Alsipercha

Alsipercha

Safety system designed to prevent falls from a height during the formwork boarding process.

Alsipercha

A safety system, especially useful for PERIMETERS. The system ensures completely safe conditions while installing: boards, safety handrails, gallows-type safety nets, formwork risers and all activities involved in formwork assembly where there is risk of falling from a height.
Easy to assemble and use, does not require outside installers.

Features of the system

- Allows the operator to work safely covering an area of 125 m^2 and moving within a radius of 6.5 m around the column.
- Inverted “L” shaped metal structure measuring 2.5 m long and 4.3 m high (3.5 m when attached to the column).
- Metal structure weighing 80 Kg, made of high quality steel (elastic limit 42 - 46 Kg/mm^2; breaking strength 61 - 76 Kg/mm^2).
- Retractable device measuring 2.5 m maximum length.
- Sunk-in cone-shaped steel tube measuring 85 cm long.
- To be moved by crane.
- With a wide range of accessories for use in any building site situation, ensuring safety at all times.
- A system designed for column heights up to 8 m (this requires use of the hook accessory).

Info The system and its components must be used by competent, qualified personnel.

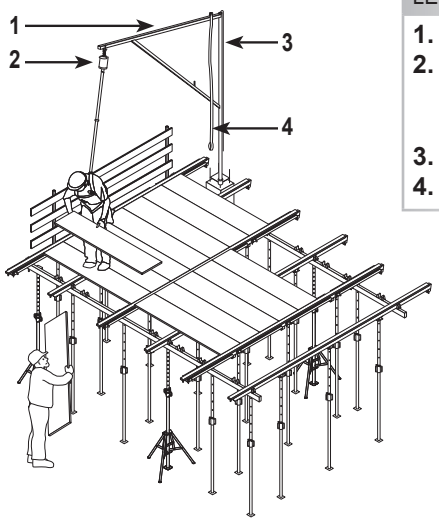
Info The system and its accessories must be inspected by competent, qualified personnel:
- Before first use and subsequent use.
- After the system is activated by a fall.
- At regular intervals (at least once a year). The inspection records may be called for. Certain individual components may require inspection at shorter intervals.
- Never use the equipment if wear, rust or unauthorized repair attempts are detected in any part of the system.
- Do not use the system for any use other than that which it was designed for.
- Use approved harnesses only.
- Do not use or fasten any components or accessories that have not been supplied by the manufacturer.
- The user must assess the risk involved before using the system

The illustrations in this assembly and safety manual are guidelines and, at any event, they may not reflect all the possible assembly formats.

Limitations of the system

- The structure on which the system is mounted must be capable of bearing the weights indicated.
- The maximum working radius when the worker is anchored to the system with the safety harness is 6.5 m. Do not attempt to extend this working radius with ropes or other such methods.

System components

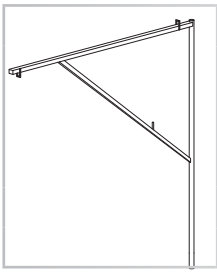


LEGEND
1. System body
2. Retractable device with protector
3. Hook
4. Sling

Alsipercha is CE certified in accordance with the DIN EN 795 standard (Notified Body 0299)


DGUV Test
EC-Type Test Certificate

Component Description



ALSIPERCHA BODY

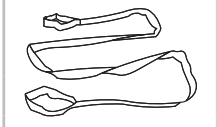
Description: Inverted “L” shaped unit, anchored in the column with a working radius of 6.5 m that allows access to a surface area of 125 m^2.

code	dimensions (m)	weight (kg)
84411		80

HOOK S.A.

Description: Component used to bring the Alsipercha fall arrest system closer to the worker when changing the anchorage.

code	dimensions (cm)	weight (kg)
83418	9 X 4	2



SLING

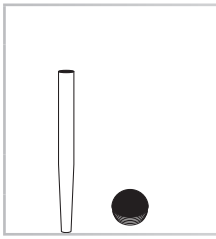
Description: An essential component used to move the assembly with a crane, to take it to the column, or remove it once the work is complete.

code	dimensions (m)	weight (kg)
84414		0.62

CYLINDRICAL LEVELLER S.A.

Description: Component that is introduced into the cast-in tube, in order to ensure its verticality and prevent the Housing Tube S.A. from rising under the pressure of the concrete.

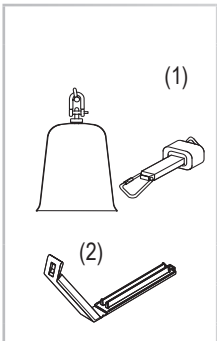
code	dimensions (m)	weight (kg)
83416		3.96



HOUSING TUBE S.A.

Description: Component that is sunk into the concrete column and houses the Alsipercha fall arrest system.

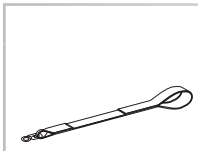
code	dimensions (m)	weight (kg)
84410		2.71



RETRACTABLE DEVICE W/PROTECTOR S.A.

Description: Retractable component that locks on a sudden acceleration. It also has the Red Clamp, which is a clip placed in such a way that the strap of the retractable device stays hanging at a length of 1 m, so that it stays within reach of the workers.

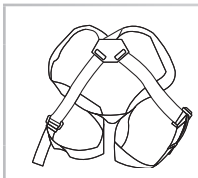
code	dimensions (m)	weight (kg)
84412 (1)		1.599
84420 (2)		0.1



HARNESS EXTENSION W/CLASP S.A

Description: Component joining the operator to the retractable device with 1.5 m maximum length.

code	dimensions (m)	weight (kg)
84423		0.31



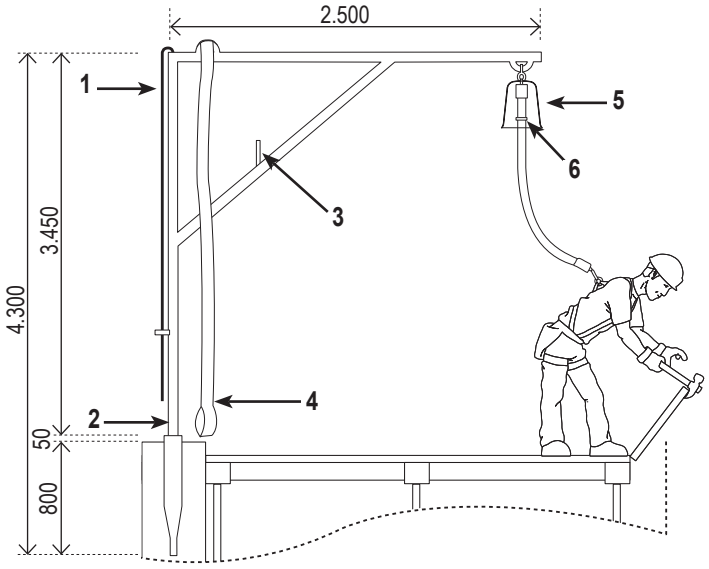
HARNESS S.A.

Description: Device anchoring the operator to the Alsipercha fall arrest system.

code	dimensions (m)	weight (kg)
84415		1

Assembly process

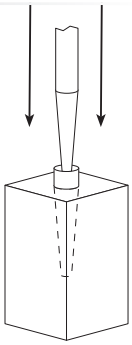
Step 1/4_System components



LEGEND

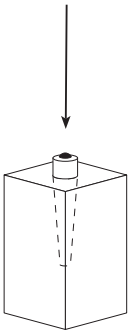
1. Hook (accessory for changing the anchor point)
2. Alsipercha Body (the main body that turns through 360º and allows the operator to work freely)
3. Pivot (used to anchor the hook)
4. Sling (used to move the assembly with a crane)
5. Retractable device (with protective hood)
6. Red clamp (to adjust the length of the retractable device)

1.- Immediately after pouring the concrete columns, place the conical tube in the center of the latter, protruding 5 cm. This tube will later accommodate the Alispercha column.



Detail of the placement of the Fall Arrest System in the conical tube

2.- Use the leveller to make sure that the tube is vertical and does not rise up. The column is strengthened by the cast-in tube.

