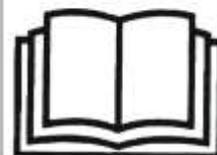
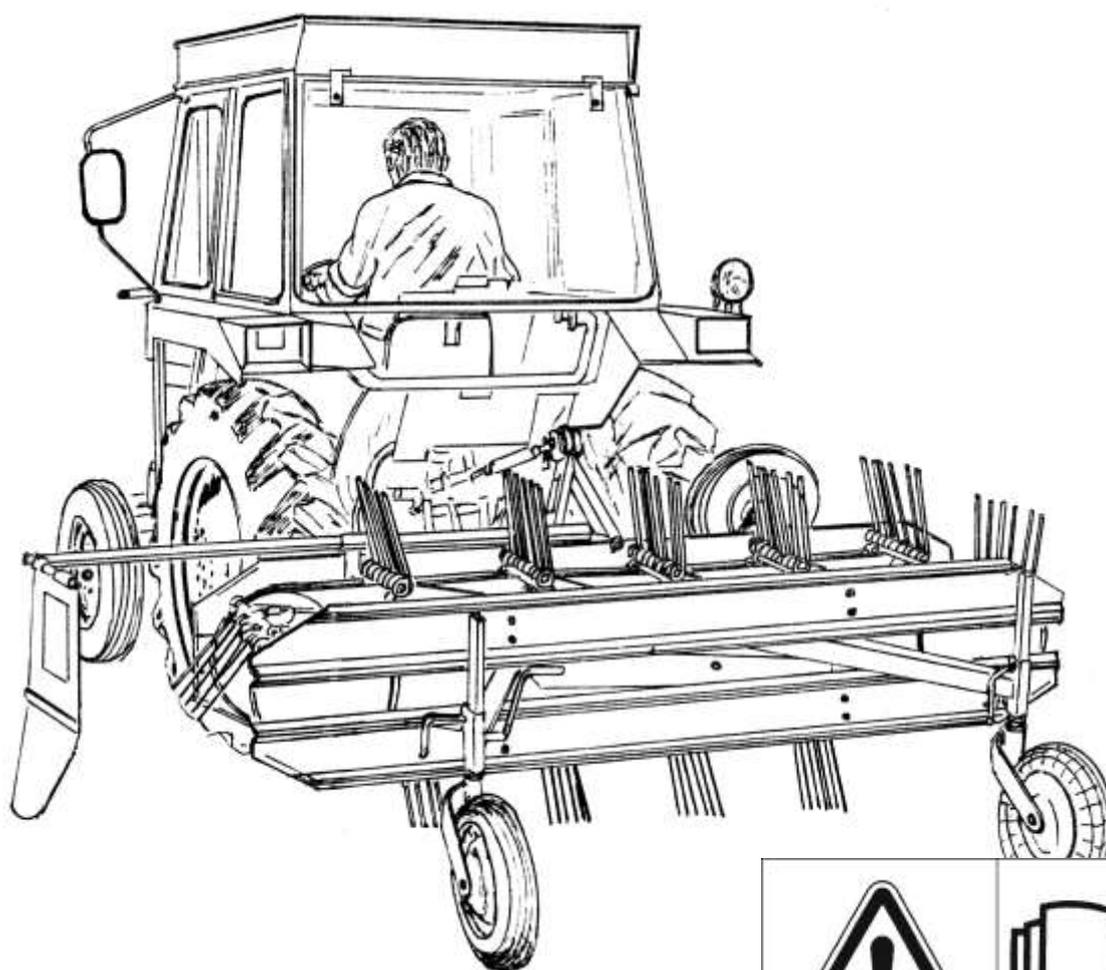




BELT HAY RAKE

FPM 627 249
FPM 627 250



№ 2670

12.2018.

INSTALLATION / HANDLING / MAINTENANCE LIST OF SPARE PARTS

• E-mail: razvoj@fpm-agromehanika.rs
info@fpm-agromehanika.rs

SERBIA

• Internet: www.fpm-agromehanika.rs

WARNING TO YOU, USER

By purchasing this tool you have made a wise choice. It is the result of many years of thinking, research and improvements. And you will, like thousands of other users, understand that now you possess the best that could be created by technique, knowledge and field testing. You have purchased a reliable tool, but only if you use it correctly, you can expect a good performance and long life.

This Instructions Manual provides all the necessary information you need to achieve the best possible efficiency from your tool. The efficiency greatly depends on how carefully you read and understand this Manual and apply this knowledge. This is a simple tool, but one can frequently overlook the obvious deficiencies reflected in the poor performance frequently resulting from the fact that you neglected the natural wear of parts or that the tool has not been set up well. Therefore, do not think that you know how to use and maintain the tool before reading this Manual that you should constantly have at hand.

Our service representatives or sales service centers with its trained staff can offer you all original parts for belt hay rake for servicing. These parts are manufactured and carefully examined in the same factory where the belt hay rakes are manufactured to ensure high quality and precise fitting for each replacement.

BELT HAY RAKE IS MANUFACTURED BY: FPM AGROMEHANIKA d.o.o. BOLJEVAC

Belt hay rake meets the criteria stipulated by the Regulation on Technical Standards for Agricultural Machinery (Official Gazette, No. 13/2010) particularly in terms of stability and protection of parts and assemblies that, by their function and form, might threaten the safety of the operator.

IMPROVEMENT: FPM Agromehanika d.o.o is constantly striving to enhance and improve its products and therefore reserves the right to make changes or improvements as necessary, without any obligation to change previously manufactured or sold equipment.

The information in this Manual is correct as of the date of publishing.

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FPM AGROMEHANIKA d.o.o BOLJEVAC

THE CERTIFICATE OF OCCUPATIONAL SAFETY IS AN INTEGRAL PART OF THE INSTRUCTIONS FOR HANDLING AND MAINTENANCE



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№ 2670

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WARNING TO YOU, USER

It is very important that the PTO which is connected to your belt hay rake is of appropriate dimensions. Therefore it is necessary to provide the PTO of the following characteristics:

- joint 35 JUS M.L1.601 at the both ends of the PTO
- continuous torque $M_r = 130 \text{ Nm}$

The PTO is the product of the company “Pobeda” FKL – Temerin and can be procured under the number:

05B - 570 - 10.10 - 10.10 ili
18 BSFT - 770 - 11 - 10 - 84 - 18 - 00



IMPORTANT: In case of failure to comply with the above mentioned warning, the factory is not responsible for the damage or breakage on the tractor, the PTO or belt hay rake.

READ CAREFULLY!

In this Manual and on the tools you will find labels with warnings: “CAUTION”; “ATTENTION” and “DANGER”. Warnings are intended to draw your attention to the personal caution and caution of those who work with you because they need to read them, too.

PERSONAL SAFETY

- CAUTION:** The word “CAUTION” is used where it is necessary to be cautious to protect the operator and others from an accident.
- ATTENTION:** The word “ATTENTION” indicates the possibility of serious injury to the operator and to staff that might occur suddenly. This is a word frequently used to alert the operator and other persons in order to avoid surprises when using belt hay rake.
- DANGER:** The word “DANGER” indicates what must not be done, because it implies risk.

