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"The Pneumatic Toggle Press Innovators". Since 1947.



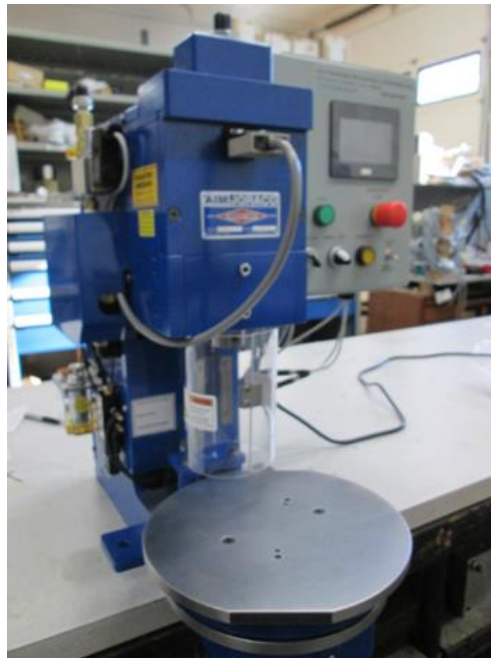
AUTOMATED INDUSTRIAL MACHINE, INC

TOGGLE-AIRE® DIVISION

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Installation, Operation and Maintenance
5 Ton, 2000 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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TOGGLE-AIRE MODEL 2000, 3 & 5 TON INDEXER INSTALLATION, OPERATION, AND MAINTENANCE

Section I, Installation

1. Mount the machine to your stand or bench.
(See photo 1.1)
 - A. Select a bench of suitable size and strength.
 - B. Use the two holes located in the mounting flanges of the base, just below the platen, to mount the unit. Drill two properly spaced holes through your bench/stand and secure the machine by bolting it down using two (2) 1/2-13 bolts. Never operate the machine unless it is securely mounted on a bench or stand.

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!

2. Connect air supply.
(See photos 1.2, 1.3, and 1.4)
 - A. The air supply must be clean and conditioned. Preferably, a Filter, Regulator, Lubricator Unit, (Joraco Part No. FRL-1530) should be located within 6 feet of the machine. For optimum results all air lines, fittings, and hoses used to supply the unit should be the equivalent of 3/8" NPT minimum.
 - B. The minimum air pressure for operation is 70 PSI. The maximum is 125 PSI. The optimum operating range is 80 to 100 PSI. If your application consistently requires substantially more than 100 PSI it may indicate the need for a stronger press.
 - C. Connect the air supply to the press at the inlet port on Part No. G-2000, 3-way, On-Off Valve.

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.



Photo 1.1



Photo 1.2



Photo 1.3



Photo 1.4

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Section II, Operation

NOTE: Whenever turning on air supply be sure the machine RUN-STOP Valve, Part No. O-2000 is set in the OFF position. (See Photo 2.10)

3. Turn on air supply.

(See photos 2.1 and 2.2)

- 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.

NOTE: When the machine 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, CLEAR THE TOOLING PLATE AND WORK AREA OF ALL TOOLS, FOREIGN OBJECTS, AND BODY PARTS.

4. Test the installation. At this point it is suggested that you operate the Model 2000 in its different modes of operation and try the various adjustments to familiarize yourself with the machine's capabilities before attempting to tool up.

(See photos 2.3 and 2.4)

- A. Check the position of the RAM SAFETY GUARD and be sure it is snapped in the centered position. (Moving this guard while the machine is operating will shut down the Model 2000, so center before startup.)
- B. Move the RUN/STOP valve to the RUN position.



Photo 2.1



Photo 2.2



Photo 2.3



Photo 2.4

(See photos 2.5, 2.6, 2.7 and 2.8)

- C. Set the MODE

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SELECTOR VALVES to the Automatic Operation Position.

- D. START the cycle by pressing the gold colored CYCLE VALVE, Part No. M-2000 located below the tooling plate on the front of the lower guard. The Model 2000 will run automatically until the RUN/STOP VALVE is moved to the STOP position.

1. NOTE: To get a "feel" for the range of adjustments available, adjust the ram speeds, index speed, etc., while running the machine for the first time. **See the labels on the machine and photos herein for reference.**
2. Note the SET UP VALVE, Part No. B-2000. This valve allows the tool setter to bring the press ram to the bottom of stroke to facilitate alignment and mounting of tools, and depth adjustment. See Paragraph 7 for additional information.

NOTE: After using the "Set-Up" valve, always lock the valve in the up position using the red locking screw.

