

# SPRAYING BOOM

user manual

Serial number

Edition 0  
11 - 2013

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### IMPORTANT SAFETY NOTE

The information published in this booklet regards the pointed out with relevant symbols in order to safeguard operational aspects of the operator unit installed on the people from risks. Remember that prudence is irreplaceable. machine. It is however

necessary that you carefully read the Safety is also in the hands of all the operators who interact general safety regulations published in Booklet 1 and those with the machine.

## 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.

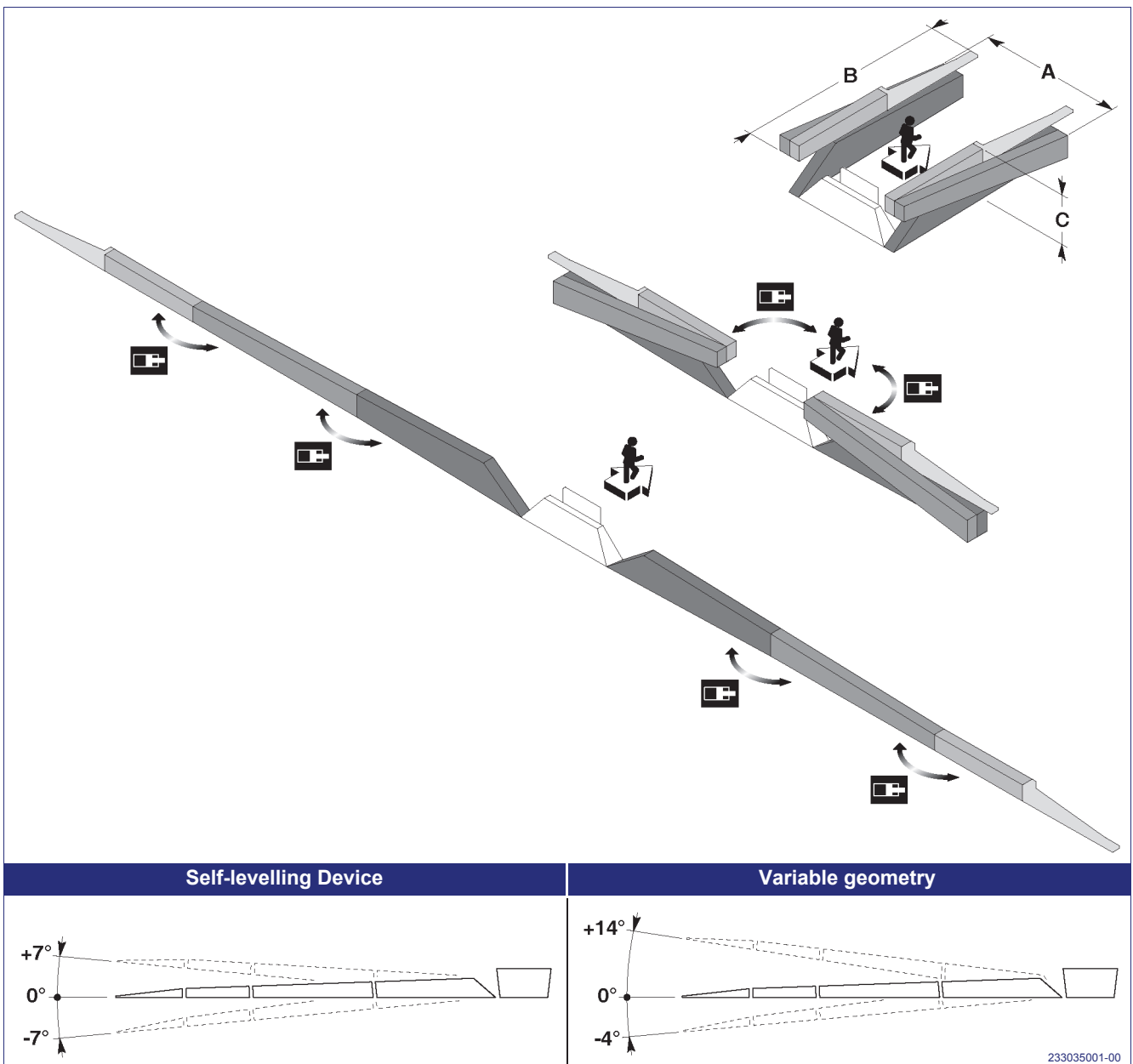
The equipment is divided into folding boom sections in order to adapt it to the spraying width and so as to reduce the space occupied during transfer.

**TECHNICAL SPECIFICATIONS**

Width (m) L	Size			(*) Weight (kg)	Qty. Jets (500 mm)
	A mm	B mm	C mm		
36	2980	6200	1900	1760	72
40	2980	7700	1900	2060	80
42	2980	7700	1900	2080	84

(\*) Boom with self-levelling devices on maximum configuration.

**Technical specification diagram**

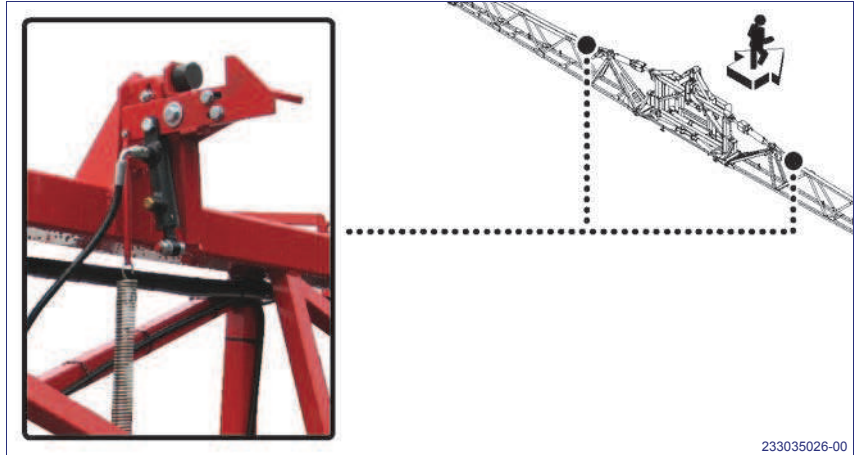


**FITTINGS ON DEMAND**

**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**

**Device locking arms:** Prevents the removal of the arms when the bar is closed. It is equipped with a hydraulic opening to open automatically during the operations of opening and closing of the arms, and a spring lock to ensure safety in the event of a fault in the hydraulic system.



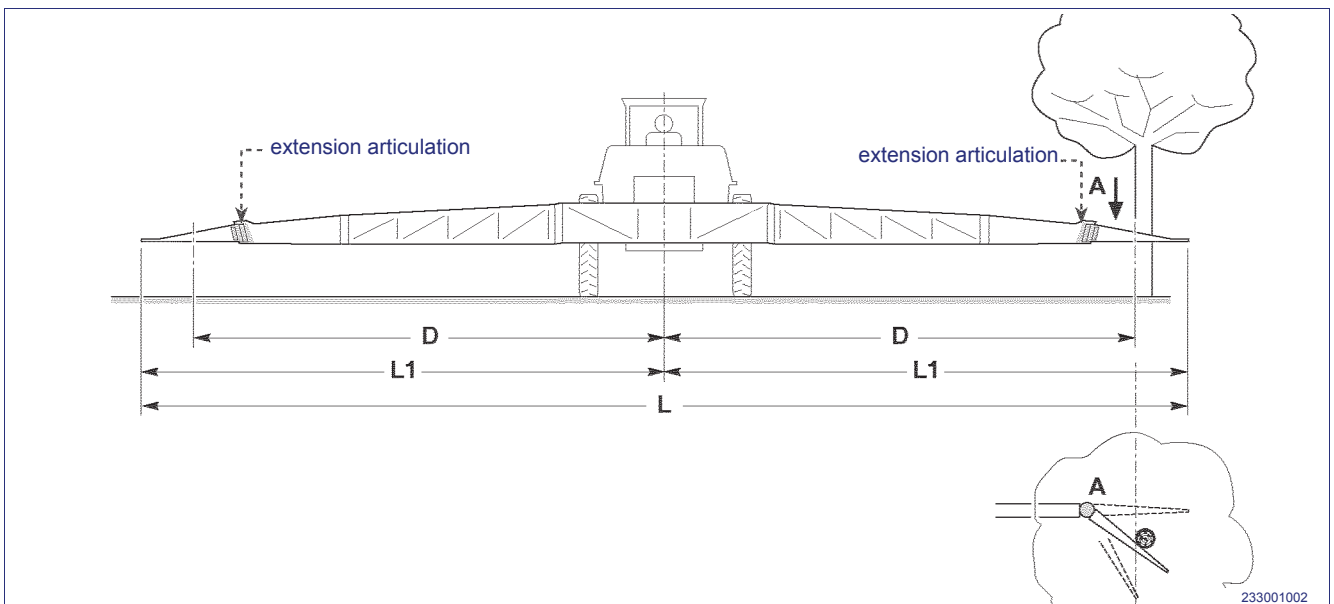
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**Extension articulation:** to allow the end of the extension to turn so as to get past obstacles. In order to get past the obstacle without damaging the equipment, it is necessary to keep a distance higher than the value given in the table.

**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.

**Safety distance table**

Width (m) <i>L</i>	Width <i>L1</i>	Safety distance <i>D</i>
36	18	16,2
40	20	18
42	21	18,9



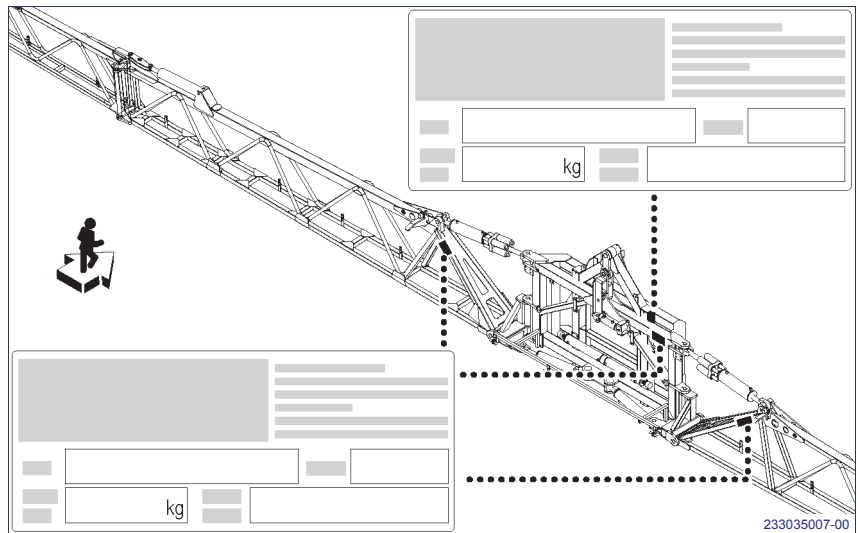
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**Safety distance diagram**

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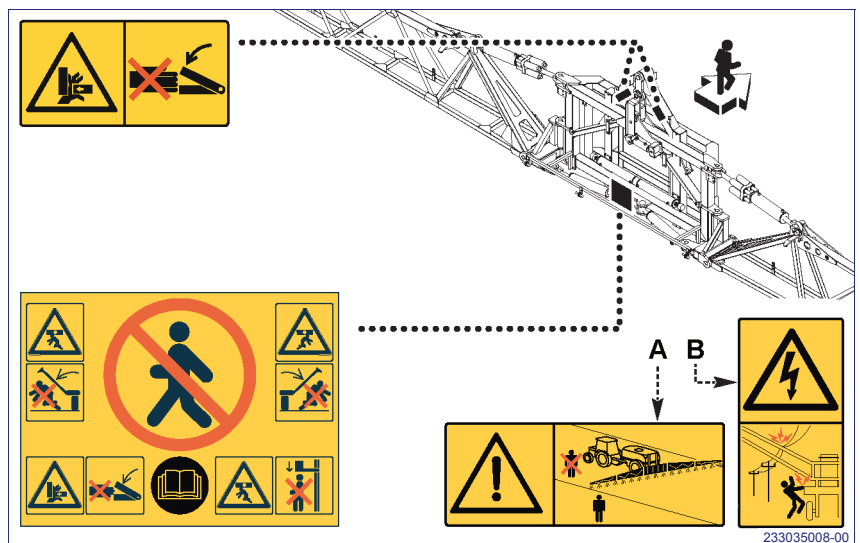
### IDENTIFICATION PLATE POSITION

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**

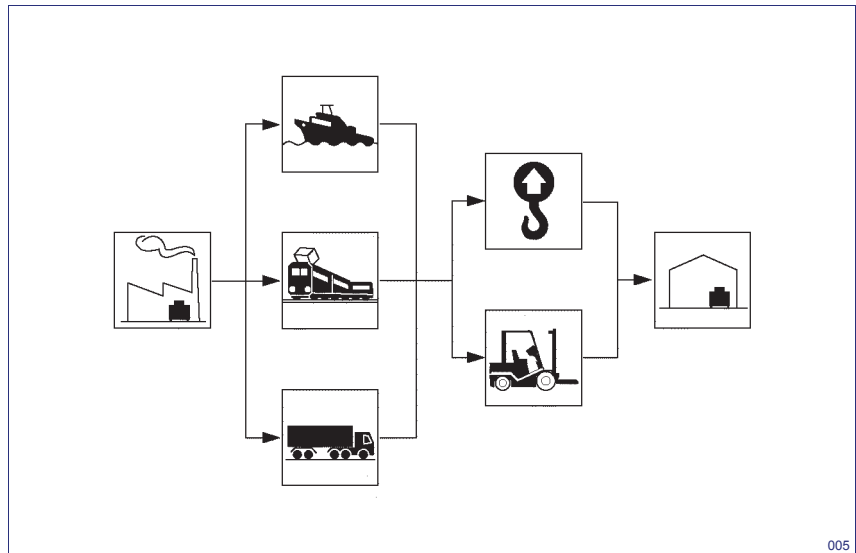
Comply with the information provided by the manufacturer, found on the equipment and in the instruction manual, when carrying out handling and loading operations.

**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.

**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 untimely shifting.



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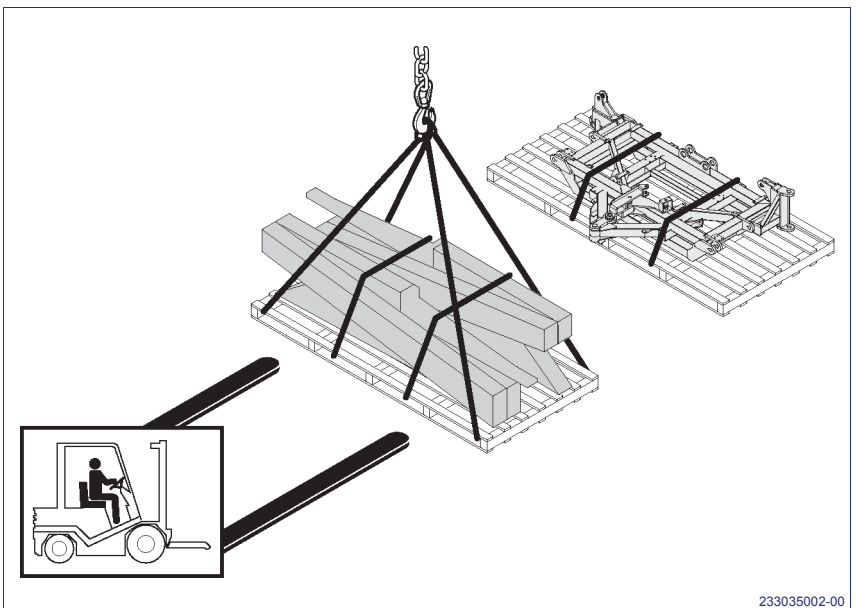
**HANDLING AND LIFTING**

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.**



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## 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.

