



# TLX LIVERPOOL SERIES

## TLX212L

Compact Dual 12" Subwoofer for Portable and Fixed Installation Applications

## TLX43

Compact Dual 2 Way 4" Line Array Element for Portable and Fixed Installation Applications

## TLX43-FLB

Fly Bar for TLX43 and TLX212L for Suspended or Ground Stacked Arrays

## Rigging Manual



### **WARNING!**

This rigging manual contains important safety information, and it must be kept in a safe place for future reference. It must be supplied with the equipment during the original sale, rental, or re-sale, and all operators and users of the equipment must be made aware that this manual is available. Please visit our website [turbosound.com](http://turbosound.com) regularly and check for any updates to this manual.

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## EN Important Safety Instructions



Terminals marked with this symbol carry electrical current of sufficient magnitude to constitute risk of electric shock.

Use only high-quality professional speaker cables with ¼" TS or twist-locking plugs pre-installed. All other installation or modification should be performed only by qualified personnel.



This symbol, wherever it appears, alerts you to the presence of uninsulated dangerous voltage inside the enclosure - voltage that may be sufficient to constitute a risk of shock.



This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Please read the manual.



### Caution

To reduce the risk of electric shock, do not remove the top cover (or the rear section). No user serviceable parts inside. Refer servicing to qualified personnel.



### Caution

To reduce the risk of fire or electric shock, do not expose this appliance to rain and moisture. The apparatus shall not be exposed to dripping or splashing liquids and no objects filled with liquids, such as vases, shall be placed on the apparatus.



### Caution

These service instructions are for use by qualified service personnel only. To reduce the risk of electric shock do not perform any servicing other than that contained in the operation instructions. Repairs have to be performed by qualified service personnel.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

11. Use only attachments/accessories specified by the manufacturer.



12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid

injury from tip-over.

13. Unplug this apparatus during lightning storms or when unused for long periods of time.

14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

15. The apparatus shall be connected to a MAINS socket outlet with a protective earthing connection.

16. Where the MAINS plug or an appliance coupler is used as the disconnect device, the disconnect device shall remain readily operable.



17. Correct disposal of this product: This symbol indicates that this product must not be disposed of with household waste, according to the WEEE Directive (2012/19/EU) and your national law. This product should be taken

to a collection center licensed for the recycling of waste electrical and electronic equipment (EEE). The mishandling of this type of waste could have a possible negative impact on the environment and human health due to potentially hazardous substances that are generally associated with EEE. At the same time, your cooperation in the correct disposal of this product will contribute to the efficient use of natural resources. For more information about where you can take your waste equipment for recycling, please contact your local city office, or your household waste collection service.

18. Do not install in a confined space, such as a book case or similar unit.

19. Do not place naked flame sources, such as lighted candles, on the apparatus.

20. Please keep the environmental aspects of battery disposal in mind. Batteries must be disposed-of at a battery collection point.

21. Use this apparatus in tropical and/or moderate climates.

## LEGAL DISCLAIMER

MUSIC Group accepts no liability for any loss which may be suffered by any person who relies either wholly or in part upon any description, photograph, or statement contained herein. Technical specifications, appearances and other information are subject to change without notice. All trademarks are the property of their respective owners. MIDAS, KLARK TEKNIK, LAB GRUPPEN, LAKE, TANNOY, TURBOSOUND, TC ELECTRONIC, TC HELICON, BEHRINGER, BUGERA and DDA are trademarks or registered trademarks of MUSIC Group IP Ltd. © MUSIC Group IP Ltd. 2017 All rights reserved.

## LIMITED WARRANTY

For the applicable warranty terms and conditions and additional information regarding MUSIC Group's Limited Warranty, please see complete details online at [music-group.com/warranty](http://music-group.com/warranty).

# Chapter 1: Safety Information

## 1.1 Intended Use

The rigging components (TLX43-FLB flybar, rigging pins, drop links) shall only be used in conjunction with TURBOSOUND TLX43 loudspeakers and TLX212L subwoofers as described in this manual.

## 1.2 Intended Use of this Manual

The instructions in this manual describe how to assemble various configurations of TLX43 loudspeaker cabinets, TLX212L subwoofers, and the TLX43-FLB, in readiness for suspending or ground stacking.

These instructions shall only be used with the TLX43, TLX212L, and TLX43-FLB components.

The instructions do not show details of external lifting equipment and do not contain details of safe lifting procedures or installation.

Possession of these instructions and procedures does not imply authorisation for their use.

## 1.3 General Safety

The operation of your product as part of a suspended system, if installed incorrectly and improperly, can potentially expose persons to serious health risks and even death. In addition, please ensure that electrical, mechanical and acoustic considerations are discussed with qualified and certified (by local, state or national authorities) personnel prior to any installation.

Installation and setup should only be carried out by qualified and authorized personnel observing the valid local, state and other safety regulations applicable in your country. If any parts or components are missing please contact your dealer before attempting to set up the system.

It is the responsibility of the person installing the assembly to ensure that the suspension/fixing points are suitable for the intended use.

We also recommend you schedule TURBOSOUND line array training with our sales partners and applications team.

Equipment used to connect to the TURBOSOUND rigging system must be properly rated and must conform to the local, state and other safety regulations. Do not use TURBOSOUND rigging with other types or brands of loudspeakers. This practice may compromise safety standards and MUSIC Group will not be responsible for damage or injury so caused. Do not modify the rigging accessories, or use them in a way other than that described in this rigging manual. Rigging components supplied as part of a complete assembly are non-interchangeable and must not be exchanged with the component parts of any other assembly.

Welding, or any other means of permanently fixing rigging components to each other or to cabinet fixing points is not allowed. Rigging components or assemblies must only be fixed to TURBOSOUND loudspeaker cabinets using the cabinet fixing points.

MUSIC Group assumes no liability for any damage or personal injury resulting from improper use, installation or operation of the product. Regular checks must be conducted by qualified personnel to ensure that the system remains in a secure and stable condition. Make sure that, where the product is suspended, the area underneath the product is free of human traffic. Do not suspend the product in areas which can be entered or used by members of the public.

## 1.4 Loudspeaker Cabling

Attach and support the speaker cables from your amplifiers to the loudspeaker cabinets, so that no significant additional weight or lateral force is applied to the array by the input wiring. Input cables or link cables should never be used to angle the array or used as rigging in any way.

## 1.5 Load Capacity and System Safety

The TLX43-FLB flybar is designed to suspend a maximum of 10 TLX43 loudspeaker cabinets, or 2 TLX212L subwoofers, or a mixed array of 1 TLX212L subwoofer with 4 TLX43 loudspeaker cabinets. The speakers may be flown with any vertical splay angle configuration and from any of the pick points. This corresponds to a Working Load Limit (WLL) of 94 kg with a design factor of 10:1.

TLX installation procedures and recommendations described in Chapters 3-5 are based on 10:1 design factor. TLX enclosure counts and combinations are also given for 5:1 and 7:1 design factors in Chapter 9. Check local regulations in order to comply with regional design factor requirements. Always refer to EASE FOCUS II modeling software error and warning indications prior to installation.

## 1.6 Safety Inspections

Carefully inspect rigging system components and cabinets for defects or signs of damage before proceeding to assemble the array to be flown. If any parts are damaged or suspect, or if there is any doubt as to the proper functioning and safety of the items DO NOT USE THEM and withdraw them from use immediately.

Refer to Chapter 8 for information about care maintenance and disposal.

### 1.7 Secondary Safeties

All loudspeakers flown in theatres, studios or other places of work and entertainment must, in addition to the principle load bearing means of suspension, be provided with an independent, properly rated, and securely attached secondary safety. Only steel wire ropes or steel chains of an approved construction and load rating shall be used as secondary safeties. Plastic-covered steel wire ropes are not permitted for use as secondary safeties.

The secondary safety suspension must be independent of the primary suspension points and capable of carrying the total system weight. The additional safety device must be mounted in a way that the array is caught by the safety device without any drop and swing in the event that the primary suspension fails.

### 1.8 Wind Loads

The loudspeakers must not be suspended or ground stacked in winds greater than:

**Beaufort Scale 6 bft** (39-49 km/h, 25-31 mph, 22-27 knots)

If the forecast or actual winds reach:

**Beaufort Scale 8 bft** (62-74 km/h, 39-46 mph, 34-40 knots)

- 1) Clear the area of personnel
- 2) Lower and secure the array

### 1.9 Operational Safety

The procedures require the use of two or more authorised persons.

Produce a lift plan: before any lift takes place, you must formulate a lift plan that describes the exact steps and procedures that will be carried out. The plan must be shared with all assistants and stake-holders in the lift so that each person will understand their responsibilities.

Observe all instructions given on the respective instruction labels of the rigging components and loudspeakers.

When using chain hoists make sure nobody is directly underneath or in the vicinity of the array.

During assembly pay attention to the possible risk of crushing.

Wear suitable protective clothing.

Safety Logo	Description	Safety Logo	Description	Safety Logo	Description
	Protective Headwear shall be worn		Protective Eyewear shall be worn		Protective Gloves shall be worn
	Protective Footwear shall be worn		Practice Safe Lifting		

### 1.10 Safety Notices in this manual

 **WARNING**

This indicates advice that if not followed, may lead to permanent injury or death.

 **CAUTION**

This indicates advice that if not followed, may lead to damage to the equipment.

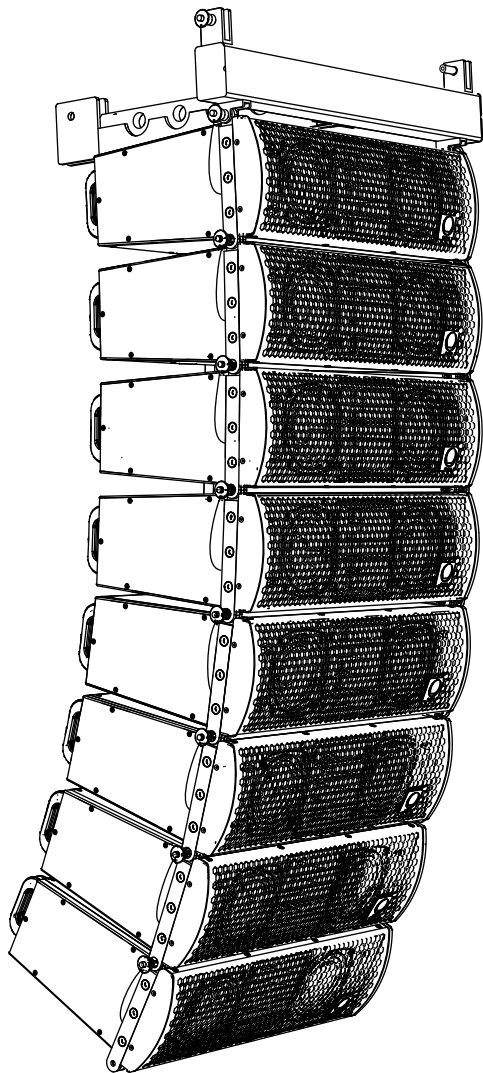
**NOTE**

This indicates extra advice that may be useful when performing the procedures.

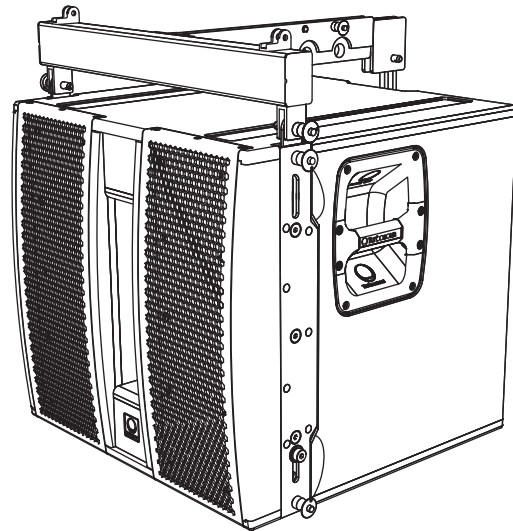
## Chapter 2: Introduction

### 2.1 Typical Configurations

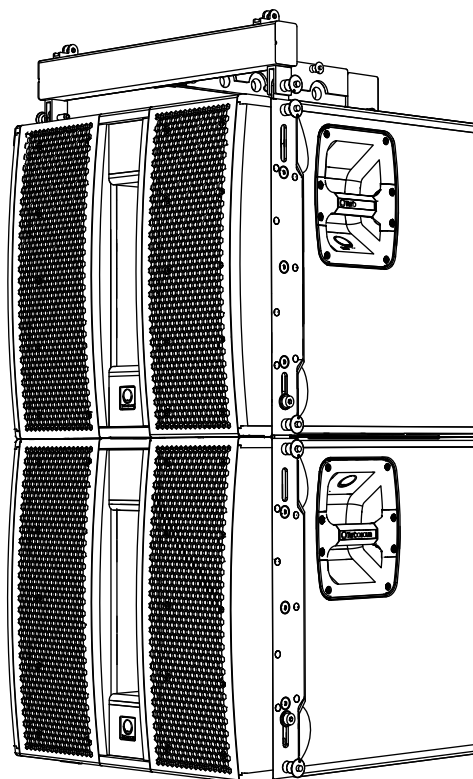
TLX43 Array (See Chapter 3)



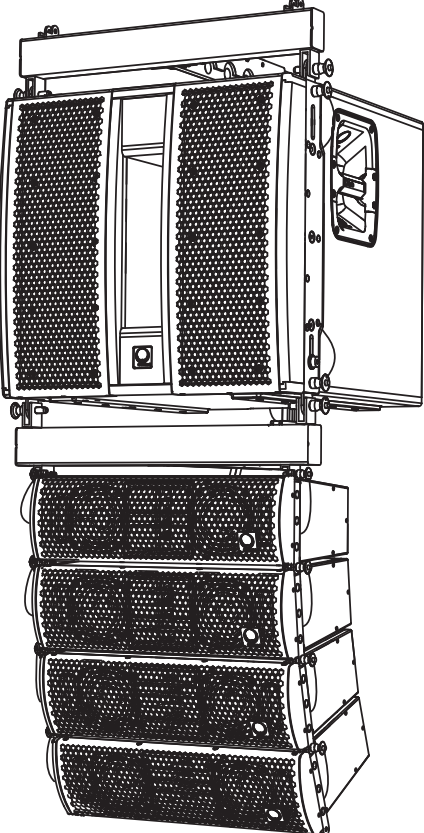
TLX212L (See Chapter 4)



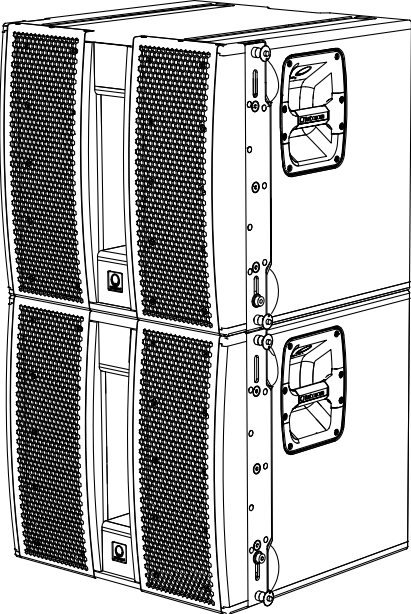
TLX212L Pair (See Chapter 4)



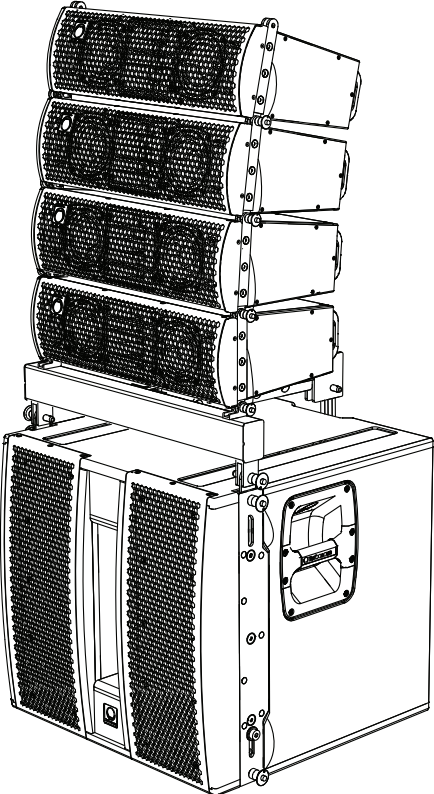
**TLX212L and TLX43 Array (See Chapter 5)**



**Two TLX212L Subwoofer Groundstack (See Chapter 6)**



**TLX212L and TLX43 Array Groundstack (See Chapter 7)**



## 2.2 Rigging and Acoustic Simulation Software

The EASE FOCUS II software allows you to configure the system for optimal performance and coverage in the venue.

The software can be downloaded from <http://www.afmg.eu/index.php/products.html>

The quantity of cabinets can be varied, the angles of each cabinet can be adjusted, and the SPL coverage calculated for any configuration.

Once an optimum system has been designed using the EASE FOCUS II software, the angles of each TLX43 cabinet should be noted, as well as the correct suspension hole on the TLX43-FLB flybar, where your bow shackle would be fitted for single-point suspension. For two-point suspension, pick point holes #1 and #5 can be utilized in conjunction with front and rear chain motors to obtain the desired array site angle.

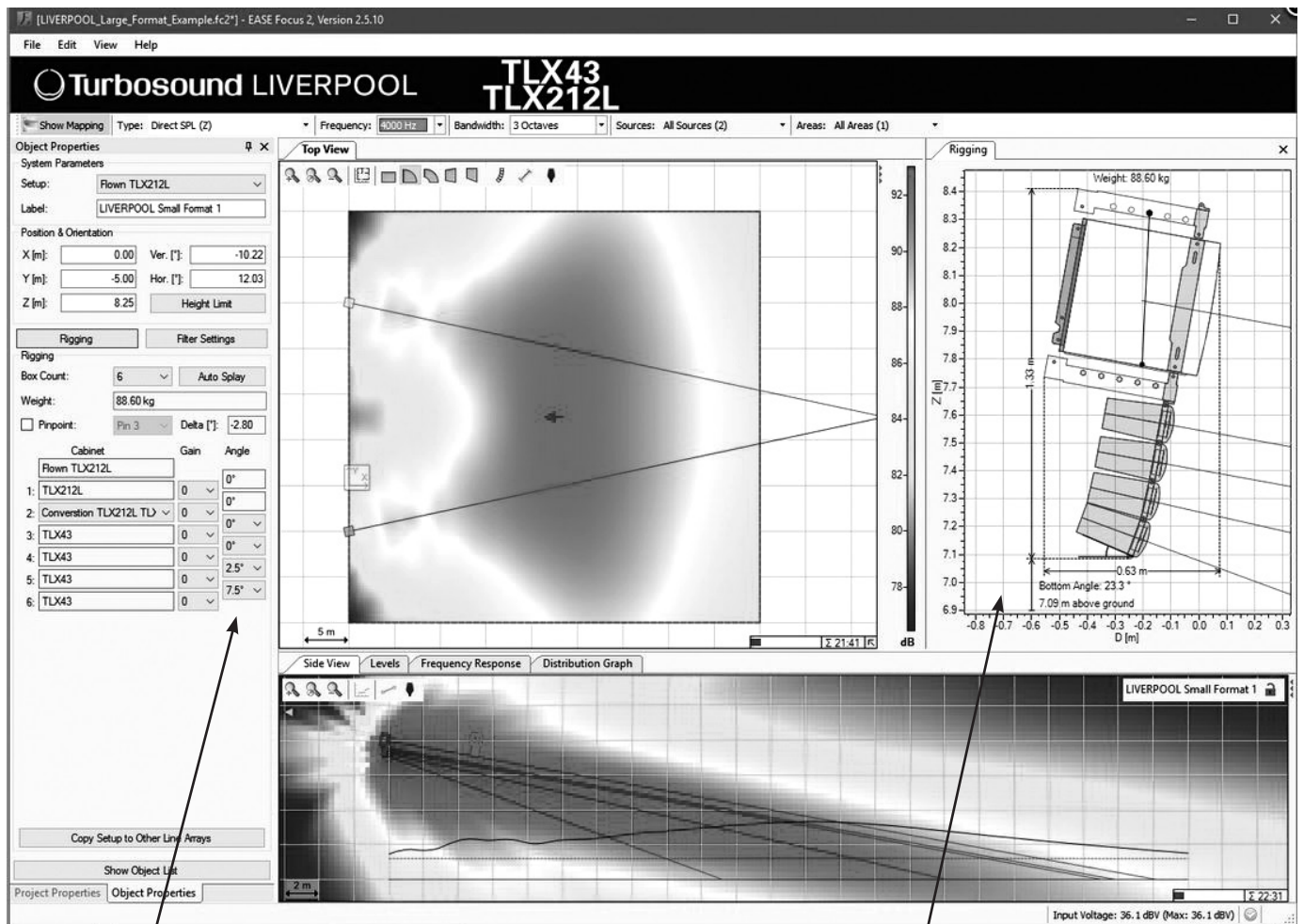
The EASE FOCUS II screenshot below is for a typical TLX43 configuration. Check the "RIGGING" Tab and note installation parameters such as: array weight, bottom element elevation above ground level, bottom enclosure angle.

