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User's and Maintenance Guide

PRO - 400

**Pre-Pruning Machine
for winter pruning in vineyards**



READ CAREFULLY BEFORE FIRST USE !

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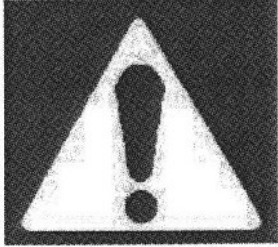
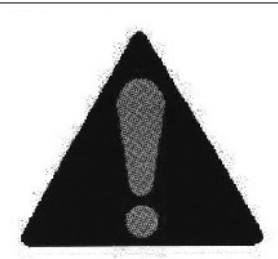
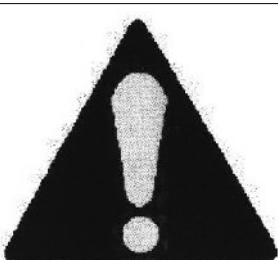
1. GUIDE OBJECT

1.1 The object of this manual

The guide contains complete practical information for a proper and safety function, operation and maintenance of the machine.

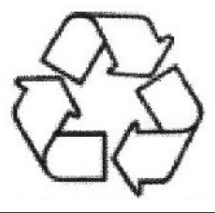


Read it carefully and do observe all the instructions and advice regarding your safety.

1.2 Warning and danger signs

	DANGER !
	Symbolizes imminent danger which, when not prevented, causes heavy injuries or even death.
	CAUTION !
	Symbolizes imminent danger which, when not prevented, may cause heavy injuries or even death.
	WARNING !
	Symbolizes imminent danger which, when not prevented, may cause slight or heavy injuries.

Respecting these warning signs is necessary for your safety. When you notice these signs do consider possible injury hazard, read carefully relevant instructions and also do inform other users.

1.3 Other signs

	Symbolizes measures taken in order to protect the environment.
	Common warning sign.
	Particularly important technical direction.

10-02-12

1.4 Machine parts movement description

Terms “right” and “left” mean a movement orientated clockwise and counter-clockwise regarding the machine movement orientation.

1.5 Storing the manual

Keep this manual always ready to hand in the place of work, stored in a place designated by supervisor. Give this manual over to further users and also when selling or hiring the machine out to a third party.

1.6 Keeping the manual up-to-date on the time of release

Technical development and scientific research improve the technology and may cause changes in the final product. Some changes may occur between the user's guide and machine itself. Owing to this the data in form of numbers, figures and description are not binding the manufacturer and it may be in no way a standpoint for laying any claims.

1.7 Important notice

In case of dubious function of the machine do not take any risks and do not try to carry out any unqualified intervention. Contact your distributor immediately. He is the only one to inform you since he has been trained in operating this machine.

2. TERMS OF WARRANTY

The constructor provides a one-year guarantee on parts and work spending on repairs in case of every manufacturing or material defect except for parts and components not produced by the Ostratický, s.r.o. company. In such cases the guarantee depends upon their producer's statement.

2.1 Object of warranty

This warranty applies to the pre-pruning machine and is extended to cover all the equipment, provided such has been delivered together with the pre-pruning machine.

2.2 Conditions

2.2.1 Specification

This warranty is provided to the initial owner and does not transfer to a third party when the machine is resold to a third party before the warranty expires. The warranty applies only when defect parts are returned to constructor and is limited to new parts delivery settlement for work spending, according to directions set by the constructor. Defect parts replacement under the warranty does not prolong the warranty. In no case the warranty binds the constructor to replace the machine under warranty.

2.2.2 Warranty period

The warranty comes into force on the date of delivery.

The warranty can be only applied in cases of revision or regular maintenance carried out in accord with the User's and Maintenance Guide, and in cases when intervention under warranty or requested changes and adjustment are carried out in the Ostratický, s.r.o. manufactory or by authorized agent.

2.2.3 Warranty exceptions

The warranty does not include the following:

- a) Damaged parts and components which are to be replaced as a part of regular maintenance – expendable parts.
- b) regarding the wear and tear period, damage caused by a standard wear of material, parts and components.
- c) indirect physical damage or financial loss
- d) damage caused by using parts or equipment not authorized by the constructor, or by not respecting the delivery terms
- e) damage caused by putting the device into operation before its repair is complete and finished.

2.2.4 Warranty cannot be applied:

- a) when no regular checks are carried out as instructed in the manual delivered with the pre-pruning machine
- b) when checks and interventions into the device are carried out anywhere but within the network of authorized OSTRATICKÝ company vendors or their agents.
- c) when original parts are replaced with unsuitable ones
- d) when the damage is caused directly or indirectly on installation or adjustment which does not comply with the standards or are carried out without approval of the constructor.
- e) when repeated errors occur due to excessive use of high-pressure cleaner.
- f) when damage appears to be caused by inappropriate maintenance, fault or inexperience of the driver, or by misusing the machine in operations it was not designed for.

2.2.5 Secondary costs – specification

The warranty does not cover:

- parts replacement and delivery related transport expenses
- eventual expenses on local intervention, transport costs of constructor's agents work station inspection
- finance spent on labour force necessarily used to dismount and remount any component and any part of pre-pruning machine equipment
- expendable supplies in time of warranty repair: oil, fuelling, etc.

3. MACHINE IDENTIFICATION

Identification plate is placed on the bottom of lifting arm and includes:

Conformity label CE Type

Year and month of construction, serial number

Machine type

Machine weight, homologation number for transport on public roads

Fill in fields (type, year, serial number) information from the plate (use the plate fixed to the machine). Tell your distributor these enquiries. He shall know exactly the type of machine and will be able to inform you as quickly as possible.

Do not remove the plate fixed to the machine

In case of damaging the plate, ask your distributor for replacement.

4. TERMS OF USE

4.1 Standard use of the machine

This device is utterly design for trimming in vineyard. This means either complete or partial removal of overhanging annual shoots.

Any other use of the machine is against the standards and inadmissible.

4.2 Operator's competence

Machine can be operated and repaired only by individuals with perfect knowledge of safety rules and machine construction and function.

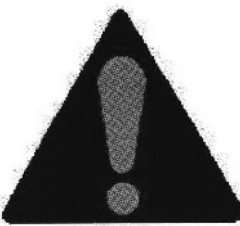
Please familiarize yourself with all the control functions and its proper use before starting the machine.

It will be too late when the machine is in operation.

The machine is not self-supporting, it is to be fixed to a tool carrier or a tractor for work. Special equipment to fix the machine in other carriers must be provided by the constructor. In other cases the installation must be carried out in accordance with instructions and approved by your distributor who ensures proper installation.

4.3 Working positions description

The machine is designed to be triggered by the carrying device or the tractor engine. It cannot work separately. Only the driver is authorized to start up the machine, there is no need of any third party intervention.

