



"The Pneumatic Toggle Press Innovators".® Since 1947.



AUTOMATED INDUSTRIAL MACHINE, INC

TOGGLE-AIRE® DIVISION

347 Farnum Pike
Smithfield, RI, USA 02917
401-232-1710
www.joraco.com



Installation, Operation and Maintenance
16 Ton, 3500 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

COPYRIGHT 2010
by
AUTOMATED INDUSTRIAL MACHINE, INC.
Smithfield, RI, USA
All rights reserved

TOGGLE-AIRE MODEL 3500 SERIES PRESSES INSTALLATION, OPERATION, AND MAINTENANCE

Section I: Installation

1. Carefully remove the press from the crate, taking note of separately packed items such as the "Synchro-Sig" Two Hand Actuator, Filter, Regulator, Lubricator Unit (optional), or any other accessories you may have ordered.
2. Attach "Synchro-Sig" Actuator.
(See photos 1.1, 1.2, 1.3)
 - 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.
 - 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.

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

3. Mount the press to your stand or workbench
(See photo 1.4)
 - 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.**



Photo 1.1



Photo 1.2



Photo 1.3



Photo 1.4

TOGGLE-AIRE MODEL 3500 SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

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!

4. Connect air supply.
(See photos 1.5, 1.6, 1.7)
 - A. The air supply must be clean and conditioned. Preferably, a Filter, Regulator, Lubricator Unit, (Joraco Part No. FRL-3500) 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" NPT minimum id.
 - B. The minimum air pressure for operation is 50 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-3500, 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 1.5



Photo 1.6



Photo 1.7

TOGGLE-AIRE MODEL 3500 SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

5. Turn on air supply.
(See photos 1.8, 1.9)

- 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.

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, CLEAR THE PRESS TABLE AND WORK AREA OF ALL TOOLS, FOREIGN OBJECTS, AND BODY PARTS.

6. Test the installation.
(See photos 1.10, 1.11)

- A. Test the "Synchro-Sig" Two Hand Actuator by simultaneously depressing the levers on the Model SS-DM 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.



Photo 1.8



Photo 1.9



Photo 1.10



Photo 1.11

TOGGLE-AIRE MODEL 3500 SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

(See photos 1.12, 1.13, 1.14, 1.15)

B. Test the "Set-Up" Valve.

The press is equipped with a "Set-Up" valve which allows tool setters or maintenance personnel to lock the ram in the down position to facilitate tool depth adjustment. Check the function of this valve. To actuate this valve, back out the red locking screw from the valve guard. Move the valve lever to the down position. The press ram will immediately descend to the bottom of the stroke and stay in that position. Once the ram depth has been set, (see Section II, Paragraph 2) return the valve lever to the up position. The ram will immediately return to the top of the stroke.

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 1.16)

C. Optional Auxiliary Ram Up Valve.(On BEM control systems only)

2530BEM presses are equipped with an Aux. Ram Up Valve. It is used to manually reverse the press ram to the up position during set up procedures or in the case of misloaded parts, ram set too deep, etc., all conditions which do not allow the press to "toggle" out and stall the press prior to completion of the stroke. See Section II, paragraphs 2 and 3 for additional information on the use of the Auxiliary Ram Up Valve and the principles of set up and operation.



Photo 1.12



Photo 1.13



Photo 1.14



Photo 1.15



Photo 1.16

TOGGLE-AIRE MODEL 3500 SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

Section II: Set Up and Operation

(See photos 2.1, 2.2)

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.

1. Mount your tooling.

(See photos 2.3, 2.4)

- 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. 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.



Photo 2.1



Photo 2.2



Photo 2.3



Photo 2.4

TOGGLE-AIRE MODEL 3500 SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

2. Adjust the depth setting (end of stroke).
(See photos 2.5, 2.6, 2.7, 2.8)

- A. Use "Set-Up" valve to bring the ram to bottom of stroke under power.
(See Section I, Paragraph 6 B)

1. Use the regulator component in your Filter, Regulator, Lubricator unit to **adjust the line pressure to approx. 40 PSI.**

(NOTE: The minimum OPERATING pressure during actual production runs should always be 50 PSI. **For Set-Up purposes, however, it is acceptable** to use lower line pressures to facilitate Set Up. See paragraph "C" below for ram adjustment.

- B. After the break in period, 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 Upper Linkage Guard to gain access to the JO-1-3500 Lever.
3. Lower ram by placing appropriate steel bar between the ram yoke (JP-7-3500) and the pivot of the lever (JO-1-3500).
4. Pull the bar towards the front of the press to lower the ram.

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

- C. Adjust the final depth of the press by loosening the Lock Nut (JP-33-3500) on the Ram Adjusting Screw (JP-11-3500) located at the top of the press.

