

SB18i SUBWOOFER

RIGGING MANUAL

VERSION 1.1



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SAFETY INSTRUCTIONS

1. **Read this manual**
2. **Heed all SAFETY INSTRUCTIONS as well as DANGER and OBLIGATION warnings**
3. **Never incorporate equipment or accessories not approved by L-ACOUSTICS®**
4. **Read all the related PRODUCT INFORMATION documents before exploiting the system**
The product information document is included in the shipping carton of the related system component.
5. **Work with qualified personnel for rigging the system**
Installation should only be carried out by qualified personnel that are familiar with the rigging techniques and safety recommendations outlined in this manual.
6. **Ensure personnel health and safety**
During installation and set-up personnel must wear protective headgear and footwear at all times. Under no circumstances personnel is allowed to climb on a loudspeaker assembly.
7. **Respect the Working Load Limit (WLL) of third party equipment**
L-ACOUSTICS® is not responsible for any rigging equipment and accessories provided by third party manufacturers. Verify that the Working Load Limit (WLL) of the suspension points, chain hoists and all additional hardware rigging accessories is respected.
8. **Respect the maximum configurations and the recommended safety level**
For safety issue, respect the maximum configurations outlined in this manual. To check the conformity of any configuration in regards with the safety level recommended by L-ACOUSTICS®, model the system in SOUNDVISION and refer to the warnings in **Mechanical Data** section.
9. **Be cautious when flying a loudspeaker array**
Always verify that no one is standing underneath the loudspeaker array when it is being raised. As the array is being raised, check each individual element to make sure that it is securely fastened to the adjacent element. Never leave the array unattended during the installation process. As a general rule, L-ACOUSTICS® recommends the use of safety slings at all times.
10. **Be cautious when ground-stacking a loudspeaker array**
Do not stack the loudspeaker array on unstable ground or surface. If the array is stacked on a structure, platform, or stage, always check that the latter can support the total weight of the array. As a general rule, L-ACOUSTICS® recommends the use of safety straps at all times.
11. **Take into account the wind effects on dynamic load**
When a loudspeaker assembly is deployed in an open air environment, wind can produce dynamic stress to the rigging components and suspension points. If the wind force exceeds 6 bft (Beaufort scale), lower down and/or secure the loudspeaker array.

SYMBOLS

The following symbols are used in this document:



DANGER

This symbol indicates a potential risk of harm to an individual or damage to the product. It can also notify the user about instructions that must be strictly followed to ensure safe installation or operation of the product.



OBLIGATION

This symbol notifies the user about instructions that must be strictly followed to ensure proper installation or operation of the product.



INFORMATION

This symbol notifies the user about complementary information or optional instructions.

WELCOME TO L-ACOUSTICS®

Thank you for choosing the L-ACOUSTICS® SB18i subwoofer enclosure.

This document contains essential information on rigging the system properly and safely. Carefully read this document in order to become familiar with these procedures.

As part of a continuous evolution of techniques and standards, L-ACOUSTICS® reserves the right to change the specifications of its products and the content of its document without prior notice.

Please check the L-ACOUSTICS® web site on a regular basis to download the latest document and software updates:
www.l-acoustics.com.

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1 RIGGING SYSTEM

The system approach developed by L-ACOUSTICS® consists in providing packaged solutions for loudspeaker systems in order to guarantee the highest and most predictable level of performance at any step: modeling, installation, and operation. An L-ACOUSTICS® loudspeaker system is the set of components available to form any loudspeaker system based on one of the full-range loudspeaker enclosures afforded by L-ACOUSTICS®. It includes enclosures, rigging accessories, loudspeaker cables, amplified controllers and software applications.

The **SB18i** is a fixed installation subwoofer compatible with L-ACOUSTICS® **KARAI**® and **XTi** enclosures. It extends the low frequency response of a loudspeaker system down to 32 Hz.

