Instruction manual

TREE SHEAR

JAK-200K, JAK-250K

Version: 1.00
Original instruction manual

TABLE OF CONTENTS

1 GENERAL

1.1 About this manual

The purpose of this Instruction manual is to promote safe, proper and optimal use and maintenance of the JAK tree shear. The manual also helps to identify, avoid and prevent hazardous situations and related consequences.

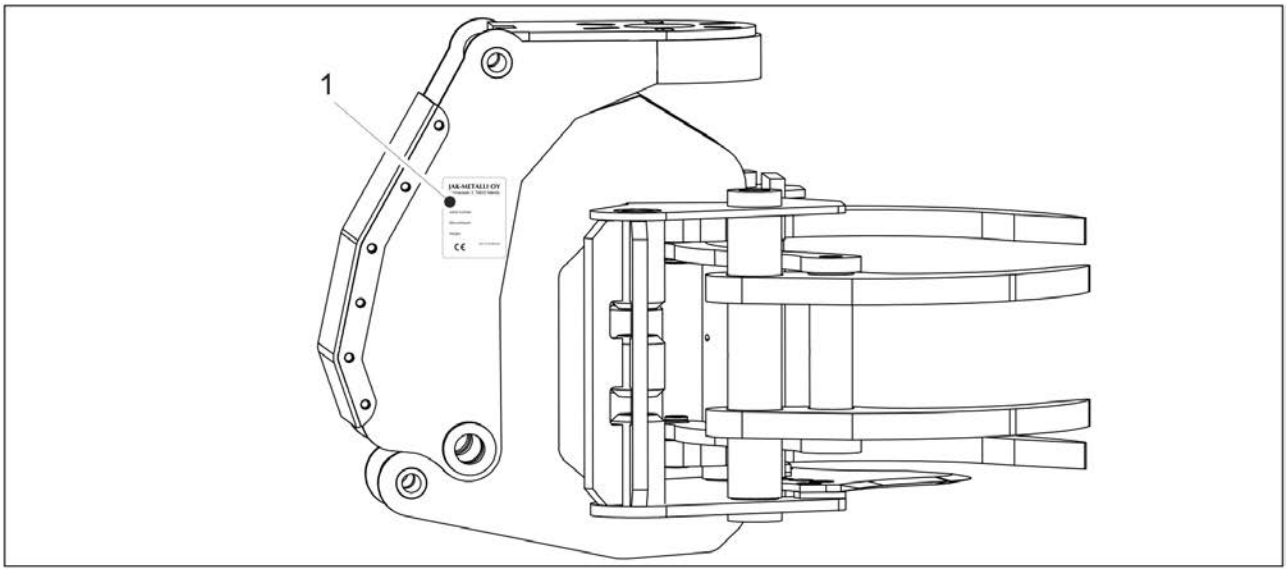
This Instruction manual is intended for the final user. If this manual is lost, damaged or becomes unreadable, contact your local JAK dealer for a replacement copy.

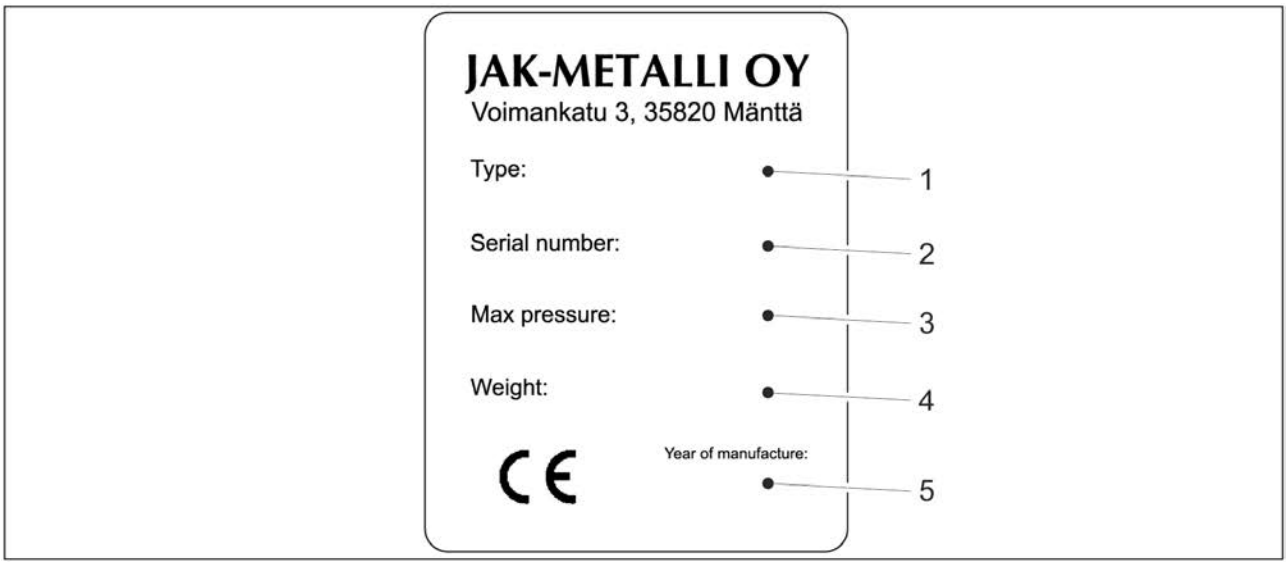
	Read and understand the manual carefully. Follow the given instructions. Follow the instructions in local laws and regulations and any orders given by local authorities.

This Instruction manual covers the tree shear models JAK-200K and JAK-250K.

1.2 Product identification

The tree shear has a manufacturer's plate (1) on the right side of the frame.





Location	Information
1	Type
2	Serial number
3	Maximum pressure
4	Weight
5	Year of manufacture

1.3 Manufacturer

JAK-Metalli Oy
Voimankatu 3
35820 Mänttä
Finland

Telephone: +358 40 080 4658
Email: info@jak.fi
Web: www.jak.fi

2 SAFETY

2.1 Safety symbols used in the manual

	**DANGER** indicates a potentially dangerous situation that can cause death or serious injury.
	**WARNING** indicates a potentially hazardous situation that can cause property damage.
	**NOTE** contains helpful tips, advice and other useful information.

2.1.1 Warning symbols

	**HANGING LOAD** indicates a load that can fall and cause injuries.
	**SHARP ELEMENT** indicates a sharp object that can cause injuries by cuts.
	**CRUSHING HAZARD** indicates a situation where a person can get crushed by moving objects.
	**ELECTRICAL HAZARD** indicates a situation where a person can receive injuries from open electric sources.

2.1.2 Mandatory symbols

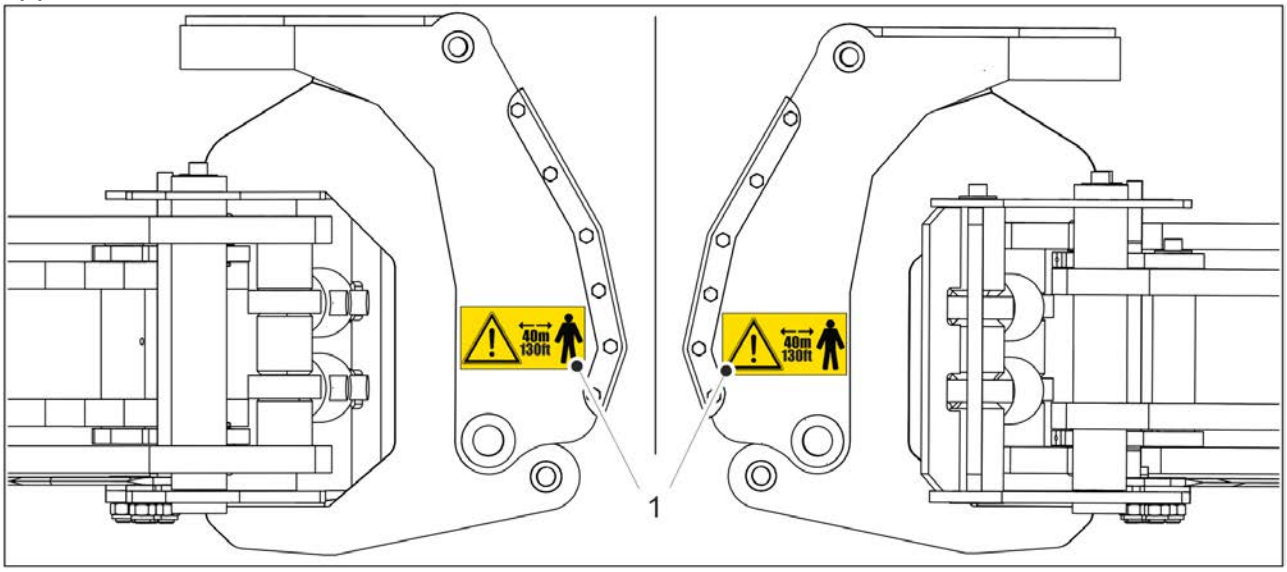
	**INSTRUCTION MANUAL** Refer to instruction manual.
	**EYE PROTECTION** Wear protective eye wear such as safety goggles.

PROTECTIVE GLOVES

Wear protective gloves.

