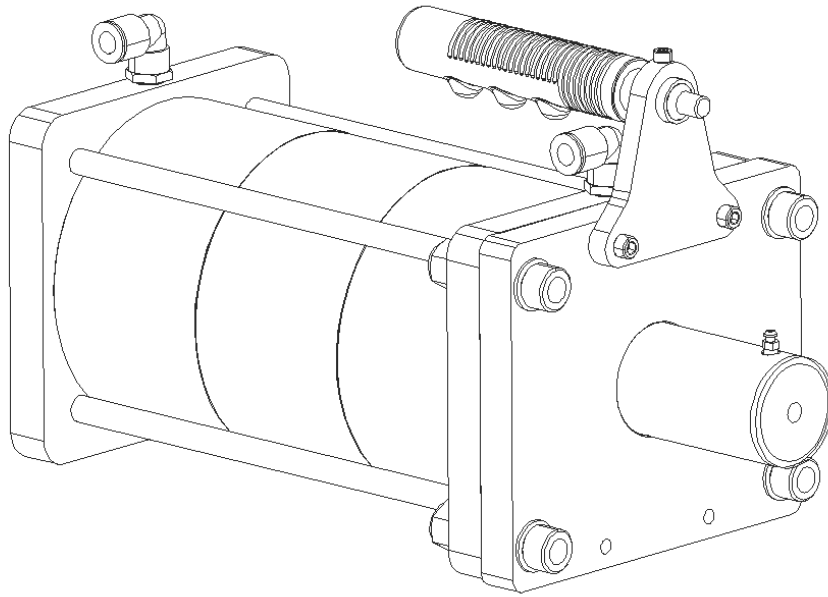


NUMATX

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**NUMATX MODEL 3320 PRESSURE INTENSIFIER
OPERATION MANUAL**

Rev A May 2014

TABLE OF CONTENTS

1.0	Overview
2.0	Specifications
3.0	Safety Warnings
4.0	Assembly
5.0	Operation
6.0	Maintenance
7.0	Bleeding the Intensifier
8.0	Contact Information

1.0 Overview

The Model 3320 Pressure Intensifier is designed to operate Numatx Rivet C-Squeezers, such as the Model 3070 (6K force) and Model 3080 (9K force), as well as the Model 3280-1, -2, and -3 Alligator Squeezers. It can also operate other devices requiring a small volumetric output of high pressure fluid. The unit is a “one shot” intensifier, meaning it will fully displace the hydraulic fluid with one stroke of the air piston in the cylinder. These types of intensifiers tend to be faster than pumping type air operated intensifiers of similar size. The 3320 also allows for “feathering” of the riveter (subtle positioning of the squeezer rivet set), when controlled by a foot operated valve. The 3320 is built from an industry leading air cylinder supplier, and Numatx components. Parts are made with cnc machining centers, with part features held to close tolerances, for years of dependable operation.

Before using the NUMATX Model 3320 Intensifier, please fully read and understand this operation manual.

2.0 Specifications

DIMENSIONS	FIGURE 1
WEIGHT, -1	23.4 Lbm (10.6 Kg)
WEIGHT, -2	21.2 Lbm (9.6 Kg)
AIR PRESSURE, NORMAL (Supplied)	80 psi (5.6 Kg/cm ²)
AIR PRESSURE, MAX (Supplied)	90 psi (6.3 Kg/cm ²)
HYDRAULIC PRESSURE, NORMAL (Generated)	3,680 psi (25.4 MPa) @ 80 psi input
HYDRAULIC PRESSURE, MAX (Generated)	4,140 psi (28.5 MPa) @ 90 psi input
FLUID DISPLACEMENT, -1	3.68 in ³ (60.3 cc)
FLUID DISPLACEMENT, -2	2.45 in ³ (40.2 cc)

