

SPRAYING BOOM

user manual

Serial number

Edition 0
05 - 2012

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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.

GENERAL AND SAFETY INFORMATION

EQUIPMENT GENERAL DESCRIPTION

The spraying boom, from now on called equipment, has been designed and manufactured to be installed on a machine that sprays grounds and/or cultivated products with chemicals. It must be applied to the lifting device and to the self-levelling device so that it

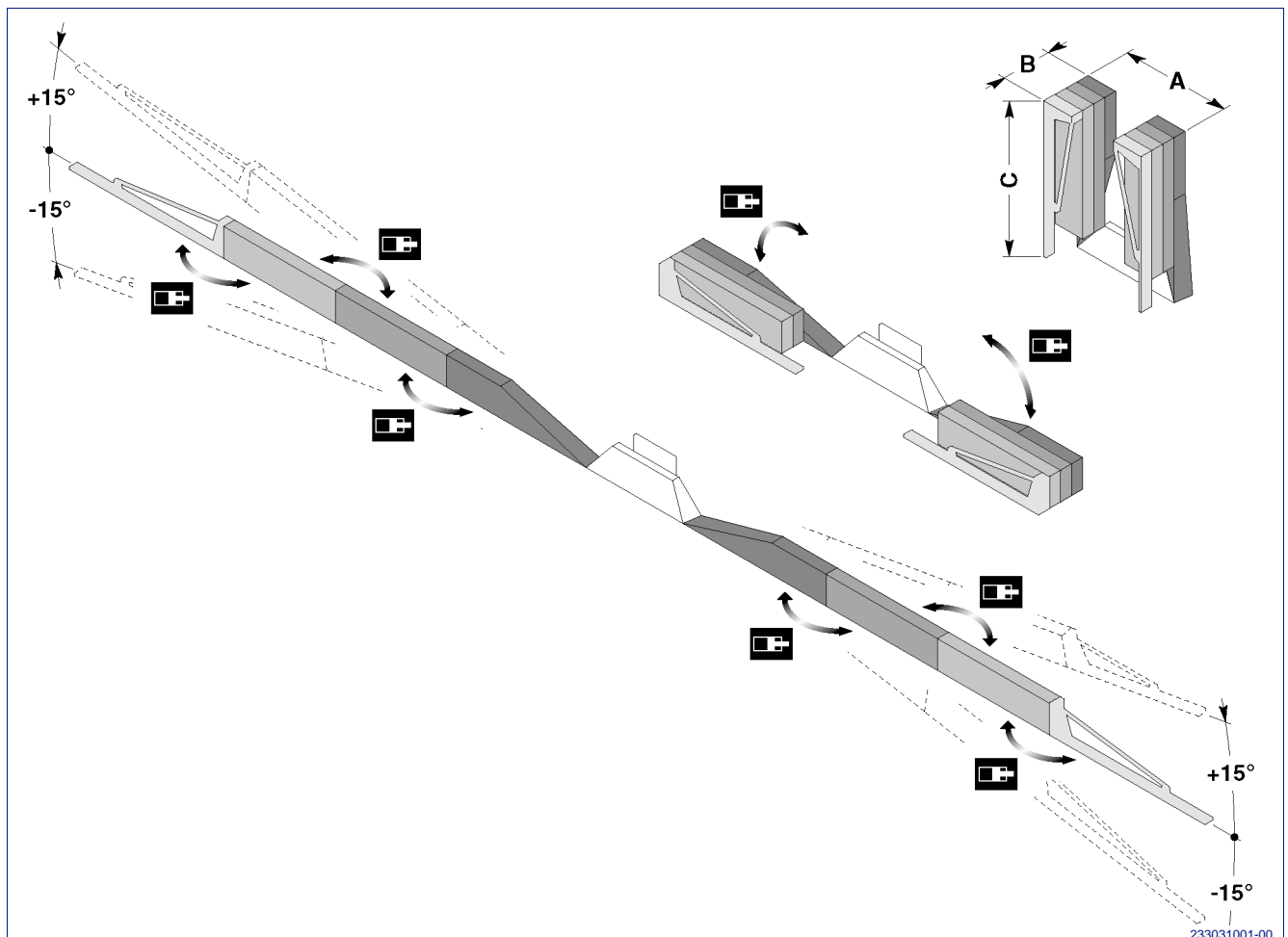
stays perfectly parallel to the ground, also in case of uneven ground.

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 L (m)	Size			(*) Weight (kg)	Qty. Jets (500mm)
	A mm	B mm	C mm		
18	2450	1200	3050	540	36
20	2450	1200	3050	626	40
21/15	2450	1200	3050	628	42
21/18	2450	1200	3050	628	42
24	2450	1200	3050	658	48
27	2450	1400	3050	776	54
28	2450	1400	3050	778	56
30	2450	1400	3050	786	60

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



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SAFETY DEVICES

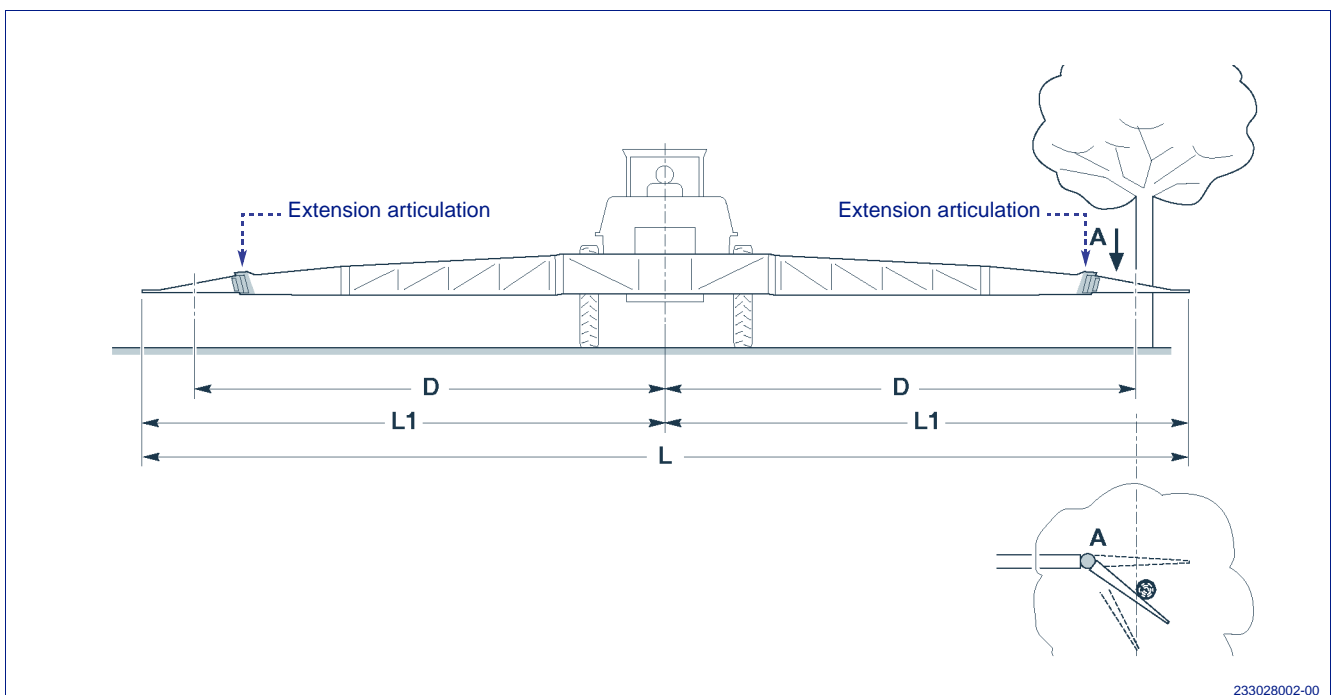
Extension articulation: to allow the end of the extension to turn so as to get past obstacles. In order to get past the obstacle without damaging the equipment, it is necessary to keep a distance higher than the value (D) given in the table.

Locking valve: to lock the motions of the different boom sectors during use and/or conveying of the equipment and to avoid accidental shifting in case of breakage of the hydraulic pipes.

Safety distance table

Width L	Width L1	Safety distance D
18	9	8,1
20	10	9
21	10,5	9,5
24	12	10,8
27	13,5	12,2
28	14	12,6
30	15	13,5

Safety distance diagram

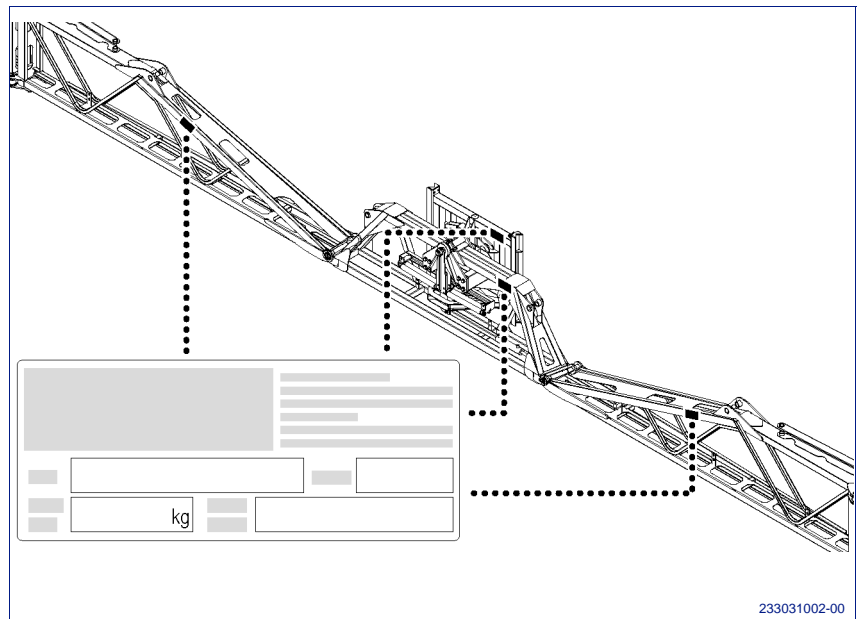


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IDENTIFICATION PLATE POSITION

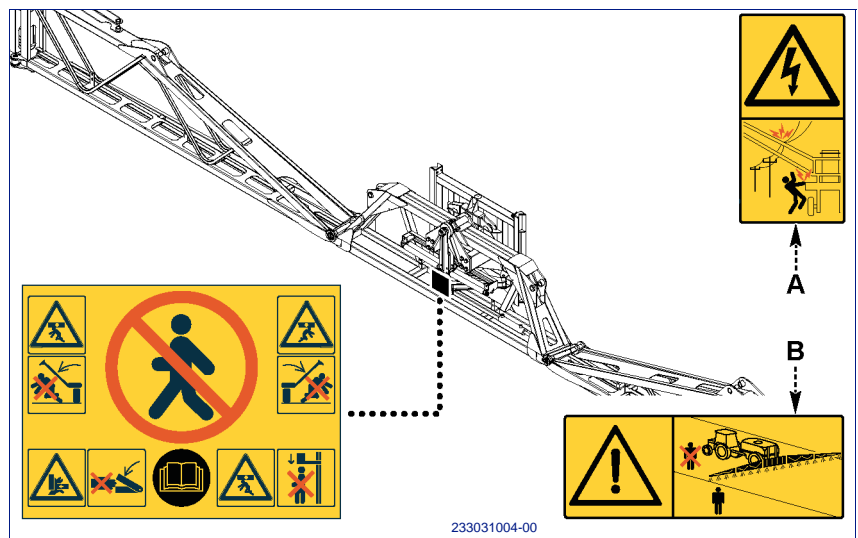
The figure points out the positions of the identification plates of the components.



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

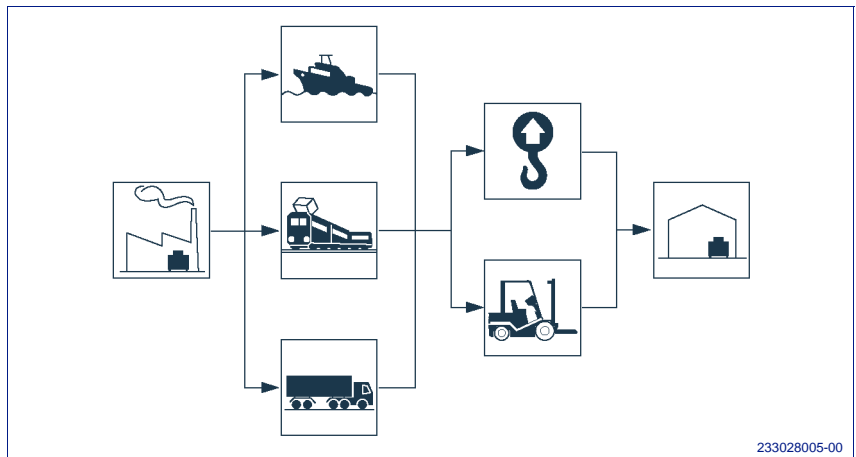
Comply with the information provided by the manufacturer, found on the equipment and in the instruction manual, when carrying out handling and loading operations.

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

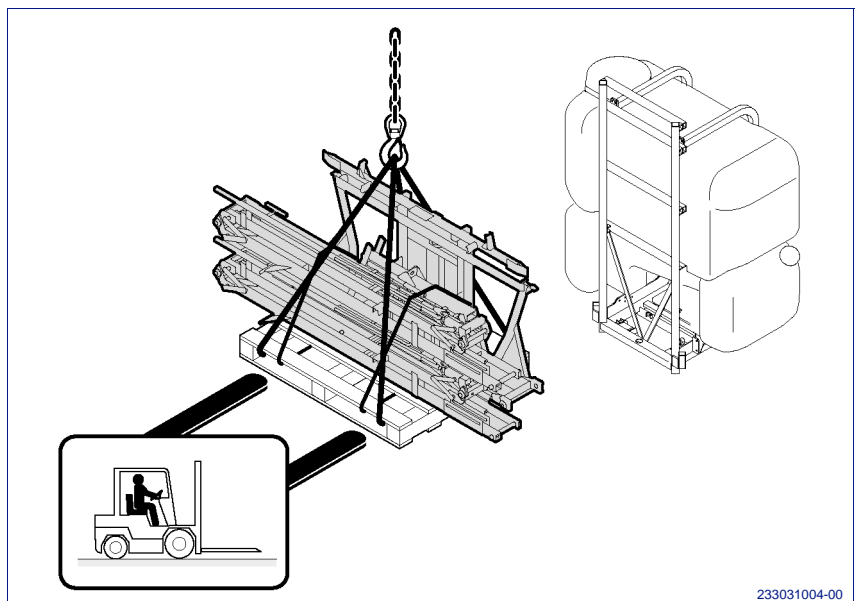
Depending on the destination, loading and transport can be carried out with different means. The diagram shows the most commonly used solutions. Secure the means properly during transportation in order to prevent untimely shifting.



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.

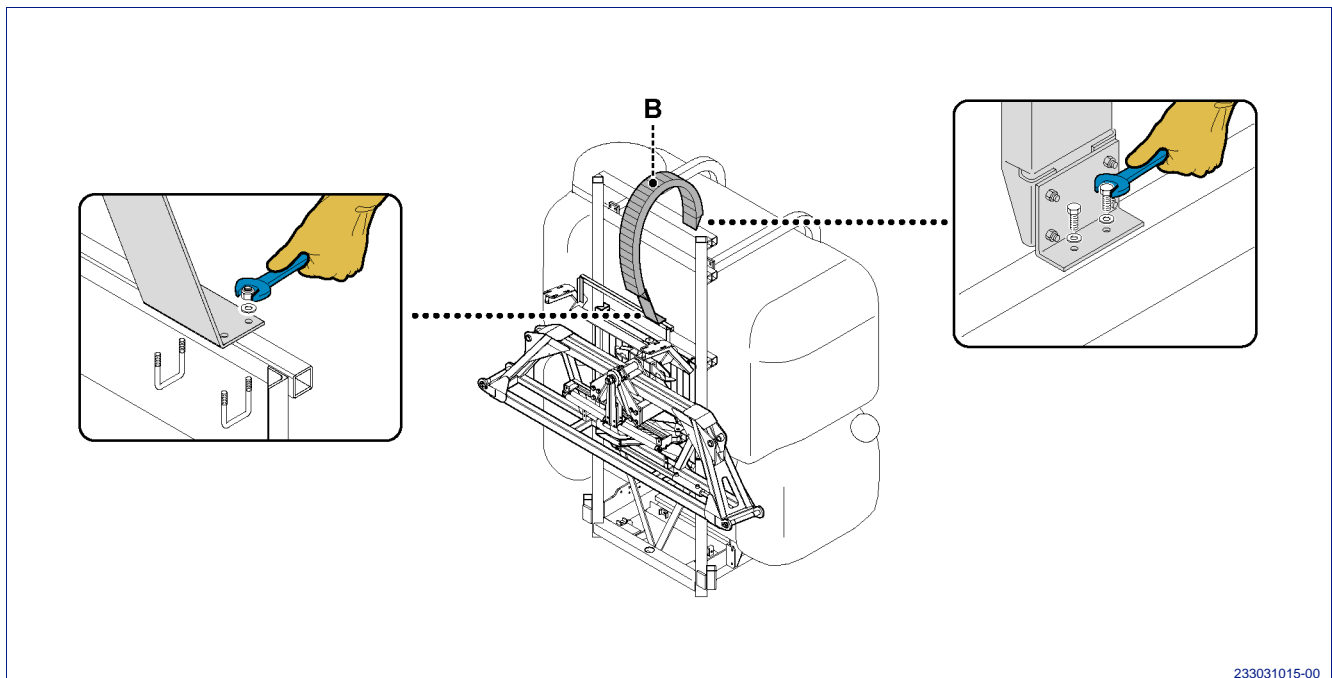
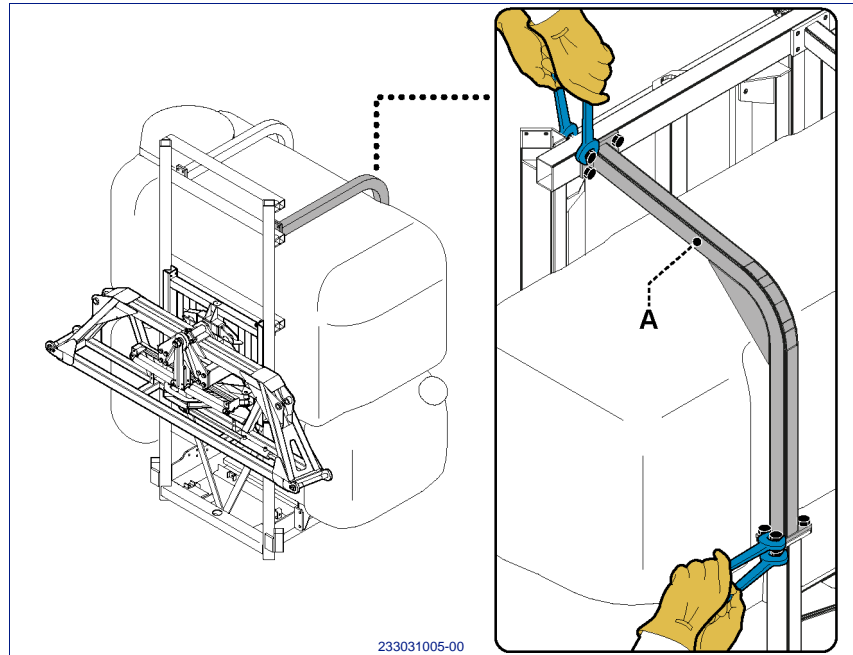
INSTALLATION OF DISASSEMBLED PARTS