2.2 Safety signs on the product

The warning signs for the safety distance (1) are on the bottom right and left sides of the upper frame.



2.3 Warnings and residual risks

DANGER

Hanging load hazard

The tree shear or its load can fall when lifted and cause injuries or even death.

Do not stand underneath the tree shear.

DANGER

Crushing hazard

Moving parts can cause injuries or even death.

Observe caution near the tree shear when the hydraulic lines are connected. Do not put your hands inside the tree shear when the hydraulic lines are connected.

DANGER

Sharp blade hazard

The blade can cause injuries and cuts.

Observe caution when near the blade. Wear protective goggles and gloves when you sharpen the blade.

DANGER

Sharp blade hazard

The blade can cause injuries and cuts.

Observe caution when near the blade. Wear protective gloves when you handle the blade.

DANGER

Electricity hazard

Current from electric lines can cause injuries or even death.

Observe caution when you use the tree shear near electric lines.

DANGER

Unstable machinery hazard

Handling of oversized trees with the tree shear can change the balance of the machine cause it to fall over.

Cut and handle large trees in segments with the tree shear. Grab large trees from the middle point.

DANGER

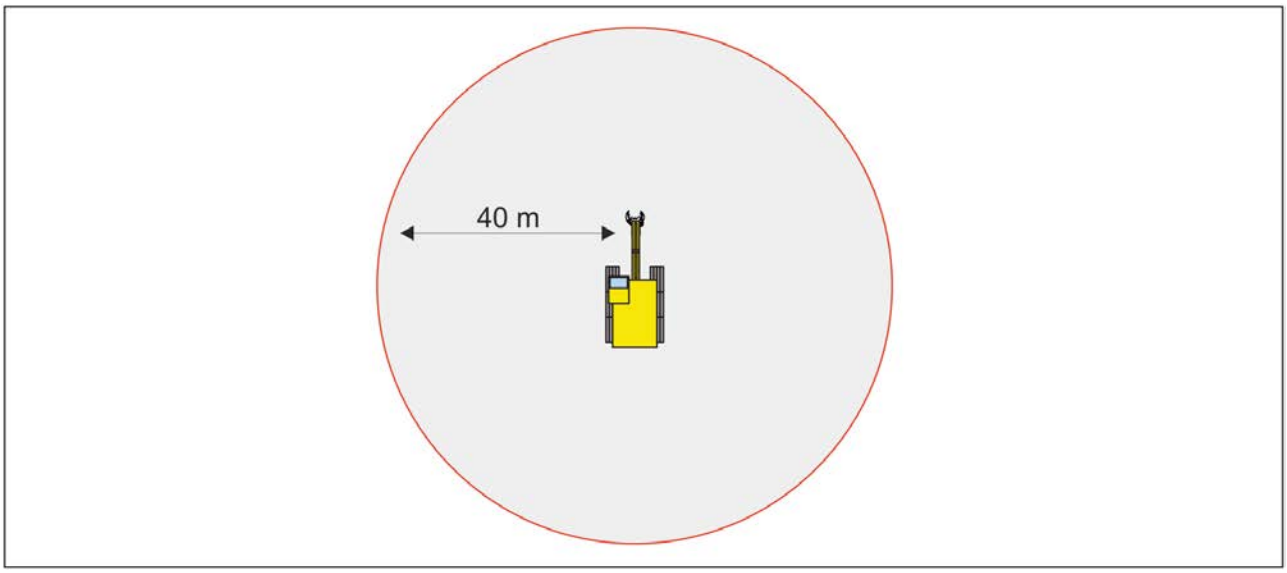
Hydraulic fluid

High pressure hydraulic fluid can cause injury or even death.

Relieve the hydraulic pressure before maintenance. Wear protective gloves and goggles when handling hydraulic fluid.

2.3.1 Danger area

The danger area is 40 m around the tree shear. Ensure that no one enters this area during operation.



2.3.2 Use of personal protective equipment (PPE)

NOTE

Wear protective goggles when you sharpen the blade and when you work with hydraulic lines.

NOTE

Wear protective gloves when you sharpen or handle the blade and when you work with hydraulic lines.

2.4 Noise emissions

The A-weighted emission sound pressure level of the tree shear is 68 dB (<70 dB), measured at 1 m distance during operation.

2.5 Product limitations

2.5.1 Intended use and prohibited use

Intended use

The tree shear is intended for efficient cutting and loading trees. It is used for clearing trees and bushes along roads, electrical lines and ditches, as well as in parks and near houses. The model designation indicates the maximum cutting width of the tree shear.

The tree shear has two hydraulically controlled jaws that can be opened and closed. When the cutting blade is attached the tree shear is used for cutting and stacking trees. When the blade is removed the tree shear can be used for loading timber.

Prohibited use

Do not use the tree shear for handling any other materials than timber.

Do not cut trees that are thicker than specified for the tree shear model.

Do not modify the tree shear in any way not specified by the manufacturer such as welding, cutting or drilling holes to it.

NOTE

Prohibited use voids the warranty of the tree shear.

2.5.2 Base machine

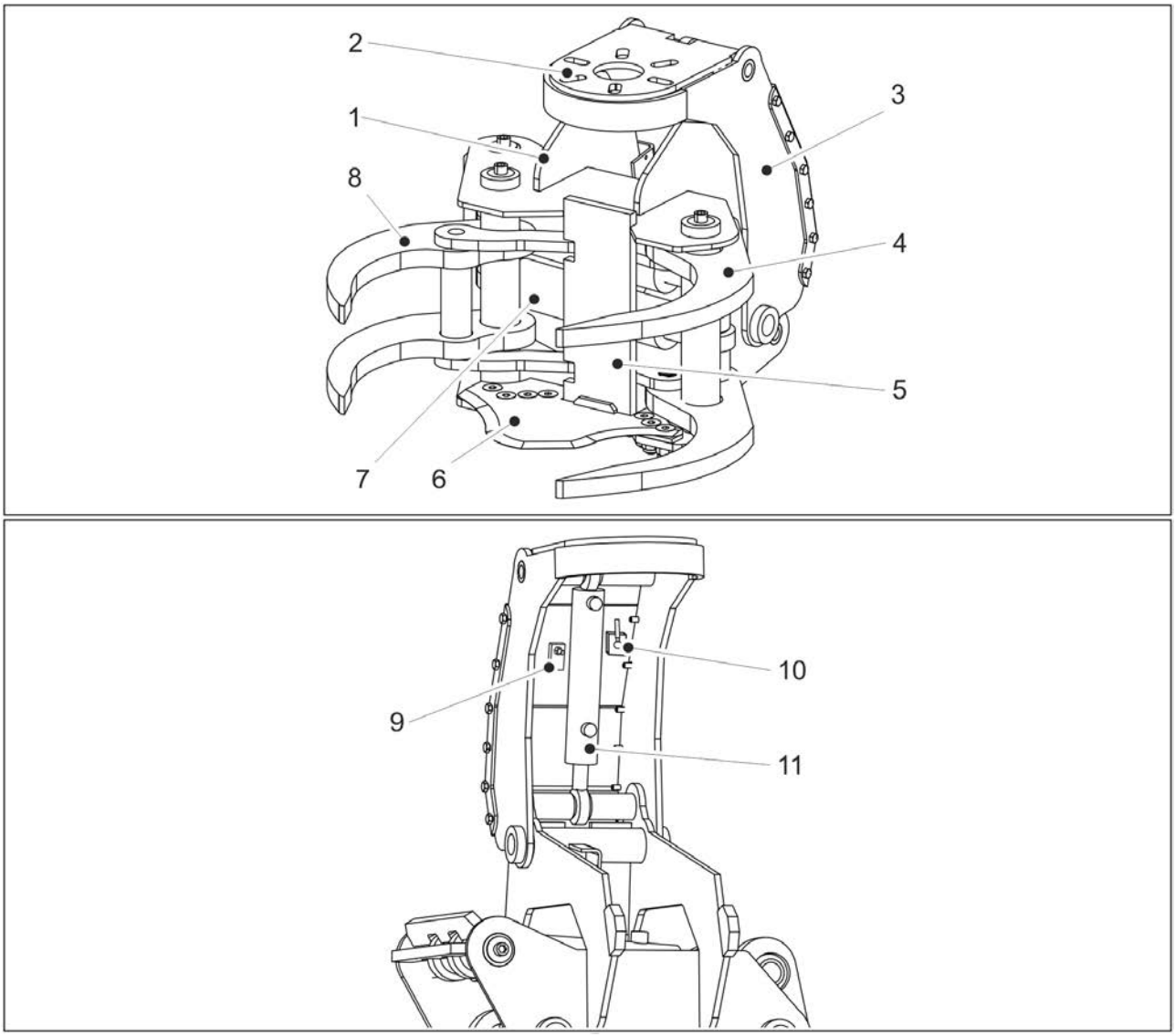
The JAK-200K tree shear is intended for small tractor timber loaders. The JAK-250K tree shear is intended for forest machines and large tractor timber loaders.

2.5.3 Operating temperature

It is not recommended to use the tree shear in temperatures under -15 °Celsius. Colder temperatures can cause metal fatique on the tree shear.