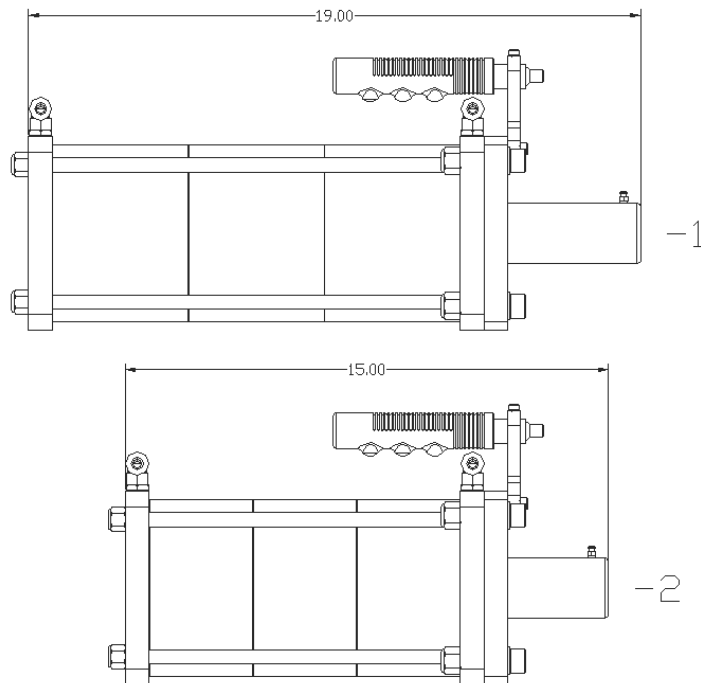


FIGURE 1

3.0 Safety Warnings

- 3.1 NEVER operate the intensifier above 90 psi (6.3 Kg/cm²). Compressed air can be dangerous at levels above this maximum specified pressure. Operating above this specified pressure can lead to failure of the hydraulic hose, hydraulic seals, and fittings.
- 3.2 NEVER disconnect air lines while the air lines are pressurized.
- 3.3 Normal operating pressure for the intensifier is 80 psi (5.6 Kg/cm²). Use a suitable pressure regulator to maintain the pressure at this specified pressure.
- 3.4 Use Dexron III or equivalent fluid for the high-pressure portion of the intensifier. Other fluids such as MIL-7808 turbine oil may be suitable, providing the Buna-N (Nitrile) seals are compatible with the alternate fluid.
- 3.5 Properly bleed the intensifier and forming head(s) per Section 7 of this manual. The unit **MUST BE PROPERLY BLED OF ALL AIR BUBBLES FOR OPTIMUM PERFORMANCE.**
- 3.6 Use proper eye protection when overhauling this unit.
- 3.7 Do not use substitute components for repair of any portion of the unit.
- 3.8 The system should be properly maintained and examined at regular intervals for damage.
- 3.9 Avoid excessive contact with the hydraulic fluid, to minimize skin irritation.

4.0 Assembly

- 4.1 Install the 1/4" NPT quick air fittings (uninstalled for protection during shipping) into the intensifier and foot valve or other controlling valve.
- 4.2 Install the 1/4" plastic air line between the foot valve and the intensifier. The tubing is pressed into the fittings with little effort. To remove the tubing, depress the collar at the end of the fitting, while pulling out the tubing. Figure 2 depicts the porting of the intensifier. Figure 3 shows a typical foot valve, and the corresponding air ports. Regardless of the valve type used, one port on the valve is used for air into the valve, and two air ports are used for air supplied to the intensifier (Ports A and B).

- 4.3 If you are unsure which valve port is A and B, flow air from a supply source to the valve inlet port. Port A will be the default position without the valve actuated, and air will be exiting Port A. Port B will be flowing air when the valve is actuated (foot valve depressed). At the intensifier, Port A will normally be pressurized, so that the internal piston is held in a retracted state, and the intensifier is NOT making pressure. Port B is pressurized to extend the intensifier piston, and thereby make hydraulic pressure.

