IMPORTANT

Keep this service manual to hand during the machine/ equipment's working life

SPRAYING BOOM
BDL PLUS GVAR 24÷33

user manual **ENGLISH**

(Translation of original instructions)

Serial number	Edition **1**
	11-2006

INDEX

BARGAM

via della Cooperazione, 20 - 40026 **IMOLA (BO)** - ITALY
tel.+390542648511 - fax +390542640539 -
www.bargam.com - e-mail: salesimola@bargam.com

GENERAL AND SAFETY INFORMATION

user manual

Serial number

Edition 1
01 - 2007

TABLE OF CONTENTS

IDM 3680102O1SINGOL

PURPOSE OF THE MANUAL

The current manual is part of the equipment and has been supplied by the manufacturer as an essential guide to those who will be involved with the machinery during its working life.

In addition to adopting good use techniques, the recipients must carefully read and strictly apply this information. This information has been produced by the manufacturer in his own original language (Italian) and can be translated into other languages to satisfy legal and/or commercial requirements.

Time dedicated to reading this information will avoid personal safety, health risks and economic damages.

In the event that supplementary information to the actual machine set up is found in this manual it will not interfere with reading.

Please keep it in a safe, easily accessible place so that it will be handy for reference when required.

Some of the pictures and pieces of information in this manual may not correspond perfectly to what you have. This does not however hinder operation.

As the manufacturer is carrying out a policy of continuous product development and updating, he reserves the right to alter this document without the obligation of prior notice.

To better stress the importance of some passages or to indicate important specifics, symbols, whose meanings are described as follows, have been adopted.

Danger - Warning

Indicates critically dangerous situations that, if neglected, can result in serious personal safety and health hazards.

Caution - Warning

Indicates that suitable actions must be employed in order to avoid personal safety, health hazards and economic damages.

Important

Indicates particularly important technical information that should not be neglected.

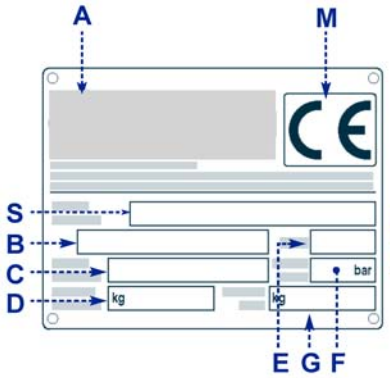
EQUIPMENT AND MANUFACTURER IDENTIFICATION

The ID plate shown is attached to the equipment and/or its components.

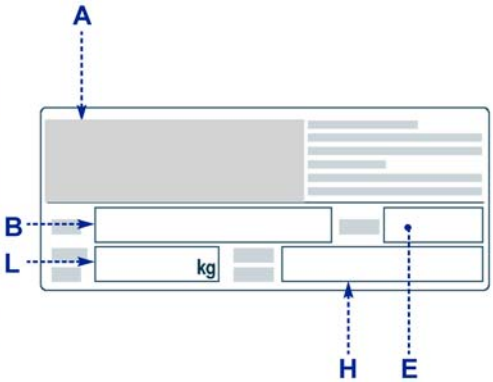
It details references and all important operational safety requirements.

A) Manufacturer identification.
B) Model.
C) Identification number
D) Total weight of the maximum configuration
E) Year of manufacture.
F) Water system maximum pressure (bar).
G) Empty weight in the maximum configuration (Kg).
H) Manufacturing order number
L) Total weight
M) EC conformity mark.
S) Designation

Trailer and unit plates



Component plate



SERVICE PROCEDURE

Please refer to the Manufacturer's service centres for any need.

Important

For every technical service request regarding the machine, please indicate the data found on the identification plate, the approximate hours of use and the type of fault detected.

DOCUMENTATION ENCLOSED

The following documentation is included with this manual.

- Wiring diagrams.
- Hydraulic system diagrams.
- Oleodynamic system diagrams.
- Documentation on commercial components (pumps, gears, etc.).
- Warranty.
- Declaration of conformity.
- Nozzle table.

SAFETY REGULATIONS

General regulations

This equipment has been designed and manufactured with all due care and attention to health and safety issues. In addition to observing the specific laws in force, the manufacturer has adopted all "exemplary construction technique principles". The purpose of this information is to advise the operators to use extreme caution to avoid risks. However, discretion is invaluable. Safety is also the responsibility of those who use the equipment.

Carefully read the instructions published in the supplied manual and found directly on the machine while strictly observing those concerning safety. Time dedicated to reading will prevent unfortunate accidents; remembering what one was supposed to do when the damage is already done is always too late.

Pay attention to the meanings of the symbols on the applied stickers; their shape and colour are significant to safety ends. Keep them legible and observe the shown information.

Never tamper, dodge, eliminate or by-pass the safety devices installed on the machine. Neglect to respect this requirement may cause serious risk to personal safety and health.

Any maintenance or other work on the equipment must always be carried out by trained, experienced technicians with specific and certified competence in this field. Neglect to observe these requirements may prove hazardous to personal safety and health.

Only wear and use the protective clothing and/or devices indicated in the instructions provided by the manufacturer or work safety laws in force when operating the machine.

Some phases may require the help of one or more assistants. In these cases such persons should be suitably trained and informed on the type of activity being performed, so as not to cause damage to the health and safety of persons.

Handling and loading specifications

Handling and loading must be carried out as per the instructions on the packaging, on the equipment itself and in the manufacturer's handbook.

Handling, loading and unloading must be carried out by trained personnel with specific competence in this field. During manoeuvres while using the equipment the driver must be familiar with the procedures necessary to carry out these operations safely.

The equipment may only be loaded onto and transported by hoisting devices having sufficient carrying capacity, anchored at the points specified by the manufacturer. Personnel who are authorised to perform these operations must possess specific skills and experience, to safeguard themselves and others involved.

Before transportation, make sure that the equipment and all its components are safely anchored to the hoisting device and that its total bulk (outline) does not exceed specifications. Place the required signals if necessary.

The equipment may have to be moved from place to place frequently. To avoid sudden, uncontrolled

IDM 3680102015INGOL

movement make sure that all parts which could cause this have been safely locked before transportation.

Approved equipment may be driven on public roads by a licensed driver. Make sure that all the parts which could cause sudden, uncontrolled movement have been safely secured before transportation, and check that the total bulk (outline) does not exceed specifications. Place the required signals if necessary.

Operation and use regulations

The operator must be familiar with the use of the equipment and be suitably qualified and experienced for this type of task.

Even after having been adequately trained on machine use, perform trial manoeuvres to familiarise the operator with machine controls and functions, start up and arrest in particular, on first use if necessary.

The equipment may only be used for the purposes specified by the manufacturer. Improper use may cause health and safety risks to persons and economic damage.

The equipment has been designed and produced to fulfil all the operations specified by the manufacturer. Tampering with any device to achieve services other than those provided may be hazardous to personal safety and health and provoke economic loss.

Do not use this equipment unless all the safety devices have been installed and are working perfectly. Neglect to observe this requirement may be hazardous to personal safety and health.

While preparing and using chemical substances all necessary safety precautions should be taken to avoid health and safety risks to personnel and environmental damage.

All residual chemical substances must be disposed of properly according to local laws and regulations. Avoid polluting the environment.

Equipment must always be parked in an appropriate area, where it does not block or endanger traffic. Turn the engine off and take adequate precautions to prevent unauthorised personnel from accessing the driving seat.

Prevent unauthorised personnel from accessing the area in which the equipment is being used. If necessary cease operations immediately and have the area at risk cleared.

Adjustment and maintenance regulations

Keep the machine in maximum working conditions by performing the programmed maintenance operations advised by the manufacturer. Good maintenance achieves the best machine performance, longer machine life and constant observance of the safety regulations.

Activate all of the security devices provided and evaluate the necessity to adequately inform personnel operating in the near vicinity before performing maintenance or adjustments on the machine. In particular, confine the neighbouring areas to impede access to the devices that could, if activated, produce unexpected danger conditions provoking hazards to personal safety and health.

All maintenance procedures that require precise technical competence or specific skills must be exclusively performed by qualified personnel with acquired certified experience in the specific field.

To perform maintenance in areas that are not easily accessible or dangerous, establish suitable safety conditions for operators and others according to the laws in force pertinent to work safety conditions.

Replace deteriorated parts with originals. Use oils and lubricants indicated in the manual. All these measures can ensure the preservation of the machine and foreseen safety level.

Do not litter the environment with pollutant material; perform disposal according to the pertinent laws in force.

IDM 3680102015INGOL

SAFETY AND INFORMATION MARKINGS

Some of the following signals are placed on the equipment, the correct position is shown in the paragraph "signals position". Their meaning is explained below.

Danger: read the manual carefully before any intervention.

Danger: turn the engine off and remove the key from the ignition before any operation.

Danger: do not place any part of your body in the tank.

Danger: do not exceed the pressure shown.

Danger: before inserting the cardan shaft check the direction of rotation and make sure the max. rpm doesn't exceed the indicated value.

Danger of electric shock: beware of the high voltage electric lines while unfolding and folding the boom.

Danger to people walking through: make sure there are no unauthorised people in the machine's operating range.

Caution - risk of corrosion: suitable gloves must be worn when handling chemical products.

Caution - risk of falling: do not climb, only use suitable means to access the higher parts of the machine.

Danger: fluid escaping under pressure: do not touch nor approach with any part of your body to avoid abrasions.

Danger of amputation for upper limbs: do not put your hands in mechanisms with moving parts.

Danger: low temperature: disconnect the pressure gauge before winter storage.

Danger of trapping and dragging: do not put your upper limbs in mechanisms with moving parts.

Caution - danger to body: do not go near the moving components.

Danger of crushing upper limbs: do not access this area while parts are moving.

Danger of crushing upper limbs: be careful during tractor height adjuster hitching.

Danger: Hot surfaces: be careful of hot surfaces.

Danger of impact: be careful of protruding parts.

IDM 3680102015INGOL

Prohibited use: do not spray water under pressure to avoid damaging parts.

No access to unauthorised people: do not stand in or walk through the machine's operating range.

Grip points: indicates the manual grip points.

Protective gear must be worn: protective earmuffs must be worn while operating the machine.

Mandatory use of fresh water: wash your hands after each contact with the chemicals used.

Mask must be worn: to protect the respiratory tract when handling and using chemicals.

Boots must be worn: to protect feet and legs when handling and using chemicals.

Gloves must be worn: to protect hands from abrasions.

Protective clothing must be worn: to protect the body when handling and using chemicals.

Mandatory reading of the User manual. The person in charge of the equipment operation shall read the manual in order to know the position and the function of controls as well as to familiarize with all information contained. Always keep the document within reach.

Clean water must be used: to fill up the clean water tank.

Height adjustment signal: this indicates the height adjustment points when using a fork-lifting device.

Height adjustment signal: this indicates the height adjustment points when using a lifting hook.

IDM 3680102015INGOL

Spraying boom
BDL PLUS GVAR 24-33

user manual

Serial number

Edition 1
11 - 2006

INDEX

IMPORTANT SAFETY NOTE

The information published in this booklet regards the people from risks. Remember that pointed out with relevant symbols in order to machine. It is however safeguard operational aspects of the operator unit necessary that you carefully read the Safety is also in installed on the the hands of all the operators who interact general with the machine. safety regulations published in Booklet 1 and those

332.068

332.068

TECHNICAL INFORMATION

EQUIPMENT GENERAL DESCRIPTION

The spraying boom, from now on called equipment, was designed and built to be installed on a machine for spraying chemical products on tilled land and/or products.

It is to be put on the height adjustment device and on the self-levelling device so that it remains perfectly parallel with the ground, even in the event the ground is uneven.

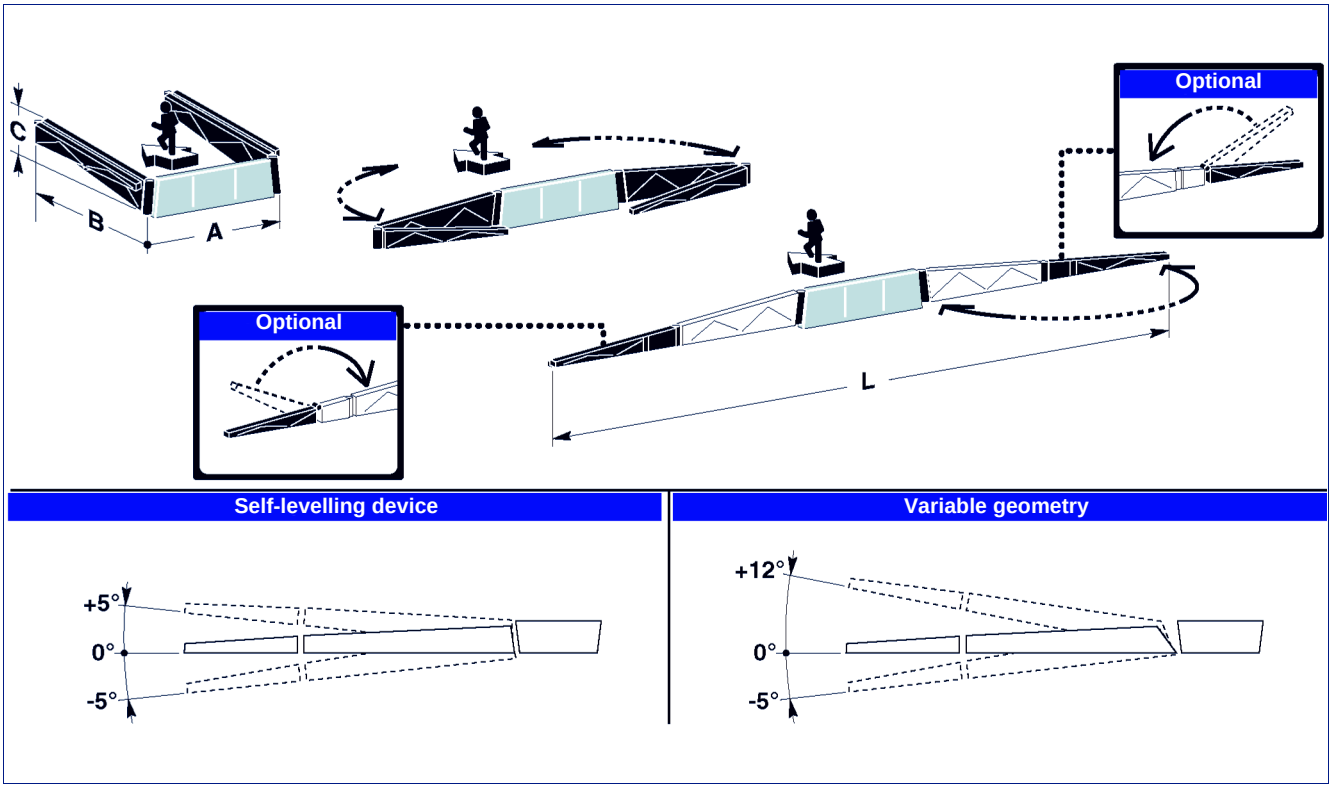
The equipment is divided into folding boom sections in order to adapt it to the spraying width and so as to reduce the space occupied during transfer.

TECHNICAL SPECIFICATIONS

Width (m) W	*Size*			*(*) Weight (kg)*	*Qty. Jets (500 mm)*
	A mm	*B mm*	*C mm*		
24	2530	5750	2350	874	48
27	2530	6690	2680	1010	54
28	2530	6690	2680	1014	56
30	2545	7900	2200	1300	60
32	2545	7900	2200	1332	64
33	2545	7900	2200	1340	66

(*) Boom with self-levelling device in its maximum configuration

Technical specification diagram



FITTINGS ON DEMAND

Arm alignment display kit: it allows the driver to check arm position directly from the driver's seat. For any other information see the relevant manual.

SAFETY DEVICES

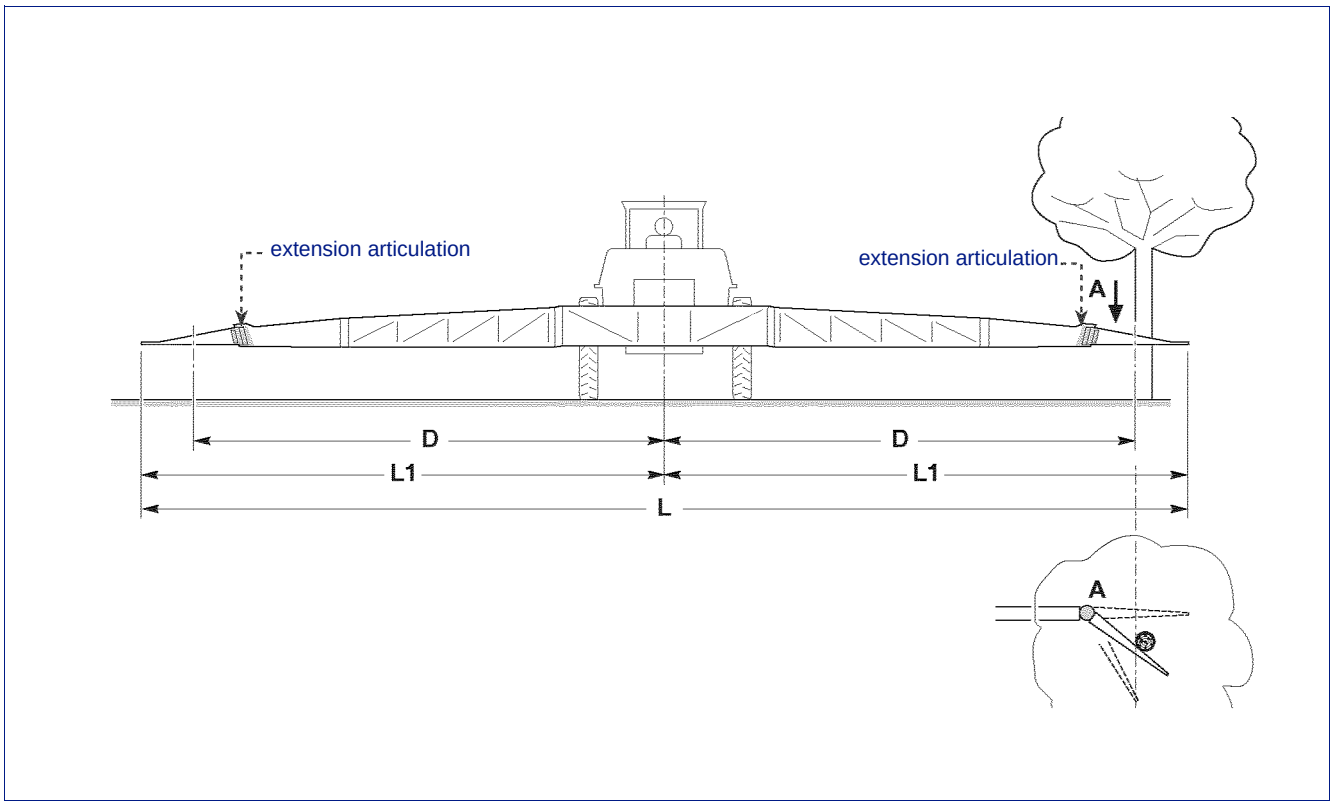
Extension articulation: to allow the end of the extension to turn so as to get past obstacles. In order to get past the obstacle without damaging the equipment, it is necessary to keep a distance higher than the value (**D**) given in the table.

Stop valve: it allows to stop movements of the various boom sections during use and/or transport of the equipment and to prevent accidental movements in the event of an hydraulic hose failure.

Safety distance table

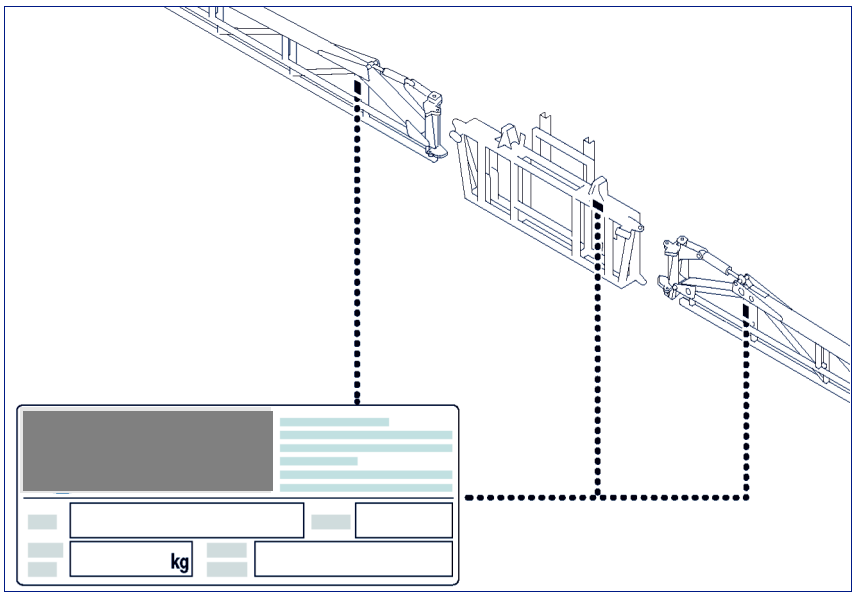
Width W	*Width W1*	*Safety distance D*
24	12	10,8
27	13,5	12,2
28	14	12,6
30	15	13,5
32	16	14,4
33	16,5	14,9

Safety distance diagram



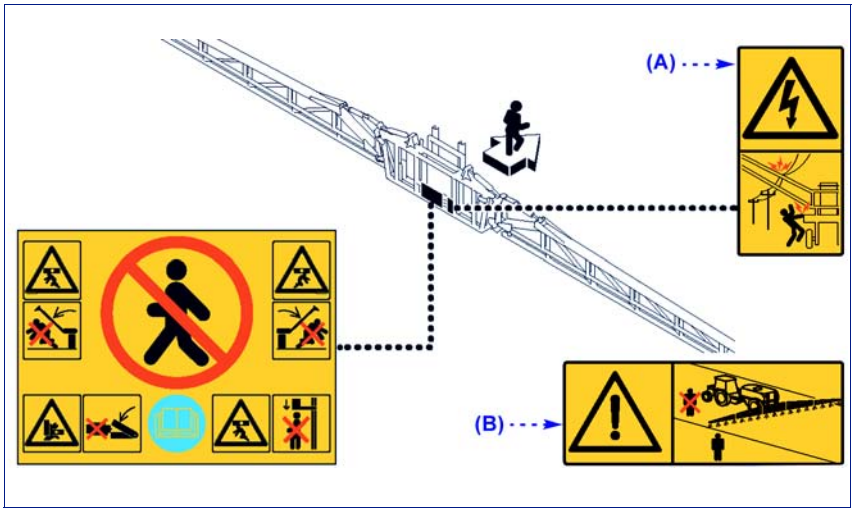
IDENTIFICATION PLATE POSITION

The figure points out the positions of the identification plates of the components.



POSITION OF SIGNALS

The figure shows the location of all safety plates, while their meaning is explained in booklet 1. The plates **(A and B)** supplied with the manual have to be placed inside the tractor cab, in a visible position.



INFORMATION ABOUT HANDLING AND INSTALLATION

HANDLING INSTRUCTIONS

Comply with the information provided by the manufacturer, found on the equipment and in the instruction manual, when carrying out handling and loading operations.

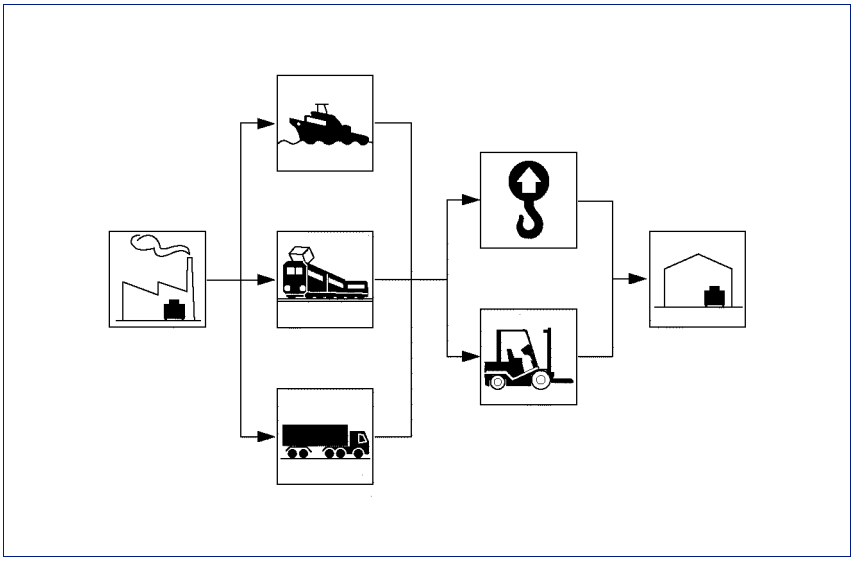
PACKING AND UNPACKING

- The equipment is to be placed on a loading platform, protected and adequately secured. To make transport easier, it can be shipped with several components disassembled.
- When unpacking, check that all the components are intact and in the exact quantities.
- The packing material is to be disposed of properly, in observance of the laws in force.

332.068

LOADING AND TRANSPORTATION

Depending on the destination, loading and transport can be carried out with different means. The diagram shows the most commonly used solutions. Secure the means properly during transportation in order to prevent un- timely shifting.

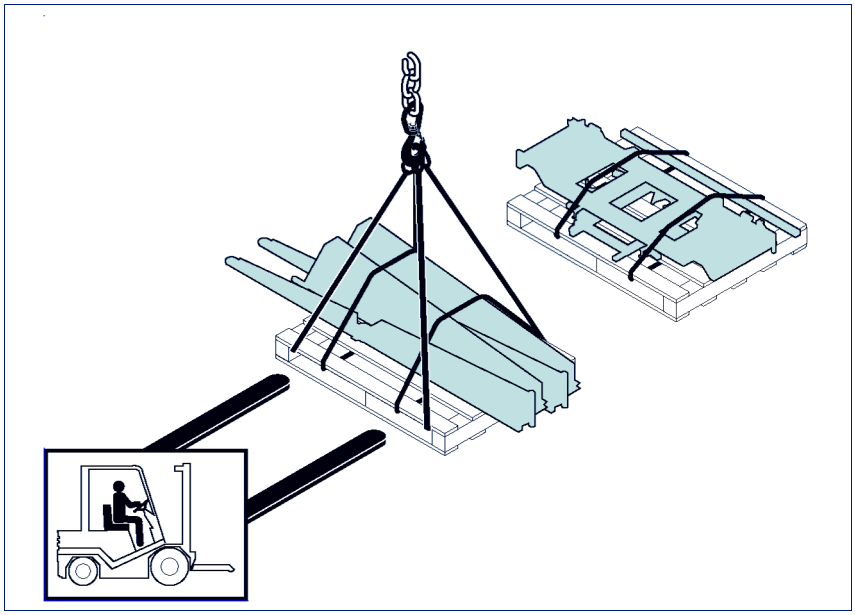


HANDLING AND LIFTING

The equipment can be handled with a lifting device with forks or hooks having a sufficient capacity.
Position the lifting device as shown in the figure.
Avoid sudden manoeuvres.

