Global Leaders in Load Testing
& Subsea Lifting Equipment

info@jwarentals.com | jwarentals.com

INSTRUCTION MANUAL
GUIDANCE FOR OPERATION

Lifting Bags

Before lift bags are used in underwater engineering tasks, a proper assessment of the task to be performed should be made. This assessment should include:
a. Calculations of the weight to be lifted or moved.
b. Calculations of the size of the lift bag and type (enclosed or open) required.
c. Calculations, where possible, to determine the centre of buoyancy and centre of gravity should be made so that steps can be taken to prevent the object being lifted spinning or turning over.
d. The number of lift bags required.
e. The positioning and attachment of the lift bag.
f. Calculated safety factors for all of the above.

Note 1 - If the weight of the object to be lifted or moved is unknown, or the object is buried in the mud, the load can only be estimated. Precautions should be taken before the lift bags are attached to ensure that when they are inflated control of the load is not lost. The restraining line from the top of the bag, if secured to the load itself, would perform its function should the lift bag attachment fail. It would not however prevent the load from going up in an uncontrolled fashion if the bag was accidentally over inflated. For this reason, the restraining line should normally be connected to an independent anchor point.

Note 2 - Extreme care should be taken when using lift bags to overcome seabed suction or free mechanically locked or snagged equipment. A hold back strop and anchor should be available which is heavier than the up thrust created by the lift bag. This can be achieved by placing Dead Man Anchors (DMA) in the vicinity of the object and attaching slings from the object to the DMA.

Note 3 - Open bottom and totally enclosed units, (with the exception of the models T35 & T50, 35,000kg & 50,000kg lift capacity bags), should be used where any form of ascent is planned, such as vessel salvage or raising objects from the seabed. Lifting beams are recommended for use with the totally enclosed range of lifting bags. The models T35 & T50 are for surface support and draft reduction only.

All Totally Enclosed lifting bags are subject to a phenomenon called 'Wicking' through the edges of the fabric. Totally Enclosed lifting bags should be continually topped up with air during use as required.

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Once the size/type and number of lift bags has been determined by the task specific assessment, then the bag(s) will need to be inspected before use for the following:
a. A check of the serial numbers on all of the components with the number on the certificate.
b. A check of the inspection date on the certificate.
c. Visual inspection of all components, even if the lift bags are new.
d. Visual inspection of the webbing strops and the stitching on the bags.
e. The "dump valve" at the top of the parachute bags should be checked to ensure that it is clean and can operate freely. The line attached to the "dump valve" should be checked to ensure that it is attached correctly and will operate the valve when pulled.
(It is recommended that these lines are made of different materials and of different sizes so can be readily distinguishable from other lines that may be present).
f. With parachute type bags, the restraining line should be checked to ensure that it is attached to the crown (top) of the bag so that the bag will invert should there be a failure of any part of the attached rigging.
g. With enclosed lift bags, the relief valve should be checked to ensure that it is free and clear of obstruction.

If it is found during the task specific assessment that the lift points cannot be distributed evenly along the load, a spreader bar should be used with pad eyes at equal distances on top for the lift bag slings to be attached. There should also be pad eyes on the bottom of the spreader bar to enable slings to be attached to the load. (If spreader bars are used then test certificates will be required and the safe working load marked on the bar).

If the load has been estimated then it may be necessary to provide residual lift capacity. In such cases it may be preferable to use a series of small lift bags, rather than a few large ones.

The use of Dead Man Anchors (DMAs) should be included in the task specific assessment prior to commencing operations that involve air lift bags. The in-water weight of any DMA should be sufficient so that the combined weight of the load and any DMA is greater than the total lift.

Note: In the UK the Lifting Operations & Lifting Equipment Regulations 1998 (LOLER) must be observed. The International Marine Constructors Association (IMCA) DO16 guidelines should also be observed.

- If you are having rigging problems, please contact our technical team as we may be able to assist you with suggesting an alternative solution.
- Above all, stay safe!