CAUTION !	
	From the moment driver has to leave his seat to set up the machine or for any other reason, the carrier or tractor engine must be turned off and the driver must keep the ignition key so that the engine cannot be started up by any other person.

4.4 Working environment specifications

4.3.1 Operation on oblique surface

Adjust the speed and driving technique to land, roads and lanes. Stay alert and careful. The machine keeps changing its tractor and carrier weight resolution and balance.

In any case and especially on an undulating and oblique surface and on crossfalls turn slowly and avoid quick gear change.

Do not put the brakes on or pick up speed quickly when driving up or down the slope.

4.3.2 Lightening, night work

When the lightening is insufficient, use the carrier or tractor lights. For a good visibility apply also the lights on the pre-pruning machine. If none of this is possible, use the device merely in the day-time.

Use a different electric circuit from that of pre-pruning machine.

4.4 Constructor's and user's liabilities

Do observe all the instructions regarding installation, operation, control, maintenance and repairs in this manual.

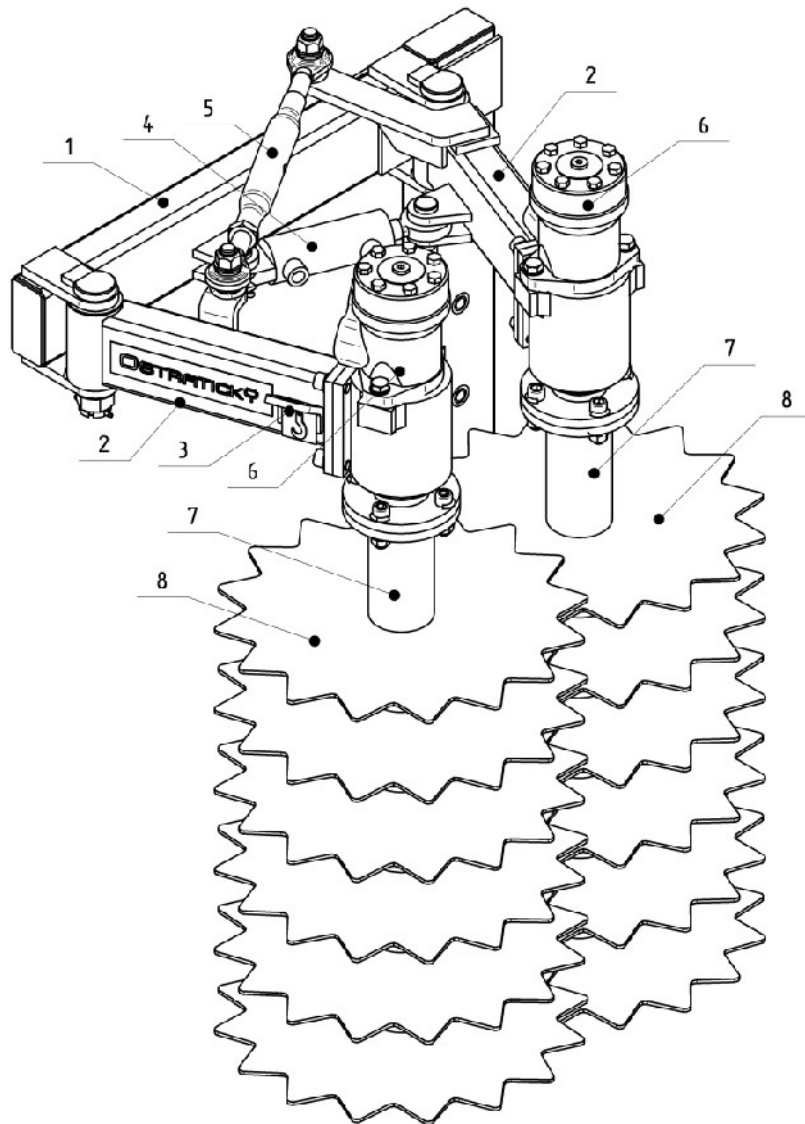
Use only spare parts recommended by the constructor.

Do not make or have made any adjustment on the machine or its equipment unless you ask your distributor for a permit.

Not respecting these precautions can make your device hazardous. In case of damage or injury the constructor is relieved from responsibility.

5. TECHNICAL SPECIFICATIONS

5.1 Definition and terms used herein



- | | |
|--------------------------------------|-------------------------------|
| 1. Frame | 5. Overlap adjustment drawbar |
| 2. Rotor arm | 6. Hydraulic engine |
| 3. Suspension point | 7. Rotor |
| 4. Hydraulic cylinder (Open / Close) | 8. Cutting disc |

5.2 Operating parameters, oil demand

Cutting discs rotation speed	:	100 - 120 rev/min
Maximum oil flow (long-term operation):		20 l/min
Maximum hydraulic circuit pressure:		180 bars
Maximum counterpressure:		30 bars
Maximum return circuit pressure (outflow pipes):		2,5 bars

5.3 Hydraulic distributor

Bilateral pre-pruning machines (consist of two working machines) can be provided with a hydraulic distributor allowing to operate only left or only right head, or both heads at the time.

5.4 Purity of oil

Oil purity must be in accordance with the quality class 9, which is 25 µm or better. The machine must be equipped with a filter capable of preventing external pressures from returning into the circulation as a result of insufficient cleaning of hydraulic system components.

5.5 Operating dimensions

Typ	Cutting range [cm]	Weight [kg]
PRO-4904	33	125
PRO-4905	43	135
PRO-4906	53	145
PRO-4907	63	155
PRO-4605	32	135
PRO-4606	39	145
PRO-4607	46	155
PRO-4608	54	165
PRO-4609	61	175

5.6 Characteristics of the carrier or tractor

Standard fuel consumption and a pressure necessary for the pre-pruning machine to work correctly must be secured by the carrier or tractor hydraulic supply. You can find the consumption in paragraph 5.2. When the hydraulic supply is insufficient, the pre-pruning machine must be connected to a secondary hydraulic supply provided by the OSTRATICKÝ company as an additional equipment.

The connection joints must be completely rid of impurities (soil, sand etc.). The hydraulic joints are universal and can be used in all OSTRATICKÝ equipment and carriers. Distributors are required to provide customers with and install connections applicable to carrier or tractor.

Electric connection is applicable to every engine with 12V/DC electric supply. When the carrier or tractor is not furnished with such a supply, it is up to the distributor to implement connection while holding the right polarity. The anode (+) complies with conductor 1, the negative pole complies with conductor 2. The supply must be attached to the plus clip to avoid the risk of short circuit on disconnecting the carrier or tractor.

