Spraying boom

user manual

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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.

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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.

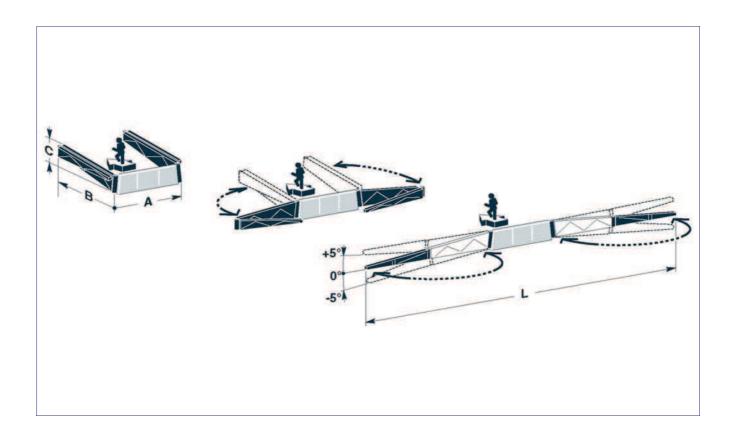
The equipment is divided into folding boom sections in order to adapt it to the spraying width and so as to reduce the space occupied during transfer.

TECHNICAL SPECIFICATIONS

	Size		Weight		Qty. Jets	
Width (m) W	A mm	B mm	C mm	(*) NEW EL (kg)	(*) NEW E (kg)	(500 mm)
24	2480	5500	2727	600	600	48

^(*) Boom with NEW EL self-levelling device (can be installed on trailed tanks, self-propelled sprayers and mounted units with pivoting wheels).

Technical specification diagram



^(**) Boom with NEW E self-levelling device (can be installed on mounted units).

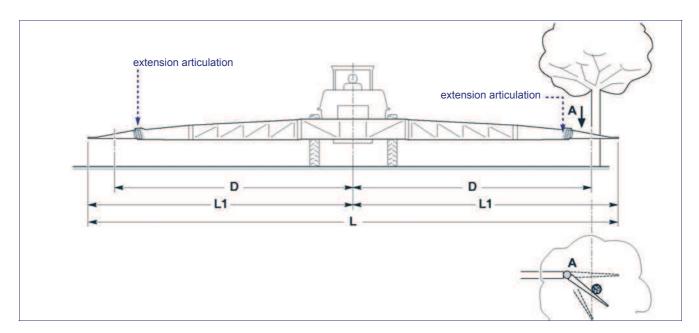
SAFETY DEVICES

- **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.

Safety distance table

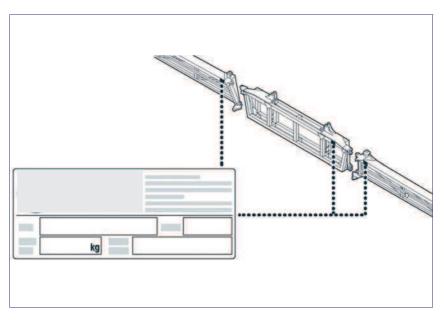
Width L	Width L1	Safety distance D
24	12	10,8

Safety distance diagram



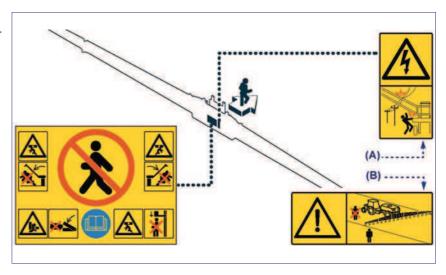
IDENTIFICATION PLATE POSITION

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

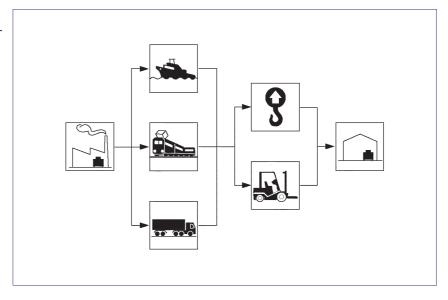
Comply with the information provided by the manufacturer, found on the equipment and in the instruction manual, when carrying out handling and loading operations.

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.

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.

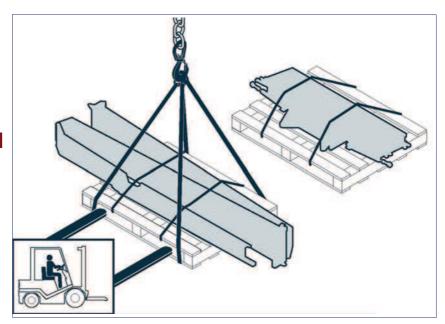


HANDLING AND LIFTING

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.

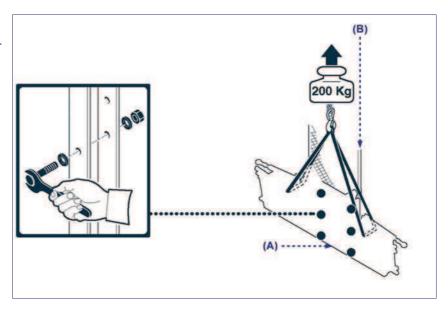
INSTALLATION OF DISASSEMBLED PARTS

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

INSTALLATION OF MIDDLE FRAME (NEW EL SELF-LEVELLING DEVICE)

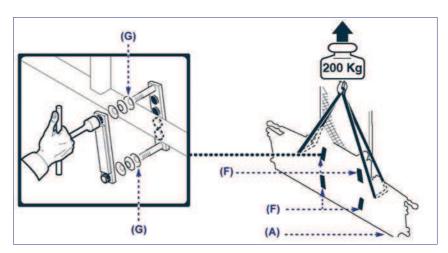
Proceed in the way indicated.

1 - Lift the middle frame (A) of the boom already mounted on the selflevelling 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 MIDDLE FRAME (NEW E SELF-LEVELLING DEVICE)

- Lift the frame (A) and place it on that of the sliding self-levelling device.
- 2 Insert the Belleville washers **(G)** as shown in the figure.
- 3 Mount the clamps **(F)** and secure them with the nuts without tightening them completely.

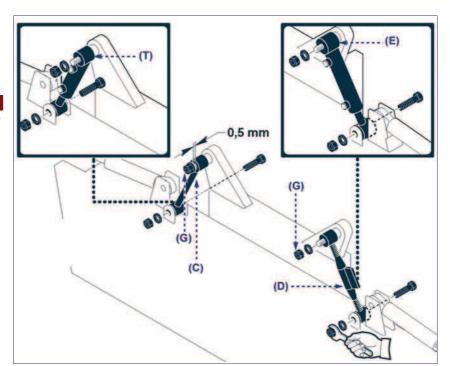


4 - Install the connecting rods (C-D). On request, they can be replaced with hydraulic cylinders (E-T).

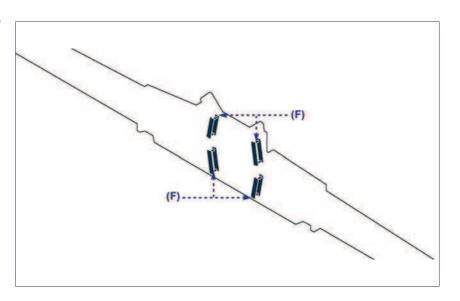


Important

In order that the boom unit will be able to swing freely, screw the nuts (G) so that there is a backlash of ~ 0.5 mm between the washer and connecting rod.



5 - By means of clamps **(F)** adjust the swing of the booms (see the Selflevelling Device booklet).



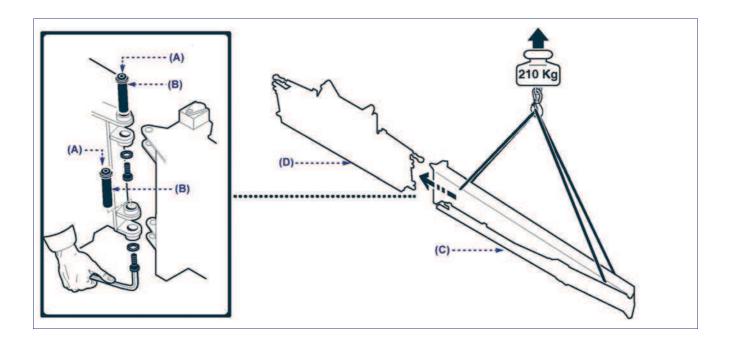
INSTALLATION OF ARM



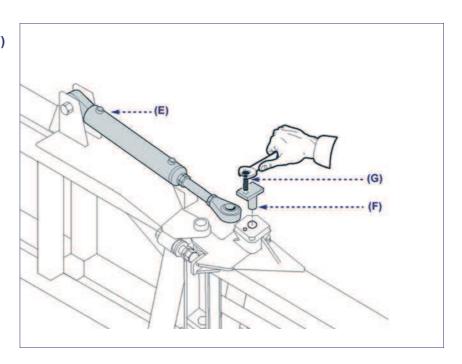
Caution - Warning

Screws (A) are tightened and locked using LOCTITE in order to prevent them from coming loose, which could cause the pins (B) 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.

