

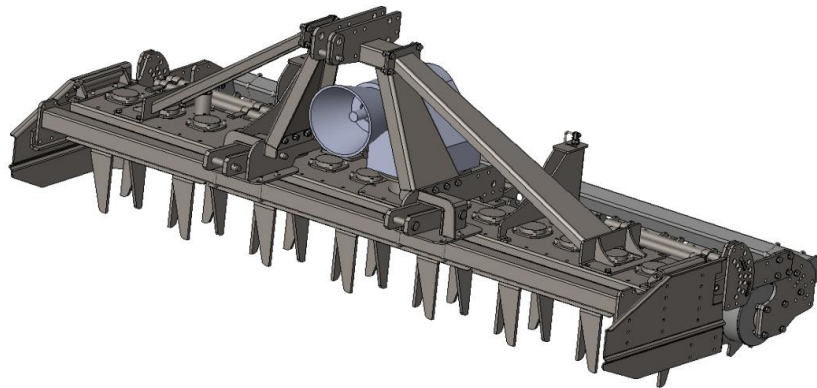
ROTARY HARROW

FPM 612 195

FPM 612 201

FPM 612 202

N° 39811



INSTALLATION / HANDLING / MAINTENANCE LIST OF SPARE PARTS

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SECTION 1

Description and main characteristics

1.1. INTRODUCTION

This Instructions Manual provides all the information and other considered indications necessary for description, proper use and normal maintenance of rotary harrow (the so called machine in the text below) manufactured by **FPM Agromehanika d.o.o.** from Boljevac.

Information and indications of the components are not fully described; how the machine works is not illustrated in detail either. However, the user can find all normal requirements for the safe use and maintenance of equipment in service condition.

Failure to comply with the indications given in this Manual, i.e. negligence during operation, improper use of the machine and unauthorized modification may void the warranty from the manufacturer.

Manufacturer therefore declines all responsibility for damages caused by negligence and failure to comply with the instructions contained in this Manual.

If repairs are of more demanding nature it is necessary to contact the authorized person of the manufacturer, service technician, who is trained in technical support to get the best and most efficient performance of the machine.

This Manual must be kept in a safe place, ready for use during the entire lifecycle of the machine.

1.2 WARRANTY

The factory provides warranty in compliance with the Law on Standardization, Regulation on Safety of Machines (Official Gazette No. 13/2010) for each original part of the rotation harrow 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 was new, without defects in material and workmanship; for rotary harrow it provides two-year warranty from the date of delivery to the end user, provided that the rotary harrow 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, belts, cardan shaft, shaft guards, 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 rotors, cutting blades, cutting blade holders, lateral sides of the harrow.
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 HARROW, 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 harrow to the place where the service is provided during the warranty period and back.
3. Travel time of the authorized service to the owner of the rotary harrow and back, or delivery and return of the harrow from the service workshop after repair.

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

The warranty is linked to strict compliance to the warning:

- All instructions in this Manual must be observed and all the guards 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.

DESCRIPTION OF THE MACHINE AND ITS USE

ROTARY HARROW bears “CE” mark in compliance with EU standards outlined in the directive 98/37 EC and subsequent amendments, laid down by the Declaration of Conformity which is provided for each machine.

1.3.1 DESCRIPTION

ROTARY HARROW consists of central carrier (1 fig. 1) with three-point linkage used to connect the harrow to the tractor.

The machine works well only when it is connected to a tractor with adequate power. Power of the operating machine (tractor) is transmitted via the central gear transmission unit of the reductor (5 Fig. 1) to the rotor (10 Fig. 1).

Fig. 1

- A. Front part
- B. Rear part
- C. Left side
- D. Right side

- 1. the connection frame
- 2. upper connection point
- 3. reductor
- 4. levelling bar holder
- 5. roller holder
- 6. roller
- 7. connection point of additional machine
- 8. lateral side
- 9. rotor
- 10. front bearing tube
- 11. lower connection point
- 12. connecting shaft
- 13. connecting shaft protector
- 14. connection point holder
- 15. identification plate

1.3.2 OPERATIONS

ROTARY HARROW is designed exclusively for use in agriculture for preparation and tillage of the soil.

Only one person who is able to perform all operations seats on the tractor seat.

Any other use of the machine different from the explanations provided in this Manual includes responsibility for injury/damage to persons, animals or property.

1.3. IDENTIFICATION

Each machine is supplied with the identification plate (15 Fig. 1) containing the following information

- 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 and commercial label of the product.
- The field “№ “contains the serial number of rotary harrow consisting of nine numbers with the following meaning:
 - 1st number – year of production
 - 2nd and 3rd number – code of manufacturer
 - the remaining 6 numbers – serial number of the product from the date of start of production



Standard machine includes:

- Instructions for operation and maintenance of the machine
- CE Declaration of Conformity

1.5. NOISE LEVEL

Noise is measured in compliance with the relevant ISO 11201 standards, with the following results:

- Acoustic pressure $L_{pAm} (A)$ dB 82.1
- Acoustic power $L_{WA} (A)$dB 98.6

SECTION 2

2.1. SAFETY INSTRUCTIONS

The user must inform his staff about the risks that may arise with safety devices installed to protect the operator and about the general rules of the basic directives under the relevant laws in the country where the machine is used.

Therefore, it is essential that the operator reads this Manual carefully, particularly the safety instructions, and pay great attention to actions that could be particularly dangerous.

2.2. SAFETY RULES

The machine is made in compliance with all relevant safety standards to protect those who work with it. Nevertheless, other risks indicated on the labels of the machine cannot be perceived. These labels described in Figure 5, are stuck to the machine and point to the various situations of unsafety and danger in the short-form. Keep stickers clean and replace them immediately if unstuck or damaged.

