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ORIGINAL USER MANUAL
SPARE PARTS CATALOGUE
WARRANTY

SINGLE-ROTOR HAY RAKE
SPYDER 420 / 360

CE

Borzytuchom 2024

Revision 9

Translation of the orginal manual

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ATTENTION!

Before starting the machine it is compulsory to read the instruction manual and adhere to the safety instructions included.

This operating manual is an integral part of the machine!

This document should always be kept at handy for instant operator's access and should be protected against accidental damage.

In case of loss or damage the owner is obliged to acquire a new copy ordering from the dealer or the manufacturer.

In case of sale or transfer of the machine it is obligatory to make sure that the operating manual and the declaration of conformity for the machine is transferred at the same time.

The manufacturer holds sole copyrights to this document.

Copying, altering full or part of this document is prohibited without written consent of the manufacturer.

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TALEX guarantees machine functionality when used following the technical and operational guidelines described in the USER MANUAL.
Defects revealed during the warranty period will be repaired by the Warranty Service.
The repair deadline is specified in the WARRANTY BOOK.

The warranty does not cover the machine parts and elements that are subject to wear under normal operating conditions, regardless the warranty period e.g.: bearings, blades/flails, protective skirts/stone guards, hydraulic hoses etc.
Warranty claims cover mechanical damage not caused by the user's fault, parts factory defects etc.

In case when the damage was caused by:

- Mechanical damage caused by user's fault or road accident,
- improper exploitation, adjustment and maintenance, use of the machine contrary to its intended use,
- using a damaged machine,
- repairs carried out by unauthorized persons, incorrect performance of repairs,
- unauthorized changes to the machine construction,

The user may loose the warranty.
The user is obliged to immediately report all noticed defects in paint coatings or traces of corrosion, and have the defects repaired, regardless of whether the damage is covered by the warranty or not. Detailed terms of the warranty are given in the WARRANTY BOOK attached to the newly purchased machine.

WARNING !
Demand the seller to carefully fill out the WARRANTY BOOK. The lack of, for example, the date of sale or the stamp of the dealership exposes the user to risk of warranty complaints rejection.

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1. Introduction

This document covers the most recent data available at the date of its publication. Due to the development of the product some of the drawings and parameters described may not fully represent your machine. The manufacturer reserves the right to introduce changes in construction and design of the machine in order to improve its safety and functionality without making any amendments to the operating manual if the modifications can be considered as minor and not affecting operator's safety and working principals of the machine stay as before.

A full and thorough reading and understanding of all sections of this manual should be completed prior to trying of the machine for the first time. The rules and recommendations contained in this document must be adhered to at all times.

CAUTION
Familiarize yourself with the operating manual prior to operating this machine

This operating manual contains the description of all risks, which may occur in case of not observing the safety rules when operating and maintenance of this rotary rake. The safety precautions are listed in this document and should be adhered to in order to minimalize or avoid the risks.

This manual explains working principals of the machine and contains instructions on how to carry out all operations with this machine safely.

In case of any doubt arising or if the information in the manual is insufficient, please ask the manufacturer directly for detailed explanation of the issue.

CAUTION
This symbol represents danger or warning.
This symbol highlights the place in the manual where there is important information about the need for special care and attention. Reading of this section and adherence to the recommended safe operation is compulsory.

2. Identification of the machine

Each of the SPYDER hay rakes can be identified by the serial plate featuring the essential data of the machine. The plate is located on the main headstock of the machine, in a prominent and easy to access place and contains unique identification data confirming compliance of the machine with currently binding legislation. Under no circumstances should the identification plate be removed from this machine or used for another machine.

Figure 1. Serial plate

The serial plate contains:

- full name and address of the manufacturer,
- serial number
- model
- CE mark
- weight
- quality control ID
- manufacturing year

Please, quote the details of the machine contained in its serial plate whilst placing a warranty complaint or an order for spare parts.

3. Occupational safety regulations

3.1 User safety

This hay rake can be operated only by a qualified adult person, familiarized with its operating principals and the content of the operating manual. The machine should be always handled with utmost care.

- The Basic Health and Safety rules should be used in addition to the recommendations included in this operating manual. Always comply with warning symbols on the machine.
- The operator must have the sufficient qualifications to drive a vehicle to which the hay rake is attached, in compliance with the manufacturer recommendations or current legislation.
- Be vigilant for places on the machine posing injury risk (sharp or pointed edges of the machine, etc.). Exercise due caution near critical places, especially whilst performing any kind of task requiring being close to the machine e.g. service, maintenance, making manual adjustments etc. Protective outfit should always be worn including protective clothing, gloves, safety boots and protective googles.
- Read operator's manual prior to use of this implement in order to familiarize yourself with its working principals, risk management and recommendations regards operation and adjustment.
- Do not use the hay rake with any missing factory-provided guard or cover limiting access to hazard zones. Keep all safety guards and covers in working condition and check regularly for their completeness.
- Due to the residual risk involved, it is imperative that all the rules and recommendations featured in this operating manual as well as common sense are followed at all times. Reasonable conduct is advised.
- Under no circumstances the machine should be operated by persons being under the influence of alcohol or of any other intoxicating agent.
- This machine should be only operated by the driver of the tractor (no passengers allowed). No one should remain in the vicinity of this machine whilst working.
- Do not use this implement against its intended purpose. Other than intended by the manufacturer use will be considered as misuse and will void the warranty as well as will exempt the manufacturer from liability for damage caused as result of such conduct.
- In case of any doubt arising regards this machine or any piece of information included in this document, please ask the manufacturer or your dealer for detailed explanation of the issue.
- Misuse, reckless behaviour around the machine and ignoring of the warnings included in this operating manual can pose unnecessary threat to life, health.
- It is recommended to check the technical condition of the machine every time before work commencement. Pay special attention to the condition of headstock, linkage pins, safety pins, chassis, PTO shaft safety covers, safety guards, crop tines etc. It is forbidden to operate the machine out of order.

- Do not carry persons or things on the machine.
- Before linking to the tractor, place the machine on a hard, flat surface, lower down the support stands and lock the chassis in place by means of wheel blocks. Beware of potential stabbing hazard whilst moving near the arms which are folded in the transport position. To reduce injury risk always cover upwards facing tines with the provided protective yellow sleeves at all times..
- **Do not power up the machine with the rotor arms in the transport position. Powering up the rotor when locked in place can cause permanent damage to the rotor gearbox and the power take off drive line.**
- No one is allowed to stand in-between the implement and the tractor whilst connecting the tractor three point linkage. This area is considered a crush zone.
- Extra care must be exercised when linking the implement to the tractor.
- The headstock of the machine is designed for use with rear tractor three point linkage of category I/II and it should not be used with any different category.
- To secure three point linkage pins from falling out use only typical cotter/ linch pins supplied by the manufacturer. Work with non-standard safety pins or without any safety pin is forbidden.
- Make sure the correct type of PTO shaft is used and it has suitable movement within the operation zones, if in doubt, consult operator's manual for PTO shaft.
- Do not use PTO shaft with no safety covers on or when the safety covers or the PTO shaft itself are damaged. Remove the fault if possible or replace the item with new.
- To prevent the PTO shaft safety cover from spinning, connect the safety chain to a rigid, not moving element of the machine.
- Always have the PTO shaft connected to the tractor and to the machine to prevent damage in transit. Do not use safety chains of the PTO shaft to support it whilst in transport.
- After connecting the PTO shaft check the correctness of the connection at both ends. Make sure that safety covers and chains are in place.
- Before you power the implement up:
    - Make sure that the direction of rotations of the PTO shaft is correct.
    - Check if the tine arms are set in correct position and are appropriately secured.
- Make sure no one stays in the hazard zones. Be especially vigilant for children and animals. The Operator is responsible for keeping sufficient visibility of the machine and work area.
- The rotary rake should not be used or transported at night or when the visibility is poor as it creates unnecessary risk of an accident involving other road user.
- Do not exceed the PTO operating speed at 540 rpm.
- Avoid placing of the drive assembly under sudden load whilst starting work. Always increase the rotations gradually.
- **It is imperative to cut off the power supply from the tractor before reversing the tractor with the mounted machine or before making U-turns. Manoeuvring with the powered machine can cause damage to the drive assembly.**
- Do not leave the driver seat when the machine is powered.

- It is the Operator's responsibility to make sure that no one comes within 50 m distance of the rotary rake whilst working due to the risk of ejecting object or coming into contact with hazard zones e.g. rotating parts.
- Make sure that the raking tines are set in correct position before starting work with the implement.
- Do not place your fingers or limbs in positions where they could be cut, crashed or trapped.
- Under no circumstances are you allowed to come in vicinity of the rotor or PTO shaft whilst in move.
- Before disconnecting the PTO shaft switch of the engine of the tractor, remove the ignition key and engage the hand brake.
- All operations should be done observing the Basic Health and Safety rules. In case of injury the wound should be immediately rinsed and disinfected.
- Any maintenance or repair works can be done only after the engine of the tractor was switched of and the ignition key was removed.
- Use protective gloves and appropriate tools whilst performing any work by the machine.
- Stop all operations immediately if any malfunctions or damages were revealed.

DO NOT WORK WITH A BROKEN DOWN MACHINE.

- To keep your machine safe and operable check its technical condition regularly. Pay special attention to all separable connections. Lubricate the greasing points following the manufacturer's recommendations. Inspect the condition, completeness and operability of all assemblies of the machine. Keep the correct tire pressure. Replace the damaged or worn part with new.
- Do not work under raised, unsecured machine. Use only attested, fully operable hoisting equipment of sufficient lifting capability. It is imperative to use additional solid supports to ensure safety in case of hoisting equipment failure. Never prop the machine with fragile objects such as bricks or breeze-blocks.
- Do not wear loose fitting clothes such as coats, unzipped or unbuttoned jackets or fleeces, scarfs or loose straps near the machine and tie the long hair up in a bun to minimalize the risk of being caught by the rotating elements of the machine such as PTO shaft or the rotor. Under no circumstances come near the machine when it is powered or still in motion. Exercise special care whilst performing any service or maintenance task near hazard zones.
- When carrying post warranty service involving any welding works it is imperative to follow the rules listed below:
    - The welding works should be done by a qualified person.
    - Ensure there is sufficient lighting and ventilation in the work area.
    - Do not weld a tractor mounted machine due to the risk of fire or electrical short.
    - After removing the layer of paint and primer, clean and degrease the surface intended to weld. Remove excess of lubricant from the nearby greasing points

- To minimalize the risk of causing fire remove all inflammable elements of the machine if possible or use sufficient heat protection. Do not touch freshly welded surfaces to avoid the risk of burns.

3.2 Residual risk assessment

Talex Sp. z o.o. Sp.k. has made every effort to eliminate the risk of an accident. However, there is some residual risk, which can lead to an accident, and is primarily associated with the actions described below:

Table 1. Residual risk

NO	*Risk*	*Risk source (cause)*	*Precautions and prevention*
1	Overload of the muscular and skeletal system (physical stress)	Working in standing, stooped or forced position, walking, moving heavy objects around	Familiarizing with the operating manual, operator's basic health and safety regarding manual lifting. Assess whether you need assistance to lift an object or use correct tools to assist you e.g. back belts, trolleys or mechanical aids to achieve movement.
2	Trip hazard and slippery surfaces	uneven ground, obstacles, poor visibility, slippery or wet surfaces, untidy operating areas and walkways e.g. electric leads on the ground	Always be precautious, use footwear with a good grip and work with adequate light. Never obstruct walkways and take great care when walking on uneven or wet surfaces. Do not run in restricted areas. Keep your work area tidy.
3	Risk of walking into fixed, protruding parts of the machine	the machine and its surrounding	Beware of protruding parts whilst servicing the machine. Keep the walkways clear. Take special care whilst near the machine. Always wear protective clothing. Secure the raking tines which are pointing upwards in transport position by means of protective tarpaulin sleeves.
4	Risk of being hit by moving objects or parts	material discharge, stones	Observe ground conditions, make sure all bystanders are at least 50 meters away whilst working with the machine. Always wear protective clothing, hard hat and goggles. Do not come in vicinity of the machine whilst powered or still in motion. Take special care whilst servicing rotating or moving parts of the rotary rake.
5	Sharp edges	exposed sharp edges, hand tools	Wear personal protection clothes and gloves at all times. No flappy clothing allowed. Take special care whilst near the machine.
6	The weight of suspended machine	Wrong assembly, badly made connection to the tractor or adjustment of the machine. Not complying with Health and Safety rules, leaving the mounted machine lifted up on the tractor linkage.	Take special care whilst near the suspended machine. Use protective outfit at all times- safety boots, safety gloves. Whilst performing inspection or service works use correct tools to lift up and secure the rotary rake in place to avoid risk of being crushed under the machine. Use assistance of the other trained person. Read operators manual carefully.

7	Microclimate – changing weather conditions	Work performed in unsettled weather conditions	Proper protective outfit, beverages, protective cream with filter, rest
8	Noise	excessive rotations of the machine; damaged, loose or vibrating parts	Work only with fully operable machine. Control regularly condition of all assemblies of the machine. Follow the recommendation regards appropriate rotations.
9	Head injury	Standing in crash zone when unfolding the safety barriers	Take special care when unfolding the safety barriers. Keep out of the crashing zones. Do not remove safety springs protecting against free falling of the barriers. Read the operators manual carefully.
10	Crushing injuries of the body	Sudden release of energy accumulated in the springs e.g. during service works	Exercise extra caution with spring loaded elements of the machine. Provide service works only when the machine and its elements are positioned in a safe way. Wear personal protection clothes, boots and gloves at all times. Use help of other qualified person when needed. Use correct tools. Do not work in hurry. Reasonable conduct advised.
11	Crushing injuries of the legs and cutting injuries of hands,	The crop deflector is mounted on a telescopic bracket and it is possible that the inner box profile of that bracket may get stuck inside the outer box profile.	Exercise extra caution. Do not work in hurry. Wear personal protection clothes, boots and gloves at all times. To release the element that got stuck, first try to move it sideways a little.
12	Risk of being trapped or pulled in	Staying near the hay rake when it is altering position e.g. when at work; rotating or moving parts of the machine; PTO shaft; not using safety barriers.	Beware of danger and never come close to the machine or driveline when in motion Do not wear loose fitting clothes. Wear clothes that will not snag on the machinery instead- preferably overalls. Remove jewellery that may snag - e.g. watch, rings, neclace. Keep long hair tied up. Read the operating manual carefully. Respect safety pictograms placed on the machine.

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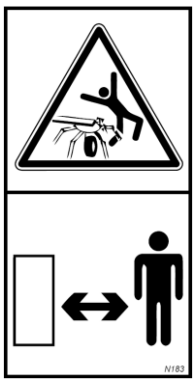
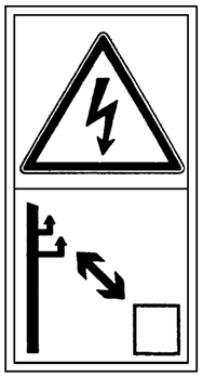
3.3 Warning decals on the machine

Table 2. Safety pictograms.

 1.0 – Caution. Prior to work commencement read the operating manual.	 1.1 – Caution. Stop the engine and remove the ignition key before carrying out any repairs or maintenance.	 1.2 – Thrown objects, pull-in accidents and other hazards. No persons allowed in distance less than 50 m from the working machine.
 1.3 – Caution. Wrap point - exposed, rotating driveline	 1.4 – Cutting hazard - Free moving parts. Do not touch rotating elements whilst in motion.	 1.5 - Crush point. Keep away from linkage arms of the tractor hydraulic lift whilst in use.
 1.6 – Caution. Wrap point - Exposed rotor assembly.	 1.7 – High voltage - risk of electric shock. Keep sufficient clearance from power supply lines.	 1.8 – Crush hazard. Keep away from the swing area around the safety barriers.

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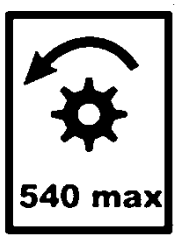
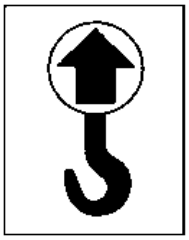
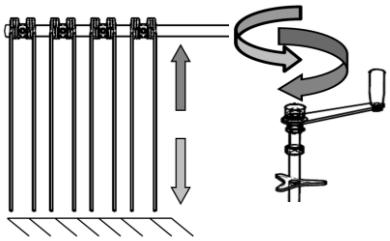
 1.9 – Do not exceed the PTO operating speed at 540 rpm.	 1.10 – Correct position of the raking arms for chosen function: TRANSPORT- transport; PRACA-work.	 1.11 – Lift point
 1.12 – Raking height adjustment	 1.13 – Transport lock – It is imperative to lock the tine arms in transport position before transport on a public road	 1.14 – Lubrication point- use solid grease.
 1.15 –Lubrication point- use oil to grease.	 1.16 – Do not exceed maximum tire pressure	 1.17 – Use ear protection
 1.18 – Use protective clothing	 1.19 – Use safety gloves	 1.20 – Use eye protection

4. Intended use

This rotary rake was designed for agricultural use in process of production of animal feed and bedding. It is intended for raking cut grass, hay or straw in uniform windrows or swaths. Machine should be use on stonless meadows or pastures where where stones were removed. Large stones can cause unnecessary machine damage.

Use of the machine in conditions other than above mentioned will be understood as its misuse. The manufacturer's recommendations and provisions mentioned in this operating manual should be strictly adhered to every time the machine is operated, maintained or serviced. Not applying to those rules will be considered as use of the machine against its intended purpose.

The machine can be operated, maintained and serviced only by trained personnel familiarized with its technical characteristics and Health and Safety rules.

The applicable provisions of Health and Safety as well as Highway Code should be adhered to at all times.

Unauthorized changes made without consent of the manufacturer will void the warranty and exempt the manufacturer from liability for damage caused as result of those changes.

All obscurities concerning intended use of the devices hall are explained by contacting with the machine manufacturer. Proper selection of a machine and the conscious of its intended use shall increase the operation safety.

Using the machine for purposes other than accepted shall be understood as misuse.

