

IMPACT HAMMER

MODEL Z-2 & Z-6

PARTS AND OPERATING MANUAL



Black & Webster
Assembly Equipment Division

air-hydraulics
INCORPORATED

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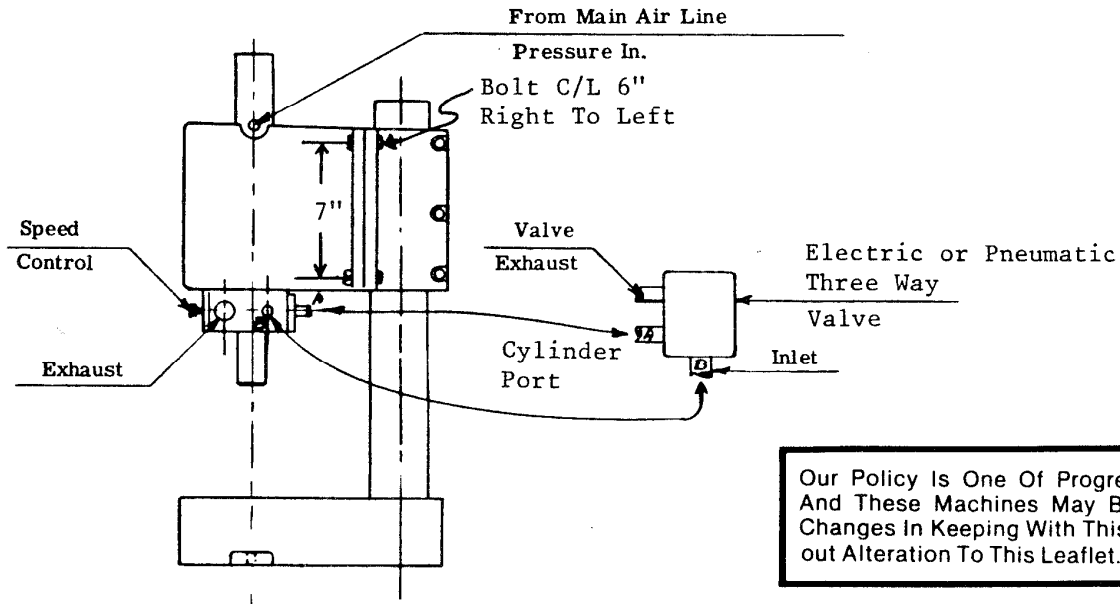
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EXPLODED AIR IMPACT HAMMER 40,000 POUNDS IMPACT WITH 100 POUNDS & PRESSURE

The Air-Hydraulics, Inc. Impact Hammer has numerous advantages over larger, heavier and more expensive mechanical presses, which are used to perform the same tasks. The operation is opposite to that of the mechanical press. With the Impact Hammer, the stroke is constant. Impact pressure may be varied precisely up to the press capacity. The pressure then remains the same at any point along the stroke. Breakdowns due to variation in stock thickness, or to improper positioning are eliminated by this feature. Construction is extremely simple. Cylinders are Hard Chrome Plated. This Impact Hammer is ideal for light stampings, forgings, trimming, molding, crimping, coining, riveting, staking and forming in various materials. Many uses will be found for this small hammer in every plant and shop because of its variable power and speed.

PRINCIPLE OF OPERATION: Before the Impact stroke begins, equal air pressure is exerted on both sides of the piston; when the built-in, pressure actuated, quick dump, exhaust valve is opened, by means of a 3-way control valve (solenoid actuated), the air from the bottom side of the piston is quickly exhausted into the atmosphere. This "explodes" the air on the top side of the piston, producing maximum impact stroke at the specified constant stroke.