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

INSTALLATION OF CENTRAL FRAME

The central frame is installed on the sliding guides of the lifting device. Assemble the cable holding chain as follows:

- 1 - Remove support **(A)**
- 2 - Assemble cable holding chain **(B)** as shown in the figure by means of the special screws.
- 3 - Install support **(A)**

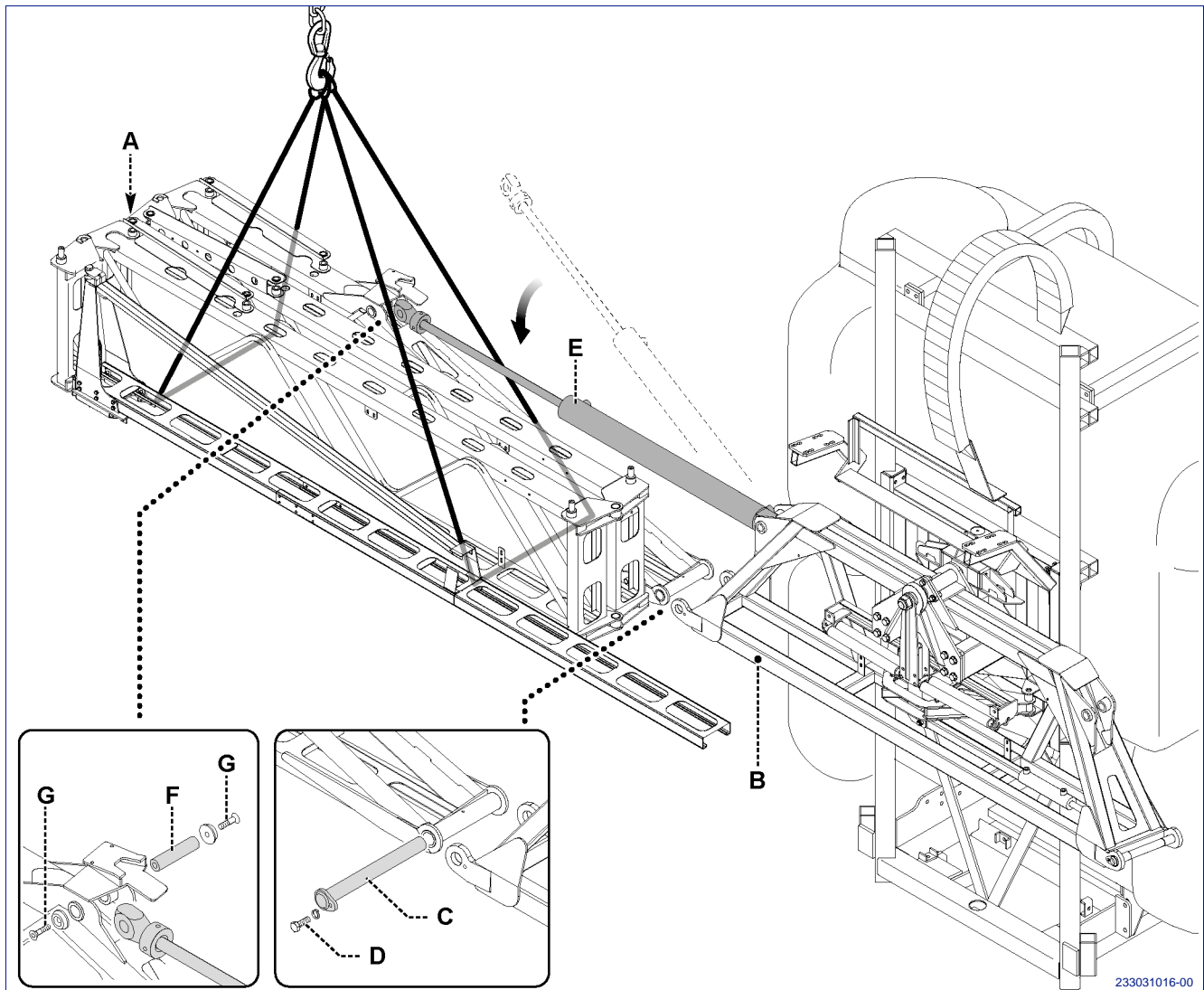


INSTALLATION OF ARM

- 1 - Lift arm (A) and fasten it to central frame (B) by means of pin (C) after lubricating the parts and their seats. Screw and tighten screw (D).
- 2 - Position hydraulic cylinder (E) as shown in the figure and connect it to the arm by means of pin (F). Screw and tighten screws (G).

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

i Important
 Position the lifting bands as shown in the figure without winding the boom extension that could be damaged during lifting.



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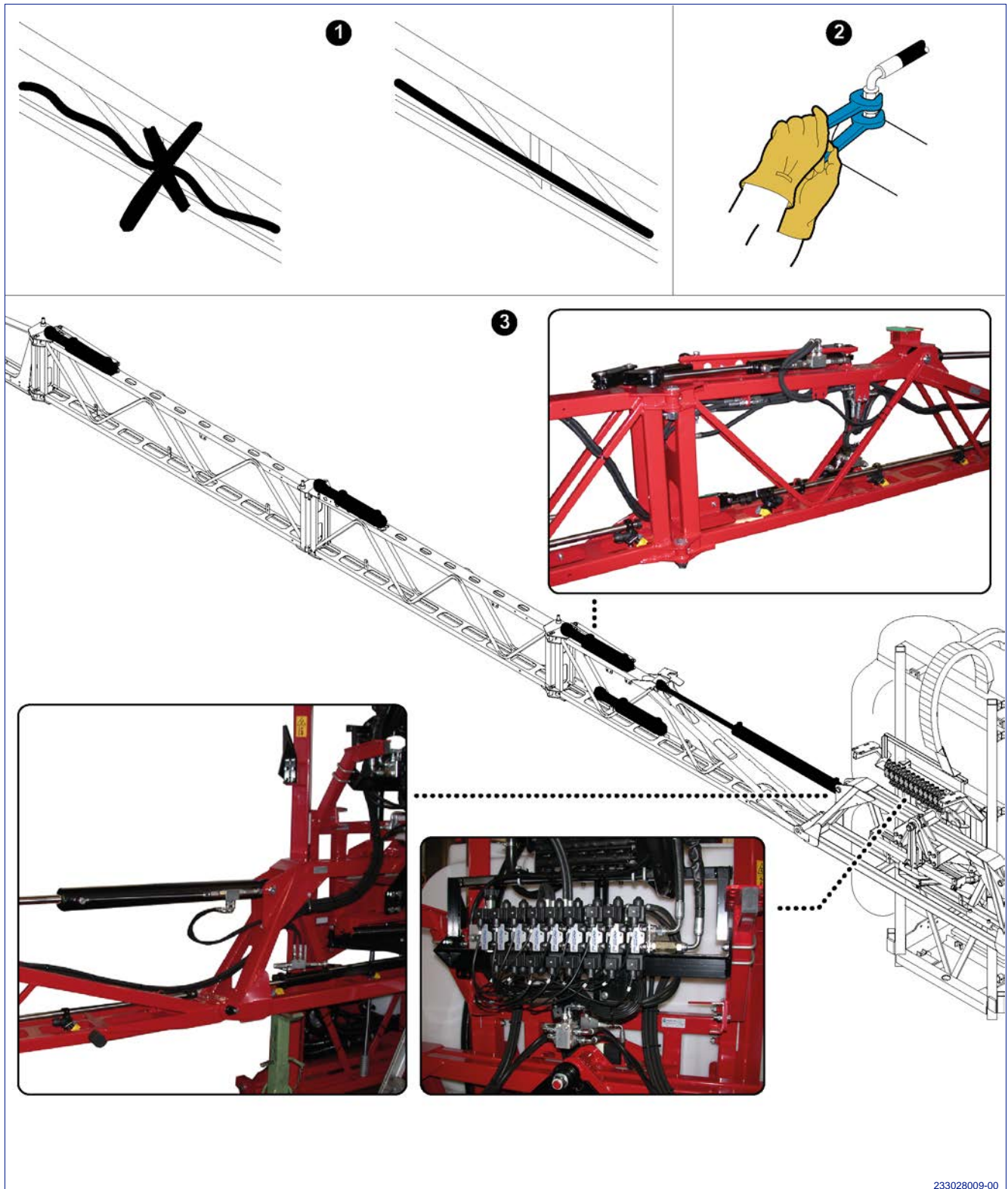
INSTALLATION OF THE HYDRAULIC SYSTEM

Proceed in the way indicated.

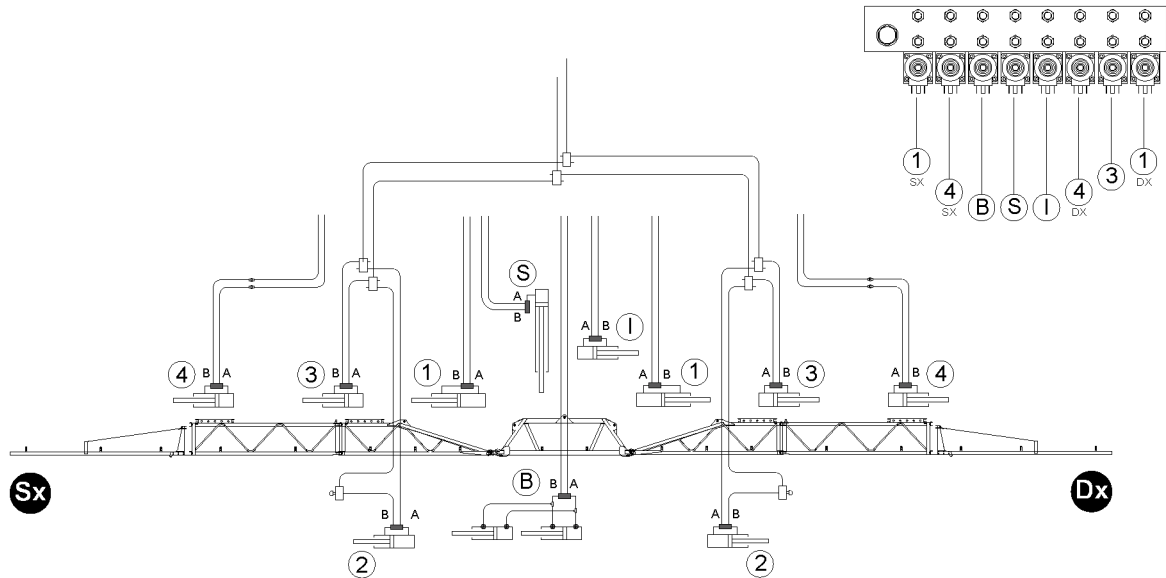
- 1 - Lay the hoses down on the boom linearly (see the figure). Leave sufficient length so as to not impede the movements at the articulation points of the boom.
- 2 - Connect the hydraulic hose (see the hydraulic diagram).

 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.



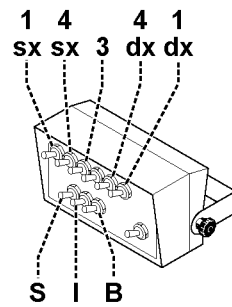
8-function hydraulic system (18 m boom) (combined arms)



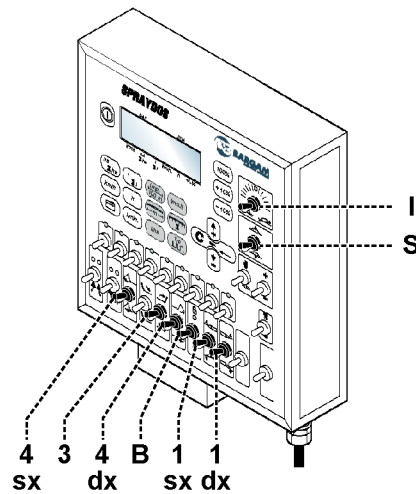
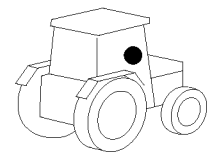
Legend

- S**- Lifting device
- B**- Locking of self-levelling device
- I**- Spraying boom inclination
- 1dx- 1st right arm
- 1sx- 1st left arm
- 3- 2nd right and left arm
- 4dx- Right extension
- 4sx- Left extension

CGA CONTROL PANEL

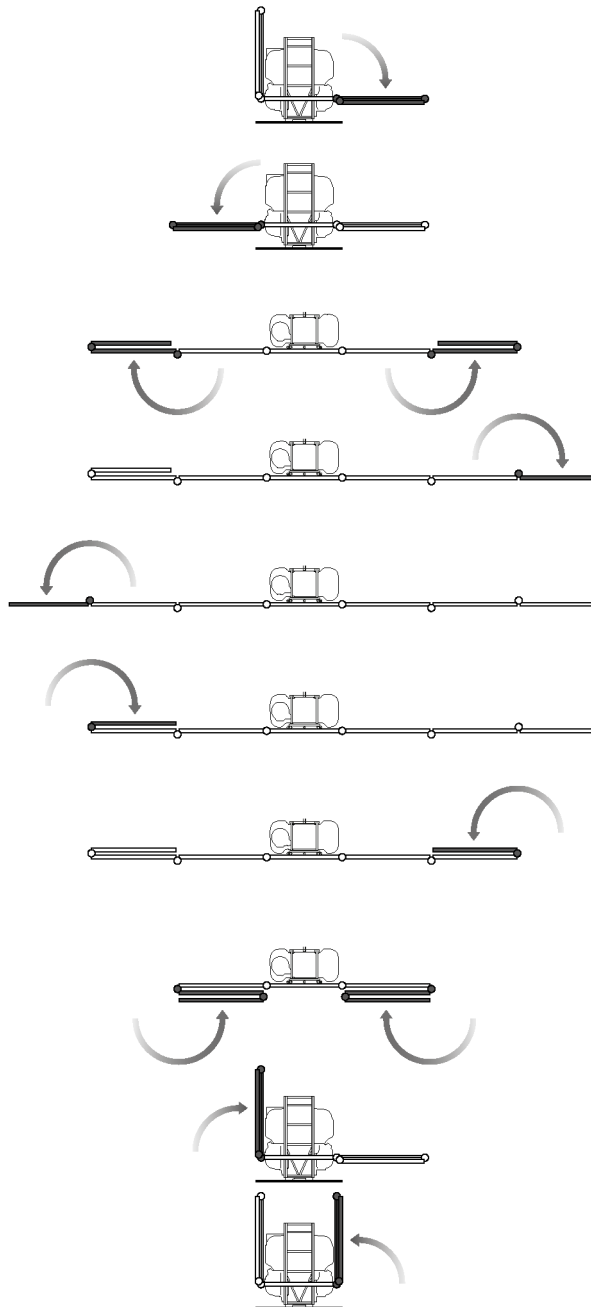


MÜLLER CONTROL PANEL

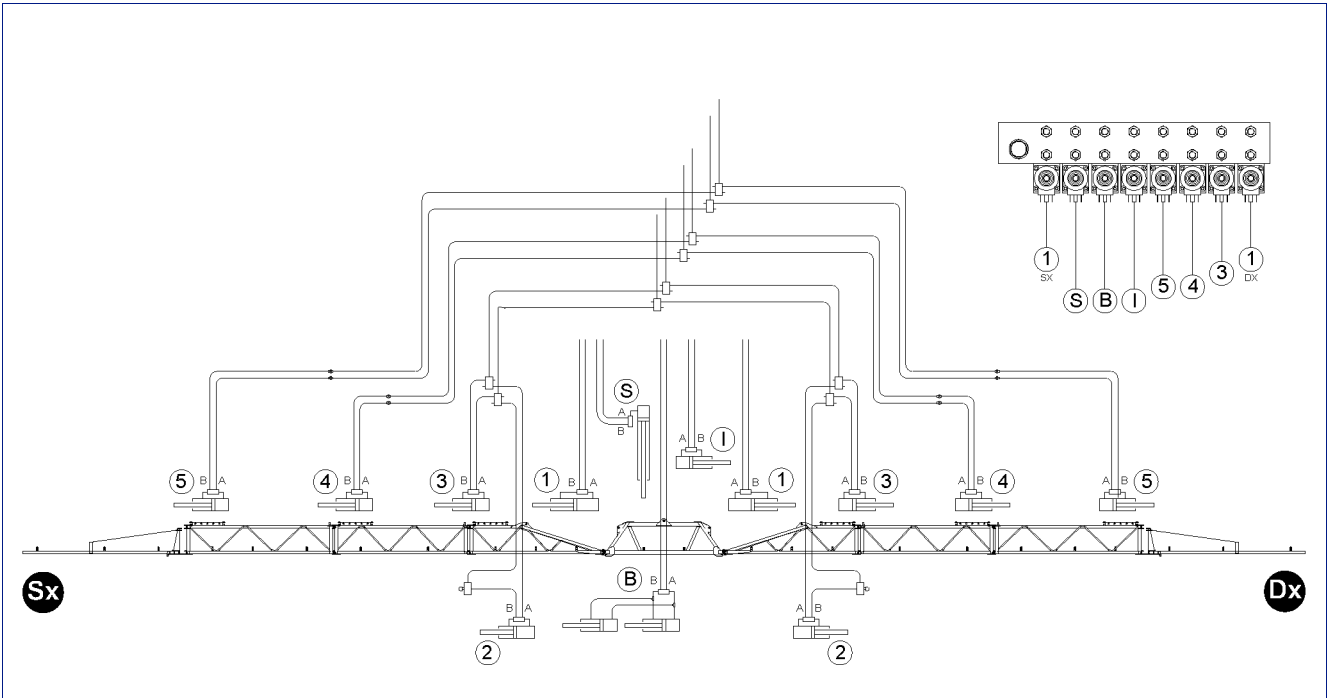


Boom folding and unfolding

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



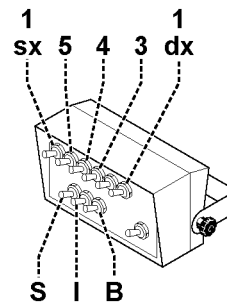
8-function hydraulic system (20/24m boom) (combined arms)



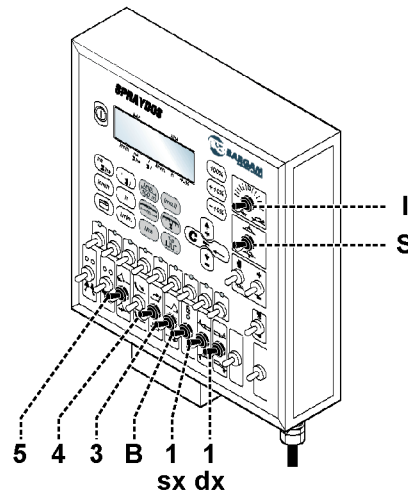
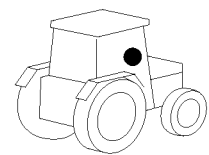
Legend

- S**- Lifting device
- B**- Locking of self-levelling device
- I**- Spraying boom inclination
- 1dx**- 1st right arm
- 1sx**- 1st left arm
- 3**- 2nd right and left arm
- 4**- 3rd right and left arm
- 5**- Right and left extension