 Lift the arm (C) and fasten it to the middle frame
 (D) with the respective pins after having greased the parts and their seats.

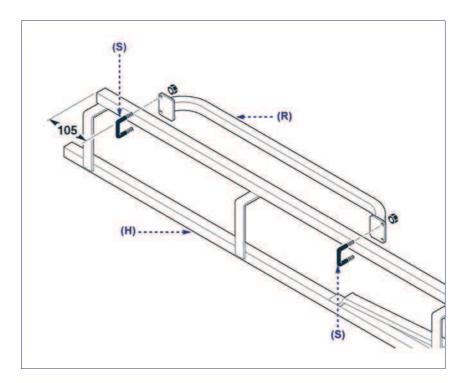


2 - Extract the cylinder stem (E) and fasten it to the arm with the pin (F) and the locking screw (G).

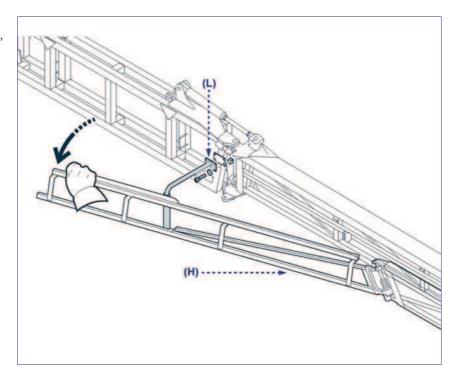


Only for 24 m booms

1 - Mount the support (R) on the endpiece (H) using the U bolts (S), as shown in the figure.



2 - Pull the endpiece **(H)** and secure the support **(L)** to the middle frame, as shown in the figure.



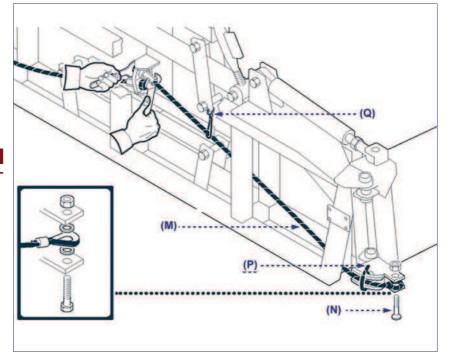
- 3 Assemble the opposite arm in the same way.
- 4 Connect the ropes **(M)** to the arms with the relative screws, as shown in the figure.



Important

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

- Fold the arms of the boom and tighten the ropes (M) (see Self-levelling Device booklet).
- 6 Lock the ropes (M) to the support using the clamp (P).



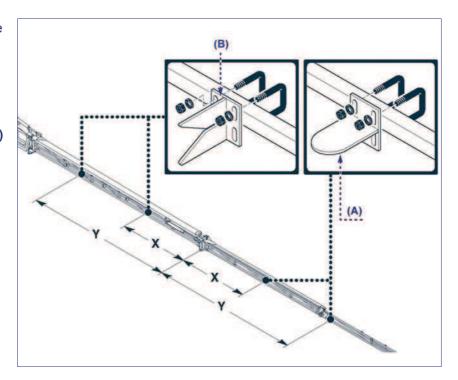


Important

Make sure the tie rod (Q) bears the strain of the ropes (M).

INSTALLATION OF EXTENSION LOCKS

- 1 Mount the stops **(A)** on the extension . one on the first piece and the other on the endpiece.
- 2 Mount the supports **(B)** on the primary arm at the distance shown in the figure.
- 3 Make sure that the supports (A B) engage properly during folding.

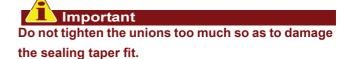


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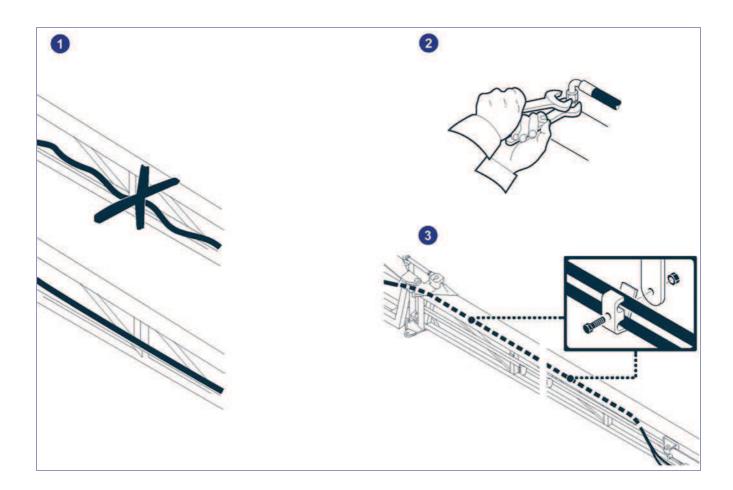
INSTALLATION OF THE HYDRAULIC SYSTEM

Proceed in the way indicated.

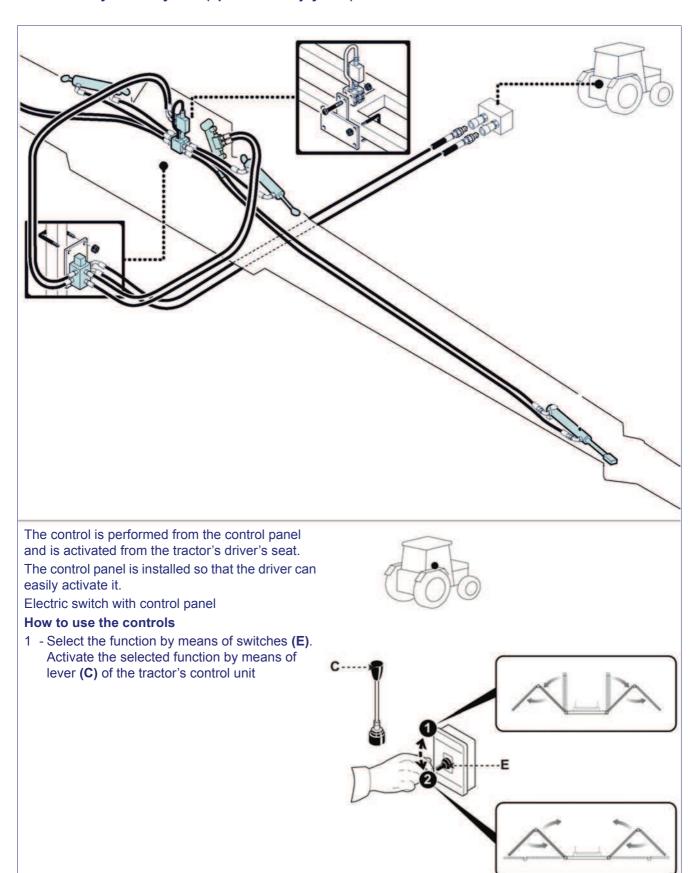
- 1 Lay the hoses down on the boom linearly (see the figure). Leave sufficient length so as to not impede the movements at the articulation points of the boom.
- 2 Connect the hoses to the cylinders (see the hydraulic diagram).



3 - Fasten the hoses to the frame with the pipe clamps provided on the boom.