CAUTION: THIS VALVE IS NOT DESIGNED FOR USE IN PRODUCTION AND SHOULD ONLY BE USED BY AUTHORIZED AND QUALIFIED PERSONNEL.

(See photo 2.9)

3. FINALLY, while still running in the automatic mode, **check the operation of the RAM SAFETY GUARD.** To do so, simply push the guard to either side, as if it were struck by a misplaced part or hand. The unit will shut down when the guard is moved, and the guard circuit must be RESET before the machine can be cycled again. See the next section for the reset procedure.



Photo 2.5
Automatic Mode



Photo 2.6



Photo 2.7



Photo 2.8

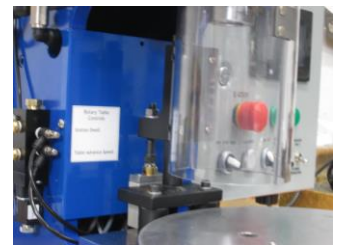


Photo 2.9

5. Resetting the RAM SAFETY

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GUARD circuit.

(See photos 2.10, 2.11, 2.12)

IN THE FOLLOWING ORDER . . .

- A. **SHUT OFF AIR SUPPLY.**
- B. Set RUN/STOP Valve to STOP.
- C. Remove any obstruction, misplaced part, etc., then manually (no air) rotate the tooling plate by hand until it reaches the next station.
- D. Re-center the RAM SAFETY GUARD.
- E. Reset the safety circuit by pressing the RESET button down. (Button is located in the upper portion of the control enclosure)
- F. Turn the air supply back on and move the RUN/STOP valve to RUN. The unit can now be cycled in the normal manner.

(See Photos 2.13, 2.14)

6. **AFTER RUNNING IN THE AUTOMATIC MODE, select SINGLE CYCLE and INDEXER ONLY modes, using the MODE SELECTOR VALVES, Part No. N-2000, to run in these modes.**

ALWAYS USE THE GOLD COLORED CYCLE VALVE, M-2000, TO INITIATE ANY CYCLE.

LIKewise, ALWAYS USE THE RUN-STOP VALVE, Part No. O-2000, TO STOP THE MACHINE.

ALWAYS STOP THE MACHINE WHEN CHANGING MODES OF OPEARTION.



Photo 2.10



Photo 2.11



Photo 2.12
Resetting Ram Guard



Photo 2.13
Single Cycle Mode



Photo 2.14
Indexer Only Mode

7. Adjusting the depth setting (end of stroke). (See photos 2.15,

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2.16, 2.17, 2.18)

- A. Set Mode Selector Valves to Single Cycle Mode (See Section II, Para. 6)
- B. Use "Set-Up" valve to bring the ram to bottom of stroke under power. (See Section III, Paragraph 9)
- C. If desired, the ram can be lowered manually to allow for alignment of tooling, etc. To lower the ram manually:
 1. SHUT OFF AIR SUPPLY.
 2. Remove the right half of the rear linkage guard.
 3. Place appropriate steel bar between the ram yoke (JP-7) and the pivot of the lever (JO-1).
 4. Pull the bar towards the front of the press to lower the ram.

CAUTION: RAM WILL RETURN UP WHEN AIR SUPPLY IS RESTORED.

- D. Adjust the final depth of the press by loosening the Lock Nut (JP-33) on the Ram Adjusting Screw (JP-11) located at the top of the press.
 1. Rotate the screw up or down to the desired position. Remember, if your press has the **Standard Ram Adjustment Screw**, one revolution of the screw is **.100"** of adjustment. If your press was ordered with the **Fine Ram Adjusting Screw**, one revolution of the adjusting screw provides **.0625"** of adjustment.
 2. In some cases, when the ram is in the down position and the air supply is on, it may not be possible to adjust the ram up. To adjust up, either use the "Set-Up" valve to raise the ram to the up position, or shut off the air supply before adjusting.



Photo 2.15

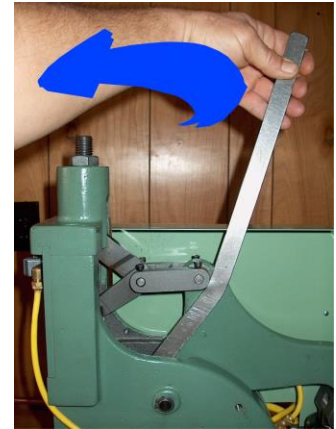


Photo 2.16



Photo 2.17



Photo 2.18

TOGGLE-AIRE MODEL 2000, 3 & 5 TON INDEXER INSTALLATION, OPERATION, AND MAINTENANCE

(See photos 2.19, 2.20)

3. Final adjustments should always be made by screwing the ram down to the desired point.
4. Lock the ram adjusting screw in place with the lock nut.

