

Sava Heavy Lift Bags Instruction Manual

WARNING!

Before using the air bag, carefully read these instructions. Non-compliance with recommendations can result in product damage and personal injury.

- Never work under a load without safety supports
- Never exceed the inflation pressure of 8 bars (118 PSI)
- Never place more than two lifting air bags one upon another

Information

This booklet contains technical information about lifting air bags and basic instructions for use. The selection and application of an air bag depend on various factors such as lifting requirements, capacity, lifting height, shape of objects. The manufacturer doesn't assume any responsibility for personal injuries or material damages arising from improper use or misuse of lifting air bags and their constituents. The figures beside the text are shown for information only. Actual conditions of lifting techniques and characteristics depend on particular application and are from case to case different.

Recommendations for safe and efficient work

When using air bags, always wear protective clothing. Firemen and rescue-team members must be equipped completely in accordance with the requirements; other users should wear safety helmet, safety glasses and gloves or other equipment if required.

Proper transportation of air bags is of great importance. Care should be taken that air bags are always being carried with the inflation nozzle facing upwards to avoid damaging it in case of an air bag's falling down. Air bags of great sizes and weights are to be carried by two persons. When air bags are stored or transported in horizontal position, the inflation nozzle must face ahead so that it can be easily seen when an air bag is to be moved, and that the work can be done safely without risk of damage.

When the surface temperature of the object to be lifted exceeds 55°C, the part of the air bag in contact with the object is to be protected by means of a fiberboard. Heat and temperatures exceeding the permissible level can damage the air bag.

Even though it is simple to place and to inflate the air bag, the operation in dark is dangerous. The work place is to be well illuminated. Sometimes, when due to the affect of shading the visibility is poor, even during the day it is reasonable to use additional sources of light.

How the inflation system operates

Prior to use the air bag, set the pressure to 0,8 Mpa (8 bar, 118 PSI) using the pressure reducing valve, the two filling valves on the double controller are to be closed. Connect the air bag to the distribution pipes and set it to the correct lifting position. Open left or right filling valve on the double controller. By means of a pressure gauge check the working pressure and the air bag operation at inflation. After concluding the operation of lifting or separating, close the filling valve on the controller {Figure 1). To let off the air open the safety valve on the double controller. Remove the air bags from the site of use, disconnect them, load them to press out the remaining air, and clean them.

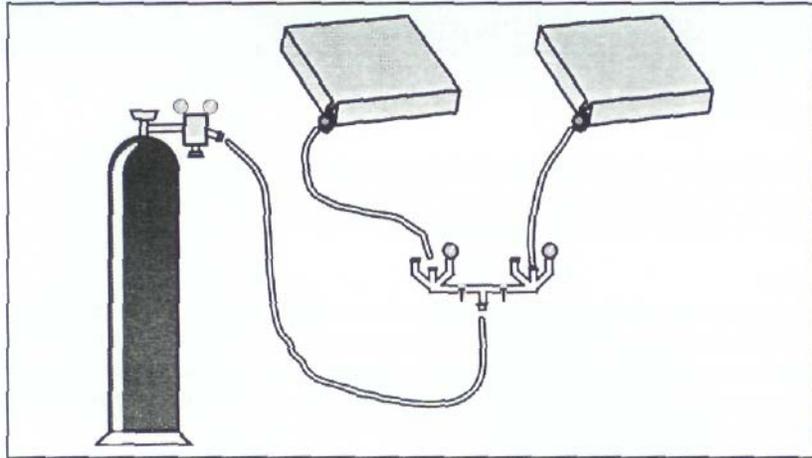
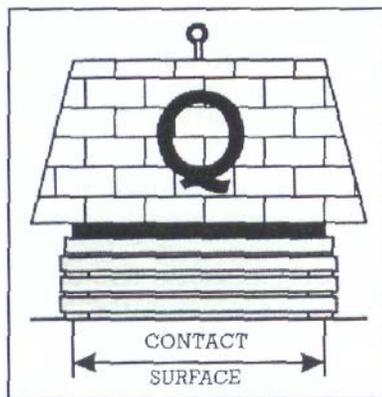
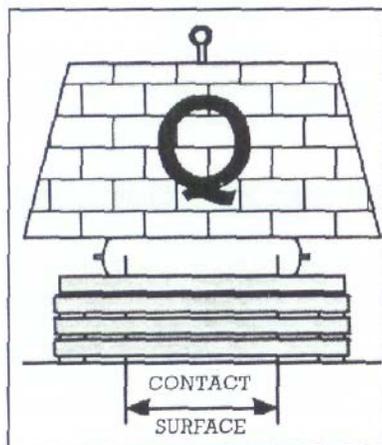


