

PRODRIVE (ABX-PRO) USER MANUAL

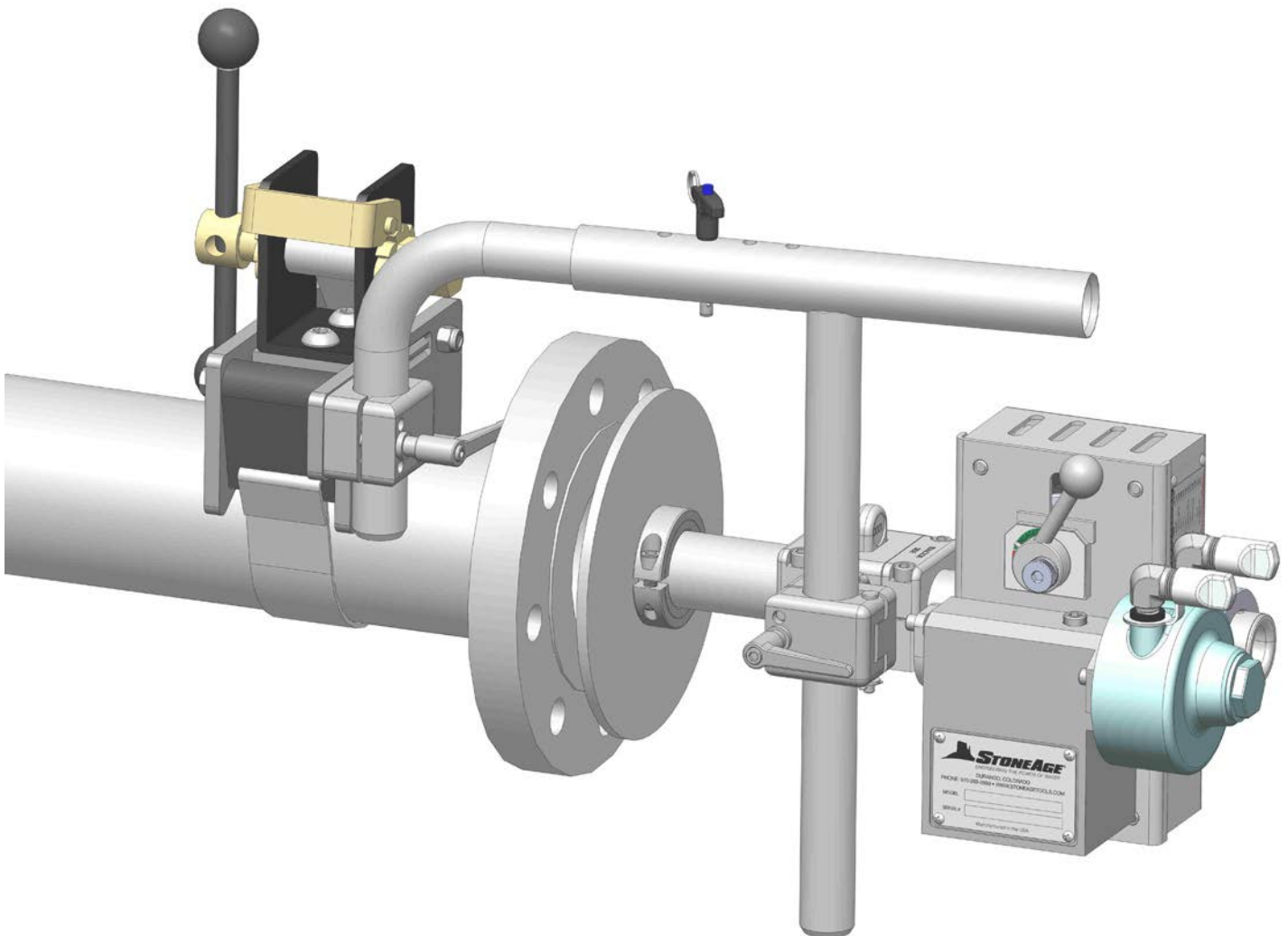


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This manual must be used in accordance with all applicable national laws. The manual shall be regarded as a part of the machine and shall be kept for reference until the final dismantling of the machine, as defined by applicable national law(s).

SPECIFICATIONS

GENERAL:

Max. Feed Rate	2.5 ft/sec (762 mm/sec)
Min. Feed Rate	0.2 ft/sec (61 mm/sec)
Poly Hose Size	4/2–8/4, 3/8 Rubber Covered
Air Connection to CB	Chicago style twist-claw fitting
Air Connection from CB to Tractor	½" JIC

WEIGHTS:

ProDrive PRO-150 with rollers	< 30 lbs (13.6 kg)
Winch Pipe Clamp	11 lb (5.0 kg)
Floor Stand Control Box	14 lb (6.4 kg)

DIMENSIONS:

ProDrive ABX-PRO	12.5" x 6" x 9.5" (318 mm x 152 mm x 241 mm)
Winch pipe clamp	6.25" x .75" x 8.25" (159 mm x 191 mm x 210 mm)
Floor stand control box	22" x 13" x 14" (559mm x 330mm x 356mm)

DESCRIPTION OF EQUIPMENT AND INTENDED USE

The ProDrive ABX-PRO is a hose feed device designed to quickly and safely clean a broad range of pipes with or without a flange. The ProDrive ABX-PRO mounts to pipes from 2 inches (51 mm) to 12 inches (305 mm) in diameter. The ProDrive ABX-PRO allows the user to be up to 23 feet (7010 mm) from the pipe entrance and shielded from a tool, high velocity water, or debris exiting the pipe. Standard safety practices should be followed.

KEY FEATURES:

ProDrive ABX-PRO

- Modular, lightweight design
- Quick install
- Winch Pipe Clamp accommodates a wide variety of pipes

Control Box

- Small, lightweight, ergonomic design that includes a portable floor stand and filter-regulator-lubricator assembly
- 8' (2438 mm) umbilical allows user to move with the controls
- Drive controls: forward/reverse hose feed
- Pneumatic dump control switch

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

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.

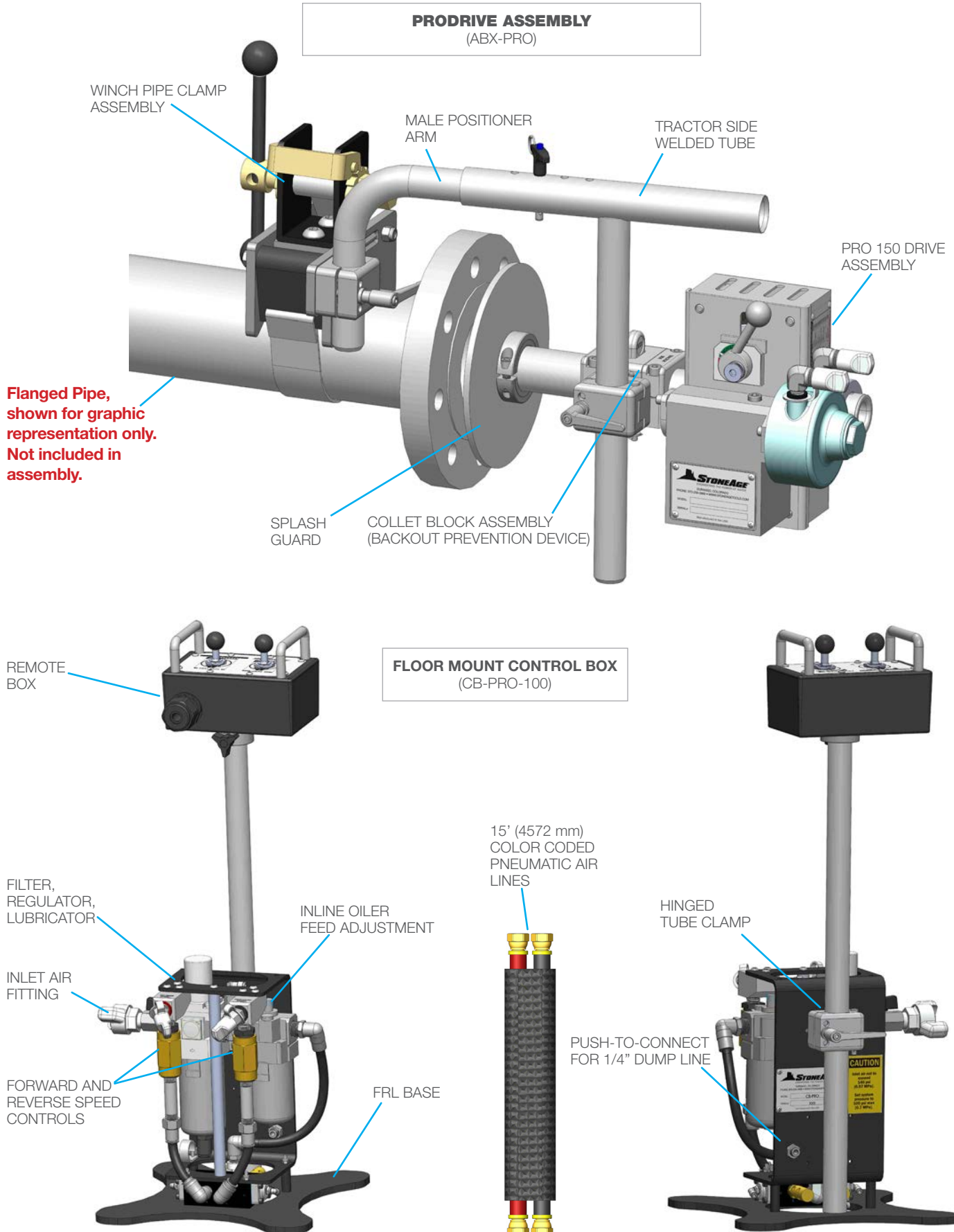
- Do not exceed the maximum operating pressure specified for any component in a system.
- The immediate work area MUST be marked off to keep out untrained persons.
- Inspect the equipment for visible signs of deterioration, damage, and improper assembly. Do not operate if damaged, until repaired.
- Make sure all threaded connections are tight and free of leaks.
- Users of the ProDrive ProDrive 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 Splash Guard of the ProDrive ProDrive ABX-PRO. The adjustment instruction is located in the "ProDrive Set-up" 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 ProDrive 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 a anti-withdrawal device (back-out preventer), and all other applicable safety devices are installed and set-up properly.****
- Test the Control Box before operating the ProDrive ProDrive 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.

