



RepossiTM
macchine agricole

USER AND MAINTENANCE MANUAL

"Translation of original Instructions"

WHEEL RAKE

Model: RA RAKE 12+12 VS – 14+14 VS



Please read this manual carefully before using the machine



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Dear farmer, we are delighted you have chosen this Wheel Rake and thank you for purchasing a Repossi Macchine Agricole machine. In our capacity as farming technology partner, we are able to offer you high quality and performance, along with a reliable service. Please read this instruction manual and bear in mind the information it contains. By doing so, you will avoid accidents, you will be covered by the manufacturer's warranty, and the machine will always be in working order and ready for use.

CE Marking



The CE marking, which the manufacturer is obliged to place on the machine, attests its compliance with the European Union machinery directive and other specific directives.

Declaration of Conformity

By signing the Declaration of Conformity, the manufacturer declares that the machinery it markets complies with all the essential safety and health requirements prescribed by the EU regulations in force.

DECLARATION OF CONFORMITY



Repossi macchine agricole S.r.l.

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REA 236205

C.F. e P.IVA 01981040189

EC Declaration of Conformity

Conforming to EEC Direction 2006/42/EC

The undersigned Company REPOSSI macchine agricole s.r.l.

DECLARES

under its responsibility that the machine

Mod. _____ s/n _____ built in _____,

which technical file is stored at its headquarters,

Is compliant with the essential Safety and Health care requirements as described in 2006/4/EC, harmonized standards UNI EN ISO 4254 - 1 - 2015 and technical specifications ISO 11684 - 1995

Angelo Reposi



Casorate Primo on _____





ESSENTIAL CONTENTS OF THIS MANUAL

INTRODUCTION

This manual describes how the star rake operates and provides instructions on how to use it, and how to carry out routine and special maintenance on it.

For ease of reference, this manual is organized into easily identifiable chapters.

The information contained in this manual is intended for a professional user, who must have specific knowledge on how to use the machine, and must be authorized, instructed and properly trained.

The use of original spare parts and accessories is recommended. In addition to invalidating the warranty, non-original parts may be dangerous and reduce the life and performance of the machine.

If the machine is passed on or sold, this manual must always be handed over with the machine. If the manual is damaged or lost, a copy must be requested from the machine manufacturer, one of their dealers or the previous owner. The manual should be considered an integral part of the machine and must be kept with it until the machine is completely decommissioned.

-1- ABOUT THIS MANUAL

This manual shall be considered an integral part of the machine and must be kept with it if it is resold, until it is complete decommissioned.

If the manual is lost or damaged, request a copy from the manufacturer or a local dealer.

The machine is fitted with pictograms, which the operator is responsible for keeping perfectly visible and replacing when they are no longer legible.



This symbol is found besides topics to which you must pay utmost attention.

The EC Declaration of Conformity is included in this manual.

You may find that some of the devices described in this manual are not found on your machine, depending on the equipment you chose and the market for which the machine is intended.

You may also find that some of the parts were removed from the machine for the photographs taken for this manual to make the illustrations clearer.

This manual consists of 64 pages.

1.1 Manual updates

The information, descriptions and illustrations contained in this manual reflect the state of the art at the time the machine was placed on the market.

The manufacturer reserves the right to make changes to the machines at any time for technical or commercial reasons. These changes do not oblige the manufacturer to alter the machines sold up to that moment, nor to consider this manual as not fit for purpose.

Any additional sections the manufacturer deems fit to provide at a later date shall be kept together with this manual and considered an integral part thereof.

1.2 Copyright

The machine manufacturer holds the copyright on this manual. The manual contains texts, drawings and illustrations of a technical nature which shall not be disclosed or passed on to third parties, in whole or in part, without the written consent of the machine manufacturer.

1.3 CE Marking and identification of the machine

The identification plate (see Figure 1), shown below, is found on the right-hand side of the main frame (see Figure 2).



Figure 1

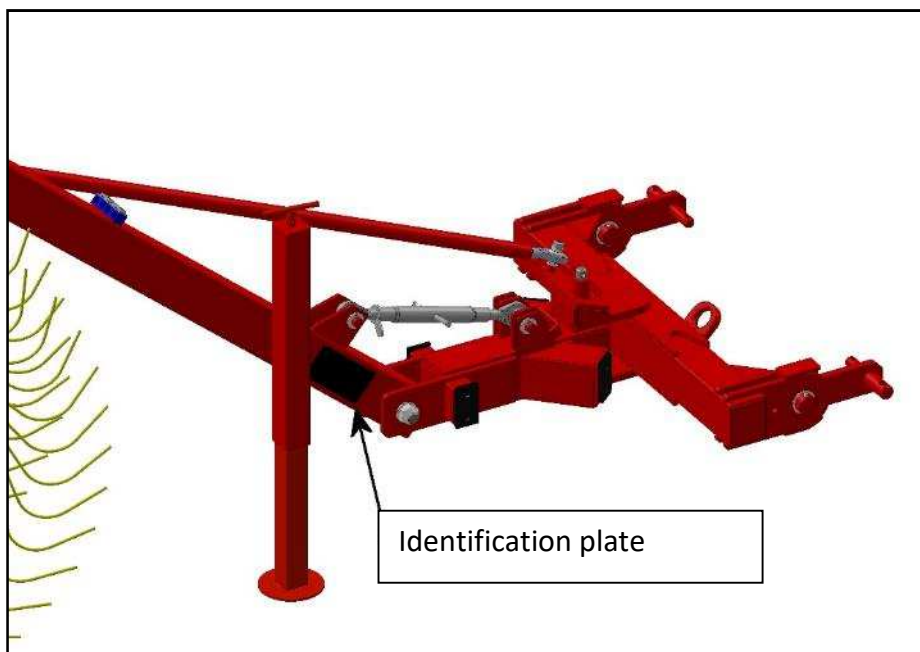


Figure 2

1.4 Information about the machine

1.4.1 Intended uses

The RA-RAKE wheel rake has been designed exclusively for use in agriculture, for haymaking, swath formation and forage turning.

The machine is towed by a tractor by means of a two point hitch attached to the lift bars.

The working parts are driven by friction on the rear idler wheels which, as the tractor moves forward, rotate and allow the forage to be collected by the front idler wheels which start to rotate.

This machine is not suitable for use in industries other than in agriculture.

The machine must be operated by a single person who must drive the tractor.

The machine operator must be familiar with all the instructions in this manual.

The machine has been designed and built to operate outdoors, so its performance is not affected by the weather.



Any use of the machine in any ways other than those indicated above shall be considered unauthorized and dangerous.

1.4.2 Description

The wheel rake works like a rake with continuous central delivery. Its main function in haymaking is to form and turn swaths.

The machine has 6+6 (mod. 12+12 VS) or 7+7 (mod. 14+14 VS) double star wheels fitted with rake tines, mounted on two load-bearing frames, which are in turn supported by a central frame.

The wheel rake (also referred to as the machine) consists essentially of (see Figure 3):

- 1 - A system for connecting to a tractor by means of a two-point hitch which is connected to the machine steering system.
- 2 - A set of double star wheels with horizontal axle.
- 3 - A main frame.
- 4 - Two raking unit frames.
- 5 - Hydraulic cylinders.
- 6 - A support device for when the machine is parked.
- 7 - Rear wheels for steering.

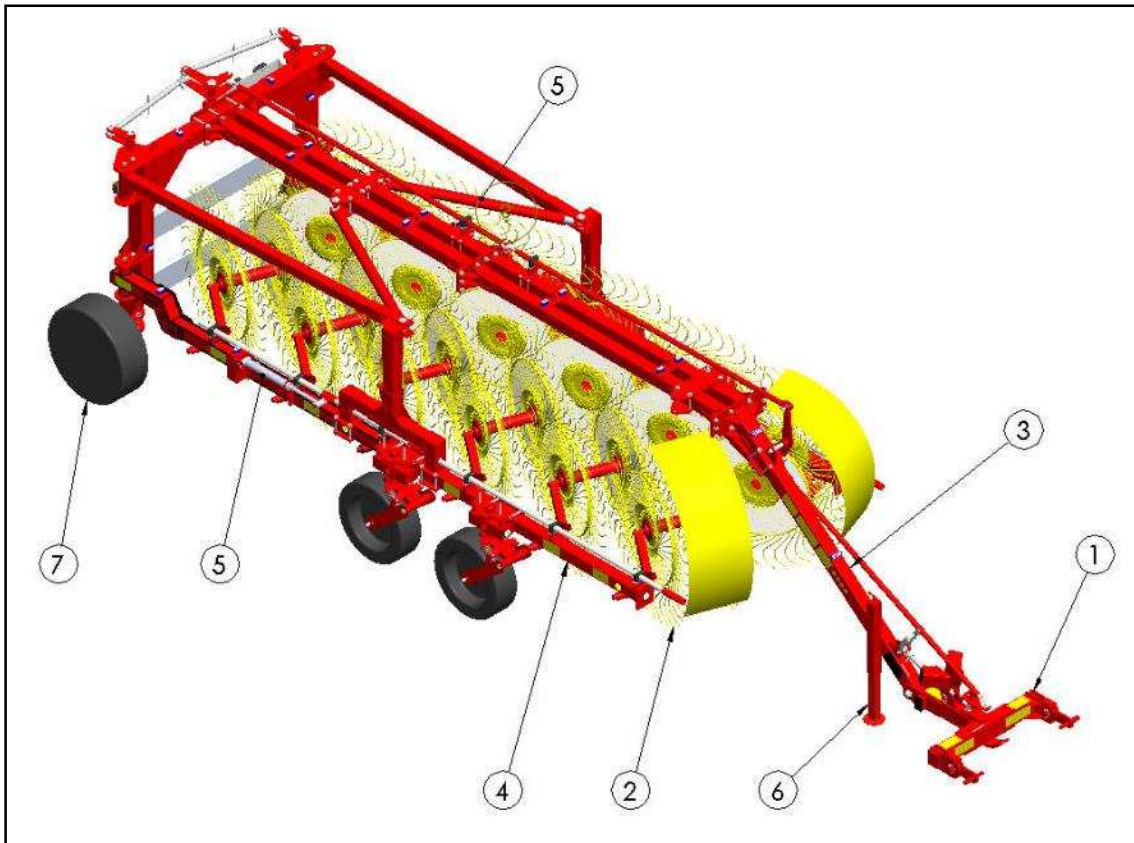
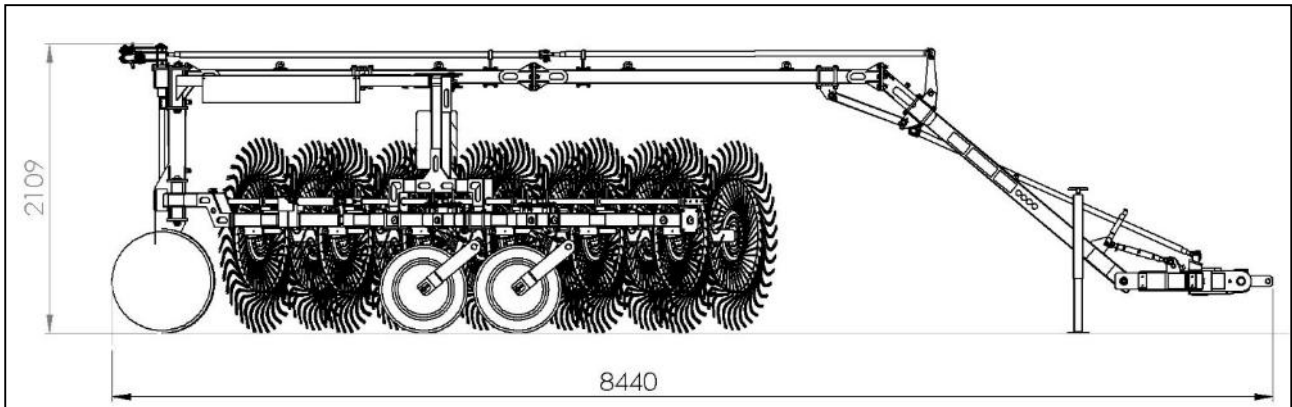


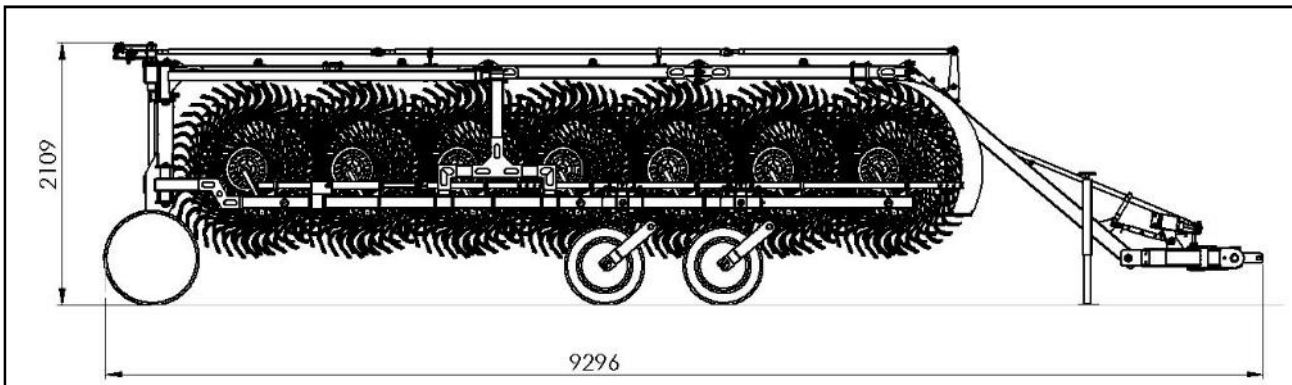
Figure 3

1.4.3 TECHNICAL DATA (not binding)

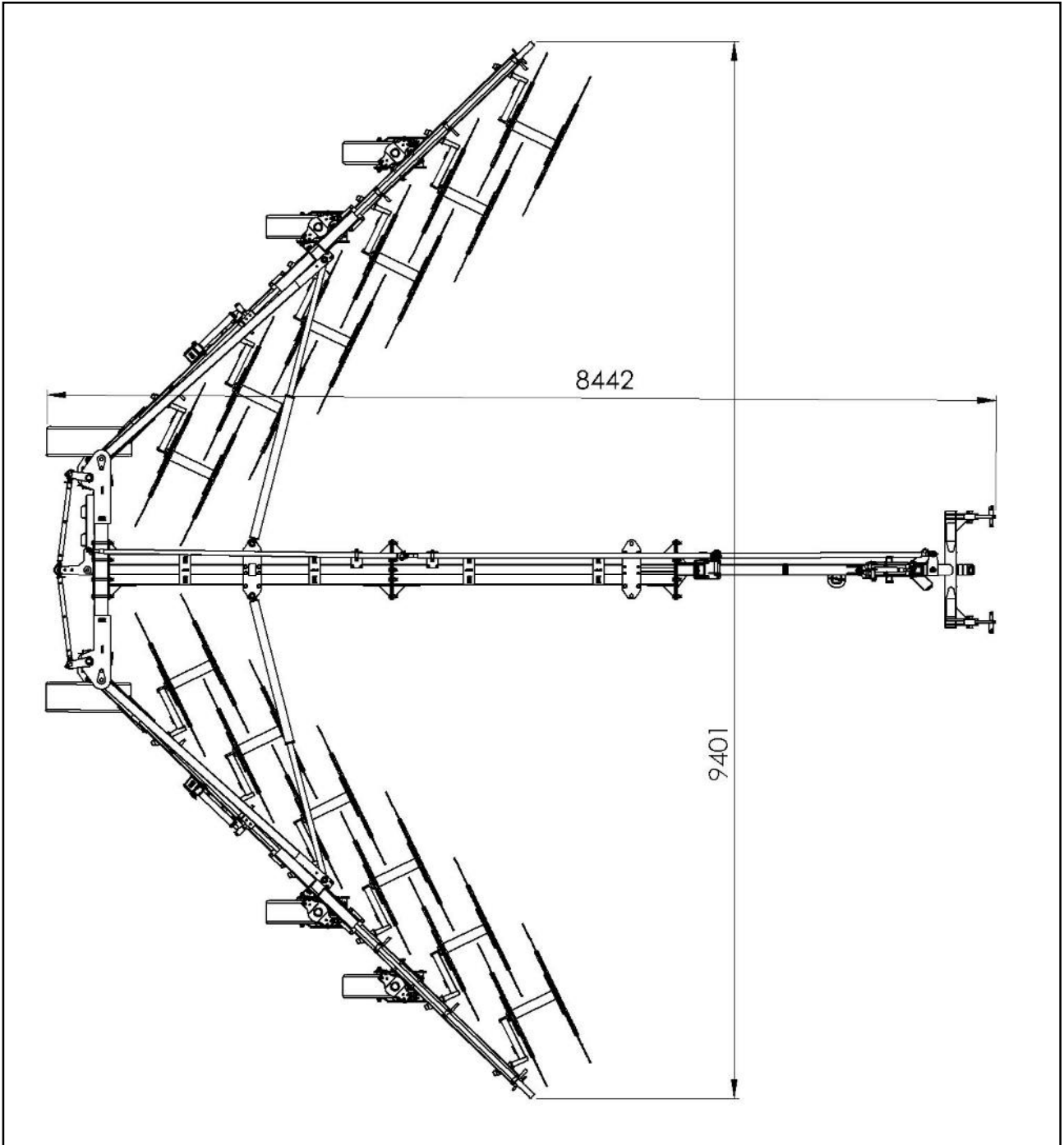
Type	12+12 VS	14+14 VS
Total width (mm)	9500	10600
Working width (mm)	7500	9000
Transport width (mm)	2550	2550
Height (mm)	2102	2102
Length (mm)	8440	9296
Number of star wheels	24	28
Weight (kg)	2480	2650
Central frame tyres	10.0/75-R15.3	10.0/75-R15.3
Side tyres	205/70-R15	205/70-R15
Maximum tire inflation pressure (bar)	2.5	2.5
Minimum tractor power (kW)	38	45
Tractor hitch (cat.)	II - III	II - III
Allowable hydraulic pressure (bar)	330	330
Distributors required (number)	2 - DE	2 - DE
Electrical system (volts)	12	12