3 OVERVIEW

3.1 Main components



1	Lower frame	7	Jaw hydraulic cylinders
2	Connecting surface	8	Assisting side jaw
3	Upper frame	9	Tipping mechanism, valve
4	Cutting side jaw	10	Tipping mechanism, lock lever
5	Buffer plate	11	Tipping mechanism, hydraulic cylinder
6	Cutting blade		

3.2 Technical data and dimensions

Product name	JAK-200K	JAK-250K
Weight	160 kg (352 lbs)	280 kg (617 lbs)
Height	570 mm (22.4 in)	700 mm (27.5 in)
Cutting diameter	200 mm (7.8 in)	250 mm (9.8 in)
Operating pressure	160-300 bar (2320-4351 psi)	200-300 bar (2901-4351 psi)
Minimum oil flow	30 l/min (7.9 gal/min)	60 l/min (15.8 gal/min)
Width when open	600mm (23.6 in)	690mm (27.1 in)

4 INSTALLATION

4.1 Transportation

Transport the tree shear in horizontal position. During transportation the jaws must be closed so that the cutting blade is covered by the jaws.

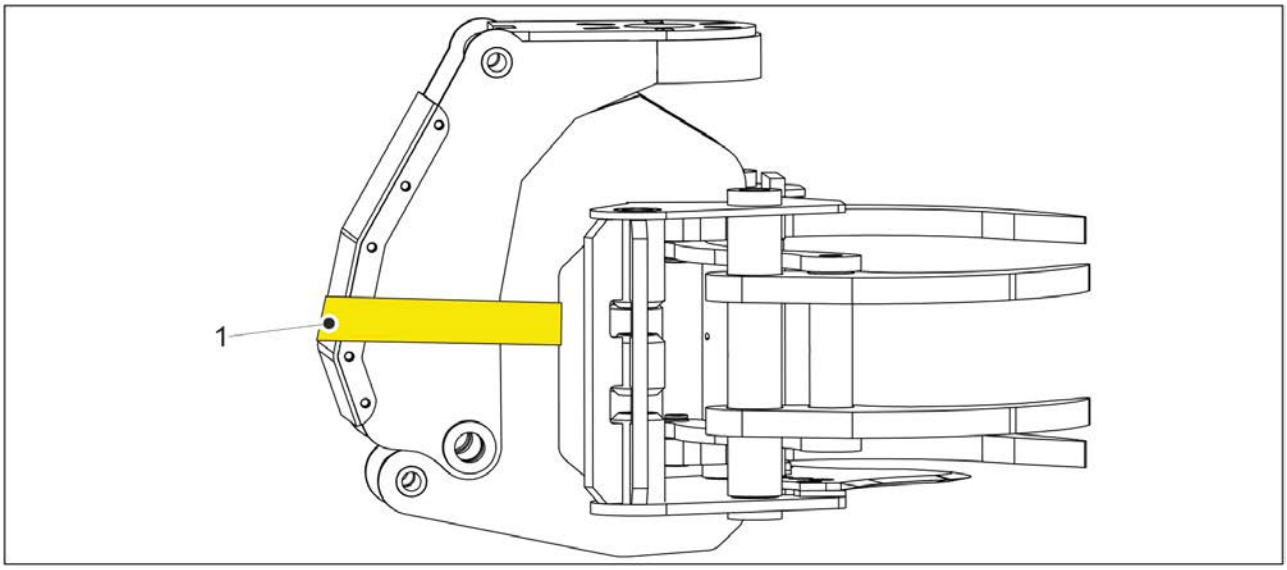
Fasten the tree shear to the transportation baseplate with cargo straps. To select suitable cargo straps, consider that:

- The tree shear has sharp edges. Use coated cargo straps.
- The tree shear and attached optional equipment are heavy. Make sure the cargo straps withstand the weight.

NOTE

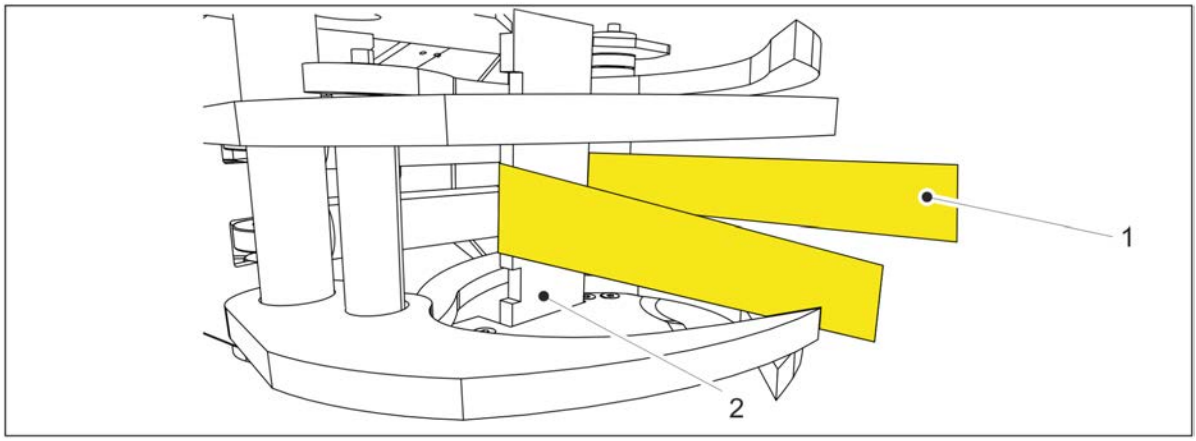
Make sure the cargo straps cannot damage the hydraulic lines during transportation.

Tie a strap (1) around the frame and the back of the tree shear.

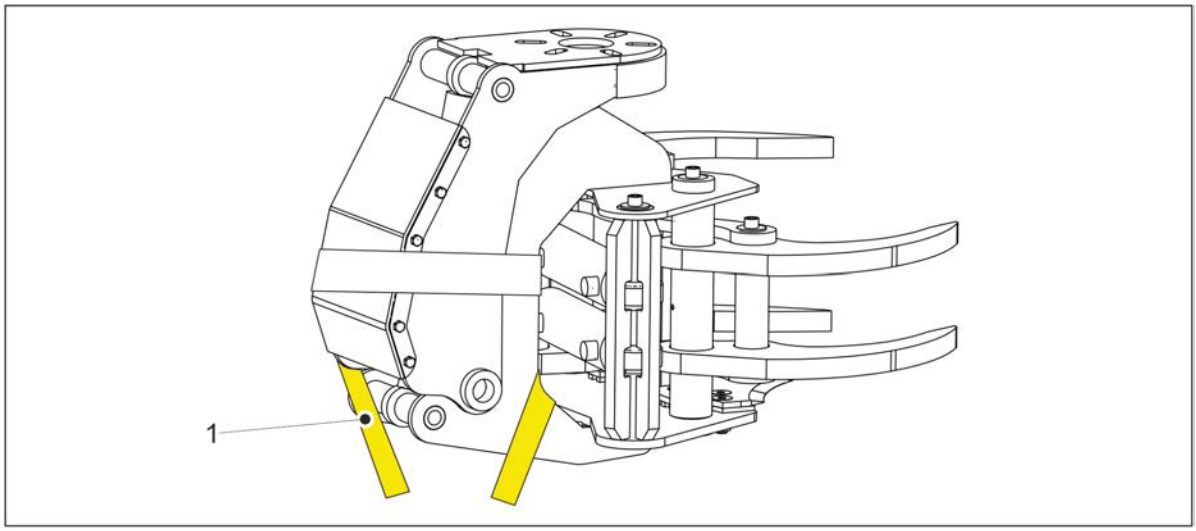


Tie the tree shear to the baseplate:

1. From behind the buffer plate (2) with cargo straps (1).



2. Through the back opening with a cargo strap (1).



4.2 Lifting

DANGER

Hanging load hazard

The tree shear or its load can fall when lifted and cause injuries or even death. Do not stand underneath the tree shear.

NOTE

Make sure that the lifting belt or chain cannot damage the hydraulic lines during lifting.

During lifting the jaws must be closed so that the cutting blade is covered by the jaws.

