



User and maintenance manual



XT PLUS



XT PRO



XT MILITARY



XT FLOATING

Immobilisation and extrication device XT PLUS - XT PRO - XT MILITARY - XT FLOATING

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English - translation of the original version



*Read this manual
carefully and keep it
for future reference*

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Ferno Technical Support

Customer Service and Technical Support are important aspects of every Ferno product. Before contacting us, note the serial number of the product and specify it in all written communications. For all queries concerning technical support, contact Ferno S.R.L.:

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Website dedicated to support - Ferno SOS	www.fernodos.it
Phone	0039 0516860028
Phone (toll-free for Italy)	800.501.711
Fax	(+39) 0516861508

Ferno S.R.L. is authorised to carry out preventive and corrective maintenance (repairs) on all Ferno products in exclusivity.

Any corrective action MUST necessarily be carried out by FERNO personnel and the operations must be carried out using original spare parts. In this way, the warranty is also extended to the components involved in the operation.

Any corrective action carried out by non Ferno personnel will automatically cancel any Civil Liability insurance and any guarantee.

Ferno Customer Service

For further details, please contact Ferno S.R.L.'s Customer Service:

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Limitation of liability

This manual contains general instructions on the use and maintenance of the product. The instructions do not cover all possible applications and operations. The user is solely responsible for proper and safe use of the product in compliance with local regulations. The safety information is provided as a service to the user and ensures only the minimum required level of safety to prevent injury to operators and patients. Any other safety measure implemented by the user must comply with applicable regulations. Before using the product, it is strongly recommended that staff be trained in its correct usage. Retain this manual for future reference. In case of change of ownership, ensure that the manual remains with the product. Additional free copies can be downloaded online at www.ferno.it.

Intellectual property declaration

The information in this manual is the property of Ferno S.R.L. - Via Benedetto Zallone 26, 40066 Pieve di Cento (Bologna) Italy. All patent rights, design, construction, reproduction, use and sale rights relating to any item covered in this manual are the confidential and exclusive property of Ferno S.R.L., except for rights expressly transferred to third parties or not attributable to parties owned by the supplier.

It is prohibited to reproduce this manual, either in full or in part, without the prior consent of Ferno S.R.L.

Limited warranty

Ferno products are covered by a 24-month warranty against manufacturing defects. For the full terms and conditions of warranty and liability, see chapter *Warranty*.



USER AND MAINTENANCE MANUAL

Additional free copies can be downloaded online at www.ferno.it.

1 - SAFETY INFORMATION

Read this user manual carefully. It is an integral part of the device and must always be stored close at hand. For your personal safety and for that of patients, please observe the following points:

- Before every use, make sure that there are no signs of wear, damage and/or malfunctioning. Refer to section *Inspection*.
- In order to avoid infections and/or bacterial contaminations, follow the indications in sections *Disinfection* and *Cleaning*.

1.1 Warning

The danger symbols draw attention to potentially dangerous situations that, if disregarded, may result in accidents, damage and/or injury.

WARNING

Unauthorised repairs, and repairs carried out by technicians not authorised by Ferno S.R.L., will render all warranties null and void and may compromise the safety of the extrication device.

Non-original spare parts and inadequate repairs may cause damage and/or injury. Use only original Ferno spare parts and refer exclusively to Ferno S.R.L.'s Customer Support.

1.2 Important

Boxes labelled "Important" contain important information on use and/or maintenance of the device.

Important

1.3 Blood-borne diseases

To reduce risks of exposure to infectious diseases that may be transmitted by blood, follow the instructions on disinfection and cleaning in this manual carefully.

1.4 Load capacity

Observe the load capacity of the XT extrication device. Refer to section *General specifications*.

1.5 Compatible accessories

Only use accessories that are certified for extrication manoeuvres and do not compromise or alter the use of the device.

Ferno S.R.L. shall not be liable for any damage to users or third parties due to improper use of the XT extrication device and/or non-Ferno accessories.



Load capacity

1.6 Glossary of symbols

The symbols used in this manual and/or on the XT extrication device's labels are defined below.



Read the user manual carefully



Two qualified operators are recommended for correct use



Load capacity



This product meets European Union Standards



Part number (abbreviated with PN, P/N, part no., or part #) unambiguously identifies a specific part of the design.



A catalogue number indicates the manufacturer's catalogue number in order to identify the medical device.



A serial number indicates the manufacturer's serial number in order to identify a specific medical device.



A lot code indicates the manufacturer's lot code in order to identify the lot.



Do not wash with high pressure water



Medical Device

Important

WARNING

All images are included for illustrative purposes.
Products may be subject to change.

1.7 Information and safety labels

The information and safety labels contain important information that the user needs to know.

Read and follow the label instructions. Replace worn and damaged labels immediately. To obtain replacement labels, contact Ferno S.R.L.'s Customer Service. (page 2).



Example of labelling with symbols shown



Label on XT board



XT Plus restraint label



XT PRO restraint label



XT Military restraint label



XT Floating restraint label



The labels for the XT series restraints are all placed on the yellow restraint of each device.

2- OPERATOR TRAINING AND SKILLS

2.1 Skills

Operators who use the extrication device must:

- Have specific experience in patient handling procedures.
- Possess the skills required to assist the patient.

2.2 Training

Operators are required to:

- Carefully read and understand all information in this manual.
- Attend a suitable training course on the use of the extrication device.
- Practice with the extrication device before using it in real situations with patients.

- Log the training sessions. An example of a form for logging the training sessions can be found at the end of the manual.

⚠ WARNING

Untrained users may injure themselves, cause damage and/or physical harm. Allow only trained and qualified staff to use the XT extrication device.

Important

Operators must be able to ensure the safety of both themselves and their patients while using the device. They must be able to determine the number of assistants required to handle the patient according to the laws in force.

3 - XT PLUS EXTRICATION DEVICE

3.1.1 Description and intended use

The XT extrication device (hereinafter also referred to as “device”) is a medical device used for the immobilisation and extrication of trauma and non-trauma patients.

Two trained and qualified operators are recommended for correct use of the XT extrication device. Always refer to local regulations.

The device is equipped with adjustable restraints to allow a correct immobilisation of the patient. The upper chest restraints must be applied in a crossed configuration; the lower groin restraints must be secured on the same side.

3.1.3 Reporting accidents

In the event of a serious accident in relation to the device, immediately contact Ferno S.r.l. and the competent authority of the member State in which the user has its main office.

E-mail: eu-regulatory.it@ferno.com

Website dedicated to support - Ferno SOS www.fernodos.it

Phone +39 051 6860028

Fax +39 051 8681508

3.1.2 CE Marking

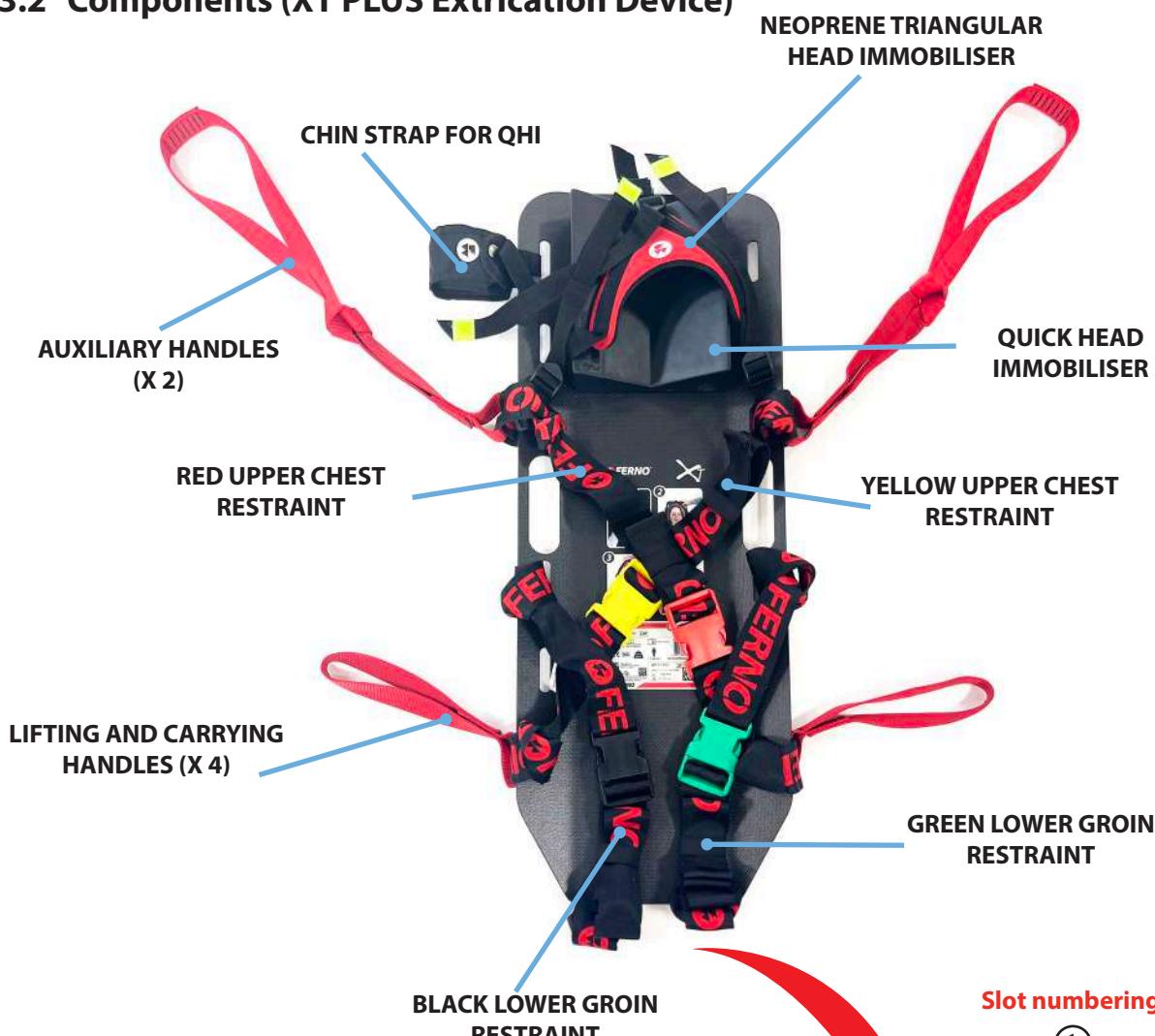
Ferno's products meet the general safety and performance requirements of European Regulation (EU) 2017/745 (MDR) concerning medical devices.
For any further information: www.ferno.it



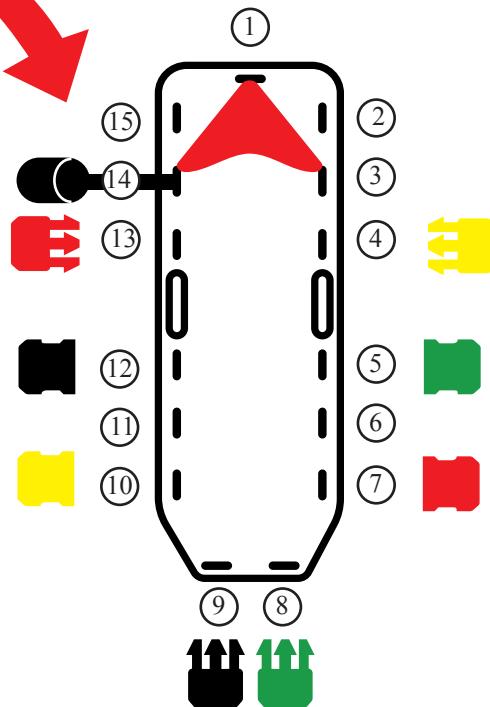
⚠ WARNING

Improper use of the extrication device may cause damage and/or injury. Use the XT extrication device as described in this manual.

3.2 Components (XT PLUS Extrication Device)



Slot numbering



WARNING

Check that all the slots allow the restraints to pass.

3.2.1 General technical specifications

Ferno reserves the right to change the specifications without notice. For further details, please contact Ferno's Customer Service (page 2).

Assembled product specifications

Length	830 mm
Width	300 mm
Thickness	60 mm
Weight (including accessories)	2 kg
Load capacity	160 kg

COMPONENTS OF THE EXTRICATION DEVICE

- Board with holes for restraint fastening
- QHI (Quick Head Immobilizer)
- Neoprene triangular head immobiliser
- Chin strap for QHI
- The yellow and red upper chest restraints are provided with red lifting and carrying handle
- Black and green lower groin restraints
- Auxiliary handles (x 2)

Materials

XT Board	Composite material
Quick Head Immobiliser	Polyurethane
Restraints	Polyester
Buckles	Plastic
Triangular head immobiliser and chin strap	Neoprene

WARNING

Untrained users may injure themselves, cause damage and/or physical harm. Allow only trained and qualified staff to use the XT extrication device.

WARNING

Never exceed the load capacity of the extrication device specified in this manual.



Load capacity

3.3 - XT PLUS extrication device assembly

3.3.1 QHI (Quick Head Immobilizer) assembly

The Quick Head Immobilizer must be applied before using the XT device.

- Before its application, make sure that the extrication device is placed on a flat surface and the part where the QHI head immobilizer will be applied is clean and dry.

- Peel off the sticker film placed under the QHI, ensuring that the black part stays on the QHI (Figure 1A).

- Centre the QHI (Figure 1B) on the upper part of the extrication device, close to the head end hole no. 1, (to identify the hole no. 1, see Figure 4).

- Press the QHI so that its sticker perfectly adheres to the surface (Figure 1B).

Once the QHI has been correctly applied, it will be possible to use the Velcro to detach and attach the cushion during cleaning and disinfection or as required (Figure 1C).

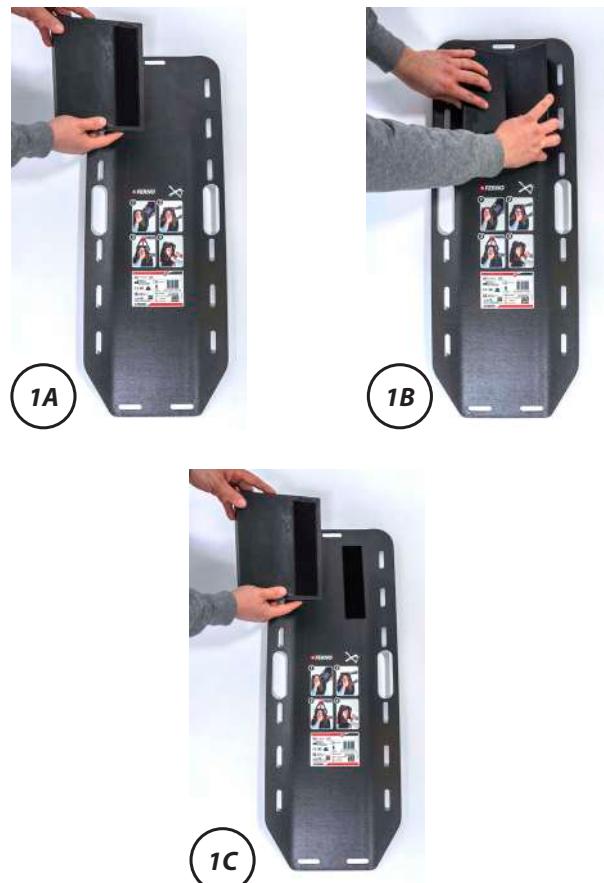


Figure 1 - QHI application

3.3.2 Triangular head immobiliser assembly

In order to apply the triangular head immobiliser correctly, follow these instructions:

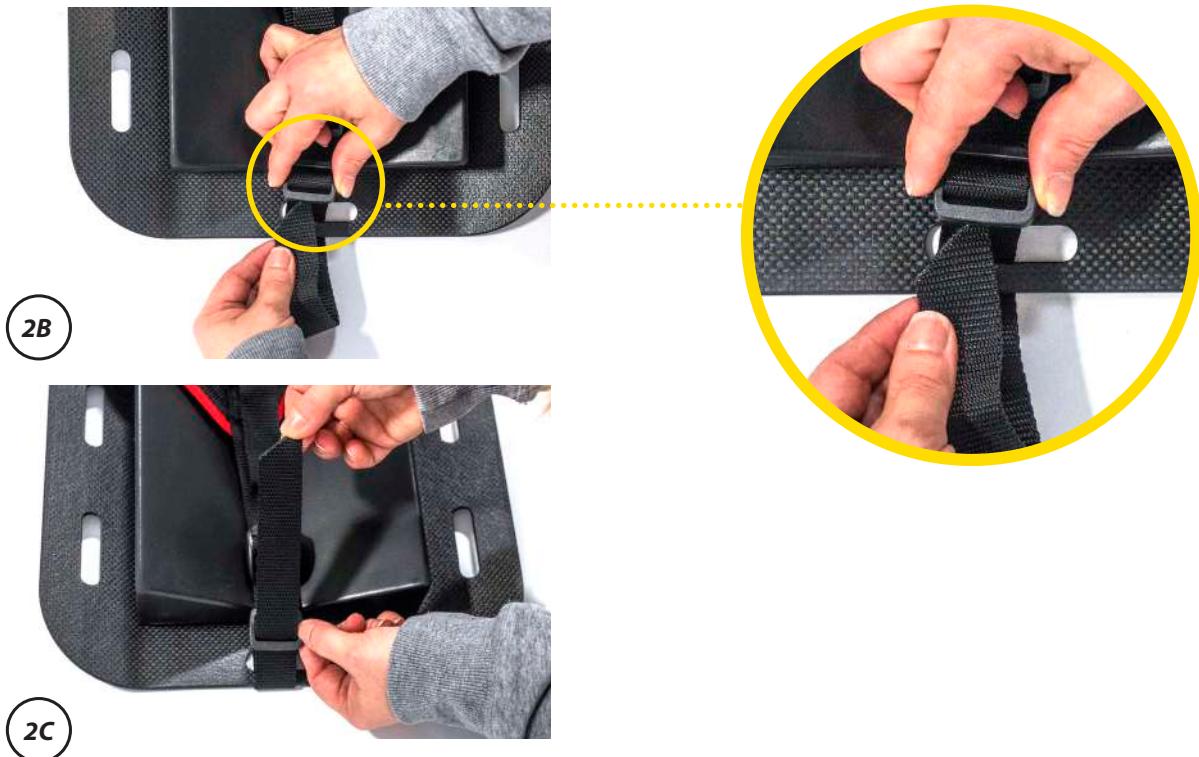
- Insert the upper strap of the triangular head immobiliser into the hole no. 1 of the board, going from the inside to the outside of the extrication device (Figure 2A).