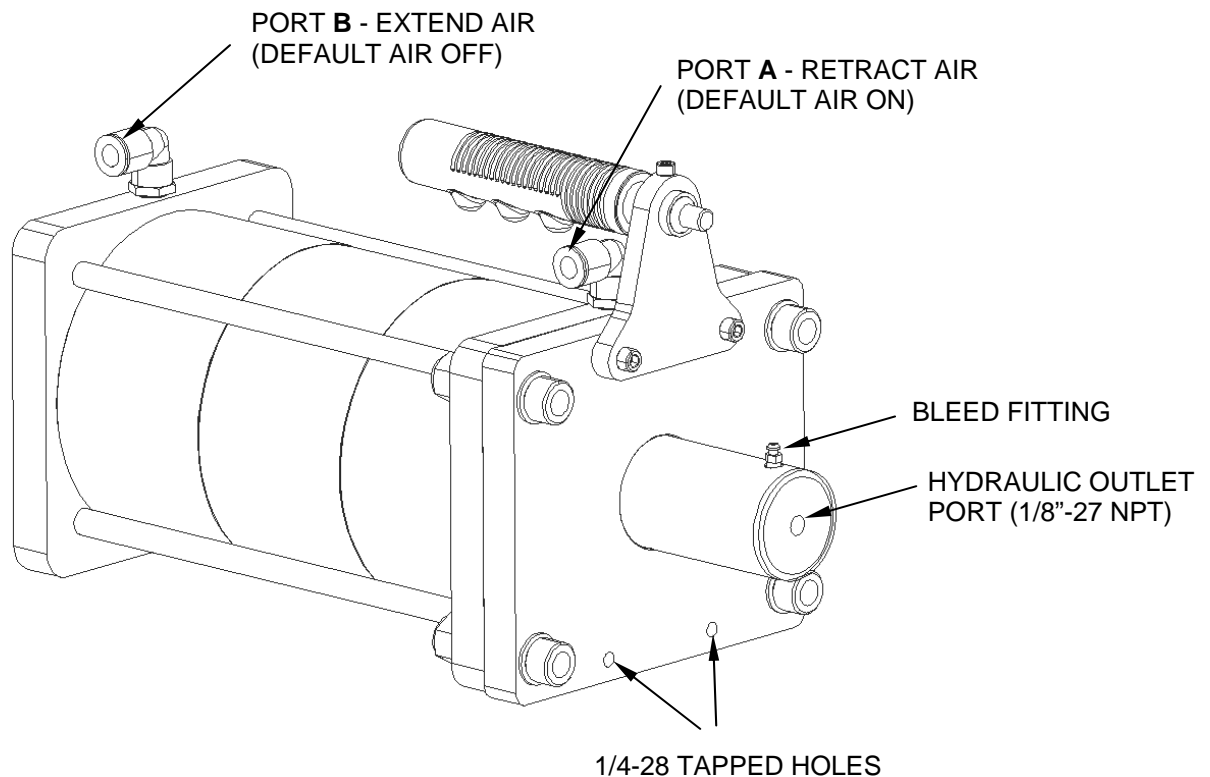


FIGURE 2

- 4.4 Referring to Figure 4, attach the hydraulic hose (normally 6-8' in length) to the intensifier, at the AN816 fitting.
- 4.5 Install the AN816 fitting and Female QD if used (PN SS-QC4-B-2PF) at the opposite end of the hydraulic hose.
- 4.6 Attach the hydraulic hose to the forming head. Usually the forming head (squeezer) must be in place prior to bleeding the system.
- 4.7 Fully bleed the intensifier of all air bubbles per Section 7. **THE UNIT MUST BE WELL BLED OF ALL AIR BUBBLES IN ORDER TO PROPERLY FUNCTION.** If the Squeezer head does not seem to be making adequate force, most likely the intensifier has not been fully bled of all air.

