



NXA SERIES ALLIGATOR SQUEEZERS

OPERATION MANUAL

TABLE OF CONTENTS

1.0	Overview	2.0	Specifications
3.0	Safety Warnings	4.0	Assembly
5.0	Operation	6.0	Maintenance
7.0	Filling and Bleeding the System	8.0	Contact Information
9.0	Parts Lists		

1.0 Overview

Numatx NXA series alligator squeezers are hydraulically operated hand-held tools, designed to squeeze a variety of rivets. These units are hydro-pneumatic operated (also known as pneudraulic), in conjunction with Numatx pressure intensifiers, such as the NXI-60. The aforementioned intensifier has been sized specifically to work with the NXA series alligator squeezers, during commercial riveting operations. The fully hydraulic alligator squeezer offers the advantages of decreased weight, smaller size, and greater control when compared to traditional pneumatic only squeezers. This reduces operator fatigue, allows for use in more confined areas, and improves control of the squeezing action (feathering operation). The units are built from high quality aircraft grade materials, with parts made on CNC machining centers and features held to close tolerances, for years of dependable operation.

Before using the Numatx NXA alligator squeezer, please fully read and understand this operation manual.

2.0 Specifications

AIR PRESSURE, MIN	30-PSIG
AIR PRESSURE, MAX	90-PSIG
DIMENSIONS	FIGURE 2
WEIGHT NXA-6 (6" REACH)	14.7 Lbm (6.67 Kg)
WEIGHT NXA-8 (8" REACH)	16.7 Lbm (7.57 Kg)
WEIGHT NXA-10 (10" REACH)	19.3 Lbm (8.75 Kg)
FLUID DISP REQUIRED, ALL UNITS	1.68 in ³ (27.5 cc)
HYDRAULIC PRESSURE, NORMAL	3,500 psi (24.1 MPa)
HYDRAULIC PRESSURE, MAX	4,500 psi (31.0 MPa)
FORCE AT NORMAL HYD PRESSURE, NXA-6	10,149 Lbf (45.1 KN)
FORCE AT NORMAL HYD PRESSURE, NXA-8	7,862 Lbf (35.0 KN)
FORCE AT NORMAL HYD PRESSURE, NXA-10	6,416 Lbf (28.5 KN)
JAW CLOSED GAP, W/O DIES (-6, -8, -10)	1.38 (35mm)
JAW OPEN GAP, W/O DIES (-6, -8, -10)	2.05 (52mm) / 2.25 (57mm) / 2.45 (62mm)
JAW EXTENDED OPEN GAP, W/O DIES (-6, -8, -10)	2.81 (71mm) / 3.23 (82mm) / 3.65 (98mm)