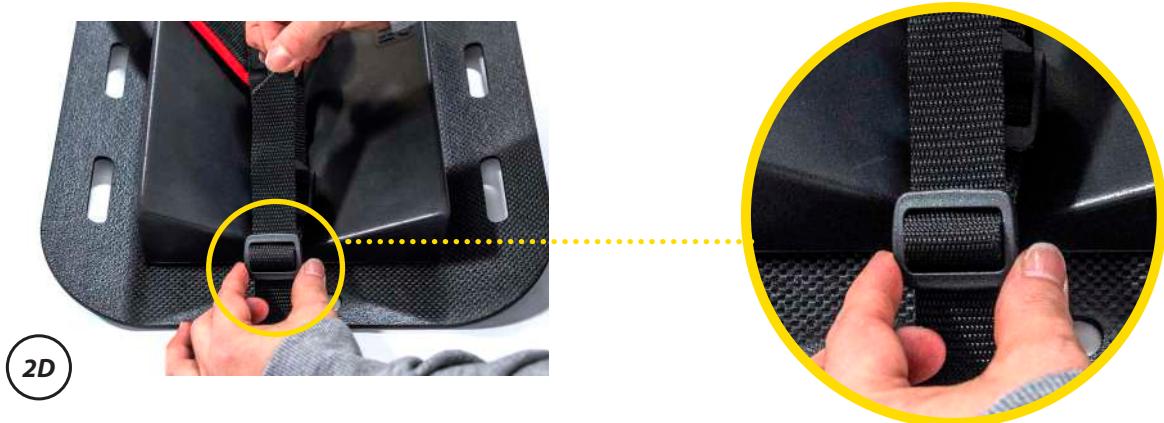
Figure 2A - Inserting the upper strap of the triangular head immobiliser

XT Series Extrication Devices

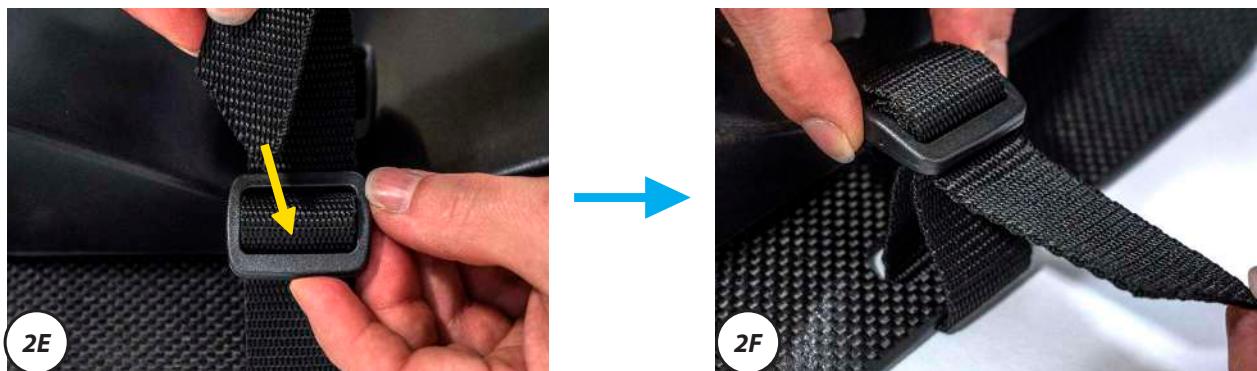
2. Insert the strap in the first loop of the fastening buckle (Figures 2B and 2C).



3. Then insert it in the second loop and pull to fasten the strap (Figure 2D).



4. Finally, reinsert the strap into the first loop to ensure a tight fit and prevent the strap from coming loose.



Figures 2A, 2B, 2C, 2D, 2E, 2F - Triangular head immobiliser assembly

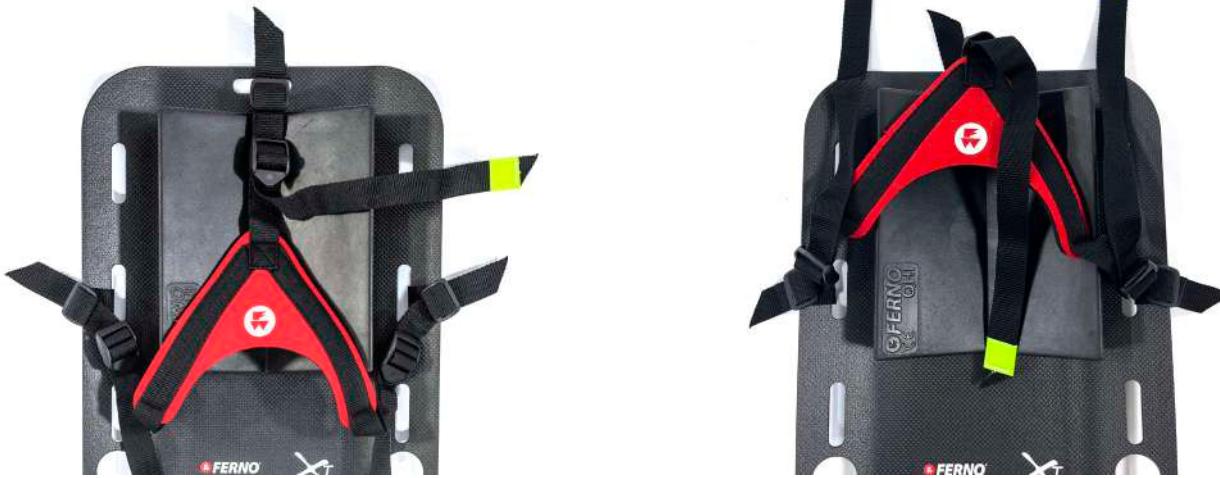
5. Repeat the same operations with the other two straps in the two side holes no. 3 and 14 or 4 and 13 (to identify the holes, see Figure 4).

WARNING

Failure to complete the three fastening steps may cause undesired loosening of the straps.

Important

Both positions of the triangular head immobiliser on holes no. 4 and 13 or 3 and 14 are possible and ensure proper stabilisation of the patient's head. The choice of set-up is at the discretion of the operator, who can choose the most suitable version, depending on the contingency.



3.3.3 Chin strap assembly

The neoprene chin strap, stored in a special bag, can be secured on the extrication device using side hole no. 14, following the same instructions used for the application of the triangular head immobiliser straps (to identify the hole no. 14, see Figure 4).



Figure 3 - Chin strap assembly

3.3.4 Assembling the restraints

The XT Plus extrication device is equipped with two upper chest restraints (yellow and red) and two lower groin restraints (black and green).

Upper chest restraints should be applied in such a way that they are in a crossed configuration when applied to the patient.

Groin restraints, on the other hand, should be applied in such a way that they fasten on the same side.

Each restraint consists of two pieces. Position the restraints so that the buckles follow the arrangement shown in Figure 4.

The chest restraints are equipped with integrated red lifting and carrying handles, to which the two extension rings can be added if necessary.

The restraints must be applied before using the XT device.

For their application and the identification of the right hole on the device, refer to Figure 4.



Figure 4 - Configuration of restraints

YELLOW CHEST RESTRAINT

In order to apply the yellow chest restraint:

1. Insert the slot of the restraint with the male end into hole no. 4 on the extrication device, with the stitching facing the operator, making sure that the red handle remains outside the board (Figure 5A).
2. Insert the yellow buckle into the newly positioned restraint slot (Figure 5B).
3. Pull the restraint to tighten the loop knot, ensuring that the red handle always remains on the outside, at the rear of the board (Figure 5C).



**Figure 5 - Yellow restraint application
(end with male buckle)**

4. Insert the slot of the restraint with the female end into hole no. 10, with the stitching facing the operator, making sure that the red handle remains outside the board (Figure 6A).
5. Insert the yellow buckle into the newly positioned restraint slot (Figure 6B).
6. Pull the restraint to tighten the loop knot, ensuring that the red handle always remains on the outside of the board and close the buckle (Figure 6C).



**Figure 6 - Yellow restraint application
(end with female buckle)**

RED CHEST RESTRAINT

In order to apply the red chest restraint:

1. Insert the slot of the restraint with the male end into hole no. 13 on the extrication device, with the stitching facing the operator, making sure that the red handle remains outside the board.
2. Insert the red buckle into the newly positioned restraint slot.
3. Pull the restraint to tighten the loop knot, ensuring that the red handle always remains on the outside of the board.
4. Insert the slot of the restraint with the female end into hole no. 7, with the stitching facing the operator, making sure that the red handle remains outside the board.
5. Insert the red buckle into the newly positioned restraint slot.
6. Pull the restraint to tighten the loop knot, ensuring that the red handle always remains on the outside, at the rear of the board, and close the buckle.

WARNING

It is important that during the assembly of the chest restraints, the red handle always remains outside and at the rear of the board, to ensure that the restraint remains securely on the board during patient handling operations.



Figure 7 - Crossed configuration of chest restraints

BLACK GROIN RESTRAINT

1. Insert the slot of the restraint with the female end into hole no. 12 on the extrication device, with the stitching facing the operator (Figure 8A).
2. Insert the black buckle into the newly positioned restraint slot (Figure 8B).
3. Pull the restraint to tighten the loop knot (Figure 5C).



8A



8B



8C

**Figure 8 - Black restraint application
(end with female buckle)**

4. Insert the slot of the restraint with the male end into hole no. 9, with the stitching facing the operator (Figure 9A).
5. Insert the black buckle into the newly positioned restraint slot (Figure 9B).
6. Pull the restraint to tighten the loop knot.



9A



9B

**Figure 9 - Black restraint application
(end with male buckle)**

GREEN GROIN RESTRAINT

1. Insert the slot of the restraint with the male end into hole no. 5 on the extrication device, with the stitching facing the operator.
2. Insert the green buckle into the newly positioned restraint slot.
3. Pull the restraint to tighten the loop knot.
4. Insert the slot of the restraint with the male end into hole no. 8, with the stitching facing the operator.
5. Insert the green buckle into the newly positioned restraint slot.
6. Pull the restraint to tighten the loop knot.



Figure 10 - Correct positioning of restraints

3.3.5 Assembling the auxiliary handles

The red carrying handles are removable and independent, so they can be moved as required. For example, they can be connected to the middle handles to make them longer and allow extrication even with larger patients. As an alternative, they can be directly secured to the board using any available hole. To attach the red handles, follow the fixing procedure with cow hitch (Figures 11A, 11B and 11C).



Figure 12 - Complete XT Plus configuration

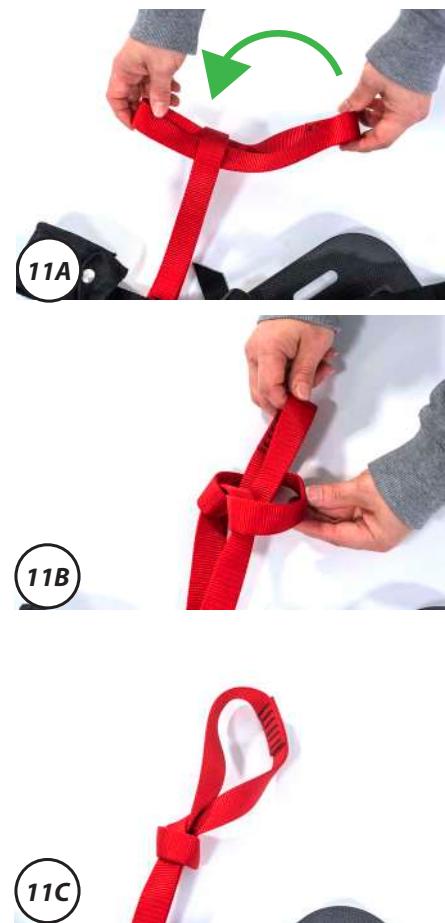


Figure 11 - Application of auxiliary handles

3.4 - Use of the XT PLUS extrication device

3.4.1 Before putting the extrication device into service

Staff using the extrication device must have carefully read and understood the information contained in this manual. Before any operation with the extrication device, ensure that:

- The QHI head immobiliser, the triangular head immobiliser and the chin strap are correctly fitted and ready for use.
- All restraints have been correctly applied.
- Ensure that the device does not show any signs of damage or wear, and that it is fully operational. Refer to section “*Inspection*”.



Read the user manual carefully



At least two qualified operators



Load capacity

3.4.2 “Ready-to-use” configuration

Before extricating the patient, prepare the device in “Ready-to-use” configuration, following the instructions below:

- Unfasten the buckles of all restraints.
- Join the chest and groin restraints so that they remain at the sides of the device and so that the board is free and ready to be inserted behind the patient's back (Figure 13).
- Ensure that the triangular head immobiliser restraints are sufficiently loose and that the chin strap is properly stowed in relevant bag.



Figure 13 - Possible “ready-to-use” configurations.

Important

Before proceeding with the application of the XT, make sure that the triangular head immobiliser is loose enough to be placed on the back of the board, so that it can be gripped together with the board when inserting the device behind the patient's back.



3.4.3 Instructions for use

This manual does not provide any medical instructions.

It is the responsibility of the operators to follow correct procedures and ensure the safety of both the patient and themselves.

This manual explains the use of the extrication device under ideal conditions and is purely indicative.

The use of the device requires a minimum of two trained and qualified operators.

These operators must work together and coordinate correctly during all operations.

Follow procedures while complying with standard regulations for moving the patient in an emergency.

Lift only the weight that you can safely support. Obtain additional assistance for heavy loads.

The extrication device can be adapted to a variety of circumstances and different scenarios. The trained staff of the emergency service must assess the patient's conditions and determine the most suitable equipment and procedures.

In any case, always observe local healthcare instructions and regulations.

Always assist the patient and never leave them alone during the operations with the device.

WARNING

Do not use XT Plus for verticalisation and water rescue, and do not use the XT board with Floating configuration for extrication from confined spaces and verticalisation.

WARNING

The use of improper and/or non-certified devices may cause accidents, damage, and/or injury. Only use medical devices that meet the requirements of European Regulation (EU) 2017/745 concerning medical devices.

Important

When the extrication device is not used, store it indoors in a dry place. It is recommended to use its carry bag for storage purposes.

Important

If you have an XT Military or XT PRO device, extrication from the vehicle is still possible by following the procedures for the XT Plus.

3.4.4 Quick extrication

A quick extrication requires the presence of an operator to stabilise the patient's head and neck manually and another operator to apply the device and help in the extrication operation.

Before proceeding with extrication, it is advisable to move the chest and groin restraints as far outwards as possible so that they do not interfere during application of the board (See Section “Ready-to-use” configuration).

The triangular head immobiliser must be positioned correctly, as indicated in the section “Ready-to-use” configuration.

For the quick extrication procedure, the presence of at least two trained and qualified operators is recommended:

1. **Operator 1:** moves the patient forwards while holding head and neck to create the necessary space to position the extrication device (Figure 14A).
2. **Operator 2:** inserts the device behind the patient and correctly centres it (Figure 14B).
3. **Operator 1:** positions the patient on the extrication device.
4. **Operator 2:** while operator 1 keeps holding the cervical spine of the patient, operator 2 applies the triangular head immobiliser (Figure 14C), arranging it with care immediately above the patient's eyebrows. The correct positioning of the head immobiliser reduces the risk of it moving upwards or downwards. It is advisable to hold the triangular head immobiliser in place with one hand and with the other to fasten the straps, starting with the side ones and, only last, the middle one.
5. **Operator 2:** before extricating the patient, seizes the two red upper lifting and carrying handles, making sure that they pass under the patient's armpit (Figure 14D).
6. **Operator 2:** extricates the patient in accordance with the procedures in force.
7. **Both operators:** take the patient away from the scenario.



Figure 14 - Quick extrication sequence

3.4.5 Precautionary extrication

A precautionary extrication requires the presence of at least two trained and qualified operators, who are able to assess the patient's conditions and are familiar with the correct positioning and use of the extrication device.

1. **Operator 1:** holds the cervical spine to make it easier for operator 2 to apply the neck brace (Figure 15). For the application of the neck brace, refer to local guidelines.
2. **Operator 2:** applies the neck brace correctly (Figure 16).
3. **Operator 1:** moves the patient forwards while holding their head and neck to create the necessary space for operator 2 to place the extrication device behind their back (Figure 17).
4. **Operator 2:** having previously ensured that the chest and groin restraints are positioned laterally in the "Ready-to-use" configuration (See Section "*Ready-to-use*" configuration) inserts the extrication device behind the patient so that it is correctly centred and reaches down to the base of the coccyx.
5. **Operator 1:** repositions the patient on the device (Figure 18).



Figure 15 - Cervical spine supporting



Figure 16 - Neck brace applied



Figure 17 - Extrication device insertion



Figure 18 - Patient repositioning

6. **Operator 2:** while operator 1 keeps holding the cervical spine of the patient, operator 2 applies the triangular head immobiliser, arranging it with care immediately above the patient's eyebrows (Figures 19A, 19B and 19C). The correct positioning of the head immobiliser reduces the risk of it moving upwards or downwards.

It is advisable to hold the triangular head immobiliser in place with one hand and with the other to fasten the straps, starting with the side ones and, only last, the middle one.



Figure 19 - Triangular head immobiliser positioning

1. **Operator 2:** positions the chest restraints (yellow and red) in crossed configuration (Figures 20A, 20B, 20C) and for each one of them fastens the upper section to the lower one on the opposite site with the buckles provided. If necessary, operator suitably adjusts the tension of the restraints. In this phase, the operators must ensure that the red lifting and carrying handles remain free, in order to find and seize them easily during the final extrication phase.



Figure 20 - Application of chest restraints (yellow and red)

2. **Both operators:** position the groin restraints (black and green) arranging them under the patient's legs, fastening them on the same side following the colour code (Figures 21A and 21B) and adjusting the tension appropriately to secure the patient to the extrication device.
3. **Operator 1:** once all restraints have been applied and fastened, operator 1 takes the chin strap from its bag, adjusts its length and gives the opposite end to operator 2 (Figure 21).