The mechanical attachment of the pre-pruning machine to carrier or tractor must be carried out only with help of facility capable of lifting the machine. It is advisable to use universal OSTRATICKÝ suspension frames for this purpose.

5.7 The ambient noise propagation level

The machine noise slurs with noise of the carrier or tractor, which produce a louder noise. For safer use it is recommended to wear protection muffs especially when the carrier cabin is not sound-proof.

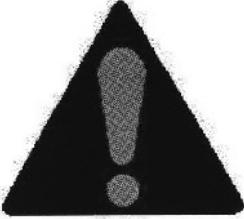
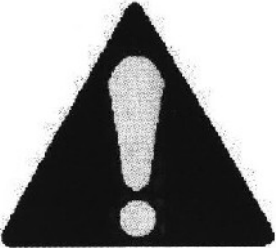
6. GENERAL SAFETY RULES

6.1 General specifications

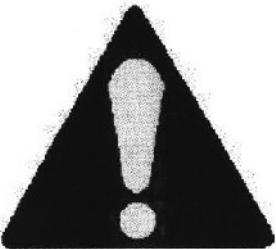
Following chapters contain additive information which also are to be respected for your safety.

CAUTION AND CIRCUMSPECTION are fundamental for your safety.

Safety measures and regulations preventing from accidents and relating to general safety, medicine practiced in work stations, environmental protection and road traffic must be respected in all circumstances!

<p>CAUTION !</p> 	<p>Make sure that no other person, no animal and no object is in the vicinity of pre-pruning machine before starting-up the engine and during the working process. Keep children at a safe distance from the machine. Never use the machine for personal transport. Before any intervention make sure the machine cannot be accidentally turned on. Before every use and after every adjustment and maintenance operation make sure that all the protection equipment is in its place and good state and it is ready to use. Loose clothes, long flowing hair or chainlets could be caught or pulled in by machine parts. Never move your hands, arms or legs close to moving parts. Always keep at a safe distance</p>
<p>WARNING !</p> 	<p>Every remote controller (cord, cable, rod, hose) must be fixed safely so that it cannot be turned on at random and cause accident or damage. Do not walk on the hood or any other part of the machine except for the parts designed for it (ladder, deck). Before use check if all the bolts, joints and nuts are tightened. If necessary, tighten them. Make sure that the ground is even and free from shards of wood, iron, plastics etc. which could damage the pre-pruning machine. If you hear a noise or feel unusual vibration, it is necessary to turn off the machine. Seek the cause of failure and remove it before further operation. If necessary, call your distributor.</p>

6.2 Individual protection equipment









<p>WARNING !</p> 	<p>Before touching sharp-edged parts i.e. when replacing knives, wear protective gloves.</p>
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6.3 Warnings / signs

Warnings and signs placed at the machine provide information about safety measures which have to be taken to prevent accidents.


See to it that all the warnings and signs are clean and visible. When any damage occurs ask your distributor for new warning signs adhesives. In case of repair see to it that all spare parts are provided with the same warnings and signs as the original parts.

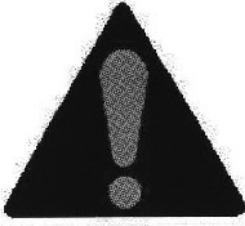

Warning signs on the pre-pruning machine

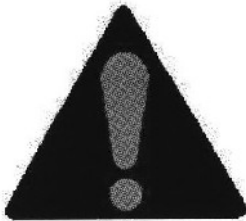
 	<p>Read over the user's manual before use.</p>
 	<p>Before carrying out any repair, adjustment or maintenance secure the machine from starting, pull the key from ignition box and follow the instructions in user's manual.</p>
 	<p>WARNING! Danger of hit by ejected object – keep at a safe distance.</p>
 	<p>WARNING! Danger of mortal or heavy injury by rotating parts – keep at a safe distance.</p>

6.4 Toxic products

The machine is put into operation by a hydraulic liquid which is under pressure and can have a temperature up to 80°C (176°F). If the hose is leaking, turn off the power supply immediately.

Do not try to fix the hose !	
	Contact your distributor as soon as possible.

CAUTION !	
	
<p>The hydraulic power of liquid leaking from the hose is great enough to penetrate skin and cause serious injuries. A pressure of 20 bars is dangerous. In case of such injury call your doctor instantly.</p>	

CAUTION !	
	<p>Avoid a contact of oils and dissolving agents with skin, eyes or mouth. Most of these products contain deleterious substances.</p>



It is recommended to keep a medical kit ready at hand!

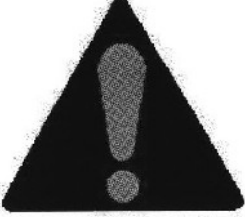
6.5 Obstruction of the machine

There are several reasons for obstruction occurrence between the rotors and the body or between rotors. Usually the trimming knife stops rotating.

In such case:

- a) stop the machine
- b) turn off the engine, pull out the key
- c) shift to neutral
- d) put the hand-brake on
- e) seek the cause of obstruction
- f) when found try to loosen it
- g) after loosening the obstruction the machine can operate at a minimum performance

	Trimming knives must rotate freely and without restraint.
	When cleaning the machine wear protective gloves.

CAUTION !	
	From the moment driver has to leave his seat to set up the machine or for any other reason, the carrier or tractor engine must be turned off and the driver must keep the ignition key so that the engine cannot be started up by any other person without notifying the driver.

6.6 Fire

The machine and its equipment must be kept clean to prevent fire. Accumulated remains of plants and grease can catch fire as a result of moving parts' friction.

6.6.1 Fighting the fire

It is recommended to keep a fire extinguisher close at hand (not the water one) so that you can prevent damage when the fire starts.

In case of fire on the machine try to get the carrier or tractor to a safe location, leave the machine immediately and prevent anybody from approaching it.

6.7 Attachment / traction

6.7.1 General information

The machine can be attached to the carrier only on designated locations.

Try to use a carrier compatible to the machine (minimum engine power, type of attachment, carrier capacity specifications etc.).

Do not step between the machine and the carrier without shifting to neutral, put the hand-brake on, turn off the secondary engine.

Do not step between the machine and the carrier when lifting the carrier.

Secure the attachment device after attaching the machine.

Check the security and state of attachment before setting off.

Make sure that after attachment neither overburdening nor faulty weight distribution occurs on the carrier, this could disturb its stability.

6.8 Accessory drive / cardan shaft

The hydraulic control box can distribute power supply to the pre-pruning machine. Hydraulic control boxes are driven by the cardan shaft. Follow the instruction in next chapter.

6.8.1 Safety operation of the accessory drive and driveshaft

Make sure that the speed and rotation of carrier accessory drive are compatible with implied use of the machine.

Make sure that the accessory drive casing is in a good state. If not, replace it immediately.