The main components involved in the **SB18i** rigging process are the following:

1.1 Loudspeaker enclosure

SB18i Compact subwoofer

1.2 Rigging elements

SB18INST Rigging bars for attaching the loudspeaker enclosures together. Delivered with the SB18i.

M-BUMPi Frame for flying or ground-stacking a vertical SB18i and/or KARAI arrays.
 Provided with ten bars, two bow shackles (Ø19mm), a set of M8 hex bolts, a set of M6 hex bolts and washers and a set of screws.

1.3 Software application

SOUNDVISION Proprietary acoustical and mechanical 3D modeling software.



SB18i



SOUNDVISION



M-BUMPi



SB18INST
(delivered with the SB18i)

Main components involved in the SB18i rigging process

2 MECHANICAL SAFETY

2.1 Maximum configurations

The SB18i rigging system complies with BGV-C1 (2012), DIN 18800 and EN ISO 12100-1 (2004) when SOUNDVISION software does not indicate any *stress warning*.



Mechanical safety of the rigging system

Before any installation, always model the system in SOUNDVISION and check the **Mechanical Data** section for any *stress warning* or *stability warning*.

2.2 Assessing mechanical safety

In order to assess the actual safety of any array configuration before implementation, refer to the following warnings:



Rated working load limit (WLL) is not enough

The rated WLL is an indication of the element resistance to tensile stress. For complex mechanical systems such as loudspeaker arrays, WLLs cannot be used per se to determine the maximum number of enclosures within an array or to assess the safety of a specific array configuration.



Mechanical modeling with SOUNDVISION

The working load applied to each linking point, along with the corresponding safety factor, will depend on numerous variables linked to the composition of the array (type and number of enclosures, splay angles) and the implementation of the flying or stacking structure (number and location of flying points, site angle). This cannot be determined without the complex mechanical modeling and calculation offered by SOUNDVISION



Assessing the safety with SOUNDVISION

The overall safety factor of a specific mechanical configuration always corresponds to the lowest safety factor among all the linking points. Always model the system configuration with the SOUNDVISION software and check the Mechanical Data section to identify the weakest link and its corresponding working load. By default, a *stress warning* will appear when the mechanical safety goes beyond the recommended safety level.



Safety of ground-stacked arrays in SOUNDVISION

For ground-stacked arrays, a distinct *stability warning* is implemented in SOUNDVISION. It indicates a tipping hazard when the array is not secured to the ground, stage or platform. It is user responsibility to secure the array and to ignore this warning.



Consideration must be given to unusual conditions

SOUNDVISION calculations are based on usual environmental conditions. A higher safety factor is recommended with factors such as extreme high or low temperatures, strong wind, prolonged exposition to salt water, etc. Always consult a rigging specialist to adopt safety practices adapted to such a situation.

3 SYSTEM SETUP



Independent or mixed

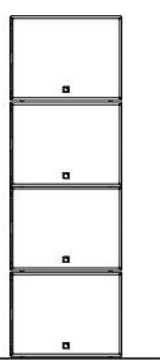
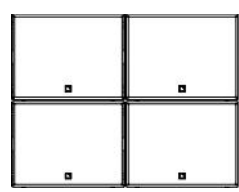
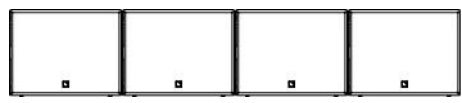
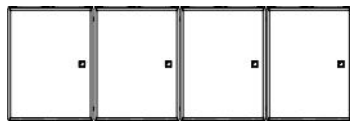
This document only deals with the independent rigging of SB18i subwoofer enclosures. When the SB18i enclosure is used with a main system, some configurations can involve mixed arrays, such as KARAI/SB18i arrays. Always refer to the rigging manual of the main system to get acquainted with the rigging procedures specific to mixed main/sub arrays.



Cardioid configuration


A cardioid configuration is an array of four subwoofers with one reversed element. Refer to the subwoofer **user manual** for details about the use of this configuration. Any of the following arrays can be set in cardioid configuration.

