LGH
THE LIFTING EXPERTS

OPERATION MANUAL

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MAT JACK®

INDIANAPOLIS INDUSTRIAL PRODUCTS, INC.

HIGH PRESSURE AIR LIFTING BAGS

OPERATION AND INSTRUCTION MANUAL

INDIANAPOLIS INDUSTRIAL PRODUCTS, INC.

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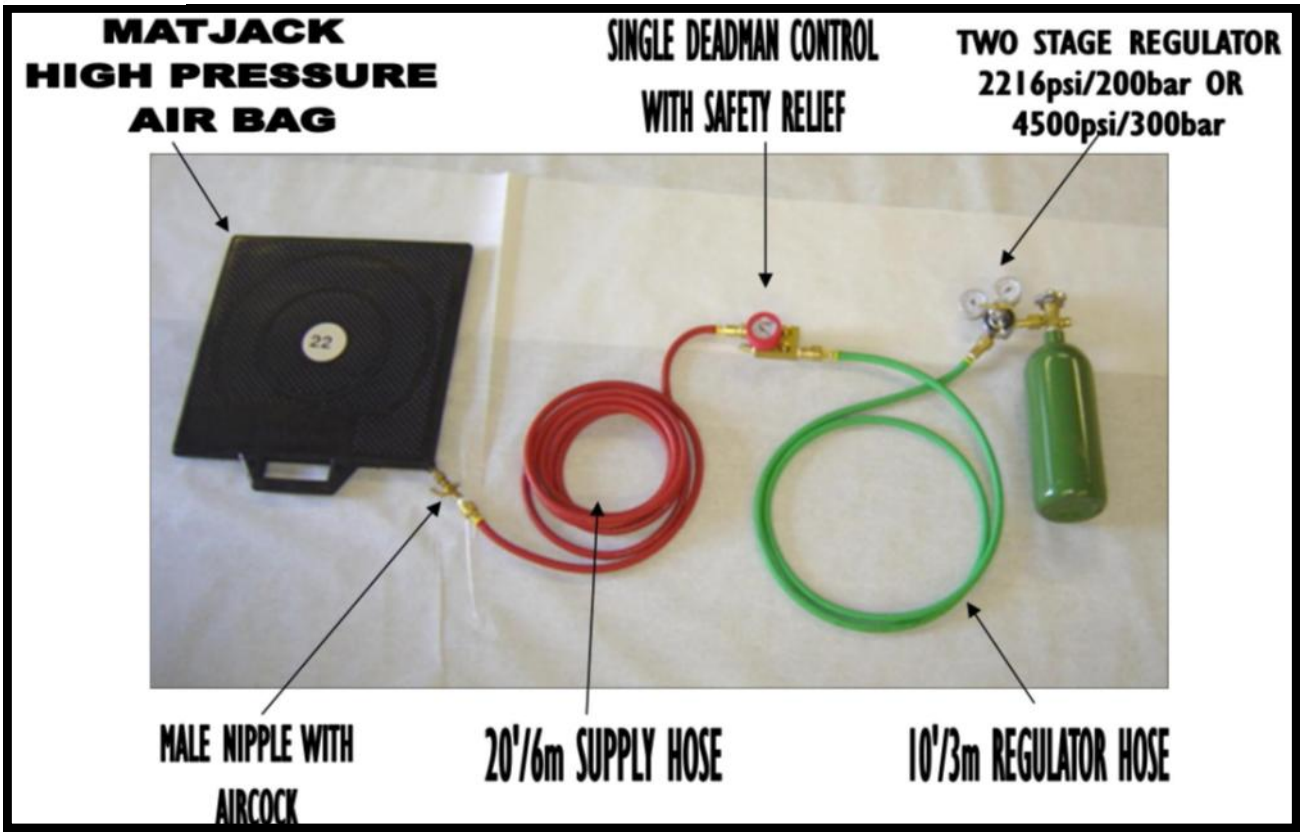