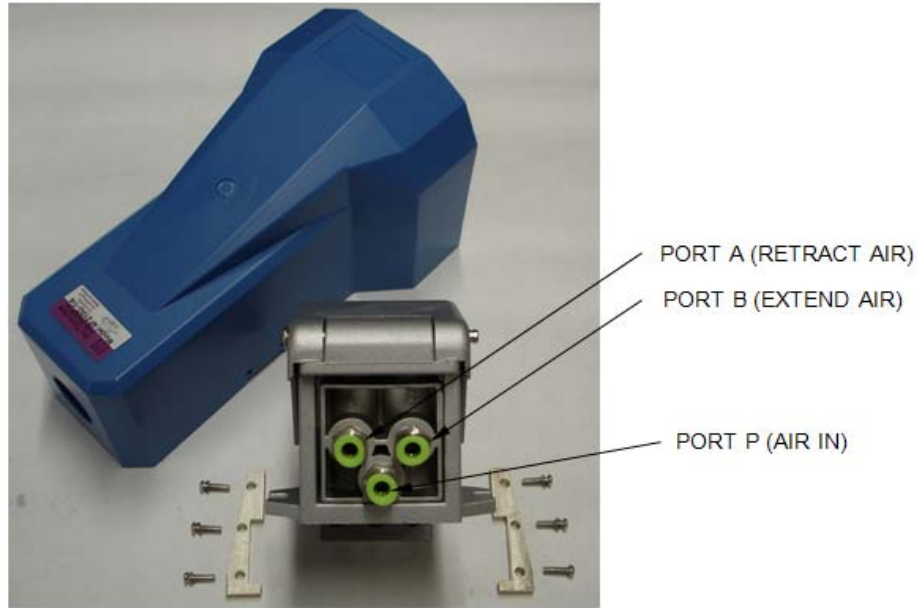


FIGURE 3 – FOOT VALVE PORTS

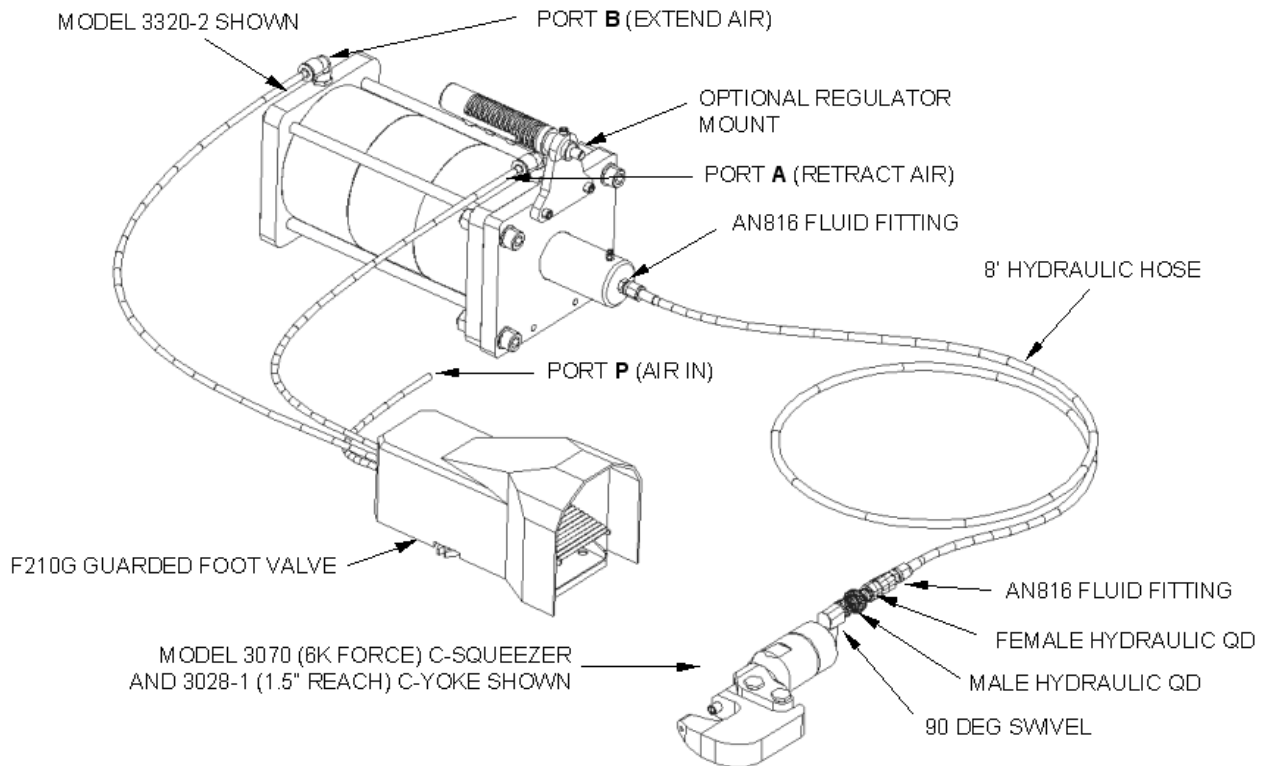


FIGURE 4 - C-SQUEEZER SYSTEM

5.0 Operation

- 5.1 Ensure the intensifier fluid displacement is adequate for the intended usage. Fluid displacements are listed in Section 2.
- 5.2 Position the intensifier unit on the floor or mounted to a table in a suitable orientation for operation. The intensifier has two (2) 1/4-28 tapped holes for mounting it to a work table, wall mount, or other desired mounting arrangement.
- 5.3 Connect the air input line to the control valve (Port P or Air In). The intensifier needs daily oiling, which can be accomplished manually by placing several drops of air tool oil into the valve inlet port prior to connecting the air line. Alternatively, it is recommended to use an automatic oiler, such as a Filter/Regulator/Lubricator (FRL).
- 5.4 Attach the forming head to the flexible hydraulic line.
- 5.5 The normal position for the intensifier is with the foot pedal un-depressed or a controlling solenoid in a de-energized state, and with the hydraulic fluid unpressurized. In this position air pressure at Port A is holding the intensifier low pressure piston in a retracted state.
- 5.6 When it is desired to create hydraulic pressure, depress the foot pedal (or actuate a control valve) of the intensifier. Air is routed to Port B by the controlling valve. The pressure intensifier will displace hydraulic fluid along the length of the hydraulic hose. The piston in the intensifier will stop when the resistance exceeds the motive force.
- 5.7 To de-energize the hydraulic pressure, release the foot valve (control valve). The piston of the intensifier will return to a retracted state.

