

UNIVERSAL FLAIL MOWER MULS - LW 110, 130, 150, 170

User and maintenance manual



TEHNOS-Proizvodnja strojev in orodij
Cesta ob železnici 1, SI-3310 Žalec Slovenija
T: +386 (0)3 713 30 50
F: +386 (0)3 713 30 60
E: info@tehnos.si
I: www.tehnos.si

Warranty statement

The warranty is valid 12 months from date of purchase. In the event of a machine malfunction due to a poor construction quality or a manufacturing defect during its warranty period, the manufacturer TEHNOS d.o.o. or its authorized representative undertakes to eliminate the malfunction in a professional manner, using genuine replacement parts and within the prescribed time.

EXAMPLES OF UNJUSTIFIED WARRANTY CLAIMS:

- Mechanical damage to the machines or errors made by the user.
- Damage arising from machine overload or unintended use of the machine.
- Improper use of the machine for failure to comply with the instructions for use.
- Failure to comply with the basic safety instructions for operating the machine.
- Any structural changes or modifications, which were not approved by the manufacturer.
- Installation of elements or spare parts, which are not genuine or have been modified in any way.
- Poor or irregular maintenance of the machine and inadequate inspection of essential components.
- If the machine is used by an unqualified person with impaired physical or mental fitness.

WARRANTY CERTIFICATE

WARRANTY PERIOD: 12 months

The warranty provider guarantees flawless operation of the machine during the warranty period starting from the date of delivery of the machine. The warranty is demonstrated by a timely registration to Tehnos PARTNER and with a confirmed warranty certificate and payment receipt. The warranty is valid on the territory where the machine was purchased. Maintenance and spare parts are provided for a minimum of 8 years after the expiration of the warranty period.

Manufacturer's headquarters and service center:

TEHNOS, d.o.o., Cesta ob železnici 1, SI-3310 Žalec

Tel.: +386 (0)3 713 30 50, Fax: +386 (0)3 713 30 60, E-mail: info@tehnos.si, [http:// www.tehnos.si](http://www.tehnos.si)

MACHINE: _____

Model/Type: _____

Construction no.: _____ Year of manufacture: _____

Dealer: _____

Dealer's stamp: _____ Signature: _____ Date of purchase: _____

After the machine is purchased and the warranty is confirmed, the latter must be registered by the dealer in the online application

Tehnos PARTNER (**b2b.tehnos.si**).

THE WARRANTY CLAIM CANNOT BE ACCEPTED WITHOUT REGISTRATION.

As soon as the machine is purchased, enter the data from the identification plate. These data are required when ordering spare parts and must be specified in the event of making a warranty claim!

 TEHNOS	SLOVENIA SI - 3310 Žalec t.: + 386 3 713 30 50 www.tehnos.si					
Model/Tip:	<input type="text"/>	1				
Ver.:	<input type="text"/>	2	<input type="text"/>	3	<input type="text"/>	4 kg
S/N:	<input type="text"/>					5

- 1 Model
- 2 Version
- 3 Year of manufacture
- 4 Weight of the machine
- 5 Construction number

Table of contents

1	Foreword	4
1.1	Designated use.....	4
2	Safety warnings and labels	5
2.1	Meaning of safety labels.....	5
2.2	Basic instructions for safe work.....	6
3	Machine overview	7
3.1	Description of the machine	7
3.2	Technical specifications	7
4	PTO drive shaft	8
4.1	General instructions for safe operation of the PTO drive shaft	8
4.2	Connection of the PTO drive shaft	8
4.3	Adjusting the length of the PTO drive shaft.....	9
5	Connection to the tractor.....	9
5.1	Recommended attachment of the machine:	10
5.2	PTO drive shaft speed.....	10
5.3	Transport position.....	11
6	Starting and operation.....	11
6.1	Shifting the machine into working position and adjusting the working height	11
6.2	Checking before beginning work:.....	12
6.3	Working speed.....	12
7	Maintenance.....	13
7.1	General maintenance	13
7.2	Cleaning and storing.....	13
7.3	Periodic maintenance.....	13
7.3.1	Oil level check and change	14
7.3.2	Changing knives/hammers.....	15
7.3.3	Tensioning and changing belts.....	15
7.4	Start up after a long period of non-use.....	16
8	Possible problems and solutions	17
9	Spare parts.....	17
9.1	Ordering spare parts.....	17
9.2	List of spare parts for MULS 110, 130, 150, 170 LW	18
10	Conformity declaration	22

1 Foreword

Dear buyer,

Thank you for showing your trust in our company by purchasing our machine.

Before using the machine for the first time, you need to learn about all its functions and safety warnings, as well as the suitable working area of machine. This Instruction manual will provide all the information required for its safe use, maintenance and optional equipment.



This mark in the Instruction manual warns you of dangers.

Before using the machine, carefully read and follow the Instruction Manual and all safety warnings to prevent accidents. If the machine is sold to another user, it must be accompanied by the Instruction manual.

1.1 Designated use

The designated use of the machine means the compliance with operating instructions specified by the manufacturer.

The machine is designed for exclusive use in agriculture and communal activities. Its purpose is to mulch all types of plant remains and debris, such as: grass, straw, corn stalks, etc. Its light and compact structure enables working on surfaces that require a lower machine weight and adjustment to smaller tractors. Any other use, which is not specified above, is considered improper and the manufacturer is not liable for any damage resulting from improper use.



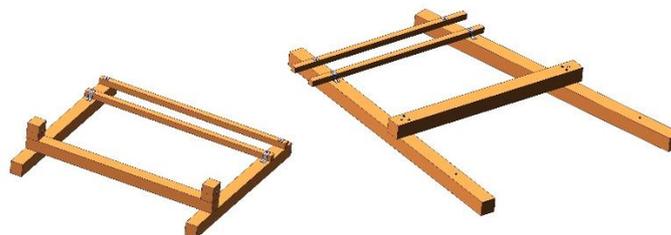
It is strictly forbidden to use the flail mower on stony and other unsuitable grounds. During operation, the machine must ALWAYS be in contact with the ground.

The machine can only be used, handled and repaired by persons qualified and authorized for this purpose, who are instructed about potential dangers. Always follow the relevant accident-safety regulations as well as generally used technical safety regulations, occupational health regulations and road traffic rules.

Any changes or modifications of the machine made by unauthorized persons exclude the manufacturer's liability for resulting damage.

Recommendation

To avoid damage to the rotor and the supporting roller, use a dedicated pallet for transporting and storing the machine.

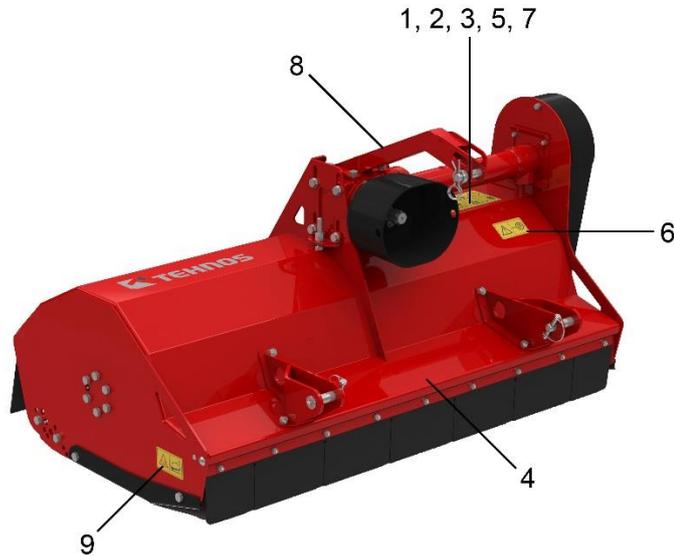


2 Safety warnings and labels

2.1 Meaning of safety labels

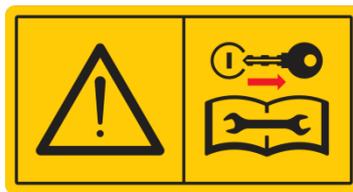


The CE mark proves that flail mower is made in accordance with all regulations and directives. The Declaration of Conformity is a document which proves that the machine fulfills general technical, safety and health regulations. TEHNOS machines are equipped with all the necessary safety equipment. To ensure various functions of the machine, some areas of the machine do not provide total safety. For this reason, the machine is equipped with safety labels that warn of residual dangers.