NOTE:

Once tools have been set, always replace the right half of the linkage guard before proceeding.

3. Important principles of set up and operation.

When setting up and operating it is important to keep in mind that the press is a pneumatically powered **TOGGLE press**. The key element in the machine is the **TOGGLE or KNUCKLE JOINT**. (See photos 2.21, 2.22, 2.23) A toggle is a simple machine in and of itself. It is a great multiplier of force. The press takes the output of the cylinder, couples it to a lever, which drives the toggle. As the toggle straightens it drives the press ram downward, creating a powerful squeeze at the end of the stroke. At the moment the toggle hits end of stroke, the upper toggle link encounters a stop block. The press is then reversed when the impulse pin is driven out through the front plate, which in turn actuates the return valve, A-2000. When controlled in this manner the press is very accurate, with a repeatability of plus or minus .001". **It is crucial that you recognize this relationship. Your tooling should be built with a shut height that falls within the shut height range of the press. In standard indexers this is approx. 4.375" maximum to 3.625" minimum.** Your tooling must be built to allow the toggle to straighten out and hit the stop block. If the tooling is too high, or if you set the depth too deep, the press will not be able to complete the stroke and stall.



Photo 2.19



Photo 2.20



Photo 2.21



Photo 2.22



Photo 2.23

(Important principles, continued)

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If you do stall the press during set up, you can either shut off the air supply and manually move the press or manually actuate the return valve, A-2000. (See photo 2.24) This will send the ram back to the up position. Re-adjust the depth setting so the toggle can straighten.

Do not confuse the nature of the force curve in the ram with the Ram Adjusting Screw or depth adjustment. The ram force developed by the press is not affected by the Ram Adjusting Screw or where you are set in terms of ram depth. **The only thing that affects ram force is the air pressure used to power the press.** The Ram Adjusting Screw is simply an end of stroke adjustment, much like the adjusting collar found on full revolution, mechanical power presses.

In fabrication jobs like punching, piercing, and blanking enter the punch only as deep as necessary to clear your blank, etc. Always set up so that the press is doing the work as close to the end of stroke as possible, where the toggle is close to straight and the rated strength of the press is developed.

Finally, once the tools have been set and locked in place, using the regulator on the Filter, Regulator, Lubricator Unit, adjust the air pressure to 5 to 10 PSI above the minimum required to do the job. Any additional line pressure is wasted, and causes unneeded "wear and tear" on the machine, etc.

Consult the factory if your application requires shorter strokes, additional shut height, etc.



Photo 2.24

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Section III, Tooling Installation

(See photos 3.1, 3.2)

NOTE: Your application may require additional guarding. Prior to installing any tooling on the tooling plate, 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.

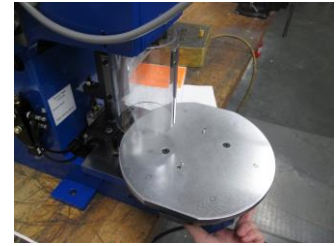


Photo 3.1



Photo 3.2

9. Suggested method for Tooling Installation:

(See photos 3.3, 3.4)

- A. Remove plastic halves of RAM SAFETY GUARD.
- B. Mount "punch" or upper tooling in press ram. The standard bore in the press ram is .8125" with a depth of 1.50". Precisely fit your shank to the bore of the ram and lock the shank in with the 5/16-18 hardened locking screw located on the face of the ram. The end of the ram should bear against the upper portion of your tooling.
- C. Set the MODE SELECTOR VALVES to SINGLE CYCLE.
- D. Using the SET-UP VALVE, B-2000 bring the press ram down.
- E. Slide lower tool or "nest" to be mounted under the ram/upper tool. Use the Ram Adjusting Screw, JP-11, (See Section II, Paragraph 7) to screw the ram down until your "nest" or tooling is suitable engaged.



Photo 3.3



Photo 3.4

IMPORTANT -- ALWAYS USE CAUTION WHEN SETTING TOOLS. USE SAFE PROCEDURES AND KEEP YOUR HANDS AND BODY AWAY FROM THE MOVING PARTS OF THE PRESS AND YOUR TOOLING.