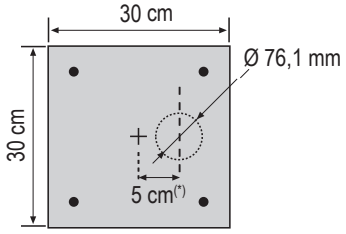


Leveller detail.

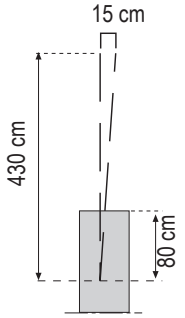
Technical details for arranging the conical tube.

Conical tube tolerances.

1) TOLERANCE IN DIVERSION, WITH RESPECT TO THE CENTRE OF THE COLUMN



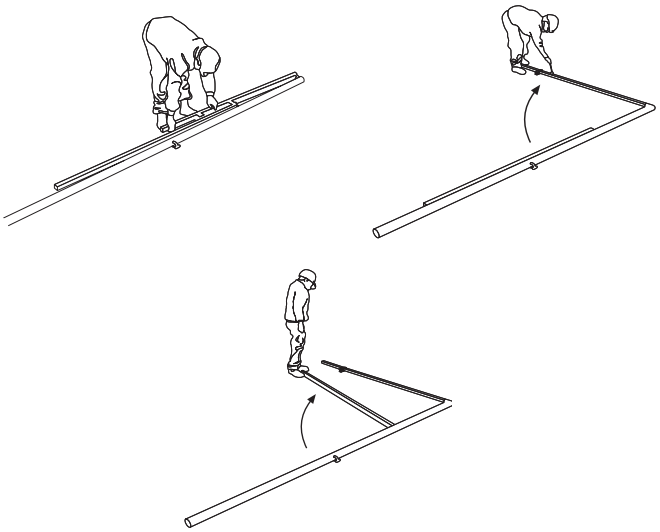
2) TOLERANCE IN VERTICAL DIVERSION



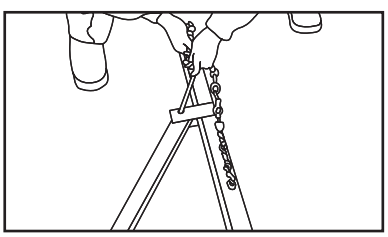
(*) This tolerance will vary depending on the column section. If using the Alsipercha system in columns with a section smaller than 30 cm, cracks may appear in the concrete. In this case, consult the structure client.

Step 2/4_System assembly

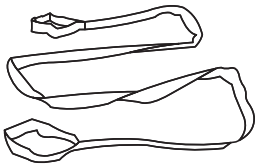
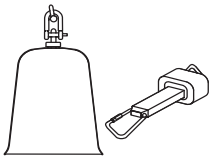
1.- Open out the Alsipercha Body.

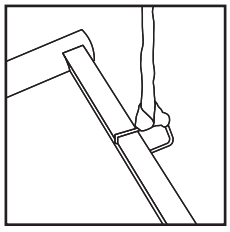


2.- Use the pin to fix the Alsipercha Body.



3.- Install the sling and the hooded retractable device.

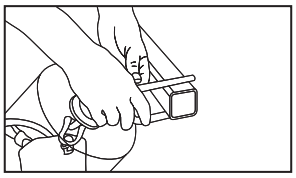
Sling	Retractable device with hood
	



Detail of sling installation:
To move the Alsipercha to its location on the column,
and to remove it once hazardous operations have been completed.

Precautions:

Warning Precautions:
- Use the slings supplied by Marwood.
- Do not allow loads to rest on the sling if they could damage it.
- Protect the sling against adverse weather conditions.
- Each sling should be examined before use. Remove the sling if it presents cuts, especially at the edges.
- Place the sling in its correct position (bight angles no greater than 120º and stable load).

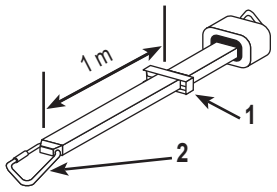


Detail of the installation of the retractable device and protective hood.
It is important to close the clasp properly.

Check:

Info Before using the retractable device, check:
- That the strap winds and unwinds completely without difficulty.
- That the locking function works correctly, by jerking the strap.
- That the entire assembly is in perfect condition, with no cuts or loose threads.
- That the metal parts are not rusted and the snap hooks work and close correctly.

When not in use, keep it clean and store in a dry place.



LEGEND
1.- Clamp
2.- Carabiner

Place the Retractable Red Clamp S.A. at 1 m from the lower snap hook so that it is within the reach of the operator once the Alsipercha Body has been placed in the tube housing in the column.

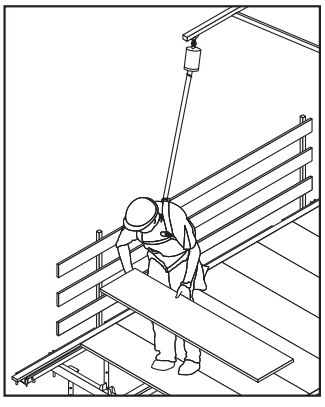
Step 3/4_Installing and using the Alsipercha

1.- Use a crane to place the Alsipercha Body in the column tube.

2.- 36 hours after pouring the column concrete, the Alsipercha can be used to: install boards, handrails, risers,...

When all the boards, handrails, netting for perimeter and openings have been put in place and the perimeter boards have been nailed and watered (dry climate), the Alsipercha Body can be removed.

Now we can start the panelling process from one end of the floor, working in an assured position with a radius of 6.5 m., which is equivalent to about 125 m2.



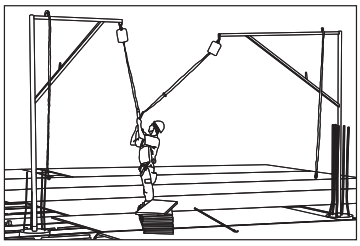
System limitations:

- The maximum number of users in each system will only be 1 (one). The system's resistance capacity is based on the weight of the person using it and the lightweight tools that may be carried, and this weight must not exceed 100kg in total.
- The structure where the system is assembled must be sufficiently resistant.
- The maximum action radius, once the system is anchored, is 6.5m. Do not try to widen this radius by lengthening the retractable system to which it is tied

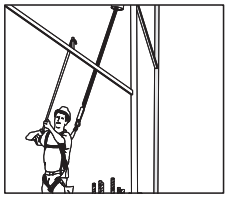
Precaution

- ONLY use slings supplied by Marwood.
- Do not keep weight hanging from the sling, as this may damage it.
- Protect the sling from inclement weather conditions.
- Each sling must be checked before being used. Reject it if it has any cuts, particularly if the cuts are at the ends.
- Place the sling in its correct position of use and the load stable.

Step 4/4_Repositioning the Alsipercha

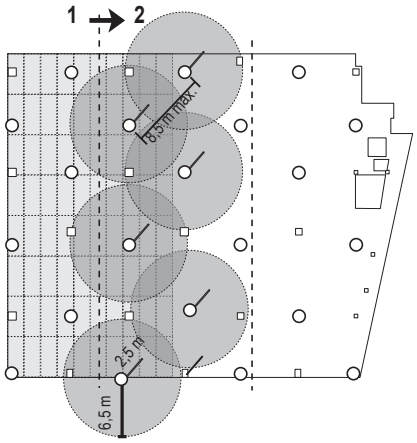


The Alsipercha allows the worker to change anchorings before unhooking from the first Alsipercha Body, so safety is maintained at all times.



Use the hook to do this if the next Alsipercha is positioned so that the worker cannot reach to anchor themselves.