Figure 1



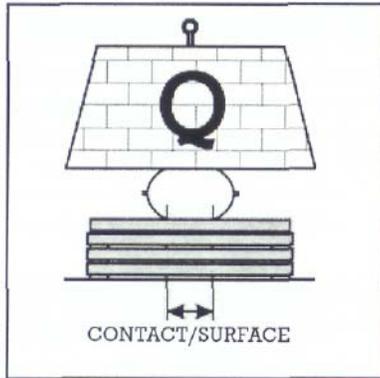
Position the air bag on a prearranged place or a constructed foundation (Figure 2). Fully emptied air bag contains very little air.

Figure 2



During the process of air bag inflation, the air column and consequently the lifting height are increasing, while the contact surface between the bag and the object is decreasing, resulting in decreasing lifting capacity (Figure 3). Thus, maximal force can be attained only at the beginning of inflation, when the lifting height is minimal. During the inflation, the air bag is gradually getting a characteristic spherical form (see enclosed diagrams).

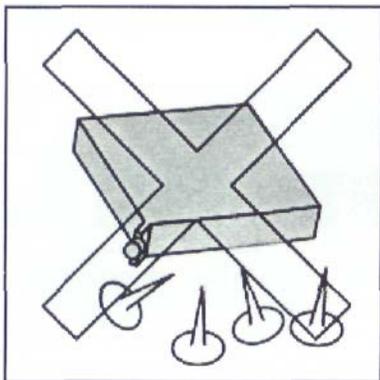
Figure 3



With the air bag fully inflated, the contact surface and lifting capacity reach their minimum, and the lifting height its maximum (Figure 4), To be able to correctly operate the air bag, a user must be acquainted with the data about maximal lifting force, maximal lifting height and maximal lifting capacity at maximal lifting height.

Figure 4

Lifting using a single air bag



1, The place where the air bag is intended to be positioned on, is to be cleaned of glass fragments and other foreign particles which might damage the air bag, When the air bag is to be put on a surface, presenting - due to oily spots or ice - to the air bag the risk of slipping the surface is to be covered with sand or any other granulated material. When the air bag is used on a not firm and soft ground, a solid support or a fiberboard is to be arranged under the air bag (Figure 5).

Figure 5

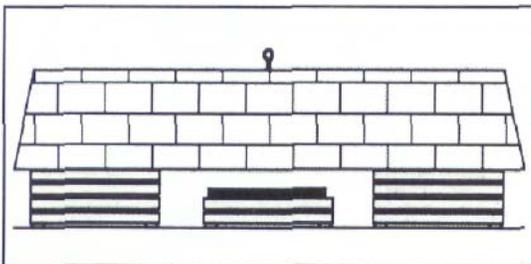


Figure 6

2. When there is more than 70 mm space between the ground and the object to be lifted, a firm, high enough foundation is to be built, leaving just enough space to insert a non inflated bag. The upper surface of the foundation should be undivided, without any gap, thus preventing the air bag from collapsing during inflation (Figure 6).