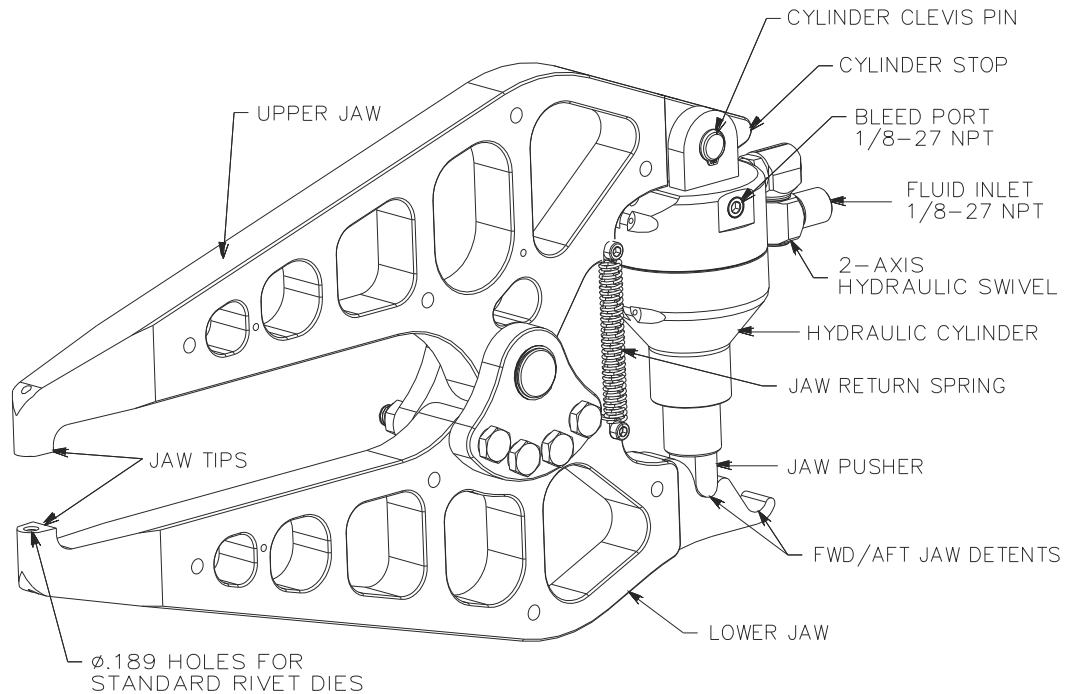


FIGURE 1 – MODEL NXA-10 DETAILS

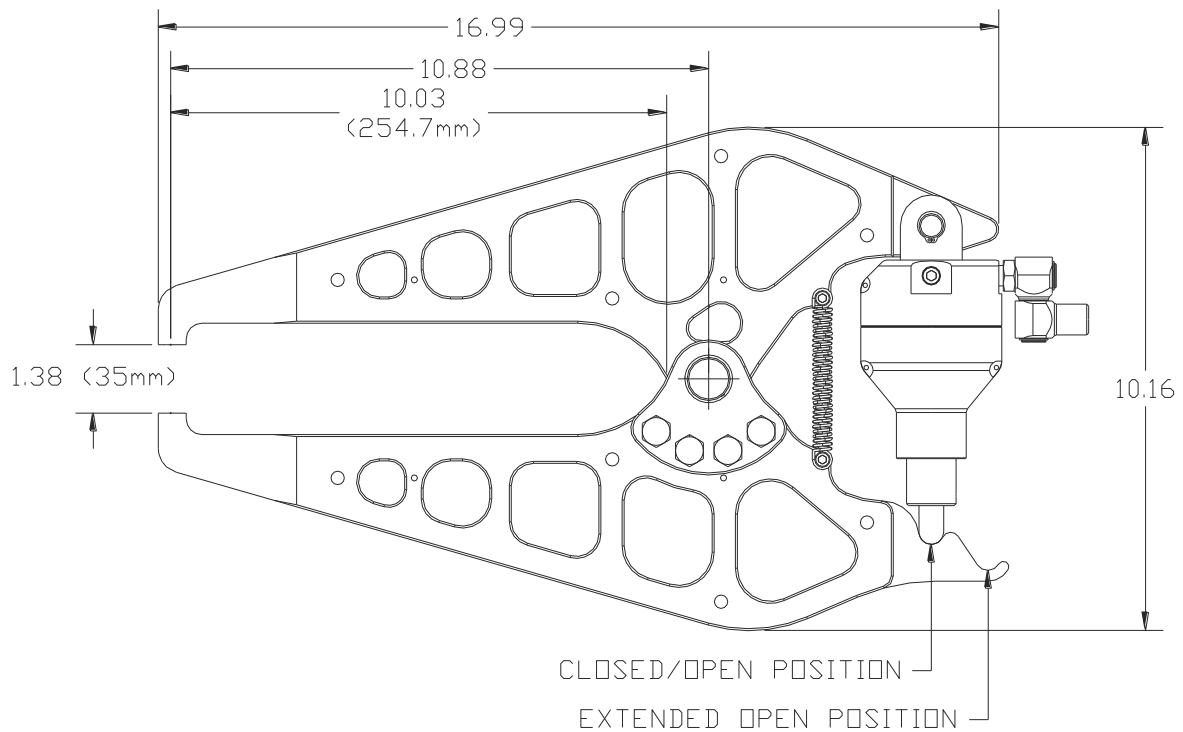


FIGURE 2 – NXA-10 DIMENSIONS (-6, -8 DIFFER IN REACH)