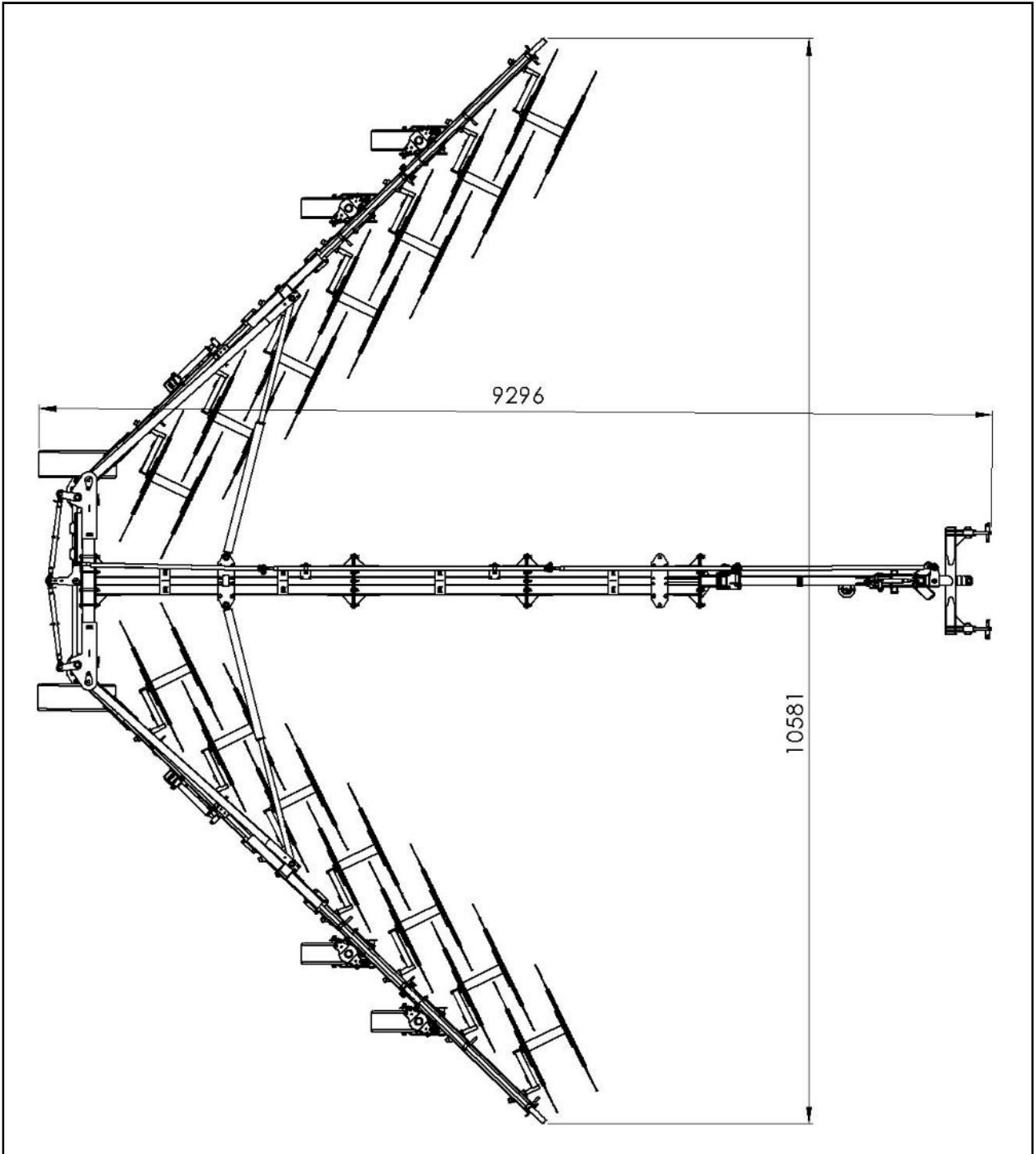
RA-RAKE 12+12 VS



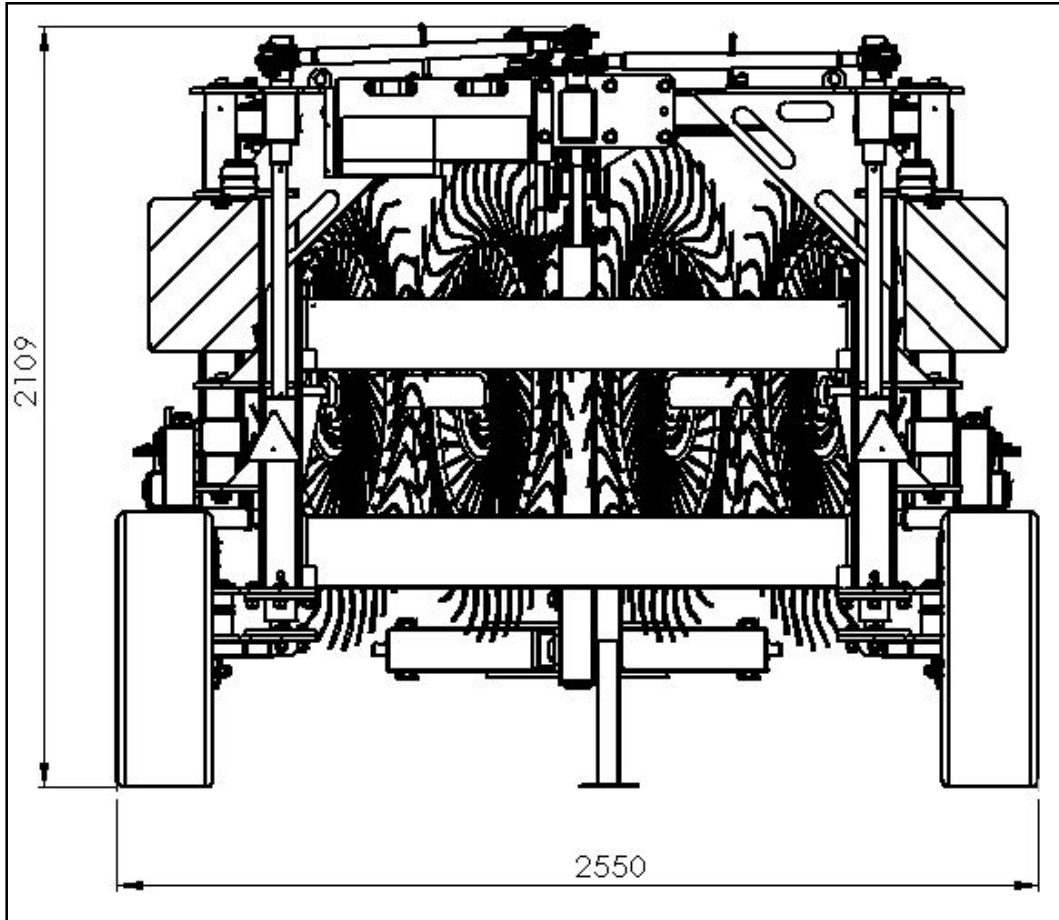
RA-RAKE 14+14 VS



RA-RAKE 12+12 VS



RA-RAKE 14+14 VS



1.5 Noise level

Sound pressure level at the driver's seat (cableless tractor):

$L_{wa} = 0 \text{ dB (A)}$

Sound power level at the driver's seat (cableless tractor):

$L_{pa} = 0 \text{ dB (A)}$

Sound pressure level at the driver's seat (in driver's cab):

$L_{wa} = 0 \text{ dB (A)}$

Sound power level at the driver's seat (in driver's cab):

$L_{pa} = 0 \text{ dB (A)}$

1.6 Storage

If you need to store the machine for long periods of time, put it in a place which is protected from the elements and possible damage. It is advisable to clean the entire machine thoroughly and lubricate all mechanical parts adequately before storing, to protect them from rusting.

Check that the storage temperature is between 0 °C and 50 °C.

Before storing the machine for long periods of time, it is advisable to:

- Clean the star wheels and tools of any remaining forage.
- Clean the machine thoroughly using compressed air and/or a water jet.
- Inspect the whole machine visually to detect any structural damage, look for any deep scratches on the paint, and check that the original safety pictograms are still found in the correct places and that they are intact and legible.
- Grease all mechanical components, clamping pins and unpainted parts to avoid rust forming on the machine.
- Park the machine in a roofed area on a flat firm floor.
- Lower the support foot.
- Put chocks under the rear wheels.
- Make sure the hydraulic system pipes are intact.



Used oil must be properly collected and not dispersed in the environment since, according to current legislation, it is classified as hazardous waste, and as such must be delivered to special collection centres.

To dispose of used oil, you must contact the “**Mandatory consortium for used oils**”.

1.7 First use or use after a long period of storage

Before using the machine for the first time, or after a long period of storage, you must:

- Make sure the machine is not damaged.
- Check the mechanical parts, which must be in good working condition and not rusty.
- Make sure the tools are not worn.
- Make sure the lights and electrical system are working correctly.
- Grease all the moving parts described in this manual carefully.
- Make sure there are no oil leaks from fittings or pipes.
- Make sure that all protection devices are correctly positioned.
- Make sure that paint still covers the whole machine and there are no rusting parts. If necessary, clean and paint the parts concerned.

1.8 Decommissioning

If the machine is decommissioned, it must be disposed of at suitable dumps in accordance with current legislation.

Before proceeding with decommissioning, you must separate out the plastic and rubber parts and the electrical and electronic material.

Collect any used oils and dispose of them at the assigned collection points.



Used oil must be properly collected and not dispersed in the environment since, according to current legislation, it is classified as hazardous waste, and as such must be delivered to special collection centres.

To dispose of used oil, you must contact the “**Mandatory consortium for used oils**”.

Parts consisting solely of plastic, aluminium or steel may be recycled if collected by the assigned centres.

1.9 Safety and accident prevention instructions



Correct use of the machine, scrupulous compliance with the instructions provided here and strict application of all precautions to prevent any hazardous situations will avert the risk of accidents or injuries, make the machine work better and for longer, and minimize breakdowns.

Repossi Macchine Agricole Srl declines any and all objective and subjective responsibility if the instructions regarding conduct referred to in this manual are not applied and complied with.

- This machine is not suitable for use in industries other than in agriculture.
- The machine must be used by a single operator who drives the tractor.
- Any use other than that specified here is considered improper.
- The machine must only be used by authorised, informed and suitably trained staff. Besides reading and assimilating the instructions in this manual, the operator in charge must prepare him/herself sufficiently to use the machine and have a driving licence. The operator is advised to contact the manufacturer in case of doubts on the use of the machine or interpretation of this manual.
- The manual must always be at hand so that it may be consulted to check the operating cycle. If it is lost or damaged, you must ask the manufacturer for a replacement copy.
- The operator must make sure that there are no people or animals in the area in which the machine works. Never use the machine near people who are standing or passing in the area in which the machine works.
- Do not use the machine if you are tired, sick, or under the influence of alcohol, pharmaceuticals or drugs.
- This machine is normally used during the day. If, exceptionally, it is used at night or in conditions of poor visibility, the tractor lighting system must be used.
- Driving the machine on a slope causes the machine itself to become unstable. Always face forward on slopes both while going downhill and while going uphill. NEVER traverse across a slope since the machine may overturn sideways.
- Any arbitrary alteration made to this machine exonerates the manufacturer from any liability for damage or injury to operators, third parties or property that may result.
- Check the machine carefully before each start-up.

- The manufacturer cannot foresee all the situations that could endanger the operator's safety. Complying with the instructions in this manual will in any case considerably reduce the possibility of injury or damage to the machine during use.
- The signs on the machine provide a number of important instructions. Comply with them in the interest of safety.
- Make sure all the safety pictograms are legible. Clean them and replace them with new ones if necessary.
- Before using the machine, make sure that all safety devices are correctly fitted in their places and in good condition. In the event of a fault or damage to the protection devices, replace them immediately.
- Before coupling the machine to the tractor, make sure that any ballast fitted to the front of the tractor is of the correct weight and dimensions (see chapter -3-). The ballast must be mounted on the supports provided for this purpose, in accordance with the tractor manufacturer's instructions.
- Before getting off the tractor and before any maintenance, apply the parking brake, switch off the engine, remove the ignition key from the dashboard and put it in a safe place.
- Staff must use safety and personal protective equipment when using and maintaining the machine.



- The machine operator is advised not to wear clothing that could become entangled.
- The machine may give rise to clouds of dust during use with dry materials (hay, straw, etc.). It is advisable to check the filters on the cab ventilation system at regular intervals or use suitable breathing protection devices, such as dust masks.
- During use, the operator must be able to see the areas where work is being carried out sufficiently well since they are considered dangerous. It is therefore advisable to keep the mirrors on the tractor clean and in the best possible condition.
- The machine must not be left unattended with the tractor engine running or the key in the dashboard.

- Keep the machine free of foreign materials (debris, tools and various objects), which could damage its operation or harm the operator.
- Avoid working on muddy or soft ground.
- Check hydraulic pipes for wear. Replace them if they are worn or at least once every four years.
- Do not use controls or pipes as handholds. These components move and do not provide stable support.
- Altering the machine may lead to safety issues. In this case, the user is solely responsible for any accidents.
- Do not remove or tamper with safety devices.
- Make sure the safety pictograms are in good condition. If the pictograms are worn, they must be replaced with other originals ordered from the manufacturer and attached in the places shown in this user and maintenance manual (*paragraph 1.10.1*).
- Never use the machine to transport people, animals or objects of any kind.
- Never use the machine to lift people, animals or objects.

1.10 Safety signs

Make sure the safety pictograms are in good condition. If the pictograms are worn, they must be replaced with other originals ordered from the manufacturer and attached in the places shown in this user and maintenance manual.

Make sure the safety pictograms are legible. Clean them using a cloth, soap and water.

