



**PRONAR Sp. z o.o.**

17-210 NAREW, UL. MICKIEWICZA 101A, PODLASKIE PROVINCE

tel.:	+48 085 681 63 29	+48 085 681 64 29
	+48 085 681 63 81	+48 085 681 63 82
fax:	+48 085 681 63 83	+48 085 682 71 10

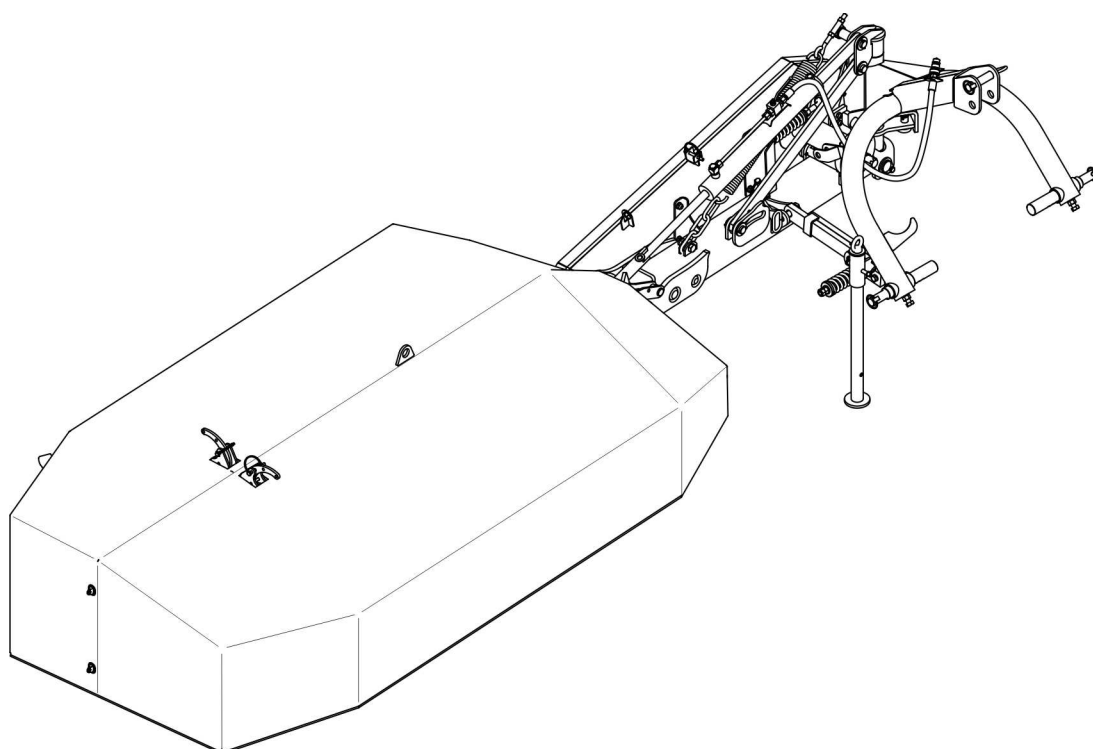
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# OPERATOR'S MANUAL

## DISC MOWER

### PRONAR PDK210

TRANSLATION OF THE ORIGINAL INSTRUCTIONS





# DISC MOWER

## PRONAR PDK210

### MACHINE IDENTIFICATION

**SYMBOL /TYPE:** PDK210

**SERIAL NUMBER:**

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# INTRODUCTION

Information contained herein is current at date of publication. As a result of improvements, some numerical values and illustrations contained in this publication may not correspond to the factual specification of the machine supplied to the user. The manufacturer reserves the right to introduce design changes in machines produced that facilitate operation and improve the quality of their work, without making minor amendments to this Operator's Manual.

This Operator's Manual is an integral part of the machine's documentation. Before using the machine, the user must carefully read this Operator's Manual and observe all recommendations. This guarantees safe operation and ensures malfunction free work of the machine. The machine is designed to meet obligatory standards, documents and legal regulations currently in force.

The manual describes the basic safety rules and operation of the implement.

If the information contained in the Operator's Manual needs clarification then the user should refer for assistance to the sale point where the machine was purchased or to the manufacturer.

## MANUFACTURER'S ADDRESS:

*PRONAR Sp. z o.o.  
ul. Mickiewicza 101A  
17-210 Narew*

## CONTACT TELEPHONES

<i>+48 085 681 63 29</i>	<i>+48 085 681 64 29</i>
<i>+48 085 681 63 81</i>	<i>+48 085 681 63 82</i>

## SYMBOLS APPEARING IN THIS OPERATOR'S MANUAL

Information, descriptions of danger and precautions and also recommendations and orders associated with user safety instructions are marked:



and also preceded by the word "**DANGER**". Failure to observe the instructions may endanger the machine operator's or other person's health or life.

Particularly important information and instructions, the observance of which is essential, are distinguished in the text by the sign:



and also preceded either word "**ATTENTION**". Failure to observe the instructions may lead to damage to the machine as a result of improper operation, adjustment or use.

In order to focus the user's attention on the need to perform maintenance, the relevant section of the Operator's Manual is marked with the pictogram:



Additional tips and advice for machine operation are marked:



and also preceded either word „**TIP**”.

## DIRECTIONS USED IN THIS OPERATOR'S MANUAL

Left side – side to the left hand of the operator facing the machine's forward travel.

Right side – side to the right hand of the operator facing the machine's forward travel.



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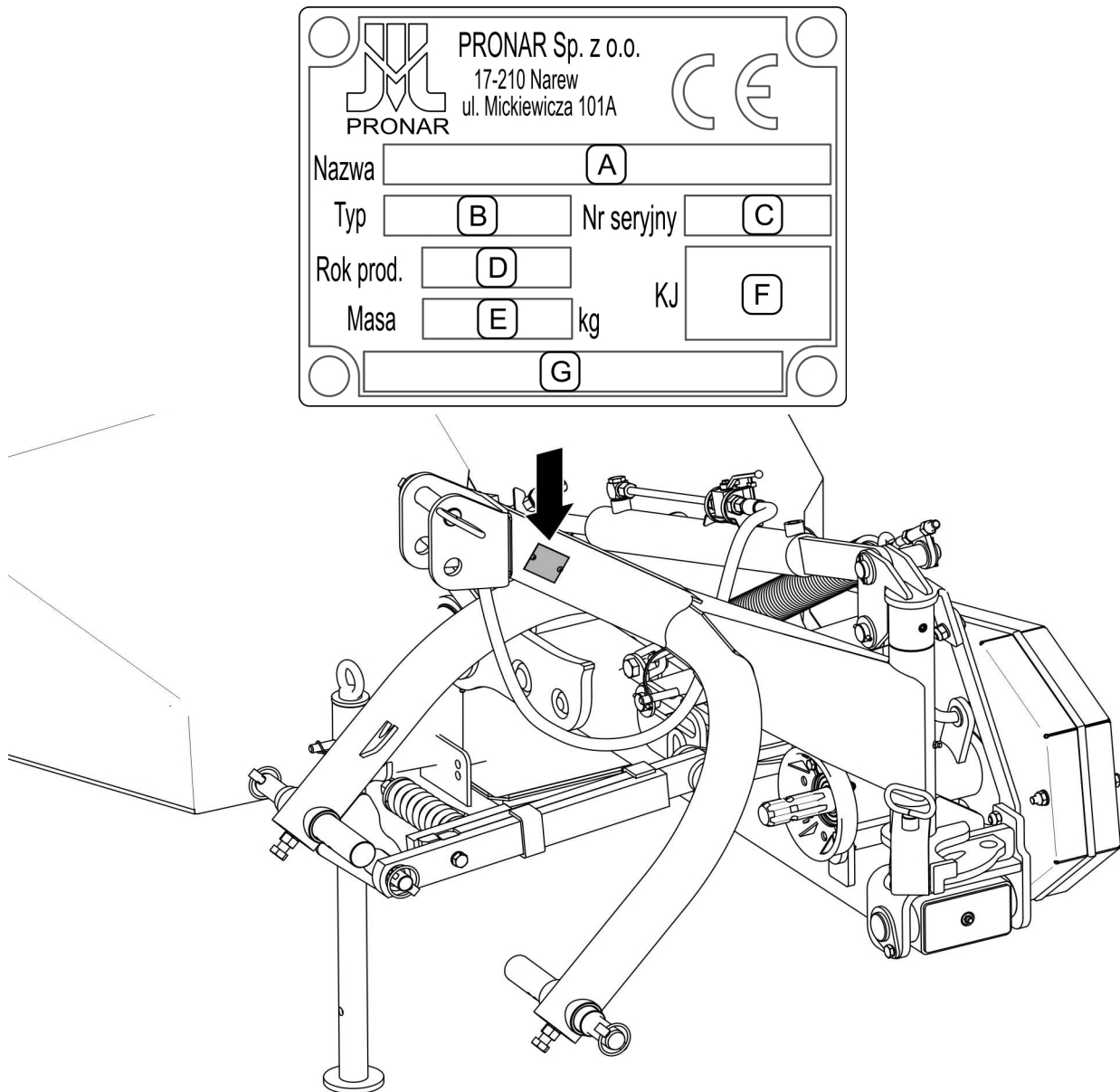
*SECTION*

**1**

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**BASIC  
INFORMATION**

## 1.1 IDENTIFICATION



**FIGURE 1.1** Location of the data plate

The PDK210 mower is marked with a data plate, placed on upper beam of the suspension system of machine. When buying the machine check that the serial numbers on the machine agree with the number written in the *WARRANTY BOOK*, in the sales documents and in the *OPERATOR'S MANUAL*.

The meaning of the individual fields found on the data plate (FIGURE 1.1) are presented in the table below:

A – Machine name

B – Type

C – Serial number

D – Production year

E – Total weight [kg]

F – Sign of quality control

G – Machine name, continued

## 1.2 PROPER USE

The PDK210 mower is constructed according to current safety requirements and engineering standards.

This machine is designed to cut grass and low stemmed green fodder (grass, lucerne, etc) on permanent grassland and on stone free cultivated fields with a level surface. Transporting people, animals or other materials is forbidden and regarded as contrary to the intended purpose. During the use of the machine comply with all road traffic regulations and transport regulations in force in the given country, and any breach of these regulations is regarded by the Manufacturer as use contrary to its intended purpose.

### IMPORTANT!



The mower must not be used for purposes other than those for which it is intended, in particular:

- for transporting people and animals,
- for transport of whatever materials or objects.

Using it as intended involves all actions connected with the safe and proper operation and maintenance of the machine. In connection with this the user is obliged to:

- carefully read the *OPERATOR'S MANUAL* and comply with its recommendations,

- understand the machine's operating principle and how to operate it safely and correctly,
- Adhere to the established maintenance and adjustment plans,
- comply with general safety regulations while working,
- prevent accidents,
- comply with the road traffic regulations and transport regulations in force in a given country, in which the machine is used,
- carefully read the Operator's Manual and comply with its recommendations,

**TABLE 1.1 Agricultural tractor's requirements**

CONTENTS	UNIT	REQUIREMENTS
<b>Hydraulic system</b>		
Hydraulic oil	-	HL 32
Pressure rating of the system	MPa	16
Number of hydraulic sockets	item	1 socket on rear of tractor
<b>Implement suspension system (TPL - three-point linkage)</b>		
Rear three point linkage system	-	Category II and III according to ISO 730-1 (or I category after changing pin)
<b>Power take-off shaft (PTO)</b>		
Rotation speed	RPM	540
Number of splines on PTO shaft	item	6
Rotation direction	-	clockwise
<b>Other requirements</b>		
Minimum power	kW / Horsepower	22/30

The mower may only be used by persons, who:

- are familiar with the contents of this publication and with the contents of the agricultural tractor service instructions,
- have been trained in mower service and safe operation,
- have the required authorisation to drive and are familiar with the road traffic regulations and transport regulations.