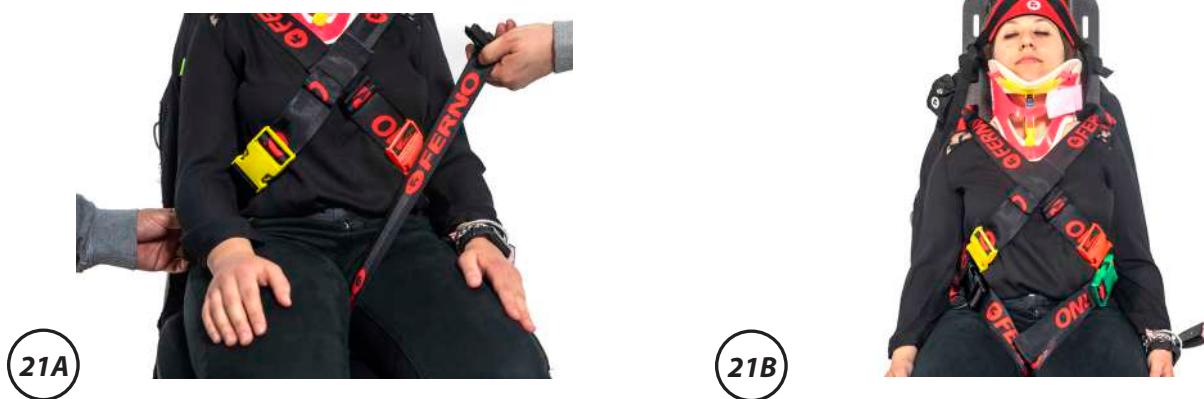


Figure 21 - Application of groin restraints



Figure 22 - Cervical spine final fastening with chin strap

4. **Operator 2:** threads the opposite end of the chin strap through the 3rd hole of the extrication device, fastens the strap by means of the Velcro fastener and adjusts it to the end where the bag is placed, so as to finish the procedure for restraining and stabilising the cervical spine (Figures 22A, 22B, 22C, 22D).
5. Before proceeding to extricate the patient, **both operators** must make sure that they have applied and adjusted all fastening systems correctly.
6. **Both operators:** work together to identify the best way out, the safe and correct procedures for themselves and the patient according to the circumstances. Then, using the red lifting and carrying handles, they extricate the patient (Figure 23), appropriately positioning the patient on the chosen device (Figure 24).



Figure 23 - Extrication with the carrying handles



Figure 24 - Positioning on backboard

4 - XT PRO EXTRICATION DEVICE

4.1.1 Description and intended use

The XT PRO extrication device is a medical device used for the immobilisation, extrication and verticalisation of trauma and non-trauma patients. Two trained and qualified operators are recommended for correct use of the XT PRO extrication device. Always refer to local regulations.

The device is equipped with adjustable restraints to allow a correct immobilisation of the patient. The upper chest restraints must be applied in a crossed configuration; the lower groin restraints must be secured on the same side.

4.1.2 CE Marking

Ferno's products meet the general safety and performance requirements of European Regulation (EU) 2017/745 (MDR) concerning medical devices.

For any further information: www.ferno.it



4.1.3 Reporting accidents

In the event of a serious accident in relation to the device, immediately contact Ferno S.r.l. and the competent authority of the member State in which the user has its main office.

E-mail: eu-regulatory.it@ferno.com

Website dedicated to support - Ferno SOS www.fernodos.it

Phone +39 051 6860028

Fax +39 051 8681508

⚠ WARNING

Improper use of the extrication device may cause damage and/or injury. Use the XT PRO extrication device as described in this manual.

⚠ WARNING

If necessary, XT PRO / Military can also be used for extrication from vehicles. In this case, follow the instructions for the XT Plus version.

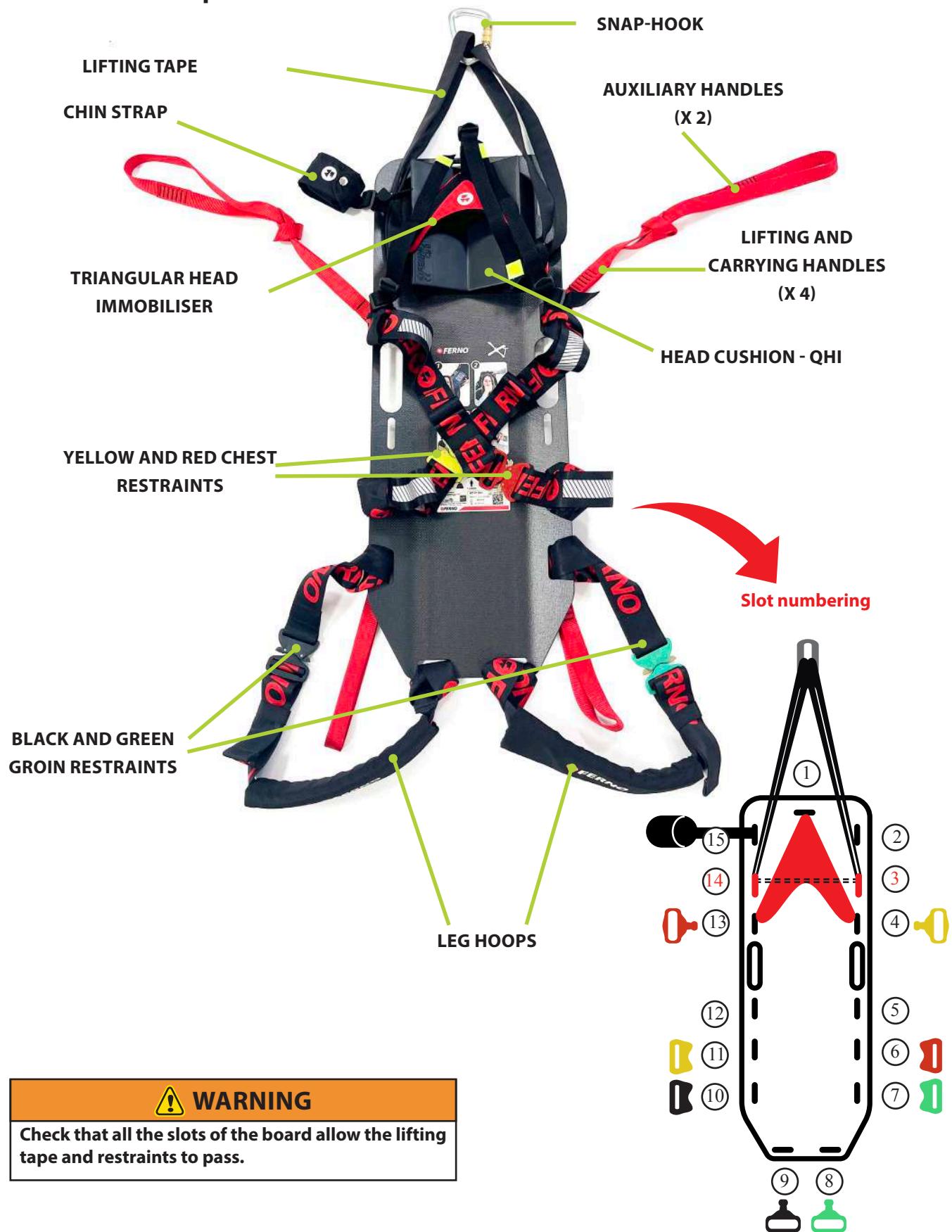
⚠ WARNING

If you have XT Military, you can carry out rescue and/or verticalisation operations following the same procedures as with XT PRO.

⚠ WARNING

Do not use XT PRO for water rescue if the extrication device is required to float. XT PRO is not a device with floating capacity.

4.2 - XT PRO components



4.2.1 General technical specifications

Ferno reserves the right to change the specifications without notice. For further details, please contact Ferno's Customer Service (Section *Ferno Customer Service*).

COMPONENTS OF THE XT PRO EXTRICATION DEVICE

- Board with holes for restraint fastening
- QHI (Quick Head Immobilizer)
- Neoprene triangular head immobiliser
- Chin strap for QHI
- Yellow and red upper chest restraints with reflective slots, "Cobra" buckles and integrated red lifting and carrying handles
- Black and green lower groin restraints provided with red lifting and carrying handle
- Thigh padding for groin restraints (x 2)
- Auxiliary handles (x 2)
- Snap hook
- Lifting tape

Materials

XT Board	Composite material
Quick Head Immobiliser	Polyurethane
Restraints	Polyester
Buckles	Aluminium alloy
Triangular head immobiliser and chin strap	Neoprene

Assembled product specifications

Length	830 mm
Width	300 mm
Thickness	60 mm
Weight (including accessories)	3.4 kg
Load capacity	160 kg

WARNING

Untrained users may injure themselves, cause damage and/or physical harm. Allow only trained and qualified staff to use the XT PRO extrication device.

WARNING

Never exceed the load capacity of the extrication device specified in this manual.

"Cobra" buckles - 18 kN

Lifting strap - Capacity 45 kN

Lifting snap hook - Capacity 50 kN



Read the user manual carefully



At least two qualified operators



Load capacity

4.3 - XT PRO assembly

4.3.1 QHI (Quick Head Immobilizer) assembly

The Quick Head Immobilizer must be applied before using the XT device.

1. Before its application, make sure that the extrication device is placed on a flat surface and the part where the QHI head immobilizer will be applied is clean and dry.
2. Peel off the sticker film placed under the QHI, ensuring that the black part stays on the QHI.
3. Centre the QHI on the upper part of the extrication device, close to the head end hole no. 1.
4. Press the QHI so that its sticker perfectly adheres to the surface (Figure 25).

The installation procedure for the QHI is identical for all versions of the XT. For more information, see the *QHI (Quick Head Immobilizer) assembly* paragraph of the XT PLUS section.



Figure 25 - QHI positioning on XT board

WARNING

In case of purchase of a PRO KIT, please assemble the red reinforcing slots before applying the restraints. Please refer to chapter *Spare parts assembly*.

4.3.2 Assembling the hanging strap and the snap hook

In case of extrications or transports in complex environments, the XT can be **hanged** by means of an anchor device (EN 566:2006), such as a validated textile ring with a minimum length of 120cm, and a connector (EN 362).

In order to apply the strap proceed as follows:

1. Turn XT PRO so that you can see the back of the board.
2. Insert the two ends of the strap into the holes reinforced by the red slots (holes no. 3 and no. 14), so that they protrude from the front of the board (Figure 27).
3. Connect the two ends of the strap with the supplied snap hook (Figure 27C).

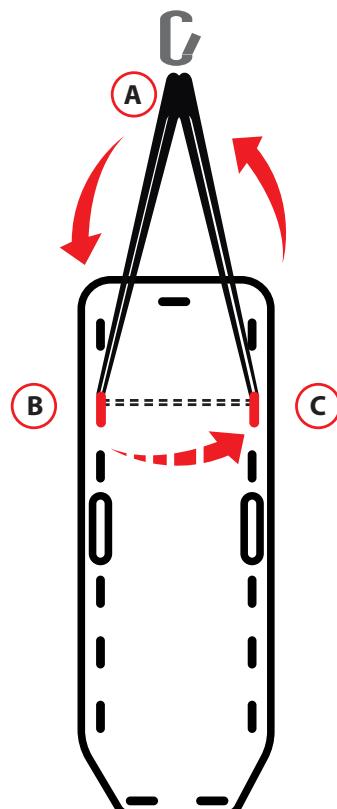


Figure 26 - Lifting tape insertion

WARNING

For the specific maintenance of strap and hook, refer to the manufacturers of the devices.



Figure 27 - Lifting tape application

4.3.3 Triangular head immobiliser assembly

In order to apply the triangular head immobiliser correctly, follow these instructions:

1. Insert the upper strap of the triangular head immobiliser into the hole no. 1 of the board, going from the front to the back of the extrication device (Figure 28).

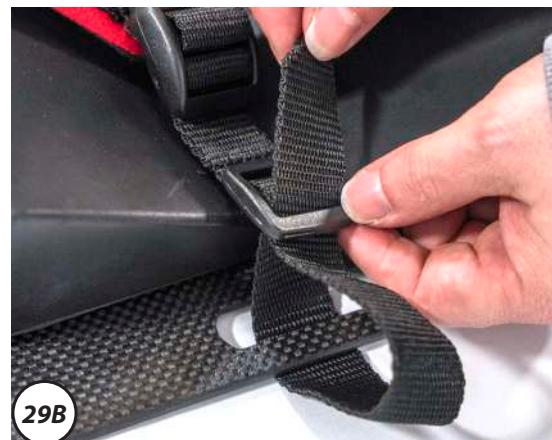


Figure 28 - Possible assembly configurations of the triangular head immobiliser

2. Insert the strap in the first loop of the fastening buckle (Figure 29B).



29A



29B

3. Then insert it in the second loop and pull to fasten the strap in the buckle (Figure 30A).

4. Finally, reinsert the strap into the first loop to ensure a tight fit and prevent the strap from coming loose (Figure 30B, 30C and 30D).



30A



30B



30C



30D

5. Repeat the same operations with the other two straps in the two side holes no. 4 and 13, or no. 3 and 14.

⚠️ WARNING

Failure to complete the three fastening steps may cause undesired loosening of the straps.

Important

Both positions of the triangular head immobiliser on holes no. 4 and 13 or 3 and 14 are possible and ensure proper stabilisation of the patient's head. The choice of set-up is at the discretion of the operator, who can choose the most suitable version, depending on the contingency.



4.3.4 Chin strap assembly



The neoprene chin strap, stored in a special bag, can be secured on the extrication device using side hole no. 15, following the same instructions used for the application of the triangular head immobiliser straps.



Figure 32 - Correct positioning of the chin strap ready for use

Figure 31 - Chin strap assembly

4.3.5 Assembling the restraints

The XT PRO extrication device is equipped with two upper chest restraints (yellow and red) and two lower groin restraints (black and green).

Upper chest restraints should be applied in such a way that they are in a crossed configuration when applied to the patient.

Groin restraints, on the other hand, should be applied in such a way that they fasten on the same side of the board.

Each restraint consists of two pieces. Position the restraints so that the buckles follow the arrangement shown in Figure 33.

The restraints are equipped with integrated red lifting and carrying handles, to which the two extension rings can be added if necessary.

The restraints must be applied before using the XT PRO extrication device. For their application and the identification of the right hole on the device, refer to Figure 33.

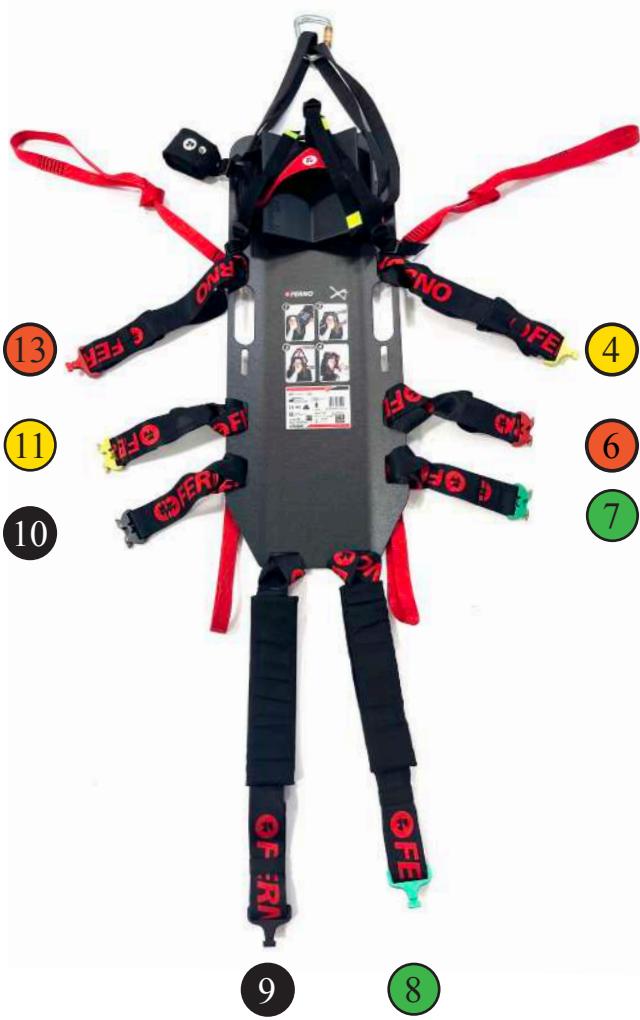


Figure 33 - Configuration of restraints

YELLOW CHEST RESTRAINT

In order to apply the yellow chest restraint:

1. Insert the slot of the restraint with the male end into hole no. 4 on the extrication device, with the stitching facing the operator, making sure that the red handle remains at the back and outside the board (Figure 34A).
2. Insert the yellow buckle into the newly positioned restraint slot (Figure 34B).
3. Pull the restraint to tighten the loop knot, ensuring that the red handle always remains on the outside of the board (Figure 34C).



Figure 32 - Yellow restraint application (end with male buckle)

XT Series Extrication Devices

4. Insert the slot of the restraint with the female end into hole no. 11, with the stitching facing the operator (Figure 35A).
5. Insert the yellow buckle into the newly positioned restraint slot (Figure 35B).
6. Pull the restraint to tighten the loop knot (Figure 35C).



35A



35B



35C

Figure 35 - Yellow chest restraint application



WARNING

It is important that during the assembly of the chest restraints, the red handle always remains outside of the board slot, to ensure that the restraint remains securely on the board during patient handling operations.

RED CHEST RESTRAINT

In order to apply the red chest restraint:

1. Insert the slot of the restraint with the male end into hole no. 13 on the extrication device, with the stitching facing the operator, making sure that the red handle remains outside the board.
2. Insert the red buckle into the newly positioned restraint slot.
3. Pull the restraint to tighten the loop knot, ensuring that the red handle always remains on the outside of the board.
4. Insert the slot of the restraint with the female end into hole no. 6, with the stitching facing the operator.
5. Insert the red buckle into the newly positioned restraint slot.
6. Pull the restraint to tighten the loop knot.