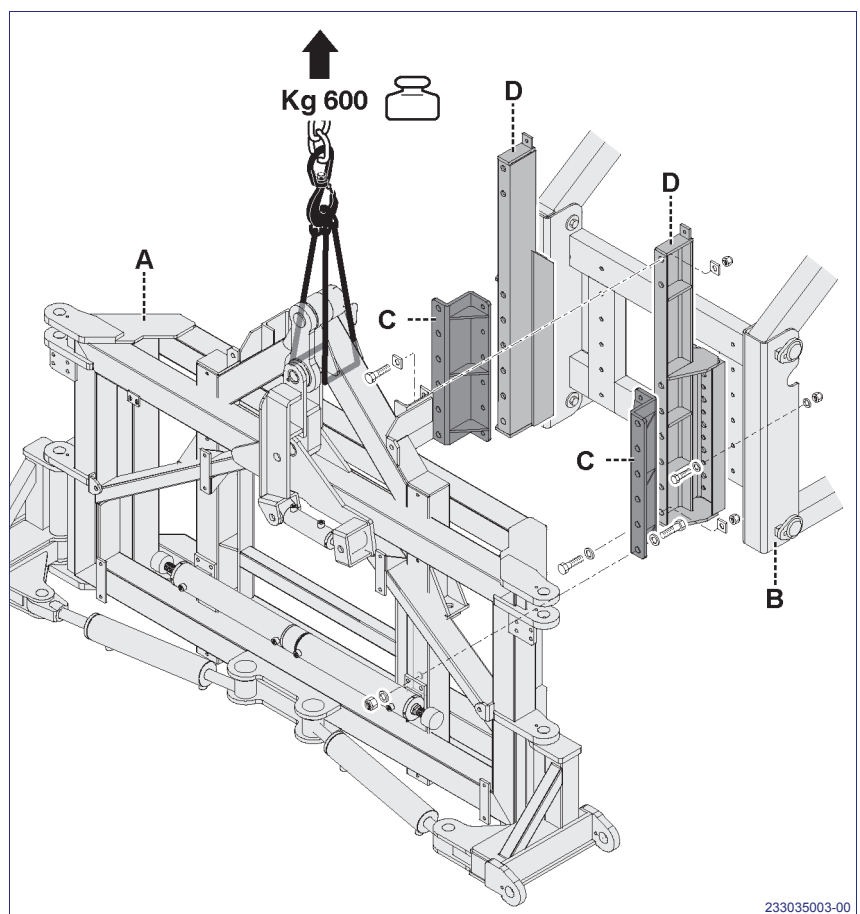
### INSTALLATION OF DISASSEMBLED PARTS

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

### INSTALLATION OF MIDDLE FRAME

Proceed as follows:

- 1 - Lift the middle frame (A) of the bar and fix it to the hoist (B) with the supports (C) and (D).



### INSTALLATION OF ARM

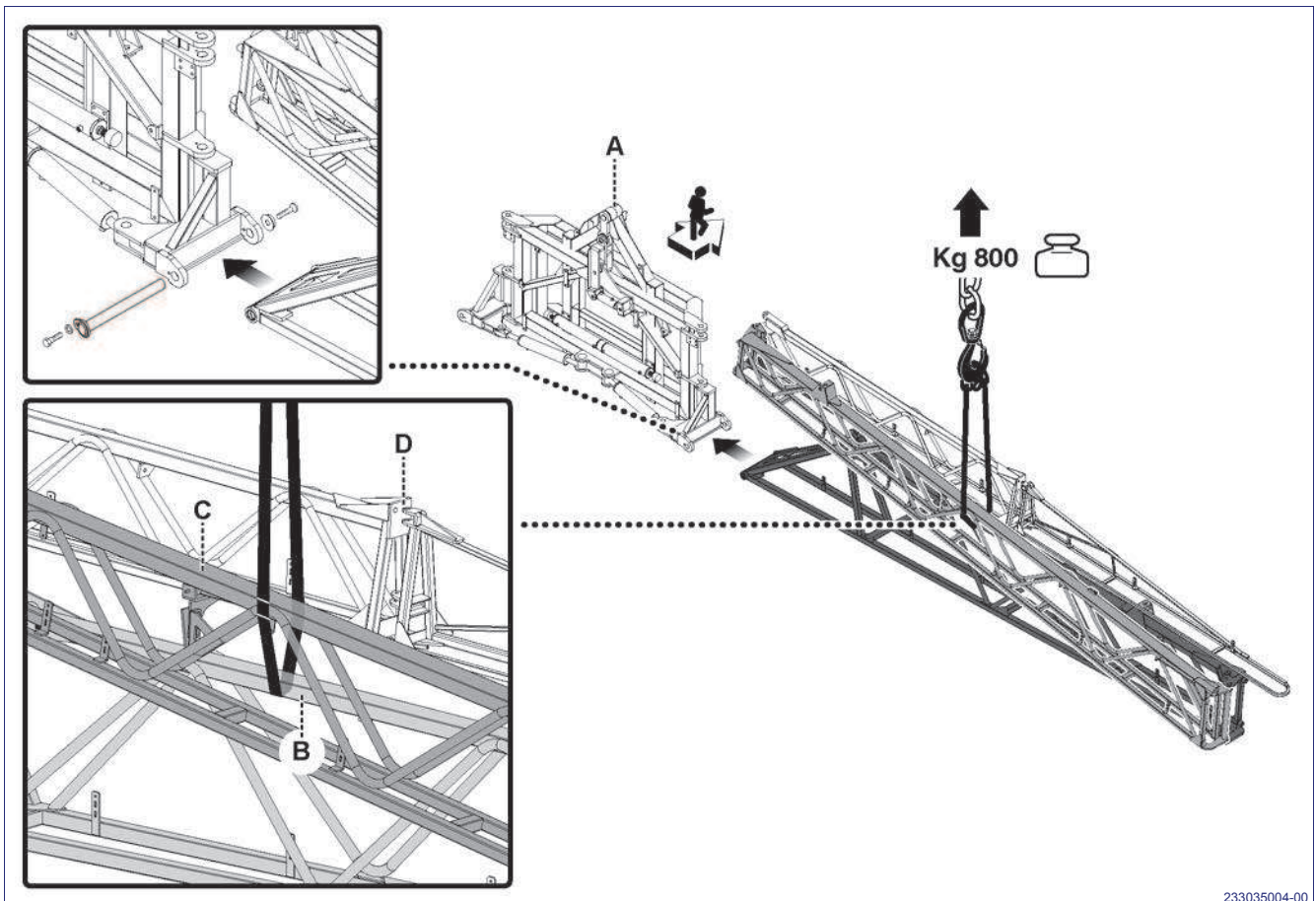
Proceed as follows:

- 1 - Lift arm and fasten it to central frame (A) as shown in the figure.



#### Danger - Warning

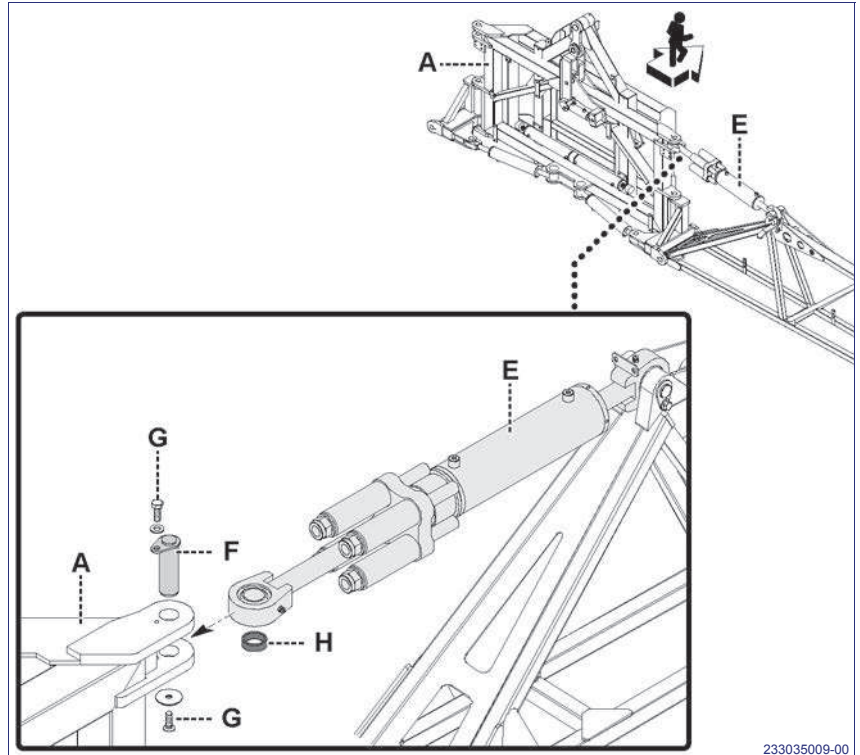
Pass the lifting strap as shown in the figure, between the first arm (B) and the second arm (C) excluding the extension (D).



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- 2 - Place the spacer (**H**) under the rod end of the cylinder (**E**) and fasten it to the middle frame (**A**) with the pin (**F**) and the locking screw (**G**).
- 3 - Install the opposite arm by following the same instructions.



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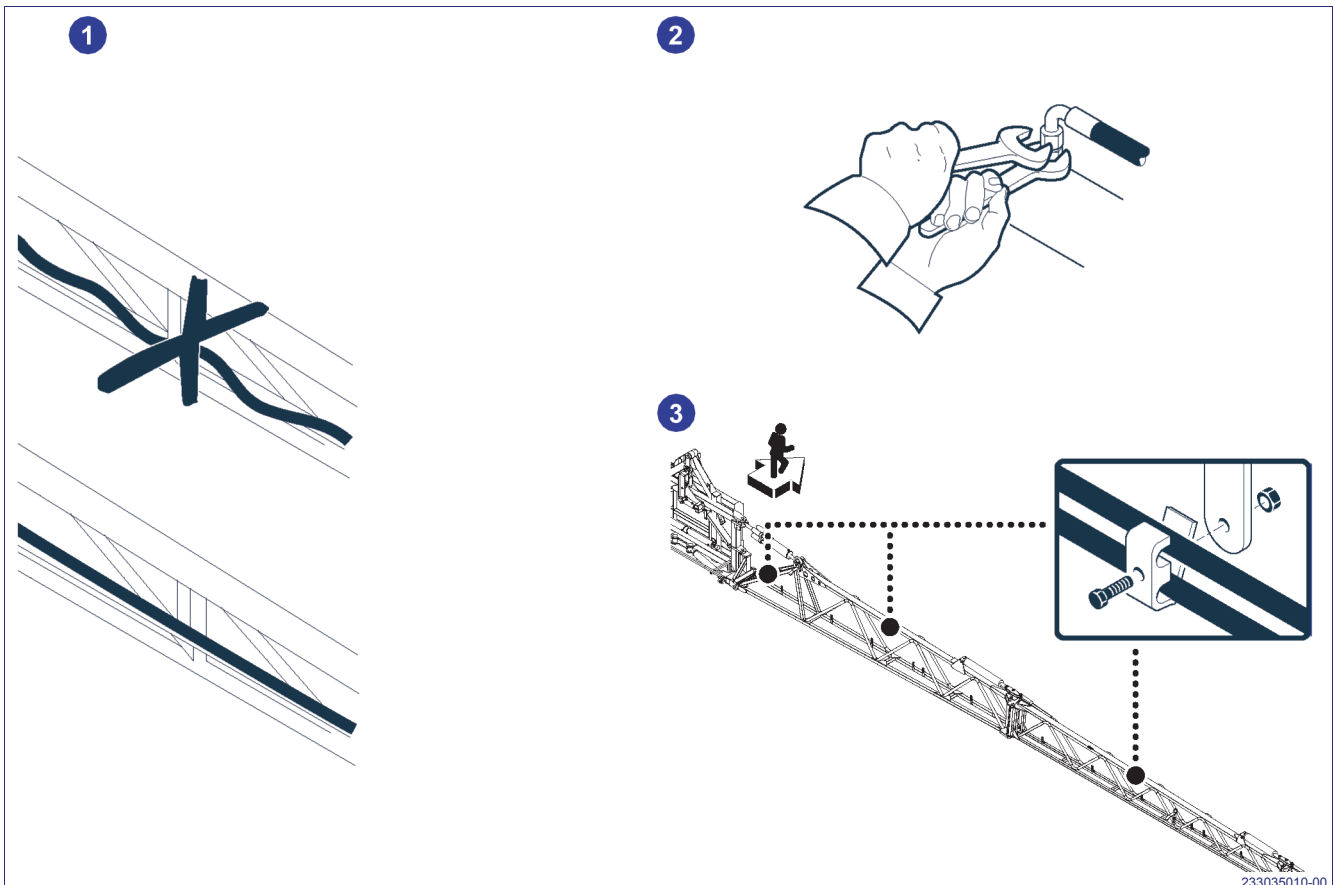
## INSTALLATION OF THE HYDRAULIC SYSTEM

Proceed as follows:

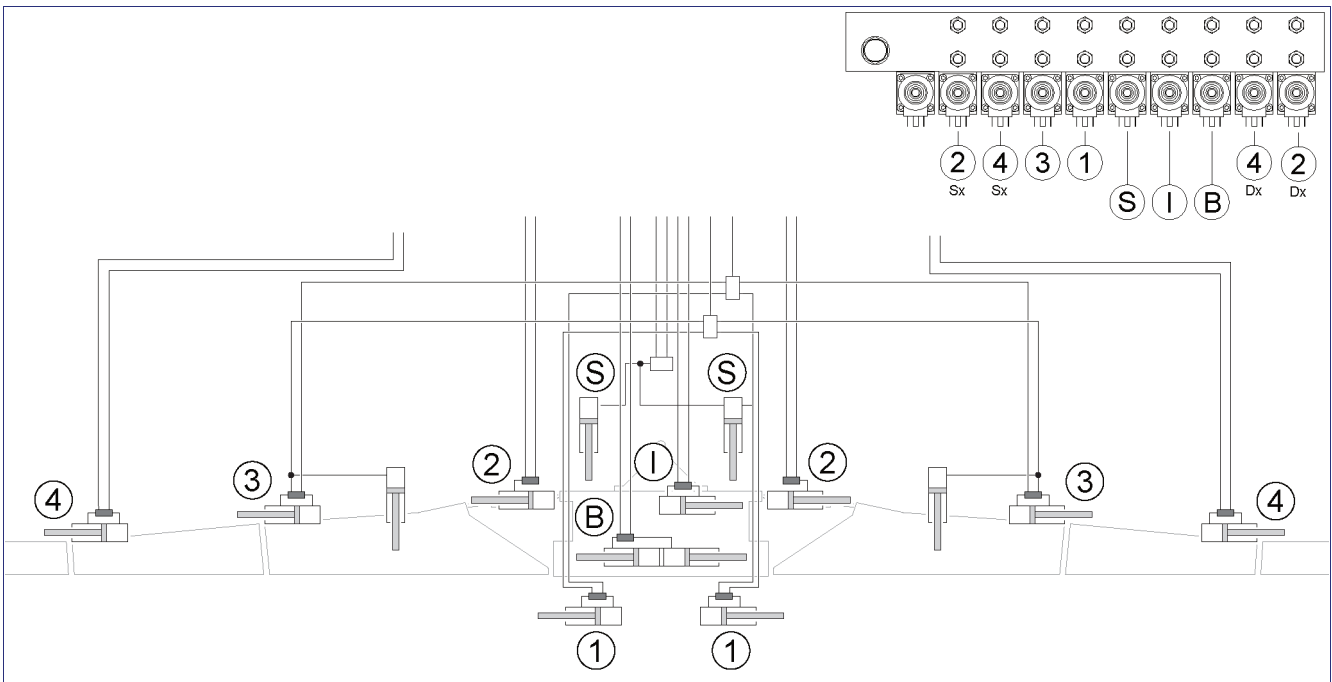
- 1 - Lay the hoses down on the boom linearly (see the figure). Leave sufficient length so as to not impede the movements at the articulation points of the boom.
- 2 - Connect the hoses to the cylinders (see the hydraulic diagram).

