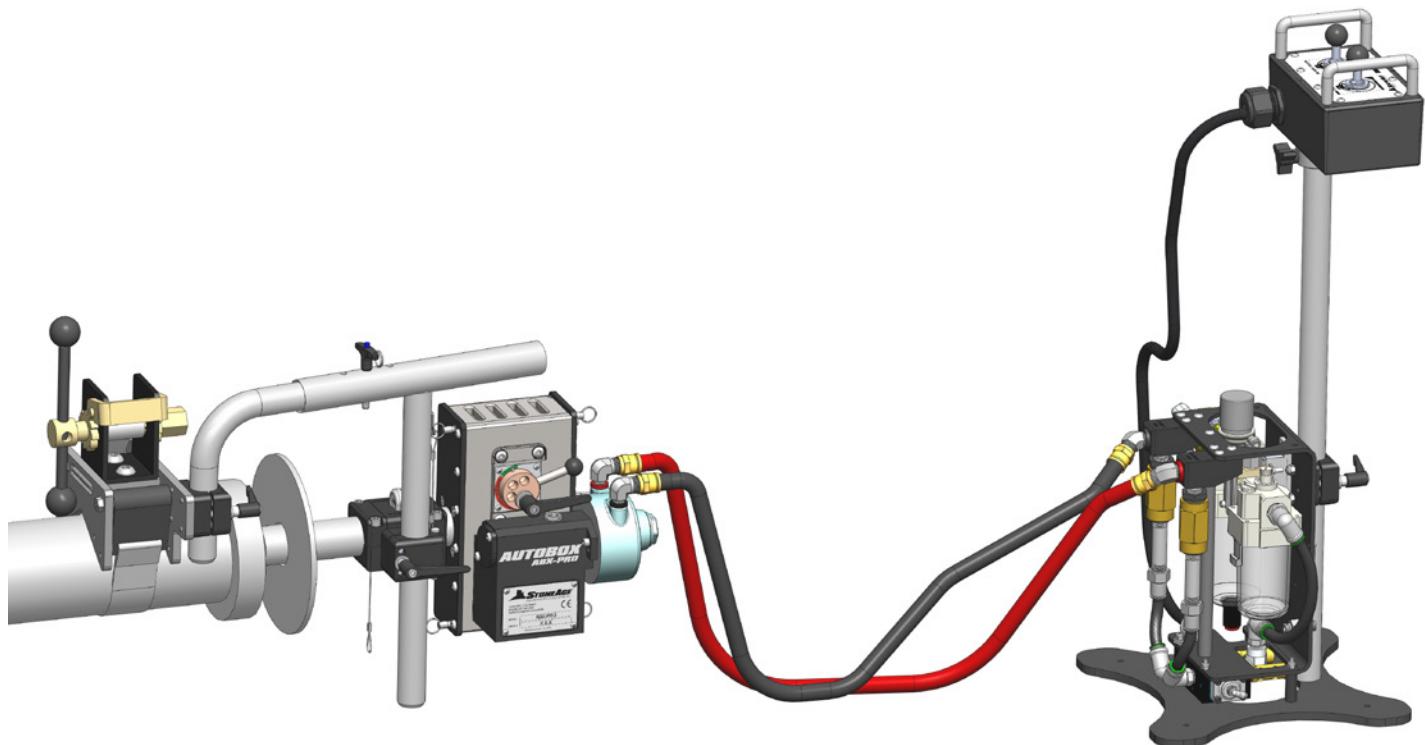




AUTOBOX® PRODRIVE (ABX-PRO-100) & CONTROL BOX (CB-ABX-PRO) USER MANUAL



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Andrew Birt Consulting Ltd.
UK

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

SPECIFICATIONS

GENERAL:

Pipe Size	2" - 8" (51 mm - 203 mm)
Feed Rate	0.2 ft/sec - 2.5 ft/sec (61 mm/sec - 762 mm/sec)
Poly Hose Size	3/2-8/4, 3/8 Rubber Covered
Air Connection to CB	Chicago style twist-claw fitting
Air Connection from CB to Tractor	1/2" JIC

WEIGHTS:

ABX-PRO Tractor with rollers	< 25 lbs (11.3 kg)
Pedestal Mount Control Box	14 lb (6.4 kg)
Side Mount Control Box	14 lb (6.4 kg)

DIMENSIONS:

AUTOBOX® ProDrive ABX-PRO-100	7" x 9.25" x 10" (178 mm x 235 mm x 254 mm)
Pedestal Mount control box	12" x 13" x 14" (305mm x 330mm x 356mm)
Side Mount control box	12" x 13" x 14" (305mm x 330mm x 356mm)

DESCRIPTION OF EQUIPMENT AND INTENDED USE

The AUTOBOX® ProDrive ABX-PRO-100 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 AUTOBOX® ProDrive ABX-PRO-100 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:

AUTOBOX® ProDrive ABX-PRO-100

- 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



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

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

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

Equipment: AUTOBOX® ProDrive

Model name: ABX-PRO-100 Is in accordance with the following Directives: and

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

EN ISO 12100:2010 Safety of machinery - General principles for design - Risk assessment and risk reduction

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

Signed _____ Date 06/15/2016

Andrew Birt

Independent Dealer Manager

StoneAge, Inc., Worcester, UK

The technical file for the AUTOBOX® ProDrive (ABX-PRO-100) User Manual is maintained at: StoneAge, Inc. 466 South Skylan Drive, Durango, CO 81303, USA

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WARNING AND SAFETY INSTRUCTIONS

OPERATOR TRAINING

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

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

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

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

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

PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

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

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

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

SAFETY LABEL DEFINITIONS

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

The AUTOBOX® ProDrive ABX-PRO-100 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 7.0) of WJTA-IMCA's Recommended Practices For The Use Of High-pressure Waterjetting Equipment, or equivalent.

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

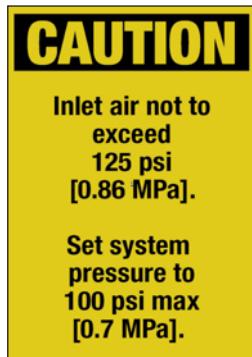
The risk assessment MUST consider potential material or substance hazards including:

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

PPE may include:

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

Maximum operating air pressure is 100 psi (0.7 MPa). Never exceed 125 psi (0.56 MPa) supply pressure. Exceeding 125 psi (0.86 MPa) supply pressure may result in injury to the Operator and/or damage to the equipment.



WARNING AND SAFETY INSTRUCTIONS

⚠ WARNING

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

- Do not exceed the maximum operating pressure specified for any component in a system.
- The immediate work area MUST be marked off to keep out untrained persons.
- Inspect the equipment for visible signs of deterioration, damage, and improper assembly. Do not operate if damaged, until repaired.
- Make sure all threaded connections are tight and free of leaks.
- Users of the AUTOBOX® ProDrive ABX-PRO-100 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 AUTOBOX® ProDrive ABX-PRO-100. 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 AUTOBOX® ProDrive ABX-PRO-100 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

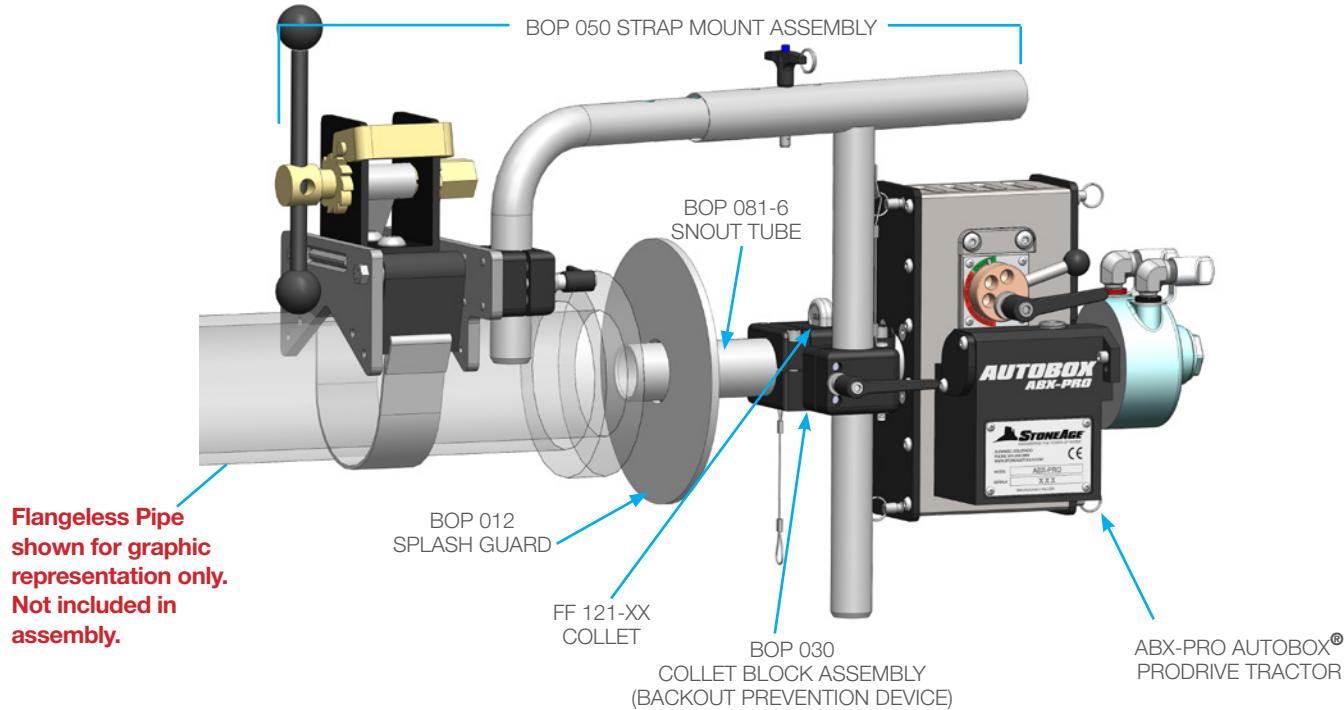
Refer to WJTA-IMCA's, Recommended Practices For The Use Of High-pressure Waterjetting Equipment and/or The Water Jetting Association's, WJA Code of Practice for additional safety information.

- 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 AUTOBOX® ProDrive ABX-PRO-100 with high-pressure water to verify the control valves move the hose in the intended direction, and that the dump valve and hose clamp are working properly.
- Ensure that Operators never connect, disconnect, or tighten hoses, adapters, or accessories with the high-pressure water pump unit running.
- Ensure no personnel are in the hydroblasting zone.

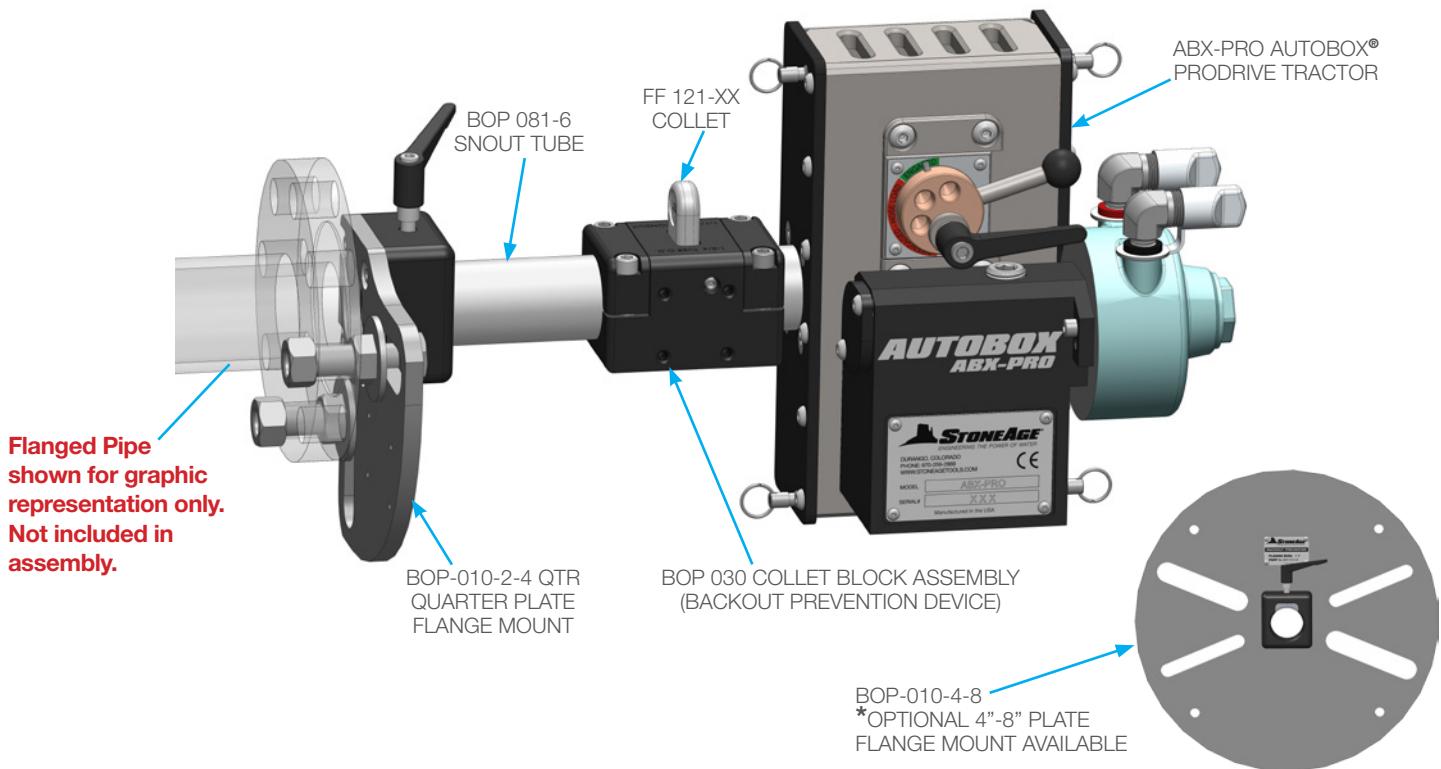
SYSTEM ASSEMBLY - OVERVIEW

ABX-PRO-100 AUTOBOX® PRODRIVE ASSEMBLY WITH STRAIGHT MOUNTING OPTIONS

THE MOUNTING OPTION BELOW IS USED ON FLANGELESS PIPES



*THE MOUNTING OPTION BELOW IS USED ON FLANGED PIPES *



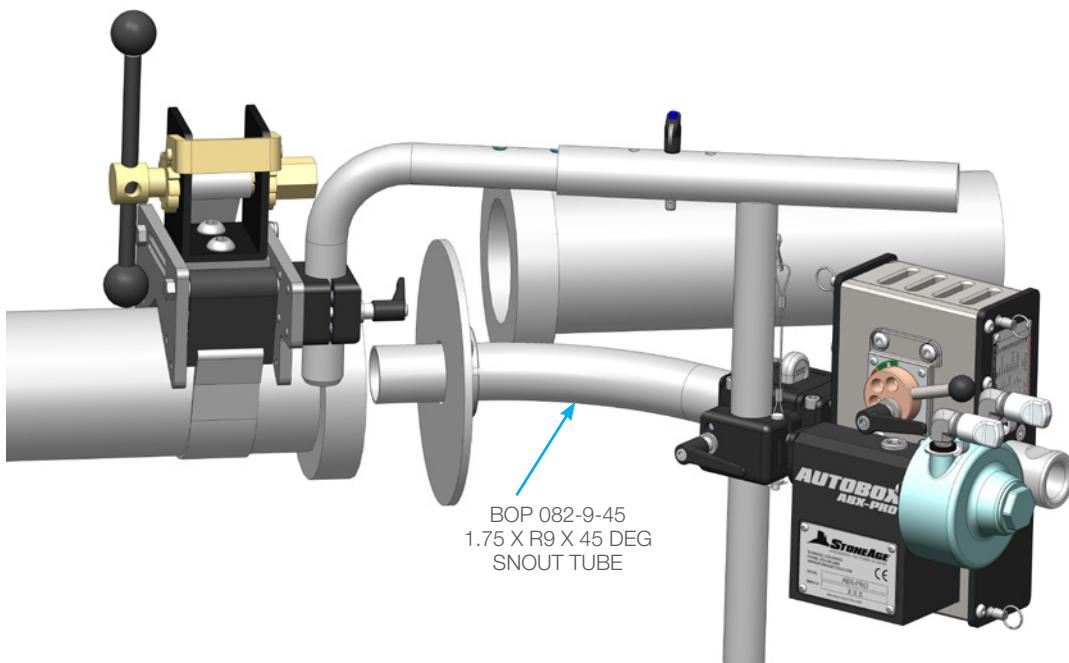
**ABX-PRO-100 AUTOBOX® PRODRIVE ASSEMBLY
WITH OFF AXIS MOUNTING OPTIONS FOR TIGHT PIPE JOINTS**

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.