1.10.1 Location of pictograms on the machine

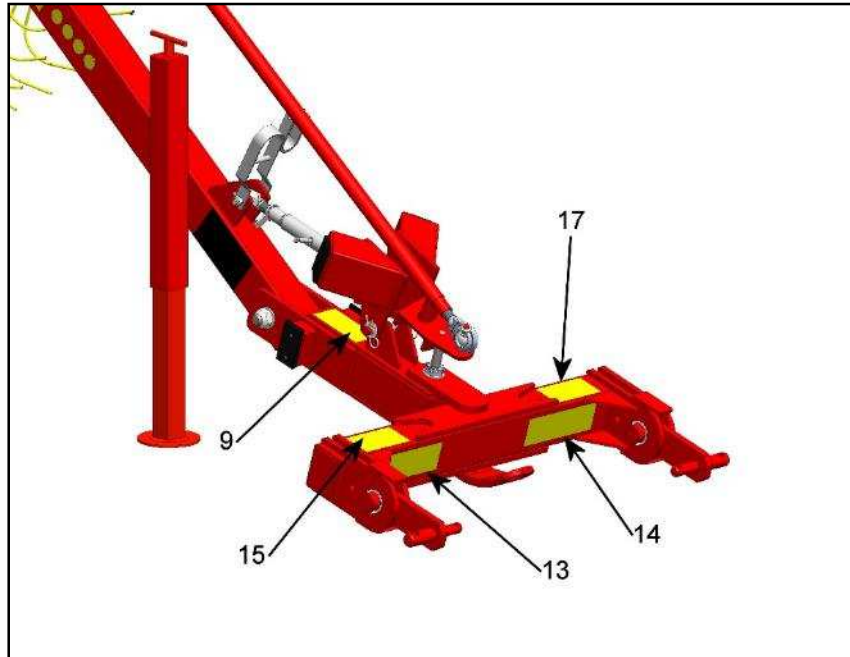


Figure 4

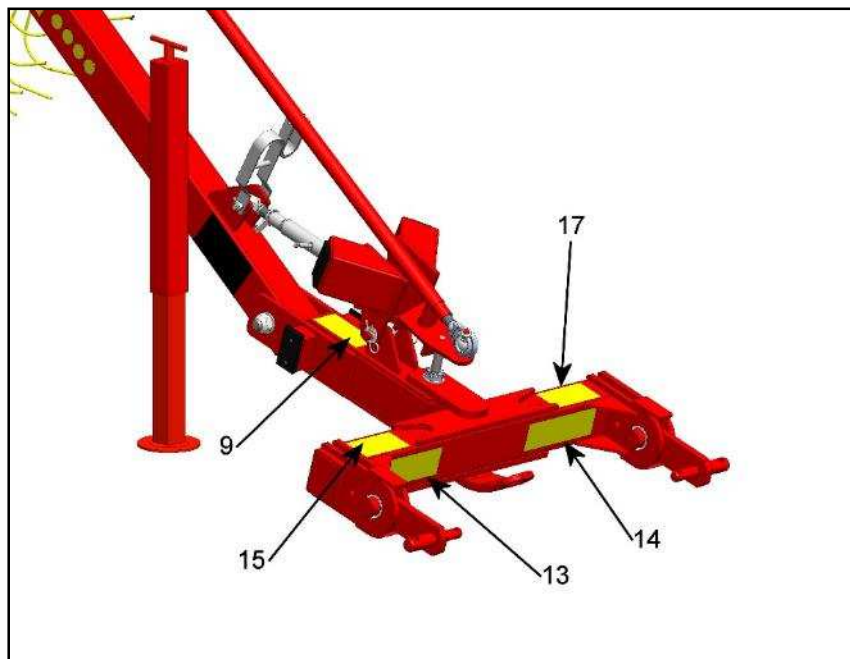


Figure 5

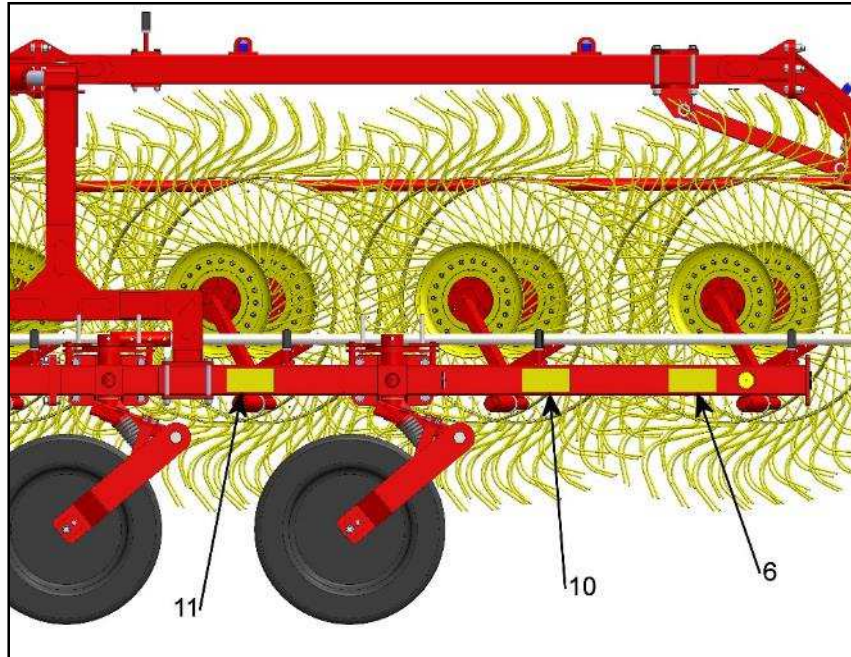


Figure 6

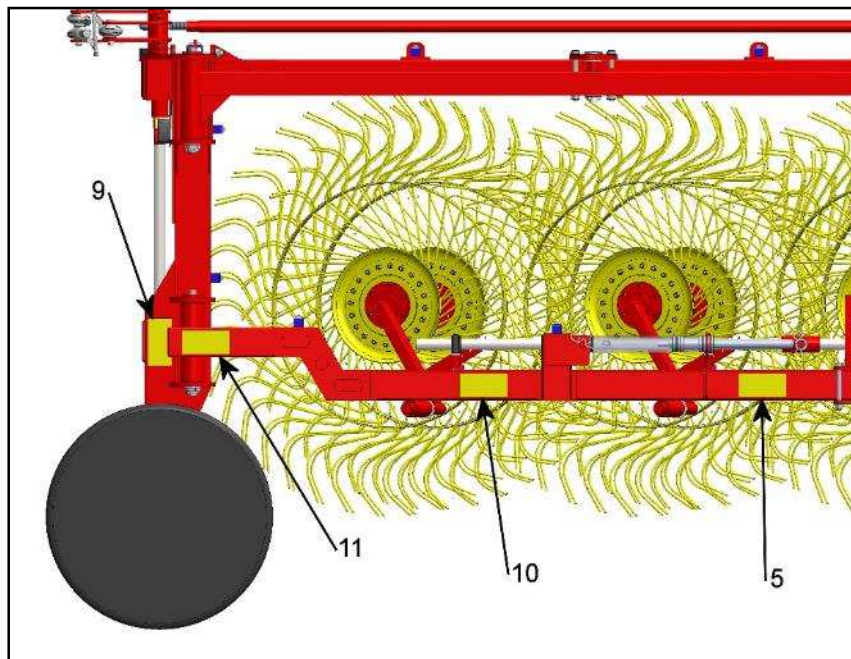


Figure 7

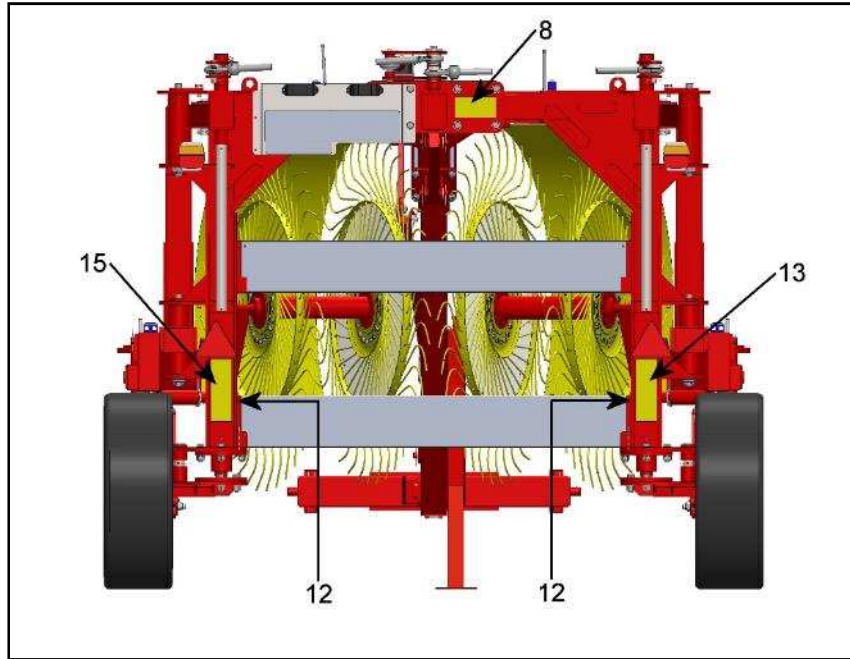


Figure 8

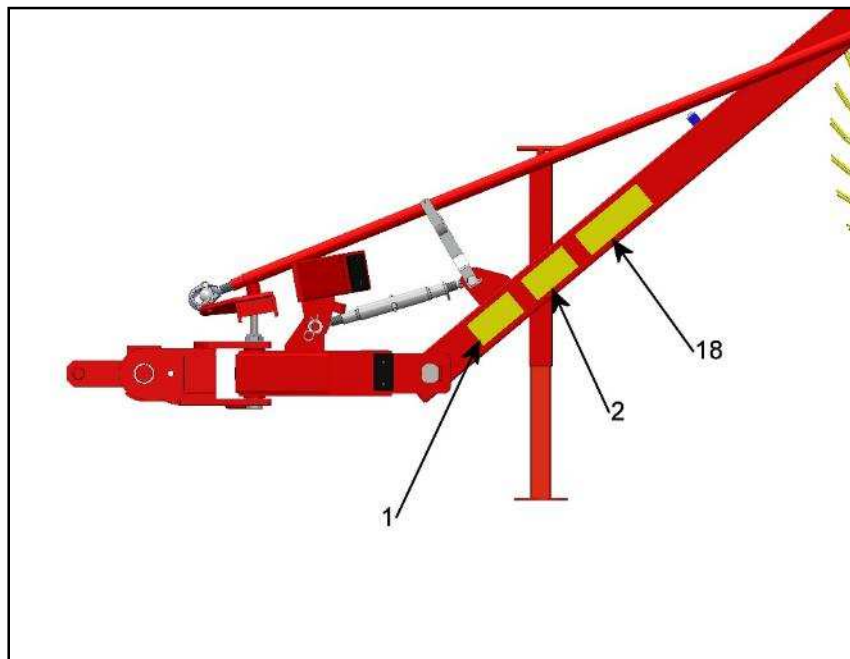


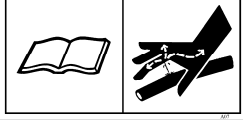
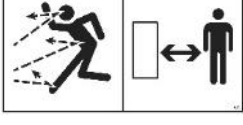


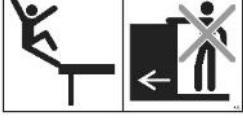




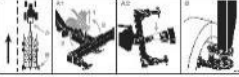
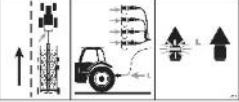
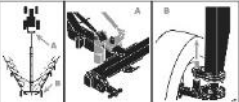
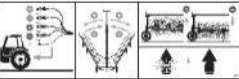
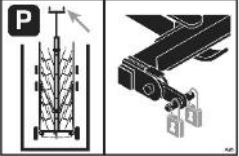
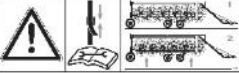





Figure 9

1.10.2 Description of pictograms

	<p>1. CAUTION: Adjustment and maintenance operations must be carried out after reading the user and maintenance manual, with the machine stationary and without the key in the ignition.</p>
	<p>2. CAUTION - DANGER of crushing. Do not stand between the tractor and the power-operated machine.</p>
	<p>4. CAUTION - DANGER of high pressure fluids. Read the manual before taking any action and consult a doctor in case of injury.</p>
	<p>5. CAUTION - DANGER of objects thrown up into the air. Keep at a safe distance.</p>
	<p>6. CAUTION - DANGER of crushing. Hazardous area owing to machine movement.</p>
	<p>7. CAUTION - DANGER This machine must be used by a single operator.</p>
	<p>8. CAUTION - Do not get onto the machine or use it as a means of transport.</p>
	<p>9. CAUTION - DANGER of crushing hands.</p>

	<p>10. CAUTION - Jack point for machine lifting</p>
	<p>11. CAUTION - Maximum tyre inflation pressure</p>
	<p>12. CAUTION - When parked, block the wheels with appropriate chocks</p>
	<p>13 INSTRUCTIONS on set-up for transport by road</p>
	<p>14 INSTRUCTIONS on how to connect systems for transport by road</p>
	<p>15 - INSTRUCTIONS on set-up for work in the field</p>
	<p>16 – INSTRUCTIONS on how to connect systems to the tractor for work</p>
	<p>17 - INSTRUCTIONS on the blocks that prevent unauthorized use</p>
	<p>18 - CAUTION Before lifting the machine, secure the front of the rakes with a belt.</p>

	<p>19 - Use the required Personal Protective Equipment.</p>
	<p>20 - GREASE POINT</p>
	<p>21 - LIFTING POINT</p>

-2- HANDLING AND TRANSPORT

Pay utmost attention to safety when loading and unloading the machine from a vehicle. This must be done by staff qualified to use slings, trolleys, etc.

When lifting the machine, the lifting points shown on the pictograms on the machine must be used (see Figure 10).

The front of the rakes **must** be attached to the main frame by means of a locking strap before the machine is lifted.

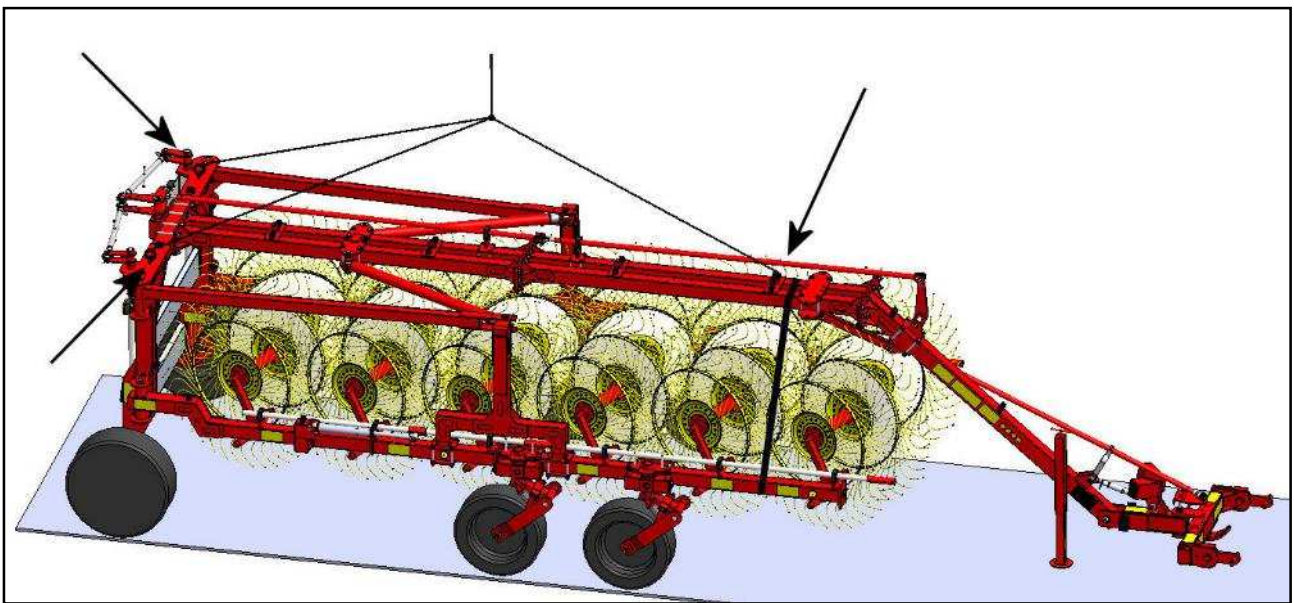


Figure 10

You must use a suitably prepared vehicle of adequate power and size to transport the machine.

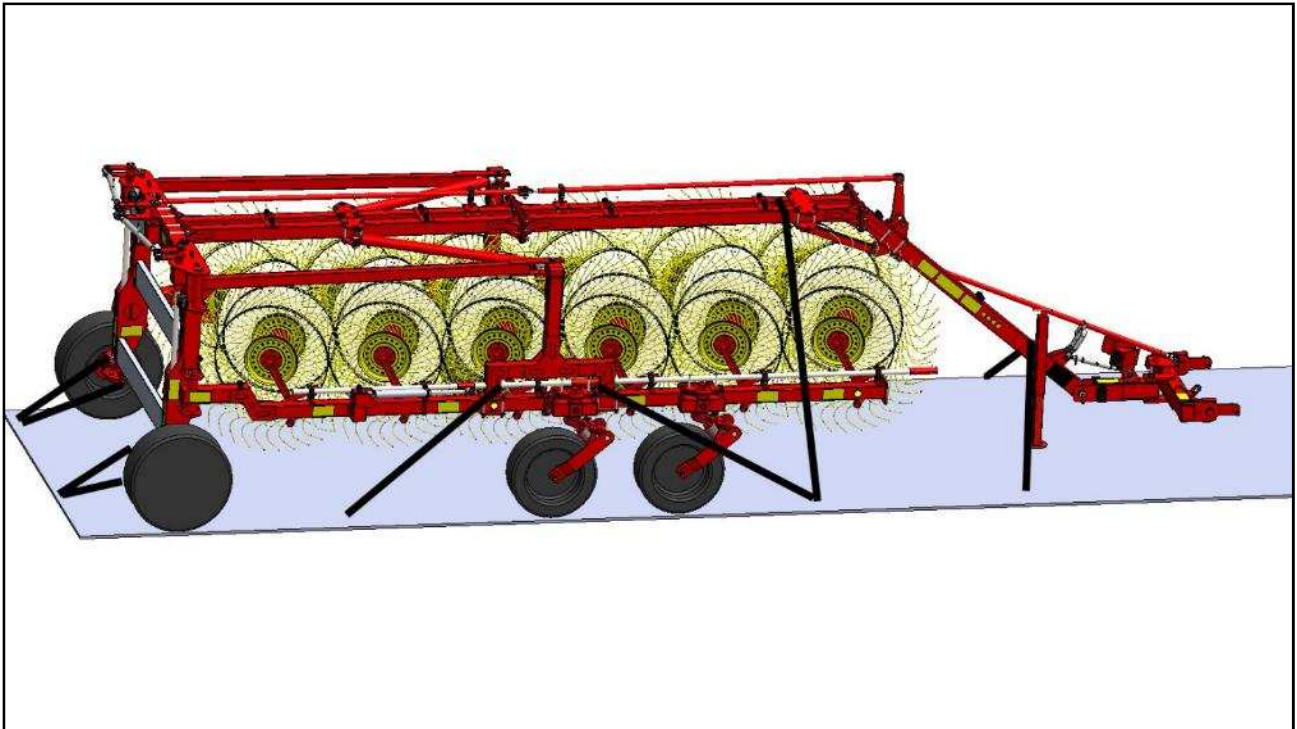


Figure 11

The rake must be loaded onto the vehicle using a crane or hoist with adequate lifting capacity (see *Figure 10*). Once loaded, the machine must be secured by means of anchoring ropes (see *Figure 11*)

-3- TRANSPORT ON PUBLIC ROADS



If you have to travel on a public thoroughfare, you must strictly comply with the Highway Code and pay particular attention to the choice of speed.

Before entering a public thoroughfare from a non-asphalted or dirty area, you must thoroughly clean any residual mud from the tractor tyres.