Fig. 5, Read the following descriptions carefully and remember the meaning of the safety labels

- 1) Carefully read the Instruction Manual before starting work
- 2) Before you continue working, stop the machine and read this Manual
- 3) Risk of getting caught by the driveline. Keep the safe distance from the driveline when the tractor engine is turned on.
- 4) Risk of breaks. Never stand between the machine and the tractor.
- 5) Risk of cutting of the upper limbs. Do not remove the protection and keep away from moving parts when the machine is running.
- 6) Risk of cutting of the lower limbs. For your safety, keep at a safe distance from the machine when it is running.
- 7) Tubes containing the liquid are under high pressure. Beware of the oil if the tube ruptures and the oil bursts out.
- 8) Risk of falling. It is absolutely forbidden to climb onto the machine in operation or during transport.

2.3. SAFETY AND ACCIDENT PREVENTION MEASURES

Carefully read the safety and accident prevention measures before use of the machine. Contact the manufacturer if you have any doubt. Manufacturer disclaims any responsibility and failure to comply with rules on safety related to accidents described below:

- Do not touch the moving parts
- Corrections or working on the machine must be carried out only when the tractor engine is turned off and the tractor blocked
- It is forbidden to transport persons or animals on the machine
- It is prohibited to work with a tractor or operate a machine by people who do not have the appropriate driving license, unqualified persons or those whose psycho-physical health is unstable.
- Follow all measures to prevent accidents recommended in this Manual.
- When the machine on the tractor stops and is lifted, the weight on the axles will be different. Therefore, it is advisable to add balance to the front of the tractor in order to balance the axles.
- When the tractor is stopped, only the drivelines with their own protectors fixed by their own chains can work on the machine. Keep at the safe distance from the moving driveline.
- Before starting the tractor and starting the machine, make sure that all security devices for transport and use are in perfect condition.
- Observe relevant law on roads in your country when traveling on public roads.
- Do not exceed the maximum tolerated weight on the axles of the tractor.
- Inform about the controls and their functions before starting work.
- Wear appropriate clothing. Do not wear dresses, scarves, necklaces and connections that could be caught by the moving parts. Wear protective clothing such as goggles, gloves, etc.
- The machine must be connected to a tractor with adequate power.
- Pay the greatest attention when stopping and starting the machine in front of and behind the tractor.
- Equipment used for transport purposes must be fitted with appropriate signs and protectors.
- Never leave the tractor while it works.
- When driving the machine in bends, take into account the centrifugal force since the load center is in a different position.
- Check the speed of the output shaft of the tractor prior to starting operation.
- It is absolutely forbidden to be in the work area when the machine is turned on.

- Before you get off the tractor, lower the machine, turn off the tractor, pull the parking brake and remove the ignition key from the control panel
- It is forbidden to stand between the machine and the tractor while the engine and driveline are on
- Move the control of the lifting lever to the locked position before connecting the machine with 3-point linkage
- Size of the pivots of the machine must match the category of the tractor
- Be careful when working around when it comes to lifting; it is a very dangerous area
- It is forbidden to stand between the tractor and the machine during operation with the lever out of the tractor
- Adjust the level of lever for the hydraulic lift to the locked position when driving on roads with the machine
- Use only the driveline recommended by the manufacturer
- Periodically check the drive protection. It must always be in optimal conditions and firmly fixed.
- Pay most attention to operational security, both during work and during transport
- Make sure the drive is well installed on the tractor and the shaft is connected properly
- Secure the plastic guard from turning with the help of chains and always read the instructions for handling and maintaining of the driveline
- Make sure that there are no people or animals in the vicinity before you start cardan shaft operation
- Do not turn the cardan shaft when the engine is turned off
- Release the cardan shaft when it exceeded its angle of rotation (never over 10 degrees, Figure 3), and when not in use
- Clean and lubricate the drive only when the cardan shaft is off, engine is off, parking brake pulled and the ignition key removed from the ignition switch of the tractor
- Keep aside the other part of the driveline when not in use
- As a secondary effect, long use of the machine can cause heating of the reductor (3 Fig.1)
- Do not touch these parts during or immediately after use because it can cause burns
- Do not clean and service until the cardan shaft is switched off and the tractor is turned off
- Periodically check whether nuts and screws are well tightened. Tighten them if necessary

- Set appropriate support to the machine as a precaution when performing repairs or replacement of cogs / blades on the machine
- Before working on the cutting tools, separate the cardan shaft, turn off the engine, pull the parking brake and make sure that the cogs do not move
- Use the recommended oils and lubricants
- Spare parts must comply with the requirements established by the manufacturer. Use only original spare parts.
- Safety labels must be clearly visible. They must be clean and if they become illegible immediately replace them (they can be provided by the manufacturer).
- Instructions must be kept throughout the lifecycle of the machine
- If the country where the machine is used has preventive laws, adapt to these provisions with the adequate protection. Measured noise levels are provided in section 1.5
- When it comes to the use and disposal of the product the cleaning and servicing of machine is performed in compliance with the relevant laws in the country where the machine is used and in compliance with the instructions provided by the manufacturer of these products
- Observe the relevant Laws on Environmental protection in the country where the machine is used if the machine must be disposed

SECTION 3

Transportation and handling

3.1. TRANSPORTATION AND HANDLING

WARNINGS



Information

If the machine is connected to the tractor which must circulate on public roads, act in compliance with the regulations on the roads relevant for the country where the machine is used.

The machine must be lifted at least 40 cm from the ground for road transport (Fig. 7). If the machine has to be transported over long distances, it can be loaded into the truck or wagon. In this case, refer to the technical specifications for weight and dimensions.

In this way you will be able to make sure that the machine can pass through tunnels or low structures without difficulty.

To lift the machine from the ground to the loading platform, use a crane with adequate load capacity indicated on the machine (15 Fig.1).

Lift the crane. Ensure that the load capacity of the crane is able to lift the weight of the machine. The linkage points are clearly visible on the label, see Figure 5.

Lift the machine with the utmost care slowly, without shaking to a truck or wagon.



Danger

The operation to lift and transport can be very dangerous unless carried out with the utmost care. All persons who are not directly involved in the operation of lifting, should step away from the place. Clear and restrict the area in which the machine should be lifted. Make sure that you have the means for lifting available and ready for this purpose.