1.

Before beginning work, carefully read the **INSTRUCTION MANUAL**.



2.

Before beginning service and maintenance work, turn off the tractor's engine and remove the ignition key.



3.

When the machine is in operation, mulched material may be ejected. Keep the safety distance.



4.

While connecting or operating the machine, keep away from the area between the machine and tractor.



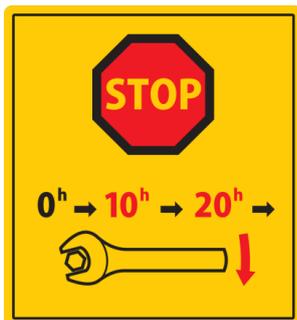
5.

Do not approach the machine until the rotor has stopped rotating completely. Keep your hands or legs away from dangerous areas with rotating and moving machine components.



6.

Maximum rotation speed of the PTO shaft at the basic factory setting.



7.

Examine all screw joints every 10 working hours.



8.

Identification plate.



9.

Minimum working height between the roller bracket and the ground.



2.2 Basic instructions for safe work

During work, pay attention to safety, prevent accidents and carefully read and follow the instructions below:

- In addition to operating instruction in this Manual, you must also observe all generally applicable safety and accident regulations!
- Warning and safety labels warn you about dangers. Follow them for your own safety!
- When using public roads, follow road traffic signs and rules!
- Before starting work, become familiar with all devices and controls as well as their functions!
- The noise level generated by the machine may exceed 85 dB (A). In this case, the use of hearing protection is obligatory.
- Wear tight-fitting clothes. Avoid loose clothes!

Recommended personal protective equipment at work



Protective gloves



Protective footwear



Work clothing



Protective mask



Ear-muffs

- Follow the instructions for the attachment of the machine!
- Pay extra attention during attaching and detaching the machine!
- Standing between the tractor and machine is forbidden if the tractor is not immobilized.
- Take into consideration the allowed axle load, total load and overall transport dimensions.
- Additional weights must be attached to the planned fixing points in accordance with the regulations!
- Only connect the machine to a tractor if all safety devices are installed and with the tractor in a secured position!
- Never operate the machine without the protective flaps. Replace any damaged protective flaps!
- Install the transport equipment (lights, warning signs, protection devices etc.)!
- Connect and disconnect the PTO drive shaft only with the tractor's engine turned off and the ignition key taken out!
- Before engaging the PTO drive shaft, make sure that the rpm and rotation direction of the machine comply with the specified number of rpm and rotation direction indicated on the machine label!
- There is a risk of injury, contusions and pinching when using external tractor hydraulic commands; keep away from the danger area!
- Before road transport, the must be prepared for transport and blocked according to instructions!
- Work at night is prohibited without the appropriate lighting.
- Pay maximum attention to safety when working close to roads, pathways or populated areas! Before operating the machine, clean all rocks and other debris from the working surfaces!
- When switching the machine from the transport to working position and vice versa, make sure that the tractor is parked on a flat and even surface.
- When switching the machine from the transport to working position and vice versa, make sure that there are no persons standing in the danger area.
- Ropes, chains, bars, valves, safety mechanisms and other control equipment must be attached so as to prevent the triggering of unplanned movements in any driving or working situation!
- Before moving off and operating the machine, pay attention to the surrounding area (children, other persons, animals)! Ensure good visibility!
- The transport of persons on the machine attached to a tractor is forbidden!
- Never leave the driver's seat when driving!
- Mulching material may be ejected while operating the machine (stones, branches) – there is a risk of injuries. Keep away from the dangerous area within the range ejected materials.
- There is a risk of cuts and tears while operating the machine. Keep away from the dangerous during the operation of the machine.
- The driving speed must always be adjusted to conditions on the driving surface and surroundings. Avoid sudden turns when driving up, down or along a steep slope!
- Turning and braking capability is changed when transporting the machine and additional weights.
- When driving around bends, pay attention to loads outside of the tractor's gravity center, as well as the inertia weight the machine!
- When driving and turning keep away from the area with rotating parts and the maneuvering area!
- Before leaving the tractor, the machine must be completely lowered to the ground! Stop the engine of the tractor and remove the ignition key!
- When the machine is detached from the tractor it must be placed on a pallet or on a solid and even surface!
- Never touch the machine until all the moving parts have stopped moving.
- Regularly check the screws of hammers/knives for wear!
- When changing knives or hammers, make sure that they are fixed correctly! You must also replace the dedicated screws and self-locking nuts!
- To avoid fire, always clean the machine after each use!

3 Machine overview

3.1 Description of the machine

The machine is attached to the tractor with a hitch. The drive is taken from the PTO drive shaft, gearbox and belt transmission to the rotor with the installed hammers. The gearbox is standardly fitted with a free-wheel clutch, which prevents damages to the drive and the gearbox. According to the longitudinal axis of the tractor, the machine can be moved laterally by 12 cm by moving the lower linkage bracket after breaking through the holes indicated on the housing of the machine (Figure 8). The distance of the machine from the ground (working height) is adjusted by adjusting the position of the supporting roller bracket.



Observe the direction and speed of PTO drive shaft rotation!
Pay extra attention during attaching and detaching the machine!

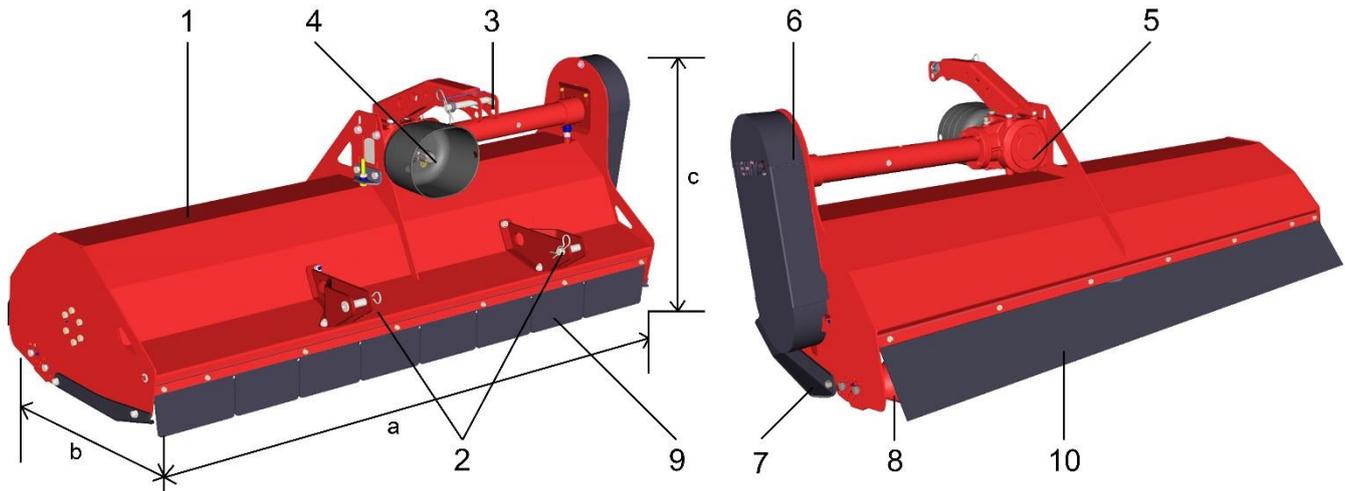


Figure 1: Machine components

1	Machine housing	6	Pulley cover
2	Lower linkage	7	Protective slides
3	Upper linkage	8	Supporting roller
4	PTO drive shaft attachment shaft	9	Front rubber flap
5	Gearbox	10	Rear rubber flap

3.2 Technical specifications

Standard configurations of the machine are shown in the following table. Additional equipment is available optionally.