## 1.3 OPTIONAL EQUIPMENT

**TABLE 1.2 PDK210 mower optional equipment**

EQUIPMENT	STANDARD	OPTION
Operator's Manual	•	
Warranty book	•	
Weasler 904-01404 PTO shaft	•	
Key for changing cutting knives	•	

## 1.4 WARRANTY TERMS

The manufacturer guarantees the reliable operation of the machine when it is used according to its intended purpose as described in the *OPERATOR'S MANUAL*. Faults discovered during the warranty period will be repaired by the Warranty Service. Repair deadline is given in warranty booklet.

The guarantee does not apply to those parts and sub-assemblies of the machine, which are subject to wear in normal usage conditions, regardless of the warranty period. Consumables include the following parts/sub-assemblies:

- cutting knives,
- plastic fabric covers,
- bearings.

The warranty service only applies to such cases as: mechanical damage which is not the user's fault, factory defects of parts, etc.

In the event of damage arising from:

- mechanical damage which is the user's fault, caused by road accidents,
- by inappropriate use, adjustment or maintenance, use of the machine for purposes other than those for which it is intended,

- use of damaged machine,
- repairs carried out by unauthorised persons, improperly carried out repairs,
- making unauthorised alterations to machine design,

the user will lose the right to warranty service.



### TIP

**Demand that the seller carefully and precisely fills out the Warranty Book and guarantee repair coupons. A missing date of purchase or sale point stamp, may make the user ineligible for any warranty repair or refund.**

The user is obliged to report immediately on noticing any wear in the paint coating or traces of corrosion, and to have the faults rectified whether they are covered by the guarantee or not. Detailed guarantee regulations are contained in the Warranty Book attached to each machine.

Modification of the mower without the written consent of the Manufacturer is forbidden. In particular, do NOT weld, drill holes in, cut or heat the main structural elements of the machine, which have a direct impact on the machine operation safety.

## 1.5 TRANSPORT

The mower is ready for sale completely assembled and does not require packing. Packing is only required for the machine's technical documentation and any extra fittings.

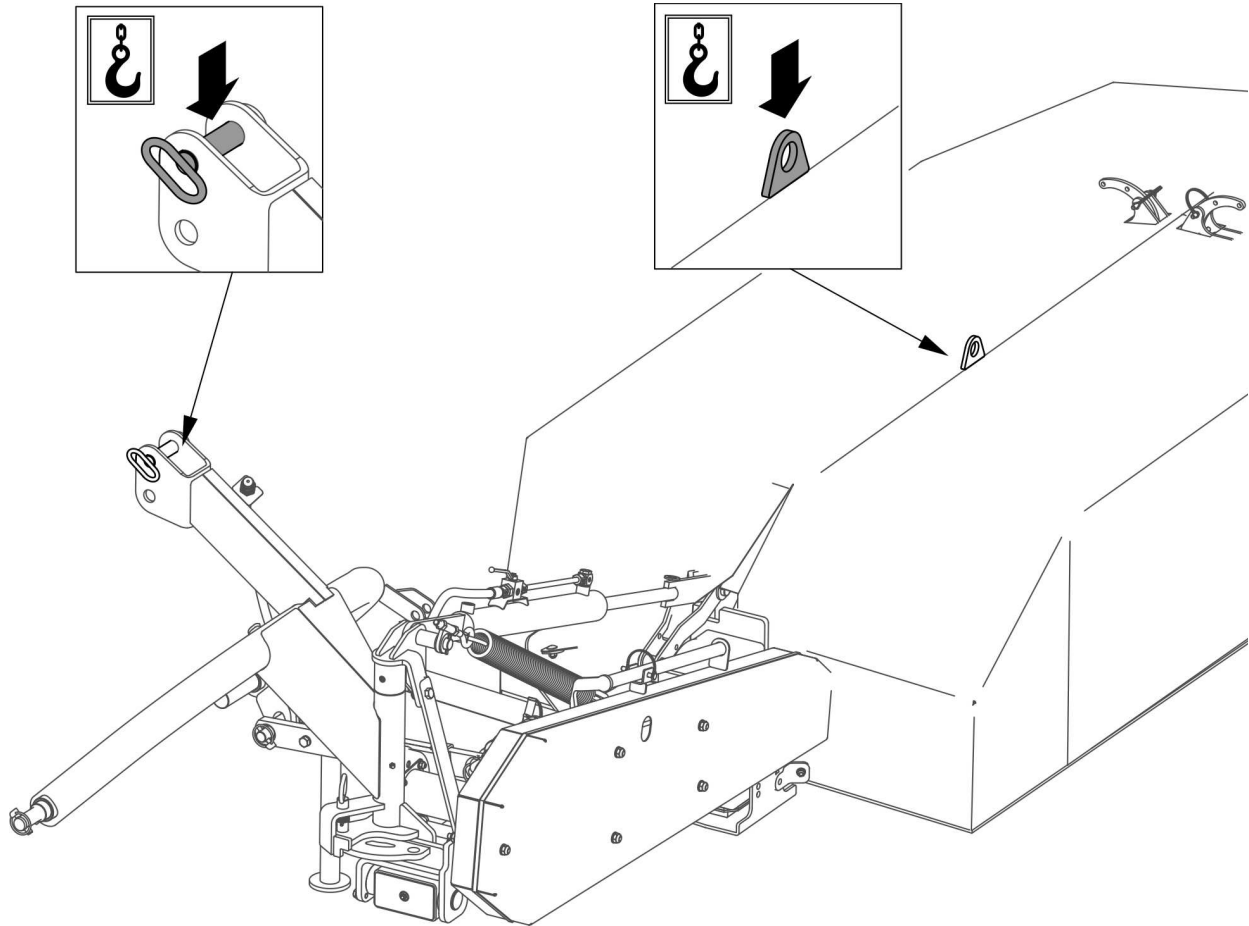


### IMPORTANT!

**When transporting independently, the user must carefully read this operator's manual and observe its recommendations. When being transported on a motor vehicle the mower must be mounted on the vehicle's platform in accordance with the transport safety requirements. The driver of the vehicle should take particular care while driving. This is due to the vehicle's centre of gravity shifting upwards when loaded with the machine.**

Delivery is either by transport on a vehicle or, after being attached to a tractor, independently. Transport of the mower is permissible connected to a tractor provided the tractor's driver familiarises himself with the machine's Operator's Manual and particularly with information concerning safety and principles of connection and transport of mower on public roads. Do NOT drive the tractor with mower connected when visibility is limited.

When loading and unloading the mower, comply with the general principles of workplace health and safety for reloading work. Persons operating reloading equipment must have the qualifications required to operate these machines.



**FIGURE 1.2** transport lugs

The mower should be attached to lifting equipment in places shown on figure (FIGURE 1.2), i.e. to central connection pin and to transport lug.

The machine should be attached firmly to the platform of the vehicle using straps or chains fitted with a tightening mechanism. The fastening equipment used must have a valid safety certificate. Exercise particular caution when lifting the machine. To keep lifted machine in the correct direction it is recommended to apply additional guy ropes. During the loading work particular care should be taken not to damage paint coating.



**TIP**

During unloading with lifting equipment, the mower should be set in park position and secured with load-bearing beam secured with pin. Support leg should be lowered and secured with a pin.

**IMPORTANT!**

Do NOT secure brackets or any types of securing elements to hydraulic cylinders.

## 1.6 ENVIRONMENTAL HAZARDS

A hydraulic oil leak constitutes a direct threat to the natural environment owing to its limited biodegradability. While carrying out maintenance and repair work which involves the risk of an oil leak, this work should take place on an oil resistant floor or surface. In the event of oil leaking into the environment, first of all contain the source of the leak, and then collect the leaked oil using available means. Remaining oil should be collected using sorbents, or by mixing the oil with sand, sawdust or other absorbent materials. The oil pollution, once gathered up, should be kept in a sealed, marked, hydrocarbon resistant container, and then passed on to the appropriate oil waste recycling centre. The container should be kept away from heat sources, flammable materials and food. Oil which has been used up or is unsuitable for further use owing to a loss of its properties should be stored in its original packaging in the conditions described above.

## 1.7 WITHDRAWAL FROM USE

In the event of decision by the user to withdraw the mower from use, comply with the regulations in force in the given country concerning withdrawal from use and recycling of machines withdrawn from use. Before proceeding to dismantle equipment oil shall be completely removed from hydraulic system, cutting knives and transmission. Locations of drain plugs and method for draining oil are described in section 5.

When spare parts are changed, worn out or damaged parts should be taken to a collection point for recyclable raw materials. Waste oil and also rubber and plastic elements should be taken to establishments undertaking the utilisation of such waste.

**IMPORTANT!**

During dismantling personal protection equipment shall be used i.e. protective clothing, boots, gloves and protective goggles etc.

Avoid contact of skin with oil. Do not allow used oil to spill.



**SECTION**

**2**

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**SAFETY  
ADVICE**

## 2.1 BASIC SAFETY RULES

### 2.1.1 USE OF MACHINE

- Before using the machine the user must thoroughly familiarise himself with the contents of this publication and with the *WARRANTY BOOK*. During the use all the recommendations contained in these documents should be observed.
- The mower may only be used and operated by persons qualified to drive agricultural tractors and agricultural machines and trained in the use of the machine.
- If the information contained in the Operator's Manual is difficult to understand, contact a seller who runs an authorised technical service on behalf of the manufacturer, or contact the manufacturer directly.
- Careless and improper use and operation of the machine, and non-compliance with the recommendations given in this operator's manual is dangerous to your health.
- Be aware of the existence of a minimal risk, and for this reason the fundamental basis for using this machine should be the application of safety rules and sensible behaviour.
- The machine must never be used by persons, who are not authorised to drive agricultural tractors, including children and people under the influence of alcohol or other drugs.
- Non-compliance with the safety rules of this Operator's Manual can be dangerous to the health and life of the operator and others.
- The machine must not be used for purposes other than those for which it is intended. Anyone who uses the mower other than the way intended takes full responsibility for himself for any consequences of this potentially improper use. Use of the machine for purposes other than those envisaged by the Manufacturer is not in accord with the purpose for which the machine is intended and may cause the invalidation of the guarantee.

- The machine may only be used when all the safety guards and other protective elements are technically sound and correctly positioned. In the event of loss or destruction of the safety guards, they must be replaced with new ones.
- In order to limit occupational risks associated with exposure to noise during mower operation use individual protection (ear protectors). In order to reduce the noise level during work the window and the door of the tractor cab should be closed.

### **2.1.2 LINKING AND DISCONNECTING FROM TRACTOR**

- Do NOT link the mower to a tractor, if hydraulic oil applied in both machines are of different types, or if the three point linkage system of the mower is not compatible with the category of the linkage system of the tractor.
- To attach the machine to the tractor only the rear Three Point Linkage may be used. After mounting the machine, check the linkage safeguards. After completion of coupling the machine, check the safeguards. Familiarise yourself with the contents of the tractor service instructions.
- To mount machine on tractor use only genuine pins and safeguard linchpins.
- The agricultural tractor to which the mower will be linked and coupled must be technically reliable and must fulfil the requirements of mower Manufacturer.
- Be especially careful when hitching the machine.
- During hitching there must be nobody between the mower and the tractor. A person assisting in the hitching of the machine should stand in such a place (beyond the area of danger), in order to be continuously visible to the tractor driver.
- Do NOT unhitch the mower from the tractor if the cutting system is raised. Exercise caution when disconnecting mower.
- Coupling may only take place with disconnected machine and tractor switched off.
- Mower uncoupled from the tractor must be supported with the aid of supports and pin must be protected.