Do not touch the suspended cargo and always keep the safe distance. When transported, it must not be lifted more than 20 cm from the ground. Also, make sure that the area is clear and that there is enough space for the “escape” i.e. clear and safe area where operators can quickly hide in case the load falls.



Information

The area on which the machine is to be put must be perfectly horizontal, to prevent movement. When the machine is lifted onto a truck or wagon, ensure whether it remains in a fixed position. Fix the machine firmly to the area it leans against on the pre-marked area with the clips (9 Fig.5), using ropes or chains, which correspond to its weight to prevent movement in that way. Once the machine is transported to the desired location before removing the elements holding it in place, make sure that its position is not in danger. Remove the ropes and unload the machine in the same way as when it was loaded.

SECTION 4

Operations

4.1. BEFORE USE



Danger

Before putting the machine into operation, the operator must read and understand all parts of the Manual and particularly “SECTION 2” on safety.

Before starting work, check whether everything is OK with the machine, the lubricating oils are at the right level, all parts are connected and all the defects completely resolved. Check also whether the protection is properly placed.



Information: Adjustments and operations necessary to prepare the machine for work must always be performed when the machine is turned off and blocked.

4.1.1. OPERATING POSITION



Danger

The operator must sit on the seat of the tractor when the machine is running, since he is able to operate properly from that position. Before leaving the seat the operator stops the machine, pulls the handbrake on and turns the tractor engine off.

4.2. CONNECTING TO TRACTOR



Danger

Connecting to the tractor can be a dangerous operation. Be very careful and strictly observe the instructions.



Information

To achieve maximum stability and ensure the execution of the operation in safe conditions, the rotary harrow must be prepared before it is connected to the tractor.

Proceed as follows to make the machine connected in the best way:

- Be sure to use a tractor which corresponds to the configuration of machine
- Make sure that there are no objects, persons and / or animals in the immediate vicinity of the machine and that the cardan shaft is separated
- Make sure the machine is in the proper horizontal position to the tractor
- When you achieve a good position, turn off the tractor engine. First place the driveline, drive shaft to the machine and then to the tractor shaft. Make sure it is firmly fixed in this position.
- Move slowly the lever for lifting to the proper position. Fix it to that position. Since the lifting system levers of the tractor are of a certain diameter, you need to find the most suitable position and set the lever to suit your needs depending on the diameter (1 Fig. 6).
- Connect the lifting system with the chains parallel with the tractor as the prevention of lateral movements.
- Connect the driveline and make sure that it is perfectly connected to the tractor. Check whether the protective shield is free to rotate. Fix the shield with the chains.



Danger

Make sure to connect well the driveline and the shaft. Be sure it is firmly connected to the drive shaft of the tractor and the machine. Secure the driveline in compliance with the labelled instructions for the user. Make sure that the driveline protection is fixed with chains, and is free to rotate without obstacles. Check the protection on the tractor, as well. If the protection is not in perfect condition it must be immediately replaced with a new one.

It is very important to provide a protective shields for covering on both sides of at least 5 cm.

- Connect the upper third point and set the upper connecting correctly, making sure that the machine is parallel to the ground. This is very important because the parallelism between axle of the machine and the shaft of the tractor is provided in this way.

4.3. DRIVE



Danger

This system is a mechanical one. When it works it can be a source of danger for persons operating it. Pay most attention while performing operations and turning on the driveline. Carefully read the Instruction Manual referring to the driveline. If you have any doubt about the way how it works, if it is without shields, damaged or broken, replace it with a new one marked by “CE” sign.



Danger

Never change or adjust the driveline in any way. If necessary, contact the nearest authorized service center.

Since the drive rotates at high speed, it was balanced during testing. Successive interventions can lead to absence of balance, which could impair the functionality of the equipment in relation to the real drive.

The angle at which the drive shaft is running must be the smallest one because it will ensure longer lifecycle of the drive and the machine. When the cardan shaft is extended under all operating conditions, the telescopic tubes must overlap at least 1/3 of their total length (Figure 4 A).

When the cardan shaft is fully inserted, there must remain at least 4 cm of workspace (Figure 4 B).

Contact Technical Service Department of the manufacturer, if this is not possible.



Information

Before starting the drive, make sure that your rotation speed corresponds to the speed for which the machine is designed (540 or 1000 rpm).

4.3.1. DRIVE WITH ADJUSTABLE CLUTCH

The driveline has a safety clutch to protect the transmission of the machine and excessive loads. The clutch is calibrated for medium-mandatory use. If it slips during operation, all nuts that hold the springs must be tightened evenly to half and then check the operation of the device after 200 meters of operation. Repeat the operation if necessary. The clutch must be adjusted by unscrewing the nut that is blocked.



Information

If the clutch is still slipping even when all nuts are tightened friction of the plates changes when they become worn or because the springs might become loose. Nuts are not fully tightened, because they eliminate the function and range of the clutch thus damaging the transmission.

4.3.2. DRIVE WITH AUTOMATIC CLUTCH

On request, the manufacturer can provide a complete drive with automatic clutch calibrated for medium-mandatory loads. This clutch cannot be adjusted. In the event of overload or slipping clutch, the operation continues as it is stated in the instructions without external intervention. Any servicing of the clutch must be done in a workshop in compliance with the instructions for the driveline provided by the manufacturer.



Information

Do not let the machine works unless it is lowered to the ground. When it works, do not drive in the bends on the terrain. It does not work in the opposite direction. It should always be lifted before changing direction of movement. During transport or at any time, the machine must be lifted; do not forget to set the lifting lever so that the machine is not lifted more than 40 cm from the ground.

Do not drive on public roads with machine full with soil, grass or other materials that may dirt the road or hinder traffic in any way.

Do not let the machine fall violently to the ground. Lower slowly so that the blades penetrate the soil gradually or all components will be subjected to damage which could result in failure/breakage.