Figure 36 - Application of yellow and red chest restraint

Important

The positioning of the yellow and red chest restraints can be performed by installing the female (lower) end of the restraints also in the holes no. 5 and 12 if the patient's build or clinical condition requires a higher strap application.

⚠️ WARNING

If the XT PRO is being used with high straps (slot no. 5 and 12) for a verticalisation, special care must be taken during the safety check to be carried out before rescue.

If, during the initial check lifting, it should be noticed that the chest strap tends to act on the patient's neck in an unsuitable way, it is possible to lower the lower end of the yellow and red restraints by one slot (slot no. 6 and 11), so as to make the "V" formed by the upper intersection of the restraints deeper, making the verticalisation more comfortable for the patient.

BLACK GROIN RESTRAINT

The application procedure for groin restraints is the same as for chest restraints. The only thing that changes are the holes on which the restraints are applied.

1. Insert the restraint slot with the female end into the hole no. 10 of the extrication device with the stitching facing upwards, taking care that the red handle remains on the outside of the board, as shown for the yellow restraint.
2. Insert the black buckle into the newly positioned restraint slot.
3. Pull the restraint to tighten the loop knot.
4. Insert the slot of the restraint with the male end into hole no. 9, with the stitching facing upwards.
5. Insert the black buckle into the newly positioned restraint slot.
6. Pull the restraint to tighten the loop knot.

37A



GREEN GROIN RESTRAINT

The application procedure for groin restraints is the same as for chest restraints. The only thing that changes are the holes on which the restraints are applied.

1. Insert the restraint slot with the female end into the hole no. 7 of the extrication device with the stitching facing upwards, taking care that the red handle remains on the outside of the board, as shown for the yellow restraint (Figure 34A).
2. Insert the black buckle into the newly positioned restraint slot.
3. Pull the restraint to tighten the loop knot.
4. Insert the slot of the restraint with the male end into hole no. 8, with the stitching facing upwards.
5. Insert the black buckle into the newly positioned restraint slot.
6. Pull the restraint to tighten the loop knot.

37B



Figure 37 - Positioning the groin restraints

4.3.6 Assembling the auxiliary handles

The auxiliary carrying handles are removable and independent, so they can be moved as required. For example, they can be installed on the middle handles to make them longer and allow extrication even with larger patients. As an alternative, they can be directly secured to the board using any available hole. To attach the red handles, follow the fixing procedure with cow hitch (Figures 38, 39 and 40).



Figure 38 - Application of auxiliary handles, step 1



Figure 39 - Application of auxiliary handles, step 2



Figure 40 - Application of auxiliary handles, assembly completed

WARNING

Take care that the two halves of the buckle of each restraint bear the same colour code.

The black and green restraints must not cross the pelvis area but must be on the same side.

Take care to leave the carrying handle out of the cow hitch.



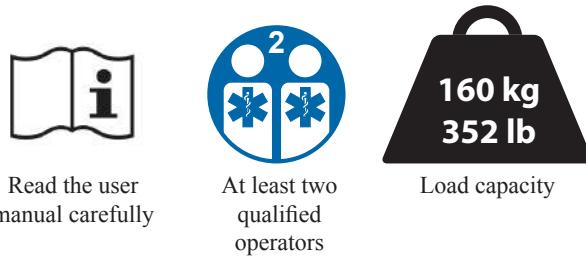
Figure 41 - XT PRO with auxiliary handles assembled

4.4 - Use of the XT PRO extrication device

4.4.1 Before putting the extrication device into service

Staff using the extrication device must have carefully read and understood the information contained in this manual. Before any operation with the extrication device, ensure that:

- The QHI head immobiliser, the triangular head immobiliser and the chin strap are correctly fitted and ready for use.
- All restraints have been correctly applied.
- Ensure that the extrication device does not show any signs of damage or wear, and that it is fully operational. Refer to section “*Inspection*”.



4.4.2 “Ready-to-use” configuration

Before extricating the patient, prepare the device in “Ready-to-use” configuration, following the instructions below:

- Unfasten the buckles of all restraints.
- Join the chest and groin restraints so that they remain at the sides of the device and so that the board is free and ready to be inserted behind the patient's back (Figures 42A and 42B).
- Ensure that the triangular head immobiliser restraints are sufficiently loose and that the chin strap is properly stowed in relevant bag.



Figure 42 - Possible “ready-to-use” configurations of restraints.

Important

Before proceeding with the application of the XT PRO, make sure that the triangular head immobiliser is loose enough to be placed on the back of the board, so that it can be gripped together with the board when inserting the device behind the patient's back.



4.4.3 Instructions for use

This manual does not provide any medical instructions.

It is the responsibility of the operators to follow correct procedures and ensure the safety of both the patient and themselves.

This manual explains the use of the extrication device under ideal conditions and is purely indicative.

The use of the device requires a minimum of two trained and qualified operators.

These operators must work together and coordinate correctly during all operations.

Follow procedures while complying with standard regulations for moving the patient in an emergency.

Lift only the weight that you can safely support. Obtain additional assistance for heavy loads.

The extrication device can be adapted to a variety of circumstances and different scenarios. The trained staff of the emergency service must assess the patient's conditions and determine the most suitable equipment and procedures.

In any case, always observe local healthcare instructions and regulations.

Always assist the patient and never leave them alone during the operations with the device.

⚠️ WARNING

**XT PRO is not a floating device.
For water rescue, use XT Floating.**

⚠️ WARNING

The use of improper and/or unauthorised devices may cause accidents, damage, and/or injury. Only use medical devices that meet the requirements of European Regulation (EU) 2017/745 concerning medical devices.

Important

When the extrication device is not used, store it indoors in a dry place. It is recommended to use its carry bag for storage purposes.

Important

If you have an XT Military or XT PRO device, extrication from the vehicle is still possible by following the procedures for the XT Plus.

4.4.4 Patient positioning procedure

Set up the XT PRO in the chosen ready-to-use configuration and position it next to the patient so that the QHI is aligned with the patient's head (Figure 43).

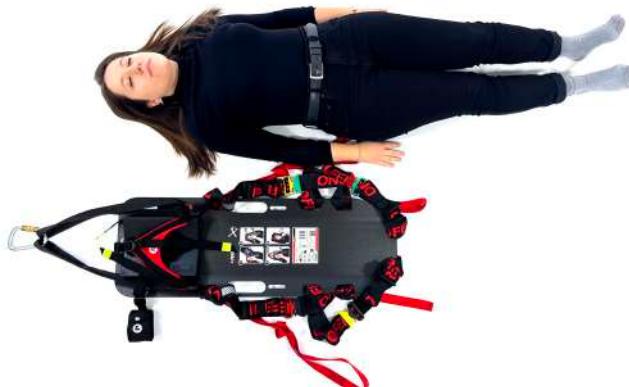


Figure 43 - Board alignment with the patient

Apply the neck brace, if required by local regulations (Figure 44).



Figure 44 - Neck brace application

⚠️ WARNING

Ferno recommends, if possible, that an operator immobilises the cervical spine manually during the XT PRO positioning operations.

Place the patient on the board, following local regulations, apply the triangular head immobiliser, making sure to tension the straps well and unfasten the restraint buckles so that they are easily retrieved by the operator. (Figure 45).



Figure 45 - Positioning the patient on the board

If the neck brace has been applied, also apply the chin strap, taking it out of the bag and attaching it to the opposite hole in the board.



Figure 46 - Patient with neck brace and chin strap applied

You can now proceed with the application of the groin restraints, marked with the colours black and green.

⚠️ WARNING

Before use, always check that the straps are correctly placed (according to the manufacturer's instructions), and comply with the operational check and disinfection program.

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Apply the groin restraints by extending the male end of the restraint and pulling it through the inside of the patient's legs (Figure 47A).

Before fastening the "Cobra" buckle, the thigh padding with Velcro fastener (Figure 47B) can be attached to the restraint, making sure to move it close to the patient's inner thigh for greater comfort.



Figure 47 - Groin restraint application

Then fasten the restraint, bringing the male end towards the patient's hip and closing the buckle in accordance with the colour code (Figure 47C).

Make sure to tension the restraint well before strapping the other leg.

Apply the second groin restraint following the same procedure (Figure 48).

⚠️ WARNING

It should be borne in mind that the bent lower limb, at the level of the thigh, tends to be larger in circumference than with the limb extended. Therefore, once the thigh straps have been correctly applied, make sure that the board has been applied in such a way as to support the entire spine up to the base of the coccyx and that the restraints are well tensioned so that the patient remains in the correct position on the XT board before proceeding with lifting and verticalisation.



Figure 48 - Correct application of groin restraints

To apply the chest restraint, extend the male end of the restraint and pass it over the patient's shoulder, bringing it diagonally across to the opposite side.

Attach the “Cobra” buckle according to the colour code (Figure 49A) and tension the restraint so that it is properly secured (Figure 49B).

Apply the second chest restraint following the same procedure (Figures 49C and 49D).



Figure 49 - Application of chest restraints



Figure 50 - XT PRO final configuration

To move the patient, use the specific red handles.
Follow the reference procedures for patient handling.

WARNING

Duly adjust the straps' tension, making sure that they are firm and well balanced.

Important

Before proceeding with the vertical rescue of the patient, it is necessary to ensure that the groin restraints are correctly tensioned.

To do this, you need to start by bringing the patient to the recovery line, without lifting him/her completely off the ground, then keeping him/her in a "sitting" position.

At this point, re-tension the groin restraints, making sure that, while proceeding with the verticalisation, the board remains in the correct position to support the entire spine up to the base of the coccyx, with the patient's head always aligned with the QHI of the board.



WARNING

It should be borne in mind that the bent lower limb, at the level of the thigh, tends to be larger in circumference than with the limb extended. Therefore, once the thigh straps have been correctly applied, make sure that the board has been applied in such a way as to support the entire spine up to the base of the coccyx and that the restraints are well tensioned so that the patient remains in the correct position on the XT board before proceeding with lifting and verticalisation.



5 - XT MILITARY EXTRICATION DEVICE

5.1.1 Description and intended use

The XT Military extrication device is a medical device designed for the immobilisation and extrication of trauma and non-trauma patients from different military vehicles, with a focus on the traumatised person wearing their personal equipment (bulletproof vest and helmet).

Two trained and qualified operators are recommended for correct use of the XT Military extrication device. Always refer to local regulations.

The device is equipped with adjustable restraints to allow a correct immobilisation of the patient. The upper chest restraints must be applied in a crossed configuration; the lower groin restraints must be secured on the same side.

5.1.2 CE Marking

Ferno's products meet the general safety and performance requirements of European Regulation (EU) 2017/745 (MDR) concerning medical devices.

For any further information: www.ferno.it



5.1.3 Reporting accidents

In the event of a serious accident in relation to the device, immediately contact Ferno S.r.l. and the competent authority of the member State in which the user has its main office.

E-mail: eu-regulatory.it@ferno.com

Website dedicated to support - Ferno SOS www.fernodos.it

Phone +39 051 6860028

Fax +39 051 8681508

Important

It is assumed that the intervention is carried out on military personnel wearing the required personal equipment (bulletproof vest and helmet).

WARNING

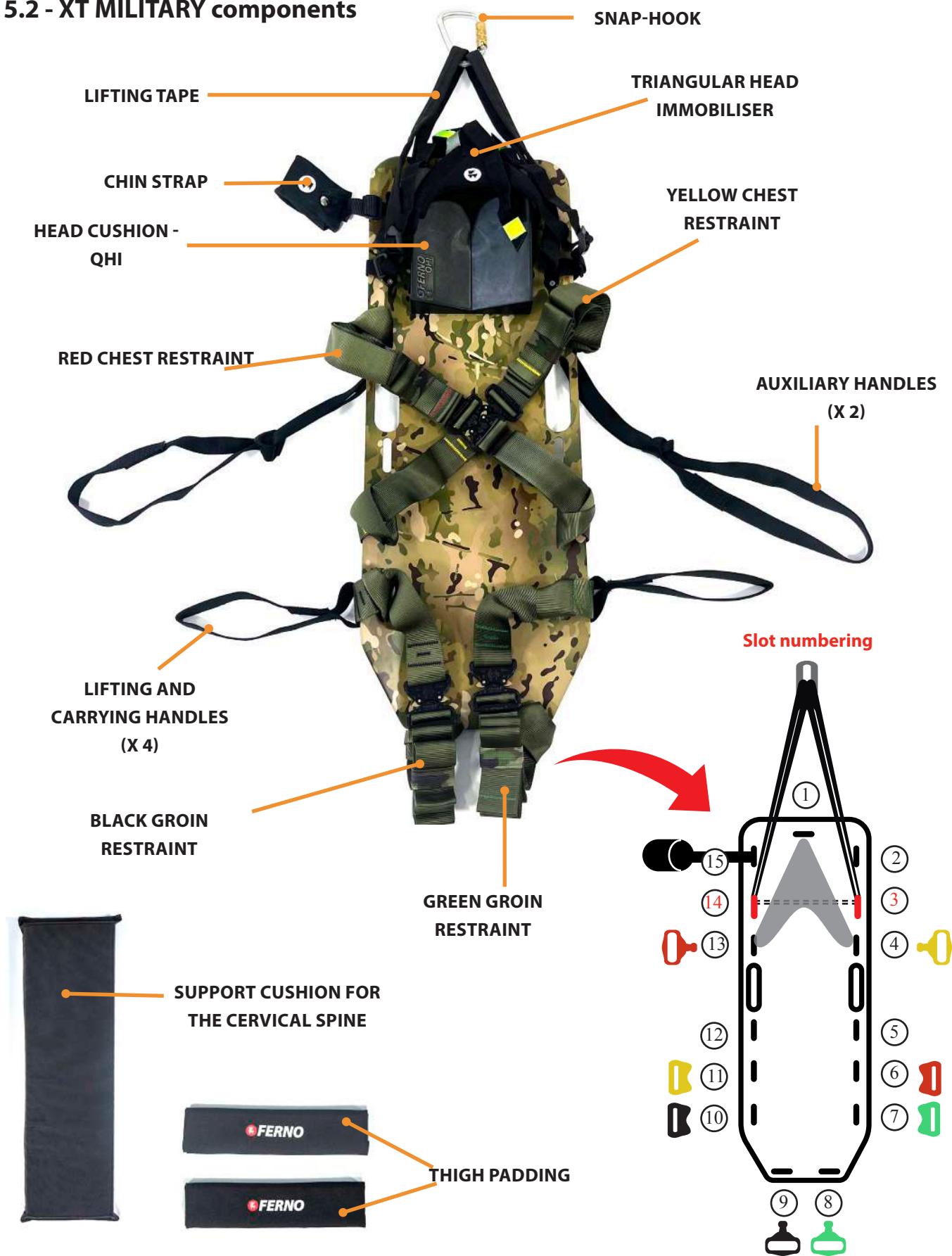
Improper use of the extrication device may cause damage and/or injury. Use the XT Military extrication device as described in this manual.

WARNING

If necessary, XT PRO / Military can also be used for extrication from vehicles. In this case, follow the instructions for the XT Plus series.

NATO number 6515150288871

5.2 - XT MILITARY components



5.2.1 General technical specifications

Ferno reserves the right to change the specifications without notice. For further details, please contact Ferno's Customer Service (page 2).

COMPONENTS OF THE XT PRO EXTRICATION DEVICE

- Board with holes for restraint fastening
- QHI (Quick Head Immobilizer)
- Neoprene triangular head immobiliser
- Chin strap for QHI
- Yellow and red chest restraints with colour-coded stitching and integrated red lifting and carrying handles
- Black and green groin restraints with colour-coded stitching and integrated red lifting and carrying handles
- Thigh padding for groin restraints (x 2)
- Auxiliary handles (x 2)
- Snap hook
- Lifting tape
- Longitudinal cushion to support the cervical spine, in case of positioning the device on a patient wearing bulletproof vest and helmet.

Materials

XT Board	Composite material
Quick Head Immobiliser	Polyurethane
Restraints	Nylon
Buckles	Aluminium alloy
Triangular head immobiliser and chin strap	Neoprene

Assembled product specifications

Length	830 mm
Width	300 mm
Thickness	60 mm
Weight (including accessories)	3.4 kg
Load capacity	160 kg

WARNING

Untrained users may injure themselves, cause damage and/or physical harm. Allow only trained and qualified staff to use the XT extrication device.

WARNING

Never exceed the load capacity of the extrication device specified in this manual.

5.3 XT MILITARY assembly

For the assembly procedure of the XT MILITARY, please refer to what is explained in the *XT PRO assembly* section, as the two only differ in colour.

WARNING

Check that all the slots of the XT Military allow the tape and restraints to pass.

5.4 Extrication procedure

Once access to the passenger compartment has been gained, manually stabilise the casualty's cervical spine. This procedure can be performed by the operator approaching from the side of the passenger compartment (Figure 51), or by another operator entering from the opposite side (Figure 52) or from the back of the passenger compartment, if accessible.



Figure 51 - Approaching the passenger compartment from the casualty's side



Figure 52 - Approaching the casualty from the opposite side

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Take care to remove any real obstacles (belts, objects located inside the passenger compartment that hinder the procedures) and potential obstacles (weapons of all kinds, especially in the case of a casualty with altered mental state) (Figures 53 and 54).

If necessary, get help in this procedure.



Figure 53 - Releasing the safety belts



Figure 54 - Removing the belts from the rescue area

Before extracting the patient, check that no more urgent stabilisation actions are necessary. Once the patient is stabilised and/or their condition permits, proceed with extrication.

In order to have the device immediately usable, it is recommended that it be stowed in a “ready-to-use” state, with the restraints fastened at the sides (Figures 55A and 55B) and the straps folded back on themselves and secured with the supplied elastic and the chin strap stowed in the bag provided.

WARNING

Check for massive haemorrhage in the limbs that can be treated with a tourniquet directly in the passenger compartment. Extrication, in this case, would shift the focus to an incorrect priority. Massive limb haemorrhage not treated with tourniquet could lead to a sudden deterioration of vital parameters with imminent danger to the life of the casualty.



Figure 55A and 55B - XT MILITARY ready for use

⚠️ WARNING

For a better understanding of the procedure for the use of the XT Military extrication device, archive photos were used in which the XT PRO was applied in the outdated red QHI version, in order to make it more visible in the images with military camouflage.