5. Description of the machine

5.1 Technical characteristics - parameters

Table 3. Technical parameters

Lp.	Description	Unit	Value/Type	
			420	360
1	Overall length in transport position	[mm]	4000	3550
2	Overall length in working position	[mm]	3965	3550
3	Overall width in transport position	[mm]	2300	2200
4	Overall width in working position (min.-max.)	[mm]	3910-4510	2800-3400
5	Maximum height in transport position	[mm]	2770	2300
6	Working width	[mm]	4200	3600
7	Tractor horsepower requirement	[HP]	min.50	min.40
8	Maximal PTO rotations	[RPM]	540	
9	Recommended PTO rotations	[RPM]	300÷400	
10	Unladen mass	[kg]	630	570
11	Number of rotors	[pcs.]	1	
12	Number of rotating arms	[pcs.]	11	9
13	Working capacity	[ha/h]	4-4,5	3,4-3,9
14	Working speed	[km/h]	10	
15	Noise level	[dB]	<75	
16	Number of wheels	[pcs.]	4	
17	Tire size	-	15x6.00-6	
18	Tire pressure	[bar]	2,2-3,0max	

5.2 Technical characteristics – major components

The construction of the machine is shown in Fig. 2. The headstock of the machine (1) is connected to the main frame (2) via the main pivot pin and additionally via a pair of steering rods with spring compression (4). The rods are mounted one at each side and are responsible for centralizing of the machine behind the tractor. The machine is fitted with 11-arm rotor (9). Inside the rotor solid cast housing there is an oil-immersed cam track on which run cam rollers connected to the individual tine arm housings. This allows for smooth, low-friction transmission. The tubular tine arms are fitted into the arm housings. The movement of cam rollers provides simultaneously the pivoting and rotary movement of the tine arms. In standard option, there are six folding arms (10) and five fixed ones (12), each fitted with a set of four, angled, double raking tines. The rotor is mounted directly on top of the undercarriage which is fitted with twin wheeled rocking beam system allowing for efficient contour following. Additionally, the machine has got a manual winding mechanism (8) to adjust tine height against the crop. After setting of the desired raking height, the threaded rod should be locked in place by means of a three-armed counter nut. The hay rake is equipped with a swath-forming screen (7) which is responsible with forming one windrow of raked mass. The width of the formed windrow is adjustable by means of extracting or retracting the profile which is mounted inside the profile of the left protective barrier, which is additionally secured with a pin and a lock to prevent from falling out. To limit the access to the working area of the machine, the rake has been equipped with right (5) and left (6) protective barriers.

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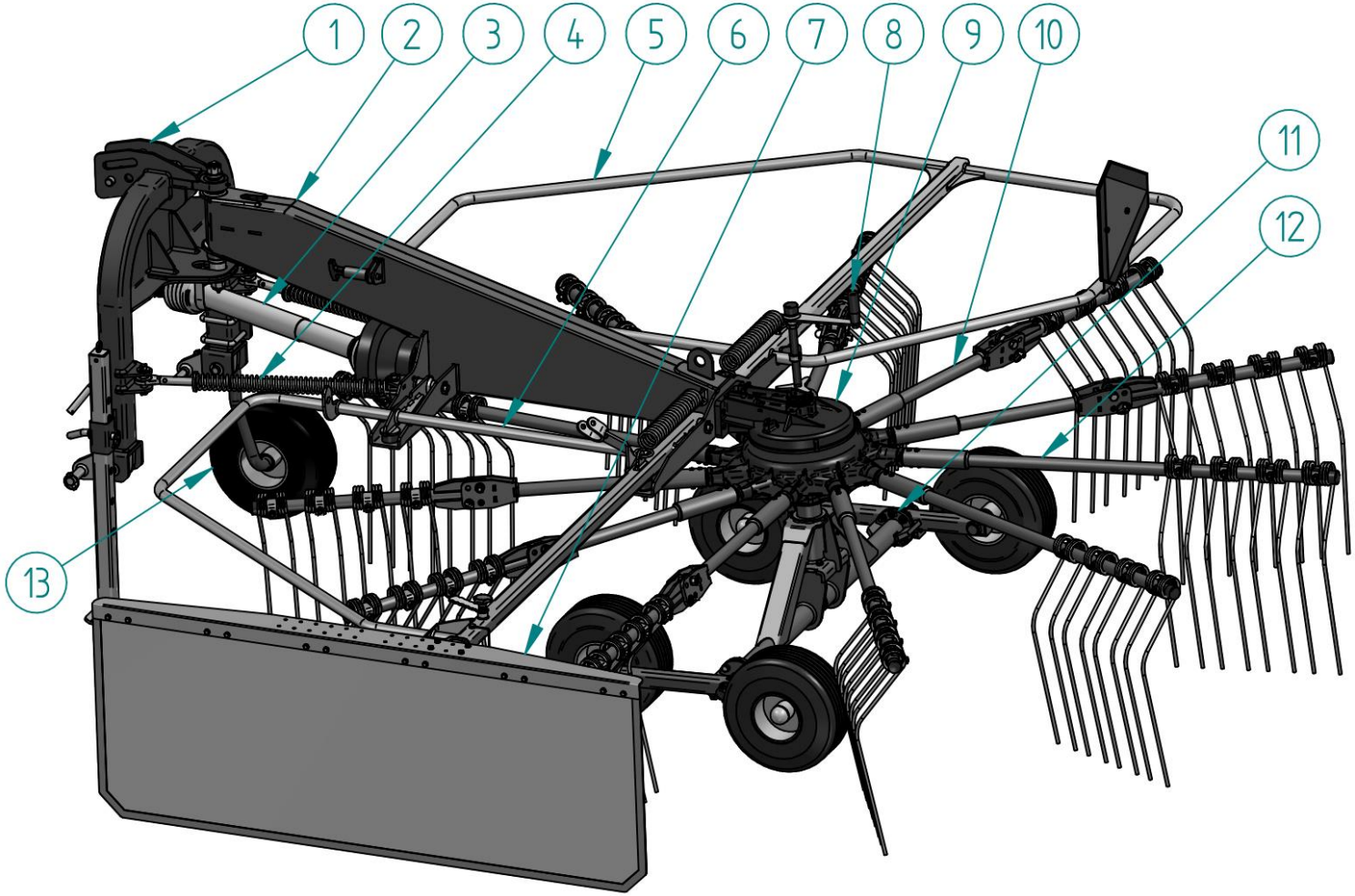

Legend:
1. Main hitch
2. Main frame
3. Drive transmission
4. Control link
5. Right barrier
6. Left barrier
7. Swath screen
8. Raking height adjustment mechanism
9. Main gearbox
10. Foldable raking arm
11. Chasis
12. Stiff raking arm
13. Support wheel

Figure 2. Single-rotor hay rake – main components

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6. Operating principals

The manufacturer ensures that the machine is fully operational and has been checked according to the quality control procedures and approved for use. However, this does not relieve the user from the obligation to check the machine after delivery, prior to starting it for the first time. Before performing any task concerning attaching of the hay rake to the tractor inspect its technical condition and prepare it for the trial start up. Follow the steps listed below:

a) Familiarize yourself thoroughly with all pieces of information described in this operating manual, especially concerning the User's Safety, built of the hay rake, its functioning and operating principals, transportation, service and maintenance recommendations etc.
b) With help of this operating manual, familiarize yourself visually with the built of the hay rake and placement of the safety alert pictograms located on the machine near the specific hazards. Make sure that you recognize thoroughly the meaning of all safety labels and what kind of danger do they represent. Be cautious when near the machine.
c) Check if the machine is complete, especially that all separable connections e.g. threaded bolts, nuts, linkage pins, safety cotter/linch pins etc. are not missing.
d) Make sure that all threaded connectors are tight.
e) Check the condition of the tires and tire pressure.
f) Check if the wheels are attached properly to the undercarriage.
g) Check the condition of paint coating.
h) Visually inspect the machine for any signs of damage incurred before or during delivery especially when loading/ unloading or in haulage. Be vigilant in particular for fractures, dents, cracks, punctures etc.
i) Check if all the greasing points were primed with lubricant. Supplement the lubricant if needed. Follow the recommendations of the manufacturer as described in the chapter „Service and maintenance".
j) Inspect if the raking height adjustment mechanism work correctly.
k) Make sure that the raking arms are attached properly to the rotor.
l) Check the condition of the raking tines and if they are bolted up correctly to the raking arms.
m) Make sure that the safety barriers were mounted in a correct way and are fully operable.
n) Check the condition of the swat deflector, especially its tarpaulin shield.
o) Inspect the condition and completeness of the headstock and linkage connectors. Make sure that nothing got damaged in transit and there are no missing elements e.g. linkage pins, linch pins, safety cotters etc.
p) Check the gearbox against the leakages. Make sure that the level of oil in the oil compartment is sufficient.

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6.1 Linking to tractor

WARNING
Do not work with broken down machine or tractor.
Use only typical cotter/ linch pins supplied by the manufacturer.
Work with non-standard safety pins or without any safety pin is forbidden.

DO NOT WORK WITH THE TOP LINK PIN IN THE TRANSPORT POSITION AS IT WILL CAUSE DAMAGE TO THE HEADSTOCK AND LOSS OF THE WARRANTY.

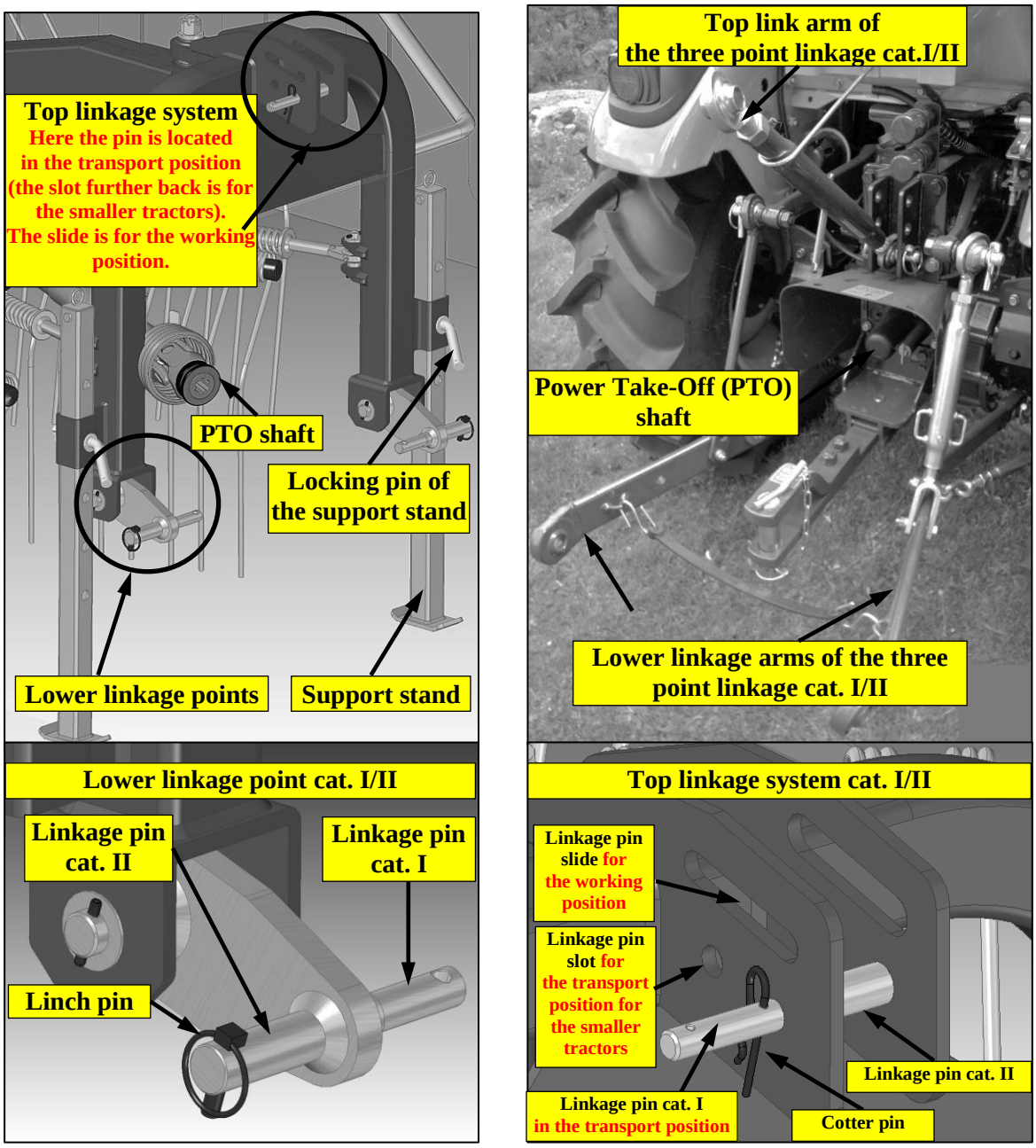

Figure 3. Linking of the hay rake to the tractor.

This hay rake was designed to work with the tractors of more than 30 HP, fitted with the rear three point linkage of category I or II. Attaching of the machine to the tractor should take place on the hard and level surface.

Caution

Familiarize yourself with the operating manual before attaching the hay rake to the tractor. Extra care must be exercised when linking the implement to the tractor.

In order to link the hay rake to the tractor:

- Reverse the tractor to the machine,
- Cautiously realign the three point linkage of the tractor with the headstock of the machine. Bear in mind that no one is allowed to stay near the machine and the tractor during the tractor manoeuvres, especially to stand in between the tractor and the machine when the machine is hitched up.
- Put the tractor lower linkage arms as close as possible to the lower linkage points of the machine
- Stop the tractor, put all controls in neutral and engage the hand brake. For the safety reasons it is recommended to stop the engine and remove the ignition key whenever you leave the operator's seat in the tractor cab. **Make sure the handbrake is fully engaged**. You need to take extra precautions when safe stop is not possible, e.g. when operating external controls.
- Start connecting the implement with the left hand lower link arm, as you can adjust the right hand lower link arm stay rod easy. Always make sure after connecting the implement that the lower link arms are level. Use the linkage pin of category matching the category of the three point linkage on the tractor.
- Secure the lower linkage points from falling out using the linch pins.
- Lift the implement slightly, retract the stand into its working position and lock it off with pin supplied.
- Then lower the machine down again.
- Release the top link arm from the transport lock and connect it to one of its fixed position holes on the headstock. Secure the top link using the linkage pin of category matching the category of the three point linkage on the tractor (see figure 11 above). Secure the linkage pin with a cotter pin. **Note that the slide is only to be used in work**. Use of the slide in transport can cause serious damage to the machine as a result of unnecessary stresses transferred to the main pivot pin. **Always use the correct slot for transport / work.**

Damage occurred in consequence of not adherence to that vital manufacturer's guideline will cause loss of warranty.

Caution

Use only the PTO shaft recommended by the manufacturer of the machine. Make sure the PTO shaft is of the correct length (look for further information of how to cut it in the operator's manual supplied with the PTO shaft).

- **Prepare the PTO shaft**. Bear in mind that the tractor engine must be stopped first. Make sure that all guards and safety chains are in place and not damaged. If so replace them before starting work. Check if the PTO shaft is of the correct length. It should have approximately 1/3 of the shaft overlapping as the minimum. But also check that the inner shaft has not bottom out on the outer shaft (i.e. it is pressed too far inside so that it touches the blind in the universal joints carrier). If the shaft length is found to be insufficient or not cut to the correct measurement serious damage can occur to both tractor and implement. Not following the manufacturers guidelines can result in unconditional void of warranty.
- Connect the PTO shaft fitting the side with the ratchet clutch to the drive shaft of the hay rake. Check the further manufacturer's recommendations in the Operator's manual of the PTO shaft.
- Take the driving seat in the tractor cab, start the engine again and lift the hay rake into the transport position.

Caution

Before using of this machine make sure that there is adequate clearance between the headstock and cab fixtures when lifting with the very short top link. Always check clearance margins before use.

6.2 Adjustments for work

After transport of the rotary rake to its work place change its configuration for work. All activities regards preparation of the machine for work can be done only directly in its work place. Do not transport the machine on the public roads with the arms and barriers unfolded.

Follow the tips given below to prepare the hay rake for work after arrival in its work place:

- Lower the machine down on a level surface so that it stands on its wheels.
- Safe stop the tractor (fully engage the handbrake, put all the controls in neutral, stop the engine and remove the ignition key).
- Get out of the tractor cab and approach the machine.
- Put the top linkage pin in the slide for the work position (see figure 3 above). When the machine will be raised, e.g. on the headlands, the pin will slide in the slide to its maximum position and the steering rods will compress locking the machine from

pivoting. Beware of clearance margins between the headstock and cab fixtures when lifting with the very short top link.

- Remove the protective sleeves from the raking tines.
- Free the first folding arm from the transport lock, unfold it and secure it in work position. Then unfold and secure the rest of the folding arms (see the subchapter No 6.5).
- Unlock and unfold the safety barriers (see the subchapter No 6.6).
- Pre-set the width of the windrows (see the subchapter No 6.7).
- Adjust the raking height (see the subchapter No 6.8).
- Make sure that the PTO shaft it is fully operable. Double check that it was adapted properly and safely connected to both the machine and the tractor.
- Check if all of the pins are secured from falling off with the safety cotter/linch pins.
- Without putting the machine under load carry out its trial start up with rotations at low speed to check if all the assemblies work correctly. The trial start-up should last several minutes. Be vigilant for untypical noises coming from the drive assembly e.g. crackling, grinding or knocking sounds. Ensure that the direction of the rotations of the rotor is correct and that the cam mechanism works properly and the arms are lifted and rotated in the correct moment. The work of the hay rake on the neutral gear should be flowless and without intensive vibrations. Ringing sounds or vibrations can be caused by the loose threaded connectors. After trial start-up inspect the drive assembly and the rotor for failures or leaks. In case that any failure was revealed, try to localize and remove its source by carrying out necessary repairs. Contact with the Seller of the machine if the problem is more serious and cannot be easy dealt with.

Caution

Make sure that the machine is in good technical condition before starting work with it. Check especially such elements as the raking assembly, undercarriage, safety guards and barriers are complete and operable. Remember to inspect the mounting of the raking tines.

6.3 Preparing the hay rake for transport

After finishing work, the machine must be folded to transport position and properly secured for transport. After finishing work, turn off the tractor engine and remove the key from the ignition switch. Then, immobilize the tractor by activating the parking brake and secure the driver's cab against intrusion by other people when preparing the rake for transport. It should be remembered that driving on public roads is forbidden after dark and in conditions of limited visibility.

The work should begin with the swath screen assembling. The steps are the same as for disassembly, except in the reverse order (see information in chapter 6.7). Then you need to assemble the protective barriers. The steps are the same as for unfolding
except in the reverse order (see information in chapter 6.6). The next step is to fold the folding arms. Folding should be done in the same way as unfolding, but in the reverse order (see instructions in chapter 6.5).
Then, put on protective aprons on the protruding raking fingers and secure against slipping by tying the ropes. It is also recommended to remove the PTO shaft. However, should the shaft not be dismantled, please note
on the categorical prohibition of engaging the roller drive during transport.
After the performed activities, go back to the operator's cabin, start the tractor and lift the machine up using the links. When lifting the machine, the main pin connecting the frame with the hitch moves in the slot until it stops, at the same time the control rods are shortened, permanently stiffening the machine during transport. When lifting the rake, the area between the tractor and the machine must be monitored all the time to prevent the upper hitch and barriers from colliding with the driver's cab.