ABX-PRO-100 AUTOBOX® PRODRIVE ASSEMBLY WITH STRAP MOUNT

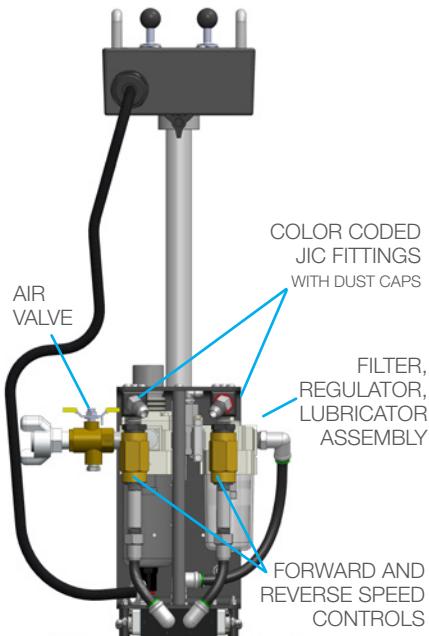
BOP 082-9-45
1.75 X R9 X 45 DEG
SNOUT TUBE

ABX-PRO-100 AUTOBOX® PRODRIVE ASSEMBLY WITH QUARTER PLATE MOUNT

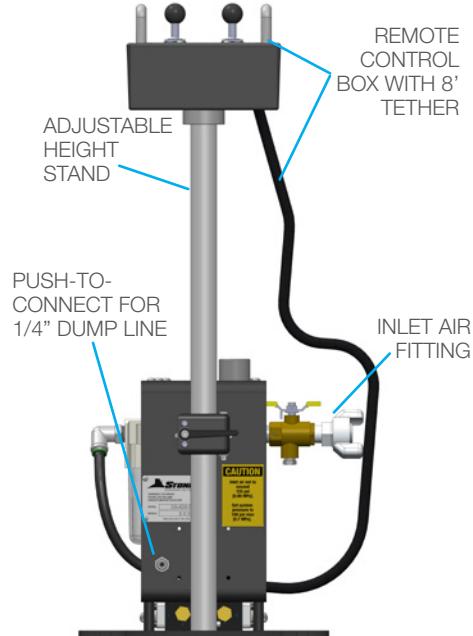
SYSTEM ASSEMBLY - OVERVIEW

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

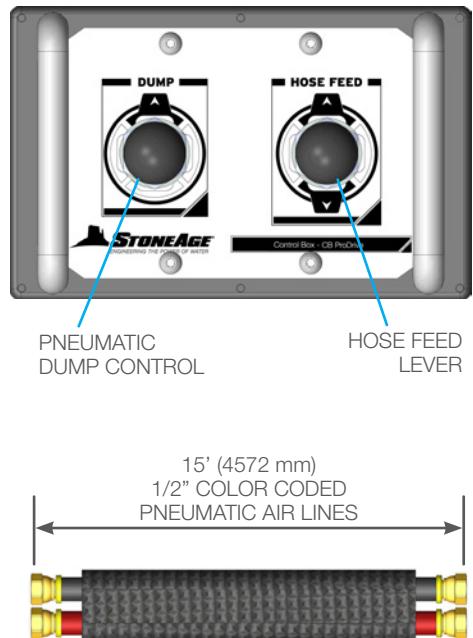
FRONT VIEW



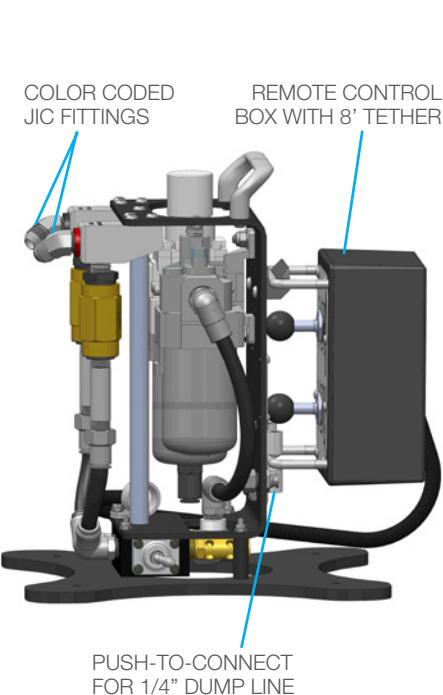
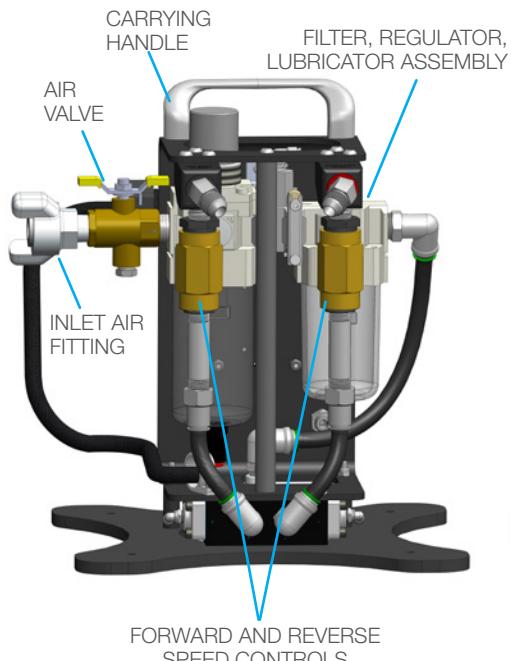
BACK VIEW



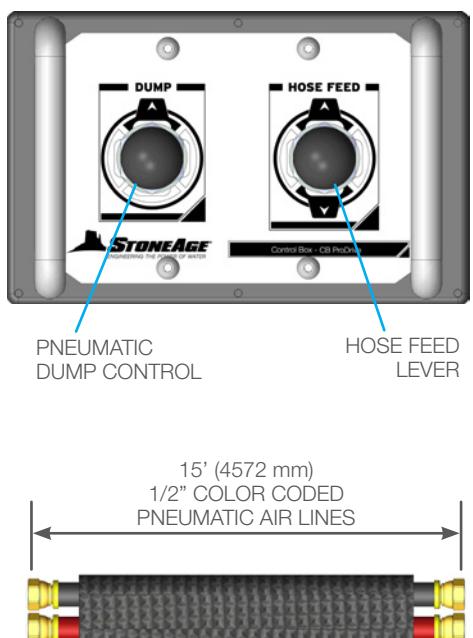
CONTROL PANEL VIEW



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



CONTROL PANEL VIEW



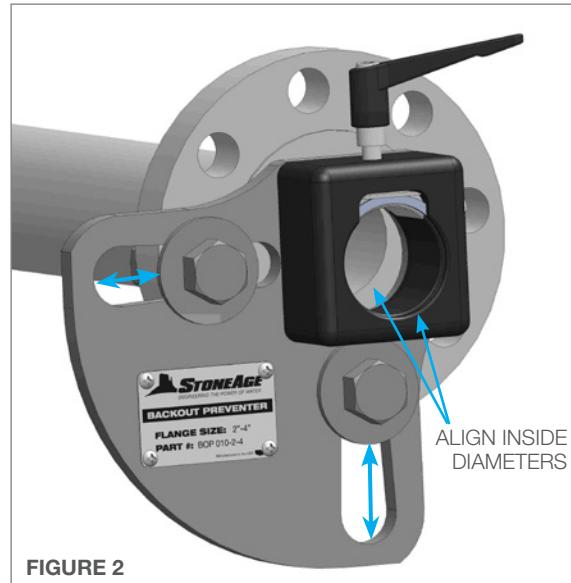
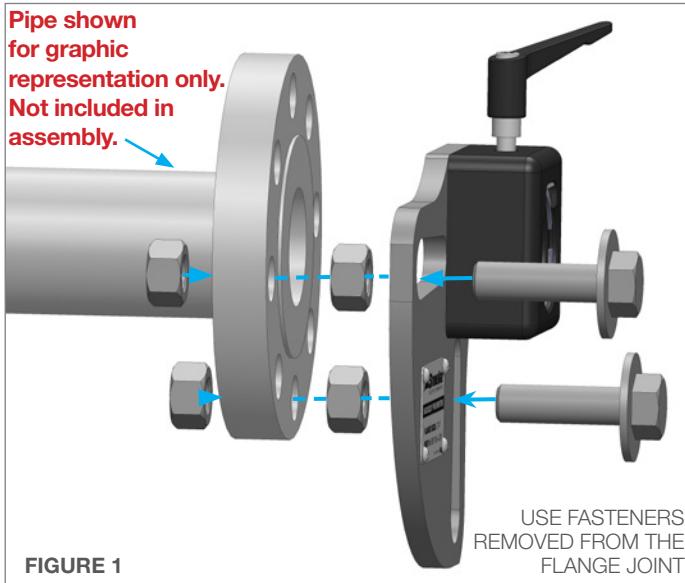
FRONT VIEW

SIDE VIEW

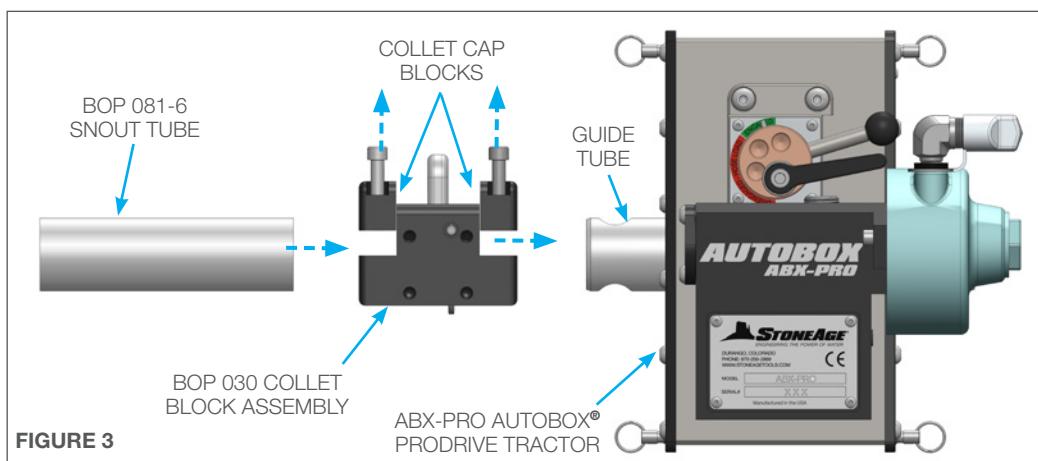
QUARTER PLATE FLANGE MOUNT ASSEMBLY SET-UP

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

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**)

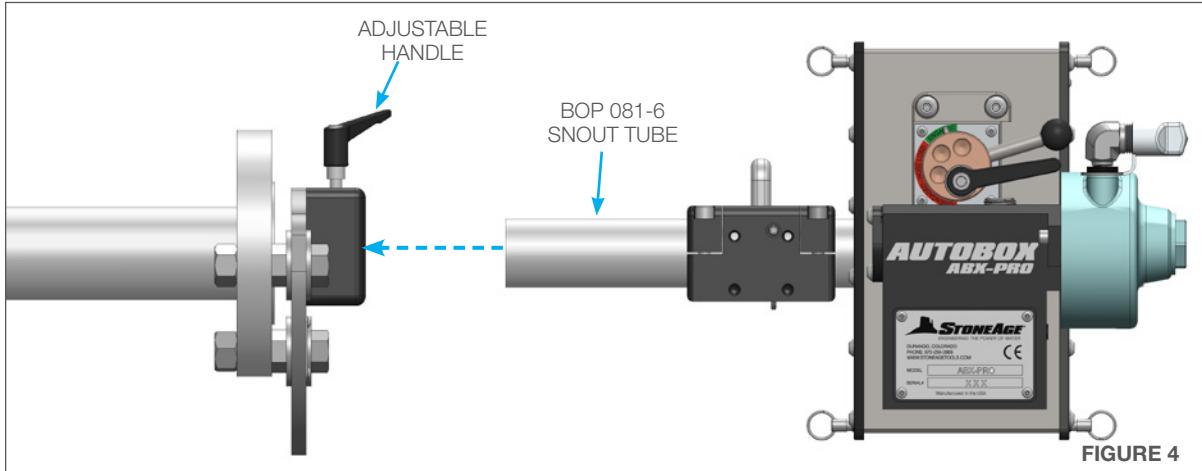


3. Loosen the screws on both collet cap blocks. Slide the BOP 030 Collet Block Assembly onto the guide tube on the ABX-PRO and tighten the two screws until secure. Slide the BOP 081-6 Snout Tube into the BOP 030 Collet Block Assembly. Push the Snout Tube in until it stops, then tighten the two until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

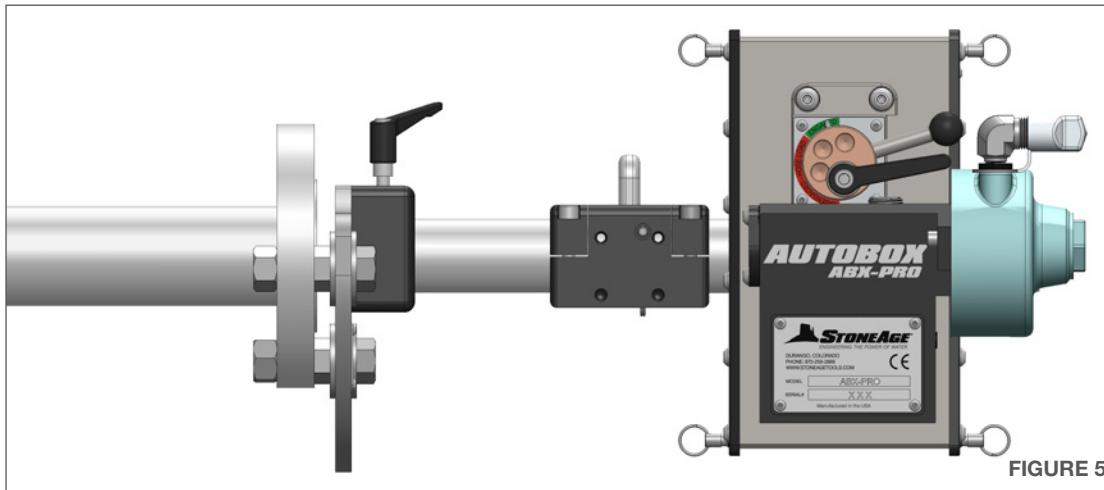


QUARTER PLATE FLANGE MOUNT ASSEMBLY SET-UP

4. 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)**



5. 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**)

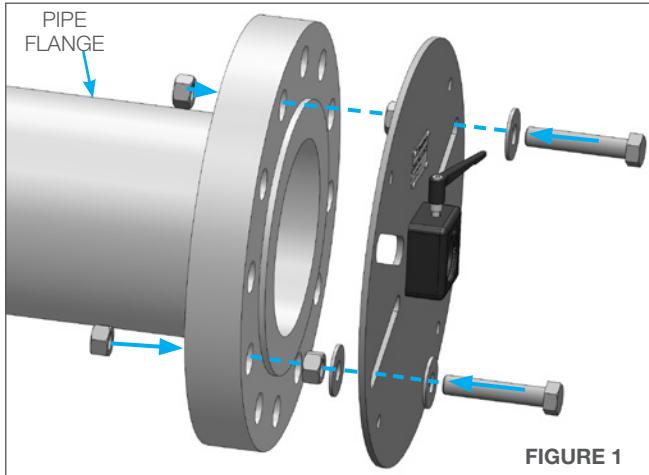


FIGURE 1

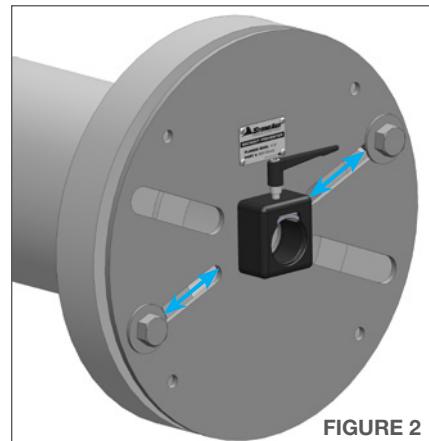


FIGURE 2

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**)

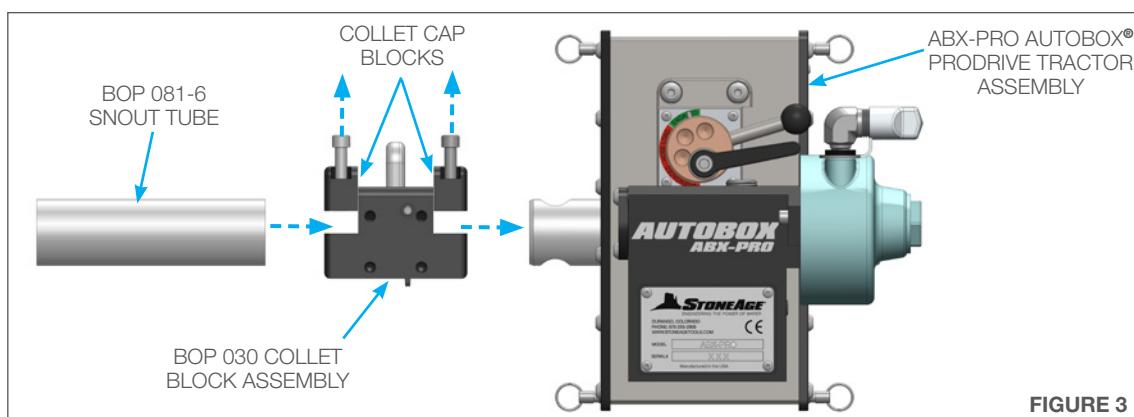


FIGURE 3

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.