4.4. COMBINED MACHINE WITH SEED DRILL

Be careful when using the machine with a seed drill in terms of maximum tolerated weight of the rear installed hydraulic coupling of the seed drill. Each hydraulic coupling of the seed drill is delivered with the machine or later on upon the request of the client; it has a serial number and Instructions manual including all the specifications for installation and use. However, if the hydraulic seed drill is installed in the end, the user must ensure the following:

- When the frame is installed on the machine in order to lift the seed drill with the seeds, the total weight must not exceed the value provided in the operation and Instructions for maintenance.
- Make sure that the seed drill is properly installed, that it is lifted in the proper way and that it does not obstruct the hydraulic pipes.
- Make sure that the mechanical parts of the seed drill do not obstruct with the machine rollers or the machine itself
- Make sure that when you drive along public roads there are no sharp parts of the machine
- Make sure that the labels on the seed drill are clearly visible. If not, observe the regulations of the relevant Law on Highways in the country where the machine is used.

4.5. ADJUSTMENT OF WORKING DEPTH

Adjustment of the harrow working depth is determined by mechanical use of the frame (7 fig.1); Lift the roller for deeper tillage of the soil. Lower roller for more shallow tillage (harrowing).

4.6. IN OPERATION

Start working with the machine in full power. Gradually dig the blades into the soil. Do not press the accelerator too much.

It is necessary to take into account several factors for soil tillage, i.e.:

- The nature of the soil (clay, sand, etc.).
- Working depth
- Tractor speed
- Optimum machine adjustments

The soil is tilled at the low speed of the tractor, with the blades rotating at 300 rpm. This ensures high quality of tilled soil evenly levelled without compacting it or changing its vertical structure thus providing the perfect seeding ground.

4.6.1. HOW IT WORKS

Set the roller (8 figure 1) to correspond to the required depth, start the drive, move forward the tractor and gradually lower. Till a short distance, and then check the depth and the quality of tillage, and whether the leveling of the soil was conducted in a proper manner.



Information

When the machine is running, the speed of the tractor should not exceed 6-8 km per hour or components will be broken or damaged.



Danger

The blades can throw stones or other sharp objects when rotating. Constantly check whether there are people, children or domestic animals within the range of operation of the machine.

4.6.2. HELPFUL TIPS

Too shallow depth:

- Check the depth adjustment
- Move forward, more slowly. Tractor power might be inadequate. Lift the rear roller.
- Repeated tillage will be necessary if the soil is hard
- Blades are dug into the soil: you will move more slowly.

Too fine tillage:

- Reduce the speed of rotation of blades
- Increase the speed of the tractor

Inadequately tilled soil

- Increase the speed of blades
- Reduce the speed of movement
- Do not till if the soil is too wet
- If the leveling bar is installed, try to lift or lower it

Stuck rotors

- The soil is wet for work
- Lift the leveling bar
- Reduce the speed of movement
- Do not till where the grass is too high

Machine impacts the ground or vibrations

- Foreign bodies that might be found between the blades
- Blades placed in the wrong positions
- Worn or broken blades
- Blades bent during operation after the impact of stones or too hard soil

The machine vibrates a lot

- Reduce the speed of the tractor
- Set the machine properly, as described in the instructions
- Check whether some of the blades are broken. Replace them if this is the case.

The rotor rotates in the opposite direction

- Check whether the drive clutch is properly regulated
- Too elastic clutch spring. Replace the spring.

Transmission overheated

- Check the oil level and fill if necessary

Clutch system overheats

- Check wearing of the clutch plate. Replace at the authorized service center if necessary
- Too elastic clutch springs. Replace the springs.

4.7. BLADES

The installed blades are suitable for normal consistency soil. Check them daily and make sure they are in good condition and not worn. If the blades are accidentally bent during operation, they must be immediately replaced. Make sure that the new blades which are installed are in the same position as the old ones.

If you need to replace several blades, it is advisable to change them one by one to avoid the mistake in positioning. The sharp side of the blade must be pointed towards the direction of rotation of the rotor.



Danger

Replacing of the blades is dangerous operation.

The process of replacement of the blades is as follows:

- Park the tractor on an flat area, stop the machine, then lift the machine
- Put two strong supports on both ends of the machine
- Lower the machine on them, turn off the tractor engine and pull the brake.

If the blades must be replaced, make sure that the blades are new and that they are in the same position as the old ones.

Torque

Class	6.6	8.8	10.9	12.9
M8x1	15	26	36	44
M10x1,25	30	52	74	88
M12x1,25	51	91	127	153
M14x1,5	81	143	201	241
M16x1,5	120	214	301	361
M18x1,5	173	308	433	520
M20x1,5	242	431	606	727
M22x1,5	321	571	803	964
M24x2	411	731	1028	1234



Danger

If a blade is blocked, it is strictly forbidden to try to clean it while the machine is running. First, disconnect the control unit from the tractor and engage the parking brake. Wait until all moving parts have stopped, and then proceed with the cleaning operations with utmost care.

4.8. TRANSMISSION

The blades rotate at a reduced speed relative to the input speed of the cardan shaft. Number of blades defines speed gear ratio and it is 1: 2.75, which means that the blade speed is up to 196 r / min. This enables the tillage of soil to various levels depending on the nature and the amount of moisture it contains, etc.

When the rotors rotate faster, the soil is better tilled, but the tractor power and the wear of the blade will be higher. We recommend that you use the lowest speed of rotation for the work in a proper manner that provides good tillage results.

4.9. LEVELLING BAR

To increase and better till the soil to a larger extent, the harrow has a levelling bar at the rear, behind the blades. Its height can be adjusted by means of the hinged bolts (4 figure 1). It is advisable to start operations in the top position and then adjust to the desired position. Make adjustments, keeping distance from the ground to the most possible extent. Whenever the position of the rear roller must be changed, re-adjust the levelling bar to “flow” on the ground.