Model/Type	MULS 110 LW	MULS 130 LW	MULS 150 LW	MULS 170 LW
Working width (cm)	110	130	150	170
Transport width (cm)	121	141	161	181
Machine dimensions a x b x c (cm)	121x87x79	141x87x79	161x87x79	181x87x79?
Possible offset of machine (cm)	12	12	12	10
Number of belts (pcs)	3	3	3	3
Engine speed (rpm)	540	540	540	540
Number of hammers (pcs)	10	12	14	16
Tractor power (kW)	11 - 26	15 - 29	18 - 33	22 - 37
Tractor power (KM)	15 - 35	20 - 40	25 - 45	30 - 50
Machine weight (kg)	190	210	230	250

4 PTO drive shaft

4.1 General instructions for safe operation of the PTO drive shaft

- Follow the instructions attached to the PTO drive shaft, specified by the manufacturer.
- Only use PTO drive shafts which meet all technical and safety requirements!
- Protection tubes, funnels and hitch protections must be installed on the PTO shaft. All protective parts must be in faultless condition.
- Observe the prescribed length of the protection tube in the transport and working positions.
- Connect and disconnect the PTO drive shaft only with the tractor's engine turned off and the ignition key taken out!
- Always make sure the PTO drive shaft is correctly attached and secured!
- Before engaging the PTO drive shaft, make sure that the rpm and rotation direction of the machine comply with the specified number of rpm and rotation direction indicated on the machine label.
- Before engaging the PTO drive shaft, make sure that there are no persons in the danger area.
- Never engage the PTO shaft if the tractor's engine is not running.
- Keep away from the danger area around the attachment when the PTO shaft is engaged.
- Always disengage the PTO drive shaft when working under excessive working angles or when it is no longer needed.
- After disengaging the PTO drive shaft command, a danger of rotating parts still exists due to inertia. Only approach the danger area once rotation has completely stopped.
- Cleaning, greasing or adjusting the PTO drive shaft can only be performed with the tractor's engine off and the ignition key taken out!
- Before using the machine, repair or replace any damaged parts of the PTO drive shaft.
- After disconnecting the PTO drive shaft, protect the grooves of the shaft with a plastic guard.
- Ensure the required oscillating space for the PTO drive shaft.
- Secure the tube of the PTO drive shaft with a chain (Figure 2).
- After disconnecting the machine from the tractor, lay down the PTO drive shaft as prescribed. The PTO drive shaft must be secured with a chain, which should never be used to support the PTO drive shaft (Figure 2).

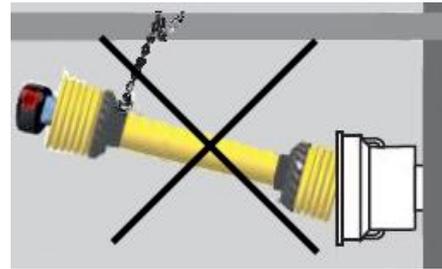
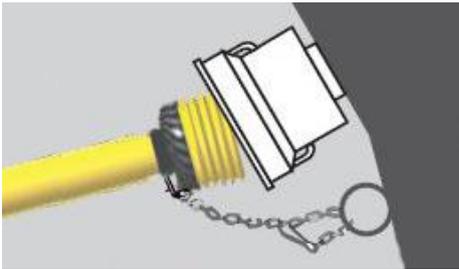


Figure 2: Securing the tube of the PTO drive shaft with a chain

The following PTO drive shafts are recommended:



Model	Designation
MULS 110-170	Walterscheid W2300

4.2 Connection of the PTO drive shaft

- Connect the appropriate PTO drive shaft and secure the protection with a chain. Make sure the PTO shaft is locked in place on both connection sides.
- If using a free-wheel PTO drive shaft, connect it to the machine's side (Figure 3)

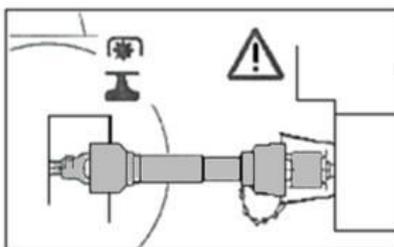


Figure 3: Connection of the PTO drive shaft

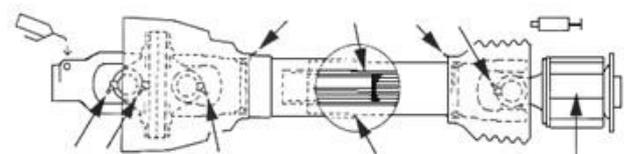


Figure 4: Lubrication of the PTO shaft as specified by the manufacturer

4.3 Adjusting the length of the PTO drive shaft

To ascertain the exact length of the PTO drive shaft, place the tractor and the machine as close as possible. Pull out the PTO drive shaft and divide it in two halves – connect one half to the tractor and the other half to the machine. Place the two halves together in the shortest position and mark them (Figure 5). If shortening is needed, cut both the safety and movable tubes to the same length. Remove any sharp edges and peelings from the ends of the tubes and grease all sliding areas well.

Read the manufacturer's instructions carefully before shortening the PTO drive shaft!

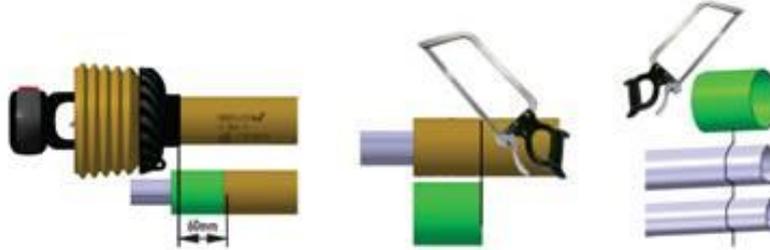


Figure 5: Adjusting the length of the PTO drive shaft

5 Connection to the tractor

The front and rear part of the tractor is loaded with a weight equal to that of the machine. To ensure correct braking and steering ability of the tractor, the front axle should bear at least 20% of total weight (Figure 6).

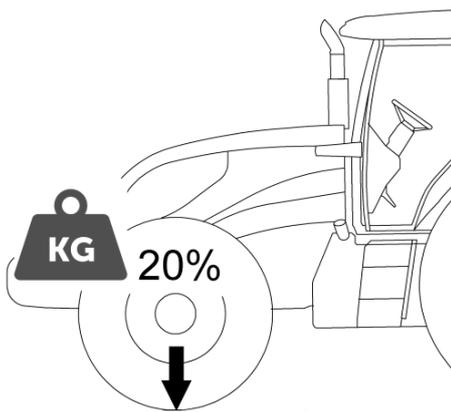


Figure 6: Installing ballasts on the tractor

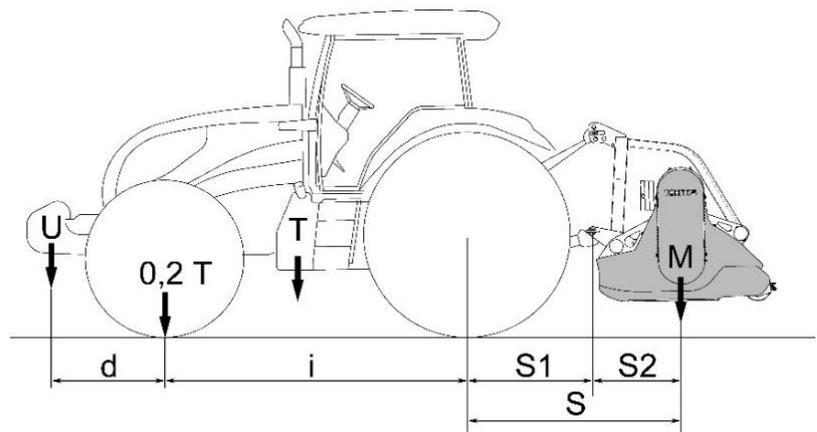


Figure 7: Ballast calculation diagram

Formula for calculating the appropriate ballasting:

$$U \geq \frac{M \times S - 0,2 \times T \times i}{d + i}$$

$$S = S1 \text{ (cm)} + S2 \text{ (cm)}$$

$$S2 = 44 \text{ cm}$$

U - ballast weight (kg)

T - tractor weight (kg)

M - machine weight (kg)

i - wheelbase (cm)

d - distance between the center of gravity of ballasts and front axle (cm)



Before connecting and disconnecting the machine, engage the hydraulic control lever to prevent sudden lifting or lowering. There is a danger of contusion or pinching in the three-point-linkage area. Standing between the tractor and machine is forbidden if the tractor is not immobilized. When driving on roads with the machine lifted, secure the hydraulic control lever to prevent sudden dropping!