When driving on public roads, the wheel rake must be kept in the transport position (*see Figure 12*).



Figure 12

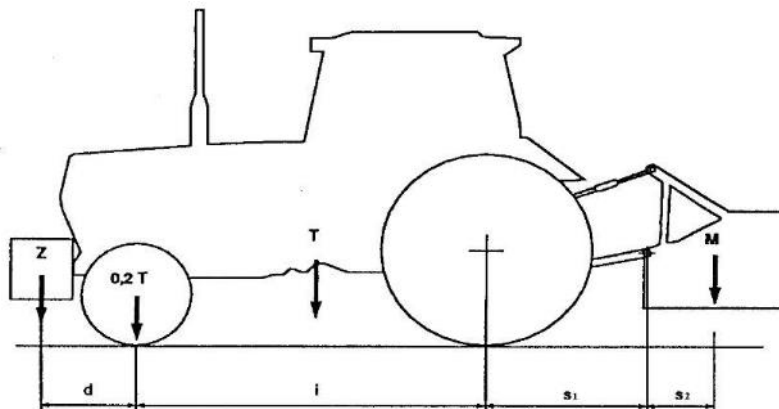
Requirements for transport on public roads (*see paragraph 5.2*):

- The machine lighting system must be connected to the tractor lighting system.
- The machine hydraulic system must be disconnected from the tractor hydraulic system.
- The rear wheels must be locked with the pins provided.
- The stabilizing foot must be lifted.
- The steering drawbar and steering joint rotation limiting stop must be set to the road transport position.
- Place protective covers over the front star wheels.
- Attach the rear protective bars.

The weight of the machine alters the stability of the tractor-rake unit and affects the steering and braking capacity, especially on sloping or uneven roads. Therefore, drive at a moderate speed according to the road and weather conditions.

In particular, bear in mind that the front axle must always be loaded with at least 20% of the overall weight of the tractor-rake unit.

Check the lifting capacity and stability of the tractor by using the following formula and, if necessary, secure ballast to the front of the tractor.



$$M \cdot (s1 + s2) \leq 0,2 T \cdot i + Z (d + i)$$

- i** = tractor wheelbase
- d** = distance of the front axle from ballast
- s1** = distance between the centre of the rear axle and the centre of the lower hitching points
- s2** = distance between the centre of the lower hitching points and the centre of gravity of the rake
- T** = weight of the tractor + 75 kg (driver)
- Z** = weight of ballast
- M** = weight of the machine applied to the bars

-4- MACHINE OPERATION



Make sure that all machine parts are functioning properly during work. Most of the problems and breakdowns which may occur during use of the machine are caused by fastening components which come loose.

Since all the mechanical parts and hydraulic connections need running in during the initial stage of the machine's life, it is essential to check the machine with utmost attention.

Before using the machine, make sure there are no people or animals in the area in which it works.

The machine must be used by a single operator sitting in the tractor driving seat.

Never remove and/or alter the protection devices on the machine.

Do not use the machine when you are unwell, tired or under the influence of drugs, pharmaceuticals or alcohol.

Before using the machine, you must learn the layout of the controls and their operation.

It is advisable to inspect the area where work is to be carried out in advance to ensure that there are no dangerous obstacles, such as stones, manholes, or other objects, especially in the vicinity of a roadway.

4.1 Controls and instruments

All controls are marked with special signs, which show their function and indicate their action and position with pictures (see Figure 13).

Connect the RED “+” and “-” pipes to a double-acting distributor to operate the raking unit opening/closing system.

Connect the BLUE “+” and “-” pipes to a double-acting distributor to operate the raking unit lifting/lowering system

Connect plug "L" to the socket that operates the lighting system.

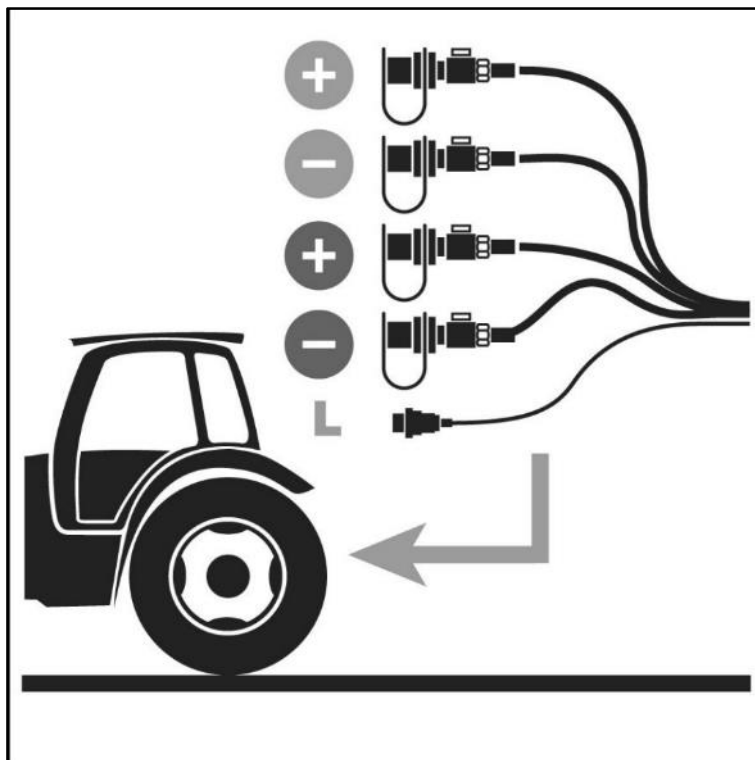


Figure 13

4.2 Visibility

The area where the work is being done must be checked using the tractor's rear-view mirrors and directly by the operator.

When reversing, there may be areas that are not visible using the rear-view mirrors.

-5- HITCHING THE MACHINE TO THE TRACTOR AND CHANGING SET-UP

5.1 Hitching the machine to the tractor

The machine must be hitched to a tractor of suitable weight and power, in compliance with the legal requirements in force in the country of use.



Before hitching the machine to a tractor, check the machine specifications, and compare them with the power, weight, etc. of the tractor to be used.



During use, adjustment, maintenance, repair or handling, the operator must use suitable Personal Protective Equipment (PPE).

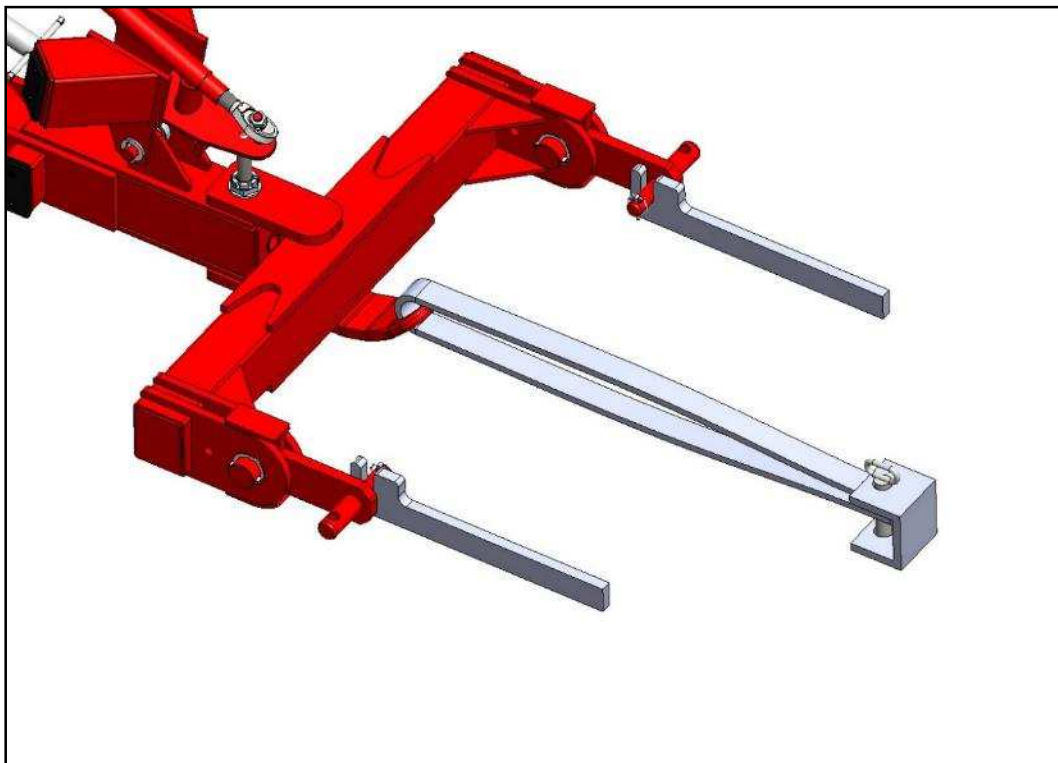


Figure 14

In order to hitch the tractor to the machine, the operator must reverse the tractor until the machine's hitch comes into line with the rear lifting bars (see *Figure 14*).

Apply the tractor's parking brake, switch off the engine, remove the ignition key and climb down from the driver's seat.

Remove the locks that prevent unauthorized use of the machine.

Insert the pins and the corresponding safety pins/split pins.

Lock the tractor lifting bars to prevent the machine from swinging sideways, which would compromise the crossways stability of the unit (see *Figure 15*).

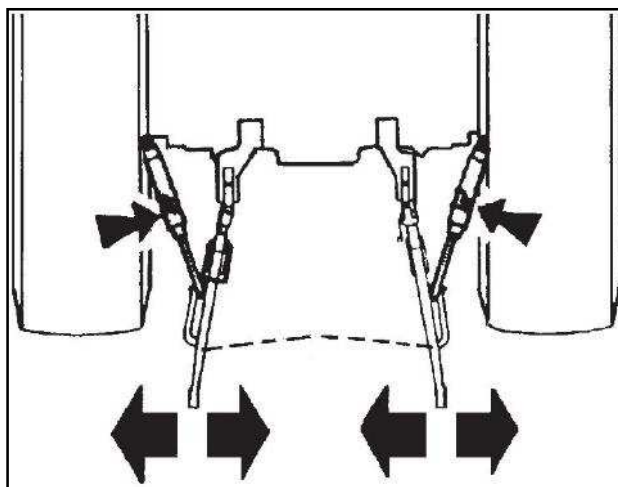


Figure 15

If the machine is hitched to the tractor for the first time, make sure that:

- the towing eyes are placed at the most suitable height for hitching to the tractor. If need be, adjust the height of the towing eyes.

As far as electrical connections are concerned, insert the plug of the machine's electrical system into the tractor's socket (see *Figure 13*).

After making the connection, make sure all the lights work correctly - in particular the stop lights and direction indicators - and the flashing light works.

As far as hydraulic connections are concerned, the machine has two separate hydraulic systems: one to open/close the rake units and one to lift/lower the gathering equipment.

The two systems are marked with coloured circular markings near the quick couplings:

- **RED** the "+" sign indicates rake opening and the "-" sign indicates rake closing;
- **BLUE** the "+" sign indicates rake lifting and the "-" symbol indicates rake lowering.

Both systems must be connected to a double-acting distributor on the tractor (see Figure 13).



CAUTION: *This operation must be carried out with the tractor switched off after releasing any remaining pressure in the system*

Once connection is complete, lift the machine and close the stabilizer foot again.

5.2 Set-up for road transport

To transport the machine by road, follow the instructions below:

- Completely close the rake arms (stop the cylinders from opening using the specific stop valves).
- Connect the safety belt to the tractor towing hook (see Figure 14)
- Lock the rotation of the rear wheels around the vertical axis with the mechanical lock provided (see Figure 16).
- Uncouple the front part of the moving steering mechanism (locked steering) (see Figure 17).
- Lift the V-shaped steering drawbar stop block (see Figure 18) and lock it together with the front part of the moving steering mechanism.
- Make sure the machine lighting system plug marked "L" is connected to the tractor's socket (see Figure 13).
- Make sure the machine hydraulic system is disconnected from the tractor hydraulic system (see Figure 13).
- Make sure the stabilizing foot is lifted.
- Place specific reinforced protective covers over the front star wheels (see Figure 19 - Figure 20 - Figure 21).
- Attach the rear protective bars (see Figure 22).