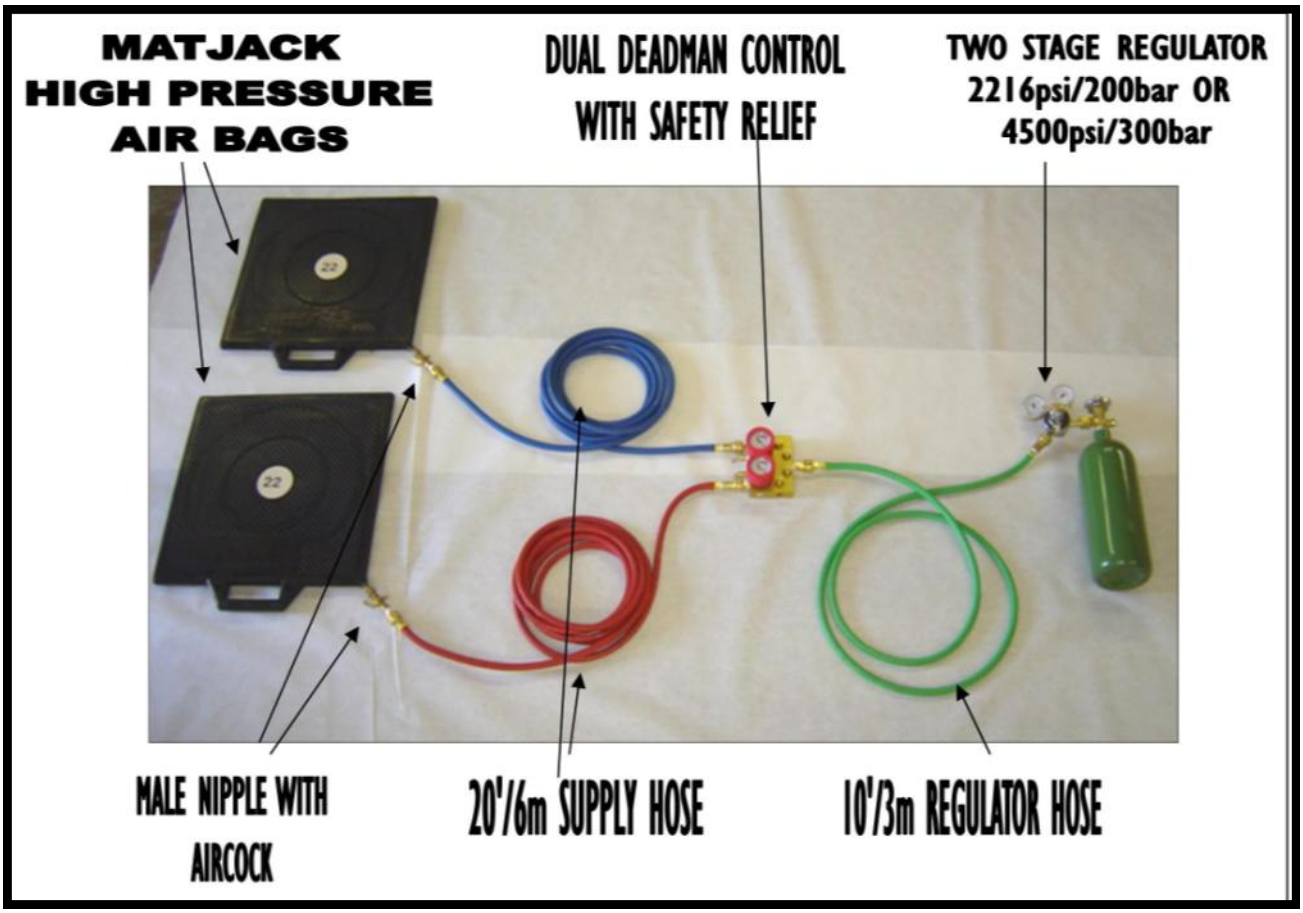

PART IDENTIFICATION
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PART IDENTIFICATION FOR MATJACK HIGH PRESSURE AIR BAGS EQUIPMENT

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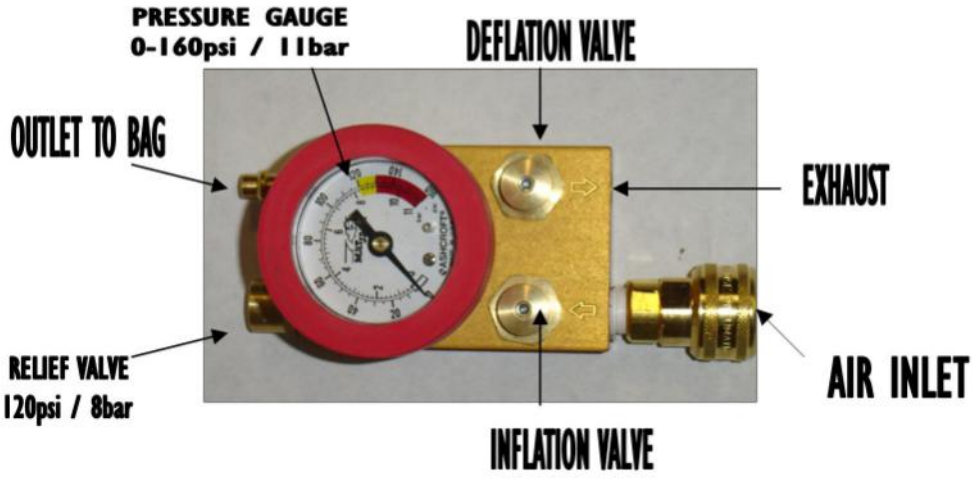