3. On each side of the air bag foundation, additional safety supports are to be built, extending to the point, which doesn't permit another insertion (Figure 6). This reduces the height, from which the object of lifting would fall in case of an eventual loss of air in the air bag or if the inflation system breaks down.

4. The air bag is to be inserted in the middle of the foundation so that the inflation nozzle is pointed right or left from the object to be lifted. Always make sure that the air bag surface lies against the lower surface of the object, A too small contact surface can cause the object to slide during the inflation, as the inflated air bag would considerably displace from the object to be moved.

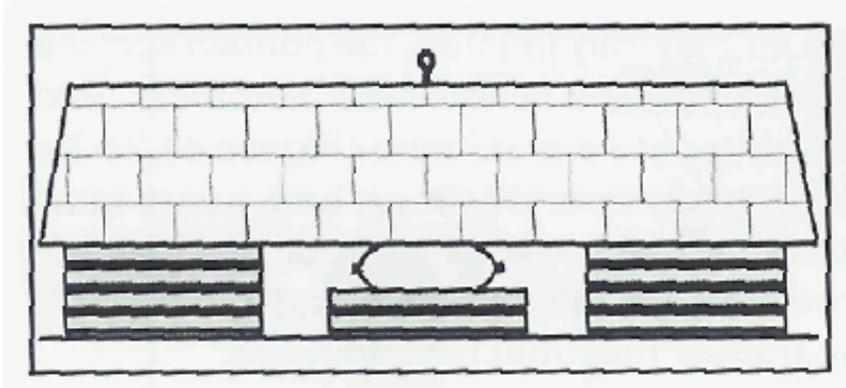
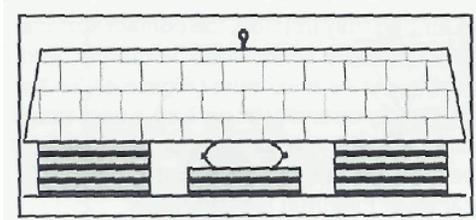


Figure 7

6. Slowly empty the air bag, allowing the object to lay safely upon the safety supports. Remove the air bag and the foundation if the required working area is located under the lifting point.

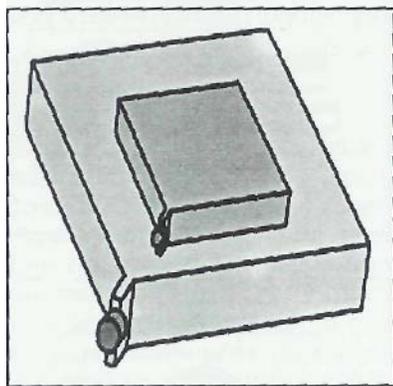


5. Inflate the air bag to achieve the required height, and then add safety supports as high as possible (Figure 7). Provided that sufficient staff is available, the safety supports are recommended to be built simultaneously with the air bag inflation.

WARNING!

At any lifting operation, the safety supports are of essential importance. Any work under a load supported only by an inflated air bag is strongly forbidden.

Lifting using two air bags



In order to increase lifting height, we can use two air bags, placing the smaller one in the middle of the greater one, with the inflation nozzles pointed away from the object to be lifted, each one to the other side, right or left (Figure 8). Never put more than two air bags one upon another.

Similarly to the lifting with a single air bag, it is necessary to construct a foundation.

Figure 8

First inflate the lower, greater air bag, so as to allow the smaller one to touch the object to be lifted. Then fully inflate the upper air bag and, if necessary, the lower one again, until the required lifting height is achieved.

Safety supports are to be added under the load with care. After concluding the inflation, slowly empty the air bags.

Increasing lifting capacity and height

It is wrong to believe that placing air bags one upon another can increase lifting capacity. With a bloc of two air bags one upon another, we only increase lifting height, while lifting capacity of the bloc is the capacity of the small air bag (Figure 10). Lifting capacity depends on the size of the air bag surface in contact with the lower surface of the object to be lifted. Thus, placing one air bag beside another can only increase lifting capacity, provided that both are being inflated simultaneously.

