

Superbrava Series

SUPERBRAVA ELECTRIC STRETCHER

Model: TG-2022

INSTRUCTIONS MANUAL



Read these maintenance instructions
before using the product and keep them
for future references.



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1. INTRODUCTION

1.1. Foreword

The **SUPERBRAVA (TG-2022)** stretcher has been solely designed to rescue and transport patients. The product complies with the directive MDR (EU) 2017/745. It is an electric-hydraulic model that allows the height to be adjusted according to different needs, with just two buttons.

Manual operation is possible when potential faults in the automated system occur.

The SUPERBRAVA stretcher model must be joined to the ambulance using the KARTSANA SUPERBRAVO (R-2022) rail.

This stretcher has been tested according to the regulation UNE-EN 1789.

All information regarding treatment, disinfection and maintenance is indicated, taking into consideration our current experience and know-how.

We reserve the right to change the specifications of the stretcher to improve the products.



*Read the instructions
manual before using.*



Maximum load 320 Kg.



Medical Product class I



*Warnings and safety
instructions*



- Do not throw away. Send to recycling center.
- Packing should be manage as a reusable refuse.
- Metals should be treated as old metal.
- Plastic product should be treated as recycling material.
- Waste management must be as regulation of the country.
- Ask municipal administration about recycling and refuse.

1.2. Intended use of product

The **SUPERBRAVA TG-2022** is a powered stretcher, which is intended to support and transport the entire body of human patient. The battery-powered electro-hydraulic lift system is intended to help reduce the effort required by the operator to raise and lower the stretcher. The device is designed to support patients in horizontal position or sitting position and facilitate the transportation of medical equipment in emergency transport vehicles.

This ambulance stretcher is rated to a maximum capacity of 320Kg and the intended operators of the device are trained professionals including emergency medical service and medical care center personnel, as well as medical first responders.

Ambulance stretchers are intended for transportation purposes. They are not intended for extended stay or to be used as hospital beds. They are also not intended to be used in devices which modify air pressure, such as hyperbaric chambers.

1.3. Responsibility and warranty

The stretcher must be checked at the time of its delivery to the rescue organisation. All its functions must be explained in detail. The assistance organisation must take charge of teaching all its employees how to use it correctly.

The product has a 24-months warranty from the delivery date to the end user. (See Warranty Conditions and Warranty Certificate enclosed with the product).

The warranty does not cover defects resulting from incorrect installation, misuse, or improper use of the stretcher. All repairs must be made by a technical service authorised by Kartsana or its respective representative.

The manufacturer will not be liable for any anomaly caused to the stretcher because of using products other than those provided by Kartsana.

Changes or modifications to the unit not expressly approved by Kartsana could void the user's authority to operate the system.

1.4. Specifications

Maximum unassisted load	320Kg
Standards	UNE-EN-1865-2 UNE-EN-1865-3 EN-1789+A1 UNE-EN 60601-1 / UNE-EN 61000-6 UL-1642
Backrest Articulation/Shock Position	De 0° a 80°
Footrest Articulation/Shock Position	Double articulation
Wheels diameter	150 mm
Total Length ¹	2090 mm
Total Width	590 mm
Maximum and minimum height ²	347 mm-1240 mm
Loading Height ³	Máx. 1090 mm
Recommended operatives required to load / unload an occupied stretcher	1 operative, or 2 if the stretcher were occupied by a larger sized patient.
Recommended/Compatible fixation system	Rail SUPERBRAVO (R-2022 model)

¹Total length could be shortened with the extensible back frame to the minimum position and the backrest folded to 80° - position used in maneuvers with little space, elevators, etc.

²Height measured from ground level to main structure of the patient area.

³For bariatric patients it is recommended to use the stretcher by a low position in patient transport.
Kartsana reserves the right to change specifications without notice.

1.5. Attention

Throughout this manual, you will find 3 types of ISO 20417 signs. For **warning**, we have ISO 7010-W001. **Prohibition** is indicated by ISO 7010-P001 and **obligation** by ISO 7010-M001.



With these signs we inform about important safety measures for the correct use of the stretcher and to avoid possible accidents.

Warnings alert the reader to situations which, if not avoided, could lead to death or serious injury. On the other hand, the prohibitions indicate actions that must not be carried out under any circumstances and the obligations, those measures and/or actions that must be carried out to use the product properly and maintain safe functionality.

1.6. Summary of safety precautions

Carefully read and strictly follow the warnings and cautions listed on these pages. Service only by qualified personnel.



WARNINGS:

- Improper usage of the stretcher can cause injury to the patient or operator. Operate the stretcher only as described in this manual.
- Do not modify the stretcher or any components of the stretcher. Modifying the product can cause unpredictable operation resulting in injury to the patient or operator. Modifying the product also voids its warranty.
- Any emergency vehicle to be used with this stretcher must have the compatible fixation system installed.
- Do not attempt to operate the stretcher when it is loaded into a stretcher fastener.
- Have the vehicle safety rail compatible installed by a certified mechanic. Improper rail installation can cause injury to the patient or operator and/or damage to the stretcher. Verify that the stretcher legs lock into the load position before without contact with the fender of the vehicle. Failure to properly lock the stretcher height into position can cause injury to the patient or operator and/or damage to the stretcher.
- To avoid risk of electric shock, never attempt to open the battery pack for any reason. If the battery pack case is cracked or damaged, do not insert it into the charger. Return damaged battery packs to a service center.
- Do not remove the battery when the stretcher is activated.
- Avoid direct contact with a wet battery or battery enclosure. Contact may cause injury to the patient or operator.
- Inspect batteries for damage before every use.
- Practice changing height positions and loading the stretcher until operation of the product is fully understood. Improper use can cause injury.
- Do not allow untrained assistants to assist in the operation of the stretcher. Untrained technicians/assistants can cause injury to the patient or themselves.
- Do not ride on the base of the stretcher. Damage to the product could occur, resulting in injury to the patient or operator.
- Transporting the stretcher sideways can cause the stretcher to tip, resulting in possible damage to the product and/or injury to the patient or operator. Transporting the stretcher in a lowered position, head, or foot end first, minimizes the potential of a stretcher tip.
- Grasping the stretcher improperly can cause injury. Keep hands, fingers, and feet away from moving parts. To avoid injury, use extreme caution when placing your hands and feet near the base tubes while raising and lowering the stretcher.
- Always use all restraint straps to secure the patient on the stretcher. An unrestrained patient may fall from the stretcher and be injured.
- Never leave a patient unattended on the stretcher or injury could result. Hold the stretcher securely while a patient is on the product.
- Never apply the optional wheel lock(s) while a patient is on the stretcher. Tipping could occur if the stretcher is moved while the wheel lock is applied, resulting in injury to the patient or operator and/or damage to the stretcher.
- Siderails are not intended to serve as a patient restraint device.
- Hydraulically raising or lowering the stretcher may temporarily affect electronic patient monitoring equipment. For best results, patient monitoring should be conducted when the stretcher is idle.
- High obstacles such as curbing, steps or rough terrain can cause the stretcher to tip, possibly causing injury to the patient or operator.
- The SUPERBRAVA TG-2022 stretcher is designed to be compatible with SUPERBRAVO Rail and is operator responsibility that these products work together.
- Transporting the stretcher in lower positions reduces the potential of a stretcher tip. If possible, obtain additional assistance or take an alternate route.
- We recommended two operators required when the stretcher is occupied by a larger sized patient.
- Operators must be able to lift the total weight of the patient, stretcher, and any items on the stretcher.

- Never install or use a wheel lock on a stretcher with excessively worn wheels. Installing or using a wheel lock on a wheel with less than a 160mm diameter could compromise the holding ability of the wheel lock, possibly resulting in injury to the patient or operator and/or damage to the stretcher or other equipment.
- When cleaning, use any appropriate personal safety equipment (goggles, respirator, etc.) to avoid the risk of inhaling contagion.
- Some cleaning products are corrosive in nature and may cause damage to the product if used improperly. If the products described above are used to clean Kartsana equipment, measures must be taken to ensure the stretchers are wiped with clean water and thoroughly dried following cleaning. Failure to properly rinse and dry the stretchers will leave a corrosive residue on the surface of the stretchers, possibly causing premature corrosion of critical components.
- Failure to properly clean or dispose of contaminated mattress or other stretcher components will increase the risk of bloodborne pathogens and may cause injury to the patient or operator.
- Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source.
- To avoid the risk of injury, do not use bare hands to check for hydraulic leaks.
- Take special precautions regarding electromagnetic compatibility (EMC) when using medical electrical equipment like SUPERBRAVA TG-2022 stretcher. Portable and mobile RF communications equipment can affect the function of the stretcher.
- The use of accessories, transducers, and cables other than those specified, apart from transducers and cables sold by Kartsana as replacement parts for internal components may result in increased emissions or decreased immunity of the SUPERBRAVA TG-2022 stretcher.



CAUTIONS:

- Changes or modifications to the unit not expressly approved by Kartsana could void the user's authority to operate the system.
- The stretcher can be set at any stretcher load height position. Establish the required stretcher load height before placing the stretcher into service.
- Set the stretcher load height to the proper stop height prior to operation.
- Installation of the safety hook should be done by a certified mechanic familiar with ambulance vehicle construction. Consult the vehicle manufacturer before installing the safety hook and be sure that the installation of the safety hook does not damage or interfere with the brake lines, oxygen lines, fuel lines, fuel tank or electrical wiring of the vehicle.
- Only use the battery and charger as specified in this Instruction Manual.
- The stretcher is not for use with an AC adapter.
- When charging a battery in an ambulance, locate the charger in an enclosed cabinet and out of patient reach during transport.
- Ensure that the battery is fully charged prior to placing into service. An uncharged or depleted battery may cause poor stretcher performance.
- Before operating the stretcher, clear any obstacles that may interfere and cause injury to the operator or patient.
- When unloading the stretcher from the patient compartment, ensure that the caster wheels are safely set on the ground or damage to the product may occur.
- Remove the battery if the stretcher is not going to be used for an extended period of time (more than 24 hours).
- Wheel lock(s) are only intended to help prevent the stretcher from rolling while unattended and to aid in patient transfer. A wheel lock may not provide sufficient resistance on all surfaces or under loads.
- Ensure that the restraints are not entangled in the base frame when raising and lowering the stretcher.
- Do not store items under the stretcher mattress. Storing items under the mattress can interfere with the operation of the stretcher.
- Do not steam clean or ultrasonically clean the unit.
- Maximum water temperature should not exceed 80°C.
- Allow stretcher to air dry.
- Towel dry all casters and interface points.



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OPERATING AND HANDLING OF SUPERBRAVA STRETCHER

- Failure to comply with these instructions may invalidate any/all warranties.
- Always remove the battery before washing the stretcher.
- For additional maintenance information, see the preventative maintenance information.
- Improper maintenance can cause injury or damage to the product. Maintain the stretcher as described in this manual. Use only Kartsana approved parts and maintenance procedures. Using unapproved parts and procedures could cause unpredictable operation and/or injury and will void the product warranty
- Failure to use authorized parts, lubricants, etc. could cause damage to the stretcher and will void the warranty of the product.
- Hydraulic lines, hoses, and connections can fail or loosen due to physical damage, kinks, age, and environment exposure. Check hoses and lines regularly to avoid damage to the stretcher. Check and tighten loose connections.



NOTES:

- Loose items or debris on the patient compartment floor can interfere with the operation of the safety hook and stretcher fastener. Keep the patient compartment floor clear.
- This manual should be considered a permanent part of the stretcher and should remain with the product even if the stretcher is subsequently sold.
- Kartsana continually seeks advancements in product design and quality. Therefore, while this manual contains the most current product information available at the time of printing, there may be minor discrepancies between your stretcher and this manual.
- Kartsana recommends that, prior to installation, the certified mechanic plan the placement of the safety hook in the rear of the vehicle.
- Automatic charging will only occur with the batteries. Pack batteries supplied by Kartsana.
- Only use Kartsana-approved batteries with SUPERBRAVO rail.
- Batteries slowly lose power when not on the charger.

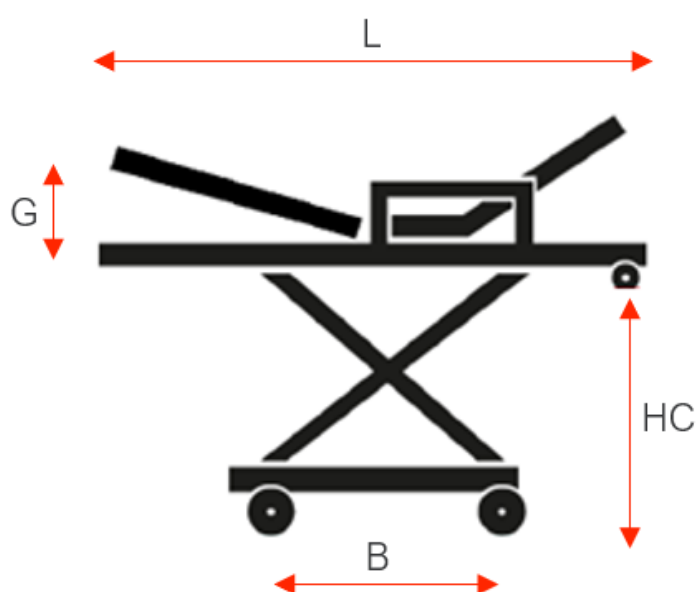
2. INSTRUCTIONS MANUAL

2.1. Technical specifications SUPERBRAVA (TG-2022) stretcher

Make sure that no damage is caused to the areas containing the stretcher mechanisms, to prevent them from malfunctioning.