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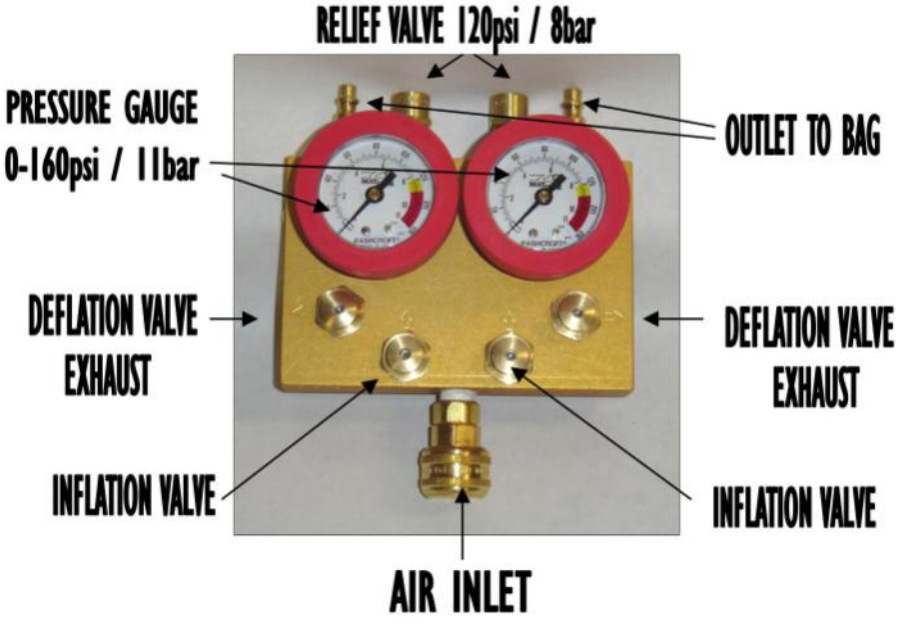
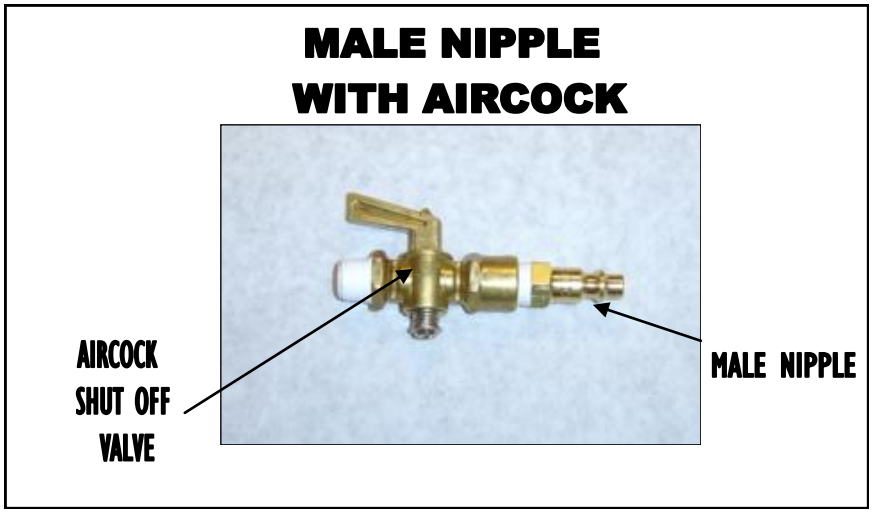
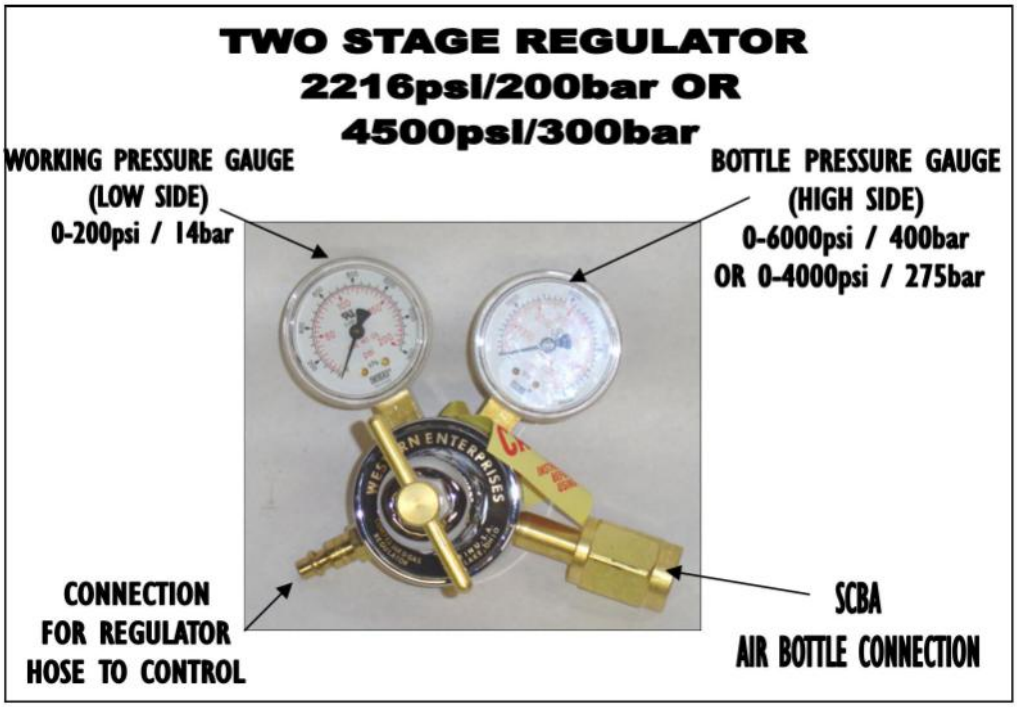