Figure 56 - Strap preparation

While manually holding the cervical spine, move the casualty's torso slightly forward in order to insert the XT MILITARY between the casualty and the seat (Figure 57).



Figure 57 - Inserting the XT Military between the casualty and the seat of the vehicle

⚠️ WARNING

When positioning the XT MILITARY between the casualty and the seat, take special care to ensure that the entire system of restraints and lifting straps that will be located towards the inside of the passenger compartment are exposed and visible. This will make it easier to find these restraints and winch hook attachments not only when it is possible to work from the opposite side of the passenger compartment (with another operator) but also when this is not possible.



Figure 58 - Proper head-QHI alignment

The device must be inserted until head is suitably aligned with the QHI (Figure 59).

Incorrect alignment would lead to incorrect positioning of the device, with potential risks for cervical spine stability during extrication (Figures 60 and 61).



Figure 59 - Proper head-QHI alignment



Figure 60 - QHI positioned too low relative to the casualty's head



Figure 61 - QHI positioned too high relative to the casualty's head

Holding the cervical spine steady in place, take the longitudinal cushion provided, checking the space created behind the cervical spine (between the neck, helmet, bulletproof vest and Ferno XT) (Figure 62), and roll it up just enough to fill this space. (Figure 63).



Figure 62 - Position for cushion application



Figure 63 - Preparing the cushion after assessing the space between the cervical spine and the XT

WARNING

In this section, archive images containing the previous version of the current black cushion were used to show the correct positioning of the longitudinal cushion behind the neck.

When the cushion is rolled up, the air contained in the cushion will be eliminated (Figure 64). When placed behind the cervical spine, it will naturally adapt to the remaining empty space (Figure 65).



Figure 64 - Cushion ready to be positioned



Figure 65 - Inserting the cushion behind the casualty's neck

WARNING

Avoid inserting an excessively thick longitudinal cushion between the cervical spine and XT MILITARY. This would lead to subsequent bending of the head, which is not recommended in a traumatised person (Figure 66).



Figure 66 - Incorrect cushion positioning resulting in the casualty's head bending forward

While manually holding the head, pull out the triangular head immobiliser and position it at the centre of the casualty's helmet (Figure 67).

Then begin to gradually tighten the straps of the triangular head immobiliser (Figure 68) until the head is fully secured to the XT MILITARY (Figure 69). Avoid over-tightening the straps or tightening them asymmetrically.



Figure 67 - Positioning the triangular head immobiliser



Figure 68 - Fastening the head immobiliser straps



Figure 69 - Triangular head immobiliser applied

WARNING

If access from the opposite side of the passenger compartment is not possible, the following manoeuvres will only be carried out by the operator who has access to the passenger compartment from the casualty's side. However, should it be possible to have a second operator (helper) on the opposite side, the following manoeuvres will be coordinated between the two operators. It is preferable that the team leader is the operator on the side of the casualty, as the other operator may have problems with freedom of movement and limited visual field.

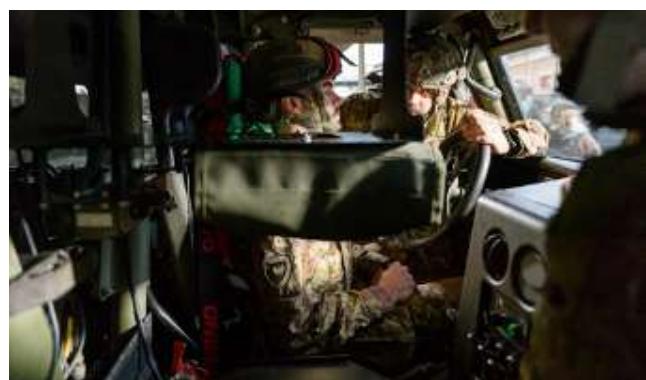


Figure 70 - Visual obstruction from the passenger compartment

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The head fastening procedure ends with the positioning of the chin strap (Figure 71).

At this point, the operator manually holding the person's head can stop, as their head will be firmly secured to the XT MILITARY, and the operator will be free to perform the subsequent manoeuvres.



Figure 71 - Complete head fastening with chin strap

Extend the chest restraints completely and pass the male end diagonally across to the opposite side (where the other operator may be) by sliding the restraints over the shoulders (Figures 72 and 73).



Figure 72 - Grabbing the chest restraints



Figure 73 - Extending the chest restraints

Fasten the buckles so that the chest restraints cross over the chest, respecting the colour codes on each buckle (Figures 74 and 75).



Figure 74 - Fastening the chest restraints



Figure 75 - Correct position of the chest restraints

Tighten the chest restraints by pulling their free end (Figure 76). If 2 operators are working together, perform this procedure in a coordinated manner, so that both restraints are tightened at the same time. Tightening will also secure the chest to the board of the XT MILITARY (Figures 77 and 78).



Figure 76 - Tightening the chest restraints



Figure 77 - Tightened chest restraints (Front view)



Figure 78 - Tightened chest restraints (Side view)



Figure 79 - Restraint sliding technique to avoid overlapping near the buckle



WARNING

Special care must be taken to ensure that the pulling of the restraint does not cause it to block inside the buckle. This phenomenon can be common and can be prevented by pulling the free portion of the restraint along the portion of the chest restraint already locked with the buckle and accompanying the tightening manoeuvre with a finger placed between the two portions of the restraint, near the buckle (Figure 79).

Extend the thigh straps to full extension and pass the end with the male buckle between the casualty's legs (Figures 80 to 82).



Figure 80 - Grabbing the groin restraints



Figure 83 - Tightening the groin restraint



Figure 81 - Extending the groin restraints



Figure 84 - Tightened groin restraint



Figure 82 - Passing the thigh straps under the thigh

This strap, once fastened, will create a sort of seat for extrication, so it must be well tightened. In order to ensure adequate tightening, it is advisable to slide the strap, with a "saw-like" movement, as far as possible under the buttocks (Figure 83) with the help of your hands while pulling the end between the legs (Figure 84).



Figure 85 - Attaching the groin restraint

Once this has been achieved, pass the groin restraint along the upper part of the same thigh, in order to reach the female buckle on the other side of the restraint (Figure 85). Again, the colour coding of the restraints will be respected (Figure 86).



Figure 86 - Colour coding of groin restraints

⚠️ **WARNING**

It should be borne in mind that the bent lower limb, at the level of the thigh, tends to be larger in circumference than with the limb extended. Therefore, check and, if necessary, re-tension the groin restraints before lifting.

Once the groin restraints have also been tightened, the entire spine can be considered to be secured to the XT MILITARY (Figure 88) and the injured person can be extracted from the passenger compartment.



Figure 88 - Casualty secured to the XT MILITARY after all straps and restraints have been tightened

In the presence of an operator accessing from the opposite side of the casualty, the operator on the casualty's side should ensure that the groin restraints are tightened correctly, tightening them further if necessary. To facilitate this last operation, if possible, the operator on the casualty's side can partially enter the passenger compartment using the vehicle's step (if present) (Figure 87).



Figure 87 - Restraint tightening check performed by an operator with access from one side of the passenger compartment only



Figure 89 - Lateral inclination of the torso



Figure 90 - Lateral inclination of the torso



Figure 91 - Exposing the torso of the casualty outside the vehicle

At this point, the two operators will rotate the casualty's torso again, so that his/her back is facing the outside of the vehicle. Each operator, on his or her own side, must grasp the side auxiliary handles (Figures 92 and 93).

With a coordinated movement of the operators, the casualty is extracted from the passenger compartment by pulling the two pairs of auxiliary handles (Figure 93).



Figure 92 - Grasping the side lifting straps



Figure 93 - Extraction of the casualty from the passenger compartment

It would be appropriate for a third operator to support the lower limbs, so that they do not dangle uncontrollably or become stuck to the structure and/or objects in the passenger compartment (Figures 94 and 95).



Figure 94 - Intervention of the third operator to facilitate the exit of the lower limbs



Figure 95 - Extraction completed

Important Possible variant on extrication

In cases in which extrication is difficult (e.g. because the casualty is tall), it is possible to set up an extrication procedure where the feet are the first part of the body to exit the vehicle.

In this case, once the XT MILITARY has been secured to the casualty, the latter must be rotated by pulling the feet out of the vehicle.

While the two main rescuers will each grab the side auxiliary handles of the XT MILITARY on their side, a third rescuer will grab the casualty's feet to ensure a "controlled" exit from the passenger compartment.



Figure 96 - Positioning the casualty on a stretcher after extrication

If, on the other hand, it is necessary to initially stabilise the casualty before evacuation, it will be necessary to release the buckles in order to assess chest conditions (in the meantime, manoeuvres to treat any other massive bleeding and breathing problems may be initiated). (Figures 97 and 98)



Figure 97 - Releasing the straps to begin the assessment of the casualty



Figure 98 - Releasing the straps to begin the assessment of the casualty

6 - XT FLOATING EXTRICATION DEVICE

6.1.1 Description and intended use

The XT Floating extrication device is a medical device designed for the immobilisation and extrication of trauma and non-trauma patients, to ensure extreme manoeuvrability and reliability during water rescue. It is recommended that the XT Floating extrication device be used by a minimum of two trained and instructed operators. Always refer to local regulations.

The extrication device is equipped with a head-end float and two side floats with Fast Clip fasteners that provide optimal support for the patient and prevent him or her from tipping over, a set of adjustable restraints that allow the patient to be properly secured to the extrication device, and an automatic strobe rescue light.

6.1.2 CE Marking

Ferno's products meet the general safety and performance requirements of European Regulation (EU) 2017/745 concerning medical devices.

For any further information: www.ferno.it



6.1.3 Reporting accidents

In the event of a serious accident in relation to the device, immediately contact Ferno S.r.l. and the competent authority of the member State in which the user has its main office.

E-mail: eu-regulatory.it@ferno.com

Website dedicated to support - Ferno SOS www.fernodos.it

Phone +39 051 6860028

Fax +39 051 8681508

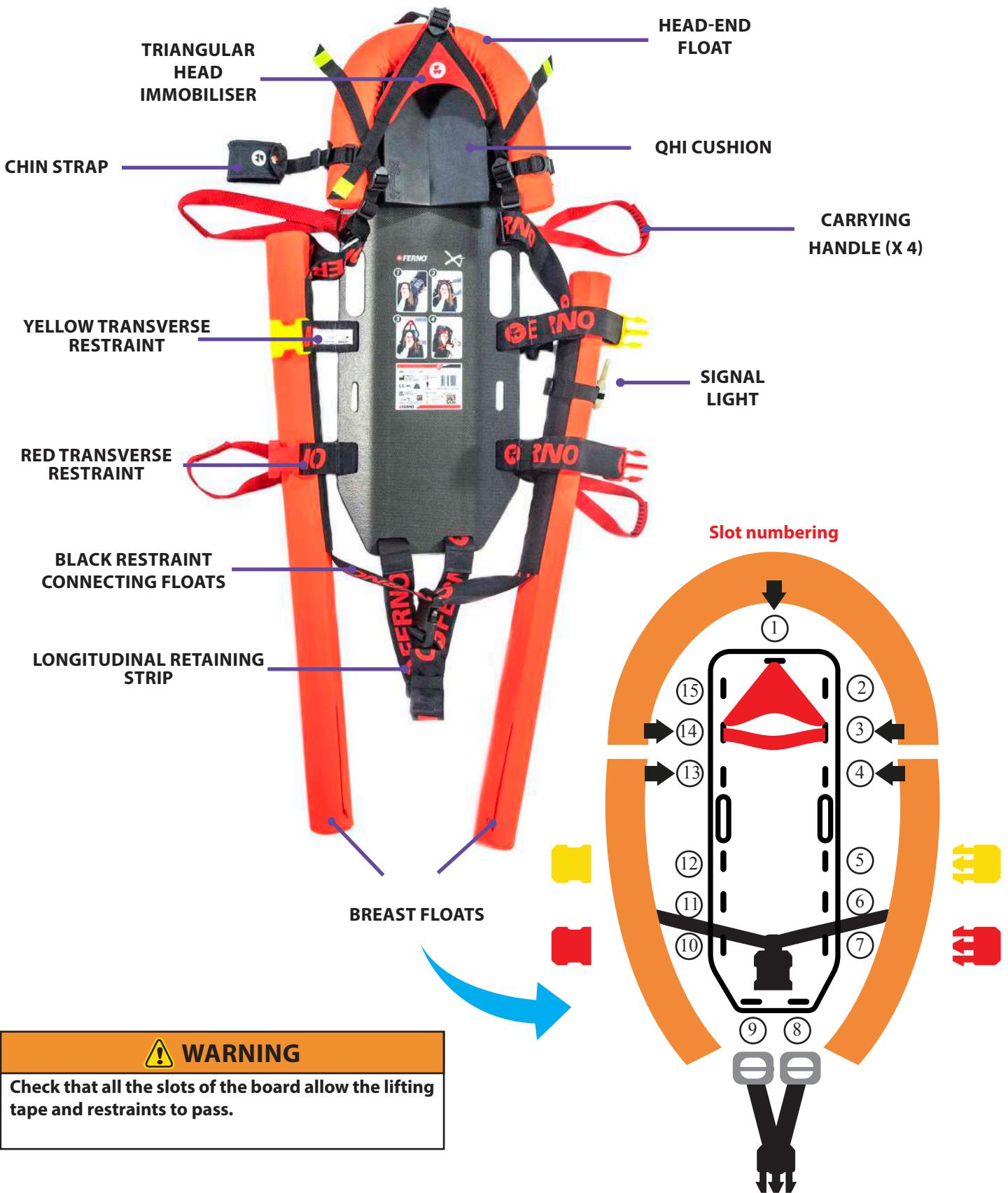


WARNING

Improper use of the extrication device may cause damage and/or injury. Use the XT Floating extrication device as described in this manual.

Do not use XT Floating for extrications from vehicles and/or verticalisation.

6.2 - XT Floating components



6.2.1 General technical specifications

Ferno reserves the right to change the specifications without notice. For further details, please contact Ferno's Customer Service (page 2).

COMPONENTS OF THE XT FLOATING EXTRICATION DEVICE

- Board with holes for restraint fastening
- QHI (Quick Head Immobilizer)
- Neoprene triangular head immobiliser
- Chin strap for QHI
- Red and yellow transverse restraints
- Carrying handles (x 4)
- Head end floats
- Breast floats (x 2)
- Longitudinal restraint
- Automatic strobe rescue light

Materials

XT Board	Composite material
Quick Head Immobiliser	Polyurethane
Restraints	Polyester
Buckles	Aluminium alloy
Triangular head immobiliser and chin strap	Neoprene
FLOATS	Polyester, Spandex and Polyethylene

Assembled product specifications

Length	1200 mm
Width	350 mm
Thickness	65 mm
Weight (including accessories)	3.3 kg
Load capacity	160 kg

WARNING

Untrained users may injure themselves, cause damage and/or physical harm. Allow only trained and qualified staff to use the XT Floating extrication device.

WARNING

Never exceed the load capacity of the extrication device specified in this manual.

WARNING

Head fastening systems, triangular head immobiliser and chin strap are attached to the head-end float and to the connection above the main floats by means of special rings.



Read the user manual carefully



At least two qualified operators



Load capacity

6.3 - XT Floating extrication device assembly

6.3.1 QHI (Quick Head Immobilizer) assembly

The Quick Head Immobilizer must be applied before using the XT FLOATING extrication device.

1. Before its application, make sure that the extrication device is placed on a flat surface and the part where the QHI head immobilizer will be applied is clean and dry.

2. Peel off the sticker film placed under the QHI, ensuring that the Velcro stays on the QHI (Figure 99A).

3. Centre the QHI (Figure 99B) on the upper part of the extrication device, close to the head end hole no. 1, (to identify the hole no. 1, see the *XT Floating components* paragraph).

4. Press the QHI so that its sticker perfectly adheres to the surface (Figure 99B).

Once the QHI has been correctly applied, it will be possible to use the Velcro to detach and attach the cushion during cleaning and disinfection or as required.



Figure 99 - QHI application

6.3.2 Assembling the head-end floats

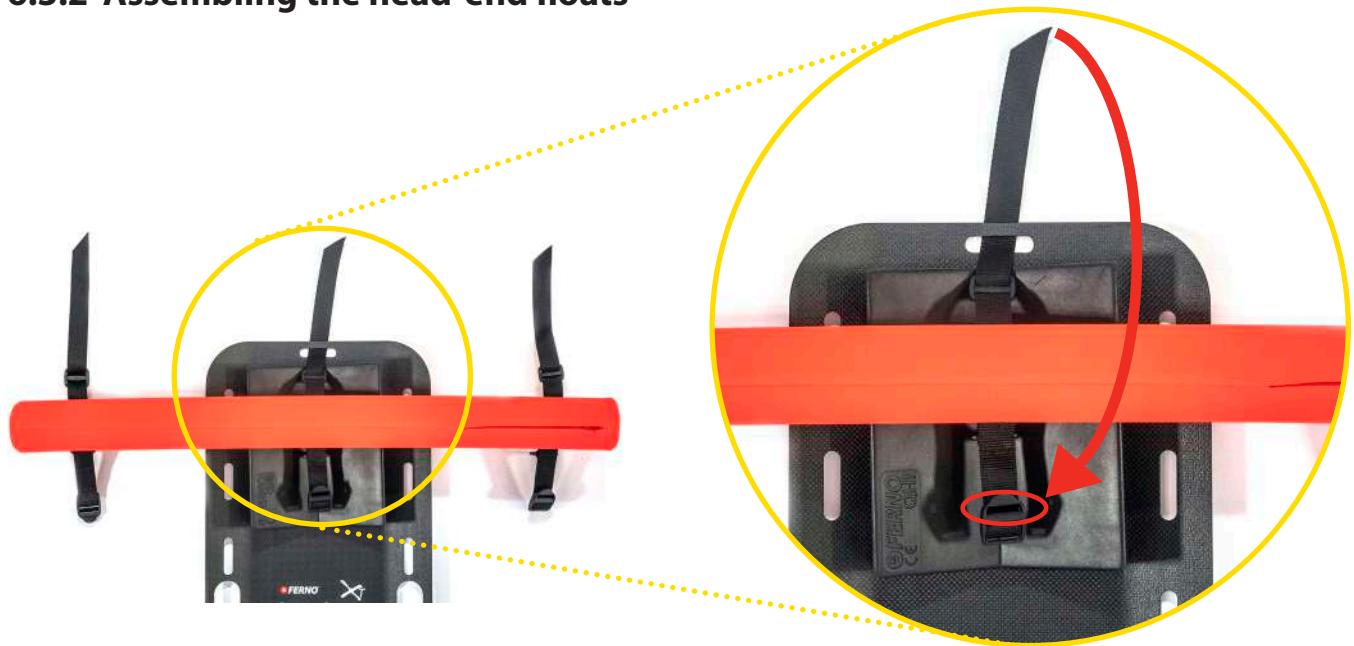


Figure 100 - Central strap application

Position the head-end float perpendicular to the board, with the buckle-free restraints side facing the top of the XT Floating, so that the central strap passes through slot number 1, from the inside to the outside, as shown in Figure 100.