**i 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.

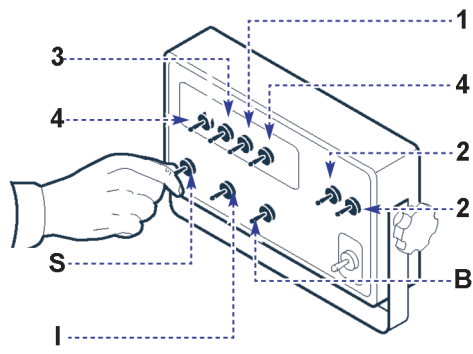


Function hydraulic system (operated with electric control unit)



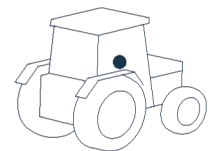
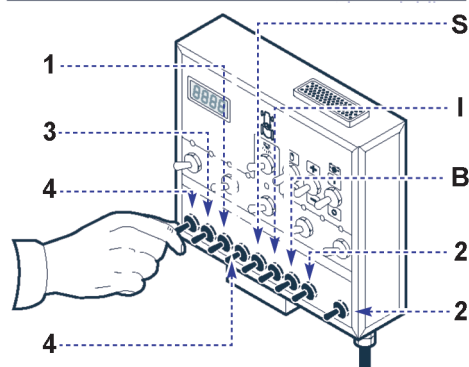
**CGA CONTROL BOARD**

- 1) Unfolding of first arm
- 2) Variable geometry
- 3) Unfolding of second arm
- 4) Unfolding extension
- S) Lifting
- I) Hydraulic tilt adjustment
- B) Hydraulic locking



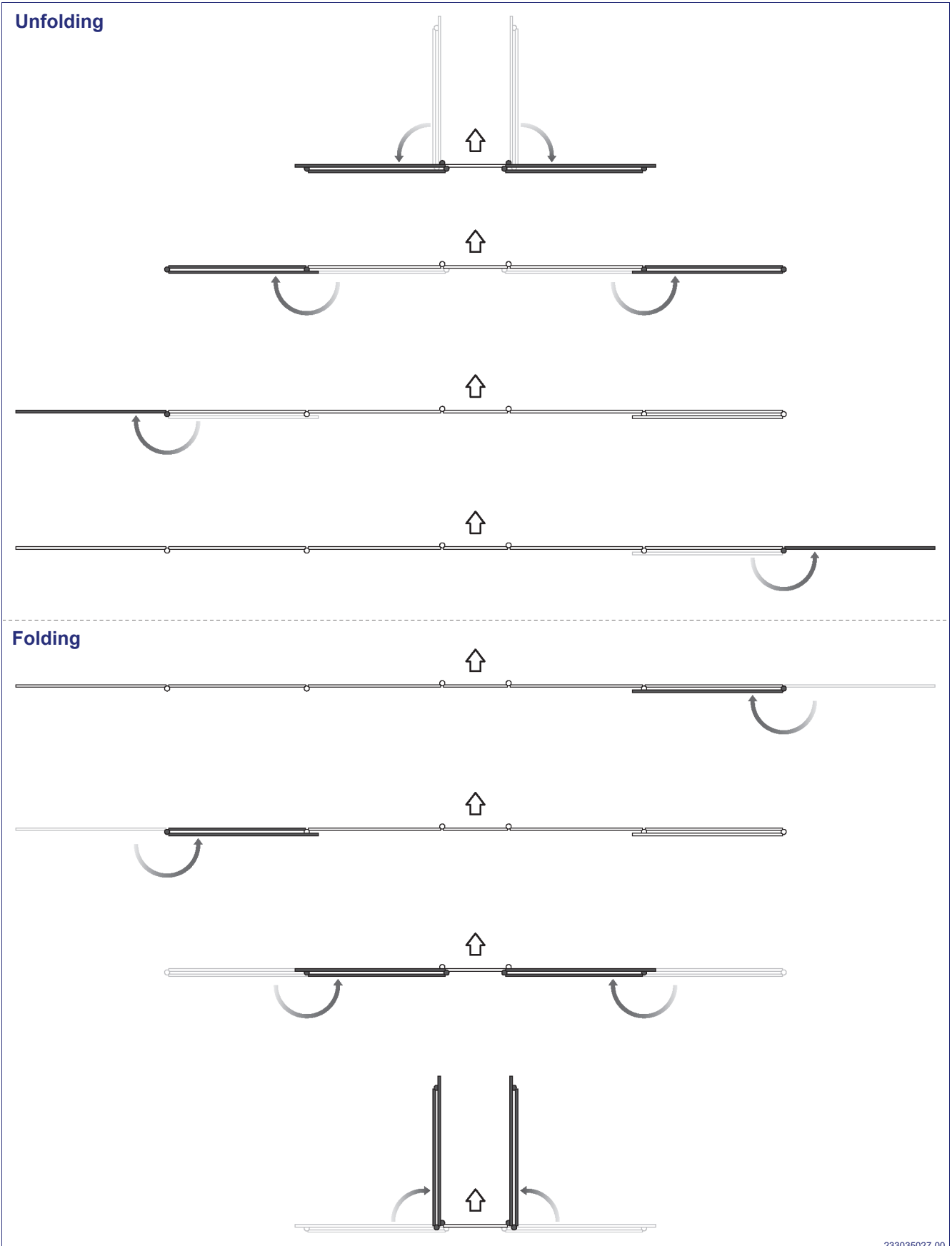
**MÜLLER CONTROL BOARD**

- 1) Unfolding of first arm
- 2) Variable geometry
- 3) Unfolding of second arm
- 4) Unfolding extension
- S) Lifting
- I) Hydraulic tilt adjustment
- B) Hydraulic locking



**Boom folding and unfolding**

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



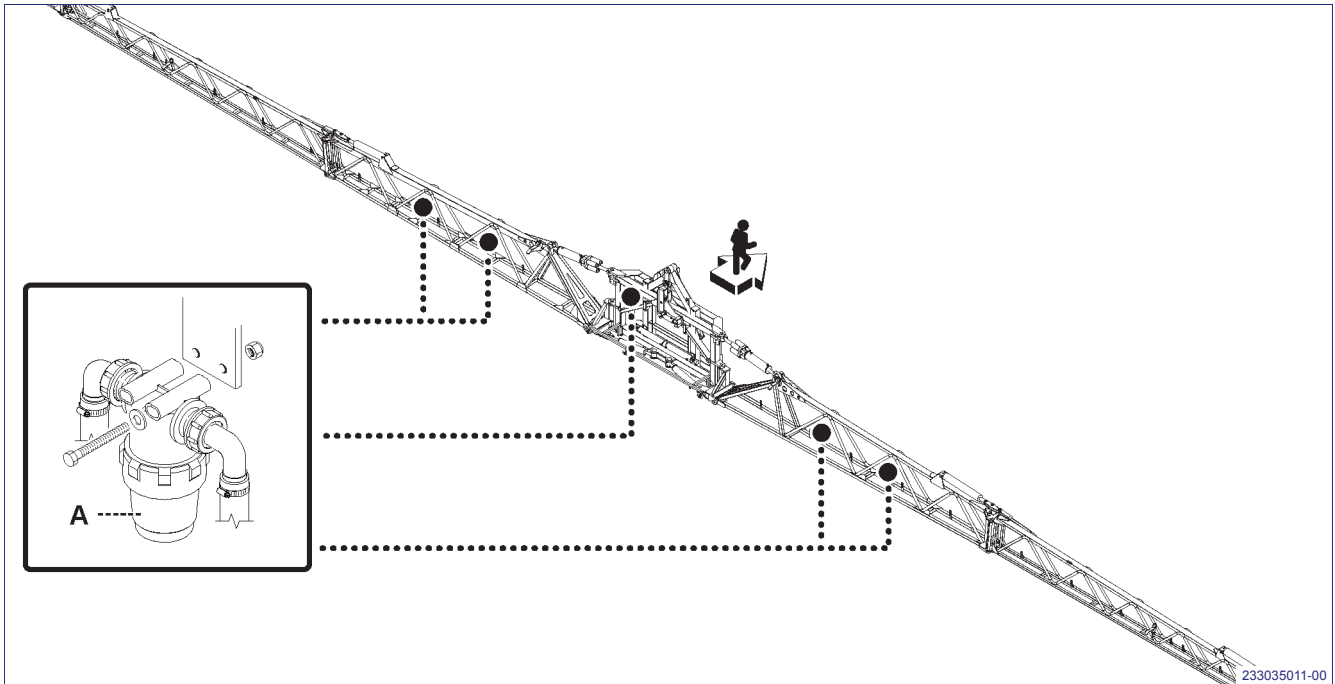
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### INSTALLATION OF LINE FILTERS (IF REQUIRED) AND JETS

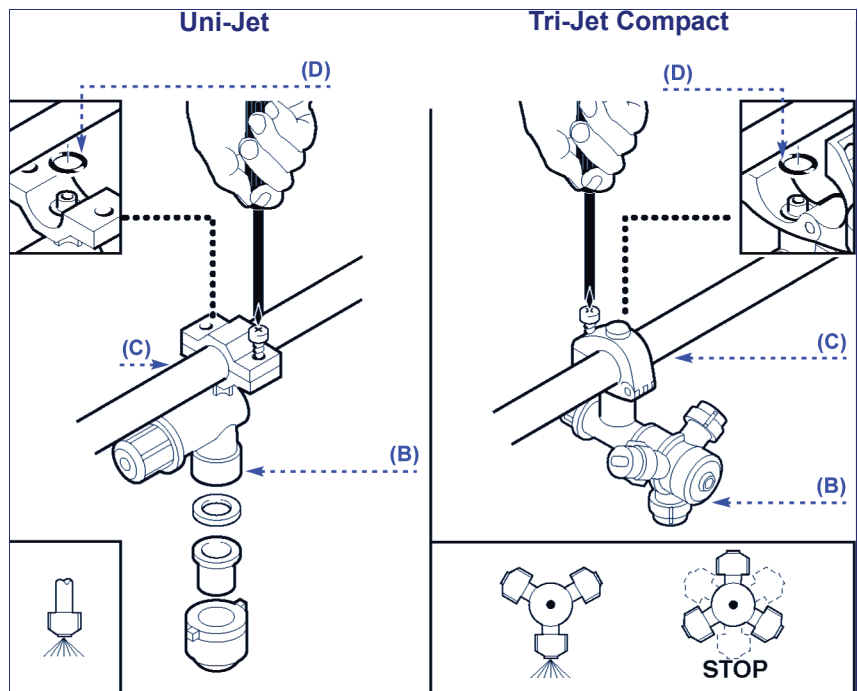
Proceed as follows:

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



- 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 14).

**i Important**  
 Properly mount the seals (D).



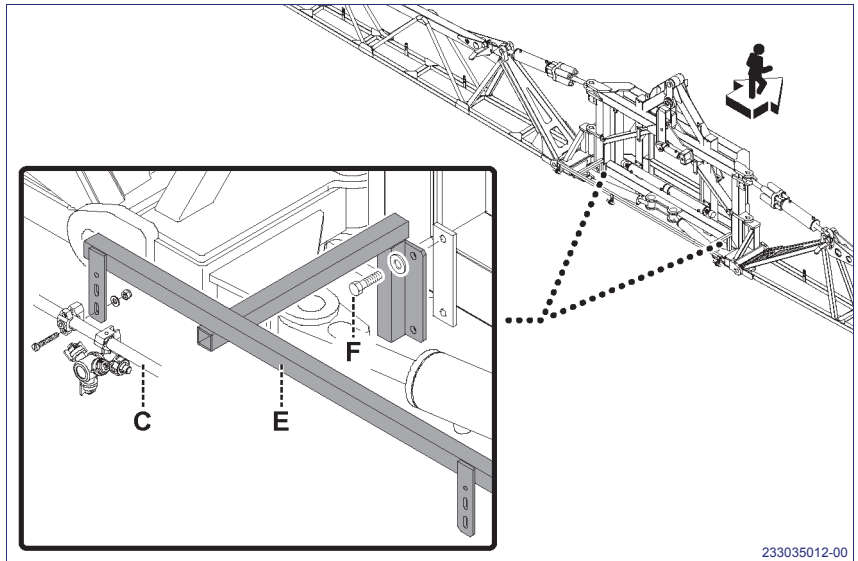
- 3 - Mount the jet support (E) using the screws (F).



**Caution - Warning**

**Make sure the support is positioned centred with the frame**

- 4 - Fasten the stainless steel pipes (C) to the jet support (E) using the relative supports..