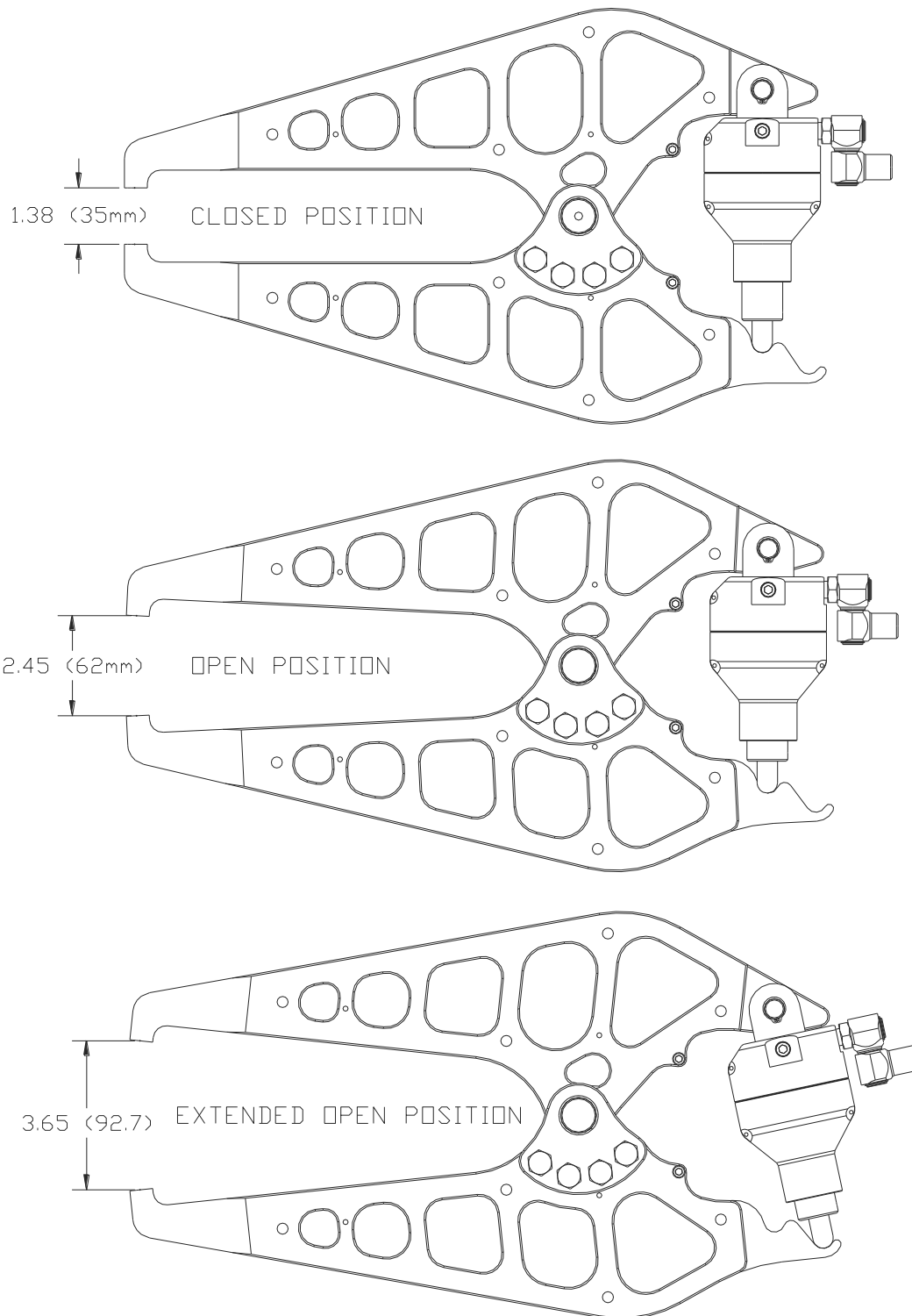


FIGURE 3 – NXA-10 OPERATING POSITIONS

(SEE SECTION 2.0 FOR NXA-6 AND NXA-8 POSITIONS)