3.1 Ground-stacking

Vertical	Block
 <ul style="list-style-type: none"> ▶ Place and attach the enclosures on top of each other with their logo down. ❶ Refer to PROCEDURE A. 	 <ul style="list-style-type: none"> ▶ Set vertical stacks, side by side, one after the other. Place and attach the SB18i enclosures on top of each other with their logo down. ❶ Refer to PROCEDURE A.
Horizontal	On-end
	
<p>▶ Place the SB18i enclosures side by side as indicated in the figures.</p>	

3.2 Flying

Vertical with M-BUMP



- ▶ Prepare the M-BUMPi as a flying structure.
- ❶ Refer to **PROCEDURE B**.
- ▶ Under the motor location, assemble a stack of 2 SB18i with their logo down.
- ❶ Refer to **PROCEDURE A**.
- ▶ Attach the M-BUMPi frame to the top enclosure.
- ❶ Refer to **PROCEDURE C**.
- ▶ Attach the motor hook to the shackle of the M-BUMPi.
- ▶ Raise the array high enough to place another stack of two SB18i under it.
- ▶ Under the motor location, assemble a stack of 2 SB18i with their logo down.
- ❶ Refer to **PROCEDURE A**.
- ▶ Lower the array until it rests on the new stack.
- ▶ Attach the bottom enclosure of the array to the top of the new stack.
- ❶ Refer to **PROCEDURE A**.
- ▶ To add more enclosures, repeat the previous steps until the array is completed.
- ▶ Raise the array to the chosen height.
- ▶ Secure the M-BUMPi to the main rigging structure with two safety slings (not included).

4 SUBSET PROCEDURES



Dismantling an array


Apply the associated set-up procedure in reversed order.

PROCEDURE A Attaching an SB18i to a second enclosure



Tools

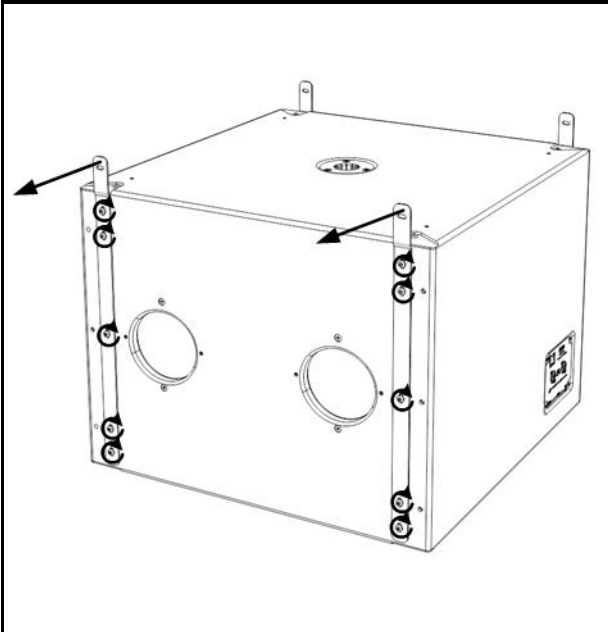
Electric screwdriver with torque selector.
T30 bit.

1. Attach four arms to a SB18i.
 - a. Unscrew the five 35 mm Torx[®] screws on one corner of the enclosure.
Use a T30 bit.
 - b. Position an arm with its bended part at the top and oriented outwards on the corner on the enclosure.
 - c. Align the five holes of the arm and the holes of the enclosure, and slightly drive the five screws.
 The four arms are identical and can be identified by the number 611 engraved on each one.
 - d. Repeat for the remaining corners.
2. Attach four arms to a second SB18i.
 - a. Leave the bottom holes free.
 - b. Fully drive the screws in all the other holes.
3. Attach the two enclosures.
 - a. Stack the second enclosure on top of the other.
 - b. Align the bottom holes of the second enclosure with the top holes on the first enclosure arms.
 - c. Drive a screw through each hole and fully drive all the screws on the enclosures.
Use a T30 bit and set the torque to 5 N.m / 45 in.lbf.