SYSTEM ASSEMBLY - OVERVIEW



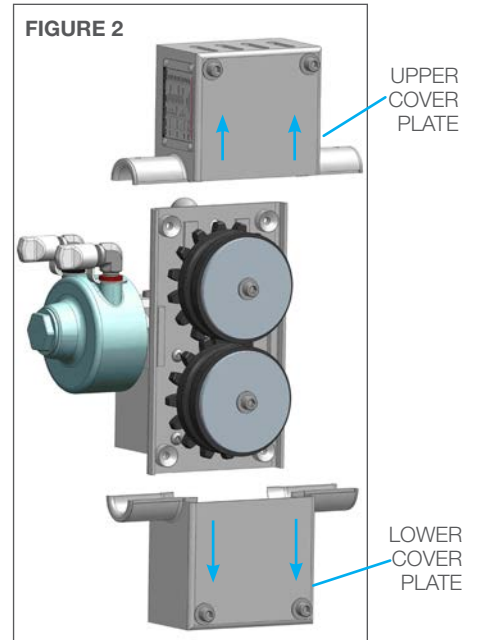
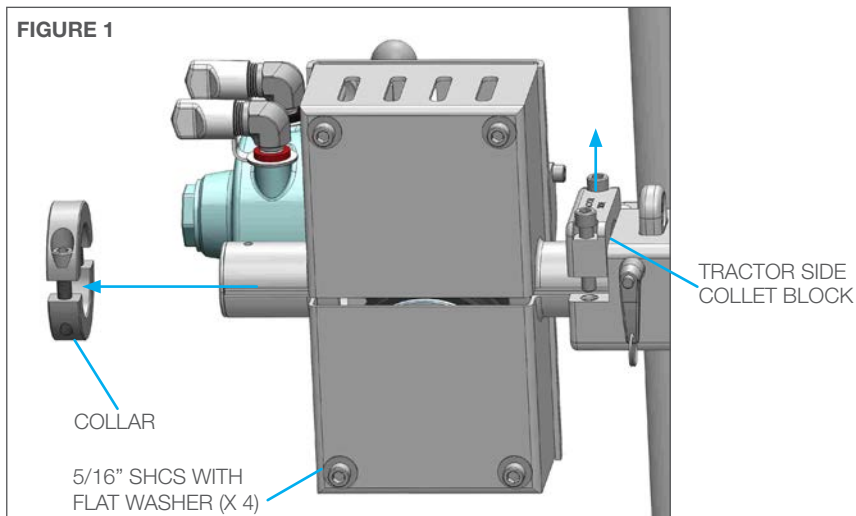
GEARPACK REMOVAL

NOTE: This process will be typical to every size Roller for the PRO 150 Drive Assembly. Installation of the appropriate Roller should be complete prior to setting up the ProDrive ABX-PRO Assembly on a pipe.

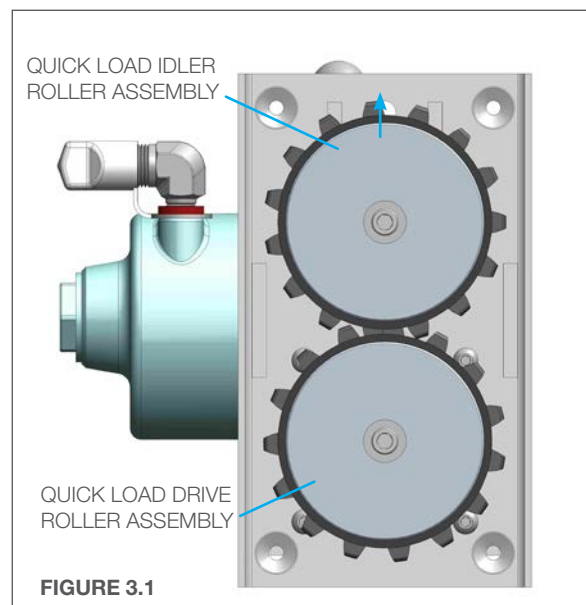
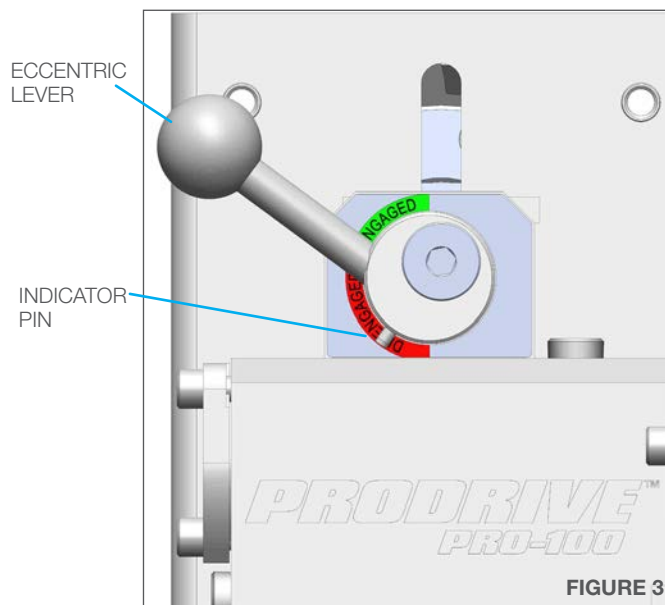
⚠ WARNING

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. Remove the protective Gearbox Cover Plates by removing the Collar Assembly, loosening the Tractor Side Collet Block, and unscrewing the four 5/16" screws with flat washers on both cover plates. **(Figure 1)**
2. Slide the Upper and Lower Cover Plates off in opposing directions and set all parts aside. **(Figure 2)**

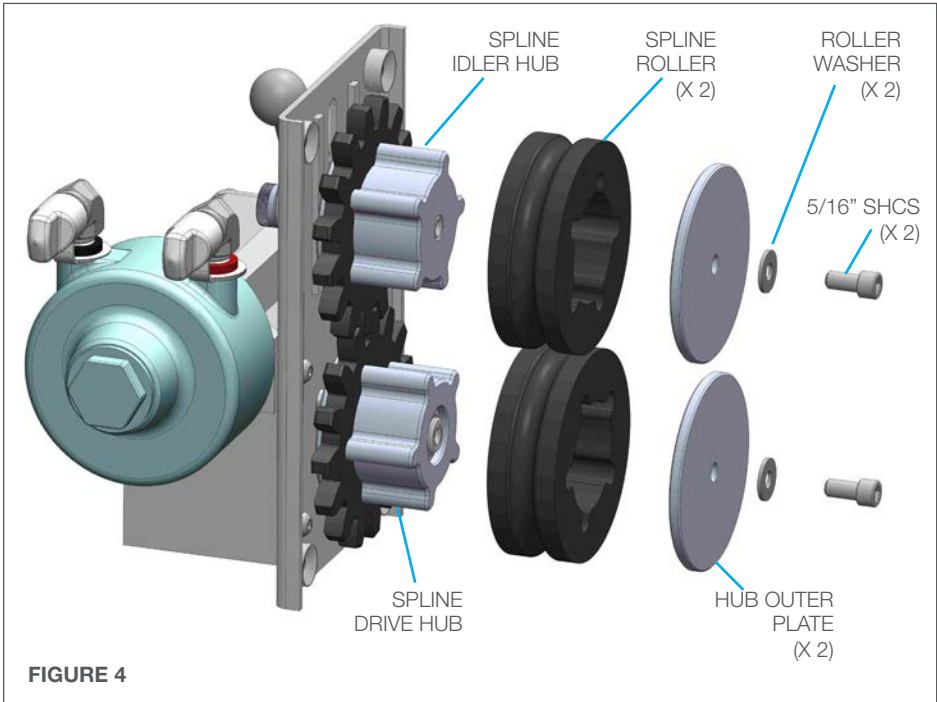


3. Set the Eccentric Lever to **"Disengaged"** in order to raise the Quick Load Idler Roller Assembly. **(Figure 3 and Figure 3.1)** This will create space to ease in the removal of the Poly Rollers.



ROLLER REMOVAL INSTRUCTIONS

4. Remove the two socket head cap screws, Roller Washers, Outer Hub Plates and Spline Rollers. **(Figure 4)**



ROLLER INSTALLATION INSTRUCTIONS

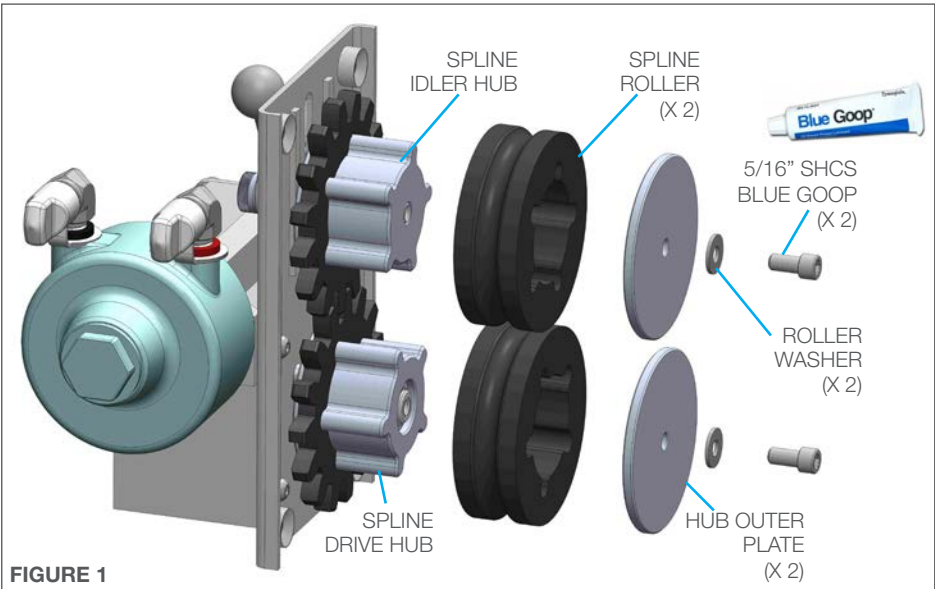
ROLLER INSTALLATION

NOTE: This process will be typical to every size Roller for the PRO 150 Drive Assembly. Installation of the appropriate Roller should be complete prior to setting up the ProDrive ABX-PRO Assembly on a pipe.