When transporting the rake in a suspended and lifted form over long distances, the machine should be additionally secured against uncontrolled inertial tilt caused by hitting unevenness on the road. For this purpose, a blocking bolt is used, which limits the possibility of machine movement.

Procedure.
In order to protect the machine against uncontrolled inertial tilt during transport, it must be secured with a special transport lock. To secure the machine with a bolt, it is necessary to first set it in the raised position. The next step is to slide out the securing pin and pull the protection up. The previously removed protection should be placed in the suspension frame from below. Lock this protection with a cotter pin. Pay special attention when carrying out protective work.

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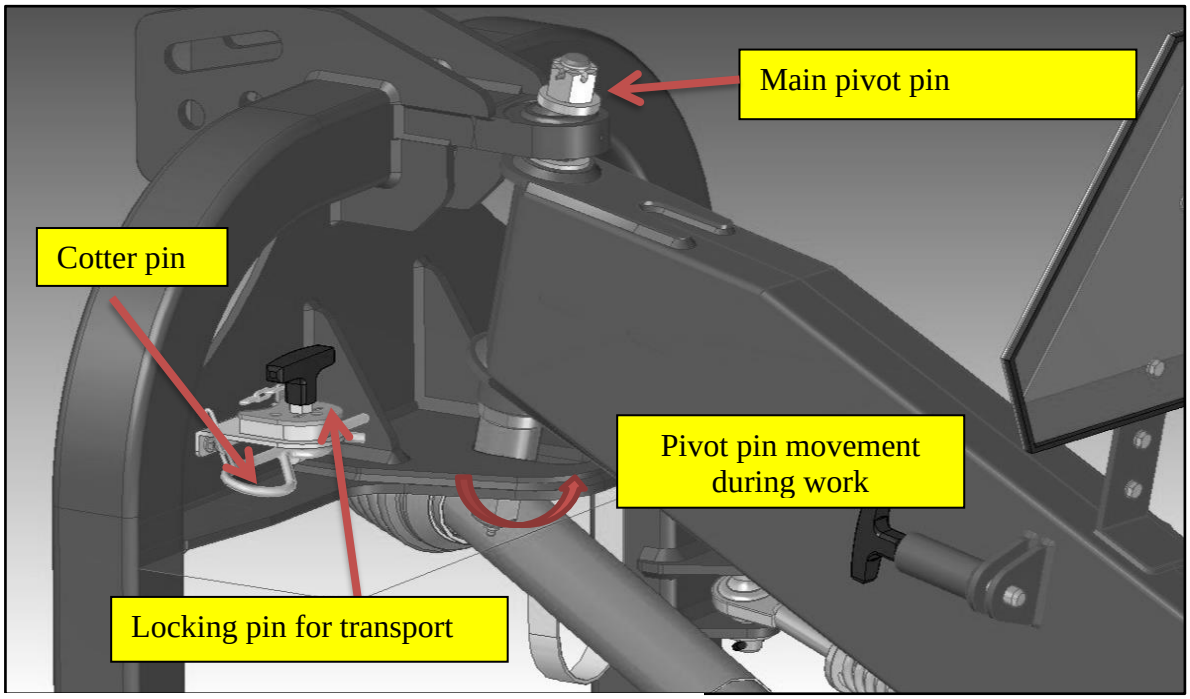

Figure 4. – Machine frame before securing for transport

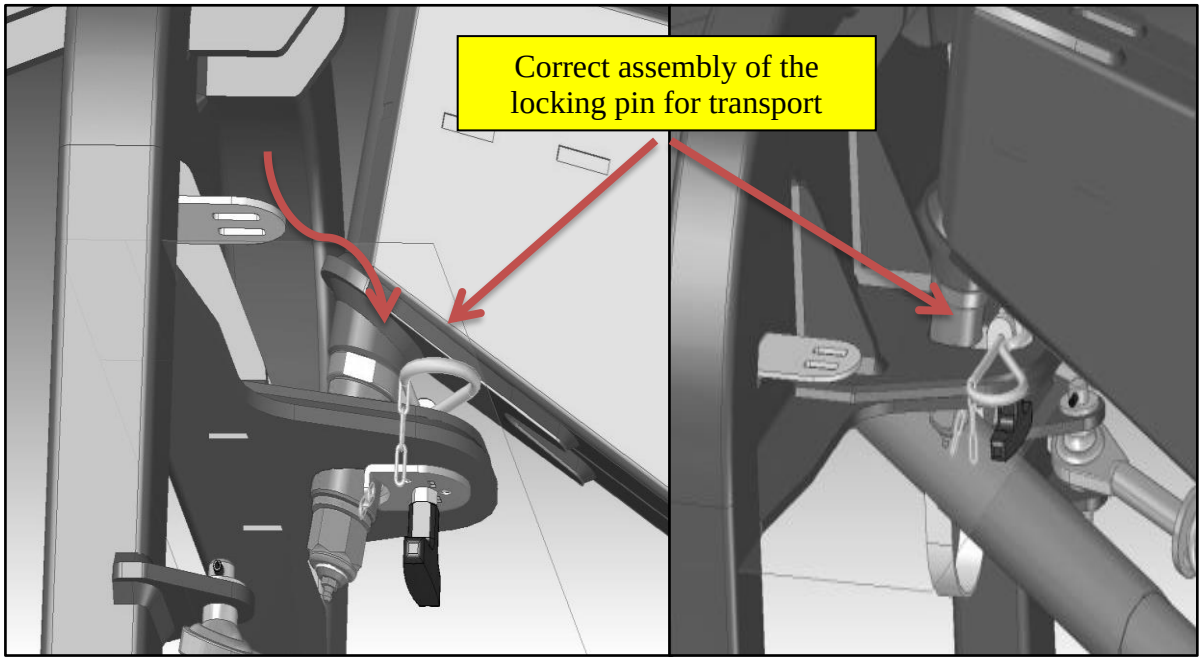

Figure 5. – Method of placing the transport locking pin

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After correctly assembling the protection device and making sure that all movable elements of the machine have been secured against free movement, you can proceed to transport. Transport should be carried out in a safe manner and in accordance with the law.

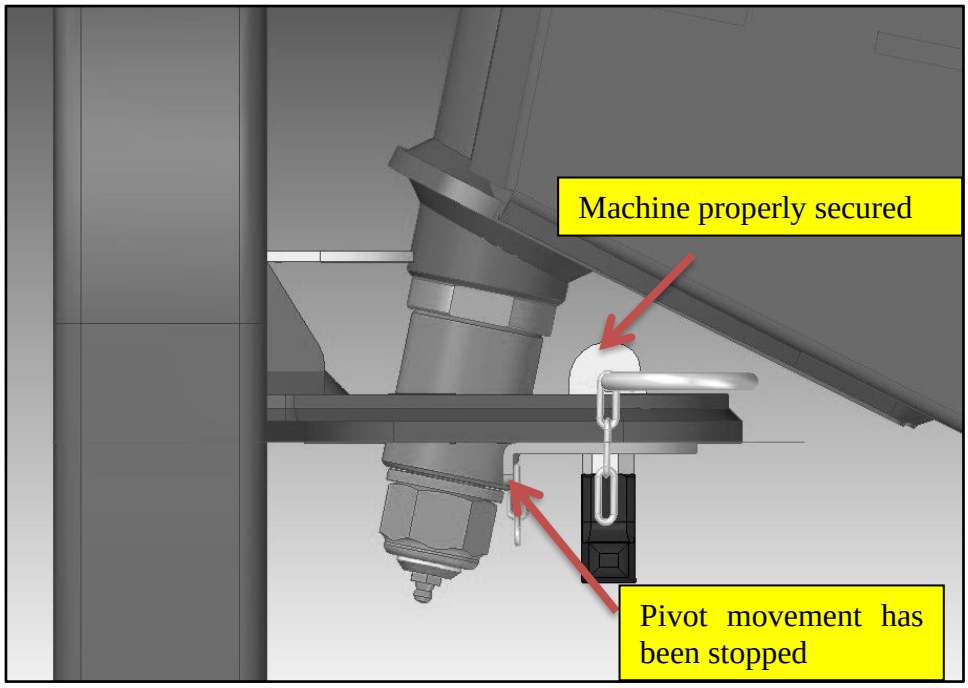

Figure 6. Machine properly secured for transport

Note that when the machine is being transported separate from the tractor e.g. on a trailer or a lorry the PTO shaft should be appropriately secured e.g. strapped to the machine. Do not use the PTO chains to support the weight of PTO shaft at any times as they are only to be used to prevent PTO guards from spinning when at work. **Never enable the Power Take Off when transporting the tractor mounted hay rake with the connected PTO shaft**. After carrying out all of the actions described above go back to the tractor cab, power the engine up and lift the mounted machine into the transport height. Beware of clearance margins between the headstock, barriers and cab fixtures when lifting with the very short top link.

Caution
Do not allow any person to stay near the machine when folding it up for the transport.

Before starting work, we act in the opposite way to securing for transport. The locking bolt must be removed to unlock the machine. To do this, remove the safety lock, place it in the gripper and secure it with a cotter pin (machine in raised position).

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6.4 Raking and forming of windrows

The rotor constitutes the main working element of the hay rake and it consists of a reduction gearbox equipped with 11 arm housings to accommodate tine arms. Via PTO shaft the torque is transferred from the tractor to main drive shaft located inside the main frame and then to the rotor gearbox. Transmission of the torque to the gearbox causes swivel movements of the rotor. Inside the rotor housing there are cam rollers connected to the individual tine arm housings. During swivel motion of the rotor, the rollers run on the cam track of special construction forcing their movement up and down as well as their pivoting motion. This allows for the fluid alteration of the vertical and horizontal position of the raking tines. In the raking phase the raking arms are lowered and the vertically set tines come into contact with the crop dragging it sideways in a sweeping motion. The thrown outwards crop stops on the crop deflector forming a uniform windrow. In the next phase the arms are lifted, the tines pulled out of the crop and angled in which position they stay until they reach the raking area again. This motion creates sufficient clearance not to drag the crop back into the raking area. Combination of all these features makes the machine thorough and efficient but gentle to the crop.

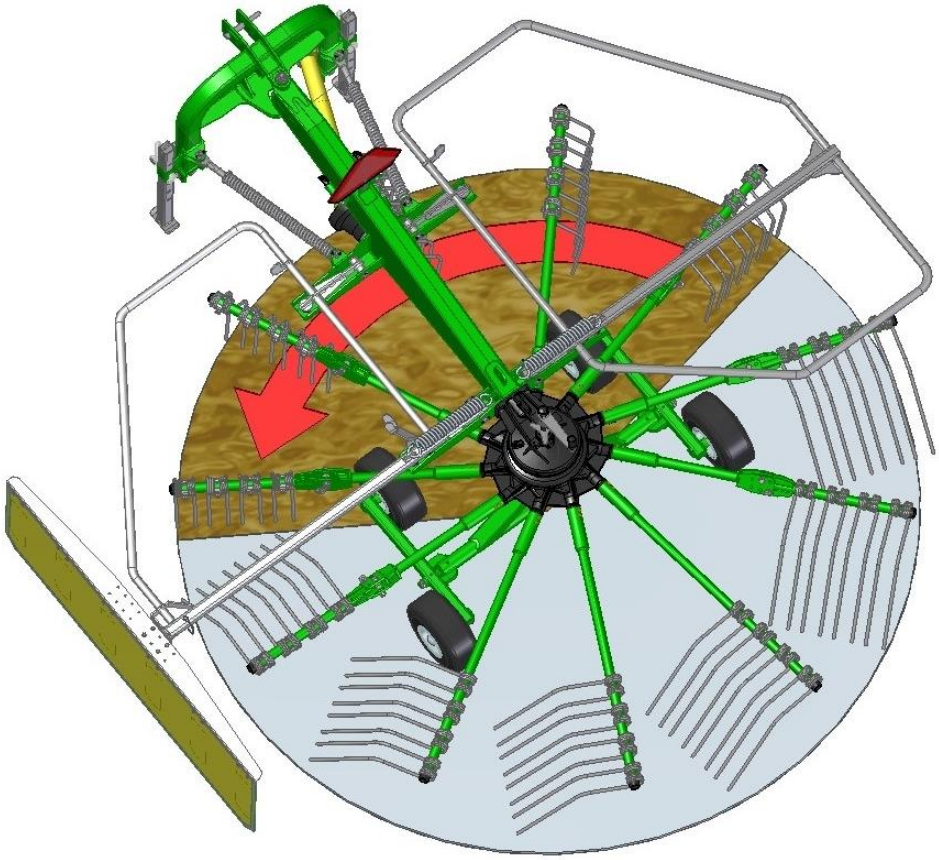

Figure 7. Working principals of the hay rake – The tinted field indicates raking area where the raking tines are directed perpendicularly to the ground.

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6.5 Tine arms operation

Prior to work commencement the all six folding tine arms should be unfolded and locked in working position. As the first, free the arm inserted in a locking socket (transport lock) located on the frame near the rotor.

Do not power up the machine if any of the arms remains folded or if the safety barriers are not lowered into the working possition. Serious damage will occur when not applying to this guideline. Carry out the safety check up to ensure that the machine can be started safely.

Follow the steps below to prepare the raking assembly to work:

a) Remove the protective sleeves from the raking tines. The protective sleeves are made of bright warning yellow tarpaulin. Their function is to minimalize stabbing risk by preventing direct contact of a person standing nearby with sharp tines of the raking arms. Take special care when folding and unfolding of the arms and stay clear of the movement zone of the arm. Be especially cautious when near the tines in the upper, transport position. Put the tarpaulin over the tines pointing upwards immediately after folding the arms into the transport position.

b) Free the arm inserted in the transport lock to enable movement of the rotor. In order to do that, pull the safety linch pin out and remove the pin from the socket of the transport lock. Then unfold that arm and reuse the same pin and the linch pin to lock the folding part of the arm in the working position.

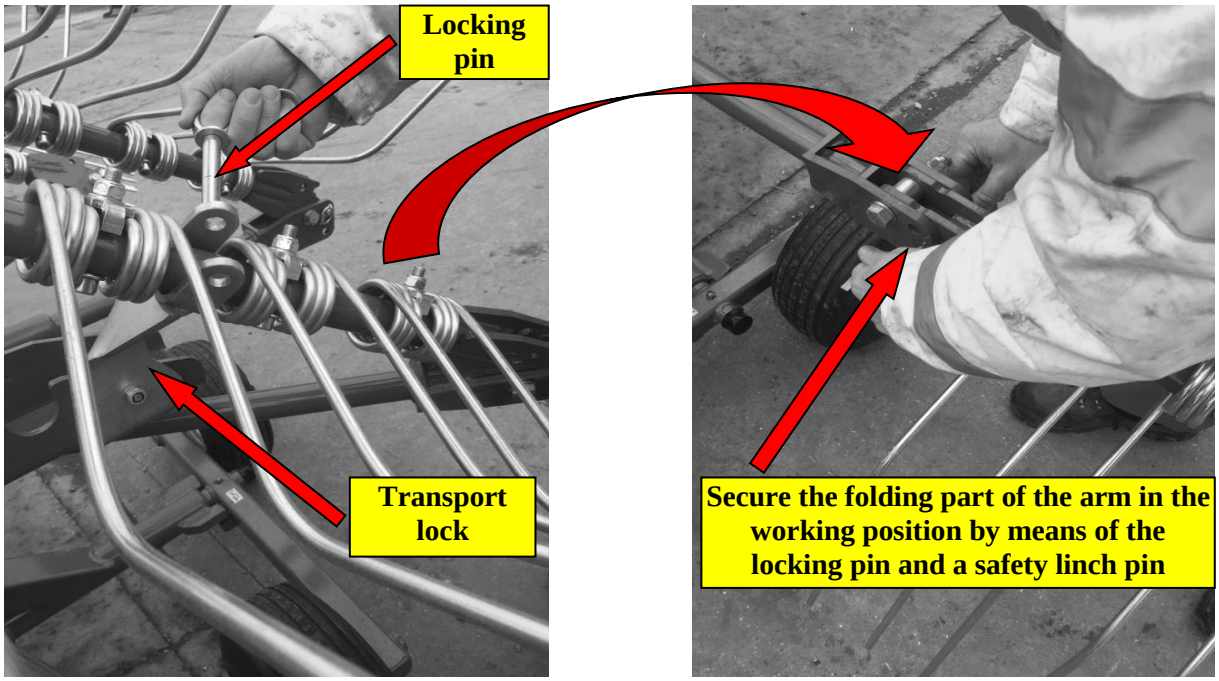

Figure 8.Freeing the first of the folding arms of the transport lock.

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c) Repeat the following steps for the rest of the folding arms:
   1. pull out the safety linch pin,
   2. unfold the arm into the working position,
   3. insert the locking pin in the appropriate slot to secure the arm in the working position,
   4. secure the locking pin from falling out using a safety linch pin.