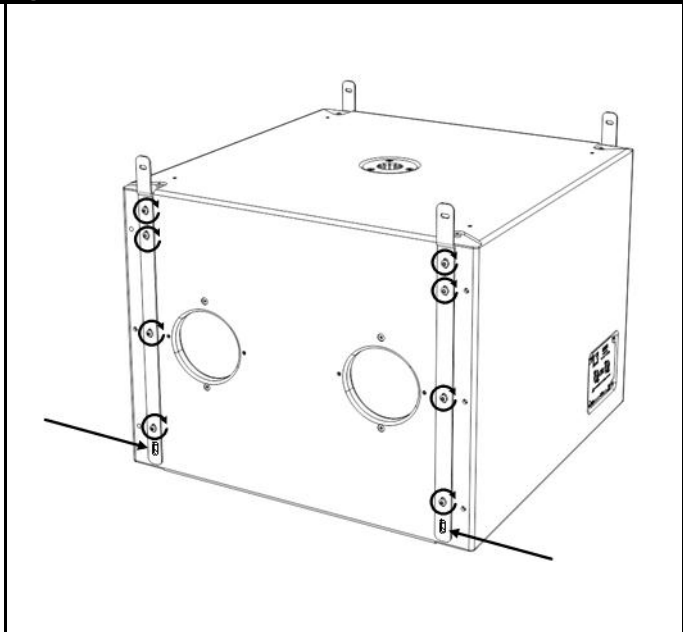


If the bottom SB18i is not the last enclosure in the array, remove and keep the screws from the bottom holes to be able to attach it to the top enclosure of the next stack.

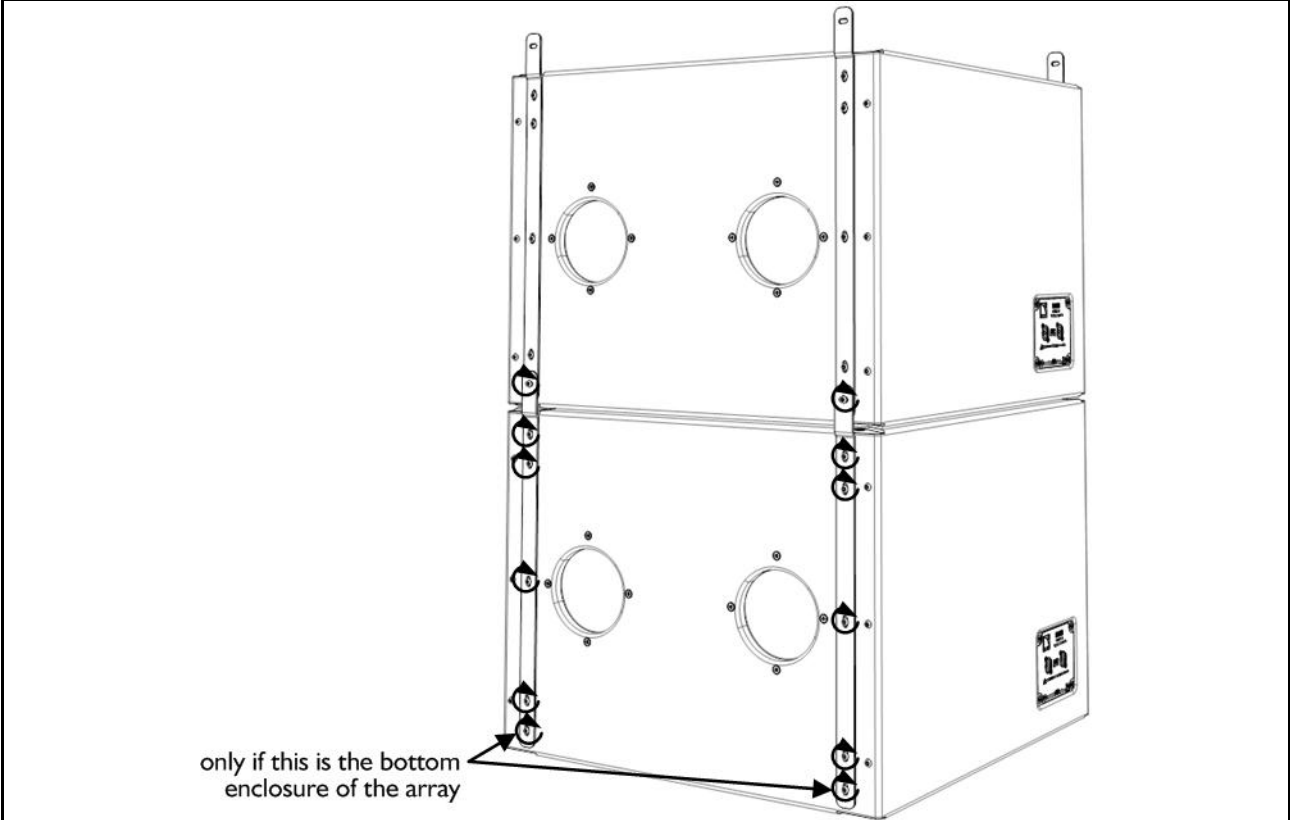
► **PROCEDURE A : Attaching an SB18i to a second enclosure**