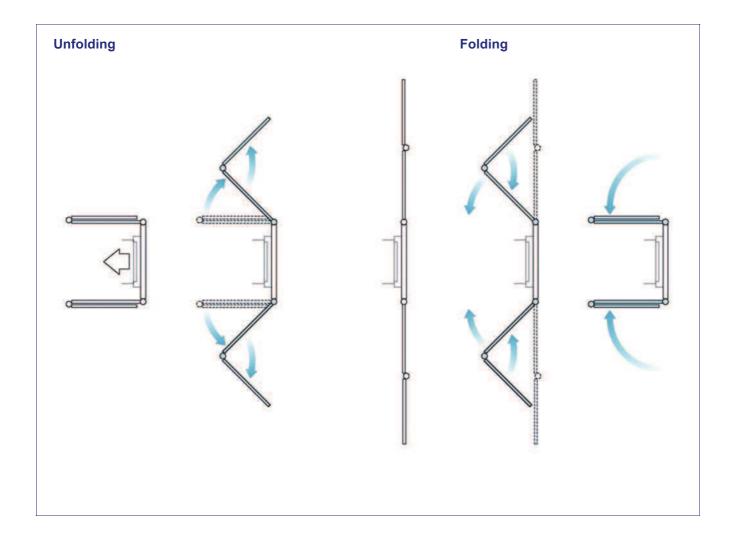


2 - function hydraulic system (operated with joystick)

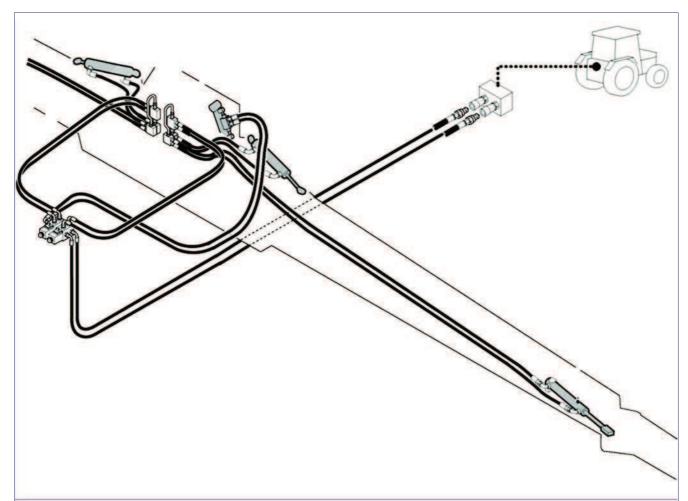


Boom unfolding and folding

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



3 - function hydraulic system (operated with joystick)



The control is performed from the control panel and is activated from the tractor's driver's seat.

The control panel is installed so that the driver can easily activate it.

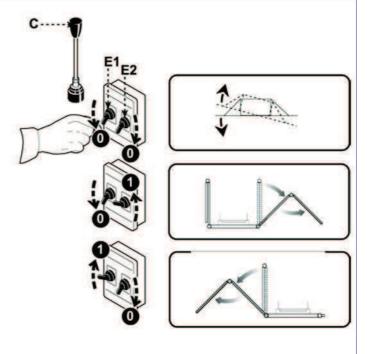
Electric switch with control panel

How to use the controls

1 - Select the function by means of switches (E).
 Activate the selected function by means of lever (C) of the tractor's control unit
 E1 Pos 0 / E2 Pos 0 = Correction of position

E1 Pos. 0 / **E2** Pos. 0 = Correction of position **E1** Pos. 1 / **E2** Pos. 0 = Unfolding / folding of left arm

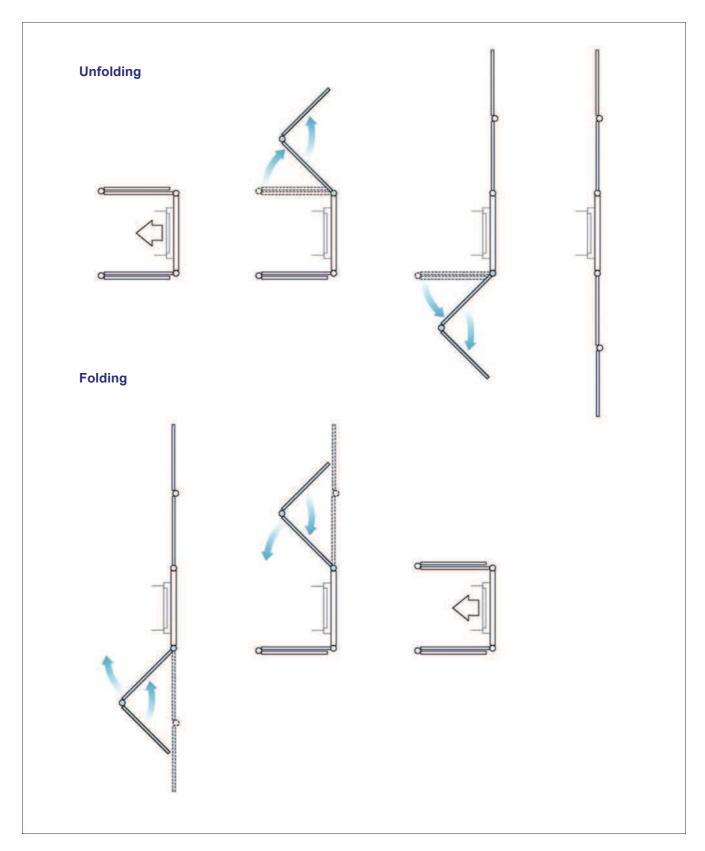
E1 Pos. 0 / **E2** Pos. 1 = Unfolding / folding of right arm



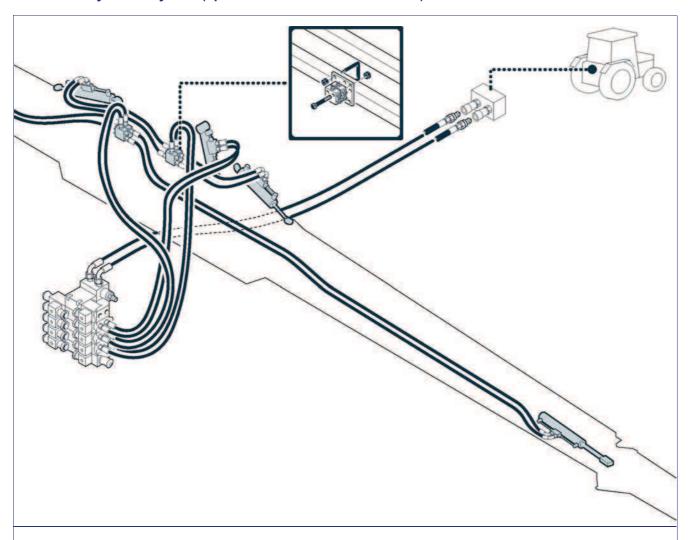
Boom unfolding and folding

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.



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

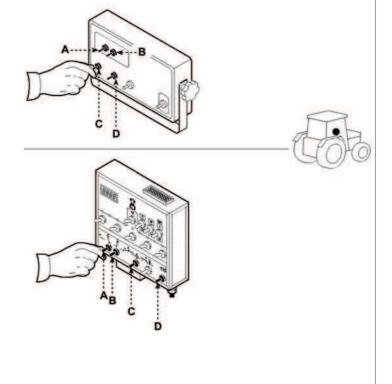


CGA CONTROL BOARD

- A) Simultaneous unfolding of extensions
- B) Simultaneous unfolding of arms
- C) Lifting
- D) Hydraulic tilt adjustment

MÜLLER CONTROL BOARD

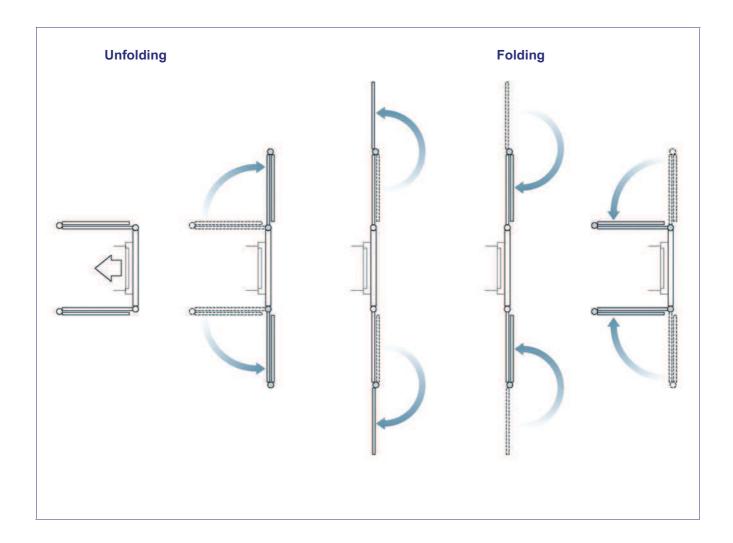
- A) Simultaneous unfolding of arms
- B) Simultaneous unfolding of extensions
- C) Lifting
- D) Hydraulic tilt adjustment