Do not use the accessory drive when the engine is switched-off.

Turn off the accessory drive when there is a risk of exceeding the cranking angle of cardan shaft, especially on turning, ascent and descent.

Every physical contact of the cardan shaft with the carrier or machine can result in damage.

6.8.2 Safety operation of the cardan shaft

Use only a distributor recommended cardan shaft.

Make sure that the cardan shaft gear cylinders overlap correctly both in operational and transport mode.

Respect the safety standards of the cardan shaft manufacturer.

Before attaching and detaching the cardan shaft, turn off the accessory drive and the engine and pull out the key.

Before every use make sure that the cardan shaft is in a good state and tightened correctly.

Make sure that the cardan shaft casing is in its place and a good state. If damaged, replace it immediately.

After detaching the tractor's accessory drive cardan shaft the cardan shaft must be fixed by a protective cap.

6.9. Basic maintenance and repairs

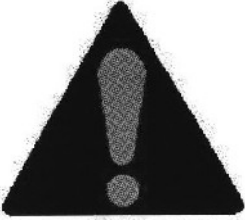
6.9.1 General information

Maintenance and repairs must be carried out by a qualified person only.

Make sure that the machine and its equipment is sustained in a perfect state.

6.9.1.1 Machine shut-down

Prior to every intervention:

CAUTION !	
	From the moment driver has to leave his seat to set up the machine or for any other reason, the carrier or tractor engine must be turned off and the driver must keep the ignition key so that the engine cannot be started up by any other person without notifying the driver.

6.9.1.2 Stopping the moving parts on machine's operation

Before every intervention:

- 1.turn off the accessory drive
- 2.disconnect the ignition box
- 3.wait until all the moving parts stop moving
- 4.disconnect hydraulic hoses

6.9.1.3 Stability of the machine and its parts

Before every intervention:

- 1.lower the machine to adequate working level.
- 2.place the attaching device

6.9.1.4 Cooling the hot parts

Wait until the machine oil cools down

6.9.2. Welding

When welding on the machine disconnect the battery of carrier or tractor, if the machine is attached. Cover the flexible conduit, hoses, electric cables and all plastic parts from damaging by molten sparks, which could result in hydraulic liquid loss or short circuit.

6.9.3 Interventions in the electric circuit

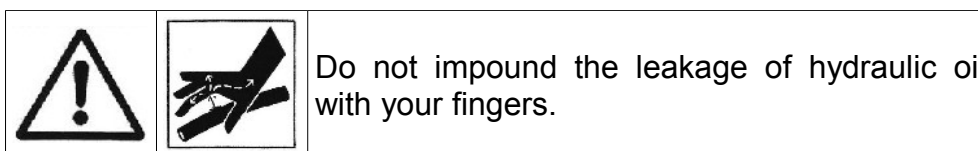
Before any work on the electric equipment, disconnect the battery. It is recommended not to work with the electric circuit without at least minimal experience and without the electric scheme.

6.9.4 Interventions in the hydraulic circuit

Before any work on the hydraulic circuit make sure it is not under pressure. Remove the pressure before detaching the hydraulic circuit. It is recommended not to work with the hydraulic circuit without at least minimal experience and without the hydraulic scheme.

6.9.5 Repairs

Remove or have removed every trouble which could threaten safety.
Fix every untightness or damage of the hydraulic circuit.



Faulty or damaged fuse fenders must be replaced immediately. No original fender can be replaced or removed.

Hoses or conduit already applied elsewhere cannot be used.

Non-flexible conduit cannot be welded. Damaged flexible or non-flexible conduit must be replaced immediately.

Repairs of parts which are under pressure or live (springs, accumulators etc.) require specific procedures and tools. It must be carried out by qualified personnel only.

7. ENVIRONMENT PROTECTION

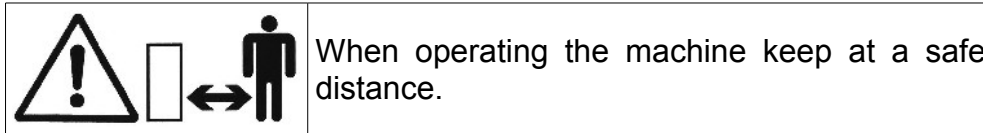
7.1 Storage, prevention from losses and harms on the environment

	When removing used oil and other greasing respect the law concerning environmental protection. Do not spill used greasing and hydraulic oils on the ground and do not bin it.
	Recommendation: Have your distributor or authorized person do the maintenance necessary for prevention from such losses. With water and soap wash very carefully those spots on your skin which had come to touch with oils and greasing used in work. Keep oils and greasing away from children. Respect warnings on these products' packaging

8. MANIPULATION

During the transport, delivery, installation and storage a trolley or other means for manipulation must be used.

The machine may be equipped with rack of four wheels on demand. Four turning wheels serve for setting a position only, in no way may this rack be used for a long-distance transportation.



9. INSTALLATION

Distributor or accredited agent is responsible for mounting, adjustment, installation and start-up of the machine attached to a carrier or tractor.

9.1 Machine receipt

9.1.1 Setting up the machine assembly

On the machine delivery you obtain:

a) Pre-pruning machine as an accessory to another machine

- Pre-pruning machine frame
- Rotors
- Hydraulic control block
- Remote control, including cables
- User's and maintenance guide

b) Pre-pruning machine as an independent equipment including the lifting arm

- Pre-pruning machine to assemble as in the point a)
- Suspension cylinder
- Suspension arm with swing head
- Set of interconnecting hydraulic hoses

9.1.2 Custom equipment

- Tractor or cylinder suspension frame
- Hydraulic or electro-hydraulic distributor for functions control
- Set of parts for low-pressure out-flow installation
- Wheeled rack

9.1.3 Delivery

The machine can be wrapped in plastic during the transport. When unwrapping be careful and do not cut any electric cable or hydraulic hose.

Use a pallet or fork-lifter for transport.

Never use wheels for transport of the machine. Wheels fixed to the rack serve only for steering the machine when attaching to a carrier or tractor and for moving the machine to the designated storage place in your work room.

On receiving the machine make sure that it is complete (parts, equipment and all the ordered items) and that it is not damaged. If the machine shows up damaged, make a list of the damaged parts and take pictures of them, and have these pictures signed by an independent person.

9.2 Operation personnel qualification

The machine may only be installed by a person who knows perfectly its specifications and means of its installation and setting-up. No special tools are required for the installation. The tools used in common workshop are sufficient.

9.3. Surrounding environment conditions

The mounting and installation must be carried out on an even and solid ground. There must be space around the machine and carrier enough for the staff to move freely. Do not leave obstructive things on a floor.

9.4 How to mount the pre-pruning machine

The following mounting process is a usual one, if any difference occurs, contact your distributor or an accredited agent.