THE ADDITIONAL WARNINGS SUCH AS “WARNING” AND “IMPORTANT” REFER TO SPECIAL INSTRUCTIONS RELATED TO THE SAFETY OF TRACTOR BELT HAY RAKE.

SAFETY OF TRACTOR BELT HAY RAKE

- WARNING:** THIS WARNING DRAWS ATTENTION TO OPERATOR OF POTENTIAL DAMAGES OF THE BELT RAKE IF HE FAILS TO COMPLY WITH ANY INSTRUCTIONS.
- IMPORTANT:** THE READER IS INFORMED ABOUT SOMETHING HE SHOULD KNOW TO PREVENT MINOR FAILURES ON BELT RAKE, IN CASE HE MISSES IT.

WARNING!

FAILURE TO OBSERVE THE ABOVE STATED WARNINGS “CAUTION”, “ATTENTION” AND “DANGER” MAY CAUSE SERIOUS BODY INJURIES.

LIMITED WARRANTY

The factory provides warranty in compliance with the Law on Standardization, Regulation on Technical Standards for Agricultural Machinery (Official Gazette No. 13/2010) for each original part of the new belt hay rake delivered to the customer by the sales network of FPM AGROMEHANIKA d.o.o. Boljevac by which it guarantees that, at the time of delivery, each part of the belt rake was new, without defects in material and workmanship and that for the belt rake it provides one-year warranty from the date of delivery to the end user, provided that the belt rake is used and serviced according to the recommendations for handling and maintenance stated in this MANUAL.

EXCEPTIONS:

1. Parts made of wood are not covered by warranty
2. Parts not manufactured by FPM Agromehanika d.o.o. Boljevac (tires, plastics, etc.). These items are not covered by this warranty but by the warranty of the corresponding producers;
3. Parts that are normally worn during exploitation such as collecting elements.
4. The warranty expires in case of misuse, improper or careless use or damage in an accident. The warranty becomes invalid in case of use of non-original parts and the factory is not responsible for damages caused in transport.

THE FACTORY IS NOT RESPONSIBLE FOR THE LOSS OF PROFITS DUE TO FAILURE OF THE BELT HAY RAKE, OR INJURY OF ANY THIRD PARTY, OR FOR ANY ADDITIONAL COSTS OF WORK ON REMOVAL AND REPLACEMENT OF PARTS.

Customer is responsible for and bears the costs of the following:

1. Regular maintenance, such as lubrication, the oil fill, minor adjustments, etc.
2. Transport of the belt rake to the place where the service is provided during the warranty period and back.
3. Travel time of the authorized servicer to the owner of the belt rake and back, or delivery and return of the belt rake from the service workshop after repair.

This warranty does not apply to the belt rake that was changed or modified without our explicit permission or was repaired by someone else, outside of authorized service.

The warranty refers to strict compliance to the warning:

- All instructions in this Manual must be observed and all the parts should be regularly checked and replaced, if necessary.

No warranty is provided for products that are not new.

Persons who only work in our factory are not official representatives of the factory and have no right to take any obligation on its behalf.

No warranty covers equipment for the products broader than the provided one, therefore the factory is not responsible for injuries resulting from such use.

SAFETY

Most accidents occur during operation, maintenance and transport as a result of failure to comply with basic safety requirements. For this reason, you are the most important person for operation and maintenance of the belt rake, whether you work alone, with family members or other persons, be sure to read and observe the basic procedures for working with the belt rake that should also be heard by all others. In addition, the hay rake is provided with the warning labels that should draw attention to the obligation to observe safety.

-  The instructions for operation, maintenance and safety at work must be unconditionally observed in order to secure a safe and secure work with belt rake.
-  Instructions for use and maintenance must be kept for the estimated operating time of the belt rake.
-  The metal plate must always be legible, visible and clean.
-  Before starting work the operator must be absolutely familiar with the functioning of all parts of the belt rake, it might be too late during the work.
-  When connecting or disconnecting the belt rake to and from the tractor, always move the supporting (the third) wheel to the adequate position (safety).
-  When disconnecting or connecting the belt rake to and from the tractor, be particularly careful.
-  Before use, check the ballast of the front tractor wheels. Fix the weights at the adequate place.
-  Observe the permitted axle load and total weight.
-  Due to safety requirements while driving, use a tractor with a cabin. Keep all the glasses closed while working.
-  Before you start the belt rake, even for a very short distance, always turn and secure it in its transport position. Pay attention to the permitted dimensions when transporting.
-  Before you start driving on public roads, be sure to secure the belt rake for safe driving and obey the rules of conduct in public transport.
-  When required by special circumstances, use the light signals to indicate the danger if it is not forbidden by traffic regulations.
-  Never transport other persons on the either belt rake or tractor during work or transport.
-  Do not transport belt rake if it is loose and not-secured for safe driving.
-  Each time before using the belt rake, make sure that all the parts (nuts, screws, etc.) are adequately tightened.
-  If the collecting elements and/or the parts that are used to tighten them (bolts, screws, etc.) are worn or damaged, replace them immediately with the original parts manufactured by FPM AGROMEHANIKA d.o.o. BOLJEVAC

- ⚠ While working, always keep away from all parts of the belt rake – take care of your arms, legs and clothes! Rotating assembly with the spring collectors or PTO can cause serious injuries.
- ⚠ Never wear loose clothing that might be caught by the rotary parts of the belt rake. Clothing should fit to the body.
- ⚠ The operator must be absolutely certain that no person, particularly children or animals are located in the area of working with the belt rake, before he starts the belt rake and starts working. One should always think about the consequences of irresponsible work, because they are irreparable.

IMPORTANT: Do not perform work on the rocky soil to avoid the risk of accidents due to bouncing of objects to other objects or persons and potential damage of the spring collectors.

- ⚠ Remove foreign objects from the field before you start working and during the work; at the places where there are potential hidden obstacles, work with the utmost care.
- ⚠ Never work with the machine when reversing.
- ⚠ At the end of the season working with the belt rake, it is necessary that the authorized servicer inspect your belt rake, bring it into proper condition, particularly the spring collectors and to accurately tighten all the parts (screws, nuts, etc.).

IMPORTANT:

- ⚠ One should in no event operate the belt hay rake whose V-belts are not fixed to all the needed spring collectors. The lack of certain number of collectors on the belts cause irregular operation and vibration which can cause major damage to the tool.
- ⚠ On completion of work, first turn-off the drive of the hay rake with the adequate handle (turn-off the PTO) and then lower the hay rake to the ground.
- ⚠ Maximum turning radius of the PTO (when not rotating) is 30°. Any exceeding of this angle can result in damage to the PTO or cardan shaft.



⚠ **THESE WARNINGS MAY NEVER BE NEGLECTED.**



WARNING: THIS TRIANGULAR SYMBOL IS USED WHEREVER YOUR SAFETY AND SAFETY OF OTHER PERSONS IS NEEDED AND TO PROTECT THE BELT RAKE AGAINST THE RISK – THEREFORE, READ CAREFULLY THE WARNING IMPLYING THIS SIGN.