Example of onsite layout

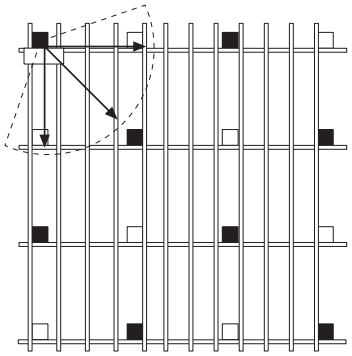


LEGEND	
Columns with a conical tube	**1.-**Starting the boarding of the floor **2.-** Direction of progress during boarding process
Body - 2.5 m Working radius - 6.5 m Distance between columns - 8.5 m	

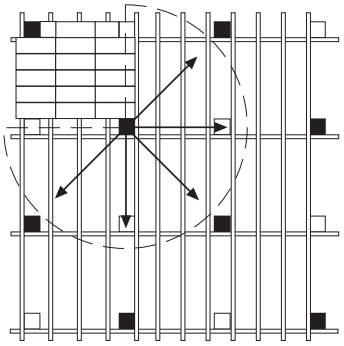
To facilitate use of the Alsipercha, we recommend prior planning of the working area where it is going to be used.
Thanks to advanced CAD systems, we can know where to place the Alsiperchas and how many are needed to optimize their use within the working radius.

Info A set of approximately 6 Alsipercha units are sufficient for complete formwork of a floor measuring approximately 500 m^2.

Working with the Alsipercha System

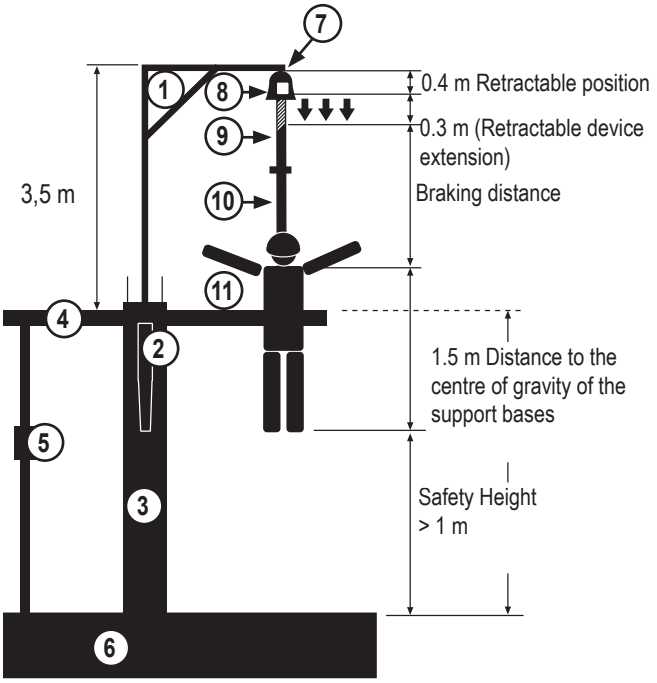


First, locate the embedded tubes in the columns where the Fall Arrest System is going to be accommodated and then begin the boarding process from that point.



Then begin the boarding process from one end of the surface and work safely with a radius of 6.5 m, which equals approximately 125 m^2.

Position after Fall



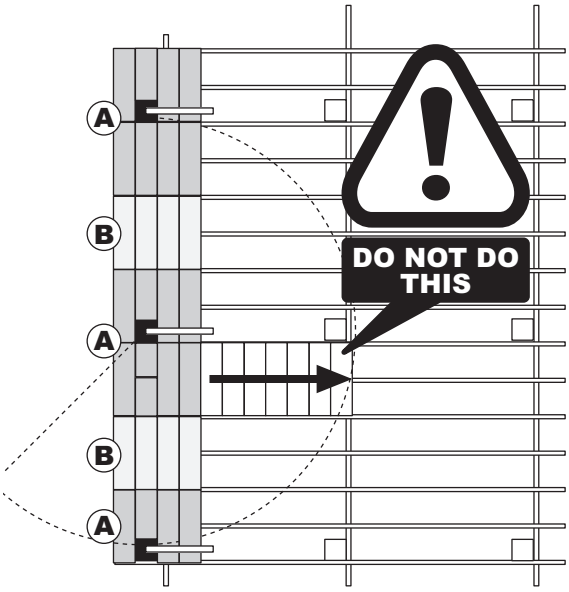
LEGEND	
1. Alsipercha	**7.** Anchor point
2. Housing tube	**8.** Protective hood
3. Column	**9.** Retractable device
4. Formwork	**10.** Harness extension
5. Struts	**11.** Operator
6. Ground	

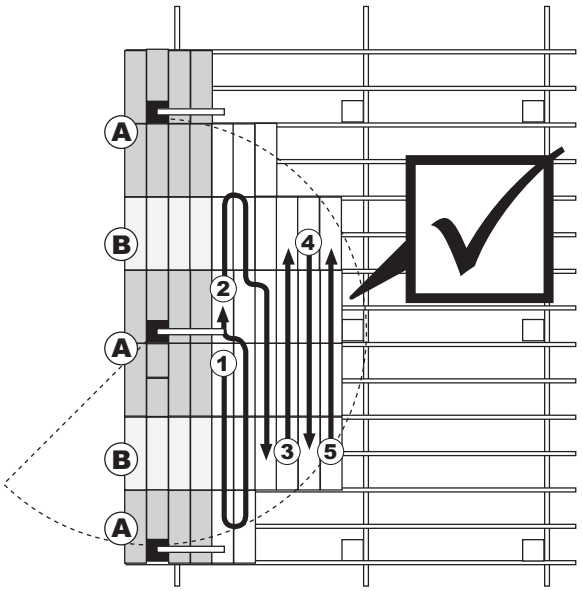
Info Rescue of operator after a fall: It is important that when operators work with the Alsipercha Fall Prevention System, they are not alone. In this way, in the event of a fall, the other operator can rescue the other, hopefully within a few minutes, in order to prevent injury due to loss of blood circulation in the legs. The rescuing operator, anchored to a safety point uses a hook to carry the trapped operator to the panelling area, in order to be able to stand up.

Extended user equipment for Alsipercha

Proposed alternative method of work, whilst using a 6.0m retractable block, with a 0,5m extended back anchorage.The extended user equipment will allow protected access along this leading edge for up to 8m in either direction.

The protected area covered by a single Alsipercha unit can be extended by using an alternative set of user equipment, however this MUST be used in a controlled and disciplined manner. Failure to follow the revised working method in detail, could result in a pendulum fall, or in an increased fall distance to the level below, both could result in injury or even death.





Important

It is extremely important that this increased protected area, is decked in a progressive, leading edge fashion working forwards from the Alsipercha body, in the priority sequence as shown beside.

Table of minimum concrete strengths

Shown below are the time periods for use (the time between pouring column concrete and when the Alsipercha can be used) depending on ambient temperature and column cross-section.

The results shown below are from tests performed with Alsipercha in columns measuring 30 x 30 cm^2, 25 x 25 cm^2 and 15 x 40 cm^2.

				AMBIENT TEMPERATURE				
Type of concrete	Column section (cm^2)	Min. compression value (Mpa)*1	Indirect tensile value (Mpa)*1	5ºC	10ºC	15ºC	≥20ºC	
Any type of structural concrete (HA-25 or superior)	30 x 30 (or superior) ***2**	3.27	0.37	28 h	23 h	19 h	15 h	Time periods for use in hours
	25 x 25 ***3**	4.72	0.52	30 h	24 h	20 h	16 h	
	15 x 40 ***3**	5.70	0.62	32 h	26 h	21 h	17 h	

(*1) When using the system for the first time.
(*2) For sections of 30x30 cm^2 or greater, the system allows for a maximum deviation in the position of the housing tube of 5 cm from the center of the column.
(*3) For sections of 25x25 cm^2 and 15x40 cm^2, the system allows for a maximum deviation in the position of the housing tube of 1 cm from the center of the column. Based on the tolerances allowed by the Spanish EHE Standard for deviation in column cross-sectional dimensions.

Info Study performed by the Universidad Politécnica de Valencia.

Appendix 1: Conditions of use on site

Below are the guidelines for reviewing each component of the Alsipercha Fall Arrest System. Reviews should be performed regularly, once per year at the very least.

As explained in Alsina's Alsipercha Assembly and Safety Manual, this review does not replace the visual inspection that the user should perform each time he or she uses the Fall Arrest System.