6.0 Maintenance

The NUMATX Model 3320 Pressure Intensifier has been manufactured to give maximum service with minimum care. In order that this may be accomplished, the following recommendations should be followed:

- 6.1 The intensifier hydraulic system should be full of oil and properly bled per Section 7.
- 6.2 Use only Dexron III or compatible fluid. See Dexron III safety Data below.
- 6.3 Oil the Low Pressure (LP) piston daily, using 4-6 drops of a quality air tool oil. Alternately, use an in-line oiler (Filter/Regulator/Lubricator - FRL).
- 6.4 Keep the unit clean and free of excessive moisture, to minimize wear on moving parts. Prevent dirt from entering the air inlet QD of the intensifier.
- 6.5 It is recommended to use dry filtered air as a pressure source to the intensifier, which will extend the seal life of the intensifier piston.
- 6.6 The system should be routinely inspected for oil leaks. Check the bleed fittings of the intensifier and forming heads to ensure they are tight. DO NOT OVERTIGHTEN.
- 6.7 Avoid dropping any portion of the unit, as this may cause damage to close tolerance parts.
- 6.8 Figure 5 shows an exploded view of the intensifier, and associated replacement parts. The main air cylinder is non-repairable.

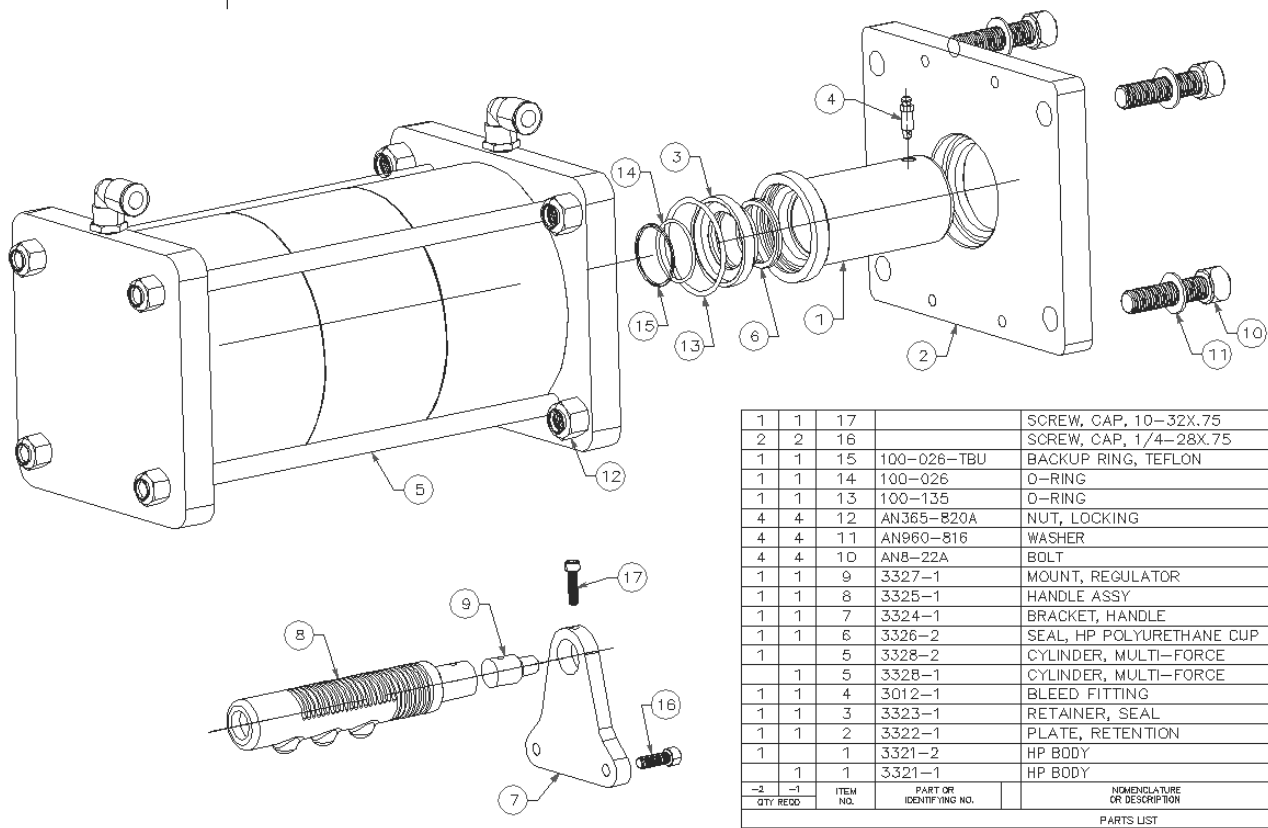


FIGURE 5 – PARTS LIST

DEXRON III OIL SAFETY DATA

First Aid

Skin: Wash thoroughly with soap and water as soon as possible. Casual contact requires attention.

Ingestion: Seek Medical attention, immediately. **DO NOT INDUCE VOMITING.**

Eyes: Flush with copious amounts of water. If irritation develops, consult a physician.

Inhalation: No significant adverse health effects are expected to occur on short term exposure. Remove from contaminated area. Apply artificial respiration if needed. If unconscious, consult a physician.

Fire

Suitable extinguishing media: CO₂, dry powder, foam or water fog. **DO NOT** use water jets.

Environment

Waste Disposal: In accordance with local, state and federal regulations.

Spillage: Prevent entry into drains, sewers and water courses. Soak up with inert material. Store waste fluid in an appropriate container for disposal.

Handling: Eye protection required. Protective gloves recommended. Chemically resistant boots and apron recommended. Use in well ventilated area.

Combustibility: Slightly combustible when heated above flash point. Will release flammable vapor which can burn in open or be explosive in confined spaces if exposed to a source of ignition.

Properties

Specific gravity: 0.863 Weight per gallon: 7.18 lbs.
Flash point: >200°C (392°F)

7.0 Bleeding the Intensifier