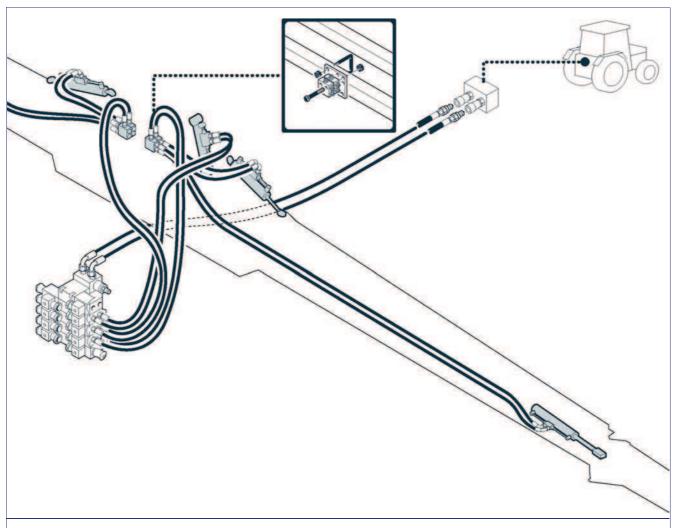
090 0

Boom unfolding and folding

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

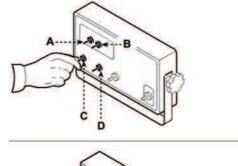


4 - function hydraulic system (operated with electric control unit)



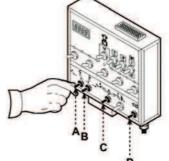
CGA CONTROL BOARD

- A) Simultaneous unfolding of arm/left extension
- B) Simultaneous unfolding of arm/right extension
- C) Lifting
- D) Hydraulic tilt adjustment





- A) Simultaneous unfolding of arm/right extension
- B) Simultaneous unfolding of arm/left extension
- C) Lifting
- **D)** Hydraulic tilt adjustment

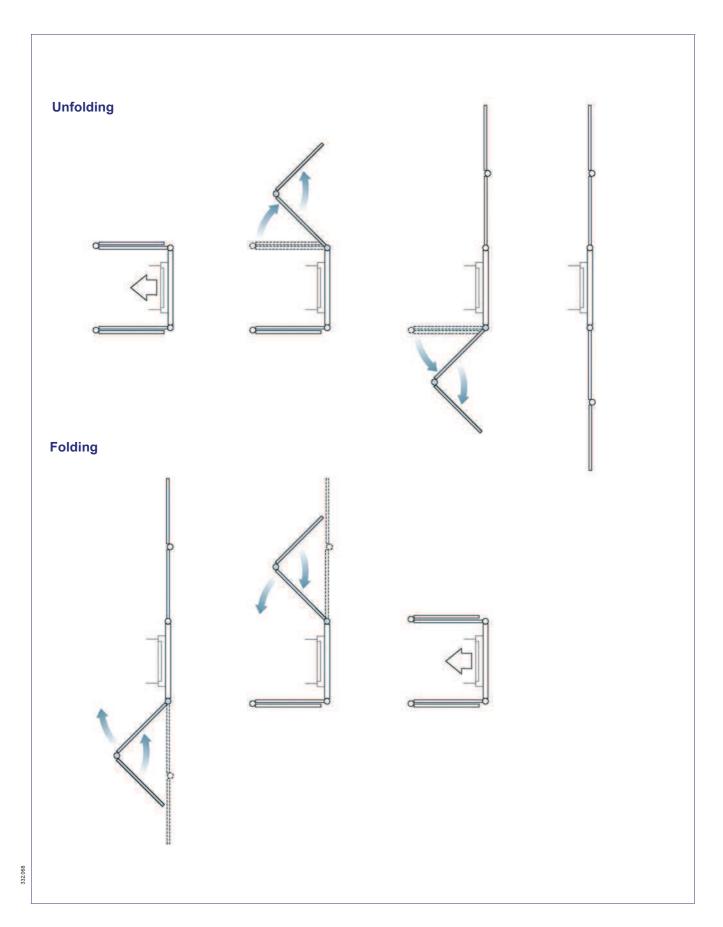


090 66

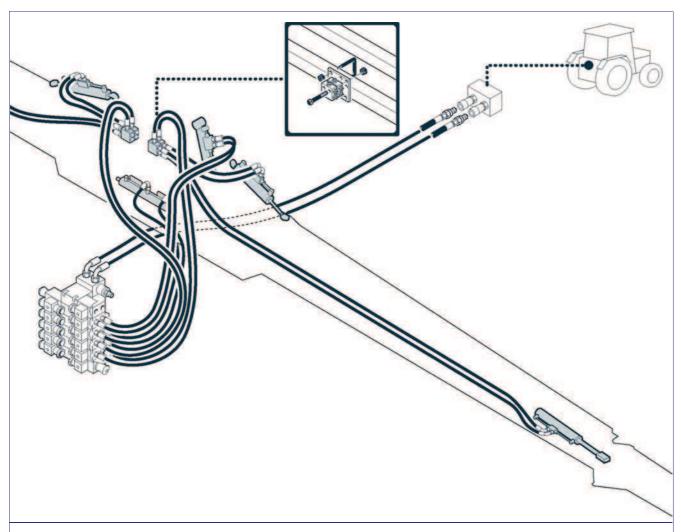
Boom unfolding and folding

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.



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

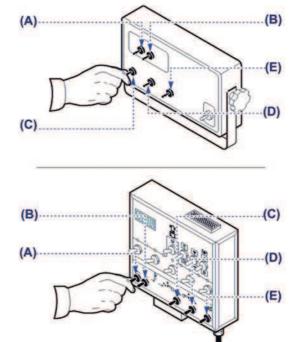


CGA CONTROL BOARD

- A) Simultaneous unfolding of arm/left extension
- B) Simultaneous unfolding of arm/right extension
- C) Lifting
- D) Hydraulic tilt adjustment
- E) Hydraulic locking

MÜLLER CONTROL BOARD

- A) Simultaneous unfolding of arm/left extension
- B) Simultaneous unfolding of arm/right extension
- C) Lifting
- D) Hydraulic locking
- E) Hydraulic tilt adjustment

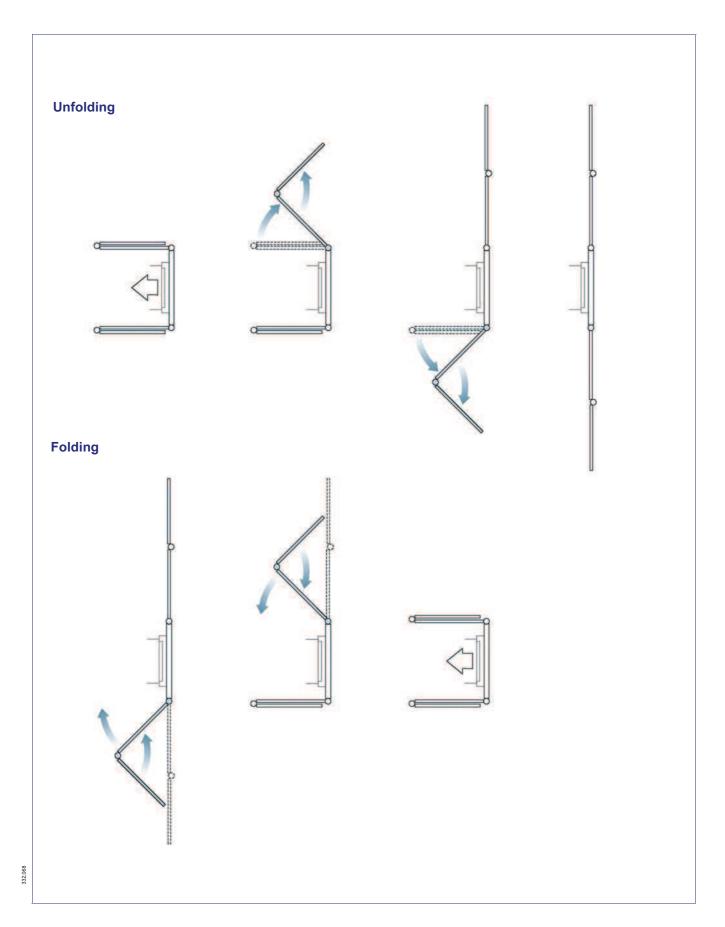


32.068

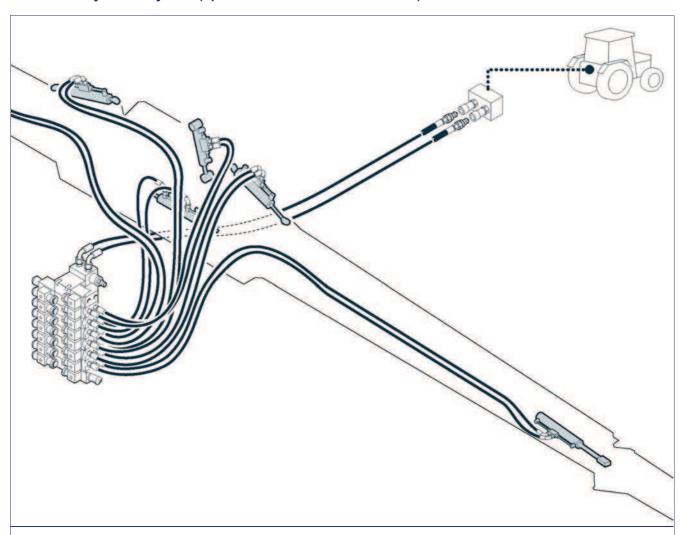
Boom unfolding and folding

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.