Stretcher weight: **78 kg**

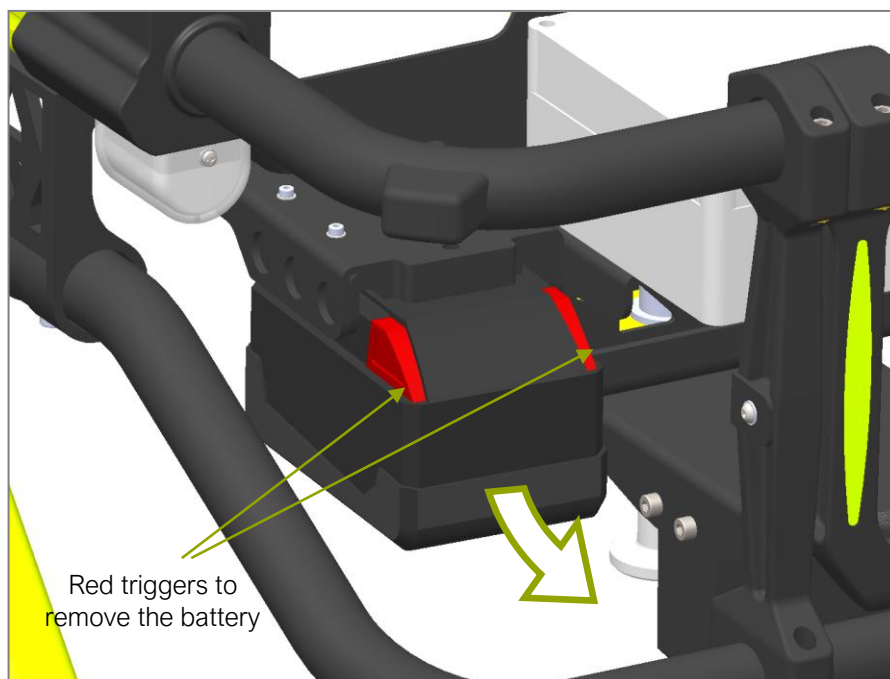
	MEASURE	SUPERBRAVA (mm)
W	WIDTH	590
A	HEADREST	545
L	LENGTH	2095
G	LEG ANGLE	20°
HC	HEIGHT LOAD	1090
FR	REAR CHASSIS WIDTH	510
FF	FRONT CHASSIS WIDTH	408
B	DISTANCE BETWEEN AXLES	1057



2.2. Operating and handling the stretcher

2.2.1. Installing the battery

The first step to work with the SUPERBRAVA is to place the 28V battery that powers the system. To do this we will place the battery in the connector incorporated in the stretcher.



To remove the battery, simultaneously press the red buttons and pull to unclip the battery from its connector.

The autonomy of the battery in no-load mode (without charge) should be about 130 cycles.



If the battery becomes excessively discharged, it must be charged using the external battery charger. Do not attempt to charge the excessively discharged battery with the charging point of the **Rail SUPERBRAVO (R-2022)**.

The front part of the stretcher corresponds to the head part of the stretcher.

The battery is delivered with a minimum charge. Before operating the stretcher, the battery must be charged with the supplied charger until all the charge indicator LEDs are lit. After that you CAN work normally.

2.2.2. Starting and controlling the stretcher

To avoid possible injury to the patient and attendants in the event of an accident, do not place objects in the path of the moving parts of the stretcher. It is also advisable to avoid protruding elements inside the ambulance.

The system starts up once the battery is connected to the stretcher and the power switch is turned on. The number of lit LEDs on the control unit will indicate the state of charge of the battery.

If an error occurs during the self-checking process, this will be indicated by the error LEDs (see error table in chapter 8).

- Functions of the buttons on the control panel*



The buttons on the keypad function as follows:

Yellow button: by pressing it, the LEDs on the stretcher light up.

Red button Right: The stretcher unfolds to the end of the stroke. It will fully deploy with a single press until the end of the stroke if the stretcher is positioned on the rail. This cycle can be interrupted by touching any button.

Red button Left: The stretcher is folded to the end of the stroke. When the end of travel is reached, the Stretcher Fold position LED lights up. It will fold completely with a single push to the end of the stroke if the stretcher is positioned on the rail. This cycle can be interrupted by touching any button.

Red Right + yellow button: the stretcher folds out to its maximum height, ignoring the end of travel.



The stretcher goes into low power Stand-By mode if no button is pressed for 60 minutes. Simply press any button to switch the stretcher on again.

Functions of the auxiliary control panel:

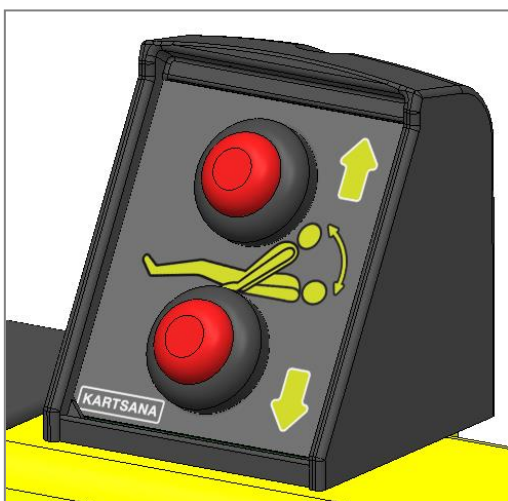


The buttons on the auxiliary control keypad function as follows:

Red button Right: The stretcher unfolds to the end of travel. It will fully deploy with a single press to the end of travel if the stretcher is positioned on the rail. This cycle can be interrupted by touching any button.

Red button Left: The stretcher folds down to the end of the stroke. When the end of the stroke is reached, the Stretcher Fold position LED lights up. It will fold completely with a single push to the end of the stroke if the stretcher is positioned on the rail. This cycle can be interrupted by touching any button.

2.2.3. Adjustable reclining headrest



The movement of the headrest is controlled by the auxiliary control controls on the right and left side of the stretcher. The system allows the head to be positioned at the desired inclination.

Top button: Headrest UP button. Raises the head to the end of the stroke.

Lower button: DOWN button. Lowering of the head to the end of the stroke.

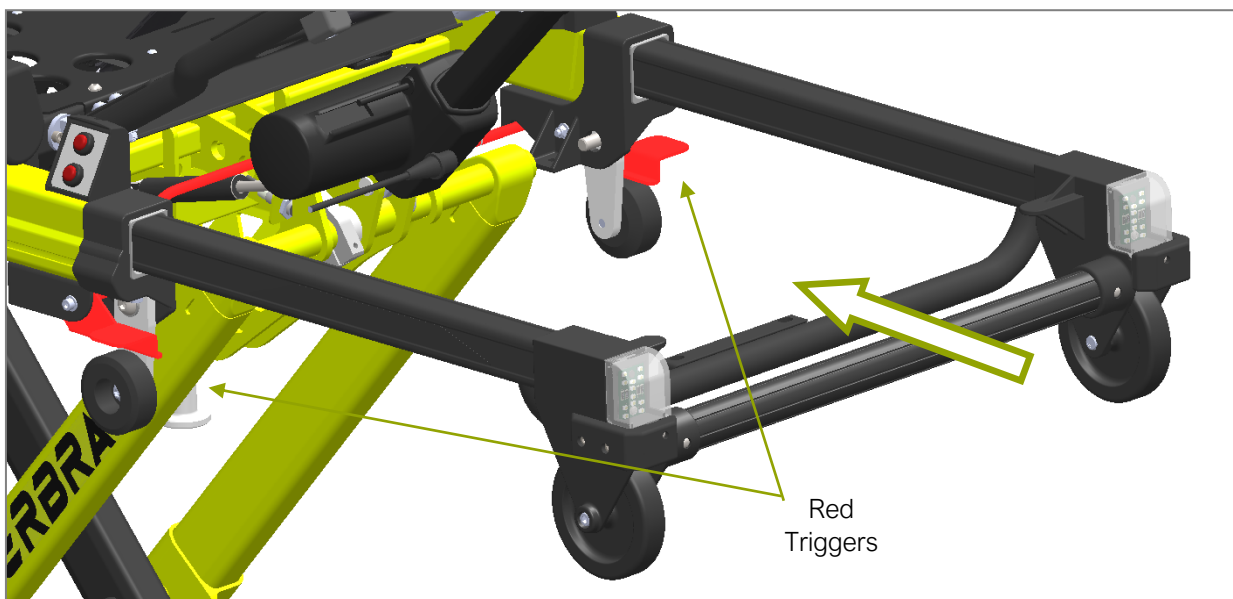


In case of malfunction, the system can be manually released, and the stretcher head can be left in the rest position (0°).

2.2.4. Extendable back rest frame

Before carrying out this action the back rest must be put at its most upright position.

To extract or fold up the telescopic back rest frame, you must pull one of the two red triggers located on each side of the stretcher. Stretching or pressing the back rest frame at the same time.

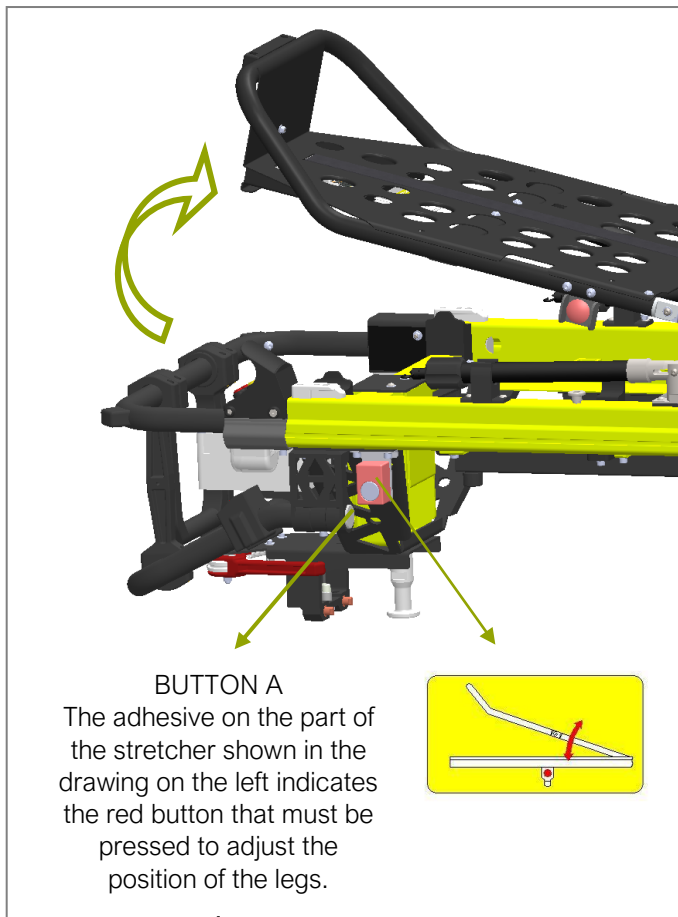


The head frame has a mechanical stop in the intermediate position (2090 mm long), one in the folded position (1723 mm) and one in the extended position (2210 mm). When the travel of the head frame reaches each of these three positions, the red lever "clicks" back into its original position.

It is important that when the stretcher is inserted into the Superbravo rail, the position of the front frame is intermediate. If it is in the extended or folded position it could cause damage to the stretcher and/or the operator.

2.2.5. Adjustable leg rest

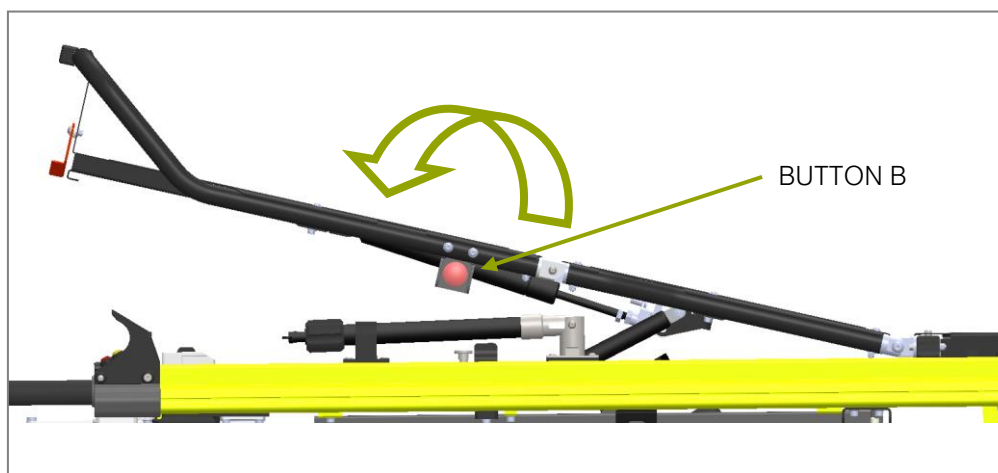
- *Button for adjusting the leg inclination*



The required inclination of the leg rest can be obtained by pressing button A and moving the leg rest manually. Once the correct inclination has been reached, release button A to automatically lock the leg rest.