In order to develop maximum force and full compression pin extension, entrapped air bubbles must be removed from the system. Bleeding the system is similar to bleeding brakes on a car. If a QD is used in the system, and is disconnected routinely, the bleeding frequency will be higher than a system without a QD. Bleeding the unit may take some patience and as much as 1/2 hour of time. It may be necessary to pass the equivalent of several 30cc charges of fluid through the unit to fully dispel any trapped air. If the unit does not seem to be performing properly, it is likely not fully bled of all air. Refer to Figure 6.

- 7.1 Place the unit so that the intensifier and the hydraulic hose are below the forming head. Try to minimize low points in the hydraulic hose, which could create space for an air pocket. The air lines to the intensifier do not need to be hooked up, providing that the intensifier air cylinder is fully retracted. The bleed port on the forming head should be as close to the relative high point in the system as possible, to preclude the possibility of an air pocket. Installing the squeezer in a vise may help position the bleed port. Remove the squeezer bleed plug, and install a 1/4" clear tube into the port, to channel excess fluid to a waste cup.
- 7.2 Slightly open the bleed fitting on the intensifier approximately 1 to 1-1/2 turns. Do not overly open this fitting, or else residual fluid may exit the intensifier due to gravity.
- 7.3 Attach a 1/4" O.D. tubing to the syringe, and fill the syringe with Dexron III fluid.
- 7.4 Make sure all air bubbles are out of the syringe and attached tubing before hooking it up to the bleed fitting of the intensifier. To do this, position the syringe so that the tubing is facing upward, and allow a small quantity of fluid to be dispelled from the syringe, force any air bubbles fully out of the syringe and attached tubing.
- 7.5 Inject the fluid into the intensifier bleed fitting. If it is difficult to force the fluid into the unit, SLIGHTLY open the bleed fitting in approximately 1/2 turn increments.
- 7.6 Observe the tubing connected to the squeezer head, watching for fluid exiting the clear tube. Continue injecting hydraulic fluid until no air bubbles are seen in the fluid exiting the forming head. An unfilled system requires several 30cc syringe injections.
- 7.7 When finished injecting fluid, tighten the bleed fitting of the intensifier BEFORE removing the tubing from each bleed fitting. This will prevent additional air from entering the system.
- 7.8 Remove the clear tube at the squeezer head, and check the fluid level at the port. Fluid may be added to "top off" the unit.
- 7.9 Reinstall the squeezer plug and tighten. Use Teflon tape on the pipe threads.
- 7.10 Wipe up any excess fluid which may be present on the intensifier and forming head.

