increase the speed and counterclockwise to slow the speed. Slow speeds are required to go forward through bends. Faster speeds are acceptable during retraction.

The **LINEAR** lever moves the Linear Drive along the Slotted Rail.

The **ROTARY** lever allows the COMPASS Positioner Assembly to pivot clockwise and counterclockwise from the Spider Plate mount.



⚠ DANGER

Do NOT run the positioner until all operators are outside of the dome and the system is ready to run.

TEST RUN PROCEDURE

- Perform the **PRE-RUN SAFETY CHECK**
Follow “THE WARNING AND SAFETY INSTRUCTIONS” section in this manual.
- Plug the Power Supply into a standard power outlet (US OR EU).
- Push the Power Button ON the Power Pack. This will activate the Monitor Screen on the Control Box and allow sight into the Dome. **(Figure 59)**
- Ensure the appropriate Hose Stop installed securely on the Hose.
- Align the Guide Tube as closely as possible to the exchanger tubes before advancing the Banshee into each tube.
- Adjust the hose feed speed controls on the Control Box. Proper forward and reverse speeds will vary, depending on the type of material being removed and the tube size. Adjustment of the hose feed speed controls may be necessary during operation in order to optimize cleaning and overall productivity.
- Operate the high-pressure water at full pressure and use the **DUMP CONTROL** to verify that the dump valve is working properly.



TECH TIP:

If the Linear and Rotary Directions don't feel intuitive, switch the connections that are labeled “Rotary” and “Linear” on the Base.

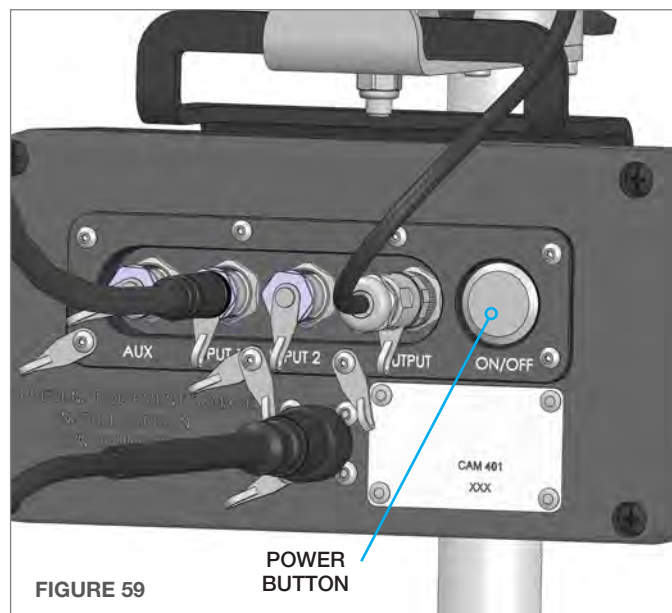


FIGURE 59

POWER
BUTTON

RUN PROCEDURE

- Loosely install the Hose Stop on the hose. **(Figure 60)**
- Feed forward and advance the Banshee Tool into the tube bundle at low pressure and listen for the high pitched whistle of the Banshee Tool exiting the tubes at the far side of the heat exchanger. There is no visibility to the end of the tubes, so listening for the high pitched whistle of the Banshee Tool exiting the tubes is critical to proper Hose Stop set up.
- When the Banshee Tools have exited the tubes, stop the forward movement of the lance and dump the high pressure water.
- Move the Hose Stop into the approximate position shown in **(Figure 60)**, and tighten it onto the Hose.
- Retract the Tool back into the Guide Tubes.
- Using the Linear and Rotary Drive Controls, locate the first tube to be cleaned on the Camera Monitor. **(Figure 61)**
- Close the dump and gradually increase the pump to the desired operating pressure.
- Feed forward and advance the tool into the tube bundle and follow the cleaning pattern as shown in **(Figure 61)** until the first half is complete.
- Make sure all tubes have been cleaned in the reachable area before moving the Spider Mount. A key indicator of a dirty tube could be scale or other materials on the outer rim. Cleaned tubes should appear shiny on the outer rim.
- Before moving the Spider Mount to clean the tubes underneath it; dump the high pressure water to de-energize the system, turn off the pump, temporarily disconnect Sub-Assembly 1 from the Linear Drive. **It will be helpful to mark the center of the tube face.**

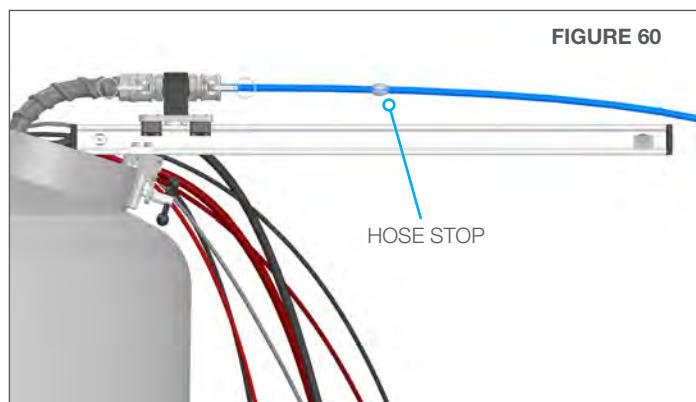


FIGURE 60

HOSE STOP

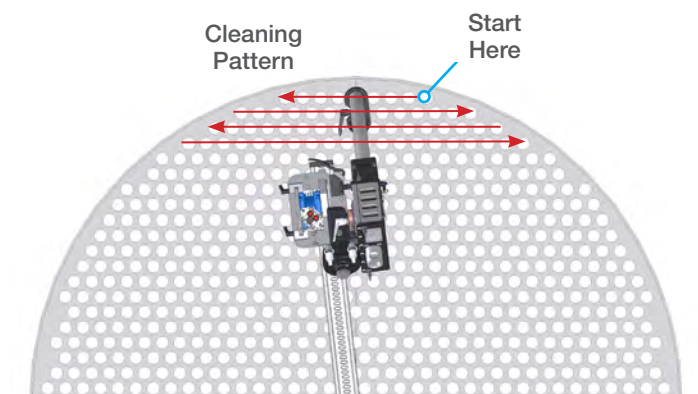
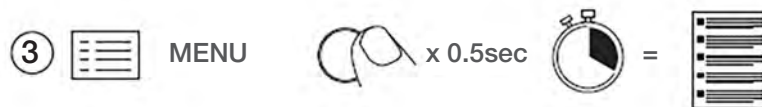
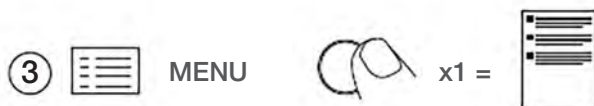
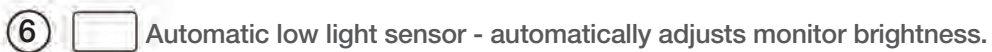
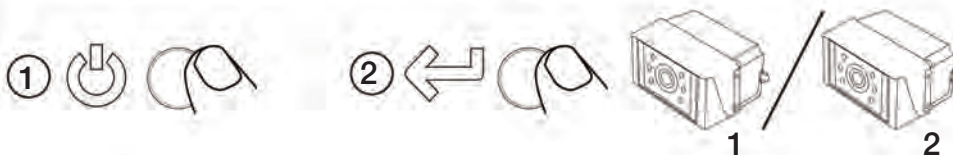
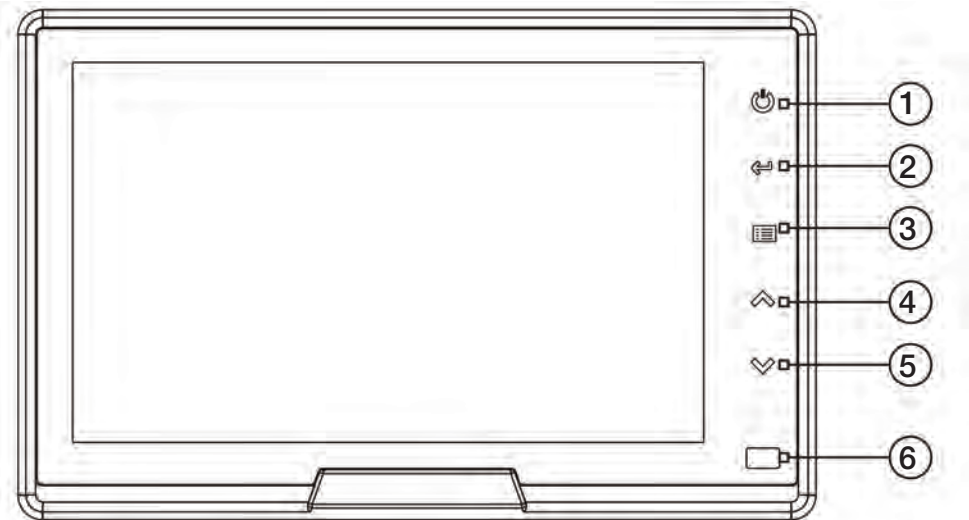


FIGURE 61

Controls






Operation

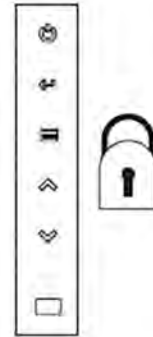
Auto Power 

③  MENU  x 20sec  =





 ?  

③  MENU  x 20sec  =

 ?  


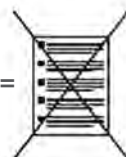


Set up menu

③  MENU  x 0.5sec  

1. CAMERA SETTING
2. TRIGGER SETTING
3. AUTO SCAN SETTING
4. DAY/NIGHT SETTING
5. **ADVANCED MENU**

1. **LANGUAGE: [ENGLISH;
DEUTCH; FRANCAIS;
ITALIANO; ESPANOL]**
2. **AUTO POWER: [ON]**
3. **FACTORY RESET**

 MENU = 

MAINTENANCE AND TROUBLESHOOTING

MAINTENANCE		
Maintenance Item	Frequency	Maintenance Required
Air Motors	After each use	Apply a small amount of air tool oil directly into the forward and reverse fittings. Then, briefly operate the controls at slow speed for a short duration in each direction to coat the interior parts of the motor.
All Air Fittings	After each use	Always use the supplied plugs and caps to seal the air motor ports when not in use. Make sure the plugs are clean and/or wipe them off before inserting them into the air motor fittings.
All components the hoses pass through	After each use	As wear occurs the rounded edges could become sharp and damage hoses. Any components showing excessive wear should be replaced.
Roller grooves	Before each use	Replace roller if cuts or roughness is present. (See the Roller Removal and Installation pages in this manual)
Hose	After each use	Install cap on threads to protect threads and prevent contamination.
Lubricator of Control Box	Before each use	Add oil when fluid drops below minimum level marking.
Guide Tube/Collet Block	After each use	Wash out any material build up to prevent components from being clogged.
Waterblast Tool	After each use	Remove tool, lubricate and store in clean container.
Rotary Drive	Every 8 hours of use	Lubricate the two Zerks on the Rotary Drive with 1 to 2 pumps of any multipurpose NLGI 2 grease.

TROUBLESHOOTING	
Problem	Solution
No air is delivered to tool	<ul style="list-style-type: none"> -Check that shut-off valve near regulator is open -Check that regulator is set to 100 psi -Open flow control valves by rotating the brass colored speed controls in the counterclockwise direction.
Hose is being damaged by Rollers	<ul style="list-style-type: none"> -Check that the proper Rollers are installed (see roller and collet reference plate) -Loosen CAM lever on ABX-PRO Tractor to reduce clamp force on hose. -Check Rollers for excessive wear in groove
Hose slippage on Rollers	<ul style="list-style-type: none"> -Check that the proper Rollers are installed (see roller and collet reference plate) -Tighten CAM lever on ABX-PRO Tractor to retain clamp force on hose.

Contact StoneAge for Safety Data Sheets for material usage, a complete list of spare part numbers, and service instructions for the COMPASS Positioner (COMPASS), and CONTROL BOX (CB-PROP-P).

STORAGE, TRANSPORTATION, AND HANDLING

Use mild soapy water to clean the equipment in order to remove corrosive materials. Before storing the unit, use compressed air to blow off debris and moisture. Apply a small amount of air tool oil directly into the Linear and Rotary 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. Always use the supplied plugs and caps to seal the air motor ports when not in use. Make sure the plugs are clean and/or wipe them off before inserting them into the air motor fittings.

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

TABLE OF CONTENTS

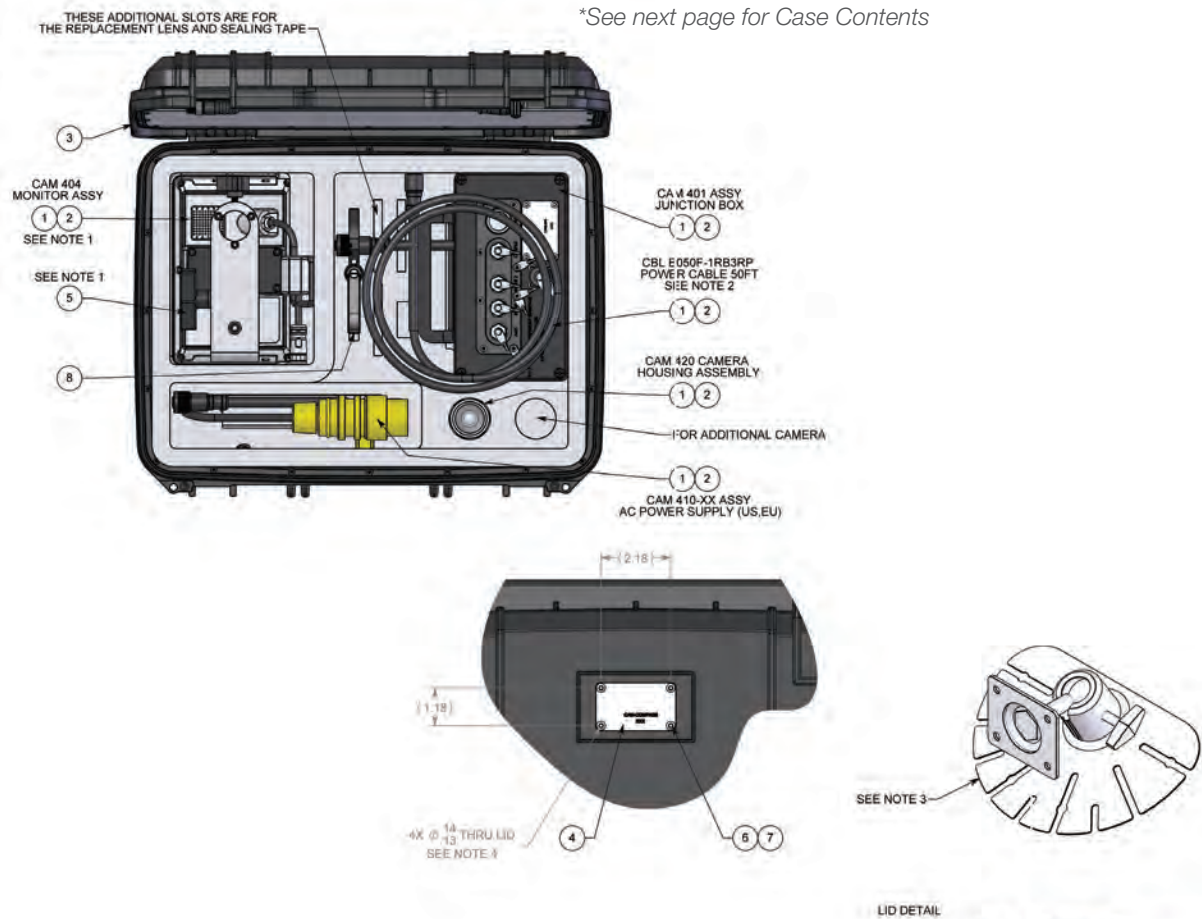
CAM-COMPASS-XX CAMERA SYSTEM	40
CAM 400-XX CAMERA BASE ASSEMBLY	41
CAM 404 MONITOR ASSEMBLY	41
CB 468 MONITOR MOUNT ASSEMBLY	42
DBP 305 RAIL PLUG ASSEMBLY	42
DBP 320 ICM (TOP MOUNT) TROLLEY CLAMP ASSEMBLY	43
DBP 330 DELTA T (SIDE MOUNT) TROLLEY CLAMP ASSEMBLY	43
PROP 187-XX-K EXPANSION PLUG KIT	44
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Please see the User Manuals for the ABX-PRO Hose Tractor and the Compass Positioner for more detailed information on those components. <https://www.stoneagetools.com/manuals>

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

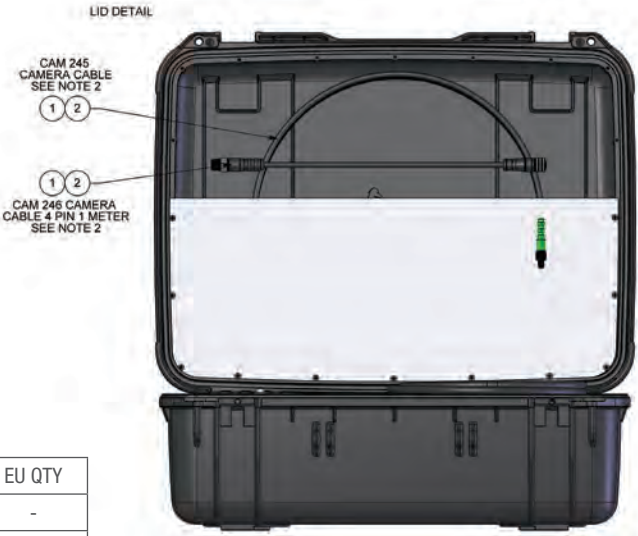
CAM-COMPASS-XX
CAMERA WITH CASE KIT

*See next page for Case Contents



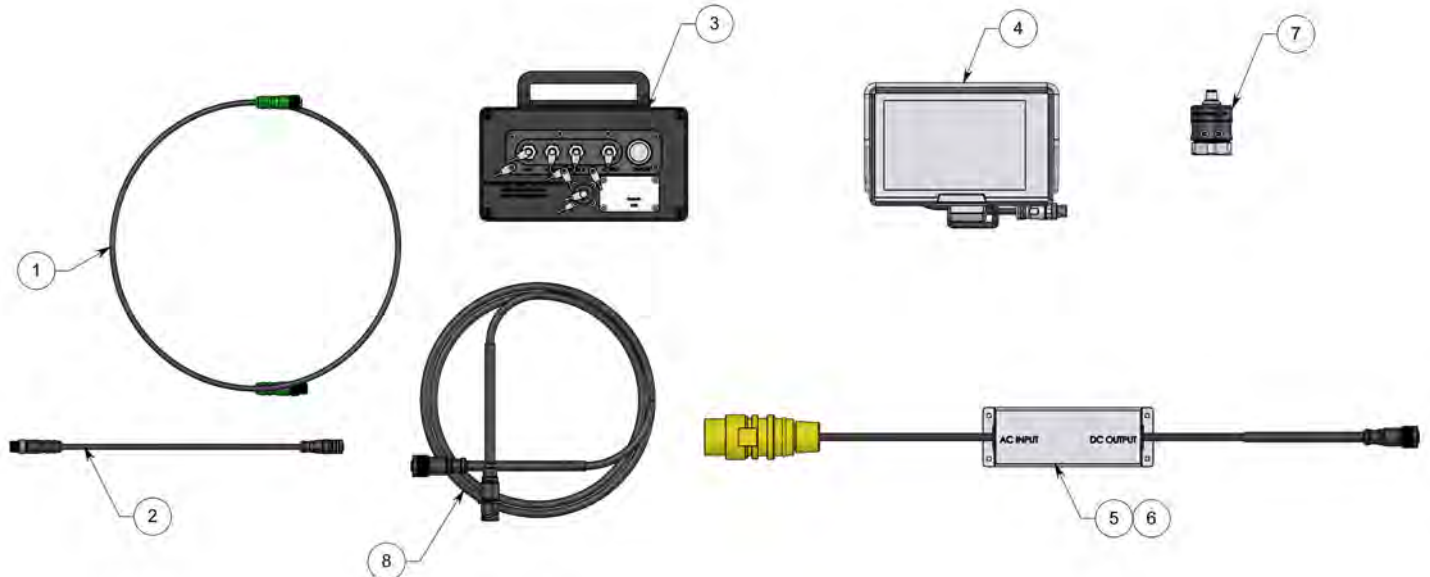
NOTES:

1. ATTACH CB 468 BRACKET ASSY TO THE CAM 404 MONITOR ASSY (PART OF THE CAM 400-XX) USING THE CB 468 SUPPLIED HARDWARE. FOLD BRACKET ASSY AND PLACE MONITOR FACE DOWN IN CASE AS SHOWN.
2. PLACE ALL CABLES INTO LID POUCH IF POSSIBLE. LAY INSIDE IF NECESSARY.
3. PLACE ALL ADDITIONAL HARDWARE FROM CAM 404 MONITOR ASSY (SCREWS AND BRACKET) IN A BAG. PLACE BAG INTO THE LID POUCH WITH CABLES.
4. INSTALL SERIAL PLATE IN LID OF CASE AS SHOWN. DRILL HOLES BY HAND USING PLATE AS TEMPLATE.



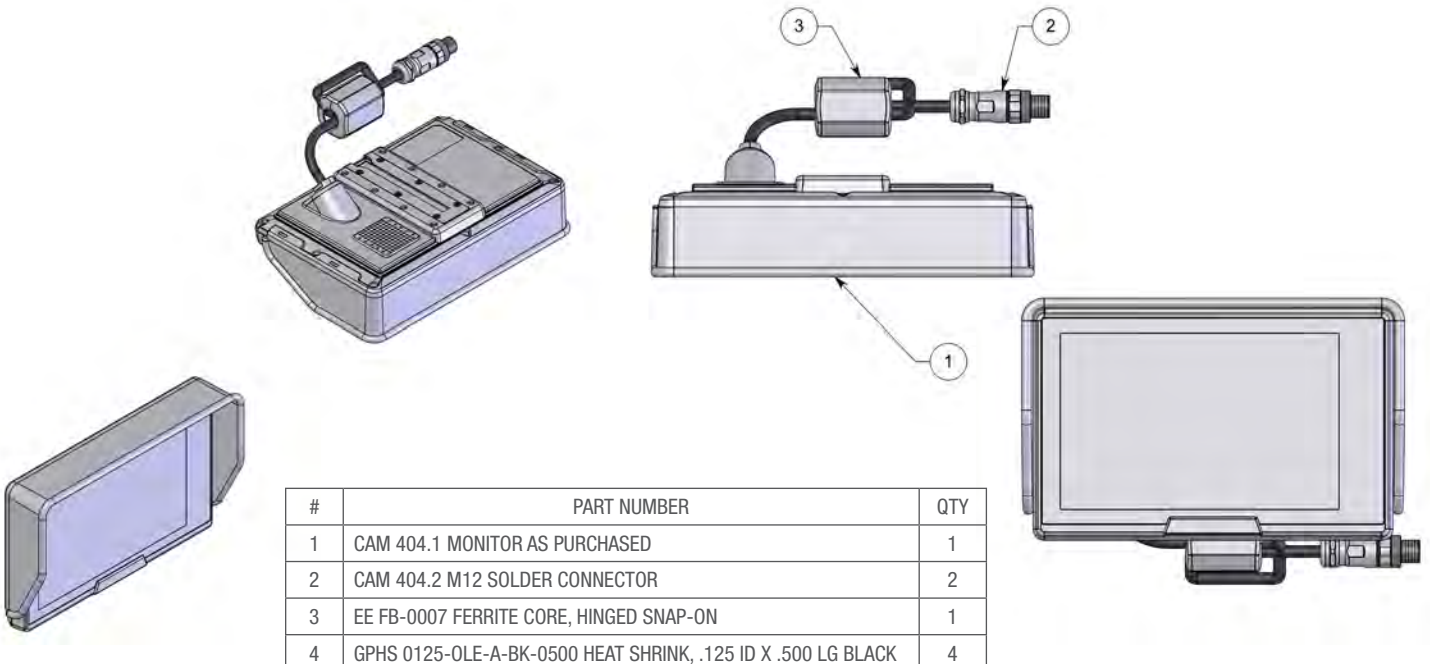
#	PART NUMBER	US QTY	EU QTY
1	CAM 400-US ASSY, CAMERA (BASE) US	1	-
2	CAM 400-EU ASSY, CAMERA (BASE) EU	-	1
3	CAM 430 ASSEMBLY, CAMERA CASE	1	1
4	CAM 438 SERIAL NUMBER PLAQUE, FCC CE SMALL	1	1
5	CB 468 MONITOR MOUNT ASSY, COMPASS CONTROL BOX	1	1
6	GR 125-AL- 313-375-S RIVET, BLIND, SEALING, DOMED, ALUM, Ø.125, .313-.375 L	4	4
7	GRW 125-SS WASHER, RIVET .125 SS	4	4
8	PROP 440-24 CAMERA MOUNT ASSY FOR DBP	1	1

CAM 400-XX (US OR EU)
BASE CAMERA ASSEMBLY



#	PART NUMBER	US QTY	EU QTY
1	CAM 245 CAMERA CABLE	1	1
2	CAM 246 CAMERA CABLE 4 PIN 1 METER	1	1
3	CAM 401 ASSY, JUNCTION BOX	1	1
4	CAM 404 MONITOR ASSEMBLY	1	1
5	CAM 410-EU ASSY, AC POWER SUPPLY (EU)	-	1
6	CAM 410-US ASSY, AC POWER SUPPLY (US)	1	-
7	CAM 420 CAMERA HOUSING ASSEMBLY	1	1
8	CBL E050F-1RB3RP POWER CABLE 50ft	1	1

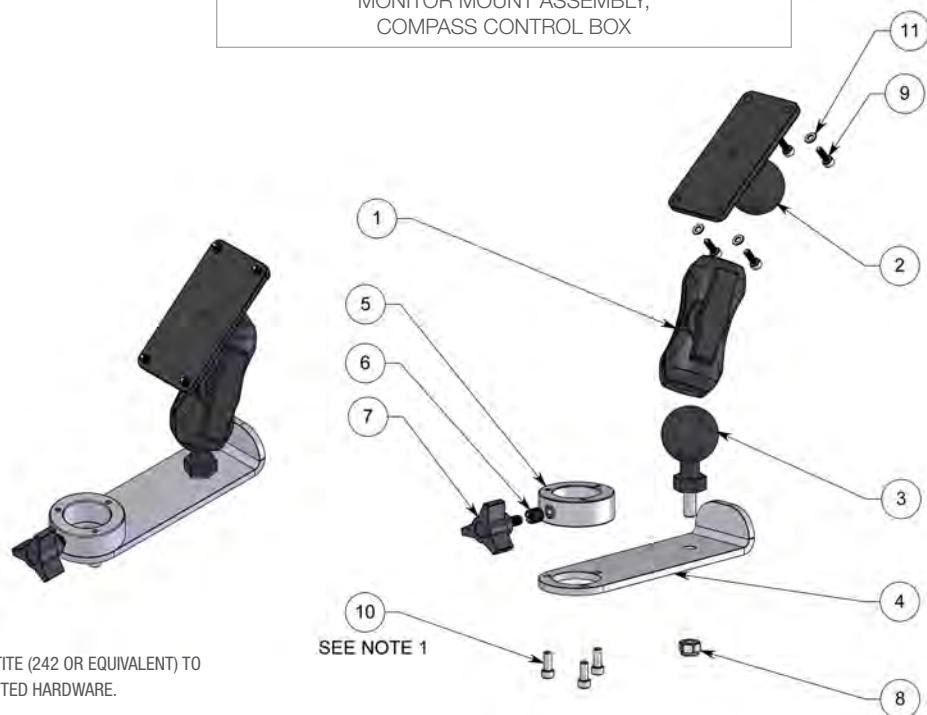
CAM 404
MONITOR ASSEMBLY



#	PART NUMBER	QTY
1	CAM 404.1 MONITOR AS PURCHASED	1
2	CAM 404.2 M12 SOLDER CONNECTOR	2
3	EE FB-0007 FERRITE CORE, HINGED SNAP-ON	1
4	GPHS 0125-OLE-A-BK-0500 HEAT SHRINK, .125 ID X .500 LG BLACK	4

PART DIAGRAMS

CB 468 MONITOR MOUNT ASSEMBLY, COMPASS CONTROL BOX



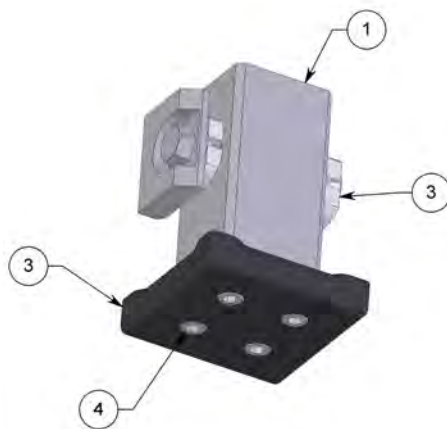
NOTE:

1. APPLY BLUE LOCTITE (242 OR EQUIVALENT) TO
THREADS OF ALL NOTED HARDWARE.

#	PART NUMBER	QTY
1	CAM 087 BALL-GRIP POSITIONING ARM	1
2	CAM 090 BALL BASE, 1.5 X 3.5 PATTERN	1
3	CAM 091 STUD BASE, BALL GRIP 5/16-18 STUD	1
4	CB 462 POLE PLATE	1
5	CB 724 MODIFIED COLLAR	1

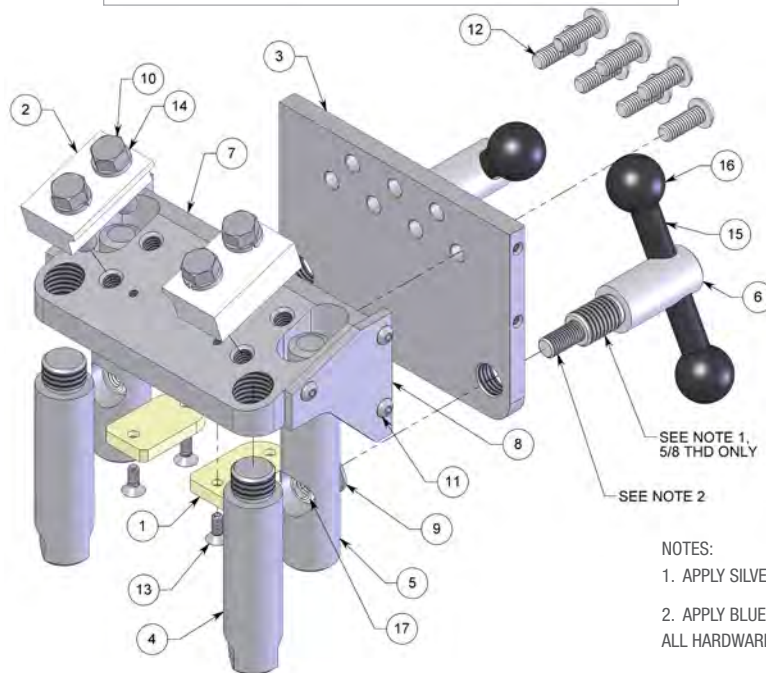
6	CB 725 THREAD LOCKING SLOTTED INSERT, 1/4-20 x 3/8-16	1
7	CB 726 THREE LOBE KNOB, .25-20	1
8	GN 531-L NUT, NYLOK .31-18	1
9	GS 3M4-12-0.7 SHCS M4x0.7 x 12 SS	4
10	GS 319-02-32 SHCS 10-32 x .50 SS	3
11	GW 3M4-F WASHER, FLAT M4, STAINLESS	4

DBP 305 RAIL PLUG ASSEMBLY



#	PART NUMBER	QTY.
1	DBP 182 RAIL BLOCK	1
2	DBP 305.1 RAIL PLUG	1
3	PROP 008-2.5-001 2.5" WEDGE BOLT ASSEMBLY	1
4	TB 050 SHCS .25-20 X .75 SS	4

DBP 320
ICM (TOP MOUNT) TROLLEY CLAMP ASSEMBLY



NOTES:

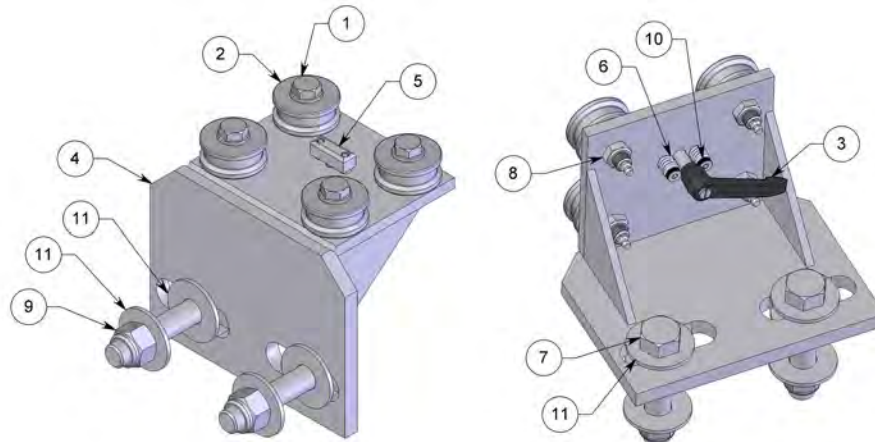
1. APPLY SILVER BOSTIK NEVER SEEZ (OR. EQUIV.) AS NOTED.
2. APPLY BLUE LOCTITE (242 OR EQUIVALENT) TO THREADS OF ALL HARDWARE, EXCEPT IF NOTED.

#	PART NUMBER	QTY.
1	ABX 573 CLEVIS BEARING PAD	2
2	BR 060-D RAIL CLAMP, DRILLED	2
3	DBP 321 PUSH PLATE	1
4	DBP 322 THREADED ROD	2
5	DBP 323 THREADED ROD PLUNGER	2
6	DBP 324 RAIL CLAMP SHAFT	2

7	DBP 325 TOP PLATE	1
8	DBP 326 GUSSET	2
9	DBP 327 HIGH LOAD THRUST BEARING	2
10	GB 337-05 BOLT, HEX .37-16 X 1.25 SS	4
11	GSB 319-02 BHCS 10-24 X .50 SS (TR130 235)	6
12	GSB 331-03 BHCS .31-18 X .75 SS	7

13	GSF 319-02 FHCS .19-24 X .50 SS (CB 555)	4
14	GW 337-L LOCK WASHER SS	4
15	LWP 531 RAIL CLAMP LEVER	2
16	LWP 532 RAIL CLAMP KNOB	4
17	SRT 333 NYLOCK NUT SS THIN (SEE GN 337-LJ)	2

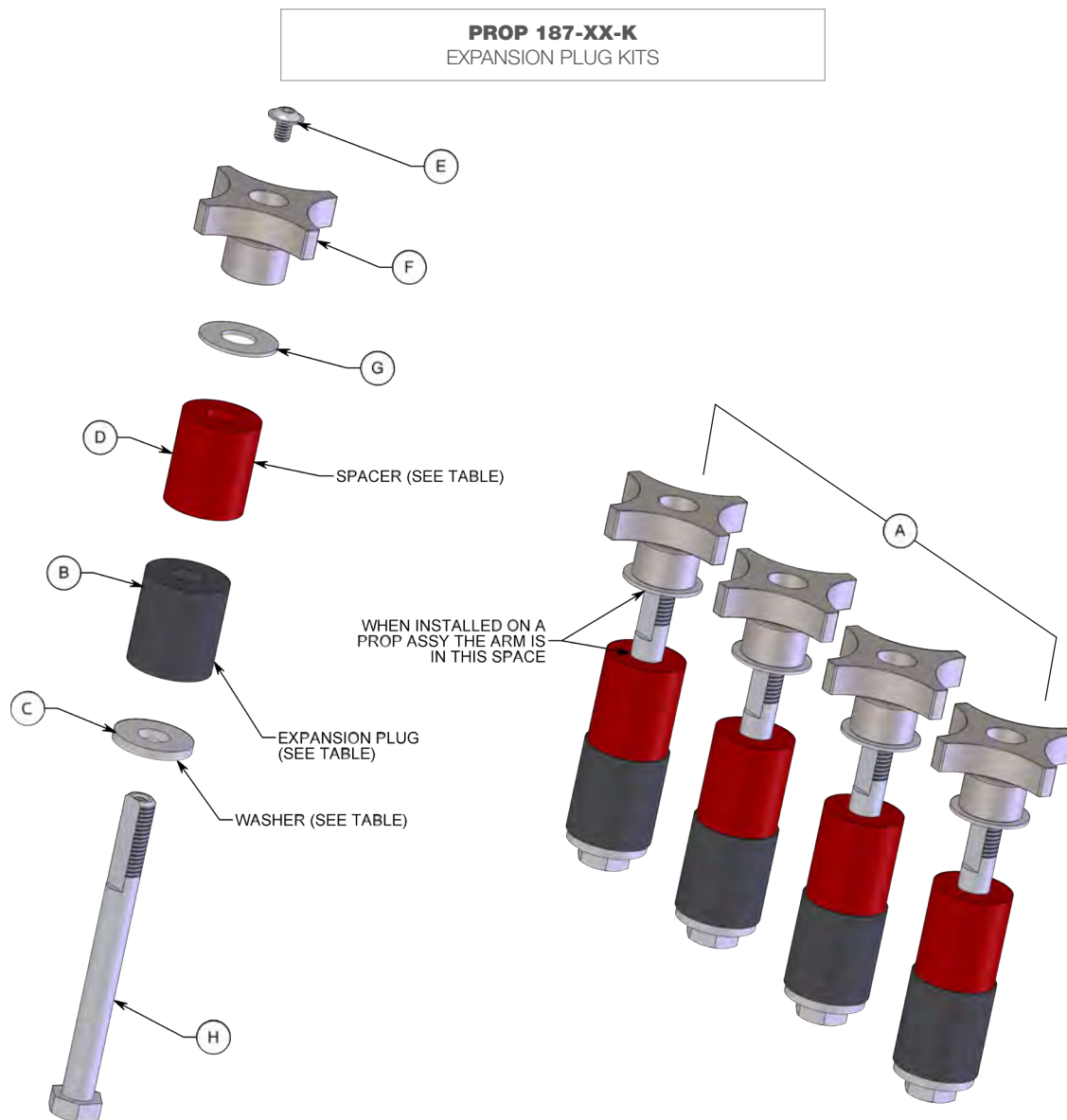
DBP 330
DELTA T (SIDE MOUNT) TROLLEY CLAMP ASSEMBLY



#	PART NUMBER	QTY.
1	BR 051-2.0-0 AXLE-ZERK	4
2	BR 055 ROLLER ASSY	4
3	BU 151 HANDLE	1
4	DBP 310 BOX RAIL FLANGE MOUNT WELDMENT	1
5	FF 163 SLIDE STOP	1

6	FF 164 SS COMPRESSION SPRING	2
7	GB 575-16 BOLT, HEX .75-10 X 4.00	2
8	GN 350-LJ NYLOK NUT THIN SS	4
9	GN 575-L NYLOK NUT	2
10	GSSH 0312-1000-SS SHOULDER SCREW	2
11	GW 575-F FLAT WASHER	6

PART DIAGRAMS



Tube ID Range:		A	B	C	D	E	F	G	H
Inches	mm	Kit Part Number	Expansion Plug	Washer	Spacer	Knob screw	Knob	Washer	Bolt
0.901-0.982	22.88-24.95	PROP 187-22-K	DBP-187-22	DBP 188-20	PROP 435-20	GSB 325-015-F	PROP 438	GW 350-F	PROP 437-001
0.983-1.064	24.96-27.03	PROP 187-24-K	DBP-187-24	DBP 188-22	PROP 435-22				
1.065-1.146	27.04-29.11	PROP 187-26-K	DBP-187-26	DBP 188-24	PROP 435-24				
1.146-1.228	29.12-31.19	PROP 187-28-K	DBP-187-28	DBP 188-26	PROP 435-26				
1.228-1.310	31.20-33.27	PROP 187-30-K	DBP-187-30	DBP 188-28	PROP 435-28				
1.310-1.392	33.28-35.35	PROP 187-32-K	DBP-187-32	DBP 188-30	PROP 435-30				
1.392-1.473	35.36-37.43	PROP 187-34-K	DBP-187-34	DBP 188-32	PROP 435-32				
1.474-1.555	37.44-39.50	PROP 187-36-K	DBP-187-36	DBP 188-34	PROP 435-34				
1.556-1.637	39.52-41.58	PROP 187-38-K	DBP-187-38	DBP 188-36	PROP 435-36				
1.638-1.719	41.60-43.66	PROP 187-40-K	DBP-187-40	DBP 188-38	PROP 435-38				
1.720-1.801	43.68-45.74	PROP 187-42-K	DBP-187-42	DBP 188-40	PROP 435-40				
1.802-1.883	45.76-47.82	PROP 187-44-K	DBP-187-44	DBP 188-42	PROP 435-42				
1.883-1.965	47.84-49.90	PROP 187-46-K	DBP-187-46	DBP 188-44	PROP 435-44				
1.965-2.046	49.92-51.98	PROP 187-48-K	DBP-187-48	DBP 188-46	PROP 435-46				

**LINEAR DRIVE HANDLE
REPLACEMENT PARTS**

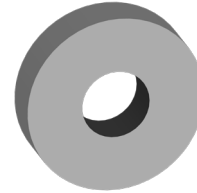
PROP 337

ADJUSTABLE M8 HANDLE



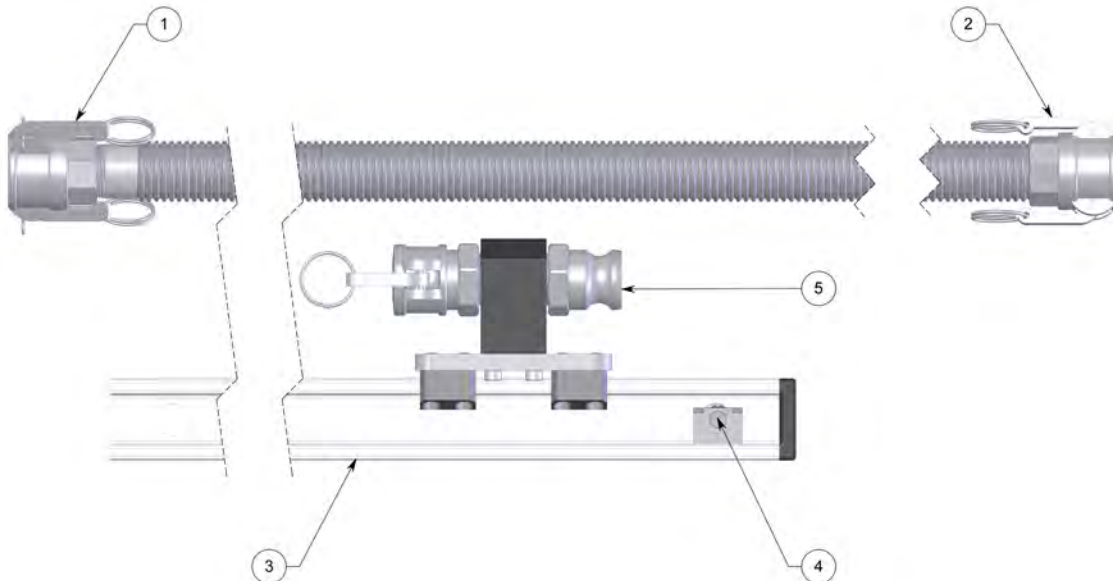
PROP 339

FLAT OVERSIZED M8 WASHER



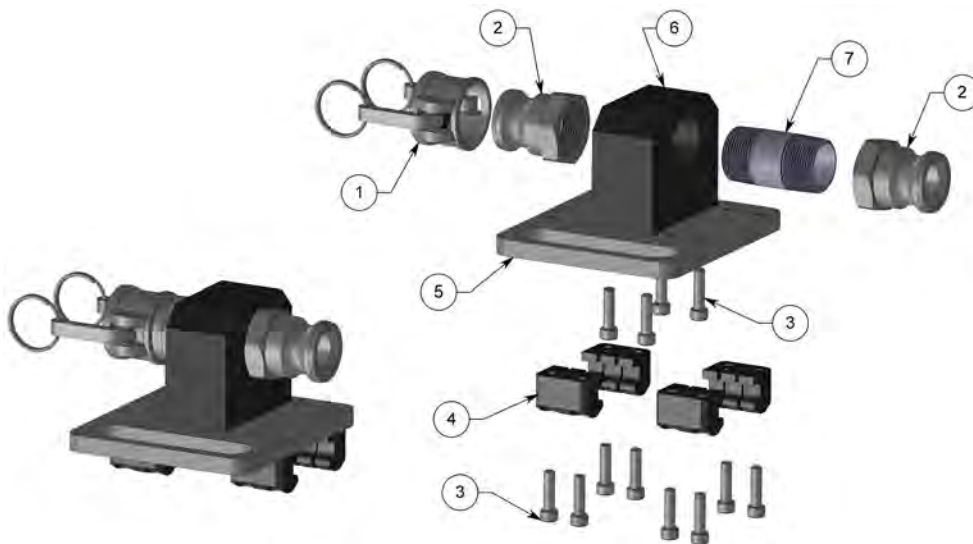
PROP 420

RAIL FLANGE MOUNT ASSEMBLY



#	PART NUMBER	QTY.
1	BOP 085 CAM LOCK 1.25F X 1.25 FNPT	1
2	BOP 090-7-001 SNOUT, CORRUGATED, 1.25 CAMLOCK, 7FT	1
3	BR 002-3.75-001 2.5" BOX RAIL EXTENSION	1
4	DBP 305 RAIL PLUG ASSY	1
5	PROP 425 SNOUT CARRIAGE ASSEMBLY	1

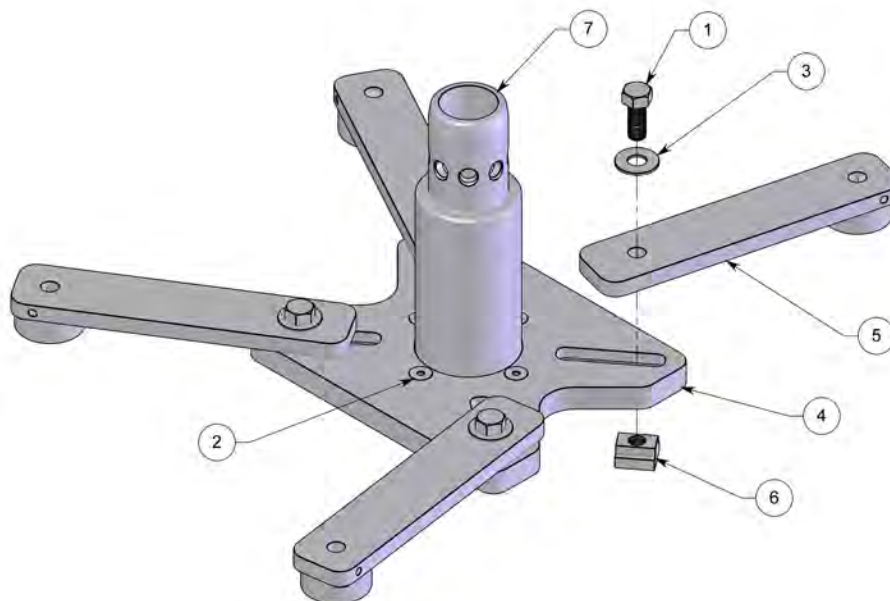
PROP 425 SNOUT CARRIAGE ASSEMBLY



#	PART NUMBER	QTY
1	BOP 048 HOSE STOP ADAPTER, PRODRIVE	1
2	BOP 091 316 STAINLESS STEEL CAM-AND-GROOVE HOSE COUPLING, 1-1/4, PLUG, 1-1/4 NPT FEMALE END	2
3	GS 3M8-30-1.25 SHCS M8X1.25 X 30 SS	12

4	PROP 332 RAIL SLIDE, PLASTIC	4
5	PROP 421 PLATE, SNOUT CARRIAGE	1
6	PROP 422 BLOCK, NIPPLE MOUNT	1
7	PROP 424 FTG, NIPPLE 1.25NPT X 3.0 LG ALUMINUM	1

PROP 430-001 SPIDER PLATE ASSEMBLY



#	PART NUMBER	QTY.
1	GB 350-05 BOLT, HEX .50-13 X 1.25 SS	4
2	GSF 331-03-24 FHCS .31-24 X .75 SS	4
3	GW 350-F WASHER, FLAT .50 SS	4

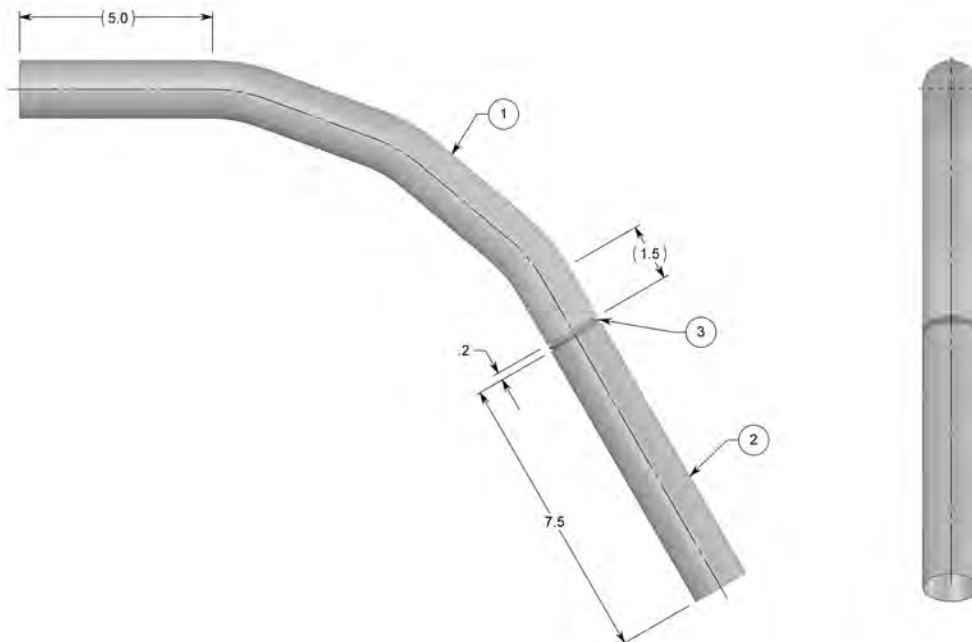
4	PROP 431 SPIDER PLATE	1
5	PROP 434 SPIDER PLATE WELDMENT	4
6	PROP 436 NUT, T-SLOT .50-13	4
7	PROP 452 SHAFT, SPIDER MOUNTING	1

PROP 440-24
CAMERA MOUNT



#	PART NUMBER	QTY
1	DB 242 DOWEL PIN, .25 OD X 1.125 LENGTH	1
2	HRS 530 HANDLE, ADJUSTABLE	1
3	PROP 441-24 PLATE, CAMERA CLAMP 1.5 INCH	1

PROP 460-BN24
GUIDE WELDMENT BN24



#	PART NUMBER	QTY
1	PROP 460.1-BN24 GUIDE TUBE, 60 DEG FOR BN24	1
2	PROP 460.2 GUIDE TUBE BN24	1
3	PROP 460.3 GUIDE TUBE INSERT BN24	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.stoneagetools.com/terms>

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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COMPASS POSITIONER (PROP-300) AND CONTROL BOX (CB-PROP-P) USER MANUAL

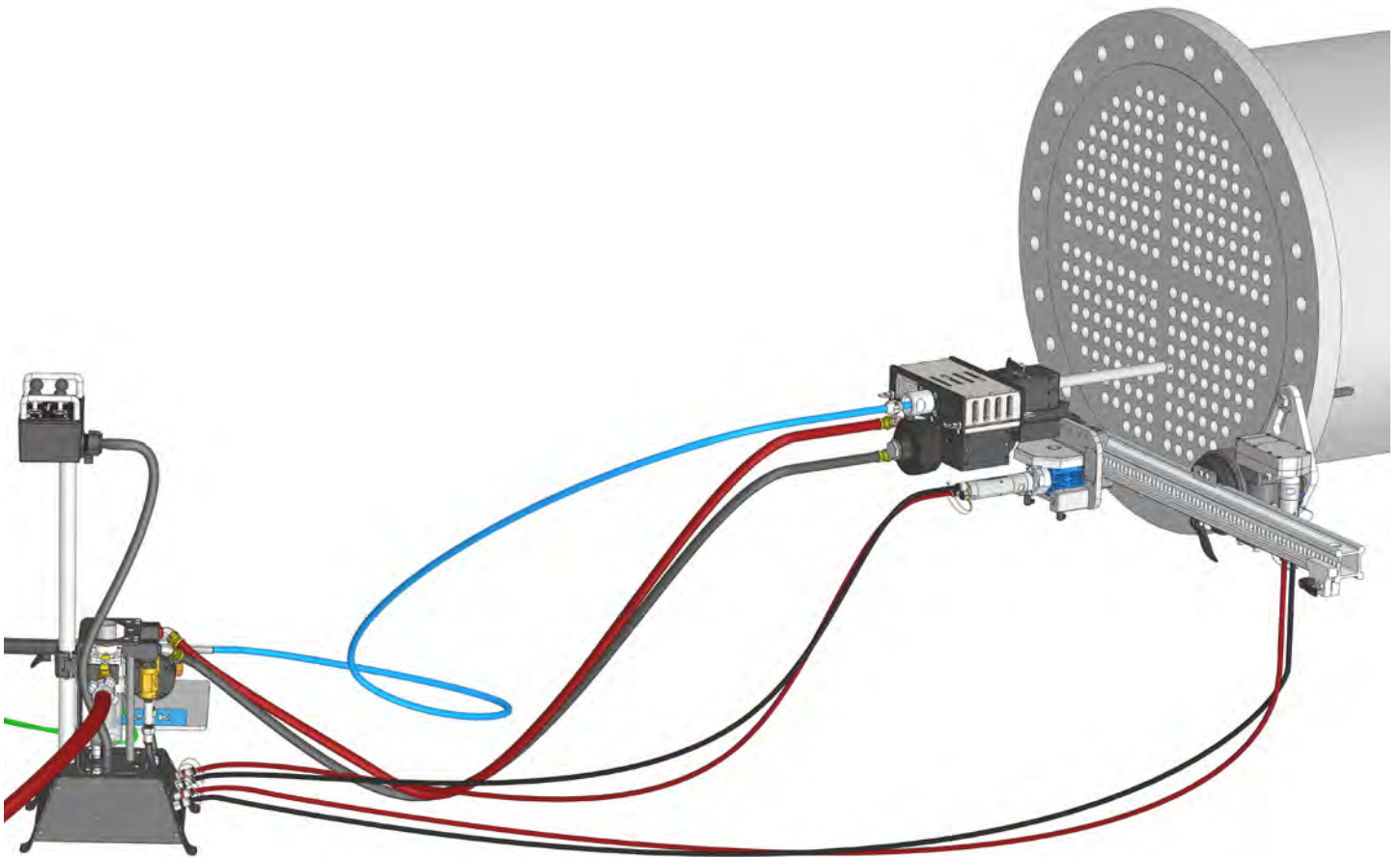


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This manual must be used in accordance with all applicable national laws. The manual shall be regarded as a part of the machine and shall be kept for reference until the final dismantling of the machine, as defined by applicable national law(s).

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

SPECIFICATIONS			
PROP-300 POSITIONER		Imperial	Metric
Weights	ABX-PRO Tractor, Guide Tube/Collet Block, and 12in Guide Tube	27 lbs	12.2 kg
	Mounting Plate	6 lbs	2.7 kg
	Linear Drive	11.5 lbs	5.2 kg
	Rotary Drive	32 lbs	14.5 kg
Dimensions	Standard Slotted Rail	2.5 x 2.5 x 45 in.	64 x 64 x 1219 mm
	Slotted Rail with extension	2.5 x 2.5 x 61 in.	64 x 64 x 1549 mm
	Mounting Plate	11 x 7 x 4 in.	279 x 178 x 102 mm
	Linear Drive	13 x 8 x 6 in.	330 x 203 x 152 mm
	Rotary Drive	8 x 11 x 9 in.	203 x 279 x 229 mm
CB-PROP-P		Imperial	Metric
(-P) Pedestal Mount Control Box Weight		14 lbs	6.4 kg
(-P) Pedestal Mount Control Box Dimensions		12 x 13 x 14 in	305 x 330 x 356 mm
Maximum Air Supply Pressure:		125 psi	8,6 bar
System Operating Pressure:		100 psi	6,8 bar
Recommended Operational Temperature Range		-20 to 140 °F	-29 to 60 °C
Air Supply Connection to Control Box		Chicago style twist-claw fitting	
Air Connections from Control Box to Tractor and Positioner		4-(15'x 3/8" Tubing) <i>Control Box to Drives</i> 2-(15' x 1/2" Hoses with JIC) <i>Control Box to Tractor</i>	
ABX-PRO TRACTOR		For detailed up to date information on these components. https://www.stoneagetools.com/assets/pdf/manuals	

DESCRIPTION OF EQUIPMENT AND INTENDED USE

The COMPASS Positioner can be mounted to a variety of heat exchanger tube bundles and has pneumatic powered horizontal and rotary drives. It is intended to be used with AUTOBOX®(ABX-PRO) TRACTOR and a Control Box (CB-PROP-P).

The COMPASS Positioner has been designed to provide a lightweight, low cost, entry level, option for contractors just starting out with hands free waterblasting equipment.

KEY FEATURES:

- Modular system designed for portability and easy assembly
- Quick install with two adjustable wrenches and a 4 mm hex wrench.
- Utilizes 2.5 in. (64 mm) slotted box rail
- Adjustable handles and Push-to-Connect air connections allow for quick adjustments.



EC DECLARATION OF CONFORMITY

Manufacturer:

StoneAge Incorporated
466 South Skyline Drive
Durango, CO 81303
USA

Authorized Representative:

StoneAge Netherlands BV
Reedijk 7Q
3274 KE Heinenoord
Netherlands
Sander de Korte, Customer Service Manager

Declare that:

**COMPASS Positioner (PROP-300) and Control Box (CB-PROP-P)
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 COMPASS Positioner (PROP-300) and Control Box (CB-PROP-P) is maintained at:

StoneAge Incorporated, 466 South Skyline 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
Liz Mancuso, Director of Engineering

03/15/2019
Date



UK DECLARATION OF CONFORMITY

Manufacturer:

StoneAge Incorporated
466 South Skylane Drive
Durango, CO 81303
USA

Authorized Representative:

StoneAge UK
Unit 3
Crucible Business Park
Woodbury Lane
Norton
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Worcestershire, WR5 2DQ
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Steve Ellis, Managing Director StoneAge UK

Declare that:

**COMPASS Positioner (PROP-300) and Control Box (CB-PROP-P)
for high pressure water cleaning of system parts.**

Are compliant with the following Statutory Requirements and Designated Standards:

S.I. 2008 No. 1597 (E) Safety of machinery – General principles for design – Risk assessment and risk reduction

The Technical File for COMPASS Positioner (PROP-300) and Control Box (CB-PROP-P) 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
Liz Mancuso, Director of Engineering

03/15/2019

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 of the Water Jetting Association (WJA) Code of Practice, or equivalent (see www.waterjetting.org.uk).

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

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

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

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

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 Personal Protective Equipment (Section 5) of WJTA-IMCA's, Industry Best 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.

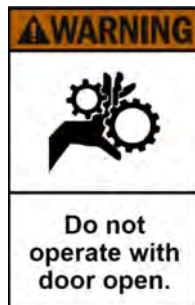
First aid provision - users MUST be provided with suitable first aid facilities at the operation site.

SAFETY LABEL DEFINITIONS

Replacement labels can be ordered through Stoneage®. See part diagrams for label locations and replace when necessary.

The PROP-300 has the potential to cause serious injury if fingers, hair, or clothing become caught between the hose rollers of the ABX-PRO Tractor.

DO NOT OPERATE WITH THE HOUSING 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 6.0) of WJTA-IMCA's, Industry Best 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

Operations with this equipment can be potentially hazardous. Caution MUST be exercised prior to and during equipment 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 COMPASS Positioner (PROP-300) 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 COMPASS Positioner (PROP-300) 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 COMPASS Positioner (PROP-300) lift with care to prevent bodily injury.

PRE-RUN SAFETY CHECK

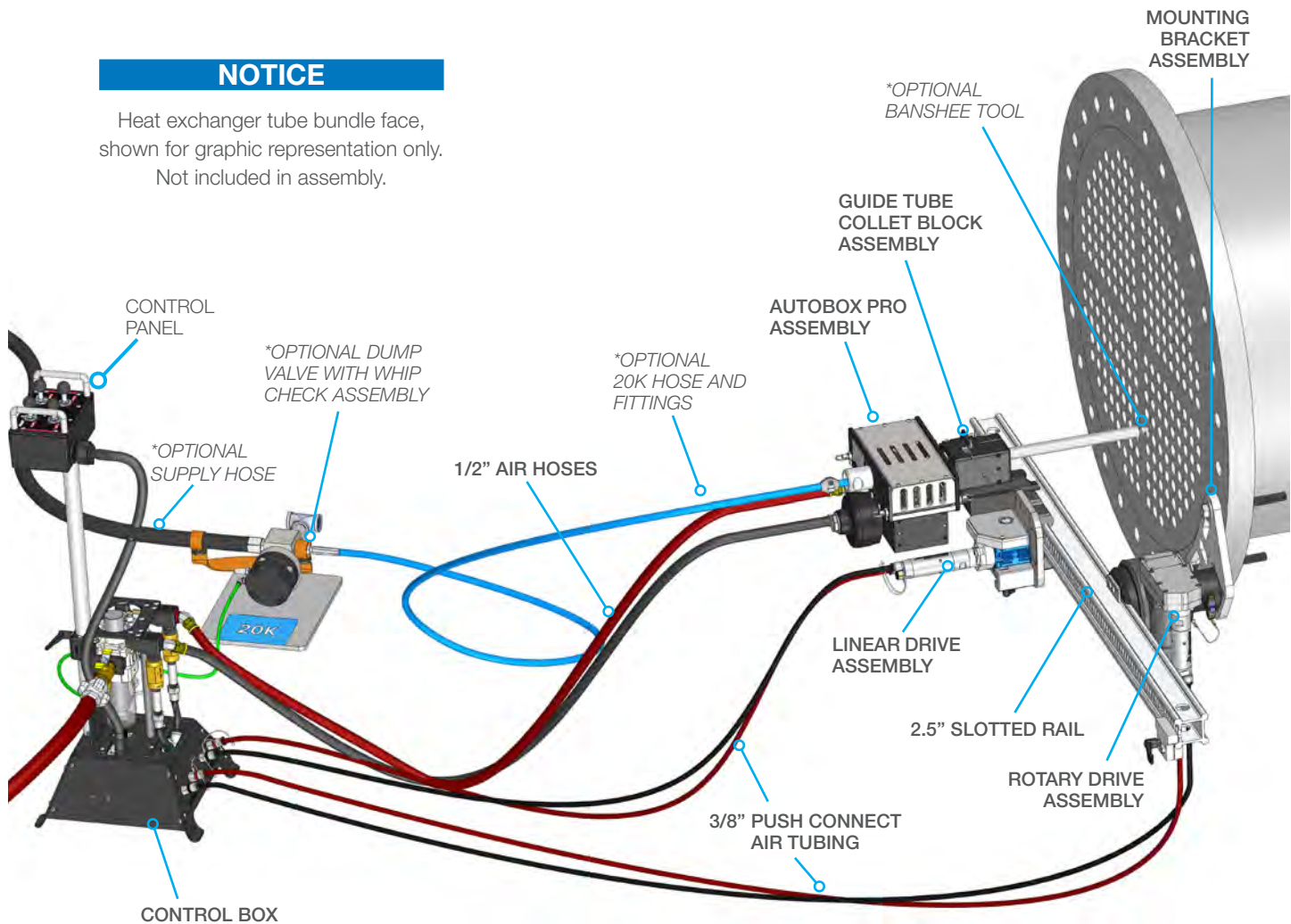
Refer to WJTA-IMCA's, Recommended Practices For The Use Of High-pressure Waterjetting Equipment and/or The Water Jetting Association's, WJA Code of Practice for additional safety information.