⚠ 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. Replace the Spline Rollers with an alternate size or replacement roller. Slide the desired Spline Load Rollers onto the Spline 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)**

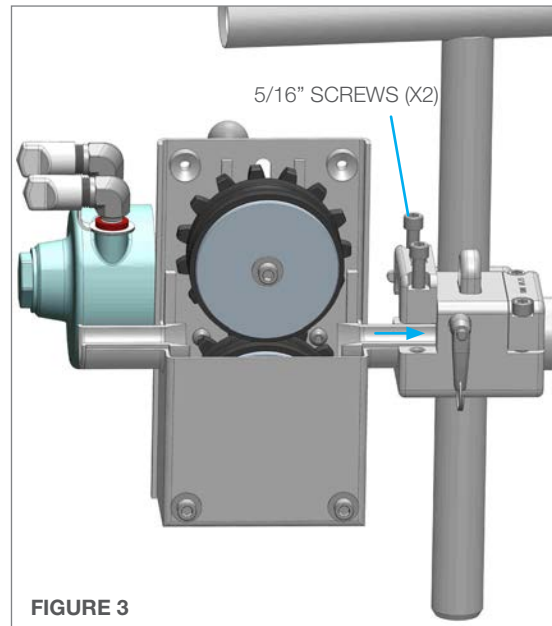
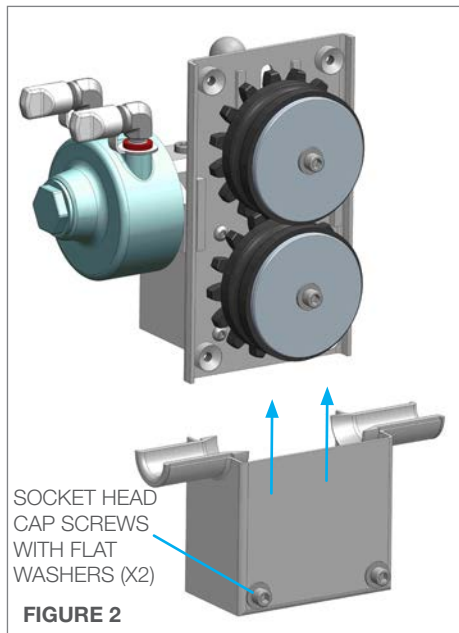


ALTERNATE SIZE ROLLERS



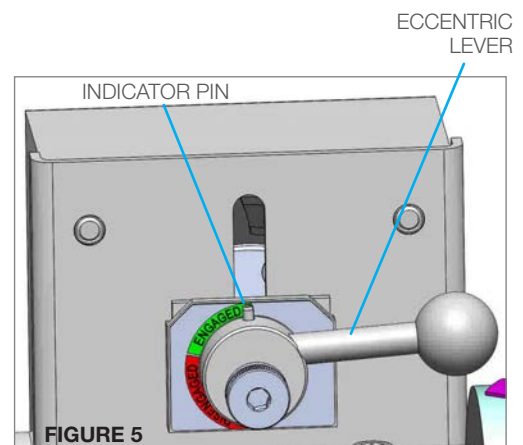
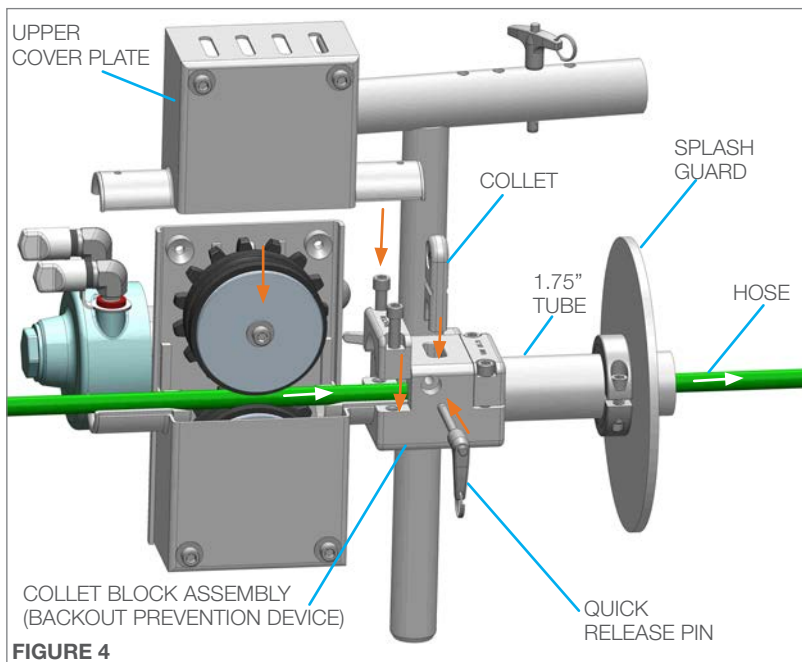
PART NUMBER	ØA
SPLINE POLY ROLLER-34	Ø.34
SPLINE POLY ROLLER-46	Ø.46
SPLINE POLY ROLLER-58	Ø.58
SPLINE POLY ROLLER-89	Ø.89

2. Install the Lower Cover Plate. Tighten the 2 socket head cap screws with flat washers. **(Figure 2)**
3. Slide the Lower Cover Plate into the Tractor Side of the Collet Block Assembly. Leave the two 5/16" screws on the Collet block loose. **(Figure 3)**



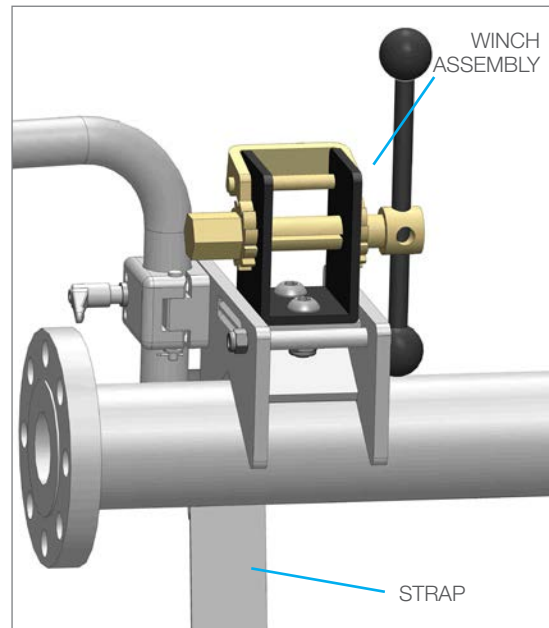
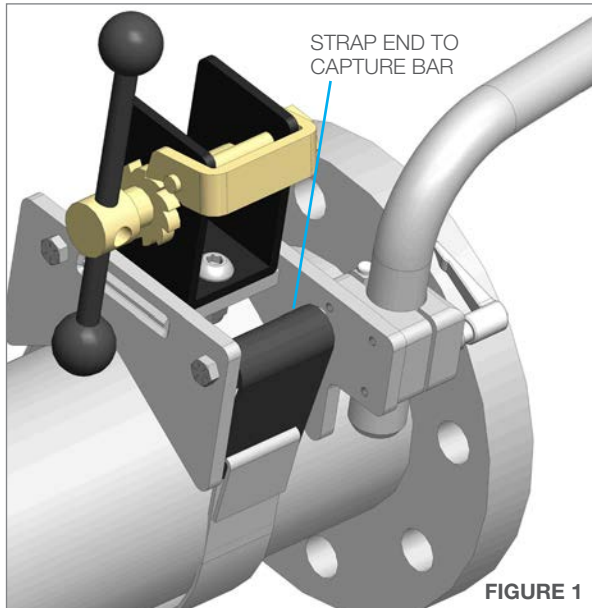
4. Install Hose into Pro-100 ProDrive Assembly **NOTE: Through loading of the hose is possible with low profile male**

- Remove the Quick Release Pin and pull the Collet from the Collet Block Assembly.
- Insert tool end of the hose through the Collet Block Assembly, 1.75" pipe, and past the Splash Guard.
- If the tool is less than 2 inches in diameter, pull back on the hose to ensure that the Collet does not allow the hose crimp to back through into the Collet Block Assembly
- Select the appropriate Collet size for the hose being used with the ProDrive Assembly. (See "Recommended Collets For Common Hose Sizes" plaque on the PRO 150 ProDrive Assembly.) Install the Collet and quick release pin.
- Rotate the Eccentric Lever to **"Engaged"** so the Idler Roller tightens down onto the hose.
- Install the Upper Cover Plate by sliding one side into the loosened Collet Block Assembly.
- Tighten the two screws on the Collet Block and the two 5/16" socket head cap screws with flat washers on the Upper Cover.

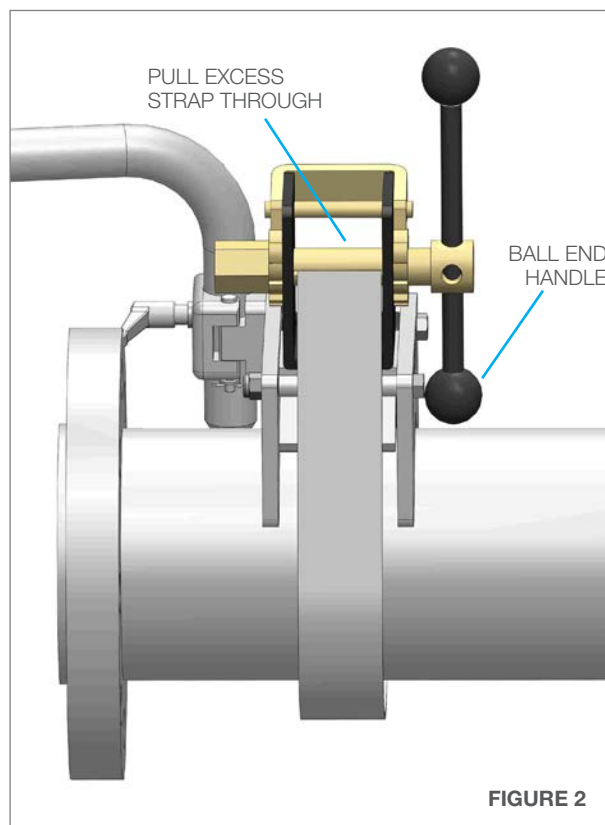


RATCHET STRAP ASSEMBLY TO PIPE

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**)