4.10. REAR ROLLERS

The machine can be equipped with different types of rollers. The main ones are:
Packer roller and cage roller.

Packer roller:

- It is used for further tillage of already tilled soil with the blades and guarantees compact area optimal for sowing. It has a bearing effect, if the seed drill is installed the configuration is combined. It is excellent for dry and hard soil.

Cage roller:

- It is used for soil of medium consistency when the moisture level is low. It prepares the soil for sowing, but not for compact areas.

4.11. STOPPING THE MACHINE

At the end of its work, the operator must:

- Turn off the tractor drive
- Lower the machine to the ground
- Stop the tractor and activate the parking brake
- Make sure that all parts of the machine stopped

Only after the above mentioned operations are completed, the operator can leave the tractor.



Warning

The place where the machine is parked must be:

- Dry
- Covered from bad weather conditions
- Protected or locked from the free and unauthorized access to the machine by children or other unauthorized persons.



Information

If the machine is not to be used for a long period of time, lubricate the parts of the machine and store it in a dry, covered place, covered with nylon. This will ensure that the machine remains in an ideal state when there is the need to re-use it.

SECTION 5

Maintenance

5.1. ROUTINE MAINTENANCE

The following text describes the various operations of routine maintenance. Keep in mind that lower costs and longer service life of the machine depend on the continuous compliance with the instructions.



Warning

Before proceeding with any operation, make sure the machine is parked on a flat area. To prevent movements, place supporters under the wheels. Servicing, setup and operation must prepare the machine for work and one must take care that the drive of the tractor is separated from the machine. Frequency of servicing stated in this Manual is indicative and refers to the normal conditions of use.

However, it can vary depending on the type of service, whether the environment is dirty or not, seasonal factors, etc. Servicing operations must obviously be performed more frequently in more severe operating conditions.



Information

Before injecting grease/lubricant, clean the area from mud, dust or foreign bodies to avoid their mixing with the grease/lubricant since it will reduce or even annihilate the effect of lubrication.

The injection of large amount of grease under pressure into the lubricating points can damage the bearing protection. Therefore, this operation must be performed with the utmost care.

- Lubricate all the points
- Use the recommended oil types for filling up and changing.



Danger

Keep all the lubricants out of the reach of children. Carefully read the warnings and precautions on the containers of lubricants. The operator should be thoroughly washed after using lubricants. Dispose the used oil in compliance with the Law on Environmental Protection.

5.2. LUBRICATION

Lubrication of any rotating part of the machine is a vital task for the proper functioning of the machine. Lubrication therefore must be performed systematically and at required intervals. Use the provided frequencies in normal environment. If the machine is used in more severe conditions, it should be lubricated more frequently.

Fig. 9

1. Filling of the oil in the reducer
2. For draining of the oil from the reduction gear
3. Roller lubricator
4. Filling of the oil in the transmission housing
5. Transmission housing

The indicated amounts correspond to the level around the upper edge of the cog in the housing when the machine is placed on a flat area.

5.2.1. RECOMMENDED LUBRICANTS

The following types of oils are recommended for reduction gear of the machine (1.11.) and transmission speed (1.7l):

- FAMHIPO 90
- FOR 3 grease, recommended for all greasing/lubrication

When servicing the driveline, in the concrete work, act strictly in compliance with the instructions for driveline provided by the manufacturer and Maintenance Manual provided with each driveline.

5.2.2 SERVICE AFTER THE FIRST 8h

Each new machine must be checked after the first 8 hours. Proceed in the following manner:

- Check the general condition of the machine
- Fully tighten the blade bolts after checking their being worn.
- Check whether the machine has all the bolts

5.2.3 AFTER EACH 20 h

- Check whether the blade bolts are fully tightened
- Lubricate the driveline, check the pivots of the adjustable roller

5.2.4. AFTER EACH 100 h

- Check the oil level in the central unit of the housing. Fill-up if necessary.
- The level is good when it is between the points on the oil-level measurer.

5.2.5. AFTER EACH 500 h

- Change the oil in the housing after every 500 h of operation or at least once a year
- Check whether the drive clutch is fully effective

Replace the repaired clutch and plate at the specialized workshop if necessary.

5.3. PREPARATION FOR STORAGE

Proceed with the following operations at the end of the season or if the machine has been out of use for a longer period of time:

- Wash all fertilizers or chemicals from the machine and wipe it.
- Carefully check the machine and replace what was damaged or worn
- Fully tighten all screws particularly the ones on the blades

If these activities are carefully performed, they will be very useful for the user of the machine when he needs to use it again. If the machine has to be uninstalled, comply with the relevant Law on Environmental protection. The old/used lubricants must be disposed in compliance with the various relevant regulations.

5.4. SPARE PARTS

All parts of the machine can be procured from the manufacturer, stating the following

- Model of the machine
- Serial number
- Year of production
- Serial number required (indicated in the Catalogue of spare parts), description of the part and the required quantity
- Means of transportation. If this is not specified, the manufacturer will pay attention to the service, but will not be responsible for any delay in delivery due to causes of Force Majeure. Transport costs and risk during transportation are always borne by the recipient. Do not forget that the manufacturer is always available for any kind of assistance or in case spare parts are required.