Danger - Warning

Lifting and handling operations must be carried out by using appropriate means and by skilled staff specialized in this kind of manoeuvres.



INSTALLATION INSTRUCTIONS

Whoever performs the installation must prepare satisfactory safety conditions in advance in order to ensure their own safety and that of the operators involved.

INSTALLATION OF DISASSEMBLED PARTS

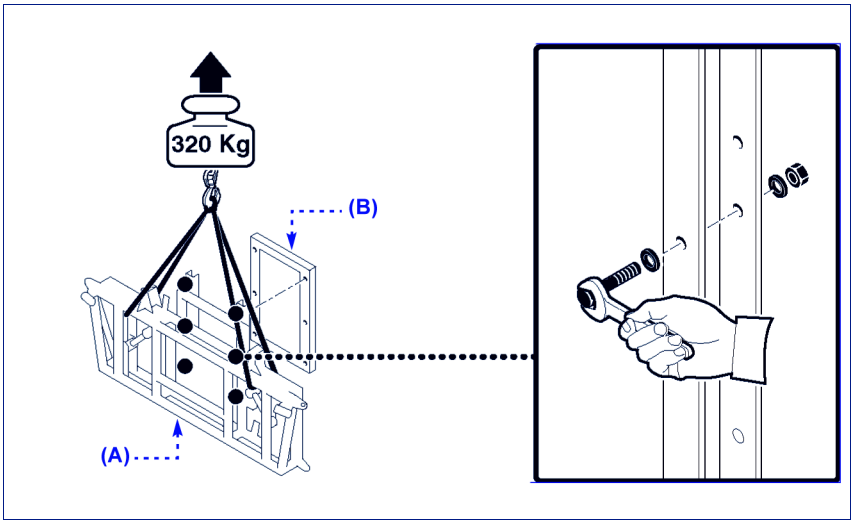
Follow the instructions given below so as to install and assemble the spraying boom properly.

332.068

INSTALLATION OF MIDDLE FRAME

Proceed in the way indicated.

1 - Lift the middle frame **(A)** of the boom already mounted on the self-levelling device (see “Self-levelling Device" booklet) and fasten it to the sliding frame of the lifting device **(B)** or to the shock absorber, if required.

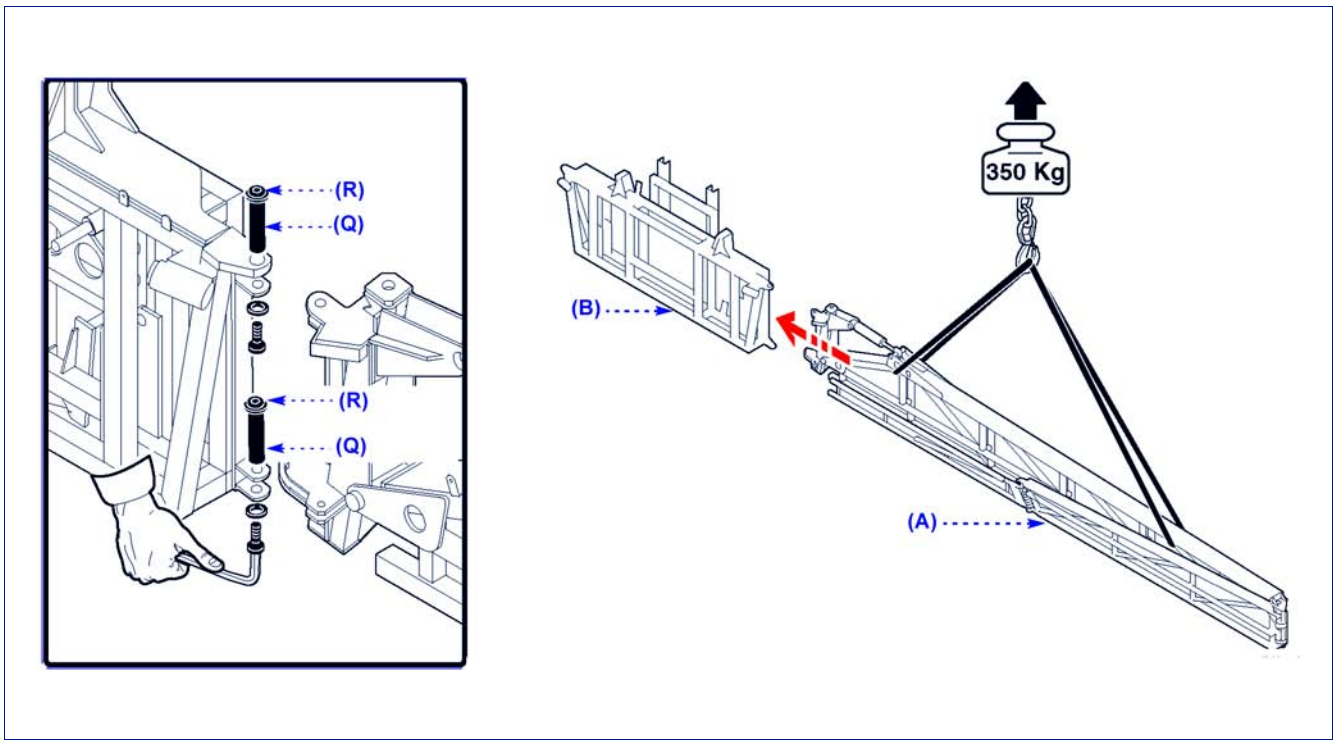


INSTALLATION OF ARM (24 TO 28 METRE BOOMS)

Caution - Warning

Screws (R) are tightened and locked using LOCTITE in order to prevent them from coming loose, which could cause the pins (Q) to accidentally become extracted. Therefore, these pins have to be adjusted as shown in the figure and have to be assembled and disassembled through the lower screws.

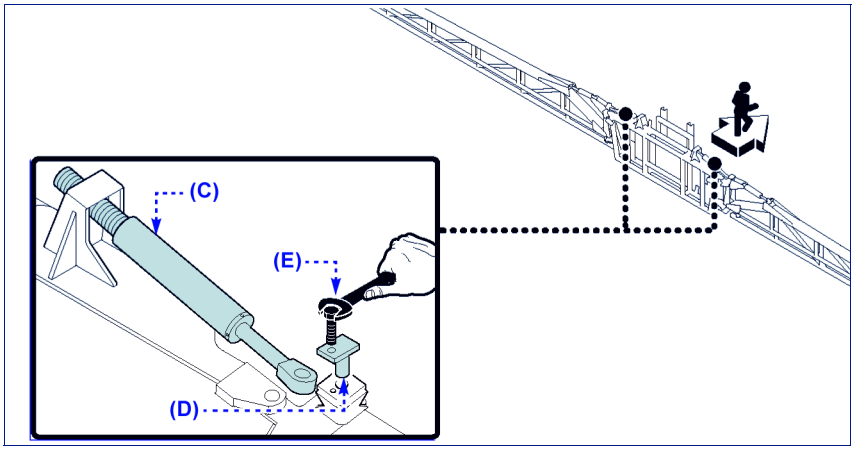
1 - Lift the arm **(A)** and fasten it to the middle frame **(B)** with the respective pins after having greased the parts and their seats.



332.068

2 - Extract the cylinder stem **(C)** and fasten it to the arm with the pin **(D)** and the locking screw **(E)**.

3 - Assemble the opposite arm in the same way.



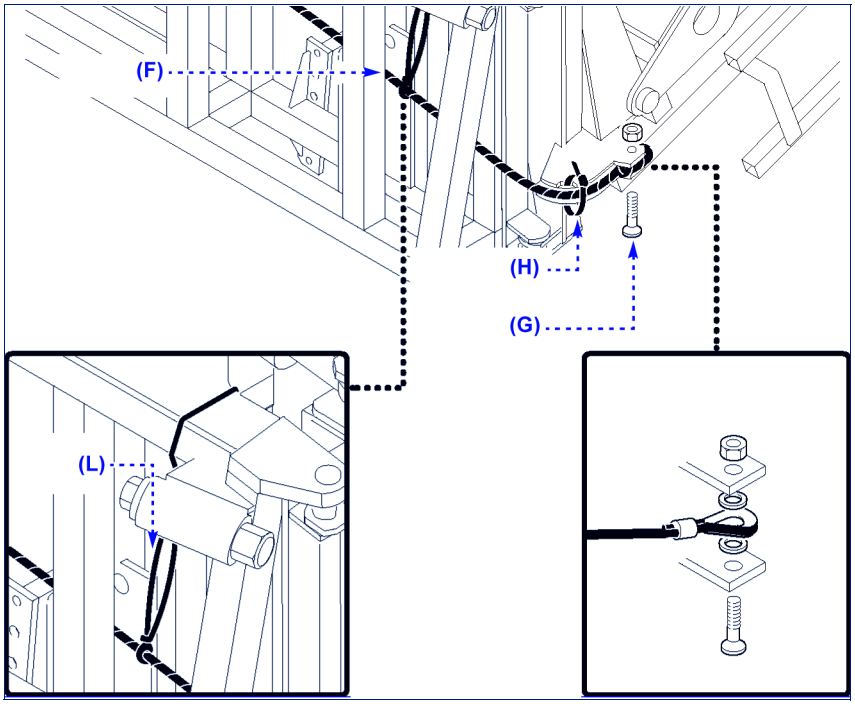
Only for versions without hydraulic locking

4 - Slightly unfold primary arms.

5 - Connect the ropes **(F)** to the arms with the relative screws, as shown in the figure.

Important

The screws (G) must always be mounted turned upwards, as shown in the figure.



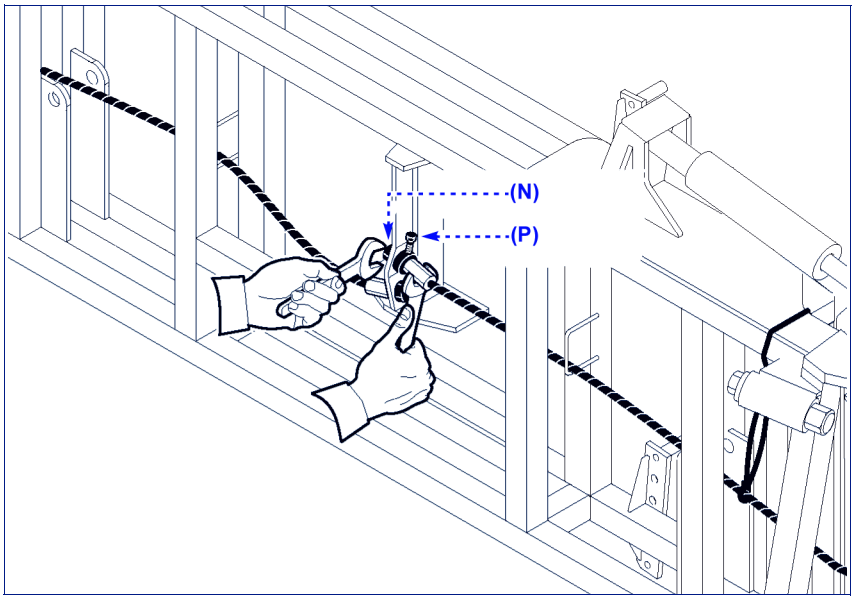
6 - Fold boom arms.

7 - Use nuts **(N)** to tighten ropes **(F)**.

8 - Bring stop **(P)** closer and lock it.

9 - -Lock the ropes **(F)** to the support using the clamp **(H)**.

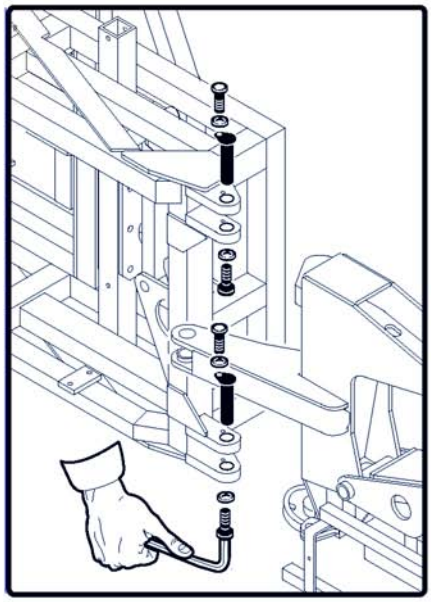
10- Use rubber bands **(L)** to support the ropes and prevent them from being damaged while the boom is moving (see figure).

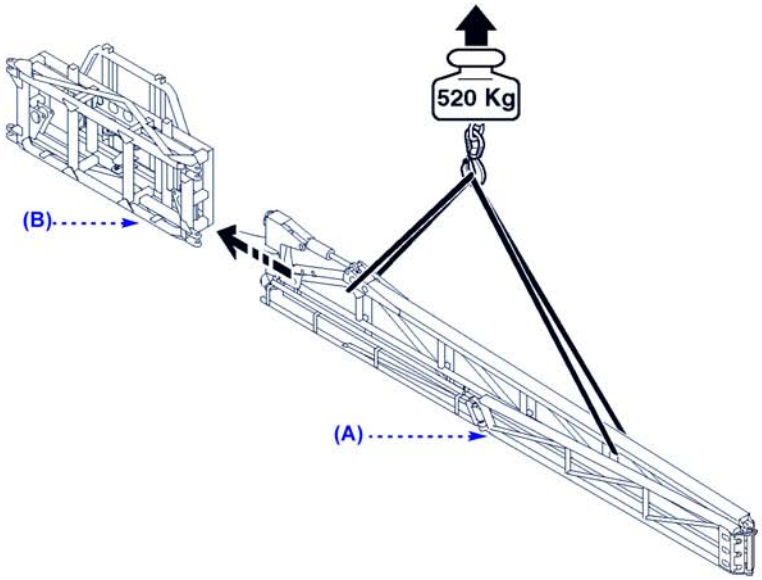


332.068

INSTALLATION OF ARM (30 TO 33 METRE BOOMS)

1 - Lift the arm **(A)** and fasten it to the middle frame **(B)** with the respective pins after having greased the parts and their seats.

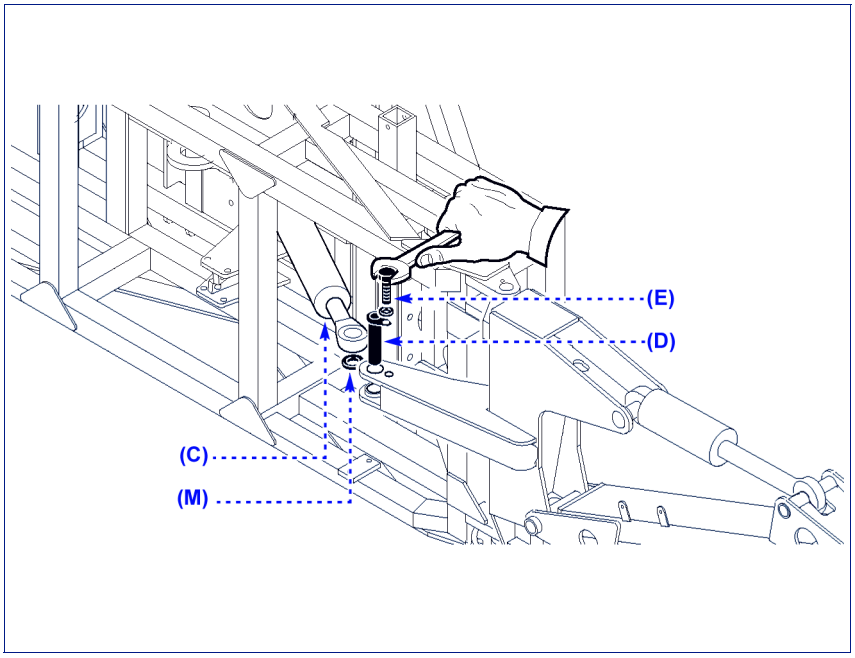




2 - Insert spacer **(M)**.

3 - Extract the cylinder stem **(C)** and fasten it to the arm with the pin **(E)** and the locking screw **(D)**.

4 - 4 -Assemble the opposite arm in the same way.



332.068

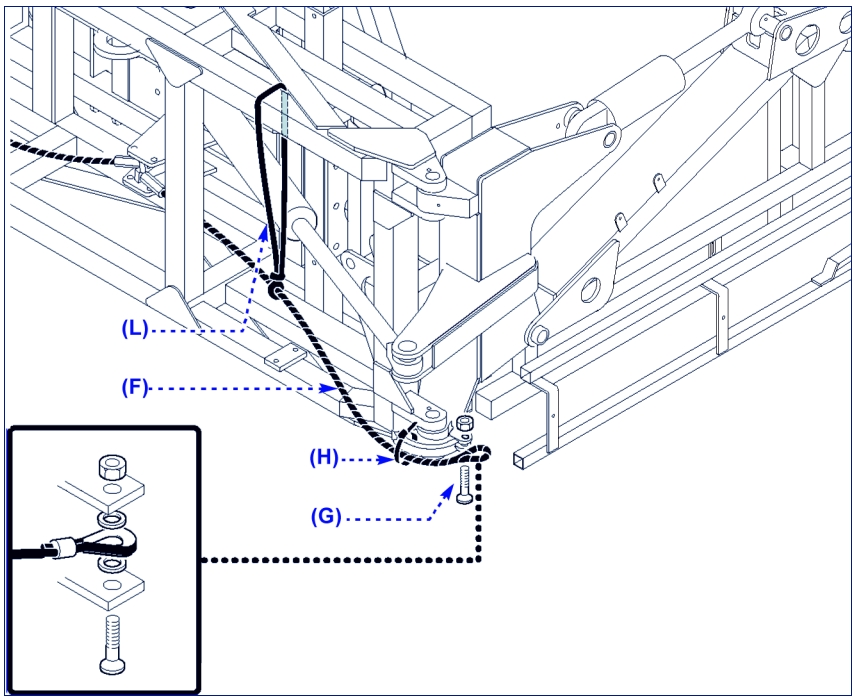
Only for versions without hydraulic locking

5 - Slightly unfold primary arms.

6 - Connect the ropes **(F)** to the arms with the relative screws, as shown in the figure.

Important

The screws (G) must always be mounted turned upwards, as shown in the figure.



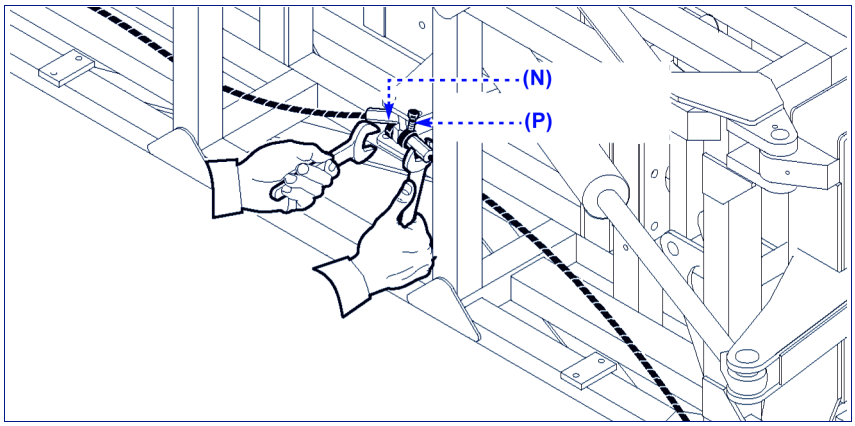
7 - Fold boom arms.

8 - Use nuts **(N)** to tighten ropes **(F)**.

9 - Bring stop **(P)** closer and lock it.

10- Lock the ropes **(F)** to the support using the clamp **(H)**.

11- Use rubber bands **(L)** to support the ropes and prevent them from being damaged while the boom is moving (see figure).

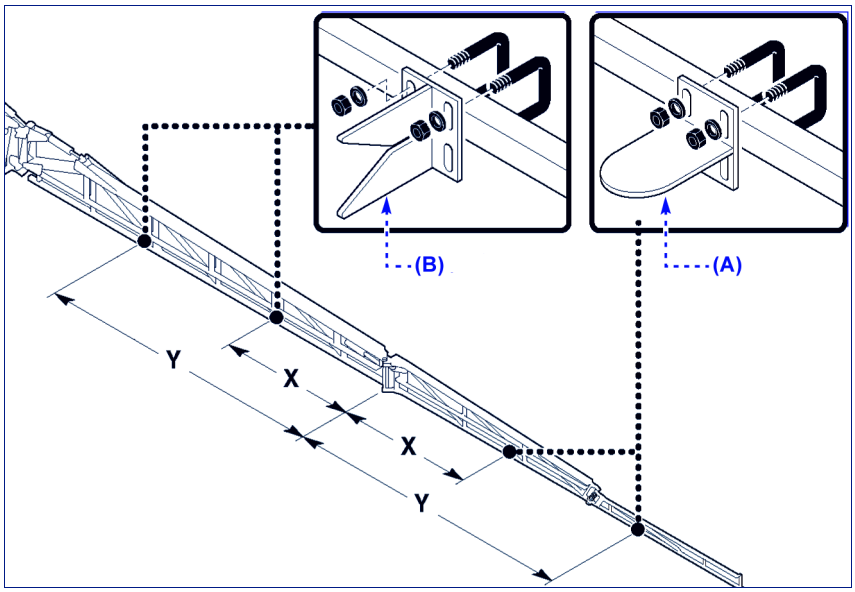


INSTALLATION OF EXTENSION LOCKS

1 - Fix stop **(A)** on the extension.

2 - Mount support **(B)** on the primary arm at the distance shown in the figure.

3 - Make sure that the supports **(A-B)** engages properly during folding.



332.068

INSTALLATION OF THE HYDRAULIC SYSTEM

Proceed in the way indicated.

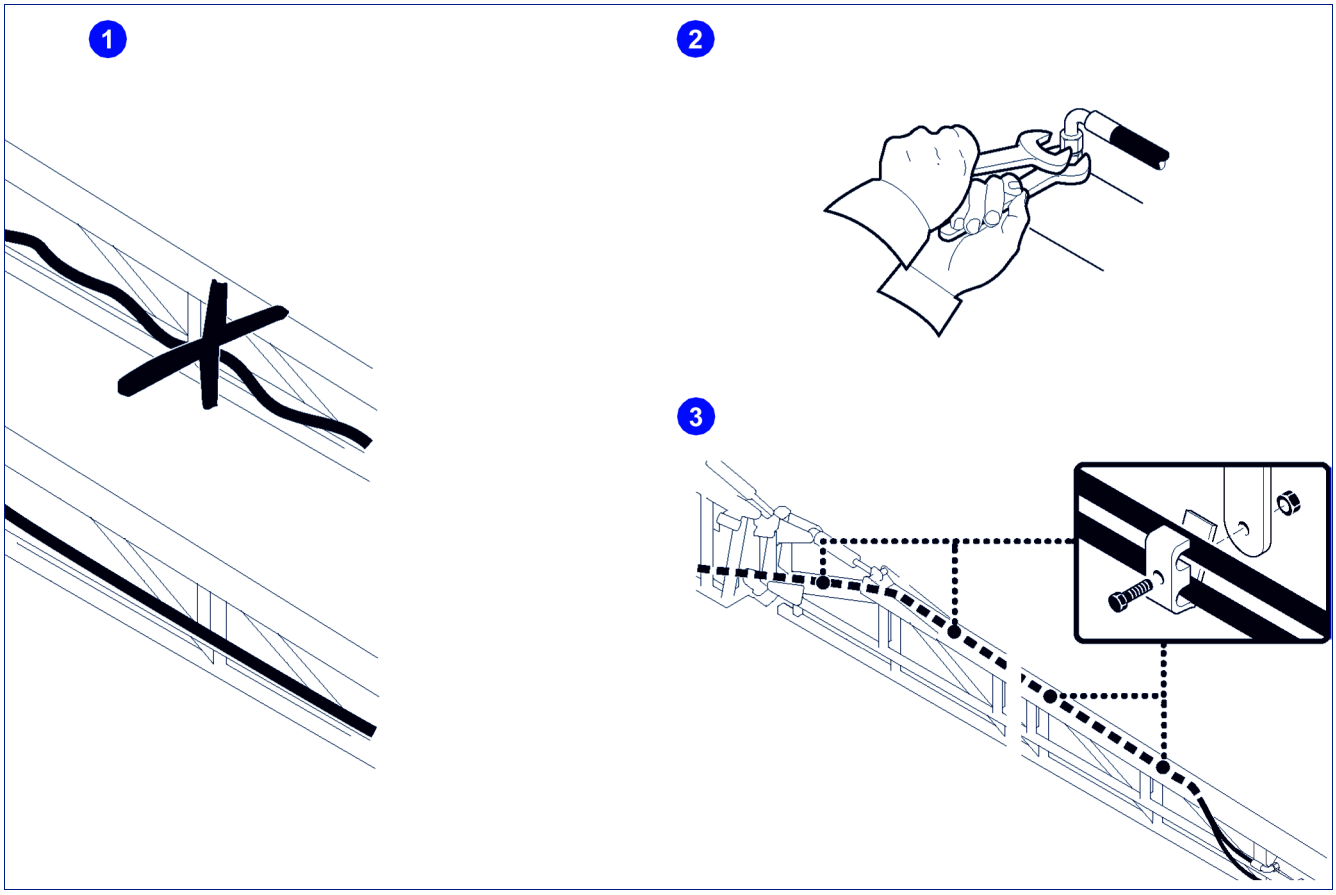
1 - Lay the hoses down on the boom linearly (see the figure). Leave sufficient length so as to not impede the movements at the articulation points of the boom.

2 - Connect the hoses to the cylinders (see the hydraulic diagram).