Retractable Review Procedure - 84412

Control guidelines	Procedure
Check that the belt **winds automatically** and unwinds normally along its whole length.	If it does not work, put the product to one side as **it is faulty**.
Check that the blocking function is operative, by pulling the belt sharply.	If it does not work, put the product to one side as **it is faulty.**
That the textile is in perfect condition, **without tears or loose ends.**	If it does not work, put the product to one side as **it is faulty**
That the metallic parts **are not oxidised** and that the karabiners work and **block correctly**.	
That the system includes the **red peg**	Otherwise, attach a **new one**.
It is important to check that the continuous energy absorber protected by the plastic and the fibres **forming it, have not broken**.	Otherwise the product will have to be put to one side because it has been dropped, and consequently **it is faulty**
Check that the hood assembly with eyebolts is in good condition. If any hoods are broken, misshapen, cracked, or missing a part, they must be removed. Pay close attention to how the hood's two upper eyebolts are attached. They should be welded or joined with a safety pin	Otherwise reject

Info To carry out the checks indicated below, it is **not** necessary to remove the retractable from the protective red hood.

Alsipercha Body Review Procedure . - 84411

Control guidelines	Procedure
Place the Alsipercha system on two trestles and open it up to: - Check that the bolts, pins, and nuts of the various extensions are in good condition and that they can move freely. - Check that the extensions are neither askew nor misshapen (maximum tolerance in both directions is 5 mm). Pay special attention to ensuring that the diagonal tube with spring is straight. - Clean the concrete and particularly some areas between the two lugs, as this is the area where various hanger accessories are housed. If these are closed, open them with a hammer, until the beam can enter. - Inspect the welds, especially on the ring to which the hood is attached.	If problems are identified with any of the above, contact the Marwood Group.

Warning - Never remove the Alsipercha Body's diagonal tube. It contains a shock absorber. Handling the tube may be dangerous. If any problem is observed in this diagonal, contact your local Marwood Group Depot

S.A. Hook Review Procedure - 83418

Control guidelines	Procedure
- Check that the hook is neither askew nor misshapen.	If the deformation is minor, it can be fixed provided that the tube structure is not misshapen.
- Clean the concrete.	
- Check that there are no fractures.	

S.A. Cylindrical Leveller Review Procedure - 83416

Control guidelines	Procedure
- Check that the leveller is in its original condition. Verify that it enters and exits a housing tube that is in good condition. - Check that there is no washer. Verify the level. Check that the leveller is not broken.	If problems are identified with any of the above, contact the Marwood Group.

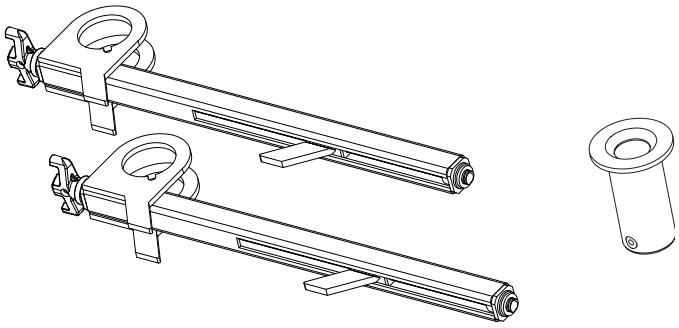
Textile Components review procedure: S.A. Sling - 84414, S.A. Harness - 84415, Alargo Harness with S.A. Jacket - 84421

Control guidelines	Procedure
- Check that all textile elements are present. Check that there are no tears (especially along the edges) or loose threads. - The textile material must be kept in a clean, dry place.	Otherwise reject

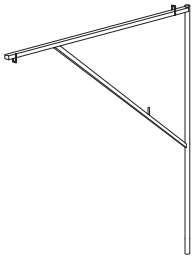
Assembly process for the column gripper sleeve

Characteristics and advantages

- Patented product made in steel, proving to be a much more lightweight accessory, easy and quick to assemble, and which only needs a hammer for attachment.
- Designed and manufactured according to the DIN EN 795 anchor devices standard.
- It can be attached to steel columns (Sections with IPE, IPN, HEB type wings, etc.) with sections from 15 to 45 cm.
- Only two sellable codes which, once assembled, are inseparable (Integrated Safety)
- Can be assembled by competent works personnel



Component Description



ALSIPERCHA BODY

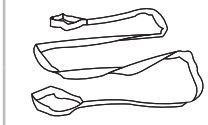
Description: Inverted “L” shaped unit, anchored in the column with a working radius of 6.5 m that allows access to a surface area of 125 m^2.

code	dimensions (m)	weight (kg)
84411	2500 x 4300	80

HOOK S.A.

Description: Component used to bring the Alsipercha fall arrest system closer to the worker when changing the anchorage.

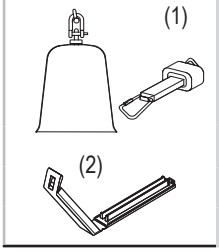
code	dimensions (cm)	weight (kg)
83418	140 x 2850	2



SLING

Description: An essential component used to move the assembly with a crane, to take it to the column, or remove it once the work is complete.

code	dimensions (m)	weight (kg)
84414		0.62



RETRACTABLE DEVICE W/PROTECTOR S.A.

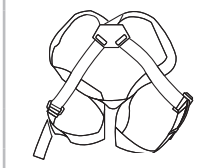
Description: Retractable component that locks on a sudden acceleration. It also has the Red Clamp, which is a clip placed in such a way that the strap of the retractable device stays hanging at a length of 1 m, so that it stays within reach of the workers.

code	dimensions (m)	weight (kg)
84412 (1)	2,5	1,599
84420 (2)		0,1

HORIZONTAL FALL ARRESTOR

Description: Retractable component that locks on a sudden acceleration.

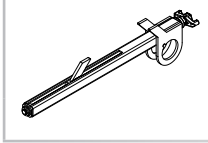
code	dimensions (m)	weight (kg)
FAH	10	6.25



HARNESS S.A.

Description: Device anchoring the operator to the Alsipercha fall arrest system.

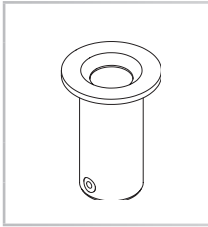
code	dimensions (m)	weight (kg)
84415		1



S.A. V-METAL COLUMN GRIPPER

Description: Accessory Alsipercha element, for scaffolding (attaching) fall arrest system to metal columns with wings (IPE, IPN, HEB... section type, etc.)

code	dimensions (mm)	weight (kg)
83424	755 x 55	6,27



S.A.V-METAL COLUMN GRIPPER SLEEVE

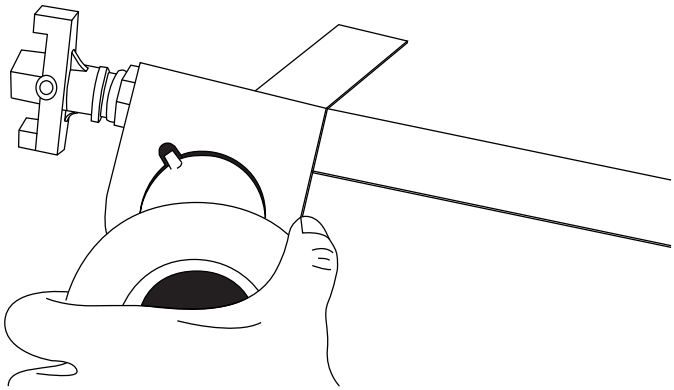
Description: Accessory Alsipercha element.

code	dimensions (mm)	weight (kg)
83426	154 ø65	1,24

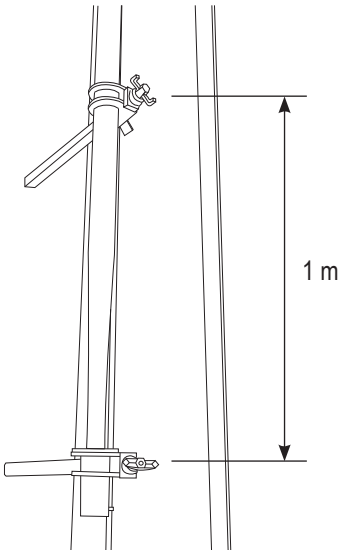
Assembly process

- For every Alsipercha sent to site, 2 S.A. V-METAL COLUMN GRIPPER units (code 83424) and 1 x S.A. V-METAL COLUMN GRIPPER SLEEVE unit (code 83426) will be sent.