PART IDENTIFICATION FOR MATJACK HIGH PRESSURE AIR BAGS EQUIPMENT

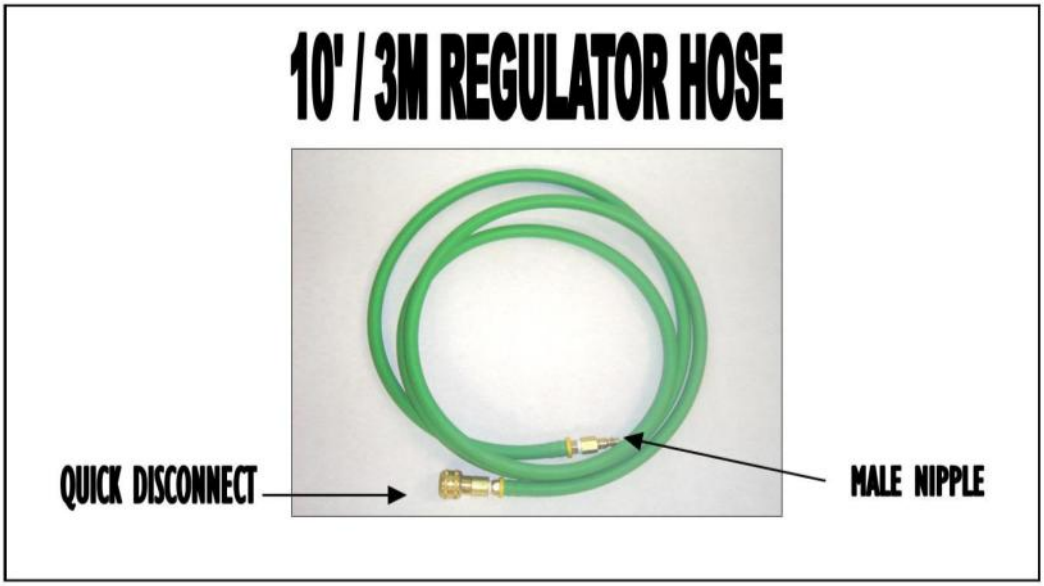


PART IDENTIFICATION
FOR MATJACK HIGH PRESSURE
AIR BAGS EQUIPMENT

TWO STAGE REGULATOR
2216psi/200bar OR
4500psi/300bar



10' / 3M REGULATOR HOSE



INSPECTION AND ASSEMBLY

After unpacking, lay out system for general familiarization. Inspect for any shipping damage, check hoses, regulator, pressure control unit, bag and accessories.

Air Lifting Bags

- Inspect them and look for any obvious shipping damage. These bags are made to be durable. If there is any damage, please report this immediately to your dealer or our service department through our toll free number 800-827-3755 or 317-359-3078

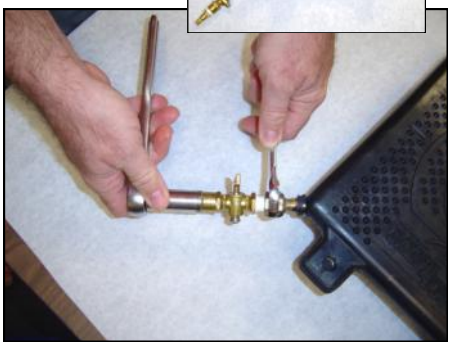
High / Low Pressure 2 stage regulator

- Regulator must be used whenever you use a high pressure air source, such as, a breathing air cylinder. Check for damaged gauge lenses, dented surfaces, bad threads, etc. before each use. If any exist contact your dealer or our service department.
- The gauge closest to the air intake will give the operator a reading of the pressure of his air source. The second gauge indicates the working pressure operating range of the air bag.

CAUTION

Working Pressure not to exceed 120 psi / 8 bar on the low pressure side of the regulator

Assembly for Male Nipple With Aircock



- Install the replaceable male nipple and aircock into the air inlet fitting on each air lifting bag. These fittings are tapered brass and do not need to be over tightened, a snug fit is all that is required.

