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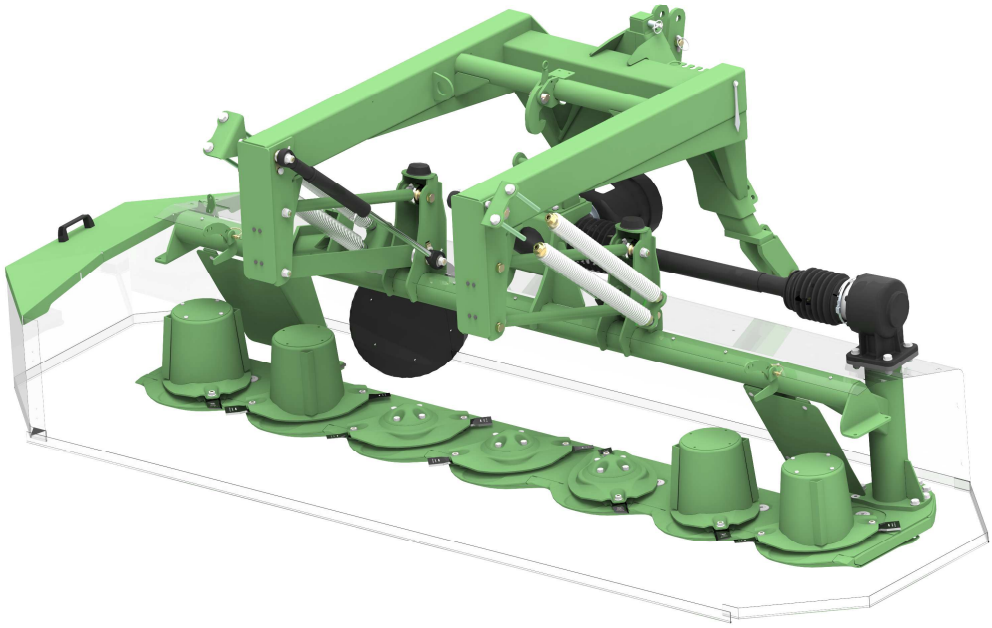
OPERATOR'S MANUAL



FRONT DISC MOWER

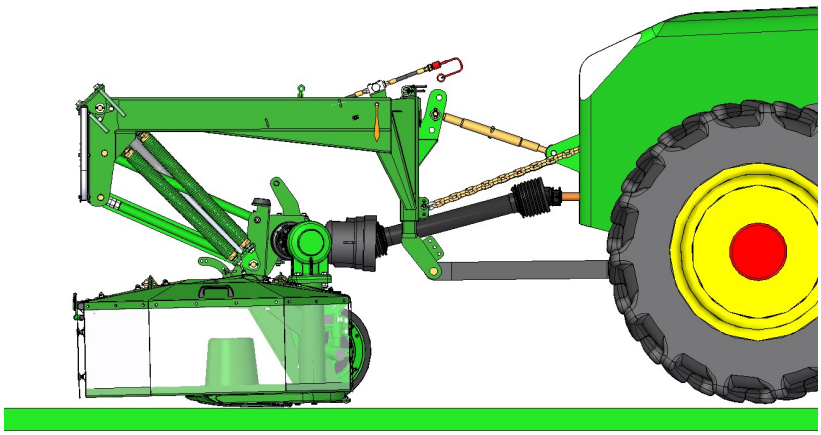
KDF 260	**- 8' 6"**	**KDF 340**	**- 11' 2"**
KDF 300	**- 9' 10"**	**KDF 341 W**	**- 11' 2"**
KDF 301 W	**- 9' 10"**	**KDF 341 S**	**- 11' 2"**
KDF 301 S	**- 9' 10"**	**KDF 341 SL**	**- 11' 2"**
KDF 301 SL	**- 9' 10"**	**KDF 390**	**- 12' 9"**

W – Mowers with roller conditioner
S – Mowers with tine conditioner
SL - Mowers with light weight swath conditioner

Serial No:

IN229USA010
2017-02-20
EDITION No 10

Translation of original instructions



Recommended inclination 0 - 5° towards mowing direction.
Do not work in horizontal position.
Different inclination may damage the mower.

DO NOT
TURN THE DRIVE ON
IF THE MOWER IS NOT IN
WORKING POSITION

DO NOT
LIFT THE MOWER
BEFORE THE MOWING
DISCS HAVE COME TO
COMPLETE STANDSTILL

DO NOT
OPERATE WHEN ANY
PERSON REMAINS IN THE
DANGER AREA OF 170′.

WARNING:
Keep this manual for future use.

Well-proven design with thousands of machines in regular use in many countries and quality materials ensure high durability and reliability of SaMASZ mowers.

We congratulate you on the purchase of your new SaMASZ mower and wish you much pleasure and the very best work results through the years to come.

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1. IDENTIFYING THE MACHINE

Data plate is mounted to the mower's main frame in the place shown below (**Fig. 1**).

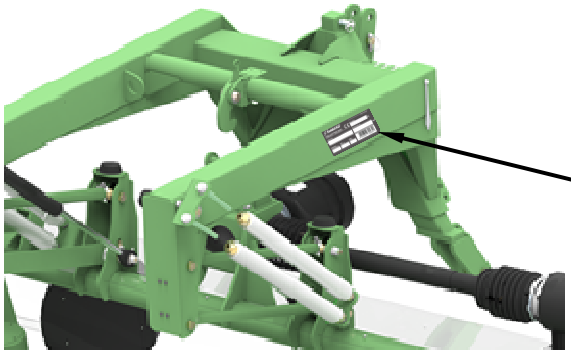


Fig. 1. Data plate location

Fig. 2. Data plate

Data plate includes:
- name and adress of the manufacturer,
- CE marking means, that the produce conforms to 2006/42/EC Directive and harmonized standards,
- machine symbol,
- date of manufacture,
- model year,
- version number,
- machine weight,
- id number,
- barcode.

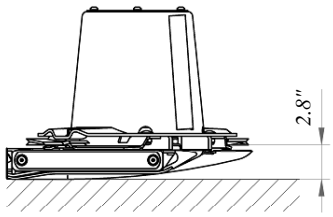
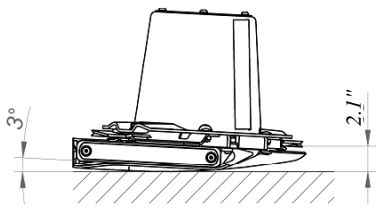
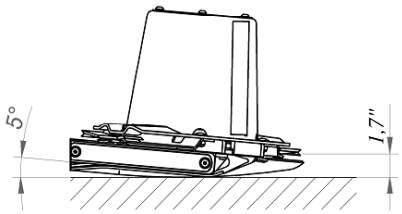
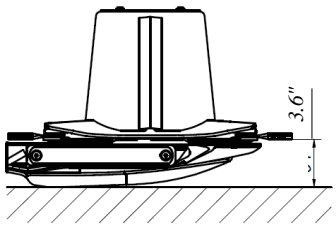
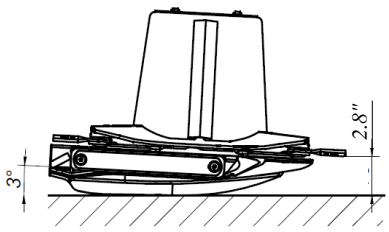
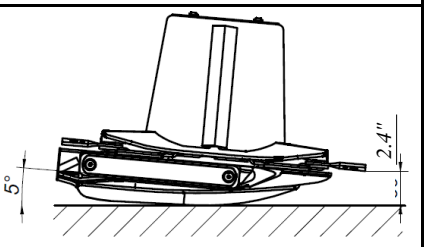
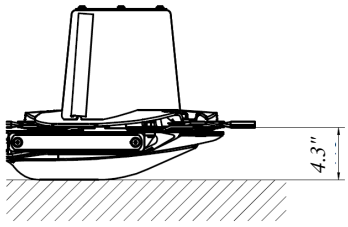
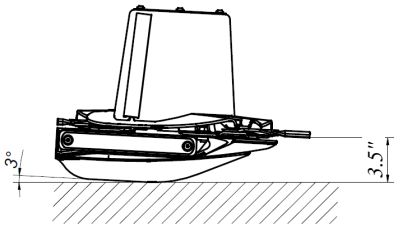
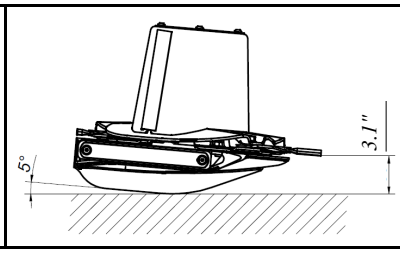
2. INTRODUCTION

- This operator's manual is essential for safe and proper use of this mower and should be read before anyone operates this mower. It should be kept near the mower for future use. If the mower is used by other operator, it should be in working condition and include this operator's manual and all other basic equipment.
- Operator's manual is delivered with every machine so that the operator can familiarize himself with the design, working principle, servicing and adjustment of the mower. The operator should be familiar with common safety rules and procedures.
- The mower is manufactured according to international safety rules.
- Compliance with the safety precautions in this operator's manual will enable safe operation.
- Please contact your dealer if you have any queries relating to the operation and service of the mower.

3. PROPER AND INTENDED USE

Mower KDF is equipped with the **"Perfect Cut"** cutting bar. In table 1 the mowing height differences, depending on the inclination angle of the cutting bar are shown.

Tab. 1. Mowing height depending on cutterbar's inclination angle

„Perfect Cut" cutting bar		
No tilt	3° tilt	5° tilt
Standard mowing height		
		
Optional heights when using high mowing topping		
		
Optional heights when using high mowing double topping		
		

- The front mounted disc mower is intended for mowing green fodder such as grass and alfalfa on permanent grassland (pastures), on crop fields without rocks, and forming loose rows of cut fodder. The pasture or field being mown should be even and best if prepared by rolling. In the event there is a majority of tall grass, the first and second mowing should be done at a height of 2.4" - 2.8", while with a majority of short grass, at a height of 2". The last mowing should be done a little higher - at 2.8" - 3.1" from the ground.
- The front mounted disc mower with tine/roller conditioner is intended for mowing green fodder such as grass and alfalfa on permanent grassland (pastures), on crop fields without rocks, and forming loose rows of cut forage. As a result of the passing of the layers of the green fodder through the flails or rollers, the grass stems are broken and a layer of wax is removed. This facilitates and speeds up the drying process of the fodder by approximately 30 to 40%. The use of rollers is especially recommended when mowing legumes such as alfalfa. The pasture or field being mown should be even and best if prepared by rolling. This is especially true of mowers with rollers as they tolerate rocks with a diameter of a few inches. If a larger stone is picked up, stop and remove it as it could cause damage to the discs. With a majority of tall grass, the first and second mowing should be done at a height of 2.4" - 2.8", while with a majority of short grass it should be cut at a height of 2". The last cut should be done a little higher - at 2.8" - 3.1"from the ground.

WARNING:
Use of the mower for purposes other than described above is forbidden. Improper use can be dangerous and may lead to voiding the warranty. Mower should be operated and repaired only by persons familiar with its detailed specifications and with all applicable safety rules and regulations as well as the relative dangers. Unauthorized modifications introduced to the mower will lead to voiding the warranty.

3.1. Technical data

Tab. 2. Specification of the mower KDF and KDF W

Model		**KDF 260**	**KDF 300**	**KDF 340**	**KDF 390**	**KDF 301W**	**KDF 341 W**
Working width		8′6″	9′10″	11′1″	12′9″	9′10″	3,40 m
Number of knives [pcs.]		12 (6x2)	14 (7x2)	16 (8x2)	19 (9x2)	14 (7x2)	16 (8x2)
Tractor PTO rpm		1000 rpm					
Tractor power required		54 kW (70 HP)	60 kW (80 HP)	66 kW (90 HP)	90 kW (120 HP)	74 kW (100 HP)	81 kW (110 HP)
Working capacity V = 12 km/h		~ 2,8 ha/h	~ 3,5 ha/h	~ 4 ha/h	~ 4,6 ha/h	~ 3,5 ha/h	~ 4 ha/h
Swath width		2′11″-3′7″	4′3″-4′11″	4′3″-5′3″	4′3″-5′11″	4′3″-4′11″	4′3″-4′11″
Transport length		5′5″	5′5″	5′5″	5′7″	5′7″	5′7″
Transport width		8′6″	9′10″	11′1″	12′9″	9′10″	9′10″
Working width		10′4″	11′8″	12′11″	14′5″	11′8″	13′3″
Weight		1774 lbs.	2073 lbs.	2248 lbs.	2347 lbs.	2999 lbs.	3251 lbs.
Noise level	L_{pA}	101 ± 1 dB				100,5 ± 1 dB	
	L_{Amax}	112,5 ± 1 dB				112 ± 1 dB	
	L_{Cpeak}	114 ± 1 dB				113,5 ± 1 dB	
Tine/roller conditioner shaft		-				818 rpm	

W – Mowers with roller conditioner

Tab. 3. Specification of the mower KDF S and KDF SL

Model		**KDF 301S**	**KDF 301SL**	**KDF 341S**	**KDF 341SL**
Working width		9′10″	9′10″	11′2″	11′2″
Number of knives [pcs.]		14 (7x2)	14 (7x2)	16 (8x2)	16 (8x2)
Tractor PTO rpm		1000 rpm			
Tractor power required		74 kW (100 HP)	74 kW (100 HP)	81kW (110 HP)	81kW (110 HP)
Working capacity V = 12 km/h		~ 3,5 ha/h	~ 3,5 ha/h	~ 4 ha/h	~ 4 ha/h
Swath width		4′7″-5′7″	4′7″-5′7″	4′7″-5′7″	4′7″-5′7″
Transport length		5′7″	5′7″	5′7″	5′7″
Transport width		9′10″	9′10″	11′2″	11′2″
Working width		11′8″	11′8″	13′3″	13′3″
Weight		2777 lbs.	-	2954 lbs.	-
Number of conditioner's tines [pcs.]		58	108	68	128
Tine/roller conditioner shaft		818 rpm			
Noise level	L_{pA}	99,5 ± 1 dB			
	L_{Amax}	111 ± 1 dB			
	L_{Cpeak}	113,5 ± 1 dB			

S – Mowers with tine conditioner SL - Mowers with light weight swath conditioner

L_{pA} – noise level related to 8 hour working time. Averaged in time acoustic pressure level corrected by frequency characteristic A.
L_{Amax} – maximum value corrected by frequency characteristic A of acoustic pressure level.
L_{Cpeak} – peak level of acoustic pressure corrected by frequency characteristic C.

3.2. Design and working principle

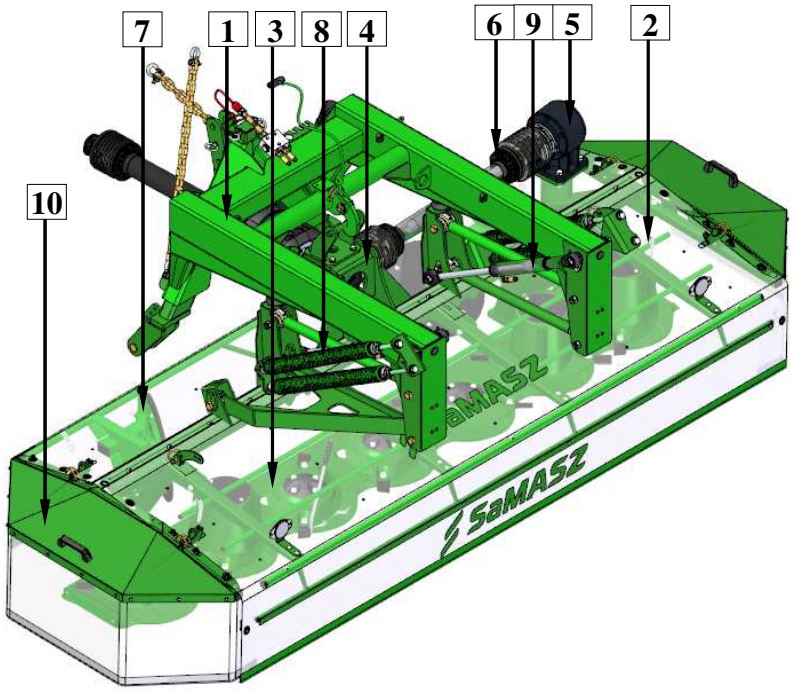


Fig. 3a. Parts of SaMASZ front disc mower

1 – Suspension frame
2 – Main frame
3 – Cutterbar
4 – Intersecting axis gear I
5 – Intersecting axis gear II
6 – Cutterbar drive shaft
7 – Swath discs
8 – Support springs
9 – Hydraulic cylinders
10 – Safety guard

Drive from tractor's rpm is transmitted through PTO shaft, intersecting axis gear I (**4**), cutterbar drive shaft (**6**) and intersecting axis gear II (**5**) to the cutterbar (**3**). On the cutterbar, there are discs with two knives each. The outer discs have additional forming drums. Cutterbar is connected to the main frame (**2**) with suspension frame (**1**). On the suspension frame, there is the mower's triangle, which is designed to connect the mower to the tractor's front 3-point linkage. Over the cutterbar, there are safety guards (**10**).