CGA CONTROL PANEL

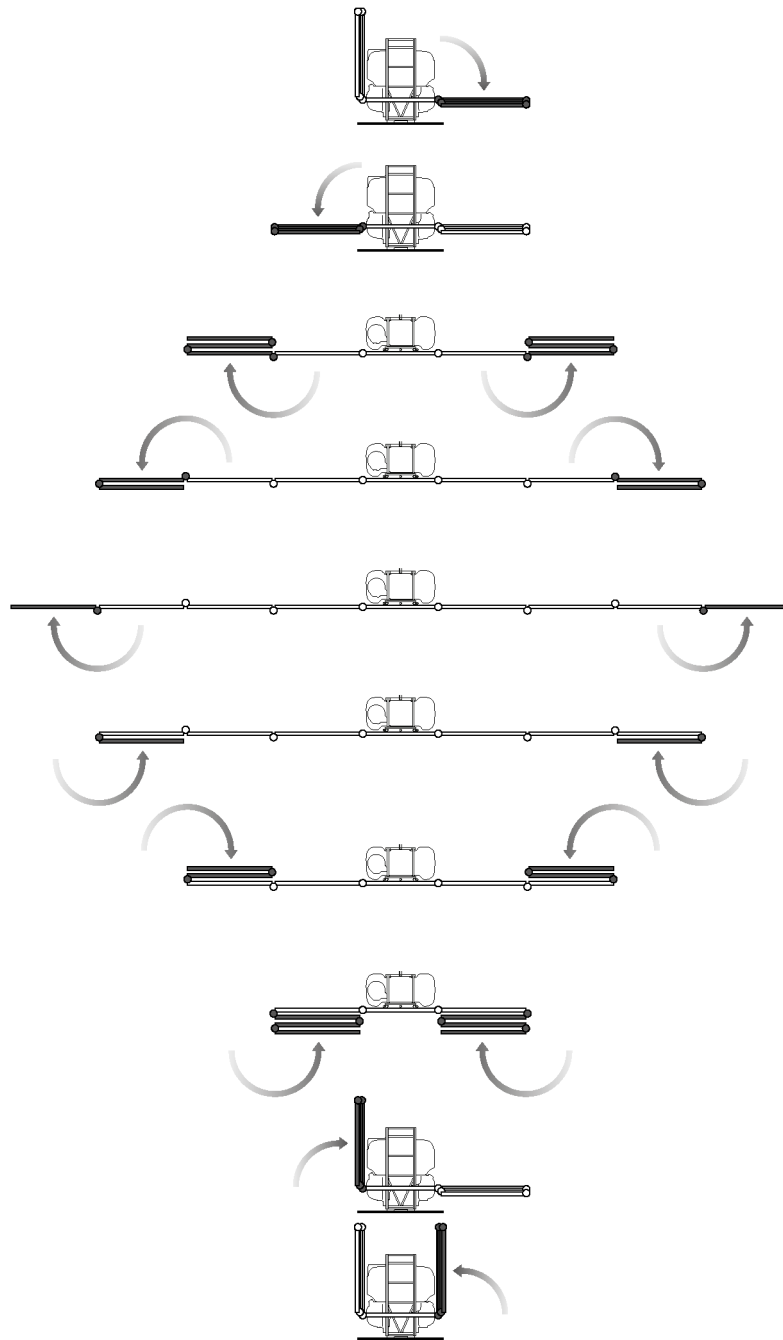


MÜLLER CONTROL PANEL

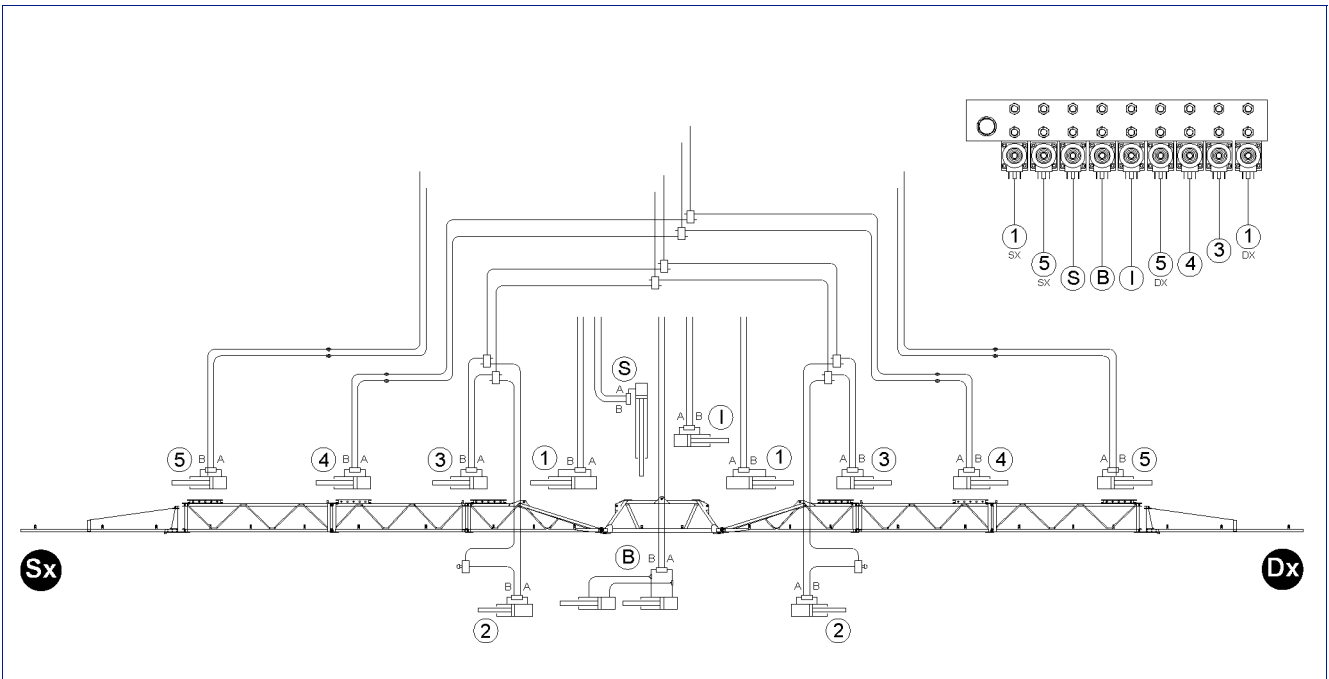


Boom folding and unfolding

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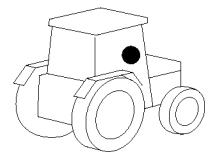
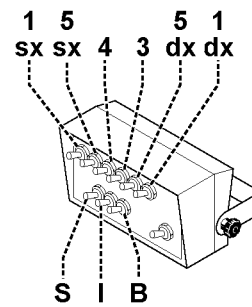
9-function hydraulic system (20/24m boom) (combined arms)



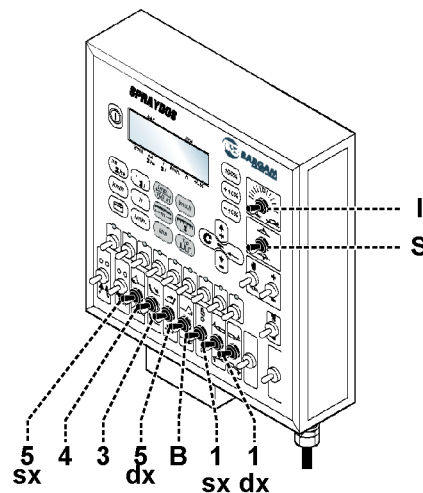
Legend

- S** - Lifting device
- B** - Locking of self-levelling device
- I** - Spraying boom inclination
- 1dx** - 1st right arm
- 1sx** - 1st left arm
- 3** - 2nd right and left arm
- 4** - 3rd right and left arm
- 5dx** - Right extension
- 5sx** - Left extension

CGA CONTROL PANEL

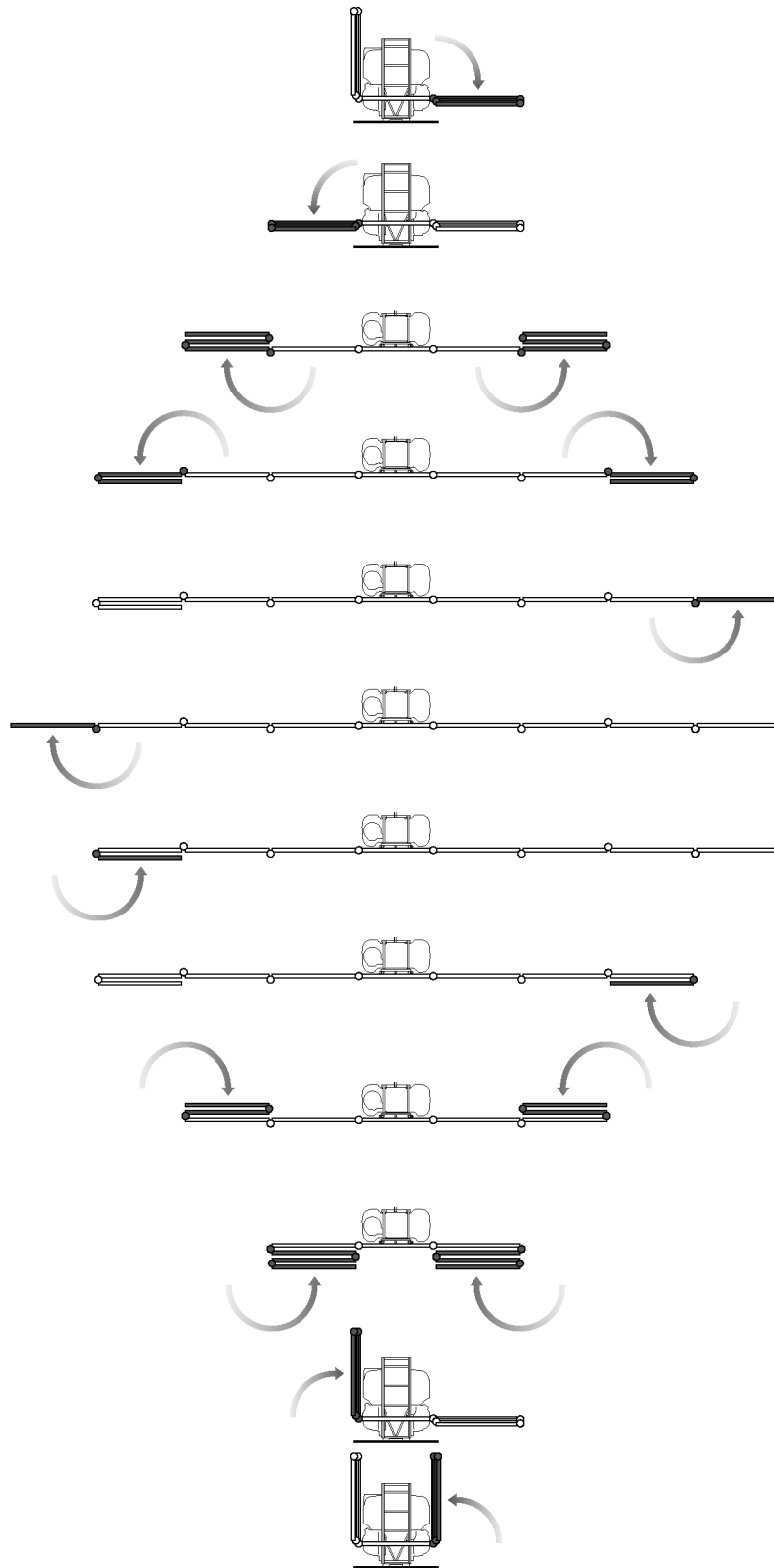


MÜLLER CONTROL PANEL



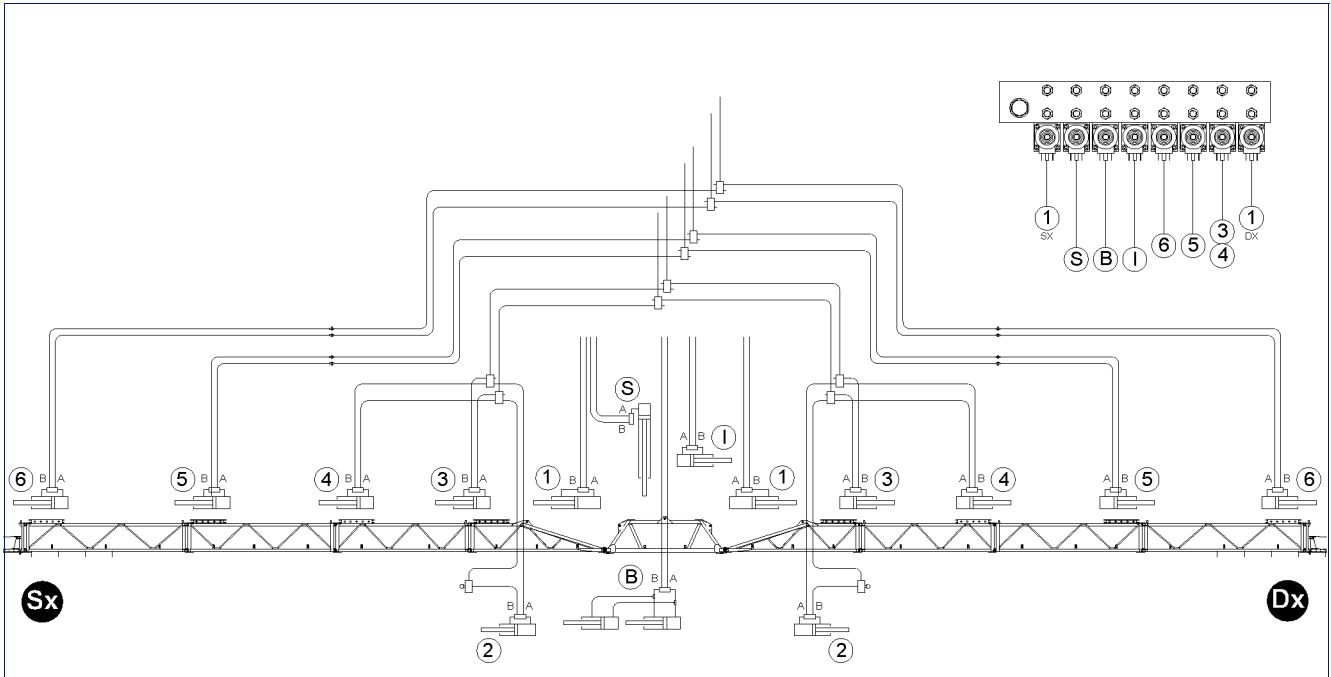
Boom folding and unfolding

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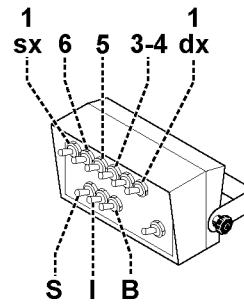
8-function hydraulic system (27/30m boom) (combined arms)



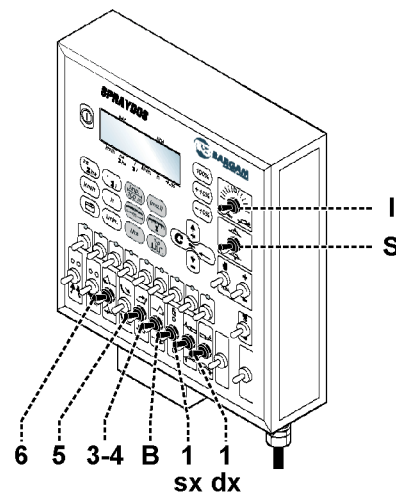
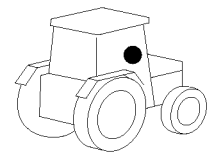
Legend

- S**- Lifting device
- B**- Locking of self-levelling device
- I**- Spraying boom inclination
- 1dx**- 1st right arm
- 1sx**- 1st left arm
- 3-4**- 2nd and 3rd right and left arm
- 5**- 4nd right and left arm
- 6**- Right and left extension

