

AIM JORACO®

"The Pneumatic Toggle Press Innovators."® Since 1947



AUTOMATED INDUSTRIAL MACHINE, INC

TOGGLE-AIRE® DIVISION

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Installation, Operation and Maintenance
Hydro-Pneumatic Series Bench Presses

IMPORTANT

It is the responsibility of the employer/purchaser to provide his or her employees with proper point of operation guards, and to insure that this equipment is used in accordance with the manufacturer's recommendations as well as any OSHA, federal, or state regulations that are applicable to such equipment. Because it is impossible to anticipate the conditions under which our equipment will be operated, additional safety devices and methods may be required to insure operator safety. Besides conforming to all federal, state, and local codes, the buyer should consider the safety of the entire operation involving any press, and see that any additional guarding, training, and maintenance deemed necessary is developed and enforced to protect the well being of the operator.

THINK SAFETY . . .
. . . WORK SAFELY

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HYDRO-PNEUMATIC SERIES PRESSES

OVERVIEW, INSTALLATION, AND OPERATION

Section I: Press Overview

1.1 Description

The Hydro-Pneumatic (HP) Series Press is a completely self-contained, air-over-oil unit that is cost-effective and can be used in a variety of assembly and forming applications including punching, marking, staking, cutting, crimping and flaring. Our HP presses are available in sizes from 2 to 16 tons and the standard specifications are: 4" stroke with up to ½" power stroke, 8" open height, 20" between columns and an 8" x 10" precision ground bolster plate. Our HP Series Presses cut down on air consumption but still deliver the maximum force required for your application.

1.2 Features

- Self-contained
- Clean
- Quiet
- Adaptable
- No springs
- Only 3 moving components
- No external hydraulics

1.3 Options

- EZ-Dial Force Regulator
- Adjustable Output
- Filter, Regulator, Lubricator (FRL) - clean room compliance
- Dwell Timer
- Non-Rotating Ram
- Can be PLC ready for automated setups and force monitoring packages

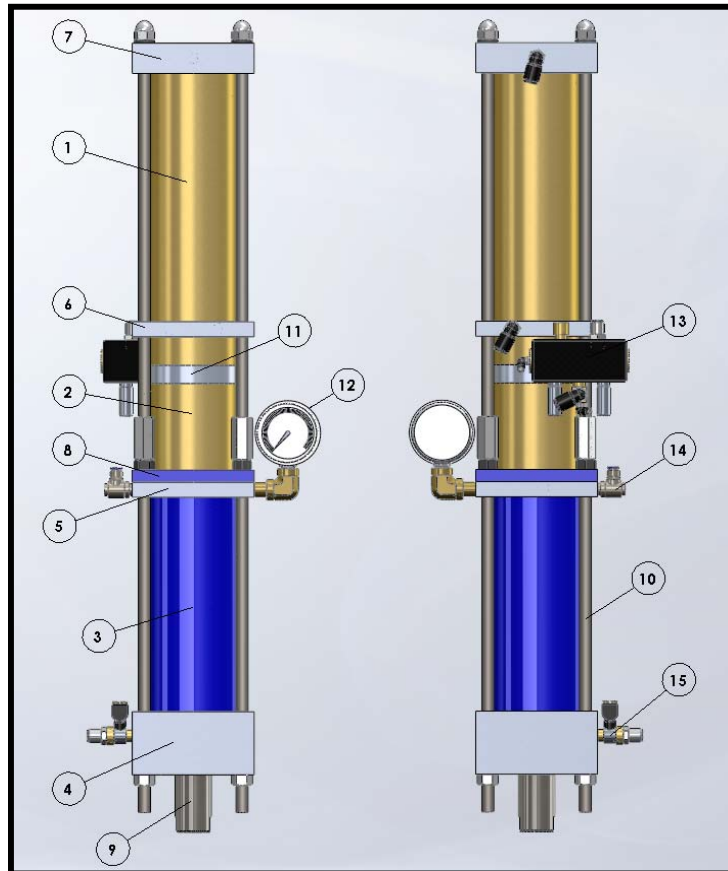
*** Custom Features may be quoted upon request

*** C-Frame option also available upon request

*** HP Series Cylinders also sold separately

HYDRO-PNEUMATIC SERIES PRESSES OVERVIEW, INSTALLATION, AND OPERATION

1.4 Cylinder Components



| Item No. | Description |
|----------|--|
| 1 | High Pressure Advance |
| 2 | Rapid Advance |
| 3 | High Pressure Intensifier |
| 4 | High Pressure Cylinder Head |
| 5 | High Pressure Intermediate Cylinder Head |
| 6 | Low Pressure Intermediate Cylinder Head |
| 7 | Low Pressure Cylinder Head |
| 8 | Tie Rod Plate |
| 9 | Ram |
| 10 | Tie Rod |
| 11 | Venting Collar |
| 12 | Pressure Gauge |
| 13 | 4 Way Valve |
| 14 | Bleed / Fill Valve |
| 15 | HP Sensor |