DIAGRAM OF Z-2 & Z-6



Warranty

Air-Hydraulics, Inc. warrants to the original user that all products manufactured will be free from defects in material and workmanship and will possess the characteristics represented in writing by us. Claim for breach of the above warranty must be made within a period of one year from date of delivery to the user. Upon satisfactory proof of claim, we will make any necessary repairs or corrections, or at our discretion, replace defective parts at the factory, transportation charges prepaid. Charges for correcting defects will not be allowed, nor can we accept goods returned for correction unless we are notified in writing and the return or correction is authorized by us in writing. **The foregoing is in lieu of all other warranties, expressed or implied, including any warranties that extend beyond the description of the product.** This paragraph set forth the extent of our liability for breach of any warranty in connection with the sale or use of our products. It is understood Air-Hydraulics, Inc. will not be liable for consequential damages such as loss of profit, or expense, whether based on tort or contract. This warranty is void if the articles covered by the warranty have not been properly installed, maintained and used.

Note: modifying any part of the machine that can alter the operation, such as the valve assembly or any other component therein, in any way can void the manufacturer's warranty.

NOTE

The Air Hydraulic Press has been carefully and accurately built to give long, trouble-free service if properly installed and maintained. Follow carefully the instructions, making sure no dirt or foreign materials are allowed to get into the cylinder or other working parts. If you have any unusual problems regarding controls or tooling, notify AIR-HYDRAULICS, INC., JACKSON, MICHIGAN, at 1-800-837-4355 and our Engineering Department will be glad to assist you.

Installation Instructions

All Models are shipped completely assembled and ready to operate with a filter, regulator, lubricator assembly, dual pneumatic palm buttons and a pneumatic non tie-down. The lubricator is adjusted at the factory but if required, adjust to (1) drop of oil for every (6-8) cycles for optimum performance.

Impact Force can be affected by (3) factors:

- 1) Regulator Pressure - To set incoming regulator for constant air pressure due to varying shop pressures, monitor incoming air pressure at various times to obtain the lowest pressure reading during the timeframe. Adjust regulator to the noted low reading pressure, then adjust down (5) PSI more. This will insure the Z-Hammer's force will not fluctuate due to varying shop line pressure. The Z Hammer's force decreases by the amount adjusted below 100-PSI incoming air pressure. See chart page #6 for "Force Output" value with varied "Air Input". **Note: regulator is not used to adjust impact force.**
- 2) Distance from tooling to work piece within specified stroke - In order to get the maximum efficiency from the impact hammer, adjust the distance from the work piece to the tooling, to 3.0" for the Z2 and 4.0" for the Z6. Conversely, to decrease the impact, shorten the distance from the work piece to the tooling.
- 3) Adjusting screw - To regulate blow, turn screw, part #7, CW to decrease blow & CCW to increase. Fine-tuning of the Impact Hammer Blow is achieved by turning the Adjusting Screw out to increase or in to decrease the amount of air exhausted by the dump valve. After adjusting the Blow, securely tighten nut to hold in position (see item #7, page 8).

Note: when stamping letters or numbers, be sure work-piece is held securely.

For replacement parts, order by number from the part to be replaced, or See page #7 for an itemized part listing by part number.

Any comments from maintenance or servicing personnel welcomed.

Note: due to the Z-Hammer's high impact force, extreme vibrations are generated at the tooling/work-piece. Depending on the application, a vibration dampening material may be required under the machine to decrease the possibility of a *ghost hit*.

Machine Guarding

Safe Guarding the Machine – Although Air-Hydraulics, Inc. has or may have provided and installed safety guarding and devices, Air-Hydraulics can not provide and does not warrant complete safe guarding of this machine, due to lack of knowledge of employer's or end user's process, application, environment, tooling and set-ups. Nor does Air-Hydraulics, Inc. warrant that it's safety guarding and devices have been designed and installed to properly safe-guard this machine, again not knowing the end user's process, application, environment, tooling and set-ups. Therefore, the employer or the end-user, and NOT Air-Hydraulics, Inc., shall make certain that the safeguarding of this machine is complete and has been designed, manufactured, installed properly, tested and operated in accordance to ANSI and OSHA standards and to general machine safety logic and common sense. However, Air-Hydraulics will gladly install guards and similar safety devices for operator protection at the request of and with design approval of the purchaser.