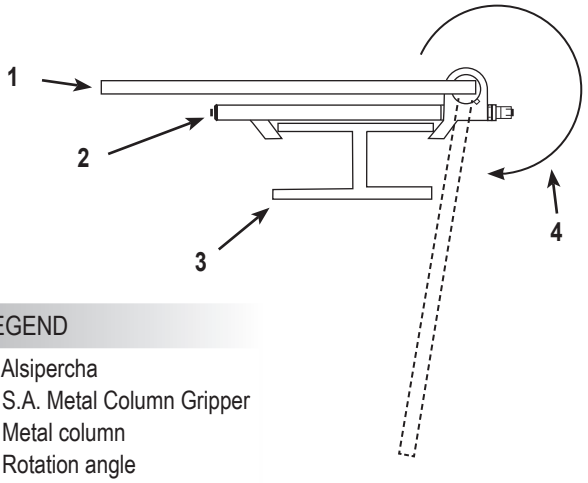
- The S.A. V-METAL COLUMN GRIPPER SLEEVE will be assembled in one of the S.A. V-METAL COLUMN GRIPPERS, passing the nipple of the sleeve through the grooves of the GRIPPER plate (this solution is called the “labyrinth”, and once the SLEEVE is assembled in the GRIPPER it prevents them from separating from one another).



- At the head of the metal column, we attach the S.A.V-METAL COLUMN GRIPPER, without SLEEVE, and 1 m below, we position the S.A.V-METAL COLUMN GRIPPER and the SLEEVE. Attach both GRIPPERS using a hammer, hitting the end nut hard (up to 50 Nm).



- Now the Alsipercha can be positioned, passing it through the housings in both grippers, until it abuts against the SLEEVE. Once the Alsipercha is connected, using the harness, the operator has a rotation angle of 280º approximately



LEGEND

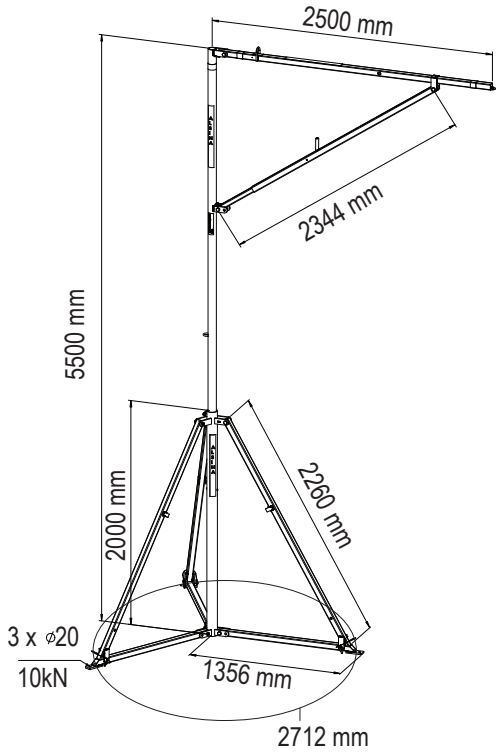
1. Alsipercha
2. S.A. Metal Column Gripper
3. Metal column
4. Rotation angle

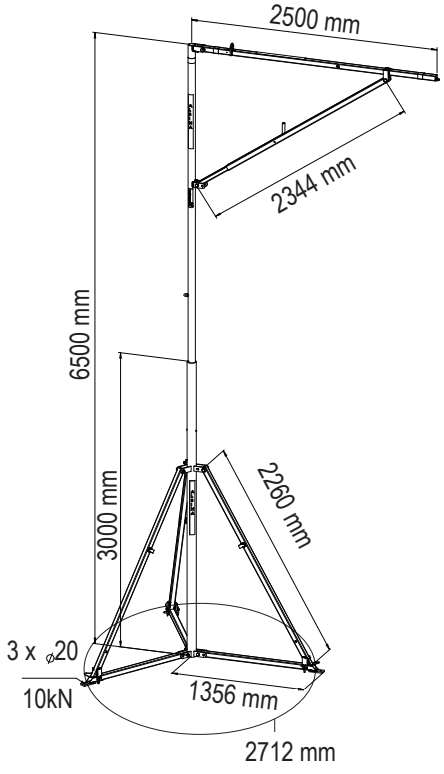
Alsipercha Tripod

Alsipercha Tripod assembly procedure

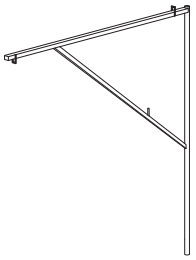
The ALSIPERCHA TRIPOD, together with Alsipercha, is a solution that allows operators to safely load/unload trucks from a trailer.

The ALSIPERCHA TRIPOD is folded up when it is delivered onsite. Once it has been placed in its work position, it is assembled according to the following steps:





Component Description



ALSIPERCHA BODY

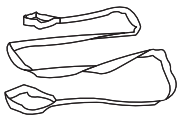
Description: Inverted "L" shaped unit.

code	dimensions (m)	weight (kg)
84411		80

HOOK S.A.

Description: Component used to bring the Alsipercha fall arrest system closer to the worker when changing the anchorage.

code	dimensions (cm)	weight (kg)
83418	140 x 2850	2



SLING

Description: An essential component used to move the assembly with a crane, to take it to the column, or remove it once the work is complete.

code	dimensions (m)	weight (kg)
84414		0,62

RETRACTABLE DEVICE 10M

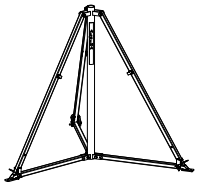
Description: Retractable component that locks on a sudden acceleration.

code	Dimensiones (m)	Weight (kg)
8441205	10	7

HARNESS S.A.

Description: Device anchoring the operator to the Alsipercha fall arrest system.

code	dimensions (m)	weight (kg)
84415		1



TRIPOD S.A.

Description: Element that supports and stabilizes the Alsipercha.

code	dimensions (m)	weight (kg)
84475	2	90
84478	3	98

FH FISCHER ANCHORS Ø18 M12X138.

Description:

code	dimensions (m)	weight (kg)
83479	18 x 80 x 25 S	0,01

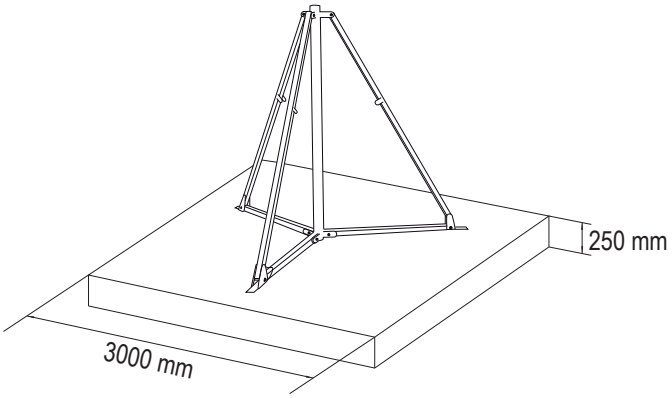
Alsipercha tripod mounting procedure

Info It is very important to mount the ALSIPERCHA TRIPOD on sufficiently compact and resistant terrain so that the anchor device provides sufficient safety guarantees. There are various terrain / slab / footing options:

Option of anchoring to concrete/slab footing

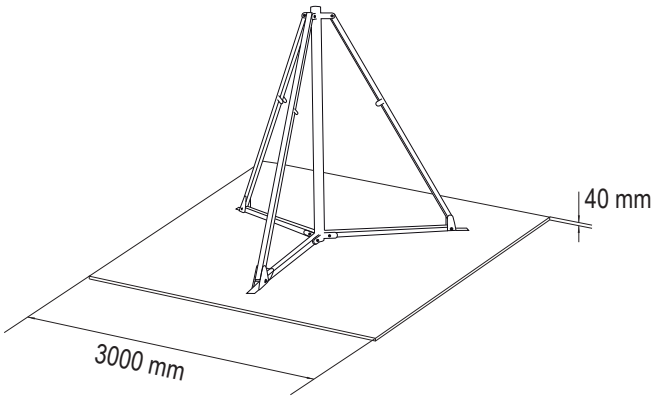
- Create a concrete footing that has the following characteristics as a minimum: HA25 concrete or higher (minimum resistance of concrete for use = 10 MPa, if fresh concrete is used), measurements of 300 x 300 cm and thickness of 25 cm, as well as a scrap metal covering.