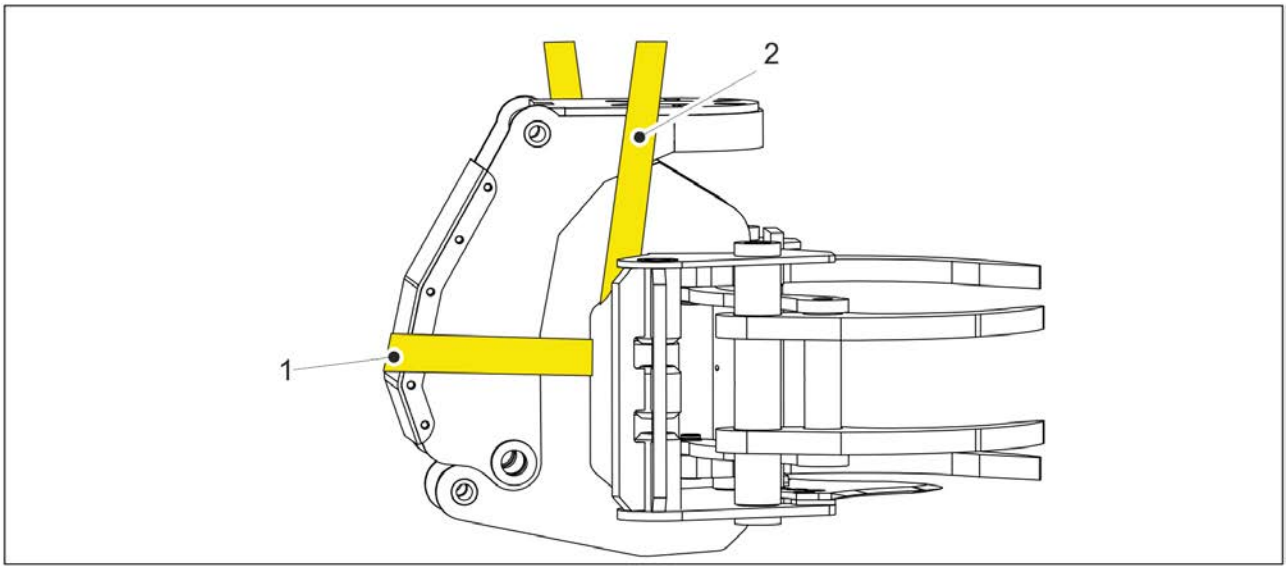
Lift the tree shear with a lifting belt or chain. To select a suitable lifting belt or chain, consider that:

- The tree shear has sharp edges.

- The tree shear and attached optional equipment are heavy. Make sure the lifting belt or chain can withstand the weight.

To lift the tree shear:

1. Secure the tipping mechanism with a strap (2).
2. Run a lifting belt (1) or chain through the opening in the middle. The tree shear remains balanced when lifted from the middle opening.



4.3 Storage

Before storage:

- Wash the tree shear with a pressure washer.
- Apply grease to the grease nipples.

Storage conditions:

- Store the tree shear indoors when possible.
- If the tree shear is stored outdoors, cover it with a waterproof tarpaulin.

Storage position:

- Store the tree shear on a stable flat surface.
- For safety reasons, close the jaw to ensure the blade is covered by the jaw.
- For safety reasons, secure the tipping mechanism with a strap before storage. See chapter 4.1 Transportation.

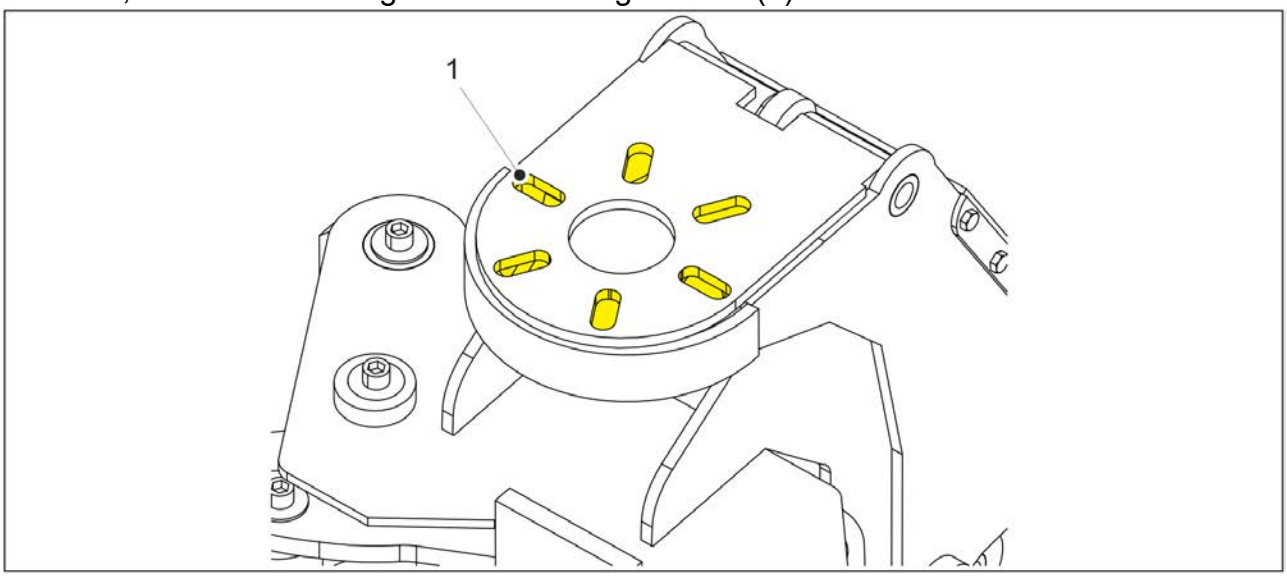
Long-term storage:

- Check that there is grease in the grease nipples at least once per year.
- If the tree shear is taken into use after a long storage period, perform the before first use checks again. See chapter 4.4.3 Before first use.

4.4 Commissioning

4.4.1 Attaching the tree shear to the base machine

The tree shear has a connecting surface on top. To attach the tree shear to the base machine, install bolts through the connecting surface (1).



4.4.2 Connecting the hydraulics

DANGER

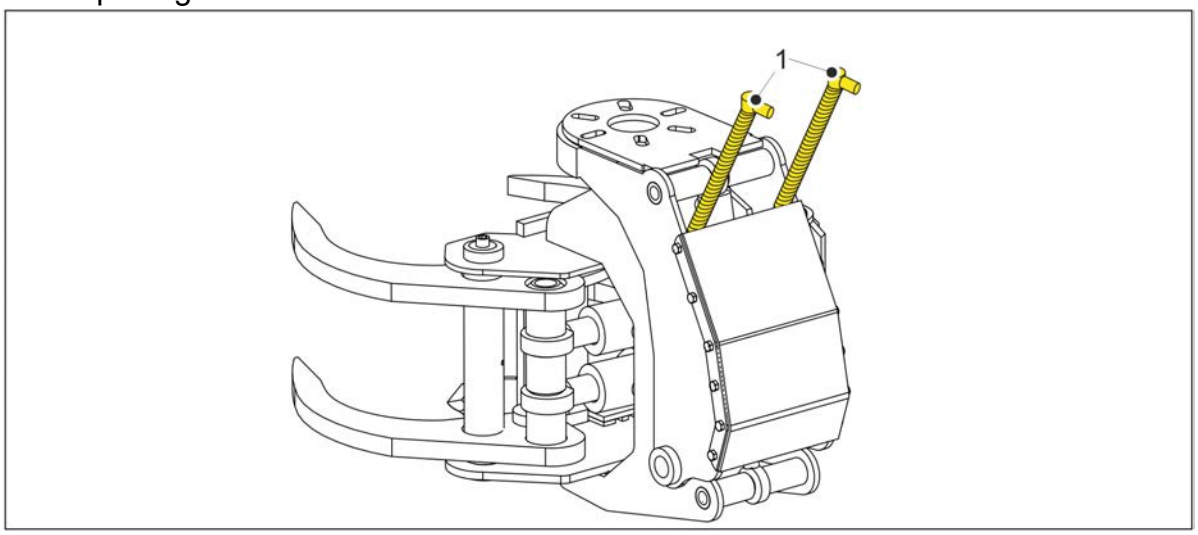
Crushing hazard

Moving parts in the tree shear can cause injuries or even death. Observe caution near the tree shear when the hydraulc lines are connected. Do not put your hands inside the tree shear when the hydraylic lines are connected.

Tree shear	Hydraulic connector
JAK-200K	R 3/8"
JAK-250K	R 1/2"

1. Ensure that the hydraulic lines in the base machine are pressure free. For safe work methods, see the instruction manual of the base machine.

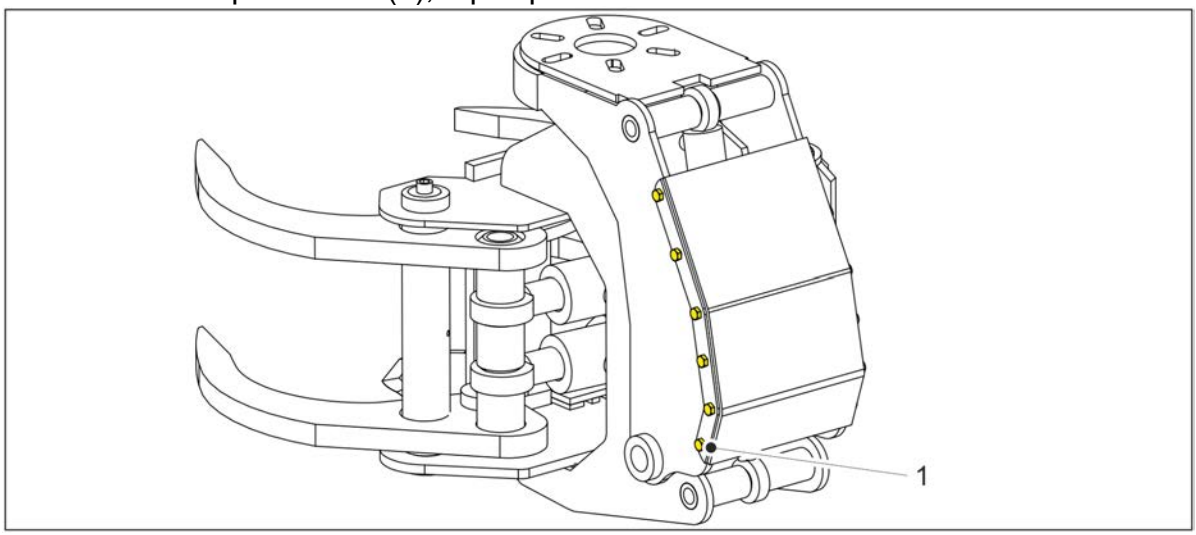
2. Connect the inflow and outflow hydraulic hoses (1) to the base machine through the back opening.