### 2.1.3 HYDRAULIC SYSTEM

- The hydraulic system is under high pressure when operating.
- Regularly check the technical condition of the connections and the hydraulic conduits. There must be no oil leaks.
- In the event of malfunction of the hydraulic system, the machine shall be disconnected from use until the malfunction is corrected.
- When connecting the hydraulic conduits to the tractor, make sure that the tractor's hydraulic system and mower are not under pressure. If necessary reduce residual pressure in the system.
- In the event of injuries being caused by pressurised hydraulic oil, contact a doctor immediately. Hydraulic oil may find its way under the skin and cause infections. In the event of contact of oil with eye, rinse with large quantity of water and in the event of the occurrence of irritation consult a doctor. In the event of contact of oil with skin wash the area of contact with water and soap. Do NOT apply organic solvents (petrol, kerosene).
- Use the hydraulic oil recommended by the manufacturer. Never mix two types of oil.
- After changing the hydraulic oil, the used oil should be properly disposed of. Used oil or oil that has lost its properties should be stored in original containers or in substitute packaging resistant to the action of hydrocarbons. Substitute containers must be precisely labelled and appropriately stored.
- Do not store hydraulic oil in packaging designed for storing food or foodstuffs.
- Rubber hydraulic conduits must be replaced every 4 years regardless of their technical condition.
- Repair and replacement of hydraulic system elements should be entrusted to the appropriately qualified persons.

### 2.1.4 TRANSPORTING THE MACHINE

- When travelling on public roads, respect the road traffic regulations in force in the country, in which the machine is used.

- Do not exceed the permitted speed arising from limitations of road conditions and construction limitations. Adjust travel speed to the prevailing road conditions and other limitations arising from road traffic regulations limits.
- Before beginning travel, the mower must be placed in transport position and raised using the rear three-point linkage system.
- Do NOT leave machine raised and unsecured while the tractor is parked. When parked, the machine should be lowered.
- Do not transport the machine with the cutting assembly set in the working position.
- During transport the hydraulic cylinder ram valve should be set in the closed position.
- During transport disconnect PTO shaft from tractor.
- The mower may not be used or transported in conditions of limited visibility.
- Do NOT ride on the machine or transport any materials on it.
- Before using the machine always check its technical condition, especially in terms of safety. In particular, check the technical condition of the hitch system, the cutting system and elements connecting hydraulic system.
- Reckless driving and excess speed may cause an accident.

### **2.1.5 MAINTENANCE**

- During the warranty period, any repairs may only be carried out by a Warranty Service authorised by the manufacturer. It is recommended that necessary repairs to machine should be undertaken by specialised workshops.
- In the event of any fault or damage whatsoever, do not use the mower until the fault has been corrected.
- During work use the proper, close-fitting protective clothing, gloves and appropriate tools. When working on hydraulic systems it is recommended to use oil resistant gloves and protective goggles.
- Any modification to the machine frees the manufacturer from any responsibility for damage or detriment to health which may arise as a result.

- Before undertaking any work on the mower disconnect tractor engine and wait until all rotating parts come to a stop.
- Regularly check the technical condition of the safety devices and correct tightening of bolt connections.
- Regularly perform service inspections of machine as recommended by the Manufacturer.
- Do NOT perform service or repair work under raised and unsupported machine.
- Before beginning repair works on hydraulic systems, reduce oil pressure.
- Servicing and repair work should be carried out in line with the general principles of workplace health and safety. In the event of injury, the wound must be immediately cleaned and disinfected. In the event of more serious injuries, seek a doctor's advice.
- Repair, maintenance and cleaning work should be carried out with the tractor's engine switched off and the ignition key removed. Immobilise tractor with parking brake. Ensure that unauthorised persons do not have access to the tractor's cab.
- Should it be necessary to change individual parts, use only original parts. Non-adherence to these requirements may cause danger to health and the user's and other people's lives, and also damage the machine and constitute a basis for withdrawal of the guarantee.
- Regularly check technical condition and mounting of all guards and protective elements.
- The paint coating should be cleaned off before beginning welding work. Burning paint fumes are poisonous for people and animals. Welding work should be carried out in a well lit and well ventilated space.
- During welding work pay attention to flammable or fusible elements (parts of the hydraulic systems, plastic parts). If there is a risk that they will catch fire or be damaged, they should be removed or covered with non-flammable material before commencing welding work. Before beginning work prepare a CO<sub>2</sub> or foam extinguisher.
- In the event of work requiring the mower to be raised, use properly certified hydraulic or mechanical lifts for this purpose. After lifting the machine, stable and

durable supports must also be used. Do NOT carry out work under a machine, which has only been raised with the three point linkage.

- The machine must not be supported using fragile elements (bricks or concrete blocks).
- After completing work associated with lubrication, remove excess oil or grease.
- Damaged, missing or worn cutting knives must be replaced in pairs in order to maintain the balance of the cutting disc.
- In order to reduce the danger of fire the machine must be kept in a clean condition.

### **2.1.6 WORK OF MOWER**

- Before lowering or lifting the mower mounted on the three-point linkage, make sure there are no bystanders, especially children, near the machine.
- Before starting mower drive, the cutting assembly must be in working position.
- Before starting the mower make sure that there are no bystanders (especially children) or animals in the danger zone. The machine operator is obliged to ensure proper visibility of the machine and the working area.
- Mowing should begin after reaching nominal PTO RPM of 540 rpm. Do NOT overload shaft and mower and also engage the clutch suddenly.
- During cutting do NOT use PTO revolution speed greater than 540 rpm.
- When mowing on the edges of streets, public roads, on stony ground there is a risk that thrown out stones and foreign bodies may pose a risk to bystanders and other vehicle passing by.
- Do NOT leave the tractor cab, when the machine drive is engaged.
- Do NOT stand within the mower's working zone.
- Do NOT approach cutting unit guards until the rotating cutting parts come to a complete standstill.
- Do NOT operate mower while reversing. While reversing lift machine.
- Keep a safe distance from electric power lines during travel with raised cutting assembly.

### 2.1.7 OPERATION OF PTO SHAFT

- While reversing and during turns, the PTO drive must be disengaged.
- The machine may only be connected to the tractor by appropriately selected PTO shaft recommended by the Manufacturer.
- The PTO shaft has markings on the casing, indicating, which end of the shaft shall be connected to the tractor.
- Never use a damaged PTO shaft, it may cause an accident. A damaged shaft must be repaired or replaced.
- Disconnect the drive shaft each time when it is not necessary to drive the machine.
- The chains preventing the shaft cover from turning while the shaft is working, shall be secured to a fixed element of machine structure.
- Do NOT use the securing chains to support the shaft while machine is parked or when transporting the machine.
- Before using the machine, the user should thoroughly acquaint himself with the PTO shaft Operator's Manual and adhere to the recommendations contained in it.
- The drive shaft must be equipped with a cover. Do NOT use the shaft with damaged or missing guards.
- After connecting shaft ensure that it is correctly and safely connected to the tractor and to the mower.
- Before starting the machine make sure that there are no bystanders (especially children) in the danger zone. The machine operator is obliged to ensure proper visibility of the machine and the working area.
- Before starting PTO shaft make certain that the PTO rotation direction is correct.
- Before disconnecting the shaft, turn off the tractor engine and remove the key from the ignition.
- Do NOT wear loose clothing, straps or whatever that may become wrapped round the rotating drive shaft. Contact with rotating PTO shaft may cause severe injuries.



- Do NOT go over and under the shaft or stand on it equally during work as also when the machine is parked.

## 2.2 DESCRIPTION OF MINIMAL RISK

Pronar Sp. z o. o. in Narew has made every effort to eliminate the risk of accidents. There is, however, a certain minimal risk, which could lead to an accident, and this is connected mainly with the actions described below:

- using the mower for purposes other than those for which it is intended,
- being between the tractor and the machine while the engine is running and when the machine is being attached,
- being on the machine while the engine is running,
- operating the mower with removed or faulty safety guards,
- not keeping a safe distance from the danger zone or being within the zones while the machine is operating,
- operation of the machine by persons under the influence of alcohol,
- cleaning, maintenance and technical checks when tractor is connected and engine is running.

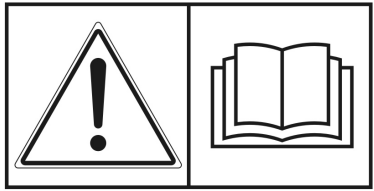
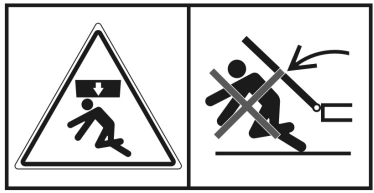
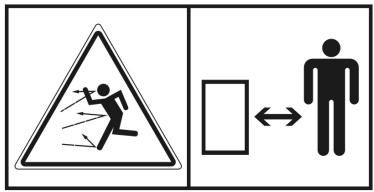
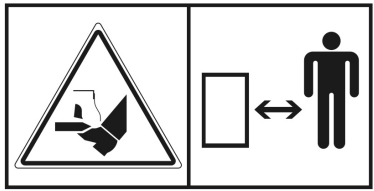
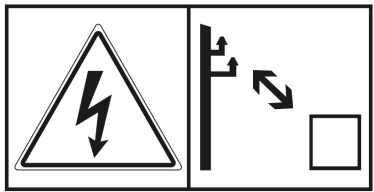
The minimal risk may be kept to a minimum by following the recommendations below:




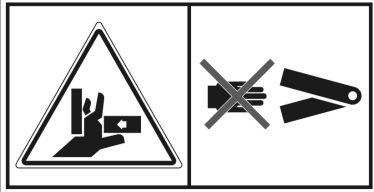

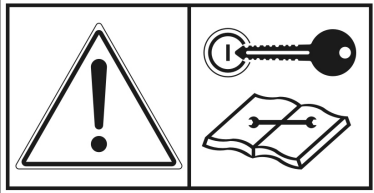

- prudent and unhurried operation of the machine,
- sensible application of the remarks and recommendations contained in the Operator's Manual,
- carrying out repair and maintenance work in line with operating safety rules,
- carrying out repair and maintenance work by persons trained to do so,
- using strictly suited protective clothing,
- ensuring unauthorised persons have no access to the machine, especially children.
- keeping a safe distance from forbidden or dangerous places
- a ban on being on the machine when it is operating


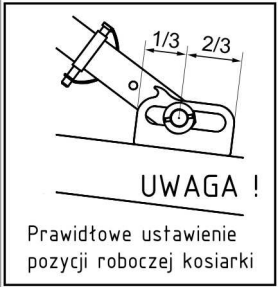




## 2.3 INFORMATION AND WARNING DECALS

The mower is labelled with the information and warning decals mentioned in table (2.1). The symbols are positioned as presented in figure (2.1). Throughout the time it is in use, the user of the machine is obliged to take care that notices and warning and information symbols located on the machine are clear and legible. In the event of their destruction, they must be replaced with new ones. Safety decals are available from your PRONAR dealer or directly from PRONAR customer service. New assemblies, changed during repair, must be labelled once again with the appropriate safety signs. During cleaning do not use solvents, which may damage label covering and do not direct strong water jet at machine.