  In this case, the anchor will consist of placing 3 “M12 FISCHER FH 18X80/25 S HIGH RESISTANCE ANCHORS” (or equivalent).



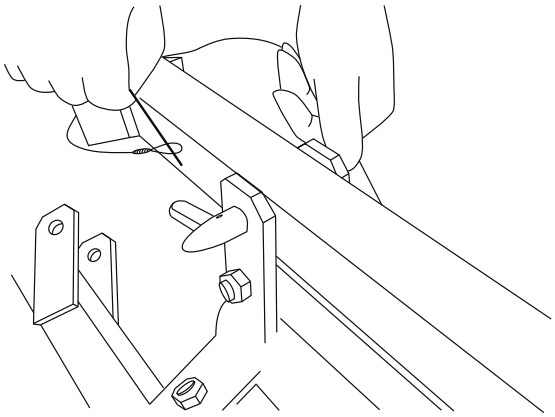
Option of anchoring to steel plate

- Place the tripod on a steel plate that has the following characteristics as a minimum: measurements of 300 x 300 cm and 4 cm thickness, with three M18 previously-bored threaded holes through which the anchors will pass (in this case it will be an 8.8 quality M18x50 DIN933 galvanised screw with an M18 DIN 125-A washer).



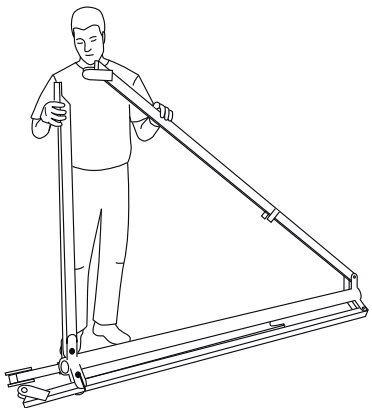
Step 1

To open the tripod feet, release the connecting PINS.



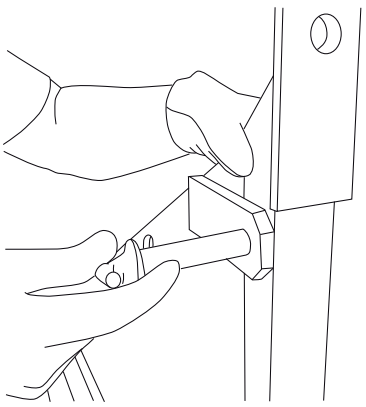
Step 2

Once the pin has been released, the first foot will open.

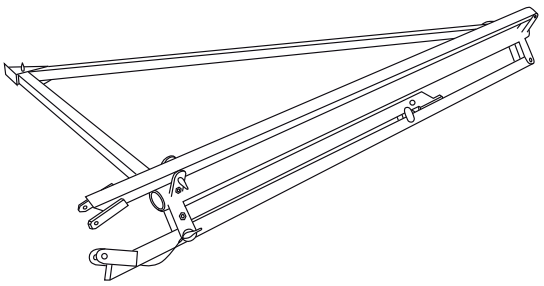


Step 3

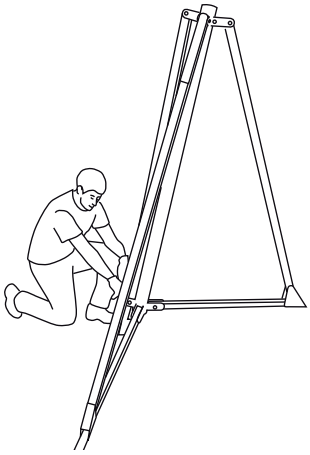
Secure it in the open position by placing the pin in the R position.



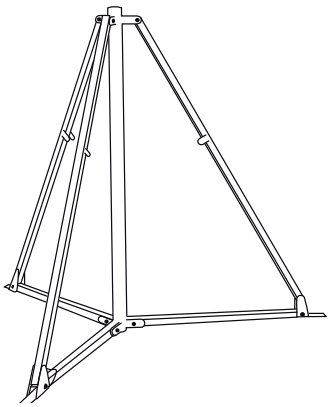
Step 4
TRIPOD with one foot open.



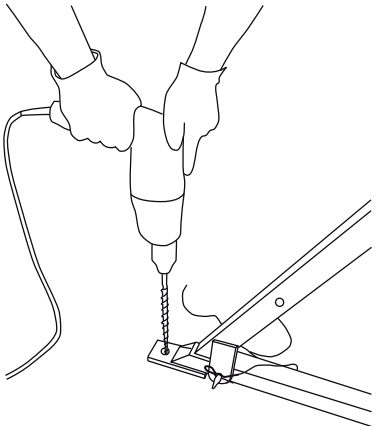
Step 5
Turn the TRIPOD 180 degrees, open the second foot, and place it upright. Use an anchoring element to secure the tripod to a high, fixed point so the structure does not overturn. Proceed to open the third foot.



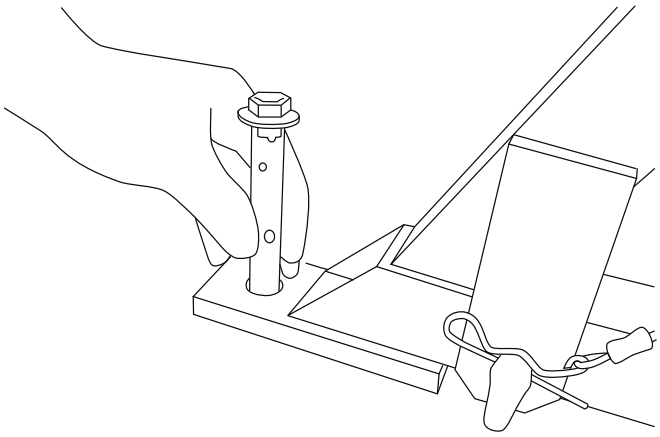
Step 6
TRIPOD in the working position.



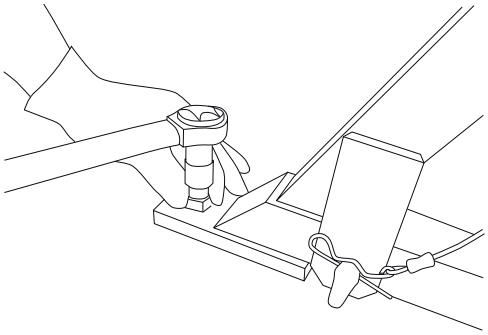
Step 7
On the HA25 concrete sole plate, drill with an 18 mm - diameter bit to a depth of 140 mm.

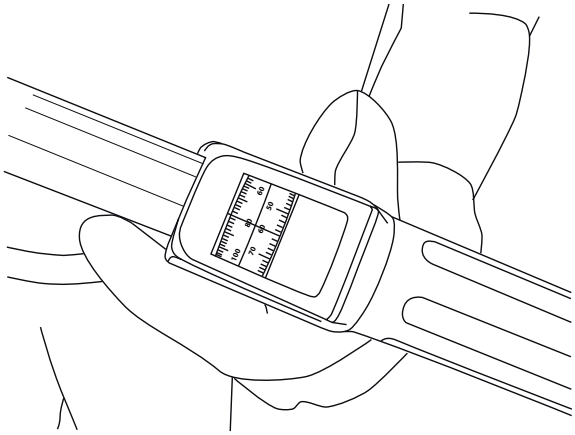


Step 8
The M12 FISCHER FH 18X80/25 S HIGH RESISTANCE ANCHOR is fitted.



Step 9
With a dynamometric wrench, torque to 80 Nm. Repeat for all three anchors. Finally, using the crane, place the Alsipercha on top of the ALSIPERCHA TRIPOD.