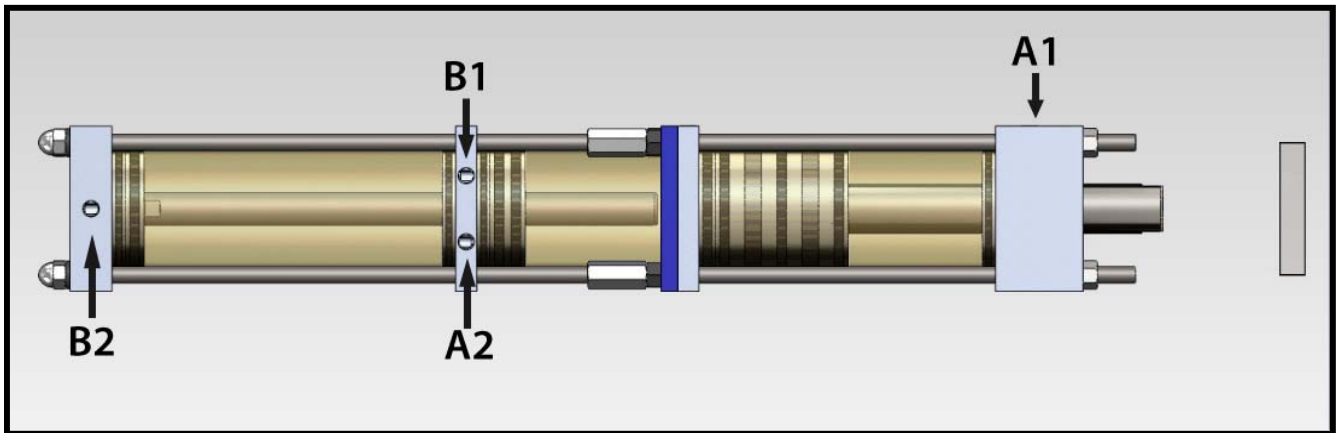
HYDRO-PNEUMATIC SERIES PRESSES

OVERVIEW, INSTALLATION, AND OPERATION

1.5 Function

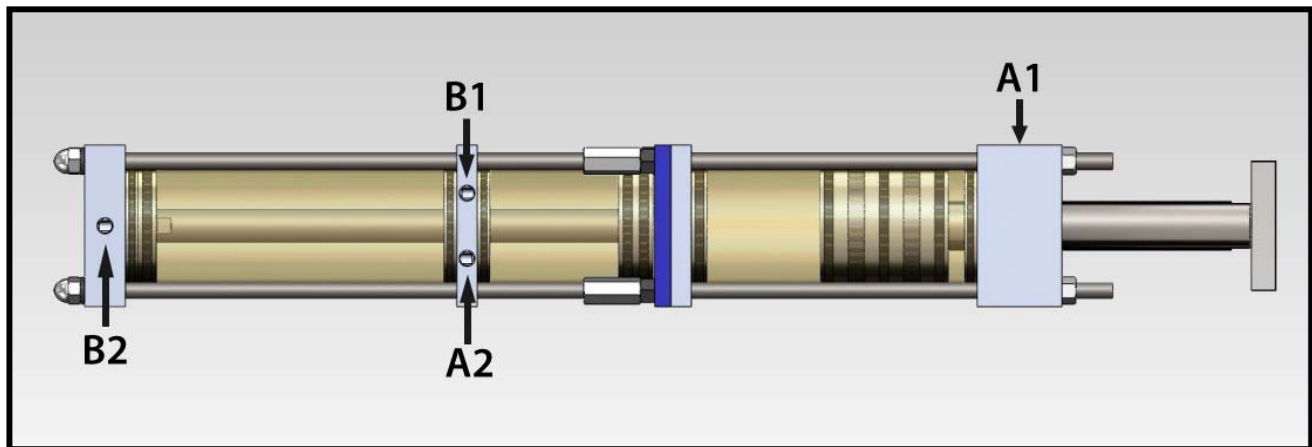
Cylinder Retracted

For the cylinder to retract, compressed air is supplied to ports A1 and A2, fully retracting the high pressure, rapid advance and intensifier pistons.



Rapid Advance

For the cylinder to begin rapid advance, compressed air is supplied to port B1. This forces the rapid advance piston down towards the working end of the cylinder, forcing oil from the reservoir to the top of the intensifier piston until resistance is met.

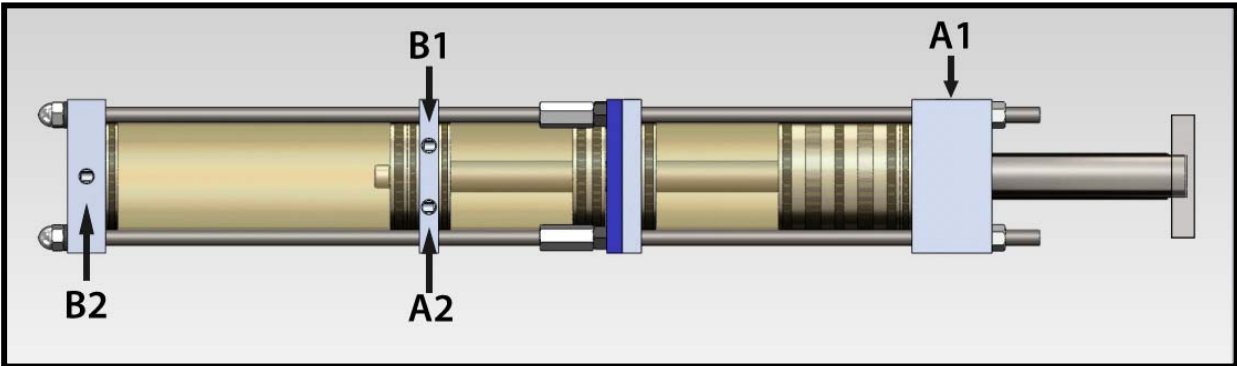


HYDRO-PNEUMATIC SERIES PRESSES

OVERVIEW, INSTALLATION, AND OPERATION

Power Stroke

For the cylinder to begin the power stroke, compressed air is supplied to port B2. This forces the high pressure piston and rod down towards the working end of the cylinder. The high pressure piston and rod travel until reaching the high pressure seal, which will be the point at which pressure begins to build. As the rod and piston continue traveling, oil that was displaced during the rapid advance is compressed and builds pressure. Once the work has been completed the cylinder will then retract as mentioned above.



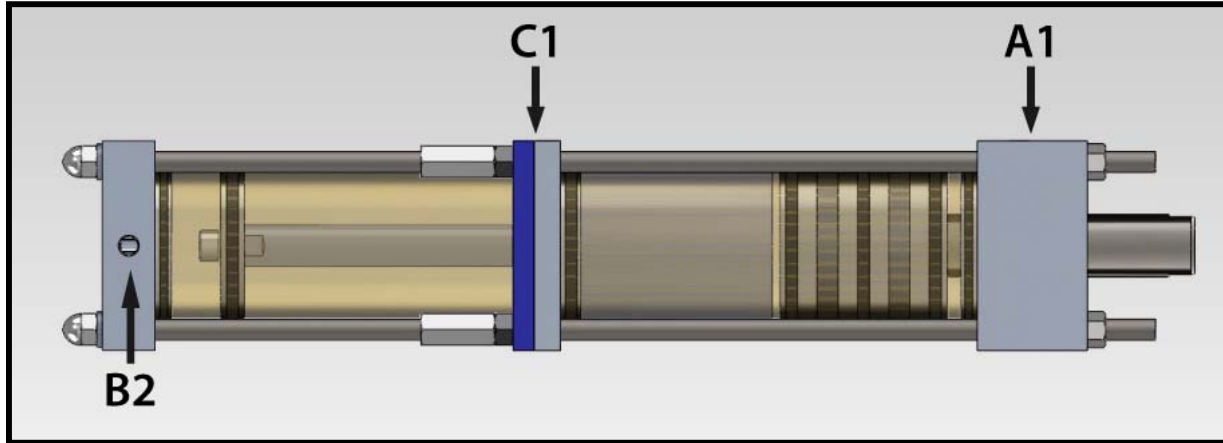
Power Stroke Only Option

HP Series Presses are also sold as power stroke only. This will simply eliminate the rapid advance section and shorten the total travel of the cylinder.

For the cylinder to begin the power stroke, compressed air is supplied to port B2. This forces the high-pressure piston and rod down towards the working end of the cylinder. In the power stroke only configuration the high pressure piston and rod are always in contact with the high pressure seal. This means that as soon as compressed air is supplied to port B2 the cylinder will begin building pressure. As the high pressure piston and rod continue traveling the oil is compressed and builds pressure. The cylinder will retract when compressed air is supplied to ports A1 and C1.

