



OWNER'S MANUAL
WARRANTY CARD
SPARE PARTS CATALOGUE

MOUNTED RIDGER

Norma

P - 475 - 3 units

P - 475/1 - 5 units

P - 475/2 - 3-sectional with rollers



**PRIOR TO STARTING WORK, PLEASE READ
THE OPERATING INSTRUCTIONS**



BOMET

Spółka z ograniczoną odpowiedzialnością
Spółka Komandytowa
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DECLARATION OF CONFORMITY for a machine



According to the Ordinance of Minister of Economy of 21 October 2008 (Journal of Laws "Dziennik Ustaw" No 199, item 1228) and European Union Directive 2006/42/WE of 17 May 2006 (Official Journal of the European Union L. 157 p. 24-86)

we declare with full responsibility that the machine:

Machine: **MOUNTED RIDGER**
Type: **P 475**
Year of production: **202**
Function: Soil tillage, weed control, forming ridges

to which this declaration relates, is in conformity with:
the Ordinance of Minister of Economy of 21 October 2008 on essential requirements for machines (Journal of Laws "Dziennik Ustaw" No 199, item 1228) and European Union Directive 2006/42/WE of 17 May 2006

Person responsible for technical documentation of the machine: Andrzej Sińczuk, ul. B. Joselewicza 2, 07-100 Węgrów

Following harmonized standards have been applied:

PN-EN ISO 12100:2012P
PN-EN ISO 4254-1:2013-08E

This Declaration of Conformity WE loses its validity if the product is misused or modified without proper authorization.

THE MANUAL CONSTITUTES MACHINE BASIC EQUIPMENT!

Węgrów,
Place and date of issue

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.....
Name and function of the signatory



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.....
Name and function of the signatory

WARRANTY CARD

Mounted ridger type **P 475**

Serial number.....

Production date **202**

Inspector signature.....

Date of sale.....

Seller signature.....

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Spółka Komandytowa
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.....
Seller stamp

CAUTION: It is seller's obligation to fill in the warranty card and complaint forms carefully (legibly). Lack of e.g. date of sale or stamp of sales point will put the user at risk of not acknowledging possible complaints. Warranty card with any written corrections or filled in illegibly – is invalid.

Warranty proceedings rules

1. A user is understood as a natural or legal person purchasing an agricultural equipment and a seller – as a corporate unit providing equipment to the user and a manufacturer - as a producer of agricultural equipment.
2. Manufacturer ensures good quality and efficient operation of the ridger, to which the warranty card is attached.
3. Any defects or damage of the ridger shall be fixed free of charge at the place of the purchaser in the period of **12 months** from the sales date.
4. Any revealed defects or damages shall be reported in person, by post mail or by phone.
5. If during warranty period, a necessity of performing 3 warranty repairs occurs and the product will still reveal defects disabling its usage according to its intended use, the purchaser is entitled to have the product exchanged into a new, flawless one or refund.
6. If the manufacturer, a seller and a user will not establish another deadline for considering the complaint, exchanging the product or refund, it should be made within 14 days from the date of reporting it by the user.
7. Warranty repairs do not cover repairs caused by:
 - using the ridger inconsistently with the manual and intended use,
 - acts of God or others for which the guarantor does not take responsibility.After warranty repairs can be performed only at the user/purchaser cost.
8. The manufacturer can cancel warranty on the product in case of stating:
 - introducing structural changes,
 - occurring any damages caused by acts of God,
 - lack of necessary records or made by one's own any records in the warranty card,
 - using the ridger inconsistently with intended use or manual.

Complaint form no 1

Mounted ridger **P 475**

Serial number..... Date of purchase.....

Seller's signature and stamp

Complaint protocol number.....

Complaint form no 2

Mounted ridger **P 475**

Serial number..... Date of purchase.....

Seller's signature and stamp

Complaint protocol number.....

Complaint form no 3

Mounted ridger **P 475**

Serial number..... Date of purchase.....

Seller's signature and stamp

Complaint protocol number.....

After repair I received technically efficient machine
on..... (date)

.....
User's signature

Notices:

.....
.....
.....

After repair I received technically efficient machine
on..... (date)

.....
User's signature

Notices:

.....
.....
.....

After repair I received technically efficient machine
on..... (date)

.....
User's signature

Notices:

.....
.....
.....

IDENTIFICATION

MOUNTED RIDGER

Mounted ridger of **series P475** has a rating plate, fitted in the front part of the frame of the ridger frame. Basic data which serves for identification of the machine: manufacturer's name, machine symbol, serial number, year of production, is put there.

Data placed on the rating plate serves for identification of the ridger and ought to correspond to the following data, filled in during the sales.

Symbol **P475**

Year of production **202**

Serial number

IT IS ADVISED THAT THE SUPPLIER OF A MACHINE, BOTH NEW AND USED ONES, KEEP THE SIGNED BY THE PURCHASER CONFIRMATION OF RECEIPT OF MANUAL ALONG WITH THE MACHINE.



THE MANUAL CONSTITUTES MACHINE BASIC EQUIPMENT
KEEP THIS INSTRUCTION FOR FUTURE REFERENCE



CAUTION !
When lending the machine to another person, the manual shall be attached to the machine.



CAUTION !
During operation, it is necessary to pay particular attention to loosening of screw connections. Therefore, it is necessary to check and tighten screw connections after stopping the tractor and turning off the tractor engine.

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1. INTRODUCTION

This manual is attached to each machine to make a user acquainted with construction, operation and adjustment of the mounted ridger. Its aim is also warning about existing or possible threats. The manual also contains information on preparation of the ridger for operation and for transportation on public roads.

Strict compliance with recommendations included in the content of the instruction will ensure long-term and non-failure operation and contribute to reduction of operating costs of the machine.

Each chapter of the instruction (according to the contents) presents proper issues in detail. If there is any unclear information for the user, they can obtain exhaustive explanation by writing to the manufacturer's address (the address is on the cover) – you are asked to give: exact address of the purchaser of the machine, machine symbol, serial number, year of production, year and number of issuing the manual.

Terms used in the manual: left side, right side, back and front – refer to the settings of an observer with his face turned according to the direction of the machine drive.

Warranty proceedings regulations and rights resulting from them, are given in the warranty card, attached to each ridger.

2. INTENDED USE OF THE RIDGER

Mounted ridger of P 475 series is intended to operate exclusively in the agriculture. Using it for other purposes shall be understood as using it against the intended use. Meeting requirements referring to operation of the machine, its maintenance and repairs according to recommendations of the manufacturer and strictly complying to them state the condition of using it according to the intended use.