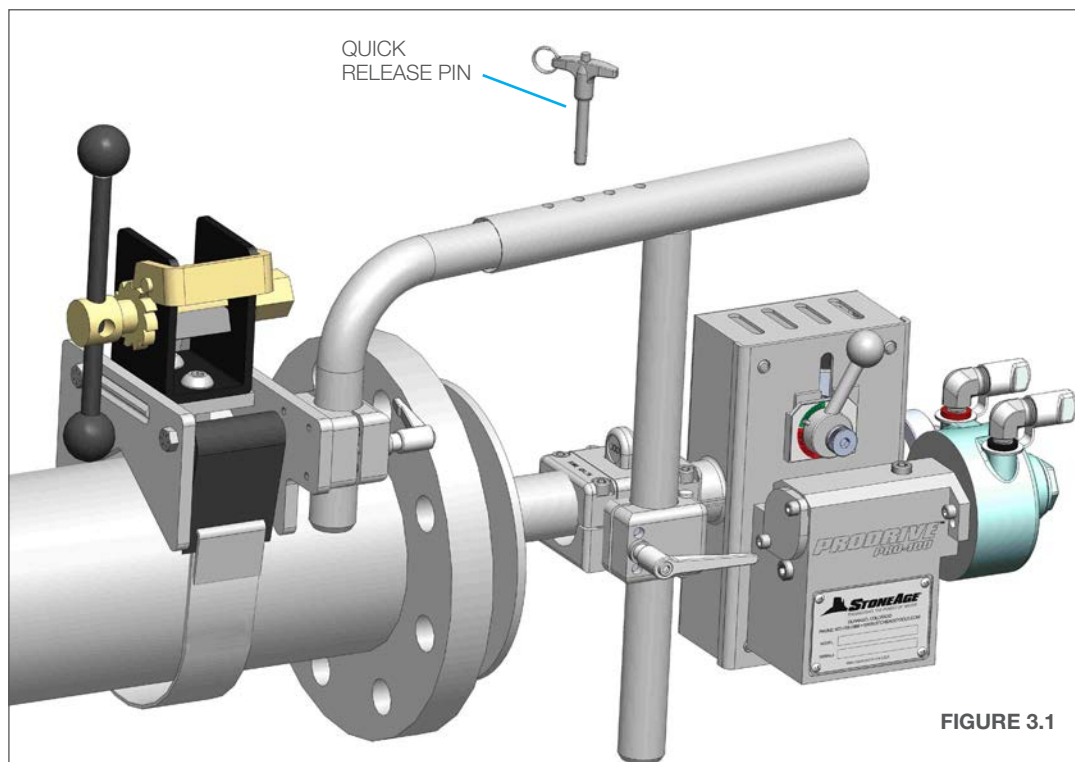
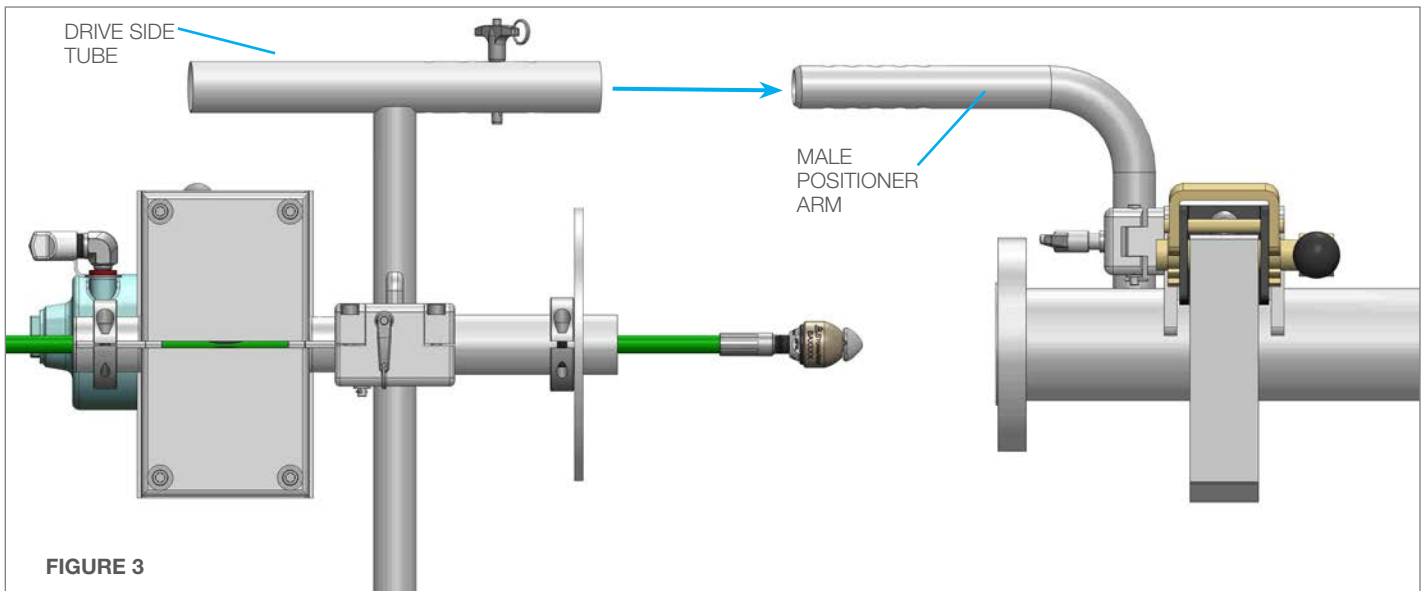


PRO-HLXD-100-XX PRODRIVE TO MALE POSITIONER ARM

⚠ 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.

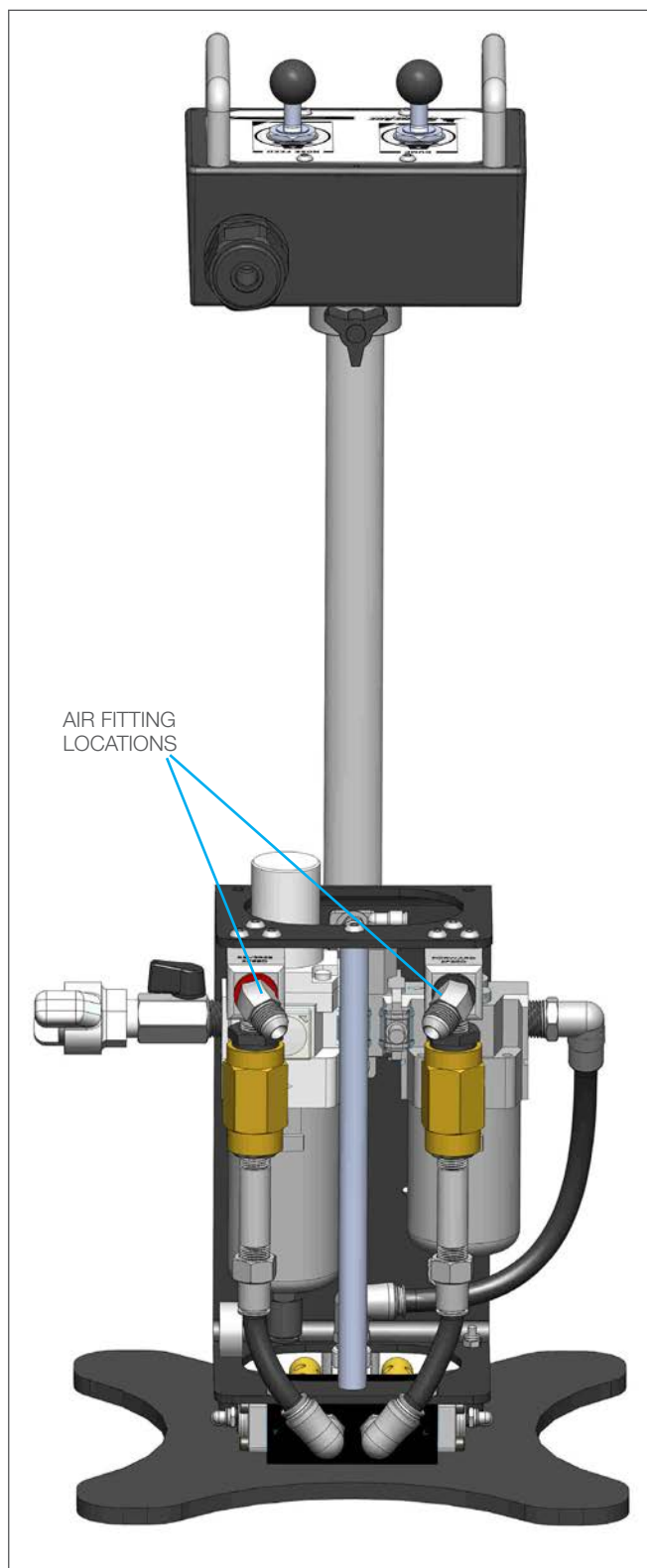
3. Install the Drive Side Tube onto the Male Positioner Arm (**Figure 3**) and push the Quick Release Pin through one of the incremental hole settings. (**Figure 3.1**)



PRODRIVE SET-UP

4. Pull the Dust Caps off the Pneumatic Air Fittings. Connect the Pneumatic Supply Lines from the Control Box to the ProDrive Assembly. Pay 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 FLOOR MOUNT



AIR MOTOR ON PRODRIVE ASSEMBLY

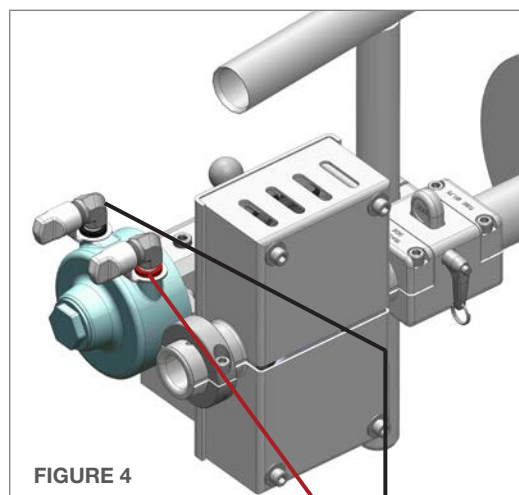


FIGURE 4

PNEUMATIC SUPPLY LINES

15 FT / 4572 mm

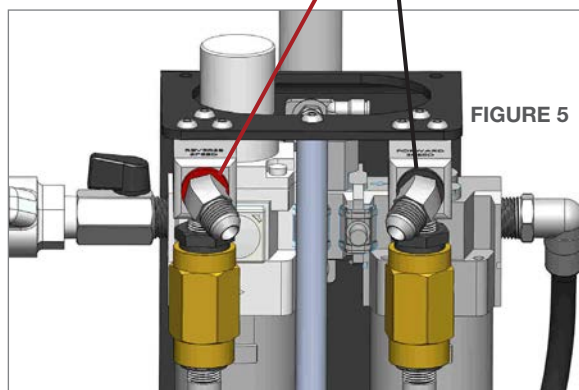


FIGURE 5

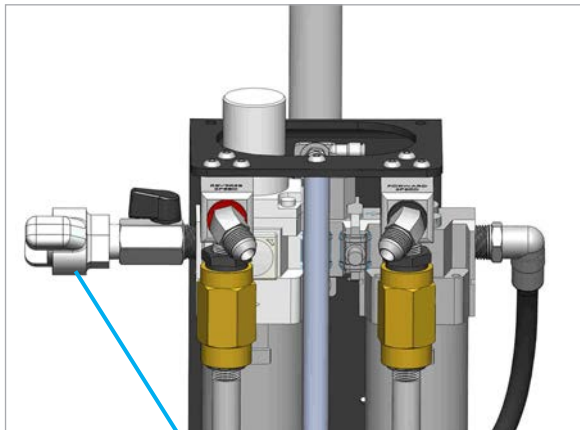
AIR FITTINGS ON CONTROL BOX ASSEMBLY

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.