1b. Positioning the arms on the first SB18i and slightly driving the screws.
1c.



2. Attaching four arms on a second SB18i and leaving the bottom holes free.



3. Attaching the two enclosures.

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PROCEDURE B Assembling the M-BUMPi as a flying structure



Tools

- Electric screwdriver with torque selector.
- 6 mm hex bit.
- Wrench with 13 mm hex socket.

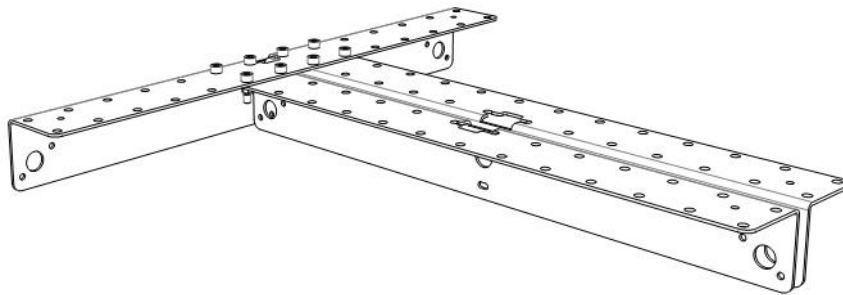


The only available rigging option for SB18i independent arrays allows assembling two flying structures with the parts contained in one M-BUMPi package.

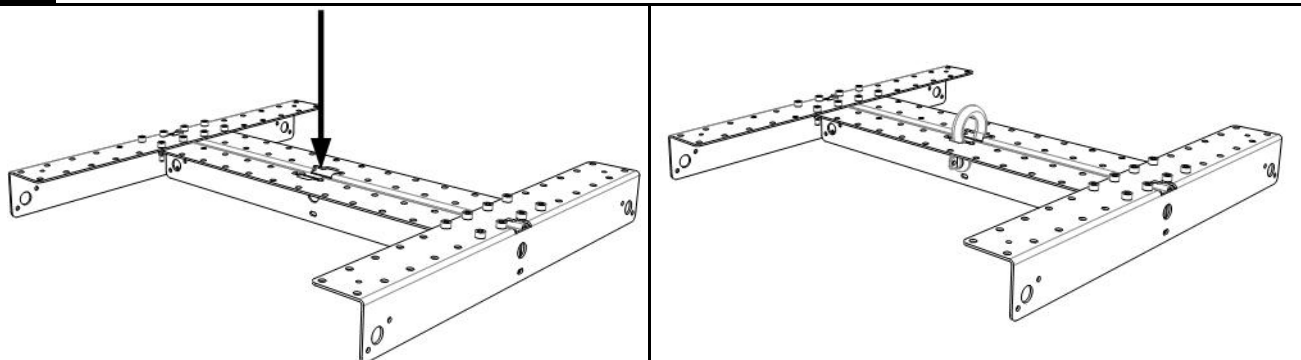
In addition, a bar can be used to close the structure for aesthetic purposes.