CONNECTING BELT HAY RAKE

-  Before each connecting and disconnecting of the belt rake to and from the tractor, lock hydraulic controls to prevent any unintentional lifting or lowering.
-  When connecting, pay attention to the category of the tractor and the connecting levers of the belt rake - they must be adjusted or to match.
-  There is a risk of injury when connecting the connecting levers.
-  When using external commands for hydraulics do not stand between the tractor and the belt rake.
-  Observe and block the lateral movement of the connecting levers of the tractor during transport.
-  When driving on public roads with the belt rake in transport position, the tractor hydraulics commands must be blocked against unintentional lowering.
-  Do not use the belt rake for work on slopes or transport the belt hay rake by using narrow track tractors.

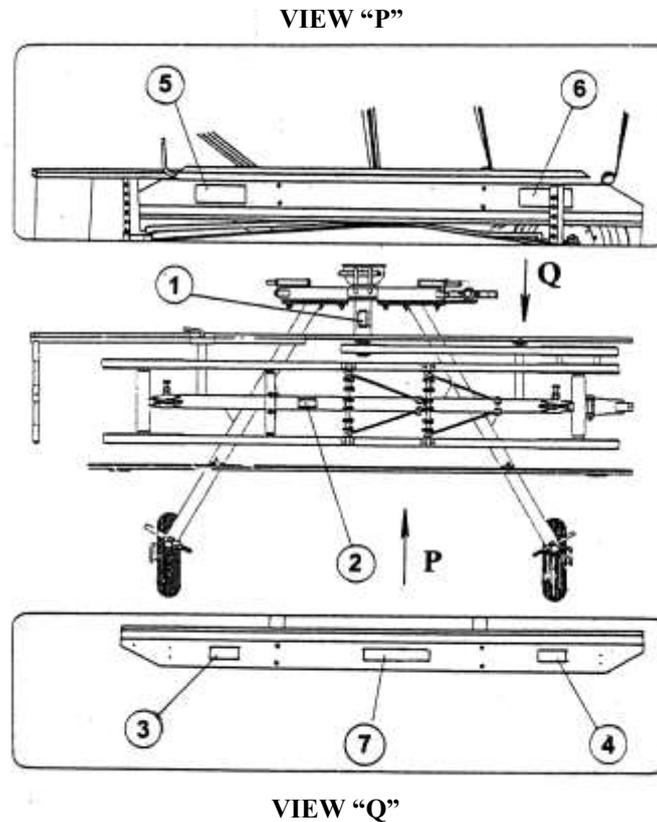


USE OF PTO

-  It is allowed to use only the PTOs that are delivered with the belt rake or recommended by the manufacturer of the belt rake.
-  The PTO covers must be installed and be in proper condition and position.
-  Take care of proper overlapping of tubes in transport and operating position.
-  Connecting and disconnecting of the PTO can be performed only with the turned off output cardan shaft of the tractor, turned off engine and ignition keys pulled out.
-  When attaching the PTO, set the coupling towards the belt rake.
-  Always properly install cardan shaft.
-  Secure the PTO covers with the chains against turning.

WARNING LABELS

The following warning labels are placed on your belt rake to ensure your safety and the safety of people who work with you. By holding this Manual in your hand, walk around the machine and check these warning labels and instructions in the Manual. The labels must be legible, otherwise replace them with the new ones.



Identification of the belt rake is performed by the identification plate (label no. 2) containing the following numbers:

- The field marked by letter "Z" contains the number of Certificate (document) on safety at work.
- The field "MASA/WEIGHT" contains the weight of the product.
- The field "GODINA/YEAR" contains the year of production (the last two numbers).
- The field "SERIJA/TYPE" contains batch code and commercial product code.
- The field "№ " contains the serial number of the belt rake consisting of nine numbers with the following meaning:
 - 1st number – year of production
 - 2nd and 3rd number – manufacturer's code
 - the remaining 6 numbers – serial No. of product from the date of start of production

1



2



627 14 747

BEFORE STARTING ADJUSTMENT, LUBRICATION OR CLEANING OF THE TOOL, TURN OFF THE TRACTOR, REMOVE THE KEY AND WAIT TILL THE MOVING PARTS STOP MOVING.

CAUTION!

BEFORE STARTING THE MACHINE, READ CAREFULLY THE INSTRUCTIONS AND PAY ATTENTION TO THE WARNINGS PROVIDED

627 14 746

BEFORE STARTING THE MACHINE, READ CAREFULLY THE INSTRUCTIONS AND PAY ATTENTION TO THE WARNINGS PROVIDED.

CAUTION!

BEFORE STARTING ADJUSTMENT, LUBRICATION OR CLEANING OF THE TOOL, TURN OFF THE TRACTOR, REMOVE THE KEY AND WAIT TILL THE MOVING PARTS STOP MOVING.

627 14 748

ROTATING ELEMENTS!
Possible bouncing of objects to other objects and persons.
Keep away from the machine for your own safety

ATTENTION!

ROTATING ELEMENTS!
POSSIBLE BOUNCING OF OBJECTS TO OTHER OBJECTS AND PERSONS. KEEP AWAY FROM THE MACHINE FOR YOUR OWN SAFETY!

627 14 749

ROTATING ELEMENTS!
Keep your feet, hands and clothes from rotating parts of the tool when the tractor and PTO are on.

ATTENTION!

ROTATING ELEMENTS!
KEEP YOUR FEET, HANDS AND CLOTHES FROM ROTATING PARTS OF THE TOOL WHEN THE TRACTOR AND PTO ARE ON.

7

627 13 656
- FPM 627.249/250



ATTENTION: THIS TRIANGULAR SYMBOL IS USED WHEREVER THERE IS THE NEED FOR YOUR SAFETY, SAFETY OF OTHER PEOPLE, AND TO HAVE YOUR BELT RAKE PROTECTED FROM RISK. THEREFORE, READ CAREFULLY THE WARNING WHEREVER YOU SEE THIS SIGN.

INFORMATION FOR PROPER READING OF THE MANUAL

In this manual “left” and “right” is defined in terms of the driving direction. Metric thread is used during installation. Tighten all screws during installation.

GENERAL INFORMATION

Belt hay rake is designed for collecting of the mowed grass mass (either dried or fresh) and collecting of the shredded maize after combine harvesting or manual harvesting for further shredding. The collecting is prior to the operation of baling by high-pressure presses, or a roll baler or self-loading trailers. This tool can also be used for raking, spreading and turning of the hay to shorten the drying time. Due to its good coping it is suitable for use on all types of terrains.

Belt hay rake is the mounting type tool. It is connected to the tractors of 1st and 2nd category equipped with 3-point linkage in compliance with ISO 730/I and a six-slot output shaft, diameter 34,9 mm. The tool is lifted during transportation and lowered to the working position by means of the control levers of the tractor hydraulics.

Belt hay rakes can be aggregated to all tractors manufactured locally or abroad whose engines have the adequate power at 540 min⁻¹ of the PTO of the tractor. The rake is manufactured as a very reliable tool that requires minimal maintenance.

The Manual is customized for the basic model of the rake. It may happen that a part that corresponds to a functional explanation while the shape slightly differs can be built-in to your rake - in that case, please do not pay attention to that.