Then fasten the strap by passing the previously threaded end through the board slot around the float and into the buckle, completing the fastening as shown in Figures 101 and 102.

It is important to carry out all three steps to ensure that the strap is securely fastened.



Figure 101 - Steps for fastening on the head-end float buckles

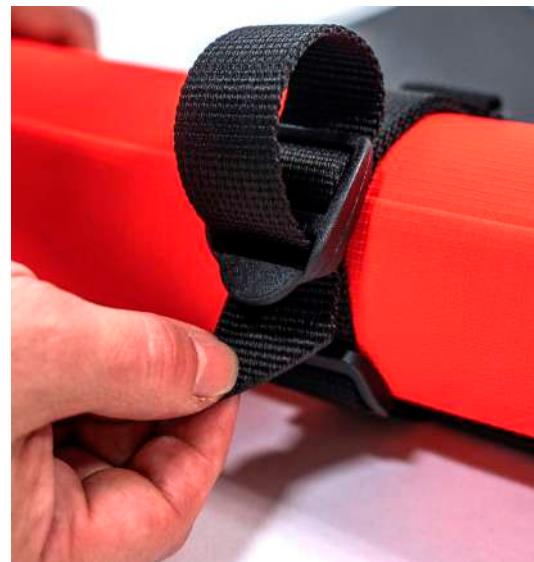


Figure 102 - Fastening the central strap

Once this is completed, fix the excess strap inside the adjacent buckle (Figures 103A and 103B).



Figure 103 - Head-end float correctly assembled

Repeat the operation described for the side fastening points, using slots 3 and 14. Always block excess tape, as shown in Figures 101, 102, 103A and 103B.

⚠️ WARNING

For correct assembly, the strap must be tensioned as tightly as possible, respecting all the steps.

6.3.3 QHI chin strap assembly

Insert the strap of the chin strap into one of the two plastic slots on the head-end float, so that the closure of the bag remains facing upwards. The chin strap can be fitted either on the right or left side of the board, depending on the operator's preference.

Once the strap is inserted into the plastic slot, fold it around it, bringing the flap in the direction of the bag as shown in Figure 104.

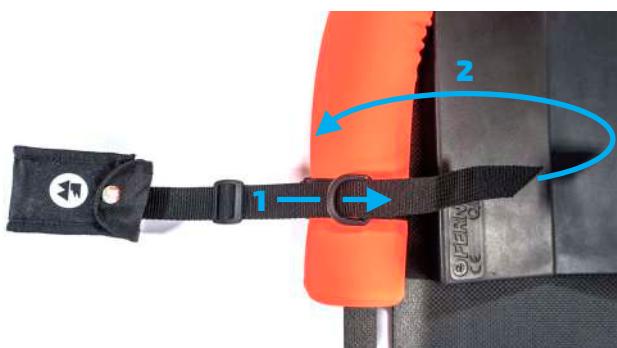


Figure 104 - Chin strap insertion

Insert the end of the strap inside the buckle and complete the fastening as shown in Figures 105A, 105B and 105C.



Figure 105 - Chin strap fastening steps

6.3.4 Assembling the restraints

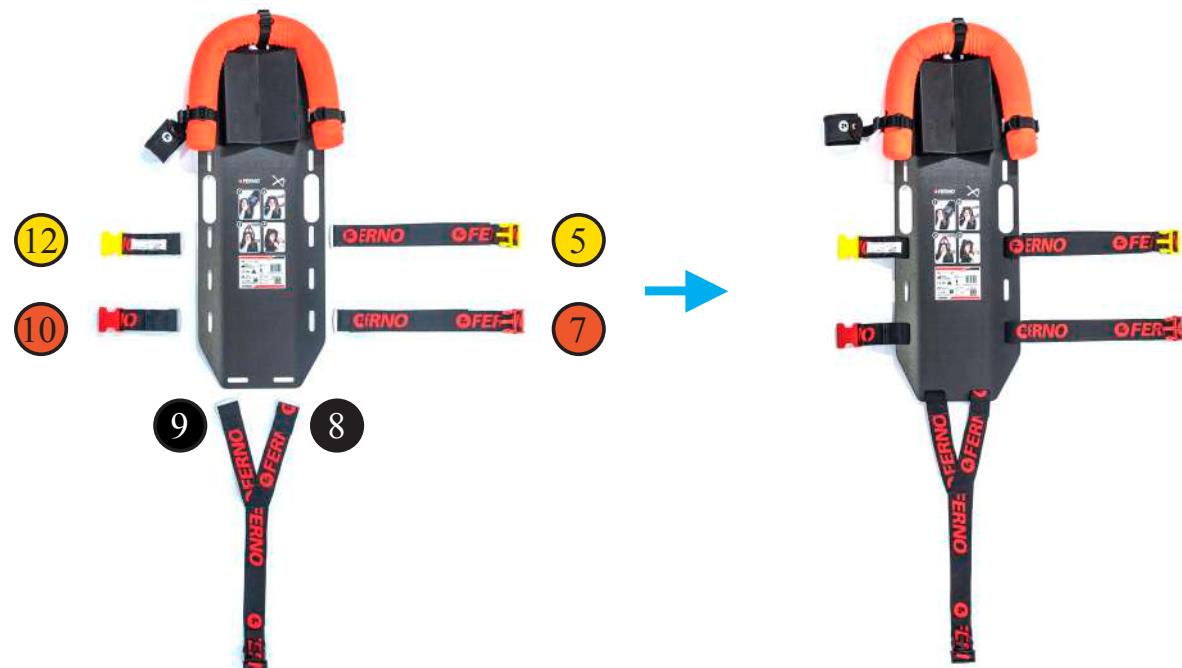


Figure 106 - XT Floating restraint configuration before and after assembly

In order to install the restraints on the XT Floating, the metal buckle of each restraint must be inserted into the respective slot so that it remains on the back of the board and positioned so that when pulled, the restraint remains fixed on the XT Floating (Figure 107A, 107B, 107C). Perform this operation for all restraints, following the arrangement shown in Figure 106.

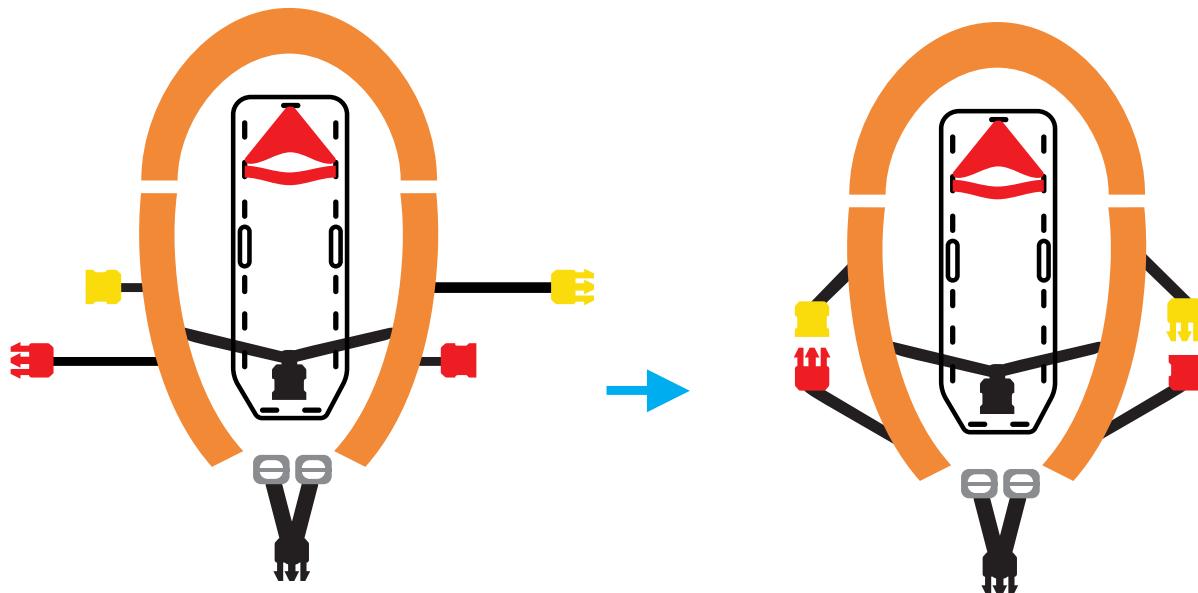


Figure 107 - Application of XT Floating restraints

Possible variant on restraint application

You can attach the restraints as shown in Figure 106, so that the male buckles are both on the same side.

Alternatively, if you want to reproduce the "ready-to-use" configuration as in the XT Plus and Pro, you can choose to fit one of the two restraints (yellow or red) with the buckles inverted as shown in the drawing, so that, by attaching them together on the sides, the board remains free.



6.3.5 Assembling the breast floats and the restraint with black buckle

Place the breast floats parallel to each other, with the black sleeves facing upwards and both positioned on the same side.

Insert the end of the retaining restraint without the metal buckle inside the sleeve of the first float, starting from the outermost side, as shown in Figure 108A.

Before attaching the restraint to the second float, insert the black female buckle on the restraint so that it remains positioned between the two floats (Figure 108B), then proceed to insert the restraint into the second sleeve starting from the centre of the float towards the outermost end as shown in Figure 108C.



Figure 108 - Assembling the retaining restraints on the breast floats

Once the end of the strap has been extracted from the outer end of the second sleeve, it must be attached to the last piece of the restraint with the two metal buckles.

It is advisable to do this by taking care to turn the floats so that the sleeves remain facing downwards (i.e. in the same position as they will be applied to the patient. Figure 109).

Once the end of the strap has been extracted from the outer end of the second sleeve, it must be attached to the last piece of the restraint, the one with the two metal buckles (Figure 110).

Insert the end of the restraint inside the buckle and complete the fastening as shown in Figures 110, 111A, 111B and 111C.



Figure 109 - Correctly applied restraint

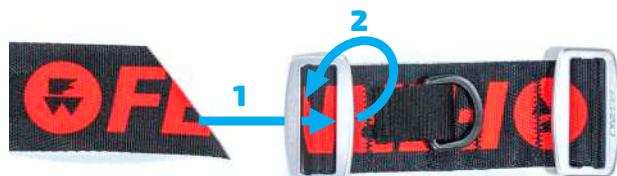


Figure 110 - Final fastening steps



Figure 111 - Final fastening steps in detail



Figure 112 - Positioning the breast floats to complete the installation

To complete the installation of the breast floats on the board, insert the metal buckles at both ends of the restraint into the slots no. 4 and 13.

To facilitate the procedure, place the floats on top of the board with the sleeves facing downwards so that the black plastic buckle can engage onto the corresponding male one already attached to the device, as shown in Figure 112.

Then insert the buckles from the front (Figure 113), ensuring that the buckle locks the restraint firmly in place (Figure 114).



Figure 113 - Breast float metal buckle fastening

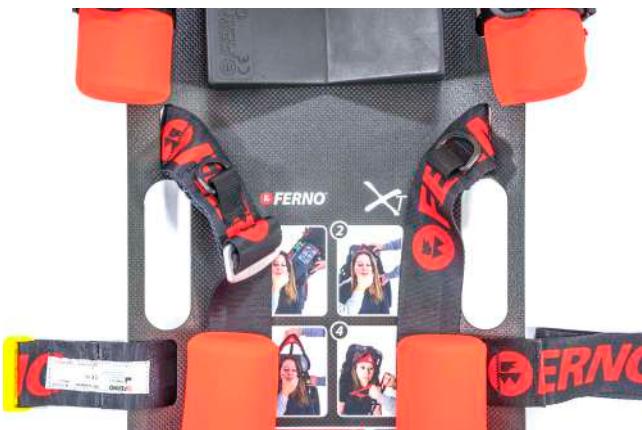


Figure 114 - Floats correctly assembled

6.3.6 Triangular head immobiliser assembly

Once the floats are assembled, it will be possible to attach the triangular head immobiliser to the plastic loops located one on the head-end float in a central position and the other two at the upper ends of the transverse connection restraint of the breast floats (Figure 115).



Figure 115 - Attachment points of the triangular head immobiliser

Before assembly, place the triangular head immobiliser so that the strap is aligned with the head-end float loop.

Now insert the strap into the loop and twist it around the loop, bringing the end in the direction of the triangular head immobiliser.

Then insert the strap into the plastic buckle adjacent to the apex of the triangle and perform the complete fastening procedure as shown in Figure 116.



Figure 116 - Fitting the upper strap to the head-end float

Fasten the side straps by passing them through the plastic slots of the transverse restraint following the same procedure as for the upper strap (Figure 117).

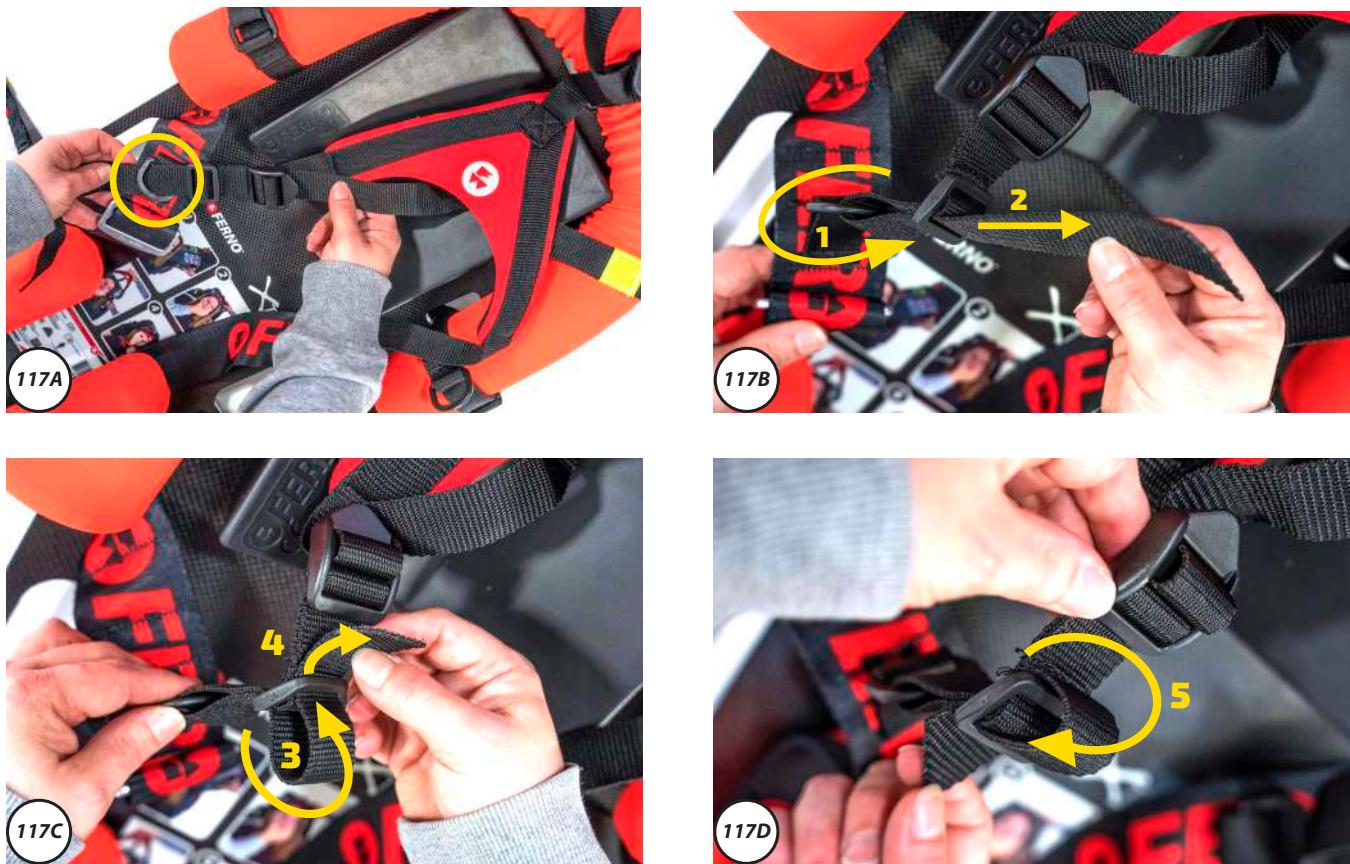


Figure 117 - Fitting the side straps of the triangular head immobiliser



Figure 118 - Triangular head immobiliser correctly installed

6.3.7 Signal light assembly

The signal light is supplied pre-assembled on the special fastening strap, which can be installed either on the right or left side of the XT Floating, attached to one of the two breast floats or to one of the two sides of the head-end float.

It is important to ensure that the light is mounted in a section of the float that does not allow it to slip out accidentally. For this reason, we recommend positioning it at the sleeve into which the longitudinal restraint passes (Figure 120).

In this way, the restraint itself will block the accidental slipping of the signal light from either side.

To proceed with installation, follow the steps below:

- Place the strap around the float so that the light remains on the outside.
- Insert the elastic strap into the two loops of the buckle (Figures 121B and 121C).

If applied correctly, the signal light will activate when it comes into contact with water.

To facilitate switching on, the position of the light can be changed by rotating the relevant holder (Figure 121D and 121E).



