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USER MANUAL

SPARE PARTS CATALOGUE

WARRANTY

FLAIL MOWER

LEOPARD RB

160/180/200

Borzytuchom 2023 - Issue 10

TRANSLATION OF THE ORIGINAL MANUAL

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CAUTION!

The safety regulations shall be followed while using the machine and this manual shall be read prior to the machine operation.

The manual is an integral part of the machine equipment!

The manual shall be kept in a safe place and shall be available for user and an operator during the whole period of the machine operation.

If the manual is lost or destroyed, new manual shall be purchased in the machine retail outlet or at the manufacturer's office.

If the machine is sold or made available to other user, the manual and the declaration of conformity shall be attached to the machine.

The notation "shredder" used in the manual refers to a flail mower.

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

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

In case when the damage was caused by:

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

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

WARNING !

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

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1. Introduction

The manual shall be carefully read prior to the flail mower operations and all recommendations included in this manual shall be followed.

CAUTION!
This manual shall be read prior to the operation

The manual contains the description of hazards which can occur if the safety regulations are not followed while the operation and servicing of the flail mower. The manual includes all precautions which shall be followed to minimize or avoid hazards.

The manual also contains the rules of proper operation of the flail mower and informs what service action shall be made.

If any information included in the manual are incomprehensible, you are requested to turn to the manufacturer for explanation.

CAUTION!
This symbol indicates a hazard.
This warning symbol indicates important information about the hazard. You are requested to read the information carefully, Follow the recommendations provided and exercise special care.

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2. Machine identification

Each mower is equipped with serial plate, which contains important identification data. Plate is located in easily accessible part of the machine. Information contained by the base plate confirm compliance with applicable safety regulations. Due to this reason it cannot be reused or removed

Serial plate contains:

- Full name of the manufacturer
- Name
- Weight
- Serial number
- Type
- Year of production
- CE sign

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3. Occupational safety regulations

3.1 User safety

The flail mowers can be operated only by adults who familiarized with the contents of this manual and are qualified. The flail mowers shall be operated with special care and the following hints shall be followed:

- Follow general occupational health and safety regulations despite recommendations included in this manual.
- Follow warning symbols installed on the machine.
- People under the influence of alcohol or other narcotic drugs cannot operate the machine.
- Only an operator can drive the flail mower, other people cannot stay inside or close to the machine.
- The flail mower can be operated only by a qualified person who can drive a vehicle attached to it, according to the manufacturer's recommendations.
- A vehicle cabin to which a machine is attached is a workplace of an operator while working with the flail mower.
- It should be remembered that a flail mower has a lot of places which could injure a body (sharp edges, protruding construction elements etc.). Special care shall be kept while moving in the vicinity of mentioned critical places and personal protection equipment, such as the following, shall be worn:
  - protective clothes,
  - protective gloves,
  - protective shoes.
- Transport of people or items on the machine is forbidden.
- Bystanders who has not familiarized with the manual cannot operate the machine.
- An employee who operates the flail mower shall have a first-aid kit and its instruction manual.
- While moving with attached vehicle, but a flail mower in a standstill, safe transport height that is ~0,3m above the surface shall be maintained.
- Special care while driving on public roads shall be maintained and it is necessary to follow traffic regulations as well.
- Electric lighting shall be used in a whole vehicle while moving on public roads, checking its technical condition and visibility, and taking care of the cleanness. Triangular plate indicating low powered vehicles shall be installed on the machine or vehicle's back. It is necessary to take care of the cleanness and visibility of reflector lights and warning signs on the construction elements of the machine.
- Transport speed shall be adapted to the condition of roads and shall not exceed 20km/h.
- The vehicle and a flail mower cannot be left on slopes or other terrain inclination with no protection against autogenous rolling. The flail mower shall be positioned on a flat surface. The chocks shall be put under a vehicle's wheel.

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- The flail mower shall be adjusted for the operation while the assembly. The position can be adjusted from the operator's cabin, with no need to leave a cabin.
- All action connected with the preparation, assembly, disassembly or adjustment can be made only upon the driver shut-off, engine stop, stoppage of a vehicle and waiting until all movable elements of the machine shall be in a standstill.
- The condition of all temporary Hastings, screw connections shall be checked upon first hour of operation.
- The flail mower shall be stored on a flat, leveled and hardened surface that is unavailable for outsiders and animals. A supporting flange shall be applied for stable position of a flail mower.
- Special care shall be kept while assembly and disassembly of a flail mower paying special attention to construction elements responsible for linking on the rear of a vehicle.
- The technical condition of a flail mower and attached vehicle shall be verified prior to the operation. The unit, vehicle and flail mower shall be maintained in a good technical condition. Worn and damaged parts shall be replaced immediately.
- The flail mower shall be equipped with all protective covers (recommended by a manufacturer) against movable parts. The covers shall be complete and in good condition.
- It is necessary to read the manual, occupational safety regulations and recommendations on the servicing and adjustment prior to the operation.
- The flail mower's weight mounted on a vehicle can influence on the maneuverability. Special care shall be kept in this case.
- The manual shall be kept with the machine. If the machine is lent it shall be in a good technical condition and with the manual.
- Attaching additional transport means to the flail mower is forbidden.
- Check the machine operations and initial adjustment with no duty shall be made while the start-up.
- Assembly protection 3PL (three point linkage suspension system) of a flail mower bolts shall be done only with typical protections such as pins. Operation with other protection type is forbidden.
- Because of natural wear it is necessary to control the condition and completeness of cutting tools of the machine by observing recommendations described in a chapter „6. Service and maintenance activities".
- The technical condition of the machine shall be checked while the reception and transport of the flail mower.
- Standing under lifted flail mower is forbidden as there is a hazard of getting caught by construction elements.
- Fingers and limbs cannot be inserted between construction elements of the machine while the adjustment.
- Vehicle operator who operates the flail mower shall be careful as nobody can stay close to the machine while operations and adjustment and **be closer than 50m from the flail mower**.
- While turning back, moving back or maneuver the machine the visibility shall be proper or qualified person shall assist in it.
- Service personnel cannot stay between a vehicle and the flail mower with engine operational.
- The operation on inclined terrain exceeding 15% is not allowed.

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- While the operation on slopes special care shall be exercised.
- While turns PTO drive shall be switched off (power take off shaft).
- The machine cannot be operated on public places such as parks and schools and on a stony terrain to avoid a hazard of throwing stones and other items.
- PTO revolutions cannot exceed 540rev/min while operation, and driving shall be adopted to required operation.
- The operation with damaged or incomplete telescopic jointed shaft is forbidden. The operation without covers of movable parts is especially forbidden.
- If the engine is operating it cannot be left unattended. If the drivers space (cabin) is left, the machine shall be positioned on the ground, a key taken out and the engine shut off and a hand-brake put on.
- Any unzipped or loose working clothes while the operation, assembly, disassembly and adjustment is forbidden. It shall be kept away from construction elements which can catch it.
- When the operation is completed it is advised to clean the flail mower in a wash equipped with waste treatment or a clarifier to the waste neutralization.
- Storage of the machine shall be made in places protected against outsiders and Animals to eliminate a risk of occidental hurt, on a leveled, hardened and canopied surface.
- In the event of damage a transmission drive shall be immediately shut off.
- During work with flail mower, operator is obligated to use ear protection to minimalize exposure to noise. Moreover, it is recommended to close the doors and windows in the vehicle.

A failure to Follow the above rules can be a hazard to the operator and outsiders and can be a reason of flail mower damage.
Any damage resulting out of a failure to Follow these rules shall be covered by a user.

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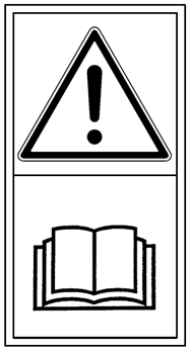
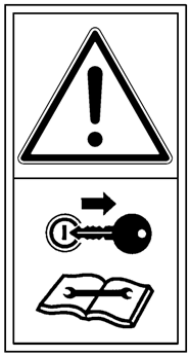
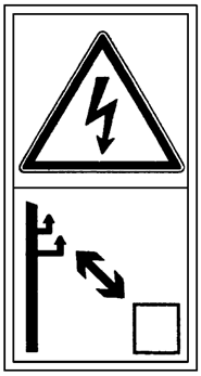
3.2.Safety signs are placed on a machine

 1.0 - Prior to using the machine, read the Instruction Manual	C.2.26  1.1 - Switch off the engine and remove the ignition key before any servicing or maintenance procedures	C.2.36  1.2 - Keep a safe distance from the machine. Do not allow unauthorised persons within the range of 50 m from the machine
+A.8.19  1.1.1 – Warning, belt transmission. Use extreme caution. Drawing-in of hand and arm.	+A.8.7  1.1.2 – Warning, possibility of being drawn-in by the machine	C.2.7  1.5 - Do not stand near the lift strands when controlling the lift
C.2.20  1.6 - Do not open or remove safety guards when the engine is running	C.2.30  1.7 - Keep a safe distance from power lines	C.2.44  1.8 - Avoid exposure to liquids flowing under pressure.

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<table>
<tr>
<td>A.6.2 + B.2.6
 
1.2.1 – Keep a safe distance from the machine. Crushing of toes or foot – Force applied from above</td>
<td>C.2.27
 
1.4 - Do not ride on platforms or ladders</td>
<td> 
2.1 - Lifting points on the mower during handling

 
2.5 – Warning message about pressure in the hydraulic system</td>
</tr>
<tr>
<td> 

2.5.1 – Warning about the pressure present in the tyres</td>
<td> 

2.3 – Use protective coverall

 
2.4 – Use safety gloves</td>
<td> 
2.6 - Wear ear protectors

 
2.7 – Wear eye protection</td>
</tr>
</table>

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3.3. Hazards while using the flail mower

No.	*Hazard*	*Hazard source (reason)*	*Protection measures against hazard*
1	Overload of motion system (physical load)	Operation in a standing position, bowed – forced, walking, shifting	Reading the instruction manual, on-the-job training including the weight carrying standards while performing manual transport works, proper techniques of weights carrying, other person assistance, devices facilitating the transport i.e. lifting jack, hoisting winch
2	Fall at the same level (falter, slipping etc.)	Bumpy surface, disorder – laying and standing items, items on the passageways, slippery surfaces	Proper working shoes, plane surface, staying alerted, keeping it tidy, reading the instruction manual
3	Hitting fixe and projecting parts of the machine	Machine, its surrounding	Proper position of the machine, safe space for moving, proper organization of work, staying alerted, reading the instruction manual
4	Moving parts can hits you	Granulated plants, accidental parts of turf, stones thrown by the machine	Staying alerted, indicating hazardous area, Ban on moving while the machine is operating, staying at the distance less than 50m from the machine is forbidden, using personal protection means – protective helmet, goggles, reading the instruction manual
5	Sharp and dangerous edges	Projecting construction elements of the machine, using manual tools	Personal protection means – protective gloves, zipped working clothes, staying alerted
6	Belt transmission	Moving wheels and belts of the transmission, whirling telescopic joined shaft, no covers of movable parts	Ban on movement, approaching and adjusting machine operated, staying alerted, using covers for movable pats, reading the instruction manual
7	Weight of loaded standing machine	Improper assembly, aggregate, improper position of the machine, improper service, leasing loaded machine on the tractor	Staying alerted, using protective protection means – protective shoes, protective gloves, safe position of the machine, using other person assistance, using lifting jack, davits, reading the instruction manual
8	Microclimate – random Feather conditions	Work performed in random weather conditions	Proper working clothes, beverages, filter creams, rest, reading the instruction manual
9	Noise	Excessive revolutions of the machine, damaged, loose or vibrating parts	Operation with machine in a good technical condition, current inspections of the machine, proper revolutions of the machine, reading the instruction manual

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4. Indicated use

Flail side mower is intended to do works connected with maintaining community infrastructure, greens and for work in orchards and in the agriculture. The machines are used for mowing, granulating scrubs, undeveloped grass, roads shoulders and granulating fine branches in orchards. It is also used for meadow reclamation with the intention to leave the swath and destruction of remains left on fields upon cultivation. Flail mowers mow and granulate cut material at the same time and spread it evenly on mowed surface and it allows to get natural swath. The machine is attached to the vehicle with three point hitch suspension system. Working element is rotating shaft with rotational positioned knives and flails. The unit is driver from PTO through intersecting axis gear and belt transmission. Meeting requirements on the machine operations, that is service and repairs according to the manufacturer's recommendations and its precise observation is the condition for operating it according to its intended use. The machine shall be used, operated and repaired only by personnel who familiarized with characteristics of the machine and occupational health and safety regulations. The manufacturer has wide choice of agricultural machines. It also gives special advises in terms of proper equipment to meet user needs.