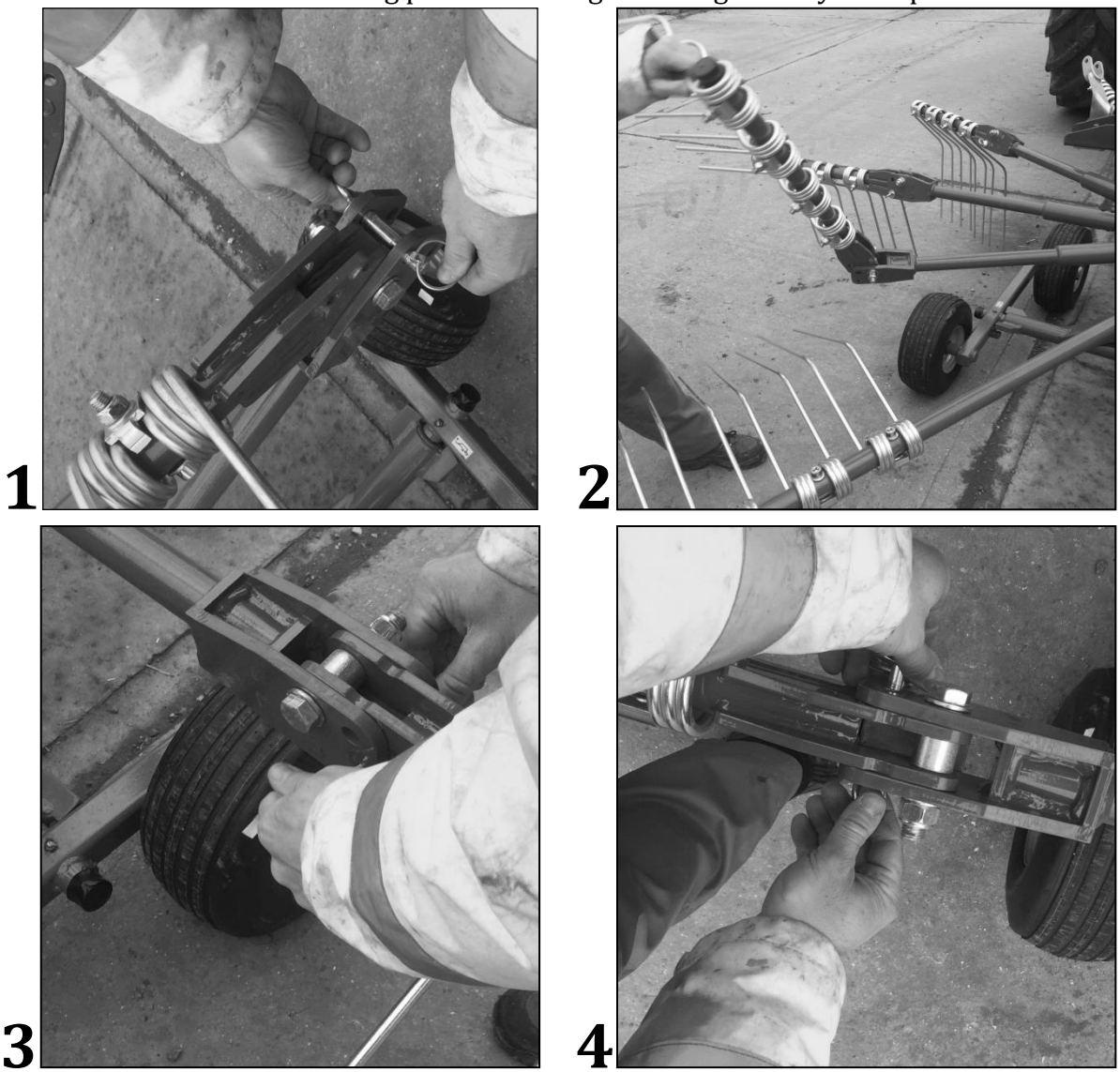

Figure 9. Preparation of the folding tine arms for work.

To prepare the tine arms for transport follow the steps from a) to c) in the reverse order.

Note that there should be two fixed arms at the front of the machine and three at rear to minimize transport width.

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6.6 Folding and unfolding of safety barriers

For the security reasons the access of the user and the bystanders to the hazard zones on the machine should be appropriately restricted. The machine is equipped with the safety barriers to minimalize the risk of accidental contact with the raking assembly whilst at work. The barriers should be lowered down after setting the arms for work and before powering the machine up. The barriers should stay in horizontal position at all times during work and after disengaging the power when the rotor is still in motion.
In order to lower down the safety barrier, grip the handle of the locking bolt firmly and pull it towards yourself to overcome the tension of the spring until you feel the resistance. Then grip the safety barrier with the other hand, pull it slightly outwards to free it from the locking socket and release the bolt. Grip the barrier with both hands and pull it down with force sufficient to overcome the tension of the safety spring, until it stops on the rubber buffers mounted on the frame. The right barrier should be additionally secured with a pin (marked with the letter "A" in the drawing below). Take special care while lowering down the barrier and do not stand in the movement zone of the barrier to avoid crushing risk.

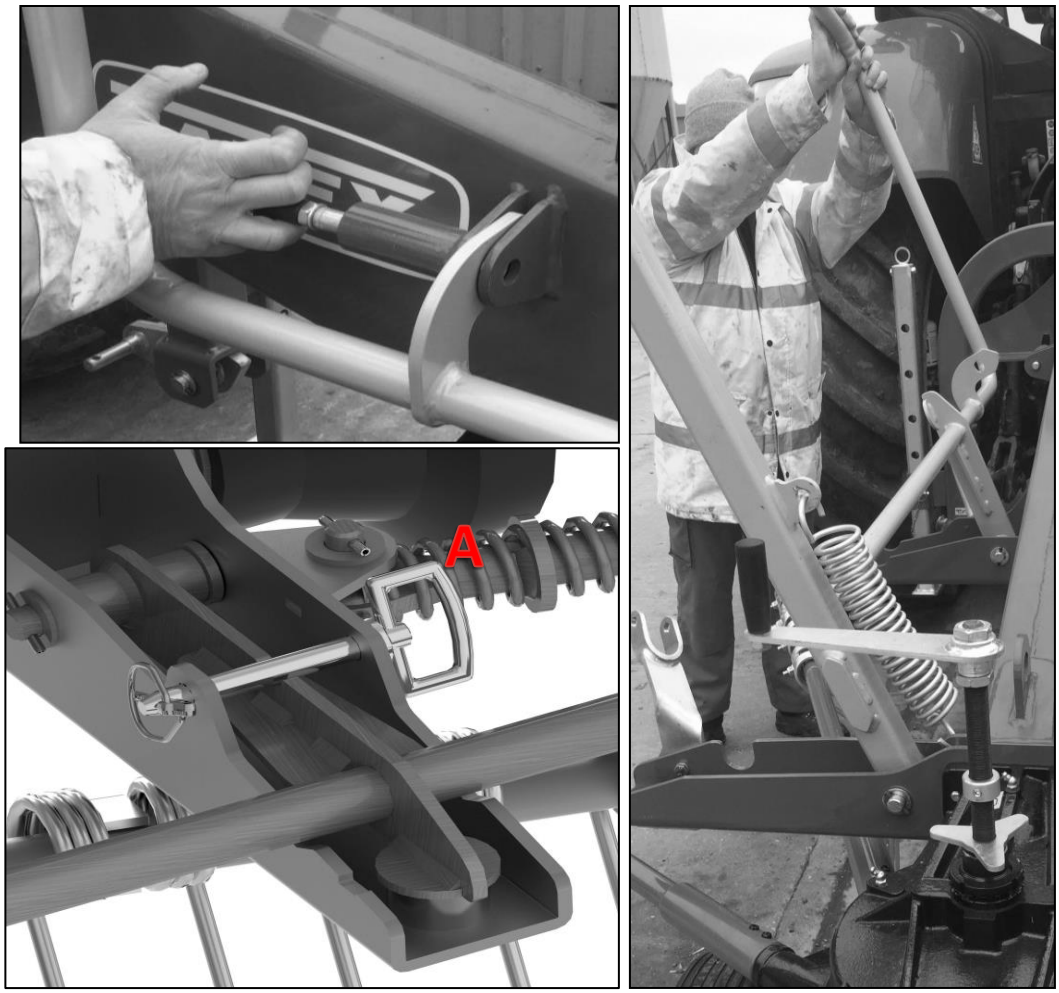

Figure 10. Unfolding of the safety barriers

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6.7 Swath width adjustment

Depending on the needs, the width of the formed swath can be adjusted. To change the width, remove the fixing pin, loosen the tightening knob and the locking lever, and then extend the screen to the required width in the range from 0 - 620 [mm]. After adjusting, insert the cotter pin, tighten the knob clockwise and secure the knob with the locking lever. An additional possibility of adjusting the swath guide is changing the position of the screen in relation to the beam. There are 9 items available to the user. To change the position of the screen, unscrew the 4 mounting screws, then move the screen by the required value within the range from -250 to +250 [mm]. Fixing the mounting holes in relation to each other using the previously disassembled screws, screw again in order to clearly fix the screen to the beam.

When adjusting the cover extension, follow the rule that the larger the swath, the further the screen should be extended, and vice versa, with a smaller amount of swath, the distance of the screen should be smaller. Moreover, it should be remembered that when preparing the swath for a baler or other collecting device, the width of the formed shaft should be slightly smaller than the width of the pick-up.

Caution
Disengage the power and lower the machine down on the even ground before carrying out any adjustments.

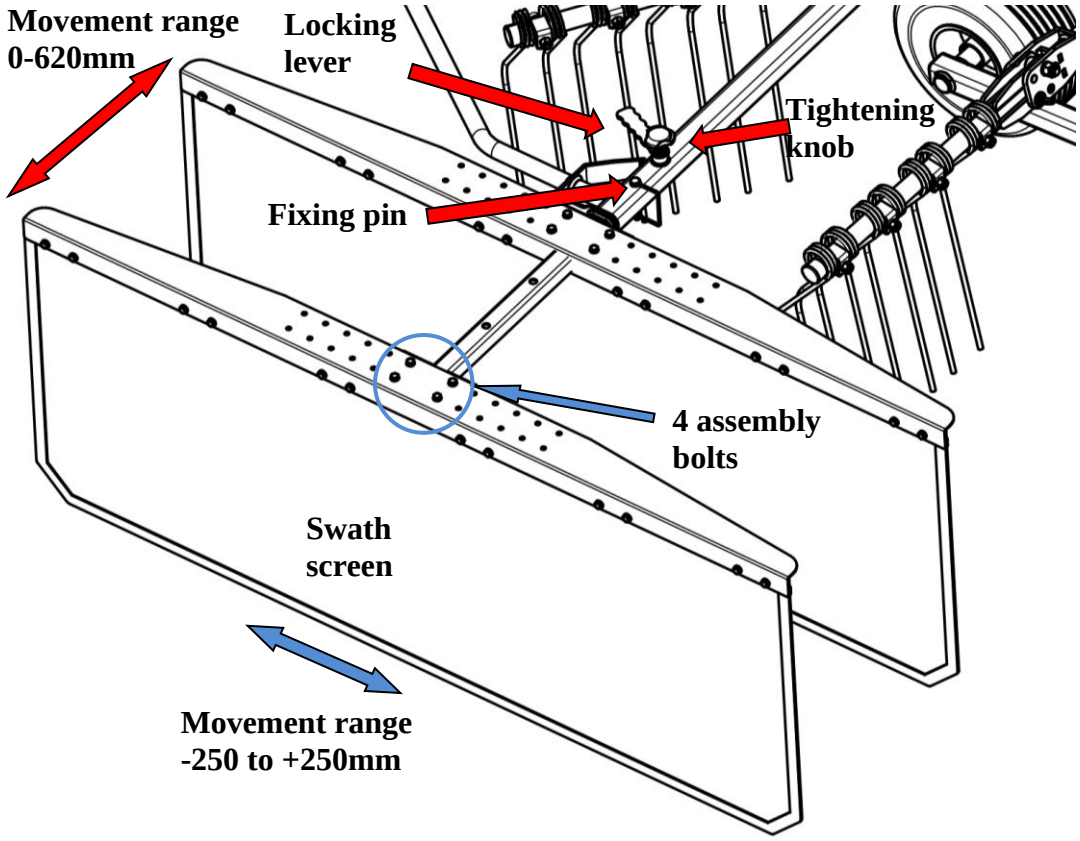

Figure 11. – Swath screen adjustment

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6.8 Working height adjustment

Choice of the proper raking height is significant for the quality of work and material as well as the shape of the formed windrows. The lower arms of the tractor three point linkage should be adjusted as first. It is imperative that both of the lift arms are set at the same height. All necessary adjustment of the lower arms should be made before linking the machine to the tractor. The further adjustment should be made to the top link of the tractor's three point linkage in order to level the raking assembly regards the ground. The raking height should be set according to parameters such as volume and type of the swath, raking speed and the ground conditions.

The raking tines should be a little lower than the stubble with sufficient clearance of the ground so that that the crop is swept clearly but the turf is left undisturbed. Bear in mind that, when the tines are set too high, the rotary rake will not sweep the swath thoroughly. If, on the other hand, the tines are set too low, they will dig into the ground causing contamination of the crop with little stones, soil and fragments of turf. It will also put unnecessary stress on the drive and raking assembly of the machine. In this case the drive assembly and the raking tines can be damaged permanently from overload. The height adjustment mechanism allows for necessary corrections in the range of 80mm to match the given conditions. In order to change the raking height, loosen up the three-armed counter nut, grip the handle and rotate the threaded rod appropriately right or left till you achieve the demanded height. Then secure the threaded rod back in place by means of the counter nut. The adjustment range is 80mm.

Caution

Do not make any adjustments or corrections to the machine when it is powered. The machine should be lowered onto the firm and flat surface before making the adjustments.

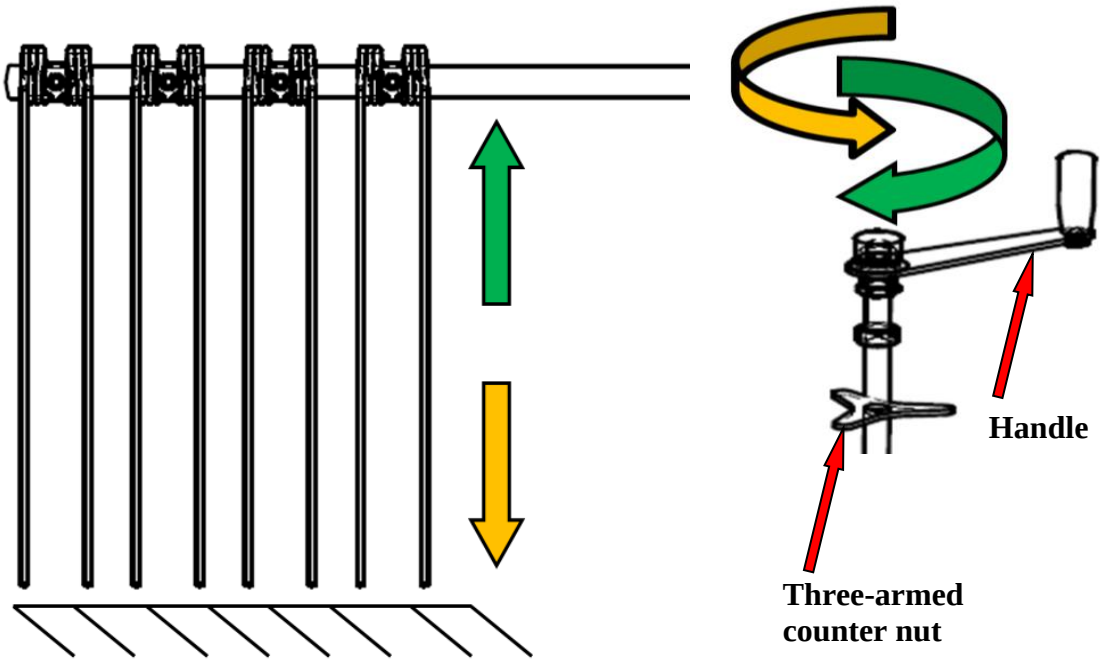

Figure 12. Raking height adjustment

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6.9 Contour following

The design of the machine has been enhanced with several pivot points with sufficient range of movement to provide the maximum raking efficiency and smooth, undisturbed operativeness of the machine. The pivot points allows for contour following of the uneven, undulated ground The figure below shows the scope of movement of particular pivot points, such as:

- top linkage pin slide,
- oscillating lower linkage pins,
- the main pivot point with the floating pin
- spring loaded stirring rods
- twin–wheeled rocking beam.

The steering rods enhance the manoeuvrability of the hay rake. What is more, when the machine is lifted or transported, the rods make it more rigid restricting the movements of the main frame against the headstock. This in turn, reduces the risk of unexpected side movements compromising the stability of the machine during transport. The hay rake stays all the time behind the tractor and within its contour.

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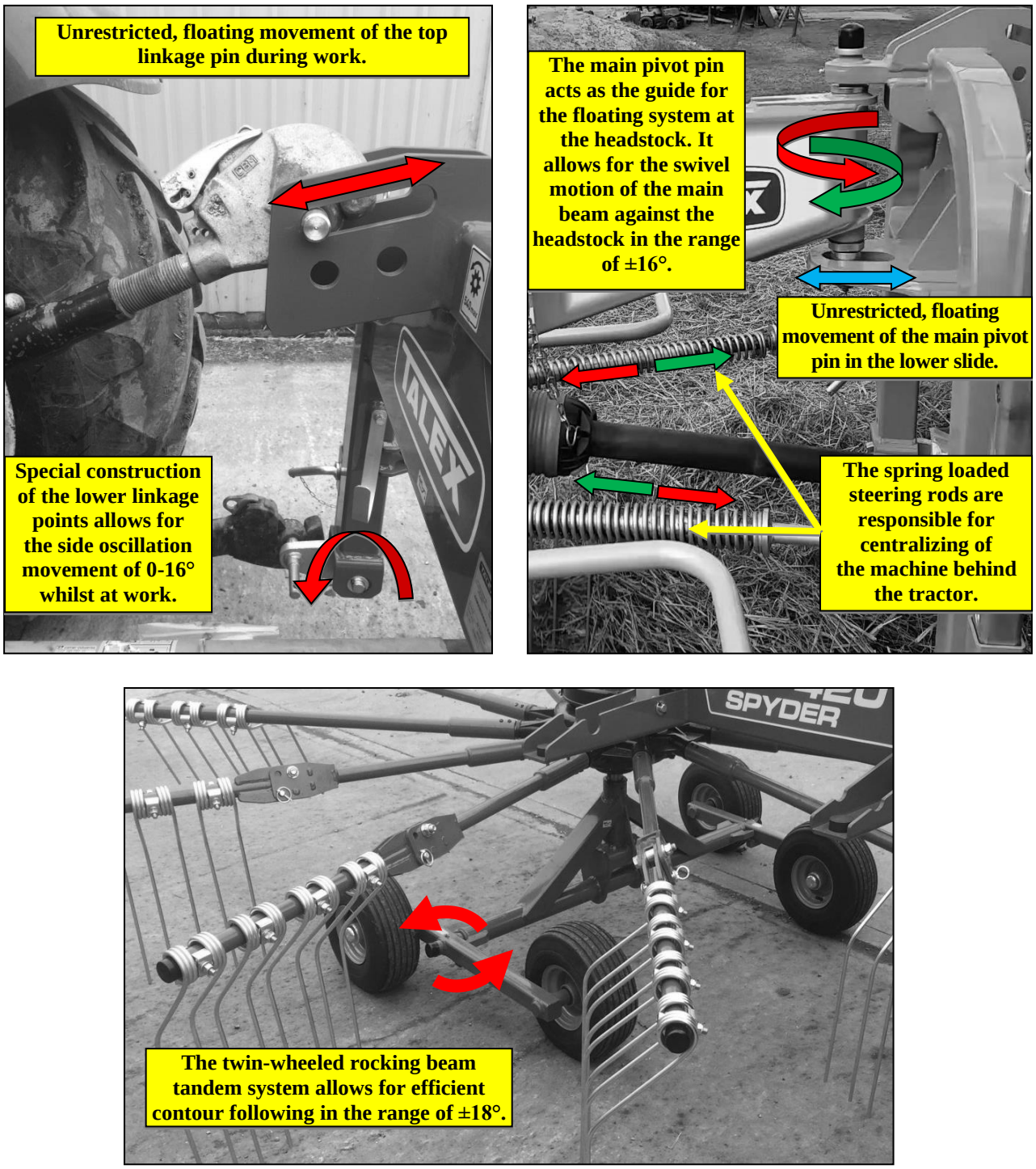

Figure 13. Range of motion of the particular components

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6.10 Additional equipment – support wheel

In order to provide more stability during operation, Spyder 360 and 420 have been equipped with a front countour copying wheel.