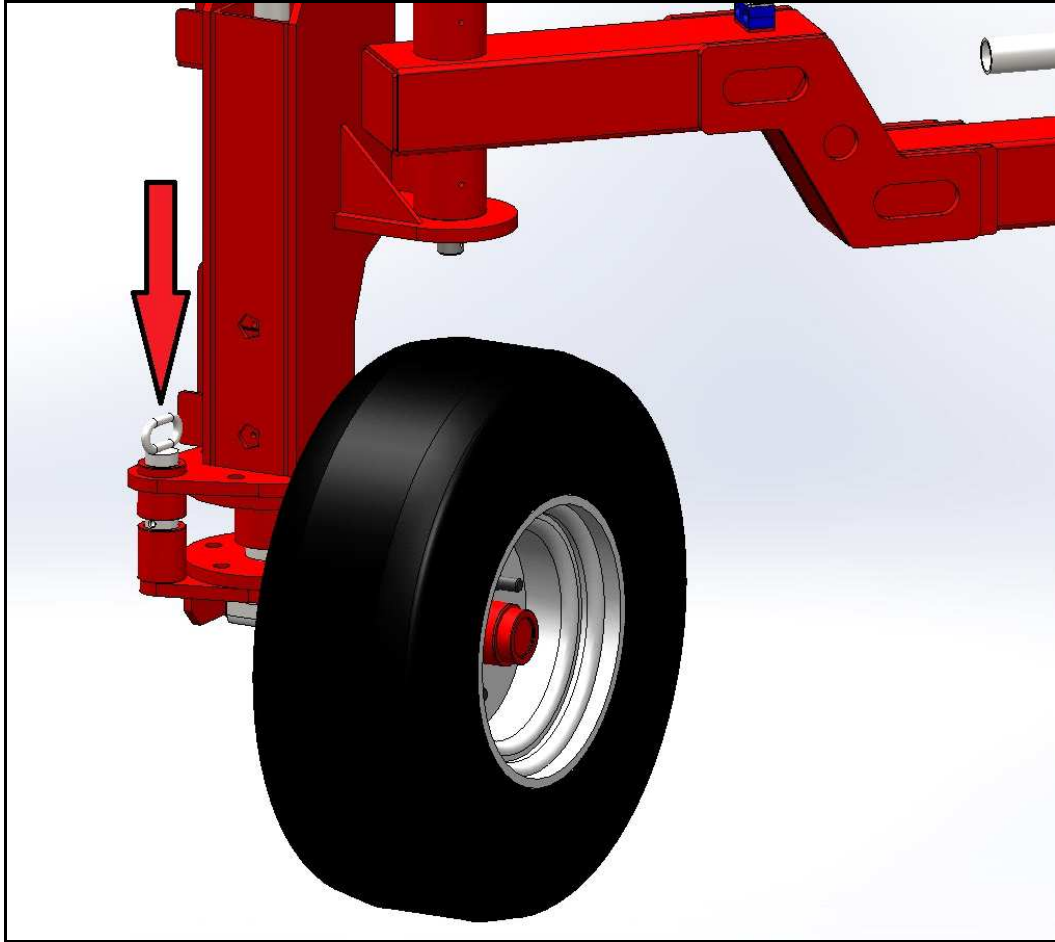


Figure 16

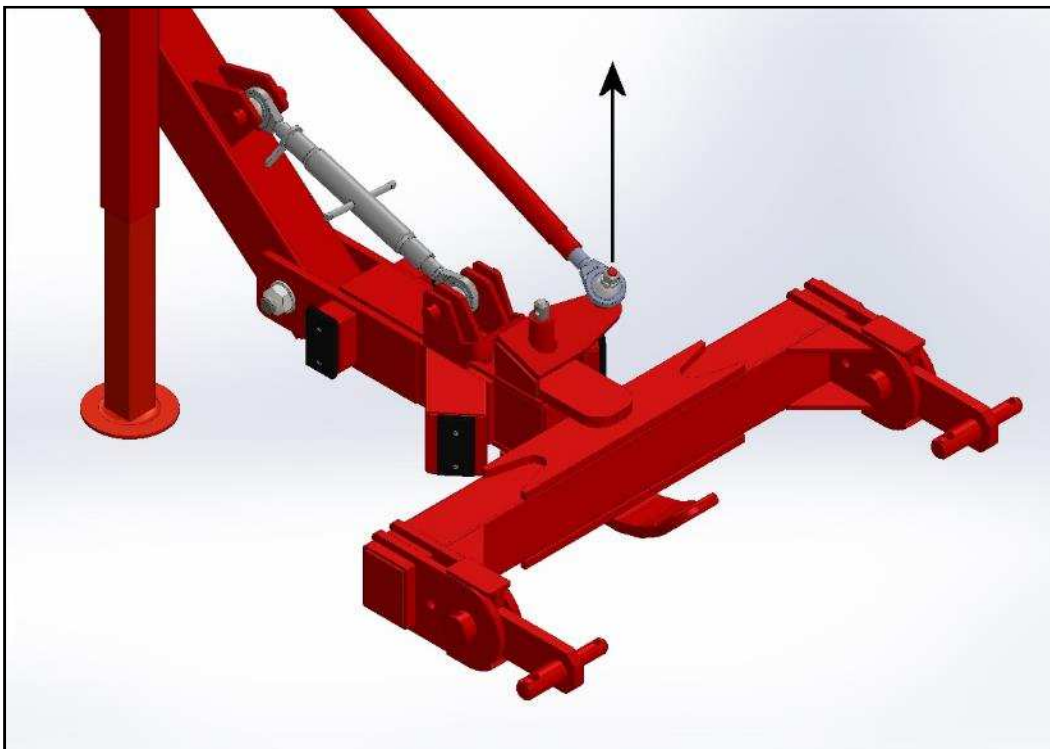


Figure 17

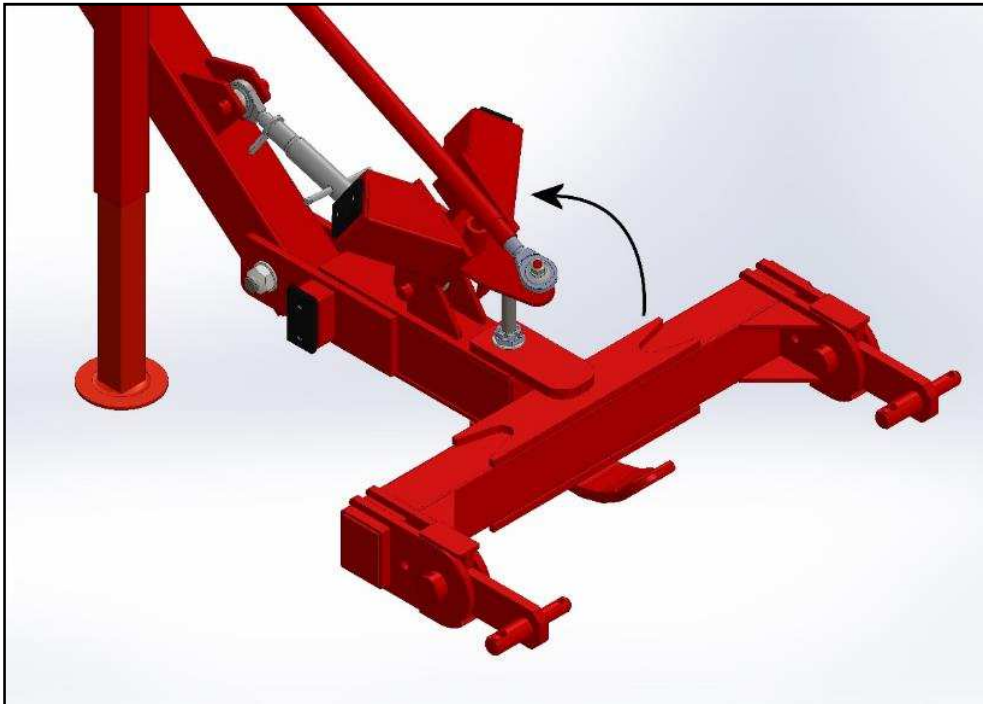


Figure 18

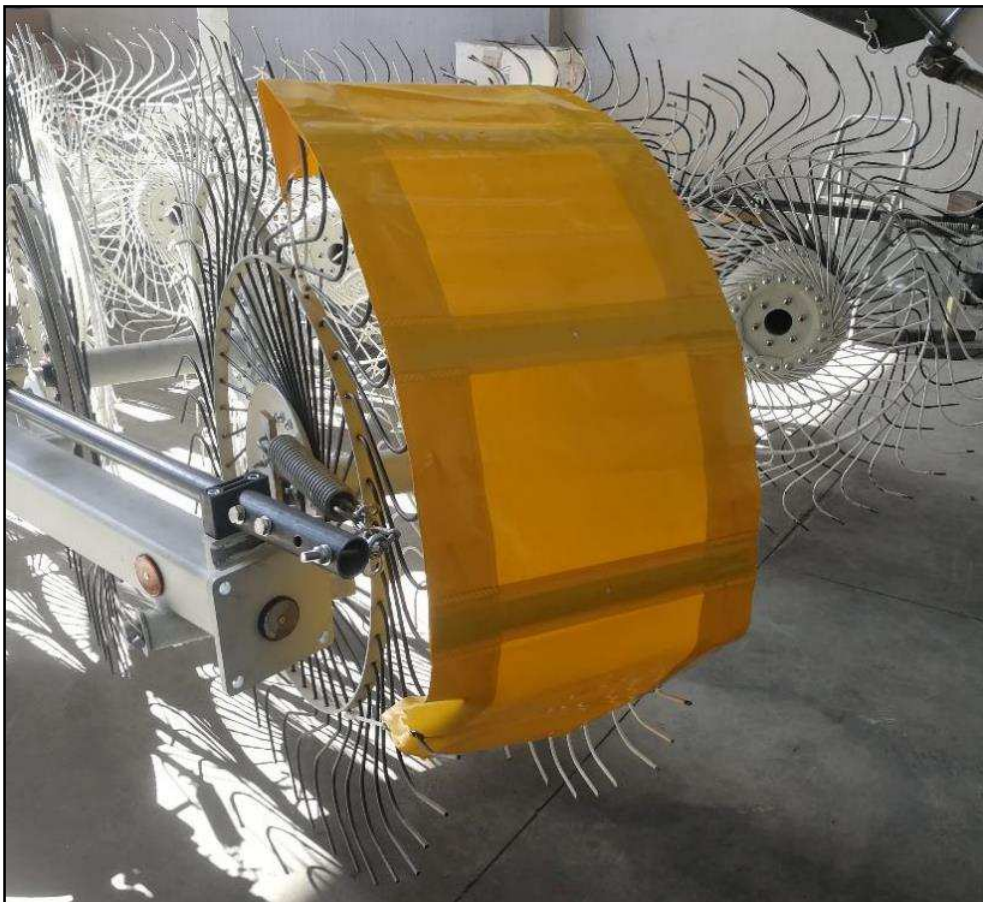


Figure 19

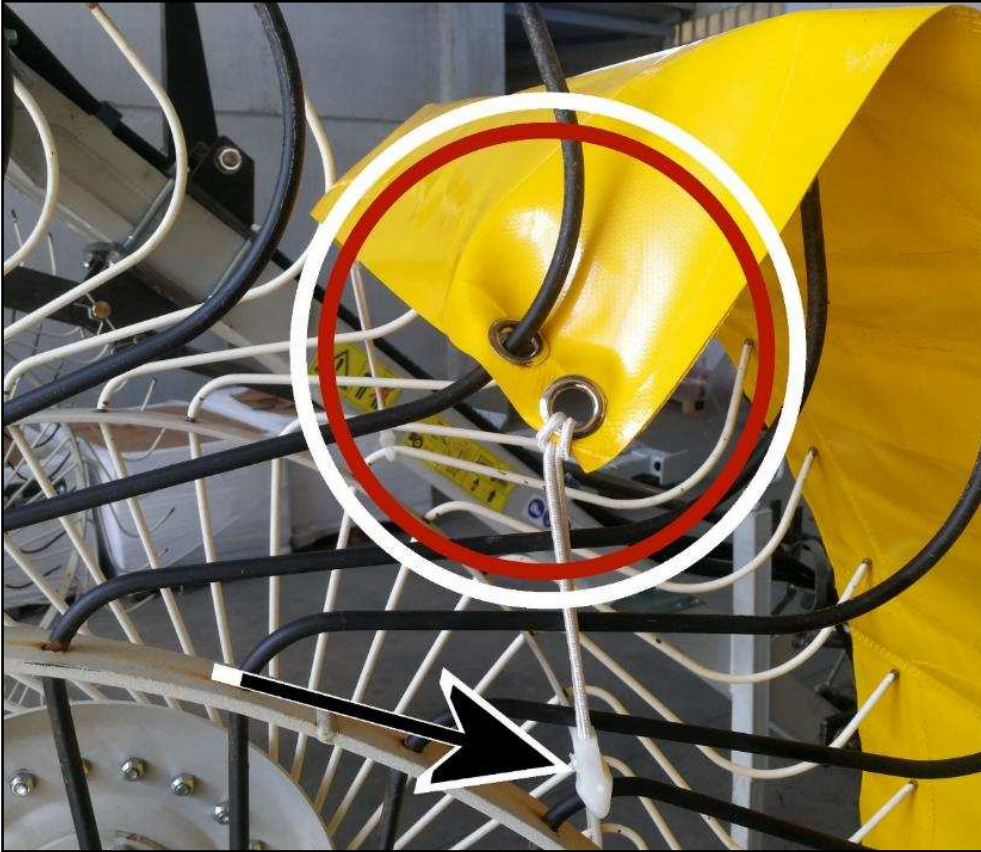


Figure 20



Figure 21

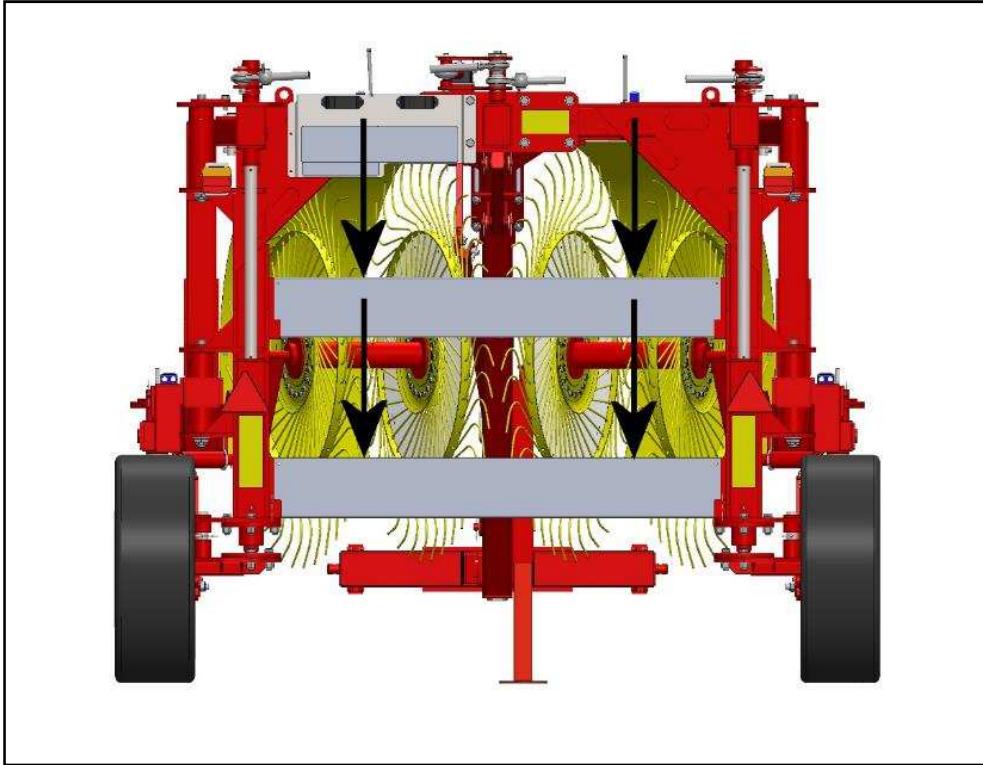


Figure 22

5.3 Set-up for work in fields

To carry out work in fields, follow the instructions below:

Remove the stop that prevents the rear wheels from rotating around the vertical axis (see Figure 23).

- Unlock and lower the V-shaped steering drawbar stop (see Figure 24).
- Couple the front part of the moving steering mechanism to the front tow bar (see Figure 25).
- Connect the machine hydraulic system to the tractor hydraulic system (see Figure 13).
- Make sure the stabilizing foot is lifted.
- Remove the protective covers from the front star wheels and store them in their protective housing (see Figure 26).
- Remove the rear protective bar and tie it in its storage place (see Figure 26).