- 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 Mounting Bracket on the exchanger face is securely fastened.**
- Check that the air hoses are properly connected and tight.
- Check all hoses and accessories for damage prior to use. Do not use damaged items. Only high quality hoses intended for waterblast applications should be used as high-pressure hoses.
- Check all high-pressure threaded connections for tightness.
- ****Ensure that an anti-withdrawal device (collet), whip checks (hose whips), and all other applicable safety devices are installed and set-up properly.****
- Ensure the door on the ABX-PRO Tractor is closed and securely latched.
- 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 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.

COMPASS POSITIONER (PROP-300) AND CONTROL BOX (CB-PROP-P) SYSTEM ASSEMBLY

NOTICE

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



REMOTE BOX CONTROLS



INSTALL THE MOUNTING BRACKET

1. Install the Mounting Bracket onto the tube face. The best location for ease of set-up is in the lower right hand quadrant of the exchanger as shown in **(Figure 1)**. However, the COMPASS Positioner can be mounted in any of the bolt hole positions around the flange. The bracket has three mounting points. The two outside points are adjustable.

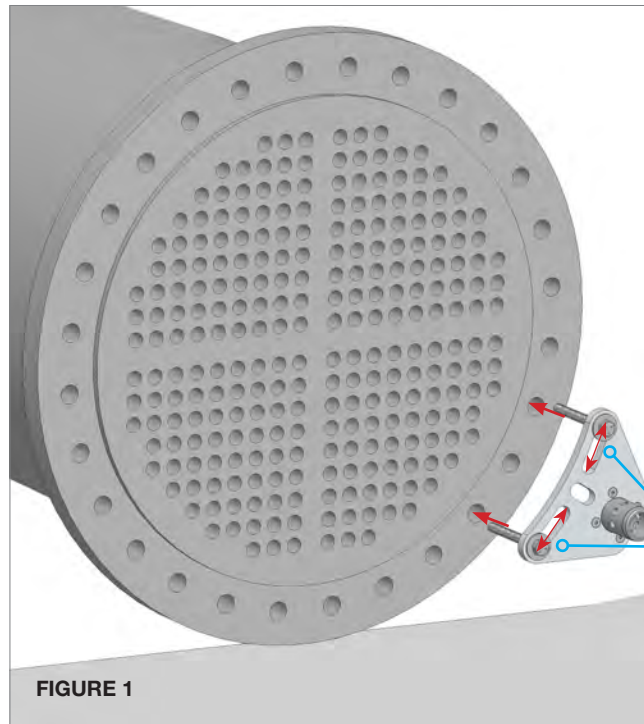



FIGURE 1

⚠ WARNING

Check that the Mounting Bracket on the exchanger face is securely fastened.

Adjustable Slots

2. Insert a 5/8" x 6" Bolt with Flat Washer through each Adjustable Slot on the Mounting Bracket and holes on the exchanger Flange. Install Flat Washers and Hex Nuts on the end of each bolt. **(Figures 1 & 2)**

 **TECH TIP:** (2) 5/8" x 6" bolts are provided for convenience, but any bolts smaller than 1" or 25mm in diameter can be used.

3. Be sure the Mounting Bracket Plate sits flat on the flange and does not overlap the ridge of tube face. Fasten in position with two adjustable end wrenches. **(Figure 3)**

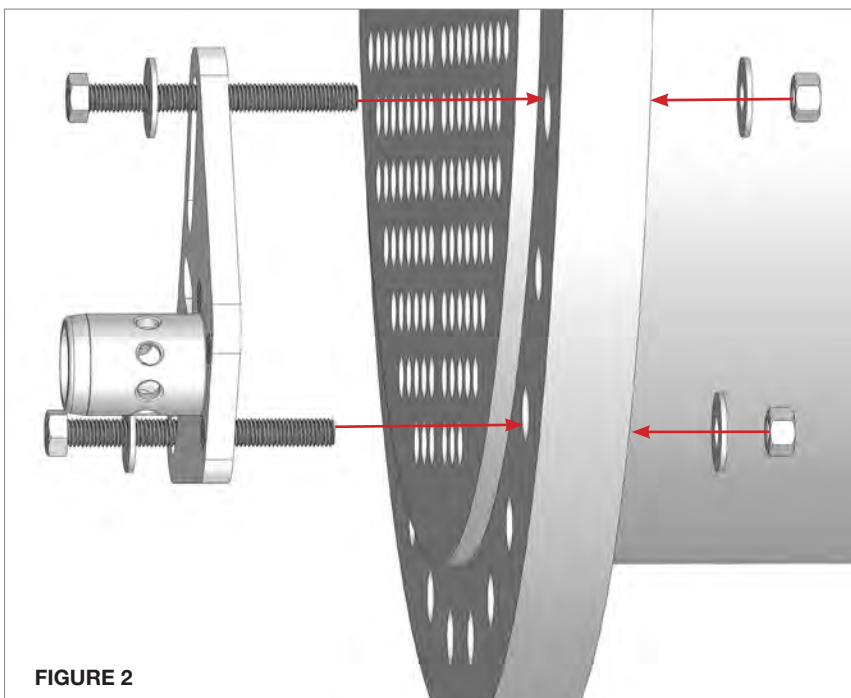


FIGURE 2

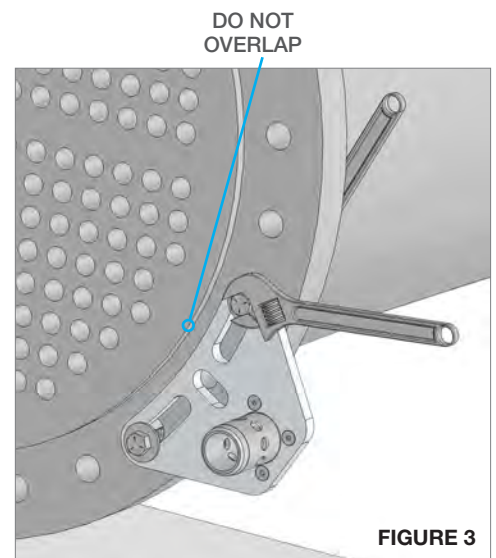


FIGURE 3

COMPASS POSITIONER SET-UP

INSTALL THE ROTARY DRIVE

4. Pull the Quick Release Pin out of the Rotary Drive. Slip the Rotary Drive over the Mounting Shaft. **(Figure 4)**
5. Rotate the Rotary Drive so that the Air Motor is as far away from the tube face as possible. This allows more room on the Drive Rail for the Linear Drive and Guide Tube/Collet Assembly. Keep in mind the orientation of the Push Lock Fittings for the routing of the umbilical. **(Figure 4)**



TECH TIP: Applying a light coat of grease to the Mounting Shaft will allow the Rotary Drive to slide on easily.

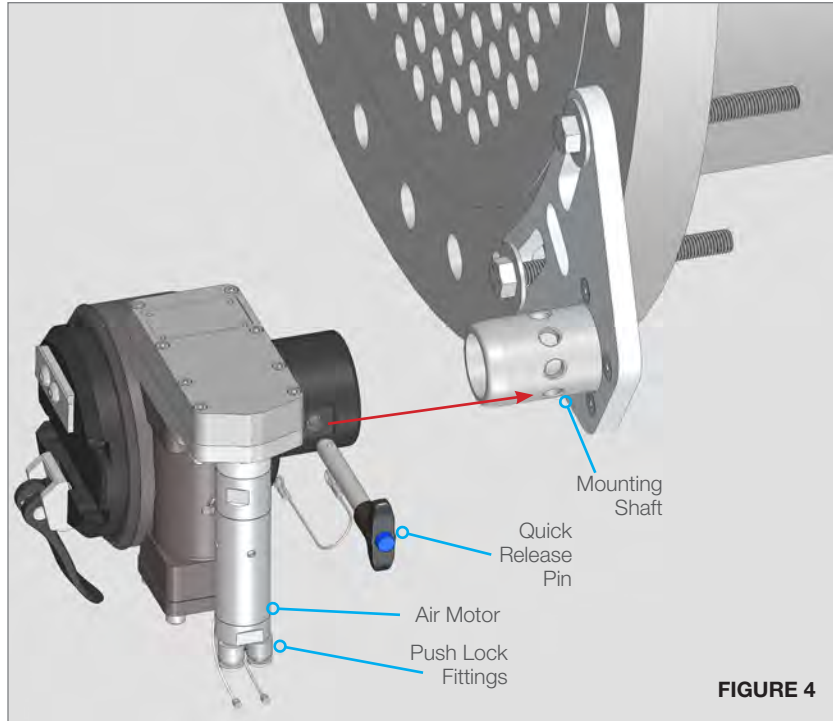


FIGURE 4

6. To make installation of the Rail and the Linear Drive easier, the Rail Clamp Handle should be facing down but is not required. In order to change the orientation of the handle, connect the air hoses from the Control Box to the Rotary Drive as shown in the next step. **(Figure 5)**

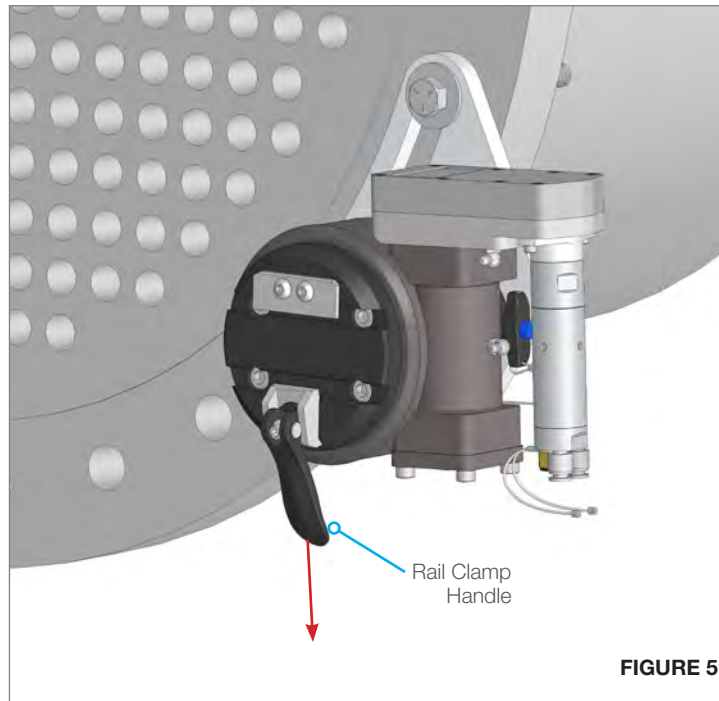


FIGURE 5

CONNECT THE CONTROL BOX TO THE ROTARY DRIVE

7. Connect the Main Air Supply Hose to the Chicago Air Fitting located on the side of the Control Box and turn the Air Valve to the "ON" position. **(Figure 6)**
8. Connect the color coded Air Tubing to their respective Push Connect Fittings, located above the "ROTARY" label on the base of the Control Box. **(Figure 6)**
9. Operate the "Rotary" lever on the control box to blow out the Air Tubing lines before connecting the opposite ends to the Rotary Drive.
10. Connect the opposite ends of the Air Tubing to the Push Connect Fittings on the Rotary Drive Air Motor. **(Figure 6)**

NOTICE

Due to the various mounting options, the Rotary Drive air motor is not color coded. If the operating directions seem reversed, the connections at the air motor can easily be switched at the Push Connect Fittings.

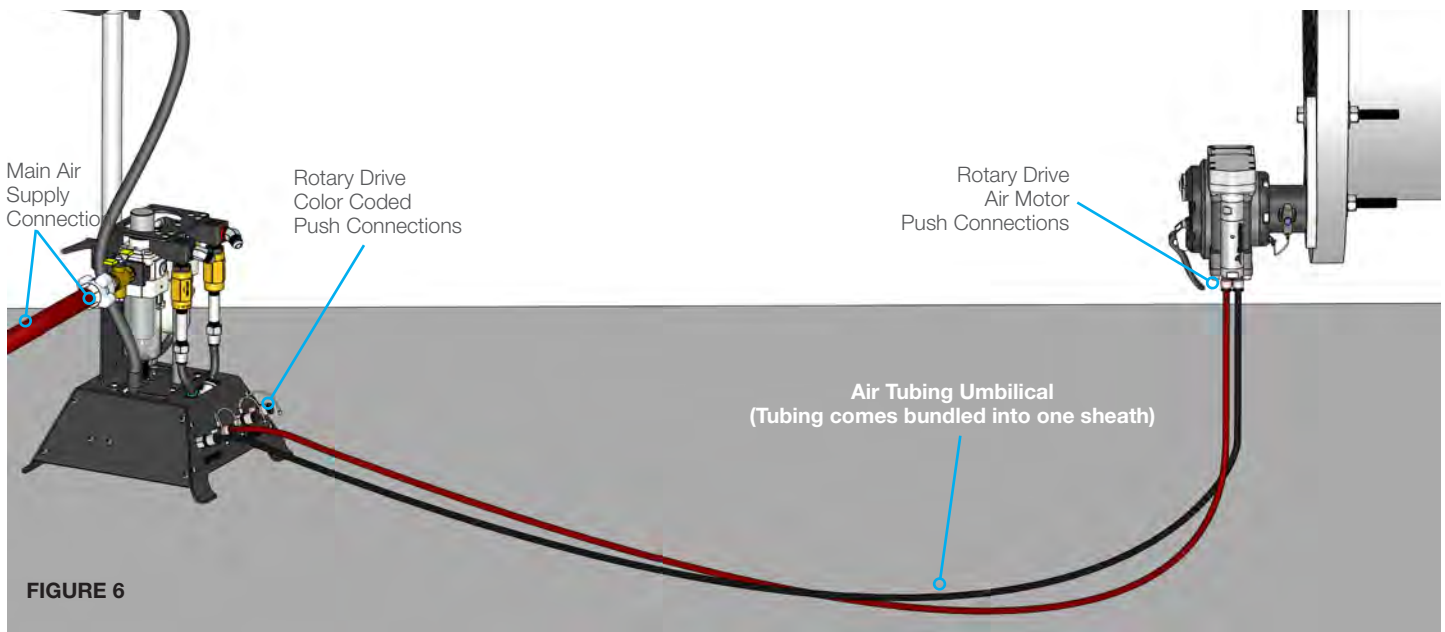


FIGURE 6

11. Using the control marked "Rotary" on the Remote Box, rotate the Rail Clamp Handle to the down position. **(Figures 7 & 8)**



FIGURE 7

Rotary Drive Controller

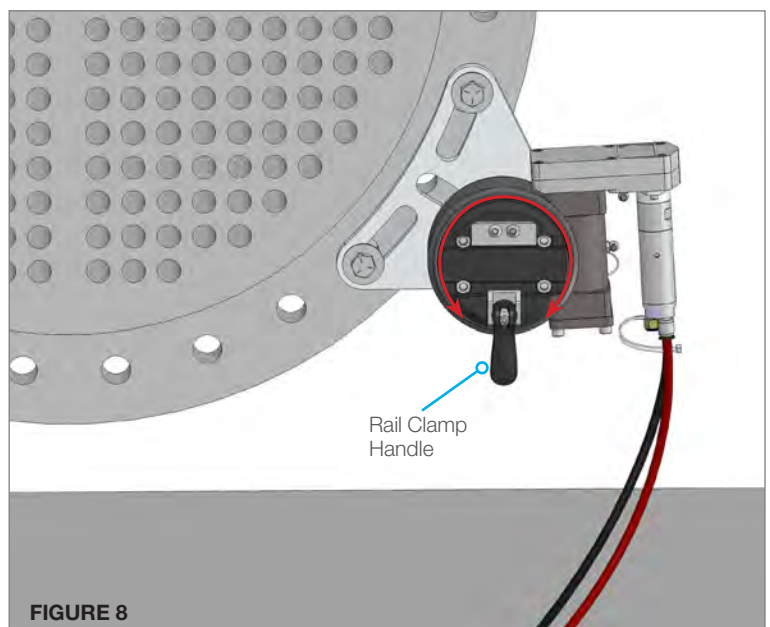



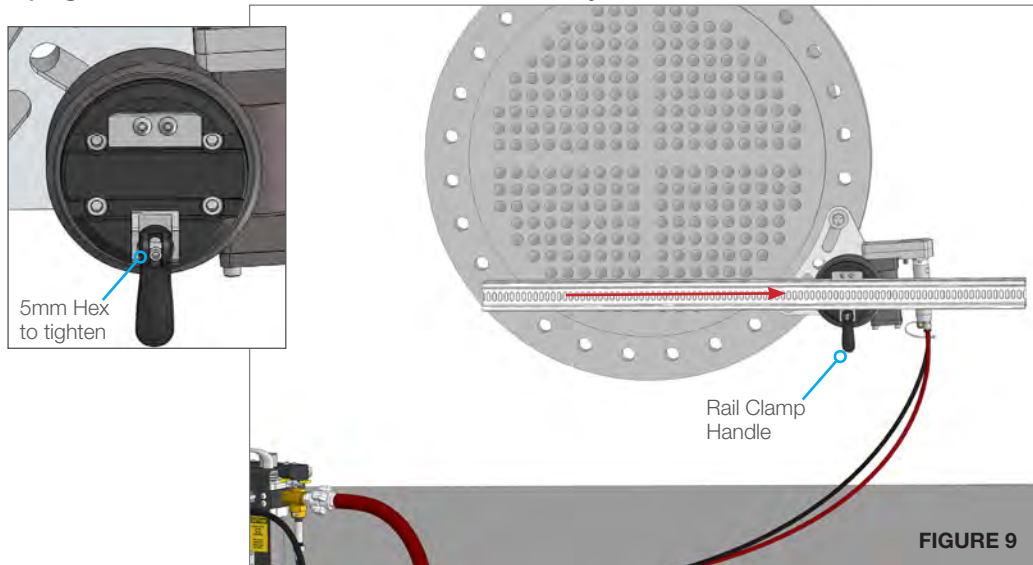
FIGURE 8

COMPASS POSITIONER SET-UP

INSTALL THE DRIVE RAIL

12. Open the Rail Clamp Handle on the Rotary Drive. Slide the Slotted Rail (slots facing out) into the clamp on the Rotary Drive face. Push the Rail Clamp Handle on the Rotary Drive to secure in place. **(Figure 9)**

 **TECH TIP:** *Clamp Handles are fully engaged when they come to a mechanical stop. If the resistance on the handle seems loose, tighten the center screw by rotating 60 degrees or one flat of the internal hex with a 5mm hex wrench. This is true for all Clamping Handles in the COMPASS Positioner Assembly.*

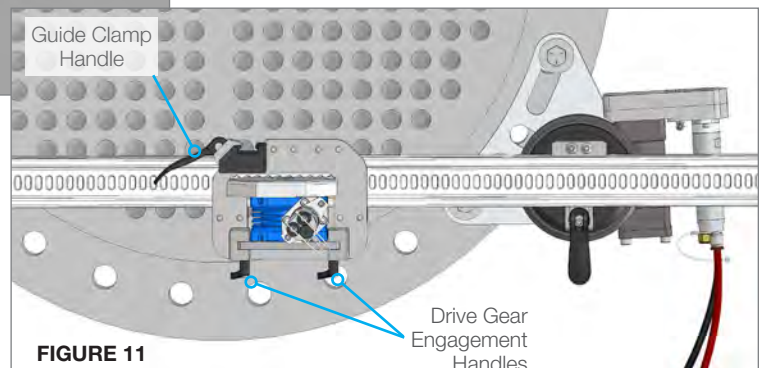
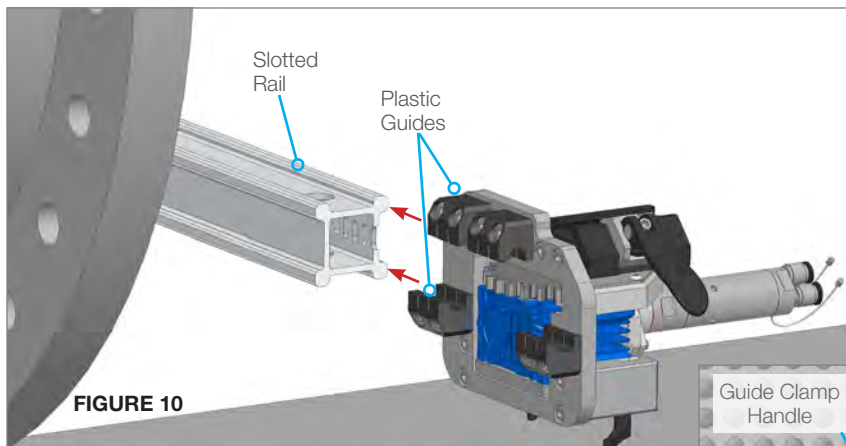


INSTALL THE LINEAR DRIVE ONTO THE RAIL

13. Orient the Linear Drive as shown in **(Figure 10)**
14. Align the bottom Plastic Guides with the Rail and slide the Linear Drive onto the Rail. **(Figures 10 & 11)**
15. Use the Drive Gear Engagement Handles to ensure the Drive Gear is engaged with the slots on the Rail. **(Figure 11)**

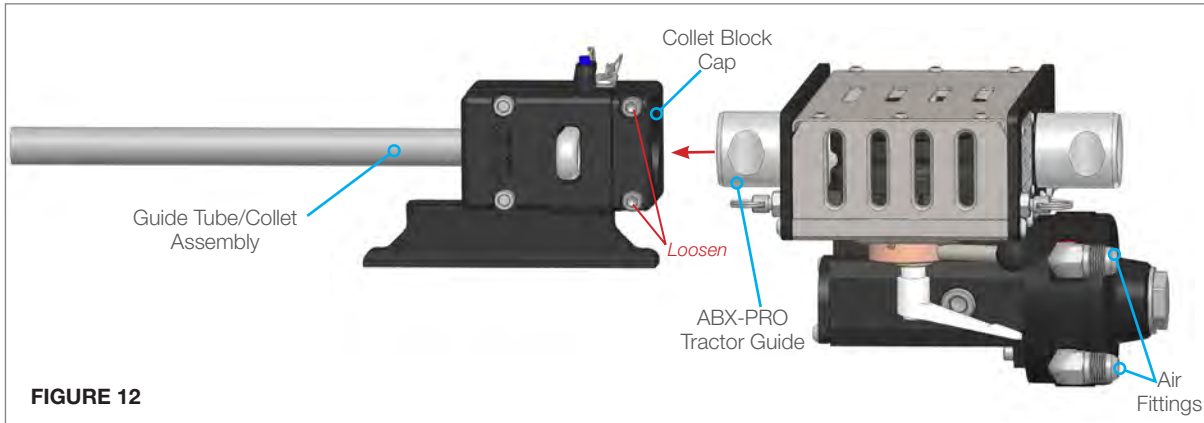
NOTICE

Verify Drive Gear Engagement Handles are tight before proceeding with the next assembly steps.



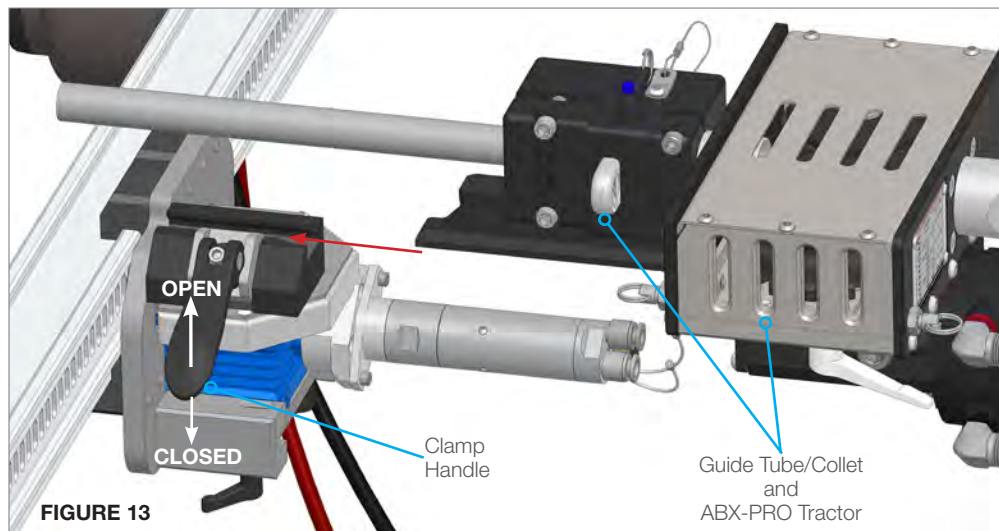
INSTALL THE ABX-PRO TRACTOR ONTO THE GUIDE TUBE/COLLET BLOCK ASSEMBLY

16. Loosen the Collet Block Cap with a 4mm Hex Wrench. (Figure 13)
17. Slide the ABX-PRO Tractor Guide into the Collet Block until it comes to a stop. The Air Fittings on the ABX-PRO Tractor should be oriented away from the Collet Block. (Figure 12)



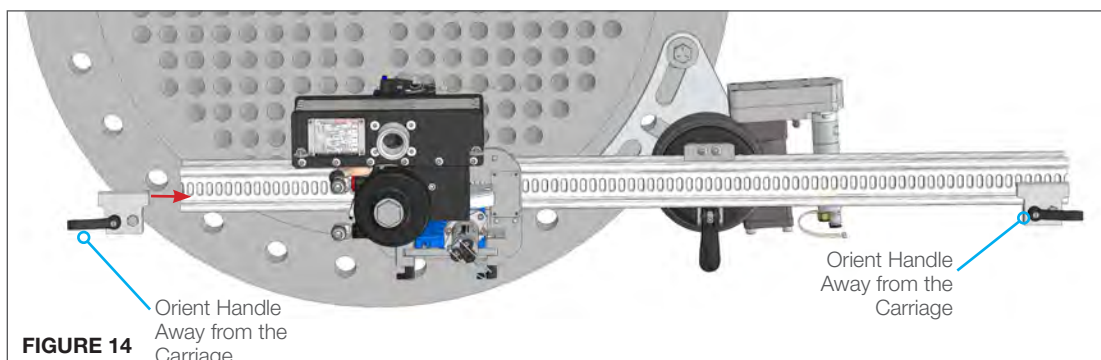
INSTALL THE GUIDE TUBE/COLLET ASSEMBLY ONTO THE LINEAR DRIVE

18. Pull the Clamp Handle up to open the clamp and slide the Guide Tube/Collet and ABX-PRO Tractor into the Clamp Block. Secure in place by closing the Clamp Handle. (Figure 13)



INSTALL RAIL STOPS

19. Loosen the handles on the two Rail Stops and slide one onto both ends of the Slotted Rail. Rotate the handles so they face away from Linear Drive (as shown) and ensure that they are securely fastened. (Figure 14)



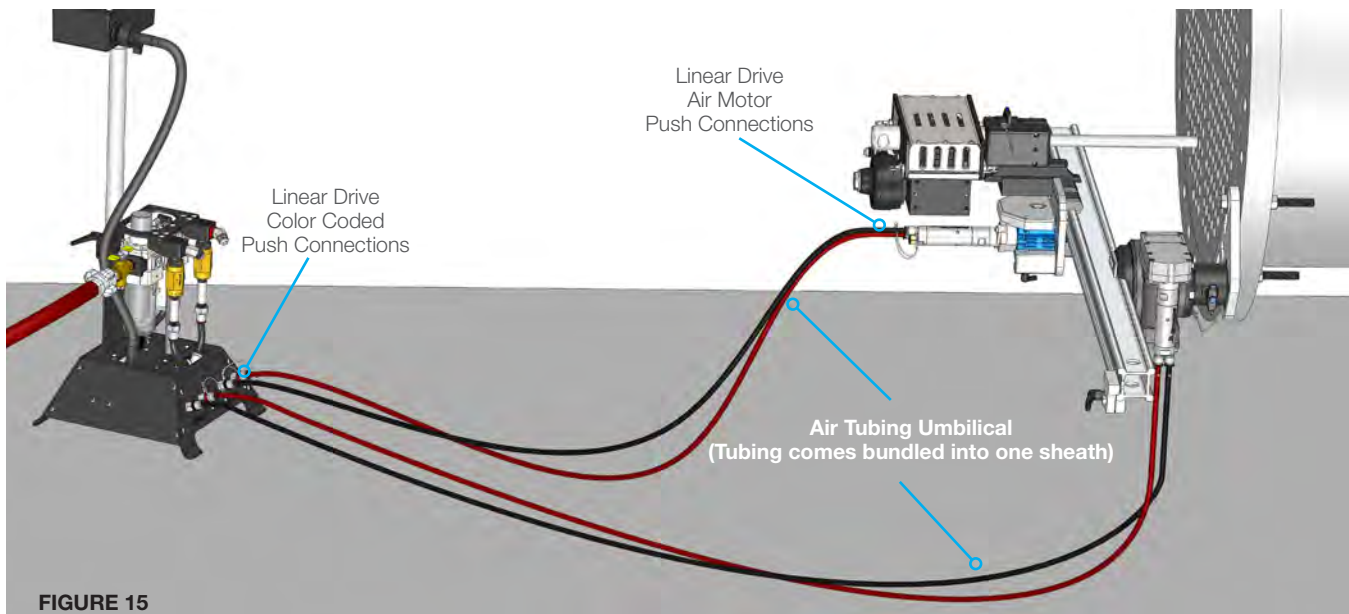
COMPASS POSITIONER SET-UP

CONNECT THE CONTROL BOX TO THE LINEAR DRIVE

20. Connect the color coded Air Tubing to their respective Push Connect Fittings, located above the “LINEAR” label on the base of the Control Box. **(Figure 15)**
21. Operate the “Linear” lever on the control box to blow out the Air Tubing lines before connecting the opposite ends to the Linear Drive.
22. Connect the opposite ends of the Air Tubing to the Push Connect Fittings on the Linear Drive Air Motor. **(Figure 15)**

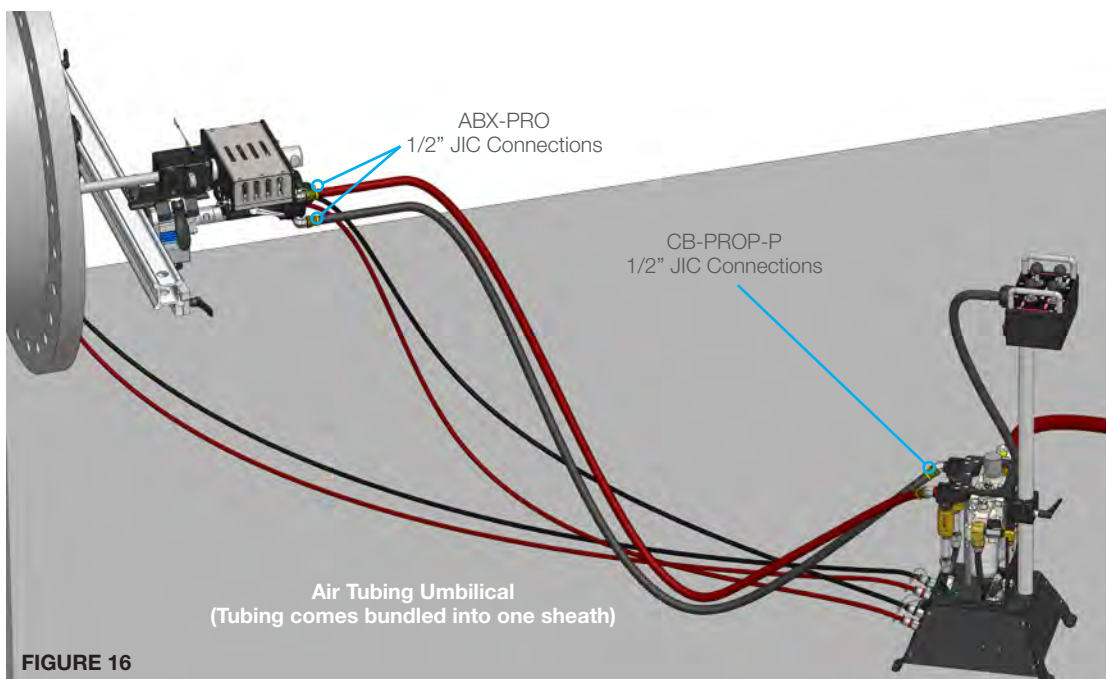
NOTICE

Due to the various mounting options, the Linear Drive air motor is not color coded. If the operating directions seem reversed, the connections at the air motor can easily be switched at the Push Connect Fittings. **(Figure 15)**



CONNECT THE CONTROL BOX TO THE ABX-PRO TRACTOR

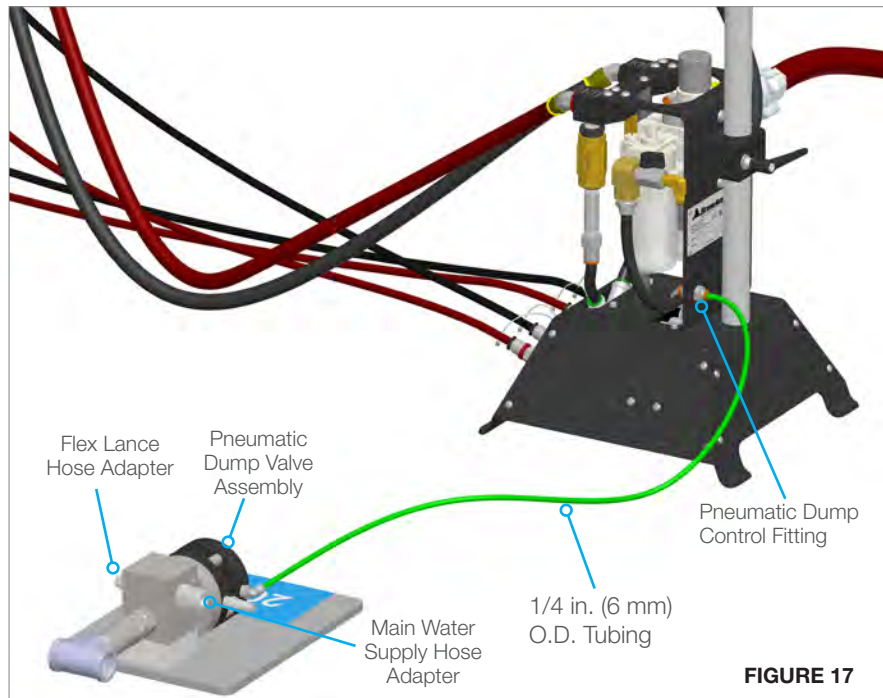
23. Screw the color coded 1/2" Pneumatic Hoses to the Color Coded JIC Fittings on the ABX-PRO Tractor. **(Figure 16)**
24. Operate the “Feed” lever on the control box to blow out the Air Tubing lines before connecting the opposite ends to the ABX-PRO.
25. Screw the opposite ends of the color coded 1/2" Pneumatic Hoses to the Color Coded JIC Fittings on the Control Box. **(Figure 16)**



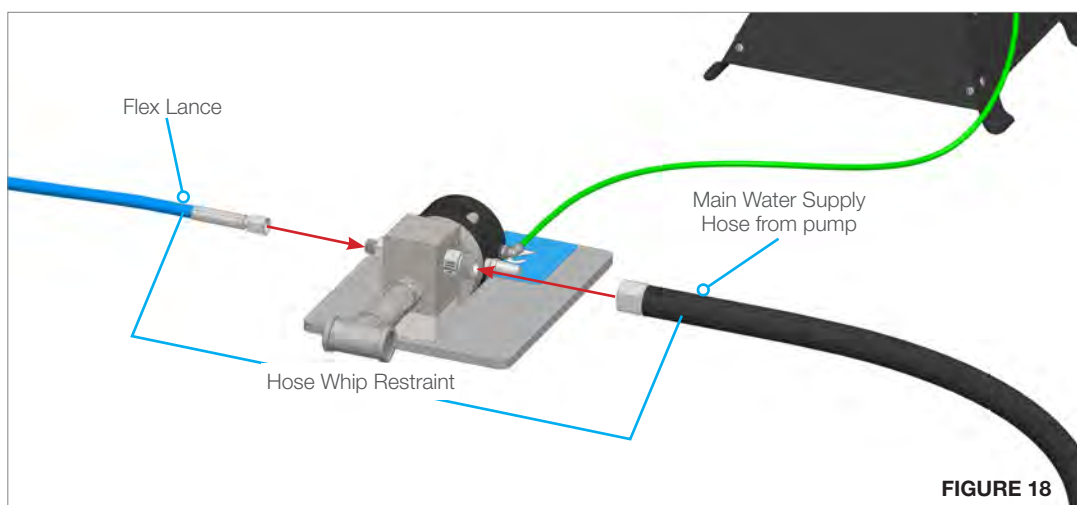
PNEUMATIC DUMP CONTROL CONNECTIONS

26. Install the 1/4 in. (6 mm) O.D. Tubing between the Pneumatic Dump Control Fitting located on the back of the Control Box and the fitting on the Pneumatic Dump Valve Assembly. **(Figure 17)**
27. Install Main Water Supply and Flex Lance Hose Adapters. Be sure to use the appropriate anti-seize, thread lubricant, and/or pipe tape as recommended in the StoneAge Tool Fittings and Accessories Catalog at the link below. **(Figure 17)**

<https://www.stoneagetools.com/product-catalogs>



28. Fasten the Main Water Supply and Flex Lance Hoses. Be sure to use the appropriate anti-seize, thread lubricant, and/or pipe tape as recommended in the StoneAge Tool Fittings and Accessories Catalog. **(Figure 18)**



⚠ WARNING

Always use Hose Whip Restraints. Failure to do so can result in severe injury and/or death. It is the responsibility of the user to properly install the Hose Whip Restraints. Never exceed safe working load. Follow manufacturer's recommendations and ratings.

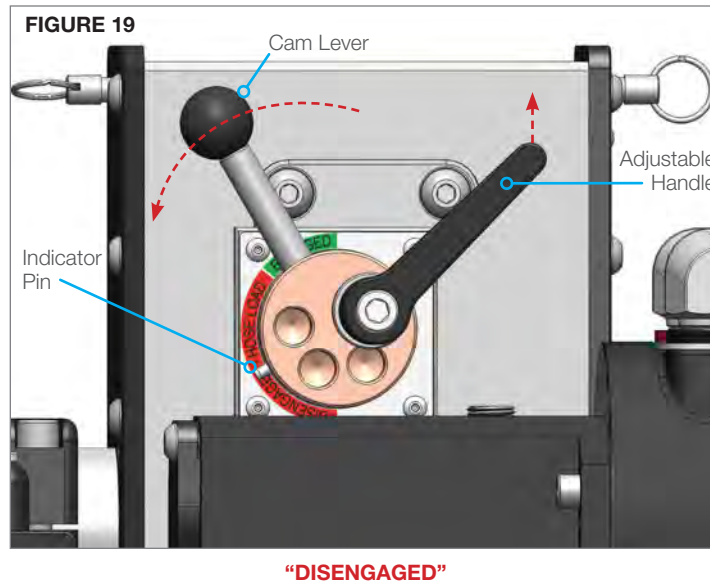
HOSE AND COLLET INSTALLATION

LOADING THE HIGH-PRESSURE HOSE INTO THE ABX-PRO TRACTOR AND GUIDE TUBE/COLLET BLOCK

NOTICE

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

29. To load a hose, release the Adjustable Handle and rotate the Cam Lever until the Indicator Pin is in the **“Disengaged”** position. This opens up the space between the rollers in the ABX-PRO Tractor. **(Figure 19)**



30. Pulling out the Spring Plungers will release the Cover Plate on the Tractor and allow access to the rollers. **(Figure 20)**
31. Pull out the Quick Release Pin on the Collet Block and remove the Collet. Feed the male hose end into the Guide Tube, through the Rollers and out the end of the Guide Tube/Collet Block Assembly. **(Figure 20)** Refer to the “Part Diagram” section of this manual for Collet sizes for high pressure hose diameter. Roller options can be found in the *ABX-PRO-100 User Manual* that is included with the ABX-PRO Tractor.

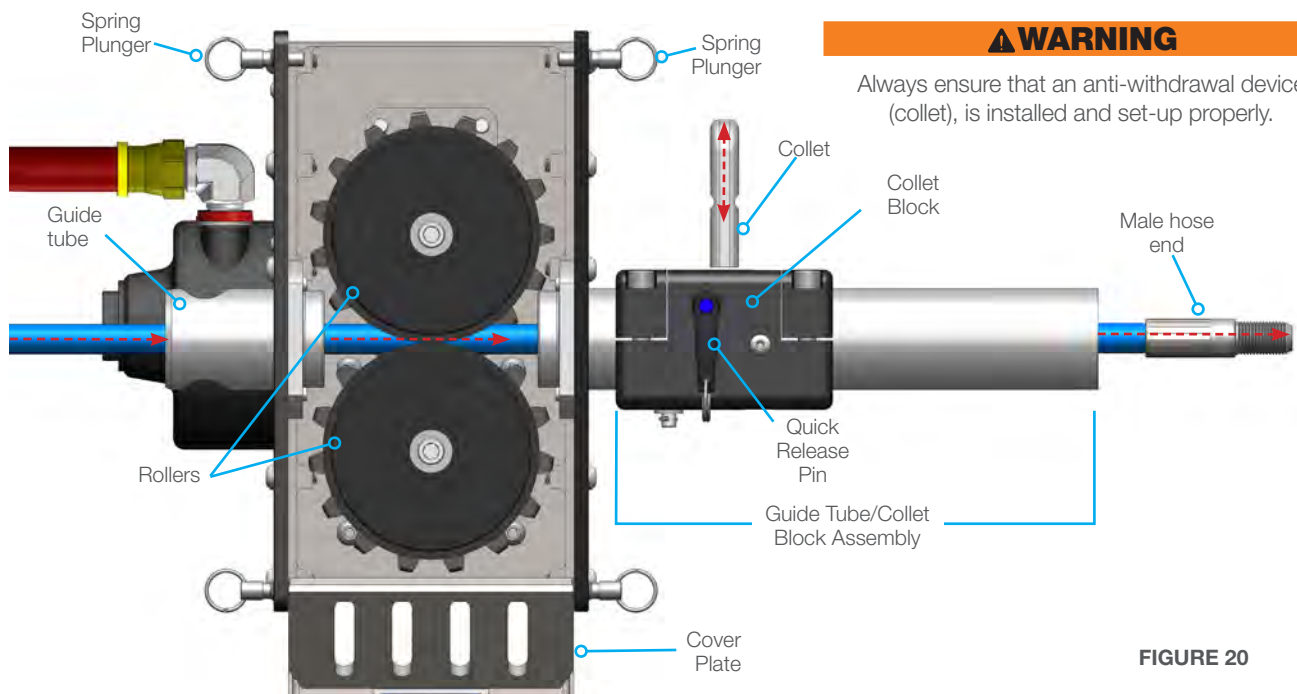


FIGURE 20

32. Rotate the Cam Lever clockwise to the **“Engaged”** position to tighten the Idler Roller down onto the hose. There should be a slow slip on the hose. If the slip is too tight or loose, move the Eccentric Lever off until a slow slip is obtained. Once the slip level is achieved, push down on the Adjustable Handle to tighten the bushing assembly. **(Figure 21)**
33. Push the back cover back into the closed position and secure the two Spring Plungers on the top of the ABX-PRO Tractor. **(Figure 22)**

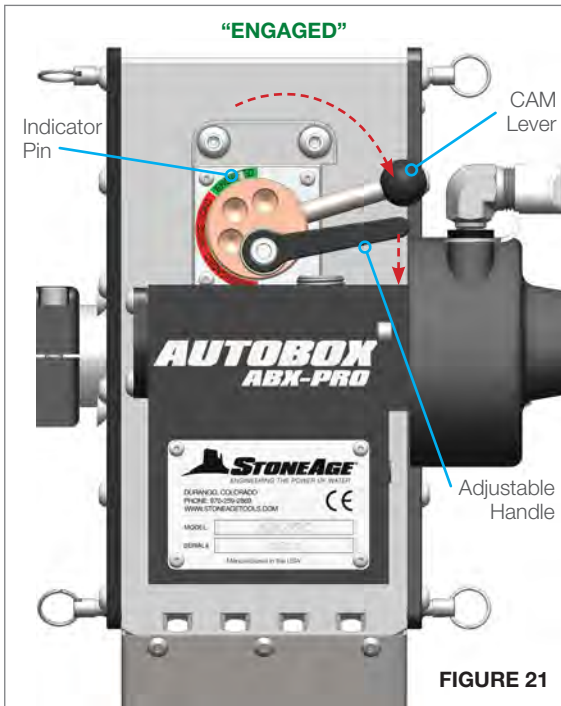


FIGURE 21

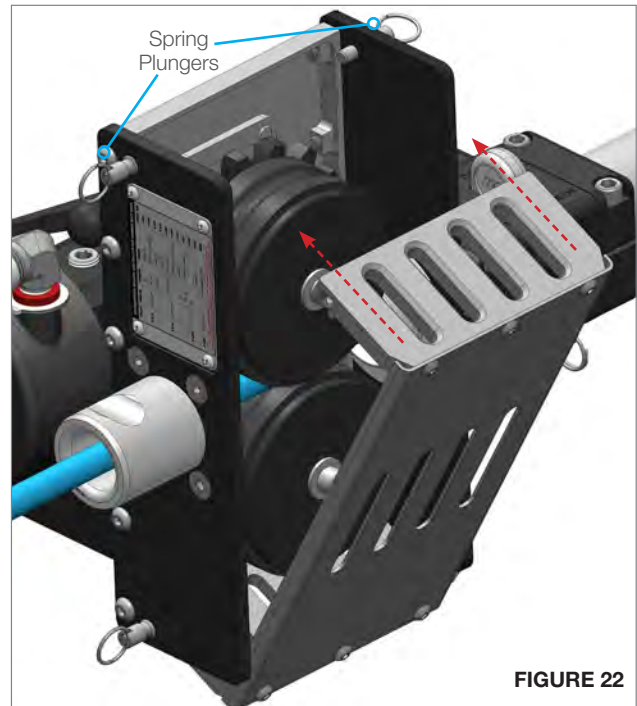


FIGURE 22

34. Attach the desired tool onto the Male Hose End on the Flex Lance. (Stoneage® BN15 Banshee® shown for reference). **(Figure 23)**
SEE THE APPLICABLE TOOL MANUAL FOR SPECIFIC INSTALLATION INSTRUCTIONS.

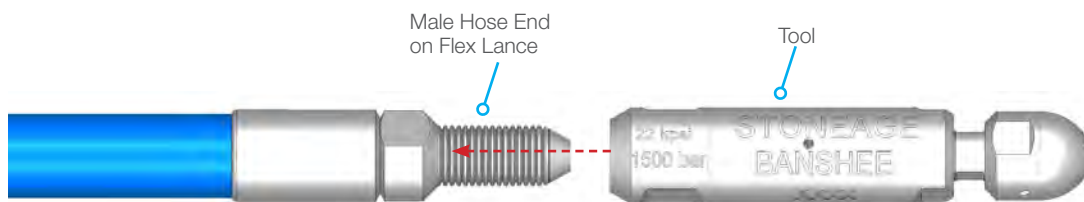


FIGURE 23

⚠ WARNING

Prior to use, always test the backout preventer (Collet) to ensure the tool does not pass backward through the Collet Block Assembly. Failure to do so can result in severe injury and/or death. It is the responsibility of the user to determine proper collet size to ensure the end of the hose will not pass through the Collet.

CONTROL BOX SETTINGS

CONTROL BOX SETTINGS

1. Using the Pressure Regulator on the FRL, adjust the operating pressure to 100 psi (6,8 bar).
2. Adjust in-line oiler to feed 1 drop of oil every 30-60 seconds for high speed or continuous duty usage.

⚠ WARNING

Maximum operating 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.

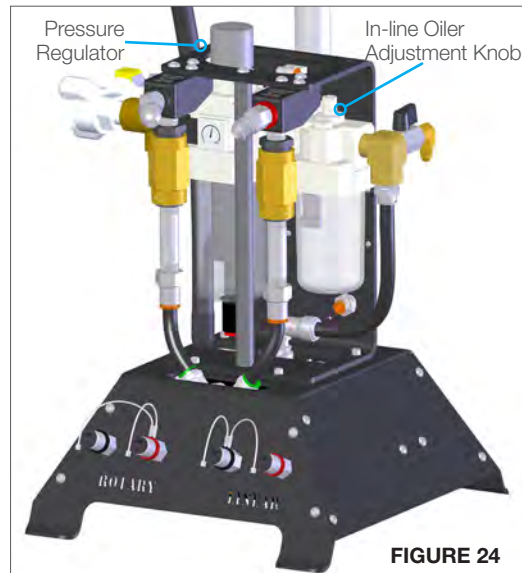


FIGURE 24

OPERATION

CONTROL PANEL OPERATION

The Control Box consists of a base unit with a tethered Remote Box to allow the operator to easily move around if desired. There are four levers on the Remote Box: **DUMP**, **FEED**, **LINEAR**, and **ROTARY**. The levers are spring loaded to return to the center, **OFF** position.

The **DUMP** lever, when pushed Forward, provides air to the 1/4" push-connect fitting that is intended to supply air to a pneumatic dump valve to divert high-pressure water to the tool.

When the **FEED** lever is pushed forward, it drives the flex lance and Tool forward into the pipe. When the **FEED** lever is pulled backward, it retracts the flex lance and Tool from the pipe.

Forward and Reverse **FEED SPEED** can be adjusted independently using the brass colored flow control valves on the base of the Control Box. The Forward and Reverse directions are labeled. Rotate the flow controls in the clockwise direction to increase the speed and counterclockwise to slow the speed. Slow speeds are required to go forward through bends. Faster speeds are acceptable during retraction.

The **ROTARY** lever allows the COMPASS Positioner Assembly to pivot up and down from the Mounting Bracket.

The **LINEAR** lever moves the Linear Drive side to side along the Slotted Rail.

CONTROL REMOTE BOX



FIGURE 25

SPEED / FLOW CONTROLS

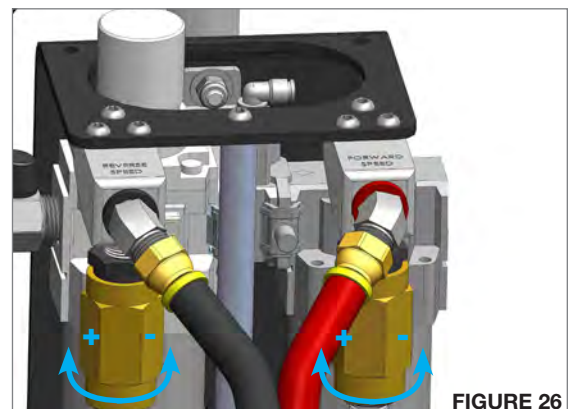


FIGURE 26

COMPASS POSITIONER (PROP 480)

SHOTGUN MOUNT ASSEMBLY

The Shotgun Mount can be paired with a StoneAge Barracuda or Spitfire rotary tool to add surface cleaning capability to the COMPASS Positioner. The Shotgun Mount is easily installed in minutes without disconnecting the whole system. Extremely dirty exchangers may require their faces be cleaned prior to tube cleaning in order to uncover the tubes. It can also be used after tube cleaning to remove blasted debris from the exchanger face.

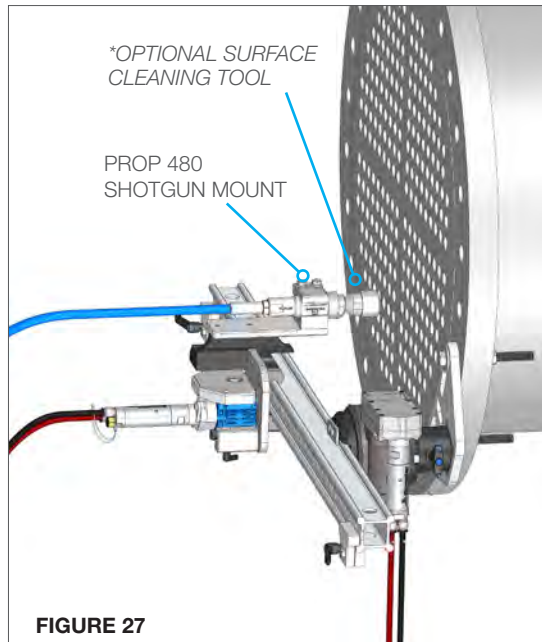


FIGURE 27

INSTALL SHOTGUN MOUNT ONTO THE LINEAR DRIVE

1. Pull the Clamp Handle up and slide the Shotgun Mount onto the Clamp Block and secure in place by closing the Clamp Handle.
2. Loosen the Tool Clamp on the Shotgun Mount, insert the Surface Cleaning Tool and tighten the Tool Clamp to secure the Tool.
3. The distance from the face of the tool to the face of the exchanger can be adjusted by opening the Linear Drive Clamp Handle and sliding the Shotgun Mount forward or back, then locking the Clamp Handle down.

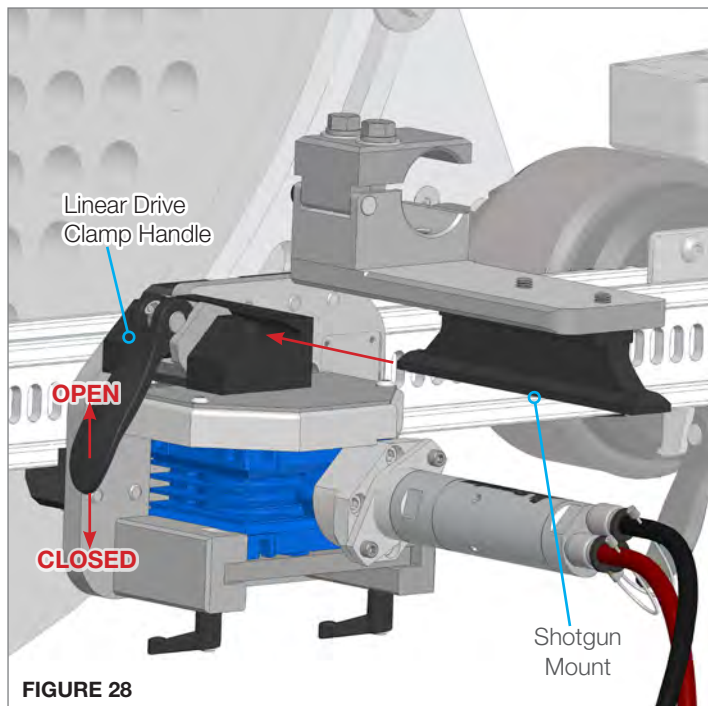


FIGURE 28

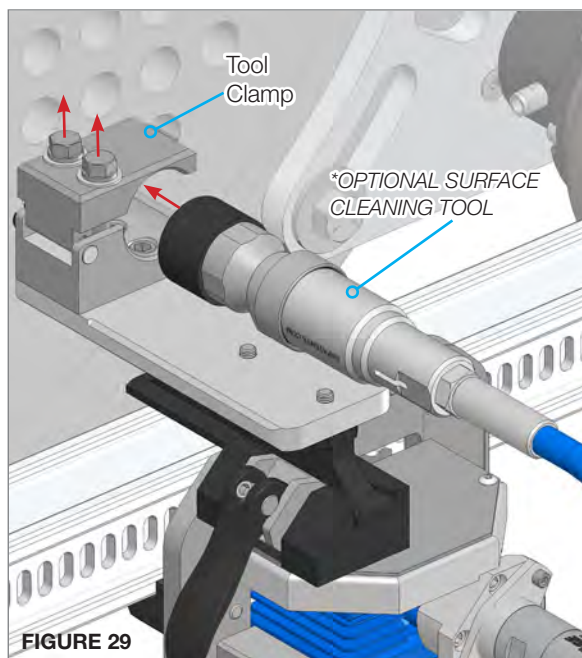


FIGURE 29

OPTIONAL ACCESSORY - QUICK CLAMP AND MOUNT FOR FLANGES WITHOUT BOLT HOLES

COMPASS Positioner RAIL MOUNT (PROP 470) AND QUICK CLAMPS (PROP 518) BOLTLESS FLANGE MOUNTING ACCESSORY

Quick Clamps are for use with boltless heat exchanger flanges that provide a robust clamping surface.
Align clamps on the surface of the flange to maximize flange engagement to clamps

INSTALL THE QUICK CLAMPS

1. Mount the Quick Clamps to the tube bundle flange as far apart and as securely as possible.
2. Rail Clamps should be aligned parallel to the direction of the tube rows
3. The Quick Clamp plates must be parallel to each other after tightening the Flange Clamp Lever. Utilize the bronze nut to keep the plate parallel.
4. When clamping to a flange, Using the handle, tightly snug the base and flange plate on the clamping surface. The clamp flange plate should have a slight inward angle, with the base plate being perpendicular to the clamping surface. Adjust the brass nut on the flange plate to acquire equal compression on both sides of the plate. This will complete the clamping pressure. When completed, the base and flange clamp plates should be in line with each other having the same angle while mounted to the flange surface.

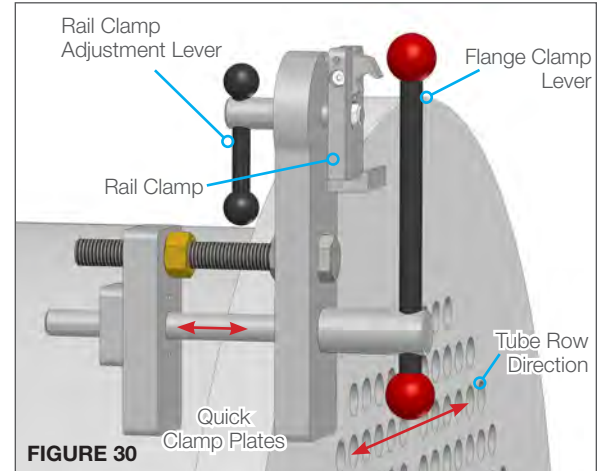


FIGURE 30

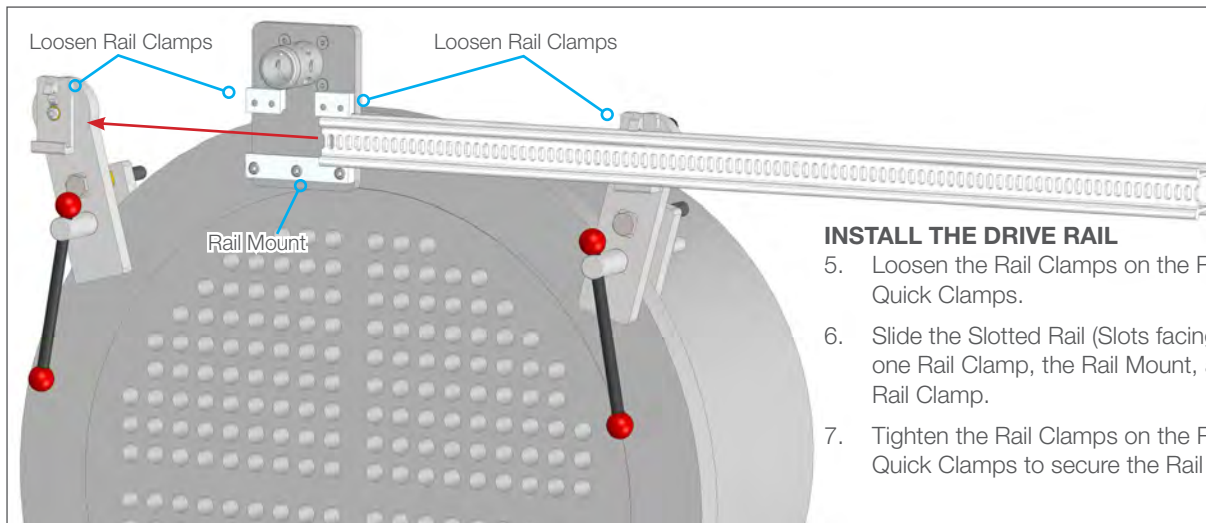


FIGURE 31

INSTALL THE DRIVE RAIL

5. Loosen the Rail Clamps on the Rail Mount and Quick Clamps.
6. Slide the Slotted Rail (Slots facing out) through one Rail Clamp, the Rail Mount, and the opposite Rail Clamp.
7. Tighten the Rail Clamps on the Rail Mount and Quick Clamps to secure the Rail in place.