ASSEMBLY INSTRUCTIONS

1. Connect regulator to air source. 1

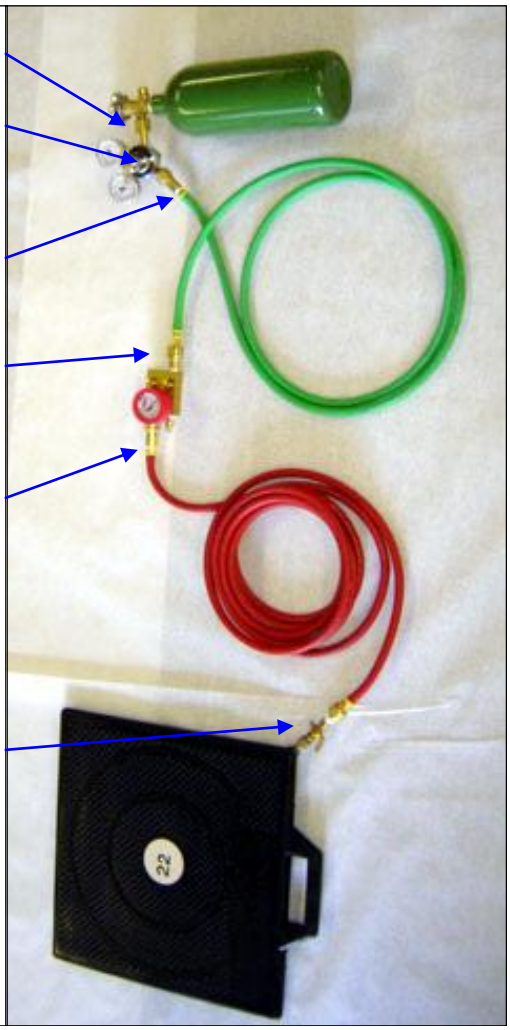
2. Loosen pressure adjusting handle on the regulator. 2

3. Connect the regulator hose quick disconnect fitting to the regulator. 3

4. Connect the regulator hose male nipple to the inlet on the control valve. 4

5. Connect the supply hose to the control valve outlet 5

6. Connect the other end of the supply hose to the male nipple with air-cock on the Matjack air lifting bag. 6



OPTIONAL EQUIPMENT

Your specific order may vary with equipment shown above, (air source, controls or fittings, etc.). For assembly and operation instructions look for separate instruction sheet or contact Matjack or your local dealer.

Lifting Gear Hire Corporation

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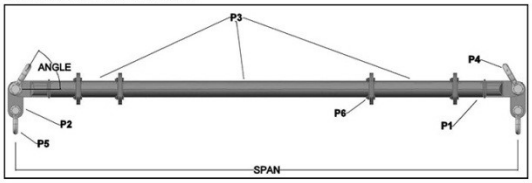
puts safety first

Modular 24 Spreader Beam Specifications

User Instructions

The Modular 24 Spreader Beam is modular in length, and every spreader consists of 1 pair of End Units and Drop Links, with intermediate struts that can be assembled to achieve different spans. The Modular 24 Spreader Beam has an assembled span ranging from 3 ft to 20 feet in 1 foot increments.

TYPICAL SPREADER ASSEMBLY - FIG. 1



Modular 24 Spreader Beam Specification:

- Rated at 24 ton WLL at 11 ft. span. See Load Table for WLL at longer spans.
- Base sling angle, α, 45 degrees or greater.
- End Units and Drop Links are rated at 12 tons (24 tons combined capacity).
- **Bolt tightening torque: 110 pound-foot.**

Table 1: Component List

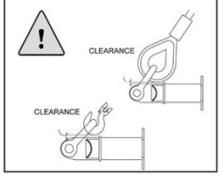
Part Ref:	Description	Item Weight lbs.
P1	End Unit (1 1/2 ft.)	35
P2	Drop Link	9
P3	6 ft. Strut	80
P3	4 ft. Strut	55.5
P3	2 ft. Strut	37
P3	1 ft. Strut	26
P4	17t Shackle	17.5
P5	12t Shackle	11
P6	M20x50 HT Bolts, Nuts & Washers	

Table 2: Load v. Span

45° BSA			Recommended Configuration EU – End Unit (1.5 ft.)						Beam Weight (lbs.)
Span (ft.)	WLL (tons)	Min. Sling Length (ft.)							
3	24	2.25	EU	EU	—	—	—	—	154
4	24	3	EU	1	EU	—	—	—	183
5	24	3.75	EU	2	EU	—	—	—	194
6	24	4.5	EU	2	1	EU	—	—	223
7	24	5	EU	4	EU	—	—	—	216
8	24	5.75	EU	4	1	EU	—	—	245
9	24	6.5	EU	6	EU	—	—	—	238
10	24	7.25	EU	6	1	EU	—	—	267
11	24	8	EU	6	2	EU	—	—	278
12	22	8.5	EU	2	6	1	EU	—	307
13	20	9.25	EU	4	6	EU	—	—	300
14	18	10	EU	4	6	1	EU	—	329
15	15	10.75	EU	6	6	EU	—	—	322
16	13	11.5	EU	6	6	1	EU	—	351
17	12	12	EU	6	6	2	EU	—	362
18	11	12.75	EU	1	6	6	2	EU	391
19	10	13.5	EU	6	6	4	EU	—	384
20	9	14.25	EU	1	6	6	4	EU	413

Beam weights calculated without top rigging.