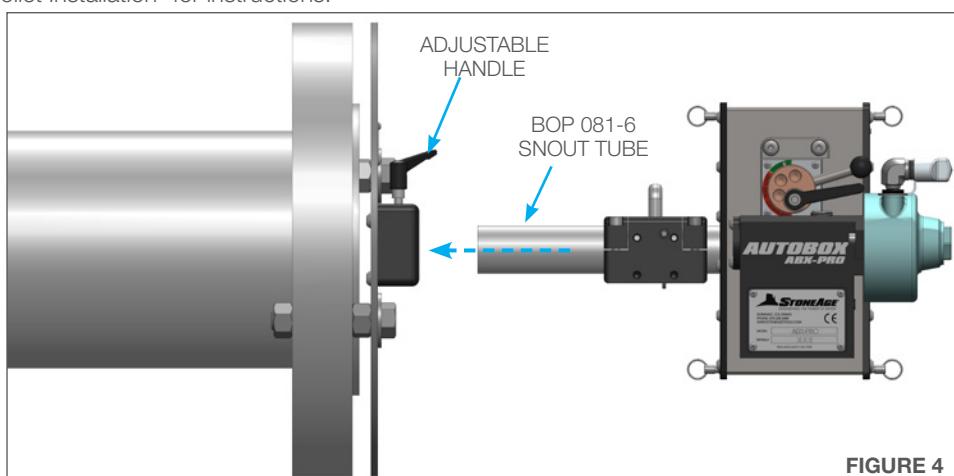


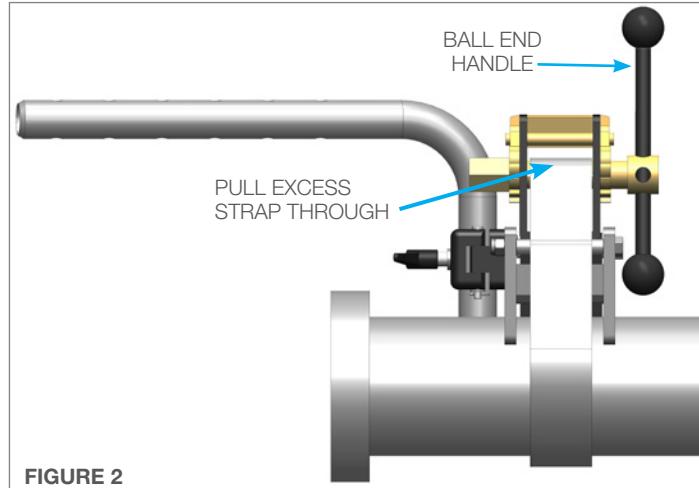
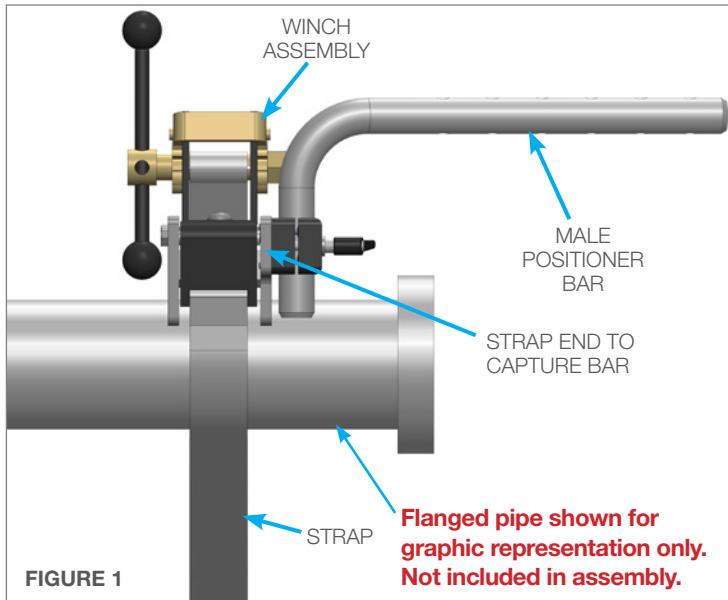
FIGURE 4

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**)

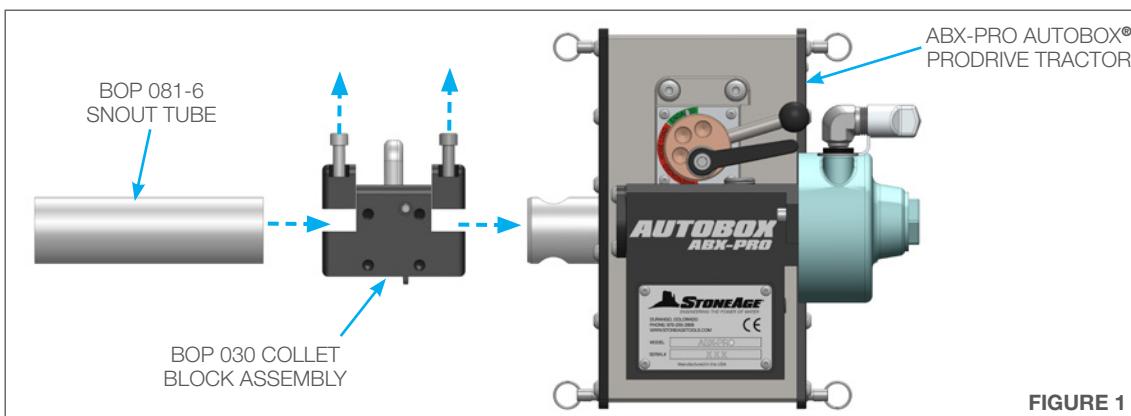
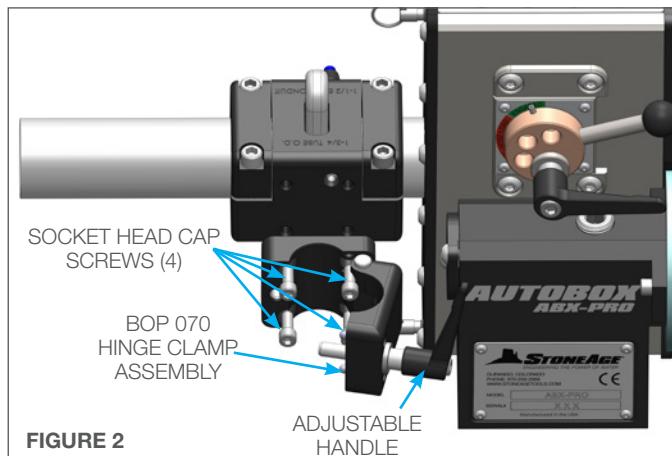


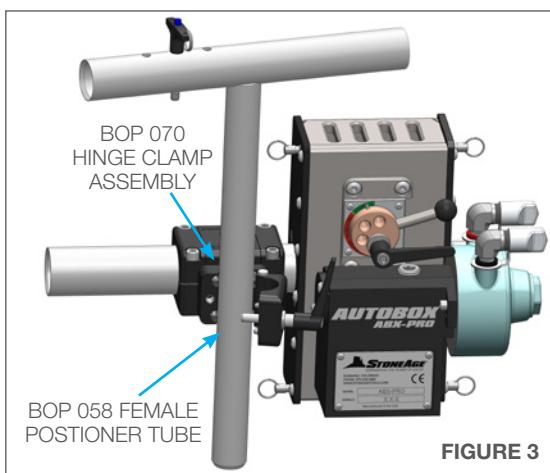
FIGURE 1

STRAP MOUNT ASSEMBLY SET-UP

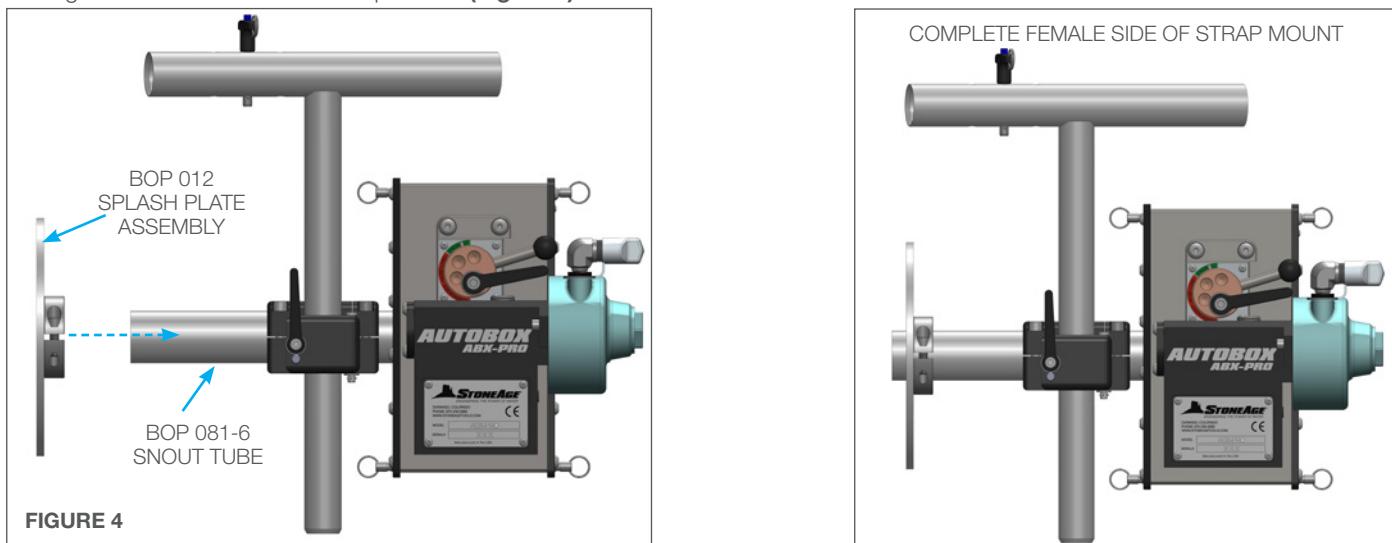
2. Release the Adjustable Handle on the BOP 070 Hinge Clamp to access the 4 socket head cap screws. Locate the side of the BOP 030 Collet Block Assembly with 4 threaded holes. Orient the Hinge Clamp so that the hinge is on the right. Fasten the Hinge Clamp Assembly to the Collet Block Assembly using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



3. 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**)



4. 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**)

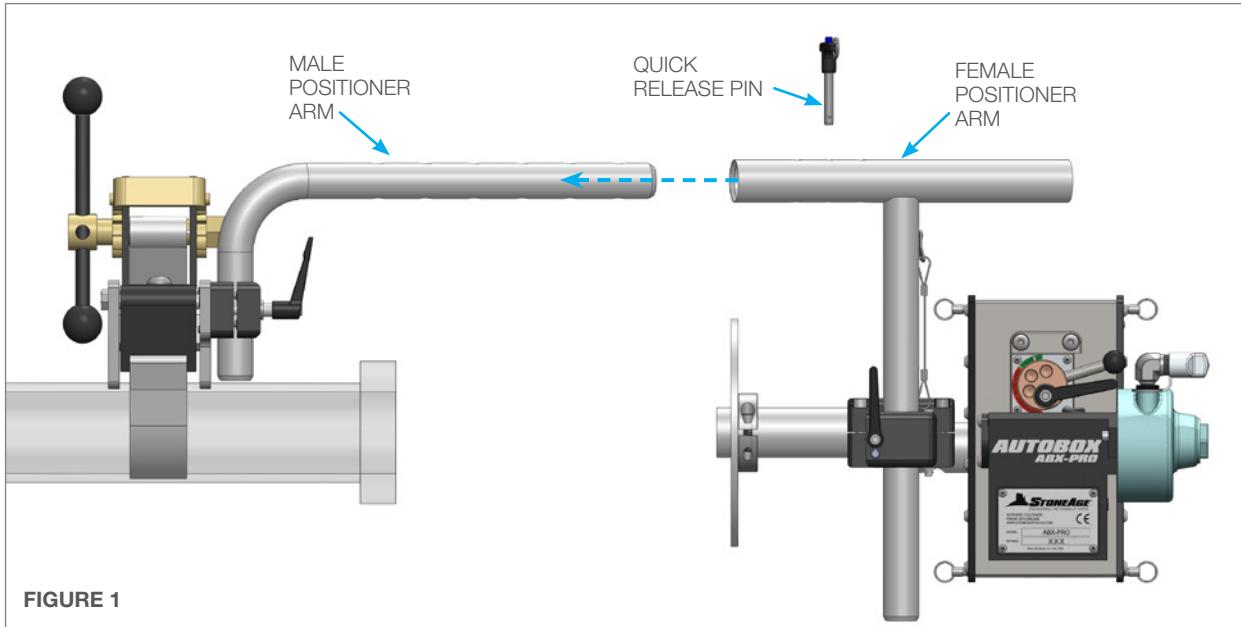


FIGURE 1

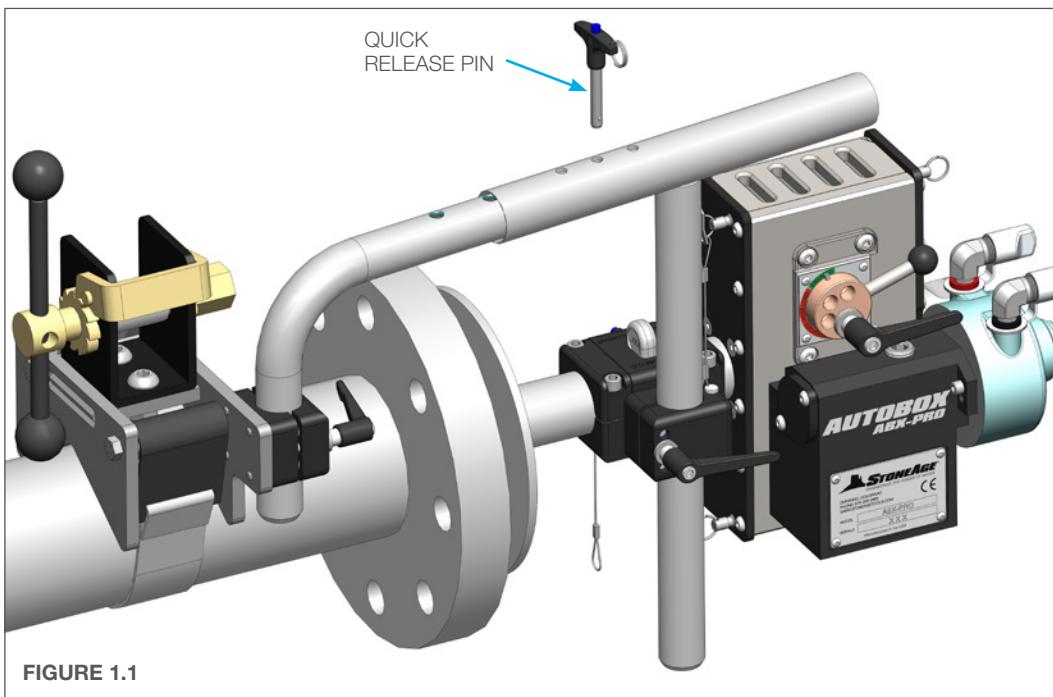


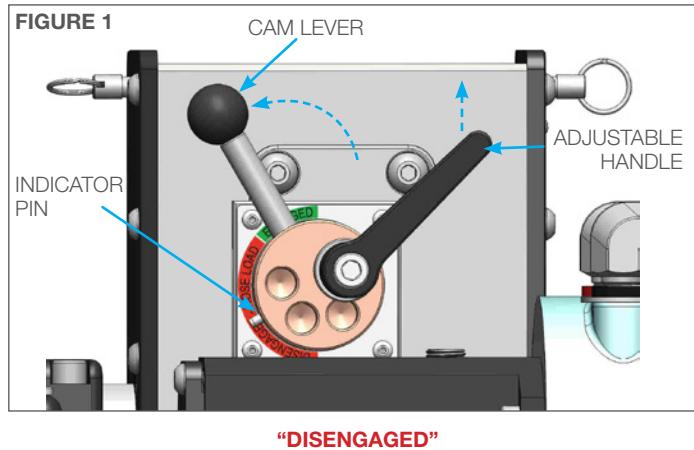
FIGURE 1.1

LOADING THE HIGH-PRESSURE HOSE

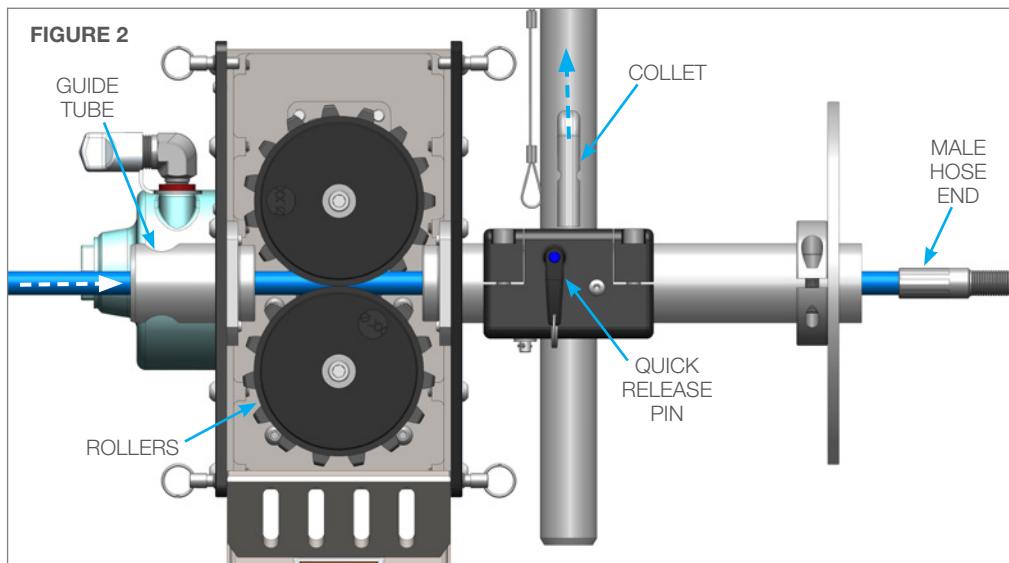
NOTICE

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.