The machine shall be employed and operated only by people acquainted with its detailed characteristics and with procedures in the field of safety.

Regulations concerning accident prevention and all the basic regulations in the field of occupational health and safety and also traffic regulations should be always abided by.

Unauthorized modifications introduced to the tool without the manufacturer's consent may absolve the manufacturer from liability for any resulting damages and harms.

Mounted ridger is a tool designed for tillage in row crops such as potatoes or vegetables e.g. carrot on all kinds of stoneless soil of humidity enabling proper operation. The task of the ridger is to form ridges on the field surface and remove weeds from the surface. The width of processed rows interspace should be in the range of 62.5 to 75 cm.

Ridgers should operate only with recommended by the manufacturer tractor classes (see technical characteristics) equipped with suspension system category II and front axle standard ballasts for keeping the required controllability factor ($s \geq 0.2$).

3. SAFETY PRECAUTIONS AND WARNINGS

3.1. Symbols: meaning and application

In the present manual symbols are used in order to draw the reader's attention and stress certain particularly important aspects requiring discussion.



DANGER

This indicates danger, with a possible serious accident risk. Not obeying recommendations marked with this sign may cause a situation of a serious risk of sustaining an injury by the operator and/or people nearby! Obey strictly these recommendations!



CAUTION

The symbol indicates possibility of damaging the machine or other object and demands to be cautious. It is important advice which should be paid special attention!



REMEMBER

The symbol indicates advice or notice regarding key functions or useful information concerning proper functioning of the machine.

3.2. Expected use

Mounted ridgers of P475 series have been designed, built and adjusted for tillage in row crops in flat and wavy fields, on all types of stoneless soil of humidity enabling proper operation. Ridgers can be used for forming ridges on the field surface and removing weeds from the surface. The operation of the ridger can be performed on slopes up to 8.5°. Ridgers should be aggregated with tractor classes recommended by the manufacturer, see technical characteristics.



REMEMBER

Regulations concerning the intended use and configurations, provided for this machine are the only ones, which are exclusively allowed. The machine shall not be employed for other purposes than those, which have been provided for it. The regulations given in this manual do not substitute obligation towards present regulations with force of a statute, referring to standards concerning safety and prevention from misadventure, but they summarize them.

3.3. Description of residual risk

Residual risk results from wrong or incorrect behavior of the ridger operator. The greatest danger can occur in performing following activities:

- Operation of the ridger by minors and also not acquainted with the manual or not having qualifications for driving an agricultural tractor,
- Operation of the ridger by people with a disease, in a state indicating for using alcohol or narcotic drugs,
- Transport and operation without proper safety measures,

- Aggregation of the ridger with a tractor if the operator is between the machine and the tractor at the engine working,
- Operation when people or animals stay within the range of operation of the assembly tractor + machine,
- Maintenance and adjustment at the ridger when the tractor engine is working and the ridger is not protected against falling down.


When describing residual risk, the ridger is treated as a machine, which since the moment of starting the production, has been designed and manufactured according to the present technique condition.


3.4. Estimation of residual risk


During operation of the ridger, threat and residual risk can be limited to the minimum when such recommendations are abided by:


- careful reading the manual,
- prohibition of people staying on the ridger during operation and transport,
- prohibition of people staying between the tractor and the ridger when the tractor engine is working,
- all adjustment, maintenance and lubrication of the ridger shall be performed only at the tractor engine stopped,
- repairs of the ridger performed only by people trained in this field,
- operation of the machine by people who have qualifications to drive agricultural tractors and are familiar with the manual,
- protection of the ridger against children access.

Although **BOMET**[®] company takes responsibility for pattern-designing and construction in order to eliminate danger, however certain risk elements during mounted ridger operation are unavoidable.

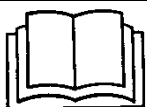
 1) **Danger of being caught or hurt** by edges of the frame or by sharp ending of knurls, duckfoot shares or body of the ridger during aggregation or changing transportation-operation position and inversely.

 2) **Danger of wound or abrasion** by sharp working elements of the machine during performing maintenance or adjustment resulting from improper position of the operator during these activities.

 3) **Danger of being squeezed** by movable elements of the articulated parallelogramas a result of improper position of the operator during performing maintenance and adjustment.

 4) **Danger of turning over the machine** during storage or transportation. When stored to keep stability, the ridger should be set on the flat ground on the ridger copying wheels and the ploughshare. The ridger shall be aggregated only with recommended tractor classes.

3.5. Regulations for occupational health and safety



CAUTION

In order to avoid threats, before starting operation of the ridger, please read the present manual and follow these rules concerning threats and safety measures.

General regulations

- Apart from this manual, one shall also follow traffic regulations and occupational safety and health regulations.
- Warnings (pictograms) placed on the ridger give advice concerning safety of the user and other people, and avoiding accidents.
- When driving on public roads, it is obligatory to follow regulations included in Highway Code.
- It is recommended to cooperate with a tractor equipped with a cabin or a protective frame.
- Before each using the machine, it is necessary to check if all elements of the ridger are in a good condition. Damage incurred shall be fixed without delay and possible deficiencies filled up.
- Avoid staying within the range of the operating ridger.
- Before leaving the tractor cabin and before each activity made at the ridger, stop the tractor engine and remove the key from the ignition switch.
- The ridger shall be stored in a dry room, on the tough and flat ground. During lowering the ridger onto the ground, keep particular caution. Danger of injury!!!

Aggregation

- Keep particular caution during connecting the ridger with a tractor and during disconnection.
- It is forbidden to stay between the ridger and a tractor during any activities performed with a hydraulic system lever.
- While aggregating the ridger with a tractor, it is forbidden to stay between the tool and the tractor at the tractor engine working.
- During performing any maintenance at the ridger, it is necessary to stop the engine, remove the key from the ignition switch and pull the handbrake.
- Pivots of the ridger suspension system shall be secured only with the use of typical protection in the form of cotter pins.
- The ridger shall be aggregated only with recommended tractor classes equipped with front axle standard ballasts.
- The ridger can be operated by a person with qualifications allowing for using agricultural tractors.
- During aggregation, keep the minimum load of the tractor front.



CAUTION

Operation with a tractor of another class than recommended by the manufacturer may cause threat of stability loss in operation or in stoppage. The load of the tractor's front axle cannot be lower than 20% of its weight.

Maintenance

- A ridger can be operated by a person with qualifications allowing for using agricultural tractors and acquainted with the manual of the ridger.
- It is not allowed for other people not acquainted with the manual to operate the ridger.
- It is not allowed for children and people after drinking alcohol to operate the ridger.
- The ridger shall be raised onto the tractor suspension system easily, without jerks or vibrations.
- Raise the ridger upwards each time when turning and making returns.
- At each getting off the tractor by the operator, leave the ridger in the lowered position.