Procedur e fo r use o n site

General Information

There are 5.5 or 6.5 metres from the anchor point to the floor, depending on the type of tripod chosen, meaning that the operator can work above the truck load in complete safety. The diameter of the circular surface occupied by the tripod base is 2.7 m

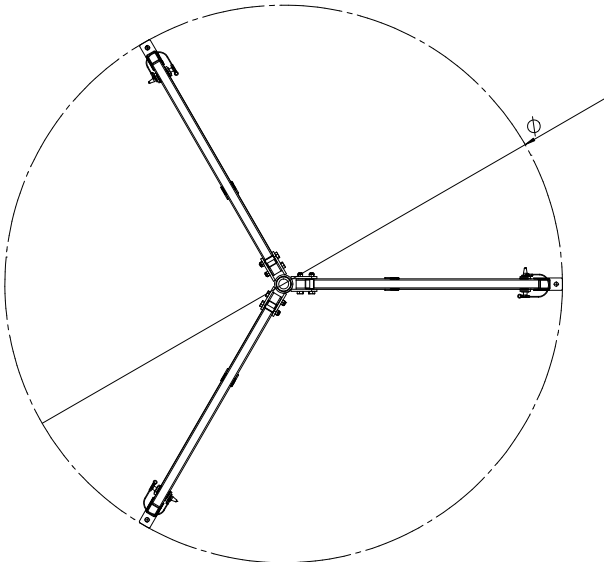
Safety information

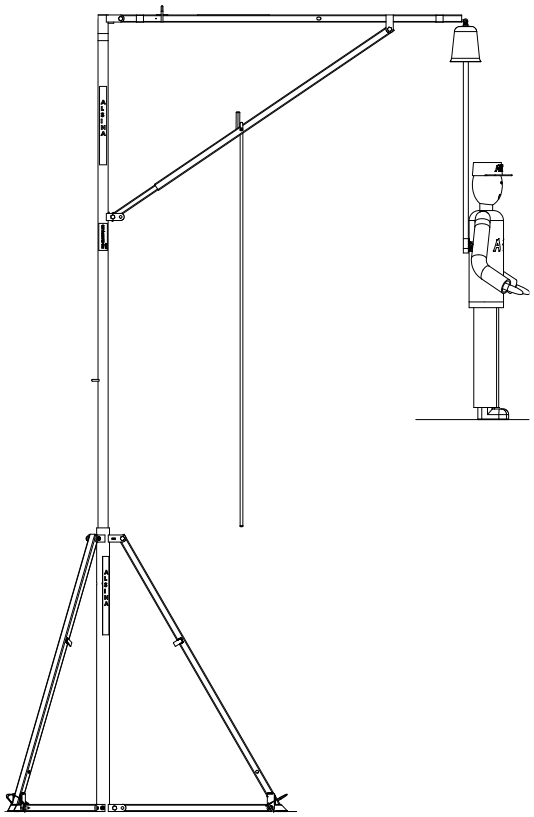
The Alsipercha is only for the operations indicated in this document, to prevent them from falling when loading on or unloading from delivery vehicle platforms.

Other spare parts that are not supplied with the system must not be used.

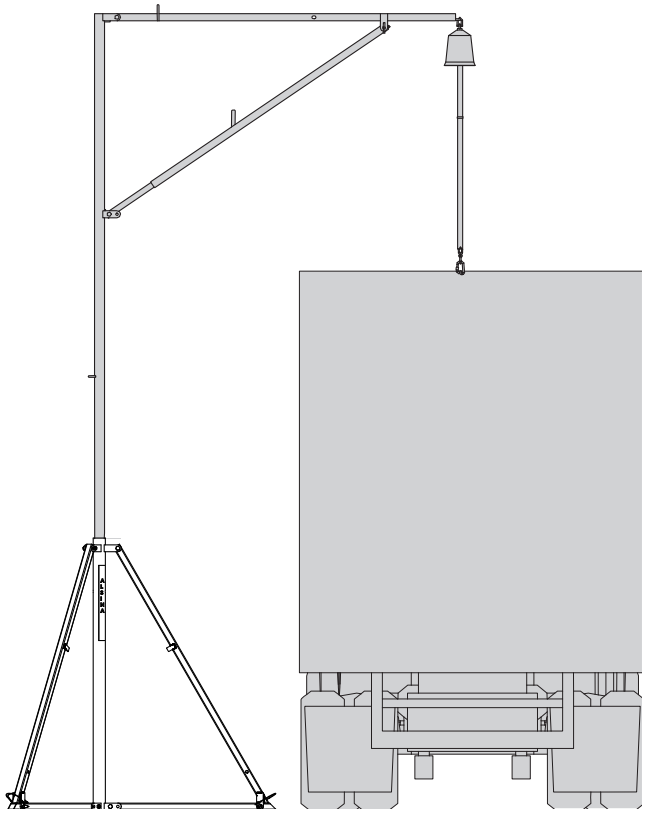
Check all the parts of the unloading system components before installing. Never use the equipment if it is damaged or rusty, as this may affect its safety.

If anyone falls when using the Alsipercha system, the retractable system must be withdrawn from service and inspected by an appropriate person. If you have any queries, please contact Marwood Group Ltd.



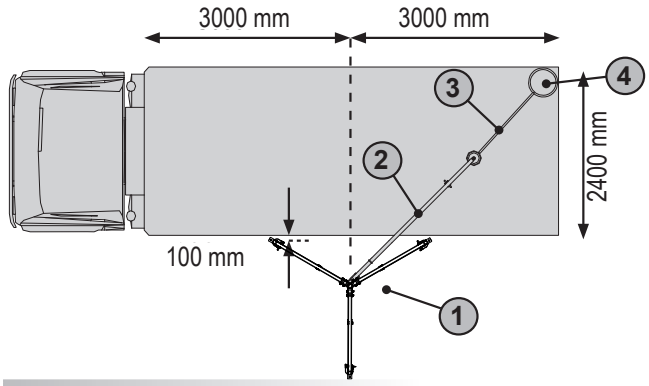


Final assembly



Trucks that are 6 m long

To unload the 6-metre platform of a truck, only one Alsipercha system will need to be used. When parking the truck, the rear box/platform must be situated according to the distances shown in the following illustration:



LEGEND

1. Alsipercha unloading system
2. Alsipercha System
3. 10m Horizontal Fall Arrestor
4. Operator

Any operator unloading a truck with a 6 m platform, must use:

- suitable footwear
- a reflective jacket and a helmet with chin protection
- a safety harness
- 0.3 m additional extension rope for subsequent anchoring

Once the operator has the PPE correct (Personal Protection Equipment), he can hang the additional 0.3 m rope on his harness by rolling it up and attach the other end of the fall arrest device to the retractable element with a snap hook.

The fall-stop device must include a retractable 10 m inertia reel.

The operator must be connected to the system before accessing the platform.

Alsipercha

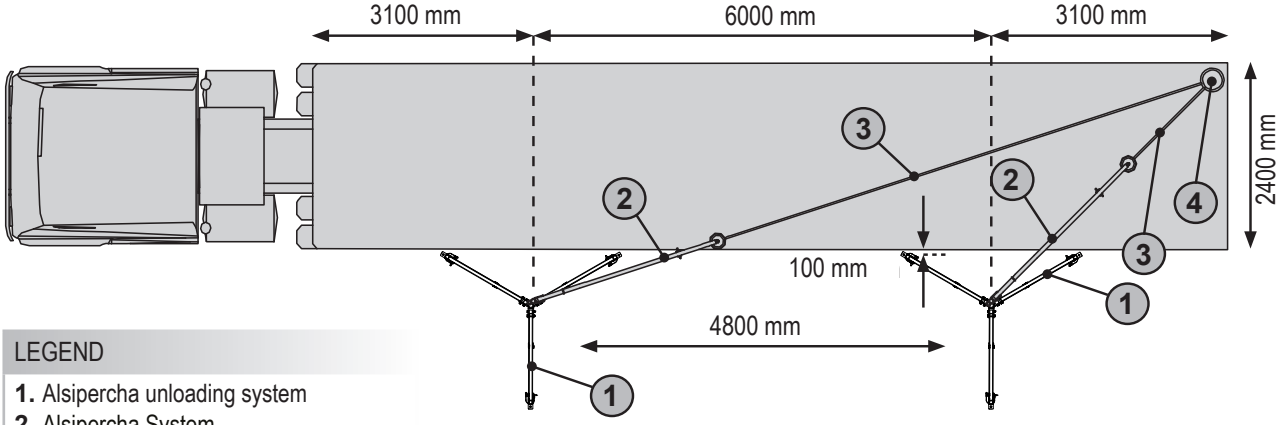
Trucks that are 12 m long

As the image below shows, when a 12-metre truck is loaded and unloaded, two Alsipercha systems must be used simultaneously.