CGA CONTROL PANEL

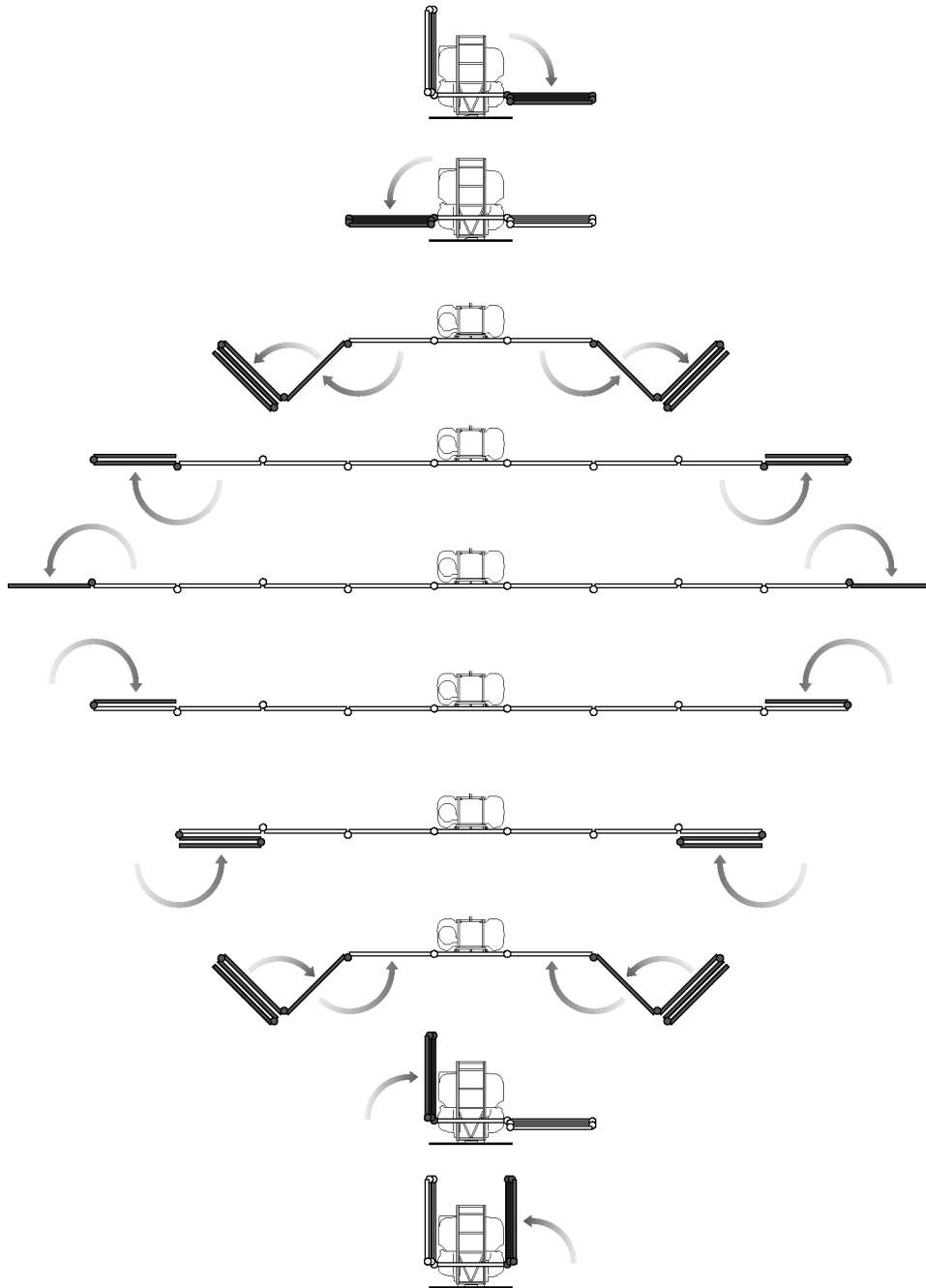


MÜLLER CONTROL PANEL



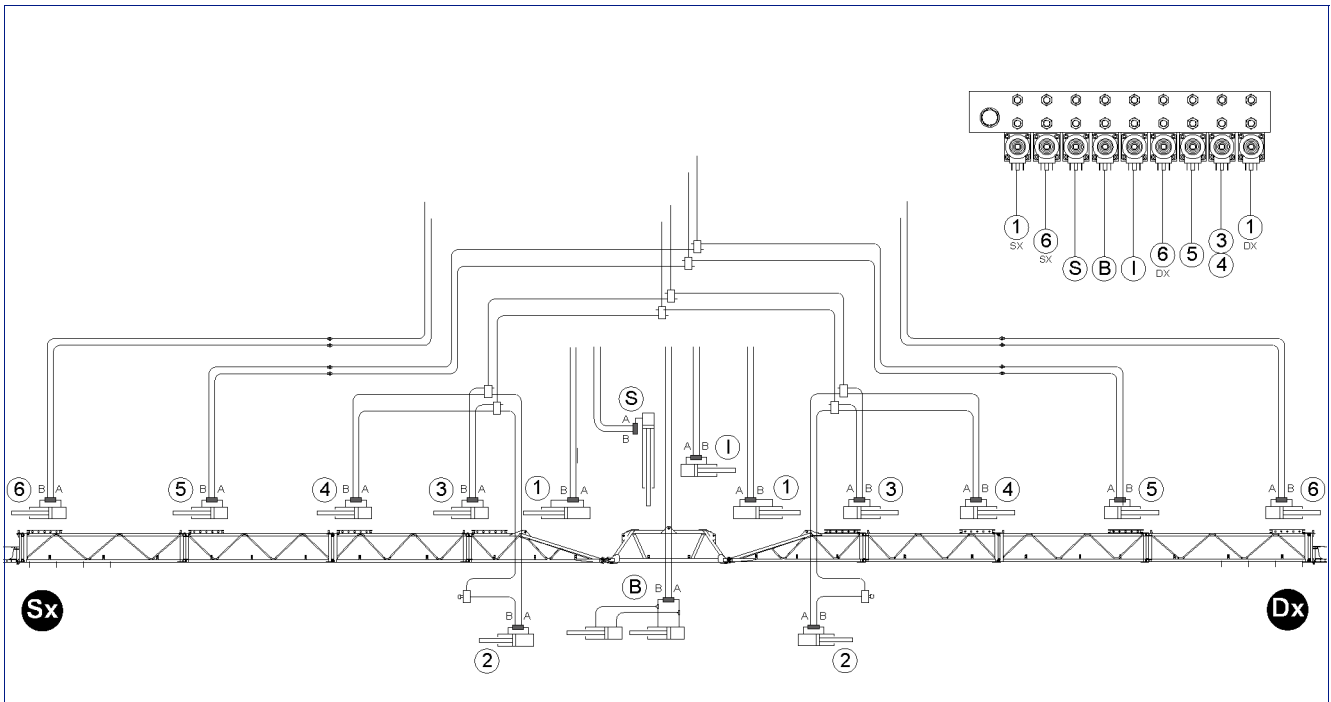
Boom folding and unfolding

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



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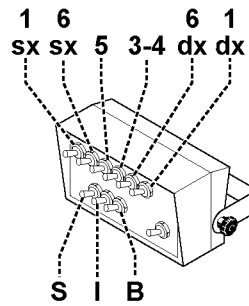
9-function hydraulic system (27/30m boom) (combined arms)



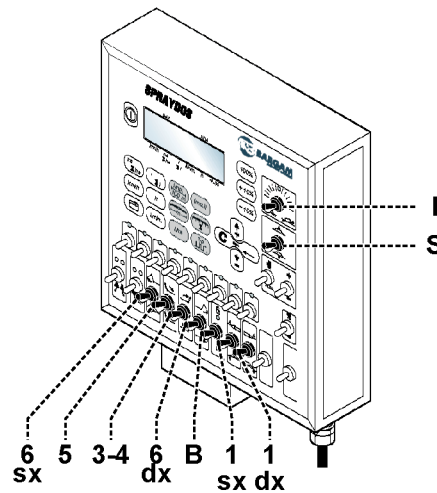
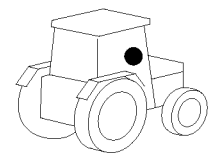
Legend

- S** - Lifting device
- B** - Locking of self-levelling device
- I** - Spraying boom inclination
- 1dx** - 1st right arm
- 1sx** - 1st left arm
- 3-4** - 2nd and 3rd right and left arm
- 5** - 4nd right and left arm
- 6dx** - Right extension
- 6sx** - Left extension

CGA CONTROL PANEL

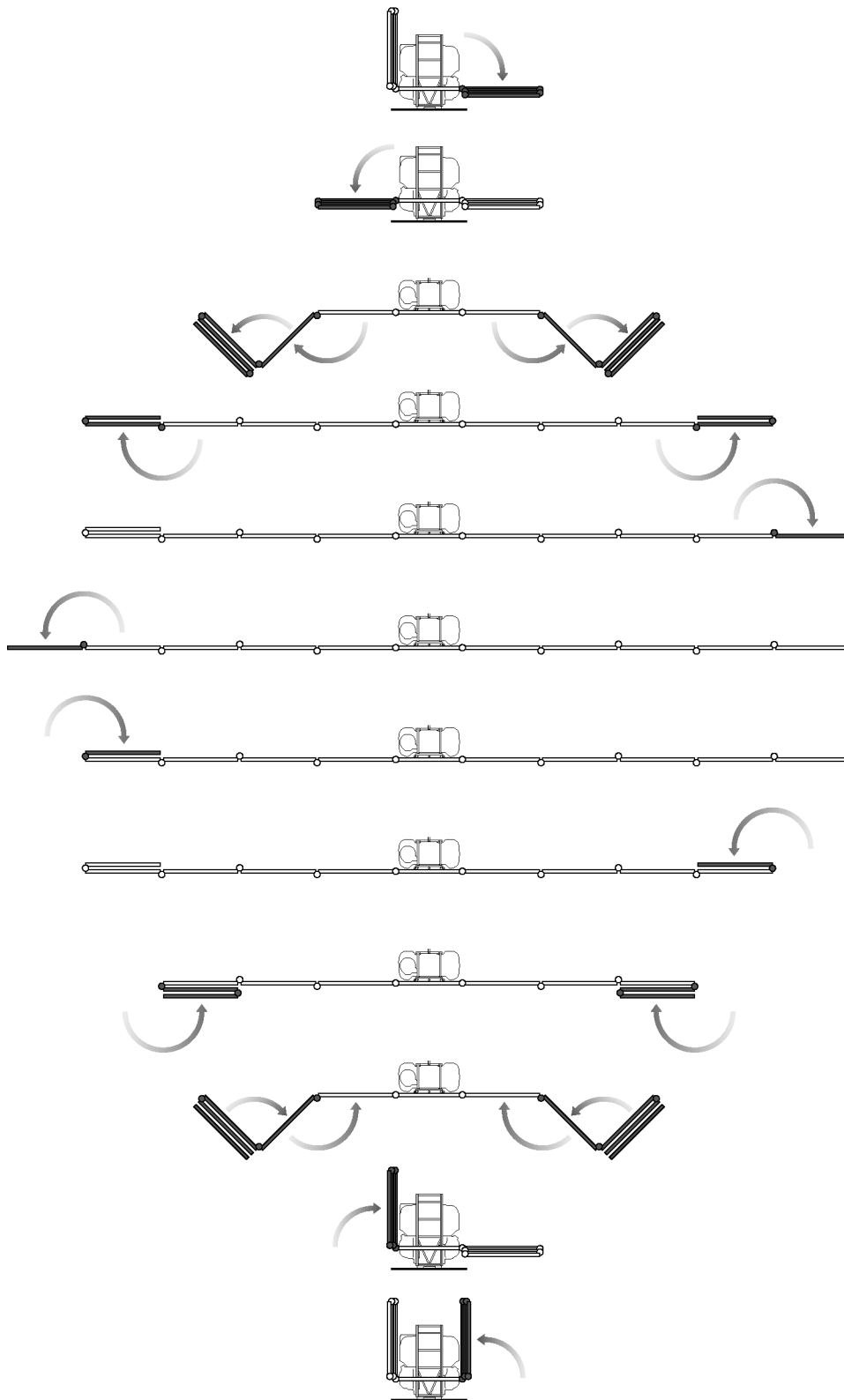


MÜLLER CONTROL PANEL



Boom folding and unfolding

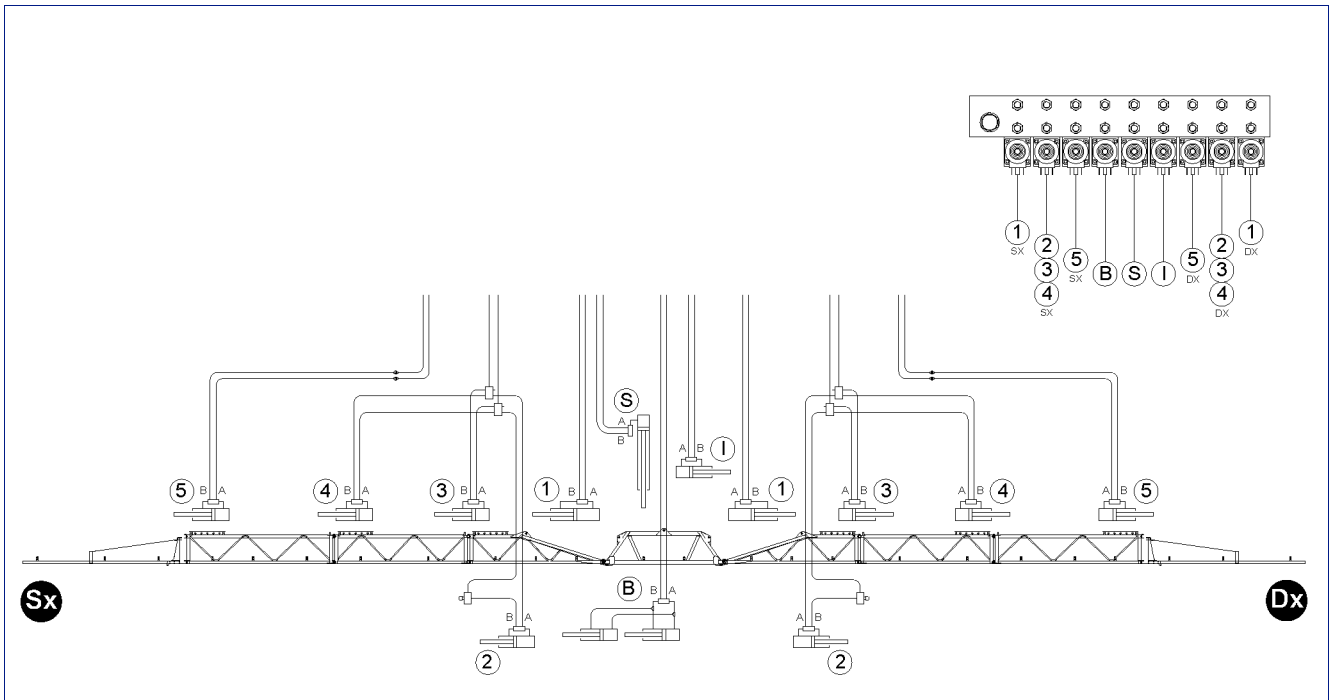
The figure indicates the procedure to follow when unfolding and folding the boom.



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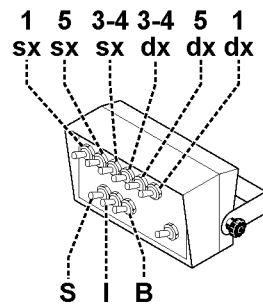
9-function hydraulic system (21-15 m boom) (right arm and left arm)



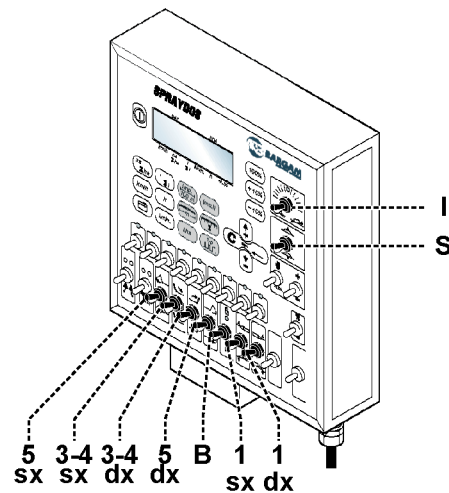
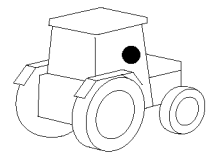
Legend

- S** - Lifting device
- B** - Locking of self-levelling device
- I** - Spraying boom inclination
- 1dx** - 1st right arm
- 1sx** - 1st left arm
- 3-4dx** - 2nd, 3rd and 4th right arm
- 3-4sx** - 2nd, 3rd and 4th left arm
- 5dx** - Right extension
- 5sx** - Left extension

CGA CONTROL PANEL

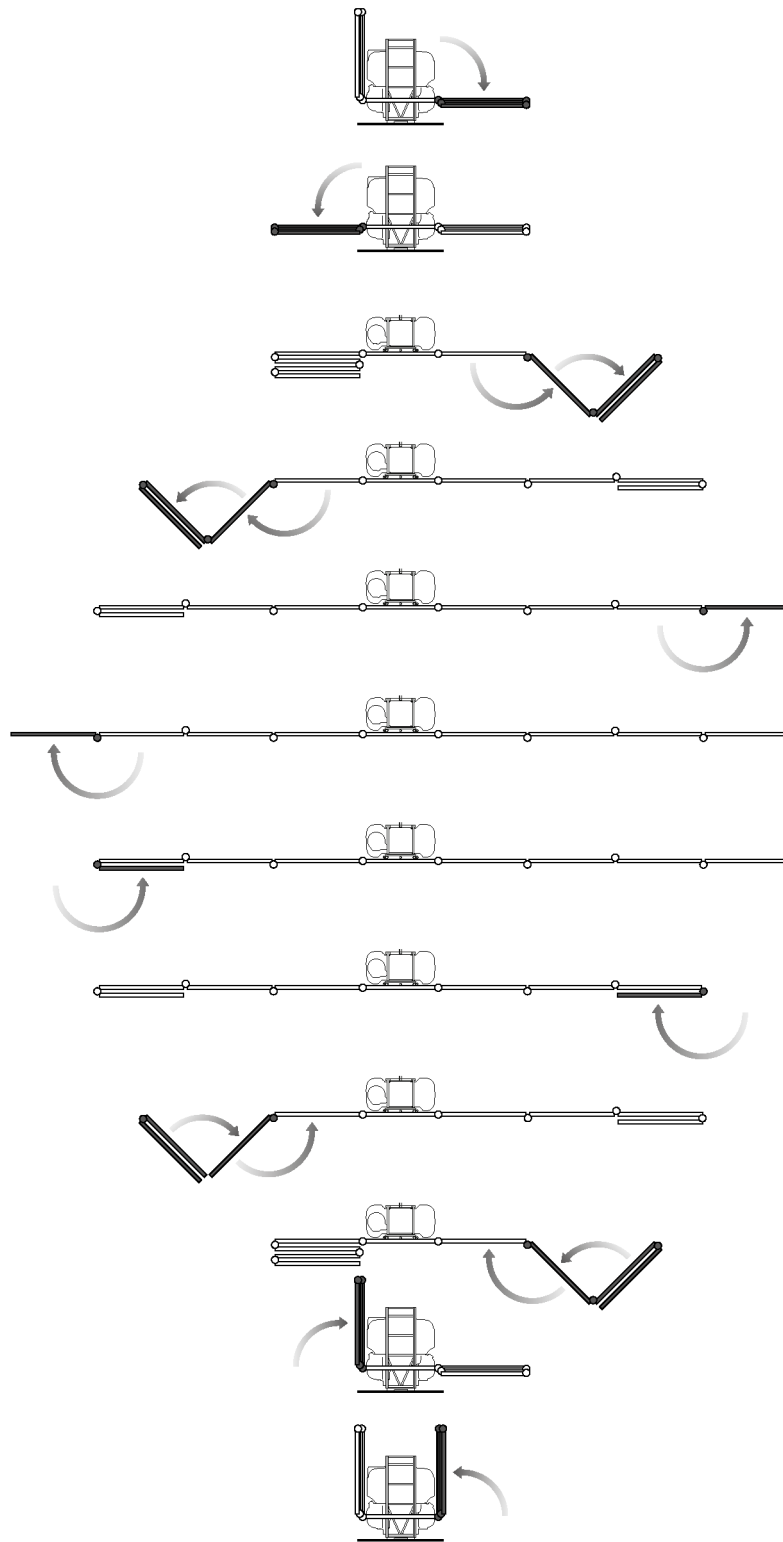


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Boom folding and unfolding

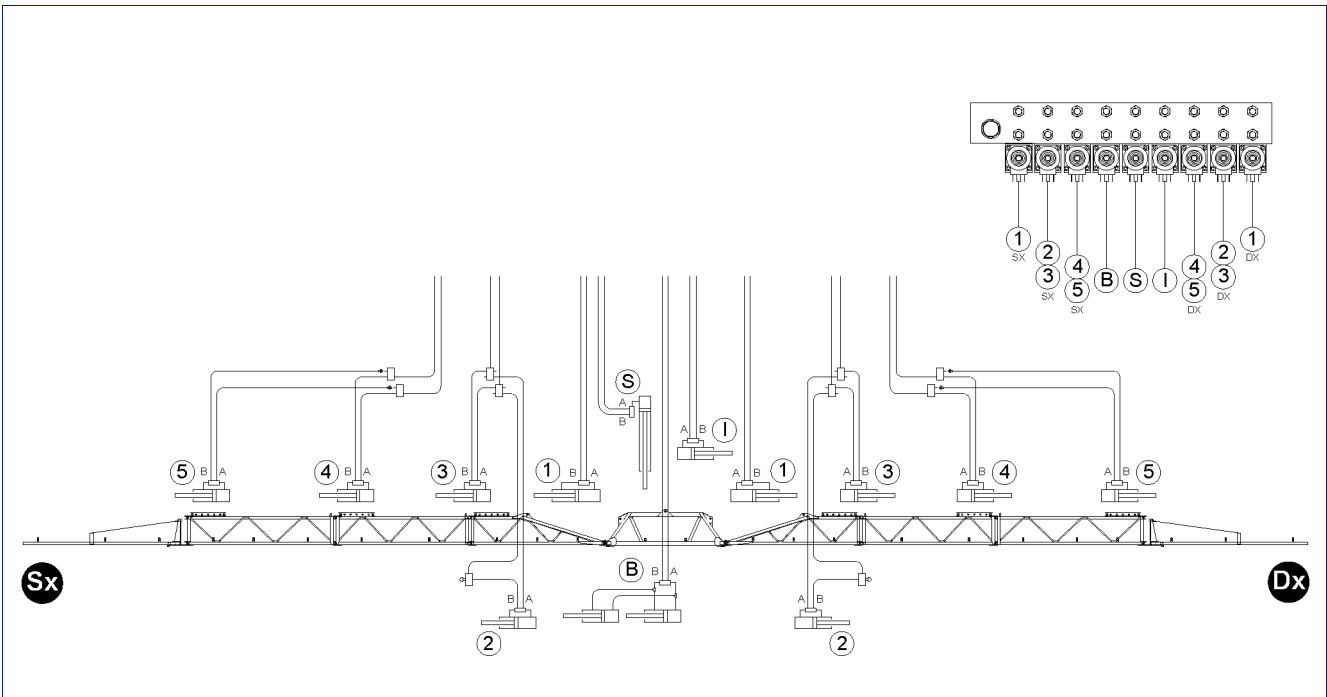
The figure indicates the procedure to follow when unfolding and folding the boom.