CORRECT INSTALLATION

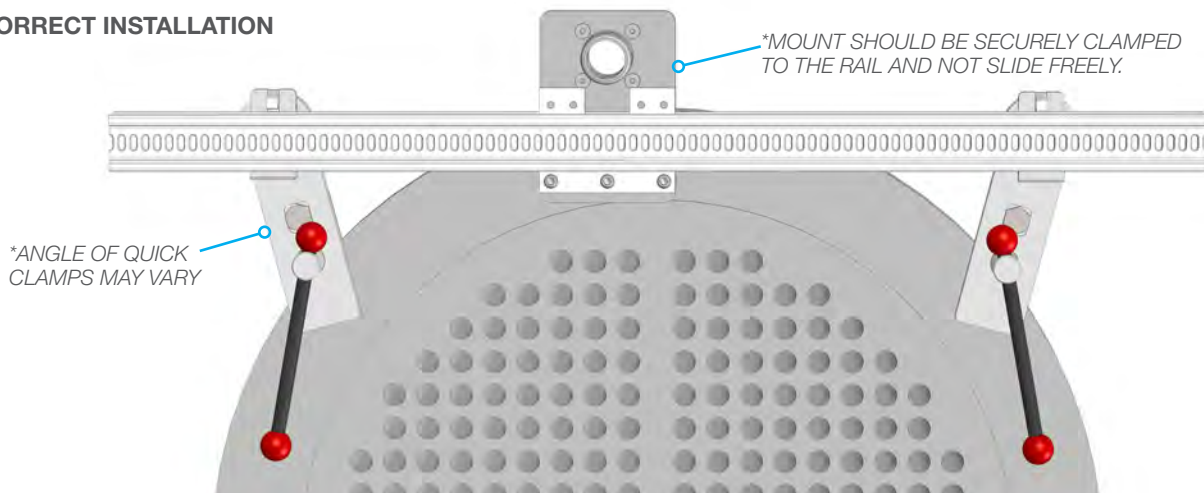


FIGURE 32

OPTIONAL ACCESSORY - QUICK CLAMP AND MOUNT FOR FLANGES WITHOUT BOLT HOLES

INSTALL THE ROTARY DRIVE

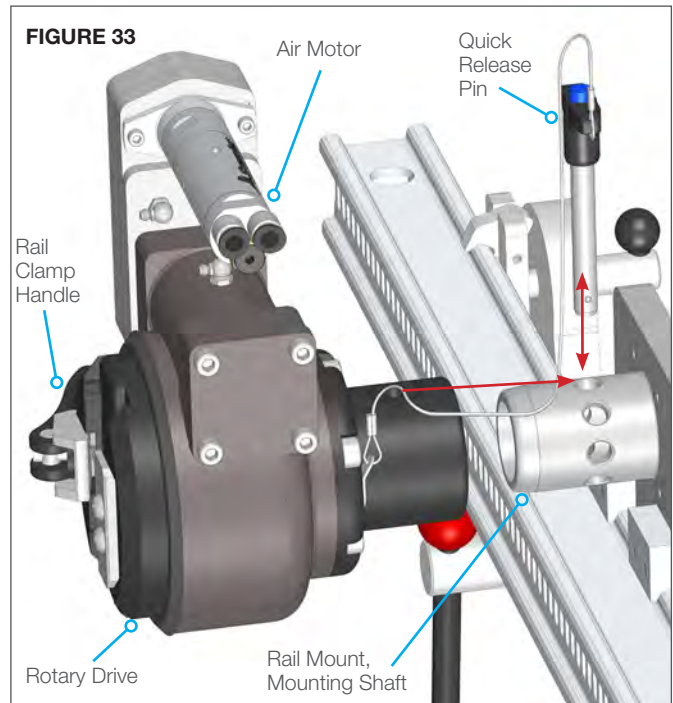
8. Pull the Quick Release Pin out of the Rotary Drive. Slip the Rotary Drive over the Mounting Shaft.



TECH TIP:

Applying a light coat of grease to the Mounting Shaft will allow the Rotary Drive to slide on easily.

9. Rotate the Rotary Drive so that the Air Motor is parallel to the Horizontal Rail.
10. To make installation of the Rail and the Linear Drive easier, the Rail Clamp Handle should be facing toward 9 O'Clock but is not required. In order to change the orientation of the handle, connect the air hoses from the Control Box to the Rotary Drive as shown in the next step.



CONNECT THE CONTROL BOX TO THE ROTARY DRIVE

11. Connect the Main Air Supply Hose to the Chicago Air Fitting located on the side of the Control Box and turn the Air Valve to the "ON" position.
12. Connect the color coded Air Tubing to their respective Push Connect Fittings, located above the "ROTARY" label on the base of the Control Box.
13. Operate the "Rotary" lever on the control box to blow out the Air Tubing lines before connecting the opposite ends to the Rotary Drive.
14. Connect the opposite ends of the Air Tubing to the Push Connect Fittings on the Rotary Drive air motor.

NOTICE

Due to the various mounting options, the Rotary Drive air motor is not color coded. If the operating directions seem reversed, the connections at the air motor can easily be switched at the Push Connect Fittings.

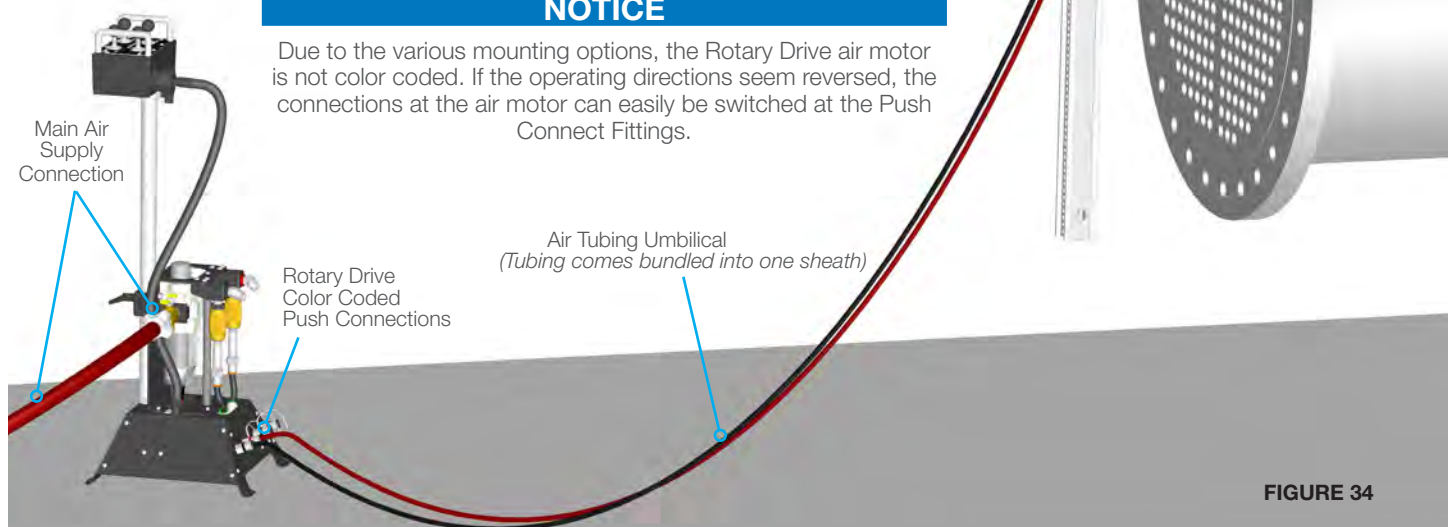


FIGURE 34

OPTIONAL ACCESSORY - QUICK CLAMP AND MOUNT FOR FLANGES WITHOUT BOLT HOLES

15. Using the control marked "Rotary" on the Remote Box, rotate the Rail Clamp Handle to the 9 O'Clock position as shown below.

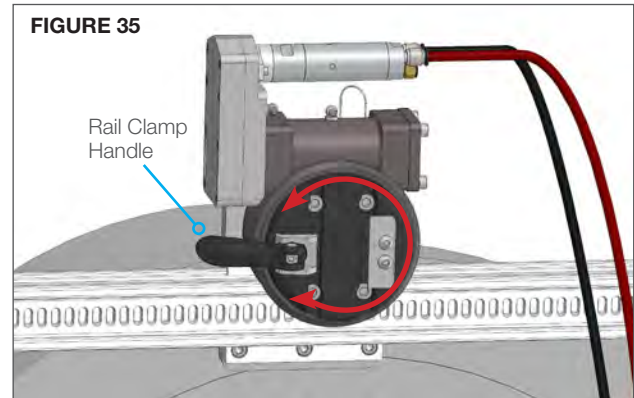
REMOTE BOX



FIGURE 35

Rotary Drive
Controller

FIGURE 35



INSTALL THE DRIVE RAIL

16. Open the Rail Clamp Handle on the Rotary Drive. Slide the Slotted Rail (Slots facing out) through the Rail Clamp on the Rotary Drive face. Push the Rail Clamp Handle on the Rotary Drive to secure in place.



TECH TIP:

If the Rail Clamp is too loose or too tight, adjust it with a 5mm Hex wrench.

FIGURE 36

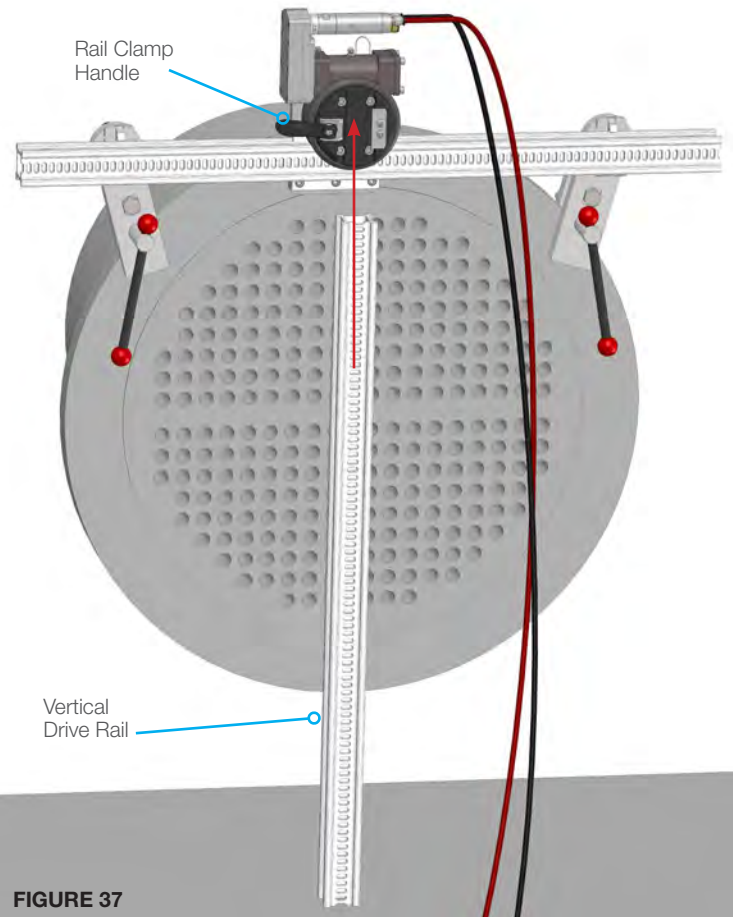
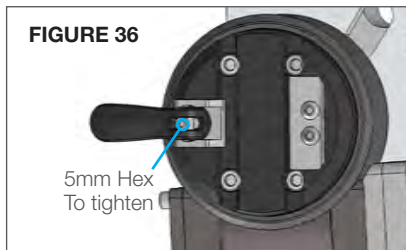


FIGURE 37

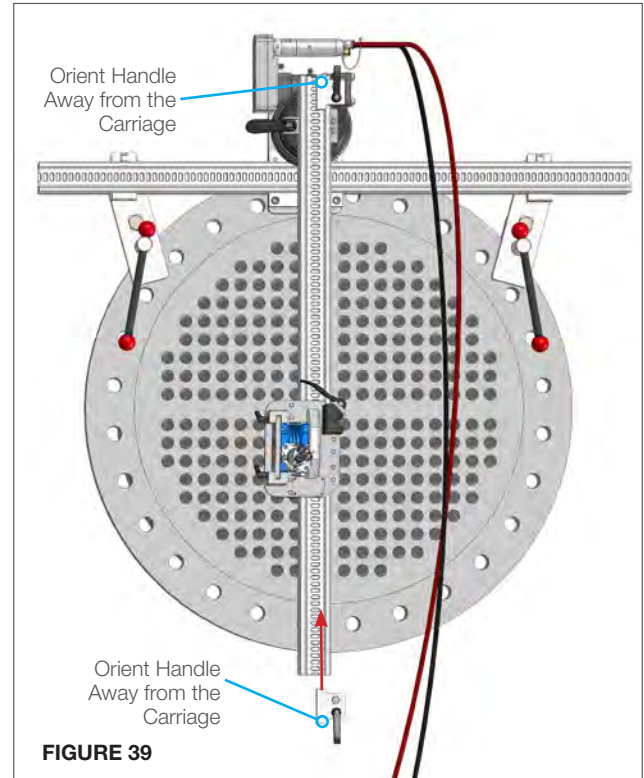
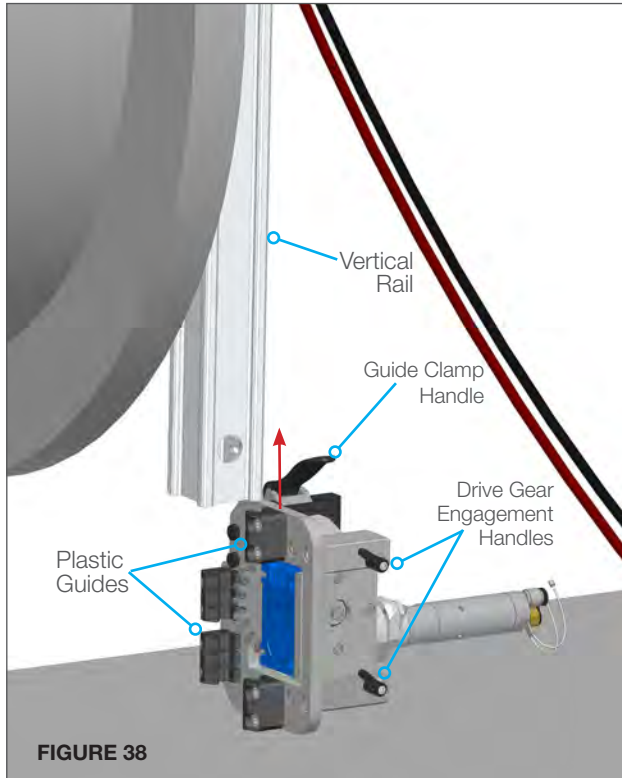
OPTIONAL ACCESSORY - QUICK CLAMP AND MOUNT FOR FLANGES WITHOUT BOLT HOLES

INSTALL THE LINEAR DRIVE ONTO THE RAIL

17. Rotate the Drive Gear Engagement Handles so the drive gear retracts into the drive.
18. Orient the Linear Drive as shown in figure below.
19. Align the Plastic Guides with the Vertical Rail and slide the Linear Drive onto the Rail.
20. Use the Drive Gear Engagement Handles to ensure the Drive Gear is engaged with the slots on the Rail.
21. Loosen the handles on the two Rail Stops and slide one onto both ends of the Slotted Rail. Rotate the handles so they face away from Linear Drive (*as shown*) and ensure that they are securely fastened.

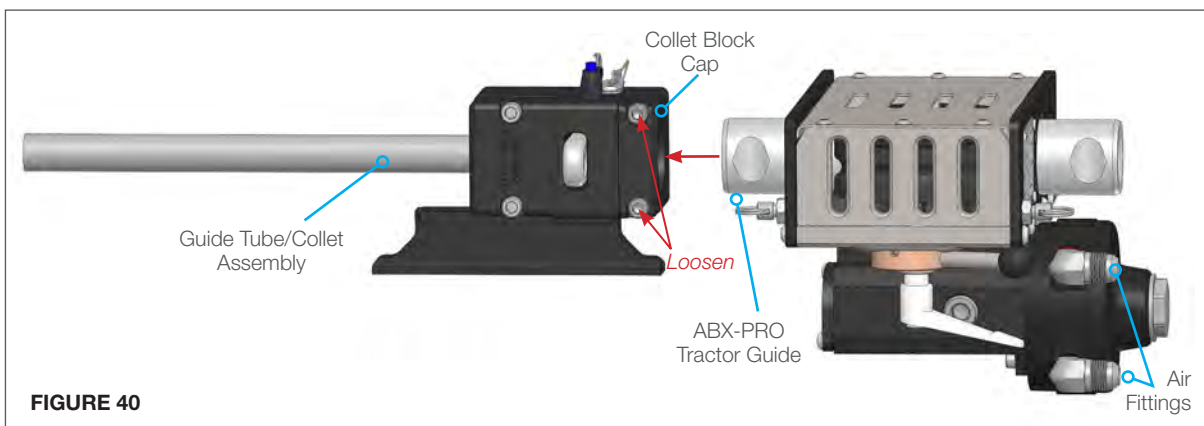
NOTICE

Verify Drive Gear Engagement Handles are tight before proceeding with the assembly steps.



INSTALL THE ABX-PRO TACTOR ONTO THE BUIDE TUBE/COLLET BLOCK ASSEMBLY

22. Loosen the Collet Block Cap with a 4mm Hex Wrench. See location below.
23. Slide the ABX-PRO Tractor Guide into the Collet Block until it comes to a stop. The Air Fittings on the ABX-PRO Tractor should be oriented away from the Collet Block.



OPTIONAL ACCESSORY - PRO 470 MOUNT WITH QUICK CLAMPS

INSTALL THE GUIDE TUBE/COLLET ASSEMBLY ONTO THE LINEAR DRIVE

24. Pull the Clamp Handle up to open the clamp and slide the Guide Tube/Collet and ABX-PRO Tractor into the clamp on the Linear Drive. Secure in place by closing the Clamp Handle.

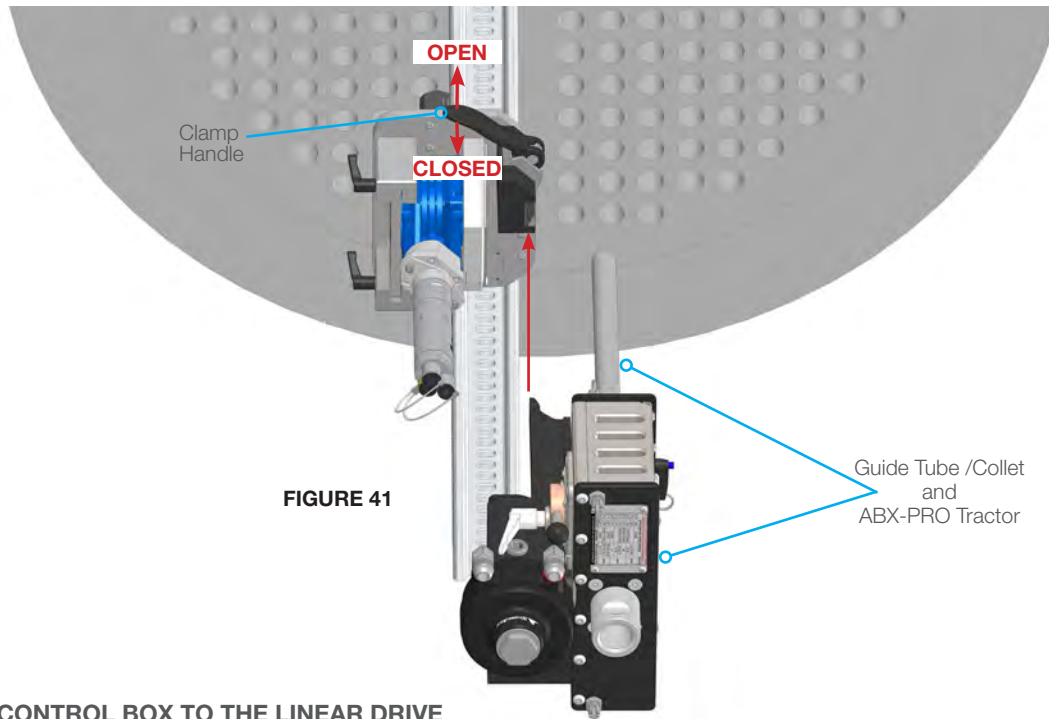


FIGURE 41

CONNECT THE CONTROL BOX TO THE LINEAR DRIVE

25. Connect the color coded Air Tubing to their respective Push Connect Fittings, located above the "LINEAR" label on the base of the Control Box.
26. Operate the "Linear" lever on the control box to blow out the Air Tubing lines before connecting the opposite ends to the Linear Drive.
27. Connect the opposite ends of the Air Tubing to the Push Connect Fittings on the Linear Drive air motor.

NOTICE

Due to the various mounting options, the Linear Drive air motor is not color coded. If the operating directions seem reversed, the connections at the air motor can easily be switched at the Push Connect Fittings.

CONNECT THE CONTROL BOX TO THE ABX-PRO TRACTOR

28. Screw the color coded 1/2" Pneumatic Hoses to the Color Coded JIC Fittings on the ABX-PRO Tractor.
29. Operate the "Feed" lever on the control box to blow out the Pneumatic lines before connecting the opposite ends to the ABX-PRO.
30. Screw the opposite ends of the color coded 1/2" Pneumatic Hoses to the Color Coded JIC Fittings on the Control Box

RETURN TO PAGE 15 TO COMPLETE PNEUMATIC DUMP CONTROL CONNECTIONS AND HIGH PRESSURE HOSE AND COLLET INSTALLATION

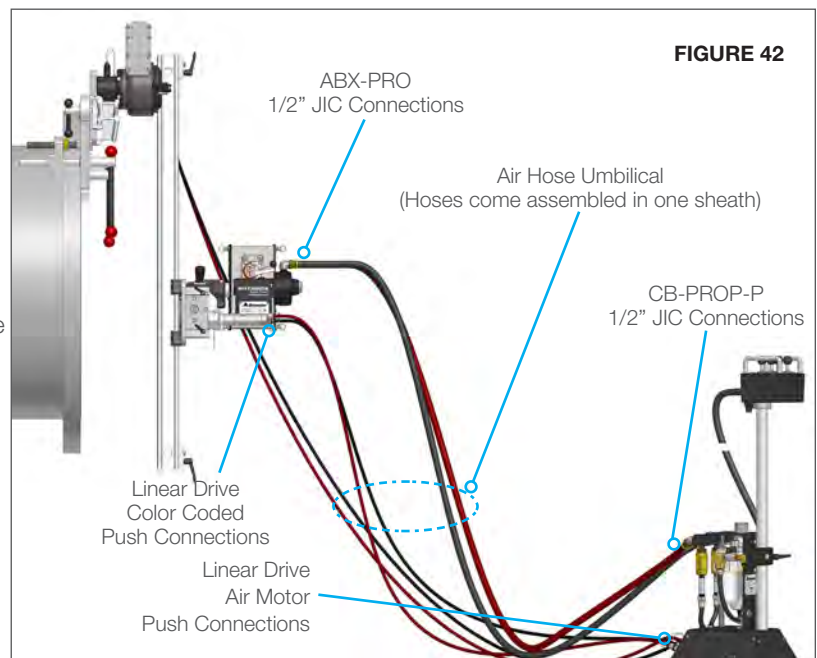


FIGURE 42

MAINTENANCE		
Maintenance Item	Frequency	Maintenance Required
Air Motors	After each use	Apply a small amount of air tool oil directly into the forward and reverse fittings. Then, briefly operate the controls at slow speed for a short duration in each direction to coat the interior parts of the motor.
All Air Fittings	After each use	Always use the supplied plugs and caps to seal the air motor ports when not in use. Make sure the plugs are clean and/or wipe them off before inserting them into the air motor fittings.
All components the hoses pass through	After each use	As wear occurs the rounded edges could become sharp and damage hoses. Any components showing excessive wear should be replaced.
Roller grooves	Before each use	Replace roller if cuts or roughness is present. (See the Roller Removal and Installation pages in this manual)
Hose	After each use	Install cap on threads to protect threads and prevent contamination.
Lubricator of control box	Before each use	Add oil when fluid drops below minimum level marking. Use SAE#10 or ISO VG32 Tool Oil (StoneAge Part Number GP 041). Using oils that are not intended for air tool systems may cause malfunction and/or component damage.
Guide Tube/Collet Block	After each use	Wash out any material build up to prevent components from being clogged.
Waterblast Tool	After each use	Remove tool, lubricate and store in clean container.
Rotary Drive	Every 8 hours of use	Lubricate the two Zerks on the Rotary Drive with 1 to 2 pumps of any multipurpose NLGI 2 grease.

TROUBLESHOOTING	
Problem	Solution
No air is delivered to tool	<ul style="list-style-type: none"> -Check that shut-off valve near regulator is open -Check that regulator is set to 100 psi -Open flow control valves by rotating the brass colored speed controls in the counterclockwise direction.
Hose is being damaged by Rollers	<ul style="list-style-type: none"> -Check that the proper Rollers are installed (see roller and collet reference plate) -Loosen eccentric lever to reduce clamp force on hose. -Check Rollers for excessive wear in groove
Hose slippage on Rollers	<ul style="list-style-type: none"> -Check that the proper Rollers are installed (see roller and collet reference plate) -Tighten eccentric lever to retain clamp force on hose.

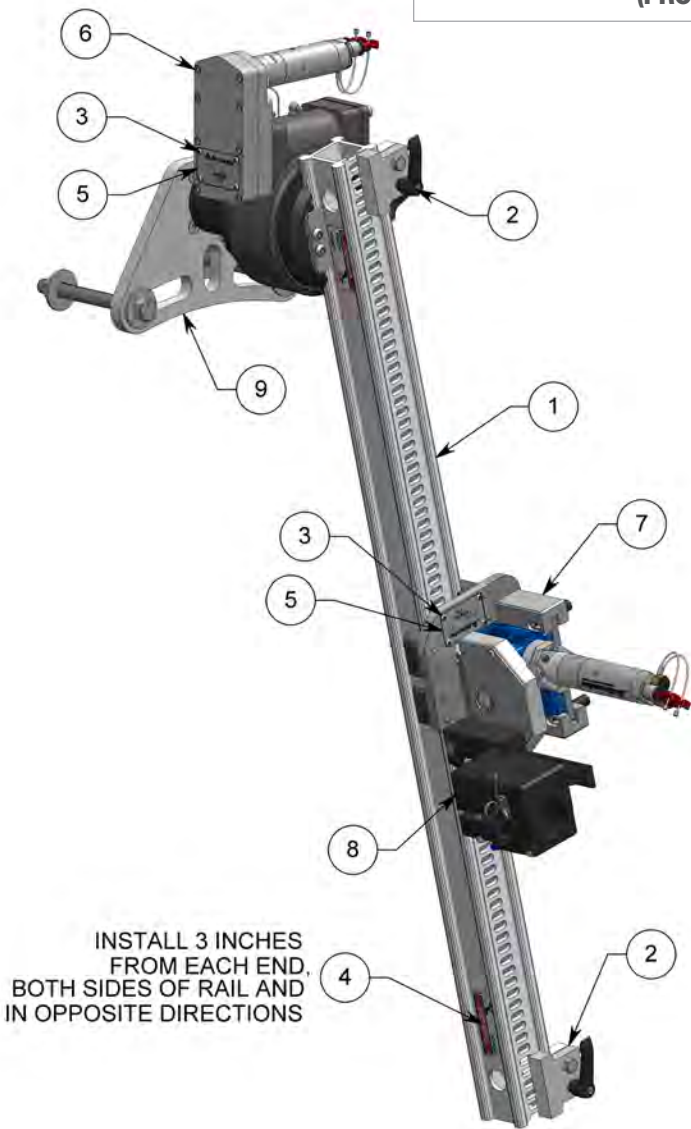
Contact StoneAge for Safety Data Sheets for material usage, a complete list of spare part numbers, and service instructions for the COMPASS Positioner (PROP-300), and CONTROL BOX (CB-PROP,-S,-P).

STORAGE, TRANSPORTATION, AND HANDLING

Use mild soapy water to clean the equipment in order to remove corrosive materials. Before storing the unit, use compressed air to blow off debris and moisture. Apply a small amount of air tool oil directly into the Linear and Rotary 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. Always use the supplied plugs and caps to seal the air motor ports when not in use. Make sure the plugs are clean and/or wipe them off before inserting them into the air motor fittings.

The COMPASS Positioner (PROP-300), can be broken down into smaller components that should be stored in a clean and dry area.

COMPASS POSITIONER ASSEMBLY
(PROP-300)



INSTALL 3 INCHES
FROM EACH END,
BOTH SIDES OF RAIL AND
IN OPPOSITE DIRECTIONS

#	PART NUMBER	QTY.
1	BU 002-3.75-001 2.5" BOX RAIL EXTRUSION, SLOTTED	1
2	BU 152 RAIL STOP ASSY	2
3	GSB 313-0075 BHCS 6-32 X .19 SS	8
4	PL 160 WARNING PINCH POINT 1.25X3.0 DECAL	4
5	PROP 305 CE SERIAL PLATE SET	1
6	PROP 320 ROTARY DRIVE ASSEMBLY	1
7	PROP 330 LINEAR DRIVE ASSEMBLY	1
8	PROP 340 GUIDE TUBE COLLET BLOCK ASSEMBLY	1
9	PROP 350 MOUNTING BRACKET ASSY	1

RAIL EXTENSION
(PROP 580-1.33-001)

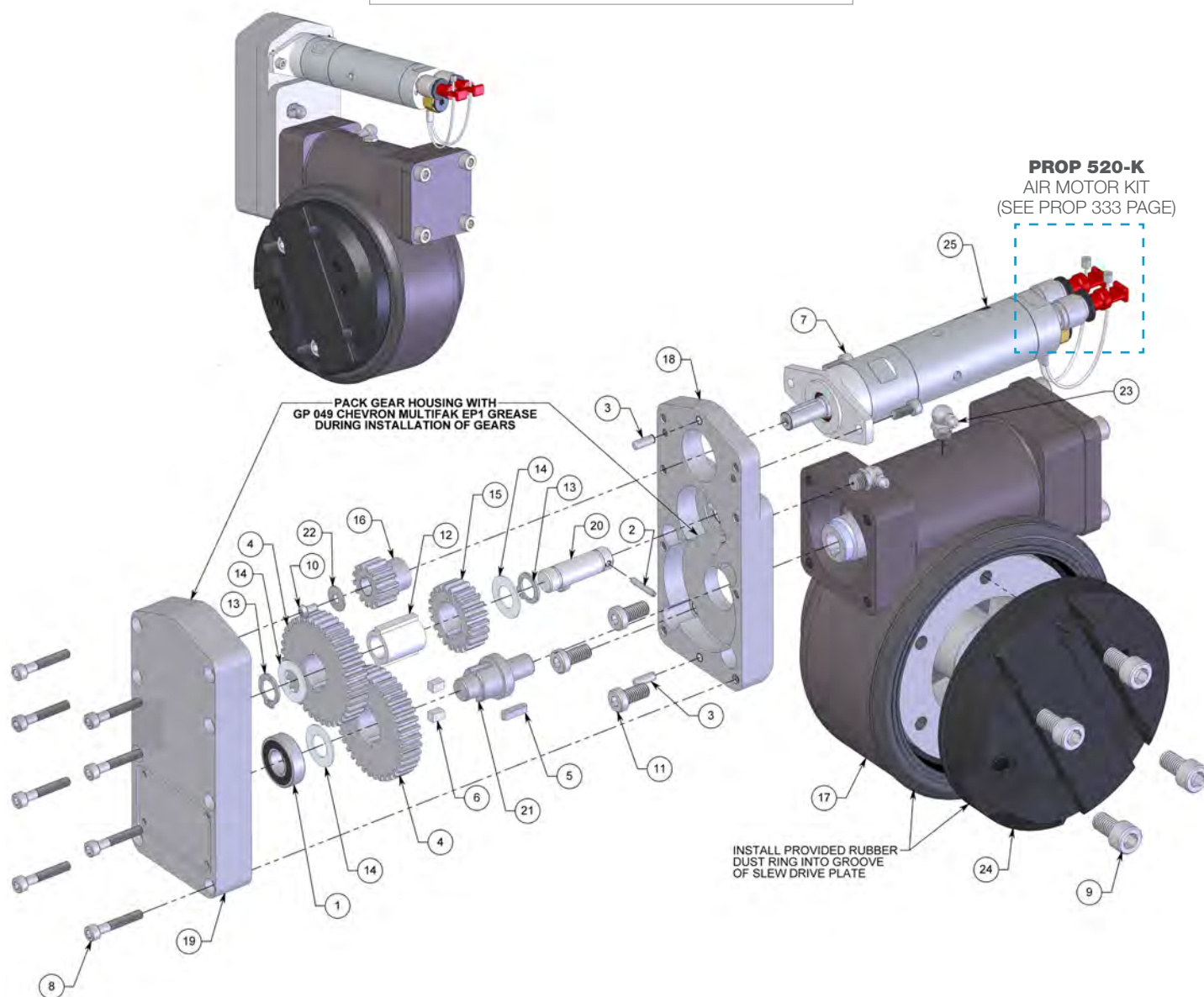
#	PART NUMBER	PROP 580-1.33-001/ QTY.
1	BR 006-2.5-001 2.5" SPLICE TUBE	1
2	PROP 008-2.5-001 2.5" WEDGE BOLT ASSEMBLY	2
3	BU 002-1.33-001 2.5" BOX RAIL EXTRUSION, SLOTTED	1



BOX RAIL EXTENSIONS CAN BE PURCHASED IN
2, 4 OR 6 FT LENGTHS. REFER TO BOM FOR PART
NUMBER OF BOX RAIL EXTENSION TO USE.



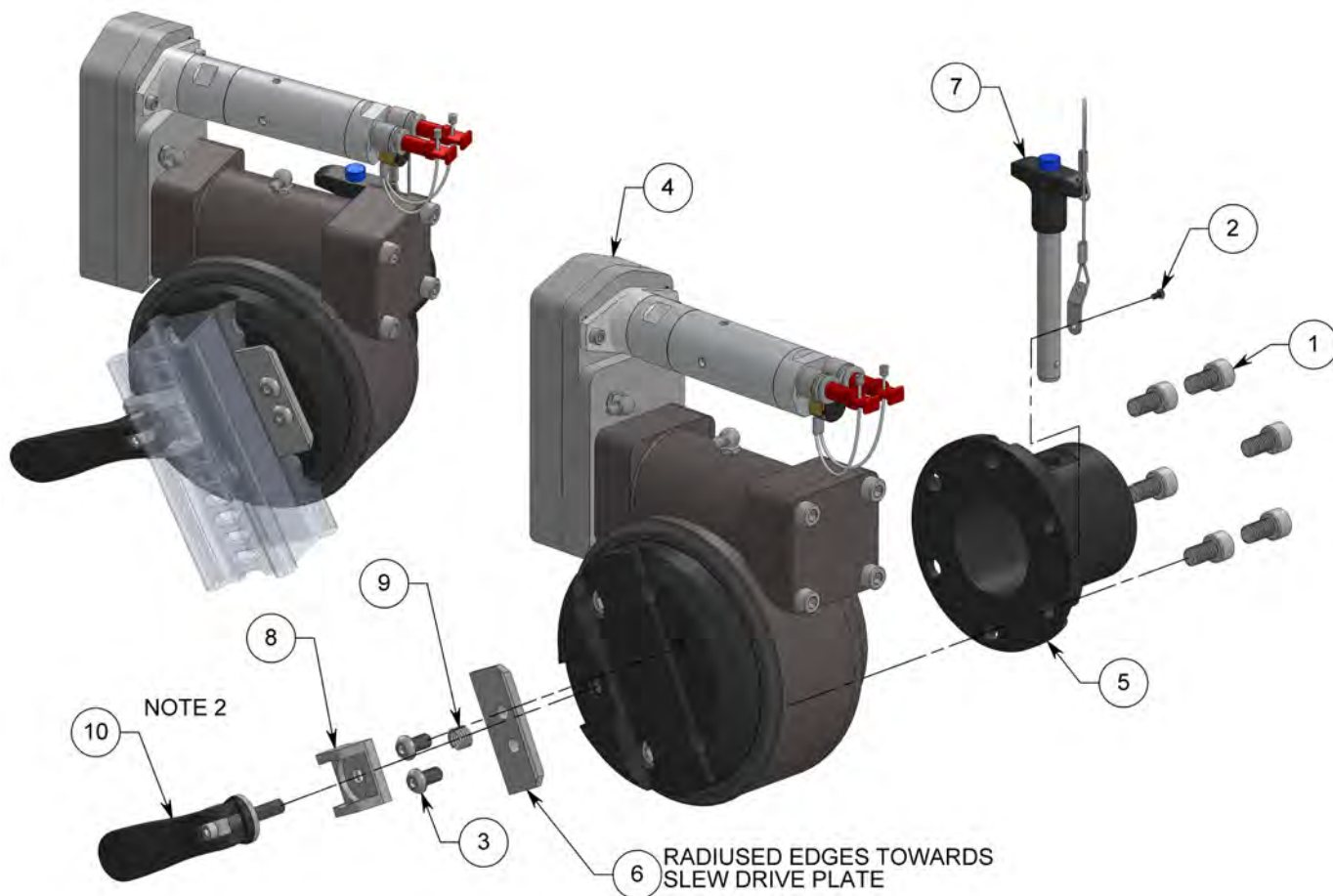
COMPASS POSITIONER (PROP 310)
GEARBOX ASSEMBLY



#	PART NUMBER	QTY
1	ABX 228 BEARING .500 ID X 1.125 OD SEALED PERMALUBE	1
2	BRLM 191 SPRING PIN, 1/8 X 3/4 OAL (18-8 SS)	1
3	BRLM 198.1 DOWEL PIN	2
4	BRLM 213 BOSTONGEAR-GB37	2
5	GK 4-4-16-RE KEY 4MM X 4MM X 16MM ROUND END	1
6	GK 188-188-0300-SE KEY .188 X .188 X .300 SQ END	2
7	GS 3M5-12-0.8 SHCS M5X0.8 X12 SS	2
8	GS 3M5-30-0.8 SHCS M5X0.8 X30 SS	8
9	GS 3M10-18-1.5 SHCS M10X1.5 X 18 SS	4
10	GSB 3M4-8-0.7 BHCS M4X0.7 X 8 SS	1
11	GSLH 3M8-16-1.25 SHCS, LOW HD M8X1.25 X 16 SS	4
12	HRS 515 GEAR BUSHING	1

13	HRS 518 RETAINING RING, EXTERNAL .50	2
14	HRS 529 THRUST WASHER	3
15	PROP 309 GEAR, CHANGE	1
16	PROP 311 GEAR, MODIFIED	1
17	PROP 312 GEARBOX, SLEW DRIVE 3IN	1
18	PROP 313 PLATE, SPUR GEARBOX	1
19	PROP 314 PLATE, SPUR GEARBOX COVER	1
20	PROP 315 SHAFT, IDLER	1
21	PROP 316 SHAFT, STUB	1
22	PROP 318 WASHER, BELLEVILLE	1
23	PROP 319 ZERK, GREASE 90 DEG M10X1.0 SS	2
24	PROP 321 PLATE, SLEW DRIVE	1
25	PROP 520-K AIR MOTOR KIT (NPT)	1

COMPASS POSITIONER (PROP 320)
ROTARY DRIVE ASSEMBLY

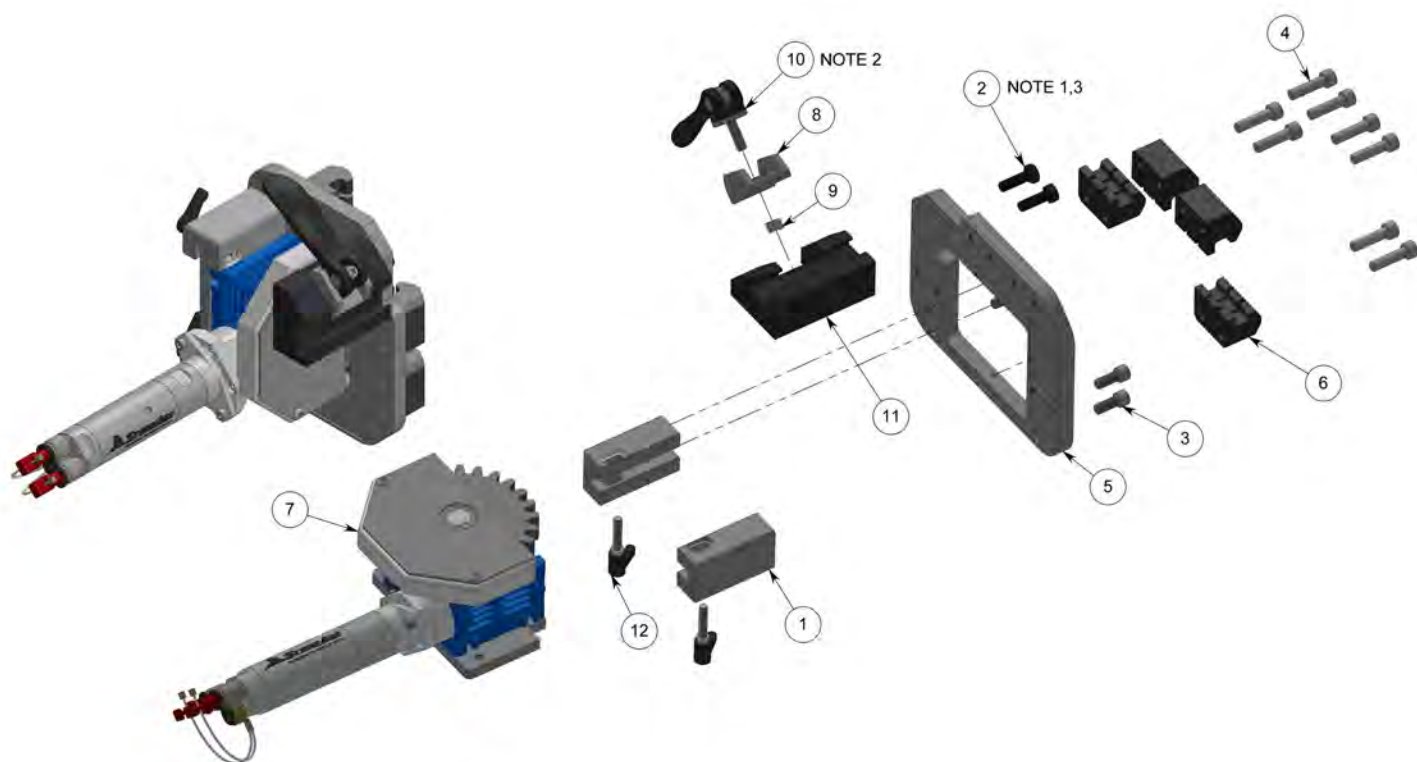


NOTE:

1. APPLY BLUE LOCTITE: PN: 242 OR EQUIVALENT
2. APPLY BLUE GOOP (A SWAGelok BRAND) ANTI-SEIZE TO THREADS OF THE HANDLE.

#	PART NUMBER	QTY.
1	GS 3M10-18-1.5 SHCS M10X1.5 X 18 SS	6
2	GSB 3M3-6-0.5 BHCS M3X0.5 X 6 SS	1
3	GSB 3M8-16-1.25 BHCS M8X1.25 X 16 SS	2
4	PROP 310 GEARBOX ASSEMBLY	1
5	PROP 322 COUPLING, SLEW DRIVE	1
6	PROP 323 PLATE, COVER	1
7	PROP 325 PIN, QUICK RELEASE	1
8	PROP 334 TAB, CLAMP	1
9	PROP 335 SPRING, COMPRESSION	1
10	PROP 336 HANDLE ASSY	1

COMPASS POSITIONER (PROP 330)
LINEAR DRIVE ASSEMBLY



NOTE:

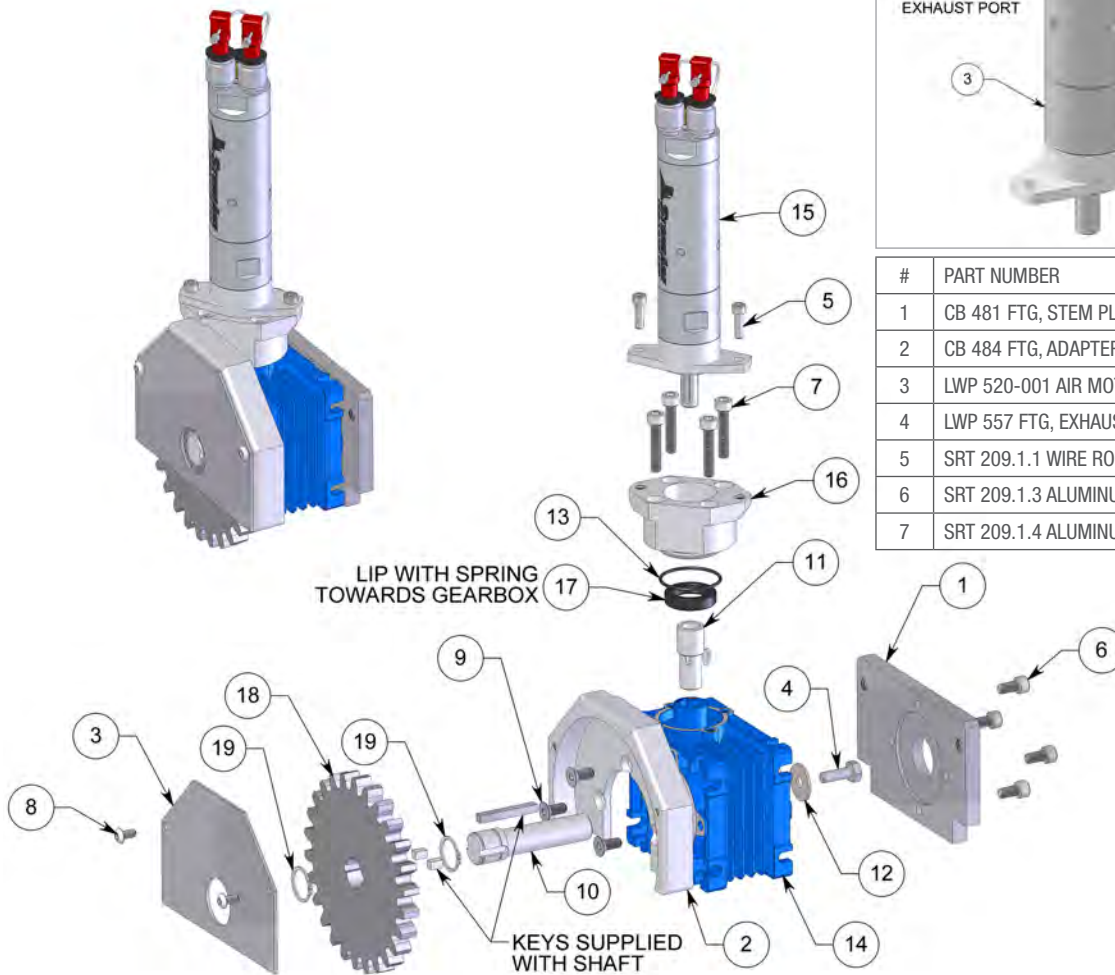
1. APPLY BLUE LOCTITE: PN: 242 OR EQUIVALENT
2. APPLY BLUE GOOP (A SWAGelok BRAND) ANTI-SEIZE TO THREADS OF THE HANDLE.
3. TORQUE M8 HEX BOLTS TO 20 FT-LBS

#	PART NUMBER	QTY.
1	DBP 116 HANDLE BLOCK MOUNT HZ	2
2	GB 5M8-25-1.25-HS BOLT, HEX M8x1.25 x 25 HIGH STRENGTH, BLACK CR COATING	2
3	GS 331-03 SHCS .31-18 x .75 SS	4
4	GS 3M8-30-1.25 SHCS M8x1.25 x 30 SS	8
5	PROP 331 PLATE, CARRIAGE	1
6	PROP 332 RAIL SLIDE, PLASTIC	4
7	PROP 333 MOTOVARIO ASSY	1
8	PROP 334 TAB, CLAMP	1
9	PROP 335 SPRING, COMPRESSION	1
10	PROP 336 HANDLE ASSY	1
11	PROP 338 BLOCK, CLAMP	1
12	SRT 557 ADJUSTABLE HANDLE .25-20 X 1.19	2

COMPASS POSITIONER (PROP 333)
MOTOVARIO ASSEMBLY



#	PART NUMBER	QTY.
1	CB 481 FTG, STEM PLUG PL6 MODIFIED	2
2	CB 484 FTG, ADAPTER P2M PL6 INTERNAL HEX	2
3	LWP 520-001 AIR MOTOR	1
4	LWP 557 FTG, EXHAUST PROTECTOR P2M	1
5	SRT 209.1.1 WIRE ROPE FOR PROP (CUT TO LENGTH)	1
6	SRT 209.1.3 ALUMINUM SLEEVE	1
7	SRT 209.1.4 ALUMINUM STOP SLEEVE	2

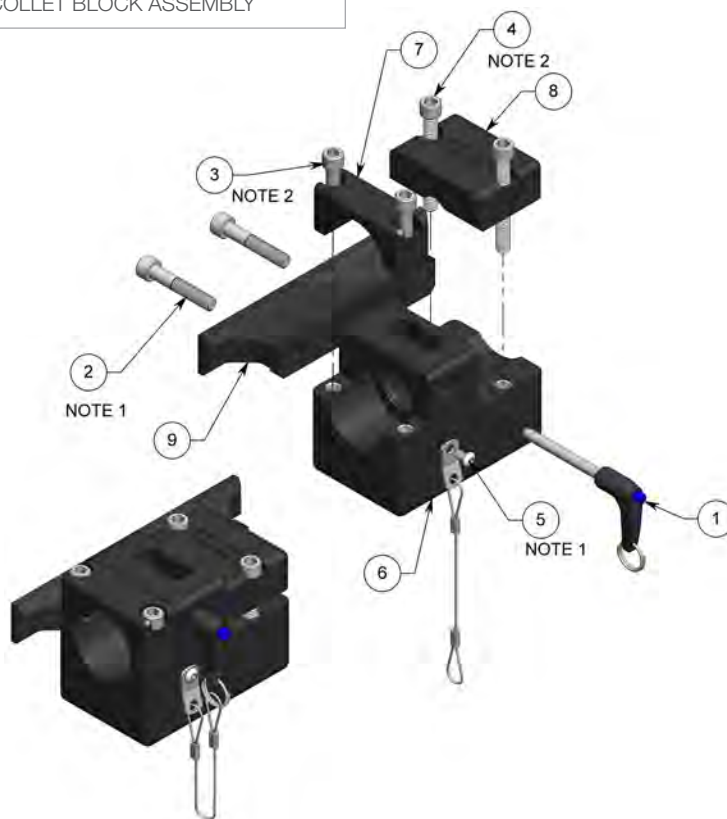


#	PART NUMBER	QTY.
1	DBP 131 MOTOVARIO PLATE HZ	1
2	DBP 135 GEAR COVER HZ	1
3	DBP 136 GEAR COVER PLATE HZ	1
4	GB 325-03 BOLT, HEX .25-20 X .75 SS	1
5	GS 319-025 SHCS .19-24 X .62 SS	2
6	GS 3M6-12-1.0 SHCS M6X1.0 X 12 SS	4
7	GS 3M6-30-1.0 SHCS M6X1.0 X 30 SS	4
8	GSB 319-015 BHCS .19-24 X .38 SS	2
9	GSF 3M6-14-1.00 FHCS M6X1.00 X 14 SS	3

10	LWP 509 MOTOVARIO SHAFT	1
11	LWP 510-001 STEP SHAFT	1
12	LWP 516 WASHER, OVERSIZED	1
13	LWP 538 O-RING	1
14	LWP 550 MOTOVARIO NMRV030301600_625IN	1
15	PROP 520-K AIR MOTOR KIT (NPT)	1
16	SKRL 179 MOTOR MOUNT HUB	1
17	SL 010 SEAL	1
18	SRT 520 SPUR GEAR SS (6 DP, 14.5 PA, 26 T)	1
19	SRT 537 RETAINING RING, SS EXTERNAL	2

COMPASS POSITIONER (PROP 340)
GUIDE TUBE COLLET BLOCK ASSEMBLY

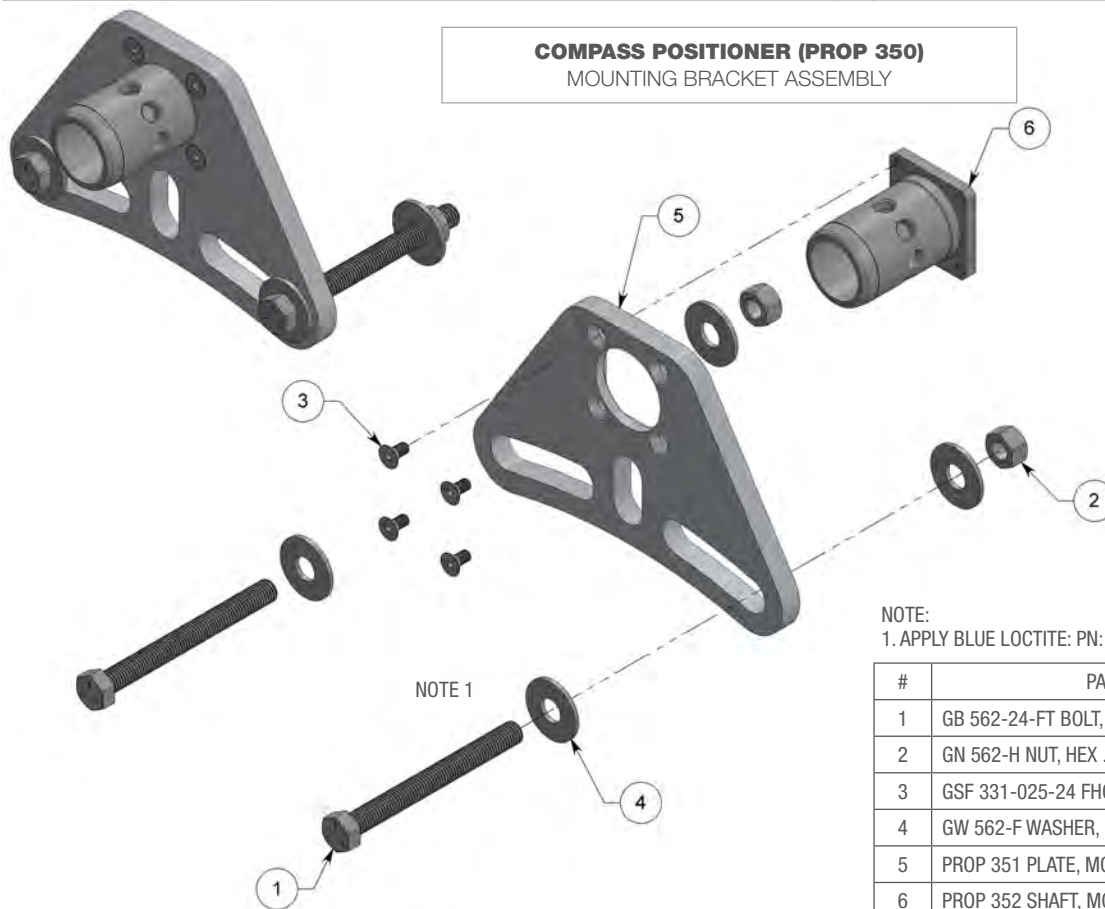
#	PART NUMBER	QTY.
1	BOP 033 QUICK PIN WITH LANYARD	1
2	GS 3M8-45-1.25 SHCS	2
3	GS 331-06 SHCS .31-18 x 1.50 SS	2
4	GS 331-10 SHCS .31-18 x 2.50 SS FULL THD	2
5	GSB 319-015 BHCS 10-24 x .38 SS	1
6	PROP 341 GUIDE TUBE COLLET BLOCK BODY	1
7	PROP 342 COLLET BLOCK CAP	1
8	PROP 343 GUIDE TUBE COLLET BLOCK CAP	1
9	PROP 345 BLOCK, SLIDE	1



NOTE:

1. APPLY BLUE LOCTITE: PN: 242 OR EQUIVALENT
2. APPLY BLUE GOOP (A SWAGELOK BRAND) ANTI-SEIZE.

COMPASS POSITIONER (PROP 350)
MOUNTING BRACKET ASSEMBLY



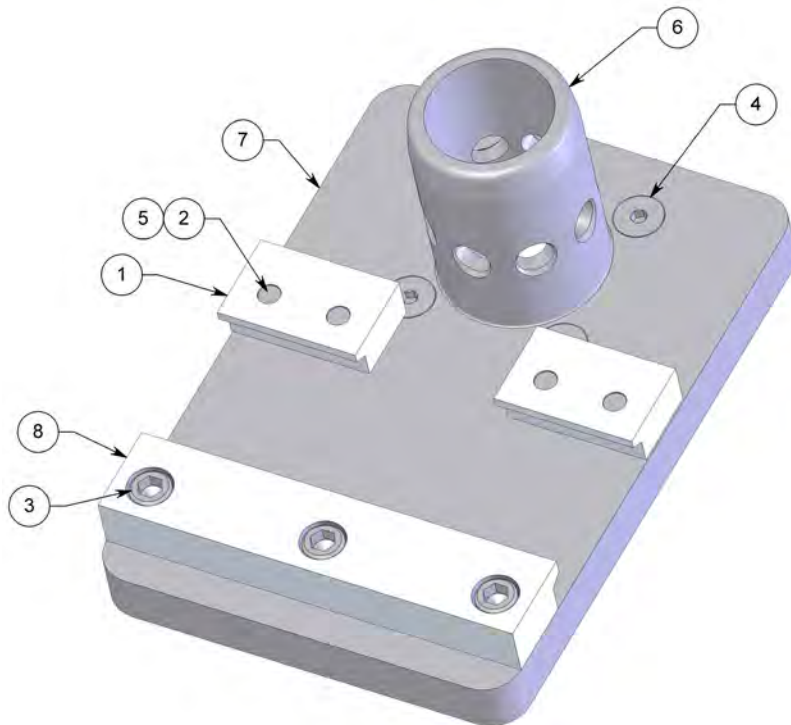
NOTE:

1. APPLY BLUE LOCTITE: PN: 242 OR EQUIVALENT

#	PART NUMBER	QTY
1	GB 562-24-FT BOLT, HEX .62-11 X 6.00 FULL THD	2
2	GN 562-H NUT, HEX .62-11	2
3	GSF 331-025-24 FHCS .31-24 X .62 SS	4
4	GW 562-F WASHER, FLAT .62	4
5	PROP 351 PLATE, MOUNTING	1
6	PROP 352 SHAFT, MOUNTING	1

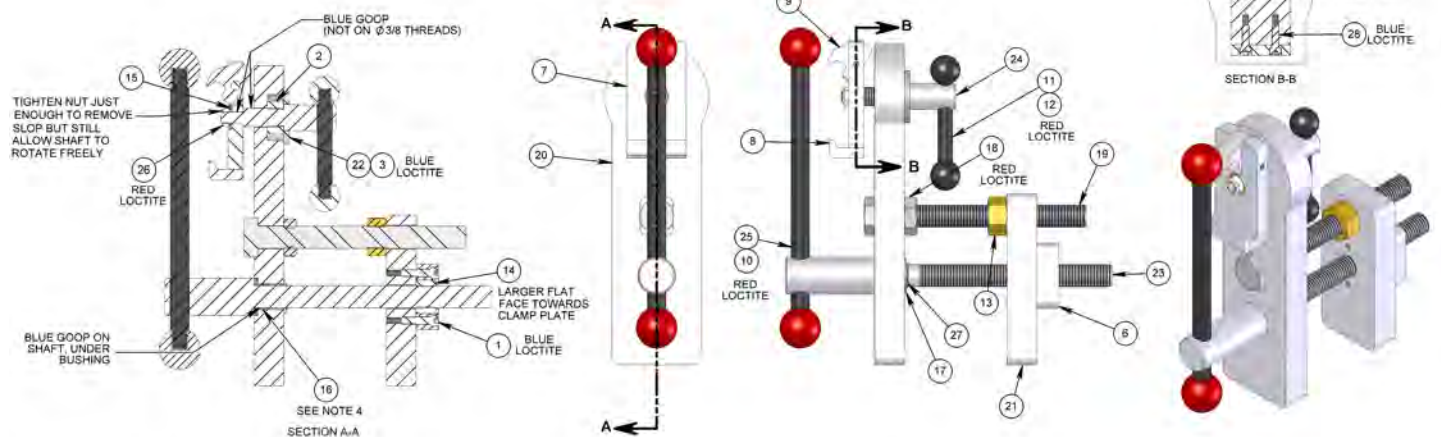
PARTS DIAGRAM

COMPASS POSITIONER (PROP 470) RAIL MOUNT ASSEMBLY



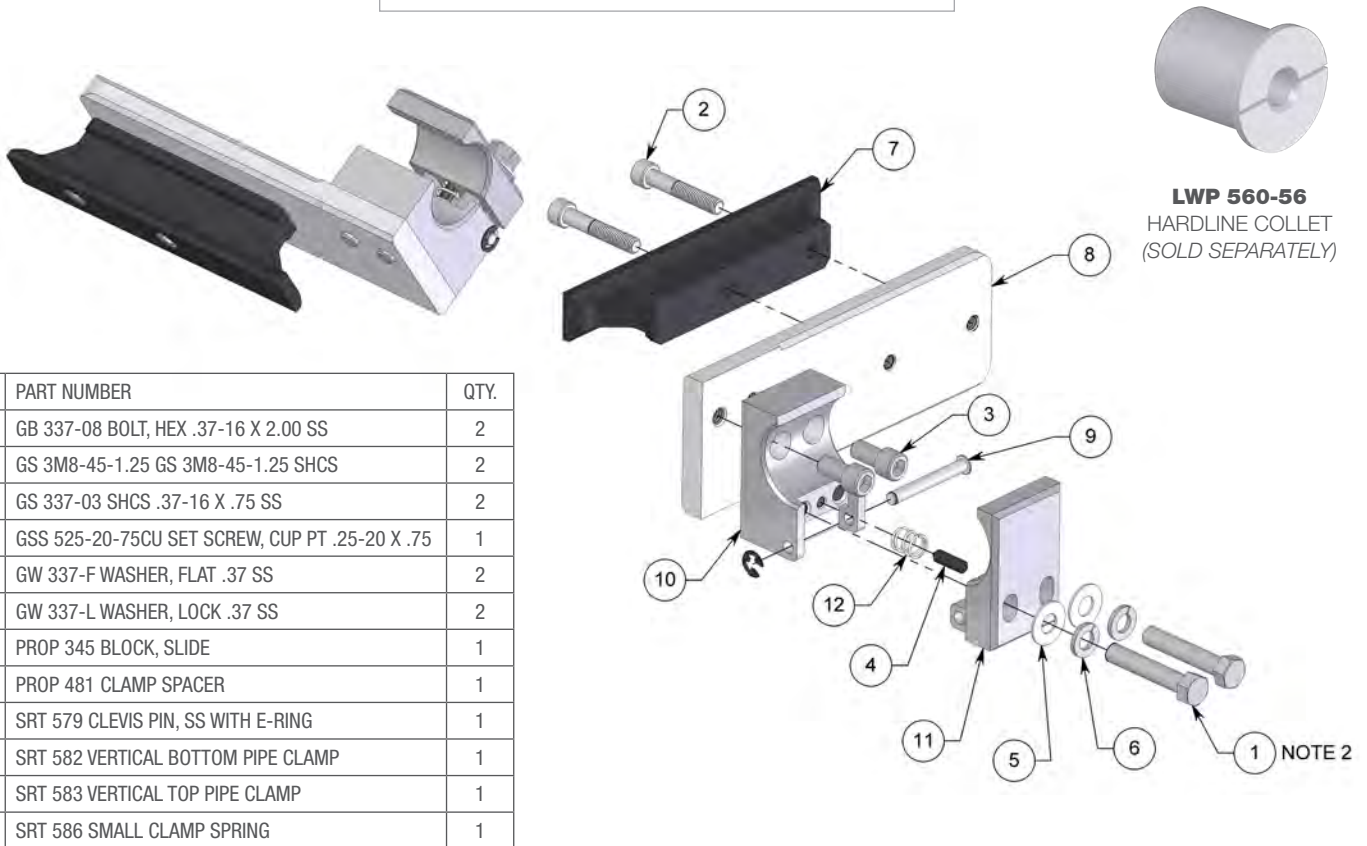
#	PART NUMBER	QTY
1	BR 060 RAIL CLAMP	2
2	GB 337-06 BOLT, HEX .37-16 X 1.50 SS	4
3	GS 337-04 SHCS .37-16 X 1.00 SS	3
4	GSF 331-025-24 FHCS .31-24 X .62 SS	4
5	GW 337-L WASHER, LOCK .37 SS	4
6	PROP 352 SHAFT, MOUNTING	1
7	PROP 471 PLATE, RAIL MOUNT	1
8	PROP 472 RAIL CLAMP, LOWER	1