SPECIFICATION OF TECHNICAL CHARACTERISTICS

	BELT HAY RAKE TYPE
	FPM 627 249/250
Working width	1,6 m/1,9 m
Tractor minimum power output	8,8 KW and more
Maximum work rate	1,6/1,9 ha/h
Number of collecting bodies	9/11
Number of collecting elements	27/33
Transmission	Mechanical
Working height adjustment	mechanical, using the lever on the wheel bearing
Linkage	3 point linkage
PTO (rpm)	540 min ⁻¹
Threads	metric
Weight	190/195 kg

DESCRIPTION OF THE TOOL

FPM tractor belt hay rake is designed to rake, turn and collect fresh or dry grass. All these operations can be performed while driving both forward and reverse.

The frame, the connecting mechanism and the wheel springs are designed to withstand shaking and bumps to both the soft and hard ground.

The protective plate protects workers and prevents the hands of the operator from entering into the interior system of turning.

Plastic bearings ensure quiet and smooth operation. Spring collecting elements are connected with wing joints, whose structure and kinematics of motion ensure gentle collection of grass and vertical pulling of spring collecting elements. The collecting drive system is performed with the drive pulley and V-belt. All drive bearings are ball ones, sealed and permanently lubricated.

Height regulating system ensures good coping of ground and is therefore convenient for use on all terrains. All installed parts are excellently made of high quality materials in the factory, thus ensuring long life.

Belt hay rakes are a very reliable tool requiring a minimal maintenance.

Construction of technical system of the belt hay rake is of modular type and consists of the following modules:

I - The supporting structure with a system for hooking and height regulation.

- | | |
|-----------------------------------|----------------------------|
| I.1. The main supporter - assy | 4. Height regulation wheel |
| 2. Pyramid - assy | 5. Belt |
| 3. Safety plates – front and rear | |

II – Transmission with safety elements.

- | | |
|---------------------------|---------------|
| II.6. Cardan shaft - assy | 7. PTO - assy |
|---------------------------|---------------|

III – Operating mode - V-belts with spring collecting elements.

- | | |
|----------------|----------------------|
| III.8. V-belts | 9. spring collectors |
|----------------|----------------------|

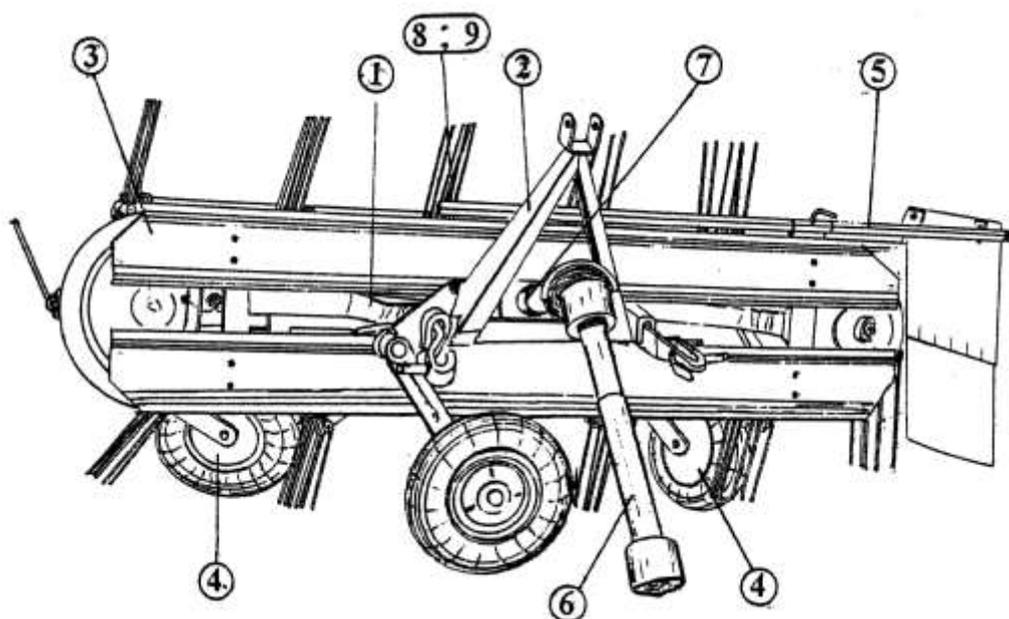


Figure 1 Belt hay rake

SETUP AND MAINTENANCE

ATTENTION: When setting-up the belt rake, remove all objects. Foreign objects and parts may bounce and strike the persons standing close.

CAUTION: Before performing any work on the setting-up or regulation of the tool, turn off cardan shaft and the tractor.

Belt hay rake manufactured by FPM Agromehanika d.o.o Boljevac provides a better quality of work and has a longer life if properly handled and maintained. Therefore, observe all the instructions provided in this Manual to obtain maximum performance and quality of work.

V-BELTS

The endless V-belts should be properly tightened to prevent excessive sliding. Poorly tightened belts are the cause of the poor performance of the belt rake and early damage and breakage.

Prior to initiation of work, one needs to check the tension of the drive belt (fig. 2 pos. 1), which should have a deflection of 24 mm when a force of 100 N (10daN) is applied. Belts bearing the working elements should have a deflection of 40 mm when applying force of 150 N (15 daN).