- 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**)



- 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.

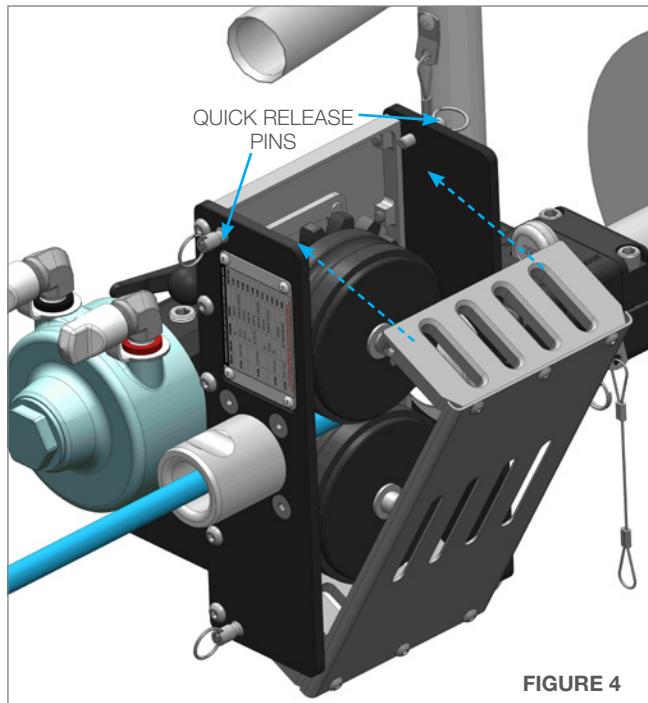
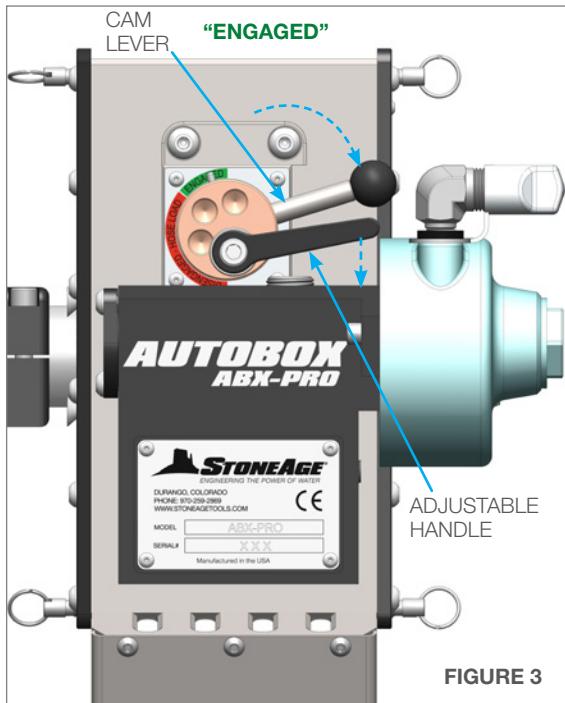


HOSE AND COLLET INSTALLATION

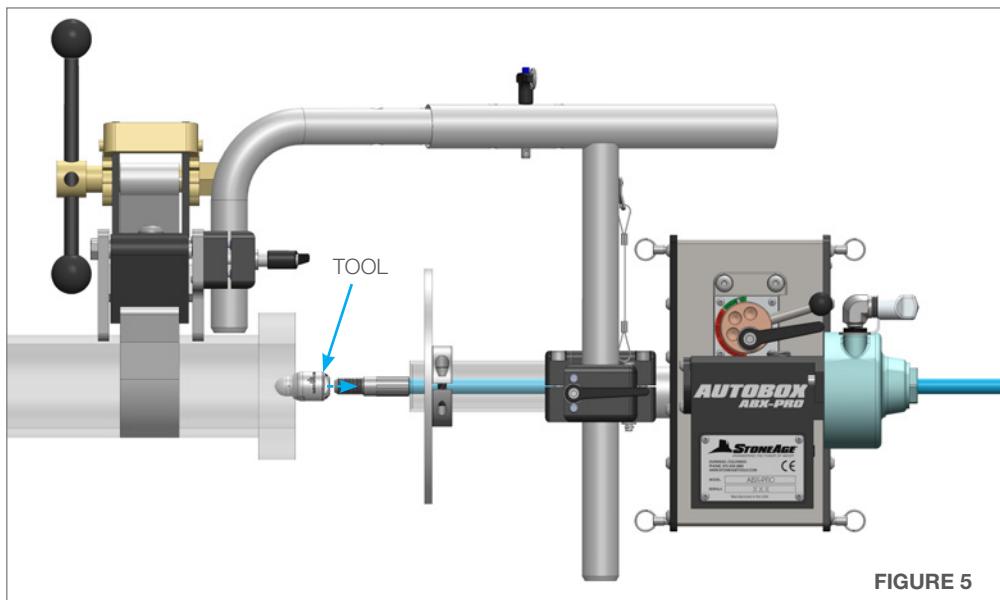
3. Rotate the Cam Lever clockwise to the “**Engaged**” position to tighten the Idler Roller down onto the hose. There should be a slow slip on the hose. If the slip is too tight or loose, move the Eccentric Lever off until a slow slip is obtained. Once the slip level is achieved, push down on the Adjustable 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 ABX-PRO AUTOBOX® PRODRIVE TRACTOR. (**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.



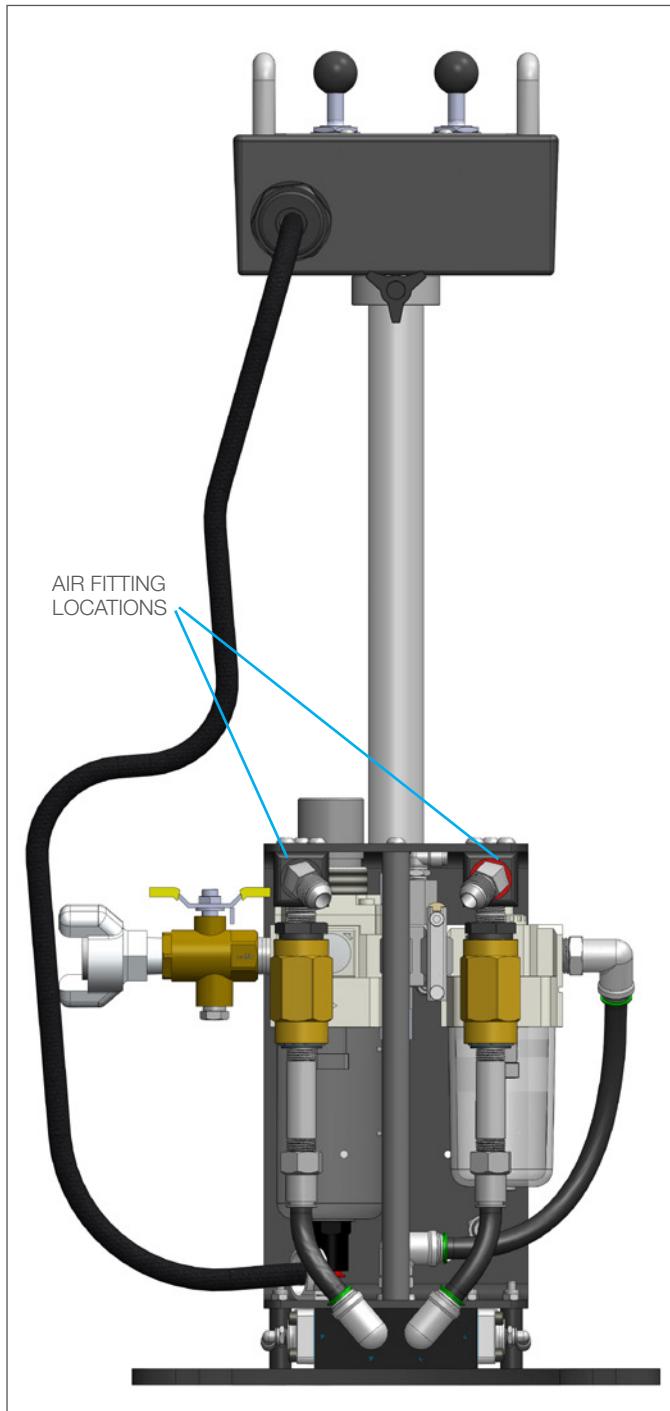
5. Attach the desired tool onto the male hose end (Stoneage® BT25 Beetle® shown for reference). SEE THE APPLICABLE TOOL MANUAL FOR SPECIFIC INSTALLATION INSTRUCTIONS.



PNEUMATIC AIR LINE CONNECTIONS

4. Pull the Dust Caps off the Pneumatic Air Fittings. Connect the Pneumatic Supply Lines from the CB-ABX-PRO Control Box to the ABX-PRO-100 AUTOBOX® 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 PRODRIVE ASSEMBLY

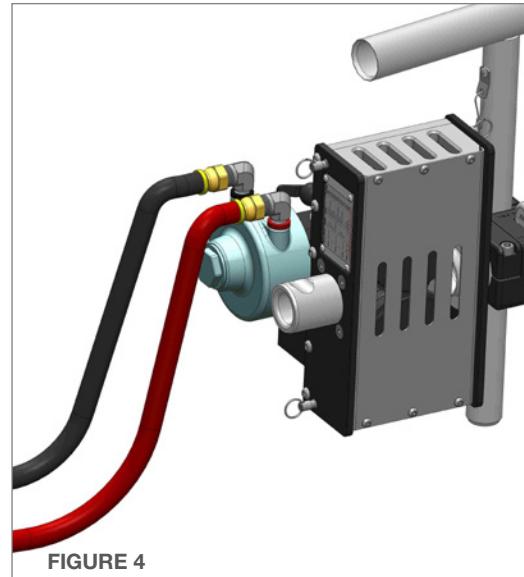


FIGURE 4

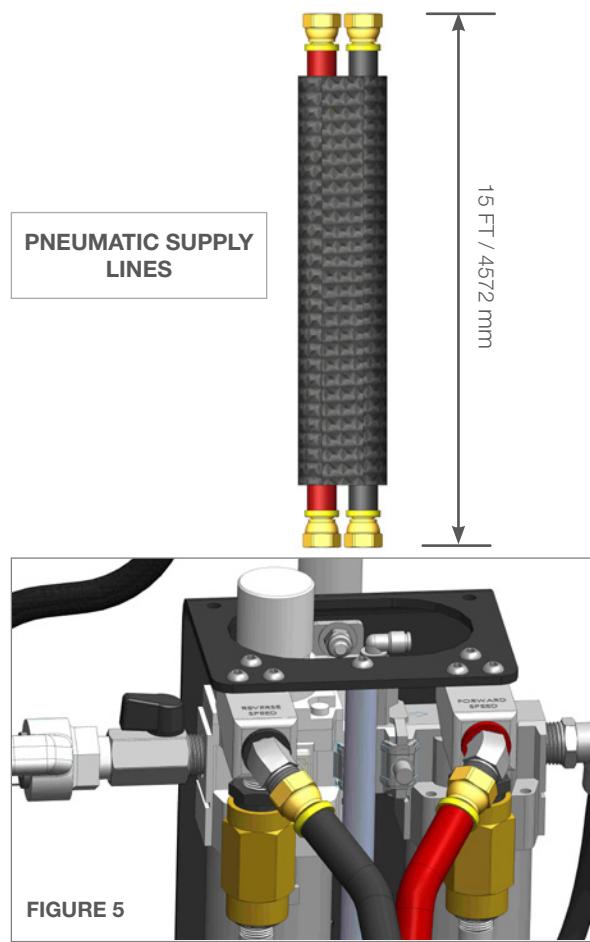


FIGURE 5

AIR FITTINGS ON CONTROL BOX ASSEMBLY

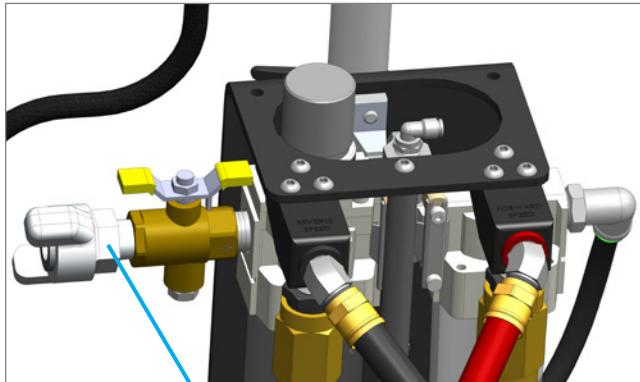
CONTROL BOX SET-UP

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 (0.7 MPa) for the application.

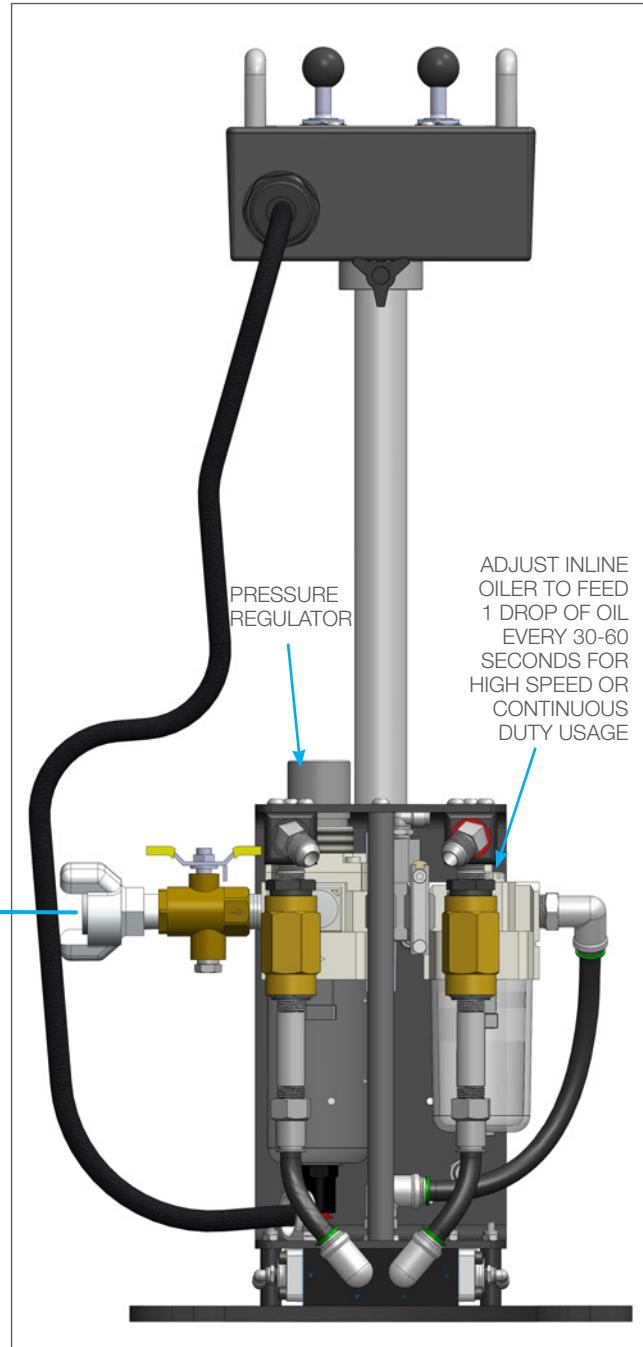
⚠ WARNING

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



AIR SUPPLY FITTING

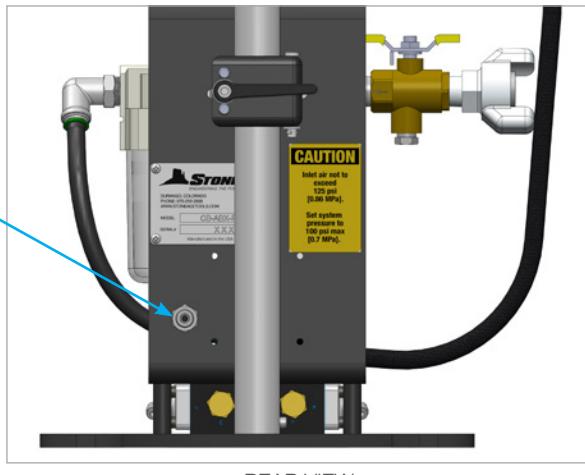
A universal **AIR SUPPLY FITTING** (Chicago style) is located on the FRL. Connect a compatible compressed air line (not included) according to the manufacturer's instructions. If another pneumatic connection is preferred, this fitting can be removed and any male 1/2 in NPT fitting may be used.