ATTENTION
Adjustment can be done only with machine turned off and on level ground!!!

ATTENTION
Keep caution
There is a possibility of machine tilting with support wheel not being mounted!

To adjust the wheel height, loosen the x4 mounting (as per picture below), then set the wheel to desired height. Secure the x4 mounting after adjustment.

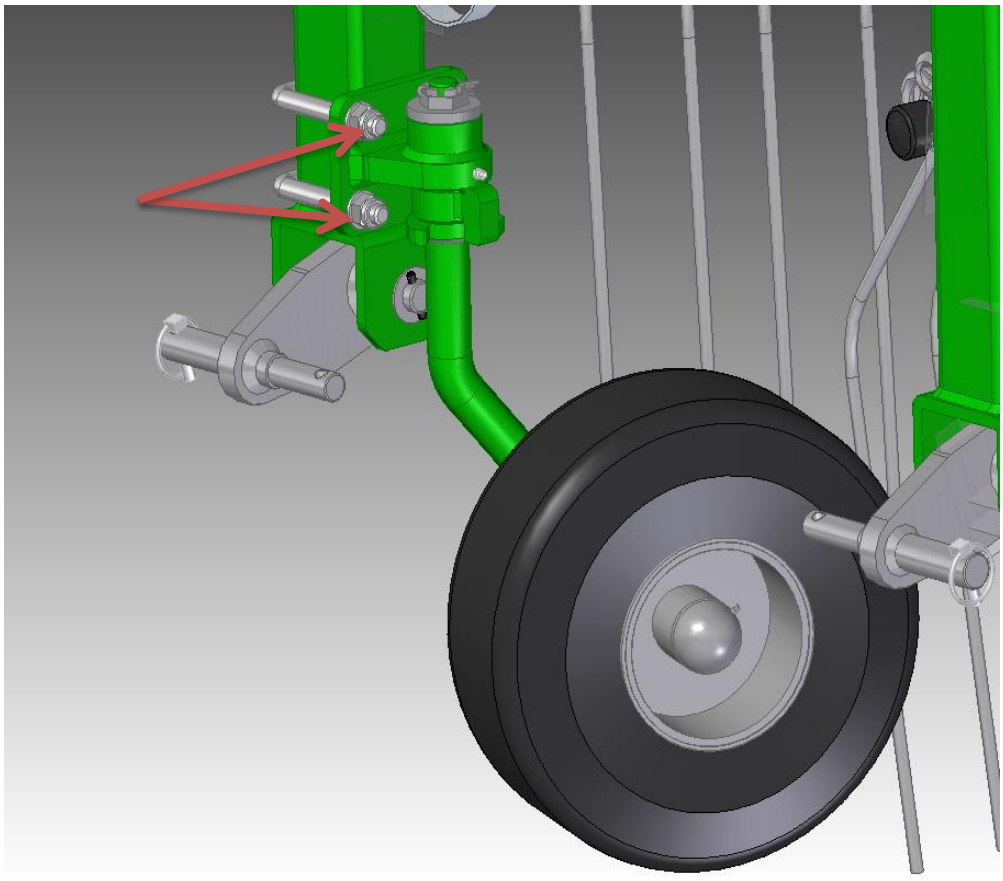

Figure 14. Support wheel

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7. Service and maintenance activities

All activities related to the maintenance of the machine may be performed by the user of the vehicle, to which it is connected, under the condition, that he is authorized to operate that vehicle.

After use machine should be stored under roof, on a flat, hardened surface with a support.

Prior to connecting the machine to the vehicle, the operator must inspect the technical condition of the machine each time and prepare it to the trial drive. For that purpose the operator must:

- Familiarize with this User Manual and follow the included suggestions
- Learn the design and understand the functioning of the machine
- Inspect all components of the machine for any possible mechanical defects
- Lubricate the machine in accordance with the suggestions
- Inspect the technical condition of the kingpins of the connecting system and the securing cotter pins
- Check the oil level in the gears
- Inspect the condition of the screw connectors
- Inspect the condition of the cutting blades; the worn should be replaced in pairs

Installing only the original manufacturer's parts may guarantee the safe and reliable operation of the device. Using generic parts or repairing damaged parts will cause loss of warranty.

If all mentioned above activities are performed and the technical condition of the machine does not raise any concerns, the machine may be then connected to the tractor.

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7.1 Inspection and maintenance of raking tines

The raking tines were made of spring steel what allows them to bear dynamic loads easily. Nonetheless, despite of their strength and durability, the tines are subject to natural wear as a result of contact with the crop, stubble, obstacles etc. Additionally, constant vibration can cause the separable connections to go loose. For this reason, the threaded bolts and nuts securing the tines to the raking arms require regular tightening up. Before starting work, make sure that all of the raking tines are in good condition and each of the connectors is complete and not loose. The manufacturer recommends immediate replacement of damaged tine with a new one. Do not work with a damaged tine or missing connector and never attempt to repair the tine if it is faulty.

Do not make any adjustments or corrections to the machine when it is powered. The machine should be lowered onto the firm and flat surface before making the adjustments.

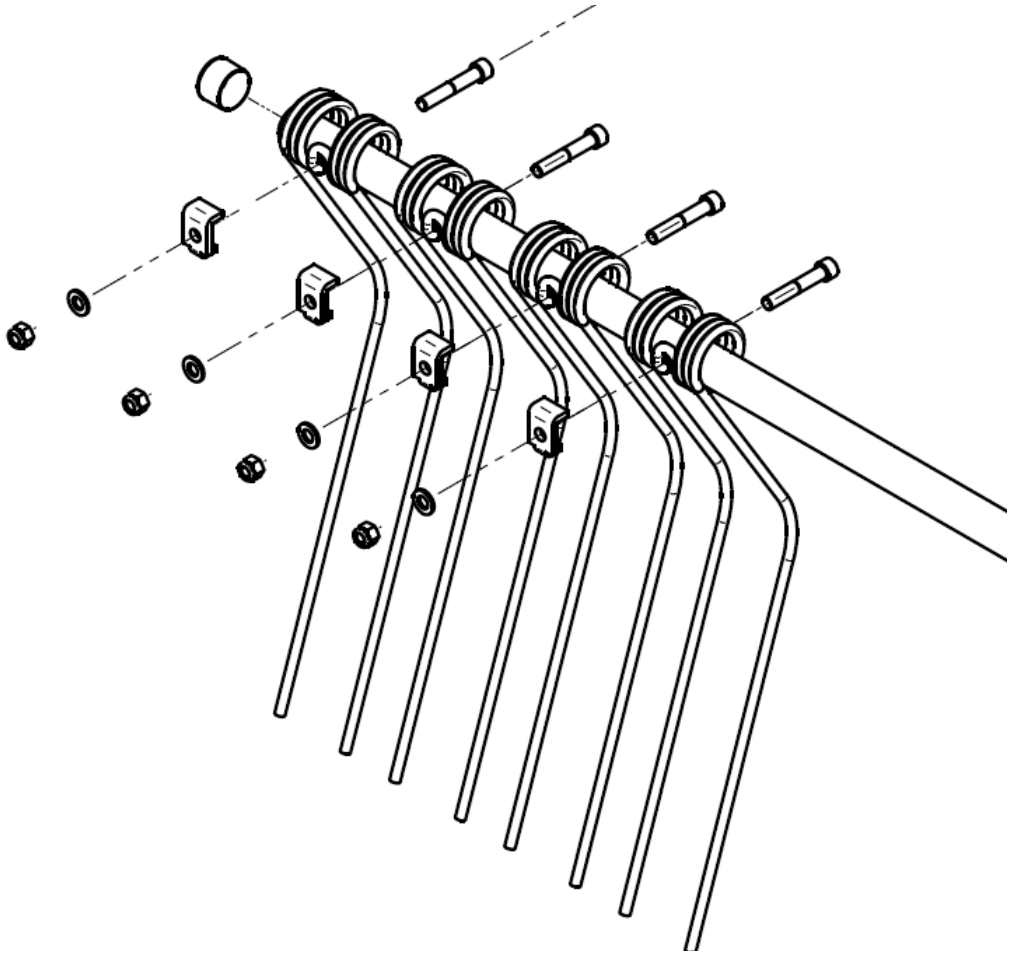

Figure 15. Tine arm

7.2 Post–operation maintenance

Each time after finishing work, the machine must be cleaned, **the cutting bar must be washed under pressure,** and it should be placed on a flat, hard surface. An inspection of the connections of parts must be performed. The damaged and worn parts should be replaced with new ones. All safety signs placed on the machine and the triangle plate of the slow moving vehicles should be kept clean. Inspect all screw connections and tighten the loose ones in accordance with the Table no. 4.

The manufacturer TALEX ensures the access to all spare parts

Table 4. The tigtening moments for bolts and nuts

Resistance	6.8	8.8	10.9	12.9
Metric thread	Tightening Torque [Nm]			
M5	4,5	5,9	8,7	10
M6	7,6	10	15	18
M8	18	25	36	43
M10	37	49	72	84
M12	64	85	125	145
M14	100	135	200	235
M16	160	210	310	365
M18	220	300	430	500
M20	310	425	610	710
M22	425	580	820	960
M24	535	730	1050	1220

7.3 Lubricating

Adequate and regular maintenance of the assemblies significantly helps to prevent premature failure of parts protects against corrosion of the elements. The list of greasing points given below describes the location of each of the greasing points and the type of the grease required. It is recommended to use grease gun to apply solid grease. Clean the place off old grease residues and contaminations before greasing. Check the condition of the grease nipples; if any is damaged replace it with a new one. Keep slowly injecting grease until all of the old grease has been purged from the grease nipple and the new grease starts to ooze out. Wipe off the excess of grease to keep the dirt away. There is SAE90EP oil in the oil reservoir of the rotor gearbox –do not use any other type of oil than recommended. The nominal volume of the gearbox is 5.7-6l. The first change of oil should be done after first 50h of work. The next oil change should be done after each 400h of work. It is recommended to change oil in the gearbox at least once a year, before start of the season. Inspect the rotor for oil leaks each time before starting work. Fix revealed leaks immediately and fill in the oil in the reservoir to the required volume. Any repairs to the rotor gearbox during warranty period can be done only by an authorised workshop.

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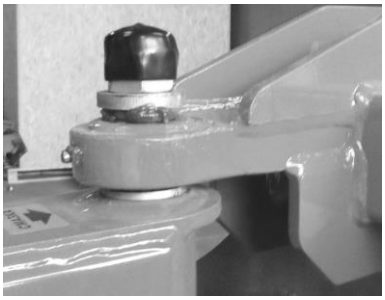
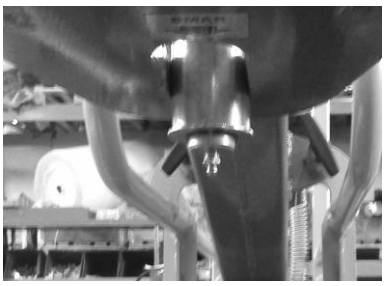
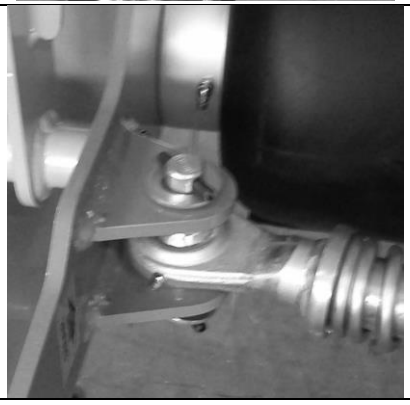
Table 5. Lubrication and service intervals

NO	**Greasing points**	**Description**	**Service intervals**	**Type of grease**
1		Main pivot pin socket	10h	Solid grease
2		Roller bush of the main pivot pin	10h	Solid grease
3		Connection of the steering rod with the headstock	10h	Solid grease
4		Connection of the steering rod with the main frame	10h	Solid grease

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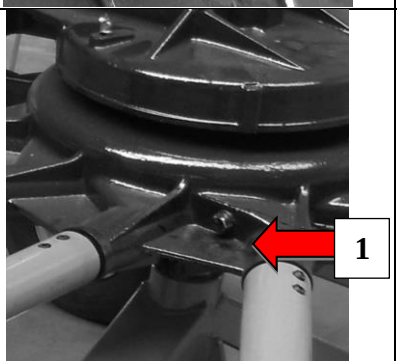
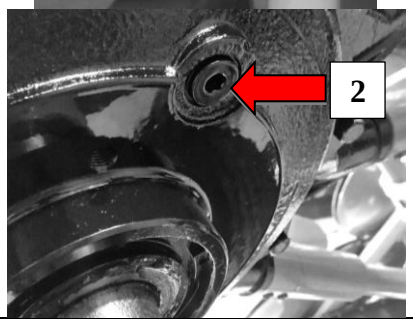
5		Lower linkage pin	10h	Solid grease
6		Driveline main bearing	10h	Solid grease
7		Gearbox bearings The screw rod of the height adjustment mechanism	20h 50h	Solid grease
8	 	*1 = oil filler plug* Gearbox – oil chamber *2 = oil drain plug*	400h or at least once a year	SAE90EP Oil **360:** 2.8 to 3.0dm^3 **420:** 5,7 to 6dm^3

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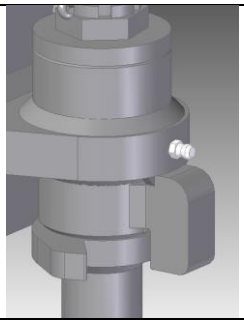
9		Main axis bushing	50h	Solid grease
10		Bogey axles	20h	Solid grease
11		PTO shaft	Look for manufacturer's recommendations in the operator's manual of the PTO shaft	Solid grease
12		Support wheel	20h	Solid grease

7.4 Post–season maintenance

Maintenance covers all activities listed in the section: 7.2 Post-operation maintenance. In addition, the machine should be stored under a roof, on a flat, hardened surface with a support. Check the sealing paint. If you notice any damage to the paint, clean the area and fill it in with a new layer of sealing paint.

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8. Disassembly, utilization and environment protection

In the event the machine is worn to the extent which prevents its further use, it should be scrapped. This also applies to regular repairs and replacement of damaged parts. Clean the machine thoroughly before scrapping. Drain oil from the machine and have the machine decommissioned. Next, disassemble the machine by segregating its parts based on the applied materials. Segregated parts should be transported to a scrap yard or disposed of.
The machine is 100% environmentally friendly. 98% of the materials used in the production process are recyclable. Worn machine parts must be disposed of in line with the local environment protection regulations. Prevent oil leakage throughout the period of use of the machine, as oil may pollute the environment.

Protect your hands (and body) against injuries, and the harmful effects of lubricants and oils. Use personal equipment measures and tools which are in good mechanical condition. Machine elements, which when dismounting can move or rotate, must be properly secured.

Worn or damaged parts removed during repair (disassembly) should be stored in a separate location, with a limited access for persons and animals. Worn out metal parts must be delivered to the scrap metal collection points. Worn out plastics must be delivered to the chemical waste collection (utilization) points.
When filling up or replacing the oil, avoid its spillage. Store the waste oil in sealed containers, and periodically deliver it to the special collection (utilization) points.

Abandoned parts or machine components, and spilled oil, may pose a risk of accident, cause an environmental pollution and violate applicable laws.

9. Parts catalogue

9.1 How to order spare parts

The order should always specify:

• address of the ordering party,

• exact shipping address (machine parking place or collection method),

• terms of payment,

• serial number of the machine and year of production (according to the nameplate on the machine),

• index of the spare part,

• number of pieces of ordered parts.

Spare parts should be ordered at machine selling points or from the manufacturer. Only the use of original manufacturer parts is a guarantee of safety and reliable operation of the device. The use of non-original parts or the repair of damaged ones will void the warranty.

The manufacturer reserves the right to make structural changes to the parts shown in the individual assembly drawings of the parts catalogue. These changes may not always be updated in the manual and parts catalogue. Individual drawings of spare parts may differ from the actual state.