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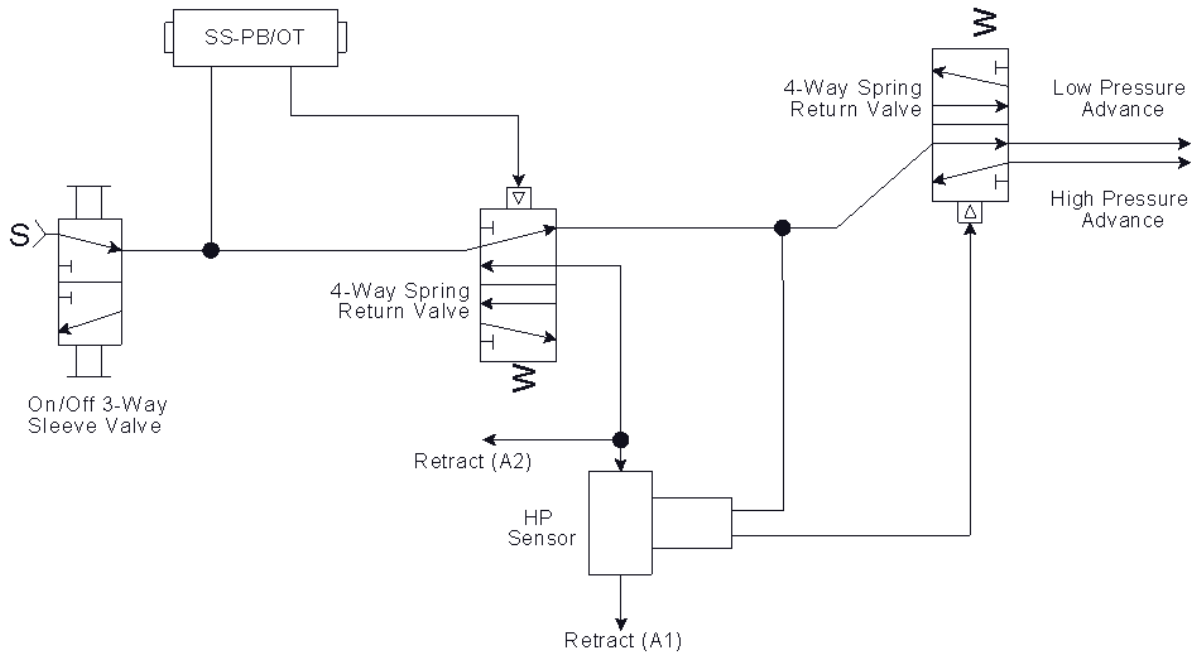
INSTALLATION, OPERATION, AND MAINTENANCE



HYDRO-AIRE SERIES PRESSES INSTALLATION, OPERATION, AND MAINTENANCE

Section II: Valving

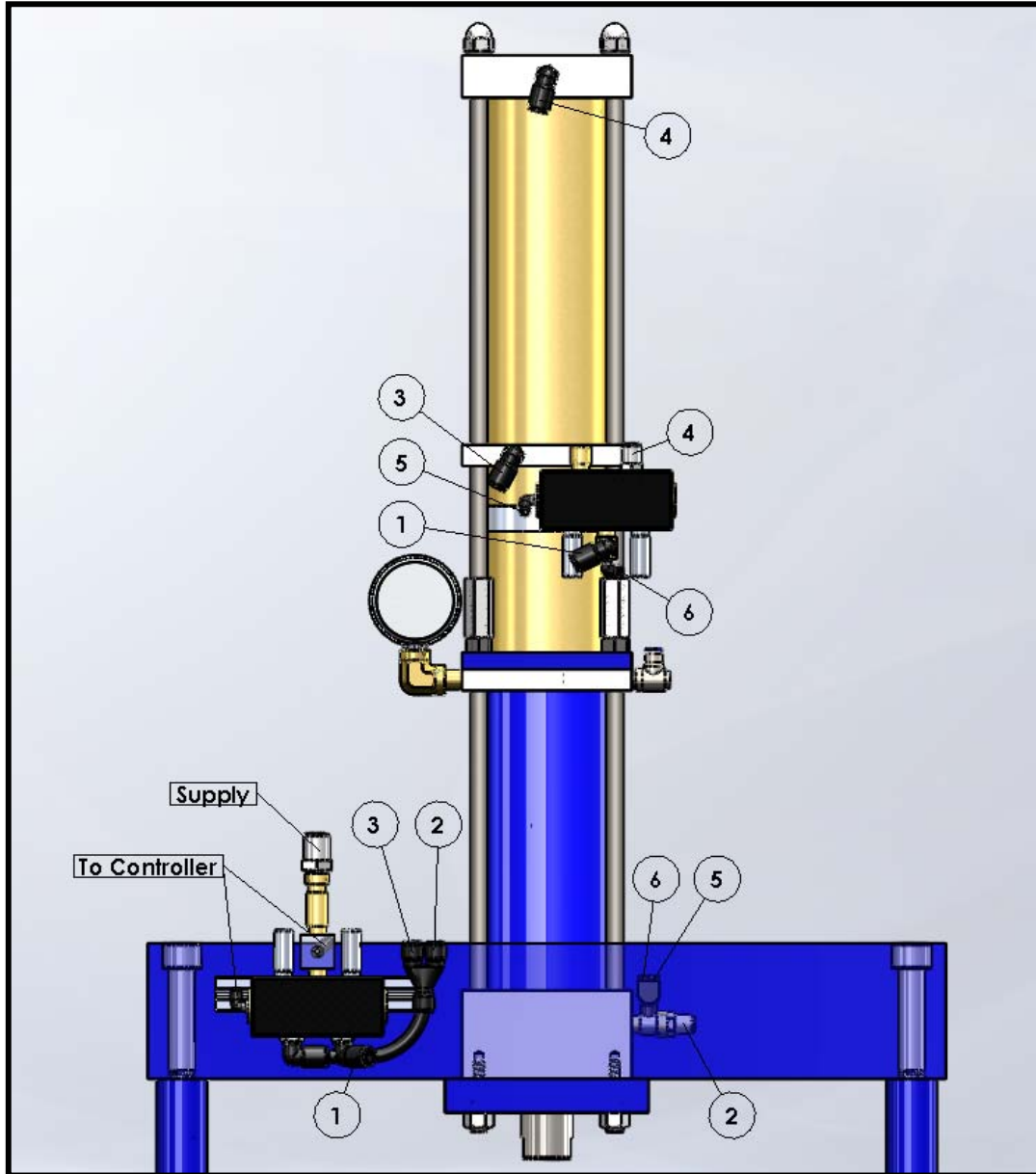
2.1 Pneumatic Circuit



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INSTALLATION, OPERATION, AND MAINTENANCE