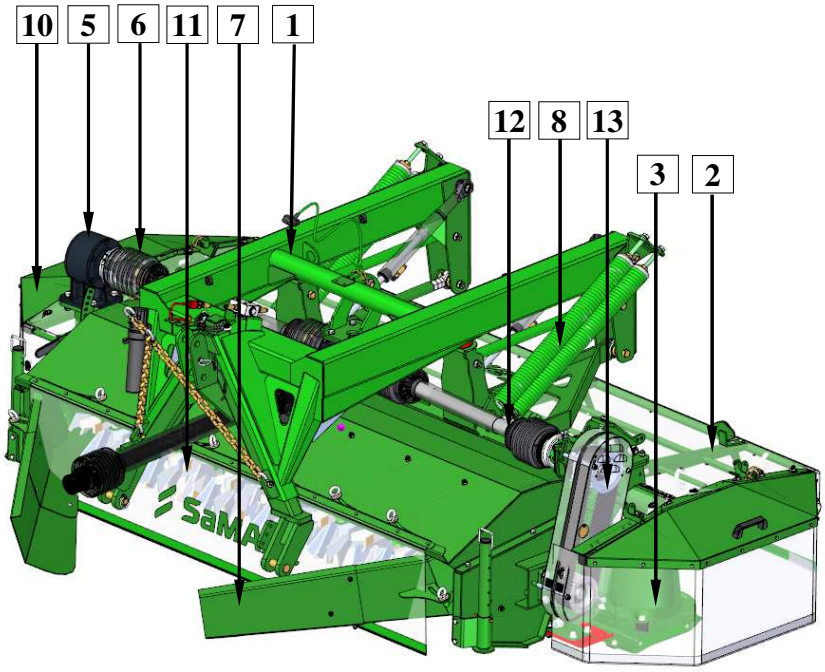


Fig. 3b. Parts of SaMASZ front disc mower with tine conditioner

1 – Suspension frame
2 – Main frame
3 – Cutterbar
4 – Intersecting axis gear I
5 – Intersecting axis gear II
6 – Cutterbar drive shaft
7 – Swath guide
8 – Support springs
9 – Hydraulic cylinders
10 – Safety guard
11 – Tine conditioner
12 – Tine conditioner drive shaft
13 – Gearbox

Drive from tractor's rpm is transmitted through PTO shaft, intersecting axis gear I (**4**), cutterbar drive shaft (**6**) and intersecting axis gear II (**5**) to the cutterbar (**3**). On the cutterbar, there are discs with two knives each. The outer discs have additional forming drums. Apart from that, drive from tractor's rpm through intersecting axis gear I (**4**), tine conditioner driver shaft (**12**) and gearbox (**13**) is transmitted to tine conditioner (**11**). Cutterbar is connected to the main frame (**2**) with suspension frame (**1**). On the suspension frame, there is the mower's triangle, which is designed to connect the mower to the tractor's front 3-point linkage. Over the cutterbar, there are safety guards (**10**).

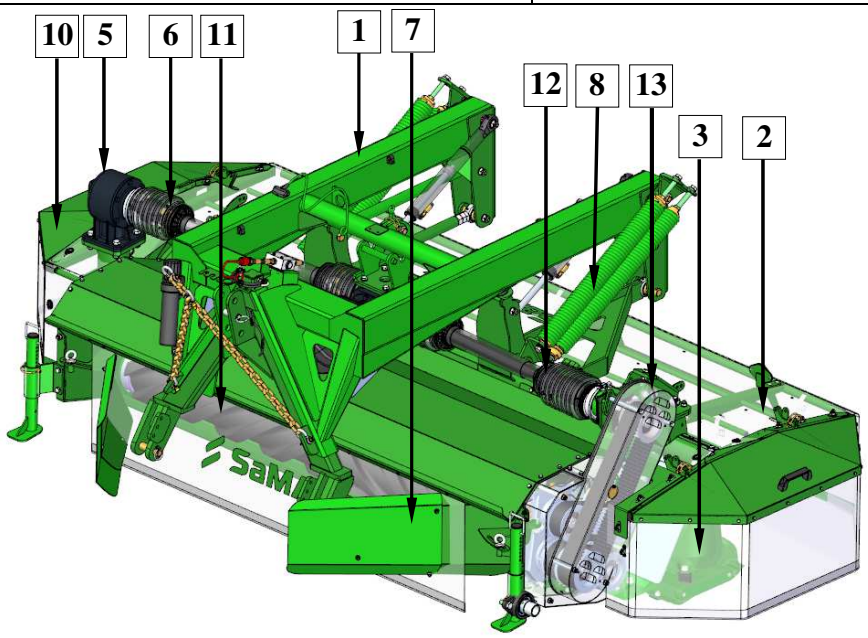


Fig. 3c. Parts of SaMASZ front disc mower with roller conditioner

1 – Suspension frame
2 – Main frame
3 – Cutterbar
4 – Intersecting axis gear I
5 – Intersecting axis gear II
6 – Cutterbar drive shaft
7 – Swath guide
8 – Support springs
9 – Hydraulic cylinders
10 – Safety guard
11 – Roller conditioner
12 – Roller conditioner drive shaft
13 – Gearbox

Drive from tractor's rpm is transmitted through PTO shaft, intersecting axis gear I (**4**), cutterbar drive shaft (**6**) and intersecting axis gear II (**5**) to the cutterbar (**3**). On the cutterbar, there are discs with two knives each. The outer discs have additional forming drums. Apart from that, drive from tractor's rpm through intersecting axis gear I (**4**), roller conditioner driver shaft (**12**) and gearbox (**13**) is transmitted to roller conditioner (**11**). Cutterbar is connected to the main frame (**2**) with suspension frame (**1**). On the suspension frame, there is the mower's triangle which is designed to connect the mower to the tractor's front 3-point linkage. Over the cutterbar, there are safety guards (**10**).

3.3. Standard equipment and spare parts

The mowers are sold with the following standard equipment:

- warranty card,
- operator's manual with spare parts list,
- cutting knives: additional set,
- holders for warning plate and lights,
- PTO shaft with friction clutch,
- tractor's triangle,
- spray paint (150 ml).

Optional extra equipment:

- warning plate with combined lights and reflectors,
- warning triangle,
- side shift adapter,
- high mowing toppings / double toppings.

Tab. 4. Recommended PTO shafts for front disc mowers

Model	Power	Length	Moment	Symbol	Clutch	Manufacturer
	HP	in	Nm			
KDF 260	74	33.46″-50.63″	520	8G5T085CE007001	Overrunning clutch = 1200 Nm	Bondioli & Pavesi
KDF 300						
KDF 340						
KDF 390						
KDF 301 S/SL/W	100	39.76″-60.75″	710	8G7T101CE007002		
KDF 341 S/SL/W						

PTO shaft's end without clutch – To be mounted on the tractor's side.

PTO shaft's end with overrunning clutch – To be mounted on mower's side

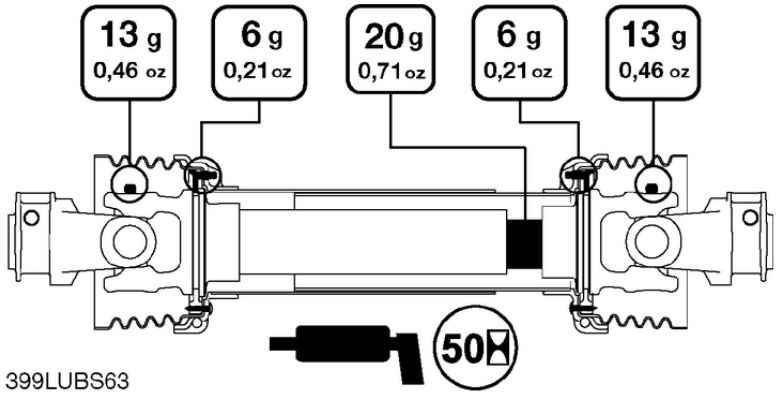


Fig. 4. PTO shaft lubrication points. Mounting directions

NOTICE:
Lubricate the PTO shaft with high quality multi-purpose grease every 50 shaft operating hours. The shaft should also be lubricated before and after longer idle periods.

PTO shafts of other brands with equivalent parameters could be used afer SaMASZ permission.

NOTICE:
Optional extra equipment should be ordered separately.

The mower is equipped with such elements as holders and brackets used to mount warning lights and plates. Combined lights and reflectors are mounted on the warning plates.

4. SAFETY PRECATIONS

⚠ WARNING The following precautions are for your safety. They must be read carefully and followed by every person who operates or maintains the machine. Failure to follow these safety precautions could result in serious injury or death to the operator, maintenance person or bystanders and property damage to the machine and surrounding property.

Safety Signal Words

This manual and the safety labels attached to this equipment utilize signal words that signify safety hazards with different levels of severity. Below are the words used and the definitions for these words:

- **DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury

- **WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury
- **CAUTION** indicates a hazardous situation which, if not avoided, could result in minor or moderate injury
- **NOTICE** is used to address practices not related to physical injury

4.1. General safety rules and regulations

The following descriptions are for your safety: They must therefore be read carefully and applied every time you use the machine.

- The machine has been designed for use by one single operator.
- When using, servicing, repairing, moving or storing the machine, the operator must wear safety shoes, safety gloves plus ear protection and dust mask if necessary.
- During use, the machine may give rise to dust, especially if the soil is dry. You are advised to use a tractor with a cab fitted with filters in the ventilation system. Failing this, wear a dust mask with filter to protect your respiratory tract.
- Front axis of the tractor should be weighted to keep the balance. If need be, use front wheel weights.
- In order to keep steering conditions, impact on front axis should be at least 20% of the complete tractor.
- Be extremely careful whenever using hydraulic lift lever or buttons. Any operation with hydraulic lift lever should be done from operator's seat; DO NOT move the lever from outside of a tractor.
- In case of tractors equipped with EHR, operating with hydraulic lift is done by the buttons mounted outside the tractor's cabin. When operating be extremely careful.
- When switching from mowing to transport position, remove the entire PTO shaft or at least one end of the shaft from the tractor's PTO so it cannot turn.
- When attaching the mower to a tractor, the operator should wear protective gloves.
- DO NOT operate the mower unless all safety guards are in place and operational. In addition, any damaged protective aprons should be replaced with a new one
- DO NOT exceed 1050 PTO rpm.
- No person (except operator) should stand within danger area which is a minimum of 170' from any operating part, especially when operating near roads and in areas with stones and other debris. Be certain that children and animals are at a safe distance away from the machine.
  IMPORTANT: Maintenance and adjustment should ONLY be done after the following has occurred:
  - tractor's engine has been stopped and ignition key has been taken out,
  - all rotating parts have come to complete standstill (NOTICE: cutting knives will rotate for several minutes after engine is turned off),
  - the cutterbar is on the ground, and
- Never tamper with or remove safety devices on the machine or make them inoperable.
- Before starting work and periodically thereafter, replace any damaged, missing and/or worn knives and knife holders.
- When driving on public roads always comply with local traffic regulations, especially those concerning warning lights.
- When the mower is lifted for repair on 3-point linkage, it should be secured against falling by mechanical support or by chain.
- The bolts and other fasteners have to be periodically checked and, if necessary, tightened or replaced. DO NOT work with damaged or worn fasteners.
- Never lift the mower on tractor linkage when the drive is operating and the cutting discs are rotating.

- When operating the mower, the tractor should always be equipped with operator protection that is required by laws and regulations.
- Never start the mower when the mower blades are off the ground.
- Before you start the tractor make sure that all drives are turned off and the levers that turn the hydraulics are in neutral position.
- Never leave tractor's engine running without supervision. Before you leave the tractor, turn off the engine and remove the key from tractor's ignition.
- DO NOT operate the mower when driving the tractor backwards.
- Permissible inclination of the mower on a slope when working and during transport is 8°. Exceeding this incline can result in mower tipover.
- Never stand between tractor and mower unless tractor and mower are secured against moving by the tractor's brake.
- If any maintenance must be done under an elevated mower, it must be blocked or otherwise secured against falling.
- When the parts of the mower need replacement, use only original spare parts as described in the spare parts list. Pay particular attention to PTO shaft's guards and mower's and tractor's spline shaft guards.
- Hydraulic hoses are potentially very dangerous. Do the following to minimize any hazards:
    - Hydraulic hoses should be periodically checked and if any damage to the hoses have occurred or if they have been used more than 5 years, replace with new ones.
    - Never use scotch tape to repair hydraulic hoses.
    - When connecting hydraulic hoses to tractor's hydraulic connectors, make sure that the tractor's or mower's hydraulic system is not under pressure.
- The mower should be stored under a roof and in a way as to not be hazardous bot people or animals.
- In the event of an accident involving this mower in a field or on a road, follow all applicable first aid procedures and contact SaMASZ technical service.
- Mower should be kept clean, so as to avoid danger of fire.

4.2. Conditions of mounting mower on tractor

- Prior to the mounting operation, be sure that the tractor and mower hitches are compatible and that the tractor's hitch load is adequate for the machine which is to be mounted or attached.
- Prior to mounting the machine, examine the technical condition of the mower's hitch assembly and tractor's 3-point linkage.
- Use only genuine cotter pins to mount the mower on a tractor.

4.3. Transport

The lifting, handling and transporting operations can be very dangerous unless they are carried out with the utmost caution. Have all persons not involved in the actual work move away from the area and limit the zone where the operations are to be carried out. Also make sure that the area in which the operations take place is clear and that there is a sufficient escape route, i.e. a free, safe zone to which the operators can quickly move if the load should fall.

The safety hooks and ropes used to lift the machine must be of an adequate carrying capacity.

To minimize the risk of serious injury or death, do the following:

- When the machine is converted from the transport position to the work position and vice versa, you could be pinched or crushed by some of its parts. Take extra care when carrying out these maneuvers and have all persons keep well clear of the danger zone.
- Do not change position of the mower until there are no people or animals around (pay particular attention to children).
- While transporting the mower, put a warning plate with combined lights and reflectors and warning triangle on the mower.

- During transport, always put the mower in its proper and safe transport position. See section 5.3.
- Before putting the mower in transport position, make sure that the tractor's PTO is turned off and all rotating parts have come to a complete stop.
- Do not drive over 25 km/h (15 mph). Drive slower if road conditions are poor, especially on irregular surfaces or steep slopes.
- The behavior of the tractor on the road, such as its turning and braking capacities, are affected by the implements mounted.
- When driving on the road after work, check to make sure that the tires and soil working tools are clean to prevent the road surface from becoming dirty.
- Make sure that the machine is not damaged during transport.

4.3.1. Putting the mower onto another vehicle for transport

The driver and the carrier are responsible for the mower's transport safety. Equipment and parts must be secured during transport. To put the mower onto another vehicle in a safe way, please obey the following rules:

- Transport should be done by qualified and specifically trained personnel,
- Grab the mower by any lifting devices only in places indicated by hook sign (**Fig. 5**),
- For mower lifting, use only lifting devices with hoisting capacity larger than mower's weight shown in data plate. This also applies to ropes and chains used for lifting,
- Do not lift if transport belts, belt suspensions, ropes are damaged. Whenever damage to these parts occurs, replace with new ones,
- When mounting slings, chains, handles etc., always set the machine's center of gravity properly,
- To safely support the machine, use ropes of adequate length so that the angle between them is no greater than 120°, and the angle between the strand and the vertical is no greater than 60°,
- Lift the machine with the utmost caution and move it slowly,
- No one should be within the range of action of the lifting equipment when any transporting operations are being carried out,
- Collapsible parts should be blocked in transport position,
- When the mower is on the vehicle's trailer, the machine should be secured against moving.