Note the angle of each TLX43 cabinet in the "Object Properties" Tab.

### WARNING

ERROR AND WARNING INDICATIONS ARE GIVEN IN THE OBJECT PROPERTIES WINDOW IF WORKING LOAD LIMITS ARE EXCEEDED AT 10:1, 7:1 OR 5:1 DESIGN FACTORS. HEED THESE WARNINGS AT ALL TIMES IN ACCORDANCE WITH LOCAL REGULATIONS.

### EASE FOCUS II Typical Screenshot for a TLX43 Array



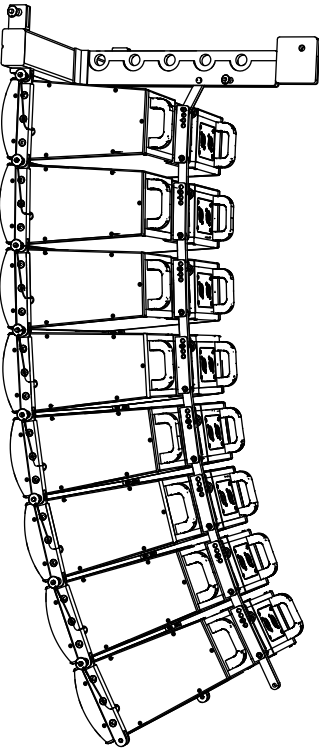
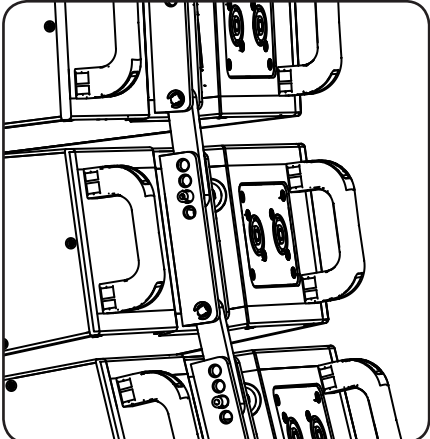
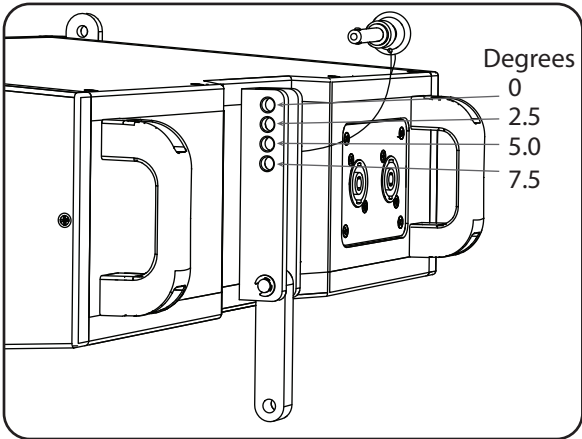
TLX43 Cabinet Angles

Rigging Tab Shows the layout graphically, and indicates the correct suspension pick point to choose on the flybar.



### 2.3 TLX43 Cabinet Angles

The angle of each TLX43 cabinet relative to the cabinet above it, is varied by selecting one of four mounting holes in the rear mounting bracket. These are labeled 0, 2.5, 5.0, and 7.5 degrees.



## 2.4 Weights

Item	Quantity	Weight (kg)	Weight (lbs)
TLX43	1	8	17.6
	2	16	35.3
	3	24	52.9
	4	32	70.6
	5	40	88.2
	6	48	106
	7	56	123
	8	64	141
	9	72	159
	10	80	176

Item	Quantity	Weight (kg)	Weight (lbs)
TLX212L	1	43	94.8
	2	86	190

Item	Quantity	Weight (kg)	Weight (lbs)
TLX43-FLB	1	6.8	15
	2	13.6	30

## 2.5 TLX43-FLB Flybar Working Load Limit (WLL)

Item	WLL (kg)	WLL (lbs)	Design Factor
TLX43-FLB	94	207	10:1
	134	296	7:1
	188	414	5:1

## 2.6 TLX43-FLB Flybar Safety Warning Label

**⚠️ CHECK ARRAY SIZE AND LOADING CONDITIONS ACCORDING TO THE MANUAL AND MODELING SOFTWARE.**  
**SUSPENDING THIS SYSTEM SHOULD ONLY BE DONE BY QUALIFIED PERSONS FOLLOWING SAFE RIGGING PRACTICES**

MADE IN CHINA  
 CE

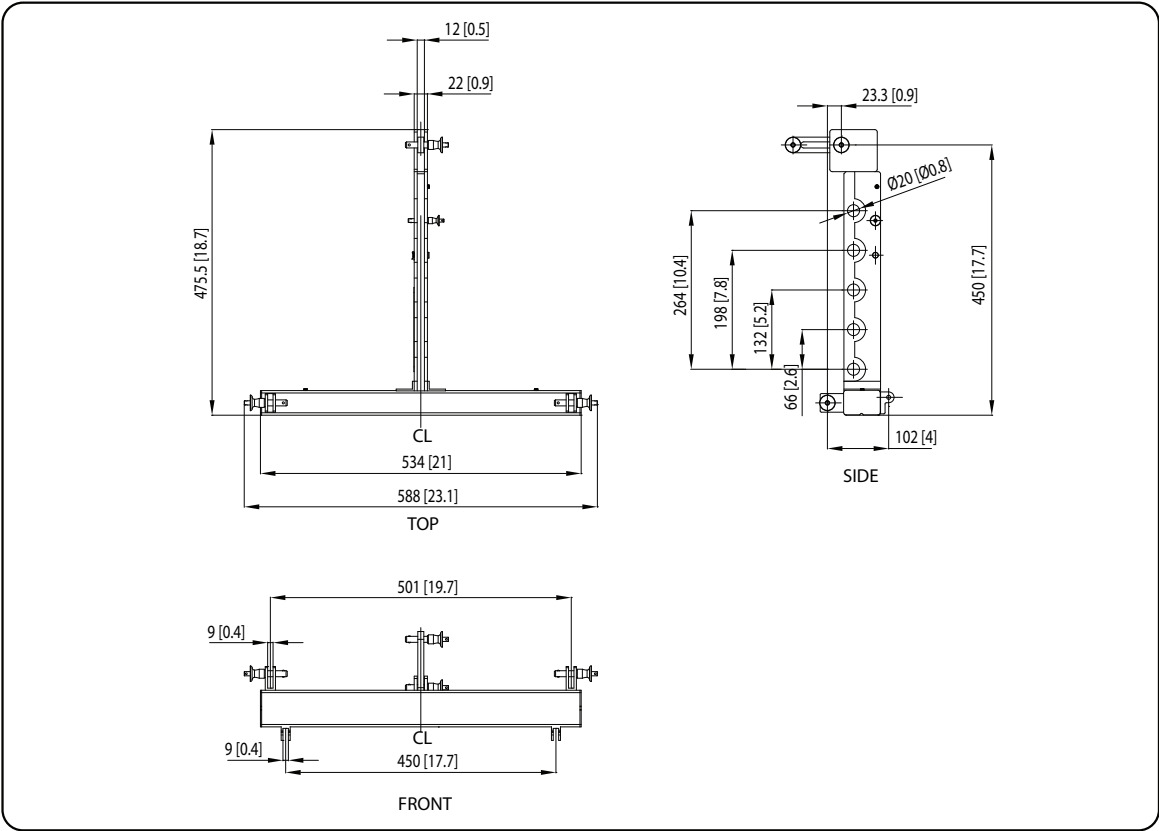
**Turbosound**  
 DESIGNED AND ENGINEERED IN THE U.K.

MUSIC Group Manufacturing PH Ltd  
 17A Brunswick Street Hamilton HM 10 Bermuda

**TLX43-FLB W.L.L.: 94 kg / 207 lbs. WEIGHT: 6.8 kg / 15 lbs.**

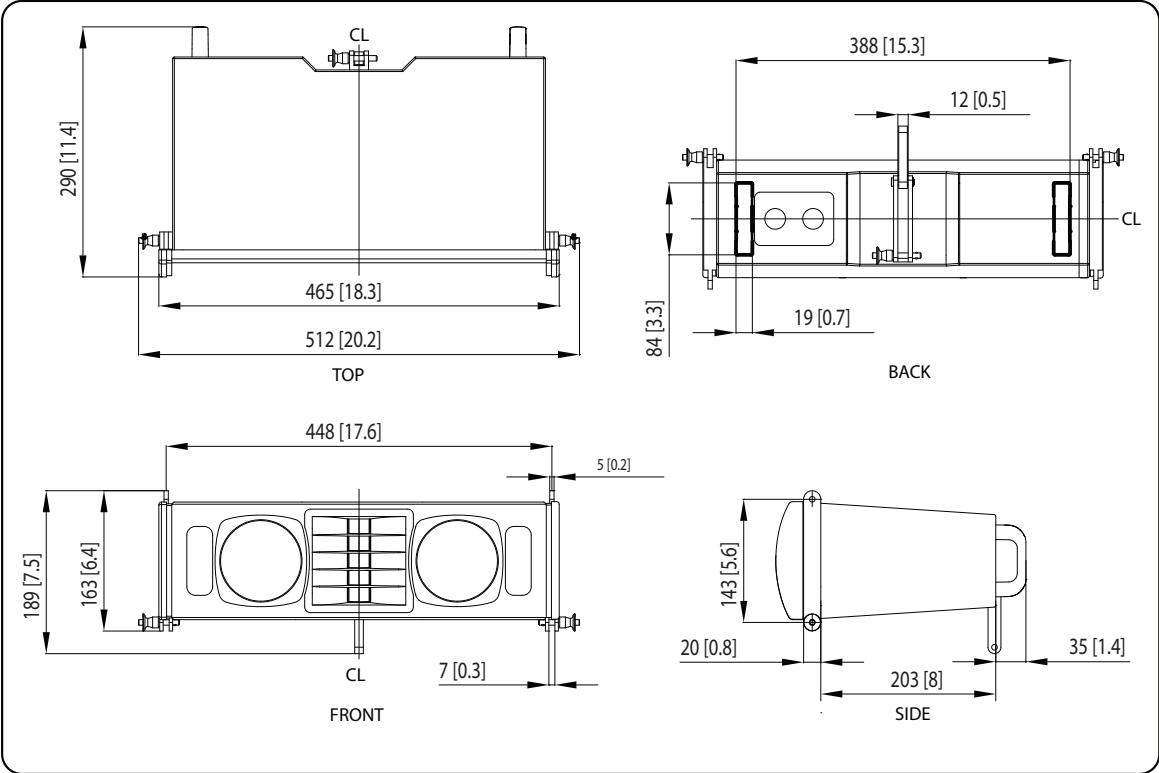
### 2.7 TLX43-FLB Flybar Dimensions

See Chapter 8 for information regarding inspection, care, and maintenance.



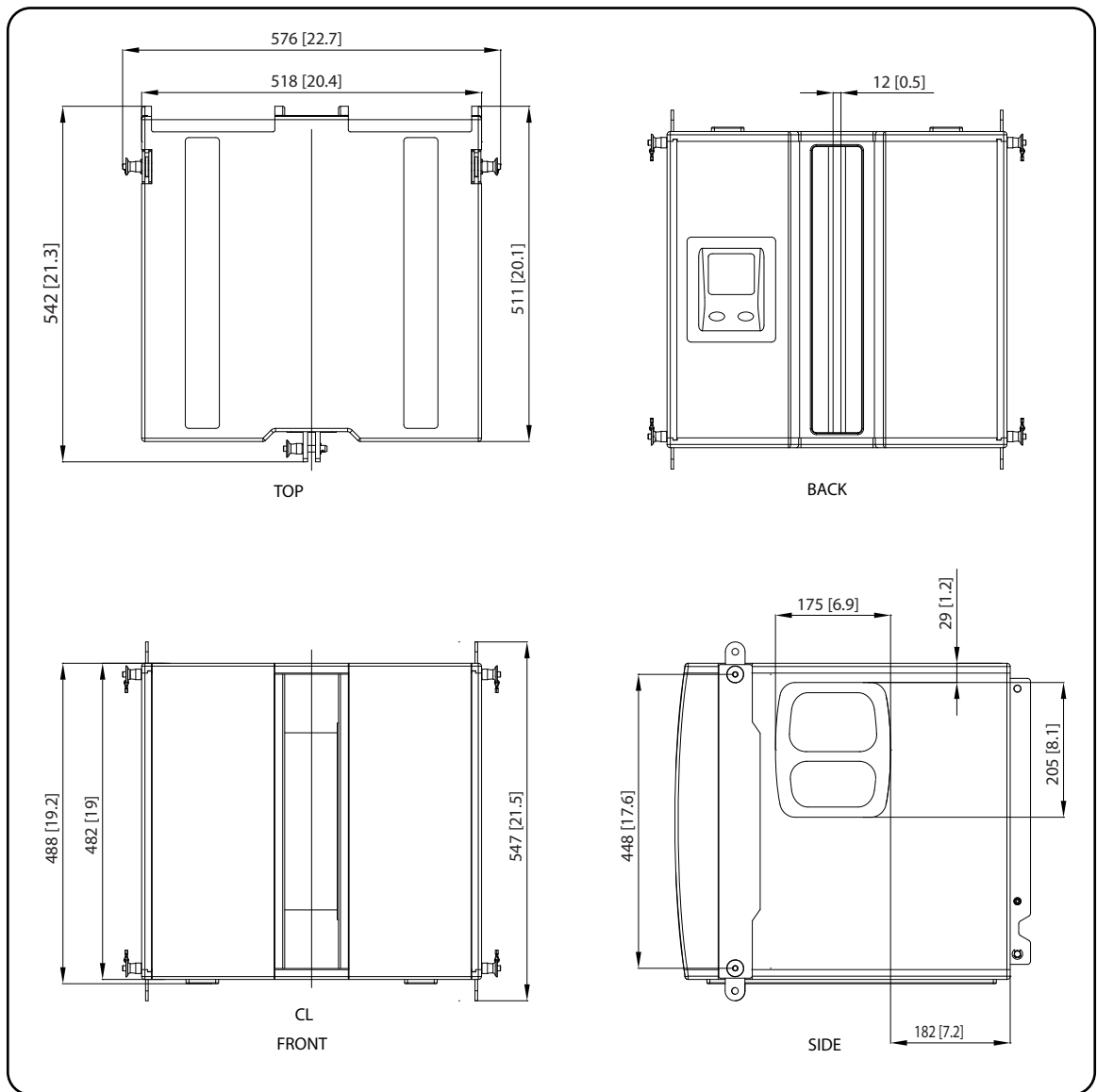
### 2.8 TLX43 Cabinet Dimensions

See Chapter 8 for information regarding inspection, care, and maintenance.



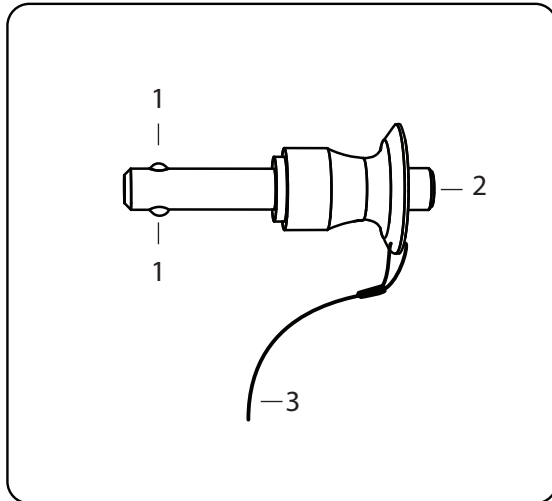
## 2.9 TLX212L Subwoofer Dimensions

See Chapter 8 for information regarding inspection, care, and maintenance.



## 2.10 Rigging Pins

See Chapter 8 for information regarding inspection, care, and maintenance.



These pins are the fundamental mechanical fastener for the assembly of the TLX43-FLB flybar, TLX43 cabinet, and the TLX212L subwoofer.

1. **Spring Balls** – These are locking devices that prevent the pin from pulling out once it has been inserted.
2. **Spring Release** – Press this button in and the spring balls (1) will unlock and allow the pin to be inserted into the mounting holes and lugs. Release this button and the spring balls will lock and prevent the pin from pulling back out.
3. **Lanyard** – These prevent the pins from being easily lost.

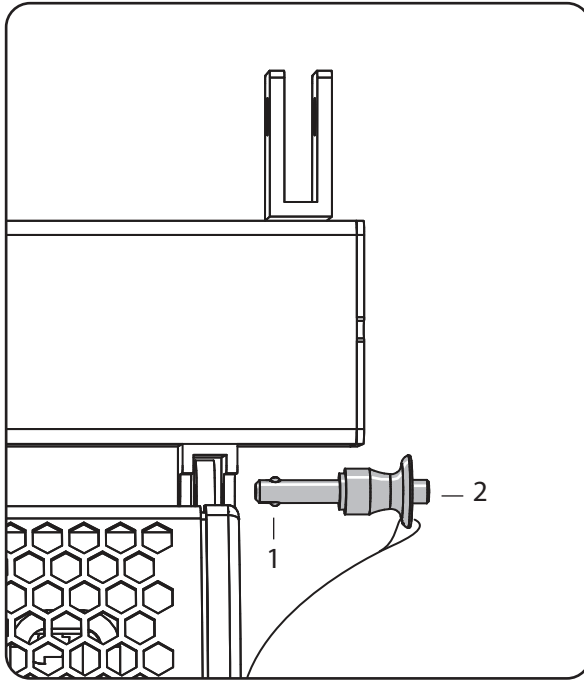
### **WARNING**

BEFORE EVERY USE, INSPECT ALL PINS FOR DAMAGE, AND VERIFY THE CORRECT OPERATION OF THE SPRING LOCKING MECHANISM. DO NOT USE ANY PINS THAT SHOW SIGNS OF DAMAGE. FAILURE TO FOLLOW INSTRUCTIONS MAY CAUSE PERMANENT INJURY OR DEATH.

### **WARNING**

BEFORE EVERY USE, MAKE SURE THAT ALL PINS ARE CLEAN AND FREE FROM DIRT AND DEBRIS THAT MAY INTERFERE WITH THE CORRECT OPERATION OF THE SPRING LOCKING MECHANISM. FAILURE TO FOLLOW INSTRUCTIONS MAY CAUSE PERMANENT INJURY OR DEATH.