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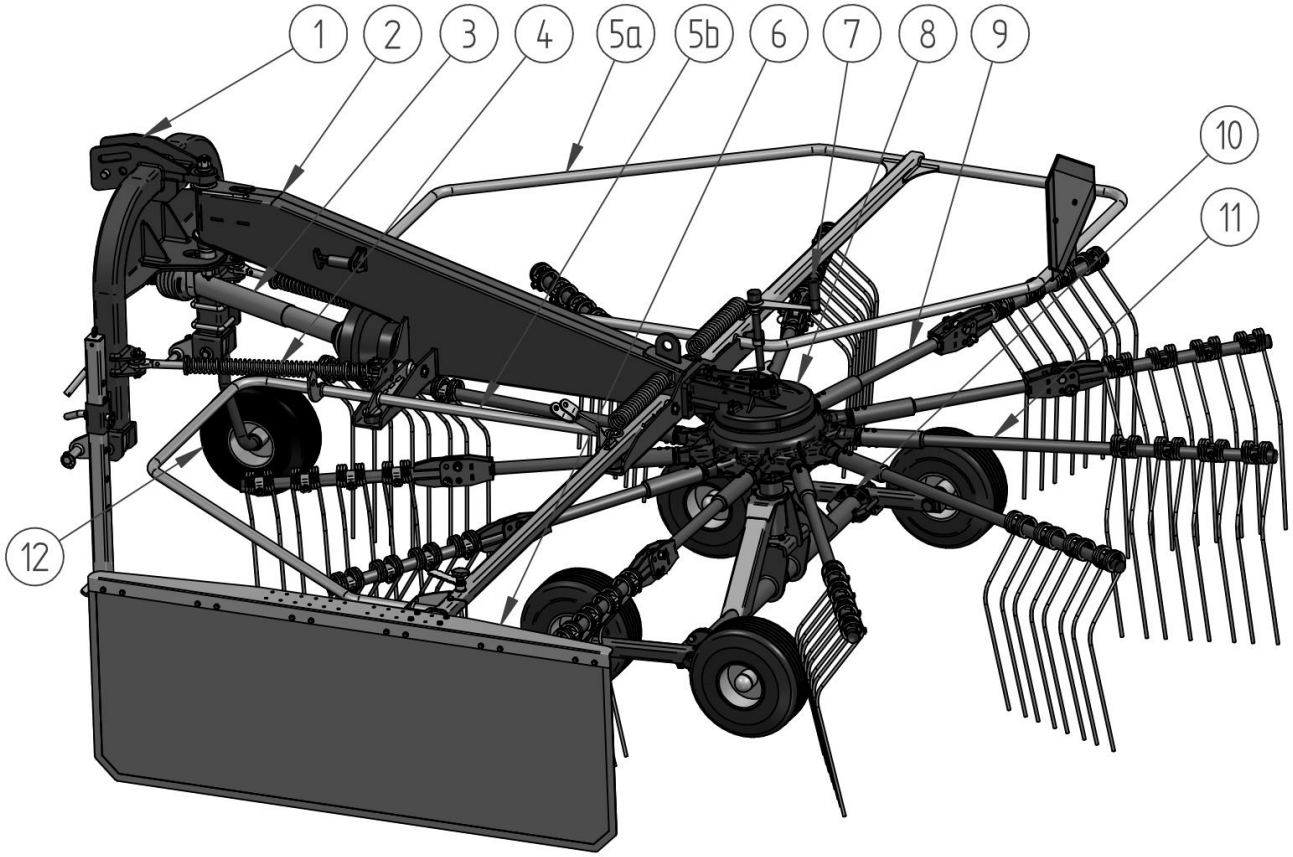
9.2 Hay rake – main components



1. **Main hitch**
2. **Main frame**
3. **Drive transmission**
4. **Control link**
5a. **Right barrier**
5b. **Left barrier**
6. **Swath screen**
7. **Raking height adjustment mechanism**
8. **Main gearbox**
9. **Foldable raking arm**
10. **Chasis**
11. **Stiff raking arm**
12. **Support wheel**

Figure 16. Hay rake – main components

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9.3 Hay rake – Main hitch

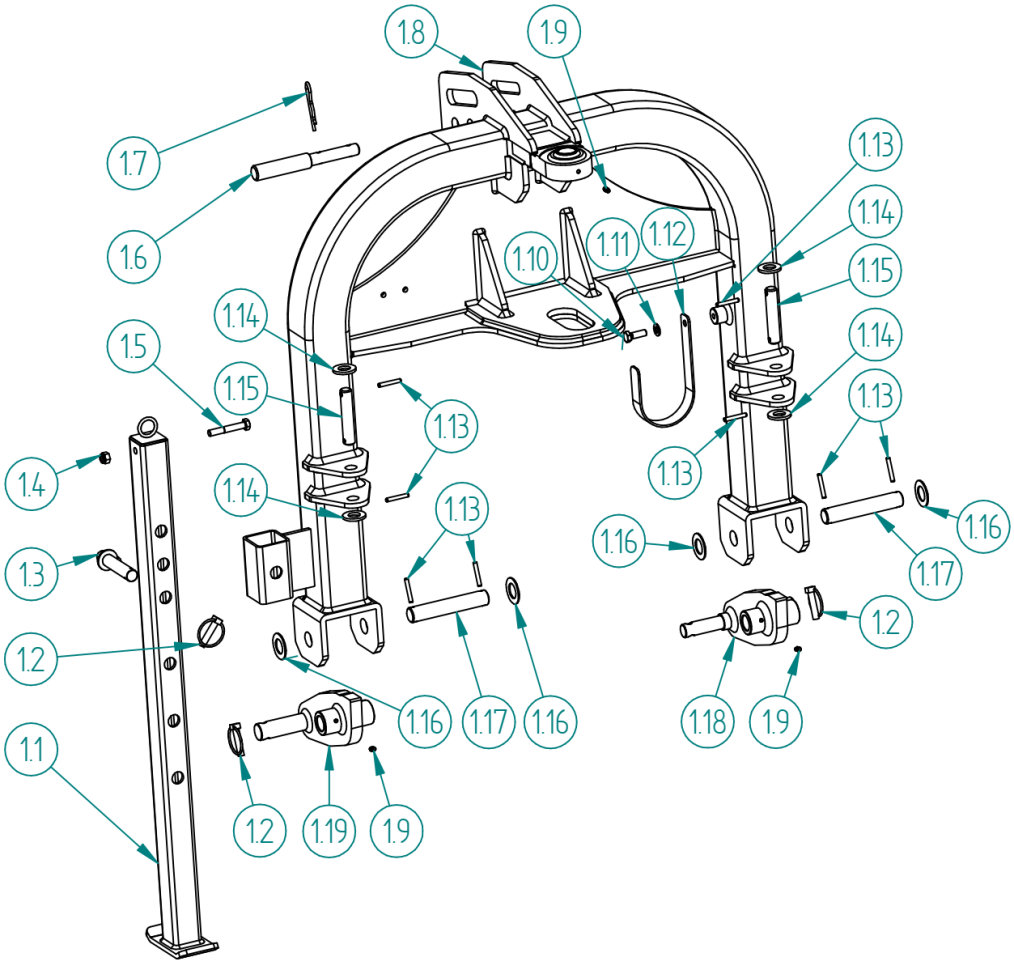

Figure 17. Hay rake – Main hitch

No	Description	Index	Quantity/MODEL	
			420	360
1.1	Support foot	P540059	1	-
		P550004	-	1
1.2	Safety pin	T000981	3	
1.3	Lock pin	P601048	1	
1.4	Self-locking nut M10 galv.	T000292	1	
1.5	Bolt M10x60-8.8 galv.	T000747	1	
1.6	Upper hitch pin	P540024	1	
1.7	Cotter pin 4x100	T000987	1	
1.8	Hitch frame	P540003	1	
1.9	Grease nipple M6x1	T000645	1	
1.10	Bolt M10x25-8.8 galv.	T000740	1	
1.11	Flat washer M10 galv.	T000456	1	
1.12	PTO shaft mounting	P540020	1	
1.13	Spring pin 6x40	T000087	8	
1.14	Flat washer M20 oc	T000462	4	
1.15	Steering arm pin	P540285	2	
1.16	Washer fi44 / fi25.5	P540042	4	
1.17	Lower suspension pin	P540043	2	
1.18	Right lower link	P540038	1	
1.19	Left lower link	P540048	1	

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9.4 Hay rake – Main frame

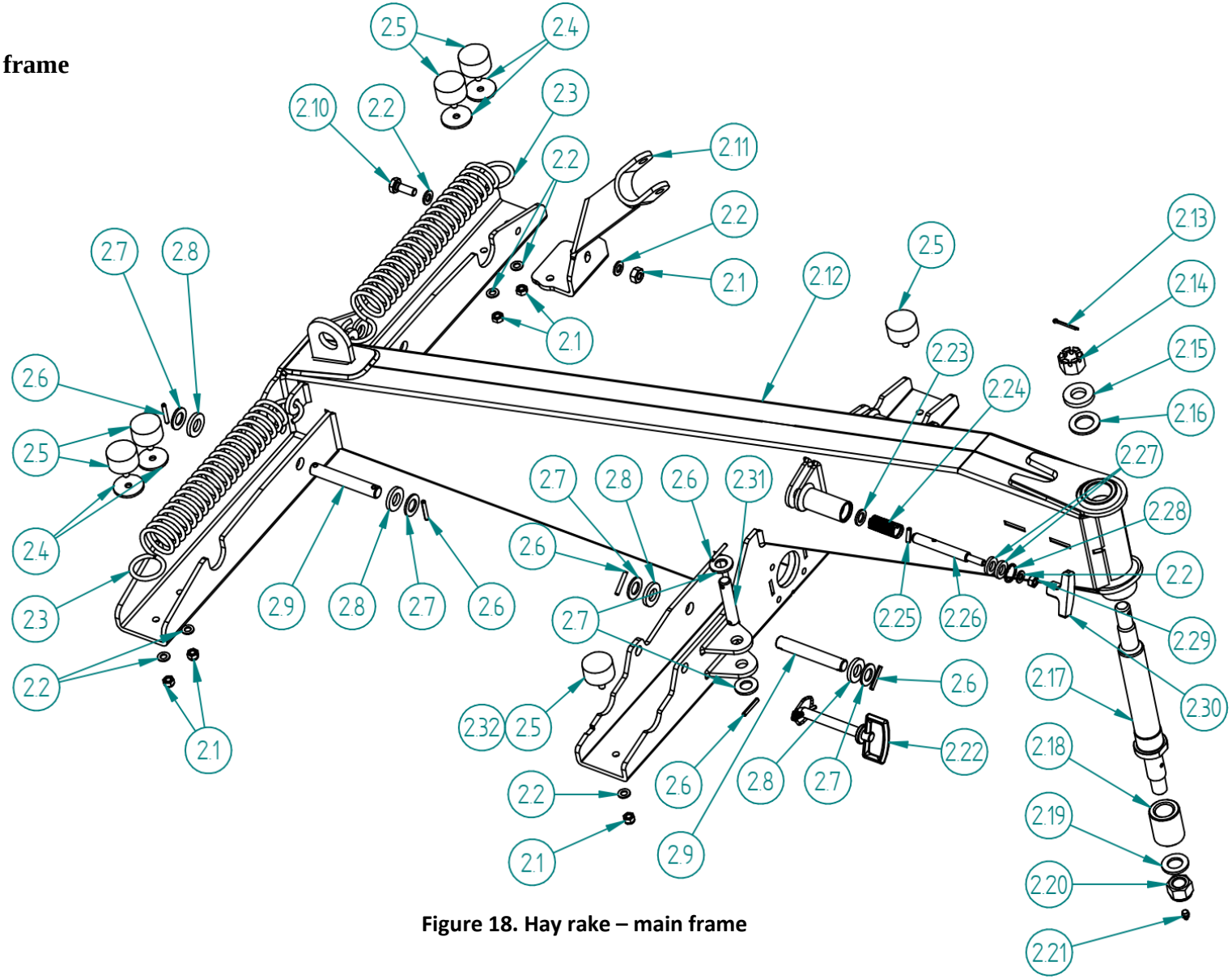

Figure 18. Hay rake – main frame

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No	Description	Index	Quantity/MODEL	
			420	360
2.1	Self-locking nut M10 galv.	T000292	7	5
2.2	Flat washer M10 galv.	T000456	10	8
2.3	Tension spring 7x60x250	T000661	2	
2.4	Rubber buffer washer 5028 D70	P540237	4	2
2.5	Vibration damper type D 5028.D70	T000841	6	2
2.6	Expansion pin 6x40	T000087	12	
2.7	Flat washer M20 galv.	T000462	16	
2.8	Barrier pin washer	P540236	8	
2.9	Barrier pin	P540285	4	
2.10	Bolt M10x35-8.8 galv.	T000743	1	
2.11	Arm rotation lock	P540269	1	-
		P540052	-	1
2.12	Main frame	P540070	1	-
		P550006	-	1
2.13	Split pin 5x40 galv.	T000985	1	
2.14	M24 crown nut galv.	T000263	1	
2.15	Washer under the M24x1.5 crown nut	P540029	1	
2.16	Main corner pin washer	P540028	1	
2.17	Main corner pin	P540027	1	
2.18	Main pin sliding bush	P540030	1	
2.19	Flat washer M25 galv.	T000464	1	
2.20	Self-locking nut M24 galv.	T000290	1	
2.21	Straight grease nipple M10x1	T000643	1	
2.22	Pin with a handle 16x112 mm	T003022	1	
2.23	Thrust washer	P540096	1	
2.24	Compression spring Ø25 L70Ø2 80.005.044	T000650	2	
2.25	Spring pin 6x25	T000087	2	
2.26	Bolt pin	P540094	2	
2.27	Spacer	P540095	4	
2.28	Circlip W30	T000626	2	
2.29	Nut M10 galv.	T000265	2	
2.30	Handle 652/80 M10	T000872	2	
2.31	Steering arm pin	P540285	2	
2.32	Vibration damper 5021D55 *	T000011	0	2

*only in 360 rake

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9.5 Hay rake – drive system

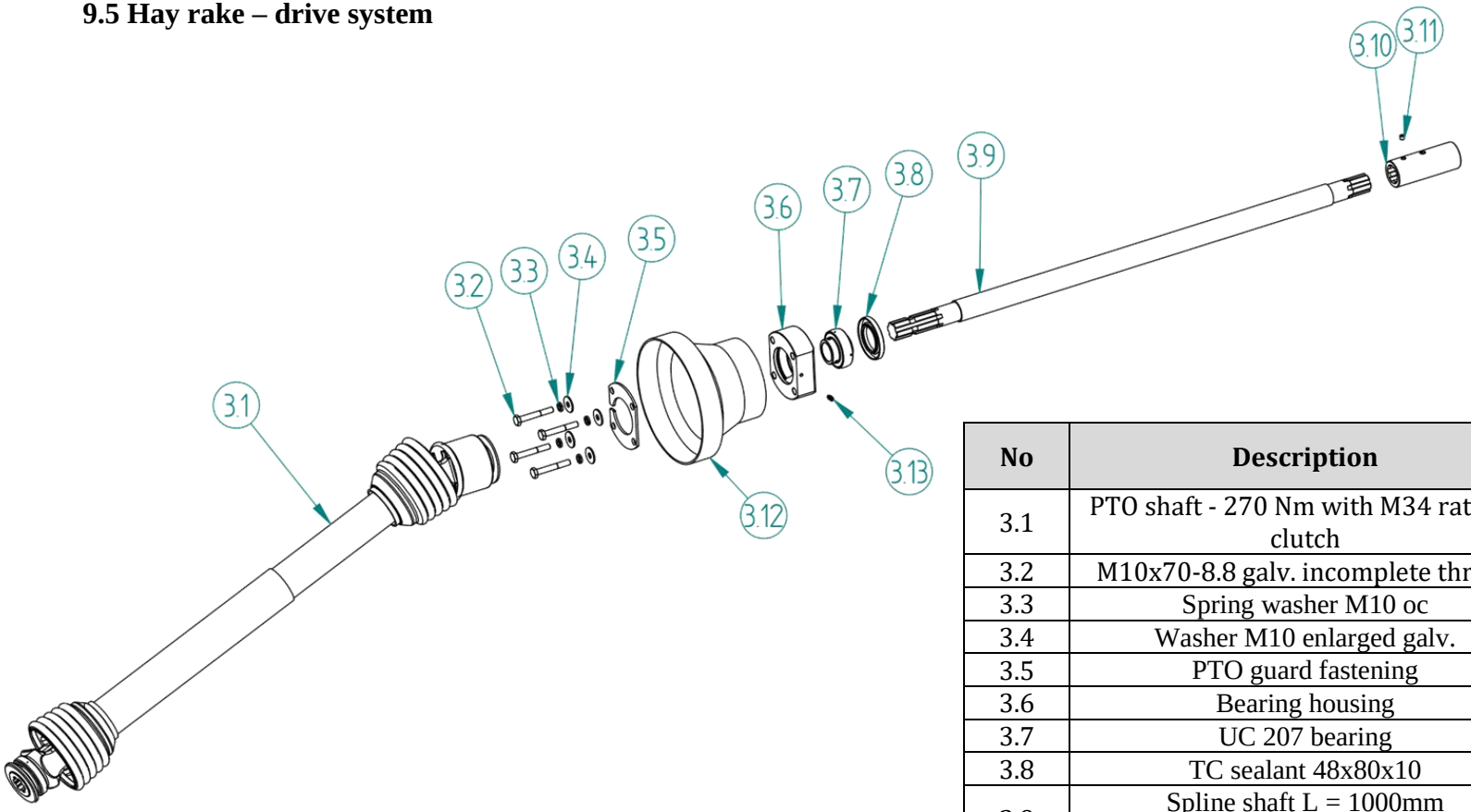

Figure 19. Hay rake – drive system

No	Description	Index	Quantity/MODEL	
			420	360
3.1	PTO shaft - 270 Nm with M34 ratchet clutch	T000902	1	
3.2	M10x70-8.8 galv. incomplete thread	T000748	4	
3.3	Spring washer M10 oc	T000450	4	
3.4	Washer M10 enlarged galv.	T000457	4	
3.5	PTO guard fastening	P540108	1	
3.6	Bearing housing	P540109	1	
3.7	UC 207 bearing	T000204	1	
3.8	TC sealant 48x80x10	T000884	1	
3.9	Spline shaft L = 1000mm	P540112	1	-
	Spline shaft L = 1195mm	P550013	-	1
3.10	L-130mm splined bushing	P540113	1	
3.11	Grub screw M8x8	T000936	1	
3.12	PTO guard	T000368	1	-
		T000370	-	1
3.13	Straight grease nipple M6x1	T000645	1	

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9.6 Hay rake – control arm

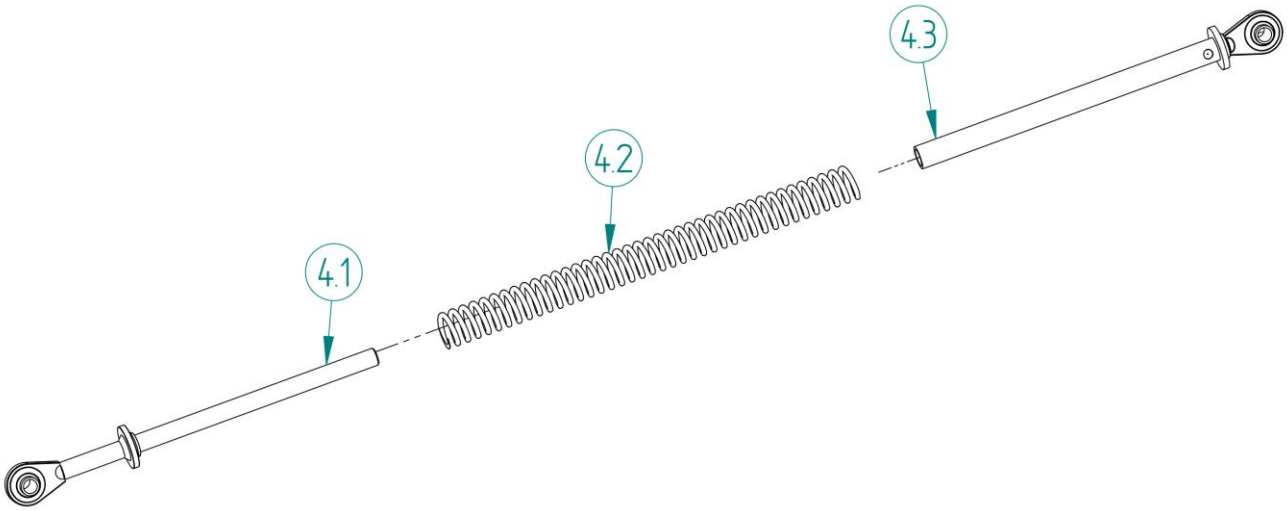

Figure 20. Hay rake – control arm

No	Description	Index	Quantity/MODEL	
			420	360
4.1	Internal link control arm	P540280	1	-
		P550036	-	1
4.2	Compression spring 600x50x7x15	T000669	1	-
	Compression spring 550x50x7x15	T001473	-	1
4.3	External link control arm	P540276	1	-
		P550034	-	1