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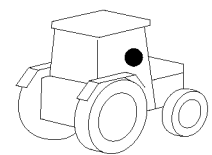
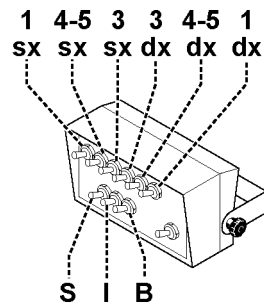
9-function hydraulic system (21 m boom) (right arm and left arm)



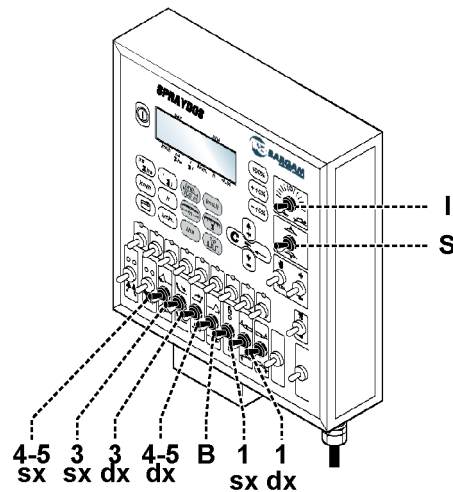
Legend

- S**-Lifting device
- B**-Locking of self-levelling device
- I**-Spraying boom inclination
- 1dx**-1st right arm
- 1sx**-1st left arm
- 3dx**-2nd right arm
- 3sx**-2nd left arm
- 4-5dx**-3rd right arm and extension
- 4-5sx**-3rd left arm and extension

CGA CONTROL PANEL

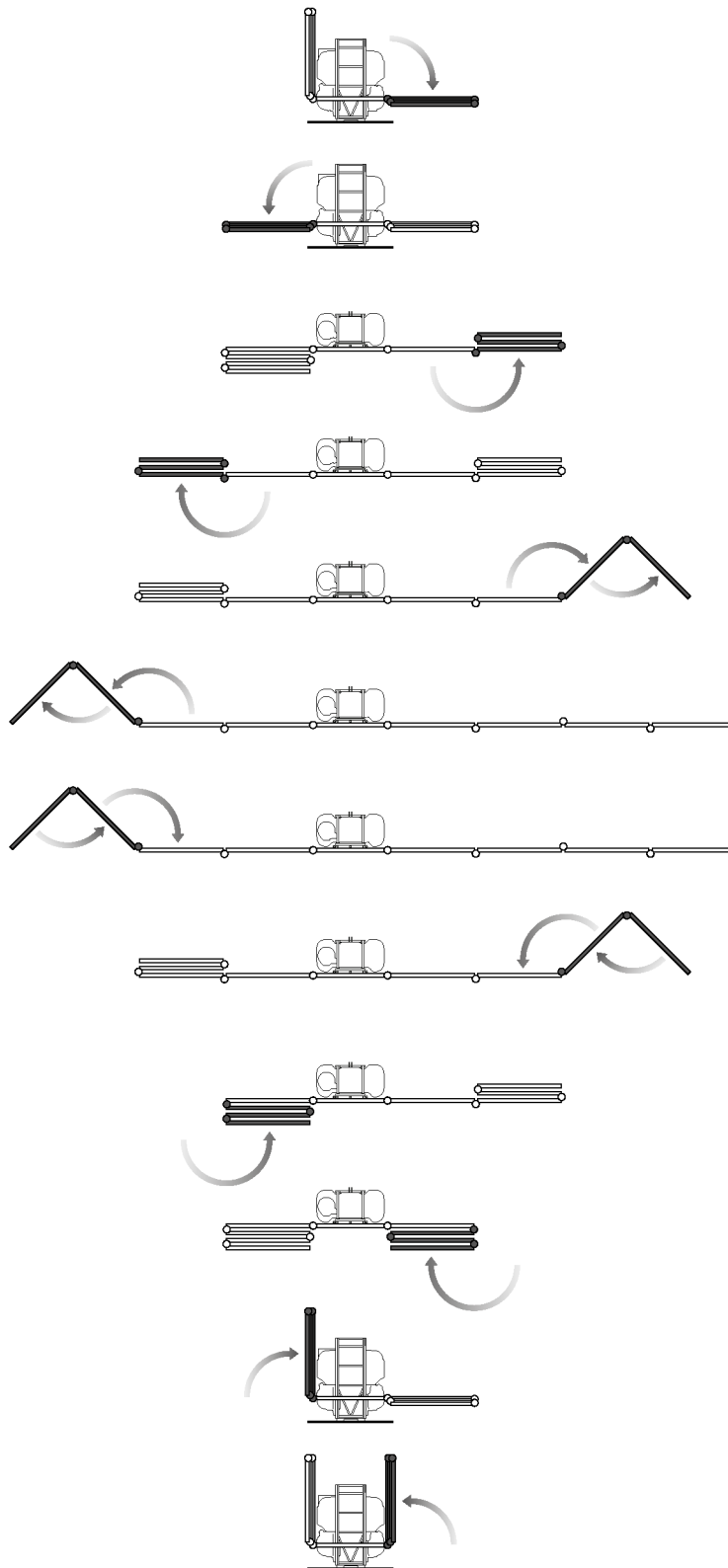


MÜLLER CONTROL PANEL



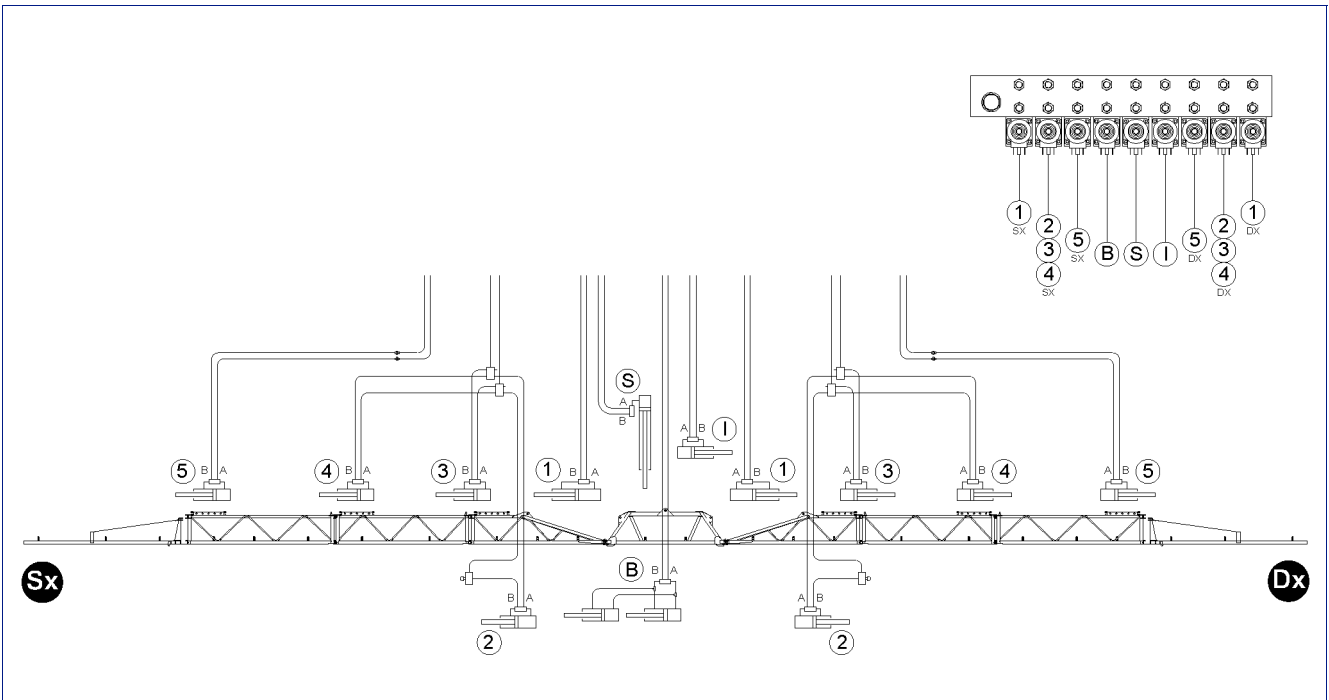
Boom folding and unfolding

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



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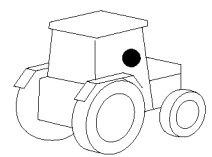
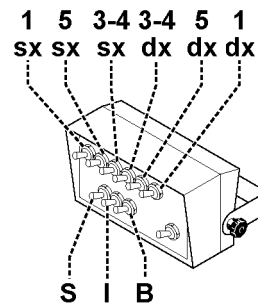
9-function hydraulic system (24 m boom) (right arm and left arm)



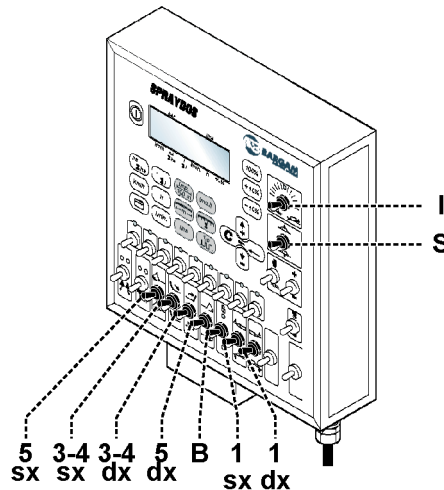
Legend

- S**-Lifting device
- B**-Locking of self-levelling device
- I**-Spraying boom inclination
- 1dx**- 1st right arm
- 1sx**- 1st left arm
- 3-4dx**- 2nd, 3rd and 4th right arm
- 3-4sx**- 2nd and 3rd left arm
- 5dx**- Right extension
- 5sx**- Left extension

CGA CONTROL PANEL

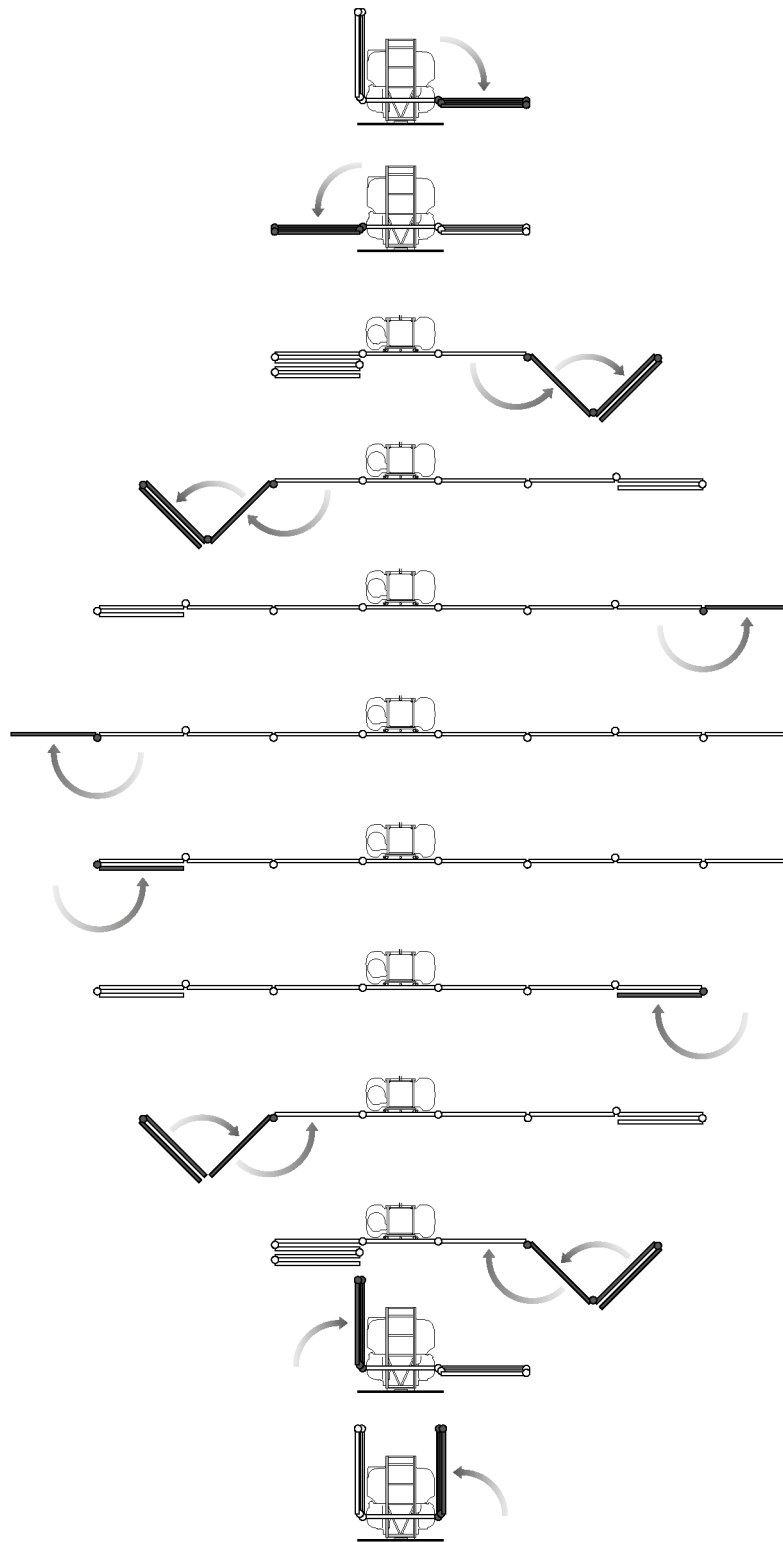


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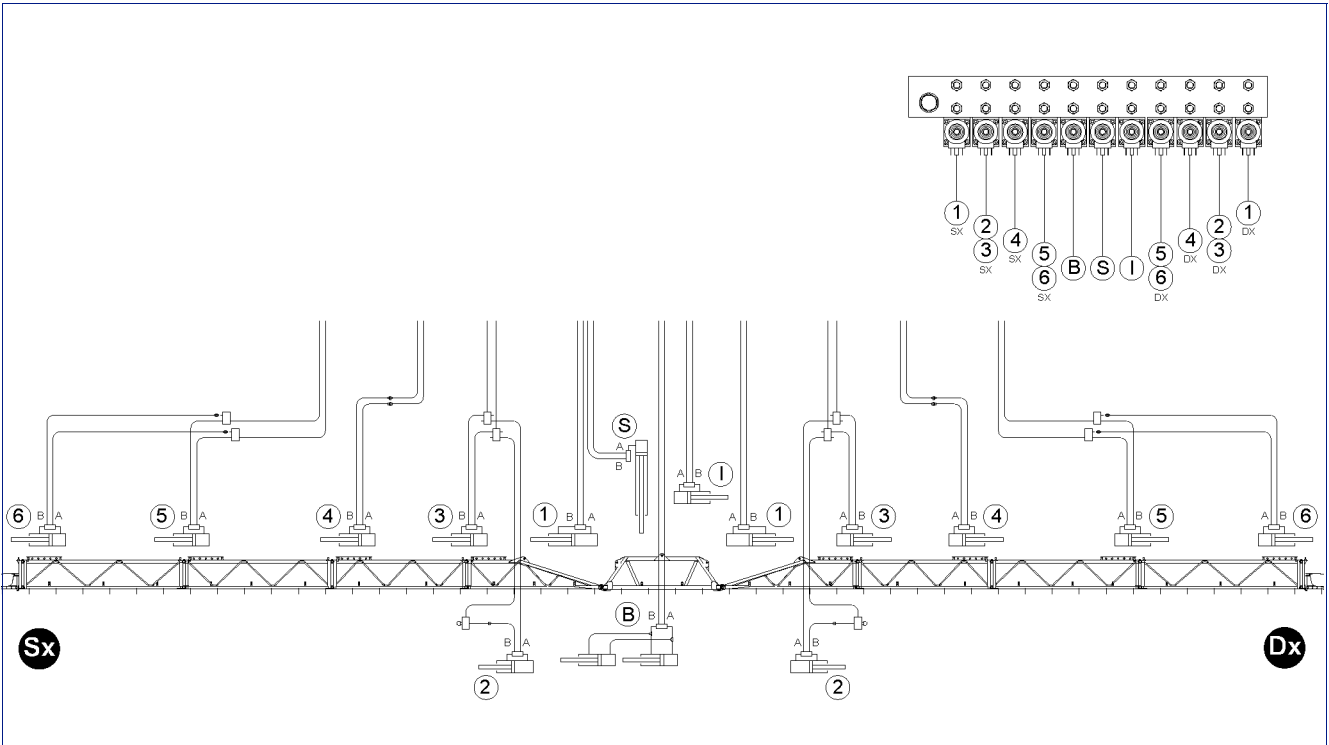
Boom folding and unfolding

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



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11-function hydraulic system (27/30m boom) (right arm and left arm)

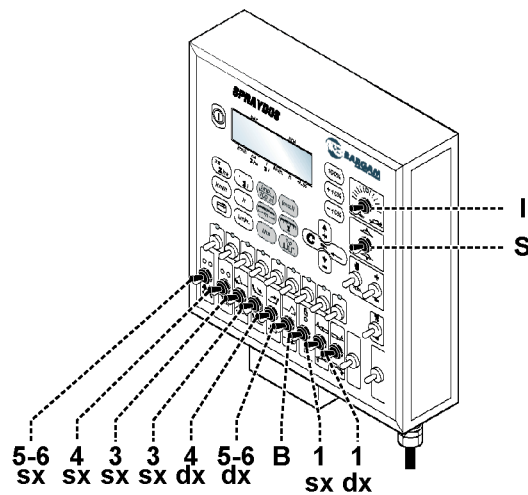
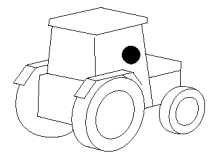


Legend

- S** - Lifting device
- B** - Locking of self-levelling device
- I** - Spraying boom inclination