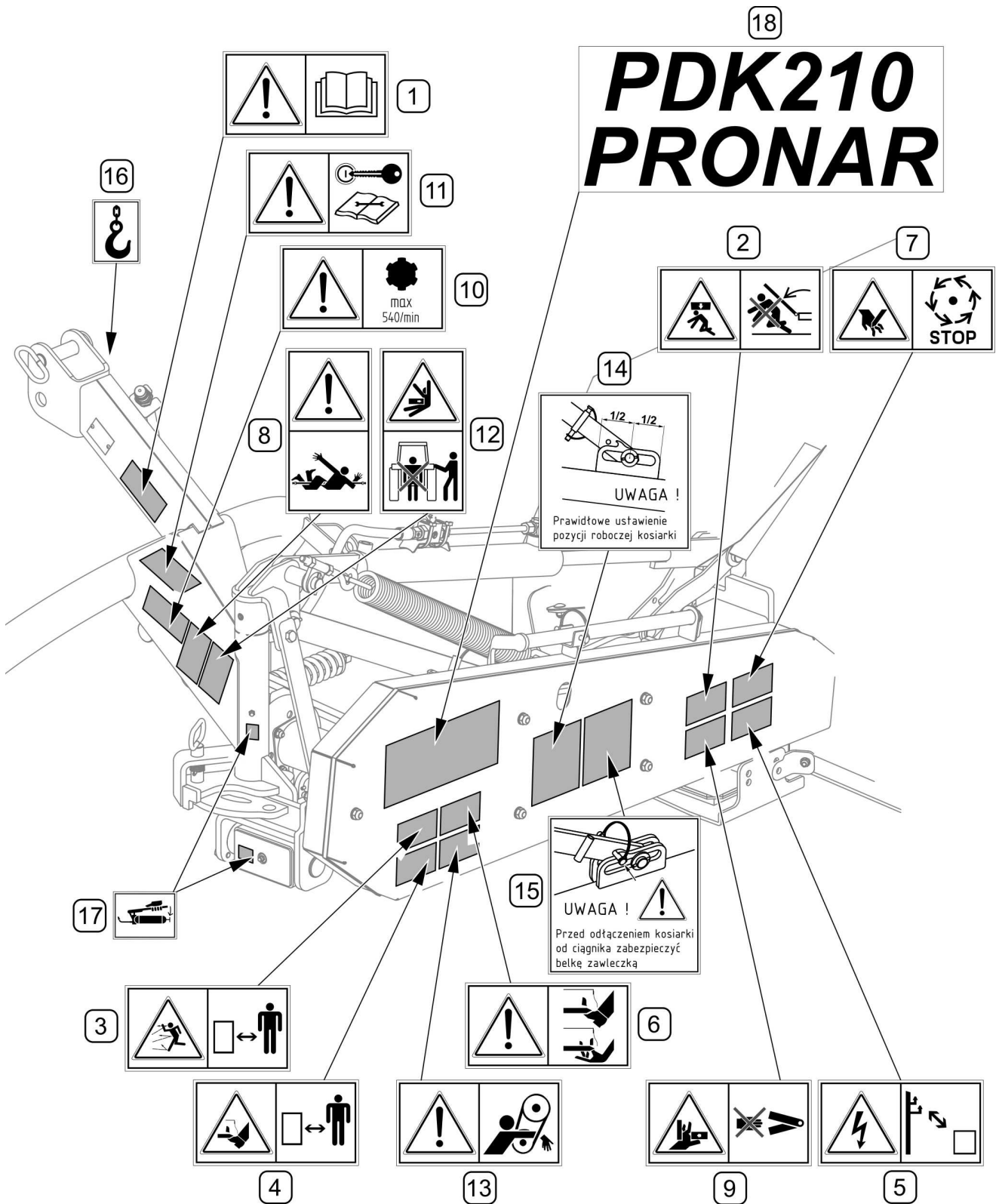
**TABLE 2.1 Information and warning decals**

ITEM	DECAL	MEANING OF SYMBOL
1		<p>Before starting work, carefully read the Operator's Manual.</p>
2		<p>Risk of injury when machine is being arranged in transport or working position.</p>
3		<p>Thrown out objects, endanger the whole body. Keep a safe distance from the operating machine.</p>
4		<p>Risk of injury to foot or leg. Keep a safe distance.</p>
5		<p>Keep a safe distance from electric power lines.</p>

ITEM	DECAL	MEANING OF SYMBOL
6		<p>Danger - cutting elements!</p> <p>Do NOT approach an operating machine.</p>
7		<p>Do not touch any rotating elements until they come to a complete standstill.</p>
8		<p>Danger associated with the rotating PTO shaft.</p>
9		<p>Do not reach into crushing space because elements may move. Danger of crushing hands or fingers.</p>
10		<p>Maximum allowable PTO shaft rotation speed is 540 rpm.</p>
11		<p>Before beginning servicing or repairs, switch off engine and remove key from ignition</p>
12		<p>Do not stand behind the tractor while lifting arm is operated.</p>

ITEM	DECAL	MEANING OF SYMBOL
13		<p>Attention! Belt transmission, take extreme care.</p>
14		<p>Proper working position setting</p>
15		<p>Before unhitching mower from the tractor secure beam with linchpin</p>
16		<p>Transport catch points marking.</p>
17		<p>Lubrication points</p>
18		<p>Machine type</p>

Numbers in the item column correspond to decals (FIGURE 2.1)



**FIGURE 2.1** Locations of information and warning decals.

Meaning of symbols (TABLE 2.1)



*SECTION*

**3**

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**DESIGN AND  
OPERATION**

### 3.1 TECHNICAL SPECIFICATION

**TABLE 3.1 BASIC TECHNICAL SPECIFICATION**

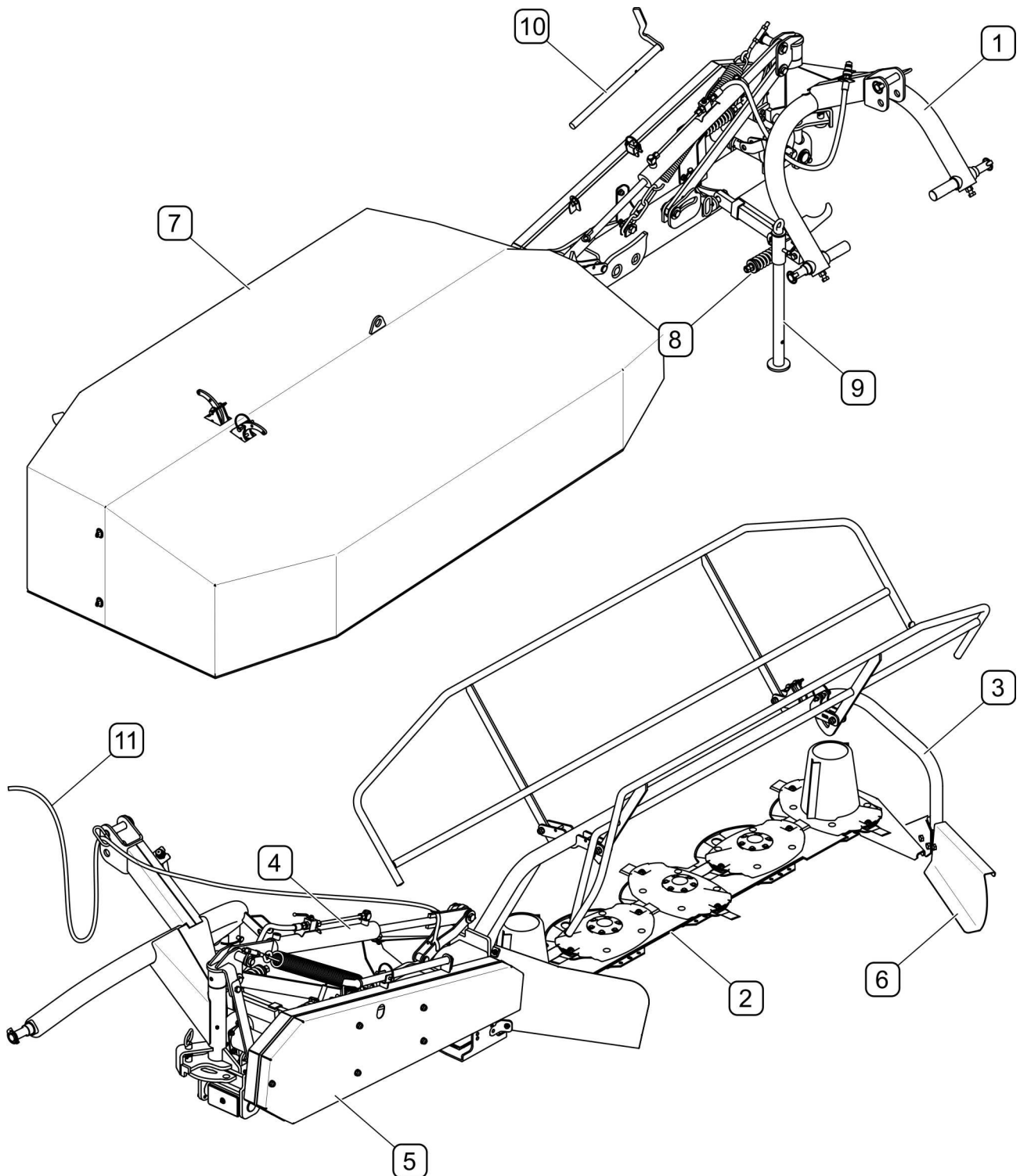
	Unit	
<b>Dimensions</b>		
Total width in working setting	mm	3 900
Total height in working setting	mm	970
Total length in working setting	mm	1 550
Total length in transport setting minimum / maximum	mm	1 600 / 4 270
Width in transport setting: minimum / maximum	mm	1 570 / 1 620
Height in transport setting: minimum / maximum	mm	970 / 2 600
<b>Technical specification</b>		
Cutting width	mm	2 100
Swath width	mm	1 380
productivity (at recommended cutting speed)	ha/h	2.1
Tare weight	kg	380
Minimum power demand	kW/KM	22/30
Maximum PTO speed	RPM	540
Linkage	-	Category II and III according to ISO 730-1 ( <i>cat. I after changing pins</i> )
Number of discs	item	5
Number of cutting knives	item	10
Rotation speed of discs	RPM	3 180
Recommended mowing speed	km/h	10
Noise emission level:		
L <sub>pA</sub>	dB	91
L <sub>Amax</sub>	dB	92

**L<sub>pA</sub>** - noise level exposure relating to 8 hour working day. Time averaged acoustic pressure emission level correlated with frequency characteristic A.