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9.7 Hay rake – protective barriers

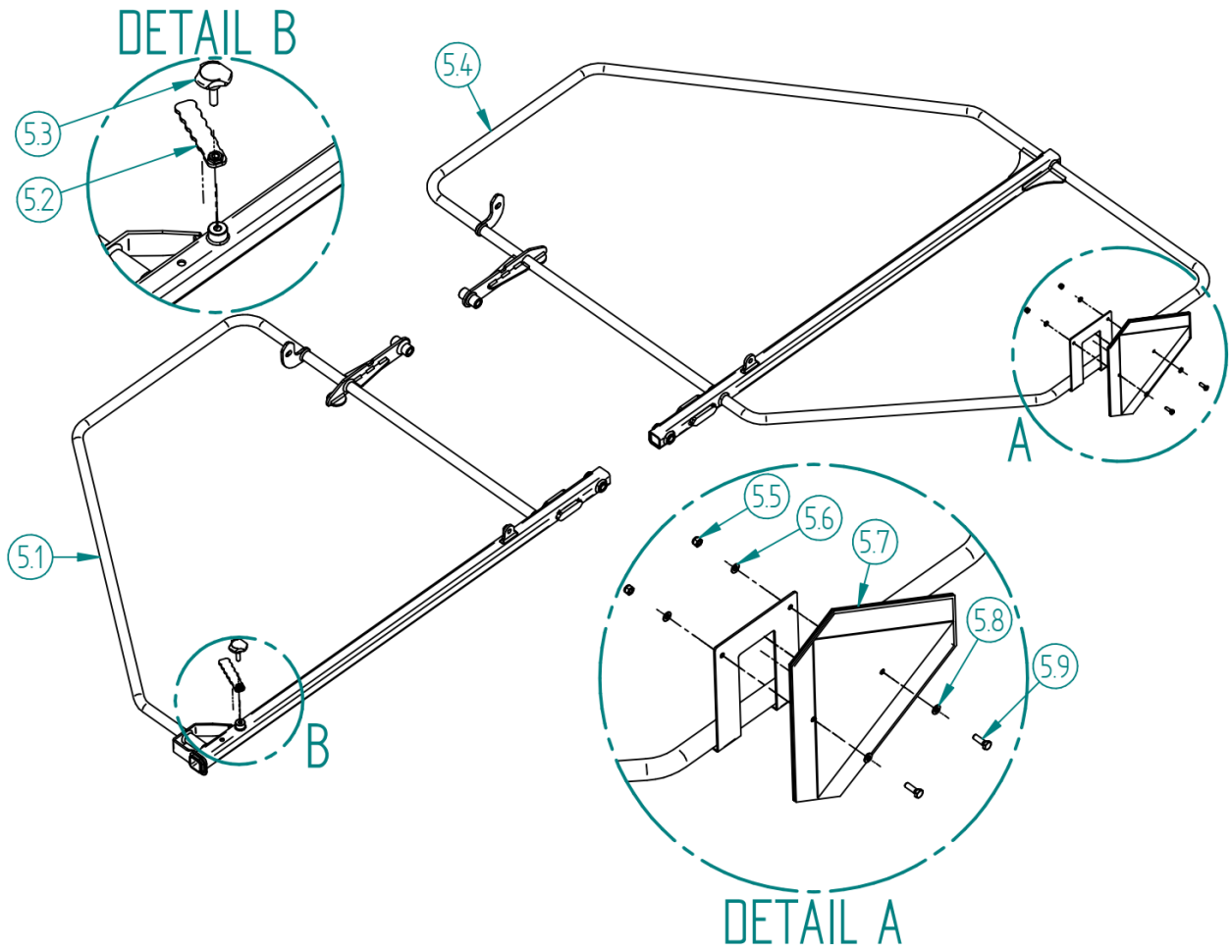

Figure 21. Hay rake – protective barriers

No	Description	Index	Quantity/MODEL	
			420	360
5.1	Protective barrier – swath side	P540222	1	-
		P550027	-	1
5.2	Counter lever	P000160	1	
5.3	Cross handwheel	T003017	1	
5.4	Protective barrier – side of reflective plate	P540245	1	-
		P550028	-	1
5.5	Self-stop nut M8 galv.	T000256	2	
5.6	Flat washer M8 galv.	T000471	2	
5.7	Reflective plate	T000832	1	
5.8	Enlarged washer M8 galv.	T000443	2	
5.9	M8x20-8.8 galv. bolt	T000804	2	

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9.8 Hay rake – swath screen

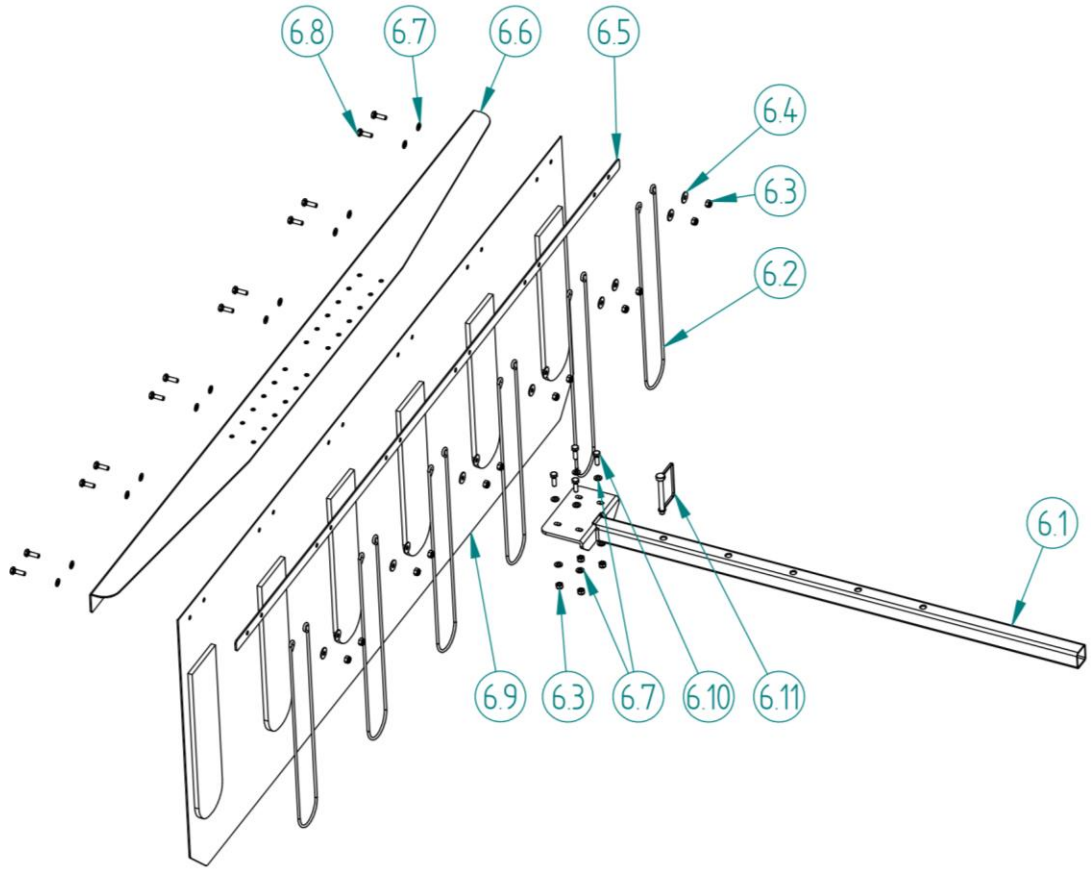

Figure 22. Hay rake – swath screen

No	Description	Index	Quantity/MODEL	
			420	360
6.1	Swath screen arm	P540289	1	-
		P550039	-	1
6.2	Stiffening element 500x84x5	T000040	6	
6.3	M8 self-stop nut	T000256	16	
6.4	Enlarged M8 washer galv.	T000443	12	
6.5	Fastening bar	P540293	1	
6.6	Tarpauling mounting	P540294	1	
6.7	M8 flat washer	T000471	20	
6.8	Bolt M8x25-8.8 galv.	T000805	4	
6.9	Rake tarpaulin 5272/512-05-202	T000042	1	
6.10	Bolt M8x30-8.8 galv.	T000807	12	
6.11	Folding pin 12x67	T000992	1	

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9.9 Hay rake – raking height adjustment mechanism

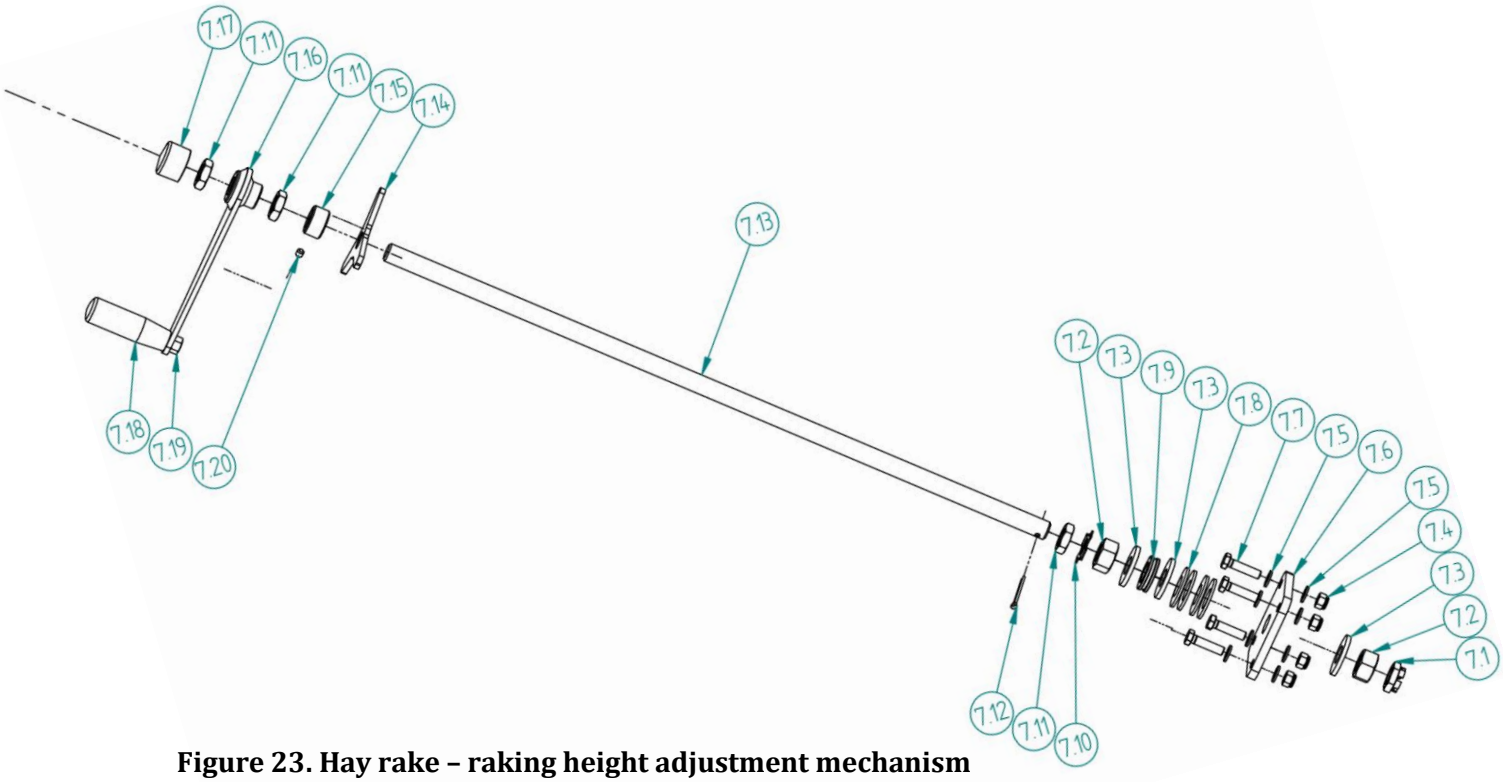

Figure 23. Hay rake – raking height adjustment mechanism

No	Description	Index	Quantity/MODEL	
			420	360
7.1	Lock nut low M22x1.5 oc	T000275	1	
7.2	Nut M22x1.5 galv.	T000277	1	
7.3	Washer	P540164	3	
7.4	Self-locking nut M10 galv.	T000292	4	
7.5	Washer M10 galv.	T000456	8	
7.6	Fastening plate	P540162	1	
7.7	Bolt M10x35-8.8 galv.	T000743	4	
7.8	Disc spring DIN2093 50x25,4x3	T000672	4	
7.9	Thrust bearing 51105	T000213	1	
7.10	Wing washer	P540160	1	
7.11	Low nut M22x1.5 galv.	T000276	4	3
7.12	Split pin 5x40	T000985	1	
7.13	Lead screw	P540159	1	
		P540158		1
7.14	Lock nut	P540161	1	
7.15	Lead screw extension limiter	P540163	1	
7.16	Crank	P540154	1	
7.17	FCWA 0381-025 blanking plug	T000301	1	
7.18	Handle 280/100 P M10 (22111)	T000223	1	
7.19	Self-locking nut M12 galv.	T000292	1	
7.20	Grub screw M8x8	T000936	1	

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9.10 Hay rake – main gearbox

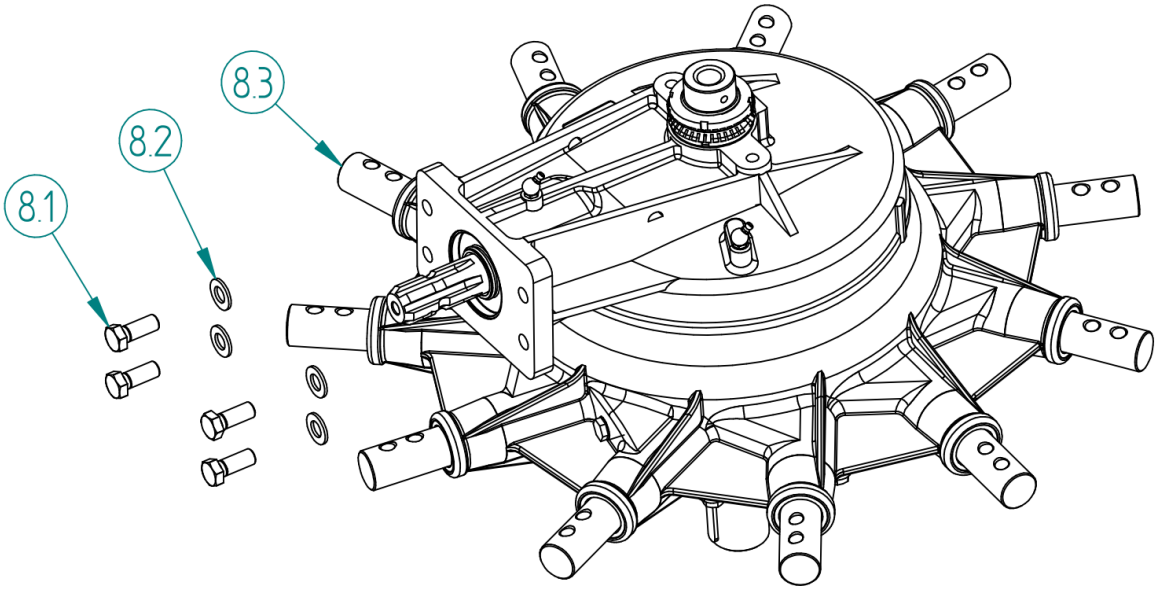

Figure 24. Hay rake – main gearbox

No	Description	Index	Quantity/MODEL	
			420	360
8.1	Bolt M14x35-8.8 galv.	T000766	4	
8.2	Flat washer M14 galv.	T000459	4	
8.3	11-arm gearbox	T000503	1	-
	9-arm gearbox	T000502	-	1

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9.11 Hay rake – foldable raking arm