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- F. Transfer or locate mounting holes in lower tooling or "nest" to the index plate.
- G. Return press ram to the UP position using SET-UP up valve. Be certain your ram depth setting will allow clearance of station in place.
- H. Set MODE SELECTOR VALVES to INDEX ONLY and cycle machine once to index to next station.
- I. Set MODE SELECTOR VALVES to SINGLE CYCLE, bring ram down again with the SET UP VALVE, and repeat steps E thru I until all stations have been located on the Tooling Plate.
- J. Once all holes have been drilled and tapped in the Tooling Plate the method above can be used for assembling the tools to the plate. Tooling should always be doweled in place to insure accurate location. Final depth adjustments should always be made with the RAM locked in the DOWN position with the air supply on. Always screw Ram down to final position, and remember to lock your setting with the Ram Adj. Screw Lock Nut, JP-33.
- K. If possible, when drilling Tooling Plate, use blind holes between the concentric circles cut on the top of the plate. If it becomes necessary to drill thru in this area, remember that the **underside of the Tooling Plate is a BEARING SURFACE** and all hole edges should be rounded and polished so as not to damage the bearings that support the plate.
- L. Once all tooling has been mounted, cut profiles in the halves of the RAM SAFETY GUARD to clear your tools as the tooling plate indexes. Clearance should be ample, but not excessive. **Replace the guard halves and center the guard as described earlier.**



Photo 3.5

TOGGLE-AIRE MODEL 2000, 3 & 5 TON INDEXER INSTALLATION, OPERATION, AND MAINTENANCE

Section IV, Maintenance

1. LUBRICATION.

- A. Press components.
(See Photos 4.1, 4.2)
 - 1. Manual lubrication.

Use any general purpose machine lubricating oil of approx. 20 wt. Lubricate the press daily or prior to each shift if running multiple shifts. Lubricate at the points indicated.

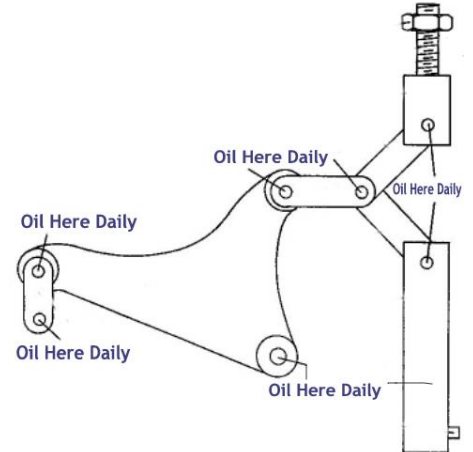


Photo 4.1

- 2. One Shot Lubrication Systems.

If your press is equipped with the L-2-P One Shot Lube System, fill the reservoir with 20 wt. general purpose machine lubricating oil. With the press ram in the up position, pull up on the plunger and release. The pump will meter the oil to the various points of lubrication. Upon filling the reservoir for the first time, it may take several pumps to purge the system of air. Generally, one pull of the plunger per shift is adequate.



Photo 4.2



Photo 4.3

- B. Air Supply
(See Photo 4.3, 4.4)

- 1. Follow the instructions provided by the manufacturer of the Filter, Regulator, Lubricator Unit you are using. (See Section I, Paragraph 2A). Fill the reservoir with Joraco Air Tool Oil, Pt. No. JO-FRL. Adjust the drip rate to approx. one drop per 50 strokes of the press. **Only use oil specifically formulated for use in pneumatic equipment.**



Photo 4.4

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1. LUBRICATION (Cont.)
 - C. Indexer Mechanism
(See Photos 4.5, 4.6, 4.7, 4.8)

1. **The Indexer Mechanism** contains composite bearings which do not require regular lubrication. In certain conditions, after many hours of operation, the indexing mechanism may require internal "cleaning" to eliminate grime and residues that can build up in the mechanism. (See "B" below)

B. TO CLEAN THE MECHANISM

1. Remove the tooling plate to expose the index plate, Part No. R-2000.
2. Remove the set screw in the index plate. This will allow you to apply some fluid to clean the inner mechanism. WE ADVISE THE USE OF A FEW DROPS OF KEROSENE OR WD-40 or similar light type penetrant. DO NOT USE A LUBRICATING OIL. The unit does not require lubrication, you simply want to clean it.

NOTE; DO NOT DISASSEMBLE THE INDEXING MECHANISM TO SERVICE. THE MECHANISM IS DESIGNED TO BE WEAR COMPENSATING AND SHOULD OPERATE INDEFINITELY. IT IS DESIGNED FOR FACTORY SERVICING ONLY.