BSA = BASE TO SLING ANGLE, α **FIG. 2**



The operator must ensure that there is a clearance between the sling end fitting and the end unit as shown in Fig. 2.

- Max number of struts allowed in spreader assembly: 5
- Assemble longer struts in the center of the spreader configuration
- Sling angle is crucial to safe use of spreader


Strut


Drop Link


End Unit Sub-Assy

WARNING!

- Personnel using this system should be suitably trained, competent and have a clear understanding of Safe Slinging procedures.
- The use of modular spreader equipment must be in accordance with the procedures laid down in 'ASME B30.20 - 1999 Section 20 - 1.6'.
- NEVER EXCEED STATED WLL - ADHERE TO WLL IN TABLE 2, FOR SLING ANGLE USED.
- THE SLING LENGTH IS CRITICAL TO THE SAFE USE OF THE SPREADER - ADHERE TO TABLE 2.
- Ensure Drop Links hang down and smaller shackles are connected to bottom hole of Drop Link.

Recommended top sling types: Textile slings, wire rope slings with soft eyes and chain slings with small end fittings. If thimble eyes are used with wire rope slings, make sure sling angle is 60 degrees or more. Other types exist but not all are suitable due to end fitting size, particularly larger capacity chain hook and thimble eyes. Note: Raising the slings can give greater clearance. Refer to LGH if in doubt.

ASSEMBLY PROCEDURE

1. Check the ID plates on each modular spreader beam component to ensure the correct size is used.
2. Lay out the Struts and End Units in the correct configuration (see table 2), laid on flats to prevent rolling.
3. Check that all pairs of flanges are clear from debris, sand etc. before connection.
4. Bolt the components together using bolts, nuts and washers provided. Tighten the bolts to a torque as shown overleaf, 4 bolts per connection.
5. Place drop link inside the jaw of an end unit, with the larger hole of drop link lined up with the End Unit hole.
6. Place a top sling onto the body of a top shackle, and put jaw of top shackle over the end unit jaw.
7. Put top shackle pin through shackle, end unit jaw and drop link, and repeat for other spreader beam end.
8. Attach free ends of top slings to crane hook.
9. Attach lower slings and shackles to lower holes of drop links, and attach them to the load to be lifted.
10. **The assembled spreader beam and lifting rig must be thoroughly checked by a competent person prior to lifting.**

DO's & DON'TS

- DO ensure to load the spreader through the drop links only. i.e. adhere to Fig. 1.
- DO ensure enough clearance between spreader and the load to prevent the load hitting the spreader. Any collision could cause failure of the spreader.
- DO NOT undertake a lift without correct use of appropriate top slings.
- DO NOT hang any load from the spreader tube or flanges.
- DO NOT exceed stated WLL for that particular span - adhere to table 2.
- DO NOT rig the lower slings more than 6 degrees from vertical.
- DO NOT twist any slings.

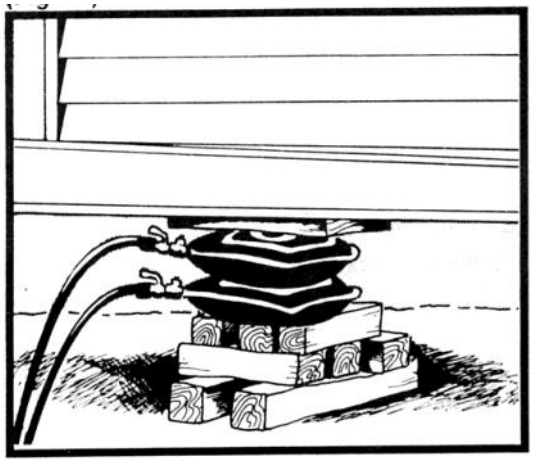
RULES FOR SAFE OPERATION

CAUTION

READ RULES FOR SAFE OPERATION BEFORE OPERATING THE AIR BAG

- **<u>NEVER</u> inflate bags against sharp objects or on a heated surface over 230 degrees Fahrenheit. When it is necessary a block can be placed between a hot or sharp surface to protect the bag.**

- **Two bags may be used safely by using a dual control.**



STACKING:
A. This allows for a greater lift height.
B. <u>NEVER</u> stack more than 2 bags at a time.
C. When using two bags always inflate the bottom bag first.
SIDE BY SIDE:
A. Allows you to lift the same load at two separate points to maximize surface contact.
B. Safer lifting practice due to spreading load on two lift points rather than a single point load lift.

- **When using the air lifting bags, always inflate at a slow rate.**
- **<u>NEVER</u> operate air lifting bags, hoses, valves, regulators, etc. that are damaged or improperly assembled.**

OPERATING INSTRUCTIONS

1. After assembly is completed make sure pressure adjusting handle on the regulator is loosened.

CAUTION

Always open the high pressure air source slowly. Failure to do so may damage the regulator.