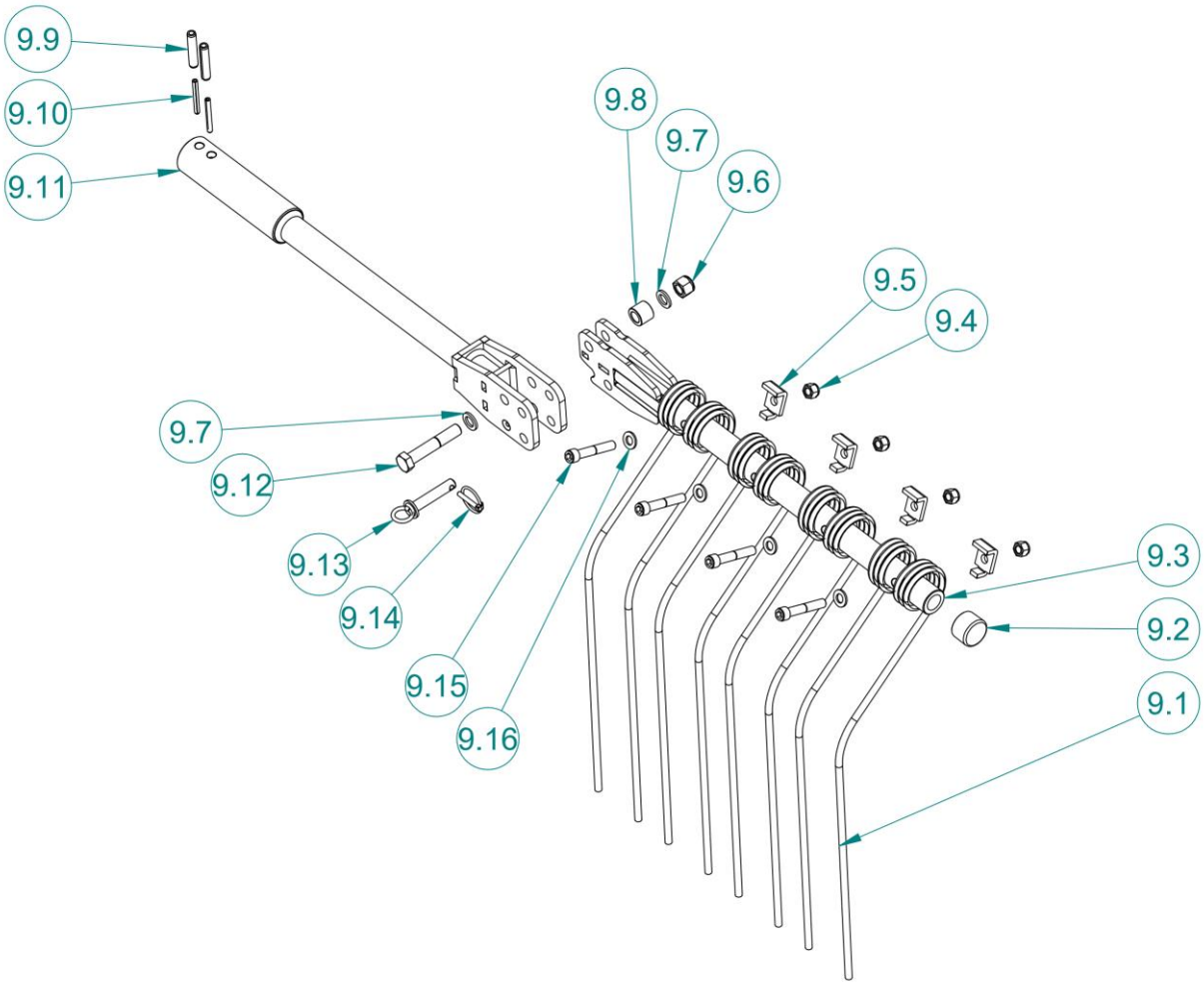

Figure 25. Hay rake – foldable raking arm

No	Description	Index	Quantity/MODEL	
			420	360
9.1	Rake tine	T000373	4	3
9.2	Plug	T003016	1	
9.3	Folding arm – raking side	P540191	1	-
		P550022	-	1
9.4	Self-locking nut M12 galv.	T000291	4	3
9.5	Rake tine fixing galv.	P540181	4	3
9.6	Self-locking nut M16 galv.	T000294	1	
9.7	Flat washer M16 galv.	T000460	2	
9.8	Spacer bushing for the arms	P540202	1	
9.9	Roll pin 12x60	T000079	2	
9.10	Roll pin 7x60	T000082	2	
9.11	Folding arm – gearbox side	P540195	1	-
		P550024	-	1
9.12	Bolt M16x90-8.8 galv, incomplete thread	T000785	1	
9.13	Pin for locking the folding arms	P540203	1	
9.14	Pin 6x27 / 32	T000986	1	
9.15	Cylinder head bolt M12x80-8.8 galv.	T000734	4	3
9.16	Flat washer M12 galv.	T000458	4	3

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9.12 Hay rake – chassis

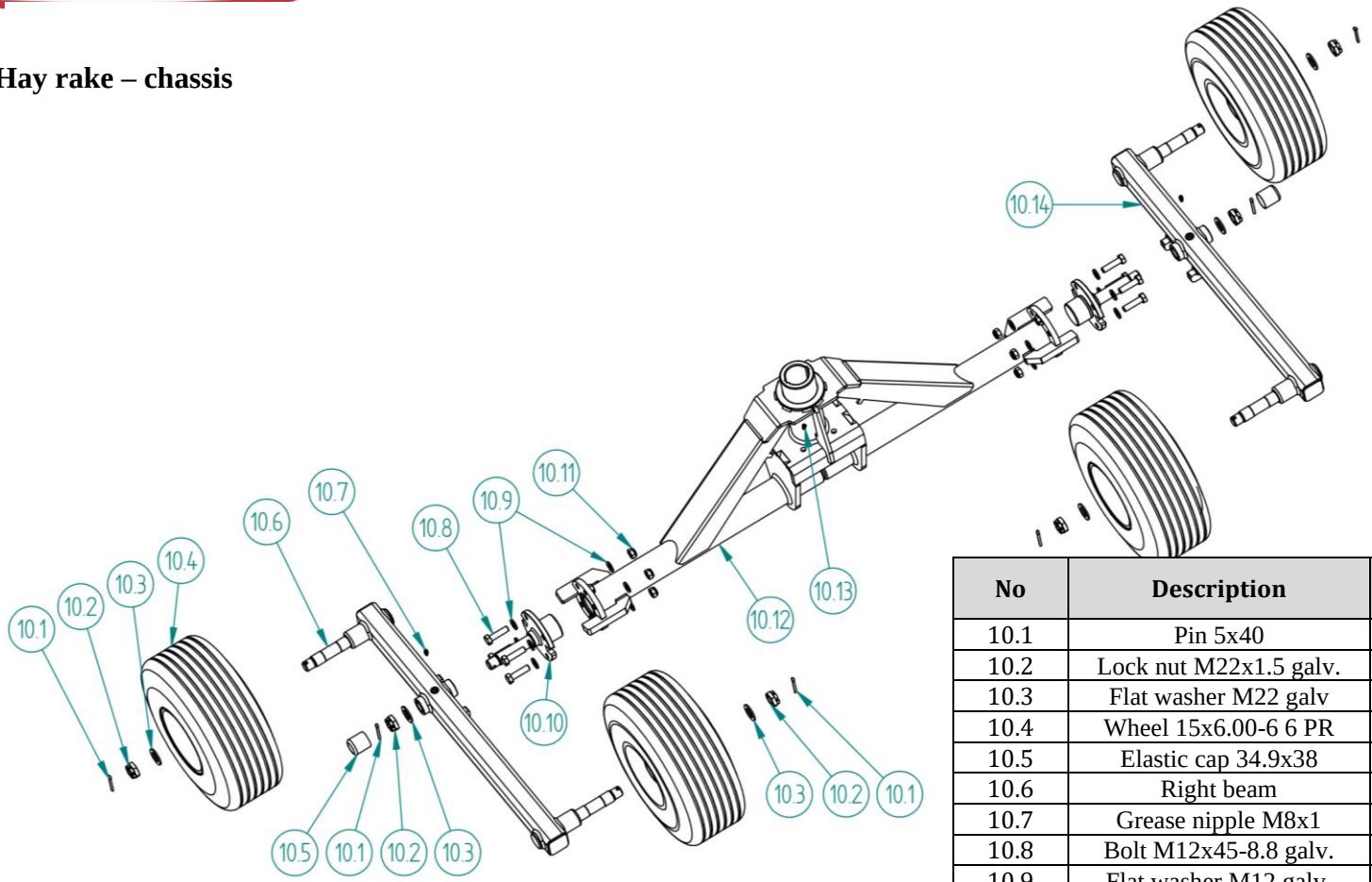

Figure 26. Hay rake – chassis

No	Description	Index	Quantity/MODEL	
			420	360
10.1	Pin 5x40	T000985	2	
10.2	Lock nut M22x1.5 galv.	T000275	6	
10.3	Flat washer M22 galv	T000463	6	
10.4	Wheel 15x6.00-6 6 PR	T000091	4	
10.5	Elastic cap 34.9x38	T000301	2	
10.6	Right beam	P540134	1	
10.7	Grease nipple M8x1	T000647	2	
10.8	Bolt M12x45-8.8 galv.	T000758	8	
10.9	Flat washer M12 galv.	T000458	16	
10.10	Plug	P000142	2	
10.11	Self-locking nut M12 galv.	T000291	8	
10.12	Axis	P540125	1	-
		P550015	-	1
10.13	Grease nipple M6x1	T000645	1	
10.14	Left beam	P540140	1	

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9.13 Hay rake – stiff raking arm

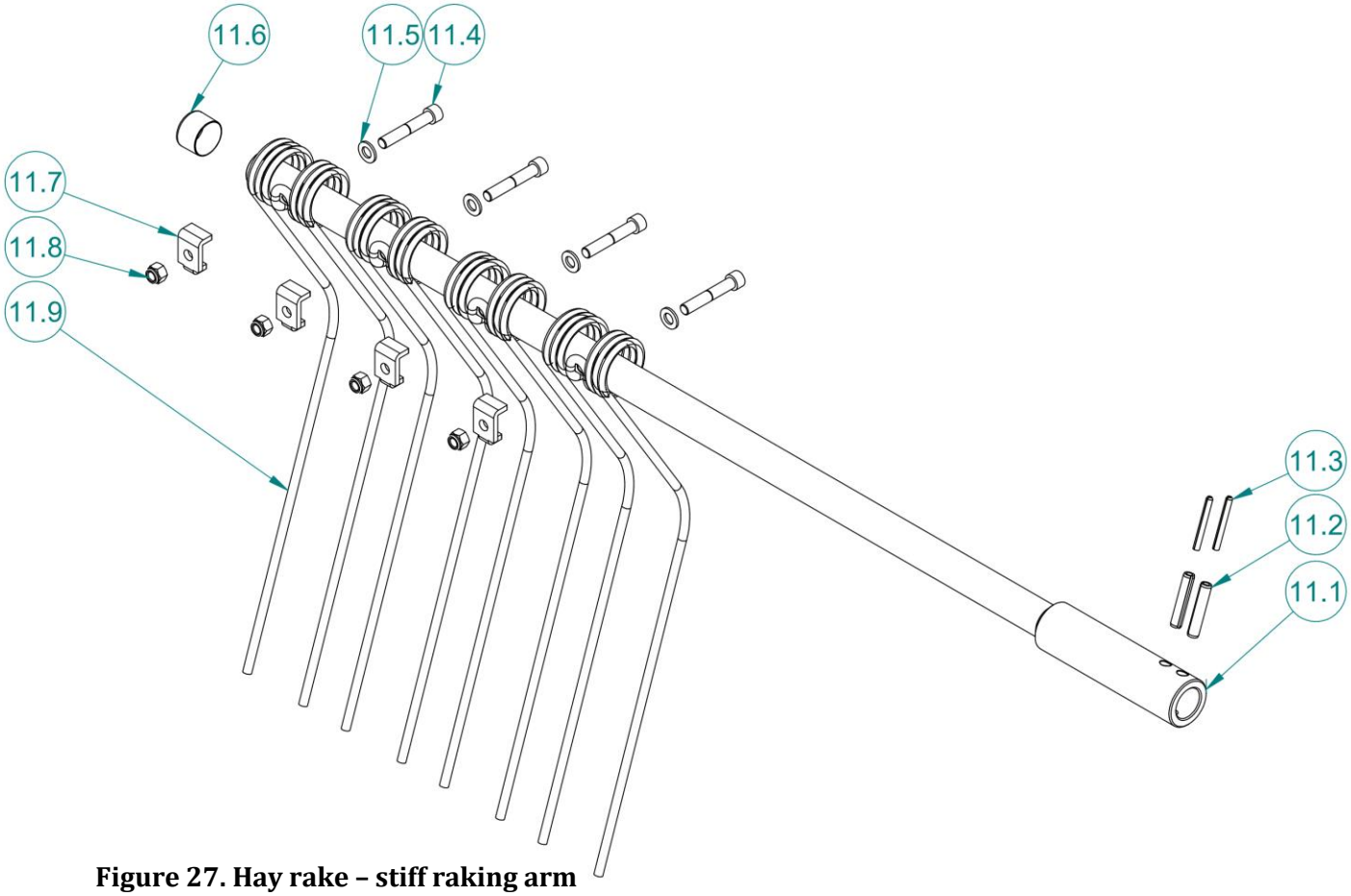

Figure 27. Hay rake – stiff raking arm

No	Description	Index	Quantity/MODEL	
			420	360
11.1	Fixed arm	P540178	1	-
		P550019	-	1
11.2	Roll pin 12x60	T000079	2	
11.3	Roll pin 7x60	T000082	2	
11.4	Socket head bolt M12x80-8.8	T000734	4	3
11.5	M12 flat washer galv.	T000458	4	3
11.6	Plug	T003016	1	
11.7	Rake tine fixing	P540181	4	3
11.8	M12 Self-stop nut	T000291	4	3
11.9	Rake tine	T000373	4	3

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9.14 Hay rake – support wheel

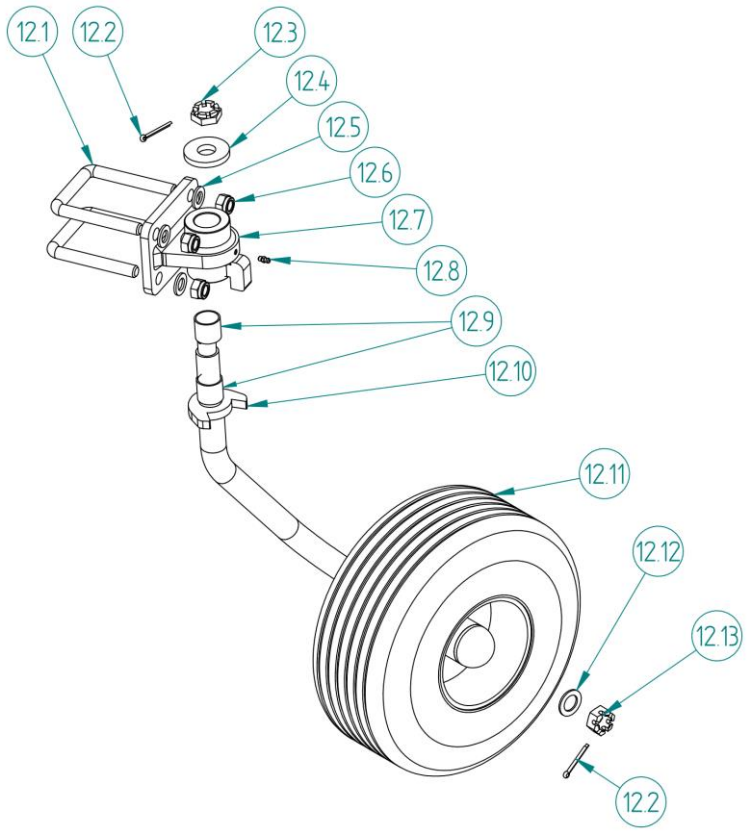

Figure 28. Hay rake – support wheel

No	Description	Index	Quantity/MODEL	
			420	360
12.1	Clamp M16 16x82x135	T001474	2	
12.2	Split pin 5x40 galv.	T000985	2	
12.3	Low lock nut M24x1,5 galv.	T000280	1	
12.4	Wheel arm bolt washer	P550043	1	
12.5	M16 galv. flat washer	T000460	4	
12.6	M16 self-stop nut galv.	T000294	4	
12.7	Wheel arm bracket	P550048	-	1
		P540034	1	-
12.8	Straight grease nipple M6x1	T000645	1	
12.9	Sliding bush PAP 3030-P10	T000218	2	
12.10	Wheel bar	P550051	-	1
		P540032	1	-
12.11	Wheel 15x6.00-6 6 PR	T000091	1	
12.12	M22 flat washer galv.	T000463	1	
12.13	Low lock nut M22x1,5 galv.	T000275	1	

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10. Warranty

WARRANTY CARD

Serial no.	……	Type	……
Year built	……	QC	……

The manufacturer agrees to repair under warranty the physical defects of the machine disclosed during the warranty period, which lasts 12 months from the date of sale, cost free.

The manufacturer is released from liability under warranty in the event of:

- Mechanical damage to the machine after handing it over to the user
- Inappropriate use , maintenance, storing of the machine, especially not in accordance with the User Manual
- Performing repairs by unauthorized persons without the manufacturer's permission
- Applying changes to the machine build without making appropriate arrangements with the manufacturer
- Fractures in the gear housing caused by shaft runout

The Warranty Card is valid if it has the seller's signature and the date of sale confirmed by the company stamp. There may not be any deletions or corrections of unauthorized persons.
The copy of the Warranty Card may be issued by a written request after providing the proof of purchase by the user.
The warranty claims must be reported 14 days from the incurred damages immediately to the seller.
The manufacturer ensures the maintenance service within 14 days from the date of reporting of the claim to the day of repair.
The warranty is extended for the period of the repair, counting from the day of reporting to the day of performing the service, if the damage made it impossible to use the machine.
The warranty does not cover elements subject to natural wear, such as bearnings, tyres, raking tines, rubber guards, conectors etc.

Date of sale: _____ _____
(Day, month, year) *(Signature and the Stamp of the selling company)*

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11. Warranty repairs form

WARRANTY REPAIRS RECORD

To by filled in by the manufacturer:

Date of complaint: _____

The scope of repairs and replaced parts: _____

_____

_____

_____

Date of repair: _____

Warranty extended till: _____

_____
(details of a service point, legible signature of a person performing warranty repair)

Date of complaint: _____

The scope of repairs and replaced parts: _____

_____

_____

_____

Date of repair: _____

Warranty extended till: _____

_____
(details of a service point, legible signature of a person performing warranty repair)

Date of complaint: _____

The scope of repairs and replaced parts: _____

_____

_____

_____

Date of repair: _____

Warranty extended till: _____

_____
(details of a service point, legible signature of a person performing warranty repair)

Date of complaint: _____

The scope of repairs and replaced parts: _____

_____

_____

_____

Date of repair: _____

Warranty extended till: _____

_____
(details of a service point, legible signature of a person performing warranty repair)*)*

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12. Declaration of conformity

WE Machine declaration of conformity

Manufacturer:

TALEX Spółka z ograniczoną odpowiedzialnością

Spółka komandytowa

ul. Dworcowa 9C

77-141 Borzytuchom

The manufacturer hereby declares that the machine:

Machine type: **Carousel Hay Rake**

Machine name: SPYDER 420/360

Serial number: .....

Year of production: .....

To which this declaration refers, satisfies the requirements:

REGULATIONS

- Machinery Directive 2006/42/EU from 17.05.2006. (Law Sheet L 157 vom 9.06.2006 S. 24) mit Änderungen aus 2009/127/EU vom 21.10.2009. (Law Sheet L 310 vom 25.11.2009 S. 29).

HARMONIZED STANDARDS

- PN-EN ISO 4254-1/2006 Agricultural machinery. Safety. Part 1: General requirements
- PN-EN 15811/2009 Agricultural machinery. Covers of moving parts of power transmission.
- PN-EN 953/2009 Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards..
- PN-EN 12100/2010 Machine safety. General planning rules. Risk assessment

  Risk reduction
- PN-ISO 11684/1998 Safety marking and pictograms of hazards

The declaration loses its validity if the machine will be rebuilt without the permission of the manufacturer.

Borzytuchom, 19.03.2016

Karol Jaworski

(place and date of issue) *(first and last name and the signature of the authorized by the manufacturer person)*