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.

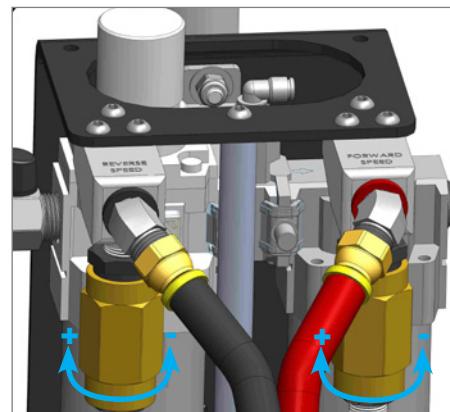
When the **HOSE FEED** lever is pushed forward, it drives the hose forward into the pipe. When the **HOSE FEED** lever is pulled backward, it retracts the hose from the pipe.

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

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.
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 ABX-PRO-100 AUTOBOX® PRODRIVE and CB-ABX-PRO Control Box.

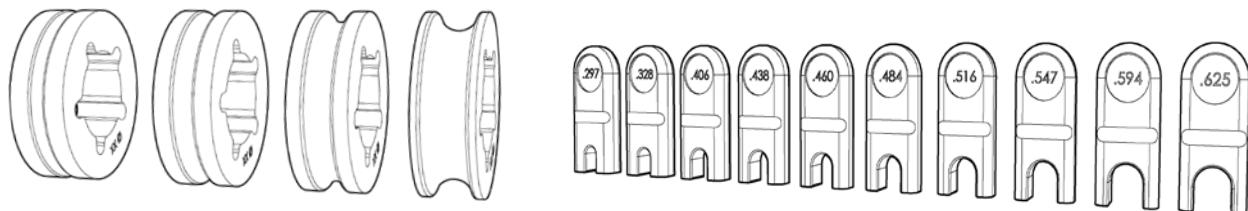
STORAGE, TRANSPORTATION, AND HANDLING

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 ABX-PRO-100 AUTOBOX® PRODRIVE comes with one pair of the PRO 174-46 installed in the ABX-PRO AUTOBOX® PRODRIVE TRACTOR. It also comes with a pair of the PRO 174-34 and PRO 174-58 rollers in the package. The PRO 174-89 rollers are available for 3/8" hoses but not included. The sizing chart below is also located on a plaque near the air motor on the ABX-PRO AUTOBOX® PRODRIVE TRACTOR.

POLY ROLLERS ABX-PRO	HOSE OD	SPIRSTAR	PARKER	COLLET SIZE	STONEAGE PART NUMBER
PRO 174-34 Ø 0.34 IN.	0.26–0.38 IN.	3/2	2240D-02	0.297 in. / 7.5 mm	FF 121-297
		3/4, 4/2	2240D-025, 2440D-02	0.328 in. / 8.0 mm	FF 121-328
		3/6, 5/2	2240D-03	0.406 in. / 10.0 mm	FF 121-406
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
		4/6, 5/4, 6/2	2240D-04	0.460 in. / 11.7 mm	FF 121-460
			2640D-025, 2740D-03	0.484 in. / 12.3 mm	FF 121-484
PRO 174-58 Ø 0.58 IN.	0.51–0.61 IN.	6/4	2440D-04	0.516 in. / 13.0 mm	FF 121-516
		5/6, 8/2	2240D-05, 2740D-03	0.547 in. / 14.0 mm	FF 121-547
		8/4		0.594 in. / 15.0 mm	FF 121-594
PRO 174-89 Ø 0.89 IN.	0.80–0.93 IN.		2440D-05	0.625 in. / 16.0 mm	FF 121-625
		3/8" RUBBER WB HOSE	N/A	N/A	N/A



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 ABX-PRO AUTOBOX® PRODRIVE 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**)

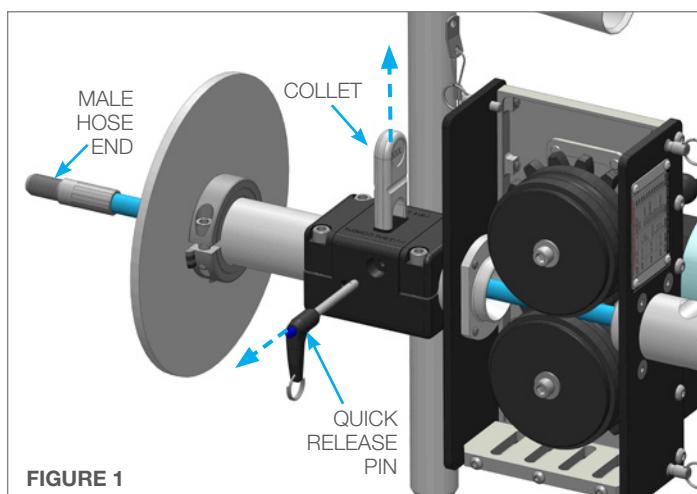


FIGURE 1

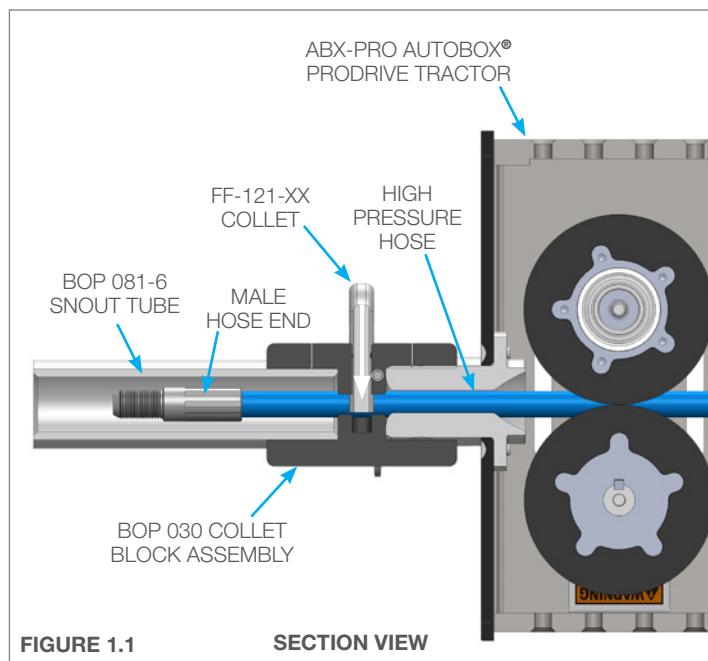


FIGURE 1.1

SECTION VIEW

ROLLER REMOVAL INSTRUCTIONS

ROLLER REMOVAL

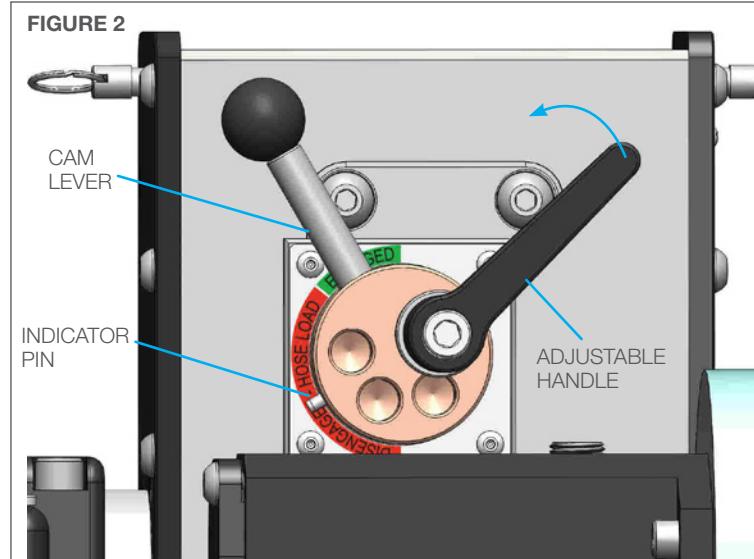
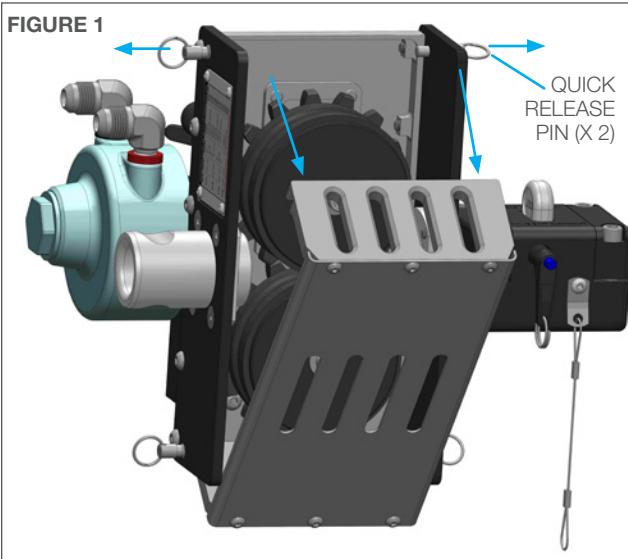
NOTICE

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 AUTOBOX® ProDrive ABX-PRO-100 Assembly.

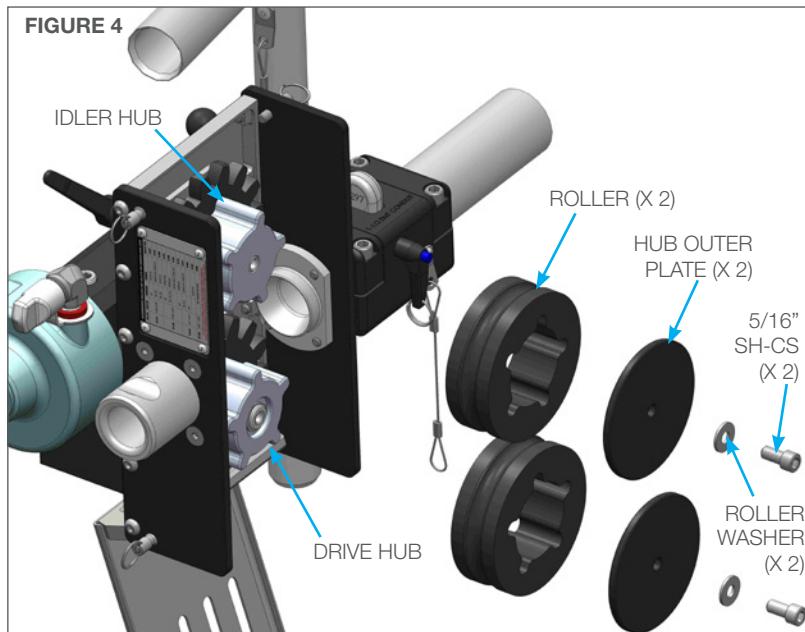
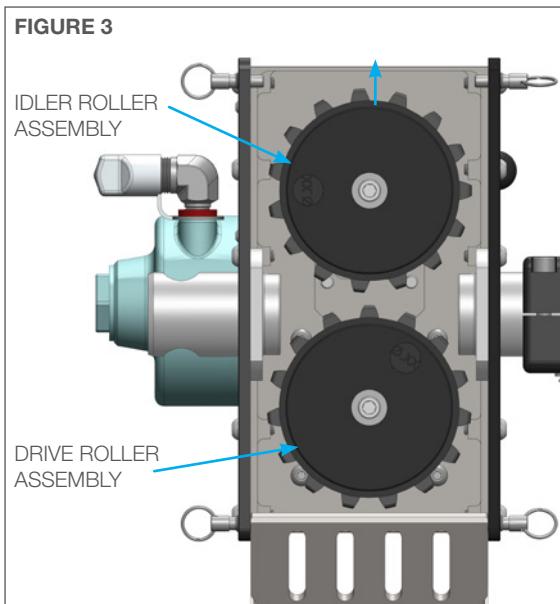
WARNING

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

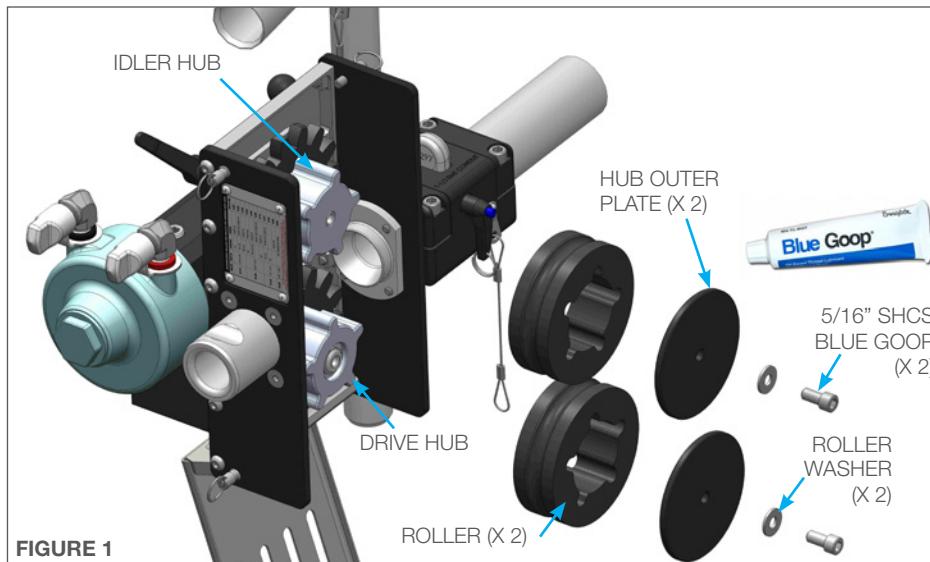
NOTICE

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 AUTOBOX® ProDrive ABX-PRO-100 Assembly.

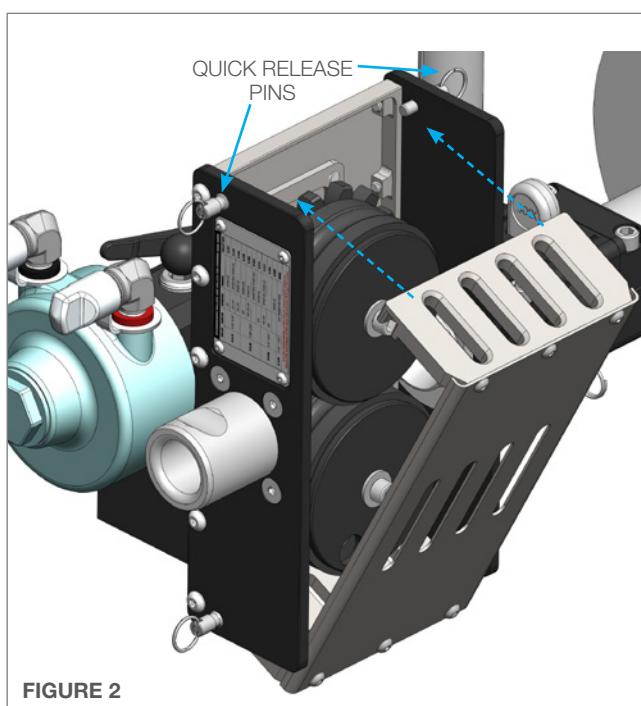
WARNING

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. Choose 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**)