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

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

5. Machine description

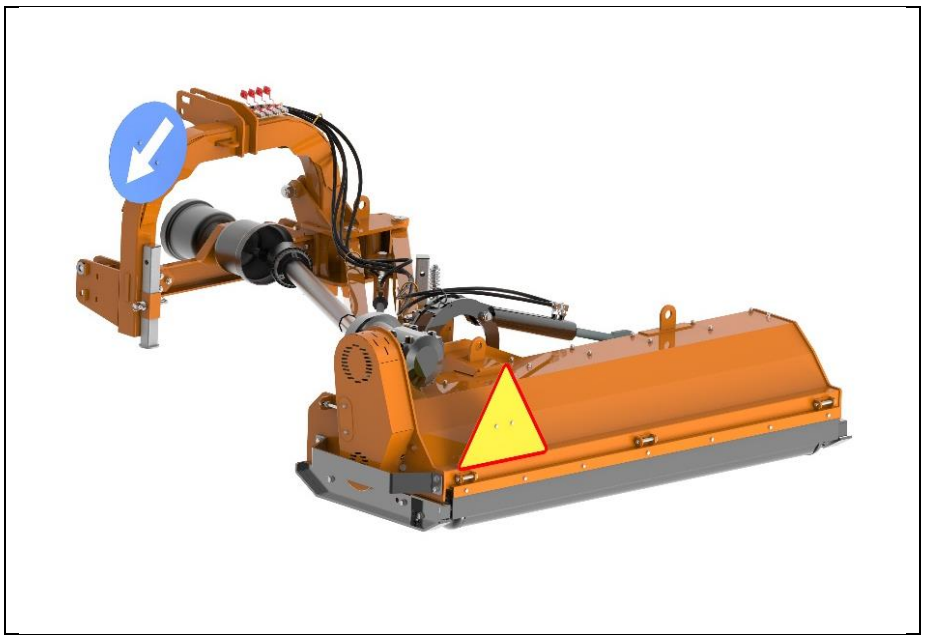

Fig.1 General view of the machine Leopard RB

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The flail mowers RB160 / RB180 / RB200 are built with two main construction units. First unit is **a supporting structure with working chamber,** which is made of steel elements connected using welding method. The construction is compact and resistant. Second element is **a driving unit of a flail mower,** which consists a shaft of power relay which transmit a torque directly from tractor shaft on direct shaft located in a machine. The next element is a wide-angle shaft transmitting a torque from direct shaft to a intersecting axis gear of the leverage 1:3. Both power take-off shafts are equipped with protective covers. It cannot be disassembled or any damaged parts cannot be used, besides the start of the machine with removed cover is not allowed. The next step is the transmission of a torque from toothed gear on the unit of working shaft. The belt transmission with the adjustment of the belt tension is used for this purpose. The belt transmission provides good shock absorption of the shock load both while the machine start and while meeting obstacles by flail or knife, in the form of a stone or other, it increase the life of toothed gear or other elements.

The machine is additionally equipped with drive shaft, which provides extra support and even distribution of machine weight while operation and the load of supporting structure is limited to a minimum. The control of working settings is carried out from an operator's cabin with 2 systems of power hydraulics (horizontal travelling, turn). It allows for very precise position of the machine while operation. The flail mowers have been equipped with curtains that protect against the throw of stones and hard items out of the flail mower chamber.

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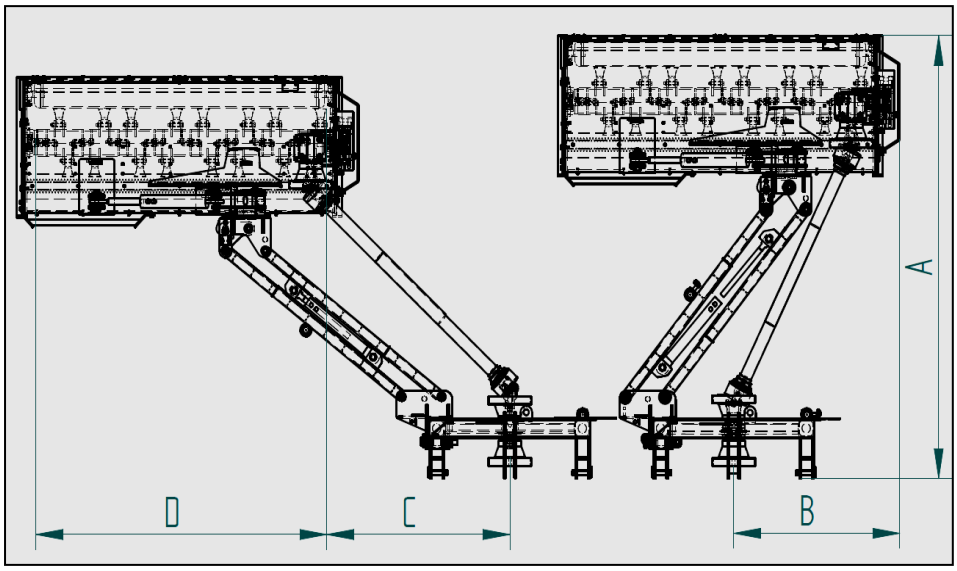

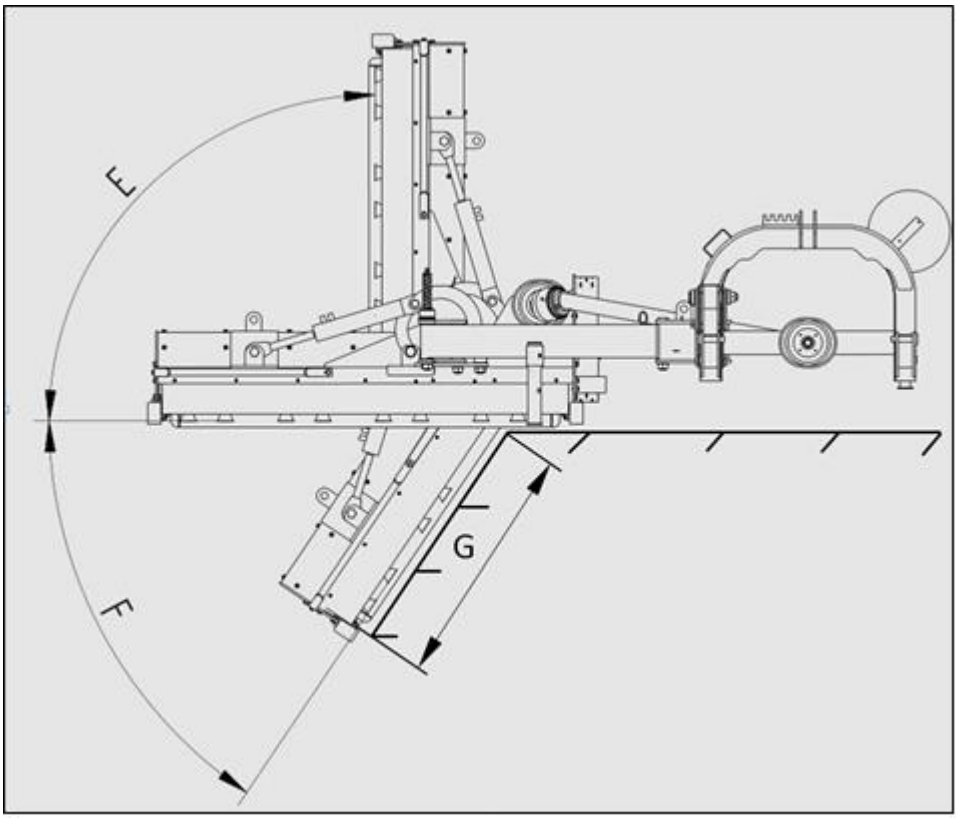

TYPE	Dimensions						
	A[mm]	B[mm]	C[mm]	D[mm] Working width	E[°]	F[°]	G [mm] (if F=45°)
RB160	2600	1080	≈1150	1500	90	45	≈1000
RB180	2600	1080	≈1150	1700	90	45	≈1200
RB200	2600	1080	≈1150	1900	90	45	≈1400

***Fig.2** Flail mower RB160/180/200 – working range, machine settings*

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5.1. Equipment

5.1.1. Basic equipment

The basic equipment of the flail mower contains the following:

- Warning labels kit
- Warning signs („vehicles may pass it from left side", „Road works")
- Wide-angle PTO shaft 830 Nm L1180 mm
- PTO shaft 620 Nm L 1010 mm
- Safety covers for driving shaft
- Stoppers for protecting suspension pins
- Base plate
- Drive shaft
- Instruction manual
- Warranty card

Warning plates, lights and triangle table for low powered trucks are basic equipment. It can be purchased for extra payment at the manufacturer or in a depot of agricultural equipment. Each user of the machine shall have proper plate for low powered trucks. Failure to install it for the transport can be a reason of accident. Machine user is responsible for any damage resulting from the accident.

Caution:
ALL ELEMENTS OF ADDITIONAL EQUIPMENT OF THE MACHINE ARE AVAILABLE AT THE MANUFACTURER'S STORAGE FOR EXTRA PAYMENT.

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5.2. Technical specification

Table No. 1

TECHNICAL DATA FLAIL MOWER LEOPARD RB160/180/200

No.	*Specification*	*UoM*	*RB160*	*RB180*	*RB200*
1.	Type Z-908	-	160	180	200
2.	Type of hitch		Mounted	Mounted	Mounted
3.	Working width	[mm]	1600	1800	2000
4.	Power requirement	[KM]	70*	85*	95*
5.	Amount of working shafts	[pcs.]	1	1	1
6.	Amount of blades	[pcs.]	48	56	64
7.	Amount of flails	[pcs.]	24	28	32
8.	Class of tractor hitch	-	II	II	II
9.	Flail mower setting for shipping	-	horizontally	horizontally	horizontally
10.	PTO Speed	RPM	540	540	540
11.	Work efficiency	[ha/h]	1,2	1,35	1,5
12.	Range of machine operation	[°]	+90 -45	+90 -45	+90 -45
13.	Operating speed	[km/h]	8-10	8-10	8-10
14.	Transport speed	[km/h]	20	20	20
15.	Operators required	[pcs.]	1	1	1
16.	Dimensions length width height	 [mm] [mm] [mm]	 2700 1820 1050	 2700 2020 1050	 2700 2220 1050
17.	Weight	[kg]	800	850	900
18.	Noise level emitted by the machine	L_{pA}	91,4±1,1dB	92,3±1dB	92,7±1 dB
		L_{Amax}	95,3±1,3dB	96,8±1,3dB	96,4±1,3 dB
		L_{Cpeak}	127,1±1,3dB	127,1±1,3dB	127,1±1,3 dB

*value of declared power guarantees proper weight of a tractor providing the stability while operations on maximal reach of the flail mower.