Connecting the machine:

- First pull out the bolts on the machine and release the lower hydraulic arm side locks on the three-point-linkage system of the tractor.
- Reverse slowly so that the holes of the lower hydraulic arms are aligned with the attachment holes on the machine.
- Insert the two bolts A and secure them with locking pins C (Figure 8).
- Connect the top link to the upper linkage of the machine with the bolt D and secure it with the washer B and locking pin C.
- Manually lock the arms of the tractor's three-point linkage. They should be secured to prevent transversal movement of the machine (Figure 9).

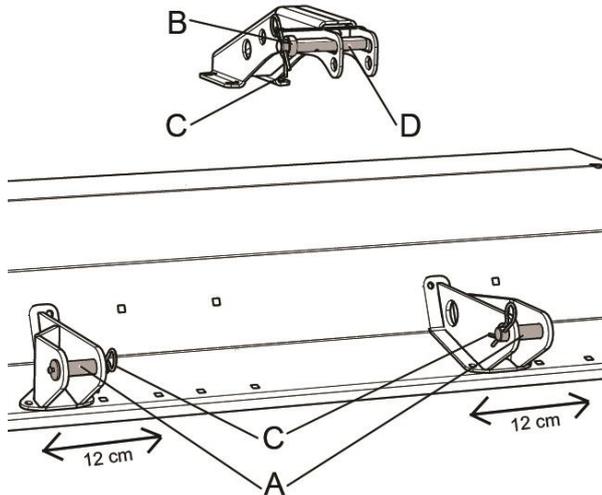


Figure 8: Connecting the machine

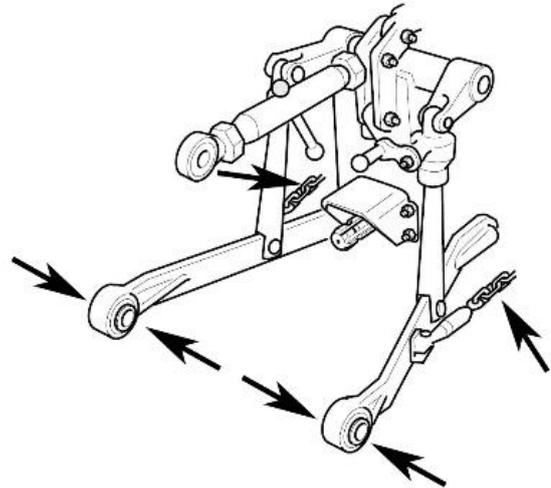


Figure 9: Securing the three-point linkage of the tractor

When connecting the machine with a quick hitch, make sure that the balls are in perfect condition and the bolts are secured from falling out.

5.1 Recommended attachment of the machine:

REAR LINKAGE (Figure 10)

Fasten the top link of the tractor with a bolt to the middle of the oval opening of the linkage (detail A), maintaining a minimum distance between the ground and the supporting roller bracket of **4 cm**! Adjust the lower link of the tractor to the **FLOATING POSITION**.

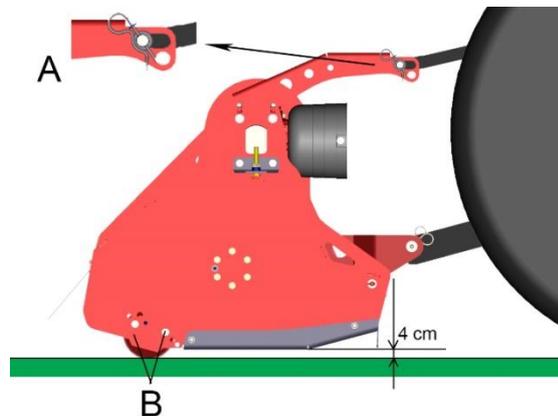


Figure 10: Rear linkage

To prevent damages to the linkage, only use the upper round holes on the linkage when the machine is operated on a flat terrain.

5.2 PTO drive shaft speed

- When mulching, **ALWAYS** use the prescribed PTO drive shaft rotation speed as indicated on the machine's label.
- Before mulching, the machine drive must operate at full speed.
- Maintain a constant rotation speed during operation.



When mulching, always use the prescribed PTO drive shaft rotation speed as indicated on the machine's label!

5.3 Transport position

To ensure a safe transport of the machine, follow the rules below:

- Make sure the machine is connected correctly (chapter 5).
- Install appropriate signaling devices (signal signs when necessary).
- Lift the machine at least 35 cm from the ground.
- Prevent any sudden movements of the machine.
- Make sure the PTO shaft and the rotor are immobilized during transport.

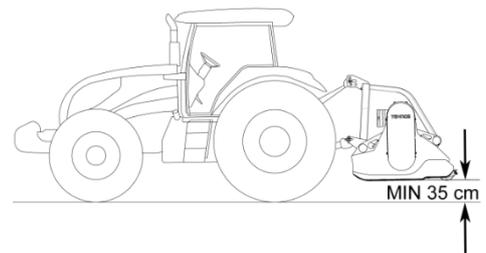


Figure 111: Transport position

6 Starting and operation

6.1 Shifting the machine into working position and adjusting the working height

To ensure proper operation, the machine must be driven **on the supporting roller**.

The recommended working height d (Figure 13) is from 2.0 to 7.2 cm. Adjust the height by removing the two screws B on the left and right side of the machine (Figure 10, 13). The working height is adjusted by moving the supporting roller bracket from position 1 to position 4 (Figure 13). Make sure that both screws B on the left and right sides of the machine are in the same position. Fully tighten the screws.

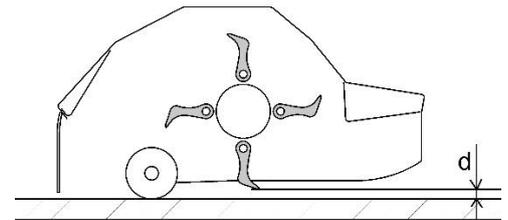


Figure 12: Working height

BRACKET	WORKING HEIGHT "d"
pos. 1	2,0 cm
pos. 2	4,0 cm
pos. 3	6,0 cm
pos. 4	7,2 cm

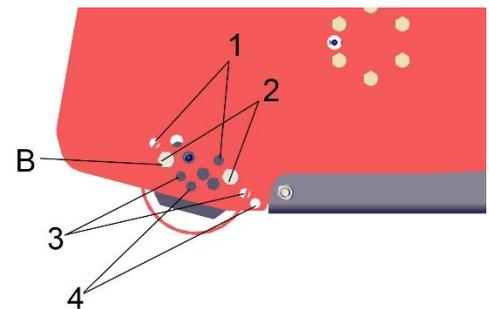
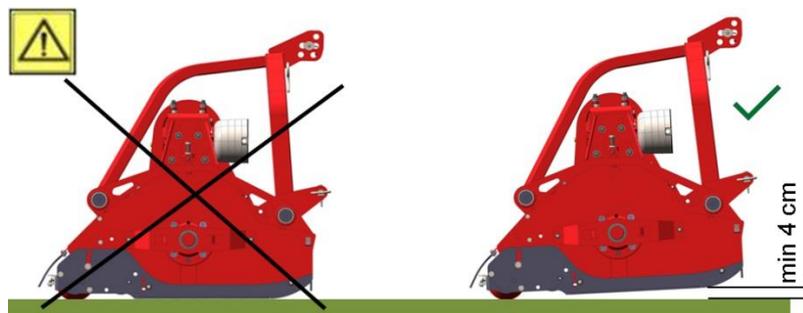


Figure 13: Working height adjustment



Lift or tilt back the front side of the machine by at least **4 cm**! Any adjustments should only be performed with the transmission and tractor's engine off! Remove the ignition key!