1. Rotate the screw up or down as required by your tooling. Remember, if your press has the **Standard Ram Adjustment Screw**, one revolution of the screw is .071" of adjustment.



Photo 2.5



Photo 2.6



Photo 2.7



Photo 2.8

TOGGLE-AIRE MODEL 3500 SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

(See photos 2.9)

2. In some cases, with the ram in the down position and the air on, it may not be possible to adjust the ram up. Either raise the ram to the up position or shut off air supply before adjusting.
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 Upper 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 2.10, 2.11, 2.12) 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-3500.(See photo 2.13) 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 presses this is approx. 5.000" maximum to 4.250" minimum.



Photo 2.9



Photo 2.10



Photo 2.11



Photo 2.12

(Note: Press front plate removed for clarity.)

TOGGLE-AIRE MODEL 3500 SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

(Important principles, continued)

Your tooling must be built to allow the toggle to straighten out. If the tooling is too high, or if you set the ram too deep, the press will not be able to complete the stroke and stall.

If you do stall the press (BEM mode only) during set up, you can either shut off the air supply and manually move the press or, with air supply on, **actuate the Optional Aux. Ram Up Valve**. (See photo 2.14, CSR-G2 modes see note below photo) This will send the ram back to the up position. **Re-adjust the depth setting so the toggle is allowed to 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 2.13

Supplied with BEM control systems only. Not req'd on CSR-G2 systems.



Photo 2.14

SEE NOTE BELOW IF YOUR PRESS WAS ORDERED WITH CSR-G2 CONTROLS.

If your press has the CSR-G2 Control System you will not require a J-3530 Aux. Ram Up Valve. In the CSR-G2 control system the press ram will always return up when the two hand actuator or B-2530 Set Up Valve are released. See the addendum to this manual for proper set up and operation in the CSR-G2 mode.

TOGGLE-AIRE MODEL 3500 SERIES PRESSES INSTALLATION, OPERATION, AND MAINTENANCE

Section III: Maintenance

1. LUBRICATION.

A. Press components.

(See photo 3.1, 3.2)

1. One Shot Lubrication Systems.

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 the plunger all the way up 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, two pulls of the plunger per shift is adequate.

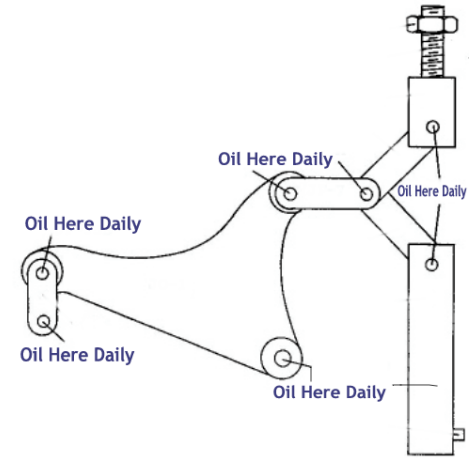


Photo 3.1

B. Air Supply

(See Photo 3.3, 3.4)

1. Follow the instructions provided by the manufacturer of the Filter, Regulator, Lubricator Unit you are using. (See Section I, Paragraph 5A). Fill the reservoir with Joraco Air Tool Oil, Pt. No. JO-FRL. Adjust the drip rate to approx. one drop per 100 strokes of the press. **Only use oil specifically formulated for use in pneumatic equipment.**



Photo 3.2



Photo 3.3

2. GENERAL.

1. Regularly check the function of the Synchro-Sig Actuator, Set Up, and Aux. Ram Up Valves.
2. Regularly check all mechanical aspects of the press including fasteners, pivot pins and set screws. Tighten any fasteners if loose; replace any badly worn or broken pins or links. Check linkage bushings for wear and replace if necessary.