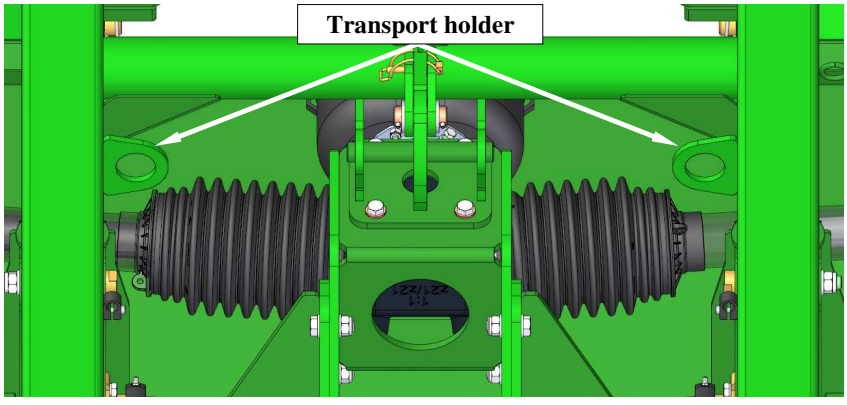


Fig. 5. Transport holders

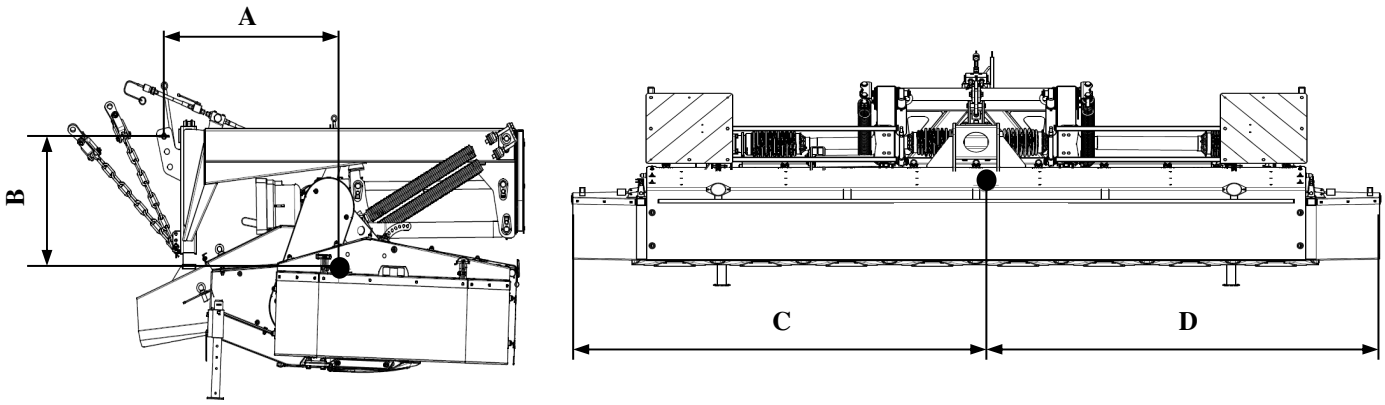


Fig. 6. Location of centre of gravity KDF mowers

Tab. 5. Location of centre of gravity

Dimension [ft in]	Model							
	KDF 260	KDF 300	KDF 340	KDF 390	KDF 301 S(SL)	KDF 341 S(SL)	KDF 301 W	KDF 341 W
A	2′5″	2′6″	2′11″	1′11″	2′11″	2′12″	2′11″	3′4″
B	2′	1′11″	2′3″	2′7″	1′10″	1′11″	1′11″	1′11″
C	5′6″	6′2″	6′11″	7′8″	6′	6′8″	5′10″	6′10″
D	4′9″	5′5″	6′	6′9″	5′7″	6′3″	5′9″	6′1″

4.4. Working parts

- Before operating the mower check knife's and knife holder's condition.
- Worn or damaged knives or knife holders should be immediately replaced with new one.

4.5. PTO shaft

- Before operating, read bar manufacturer's manual placed on the bar. Follow all safety precautions in that manual.
- Use only PTO shafts recommended by mower's manufacturer with guards in good condition.
- In order to operate safely, use only undamaged PTO shafts and shields. Damaged PTO shafts and shields must be repaired or replaced with new ones before use.

4.6. Hydraulic assembly

- Hydraulic assembly is under high pressure. Hydraulic oil under pressure may penetrate skin and cause serious injury or death. Skin and eyes should be protected when working around this assembly.
- In case of injury caused by a liquid under pressure, call a doctor immediately.
- Hydraulic hoses can be connected to the tractor's hydraulics provided that both the tractor's and the mower's hydraulic assemblies are not under pressure. To remove the pressure from the hoses, start the tractor's hydraulic valves several times with the tractor off.
- When looking for oil leaks, do so safely. Use a cardboard card. Do not touch any potential leaks until the entire hydraulic assembly has been relieved of pressure.
- Use only hydraulic oil featuring oil purity class 9 - 10 in accordance with NAS 1638.

When using hydraulic hoses:

- Avoid stretching the hoses when operating.
- Do not allow hydraulic hoses to get deflected.
- Do not expose hydraulic hoses to contact with any sharp edges.
- If damaged or worn, replace the hoses with new ones.
- Useful life for hydraulic hoses is 5 years from their production date.

4.7. Safety curtains

SaMASZ mowers feature standard safety curtains (**1**) for self-mounting. In order to mount the guard properly, put it on a mower and secure with catches (**2**) and front guard (**3**) **Fig. 7**. Examine condition of guards and its mounting on a regular basis. Fix immediately if damaged and replace if missing. Do not operate mower without safety curtains.

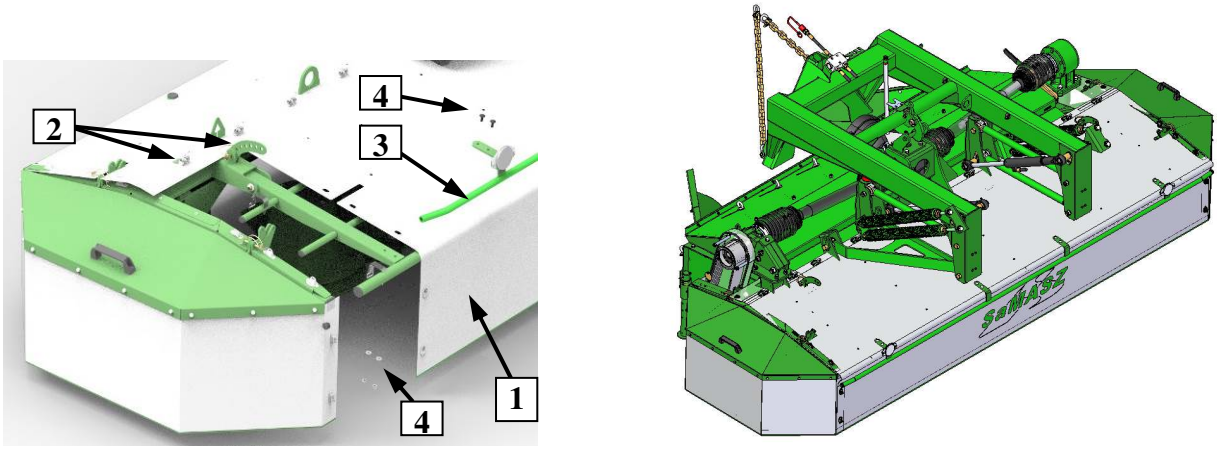


Fig. 7. Mounting safety curtains on the mower

4.8. Residual risk

Despite the fact that SaMASZ Białystok, the manufacturer of the mower, has taken great care in the design and manufacturing of the mower, certain risks during mower operation and maintenance are unavoidable. A major source of risk that could result in serious injury or death can occur during the performance of these operations.

Major source of risk follows performance of these operations:

- operation of mower by minors,
- operation by individuals who have not read the operator's manual and safety labels,
- operation of mower by persons under influence of alcohol or other substances,
- not being cautious during transportation and moving mower during operation,
- transport of persons who are on the machine,
- presence of persons and animals within the mower operation range,
- performing servicing and machine adjustments with the engine on.

4.8.1. Danger of machine entanglement

This risk occurs when (1) changing position of a mower, (2) operating near rotating parts, and (3) working without safety guards. During operation, maintenance and adjustment, always wear protective gloves, shoes and clothes without loose parts, belts and so on. Always comply with safety labels placed on the mower.

4.8.2. Danger of cutting injury

This risk occurs during replacement of working parts with sharp edges. During any maintenance work, always use safety gloves.

4.8.3. Danger of injury from liquid ejection out of hydraulic system

During connection of hydraulic hoses to hydraulic connectors, be sure that tractor's or mower's hydraulic system is not under pressure. Regularly check hydraulic hoses for leaks.

4.8.4. Forbidden actions

During mower's operation, do not do the following:

- never unblock the mower, make any regulations or repairs of the mower while it is in motion,
- never change order of operation and maintenance activities described in operator's manual,

- never operate the mower when it is not in working order or has damaged safety guards,
- never get your hands and legs close to rotating parts of the mower,
- during repair and maintenance of the mower, always comply with descriptions included in operator's manual. Always do these activities when the tractor's drive is off,
- never operate the mower under influence of alcohol, drugs, or strong medicine that impair your attention,
- do not wear clothes or jewelry that are too loose or too tight. Too loose clothing or jewelry may be pulled in by the rotating parts of the mower,
- the mower should not be operated by children or by handicapped people,

When describing residual risk, the mower complies with the state of the art in technology on the date it was manufactured.

4.9. Residual risk assessment

Residual risk occurs from not complying with the instructions and safety precautions. Such risk can be minimized by doing the following:

- thorough familiarizing yourself with operator's manual,
- allow no persons on the machine when operating,
- allow no persons within the mower operation range,
- adjust, maintain and lubricate the machine with the engine off,
- only skilled persons should perform repairs of the machine,
- children and strangers must keep away when the machine is operating,

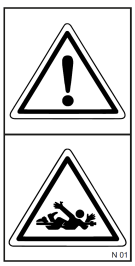
When the risk of exposure to noise cannot be avoided or eliminated by any protective means or organization of work, the employer (farmer) must:

1) provide the operator with individual means of noise protection if the noise level in work place exceeds 80 dB.
2) provide the operator with individual means of noise protection and supervise the correctness of its usage, if the noise level in work place reaches or exceeds 85 dB.

4.10. Safety labels and their meaning

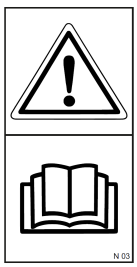
Safety labels are critical to safe use of this mower. They must be read, understood and followed. Also, be sure that:

- All warning decals are clean and legible
- All lost or damaged decals are replaced by ordering new decals from your dealer or supplier
- All persons using this mower have read the section of this manual explaining the meanings of these labels
- All spare part used for repair of the mower should have all safety labels provided by the manufacturer.

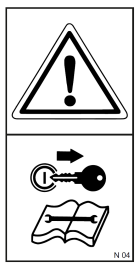


N-01
Be extremely careful when PTO shaft is rotating!

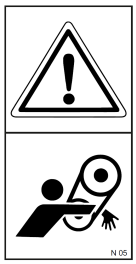
N-02
Caution – cutting knives. Approach during operation is forbidden!



N-03
Caution – read the operator's manual before putting the mower into operation!



N-04
Caution – while making repairs the machine must be stopped

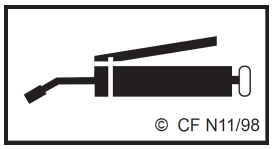


N-05
CAUTION – belt transmission, be extremely careful!

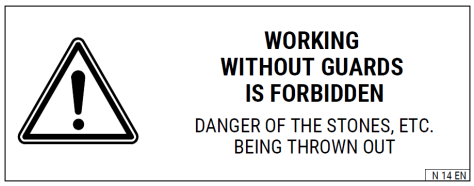
N-06
Caution – rotating parts

N-07
Operating is forbidden when any person is within the danger area of 170'!

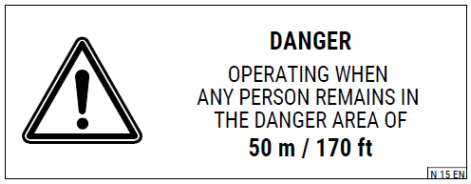
N-09
Caution: rotor



N-11

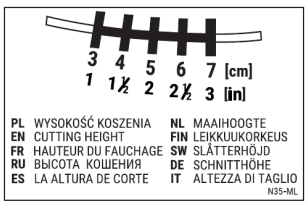


N-14

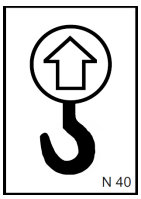


N-15

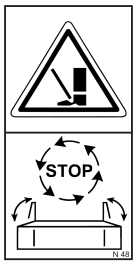
N-23
Watch out: power lines



N-35
Cutterbar **"Perfect Cut"**



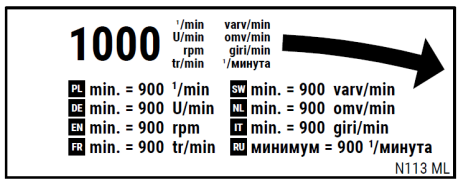
N-40
Signs indicating transport holders



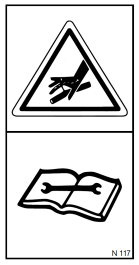
N-48
Lower side safety guards before turning the drive on

N-49
Do not get too close to the hoist of the tractor during operation of the hoist

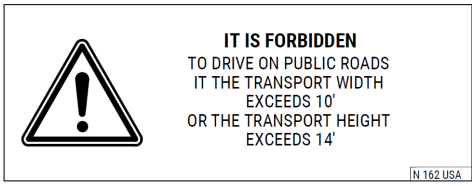
N-50
Do not stay in the swinging area of mower's parts



N-113

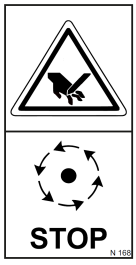


N-117
Under pressure. Consult technical manual for service procedures



N-162

N-167
Do not remain on the machine while driving

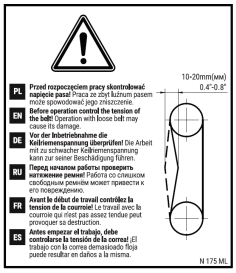


N-168
Do not touch the machine before the rotating parts have not come to a complete standstill

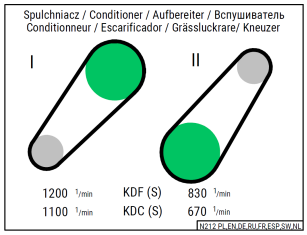
N-204
Use the required Personal Protective

N-205
Use the required Personal Protective

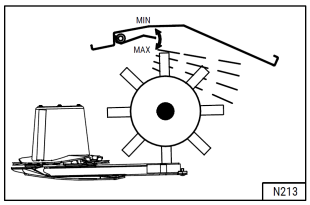
N-206
Use the required Personal Protective



N-175



N-212
Conditioner's rpm



N-213
Conditioner's intensity

N-224
Do not open and remove safety guards with motor operating

CAUTION:
Any spare part used for repair of the mower should have all warning decals provided by the manufacturer.

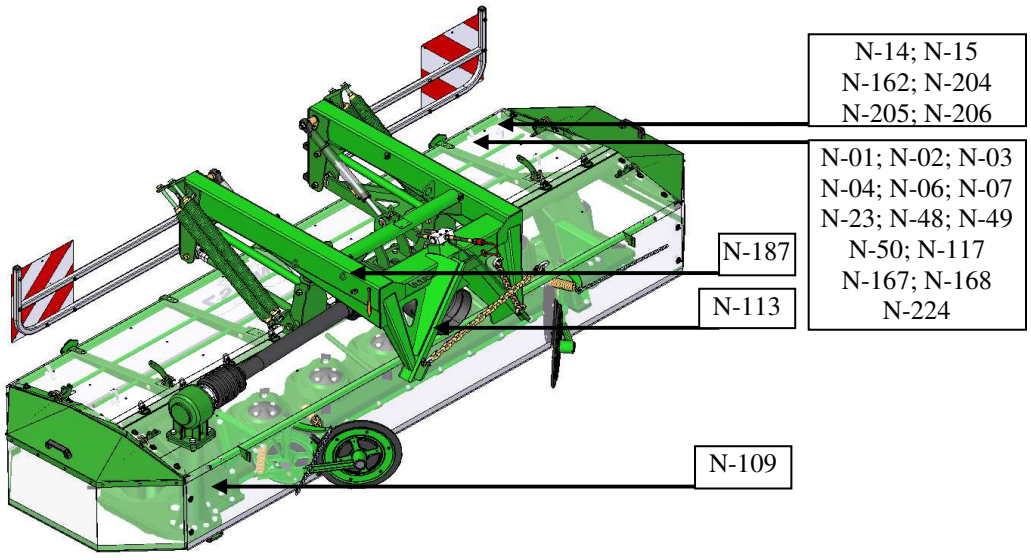


Fig. 8a. Warning decals placed on the mower without conditioner

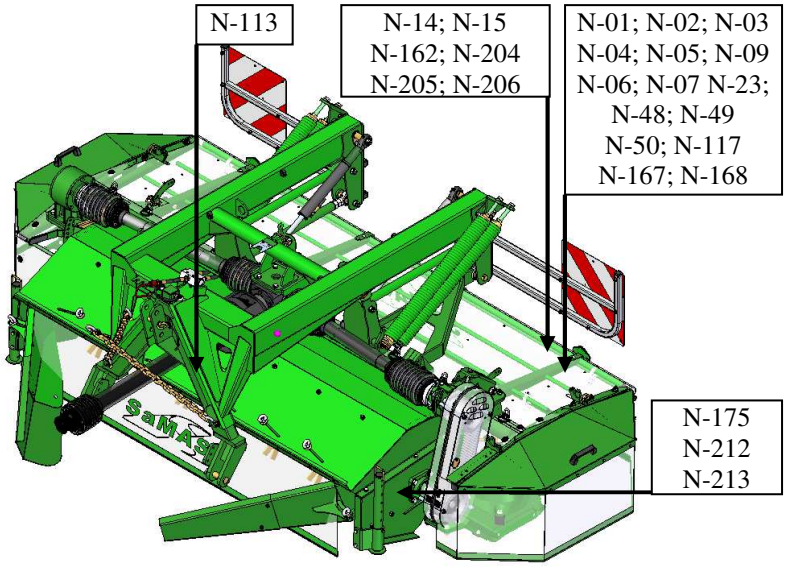


Fig. 8b. Warning decals placed on the mower with tine conditioner

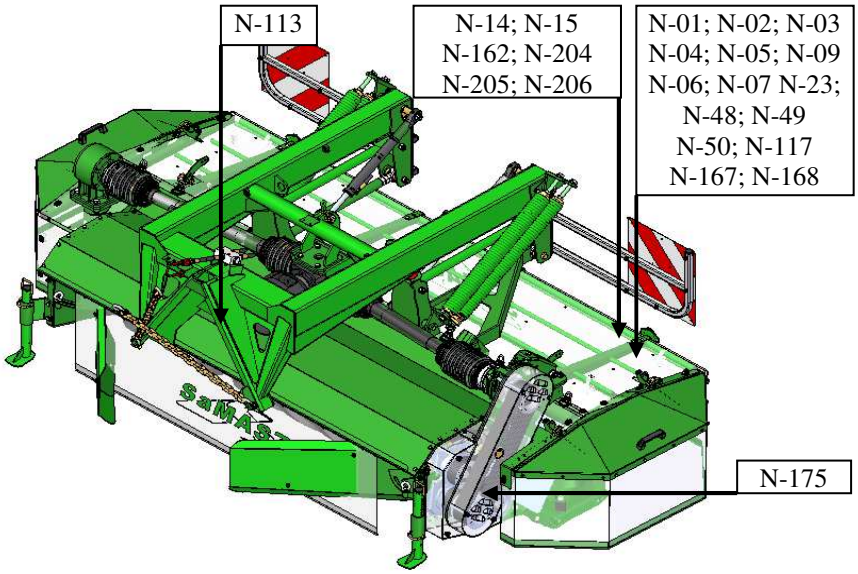


Fig. 8c. Warning decals placed on the mower with roller conditioner

5. OPERATION

5.1. Attaching the mower to the tractor

WARNING:

Before beginning to use this machine, do the following:

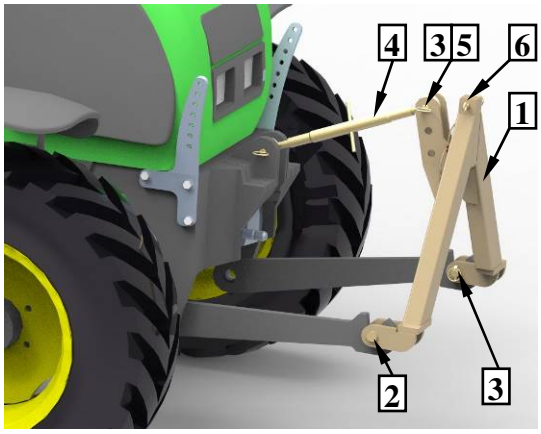
- Read manual, especially safety precautions in section 4.
- Make sure you are familiar with all controls and functions.
- Make sure all safety devices are in place and working. Fix or replace if not working or damaged.
- Replace protective cover if damaged.