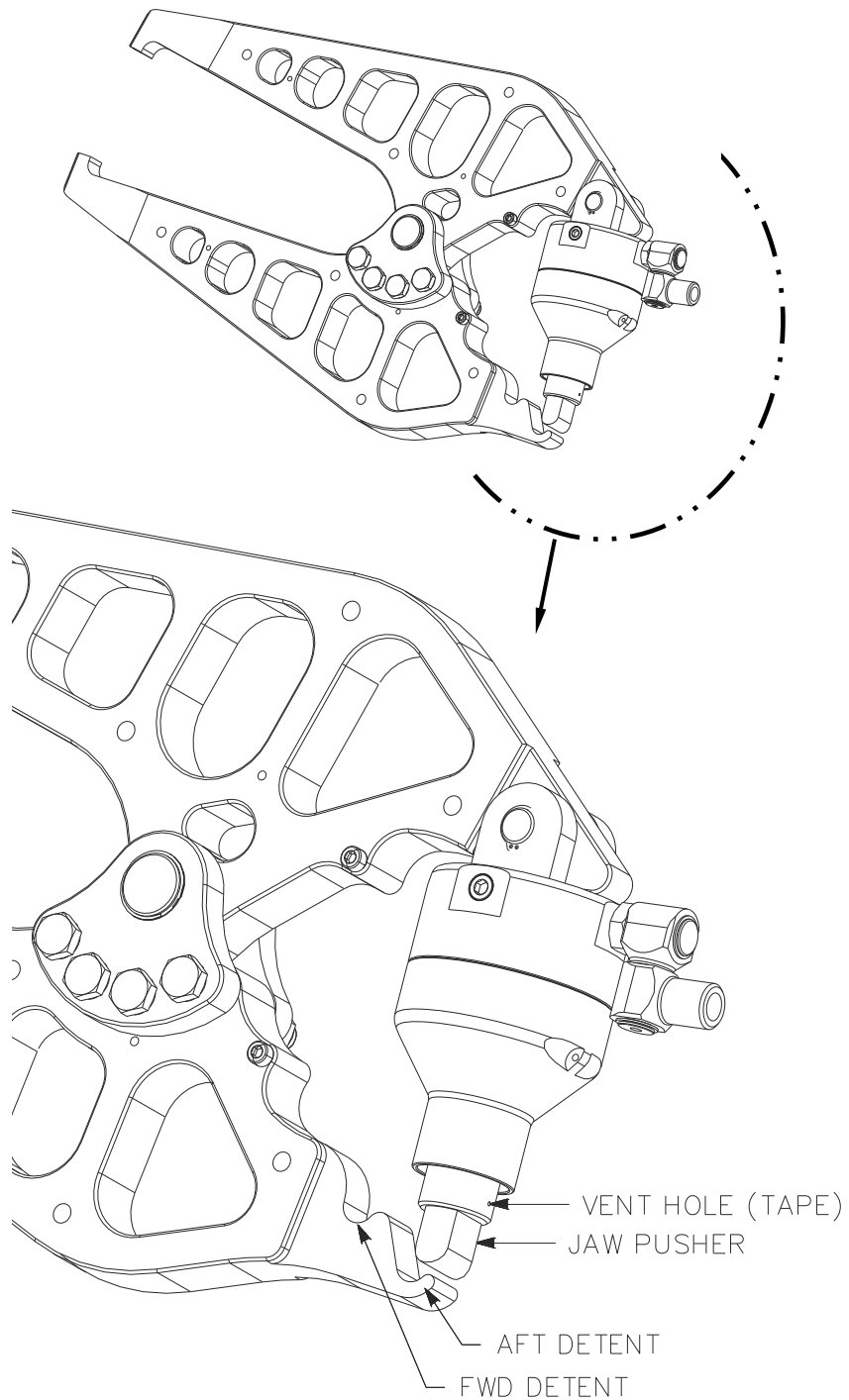


FIGURE 4 – JAW DETENTS

3.0 Safety Warnings

- 3.1 **NEVER operate the system below 30-psig or above 90-psig air pressure.**
- 3.2 **Use extreme caution when operating the Alligator Squeezer**, exercising prudent hand and finger positioning while supporting the squeezer. **KEEP YOUR FINGERS AWAY FROM THE JAW TIPS AT ALL TIMES.** Watch for the potential pinch points located around the hydraulic cylinder, jaw aft ends and jaw pusher interface points. Treat the alligator squeezer tool with respect for the enormous force it can generate, and act accordingly (Do not become an accident waiting to happen).
- 3.3 NEVER operate the alligator squeezer with hydraulic pressure above 4,500 psi (31.0 Kg/cm²). Operating above this specified pressure can lead to failure of the hydraulic hose, hydraulic seals, and fittings.
- 3.4 NEVER disconnect the hydraulic line while the line is pressurized.
- 3.5 Use Dexron III or equivalent fluid for the alligator squeezer actuation fluid. Other fluids such as MIL-7808 turbine oil may be suitable, providing the Buna-N (Nitrile) seals are compatible with the alternate fluid.
- 3.6 Properly bleed the alligator squeezer per Section 7 of this manual. **THE ENTIRE SYSTEM MUST BE FULLY BLED OF ANY AIR BUBBLES FOR OPTIMUM PERFORMANCE.**
- 3.7 Use proper eye protection when operating this unit.
- 3.8 Do not use substitute components for repair of any portion of the unit.
- 3.9 The system should be properly maintained and examined at regular intervals for damage.
- 3.10 Avoid excessive contact with the hydraulic fluid, to minimize skin irritation. Refer to Section 6 for Dexron III safety data.

4.0 Assembly

- 4.1 Refer to Figure 6, SYSTEM SETUP.
- 4.2 Install an AN816-4D fluid fitting or male quick disconnect (QD) (PN 6705) into the fluid inlet port of the swivel on alligator squeezer. Use Teflon tape on the pipe threads, to ensure there are no hydraulic leaks.
- 4.3 Install an AN816-4D fluid fitting into the end of the pressure intensifier. Use Teflon tape on the pipe threads, to ensure there are no hydraulic leaks.
- 4.4 Connect the alligator squeezer directly to the hydraulic hose, at the AN816-4D fitting. Alternately, attach an AN816-4D to the hydraulic hose end, and a female QD (PN 6706) further attached to the AN fitting. The QD will allow for rapid change of Numatx forming heads.
- 4.5 Install the 3/8" air lines between the foot valve and intensifier, using the supplied one-touch air fittings. Use Teflon tape on the threads of the air fittings. Note that the default position of the foot valve (pedal un-depressed) should be flowing air to the air fitting located on the top of the intensifier. When the foot valve pedal is depressed, air should be flowing to the air fitting at the bottom of the intensifier.
- 4.6 Bleed the entire system per Section 7 of this manual. The system **MUST** be properly bled of all air in order to develop full force and stroke.
- 4.7 Install a pressure limiting "pop-off" valve, either upstream of the main air supply to the foot valve, or at Port A of the pressure intensifier. The pop-off valve should be set to relieve excess pressure at levels above 100 psi.
- 4.8 Use filtered air for motive power.
- 4.9 Mount appropriate rivet dies in the tips of the alligator squeezer, for the rivet type being squeezed. The alligator jaws are set up to receive rivet dies with .187 diameter (3/16") shanks.
- 4.10 The rivet dies used should allow for slight jaw flex under load. For example, the NXA-6 (6" reach) alligator jaws will flex up to .060" for each jaw, under a load of 10,000 Lbf.