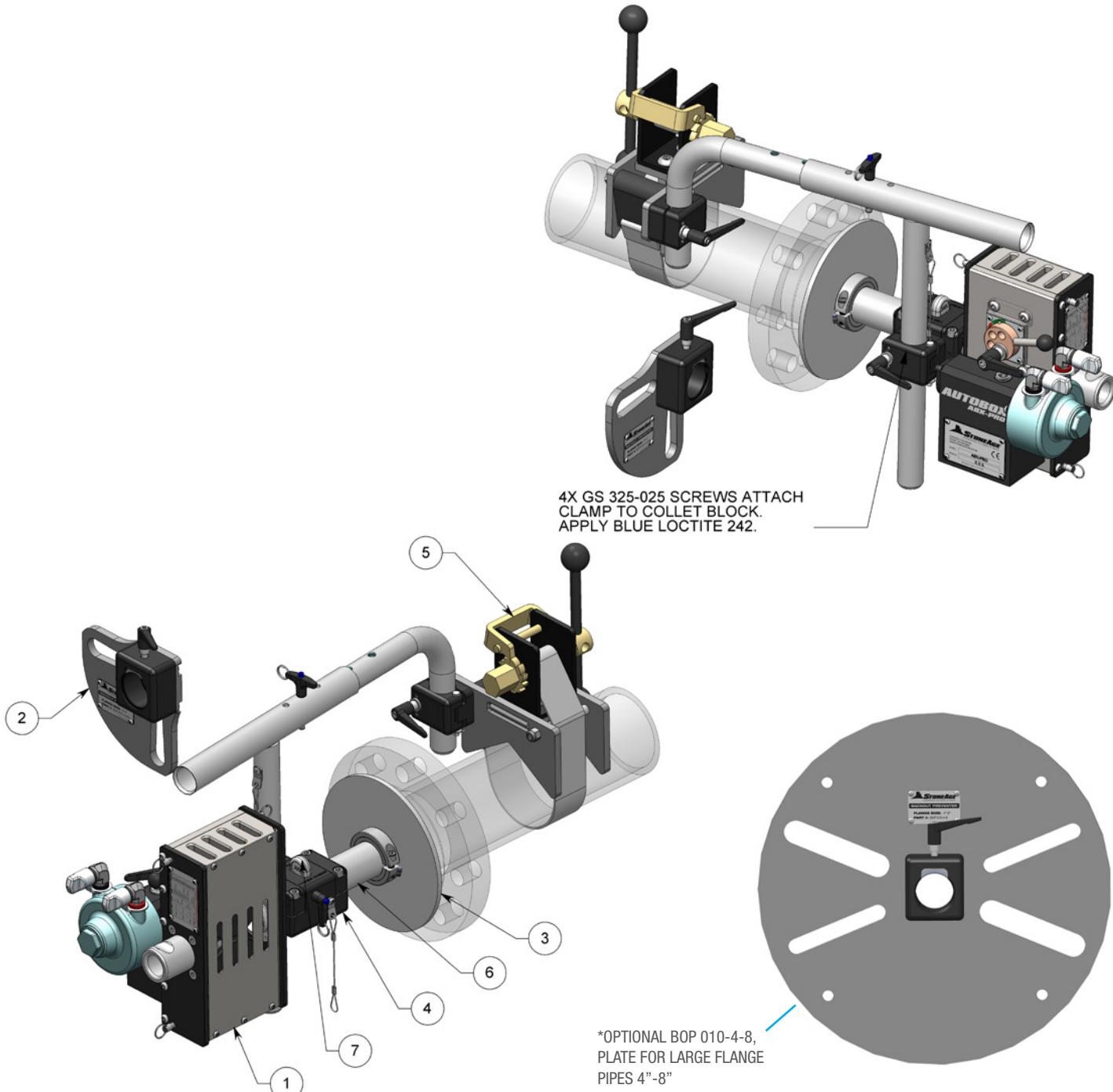


2. Push the back cover back into the closed position and secure the two Quick Release Pins on the top of the ABX-PRO AUTOBOX® PRODRIVE TRACTOR. (**Figure 2**)

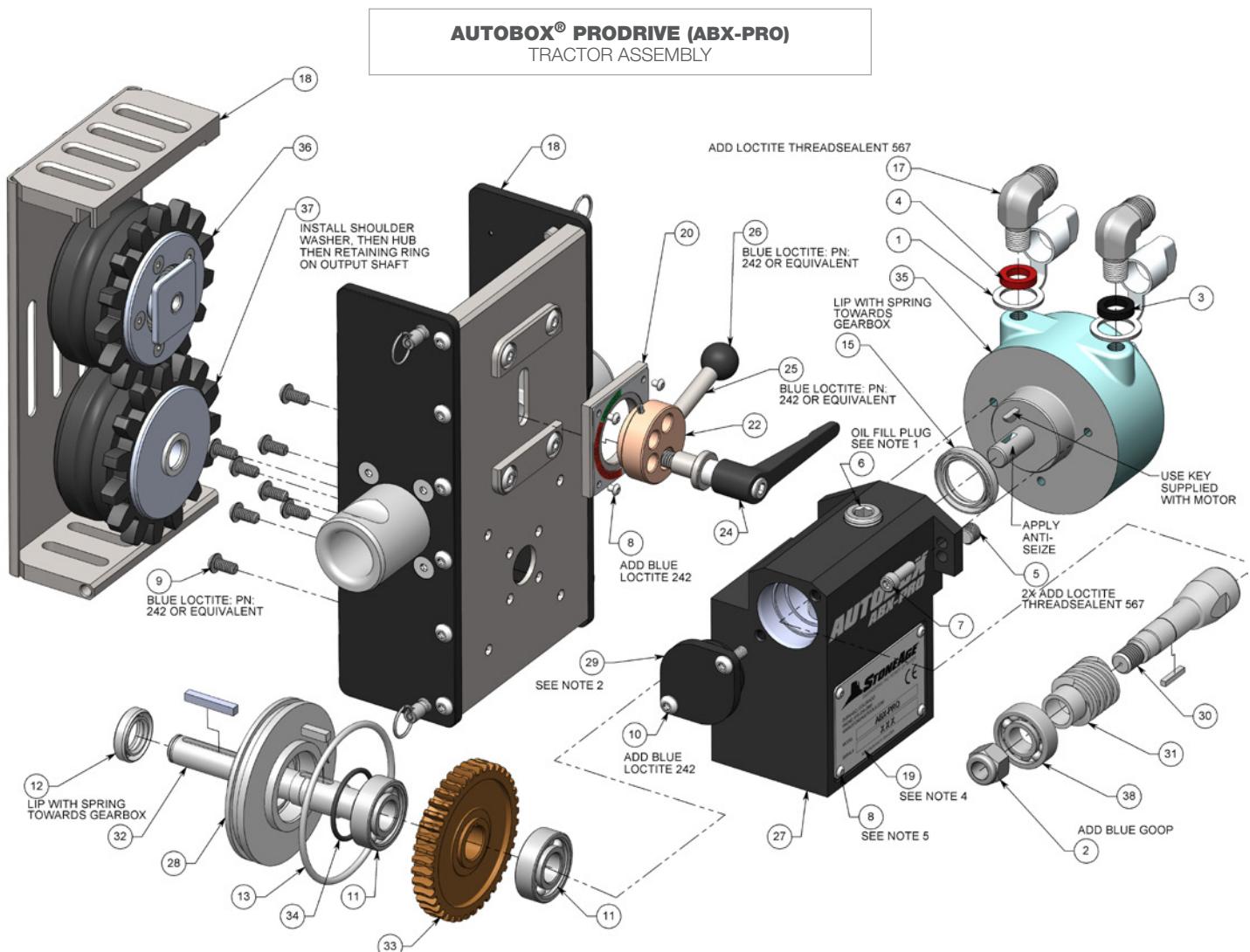


PARTS DIAGRAM

AUTOBOX® PRODRIVE (ABX-PRO-100)
FULL PRODRIVE ASSEMBLY



#	PART NUMBER	QTY.
1	ABX-PRO AUTOBOX 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
7	FF 121-XXX HOSE STOP COLLET SINGLE, .XXX	1



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.

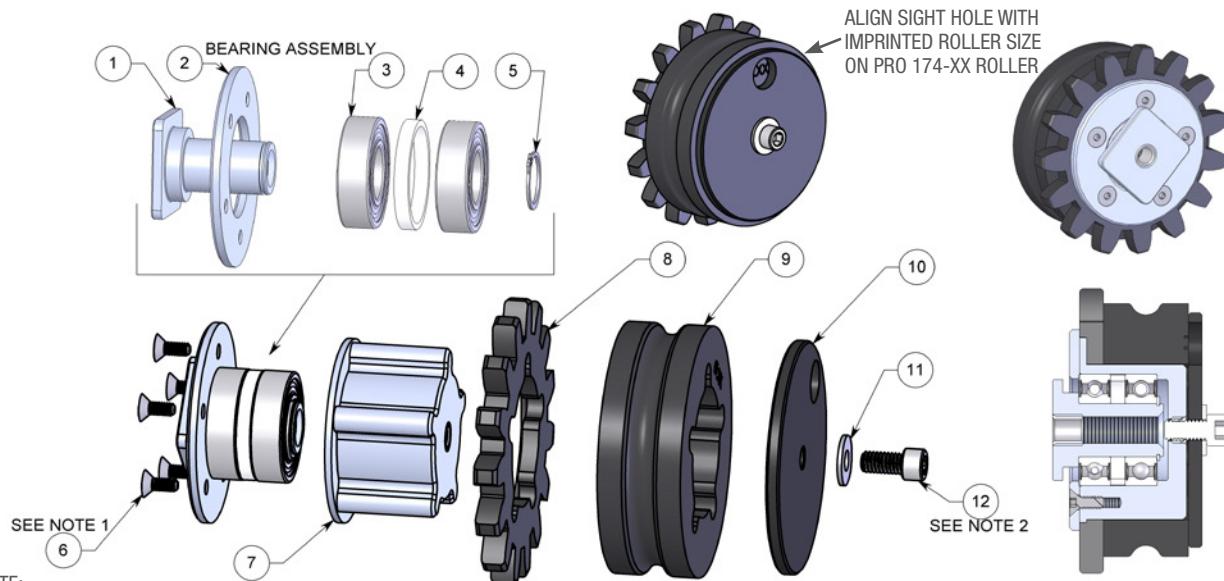
#	PART NUMBER	QTY.
1	BR 167 90° DUST CAP	2
2	GN 550-L NYLOK NUT	1
3	GP 013-BK BLACK ID BAND, SM	1
4	GP 013-R RED ID BAND, SM	1
5	GP 025-P2SS HEX SOCKET PLUG	1
6	GP 025-P8SS HEX SOCKET PLUG	1
7	GS 325-03 SHCS .25-20 X .75 SS (TB 050)	2
8	GSB 313-0075 BHCS 6-32 X .188 LG SS	8
9	GSB 325-02 BHCS .25-20 X .50 LG SS	8
10	GSB 325-03 BHCS .25-20 X .75 LG SS	2
11	HLXD 002 BEARING, OUTPUT	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 FITTING, ELBOW OUTLET P4J8 90°	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	1
32	PRO 136 OUTPUT SHAFT	1
33	PRO 137 WORM GEAR 20-1	1
34	PRO 138 O-RING	1
35	PRO 155 AIR MOTOR	1
36	PRO 170 IDLER ROLLER ASSEMBLY	1
37	PRO 181 DRIVE ROLLER ASSEMBLY	1
38	RJ 009 BEARING	1

PARTS DIAGRAM

PRO 170
IDLER ROLLER ASSEMBLY

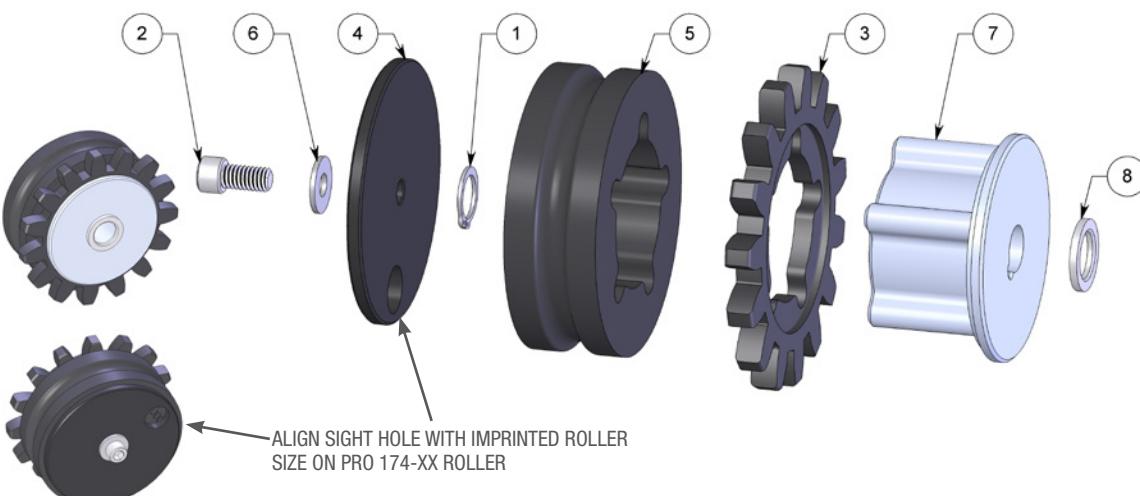


#	PART NUMBER	QTY.
1	PRO 176 IDLER SHAFT	1
2	PRO 177 IDLER BEARING PLATE	1
3	PRO 178 BEARING	2
4	PRO 179 BEARING SPACER OD	1

5	PRO 180 RETAINING RING	1
6	GSF 319-02-24 FHCS .19-24 X .50 LG SS	5
7	PRO 171 IDLER HUB	1
8	PRO 172 ROLLER GEAR 15T	1

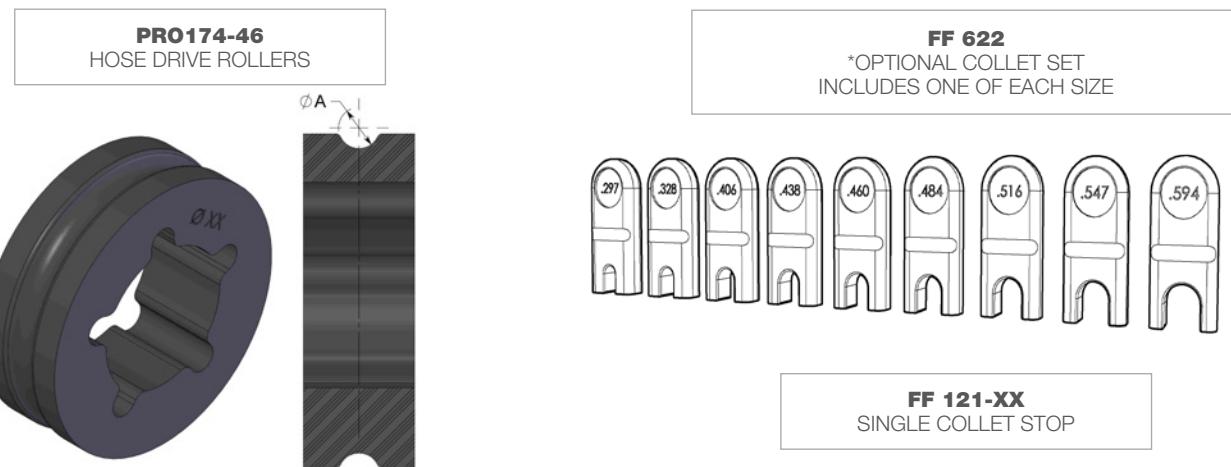
9	PRO 174-46 POLY ROLLER	1
10	PRO 173 ROLLER PLATE	1
11	PRO 175 HIGH-STRENGTH WASHER	1
12	GS 331-025 SHCS .31-18 X .62 SS	1

PRO 181
DRIVE ROLLER ASSEMBLY

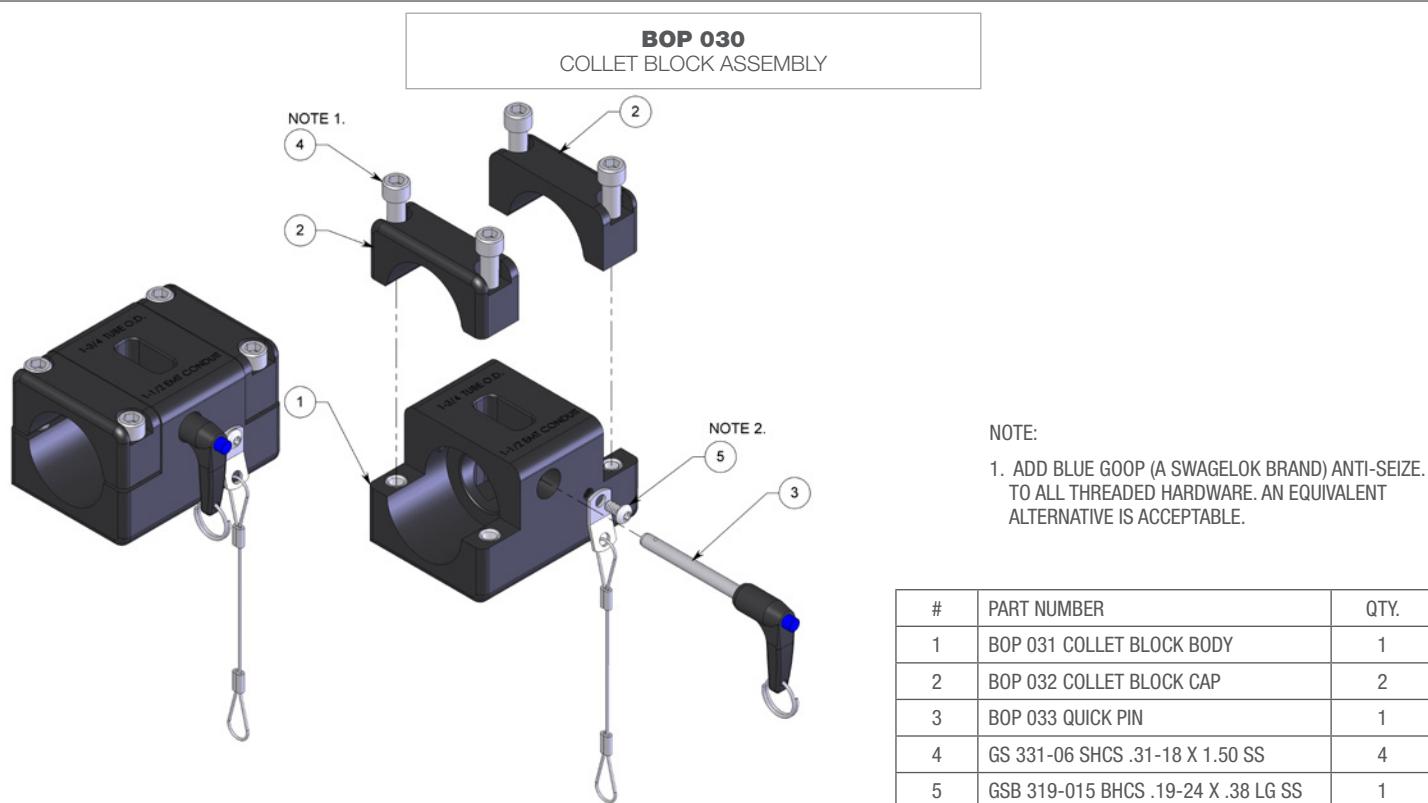


#	PART NUMBER	QTY.
1	ABX 249 RETAINING RING, HD EXT SS	1
2	GS 531-025 SHCS .31-18 X .62 SS	1
3	PRO 172 ROLLER GEAR	1
4	PRO 173 ROLLER PLATE	1