L_{pA} - Noise exposure level related to 8 hours of work per 24 hours

L_{Amax} – Maximum sound measurement value

L_{Cpeak} – Peak sound value

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6. Device use

The manufacturer guarantees that the machine is in a good technical condition and was verified according to the procedures of quality control and is accepted for usage. The user is obliged to verify the machine upon reception.

Before the mower usage, it is necessary to check its technical condition, and especially the condition of cutting unit, driving system, hydraulic installation and covers.

The machine can be launched after placing on the ground. It is forbidden to turn on the drive when the machine is raised over the work surface, it does not rest on the ground. It is forbidden to lift the machine on the lift. Disconnect the drive before lifting and wait until the working shaft stop. The machine is safe when it rests on the ground and it is pulled on the skids during operation.

6.1. Linking – flail mower assembly

It is necessary to make sure that elements of a vehicle and machines are properly set to guarantee safe assembly and operation. If any obscurities occur turn to the vehicle or machine manufacturer.

I. The assembly of the suspension system of the vehicle and machine.

The machine is suspended on three-point suspension system of a tractor, vehicle. To facilitate the aggregation bottom springs shall be installed at the height of approx. 350mm. Upon machine suspension, adjust the length of upper connector in a way that the position of side slippers is parallel to the surface. The chain of bottom springs of tractor suspension shall be adjusted to minimize side deflection of the machine.

Depending on the type of three-point suspension system it is necessary to cafe for original protection. Check the wear of connecting elements upon each assembly: pins and pivots. Replace a part if it is worn. **Pay special attention to verify if nobody is standing between while connecting the machine and the tractor.**

II. The assembly of the driving shaft of the machine.

When the machine is installed on three-point suspension system, we install driving shaft telescopic and jointed shaft on tractor's PTO and machine's PTO and lift supports in upper position and protect bolts with pins.

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Only original telescopic and jointed shaft with overrunning clutch (OC) shall be used, (620Nm, Lmin=1010mm) marked with CE sign and roof shields PTO and WPM. When ends of telescopic jointed shaft is inserted on PTO and WPM the catch fastener shall be checked.
For power hydraulics only proper and tight cables finished with fitted connections shall be used.

III. Assembly of power hydraulics system

The flail mower has two systems of hydraulic control. The machine is equipped with stub-pipes which shall be connected with hydraulic cables with stub-pipes of vehicle power system. Special attention shall be paid to ducting and cleanness of hydraulic connections.

Machine disassembly shall be made the other way round with special care for the safety while disassembly of mechanic system which separates the machine and the vehicle.

6.2. Working position

Before starting work, follow the instructions below to properly set the machine in the working position.

Fig.3 *General view of the Leopard RB machine in the working position*

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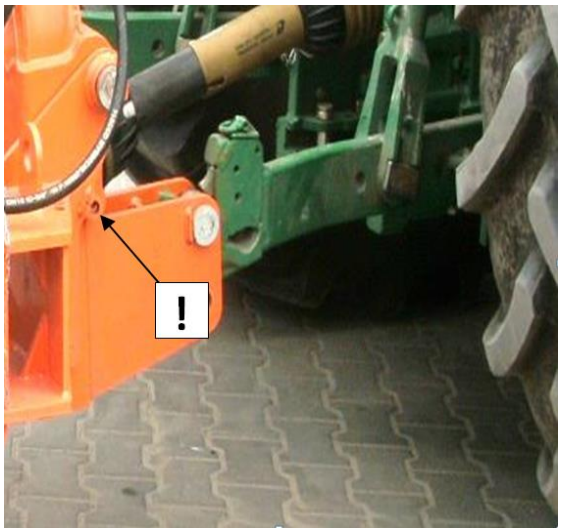
A very important stage is the correct linking of the tractor with the shredder. To carry this out properly, follow the instructions below.

No	Mounting instructions	Picture
1	During operation, the central connector should be fastened in the correct hole ensuring smooth free movement of the pin,	
2	The lower links should be secured at the same height in one of the two positions (lower or upper); the correct position is when the machine rests on the ground with the drive shaft and the PTO shaft, which transmits the drive from the tractor to the machine, in the working position is inclined at an angle α <16 °. **It is absolutely necessary to remove the transport lock before starting work (marked in the picture beside!).** It is also very important to choose the right shaft length for a given type of tractor. If the PTO shaft is too long, it should be shortened to the correct size. These activities should be carried out strictly according to the instructions attached to the PTO shaft.	
3	For proper functioning of the mover, it is necessary to set the machine so that the copy shaft rests on the ground and the glides are parallel to the ground	

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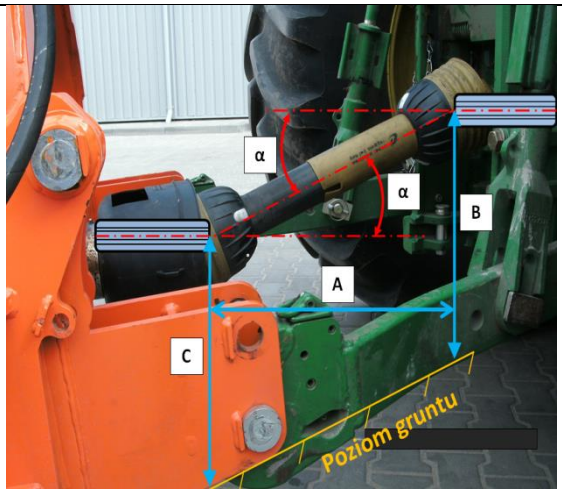
4	The correct setting of the machine is when the angle α DOES NOT EXCEED 16 ° at 540min^{-1} throughout the entire operating range of the PTO shaft.	
5	Adjust the throttling valve (fig. 3 pos. 4) to suit your needs.	

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6.3. Transport position

For safe and proper transportation of the mower, follow the instructions below:

- Fasten the lower suspension links at an equal height in one of two positions (lower or upper) (daw. 3 pos. 3)
- Insert the pin of the center connector into the transport hole (fig. 4 pos. 1)
- Lock the position of the suspension frame using the transport pin (fig. 4 pos. 2)
- Lift the machine to a height of approximately 50 cm using the tractor's hitch
- Adjust the minimum side tilt of the mower using the side tilt cylinder (fig. 3 pos. 5)
- Raise the mower to a vertical position using the tilt adjustment cylinder (fig. 3, pos. 6)

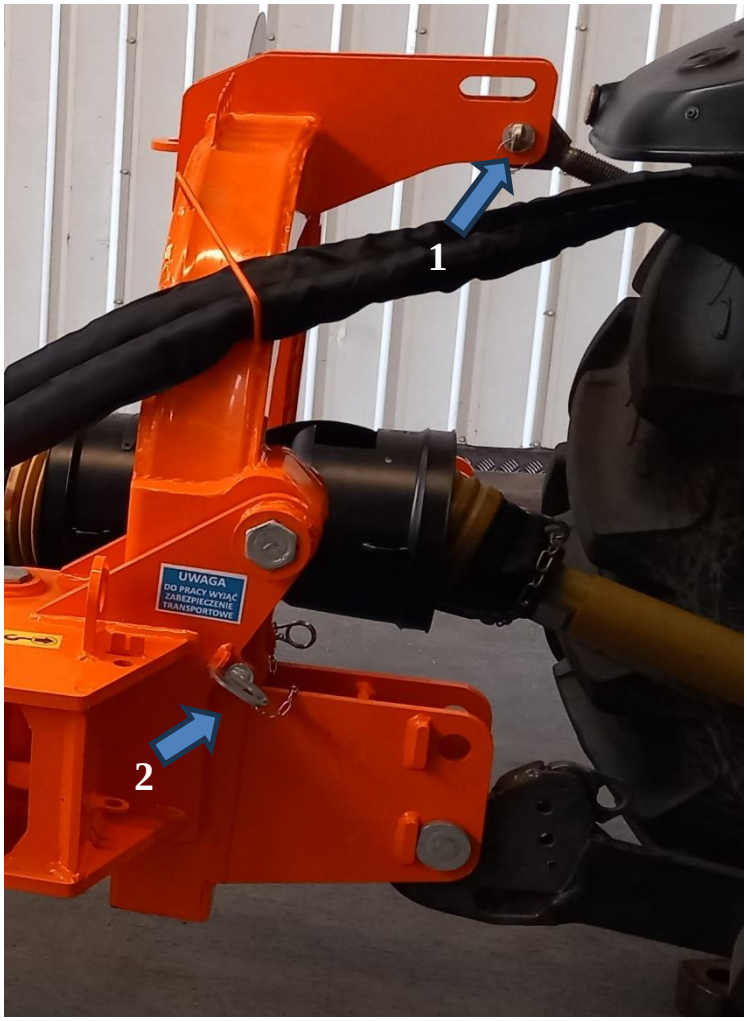

Fig.4 *Position of the pins in the transport position*

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Fig.5 *General view of machine in transport position*

Convert the mower from the transport position to the working position in reverse order. It is crucial to remember to adjust the center link pin and remove the transport locking pin and place it in the prepared holder.

7. Service and maintenance activities

All activities connected with the machine operations can be made only by the vehicle's operator if he is authorized for this vehicle operation.
Prior to the connection of machine and tractor, the machine operator shall check technical condition of the machine and prepare it for trial start-up, for this purpose it is necessary to do the following:

- Read this manual and Follow recommendations included in it.
- Learn the construction and understand the rule of machine operation.
- Inspect all elements of the machine for mechanical damages.
- Lubricate the machine according to recommendations.
- Check technical condition of pins of catching system and protective stoppers.
- Check the oil level in a transmission.
- Make visual inspection of transmission covers and condition of driving shafts covers

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If all above activities were made and technical condition of the machine is good, it can be attached to the tractor.

- Position the machine for operation.
- Adjust the length of telescopic and jointed shaft for a tractor according to the shaft manual.
- Connect telescopic and jointed shaft for a tractor and flail mower.
- Start a drive.

Start a drive of working shaft for 3 min. While this time check the following:

- Taps in driving system.
- Any vibrations in cutting unit.