WARNING:

- Only hitch and unhitch machine on a flat surface with compact dirt.
- Keep everyone away from area between mower and tractor.
- Be careful near link road zone of tractor's rear power lift. Contains sharp parts.

The mower is attached directly onto hitch triangle which is mounted to tractor's front 3-point linkage (hitch triangle, Cat. II is delivered as mower's standard equipment).

Mount triangle (**1**) on tractor's lower arms, connect with pins (**2**), and then secure with spring cotters (**3**). Next install upper connector (**4**), connect with pins (**5**) and secure both with spring cotters (**3**) (**Fig. 9**).



1. - Hitch triangle Cat. II
2. - Lower strand pin
3. - Spring cotter
4. - Upper link
5. - Upper link pin
6. - Safety pin for protection against machine disconnection

Fig. 9. Mounting hitch triangle, cat. II

After the mower has been attached to tractor, check the balance and steerability of tractor-mower set. To do this, calculate to formulas given in the appendix or weigh the set, and then drive on the scales only with front axis of the tractor (the mower must be in transport position – lifted upwards). If the pressure on the rear axis is at least 20% of the whole set's pressure, it means the set is stable. If not, the rear axis should be balanced. After having mounted the hitch triangle on the 3-point linkage drive perpendicularly to the mower, using upper strand set the hitch triangle so it is parallel to the machine's triangle (**Fig. 10**), lift the 3-point linkage until the mower is in the air and the triangle in place. Secure the hitch triangle with pin and connect it with spring cotter. Finally adjust the length of chains (it. 5.3).

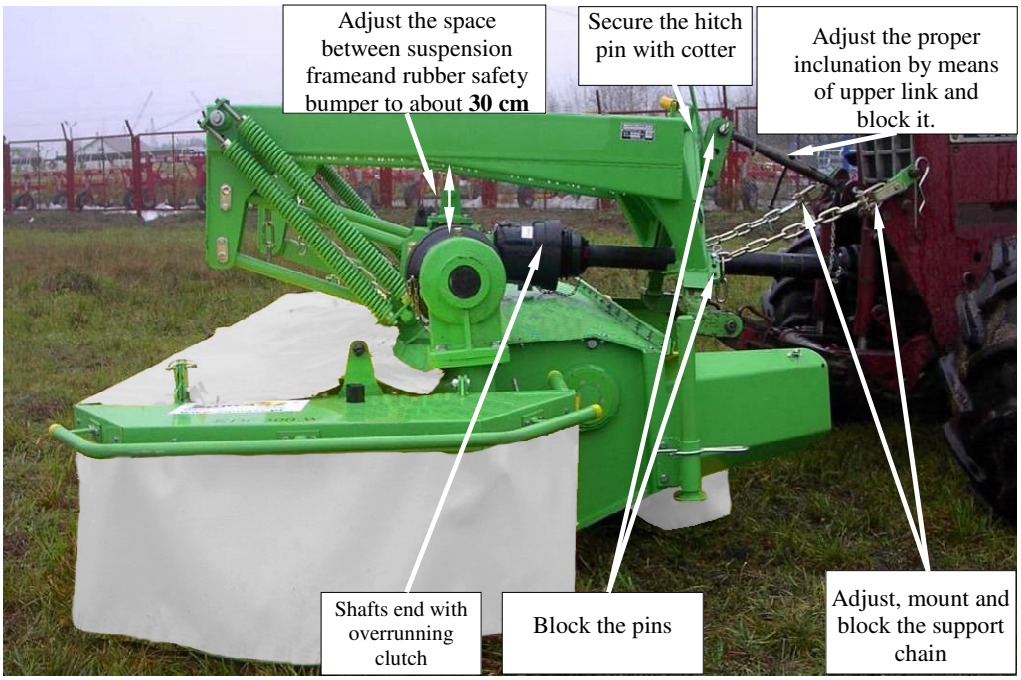


Fig. 10. Mounting the mower on hitch triangle, cat. II

For front 3-point linkage lifters with forced pressure (cylinders of front lifter are under pressure when being lowered) there is a risk that the machine is damaged when being lowered. Excess pressure of the mower on the ground may cause damage to the mower's hitch, damage to the entire machine, excess stretching or damaging the support chains.

5.2. Setting clearance between suspension frame and bumper base with indicator (option)

Optionally, to facilitate correct setting of the mower for mowing from the tractor driver's position, it is possible to install indicator and indicator's spirit level on the mower.

Once the mower is aggregated with the tractor, lift the mower using strands, and then using the mower's hydraulics, lower it onto such height that the indicator's green area is on the indicator's spirit level height (**Fig. 11**). With such setting, the clearance between the suspension frame and rubber bumper base shall be around 30cm (**Fig. 10**).

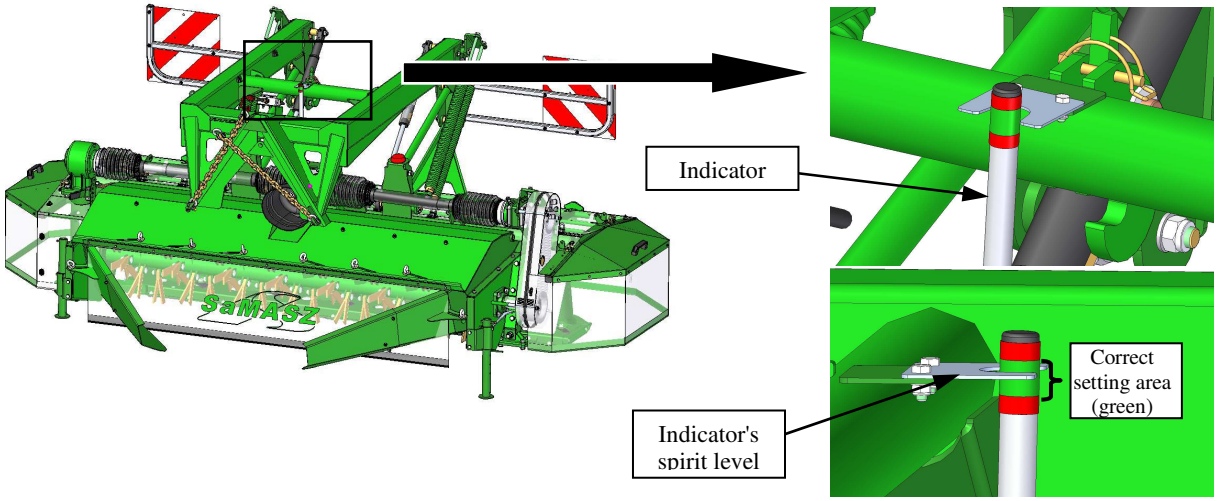


Fig. 11. Correct clearance setting (around 30cm)

5.3. Adjusting the length of support chains

- lift the mower on tractor's 3-point linkage until the space between the frame suspension and a rubber safety bumper reaches about 1′ (**Fig. 10**),
- tighten the chains and check where to block them,
- lift the mower higher and block the chains with pins,
- lower the mower until the chains tighten,
- check the space between the frame suspension and a rubber safety bumper. If the space is lower or higher than 1′, correct it (**Fig. 10**).

5.4. Preparing the mower for transport

- Lift side safety guards (**Fig. 13**).
- Lift the cutterbar by means of hydraulic cylinders.
- Lift the mower on tractor's 3-point linkage.
- Lift and protect support legs (KDF S/SL/W).
- Close the lock (**Fig. 12a**).
- To meet safety precautions concerning transport on the public roads and valid regulations the mower should be equipped with the following portable warning light plates, consisting of panel mounted on the linkage (to be ordered optionally). Panel comprises a warning plate.
- When driving pay particular attention to the space around the tractor-mower set.

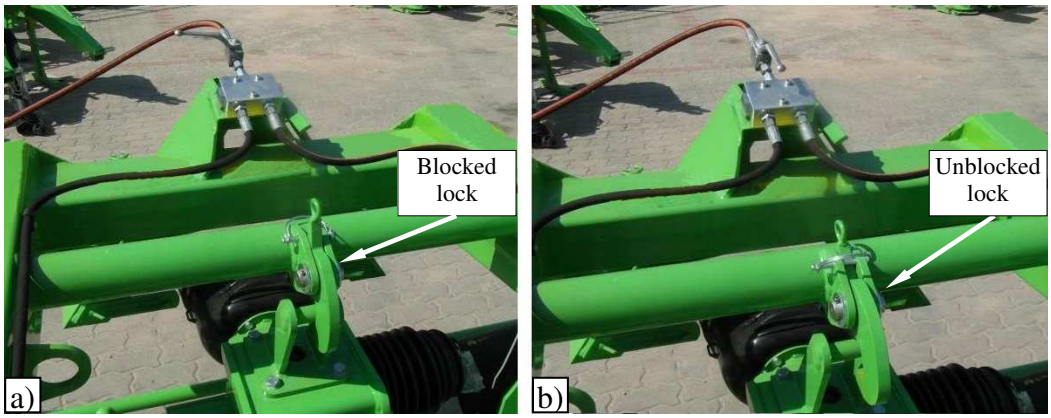


Fig. 12. The lock in transport position

Fig. 13. Front disc mower in its transport position

5.5. Mounting PTO shaft

PTO shaft's end with overrunning clutch should be mounted on mower's side. When connecting PTO shaft between tractor and mower make sure that external guard tube of the shaft is on the tractor's side. The PTO shaft plastic guards have to be secured by fastening their small chains to immovable parts of tractor and mower. The PTO shaft must operate at the lowest possible angle. This will ensure that both shaft and the machine last as long as possible.

CAUTION:
If need be, shorten the PTO shaft according to its operator's manual given by the shaft's manufacturer (**Fig. 14**).

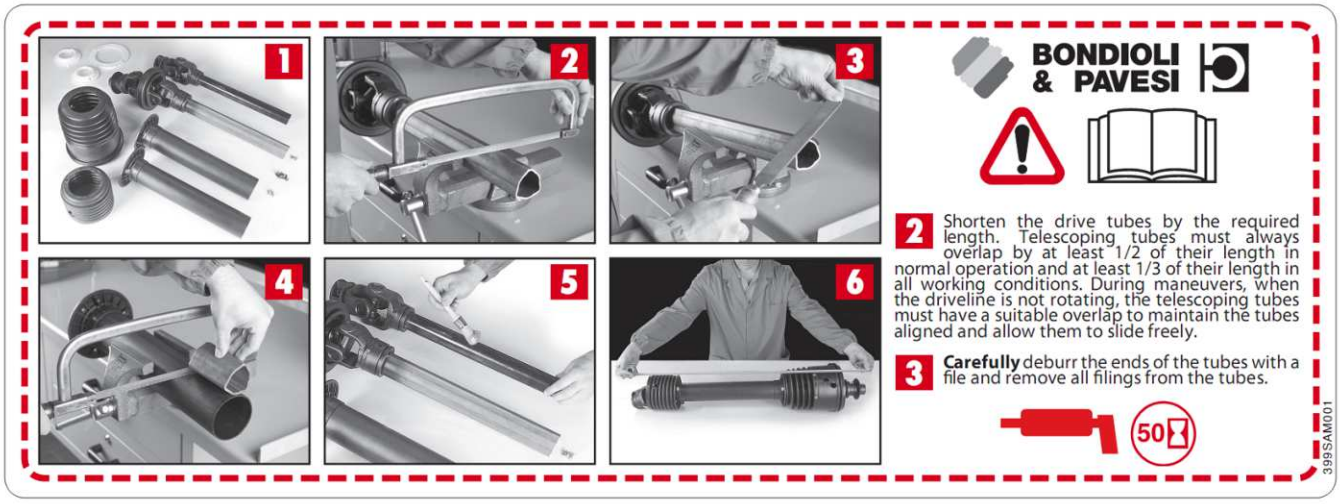


Fig. 14. Instruction of PTO shaft shortening

CAUTION:
Handle all parts with utmost care. Never place your hands or fingers between one part and the other. Wear safety clothes such as gloves, protective footwear and goggles. The operation of shortening must be carried out with the utmost care as the PTO shaft will have to be replaced if the telescopic shafts are shortened to an excessive extent.

CAUTION:
The PTO shaft should be mounted only during operation time and disconnected from tractor PTO for transport and service.

NOTICE:
The manufacturer declines all liability for damage caused by an incorrectly fitted or used PTO shaft.

CAUTION:
Use the machines with PTO shafts designed to drive them. Before the work begins, check the safety guards (in tractor, mower and PTO shaft), if they are placed correctly and are not damaged. Damaged or lost parts must be replaced with genuine ones. Make sure the PTO shaft is properly mounted. It is forbidden to approach the rotating parts, because it may lead to serious injuries or even death. All service and repair operations must be done only after the tractor engine has been stopped and ignition key off, all rotating parts have come to the complete standstill and the cutterbar is on the ground. Before the operation begins, read operator's manuals of both the machine and PTO shaft.

5.6. Moving from transport to working position

WARNING:
Moving the mower to and from operating position from the transport position should only take place on even and stable ground. Prior to making the moves make sure whether there are no unauthorized persons exposed to any hazardous moving parts.

Before the work begins, please carry out the procedures included in the previous chapters and after that the mower is considered to be ready for work, and then:

- lower the mower until the cutterbar comes into contact with the ground,
- by means of upper link adjust the cutterbar's height and inclination towards the ground. Proper inclination of the cutterbar is between 0° and 5°. It is regulated by extending or shortening the link.

5.7. Preparing the mower for work

- Slowly engage the PTO clutch and wait until the cutting unit reaches its rated speed.
- Engage tractor gear and drive slowly into the grass-field. If thge conditions are favourable, the 3rd gear can be turned on. If the conditions are bad, turn off the 1st gear.
  Support chain holds up tractor's hydraulic cylinders and maintains mower's level.

WARNING:
Do not operate the conveyor when it is in vertical position.

NOTICE:
DO NOT pull the cutterbar towards the tractor, because it will lead to cutterbar's premature wear or even its damage.

5.8. Operation (mowing)

WARNING:
The operator must be seated in the tractor's driver's seat when the machine is operating since only from that position is he able safely and properly operate the mower. Before he leaves the driver's seat, the operator must stop the engine, apply the parking brake and turn off the tractor engine.

Always use appropriate protective equipment (safety footwear, gloves, ear protection and dust mask).
Before using the machine, make sure that all the safety devices are in their correct positions and in a good condition. These safety devices must be immediately replaced if they are faulty or damaged. In particular, the protective cover must be checked regularly. It must be immediately replaced if it is missing or damaged in any way.