9.4.1 Mechanical installation

9.4.1.1 Fixing the suspension frame

The OSTRATICKÝ pre-pruning machines use a universal junction with angular thick-walled tubes 70x70x5 for attaching to the machine or tools carrier. To install the suspension frame follow the construction scheme delivered together with the suspension frame.

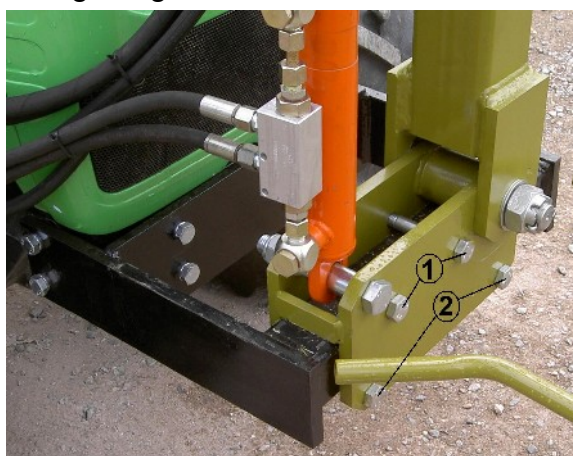
If your machine is not provided with the suspension frame, it is necessary to make one. Contact your distributor or an accredited agent.



9.4.1.2 Installation of the lifting post

Fix the lifting post to a solid and competently welded suspension frame.


1. Lift the post into vertical position so that the mounting flange is downwards.
2. Lean the upper fixing bolts (1) against the suspension frame tube.
3. Insert bottom fixing bolts (2) into mounting flange (STS model) and put on the safety strap (model US).
4. Fix spring washers and nuts to all the bolts and tighten them properly.



9.4.1.3 Installation of prepruning equipment

1. Fix the side shift arm sleeve to the lifting arm
2. Insert the side shift arm into the side shift arm sleeve.
3. Put together the pre-pruning equipmen as showed in the picture, chapter 5.1.
4. Fix the pre-pruning equipmen to the swing head sleeve of the lifting arm.
5. Check properly and tighten all bolts.

9.4.2 Installation of hydraulics

	<p>Before connecting the hydraulic quick-coupling device, make sure it is rid of all impurities (soil, sand). Then make sure that hydraulic quick-coupling device of the carrier is clean and is not under remanent pressure.</p>
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Hydraulic hoses of the OSTRATICKÝ pre-pruning machines are in its endings equipped with quick-couplers and marked by color caps as shows the following figure:

Main function of the pre-pruning machine	=	RED
Lifting	=	BLUE
Tilting	=	GREEN
Extension	=	YELLOW
Pressureless outflow (hydraulic engines waste)	=	BLACK

Hydraulic hoses of the pre-pruning machine must be connected to the tractor hydraulic system this way:

Main function – cutting discs drive

- Single-acting hydraulic circuit with latched work position and flow regulation

Lifting

- Double-acting hydraulic circuit without latched end positions

Tilting

- Double-acting hydraulic circuit without latched end positions

Extension


- Double-acting hydraulic circuit without latched end positions

Pressureless outflow (hydraulic engines waste)- Special tractor hydraulic system outlet, maximum backpressure is 2,5 bars.

9.4.4 Electric installation

1. The remote control cable for opening and closing of the pre-pruning machine rotor heads must be drawn out to the working location of tractor operating person. Make sure no damage occurs, mainly on tractors with cab.
2. Connect the remote control cable with the control box cable connector.
3. Feed the remote control box with 12 V DC source.

9.5 Wheel tractors extra load

	<p>When you intend to use the tractor in a very narrow row (<120 cm) it is instructed to apply extra load to the tractor.</p>
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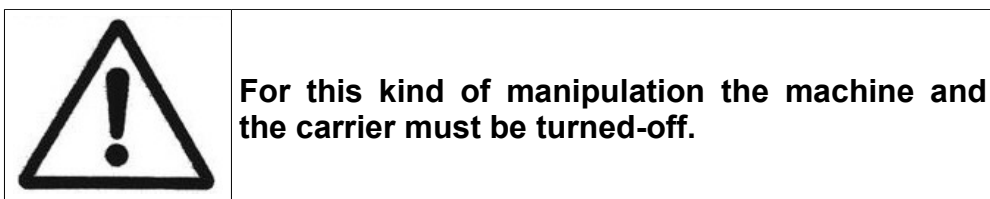
Several ways of applying extra load:

1. Left rear wheel weight.
2. Weight / load suspended on a rear 3-point linkage.
3. Tank on the hydraulic control box burdened with weight.
4. Combination of the three methods above.

This additional weight must be sufficient to secure the stability both of the tractor and machine. When burdening the carrier or tractor chassis, respect the tractor manufacturer's instructions.

10. STARTING-UP AND WORKING WITH THE MACHINE

10.1 Mechanical functions and description of adjustment.



10.1.1 Pruning head height adjustment

The most efficient position you can reach by sliding the lifting cylinder of suspension arm by 20 cm and the machine is in an actual working position. This adjustment enables sufficient elevation (by 40 cm) in case the tractor slumps into track, or if stakes are sticking out too much a sufficient lowering, when the field conditions are changing. The initial point can be adjusted by shifting the suspension sleeve, by changing the initial suspension height on the tractor, or by combining both methods.

10.1.2 Pre-pruning machine tilt adjustment

Correct operation of the PRO-400 pre-pruning machine is only reached when the machine is in vertical position.

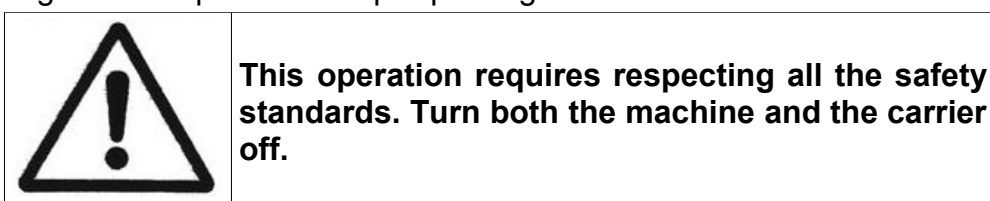
1. Use the spacing nut on the swing head bottom to set the position. If your machine has a mechanical tilting tighten the spacing nut down, or
2. use the hydraulic cylinder to set the position, if your machine is fitted with hydraulic tilting.