Important

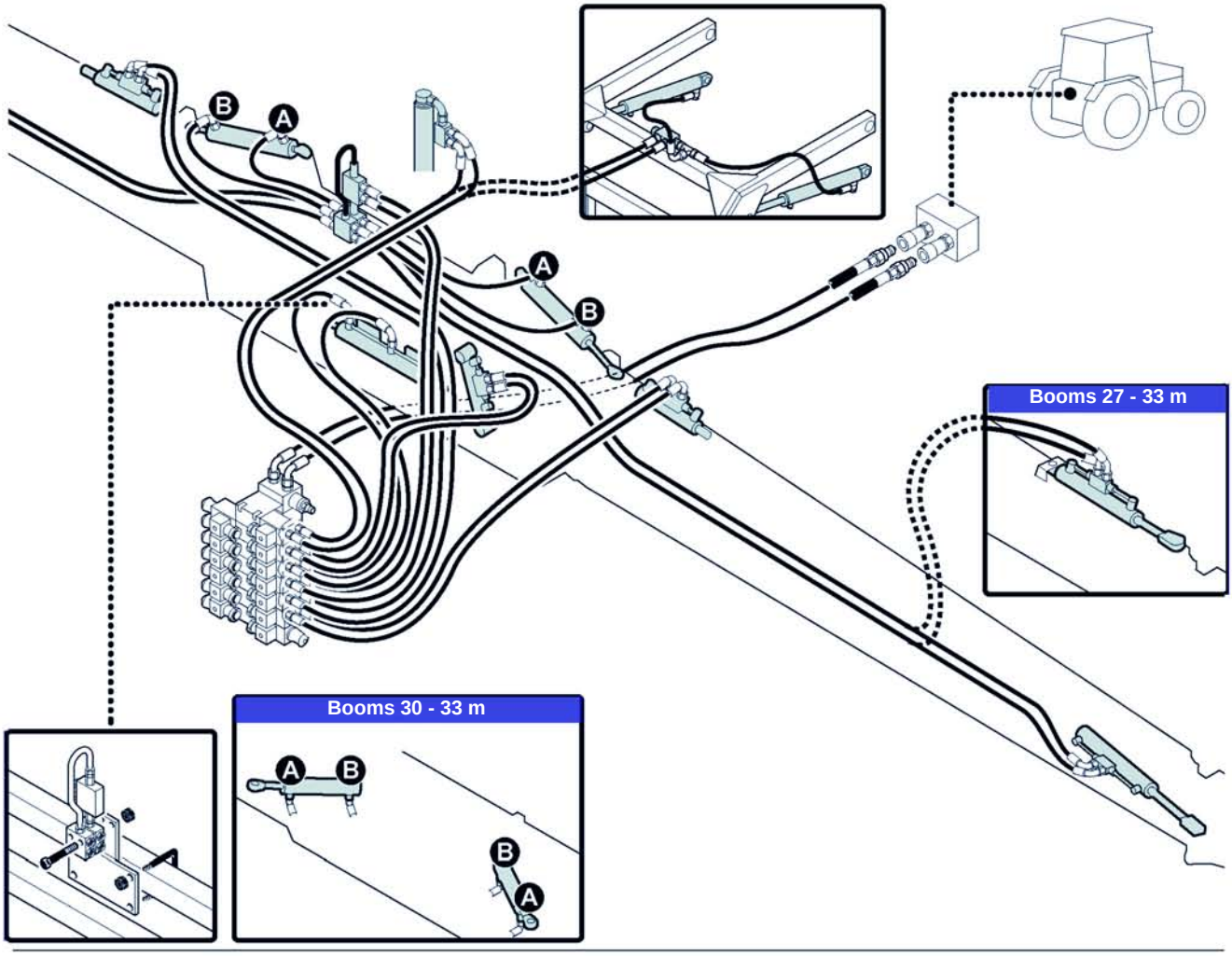
Do not tighten the unions too much so as to damage the sealing taper fit.

3 - Fasten the hoses to the frame by means of the hose clamps provided on the boom and with clamps at a distance of ~20 cm.



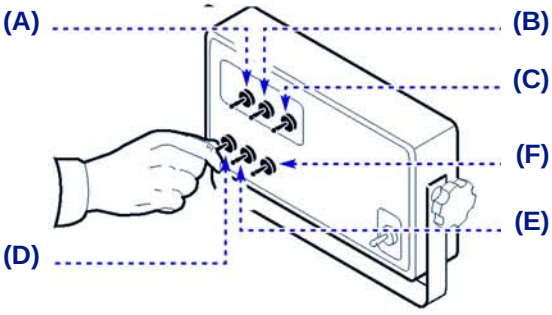
332.068

6 - function hydraulic system (operated with electric control unit)



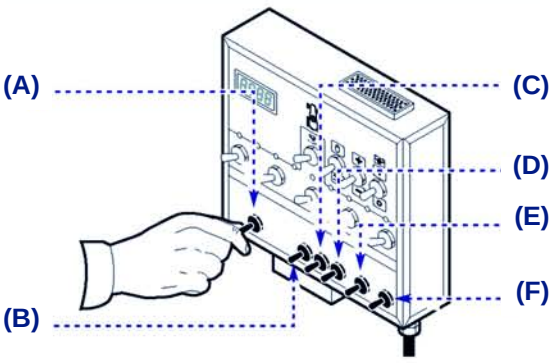
CGA CONTROL PANEL

A) Left variable geometry
B) Simultaneous unfolding of boom sections
C) Right variable geometry
D) Lifting
E) Hydraulic tilt adjustment
F) Hydraulic locking



MÜLLER CONTROL PANEL

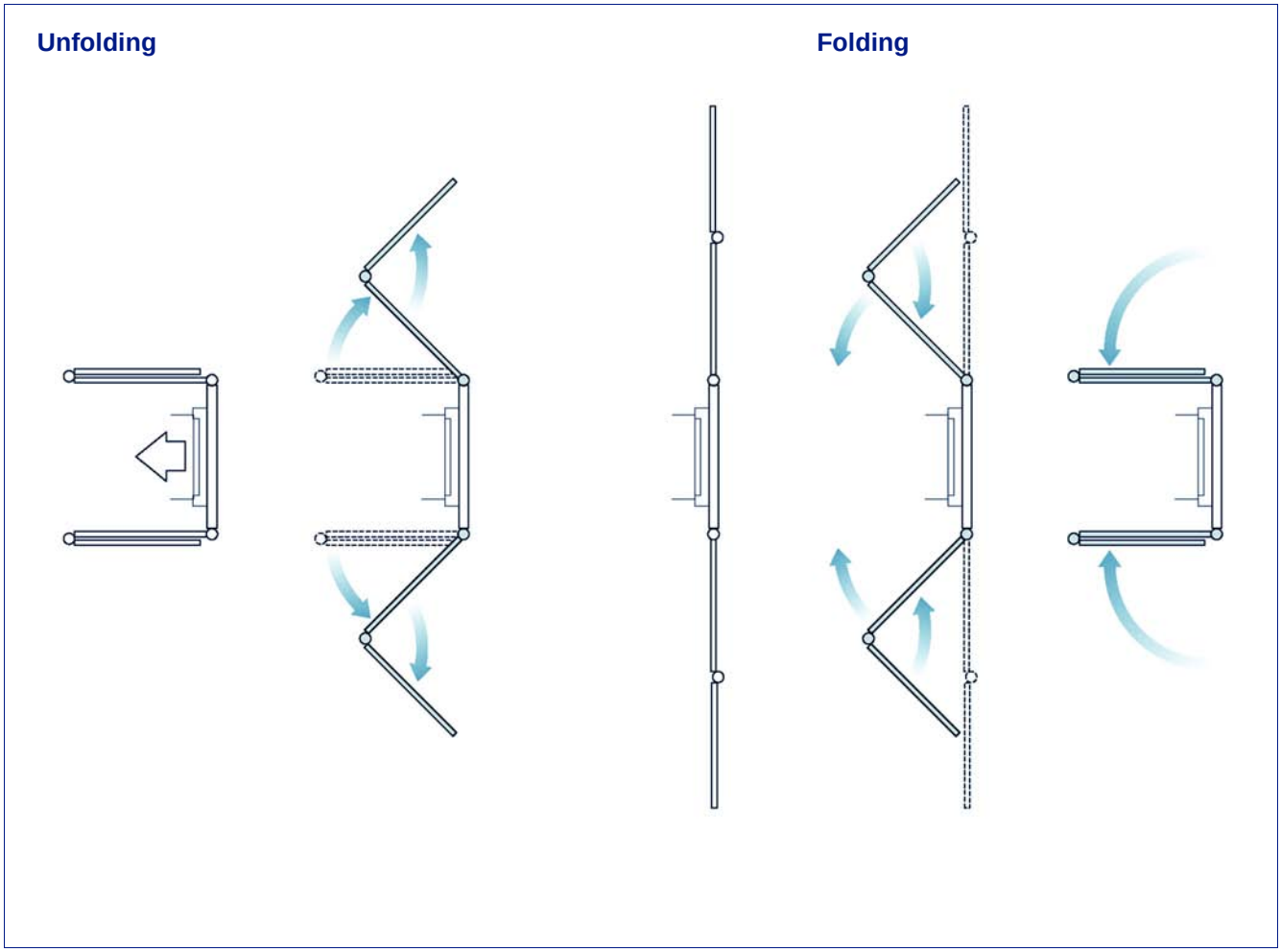
A) Simultaneous unfolding of boom sections
B) Left variable geometry
C) Lifting
D) Right variable geometry
E) Hydraulic locking
F) Hydraulic tilt adjustment



332.068

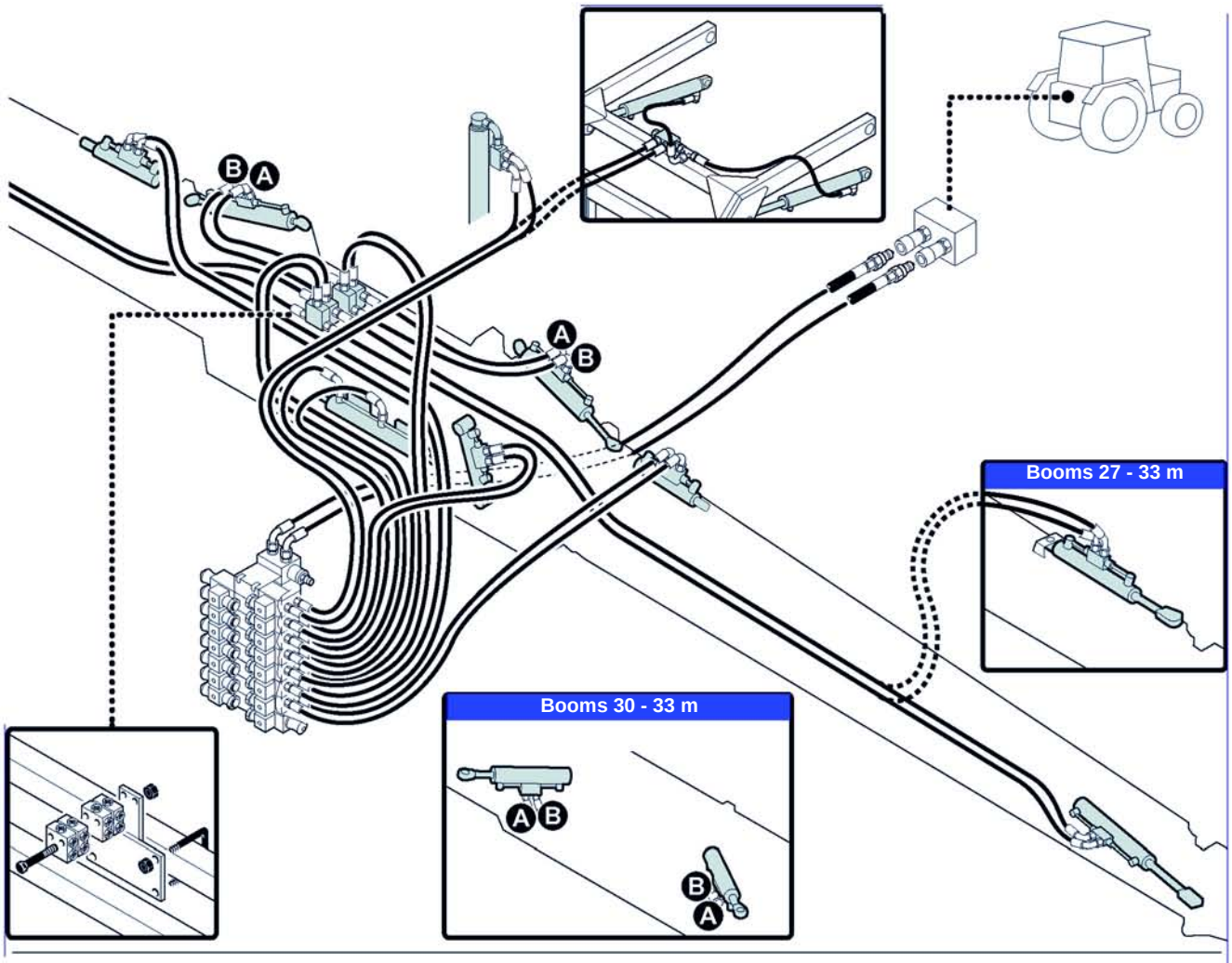
Boom unfolding and folding

The figure indicates the procedure to follow when unfolding and folding the boom.



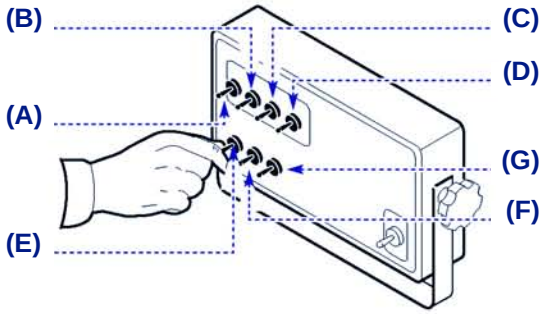
332.068

7 - function hydraulic system (operated with electric control unit)



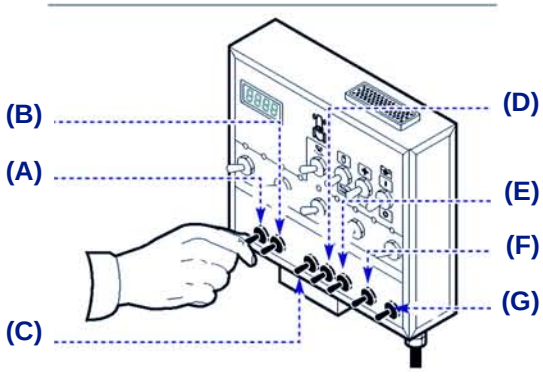
CGA CONTROL PANEL

A) Left variable geometry
B) Simultaneous unfolding of extensions
C) Simultaneous unfolding of arms
D) Right variable geometry
E) Lifting
F) Hydraulic tilt adjustment
G) Hydraulic locking



MÜLLER CONTROL PANEL

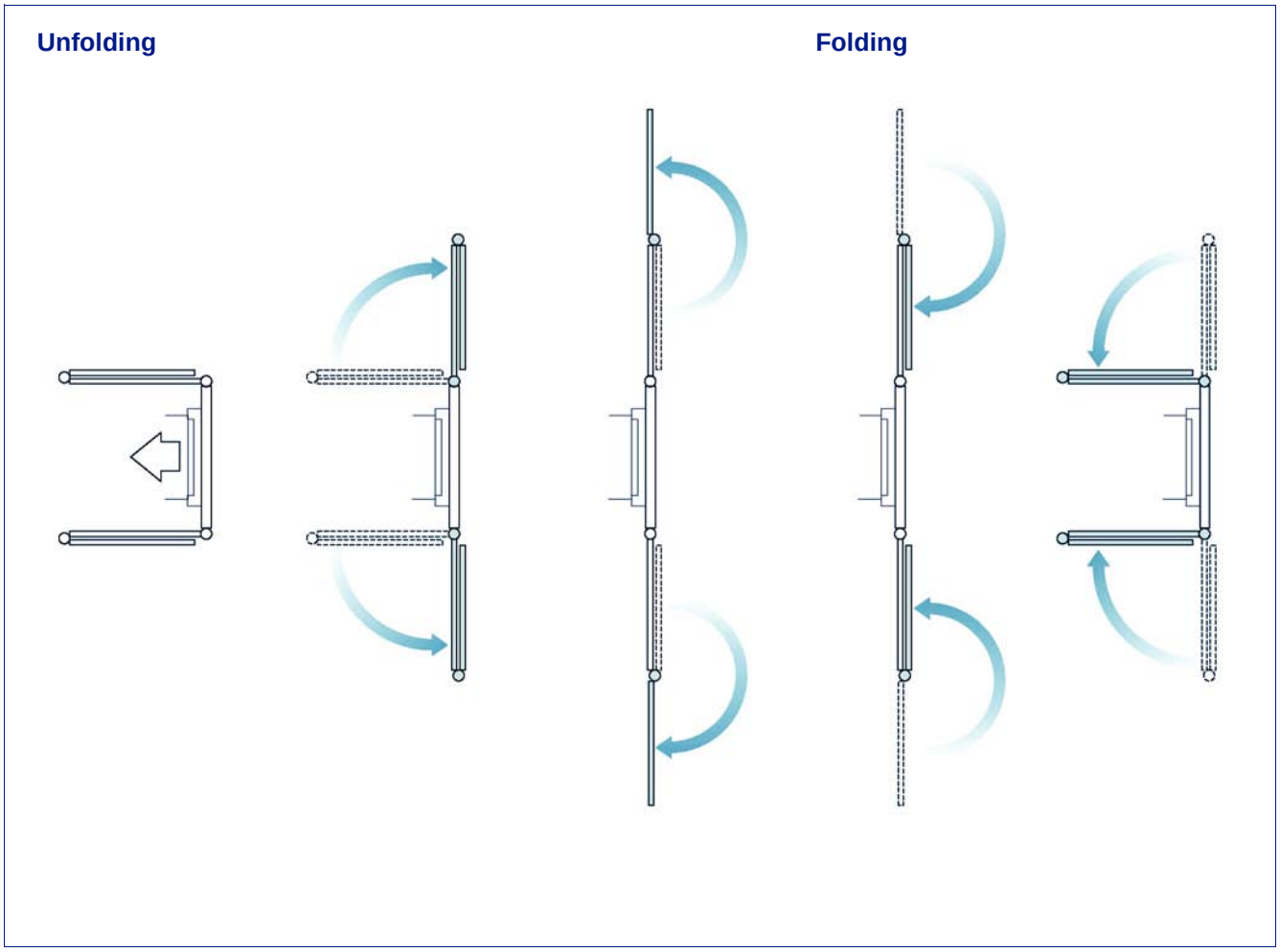
A) Simultaneous unfolding of extensions
B) Simultaneous unfolding of arms
C) Left variable geometry
D) Lifting
E) Right variable geometry
F) Hydraulic locking
G) Hydraulic tilt adjustment



332.068

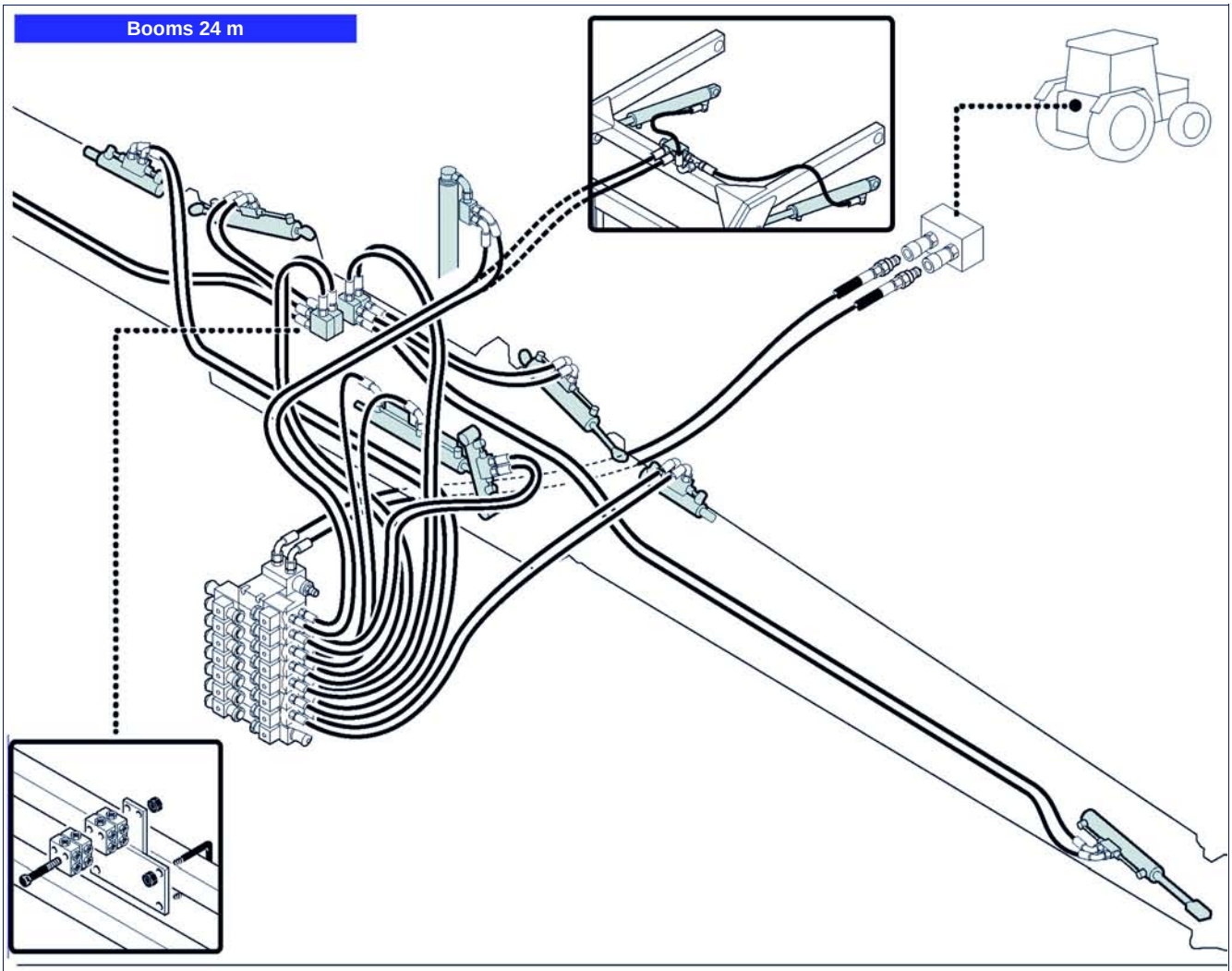
Boom unfolding and folding

The figure indicates the procedure to follow when unfolding and folding the boom.



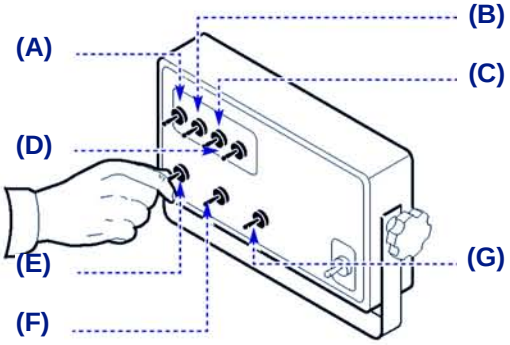
332.068

7 - function hydraulic system (operated with electric control unit)



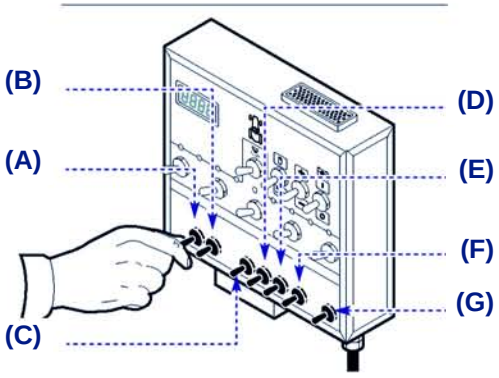
CGA CONTROL PANEL

A) Left variable geometry
B) Simultaneous unfolding of arm/left extension
C) Simultaneous unfolding of arm/right extension
D) Right variable geometry
E) Lifting
F) Hydraulic tilt adjustment
G) Hydraulic locking



MÜLLER CONTROL PANEL

A) Simultaneous unfolding of arm/left extension
B) Simultaneous unfolding of arm/right extension
C) Left variable geometry
D) Lifting
E) Right variable geometry
F) Hydraulic locking
G) Hydraulic tilt adjustment



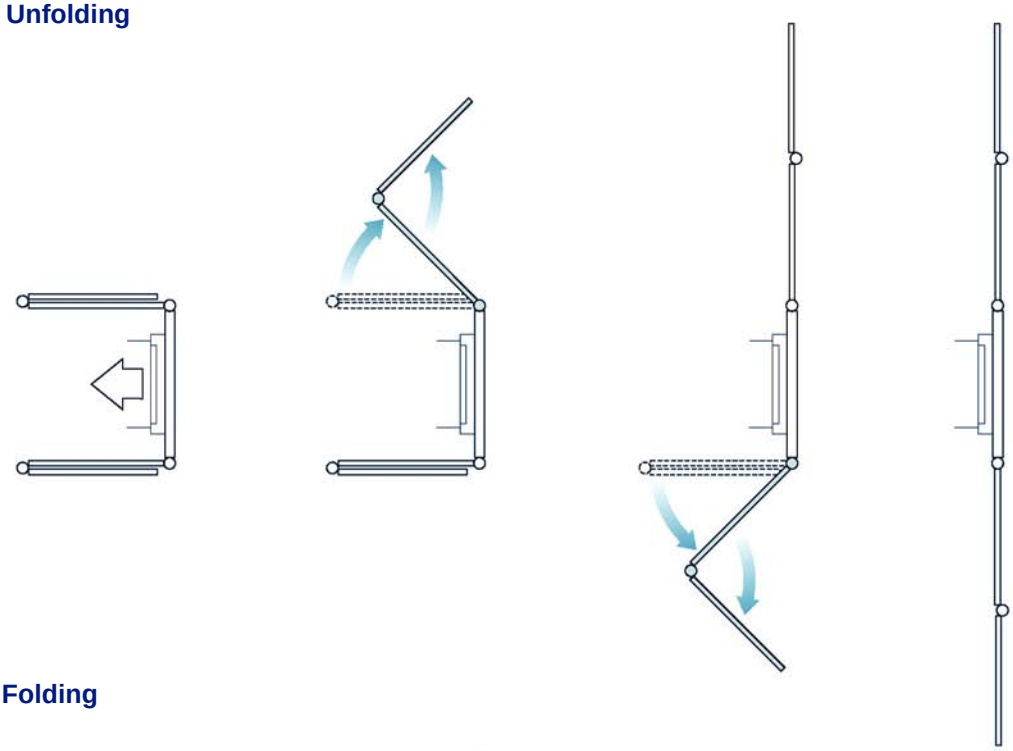
332.068

Boom unfolding and folding

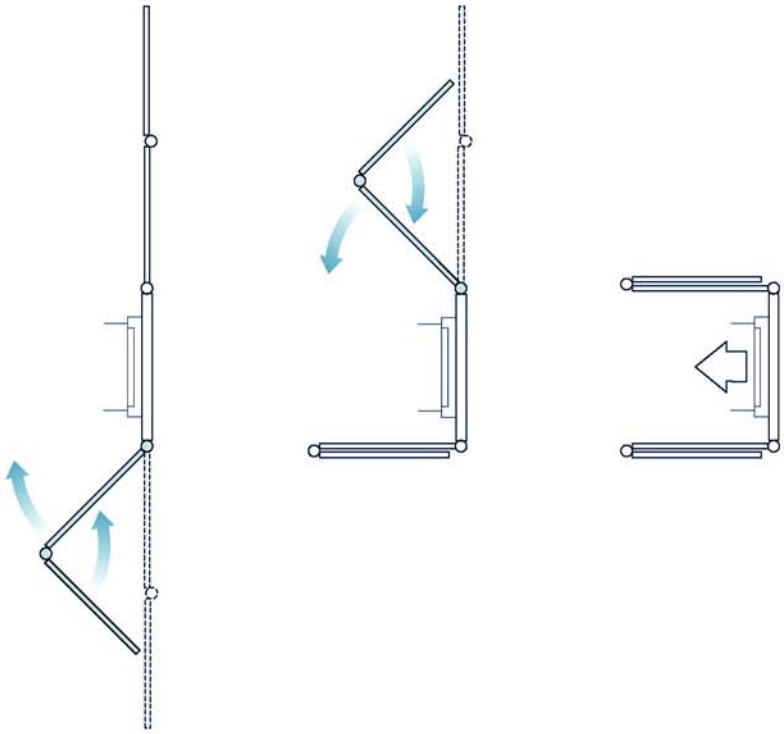
The figure indicates the procedure to follow when unfolding and folding the boom.