COMPASS POSITIONER (PROP 518) QUICK CLAMP ASSEMBLY



#	PART NUMBER	QTY.	#	PART NUMBER	QTY.	#	PART NUMBER	QTY.
1	BC 053 SHCS .25-20 X 1.00 SS	2	9	LWP 526 QUICK RAIL CLAMP FINGER	1	19	LWP 555 BOLT, 3/4-10 X 7.00L, THREADED	1
2	GN 562-H-LH-18 HEX NUT .62-18 LEFT HAND	1	10	LWP 530 FLANGE CLAMP KNOB	2	20	PROP 521 QUICK CLAMP BASE PLATE	1
3	GSF 319-02 FHCS 10-24 X .50 SS	2	11	LWP 531 RAIL CLAMP LEVER	1	21	PROP 522 FLANGE CLAMP PLATE	1
4	GSSH 0312-0750-SS SHOULDER SCREW .312 X .750 .25-20 SS	1	12	LWP 532 RAIL CLAMP KNOB	2	22	PROP 523 NUT CAPTIVE PLATE	1
5	LWP 517 BALL NOSE SPRING PLUNGER	1	13	LWP 533 NUT, BRASS, 3/4-10	1	23	PROP 527 FLANGE CLAMP SCREW	1
6	LWP 523 NUT CAP	1	14	LWP 534 NUT, SQUARE, 3/4-10	1	24	PROP 528 RAIL CLAMP SHAFT	1
7	LWP 524 RAIL CLAMP PLATE	1	15	LWP 535 THRUST WASHER	1	25	PROP 529 FLANGE CLAMP LEVER	1
8	LWP 525 STATIC RAIL CLAMP	1	16	LWP 545 FLANGED BUSHING	1	26	SRT 333 NYLOCK HEX JAM NUT SS THIN	1
			17	LWP 547 SHIM	1	27	SRT 537 RETAINING RING, SS EXTERNAL	1
			18	LWP 548 NUT, HEX JAM .75-10	1	28	TB 050 SHCS .25-20 X .75 SS	2

COMPASS POSITIONER (PROP 480)
SHOTGUN MOUNT ASSEMBLY



HS 121-XX-XX
HOSE STOP CLAMPS

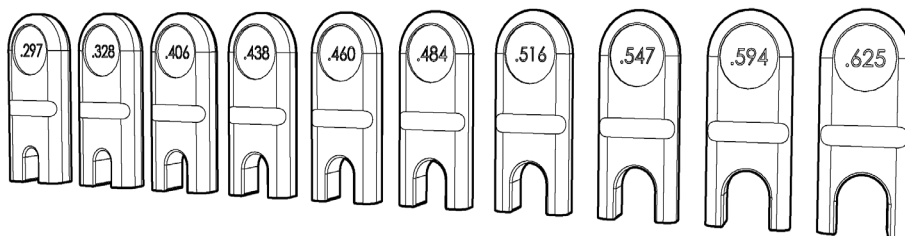


HOSE STOP TO HOSE REFERENCE TABLE

HOSE STOP PART NUMBER	HOSE STOP CLAMP ASSEMBLY SIZE		SPIRSTAR	PARKER	REQUIRED QTY
	in.	mm			
HS 121-27-34	0.27-0.34	6.8-8.6	3/2, 3/4	2240D-02, 2440D-02	1 PER LANCE
			4/2	2240D-025	
HS 121-34-42	0.34-0.42	8.6-10.7	4/4	2448D-025	
			5/2	2240D-03	
HS 121-42-50	0.42-0.50	10.7-12.7	4/4	2448D-025	
			4/6, 5/4, 6/2	2240D-04	
HS 121-50-56	0.50-0.56	12.7-14.2	5/6	2240D-05	
			6/4	2440D-04	
			8/2	2740D-03	
HS 121-56-61	0.56-0.61	14.2-15.5	8/4		

PARTS DIAGRAM

FIN FAN (FF 622)
*OPTIONAL COLLET SET
INCLUDES ONE OF EACH SIZE **(FF 121-XX)**



COLLET TO HOSE REFERENCE TABLE					
HOSE OD	SPIRSTAR	PARKER	COLLET	COLLET SIZE	
				in.	mm
0.26–0.38 IN.	3/2	2240D-02	FF 121-297	0.297	7.5
	3/4, 4/2	2440D-02, 2240D-025	FF 121-328	0.328	8.0
	3/6, 5/2	2240D-03	FF 121-406	0.406	10.0
0.39–0.50 IN.	4/4	2448D-025	FF 121-438	0.438	11.0
	4/6, 5/4, 6/2	2240D-04	FF 121-460	0.460	11.7
		2640D-025, 2740D-03	FF 121-484	0.484	12.3
	6/4	2440D-04	FF 121-516	0.516	13.0
0.51–0.61 IN.	5/6, 8/2	2740D-03, 2240D-05	FF 121-547	0.547	14.0
	8/4		FF 121-594	0.594	15.0
		2440D-05	FF 121-625	0.625	16.0
0.80–0.93 IN.	3/8" RUBBER WB HOSE	N/A	N/A	N/A	

PROP 490-X
AUTOBOX GUIDE TUBE KITS

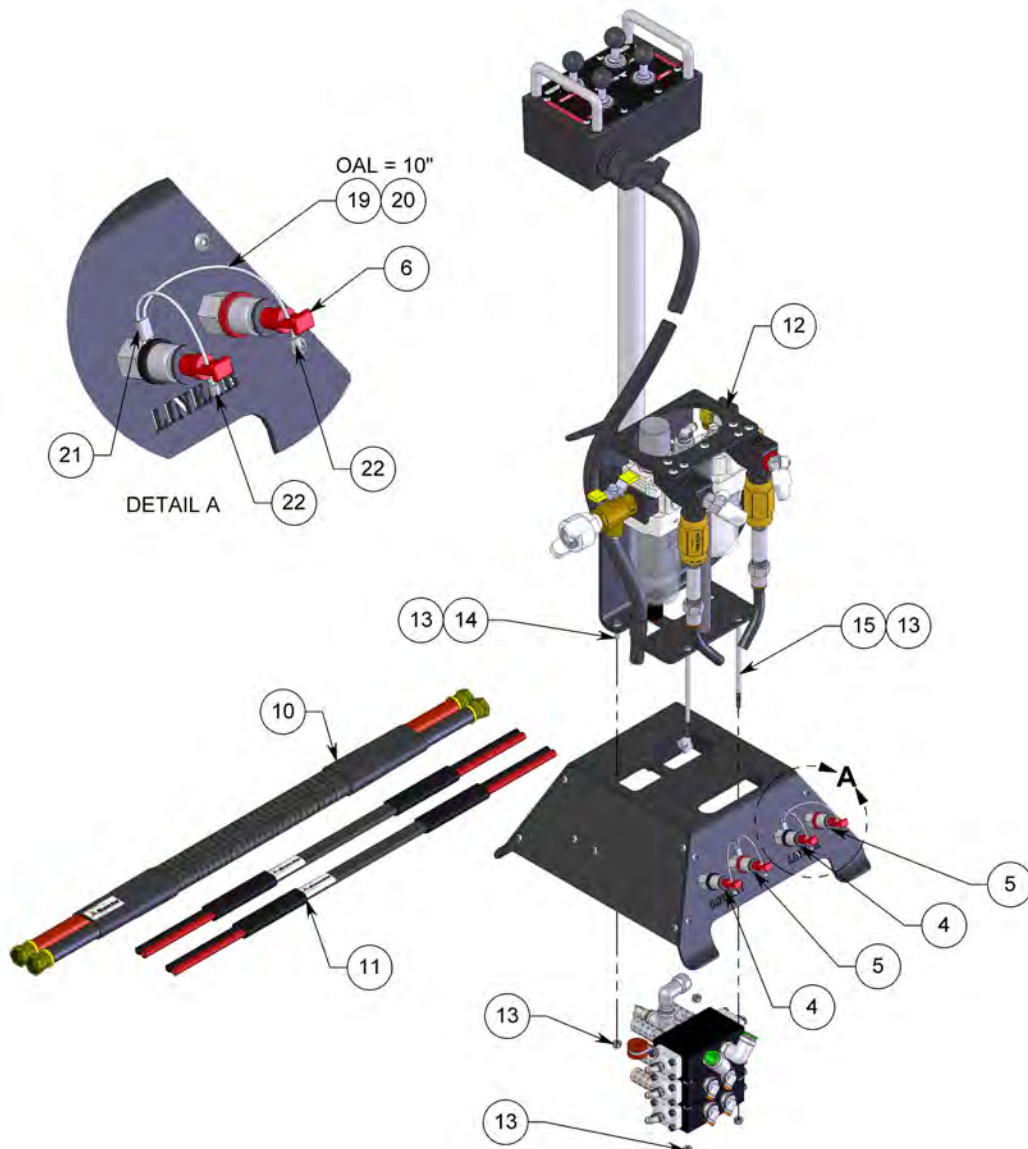
GUIDE TUBE TO BANSHEE SIZE REFERENCE TABLE				
COMPASS POSITIONER KIT NUMBER	BANSHEE PART NUMBER	GUIDE TUBE PART NUMBER	INSIDE DIAMETER	
			in.	mm
PROP-490-S	BN9.5	ABX 115-12	.459	12
	BN13	ABX 116-12	.546	14
	BN15	ABX 117-12	.674	17
	BN18	ABX 119-12	.745	19
PROP-490-L	BN24	ABX 125-12	1.01	26
	BN24 / BN27	ABX 126-12	1.12	28
	BN33	ABX 127-12	1.38	35



COMPASS POSITIONER (CB-PROP-P)

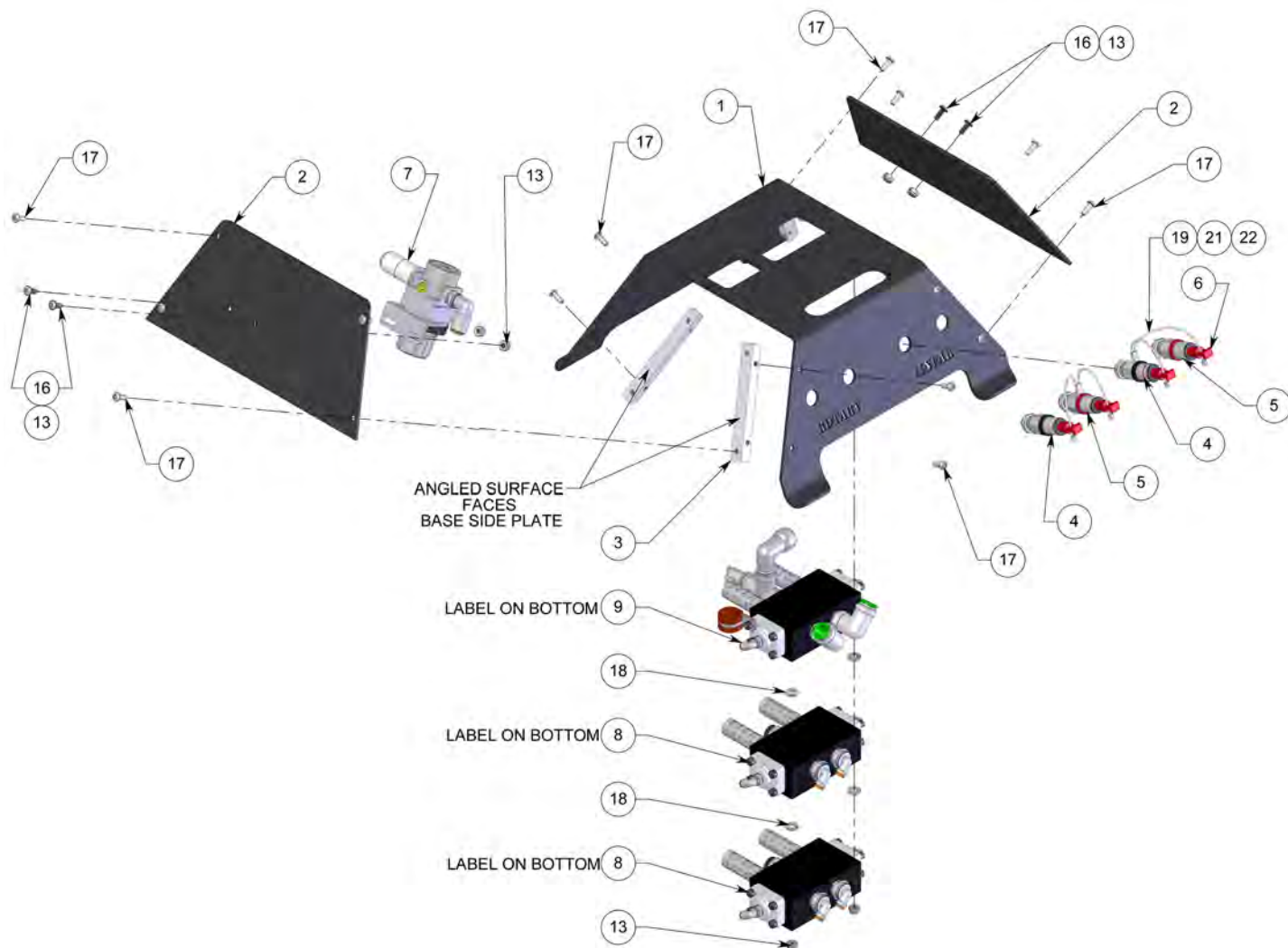
CONTROL BOX PEDESTAL ASSEMBLY

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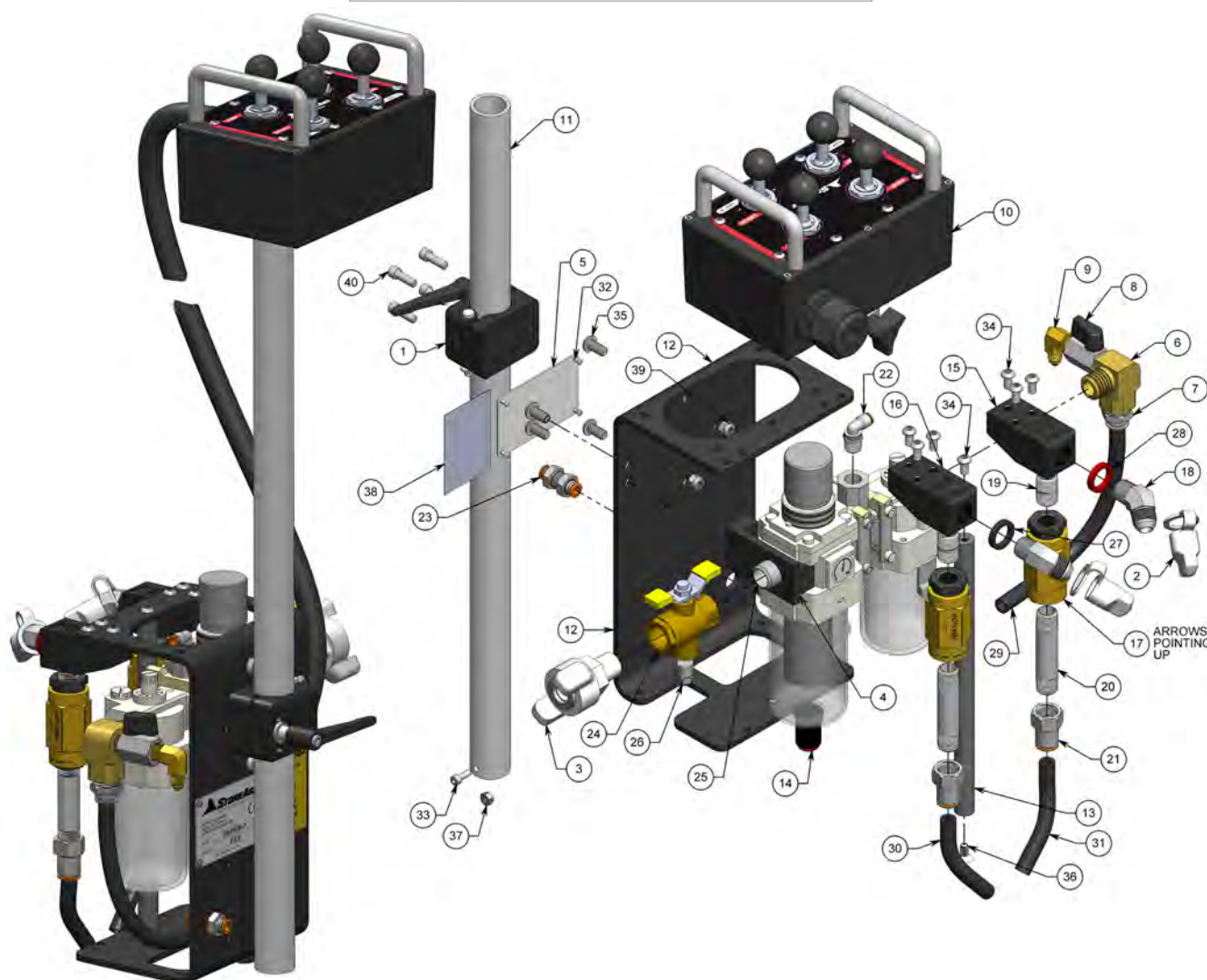
#	PART NUMBER	QTY.
4	CB 480-XX FTG ASSY, PL6	2
5	CB 480-XX FTG ASSY, PL6	2
6	CB 481 FTG, STEM PLUG PL6 MODIFIED	4
10	CB 745-15 PRODRIVE SUPPLY HOSE BUNDLE	1
11	CB 749-15 PRO POSITIONER UMBILICAL ASSEMBLY	2
12	GN 319-L NYLOK NUT SS (HC 025.1)	8
13	GS 319-03 SHCS .19-24 X .75 SS	2
14	GS 319-20 SHCS .19-24 X 5.00 SS	2
15	GSB 319-02 BHCS 10-24 X .50 SS (TR130 235)	4
19	SRT 209.1.1 WIRE ROPE FOR CB-PROP LEFT (CUT TO LENGTH)	1
20	SRT 209.1.1 WIRE ROPE FOR CB-PROP RIGHT (CUT TO LENGTH)	1
21	SRT 209.1.3 ALUMINUM SLEEVE	2
22	SRT 209.1.4 ALUMINUM STOP SLEEVE	4

COMPASS POSITIONER (CB-PROP-P) CONTINUED
CONTROL BOX PEDESTAL ASSEMBLY



#	PART NUMBER	QTY.
1	CB 471 BASE	1
2	CB 472 BASE SIDE PLATE	2
3	CB 473 BASE BRACE	4
4	CB 480-XX FTG ASSY, PL6	2
5	CB 480-XX FTG ASSY, PL6	2
6	CB 481 FTG, STEM PLUG PL6 MODIFIED	4
7	CB 486 REGULATOR ASSY, SUPPLY	1
8	CB 496 SPOOL VALVE ASSY, CB-PROP (PROP)	2
9	CB 497 SPOOL VALVE ASSY, CB-PROP (PRO)	1
13	GS 319-03 SHCS .19-24 X .75 SS	2
16	SRT 209.1.3 ALUMINUM SLEEVE	2
17	GSB 319-02-32 BHCS 10-32 X .50 SS	16
18	GW 325-L LOCK WASHER SS	4
19	SRT 209.1.1 WIRE ROPE FOR CB-PROP LEFT (CUT TO LENGTH)	1
21	SRT 209.1.3 ALUMINUM SLEEVE	2
22	SRT 209.1.4 ALUMINUM STOP SLEEVE	4

COMPASS POSITIONER (CB-PROP.1-P)
CONTROL BOX PEDESTAL SUB-ASSEMBLY



#	PART NUMBER	QTY.
1	BOP 070 HINGE CLAMP ASSEMBLY	1
2	BR 167 DUST CAP J8	2
3	CB 114 INLET FITTING	1
4	CB 395 FRL BRACKET	1
5	CB 469-P CE SERIAL PLATE, PEDESTAL	1
6	CB 475 FTG, ELBOW 90 P8M P8F P4F	1
7	CB 477 FTG, ADAPTER P8M PL8	1
8	CB 478 FTG, BALL VALVE P4M P4F	1
9	CB 479 FTG, ELBOW 90 P4M J4M BRASS	1
10	CB 490-P CB-PROP REMOTE BOX ASSEMBLY, PEDESTAL	1
11	CB 727 REMOTE BOX POLE, 1.250D	1
12	CB 760 FRL FRAME, ABX-PRO	1
13	CB 762 FRL SUPPORT ROD, ABX-PRO	1
14	CB 763 FRL ASSY, ABX-PRO	1

15	CB 765-XXX 90 DEG FLOW CONTROL BLOCK	1
16	CB 765-XXX 90 DEG FLOW CONTROL BLOCK	1
17	CB 780-P6 IN-LINE FLOW CONTROL, P6	2
18	CB 781 FTG, ELBOW 45 P6M J8M	2
19	CB 782 FTG, NIPPLE CLOSE P6M P6M SS	2
20	CB 783 FTG, NIPPLE P6M P6M X 3.00 SS	2
21	CB 784 FTG, ADAPTER P6F PL8	2
22	CB 786 FTG, ELBOW SWIVEL 90 P4M PL4	1
23	CB 790 FTG, BULKHEAD UNION PL4 PL4	1
24	CB 792 VALVE, AUTODRAIN, P8	1
25	CB 794 FTG, NIPPLE CLOSE P8M P8M SS	1
26	DB 026 MUFFLER, SINTERED BRONZE, P4	1

27	GP 011-BK BLACK ID BAND MED	1
28	GP 011-R RED ID BAND MED	1
29	GPTB 0500-PUR95A-BK	1
30	GPTB 0500-PUR95A-BK	1
31	GPTB 0500-PUR95A-BK	1
32	GR 125-SS-188-250 RIVET	4
33	GS 319-02 SHCS .19-24 X .50 SS	1
34	GSB 325-02 BHCS .25-20 X .50 SS	7
35	GSB 331-025 BHCS .31-18 X .62 SS	4
36	GSF 325-02 FHCS .25-20 X .50 SS	1
37	GN 319-L NYLOK NUT SS (HC 025.1)	1
38	PL 156-125 CAUTION INLET AIR, 125PSI MAX	1
39	GN 325-L NYLOK NUT SS (TB 044.1)	4
40	GS 325-03 SHCS .25-20 X .75 SS (TB 050)	4

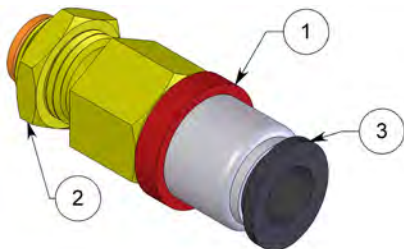
PARTS DIAGRAM

POSITIONER CONTROL BOX (CB 470) BASE ASSEMBLY



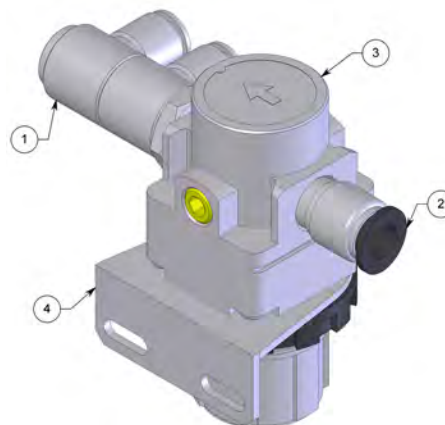
#	PART NUMBER	QTY.
1	CB 471 BASE	1
2	CB 472 BASE SIDE PLATE	2
3	CB 473 BASE BRACE	4
4	GSB 319-02-32 BHCS 10-32 X .50 SS	16

CB 480-XX FTG ASSY, PL6 (BK OR RD)



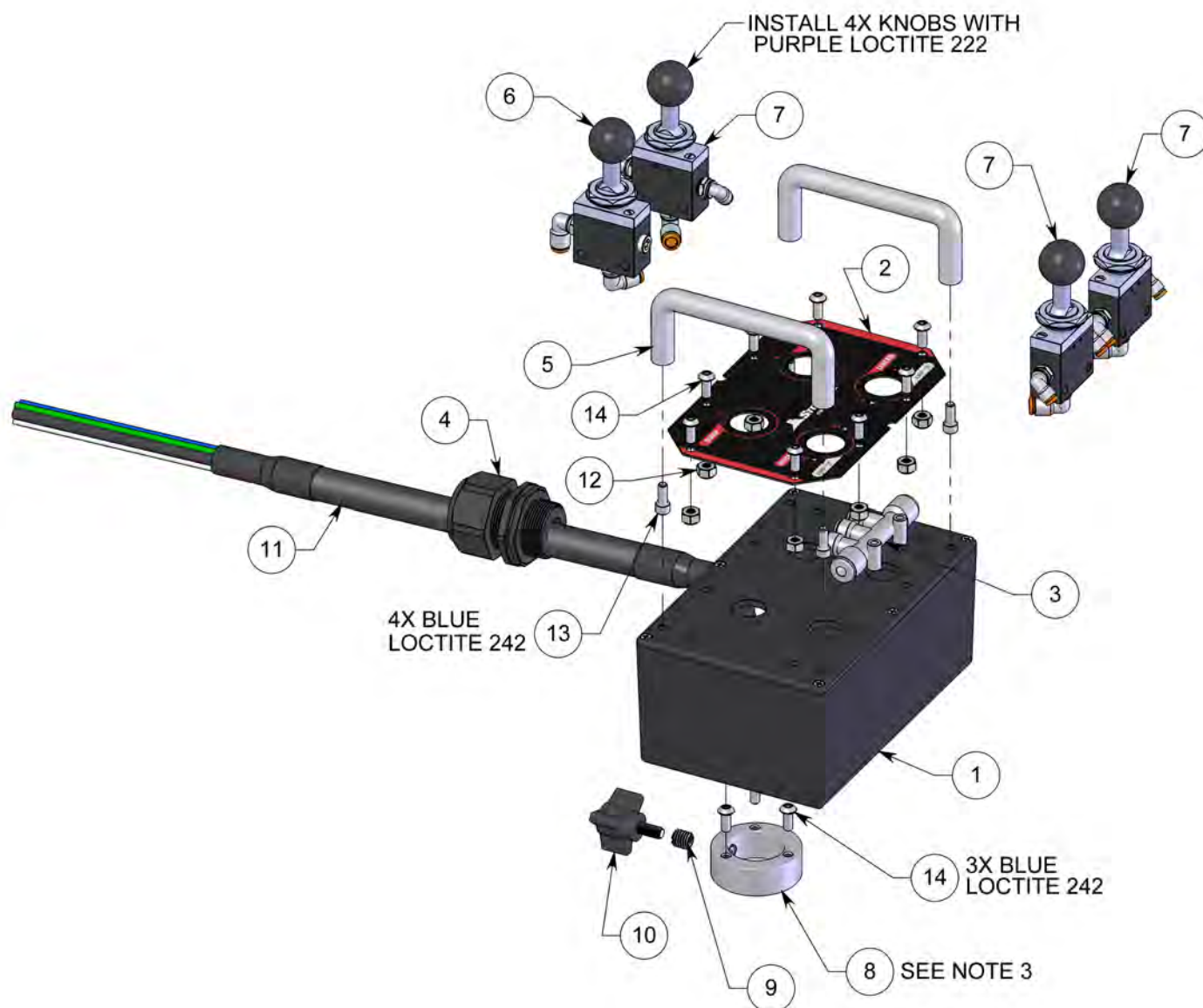
#	PART NUMBER	-BK PL6/ QTY.	-RD PL6/ QTY.
1	GP 013-BK ID WASHER, RUBBER, SMALL, BLACK	1	-
1	GP 013-R ID WASHER, RUBBER, SMALL, RED	-	1
2	CB 482 FTG, BULKHEAD ADAPTER P4F PL4	1	1
3	CB 483 FTG, ADAPTER P4M PL6	1	1

CB 486 PILOT REGULATOR ASSEMBLY



#	PART NUMBER	QTY
1	CB 339 FTG, MANIFOLD 90 P4M 2XPL6	1
2	CB 483 FTG., ADAPTER P4M PL6	1
3	CB 704 PRESSURE REGULATOR, 60 PSI	1
4	CB 704.1 BRACKET ASSY	1

CB 490-P
REMOTE BOX PEDESTAL ASSEMBLY

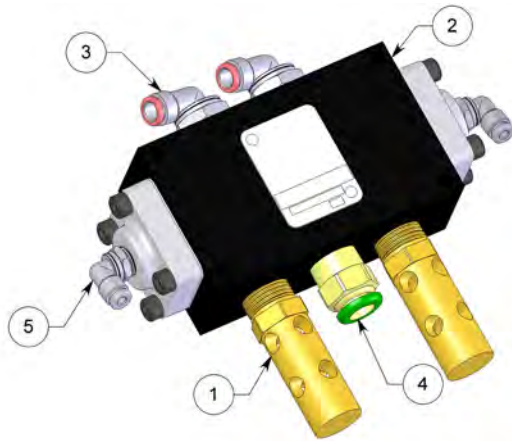


#	PART NUMBER	QTY.
1	CB 491 ENCLOSURE, CB-PROP	1
2	CB 492-001 GRAPHIC, CB-PROP	1
3	CB 493-001 FTG, MANIFOLD 5xPL4	1
4	CB 714 CORD GRIP, .51-.79	1
5	CB 716 ANODIZED PULL HANDLE	2
6	CB 721 PNEUM 3WAY ASSY, DUMP	1
7	CB 722 PNEUM 3WAY ASSY, FWD-REV	3

8	CB 724 MODIFIED COLLAR	1
9	CB 725 THREAD LOCKING SLOTTED INSERT, 1/4-20 x 3/8-16	1
10	CB 726 THREE LOBE KNOB, .25-20	1
11	CB 748-10 PRO POSITIONER UMBILICAL ASSEMBLY	1
12	GN 319-L-32 NUT, NYLOK 10-32 SS	8
13	GS 319-02-32 SHCS 10-32 x .50 SS	4
14	GSB 319-02-32 BHCS 10-32 x .50 SS	11

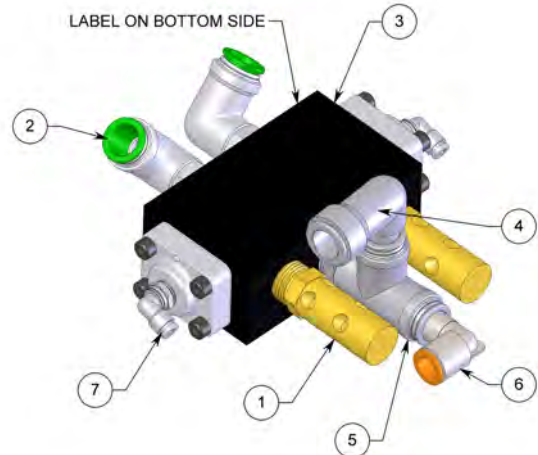
PARTS DIAGRAM

CB 496
SPOOL VALVE ASSEMBLY



#	PART NUMBER	QTY.
1	BR 154 MUFFLER P6	2
2	CB 329-OPEN PILOT SPOOL VALVE, OPEN CENTER	1
3	CB 375 FTG, ELBOW SWIVEL 90 P6M PL4	2
4	CB 559 FTG, ADAPTER P6M PL6	1
5	CB 785 FTG, ELBOW SWIVEL 90 P2M PL2	2

CB 497
SPOOL VALVE ASSEMBLY



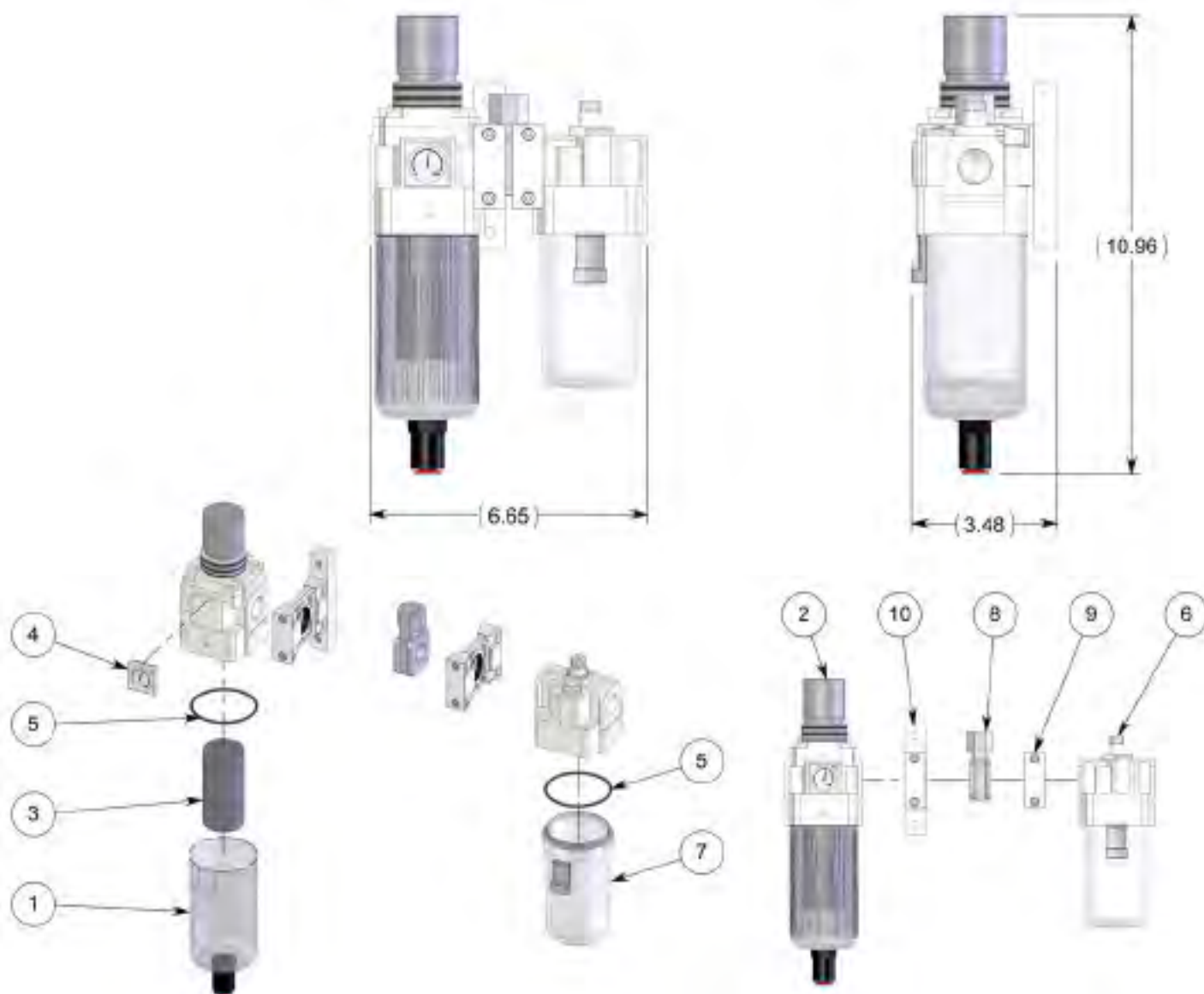
#	PART NUMBER	QTY.
1	BR 154 MUFFLER P6	2
2	BUD 141 FTG, ELBOW SWIVEL 90 P6M PL8	2
3	CB 329-OPEN PILOT SPOOL VALVE, OPEN CENTER	1
4	CB 494 FTG, STEM ELBOW 90 PL8M PL8F	1
5	CB 495 FTG, TEE MALE RUN P6M PL8F PL8F	1
6	CB 756 FTG, STEM ELBOW 90 PL8M PL6F	1
7	CB 785 FTG, ELBOW SWIVEL 90 P2M PL2	2

CB 755-15-C
PRODRIVE SUPPLY HOSE WITH CAMERA CABLE



#	PART NUMBER	MATERIAL	QTY	OAL
1	CAM 247-22	SEE BOM & NOTE 1	1	
2	CB 755.6-15-C	LABEL PROVIDED BY VENDOR	1	
3	GP 053	1/2" PUSH-ON BRASS HOSE FITTING 1/2" JIC (REFERENCE ONLY DIXON 287-0812)	4	
4	GPHO 0500-RUB-BK	1/2" ID X 3/4" OD PUSH-ON AIR HOSE, BUNA-N/PVC, 250 PSI, BLACK (REF ONLY MC 5288K13)	1	15'
5	GPHO 0500-RUB-RD	1/2" ID X 3/4" OD PUSH-ON AIR HOSE, BUNA-N/PVC, 250 PSI, RED (REF ONLY MC 5288K13)	1	15'
6	GPHS 1500-OLE-A-BK	1.50 DIA HEAVY DUTY MOISTURE SEAL HEAT-SHRINK (REF ONLY MC 7270K84)	2	5"
7	GPSL 1250-NYL-G-BK	1.25 DIA BRAIDED EXPANDABLE HEAVY DUTY NYLON (TECHFLEX GORILLA SLEEVE NHN 1.25 BK)	1	15'

CB 763-001
CONTROL BOX FRL ASSEMBLY



#	PART NUMBER	QTY
1	CB 312.1.1 FILTER REGULATOR BOWL	1
2	CB 312.1.3 FILTER BODY	1
3	CB 312.1.6 REPLACEMENT SMC FILTER	1
4	CB 312.1.7 SMC GAUGE WITH LENS	1
5	CB 312.1.8 O-RING FOR AW40-A REGULATOR	2
6	CB 312.2.1 LUBRICATOR BODY	1
7	CB 312.2.2 LUBRICATOR BOWL	1
8	CB 312.4 SPACER ATTACHMENT	1
9	CB 312.5-001 SPACER ASSEMBLY, FRL	1
10	CB 763.1-001 MOUNTING SPACER ASSEMBLY, MOD	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.stoneagetools.com/terms>

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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USER MANUAL

PRODRIVE[®] AUTOBOX[™] (ABX-PRO) CONTROL BOX (CB-ABX-PRO-100-X) AND

PRODRIVE[®] ACCESSORIES:
LIGHTWEIGHT POSITIONER (LWP-500-V2)
FIN FAN KIT (FF-XX)
PRODRAIN (PRO-700-V3)
NAVIGATOR & CONTROL BOX (NAV-170)

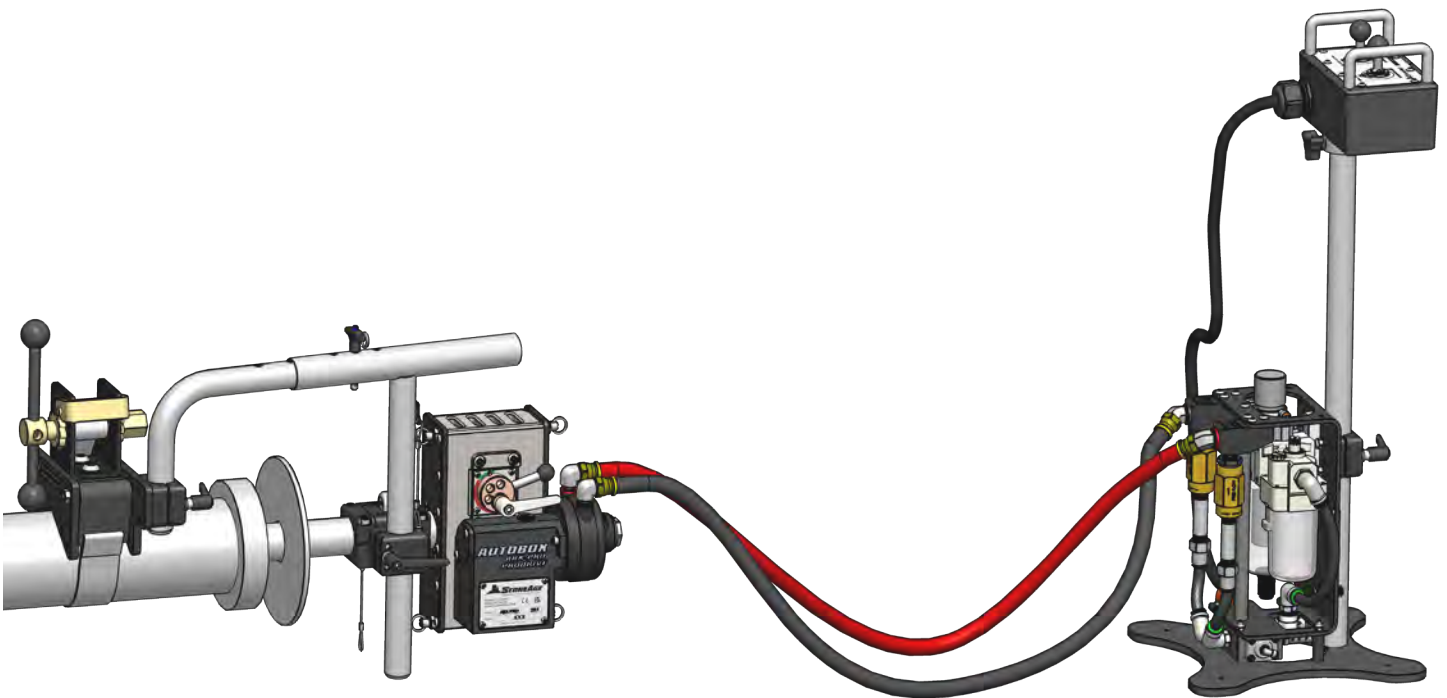


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+44 (0) 1684 892065
sales-eu@stoneagetools.com

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			
PRODRIVE® (ABX-PRO) TRACTOR		Imperial	Metric
Weight		< 25 lbs	11.3 kg
Dimensions		7" x 9.25" x 10"	178 mm x 235 mm x 254 mm)
Pipe Size		2" - 8"	51 mm - 203 mm
20:1 Air Motor	Feed Rate	0.4 ft/sec - 2.5 ft/sec	122 mm/sec - 762 mm/sec
	Maximum Push/Pull Force	90 lbf	41 kg
	System Air Consumption	30 cfm at 100 psi	850 lpm at 6,8 bar
40:1 Air Motor	Feed Rate	0.2 ft/sec - 1.25 ft/sec	60 mm/sec - 381 mm/sec
	Maximum Push/Pull Force	150 lbf	68 kg
	System Air Consumption	30 cfm at 100 psi	850 lpm at 6,8 bar
Poly Hose Size		3/2-8/4, 3/8 Rubber Covered	
CB-ABX-PRO-100-X (-P or -S)		Imperial	Metric
(-P) Pedestal Mount Control Box Weight		14 lbs	6.4 kg
(-P) Pedestal Mount control box Dimensions		12" x 13" x 14"	305mm x 330mm x 356mm
(-S) Side Mount Control Box Weight		14 lbs	6.4 kg 6.4 kg
(-S) Side Mount control box Dimensions		12" x 13" x 14"	305mm x 330mm x 356mm
Maximum Air Supply Pressure:		125 psi	8,6 bar
System Operating Pressure:		100 psi	6,8 bar
Recommended Operational Temperature Range		-20° to 140° F	-29° to 60° C
Air Connection to CB		Chicago style twist-claw fitting	
Air Connection from CB to Tractor		1/2" JIC	

DESCRIPTION OF EQUIPMENT AND INTENDED USE

The ProDrive®AUTOBOX (ABX-PRO) is a hose feed device engineered to quickly and safely clean a broad range of pipes with or without a flange. The system is lightweight, portable, and highly adaptable, making it the perfect tool for limited access applications.

The ProDrive®AUTOBOX (ABX-PRO) is designed with multiple mounting options allowing it to be used with a wide variety of pipe sizes and configurations. The system also includes a lightweight control box for increased safety and mobility.

KEY FEATURES:

ProDrive®AUTOBOX (ABX-PRO)

- Ultra portable system design allows a single operator to move, setup and run.
- Interchangeable rollers accommodate multiple hose sizes and can handle a wide range of tube/pipe cleaning applications.
- Adjustable forward and reverse feed rate to customize dwell time for consistent controllable cleaning in both directions and better results in less time.
- Multiple mounting options for pipes with or without a flange provide quick set-up in a variety of application environments.
- Built in back-out preventer and splash guard increases job site safety.
- Optional snout enables quick, easy setup for challenging or unique applications.

CB-ABX-PRO-100-X Control Box

- The Control Box is available in two different configurations;
 - P for the Pedestal style
 - S for the Side mount style
- Small, lightweight, ergonomic design that includes a portable floor stand and filter-regulator-lubricator assembly
- 10' (3048 mm) umbilical allows user to move with the controls
- Drive controls: forward/reverse hose feed



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
Sander de Korte, Customer Service Manager StoneAge NL

Declare that:

**ProDrive®AutoBox (ABX-PRO), Control Box (CB-ABX-PRO-100-X), and
Pro Drain Accessory (PRO-700-V3) 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 Files for ProDrive® AutoBox (ABX-PRO) Hose Tractor, Control Box (CB-ABX-PRO-100-X), and Pro Drain Accessory (PRO-700-V3) are 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
Liz Mancuso, Director of Engineering

02/11/2019
Date



UK DECLARATION OF CONFORMITY

Manufacturer:

StoneAge Incorporated
466 South Skyline Drive
Durango, CO 81303
USA

Authorized Representative:

StoneAge UK
Unit 3
Crucible Business Park
Woodbury Lane
Norton
Worcester
Worcestershire, WR5 2DQ
United Kingdom
Steve Ellis, Managing Director StoneAge UK

Declare that:

**ProDrive®AutoBox (ABX-PRO), Control Box (CB-ABX-PRO-100-X), and
Pro Drain Accessory (PRO-700-V3) for high pressure water cleaning of system parts.**

Are compliant with the following Statutory Requirements and Designated Standards:

S.I. 2008 No. 1597 (E) Safety of machinery – General principles for design – Risk assessment and risk reduction

The Technical Files for ProDrive® AutoBox (ABX-PRO) Hose Tractor, Control Box (CB-ABX-PRO-100-X), and Pro Drain Accessory (PRO-700-V3) are maintained at:
StoneAge Incorporated, 466 South Skyline Drive, Durango, CO 81303, USA and was compiled by the Engineering Manager.
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StoneAge Incorporated, Durango, CO, USA
Liz Mancuso, Director of Engineering

02/11/2019
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.

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

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

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

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

PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

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

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

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

PPE may include:

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

SAFETY LABEL DEFINITIONS

Replacement labels can be ordered through Stoneage®. See part diagrams for label locations and replace when necessary.

The ProDrive®AUTOBOX (ABX-PRO) has the potential to cause serious injury if fingers, hair, or clothing become caught between the hose rollers of the ABX-PRO Tractor.

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



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

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 ProDrive® AUTOBOX (ABX-PRO) 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 located on the Collet Block Assembly of the ProDrive® AUTOBOX (ABX-PRO). The instruction is located in the "Hose and Collet Installation" section of this manual.
- The Control Box should be located in a safe location where the Operator has good visibility of the pipe and hose. The ProDrive® AUTOBOX (ABX-PRO) and Control Box MUST be supervised at all times and should never be left unattended.
- Always de-energize the system before servicing or replacing any parts. Failure to do so can result in severe injury and/or death.

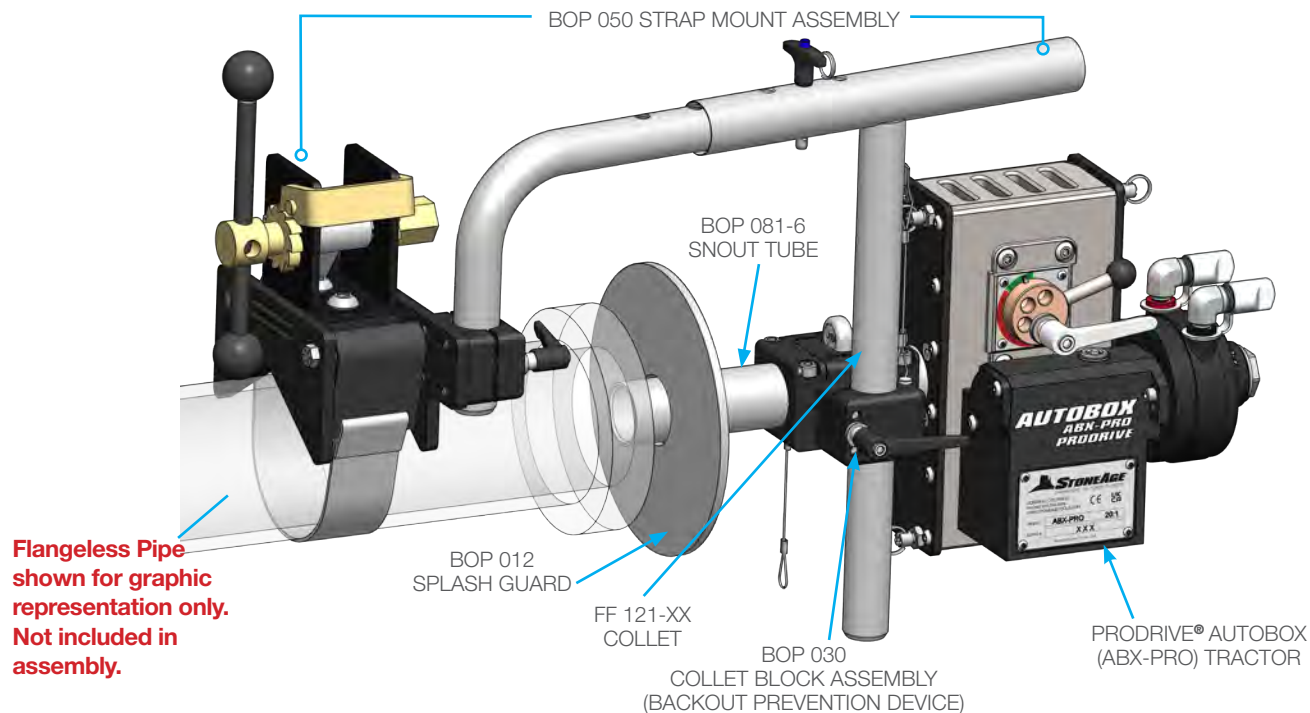
PRE-RUN SAFETY CHECK

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

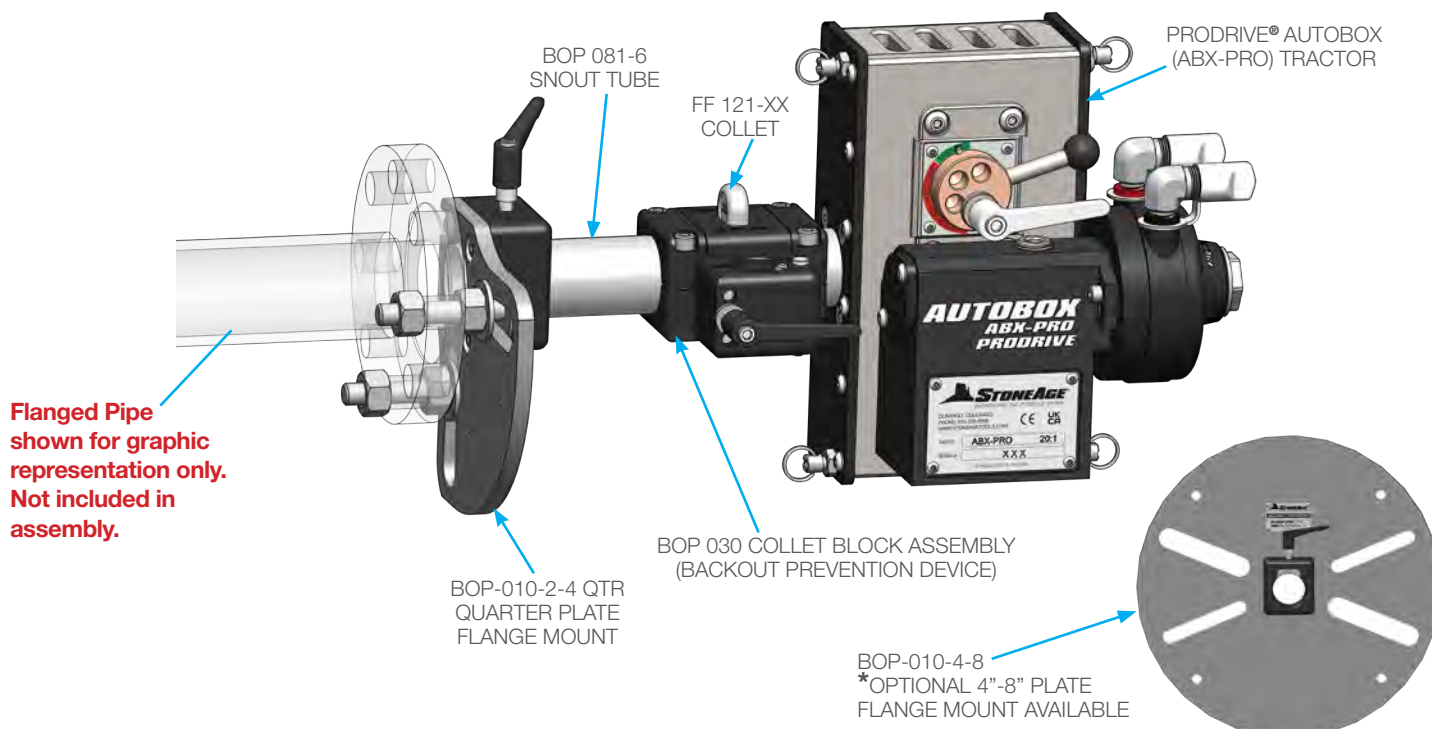
- Complete a job specific risk assessment and act on the resulting actions.
- Adhere to all site specific safety procedures.
- Ensure the waterblasting zone is properly barricaded and that warning signs are posted.
- Ensure the work place is free of unnecessary objects (e.g. loose parts, hoses, tools).
- Ensure all Operators are using the correct Personal Protective Equipment (PPE).
- Check that the air hoses are properly connected and tight.
- Check all hoses and accessories for damage prior to use. Do not use damaged items. Only high quality hoses intended for waterblast applications should be used as high-pressure hoses.
- Check all high-pressure threaded connections for tightness.
- ****Ensure that an anti-withdrawal device (back-out preventer), and all other applicable safety devices are installed and set-up properly.****
- Test the Control Box before operating the ProDrive® AUTOBOX (ABX-PRO) 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.

PRODRIVE® AUTOBOX (ABX-PRO) ASSEMBLY WITH STRAIGHT MOUNTING OPTIONS

THE MOUNTING OPTION BELOW IS USED ON FLANGELESS PIPES



*THE MOUNTING OPTION BELOW IS USED ON FLANGED PIPES *



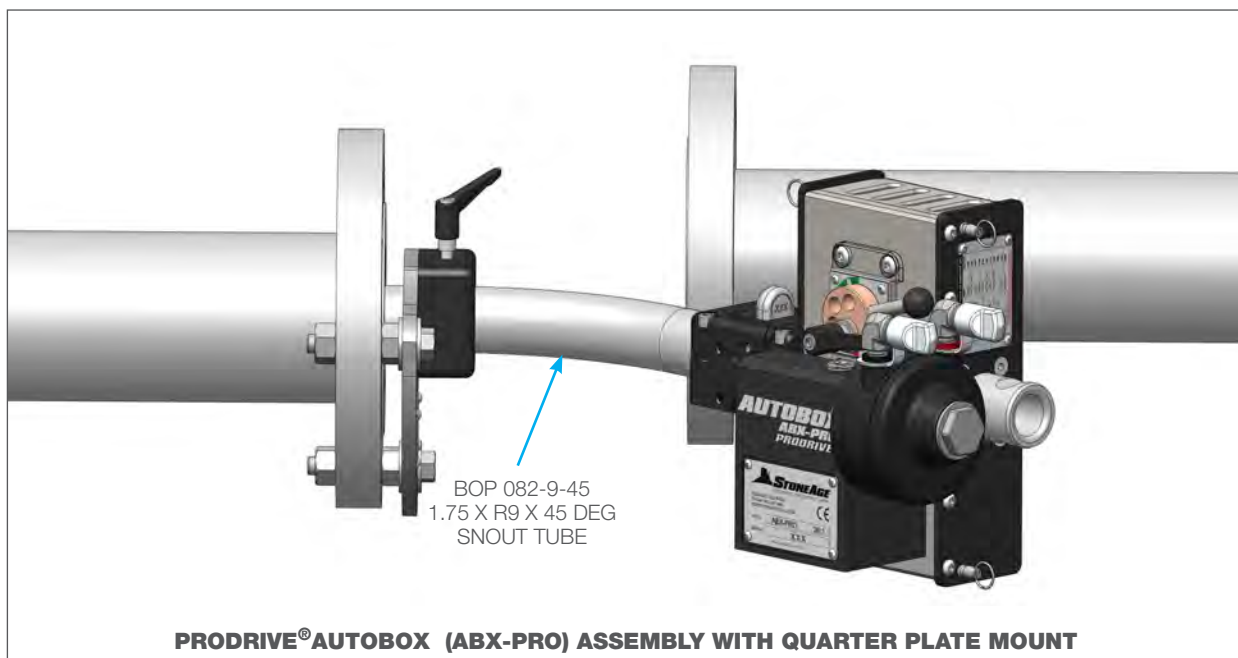
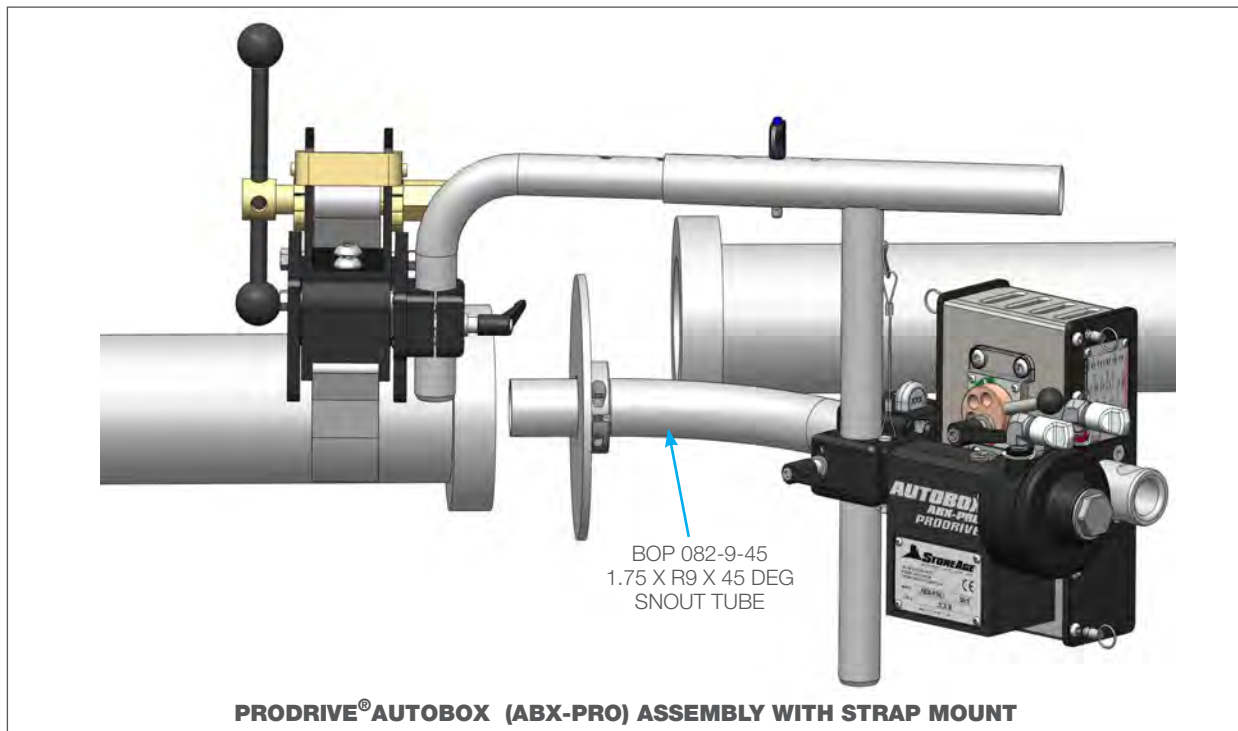
PRODRIVE® AUTOBOX (ABX-PRO) ASSEMBLY WITH OFF AXIS MOUNTING OPTIONS FOR TIGHT PIPE JOINTS

THE MOUNTING OPTIONS BELOW ARE FOR USE WHEN THE PIPE JOINT WILL NOT SEPARATE ENOUGH TO ALLOW A STRAIGHT ENTRY CONNECTION.