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

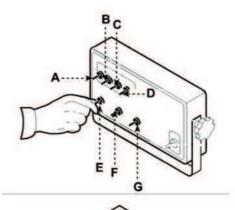


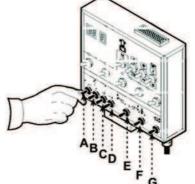
CGA CONTROL BOARD

- A) Unfolding of left extension
- B) Unfolding of left arm
- C) Unfolding of right arm
- **D)** Unfolding of right extension
- **E)** Lifting
- F) Hydraulic tilt adjustment
- **G)** Hydraulic locking

MÜLLER CONTROL BOARD

- A) Unfolding of left extension
- B) Unfolding of left arm
- **C)** Unfolding of right arm
- **D)** Unfolding of right extension
- E) Lifting
- F) Hydraulic locking
- **G)** Hydraulic tilt adjustment

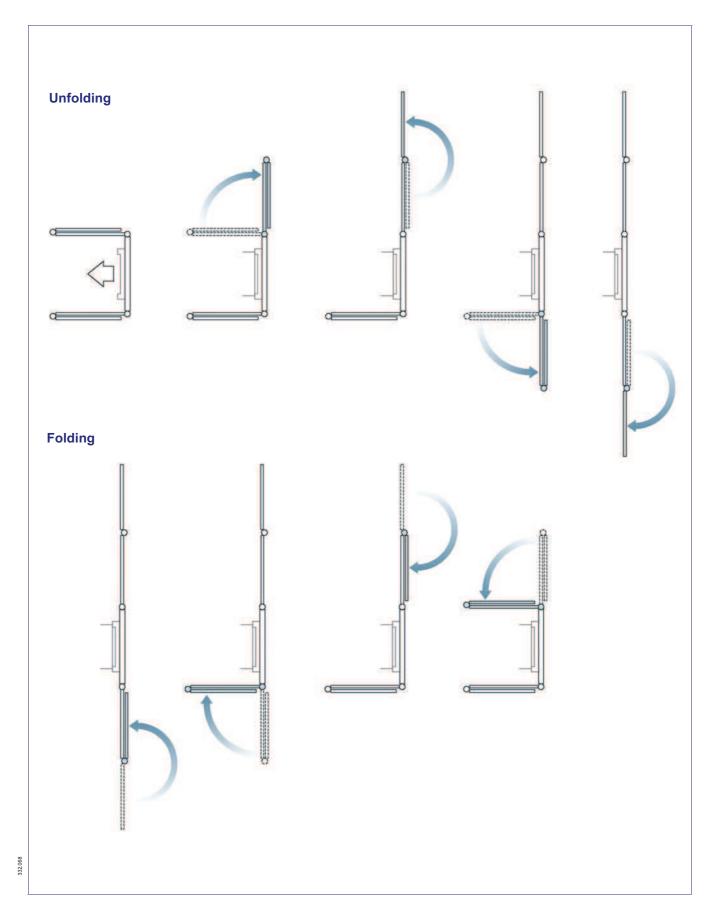




Boom unfolding and folding

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

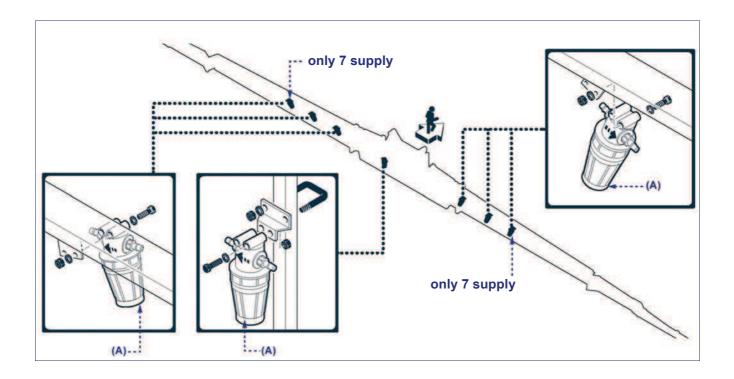
Please note: the two arms can be folded or unfolded independently of each other.



INSTALLATION OF LINE FILTERS (IF REQUIRED) AND JETS

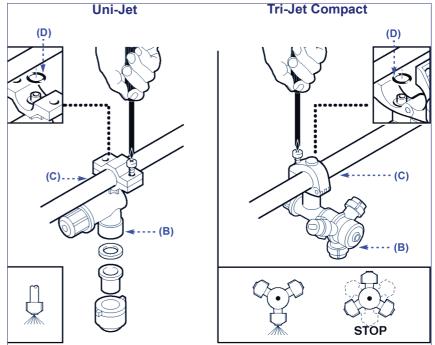
Proceed in the way indicated.

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



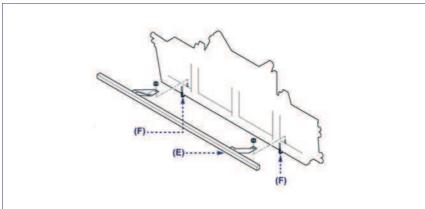
2 - Mount the jets (B) next to the outlet holes of the stainless steel pipes
(C) (see the "Jet and clamp position (for standard stainless-steel tubes having a 50 cm centre distance hole)" diagram, page 26-27).



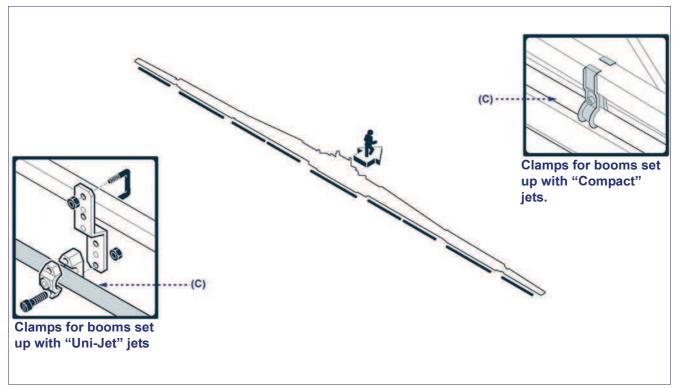


3 - Mount the jet support **(E)** using the U bolts **(F)**.





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



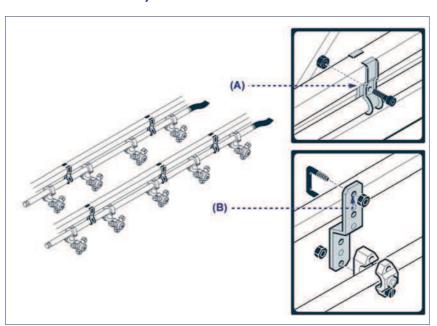
JET AND CLAMP POSITION (FOR STANDARD STAINLESS-STEEL TUBES HAVING A 50 cm CENTRE DISTANCE HOLE)

Position the nozzle holder hoses depending on the length of the boom while referring to the diagram indicated below.

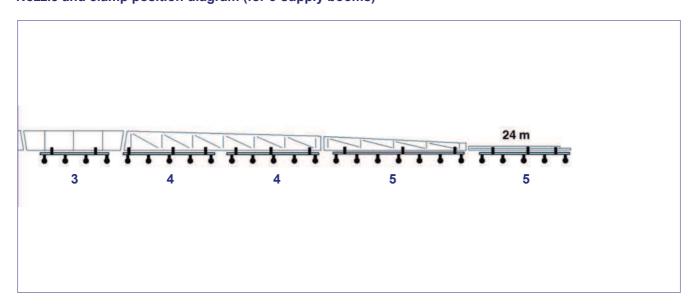
Also the positions and quantities of body bearings for each hose are shown in the diagram on page 24.



Use two pair of clamps (A) or two brackets (B) for hoses having up to four jets, and use three pair of clamps (A) or three brackets (B) for hoses with more than four jets.