When parking the truck, the rear box/platform must be situated according to the distances shown in the illustration below.

The operator must be attached to two Alsipercha systems. This will help him control the movement on the 12 m long platform in the event of a fall.

If it should be necessary to access the outer corners of the platform, it is best to move the truck to ensure that the operator is within a range of 3.5 m from the structure.



LEGEND

1. Alsipercha unloading system
2. Alsipercha System
3. 10m Horizontal Fall Arrestor
4. Operator

Any operator unloading a truck with 12 m platform, must use:

- suitable footwear
- a reflective jacket and a helmet with chin protection
- a safety harness
- 0.3 m additional extension rope for subsequent anchoring

Once the operator has the correct PPE (Personal Protection Equipment) he can hang the additional 0.3 m rope on his harness by rolling it up and attach the other end of the fall arrest device to the retractable element with a snap hook.

The fall arrest device is comprised of a retractable inertia reel of 10 m, to allow the operator to move freely to the ends of the truck.

The operator must be connected to the two systems before accessing the platform.

Conditions of use

The system has been designed and created for the specific uses and applications described in this manual. Therefore, we take no responsibility for the use of the equipment in situations other than those considered in this manual.

At the time of assembly, the material must always be checked by a competent person, who must ensure that it is fit for use. To this end, each system has specific control guidelines defined for its main components. These guidelines can be found in the Annex (Annex 1) at the end of this section. In accordance with these criteria, when a part that is not fit for use is identified, it must be **rejected**.

Set out below are the main considerations to be taken into account during the installation, recovery and system maintenance phases.

Installing the components of the system

1. All the components are sufficiently strong and stable to support the loads and stresses described in this manual. It is essential to **install all the components** included in the system, with all the accessories assembled and correctly attached and especially to verify that the panels are correctly positioned and supported.

2. Alsina disclaims all responsibility if the system components are **substituted with other, similar components** supplied by another company.

3. In extreme weather conditions (very dry and hot) it is necessary to **wet the panels**. The Alsina system allows **the panels to be nailed to the dropheads incorporating wood** which is almost essential in the perimeters, in areas near interior openings, column filling, in the event of strong winds, in angled formwork and generally wherever there is a risk of the panel moving for any other reason.

4. To guarantee proper support, **the panel placed between two aligned dropheads should rest on both simultaneously**, so boards cut to size can be placed in between. Actually, due to the size combination of the panel and the dropheads, when one panel rests on both dropheads, the sequence of panels which follows will also be supported correctly.
   Otherwise nail the panels or use an intervening drophead.

5. Ensure **that the connections are effected properly**. The nails, when necessary, should not be nailed to the same row of wood, but staggered, making sure than they are neither loose nor protrude from the wood. Special care should be taken with column joints.

6. **Do not leave any panels or pieces of wood loose, nor loose or unstable components**. Storage components and working tools must be placed or stored in such a way as to avoid risk of collapse, falling or turning over.

7. **The beams must have all their props present** even if their pivots coincide with the support girders; the latter must be level and as for the **dropheads, verify that they are all correctly placed and the pins are closed**.

8. The worksite technician must decide whether it is appropriate to brace all or only part of the post-shores, depending on the structural component being formworked, and legislation and practice in the community or country.

9. During the entire assembly process, the beams must always be supported by a minimum of one line of support girders, except at the starting point where there will be two.

10. In the subsequent placement of the various components, try to provide **maximum stability (using tripods, X-crosses, ...)** It is important to **brace the first line of support girders to the columns**.

11. During the positioning of **panels, handrails, perimeter nets**,... and whenever there is risk of falling from a height, in order to prevent accidents and ensure safety, we recommend **the use of the fall prevention system designed by Alsina, the deployment of safety nets** under the floor slabs attached to the post-shores with hook fasteners (in such case, follow the manufacturer's and/or installer's instructions for the assembly of the nets) (see Annex 3), a lifeline between columns, etc.
    The risk of fall from a height must be assessed by a competent person who should take into consideration the experience of the formworkers, the project conditions, current legislation, etc. He should to consider the option of assembly from below or equivalent protection if regarded as necessary.

12. All **openings** located on the inside of the formworking surface must be properly **protected by handrails or nets, mesh or other equivalent protection, taken collectively,** to prevent accidents. **The entire perimeter** of first the horizontal formwork and then the floor structure, **must have handrails installed, in addition to the collective perimeter protection system consisting of gallows-type nets, or cantilever type (also known as tray or canopy), or other collectively equivalent protection**. The be at 90 cm from floor level, and have mid-height baseboards, the latter to prevent objects from falling. **Workers must use the individual protection measures required for each phase: helmet, gloves and boots.**

13. When workers have to move on partial floor formwork, **place toeboards over the flooring blocks to prevent them from breaking.**

14. For floor structure heights over 4.9 m, we do not recommend counter scaffolding with post-shores, as this has resulted in a large number of accidents and requires extremely precise assembly by specialized personnel under the supervision of expert, competent technicians. Alsina disclaims all responsibility should a solution of this type be attempted.

15. In cases where a **post-shore might be perforated**, we recommend that these rest on boards, rather than resting directly on the previous floor structure. If the post-shores for the floor structure of the bottom floor are supported on the ground, they should never do so directly, but rather on panels that distribute the load. It is important that the post-shores at the edges of the floor structure are properly supported.

16. To prevent the post-shores from falling on persons and/or materials during hoisting, loading or unloading operations, we recommend using trays or transportation containers and always following the manufacturer's instructions. An alternative is to hoist the post-shores using slings, distribution beams, balance beams, etc in packs strapped at both ends to stabilize the set and prevent it from moving horizontally.

Recovering the components of the system

1. Recovery requires careful study and cordoning off of areas, to avoid unexpected fall of materials. Underneath each of these areas **only those workers required** for the operation must be present.

2. The components to be recovered must be loosened gradually so that, if deformations are discovered, they can be braced immediately.

3. During the 1st stage of formwork stripping, **do not remove any post-shores from the beams that are still providing support.**

4. In general, no post-shores are to be removed before 3 days have passed from the time concrete is poured, and always after the concrete has had time to set and acquire a minimum strength of 40%.

5. **It is not advisable to deposit heavy loads on areas where concrete has been recently poured and formwork recently stripped** such as; deposit of materials, machinery or lifting equipment, allowing movement of personnel on such surfaces if this runs the risk of becoming too great and cause dynamic stresses that may result in accidents.

6. The complete stripping of formwork relating to the 2nd phase must be carried out 28 days after pouring the concrete or when the concrete is safe enough, free of excessive deformation and has achieved the necessary strength to bear the stresses to which it will be subjected.

7. After each position and before the next assembly, **clean the grout from all the beams and panels and remove all the nails from the panels**. Never do this while the beams are mounted, to avoid dangerous situations.

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Info While performing formwork stripping of the "with supports" system (rebracing) the special conditions included in Annex 2 must also be taken into account.

Maintenance, use and safety

Maintenance conditions

A pre-established expiry date can not be set for formwork, but improper use of equipment that could damage it must be avoided. When the material fails to satisfy the requirements established in Annex 1, it must be replaced, since its state of preservation will then be below the minimum requirement.

The users are responsible for maintenance of all items of equipment, whether rented or the customer's property, for reuse or alternatively to reject them.

It is advisable to remove all nails and apply a concrete release agent immediately after formwork stripping and before the next position to prolong the working life of panels.

Metal components must be cleaned of concrete remains with a scraper, never striking them with a hammer . Also avoid use of nails in such way as might damage the material. In the interests of this, wooden strips have been inserted in the dropheads.