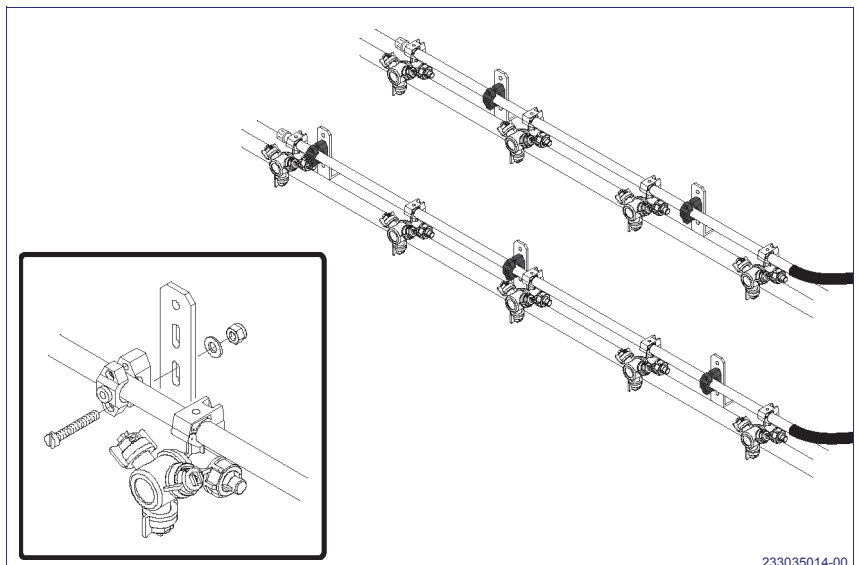
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**NUMBER OF JETS ON EACH BOOM SECTION**

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

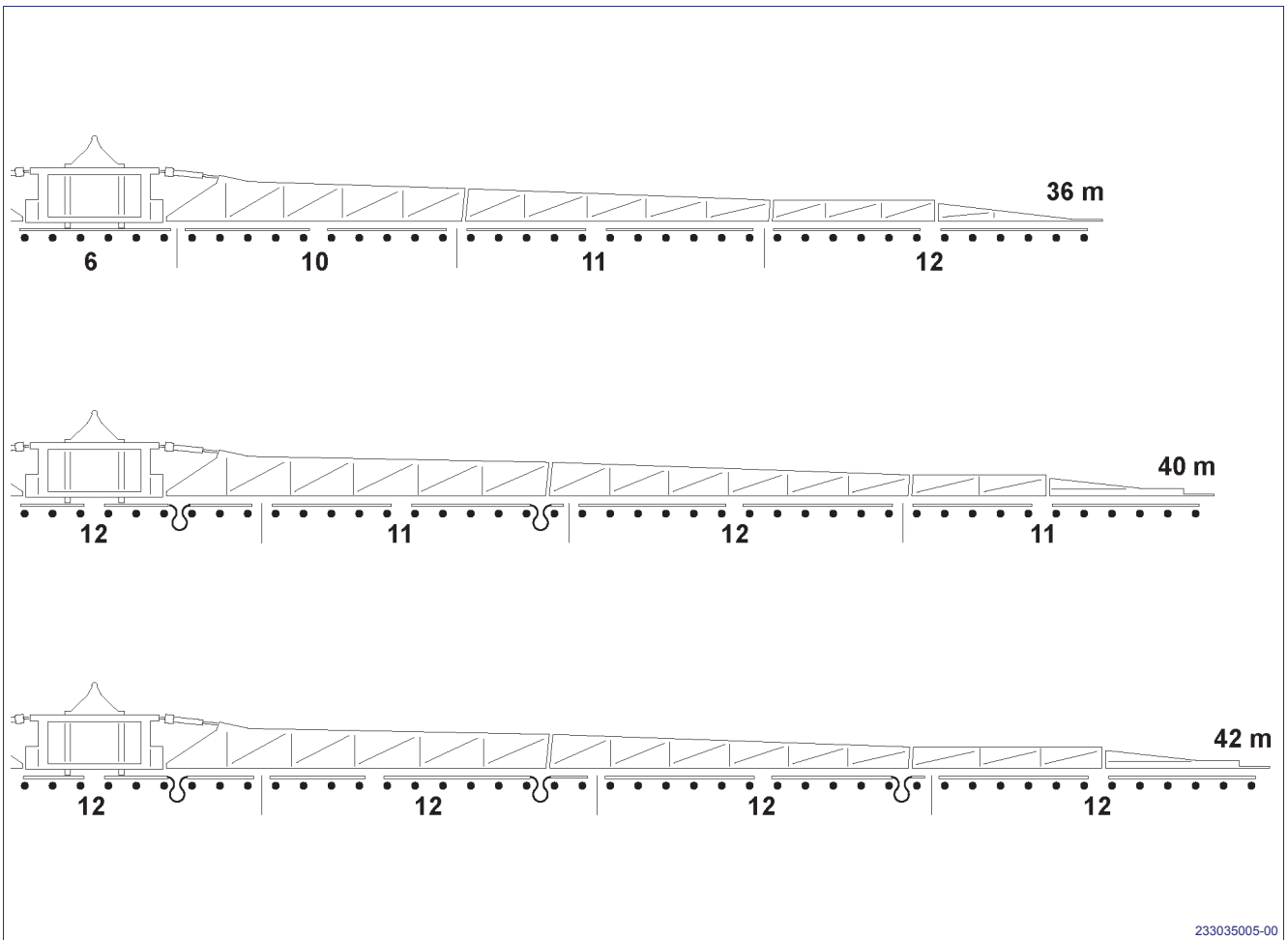
The diagram shows as well position and number of supports on each hose and installation instructions, depending on the number of supplies.

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



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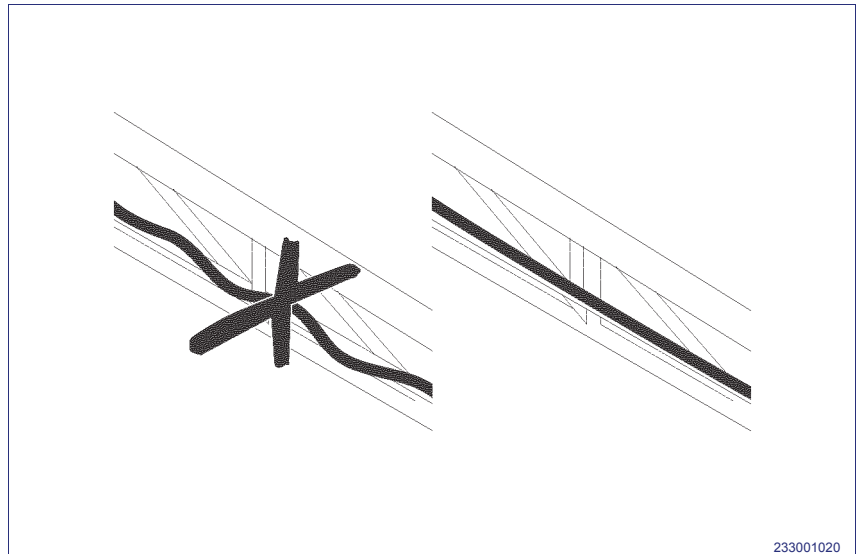
Jet number diagram for each boom section (500 mm pitch)



### INSTALLATION OF WATER HOSES

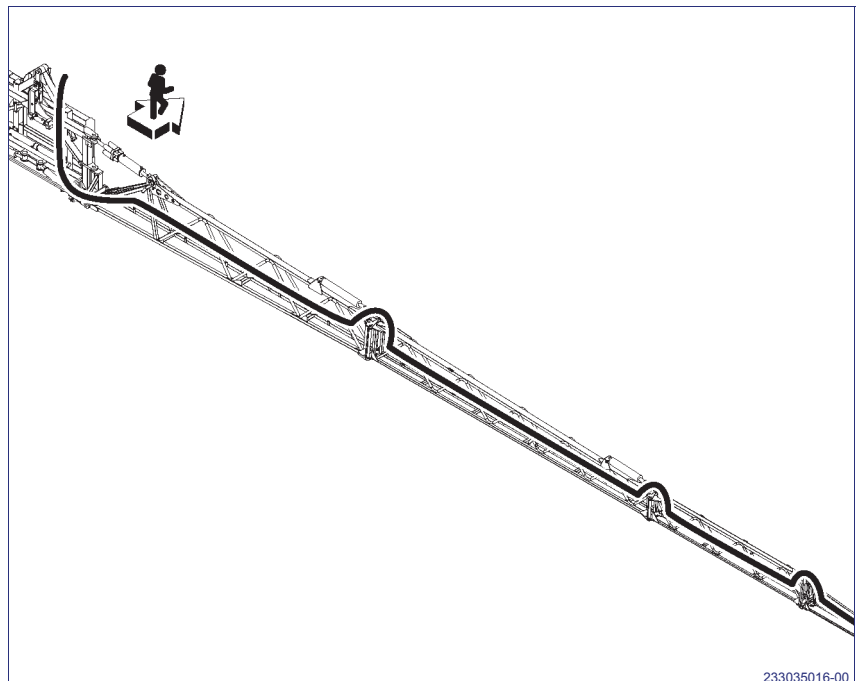
Proceed as follows:

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



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- 2 - Leave sufficient length so as to not impede the movements at the articulation points of the boom.
- 3 - Connect the hoses (see “7-supply water connection diagram”).



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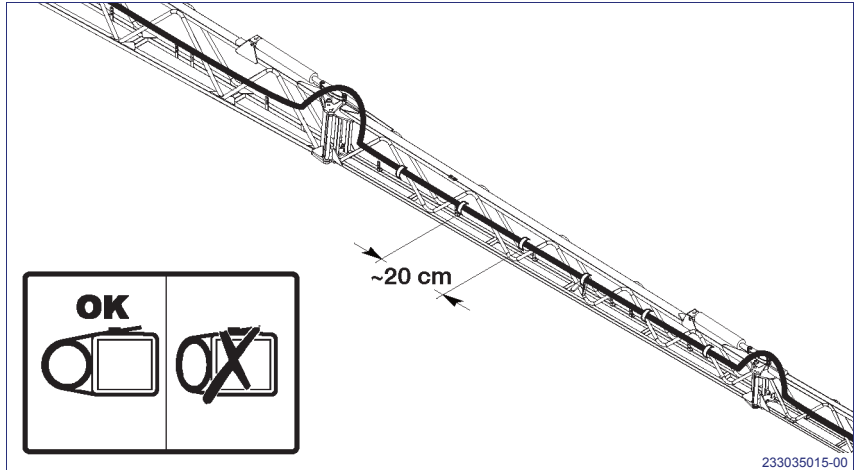


- 4 - Secure the hoses to the boom with clamps spaced out ~ 20 cm.



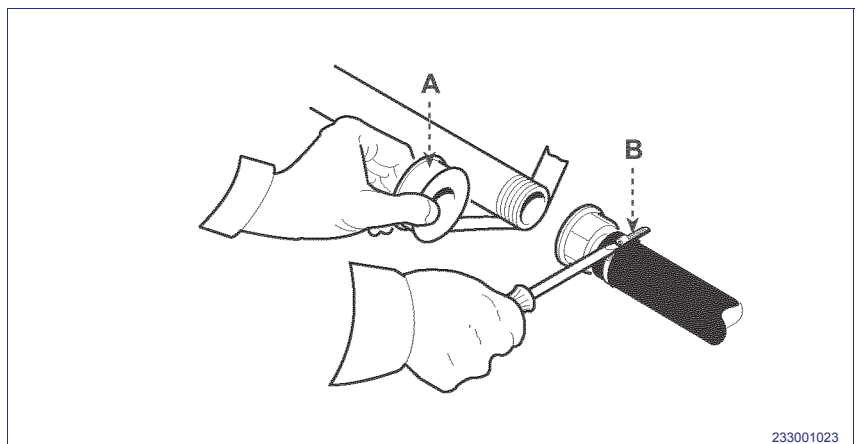
**Important**

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



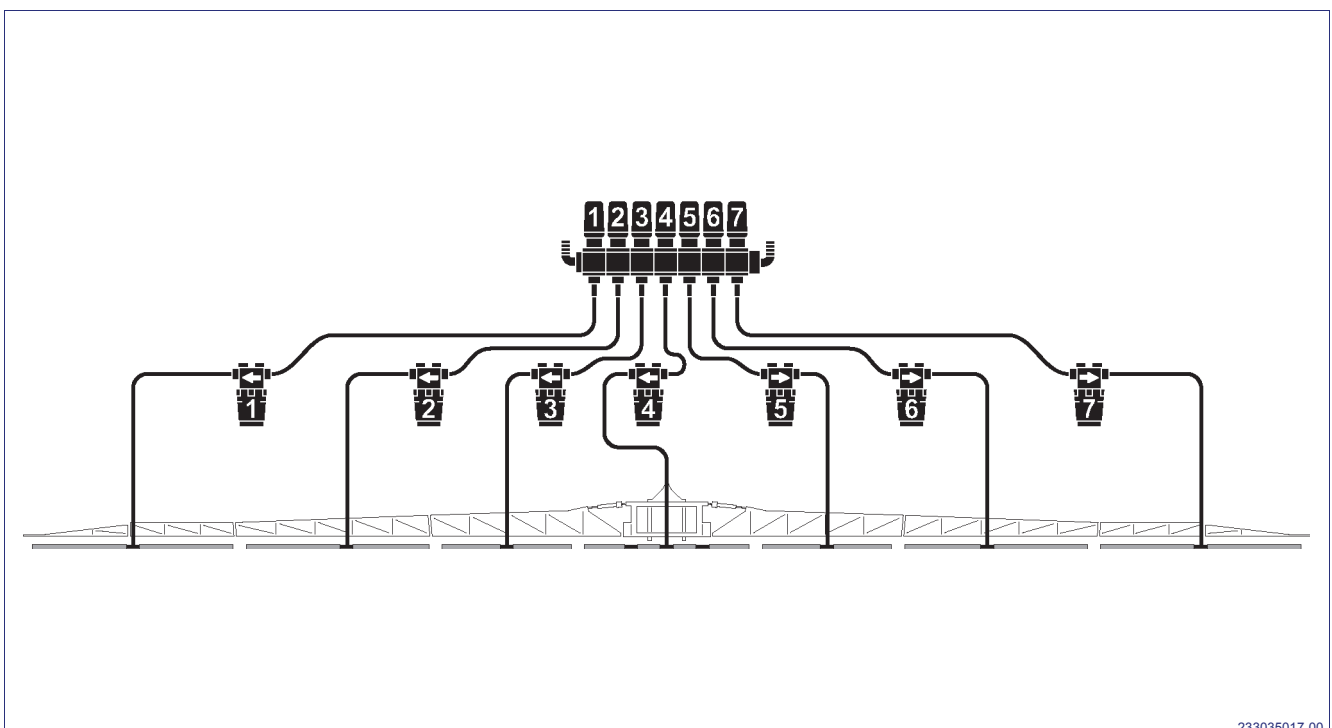
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- 5 - Use the Teflon seal (A) and tighten the stainless steel clamps (B) in order to ensure tightness in the joints.