The BOP 082-9-45 is available through STONEAGE® for 45° BENDS. A standard 1.75" electrical conduit can also be used for connections of varying angles.

NOTICE

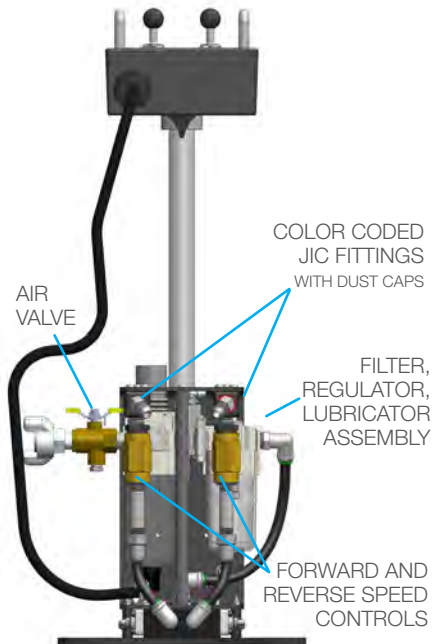
If using electrical conduit, be sure to maintain a greater than 6" centerline radius bend to avoid constraining the movement of the tool.



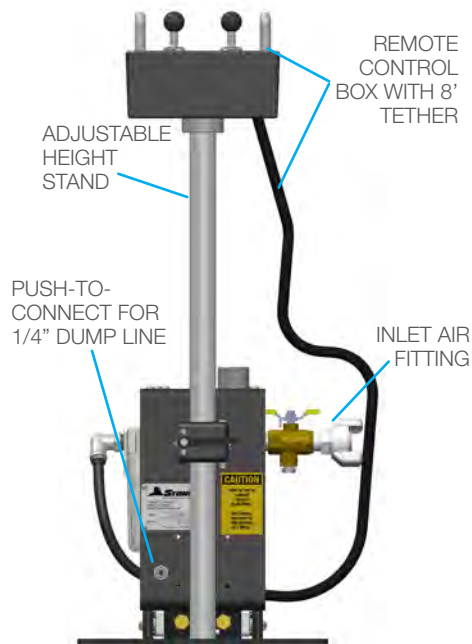
SYSTEM ASSEMBLY - OVERVIEW

PEDESTAL MOUNT OPTION CONTROL BOX (CB-ABX-PRO-100-P)

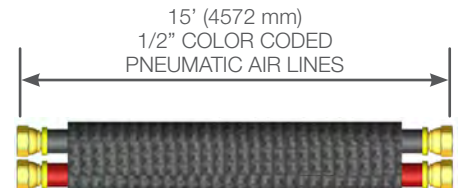
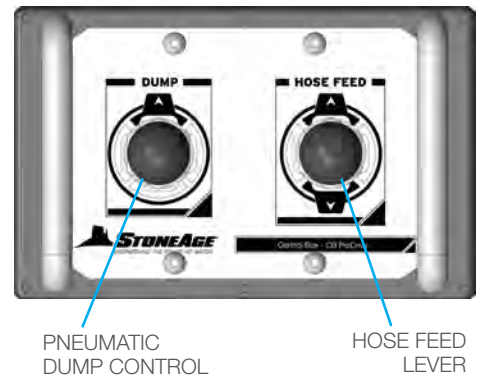
FRONT VIEW



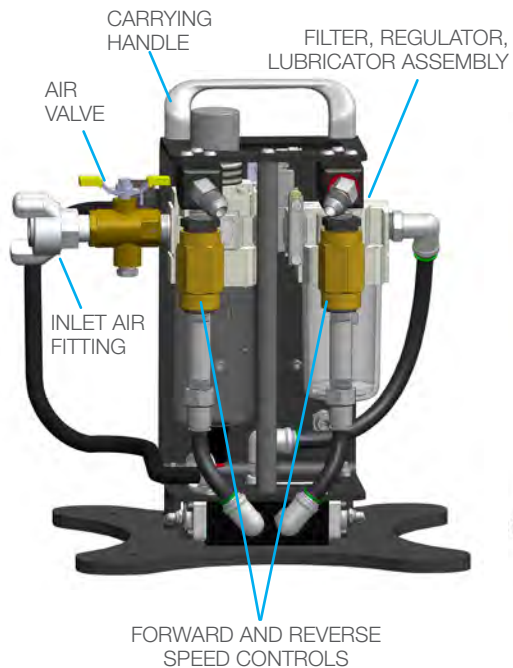
BACK VIEW



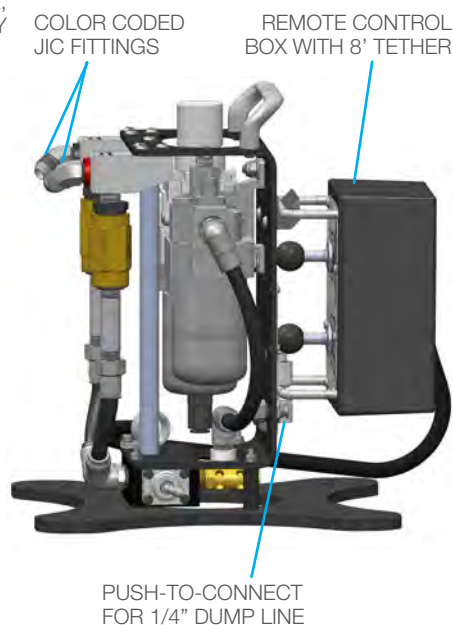
CONTROL PANEL VIEW



SIDE MOUNT OPTION CONTROL BOX (CB-ABX-PRO-100-S)

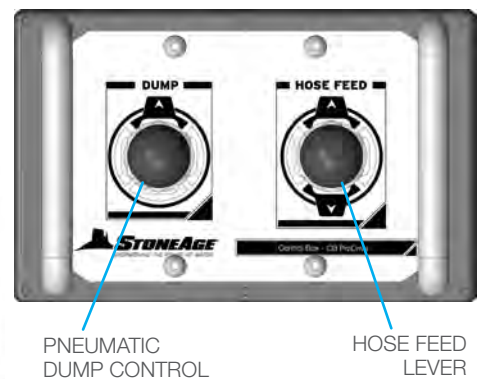


FRONT VIEW



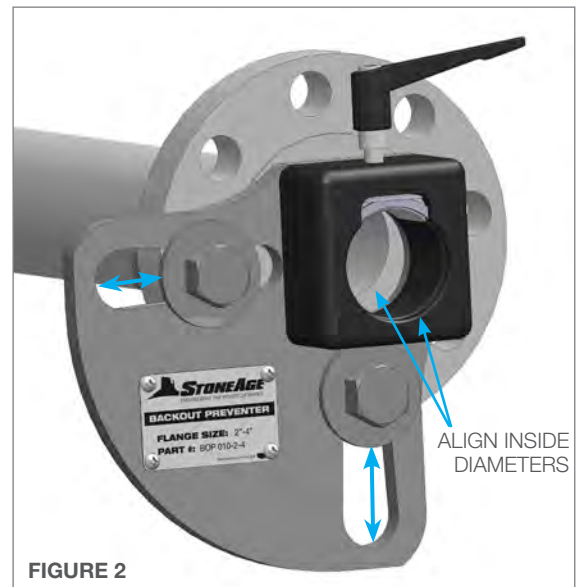
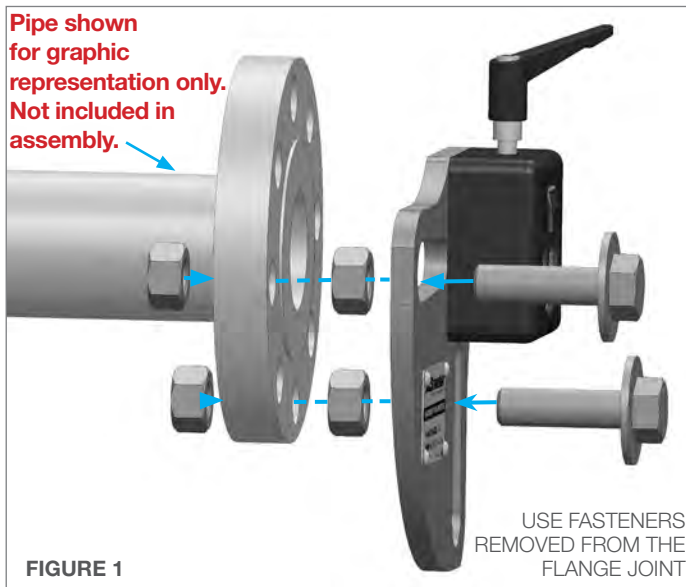
SIDE VIEW

CONTROL PANEL VIEW

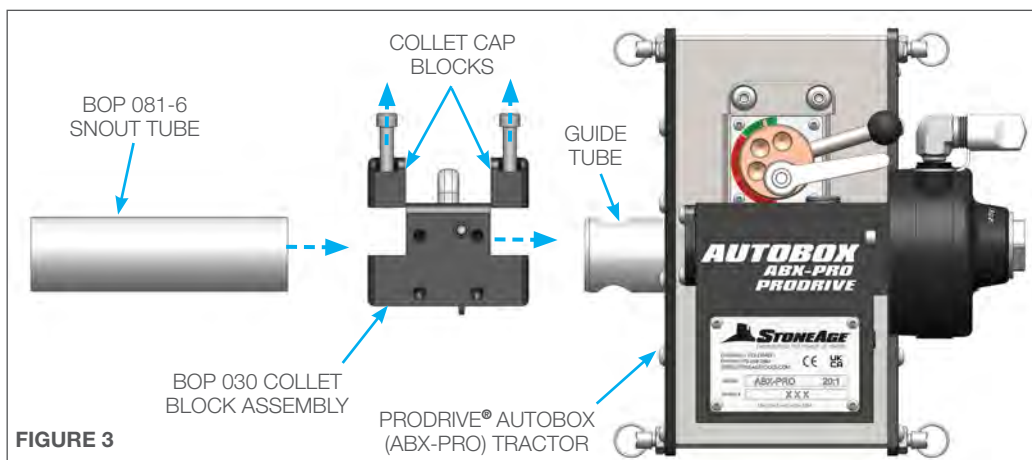


QUARTER PLATE FLANGE MOUNT (BOP 010-2-4 QTR) TO PIPE AND PRODRIVE

1. Attach the Quarter Plate Flange Mount to the pipe flange using the fasteners that were removed from the flange joint. The nuts shown between the pipe flange and the Quarter Plate Flange Mount are to allow for drainage. Other spacer options such as washers are acceptable. **(Figure 1)**
2. Adjust the Quarter Plate Flange Mount by sliding it along the slots to center the inside diameter of the Hinge Clamp with the inside diameter of the pipe. Tighten all hardware to secure in place. **(Figure 2)**

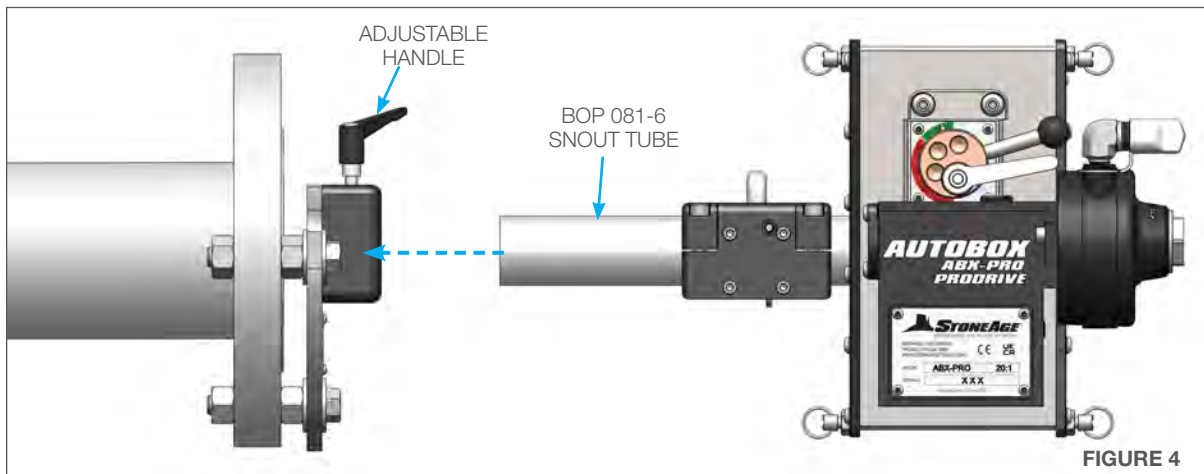


3. Loosen the screws on both collet cap blocks. Slide the BOP 030 Collet Block Assembly onto the guide tube on the ABX-PRO and tighten the two screws until secure. Slide the BOP 081-6 Snout Tube into the BOP 030 Collet Block Assembly. Push the Snout Tube in until it stops, then tighten the two until secure. **(Figure 3)**

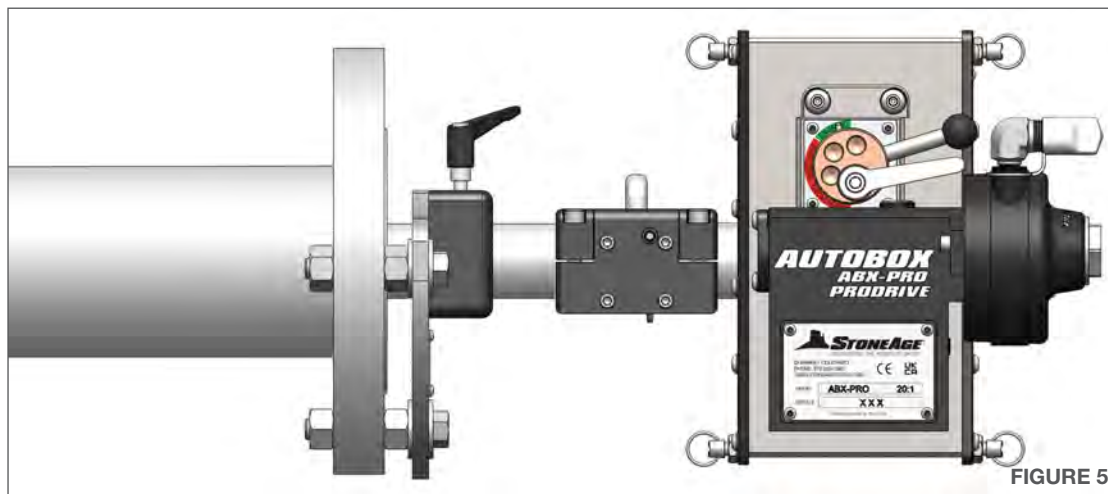


QUARTER PLATE FLANGE MOUNT ASSEMBLY SET-UP

- Loosen the adjustable handle on the Hinge Clamp. Slide the Snout Tube into the Quarter Plate Flange Mount. Tighten the adjustable handle to secure. **(Figure 4)**

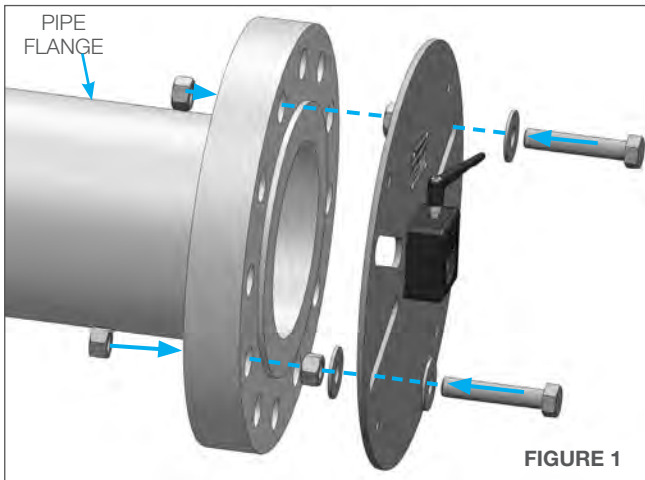


- The Quarter Plate Flange Mount option is now ready to be loaded with a high pressure hose. **(Figure 5)** Go to page 17, "Hose and Collet Installation" for instructions.

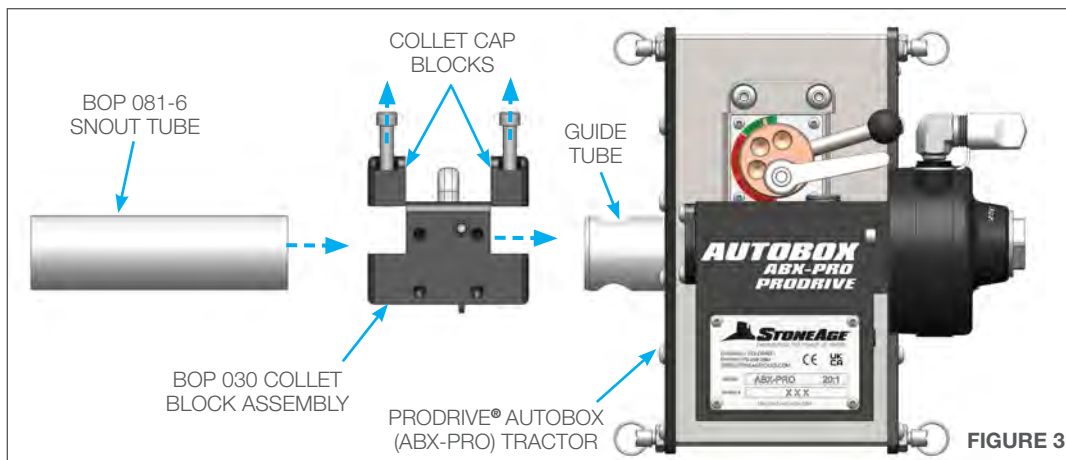


4"-8" FLANGE MOUNT PLATE (BOP 010-4-8)

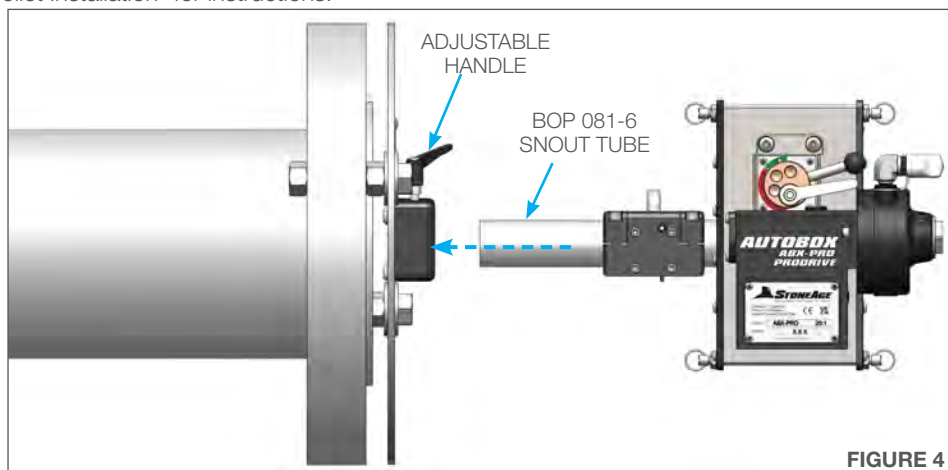
1. Attach the 4"-8" Flange Mount Plate to the pipe flange using the fasteners that were removed from the flange joint. The nuts shown between the flange and the Flange Mount Plate are to allow for drainage. Other spacer options are acceptable. **(Figure 1)**
2. Align the appropriate slots or pre-drilled holes to the hole pattern on the flange. Adjust the Flange Mount Plate by sliding it along the slots to center the inside diameter of the Hinge Clamp with the inside diameter of the pipe. Tighten all hardware to secure in place. **(Figure 2)**



3. Loosen the screws on both collet cap blocks. Slide the BOP 030 Collet Block Assembly onto the guide tube on the ABX-PRO and tighten the two screws until secure. Slide the BOP 081-6 Snout Tube into the BOP 030 Collet Block Assembly. Push the Snout Tube in until it stops, then tighten the two until secure. **(Figure 3)**



4. Loosen the adjustable handle on the Hinge Clamp. Slide the Snout Tube into the 4"-8" Plate Flange Mount. Tighten the adjustable handle to secure. The 4"-8" Plate Flange Mount option is now ready to be loaded with the high pressure hose. **(Figure 4)** Go to page 17, "Hose and Collet Installation" for instructions.

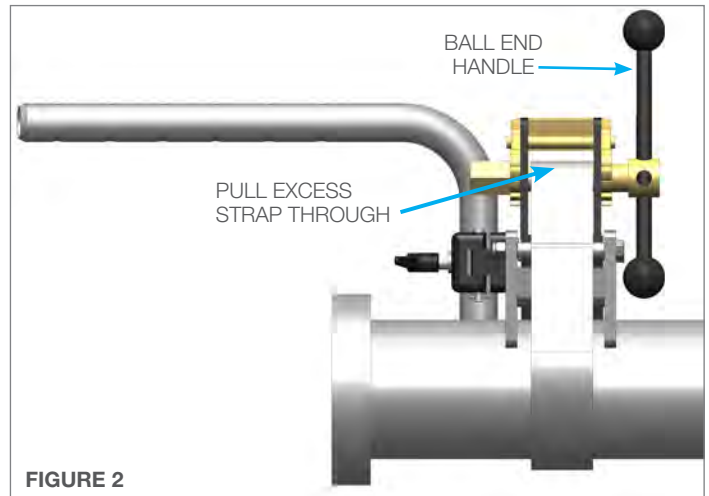
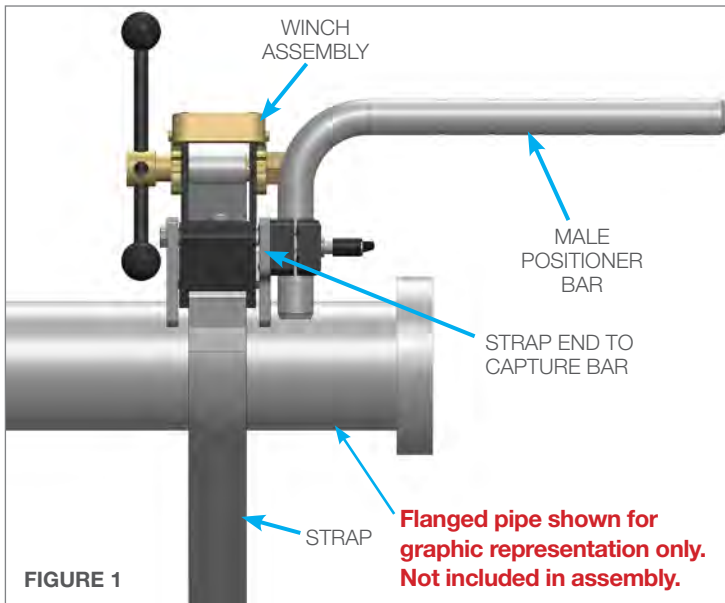


STRAP MOUNT ASSEMBLY SET-UP

STRAP MOUNT ASSEMBLY (BOP 050) - MALE POSITIONER SIDE

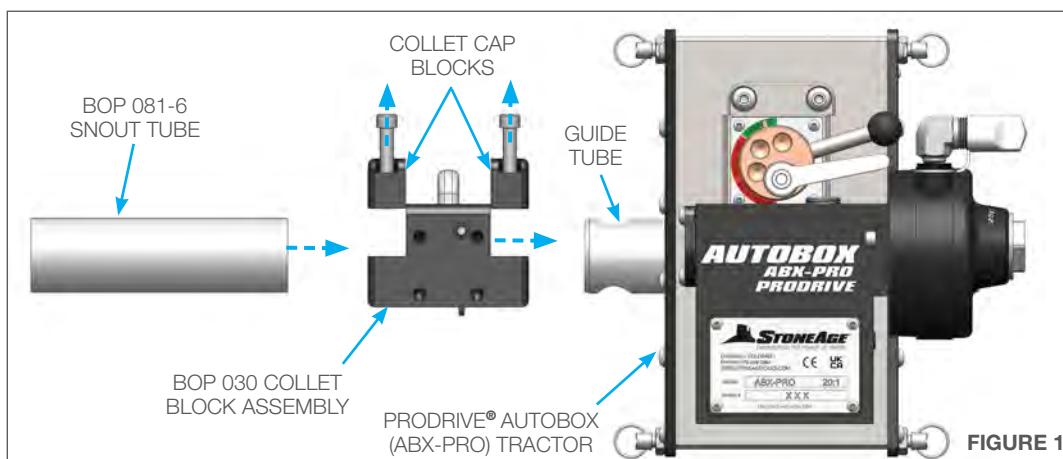
The Strap Mount Assembly (BOP 050) is designed for pipes that do not have flanges.

1. Attach the strap end to the strap capture bar and wrap the strap around the pipe towards the Winch Assembly. **(Figure 1)**
2. Pull excess strap through the Winch Assembly and tighten down with the Ball End Handle. **(Figure 2)**

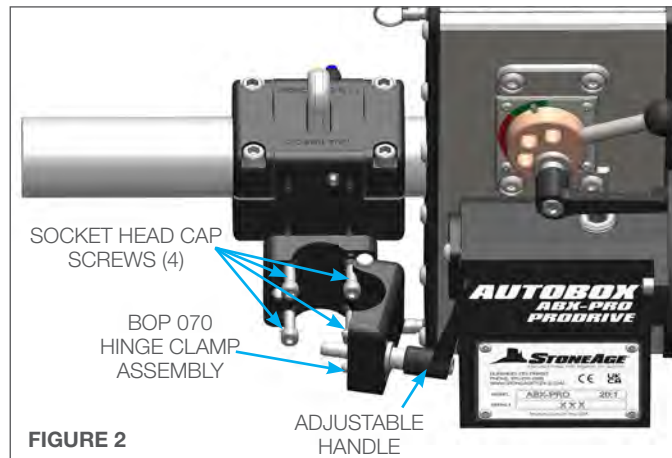


STRAP MOUNT ASSEMBLY (BOP 050) - FEMALE POSITIONER SIDE

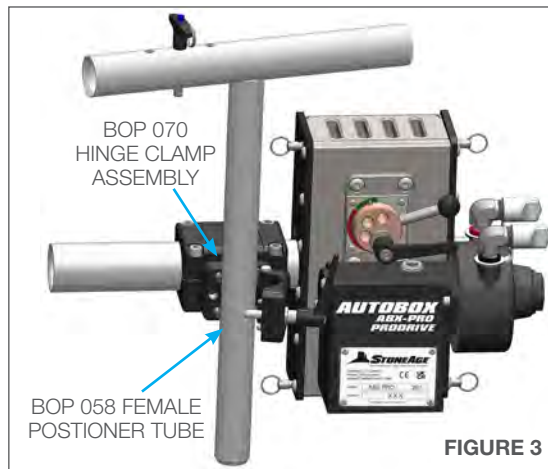
1. Loosen the screws on both collet cap blocks. Slide the BOP 030 Collet Block Assembly onto the guide tube on the ABX-PRO and tighten the two screws until secure. Slide the BOP 081-6 Snout Tube into the BOP 030 Collet Block Assembly. Push the Snout Tube in until it stops, then tighten the two until secure. **(Figure 1)**



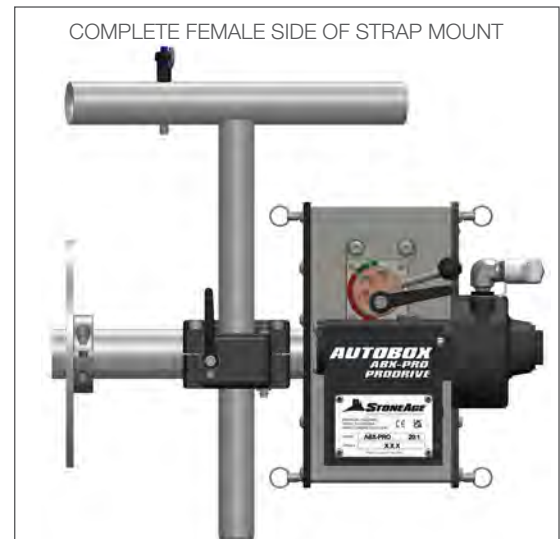
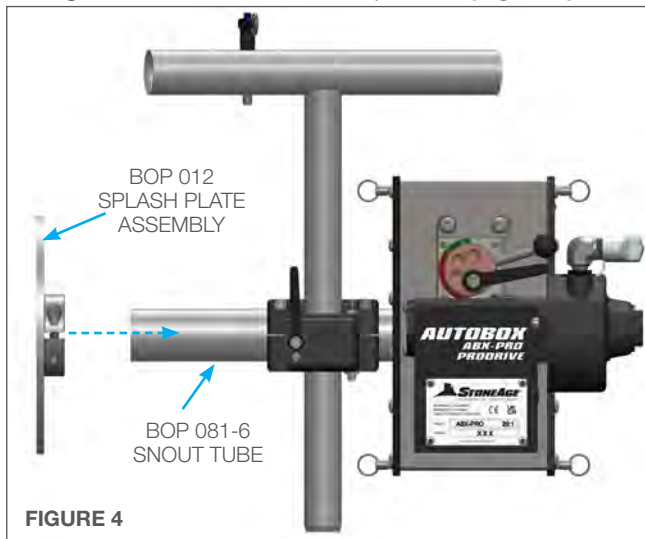
- Release the Adjustable Handle on the BOP 070 Hinge Clamp to access the 4 socket head cap screws. Locate the side of the BOP 030 Collet Block Assembly with 4 threaded holes. Orient the Hinge Clamp so that the hinge is on the right. Fasten the Hinge Clamp Assembly to the Collet Block Assembly using the 4 supplied socket head cap screws. **(Figure 2)**



- Insert the BOP 058 Female Positioner Assembly into the Hinge Clamp Assembly then close the Hinge Clamp Assembly and tighten the Adjustable Handle. The Female Positioner height can be adjusted in the open or closed position and is designed to be adjustable based on the size of the pipe. **(Figure 3)**



- To Install the BOP 012 OPTIONAL Splash Plate, loosen the two bolts on the collar, slide it onto the BOP 081-6 Snout Tube and hand tighten the collar bolts when in position. **(Figure 4)**



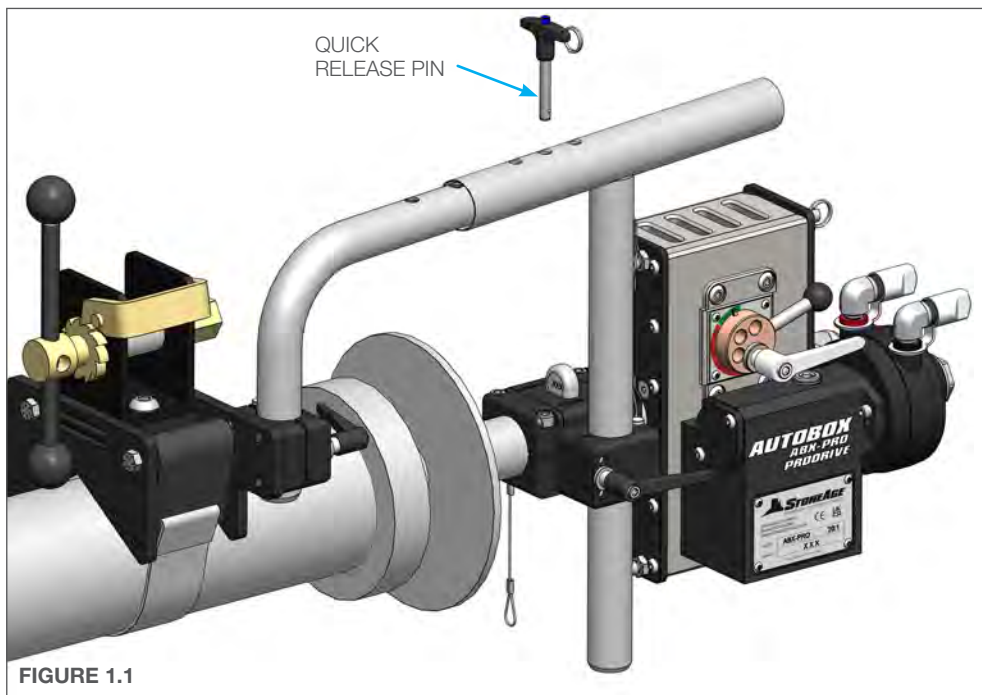
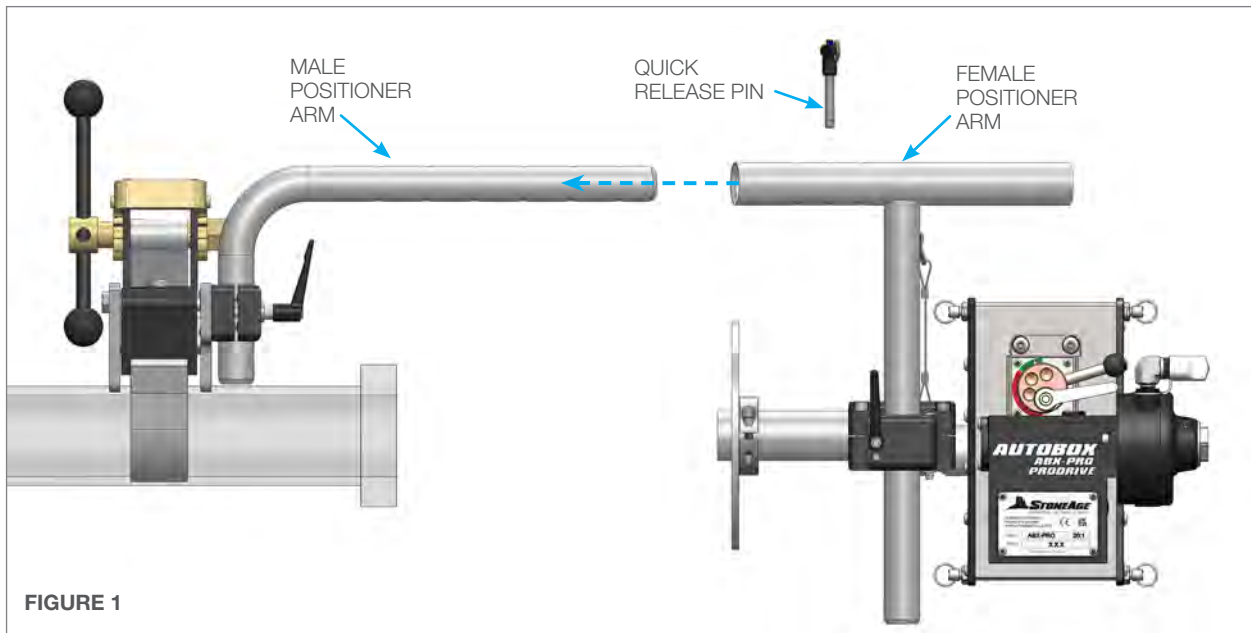
STRAP MOUNT ASSEMBLY SET-UP

FEMALE POSITIONER ARM TO MALE POSITIONER ARM CONNECTION

⚠ WARNING

Prior to use, always tighten and test the Backout Preventer to ensure the tool does not pass backward toward the Collet Block Assembly. Failure to do so can result in severe injury and/or death.

1. Slide the Female Positioner Arm onto the Male Positioner Arm. **(Figure 1)** Line up the incremental holes and push the Quick Release Pin through both positioner arms. **(Figure 1.1)**

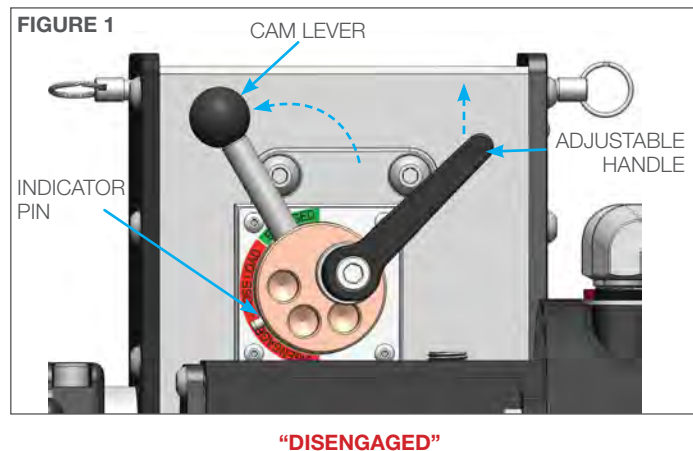


LOADING THE HIGH-PRESSURE HOSE

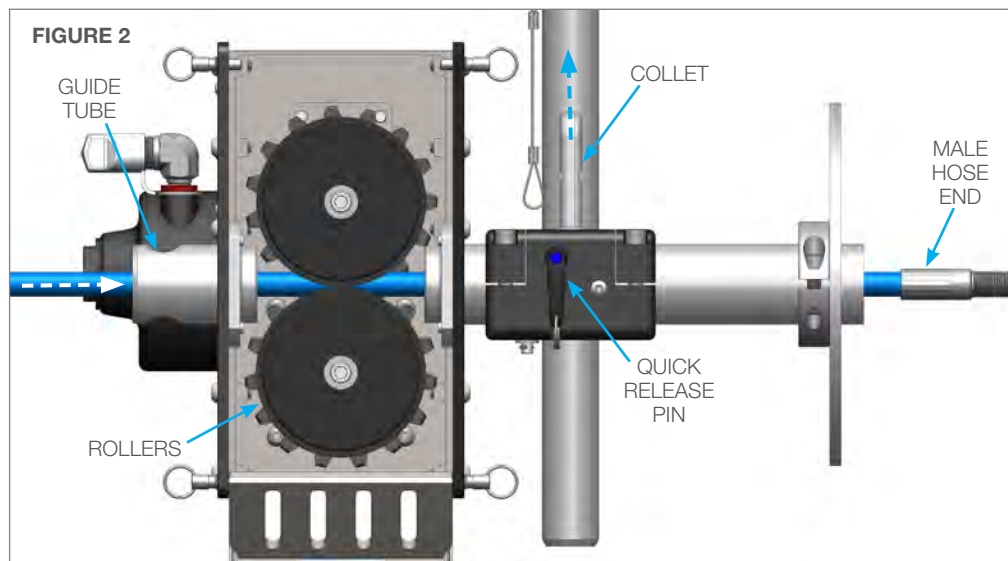
NOTICE

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

1. To load a hose, release the Adjustable Handle and rotate the Cam Lever until the Indicator Pin is in the **"Disengaged"** position. This opens up the space between the rollers. **(Figure 1)**



2. Pull out the Quick Release Pin and remove the Collet. Feed the male hose end into the guide tube, through the rollers and out the end of the BOP 081-6 Snout Tube. **(Figure 2)** Go to page 23, "Roller and Collet Selection" to determine the appropriate size Rollers and Collets for the high pressure hose diameter.



HOSE AND COLLET INSTALLATION

3. Rotate the Cam Lever clockwise to the **“Engaged”** position to tighten the Idler Roller down onto the hose. There should be a slow slip on the hose. If the slip is too tight or loose, move the Eccentric Lever off until a slow slip is obtained. Once the slip level is achieved, push down on the Adjustable Handle to tighten the bushing assembly. **(Figure 3)**
4. Push the back cover back into the closed position and secure the two Quick Release Pins on the top of the PRODRIVE®. **(Figure 4)**

⚠ WARNING

Prior to use, always tighten and test the backout preventer to ensure the tool does not pass backward toward the Collet Block Assembly. Failure to do so can result in severe injury and/or death. It is the responsibility of the user to select proper collet sizing to assure the end of the hose will not pass through the collet.

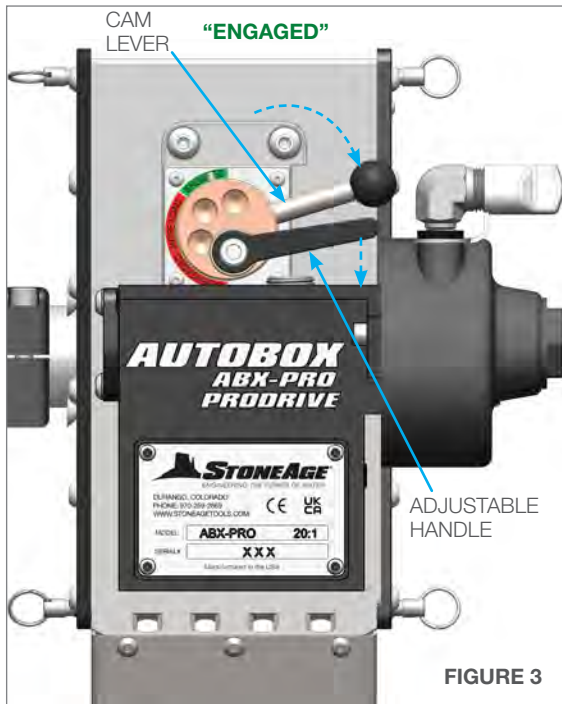


FIGURE 3

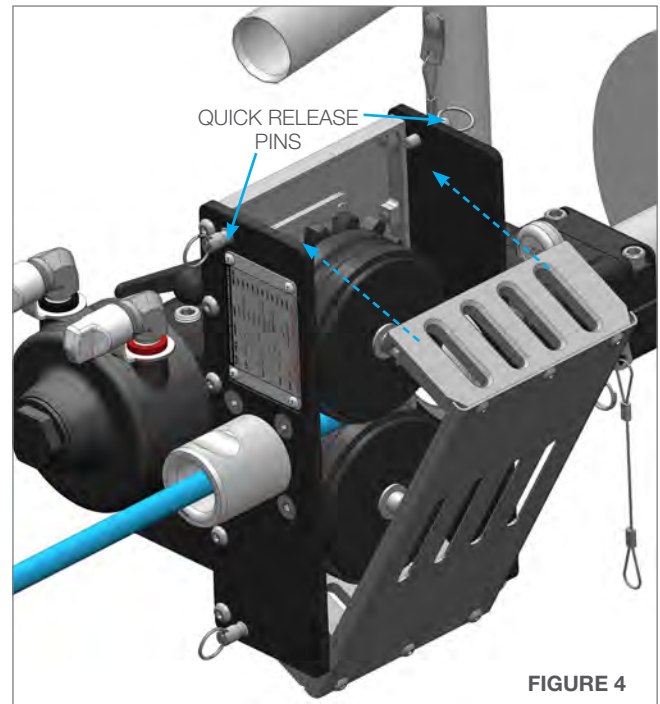


FIGURE 4

5. Attach the desired tool onto the male hose end (Stoneage® BT25 Beetle® shown for reference). SEE THE APPLICABLE TOOL MANUAL FOR SPECIFIC INSTALLATION INSTRUCTIONS.

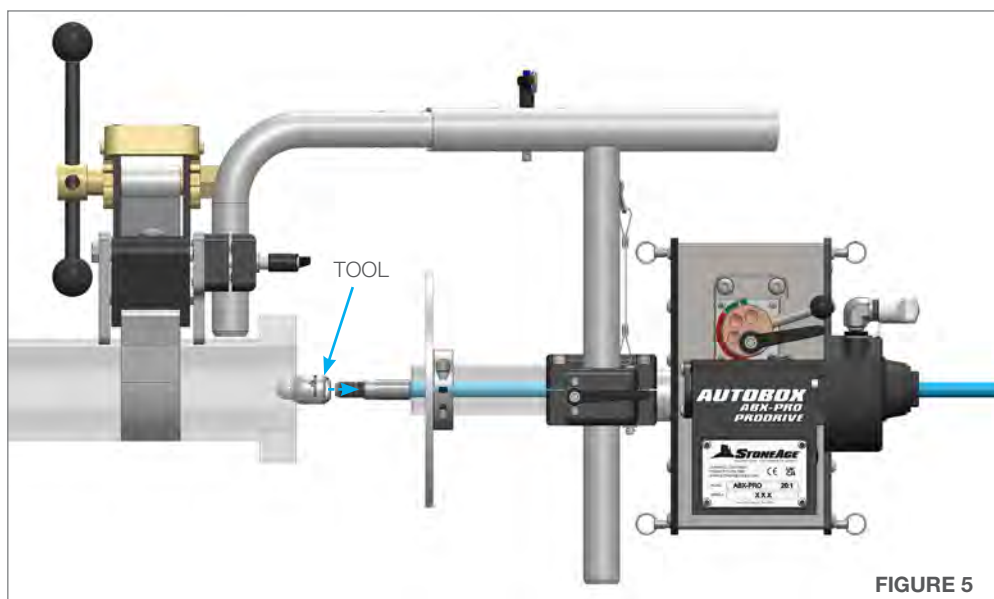
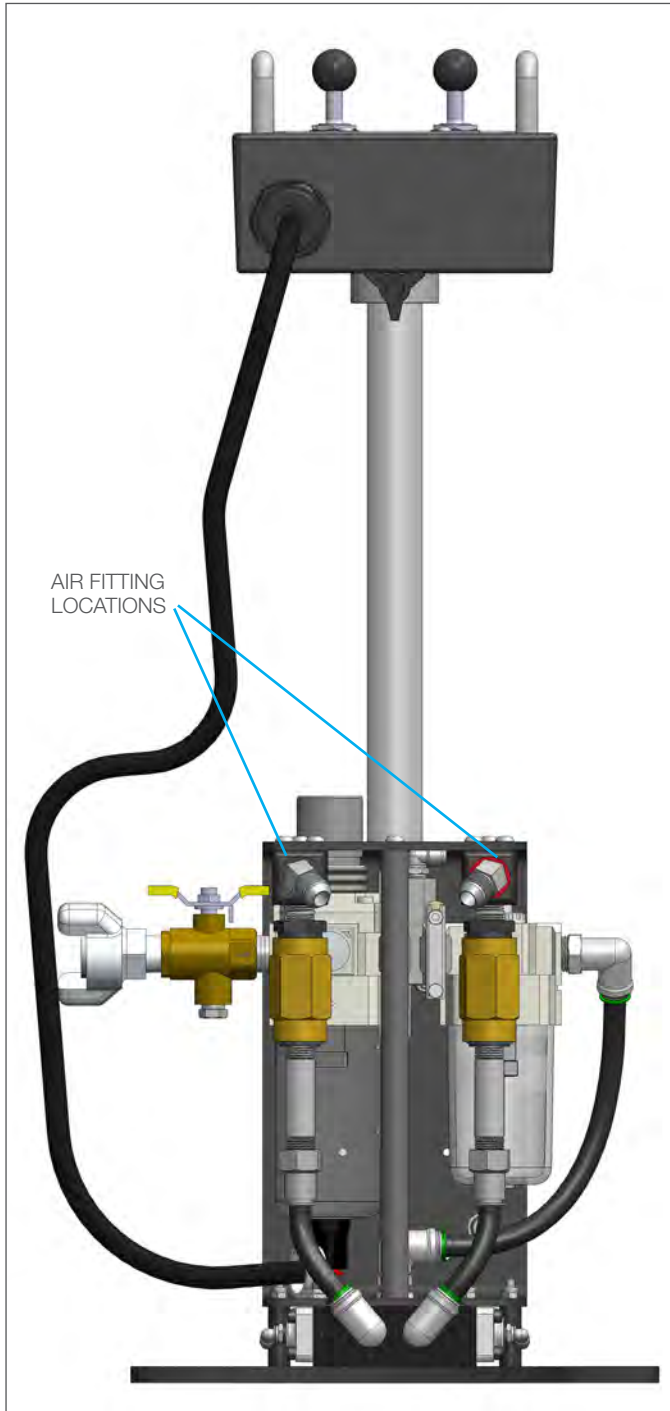


FIGURE 5

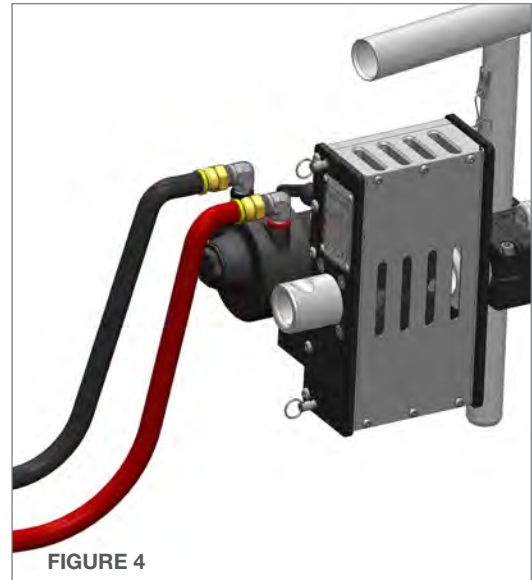
PNEUMATIC AIR LINE CONNECTIONS

4. Pull the Dust Caps off the Pneumatic Air Fittings. Connect the Pneumatic Supply Lines from the CB-ABX-PRO-100-X Control Box to the PRODRIVE®. Pay close attention to the color coded tabs on the air fittings of the Air Motor and the Control Box. Connect the red hose to the red banded air fittings and the black hose to the black banded air fittings. **(Figure 4 & 5)**

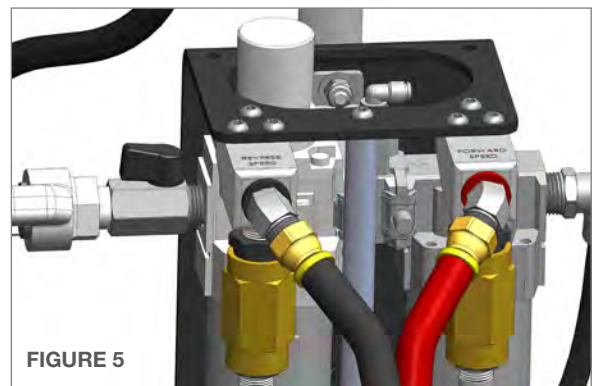
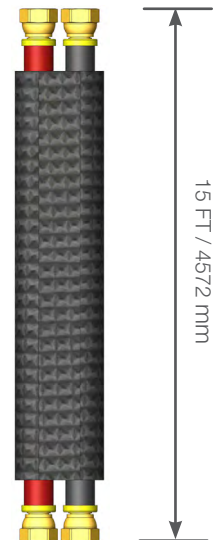
CONTROL BOX WITH PEDESTAL MOUNT



AIR MOTOR ON TRACTOR ASSEMBLY



PNEUMATIC SUPPLY LINES



AIR FITTINGS ON CONTROL BOX ASSEMBLY

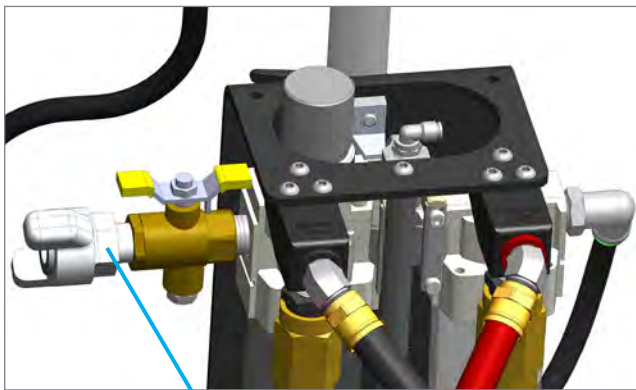
CONTROL BOX SET-UP

AIR SUPPLY AND LUBRICATOR SETTING

1. The Control Box is supplied with a twist claw style inlet coupling (Chicago style) located on the side of the FRL Assembly. Connect a compatible compressed air line (not included) according to the Manufacturer's instructions. If another pneumatic connection is preferred, this fitting can be removed and any male 1/2 in NPT fitting may be used.
2. Using the pressure regulator on the FRL, adjust the operating pressure to 100 psi (6,8 bar) for the application.

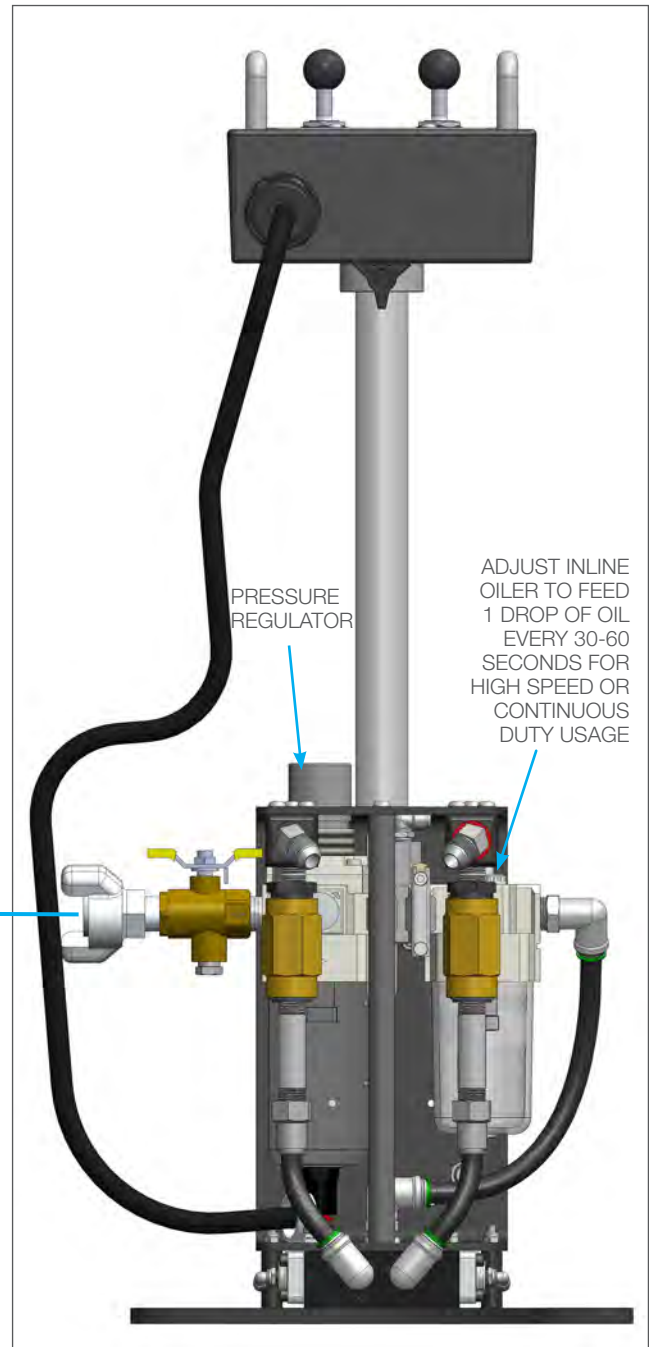
⚠ WARNING

Maximum operating 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.



AIR SUPPLY FITTING

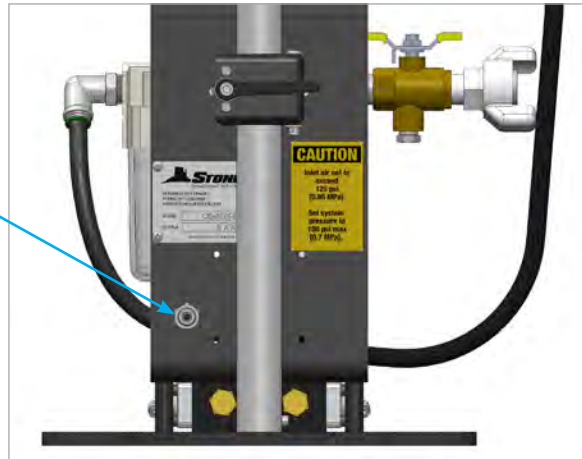
A universal **AIR SUPPLY FITTING** (Chicago style) is located on the FRL. Connect a compatible compressed air line (not included) according to the manufacturer's instructions. If another pneumatic connection is preferred, this fitting can be removed and any male 1/2 in NPT fitting may be used.



PNEUMATIC DUMP CONTROL FITTING AND LINE

A **DUMP CONTROL** is located on the Control Box panel and can be set up to control an air actuated dump valve. To utilize the toggle, the end user will need to install 1/4 in. (6.35 mm) O.D. nylon tubing (not included) between the **DUMP CONTROL FITTING** and the pneumatic dump valve. (NOT INCLUDED)

DUMP CONTROL FITTING
INSTALL 1/4 IN. (6.35 MM) O.D. NYLON
TUBING (NOT INCLUDED) HERE



REAR VIEW

OPERATION

CONTROL PANEL OPERATION

The Control Box consists of a base unit with a tethered Remote Box to allow the operator to easily move around if desired. There are two levers on the Remote Box: **DUMP** and **HOSE FEED**. The levers are spring loaded to return to the center, **OFF** position.

The **DUMP** lever, when pushed forward, provides air to the 1/4" push-connect fitting that is intended to supply air to a pneumatic dump valve to divert high-pressure water to the tool.

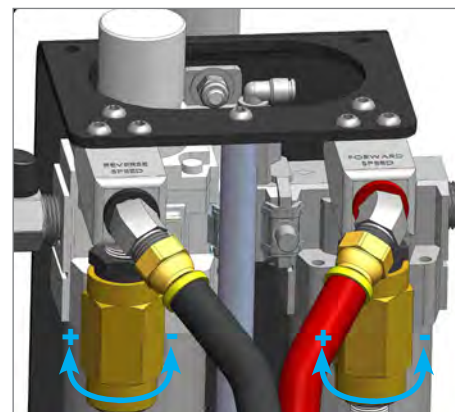
When the **HOSE FEED** lever is pushed forward, it drives the hose forward into the pipe. When the **HOSE FEED** lever is pulled backward, it retracts the hose from the pipe.

Forward and Reverse **HOSE FEED SPEED** can be adjusted independently using the brass colored flow control valves on the base of the control box. The Forward and Reverse directions are labeled. Rotate the flow controls in the clockwise direction to increase the speed and counterclockwise to slow the speed. Slow speeds are required to go forward through bends. Faster speeds are acceptable during retraction.

CONTROL PANEL REMOTE BOX



SPEED / FLOW CONTROLS



MAINTENANCE AND TROUBLESHOOTING

Maintenance Item	Frequency	Maintenance Required
Air Motors	After each use	Apply a small amount of air tool oil directly into the forward and reverse fittings. Then, briefly operate the controls at slow speed for a short duration in each direction to coat the interior parts of the motor.
All Air Fittings	After each use	Reinstall all dust caps to protect from dirt and moisture.
All components the hoses pass through	After each use	As wear occurs the rounded edges could become sharp and damage hoses. Any components showing excessive wear should be replaced.
Roller grooves	Before each use	Replace roller if cuts or roughness is present. (See the Roller Removal and Installation pages in this manual)
Hose	After each use	Install cap on threads to protect threads and prevent contamination.
Lubricator of control box	Before each use	Add oil when fluid drops below minimum level marking. Use SAE#10 or ISO VG32 Tool Oil (StoneAge Part Number GP 041). Using oils that are not intended for air tool systems may cause malfunction and/or component damage.
Snout and BOP Components	After each use	Wash out any material build up to prevent components from being clogged.
Waterblast Tool	After each use	Remove tool, lubricate and store in clean container.
Webbing strap	Before each use	Replace strap when frayed, cut or torn

TROUBLESHOOTING	
Problem	Solution
No air is delivered to tool	<ul style="list-style-type: none"> -Check that shut-off valve near regulator is open -Check that regulator is set to 100 psi -Open flow control valves by rotating the brass colored speed controls in the counterclockwise direction.
Hose is being damaged by Rollers	<ul style="list-style-type: none"> -Check that the proper Rollers are installed (see roller and collet reference plate) -Loosen eccentric lever to reduce clamp force on hose. -Check Rollers for excessive wear in groove
Hose slippage on Rollers	<ul style="list-style-type: none"> -Check that the proper Rollers are installed (see roller and collet reference plate) -Tighten eccentric lever to retain clamp force on hose.

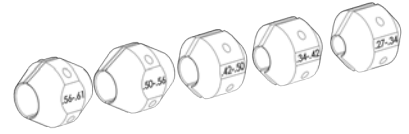
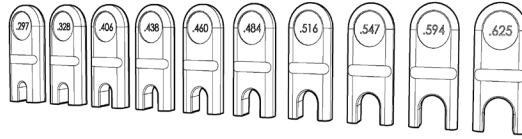
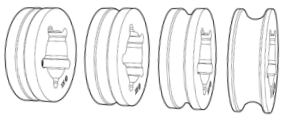
Contact StoneAge for Safety Data Sheets for material usage, a complete list of spare part numbers, and service instructions for the PRODRIVE® AUTOBOX (ABX-PRO) and CB-ABX-PRO-100-X Control Box.


STORAGE, TRANSPORTATION, AND HANDLING

When storing the unit, use compressed air to blow out the air lines to remove debris and moisture. Use mild soapy water to clean the machine in order to remove corrosive materials.

SELECTING THE APPROPRIATE COLLET AND ROLLERS

The ProDrive®AUTOBOX (ABX-PRO) comes with one pair of the PRO 174-46 installed in the ProDrive® tractor. A pair of the PRO 174-34 and PRO 174-58 rollers are also included in the package.