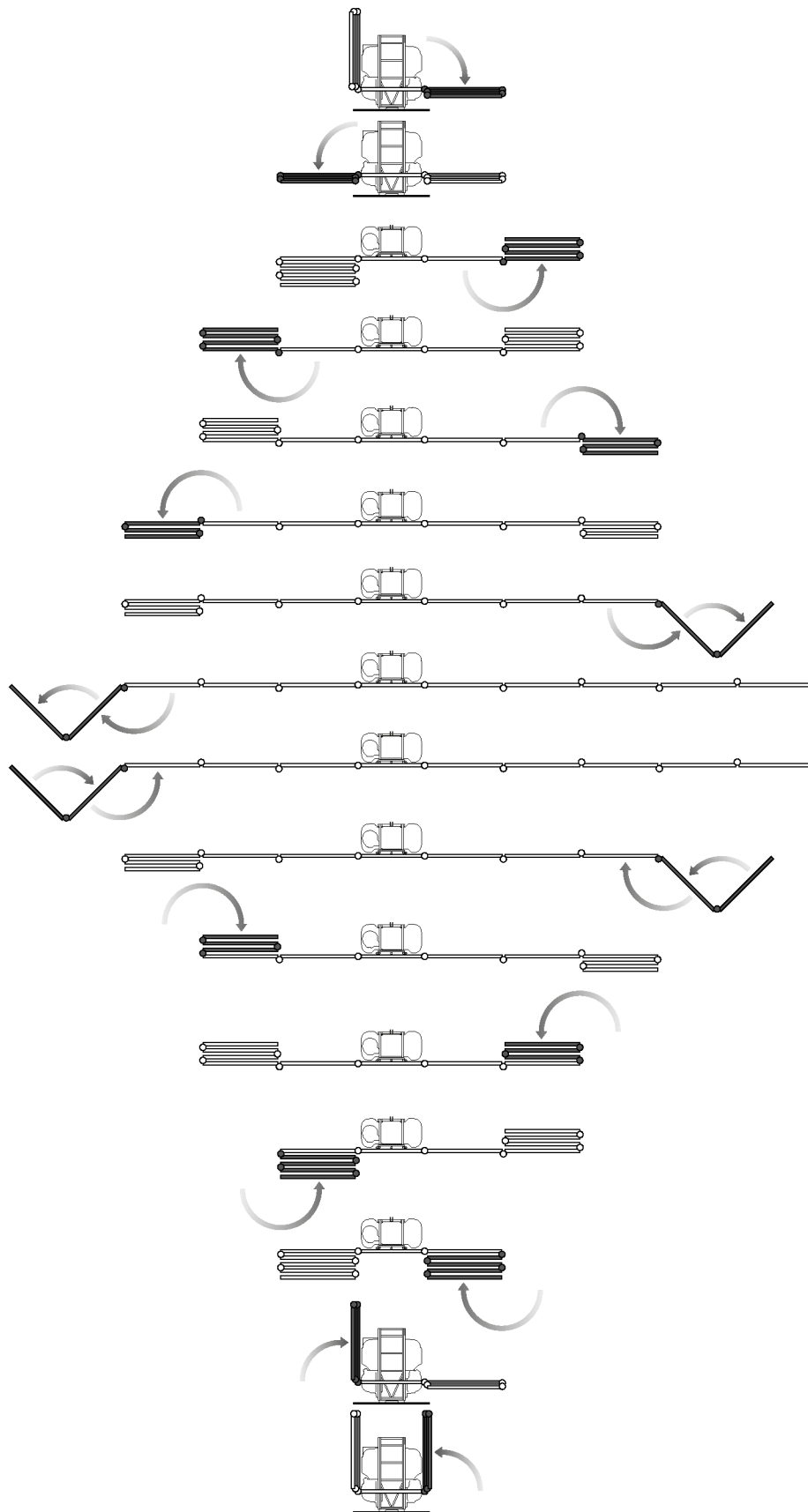
- 1dx - 1st right arm
- 1sx - 1st left arm
- 3dx - 2nd right arm
- 3sx - 2nd left arm
- 4dx - 3rd right arm
- 4sx - 3rd left arm
- 5-6dx - 4th right arm and extension
- 5-6sx - 4th left arm and extension

MÜLLER CONTROL PANEL



Boom folding and unfolding

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

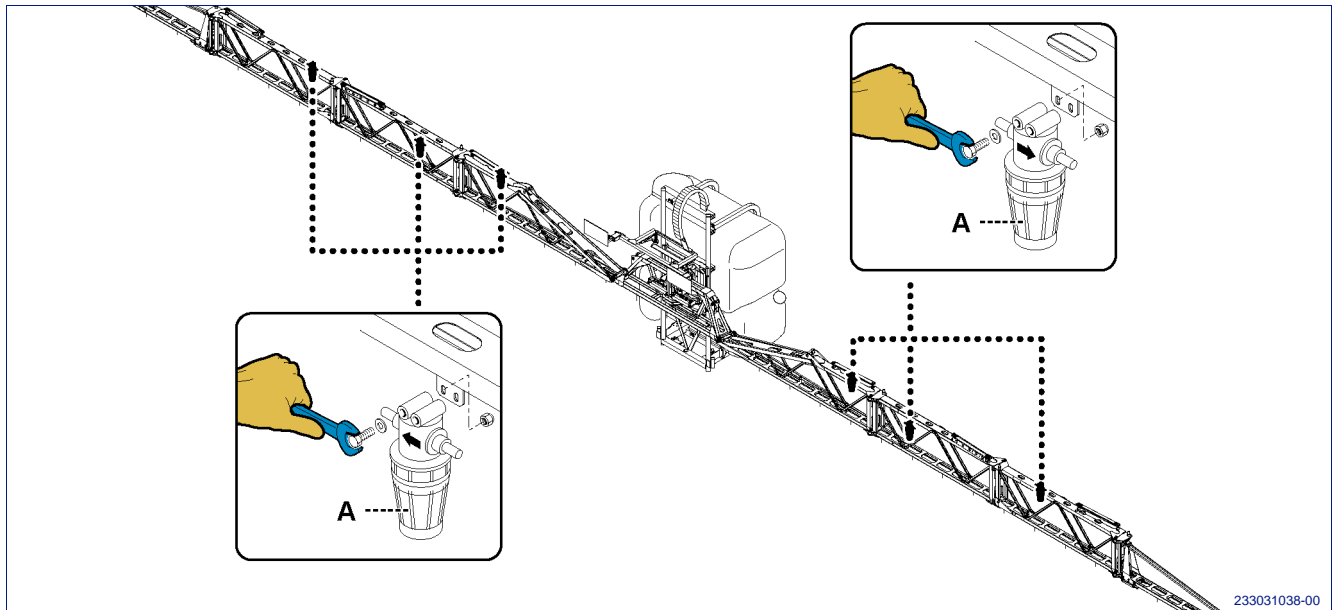


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INSTALLATION OF LINE FILTERS (IF REQUIRED) AND JETS

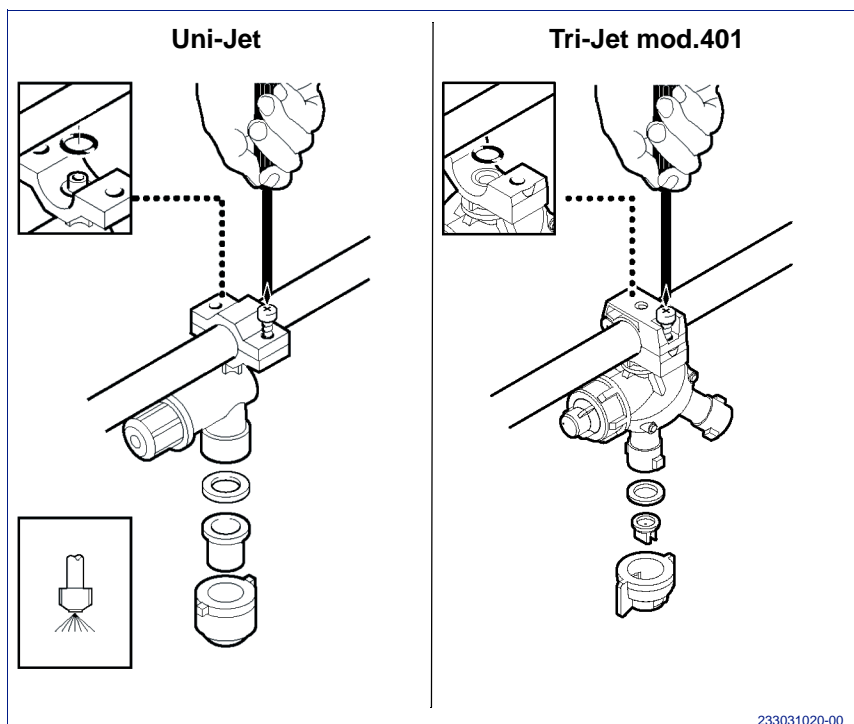
Proceed in the way indicated.

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

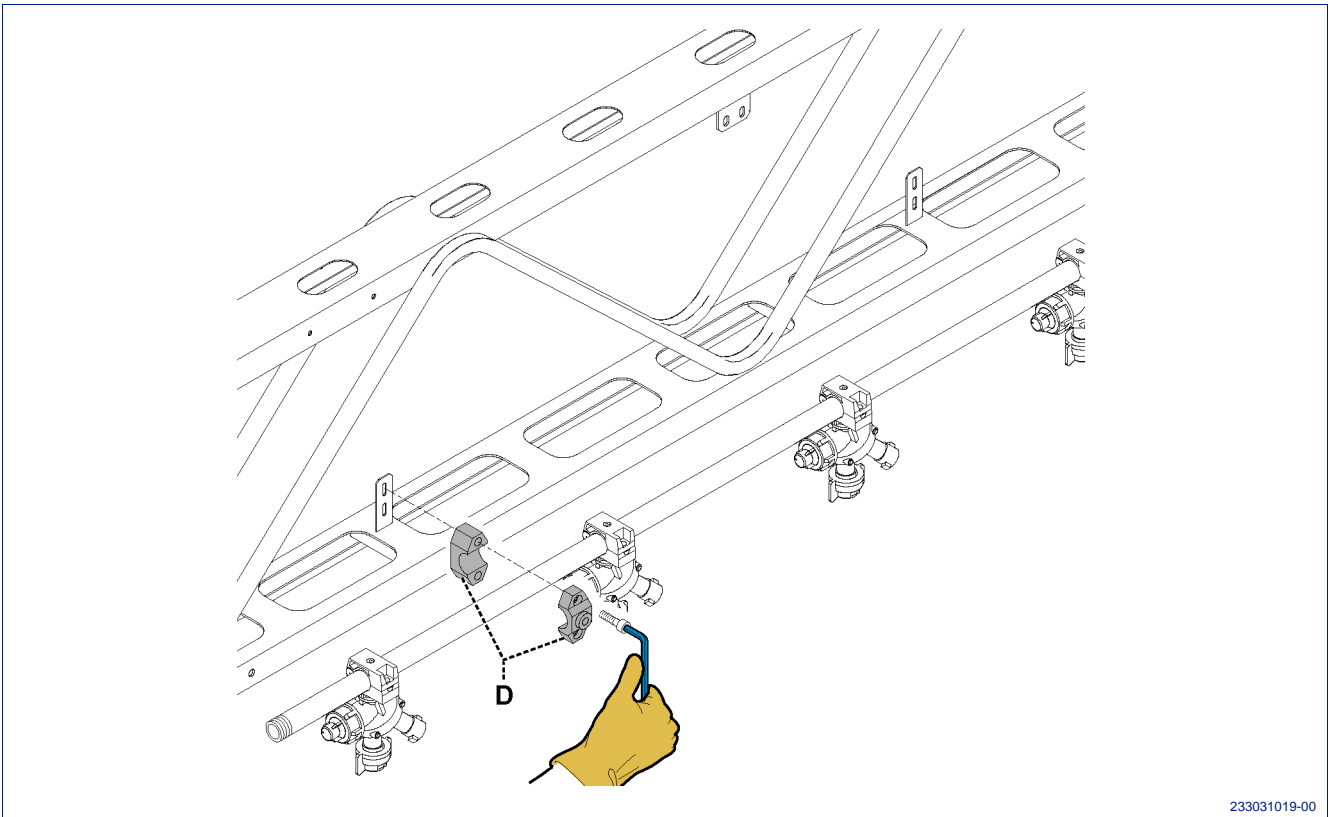


2 - Install jets (B) on the holes at the outlet of stainless steel pipes (C) (see diagram “Jet number diagram for each boom section (500 mm pitch)” page 29).

Important
 Properly mount the seals (D).

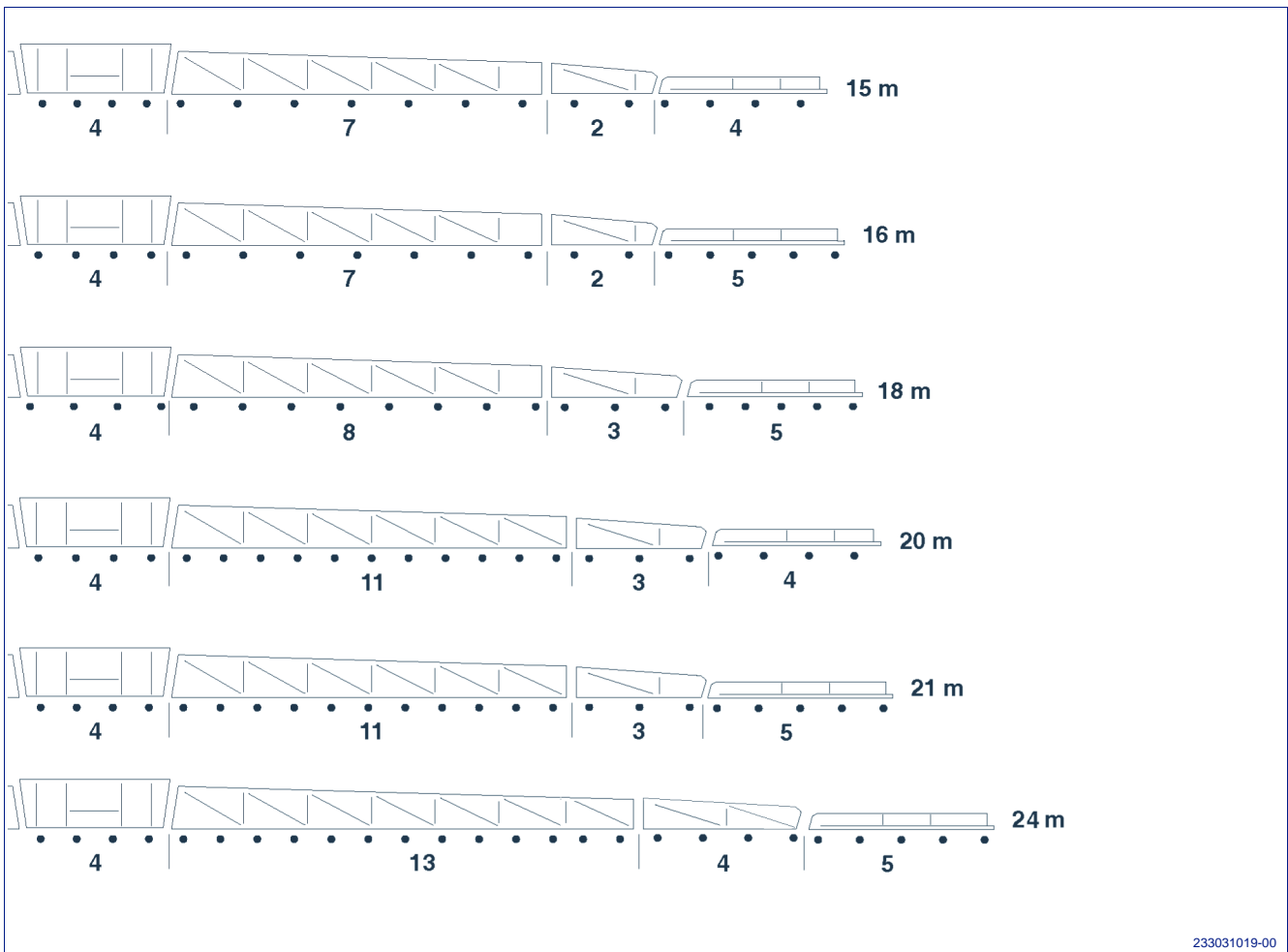


3 - Fasten stainless steel pipes (C) to the spraying boom with the special supports.



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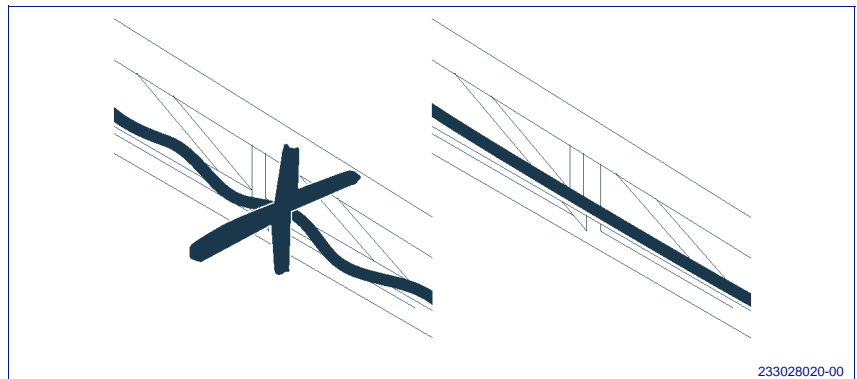
Jet number diagram for each boom section (500 mm pitch)



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

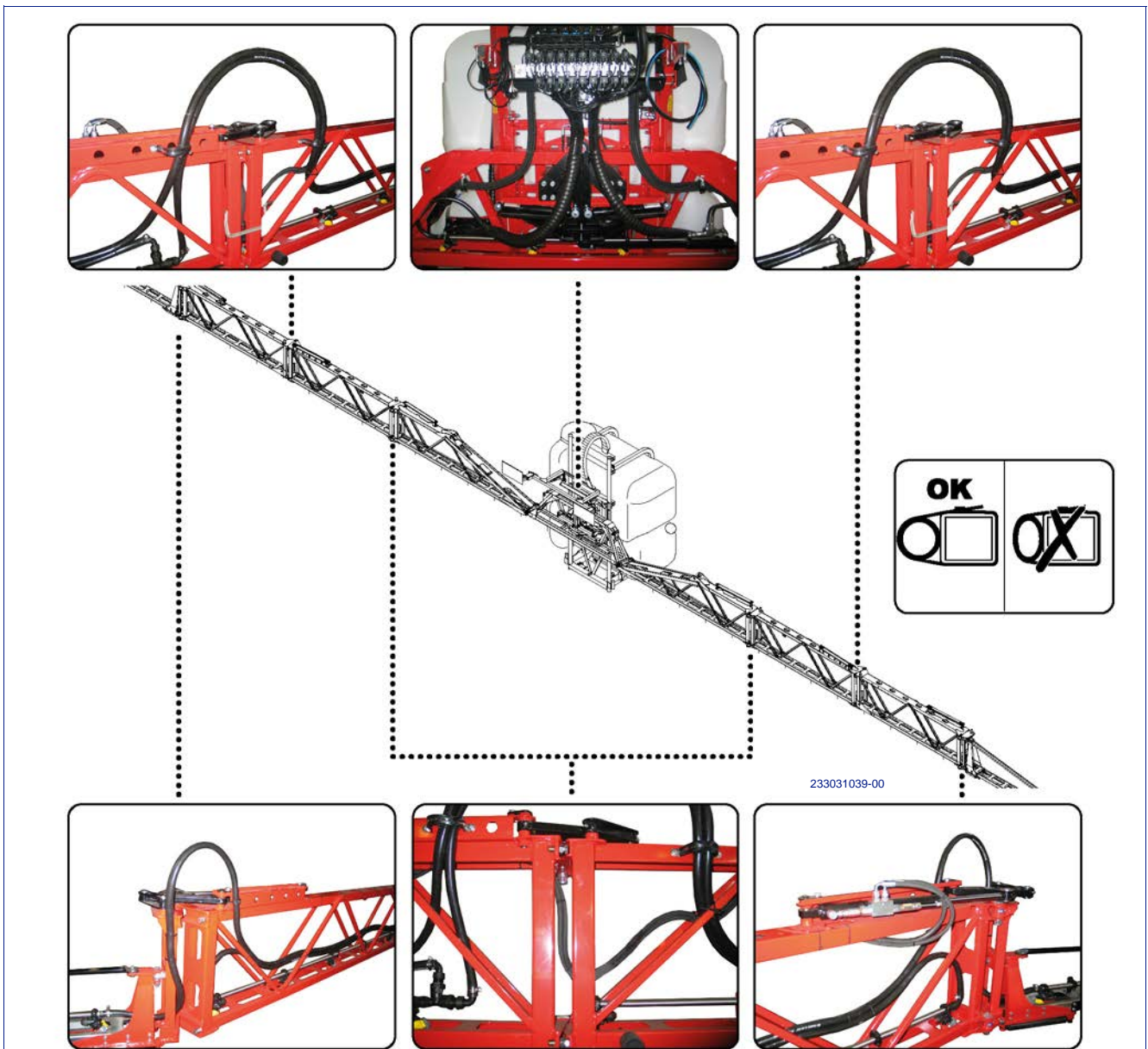


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Important

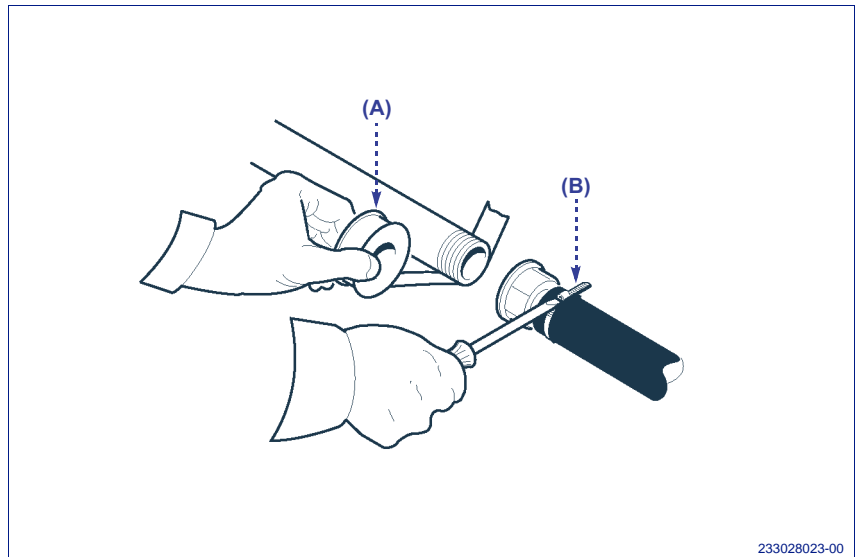
Do not tighten the clamps too much so as to avoid throttling.