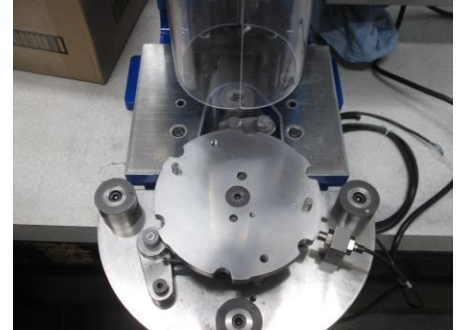


Photo 4.5

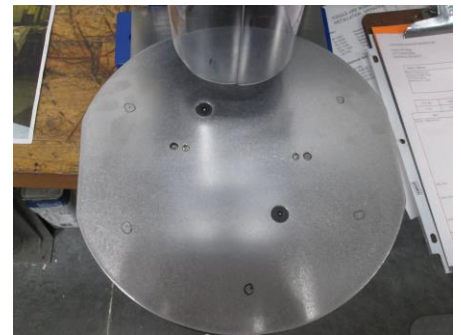


Photo 4.6

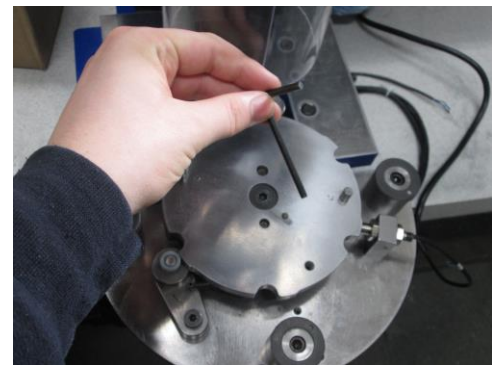


Photo 4.7



Photo 4.8

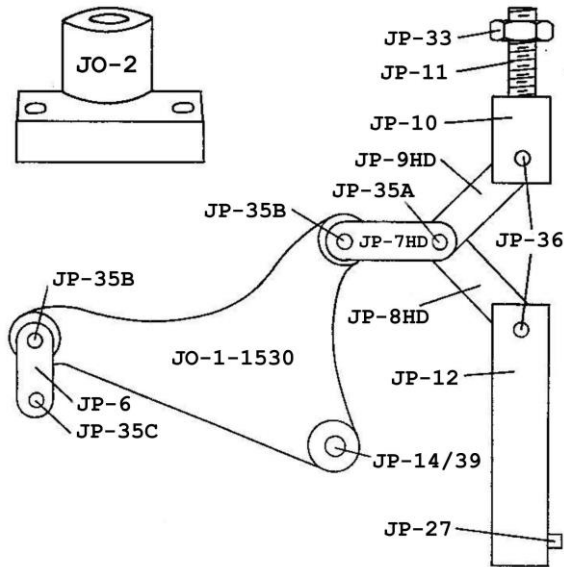
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Section V:

3. Indexer Control Valving, Side Enclosure

Parts Identification Photos

1. Linkage Parts



A-2000 Ram Return Valve Ass'y.