In the event of poor driving conditions, the front side of the machine must be lifted by at least **4 cm**. This is achieved by adjusting the top link.

The supporting roller bracket (sleds) is not designed for supporting the machine during work, but exclusively to secure the rotor. Failure to comply with the basic set up may result in the working height being too low. The manufacturer does not recommend this setting because it requires more power and may cause a premature wear of components and potential damage to the rotor.

To prevent excessive wear of the essential components and extend the lifetime of the machine, make sure that all adjustments of the machine are appropriate (Figure 14).



Figure 14: Position of the machine during operation

 Always make sure that the working height of the machine is sufficient. The hammers must never be in contact with the ground or dig in the soil!

6.2 Checking before beginning work:

Before starting work, make sure that:

- The machine is correctly connected, secured and positioned.
- The working height of the machine with the supporting roller is appropriate.
- All screws and nuts are tightened (screw torques, chapter 7.3).
- Wearing of the hammers/knives is even.
- Oil is in the gearbox (chapter 7.3.1).
- The greasing points are lubricated (Figure 15).
- The belts are tensioned correctly (chapter 7.3.3).

6.3 Working speed



The operator must ensure that persons, animals, vehicles or objects are outside of the machine's danger area. Adjust the speed to driving and working conditions. Never drive in reverse during mulching! It is strictly forbidden to leave the tractor cabin when the PTO shaft is engaged and the rotor still rotates due to inertia.

If the material is jammed and the machine is overloading the tractor, the working speed is too high for the current mulching volume. Immediately reduce the speed or increase the working height.

The working height depends on the type and volume of mulched material (see the table below).

MATERIAL TYPE	MULCHING SPEED		
			
Short grass			
Crops			
Tall grass			
Overgrown grassland			
Vine shoots			

Eliminating a mulching blockage due to excessive volume of mulching material

If the rotor area is overloaded with excessive mulching or foreign material during operation, the belts may slip, which stops the rotor. If this happens, immediately stop mulching and disengage the PTO drive shaft. Drive away from the problematic area and try to engage the PTO drive shaft again. If the PTO shaft does not rotate or its rotation is abnormal, stop the tractor, lift the machine and turn off the tractor's engine. After doing so, leave the tractor, support the machine and remove the mulching material from the rotor area.

When cleaning is finished, check the condition of the rotor and belts. If all components are undamaged, you can continue working.

7 Maintenance

Regular maintenance of the machine is vital for efficient use, correct operation, long service life and spare parts savings, and above all, for improved work safety.

7.1 General maintenance

- Before beginning repair, maintenance or cleaning work or in the event of operational faults, always switch off the PTO drive shaft command, turn off the tractor's engine and remove the ignition key.
- Wait until all rotating parts stand still before making any interventions on the machine.
- During maintenance work, support the machine with appropriate supports and secure it to prevent sudden movement.
- When performing repair, maintenance and cleaning work, use suitable tools, gloves, goggles and protective clothing.
- Before making any interventions to the hydraulic system, lower the machine to the ground, stop the tractor's engine and release the oil pressure.
- Immediately seek medical advice in case of injuries due to abrasions or hydraulic oil leakage.
- Safety devices that are exposed to wear must be checked regularly and replaced if necessary.
- To avoid accidents, follow all the prescribed and other general safety rules.
- During machine maintenance, only use genuine spare parts as prescribed by the manufacturer.

7.2 Cleaning and storing

- Clean the machine internally and externally. Dirt attracts moisture, which causes corrosion. When using a high pressure water cleaner, do not point the jet of water directly at the bearings.
- Always lubricate the machine after cleaning.
- Lubricate the PTO shaft as prescribed by the manufacturer.
- Clean the rust from damaged surfaces and apply coating.
- Store the machine on a pallet and in a dry room.

7.3 Periodic maintenance

Follow the maintenance intervals indicated in the table below.

MAINTENANCE REMINDER	After first 5 working hours	After first 20 working hours	Every 10 working hours	Every 200 working hours	Periodically	Every 2 years
Belt tensioning	X	X			X	
Tightening the screws	X		X			
Oil level check					X	
Oil change		X		X		X
Lubrication of all greasing points			X			

Tightening torques for screws (Nm)		
Thread	Screw quality	
	8.8	10.9
M 8	28	40
M 10	55	80
M 12	95	140
M 14	150	225
M 16	240	314
M 18	330	475
M 20	430	615

Greasing points

At the end of each working day:

- Clean the machine, particularly the greasers and lubricate all greasing points.
- Regularly lubricate the machine to ensure maximum efficiency and long service life.
- Use the LC2 grease, intended for the lubrication of bearings.
- Lubricate the PTO shaft as prescribed by the manufacturer.

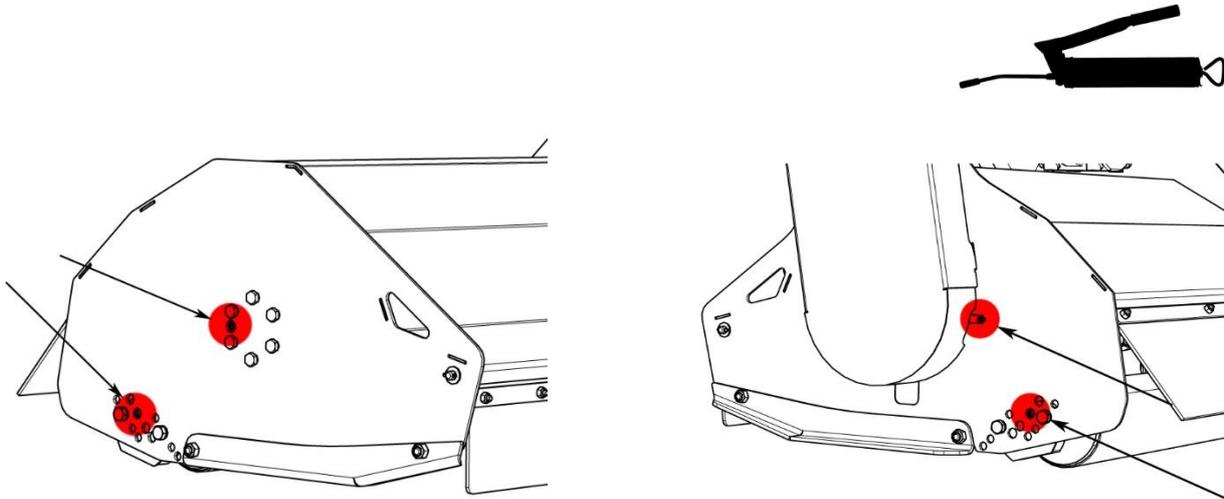


Figure 15: Greasing points on the machine

It is strictly forbidden to dispose waste grease in the environment.

7.3.1 Oil level check and change

Checking the oil level and adding oil:

- Remove the guard from the PTO drive shaft on the gearbox D.
- Unscrew the two plugs A.
- If the oil level is below the level of plug openings A, add more oil through plug openings C, up to the level of plug openings A.
- To reassemble, follow the procedure in reverse order.