2.2 Valving Connections



| Valving Connections | Valving Description |
|---------------------|--------------------------|
| 1-1 | Rapid Advance |
| 2-2 | Low Pressure Retract |
| 3-3 | High Pressure Retract |
| 4-4 | High Pressure Advance |
| 5-5 | High Pressure Signal (S) |
| 6-6 | High Pressure Power (P) |

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INSTALLATION, OPERATION, AND MAINTENANCE

Section III: Installation

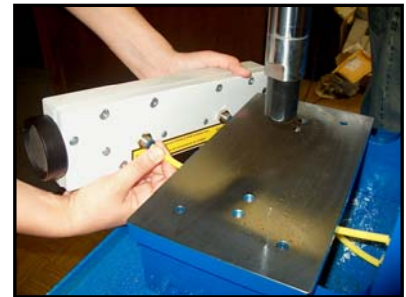
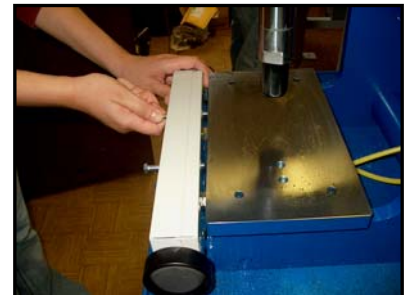
3.1 Un-boxing

Carefully remove the press from the crate, taking note of separately packed items such as the "Quick Exhaust Unit"(Optional), FRL Unit (Optional) and "Synchro-Sig" Actuator.

Synchro-Sig may come mounted on some models

3.2 Synchro-Sig Installation

- A. Locate the 1/4" yellow tubing found under the press platen. Connect the tubing to the appropriate fittings on the actuator. See markings on the tubing. DO NOT OVERTIGHTEN normally, 1/2 turn past finger tight is sufficient for an airtight connection. (Figure 1.1)
- B. Using the 1/4-20 hex head bolts supplied, mount the "Synchro-Sig" to the press as shown. Be sure to mount the aluminum lever guard between the actuator and the press at the same time. (Figure 1.2)



NOTE: To insure operator safety some applications may require that you locate the "Synchro-Sig" actuator further away from your tooling.

- PICTURES ARE FOR REFERENCE ONLY -
SOME SECTIONS OF THIS MANUAL MAY NOT APPLY
TO YOUR PRESS UNIT.

HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

3.3 Mounting Press

- A. Select a bench of suitable size and strength.
- B. Bolt the press to the bench using the holes located in the press frame below the platen area. Never operate the press unless it is securely mounted on a bench or stand. (Figure 1.3)



(Figure 1.3)

CAUTION: WHENEVER CONNECTING YOUR AIR SUPPLY TO THE PRESS BE CERTAIN TO FOLLOW SAFE OPERATING PROCEDURES AND KEEP ALL PARTS OF YOUR BODY AWAY FROM THE MOVING PARTS OF THE PRESS!

3.4 Connect Air Supply

- A. The air supply must be clean and conditioned. Preferably, a Filter, Regulator, Lubricator Unit, (Joraco Part No. FRL-HP) should be located within 6 feet of the press. For optimum results all air lines, fittings, and hoses used to supply the press should be the equivalent of **1/2" minimum**.
- B. The minimum air pressure for operation is 50 PSI; the maximum is 100 PSI. The optimum operating range is 60-100 PSI. If your application consistently required substantially more than 100 PSI it may indicate the need for a stronger press.
- C. Connect air supply to the press at the inlet port.



(FRL Unit)

NOTE: If lower pressure is required consult factory about EZ-Dial option

NOTE: A three way Shut Off Valve like the one supplied must always be used to insure complete bleeding of the press circuits when air supply is off.



(Inlet)

HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

3.5 Turn On Air Supply

- A. Remove the yellow lock out device found on the On-Off Valve. To turn the air on simply move the gold colored sleeve downward until it stops. Slide the sleeve upward to the stop to shut the supply off. With the supply on, check for air leaks and be sure all connections you have made are secure and air tight. If air leaks from inside the "Synchro-Sig" actuator the connections are incorrect. Correctly reconnect the tubing, taking note of the tubing labels.

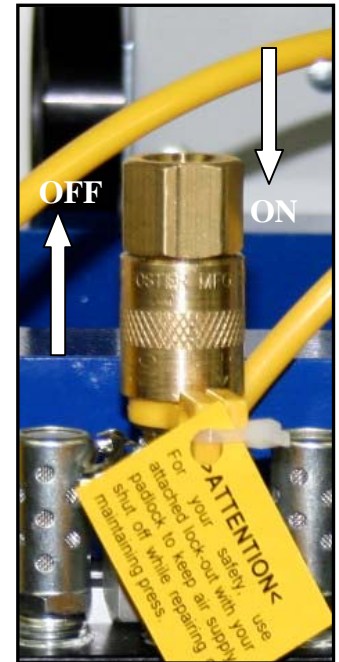
CAUTION: INSURE HANDS ARE CLEAR OF ANY TOOLING BEFORE TURNING OFF AIR SUPPLY. THE WEIGHT OF A HEAVY TOOL MAY CAUSE IT TO DROP UNEXPECTEDLY. IF HEAVY TOOLING IS BEING USED BE SURE TO PLACE A STOP UNDER TOOLING BEFORE TURNING OFF AIR SUPPLY

NOTE: When the press is not in use or being serviced or maintained, always SHUT OFF the air supply and replace the lockout device. Secure with a padlock, etc. to prevent unauthorized use of the press.

CAUTION: BEFORE PROCEEDING, MAKE SURE THE TABLE AND WORK AREA IS CLEAR OF ALL TOOLS, FOREIGN OBJECTS, AND BODY PARTS.

3.6 Test The Installation

- A. Test the "Synchro-Sig" Two Hand Actuator by simultaneously depressing the levers on the Model SS-PB or by simultaneously placing a finger in each sensing "button" on the Model SS-OT. The press should cycle once, return to the top of the stroke, and await another signal from the actuator. If the levers or "buttons" are continuously held down the press should remain in the down position until one or both levers or buttons are released.



HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

Section IV: Set Up and Operation

NOTE: Prior to installing any tooling in the press, proper point of operation guarding, specifically designed for your tooling, must be built and mounted on or around your tooling.

CAUTION: NEVER OPERATE, SERVICE OR ADJUST THIS MACHINE WITHOUT PROPER INSTRUCTION.

NEVER SERVICE THIS MACHINE WITHOUT FIRST SHUTTING OFF AIR SUPPLY.

NEVER OPERATE THIS MACHINE WITH SAFETY GUARDS REMOVED.