1. Assemble the structure using four bars from an M-BUMPi package.
 - a. Position and attach one bar perpendicularly to two parallel bars.
 - b. Fully drive eight M8 self-locking bolts in the aligned holes.
Use a wrench with a 13 mm hex socket, a 6 mm hex bit and set the torque to 5 N.m/45 in.lbf.
 - c. Repeat for the other bar.
2. Insert and attach a shackle at the center of the structure.
 - a. Insert an unlocked shackle in the central opening of the structure.
 - b. Lock the shackle with its safety pin through the aligned holes (see **APPENDIX B**).

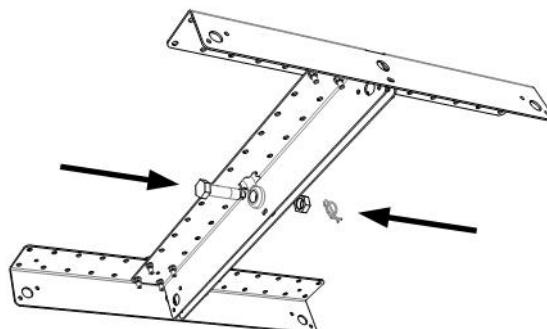
► PROCEDURE B : Assembling the M-BUMPi as a flying structure



1a. Positioning and attaching the bars.



2a. Inserting the shackle in the central opening of the structure.



2b. Inserting and locking the safety pin.

PROCEDURE C Attaching the M-BUMPi to a SB18i



Tools

- Electric screwdriver with torque selector.
- 5 mm hex bit.
- 10 mm hex key.

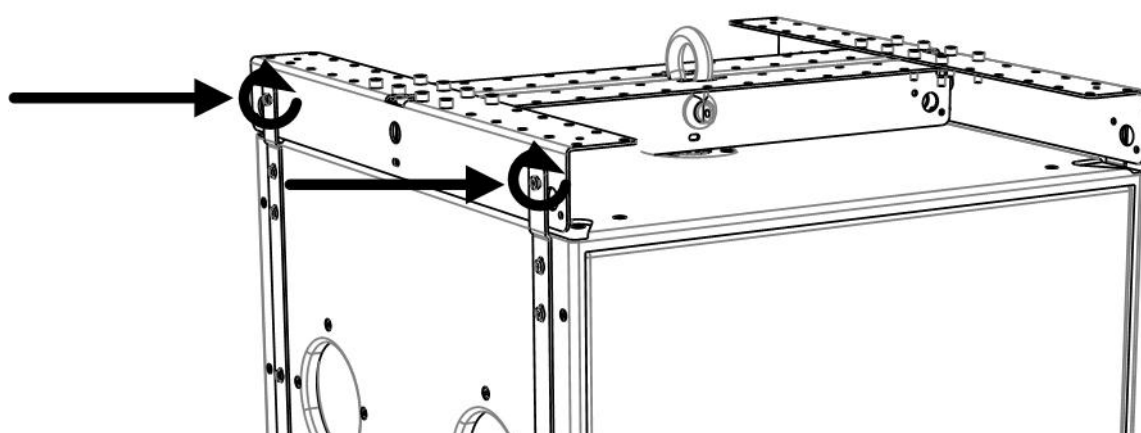
I. Attach the M-BUMPi to the top enclosure of the array.