### 2.10.1 Rigging Pin Installation



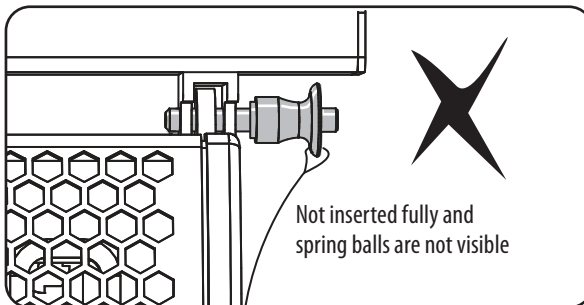
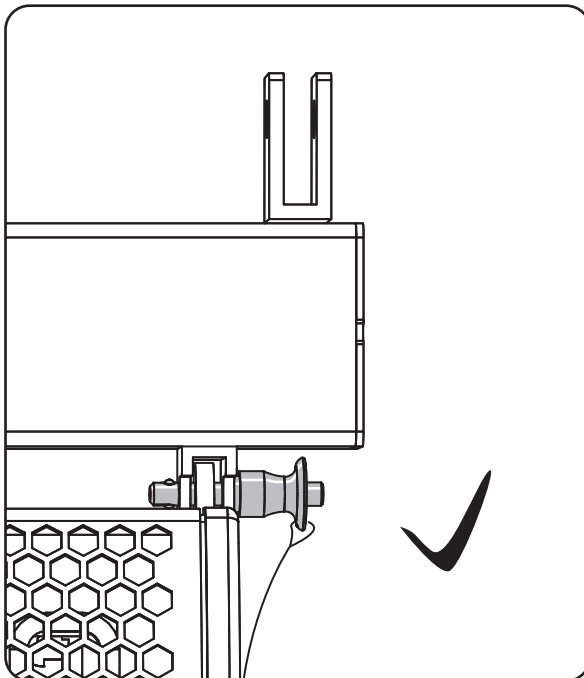
#### Pin Installation

The following example shows how to use a pin to join the lugs of a TLX43 cabinet and a TLX43-FLB flybar. Exact details of the connections for various configurations are given in the various chapters of this manual.

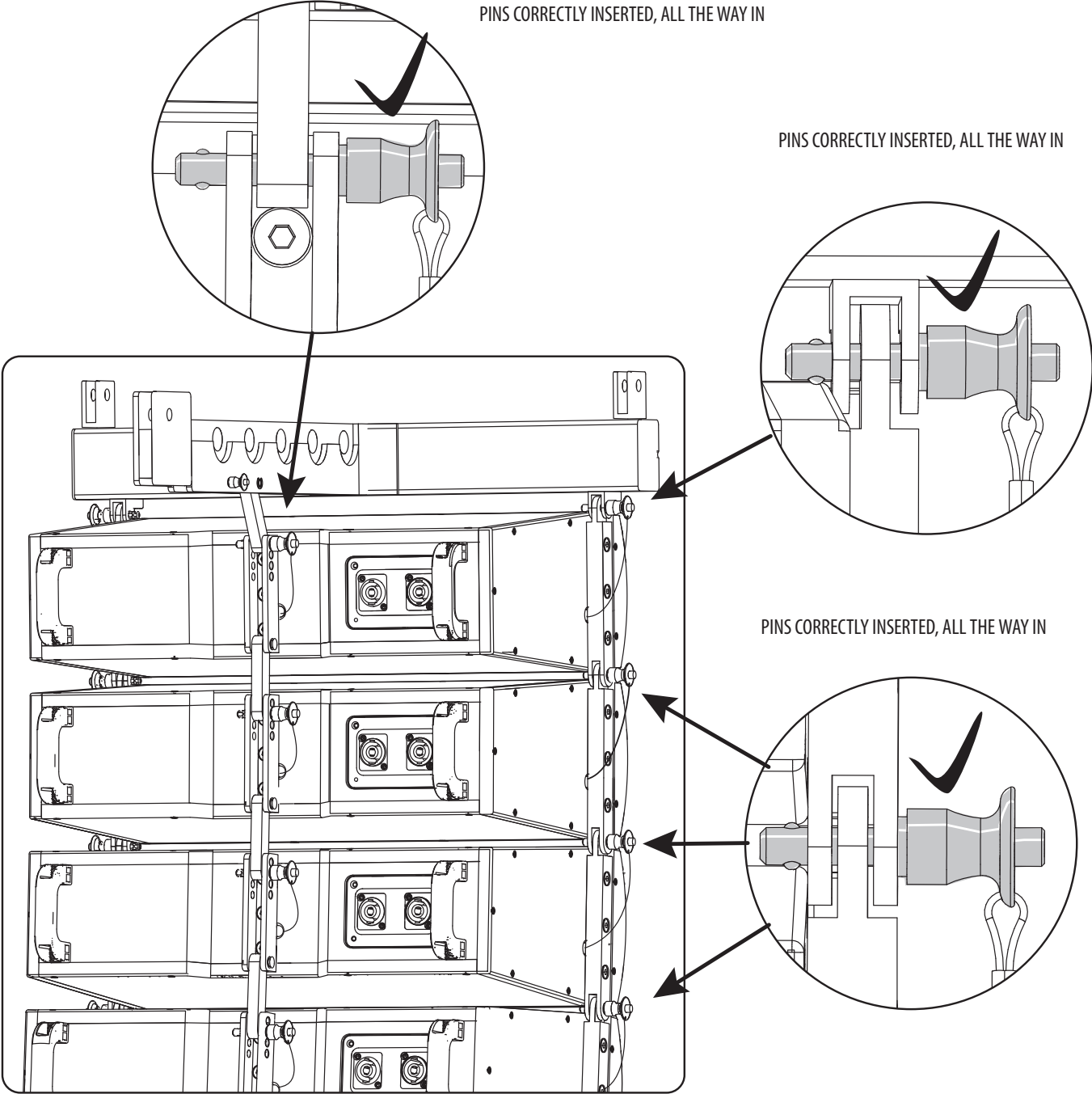
1. Support the weight of the components to be joined.
2. Align the top lug of the TLX43 cabinet with the bottom lug of the TLX43-FLB flybar. Align the lug holes so the pin can pass through and join them together.
3. Press the button (2) at the end of the pin, and insert the pin in as far as it will go. The spring balls(1) will retract while the button is being held, allowing the pin to pass through the holes.
4. Release the button (2) when the pin is fully inserted.
5. Check the pin is correctly inserted as far as it will go, and that the spring balls are visible. Check that the components being connected have been correctly captured together by the pin.
6. With the weight of the components still supported, and without pressing the button (2), try to pull on the pin sharply, to check it is secured in position by the spring ball locking mechanism.

#### Pin Removal

1. Support the weight of the components to be disconnected.
2. Press the button (2) and pull out the pins joining the components together.
3. Carefully separate the components.

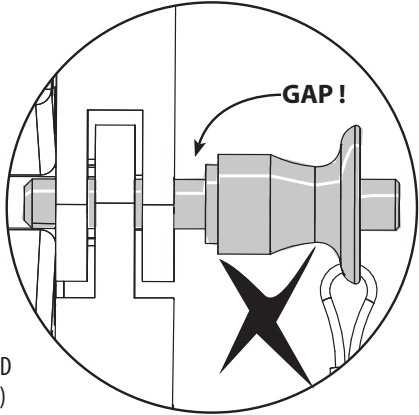


2.10.2 Typical Locations where Rigging Pins are used



**⚠ WARNING**

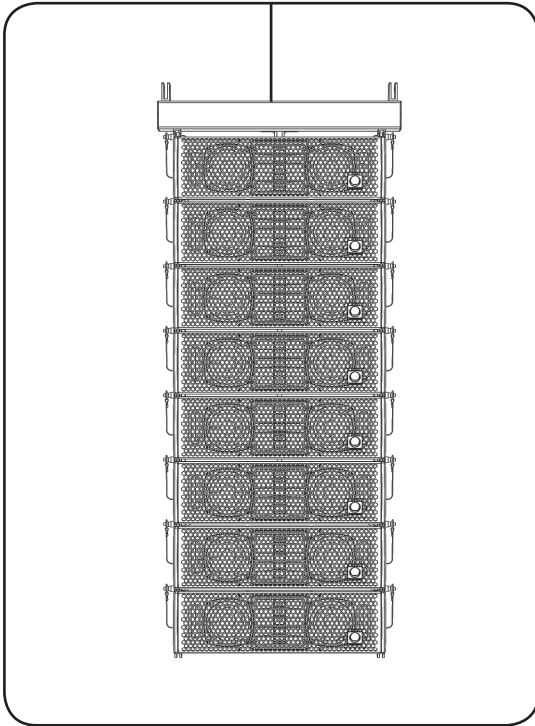
VERIFY THAT EACH PIN IS CORRECTLY INSERTED, AND THAT EACH PIN CANNOT BE PULLED OUT WITHOUT PRESSING THE RELEASE BUTTON FIRST. FAILURE TO FOLLOW INSTRUCTIONS MAY CAUSE PERMANENT INJURY OR DEATH.



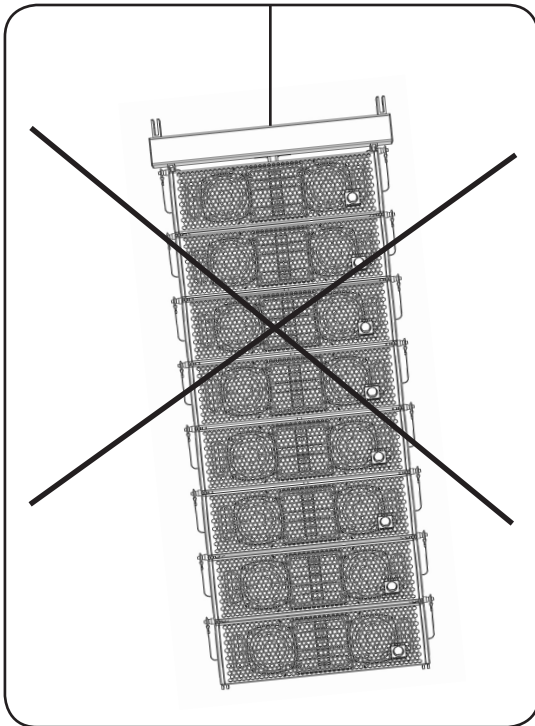
PINS INCORRECTLY INSERTED (NOT INSERTED FULLY AND SPRING BALLS ARE NOT VISIBLE)

## 2.11 Vertical Orientation

### CORRECT INSTALLATION



### INCORRECT INSTALLATION



### Vertical Orientation Only!

The mechanical design of the TLX43 cabinet, TLX212L subwoofer, and the TLX43-FLB flybar uses lugs, links, and pins to assemble the various components. The mechanical strength comes from the cabinet's metal side pieces and the pins, and not through the wooden cabinets. The cabinets are supported vertically below each other, and vertically below the flybar.

### **WARNING**

THE ASSEMBLY MUST BE ORIENTED SO THAT THE SIDES OF THE CABINETS AND SUBWOOFER ARE ALWAYS KEPT IN THE VERTICAL PLANE. FAILURE TO DO THIS MAY CAUSE STRAIN AND FAILURE OF THE MECHANICAL STRUCTURE, LEADING TO POSSIBLE PERMANENT INJURY OR DEATH.

### **WARNING**

THIS ILLUSTRATION SHOWS AN INCORRECT INSTALLATION, WHERE THE SIDES OF THE CABINETS ARE NOT IN THE VERTICAL PLANE. THIS MAY CAUSE STRAIN AND FAILURE OF THE MECHANICAL STRUCTURE, LEADING TO POSSIBLE PERMANENT INJURY OR DEATH.

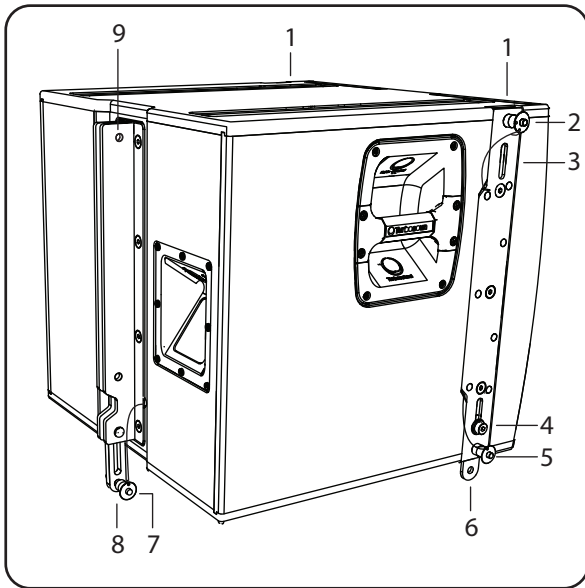
### **WARNING**

THE TLX43 CABINETS, TLX212L SUBWOOFERS, AND TLX43-FLB FLYBAR SHALL NOT BE CLIMBED UPON. THIS MAY CAUSE STRAIN AND FAILURE OF THE MECHANICAL STRUCTURE, LEADING TO POSSIBLE PERMANENT INJURY OR DEATH.

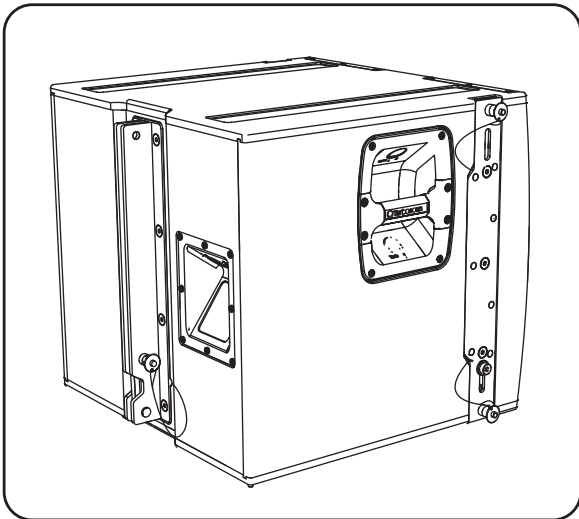


## 2.12 TLX212L Subwoofer Mounting Components

### Mounting Links Out



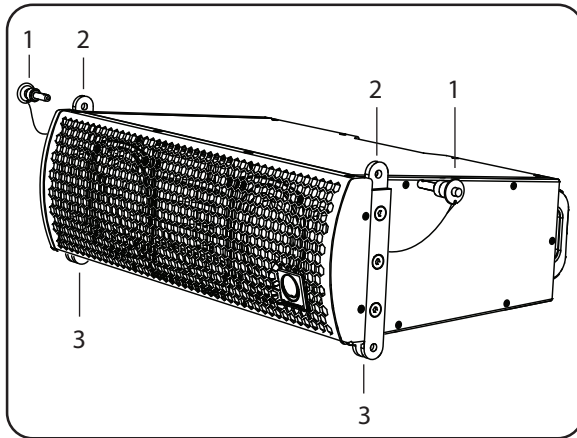
### Mounting Links In



The TLX212L subwoofer has two retractable mounting links at the bottom (6), one mounting hole at the rear top (9), and a drop-down link (8) at the rear bottom. The TLX43-FLB flybar is supplied with two drop down links that fit in these two locations (1) on top of the subwoofer. These mounting points allow the subwoofer to be connected to the TLX43-FLB flybar in various configurations, or joined to another TLX212L.

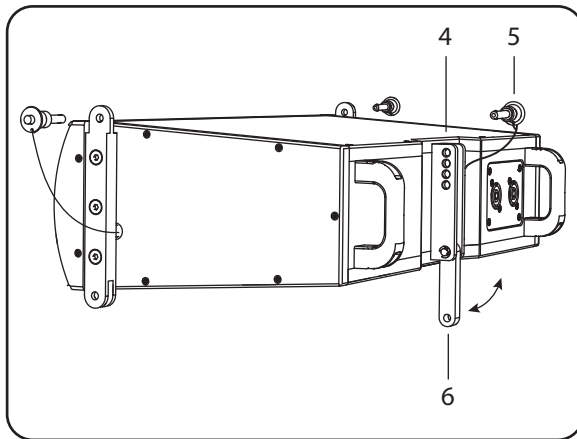
1. **Location for Top Mounting Links** – TLX43-FLB flybar is supplied with two drop down links that fit in these two locations. The bottom links (6) of a second TLX212L subwoofer can also fit here.
2. **Top Pins** – Secures the mounting links of the TLX43-FLB flybar (if used) or the drop down links of a second TLX212L subwoofer.
3. **Slot** – TLX43-FLB flybar is supplied with two drop down links, and two bolts that fit into these slots.
4. **Bottom Bolts** – These allow the bottom mounting links (6) to be positioned up or down, by sliding in the slot, then securing with the bottom pin (5).
5. **Bottom Pins** – Secures the bottom mounting link (6) in the down or up position.
6. **Bottom Mounting Links** – These connect to the top of a second TLX212L subwoofer or the mounting lugs of a TLX43-FLB flybar that can be fitted below the subwoofer. Fitting the flybar beneath the subwoofer allows an array of up to 4 TLX43 cabinets to be hung below the subwoofer.
7. **Rear Pin** – This is used to connect the drop down link (8) to a subwoofer below, or to the rear mounting hole of a TLX43-FLB flybar attached beneath the subwoofer.
8. **Rear Drop-Down Link** – This is used to connect to the rear mounting hole (9) of a second TLX212L subwoofer, or to connect to the rear mounting hole of a TLX43-FLB flybar attached beneath the subwoofer.
9. **Rear Mounting Hole** – This is used to connect to the drop-down link (8) of a TLX212L subwoofer above it, or to the drop-down link of a TLX43-FLB flybar.

## 2.13 TLX43 Cabinet Mounting Components

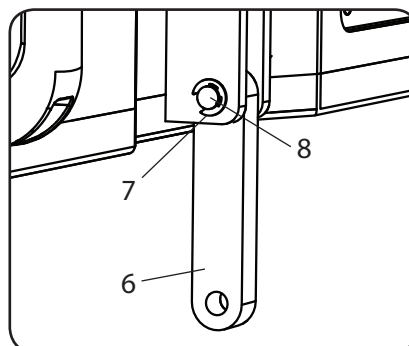
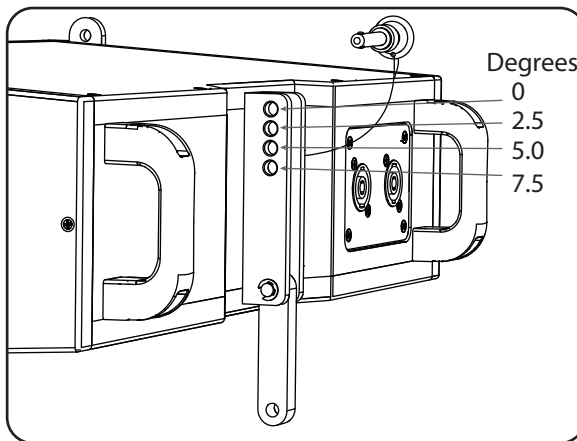


The TLX43 cabinet has two fixed mounting lugs (2) at the top, two fixed mounting lugs (3) at the bottom, a choice of four mounting holes (4) at the rear top, and a drop-down link (6) at the rear bottom. These allow the TLX43 cabinets to be connected together, and attached to the TLX43-FLB flybar.

1. **Front Pins** – These are used to secure the top mounting lugs (2) of the TLX43 cabinet to the bottom lugs (3) of the TLX43 cabinet above, or to the bottom mounting lugs of the TLX43-FLB flybar. They are attached with lanyards to prevent loss.
2. **Top Mounting Lugs** – These connect to the bottom lugs (3) of the TLX43 cabinet above, or to the bottom mounting lugs of the TLX43-FLB flybar.
3. **Bottom Mounting Lugs** – These connect to the top lugs (2) of the TLX43 cabinet below.

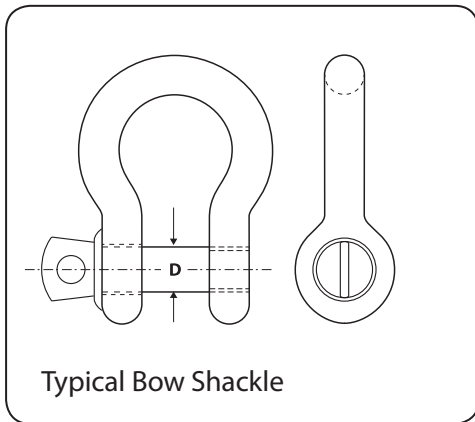
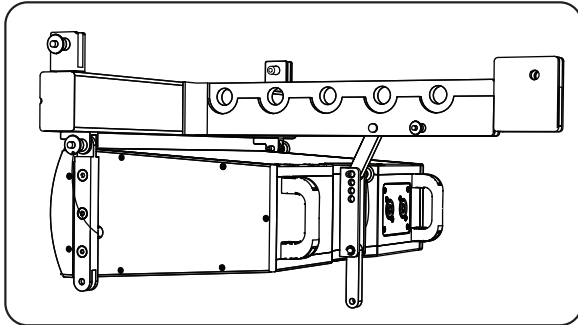
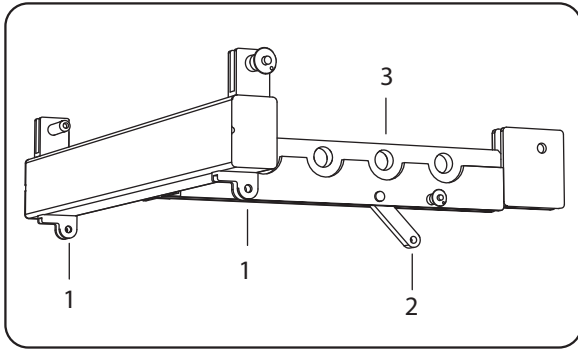


4. **Rear Mounting Holes** – These are used to connect the rear drop-down link (6) of the TLX43 cabinet above, or the drop-down link of the TLX43-FLB flybar. The angle of the cabinet is defined by choosing one of these four holes. They are marked as follows, starting with the top hole: 0, 2.5, 5.0, and 7.5 degrees.
5. **Rear Pin** – This is used to secure the rear drop-down link (6) of the TLX43 cabinet above, or the drop-down link of the TLX43-FLB flybar, to the selected rear mounting hole (4). If the drop-down link (6) is not in use, then the pin is used to secure it using the bottom mounting hole (7.5 degrees).