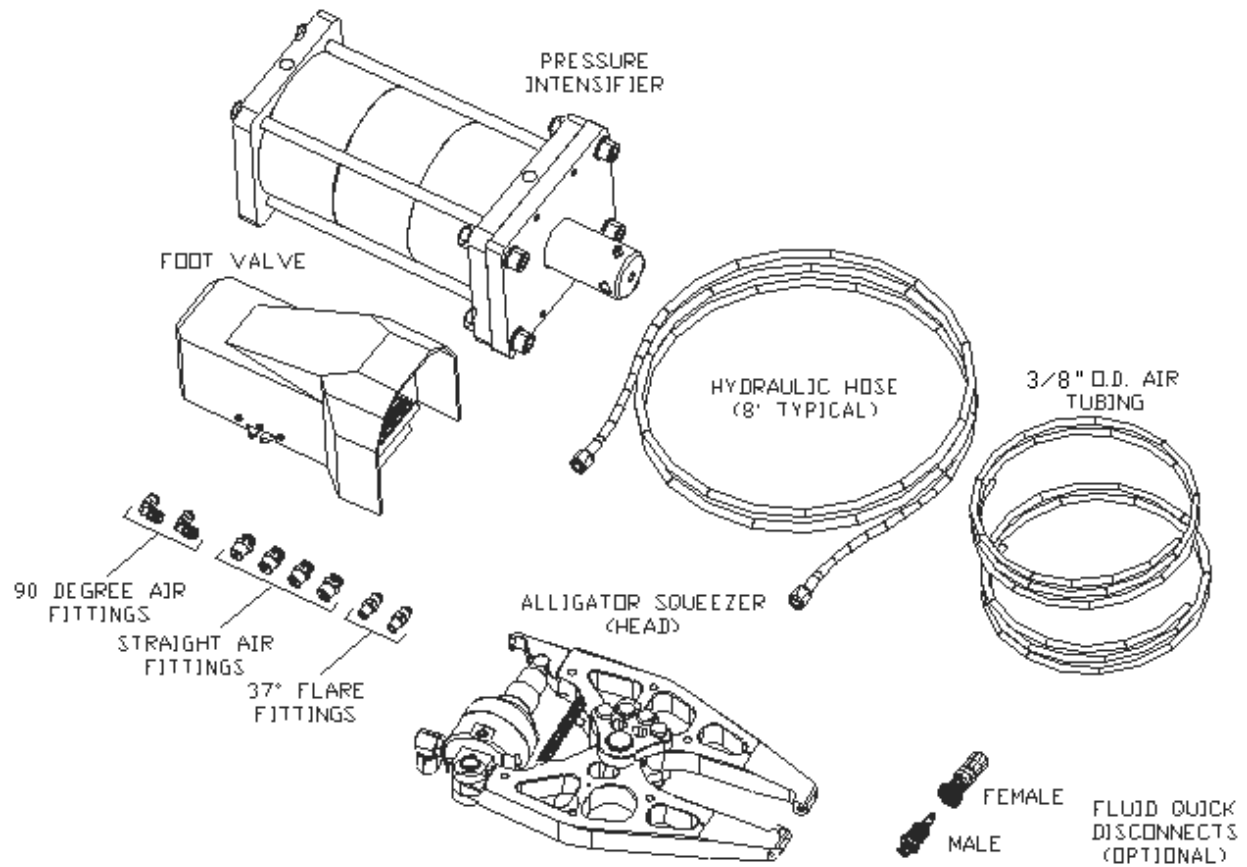


FIGURE 5 – SYSTEM CONTENTS

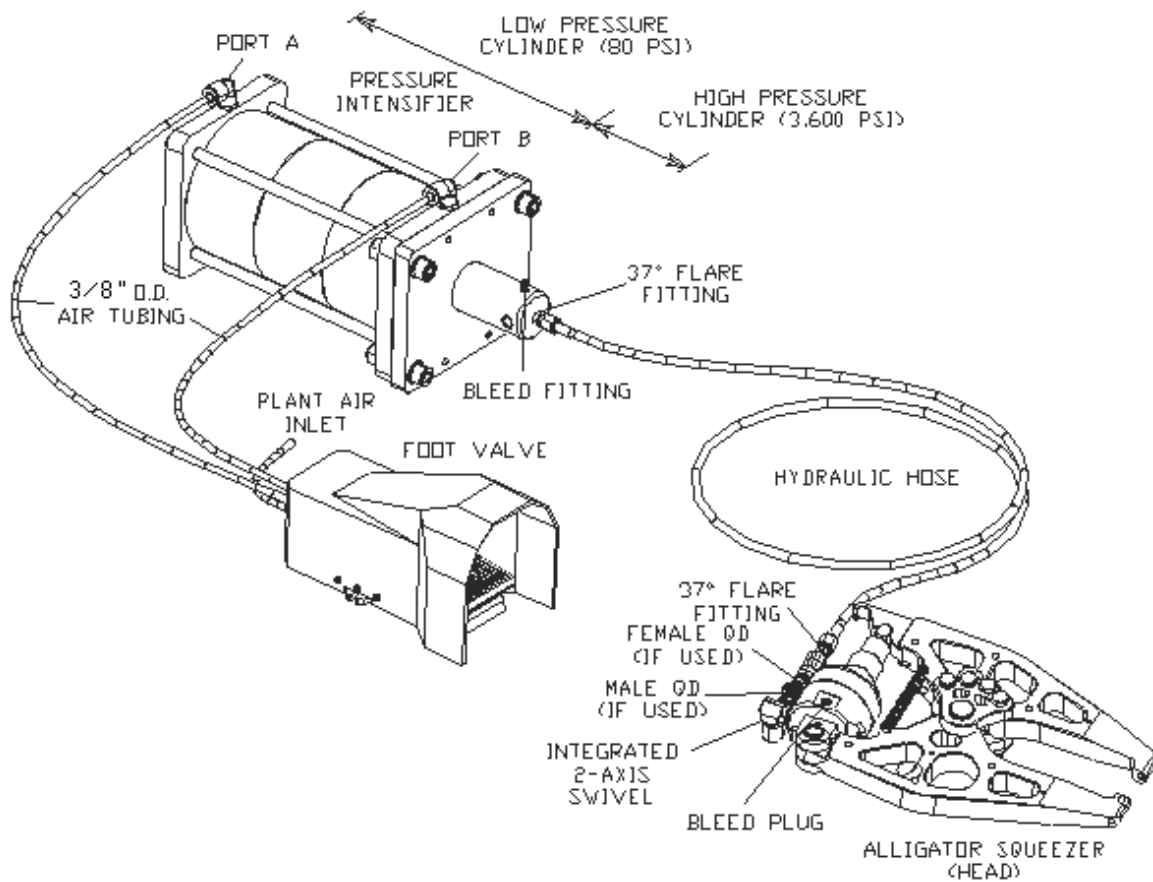


FIGURE 6 – SYSTEM SETUP

5.0 Operation

- 5.1 Referring to Figure 1, become familiar with the components and features shown.
- 5.2 The NXA alligator squeezer has three (3) operating positions, as shown in Figure 3. These figures are with no rivet dies installed, which will vary in length. The normal position, with no hydraulic pressure applied to the squeezer, is the “Open Position”. With hydraulic pressure applied, the jaw tips close to the “Closed Position” distance shown in Figure 3. For additional jaw tip clearance, the squeezer jaws can be moved to an “Extended Open Position”. To accomplish this, slightly close the jaws while in the Open Position, and rotate the cylinder aft, so that the cylinder jaw pusher is located against the aft detent, shown in Figure 4. **DO NOT** attempt to operate the squeezer while the jaws are in the Extended Open Position, as damage to the squeezer may occur. Return the jaws to the “Open Position” prior to squeezing a rivet.
- 5.3 The alligator jaws may be manually folded for clearance check of adjacent structure. The jaw return spring will return the jaws to the Open Position, when no pressure is applied to the alligator hydraulic cylinder. Use this folding feature to begin to establish the rivet die lengths needed for a particular riveting task.
- 5.4 The jaw pusher is installed on the tip of the hydraulic actuator piston shaft, and retained with grease (Figure 4). A small vent hole is taped closed to produce a suction force to retain the pusher on the shaft. The pusher can be removed for service of the actuator.
- 5.5 Shorter or longer rivet dies are used to statically adjust the effective length of the jaw tip, in conjunction with thin shims between the die and jaw tip. Some experimentation is necessary to determine the exact stack-up required for a given rivet material and rivet diameter.
- 5.6 For your particular riveting needs, a good practice is to perform a series of test coupons, to construct a matrix of operating parameters necessary to achieve acceptable squeezing results for various rivet materials and rivet diameters.