2. Press Control Valving, Main Valve Enclosure

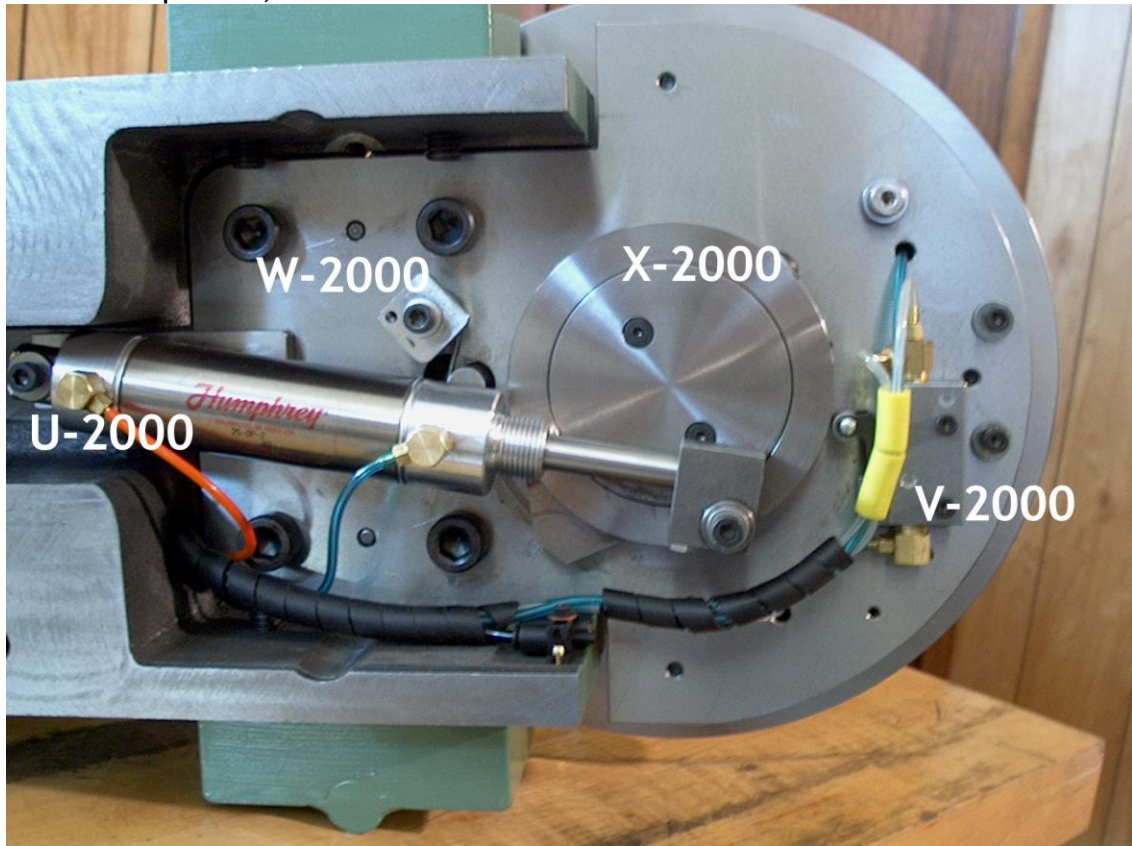


4. K-2000 Index Actuator Valve and

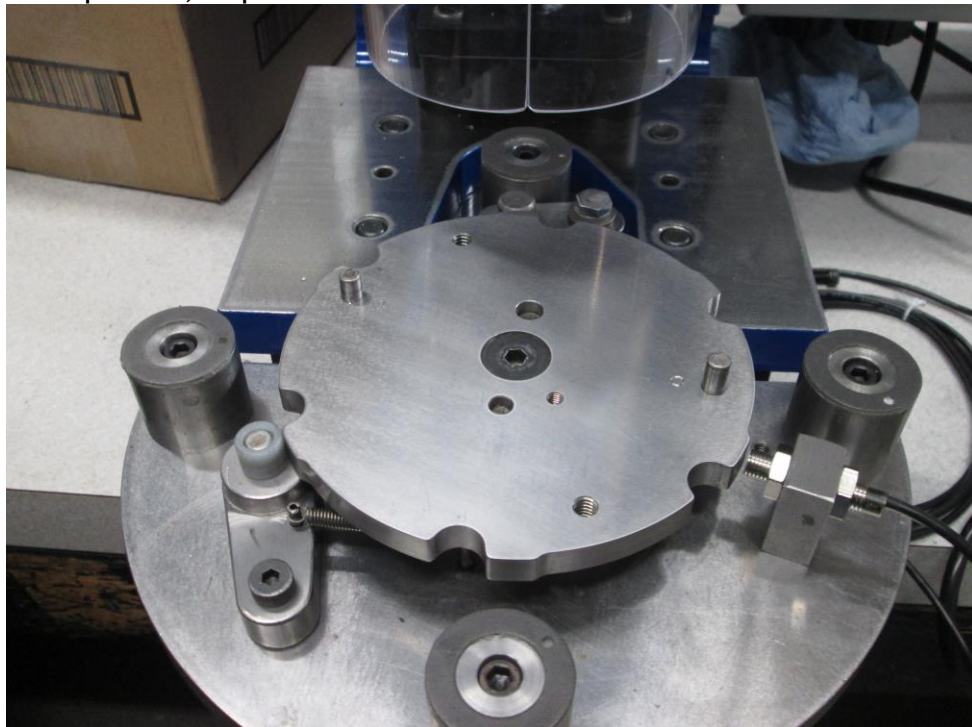


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5. Indexer Component, Underside View