- *Button for adjusting the foot inclination*

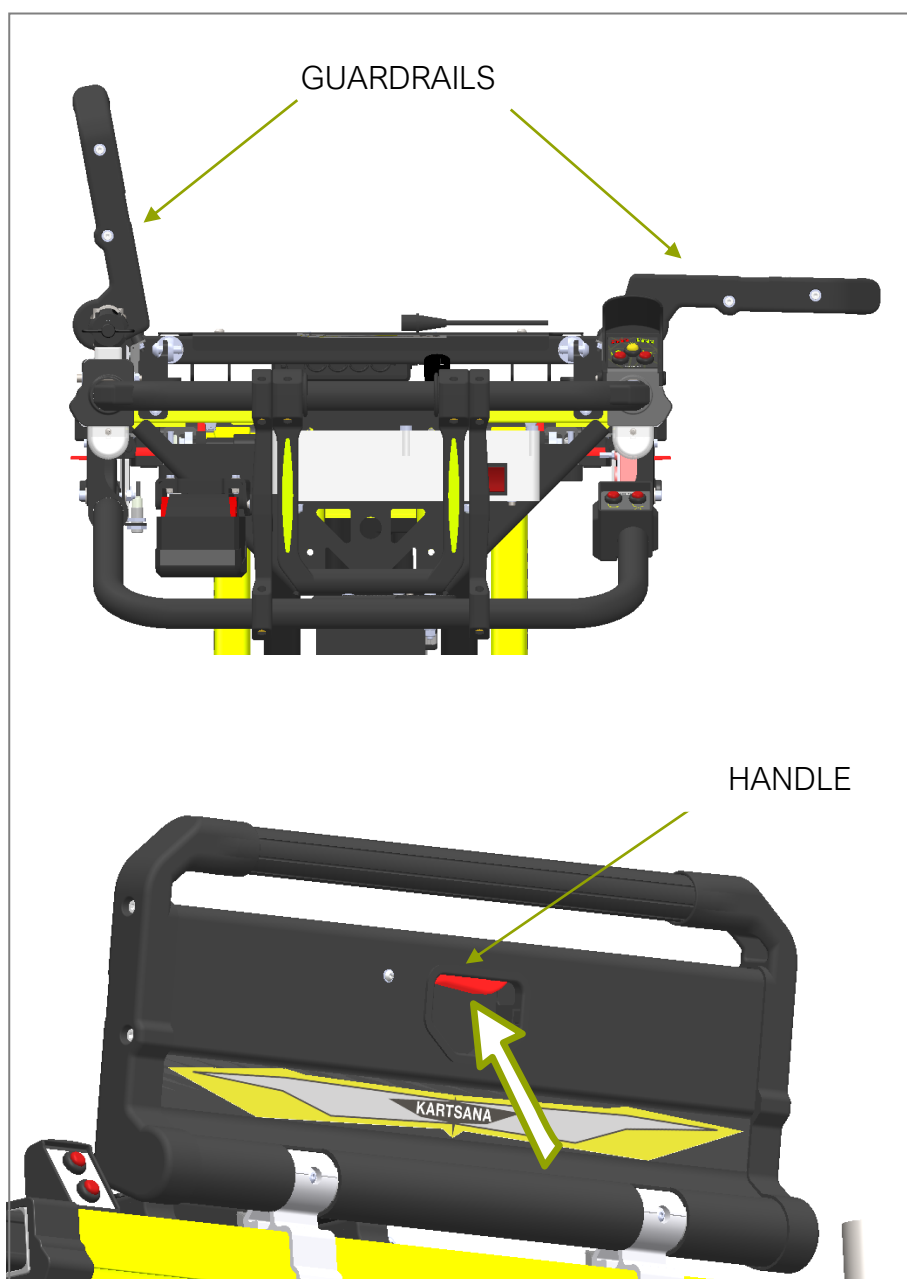
Press button B to change the feet inclination to the required position without changing the inclination of the legs, moving it only in the direction shown in the figure below until the required inclination is obtained.



2.2.6. Guardrails

The safety rails can be adjusted from a fully horizontal position to a 90-degree position. The system allows the guardrail to be fixed in the 5 intermediate positions. The upward movement from the horizontal position to the 90° position is carried out manually. Once the desired position is reached, the position of the railing is automatically fixed.

To unlock the system, the red handles must be pressed, releasing the system, and the handrails can be moved manually towards the outside of the stretcher.

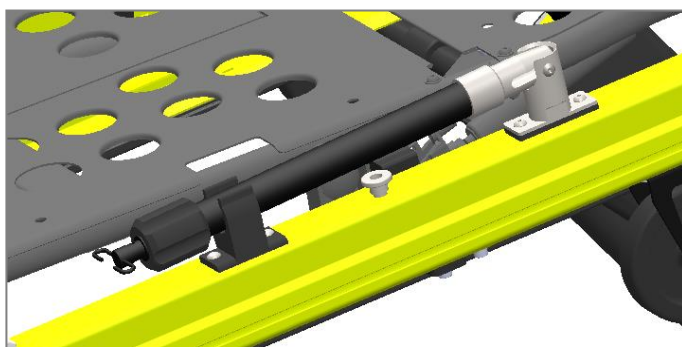


2.2.7. IV Poles



The stretcher is equipped with two I.V. holders on both sides of the SUPERBRAVA stretcher. The IV pole is raised to its vertical position so that it can be fixed perpendicularly to the stretcher.

The length of the IV pole can be lengthened or shortened by unscrewing the fixings on the telescopic rod. Lift the hook to the desired position and screw the attachment back on.

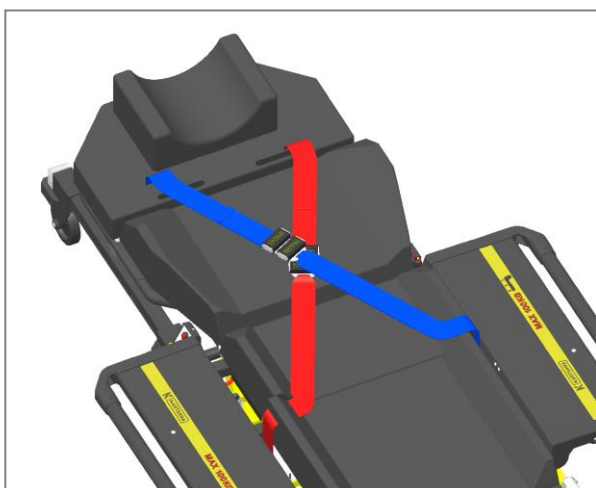


The maximum permissible load of the whey pole is 6 kg.

PESO MÁXIMO: 6 Kg
MAXIMUM LOAD:

2.2.8. How to secure safety belts to the patient

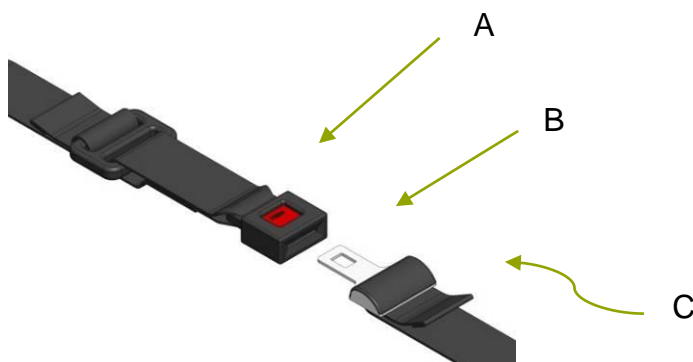
2.2.8.1. Head belts



The head belts are mounted crosswise, always joining the upper and lower parts with the same colour.

2.2.8.2. Belly and foot belts

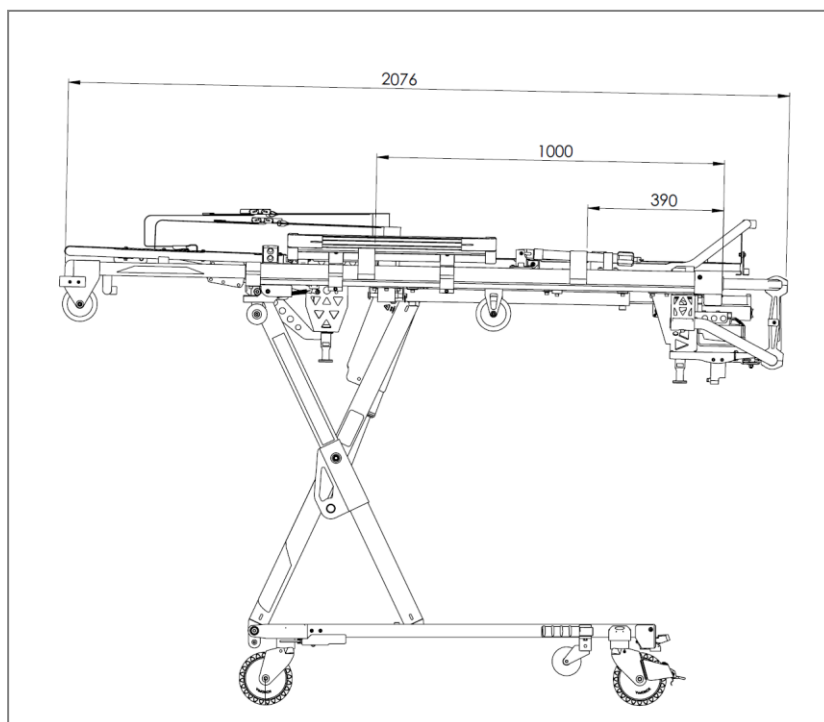
Place female buckle A and male buckle B in the position shown in the figure below and insert the latter into the groove of the former. Once the assembly is anchored, centre and tighten the assembly by adjusting the belt tension by means of end C.



It is recommended that the patient is always restrained with safety belt during the time he/she is on the stretcher.

2.2.9. Belts position

The belts are positioned at the approximate measurements shown in the figure below:





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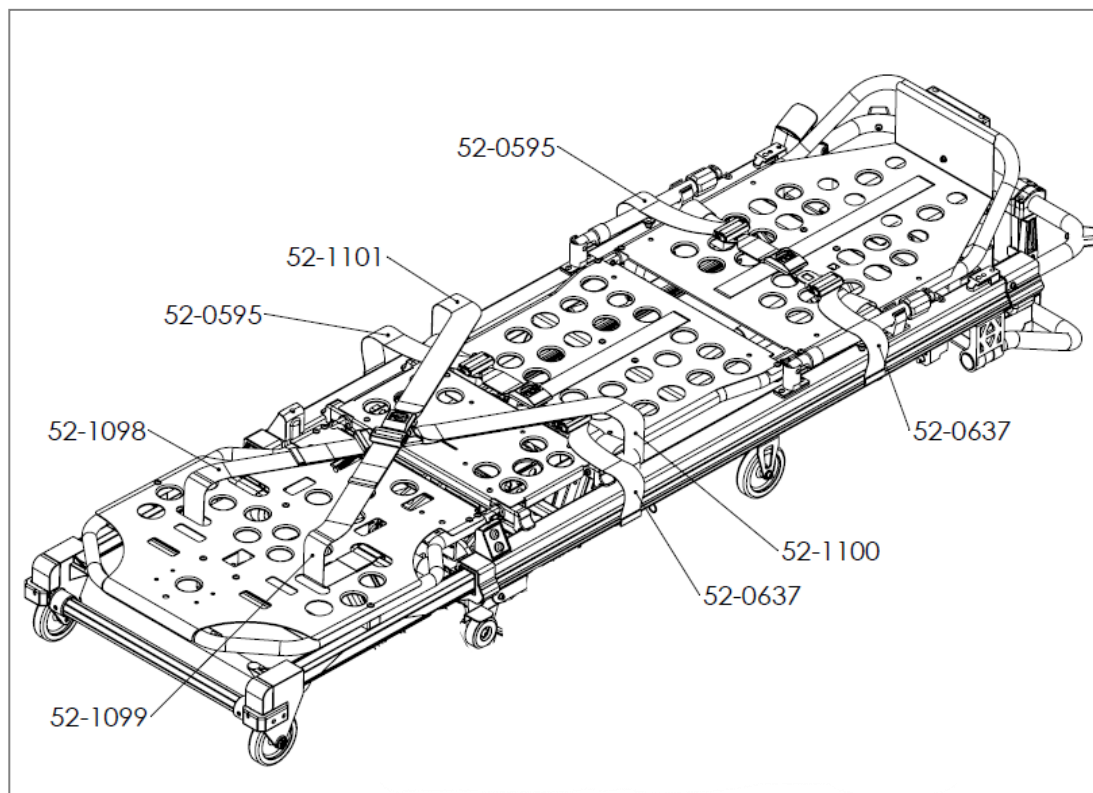
OPERATING AND HANDLING OF SUPERBRAVA STRETCHER

2.2.9.2. Head belts

The head straps must be threaded through the holes into the head and secured to the cross member by means of a knot as shown in the following figures:



The codes for our belts are:



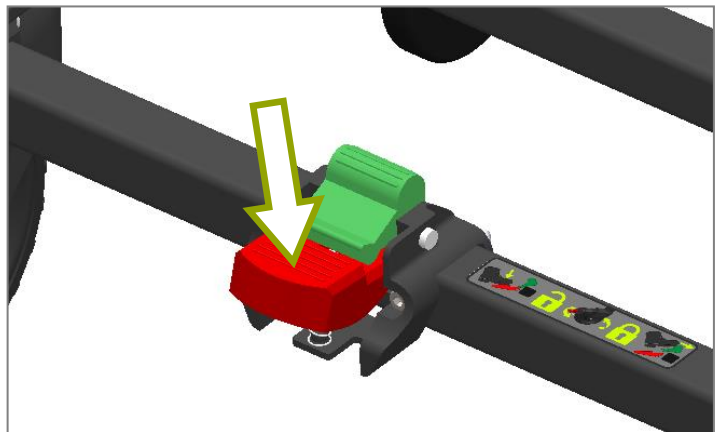
2.2.10. Rear wheel brake lever

Activate the lever with your foot to enable the brake to lock the rear wheels. This lever locks both the lengthways and revolving movement of the trolley.



2.2.11. Lever to unlock revolving front wheels

Pressing the red centre lever allows the wheels to turn freely. Pressing the green rear lever blocks the free rotation of the wheels..



Front wheels **must be always blocked** (position 1) when you load the stretcher on the rail. The omission of this, may cause injury to the patient or operator.



Never apply the optional wheel lock(s) while a patient is on the stretcher (if you have to move it). Tipping could occur if the stretcher is moved while the wheel lock is applied, resulting in injury to the patient or operator and/or damage to the stretcher.

Transporting the stretcher sideways can cause the stretcher to tip, resulting in possible damage to the product and/or injury to the patient or operator. Transporting the stretcher in a lowered position, head or foot end first, minimizes the potential of a stretcher tip

Never leave a patient unattended on the stretcher or injury could result. Hold the stretcher securely while a patient is on the product.