2. Open air source slowly. Observe the high pressure gauge. The gauge should reflect the air supply pressure.

3. The outlet valve on the regulator can now be opened, allowing air flow to the controller by adjust working pressure on the regulator to 120 psi by turning the handle clockwise.

4. The operation of the controller is simple. On the deadman push button control the inflation valve is simply depressed allowing air to flow to the bag.

* Notice on the operating gauge dial
Clear / Go Red / No Go

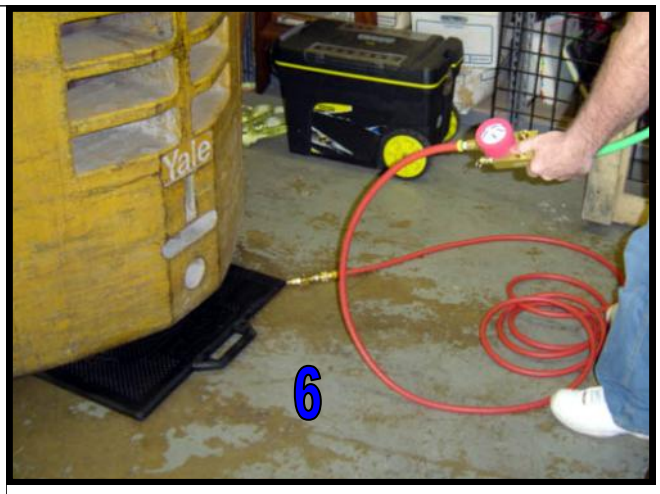
5. To deflate the air bag the deflation valves are depressed. Make sure the air exhaust outlet is clear of debris.

CAUTION

Due to tremendous forces exerted on the air lifting bag, inflation should not exceed 30 psi while the air lifting bag is unrestrained. Always have the air lifting bag connected prior to placing the bag under or between the load to minimize the operator's exposure to the load area and eliminate the possibility of the operator placing the air lifting bag with the air inlet under the load.

OPERATING INSTRUCTIONS

6. Place the air lifting bag under the load with the air inlet protruding. Always place the bag as close to the load as possible. This will maximize the contact area between the air lifting bag and the load and make for a much more efficient lift, (see load vs contact area page 13).



7. When operating the controller with (2) air lifting bags connected, practice operating the bags simultaneously and alternately, inflating and deflating. As you can see, the operation of the air bag system is simple.

- Remember when using (2) bags always inflate the bottom bag first.
- When using more than one air lifting bag the use of different colored air hoses enables the operator to rapidly identify the air lifting bag that is connected to each outlet of the control valve.

CAUTION

Always inflate the air lifting bags slowly to minimize chance of the load shifting.

OPERATING INSTRUCTIONS
LOAD VS CONTACT

The purpose of this information is to provide information regarding the lifting and height capabilities of Matjack Air Lifting Bags.

Mechanical or hydraulic jacks concentrate their energy into a small contact surface area, while air lifting bags distribute forces equally over the entire surface area of the bag.

Matjack air lifting bags work on a simple yet proven law of physics. For each pound (psi) of air pumped into the lifting bags, that force is multiplied over the bag's entire surface area, creating tons of force.

Both standard jacks and air lifting bags have their merits. Matjack air lifting bags have a 1" maximum thickness and this singular difference permits access to lift areas where no known conventional lifting devices can be used.

MAXIMUM LIFTING CAPACITIES AND HEIGHTS AS SHOWN IN OUR LITERATURE ARE BASED ON:

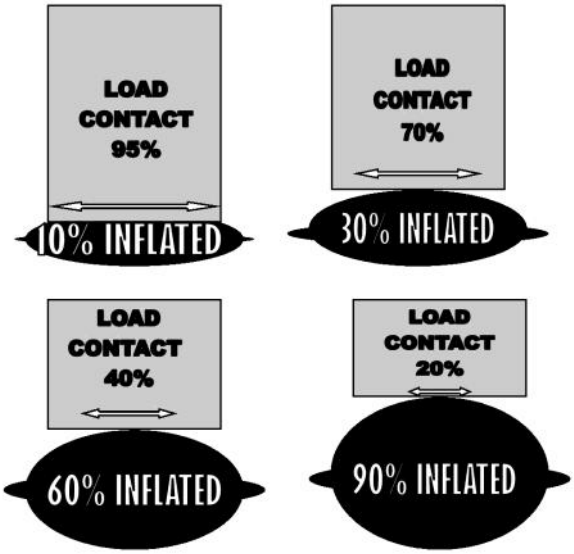
1. Full surface contact of the bag to the load and support area.
2. Maximum lifting height the bags can achieve at nominal-not listed maximum tonnages as shown.

MAXUMUM LIFTING HEIGHT AND MAXIMUM LIFTING FORCE CANNOT BE ACHIEVED SIMULTANEOISLY.