IMPACT HAMMER SPECIFICATIONS

	Z-2	Z-6
Max. Impact in Tons with 100 P.S.I. Air	6	20
Cylinder I.D.	3 ½"	6"
Ram Diameter	1 ½"	2 ¼"
Constant Stroke (for max. impact)	3"	4"
Overall Stroke	4"	5"
Open Height (platen to ram extended for max impact)	5"	11"
Throat Size (center of ram to column)	6 25/32	8"
Platen Area	10" x 8 ¾	11" x 8"
Air Cushion at Bottom of Stroke after Max. Impact	Yes	Yes
Strokes per Cu. Ft. of 100 P.S.I. Air	50	15
Strokes per Minute Foot Operation	60	60
Connecting Pipe Size	3/8"	½"
Shipping Weight in Lbs.	210	800
Hole Size in End of Ram	9/16-1-1/2	7/8-1-3/4
Cubic Inch of Air per Cycle	29.096	111.01
Lift at End of Ram with 100 P.S.I. Air	137 lbs.	369 lbs.

Z-2 HAMMER

Air Input	Force Output	Ram-Tool Lift Ability
120 PSI	7.2 Tons	164Lbs.
110 PSI	6.6 Tons	151 Lbs.
100 PSI *	6.0 Tons	137 Lbs.
90 PSI	5.4 Tons	123 Lbs.
80 PSI	4.8 Tons	109 Lbs.
70 PSI	4.2 Tons	96 Lbs.
60 PSI	3.6 Tons	82 Lbs.
50 PSI	3.0 Tons	68 Lbs.

* At Press Rating

Z-6 HAMMER

Air Input	Force Output	Ram-Tool Lift Ability
120 PSI	24 Tons	443Lbs.
110 PSI	22 Tons	406 Lbs.
100 PSI*	20 Tons	369 Lbs.
90 PSI	18 Tons	332 Lbs.
80 PSI	16 Tons	295 Lbs.
70 PSI	14 Tons	258 Lbs.
60 PSI	12 Tons	221 Lbs.
50 PSI	10 Tons	164 Lbs.