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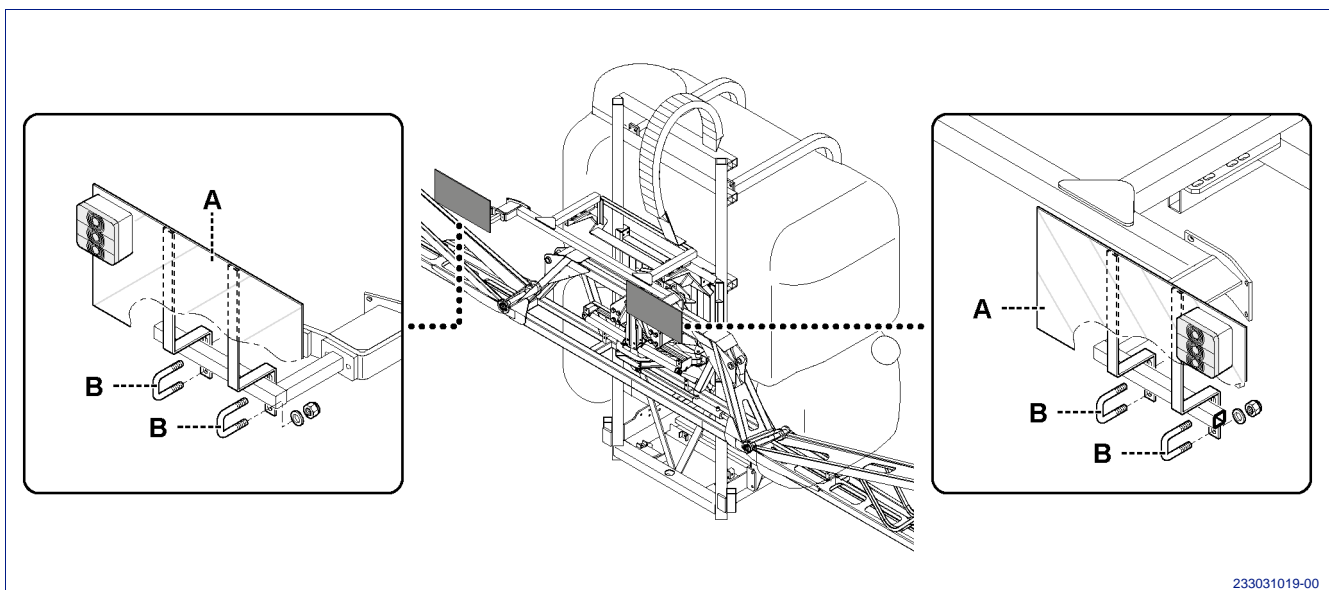
5 - Use the Teflon seal **(A)** and tighten the stainless steel clamps **(B)** in order to ensure tightness in the joints.



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INSTALLATION OF REAR LIGHT KIT

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



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INFORMATION ABOUT ADJUSTMENTS

INSTRUCTIONS FOR THE 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 FIRST ARM ALIGNMENT

Proceed in the way indicated.

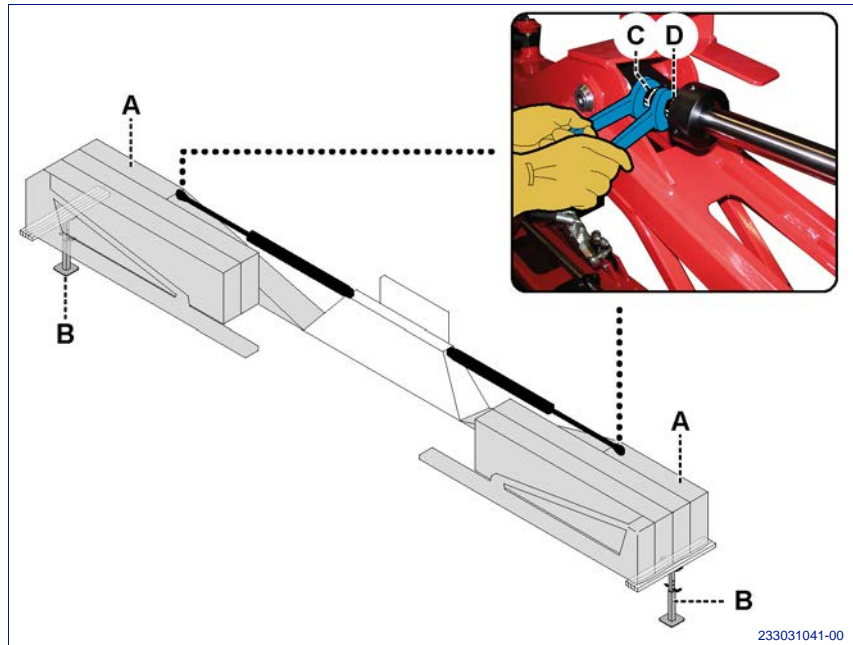
- 1 - Operate the controls to open primary arms (A).



Danger - Warning

Position the support devices with suitable carrying capacity under the arms, as shown in the figure.

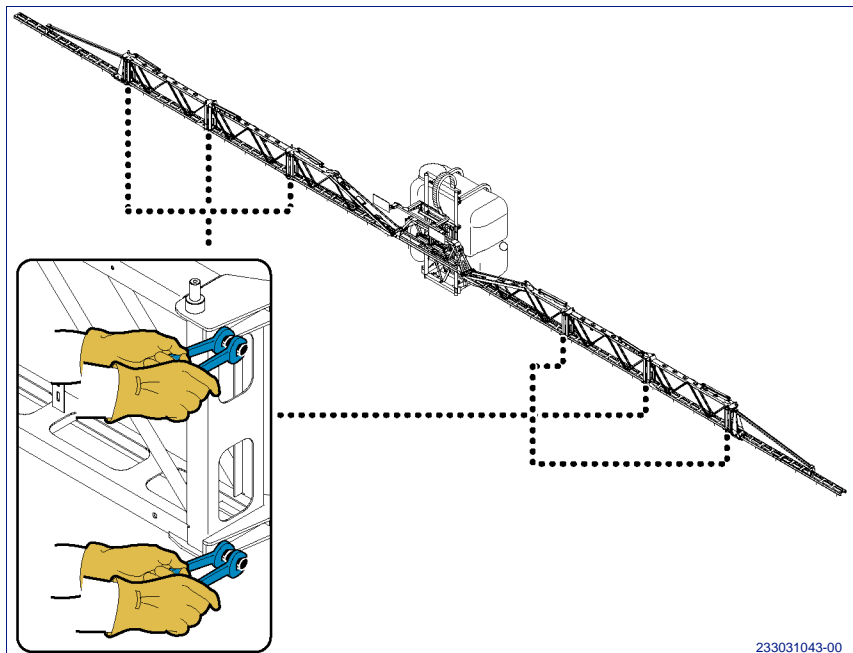
- 2 - Operate the controls to position the arms on supports (B).
- 3 - Loosen lock nut (C).
- 4 - Regulate rod (D) to carry out the adjustment.
- 5 - After the adjustment, tighten counter-nut (C) to the articulation.
- 6 - Adjust the other arm in the same way.



ADJUSTMENT OF EXTENSION ALIGNMENT

Proceed in the way indicated.

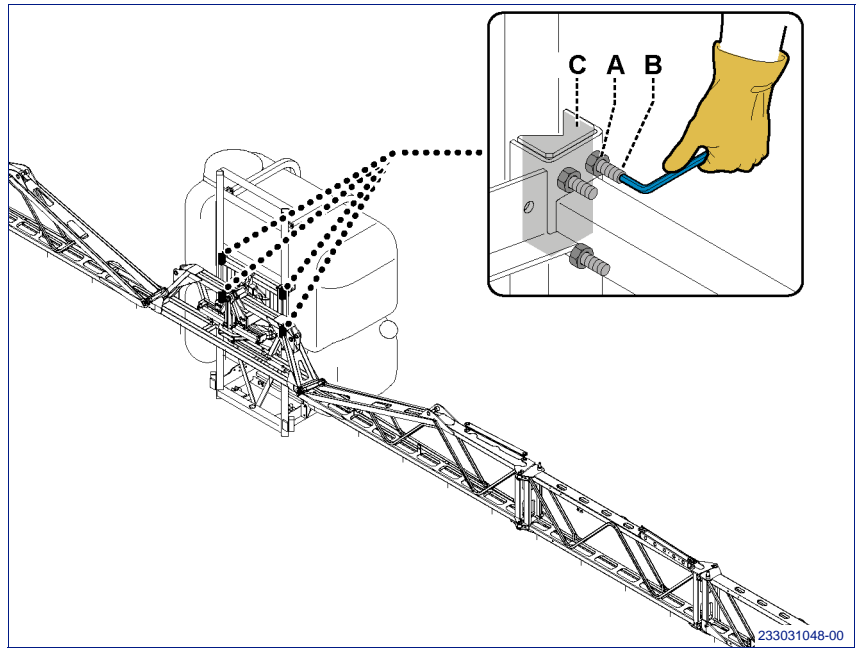
- 1 - Loosen the lock nuts (A) and act on the screws (B) so that the extensions are aligned with the primary arms.
- 2 - Tighten lock nuts (A) once the operation is completed.



ADJUSTMENT OF GUIDE PLUG

Proceed in the way indicated.

- 1 - Loosen the lock nuts **(A)**.
- 2 - Use adjusting screws **(B)** to regulate the play of guide plug **(C)**.
- 3 - Tighten lock nuts **(A)** once the operation is completed.



INFORMATION ON 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

The information on the types of hydraulic connections are included in the “Hydraulic systems” diagrams. The boom opening and closing instructions, which may change according to the installed control, are described in the “Boom opening and closing” section. If the equipment is installed on units belonging to other manufacturers, this information is not included in this manual.

BOOM FOLDING AND UNFOLDING

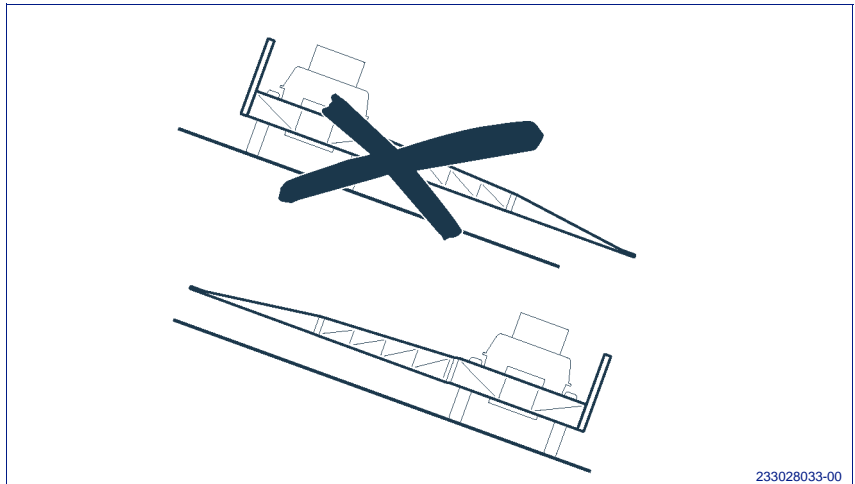


Important

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.



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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 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.



Caution - Warning

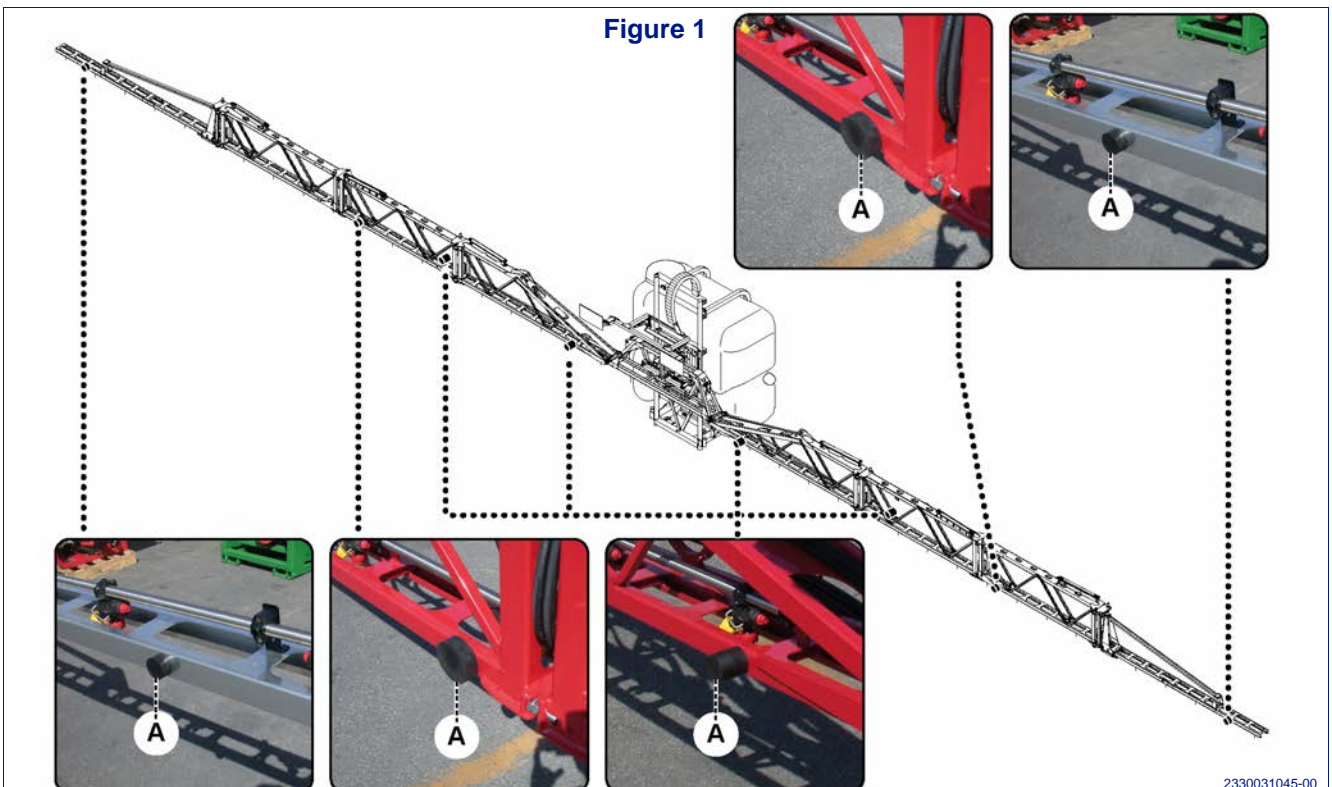
Prevent strangers from approaching the working area when the machine is in use. Should it become necessary, stop it immediately and make the people found in the risk area move away.