Please note: the two arms can be folded or unfolded independently of each other.

Unfolding

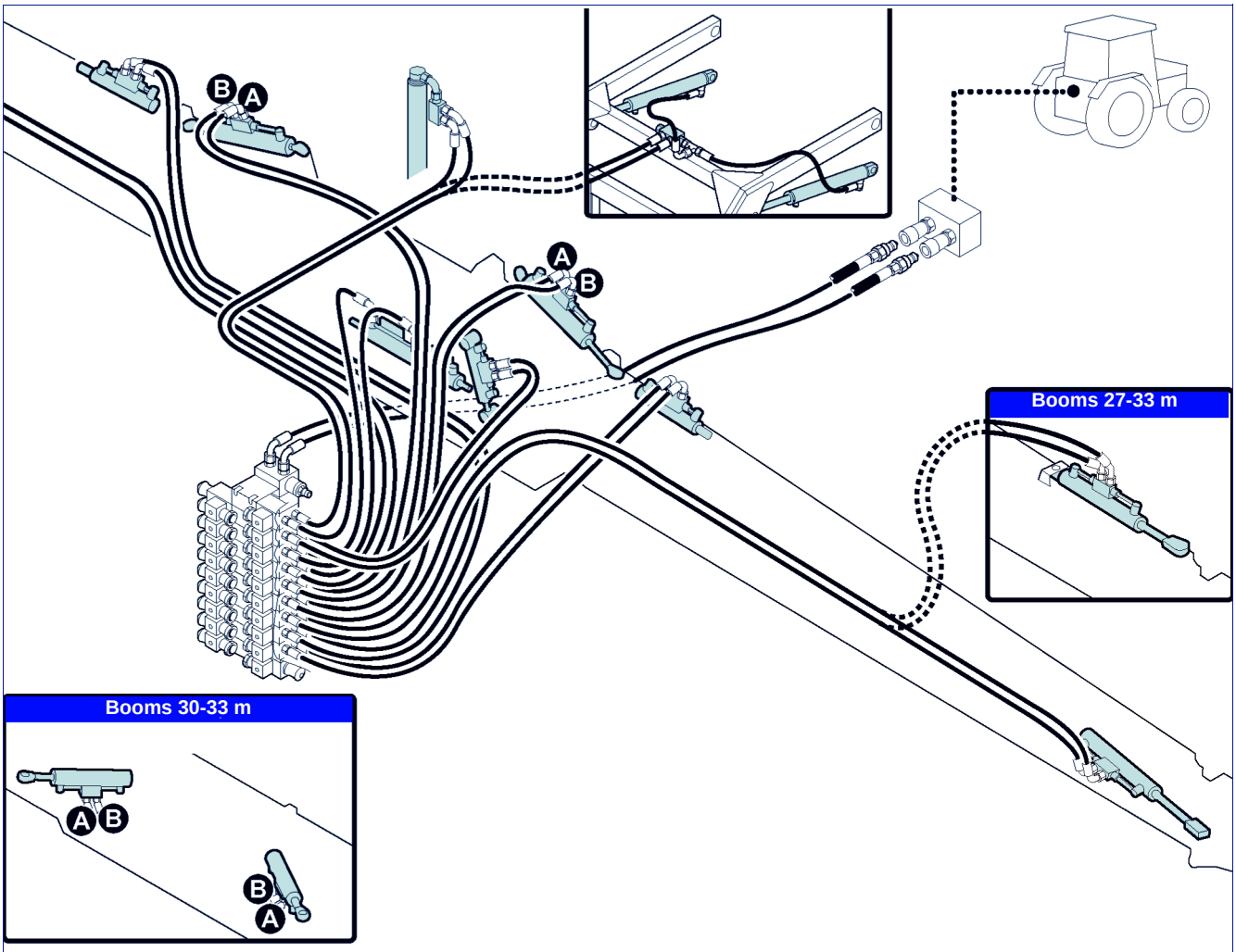


Folding



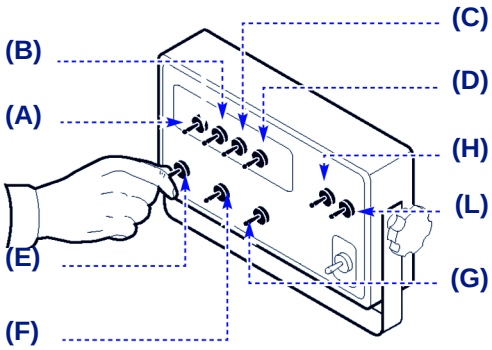
332.068

9 - function hydraulic system (operated with electric control unit)



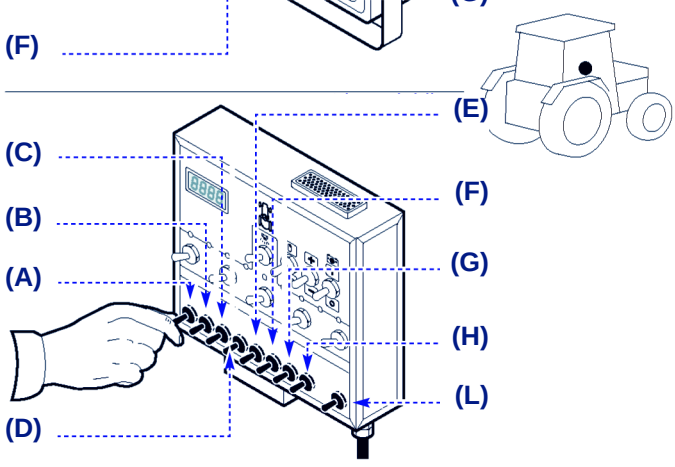
CGA CONTROL PANEL

A) Left extension unfolding
B) Left arm unfolding
C) Right arm unfolding
D) Right extension unfolding
E) Lifting
F) Hydraulic tilt adjustment
G) Hydraulic locking
H) Left variable geometry
L) Right variable geometry



MÜLLER CONTROL PANEL

A) Left extension unfolding
B) Left arm unfolding
C) Right arm unfolding
D) Right extension unfolding
E) Left variable geometry
F) Lifting
G) Right variable geometry
H) Hydraulic locking
L) Hydraulic tilt adjustment



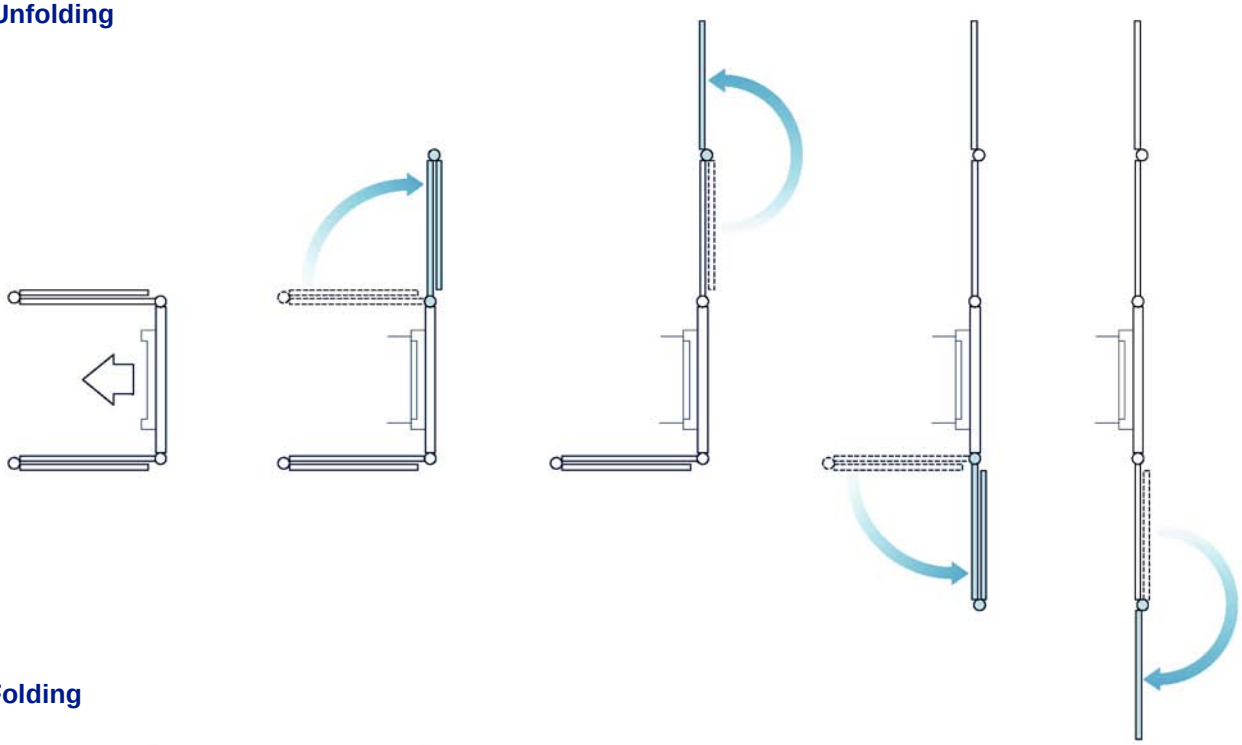
332.068

Boom unfolding and folding

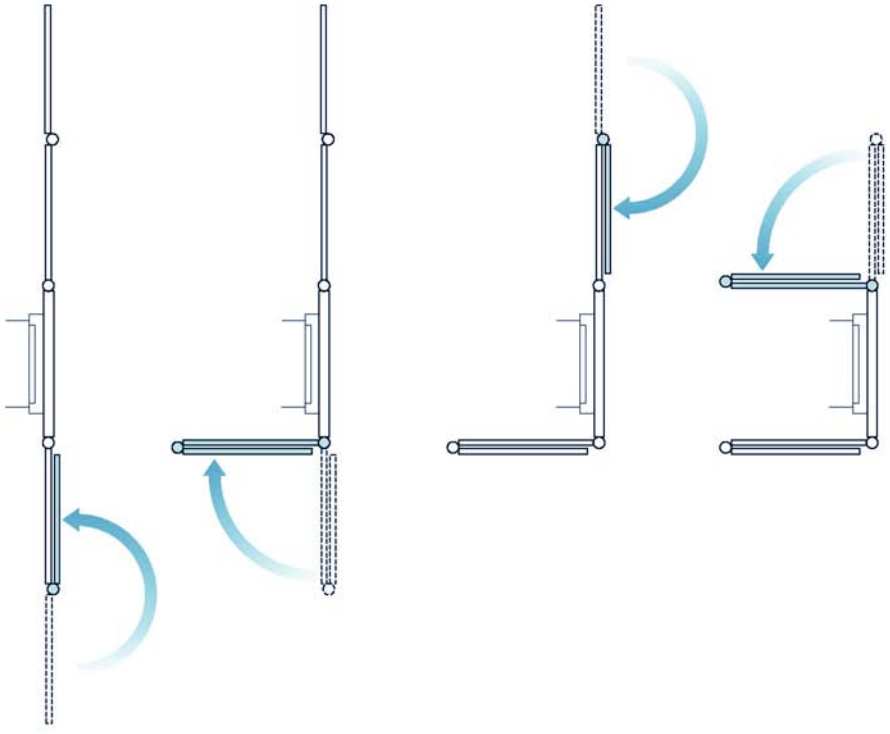
The figure indicates the procedure to follow when unfolding and folding the boom.

Please note: the two arms can be folded or unfolded independently of each other.

Unfolding



Folding



332.068

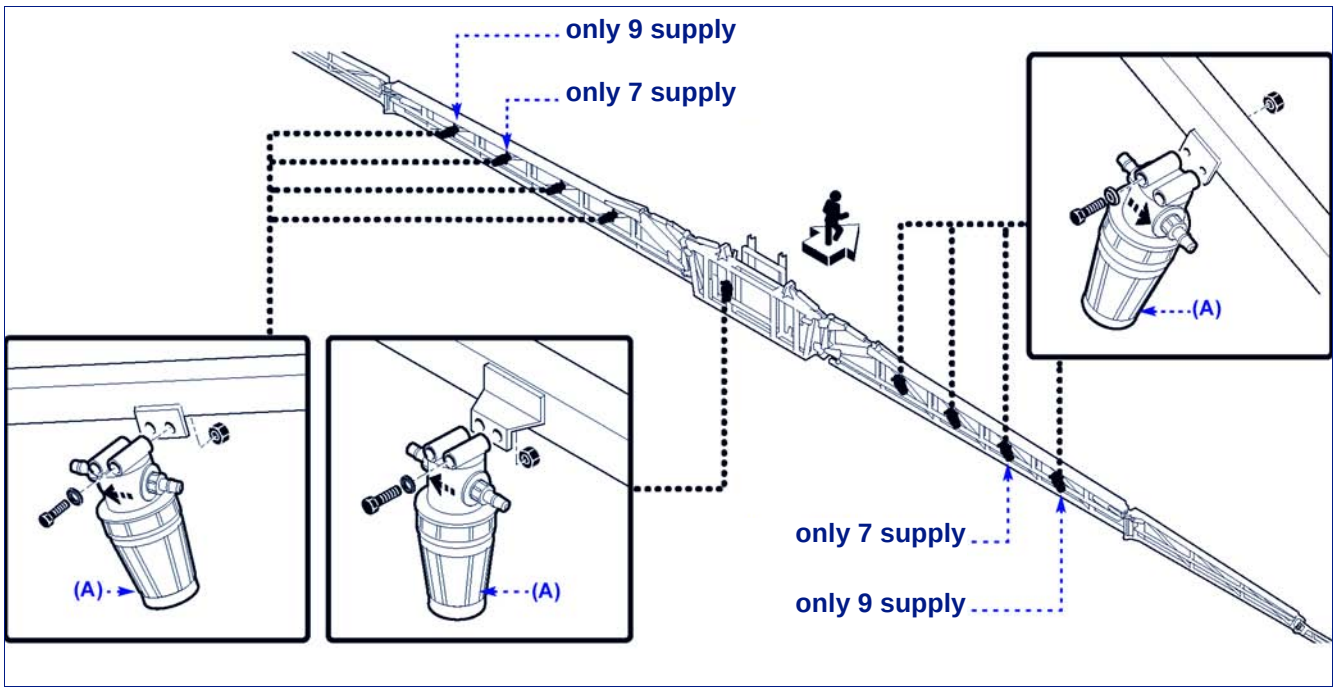
INSTALLATION OF LINE FILTERS (IF REQUIRED) AND JETS

Proceed in the way indicated.

1 - Install the line filters (**A**) as shown in the figure.

Important

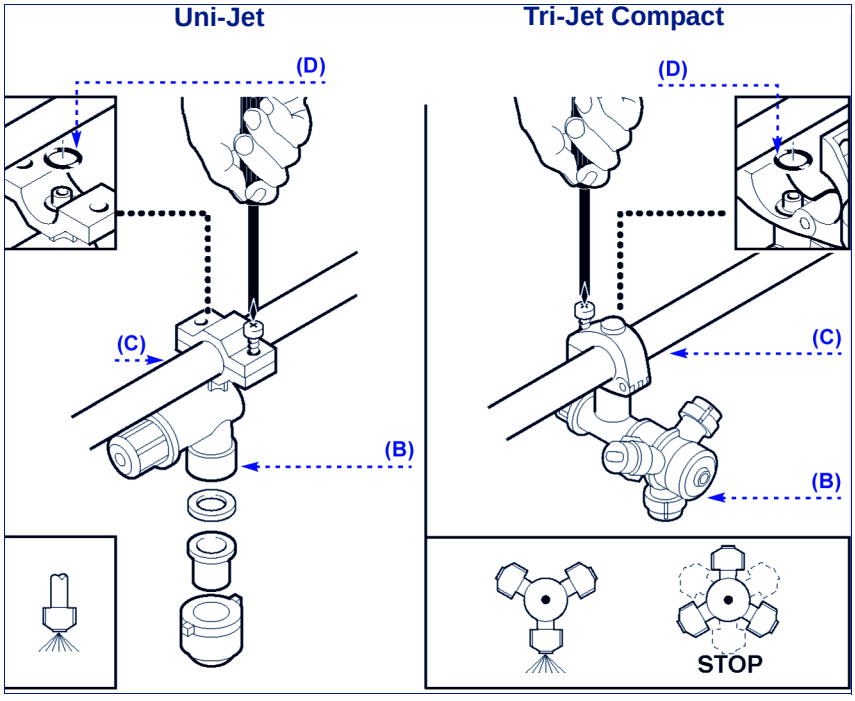
If the equipment is fitted with the “air assisted" kit, see booklet 10 before performing this operation.



2 - Mount the jets **(B)** next to the outlet holes of the stainless steel pipes **(C)** (see the “Number of jets on each boom section" diagram, page 23).

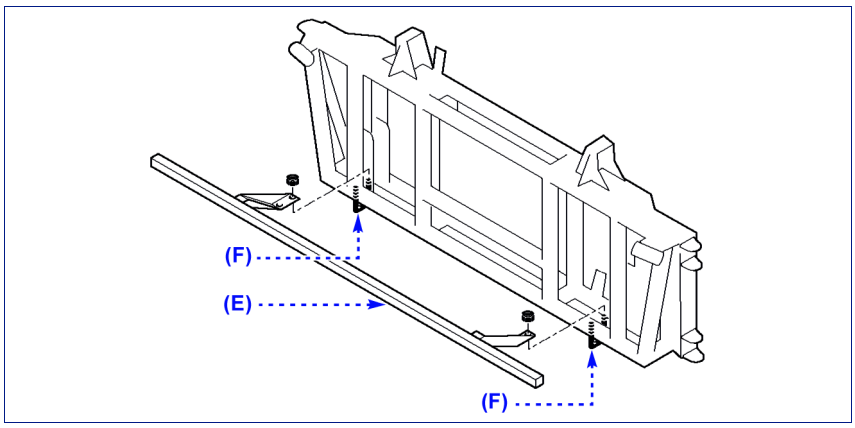
Important

Properly mount the seals (D).



332.068

3 - Mount the jet support **(E)** using the U bolts **(F)**.



Caution - Warning

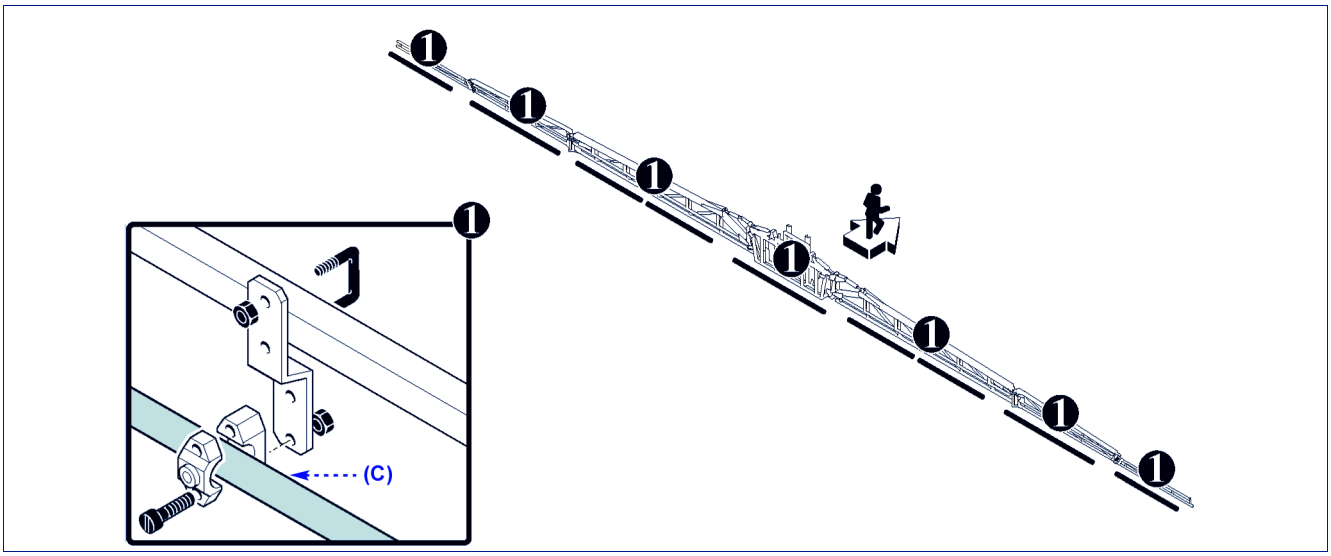
Make sure the support is positioned centred with the frame

Important

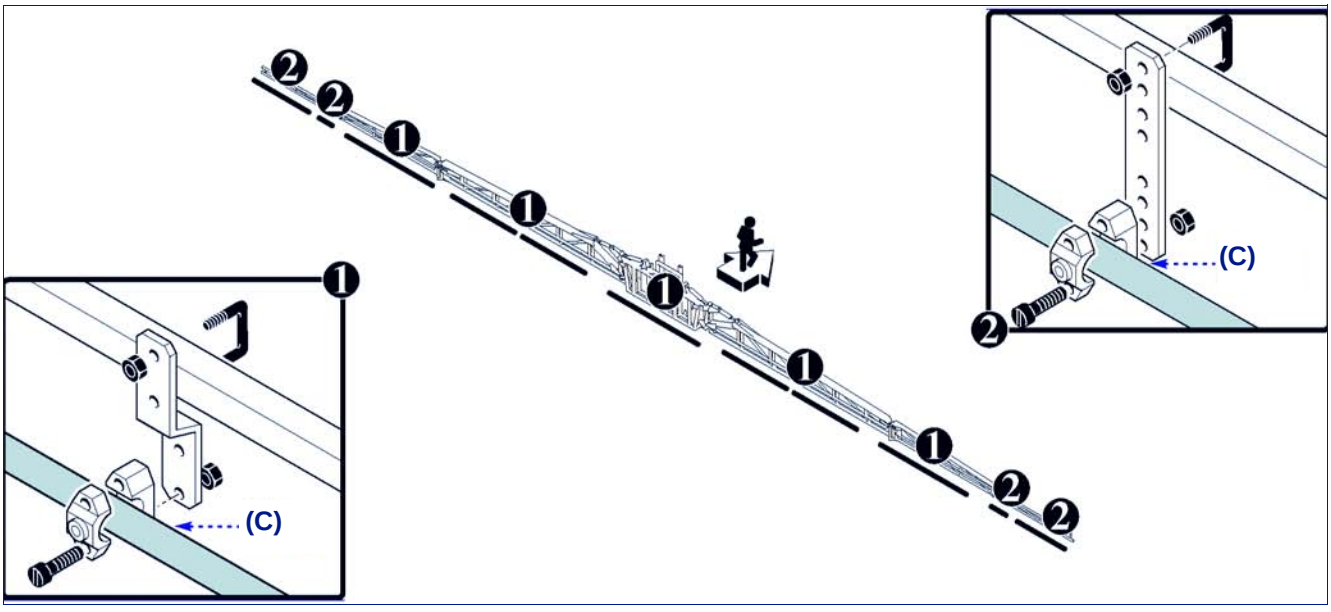
If the equipment is fitted with the "air assisted" kit do not install support (E).

4 - Fasten the stainless steel pipes **(C)** to the spraying boom using the relative supports, depending on the type of jets installed (see figure).