**L<sub>Amax</sub>** - maximum value of measurement correlated with frequency characteristic A of acoustic power level.



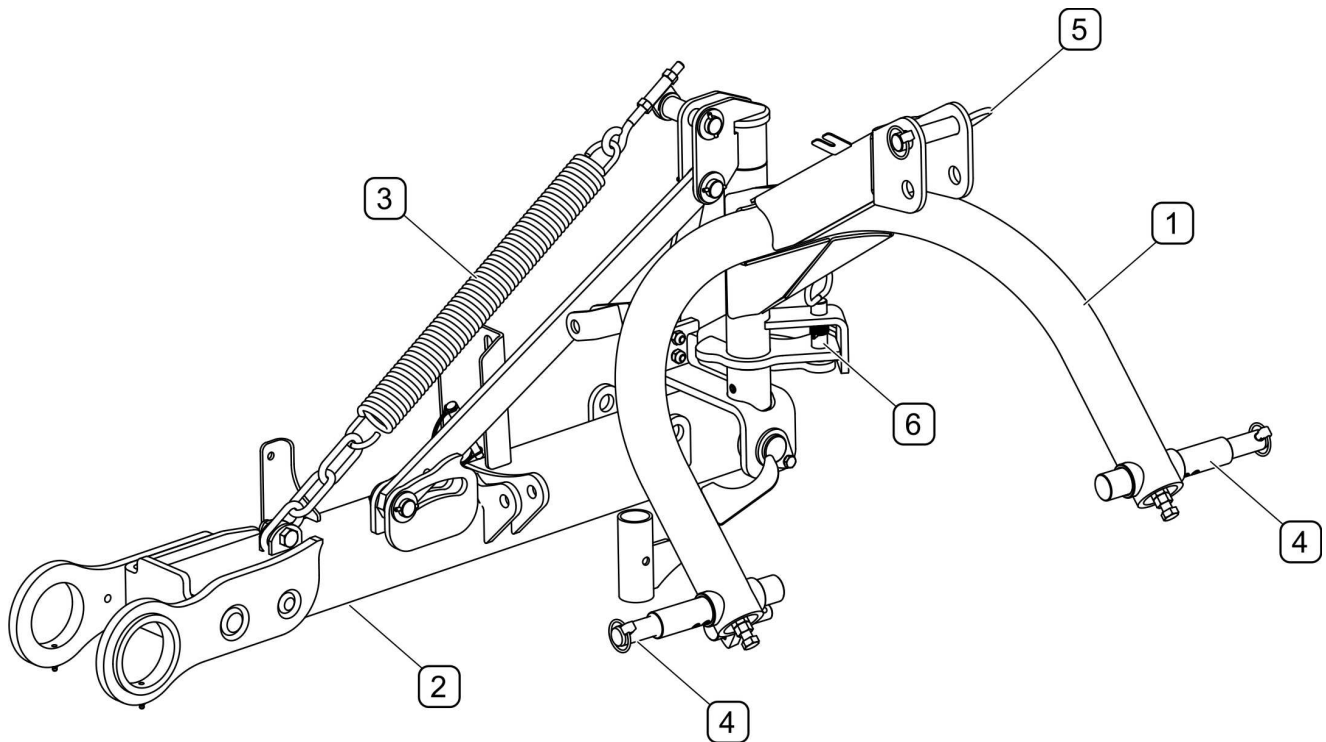
## 3.2 GENERAL DESIGN



**FIGURE 3.1** General design

(1)- linkage; (2)- cutting unit; (3)- bearing frame; (4)- hydraulic cylinder; (5)- drive transmission; (6)- swath guide; (7)- tarpaulin shields; (8)- safety device; (9)- support; (10)- key for changing cutting knives; (11)- block cable

### 3.3 LINKAGE

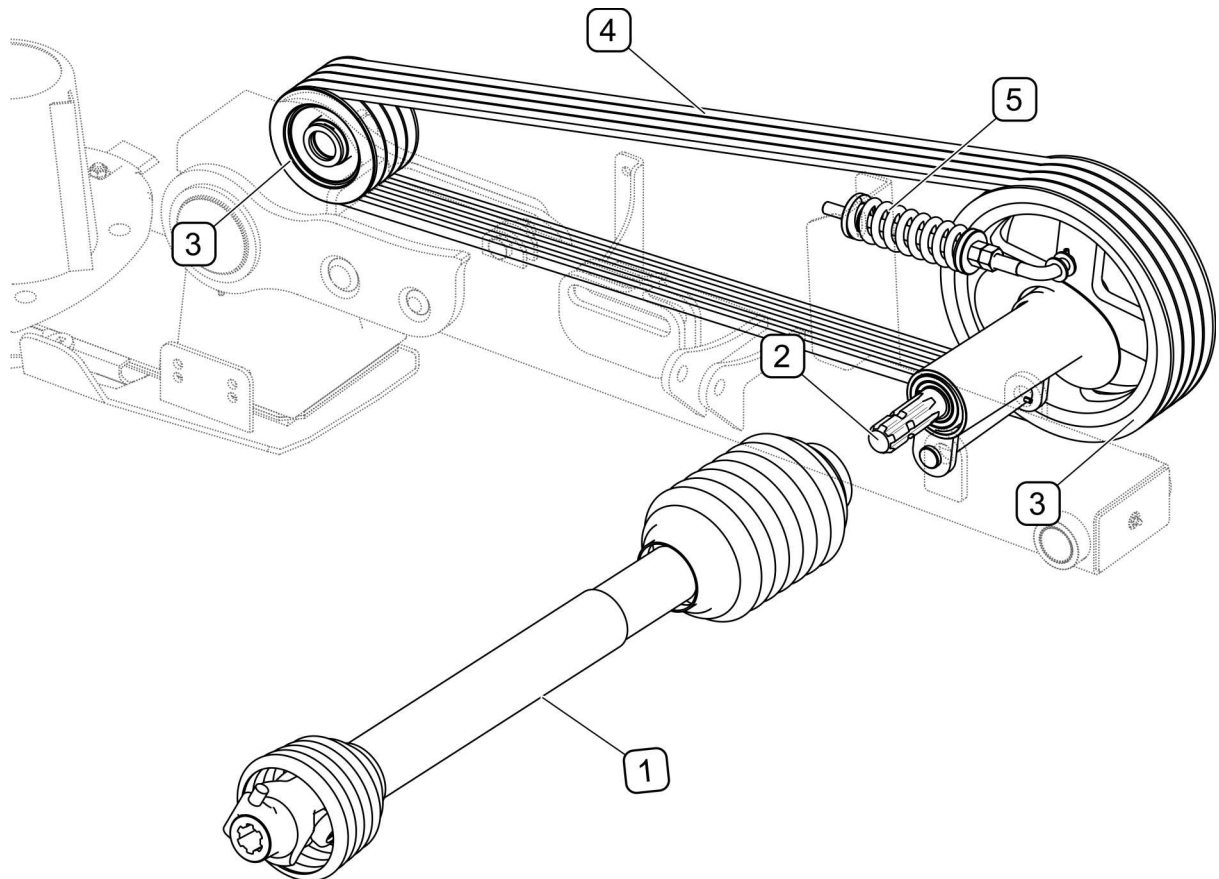


**FIGURE 3.2 Linkage**

(1)- Three point linkage frame; (2)- load-bearing beam; (3)- stay spring; (4)- three point linkage lower connecting pin; (5)- central connection pin; (6)- spring tensioner; (7)- carrying frame rotation block pin;

The main element of the PDK210 mower mounting system (FIGURE 3.2) is the three point linkage frame (1), which is equipped with two lower pins (4) and upper pin (5) for connection to the three point linkage system of the tractor. Load-bearing beam(2) lifts and lowers cutting unit. The spring relieves the cutting unit (3). With the aid of pin (6) the carrying frame is locked rotated to transport position behind tractor.

### 3.4 DRIVE TRANSMISSION

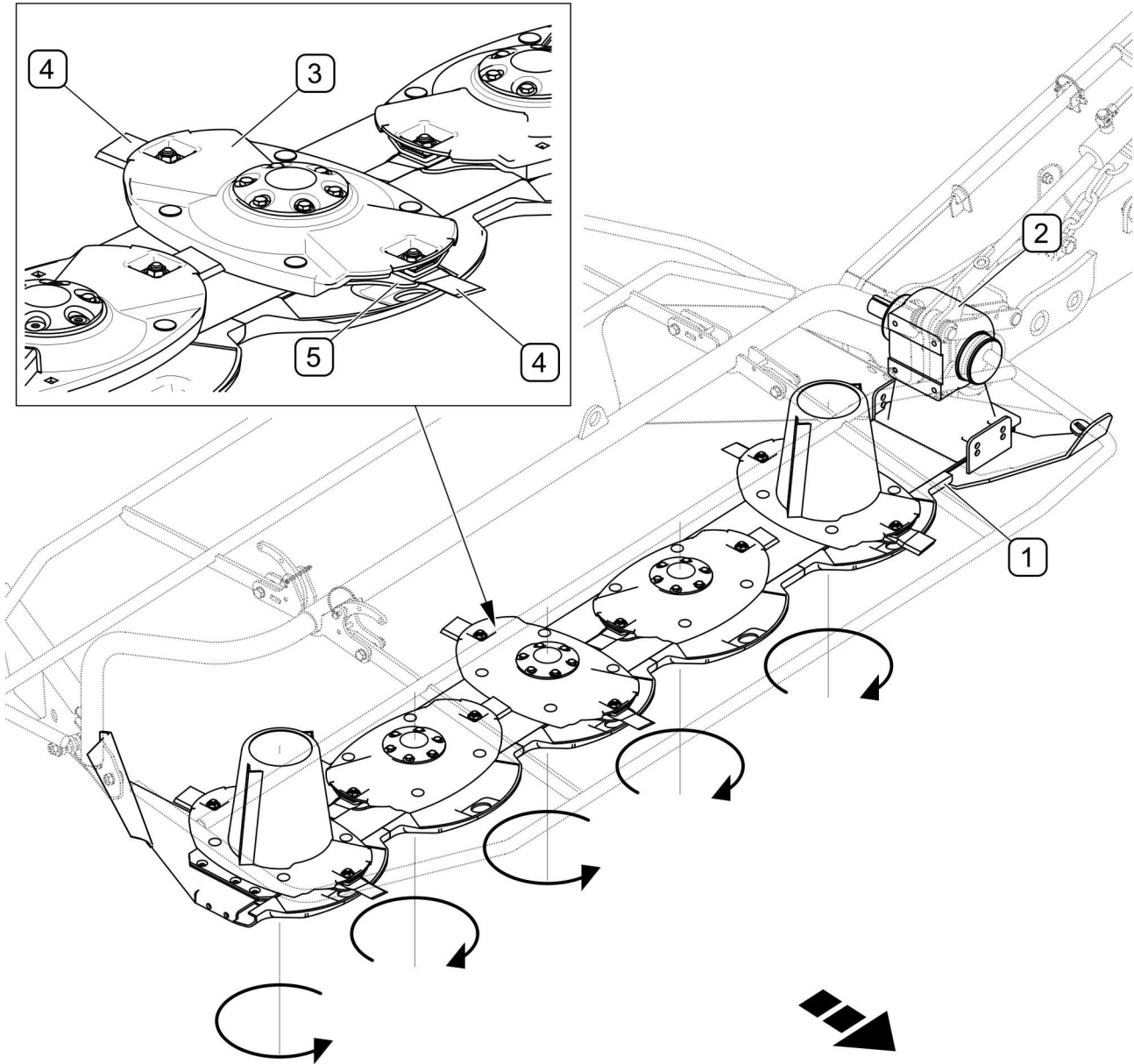


**FIGURE 3.3 Drive transmission**

(1)- PTO shaft; (2)- drive shaft; (3)- belt pulley; (4)- vee belts; (5)- tensioner;

Drive is transmitted from the power take-off shaft (PTO) of the tractor through the PTO shaft (1) with single direction clutch to drive shaft (2). Then with the aid of belts (4) and belt pulleys (3) the Intersecting axis gear of the cutting unit is driven. To adjust the tension use tensioner (5)

### 3.5 CUTTING UNIT



**FIGURE 3.4** Cutting unit

(1)- cutter bar; (2)- intersecting axis gear;(3)- cutting disc; (4)- knife; (5)- knife holder

The cutting unit of mower PDK210 is composed of cutter bar (1) on which is mounted intersecting axis gear (2). On the cutter bar are mounted five cutting discs (3). On each disc are seated two rotating cutting knives (4) to right or left depending on the rotation direction of the disc. Discs are equipped with knife holders (5). Rotation direction of individual discs is shown on figure 3.4.