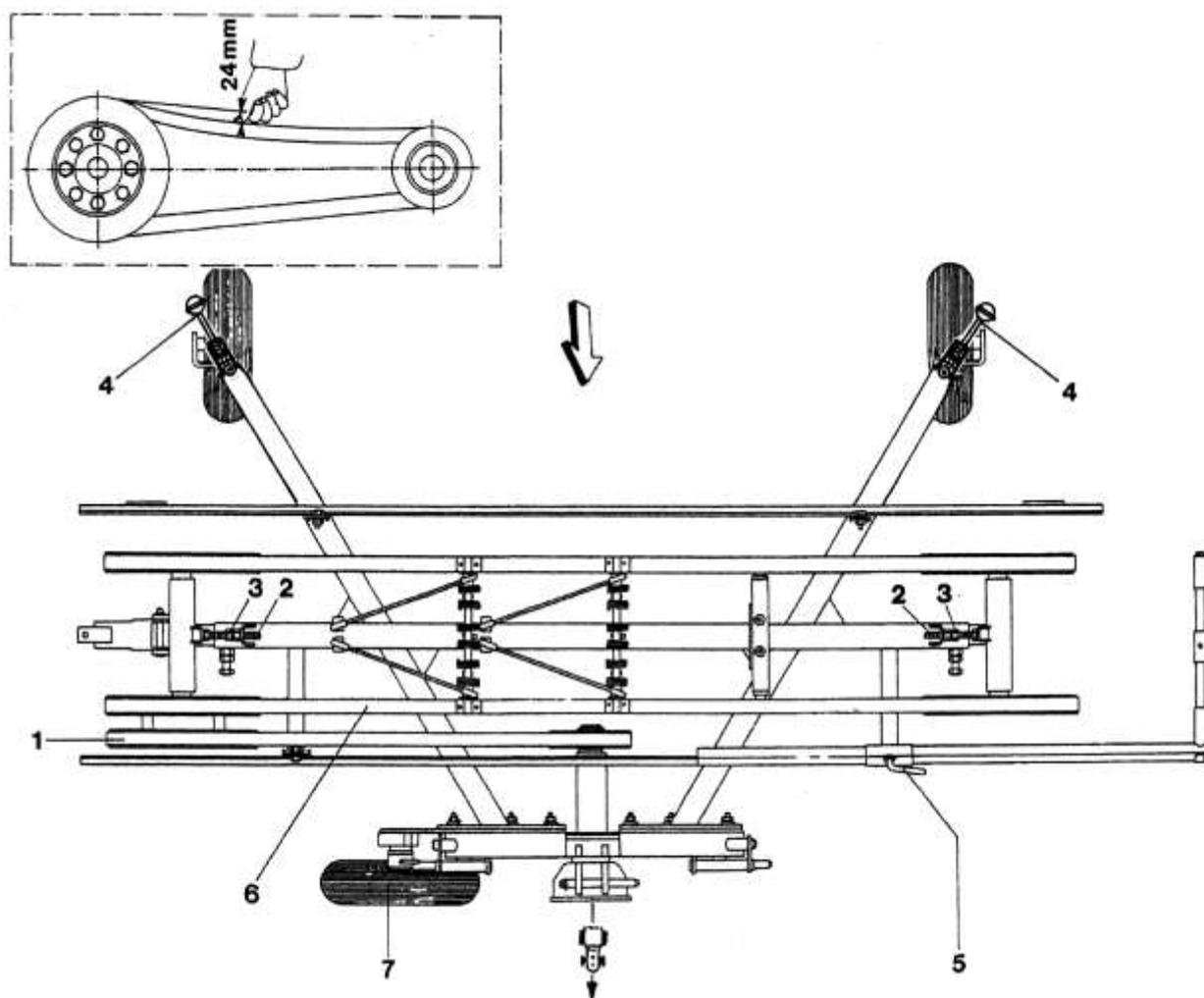


Figure 2 Belt hay rake - tightening belts

Setting-up the tension of endless V-belts is performed in the following manner:

First, setup the tension of the drive belt (Fig. 2, Pos. 1) through a screw with a counter-nut, on the right side of the belt rake (Fig. 2, Pos. 2). When deflection of the belt is 24 mm, use counter-nut to secure the screw against unscrewing (Fig. 2, Pos. 3).

Setting-up of the belts (Fig. 2, Pos. 6) bearing the working elements at 40 mm of deflection is performed by a screw in a similar manner as the previous setting-up, by means of screw on the left side (Fig. 2, Pos. 2 and 3).

When it comes to the collecting of hay, the height of the collectors is set up by operating the lever on a wheel support (Fig. 2, Pos. 4). This is set up so that both wheels are at the same height. When working on collection of hay one should set up the belt on the left side using the handle (Fig. 2, Pos. 5). This set-up is shown in Figure 5.

For raking, spreading and turning of the mowed grass, the left wheel must be adjusted with the lever on the wheel support so that the collecting element on the right side of the belt rake viewed in the driving direction is at a height of about 8 cm. For these working operations it is necessary to remove the belt, as schematically shown in Figure 5.

V-belts should be occasionally thoroughly cleaned and coated with glycerin to keep their elasticity for a longer time.

WARNING: IT IS NECESSARY AND IMPORTANT TO CHECK THE BELTS TENSION AND TO TIGHTEN THEM PROPERLY. IT IS PARTICULARLY IMPORTANT TO DO IT AFTER THE FIRST 1/2 HOUR OF USE. WHEN REPLACING THE WORN BELTS, REPLACE THE WHOLE SET OF BELTS, REGARDLESS OF THE CONDITION OF ONE BELT COMPARED TO OTHERS.



CAUTION

- 1. IT IS UP TO YOU TO PROTECT AND MIANTAIN THE BELT RAKE, THEREFORE, IMMEDIATELY REPLACE ALL WORN OR DAMAGED PARTS WITH THE GENUINE PARTS MANUFACTURED BY FPM AGROMEHANIKA AD BOLJEVAC.**
- 2. ALL WORK RELATED TO LUBRICATION, ADJUSTING AND REGULATION MAY BE PERFORMED ONLY WHEN THE TRACTOR AND THE CARDAN SHAFT ARE TURNED OFF.**
- 3. WAIT TILL ALL MOVING ELEMENTS STOP AND THEN START SERVICING THE BELT RAKE.**
- 4. KEEP YOUR HANDS, FEET AND CLOTHING AWAY FROM MOVING PARTS OF THE BELT RAKE**
- 5. THINK OF THE CONSEQUENCES OF IRRESPONSIBLE WORK SINCE THEY ARE IRRECOVERABLE.**
- 6. BEFORE YOU TURN ON THE TRACTOR AND START WORKING, MAKE SURE THAT OTHER PERSONS AND ANIMALS ARE NOT IN THE AREA OF WORK OF THE BELT HAY RAKE.**



ATTENTION: STOP AND THINK! ROTATING ELEMENTS CAN CAUSE SERIOUS BODY INJURIES.

LUBRICATION

Plastic bearings on the belts of double collecting elements must be periodically, at least once a year lubricated (mandatory after the season of work). Make sure that the lubricant does not come into contact with V-belts as this will damage them.

At every 10 hours of operation, lubricate all the places where there are nipples with the grease ML-3 JUS B.H3.656 or VM-2 JUS B.H3.634.

LUBRICATION OF U-JOINT

Control the lubrication of all spots with installed nipples and other sliding surfaces. A good level of lubrication is achieved every eight hours of operation. Before lubricating, wipe the surfaces of the earth and dust. At every fifty hours of lubricate turning and joint parts. Also grease all parts that move one in another (telescoping) when needed.

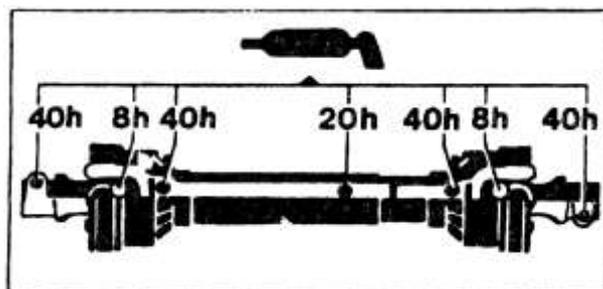


Figure 3

1. - grease nipple at the front joint.
- every 8 hours.
2. - rotating part of the cover at the front part of PTO.
- every 40 hours.
3. - The inner part of the telescopic tube.
- every 20 hours.
4. - rotating part of the cover at the rear part of PTO.
- every 40 hours.
5. - grease nipple at the rear joint.
- every 8 hours.
6. - The lock pin at the front and rear part.
- every 40 hours.
7. - clean all parts of the PTO if not used for a long time

If you stick to this plan of lubrication, you will achieve longer life of PTO. By careful maintenance you avoid failures which may occur due to heating of the bearings, damaging of the bearings or increased axial force. Lubricate PTO at the designated places, only with high quality lubricants.