4.1 Mount your tooling

- A. Using the tapped holes in the press platen, mount the lower portion of your tooling to the press. The platen is machinable and can be drilled and tapped as necessary. The standard bore in the press ram is .8125" with a depth of 1.5". Precisely fit your shank to the bore of the ram and lock the shank in with the 5/16-18 hardened lock screw located on the face of the ram. The end of the ram should bear against the upper portion of your tooling.



NOTE: If your tool incorporates guide pins etc., be sure the tooling easily moves along the full length of travel with no binding or misalignment. Correct any problems found in the tool before placing tooling into production.

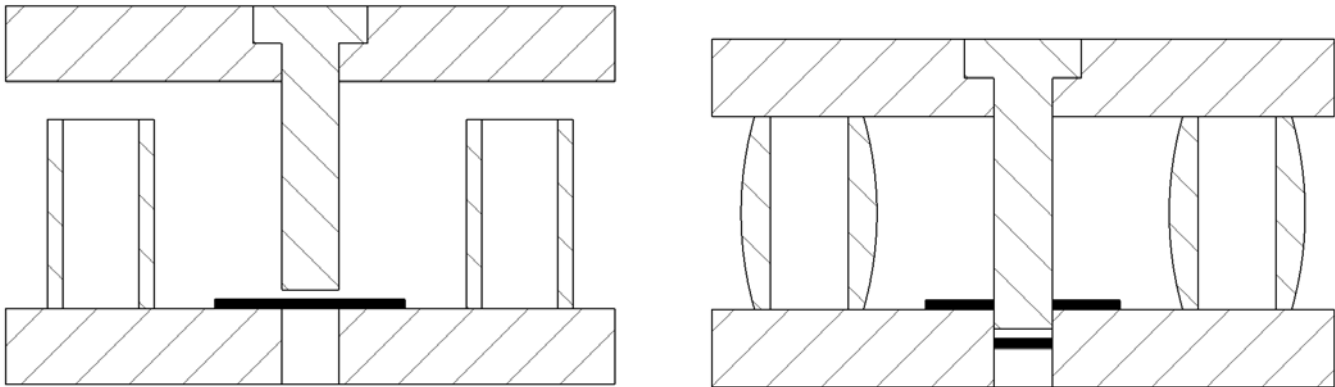


HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

4.2 Stroke Limitation

For punching and piercing applications the travel of the cylinder must be limited after completing the work required. This limitation can be built into the tooling that is being used for the application, with the use of die springs. Failure to limit the travel of the cylinder in these types of applications may cause damage and premature failure of the cylinder.



HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

Section V: Venting / Filling

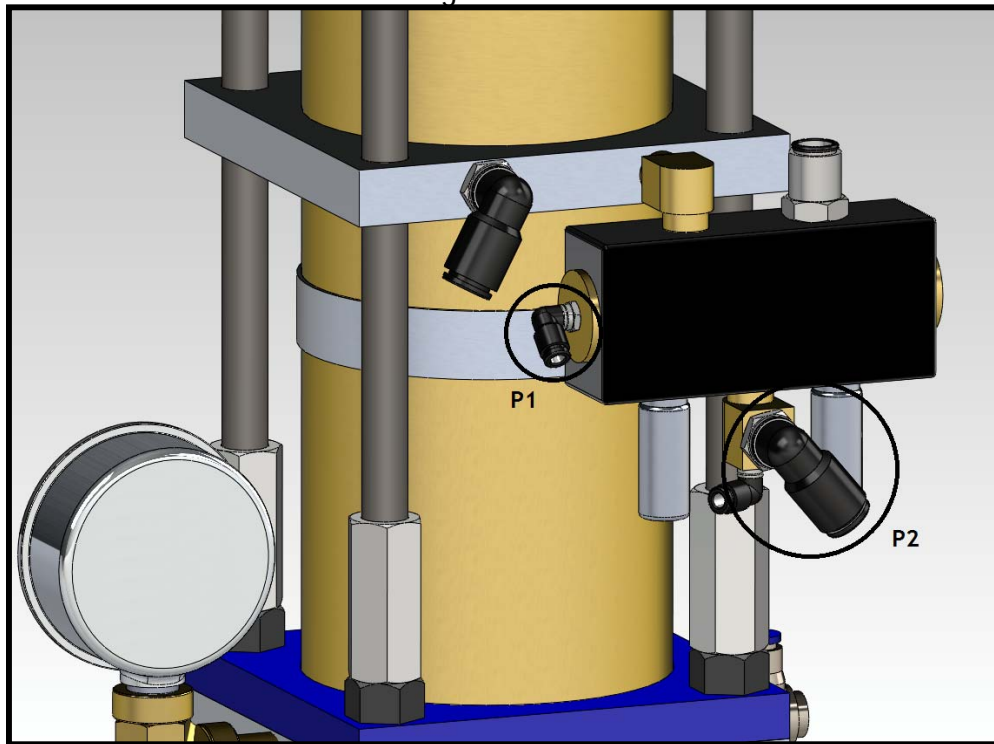
DO NOT DEVIATE FROM THE FOLLOWING PROCEDURES. DOING SO COULD RESULT IN OVERFILLING OF THE CYLINDER, WHICH COULD CAUSE DAMAGE/MALFUNCTION.

IT IS RECCOMENDED TO WEAR EYE PROTECTION WHEN PERFORMING THE FOLLOWING PROCEDURES.

Items Required

- Hydraulic Oil - HF-101 ISO-VG 32
- AIM Joraco Oil Pump - HP-100F
- Flathead screwdriver
- 7/16" wrench
- Shimming material
- Catch can
- Eye protection (recommended)