- Removing clogs can be performed after lowering the tool onto the ground and turning off the tractor engine.
- Work with a ridger on slopes with gradient exceeding 8.5° is not allowed.
- It is not allowed to use tractor reverse gear during work, when the tool is in the working position.
- All maintenance (lubrication, repairs, cleaning etc.) shall be performed with the ridger lowered onto the ground, the tractor engine stopped, key taken out from the ignition switch and handbrake pulled.
- People operating agricultural equipment should be equipped with working clothes and footwear, and personal protection measures appropriate for existing threats e.g. gloves.

Transportation

- Transportation of a ridger by means of transport from the manufacturer to a sales person or a client is described in the chapter 'Transportation on public roads' in detail. One shall remember safety rules during the loading and proper fixing of the ridger on a car trailer. Hooks for ropes or chains are marked with pictograms.
- A ridger transported on public roads must be equipped with portable light and warning devices and a triangular sign for low-speed vehicles, fixed in special handles on the ridger frame, see details in chapter 'Transportation on public roads'.
- It is forbidden to transport any people or items on the ridger frame.
- Due to considerable width of a ridger and a fixed connection with the tractor, keep caution especially at returns and turnings during transportation on public roads with regard to overlapping of the tool.
- Keep extreme caution while making a turn of a tractor with a mounted ridger, both during transportation and also while making returns in the field, especially when there are any people or items nearby.
- Driving speed of the tractor with a ridger during transportation cannot exceed:
 - driving on hardened roads with flat surface – 15 km/h,
 - driving on field ways – 10 km/h.

Storage

- Disconnecting the ridger from the tractor can take place only after the tractor engine is stopped, key taken out and the handbrake pulled.
- A ridger shall be stored in a dry room, on the tough and flat ground. When lowering the ridger onto the ground, keep extreme caution – danger of injury!!!
- A ridger should be stored in places where there is no possibility of accidental injury of people or animals, on the flat ground, preferably under a roof.
- During storage the ridger should be leant firmly on working elements and the copying wheel. The ridger shall be stored in a clean condition.

Others

- It is not allowed to use a ridger for other purposes than given in the manual.



CAUTION

Not following these rules may cause threat to the operator and other people and also may cause damage to a ridger. Any damage resulting from not following these rules is the only responsibility of the user.

3.6. Standard conformity

The machine has been designed and made in accordance with standards concerning safety in the machine industry, valid on the day of marketing the mounted ridger. Particularly, following legal acts and harmonized standards have been taken into account:

- 2006/42/WE –Directive on machinery safety introduced by the Ordinance of Minister of Economy on 21 October 2008 (Journal of Laws ‘Dziennik Ustaw’ No 199, item 1228).
- PN-EN ISO 12100:2011 – Machinery. Safety. Basic concepts, general principles for design. Basic terminology, methodology (orig.).
- PN-EN ISO 4254-1:2009 +AC:2010 – Agricultural machinery. Safety. Part 1: General requirements.
- PN-ISO 730-1+AC1:1996 – Wheeled agricultural tractors. Rear three-point suspension system. Categories 1, 2, 3 and 4.
- PN-ISO 2332:1998 – Tractors and agricultural machinery. Mounting machinery on a three-point suspension system. Free space zone.
- PN-ISO 3600:1998 – Tractors, agricultural and forest machinery, mototools. Manual. Contents and form.
- PN-ISO 11684:1998 – Tractors, agricultural and forest machinery, mototools. Safety and warning signs. General principles.

3.7. Manufacturer’s responsibility and guarantee

In relation to described in this manual types of machines, *BOMET*[®] company does not acknowledge any civil responsibility towards:

- improper or inconsistent with the manufacturer’s recommendations using the machine,
- using the machine in a way breaking domestic law concerning safety and preventing from unfortunate accidents,
- non-compliance or improper following regulations cited in this manual,
- making unauthorized changes in the machine,
- using the machine by unqualified staff,
- using spare parts that are not original.

As long as the purchaser wants to make use of warranty, he should strictly follow recommendations and regulations given in the manual. In particular:

- he should work only in the given ranges of the machine operation,
- he should always perform unchangeable and thorough maintenance,
- only operators with proper abilities and qualifications shall be allowed to use the machine,
- he should use only original spare parts recommended by the manufacturer.

3.8. Noise and vibrations

During the operation of a ridger for the operator there is no threat caused by noise contributing to the loss of hearing because the ridger is an inactive tool and the workplace of the operator is in the tractor cabin. The tractor and not the machine is the source of noise.

There is no threat caused by vibrations when working with a ridger because the operator’s workplace is located in the tractor cabin where the seat is amortized and properly ergonomically shaped.

3.9. Safety signs and captions







Mounted ridgers of P475 series are equipped with all devices that ensure safe work. Where it is not possible to entirely secure dangerous places due to the proper operation of

the ridger, there are warning signs – pictograms which indicate for possibility of danger and present manners of avoiding it.

In table 1 pictograms placed on the machine and their meaning have been specified. Safety pictograms should be protected against being lost and against loss of legibility. Lost or illegible signs and captions should be replaced with new ones. It is required that new assemblies employed during repair were marked with all safety signs predicted by the manufacturer.

If you want to buy pictograms, write to the manufacturer’s address or send information to the e-mail address and give the sign number (according to the table 1), version and year of issuing this manual.

Table 1. Safety signs and captions

No.	Pictogram	Meaning	Location
1	2	3	4
1.	(Rating plate)	Rating plate	At the front of the central frame on the left side
2.		Before operating the machine, read the manual.	On the ridger frame.
3.		Caution. Before operation turn off the engine and remove the key from the ignition switch.	On the ridger frame.
4.		Do not stay near the lift rods, while controlling the lift.	On the ridger frame.
5.		Caution danger of crushing. Do not reach operation area of the parallelogram arms.	On ridger arms.
6.		Marking places of loading hooks.	On the ridger frame.
7.		Company logo	On the ridger frame.

4. USAGE REGULATIONS

4.1. General information

The P475 series mounted ridgers are manufactured in two working versions as a 3-section machine for 3 rows or 5-section machine for 5 rows. Mounted ridgers of P475 series are suitable for operation on slopes not exceeding 8.5° and cooperate with tractor classes 0.6 and 0.9 (see technical characteristics - table 4) equipped with standard wheel ballasts.