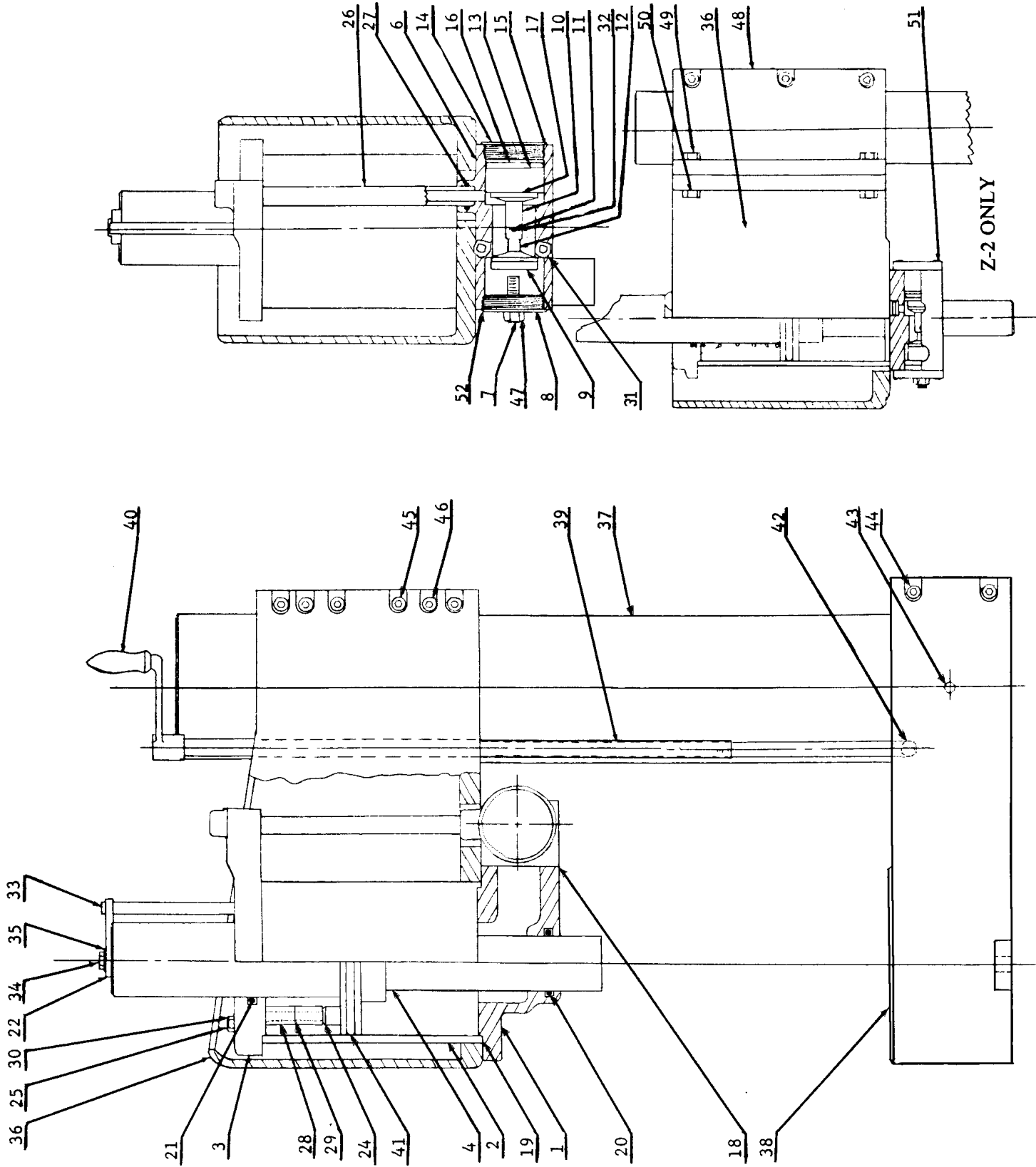
* At Press Rating

Z-2 AND Z-6 PARTS LIST

Part No.	Part Name	Z-6	Z-2
1	Bottom Cylinder Cap	1	1
2	Cylinder	1	1
3	Top Cylinder Cap	1	1
4	Ram	1	1
6	Main Valve Body	1	1
7	Adjusting Screw	1	1
8	Adj. Screw Valve End	1	1
9	Valve	1	1
10	Inlet Valve Stem	1	1
11	Valve Pin	1	1
12	Outlet Valve Stem	1	1
13	Valve Piston	1	1
14	Air Inlet Valve End	1	1
15	Valve Gasket	1	1
16	Valve Piston O Ring	1	1
17	Valve Leathers	2	1
18	Valve Gasket	1	1
19	Cylinder Gasket	2	1
20	Bottom Head O Ring	1	1
21	Top Head O Ring	1	1
22	Ram Guide	1	1
24	Ram Bumper	2	0
25	Cylinder Tie Rods	8	4
26	Valve Air Inlet Tube	1	1
27	Inlet Tube O Ring	2	2

Part No.	Part Name	Z-6	Z-2
28	Urethane Bumper Spring	2	1
29	Bumper Bolt	2	0
30	Cylinder Tie Rod Nut	8	4
31	Valve Mounting Screw	4	3
32	Valve Pin Cotter Pin	2	0
33	Guide Rod	1	1
34	Guide Rod Screw	1	1
35	Guide Cap Screw Lockwasher	1	1
36	Hammer Housing	1	1
37	Column	1	1
38	Base	1	1
39	Housing Raising Screw	1	0
40	Raising Screw Handle	1	0
41	Hammer Piston O Ring	1	1
42	Raising Screw Support	1	0
43	Column Lock Pin	1	0
44	Base Lock Screw	2	1
45	Housing Lock Screw	4	3
46	Housing Jack Screw	2	1
47	Adjusting Screw Nut	1	1
48	Column Bracket	0	1
49	Column Bracket Bolt	0	4
50	Column Bracket Nut	0	4
51	Valve Plate Screws	0	8
52	Cylinder Mounting Screws	4	4