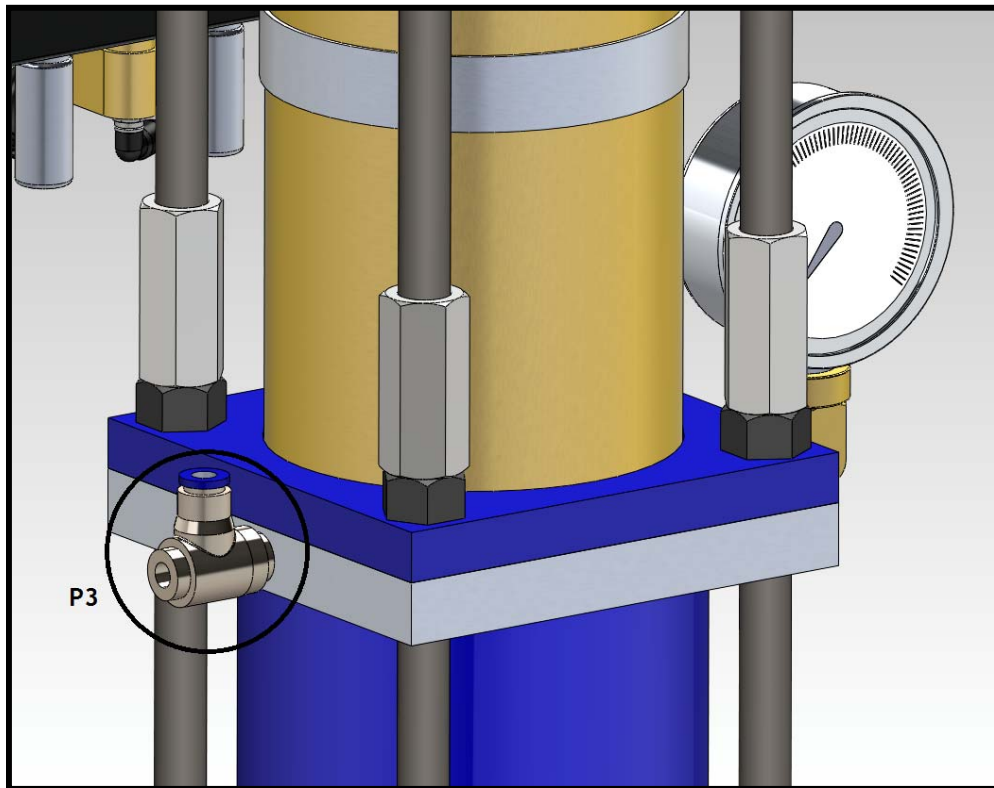
Figure 1



HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

Figure 2



5.1 Vent / Fill Procedure

1. With air still supplied to the cylinder make sure the ram is in the home position (cylinder retracted)
2. Place shims between the bolster plate and the ram. It is important to get the shims as tight as possible to ensure the correct amount of oil will be added to the cylinder.
3. Dump the air to the cylinder by releasing the sleeve valve
4. Using a 7/16" wrench loosen the nut on the venting collar and slide collar upward to expose the 0.025" hole.
5. Make sure that AIM Joraco Oil Pump - HP-100F is filled with oil (30 fl oz min) and vented completely of any air (no air bubbles in the hose)
6. Attach ¼" Poly-flow line from AIM Joraco Oil Pump HP-100F to the bleed valve

HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

5.1 Vent / Fill Procedure (continued)

7. Turn screw on bleed valve counter-clockwise until it stops (valve open)
8. Begin pumping oil from AIM Joraco Oil Pump - HP-100F (some force may be required)
9. Continue pumping oil until it begins to flow out of the 0.025" vent hole and is free of any air bubbles.
10. Wait 30 minutes to let any remaining bubbles in the oil to escape, then repeat step 8
11. Turn screw on bleed valve clockwise until it stops (valve closed)
12. Wipe any excess oil from the cylinder tube making sure the area around the vent hole is clean and dry.
13. Slide the venting collar back down over the vent hole **making sure that the rubber liner of the collar is positioned over the vent hole**
14. Using a 7/16" wrench tighten the venting collar making sure that the rubber liner has a tight seal with the cylinder tube
15. Remove AIM Joraco Oil Pump - HP-100F from bleed valve
16. Cylinder is ready for operation

HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

5.2 Purge / Fill Procedure

Do not perform Purge / Fill procedure unless recommended by an AIM Joraco technician.

1. With air still supplied to the cylinder make sure the ram is in the home position (cylinder retracted)
2. Place shims between the bolster plate and the ram. It is important to get the shims as tight as possible to ensure the correct amount of oil will be added to the cylinder.
3. Dump the air to the cylinder by releasing the sleeve valve
4. Using a 7/16" wrench loosen the nut on the venting collar and slide collar upward to expose the 0.025" hole.
5. Disconnect hose from port (P1) on 4-way valve
See Figure 1
6. Disconnect hose from port (P2) on 4-way valve
See Figure 2
7. Attach ¼" Poly-flow line to bleed valve (P3)
8. Route ¼" Poly-flow line to catch pan to retain oil being removed from cylinder
9. Turn screw on bleed valve counter-clockwise until it stops (valve open)
10. Supply air to port (P2) to begin forcing the oil out of the cylinder
11. Continue supplying air to port (P2) until oil stops flowing from ¼" Poly-flow line
12. Turn screw on bleed valve clockwise until it stops (valve closed)
13. Remove ¼" Poly-flow line from bleed valve

HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

5.2 Purge / Fill Procedure (continued)

14. Make sure that AIM Joraco Oil Pump - HP-100F is filled with oil (30 fl oz min) and vented completely of any air (no air bubbles in the hose) *See notes below*
15. Attach ¼" Poly-flow line from AIM Joraco Oil Pump HP-100F to the bleed valve
16. Turn screw on bleed valve counter-clockwise until it stops (valve open)
17. Begin pumping oil from AIM Joraco Oil Pump - HP-100F (some force may be required)
18. Continue pumping oil until it begins to flow out of the 0.025" vent hole and is free of any air bubbles.
19. Wait 30 minutes to let any remaining bubbles in the oil to escape, then repeat step 8
20. Turn screw on bleed valve clockwise until it stops (valve closed)
21. Wipe any excess oil from the cylinder tube making sure the area around the vent hole is clean and dry.
22. Slide the venting collar back down over the vent hole **making sure that the rubber liner of the collar is positioned over the vent hole**
23. Using a 7/16" wrench tighten the venting collar making sure that the rubber liner has a tight seal with the cylinder tube
24. Remove AIM Joraco Oil Pump - HP-100F from bleed valve
25. Replace lines to ports (P1) and (P2)
26. Cylinder is ready for operation.

HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

Section VI: Troubleshooting

6.1 Ram Will Not Extend

| Cause | Solution |
|-------------------------|-------------------------------|
| Air is not on | Turn on air supply |
| Insufficient air supply | Increase air supply pressure |
| Defective valve | Contact AIM Joraco to replace |
| Tooling is binding | Inspect / repair tooling |

6.2 Ram Will Not Retract (stuck in down position)

| Cause | Solution |
|-------------------------|-------------------------------|
| Insufficient air supply | Increase air supply pressure |
| Defective valve | Contact AIM Joraco to replace |
| Tooling is binding | Inspect / repair tooling |

6.3 Cylinder Will Not Switch to Power Stroke Cycle

| Cause | Solution |
|------------------------------|-------------------------------|
| Air lines routed incorrectly | Refer to section 2.1 |
| Defective valve | Contact AIM Joraco to replace |
| Defective HP sensor | Contact AIM Joraco to replace |
| Cylinder low on oil | Refer to section 5.1 |
| Air trapped in oil reservoir | Refer to section 5.1 |

6.4 Frequent Oil Fills

| Cause | Solution |
|------------------------------|-------------------------------|
| Damaged / worn seals | Send cylinder to AIM Joraco |
| Defective bleed / fill valve | Contact AIM Joraco to replace |

HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

6.5 Press Not Generating Pressure

| Cause | Solution |
|-------------------------------|------------------------------|
| Insufficient air supply | Increase air supply pressure |
| Cylinder low on oil | Refer to section 5.1 |
| Cylinder out of working range | Adjust tooling |
| Damaged / worn seals | Send cylinder to AIM Joraco |