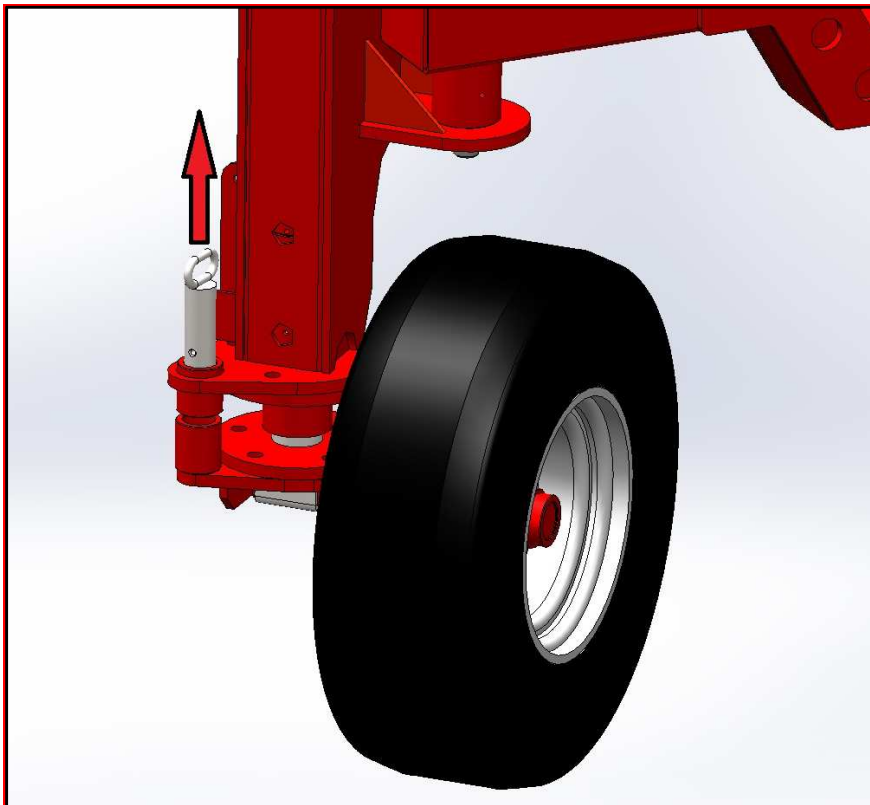


Figure 23

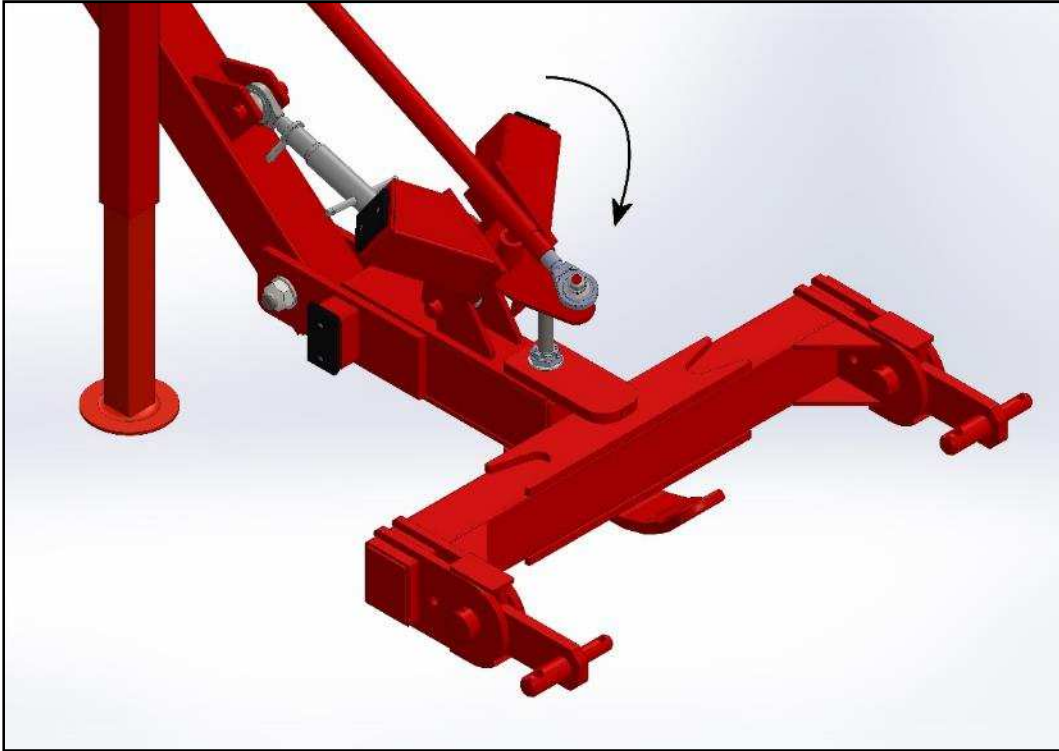


Figure 24

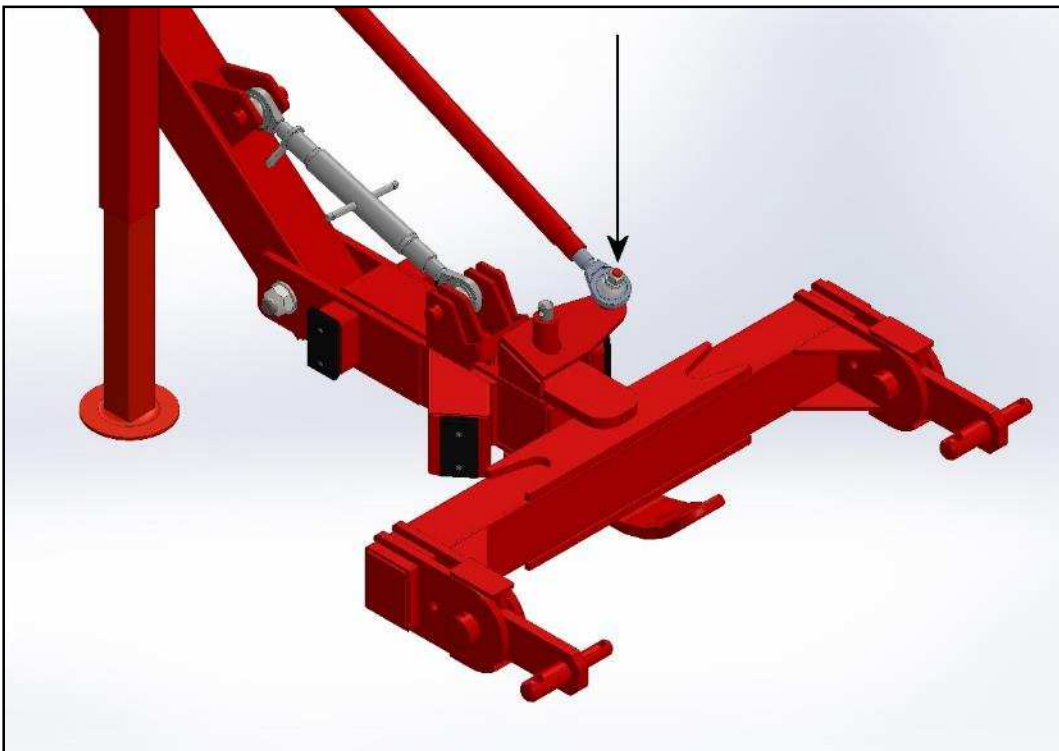


Figure 25

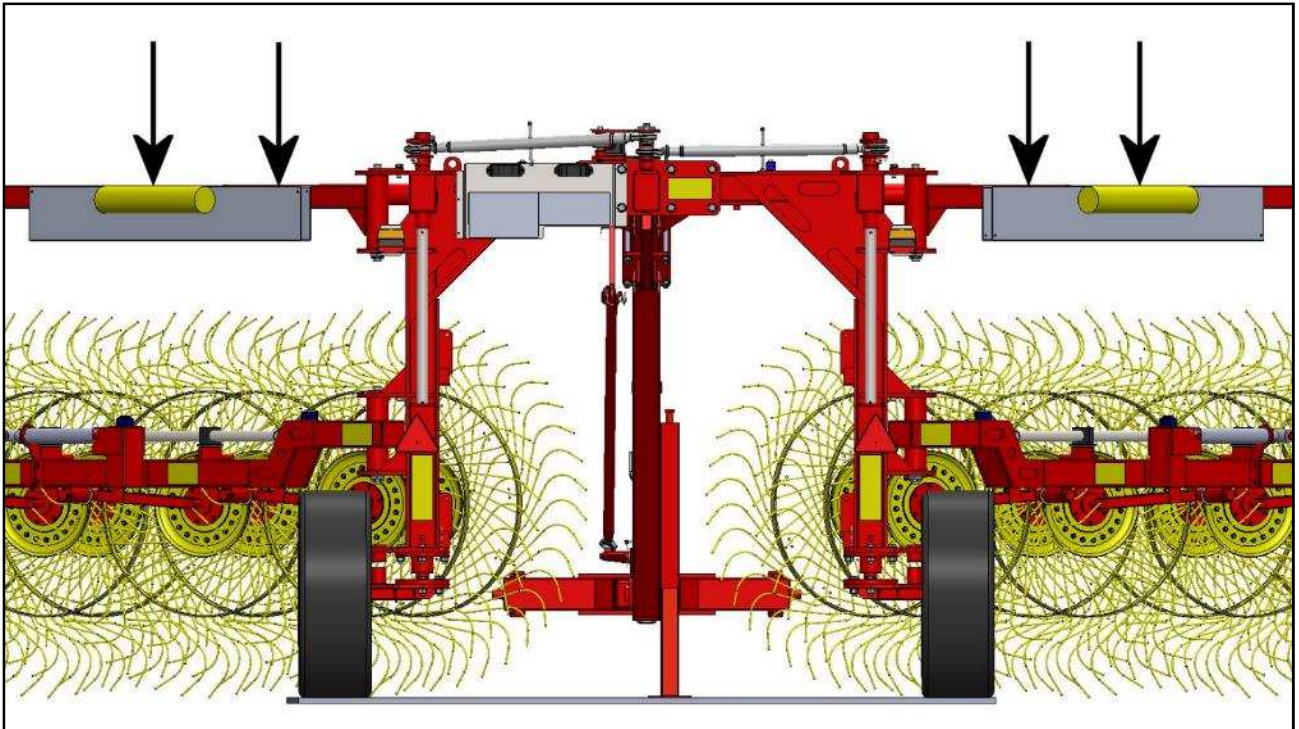


Figure 26

IMPORTANT - In the event of abundant forage (generally the first and second mowings) remove the front star wheels of the two central pairs (see *Figure 27*) to facilitate the forage outflow and avoid clogging the area through which it flows. In this case the rear star wheel does not need to brush the ground; the lightening spring must be adjusted in the same way as the one on the adjacent unit (see 7.2) since the star wheel rotates thanks to friction with the forage and does not need to touch the ground.

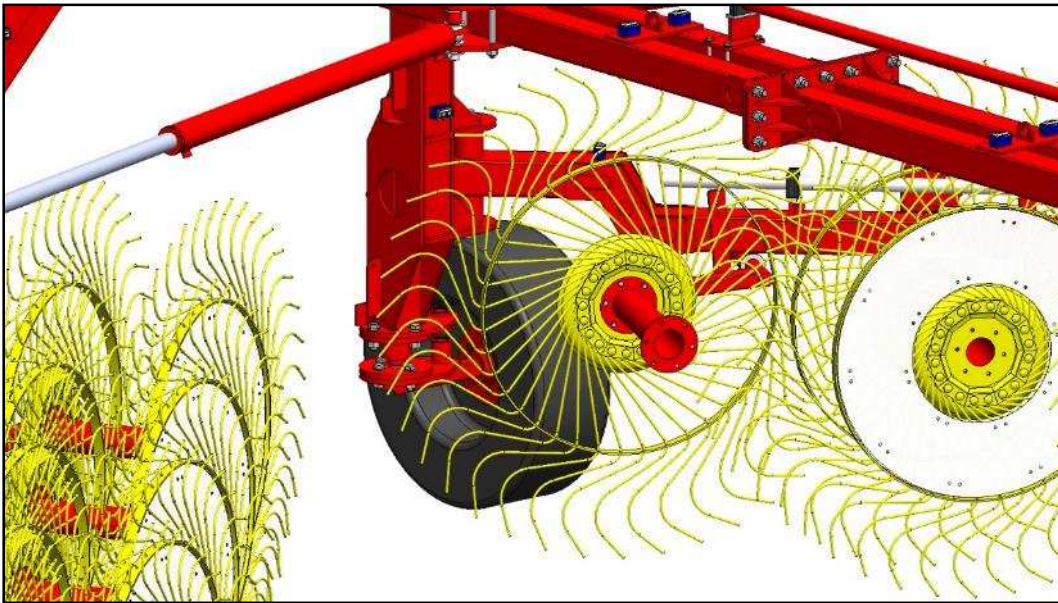


Figure 27

To remove the front star wheels of the two centre pairs, proceed as follows:

- Open the rake units using the distributor to which the pipes marked with the RED markings are connected.
- Turn off the tractor, apply the handbrake, remove the key and put it in a safe place.
- With the help of a colleague, unscrew the central screws that secure the front star wheel to the connection bracket (see *Figure 28*).
- Place the removed star wheels in a safe place.

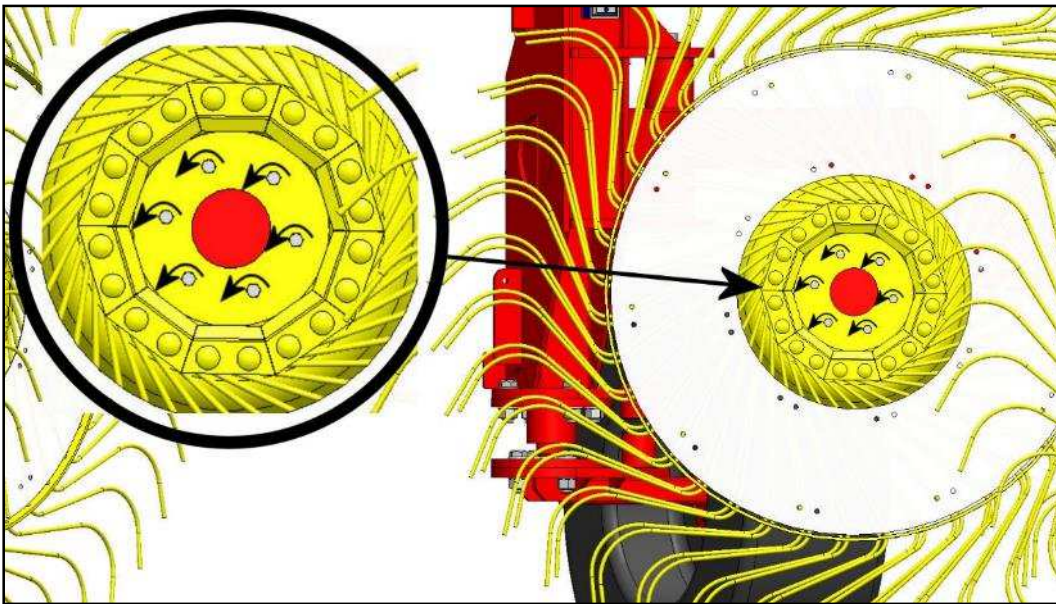


Figure 28

If the front star wheels have already been removed and there is not much forage to collect (in this case, the windrow looks like the right side one depicted in figure 29-b – flat windrow), they must be reconnected to the rake as follows:

- Open the rake units using the distributor to which the pipes marked with the RED markings are connected.
- Turn off the tractor, apply the handbrake, remove the key and put it in a safe place.
- With the help of a colleague, place the front star wheel on the connection bracket and tighten the screws (see Figure 29).

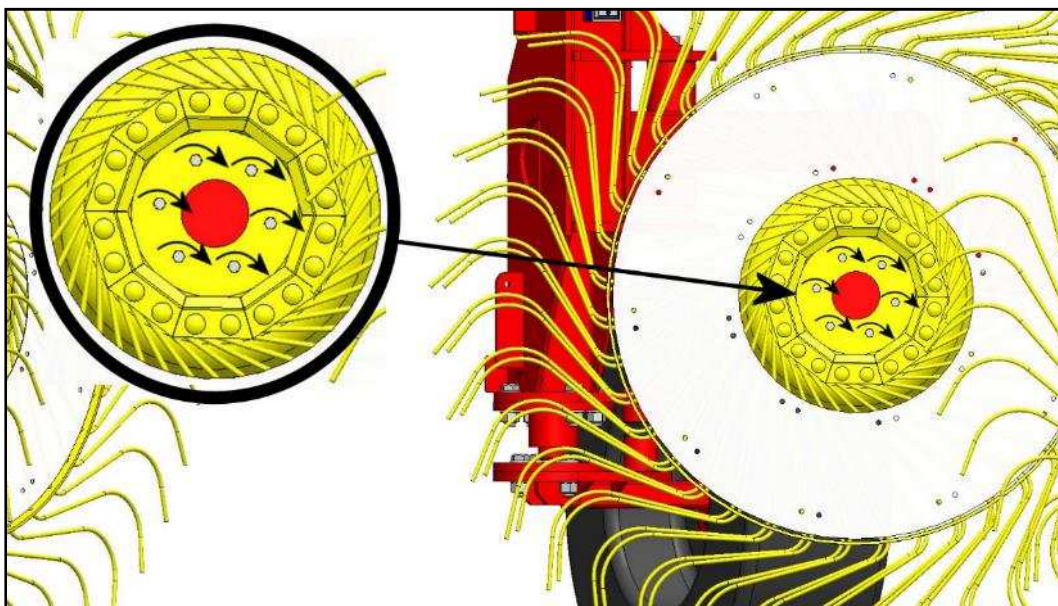


Figure 29

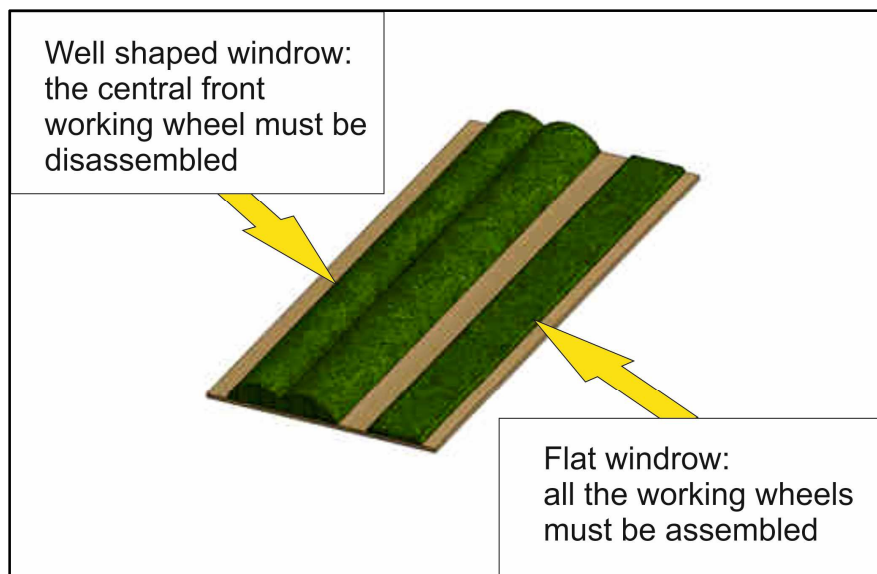


Figure 30

-6- USE OF THE MACHINE



Before using the machine, familiarize yourself with the controls and what can be done with them.

In all circumstances, always keep all parts of your body inside the tractor cab to minimize the risk of exposing yourself to any external hazards.

Before getting off the tractor and before any maintenance or adjustments, apply the parking brake, switch off the engine, remove the ignition key from the dashboard and wait for all moving parts to stop.

The safety of the operator and persons in the vicinity depends on the operator's judgement and prudence when using the machine. The operator must therefore know the location and function of all the controls. Before use, make sure there are no people or animals in the area in which work is to be performed.

The machine must always be in perfect working order and must only be repaired using original spare parts.

6.1 First use of the machine



Before using the machine, familiarize yourself with the controls and what can be done with them.



During use, adjustment, maintenance, repair or handling, the operator must use suitable Personal Protective Equipment (PPE).



Before starting work, make sure there are no people or animals in a radius of 20 m (65 feet).



Before starting work, make sure all machine protection devices are intact and fully functional.

To start work, do as follows:

- Open the rake units using the distributor to which the rake unit system is connected.
- Move the tractor forward a few metres to move the swivel wheels into place.
- Lower the rake units using the distributor to which the raking tools are connected.
- Move forward at a working speed suitable for the type of forage to be gathered.

Keep the tractor engine at a speed that ensures the machine enough power for the use it is being put to.

Drive a short distance with the rake, and check the quality of the work being performed. If it is not satisfactory, repeat the machine adjustments (*see -7-*).

6.2 Working process



Before starting work, make sure there are no people or animals in the area in which the machine works.

The machine must be used by a single operator sitting in the tractor driving seat.

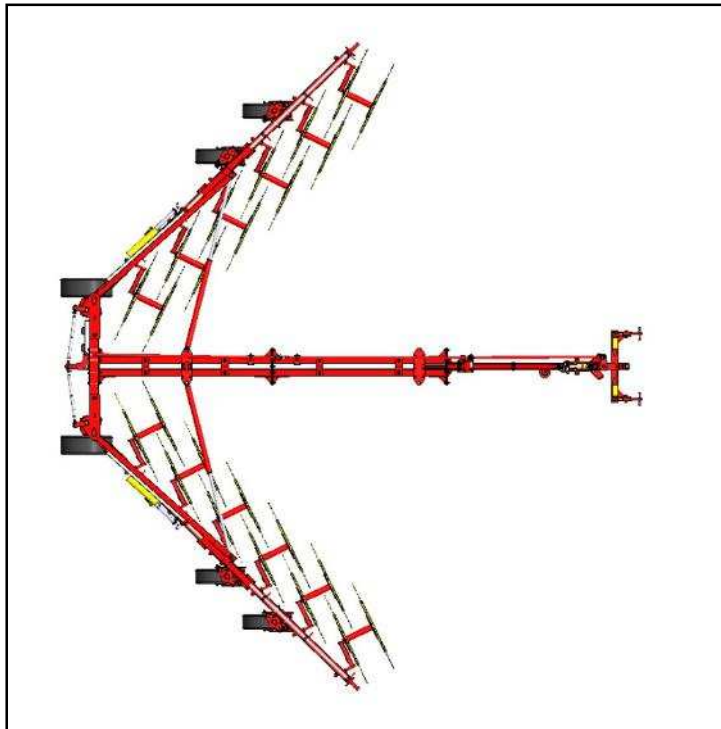


Figure 31



When changing direction, turning or reversing, lift the rakes to prevent structural damage.

Once in the field, open the rake units using the distributor to which the pipes marked with the RED markings are connected, lower the star wheels using the distributor to which the pipes marked with the BLUE markings are connected, and start working preferably at a speed of between 15 and 23 Km/h (between 9.32 and 14.29 mph).