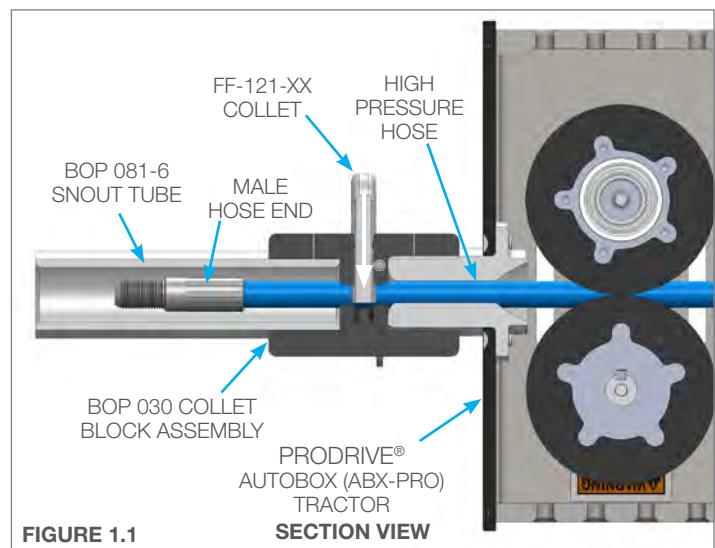
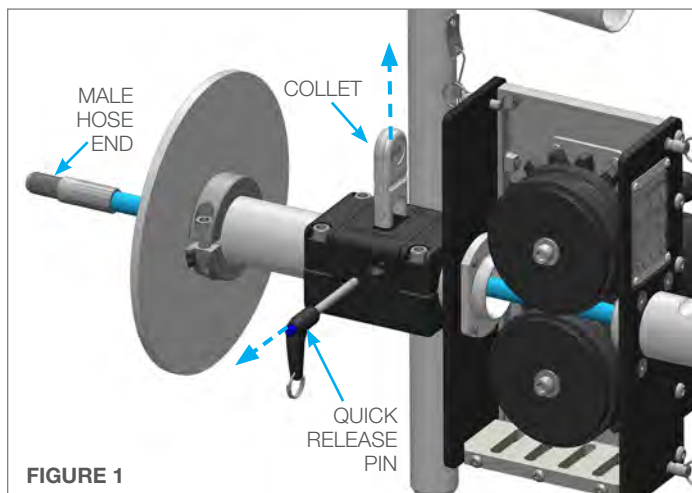


PRO 174-XX ROLLERS	HOSE OD	RUBBER COATED		SPIRSTAR	PARKER	BACK OUT PREVENTION		HOSE STOP SIZE
		I.D.	O.D.			COLLET SIZE	COLLET	
PRO 174-34 Ø 0.34 IN.	0.26–0.38 IN.	N/A		3/2	2240D-02	0.297 in. / 7.5 mm	FF 121-297	.27-.34 / 7-9 mm
				3/4, 4/2	2240D-025, 2440D-02	0.328 in. / 8.0 mm	FF 121-328	.27-.34 / 7-9 mm
				3/6, 5/2	2240D-03	0.406 in. / 10.0 mm	FF 121-406	.34-.42 / 9-11 mm
PRO 174-46 Ø 0.46 IN.	0.39–0.50 IN.			4/4	2448D-025	0.438 in. / 11.0 mm	FF 121-438	.34-.42 / 9-11 mm
				4/6, 5/4, 6/2	2240D-04	0.460 in. / 11.7 mm	FF 121-460	.42-.50 / 11-13 mm
					2640D-025, 2740D-03	0.484 in. / 12.3 mm	FF 121-484	.42-.50 / 11-13 mm
				6/4	2440D-04	0.516 in. / 13.0 mm	FF 121-516	.50-.56 / 13-14 mm
PRO 174-58 Ø 0.58 IN.	0.51–0.61 IN.			5/6, 8/2	2240D-05, 2740D-03	0.547 in. / 14.0 mm	FF 121-547	.50-.56 / 13-14 mm
				8/4		0.594 in. / 15.0 mm	FF 121-594	.56-.61 / 14-16 mm
					2440D-05	0.625 in. / 16.0 mm	FF 121-625	.56-.61 / 14-16 mm
PRO 174-67 Ø 0.67 IN.	0.63–0.71 IN.	.25"	.69"	6/6H	2740D-03, 2748D-05, 2749D-05	STONEAGE RECOMMENDS USING EITHER A BOP 010-4-8 OR BOP 010-9-18 WITH THESE LARGER SIZE HOSES		
PRO 174-76 Ø 0.76 IN.	0.72–0.80 IN.	.375"	.80"	6mm UHP, 8/6 UHP, 8/6 UHP-X, 10/4, 13/2	2840D-05, 2440N-06			
PRO 174-85 Ø 0.85 IN.	0.81–0.89 IN.			13/2 WR	2380N-08, 2440N-08			
PRO 174-94 Ø 0.94 IN.	0.90–0.98 IN.	.5"	.91"					



COLLET AND HOSE INSTALLATION

- Once the appropriate Collet size for the hose diameter is selected, pull the Quick Release Pin and remove the Collet. Feed the Male Hose End through the ProDrive® AUTOBOX (ABX-PRO) tractor, BOP 030 Collet Block, and BOP 081-6 Snout Tube. **(Figure 1)**
- Replace the Collet and Quick Release Pin. Pull back on the hose to ensure the Male Hose End does not back out past the Collet. **(Figure 1.1)**



ROLLER REMOVAL INSTRUCTIONS

ROLLER REMOVAL

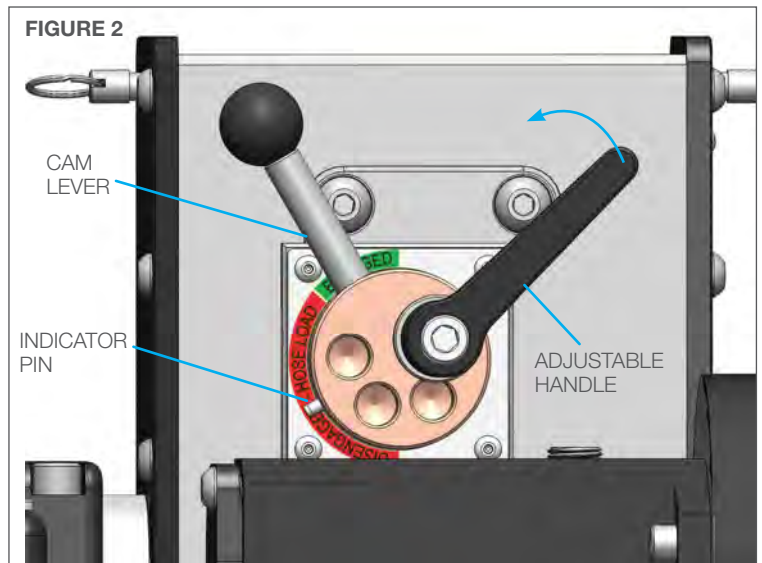
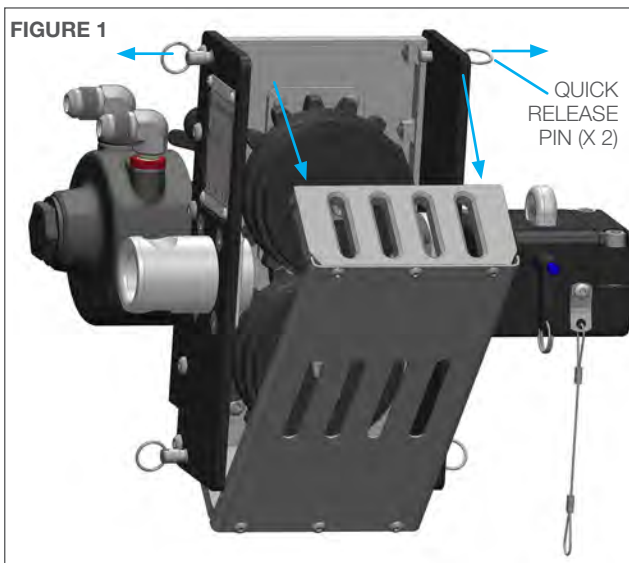
NOTICE

This process will be typical for Poly Roller replacements on the ABX-PRO Tractor Assembly. Installation of the appropriate Roller should be completed prior to installing the hose and tool into the ProDrive® AUTOBOX (ABX-PRO) Assembly.

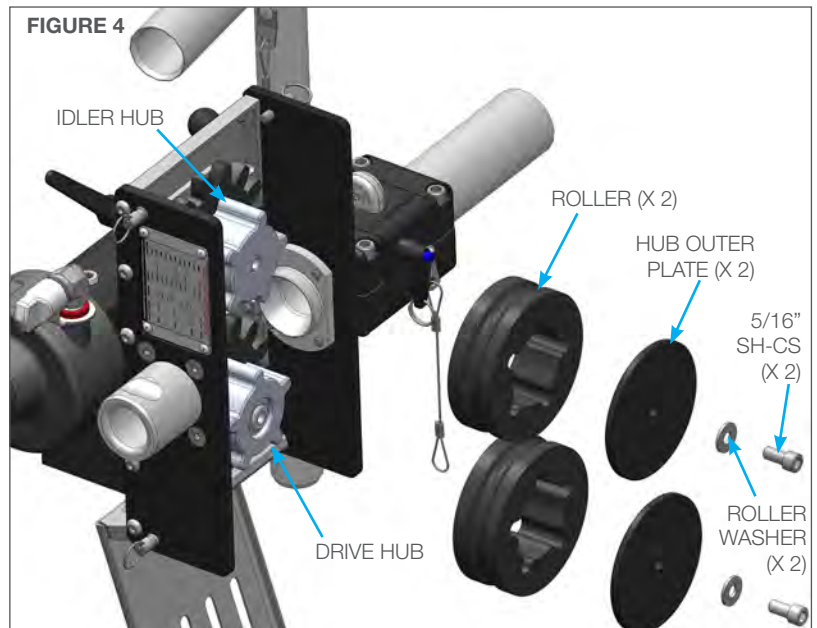
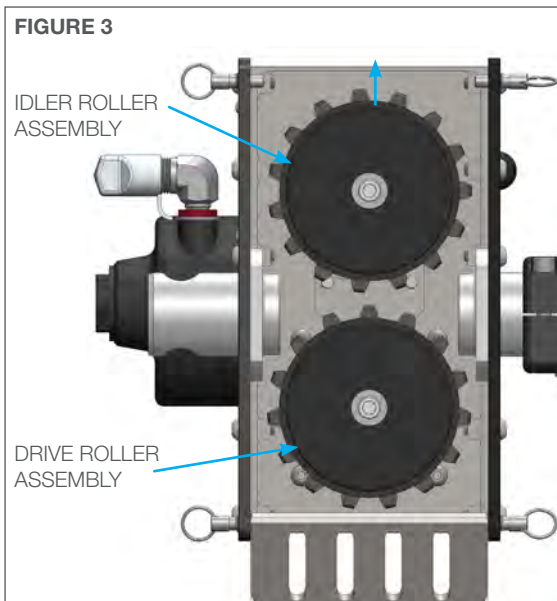
⚠ WARNING

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.

1. Open the back cover of the ABX-PRO Tractor by pulling the top two Quick Release Pins in the outward direction. **(Figure 1)**
2. Push the Adjustable Handle in the counterclockwise direction to loosen the CAM Lever and bushing. Push the Eccentric Lever in the counterclockwise direction, moving the indicator pin to **"Disengaged"**. **(Figure 2)**



3. Loosening the Cam Lever opens up the space between the Spline Roller Assemblies. **(Figure 3)**
4. Remove the two socket head cap screws, Roller Washers, Hub Outer Plates and Rollers. **(Figure 4)**



ROLLER INSTALLATION

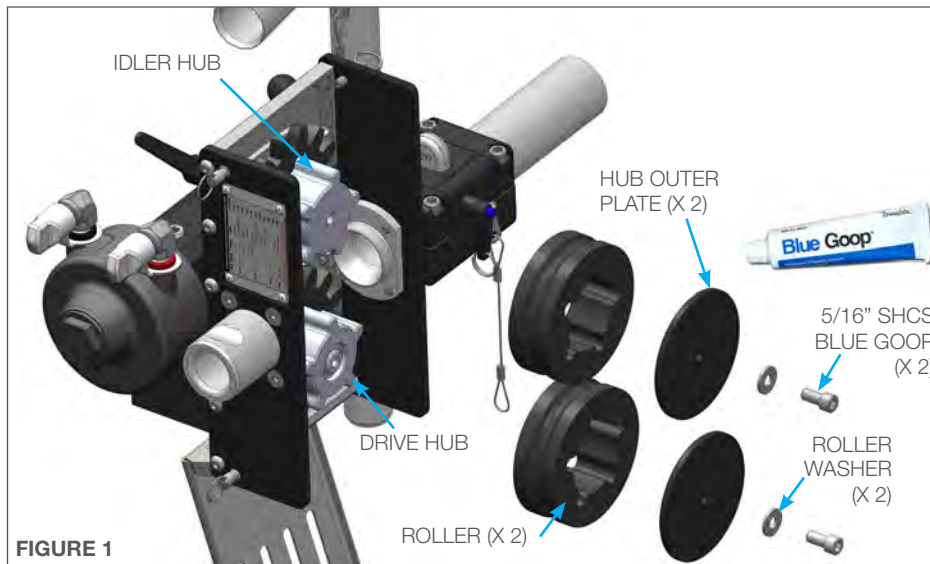
NOTICE

This process will be typical for Poly Roller replacements on the ABX-PRO Tractor Assembly. Installation of the appropriate Roller should be completed prior to installing the hose and tool into the ProDrive® AUTOBOX (ABX-PRO) Assembly.

⚠ 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.

1. Chose an alternate size or replacement set of Poly Rollers by using the reference chart in the section below to select the proper sizing. Slide the Poly Rollers onto the Hubs. Then fasten the Hub Outer Plates and Roller Washers onto the Spline Load Rollers with the two 5/16" socket head cap screws. **(Figure 1)**



2. Push the back cover back into the closed position and secure the two Quick Release Pins on the top of the PRODRIVE® **(Figure 2)**

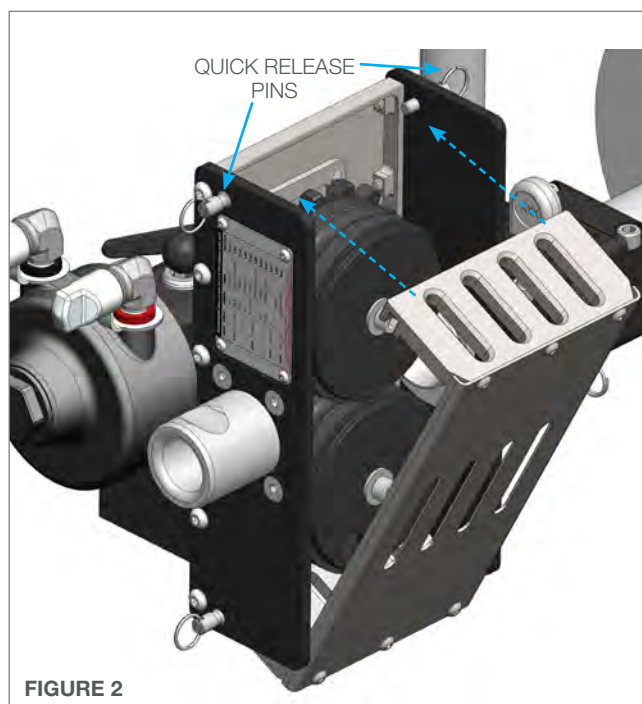
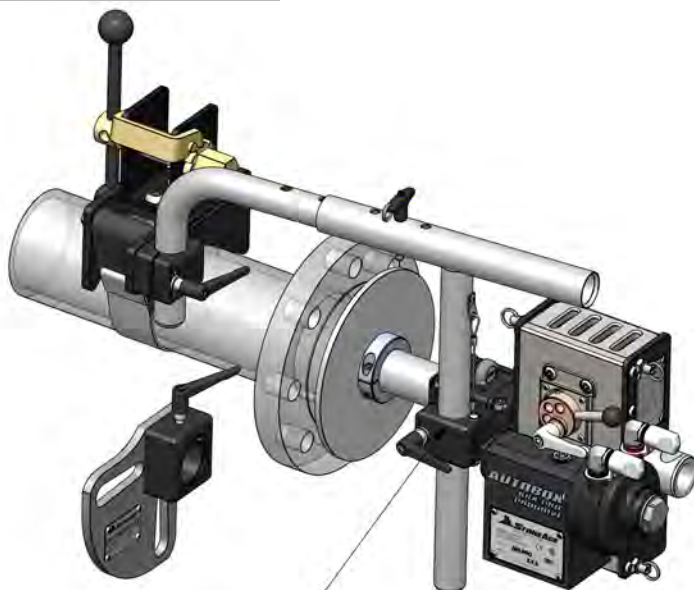


FIGURE 2

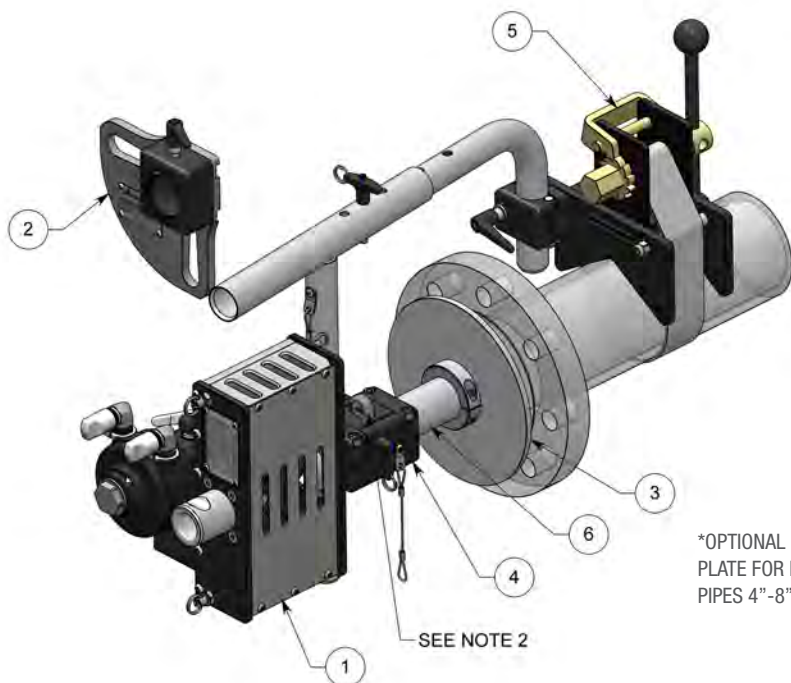
PRODRIVE® AUTOBOX (ABX-PRO) FULL SYSTEM ASSEMBLY

NOTICE

ASSEMBLY MUST NOT BE OPERATED WITHOUT THE USE OF A COLLET (FF 121-XXX) OR COLLET SET (PRO 621 OR PRO 622)

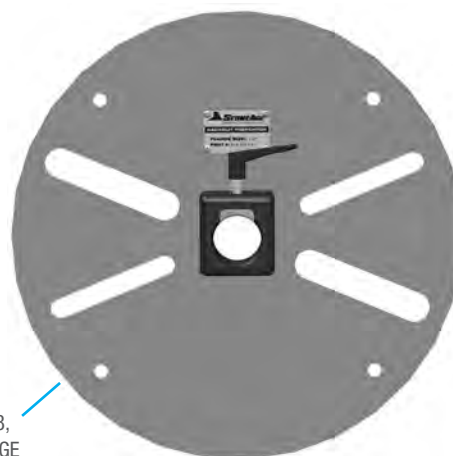


4X GS 325-025 SCREWS ATTACH CLAMP TO COLLET BLOCK. APPLY BLUE LOCTITE 242.



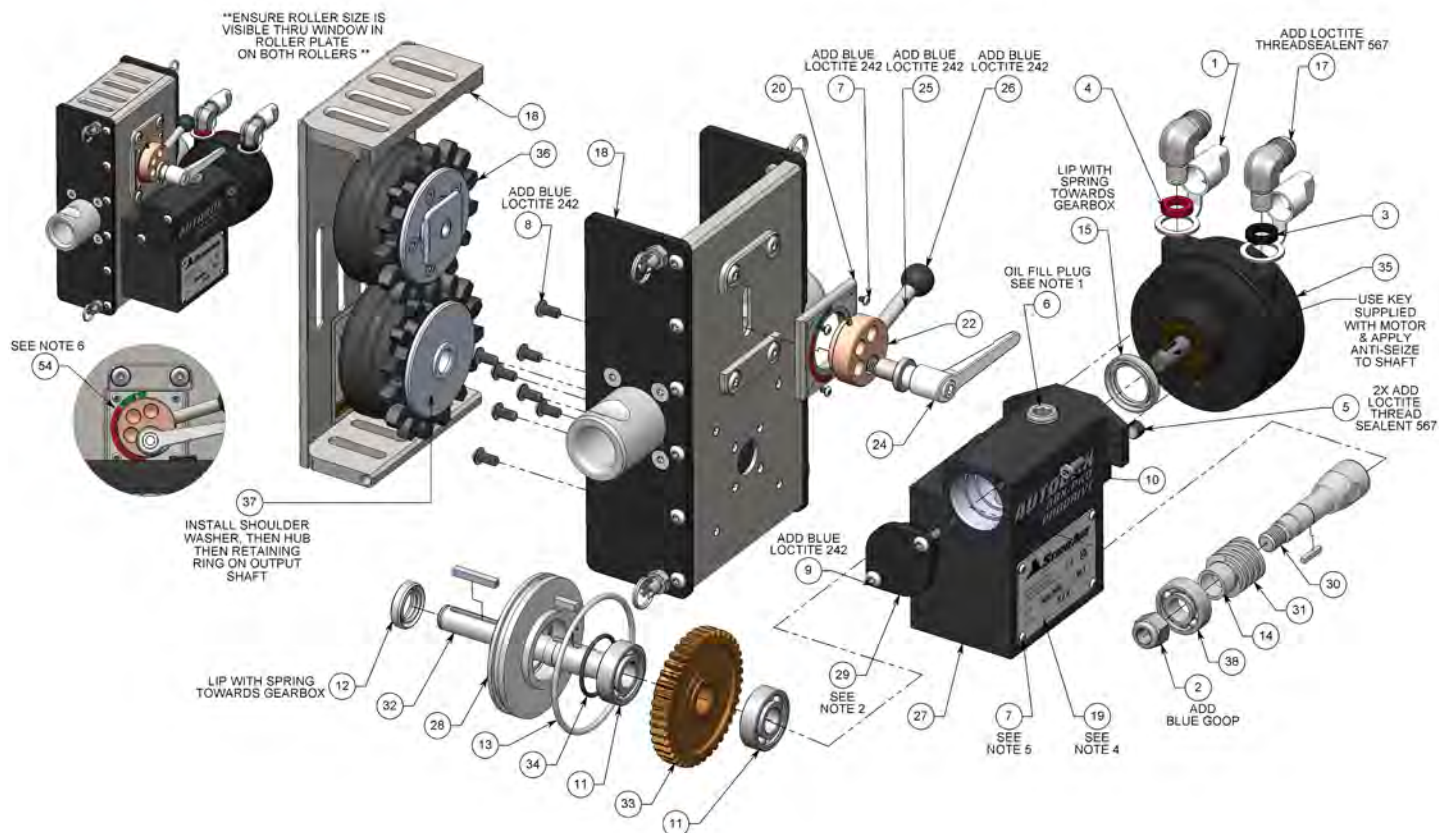
SEE NOTE 2

*OPTIONAL BOP 010-4-8, PLATE FOR LARGE FLANGE PIPES 4"-8"



#	PART NUMBER	QTY.
1	AUTOBOX ABX-PRO PRODRIVE TRACTOR ASSEMBLY	1
2	BOP 010-2-4 QTR, QUARTER PLATE BOP	1
3	BOP 012 SPLASH PLATE WELDMENT	1
4	BOP 030 COLLET BLOCK ASSEMBLY	1
5	BOP 050 STRAP MOUNT ASSEMBLY	1
6	BOP 081-6 SNOUT TUBE 1.75 X 6 SS	1

PRODRIVE® AUTOBOX (ABX-PRO)
TRACTOR ASSEMBLY



NOTE:

1. ADD 5.0 OUNCES OF MOBIL SYNTHETIC OIL SCH 634 (SA# GP 146.1)
2. THIS WORM CAP WILL BOTTOM ON BEARING, WILL NOT BOTTOM ON HOUSING WHEN TIGHTENED
3. ADD PRELUBE TO ALL SHAFTS, GEARS, BEARINGS, AND SEALS.
4. CLEAN SURFACE PRIOR TO INSTALLING SERIAL PLAQUE. STAMP IN ACCORDANCE WITH WORK INSTRUCTIONS.
5. 4X ADD RED LOCTITE: PN: 262 OR EQUIVALENT.
6. ORIENT GRAPHIC PLATE AS SHOWN

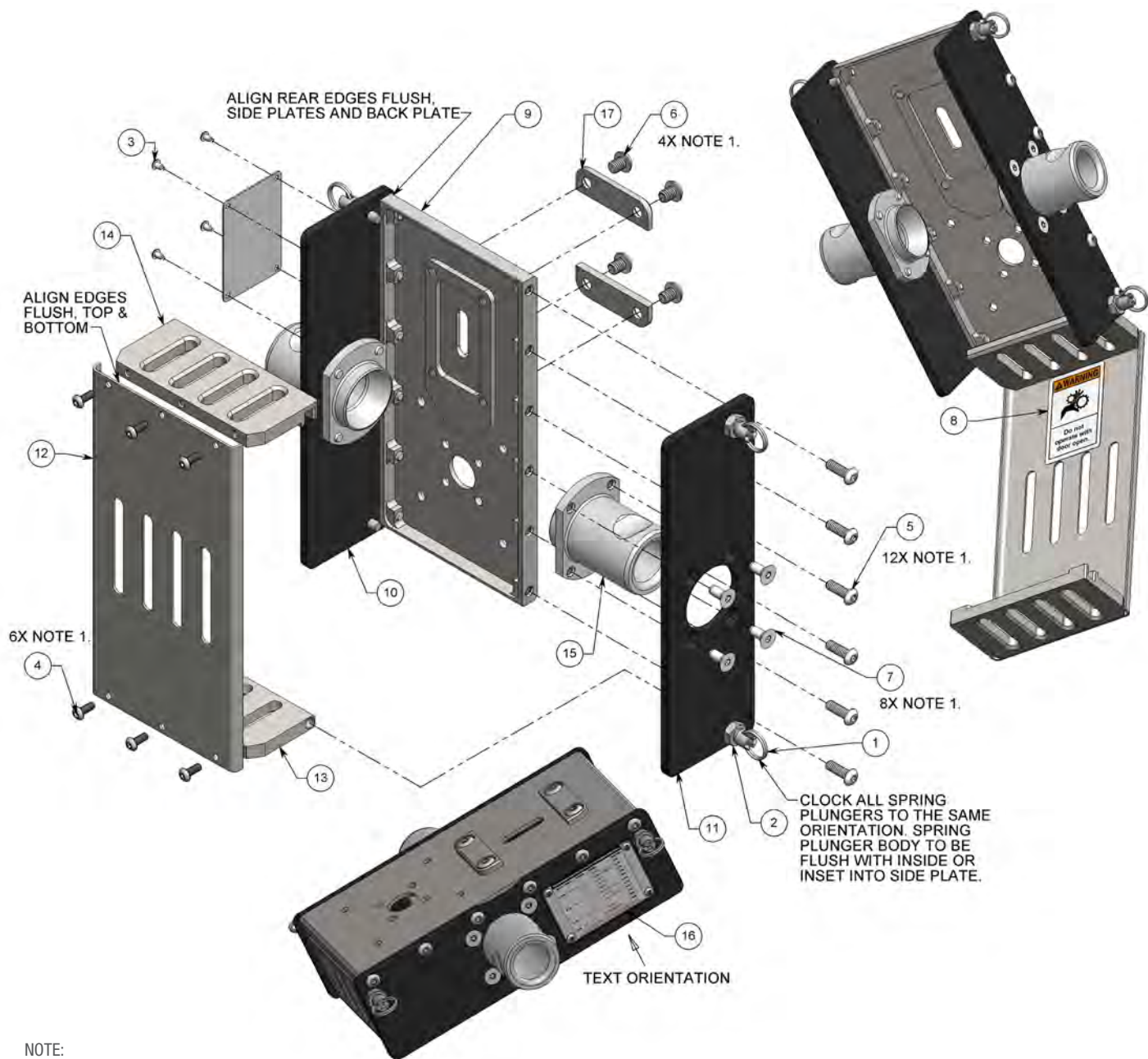
#	PART NUMBER	QTY
1	BR 167 DUST CAP, J8	2
2	GN 550-L NUT, NYLOK .50-13	1
3	GP 013-BK ID WASHER, RUBBER, SMALL, BLACK	1
4	GP 013-R ID WASHER, RUBBER, SMALL, RED	1
5	GP 025-P2SS HEX SOCKET PLUG, 1/8 NPT, SS-15K	1
6	GP 025-P8SS HEX SOCKET PLUG, 1/2 NPT, SS-15K	1
7	GSB 313-0075 BHCS 6-32 X .19 SS	8
8	GSB 325-02 BHCS .25-20 X .50 SS	8
9	GSB 325-03 BHCS .25-20 X .75 SS	2
10	GSLH 325-025 SHCS, LOW HD .25-20 X .625 SS	2

11	HLXD 002 BEARING, OUTPUT (TC 17 X 40 X 12)	2
12	HLXD 003 SEAL, OUTPUT	1
13	HLXD 006 O-RING, OUTPUT	1
14	HLXD 011 SPACER	1
15	HLXD 013 SEAL, INPUT	1
16	HLXD 017 CAP O-RING, INPUT	1
17	HRS 552 FTG, ELBOW 90 P4M J8M	2
18	PRO 101 HOUSING ASSEMBLY	1
19	PRO 109 CE SERIAL PLATE	1
20	PRO 112 CAM PLATE	1
21	PRO 113 CAM PLATE, DECAL	1
22	PRO 114 CAM BUSHING	1
23	PRO 115 ROLL PIN	1
24	PRO 116 ADJUSTABLE HANDLE ASSEMBLY	1

25	PRO 117 CAM LEVER SHAFT	1
26	PRO 118 CAM LEVER KNOB	1
27	PRO 130 GEARBOX HOUSING	1
28	PRO 131 BULKHEAD, OUTPUT	1
29	PRO 132 INPUT CAP	1
30	PRO 133 INPUT SHAFT	1
31	PRO 134 WORM 20-1, 12DP, 14.5PA, DOUBLE	1
32	PRO 136 OUTPUT SHAFT	1
33	PRO 137 WORM GEAR 20-1	1
34	PRO 138 O-RING	1
35	PRO 155-001 AIR MOTOR, GAST 2AM	1
36	PRO 170 IDLER ROLLER ASSEMBLY	1
37	PRO 181 DRIVE ROLLER ASSEMBLY	1
38	RJ 009 BALL BEARING	1

PARTS DIAGRAM

AUTOBOX® (PRO 101) HOUSING ASSEMBLY

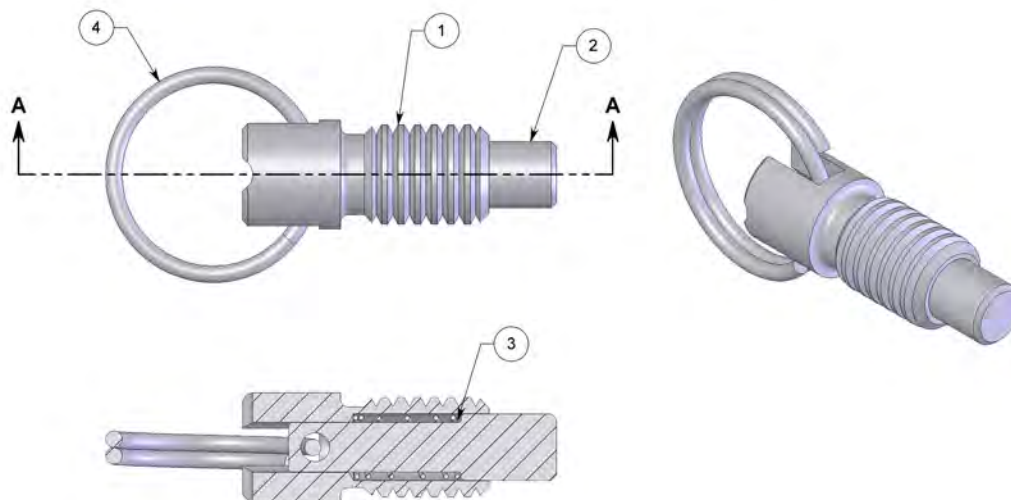


NOTE:

1. ADD BLUE LOCTITE: PN: 242 OR EQUIVALENT.

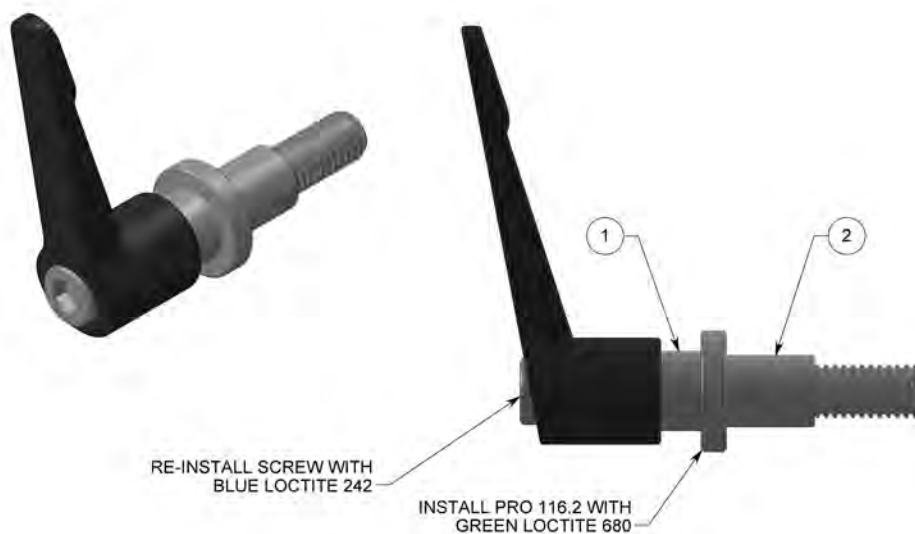
#	PART NUMBER	QTY.
1	ABX 566-001 SPRING PLUNGER ASSY	4
2	GN 337-HJ HEX JAM NUT SS	4
3	GSB 313-0075 BHCS 6-32 X .188 LG SS	4
4	GSB 319-02 BHCS .19-24 X .50 LG SS	6
5	GSB 325-03 BHCS .25-20 X .75 LG SS	12
6	GSB 331-015-24 BHCS .31-24 X .375 LG	4
7	GSF 325-0225 FHCS .25-20 X .5625 LG SS	8
8	PL 157 WARNING DOOR OPEN	1

9	PRO 102 BACK PLATE	1
10	PRO 103 SIDE PLATE, MOTOR	1
11	PRO 104 SIDE PLATE, FRONT	1
12	PRO 105 COVER, FRONT PANEL	1
13	PRO 106 COVER, BOTTOM PLATE	1
14	PRO 107 COVER, TOP PLATE	1
15	PRO 108 GUIDE TUBE	2
16	PRO 110 COLLET REFERENCE PLATE	1
17	PRO 111 CAM TAB	2

AUTOBOX® (ABX 566-001)
 SPRING PLUNGER ASSEMBLY


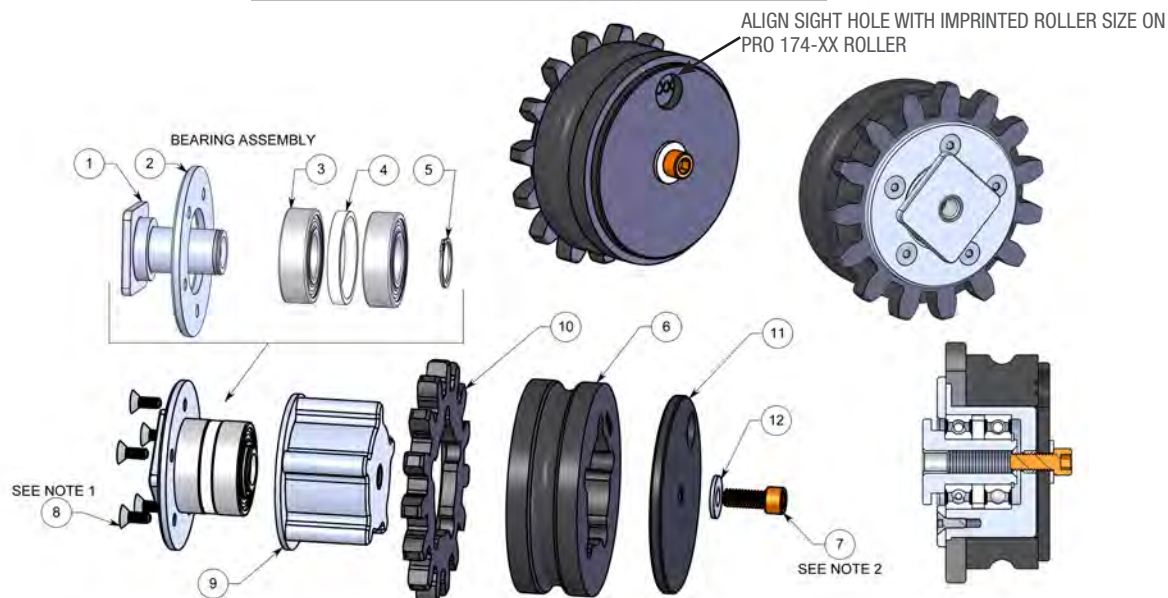
SECTION A-A

#	PART NUMBER	QTY.
1	ABX 566.1-001 BODY	1
2	ABX 566.2-001 PIN	1
3	ABX 566.3-001 SPRING	1
4	ABX 566.4-001 RING	1

AUTOBOX® (PRO 116)
 ADJUSTABLE HANDLE ASSEMBLY


#	PART NUMBER	QTY.
1	SRT 556 ADJUSTABLE HANDLE .38-16 X 1.56 SS	1
2	PRO 116.2 SHOULDER SLEEVE	1

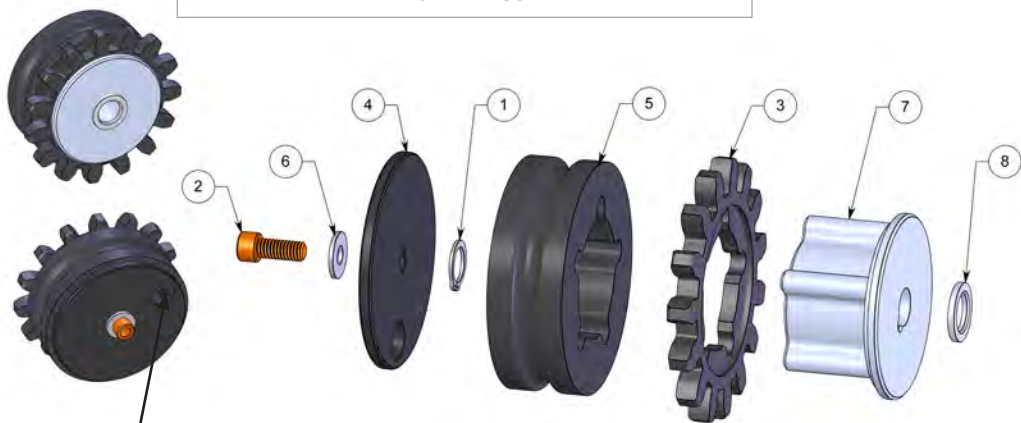
PRO 170
IDLER ROLLER ASSEMBLY



- NOTE:
- 1. 5x BLUE LOCTITE: PN: 242 OR EQUIVALENT
 - 2. APPLY BLUE GOOP (A SWAGELOK BRAND) ANTI-SEIZE.

#	PART NUMBER	QTY.	#	PART NUMBER	QTY.
1	PRO 176 IDLER SHAFT	1	7	GS 431-03 SHCS .31-18 X .75 BRZ	1
2	PRO 177 IDLER BEARING PLATE	1	8	GSF 319-02-24 FHCS .19-24 X .50 LG SS	5
3	PRO 178 BEARING	2	9	PRO 171 IDLER HUB	1
4	PRO 179 BEARING SPACER OD	1	10	PRO 172 ROLLER GEAR 15T	1
5	PRO 180 RETAINING RING	1	11	PRO 173 ROLLER PLATE	1
6	PRO 174-46 POLY ROLLER	1	12	PRO 175 HIGH-STRENGTH WASHER	1

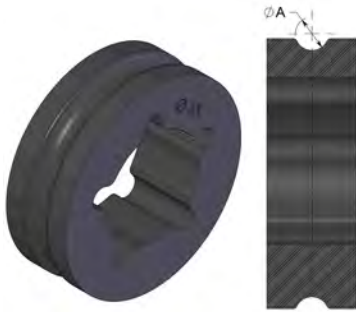
PRO 181
DRIVE ROLLER ASSEMBLY



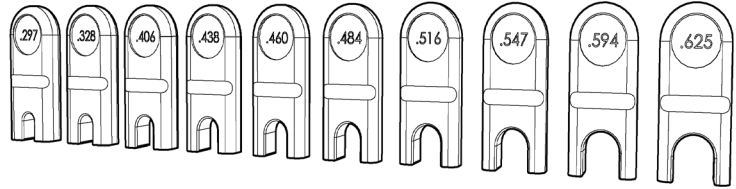
ALIGN SIGHT HOLE WITH
IMPRINTED ROLLER SIZE ON
PRO 174-XX ROLLER

#	PART NUMBER	QTY.
1	ABX 249 RETAINING RING, HD EXT SS	1
2	GS 431-03 SHCS .31-18 X .75 BRZ	1
3	PRO 172 ROLLER GEAR	1
4	PRO 173 ROLLER PLATE	1
5	PRO 174-46 POLY ROLLER	1
6	PRO 175 HIGH-STRENGTH WASHER	1
7	PRO 182 DRIVE HUB	1
8	PRO 183 SHAFT SHOULDER WASHER	1

PRO174-46
HOSE DRIVE ROLLERS




PRODRIVE EXTENDED KIT (PRO 622)
*OPTIONAL COLLET SET INCLUDES ONE OF EACH SIZE



PRO 621
*OPTIONAL COLLET SET INCLUDES 1 EACH
OF SIZES FF 121-297-516

TO ORDER A **SINGLE COLLET**
USE THE **FF 121-XX**
PART NUMBER

PRO 174-XX ROLLERS	HOSE OD	RUBBER COATED		SPIRSTAR	PARKER	BACK OUT PREVENTION		HOSE STOP SIZE
		I.D.	O.D.			COLLET SIZE	COLLET	
PRO 174-34 Ø 0.34 IN.	0.26–0.38 IN.	N/A		3/2	2240D-02	0.297 in. / 7.5 mm	FF 121-297	.27-.34 / 7-9 mm
				3/4, 4/2	2240D-025, 2440D-02	0.328 in. / 8.0 mm	FF 121-328	.27-.34 / 7-9 mm
				3/6, 5/2	2240D-03	0.406 in. / 10.0 mm	FF 121-406	.34-.42 / 9-11 mm
PRO 174-46 Ø 0.46 IN.	0.39–0.50 IN.			4/4	2448D-025	0.438 in. / 11.0 mm	FF 121-438	.34-.42 / 9-11 mm
				4/6, 5/4, 6/2	2240D-04	0.460 in. / 11.7 mm	FF 121-460	.42-.50 / 11-13 mm
					2640D-025, 2740D-03	0.484 in. / 12.3 mm	FF 121-484	.42-.50 / 11-13 mm
				6/4	2440D-04	0.516 in. / 13.0 mm	FF 121-516	.50-.56 / 13-14 mm
PRO 174-58 Ø 0.58 IN.	0.51–0.61 IN.			5/6, 8/2	2240D-05, 2740D-03	0.547in. / 14.0 mm	FF 121-547	.50-.56 / 13-14 mm
				8/4		0.594 in. / 15.0 mm	FF 121-594	.56-.61 / 14-16 mm
					2440D-05	0.625 in. / 16.0 mm	FF 121-625	.56-.61 / 14-16 mm
PRO 174-67 Ø 0.67 IN.	0.63–0.71 IN.	.25"	.69"	6/6H	2740D-03, 2748D-05, 2749D-05	STONEAGE RECOMMENDS USING EITHER A BOP 010-4-8 OR BOP 010-9-18 WITH THESE LARGER SIZE HOSES		
PRO 174-76 Ø 0.76 IN.	0.72–0.80 IN.	.375"	.80"	6mm UHP, 8/6 UHP, 8/6 UHP-X, 10/4, 13/2	2840D-05, 2440N-06			
PRO 174-85 Ø 0.85 IN.	0.81–0.89 IN.			13/2 WR	2380N-08, 2440N-08			
PRO 174-94 Ø 0.94 IN.	0.90–0.98 IN.	.5"	.91"					

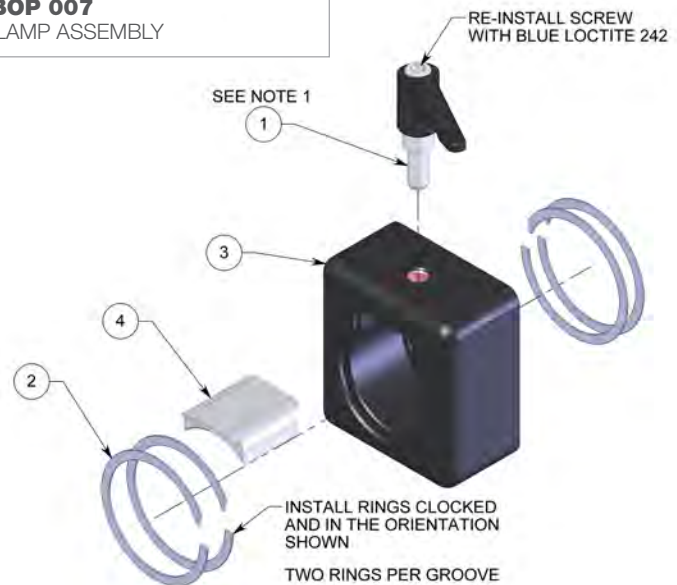


BOP 007
TUBE CLAMP ASSEMBLY

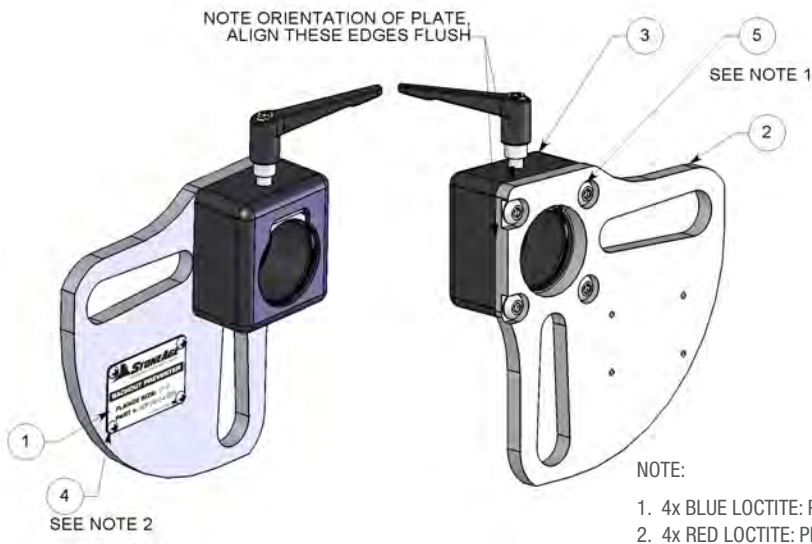
NOTE:

1. ADD BLUE BLUE GOOP (A SWAGELock BRAND) ANTI-SEIZE TO ALL THREADED HARDWARE. AN EQUIVALENT ALTERNATIVE IS ACCEPTABLE.

#	PART NUMBER	QTY.
1	BOP 003 ADJUSTABLE HANDLE .31-18X.75 BLK	1
2	BOP 004 RETAINING RING	4
3	BOP 005 TUBE CLAMP 1.75ID	1
4	BOP 006 TUBE CLAMP COLLET 1.75ID	1

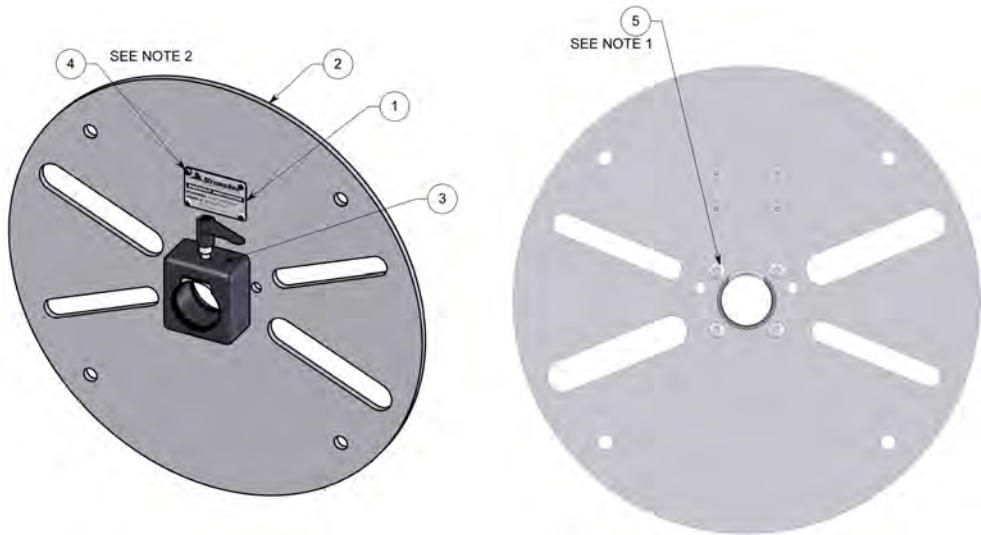


BOP-010-2-4 QTR
QUARTER PLATE BOP



#	PART NUMBER	QTY.
1	BOP 001-2-4-QTR DECAL PLATE	1
2	BOP 002-2-4-QTR QUARTER FLANGE PLATE 2-4IN	1
3	BOP 007 TUBE CLAMP ASSY (SEE PAGE 31)	1
4	BOP 013 SCREW 6-32X.25 SELF TAP	4
5	GSB 331-03 BHCS .31-18 X .75 LG	4

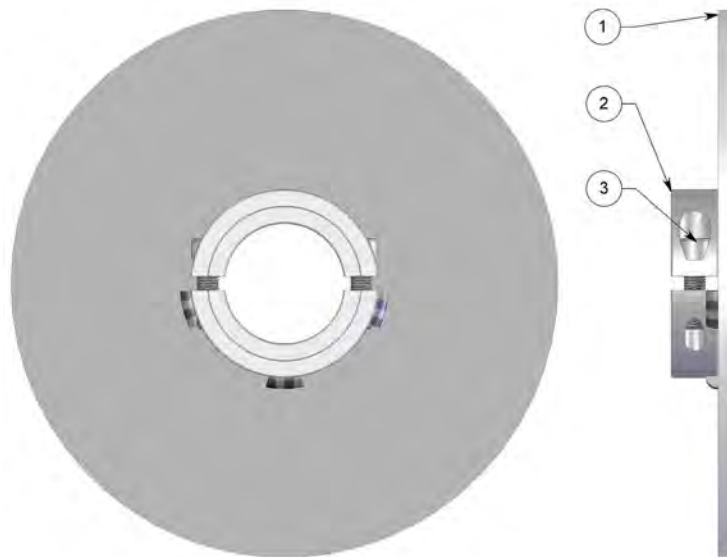
BOP-010-4-8 QTR
LARGE PLATE FOR LARGE PIPES 4"-8"



#	PART NUMBER	QTY.
1	BOP 001-4-8 DECAL PLATE	1
2	BOP 002-4-8 FLANGE MOUNT PLATE	1
3	BOP 007 TUBE CLAMP ASSY (SEE PAGE 31)	1
4	BOP 013 SCREW 6-32X.25 SELF TAP	4
5	GSB 331-03 BHCS .31-18 X .75 SS	4

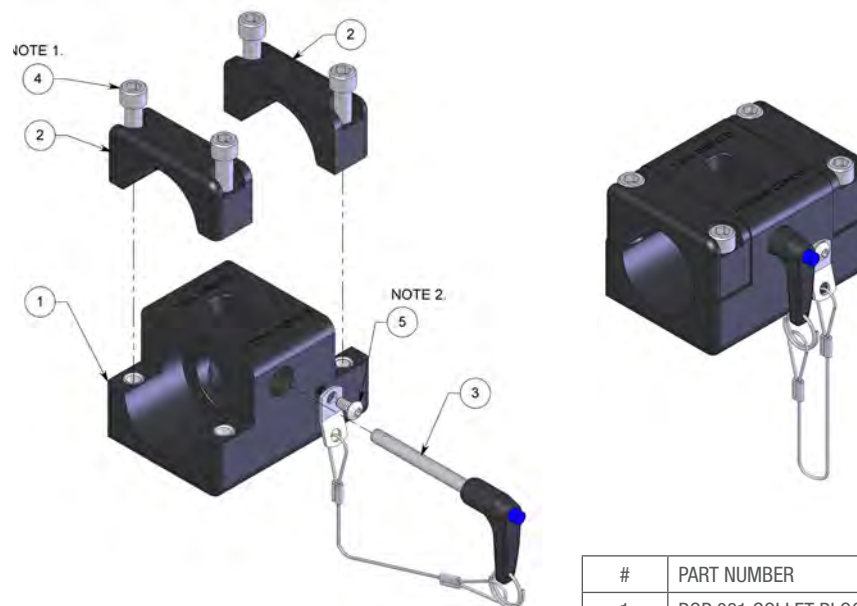
NOTE:
1. 4x BLUE LOCTITE: PN: 242 OR EQUIVALENT
2. 4x RED LOCTITE: PN: 262 OR EQUIVALENT

BOP 012
SPLASH PLATE WELDMENT



#	PART NUMBER	QTY.
1	BOP 012.1 SPLASH PLATE	1
2	GC SP-28-A COLLAR ASSEMBLY	1
3	GS 331-04-24 SHCS .31-24 X 1.00 SS	2

BOP 030
COLLET BLOCK ASSEMBLY



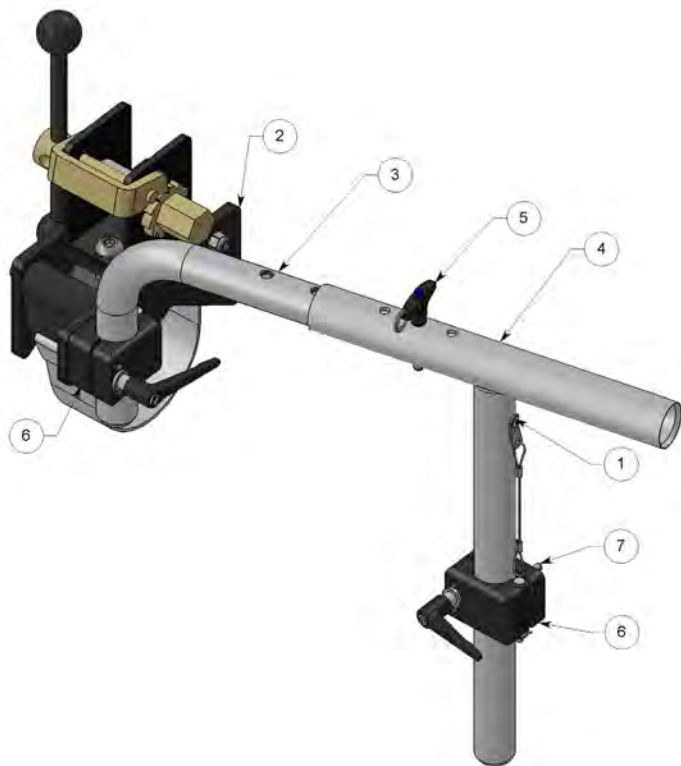
NOTE:

1. ADD BLUE GOOP (A SWAGelok BRAND) ANTI-SEIZE. TO ALL THREADED HARDWARE. AN EQUIVALENT ALTERNATIVE IS ACCEPTABLE.
2. BLUE LOCTITE PN:242 OR EQUIVALENT

#	PART NUMBER	QTY.
1	BOP 031 COLLET BLOCK BODY	1
2	BOP 032 COLLET BLOCK CAP	2
3	BOP 033 QUICK PIN	1
4	GS 331-06 SHCS .31-18 x 1.50 SS	4
5	GSB 319-015 BHCS .19-24 x .38 Lg SS	1

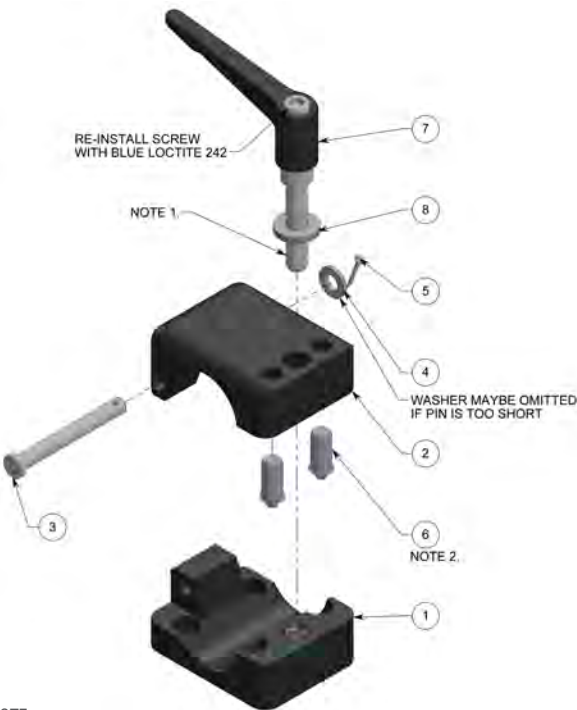
PARTS DIAGRAM

BOP 050
STRAP MOUNT ASSEMBLY



#	BOP 050 PART NUMBERS	QTY.
1	BOP 049 RIVET SS	1
2	BOP 051 RATCHET STRAP ASSEMBLY	1
3	BOP 057 POSITIONER TUBE, MALE	1
4	BOP 058 POSITIONER TUBE, FEMALE WELDMENT	1
5	BOP 059 QUICK PIN	1
6	BOP 070 HINGE CLAMP ASSEMBLY (DIAGRAM RIGHT)	2
7	GS 325-025 SHCS .25-20 X .62 SS	8

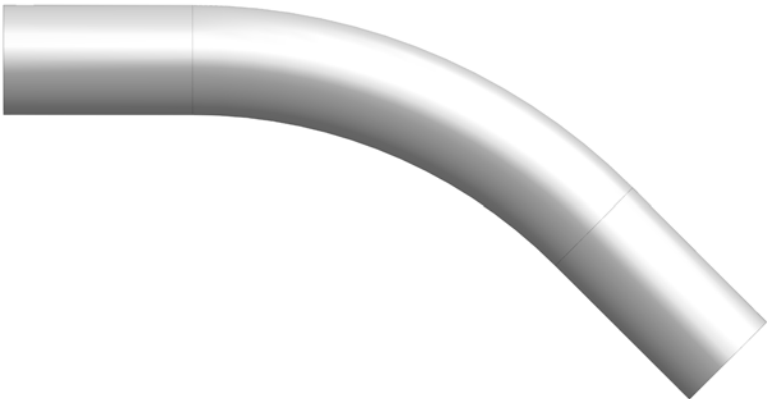
BOP 070
HINGE CLAMP ASSEMBLY



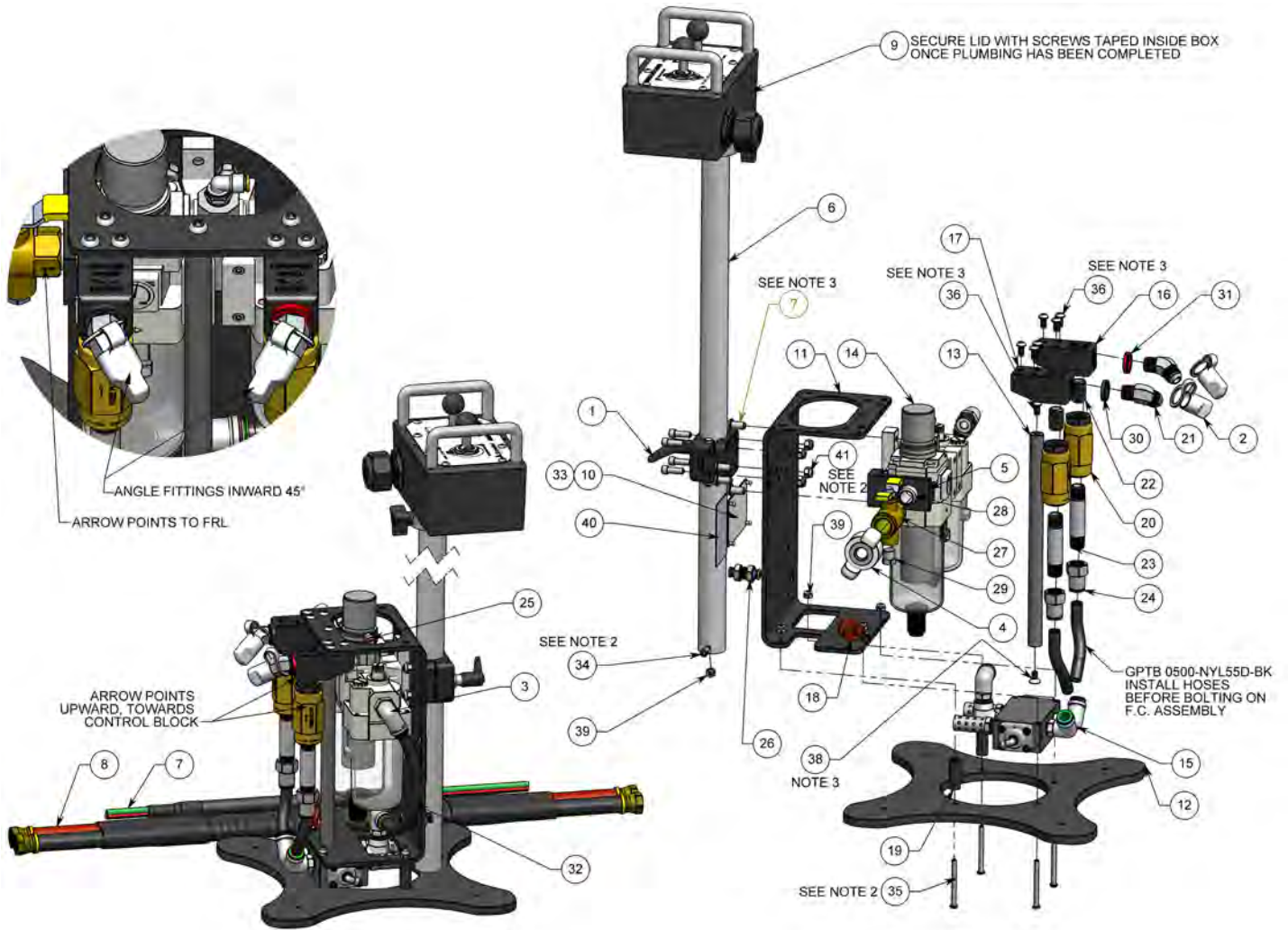
- NOTE:
- 1. ADD BLUE GOOP (A SWAGELock BRAND) ANTI-SEIZE TO ALL THREADED HARDWARE. AN EQUIVALENT ALTERNATIVE IS ACCEPTABLE.
 - 2. APPLY GREEN RETAINING COMPOUND, LOCTITE PN: 290 OR EQUIVALENT TO COMPONENTS AS NOTED.