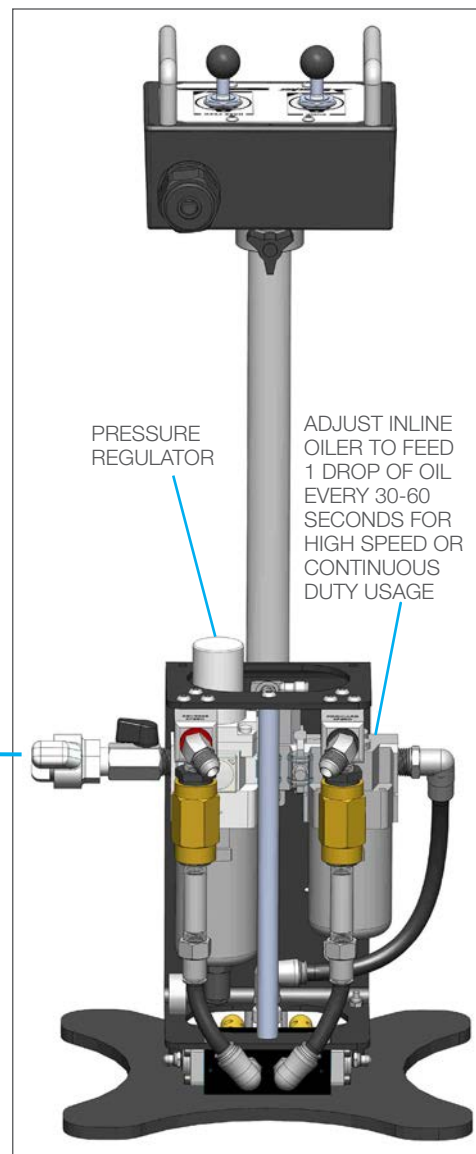
⚠ WARNING

Maximum operating pressure is 100 psi (0.7 MPa). Never exceed 140 psi (0.97 MPa) supply pressure. Exceeding 140 psi 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.



CONTROL BOX AIR SUPPLY FITTING

PNEUMATIC DUMP CONTROL FITTING AND LINE

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

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



FRL REAR VIEW

OPERATION

CONTROL PANEL

The **HOSE FEED LEVER** will move the hose in the forward (feeding) and reverse (retracting) directions. The **OFF** position is at the spring centered middle position and will stop the ProDrive from feeding or retracting.

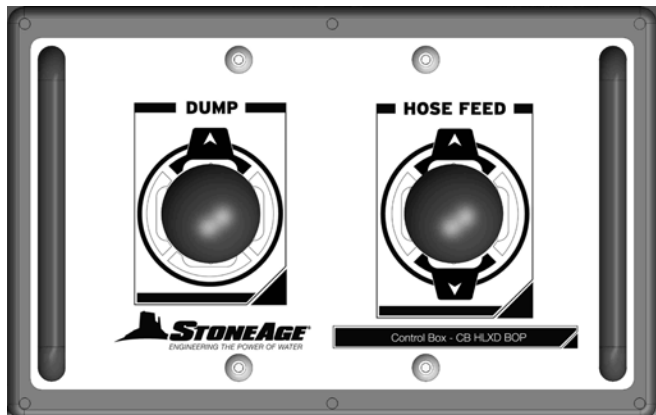
To use the **MOMENTARY PNEUMATIC DUMP CONTROL**, hold it in the **UP/FORWARD** position to route the high-pressure water to the tool. Release the knob to divert the high-pressure water away from the tool.

To de-energize the system, release the **HOSE FEED LEVER** and release the **MOMENTARY PNEUMATIC DUMP CONTROL**. This will stop the ProDrive from feeding or retracting and reroute the high-pressure water away from the ProDrive.

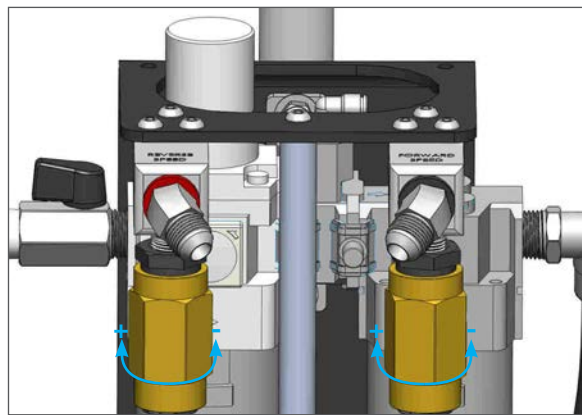
SPEED CONTROLS are located on the FRL. Speed is independently adjustable for Forward/Reverse.

(Minimum speed is 0.2 ft/sec (61 mm/sec). Maximum speed is 2.5 ft/sec (762 mm/sec).

Facing the front of the FRL, rotate the brass colored, speed controls in the clockwise direction to increase the speed. Inversely, rotating the brass colored, speed controls in the counterclockwise direction will slow the speed.



CONTROL PANEL



SPEED CONTROLS

MAINTENANCE

Maintenance Item	Frequency	Maintenance Required
Lubricator of control box	Before each use	Add oil when fluid drops below minimum level marking.
Webbing strap	Before each use	Replace strap when frayed, cut or torn
Gearpack grooves	Before each use	Replace roller if cuts or roughness is present.
Forward and reverse fittings	After each use	Apply a small amount of air tool oil directly into the forward and reverse fittings. Then, briefly operate the controls at slow speed for a short duration in each direction to coat the interior parts of the motor. Install the dust caps onto all three fittings to keep moisture and dirt out.
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.
Clean effluent oil off PRO-150 Tractor	After each use	

TROUBLESHOOTING

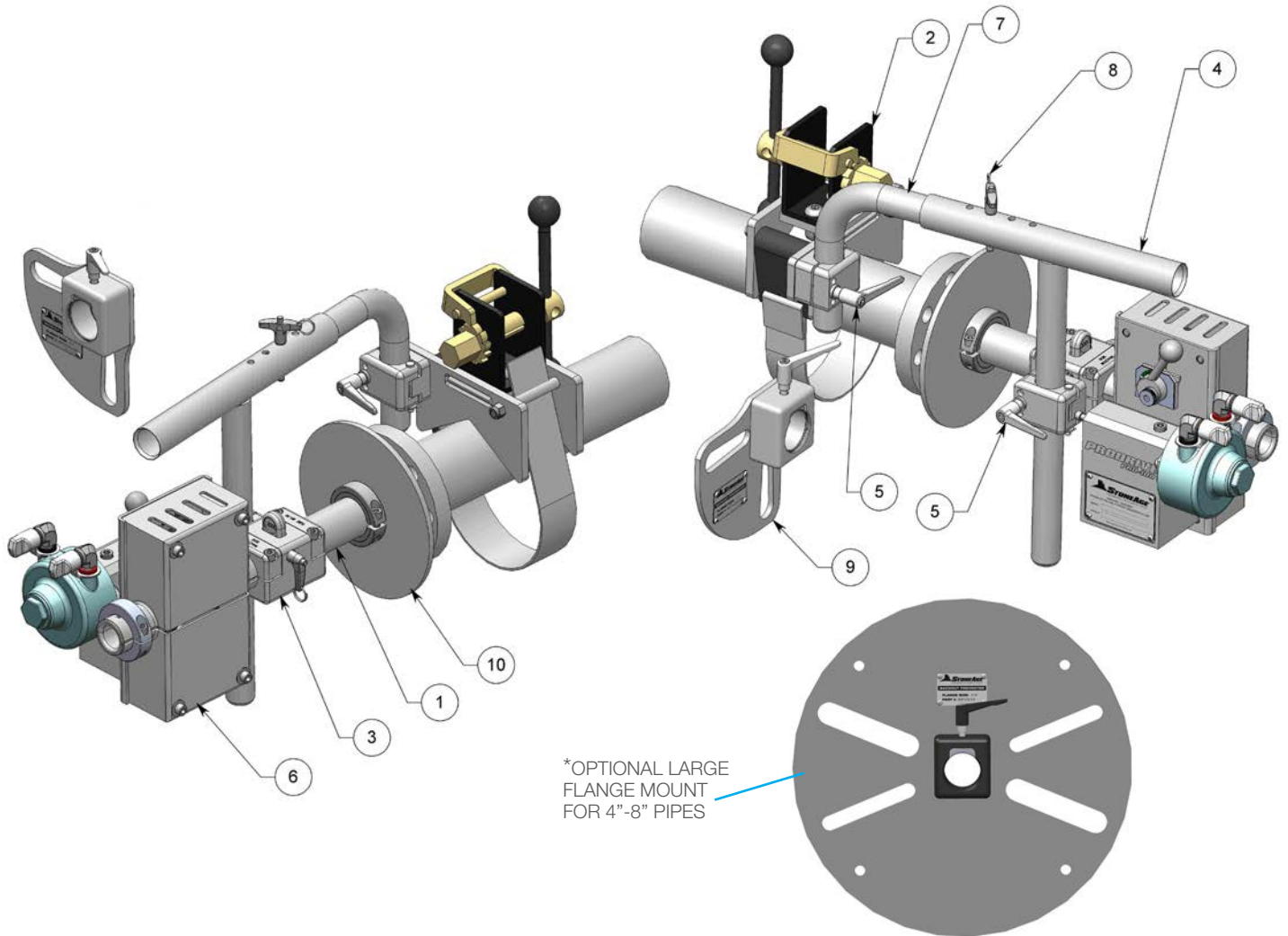
Problem	Solution
No air is delivered to tool	<ul style="list-style-type: none"> -Check that shut-off valve near regulator is open -Check that regulator is set to 100 psi -Open flow control valves by rotating the brass colored speed controls in the counterclockwise direction.
Hose is being damaged by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