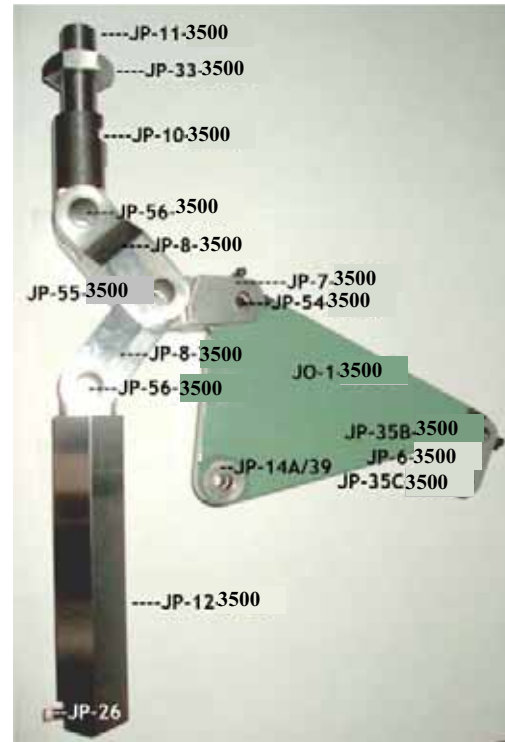


Photo 3.4

TOGGLE-AIRE MODEL 3500 SERIES PRESSES INSTALLATION, OPERATION, AND MAINTENANCE

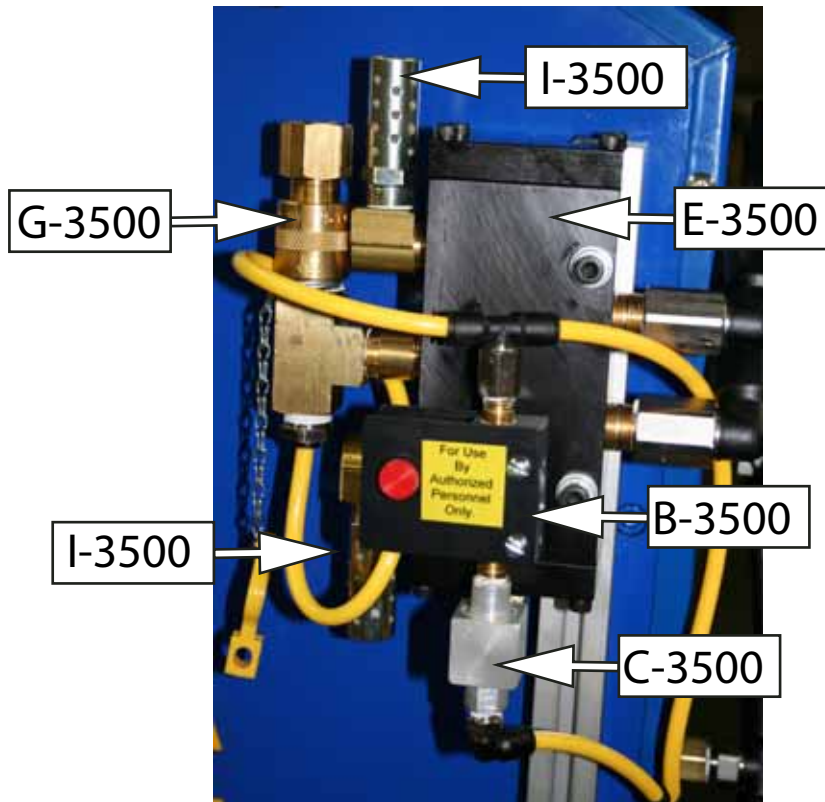
Section IV: Parts Identification Drawings

1. Linkage Parts
(See pages 11 & 12)



IMPORTANT: NOTE ORIENTATION OF
TOGGLE LINKS JP-8-3530 WHEN REPLACING.
(See Photos 2.10, 2.11, 2.12)

2. Valving Parts (See pages 11 & 12) Model 2530 and Model 3530 Interchangeable.



TOGGLE-AIRE MODEL 3500 SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

Section V: Replacement Parts List

Linkage Parts:

JO-1-3500	Lever, Standard Steel, 3500	327.00
JO-2-3500	Cap	267.00
JP-6-3500	Cylinder Yoke.....	72.50
JP-7-3500	Ram Yoke	92.50
JP-8-3500	Toggle Link, (set of 2)	384.50
JP-10-3500	Ram Adjusting Block	92.50
JP-11-3500	Ram Adjusting Screw	58.36
JP-12-3500	Press Ram	256.80
JP-13-3500	Front Plate Assembly	125.77
JP-14A/39	Main Pivot Pin with Retaining Rings.....	52.00
JP-27	Ram Screw	2.79
JP-33-3500	Adjusting Screw Lock Nut	19.26
JP-35B-3500	Pivot Pin.....	14.25
JP-35C-3500	Pivot Pin.....	14.25
JP-54-3500	Pivot Pin.....	19.25
JP-55-3500	Pivot Pin.....	24.75
JP-56-3500	Pivot Pin.....	22.15
BK-3500	Linkage Bearing Kit.....	89.95

Cylinder Parts:

3500MC	Main Cylinder, Complete	972.25
JP-4-3500	Replacement Cylinder Tubes Std. Stroke(3 pcs.)	238.85
JP-1/5-3500	Piston Rod Assembly	367.80
JP-26	Cylinder Screw w/ lock washer (set of 4)	58.98
JP-32	Cylinder Hold Down Screw (set of 2)	7.16
SK-3500	Cylinder Seal Kit.....	58.25