IMPORTANT: If a disc mower is your first experience (you have mowed with 2-drum mower), you need a piece of essential information:

- Main advantage of disc mowers is their small power demand – 20% less tractor power, small moment of inertia and possibility to manufacture mowers with large working width.
- There is however a certain disadvantage - creased stubble, especially when it comes to lying grass. Straight grass may be mowed with horizontal adjustment of the mower and then the stubble will be even, but it will not look as attractive as with 2-drum or 4-drum mowers, because the knives work horizontally to the ground and inclined grass bends because of wind blasts. After the grass is mowed, it stands up, which makes an impression of inaccurate mowing. Every mower may leave stripes of uncut grass when it comes to the knives which cut the grass towards the grass direction.
  It is a normal phenomenon. Practically, it is not possible to achieve such attractive stubble as in 2-drum mowers, because the knives work horizontally or at an angle of up to 8° to the ground, and when it comes to 2-drum and 4-drum mowers, slantwise through the ground (even 23°).
  Despite these 'disadvantages', disc mowers are 'winning farmers' trust' and modern technologies give an opportunity to manufacture very durable mowers.

The most even stubble with very low grasses is obtained with disc mowers when half of the discs rotate to the right and half to the left. A disadvantage of this system is a narrow and thick windrow which needs to be spread out.

5.8.1. Essential information concerning mowing

Optimum work parameters

1. Inclination towards the front 0-5 degrees which equates to 1.8" - 2.8" of mowing height.
2. Operation speed around 10 km/h or more, if the conditions allow.
3. PTO rpm = 950-1000 rpm. PTO rpm less than 1000 may cause stripes of uncut grass between the disc.

High and inclined grass

4. Heighten the cutterbar's inclination to H = about 1.8".
5. If there is no inclination the grass will be wedged on the forming drums.
6. Speed can be more than 12 km/h (7.45 mph) (faster – better).
7. Do not turn in the mowed grass.

- Optimum inclination of the cutterbar towards the ground is between 0° to 5°. If the inclination exceeds 5°, there might be a slight unevenness of mowed grass. It impairs slightly the quality of mowing and has an influence on the mower's operation. When the cutterbar is pulled in the other direction, it significantly impairs the quality of mowing and in some cases the mower stops mowing. Besides, it may lead to premature wear or even damage of the slides and cutterbar.

- When high grass prevails, first and second cut should be mowed at height level 2.4" - 2.8", but when the grass grows low it should be mowed at 2". The last cut should be mowed a little bit higher, 2.8" - 3" above the ground.
- Too high a PTO rpm whirls the air, which may cause inclination of the grass in front of discs, which impairs the quality of mowing.
- Too low a PTO rpm impairs the quality of mowing and in some cases the mower stops mowing (too low linear velocity of the knife).
- In contrast with 2-drum mowers, straight mounting of the mower and full speed are not always possible. Adjust inclination of the mower, PTO rpm, speed and correctness of knife-mounting to get the best results.
- In case of mowing soft meadows, the pressure of the cutterbar on the ground should be reduced by adjusting support springs.
- Always check to make sure that the ground speed suits the conditions or work and that it does not create a potential source of danger
- Do not take sharp turns anytime and do not operate in reverse.

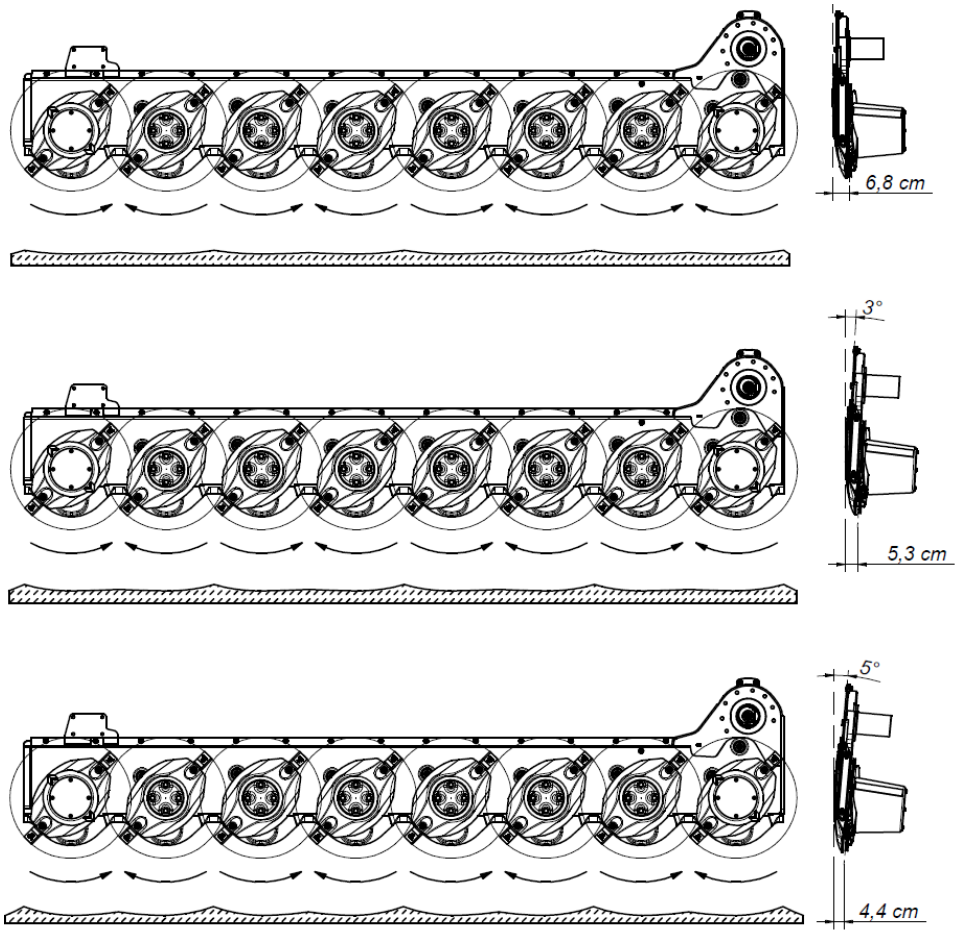


Fig. 15. Shape of the stubble with cutterbar's inclination 0°, 3° and 5°

5.8.2. Mower clogging

When operating the mower, pay attention to variable conditions on the field, which may cause the mower to clog, such as: terrain unevenness, height and density of grass as well as other objects in the grass. In order to avoid clogging, mowing speed should be adjusted to the conditions. In order to take care of machine clogging, lower the cutterbar onto the ground, disconnect the drive and remove the ignition key. When eliminating the mower's clogging wear all appropriate protective gear.

5.8.3. Taking turns over swaths

Lift the mower with hydraulic cylinder and take the turn. The mower does not need to be additionaly lifted by tractor's 3-point linkage.

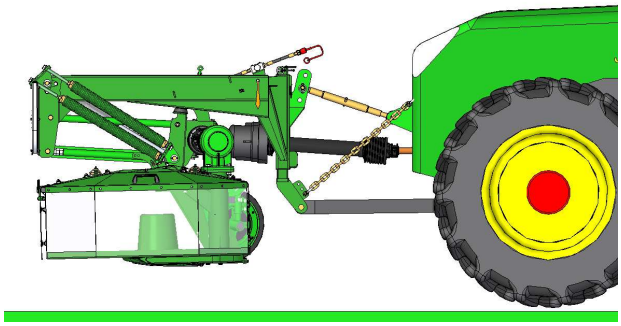


Fig. 16. KDF in position to take turns

5.9. Dismounting mower from tractor

CAUTION:
When dismounting, make sure there is no person in between the mower and the tractor.

To dismount the mower from the tractor:

- turn cutterbar's drive off,
- place the mower on even, paved ground, lower and protect support legs (for KDF S/SL/W mowers) - check, if the mower is properly protected against falling,
- turn the tractor's engine off and take ignition key off,
- dismount tractor's rpm and place it on a PTO shaft holder, that is standard-delivered with the mower,
- disconnect hydraulic hose.

6. MOUNTING AND ADJUSTMENTS

6.1. Mounting and timing of the knives

The knives should be mounted as shown in **Fig.17**, **18** according to the rule, that the cutting edges should be directed towards ground, so that a knife will lift the grass after cutting.

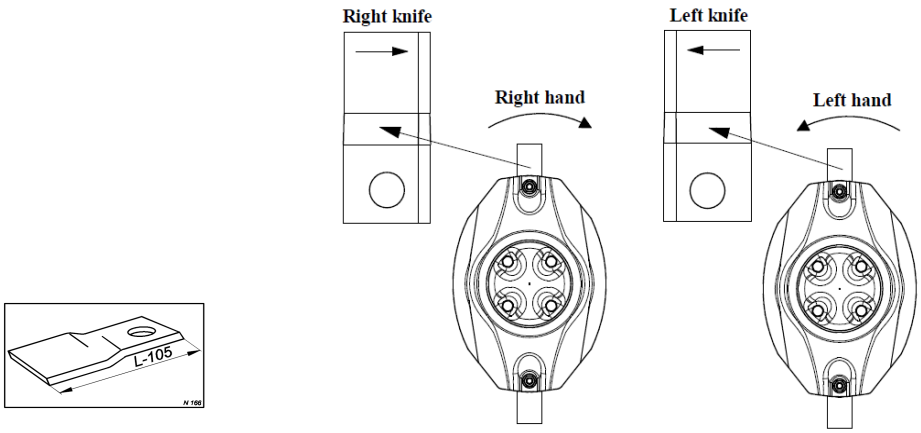


Fig. 17. Mounting of the knives on mowing discs

WARNING:
- Use only knives recommended by manufacturer.
- Check condition of knives and holders before each operation. Worn or damaged knives should be replaced immediately.

6.2. Replacing the knives

Worn and/or damaged knives should be immediately replaced (**Fig. 18**).

Replace knives, if necessary, only in sets. Make sure all knives in a set are of the same length and weight. The knife holders (**Fig. 29**) must not be damaged or deformed. If the knife holder pin is worn too much, please replace it immediately.

NOTICE:
During work, if mower begins to shake, it means that the disc (discs) are operating only with one knife. In that case, using the mower in this condition for a long time could cause serious damage to the cutterbar.

WARNING:
When replacing knives, the engine must be stopped and the cutterbar must lie on the ground. PTO shaft must be disconnected. Discs should be perpendicular to cutterbar.

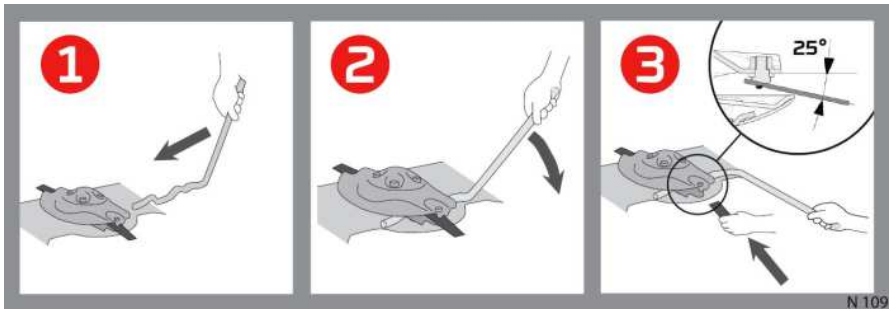


Fig. 18. Quick replacing of the knives with mounting lever

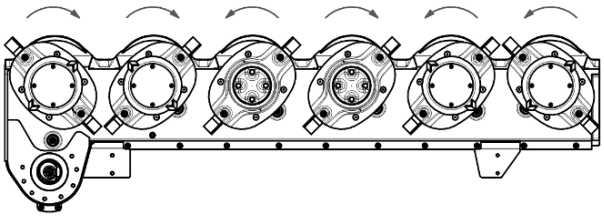


Fig. 19a. Disc turns KDF - 8' 6"

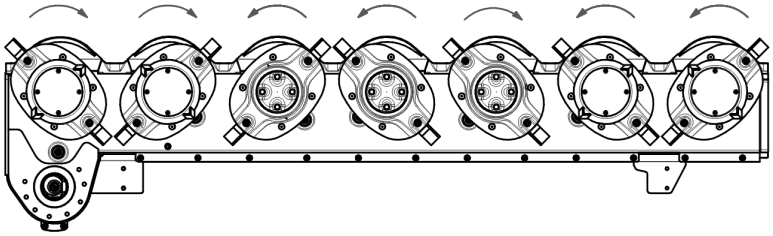


Fig. 19b. Disc turns KDF - 9' 10"

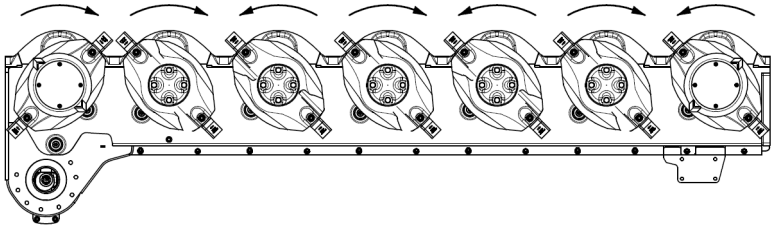


Fig. 19c. Disc rotation directions on mower's cutterbar with cutting width of 9' 10" (wide swath)

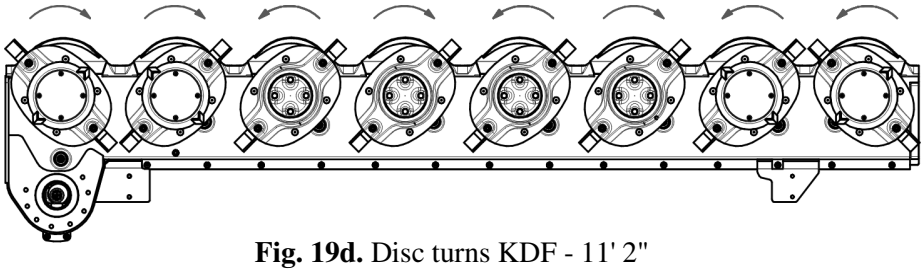


Fig. 19d. Disc turns KDF - 11' 2"

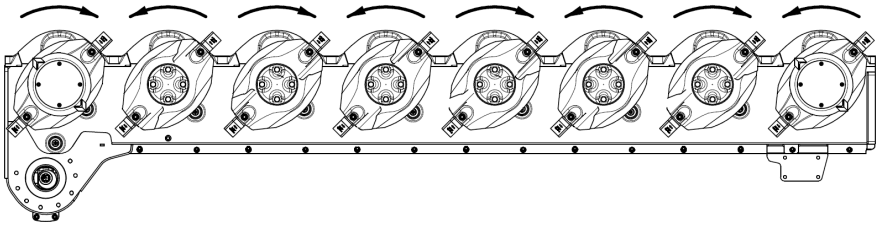


Fig. 19e. Disc rotation directions on mower's cutterbar with cutting width of 9' 10" (wide swath)

NOTICE:
Before changing the knives check discs for correct turns (**Fig. 19**).

NOTICE:
Mounting the knives in a different manner will block the mower. When mounting pay particular attention whether the knife rotates freely on the knife holder pin.

NOTICE:
Because of high discs rpm, knife holders should be changed in sets of the same weight – each holder has its corresponding weight marked on. If knives are improperly changed disc bearings will be damaged.

6.3. Adjusting the cutterbar

Swath width is adjusted with swath guides mounted on the 3-point linkage frame of the cutterbar (**Fig. 20**).

In order to adjust the guide, the following should be performed (for: KDF 260, KDF 300, KDF 340, KDF 390):

- loosen locknuts (**2**) and screws (**3**),
- shift the guide arm (**6**),
- tighten screws (**3**) and locknuts (**2**),
- loosen locknuts (**4**) and screws (**5**),
- then adjust height and shield angle (**7**),
- tighten screws (**5**) and locknuts (**4**).