6. **Drop-Down Link** – This connects to the rear mounting hole (4) of the TLX43 cabinet below it.
7. **Circlip** – A circlip (7) holds the pivot pin (8) in place, and prevents the pivot pin and the drop down link (6) from falling out.
8. **Pivot Pin** – This pin holds the drop-down link (6) in place and allows it to rotate in the up or down position. A circlip (7) holds the pivot pin in place.

## 2.14 TLX43-FLB Flybar Mounting Components



The TLX43-FLB flybar shall only be used with TLX43 cabinets and TLX212L subwoofers. One side is used to connect to a TLX43 cabinet, the other side is used to connect to the top (or bottom) of a TLX212L subwoofer.

### 2.14.1 Use with TLX43 Cabinet

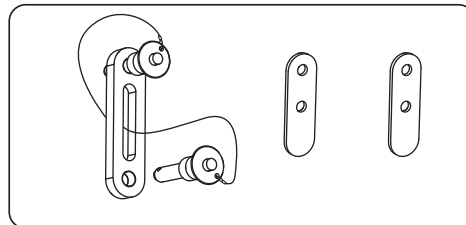
1. **Mounting Lugs** – These connect the flybar to the top lugs of the TLX43 cabinet. The connections are secured using the front pins of the TLX43 cabinet.
2. **Drop-Down Link** – This connects the flybar to the rear mounting point of the TLX43 cabinet. It has a fixed pivot and circlip. The connection is secured using the rear pin of the TLX43 cabinet.
3. **Suspension Points** – These 20 mm diameter holes are used to attach a bow shackle or similar lifting equipment for suspending the assembly. Use the EASE FOCUS II software to determine the correct pick point for each configuration.

Suspend the array by attaching one or more bow shackles or similar lifting devices with a pin diameter (D) to fit the 20 mm suspension pick point. Typically, manufacturers of bow shackles provide suitable devices with pin diameters between 11 mm and 19 mm, and with work loads between 1 tonnes and 3.25 tonnes.

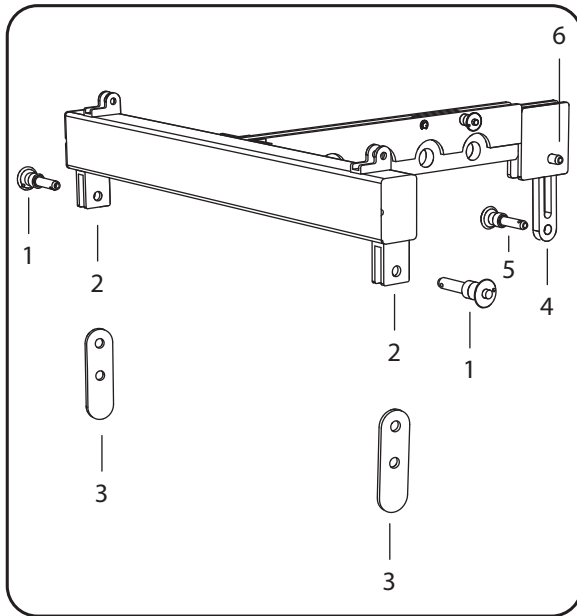
Installation and setup should only be carried out by qualified and authorized personnel observing the valid national Rules for the Prevention of Accidents (RPA). Refer to Chapter 1 for more details.

### NOTE

The TLX43-FLB flybar is supplied with hardware for use with a TLX212L subwoofer. See the next page for more details. The hardware can be removed and kept in a safe place if a TLX212L subwoofer is not used.



**2.14.1 TLX43-FLB Flybar (continued)**

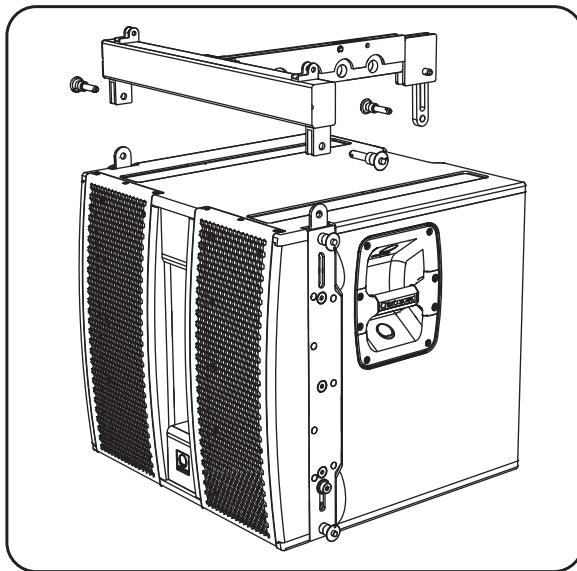


**2.14.2 Use with TLX212L Subwoofer**

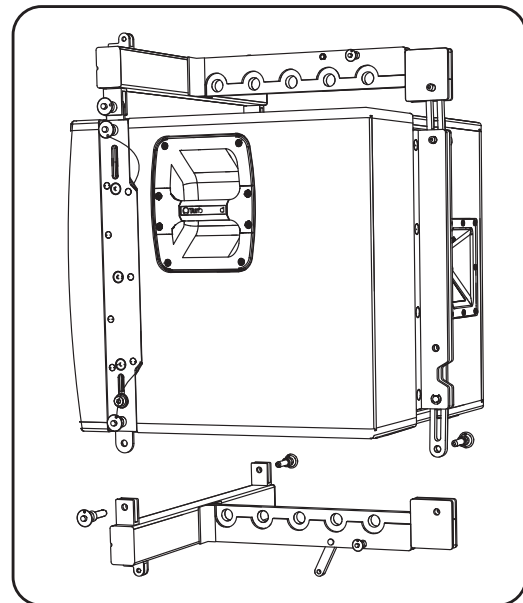
1. **Front Pins\*** – These secure the mounting lugs (2) of the flybar either to the mounting links (3) that fit into the top of the TLX212L subwoofer, or to the retractable links at the bottom of the TLX212L subwoofer.
2. **Mounting Lugs** – These connect the flybar either to the mounting links (3) that fit into the top of the TLX212L subwoofer, or to the retractable links at the bottom of the TLX212L subwoofer.
3. **SUB Links** – These are used to connect the flybar to the top of the TLX212L subwoofer.
4. **Sub Drop Link** – This is used to connect the flybar to the rear mounting point of a TLX212L subwoofer. (This is not used if mounting to the bottom of a TLX212L.)
5. **Rigging Pins\*** – Rigging pins are connected to the removable sub drop link (5) by captive lanyard. These pins are used to secure the rear drop link to the rear mounting hole of the flybar, and to secure the other end to the rear mounting point of a TLX212L subwoofer.

\* This hardware is supplied with the TLX43-FLB flybar.

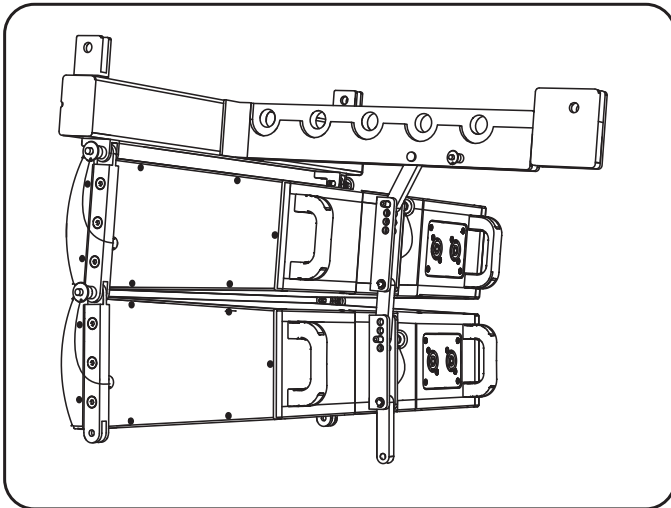
**TLX43-FLB Flybar on top of a TLX212L Subwoofer (with mounting links (3) and bolts (4) already fitted to the subwoofer)**



**TLX43-FLB Flybar mounted on top and bottom of a TLX212L Subwoofer**



## Chapter 3: Assembling a TLX43 Array on a TLX43-FLB Flybar



The following procedure shows how to build an array of TLX43 cabinets by adding them one at a time.

Alternatively, cabinets can be pre-assembled into groups of four, and then connected to the flybar at a later time. This method is shown in procedure 3.2.

The system is suspended using a TLX43-FLB flybar that attaches to your lifting system.

The top TLX43 cabinet connects to two front lugs on the flybar, and one rear drop-down link.

Four rear mounting holes on the back of the TLX43 allow the cabinet angle to be selected from 0, 2.5, 5.0, or 7.5 degrees. To set the site angle of the top TLX43 element parallel to the TLX43-FLB, select the 0 degree hole to attach the top TLX43 enclosure to the flybar.

### **WARNING**

DO NOT EXCEED A TOTAL QUANTITY OF 10 TLX43 CABINETS FOR ONE TLX43-FLB FLYBAR. FAILURE TO FOLLOW INSTRUCTIONS MAY CAUSE PERMANENT INJURY OR DEATH.

### 3.0.1 Required Components

Item	Quantity
TLX43-FLB Flybar	1
TLX43 Cabinet	10 (maximum)

### 3.0.2 Preparation

Use the EASE FOCUS II software application to design your system to suit the venue. This will calculate which flybar mounting hole to attach your bow shackle, and at which angle to set each TLX43 cabinet to achieve optimum coverage.

### 3.0.3 Location

Move the first TLX43 cabinet so it is sitting upright on a safe flat surface, directly below the suspension point.

### 3.0.4 Measured Weights

Item	Quantity	Total Weight including one TLX43-FLB Flybar	
TLX43	1	14.8 kg	32.6 lbs
	2	22.8 kg	50.3 lbs
	3	30.8 kg	67.9 lbs
	4	38.8 kg	85.5 lbs
	5	46.8 kg	103 lbs
	6	54.8 kg	121 lbs
	7	62.8 kg	138 lbs
	8	70.8 kg	156 lbs
	9	78.8 kg	174 lbs
	10	86.8 kg	191 lbs

### 3.0.5 Personnel

The following procedures shall be undertaken by experienced, certified, qualified, and authorised personnel only. The procedures require the use of three or more authorised persons.



Protective Headwear shall be worn



Protective Footwear shall be worn



Protective Gloves shall be worn



Protective Eyewear shall be worn

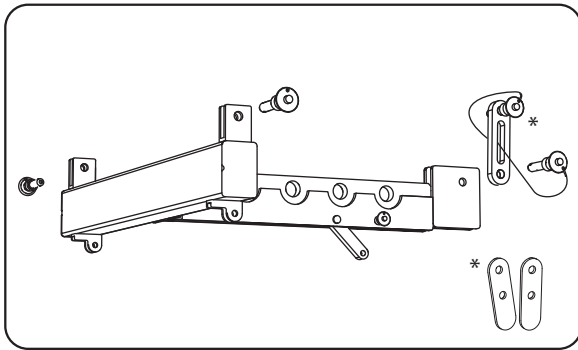


Practice Safe Lifting

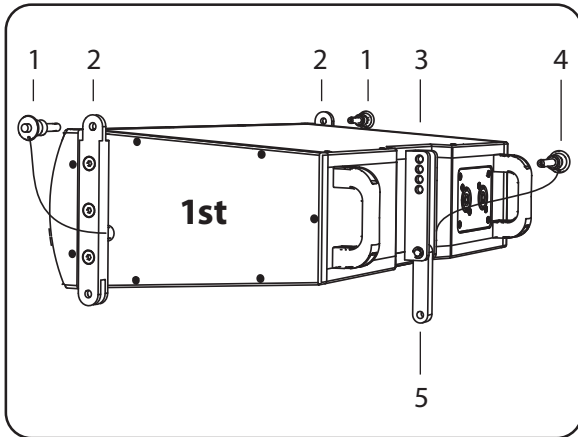
### TLX43-FLB Flybar Working Load Limit (WLL)

Item	Working Load Limit (WLL)	
TLX43-FLB	94 kg	207.23 lbs

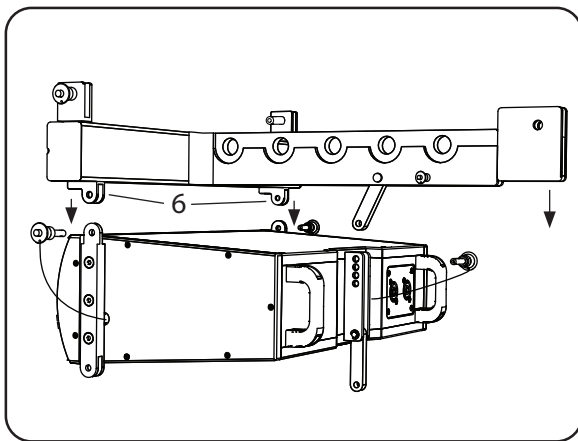
### Procedure 3.1 Connecting TLX43 Cabinets to the TLX43-FLB Flybar



1. The TLX43-FLB flybar comes with extra components (marked\* in this drawing) that are only used when rigging the TLX212L subwoofer. Remove these components from the flybar and keep them together in a safe place.

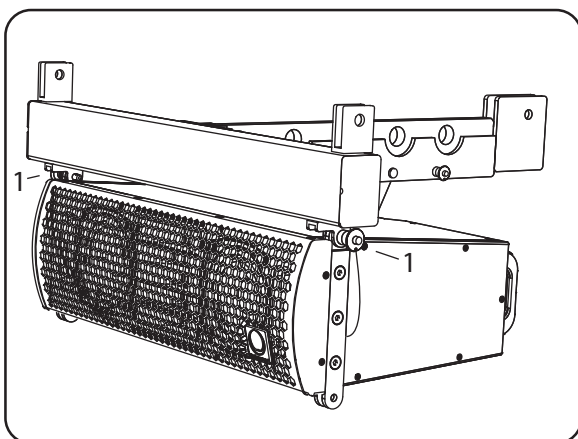


2. Prepare the first TLX43 cabinet, by pulling out the front two pins (1) from the top mounting lugs (2), and remove the rear pin (4) from the rear mounting holes (3). The rear drop-down link (5) of the cabinet will drop down.



3. Remove the small rigging pin from its storage position on the flybar and allow the flybar's captive rear drop link to drop down. Re-insert the rigging pin in its storage location on the TLX43-FLB.

Carefully lower the TLX43-FLB flybar on top of the first TLX43 cabinet and align the flybar's mounting lugs (6) with the two top mounting lugs (2) of the cabinet.



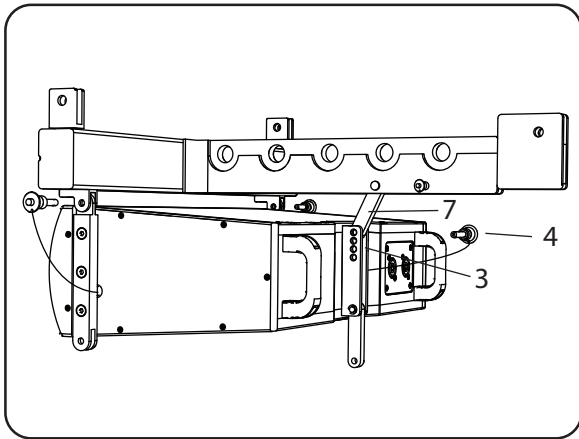
4. Insert the front two pins (1) to secure the front mounting lugs of the flybar (6) with the two top mounting lugs (2) of the TLX43 cabinet.

**⚠ CAUTION:**

Support the rear of the flybar until the rear drop-down link (7) of the flybar is connected in the next step.

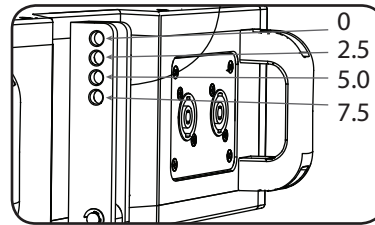
Take care not to trap your fingers between components.



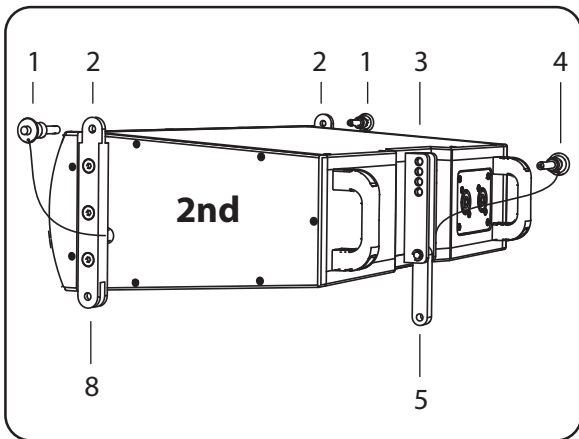


- Align the flybar's drop-down link (7) with the desired hole (3) in the TLX43 rear bracket. The holes are marked with the angle. Choose the correct hole that corresponds to the angle recommended by EASE FOCUS II software for the first TLX43 cabinet. Insert the rear pin (4).

**Note:** normally the 0 degree hole is selected to attach the top TLX43 enclosure to the TLX43-FLB in order to set the site angle of the top element parallel to the flybar. This allows the TLX43-FLB to serve as a visual reference for checking array focus on the audience area, i.e., if you can see the top of the TLX43-FLB then you are outside the vertical coverage pattern of the array.



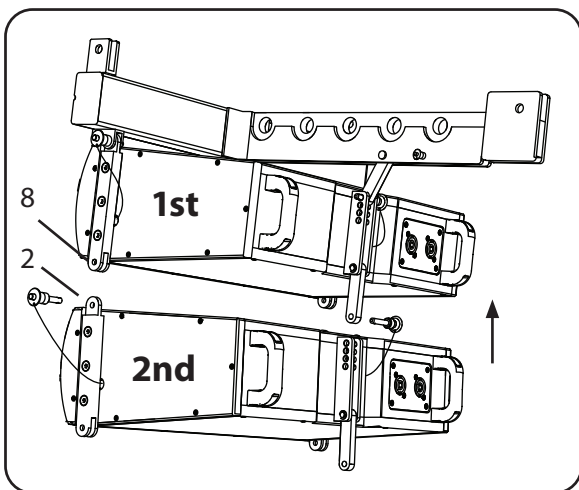
Double check that all pins are correctly inserted, before proceeding further.



- Attach the bow shackle or other lifting equipment securely to the flybar mounting hole recommended by the EASE FOCUS II software, then attach the hook and chain. Carefully raise the flybar to a reasonable working height to allow attaching the next cabinet.
- Prepare the next TLX43 cabinet, by pulling out the front two pins (1) from the top mounting lugs (2), and remove the rear pin (4) from the rear mounting holes (3). The rear drop-down link (5) of the cabinet will drop down.