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**7-supply water connection diagram**

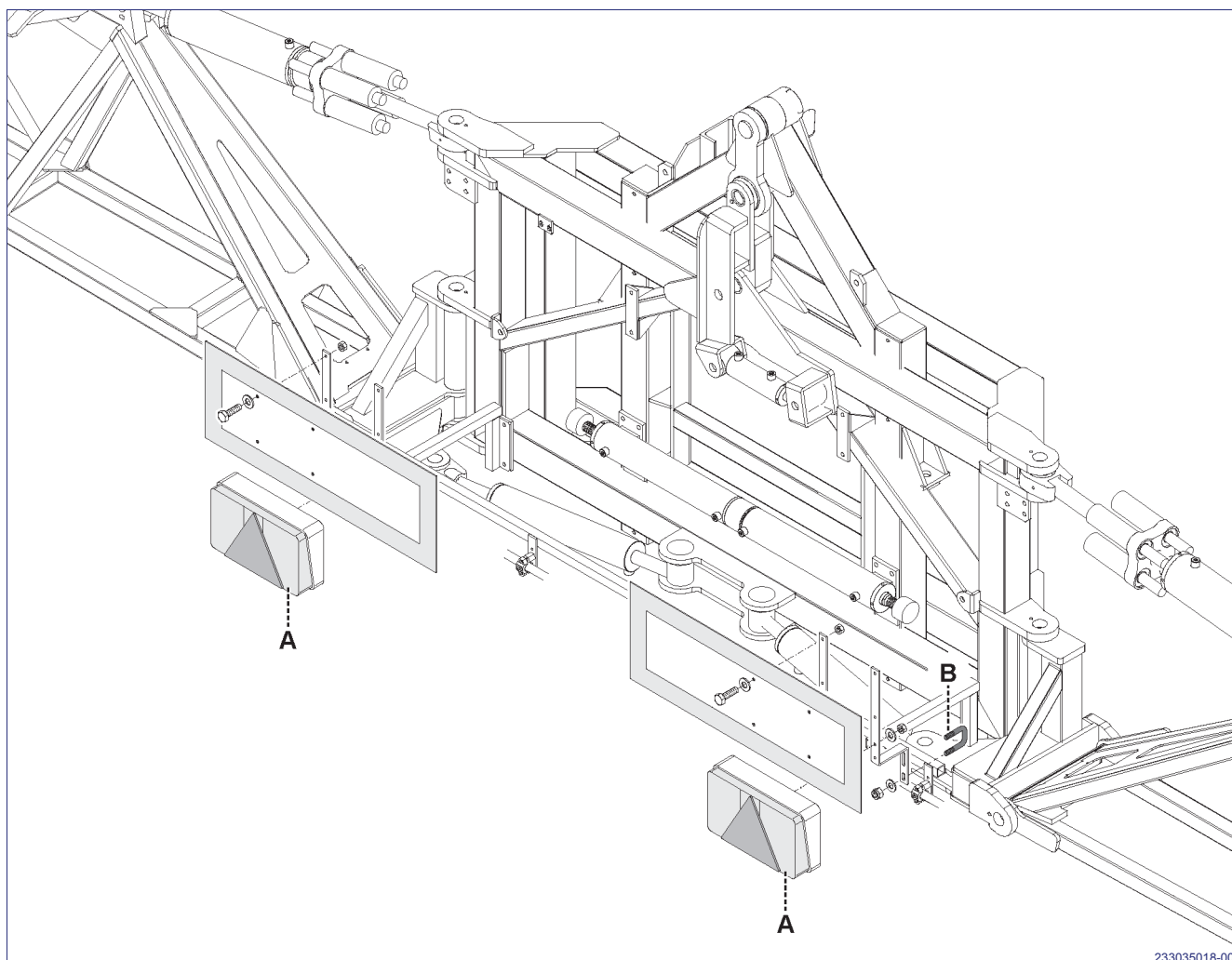


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## INSTALLATION OF REAR LIGHT KIT

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

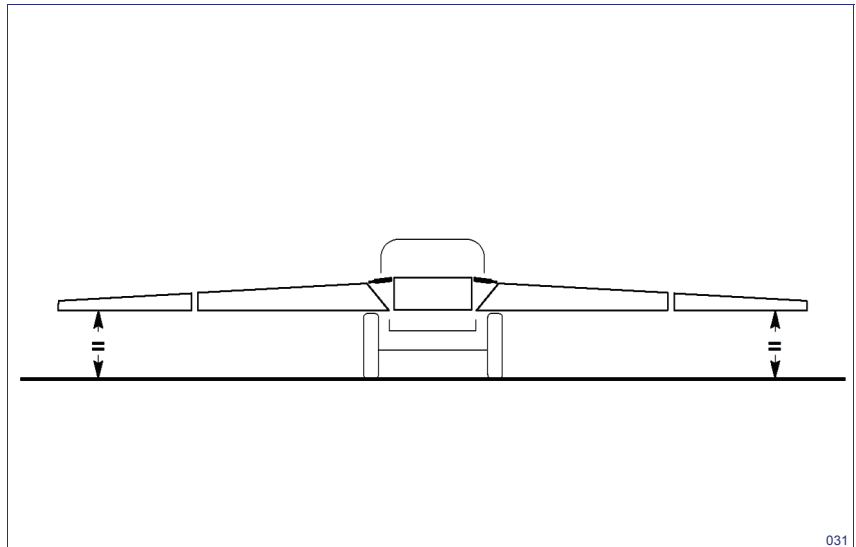


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### INSTALLATION OF THE VARIABLE GEOMETRY INDICATOR

Proceed as follows:

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

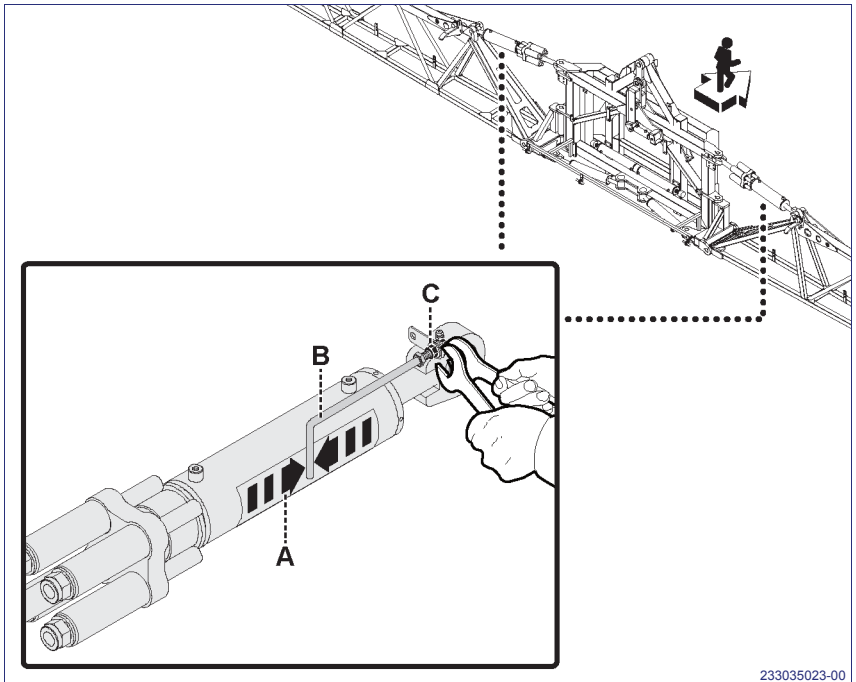


- 2 - Apply sticker (A) on the cylinder, so that the two arrows be centred with respect to indicator (B).



#### Important

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

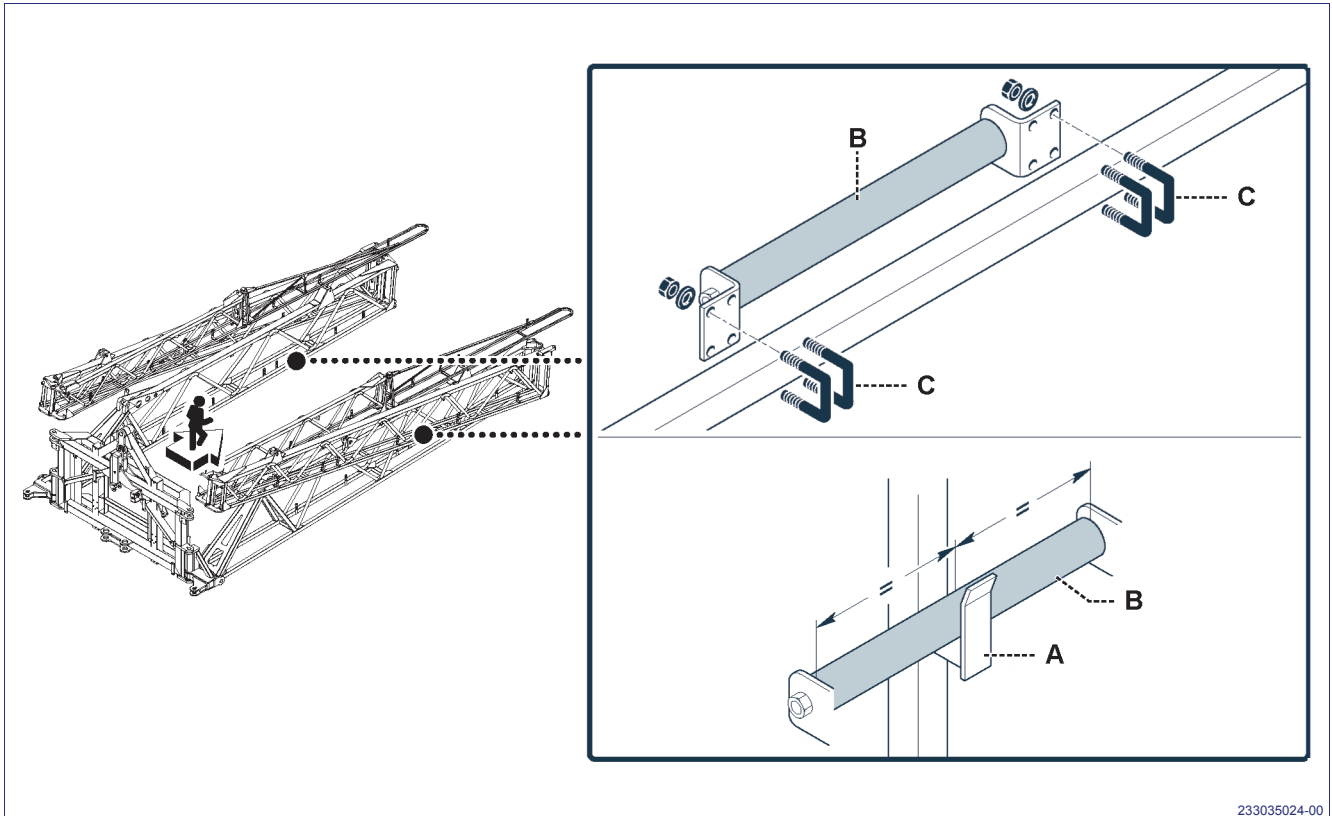


### INSTALLATION OF SUPPORT ROLLER

Proceed as follows:

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).



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## INFORMATION ABOUT ADJUSTMENTS

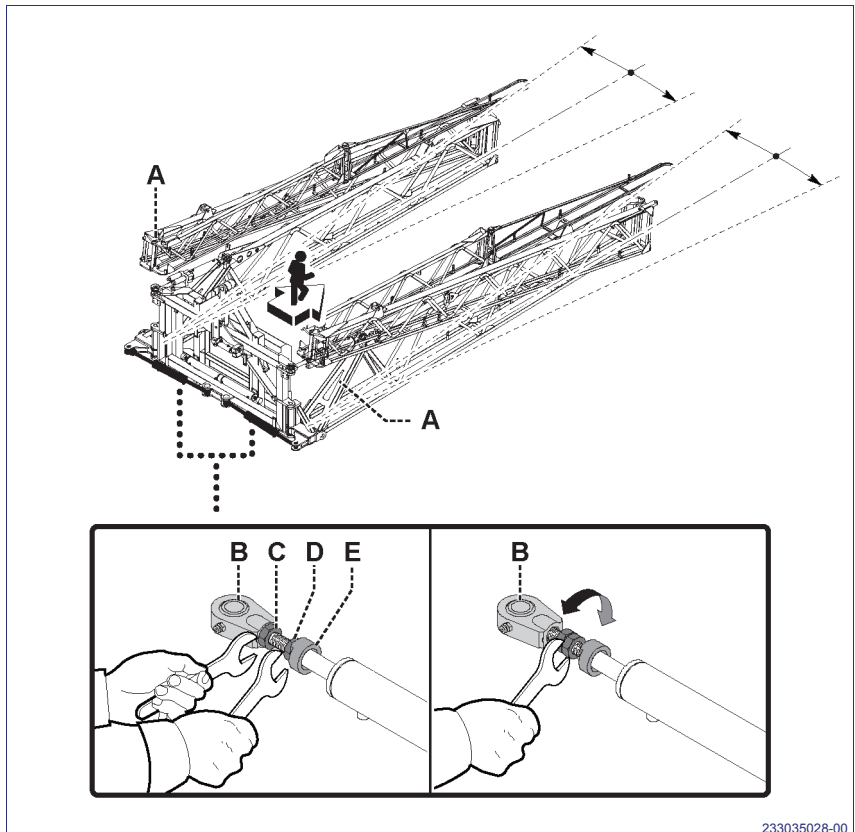
### INSTRUCTIONS FOR ADJUSTMENTS

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 PRIMARY ARM ALIGNMENT

**Folding stage:** proceed in the way indicated.

- 1 - Start up the controls to completely unfold the arms (A) of the boom and slightly fold them to reduce the thrust pressure on the cylinder.
- 2 - Loosen the lock nuts (C - D), bringing them closer to the center of the thread and tighten them to have a strength point.
- 3 - Use the strength point to rotate the cylinder rod and closer or farther away from the rod end (B).
- 4 - Completely unfold the arms (A) again and check that they fit correctly on to its supports.
- 5 - Tighten the lock nut (C) to the rod end (B) and the lock nut (D) to the ring nut (E) once the operation is completed.



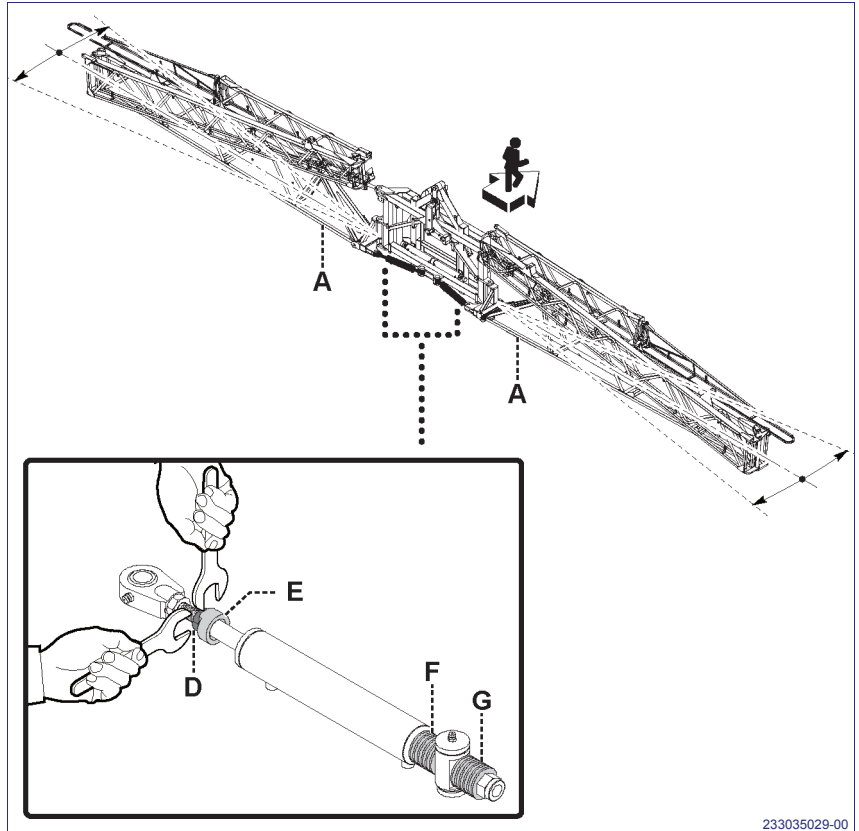
**Unfolding stage:** proceed in the way indicated.