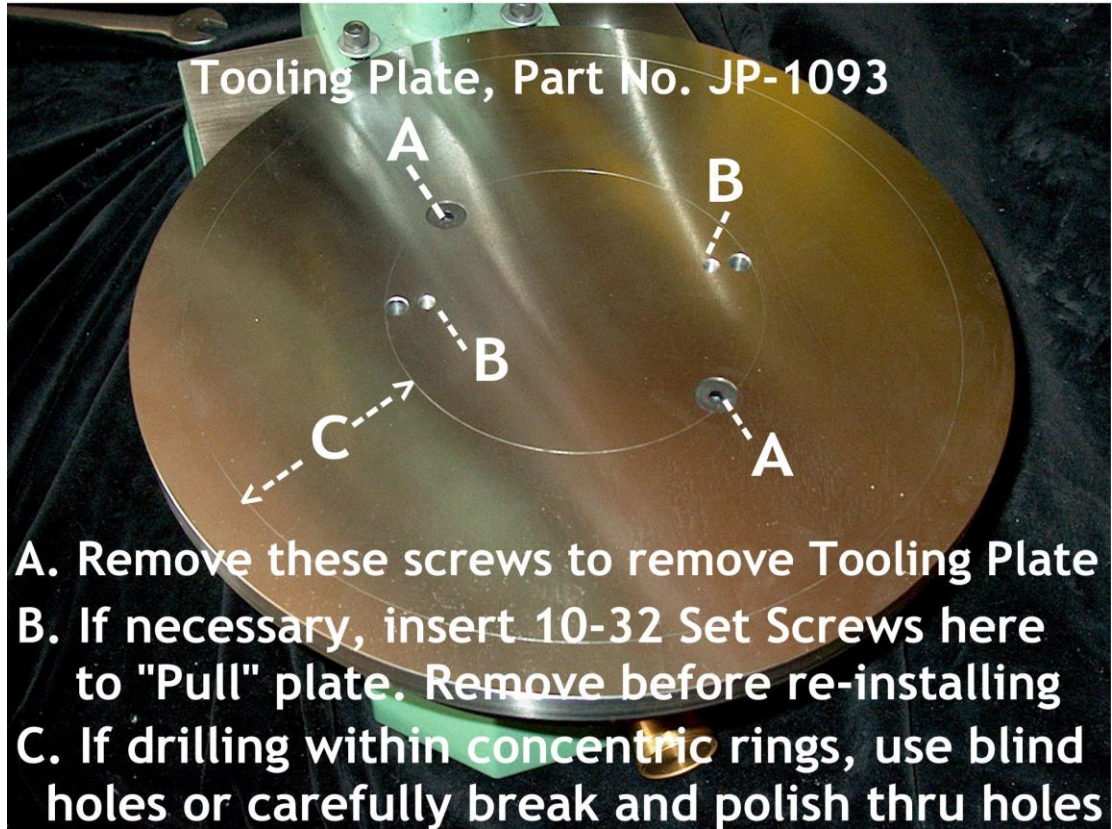


6. Indexer Component, Top View



7. JP-1093 Tooling Plate Notes

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8. Always clean the underside of the Tooling Plate before Re-installing. Lightly oil the surface.



Section VI: Replacement Parts List

TOGGLE-AIRE MODEL 2000, 3 & 5 TON INDEXER INSTALLATION, OPERATION, AND MAINTENANCE

(See page 12 and13)

Linkage Parts:

NOTE: As of Jan. 1, 2000 all 5 Ton Model 2000s shipped have Heavy Duty Toggle Links installed as standard. 3 Ton Model 2000s have Standard Toggle Links. Heavy Duty Links can be retrofitted to earlier 5 Ton and 3 Ton Series Presses.

JO-1-1530	Lever, Standard ,2000.....
JO-1-1530ST	Lever, Heavy Duty Steel, 2000
JO-2	Cap, Standard Adjusting Screw
JO-2FRA	Cap, Fine Adjusting Screw(use with JP-11FRA and JP-33FRA) .
JP-6-2000	Cylinder Yoke.....
JP-7 (3 Ton)	Ram Yoke, Standard.....
JP-7HD (5 Ton)	Ram Yoke for use with Heavy Duty Links, JP-8HD and JP-9HD .
JP-8 (3 Ton)	Bottom Toggle Link, Standard.....
JP-8HD (5 Ton)	Bottom Toggle Link, Heavy Duty (use w/ JP-7HD & JP-9HD).....
JP-9 (3 Ton)	Top Toggle Link, Standard.....
JP-9HD (5 Ton)	Top Toggle Link, Heavy Duty (use w/ JP-7HD & JP-8HD).....
JP-10	Ram Adjusting Block.....
JP-11	Ram Adjusting Screw, Standard
JP-11FRA	Ram Adjusting Screw, Fine (use with JO-2FRA & JP-33FRA).....
JP-12	Press Ram
JP-13/15-1530	Front Plate Assembly w/ Stop Block (5 Ton Press).....
JP-13/15-1030	Front Plate Assembly w/ Stop Block (3 Ton Press).....
JP-14/39	Main Pivot Pin with Retaining Rings.....
JP-17	Gib
JP-27	Ram Screw
JP-33	Ram Adjusting Screw Lock Nut, Standard
JP-33FRA	Ram Adjusting Screw Lock Nut, Fine Thread
JP-35A	Pivot Pin.....
JP-35B	Pivot Pin.....
JP-35C	Pivot Pin.....
JP-36	Pivot Pin.....
JP-35/36K	Pivot Pin Kit, includes all .375" dia. pins in linkage