#	BOP 070 PART NUMBERS	QTY.
1	BOP 071 HINGE CLAMP BASE	1
2	BOP 072 HINGE CLAMP CAP	1
3	BOP 073 CLEVIS PIN	1
4	BOP 074 PIN WASHER	1
5	BOP 075 COTTER PIN	1
6	BOP 076 SPRING PLUNGER	2
7	BOP 077 ADJUSTABLE HANDLE	1
8	BOP 078 THICK WASHER	1

***OPTIONAL BOP 082-9-45**
1.75 X R9 X 45 DEG SNOOT TUBE



AUTOBOX® (CB-ABX-PRO-100-P)
CONTROL BOX ASSEMBLY, PEDESTAL MOUNT



NOTE:

2. APPLY BLUE GOOP (A SWAGelok BRAND) ANTI-SEIZE. TO ALL THREADED HARDWARE.
3. BLUE LOCTITE: PN: 242 OR EQUIVALENT
4. LOCTITE THREAD SEALANT 567 TO ALL NPT THREADS

NOTE:

SEE THE CB-ABX-PRO-S PART DIAGRAM ON THE NEXT PAGE FOR NOTES AND UMBILICAL LINE TABLE.

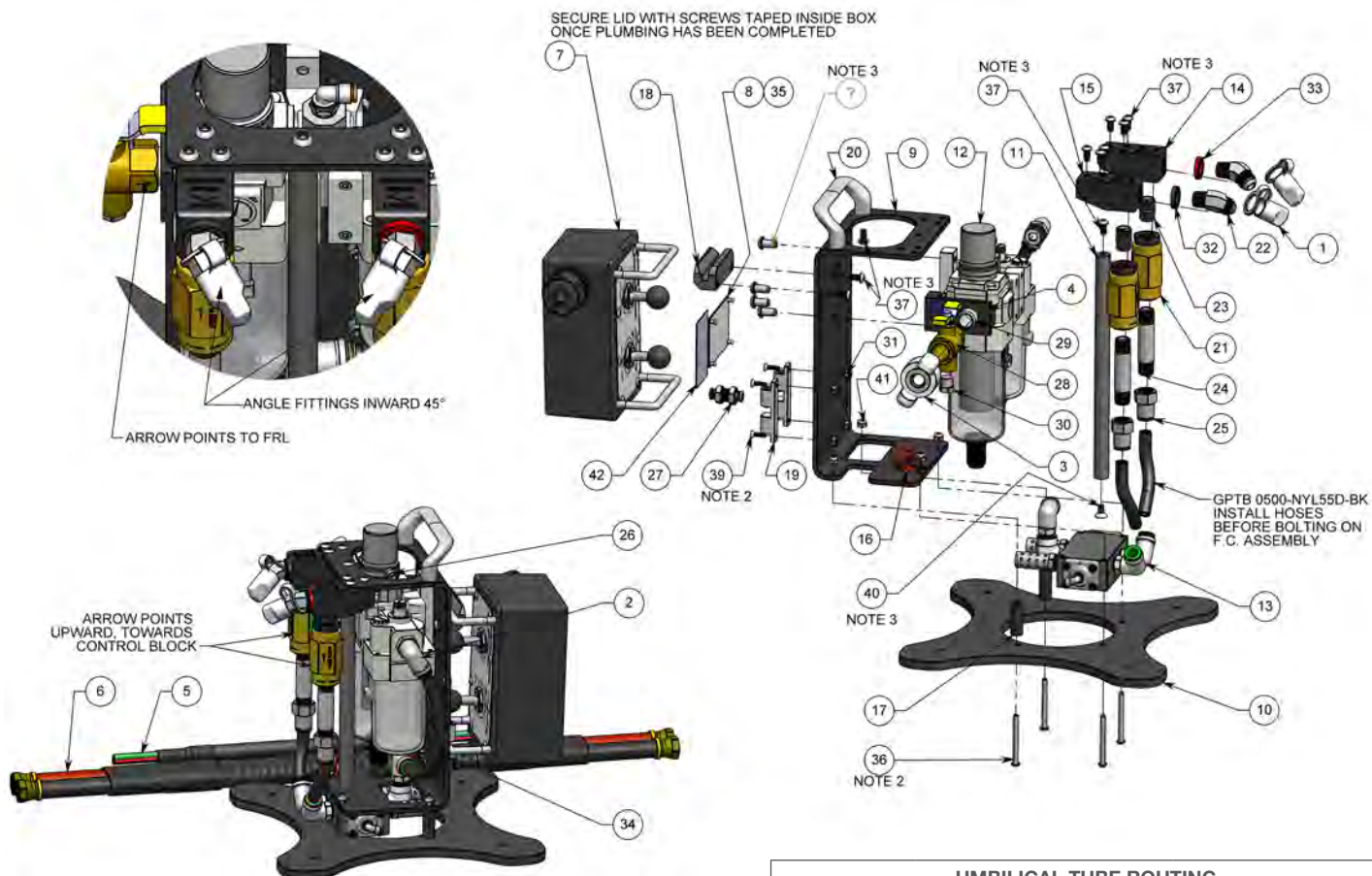
#	PART NUMBER	QTY.
1	BOP 070 HINGE CLAMP ASSEMBLY	1
2	BR 167 DUST CAP, J8	2
3	BUD 142 FTG, ELBOW SWIVEL 90 P8M PL8	1
4	CB 114 INLET FITTING W/ PIN	1
5	CB 395 FRL BRACKET	1
6	CB 727 REMOTE BOX POLE, 1.250D	1
7	CB 740-10 PRODRIVE UMBILICAL ASSEMBLY	1
8	CB 745-15 PRODRIVE SUPPLY HOSE BUNDLE	1
9	CB 750-P PRODRIVE REMOTE BOX ASSY, PEDESTAL	1
10	CB 754 CE SERIAL PLATE	1
11	CB 760 FRL FRAME, ABX-PRO	1
12	CB 761 FRL BASE	1
13	CB 762 FRL SUPPORT ROD, ABX-PRO	1
14	CB 763-001 FRL ASSY	1

15	CB 764 SPOOL VALVE ASSY, ABX-PRO	1
16	CB 765-FWD 90 DEG FLOW CONTROL BLOCK, FORWARD	1
17	CB 765-REV 90 DEG FLOW CONTROL BLOCK, REVERSE	1
18	CB 766 LOOP CLAMP	1
19	CB 767 SPACER	2
20	CB 780-P6 IN-LINE FLOW CONTROL, P6	2
21	CB 781 FTG, ELBOW 45 P6M J8M	2
22	CB 782 PIPE NIPPLE P6P6 X 1.00 SS	2
23	CB 783 PIPE NIPPLE P6P6 X 3.00 SS	2
24	CB 784 FTG, ADAPTER P6F PL8	2
25	CB 786 FTG, ELBOW SWIVEL 90 P4M PL4	1
26	CB 790 FTG, BULKHEAD UNION PL4 PL4	1
27	CB 792 VALVE, AUTODRAIN, P8	1
28	CB 794 FTG, NIPPLE CLOSE P8M P8M SS	1

29	DB 026 BREATHER, SINTERED BRONZE, P4	1
30	GP 011-BK ID WASHER, RUBBER, MED, BLACK	1
31	GP 011-R ID WASHER, RUBBER, MED, RED	1
32	GPTB 0500-PUR95A-BK MAIN TUBE, FRL, 10IN	2FT
33	GR 125-SS-188-250 RIVET, BLIND, DOMED, SS, Ø.125, .188-.250 L	4
34	GS 319-02 SHCS 10-24 X .50 SS	1
35	GSB 319-09 BHCS 10-24 X 2.25 SS	4
36	GSB 325-02 BHCS .25-20 X .50 SS	7
37	GSB 331-025 BHCS .31-18 X .62 SS	4
38	GSF 325-02 FHCS .25-20 X .50 SS	1
39	HC 025.1 NUT, NYLOK 10-24 SS	5
40	PL 156-125 CAUTION INLET AIR, 125 MAX	1
41	TB 044.1 NUT, NYLOK .25-20 SS	4
42	TB 050 SHCS .25-20 X .75 SS	4

PARTS DIAGRAM

AUTOBOX® (CB-ABX-PRO-100-S) CONTROL BOX ASSEMBLY, SIDE MOUNT



NOTE:

2. APPLY BLUE GOOP (A SWAGELOK BRAND) ANTI-SEIZE. TO ALL THREADED HARDWARE.
3. BLUE LOCTITE: PN: 242 OR EQUIVALENT
4. LOCTITE THREAD SEALANT 567 TO ALL NPT THREADS

UMBILICAL TUBE ROUTING

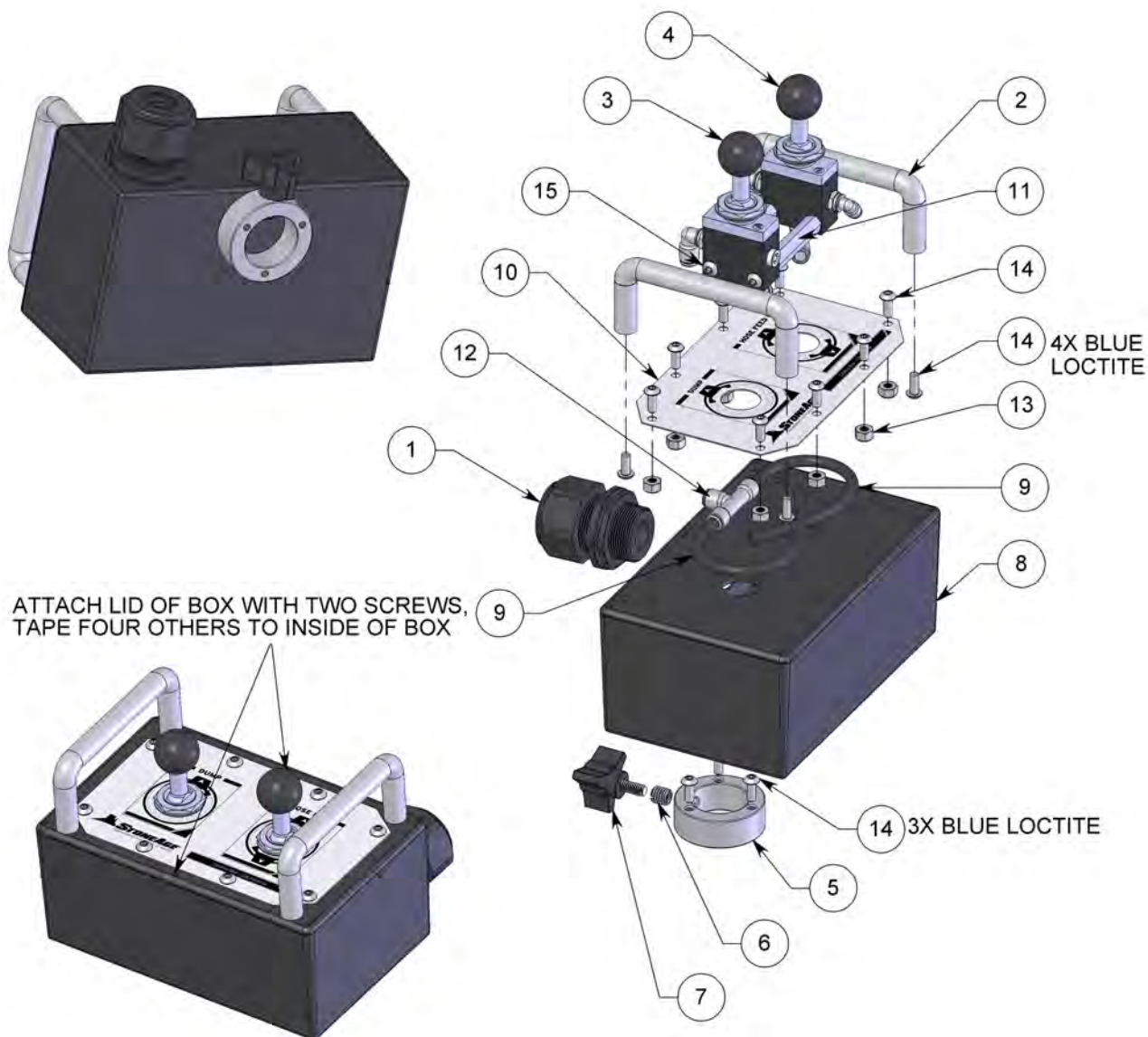
UMBILICAL LINE	REMOTE BOX TERMINATION (SHORT SIDE)	FRL TERMINATION (LONG SIDE)
1/4" BLACK	TEE FOR SUPPLY	DRY AIR TAP
1/4" GREEN	DUMP	BULKHEAD DUMP
1/8" BLACK	FORWARD	"REVERSE SPEED" SIDE
1/8" RED	REVERSE	"FORWARD SPEED" SIDE

#	PART NUMBER	QTY.
1	BR 167 DUST CAP, J8	2
2	BUD 142 FTG, ELBOW SWIVEL 90 P8M PL8	1
3	CB 114 INLET FITTING W/ PIN	1
4	CB 395 FRL BRACKET	1
5	CB 740-10 PRODRIVE UMBILICAL ASSEMBLY	1
6	CB 745-15 PRODRIVE SUPPLY HOSE BUNDLE	1
7	CB 750-S PRODRIVE REMOTE BOX ASSY, SIDE LATCH	1
8	CB 754 CE SERIAL PLATE	1
9	CB 760 FRL FRAME, ABX-PRO	1
10	CB 761 FRL BASE	1
11	CB 762 FRL SUPPORT ROD, ABX-PRO	1
12	CB 763-001 FRL ASSY	1
13	CB 764 SPOOL VALVE ASSY, ABX-PRO	1

14	CB 765-FWD 90 DEG FLOW CONTROL BLOCK, FORWARD	1
15	CB 765-REV 90 DEG FLOW CONTROL BLOCK, REVERSE	1
16	CB 766 LOOP CLAMP	1
17	CB 767 SPACER	2
18	CB 771 UPPER HANGER	1
19	CB 772 TENSION CATCH	2
20	CB 773 OFFSET HANDLE	1
21	CB 780-P6 IN-LINE FLOW CONTROL, P6	2
22	CB 781 FTG, ELBOW 45 P6M J8M	2
23	CB 782 PIPE NIPPLE P6P6 X 1.00 SS	2
24	CB 783 PIPE NIPPLE P6P6 X 3.00 SS	2
25	CB 784 FTG, ADAPTER P6F PL8	2
26	CB 786 FTG, ELBOW SWIVEL 90 P4M PL4	1
27	CB 790 FTG, BULKHEAD UNION PL4 PL4	1

28	CB 792 VALVE, AUTODRAIN, P8	1
29	CB 794 FTG, NIPPLE CLOSE P8M P8M SS	1
30	DB 026 BREATHER, SINTERED BRONZE, P4	1
31	GN 316-L NUT, NYLOK 8-32 SS	4
32	GP 011-BK ID WASHER, RUBBER, MED, BLACK	1
33	GP 011-R ID WASHER, RUBBER, MED, RED	1
34	GPTB 0500-PUR95A-BK MAIN TUBE, FRL, 10IN 2FT	
35	GR 125-SS-188-250 RIVET, BLIND, DOMED, SS, Ø.125, .188-.250 L	4
36	GSB 319-09 BHCS 10-24 X 2.25 SS	4
37	GSB 325-02 BHCS .25-20 X .50 SS	11
38	GSB 331-025 BHCS .31-18 X .62 SS	4
39	GSF 316-025 FHCS 8-32 X .62 SS	4
40	GSF 325-02 FHCS .25-20 X .50 SS	1
41	HC 025.1 NUT, NYLOK 10-24 SS	4
42	PL 156-125 CAUTION INLET AIR, 125 MAX	1

CB 750-P
ABX-PRO REMOTE BOX ASSEMBLY, PEDESTAL



#	PART NUMBER	QTY.
1	CB 714 CORD GRIP, .51-.79	1
2	CB 716 ANODIZED PULL HANDLE	2
3	CB 721 PNEUM 3WAY ASSY, DUMP	1
4	CB 722 PNEUM 3WAY ASSY, FWD-REV	1
5	CB 724 MODIFIED COLLAR	1
6	CB 725 THREAD LOCKING SLOTTED INSERT	1
7	CB 726 THREE LOBE KNOB, .25-20	1

8	CB 751 ENCLOSURE, ABX-PRO	1
9	CB 751.1 TUBE, REMOTE BOX CONTROLS	2
10	CB 752 GRAPHIC ABX-PRO	1
11	CB 753 HEX STANDOFF	2
12	CB 791 FITTING, TEE, PL4	1
13	GN 319-L-32 NYLOK NUT SS	8
14	GSB 319-02-32 BHCS .19-32 X .50 LG	15
15	GSB 319-04-32 BHCS .19-32 X 1.00 LG SS	4

#	PART NUMBER	QTY.	UNIT
9	CB 751.1 TUBE, REMOTE BOX CONTROLS GPTB 0250-PUR95A-BK	2	7.5 IN

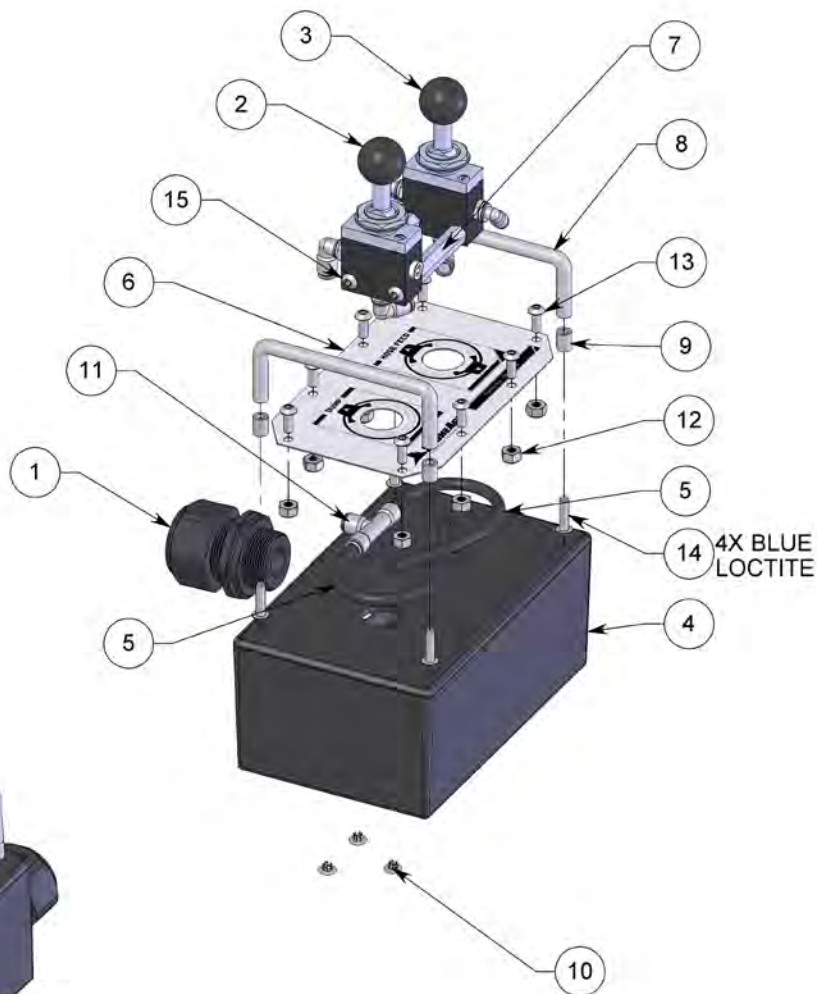
PARTS DIAGRAM

CB 750-S ABX-PRO REMOTE BOX ASSEMBLY, SIDE MOUNT



3X GLUE (RTV OR EQUIV.) PLUGS INTO BOX TO FORM A WATER TIGHT SEAL. WIPE EXTRA GLUE FROM FACE.

ATTACH LID OF BOX WITH TWO SCREWS, TAPE FOUR OTHERS TO INSIDE OF BOX

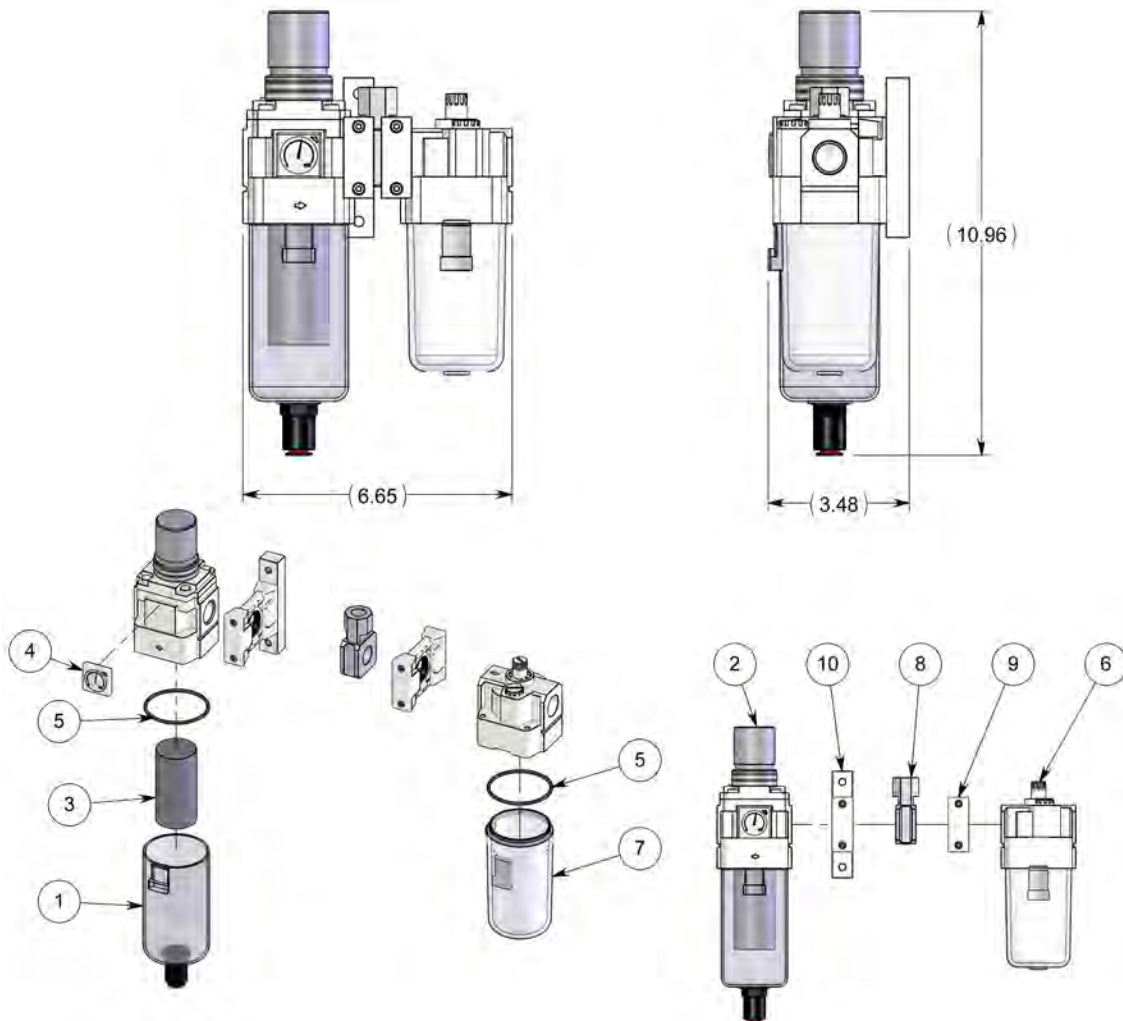


#	PART NUMBER	QTY.
1	CB 714 CORD GRIP, .51-.79	1
2	CB 721 PNEUM 3WAY ASSY, DUMP	1
3	CB 722 PNEUM 3WAY ASSY, FWD-REV	1
4	CB 751 ENCLOSURE, ABX-PRO	1
5	CB 751.1 TUBE, REMOTE BOX CONTROLS	2
6	CB 752 GRAPHIC ABX-PRO	1
7	CB 753 HEX STANDOFF	2

8	CB 775 HANDLE, SIDE LATCH	2
9	CB 776 HANDLE SPACER, SIDE LATCH	4
10	CB 777 HOLE PLUG	3
11	CB 791 FITTING, TEE, PL4	1
12	GN 319-L-32 NYLOK NUT SS	8
13	GSB 319-02-32 BHCS .19-32 X .50 LG	8
14	GSB 319-03-32 BHCS .19-32X.75 SS	4
15	GSB 319-04-32 BHCS .19-32 X 1.00 LG SS	4

#	PART NUMBER	QTY.	UNIT
5	CB 751.1 TUBE, REMOTE BOX CONTROLS GPTB 0250-PUR95A-BK	2	7.5 IN

CB 763-001
ABX-PRO FILTER, REGULATOR, LUBRICATOR ASSEMBLY

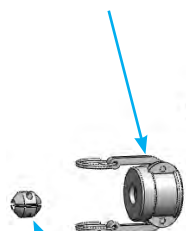


#	PART NUMBER	QTY
1	CB 312.1.1 FILTER REGULATOR BOWL	1
2	CB 312.1.3 FILTER BODY	1
3	CB 312.1.6 REPLACEMENT SMC FILTER	1
4	CB 312.1.7 SMC GAUGE WITH LENS	1
5	CB 312.1.8 O-RING FOR AW40-A REGULATOR	2
6	CB 312.2.1 LUBRICATOR BODY	1
7	CB 312.2.2 LUBRICATOR BOWL	1
8	CB 312.4 SPACER ATTACHMENT	1
9	CB 312.5-001 SPACER ASSEMBLY, FRL	1
10	CB 763.1-001 MOUNTING SPACER ASSEMBLY, MOD	1

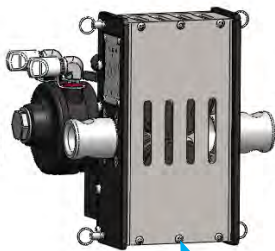
ABX-PRO TRACTOR
ON THE
LWP-500-V2 LIGHTWEIGHT POSITIONER

FULL PART DIAGRAMS ARE LOCATED IN THE
"OPTIONAL ACCESSORY PART DIAGRAM"
SECTION OF THIS MANUAL

BOP 048
HOSE STOP ADAPTER

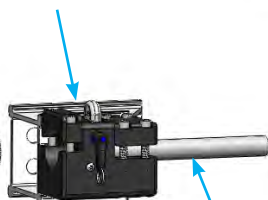


HS 121.1-XX
HOSE STOP

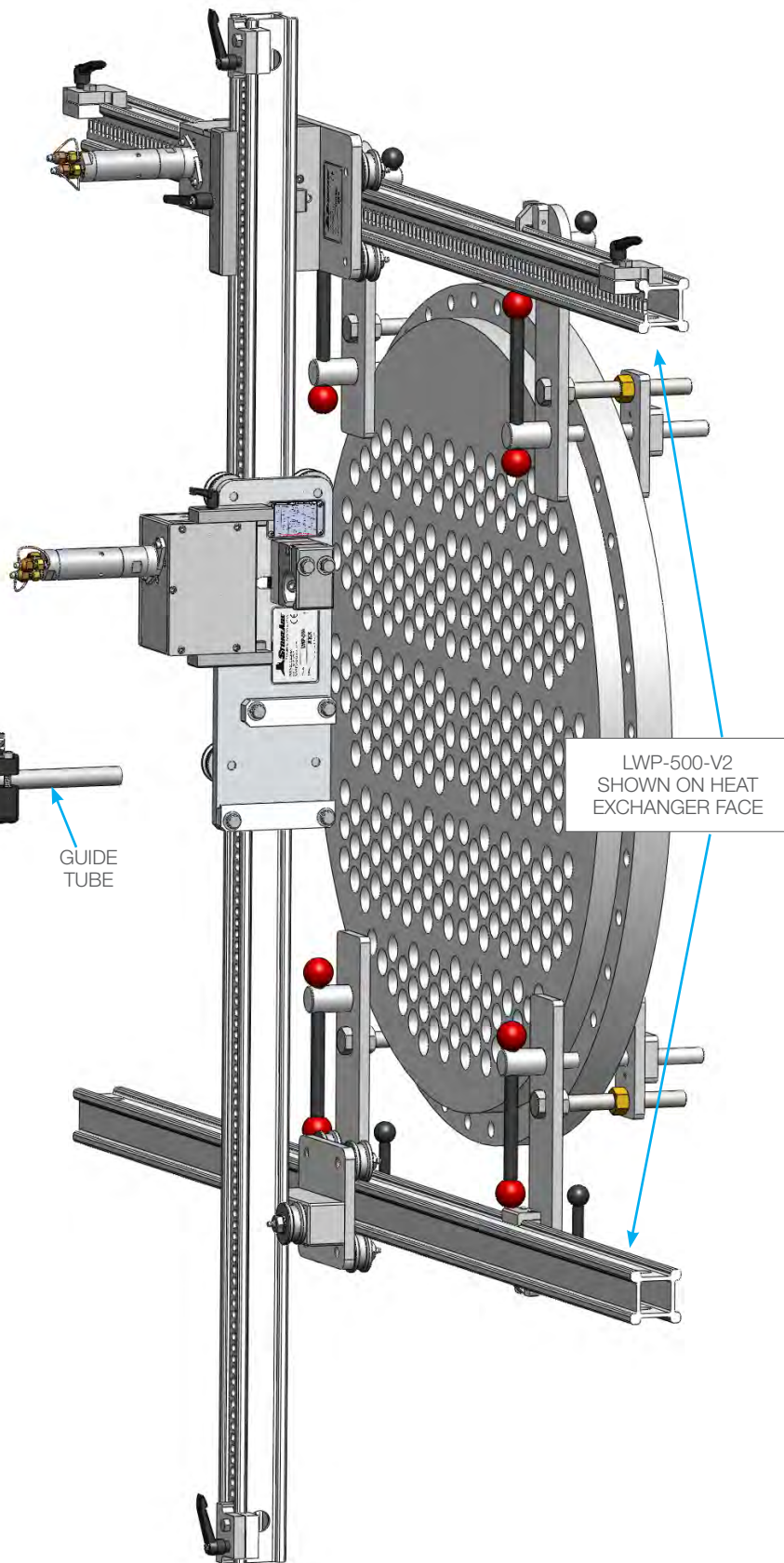


ABX-PRO
TRACTOR

BOP 035-8
HOSE GUIDE WITH
COLLET BLOCK



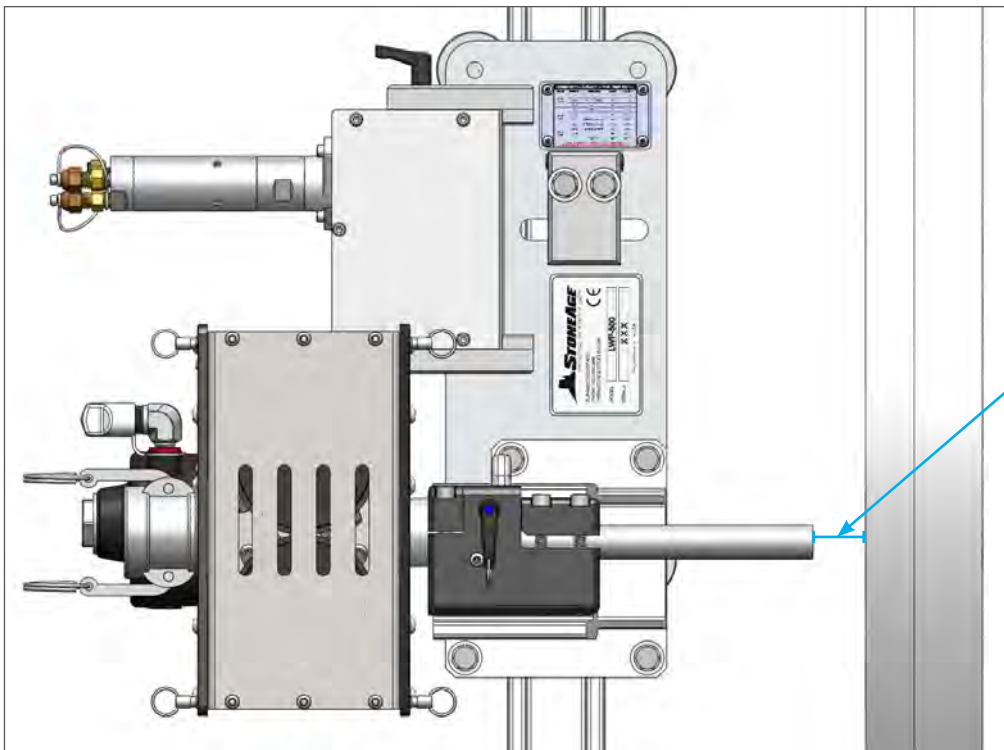
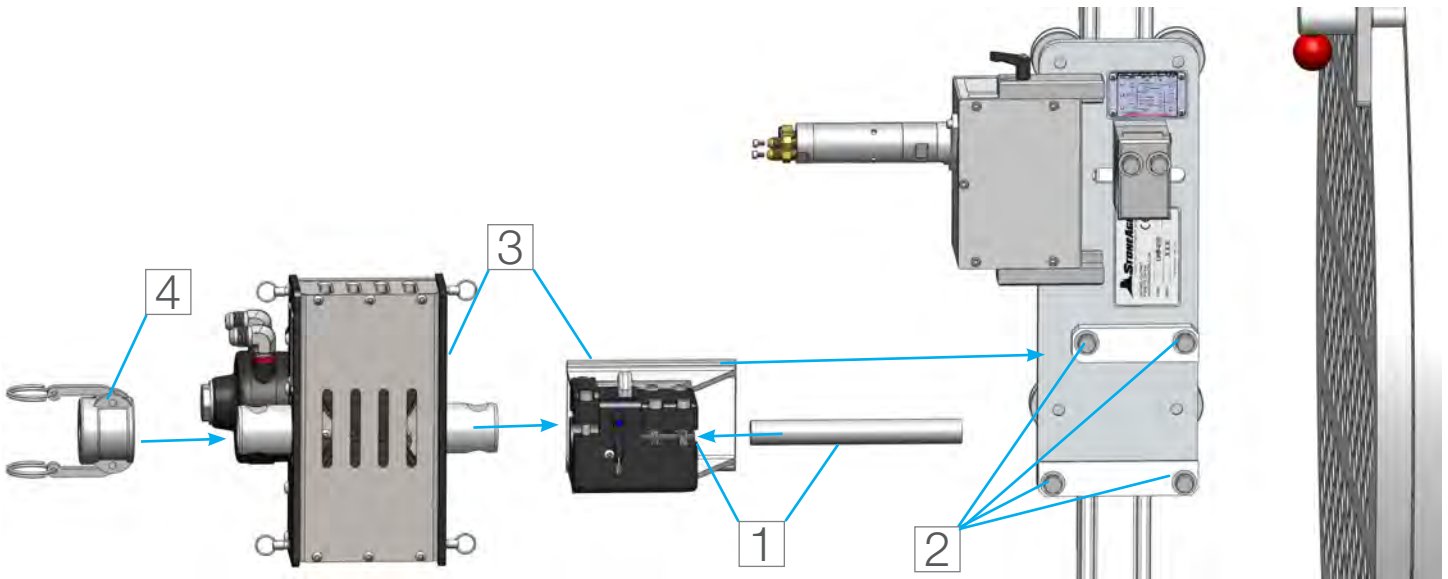
GUIDE
TUBE



LWP-500-V2
SHOWN ON HEAT
EXCHANGER FACE

ATTACH ABX-PRO TRACTOR TO GUIDE ASSEMBLY AND LIGHTWEIGHT POSITIONER

1. Select an appropriate size Guide Tube from the chart located in the "Part Diagram" section of this manual. Install Guide Tube into the Collet Block on the Guide Assembly by loosening the 4 screws with a 1/4" Allen Wrench. Insert the Guide tube and tighten the 4 screws on the Collet Block Cap.
2. Using a 9/16 in. wrench, loosen all four rail clamp bolts located on the vertical carriage. Install the Guide Assembly into the rail clamps and adjust position until the Guide Tubes are approximately 1/2 in. (13 mm) away from the tube sheet face. Tighten the four rail clamp bolts.
3. Loosen the 2 screws on the Collet Block with a 1/4" Allen Wrench and slide the Guide on the Tractor into the Collet Block Cap. Tighten the two screws on Collet Block Cap until secure.
4. Rotate the pull rings on the BOP 048 Female Camlock to align with the notches on the ABX-PRO Tractor Guide. Slide the BOP 048 Female Camlock onto the ABX-PRO Tractor Guide and secure in place.










NOTE:
Adjust position until the Guide Tubes are approximately 1/2 in. (13 mm) away from the tube sheet face.

CONTROL BOX TO ABX-PRO TRACTOR ASSEMBLY

PNEUMATIC SUPPLY LINE CONNECTIONS

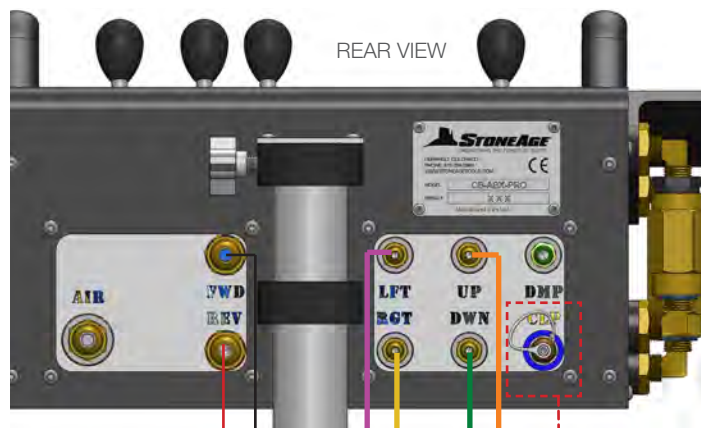
1. Remove the dust caps from the Joint Industry Council (JIC) fittings of the Control Box and the ABX-PRO Tractor.
2. Connect the ABX-PRO Tractor to the CB-ABX-PRO Control Box with two 1/2 in. (13 mm) JIC hoses. Verify the Control Box moves the hose in the appropriate directions.
3. Connect the Horizontal Positioner drive air motor to the CB-ABX-PRO Control Box with two 1/4 in. (6 mm) JIC hoses. Use the diagram below for proper connections. Verify the CB-ABX-PRO Control Box moves the Horizontal Carriage in the LEFT AND RIGHT directions.

	LEFT		UP		FORWARD
	RIGHT		DOWN		REVERSE
			CLAMP		

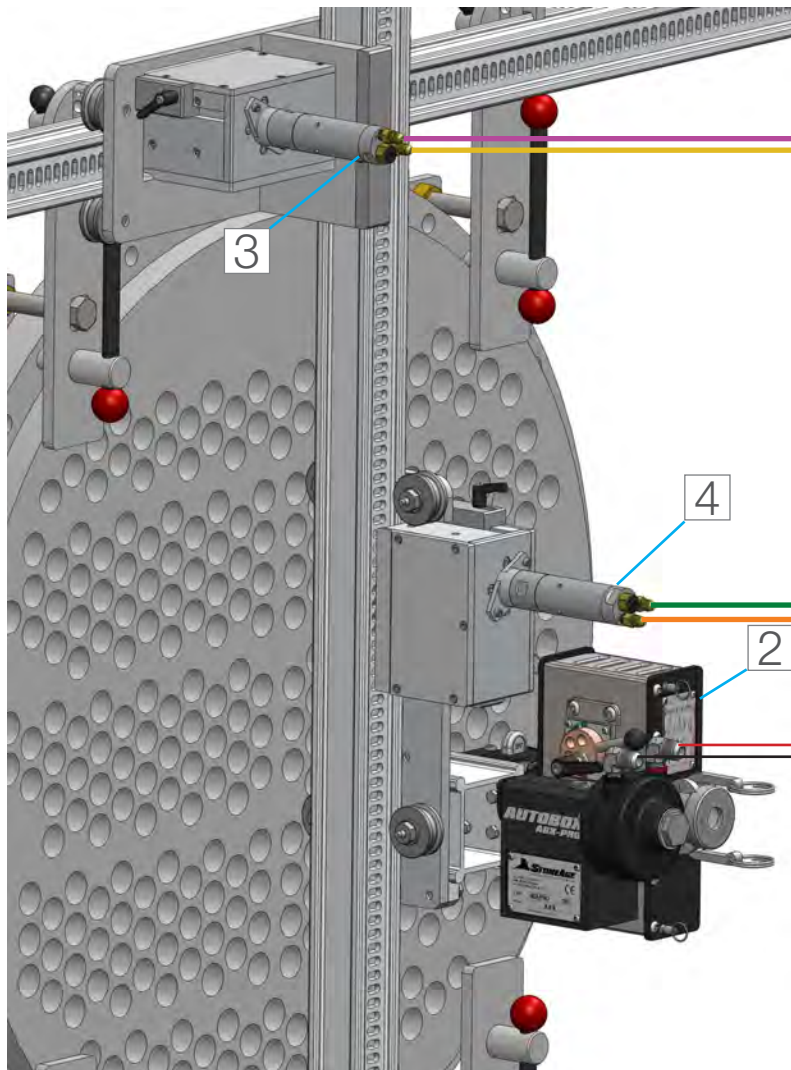
NOTICE

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

4. Connect the vertical positioner drive air motor to the CB-ABX-PRO Control Box with two 1/4 in. (6 mm) JIC hoses. Use the diagram below for proper connections. Verify the CB-ABX-PRO Control Box moves the vertical carriage in the UP AND DOWN directions.
5. Test the CB-ABX-PRO Control Box before operating the ABX-PRO Tractor with high pressure water to verify the control valves move the hose in the intended directions and that the dump valve is working properly.



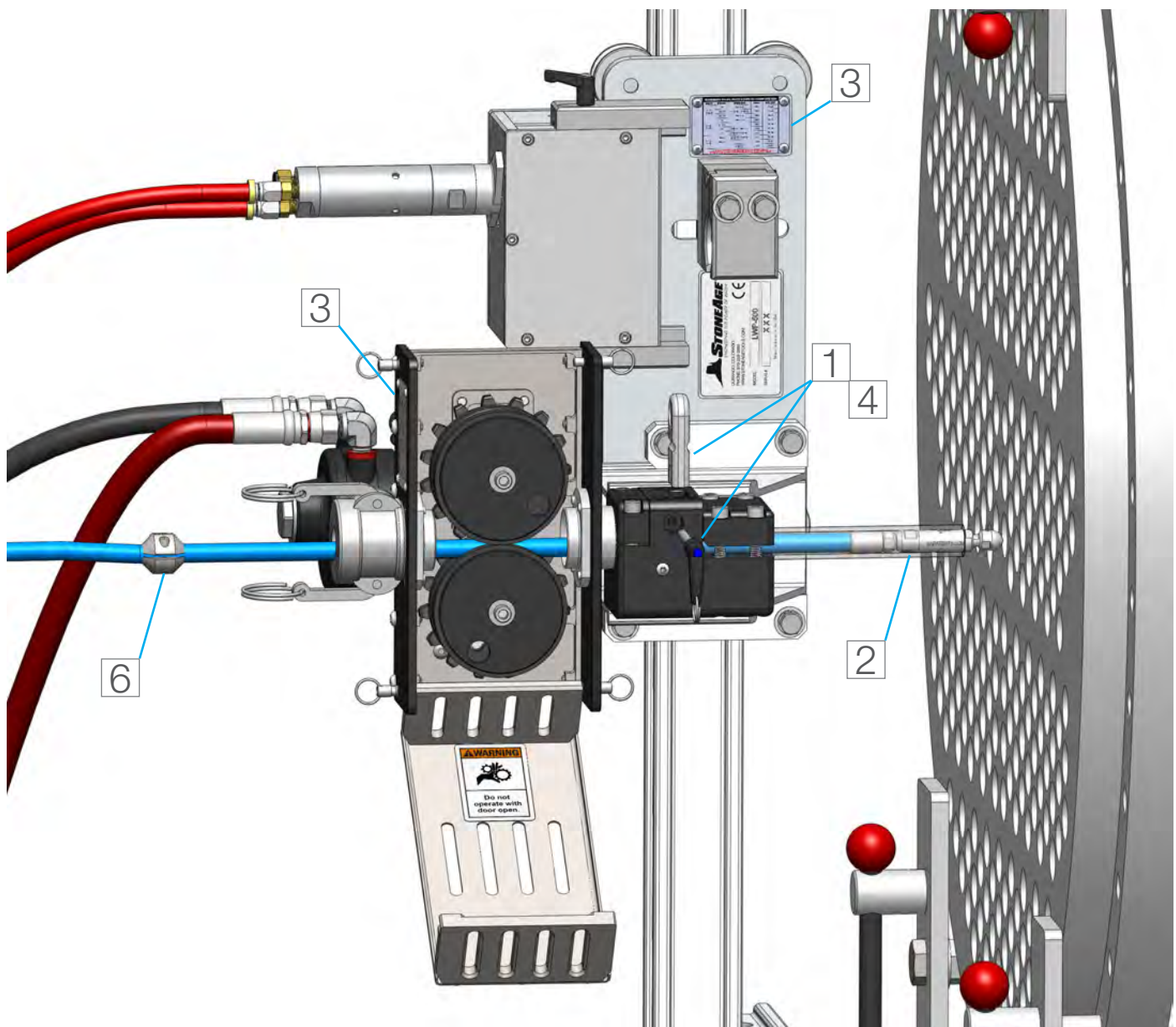
CLAMP FITTING IS NOT USED WITH THE PRODRIVE IT IS FOR USE WITH ABX TRACTORS ONLY THIS SHOULD REMAIN CAPPED DURING USE



MORE DETAILED OPERATIONAL INSTRUCTIONS ARE LOCATED IN THE "OPERATION" SECTION OF THIS MANUAL

COLLET INSERTION, HOSE, AND HOSE STOP INSTALLATION

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

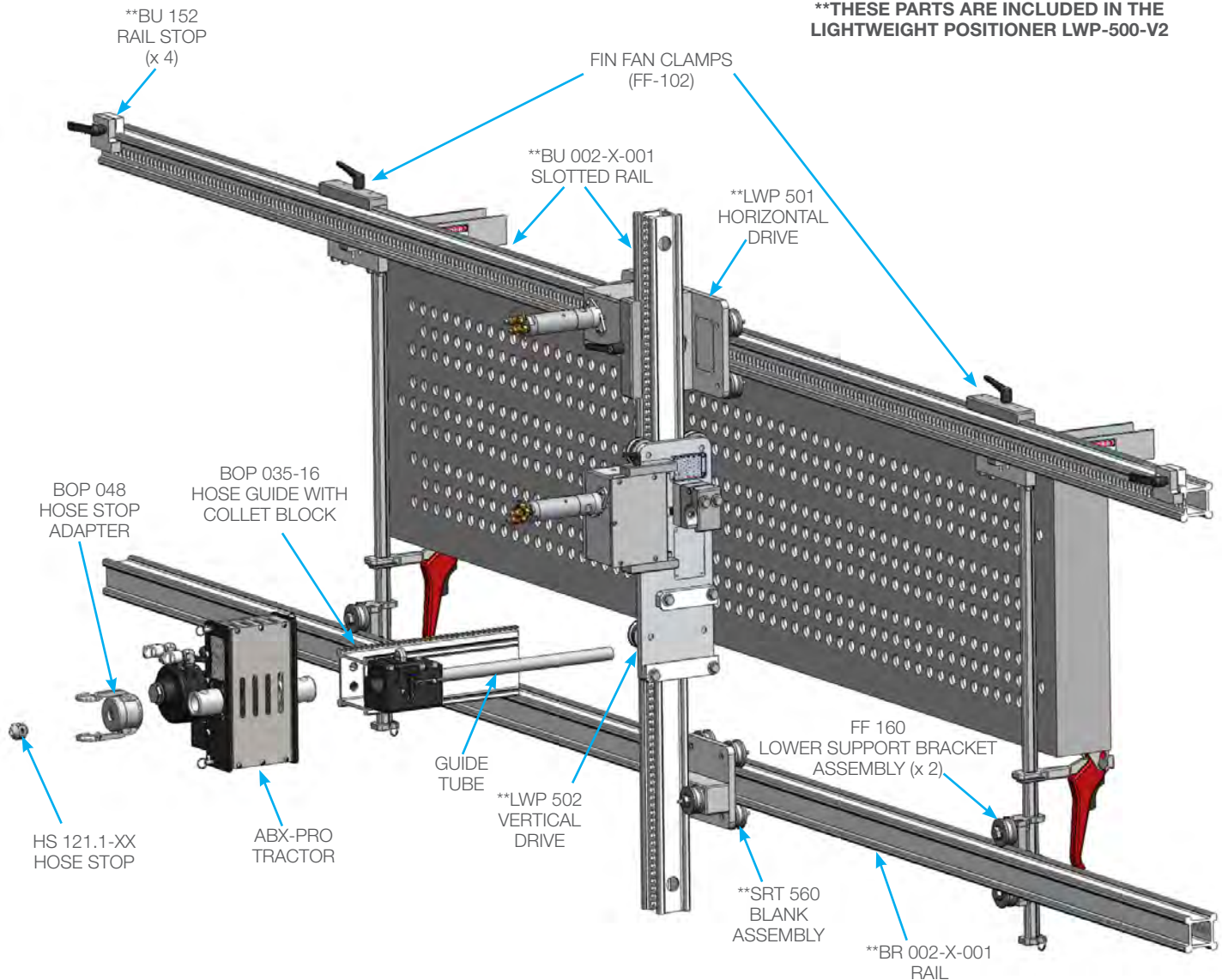


OPTIONAL ACCESSORY OVERVIEW- ABX-PRO TRACTOR ON FF-100 FIN FAN KIT

ABX-PRO TRACTOR ON THE FIN FAN

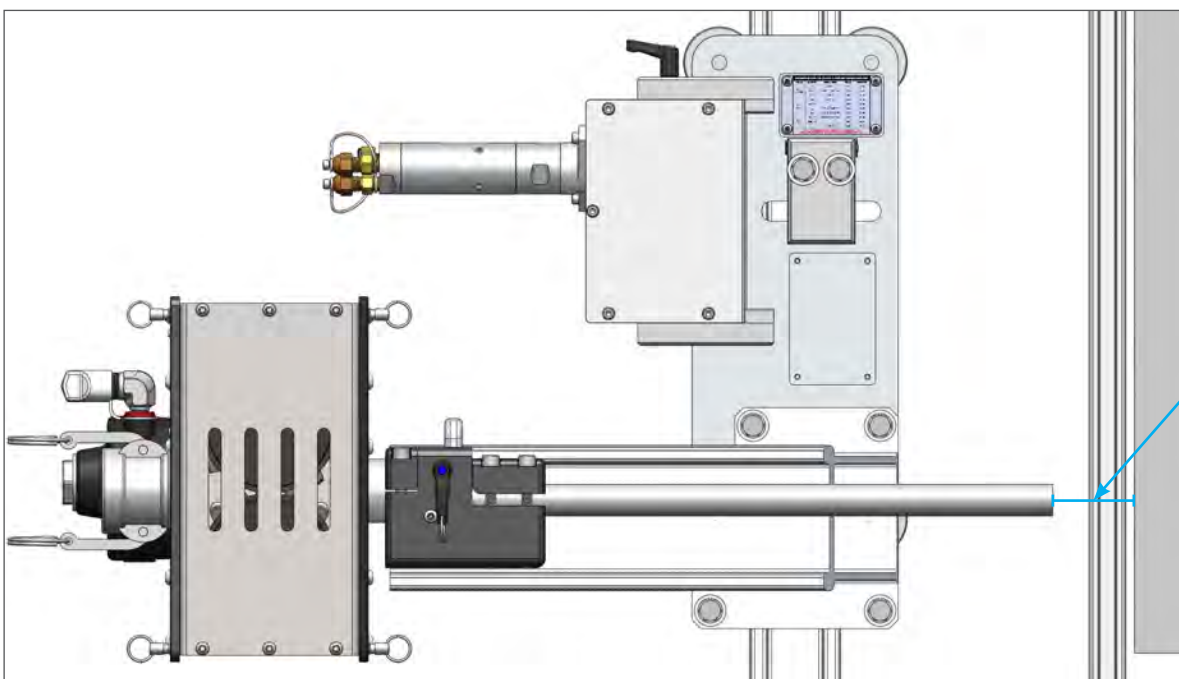
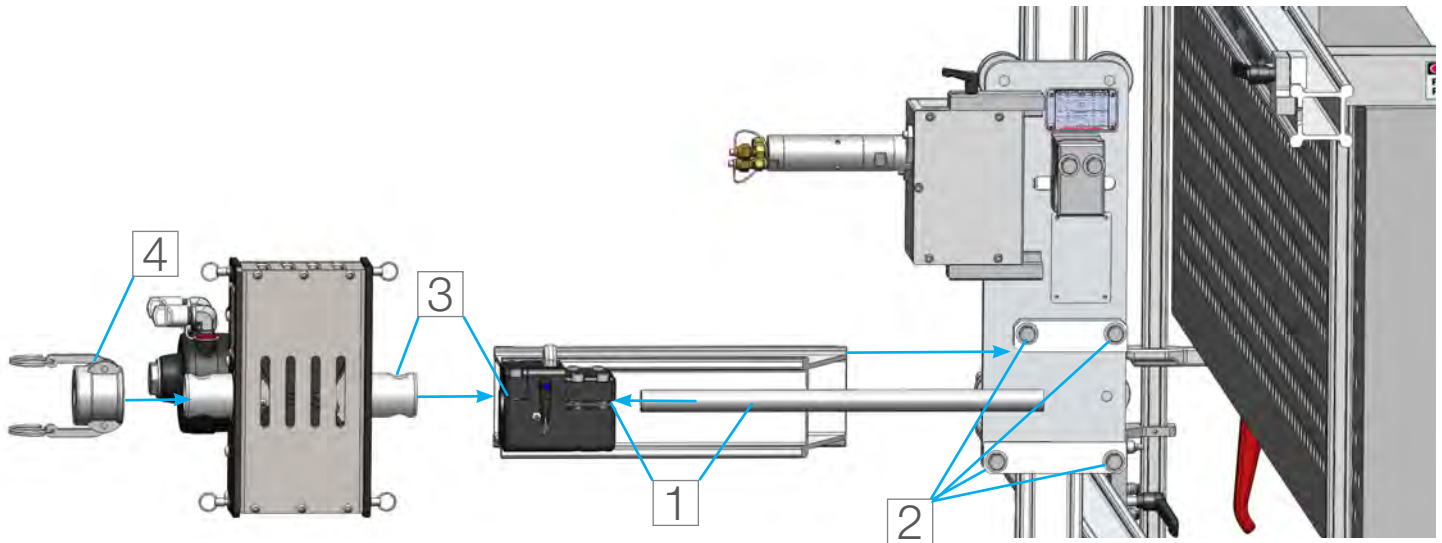
FULL PART DIAGRAMS ARE LOCATED IN THE
“OPTIONAL ACCESSORY PART DIAGRAM”
SECTION OF THIS MANUAL

**THESE PARTS ARE INCLUDED IN THE
LIGHTWEIGHT POSITIONER LWP-500-V2



ATTACH ABX-PRO TRACTOR TO GUIDE ASSEMBLY AND FIN FAN

1. Select an appropriate size Guide Tube from the chart located in the "Part Diagram" section of this manual. Install Guide Tube into the Collet Block on the Guide Assembly by loosening the 4 screws with a 1/4" Allen Wrench. Insert the Guide tube and tighten the 4 screws on the Collet Block Cap.
2. Using a 9/16 in. wrench, loosen all four rail clamp bolts located on the vertical carriage. Install the Guide Assembly into the rail clamps and adjust position until the Guide Tubes are approximately 1/2 in. (13 mm) away from the tube sheet face. Tighten the four rail clamp bolts.
3. Loosen the 2 screws on the Collet Block with a 1/4" Allen Wrench and slide the Guide on the Tractor into the Collet Block Cap. Tighten the two screws on Collet Block Cap until secure.
4. Rotate the pull rings on the BOP 048 Female Camlock to align with the notches on the ABX-PRO Tractor Guide. Slide the BOP 048 Female Camlock onto the ABX-PRO Tractor Guide and secure in place.









NOTE:
Adjust position
until the Guide
Tubes are
approximately
1/2 in. (13 mm)
away from the
tube sheet face.

CONTROL BOX TO ABX-PRO TRACTOR ASSEMBLY

PNEUMATIC SUPPLY LINE CONNECTIONS

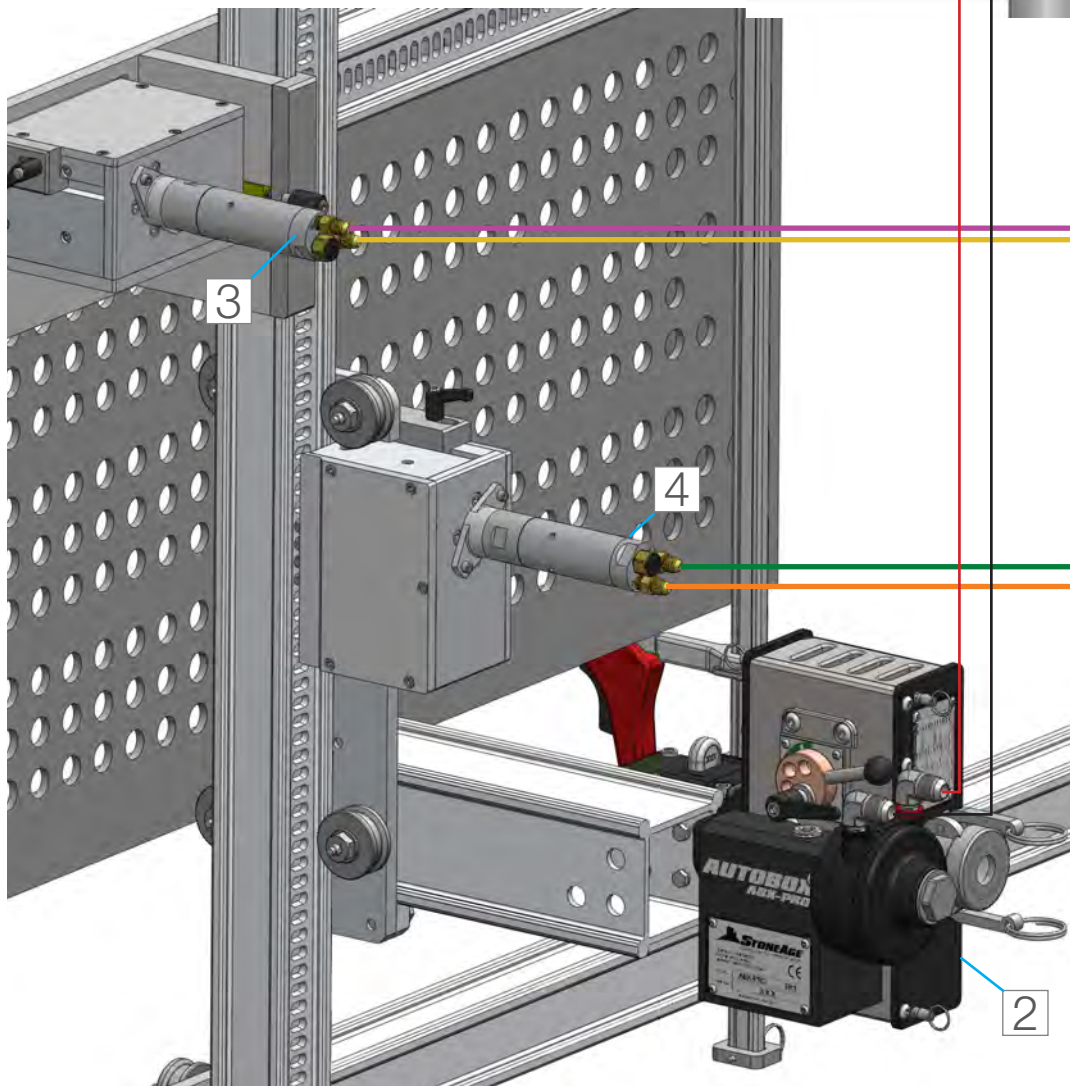
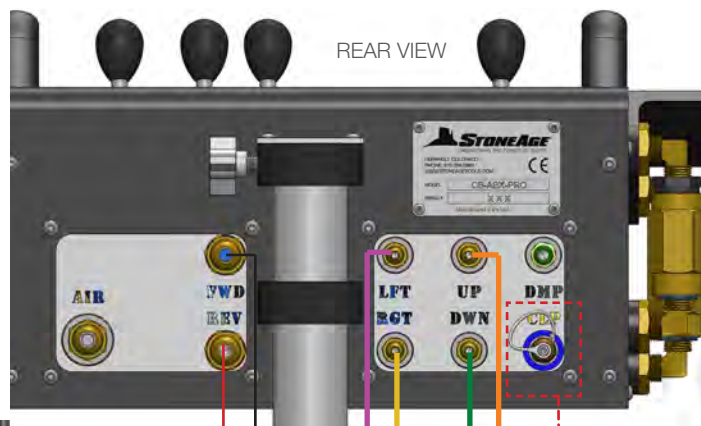
1. Remove the dust caps from the Joint Industry Council (JIC) fittings of the Control Box and the ABX-PRO Tractor.
2. Connect the ABX-PRO Tractor to the CB-ABX-PRO Control Box with two 1/2 in. (13 mm) JIC hoses. Verify the Control Box moves the hose in the appropriate directions.
3. Connect the Horizontal Positioner drive air motor to the CB-ABX-PRO Control Box with two 1/4 in. (6 mm) JIC hoses. Use the diagram below for proper connections. Verify the CB-ABX-PRO Control Box moves the Horizontal Carriage in the LEFT AND RIGHT directions.

	LEFT		UP		FORWARD
	RIGHT		DOWN		REVERSE
			CLAMP		

NOTICE

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

4. Connect the vertical positioner drive air motor to the CB-ABX-PRO Control Box with two 1/4 in. (6 mm) JIC hoses. Use the diagram below for proper connections. Verify the CB-ABX-PRO Control Box moves the vertical carriage in the UP AND DOWN directions.
5. Test the CB-ABX-PRO Control Box before operating the ABX-PRO Tractor with high pressure water to verify the control valves move the hose in the intended directions and that the dump valve is working properly.