4.2. Construction and operation of the machine

The U724 series ridgers (Figure 1) are tools mounted on the three-point tractor suspension system equipped with the suspension category II. Construction of the ridger is modular, i.e. ridgers have the same working sections but only differ in the frame.

The ridger working sections are mounted with the yoke 10 to the ridger frame 1 (figure 1) equipped with a tool three-point suspension on the tractor. The working sections have articulated parallelograms 2 which provide an equal operating angle for the ridger operating units. In the parallelogram there is a spring tensioner 3 which facilitates immersion of ridging coulters 4, a ripper 5 and a cultivator point 6. During the operation, the ridger frame is supported on the copying wheels 7 of the working sections. The ridging body consists of a two-sided ploughshare, a mouldboard and two wings. The ploughshare passes the undercut soil onto the mouldboard. The mouldboard partly rakes the soil to the sides and passes it to the wings. Wings form a ridge and spread soil under plants. There are brackets 2 for installing light and warning devices, and a triangular sign for low-speed vehicles welded to the ridger frame.

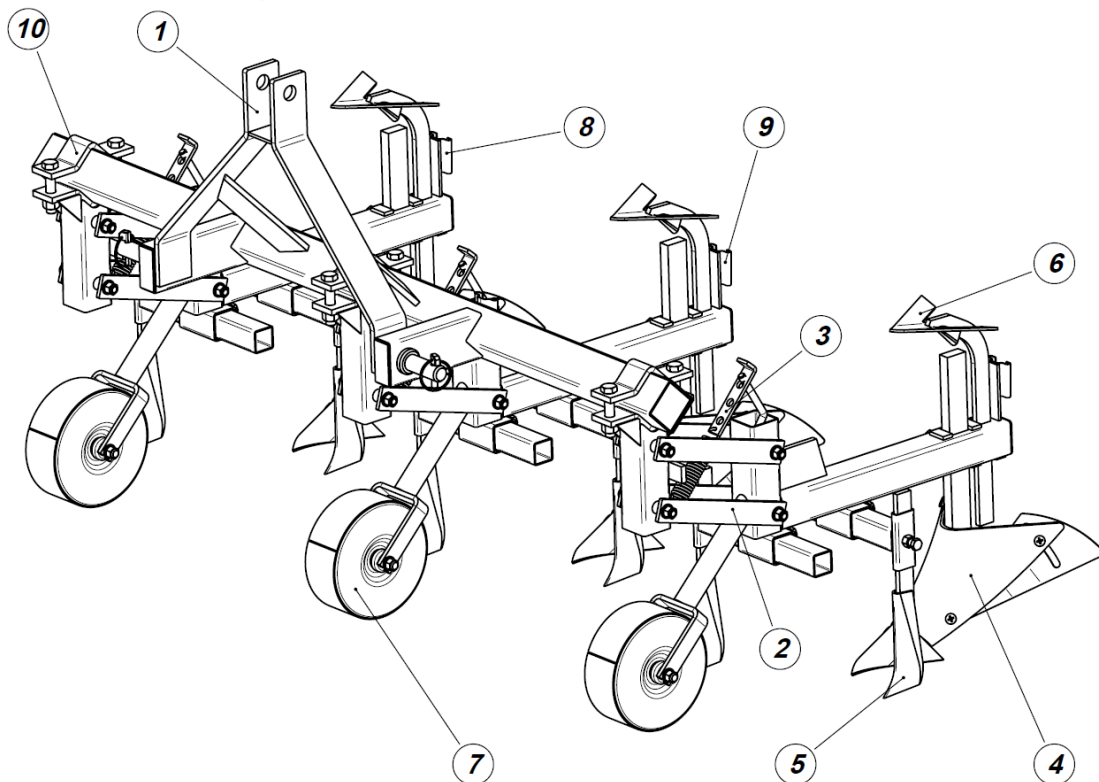


Figure 1. Hoe-ridger - general construction: 1 - frame, 2 - articulated parallelogram, 3 - spring tensioner, 4 - ridging coulters, 5 - ripper, 6 - cultivator point, 7 - copying wheel, 8 - bracket for mounting light and warning devices, 9 - bracket for mounting a triangular sign for low-speed vehicles, 10 - working section yoke

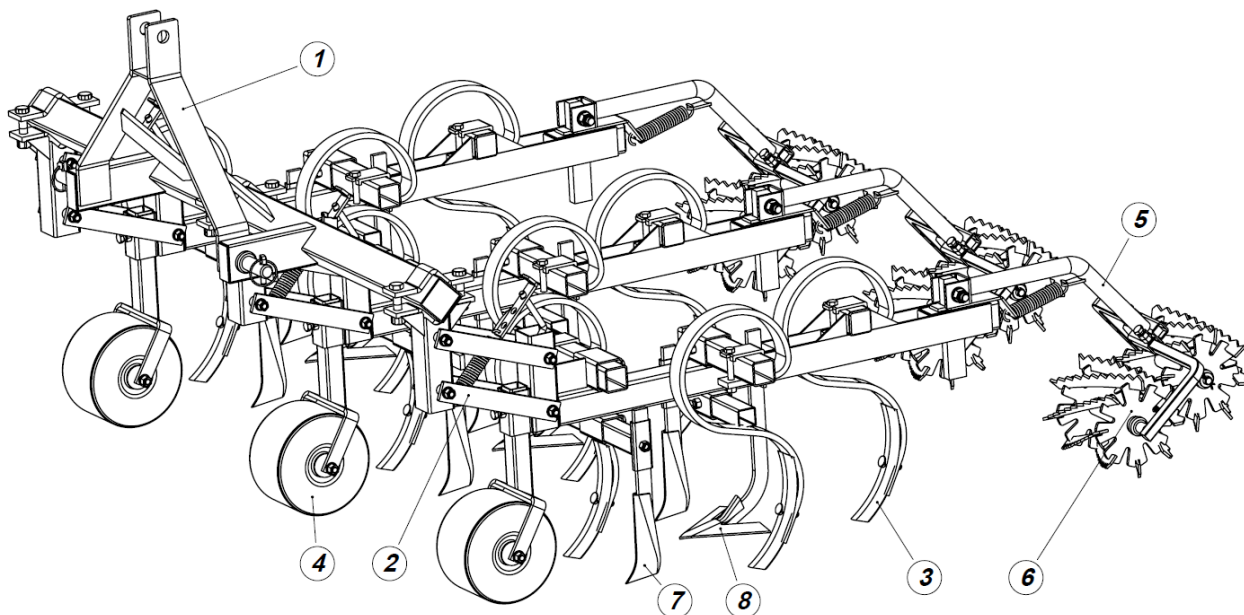


Figure 2. Ridger with rollers - general construction: 1 - frame, 2 - articulated parallelogram, 3 - spring tine set, 4 copying wheel, 5 - roller arm, 6 - string rollers, 7 - ripper, 8 - cultivator point

The ridger can be additionally equipped with a section of a hoe and string rollers. The section of the hoe works using a parallelogram (2). The section consists of three spring tines (3), and two string rollers (6) on movable arms (5), two rippers (7) and a cultivator point (8) are attached to the end of the section.