LUBRICATE ALL ROTATING, SLIDING AND U JOINTS AT THE FRAME OF THE BELT RAKE.

WARNING: ALWAYS KEEP IN MIND TO USE THE PRESCRIBED QUALITY LUBRICANTS TO AVOID DAMAGES OF THE MACHINE.

BY PROPER AND REGULAR LUBRICATION YOU ENSURE SMOOTH AND SAFE OPERATION OF YOUR BELT HAY RAKE.

PROCEDURE OF AGGREGATING OF THE TRACTOR RAKES ON THE TRACTOR

BEFORE USE

1. Check whether all parts (screws, bolts, etc.) are well tightened.
2. It is mandatory to use stabilizing levers and stabilizing chains when working with the belt hay rake.
3. Lubricate all the spots on the belt hay rake that are designed for lubrication.

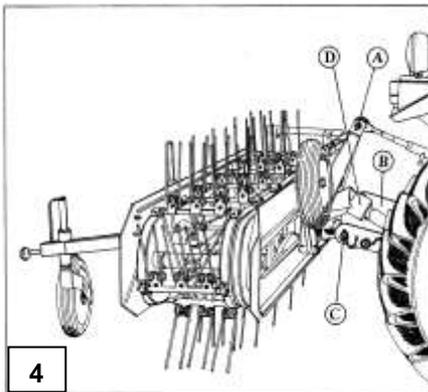
PROCEDURE ON AGGREGATING O THE TRACTOR

The aggregating procedure should always be performed on a flat surface in the following manner:

1. First, remove the paint from the connecting arm of the belt rake.
2. Slowly move the tractor backwards at an angle of 90° relative to the belt rake, use the hydraulic arm to lower the bottom tractor lever to the height of the connecting points' axle of the belt rake.

IMPORTANT: If the tractor is in wrong position, it is considerably easier to again move the tractor forward-backward rather than trying to personally move the belt hay rake to the tractor's levers.

3. Secure the top tractor lever – toplink to the supporter of the top spot on the belt rake frame.
4. Hook the bottom left tractor lever to the left arm of the tool, and secure it with the existing protectors (Fig. 4, Pos. B).
5. Hook the bottom right tractor lever to the right arm of the tool, and secure it with the existing protectors (Fig. 4, Pos. C).
6. Fix the front end of the cardan shaft to the belt hay rake PTO and secure it in that position (Fig. 4, Pos. D).
- Connect the other end of the cardan shaft to the tractor PTO and secure it in that position.



CAUTION: There must be protection on the cardan shaft, therefore, make sure to place it before you connect the cardan shaft to PTO.

7. Then, from the tractor seat, with the hydraulics control handle in the lower position on the quadrant, slowly move the tractor forward or backward until it has access to fastening the front end of the upper tractor lever (toplink) for the tractor and secure in this position with the existing protectors.
8. Once you hooked the tool to the tractor as described, it is necessary to bring the housing axis of drive belt into the horizontal position by shortening or lengthening of the upper tractor lever (toplink) (Fig. 4, Pos. A).

IMPORTANT: The order of hooking of the tool to tractor should always be the same:

- a) Left bottom tractor lever
- b) Right bottom tractor lever
- c) Upper tractor lever (toplink)

9. By using hydraulics, carefully lift the belt rake so that the angle of breaking of the cardan shaft is not too wide. When you lifted the tool to the highest position in this way, check the following:
 - a) Whether the cardan shaft rotates freely and the joints do not get stuck somewhere.
 - b) Whether the cardan shaft is not overstretched.



CAUTION: maximum angle of breaking of the cardan shaft is 30° (see Fig. 12). If this angle is exceeded during work it might cause serious damages to either cardan shaft or PTO of the tractor.

Particularly ensure that cardan joints run smoothly without any obstacles.



WARNING: Non-observing of the basic requirements for work with cardan shaft may result in breaking of cardan shaft or damaging of the belt hay rake.

10. All these positions of the belt rake should be marked, so that next time when you connect the tool to the tractor you will avoid all these adjustments and the tool will work properly.

All tractor belt hay rakes manufactured by FPM Agromehanika d.o.o Boljevac are constructed in the way that they can be connected to all tractors having a 3-point linkage no matter whether they are 1st or 2nd category tractors.



CAUTION: When connecting the tool to the tractor be cautious and strictly observe the instructions provided in this Manual.

WORKING HEIGHT REGULATION AND WORK WITH THE BELT RAKE

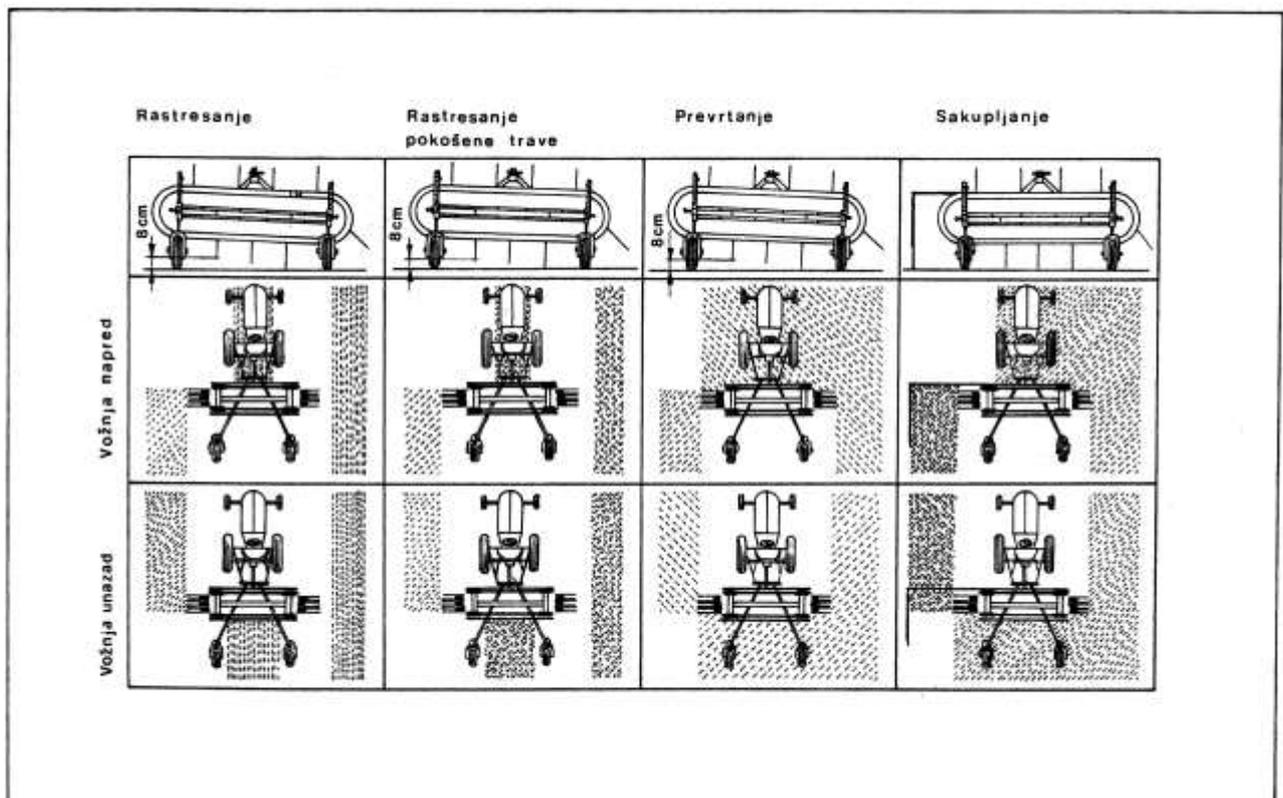


Figure 5. working height regulation

Before you start work with the belt hay rake, adjust the belt rake to the height required by the type of work (Fig. 5). The easiest way to adjust the height is as follows:

1. Spreading, turning

Switch the belt hay rake from the transport position to the working position so that you lower it to the ground while connected to the 3-point linkage.