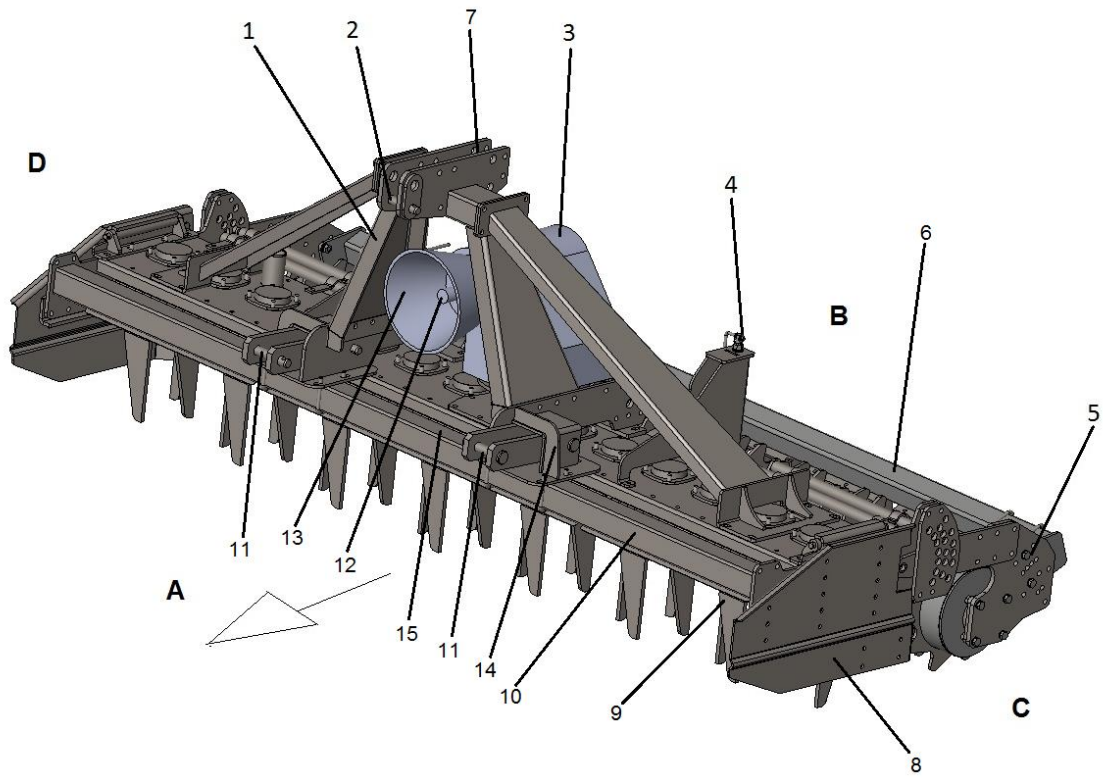
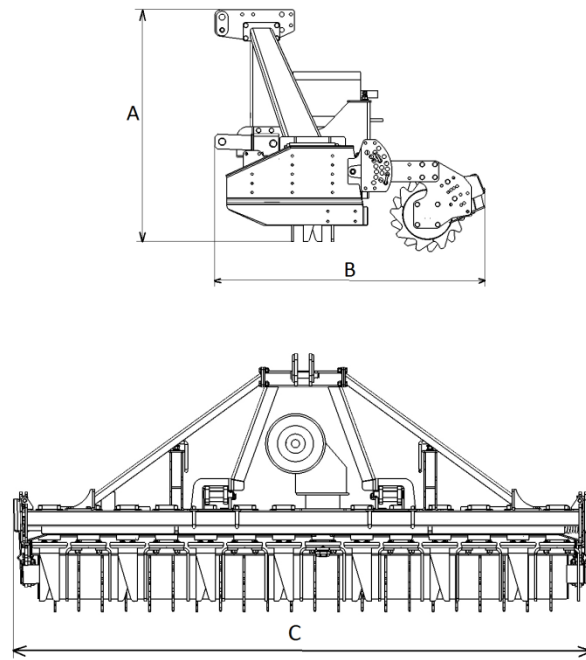


Figure 1



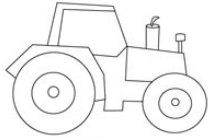

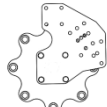
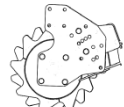
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	cm	cm	cm					
200	127	148	216	44-51	(60-70)	20	760	830
250	127	148	256	51-66	(70-90)	24	910	990
300	127	148	296	66-81	(90-110)	28	1060	1150