4.3. Equipment and fittings

The manufacturer delivers the ridger for sale assembled. The manual with a spare parts catalogue and a warranty card are delivered along with the machine by the manufacturer.



REMEMBER

Manual with a spare parts catalogue comprise basic equipment of the ridger.

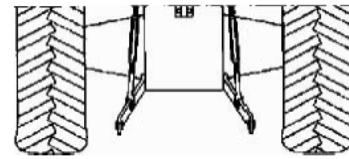
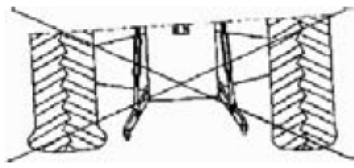
Basic equipment of the machine **does not involve** portable light and warning devices and a triangular sign for low-speed vehicles which are available at the agricultural equipment storehouse.

Each user of a ridger shall have light and warning signs, in working order, and a triangular sign for low-speed vehicles (sign description is available in the section 'Transportation'). Not having them during transportation may result in an accident. For damage incurred during an accident the user of the machine is responsible.

4.4. Preparing the tractor to work

Preparation of a tractor to cooperation with a ridger consists in checking its general efficiency in accordance with the tractor manual (pay particular attention to the proper operation of the suspension system). It is mandatory to aggregate the ridger with recommended tractor classes equipped with standard ballasts of front axle and rear wheels in accordance with data given in the technical characteristics of the tractor.

Air pressure, particularly in rear tires of the tractor should be equal in both wheels and in accordance with the tractor's manual!



Before suspension of the machine, lower rods of the tractor's suspension system shall be in lower position at the same height (distance between joints and ground is minimum 200 mm). Rods set at the equal height from the ground facilitate mounting the ridger on the tractor.

4.5. Assembly of the ridger

Ridgers from the manufacturer to a sales person or a client are transported partly disassembled and therefore during the first run and preparation of the ridger for operation, it shall be assembled. First, install the ridger frame on the tractor three-point suspension system. Then on the frame, after raising it with the tractor lift and securing against falling down, install the ridger working units. Position of the ridger units shall be set on the frame by tightening two bolts fastening unit covers. After installing units, install the ridger working elements by twisting off bolts fastening working elements caps in rails.



CAUTION

Assembly of the ridger shall be performed on the flat and even ground. Keep extreme caution when installing the ridger body, knurls and duckfoot shares due to possibility of danger of being hurt with sharp edges of the machine.



CAUTION

During assembly use the tables from the spare parts catalogue where connection of ridger each element is presented.

4.6. Preparing the ridger to work

Preparation of a new ridger to operation and after storage period (e.g. after winter) consists in checking its technical condition and most of all durability of connections of working elements with the frame. In case of stating damage or worn elements it is necessary to exchange them into new or regenerated ones. Otherwise it can lead to reduction of the tool work quality.



CAUTION

It is forbidden for the operator to stay between the tractor and the machine at the tractor engine running. The ridger shall be raised easily, without jerks or vibrations.

Furthermore, it is necessary to:

- check screw connections, in case of backlash tighten the nuts,
- check if copying wheels move easily and without jamming, in case of stating jamming of a copying wheel, it shall be uninstalled, cleaned and lubricated or bushings of copying wheels shall be exchanged,
- check if axles of articulated parallelograms and pull springs move easily and without jamming, in case of stating jamming, they shall be cleaned and lubricated,
- lubricate the ridger in accordance with recommendations (see chapter 'Lubrication instruction').



CAUTION

All maintenance in the ridger shall be performed before installing it on the tractor.

4.7. Mounting the ridger on the tractor

When mounting the ridger on the tractor, perform following activities:

- disassemble a tool drawbar from lower rods of the tractor three-point suspension system,
- drive to the machine frame close enough with the tractor,
- **turn off the tractor engine, remove the key from the ignition switch and pull handbrake,**
- install tractor lower rods onto the tool studs and secure with typical cotter pins,
- using a pivot, link the upper connector of the tractor with the ridger frame rack and secure with a typical cotter pin,
- tighten gently chains of lower rods of the tractor, keeping the symmetry between the ridger suspension and the tractor,
- install portable light and warning signs and a triangular sign for low-speed.



CAUTION

It is forbidden to connect the machine with a tractor when the tractor engine is running. It is forbidden to use other elements to secure the tool suspension system than recommended by the manufacturer.

4.8. Ridger adjustment regulations

Before starting work with the ridger, it is necessary to perform its adjustment. Adjustment of a ridger consists in setting the required operation depth, working units spacing and its transversal and longitudinal leveling.

Change of working depth is performed by proper putting forward caps of working devices (ridging body, knurl, duckfoot share) and setting them in rails with the use of bolts.

Change of working unit spacing is performed by loosening yoke 10 bolts (figure 1) and setting the unit in the required position, and then tightening fastening bolts.

Transversal leveling ensures setting equal working depth of the right and left units of the ridger and is performed with a hook of the right rod of the tractor suspension system.

Longitudinal leveling ensures setting equal working depth of working elements at the front and back of the unit. Longitudinal levelling is performed by shortening or lengthening the upper connector of the tractor suspension system. At properly performed leveling, the ridger frame surface should be parallel to the ground during the tool work at the required depth.

In case of clogging of double string rollers, the point of installing the pulling chain shall be lowered.



WARNING

It is forbidden to perform adjustment of the ridger at the tractor engine running. When changing the rows interspace it is necessary to use bent box spanners.

4.9. Operation with the ridger

During operation properly suspended and adjusted ridger should move equally after the tractor and keep equal depth on the whole working width. Working speed of the ridger should equal 5-8 km/h. The assembly tractor + ridger should be led so that it does not damage or cut plants.

If during work, clogging of working units occurs, the ridger shall be cleaned by lifting it and then by moving it, lower it down and continue operation. It is not allowed to leave the ridger on a slope or other terrain gradient without securing it against moving.

**CAUTION**

It is not allowed to use the reverse gear of the tractor during work, when the tool is in the working position. The ridger shall be raised easily, without jerks or vibrations.