10.2 Hydraulic function

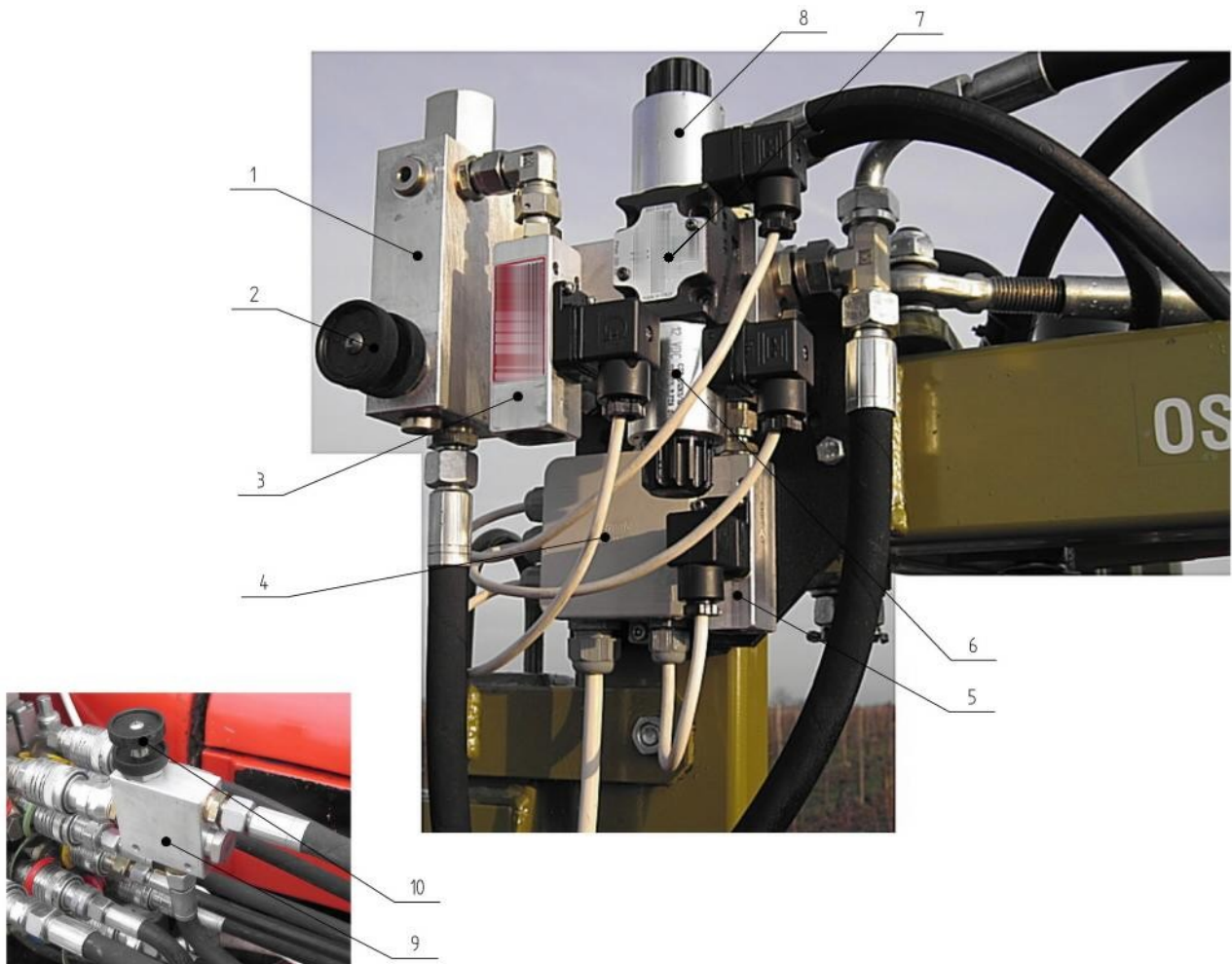
The construction of pre-pruning machine is designed for rated speed 100 - 120 rev/min. in dependence on tractor's travelling speed. This complies with 10 litres per minute oil supply. The input for correct function must be at least twice as many, otherwise the rotors stop working whenever the machine changes its position.

To reach sufficient oil flow and correct function the pre-pruning machine is equipped with a special flow splitter with pressure regulation (see the machine control hydraulics set-up).

10.2.1 Setting rotation speed on the pre-pruning machine



To set the rotation speed of the rotors correctly you will need a device for contact or non-contact rotation speed sensing – the tachometer.



- | | |
|------------------------------------------|----------------------------------------|
| 1. Rotation speed controller DP2 | 6. Cylinder closing-up EM coil |
| 2. Rotation speed controller | 7. Cylinder opening/closing EM valve |
| 3. Rotors protection cut-off valve | 8. Cylinder closing-up EM coil |
| 4. Connecting block of the wiring system | 9. Closing/opening speed regulator DP1 |
| 5. Cylinder closing-up cut-off valve | 10. Closing/opening speed regulator |

Using the non-contact device:

1. Stick a shred of reflective strip to the bottom of the rotor blade.
2. Turn on the pre-pruning machine.
3. Set the tachometer to rev/min mode.
4. Set the digital tachometer to an optical insert reading mode, 15 or 20 centimetres from the reflective strip. The device displays speed in rev/min.
5. Use the power regulator DP2 to adjust the hydraulic output.

Using the contact device

1. Turn on the pre-pruning machine.
2. Set the measuring device to rev/min mode.
3. Place the tachometer close to the rotor shaft. The speed is displayed in rev/min.
4. Use the power regulator DP2 to adjust the hydraulic output.

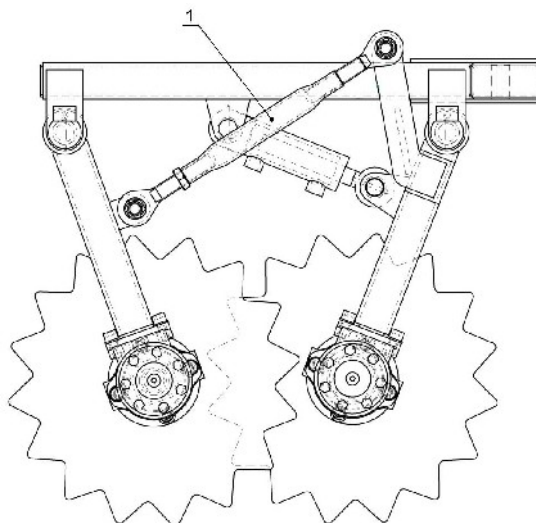


10.2.2 Setting up the opening/closing speed

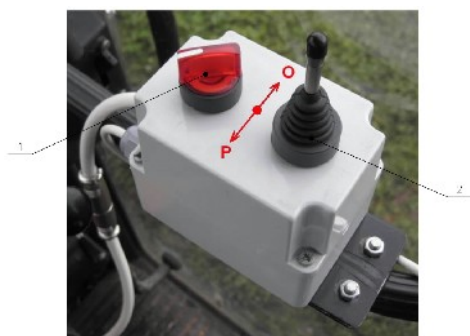
Using the DP1 power regulator set the opening/closing speed of rotors head so that the rotors move at the highest speed but the rotation is fluent without surges at the movement trajectory.