Lower the belt rake so that the collecting elements on the right side touch the flat area and on the left side they should be lifted for about 8 cm from the ground. Work speed is up to 8 km/h (see Fig. 5).

For this operation of working with the hay you must take the belts off.

2. Collecting

Lower the belt hay rake connected to the tractor levers to the ground. Lower it in that position so that all the collecting springs touch the grass and collect it. Shape the swaths with the belt which can be regulated (see Fig. 5).

Work speed is up to 6 km/h.

3. Transport

- Belt hay rake as a transported tool -

Before transport, lift the belt hay rake with the tractor hydraulics to the transport position. Block the lateral movement of the connecting levers. Tractor hydraulics control must also be blocked against accidental lowering.



ATTENTION: STOP AND THINK! ROTATING ELEMENTS CAN CAUSE SERIOUS BODY INJURIES.



DANGER: NEVER TRY TO CLEAN OR REMOVE ANY MATERIAL FROM THE BELT RAKE AT WORK. TURN OFF THE TRACTOR AND WAIT FOR THE ROTATING ELEMENTS TO STOP.



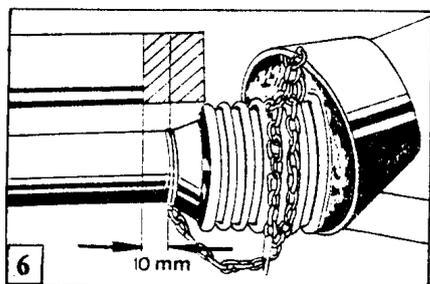
ATTENTION: ENSURE THAT THERE ARE NO OTHER PERSONS IN THE AREA OF WORK OF THE BELT HAY RAKE AND ONLY THEN TURN ON THE BELT RAKE AND START YOUR WORK.

U-JOINT - PTO

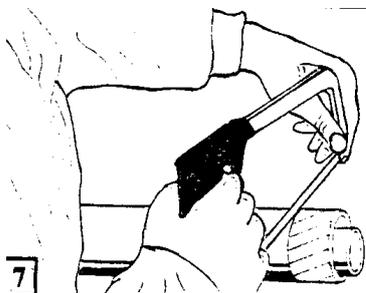
It is very important for the cardan shaft to be properly set-up when connecting the belt rake to the tractor. It is in no way allowed that the cardan joints get mutually stuck once the tool is lifted to the highest or the lowest position.

If you find your cardan shaft longer and cannot connect it to the tractor you have to shorten it. An example of shortening of the cardan shaft is shown in the following Figures.

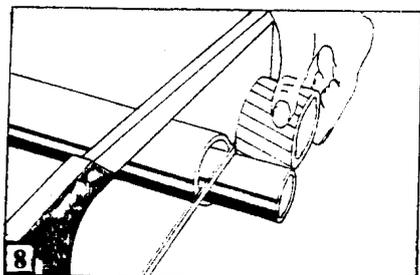
1. Connect one half of the cardan shaft to the tractor and belt rake, hold the halves by each other and by different adjustments of the tractor and belt rake define the length of 10 mm and mark it on the protector, Fig. 6.



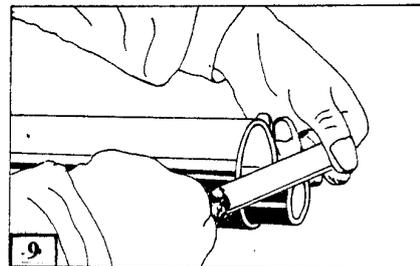
2. Cut off the protective cover, see Fig. 7.



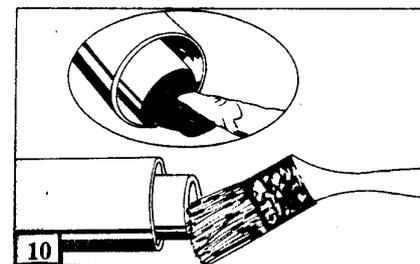
3. Cut off the profile tube, Fig. 8. Further corrections on the cover or profile tube are not allowed.



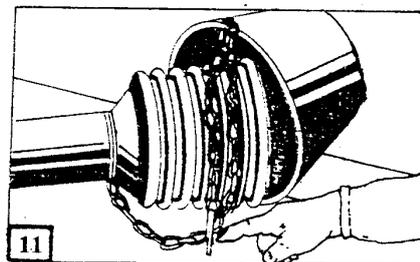
4. Pull down the sharp edges, Fig. 9.



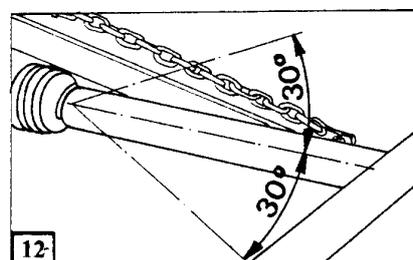
5. Clean and lubricate, Figure 10. Join the PTOs



6. The cardan cover must not be removed or rotating during work. Hook the cover holding chain to the belt rake PTO protector. Fig. 11.