Nozzle and clamp position diagram (for 5-supply booms)



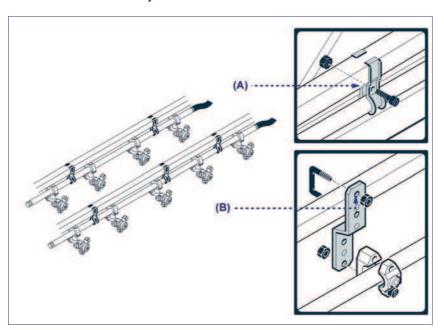
JET AND CLAMP POSITION (FOR STANDARD STAINLESS-STEEL TUBES HAVING A 50 cm CENTRE DISTANCE HOLE)

Position the nozzle holder hoses depending on the length of the boom while referring to the diagram indicated below.

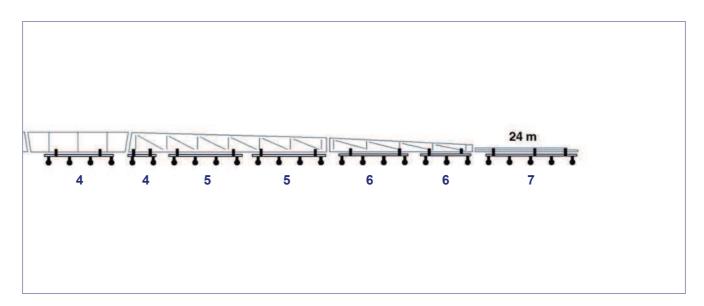
Also the positions and quantities of body bearings for each hose are shown in the diagram on page 24.



Use two pair of clamps (A) or two brackets (B) for hoses having up to four jets, and use three pair of clamps (A) or three brackets (B) for hoses with more than four jets.



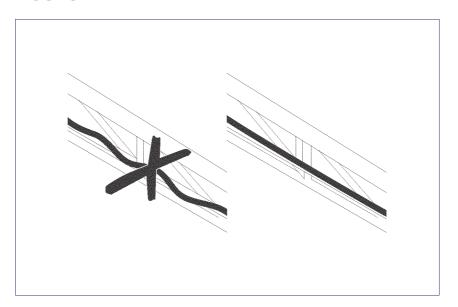
Nozzle and clamp position diagram (for 7-supply booms)



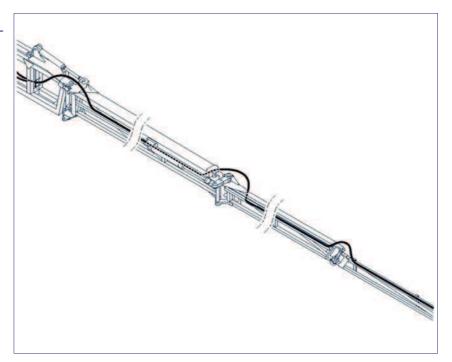
INSTALLATION OF WATER HOSES

Proceed in the way indicated.

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

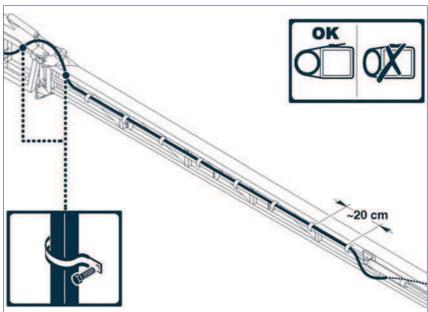


- 2 Leave sufficient length so as to not impede the movements at the articulation points of the boom.
- 3 Connect the hoses (see "Water connection diagram").

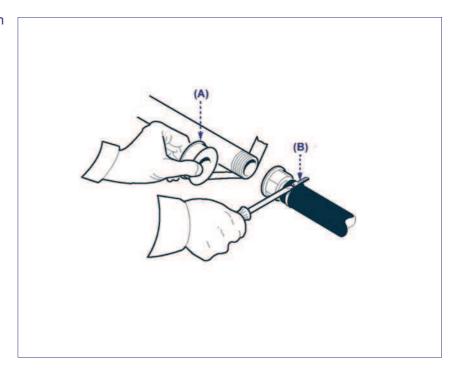


4 - Secure the hoses to the boom with clamps spaced out ~ 20 cm.

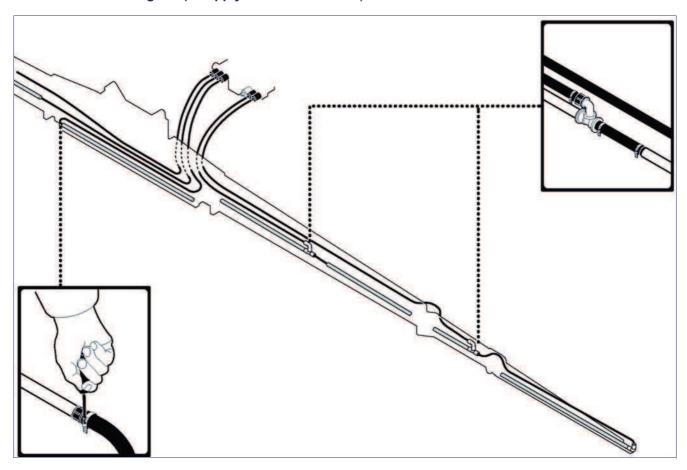




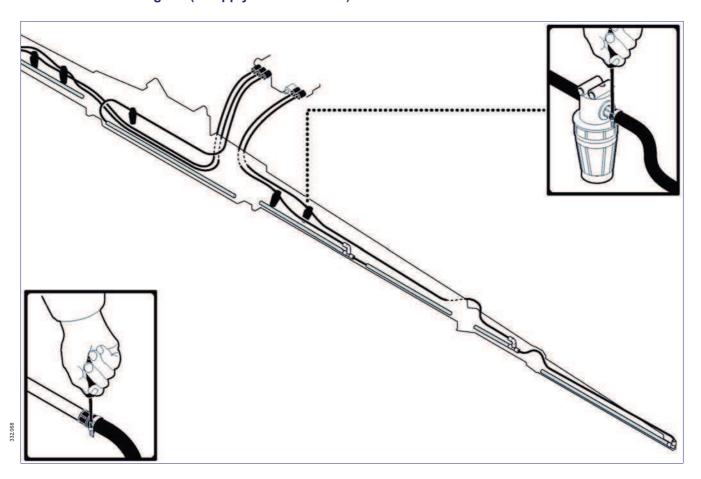
5 - Use the Teflon seal (A) and tighten the stainless steel clamps (B) in order to ensure tightness in the joints.



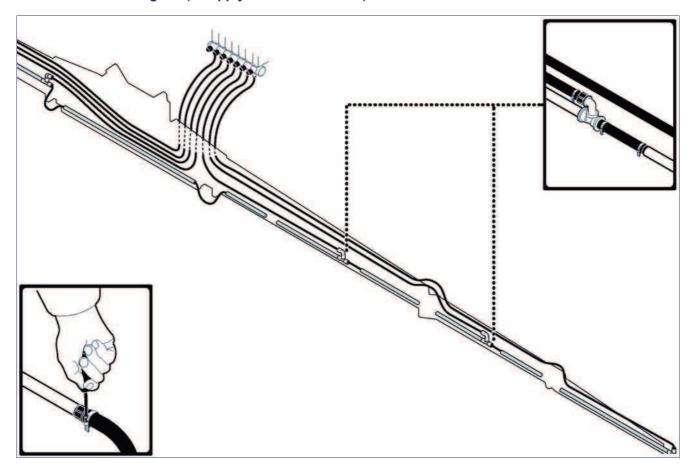
Water connection diagram (5-supply without line filters)



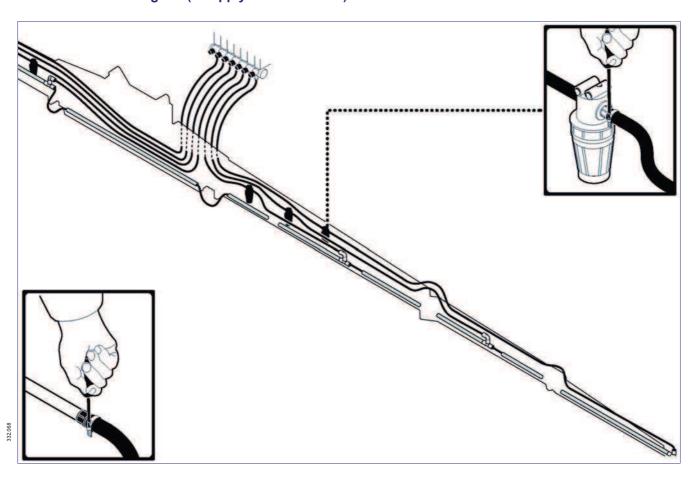
Water connection diagram (5-supply with line filters)



Water connection diagram (7-supply without line filters)