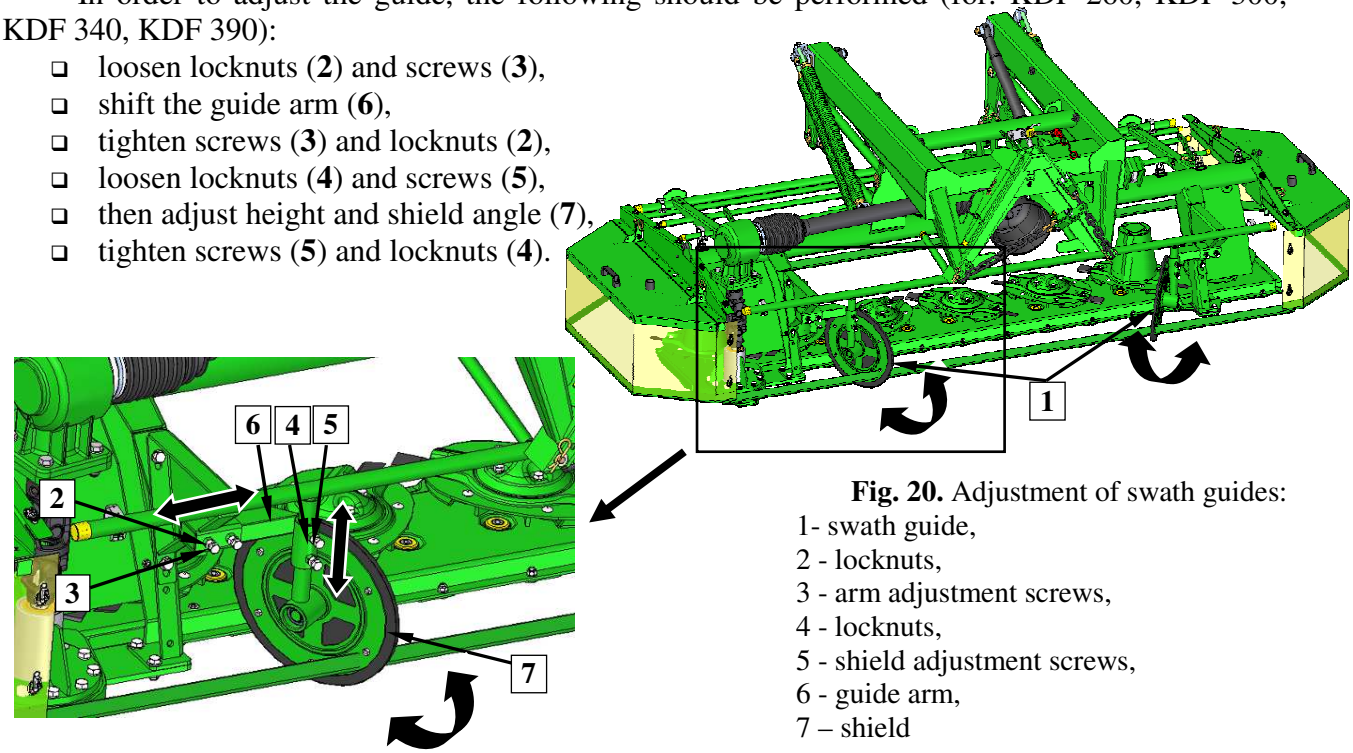


Fig. 20. Adjustment of swath guides:
1- swath guide,
2 - locknuts,
3 - arm adjustment screws,
4 - locknuts,
5 - shield adjustment screws,
6 - guide arm,
7 – shield

In order to set swath width, adjustment of swath guides (**1**) should be performed (**Fig. 21**) (for: KDF S (SL)):

- loosen eye screw (**2**) of the swath guide,
- set the swath guide (**1**) as needed,
- tighten screw (**2**),
- even spreading of swath might be adjusted with wheels (**3**) the same as it is preformed with guides.

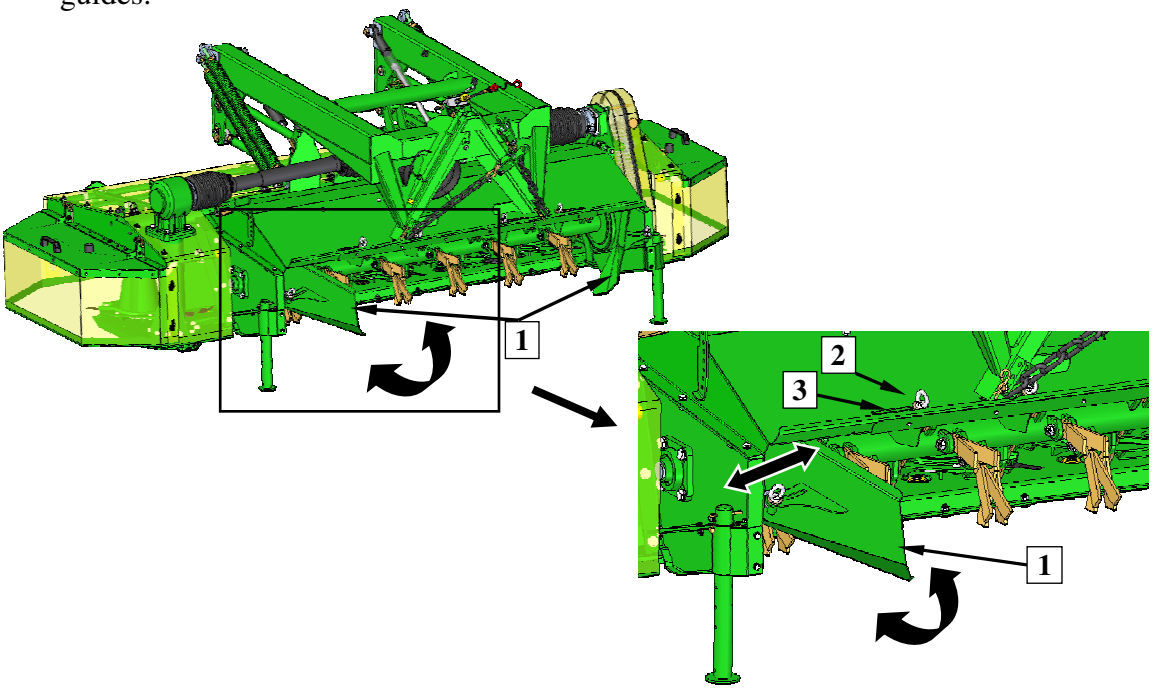


Fig. 21. Adjustment of swath guides: 1- swath guide, 2 - adjustment screw, 3 - swath wheel

In order to set swath width, adjustment of swath guides (**1**) should be performed (**Fig. 22**) (for: KDF W):

- loosen eye screw (**2**) of the swath guide,
- set the swath guide (**1**) as needed,
- tighten screw (**2**).

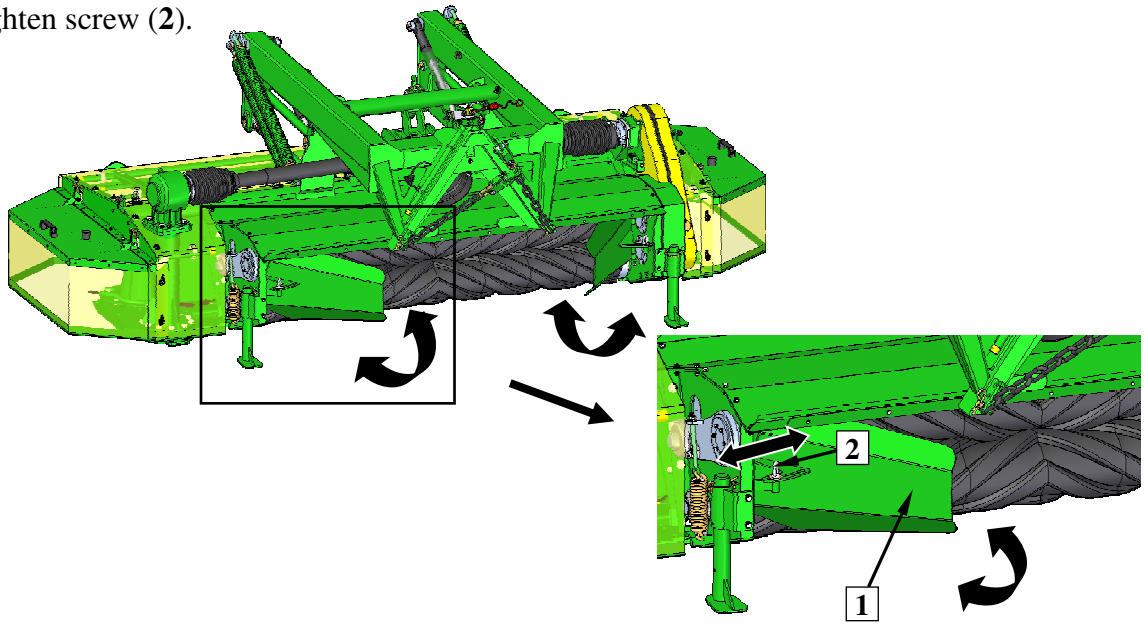


Fig. 22. Adjustment of swath guides: 1- swath guide, 2 - adjustment screw

6.4. Adjusting the space between tine conditioner's mask and its shaft

(Models: KDF S (SL))

Depending on size and thickness of the mowing grass, there may be a necessity to adjust the mask of the conditioner. The higher and thicker grass, the bigger the space between conditioner's mask and its shaft should be. Proper adjustment should be based on the experience, in order not to block the conditioner and not to activate the friction clutch of PTO shaft. The way how the mask is regulated is shown in **Fig. 23**.

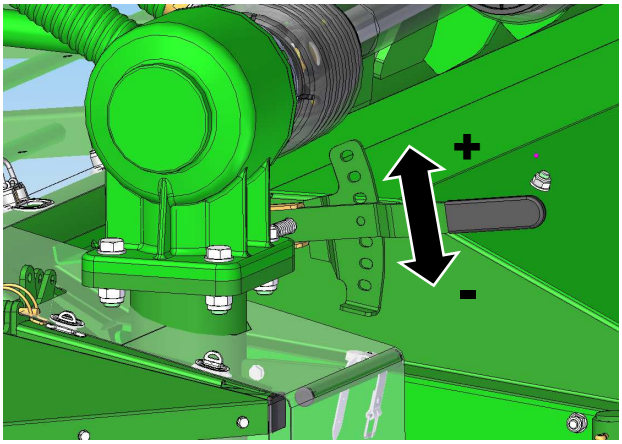


Fig. 23. Adjusting tine conditioner's mask

6.5. Replacing the conditioner's tines

(Models: **KDF S(SL)**)

Each time, prior to operation, check condition of rubber holders in conditioner's flails along with screws, on which flails are mounted (KDF SL).

If rubber holders and plastic or metal flails are worn or damaged, replace them. **Bear in mind that flails should be replaced in pairs (opposite) featuring the same weight (metal flails) in order to keep shaft well balanced.** Not keeping the shaft well balanced may lead to premature wearing of bearings as well as the shaft itself.

Removal of the flail consists of unscrewing the nut using a flat and removing the flail. Installation of the flail is accomplised by revering these steps.

1. Conditioner roller
2. Flail
3. Bolt M16x60, Property Class 10.9
4. Self-locking nut M16 zinc plated, Property Class 8
5. Key

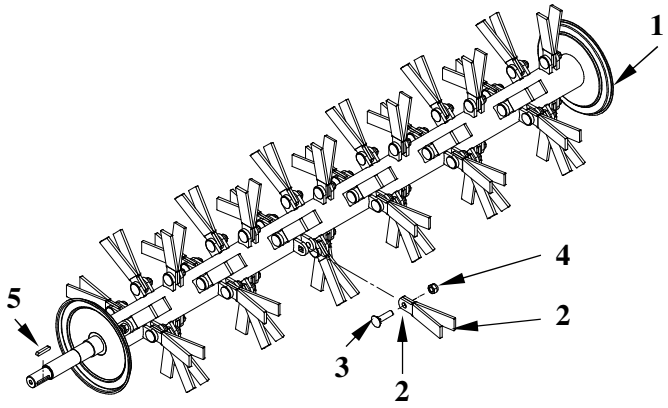
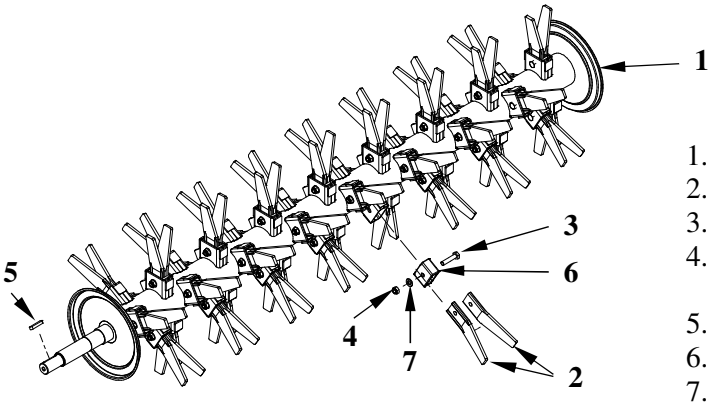


Fig. 24. Parts of tine conditioner



1. Conditioner roller
2. Flail
3. Bolt M12x55, Property Class 8.8
4. Self-locking nut M16 zinc plated, Property Class 8
5. Key
6. Flail's insert
7. Flat washer

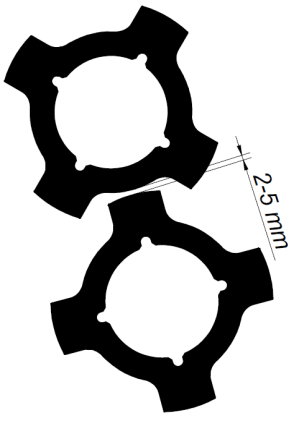
Fig. 25. Replacing (light-weight) conditioner flails

6.6. Adjusting force of the pressure of roller conditioner

(Models: KDF W)

With factory set rollers, a ridge on one roller should enter a groove on the other. Clearance between a ridge and a groove on rollers should be within 0.08"-0.2". The clearance can be adjusted by a bolt **U**.

If need be, the force of the roller conditioner's pressure can be regulated by changing the tension of springs **S** (**Fig. 26**) by means of the nut **N**. Adjustment should be done on both sides of the conditioner.



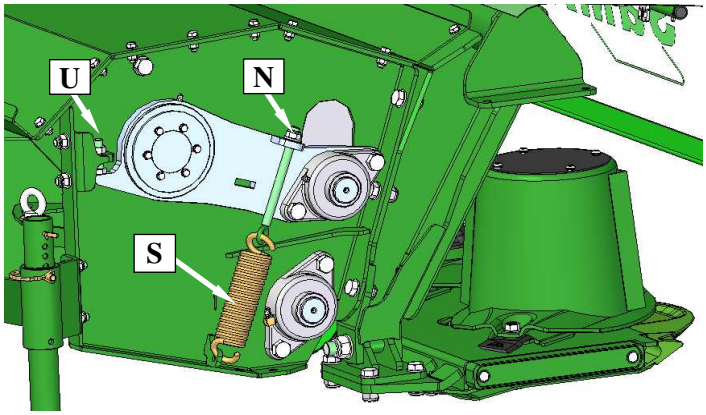


Fig. 26. Adjusting force of the pressure of roller conditioner

6.7. Adjusting pressure of the cutterbar using support springs

Adjusting pressure of the cutterbar comprises changing tensioning of support springs.

- To reduce pressure of the cutterbar on the ground, at the same time it is required to increase tensioning of the springs by tightening the screw (reducing the distance **L** between the screw head and spring catch – **Fig. 27**).
- Increase in pressure of the cutterbar on the ground is caused by reduction in tensioning of support springs, and this is done by unscrewing the screw (increasing the distance **L** between the screw head and spring catch – **Fig. 27**).

Adjustment should be carried out with the mower lowered on the ground and retracted cylinders.

CAUTION:
Springs are selected by the manufacturer to suit a given mower model. Do not swap the springs, and during repairs mount springs purchased according to a symbol given in parts catalogue at adequate side of the machine (**Tab.6**).

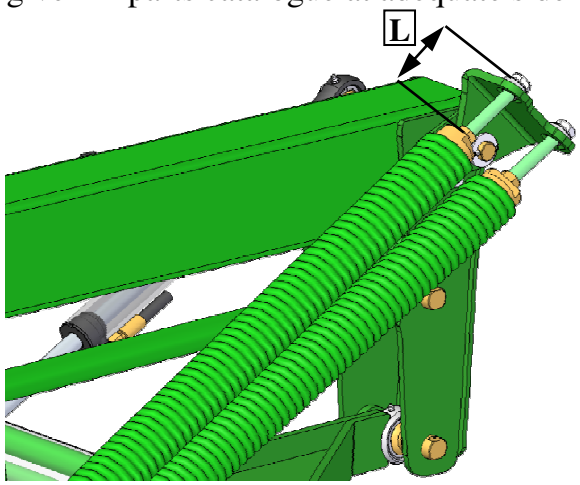


Fig. 27. Support springs (adjusting spring tensioning)

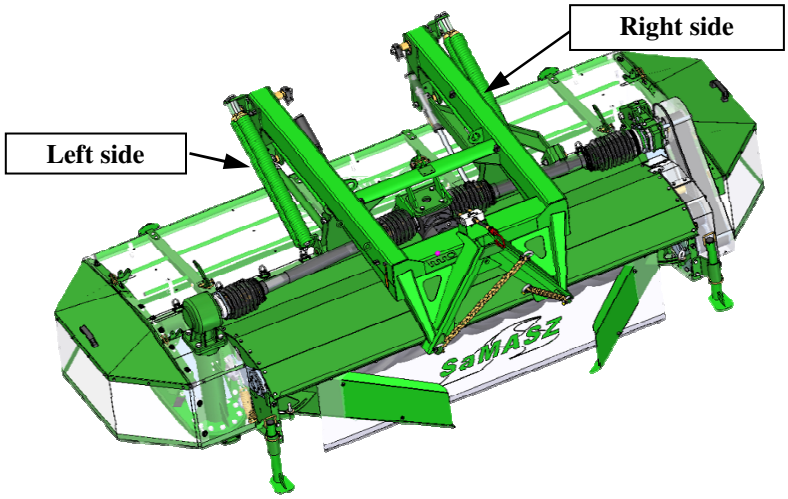


Fig. 28. Support springs (left and right spring)

Tab. 6. Factory setting of support springs

Mower	Left side [in]		Right side [in]		Remarks
KDF 260	Spring d 10 L= 25.59″	L= 3.94″	Spring d 9 L= 27.17″	L= 4.72″	
KDF 300	Spring d 10 L= 25.20″	L= 3.94″	Spring d 9 L= 25.98″	L= 4.72″	
KDF 301 S	Spring d 13 L= 29.53″	L= 3.54″	Spring d 13 L= 29.58″	L= 3.54″	
KDF 301 SL	Spring d 13 L= 29.92″	L= 3.74″	Spring d 13 L= 29.92″	L= 3.94″	
KDF 301 W	Spring d 13 L= 29.53″	L= 2.95″	Spring d 13 L= 27.56″	L= 4.53″	
KDF 340	Spring d 11 L= 27.56″	L= 4.13″	Spring d 10 L= 29.53″	L= 4.72″	
KDF 341 S	Spring d 13 L= 27.17″	L= 4.72″	Spring d 13 L= 29.53″	L= 3.54″	
KDF 341 SL	Spring d 13 L= 27.17″	L= 5.51″	Spring d 13 L= 29.13″	L= 4.13″	
KDF 341 W	Spring d 13 L= 28.35″	L= 4.53″	Spring d 13 L= 25.98″	L= 4.53″	

6.8. Maintenance and service

6.8.1. Checking the knives and knife holders

All knives should have the same lengths and weights. Always check mower before starting work for damaged, missing and/or worn knives. Replace them, if necessary, only in sets. Make sure all knives in a set are of the same length and weight.