- 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 nut (D) and adjust on the ring nut (E) to adjust the alignment of the primary arms (A).
- 3 - Completely unfold the primary arms (A) again and check that it is aligned with the middle frame.
- 4 - Tighten the nut (D) onto the ringnut (E) when adjustment is completed.



**Important**

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

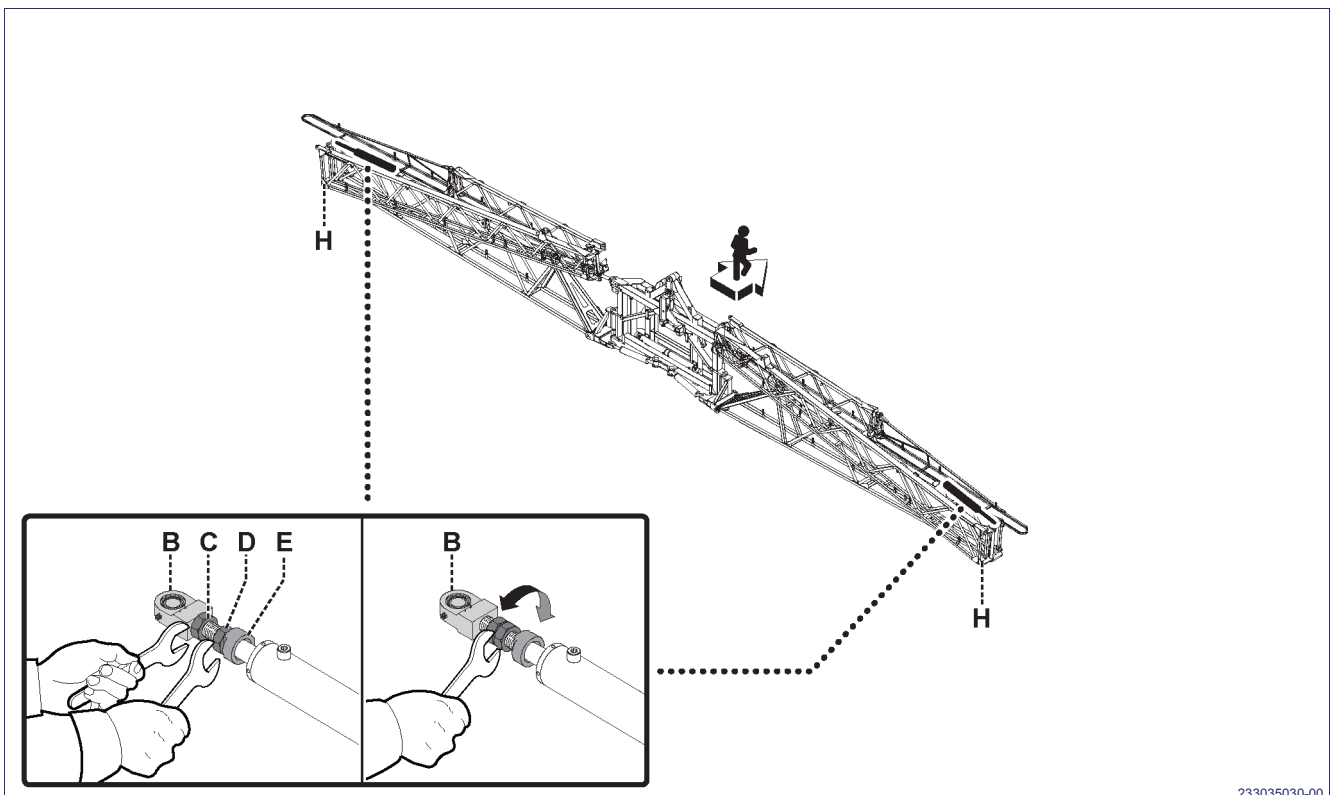


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## ADJUSTMENT OF SECONDARY ARM ALIGNMENT

**Folding stage: proceed in the way indicated.**

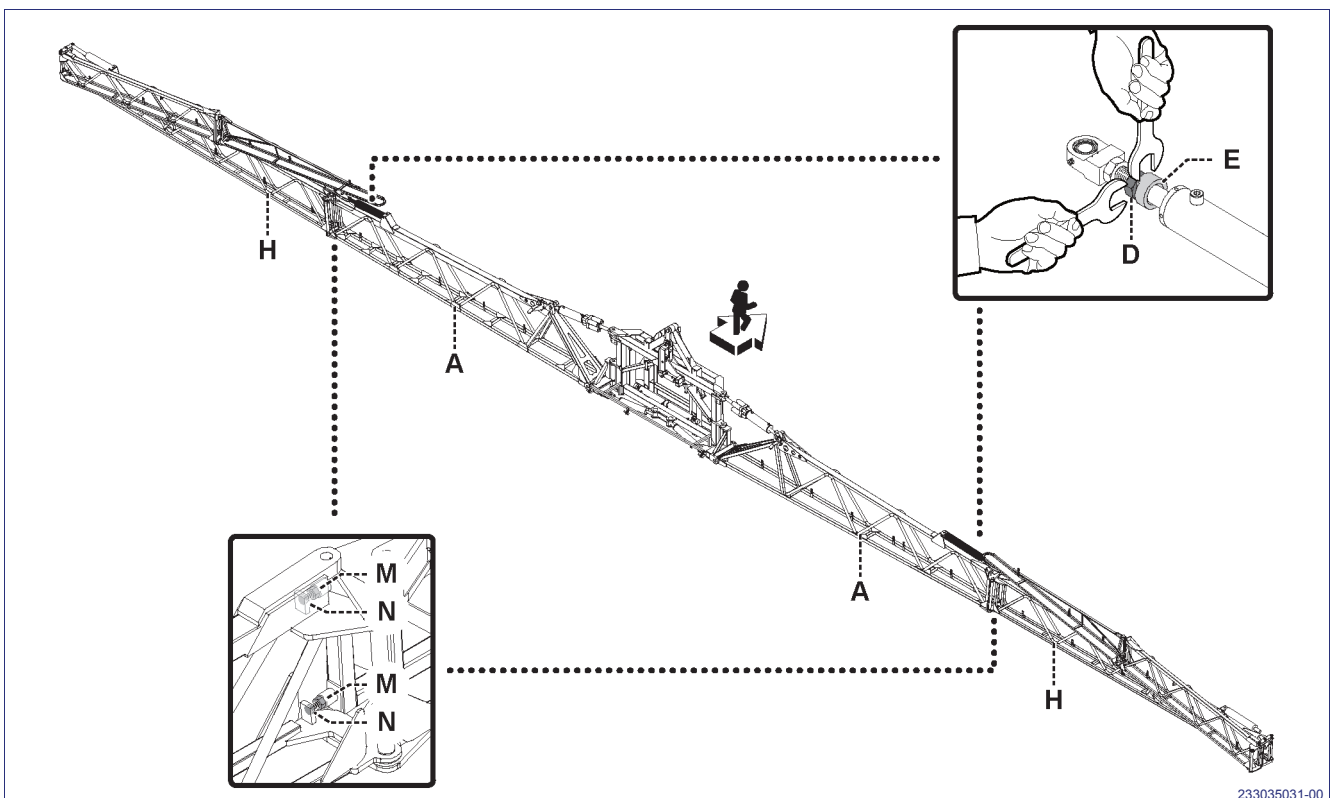
- 1 - Start up the controls to completely unfold the secondary arms (**H**) of the boom and slightly fold them to reduce the thrust pressure on the cylinder.
- 2 - Loosen the lock nuts (**C - D**), bringing them closer to the center of the thread and tighten them to have a strength point.
- 3 - Use the strength point to rotate the cylinder rod and closer or farther away from the rod end (**B**).
- 4 - Completely unfold the secondary arms (**H**) again and check that they fit correctly on to its supports.
- 5 - Tighten the lock nut (**C**) to the rod end (**B**) and the lock nut (**D**) to the ring nut (**E**) once the operation is completed.



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**Unfolding stage:** proceed in the way indicated.

- 1 - Start up the controls to completely unfold the secondary arms (**H**) of the boom and slightly fold them to reduce the thrust pressure on the cylinder.
- 2 - Loosen lock nuts (**M**) and screw the screws (**N**) so they do not hinder the adjustment.
- 3 - Loosen the nut (**D**) and adjust on the ring nut (**E**) to adjust the alignment of the secondary arms (**H**).
- 4 - Completely unfold the secondary arms (**H**) again and check that it is aligned with the primary arms (**A**) and the middle frame.
- 5 - Tighten the nut (**D**) onto the ringnut (**E**) when adjustment is completed.
- 6 - Adjust the screws (**N**) until they stop against the secondary arms (**H**) so lock with the lock nuts (**M**).



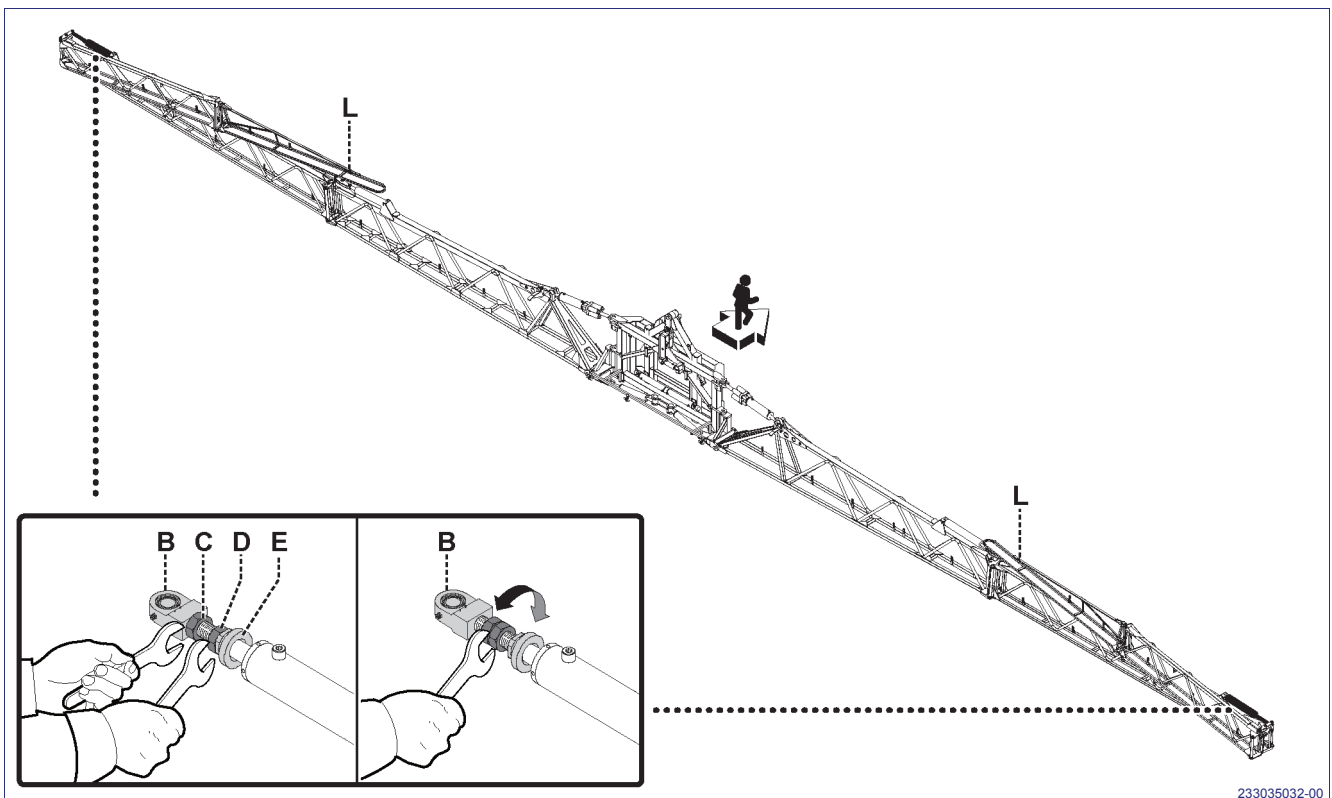
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## ADJUSTMENT OF EXTENSION ALIGNMENT

**Folding stage:** proceed in the way indicated.

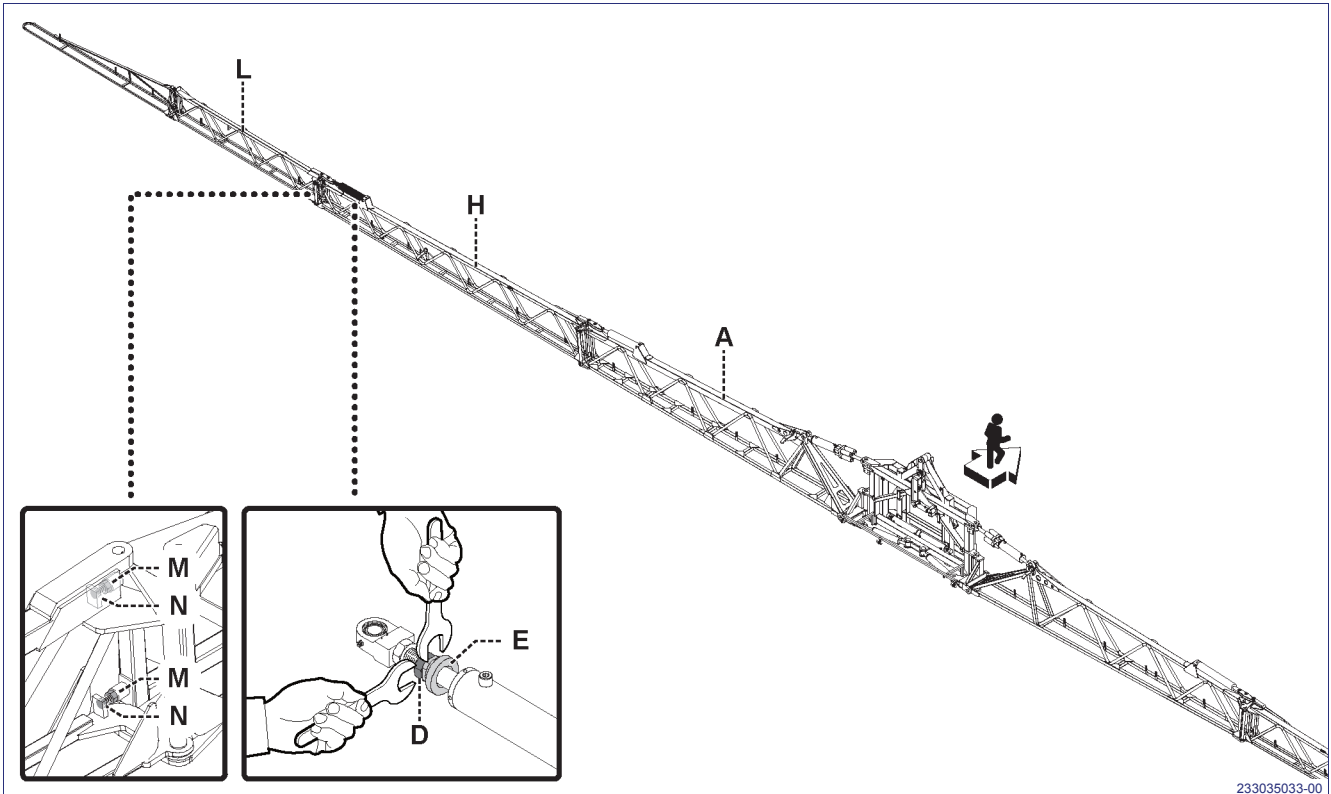
- 1 - Start up the controls to completely fold one of the extension (**L**) of the boom and slightly unfold them to reduce the thrust pressure on the cylinder.
- 2 - Loosen the lock nuts (**C - D**), bringing them closer to the center of the thread and tighten them to have a strength point.
- 3 - Use the strength point to rotate the cylinder rod and closer or farther away from the rod end (**B**).
- 4 - Completely unfold the extension (**L**) again and check that it is aligned with the middle frame.
- 5 - Tighten the lock nut (**C**) to the rod end (**B**) and the lock nut (**D**) to the ring nut (**E**) once the operation is completed.
- 6 - Make the same adjustment on the other extension.