7.1 Adjustment of belts tension

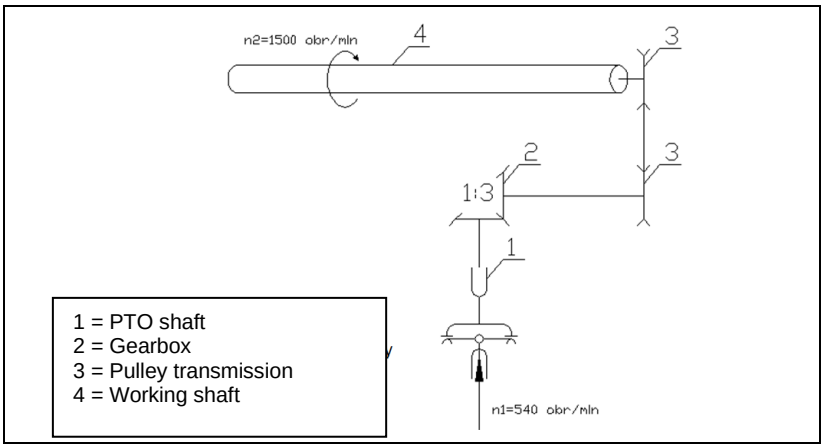

Fig.6 Drive diagram of Leopard flail mower

The adjustment of driving belts tension of the flail mower transmission is done with machine and engine switched off. See fig.4. Optimal tension of belts – with the 100N (10kgG) thrust, the belt bends 1,5-2,5cm. The following activities shall be done:

I. Disassembly the cover of inspection glass (2) by unscrew a bolt (1),
II. Loosen screw M14 (3) located inside of inspection glass with tabular spanner,
III. Loosen a nut (4) and tighten a nut (5) afterwards thus increasing the tension,
IV. Tighten a nut (4) for additional protection against loosening,
V. Install a diaphragm (2) of inspection glass with screws and spring washers (1)

It is advise to remove main cover before and while the season (6) and perform precise inspection of mechanical condition of v-belts, wheels and tensioner, pay special attention to condition of working surfaces of belt and wheels. If any mechanical damage occurs it is recommended to replace damaged parts; besides, the tension of belts shall be checked (optimal tension of belts – at thrust 100N (10kgG) belt is bending 1,5-2,5cm), Belts shall be tensioned so that a slipper on a wheel does not exceed 1%. Insufficient tension is a reason of belts slipper, excessive decrease of belts life and excessive wear of bearings.

The belts tension while machine storage shall be reduced.

VI. Upon adjustment and control works completion main cover shall be installed (6)

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It is forbidden to lift the machine on the lift. Disconnect the drive before lifting and wait until the working shaft stop. The machine is safe when it rests on the ground and it is pulled on the skids during operation.

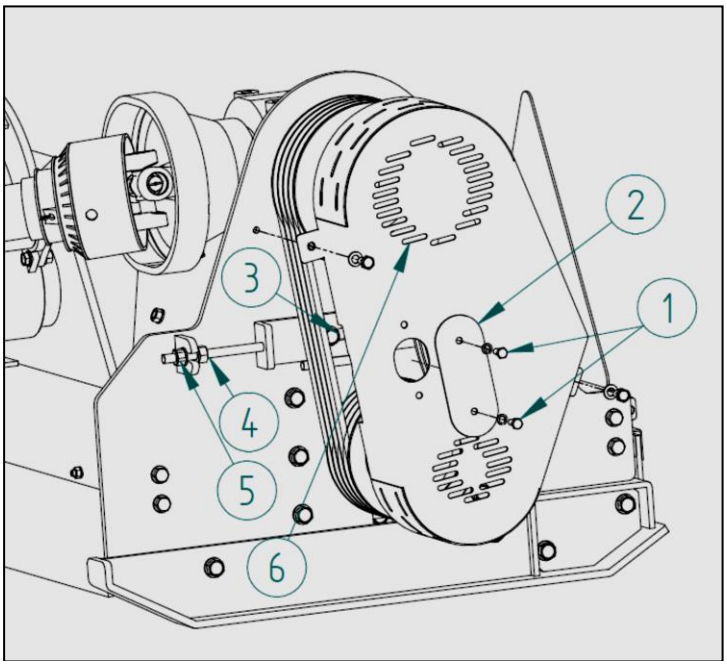
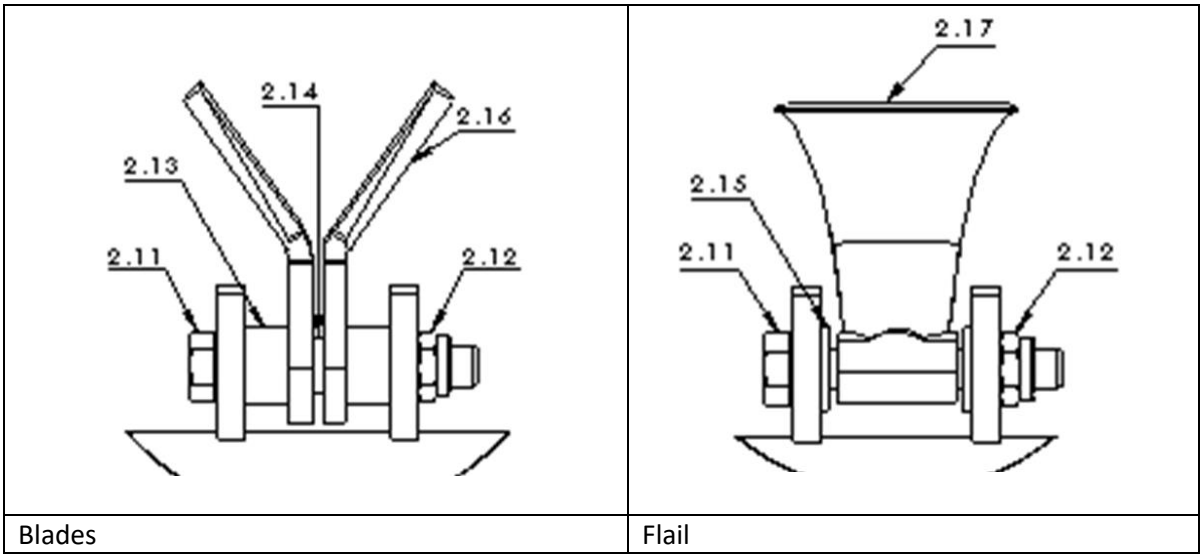


Fig.7. Adjustment of transmission belts tension

7.2 Replacement of blades or flails

Depending on customer requirements, working shaft is equipped with proper equipment that is granulating tools - knifes 2.16 (Z-908) or beaters 2.17 (Z-908) Fig.8.



Blades	Flail

Fig. 8 Drawing of knives and beaters assembly

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Granulating tools shall be replaced if any defects, visible wear, blunt of cutting edges, lack of knives or beaters or excessive loose of installed tools occur.

Table No. 2 **RANGE OF MAX PLAY OF BLADES / FLAILS**

Play	Nominal [mm]		Maximum [mm]	
	Blade	Blade	Knife	Flail
Axis transverse	0,2	0,3	0,5	0,6
Axis longitudal	0,1	0,2	0,4	0,6

Shredding tools shall be replaced keeping in mind special safety regulations.

1. Only original and operable cutting parts shall be used
2. The replacement covers the whole set of tools. It shall be remembered that the distribution of vibrating weight must be even and wear of tools shall be regular as well.
3. Screw connections shall be replaced each time with tools keeping in mind that the class of screw resistance and locknut is 10.9.
4. While screw tightening it is necessary to pay attention to loose of cutting tool turn but with no excessive loose (beater or knife set) with regard to screw axis.

It is forbidden to lift the machine on the lift. Disconnect the drive before lifting and wait until the working shaft stop. The machine is safe when it rests on the ground and it is pulled on the skids during operation.

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7.3 Maintenance after work

The machine shall be cleaned and positioned on a even and hard surface after operation. The inspection of parts and elements connections shall be done. Damaged and worn parts shall be replaced. Check all screw connections and tighten loose connections according to table no. 3 – tightening torque value for screws and nuts.

Table no. 3

TIGHTENING TORQUE VALUE FOR SCREWS AND NUTS

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

All safety signs placed on the machine, triangle plate for low powered trucks shall be kept clean.

The oil level in axis gear shall be checked at least once a year. Gear oil of GL 4 80W90 specification shall be used. Replacement period is 550h.

It is also necessary to check the tension of transmission belts, damaged parts shall be replaced, the unit shall be adjusted according to the manual - 6.1 Adjustment of belts tension.
It is important to check the clearance of axis and shafts. If any clearance is noticed, bearings of axis or shaft shall be replaced (pairs) according to the spare parts catalogue. All bearings have rings protecting against ZZ soil.

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7.4 Lubrication

For the purpose of providing proper operation, the machine shall be carefully lubricated, according to the lubrication diagram.

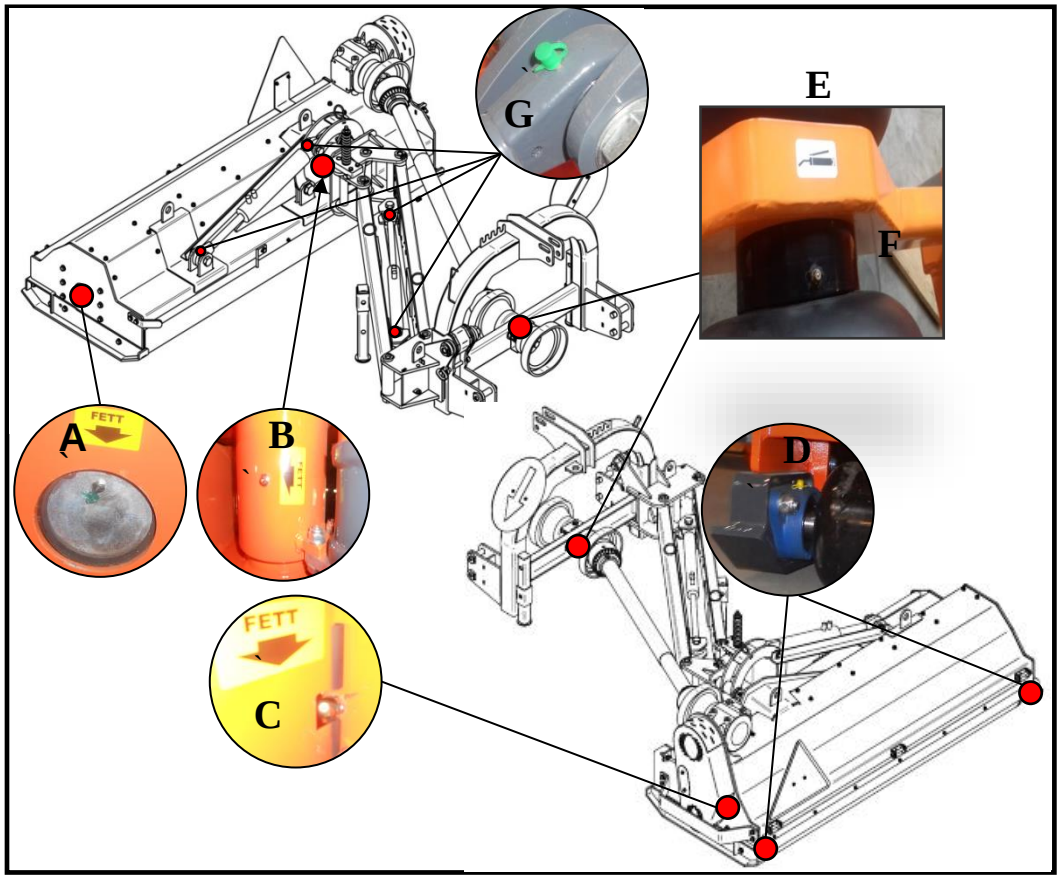

Fig. 9. Lubrication diagram

Table No. 4 Lubrication points

Item	Description	Lubricate	Lubrication periods
A,C	Bearing of working shaft	Grease	daily, before operation
B	Turnover device	Grease	30h
D	Bearing of driving shaft	Grease	30h
E,F	Bearing of transmission shaft	Grease	daily
G	Self-aligning bearing of servo-motor fitting	Grease	30h
Lubrication of telescopic jointed shafts		Grease	according to manual attached to shafts
Oil replacement in a transmission		GL 4 80W90	550h
*Sleeves of flail mower arms are equipped with maintenance free Igus slide bearings which do not require lubrication			

All points described in fig. 9 are equipped with ball grease fittings, it shall be filled with solid oil. Telescopic jointed shaft shall be lubricated upon disassembly of the machine according to the manual.