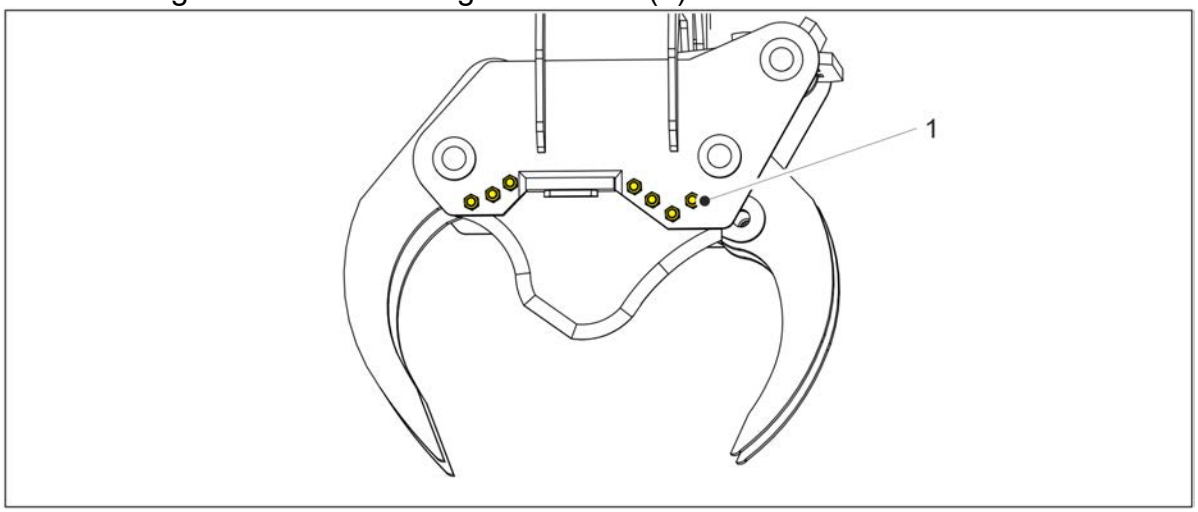
3. Open and close the jaws to ensure that the hydraulic lines are connected in the intended order.
4. Measure the hydraulic pressure before using the tree shear. Target pressure is the maximum pressure of the tree shear model. The opening and closing speed of the jaws is dependent on the hydraulic oil flow of the base machine.

4.4.3 Before first use

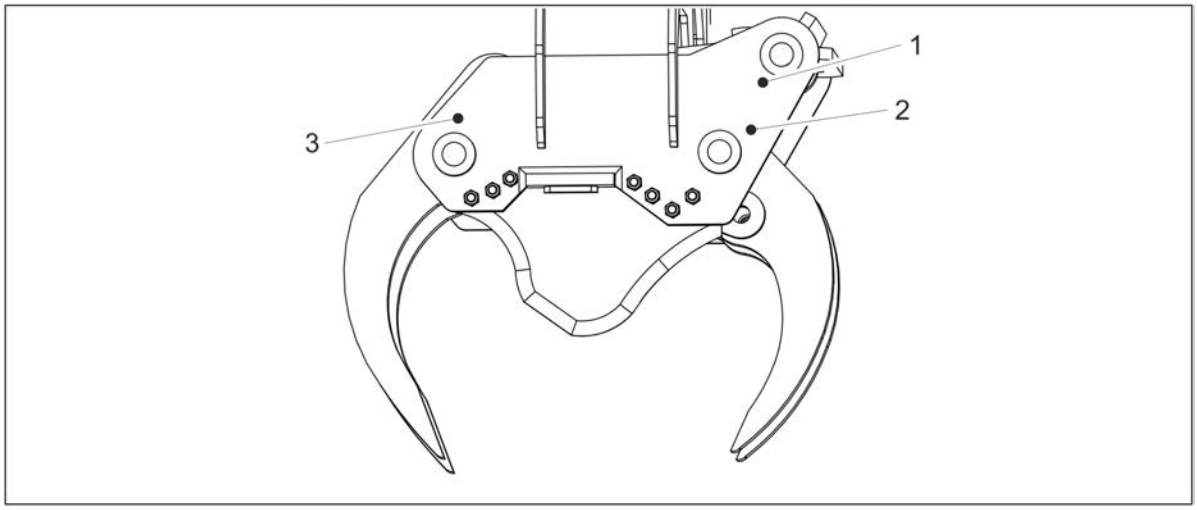
1. Check the back plate bolts (1), 6 pcs per side.



2. Check the tightness of the cutting blade bolts (1).



3. Check the tightness of the bottom bolts (1-3).



4. Apply grease to the grease nipples. See section 6.3.5 Greasing the tree shear.

4.5 Dismounting the tree shear

1. Close the jaws almost shut so that the cutting blade is covered by the jaws.
2. Lower the tree shear to the ground or transportation vehicle.
3. Relieve pressure from the hydraulic lines. For safe work methods, see the instruction manual of the base machine.

	NOTE Oil can leak from the hydraulic lines when they are detached.

4. Detach the hydraulic lines.
5. Detach the three shear from the base machine.

5 OPERATION

5.1 Felling a tree

DANGER

Falling tree hazard

Felled tree can cause damage, injuries or even death if it hits objects or people.

Always fell the tree in direction away from the base machine and buildings.

DANGER

Electricity hazard

Current from electric lines can cause injuries or even death. Observe caution when you use the tree shear near electric lines.

DANGER

Unstable machinery hazard

Handling of oversized trees with the tree shear can change the balance of the machine and cause it to fall over.

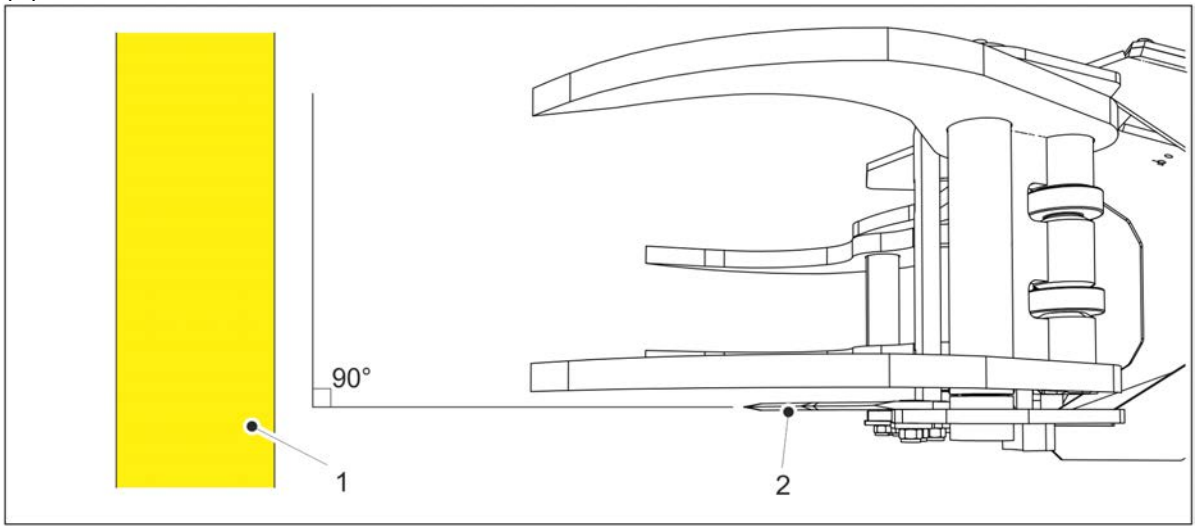
Cut and handle large trees in segments with the tree shear. Grab large trees from the middle point.