Never install or use a wheel lock on a stretcher with excessively worn wheels. Installing or using a wheel lock on a wheel with less than a 160mm diameter could

compromise the holding ability of the wheel lock, possibly resulting in injury to the patient or operator. Wheel lock(s) are only intended to help prevent the stretcher from rolling while unattended and to aid in patient transfer. A wheel lock may not provide sufficient resistance on all surfaces or under high loads.



For weights **higher than 200kg** it is recommended to use the stretcher by a low position in patient transport, rising up the stretcher until the necessary position just in the moment of introduce it into the ambulance.

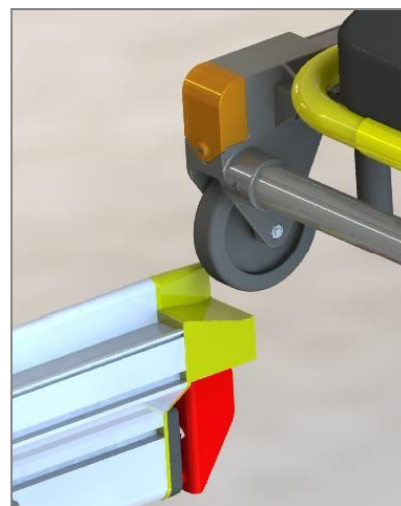
2.2.12. Assembling the SUPERBRAVA Stretcher onto the SUPERBRAVO Rail



IMPORTANT:

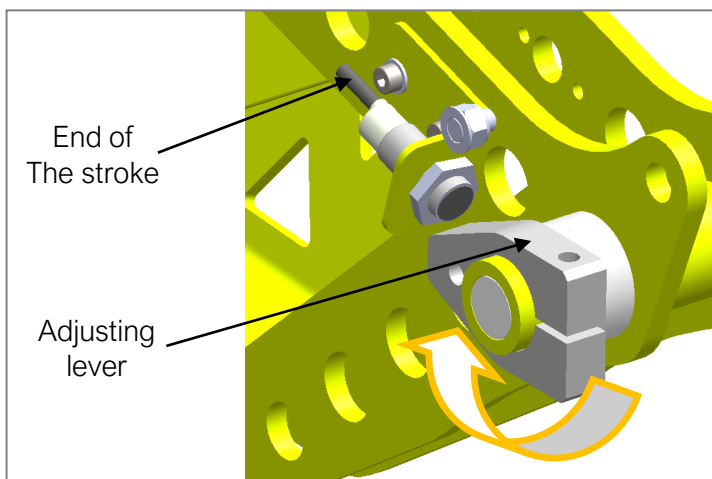
We must adjust the maximum elevation range of the stretcher only the **first time** we load it on the rail. If we change to another ambulance of a different height, we will have to adjust it again.

To adjust the maximum elevation of the upwards range of the stretcher, we must place it opposite the extended Safety handrail on the outside of the ambulance. Place the front wheels half a centimeter above where the small loading wheels slide. See picture



The stretcher should be held in this position when it is removed from the rail. Then look for the adjusting lever on the top of the stretcher near the shock absorber attachment on the headrest.

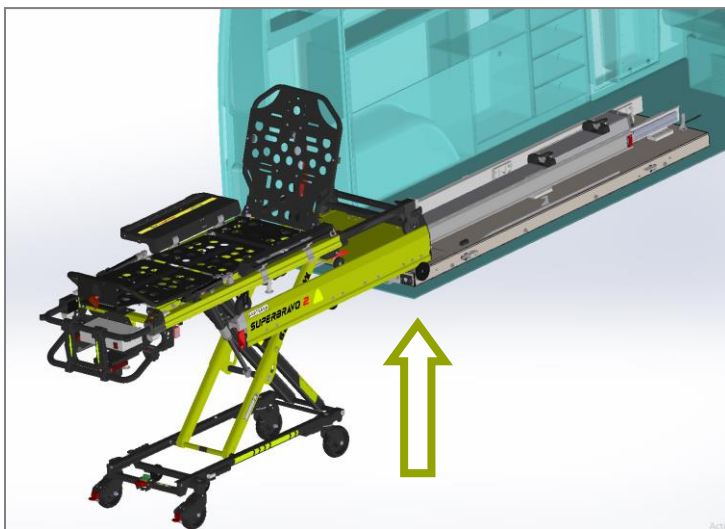
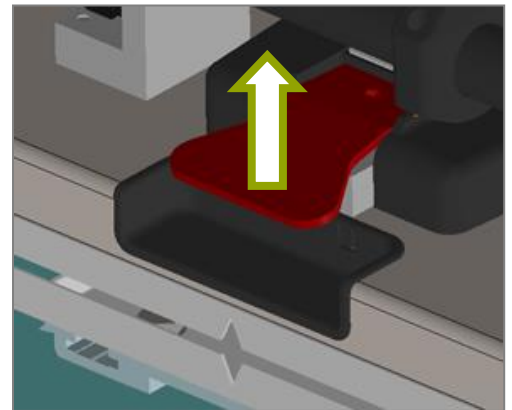
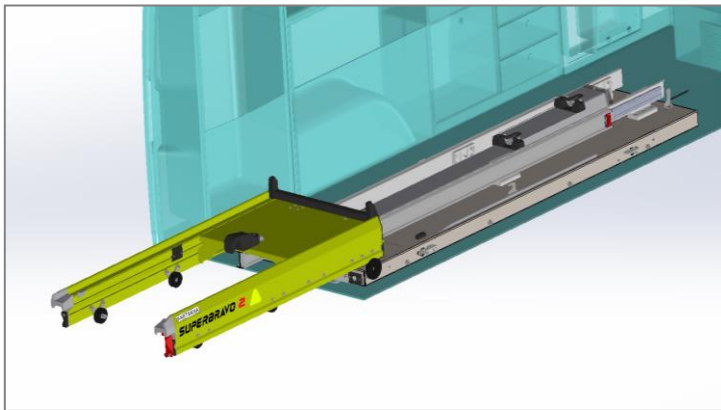
The cam is fixed to the shaft with a screw "H" which must be loosened, then rotate the cam until it presses the end of the stroke. For this purpose, there is a sticker with a graduated scale to serve as a reference. Once oriented in such a way that we have heard the "click" of the limit switch, we will tighten the screw 8 Nm to fix the cam in this definitive position.



The stretcher is then raised to the set height at the latest. Check a loading maneuver and readjust if necessary.

On uneven terrain or changes in gradient, the stretcher can be raised to its maximum travel by pressing the red button on the right and the yellow button on the right and yellow button on the left at the same time.

To load the stretcher onto the SUPERBRAVO rail, the SUPERBRAVO rail must be in the outer position of the ambulance. Pull the red lever to release the block so that it can be removed. Direct the stretcher towards the profiles protruding from the ambulance and align the small wheels of the stretcher on the rail.



Once the stretcher is oriented on the side profiles, push the stretcher until it reaches the stop of the front wheels.

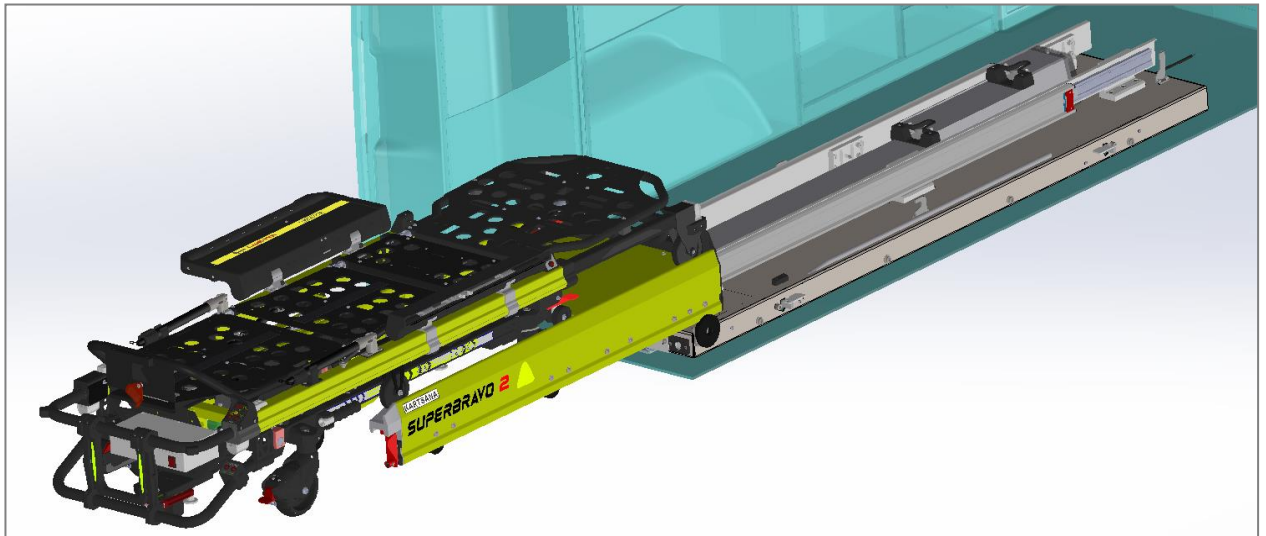
Press the Red Left Button on the control panel to fold the stretcher legs to the end of their travel. If the operation is correct, the front axle should remain inside the hooks, and the stretcher folding LED on the control panel will light up.



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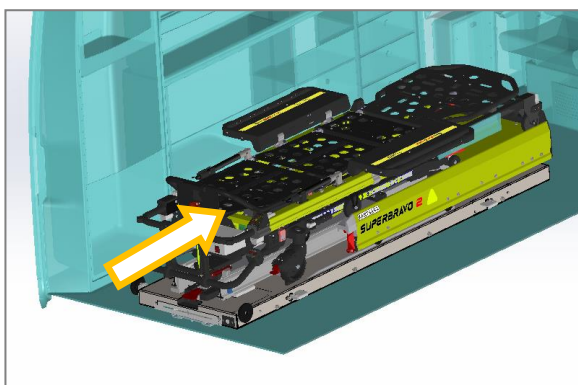


The front wheels must always be locked when loading the stretcher onto the rail. Failure to do so may damage important parts of the stretcher.

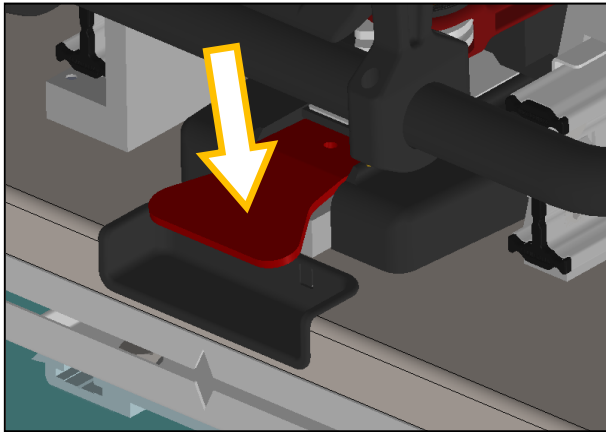
Pull the right rear red trigger on the rail to unlock the mechanism and push the stretcher towards the inside until it reaches the end of the stroke.



Once this process has been completed, the stretcher must be perfectly fixed on the rail.



You can also check that the unloading lever is in the resting position.



Do not disconnect the secondary battery from the ambulance when the ambulance is not in service to allow the stretcher battery to charge between services.

2.2.13. Transfer of the patient to the stretcher

➤ To transfer the patient to the stretcher:

1. Bring closer the stretcher to the patient.
2. Place the stretcher beside the patient and raise or lower the stretcher to the level of the patient.
3. Lower the siderails and open the restraint belts.
4. Transfer the patient to the stretcher using accepted emergency medical procedures.
5. Use all the restraint belts to secure the patient to the stretcher.
6. Adjust the backrest and footrest as necessary.

➤ When rolling the stretcher:

- Make sure that all the restraint belts are securely buckled around the patient.
- Always position an operator at the foot end and one at the head end of the cot when rolling the cot with a patient on it.
- Approach door sills and/or other low obstacles squarely and lift each set of wheels over the obstacle separately.

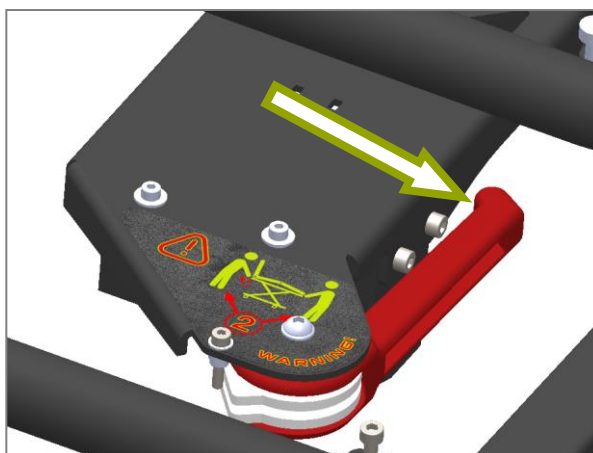
➤ Proper lifting techniques

When lifting the cot and patient, there are basic guidelines to help you avoid injuries:

- Keep your hands close to your body.
- Keep your back straight.
- Coordinate your movements with your partner and lift with your legs.
- Avoid twisting.
- Always use the stretcher as we describe in this manual.