**WARNING.**

All clogging made during operation of the ridger requiring interference in the operation, shall be removed after stopping the tractor, leaving the ridger, turning off the tractor engine and pulling the handbrake.

5. TECHNICAL OPERATION

To ensure a lasting and reliable operation of the ridger, condition of screw connections should be checked and tightened in case of losing. After work, the ridger should be cleaned thoroughly. Worn or damaged working parts should be replaced following these recommendations:

- all worn elements of the ridger shall be exchanged in the proper time,
- for exchange only original parts ensuring good quality shall be used, it comprises one of conditions of keeping warranty validity.

5.1. Instruction on maintenance of a ridger

Each time, after work, clean the ridger out of soil, and inspect connections of parts and assemblies. Technical maintenance of the ridger consists in checking the condition of knurls, ploughshares, wings of ridgers and duckfoot shares, the condition of the spring and arms of articulated parallelogram and also checking the condition of screw and pivot connections. All loose screw connections shall be tightened. Pivots and studs of the ridger suspension system should not be lubricated and kept in a clean and dry condition. Warning signs and a triangular sign for low-speed vehicles shall be kept clean.

5.2. After-seasonal maintenance

After season, the ridger shall be cleaned thoroughly out of contamination and washed. Worn or damaged working parts shall be exchanged and all loose screw connections tightened. Loss occurred in paint coat should be cleaned and filled by covering with a fresh layer of protective paint and then the ridger should be greased in accordance with the lubrication instruction.

5.3. Tillage outfit storage

Ridger should be kept under a roof on the flat, solid ground. In case of lack of a roofed place, it is possible to keep the tool outside. **The ridger should be kept in a place posing no threat to people and surrounding.** After disconnecting the ridger from the tractor, the tool should be supported on ridger bodies and copying wheels.

**CAUTION**


The ridger should be kept in a place posing no threat to people and surrounding.

During long-term storage of the tool outside, preservation of working elements shall be repeated in case of the preservative layer rinsed. **Light and warning signs and a**

triangular sign for low-speed vehicles should be uninstalled from the ridger and placed in a dry room, to be protected from being damaged.

5.4. Working parts exchange

In the ridger there can happen necessity of exchange of ridges, duckfoot shares, ploughshares or wings of the ridger. In order to exchange working elements, the ridger suspended on the tractor shall be raised into the transportation position. The assembly shall be secured against falling by putting a strong support excluding its falling over under the tool frame. After setting the support, lower the ridger until it is leant on it, stop the tractor engine, remove the key from the ignition switch, pull the handbrake, and secure one of the rear wheels of the tractor with wedges against moving. Before exchange of the working elements, stability of the assembly: tractor – ridger shall be checked.


	<p>CAUTION All activities connected with uninstalling and installing of worn parts of the ridger shall be performed on the tough flat ground, after lowering the ridger onto the ground or supports.</p>
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Exchange of a ridge or a duckfoot share

- Ridger frame should be set upwards on the support,
- Twist off the bolt fastening caps of working elements in rails,
- Slide out caps of worn elements of the ridger,
- Insert the caps of new working element into the rails,
- tighten the bolt fastening caps of working elements of the ridger.

Exchange of ploughshares and wings of the ridger

The ridger ploughshare shall be exchanged after the ridger body is previously uninstalled from the working unit. After uninstalling the ridger, it shall be put in a vice and the bolt fastening the double-sided ploughshare (item 18– table 2, parts catalogue) shall be untwisted. After putting a new or regenerated ploughshare, the fastening bolt shall be tightened and the ridger cap shall be installed in the unit rail.

	<p>CAUTION When exchanging working elements, proper tools and protective gloves shall be used.</p>
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5.5. Detection and removal of failure

During operation, following failure can occur, which can affect unfavourably the ridger operation quality, raise the application cost and also lead to damage both of the ridger and the tractor.

Table 2. Table of inefficiency reasons and methods of removal

Inefficiency	Reason	Method of removal
Tractor front tends to rise upwards	Too little load on the front. IMPORTANT: Tractor front axle load cannot be less than 0.2 of the tractor's weight.	Check if the tractor class is consistent with the manual recommendations. If not – change the tractor. If so – check and if need be add the proper number of front axle ballasts.
Ridger will not submerge	Damaged or worn ridges or ploughshares of the ridger	Check and exchange
	Support wheels lowered too low	Check and adjust the operation depth
	Improper longitudinal leveling	Check and level the ridger
Uneven working depth	Improper longitudinal or transversal leveling	Check and perform proper adjustment
Transverse swinging of the ridger	Improperly adjusted side rods turnbuckles	Check and perform adjustment

**REMEMBER!**

Work with an inefficient tool, improperly adjusted may lead to serious threats to the operator and other people. Inefficiencies and damages noticed shall be removed without delay.

5.6. Lubrication instruction

Basic maintenance activities are keeping lubrication periods and using proper types of grease. Before lubrication all the points of lubrication shall be cleaned out of contamination. Lubrication of the assembly shall be performed according to the table 3.

Used oil and lubricants should be passed to a chain of points collecting them, where they are processed in order to be re-used.

Table 2. Lubrication points

No. of lubrication point	Lubrication place	Frequency	Grease type
1.	Pivot connections of the articulated parallelogram	Twice a season	Graphite grease
2.	Rinsing working surfaces	After season	“Antykor” kerosene
	Preservation of working surfaces	After season	“Antykor” kerosene

6. TRANSPORTATION ON PUBLIC ROADS**6.1. Ridger transportation by means of transport**

Ridgers can be transported from the manufacturer to the sales person or client by trailers of means of transport. Ridgers are transported assembled and ready for operation. Ridgers are loaded onto the trailers with lifting devices after installing lines or chains in places marked by the manufacturer with pictograms. The ridgers should be secured still on means of transport. The transporting person is responsible for proper securing the ridger.

**CAUTION**

When loading the ridgers on means of transport, lines or chains shall be installed in places marked by the manufacturer with pictograms.

6.2. Transportation of a ridger on the tractor

The ridger transported on public roads on a tractor should be equipped with portable light and warning devices having at the front: white side lights, at the back: side and red brake lights, orange turning and red reflective one. On the machine there must be a triangular sign for low speed vehicles placed. Portable light devices are connected with the tractor wiring with the use of a connecting cable ended with 7-pole plugs.

During transportation a ridger shall be lifted upwards, to the position ensuring required transportation clearance. The tractor, on which the ridger is suspended, should fulfill conditions of admitting it to motion on public roads in accordance with Highway Code.

**CAUTION!**

It is forbidden to move on public roads without the proper marking (Ordinance of Minister of Infrastructure of 31 December 2002 Journal of Laws (“Dziennik Ustaw”) No 32/2003 item 262 with later amendments).