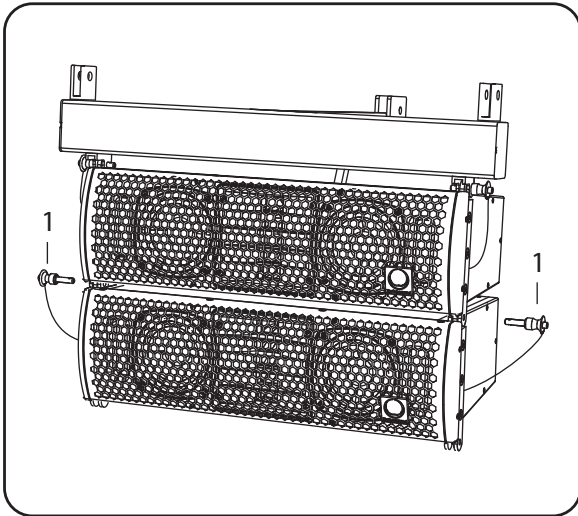
**CAUTION**

Check that the drop down link (5) and its pivot pin and circlip and are all present, clean, and in good condition. Check that the circlip is correctly holding the pivot pin in place, and preventing it and the drop down link from falling out.



- Lift this TLX43 cabinet until the front top mounting lugs (2) align with the two bottom mounting lugs (8) of the TLX43 cabinet above it.

### Procedure 3.1 continued

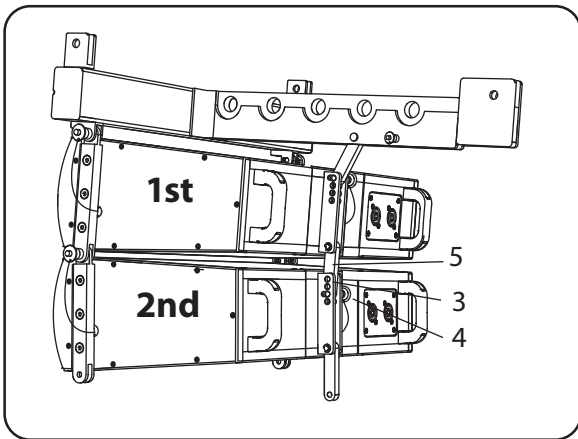


9. Insert the front two pins (1), to secure the front top mounting lugs (2) of this TLX43 cabinet to the two bottom mounting lugs (8) of the TLX43 cabinet above it.

**CAUTION:**

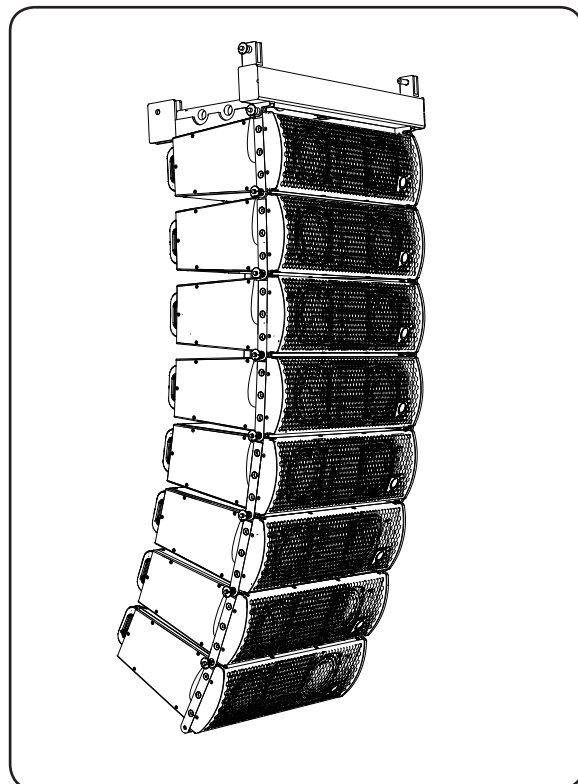
Support the rear of the cabinet until the rear drop-down link (5) is connected (next step).

Take care not to trap your fingers between components.



10. Align the rear drop-down link (5) of the top TLX43 cabinet with the desired mounting hole (3) in the rear of the TLX43 cabinet below it. The holes are marked with the angle. Choose the correct hole that corresponds to the angle recommended by EASE FOCUS II software for this TLX43 cabinet. Insert the rear pin (4).

Double check that all pins are correctly inserted, before proceeding further.



11. The addition of other TLX43 cabinets is performed by repeating steps 7 through 10 for each additional cabinet.

**WARNING**

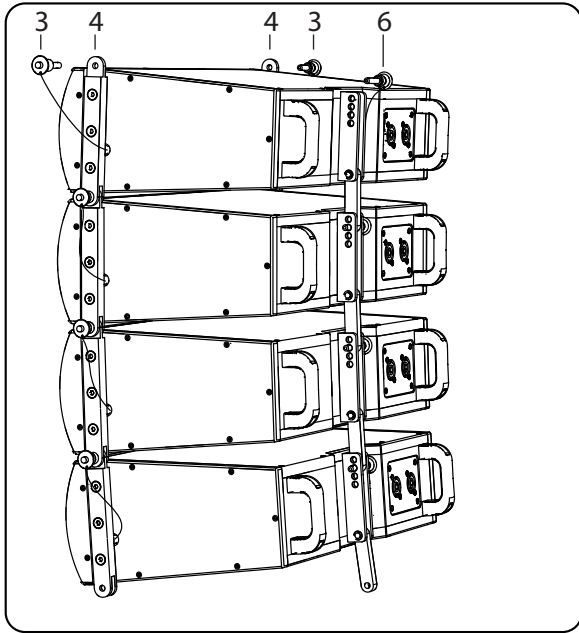
DO NOT EXCEED A TOTAL QUANTITY OF 10 TLX43 CABINETS FOR ONE TLX43-FLB FLYBAR. FAILURE TO FOLLOW INSTRUCTIONS MAY CAUSE PERMANENT INJURY OR DEATH.

**NOTE**

Disassembly is the reverse of assembly.



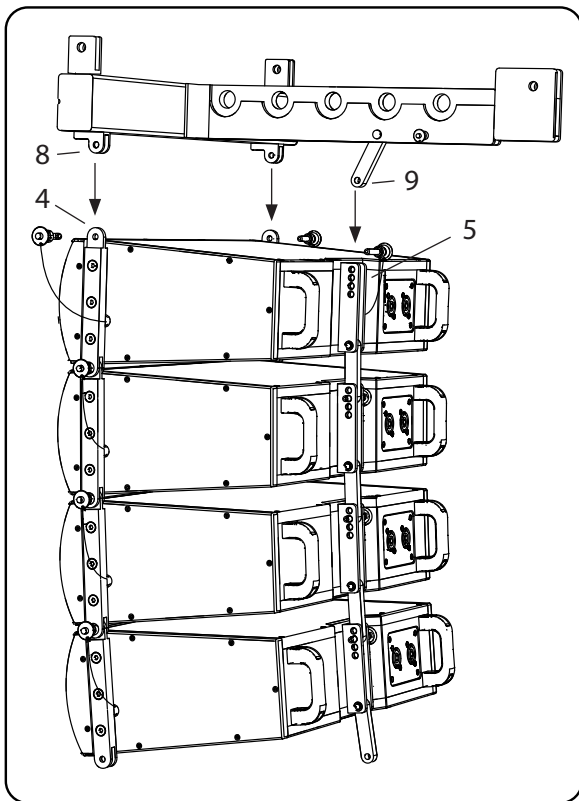
### Procedure 3.2: Adding a group of four TLX43 Cabinets to the TLX43-FLB Flybar



Groups of four cabinets can be pre-assembled using Procedure 3.1, steps 7 through 10, and then connected to the TLX43-FLB flybar as an assembled group of four just prior to flying.

The TLX43 cabinets connect to each other using the top and bottom front mounting links, and the rear drop-down link.

1. Prepare the top TLX43 cabinet of the group of four, by pulling out the front two pins (3) from the top mounting lugs (4).



2. Carefully lower the TLX43-FLB flybar onto the top TLX43 cabinet and align the front mounting lugs (8) of the flybar with the two top mounting lugs (4) of the cabinet.

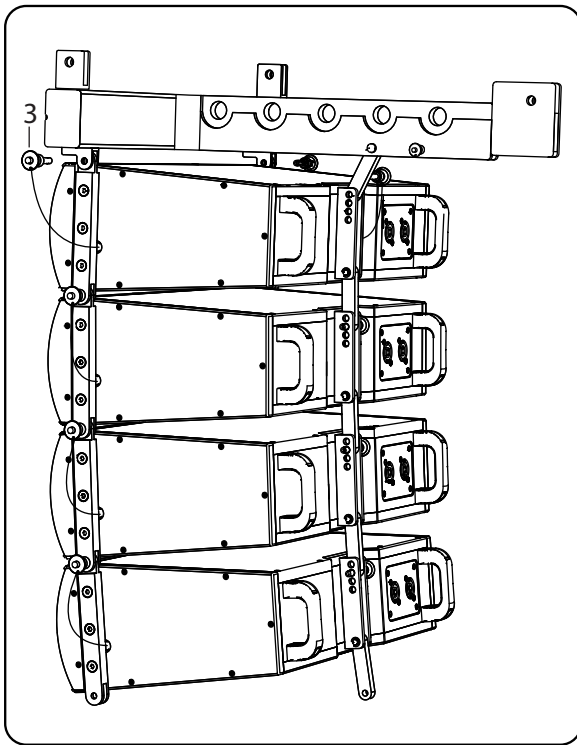
**⚠ WARNING**

DO NOT EXCEED A TOTAL QUANTITY OF 4 TLX43 CABINETS FOR EACH PRE-ASSEMBLED GROUP. FAILURE TO FOLLOW INSTRUCTIONS MAY CAUSE PERMANENT INJURY OR DEATH.

**⚠ WARNING**

DO NOT FLY THE PRE-ASSEMBLED GROUPS OF TLX43 CABINETS WITHOUT THE TLX43-FLB FLYBAR. FAILURE TO FOLLOW INSTRUCTIONS MAY CAUSE PERMANENT INJURY OR DEATH.

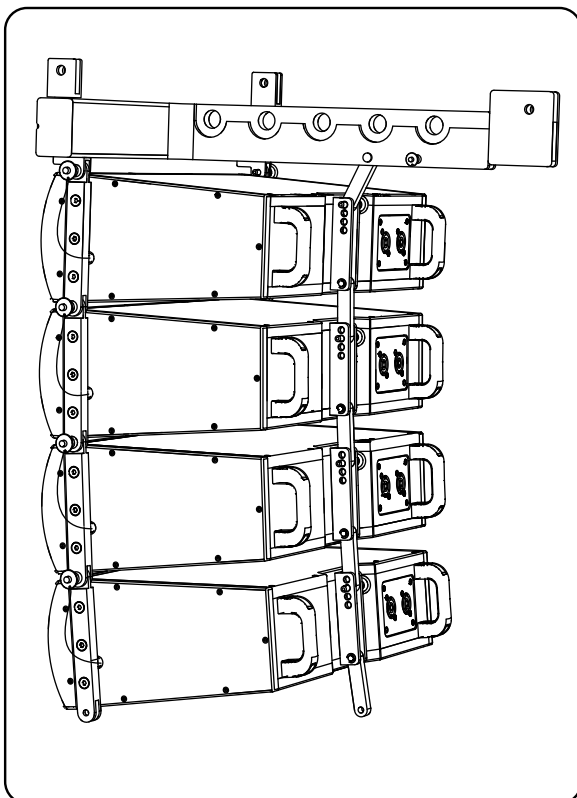
### Procedure 3.2 continued



3. Insert the front two pins (3) to secure the front mounting lugs of the flybar (8) with the two top mounting lugs (4) of the TLX43 cabinet.

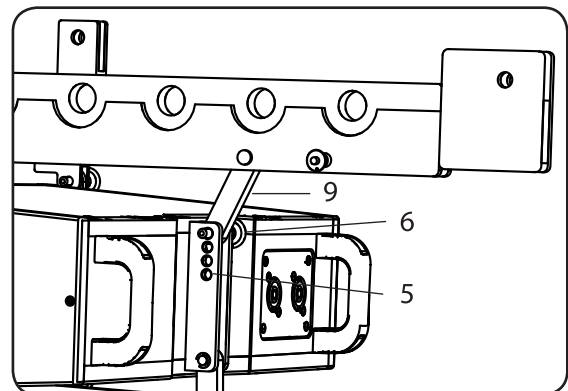
**CAUTION:**

Do not let the TLX43 cabinet assembly hang from the two front lugs only. This may cause damage to the front lugs. Always support the weight of the cabinets until the rear drop-down link (9) is secured with its pin (6) in the next step.



4. Align the flybar's drop-down link (9) with the desired hole (5) in the TLX43 rear bracket. The holes are marked with the angle. Choose the correct hole that corresponds to the angle recommended by EASE FOCUS II software for the top TLX43 cabinet.

**Note:** normally the 0 degree hole is selected to attach the top TLX43 enclosure to the TLX43-FLB in order to set the site angle of the top element parallel to the flybar. This allows the TLX43-FLB to serve as a visual reference for checking array focus on the audience area, i.e., if you can see the top of the TLX43-FLB then you are outside the vertical coverage pattern of the array.



5. Insert the rear pin (6) into the hole (5) to capture the hole in the drop-down link (9).
6. The angles of the lower three cabinets can be adjusted by first supporting their weight, and then moving the rear pins (6) to the desired holes.

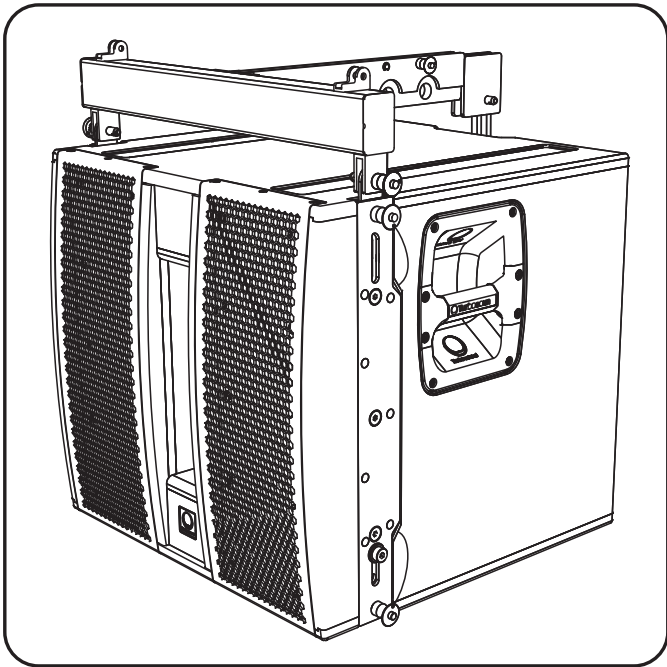
Double check that all pins are correctly inserted.



**NOTE**

Disassembly is the reverse of assembly.

## Chapter 4: Assembling one TLX212L Subwoofer on a TLX43-FLB Flybar



The following procedure describes how to assemble a single TLX212L subwoofer to the TLX43-FLB flybar.

The TLX43-FLB flybar is attached to the top of the TLX212L subwoofer, using 2 front pins, 2 mounting links, and a rear drop-down link, supplied with the TLX43-FLB flybar.



### WARNING

DO NOT EXCEED A TOTAL QUANTITY OF 2 TLX212L SUBWOOFERS FOR ONE TLX43-FLB FLYBAR. FAILURE TO FOLLOW INSTRUCTIONS MAY CAUSE PERMANENT INJURY OR DEATH

### 4.0.1 Required Components

Item	Quantity
TLX43-FLB Flybar	1
TLX212L Subwoofer	2 (max)

### 4.0.2 Location

Move the TLX212L subwoofer so it is sitting upright on a safe flat surface, directly below the suspension point.

### 4.0.3 Measured Weights

Total Measured System Weight			
Item	Quantity	Total Weight Including one TLX43-FLB Flybar	
TLX212L	1	49.8 kg	110 lbs
	2	92.8 kg	205 lbs

### TLX43-FLB Flybar Working Load Limit (WLL)

Item	Working Load Limit (WLL)	
TLX43-FLB	94 kg	207.23 lbs

### 4.0.4 Personnel

The following procedures shall be undertaken by experienced, certified, qualified, and authorised personnel only. The procedures require the use of three or more authorised persons.



Protective Headwear shall be worn



Protective Footwear shall be worn



Protective Gloves shall be worn

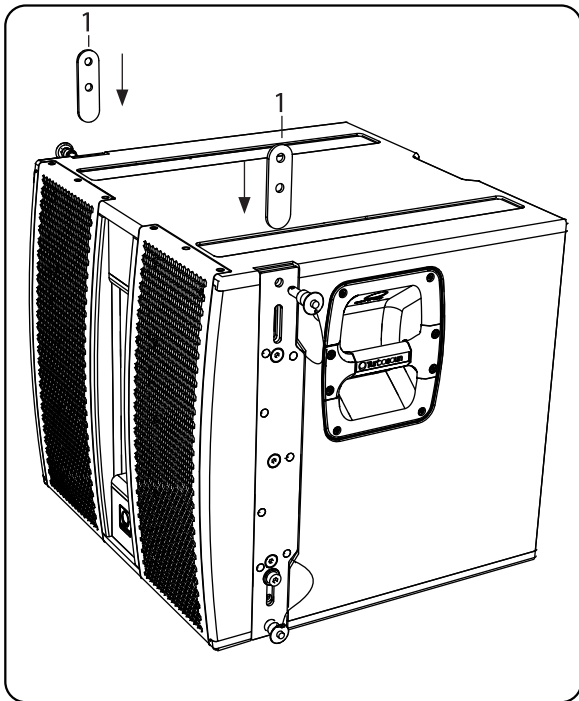


Protective Eyewear shall be worn

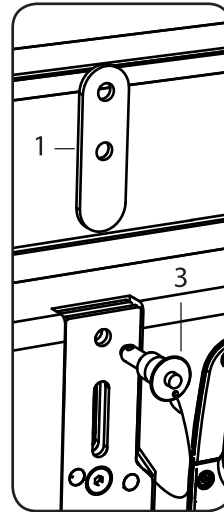


Practice Safe Lifting

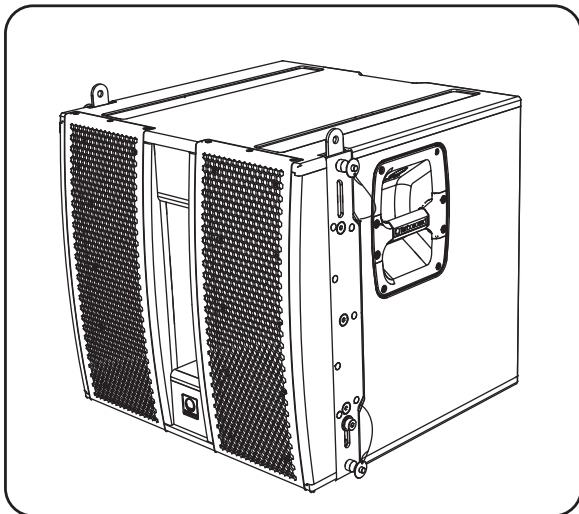
## Procedure 4.1 - Installing the TLX212L Subwoofer Top Mounting Links



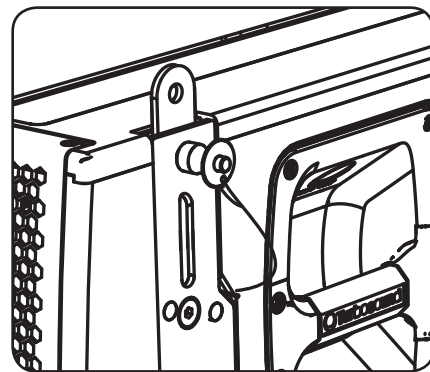
The TLX43-FLB flybar is supplied with two sub links (1) that are installed in the top of the TLX212L subwoofer. These form the mounting points for connecting the flybar to the subwoofer.



1. Remove the upper-front pin (3) of the subwoofer.
2. Lower the mounting link (1) into the slot on top of the subwoofer, until the middle hole of the link lines up with the hole of the pin (3).
3. Insert the pin (3) to capture the center hole of the mounting link (1).