3. EMERGENCY LEVER USE

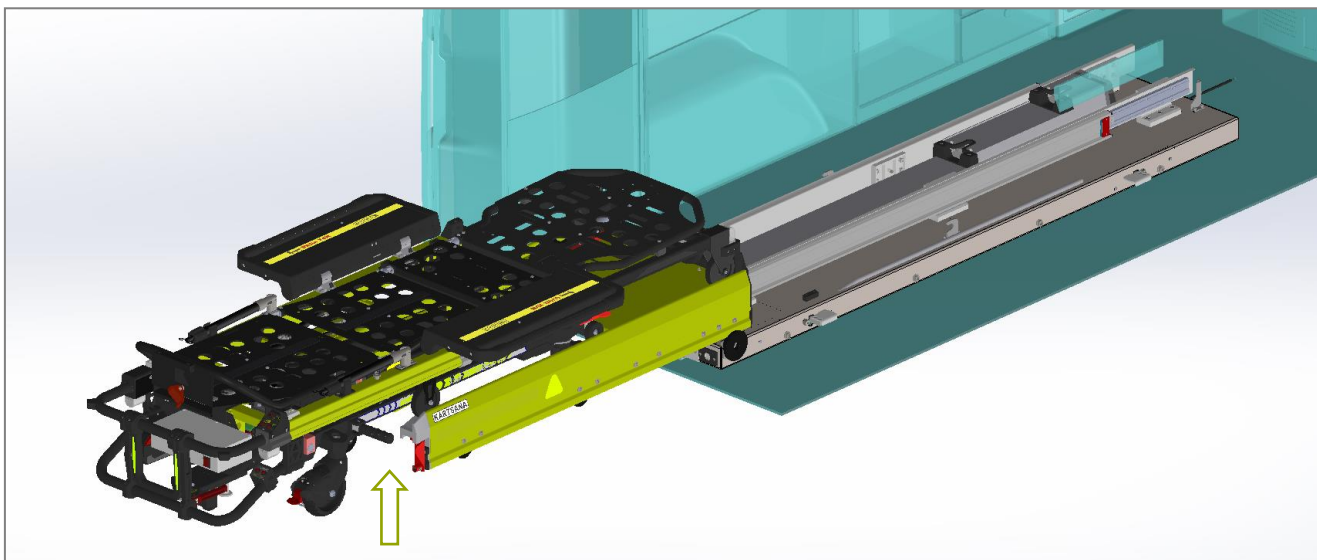
In the event of a malfunction of the hydraulic system, the stretcher can be operated manually. For the following procedure, it is essential that the stretcher is handled by two operators. With the stretcher in the unfolded position, pull the red trigger located next to the battery at the rear of the stretcher. The stretcher will lower to the lower stop and remain in this position.



In the same way, by pressing the trigger and lifting the stretcher (always between the two operators), the stretcher legs unfold until the trigger is released and the stretcher is fixed in the adopted position.

If you wish to load the rail, you must position it on top of the block (as in the normal procedure) and fold the stretcher manually by pushing the handles located on the lower part of the chassis.

To insert the rail into the ambulance, the folded position of the stretcher must be held manually until the rail is secured.



4. PRODUCT CARE & DISPOSAL

4.1. Servicing requests

For any service requests or consultations regarding the use, maintenance, or installation of any KARTSANA product, please contact KARTSANA Customer Care Service.

- Telephone #: +34 93 715 86 72
- E-mail: info@kartsana.com
- Narcís Monturiol, 34
08192 Sant Quirze del Vallès
Barcelona (Spain)

4.2. Environmental conditions

For both use and storage:

Temperature: from -10 °C to +60 °C

Relative Humidity: 5 - 95%

4.3 Cleaning

When disinfecting the device, use non-corrosive products that will not damage the surface of the materials and wipe with a cloth or similar non-abrasive cleaning utensil. If the surface to be disinfected is greased, re-grease it after disinfection.

All disinfectants must be used in accordance with the manufacturer's instructions.



Do not wash the product with high pressure water, take special care with electrical components, the circuit board housing, keypads, LEDs and motor.



Remove the batteries before washing and then thoroughly dry the terminal contacts.

The manufacturer will not be held responsible for any anomaly or damage caused by using a cleaning product that could damage the stretcher's surface materials.

To ensure the hygiene and proper conservation of the product components, the manufacturer recommends that they be disinfected after each use.

4.4. Maintenance

4.4.1. Precautionary Maintenance

A periodic and correct maintenance guarantees the durability of the device.

Creating a maintenance plan including periodic check-ups and establishing a responsible employee to carry it out is recommended.

The person who carries out the precautionary maintenance of the appliance (user, manufacturer/supplier or third party) must meet or adhere to the following basic requirements:

- ✓ Possession of technical knowledge pertaining to the device and of the periodic maintenance procedures as described in these instructions.
- ✓ Use or support of qualified technical personnel trained specifically in the maintenance operations required for the device in question.
- ✓ Use of components, replacement parts, or accessories that are either original to or approved by the supplier to avoid the need to carry out alterations or modifications to the device that would void warranty.
- ✓ Record keeping of all maintenance operations carried out on the device, in adherence to the instructions of European Council directive 93/42/CEE which states the obligation of the purchaser to provide when requested the afore mentioned after-sales care record for the purpose of product traceability.

Check the device before every use.

Before each service, the following points must be ensured:

- ✓ Functionality of the product.
- ✓ Fixation of nuts and bolts.
- ✓ Good condition of moving parts, wheels, belts, mattress.
- ✓ Spring sensibility.
- ✓ Full working order of all electrical functions must be checked: full range of movement, lighting, etc.

If the device does not appear suitable for correct and safe use, it must be taken out of service until the device is repaired or restored to full working order.

Do not modify the device structurally for any reason, as this may cause serious damage to patients and / or operators.

Recommended lubrication interval for moving parts:

- 1 - 30 services per month: every 3 months
- 30 - 50 services per month: every 2 months
- over 150 services per month: every month

All maintenance other than lubrication, tightening of nuts and bolts and ordinary cleaning must be performed by KARTSANA or an authorized service centre.

4.4.2. Servicing Maintenance

The person to whom the servicing of the product is entrusted must guarantee the following basic requirements:

- ✓ Adequate knowledge of the product, of its technical / construction features, of checkpoints and final tests, packaging, conservation, and handling.
- ✓ Adequate knowledge of the technology used in production of the product.
- ✓ Knowledge of all correct product functions and of any potential risks or possible malfunctions or breakdowns of the product
- ✓ Possession of all instruments necessary for carrying out any technical servicing or minor repairs.
- ✓ Possession (or ability to procure) replacement parts from the original manufacturer or authorised by the manufacturer.
- ✓ Use or support of specialized technical personnel trained by the manufacturer for the servicing of the product in question.
- ✓ Record keeping of all maintenance operations carried out on the device, in adherence to the instructions of European Council directive 93/42/CEE which states the obligation of the purchaser to provide when requested the afore mentioned after-sales care record for the purpose of product traceability.

4.5. Transport and storage

Before transporting the device, make sure it has been packed adequately and secured to avoid damage during transport.

Keep the original packaging for other eventual transports. Any damage caused to the device during transport is not covered by warranty. Repairs and substitutions of damaged parts are at the customer's charge.

The device must be stored in a dry place.

During storage, do not put any heavy object on top of the product. It should not be used as support for any type of object.

4.6. Disposal

When the product is no longer in working condition, if it has not been contaminated by any corrosive or contagious agent, it can be disposed of as any metal-based waste, following the local current regulations regarding metal-based waste disposal.

5. MAINTENANCE



Always inspect the mattress each time you clean the mattress cover. Follow hospital protocols and perform preventive maintenance each time the mattress cover is cleaned. If the mattress is affected, remove it from service and replace it to avoid cross-contamination.

For proper stretcher maintenance, review the following checklist items:

- The mattress cover (top and bottom) shall be free of tears, cuts, and holes.
- The welds of the mattress must be free of tears or other defects.
- All belts are secure.
- All product labels are in place and legible.
- No welded parts are damaged.
- The swivel castor is not worn or damaged.
- Swivel castors lock when using the brake pedal, are free of debris, and are not worn or damaged.
- Stretcher backrest is raised, lowered, and securely fixed.
- The backrest does not deflect or lower unexpectedly.
- There are no leaks in the backrest cylinders.
- Backrest cylinder pin is not jammed.
- Brake/steering pedals are not bent or damaged.
- Brake mechanism works.
- Base frame is not damaged.
- No fluid leaks from the electro-hydraulic motor.
- The emergency hydraulic release system cable is not lost or damaged.
- The emergency system lever is free of debris and does not get stuck.
- The stretcher raises and lowers smoothly.
- Sleeves are not out of position, loose, worn, or damaged.
- Velcro fasteners are in place, intact and secure.
- There is no interference between wiring and moving mechanical components.
- No leaks at hydraulic connections.
- Lubricate as necessary.
- Fittings and mounting hardware are in good condition.