6.6 Ram Does Not Fully Retract

| Cause | Solution |
|------------------------------|------------------------------|
| Insufficient air supply | Increase air supply pressure |
| Tooling is binding | Inspect / repair tooling |
| Air trapped in oil reservoir | Refer to section 5.1 |

HYDRO-AIRE SERIES PRESSES

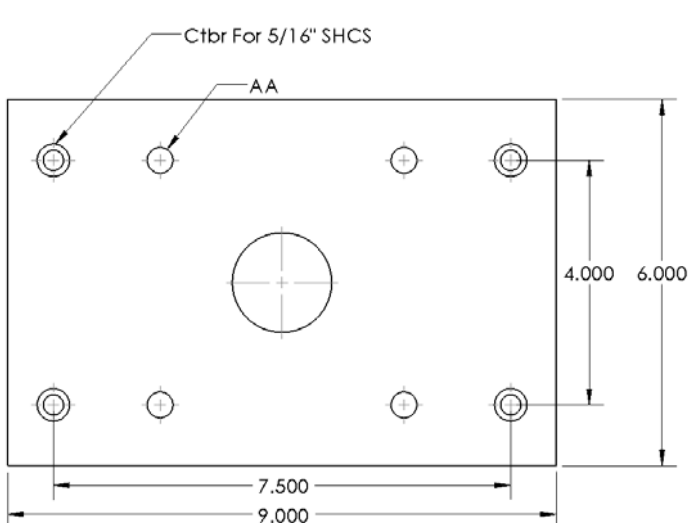
INSTALLATION, OPERATION, AND MAINTENANCE

Section VII: Engineering Data

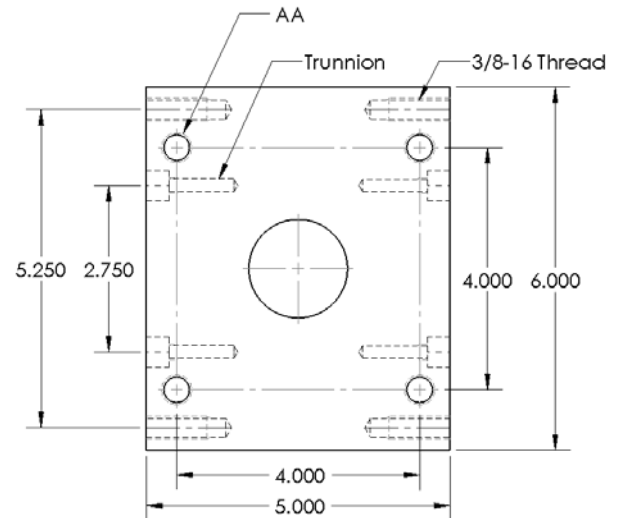
7.1 Standard Specifications

| Specifications | HP-4 | HP-8 | HP-16 |
|----------------------------------|------------------------|------------|-----------|
| Force at 100 PSI | 9,700 lbs | 17,700 lbs | 34,200lbs |
| Air Consumption at 80 PSI | 0.76 cf. | 1.15cf. | 1.80cf. |
| Open height | 8.0" | | |
| Total stroke (1/2" Power Stroke) | 4.0" | | |
| Working area (H-frame) | 20" L-R, 10" F-B | | |
| Ram mounting | 13/16" Bore, 1/2" Deep | | |

7.2 Cylinder Mounting



H-Frame Cylinder Mount

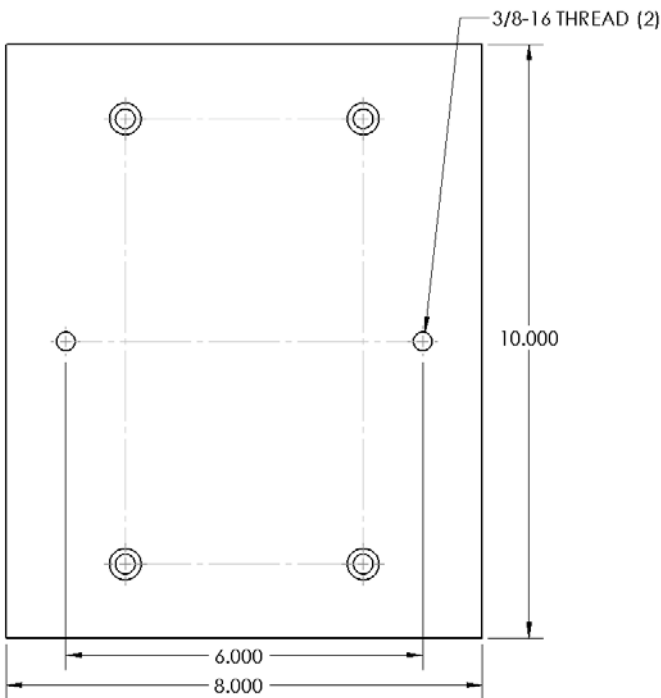


C-Frame Cylinder Mount

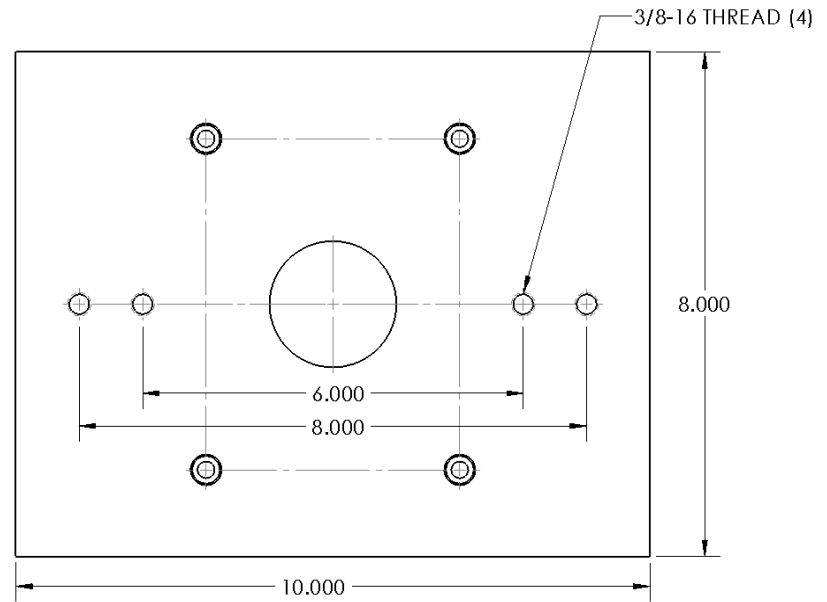
| Model | AA |
|-------|--------|
| HP-4 | 1/2-13 |
| HP-8 | 1/2-13 |
| HP-16 | 3/4-16 |