Figure 9 shows two air bags, placed one next to the other on foundations. The first air bag can lift 8 tons, the second 12 tons. Neither of the bags can lift the load of 15 tons. However, when being inflated together, they are able to lift even 20 tons, and consequently, using this bloc, the load of 15 tons can be lifted.

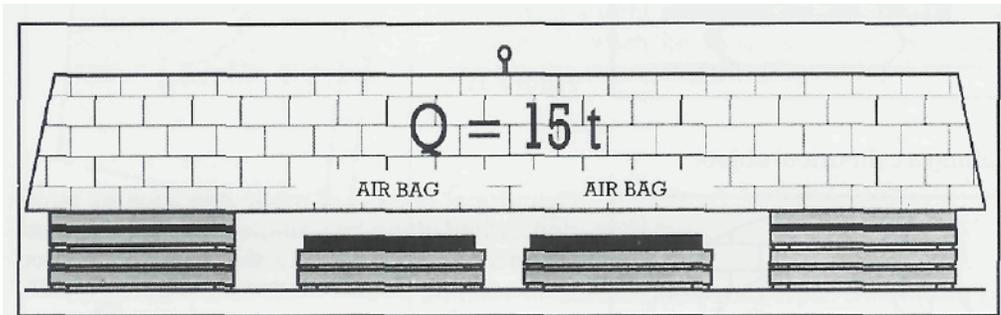
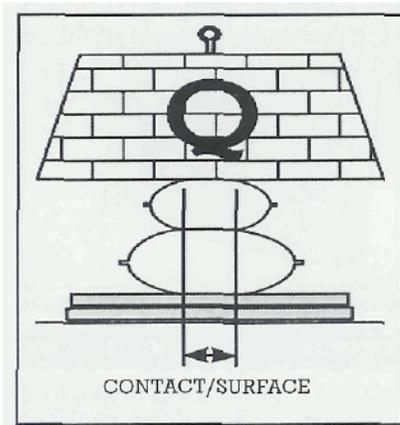


Figure 9



Lifting height can be increased by placing one air bag upon another (Figure 10). If the lifting height of one bag is 18 cm max and of the other 22 cm, both together and fully inflated can achieve the lifting height of 40 cm,

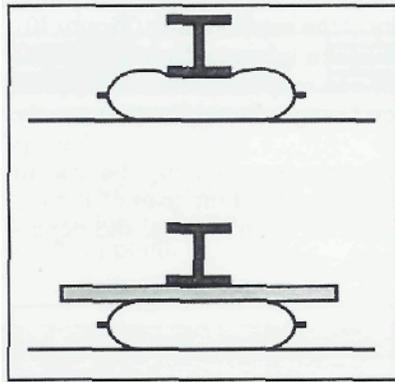
Figure 10

WARNING!

Never put more than two air bags one upon another.
By constructing supports we can achieve topmost lifting heights and capacities.

Lifting the objects of unusual forms

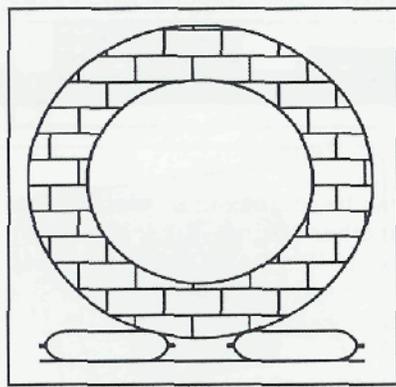
Lifting a profile or a hose



At lifting a profile or a hose using an air bag, problems arise as the object doesn't contact the entire surface of the bag. Further, twisting can damage a steel or kevlar cord. For that reason a fiberboard is to be inserted between the air bag and the object to be lifted, in order to permit the lifting force to be equally distributed over the entire lifting surface of the air bag (Figure 11),