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7.5 Post-season maintenance

It covers all activities mentioned in the point: after operations service. Additionally, the machine shall be kept under the roof on even and hard surface. It is necessary to Follow the tightness of varnish coat. If any defects are present, these places shall be filled through application of fresh layer of protective paint.

7.6 Withdrawal from use, environment

If the machine is worn and cannot be operated any more, it shall be withdrawn from use. It also concerns ongoing repairs and the replacement of damaged parts. For this purpose the machine shall be cleaned. Drain operating oils and send to disposal. Disassembly the machine and segregate parts according to the type of materials applied. Segregated parts shall be delivered to the strap yard or disposal.

The machine is environment friendly. 97% of materials used for the production can be recycled. Worn parts of the machine shall be disposed according to local regulations of environmental protection. Thorough the whole period of operation it is necessary to try to avoid oil spill, which can contaminate environment.

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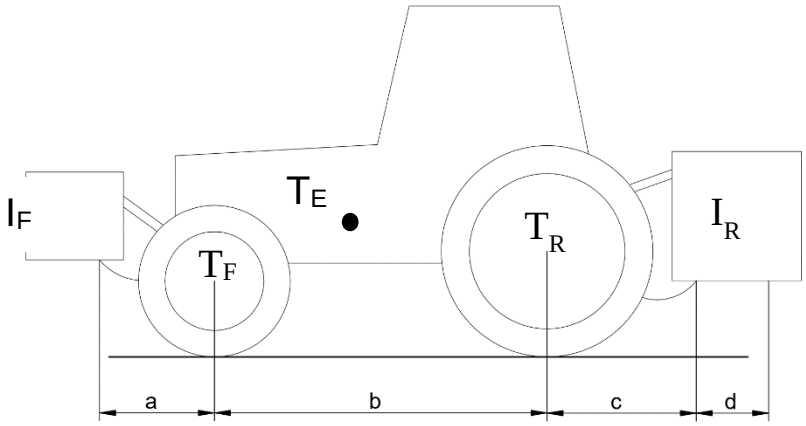
7.7 Stability of tractor-machine unit suspended

To verify the overall stability, the following equation can be used to calculate the minimum front load $I_{F,min}$, expressed in kg, to achieve a front axle load equal to 20% of the tractor's empty weight..

$$I_{F,min}=\frac{[I_R \times (c+d)]-(T_F \times b)+(0{,}2 \times T_E \times b)}{a+b}$$



Explanation:

T_E-tractor empty mass[kg]

T_F- Front axle load of an unloaded tractor [kg]

T_R- Rear axle load of an unloaded tractor [kg]

I_F- weight of the front mounted machine/front weights [kg]

I_R- weight of the rear mounted machine/rear weights [kg]

a- The distance between the center of gravity of the front-mounted machine/front weights and the center of the front axle [m]

b- tractor wheelbase [m]

c- The distance from the center of the rear axle to the center of the rear suspension ball joints[m]

d- The distance between the center of the rear suspension ball joints and the center of gravity of the rear-mounted machine / rear weights [m]

8. Spare parts catalogue

METHOD OF SPARE PARTS PURCHASE

The order shall contain the following:

- purchaser address,
- precise shipping address (place of machine stay or reception method),
- payment conditions,
- serial no. of the flail mower and manufacturing year (according to the plate on the machine),
- precise name of spare part,
- amount of parts ordered.

The spare parts shall be purchased in machines retail outlets or at the manufacturer.
Only original parts of the manufacturer can guarantee safe and failure free operation of the device. The use of non-original parts or repairing damaged parts can be a reason of guarantee loss.

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

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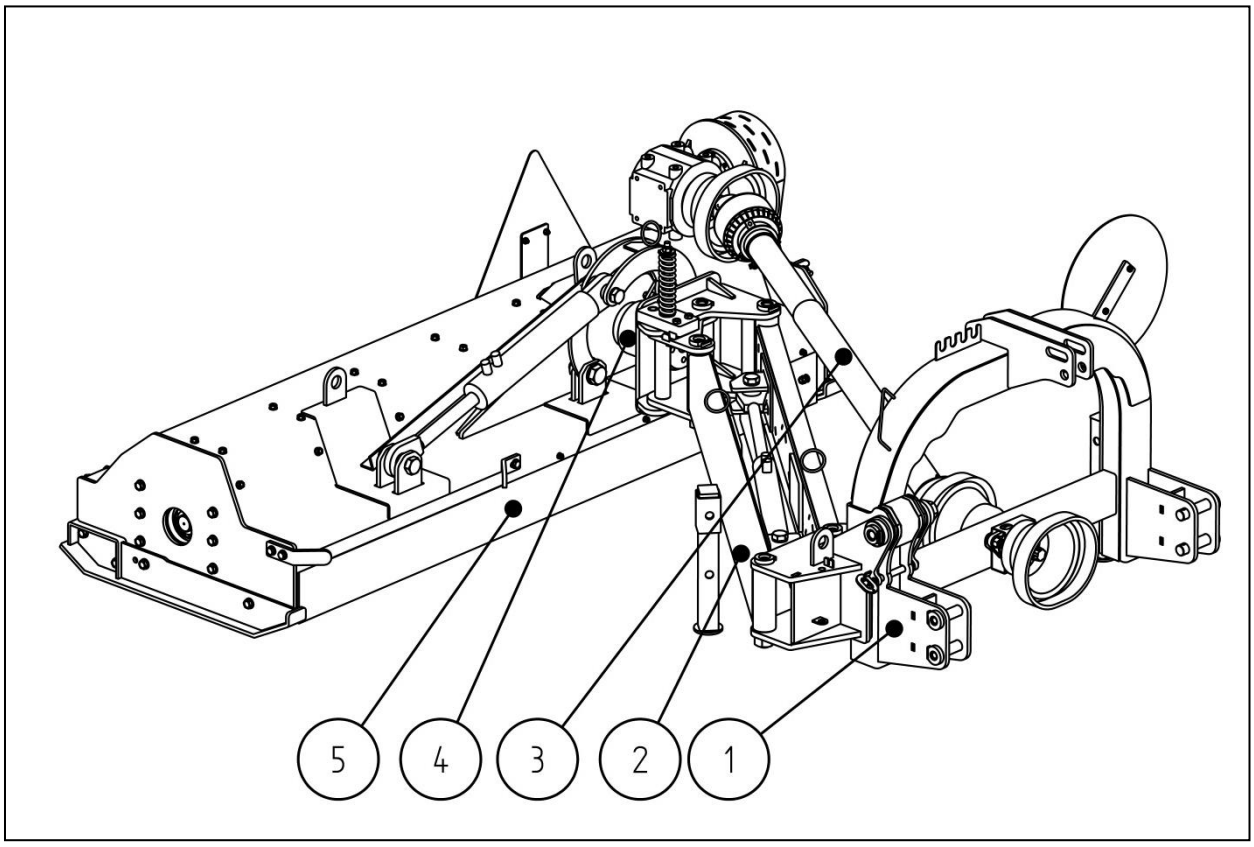

Fig. 10 Demonstrative view of a flail mower LEOPARD RB160/180/200

Table No. 5 Distribution of the machine on parts

Item	Description	Figure no.
1	3-point linkage	Fig. 11
2	Arms unit	Fig. 12
3	Drive unit	Fig. 13
4	Turning device and arms fitting	Fig. 14
5	Working chamber unit	Fig.15
6	Hydraulic unit	Fig. 16

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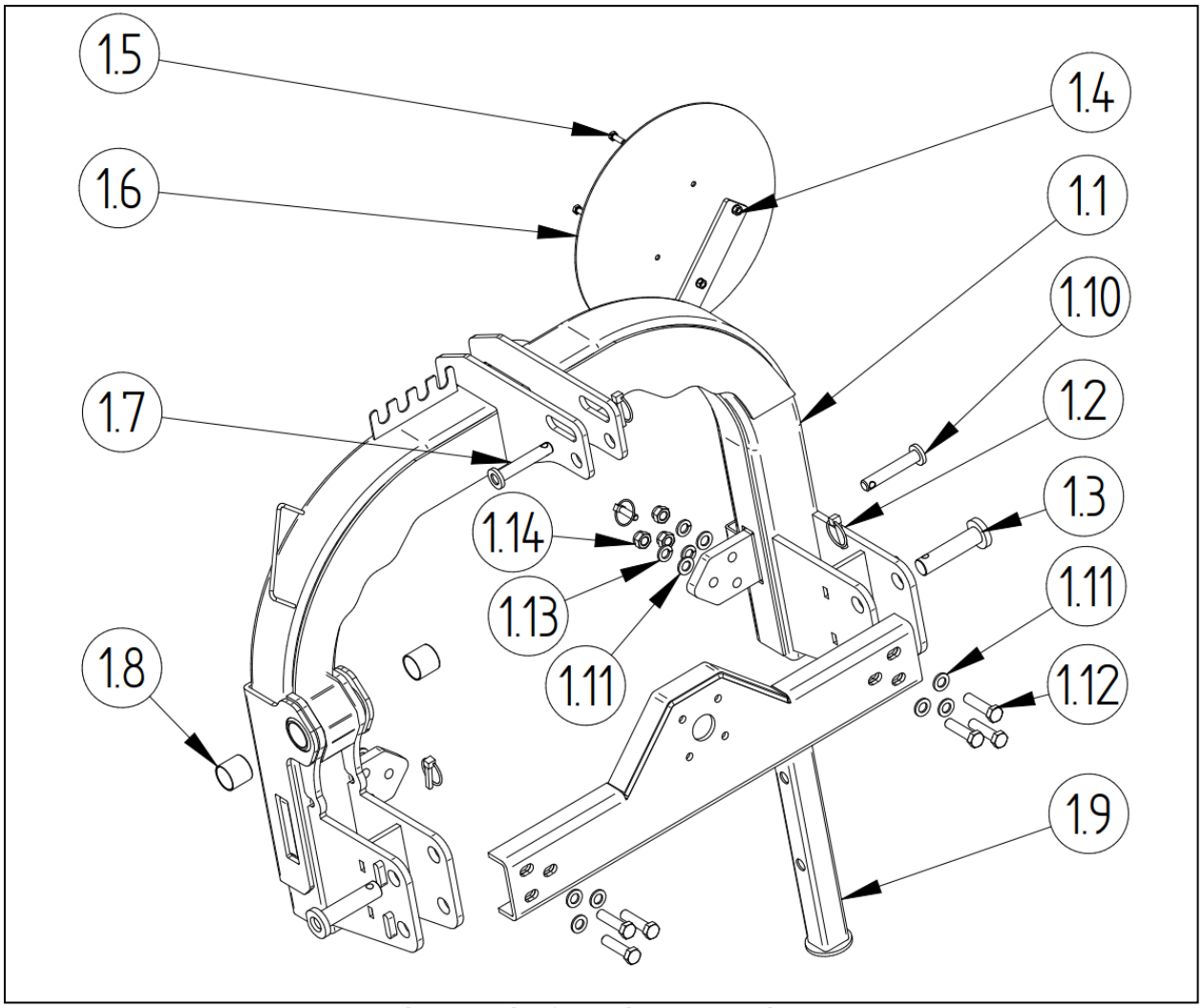