Cylinder Parts: 5 TON MODEL 2000

1530MC	Main Cylinder, Complete.....
JP-4-1530	Replacement Cylinder Tube, Std. Stroke
JP-4-1530SPC	Replacement Cylinder Tube, Special Lgn. Stroke.....
JP-1/5-1530	Piston Rod Assembly
JP-26	Cylinder Screw w/ lock washer (set of 4)
JP-32	Cylinder Hold Down Screw (set of 2)
SK-1500	Cylinder Seal Kit.....

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Cylinder Parts: 3 TON MODEL 2000

1030MC	Main Cylinder, Complete
JP-4	Replacement Cylinder Tube, Std. Stroke
JP-4SPC	Replacement Cylinder Tube, Special Lgn. Stroke.....
JP-1/5	Piston Rod Assembly
JP-26	Cylinder Screw w/ lock washer (set o f 4)
JP-32	Cylinder Hold Down Screw (set of 2)
SK-1000	Cylinder Seal Kit.....

Control Parts: Press

A-2000	Return Valve
1026B	Return Valve Bracket
IP-1030	Return Valve Impulse Pin (3 Ton Press)
IP-1530	Return Valve Impulse Pin (5 Ton Press)
B-2000	Set Up Valve Assembly.....
C-2000	Shuttle Valve
I-2000	Muffler, Ram Speed Control.....
E-2000	4-way Press Power Valve
F-2000-3T	Aluminum Manifold (3 Ton Press)
F-2000-5T	Aluminum Manifold (5 Ton Press)
G-2000-3T	On-Off Valve w/ Lock Out (3 Ton Press).....
G-2000-5T	On-Off Valve w/ Lock Out (5 Ton Press).....
J-2000	Press Trip Impulse Valve

Control Parts: Indexer (See pages 12, 13)

F-18	Muffler
1800DP-3	Ram Safety Guard Reset Valve
1800DP-4	Indexer 4-way Power Valve
K-2000	Index Actuator Valve
L-2000	Ram Safety Guard, Complete
L-2000T	Standard Replacement Tube for Ram Guard.....
L-2000V	Ram Safety Guard Valve Only
M-2000	Start Cycle Valve Ass'y
MFC-1	Indexer Speed Control
N-2000	Mode Selector Valve
O-2000	Run - Stop Valve
P-2000	Press Trip Valve.....
Q-2000	Anti Back Up Pawl Ass'y
R-2000	Index Plate (Consult Factory).....
S-2000	Station Locator Pin Ass'y
T-2000	Tooling Plate Support (Set of 4).....
U-2000	Index Cylinder
V-2000	Index Advance Valve
W-2000	Station Locator Pin Adj. Spring Ass'y
X-2000	Index Drive Ring (Consult Factory)

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Misc:

JP-1093	Replacement Tooling Plate
VC-2000	Replacement Press Valving Cover.....
PC-1030	Pneumatic/Electronic Stroke Counter
DT-1030	Bottom of Stroke Dwell Timer.....
FRL-1530	Filter, Regulator, Lubricator Unit (3 & 5 Ton Press)
JO-FRL	Pneumatic Tool Lubricating Oil for use in FRL Units, 1 Qt.

Optional Actuators:

SS-DM	Synchro-Sig 18" Std. Two Hand Actuator
SS-DM-24	Synchro-Sig 24" Std. Two Hand Actuator
SS-OT-18	Synchro-Sig 18" Photo Optic "No Touch" Two Hand Actuator
SS-OT-24	Synchro-Sig 24" Photo Optic "No Touch" Two Hand Actuator
RK-SS-2000	Two Hand Actuator Retrofit Kit (Req'd to use actuators above) ..