If the knife holder pin is worn too much and/or the knife holder is worn or deformed, please replace it immediately (**Fig. 29**).

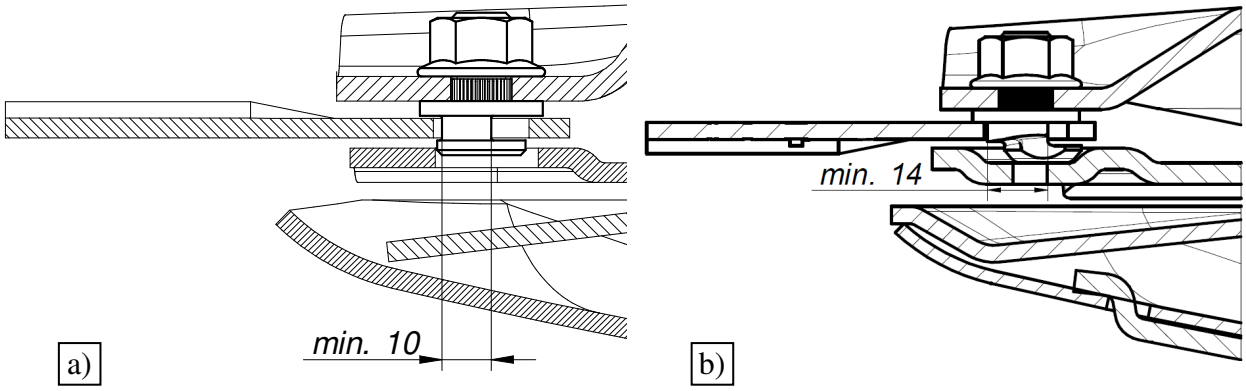


Fig. 29. Permissible wear of knife holder pin on disk a) knife base M12
b) knife base M12 with claw

NOTICE:
If the knife is missing or disc cover plate is damaged the vibrations may occur, which leads to cutterbar's damage. In that case warranty claim will be revoked.
If the disc or disc cover plate is damaged, the whole set must be immediately replaced (2 knives) with new genuine ones.

6.8.2. Control and tension of cogbelt

(for: KDF S/SL/W)

When starting for very first time after ca. 2 hours of operation, control tension of cogbelt transmitting the drive onto the conditioner or rollers. If cogbelt tension is too low, tighten it as per decal N175.

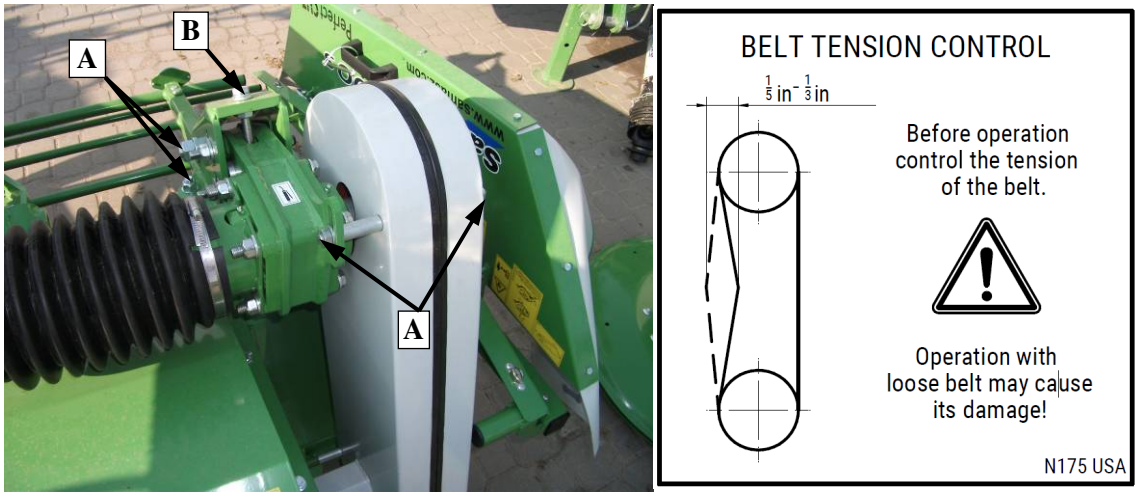


Fig. 30. Control and tension of cogbelt

Procedure when tensioning the cogbelt:

1. Loosen nuts and bolts (**A**).
2. Tighten cogbelt by tightening bolt (**B**) and check the belt deflection as per decal N175.
3. Tighten nuts and bolts (**A**).

6.8.3. Daily maintenance

When you finish each day of operation carry out the following maintenance:

- check all visible parts and components and their connections; tighten all loose bolts and nuts and replace all damaged and/or worn parts with new genuine ones,
- clean the mower, especially between discs and cutterbar, because grass with mud may damage bearings in disc module,
- remove grass and mud,
- check the cutterbar,
- grease PTO shaft tubes with STP grease,
- if necessary, lubricate the parts and components according to lubrication instructions (chapter 7).

Parts which may cause risk to operator's health and safety are as follows: damaged discs, missing or damaged safety covers, worn or damaged hydraulic hoses, PTO shaft guides, worn knives and knife holder pins.

6.8.4. After-season maintenance and storing of machine

At the end of mowing season the following shall be performed:

- lower the mower's cutterbar onto the ground,
- take the PTO shaft extension out of the tractor rpm or dismount the complete PTO shaft and install it into corresponding holder at the 3-point linkage frame,
- unmount hydraulic and electrical hoses from the tractor and hang them onto corresponding holders on the 3-point linkage frame,
- unmount the mower from the tractor (reverse procedure as in case of attaching the mower to the tractor item 5.1), and then drive the tractor away.

Mower should be stored in standstill position, so it is supported onto supporting leg and the cutterbar. It is recommended to store the set on paved ground, preferably in roofed places, inaccessible to unauthorized personnel or animals.

If the machine is stored for a long period of time before first operation, its technical condition should be examined and special attention should be paid to the hydraulics and the drive. Paint the area where the paint is missing, hydraulic hoses checked and lubricated.

Additionally:

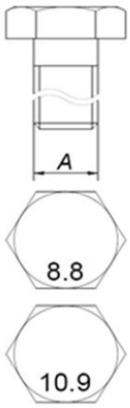
- remove any traces of rust and paint the area,
- check the oil level in the angle drives and the cutterbar (Section 7). If leaks are discovered, they should be repaired immediately and lost oil replaced. If water in oil is discovered, immediately change the oil as it could cause corrosion of internal mechanisms such as gear wheels, bearings, or shafts, and cause breakdowns,
- periodically inspect the mower and lubricate moving parts in order to protect them from corrosion which adversely affects the proper operation of the mower,
- check hydraulic hoses regularly. Replace any damaged or old hoses. In any case, you should replace hoses that have been in use more than 5 years from the date of their manufacture printed on the hose.

After storage period, before the machine is used:

- check the mower's technical condition, and the transmission in particular,
- supplement the paint where missing,
- make sure that all nuts and screws are tightened properly,
- make sure that all guards are in place,
- protect all moving parts with grease in order to prevent their baking and creating any sources of corrosion, which significantly influences mower's proper operation,
- check oil level in axis gears and cutterbar. If leaks are found remove them immediately and refill the oil. If water in oil is found, immediately change the oil as it could cause corrosion of internal mechanisms such as gear wheels, bearings, or shafts, and cause breakdowns.

Tab. 7. Torque values for bolts

A	6.8		8.8		10.9		12.9	
	Maximum torque							
	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm
M4	1.5	2.2	2	3.0	3	4.4	4	5.1
M5	3.5	4.5	4.5	5.9	6.5	8.7	7.5	10
M6	5.5	7.6	7.5	10	11	15	13	18
M8	13	18	18	25	26	36	33	43
M10	27	37	37	49	55	72	63	84
M12	47	64	63	85	97	125	111	145
M14	74	100	103	135	151	200	177	235
M16	118	160	159	210	232	310	273	365
M18	162	220	225	300	321	430	376	500
M20	229	310	321	425	457	610	535	710
M22	314	425	435	580	620	820	726	960
M24	395	535	553	730	789	1050	926	1220



In the absence of specific torque values, the following chart can be used as a guide to the maximum safe torque for a particular size and grade of fastener. There is no torque difference for fine or coarse threads. Torque values are based on clean, dry threads. Reduce value by 10% if threads are oiled before assembly.

7. LUBRICATION

7.1. Cutterbar

Refilling the oil of the cutterbar is done through the inlet **A** (**Fig. 31**). Proper oil level is 0.2" - 0.3" from the cutterbar bottom. In order to drain oil from the cutterbar dismount the cutterbar enclosure by releasing bolts (**B**). The best time to drain the oil is immediately after the operation, if still warm. Oil capacities are show in **Tab. 8**.

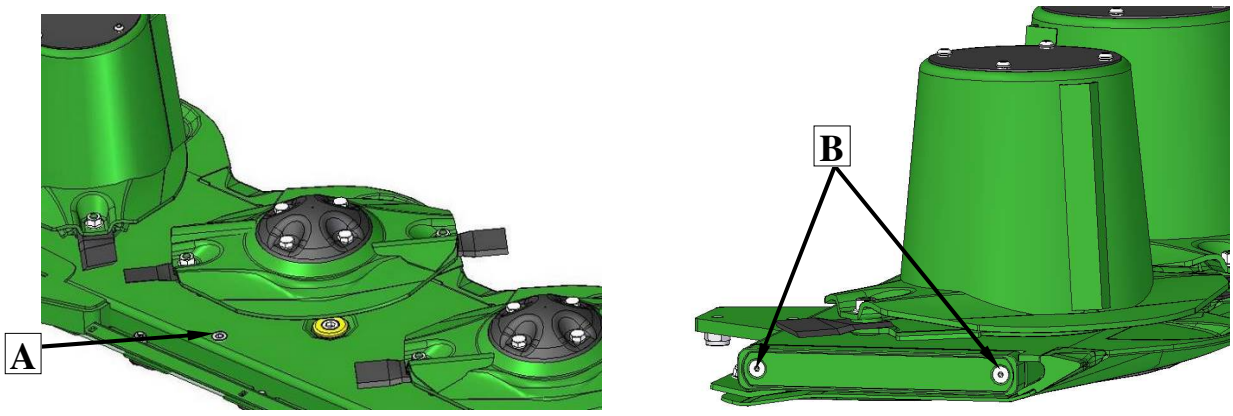


Fig. 31. Oil check and replacement points on cutterbar

Tab. 8. Oil capacities

Model	Oil capacity [US gal lqd]	Oil type	Lubrication frequency
KDF 260 – 8' 6"	1.3	80W90	Once every 3 seasons (if working intensively more frequently)
KDF 301 (S/SL/W) – 9' 10"	1.6		
KDF 341 (S/SL/W) – 11' 2"	1.7		
KDF 390 – 12' 9"	1.85		

7.2. Intersecting axis gears

Everyday before starting work please check the oil level and, if needed, please refill after having removed the vent **A** on the top of the gear (**Fig. 32**). The oil level can be checked through the check opening **B** on the side of the gear. Please refill the oil until it is visible in the check opening **B**. The oil capacity: about 0.26 US gal lqd.

Tab. 9. Oil capacity

Model	Oil capacity [US gal lqd]	Oil type	Lubrication frequency
All models	about 0.26	(SAE 80W/90, API GL-4)	Once every 3 seasons (if working intensively)

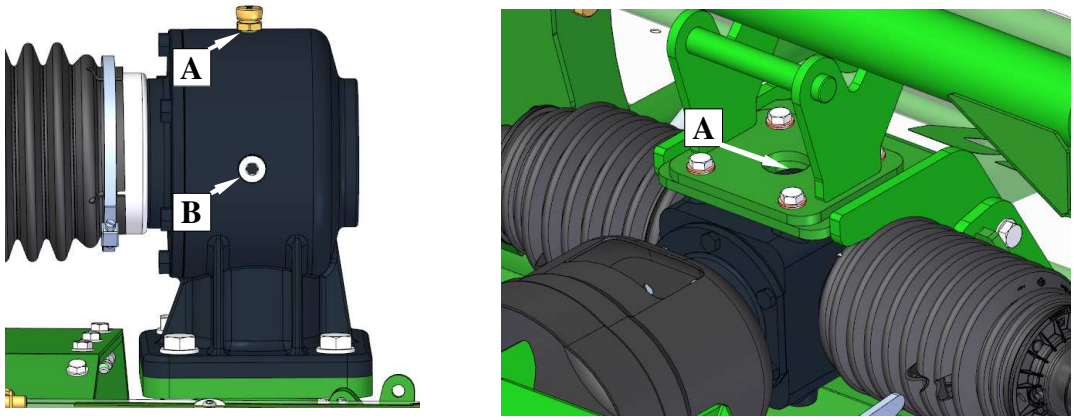


Fig. 32. Intersecting axis gear lubrication point

IMPORTANT:
The above instructions should be strictly followed. If the discs in the cutterbar rotate loosely, do not worry about high intersecting axis gear temperature; after long working time, it may reach as much as 100ºC.

7.3. Roller conditioner's gearbox

Before you check the lubrication of the gearbox, please remove the safety guard. Everyday before starting work please check the oil level and, if needed, please refill after having removed the vent **A** on the top of the gearbox (**Fig. 33**) The oil level can be checked through the check opening **B** on the side of the gear. Please refill the oil until it is visible in the check opening **B**. The oil level: about 1.3 US gal lqd. Check oil level when the cutterbar is on the ground. Removing the worked oil from the gearbox is done through the outlet **C**.

Tab. 10. Oil capacities

Model	Oil capacity [US gal lqd]	Oil type	Lubrication frequency
All types	1.3	80W90	Once every 3 seasons (if working intensively)

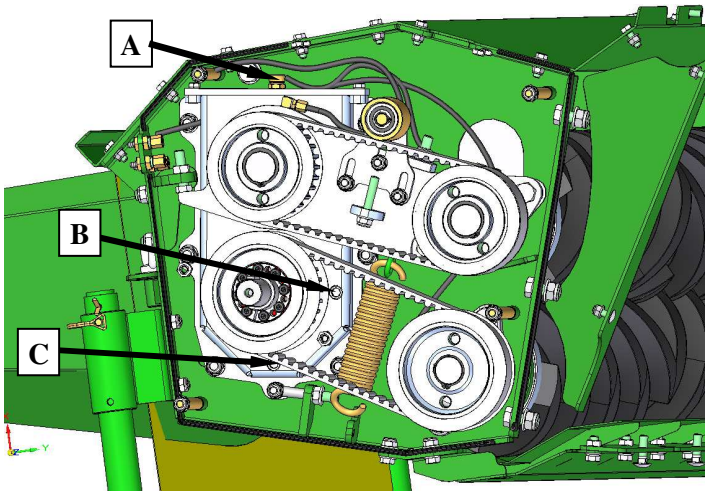


Fig. 33. Roller conditioner's gearbox lubrication points

7.4. Bearings and joints

Every 50 mower working hours lubricate tine/roller conditioner's bearings and main joints of the mower (**Fig. 34 - 36**). Recommended grease: **LT43** (or other designed to lubricate rolling and slide bearings, that work in -30ºC up to +130ºC).