Fig. 11 Unit of 3- point suspension

Table No. 6 Unit of 3- point suspension

Pos.	Description	Index	Quantity
1.1	3-point hitch	P680004	1
1.2	Universal cotter	T000981	4
1.3	Bottom link pin	P680027	2
1.4	M8 self-stop nut/M8 washer	T000256/T000471	2/2
1.5	M8x20 8.8 bolt	T000804	2
1.6	Keep left sign	T001047	1
1.7	Top link pin	P280199	1
1.8	Sliding bush	T000214	2
1.9	Support jack	P680049	1
1.10	Support jack pin	P570200	1
1.11	M16 galv. flat washer	T000460	12
1.12	M16x60 8.8 bolt	T000783	6
1.13	M16 spring washer	T000453	6
1.14	M16 self-stop nut	T000294	6

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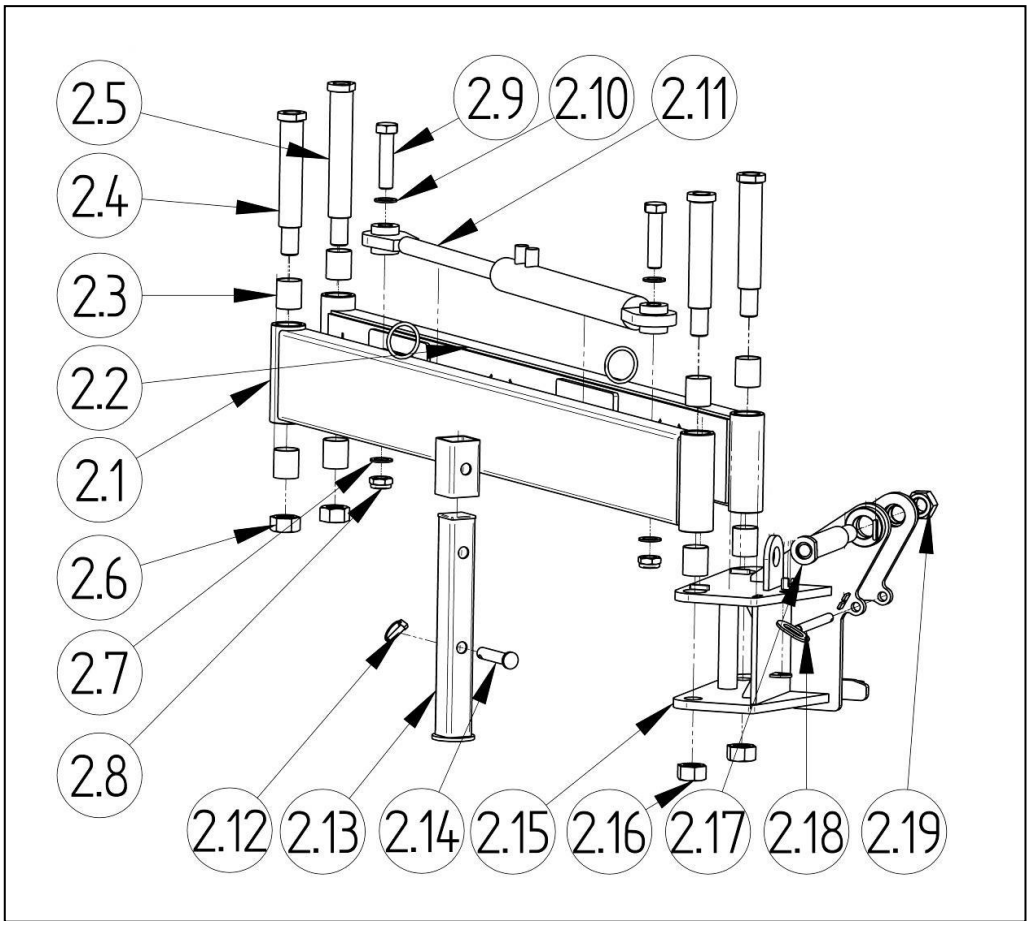

Fig. 12 Arms unit

Table No. 7 Arms unit

Item	Description	Index	Amount [pcs.]
2.1	Arm I	P680111	1
2.2	Arm II	P680092	1
2.3	Slide bearing GSM 4044-50	T000215	8
2.4	Arm's pin	P680132	3
2.5	Arm's pin	P680138	1
2.6; 2.16; 2.19	Self-locking nut M30x2 OC	T000296	5
2.7; 2.10	Flat washer ZW 25 OC	T000464	4
2.8	Self-locking nut M24	T000290	2
2.9	Screw M24 x110 8.8 OC	T000795	2
2.11	Hydraulic servo-motor 50/30H355L	T000029	1
2.12	All purpose plug 42/37-038/1	T000981	4
2.13	Support base	P680049	1
2.14	Support pin	P570200	1
2.15	Suspension cross	P680064	1
2.17	Pin of suspension cross	P680088	1
2.18	Safety pin for transport (including the lug and double BETA cotter pin)	P680079 T000168 T000987	1 0,3m 1

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Fig. 13 Driving unit

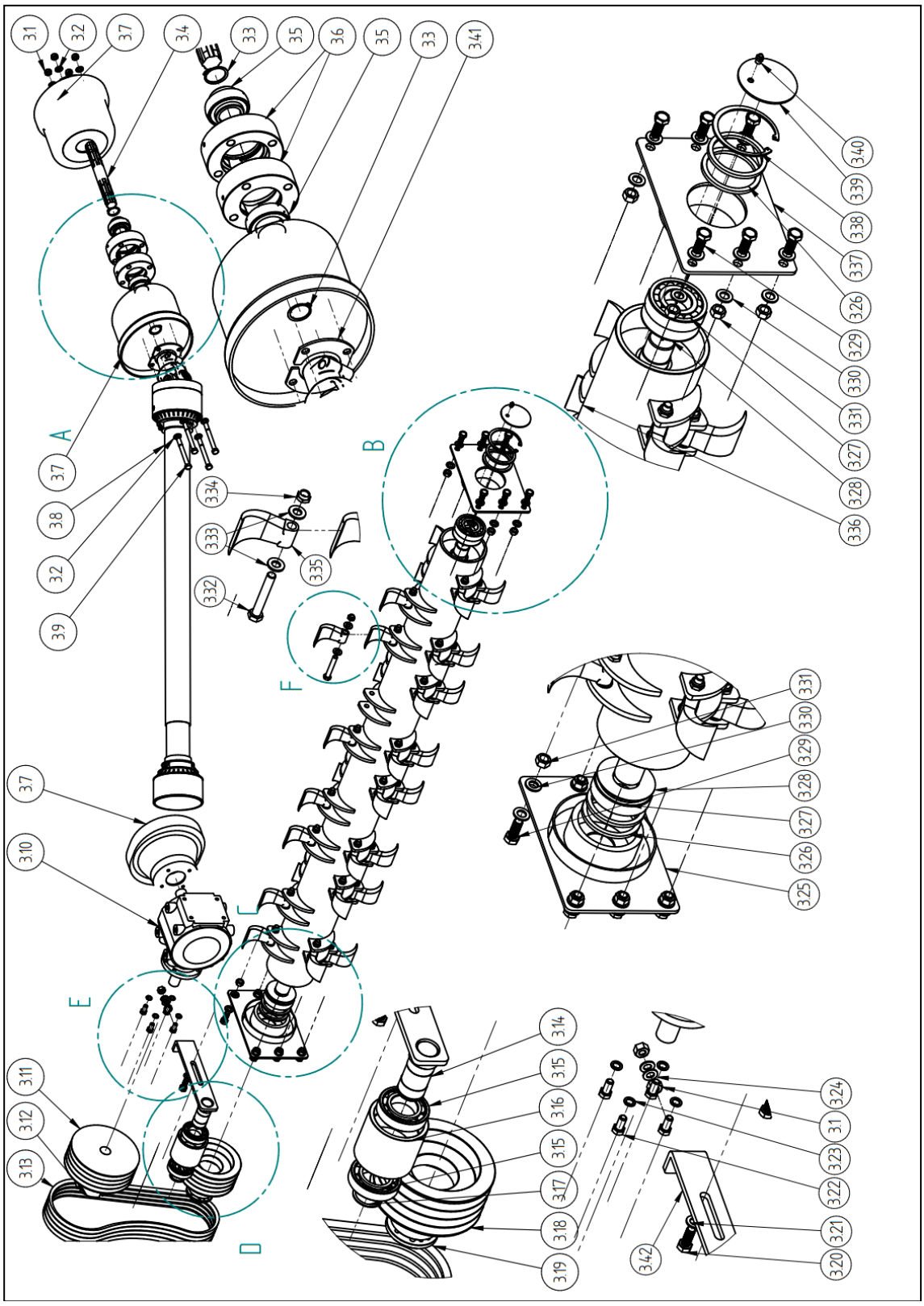

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Table No. 8 Driving unit

Pos.	Description		Index	Quantity
3.1	Self-locking nut M12		T000291	6
3.2	M12 OC flat washer		T000458	10
3.3	Z35 lock ring		T000412	2
3.4	Shaft – double sided spline		T000934	1
3.5	UC 207 bearing		T000204	2
3.6	Bearing housing		P680416	2
3.7	Shaft cover		T000344	3
3.8	Wide angle shaft 1500 Nm L-1190		T000917	1
3.9	Bolt M12x120 8.8		T000752	4
3.10	Gearbox		T000501	1
3.11	TB SPB 224/4 pulley		T000106	1
3.12	TB 3020/33 clutch		T000680	1
3.13	V-belt B1375		T001297	4
3.14	Tensioner base		P680385	1
3.15	6209 RS bearing		T000181	2
3.16	Tensioner roller		P127131	1
3.17	Lock ring Z45		T000414	1
3.18	Pulley Ø189		T000102	1
3.19	Clampex 225-45x80 clutch		T000682	1
3.20	Bolt M14x35 8.8 galv.		T000766	1
3.21	Flat washer M14 galv.		T000459	1
3.22	Bolt M12x35 8.8 galv.		T000756	4
3.23	Spring washer M12 galv.		T000451	4
3.24	Large washer M12 galv.		T000442	2
3.25	Shaft bearing housing		P280061	1
3.26	Spacer		P280086 / P280087	4
3.27	1309 Bearing		T000209	2
3.28	Spacer		P280084	2
3.29	M14x35 8.8 galv. bolt		T000766	12
3.30	M14 flat washer		T000459	12
3.31	M14 self-stop nut		T000293	12
3.32	Screw M14x90 10.9 (Quantity depends on the type of shredder RB 160/180/200)		T000772	24/28/32
3.33	Hammer washer (The amount depends on the type of shredder RB 160/180/200)		P000097	48/56/64
3.34	Self-locking nut M14 (Quantity depends on the type of shredder RB160/180/200)		T000293	24/28/32
3.35	Hammer RM 33 5151-221333 (quantity depends on the type of shredder RB 160/180/200)		T000225	24/28/32
3.36	Working shaft	RB 160	P660338	1
		RB 180	P670338	
		RB 200	P680338	
3.37	Shaft bearing housing		P280065	1
3.38	100 int. Lock ring		T000405	1
3.39	Plug		P280085	1
3.40	M10 grease nipple		T000643	1
3.41	Shaft covers bracket		P680423	2
3.42	Tensioner arm		P680386	1