Support layout diagram for booms with "Uni-Jet" jets

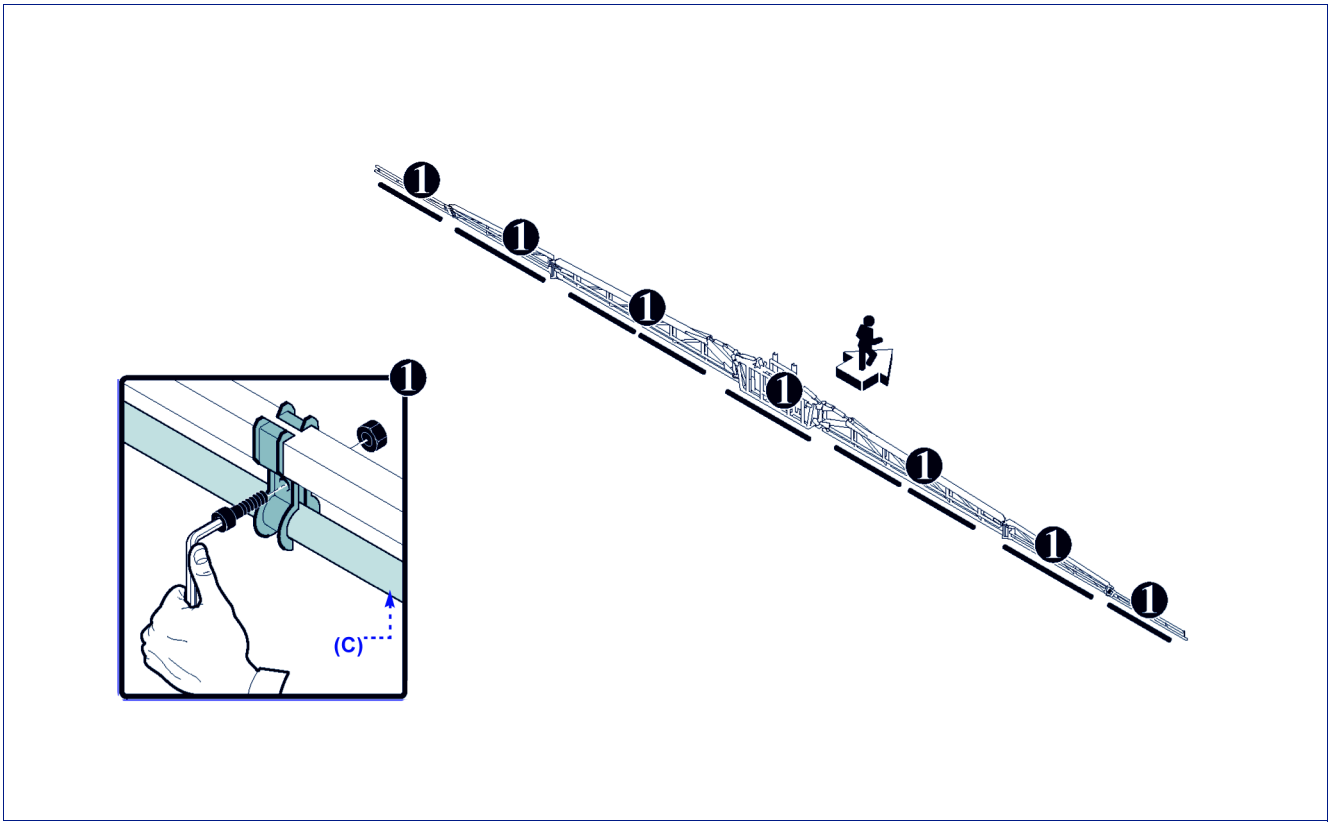


Support layout diagram for booms with folding endpiece (optional) and "Uni-Jet" jets

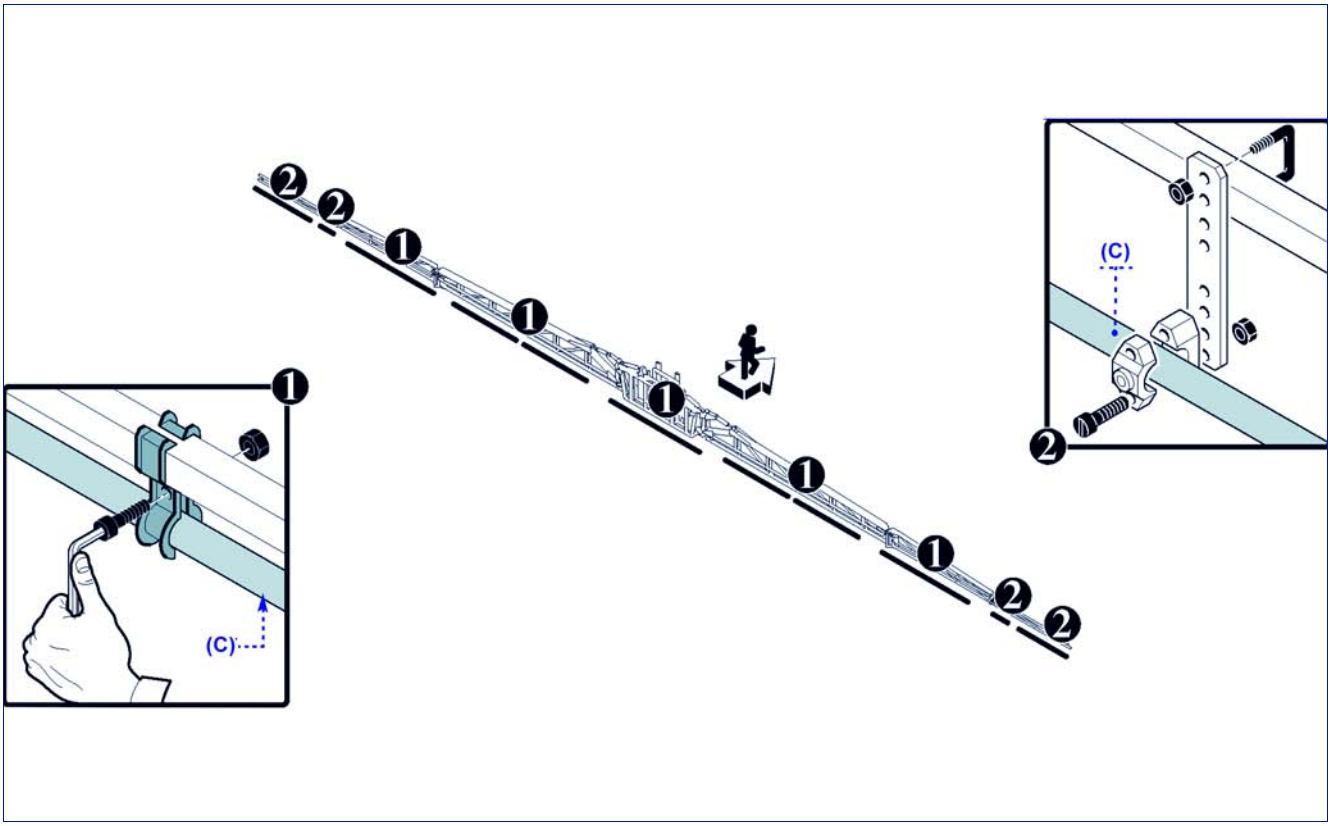


332.068

Support layout diagram for booms with “Compact” jets



Support layout diagram for booms with folding endpiece (optional) and “Compact” jets

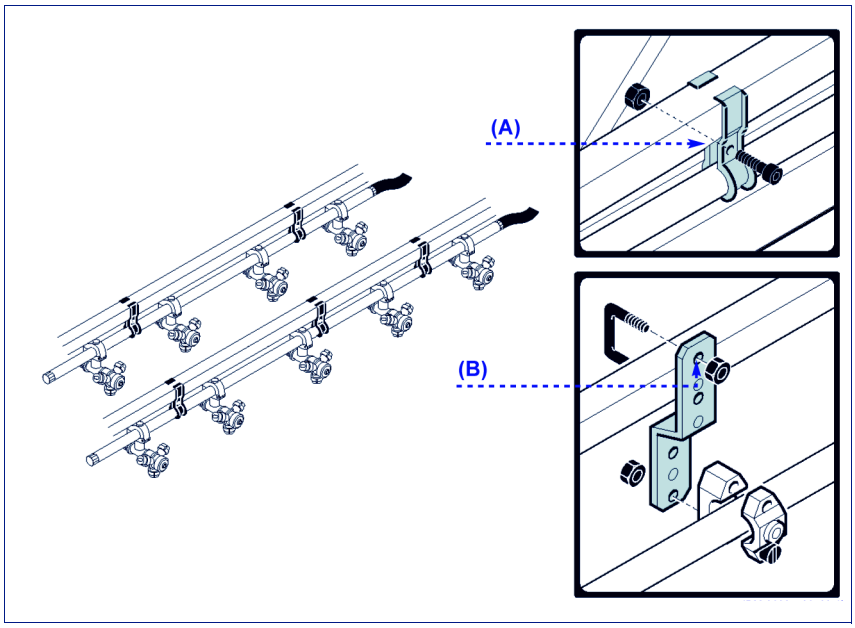


NUMBER OF JETS ON EACH BOOM SECTION

Position the nozzle holder hoses depending on the boom length (see diagram).

The diagram shows as well position and number of supports on each hose and installation instructions, depending on the number of supplies.

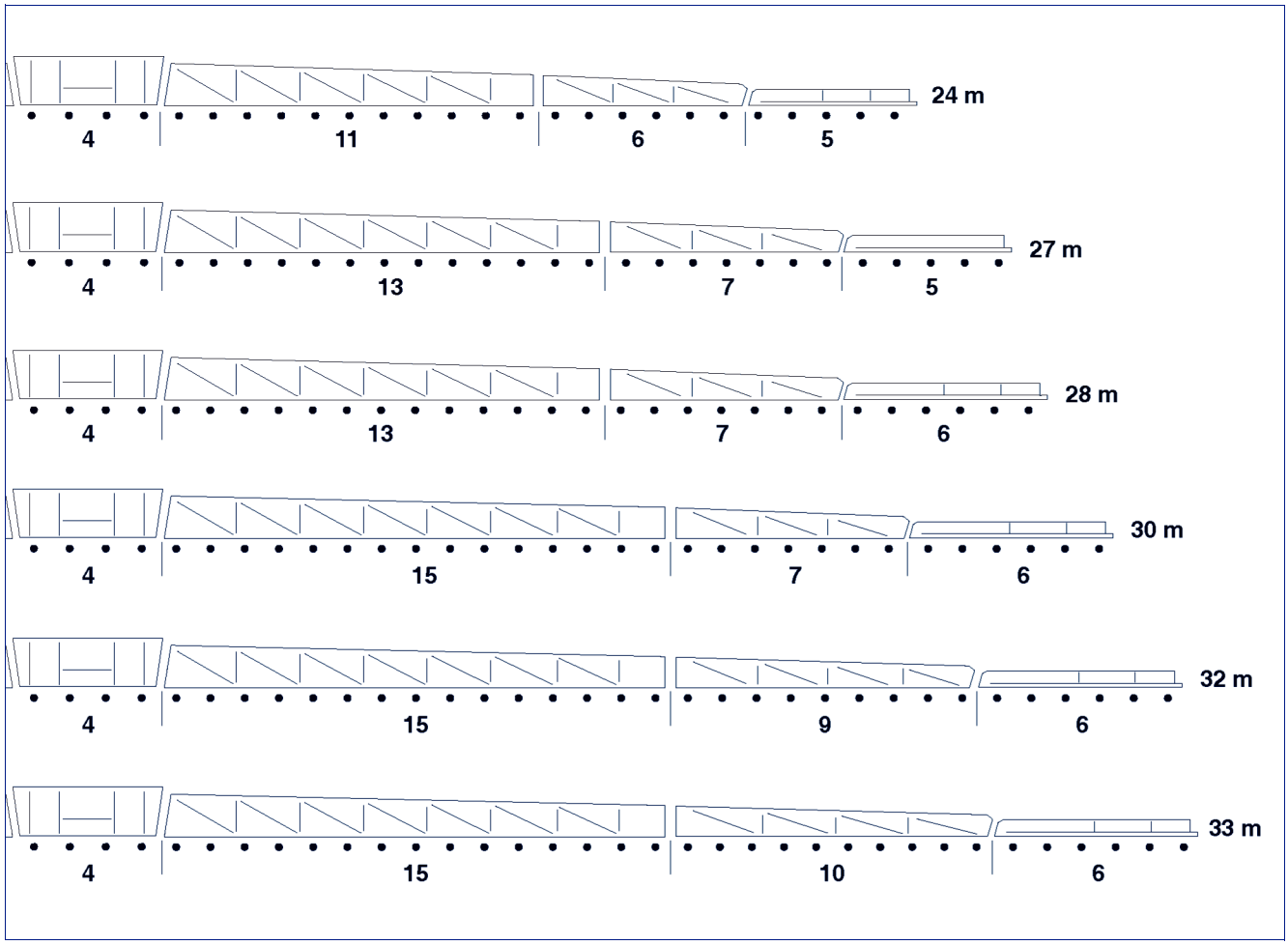
If the equipment is supplied disassembled, the diagram is enclosed with the small items of the boom.



Important

For hoses with up to four jets use two pairs of clamps (A); for hoses with more than four jets use three pairs of clamps (B).

Jet number diagram for each boom section (500 mm pitch)

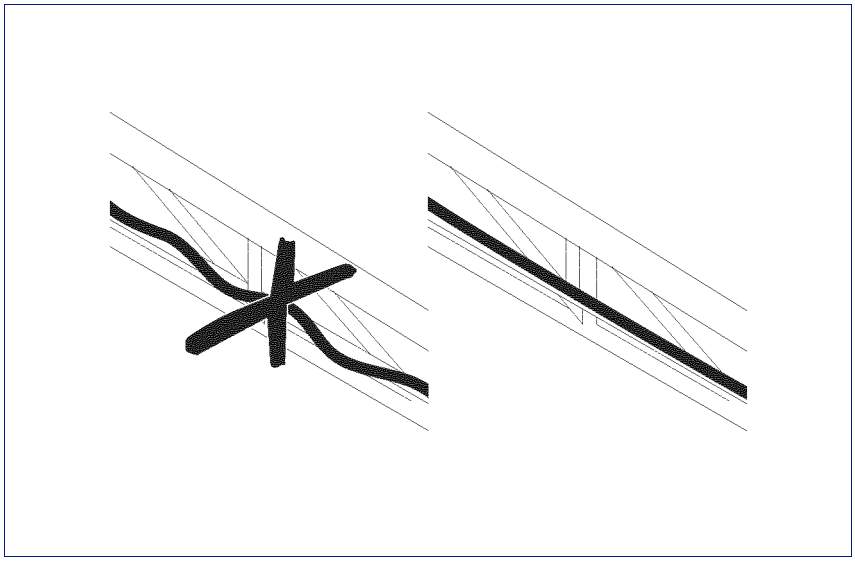


332.068

INSTALLATION OF WATER HOSES

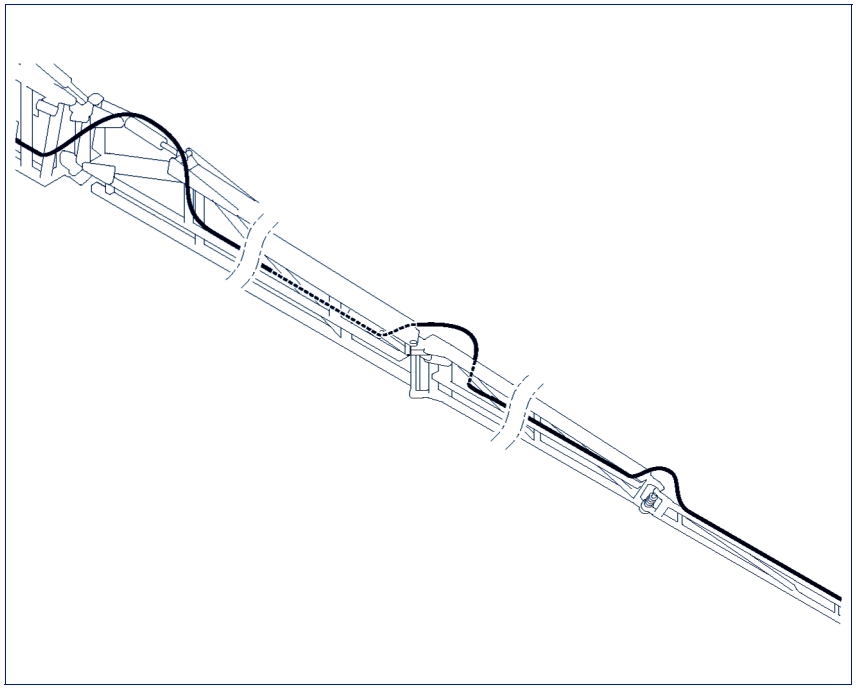
Proceed in the way indicated.

1 - Lay the hoses down on the boom linearly (see the figure).



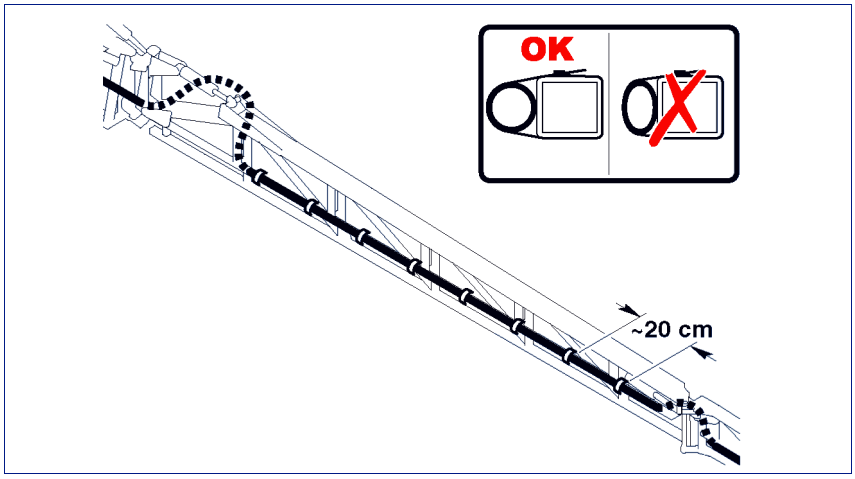
2 - Leave sufficient length so as to not impede the movements at the articulation points of the boom.

3 - Connect the hoses (see “Water connection diagram”).



332.068

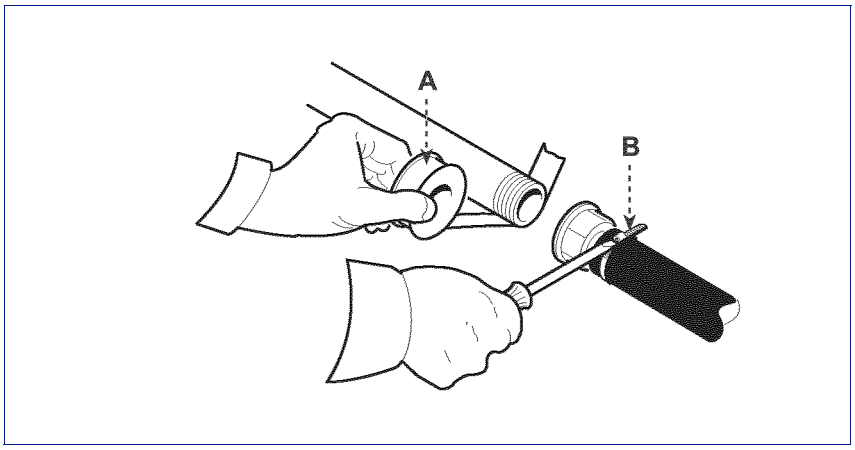
4 - Secure the hoses to the boom with clamps spaced out ~ 20 cm.



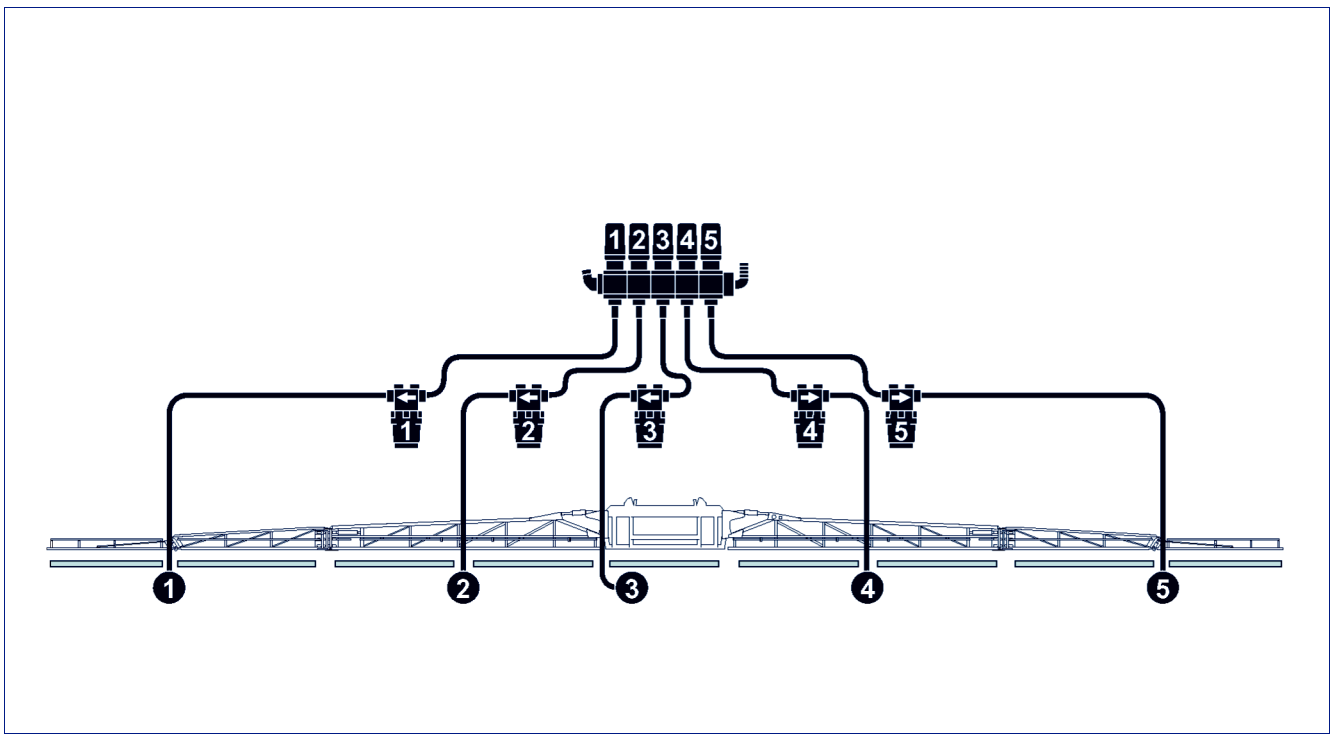
Important

Do not tighten the clamps too much so as to avoid throttling.

5 - Use the Teflon seal (**A**) and tighten the stainless steel clamps (**B**) in order to ensure tightness in the joints.

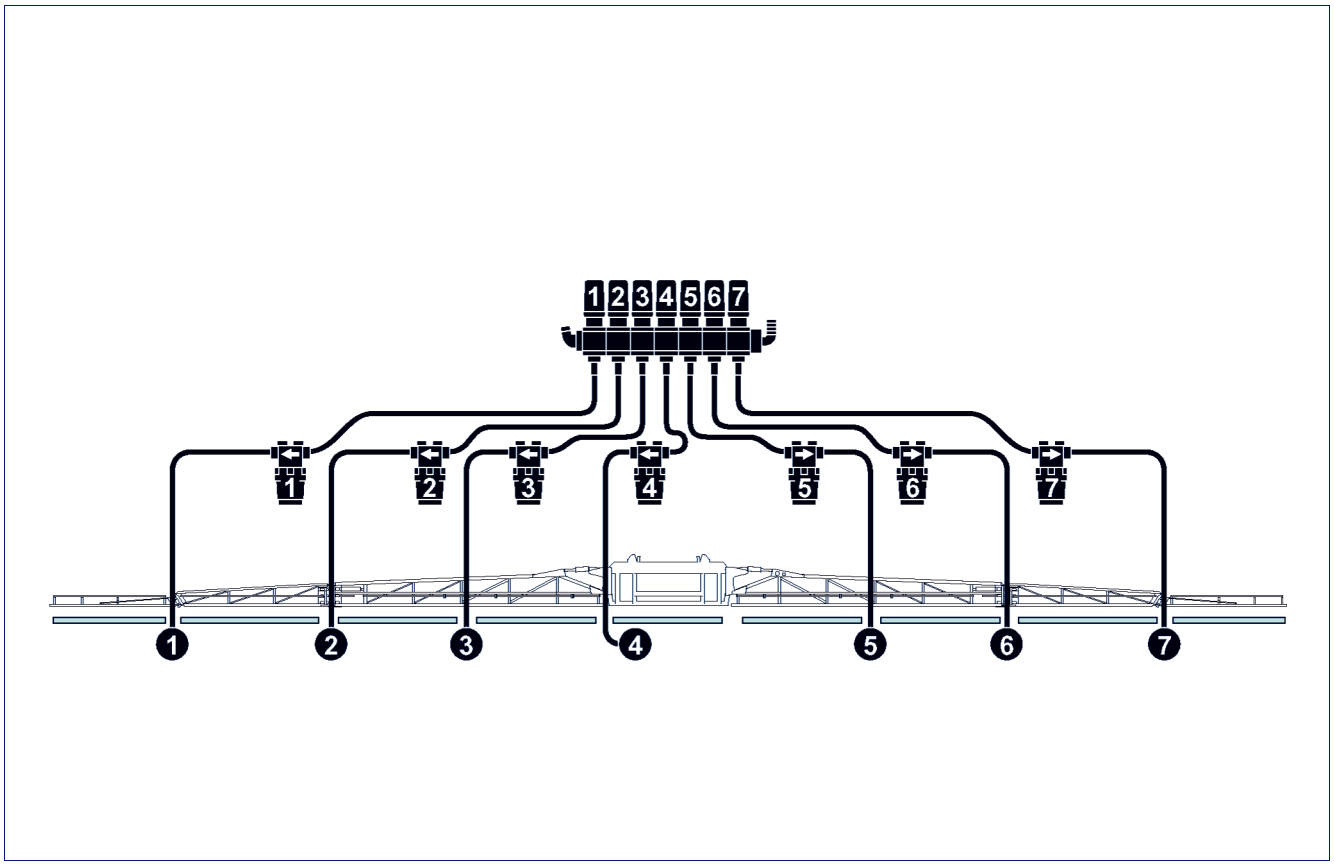


5-supply water connection diagram

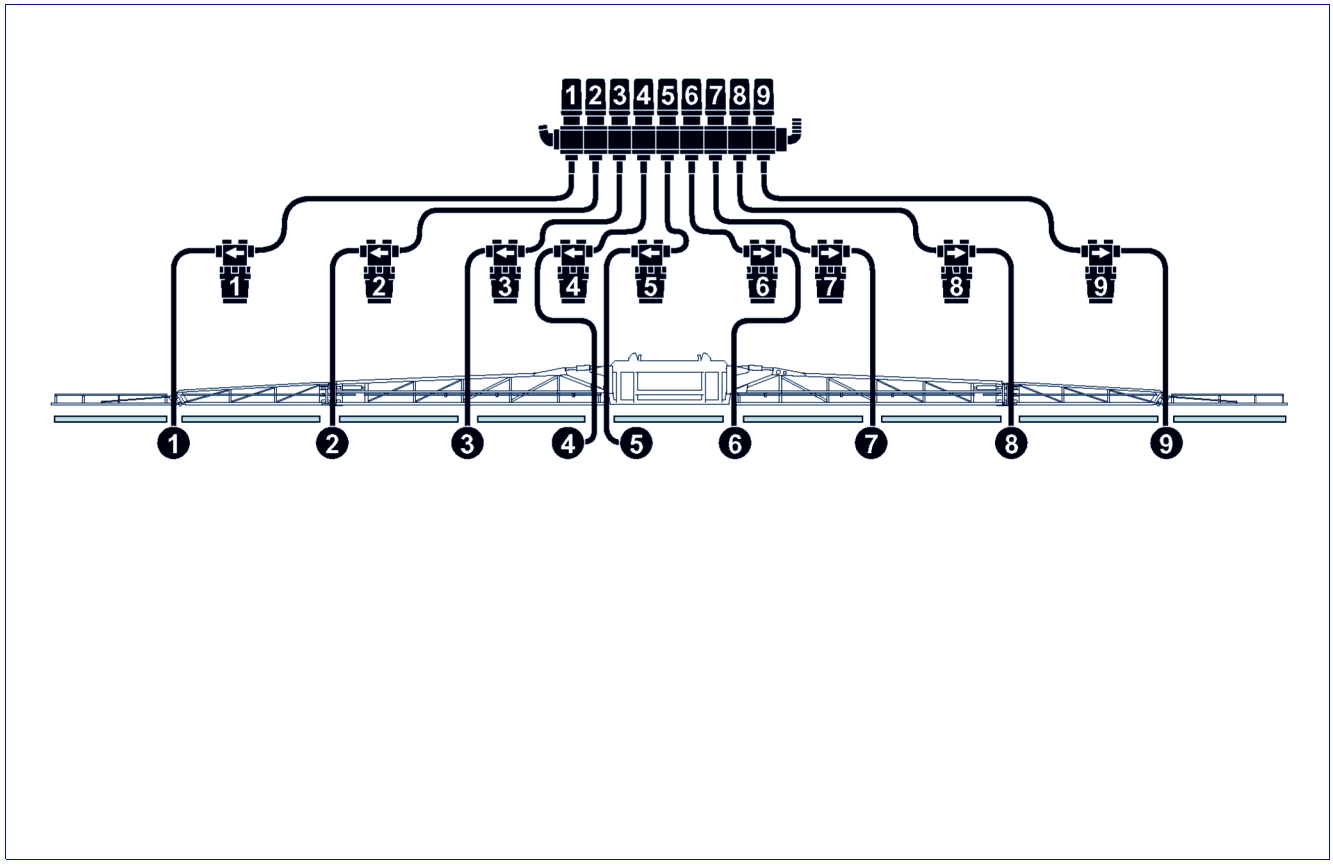


332.068

7-supply water connection diagram



9-supply water connection diagram

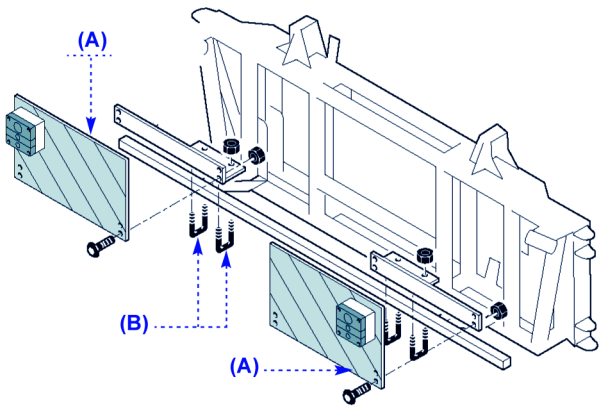


332.068

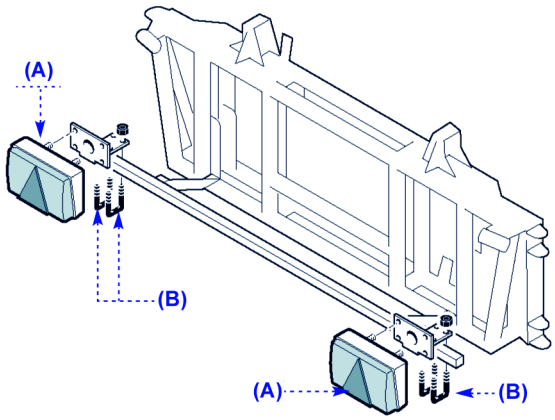
INSTALLATION OF REAR LIGHT KIT

1 - Install the rear light kit (**A**) and fasten it with U bolts (**B**).