**Unfolding stage:** proceed in the way indicated.

- 1 - Start up the controls to completely unfold the extension (A) and slightly fold them to reduce the thrust pressure on the cylinder.
- 2 - Loosen lock nuts (M) and screw the screws (N) so they do not hinder the adjustment.
- 3 - Loosen the nut (D) and adjust on the ring nut (E) to adjust the alignment of the extension (L).

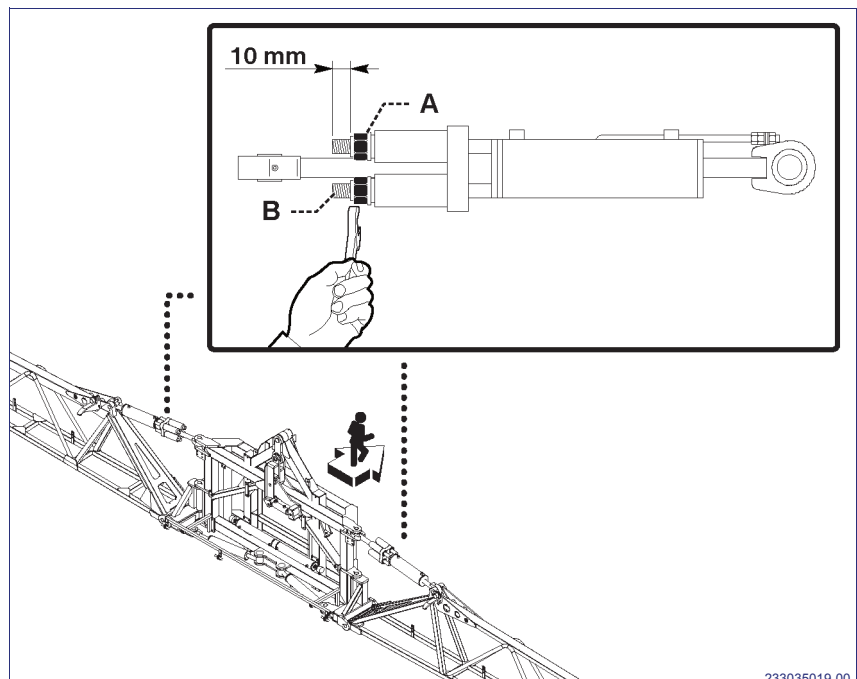
- 4 - Completely unfold the extension (L) again and check that it is aligned with the secondary arms (H) and the middle frame.
- 5 - Tighten the nut (D) onto the ringnut (E) when adjustment is completed.
- 6 - Adjust the screws (N) until they stop against the extension so lock with the lock nuts (M).
- 7 - Make the same adjustment on the other extension.



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**VARIABLE GEOMETRY SPRING ADJUSTMENT**

- 1 - Activate controls for unfolding the boom.
- 2 - Use nuts (A) in order to have the thread protruding (B) by 10 mm.



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## INFORMATION ABOUT USE

### OPERATING ADVICE

During operation, disconnect blocking device of the self-levelling device in order to allow the spraying boom to swing, and keep it parallel to the ground, also in sloping and / or uneven areas.

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 described 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

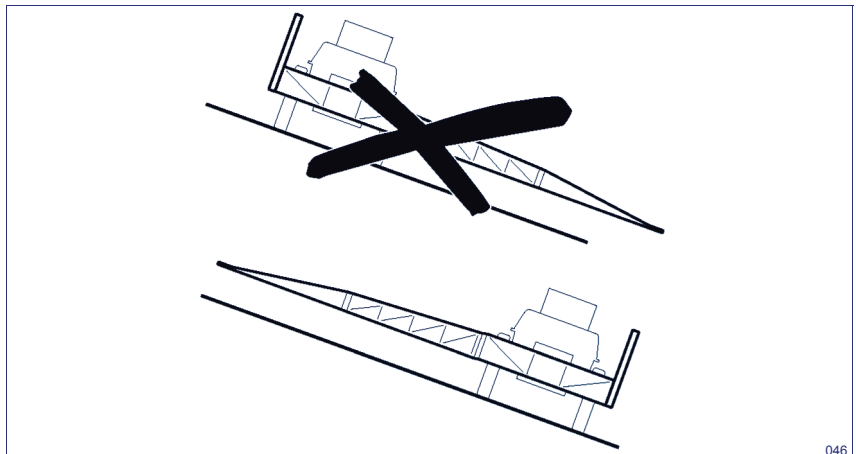


#### Important

The environment and field 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 gradients allowed.
- In the event of spraying while moving crosswise to the slope, follow the instructions extremely carefully:
  - 1) **Boom unfolding stage:** always unfold the extension uphill first, and then the one downhill.
  - 2) **Boom folding stage:** always fold the extension downhill first, and then the one uphill.



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#### 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.



#### Important

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

- Never work if just the downhill extension is open.
- Keep the forward speed moderate (max. 8-10 km/h) to prevent the booms from swinging and to keep spraying even.



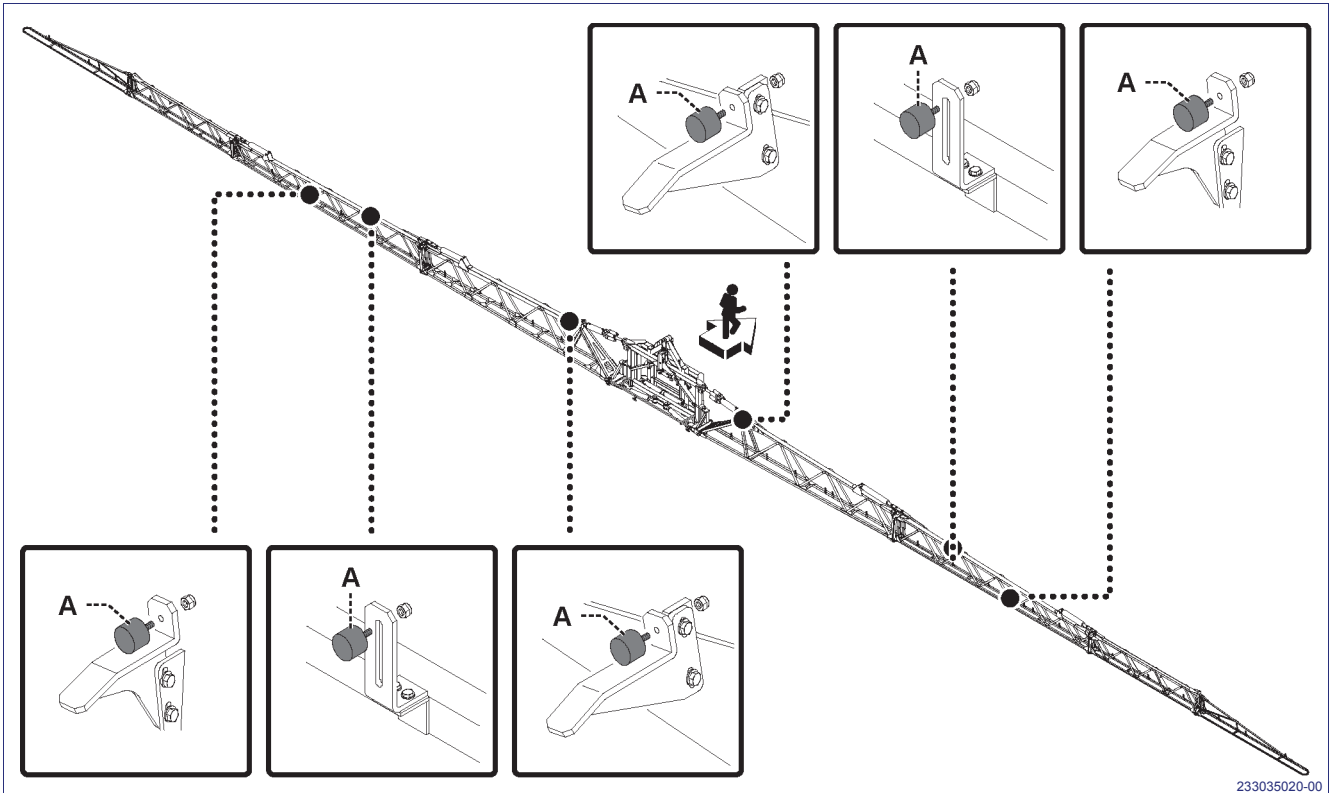
#### Caution - Warning

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

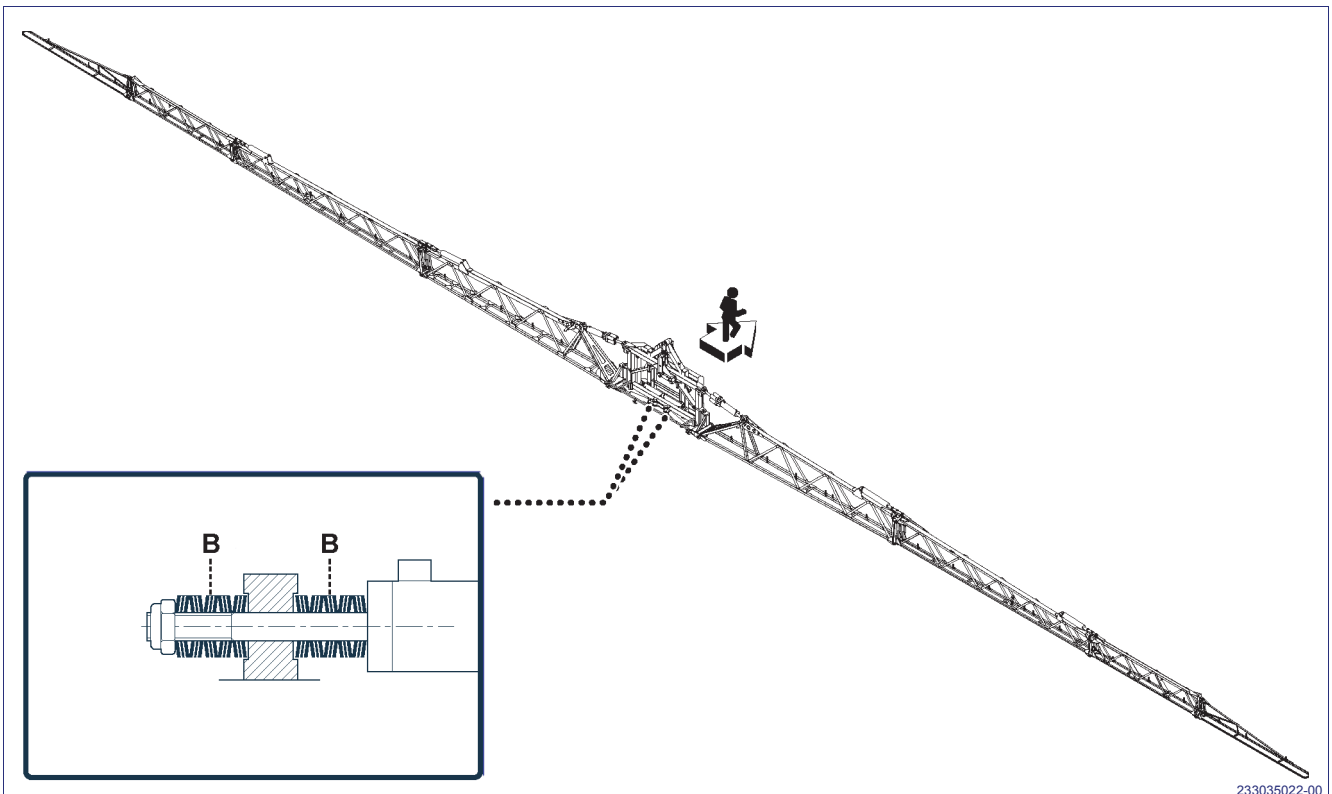
**INFORMATION ABOUT MAINTENANCE**

**MAINTENANCE SCHEDULE TABLE**

Interval	Component	Type of intervention	Operation	Reference
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	
	Jets and nozzles	Check operation	Clean and replace if necessary	See "Cleaning nozzles", page 30
Each working day	Jets, nozzles antidrip valve	Check installation	Install properly	
	Complete equipment	Clean and wash	Use a clean jet of water	
Every 40 hours	Complete equipment	Check the greased parts	Grease if necessary	See "Lubrication points diagram" page 30
		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	See "Replacement endpiece extension spring" page 33
	Arm shock absorber Belleville washers (B)	Check its effectiveness	Replace if necessary	