STORAGE, TRANSPORTATION, AND HANDLING

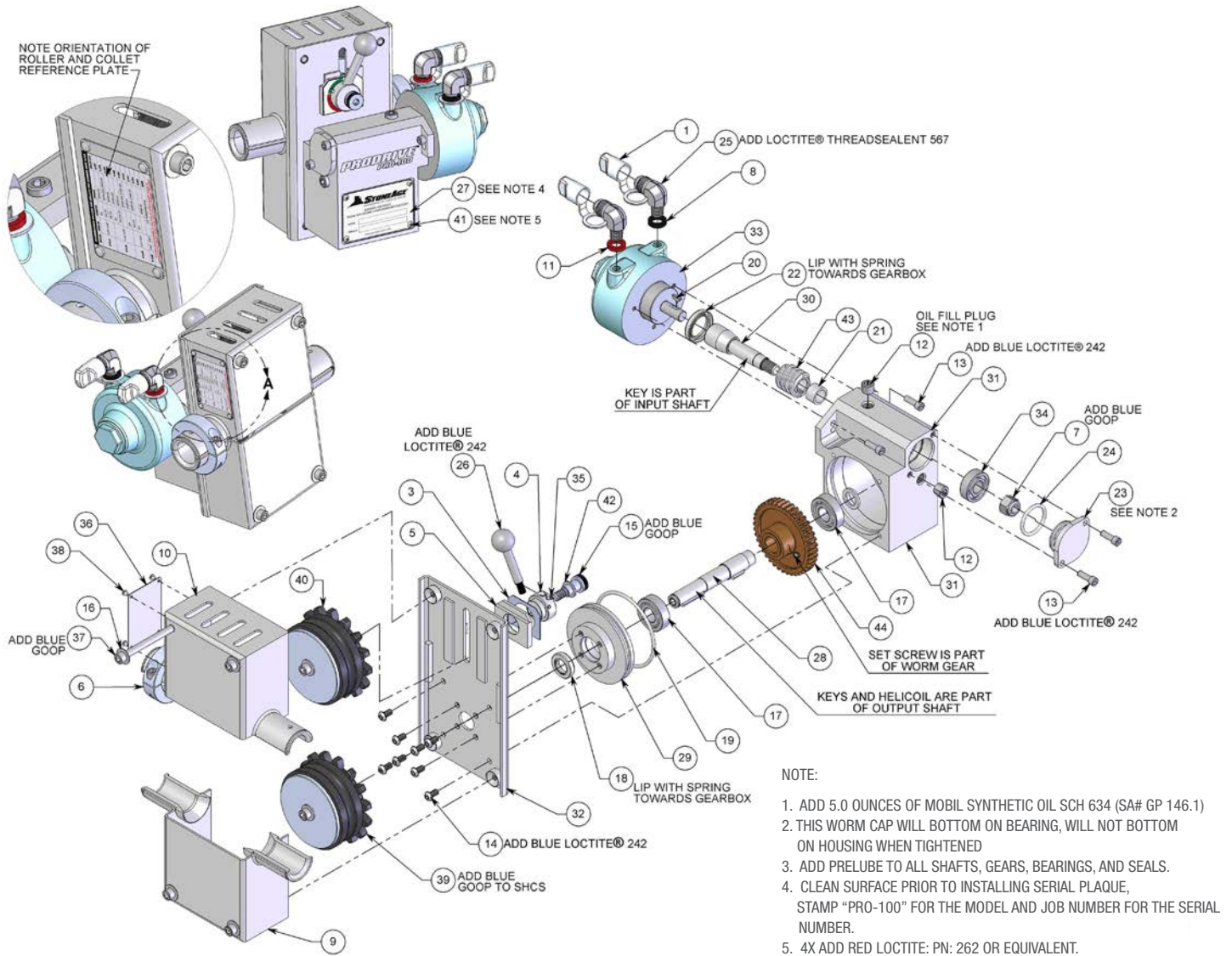
When storing the unit, use compressed air to blow out the air lines to remove debris and moisture. Use mild soapy water to clean the machine in order to remove corrosive materials.

PRODRIVE (ABX-PRO) FULL ASSEMBLY



#	PART NUMBER	QTY.
1	1.75 OD TUBE	1
2	RATCHET STRAP CLAMP ASSY V2	1
3	COLLET BLOCK ASSEMBLY	1
4	DRIVE SIDE TUBE WELDMENT	1
5	HINGED TUBE CLAMP 1.25ID ASSEMBLY	2
6	PRO 150 PRODRIVE TRACTOR ASSEMBLY	1
7	POSITIONER ARM MALE 1.25OD	1
8	QUICK PIN .312X1.5	1
9	BOP 010-2-4 QTR, QUARTER PLATE BOP	1
10	SPLASH PLATE WELDMENT	1
11	GS 325-025 SHCS .25-20 X .62 SS	8
12	FF 121-XXX HOSE STOP COLLET SINGLE, .XXX	1

PRODRIVE (PRO 150)
DRIVE ASSEMBLY



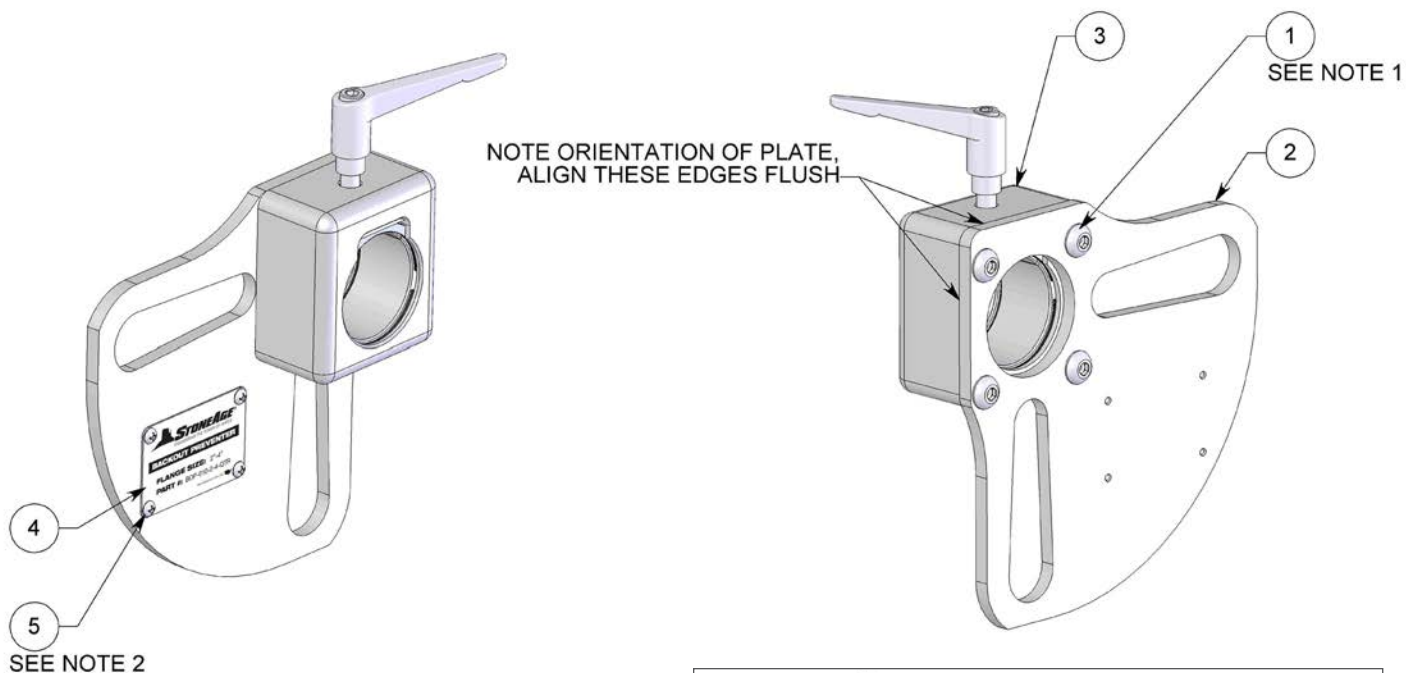
#	PART NUMBER	QTY.
1	BR 167 90° DUST CAP	2
2	DRIVE SHAFT SHOULDER WASHER	1
3	ECC EPLATE, ANODIZE	1
4	ECC BUSHING	1
5	ECC PLATE	1
6	GC SP-26-A COLLAR ASSY	1
7	GN 350-L NYLOK NUT SS	1
8	GP 013-BK BLACK ID BAND, SM	1
9	GEARBOX COVER WELDMENT-B	1
10	GEARBOX COVER WELDMENT-T	1
11	GP 013-R RED ID BAND, SM	1
12	GP 025-P4SS HEX SOCKET PLUG	2
13	GS 325-03 SHCS .25-20 X .75 SS (TB 050)	4
14	GSSB 325-02 BHCS .25-20 X .50 LG SS	8
15	GSSH 0500-0750-SS SHOULDER SCREW	1

16	GW 331-F FLAT WASHER SS	4
17	HLXD 002 BEARING, OUTPUT	2
18	HLXD 003 SEAL, OUTPUT	1
19	HLXD 006 O-RING, OUTPUT	1
20	HLXD 007 WOODRUFF KEY	1
21	HLXD 011 SPACER	1
22	HLXD 013 SEAL, INPUT	1
23	HLXD 016 WORM CAP, INPUT	1
24	HLXD 017 CAP O-RING, INPUT	1
25	HRS 552 FITTING, ELBOW OUTLET P4J8 90°	2
26	HANDLE	1
27	PL 152 STONEAGE LABEL, SERIAL NUMBER PLAQUE	1
28	PRO 001 OUTPUT SHAFT .625	1
29	PRO 005 BULKHEAD, OUTPUT	1
30	PRO 015 INPUT SHAFT	1