Figure 11

Lifting a cylindrical object

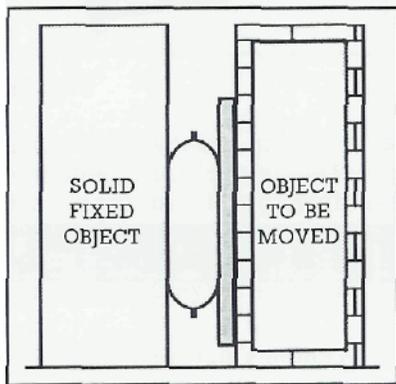


Cylindrical objects of great size such as tanks don't admit lifting by a single air bag. If such object is not firmly fastened it shall roll away as soon as the air bag begins extending to get its typical spherical form.

For that reason cylindrical objects are to be lifted using two air bags, one at each side of the object. The air is to be supplied so as to permit equal, coordinated lifting (Figure 12).

Figure 12

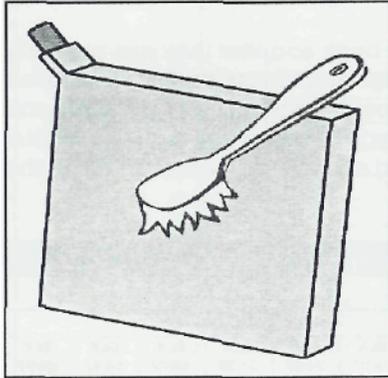
Separating and pushing, using air bags



Air bags can also be used to separate and to move objects, usually without special difficulties. Problems arise if an object has thin walls, which could be bent or broken by the pressure of the air bag. For that reason the air bag is to be reclined against a rib, a pillar or another tough and rigid element. If this is not possible, insert a wide fiberboard between the air bag and the object to increase the surface the pushing force shall act upon (Figure 13).

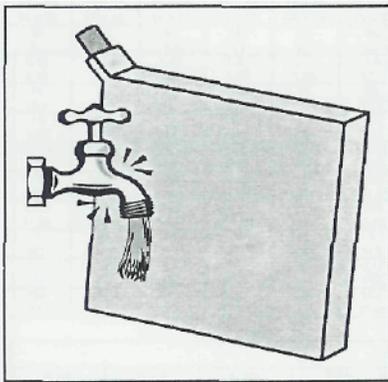
Figure 13

Each time after use air bags are to be cleaned. Oil or grease spots can cause air bags to slide, the presence of dirt in the nozzle disable the connection of pipe. In the upright position with the nozzle at the top, the air bag is to be knocked against the floor to shake off the dirt. Check the opening in the nozzle. If it is full of dirt, remove it using a thin piece of wire, Don't push the dirt inside the bag but draw it out.



To remove agglutinated dirt from the air bag surface, use a brush with hard bristles, Move the brush in all directions. Don't use sharp objects to remove dirt from the air bag surface. After cleaning all the agglutinated dirt, soak the spots with a light solution of warm water and a detergent to wash the dishes, and using the brush, remove the remaining dirt (Figure 14).

Figure 14



Rinse the surface with cold, fresh water (Figure 15), Strong water jet shall remove all the dirt and detergent which might have remained on the air bag surface.

With the air bag in the upright position, wipe the nozzle using a clean cloth. Let the air bag dry. Don't speed up drying by putting the air bag in a drier or close to a source of heat.

Figure 15

Checking, storage and preventive maintenance

Adequate maintenance and care for air bags require more than cleaning after use. Air bags call for inspection, and preventive maintenance throughout the period of storage.

Check after use

1. When dry, check the air bag for eventual air blisters, notches or worn out segments that might be hidden under the dirt. If you observe any damage or defect, mark it with a chalk, and consult the manufacturer or an authorized service.
2. Check the nozzle for any damage, which could disable the connection. Replace the nozzle, if necessary.