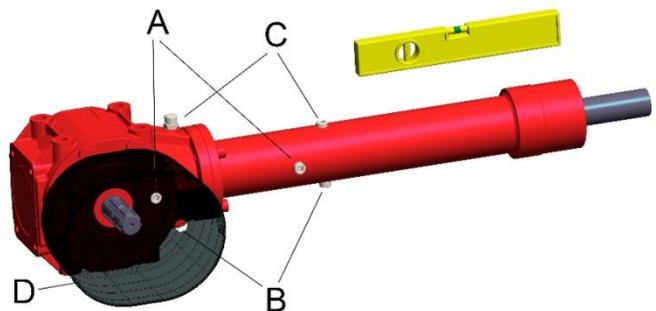
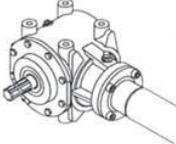
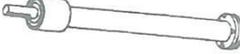


Figure 16: Oil level check

Oil change (Figure 16)

- Remove the guard from the PTO drive shaft on the gearbox D.
- Unscrew the plugs C and B.
- Discharge the oil into suitable containers through the plug openings B.
- Tighten the plugs B.
- Unscrew the two plugs A.
- Pour the oil through the plug openings C until the level reaches the plug openings A.
- To reassemble, follow the procedure in reverse order.

Oil volume in the gearbox and the extension	Model	Oil volume (l)
	MULS 110	~ 0,8
	MULS 130	~ 0,8
	MULS 150	~ 0,8
	MULS 170	~ 0,8
	MULS 110	~ 0,4
	MULS 130	~ 0,5
	MULS 150	~ 0,5
	MULS 170	~ 0,6

It is strictly forbidden to dispose waste oil in the environment.

Recommended oil type

Mineral oil in accordance with the standard SAE 90.

Alternative oils: SHELL Spirax A LS 90, AGIP Rotra HY, CASTROL Hypoy LS.

As an alternative for more difficult working conditions, the manufacturer recommends synthetic oils 75w-90; CASTROL TAF-X or Shell Spirax 75w 90.

7.3.2 Changing knives/hammers

If vibrations or shaking movements arise during machine operation, immediately stop the machine and check the hammers/knives (Figure 17). Immediately replace them if they are worn or damaged. If the vibrations of the rotor persist, it may be partially damaged and must be balanced. The rotor is balanced by the machine manufacturer or a qualified repair technician.

Before changing the knives/hammers, machine must be disconnected and turned upside down. Loosen the nut A (Figure 17), remove the corresponding screw B and replace the hammer/knife with a new one. When changing hammers/knives, you must also change the corresponding nut and screw.

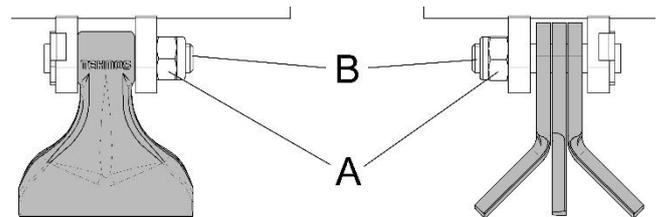


Figure 17: Changing knives/hammers

7.3.3 Tensioning and changing belts

If for any reason, the belts begin slipping during operation, immediately stop working, lower the machine on level ground and disengage the PTO shaft. Stop the engine of the tractor and remove the ignition key. After all rotating parts have stopped, the reason for belt slipping can be determined.

Belt tensioning



Before tensioning, stop the engine of the tractor and disconnect the PTO shaft. Tensioning of the belts can be done only when the belts have cooled down.

First remove the pulley cover B (Figure 18) and check the tension of the belts. Belt tension is correct once they bend by 1 cm if pushed with a force of 8 kg (push with a thumb) (Figure 19). To adjust the tension of the belt, tighten the nut C (Figure 18). Make sure that the pulleys are parallel to one another (Figure 19). Adjust the pulleys in parallel by tightening the screw D and loosening the screws A (Figure 18). When the belt tensioning is completed, place back the pulley cover B and make sure that all the bolting assemblies are appropriately fastened. The belt tension can be also checked by inserting a flat object in the slot on the pulley cover E (Figure 19)

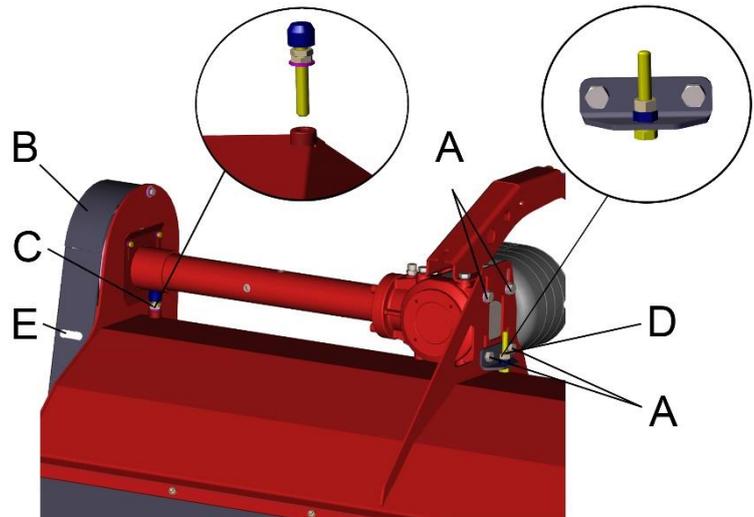


Figure 18: Tensioning / changing belts

Changing belts

Remove the pulley cover B and loosen the four screws A on the gearbox bracket (Figure 18). Release the belts by loosening the nuts C (Figure 18). Rotate the pulley, remove the belts off and replace them with new ones by manually rotating the pulleys. Do not use sharp objects during disassembly or assembly – they can damage the belts. After assembly, tension the belts as described in the instructions for tensioning belts.

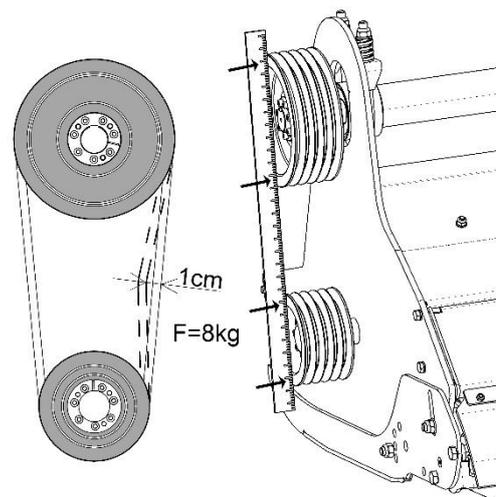


Figure 19: Checking the tension of belts and parallel position of pulleys

7.4 Start up after a long period of non-use

- Read the Instruction manual and safety warnings carefully.
- Wipe away old grease and oil that were used as protection.
- Grease all parts requiring grease.
- Check the oil level in the gearbox and fill it if needed.
- Check all screws and nuts and tighten them if needed.
- Check all adjustments on the machine and, if needed, adjust them again.
- Check the condition and tension of belts and adjust their tension or replace them if necessary.
- Check the condition of protective flaps and replace them if necessary.

8 Possible problems and solutions

PROBLEM	CAUSE	SOLUTION
The belts are worn out.	The pulleys are not parallel to each other.	Check and adjust the parallel position of pulleys with a linear ruler.
The belts are slipping and overheating.	Incorrect belt tension.	Observe the recommended working speeds. Adjust the tension and, if necessary, replace the belts.
	Working with an overly powerful tractor, excessive working speed or volume of the mulching material.	Check the tension of belts and adjust the tension if necessary.
Excessive power consumption of the tractor.	Inadequate working height. Excessive working speed with regard to the material volume.	Adjust the working height of the machine (chapter 6.1).
	The mulching material is too moist.	Wait until working conditions improve.
Excessive or uneven wear of hammers/knives.	Inadequate working height with regard to poor field conditions.	Adjust the working height of the machine (chapter 6.1).
Jammed material in the machine.	Excessive working speed.	Reduce the working speed or increase the working height.
	Insufficient rpm of the rotor.	Increase the rpm speed of the rotor as prescribed. Check and adjust the position of pulleys as prescribed (chapter 5.2).
Excessive vibrations or shaking.	Uneven wear of hammers/knives.	Check the hammers/knives. If necessary, replace the hammers/knives and balance the rotor.
	Worn out bearings.	Replace the bearings.
	Damaged rotor.	The rotor must be balanced again.
The gearbox is overheating.	Insufficient oil level.	Add oil to the required level.
	The oil is spent.	Change the oil.
	Excessive working speed.	Reduce the mulching speed.
	Excessive rpm of the PTO drive shaft.	Reduce the rpm speed of the PTO drive shaft as prescribed (chapter 5.2).
Gearbox oil leakage.	Damaged sealing.	Replace the sealing.
	The oil level is too high.	Check the oil level and, if necessary, drain some oil from the gearbox.
The noise level of the machine is too high.	Worn out bearings.	Replace the bearings.
	Low gearbox oil level.	Check the oil level and add more oil if necessary.
	The nuts and screws are loose.	Tighten the nuts and screws (see the table with torques, chapter 7.3).
	Excessive rpm of the PTO drive shaft.	Reduce the rpm speed of the PTO drive shaft as prescribed (chapter 5.2).
The rotor is not rotating.	Excessive volume of mulching material or foreign material stuck in the rotor area.	Remove the jammed material as described in chapter 6.3.