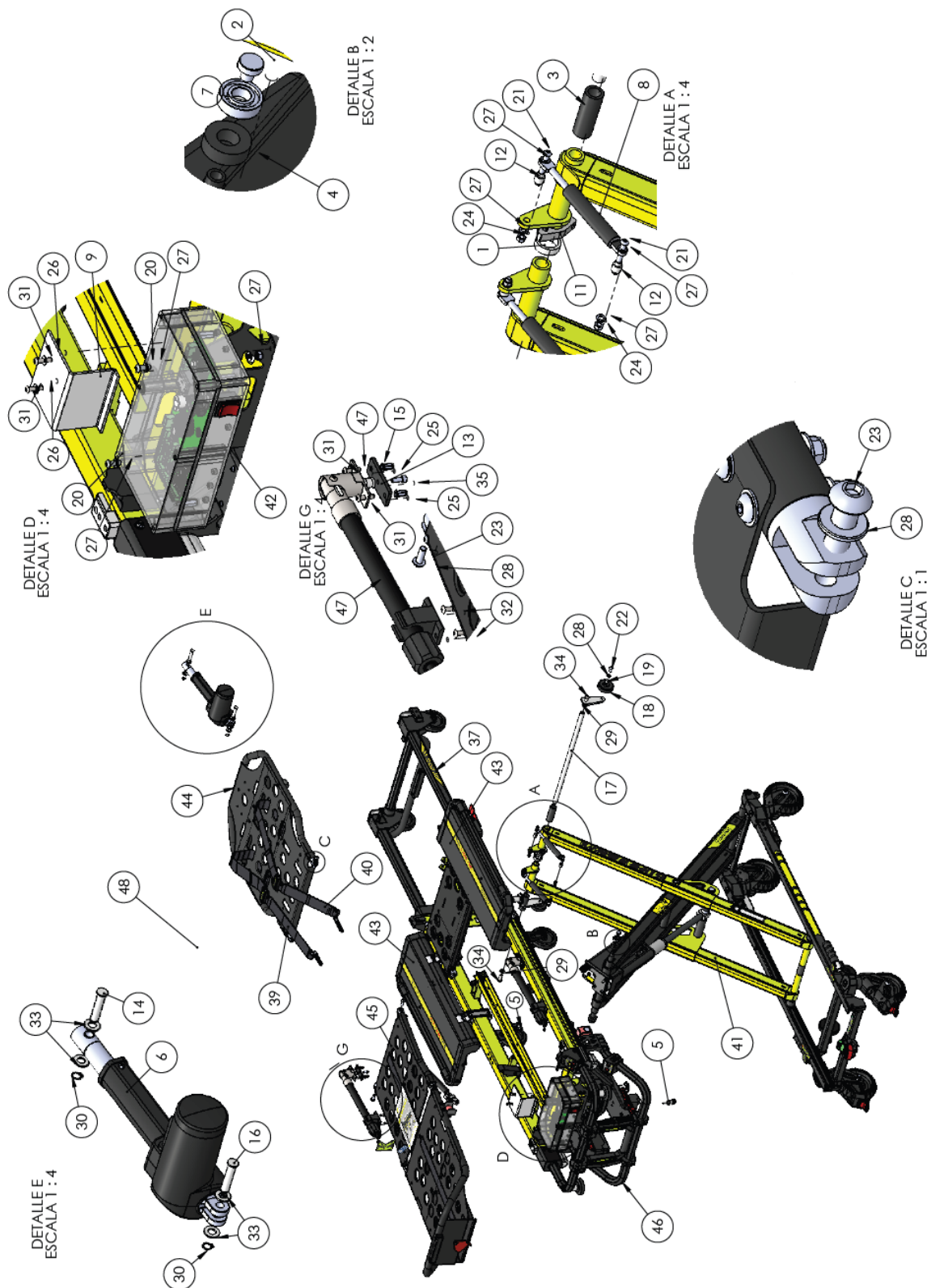


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OPERATING AND HANDLING OF SUPERBRAVA STRETCHER

6. SUPERBRAVA STRETCHER EXPLODED





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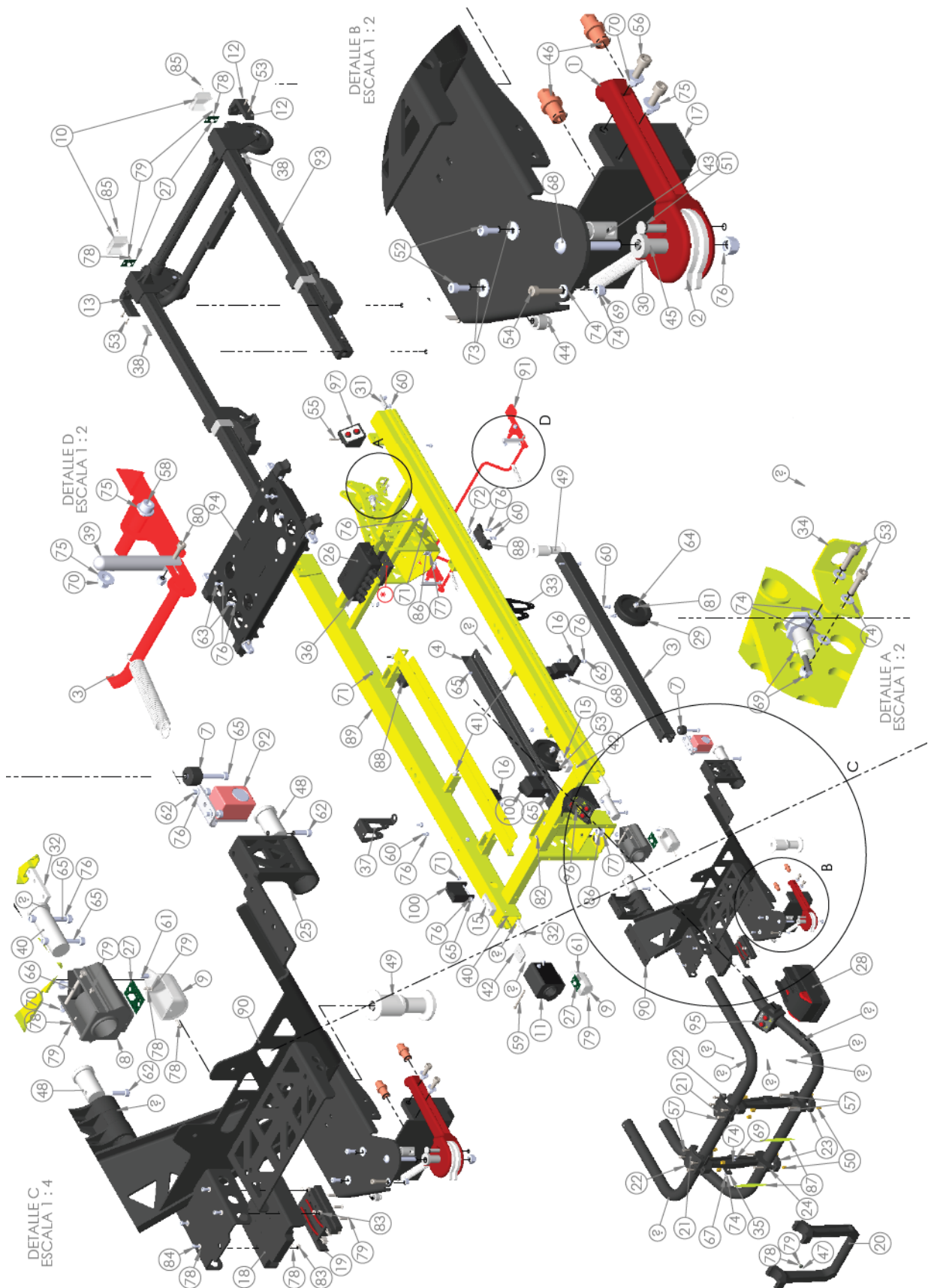
N.º	Nº DE PIEZA	Descripción	UDS
1	05-0236-001	SEPARADOR LEVA BRAVA	1
2	05-0293-001	TAPON PROTECCION DESGASTE GUIA	2
3	05-1000-001	CASQUILLO EJE SUPERIOR DELANTERO SUPERBRAVA	2
4	05-1033-001	CASQUILLO EJE DELANTERO SUPERBRAVA	2
5	07-0064-001	DETECTOR INDUCTIVO XS112B3NAL2 DIST. 4mm M12x35	2
6	07-0117-001	ACTUADOR TA23-2O-150318-25112-210RR-911	1
7	09-0070-001	RODAMIENTO - 6001Z	2
8	09-0331-001	AMOR.300N S.082309 6/145.5/B-B	2
9	11-1800-001	TAPA PASACABLES 3R PUNTO SUPERBRAVA	1
10	11-1881-002	SOPORTE RUEDA INTERMEDIA SUPERBRAVA	2
11	12-0690-003	LEVA DETECTOR INDUCTIVO BASIC	1
12	12-1800-001	CASQUILLO D.8x6x20 AMORTIGUADOR SUPERBRAVA	4
13	12-1801-001	TETON CENTRADOR SUERO	2
14	12-1802-001	PASADOR D.10x50 CABEZAL SUPERBRAVA	1
15	12-1803-001	BASE CENTRADOR SUERO SUPERBRAVA	2
16	12-1804-001	PASADOR D.10x45 CABEZAL SUPERBRAVA	1
17	12-1805-001	EJE DEL. SUP. PATAS BRAVA	1
18	12-1875-001	RUEDA D60 PARAGOLPES SUPERBRAVA	2
19	12-1876-001	CASQUILLO d8.2 D12 x 11 mm S-1000	2
20	13-0102-001	ULS ISO-7381 M6x16 CINCADO	2
21	13-0106-001	DIN 7380 ULS M6x35 -10.9 CINCADO	4
22	13-0113-001	ULS ISO-7381 M8x20 10.9 CINCADO	2
23	13-0114-001	ULS ISO-7381 M8x25 10.9 CINCADO	4
24	13-0177-001	TUERCA AUTOBLOCANTE M6	6
25	13-0194-001	TUERCA REMACHABLE M5	4
26	13-0206-001	ARANDELA DIN 125-A ø5 CINCADA	2
27	13-0207-001	ARANDELA d6 CINCADA	12
28	13-0208-001	ARANDELA d8 CINCADA	6
29	13-0210-001	ARANDELA d10 CINCADA	2
30	13-0216-001	ANILLO ELASTICO EXT. ø 10 DIN 471 CINCADO	2
31	13-0355-001	DIN 7380 ULS INOX. M5X20	6
32	13-0429-001	REMACHE DE ACERO INOX. 5X12	4
33	13-0484-001	ARANDELA DE NYLON d 10	4
34	13-0562-001	ULS ISO-7381 M10x35 10.9 CINCADO	2
35	13-0667-001	DIN 7380 ULS M5X12 -10.9 CINCADO	2
36	14-0020-001	ETIQUETA K PIERNAZAL SUPERBRAVA 50x60	1
37	14-0360-001	ETIQUETA 20-G SUPERBRAVA	2
38	14-0363-001	ETIQUETA CAJÓN MANUAL SUPERBRAVA	1
39	52-0047-001	CINTURÓN TORÁCICO IZQUIERDO	1
40	52-0048-001	CINTURÓN TORÁCICO DERECHO	1
41	52-0894-001	CHASIS SUPERBRAVA	1
42	52-1070-001	PREMONTAJE CAJA HERMÉTICA PLACA SUPERBRAVA	1
43	52-1071-001	BARANDILLA ABATIBLE LATERAL SÓLIDA	2
44	52-1072-002	PREMONTAJE CABEZAL SUPERBRAVA	1
45	52-1073-002	PIERNAZAL DOBLE COMPLE.BRAVA	1
46	52-1074-002	PREMONTAJE CUADRO SUPERBRAVA	1
47	90-2001-001	SOPORTE PALO DE SUERO S03	2
48	90-2066-002	COLCHÓN SUPERBRAVA (P-104)	1



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N.º DE ELEMENTO	Nº DE PIEZA	Descripción	CANT.
1	01-0408-001	MANETA DESBLOQUEO MOTOR SUPERBRAVA	1
2	01-0409-001	POLEA MANETA MOTOR SUPERBRAVA	1
3	03-1328-001	GUIA SUPERIOR IZQ RODAMIENTOS SUPERBRAVA	1
4	03-1329-001	GUIA SUPERIOR DCH RODAMIENTOS SUPERBRAVA	1
5	03-1330-002	PUÑO TRASERO INFERIOR NUEVA BRAVA	1
6	03-1331-002	PUÑO TRASERO SUPERIOR SUPERBRAVA	1
7	05-1053-001	TOPE POSICIÓN PLEGADA SUPERBRAVA	4
8	05-0223-001	SOPORTE PLACA MANDO BRAVA	1
9	05-0227-002	PILOTO TRAS. BRAVA	2
10	05-0232-001	PILOTO DEL. BRAVA	2
11	05-0233-002	PROTECTOR PERFIL GOMA IZQ. LUZ BRAVA	1
12	05-0540-004	PARAGOLPES DELANTERO DERECHO SUPERBRAVA	1
13	05-0541-004	PARAGOLPES DELANTERO IZQUIERDO SUPERBRAVA	1
100	05-1020-002	ABRAZADERA PIERNALZAL SUPERBRAVA	2
15	05-1022-001	GUIA SOPORTE PALO DE SUERO SUPERBRAVA	2
16	05-1023-001	APOYO PIERNALZAL SUPERBRAVA	2
17	05-1024-002	SOPORTE BORNES SUPERBRAVA	1
18	05-1025-002	BASE ENCHUFE CARGA BATERIA SUPERBRAVA	1
19	05-1026-001	ENCHUFE CARGA BATERIA SUPERBRAVA	1
20	05-1027-001	TIRADOR SOPORTE PANTALLA SUPERBRAVA	1
21	05-1028-001	ANCLAJE TIRADOR PANTALLA SUPERBRAVA	2
22	05-1029-001	ANCLAJE LARGO TIRADOR UNIÓN PUÑOS SUPERBRAVA	2
23	05-1030-002	ANCLAJE INFERIOR TIRADOR UNIÓN PUÑOS SUPERBRAVA	2
24	05-1031-002	TIRADOR UNIÓN PUÑOS SUPERBRAVA	2
25	05-1032-003	ANCLAJE PUÑOS SUPERBRAVA	2
26	06-0131-001	CAJA TMOTION	1
27	07-0104-001	PLACA ELECTRÓNICA LEDs BRAVA	4
28	07-0110-001	BATERÍA MILWAUKEE M28 A.0 Ah + CARGADOR	1
29	09-0003-001	RUEDAS d 100 X 22 CON CASQUILLO	2
30	09-0060-001	MUELLE GANCHO CENTRAL R-450	3
31	11-0535-001	PLETINA ROSCADA AMARRE FUND. DEL. BRAVA	2
32	11-0548-002	PLETINA ROSCADA AMARRE PUÑOS TRAS. BRAVA	2
33	11-1821-002	SOPORTE RUEDA CAMILLA SUPER BRAVA	1
34	11-1831-001	CHAPA SOPORTE DETECTOR	1
35	11-1833-001	TOPE IMÁN PANTALLA SUPERBRAVA	1
36	11-1835-002	SOPORTE MUELLE PUÑOS SUPERBRAVA	2
37	11-1880-002	SOPORTE RUEDA CAMILLA SUPERBRAVA CON SENSOR	1

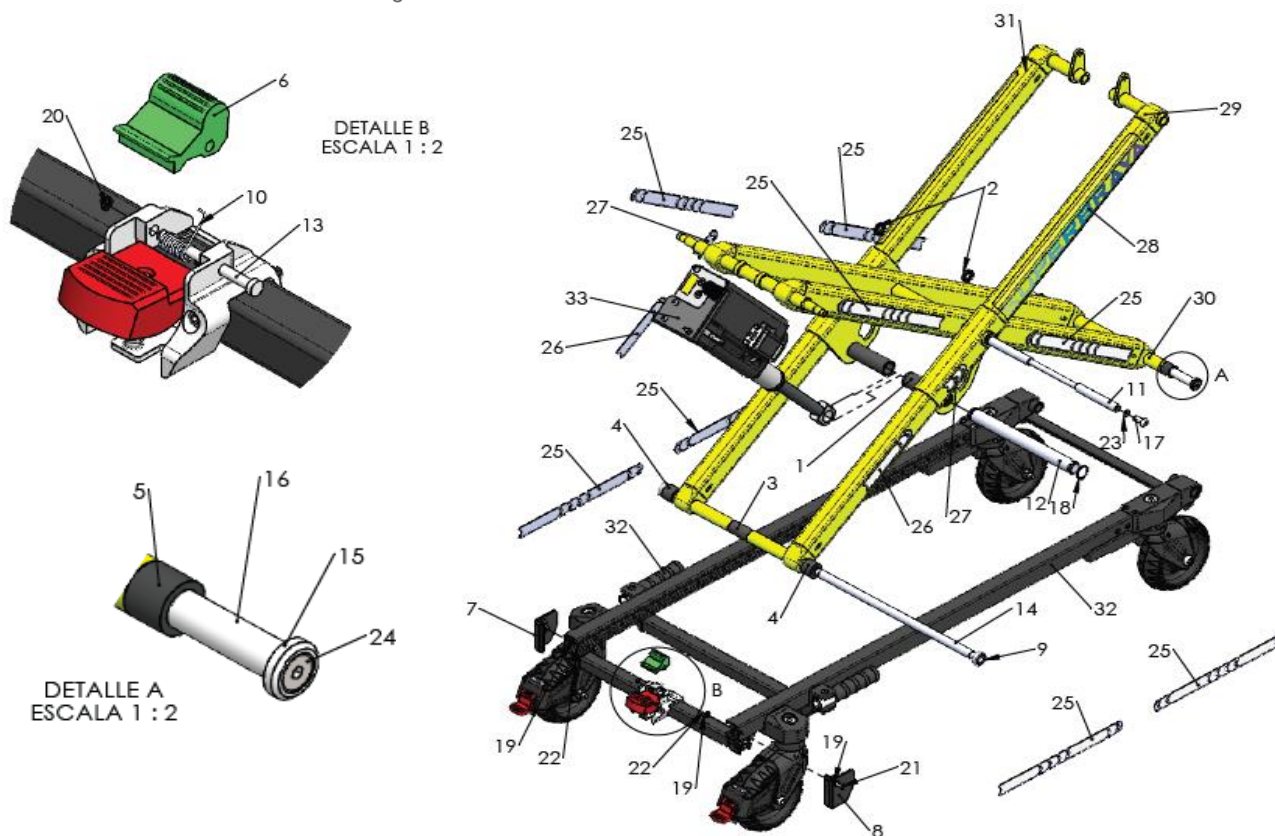
N.º DE ELEMENTO	Nº DE PIEZA	Descripción	CANT.
38	11-1882-001	CONTRACHAPA FIJACIÓN PARACHOQUES SUPERBRAVA	2
39	12-0257-002	TETONES PEQUEÑOS BLOQUEO PUÑOS BRAVA	2
40	12-0434-002	MACIZO INTERIOR ASA BRAVA	2
41	12-1833-001	BULON AMORTIG. PIERNALZAL 1 BRAVA	2
42	12-1834-002	CHAPA FIJACIÓN GUÍA PALO DE SUERO SUPERBRAVA	2
43	12-1835-002	TOPE FUNDA MANETA SEGURIDAD SUPERBRAVA	1
44	12-1836-001	CASQUILLO SOPORTE MUELLE SEGURIDAD SUPERBRAVA	1
45	12-1837-001	CASQUILLO MANETA SEGURIDAD SUPERBRAVA	1
46	12-1838-002	CONECTOR CARGADOR SUPERBRAVA	2
47	12-1839-001	IMÁN POSICIÓN PANTALLA SUPERBRAVA	1
48	12-1840-002	TAPÓN FINAL PUÑO CURVADO SUPERBRAVA	2
49	12-1841-001	3R PUNTO SUPERBRAVA	2
50	12-1842-002	TUERCA ESPECIAL TIRADOR SUPERBRAVA	12
51	12-1843-001	PASADOR MANETA DESBLOQUEO SUPERBRAVA	1
52	13-0005-001	ALLEN DIN 912 M4X10 - 8.8 CINCADO	2
53	13-0007-001	ALLEN DIN 912 M4X16 - 8.8 CINCADO	8
54	13-0008-001	ALLEN DIN 912 M4X20 - 8.8 CINCADO	1
55	13-0009-001	ALLEN DIN 912 M4X25 - 8.8 CINCADO	2
56	13-0014-001	ALLEN DIN 912 M5X20 - 8.8 CINCADO	6
57	13-0015-001	ALLEN DIN 912 M5X25 - 8.8 CINCADO	12
58	13-0018-001	ALLEN DIN 912 M5X55 - 8.8 CINCADO	2
59	13-0019-001	ALLEN DIN 912 M5X60 - 8.8	1
60	13-0022-001	ALLEN DIN 912 M6X14 - 8.8 CINCADO	22
61	13-0023-001	ALLEN DIN 912 M6X16 - 8.8 CINCADO	2
62	13-0024-001	ALLEN DIN 912 M6X20 - 8.8 ZINC	6
63	13-0028-001	ALLEN DIN 912 M6X35 - 8.8 CINCADO	4
64	13-0031-001	ALLEN DIN 912 M6X50 - 8.8 CINCADO	2
65	13-0033-001	ALLEN DIN 912 M6X60 - 8.8 CINCADO	10
66	13-0070-001	AVELLANADO ALLEN DIN 7991 - M5 x 70 CINCADO	1
67	13-0094-001	ULS ISO-7381 M4X20 CINCADO	1
68	13-0108-001	ULS ISO-7381 M6X45 CINCADO	5
69	13-0175-001	TUERCA AUTOBLOCANTE M4	4
70	13-0176-001	TUERCA AUTOBLOCANTE M5	8
71	13-0177-001	TUERCA AUTOBLOCANTE M6	23
72	13-0193-001	TUERCA RECTANGULAR M6	22
73	13-0201-001	ARANDELA ANCHA d 4 CINCADA	2
74	13-0205-001	ARANDELA d4 CINCADA	8