- 5.7 To squeeze a rivet, depress the foot pedal (or actuate a control valve) connected to the intensifier. The pressure intensifier will displace hydraulic fluid along the length of the hydraulic hose, forcing the piston in the squeezer to move the alligator jaws to the Closed Position.
- 5.8 To retract the alligator squeezer jaw tips, release the foot valve (or other control valve). The piston of the intensifier will return to a retracted state, allowing the fluid in the squeezer to return to the intensifier. The default position of the foot valve is with air supplied to port A of the intensifier.
- 5.9 The use of a foot valve will allow full feathering control of the alligator jaws. Feathering is possible with a foot valve since the foot valve can be finely controlled to cause the air to be differentially delivered to both ports A and B at the same time.

6.0 Maintenance

The NUMATX NXA alligator squeezers have 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 squeezer system should be full of oil and properly bled per Section 7.
- 6.2 Use only Dexron III or fluid compatible with Buna-N (Nitrile) seals. See Dexron III safety Data below.
- 6.3 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.
- 6.4 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.
- 6.5 The system should be routinely inspected for oil leaks. Check the bleed fitting of the intensifier and bleed plug of the alligator squeezer to ensure they are tight. **DO NOT OVERTIGHTEN.**
- 6.6 The bleed plug in the alligator squeezer may be removed to examine the fluid level. Re-install using Teflon tape and tighten.
- 6.7 Avoid dropping any portion of the unit, as this may cause damage to close tolerance parts.
- 6.8 Section 9 shows an exploded 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 a 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 Riveter System

In order to develop maximum force and full jaw travel, 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 50-60cc 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.

Numatx offers a Model 3450-1 Power Bleeder, which can make system bleeding easier. Low pressure air (20-30-psig) is used to force hydraulic fluid into the system. The power bleeder holds a sufficient quantity of fluid for several system charges.