HYDRO-AIRE SERIES PRESSES INSTALLATION, OPERATION, AND MAINTENANCE

7.3 Bolster Plate Mounting



H-Frame Bolster Plate



C-Frame Bolster Plate

NOTE: CUSTOM MOUNTING HOLES AVAILABE UPON REQUEST

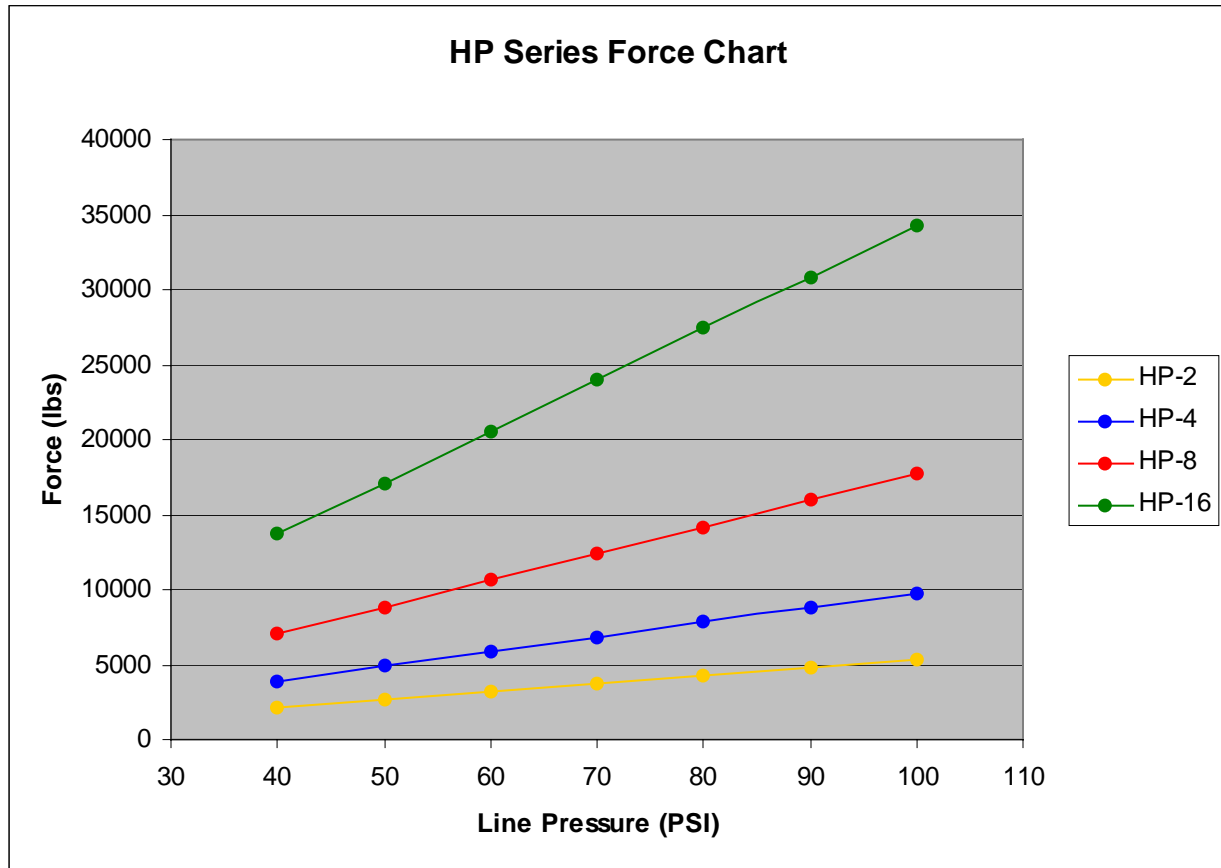
7.4 Cycle Times

Cycle times vary depending on the volume of air supplied to the unit by the customer, the length of the stroke and the weight of tooling applied to the press.

HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

7.5 Force Charts



| | Force Multiplier | Pressure Multiplier | Approach Force | Retract Force |
|-------|------------------------|-----------------------|-----------------------|-----------------------|
| HP-2 | 53.69 x line pressure | 8.27 x line pressure | 5.71 x line pressure | 4.73 x line pressure |
| HP-4 | 97.53 x line pressure | 8.27 x line pressure | 11.00 x line pressure | 10.00 x line pressure |
| HP-8 | 177.16 x line pressure | 15.02 x line pressure | 11.00 x line pressure | 10.00 x line pressure |
| HP-16 | 342.54 x line pressure | 29.05 x line pressure | 11.00 x line pressure | 10.00 x line pressure |

HYDRO-AIRE SERIES PRESSES
INSTALLATION, OPERATION, AND MAINTENANCE

Section VIII: Replacement Parts List

8.1 Replacement Parts List

| Part # | Description |
|---------------|--|
| HP16-CYL | Replacement Cylinder, 16T STANDARD |
| HP8-CYL | Replacement Cylinder, 8T STANDARD |
| HP4-CYL | Replacement Cylinder, 4T STANDARD |
| HP2-CYL | Replacement Cylinder, 2T STANDARD |
| HP-RAM-E | Ram Height Extention w/ 1" Adjustment and Threaded Screw |
| SS-PB-18 | Puch Button-Pneumatic Synchro-Sig Two Hand Actuator, 18" |
| EZ-DIAL | Easy Dial Pressure Regulator - 270 Sweep |
| PRS-1000 | Pressure Return System |
| SCM | Speed Control Mufflers |
| HP-VPKG | HP Valve Package Complete |

HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

Factory Support

Our staff is available to assist you with any questions you may have regarding your AIM Joraco press.

Call: 1-888-889-4287
Email: sales@joraco.com

WARRANTY

AIM Joraco, Incorporated (hereafter referred to as the manufacturer) warrants that all TOGGLE-AIRE®, DIRECT-AIRE®, and HYDRO-AIRE products will be free from defects in material and workmanship for a period of 180 days (6 months) from the date of shipment to the original purchaser. Any claim made against this LIMITED WARRANTY must be made by contacting the customer service department of the manufacturer. At its option AIM Joraco, Inc. will repair or replace any product it deems defective under the terms of this warranty. If factory service is required, transportation costs to and from the factory are to be paid by the purchaser. This warranty does not apply to equipment which has been subject to abuse, misapplication, negligence, improper maintenance, alteration, or failure to follow AIM Joraco, Inc. instructions.

AIM JORACO INCORPORATED'S SOLE OBLIGATION UNDER THIS WARRANTY IS STATED ABOVE. THIS WARRANTY IS IN LIEU OF ALL OTHERS, EXPRESSED OR IMPLIED AND UNDER NO CIRCUMSTANCES WILL AIM JORACO, INCORPORATED BE LIABLE FOR ANY CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF TOGGLE-AIRE® PRODUCTS.

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