10.2.3 Setting up the cutting disks overlap

Use the adjusting stud (1) to set an optimum overlap of the cutting discs. The default setting is ca 30 mm between cog hollows.



10.2.4 Electric function



1. Pre-pruning machine wiring system master switch
2. Rotors head opening/closing switch

10.3 Turning the machine on and off

1. When using carriers with hydraulic pump or pumping generators operated by output shaft, set the carrier engine speed to minimum.
2. Activate the power input or start the pump (provided the power control is on the carrier pump).
3. Add oil to the pre-pruning machine using the distributor between the oil supply and pre-pruning machine engine.
4. Start up the electric control system for opening and closing the rotors head.
5. When rotating the cutting rotors increase the engine speed up to 2500 rev/min.
6. When turning around at the end of the row, do not turn off the hydraulic system, only set the carrier engine speed lower. After turning the tractor around, set the engine to working mode again.

Turning off and on in the full power mode damages the hydraulic engine and gear mechanism.



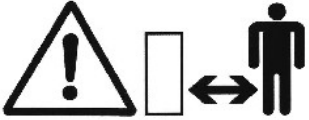
When using carriers with variable delivery pump familiarize yourself with available performance of the pump and make sure it is compatible with the hydraulic motor. Make sure that the pre-pruning machine is not turned off with the pump fed with the highest input.

10.4 Setting off in the vineyard

10.4.1 Preliminary revisions


- Oil level check
- Check for presence of all safety devices, good state of working implements, hydraulic system tightness (prevention from oil leakage).

10.4.2 Initiating the pre-pruning machine

	Check properly hydraulic connections and pressures. A pressure above 2,5 bars in the outflow circuit may result in hydraulic motors damage.
	Respect all the instructions for initiating the carrier or tractor.
	Keep at a safe distance.

10.4.3 Steering the machine, moving in the row

1. Position the pre-pruning machine in a parallel with the grapevine, make sure that the rotors are in vertical position.
2. Set the working position with the hydraulic cylinder for lifting,
3. Increase the speed of tractor until you get the correct rotation speed.
4. Set the rotors head opening/closing switch to position O - open.
5. Proceed with the machine in the row passing the first stake of the support construction. Set the rotors head opening/closing switch to position P - pulse
6. Move on with the machine at such speed that you are able to switch the rotors head opening/closing switch to position P at each supporting stake so that you run the machine around the stake safely.
7. Adjust the position, using various hydraulic equipment on the suspension arm or carrier.
8. In the end of the row pass the last stake, turn the machine into such position that the tractor makes its way outside the row.
9. When driving, it is possible to adjust the machine's position using the hydraulic system.

	If you hear a suspect noise, stop the machine immediately.
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10.5 Turning the machine off

10.5.1 Pre-pruning machine standard switch off

Pre-pruning machine mounted to a wheeled tractor, gantry tractor or harvesting machine is switched off by a carrier hydraulic circuit turn-off device. This device is either electric or mechanic accordingly to the type of carrier.


Pre-pruning machine mounted to a suspension arm with OSTRATICKÝ electric hydraulic console is equipped with electric device and machine control switch. It means that when stopping the pre-pruning machine the hydraulic circuit is off. To stop the machine, use the appropriate tractor equipment.

10.5.2 Equipment for immediate switch off in the work place

Pre-pruning machines furnished with our electric divider can be switched off immediately. The harvesting machine (carrier) is equipped with its own switch for immediate turning off. To obtain as comprehensive information on immediate turning off as possible consult the user's manual of the carrier.

10.5.3 Restart of the machine after immediate turn off

Follow the above instructions on starting up the machine.

Caution!	<p>To do general inspection of equipment, to check fastness of all bolts, faultlessness of all hydraulic and electric parts:</p> <ul style="list-style-type: none"> - latest after first 2 working hours and then - latest after 4 working hours - latest after 10 working hours <p>Then EVERYTIME BEFORE USE OF EQUIPMENT.</p>
	

11. MAINTENANCE AND REPAIRS

11.1 Staff competence

All the maintenance or repair operations apart from those which require distributor's intervention, must be performed by a trained person.


11.2 Types of maintenance operation – regular checks and service

Service type	Frequency
<p>Electric:</p> <ul style="list-style-type: none"> - power supply electric cables and equipment (strain, obstructions, frictional wear) - remote control box (starting-up, adjustment, turning off) 	<p>on every use</p> <p>on every use</p>
<p>Hydraulic:</p> <ul style="list-style-type: none"> - hydraulic hoses condition (strain, obstructions, frictional wear) - hydraulic parts untightness (tightening) - hydraulic cylinder leaks (packing) - trimming knives hydraulic motor - pressure filter choking indicator, when indicating in the red zone and the oil temperature is 50°C (122°F), clean up the filter 	<p>on every use</p> <p>on every use</p> <p>on every use</p> <p>on every use</p>
<p>Recommended hydraulic liquid:</p> <ul style="list-style-type: none"> - hydraulic oil type HM 46 	
<p>Mechanic:</p> <ul style="list-style-type: none"> - pruning discs tightening – grasp the disc in your hand, no pulling and rotating play should occur, otherwise tighten nuts - rotors bearings – grasp the rotor in your hand. If the shaft is moving or cannot be rotated, that means the knife or bearings are damaged 	<p>on every use</p> <p>on every use</p> <p>on every use</p>
<p>- USE PROTECTIVE GLOVES WHEN WORKING</p> <ul style="list-style-type: none"> - all bolts tightness check - gas pressure spring (STS) and safety links - suspension attachment bolts - frame bolts 	<p>on every use</p> <p>on every use</p> <p>on every use</p> <p>on every use</p>

<p>Greasing: - lubricate all the spots marked ● using the grease press - use all-purpose lubricants</p>	<p>in case of stiffening</p>
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11.3 Repairs

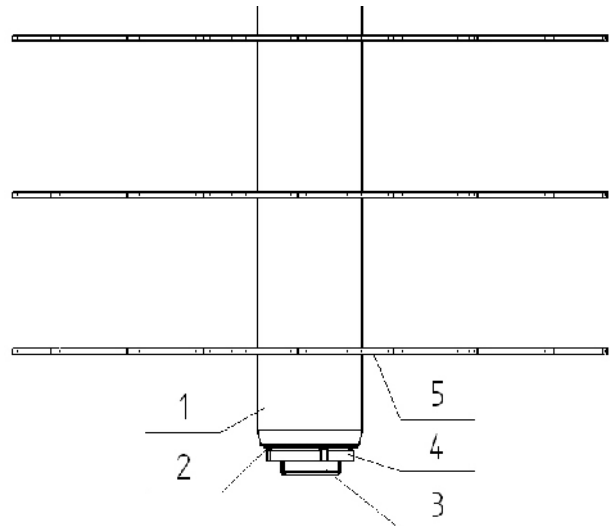
	<p>Use original parts only.</p>
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	<p>The machine and carrier must be turned off for these operations.</p>
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11.3.1 Parts subject to hard wear
 - cutting disc of the rotor

11.3.2 Cutting disc replacement

1. Loosen the safety washer (2)
2. Loosen the nut (4).
3. Secure the bottom distance ring (1) so that the cutting discs cannot slide freely down the shaft.
4. Unscrew the nut (4).
5. Remove distance rings and cutting discs step by step.
6. When reassembling proceed backwards following steps: 5 – 4 – 3 – 2 – 1.