Figure 2

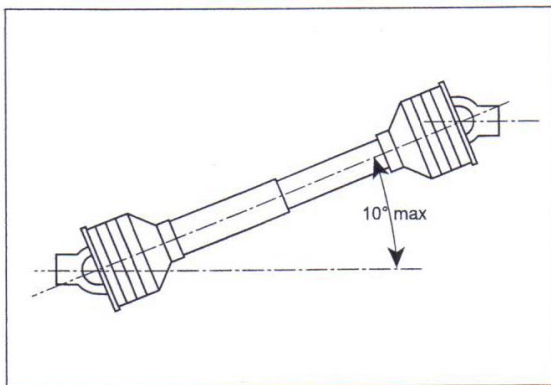


Figure 3

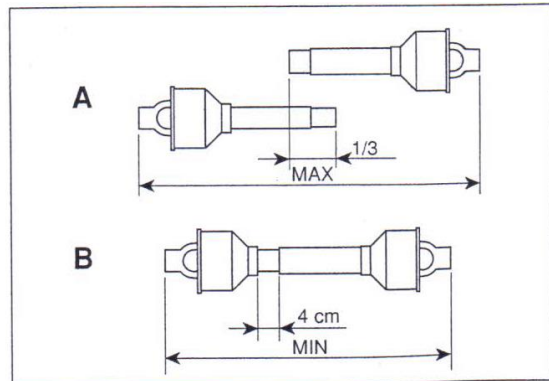


Figure 4

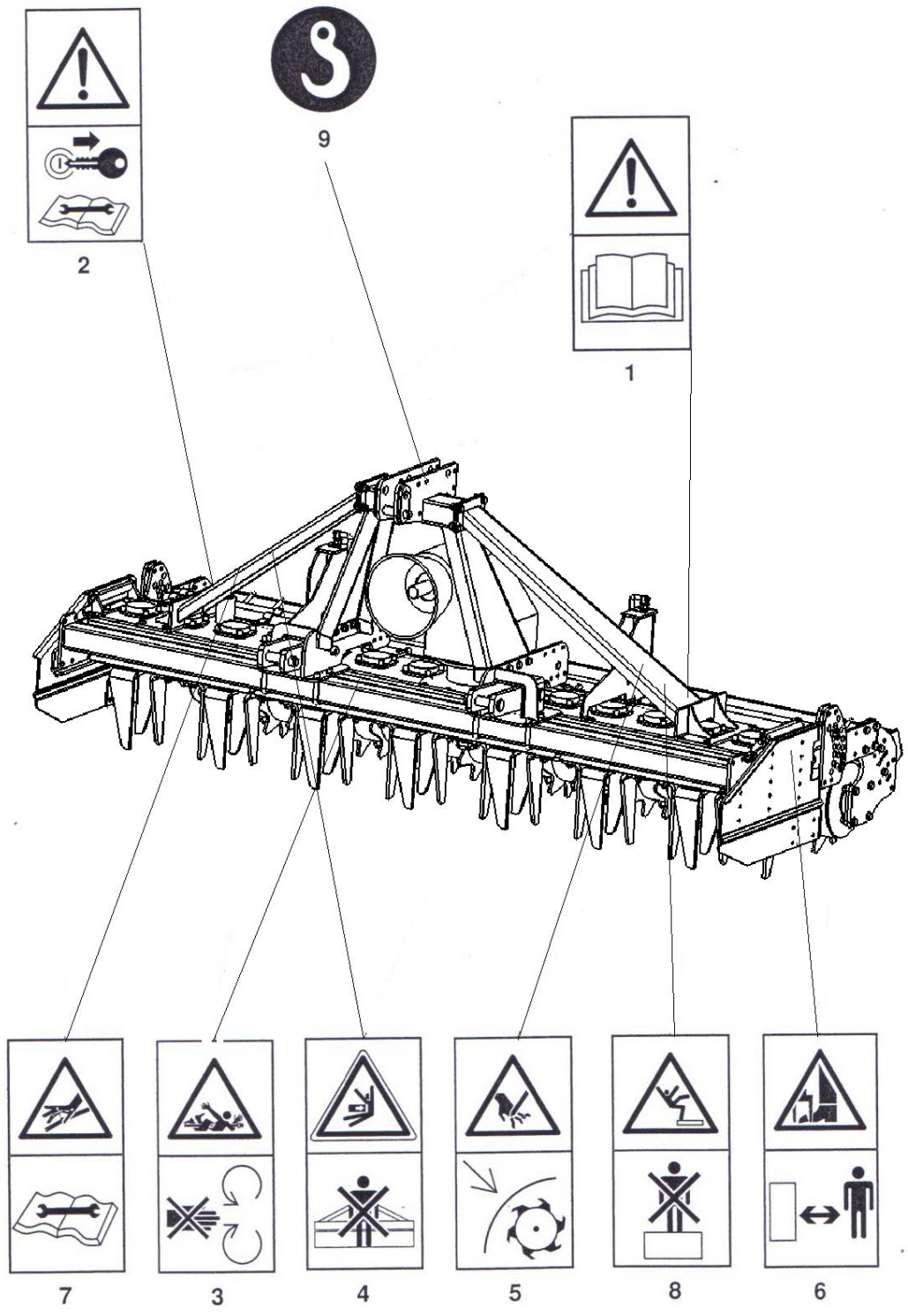


Figure 5

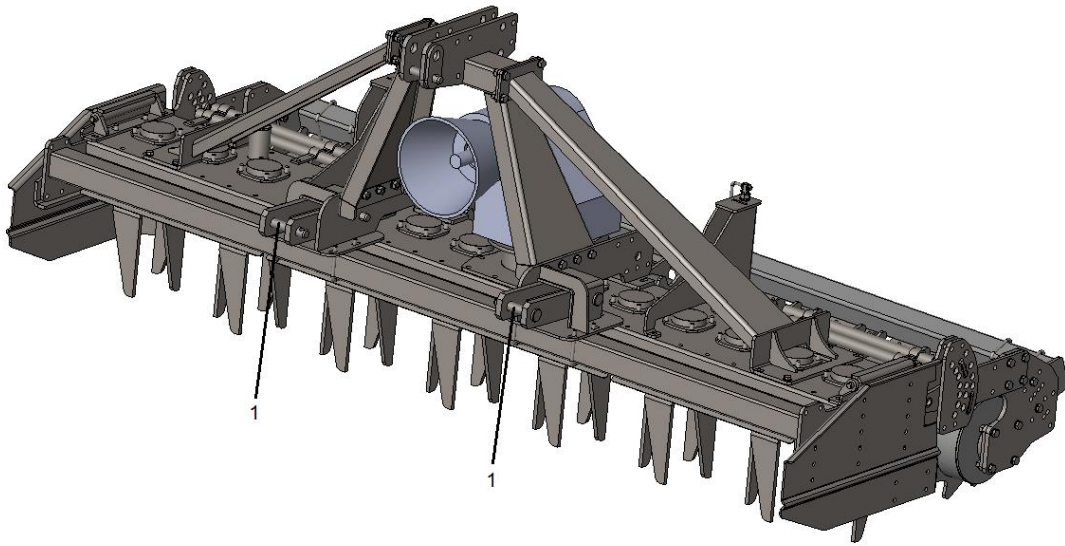


Figure 6

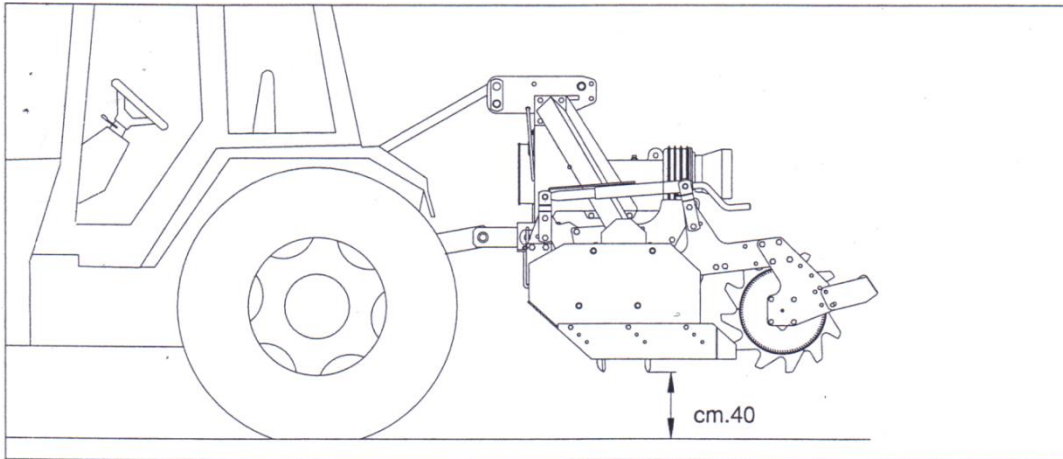


Figure 7

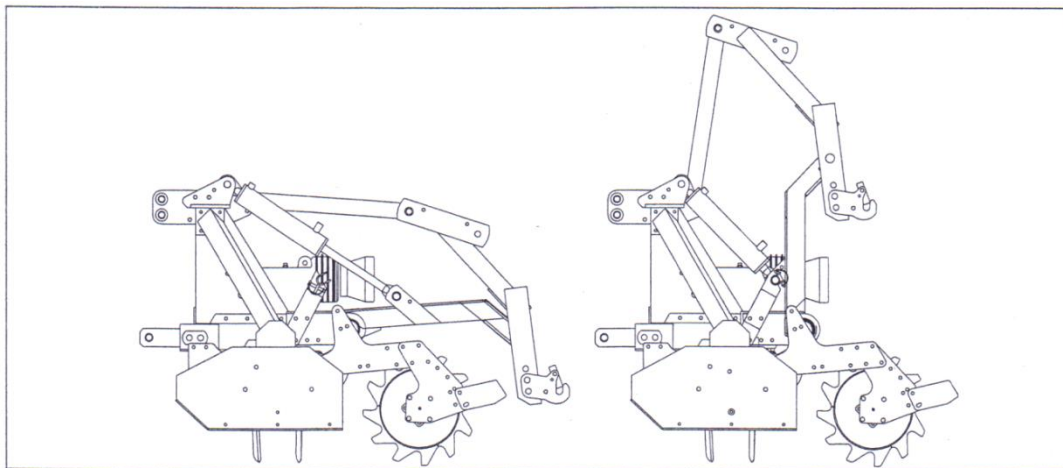


Figure 8

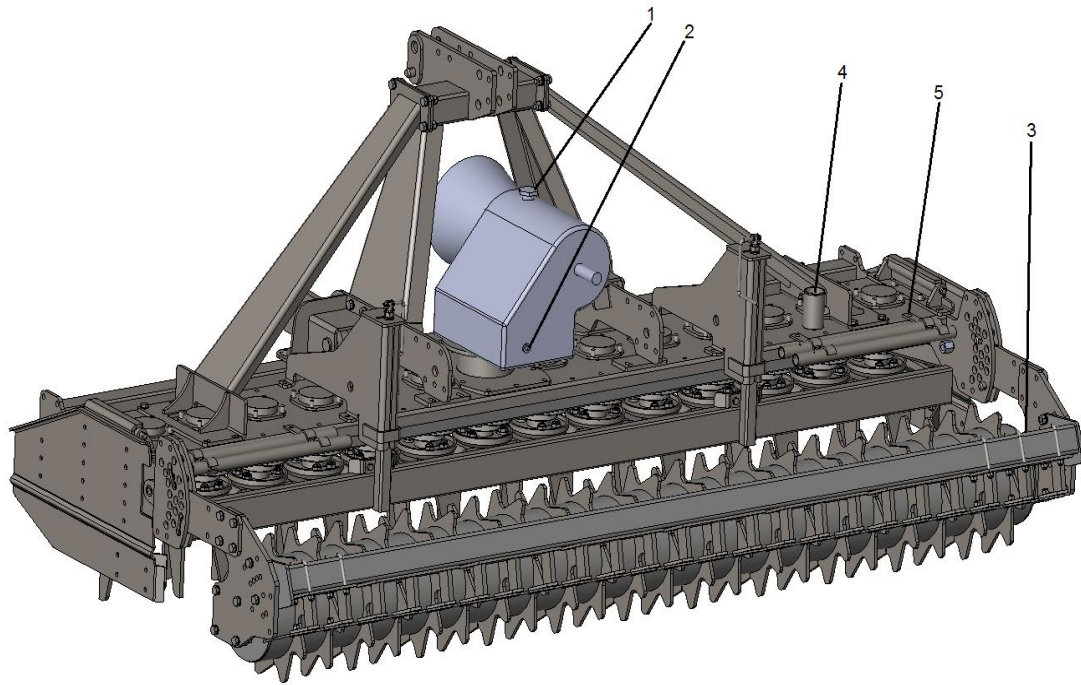


Figure 9



FPM AGROMEHANIKA DOO
Djordja Simeonovica 25
19370 Boljevac – Serbia

DECLARATION OF CONFORMITY 2006/42/EC

We,

FPM Agromehanika DOO,
Djordja Simeonovica 25, 19370, Boljevac, Serbia

hereby declare, as manufacturers within our responsibility that the product

Type: **Rotation harrow**

Model: **FPM 612 195 – working width 2 m**
 FPM 612 201 – working width 2,5 m
 FPM 612 202 – working width 3 m

Year of production: **2017**

is in compliance with all the relevant requirements defined by **European Directive 2006/42/EC (for machines)**.

The product complies with the following standards:

- SRPS EN ISO 12100:2014
- SRPS EN ISO 13857:2010
- SRPS EN ISO 4254-1:2016
- SRPS EN ISO 4254-14:2017
- EN 1553:2000
- ISO 11684:1999
- EN ISO 11201:2014

In Boljevac,
20.03.2017.

Signature of authorized person
DIRECTOR GENERAL
Branislav Rajic, BA in Mechanical Engineering