- 7.1 Place the unit so that the intensifier and the hydraulic hose are below the alligator squeezer. 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 alligator squeezer should be as close to the relative high point in the system as possible, to preclude the possibility of an air pocket. Remove the alligator squeezer bleed plug, and install a 1/8" NPT barb fitting and 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 the 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, forcing any air bubbles out.
- 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 alligator squeezer, watching for fluid exiting the clear tube. Continue injecting hydraulic fluid until no air bubbles are seen in the fluid exiting the alligator squeezer. An unfilled system requires several 50-60cc syringe injections.
- 7.7 Injecting the fluid at a slower rate may lessen cavitation of air bubbles within the alligator squeezer hydraulic cylinder. The goal is to remove ALL air bubbles.
- 7.8 When finished injecting fluid, tighten the bleed fitting of the intensifier BEFORE removing the tubing from the bleed fitting. This will prevent additional air from entering the system.
- 7.9 Remove the clear barb fitting and tube at the alligator squeezer, and check the fluid level at the port. Fluid may be added to "top off" the unit.
- 7.10 Reinstall the alligator squeezer bleed plug and tighten. Use Teflon tape on the pipe threads. DO NOT over-tighten this bleed plug, it does not need to be buried into the cover stem. Repeat: USE TEFLON TAPE.
- 7.11 Wipe up any excess fluid present on the intensifier and alligator squeezer.