Ridger transported on a tractor suspension system, on public roads must be obligatory equipped with portable light and warning devices and a triangular sign for low-speed vehicles fixed in special handles installed on the machine. It is forbidden to transport people or cargo on the frame of the machine.

**CAUTION!**

When turning, pay attention to “overlapping” of the machine.

7. DISASSEMBLY

**CAUTION**

Before starting to disassembly, the ridger shall be disconnected from the tractor.

Disassembly of the machine should be performed by people, equipped with protective gloves and previously acquainted with its construction after disconnecting the machine from the tractor and setting on the flat and tough ground. Due to a number of elements of the ridger exceeding 20 kg (frame, unit), use lifting devices when disassembling. Disassembly and exchange of working parts shall be performed according to the tables included in the spare parts catalogue. In case of worn parts, follow ‘Totaling’ point.

**CAUTION**

Lifting devices used during disassembly can be operated only by a person properly authorized and qualified.

All fixings are made of normalized elements adjusted to metric keys. For key movement there are free spaces ensuring unconstrained unscrewing and tightening up nuts and screws predicted. In case of screws of yoke fastening working sections to the frame, use bent box spanners.

8. TOTALING

Totaling of a ridger shall be performed after its previous complete disassembly and inspection of the machine parts. During disassembly, parts should be grouped according to the material type - ferrous metals. Used elements of ferrous metals should be grouped and passed to points collecting these metals.

9. TECHNICAL CHARACTERISTICS

Technical data of ridgers of P475 series is listed below.
Table 4. Technical characteristics of a mounted ridger

No.	Specification	Unit of measure	Manufacturer data		
			<i>P 475</i>	<i>P 475/1</i>	<i>P 475/1</i>
1.	Symbol	-	<i>P 475</i>	<i>P 475/1</i>	<i>P 475/1</i>
2.	Machine type	-	mounted		
3.	Working width	m	1.87	3.10	1.87
4.	Working depth	mm	70-100	70-100	70-100
5.	Overall dimensions (in working and transportation position)				
	- length	mm	1250	1250	2070
	- width	mm	1500	3100	1500
	- height	mm	1000	1000	1100
7.	Machine weight	kg	110	185	205
8.	Working elements				
	- number of working units	pc/ pcs	3	5	3
	- number of processed rows	pc/ pcs	3	5	2
	- distance of processed rows	mm	625-750	625-750	625-750
	- number of ridges	pc/ pcs	6	10	6
	- number duckfoot shares	pc/ pcs	3	5	3
	- number of spring tine	pc/ pcs	-	-	3
9.	Copying wheel				
	- number of wheels	item	3	5	3
	- diameter of wheel	mm	210	210	210
	- width of wheel	mm	70	70	70
10.	String rollers				
	- - number of rollers	pc/ pcs	-	-	6
	- - string roller diameter	mm	-	-	210
	- - string roller width	mm	-	-	210
11.	Power demand				
	- suspension system	-	Category II		
	- tractor class	-	0.6	0.9	0.6
	- tractor nominal pulling force	kN	6	0.9	6
	- tractor force	kW	22-32	35-45	22-32
12.	Transportation clearance	m	0.35	0.35	0.35
13.	Working speed	km/h	5-8	5-8	5-8
14.	Transportation speed	km/h	15	15	15
15.	Operation	person	1	1	1

Measurements of geometric dimensions and weights are given in the technical characteristic to an accuracy of 1%.

SPARE PARTS CATALOGUE

How to use the catalogue.

Spare parts catalogue includes other assemblies of the ridger marked with proper numbers of tables.

The catalogue should be used as follows:

- determine the proper assembly the exchanged part belongs to according to the tables,
- find the needed part on the assembly table following the reference number from the assembly drawing.

Spare parts can be purchased at the tool manufacturer, by writing to his address or by calling; then you are supposed to specify:

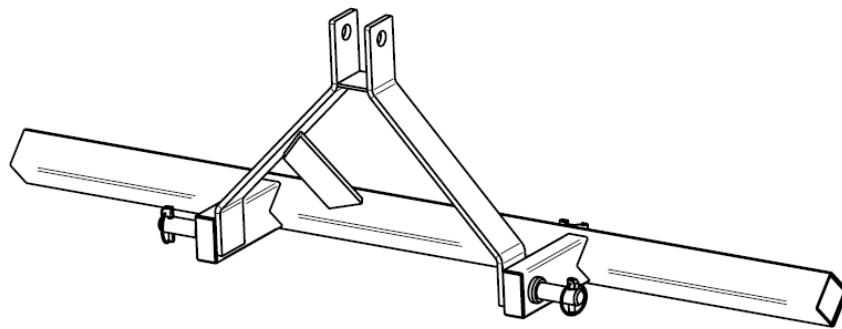
- the exact address of the orderer,
- ridger symbol,
- ridger serial number,
- year of production,
- manual issue number,
- the exact name of parts or assembly,
- Catalogue symbol (KTM), spare part number or standard,
- number of pieces,
- payment terms.

All standard parts can be purchased in the public sale.

Table 1. Ridger main frame

Position Figure No	Part name	Catalogue number or norm number	Items quantity in the ridger	
			P 475 / P 475/2	P 475/1
1.	Main frame A type	8234-475-002-001	1	-
	Main frame B type	8234-475-002-002	-	1