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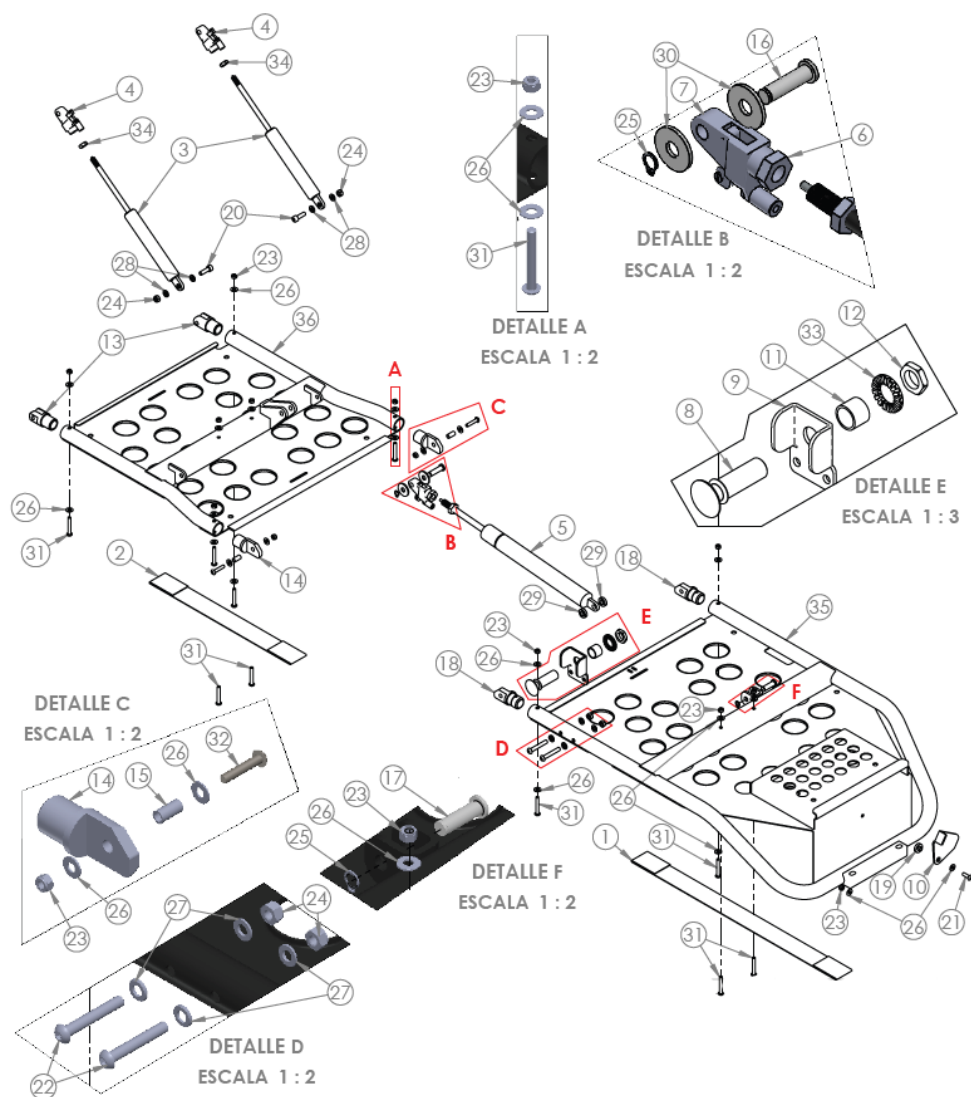
N.º	Nº DE PIEZA	Descripción	UDS
1	03-0817-001	CASQUILLO DISTANCIADOR CILINDRO BRAVA	2
2	05-0211-001	CASQUILLO PLÁSTICO EJE PATAS BRAVA	2
3	05-0212-001	CASQUILLO LARGO INF. EJE PATAS BRAVA	1
4	05-1004-001	CASQUILLO 30 x 14.5 x 23	2
5	05-1005-001	CASQUILLO 24 x 16.5 x 19	2
6	05-1006-001	PEDAL VERDE SUPERBRAVA	1
7	05-1007-001	EMBELLECEDOR FRENO DCH SUPERBRAVA	1
8	05-1008-001	EMBELLECEDOR FRENO IZQ SUPERBRAVA	1
9	09-0070-001	RODAMIENTO - 6001Z	2
10	09-0401-001	MUELLE PEDAL BLOQUEO RUEDA DELANTERA SUPERBRAVA	1
11	12-0251-002	EJE GIRO BRAVA	1
12	12-0252-001	EJE PATA CILINDRO HIDRAULICO BRAVA	1
13	12-1003-002	PASADOR D5 x 50 PEDAL BLOQUEO RUEDAS	1
14	12-1815-001	EJE DELANTERO PATAS EXT. SUPERBRAVA	1
15	12-1816-001	ARANDELA AVELLANADA SUPERBRAVA	2
16	12-1817-001	EJE DELANTERO SUPERBRAVA	1
17	13-0125-001	ULS ISO-7381 M10x20 10.9 CINCADO	2
18	13-0199-001	ANILLO ELASTICO EXT. d 25	2
19	13-0206-001	ARANDELA DIN 125-A ø5 CINCADA	4
20	13-0213-001	ANILLO ELASTICO EXT. ø5 CINCADO	1
21	13-0302-001	DIN 7380 ULS M5x25 -10.9 CINCADO	2
22	13-0356-001	TUERCA INOX. AUTOBLOCANTE M5	2
23	13-0365-001	ARANDELA d8 INOX	2
24	13-0404-001	AVELLANADO ALLEN DIN 7991 - M8 x 30 INOX.	2
25	14-0162-001	ETIQUETA REFLECT. INFERIOR BANCADA Y TIJERAS	8
26	14-0169-001	ETIQUETA REFLECT. ZONA TIJERAS BRAVA	2
27	14-0171-001	ETIQUETA REFLECT. MACIZO CENTRO TIJERAS BRAVA	2
28	14-0359-001	ETIQUETA SUPERBRAVA 420 x 80	2
29	50-0881-001	PATA EXT. DCH. SUPERBRAVA	1
30	50-0885-001	PATAS INTERIORES SUPERBRAVA	1
31	50-0900-001	PATA EXT. IZQ. BRAVA	1
32	52-0895-002	BASE RUEDAS SUPERBRAVA	1
33	52-1069-001	CONJUNTO MOTOR POWER PACKER	1



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Nº	Nº DE PIEZA	Descripción	UDS
1	04-0003-001	VELCRO HEMBRA 600 x 38 mm PERNAZAL BRAVA	1
2	04-0004-001	VELCRO HEMBRA 455 x 38 mm PERNAZAL BRAVA	1
3	09-0091-001	AMOR.PIER.WO/D2/P/KO/1/45/160/150	2
4	09-0092-001	CABEZA DISPARO AMOR. LA-ST M8X1	2
5	09-0100-001	AMOR.PIERNAZAL FUEGO 006377 200N	1
6	09-0105-001	TUERCA PALANCA 1041BN AMORT. 012491	1
7	09-0107-001	CABEZA DISPARO AMOR. LA-ST M10X1	1
8	09-0241-001	PULSADOR ROJO AMORT. BRAVA Long. FUNDA 340mm	1
9	11-0594-004	SOPORTE PULSADOR PIERNAZAL DOBLE BRAVA	1
10	11-1815-001	SUJETA-MANUALES SUPERBRAVA	1
11	12-0176-001	CLAMP BUSHING FOR PUSH-BUTTON FUEGO	1
12	12-0185-001	TUERCA ESPECIAL AMORTIGUADOR M16X1	1
13	12-0254-001	MACIZO HEMBRA BISAGRA CABEZAL BRAVA	2
14	12-0256-001	TERMINAL ALUMINIO TUBO ARTICULADO BRAVA	2
15	12-0316-001	CASQUILLO ARTICULACION PIERNAZAL BRAVA	2
16	12-0372-001	PASADOR EJE CILINDRO PIERNAZAL BRAVA	1
17	12-0373-002	PASADOR EJE CILINDRO PIERNAZAL BRAVA	1
18	12-0385-001	TERMINAL ALUMINIO TUBO ARTICULADO BRAVA	2

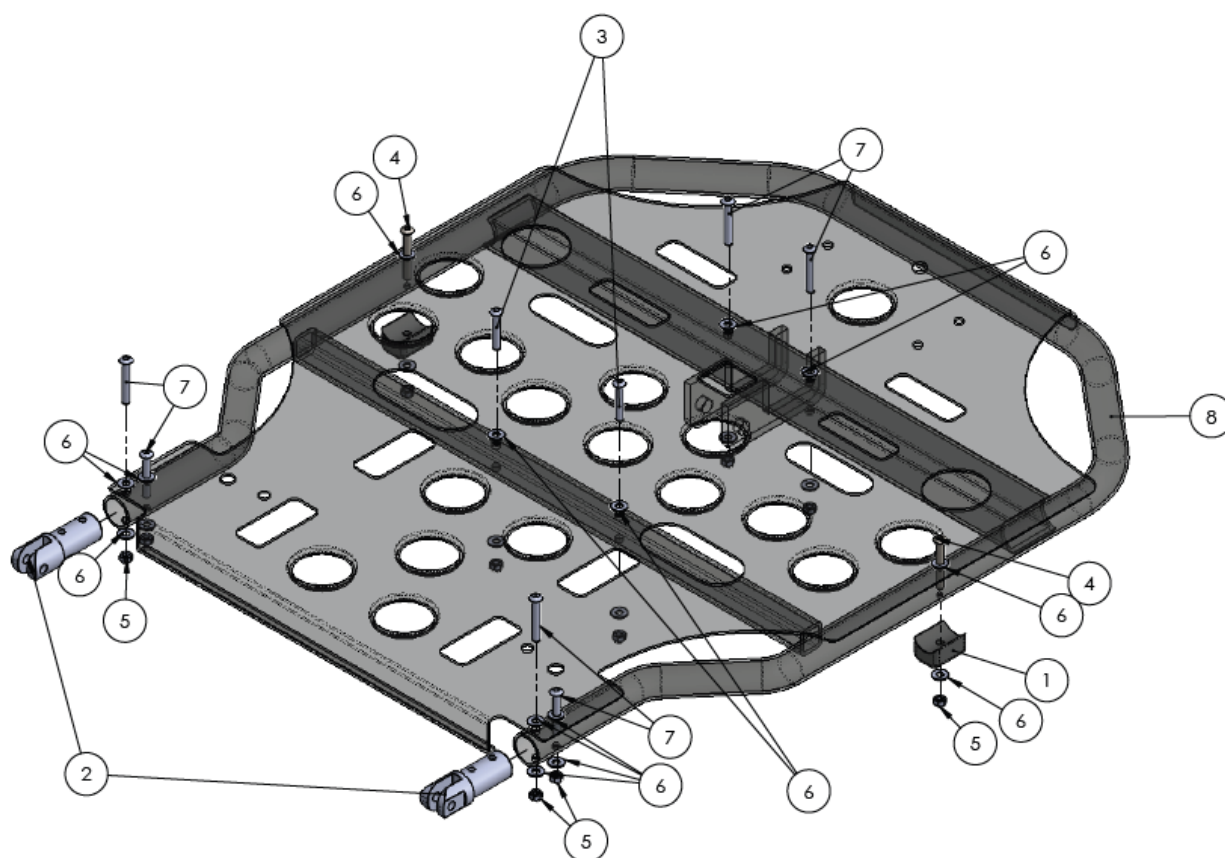
19	12-1825-001	EJE SUJETA-MANUALES SUPERBRAVA	1
20	13-0024-001	ALLEN DIN 912 M6x20 - 8.8 ZINC	2
21	13-0097-001	ULS ISO-7381 M5x16 CINCADO	1
22	13-0107-001	ULS ISO-7381 M6x40 CINCADO	2
23	13-0176-001	TUERCA AUTOBLOCANTE M5	13
24	13-0177-001	TUERCA AUTOBLOCANTE M6	4
25	13-0196-001	ANILLO ELASTICO d 8	2
26	13-0206-001	ARANDELA DIN 125-A ø5 CINCADA	26
27	13-0207-001	ARANDELA d6 CINCADA	4
28	13-0220-001	ARANDELA NYLON d.6	4
29	13-0221-001	ARANDELA NYLON d.8 GORDA	2
30	13-0222-001	ARANDELA ANCHA NYLON d8	2
31	13-0240-001	DIN 7380 ULS M5X35 -10.9 CINCADO	10
32	13-0302-001	DIN 7380 ULS M5X25 -10.9 CINCADO	2
33	13-0483-001	ARANDELA d 16 CINCADA	1
34	13-0499-001	TUERCA DIN 936 M8 x 1.0 (PASO FINO) CINCADA	2
35	50-0876-002	CONJ. SOLD. LARGO PIERNAZAL SUPERBRAVA	1
36	50-0877-002	CONJ. SOLD. SUPERIOR PIERNAZAL SUPERBRAVA	1