9 Spare parts

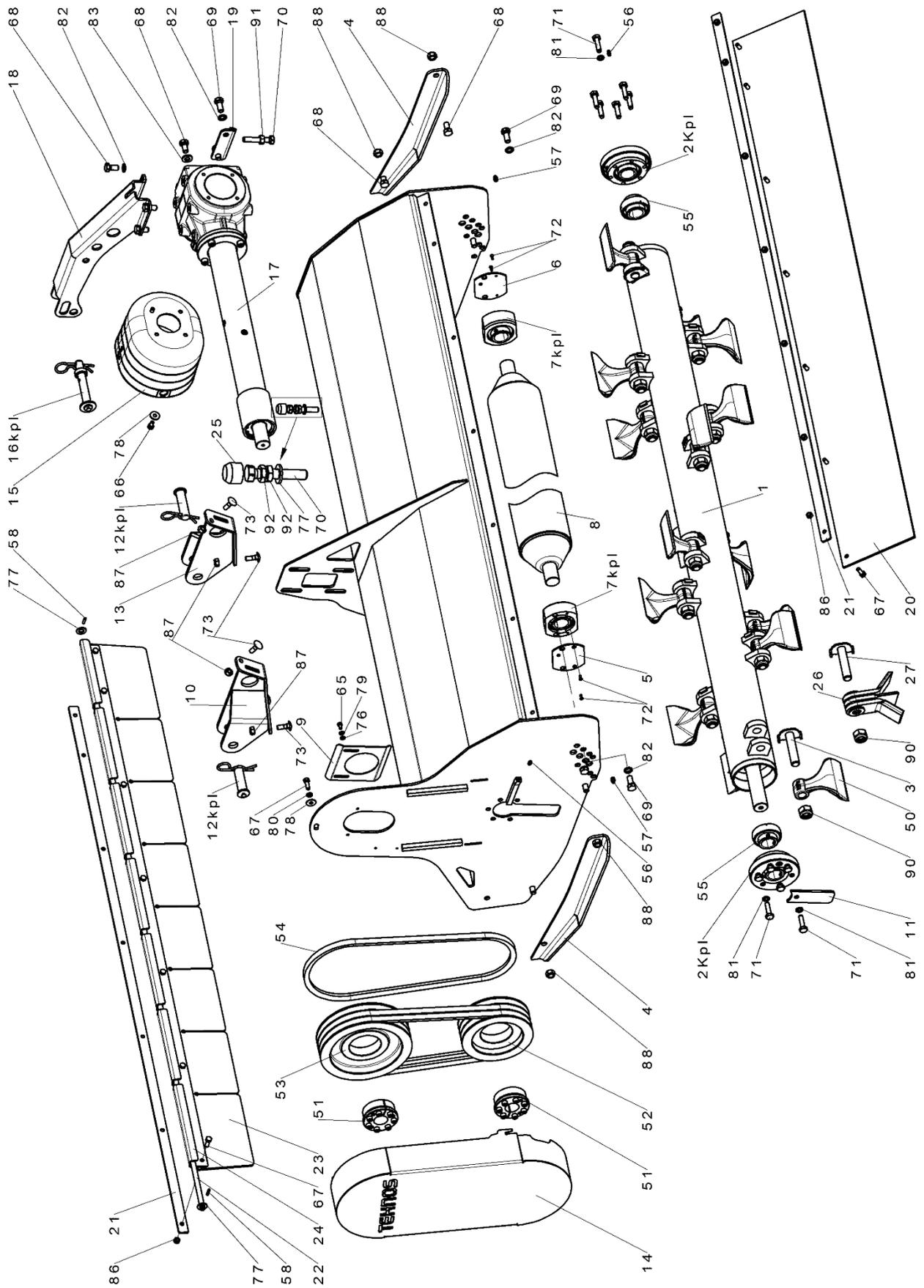
9.1 Ordering spare parts

When ordering spare parts or making warranty claims, you must specify the entire construction number of the machine.



Always use genuine **TEHNOS** spare parts due to their verified quality and safety!