The flying structure is symmetrical, it can be attached either way

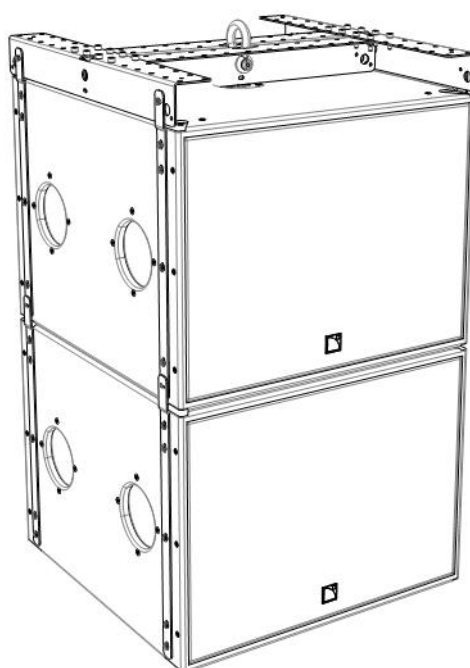
- a. Align the holes at the ends of the M-BUMPi bar with the top holes of the arm.
- b. Drive four self-locking M6 hex bolts (from the M-BUMPi package) in the aligned holes. Use a 10 mm hex key, a 5 mm hex bit and set the torque to 5 N.m/45 in.lb

► PROCEDURE C : Attaching the M-BUMPi to a SB18i



I.

Attaching the flying structure on one side.



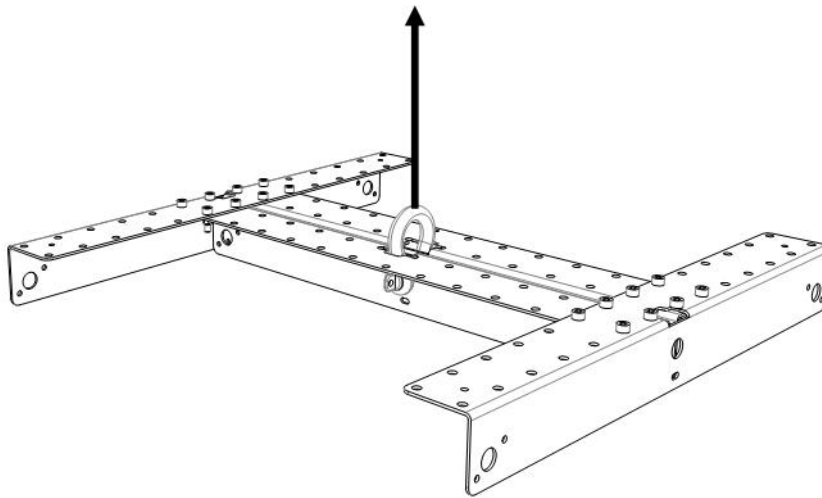
END

The array is ready to be flown.

APPENDIX A M-BUMPi FLYING OPTION

L-ACOUSTICS® recommends a single rigging option when the M-BUMPi is used to fly SB18i independent arrays.

Other rigging options are available when the M-BUMPi is used to fly KARAi arrays. For more information refer to the KARAi rigging manual



Option 0

I motor point

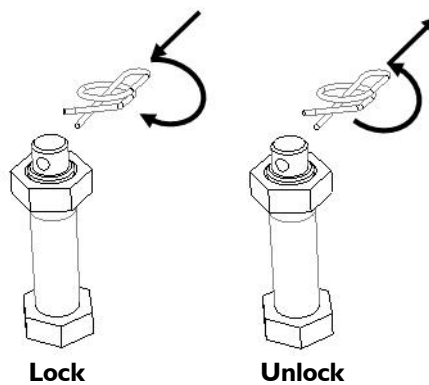
I shackle at I position (center)

APPENDIX B SHACKLES SAFETY PIN MECHANISM



Securing the shackle

ALWAYS put the safety pin in locked position to secure an assembly





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