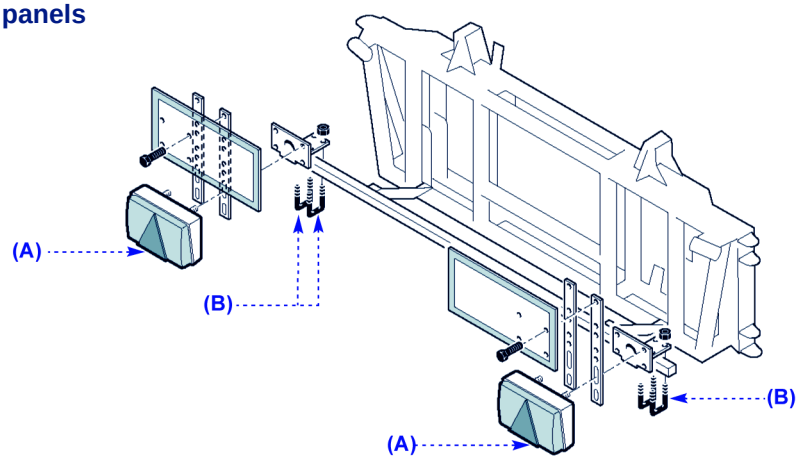
Rear light kits for mounted units with rear-reflecting panels



Rear light kits for trailed tanks without rear-reflecting panels



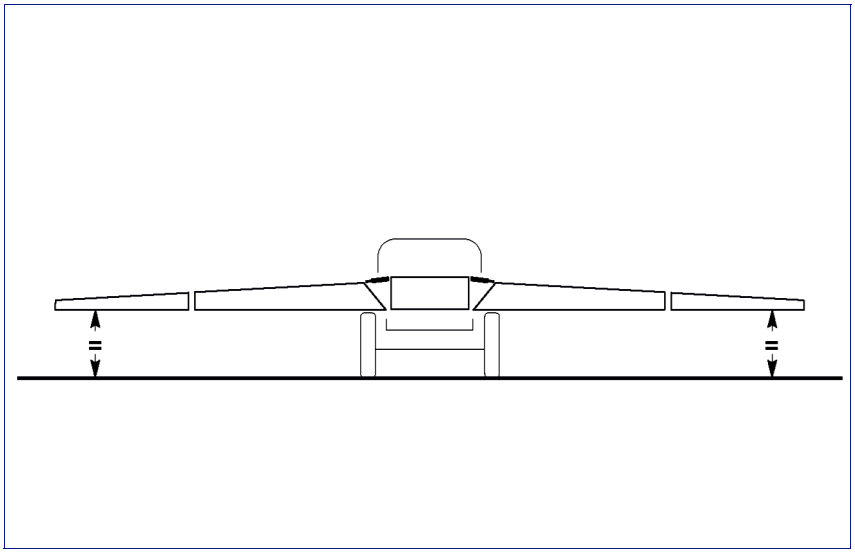
Rear light kits for trailed tanks with rear-reflecting panels



INSTALLATION OF THE VARIABLE GEOMETRY INDICATOR

Proceed in the way indicated.

1 - Activate controls for completely unfolding the boom and adjust variable geometry so that arms be perfectly horizontal.

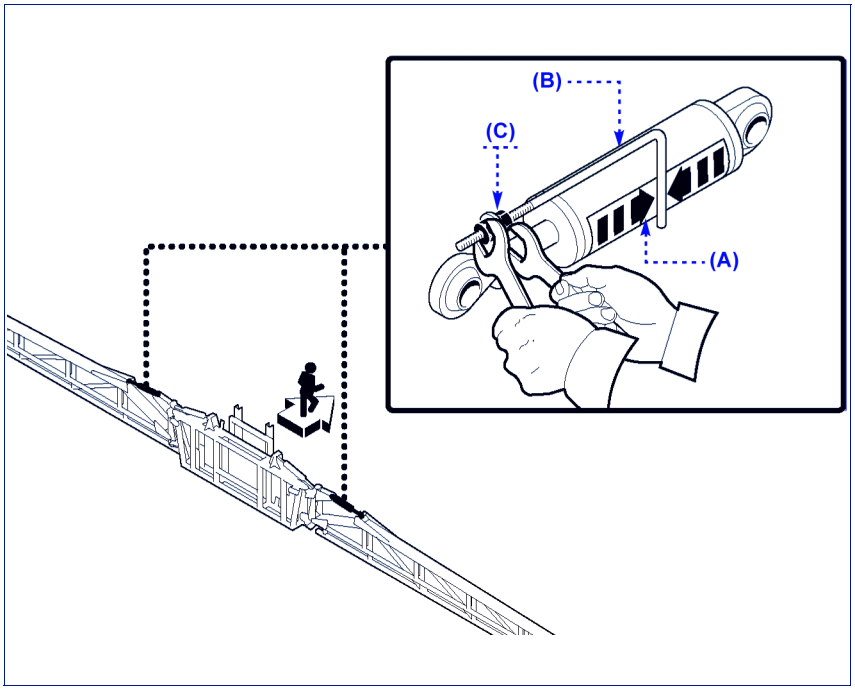


332.068

2 - Apply sticker **(A)** on the cylinder, so that the two arrows be centred with respect to indicator **(B)**.

Important

If the indicator position does not allow to apply sticker (A) on the cylinder, use bolts (C) to move it.

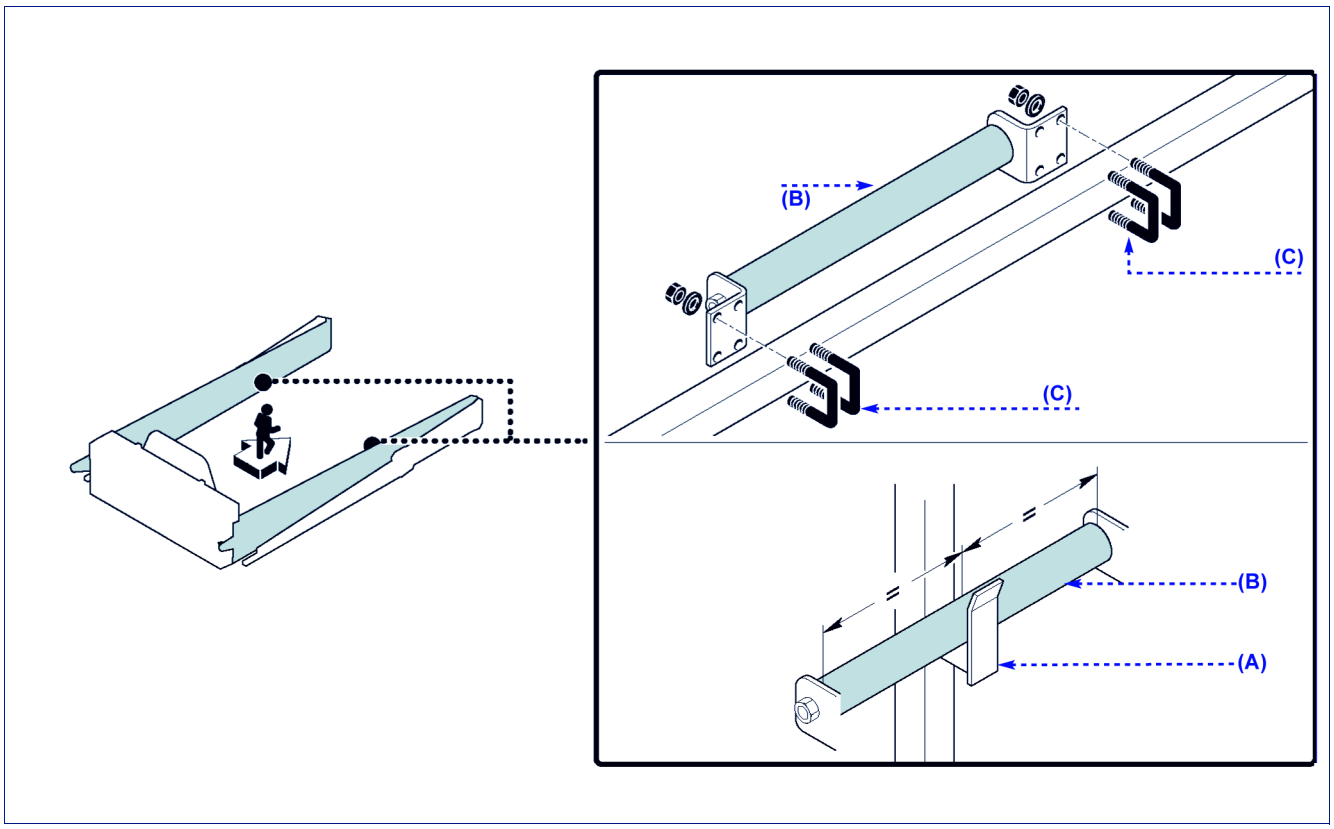


INSTALLATION OF SUPPORT ROLLER

Proceed in the way indicated.

1 - Bring boom arms closer to supports **(A)**.

2 - Assemble and fix support rollers **(B)** by means of U-bolts **(C)**, so that they be centred with respect to supports **(A)**.



332.068

INFORMATION ABOUT ADJUSTMENTS

INSTRUCTIONS FOR ADJUSTMENTS

Whoever makes the adjustments must prepare satisfactory safety conditions in advance in order to ensure their own safety and that of the operators involved.

ADJUSTMENT OF ARM ALIGNMENT (23 TO 28 METRE BOOMS)

Unfolding stage: proceed in the way indicated.

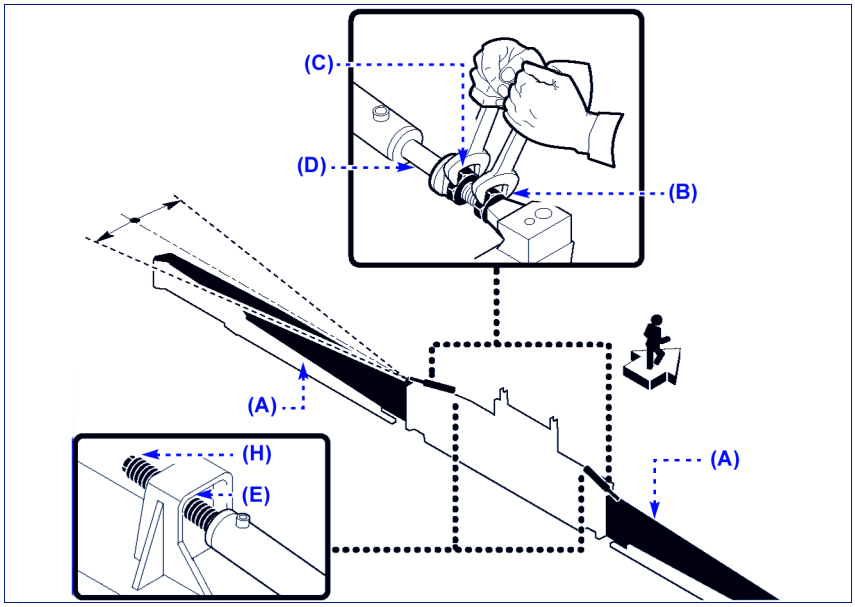
1 - Start up the controls to completely unfold the primary arms **(A)** of the boom and slightly fold them to reduce the thrust pressure on the cylinder.

2 - Loosen the lock nuts **(B-C)**, bring them close together and lock one against the other.

3 - Work on the lock nuts **(B-C)** to adjust the extension of the stem **(D)**.

4 - Completely unfold the primary arm **(A)** again and check that it is aligned with the middle frame.

5 - Put the lock nuts **(B-C)** back into their original position and lock them when adjustment is completed.



Important

If the required position cannot be reached, move one or more pairs of cylinder springs from area (E) to area (H) or viceversa, as required.

6 - Make the same adjustment on the other arm.

Folding stage: proceed in the way indicated.

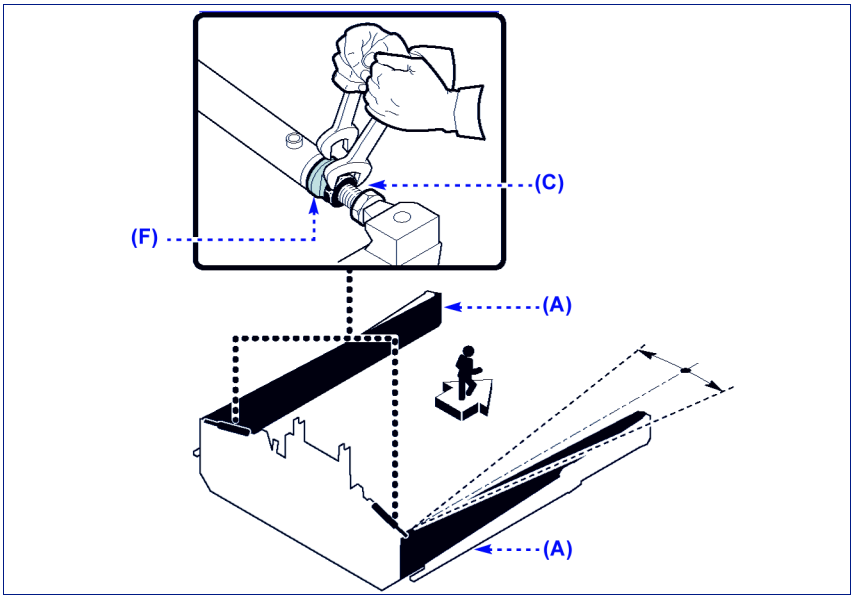
1 - Start up the controls to completely fold the primary arms **(A)** of the boom and slightly unfold them to reduce the thrust pressure on the cylinder.

2 - Loosen the lock nut **(C)** and adjust on the ring nut **(F)**.

3 - Completely fold the primary arm **(A)** again and check that it is properly resting on the support.

4 - Lock the lock nut **(C)** onto the ring nut **(F)** when adjustment is completed.

5 - Make the same adjustment on the other arm.

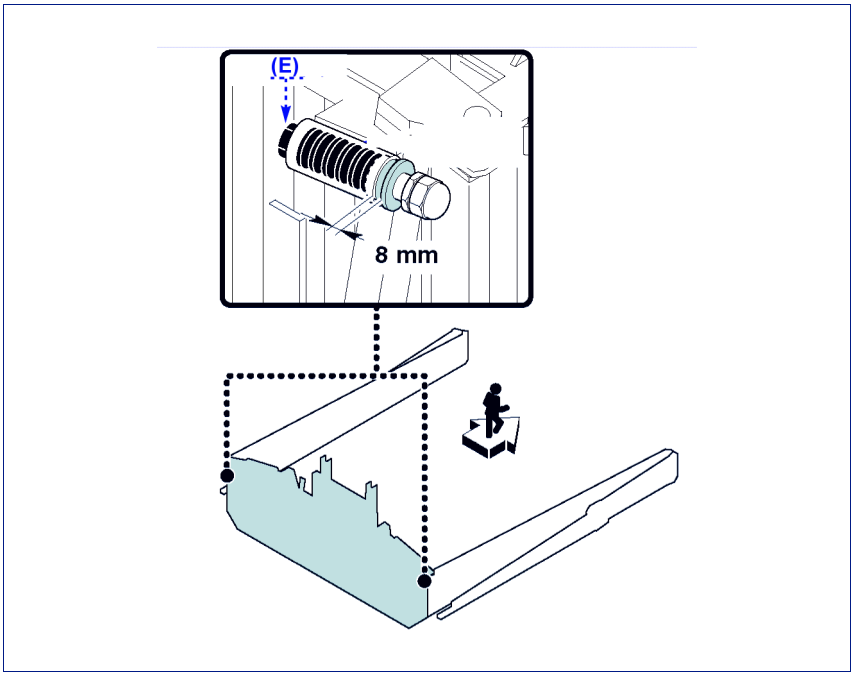


332.068

Shock absorber (G) adjustment: proceed in the way indicated.

1 - Start up the controls to completely fold the primary arms of the boom.

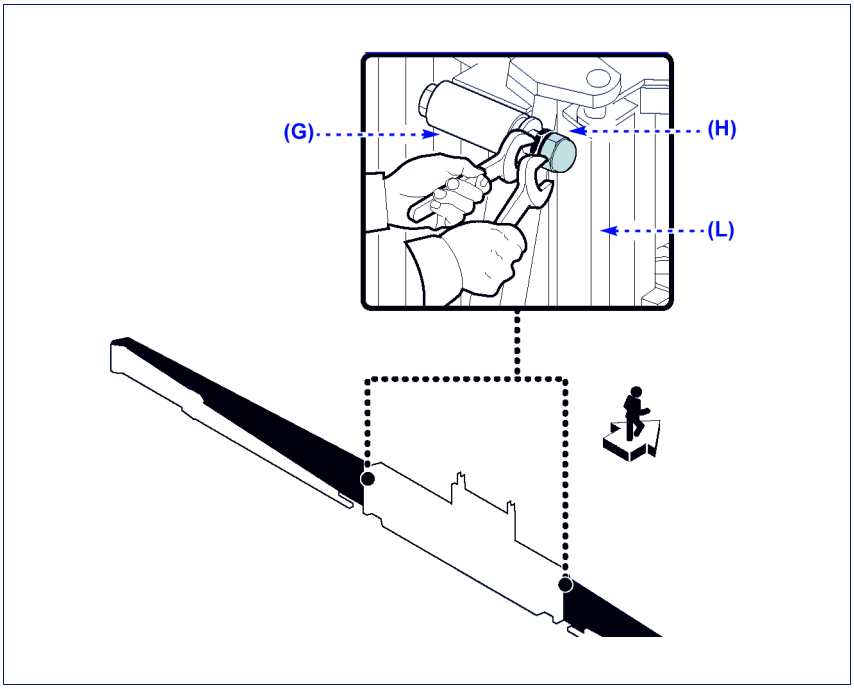
2 - Check that the distance indicated in the figure corresponds. If it does not, adjust it by means of nut **(E)**.



3 - Completely unfold the primary arm again and check that the nut **(H)** is resting on the limit stop **(L)** and slightly compresses the washers. Otherwise, complete the adjustment by means of nut **(H)** and lock nut.

4 - Lock the nut and lock nut **(H)** when adjustment is completed.

5 - Make the same adjustment on the other shock absorber.



332.068

ADJUSTMENT OF ARM ALIGNMENT (30 TO 33 METRE BOOMS)

Unfolding stage: proceed in the way indicated.

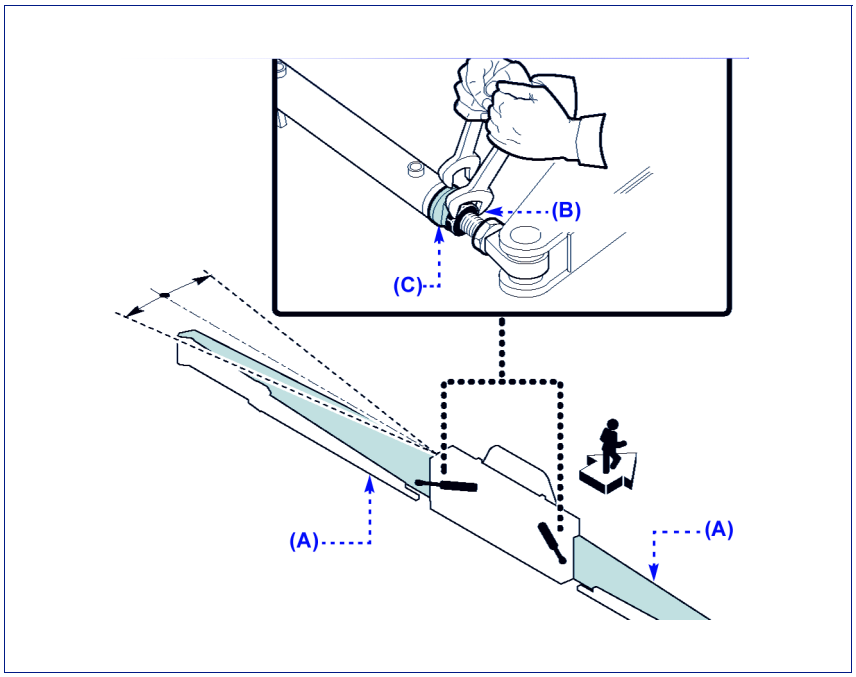
1 - 1 -Start up the controls to completely unfold the primary arms **(A)** of the boom and slightly fold them to reduce the thrust pressure on the cylinder.

2 - Loosen the lock nut **(B)** and adjust on the ring nut **(C)**.

3 - Completely unfold the primary arm **(A)** again and check that it is aligned with the middle frame.

4 - Lock the lock nut **(B)** onto the ring nut **(C)** when adjustment is completed.

5 - Make the same adjustment on the other arm.



Folding stage: proceed in the way indicated.

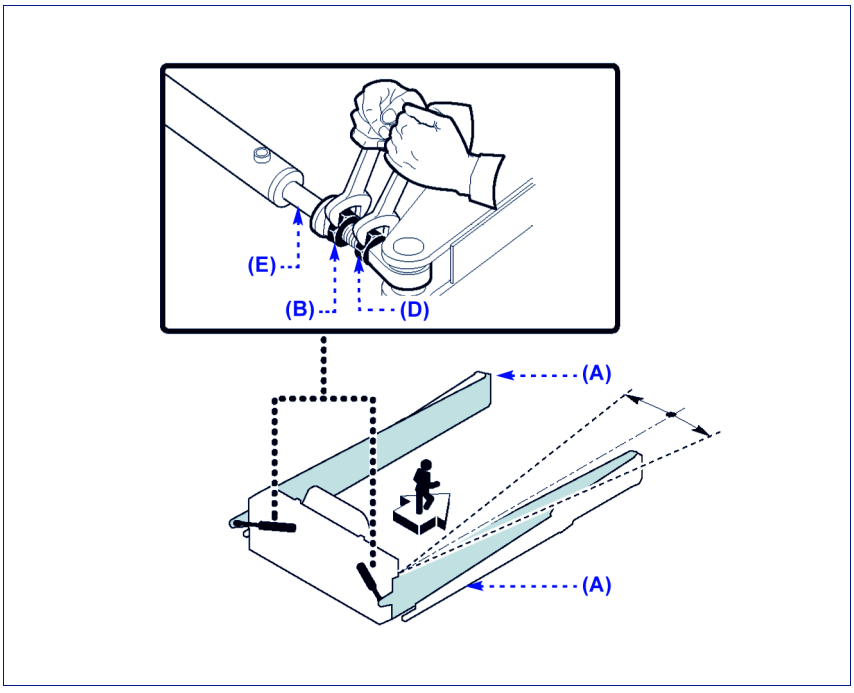
1 - Start up the controls to completely unfold the primary arms **(A)** of the boom and slightly fold them to reduce the thrust pressure on the cylinder.

2 - Loosen the lock nuts **(B-D)**, bring them close together and lock one against the other.

3 - Work on the lock nuts **(B-D)** to adjust the extension of the stem **(E)**.

4 - Completely unfold the primary arm **(A)** again and check that it is aligned with the middle frame.

5 - Put the lock nuts **(B-D)** back into their original position and lock them when adjustment is completed.



6 - Make the same adjustment on the other arm.