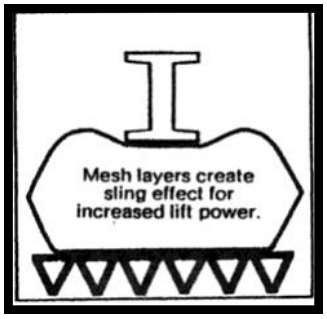
Matjack air lifting bags are either square or rectangular. The 1" deflated profile begins to oval, as shown in the illustrations. With each additional pound of air pressure introduced, the arcing effect of the bag reduces surface contact and a loss of lifting power and height is in evidence. The same phenomenon occurs if the load being listed (ie—beams or similar items) are smaller than the bag itself. In these cases, a shim/block equal in size to the air lifting bags is used to transfer the energy from the non -contact bag surface area to the lifted object. In addition on partially-contacted loads, the internal steel cord construction aids in transferring lifting power to the point of lift.

Because of the infinite number of variables in weights, arc and contact areas Matjack or its representatives should be contacted prior to lifting bag selection on critical weight/ height requirements. The surest way to resolve any doubt is with a field demonstration on your specific application. Should Matjack air lifting bags mot meet with your complete satisfaction for any reason, they will be replaced to comply with customer need and satisfaction.

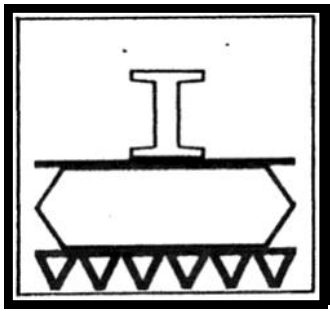
Effect of surface contact as bags are inflated is variable in accordance with different load weight.



When only partial surface area of bags contact the load– lifting capacity varies in relation to load weight and bag arc.



NOT RECOMMENDED
Maximum lifting power cannot be achieved when only partial contact with top of bag is achieved (as illustrated).



RECOMMENDED
For partial contact loads, use steel plate (or equal) to place under load, ncreasing load distribution over more bag surface area.

Illustrations above are for reference only and are not to be used as examples of the actual performance capabilities of the bags.

CARE AND MAINTENANCE

Matjack air lfiting bags

- Inspect after each use.
- Remove any foreign objects that may be on the bag surface, such as, broken glass and debris.
- Wash bag in soap and water. Avoid getting water in the bag. If water does get in, allow the bag to thoroughly dry before the next use.
- Cuts on the surface can be repaired with rubber cement.
- Leak test the bag by pressurizing to 30 PSI for 30 minutes. If a loss of pressure has occurred, immerse in water of soap solution. The appearance of small air bubbles around the connection pipe/air inlet is of no significance with regards to the safety and operational readiness of the bag and may be disregarded or repaired by disassembling and re-taping threads and reassembling and then recheck for leaks.
- Check for damage on the air inlet nipple, if present contact manufacturer or local dealer for replacement.
- Always field test your air lifting bags annually to check for potential problems, (see field test procedures).
- All other questions contact Matjack or local authorized dealer.

Extension Hoses

- Keep couplings clean and dry.
- Broken hose must be replaced.
- Inspect for cracks or nicks.

Control Valves & safety relief

- Keep couplings clean and dry.
- Replace broken gauge or fittings.

Two stage regulator assembly

- Keep clean and dry.
- **Do not** lubricate.
- Operator should limit repairs to lens or gauge replacement and / or fittings.
- If any other repairs are necessary contact an authorized dealer or return to: Indianapolis Industrial Products, Inc.

MAT JACK

INDIANAPOLIS INDUSTRIAL PRODUCTS, INC
STATEMENT OF WARRANTY FOR HIGH PRESSURE AIR LIFTING BAG PRODUCTS

Seller warrants to the original purchaser that its product shall be free of defect in material and workmanship for a period not exceeding 5 years after delivery: Under normal use and service for which it is intended if, but only, if it has been properly operated pursuant to instructions supplied by seller. Seller's obligation under the warranty is limited to replacing free of charge any defective products manufactured by seller which are returned to seller's factory within 45 days after the defect is discovered. 5 years after delivery buyer shall receive a credit against the cost of replacing the product limited to $100.00

THE WARRANTY PROVIDED IN THIS ARTICLE AND THE OBLIGATIONS AND LIABILITIES OF SELLER THEREUNDER ARE EXCLUSIVE AND IN LIEU OF AND BUYER HEREBY WAIVES ALL OTHER REMEDIES, WARRANTIES, GUARANTIES OR LIABILITIES, EXPRESS OR IMPLIED, ARISING BY LAW OR OTHERWISE (INCLUDING WITHOUT LIMITATION ANY OBLIGATIONS OF THE SELLER WITH RESPECT TO FITNESS, MERCHANTABILITY AND CONSEQUESNTIAL DAMAGES) OR WHETHER OR NOT OCCASIONED BY SELLER'S NEGLIGENCE. THIS WARRANTY SHALL NOT BE EXTENDED, ALTERED OR VARIED BY A WRITTEN INSTRUMENT SIGNED BY SELLER AND BUYER.

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