Figure 119 - Signal light



Figure 120 - Recommended signal light positioning



121A



121B



121C



121D



121E

Figure 121 - Signal light application

6.3.8 Assembling the auxiliary handles

The red carrying handles are removable and independent, so they can be moved as required.

They can operate directly on the board by using any available hole, or they can be mounted on other previously installed auxiliary handles, in order to lengthen them and allow an extrication manoeuvre even on large builds.

To attach the red handles, follow the fixing procedure with cow hitch (Figure 122A and 122B).



Figure 122 - Fixing the auxiliary handles

6.4 - Use of the XT Floating extrication device

6.4.1 Before putting the extrication device into service

Staff using the extrication device must have carefully read and understood the information contained in this manual. Before any operation with the extrication device, ensure that:

- The QHI head immobiliser, the triangular head immobiliser, the floats, the signal light and the chin strap are correctly fitted and ready for use.
- All restraints have been correctly applied.
- Ensure that the device does not show any signs of damage or wear, and that it is fully operational. Refer to section “*Inspection*”.



Read the user manual carefully



At least two qualified operators



Load capacity

6.4.2 Instructions for use

This manual does not provide any medical instructions.

It is the responsibility of the operators to follow correct procedures and ensure the safety of both the patient and themselves.

This manual explains the use of the extrication device under ideal conditions and is purely indicative.

The use of the device requires a minimum of two trained and qualified operators.

These operators must work together and coordinate correctly during all operations.

Follow procedures while complying with standard regulations for moving the patient in an emergency.

Lift only the weight that you can safely support. Obtain additional assistance for heavy loads.

The extrication device can be adapted to a variety of circumstances and different scenarios. The trained staff of the emergency service must assess the patient's conditions and determine the most suitable equipment and procedures.

In any case, always observe local healthcare instructions and regulations.

Always assist the patient and never leave them alone during the operations with the device.



WARNING

The use of improper and/or unauthorised devices may cause accidents, damage, and/or injury. Only use medical devices that meet the requirements of European Regulation (EU) 2017/745 concerning medical devices.

Important

When the extrication device is not used, store it indoors in a dry place. It is recommended to use its carry bag for storage purposes.



123 - XT Floating storage

6.4.3 “Ready-to-use” configuration

Before proceeding with rescue manoeuvres in the water, ensure that the XT Floating is set in the “Ready-to-use” configuration:

- Unfasten the buckles of all restraints.
- Ensure that the triangular head immobiliser restraints are sufficiently loose and that the chin strap is properly stowed in relevant bag.
- Place the breast floats on the back of the board, tipping them on the head end.

⚠️ WARNING

Prepare the board straps so that they do not interfere with this operation.

For example, tie the straps on the back of the board so they can be extracted when the patient is in place.

If the red and yellow restraints are positioned with the male and female buckles reversed, it is possible to attach them together so that they remain at the sides of the device and thus the board remains free and ready to be inserted behind the patient's back (See box “Possible variant on restraint application”, in the chapter on restraint assembly).



Figure 124 - “Ready-to-use” configuration with yellow and red restraints symmetrical and open

6.4.4 Patient positioning procedure

Adopt the safety position with the patient in water, leaving the back free for the subsequent positioning of the XT Floating (Figure 125).

Position the XT Floating under the patient's back (Figure 126).



Figure 125 - Patient's safety position



Figure 126 - XT Floating positioning

XT Series Extrication Devices

Release the black buckle of the main floats first and place the floats on the patient's chest.

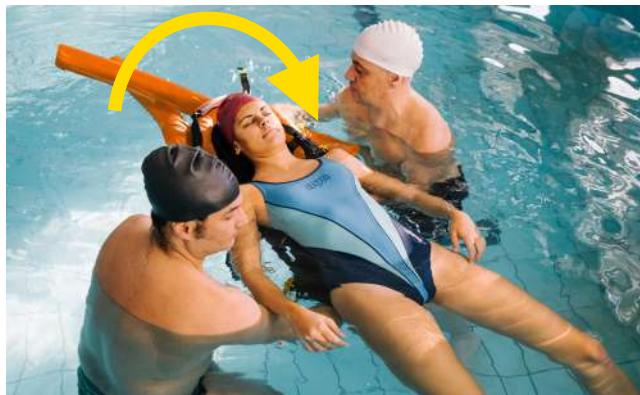


Figure 127 - Positioning the floats on the chest

Fasten the female buckle located between the two floats with the male buckle on the groin restraint.



Figure 128 - Black restraint fastening

Adjust the groin restraint.



Figure 129 - Black restraint tensioning



WARNING

It is important that the black restraint is well stretched, so as to ensure a first immobilisation (although partial) and, above all, allow the patient to float.

Secure the head with the triangular head immobiliser, placing it on the patient's forehead at eyebrow level and, holding the triangle in place with one hand, tension the lateral straps first and then the central strap.



Figure 130 - Triangular head immobiliser application

Important

It is important that the triangular head immobiliser is well tightened to guarantee the cervical spine alignment.

Normally, the head is well restrained by just using the latter.

If it is deemed necessary, we recommend the application of the neck brace before the application of the triangle. In this case, the immobilisation can also be completed with the application of a chin strap.

Proceed with closing the transverse restraint on the pelvis with the red buckle. This restraint must be well stretched.



Figure 131 - Red restraint fastening

Complete the immobilisation by fastening the last yellow transverse restraint with yellow buckle on the chest.

This restraint must be well stretched.



Figure 132 - Yellow restraint fastening

Move the patient with the suitable carrying handles.

The lower end of the breast floats must always be left free, without any constraints.



Figure 133 - Using the auxiliary carrying handles

The same handles can also be used to lift the patient out of water.



Figure 134 - Extraction from water via auxiliary handles

7 - MAINTENANCE

7.1.1 XT PLUS Maintenance

INSPECTION BEFORE USE

To ensure optimal use of the device, it is important to keep all the components in good conditions and to remove all traces of dirt, debris and body fluids. The XT must be inspected before and after each use, and must be cleaned after use. When not in use, it must be stored in a dry, indoor environment and inspected at least once a month. If wear or damage is found during the inspection, the device must be put out of service.

PREVENTIVE INSPECTION

The XT is a medical device requiring regular maintenance. Preventive inspections are the responsibility of the user. It is recommended to use the checklist in this manual and to report the check in the appropriate registration table.

PERIODIC MAINTENANCE

It is recommended that the XT undergo a complete product overhaul and certification by Ferno personnel once a year from the 10th year after purchase.

EXTRAORDINARY MAINTENANCE

Whenever, during the inspection, user finds cracks on the board, deep scratches or obvious signs of wear on the textile material, it is recommended to contact Ferno's Technical Support Department to have the XT completely overhauled and certified by Ferno's authorised personnel. See chapter Technical Support.

If the XT undergoes particularly heavy use, if it is used in an environment contaminated by hazardous chemical substances or for carrying heavy loads, maintenance should preferably be carried out on a more frequent basis.

Preventive maintenance intervals	After each use	Whenever necessary	Every month
Disinfection	•	•	
Cleaning		•	•
Inspection	•	•	•



WARNING

Improper maintenance may cause serious accidents and/or damage. Perform maintenance as instructed in this user manual.

TEXTILE MATERIAL (RESTRAINTS)

Check along the entire length of the device that:

- All textile parts and stitching on the device are free from cuts, abrasion, frayed borders, wear, corrosion, burns and signs of chemical substances; also check that the stitching is not cut, frayed or loose.
- Check the devices made of textile material by feeling them with your fingers along their entire length.
- Ensure the integrity of the stitching protective cover (no movements or detachments from its terminal).
- Before use, also check that the maintenance sheets of each device are correctly updated.

During each use:

- Regularly check the proper functioning of the product and the optimal connection and arrangement of the other system components.
- Pay attention to the effects of moisture and frost, as these could compromise the tightness of the device.
- Beware of contact with sharp edges and, if necessary, recheck the device after use.

If the textile material is found to be intact during the preventive inspections, it is considered to have a life of 10 years from first use without any official Ferno overhaul, after which it is recommended that XT undergo a complete overhaul and product certification by Ferno personnel once a year.

The product must be disposed of:

- After 10 years, if it includes plastic or textile components.
- After a strong effort.
- If the result of the checks is not satisfactory and one has doubts about its reliability.

Important

Ferno directly carries out repair maintenance operations, without the need of dealers, mechanics or external service centres (if not recommended by the manufacturer). You are thus invited to be wary of those who present themselves as Ferno's authorised technician without providing further information.

7.1.2 XT PRO and XT MILITARY Maintenance

INSPECTION BEFORE USE

To ensure optimal use of the device, it is important to keep all the components in good conditions and to remove all traces of dirt, debris and body fluids. The XT must be inspected before and after each use, and must be cleaned after use. When not in use, it must be stored in a dry, indoor environment and inspected at least once a month. If the inspection reveals cracks on the board, deep scratches or wear signs on textile components, place the device out of service and contact Ferno's technical support.

PREVENTIVE INSPECTION

The XT is a medical device requiring regular maintenance. Preventive inspections are the responsibility of the user. It is recommended to use the checklist in this manual and to report the check in the appropriate registration table.

PERIODIC MAINTENANCE

It is recommended that the XT undergo a complete product overhaul and certification by Ferno personnel once a year from the expiry of the warranty.

Preventive maintenance intervals	After each use	Whenever necessary	Every month
Disinfection	•	•	
Cleaning		•	•
Inspection	•	•	•

EXTRAORDINARY MAINTENANCE

Whenever, during the inspection, user finds cracks on the board, deep scratches or obvious signs of wear on the textile material, it is recommended to contact Ferno's Technical Support Department to have the XT completely overhauled and certified by Ferno's authorised personnel. See chapter Technical Support.

If the XT undergoes particularly heavy use, if it is used in an environment contaminated by hazardous chemical substances or for carrying heavy loads, maintenance should preferably be carried out on a more frequent basis.



WARNING

Improper maintenance may cause serious accidents and/or damage. Perform maintenance as instructed in this user manual.

TEXTILE MATERIAL

(120CM LIFTING STRAP RING AND "COBRA" RESTRAINTS)

Check along the entire length of the device that:

- All textile parts and stitching on the device are free from cuts, abrasion, frayed borders, wear, corrosion, burns and signs of chemical substances; also check that the stitching is not cut, frayed or loose.
- Check, by feeling the entire length of the rope devices with your fingers, that the inner core has no cuts, hollow points, cracks, bulges (any problems with the inner core are invisible and can be caused by over-stressing, local creases, dirt).
- Ensure the integrity of the stitching protective cover (no movements or detachments from its terminal).
- Before use, also check that the maintenance sheets of each device are correctly updated.

During each use:

- Regularly check the proper functioning of the product and the optimal connection and arrangement of the other system components.
- Pay attention to the effects of moisture and frost, as these could compromise the tightness of the device.
- Beware of contact with sharp edges and, if necessary, recheck the device after use. For the safety of the operator, it is necessary that the device or anchor point is always correctly positioned and that the operation is carried out in such a way as to minimise the risk and height of a fall.

As far as the textile material is concerned, the MAXIMUM useful life is considered to be equal to 10 years from its first use, so it must be replaced after this period of time.

The product must be disposed of:

- After 10 years, if it includes plastic or textile components.
- After a strong effort.
- If the result of the product checks is not satisfactory and one has doubts about its reliability.

Important

Ferno directly carries out repair maintenance operations, without the need of dealers, mechanics or external service centres (if not recommended by the manufacturer). You are thus invited to be wary of those who present themselves as Ferno's authorised technician without providing further information.

- When it becomes obsolete (new laws, standards, techniques or incompatibility with other devices).

Avoid any contact with chemical substances, especially acids that can destroy fibres.



WARNING

The following instructions should only be followed if the textile ring (EN 795/B) is the one supplied by Ferno. If a device from another manufacturer is used, the manufacturer's instructions must be used (EN 365).

7.1.3 XT Floating Maintenance

INSPECTION BEFORE USE

To ensure optimal use of the device, it is important to keep all the components in good conditions and to remove all traces of dirt, debris and body fluids. The XT Floating must be inspected before and after each use, and must be cleaned after use. When not in use, it must be stored in a dry, indoor environment and inspected at least once a month. If the inspection reveals cracks on the board, deep scratches or wear signs on textile components, place the device out of service and contact Ferno's technical support.

PREVENTIVE INSPECTION

The XT Floating is a medical device requiring regular maintenance. Preventive inspections are the responsibility of the user. It is recommended to use the checklist in this manual and to report the check in the appropriate registration table.

PERIODIC MAINTENANCE

It is recommended that the XT undergo a complete product overhaul and certification by Ferno personnel once a year from the 10th year after purchase.

Preventive maintenance intervals	After each use	Whenever necessary	Every month
Disinfection	•	•	
Cleaning		•	•
Inspection	•	•	•



WARNING

Improper maintenance may cause serious accidents and/or damage. Perform maintenance as instructed in this user manual.

EXTRAORDINARY MAINTENANCE

Whenever, during the inspection, user finds cracks on the board, deep scratches or obvious signs of wear on the textile material, it is recommended to contact Ferno's Technical Support Department to have the XT completely overhauled and certified by Ferno's authorised personnel. See chapter Technical Support.

If the XT undergoes particularly heavy use, if it is used in an environment contaminated by hazardous chemical substances or for carrying heavy loads, maintenance and overhaul should preferably be carried out on a more frequent basis.

TEXTILE MATERIAL (RESTRAINTS AND FLOATS)

Check along the entire length of the device that:

- All textile parts and stitching on the device are free from cuts, abrasion, frayed borders, wear, corrosion, burns and signs of chemical substances; also check that the stitching is not cut, frayed or loose.
- Check, by feeling the entire length of the devices made of textile material with your fingers.
- Ensure the integrity of the stitching protective cover (no movements or detachments from its terminal).
- Before use, also check that the maintenance sheets of each device are correctly updated.

During each use:

- Regularly check the proper functioning of the product and the optimal connection and arrangement of the other system components.
- Pay attention to the effects of moisture and frost, as these could compromise the tightness of the device.
- Beware of contact with sharp edges and, if necessary, recheck the device after use.

As far as the textile material is concerned, the MAXIMUM useful life is considered to be equal to 10 years from its first use, so it must be replaced after this period of time.

The product must be disposed of:

- After 10 years, if it includes plastic or textile components.
- After a strong effort.
- If the result of the product checks is not satisfactory and one has doubts about its reliability.

Important

Ferno directly carries out repair maintenance operations, without the need of dealers, mechanics or external service centres (if not recommended by the manufacturer). You are thus invited to be wary of those who present themselves as Ferno's authorised technician without providing further information.

7.2 Disinfection

After each use, disinfect the surfaces of the device with a non-abrasive product.

1. Remove restraints, handles, headrest and any other accessory from the product.
2. In the case of surfaces visibly contaminated with organic substances, proceed with decontamination as follows: remove the material using a disposable cloth and/or paper and dispose of it in the specific container for special waste and proceed with cleaning operations.
3. Disinfect all equipment (including accessories such as head immobiliser, restraints, etc.) with a cloth or sponge dampened with disinfectant solution, let it sit for 10-20 minutes; use brushes to rub and clean the least accessible parts;
4. Use a cloth to rinse and dry the treated surfaces, make sure that all the device's components are completely dry before using them.

Warning: Concerning points 3 and 4 in any case check the procedures recommended by the disinfectant manufacturer.

Do not immerse the device directly in disinfectant.

During disinfection, use gloves and the appropriate PPE according to the risk assessment guide.

Also ensure there are no signs of wear and/or damage.

Important

DO NOT WASH WITH HIGH PRESSURE WATER



Do not use high pressure water to clean the device.

WARNING

Disinfectants and detergents containing phenols (if above the threshold of 2500 ppm), chlorine (bleach) or iodine-based solutions can cause damage. Do not use products containing these chemicals.

7.3 Cleaning

1. Remove any restraint, handle, headrest and in case accessories
2. Wash all components of the product with a cloth or sponge dampened with detergent solution (rinsing the sponge frequently with clean water);
3. If necessary, remove stains with a stiff bristle brush (not metal), or a light solvent, paying attention to the labels.
4. Use a cloth to rinse and dry the treated surfaces, make sure that all the device's components are completely dry before using them;

5. After cleaning, be sure to refit the device with restraints, handles, QHI and any other accessory that has been removed.

Warning: during cleaning, use gloves and any appropriate PPE. Also ensure there are no signs of wear and/or damage.

Important

After disinfection/cleaning, ensure that the device and its components are completely dry before use.

CLEANING AND DISINFECTING RESTRAINTS WITH METAL BUCKLES

The sanitisation of restraints must be carried out at the end of the shift or after each transport, if necessary.

WARNING: never immerse the restraints completely in water and never wash them in the washing machine.

* When there is no contamination from organic substances, it is possible to just disinfect the restraint by just spraying disinfectant and leave it to dry.

* In case of surfaces visibly contaminated by organic substances (blood, urine, vomit, faeces, etc.) proceed with decontamination according to the following procedure:

1. Wear suitable PPE based on the Risk Assessment Document.
2. Remove the material using a disposable cloth and/or paper and dispose of it in the specific container for special waste.
3. Sanitise.
4. Before starting sanitisation, move all restraint hooks upwards.
5. Sanitisation is carried out by immersing the restraints in a container and leaving them to soak in water with sanitising product, and leaving the metal parts outside the container. Leave to soak for approx. 10-20 minutes then dry with paper.
6. Afterwards hook up all hooks together and hang the restraints to a support.
7. Clean by directly spraying the cleaning and disinfecting product then leave it to dry.
8. Re-fit the restraints only once they are dry.

CLEANING RESTRAINTS WITH PLASTIC BUCKLES

1. Remove the restraints from the product.
2. Place the restraints inside a mesh bag (not supplied with the products) and put it in the washing machine.
3. Wash the restraints with hot water using a cleaning and disinfecting product and selecting a cycle for delicate items, with slow spin. Do not bleach.
4. Remove the restraints from the mesh bag and let them dry in the open air. Do not tumble dry.
5. Re-fit the restraints only once they are dry.