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N.º DE ELEMENTO	Nº DE PIEZA	Descripción	CANTIDAD
1	05-1013-001	TOPE CABEZAL SUPERBRAVA	2
2	12-1824-001	MACIZO HEMBRA BISAGRA CABEZAL SUPERBRAVA	2
3	13-0099-001	ULS ISO-7381 M5x30 CINCADO	2
4	13-0100-001	ULS ISO-7381 M5x40 CINCADO	2
5	13-0176-001	TUERCA AUTOBLOCANTE M5	10
6	13-0206-001	ARANDELA DIN 125-A Ø5 CINCADA	20
7	13-0240-001	DIN 7380 ULS M5x35 -10.9 CINCADO	6
8	50-0902-002	CONJUNTO SOLDADO CABEZAL SUPERBRAVA	1

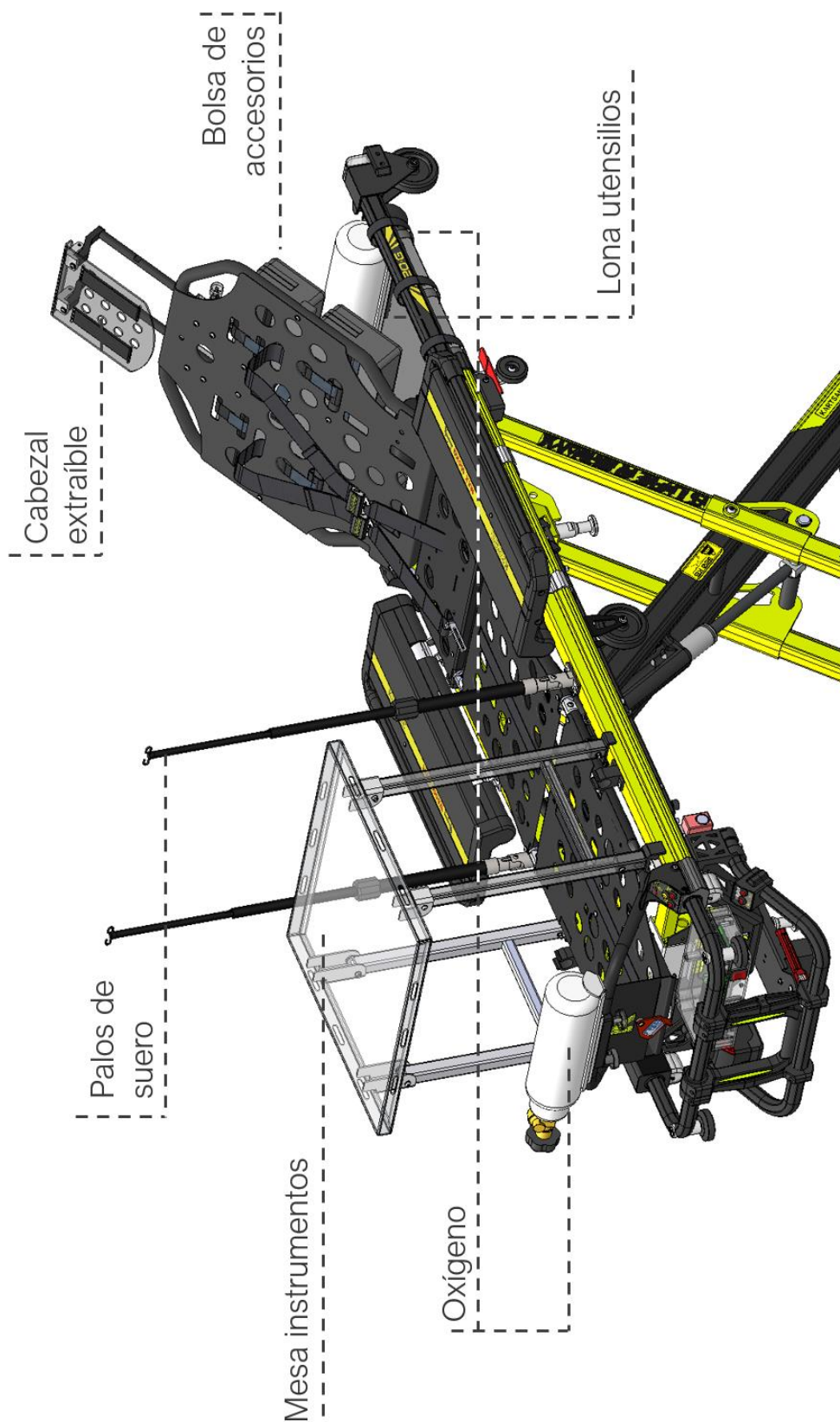


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7. ACCESORIES



8. ERRORS

In the event of an error, the stretcher becomes inactive:

- Folded stretcher indicator flashing.
- Blinking LEDs
- The error code is indicated by a combination of the four yellow error LEDs.

To exit the Error status:

- Red UP button, red DOWN button and yellow Light button pressed simultaneously for 2sec.
- To switch off the LED lights during an error, press the yellow button.

8.1. Error codes

ERROR NAME	COD	LEDS			
		A	A	A	A
Battery charging error due to NOT exceeding minimum voltage.	2			ON	
Charging current error Batteries (HIGH)	3			ON	ON
Battery charging error due to lack of Ambulance Voltage	4		ON		
LOW or VERY LOW Batteries	5		ON		ON
Ambulance Switch Error	6		ON	ON	
Charger error due to missing battery, or stretcher switched off	7		ON	ON	ON
Load error due to exceeding Duty max in PWM	8	ON			
Error in upstream movement due to excessive time	9	ON			ON
Error in downstream movement due to excessive time	10	ON		ON	
Motor error due to exceeding maximum current	11	ON		ON	ON
Motor error due to low voltage	12	ON	ON		

8.2. Troubleshooting

If the stretcher is raised and lowered continuously for 2 minutes, it should be stopped for 10 seconds to allow the system to recover and continue operating without problems.

It is advisable to remove the battery if the stretcher is not going to be used for long periods of time.



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TROUBLESHOOTING			
CODE	ERROR DESCRIPTION	CAUSE OF ERROR	SOLUTION
2	Battery voltage is below 3V. Battery is disconnected or damaged.	Battery disconnected	Connect the batteries correctly to the docking station.
			Check that the battery cables are properly connected to the electronic board.
		Damaged battery	Replace with new battery
3	La Tensión de la batería es superior a 34V	An overload has occurred in the battery recharging process. (Use ONLY the charger supplied by KARTSANA or the stretcher to recharge the batteries).	Leave the battery at rest, preferably in a cold place, for 3 or 4 hours (or until it does not report error 3 when connected to the stretcher) to allow it to self-discharge. Check that the batteries have not suffered internal damage by discharging them by moving the stretcher up and down. Allow at least 15 cycles before discharging.
		Damaged battery	Replace with new battery
4	The stretcher does not receive any voltage from the ambulance.	The stretcher-rail socket does not connect correctly.	Check that the two contacts of the stretcher plug and the rail are touching each other and that there is no foreign body between them.
		Ambulance battery is discharged or damaged.	Charge battery or replace with a new one respectively.
		Incorrectly connected power cables either on the ambulance, rail or stretcher.	Check cable connections. Recommended order of testing: ambulance, rail and stretcher.
		One of the copper contacts of the couch plug has not come completely out of its housing in the plastic part.	Check that the plug contacts move smoothly in and out of the socket.
5	Battery voltage is less than 18V.	Discharged battery	Charging with external charger
6	The stretcher is receiving voltage through the plug, but the copper contacts have not been pressed.	The stretcher has not fully entered the rail.	Position it correctly inside the rail.
7	Battery not detected	Disconnected batteries	Push them fully into the clamping plate until they click into place.
		Damaged battery	Replace with new battery
		Very low battery	Charging with external charger
8	Failure in reloading process	Contact the technical service	Contact the technical service
9	More than 22 seconds have elapsed in an upward motion.	Discharged battery	Charge battery
		Hydraulic system failure	Contact the technical service
		The mechanism does not move freely	Check mechanisms for excessive friction or interference between parts.
10	More than 22 seconds have elapsed in a downward movement.	Discharged battery	Charge battery
		Hydraulic system failure	Check for possible oil leaks. Contact technical service

		The mechanism does not move freely	Check mechanisms for excessive friction or interference between parts.
11	Current greater than 48 A	Overloaded stretcher	Do not load the stretcher with more than 320Kg.
		Discharged battery	Charge battery
		The mechanism does not move freely	Check mechanisms for excessive friction or interference between parts.
12	Voltage below 15V	Overloaded stretcher	Do not load the stretcher with more than 320Kg.
		Discharged battery	Charge battery
		The mechanism does not move freely	Check mechanisms for excessive friction or interference between parts.

8.3. Motor protections

The system switches off in the following situations:

- For a time-out of 22 sec.
- For current greater than 60A for more than 0.5 sec.
- Motor battery voltage less than 18 Volts.

8.4. Ambulance entry

If there is ambulance entry, 3 cases may occur:

- 1) Stretcher switched on without ambulance voltage: the LEDs will be off waiting for vehicle voltage. After 10 seconds the stretcher LEDs will flash. They will stop flashing once the stretcher is charged by the ambulance.
- 2) Stretcher switched off and ambulance voltage: the LEDs will be off waiting for vehicle voltage. Therefore, before bringing the stretcher into the ambulance, check that the battery switch is pressed.
- 3) Stretcher switched on and ambulance voltage. The batteries start to charge (see table). At the end, the upper error LED lights up and waits 1h until a new recharge sequence.

8.5. Battery charge

On entering the ambulance, the battery is tested for 10 seconds to check that the battery voltage is between 3 and 34 volts. In addition, 100 mA of current is applied to check that the battery is connected. The battery charging process consists of 2 phases. For the first phase, one of the following conditions must be met:

- Previous charge was incomplete.
- Battery is discharged.
- Battery voltage is less than 25.6 volts.

For the second phase, it is only required that no errors have occurred.

PHASE 1: Consists of 3 consecutive steps (*must be completed to give the battery as charged*):

1) **START OF CHARGE** → Charge at a constant current of 0.15C (750mA) until one of the following conditions is met:

- Voltage greater than 24 volts
- Maximum time of 20 minutes
- Ambulance output
- Error by:
 - Duty Max
 - Voltage greater than 30.4 volts
 - Does not exceed the minimum voltage of 17.6 volts within 30 min.

2) **FAST CHARGING** → Charge at a constant current of 0.36C (1.8A) until one of the following conditions is met:

- The voltage of 28.8 Volts is reached.
- Maximum time 120min
- Departure of the ambulance
- Error by:
 - Duty Max
 - Voltage greater than 30,4 volts

3) **FULL CHARGED**. Charge at a constant voltage of 28.8 volts until one of the following conditions is met:

- Maximum time 60 minutes
- Departure of the ambulance
- Error by:
 - Duty Max
 - Intensity greater than 1,2C (6,0A)
 - Voltage greater than 30,4 volts

PHASE 2: Consists of 1 step (*maintenance charge which does not need to be completed*):

1) **MAINTENANCE CHARGE**: load with a constant current of 0,016C (80mA) until one of the following conditions is met:

- Maximum time 10 minutes
- The saturation voltage of 29.04 Volts is reached.
- Departure of the ambulance
- Error by:
 - Duty Max
 - Voltage greater of 30,4 volts



If the battery falls below 20 volts, the battery must be charged by the battery charger and not by ambulance.



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