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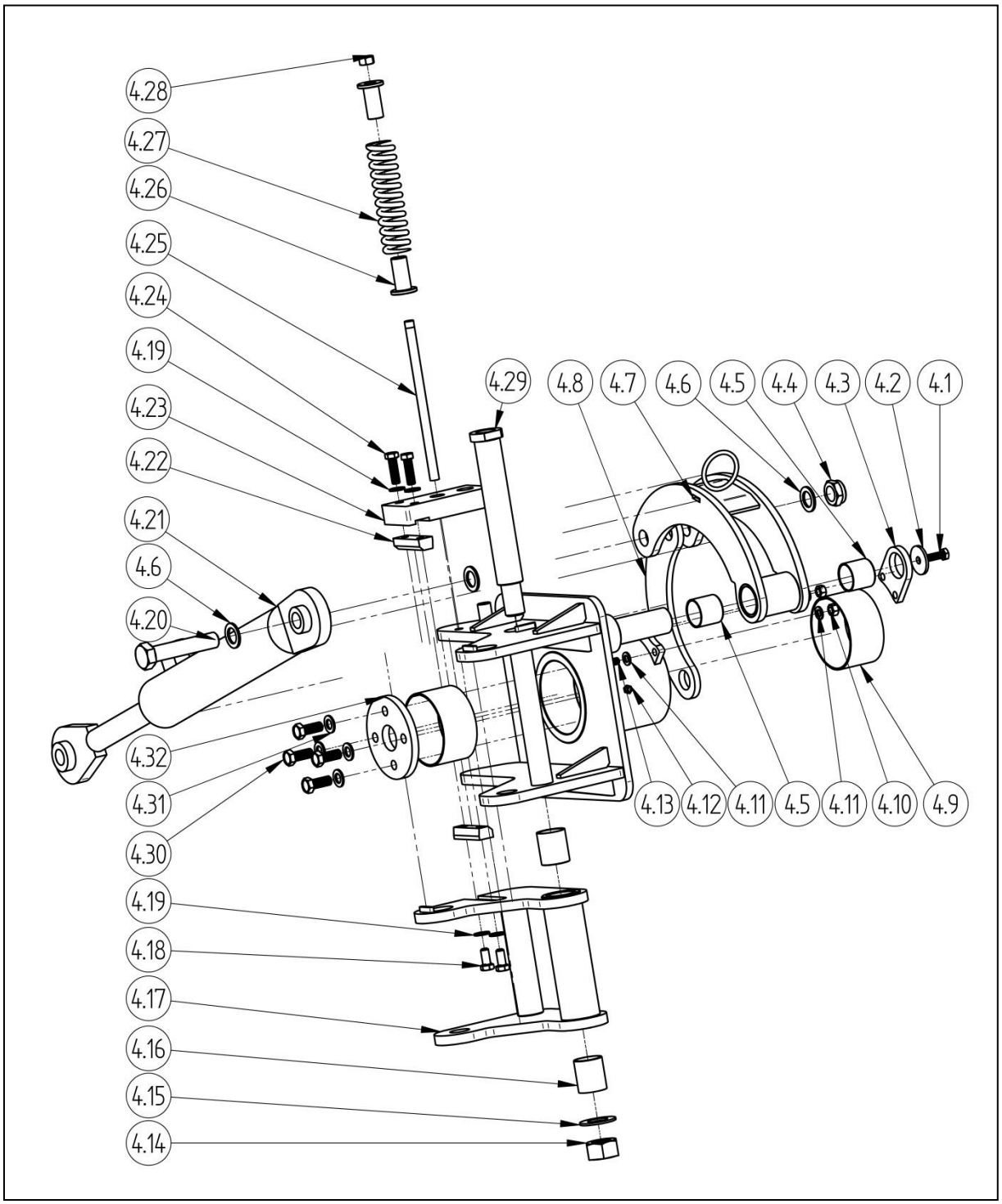

Fig. 14 Turnover device

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Table No. 9 Turning unit

Item	Description	Index	Quantity
4.1	Screw M10x30 8.8 OC	T000742	1
4.2	Washer	P680172	1
4.3	Housing flange	P680166	1
4.4	Self-locking nut M24	T000290	1
4.5	Slide bearing Igus	T000215	8
4.6	Flat washer ZW 25 OC	T000464	3
4.7	Turn arm	P680174	1
4.8	Tension member	P680201	1
4.9	Slide bearing 110x60	T000859	2
4.10	Self-locking nut M10	T000292	2
4.11	Washer ZW 10 OC	T000456	4
4.12	Grease fittings M10	T000643	1
4.13	Screw M10x35 8.8 OC	T000743	2
4.14	Self-locking nut M30x2 OC	T000296	1
4.15	Washer ZW 30 OC	T000466	1
4.16	Slide bearing GSM 4044-50	T000215	2
4.17	Arm coupling	P680190	1
4.18	Screw M12x25 8.8 OC	T000755	2
4.19	Wsher ZW 12 OC	T000458	4
4.20	Screw M24 X110 8.8 OC	T000796	1
4.21	Hydraulic servo-motor 70/36 H285L	P680126	1
4.22	Fuse block	T001128	2
4.23	Safety device	P680025	1
4.24	Screw M12x40 8.8 OC	T000757	2
4.25	Winding rod M14 of a spring	P680207	1
4.26	Spring foundation	T000863	2
4.27	Fuse spring 5036/02-0.35 galvanized	T000651	1
4.28	Nut M14	T000293	2
4.29	Pin	P680138	1
4.30	Screw M14x35 8.8 OC	T000766	4
4.31	Washer ZW 14 OC	T000459	4
4.32	Flange	T002117	1

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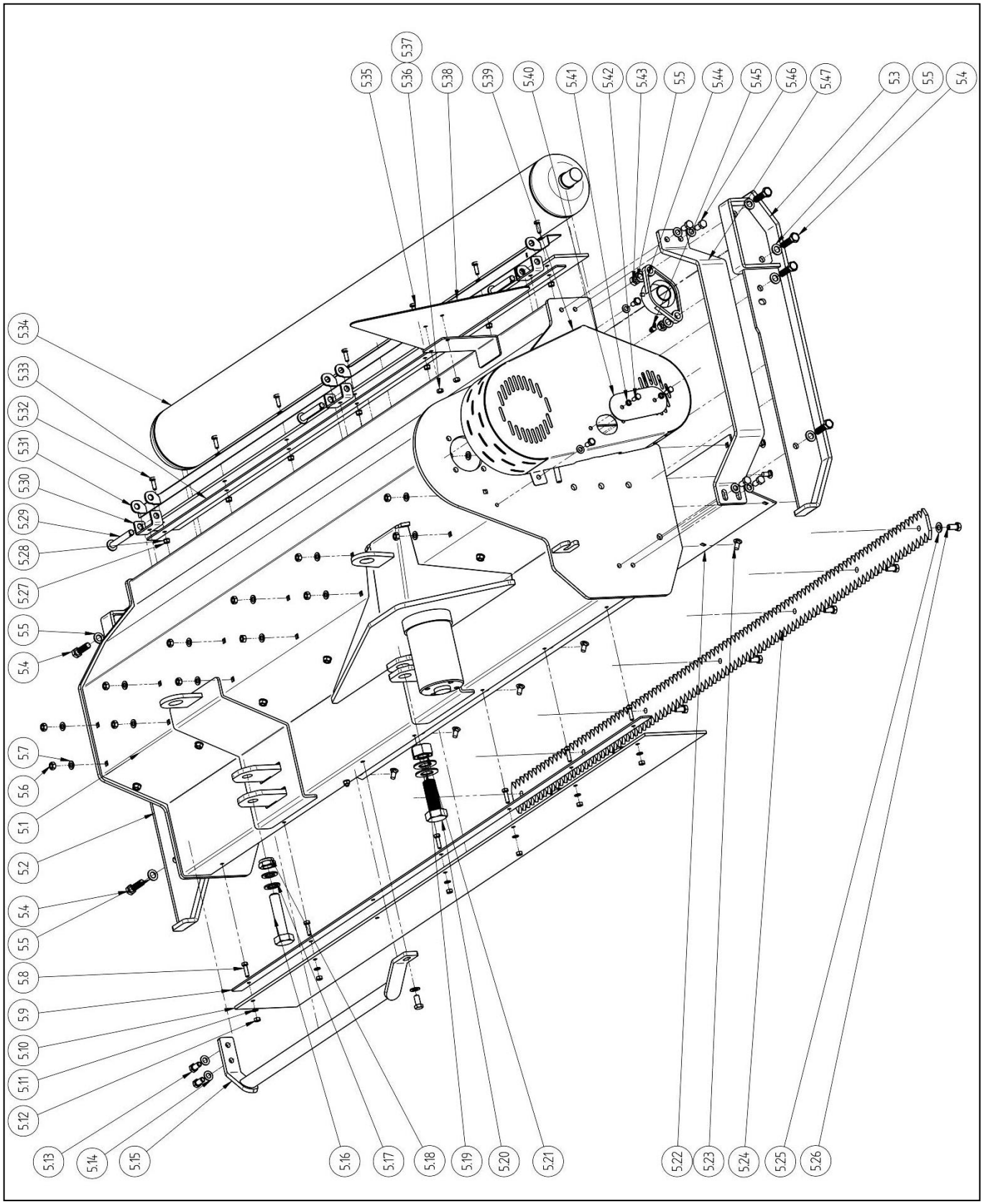

Fig. 15 Flail mowers working chamber unit

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Table No. 10 Flail mower working chamber unit

Pos.	Description		Index	Quantity
5.1	Body	RB160	P660219	1
		RB180	P670219	
		RB200	P680219	
5.2	Right skid		P680295	1
5.3	Left skid		P680307	1
5.4	Bolt M14x40 8.8 galv. / Bolt M14x35 8.8 galv.		T000767/ T000766	4/4
5.5	M14 flat washer		T000459	20
5.6	M10 cap nut	RB160	T000260	20
		RB180		
		RB200		
5.7	M10 galv. washer		T000456	20
5.8	M8x30 8.8 galv. bolt		T000807	7
5.9	Strip for fastening the front elastic curtain	RB160	P660270	1
		RB180	P670270	
		RB200	P680270	
5.10	Rubber apron	RB160	P660020	1
		RB180	P670020	
		RB200	P680020	
5.11	M8 galv. washer		T000471	14
5.12	M8 self-stop nut		T000256	7
5.13	M12x35 8.8 galv. bolt		T000756	3
5.14	M12 galv. washer		T000458	3
5.15	Front bumper	RB160	P680042	1
		RB180	P680262	
		RB200	P680262	
5.16	M24x110 8.8 galv. bolt		T000795	1
5.17	M25 galv. thin washer		T000464	1
5.18	M24 self-stop nut		T000290	1
5.19	M30 galv. flat washer		T000466	2
5.20	M30x70 8.8 galv. bolt		T000799	1
5.21	M30 self-stop nut		T000296	1
5.22	Protective plate	RB160	P660224	1
		RB180	P670224	
		RB200	P680224	
5.23	M10x20 8.8 lock bolt		T000739	20
5.24	Flat tooth bar (counter-blade)	RB160	P660221	1
		RB180	P670221	
		RB200	P680221	
5.25	M12 galv. spring washer		T000451	7
5.26	M12x35 8.8 galv. bolt		T000756	7
5.27	M8 self-stop nut		T000256	7