You may change the working width during raking using the distributor to which the pipes with red markings are connected, either to partially close the raking units or open them up to maximum width.

6.3 Adjusting the working speed

Adjust the working speed according to the type and quantity of forage, and the quality of the swath shape.

As a general rule, keep the tractor at a speed of between 15 and 23 km/h (between 9.32 and 14.29 mph).



When changing direction, turning or reversing, lift the rakes to prevent structural damage.

6.4 Stopping the machine

The machine stops when the tractor stops.

6.5 Unhitching the machine from the tractor

Unplug the machine on firm, flat ground only, making sure that it does not obstruct the passage of vehicles or people once parked.

When you park the machine, you must:

- Apply the tractor parking brake.
- Stop the tractor engine.
- Release any residual pressure in the hydraulic circuit.
- Remove the ignition key from the dashboard and put it in a safe place.
- Get down from the driver's seat.
- Lower the machine support foot.
- Disconnect the hydraulic connections (*see Figure 13*).
- Disconnect the lighting system plug (*see Figure 13*).
- Remove the split pins and connection pins. Then remove the arms of the tractor's rear hydraulic lift from the rake hitching points.
- Get back onto the tractor.
- Start the tractor and proceed with caution.



The ground on which the machine is parked must be flat and in a place where unauthorized persons are not allowed to approach.

After moving the tractor, the rake must be secured as follows:

- Insert locks against unauthorized use (see *Figure 32*)
- Place chocks under the main wheels

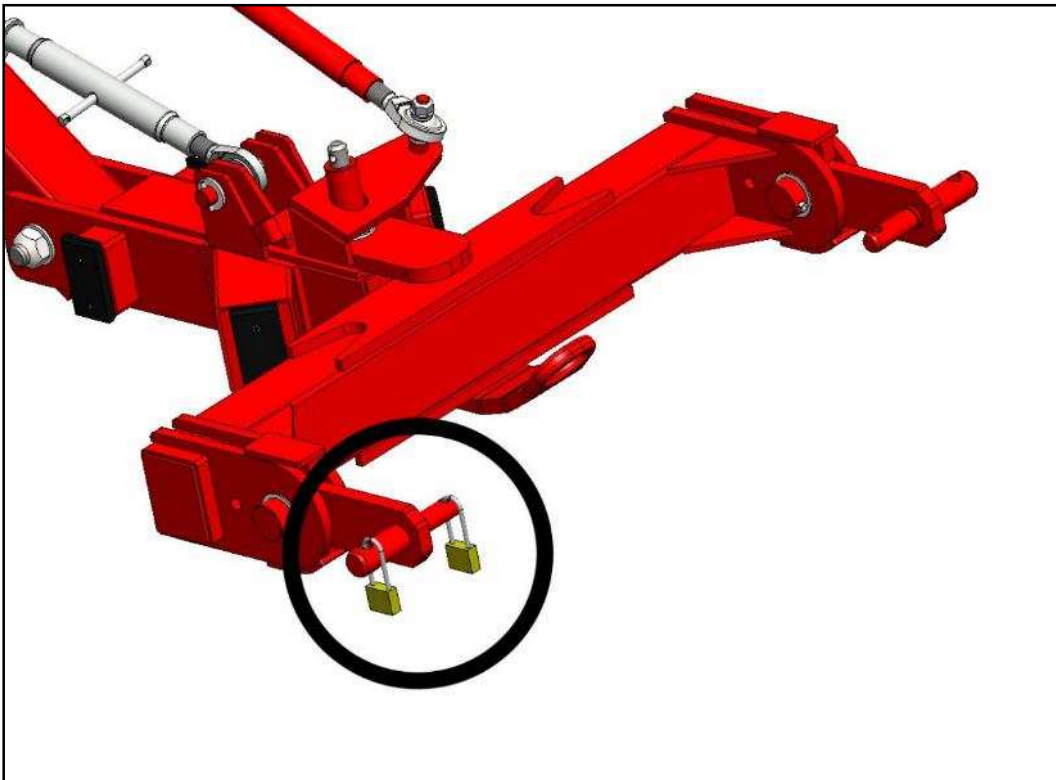


Figure 32



Carelessness in hitching or unhitching the machine from the tractor, and consequent engagement of the mechanical foot can cause the machine to be unstable.

-7- SETTINGS

7.1 *Adjusting the working speed*

Adjust the working speed according to the type and quantity of forage, and the quality of the swath shape.

As a general rule, keep the tractor at a speed of between 15 and 23 km/h (between 9.32 and 14.29 mph).

7.2 *Working height adjustment*

The working height must in any case be adjusted so as to prevent the rake tines on the front star wheels of each single pair from touching the ground.

Correct adjustment of the working height contributes substantially towards reducing dust in the working area and ash in the forage.

To adjust the working height of the star wheel tines, use the devices provided.



To do so, park the tractor on a flat stretch of ground, with the engine stopped, the parking brake applied and the ignition key removed from the dashboard and put in a safe place.

As a general rule, the working parts must always be adjusted to a height such that the front star wheels do not come into contact with the ground.

To adjust the working height of the working parts, proceed as follows:

- Open the rake units using the distributor to which the pipes marked with the RED markings are connected.
- Move the rake forward until all the four swivel wheels are aligned with the moving direction (*as they are in Figure 30*)
- Lower the star wheels using the distributor to which the pipes marked with the BLUE markings are connected.
- Turn off the tractor, apply the handbrake, remove the key and put it in a safe place.

- Make sure the rear star wheel of each pair almost touches the ground (*see Figure 34*)
- If it is too high, lift the pair to be adjusted by hand with the help of a colleague standing in front of the front star wheel, and move the upper hook of the lightening spring into the immediately lower link of the chain in order to lower the star wheel unit (*see Figure 33*); repeat the operation until the required setting is achieved (the rear star wheel must be at least 3 mm / 0.12 inches above the ground).
- If it is too low, lift the unit to be adjusted by hand with the help of a colleague standing in front of the front star wheel, and move the upper hook of the lightening spring into the immediately higher link of the chain in order to raise the star wheel unit (*see Figure 35*); repeat the operation until the required setting is achieved (the rear star wheel must be at least 3 mm / 0.12 inches above the ground).

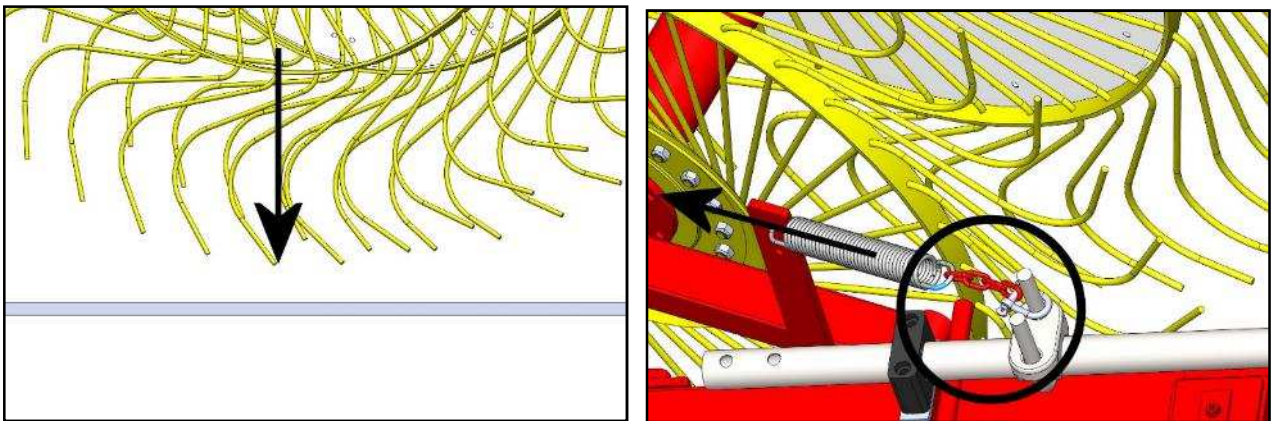


Figure 33

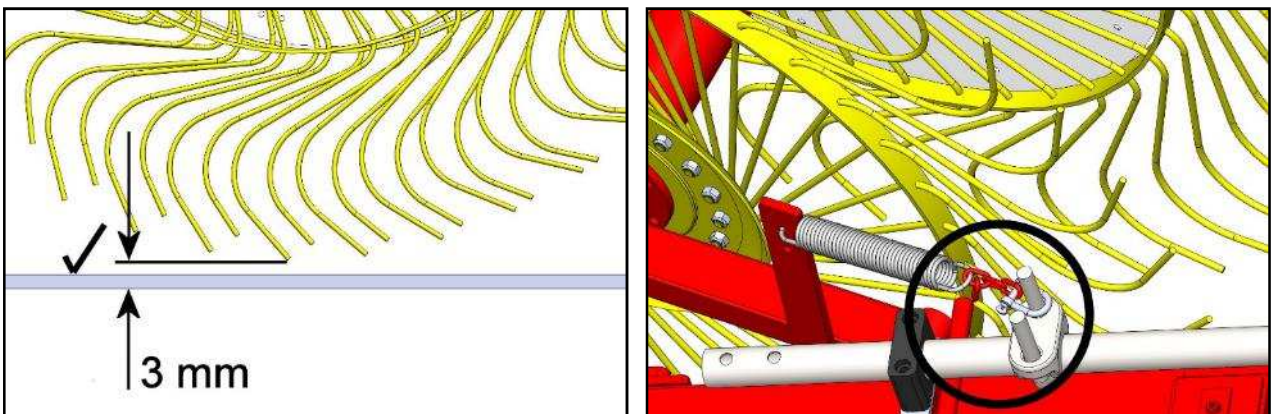


Figure 34

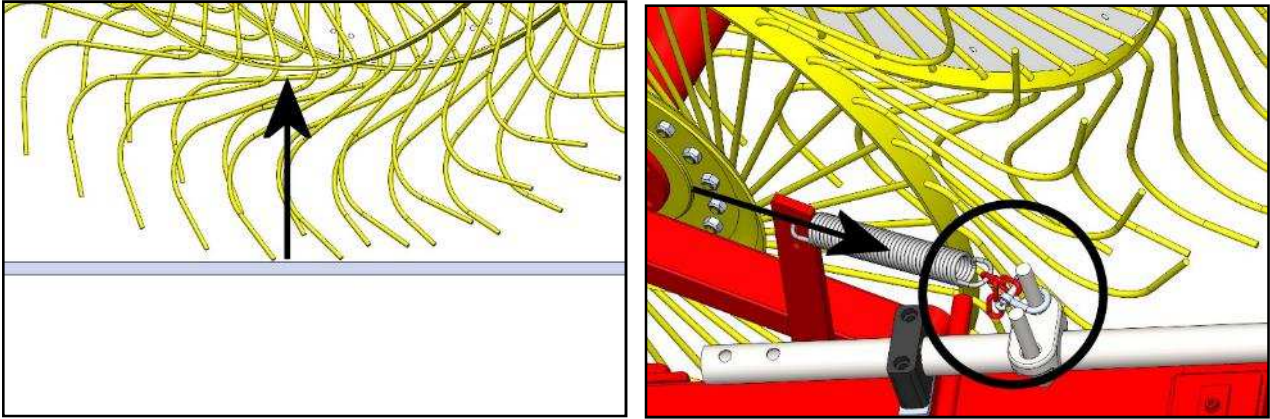


Figure 35

-8- MAINTENANCE



If the rake breaks down, the operator must stop the tractor, remove the ignition key, get off the tractor, inspect the extent of the problem, and proceed with any machine adjustments or repairs.

Remember that all maintenance must be carried out by qualified, trained staff, with the machine stopped, the tractor engine off, the key removed and the parking brake applied.

Maintenance and repair work must not be carried out outdoors, but in a suitably equipped workshop.



During use, adjustment, maintenance, repair or handling, the operator must use suitable Personal Protective Equipment (PPE).

Used oil must be properly collected and not dispersed in the environment since, according to current legislation, it is classified as hazardous waste, and as such must be delivered to special collection centres. Please contact the nearest “Mandatory consortium for used oils”.

Before starting any maintenance, the following operations must be carried out:

- During maintenance operations, the machine must be parked on flat, firm ground, with a maximum slope of 3%.
- Stop the tractor engine, disconnect the machine, apply the parking brake, remove the ignition key from the dashboard and put it in a safe place.
- Always use suitable Personal Protective Equipment (safety footwear, work gloves, tight-fitting work clothing and dust mask).
- Implement all the forms of accident prevention foreseen for the type of operation in progress.
- If you use compressed air to clean the machine, you must protect your eyes with special glasses.

- When the maintenance involves access to parts of the machine that cannot be reached from the ground or in places higher than 1.50 m (4.92 feet) from the ground, use a ladder or a platform in accordance with current safety regulations.
- Do not carry out repairs you do not know how to do. Always follow the instructions, and if there are no instructions, contact the supplier or experienced staff.
- Check hydraulic pipes for wear. Replace them if they are worn or at least once every four years.
- Before carrying out maintenance and repair work under raised machine parts, make sure any locking devices are correctly positioned. In the absence of suitable locking devices, use support stands with suitable specifications for the weight they have to support.
- Do not use any lifting points besides those indicated.
- Make sure that the lifting device chosen is suitable for carrying out the operations in compliance with safety regulations.
- Do not keep the tractor engine running in closed spaces without suitable ventilation to remove the harmful exhaust gases which may concentrate in the air.
- Avoid prolonged and repeated skin contact with fuels/lubricants/fluids, since they may cause skin disorders or other syndromes.
- Do not ingest fuels/lubricants/fluids. In case of accidental contact with the eyes, rinse the affected area thoroughly with water.
- Do not weld in closed or inadequately ventilated spaces.
- Do not weld on or near painted surfaces to prevent toxic fumes from forming. Remove the paint with suitable products, then wash the surfaces and leave them to dry.
- Release the pressure from hydraulic circuits before carrying out any work.
- Do not use your hands to detect high pressure fluid leaks.
- High pressure fluid leaks can penetrate the skin and eyes with very serious consequences.

Clean the machine completely at least once a week.

8.1 Maintenance work which can be carried out by the operator


The maintenance described below does not require any special qualifications. The operator must know and follow the instructions precisely and must have shut the machine down.

Routine checks and maintenance must be carried out under the operator's responsibility with the frequency and in the way set out.

Failure to comply with the maintenance instructions and frequency will affect whether the machine functions correctly and its lifespan, and consequently invalidate the warranty.

Increase the frequency of maintenance in severe operating conditions (intensive use on particularly rough or firm terrain, etc.).

During the first five hours of work, it is advisable to check the tightness of all bolts, since the stresses generated during work lead to structural adjustment. If necessary, tighten the bolts shown in the following table.

	M8	M10	M12	M14	M16	M20	M22	M24	wheels
	13	17	19	22	24	30	32	36	27
Tightening torque (Kg m)	3	6	10	14	21	40	54	70	23
Tightening torque (N m)	30	59	98	137	205	390	530	685	230

8.2 Greasing

Grease the points shown in the Figure 36, Figure 37 and by the pictograms on the machine.

The lubrication points are:

- The steering joint.
- The steering control rod transmission.
- The star wheel hub bearings.
- The star wheel swing arm mounts.
- The pins around which the vertical axis of the swivel wheels rotate.
- The upper and lower joints of the rake units.
- The central rear transmission of the steering wheel mechanism.
- The bearings of the upper and lower supports of the wheel steering control rods.