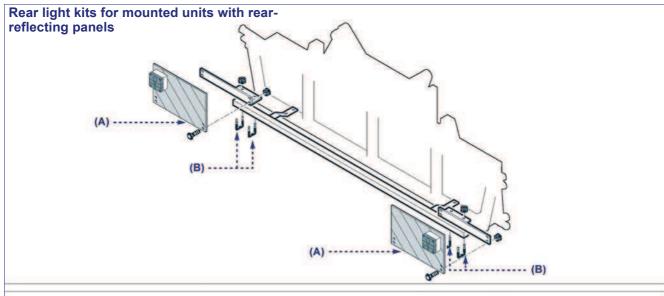


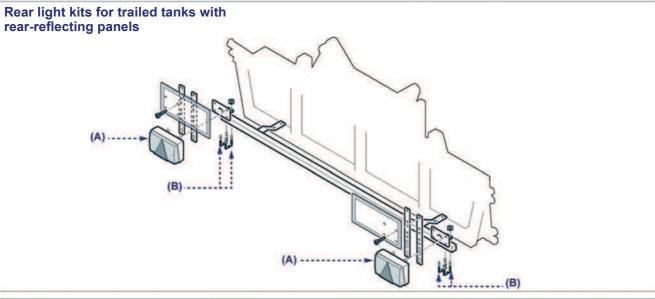
Water connection diagram (7-supply with line filters)

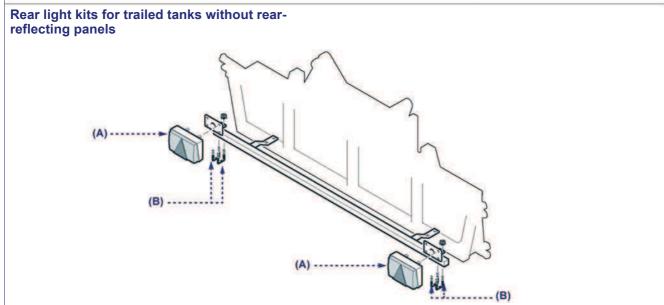


INSTALLATION OF REAR LIGHT KIT

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







INFORMATION ABOUT ADJUSTMENTS

INSTRUCTIONS FOR ADJUSTMENTS

Whoever makes the adjustments must prepare satisfactory safety conditions in advance in order to ensure

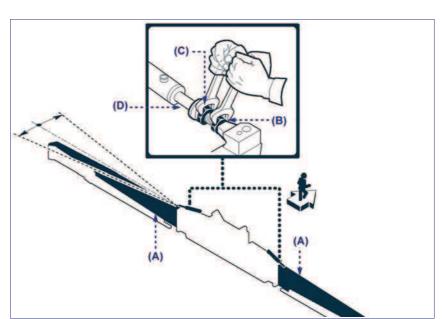
their own safety and that of the operators involved.

ADJUSTMENT OF ARM ALIGNMENT

Unfolding stage: proceed in the way indicated.

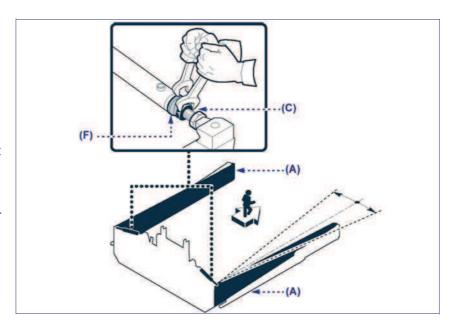
- Start up the controls to completely unfold the primary arms (A) of the boom and slightly fold them to reduce the thrust pressure on the cylinder.
- 2 Loosen the lock nuts (**B-C**), bring them close together and lock one against the other.
- 3 Work on the lock nuts (B-C) to adjust the extension of 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.





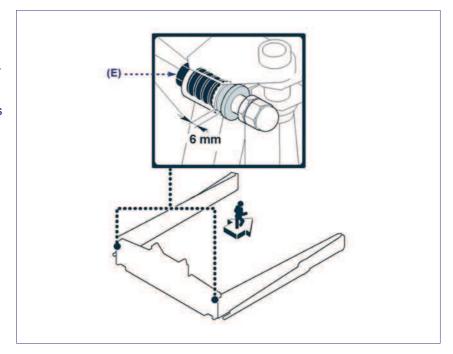
Folding stage: proceed in the way indicated.

- 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.

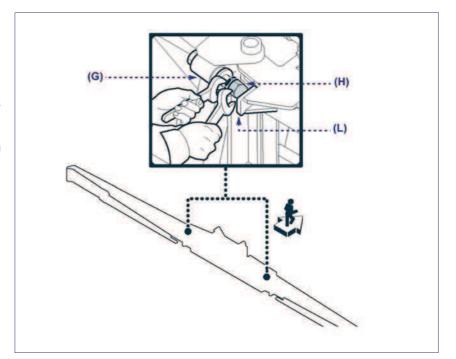


Shock absorber (G) adjustment: proceed in the way indicated.

- 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).



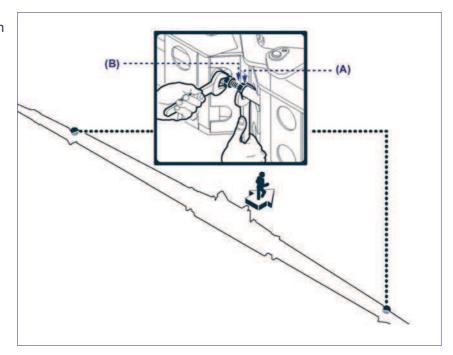
- 3 Completely unfold the primary arm again and check that the nut (H) is resting on the limit stop (L) and slightly compresses the washers. Otherwise, complete the adjustment by means of nut (H) and lock nut.
- 4 Lock the nut and lock nut **(H)** when adjustment is completed.
- 5 Make the same adjustment on the other shock absorber.



ADJUSTMENT OF EXTENSION ALIGNMENT

Proceed in the way indicated.

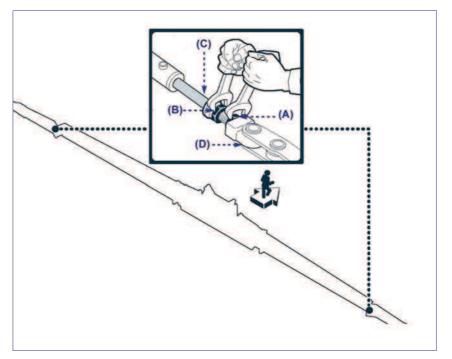
- Loosen the lock nuts (A) and act on the screws (B) so that the extensions are aligned with the primary arms.
- 2 Tighten the lock nut (A) when the operation is completed.



ADJUSTMENT OF EXTENSION OPENING AND CLOSING CYLINDER

Unfolding stage: proceed in the way indicated.

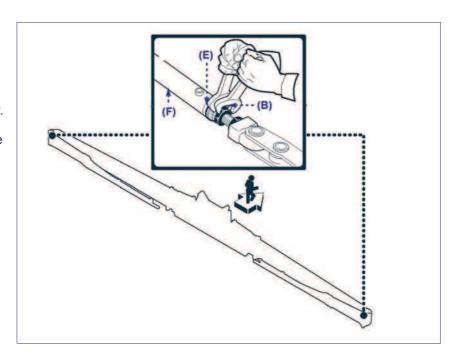
- Start up the controls to completely unfold the extensions of the boom and slightly fold them to reduce the thrust pressure on the cylinder.
- 2 Loosen the lock nuts (A-B), bring them close together and lock one against the other.
- 3 Work on the lock nuts (A-B) to adjust the extension of the stem (C).
- 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.
- Put the lock nuts (A-B) back into their original position and lock them when adjustment is completed.
- 7 Make the same adjustment on the other extension.



Folding stage: proceed in the way indicated.

- 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 nut (B), act on the ring nut (E) and place it so it rests on the cylinder (F).
- 3 Completely fold the extension again.
- 4 Check that the thrust force of the cylinder is such as to prevent any unfolding movement of the extension as to the arm.
- 5 Lock the lock nut **(B)** onto the ring nut **(E)** when adjustment is completed.





INFORMATION ABOUT USE

OPERATING ADVICE

Depending on the type of hydraulic connection and the type of control installed (computer, joystick, etc.), the information is contained in the "hydraulic system" diagrams for the first, and in the "Computer" booklet for the second.

The boom unfolding and folding procedure, variable depending on the type of control installed, is described in "Boom Unfolding and Folding".

Â

mportant

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

SELF-LEVELLING DEVICE USE

The self-levelling device is equipped with a locking device that prevents it from swinging when engaged. On request, the self-levelling device can be equipped with a hydraulic locking unit that can be operated with its respective control (see "Hydraulic System", page 11).