9.2 List of spare parts for MULS 110, 130, 150, 170 LW

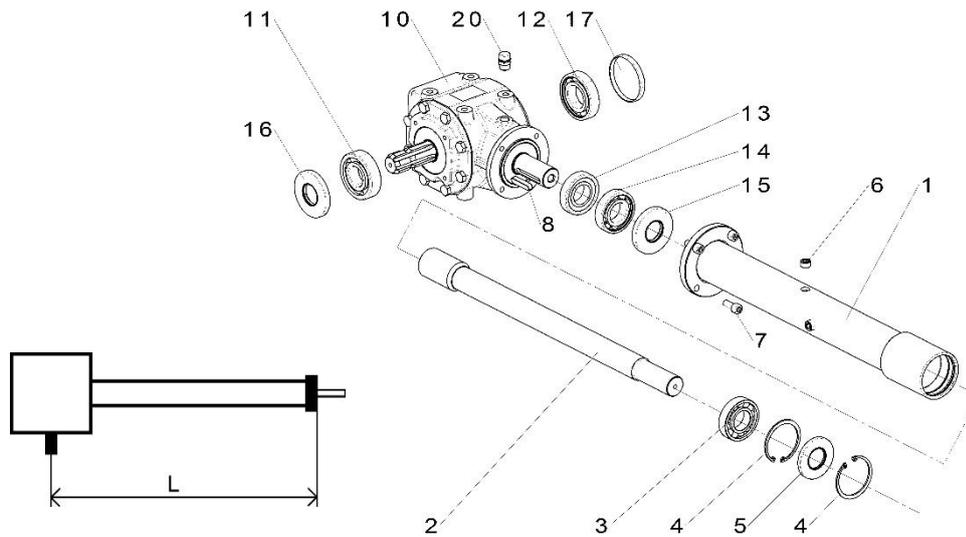


EXP_MULS_110-170_Rev.01_1

POS.	IDENT	NAME		QTY.
1	T03764	ROTOR WITH HAMMERS	MULS 170	1
	T03763		MULS 150	1
	T03762		MULS 130	1
	T03761		MULS 110	1
2 kpl	T03839	ROTOR BEARING BRACKET 114.3 KPL		2
3	T00161	SCREW M20x100 FOR HAMMER	MULS 170	16
			MULS 150	14
			MULS 130	12
			MULS 110	10
4	T03821	SLIDE MULS		2
5	T03824	BEARING BRACKET COVER LEFT		1
6	T03825	BEARING BRACKET COVER RIGHT		1
7 kpl	T03823	SUPPORTING ROLLER BEARING BRACKET MULS KPL		2
8	T03817	SUPPORTING ROLLER	MULS 170	1
	T03818		MULS 150	1
	T03819		MULS 130	1
	T03820		MULS 110	1
9	T03837	EXTENSION BLOCKING PLATE MULS		1
10	T00829	LOWER LINKAGE CONSOLE LEFT WELDED		1
11	T03822	HOUSING BLOCKING TIN PLATE MULS		1
12 kpl	T03828	LOWER LINKAGE BOLT MULS KPL		2
13	T03830	LOWER LINKAGE CONSOLE RIGHT WELDED		1
14	T03835	PULLEY GUARD MULS		1
15	70125	PTO DRIVE SHAFT GUARD		1
16 kpl	T03827	UPPER LINKAGE BOLT MULS KPL		1
17		GEARBOX		1
18	T03826	UPPER LINKAGE CONSOLE WELDED		1
19	T03836	GEARBOX TENSIONER MULS		1
20	T02860	REAR RUBBER FLAP	MULS 170	1
	T02873		MULS 150	1
	T02877		MULS 130	1
	T02881		MULS 110	1
21	T02861	PROTECTIVE FLAP SUPPORTING BAR	MULS 170	2
	T02874		MULS 150	2
	T02878		MULS 130	2
	T02882		MULS 110	2
22	T03840	FRONT PROTECTIVE FLAP AXLE	MULS 170	1
	T03841		MULS 150	1
	T03842		MULS 130	1
	T03843		MULS 110	1
23	T03809	FRONT RUBBER	MULS 170	1
	T03810		MULS 150	1
	T03811		MULS 130	1
	T03812		MULS 110	1
24	T03805	FRONT PROTECTIVE FLAP BRACKET MULS 170	MULS 170	1
	T03806		MULS 150	1
	T03807		MULS 130	1
	T03808		MULS 110	1
25	13660	RUBBER PLUG		1
26	10633	ROTOR KNIFE (KPL 2+1) L= 110	MULS 170	16
			MULS 150	14
			MULS 130	12
			MULS 110	10

POS.	IDENT.	NAME		QTY.
27	70332	SCREW M20x100 FOR KNIFE	MULS 170	16
			MULS 150	14
			MULS 130	12
			MULS 110	10
50	10302	HAMMER P2 Ø 20.5	MULS 170	16
			MULS 150	14
			MULS 130	12
			MULS 110	10
51	11135	LOCKING SLEEVE 35x80		2
52	12107	PULLEY 170 SPB 3 F.80		1
53	13643	PULLEY 225 SPB 3 F.80		1
54	13640	V-BELT DIN 2215		3
55	13567	BALL BEARING (r.)		2
56	10595	GREASER AM 6 DIN 71412 (M6x1 STRAIGHT)		2
57	10596	GREASER AM 8 DIN 71412 (M8x1 STRAIGHT)		2
58	11772	SPRING PIN DIN 1481 5x30		2
65	11321	SCREW DIN 933 8.8 M6x12		2
66	11332	SCREW DIN 933 8.8 M8x16		2
67	11334	SCREW DIN 933 8.8 M8x25	MULS 170	15
			MULS 150	13
			MULS 130	11
			MULS 110	9
68	11354	SCREW DIN 933 8.8 M12x25	MULS 170	10
69	11355	SCREW DIN 933 8.8 M12x30	MULS 150	6
70	12095	SCREW DIN 933 8.8 M12x70	MULS 130	2
71	13644	SCREW DIN 931 10.9 M10x40	MULS 110	12
72	11519	FLAT HEAD COUNTERSUNK SOCKET DIN 7991 M4x12		4
73	11627	CARRIAGE SCREW DIN 603 8.8 M10x30		6
76	11043	WASHER DIN 125 Ø 6		2
77	11046	WASHER DIN 125 Ø 12		3
78	11076	WASHER WIDE DIN 9021 8		3
79	11084	SPRING WASHER DIN 127 A6		2
80	11085	SPRING WASHER DIN 127 A8		1
81	11835	WASHER DIN 25201 NL 10		12
82	11836	WASHER DIN 25201 NL 12		10
83	12011	WASHER DIN 25201 NL 12F		2
86	10578	SELF-LOCKING NUT DIN 985 M8	MULS 170	14
			MULS 150	12
			MULS 130	10
			MULS 110	8
87	10579	SELF-LOCKING NUT DIN 985 M10		6
88	10580	SELF-LOCKING NUT DIN 985 M12		4
90	10587	SELF-LOCKING NUT DIN 985 M20	MULS 170	16
			MULS 150	14
			MULS 130	12
			MULS 110	10
91	10544	NUT DIN 934 M12		1
92	10562	NUT LOW DIN 439 M12		2

Gearbox for MULS 110, 130, 150, 170 LW



When ordering spare parts for the gearbox, you must specify the manufacturer, code and type of the gearbox or provide a photo of the identification plate of the gearbox. The length of the gearbox extension L is measured with the gearbox included.

POS.	IDENT.	NAME		QTY.
1	T03838	GEARBOX EXTENSION TUBE L715	MULS 170	1
	13294	GEARBOX EXTENSION TUBE L615	MULS 130.150	1
	13384	GEARBOX EXTENSION TUBE L500	MULS 110	1
2	T03831	GEARBOX EXTENSION SHAFT L715	MULS 170	1
	T03832	GEARBOX EXTENSION SHAFT L615	MULS 130.150	1
	T03834	GEARBOX EXTENSION SHAFT L500	MULS 110	1
3	13317	BEARING 6207		1
4	11706	INTERNAL RETAINER RING DIN 472 fi 72		2
5	13301	AXIS SEALANT DIN 3760 35x72x7		1
6	13299	GEARBOX PLUG WITH TAP 3/8"		3
7	11442	HEX SCREW DIN 912 M10x25		4
8		DOWEL TALL DIN 6885A		1
10	13583	SINGLE SIDE GEARBOX		
11		BEARING		
12		BEARING		
13		BEARING		
14		BEARING		
15		AXIS SEALANT		
16		AXIS SEALANT		
17		COVER SEALANT		
20	13300	GEARBOX AIR VENT		1

10 Conformity declaration

EC conformity declaration

Pursuant to

EC DIRECTIVE 2006/42/EC AND MACHINERY SAFETY RULES

(OFFICIAL GAZETTE OF THE REPUBLIC OF SLOVENIA NO. 75/08, 66/10 AND 74/11).

The manufacturer:

TEHNOS - PROIZVODNJA STROJEV IN ORODIJ,
CESTA OB ŽELEZNICI 1, 3310 ŽALEC, SLOVENIA

Description of the device – machine:

FLAIL MOWER

MULS 110 LW, MULS 130 LW, MULS 150 LW, MULS 170 LW

Declares under full liability, that the following machine

FLAIL MOWER

MULS 110 LW, MULS 130 LW, MULS 150 LW, MULS 170 LW

complies with the following regulations and standards:

EC DIRECTIVE 2006/42/EC AND MACHINERY SAFETY RULES

(OFFICIAL GAZETTE OF THE REPUBLIC OF SLOVENIA NO. 75/08, 66/10 AND 74/11).

Harmonized and other standards:

SIST EN ISO 12100: 2011, SIST EN ISO 4254-1: 2016, SIST EN ISO 4254-12: 2012

SIST EN ISO 4254-12: 2012/opr A1: 2016, SIST EN ISO 13857: 2008, SIST EN ISO 4413-1: 2011

Person responsible for technical documentation:

RKT, Jože Leva, Aleš Zorko, TEHNOS - PROIZVODNJA STROJEV IN ORODIJ,
CESTA OB ŽELEZNICI 1, 3310 ŽALEC, SLOVENIA

Date:

Žalec, 01. 06. 2017

SIGNATURE OF THE PERSON RESPONSIBLE:

Anton Kisovar, Director

LIST OF PREVENTIVE EXAMINATIONS AND MAINTENANCE INTERVENTIONS FOR THE USER

MAINTENANCE REMINDER	After first 5 working hours	After first 20 working hours	Every 10 working hours	Every 200 working hours	Periodically	Every 2 years
Belt tensioning	X	X			X	
Tightening the screws	X		X			
Oil level check					X	
Oil change		X		X		X
Lubrication of all greasing points			X			

Tightening torques for screws (Nm)		
Thread	Screw quality	
	8.8	10.9
M 8	28	40
M 10	55	80
M 12	95	140
M 14	150	225
M 16	240	314
M 18	330	475
M 20	430	615

ACTIVITY	DATE	NOTES