IMPACT HAMMER

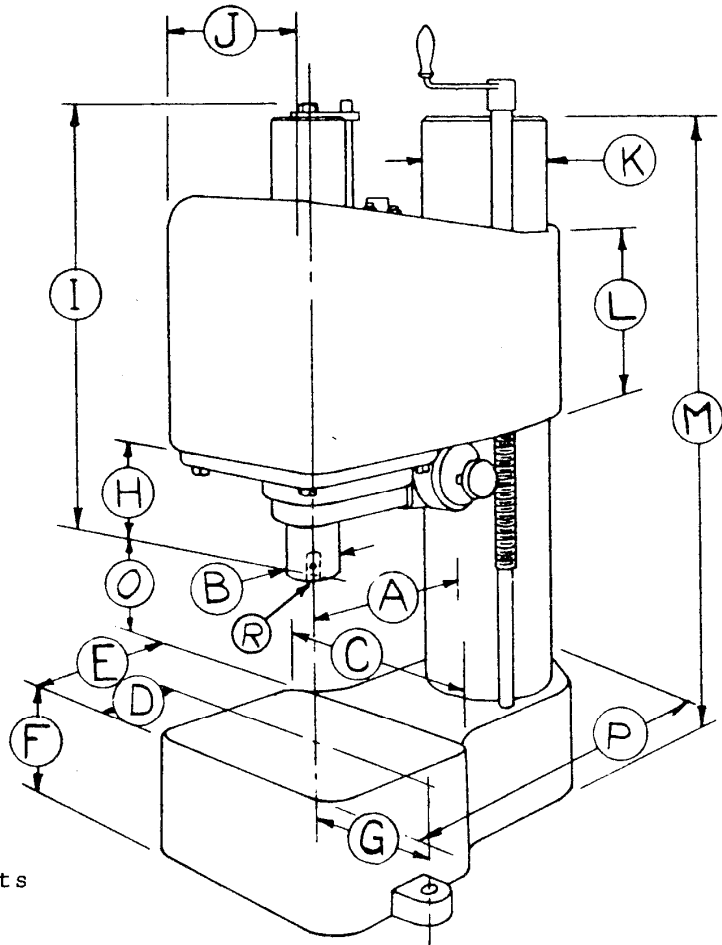
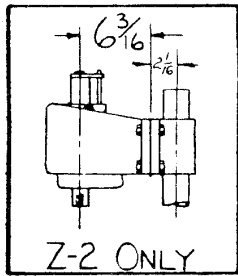


DIMENSIONS and SPECIFICATIONS

MORE WORK PER CU. FT. OF AIR

STROKES PER CUBIC FOOT OF AIR BASED ON 100 POUNDS PER SQUARE INCH

12,000 lb. Hammer Z-2 50 40,000 lb. Hammer Z-6 15



- (R) Hole In End Of Ram
- (T) Max. Tons Impact
- (S) Stroke For Best Results
- (N) Connecting Pipe Size

MODEL	R	T	S	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Z-2	$\frac{9}{16}$	6	3"	$6\frac{25}{32}$	$1\frac{1}{2}$	10	$3\frac{1}{4}$	8	4	$5\frac{5}{8}$	5	19	7	$2\frac{15}{16}$	$9\frac{1}{8}$	26	$\frac{3}{8}$	8	$14\frac{1}{2}$
Z-6	$\frac{7}{8}$	20	4"	8	$2\frac{1}{4}$	11	4	8	5	$6\frac{1}{2}$	5	$20\frac{5}{8}$	$9\frac{1}{4}$	$5\frac{15}{16}$	9	34	$\frac{1}{2}$	15	$19\frac{3}{4}$

Z-2 $\frac{5}{16}$ -18 Tap Hole $\frac{3}{4}$ Up From End Of Ram Z-6 $\frac{1}{2}$ -20 Tap Hole $\frac{3}{4}$ Up From End Of Ram