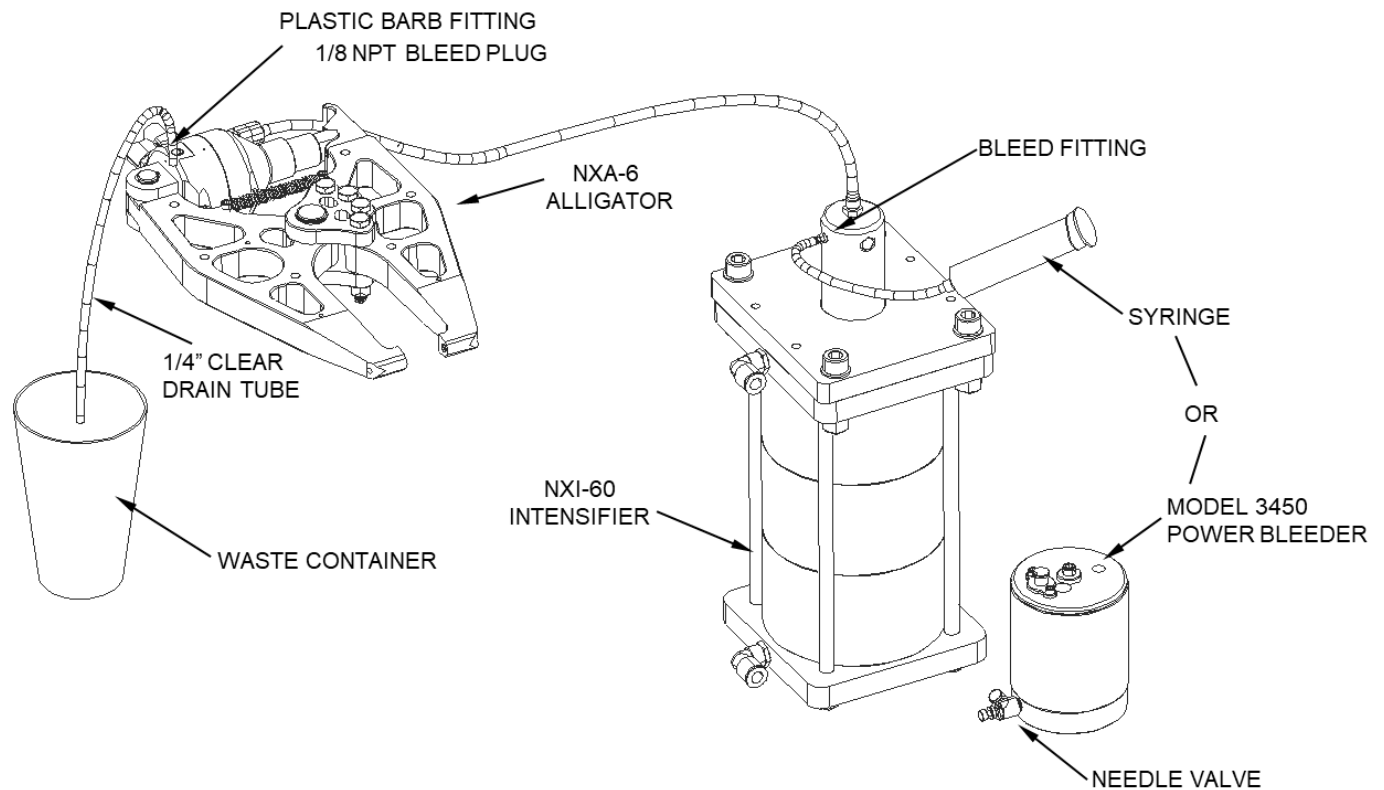


FIGURE 6 – BLEEDING SETUP

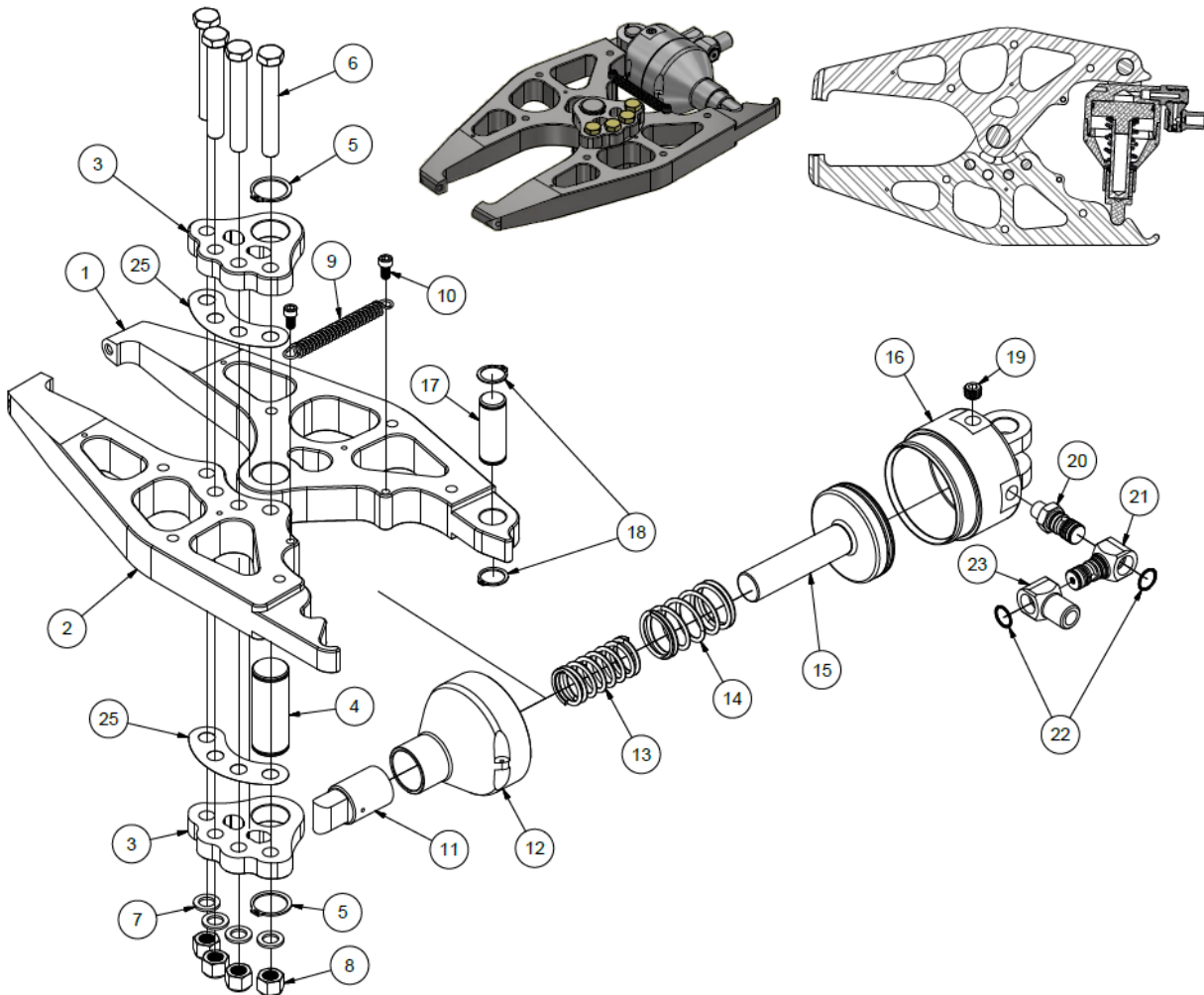
8.0 Contact Information

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



25 Leonberg Road
Cranberry Twp., PA 16066
Phone: 724-776-6800
Fax: 724-776-0227

9.0 Parts List



Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	3801 (-1, -2, OR -3)	UPPER JAW
2	1	3802 (-1, -2, OR -3)	LOWER JAW
3	2	3803-1	HINGE PLATE
4	1	3805-1	SHEAR PIN
5	2	SH-87SS	RETAINING RING
6	4	AN6-25A	SHEAR BOLT
7	4	AN960-616	WASHER
8	4	AN365-624A	LOCKNUT
9	1	E0360-055-2000	EXTENSION SPRING
10	2	SHCS-1032-375	CAP SCREW
11	1	3804-1	JAW PUSHER
12	1	3285-1	LOWER CYLINDER
13	1	C0975-105-2000M	RETURN SPRING
14	1	C1225-105-2000M	RETURN SPRING
15	1	3283-1	PISTON ASSEMBLY
16	1	3282-1	UPPER CYLINDER
17	1	3805-2	SHEAR PIN
18	2	SH-62SS	RETAINING RING
19	1	PP-1/8	1/8 NPT PLUG
20	1	3008-1A	SWIVEL STEM ASSEMBLY
21	1	3015-1A	DOUBLE AXIS SWIVEL ASM
22	2	WS-50	RETAINING RING
23	1	3014-1	90 DEG SWIVEL
25	2	3806-2	HINGE SHIM
	X	3806 (-1, -2, OR -3)	SHIM (OPTIONAL)