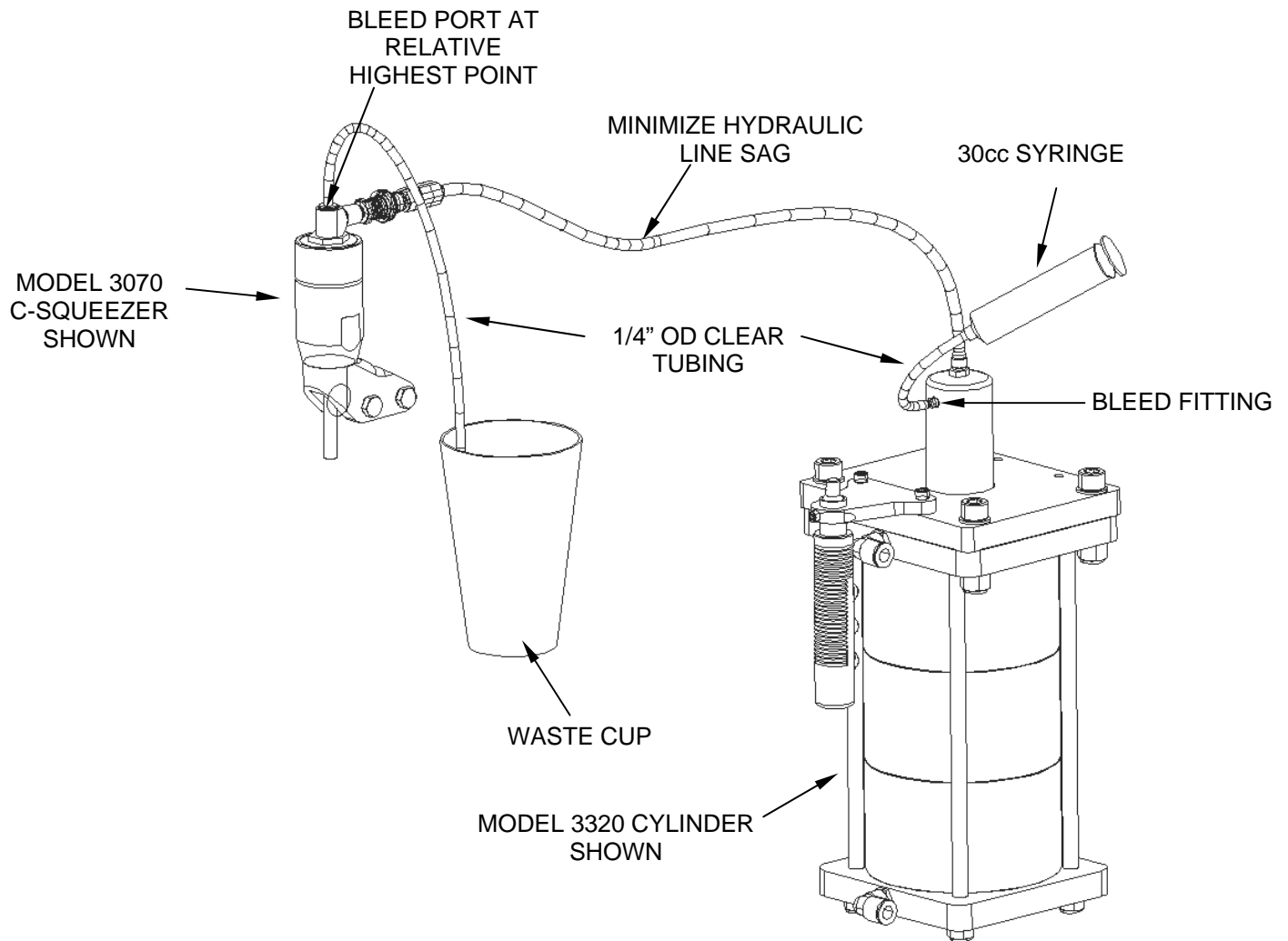


FIGURE 6 – SYSTEM BLEEDING

8.0 Contact Information

NUMATX welcomes any comments, suggestions or questions regarding this product.

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