Important

In this case, the self-levelling device.s locking device can be locked during unfolding stages and road travelling.

USE AND OPERATION INFORMATION



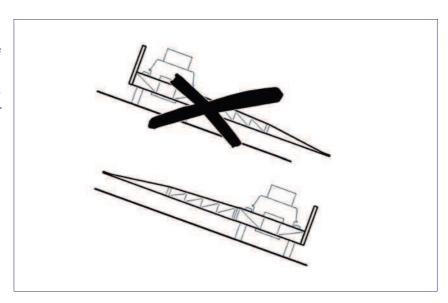
Important

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.

METHODS FOR UNFOLDING AND FOLDING ARMS

Evaluate the following requirements.

- Check whether or not there are electric lines and assess the risks of contact with the spraying booms.
- 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:
- Boom unfolding stage: always unfold the one uphill first, and then the one downhill.
- 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 boom is opened.
- Keep the forward speed moderate (8-10 km/h max) so as to prevent the booms 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

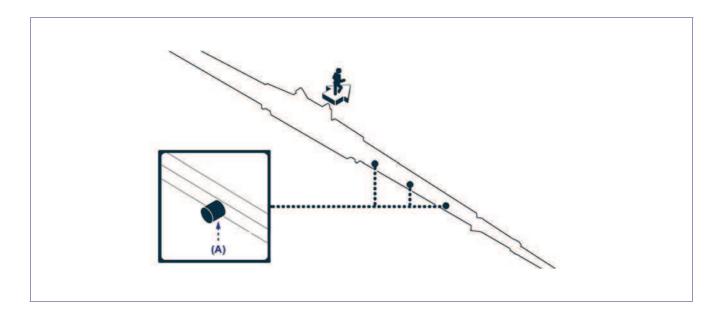
Prevent strangers from approaching the working area when the machine is in use. Should it become necessary, stop it immediately and make the people found in the risk area move away.

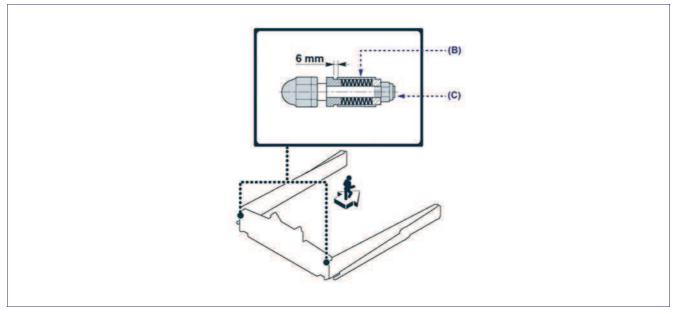
INFORMATION ABOUT MAINTENANCE

MAINTENANCE SCHEDULE TABLE

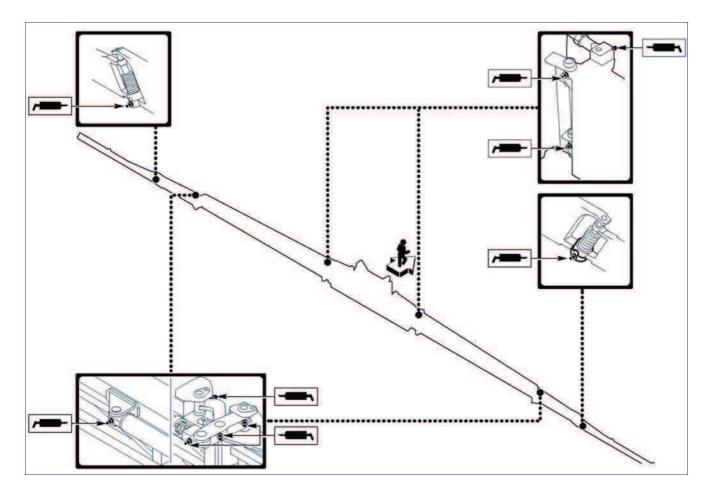
	Interval	Component	Type of intervention	Operation	Page
•	Each working day and with each interval higher than one hour	Jets and nozzles	Clean and rinse the water supply	Make the clean water come out of the nozzles	
	Each working day	Jets and nozzles	Check operation	Clean and replace if necessary	See "Cleaning nozzles", page 39
332.068		Jets, nozzles antidrip valve	Check installation	Install properly	
		Complete equipment	Clean and wash	Use a clean jet of water	

Interval	Component	Type of intervention	Operation	Page
	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	
Every 40 hours		Check the painted surfaces	Touch up the parts the paint has come off of if necessary	
of work	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 (B)	Check its effectiveness	With the arm folded, adjust nut (C) to get the distance indicated in the figure. Replace if necessary.	





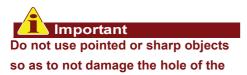
LUBRICATION POINTS DIAGRAM

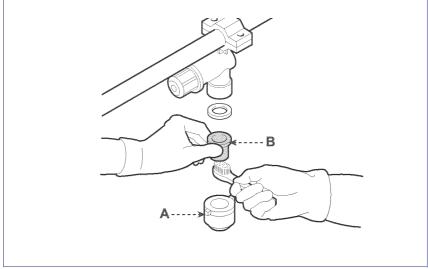


Use PERSIAN POLIGREASE 2 grease

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.





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 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

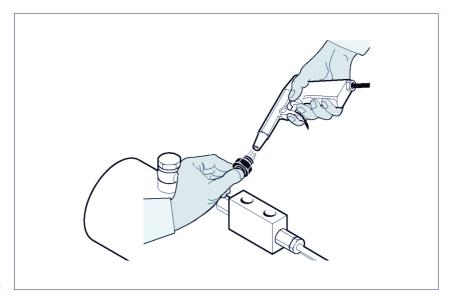
TROUBLES, CAUSES, REMEDIES

Trouble: the boom unfolds halfway and then stops.

Cause: impurities in the calibrated joints of the jacks.

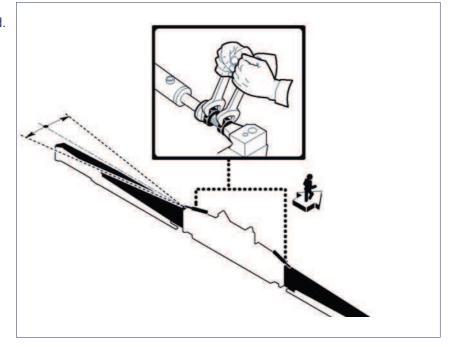
Cures: disassemble the joints and

clean them.



Trouble: the boom is not aligned when unfolded.

Cause: unfolding cylinder not adjusted. **Cures**: adjust the alignment of the arms (see "Adjustment of arm alignment")



Trouble: the extensions are not aligned when unfolded.

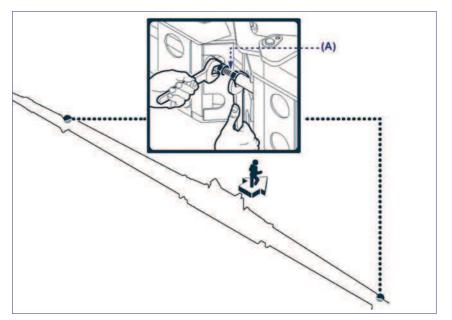
Cause: stop bolt not adjusted.

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 opening and closing cylinder").



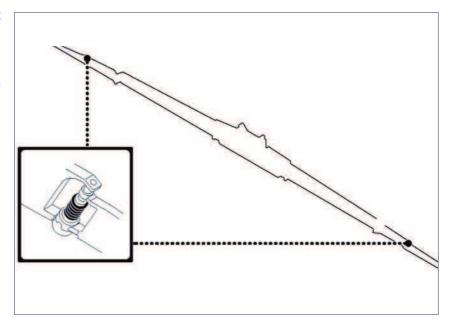
Trouble: the endpiece extension is not steady enough with the boom unfolded.

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 articulation spring and bushing").



INFORMATION ABOUT REPLACEMENTS

REPLACEMENT OF ARTICULATION SPRING AND BUSHING

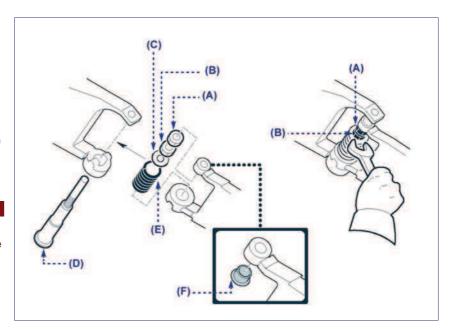
Proceed in the way indicated.

- 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.

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.