11.3 Removal of faults

11.4.1 Mechanical faults

Fault	Cause	Remedy
- unusual noise of rotating	- rotating discs are spinning - foreign object in the machine	- rotor follower pin replacement - removing the object
- vibrations	- rotation speed is too high - disc imbalance as a cause of damage or break	- lower the rotation speed - check the cutting discs
- cutting discs are not rotating	- follower pin is broken - motor is seized	- check whether the pin needs to be replaced - replace the motor

11.4.2 Electro-hydraulic faults

Fault	Cause	Remedy
- the machine does not work	- hydraulic or electric supply does not work	<ul style="list-style-type: none"> - start up the tractor - check the carrier (pump, limiter) - check the hydraulic hoses linkage - check the electric supply function - check the gearbox - check the electric cables linkage - make sure that the electromagnetic slide valves are alive - check the electrical control system of the hydraulic circuit

11.5 Restarting the machine after intervention

After any intervention into electric, mechanic and hydraulic system of the machine, respect the instructions for starting-up the machine.

12. CLEANING

12.1 Before you start

First, place the machine in a cleaning area.

12.2 Protection equipment

Use clothes suitable for cleaning the machine, which is rubber boots, goggles and a raincoat.

12.3 Cleaning instructions

Do not direct the water jet on shaft bearings and moving parts.

Firstly use a wide tube to get sufficient amount of water.

Rinse the machine, do not rinse boxes and electric cabling, hydraulic system and dividers. If the machine is heavily soiled use an appropriate washing and cleaning agents.

If using jet wash keep the end of the tube 30 to 40 cm from the machine and do not direct the stream on electronic parts, motor and electric supply, tubing and hydraulic hoses, couplings, bearings, symbols and signs.

12.4 Cleaning agent types

Do not use aggressive agents (containing chlorine)

Use sponges, swabs and smooth brushes.

12.5 Checking good condition after washing

After washing leave the machine running for several minutes so that the remanent can be released.

Let the machine completely dry out.

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Check the condition of electric and hydraulic hoses (leaks, cuts, frictional wear).
If necessary, replace the hoses.
Carry out greasing as instructed.
Check tightness of all hydraulic connections and all bolts.

13. TRANSPORT / MOVING

13.1 The correct position for transport

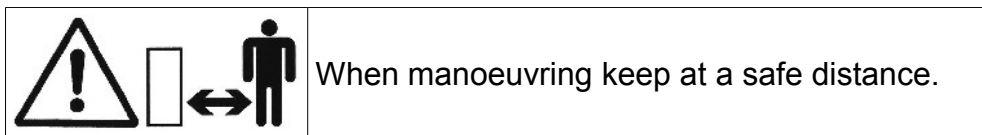
The pre-pruning machine is for transport purposes attached to a rack or a powerful suspension device of the tractor or carrier.

Safety position of the pre-pruning machine is requisite for its transport. These are the steps taken for safety transport:

- Hydraulic lifter must be in the lower position (the lever pulled in)
- The machine will be as lowered as possible, the clearance is sufficient however to avoid any obstruction.

Important is that in such position impacts on the uneven ground transferred onto the machine are minimal.

Never set off with the rack mounted to the pre-pruning machine.



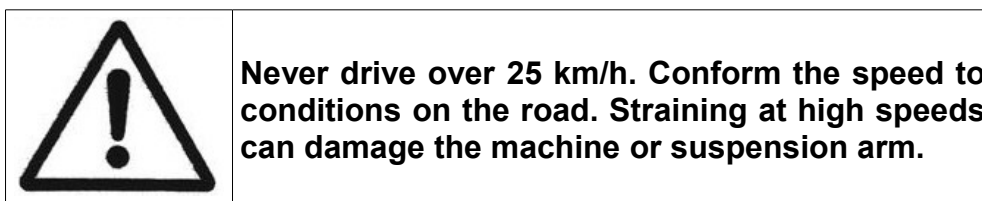
13.2 Transport on public roads

The machine must not block the view of traffic lights and signs in accordance with relevant directions.

If the tractor or carrier signalization is hidden, use a substitute signaling and lighting. This equipment may be removable. In such case ask for information about installation (schemes, electric supply of the tractor).

Before setting of on public roads:

- Put the machine into transport position as instructed in the manual
- Respect rated maximum dimensions (length, width) when maximum dimensions are exceeded follow the transport directions for the material transported.



13.3 Putting to work position after transport

A machine without any special equipment for transport is ready to use instantly.
It is necessary to demount the substitute signaling and lighting.

14. DETACHMENT AND STORAGE

14.1 Regular maintenance

For storing the machine it is recommended:

- Take out batteries of electric equipment
- Clean the machine completely
- Check the condition of electric cables (leaks, cuts, frictional wear). Replace it when necessary.
- Check the condition of hydraulic hoses (leaks, cuts, frictional wear). Replace it when necessary.

14.2 Storing the machine

- Store the machine in aired room, protected from bad weather and away from children
- Do not cover the machine with protective sheet, it could cause condensation

14.3 Starting up the machine after storing.

Proceed as in the case of first starting up.

15. DISMANTLING AND SETTING ASIDE THE MACHINE

You are supposed to dismantle the machine and sort the parts. These parts are processed by companies or centres specialized in processing industrial waste. This waste can be turned into new products.

Hydraulic parts group:

- hydraulic components (sleeves, hydraulic block, washer, limiter, reducer, etc.)
- hydraulic hoses

Hydraulic liquids and lubricants group

- hydraulic oil
- greasing

Ferrous parts group:

- every ferrous part of the machine

Non-ferrous parts group:

- every aluminium, bronze and brass part
- every plastic part

Electric parts group:

- every electric and electronic part

PROTECT YOUR ENVIRONMENT !

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16. NOTES

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