NOTE

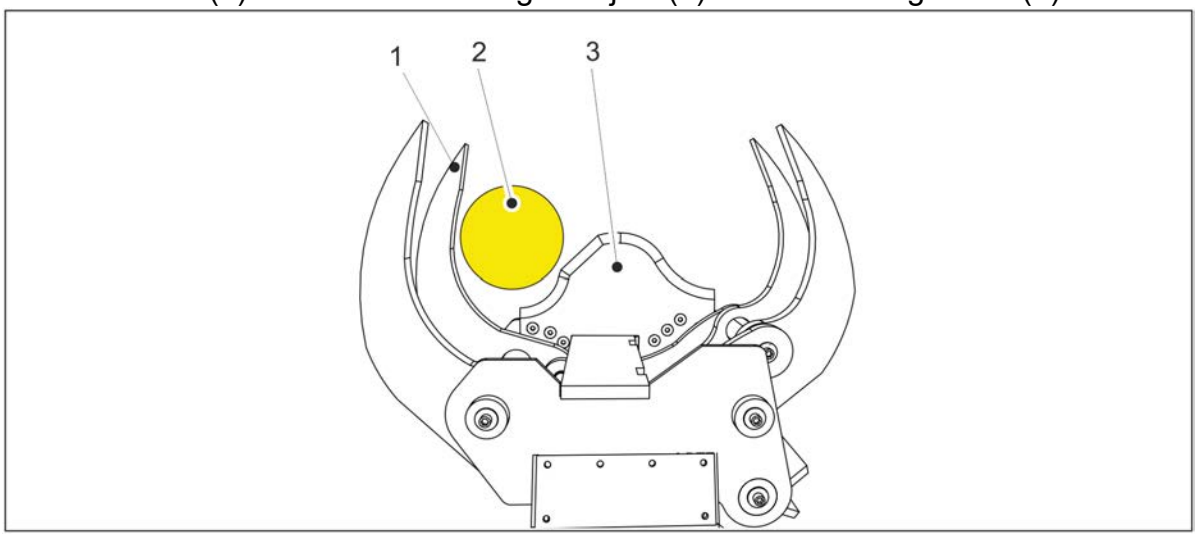
If the wood is hard or the hydraulic pressure is low, it is possible that the tree shear cannot cut a tree of maximum width.

1. Lower the tree shear to the base of the tree.

2. Turn the tree shear until the cutting blade (2) is at 90 degree angle towards the tree (1).



3. Place the tree (2) between the cutting side jaw (1) and the cutting blade (3).



4. Close the jaws to press the tree against the blade. This will cut the tree.
5. Move the tree to a stacking location on the ground.
6. To release the tree, open the jaws.

5.2 Loading timber

When the cutting blade is detached, the tree shear can be used for loading timber. See chapter 6.3.8 Replacing the cutting blade for how to detach the blade.

- Move the tree shear to the midpoint of the timber stack. Grabbing the tree from the middle will help to balance the machine.
- Close the jaws so that the timber is firmly in the tree shear.

5.3 Operation in case of malfunction

Malfunction	Action
Tree shear cannot cut a tree and becomes stuck	Do not open the jaw of the tree shear. Do not approach a tree that is partially cut. Try to fell the tree away from the machine by pushing it with the machine. Check that the tree shear is not damaged before you use the tree shear again.
Branches or debris in the tree shear	Before removing branches or debris: • Lower the tree shear to the ground. • Turn off the base machine.
Cutting blade detaches from the tree shear	Lower the tree shear to the ground. Turn off the base machine. Ensure that the blade and its bolts are not damaged before reattaching the blade.
Hydraulic fault, jaws do not open or close	Relieve the hydraulic pressure. Check for leaks in the connectors and lines. Replace any faulty connectors or lines.
Tipping mechanism does not open or close	Adjust the tipping mechanism valve, see chapter 6.3.10 Adjusting the tipping mechanism valve.

6 MAINTENANCE

6.1 Maintenance schedule, tree shear

Task	Interval
Check the tightness of screws and nuts.	Daily
Check that there are no cracks or fractures.	Daily
Check the condition of the blade.	Daily
Check that there are no hydraulic leaks.	Daily
Grease the tree shear.	Daily
Clean the tree shear.	When needed
Sharpen the blade.	When needed
Replace the blade.	When needed
Adjust the valve of the tipping mechanism.	When needed.

6.2 Tightening torques

Class 8.8 bolt	Tightening torque
M10	43 Nm
M12	75 Nm
M16	181 Nm
M20	353 Nm

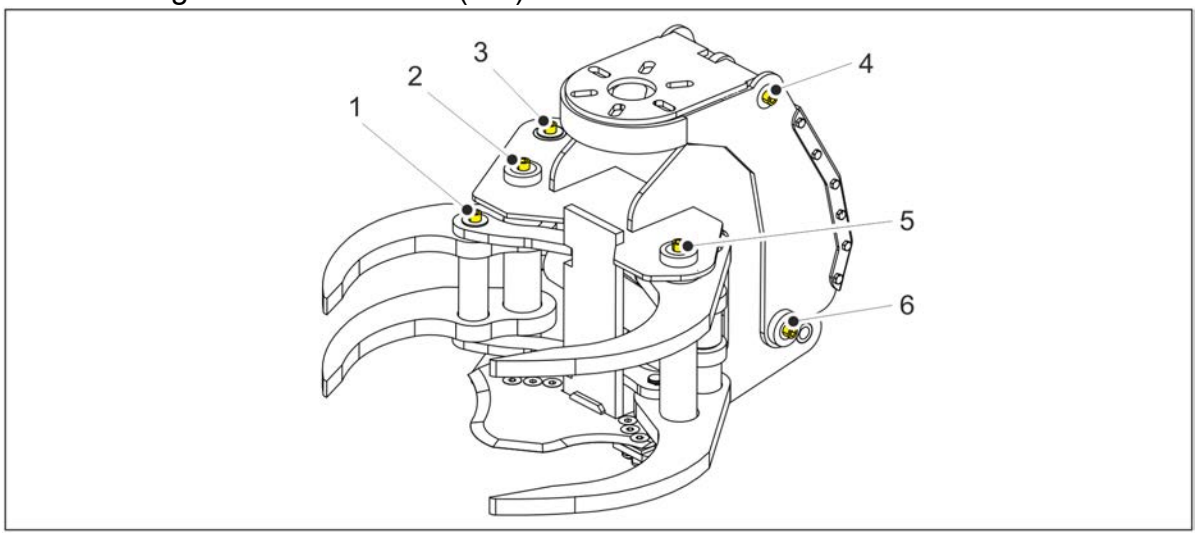
6.3 Maintenance instructions, tree shear

NOTE

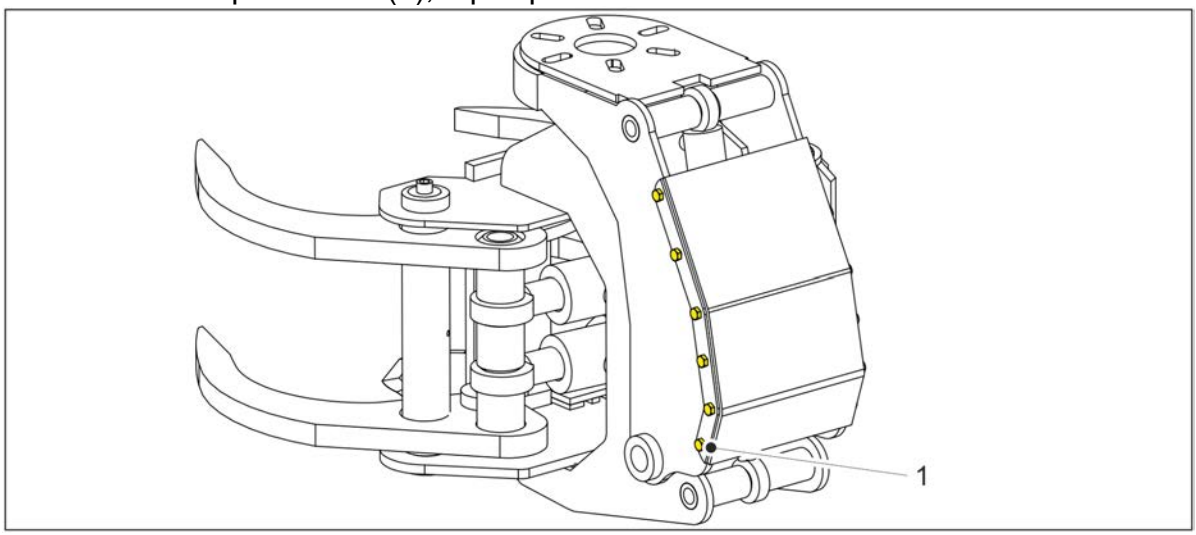
Before performing any maintenance, lower the tree shear to the ground and turn off the base machine.

6.3.1 Checking the tightness of screws and nuts

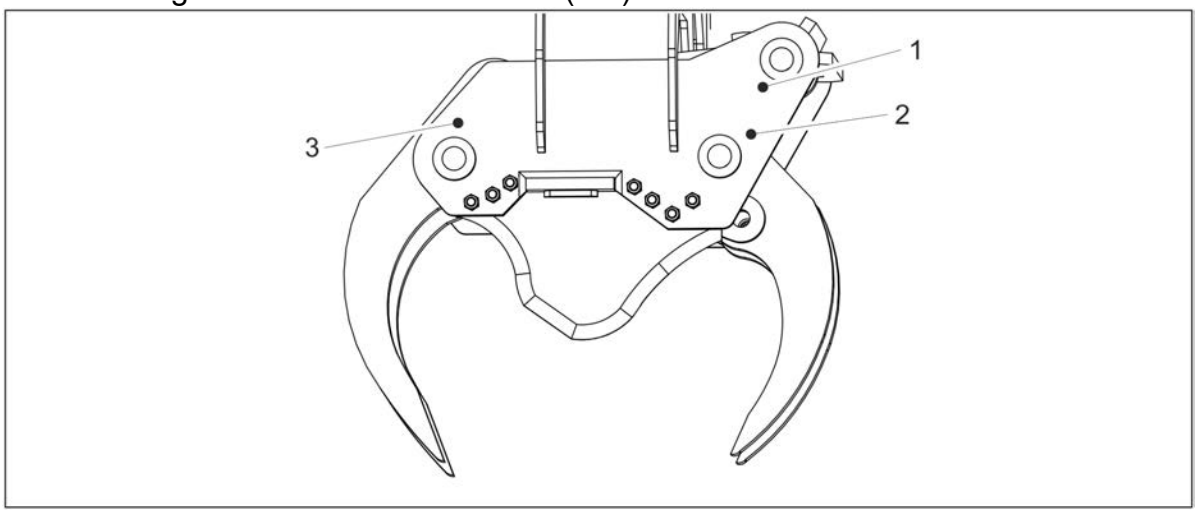
1. Check the tightness of the bolts (1-6).