Control Parts:

3500MVA	Main Power Valve Assembly.....	470.00
A-3500	Return Valve	52.00
1026B	Return Valve Bracket	6.39
IP-3500	Return Valve Impulse Pin.....	7.85
B-3500	Set Up Valve Assembly.....	64.50
C-3500	Shuttle Valve	24.98
D-3500	Quick Exhaust Valve	45.00
CSR-G2M	CSR-G2 Stroke Completion Module	325.00
SK-D, Type II	Quick Exhaust Seal Kit, New style valves	31.00
E-3500	4-way Power Valve	285.00
F-3500	Aluminum Manifold.....	25.00
G-3500	On-Off Valve w/ Lock Out	37.00

TOGGLE-AIRE MODEL 3500 SERIES PRESSES INSTALLATION, OPERATION, AND MAINTENANCE

Section V: Replacement Parts List, Continued

Control Parts Cont:

KOS-3500	Key Operated Air Supply Shut Off.....	129.95
H-3500	Muffler, Adjustable	13.50
I-3500	Muffler, Steel	10.50
J-3500	Auxiliary Ram Up Valve	72.75
SS-PB	Std. Two Hand Actuator w/ guard	599.00
SS-OT	Optical Touch Two Hand Actuator w/ Power Supply.....	850.00
PS-SSOT	Replacement Power Supply for SS-OT Actuator	69.00
PK-3500	Plumbing Kit (includes all tubing & fittings in std. control pkg.)	59.85

Misc:

VC-3500	Replacement Valve Cover	53.00
GK-3500	Rear Guard Kit (2 rear covers).....	80.00
PC-3500	Pneumatic/Electronic Stroke Counter	196.00
L-2-P-3500	One Shot Lube System Retrofit Kit	459.00
L-2-P-2CC	Pump Assembly Only, One Shot Lube System.....	150.75
DT-3500	Bottom of Stroke Dwell Timer.....	250.00
FRL-3500	Filter, Regulator, Lubricator Unit	249.00

Tooling Components:

TL-4.6-Punch	Toggle-Lock Punch each	\$54.00
TL-4.6-Die	Die Assembly each	\$195.00
RD-Post	Hardened Alignment post each	\$46.00

Call for current prices and availability 1-888-889-4287



TOGGLE-AIRE MODEL 3500 SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

About Control Systems . . .

Unless otherwise specified, your TOGGLE-AIRE press has been shipped complete with all valving necessary for two hand, single stroke operation, including one of our SYNCHRO-SIG series two hand, anti tie down actuators. The actuators provide "state of the art", anti tie down control. The two levers (on the SS-DM series) or the two photo optic "buttons" (on the SS-OT series) must be simultaneously activated to provide a down signal to the press. When one or both are released, the down signal is terminated. Both levers or "buttons" must be totally released before the units will allow another down signal. The units cannot be locked or tied down to allow single hand operation.

Standard presses are valved to operate in the "impulse" or "BEM" Mode. That is, once the press has been activated, the ram will descend to the bottom of the stroke. The ram will not reverse until it has reached maximum strength and travel. Repeatability in this mode is plus or minus .001".

In some applications, (i.e. very slow ram speed, special loading considerations, etc.) you may desire to have the ram reverse when the operator's hand or hands are removed from the SYNCHRO-SIG Two Hand Unit. This is the new **CSR-G2 Mode. (2nd generation Constant Signal Required)**. Your press can be easily converted to this mode by purchasing the CSR-G2 Conversion Kit, Part No. CSR-G2-CON-1030. Existing valving, including the SYNCHRO-SIG unit, remains intact and is utilized. Conversion requires approximately 15 minutes and is easily accomplished.

Please contact our engineering department to discuss any questions you may have about control systems, modifications, and your applications. We are glad to supply our presses built to your specifications should you require other than our standard systems.

Factory Support . . .

Our 40 year reputation for providing quality TOGGLE-AIRE presses that meet a wide range of special requirements and our 55 years of service and support experience are all available to you with one phone call. It's your biggest advantage in dealing directly with our factory. Make use of it. Please call with any and all questions you may have regarding your applications and our equipment.



WARRANTY

A I M (hereafter referred to as the manufacturer) warrants that all TOGGLE-AIRE products will be free from defects in material and workmanship for a period of 180 days 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, A I M 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 that has been subject to abuse, misapplication, negligence, improper maintenance, alteration, or failure to follow manufacturer's instructions.

A I M'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 A I M BE LIABLE FOR ANY CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF TOGGLE-AIRE PRODUCTS.

347 Farnum Pike • Smithfield, RI 02917

Call us Toll Free: **1-888-889-4287**

Visit us online at **www.joraco.com**