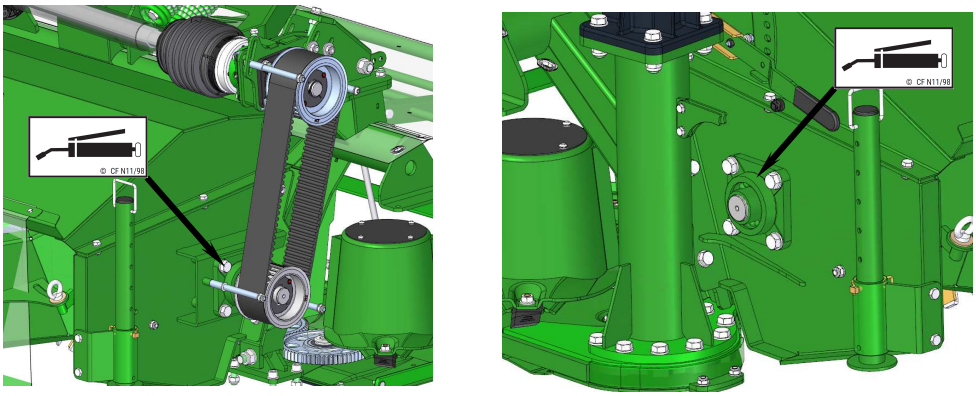


Fig. 34. Bearing lubrication point with LT43

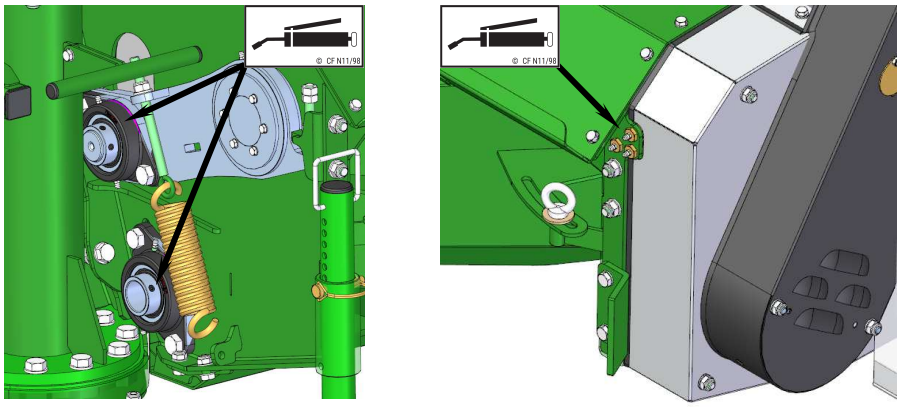


Fig. 35. Bearing lubrication points with LT 43 grease

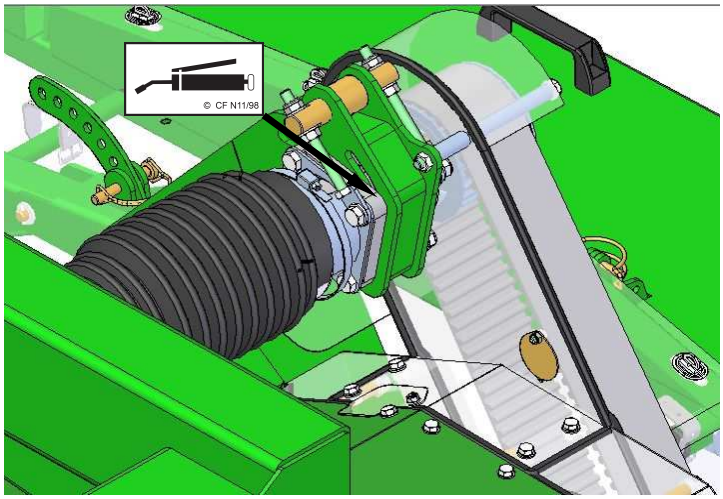


Fig. 36. Tine conditioner tensioner's lubrication point

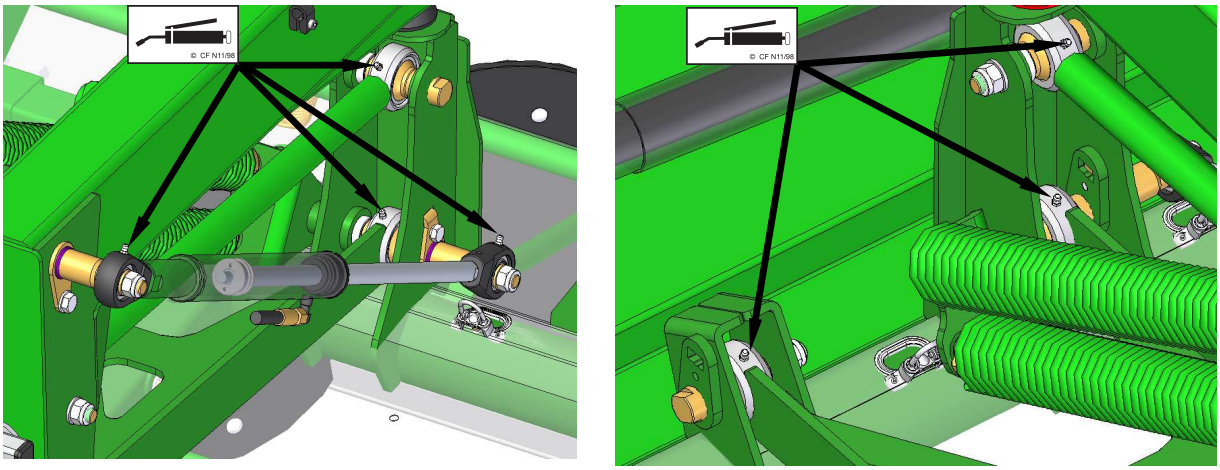


Fig. 37. Lubrication points

8. MALFUNCTION AND THEIR REPAIRS

Tab. 11. Defects and their repairs

Defect	Reason		Repair
Mower stops working (partly) – leaves stripes of uncut grass between the discs	1	Lack of knives	Put on knives
	2	Worn knives	Replace knives
	3	Improperly mounted knives (left – right)	Put on knives strictly acc. to instructions
	4	Improper front inclination	Adjust inclination strictly acc. to instructions
	5	Too high PTO rpm (The most frequent mistake)	Reduce PTO rpm
	6	Too low work speed	Speed up to V 10 km/hor more
	7	Damaged tractor's PTO	Repair
	Mower with either tine or roller conditioner may mow improperly in case of very small grass or after the rain		
	Replace the internal working discs with a drum to the working discs with instep (additional equipment). - for mowers: **KDF 260, KDF 300, KDF 340**		
The grass is wound on the forming drums	Mowing lying grass without inclination towards the front		Always mow low and fast – inclination towards the front –1.57″
Grass blocks the mower – lack of grass flow or the flow is uneven	Too low work speed		Speed up to 10 km/h (6.21 mph) or more
Mower does not work, even though the drive is transmitted from the tractor	Torn off shaft of intersecting axis gear		Replace intersecting axis gear
Mower is blocked	Damaged gears in the cutterbar. Damaged bearings in the disc hub		This repair must be done by SaMASZ service
	Swath guides are set too narrow		Widen swath guides to the maximum
Leaking cylinder	Dirty oil in hydraulic unit of the tractor		Replace oil in the tractor hydraulics. Provide brand new cylinder repair kit and replace worn gaskets
Excesive vibration during work	Damaged PTO shaft		Check the condition of PTO shaft and if need be replace
Oil leak in gear	Not tight assembly		Examine tightness and check oil level

9. DISASSEMBLY AND WITHDRAWAL FROM USE

9.1. Scrapping

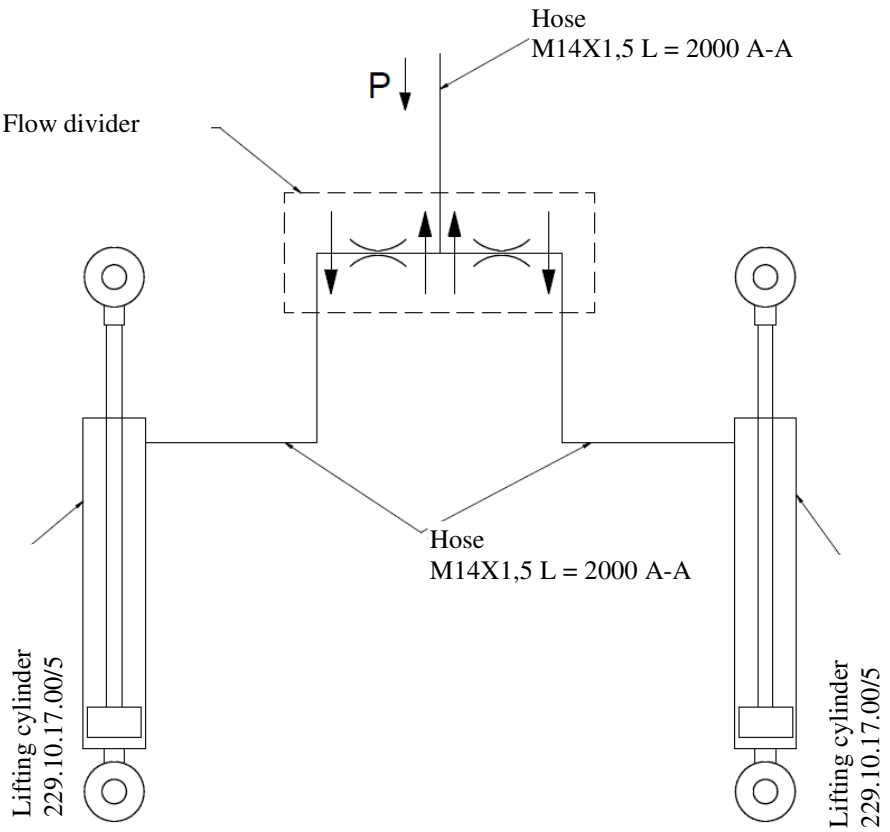
If the mower cannot be repaired anymore, it should be withdrawn from use.

To do so, oil from intersecting axis gear and cutterbar should be drained and delivered to a proper waste treatment company. Clean the mower parts, dismantle and dispose properly of all plastic parts. After that, the mower can be scrapped.

NOTICE:
Before disassembly disconnect the mower from the tractor.

10. HYDRAULIC SCHEME

Hydraulic scheme for KDF mowers



11. WARRANTY CARD

FRONT DISC MOWER

	Serial number Date of manufacture Manufacturer's stamp QC signature
	Date of purchase Dealer's stamp Dealer's signature

The product quality has been checked and meets the required standards and regulations and is permitted for use.

NOTICE:
A warranty card without the required information or with corrected or illegible information – **is invalid**.

12. WARRANTY TERMS

12.1. Warranty claims procedures

1. The manufacturer guarantees its products against faults in materials or production.
2. The warranty period is for two years from the date of sale to the purchaser, stated above.
3. Any repair which is subject to warranty should be carried out by an authorised SaMASZ dealer. Upon completion of the repair the dealer must submit a warranty claim within 14 days.
4. Warranty claims regarding replacing of the product or repayment are considered within 14 days by the manufacturer.
5. The following cases are not covered by warranty:
   a) **wearing parts: mowing discs, sliding skids, sidle bushings Pcw, intersecting axis gears and parts inside the gearboxes, bushings and sliding elements, joints, knife holders, cutting knives, V-belts, chain gears, drivechain, conditioner's tines and rollers, roller conditioner's rubbers, bearings, rubber-metal fenders, safety curtains, conveyor's belts, swath guides rubbers, connective elements, etc.**
      These repairs may be done only at purchaser's cost.
   b) **use for any other purpose than those described in the operator's manual,**
   c) **operation on stoney fields and results such as: damage of tine conditioner's shaft, discs, bending of cutterbar (stone with its diameter of 5.5" will not move between the discs and conditioner's shaft,**
   d) **running into any obstacle,**
   e) **too fast lowering of the cutterbar to the ground,**
   f) **transport and accidental damage,**
   g) **breaking, damage of tine conditioner's shaft, conveyor's belt.**
6. The Purchaser bears the costs of technical evaluation - when the manufacturer finds that a claimed product is free of defects and a technical report confirms that.
7. The manufacturer has the right to cancel a warranty in the following cases:
   a) **interference of the interior of the mower, changes of its mechanical design or intentional damages, bending parts of the mower and so on.**
   b) **operating with only 1 knife on the disc or without disc cover plates.**
   c) **damage caused by accidents, running into obstacles or other events, for which the warrantor is not responsible,**
   d) **using of knives, knife holders and mountings other than originally delivered by SaMASZ,**
   e) **negligent maintenance,**
   f) **use of non-genuine spare or replacement parts that are not specifically designed for the model in question,**
   g) **lack of needed records in the warranty card or filling in the warranty card independently,**
   h) **use of the mower not in accordance with operator's manual or for incorrect purpose, or use of the machine by untrained persons.**
8. Manufacturer can break the service agreement with immediate effect when the user does not pay the invoice according to that agreement in a timely manner and the delay in payment is longer than 30 days from maturity date. Breaking the service agreement caused by the user also invalidates the warranty.

NOTICE:
Please ask your dealer to complete and return the warranty card, otherwise you may lose your warranty rights.

The warranty card is valid only when it contains the following information: address, date and place of purchase, mower type and invoice number.

12.2. Warranty repairs record

Repairs description and changed spare parts:

Date, stamp and signature of repair shop.

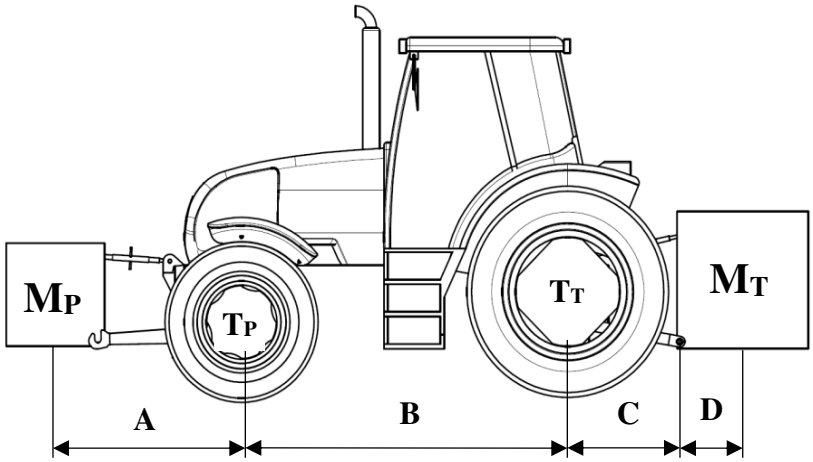
Date, stamp and signature of repair shop.

Date, stamp and signature of repair shop.

APPENDIX
CALCULATING AXIS LOAD

ATTENTION!
When mounting the machine on a tractor using front and/or rear 3-point linkage, a maximum value of permissible load cannot be exceeded – tractor's front axis load must be 20% of the tractor's overall weight.
Before using the tractor-machine assembly, check whether these conditions are met, while calculating and weighing the assembly.

1. Defining the total weight, axis load, tyre load capacity and minimum load.



For calculations the following data is necessary:

T	[lbs.]	Tractor's overall weight	(1) (3)
T_P	[lbs.]	Front axis load on unloaded tractor	(1) (3)
T_T	[lbs.]	Rear axis load on unloaded tractor	(1) (3)
M_P	[lbs.]	Total weight of machine mounted on front 3-point linkage or weight of front ballast	(2) (3)
M_T	[lbs.]	Total weight of machine mounted on rear 3-point linkage or weight of rear ballast	(2) (3)
A	[ft.]	Distance between centre of gravity of machine mounted on front 3-point linkage / front ballast and tractor's front axis centre	(2) (3)
B	[ft.]	Distance between tractor's axes	(1) (3)
C	[ft.]	Distance between tractor's rear axis centre and centres of ball joints on tractor's lower links	(1) (3)
D	[ft.]	Distance between centres of ball joints on tractor's lower links and centre of gravity of machine mounted on rear 3-point linkage / rear ballast	(2)

(1) Refer to tractor's operation manual

(2) Refer to technical data for machine in operation manual or price list

(3) Dimensions / measurement

- Calculating minimum weight of front ballast **$M_{P\ min.}$** – machine mounted at tractor's rear or at rear and front:

$$M_{Pmin.} = \frac{M_T \times (C + D) - T_P \times B + 0{,}2 \times T \times B}{A + B}$$

- Calculating minimum weight of rear ballast **$M_{T\ min.}$** – machine mounted at tractor's front:

$$M_{T\ min.} = \frac{M_P \times A - T_P \times B + 0{,}45 \times T \times B}{B + C + D}$$

- Calculating real axis load at tractor's front axis **$T_{P\ rzecz.}$**:

$$T_{P\ rzecz.} = \frac{M_P \times (A + B) + T_P \times B - M_T \times (C + D)}{B}$$

** If machine is mounted on tractor's front 3-point linkage (M_P) it is lighter than minimum required load at the front, so increase the weight of this machine to the required minimum load*

- Calculating total weight of tractor-machine assembly **M_C**:

$$M_C = M_P + T + M_T$$

** If machine is mounted on tractor's rear 3-point linkage (M_T) it is lighter than minimum required load at the rear, so increase the weight of this machine to the required minimum load*

- Calculating real axis load at tractor's rear axis **$T_{T\ rzecz.}$**:

$$T_{T\ rzecz.} = M_C - T_{P\ rzecz.}$$

- Tyre load capacity – apply double the load indicated by the tyres' manufacturer.

ENTER THE ABOVE CALCULATION DATA AND TECHNICAL DATA PROVIDED BY THE MANUFACTURER IN THE BELOW TABLE.

	Real value from calculations		Value to technical specification		Double value of tyre capacity load
Minimum weight of front or rear ballast **$M_{Pmin.}$ or $M_{Tmin.}$**					
Total weight **M_C**		≤			
Front axis load **$T_{P\ rzecz.}$**		≤		≤	
Rear axis load **$T_{T\ rzecz.}$**		≤		≤	

Minimum ballast must be reached by mounting the machine or additional weights provided on the tractor. Values resulting from calculations should be lower than or even to values given in technical specification.