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5.28	M8 galv. flat washer		T000471	14
5.29	5x40 hinge pin with cotter		P127065 / T000985	3
5.30	Curtain hinge (including M8x25 8.8 galv. bolt and M8 spring washer)		P680284	3
5.31	Rear curtain profile	RB160	P660277	1
		RB180	P670277	
		RB200	P680277	
5.32	M8x20 8.8 galv. bolt		T000804	7
5.33	Strip for fastening the front elastic curtain	RB160	P660270	1
		RB180	P670270	
		RB200	P680270	
5.34	Roller shaft	RB160	P660326	1
		RB180	P670326	
		RB200	P680326	
5.35	M8x20 8.8 bolt		T000804	2
5.36	M8 galv. flat washer		T000471	2
5.37	M8 self-stop nut		T000256	2
5.38	„ROAD WORKS” warning sign		T001047	1
5.39	Belt drive cover		P680372	1
5.40	Inspection hole cover		P680376	1
5.41	M8 flat washer		T000471	2
5.42	M8x16 8.8 galv. bolt		T000803	2
5.43	M14 self-stop nut		T000293	4
5.44	UCFL207 SNR bearing		T000208	2
5.45	M10x1 angled grease nipple		T000644	1
5.46	M12x35 8.8 galv. bolt + galv. flat washer		T000756 / T000458	4/4
5.47	Side bumper		P680247	1
5.48	Rubber apron	RB160	T000142	1
		RB180	T000140	
		RB200	T000139	

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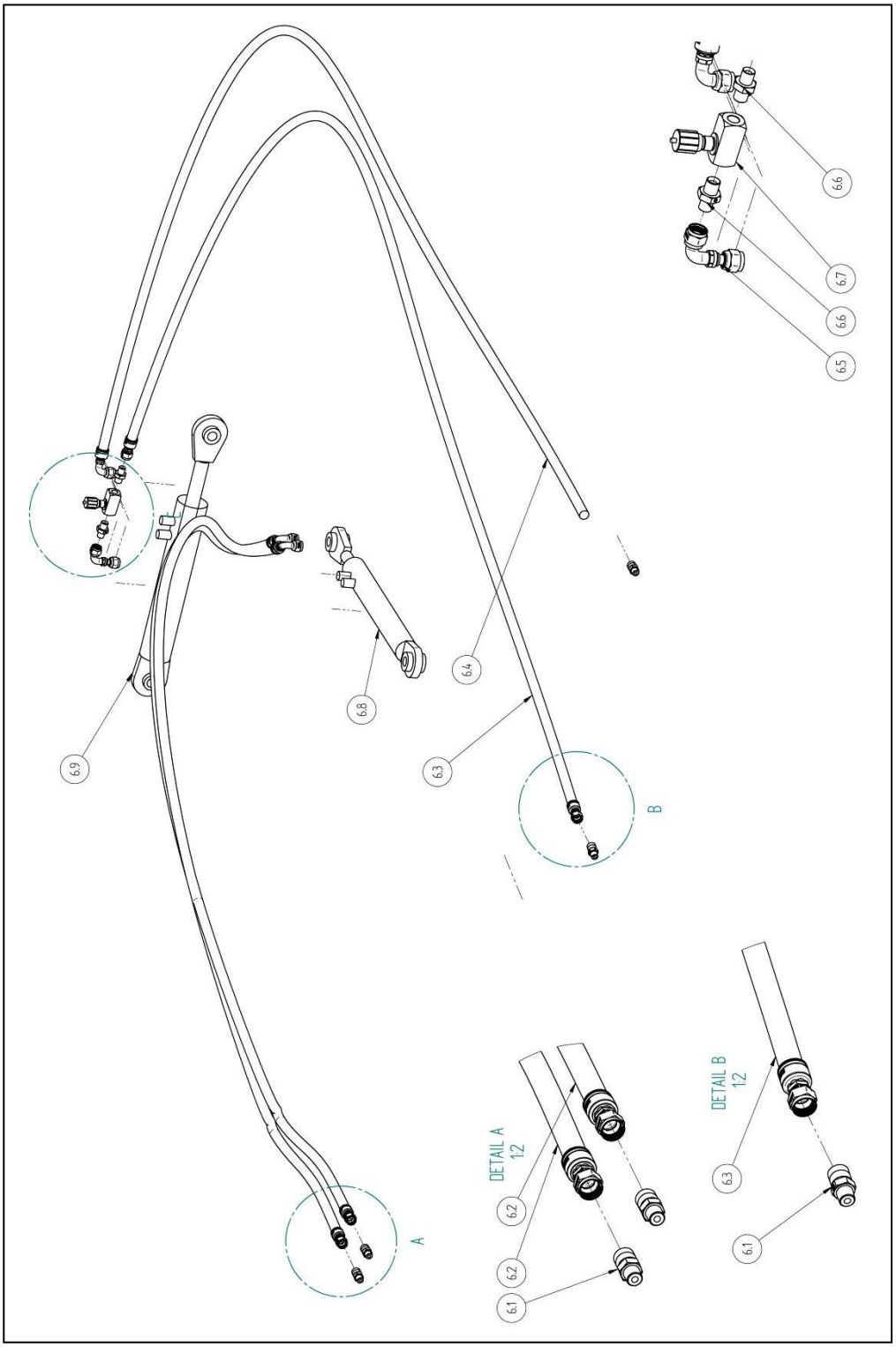

Fig. 16 Hydraulic unit

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Table No. 11 Hydraulic unit

Item	Description	Index	Quantity
6.1	Hydraulic connection EURO M18x1,5	T000995	4
6.2	Hydraulic cable P51/P52/211/10 L-3400	T000519	2
6.3	Hydraulic cable P51/P51/211/10 L-4100	T000518	1
6.4	Hydraulic cable P51/P52/211/10 L-4100	T000520	1
6.5	Angle connection AA M18x1,5 12L	T001027	1
6.6	Straight coupling Zn-140 G3/8	T000582	2
6.7	Throttle valve VRFV90°	T000994	1
6.8	Hydraulic servo-motor 50/30H355L	T000029	1
6.9	Hydraulic servo-motor 70/36 H285L	T001068	1
6.10	Cable guard – weaved cover DN40-set	T000366	8m

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9. Warranty

WARRANTY CARD

Serial no.	……	Type	……
Manufacturing year	……	KJ	……

Under this warranty a manufacturer is obliged to repair defects during the warranty periods which lasts 12 months starting from a sale date free of charge.

A manufacturer is free from any liability resulting from the warranty in the following cases:

- Mechanical damages of a machine upon its transfer to a user;
- Improper operations, maintenance, machine storage, and especially inconsistent with the manual;
- Repairing by unauthorized personnel without a consent of the manufacturer;
- Introducing construction changes without agreement of a manufacturer;
- Cracks of transmission cover because of shaft run-out;

The warranty card is valid if it has a seller's signature and date of sale confirmed by company's Stamp of commercial unit. Any crossing outs or corrections made by unauthorized persons are not allowed.
A duplicate of warranty card can be issued upon written request if a user submits a purchase proof.
If the event of baseless service calls to make warranty repairs, costs are covered by the user.
The user submits claims within 14 days starting from the date of a defect directly to the seller.
A manufacturer provides warranty service within 14 days starting from a notification date until repair date.
The warranty is prolonged for the rep air time, counting from the notification day until the day when service is provided, if the defect allowed to use the machine.
The warranty does not cover hydraulic cables of the machine.

Date of sale: _____ _____
(day, month, year) *(signature and stamp of sales retail outlet)*

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10. RECORD OF WARRANTY REPAIRS

Filled by a manufacturer

Claim submission date: _____ *Scope of repairs and replaced parts:* _____ _____ _____ _____ *Date of service provided:* _____ *Warranty prolonged to:* _____ _____ *(signature and stamp of a service personnel)*	*Claim submission date:* _____ *Scope of repairs and replaced parts:* _____ _____ _____ _____ *Date of service provided:* _____ *Warranty prolonged to:* _____ _____ *(signature and stamp of a service personnel)*
Claim submission date: _____ *Scope of repairs and replaced parts:* _____ _____ _____ _____ *Date of service provided:* _____ *Warranty prolonged to:* _____ _____ *(signature and stamp of a service personnel)*	*Claim submission date:* _____ *Scope of repairs and replaced parts:* _____ _____ _____ _____ *Date of service provided:* _____ *Warranty prolonged to:* _____ _____ *(signature and stamp of a service personnel)*

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11. Declaration of conformity

Declaration of conformity WE

Within the meaning of the Machinery Directive 2006/42/WE. Enclosure II, 1.A

Manufacturer: ***TALEX Sp. z o.o.*** address: Dworcowa 9c 77-141 Borzytuchom

The undersigned hereby declares that the product

Brand (trade name): .....LEOPARD RB.....
Function: *Maintenance of municipal infrastructure, urban greenery, orchards and green areas. Mowing grass, shredding cut branches and trees, cutting weeds and bushes in undeveloped areas. Mulching and laying of chopped crop (biomass).*

Type/model: .....*160; 180; 200*....., Serial number.: .....

Meets the requirements of the following EU directives

- **Machine Directive 2006/42/WE** from 17.05.2006 (Dz. U. L 157 from 9.06.2006. p.24) and its modification 2009/127/WE from 21.10.2009 (Dz. U. L 310 from 25.11.2009. p.29).

Meets the requirements of the following harmonized standards

- **PN-EN ISO 4254-1:2016-02** Agricultural machinery - Safety - Part 1: General requirements.
- **PN-EN ISO 4413:2011** Hydraulic drives and controls -General rules and safety requirements for systems and their components.
- **PN-EN 15811:2015-04** Agricultural machinery -Fixed and locked guards, with or without locking guards for moving transmission parts.
- **PN-EN ISO 12100:2012** Safety of machinery -- General principles of design -- Risk assessment and risk reduction
- **PN-ISO 11684:1998** Tractors, farm and forest machines, moto-tools. Safety signs and pictographs of hazard. General provisions.
- **PN-EN ISO 14120:2016-03** Safety of machinery -- Guards -- General requirements for the design and construction of fixed and movable guards
- **PN-EN 17106-4:2022-03** Road maintenance - Safety - Part 4: Roadside maintenance machines - Requirements for grass cutting and brush clearing machines

Meets the requirements of other applied technical standards and specifications

- **KJ manual** Quality control manual 2022/08 Edition 02
- **Painting manual** Painting manual, application of wet lacquered covers 2022/08 Edition 02
- **Welding manual** Welding instruction MIG/MAG 2022/08 Edition 02

Conformity with directives and standards requirements was stated on the basis of tests carried out by the company:
„SIMP" Association of Engineers and Polish Mechanic Technicians in Gdańsk.
The test was carried out by: M.A Eng. Zbigniew Myszka –SIMP Expert no. 9763

Person responsible for preparing the technical documentation: Karol Jaworski, Address: Dworcowa 9c, 77-141 Borzytuchom

PREZES ZARZĄDU

Borzytuchom, 15.02.2023r. .....
(place and date of issue) *(first name, surname and signature of person authorized by the Manufacturer)*