*SECTION*

**4**

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**CORRECT USE**

## 4.1 PREPARING FOR WORK

The manufacturer guarantees that the machine is fully operational and has been checked according to quality control procedures and is ready for normal use. This does not release the user from an obligation to check the machine's condition after delivery and before first use. The machine is delivered to the user completely assembled.

Before connecting to tractor, machine operator must check the technical condition of the mower and prepare it for test start-up. In order to do this:

- the user must carefully read this Operator's Manual and observe all recommendations, understand the design and the principle of machine operation
- check the condition of protective paint coat,
- Inspect machine's individual components for mechanical damage resulting from incorrect transport (dents, piercing, bent or broken components),
- Check all the lubrication points, lubricate the machine as needed according to recommendations provided in section 5 "*MAINTENANCE*",
- check technical condition of the hydraulic system;
- check if cutting knives, cutter bar, lifting arms and safety guards are correctly installed,
- check technical condition of hitching system pins and locking linchpins,
- Check level of lubricating oil in angle transmission and cutter bar.

If all the above checks have been performed and there is no doubt as to the machine's good technical condition, it can be connected to tractor. Start the tractor's engine, check all systems and perform a test run before beginning work. In order to inspect:

- hitch the mower to tractor (see "*ATTACHING TO TRACTOR*")
- set in working position,
- connect PTO shaft to tractor and mower,
- start PTO drive.

Engage mower's drive for 3 minutes and check the following:

- that there is no knocking or noise in the drive system arising from scraping or grinding of metal elements,

- whether there is excessive vibration in the cutting unit,
- synchronised rotation of cutting unit,



### **ATTENTION!**

**Before using the mower always check its technical condition. In particular check the technical condition of the cutting unit, linkage, drive system, and integrity of protective guards.**

The mower's operation at no load should be smooth. Shaking of drive transmission, cutting unit and whole machine is not acceptable, nor is changed noise and vibrations coming from loose nut and bolt connections. After stopping mower, check fastening of cutting knives. Check that gear oil does not leak from reduction gear and cutter bar.



### **DANGER**

**Before using the mower, the user must carefully read this operator's manual.**

**Careless and improper use and operation of the mower, and non-compliance with the recommendations given in this operator's manual is dangerous to your health.**

**The mower must never be used by persons, who are not authorised to drive agricultural tractors, including children and people under the influence of alcohol or other drugs.**

**Non-compliance with the safety rules of this Operator's Manual can be dangerous to the health and life of the operator and others.**

**Before starting the mower, make sure that there are no bystanders in the danger zone.**


If any faults are detected they must be identified and rectified. If a fault cannot be rectified or the repair could void the guarantee, please contact retailer for additional clarifications.

## 4.2 CHECKING TECHNICAL CONDITION

When preparing the mower for normal use, check individual elements according to guidelines presented in table (4.1)

**TABLE 4.1 TECHNICAL INSPECTION SCHEDULE**

DESCRIPTION	SERVICE OPERATION	FREQUENCY
Condition of safety guards	check the technical condition of safety guards, if complete and correctly mounted.	Daily before beginning work
check if cutter bar and lifting arm are correctly installed,	check if correctly installed	
Technical condition of cutting knives	Visually inspect and if necessary replace according to section „ <i>CHECKING AND REPLACING CUTTING KNIVES</i> ”	
Oil level in intersecting axis gear	For details please refer to section “ <i>CUTTING UNIT MAINTENANCE</i> ”	
Check oil level in cutter bar	For details please refer to section “ <i>CUTTING UNIT MAINTENANCE</i> ”	
Check of all main nut and bolt connections are properly tightened	Torque values should be according to table (5.5)	Every six months
Lubrication	Lubricate elements according to table „ <i>LUBRICATION</i> ”.	According to table (5.3)

	<p><b>ATTENTION!</b></p> <p>Do NOT use unreliable mower.</p>
---	--



## 4.3 HITCHING TO TRACTOR

The PRONAR PDK210 mower may only be mounted on a tractor fulfilling the requirements contained in table „1.1 AGRICULTURAL TRACTOR'S REQUIREMENTS”.



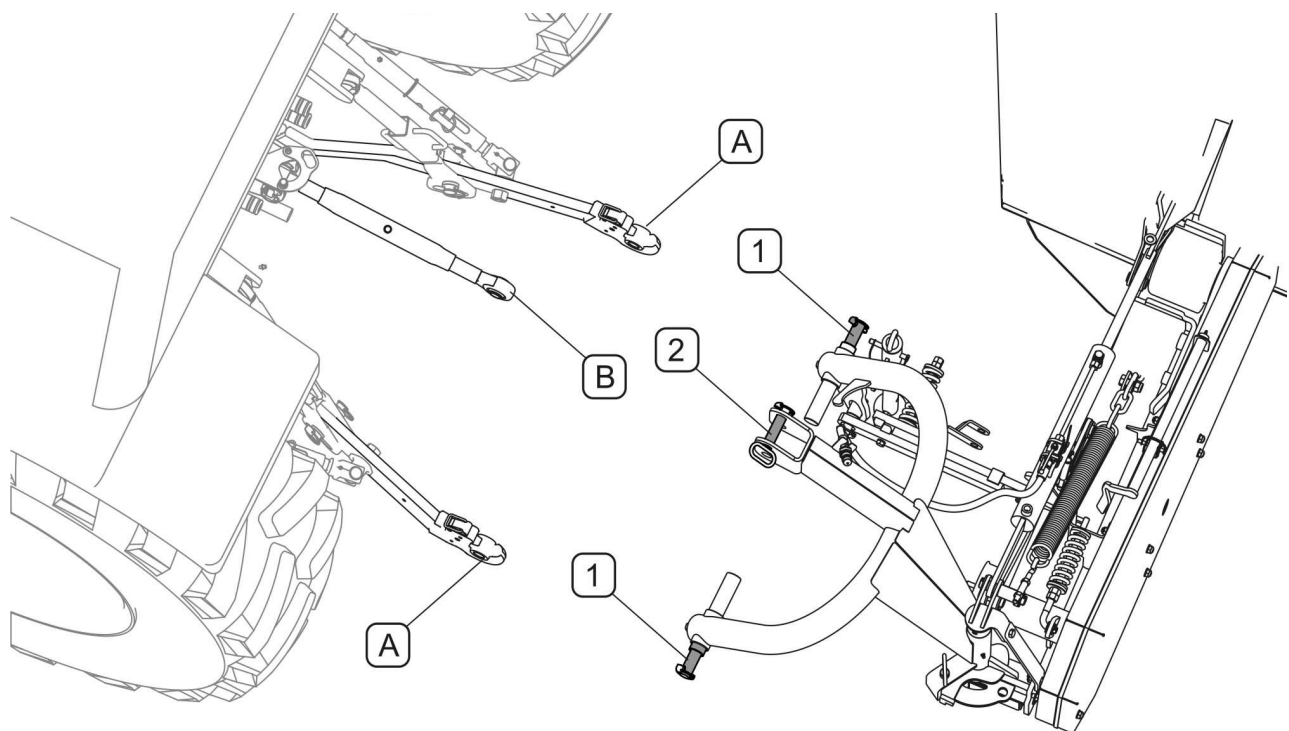
### ATTENTION!

Before using the mower, the user must carefully read the tractor operator's manual.



### DANGER

When hitching, there must be nobody between the mower and the tractor.  
Exercise caution when hitching the machine.



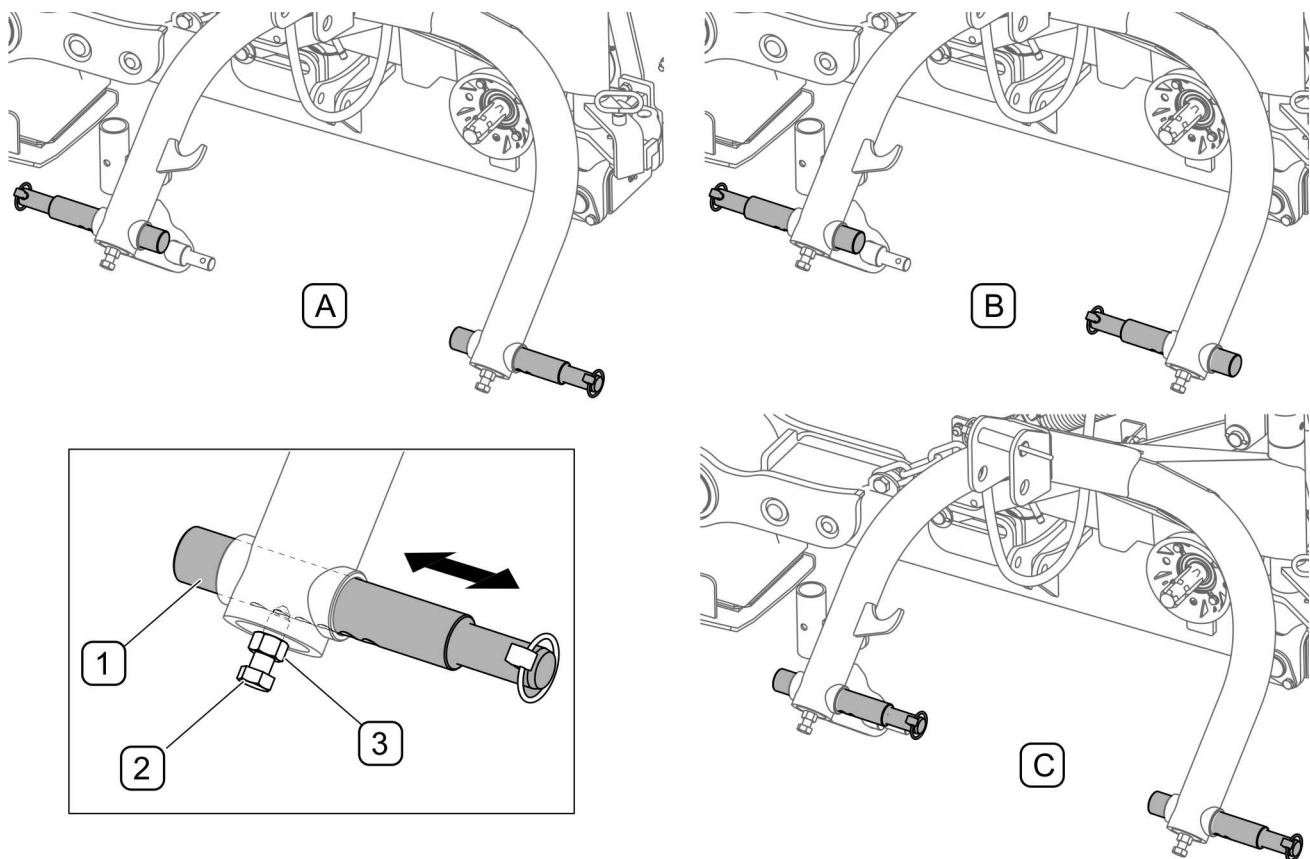
**FIGURE 4.1** Hitching to tractor

(A)- lower three point linkage arms; (B)- top link; (1)- mower linkage lower pins; (2)- top link mounting pin

In order to attach the mower to tractor (FIGURE 4.1), proceed as follows:

- Reversing the tractor bring the lower three point linkage connection points (A) of the tractor close to pins (1) of the mower.
- Set connection arms (A) of tractor at appropriate height.
- Switch off tractor's engine and prevent it from rolling.
- Connect lower pins (1) with linkage arms (A) and lock with the aid of linchpins,
- Connect top link (B) of tractor with pin (2) mower and lock with linchpin.
- Lift mower using tractor's three point linkage.
- Raise parking support and secure with linchpin.
- Unblock bearing beam removing pin (2) from block (FIGURE 4.12)

It is recommended to set both tractor lower linkage arms at the same height.