31	PRO 018 MAIN GEARBOX	1
32	PRO 061 GEARBOX BASE PLATE WELDMENT	1
33	PRO 155 AIR MOTOR	1
34	RJ 009 BEARING	1
35	ROLL PIN	1
36	ROLLER AND COLLET REFERENCE PLATE	1
37	SHCS .31-18X3 SS (MC 92196A595)	4
38	SOLID RIVET	4
39	SPLINE LOAD DRIVE ROLLER ASSEMBLY	1
40	SPLINE LOAD IDLER ROLLER ASSEMBLY	1
41	THREAD CUTTING SCREW, 6-32 X .25	4
42	THRUST WASHER	1
43	WORM 20-1	1
44	WORM GEAR 20-1	1

PARTS DIAGRAM

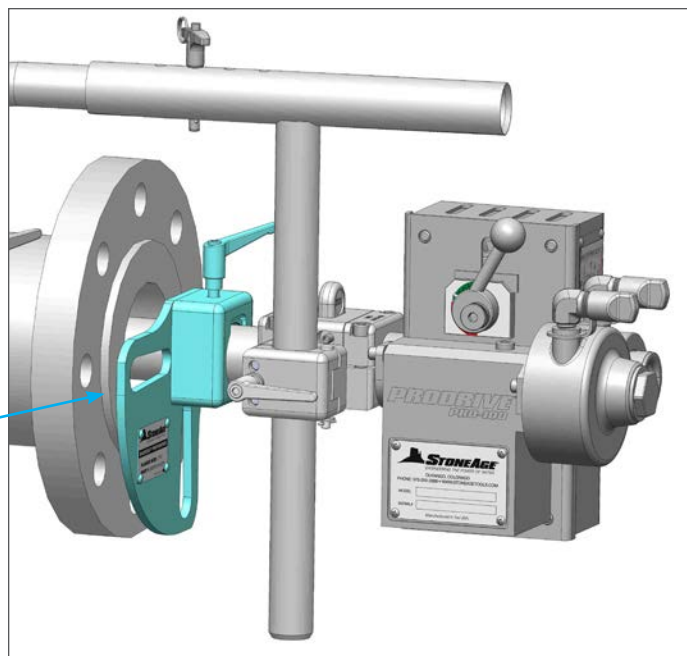
PRODRIVE (BOP-010-2-4 QTR) QUARTER PLATE BOP



NOTE:

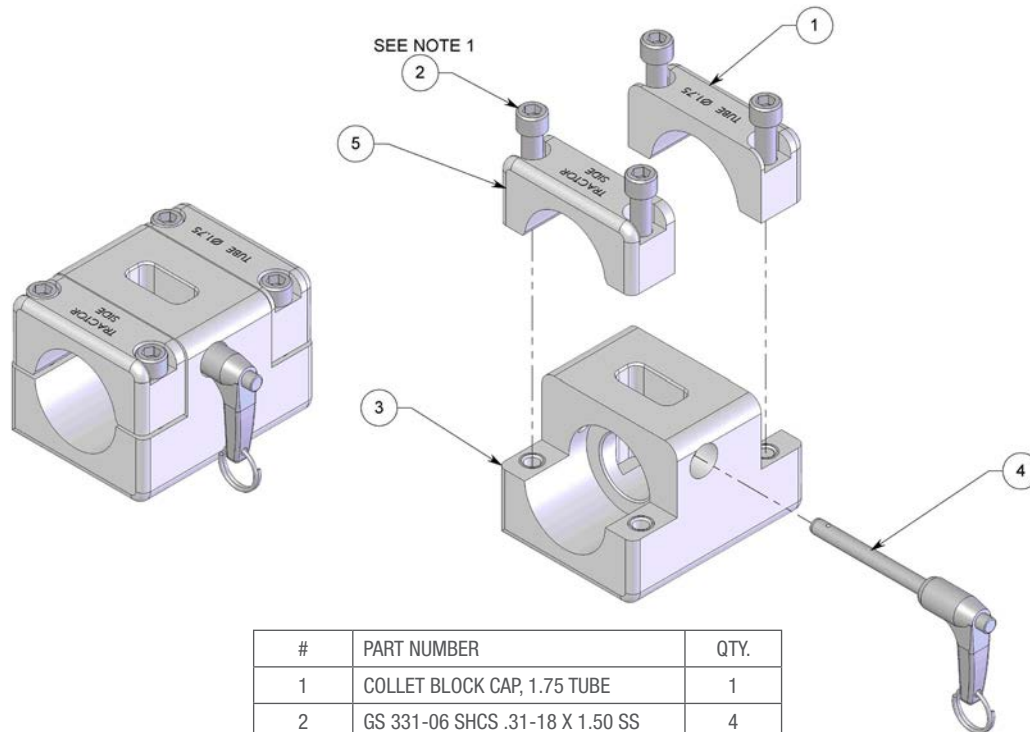
1. 4x BLUE LOCTITE: PN: 242 OR EQUIVALENT
2. 4x RED LOCTITE: PN: 262 OR EQUIVALENT

QUARTER PLATE
BOP LOCATION



#	PART NUMBER	QTY.
1	GSB 331-03 BHCS .31-18 X .75 LG	4
2	BOP 002-2-4-QTR QUARTER FLANGE PLATE 2-4IN	1
3	BOP 007 TUBE CLAMP ASSEMBLY	1
4	BOP DECAL PLATE, 2"-4"	1
5	THREAD CUTTING SCREW, 6-32 X .25	4

PRODRIVE
COLLET BLOCK ASSEMBLY

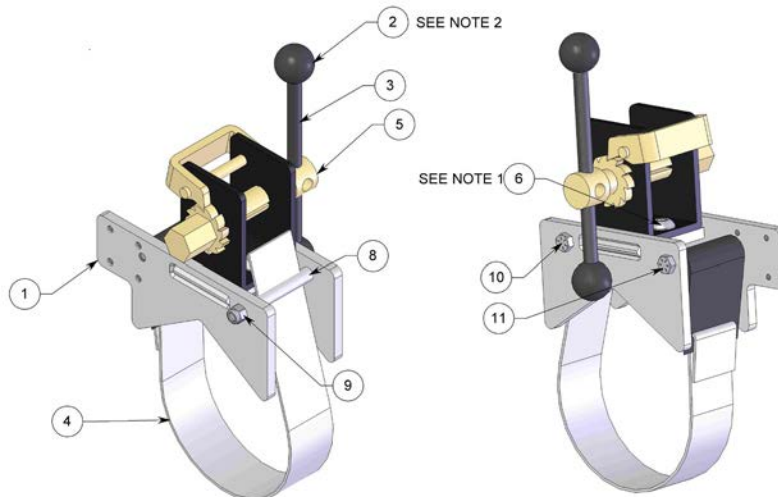


NOTE:

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

#	PART NUMBER	QTY.
1	COLLET BLOCK CAP, 1.75 TUBE	1
2	GS 331-06 SHCS .31-18 X 1.50 SS	4
3	PRODRIVE COLLET BLOCK BODY	1
4	QUICK RELEASE PIN .25X2	1
5	COLLET BLOCK CAP, TRACTOR SIDE	1

PRODRIVE
RATCHET STRAP CLAMP ASSEMBLY V2



NOTE:

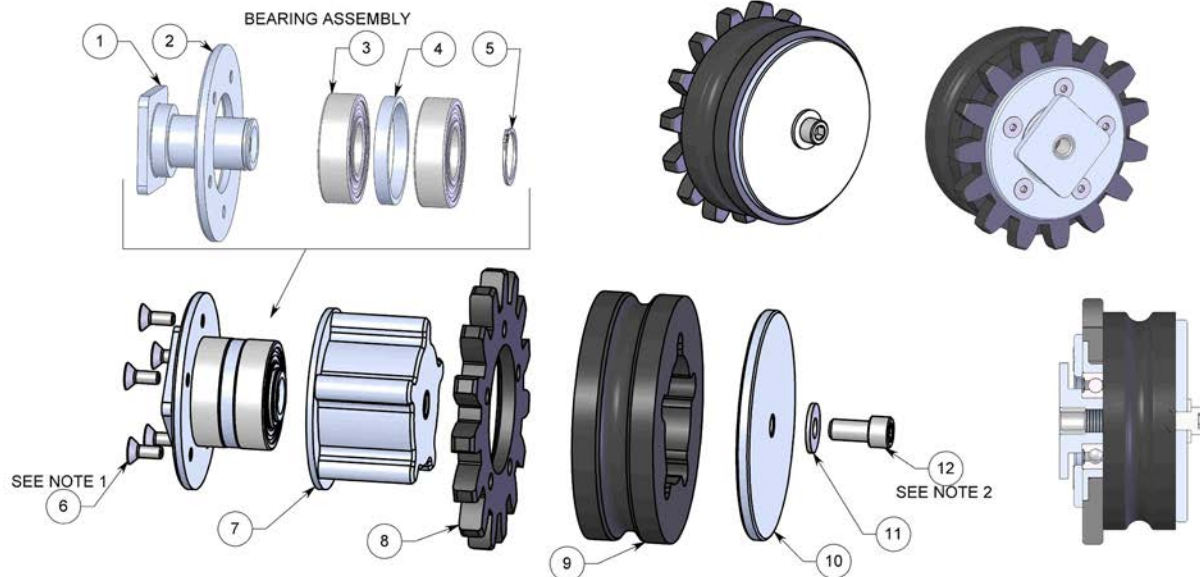
1. ADD BLUE GOOP (A SWAGelok BRAND) ANTI-SEIZE. TO ALL THREADED HARDWARE. AN EQUIVALENT ALTERNATIVE IS ACCEPTABLE.
2. BLUE LOCTITE: PN: 242 OR EQUIVALENT TO THREADS.