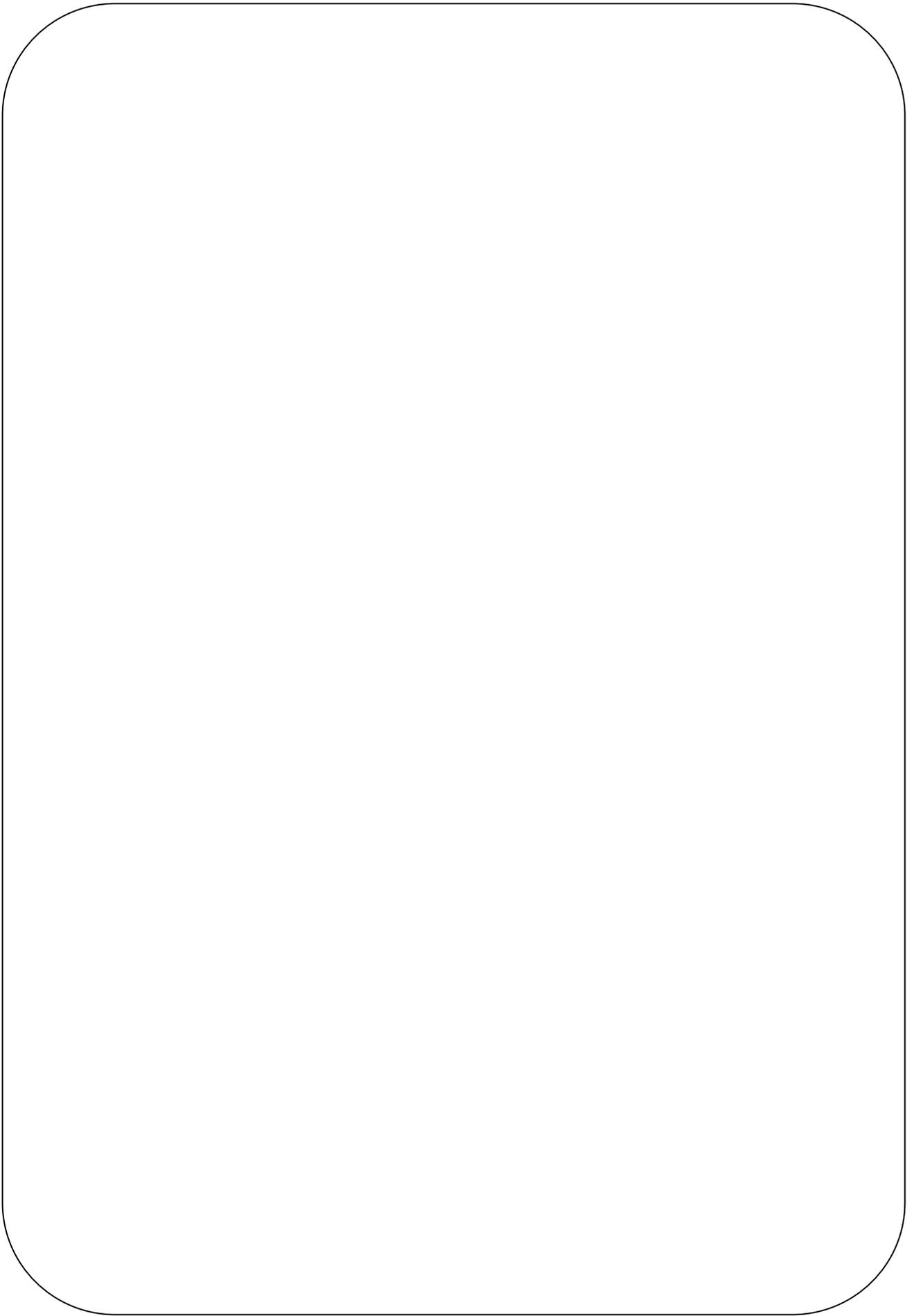
7. Maximum allowed angle of the cardan shaft must be less than 30°, Fig. 12.



WARNING: NON-APPLIANCE OF THE BASIC REQUIREMENTS FOR WORK WITH PTO MAY RESULT IN PTO BREAKAGE OR DAMAGES OF THE BELT HAY RAKE.



CAUTION: BE CAUTIOUS EVERY TIME YOU HANDLE PTO OF THE BELT HAY RAKE.



STORAGE OF THE BELT HAY RAKE

PREPARATION FOR STORAGE

1. — If you do not use the belt rake for a longer period of time, thoroughly clean all the parts having contact with earth and grass mass from the stuck earth and grass.
2. — Wash thoroughly the toll after cleaning.
3. — Replace all damaged or broken spring collecting elements.
4. — Tighten all the screws and nuts on the tool
5. — Clean the rusted area and bare places and coat with protective paint.
6. — Lift the tool on a wooden stand and place it under a canopy or in a separate facility.



CAUTION:

- 1. USE THE TRACTOR WITH SAFETY CABIN TO PROTECT THE DRIVER.**
- 2. NEVER WEAR CLOTHING THAT MIGHT BE CAUGHT BY PTO OR OTHER ROTATING PARTS.**
- 3. DO NOT DRIVE OTHER PERSONS ON THE TRACTOR OR BELT HAY RAKE.**
- 4. WE RECOMMEND THAT AFTER EACH SEASON OF WORK, YOUR SERVICE PROVIDER FROM FPM AGROMEHANIKA d.o.o BOLJEVAC CHECK THE CONDITION OF BELT RAKE, PARTICULARLY OF COLLECTING ELEMENTS, V-BELTS AND OTHER RELATED PARTS.**
- 5. ALWAYS OBSERVE THE INSTRUCTIONS PROVIDED IN THIS MANUAL.**



CAUTION: THIS SYMBOL IS USED IN THE MANUAL WHENEVER REFERRING TO YOUR PERSONAL SAFETY. BE CAUTIOUS!

LIST OF SPARE PARTS

- Instructions for ordering spare parts -

- For ordering spare parts or components, please contact the Sales Department - spare parts.
- For ordering the additional equipment or tools whose identification number starts with 1, as well as instructions for installation and use, please contact Sales of Machines Department.

The existing images on the following pages show the mechanical parts that are numbered.

The text by the image provides the following: the number of mechanical part, its identification number, quantity within the assy of the belt hay rake and dimensions if needed, standard or required torque. Pay attention to the additional marks on the sheets.

To avoid misunderstandings and errors when ordering and delivery of spare parts, please state the following:

- code and number of the tool (batch, №)
- number and name of spare part (List of spare parts)
- Quantity of the needed parts
- preferred delivery method (post, express, etc.)
- full address of the purchaser (with zip code)



Batch and serial number are imprinted on the plate on your tool as shown in the figure.

Warranty and other related cases could not be resolved without data on batch and factory number. Please, enter these numbers here, into the original immediately after the delivery.

Adopted symbols for abbreviated labeling

DNO	Additional optional equipment
:	For
< >	Except
>	From to ...
Zam	Replacing
∅	Diameter
> <	Strength (thickness)
T1N	For vineyard tractors
T1	For 1 st category tractors
T2	For 2 nd category tractors
T3	For 3 rd category tractors

Q	No. of pieces (quantity) when needed
*	See remark
	Direction of movement
	Turning direction
	Package of parts & components
ZA	Replaced by one or more parts
D.P	Thickness of washer (pad)
DPS	Thickness of washer reducing zaz.

FPM AGROMEHANIKA d.o.o BOLJEVAC



OPERATOR SHOULD COMPLY WITH ALL APPLICABLE SAFETY AND HEALTH PROTECTION REGULATIONS AND LEGISLATION ON ROAD TRAFFIC. FOR YOUR OWN SAFETY, ONLY USE ORIGINAL PARTS MANUFACTURED BY FPM AGROMEHANIKA d.o.o - BOLJEVAC.

MANUFACTURER IS NOT RESPONSIBLE FOR THE CONSEQUENCES OF IMPROPER USE OR NON-COMPLIANCE WITH RECOMMENDATIONS PROVIDED IN THIS MANUAL.



**FOR YOUR OWN SAFETY AND TO GET ALL
THE BEST FROM YOUR BELT HAY RAKE,
USE ONLY ORIGINAL PARTS
MANUFACTURED BY FPM
AGROMEHANIKA d.o.o. BOLJEVAC**

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