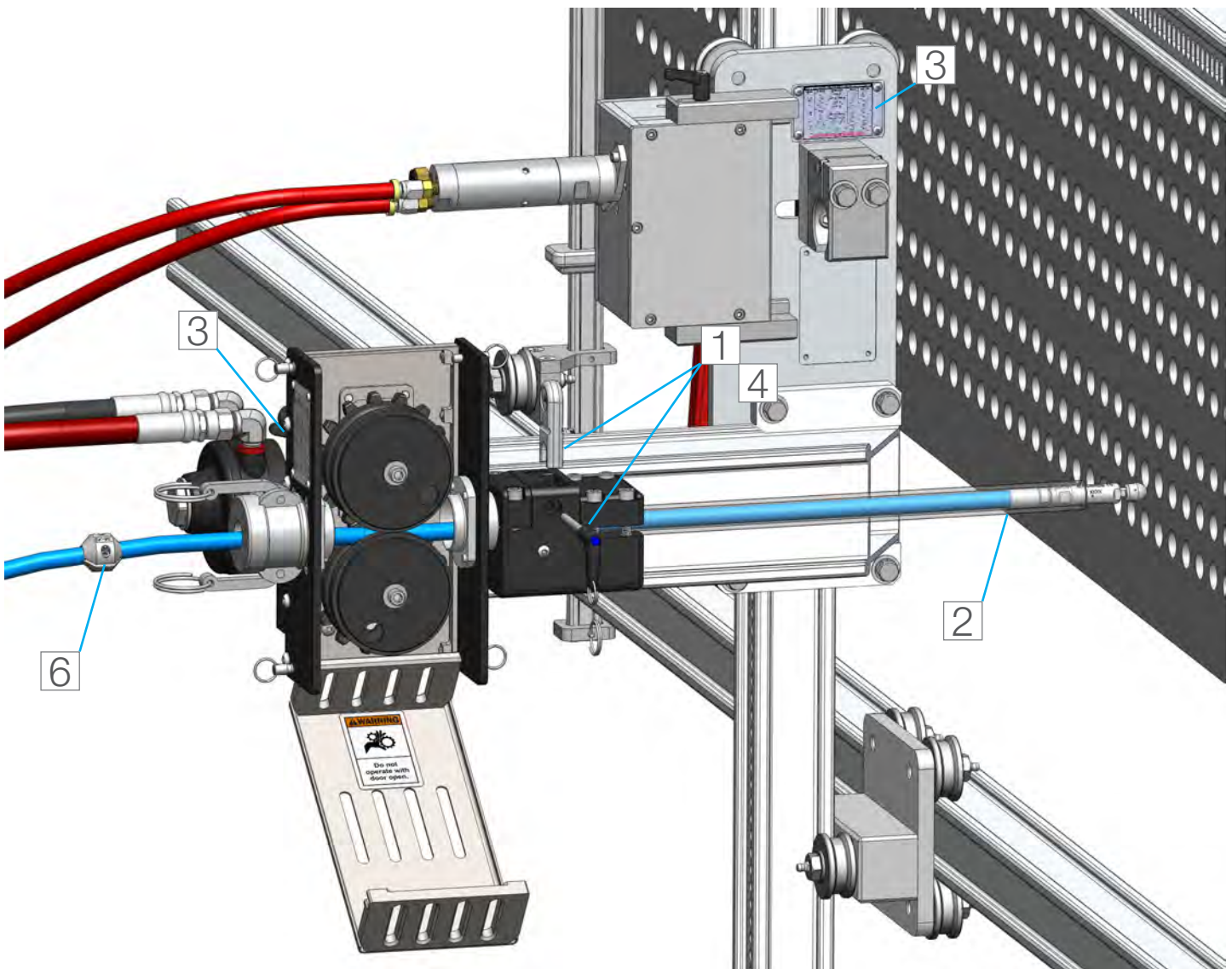


CLAMP FITTING IS NOT USED WITH THE ABX-PRO PRODRIVE IT IS FOR USE WITH AUTOBOX ONLY THIS SHOULD REMAIN CAPPED DURING USE

MORE DETAILED OPERATIONAL INSTRUCTIONS ARE LOCATED IN THE "OPERATION" SECTION OF THIS MANUAL

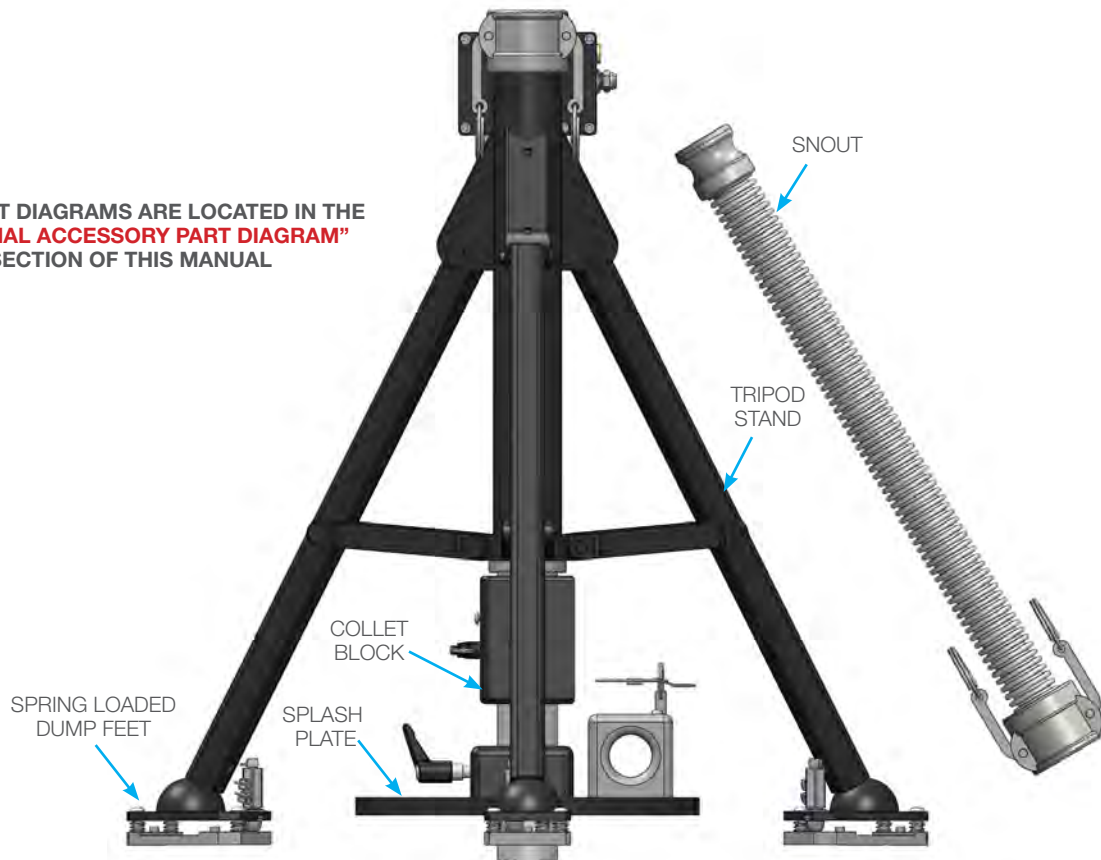
COLLET INSERTION, HOSE, AND HOSE STOP INSTALLATION

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

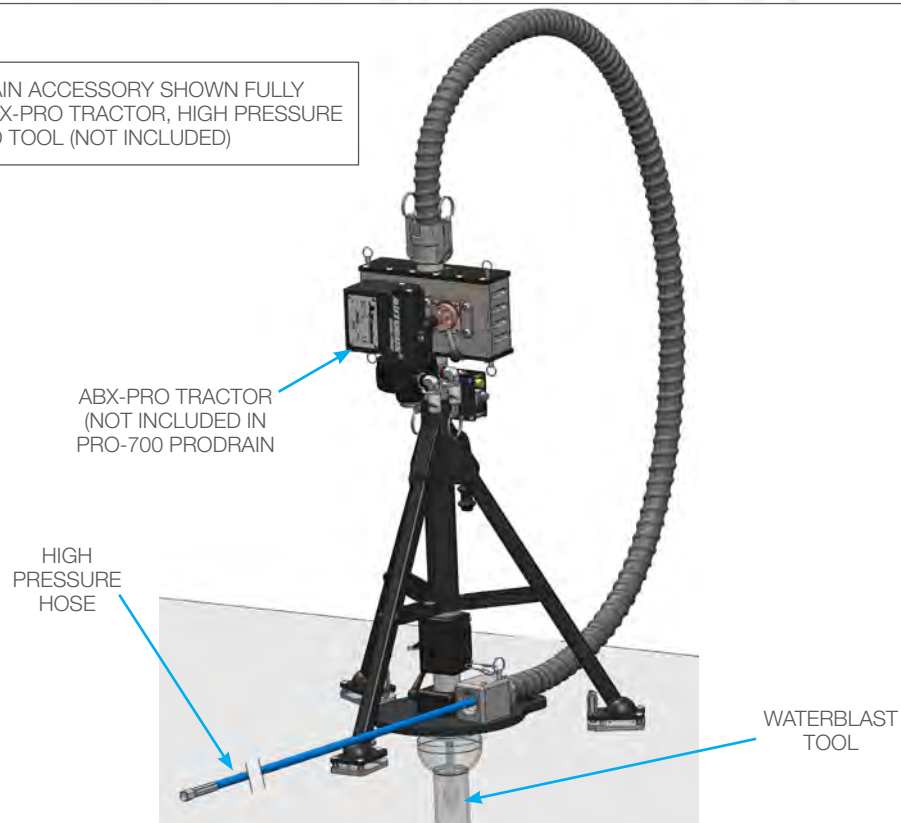


PRO-700 PRODRAIN PRODRAIN FULL ASSEMBLY

FULL PART DIAGRAMS ARE LOCATED IN THE
"OPTIONAL ACCESSORY PART DIAGRAM"
SECTION OF THIS MANUAL



PRO-700 PRODRAIN ACCESSORY SHOWN FULLY
ASSEMBLED WITH ABX-PRO TRACTOR, HIGH PRESSURE
HOSE AND TOOL (NOT INCLUDED)



PRO-700 PRODRAIN SET-UP PROCEDURE

1. Attach the BOP 030 Collet Block to the Tripod Stand. Loosen two screws on one Collet Cap with a 1/4" Allen wrench. Slide the BOP 030 Collet Block onto the Tube Adapter located on the bottom end of the Tripod Stand. Tighten the two screws on the Collet Cap until secure. The BOP 030 Collet Block Assembly can stay attached to Tripod Stand when not in use. **(Figure 1)**
2. Attach the BOP 081-6 Snout Tube to BOP 030 Collet Block. Loosen two screws on the other Collet Cap with a 1/4" Allen wrench. Slide the Snout Tube into the Collet Block and tighten the two screws until secure. **(Figure 1)**
3. Attach the PRO 740 Weighted Splash Plate to the BOP 081-6 Snout Tube. Loosen two screws on the other Collet Cap with a 1/4" Allen wrench. Slide the Weighted Splash Plate onto Snout Tube and tighten the Quick Release Lever until secure. **(Figure 1)**

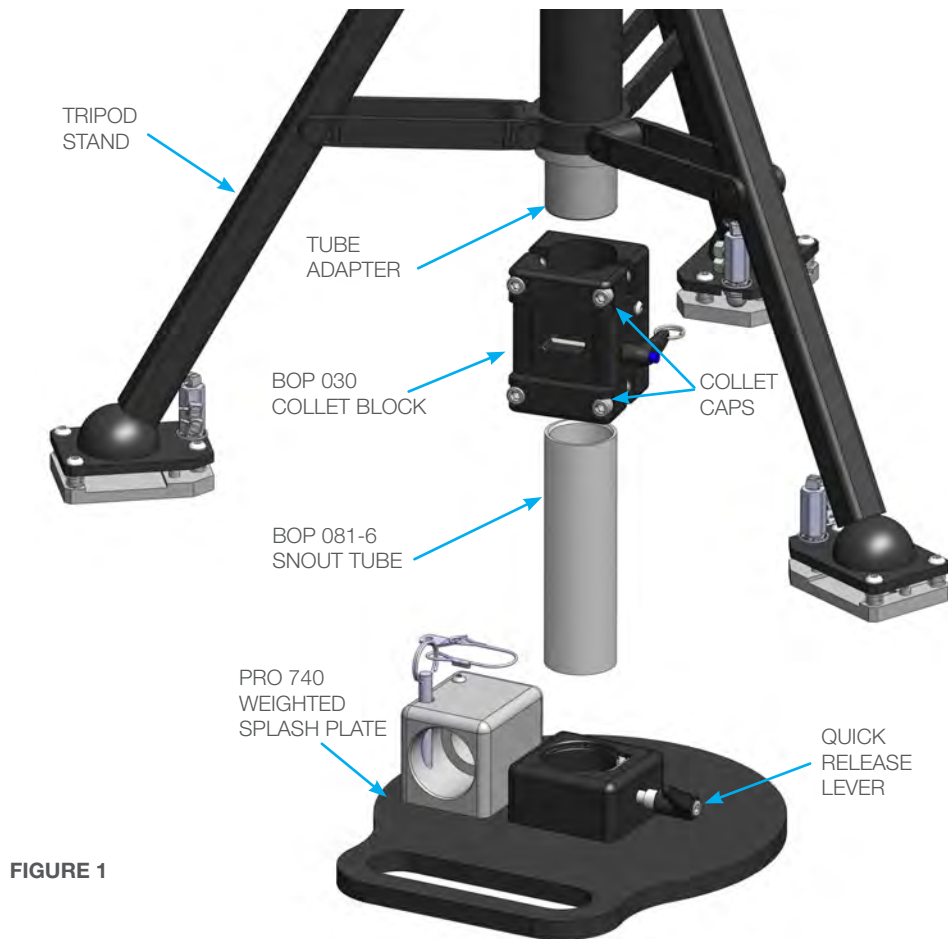


FIGURE 1

4. Place the Tripod Stand Assembly over the drain. Center the Snout Tube into the drain and be sure that all three feet are planted firmly on the ground. **(Figure 2)**

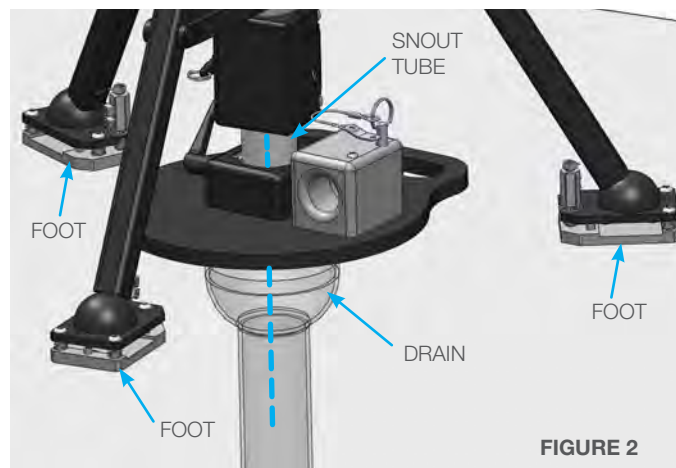
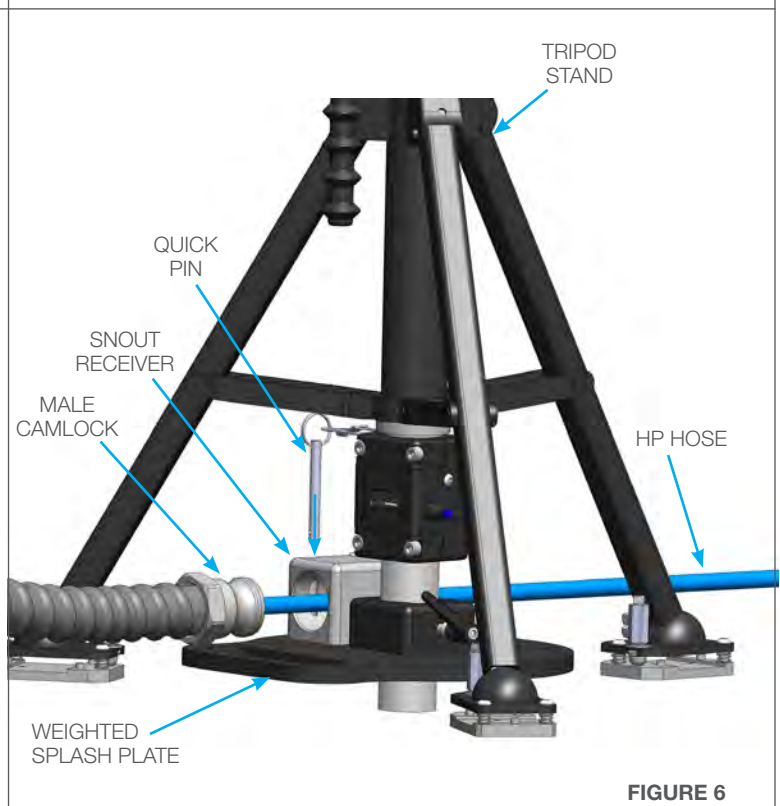
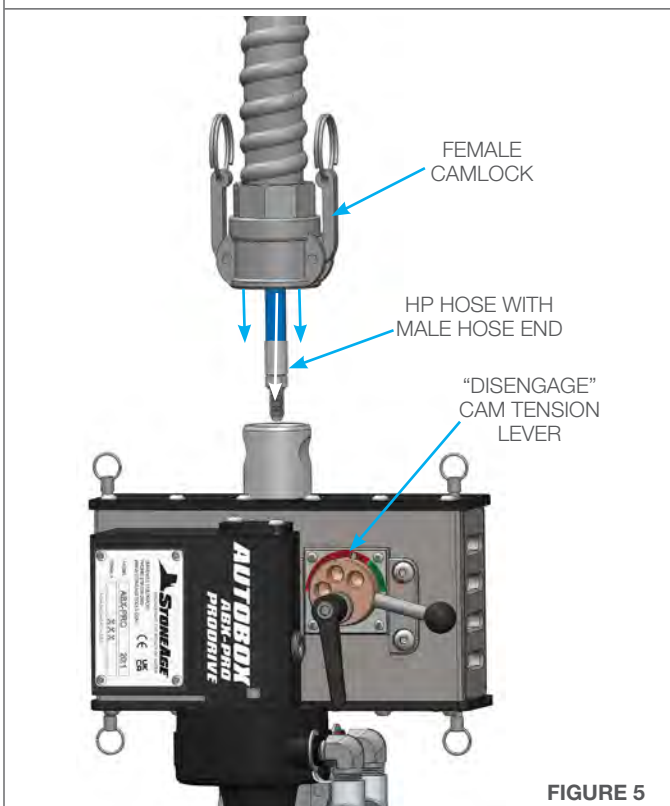
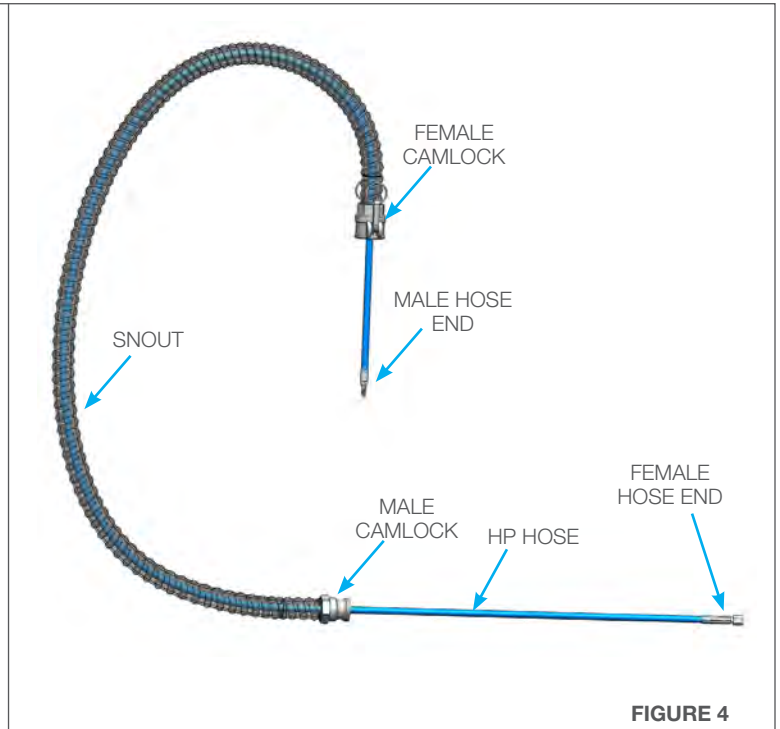


FIGURE 2

PRO-700-V3 PRODRAIN SET-UP

5. Slide the hose guide on the ABX-PRO Tractor into the Camlock on the Tripod Stand, with air fittings pointed down. Make sure to engage the Camlock lever lock pins. **(Figure 3)**
6. Feed the HP Hose through BOP 09-7 Snout. **(Figure 4)**
7. Rotate the Cam Tension Lever counterclockwise on the ABX-PRO Tractor to the “Disengaged” position and feed the HP Male Hose End through the ABX-PRO Tractor and attach the Female Camlock to the ABX-PRO hose guide. **(Figure 5)**
8. Feed the HP Female Hose End through the Snout Receiver on the Weighted Splash Plate. Remove the Quick Pin from the Snout Receiver, insert the Male Camlock and reinsert the Quick Pin. **(Figure 6)**



9. The image below shows how the Prodrain should look once the HP Hose and Snout have been properly installed. **(Figure 7)**
10. Lay the assembly down to attach the waterblast tool to the Male Hose End. Coat the threads of the hose end with Blue Goop by SWAGELOK® or an equivalent Anti-seize. **(Figure 8)**
11. Remove the Quick Release Pin and insert the FF 121-XX into the collet block. **(Figure 9)**
12. Rotate the Clamp Tension Lever clockwise on the ABX-PRO Tractor to tighten the cam in place. **(Figure 10)**



FIGURE 7



FIGURE 8

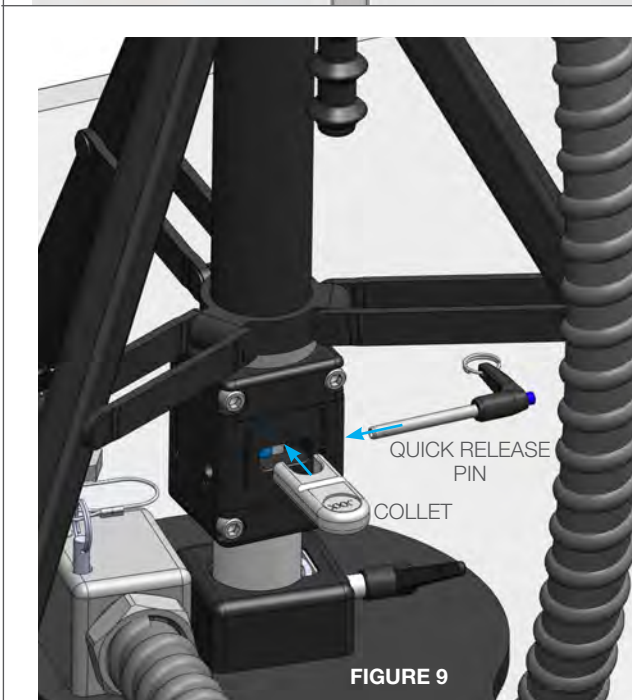


FIGURE 9

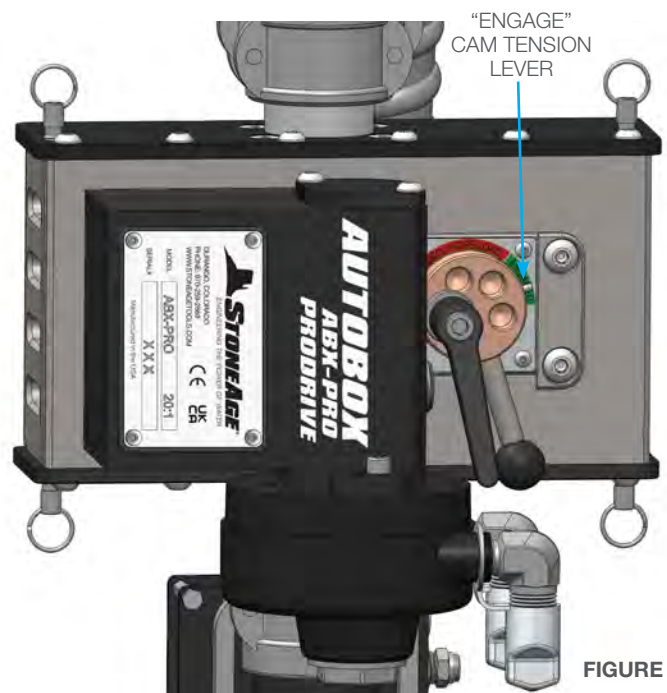


FIGURE 10

PRO-700-V3 PRODRAIN TO DUMP AND CONTROL BOX SET-UP

13. Connect 1/4" air lines from Control Box to the valve assembly on the Tripod Stand and from the Tripod Stand to the Dump. **(Figure 11)**
14. Connect 1/2" black and red air supply hoses from the fittings on the Control Box to the fittings on the ABX-PRO Tractor. Mate each hose to its respective color bands. **(Figure 12)**
15. Test run the assembly without HP water to in and out set feed rates and verify hose clamp pressure.
16. Verify each pneumatic foot function and cuts air supply to the dump
17. Ready to operate and clean the drain.

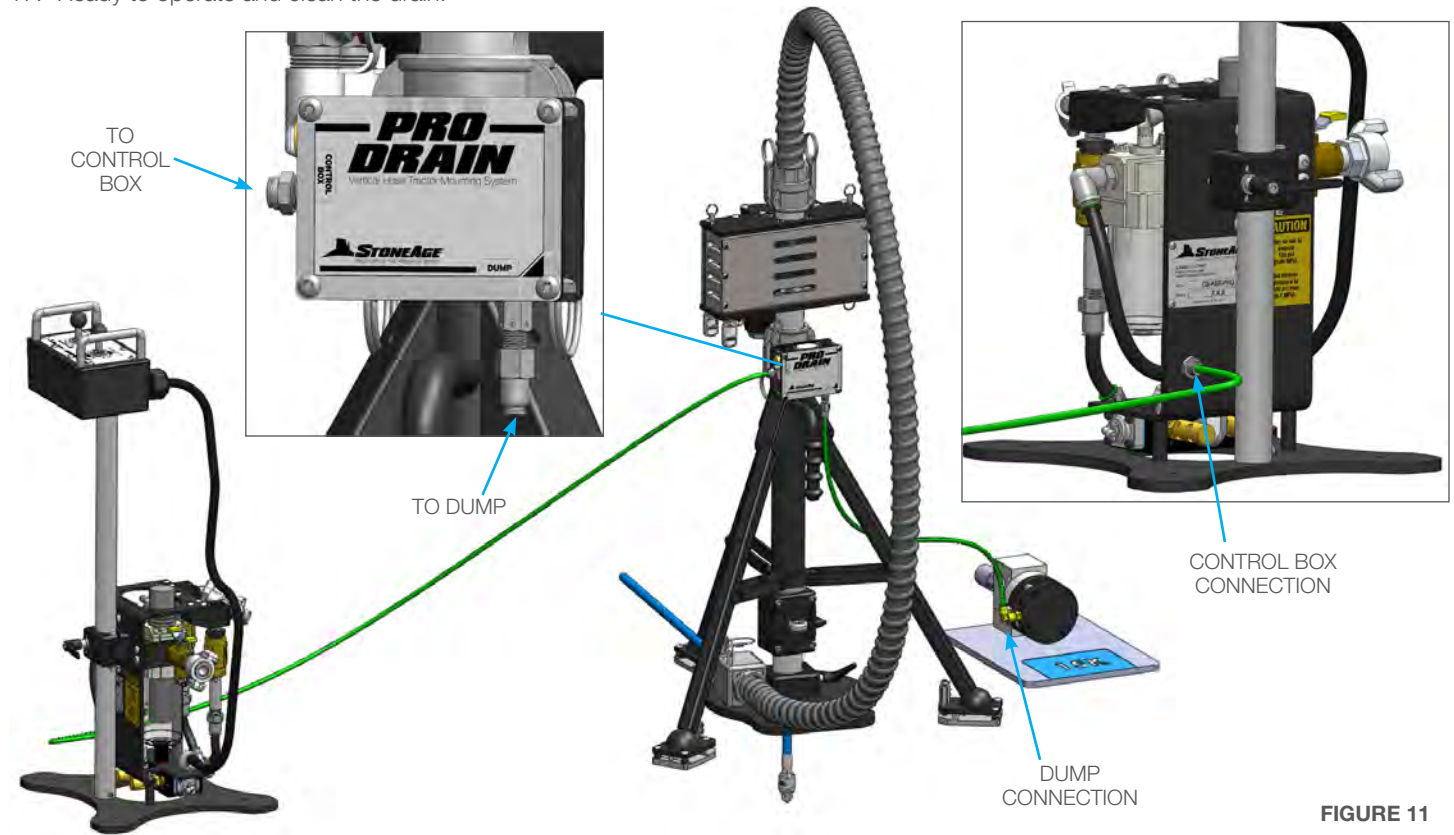


FIGURE 11

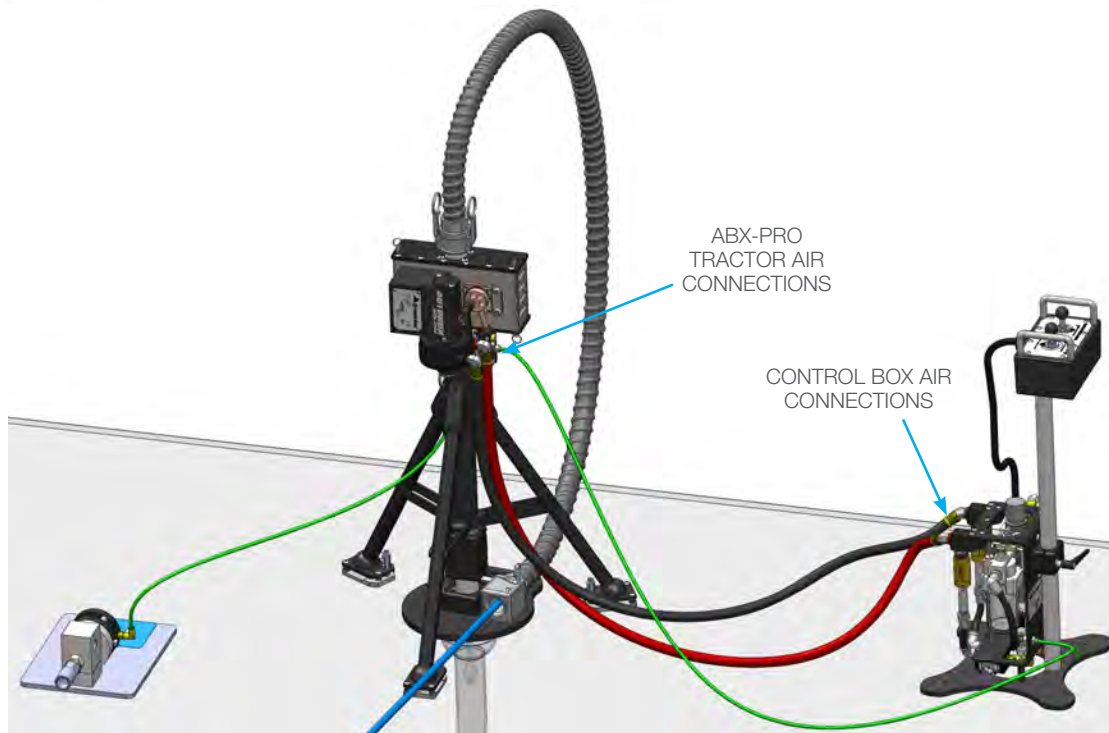


FIGURE 12

OPTIONAL ACCESSORY OVERVIEW- NAV-170-PKG NAVIGATOR

NAV-170-PKG

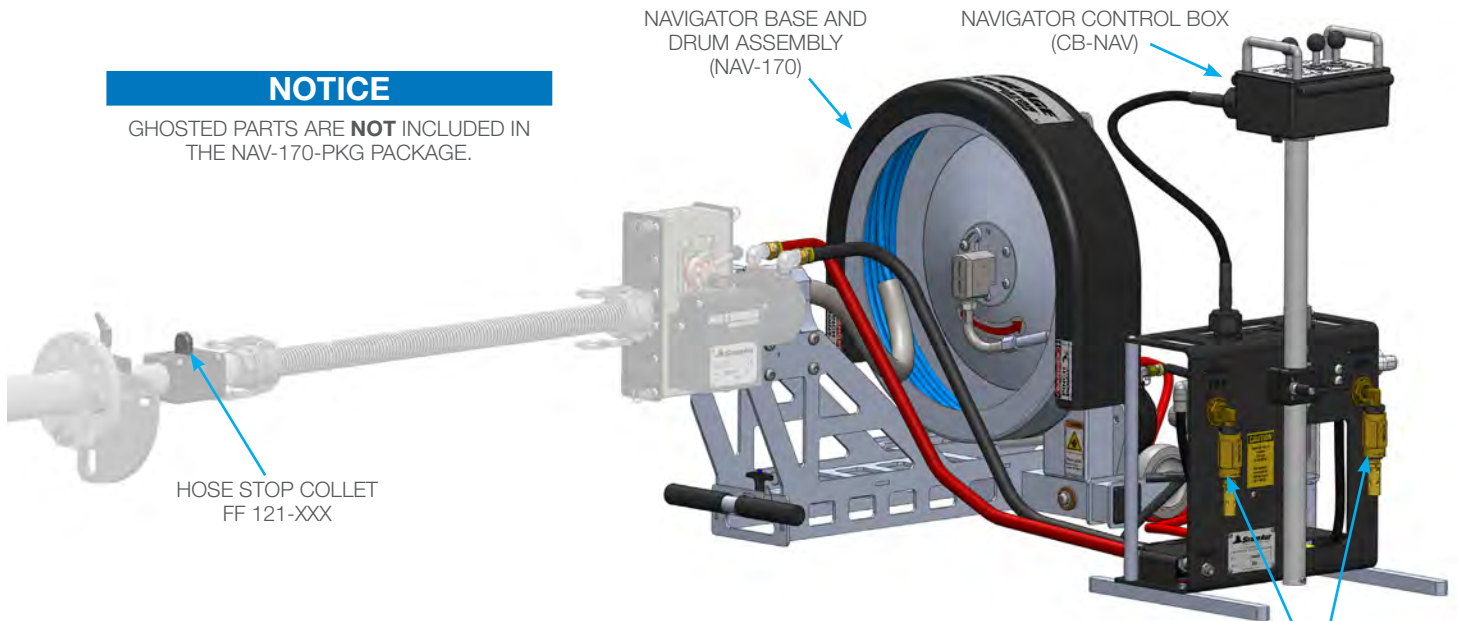
NAVIGATOR ROTARY HOSE DEVICE WITH CONTROL BOX

This is the only automated rotary hose device in the industry specifically engineered to clean small diameter process pipe with bends. It cleans past multiple bends and elbows using hose rotation and is used in conjunction with the AutoBox ABX-PRO hose tractor. It can hold up to 100 feet (30 m) of hose for job site safety, hose protection and transport. Lightweight, compact and portable.

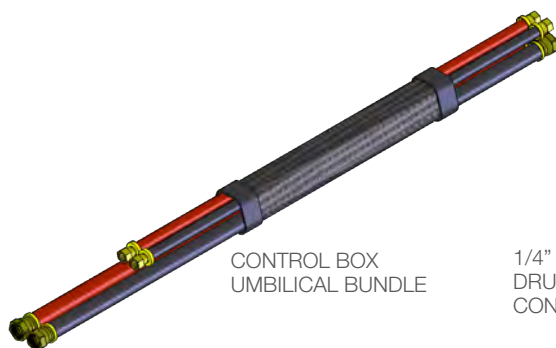
For more details see <http://www.stoneagetools.com/navigator>

NOTICE

GHOSTED PARTS ARE **NOT** INCLUDED IN THE NAV-170-PKG PACKAGE.



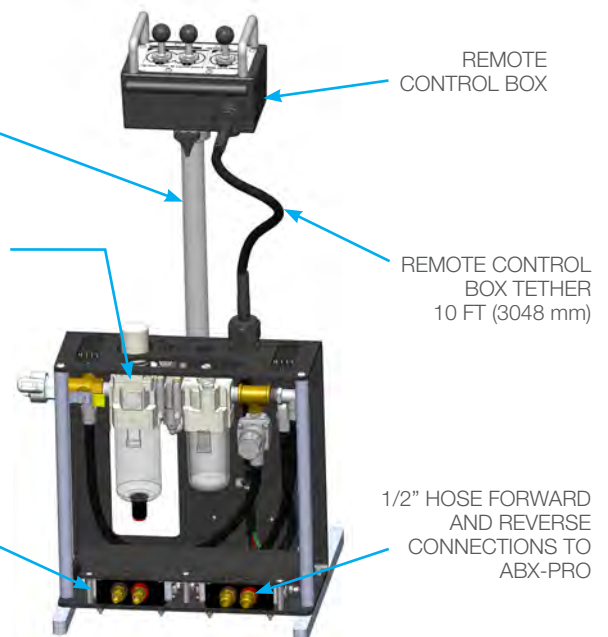
SPECIFICATIONS	
MAX PRESSURE	22k psi (1500 bar)
PIPE SIZE	2-4 in. (51-102 mm)
HOSE SIZE	4/4, 5/4, 6/4
HOSE CAPACITY	Storage: 100 ft (30 m) Reach: 85 ft (26 m)
FEED RATE	1.0-32 in/sec (25-813 mm/s)



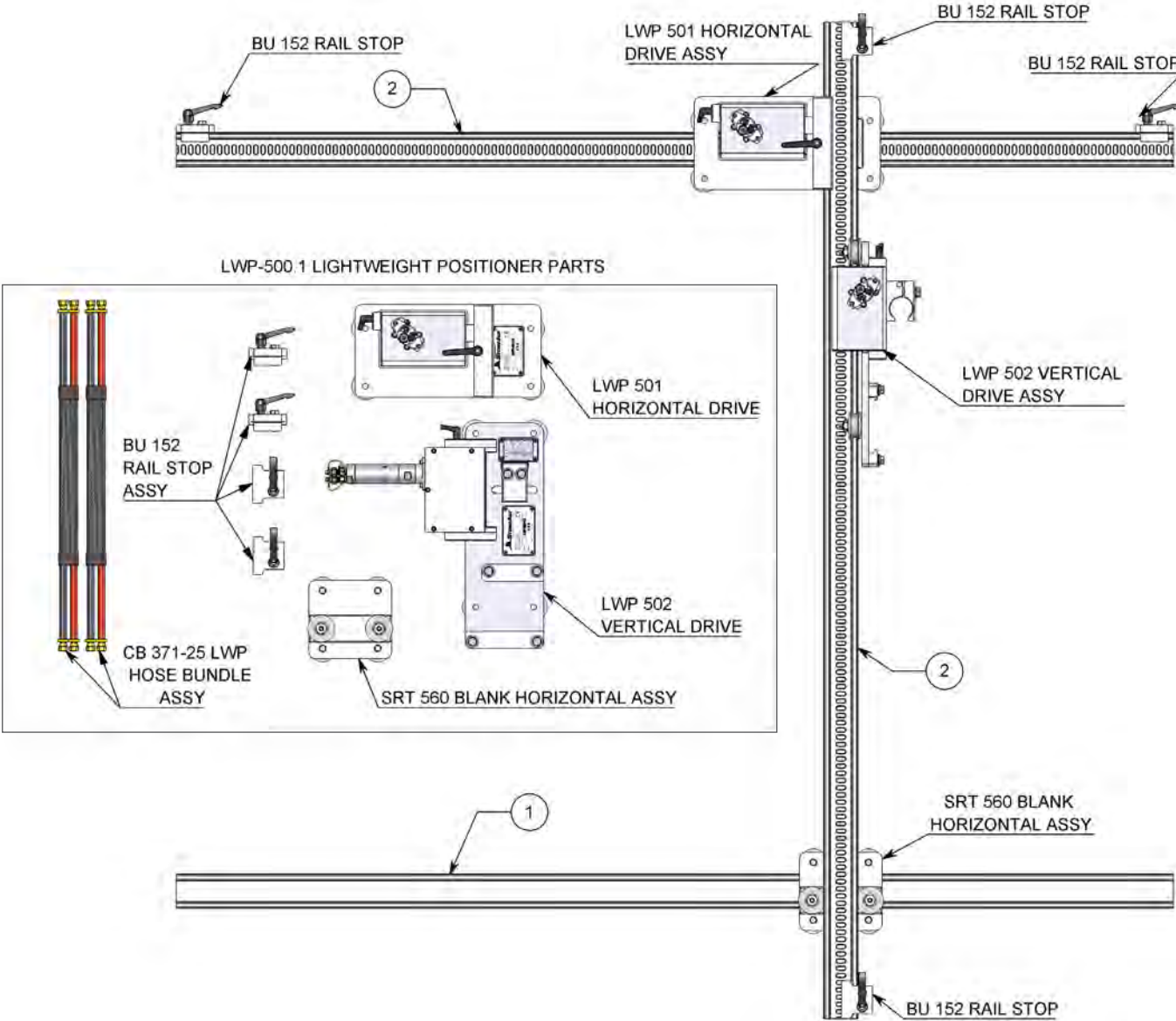
ADJUSTABLE HEIGHT STAND
18 IN - 28 IN
(457mm - 711mm)

FILTER, REGULATOR, LUBRICATOR (FRL)

1/4" REEL TO AND FROM DRUM ROTATION MOTOR CONNECTIONS

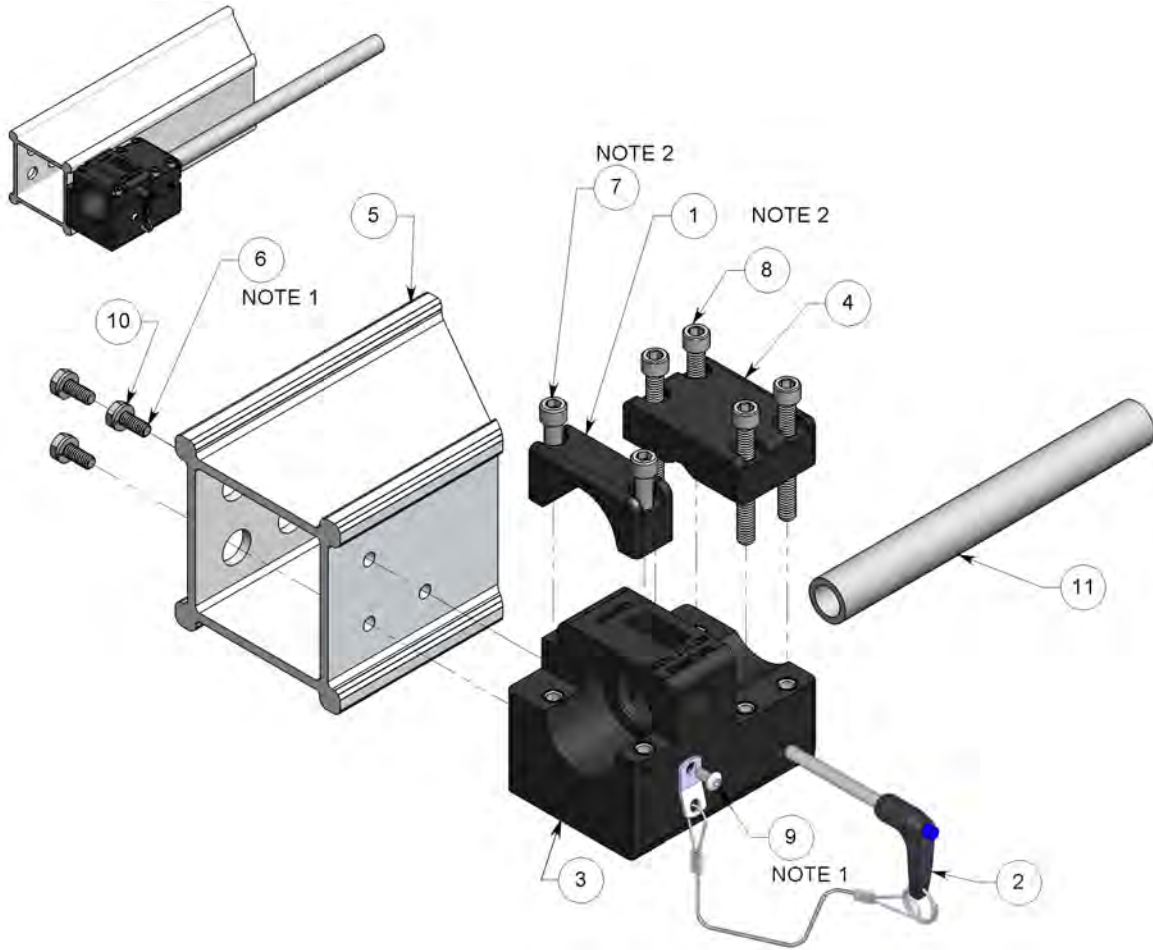


LIGHTWEIGHT POSITIONER ASSEMBLY
(LWP-500-V2)



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

***OPTIONAL (BOP 035-XX)**
GUIDE TUBE COLLET BLOCK ASSEMBLY



#	PART NUMBER	QTY.
1	BOP 032 COLLET BLOCK CAP	1
2	BOP 033 QUICK PIN WITH LANYARD	1
3	BOP 036 GUIDE TUBE COLLET BLOCK BODY	1
4	BOP 037 GUIDE TUBE COLLET BLOCK CAP	1
5	BOP 038-XX BOX RAIL, PRO LWP MOUNT	1
6	GB 325-025 BOLT, HEX .25-20 X .63 SS	3
7	GS 331-06 SHCS .31-18 X 1.50 SS	2
8	GS 331-10 SHCS .31-18 X 2.50 SS FULL THD	4
9	GSB 319-015 BHCS .19-24 X .38 LG SS	1
10	GW 325-L LOCK WASHER SS	3
11	ABX XXX-XX GUIDE TUBE (SEE CHART THIS PAGE)	1

GUIDE TUBE OPTION TABLE		
GUIDE TUBE	O.D. X I. D.	BANSHEE
ABX 115-XX	.625 X .459	BN9.5
ABX 116-XX	.840 X .546	BN13
ABX 117-XX	.840 X .674	BN15
ABX 119-XX	.875 X .745	BN18
ABX 125-XX	1.25 X 1.01	BN24
ABX 126-XX	1.25 X 1.12	BN27 / BN24
ABX 127-XX	1.66 X 1.38	BN33

BUILD CONFIGURATIONS TABLE			
APPLICATION	BOP 035-XX GUIDE TUBE COLLET BLOCK	BOP 038-XX BOX RAIL, PRO LWP MOUNT	ABX-XXX-XX GUIDE TUBE
FOR USE WITH THE LIGHTWEIGHT POSITIONER FOR TUBE BUNDLE CLEANING	BOP 035-8	BOP 038-6	ABX-XXX-8
FOR USE WITH THE FIN FAN AND FOR TUBE BUNDLE CLEANING	BOP 035-16	BOP 038-14	ABX-XXX-16

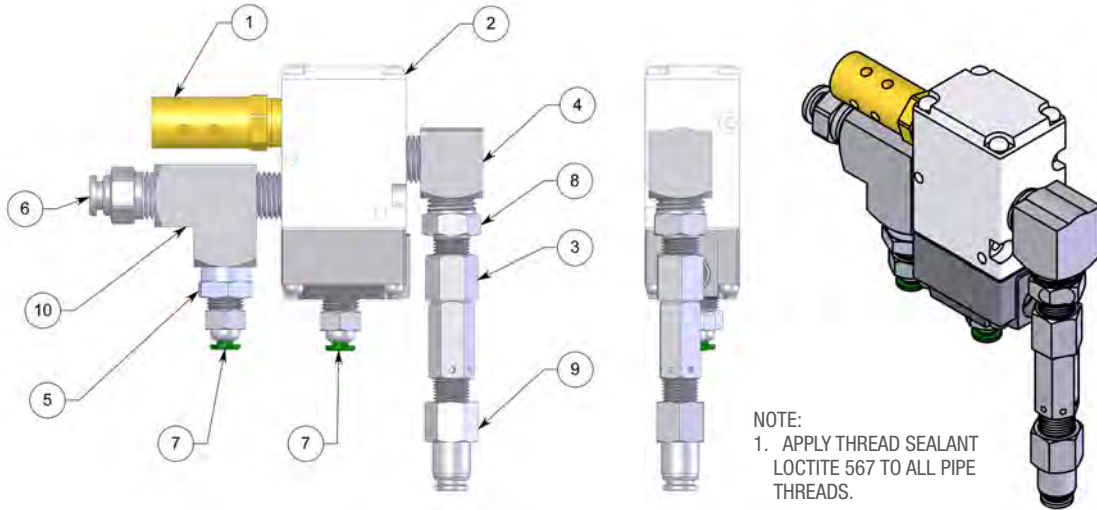
OPTIONAL ACCESSORY PART DIAGRAM



#	PART NUMBER	QTY.	OAL
1	BOP 030 COLLET BLOCK ASSEMBLY (SEE PAGE 33)	1	
2	BOP 081-6 SNOUT TUBE 1.75 X 6 SS	1	
3	BOP 090-7-001-K SNOUT, CORRUGATED, 1.25 CAMLOCKS, 7FT KIT	1	
4	GHS 319-025-32 HHMS 10-32 X .63 SS	6	
5	GN 319-L-32 NYLOK NUT SS	2	
6	GPTB 0125-PUR95A-BK	1	17 FT
7	GPTB 0250-PUR95A-GN 250 URETHANE TUBING GREEN	2	25 FT
8	GS 316-01 SHCS .16-32 X .25 SS	9	
9	GSB 311-045 BHCS 4-40 X 1.125 SS	2	
10	GSB 325-035 BHCS .25-20 X .88 SS	9	
11	GTB 319-02-32 BHTS .19-32 X .50 TORX SS	4	
12	PRO 701-V2 PRORAIN STAND, WELDMENT	1	

13	PRO 701.1.2 YELLOW GRIP	1	
14	PRO 705 FOOT SHOE	3	
15	PRO 706 FOOT BOLT SPACER	9	
16	PRO 707 FOOT SPRING	9	
17	PRO 708 FOOT VALVE	3	
18	PRO 709 FITTING, .06 BARB X 10-32, 90DEG	9	
19	PRO 710 SEALED WASHER	3	
20	PRO 711 VALVE BOOT	3	
21	PRO 715 VALVE ASSEMBLY	1	
22	PRO 716 VALVE INTERNAL PLATE	1	
23	PRO 717 VALVE COVER PLATE	1	
24	PRO 728 HEX STANDOFF, 1.25 LG X 10-32	4	
25	PRO 740 WEIGHTED SPLASH PLATE ASSEMBLY	1	
26	PRO 750 CE SERIAL PLATE W GRAPHIC OVERLAY	1	

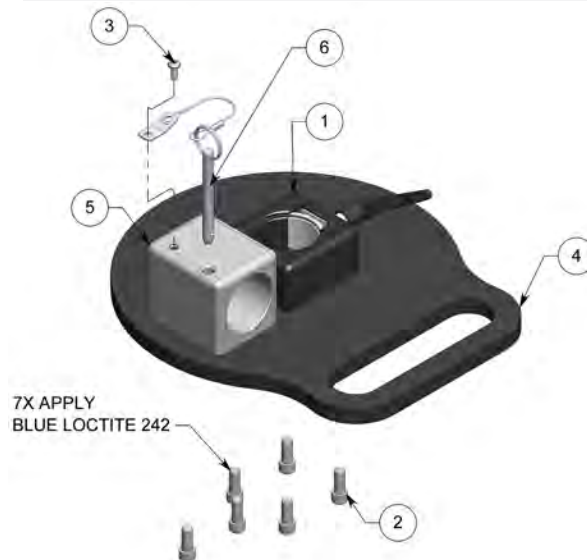
*OPTIONAL PRO 715 VALVE ASSEMBLY



#	PART NUMBER	QTY.
1	BR 153 MUFFLER P4	1
2	PRO 718 VALVE, P4 3-2	1
3	PRO 719 QUICK EXHAUST, P2 INLINE	1
4	PRO 721 FTG, ELBOW STREET 90 P4M P4F	1
5	PRO 727 FTG, BUSHING P4M P2F	1

6	SM 309 FTG, ADAPTER P4M PL4	1
7	PRO 726 FTG, ADAPTER P2M PL2	2
8	PRO 722 FTG, NIPPLE P4M P2M	1
9	PRO 723 FTG, BUSHING P2F PL4	1
10	PRO 725 FTG, TEE P4M P4F P4F	1

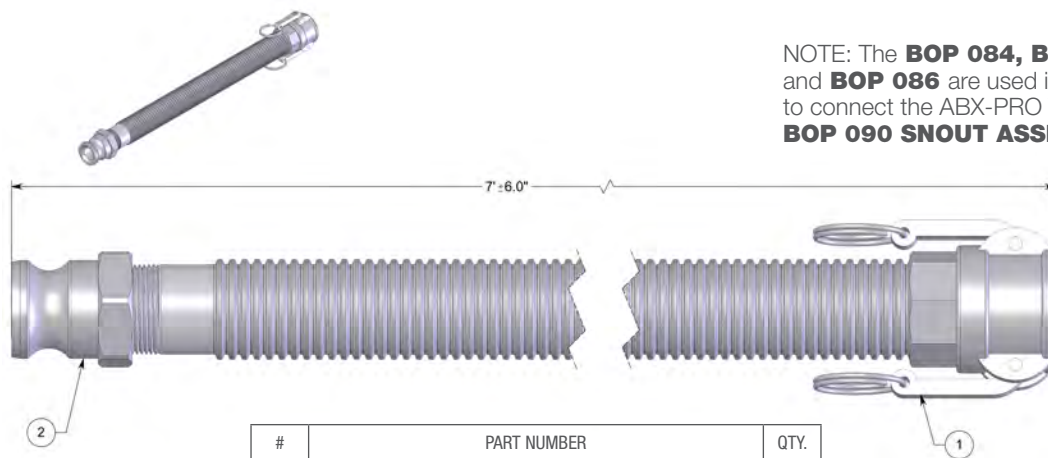
*OPTIONAL PRO 740 WEIGHTED SPLASH PLATE ASSEMBLY



#	PART NUMBER	QTY.
1	BOP 007 TUBE CLAMP ASSY (SEE PAGE 31)	1
2	GS 331-03 SHCS .31-18 X .75 SS	6
3	GSB 319-02 BHCS 10-24 X .50 SS (TR130 235)	1
4	PRO 741 WEIGHTED SPLASH PLATE	1
5	PRO 742 SNOUT RECEIVER	1
6	PRO 743 QUICK PIN WITH LANYARD, .312X2.5 SS	1

OPTIONAL ACCESSORY PART DIAGRAM

***OPTIONAL BOP 09-7-001-K**
1 1/4" SNOUT WITH CAMLOCKS, 6FT



NOTE: The **BOP 084**, **BOP 085**, and **BOP 086** are used in combination to connect the ABX-PRO Tractor to the **BOP 090 SNOUT ASSEMBLY**

#	PART NUMBER	QTY.
1	BOP 090-7-001 CORRUGATE SNOUT, 1.25 CAMLOCKS 7FT	1
2	BOP 091 MALE CAMLOCK SS, 1.25	1

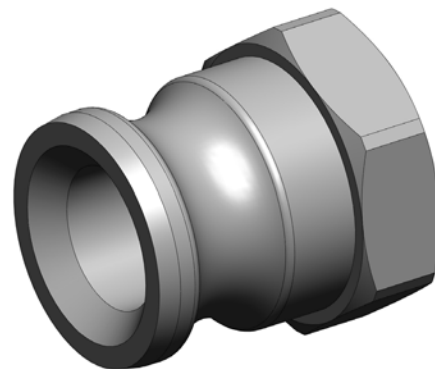
***OPTIONAL BOP 048**
HOSE STOP ADAPTER



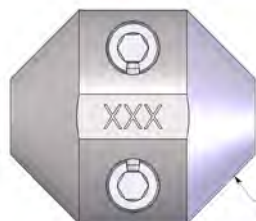
***OPTIONAL BOP 085**
1 1/4" FEMALE CAMLOCK END



***OPTIONAL BOP 086**
1 1/4" MALE CAMLOCK END



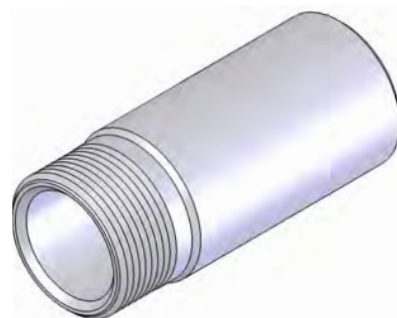
***OPTIONAL HS 121-XX-XX**
HOSE STOP CLAMP



HS 121-XXX
XXX= HOSE STOP SIZE

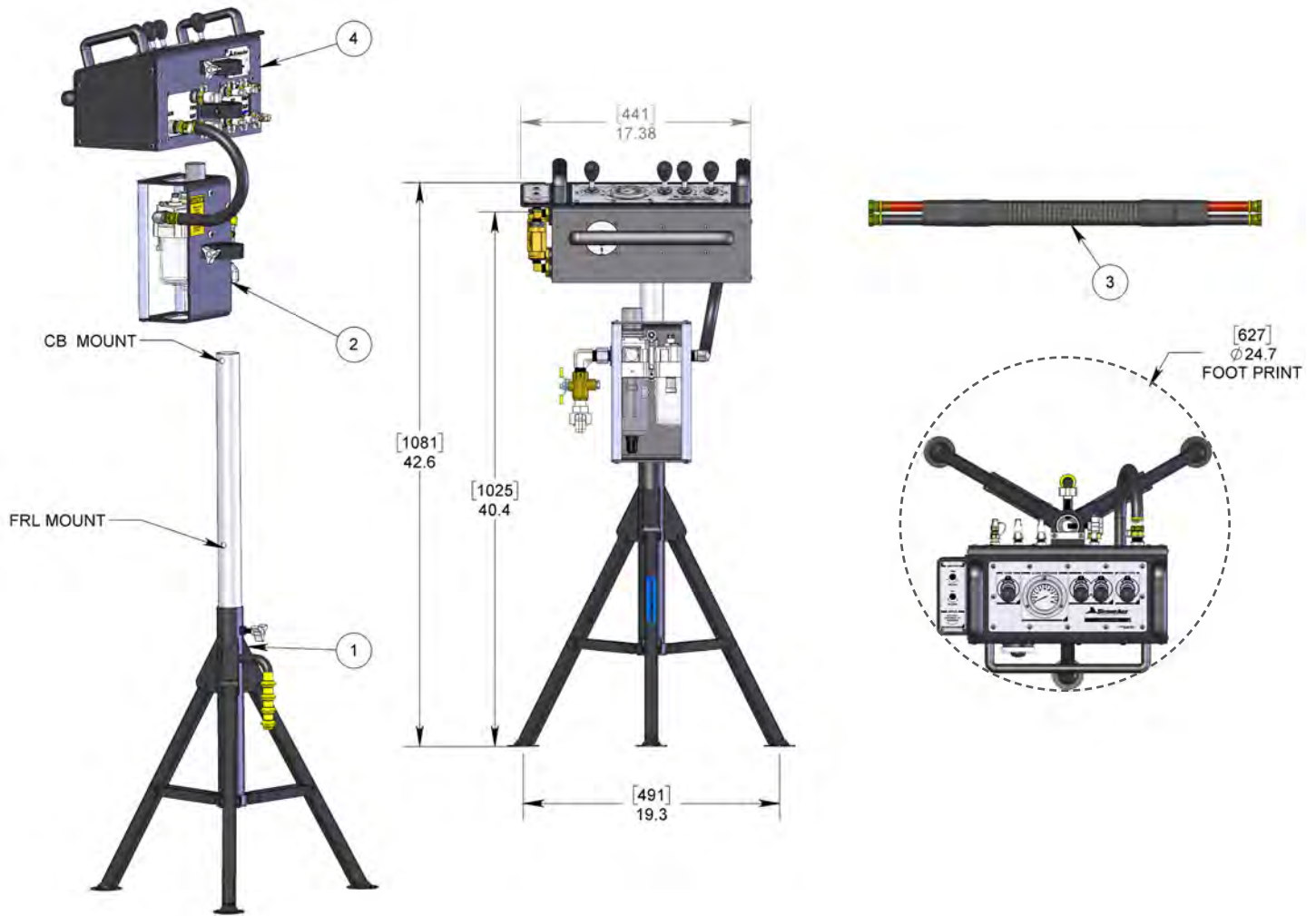
HS 121-XX-XX	SIZE DESCRIPTION
HS 121-27-34	HOSE STOP, CLAMP STYLE FOR 3MM OR 4MM (.27-.34"/6.8-8.6MM HOSE DIA)
HS 121-34-42	HOSE STOP, CLAMP STYLE FOR 5/2 (.34-.42"/8.6-10.7MM HOSE DIA)
HS 121-42-50	HOSE STOP, CLAMP STYLE FOR 5MM OR 6MM (.42-.50"/10.7-12.7MM HOSE DIA)
HS 121-50-56	HOSE STOP, CLAMP STYLE FOR 6 OR 8MM (.50-.56"/12.7-14.2MM HOSE DIA)
HS 121-56-61	HOSE STOP, CLAMP STYLE FOR 8MM (.56-.61"/14.2-15.5MM HOSE DIA)

***OPTIONAL BOP 084**
1.75 X 1.25 MNPT THREADED SNOUT TUBE



*OPTIONAL CB-ABX-PRO CONTROL BOX

The **CB-ABX-PRO** allows the Operator to use the ABX-PRO Tractor on a Lightweight Positioner.



NOTES:

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

#	PART NUMBER	QTY.
1	CB 301 STAND ASSEMBLY	1
2	CB 310 FRL ASSEMBLY	1
3	CB 745-25 ABX HOSE BUNDLE ASSEMBLY	1
4	CB 800 CONTROL BOX ASSEMBLY	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.stoneagetools.com/terms>

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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