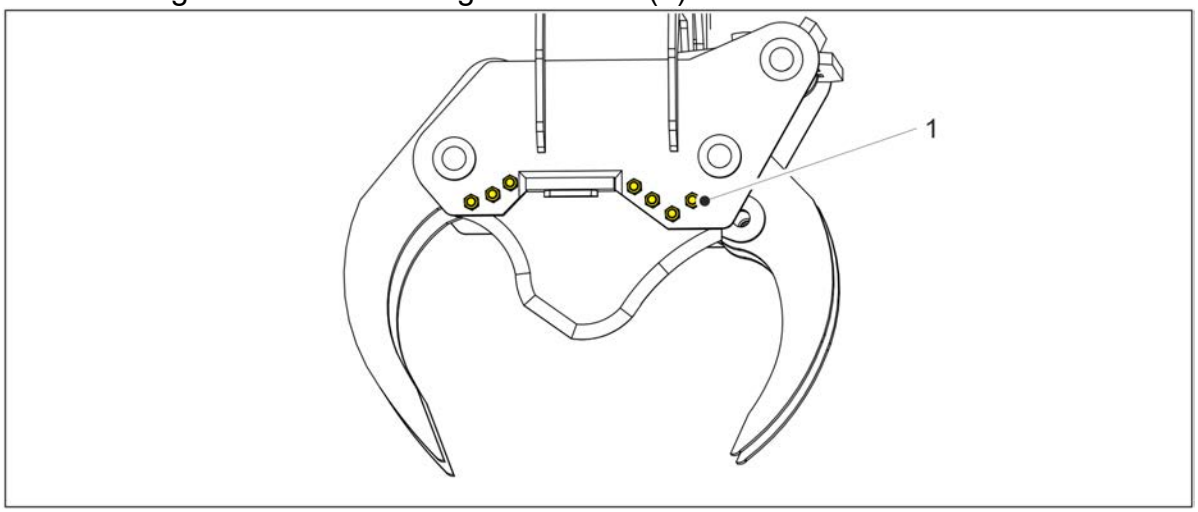
2. Check the back plate bolts (1), 6 pcs per side.



3. Check the tightness of the bottom bolts (1-3).



4. Check the tightness of the cutting blade bolts (1).



6.3.2 Checking the tree shear for cracks or fractures

Visually check the jaws and main body of the tree shear for cracks or fractures in the metal. If cracks or fractures are found, do not attempt to fix them, instead contact your JAK-dealer.

6.3.3 Checking the condition of the cutting blade

DANGER

Sharp blade hazard

The blade can cause injuries and cuts.

Observe caution when near the blade. Wear protective gloves when you handle the blade.

Visually check that the blade is not damaged, bent or dull. If the blade is dull or notched, sharpen it. Damaged or bent blade must be replaced.

6.3.4 Checking for hydraulic leaks

DANGER

Crushing hazard

Moving parts in the tree shear can cause injuries or even death.

Observe caution near the tree shear when the hydraulic lines are connected. Do not put your hands inside the tree shear when the hydraulic lines are connected.

DANGER

Hydraulic fluid

High pressure hydraulic fluid can cause injury or even death.

Relieve the hydraulic pressure before maintenance. Wear protective gloves and goggles when handling hydraulic fluid.

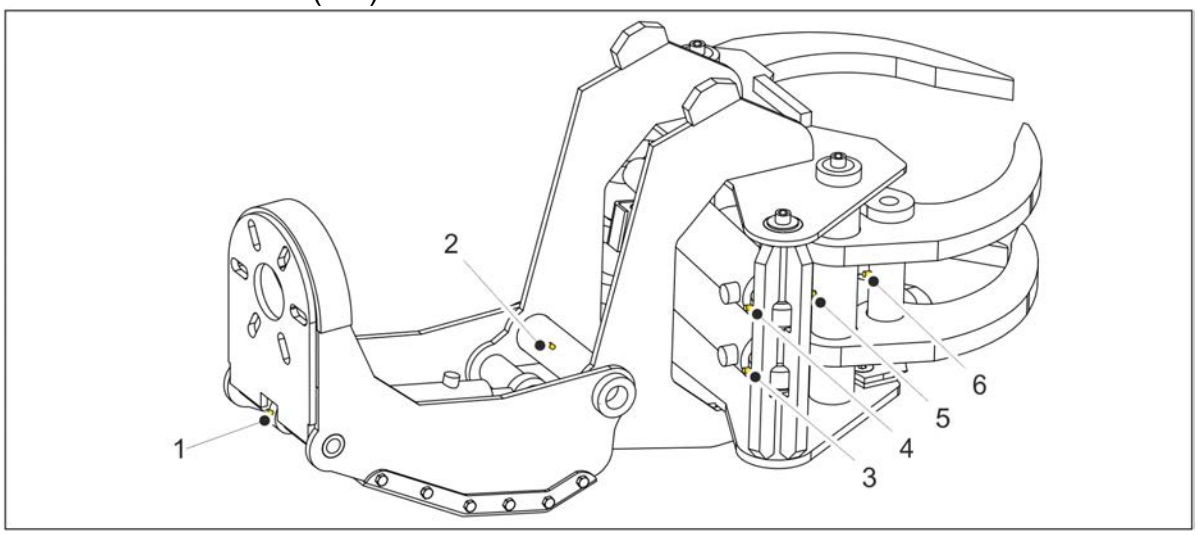
Visually check the inflow and outflow hydraulic connections for leaks. Hydraulic leaks are more common in cold operating temperatures. If possible, pre-heat the hydraulic oil of the base machine before operation in cold temperatures.

If a leak is found, replace the hydraulic hose or connector.

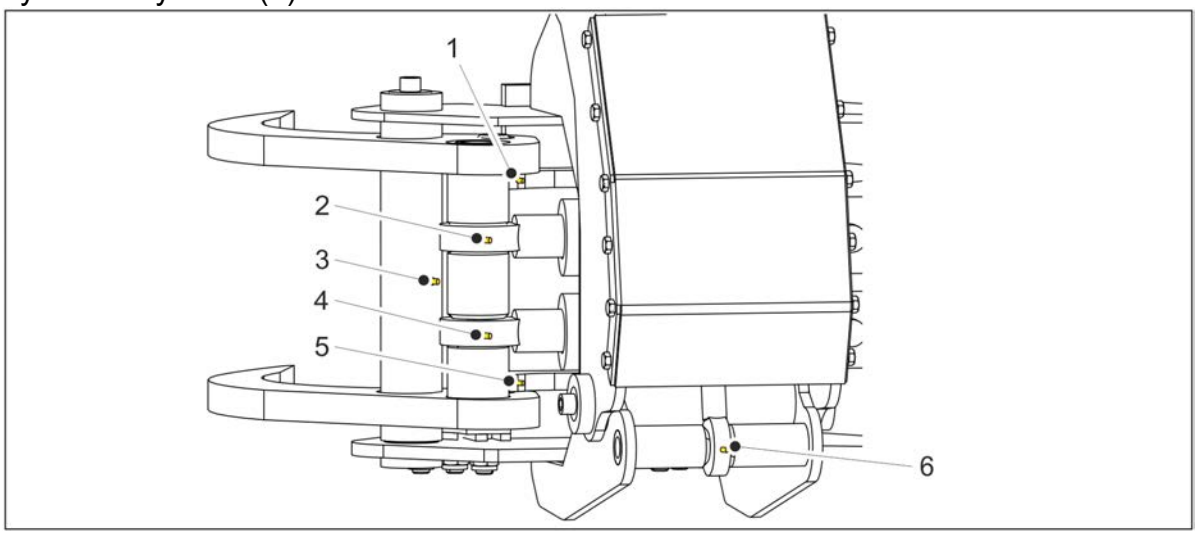
6.3.5 Greasing the tree shear

Use good quality NLGI.2 multi-purpose grease for greasing the tree shear.

1. Grease the nipples at the top of hydraulic cylinder (1), the tipping shaft (2) and right side of the tree shear (3-6).



2. Grease the nipples at the left side of the tree shear (1-5) and the bottom of the hydraulic cylinder (6).



6.3.6 Cleaning the tree shear

The tree shear can be washed using a pressure washer. Check that no branches or debris remain inside the tree shear after washing.