INFORMATION ON 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 37
	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 36
	Complete equipment	Check the condition and tightness of the screws	Tighten and replace if necessary	
	Complete equipment	Check the painted surfaces	Touch up the parts the paint has come off of if necessary	
	Boom limit stop bumper (A)	Check its condition	Replace if necessary.	See figure 1 below
	Endpiece articulation springs	Check its effectiveness	Replace if necessary.	See "Replacement of articulation spring" page 39

Figure 1

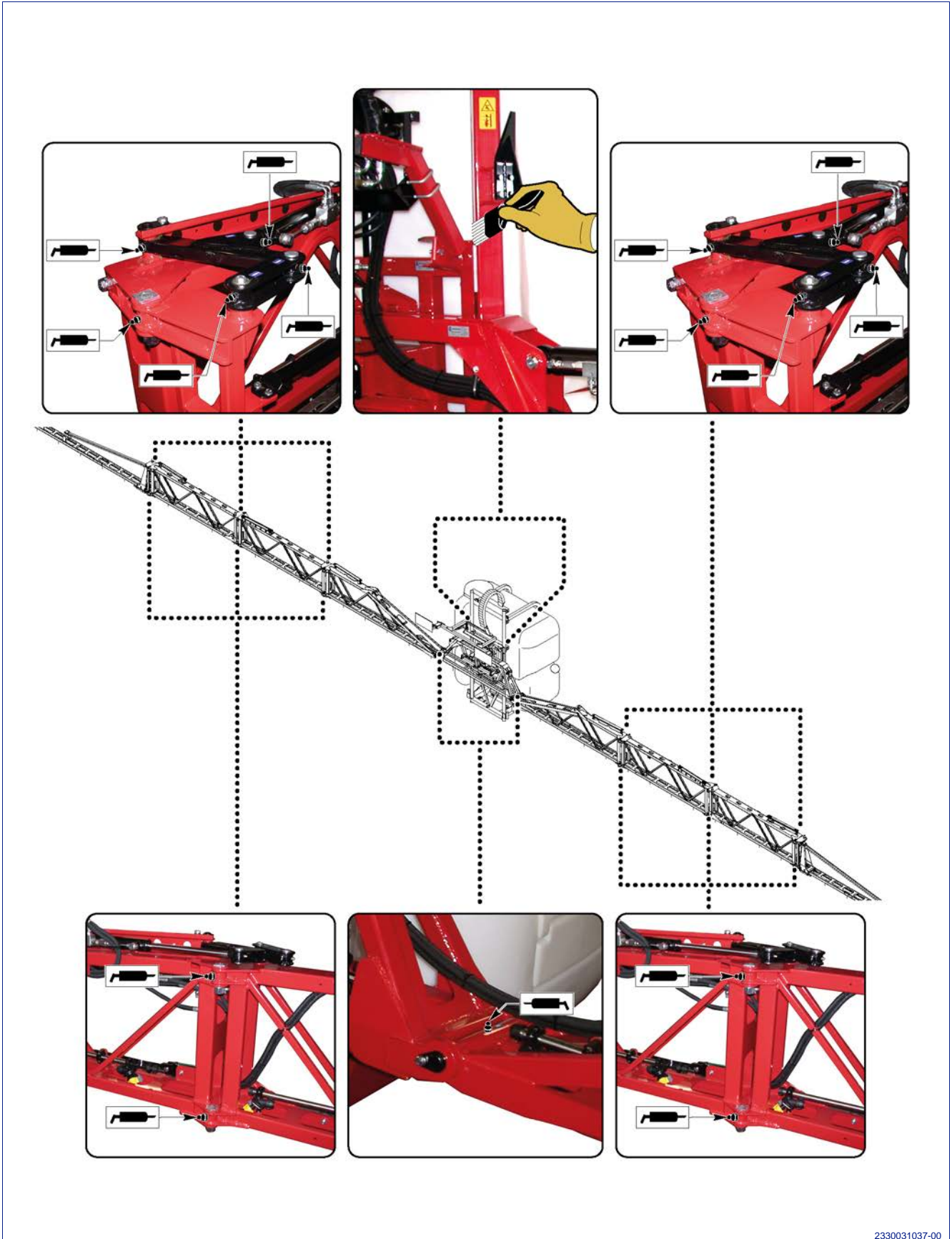


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LUBRICATION POINTS DIAGRAM

Use *PERSIAN POLIGREASE 2* grease



CLEANING NOZZLES

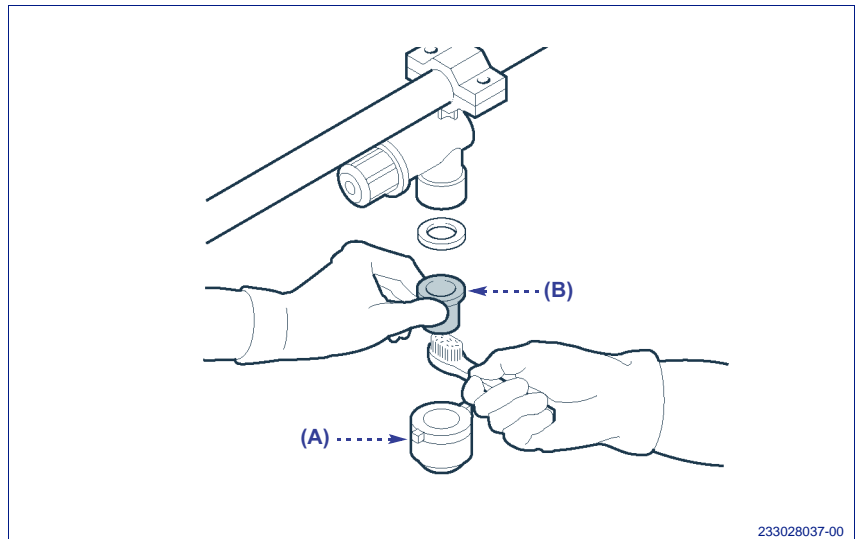
Wear protective gloves for this operation.

- 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.



PROLONGED INACTIVITY

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

- 1 - Perform the scheduled maintenance (see page 35).
- 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.

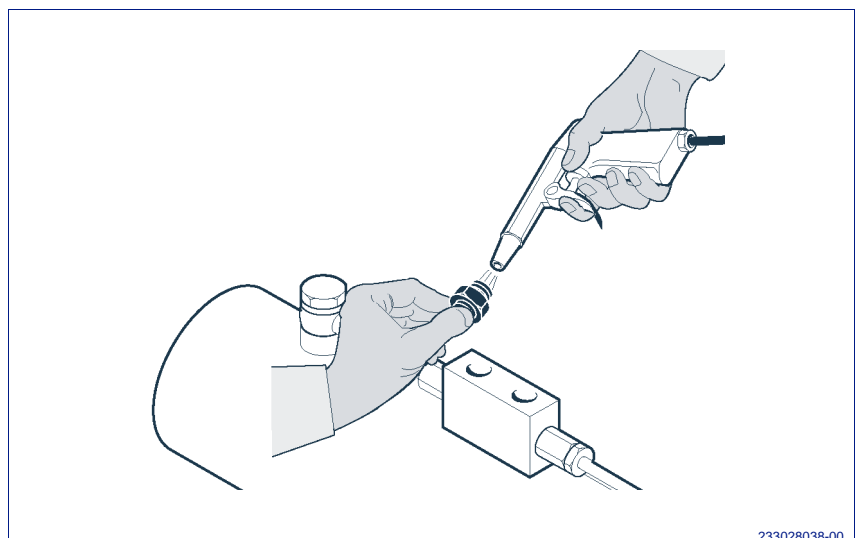
TROUBLESHOOTING

TROUBLES, CAUSES, REMEDIES

Trouble: the boom unfolds halfway and then stops.

Cause: impurities in the calibrated joints of the jacks.

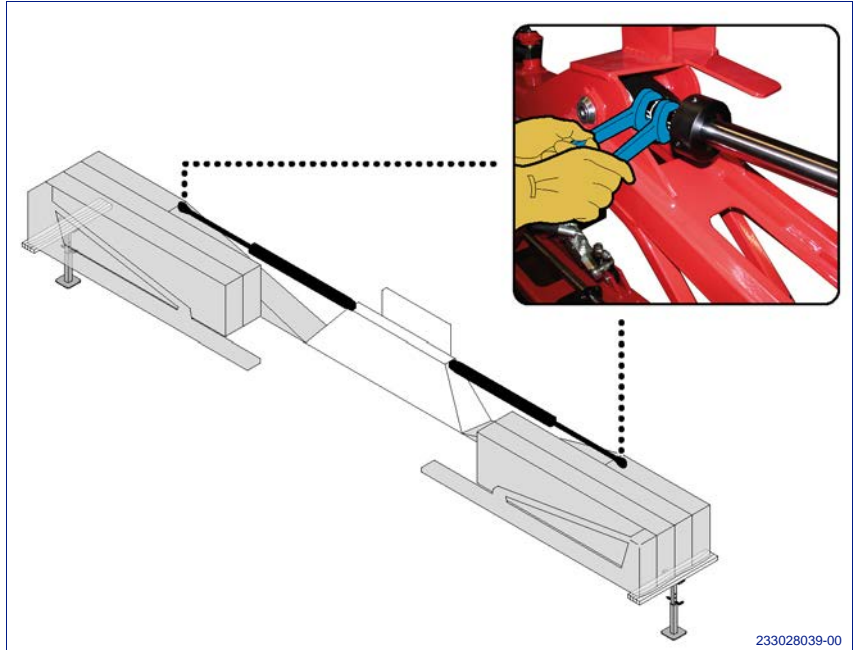
Cures: disassemble the joints and clean them.



Trouble: the boom is not aligned when unfolded.

Cause: unfolding cylinder not adjusted.

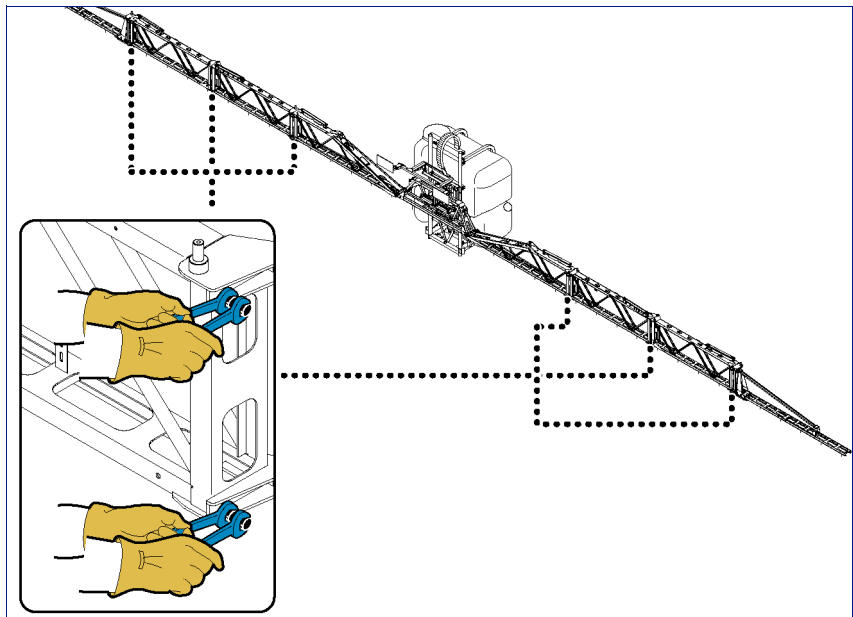
Remedies: adjust the arm alignment (see "Adjustment of first arm alignment" page 32).



Trouble: the extensions are not aligned when unfolded.

Cause: stop bolt not adjusted.

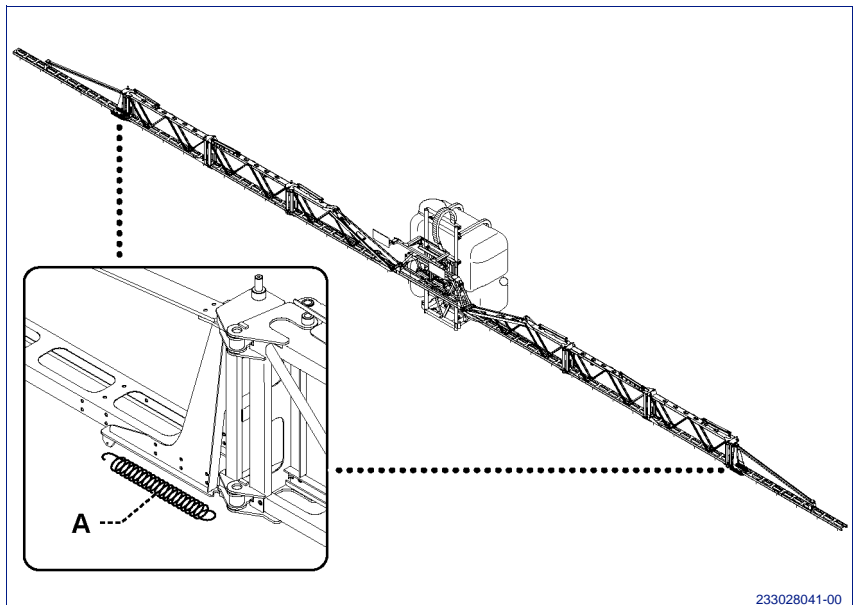
Cures: adjust the alignment of the extensions (see "Adjustment of extension alignment" page 32).



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

Cause: the articulation is loose.

Remedies: replace springs (A) if they are no longer efficient (see "Replacement of articulation spring" page 39).

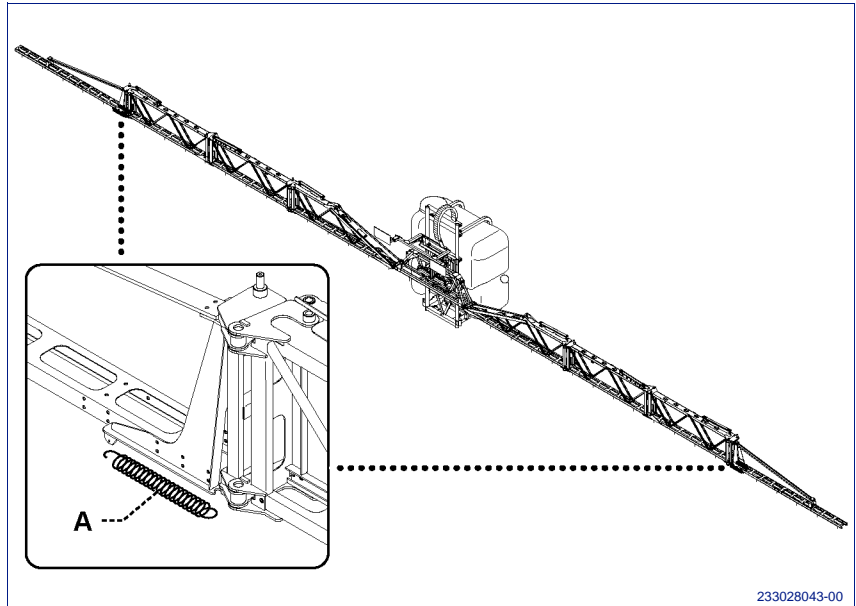


INFORMATION ABOUT REPLACEMENTS

REPLACEMENT OF ARTICULATION SPRING

Proceed in the way indicated.

- 1 - Completely open the boom
- 2 - Replace springs **(A)**.
- 3 - Check the proper operation of the articulation and close the boom.



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REPLACEMENT OF SLIDING BLOCKS



Danger - Warning

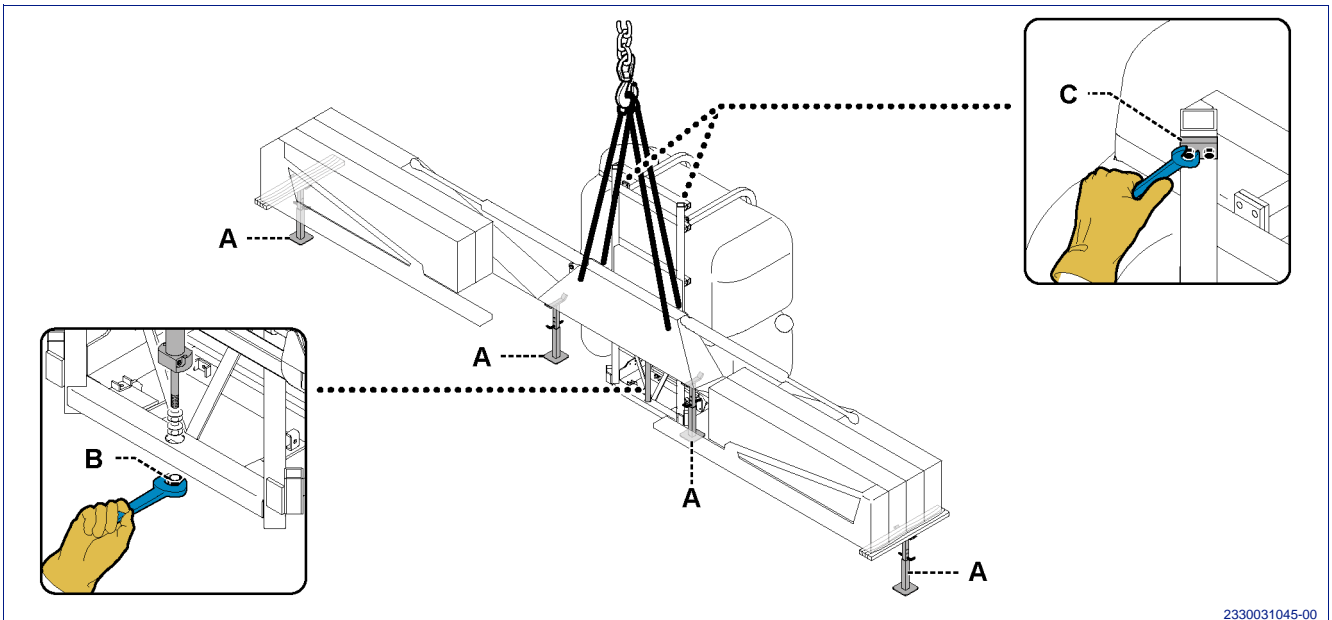
The sliding blocks must be replaced in a suitably equipped workshop.

Proceed in the way indicated.

- 1 - Use a lifting device with suitable carrying capacity to support the whole boom.
- 2 - Open the primary booms and position supports **(A)**

with suitable carrying capacity in the points shown in the figure.

- 3 - Lower the boom until it is positioned on supports **(A)**.
- 4 - Loosen nut **(B)** that fastens the lifting cylinder.
- 5 - Remove locking devices **(C)**.



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6 - Position the lifting device as shown in the figure and lift it until the lower sliding blocks are extracted from the sliding guides.

7 - Access the high part of the machine with a suitable ladder.

8 - Replace sliding blocks **(D)**.

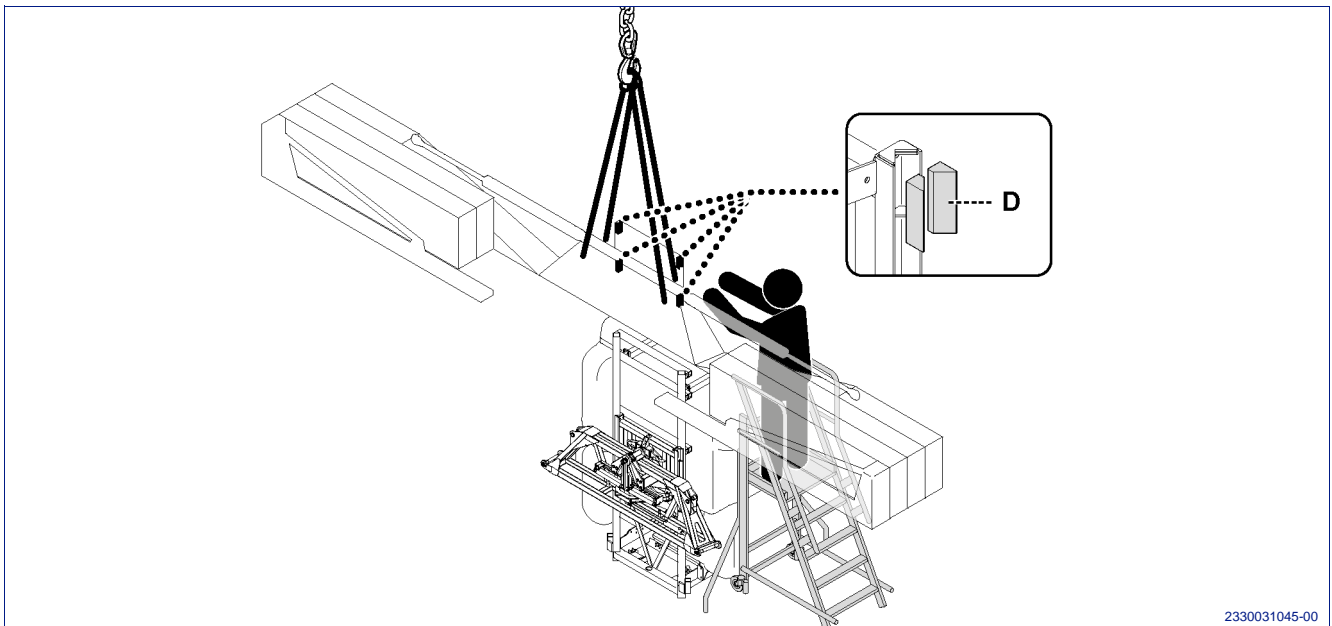
9 - Insert the sliding blocks into the guides and reinstall the lifting cylinder by means of nut **(B)**.

10-Install locking devices **(C)**.



Danger - Warning

Temporary operations at high positions must be carried out by qualified and skilled personnel under safe and suitable ergonomic conditions and by means of suitable working equipment that guarantees safe working conditions.



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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.