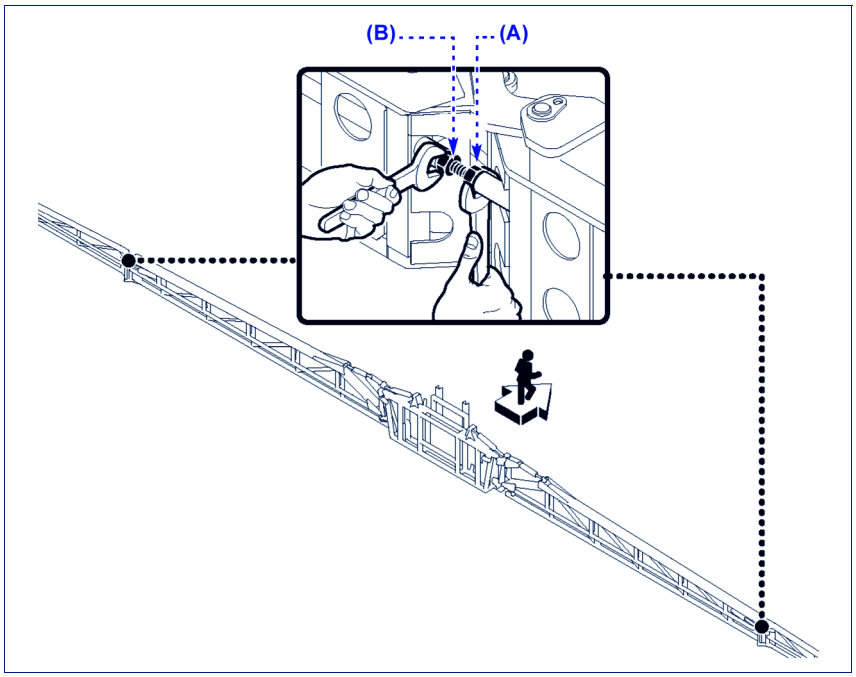
332.068

ADJUSTMENT OF EXTENSION ALIGNMENT

Proceed in the way indicated.

1 - Loosen the lock nuts **(A)** and act on the screws **(B)** so that the extensions are aligned with the primary arms.

2 - Tighten the lock nut **(A)** when the operation is completed.



ADJUSTMENT OF THE ARM TILT (G/FIX VERSION BOOMS)

Proceed in the way indicated.

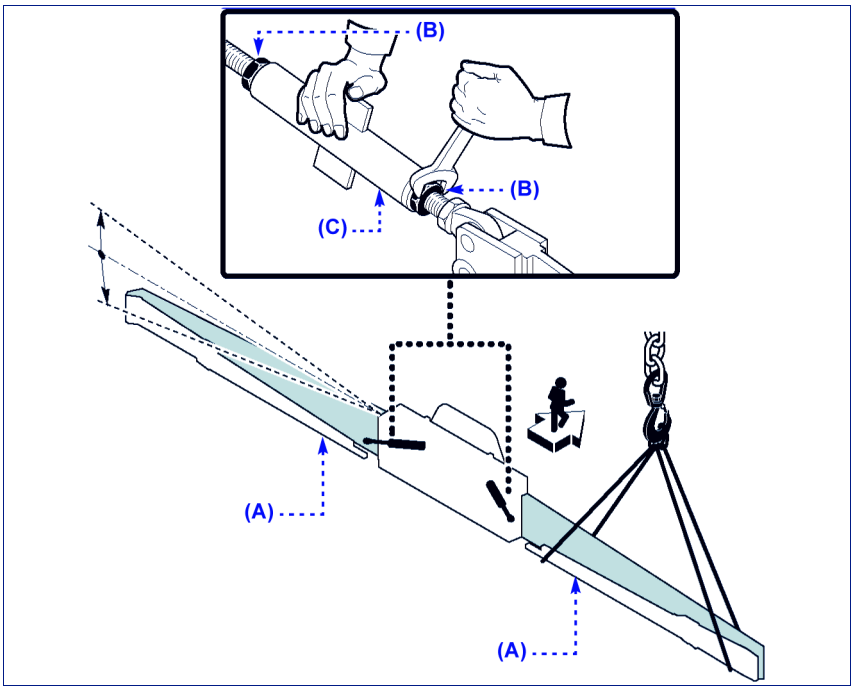
1 - Prepare a lifting device with an adequate lifting capacity and slightly lift the primary arm **(A)**.

2 - Loosen lock nuts **(B)** and adjust the arm tilt by means of register **(C)**.

3 - Lower the primary arm **(A)** and check the tilt.

4 - Tighten lock nuts **(B)** once the operation is completed.

5 - Adjust the other arm in the same way.



332.068

ADJUSTMENT OF EXTENSION FOLDING AND UNFOLDING CYLINDER (24 TO 28 METRE BOOMS)

Unfolding stage: proceed in the way indicated.

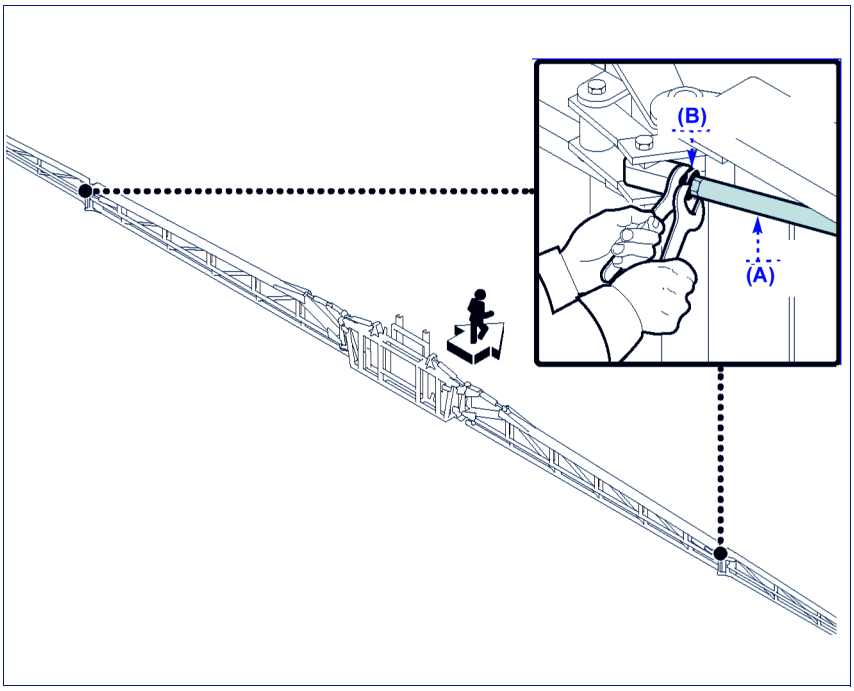
1 - Start up the controls to completely unfold the extensions of the boom and slightly fold them to reduce the thrust pressure on the cylinder.

2 - Loosen lock nut **(A)**.

3 - Use the cylinder stem **(B)** to adjust the extension.

4 - Completely unfold the extension again.

5 - Check that the thrust force of the cylinder prevents the articulation between the primary arm and the extension from moving.



Important

If the thrust force increases during unfolding, it will decrease during folding. Therefore try to choose the mean between the two extremes.

6 - Tighten the lock nut **(A)** when the operation is completed.

Folding stage: proceed in the way indicated.

1 - Start up the controls to completely fold the extensions of the boom and slightly unfold them to reduce the thrust pressure on the cylinder.

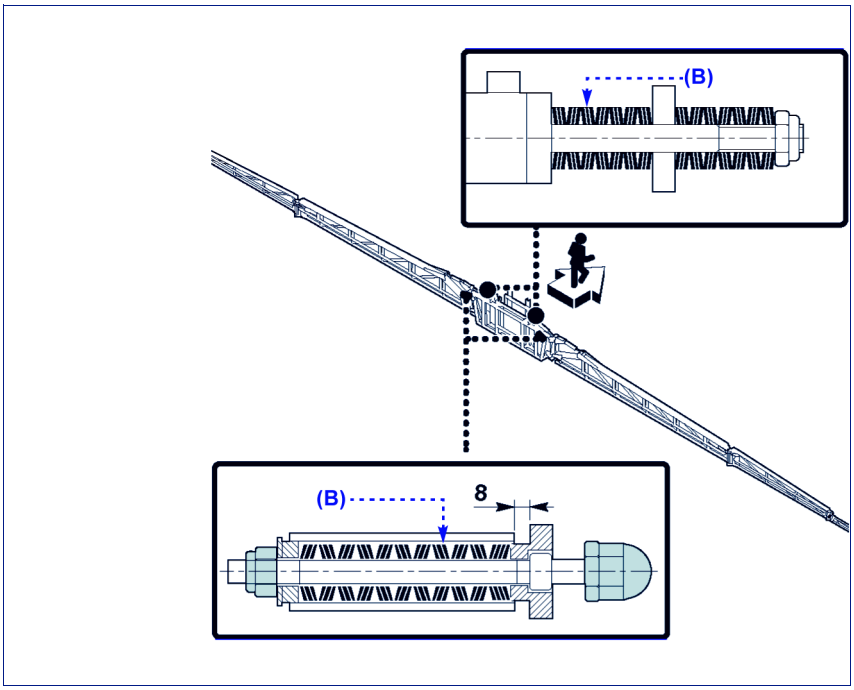
2 - Loosen lock nut **(A)**.

3 - Use the cylinder stem **(B)** to adjust the extension.

4 - Completely fold the extension again.

5 - Check that the thrust force of the cylinder prevents the articulation between the primary arm and the extension from moving.

6 - Tighten the lock nut **(A)** when the operation is completed.



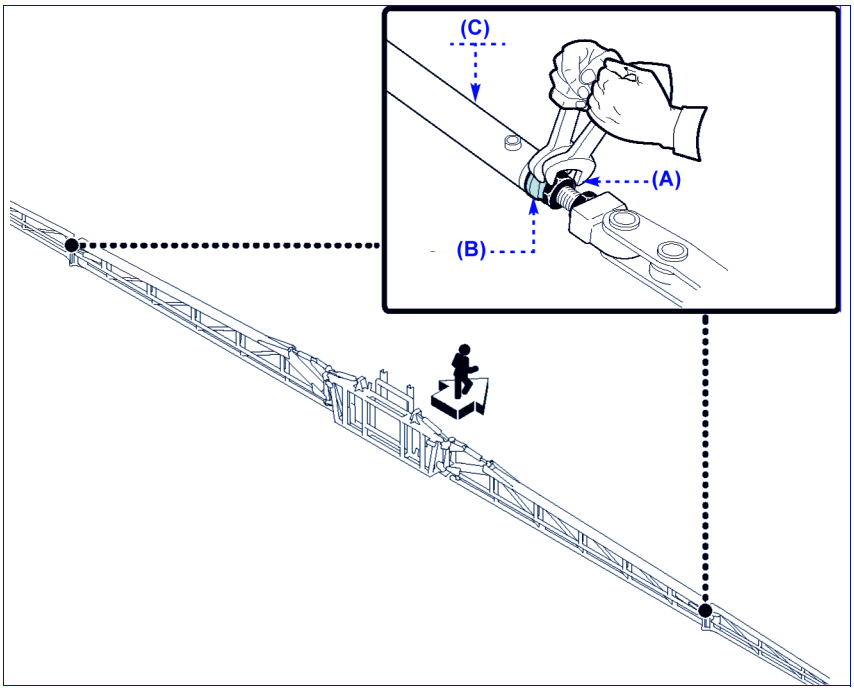
7 - Make the same adjustment on the other extension.

332.068

ADJUSTMENT OF EXTENSION FOLDING AND UNFOLDING CYLINDER (27 TO 33 METRE BOOMS)

Adjustment should be carried out both in the folding and unfolding phase.

Unfolding stage: proceed in the way indicated.



1 - Start up the controls to completely unfold the extensions of the boom and slightly fold them to reduce the thrust pressure on the cylinder.

2 - Loosen lock nut **(A)** and placering nut **(B)** so that it rests on cylinder **(C)**.

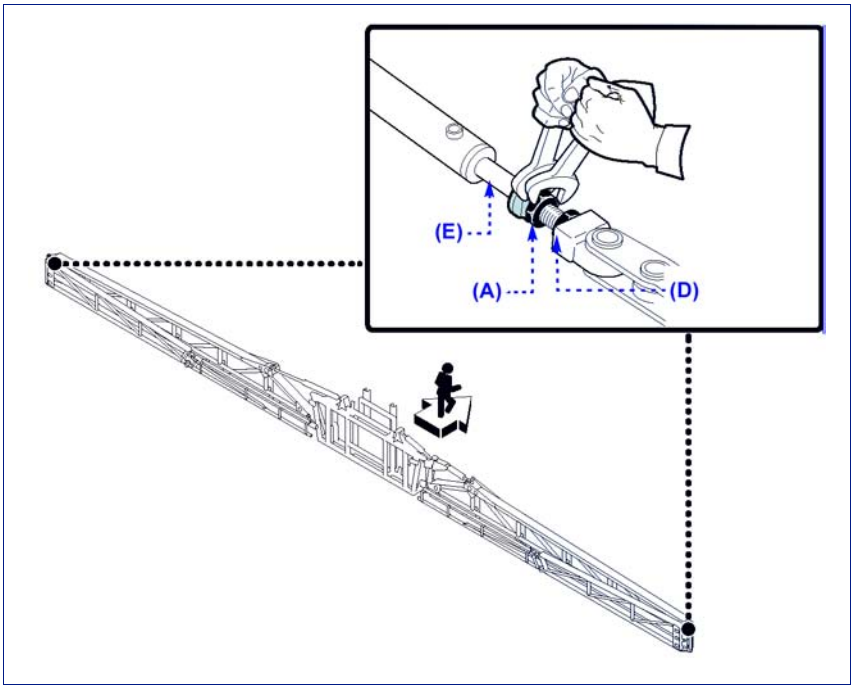
3 - Completely unfold the extension again.

4 - Check that the thrust force of the cylinder prevents the articulation between the primary arm and the extension from moving.

5 - Lock the lock nut **(A)** onto the ringut **(B)** when adjustment is completed.

6 - Make the same adjustment on the other extension.

Folding stage: proceed in the way indicated.



1 - Start up the controls to completely fold the extensions of the boom and slightly unfold them to reduce the thrust pressure on the cylinder.

2 - Loosen the lock nuts **(A-D)**, bring them close together and lock one against the other.

3 - Work on the lock nuts **(A-D)** to adjust the extension of the stem **(E)**.

4 - Completely fold the extension again.

5 - Check that the thrust force of the cylinder prevents the articulation between the primary arm and the extension from moving.

6 - Put the lock nuts **(A-D)** back into their original position and lock them when adjustment is completed.

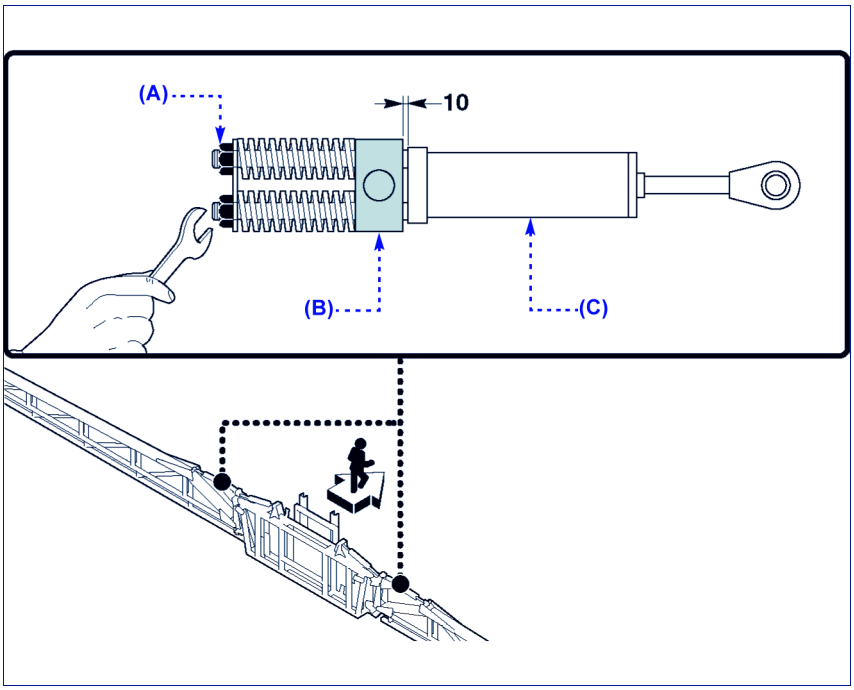
7 -Make the same adjustment on the other extension.

332.068

VARIABLE GEOMETRY SPRING ADJUSTMENT (24 TO 28 METRE BOOMS)

1 - Activate controls for unfolding the boom.

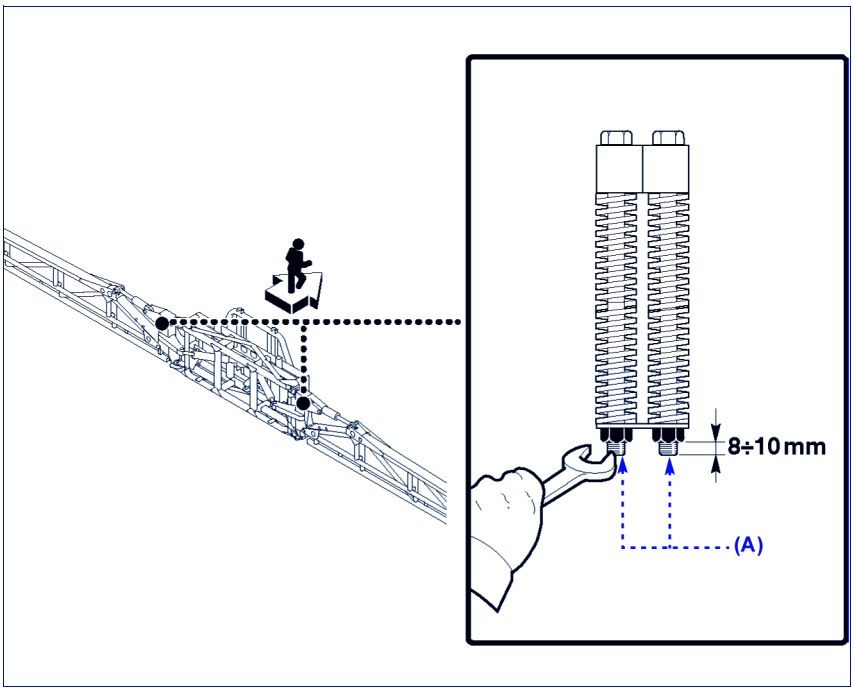
2 - Adjust both nuts **(A)** until the distance between dowel **(B)** and cylinder **(C)** is 10 mm.



VARIABLE GEOMETRY SPRING ADJUSTMENT (30 TO 33 METRE BOOMS)

1 - Activate controls for unfolding the boom.

2 - Use nuts **(A)** in order to have the thread protruding by 8-10 mm.



332.068

INFORMATION ABOUT USE

OPERATING ADVICE

While in use, disengage the self-levelling devices locking device so as to allow the spraying boom to swing and keep it parallel to the ground also on slopes and uneven ground.

The self-levelling device.s locking device should be engaged when using the equipment with the boom not symmetrically folded and while transporting the equipment itself.

Important

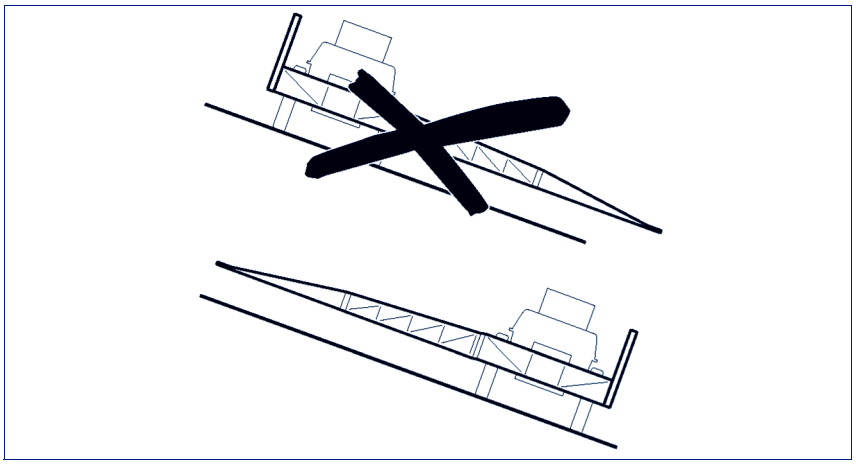
Information on hydraulic connections is to be found in the "Hydraulic system" diagram. The boom unfolding and folding procedure, variable depending on the type of control installed, is de- scribed in "Boom Unfolding and Folding".

The information mentioned is not published in the manual if the equipment is installed on units belonging to other manufacturers.

BOOM FOLDING AND UNFOLDING

Important

The environmental and territorial conditions of the area where you plan to operate have to be checked every time the equipment is set up for spraying.



Evaluate the following requirements.

- Check whether or not there are electric lines and assess the risks of contact with the spraying boom.
- Check the gradient of the land so as to evaluate the most suitable conditions for operating in safety. Always bear in mind the maximum gradient limits allowed.
- In the event of spraying with progress transversal to the gradient, carefully follow the instructions given:
  1) Boom unfolding stage: always unfold the one uphill first, and then the one downhill.
  2) Boom folding stage: always fold the one downhill first, and then the one uphill.

Important

Lock the self-levelling device (if present) before you unfold and fold the arms.

- Never work if just the downhill arm is open.
- Keep the forward speed moderate (8-10 km/h max) so as to prevent the boom from swinging and getting uneven spraying.

Important

If it is windy, also stay below the maximum allowed limits (5 m/sec) so as to prevent the product from being dispersed in the surrounding environment. Keep the boom at a lower height and increase the volume of the droplets.

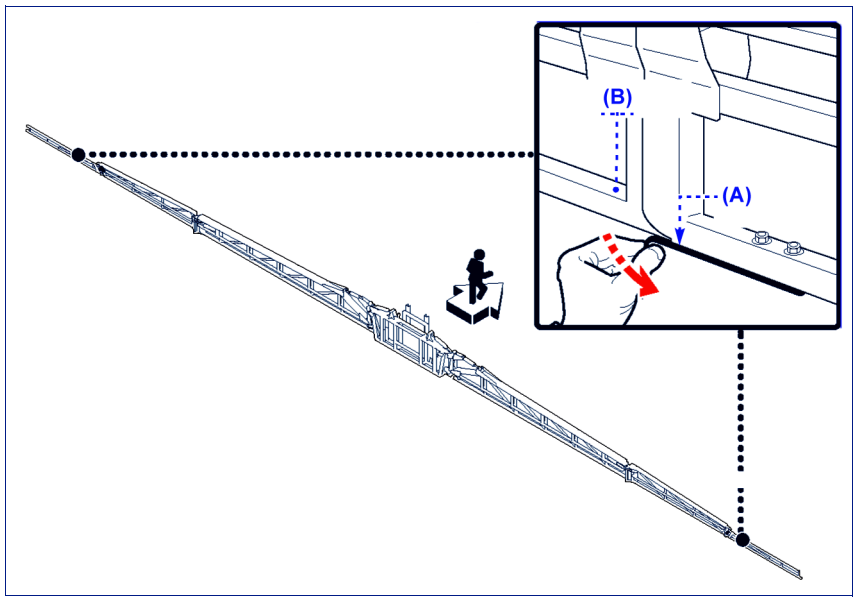
Caution - Warning

Prevent strangers from approaching the working area when the machine is in use. Should it become necessary, stop it immediately and make the peo- ple found in the risk area move away.

332.068

Only for booms with folding end-piece (optional)

Pull bracket **(A)** to unlock and manually fold endpiece **(B)**.