6.3.7 Sharpening the cutting blade

DANGER

Sharp blade hazard

The blade can cause injuries and cuts.

Observe caution when near the blade. Wear protective goggles and gloves when you sharpen the blade.

NOTE

Excessive heat during sharpening can weaken the structure of the blade.

Use a battery powered angle grinder equipped with an abrasive disc for sharpening.

- Move the abrasive disc continuously when sharpening.
- Pause the sharpening if the blade becomes hot and let it cool down.
- Sharpen the blade equally from both sides.

6.3.8 Replacing the cutting blade

DANGER

Sharp blade hazard

The blade can cause injuries and cuts.

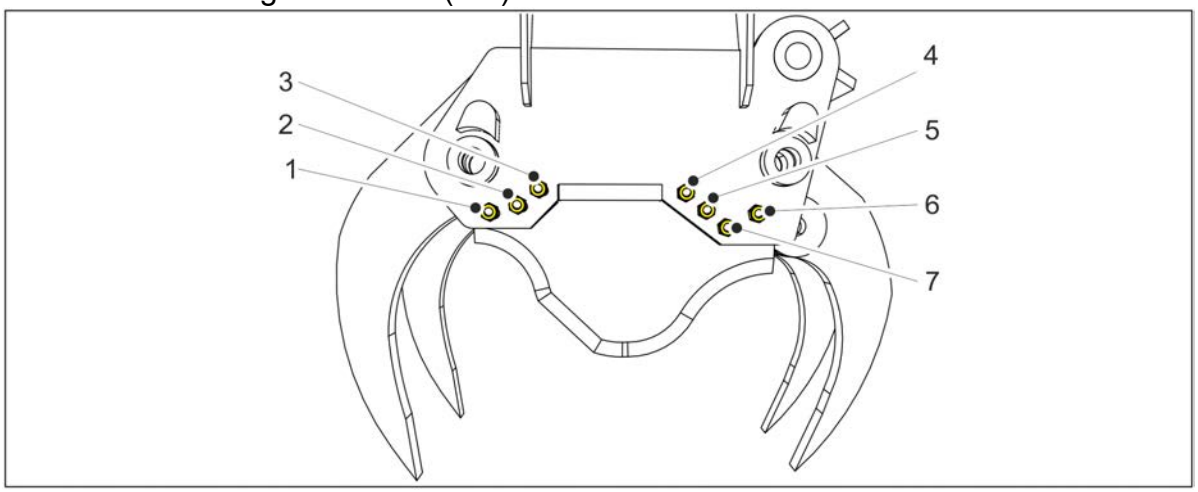
Observe caution when near the blade. Wear protective gloves when you handle the blade.

NOTE

Use an electrical wrench or alternatively a socket wrench with a 1 m extender at least.

Model	Part	Part number
JAK-200	Blade	10170
JAK-250	Blade	10079

1. Remove the cutting blade nuts (1-7) at the bottom of the tree shear.



2. Remove the cutting blade bolts.
3. Remove the old blade and spacer plate.
4. Align the spacer plate and new blade with the bolt holes.
5. Attach the bolts.
6. Attach the nuts.

6.3.9 Replacing the hydraulic hose and connector

DANGER

Hydraulic fluid

High pressure hydraulic fluid can cause injury or even death.

Relieve the hydraulic pressure before maintenance. Wear protective gloves and goggles when handling hydraulic fluid.

1. Determine whether a hose or connector is the cause of the leak.
2. Prepare a spare hose or connector according to the leak.
3. Depressurize the hydraulic lines in the base machine. See manufacturers documentation.
4. Turn off the base machine.
5. Put a container underneath the hydraulic connection for any oil that might spill out.
6. Detach the leaking connector or connectors of the hose segment.
7. Attach the new connector or hose segment with its connectors.

6.3.10 Adjusting the tipping mechanism valve

DANGER

Hydraulic fluid

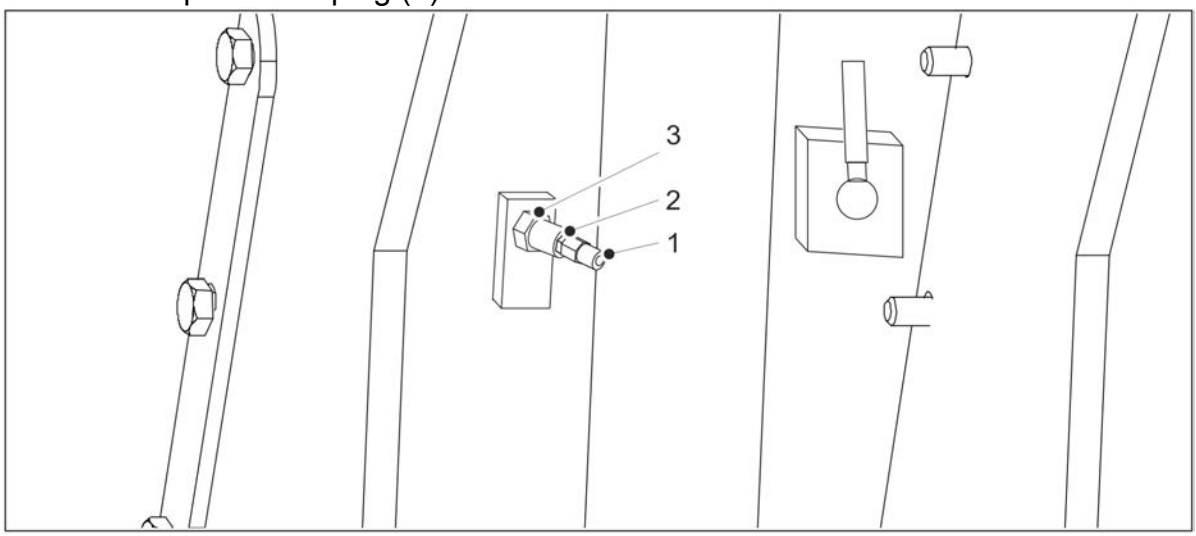
High pressure hydraulic fluid can cause injury or even death.

Relieve the hydraulic pressure before maintenance. Wear protective gloves and goggles when handling hydraulic fluid.

If the tipping mechanism does not open and close correctly, adjust the valve. Ensure that the base machine hydraulic system is warmed-up before you do the adjustment.

To adjust the tipping mechanism valve:

1. Lower the tree shear to the ground.
2. Turn off the base machine.
3. Remove the protective plug (1) from the valve.



4. Open the locking nut (2).
5. Turn the hexagonal socket-head screw (3) 1/4 of a turn.
    - Closing the screw will increase the pressure required for tipping.
    - Opening the screw will lower the pressure required for tipping.
6. Tighten the locking nut.
7. Insert the protective plug on the valve.

If the tipping mechanism still does not operate correctly, repeat steps 1-7.

6.4 Spare parts and maintenance contacts

For spare parts and service, contact your JAK-dealer. When ordering spare parts, indicate the model and serial number of the tree shear. The information is found on the manufacturer's plate.

7 ATTACHMENTS

Warranty

Warranty period is model and equipment specific, confirm the warranty period length from the reseller.

The warranty period starts on the date of purchase.

Warranty does not cover:

- Cutting blades and hydraulic hoses.
- Defects caused by wear or prohibited use. For prohibited and intended use of the equipment, read the instruction manual.
- Loss of earnings and other indirect costs from down time.
- Costs due to transporting the equipment to warranty repair.

Warranty is void if:

- Other than original parts are used on the tree shear.
- The owner of the tree shear changes during the warranty period.
- The tree shear is used in temperatures below -15 °Celsius.

Warranty repairs are performed at the faclities of JAK-Metalli Oy or the retailer.

The warranty repair is carried out within a reasonable time, maximum of 4 weeks.

31.10.2022

EU Declaration of conformity

CE

Manufacturer Name: JAK-Metalli Oy
Address: Voimankatu 3
35820 Mänttä
Phone: 040 080 4658
e-mail: info@jak.fi

JAK-Metalli Oy declares that the products manufactured by us are compliant with requirements of following European parliament and council directives:

- Machine Directive 2006/42/EU

The Declaration of Conformity covers the following products:

- JAK-400 R
- JAK-300 B, R and C
- JAK-250 B, R and K
- JAK-200 B, R and K
- JAK-300 and 250 Tilting units
- JAK-300 and 250 Collector units
- JAK-350 Guillotine unit

Note! The declaration of conformity is not valid if the tree shears mentioned before are used against laws, general safety instructions and this user instruction.

In the usage of the machine, situations may arise not mentioned in the user instructions. In these situations, we recommend following extreme caution. The manufacturer is not responsible for the use of the actions in these situations or for the damages happening in these situations.

The manufacturer is not responsible for the damages to a third party.
The manufacturer is not responsible for the damages that the JAK tree shear has caused to machine or to the device.
The owner of the tree shear is responsible for the correct functioning, use and maintenance of the tree shear if not agreed in other ways separately.
The owner of the tree shear is responsible, as well, for the case that all the persons using the machine have enough information about the handling and use of the tree shear.

Instructions and technical file for machinery: Please contact the manufacturer

Mänttä 31.10.2022

Jani Sipilä, Technical expert