Frame A type



Frame B type

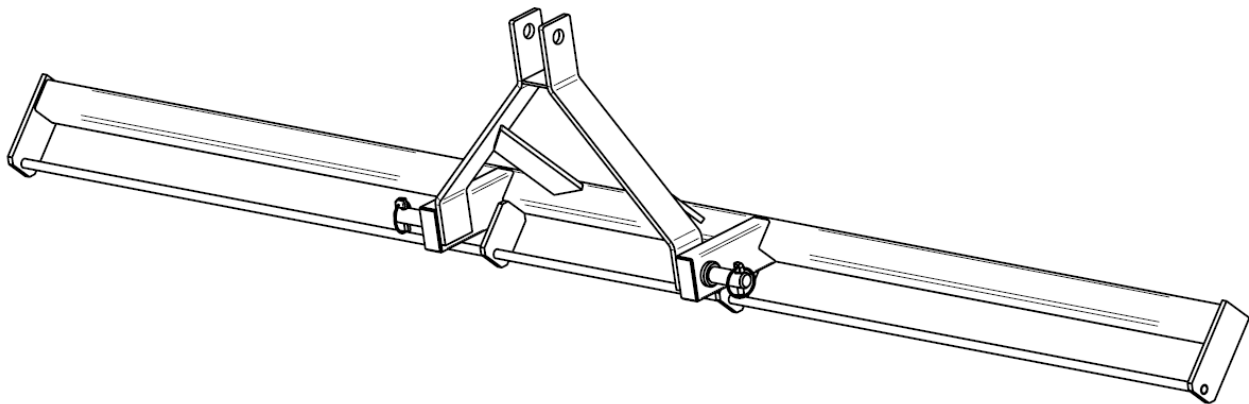


Table 2. Ridger working section

Pos. Fig.	Part name	KTM symbol or standard number	Number of pieces in the ridger	
			P 475	P 475/1
1.	Supporting frame of the section welded	8234-475-001-001	3	5
2.	Yoke welded	8234-475-001-002	3	5
3.	Lever with pivots welded	8234-475-001-003	6	10
4.	Lever	8234-475-001-004	6	10
5.	Overlay	8234-475-001-005	3	5
6.	Wheel	8234-475-001-006	3	5
7.	Sleeve	8234-475-001-007	6	10
8.	Axle	8234-475-001-008	3	5
9.	Cup	8234-475-001-009	6	10
10.	M12 nut	PN-86/M-82144	18	30
11.	Tensioner	8234-475-001-011	3	5
12.	Spring	8234-475-001-012	3	5
13.	Ripper arm welded	8234-475-001-013	6	10
14.	Ripper	8234-475-001-014	6	10
15.	Ridging coulter welded	8234-475-001-015	3	5
16.	Ploughshare	8234-475-001-016	3	5
17.	Cultivator point	8234-475-001-017	3	5
18.	Screw M 10x25	PN-87/M-82402	18	30
19.	Screw M 16x35 -10.9-B	PN-85/M-82105	3	5
20.	Screw M 12x20 -10.9-B	PN-85/M-82105	18	30
21.	Screw M 16x50 -8.8-B	PN-85/M-82105	6	10

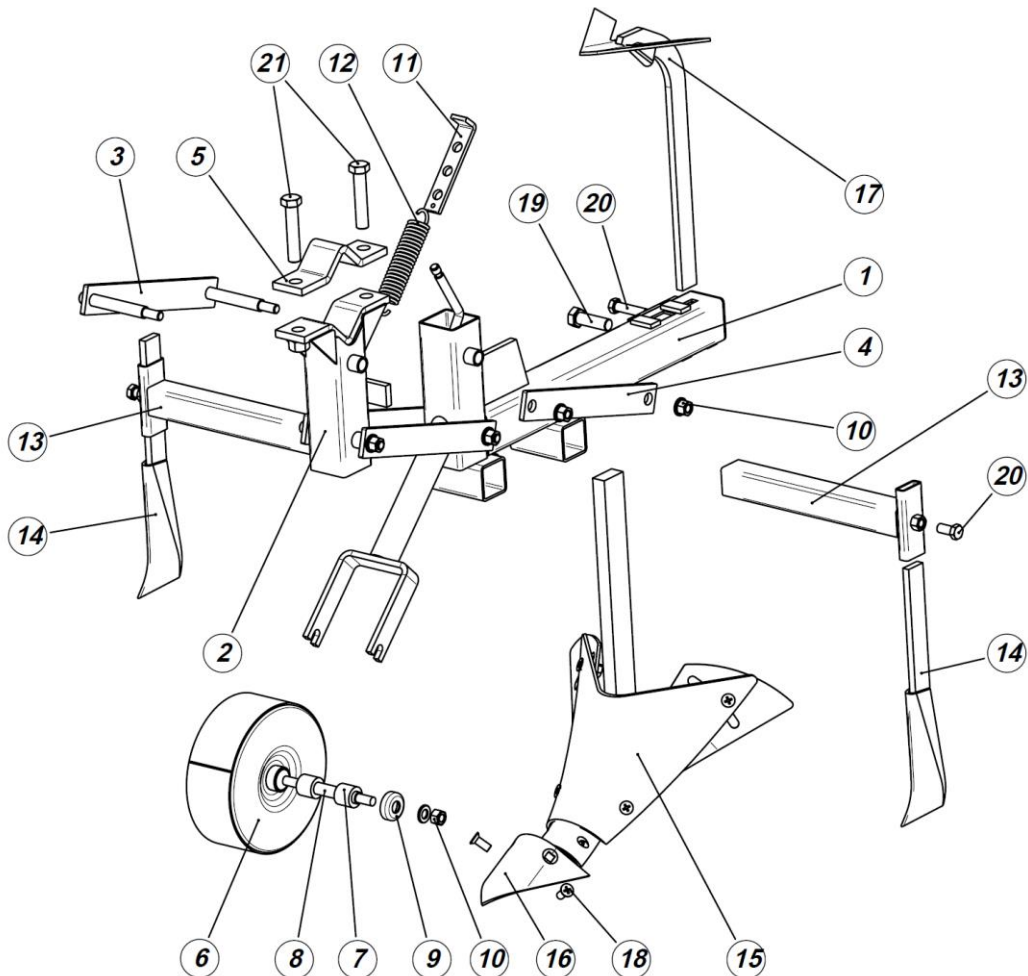


Table 3. Ridger working section with rollers

Poz. Rys.	Nazwa części	Symbol KTM lub nr normy	Ilość sztuk w obsypniku
			P 475/2
1.	Supporting frame of the section welded	8234-475-003-001	3
2.	Support wheel arm welded	8234-475-003-002	3
3.	Support wheel welded	8234-475-003-003	3
4.	Axle of the support wheel	8234-475-003-004	3
5.	Plastic sleeve	8234-475-001-007	12
6.	Cup	8234-475-001-009	3
7.	M12 nut	PN-86/M-82144	6
8.	Tensioner	8234-475-001-011	3
9.	Spring	8234-475-001-012	6
10.	Overlay	8234-475-001-005	3
11.	Screw M 16x50 -6.8-B	PN-85/M-82105	3
12.	Spring tine arm	8234-475-003-012	6
13.	Spring tine	8234-475-003-013	9
14.	Spring tine coulter	8234-475-003-014	9
15.	Spring tine bracket	8234-475-003-015	9
16.	Roller arm bracket welded	8234-475-003-016	3
17.	Roller fixing arm welded	8234-475-003-017	3
18.	Arm with roller axle welded	8234-475-003-018	6
19.	Roller welded	8234-475-003-019	6
20.	Ripper arm welded	8234-475-001-013	6
21.	Ripper	8234-475-001-014	6
22.	Ridging coulter welded	8234-475-001-015	3