CLEANING FLOATS, CHIN STRAP AND TRIANGULAR HEAD IMMOBILISER

1. Remove triangular head immobiliser, chin strap and floats from the board.
2. Open the float zipper and extract the stuffing.
3. Soak triangular head immobiliser, chin strap, padding and liners in a bowl with water and the sanitising detergent. Take care that the padding is completely submerged in the liquid (possibly by applying a weight). Leave to soak for approx. 10-20 minutes then dab with paper and leave it dry with paper in a dry and clean place.
4. Once they have dried, refit stuffing inside covers and fit the board with floats, chin strap and triangular head immobiliser.

7.4 Inspection

To ensure optimal use of the device, it is important to keep all the components in good conditions and to remove all traces of dirt, debris and body fluids. The extrication device must be inspected and cleaned before and after each use. When not in use, it must be stored in a dry, indoor environment and inspected at least once a month.

The extrication device should be inspected regularly by maintenance personnel. If signs of wear or damage are found during inspection, discontinue use of the device and immediately contact Ferno's Technical Support Service to request repairs or maintenance. See section Technical Support.

7.5 Storage

The extrication device must be stored clean, indoors, in a dry place and away from direct sunlight. When not in use, it can be put into its handy carry bag (Figures 135 and 136).

It is recommended to store the extrication device in the bag in its "ready-to-use" configuration:

1. The chest and groin restraints must be arranged sideways, leaving the central space free to accommodate the patient.
2. The triangular head immobiliser and the chin strap must be correctly installed on the device and readily available for the operator. In particular, the chin strap must be stored in its bag so as to be extracted when necessary.
3. The QHI must be correctly applied on the extrication device.



Figure 135 - XT Plus, XT PRO and XT Military carry bag



Figure 136 - XT Floating carry bag

Important

Store the XT extrication device indoors, in a dry place and away from direct sunlight. If exposed to sunlight for a long time, the materials of the device and its accessories could deteriorate.

7.6 Disposal

The user is responsible for the proper disposal of the device and its accessories.

In order to safeguard, protect and improve the quality of the environment and the protection of human health, at the end of its useful life, the device must be disposed of in accordance with current national and/or European standards and regulations.

XT PLUS - INSPECTION SHEET

Serial number	
Purchased on	
First used on	
Inspection frequency	
Overhaul frequency	

Board	YES / NO
The graphical instructions on the board are still readable.	
Every portion of the board is undamaged and rigid.	
No scratches or cracks more than 1 mm deep on both sides of the board.	
No damage or sharp edges on external borders of the board.	
The slots for fitting the restraints are undamaged.	

Quick Head Immobilizer	YES / NO
The cushion is undamaged.	
The cushion remains attached to the board quite firmly.	

Triangular head immobiliser and chin strap	YES / NO
The triangular head immobiliser and the chin strap do not show any damage or cuts.	
The triangular head immobiliser and the chin strap are firmly fastened to the board.	
The fastening buckles on the triangular head immobiliser and the chin strap are undamaged and allow the restraints to slide properly.	

Auxiliary straps and handles	YES / NO
The auxiliary straps and handles do not show any damage or cuts.	
The straps are correctly positioned, according to Ferno's instructions and colour code.	
The auxiliary straps and handles are firmly fastened to the board.	
The cow hitch that connects the auxiliary straps and handles to the board has been tied as Ferno requires.	
The fastening buckles are undamaged, free from any deformation, cracks and/or crevices.	
The fastening buckles are working properly (they can be opened and closed effortlessly).	
The straps are easily passed into the buckles to adjust their tension and remain locked in the desired position.	



XT PRO AND MILITARY - INSPECTION SHEET

Serial number	
Purchased on	
First used on	
Inspection frequency	
Overhaul frequency	

Board	YES / NO
The graphical instructions on the board are still readable.	
Every portion of the board is undamaged and rigid.	
No scratches or cracks more than 1 mm deep on both sides of the board.	
No damage or sharp edges on external borders of the board.	
The slots for fitting the restraints are undamaged.	

Quick Head Immobilizer	YES / NO
The cushion is undamaged.	
The cushion remains attached to the board quite firmly.	

Triangular head immobiliser and chin strap	YES / NO
The triangular head immobiliser and the chin strap do not show any damage or cuts.	
The triangular head immobiliser and the chin strap are firmly fastened to the board.	
The fastening buckles on the triangular head immobiliser and the chin strap are undamaged and allow the restraints to slide properly.	

Auxiliary straps and handles	YES / NO
The auxiliary straps and handles do not show any damage or cuts.	
The straps are correctly positioned, according to Ferno's instructions and colour code.	
The auxiliary straps and handles are firmly fastened to the board.	
The cow hitch that connects the auxiliary straps and handles to the board has been tied as Ferno requires.	
The fastening buckles are undamaged, free from any deformation, cracks and/or crevices.	
The fastening buckles are working properly (they can be opened and closed effortlessly).	
The straps are easily passed into the buckles to adjust their tension and remain locked in the desired position.	

Hanging system	YES / NO
Textile ring EN795/B (refer to the specific instructions of the manufacturer).	
Connector EN362 (refer to the specific instructions of the manufacturer).	



XT FLOATING - INSPECTION SHEET

Serial number	
Purchased on	
First used on	
Inspection frequency	
Overhaul frequency	

Board	YES / NO
The graphical instructions on the board are still readable.	
Every portion of the board is undamaged and rigid.	
No scratches or cracks more than 1 mm deep on both sides of the board.	
No damage or sharp edges on external borders of the board.	
The slots for fitting the restraints are undamaged.	

Quick Head Immobilizer	YES / NO
The cushion is undamaged.	
The cushion remains attached to the board quite firmly.	

Triangular head immobiliser and chin strap	YES / NO
The triangular head immobiliser and the chin strap do not show any damage or cuts.	
The triangular head immobiliser and the chin strap are firmly fastened to the board.	
The fastening buckles on the triangular head immobiliser and the chin strap are undamaged and allow the restraints to slide properly.	

Restraints, auxiliary handles and floats	YES / NO
The auxiliary straps and handles do not show any damage or cuts.	
The straps are correctly positioned, according to Ferno's instructions and colour code.	
The auxiliary straps and handles are firmly fastened to the board.	
The cow hitch that connects the auxiliary straps and handles to the board has been tied as Ferno requires.	
The fastening buckles are undamaged, free from any deformation, cracks and/or crevices.	
The fastening buckles are working properly (they can be opened and closed effortlessly).	
The straps are easily passed into the buckles to adjust their tension and remain locked in the desired position.	
The floats and their sleeves are undamaged and uncut.	
The floats are all present and are positioned as per the user manual.	
The floats are firmly fastened to the board.	
The signal light is undamaged and functioning properly.	



8 - ACCESSORIES AND SPARE PARTS

8.1 Accessories

Ferno offers various approved accessories for use with the XT extrication device. Always follow the directions in this instruction manual.

For more product information, contact Ferno's Customer Service.

XT PLUS ACCESSORIES

Description	Part no.
PRO KIT	PRO KIT
FLOATING KIT	FLOATING KIT
WIZLOC COLLAR	0822074
XT FLOATING STORAGE BAG	10-1605-002
CERVICAL COMPENSATION CUSHION	10-00313

XT PRO AND XT MILITARY ACCESSORIES

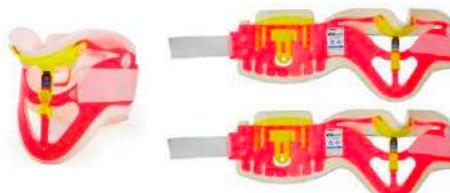
Description	Part no.
FLOATING KIT	FLOATING KIT
WIZLOC COLLAR	0822074
XT FLOATING STORAGE BAG	10-1605-002
CERVICAL COMPENSATION CUSHION	10-00313
SET OF 4 RESTRAINTS FOR XT PLUS	25-0500-001

WARNING

The use of improper and unauthorised accessories may cause accidents, damage, and/or injury. Use only accessories that have been approved and authorised by Ferno S.R.L.

XT FLOATING ACCESSORIES

Description	Part no.
PRO KIT	PRO KIT
FLOATING KIT	FLOATING KIT
WIZLOC COLLAR	0822074
XT STORAGE BAG	10-1605-001
CERVICAL COMPENSATION CUSHION	10-00313
SET OF 4 RESTRAINTS FOR XT PLUS	25-0500-001



WIZLOC COLLAR



PRO KIT



FLOATING KIT



SET OF 4 RESTRAINTS FOR XT PLUS



XT PLUS AND PRO STORAGE BAG



XT FLOATING STORAGE BAG



CERVICAL COMPENSATION CUSHION

8.2 Spare parts

XT PLUS SPARE PARTS

Description	Part no.
SET OF XT PLUS RESTRAINTS	25-0500-001
AUXILIARY HANDLES	10-1606-001
QHI	QHI-B
TRIANGULAR HEAD IMMOBILISER	038245211
XT PLUS AND PRO STORAGE BAG	10-1605-001
CHIN STRAP	25-0601-002
WIZLOC COLLAR	0822074

XT FLOATING SPARE PARTS

Description	Part no.
FLOATING KIT	PRO KIT
AUXILIARY HANDLES	10-1606-001
QHI	QHI-B
TRIANGULAR HEAD IMMOBILISER	038245211
XT FLOATING STORAGE BAG	10-1605-001
CHIN STRAP	25-0601-002
SIGNAL LIGHT	SLBEST0001

XT PRO AND XT MILITARY SPARE PARTS

Description	Part no.
PRO KIT	PRO KIT
AUXILIARY HANDLES	10-1606-001
QHI	QHI-B
TRIANGULAR HEAD IMMOBILISER FOR XT PRO	038245211
XT PLUS AND PRO STORAGE BAG	10-1605-001
CHIN STRAP FOR XT PRO	25-0601-002
MILITARY RESTRAINT KIT	25-0550-001-M
THIGH PADDING	10-00300-L
TRIANGULAR HEAD IMMOBILISER FOR XT MILITARY	038245211-N
CHIN STRAP FOR XT MILITARY	25-0601-002-N

WARNING

Non-original spare parts may cause damage and/or injury. Use only original spare parts by Ferno.

8.2.1 Spare parts assembly

Please refer to the spare parts list in the *Spare parts* chapter in this manual.

ASSEMBLY OF REINFORCING SLOTS OF THE PRO KIT

If you purchase a PRO KIT, you will need to install the reinforcing slots for the lifting strap on the board.

To do this, place the pair of red reinforcements on the upper and lower surfaces of holes 3 and 14, mating the slot with the screw slot on the upper side, i.e. the side where the QHI is glued. Then apply a drop of threadlocker to the two fixing screws and tighten them as shown in the image below, ensuring that the two reinforcements are firmly fixed to the board.

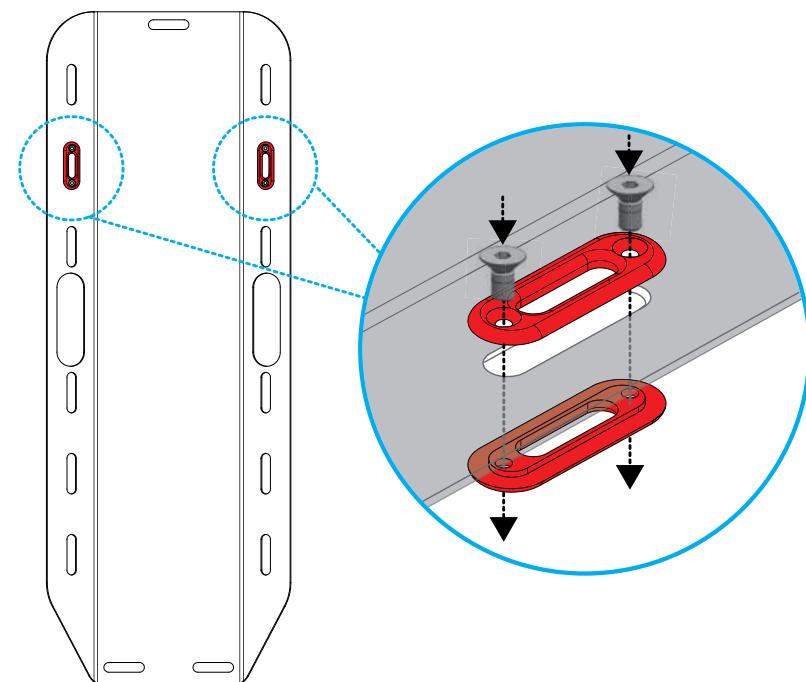


Figure 137 - Assembling the reinforcing slots of the PRO KIT

9 - TECHNICAL SUPPORT

Ferno Technical Support

Customer Service and Technical Support are important aspects of every Ferno product. Before contacting us, note the serial number of the product and specify it in all written communications. For all queries concerning technical support, contact Ferno S.R.L.:

E-mail	assistenza.it@ferno.com
Website dedicated to support - Ferno SOS	www.fernodosos.it
Phone	0039 0516860028
Phone (toll-free for Italy)	800.501.711

Ferno S.R.L. is authorised to carry out preventive and corrective maintenance (repairs) on all Ferno products in exclusivity.

Any corrective action must necessarily be carried out by Ferno personnel and the operations must be carried out using original spare parts. In this way, the warranty is also extended to the components involved in the operation.

Any corrective action carried out by non Ferno personnel will automatically cancel any Civil Liability insurance and any guarantee.

WARNING

Non-original spare parts and inadequate repairs may cause damage and/or injury. Use only original Ferno spare parts and refer exclusively to Ferno S.R.L.'s Customer Support.

WARNING

Unauthorised modifications of the XT extrication device could cause serious damage, injury and/or unforeseeable operating problems. Do not modify or alter the device in any way.

10 - WARRANTY

10.1 Warranty terms and conditions

Ferno products are guaranteed to be free of manufacturing defects for a period of 24 months, starting from the date indicated on the Ferno s.r.l. shipping document. Ferno guarantees a 12-month warranty period on spare parts and reconditioned equipment unless otherwise stated. During the warranty period, repair and/or replacement will be provided free of charge for all defective parts due to well established manufacturing causes, excluding labour costs or any travel, transport and packaging.

The warranty does not cover consumables or parts subject to wear and tear due to normal use of the product, all parts typically subjected to sliding or rolling friction, parts potentially exposed to oxidation or corrosion (copper or metal alloy contacts, mechanical equipment).

On new devices, the external finish (gelcoat/resin, paint, powder coating, decals, tapes, lettering, etc.) are guaranteed for 90 days.

Repairs are performed by trained technical staff at the Ferno s.r.l. site in Via Zallone 26- 40066 Pieve di Cento (BO), Italy or at the Customer's premises if suitable arrangements with Ferno s.r.l.'s Customer Service have been made.

Technical support at the Customer's premises must be arranged beforehand and involves a refund of costs incurred and documented on request.

For information on the costs of technical support, please contact the relevant department of Ferno s.r.l..

Repairs are guaranteed for 6 months from the date of repair. This warranty applies only when the product is used according to the instructions in the user manual provided. Misuse and negligence invalidate this warranty.

The warranty is valid from the day the product is shipped from Ferno s.r.l., and the shipping costs are not covered by this warranty. Ferno s.r.l. is not liable for damages incurred during shipment or due to misuse of the product.

Ferno s.r.l. accepts no liability for products manufactured by others.

The warranty is rendered null and void in the case of:

- failure to observe the operating instructions,
- misuse,
- inappropriate use or handling,
- intervention by unauthorised personnel
- damage during transport due to improper packaging in the case of items returned by the user,
- failure to perform periodic maintenance and preventive inspections
(see definitions in the Maintenance section),
- failure to use original spare parts.

In cases not covered by the warranty, Ferno will not cover the transport costs for sending or returning the product.

10.2 Limitation of liability

If a product is found to be defective, Ferno s.r.l. will repair, replace it, or refund the purchase price. Under no circumstances can Ferno s.r.l. be held liable for more than the selling price of the product.

The buyer accepts these conditions for all types of damage. Ferno s.r.l. does not offer other warranties, either express or implied, or any implied warranties of saleability or fitness for a particular purpose for its own products, or those manufactured by others.

In case of infringement of the limited warranty, any legal actions must be filed within one year from the date on which the infringement was, or should have been, discovered. Ferno s.r.l. reserves the right to terminate the warranty of the products sold:

- if the labels or plates bearing the trade mark of the Manufacturer and the code or serial number have been deleted or removed.

- if the product has undergone modifications, repairs and/or processing not authorised by Ferno.

- if the product has been used in a way not complying with the instructions provided and/or for purposes other than those for which it was designed.

- further to the conditions indicated in section Warranty Terms and Conditions.

Ferno s.r.l. is under no circumstances liable for direct or indirect damage resulting from uses other than those prescribed by the user manual and the intended use of the product.

10.3 Warranty claims

Contact Ferno's Customer Service immediately if you receive a product that is suspected to be defective. An agent will assist the customer through the complaints procedure.

Before returning a product to Ferno s.r.l., contact Ferno's Customer Service to request authorisation.

10.4 Complaints

Any complaints must be communicated to the reseller, or to Ferno s.r.l.'s Customer Service, within 5 days of receipt of the product or of discovery of the alleged defect. Claims or disputes regarding a single product shall not release the buyer from the obligation to collect and pay for other products in the order, unless otherwise agreed with the seller.

10.5 Return authorisation

No return will be accepted without the prior approval of Ferno s.r.l.. Products returned for business reasons, or for reasons not relating to nonconformity, will be accepted only after verification of their condition by Ferno s.r.l.'s qualified personnel.

TRAINING RECORD

TRAINING RECORD

MAINTENANCE RECORD

MAINTENANCE RECORD

XT Series Extrication Devices

Product User and Maintenance Manual, required to operate the product safely, maintain its efficiency and reliability, and comply with the terms of the warranty.

Ferno s.r.l.

Via Benedetto Zallone 26
40066 - Pieve di Cento (BO) - ITALY

Telephone (toll-free for Italy)	800 501 711
Phone	0039 0516860028
Fax	0039 0516861508
Website	www.ferno.it

Ferno s.r.l., Pieve di Cento, Subsidiary of Savosa

Via Tesserete, 67
6942 - Savosa - SWITZERLAND

Telephone	+41 (0) 412596000
E-mail	info.ch@ferno.com
Website	www.ferno.-schweiz.ch