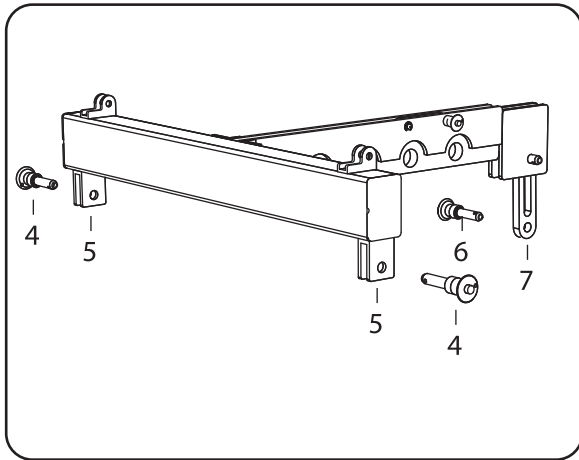
Check all links, and pins are securely connected to the subwoofer.



### NOTE

Disassembly is the reverse of assembly.

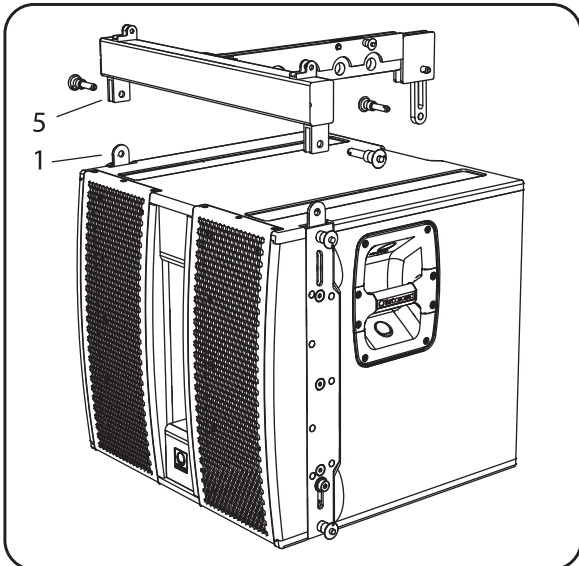
### Procedure 4.2 - Preparing the TLX43-FLB Flybar for a TLX212L Subwoofer



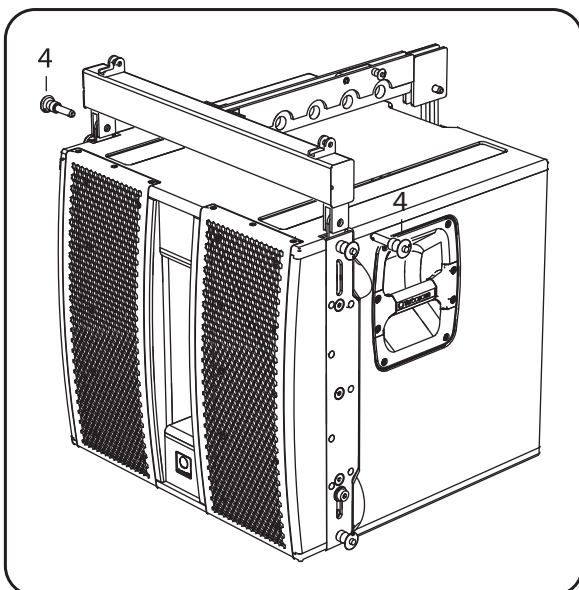
The TLX43-FLB flybar is supplied with captive front pins and a removable rear sub drop link and rigging pin assembly that is only used when suspending the TLX212L subwoofer.

1. Remove the two front pins (4) from the front mounting lugs (5).
2. Remove the lowest pin (6) from the rear drop-down link (7) as shown.

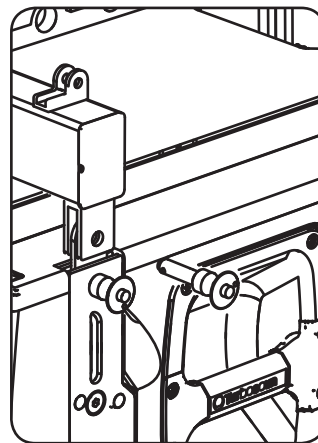
### Procedure 4.3 - Attaching the TLX43-FLB Flybar to the TLX212L Subwoofer



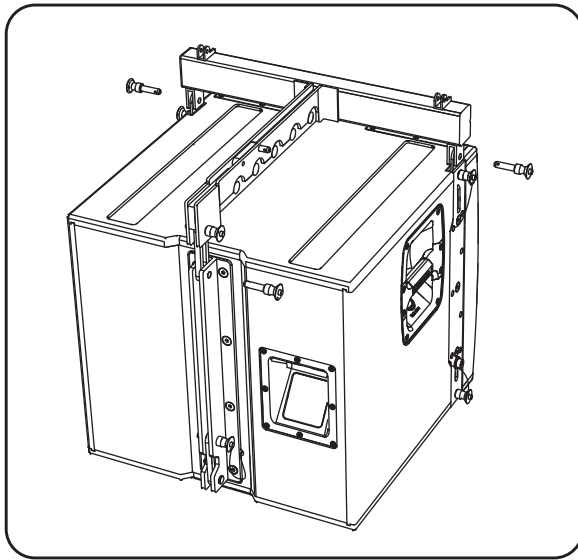
1. Position the flybar over the top of the TLX212L subwoofer as shown.
2. Carefully lower the flybar on top of the subwoofer and align the flybar's front mounting lugs (5) with the subwoofer's mounting links (1).



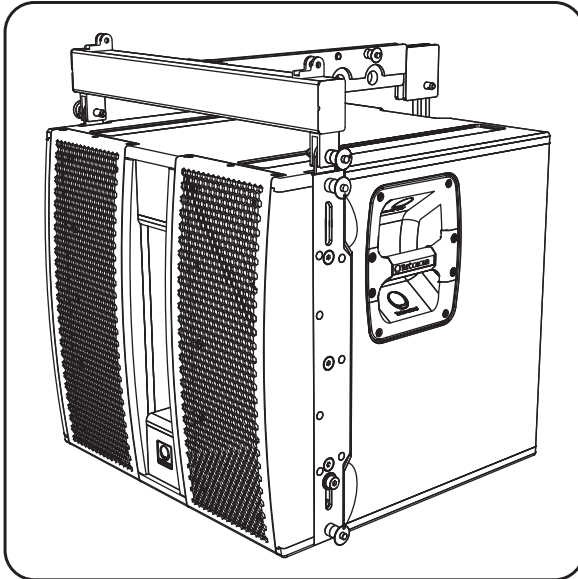
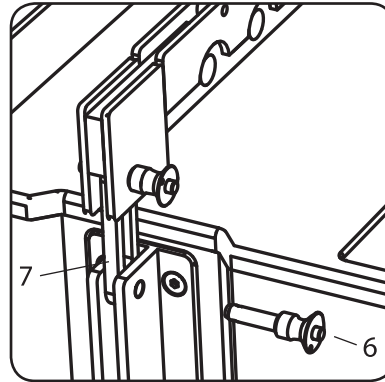
3. Insert the two front pins (4) to secure the flybar to the mounting links (1) of the TLX212L subwoofer.




### Procedure 4.3 continued



4. Line up the hole in the rear drop-down link (7) of the flybar, with the hole in the rear mounting bracket of the subwoofer. Insert the rear pin (6) to capture the drop-down link.

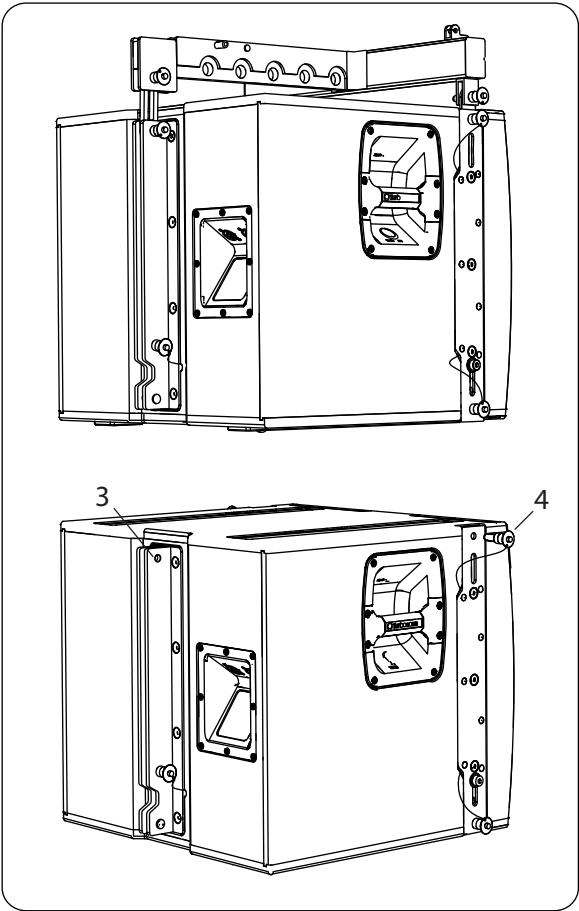


Double check all pins are correctly inserted, and that the flybar is now securely attached to the subwoofer at all points. 


#### NOTE

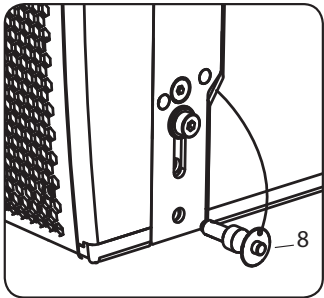
Disassembly is the reverse of assembly.

### Procedure 4.4 - Connecting a Second TLX212L Subwoofer

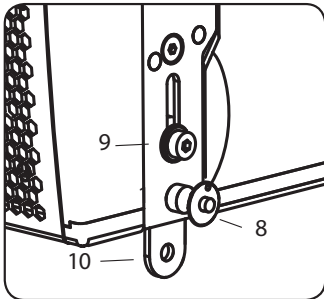
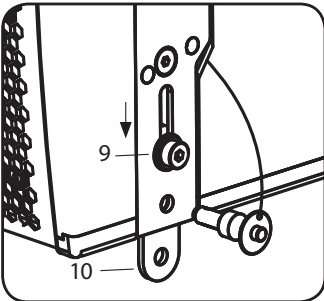


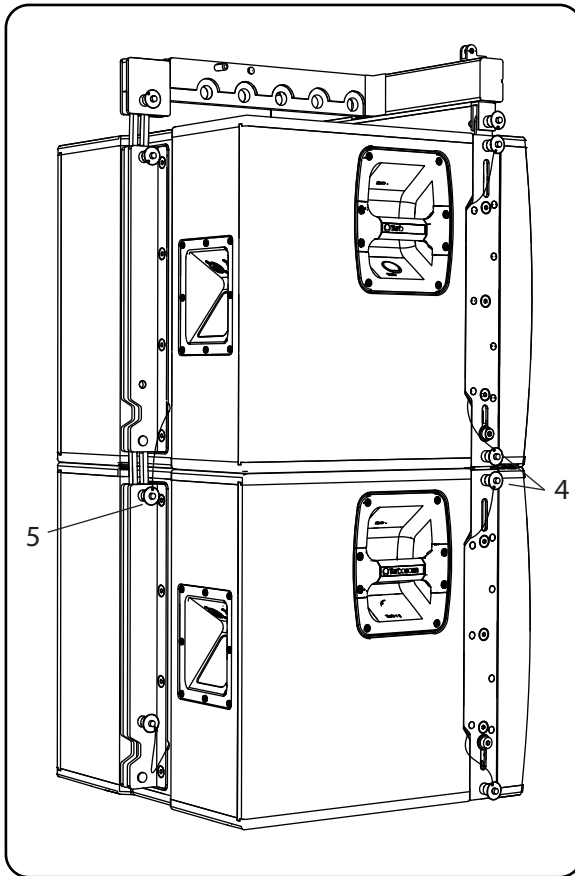
1. Attach a bow shackle or other lifting equipment securely to the correct flybar pick point hole as recommended by EASE FOCUS II software, then attach the hook and chain to the bow shackle.
2. Carefully raise the flybar/subwoofer to provide sufficient clearance for adding a second subwoofer, in preparation for the next steps.
3. Move the bottom TLX212L subwoofer to a position directly below the top subwoofer. Make sure it is resting on a flat steady surface.
4. Carefully lower the first subwoofer down on top of the second subwoofer, and allow the stacking runners on the bottom of the upper enclosure to self-center with the stacking recesses on the top of the lower enclosure.

Take care not to trap your fingers between components. 



5. Lower front drop links; pin to upper enclosure; pin to lower enclosure
6. Lower rear drop link; pin to lower enclosure





7. Check that left and right front rigging pins (4) are correctly inserted - 4x rigging pins total. Check that the rear drop down link rigging pin (5) is correctly inserted.

Double check all the connections to make sure that the TLX212L subwoofers and the TLX43-FLB flybar are securely connected together.



**NOTE**

Disassembly is the reverse of assembly.

**! WARNING**

DO NOT EXCEED A TOTAL QUANTITY OF 2 TLX212L SUBWOOFERS FOR ONE TLX43-FLB FLYBAR. FAILURE TO FOLLOW INSTRUCTIONS MAY CAUSE PERMANENT INJURY OR DEATH

**! CAUTION**

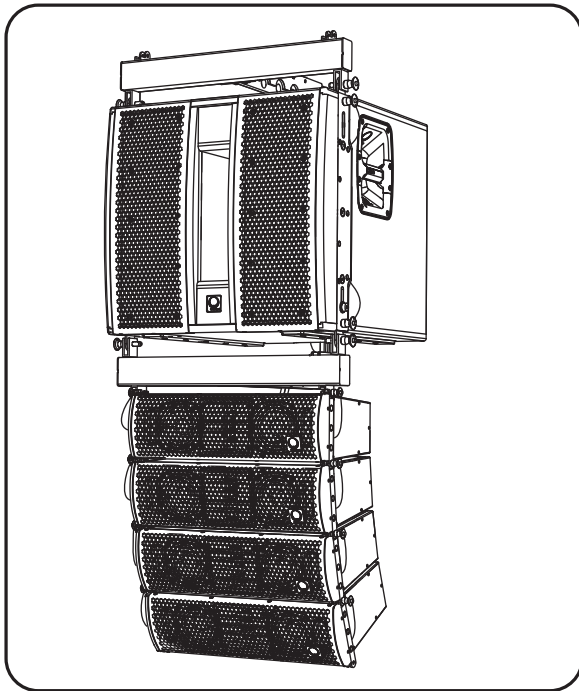
Do not lower the TLX212L subwoofer onto the ground with the mounting links and drop-down link in the down position. This may cause damage to the links and the drop-down link, or cause damage to the stage. They should be retracted by reversing the order of the steps above.

**NOTE**

Disassembly is the reverse of assembly.



## Chapter 5: Assembling a TLX43 Array with a TLX212L Subwoofer



The following procedure describes how to assemble a mixed array consisting of one TLX212L subwoofer and four TLX43 cabinets below it.

One TLX43-FLB flybar is attached to the top of the TLX212L subwoofer, using components supplied with the TLX43-FLB flybar.

A second TLX43-FLB flybar is attached to the bottom of the TLX212L subwoofer, using 2 front pins supplied with the flybar, and a rear drop-down link of the subwoofer

An array of up to a maximum of four TLX43 cabinets is suspended from the lower TLX43-FLB flybar.

**⚠ WARNING**

DO NOT EXCEED A TOTAL QUANTITY OF 1 TLX212L SUBWOOFER AND 4 TLX43 CABINETS FOR THIS CONFIGURATION. FAILURE TO FOLLOW INSTRUCTIONS MAY CAUSE PERMANENT INJURY OR DEATH.

**⚠ WARNING**

THIS ARRAY SHALL ONLY BE MADE WITH THE TLX212L SUBWOOFER ON TOP, AND THE TLX43 CABINETS BELOW. FAILURE TO FOLLOW INSTRUCTIONS MAY CAUSE PERMANENT INJURY OR DEATH.

### 5.0.1 Required Components

Item	Quantity
TLX43-FLB Flybar	2
TLX212L Subwoofer	1 (maximum)
TLX43 Cabinet	4 (maximum)

### 5.0.2 Measured Weights

Total Measured System Weight			
Item	Quantity	Total Weight including two TLX43-FLB Flybars and one TLX212L Subwoofer	
TLX43	1	64.6 kg	142 lbs
	2	72.6 kg	160 lbs
	3	80.6 kg	178 lbs
	4	88.6 kg	195 lbs

### TLX43-FLB Flybar Working Load Limit (WLL)

Item	Working Load Limit (WLL)	
TLX43-FLB	94 kg	207.23 lbs

### 5.0.3 Personnel

The following procedures shall be undertaken by experienced, certified, qualified, and authorised personnel only. The procedures require the use of three or more authorised persons.



Protective Headwear shall be worn



Protective Footwear shall be worn



Protective Gloves shall be worn

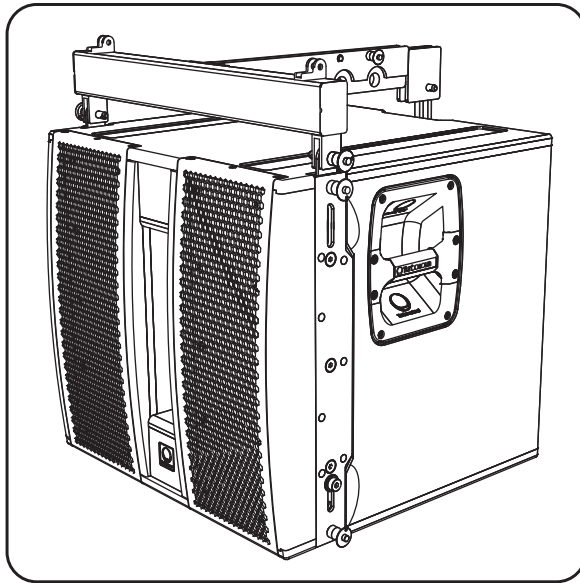


Protective Eyewear shall be worn



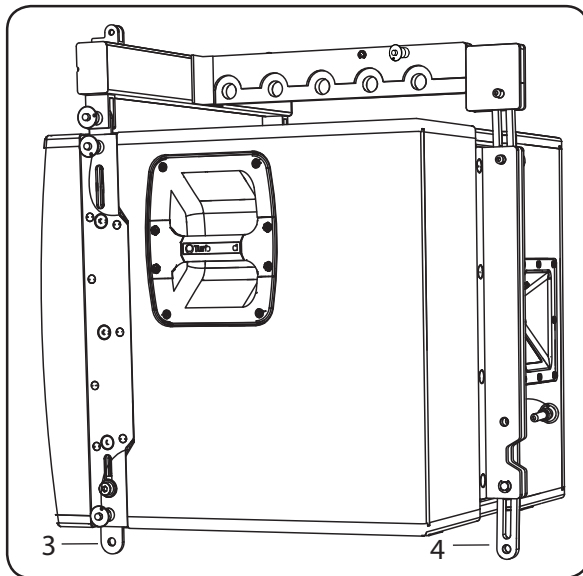
Practice Safe Lifting

## Procedure 5.1 - Attaching the top TLX43-FLB flybar to the TLX212L Subwoofer



1. Perform the previous procedures in **Chapter 4**: 4.1, 4.2, and 4.3, to attach the TLX43-FLB flybar to the TLX212L subwoofer.

Procedure	Description of Work	Check
4.1	Installing the TLX212L Subwoofer Top Mounting Links	
4.2	Preparing the TLX43-FLB Flybar for suspending a TLX212L	
4.3	Attaching the TLX43-FLB Flybar to the TLX212L Subwoofer	



2. Lower the bottom front mount links on the TLX212L subwoofer (3) and secure with rigging pins on both sides. Lower the rear drop-down link at the rear of the TLX212L subwoofer. This is done with the TLX212L subwoofer suspended approximately 1 metre from the ground.

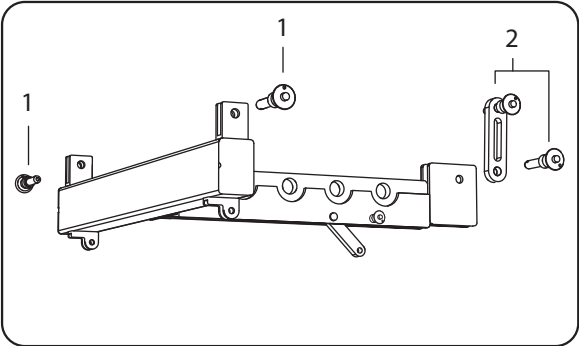
Double check all pins are correctly inserted, and that the upper flybar is securely attached to the subwoofer.