**FIGURE 4.2 Adjustment of mower lower linkage pins**

(1)- lower linkage pins; (2)- setting screw; (3)- counter nut, (A), (B), (C)- setting pin in arm

Lower pins (1) of the mower linkage enable spacing adjustment (FIGURE 4.2). To change spacing of linkage pin spacing:

- loosen counter nut (1),
- unscrew setting bolt (2),
- move pin (1) to the right or the left to obtain the required spacing,
- the pin may be turned equally inside or the outside of the arm (A), (B), (C)
- block pin position with setting bolt (2) and counter nut (3).

The method of adjustment of right and left pins is identical.

As standard PRONAR PDK210 mower is equipped with pins for linking with category II linkage according to ISO 730-1. To link to category III system, apply the appropriate pins (optional equipment).

Conduit connections of the raising cylinder of the cutting unit lifting frame should be connected to the hydraulic circuit in so-called "floating section".



### **DANGER**

**When connecting the hydraulic conduits to the tractor, make sure that the tractor's hydraulic system is not under pressure.**

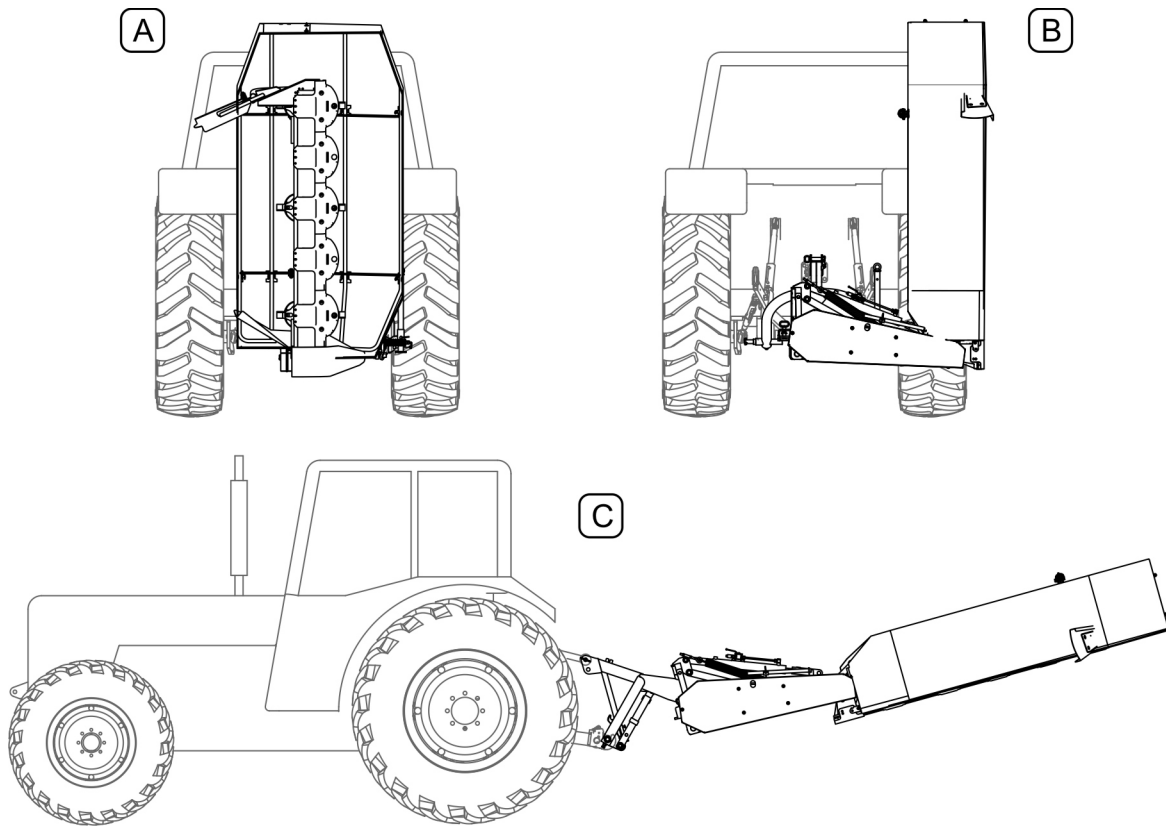
## **4.4 TRANSPORTING THE MACHINE**

For transport to place of work and back, raise mower on tractor three point linkage so that the lower pins are at height of not less than 500 mm above the ground. Disconnect PTO shaft from tractor's PTO and place on support.

The PRONAR PDK210 mower can be set in one of three transport positions (FIGURE 4.3)

To set the mower in (A) position:

- raise lifting arm by operation of appropriate hydraulic circuit in tractor until it is locked with the catch (1) (FIGURE 4.4),
- close cylinder valve



**FIGURE 4.3 Transport position**

(A), (B), (C)- transport positions

To set the mower in (B) position:

- raise lifting arm by operation of appropriate hydraulic circuit in tractor till it is locked with the catch (1) (FIGURE 4.4), close valve (2) of lifting ram,
- release and take out securing pin (2), from safety catch (**Błąd! Nie można odnaleźć źródła odwołania.**)
- raise safety catch (1) and place in bracket frame and secure with pin (2) and linchpin (**Błąd! Nie można odnaleźć źródła odwołania.**)
- manually tilt whole cutting unit backwards until it locks in that position;

To set the mower in (C) position:

- Lift the mower on three-point linkage
- release and take out securing pin (2), from safety catch (**Błąd! Nie można odnaleźć źródła odwołania.**)
- raise safety catch (1) and place in bracket frame and secure with pin (2) and linchpin (**Błąd! Nie można odnaleźć źródła odwołania.**)
- manually tilt whole cutting unit backwards until it locks in that position;
- close lifting cylinder valve (2) (FIGURE 4.4)

In (C) transport position the mower can be transported only short distances at an appropriately reduced travel speed.

Three point linkage lower arms must be secured so that mower does not swing sideways.



## DANGER

During transport of mower suspended on tractor, the lifting cylinder valve should be set in position "0 – closed"

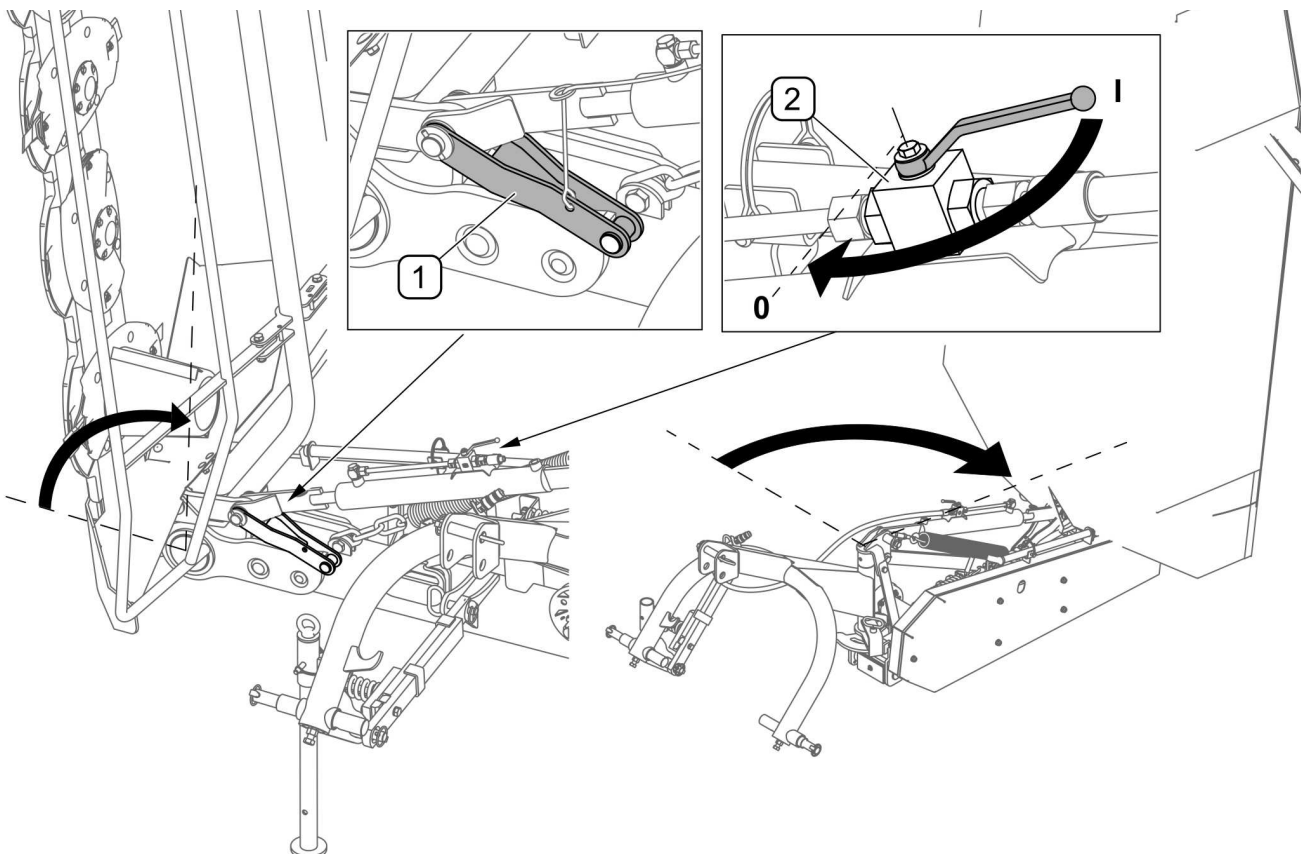
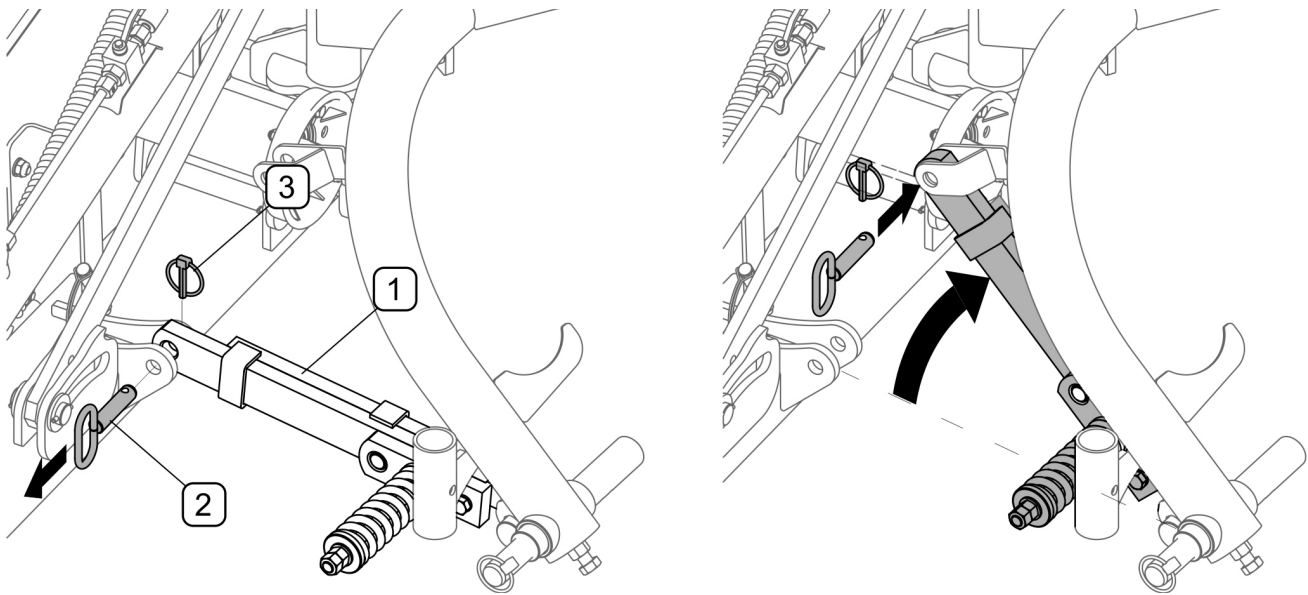