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

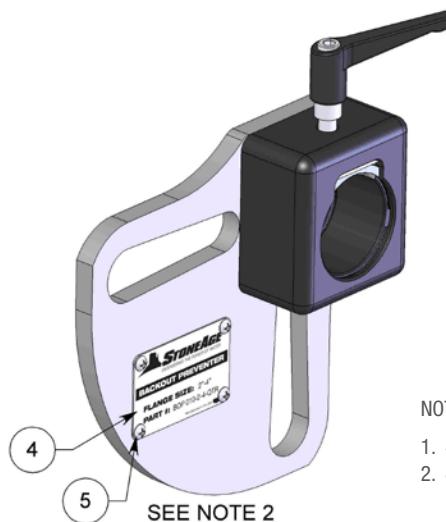


ROLLER INSIDE ABX-PRO-100	HOSE OD	SPIRSTAR	PARKER	COLLET SIZE	COLLET
PRO 174-34 Ø 0.34 IN.	0.26–0.38 IN.	3/2	2240D-02	0.297 in. / 7.5 mm	FF 121-297
		3/4, 4/2	2240D-025, 2440D-02	0.328 in. / 8.0 mm	FF 121-328
		3/6, 5/2	2240D-03	0.406 in. / 10.0 mm	FF 121-406
PRO 174-46 Ø 0.46 IN.	0.39–0.50 IN.	4/4	2448D-025	0.438 in. / 11.0 mm	FF 121-438
		4/6, 5/4, 6/2	2240D-04	0.460 in. / 11.7 mm	FF 121-460
		6/4	2640D-025, 2740D-03	0.484 in. / 12.3 mm	FF 121-484
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
		8/4	2440D-05	0.594 in. / 15.0 mm	FF 121-594
				0.625 in. / 16.0 mm	FF 121-625
PRO 174-89 Ø 0.89 IN.	0.80–0.93 IN.	3/8" RUBBER WB HOSE	N/A	N/A	N/A

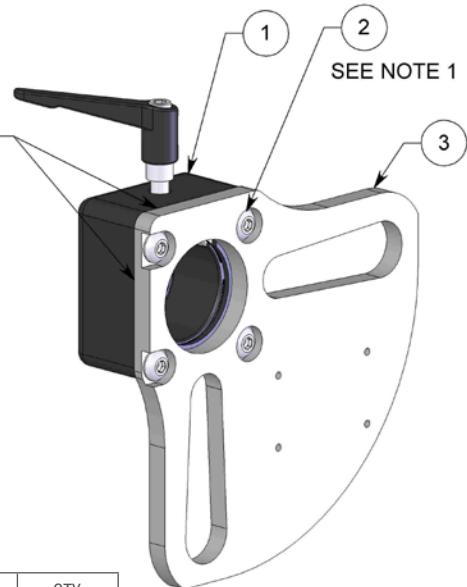


PARTS DIAGRAM

BOP-010-2-4 QTR
QUARTER PLATE BOP



NOTE ORIENTATION OF PLATE,
ALIGN THESE EDGES FLUSH

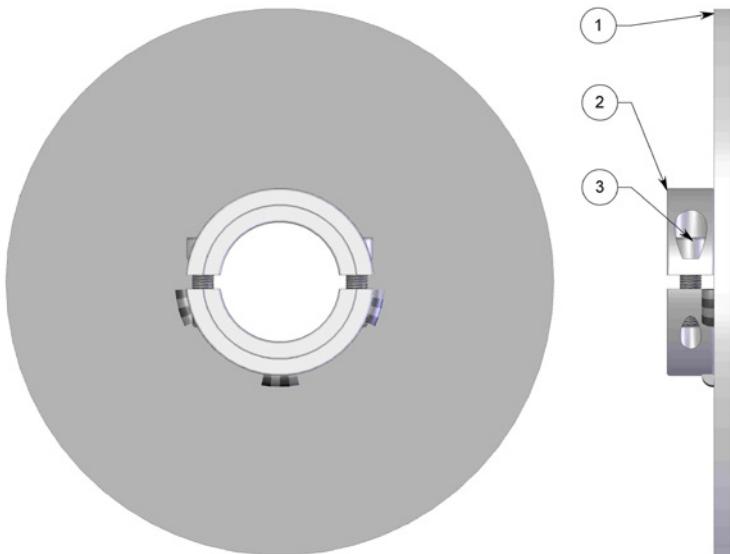


NOTE:

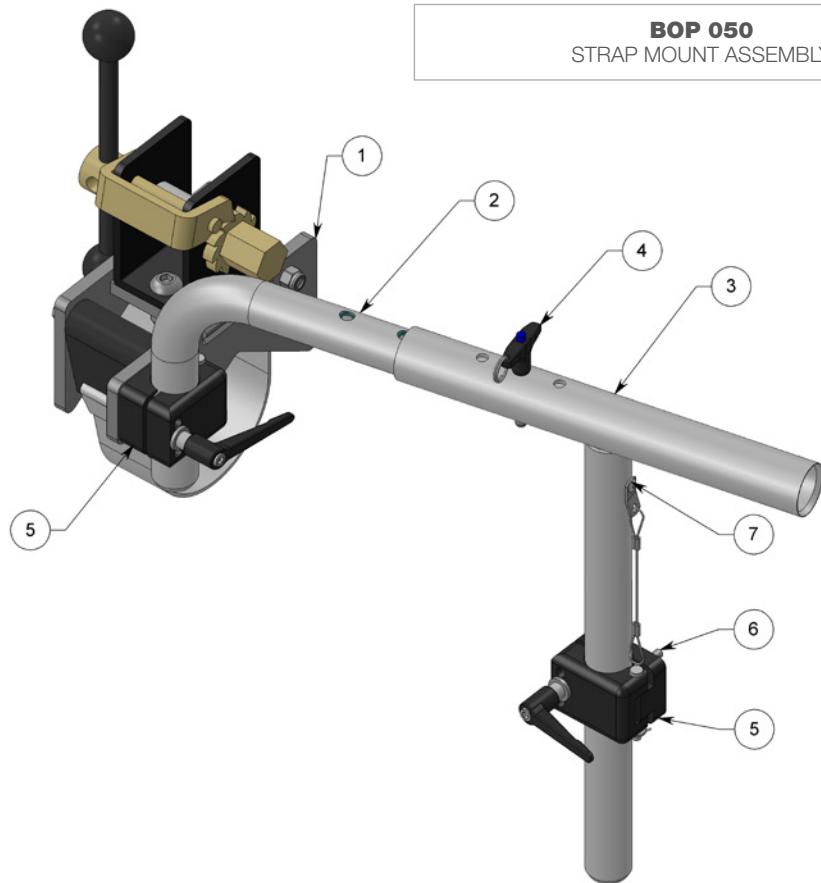
1. 4x BLUE LOCTITE: PN: 242 OR EQUIVALENT
2. 4x RED LOCTITE: PN: 262 OR EQUIVALENT

#	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	1
4	BOP 013 SCREW 6-32X.25 SELF TAP	4
5	GSB 331-03 BHCS .31-18 X .75 LG	4

BOP 012
SPLASH PLATE WELDMENT



#	PART NUMBER	QTY.
1	BOP 012.1 SPLASH PLATE	1
2	BOP 012.2 SPLIT COLLAR 1.75 ALUMINUM	1
3	GS 331-04-24 SHCS .31-24 X 1.00 SS	2



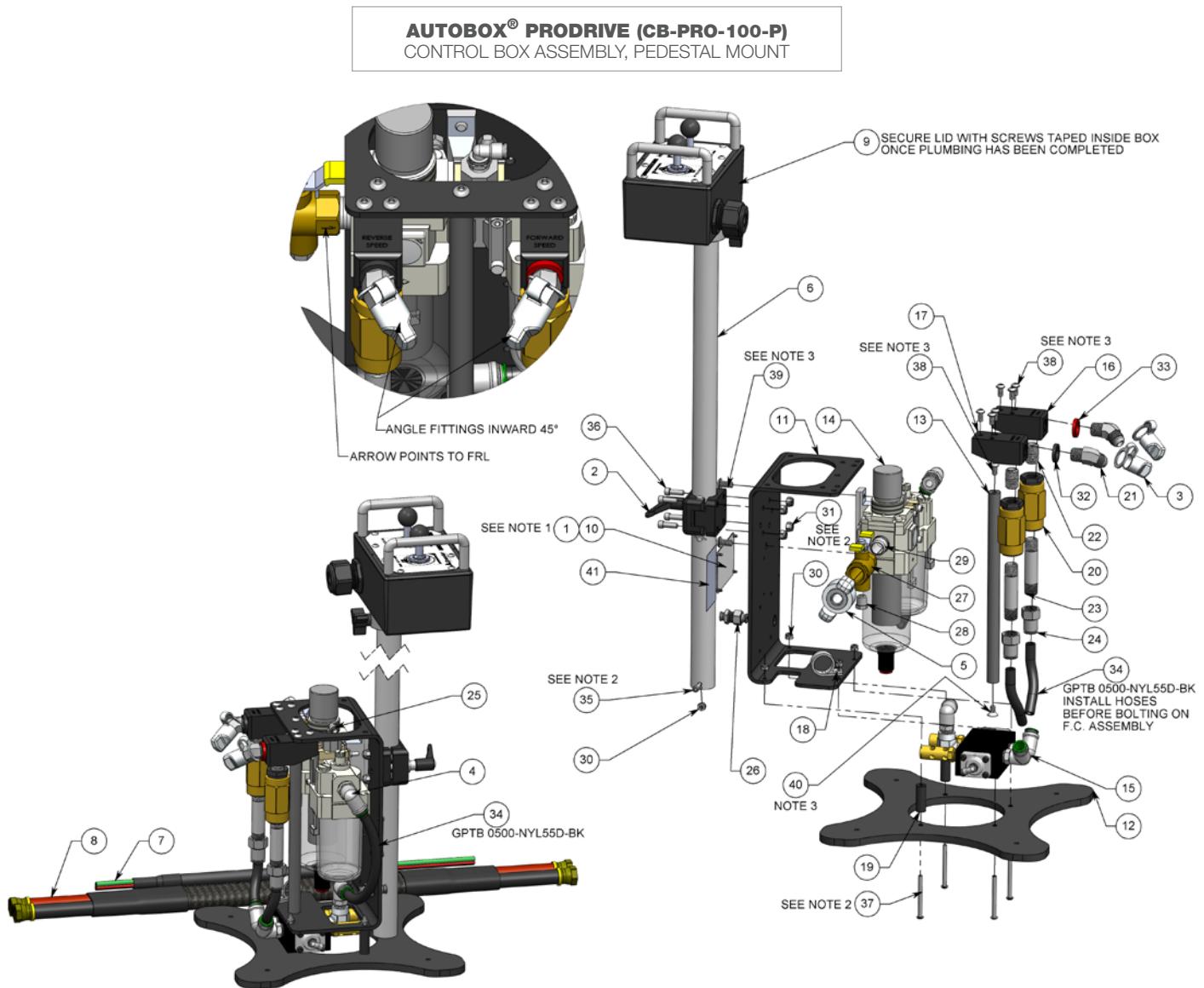
BOP 050
STRAP MOUNT ASSEMBLY

#	PART NUMBER	QTY.
1	BOP 051 RATCHET STRAP ASSY	1
2	BOP 057 POSITIONER ARM MALE	1
3	BOP 058 POSITIONER TUBE, FEMALE WELDMENT	1
4	BOP 059 QUICK PIN	1
5	BOP 070 HINGE CLAMP ASSEMBLY	2
6	GS 325-025 SHCS .25-20 X .62 SS	8
7	TB 015.1 RIVET	1

BOP 082-9-45
1.75 X R9 X 45 DEG
SNOUT TUBE



PARTS DIAGRAM

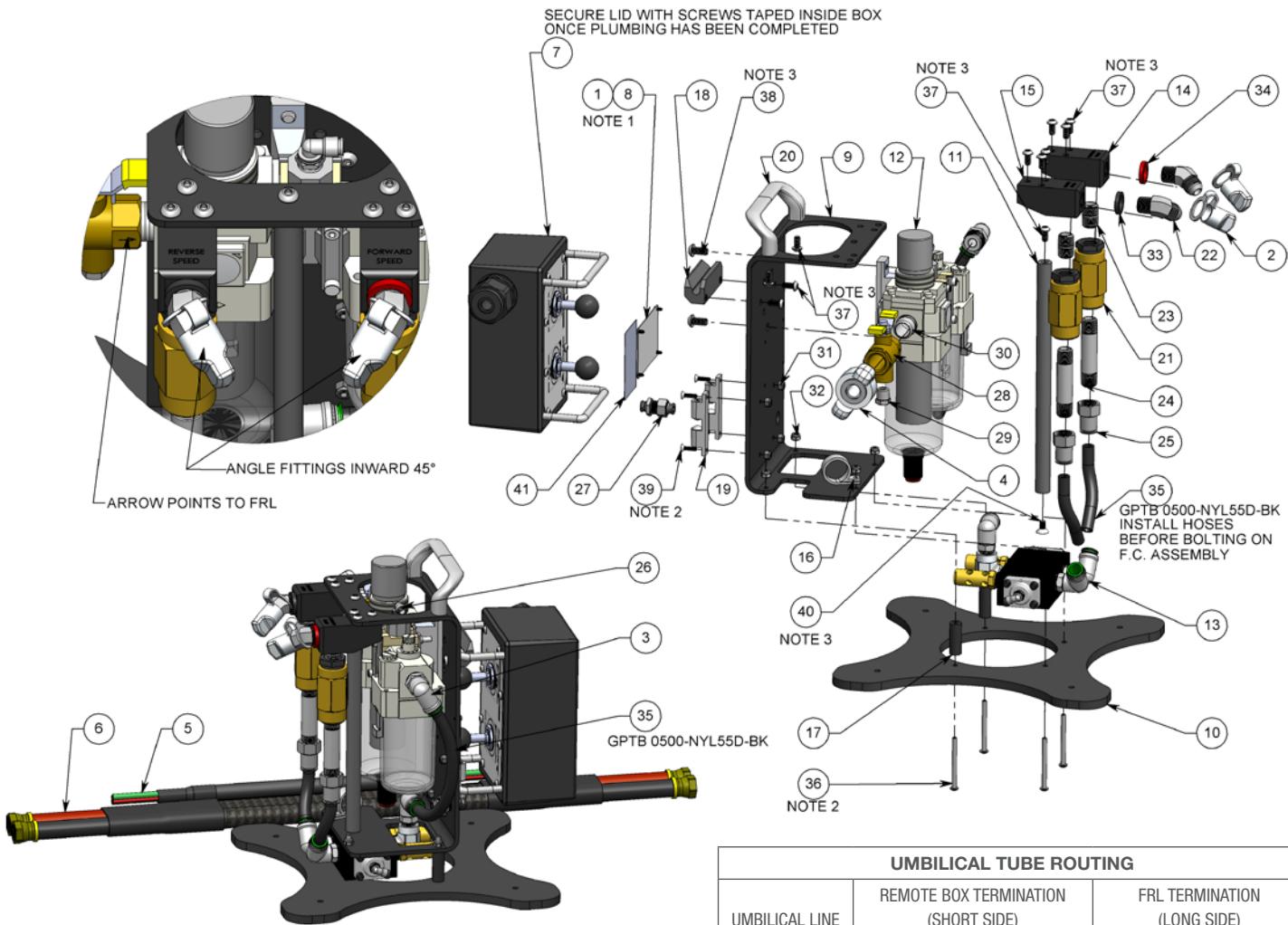


NOTE:

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

#	PART NUMBER	QTY.					
1	BOP 013 SCREW 6-32X.25 SELF TAP	4	14	CB 763 FRL ASSY, ABX-PRO	1	28	CB 793 BREather, SINTERED BRONZE, P4
2	BOP 070 HINGE CLAMP ASSEMBLY	1	15	CB 764 SPOOL VALVE ASSY, ABX-PRO	1	29	CB 794 PIPE NIPPLE, P8P8 X 1.13 SS
3	BR 167 DUST CAP	2	16	CB 765-XXX 90 DEG FLOW CONTROL BLOCK	1	30	GN 319-L NYLOK NUT SS (HC 025.1)
4	BUD 142 FITTING 90° SWIVEL P8MPL8	1	17	CB 765-XXX 90 DEG FLOW CONTROL BLOCK	1	31	GN 325-L NYLOK NUT SS (TB 044.1)
5	CB 114 INLET FITTING	1	18	CB 766 LOOP CLAMP	1	32	GP 011-BK BLACK ID BAND MED
6	CB 727 REMOTE BOX POLE, 1.25OD	1	19	CB 767 FRAME SPACER	2	33	GP 011-R RED ID BAND MED
7	CB 740-10 PRODRIVE UMBILICAL ASSEMBLY	1	20	CB 780-P6 IN-LINE FLOW CONTROL, P6	2	34	GPTB 0500-NYL55D-BK
8	CB 745-15 PRODRIVE SUPPLY HOSE BUNDLE	1	21	CB 781 FITTING, 45DEG, P6J8	2	35	GS 319-02 SHCS .19-24 X .50 SS
9	CB 750-X ABX-PRO REMOTE BOX ASSEMBLY	1	22	CB 782 PIPE NIPPLE P6P6 X 1.00 SS	2	36	GS 325-03 SHCS .25-20 X .75 SS
10	CB 754 CE SERIAL PLATE	1	23	CB 783 PIPE NIPPLE P6P6 X 3.00 SS	2	37	GSB 319-09 BHCS .19-24 X 2.25 LG SS
11	CB 760 FRL FRAME, ABX-PRO	1	24	CB 784 FITTING, P6PL8	2	38	GSB 325-02 BHCS .25-20 X .50 LG SS
12	CB 761 FRL BASE	1	25	CB 786 FITTING, 90DEG SWIVEL, P4MPL4	1	39	GSB 331-025 BHCS .31-18 X .62 LG SS
13	CB 762 FRL SUPPORT ROD, ABX-PRO	1	26	CB 790 FITTING, BULKHEAD, PL4PL4	1	40	GSF 325-02 FHCS .25-20 X .50 LG SS
			27	CB 792 VALVE, AUTODRAIN, P8	1	41	PL 156-125 CAUTION INLET AIR, 125PSI MAX

AUTOBOX® PRODRIVE (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. APPLY TEFLON TAPE OR EQUIVALENT TO ALL NPT THREADS.