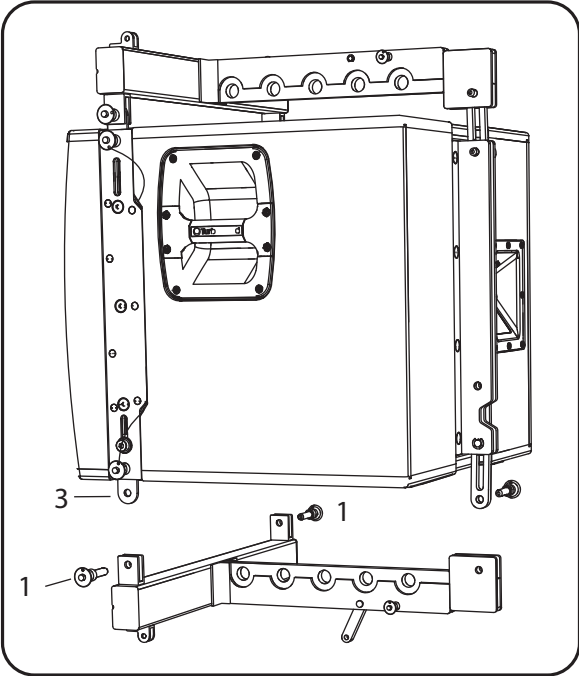
### CAUTION

Do not lower the TLX212L subwoofer onto the ground with the mounting links (3) and drop-down link (4) in the down position. This may cause damage to the links and the drop-down link, or cause damage to the stage. They should be retracted by reversing the order of the steps above.

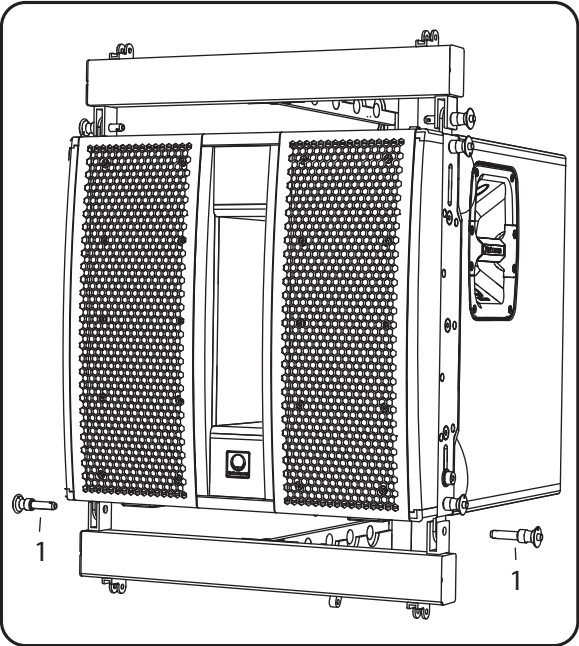
### Procedure 5.2 - Attaching the bottom TLX43-FLB Flybar to the TLX212L Subwoofer

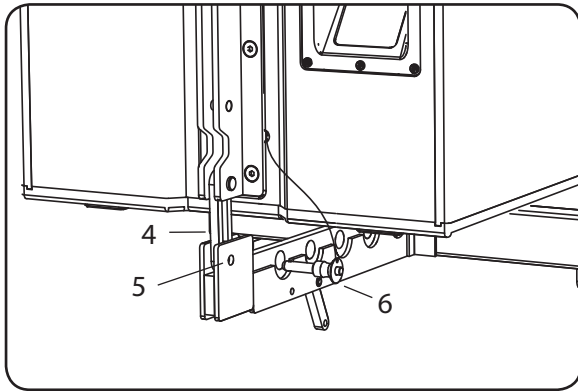


- 1. Remove the two front pins (1) and the rear drop link and pins (2) from the second (bottom) flybar. (The rear drop link and pins are not used, but the two front pins are.)
- 2. Line up the flybar with the bottom of the TLX212L subwoofer as shown.

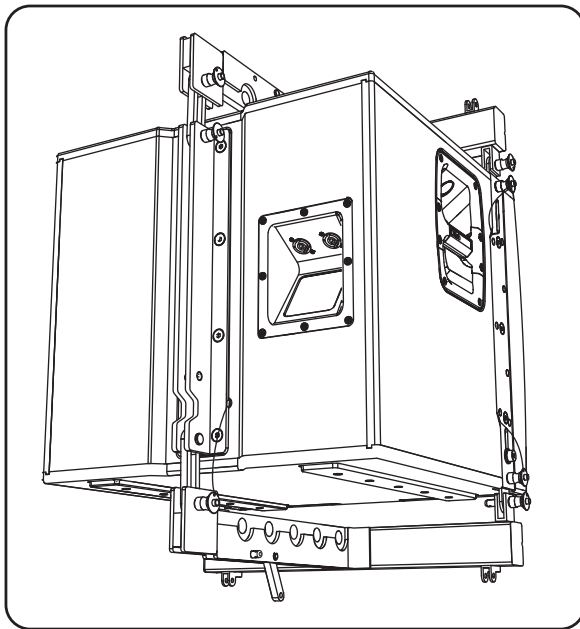


- 3. Align the flybar with the bottom front links (3) of the subwoofer, and insert the two front pins (1) to secure the flybar to the subwoofer.





4. Support the rear of the flybar and align the rear hole (5) of the flybar with the lower hole in the rear drop-down link (4) of the subwoofer.
5. Insert the rear pin (6) to secure the drop-down link to the flybar.



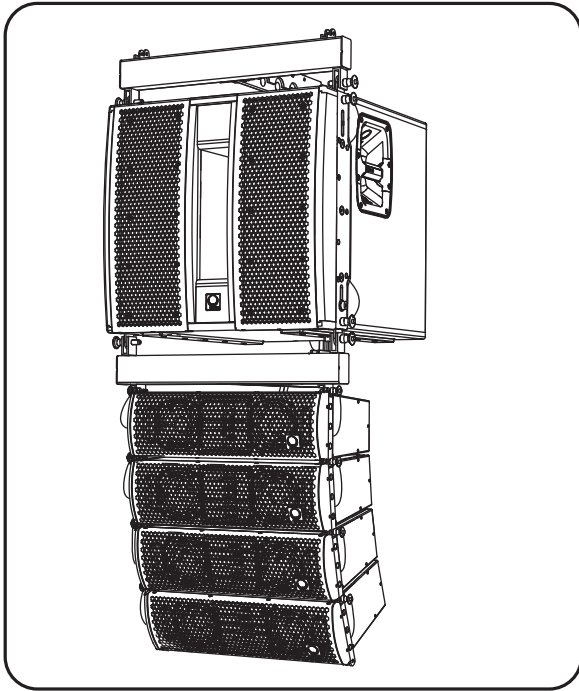
Double check that all pins are correctly inserted, and that the lower flybar is now securely attached to the subwoofer.



**NOTE**

Disassembly is the reverse of assembly.

### Procedure 5.3 - Attaching the TLX43 Cabinets to the TLX43-FLB Flybar



1. Perform the previous procedures shown in **Chapter 3** to attach a **maximum of four** TLX43 cabinets to the bottom TLX43-FLB flybar.

Follow all safety precautions in the procedure.



Procedure	Description of Work	Check
3.1	Connecting TLX43 cabinets to the TLX43-FLB flybar	

Alternatively, a previously-assembled group of four TLX43 cabinets can be assembled to the bottom TLX43-FLB flybar.



**WARNING**

DO NOT EXCEED A TOTAL QUANTITY OF 1 TLX212L SUBWOOFER AND 4 TLX43 CABINETS FOR THIS CONFIGURATION. FAILURE TO FOLLOW INSTRUCTIONS MAY CAUSE PERMANENT INJURY OR DEATH.



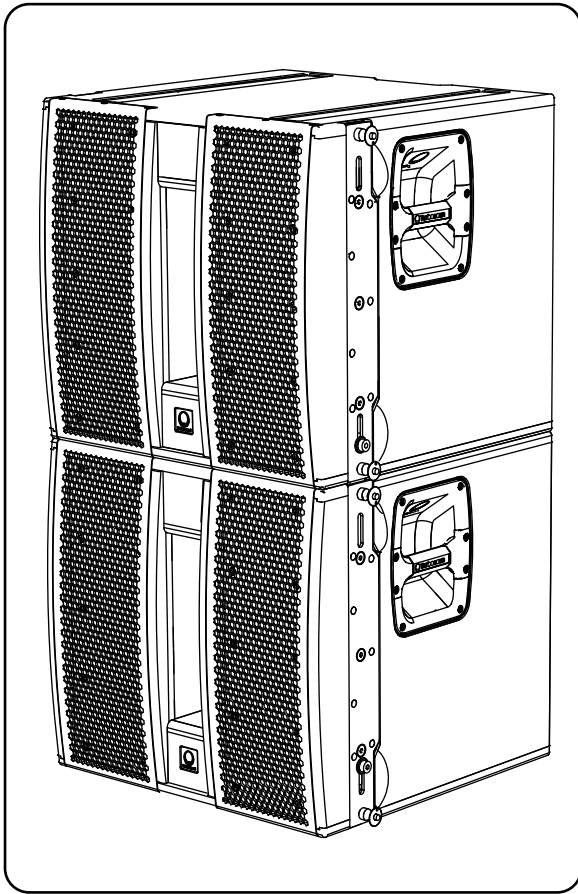
**WARNING**

THIS ARRAY SHALL ONLY BE MADE WITH THE TLX212L SUBWOOFER ON TOP, AND THE TLX43 CABINETS BELOW. FAILURE TO FOLLOW INSTRUCTIONS MAY CAUSE PERMANENT INJURY OR DEATH.

**NOTE**

Disassembly is the reverse of assembly.

## Chapter 6: Groundstack of two TLX212L Subwoofers



The following procedure describes how to assemble a groundstack with two TLX212L subwoofers.

The TLX212L subwoofers are attached using the 2 bottom mounting links and the rear drop-down link of the top subwoofer.

**⚠ WARNING**

DO NOT EXCEED A TOTAL QUANTITY OF 3 TLX212L SUBWOOFERS FOR THIS GROUNDSTACK CONFIGURATION. FAILURE TO FOLLOW INSTRUCTIONS MAY CAUSE PERMANENT INJURY OR DEATH.

**⚠ WARNING**

WHERE POSSIBLE ALWAYS SECURE THE GROUND-STACKED SPEAKERS TO THE STACKING SURFACE WITH ADDITIONAL FIXINGS SUCH AS RATCHET STRAPS.

### 6.0.1 Required Components

Item	Quantity
TLX212L Subwoofer	3 (maximum)

### 6.0.2 Location

The TLX212L subwoofers should be located on a flat, horizontal, and dry surface, capable of supporting the weight of the complete assembly.

### 6.0.3 Measured Weights

Item	Quantity	Weight (kg)	Weight (lbs)
TLX212L	1	43	94.8
	2	86	190
	3	129	284

### 6.0.4 Personnel

The following procedures shall be undertaken by experienced, certified, qualified, and authorised personnel only. The procedures require the use of three or more authorised persons.



Protective Headwear shall be worn



Protective Footwear shall be worn



Protective Gloves shall be worn

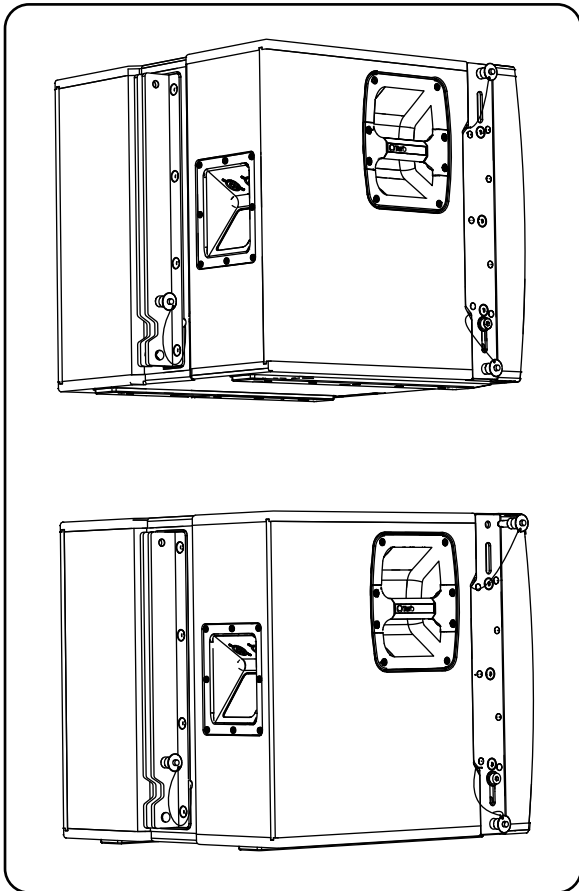


Protective Eyewear shall be worn



Practice Safe Lifting

## Procedure 6.1 - Assembling the two TLX212L Subwoofers

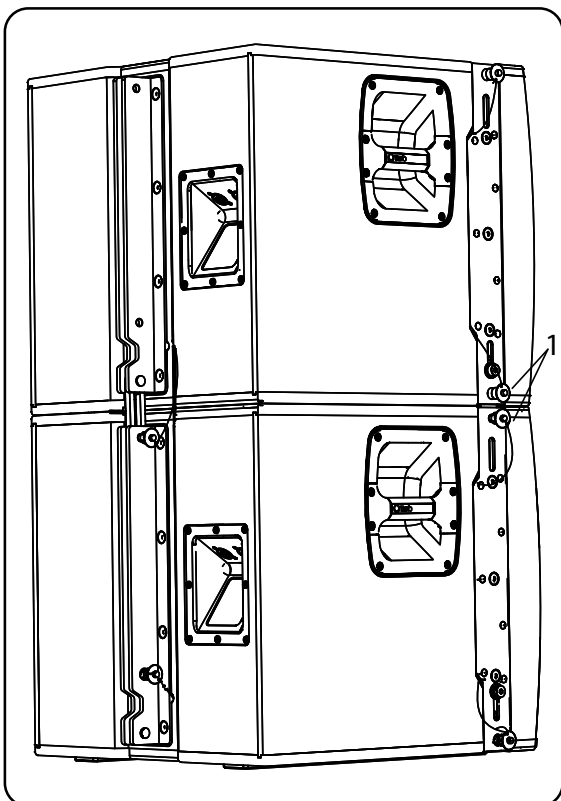


1. Make sure the bottom subwoofer is on a flat, horizontal, and steady surface.
2. Carefully lower the top subwoofer on top of the bottom subwoofer and allow the stacking runners on the bottom of the upper enclosure to self-center with the stacking recesses on the top of the lower enclosure.

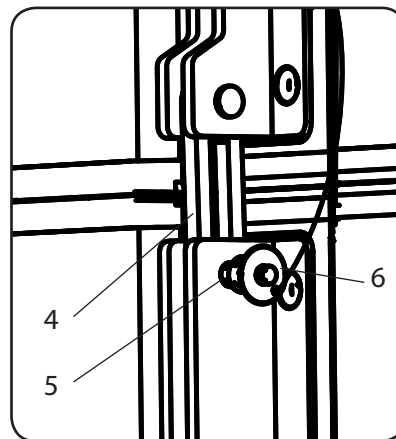
Take care not to trap your fingers between components.



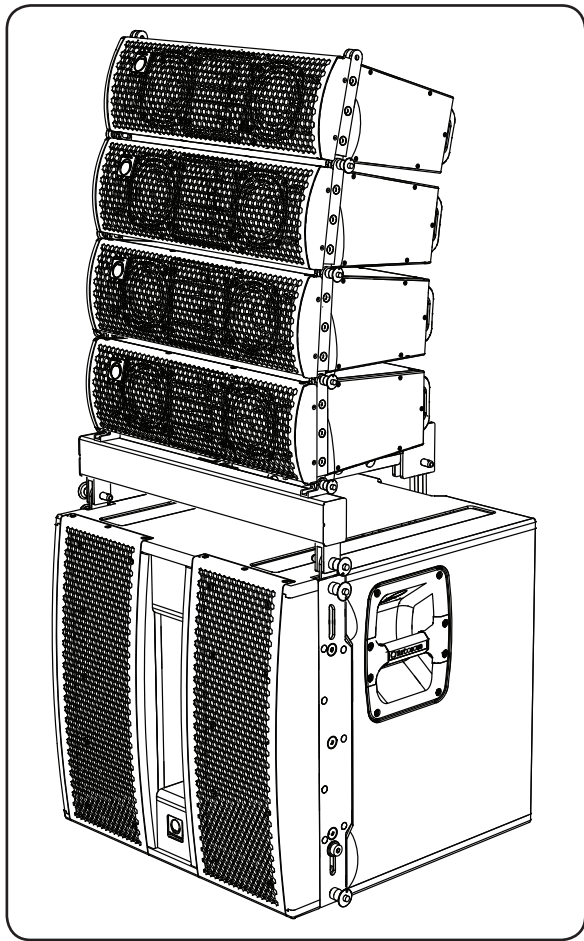
3. Remove the front rigging pins on both sides of the lower TLX212L subwoofer. Remove rigging pins on the front drop links of the upper TLX212L subwoofer and lower the drop links into position between upper and lower subwoofers.
4. Secure front drop links using two rigging pins (1) on upper and lower TLX212L subwoofers on both sides (4 rigging pins total).
5. Remove the rigging pin on the rear drop link of the upper TLX212L subwoofer and rotate the drop link into position between upper and lower subwoofers.



6. Insert the rear pin (6) to secure the drop down link (4) of the top subwoofer into the mounting hole (5) of the bottom subwoofer.



## Chapter 7: Groundstack TLX212L Subwoofer and TLX43 Array



The following procedure describes how to assemble a groundstack with a TLX212L subwoofer as a base and an array of four TLX43 cabinets on top.

The TLX43-FLB flybar is attached to the top of the TLX212L subwoofer, using 2 front pins and a rear drop-down link supplied with the TLX43-FLB flybar.

The array of up to 4 TLX43 cabinets is built on top of the TLX43-FLB flybar.

**⚠ WARNING**

DO NOT EXCEED A TOTAL QUANTITY OF 4 TLX43 CABINETS FOR THIS GROUNDSTACK CONFIGURATION. FAILURE TO FOLLOW INSTRUCTIONS MAY CAUSE PERMANENT INJURY OR DEATH.

**⚠ WARNING**

WHERE POSSIBLE ALWAYS SECURE THE GROUND-STACKED SPEAKERS TO THE STACKING SURFACE WITH ADDITIONAL FIXINGS SUCH AS RATCHET STRAPS.

### 7.0.1 Required Components

Item	Quantity
TLX43-FLB Flybar	1
TLX212L Subwoofer	2 (maximum)
TLX43 Cabinet	4 (maximum)

### 7.0.2 Location

The TLX212L subwoofer should be located on a flat, horizontal, and dry surface, capable of supporting the weight of the complete assembly.

### 7.0.3 Measured Weights

Total Measured System Weight			
Item	Quantity	Total Weight including one TLX43-FLB Flybar and one TLX212L Subwoofer	
TLX43	1	57.8 kg	127 lbs
	2	65.8 kg	145 lbs
	3	73.8 kg	163 lbs
	4	81.8 kg	180 lbs

### 7.0.4 Personnel

The following procedures shall be undertaken by experienced, certified, qualified, and authorised personnel only. The procedures require the use of three or more authorised persons.



Protective Headwear shall be worn



Protective Footwear shall be worn



Protective Gloves shall be worn



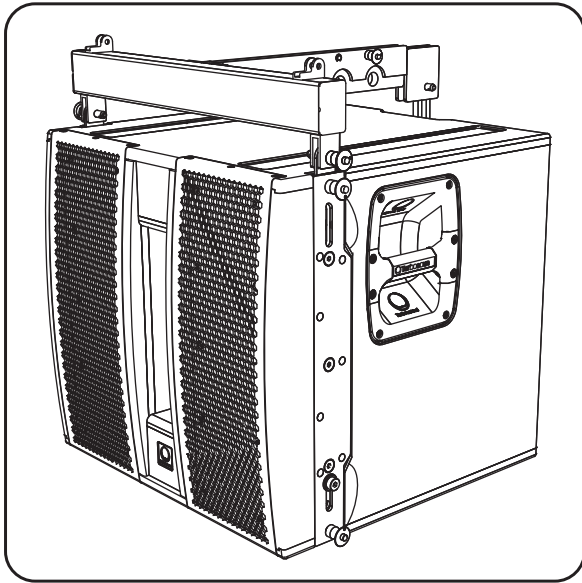
Protective Eyewear shall be worn



Practice Safe Lifting



## Procedure 7.1 - Attaching the top TLX43-FLB Flybar to the TLX212L Subwoofer



1. Perform the previous procedures in **Chapter 4**: 4.1, 4.2, and 4.3, to attach the TLX43-FLB flybar to the TLX212L subwoofer.