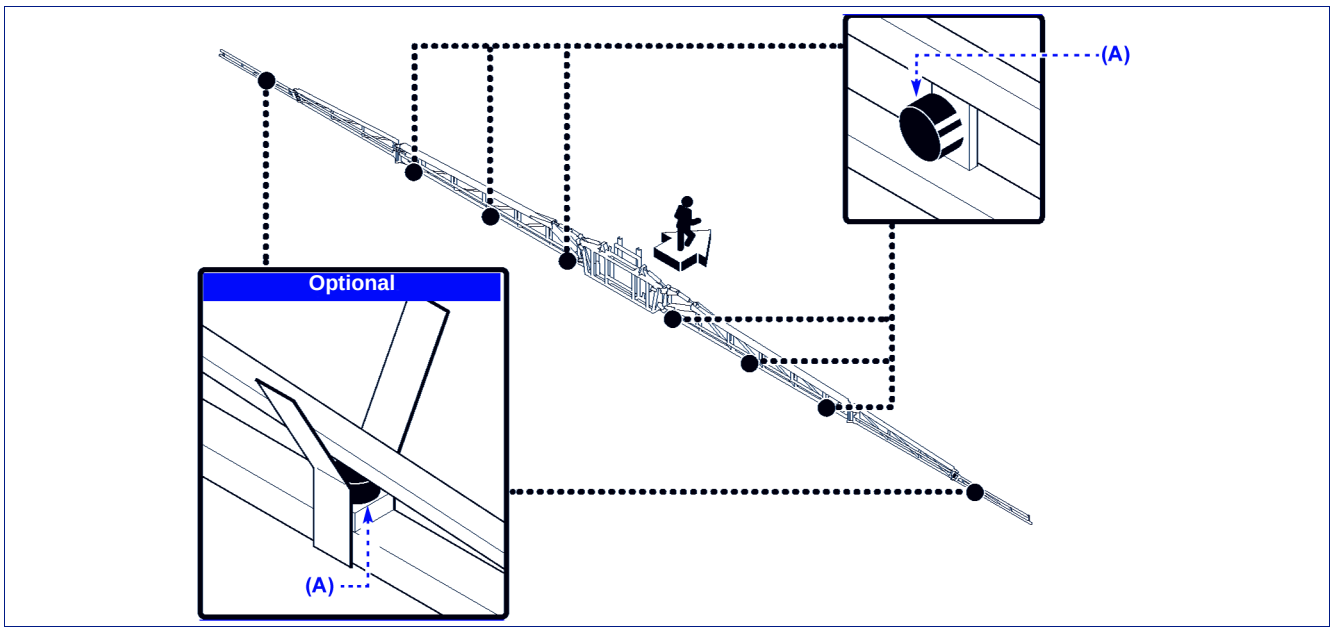


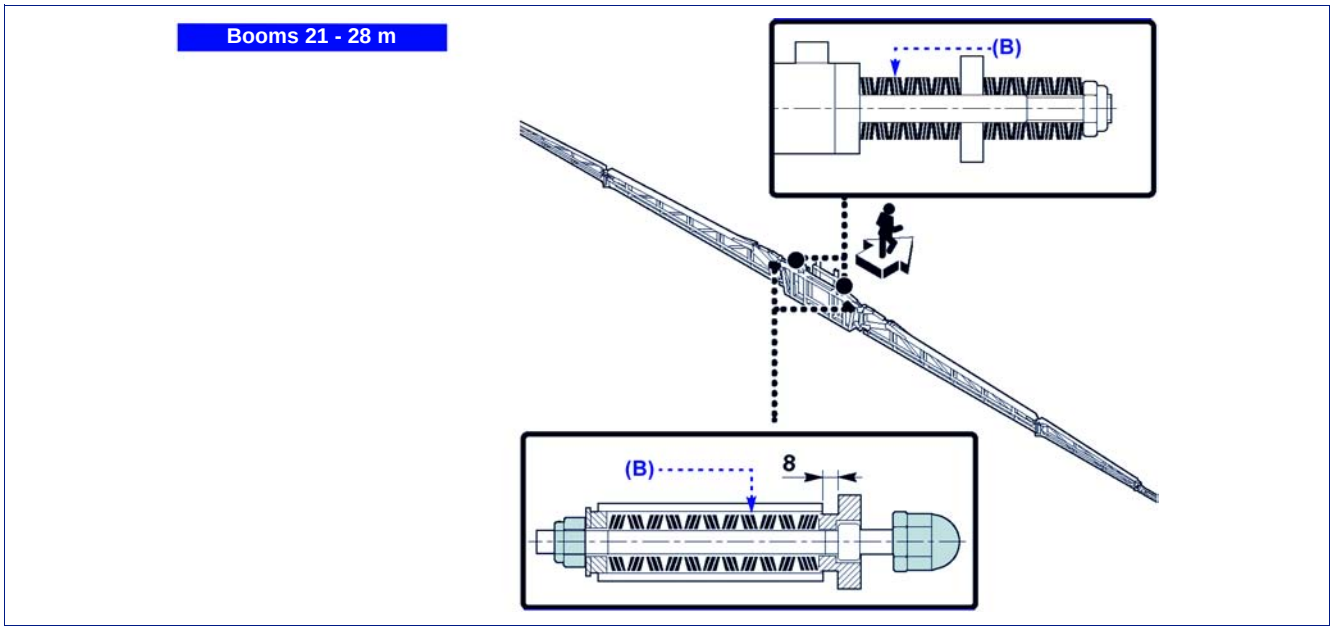
INFORMATION ABOUT MAINTENANCE

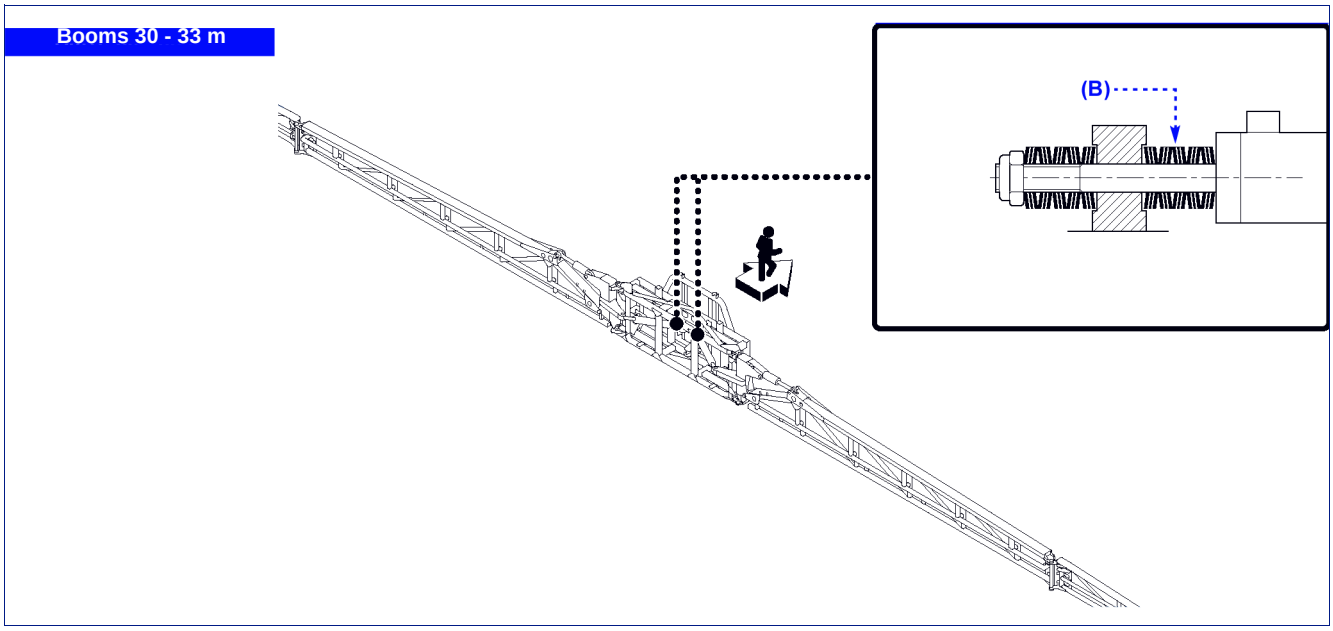
MAINTENANCE SCHEDULE TABLE

Interval	Component	Type of intervention	Operation	Page
Each working day and with each interval higher than one hour	Jets and nozzles	Clean and rinse the water supply	Make the clean water come out of the nozzles	
Each working day	Jets and nozzles	Check operation	Clean and replace if necessary	See “Cleaning nozzles”, page 39
	Jets, nozzles antidrip valve	Check installation	Install properly	
	Complete equipment	Clean and wash	Use a clean jet of water	
Every 40 hours of work	Complete equipment	Check the greased parts	Grease if necessary	See “Lubrication points diagram” page 39
		Check the condition and tightness of the screws	Tighten and replace if necessary	
		Check the painted surfaces	Touch up the parts the paint has come off of if necessary	
	Boom limit stop bumper (**A**) (see figure)	Check its condition	Replace if necessary	
	Endpiece articulation springs	Check its effectiveness	Replace if necessary	
	Arm shock absorber Belleville washers	Check its effectiveness	Replace if necessary.	

332.068

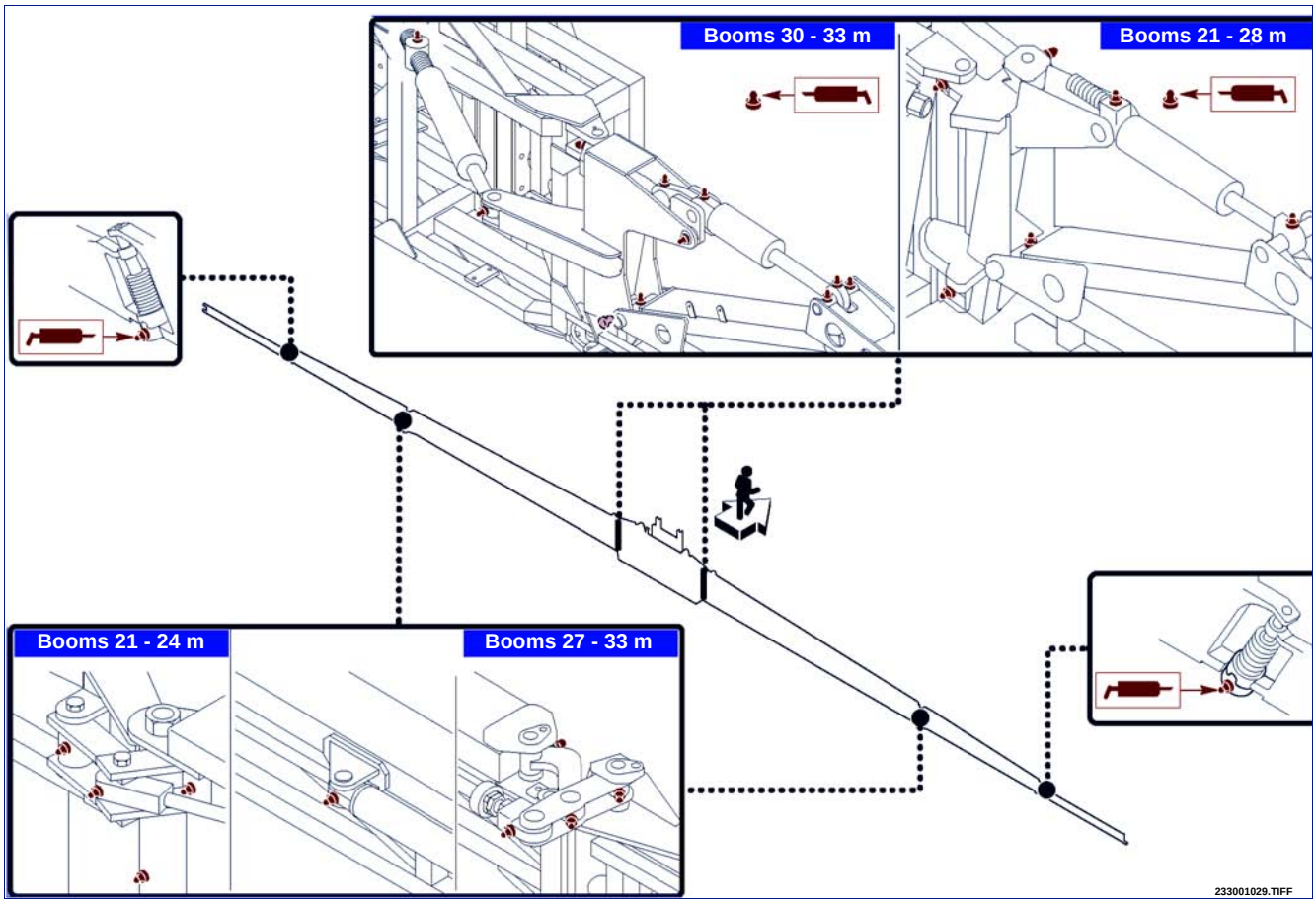






332.068

LUBRICATION POINTS DIAGRAM



Use PERSIAN POLIGREASE 2 grease

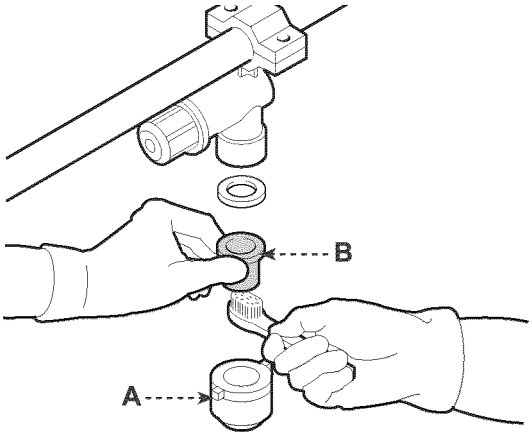
CLEANING NOZZLES

1 - Wear protective gloves for this operation. Disassemble the bayonet (**A**) and nozzle (**B**).

2 - Clean the nozzle with a jet of air and a small soft-bristle brush.

Important

Do not use pointed or sharp objects so as to not damage the hole of the nozzle.



332.068

PROLONGED INACTIVITY

If the equipment is not used for a long time, adopt the procedures given below.

1 - Perform the scheduled maintenance (see page 37).

2 - Perform the general cleaning (see page 37).

3 - Put in antifreeze fluid or completely empty the hoses in order to prevent the components (pump, control unit, filters, hoses, etc.) from breaking in the case of severe temperatures.

4 - Disconnect the hoses from the pressure gauges.

5 - Grease all the components provided with a grease nipple.

6 - Place the equipment in a sheltered place accessible only to the operators.

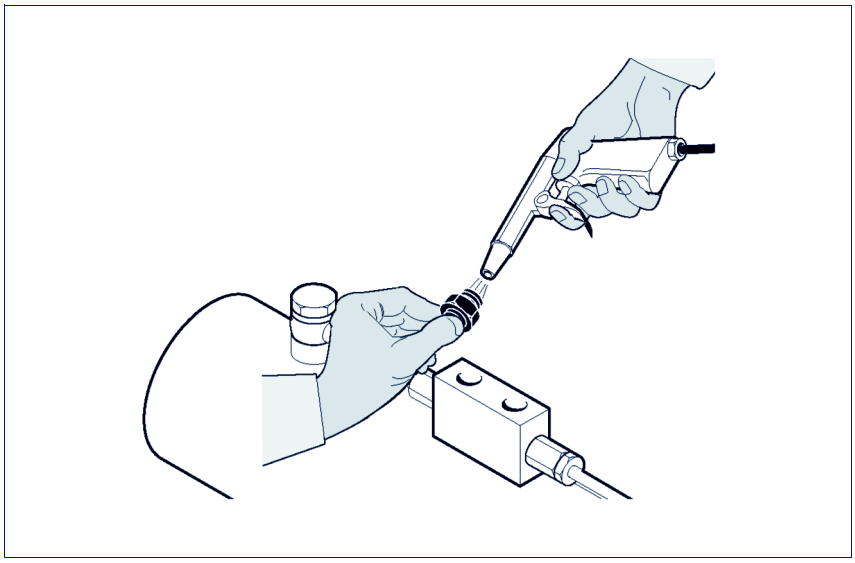
TROUBLESHOOTING

TROUBLES, CAUSES, REMEDIES

Trouble: the boom unfolds halfway and then stops.

Cause: impurities in the calibrated joints of the jacks.

Cures: disassemble the joints and clean them.



Trouble: the boom is not aligned when unfolded.

Cause: unfolding cylinder not adjusted.

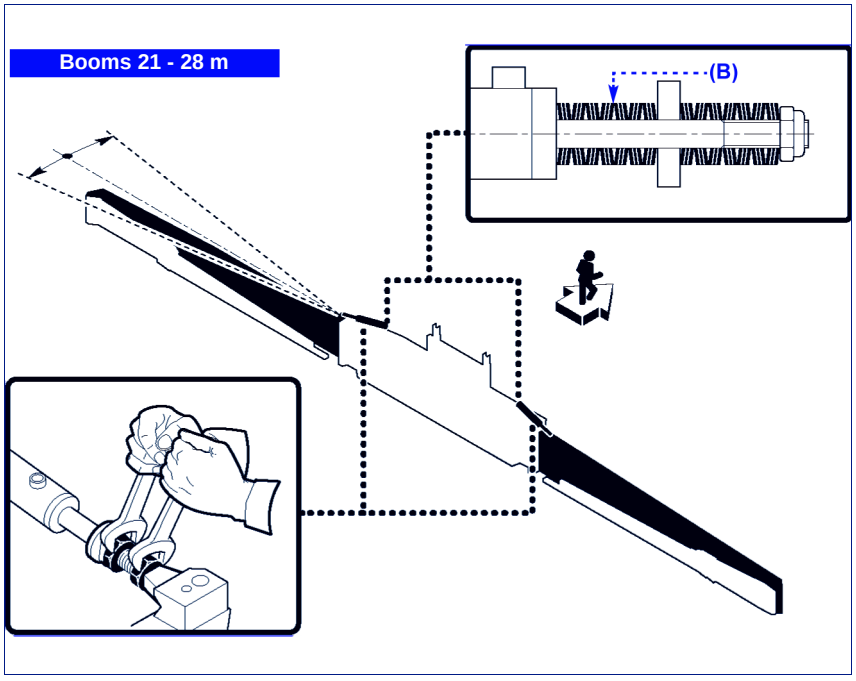
Cures: adjust the alignment of the arms (see “Arm alignment adjustment”)

Cause: Belleville washers **(B)** failure.

Cures: Check and replace Belleville washers **(B)** if necessary.

Cause: arm case-hardened bushing failure

Cures: replace bushings (see “Replacement of arm case-hardened bushings”).



332.068

Trouble: the boom is not aligned when unfolded.

Cause: unfolding cylinder not adjusted.

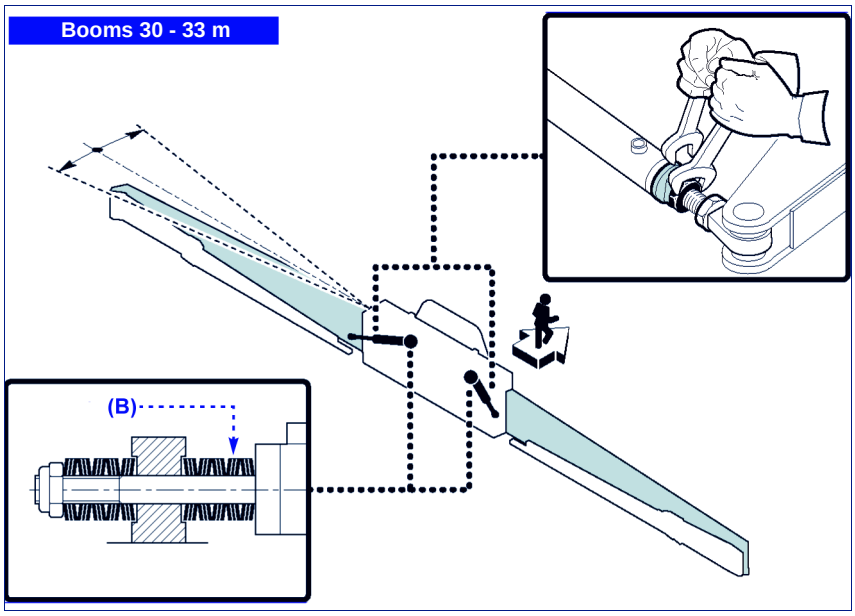
Cures: adjust the alignment of the arms (see “Arm alignment adjustment”)

Cause: Belleville washers **(B)** failure.

Cures: Check and replace Belleville washers **(B)** if necessary.

Cause: arm case-hardened bushing failure

Cures: replace bushings (see “Replacement of arm case-hardened bushings”).



Trouble: the extensions are not aligned when unfolded.

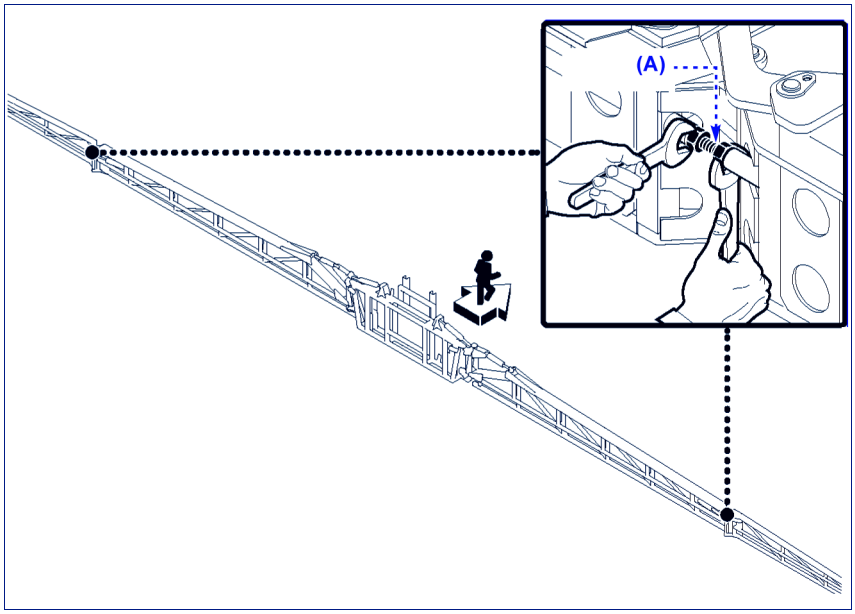
Cause: stop bolt not adjusted.

Cures: work on the screw **(A)** to adjust the alignment of the extensions (see “Adjustment of extension alignment").

Trouble: the complete extension moves as to the primary arm with the boom unfolded and/or folded.

Cause: extension unfolding cylinder not adjusted.

Cures: (see “Adjustment of extension folding and unfolding cylinder”).



332.068

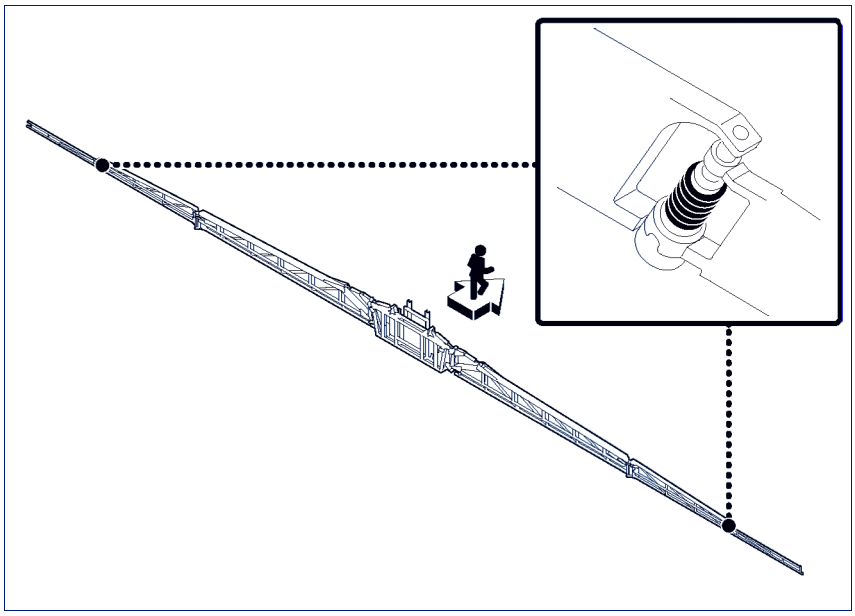
Trouble: the endpiece extension is not steady enough with the boom unfolded.

Cause: the articulation is loose.

Cures: compress the spring or replace it if it is no longer effective (see “Replacement of articulation spring and bushing”).

Cause: the self-lubricating bushing of the endpiece extension is worn.

Cures: replace the bushing (see “Replacement of arm case-hardened bushings").



INFORMATION ABOUT REPLACEMENTS

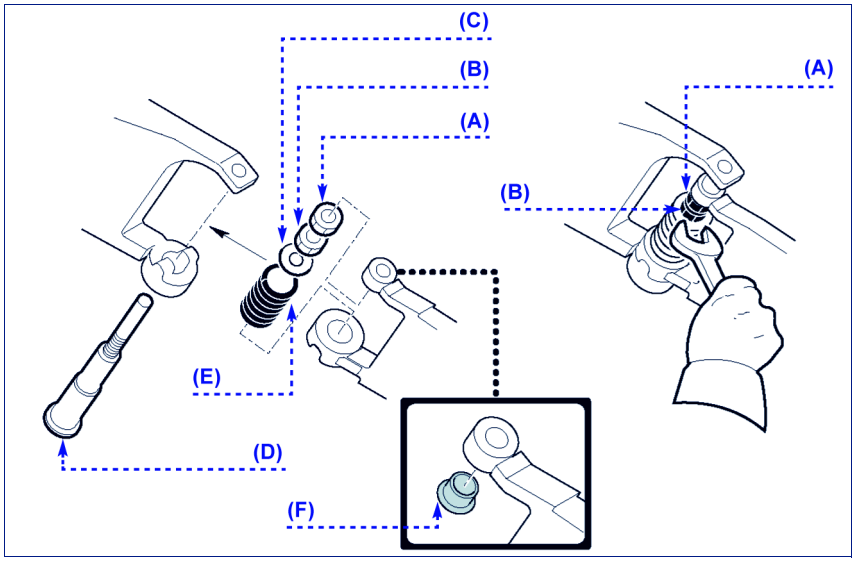
REPLACEMENT OF ARTICULATION SPRING AND BUSHING

Proceed in the way indicated.

1 - Unscrew the nuts **(A - B)** and extract the washer **(C)**.

2 - Remove the pin **(D)** and the spring **(E)**.

3 - Check the efficiency of the spring **(E)** and the wear of the bushing **(F)** and, if necessary, replace them.



Important

The self-lubricating bushing (F) is to be inserted by apply pressure with the limit stop facing downwards and locked with LOCTITE in order to ensure it is secure.

4 - Reassemble the parts **(D - E - C - B - A)** as shown in the figure.

5 - Tighten the nut **(B)** until you get the right compression of the spring **(E)**.

6 - Tighten the lock nut **(A)** when the operation is completed.

332.068

REPLACEMENT OF ARM CASE-HARDENED BUSHINGS

Proceed in the way indicated.

1 - Prepare a lifting device with an adequate lifting capacity to support the primary arm **(A)**.

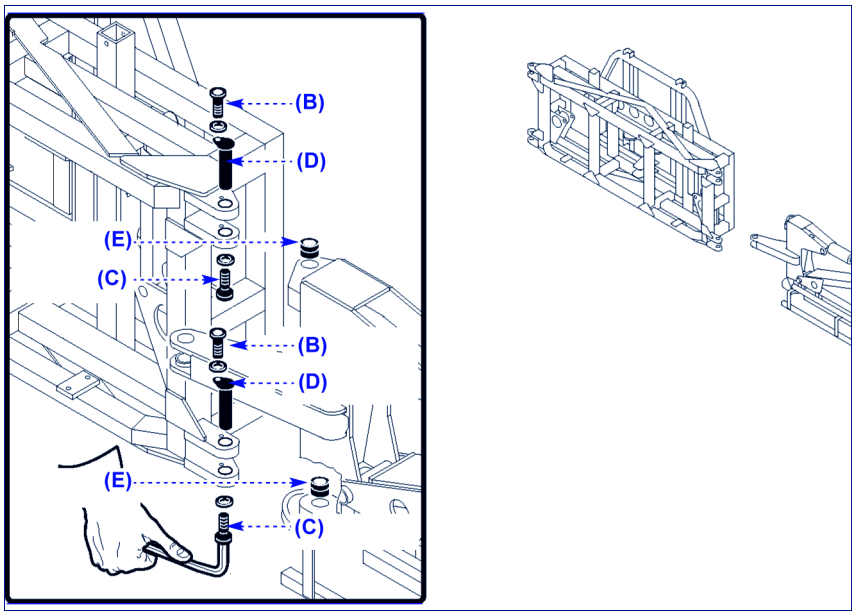
2 - Loosen screws **(B-C)** and remove pins **(D)**.

3 - Remove primary arm **(A)**.

4 - Remove the case-hardened bushings **(E)** and replace them.

5 - Reinstall primary arm **(A)**.

6 - Reassemble pins **(D)** and screws **(B-C)** once the operation is completed.



DISPOSING OF THE EQUIPMENT

Important

This intervention has to be carried out by skilled technicians and in accordance with the current safety regulations. Do not disperse in the environment non-biodegradable products, lubricating oils and non-ferrous components (rubber, PVC, resins, etc.). Dispose of them according to the local regulations in force.

332.068