#	PART NUMBER	QTY.
1	V BLOCK WELDMENT, AL V2	1
2	PHENOLIC BALL KNOB, 6046K190	1
3	LEVER HANDLE, 6303K500	1
4	2.00 WEBBING STRAP	1
5	TIE DOWN WINCH	1

6	GSB 350-05 BHCS .50-13 X 1.25 LG SS	2
7	GN 350-L NYLOK NUT SS	2
8	ROLLER BAR	2
9	GN 537-L NYLOK NUT	1
10	GB 837-16 BOLT, HEX .37-16 X 4.00	1
11	GB 837-14 BOLT, HEX .37-16 X 3.50	1

PARTS DIAGRAM

PRODRIVE SPLINE IDLER ROLLER ASSEMBLY

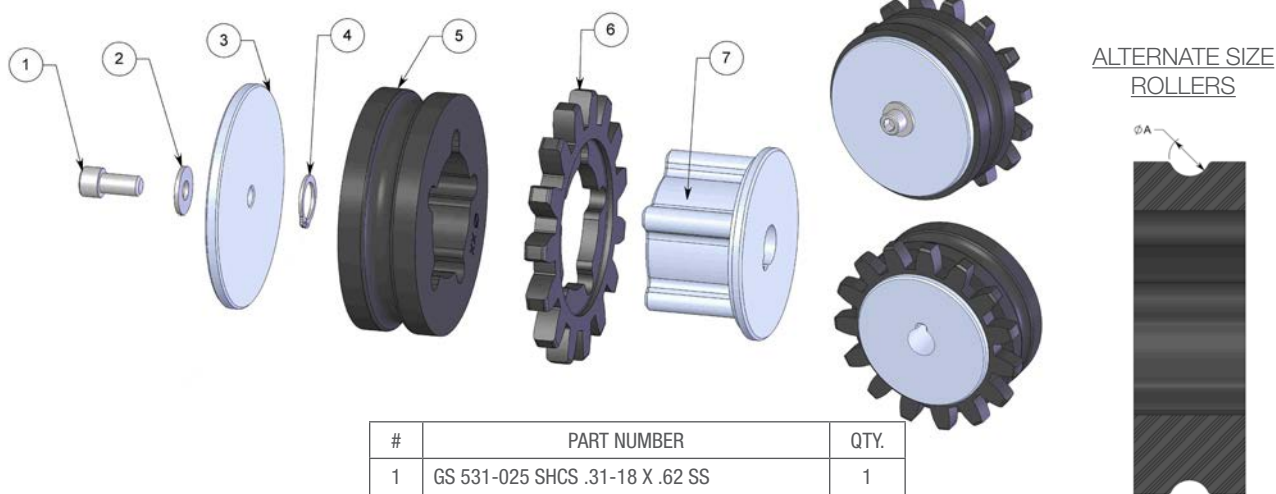


NOTE:
1. 5x BLUE LOCTITE: PN: 242 OR EQUIVALENT
2. APPLY BLUE GOOP (A SWAGelok BRAND) ANTI-SEIZE.

#	PART NUMBER	QTY.
1	PRO 039 IDLER SHAFT	1
2	IDLER BEARING PLATE	1
3	BEARING	2
4	BEARING SPACER OD	1
5	RETAINING RING .780D SHAFT	1
6	GSF 319-02-32 FHCS .19-32 X .50 LG SS	5

7	SPLINE IDLER HUB	1
8	ROLLER GEAR 15T	1
9	SPLINE LOAD POLY ROLLER	1
10	FACE PLATE	1
11	ROLLER WASHER	1
12	GS 531-025 SHCS .31-18 X .62 SS	1

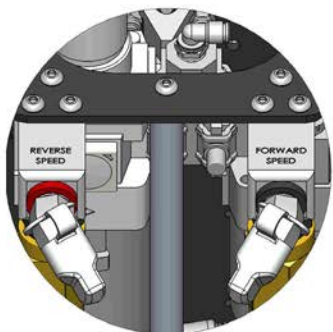
PRODRIVE SPLINE DRIVE ROLLER ASSEMBLY



#	PART NUMBER	QTY.
1	GS 531-025 SHCS .31-18 X .62 SS	1
2	ROLLER WASHER	1
3	FACE PLATE	1
4	ABX 249 RETAINING RING, HD EXT SS	1
5	SPLINE LOAD POLY ROLLER	1
6	SPLINE ROLLER GEAR 15T	1
7	SPLINE DRIVE HUB	1

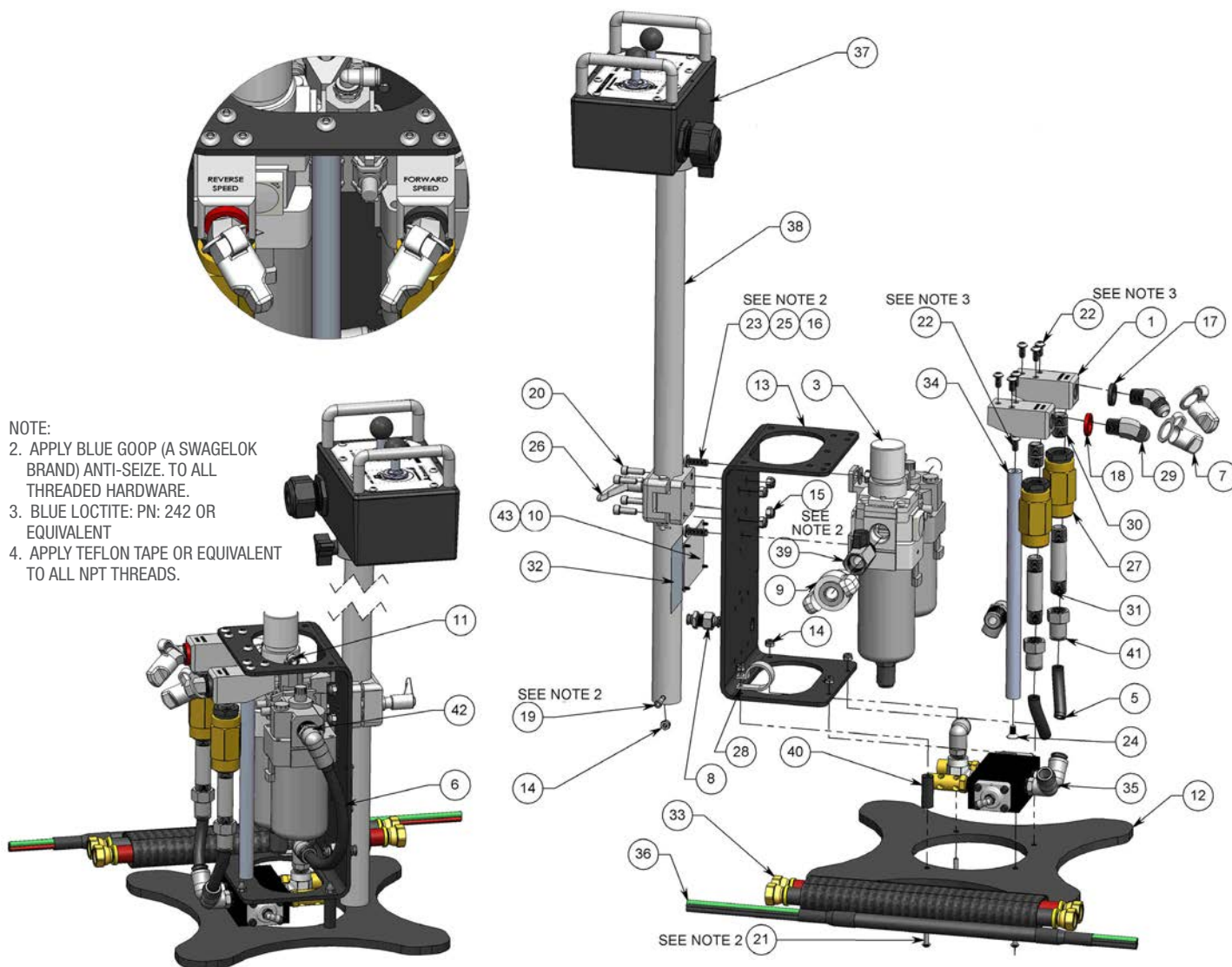
PART NUMBER	ØA
SPLINE POLY ROLLER-34	Ø.34
SPLINE POLY ROLLER-46	Ø.46
SPLINE POLY ROLLER-58	Ø.58
SPLINE POLY ROLLER-89	Ø.89

PRODRIVE (CB-PRO-100)
CONTROL BOX ASSEMBLY



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	90 DEG FLOW CONTROL BLOCK FWD	1
2	90 DEG FLOW CONTROL BLOCK REV	1
3	AAP1359 SMC FRL WITH AIR TAP	1
4	AIR TUBE 1	1
5	AIR TUBE 2	1
6	AIR TUBE 3	1
7	BR 167 DUST CAP	2
8	BULKHEAD FITTING	1
9	CB 114 INLET FITTING	1
10	CB-PRO SERIAL PLATE	1
11	ELBOW FITTING	1
12	FRL BASE	1
13	FRL FRAME, PRODRIVE	1
14	GN 319-L-24 NYLOK NUT SS	5

15	GN 325-L NYLOK NUT SS (TB 044.1)	4
16	GN 331-L NYLOK NUT SS	2
17	GP 011-BK BLACK ID BAND	1
18	GP 011-R RED ID BAND	1
19	GS 319-02 SHCS .19-24 X .50 SS	1
20	GS 325-03 SHCS .25-20 X .75 SS	4
21	GSB 319-09 BHCS .19-24 X 2.25 LG SS	4
22	GSB 325-02 BHCS .25-20 X .50 LG SS	7
23	GSB 331-035 BHCS .31-18 X .88 LG SS	2
24	GSF 325-02 FHCS .25-20 X .50 LG SS	1
25	GW 331-F FLAT WASHER SS	2
26	HINGED TUBE CLAMP 1.25ID ASSEMBLY	1
27	IN-LINE FLOW CONTROL	2
28	LOOP CLAMP	1
29	P6J8 45 DEG FITTING	2

30	P6P6 X 1.00 SS NIPPLE	2
31	P6P6 X 3.00 SS NIPPLE	2
32	PL 156 CAUTION INLET AIR	1
33	PRO CONTROL LINE	1
34	PRO FRL SUPPORT ROD	1
35	PRO SPOOL VALVE ASSY	1
36	PRO UMBILICAL	1
37	REMOTE BOX	1
38	REMOTE BOX POLE, 1.250D	1
39	SHUT-OFF VALVE	1
40	SPACER	2
41	TUBE FITTING P6PL8	2
42	TUBE FITTING P8PL8 90DEG	1
43	THREAD CUTTING SCREW, 6-32 X .25	4

TERMS AND CONDITIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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