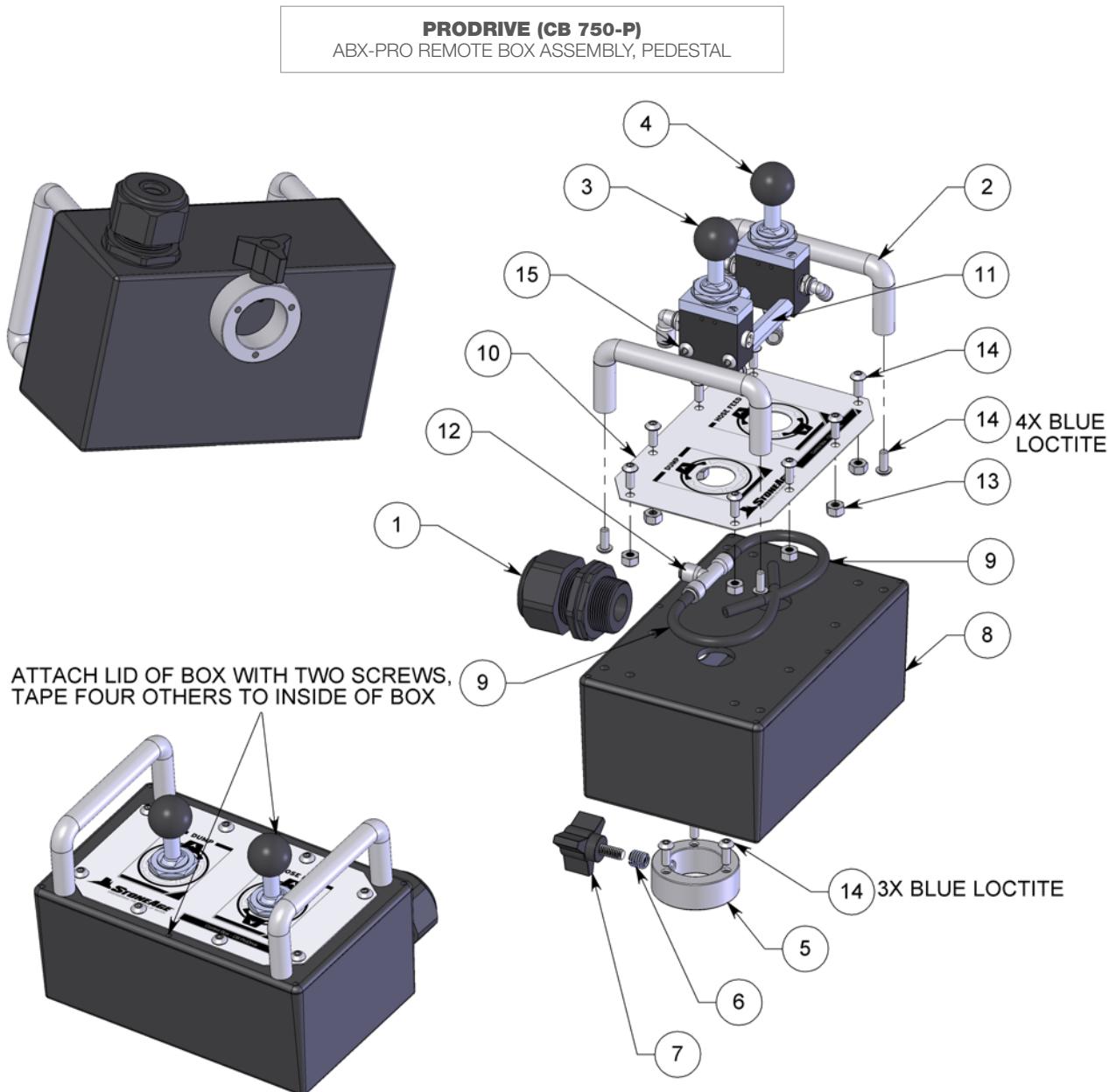
UMBILICAL TUBE ROUTING		
UMBILICAL LINE	REMOTE BOX TERMINATION (SHORT SIDE)	FRL TERMINATION (LONG SIDE)
1/4" BLACK	TEE FOR SUPPLY	DRY AIR TAP
1/4" GREEN	DUMP	BULKHEAD DUMP
1/8" BLACK	FORWARD	"REVERSE SPEED" SIDE
1/8" RED	REVERSE	"FORWARD SPEED" SIDE

#	PART NUMBER	QTY.
1	BOP 013 SCREW 6-32X.25 SELF TAP	4
2	BR 167 DUST CAP	2
3	BUD 142 FITTING 90° SWIVEL P8MPL8	1
4	CB 114 INLET FITTING	1
5	CB 740-10 PRODRIVE UMBILICAL ASSEMBLY	1
6	CB 745-15 PRODRIVE SUPPLY HOSE BUNDLE	1
7	CB 750-X ABX-PRO REMOTE BOX ASSEMBLY	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 FRL ASSY, ABX-PRO	1
13	CB 764 SPOOL VALVE ASSY, ABX-PRO	1

14	CB 765-XXX 90 DEG FLOW CONTROL BLOCK	1
15	CB 765-XXX 90 DEG FLOW CONTROL BLOCK	1
16	CB 766 LOOP CLAMP	1
17	CB 767 FRAME 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 FITTING, 45DEG, P6J8	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 FITTING, P6PL8	2
26	CB 786 FITTING, 90DEG SWIVEL, P4MPL4	1
27	CB 790 FITTING, BULKHEAD, PL4PL4	1

28	CB 792 VALVE, AUTODRAIN, P8	1
29	CB 793 BREATHER, SINTERED BRONZE, P4	1
30	CB 794 PIPE NIPPLE, P8P8 X 1.13 SS	1
31	GN 316-L-32 NYLOK NUT SS	4
32	GN 319-L NYLOK NUT SS (HC 025.1)	4
33	GP 011-BK BLACK ID BAND MED	1
34	GP 011-R RED ID BAND MED	1
35	GPTB 0500-NYL55D-BK	2FT
36	GSB 319-09 BHCS .19-24 X 2.25 LG SS	4
37	GSB 325-02 BHCS .25-20 X .50 LG SS	11
38	GSB 331-025 BHCS .31-18 X .62 LG SS	2
39	GSF 316-025 FHCS .16-32 X .63 LG SS	4
40	GSF 325-02 FHCS .25-20 X .50 LG SS	1
41	PL 156-125 CAUTION INLET AIR, 125PSI MAX	1

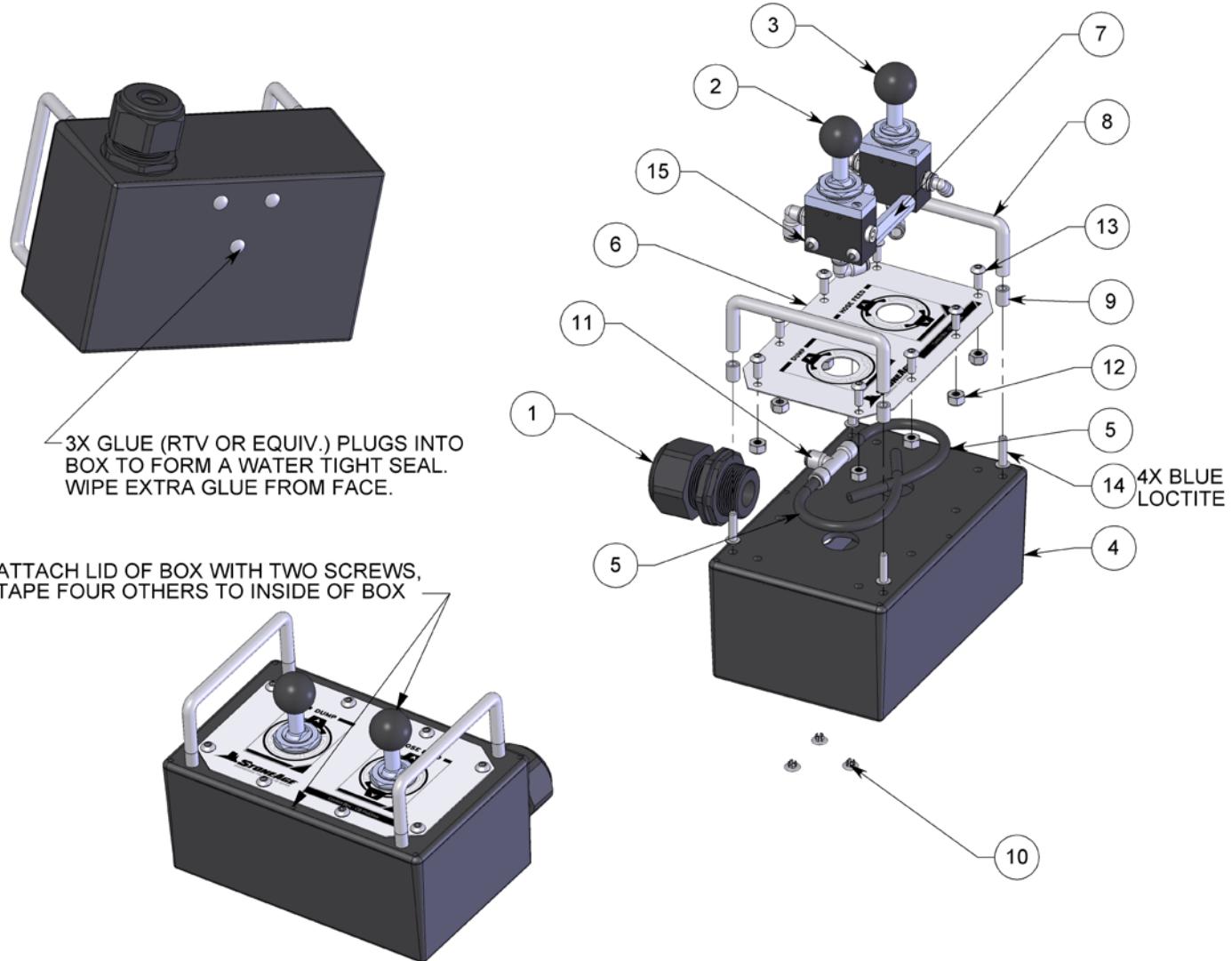
PARTS DIAGRAM



#	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

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

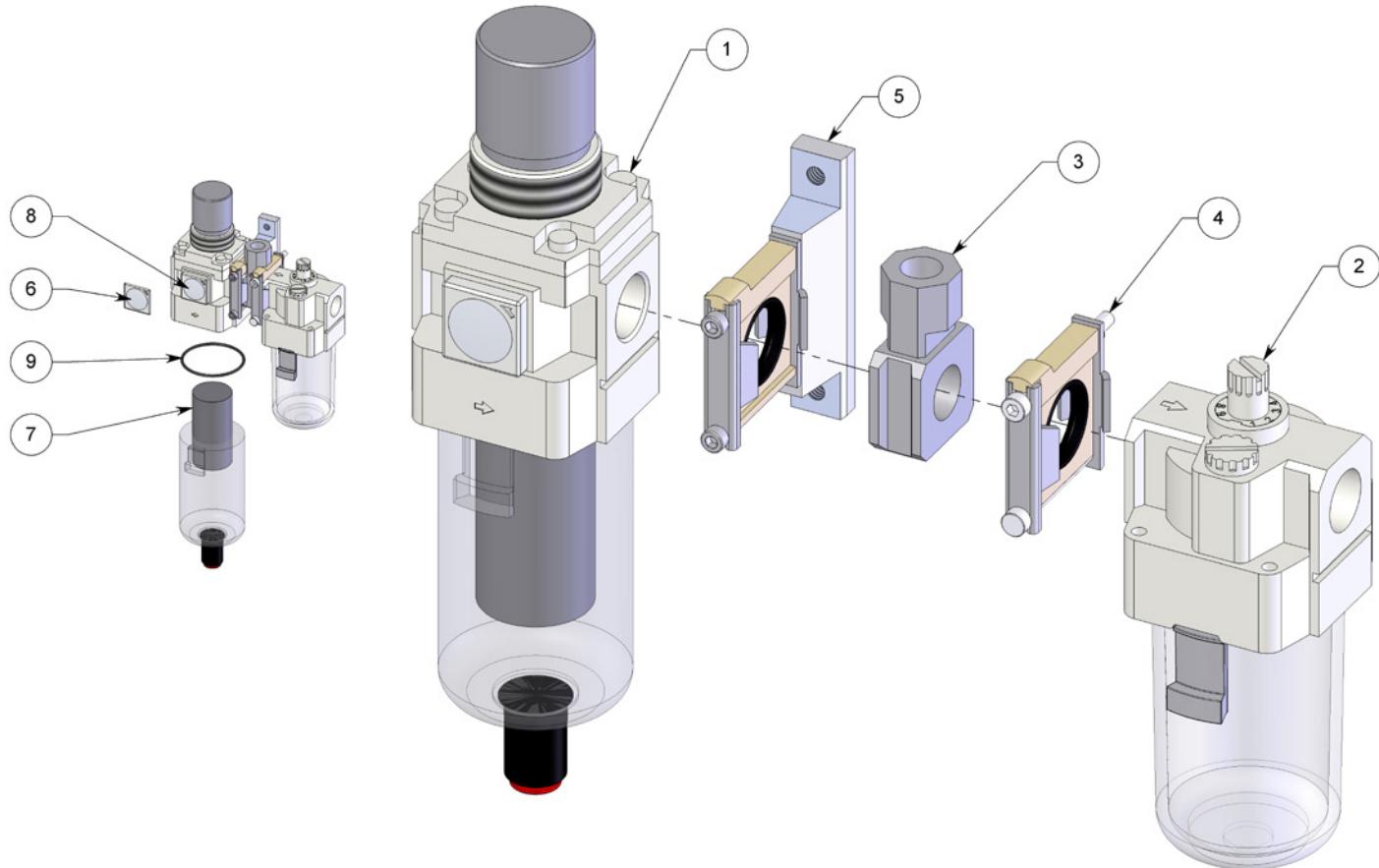


#	PART NUMBER	QTY.
1	CB 714 CORD GRIP, .51-.79	1
2	CB 721 PNEUM 3WAY ASSY, DUMP	1
3	CB 722 PNEUM 3WAY ASSY, FWD-REV	1
4	CB 751 ENCLOSURE, ABX-PRO	1
5	CB 751.1 TUBE, REMOTE BOX CONTROLS	2
6	CB 752 GRAPHIC ABX-PRO	1
7	CB 753 HEX STANDOFF	2

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

PARTS DIAGRAM

PRODRIVE (CB 763)
ABX-PRO FILTER, REGULATOR, LUBRICATOR ASSEMBLY



#	PART NUMBER	QTY.
1	CB 312.1 GEN3 REGULATOR-FILTER	1
2	CB 312.2 LUBRICATOR AL40-N04-Z-A	1
3	CB 312.4 SPACER ATTACHMENT Y410-N02-A	1
4	CB 312.5 SPACER W-O BRACKET, GEN2 Y400	1
5	CB 763.1 MODIFIED SPACER W-O BRACKET, GEN2 Y400	1
6	CB 312.1.4 LENS COVER FOR GAUGE	1
7	CB 312.1.6 FILTER	1
8	CB 312.1.7 GAUGE WITH LENS	1
9	CB 312.1.8 O-RING	1

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TERMS AND CONDITIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

STONEAGE PATENT DATA

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

<http://www.sapatents.com>



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