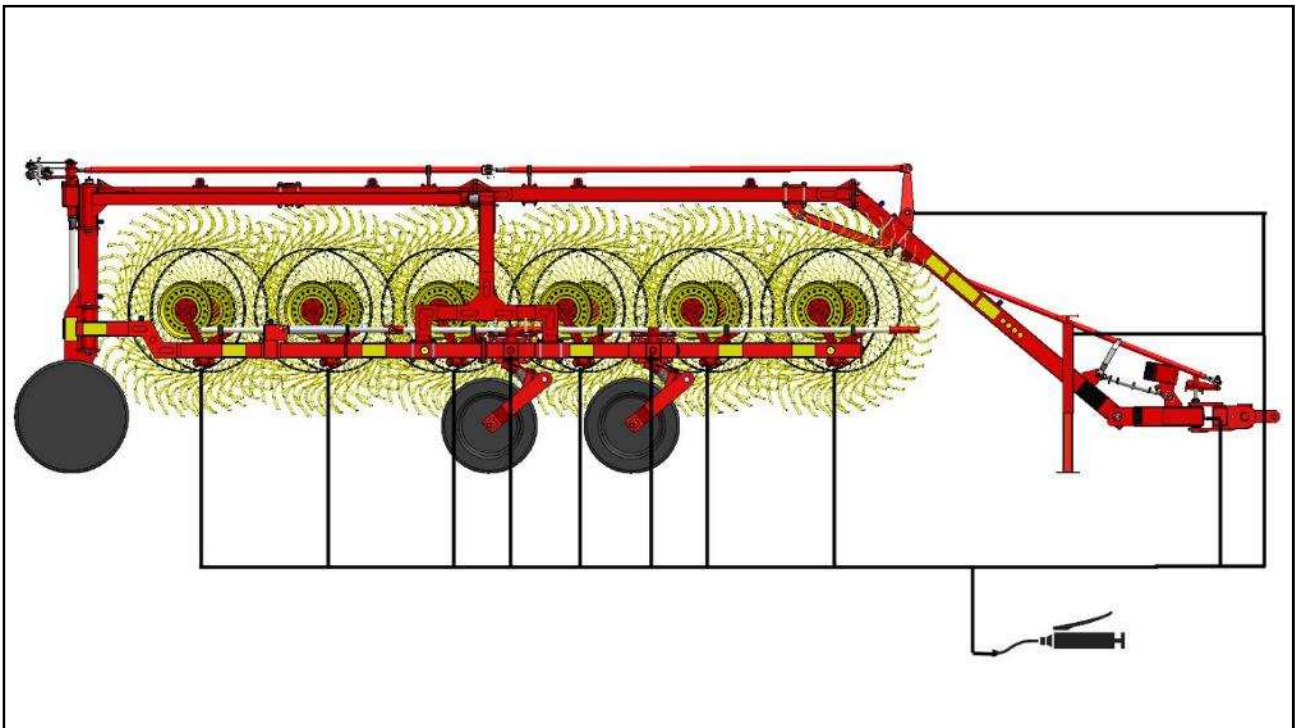


Figure 36

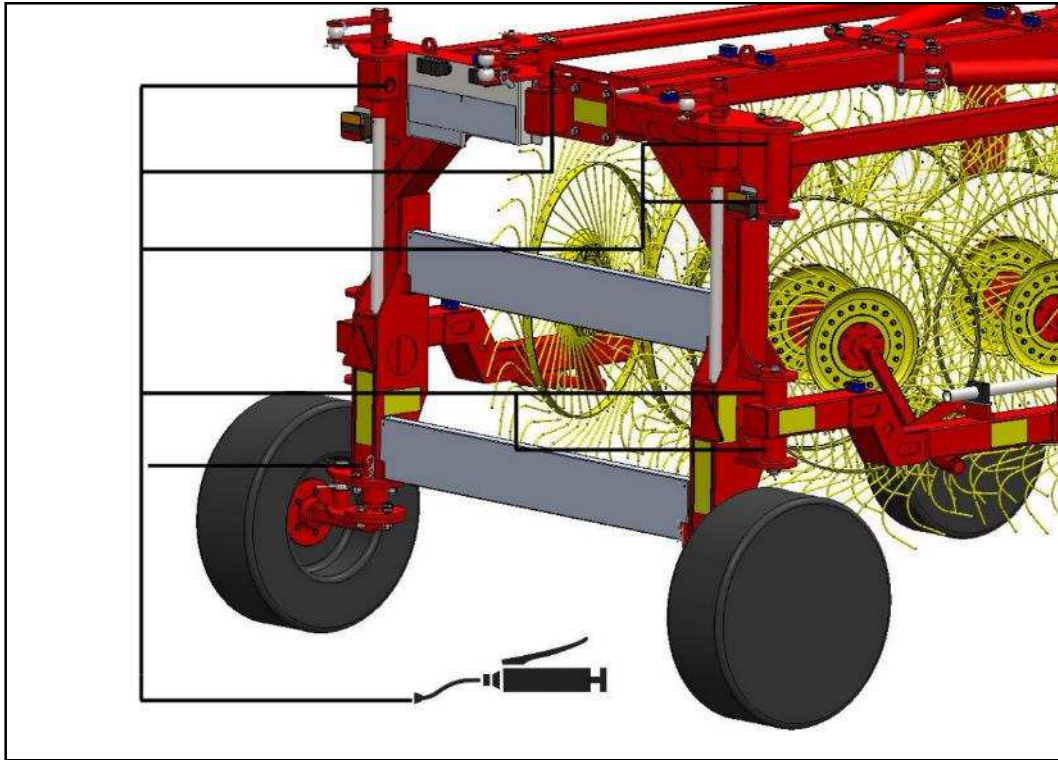


Figure 37

Grease the points shown generously using a grease pump.

Use a manual grease pump only, to prevent damage to bearing seals and grease lines.

Machine components are greased sufficiently when there is a slight overflow of grease from the component itself. Once a component has been greased, do not persist otherwise you may damage the bearing seals and grease lines.

Use NLGI 2 lithium grease (ISO-L-XCCEB2 according to ISO 6743-9).

8.3 Hydraulic system

Visually inspect the machine for loose fittings or damaged, cut or worn pipes. Tighten loose fittings and replace worn or damaged pipes.

The rubber hydraulic pipes must be completely replaced every four years of the machine's life.

8.3.1 Replacing a hydraulic pipe

Before starting to replace a hydraulic pipe, take all the safety measures required for maintenance work, stop the machine, and close the hydraulic system valves.

Before removing a hydraulic pipe, make sure any remaining pressure has been released from the system.

Single out the damaged pipe and loosen the two connection points with a wrench, paying attention to any hydraulic fluid which may leak out.

Only replace damaged pipes with original spare parts.

Make sure the connection points (threads, gaskets, etc.) are in perfect condition before fitting the new pipe.

Use wrenches to tighten (in a clockwise direction) hydraulic pipe connections that are leaking. Do not over tighten, since this will damage the fitting threads.

8.4 Check for tool wear

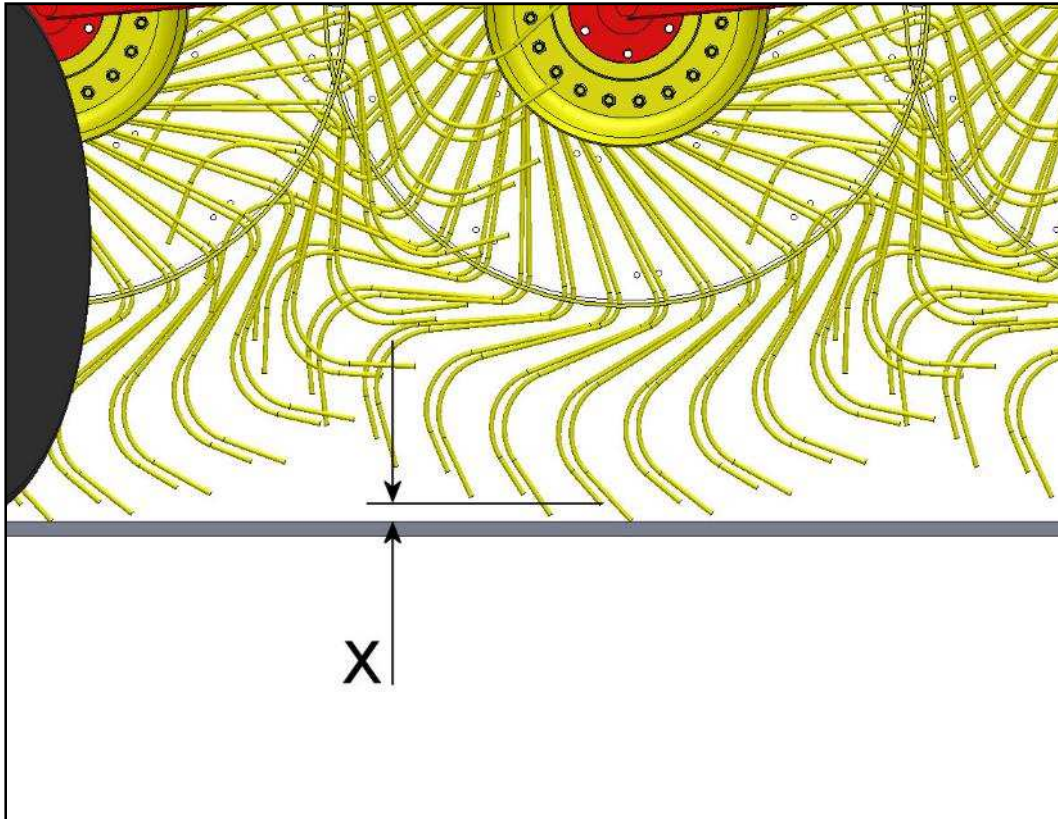


Figure 38

Visually check the rakes (tines) $X > 10$ mm (see Figure 38). Replace tines when you notice an increase in power consumption or when they are misshapen or cracked, or when the forage is not spread correctly in the field.

Using the machine with damaged tools will compromise the quality of the work.

8.5 Replacing tools

To replace tines, proceed as follows (see Figure 39 and Figure 40):

- Open the rake units using the distributor to which the pipes marked with the RED markings are connected.
- Turn off the tractor, apply the handbrake, remove the key and put it in a safe place.
- Unscrew the nuts on the retaining plate that locks the tine to be replaced.
- Remove the tine from the ring and insert the new one.
- Lock the replaced tine by tightening the nuts on the plate.



Figure 39

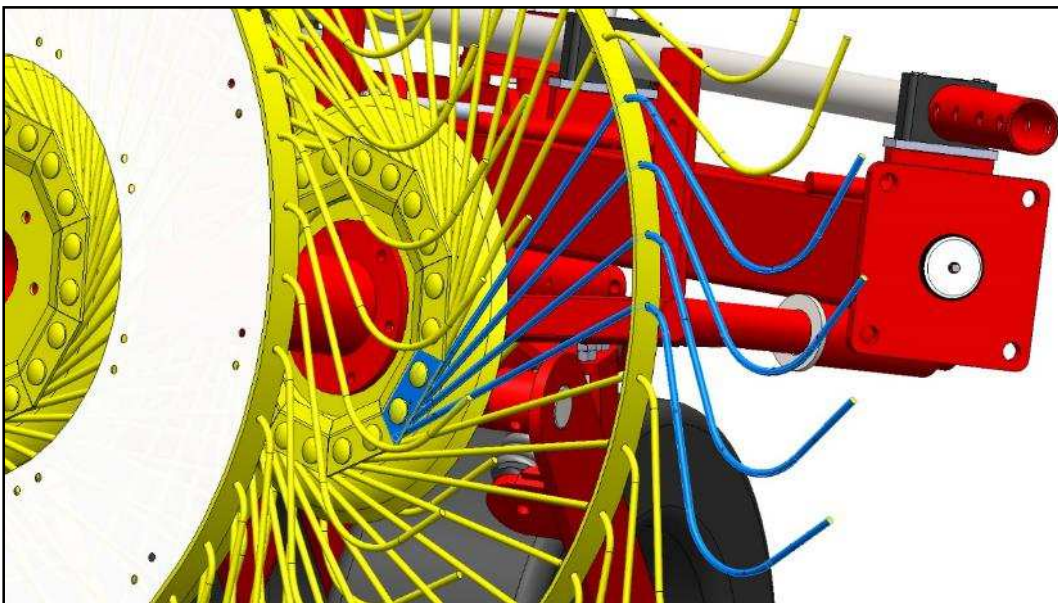


Figure 40



Before replacing tools, stop and switch off the tractor, remove the ignition key, switch off the power take-off and apply parking brake.



When changing tools with the rakes raised off the ground, do not rely on the hydraulic lift to hold them up. Insert a mechanical block on the raking unit control tube to prevent the units themselves from lowering unintentional and dangerously

8.6 Machine cleaning

Clean the machine regularly using high pressure water, paying particular attention to any residues of flammable materials.

The machine must only be cleaned after it has stopped, the tractor engine has been switched off, the ignition key removed and the parking brake applied.

Check that the machine wiring is in good condition. If you see any deterioration in the wire sheathing, replace the affected wiring.

-9- MAINTENANCE SCHEDULE

■ GREASING

◆ REPLACEMENT

● CHECKS

Description	After the first five hours	After the first fifty hours	Interval in hours			
			10	50	200	500
GENERAL MACHINE CHECKS						
Greasing	■		■			
Safety protection check	●	●		●		
Tyre pressure check	●		●			
Bolt tightening check	●	●		●		
Tine wear check		●			●	
Tine replacement						●
HYDRAULIC SYSTEM						
Hydraulic pipe check	●	●		●		
Hydraulic pipe replacement						◆
Stop valve check	●	●		●		
ELECTRIC SYSTEM						
Light operation check	●	●		●		
Wiring check	●	●			●	

-10- TROUBLESHOOTING

FAULT	CAUSE	SOLUTION
Uneven swath	Worn or damaged tines	Replace tines (<i>see 8.5</i>)
	Machine not correctly adjusted	Make adjustments (<i>see 7.2</i>)
	Forage not unloaded correctly and the machine blocks up	Remove front star wheel from the two central units (<i>see 5.3</i>)
		Reduce working width
		Reduce speed
Early tool wear	Stony terrain	Prepare terrain beforehand
	Excessive contact between tools and ground	Adjust the working height (<i>see 7.2</i>)
Machine noisiness	Damaged, worn or missing tools	Replace tools
	Worn bearings	Have hub bearings replaced by an authorised workshop
	Excessive contact between tools and ground	Adjust the working height (<i>see 7.2</i>)

-11- SPARE PARTS

Repairs and replacements must be carried out using original spare parts, which must be requested from an authorized dealer. The order for spare parts must be correct and bear the following information:

- Type of machine.
- Serial number.
- Spare part code number which can be found in the spare part catalogue.

-12- WARRANTY

In order to be covered by the contractual warranty provided by the manufacturer, the operator must comply scrupulously with the precautions shown in this manual, and in particular:

- Comply with the limits of use set out by the manufacturer.
- Not alter or make changes to the machine without the written approval of the manufacturer.
- Always carry out all prescribed maintenance work.
- Always use original spare parts.
- Make sure the staff using the machine has the necessary skills and training.

The contractual warranty does not apply if the above mentioned conditions are not complied with, even only partially.

The use of spare parts that have not been approved by the manufacturer invalidates all warranties and exonerates the manufacturer and dealer from all liability for malfunctions or accidents.

The removal or alteration of guards and protection devices exonerates the manufacturer from any liability for damage caused to property and/or persons.

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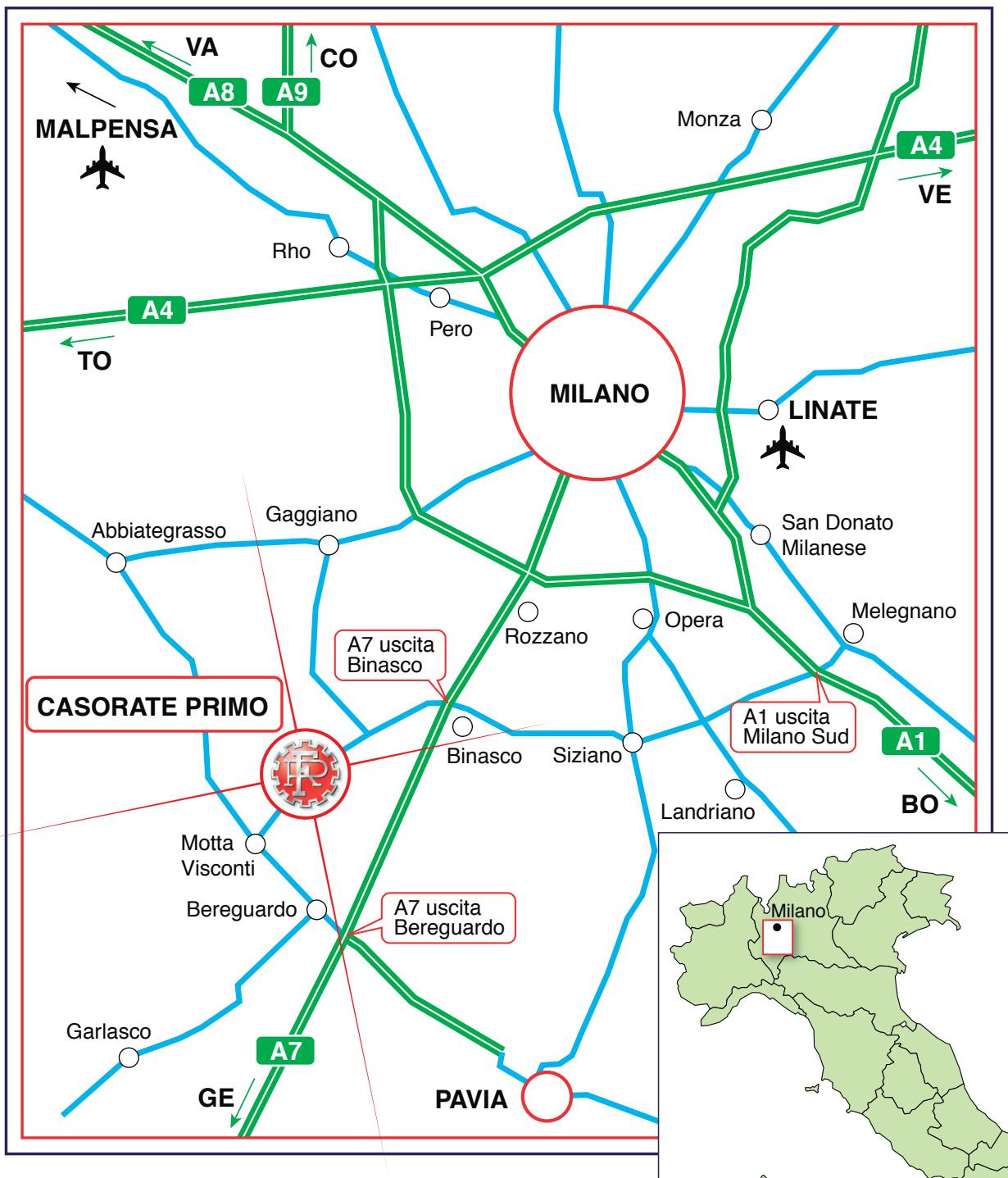
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