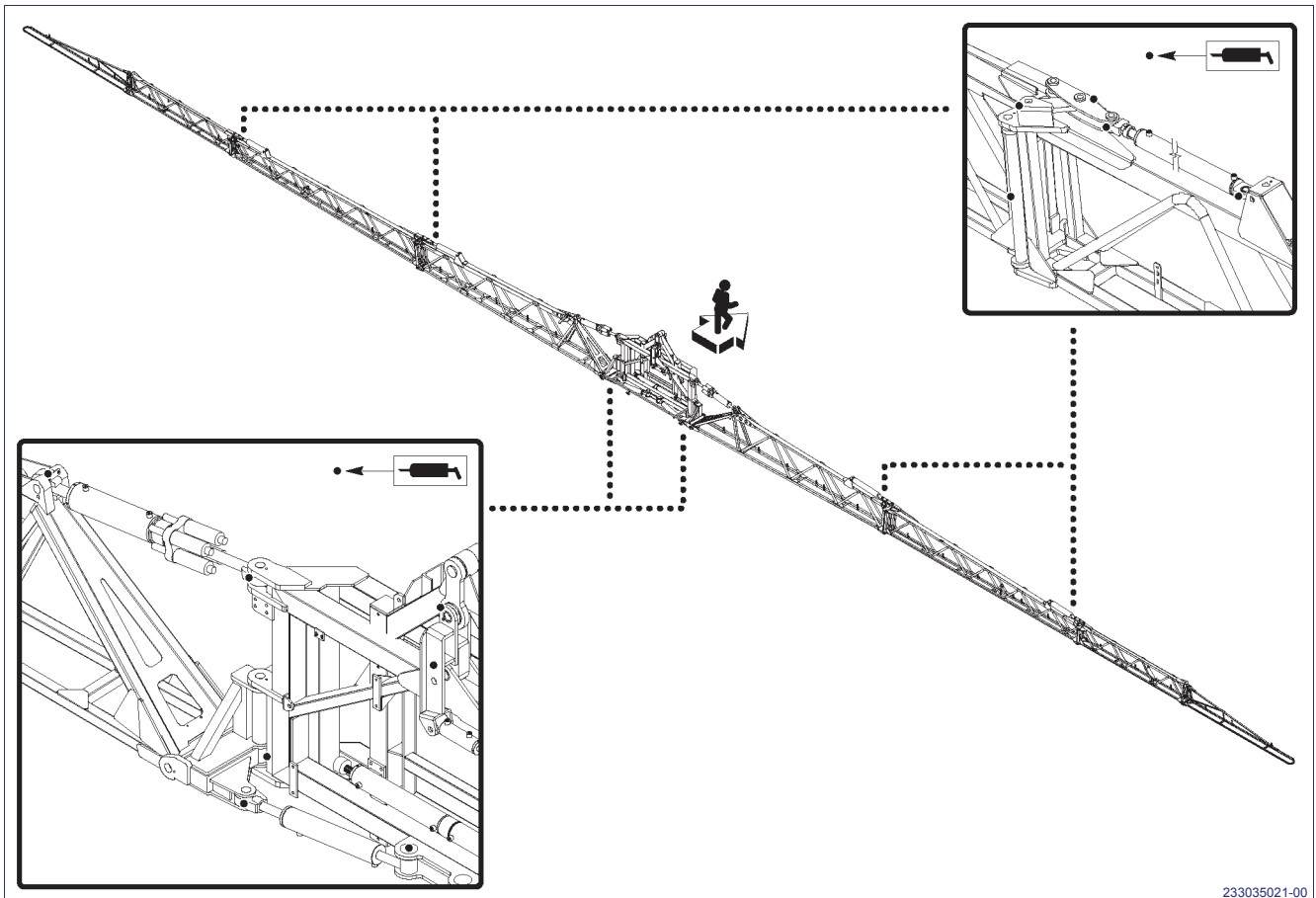


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### LUBRICATION POINTS DIAGRAM



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Use *PERSIAN POLIGREASE 2* grease

### CLEANING NOZZLES

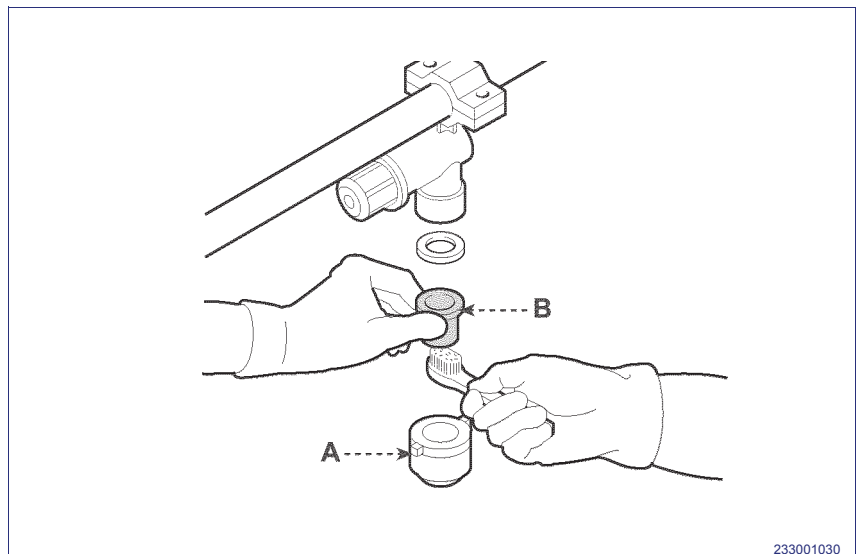
Wear protective gloves for this operation.

- 1 - 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.**



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**LONG PERIOD OF INACTIVITY**

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

- 1 - Perform the scheduled maintenance (see page 28).
- 2 - Perform the general cleaning (see page 28).
- 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 event 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.

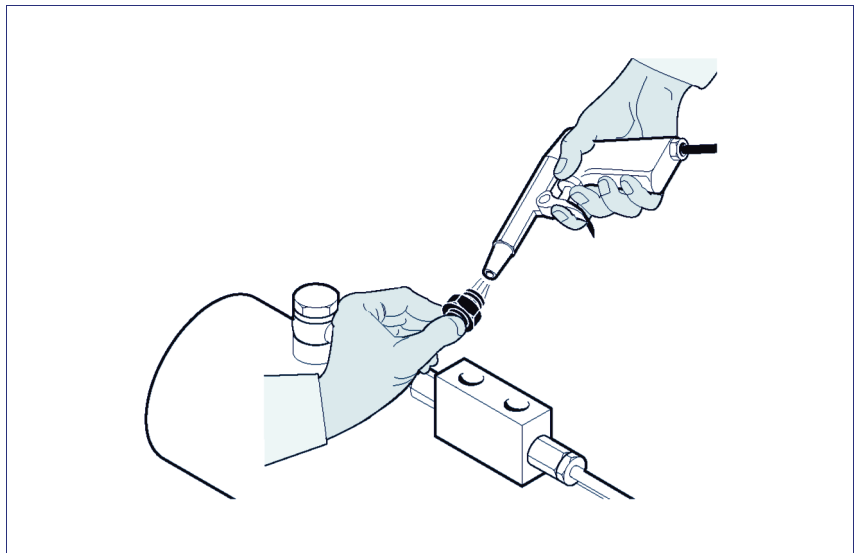
**TROUBLESHOOTING**

**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.



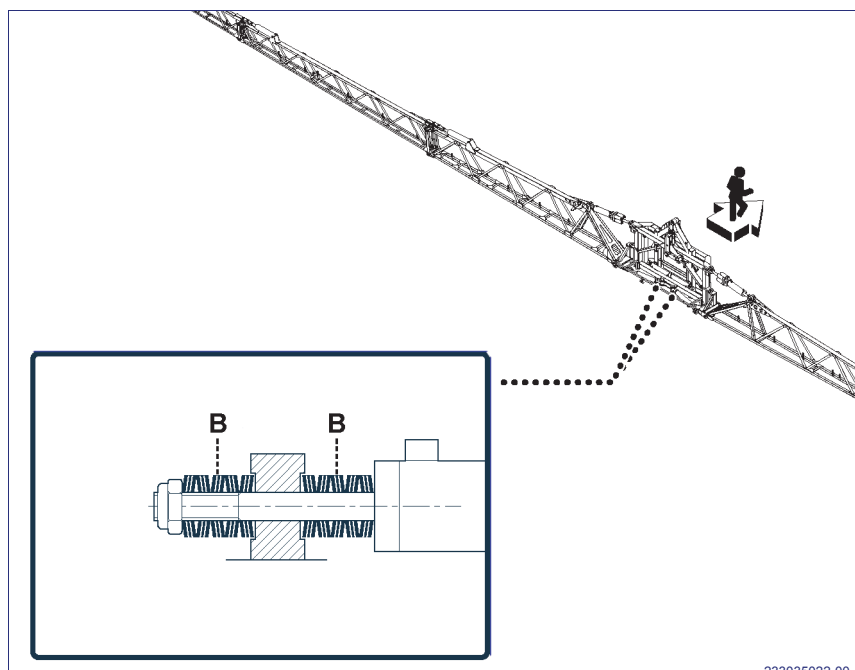
**Trouble:** the boom is not aligned when unfolded.

**Cause:** unfolding cylinder not adjusted.

**Remedies:** adjust the arm alignment (see "Adjustment of primary arm alignment").

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

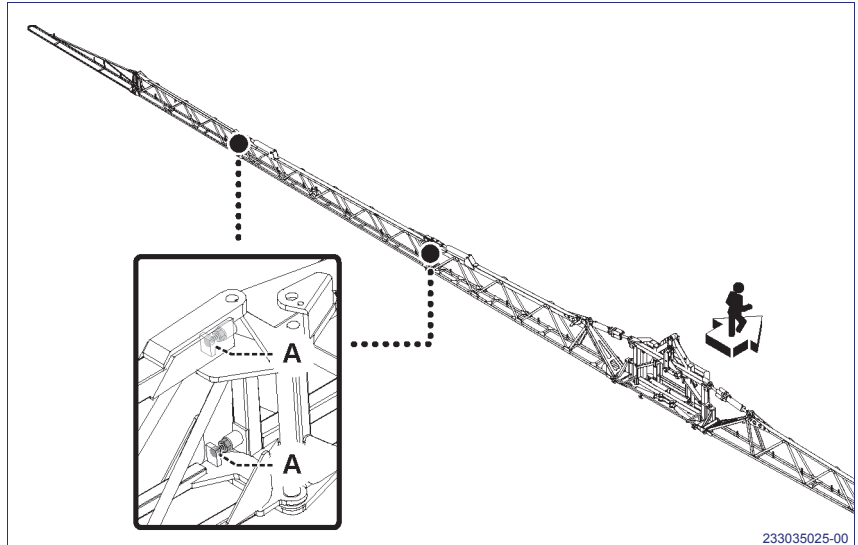
**Cures:** Check and replace Belleville washers (B) if necessary.



**Trouble:** when open, the secondary arms and extensions are not aligned.

**Cause:** unfolding cylinder not adjusted.

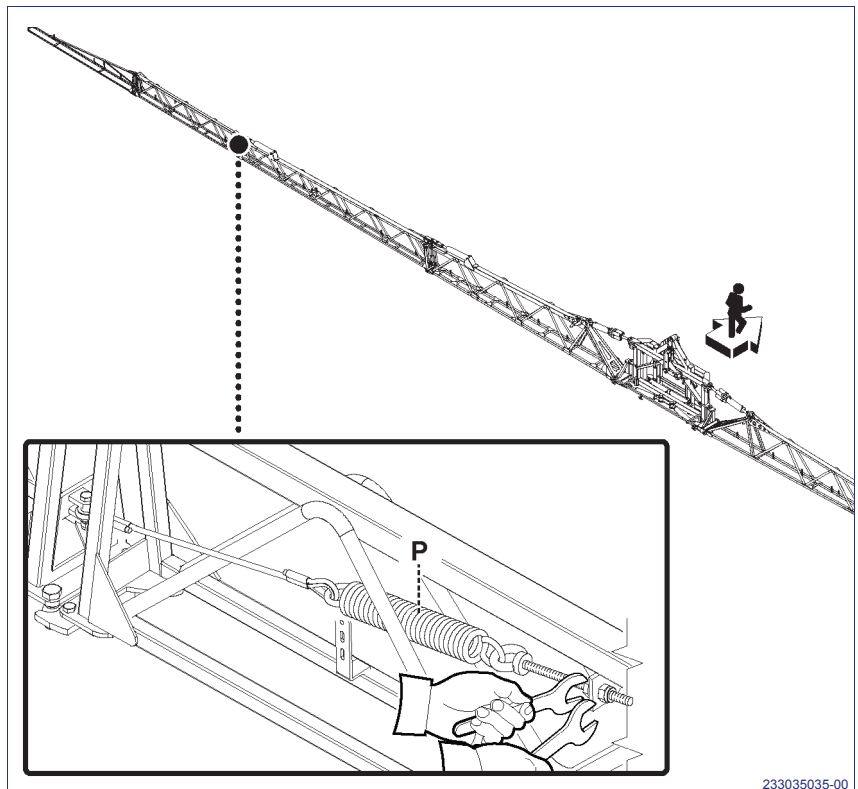
**Cures:** use the screws (A) to adjust the alignment of the arms (see "Adjustment of secondary arm alignment").



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

**Cause:** the articulation is loose.

**Cures:** increase the traction of the spring (P) or replace if it lost effectiveness (see "Replacement endpiece extension spring").



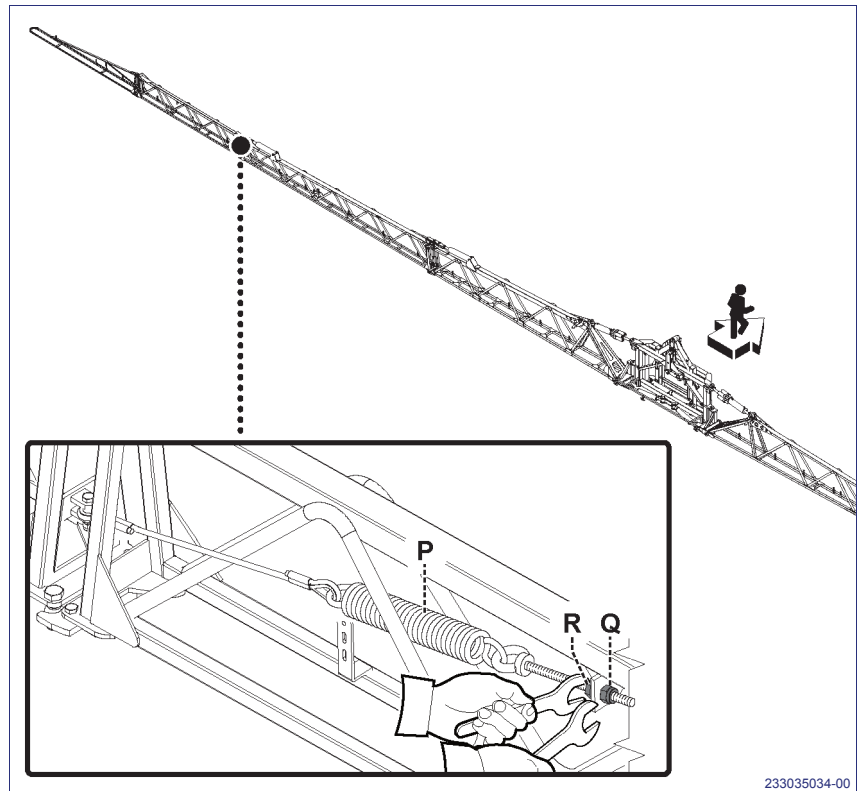


## INFORMATION ABOUT REPLACEMENTS

### REPLACEMENT ENDPIECE EXTENSION SPRING

Proceed as follows:

- 1 - Loosen the nut (**Q**) to completely release the spring (**P**).
- 2 - Replace the spring (**P**) with a new one.
- 3 - Tighten the nut (**Q**) until you get the right compression of the new spring.
- 4 - Tighten the lock nut (**R**) when the operation is completed.



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### 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.