Procedure	Description of Work	Check
4.1	Installing the TLX212L Subwoofer Top Mounting Links	
4.2	Preparing the TLX43-FLB Flybar for flying a TLX212L	
4.3	Attaching the TLX43-FLB Flybar to the TLX212L Subwoofer	

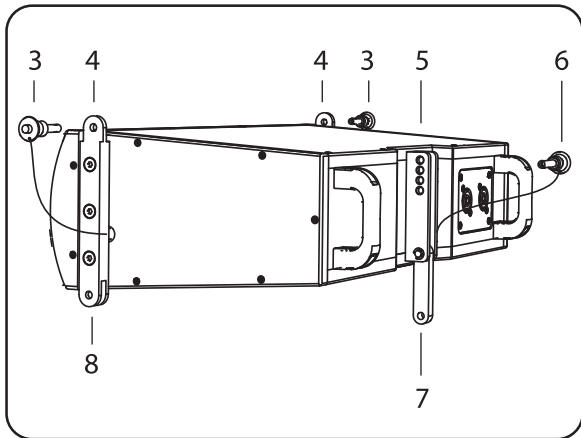
2. Double check all the connections to make sure the flybar and subwoofer are securely attached together.



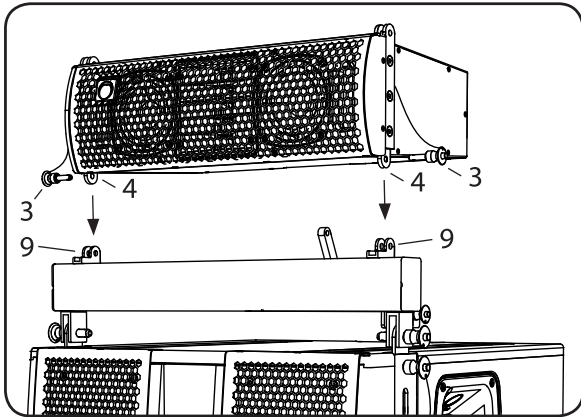
### NOTE

Disassembly is the reverse of assembly.

## Procedure 7.2 - Attaching the TLX43 Cabinets to the TLX43-FLB Flybar

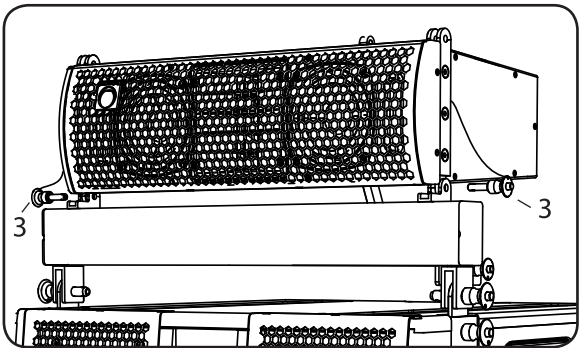


1. Prepare the first TLX43 cabinet, by pulling out the front two pins (3) from the top mounting lugs (4), and remove the rear pin (6) from the rear mounting hole (5). The rear drop-down link (7) of the cabinet will drop down.

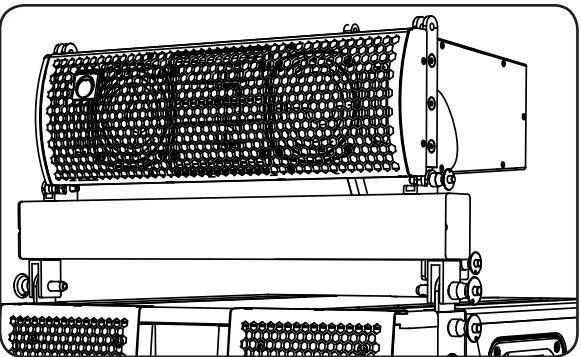


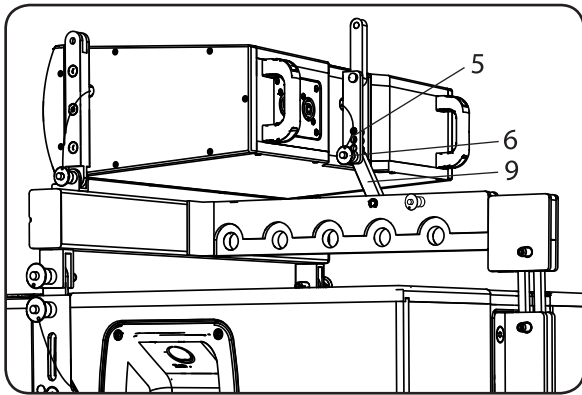
2. Turn the TLX43 cabinet upside-down.
3. Carefully lift the TLX43 cabinet onto the TLX43-FLB flybar on top of subwoofer, and align the front mounting lugs (9) of the flybar with the two mounting lugs (4) of the TLX43 cabinet.

Take care not to trap your fingers between components.



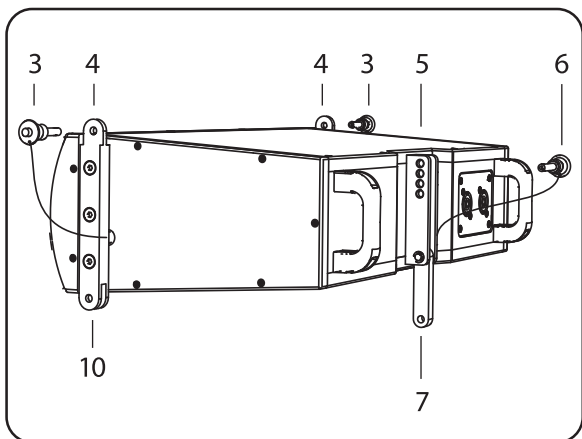
4. Insert the front two pins (3) to secure the front mounting lugs (9) of the flybar with the two top mounting lugs (4) of the TLX43 cabinet. Support the rear of the cabinet until the flybar's rear link is connected in the next step.



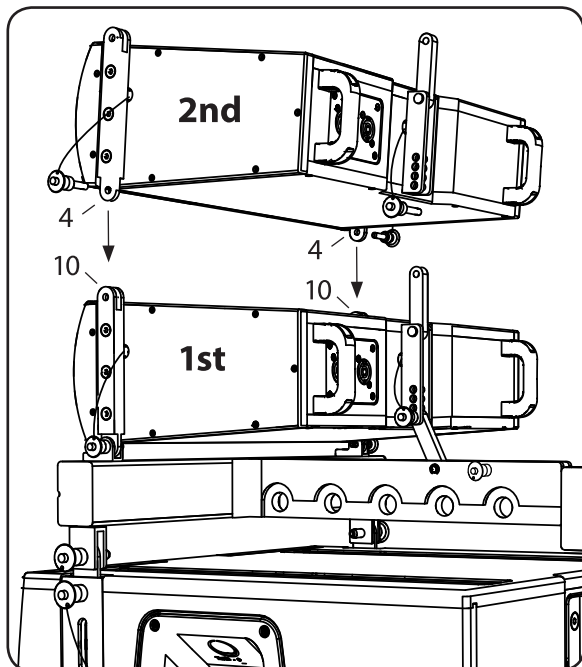


5. Align the flybar's link (9) with the desired hole (5) in the TLX43 rear bracket. The holes are marked with the angle.
6. Insert the rear pin (6) to secure the flybar link (9) to the TLX43 cabinet.

Double check all pins are correctly inserted, before proceeding further.

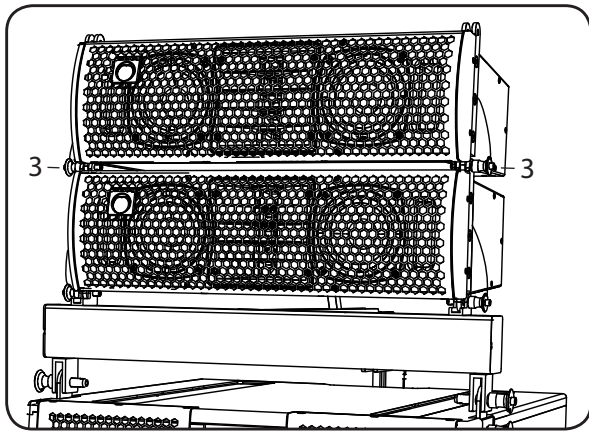


7. Prepare the second TLX43 cabinet, by pulling out the front two pins (3) from the top mounting lugs (4), and remove the rear pin (6) from the rear mounting hole (5). The rear drop-down link (7) of the cabinet will drop down.



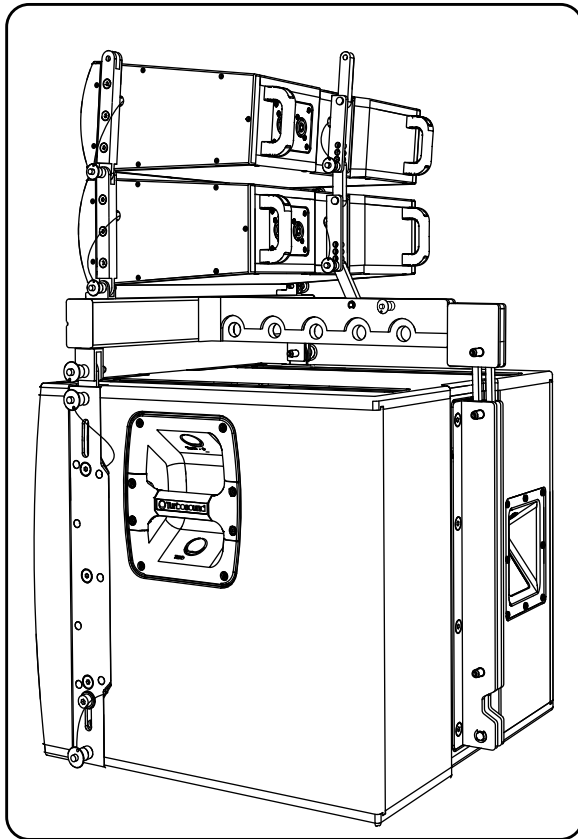
8. Turn the TLX43 cabinet upside-down.
9. Lift this TLX43 cabinet until the front two mounting lugs (4) align with the two mounting lugs (10) of the TLX43 cabinet below it.

## Procedure 7.2 continued

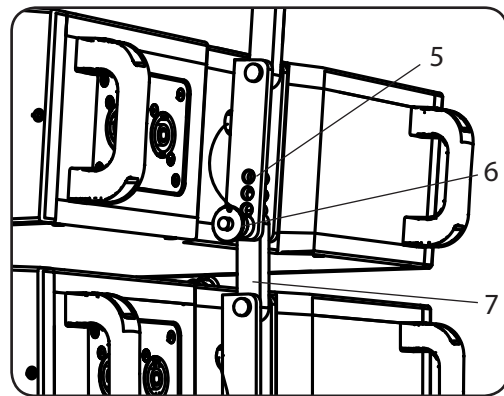


10. Insert the front two pins (3) to secure the front two mounting lugs to the two mounting lugs of the TLX43 cabinet below it. Support the rear of the cabinet until the rear link is connected in the next step.

Take care not to trap your fingers between components.

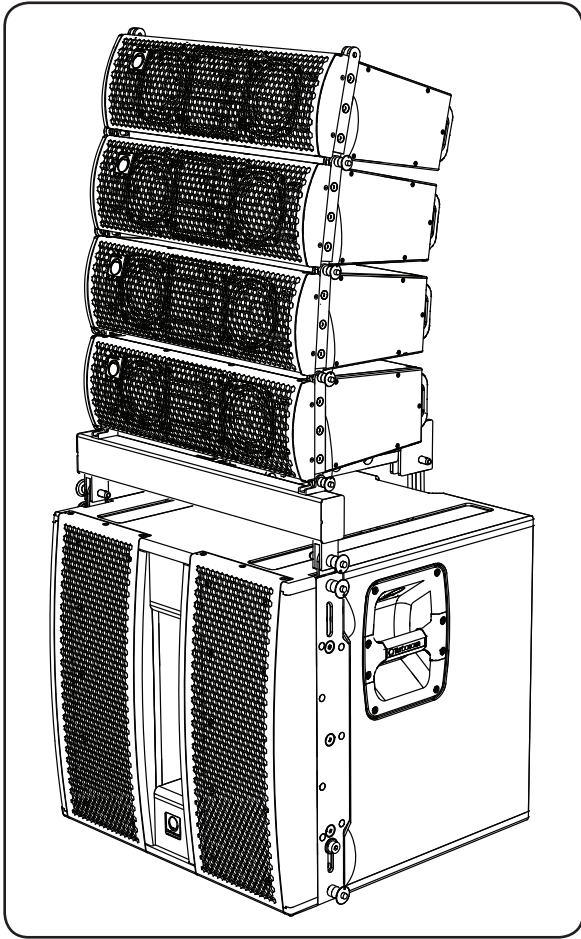


11. Align the rear link (7) of the bottom TLX43 cabinet with the desired mounting hole (5) in the rear of the TLX43 cabinet above it.
12. Insert the pin (6) to secure the rear link (7) of the bottom cabinet to rear of the cabinet above it.



Double check all pins are correctly inserted, before proceeding further.





13. The addition of other TLX43 cabinets is performed by repeating procedure steps 7 through 12 for each additional cabinet.

**!** **WARNING**

DO NOT EXCEED A TOTAL QUANTITY OF 4 TLX43 CABINETS FOR THIS GROUNDSTACK CONFIGURATION. FAILURE TO FOLLOW INSTRUCTIONS MAY CAUSE PERMANENT INJURY OR DEATH.

**NOTE**

Disassembly is the reverse of assembly.

## Chapter 8: Safety Inspection



The following notes must be read and followed before suspending the systems or ground stacking:

### Cabinets

Inspect all cabinets carefully and make sure that all surfaces are clean, in good condition, and free from cracks, corrosion, or any other defects that may weaken the assembly. Check for any missing screws, rigging pins, mounting links, or drop down links, pivot pins, or their circlips.

All cabinets must be clean and dry, and free from any debris that might cause incorrect or faulty operation.

Check that all mounting holes are clean and in good condition, and will accept the rigging pins correctly.

### Flybar

Inspect the flybar carefully and make sure it is in good condition and free from cracks, corrosion, or any other defects that may weaken the assembly. Check for any missing rigging pins, or drop down links.

Check that all mounting holes are clean and in good condition, and will accept the rigging pins correctly.

### Rigging Pins

Inspect all rigging pins carefully and make sure they are in good condition and free from cracks, corrosion, or any other defects that may weaken them.

Check that the retaining ball bearings are present and operate correctly.

Check that all rigging pins and connecting drop down links are correctly and fully inserted.

### Drop Down Links

Inspect all drop down links and their pivot pins and circlips carefully and make sure they are in good condition and free from cracks, corrosion, or any other defects that may weaken them.

Check that the retaining pivot pins are present and operate correctly to retain the drop down links.

Check that all circlips are present, installed correctly, and retain the pivot pins correctly.

### Care and Maintenance

In addition to regular inspections, make sure that all equipment is kept clean and dry by careful brushing and wiping down with a cloth. Light use of lubrication such as WD40 may be applied to the rigging pins and mounting holes.

All equipment must be stored in a clean and dry state to prevent corrosion.

### Transportation

Use only recommended road cases to transport the loudspeakers and components.

### Regularly Scheduled Inspections



In addition to the visual inspection of all rigging components, regular, more rigorous test and inspection of rigging components must also be carried out. Safety legislation and test and inspection requirements will vary from country to country. In most cases, semi-annual or annual independent test and inspection by a suitably approved and qualified inspector will be required. Users must ensure compliance with all applicable safety requirements. TURBOSOUND recommends regular safety inspections, and further recommends that a logbook be kept detailing the test and inspection history of each TURBOSOUND rigging accessory. Always wear protective head-wear, footwear and eye protection in accordance with local regulations. Anyone involved in suspending ANY sound system should take note of the following advice:

The rigging of a suspended sound system may be dangerous unless undertaken by qualified personnel with the required experience and certification to perform the necessary tasks. Fixing of hanging points in a roof should always be carried out by a professional rigger and in accordance with the local rules of the venue. The house rigger and/or building manager must always be consulted.

## Chapter 9: Enclosure Quantities and Combinations for TLX43-FLB Flybar Suspension at 10:1, 7:1, 5:1 Design Factors

Maximum allowed TLX43 and TLX212L enclosure quantities and combinations for suspension using TLX43-FLB Fly Bar at 10:1, 7:1 and 5:1 design factors.

Design Factor	Working Load Limit	Maximum Number of Suspended Cabinets / Weight									
		TLX43 Only		TLX212L Only		TLX212L / TLX43 Mixed Array					
5:1	188 kg (414 lbs)	TLX43	22	TLX212L	4	TLX212L	3	TLX212L	2	TLX212L	1
		TLX43-FLB	1	TLX43-FLB	1	TLX43	5	TLX43	11	TLX43	16
		Weight	183 kg (403 lbs)	Weight	179 kg (394 lbs)	TLX43-FLB	2	TLX43-FLB	2	TLX43-FLB	2
		Weight	183 kg (403 lbs)	Weight	188 kg (414 lbs)	Weight	185 kg (407 lbs)				
7:1	134 kg (296 lbs)	TLX43	15	TLX212L	2			TLX212L	2	TLX212L	1
		TLX43-FLB	1	TLX43-FLB	1			TLX43	4	TLX43	9
		Weight	127 kg (280 lbs)	Weight	93 kg (205 lbs)			TLX43-FLB	2	TLX43-FLB	2
		Weight	127 kg (280 lbs)	Weight	93 kg (205 lbs)	Weight	132 kg (290 lbs)	Weight	129 kg (284 lbs)		
10:1	94 kg (207 lbs)	TLX43	10	TLX212L	2					TLX212L	1
		TLX43-FLB	1	TLX43-FLB	1					TLX43	4
		Weight	87 kg (191 lbs)	Weight	93 kg (205 lbs)					TLX43-FLB	2
		Weight	87 kg (191 lbs)	Weight	93 kg (205 lbs)			Weight	89 kg (195 lbs)		

Local Regulatory Compliance: The design factor and Working Load Limit (WLL) ratings of the TLX suspension system are intended to be in compliance with all known regulatory statutes. Recommendations throughout this manual are based on a 10:1 design factor, however there are variations internationally in the regulations and practices applying to suspension of sound systems in public places and 7:1 or 5:1 design factors may be acceptable. IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO MAKE CERTAIN THAT ANY TURBOSOUND LOUDSPEAKER SYSTEM IS SUSPENDED IN ACCORDANCE WITH ALL APPLICABLE NATIONAL/FEDERAL, STATE/PROVINCIAL, AND LOCAL REGULATIONS.

## Manufacturer's Declaration

We, MUSIC Group Manufacturing PH Ltd.

MUSIC Group Manufacturing PH Ltd.  
17A Brunswick Street  
Hamilton HM 10  
Bermuda

Do hereby declare that the following components:

TLX43 Loudspeaker Cabinets  
TLX212L Subwoofer Cabinets  
TLX43-FLB Flybar

are in compliance with the relevant fundamental safety and health criteria of the applicable EC Directive(s).

This declaration is void if unauthorised modifications are made to the equipment.

### National standards and technical specifications applied:

#### DIN EN ISO 12100

Safety of machinery - General principles for design - Risk assessment and risk reduction

#### BGV C1

Accident-prevention regulation, "Staging and Production Facilities for the Entertainment Industry"

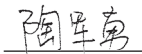
#### ANSI E1.8 - 2012

Entertainment Technology—Loudspeaker Enclosures Intended for Overhead Suspension—Classification, Manufacture and Structural Testing

#### 2006/42/EC

Machinery Directive

### The person responsible for making this declaration:



Jun Yong. Tao  
(COMP team Senior Engineer)

Date: 2016-11-21

MUSIC Group Manufacturing PH Ltd.  
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