FIGURE 4.4 Setting transport position

(1)- lifting arm catch

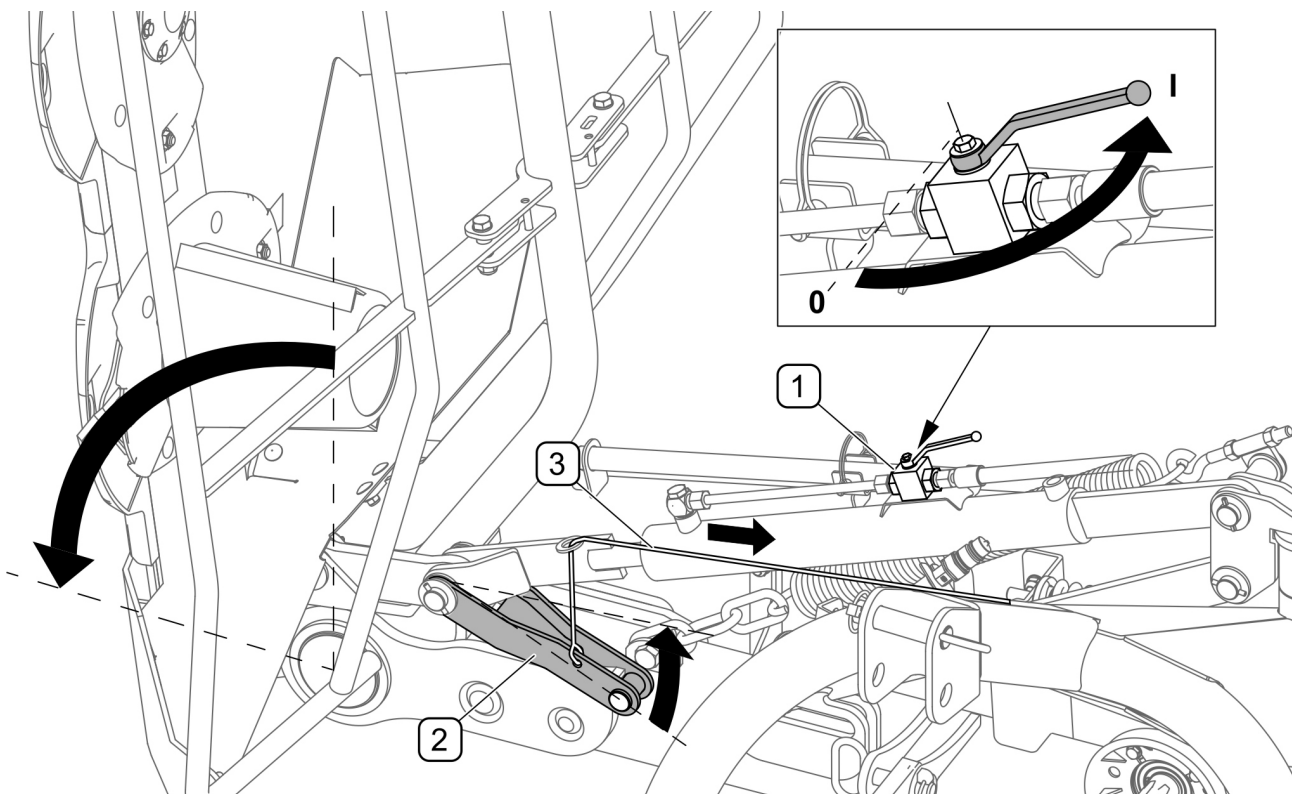


**FIGURE 4.5** Disassembly of safety device

(1)- safety catch; (2)- pin; (3)- linchpin

## 4.5 SETTING AND MOWING

### 4.5.1 SETTING THE MOWER IN WORKING POSITION



**FIGURE 4.6** Setting mower in working position

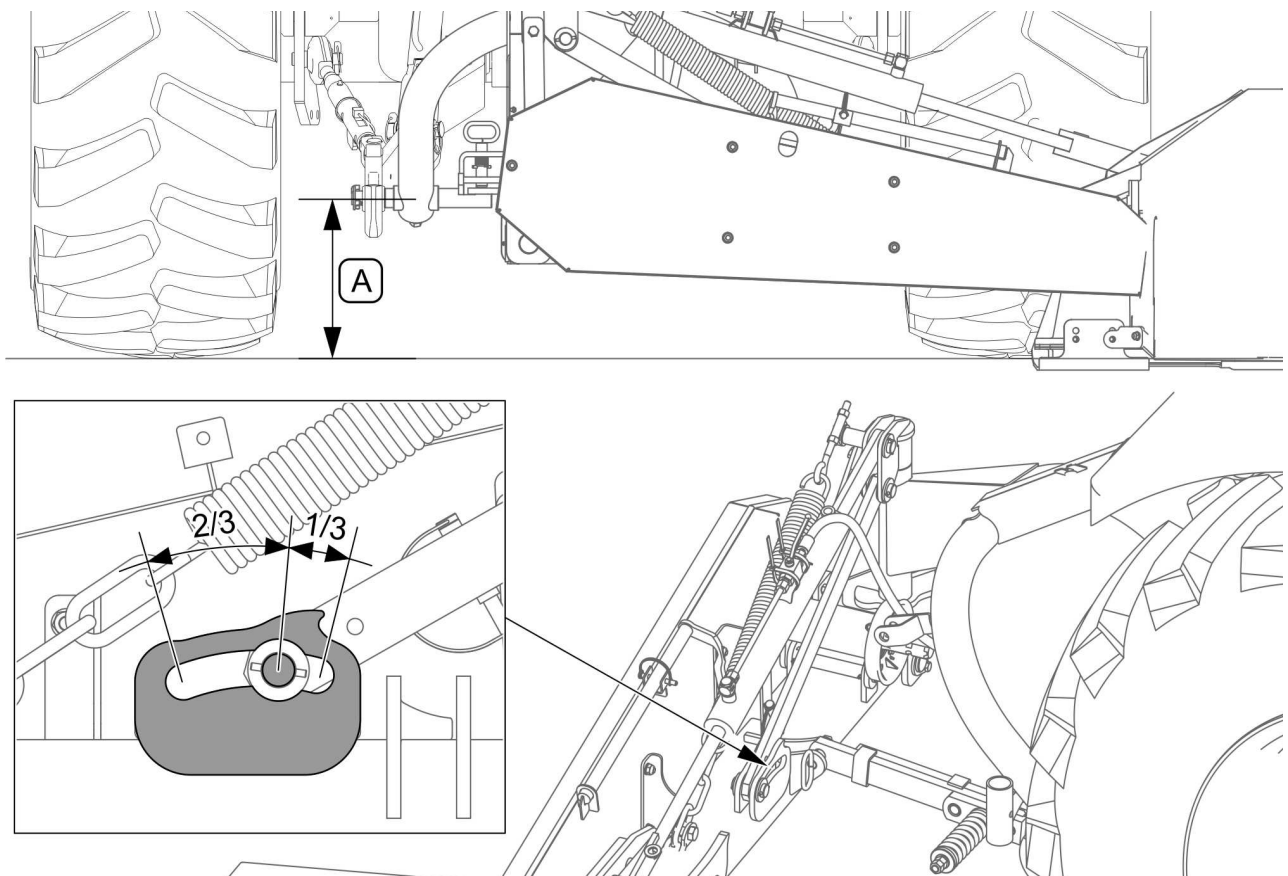
(1)- cylinder valve ;(2)- catch; (3)- catch cord;

in order to set mower in working position from transport position:

- release valve (1) of cylinder (FIGURE 4.6),
- release catch (2) by pulling cord (3) and operating hydraulic circuit in tractor lower bearing beam with cutting assembly so that the cutter bar is supported freely on the surface setting tractor hydraulic circuit in so-called "floating position",

#### 4.5.2 SETTING CUTTING HEIGHT

Raise lower lifting arms of tractor to such a height (A) that the pin may be set as in figure 4.7



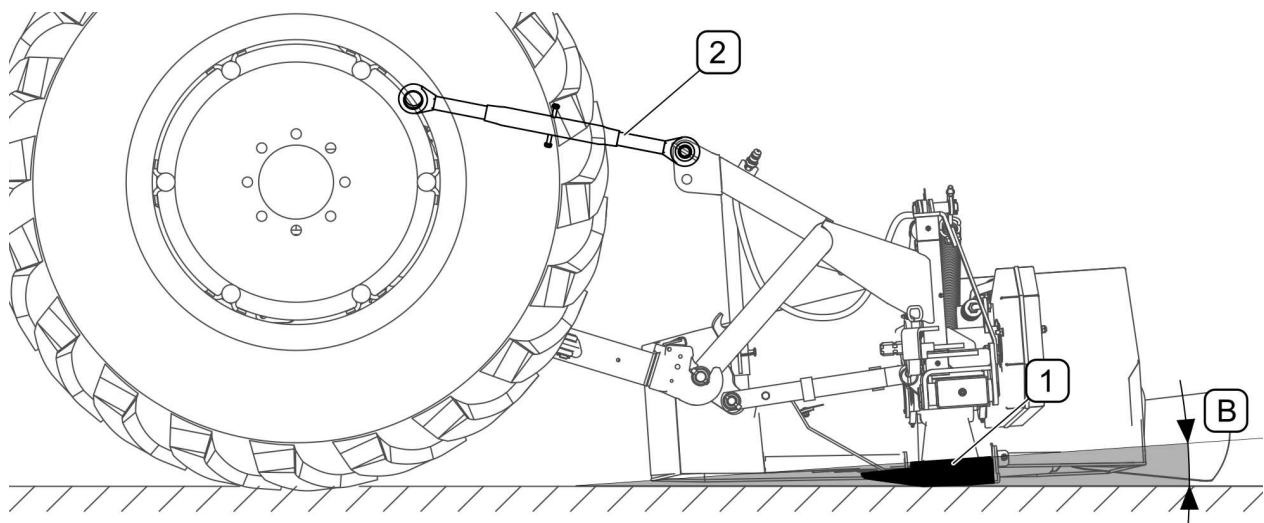
**FIGURE 4.7** Setting mower suspension height

(A)- distance of lower lifting arms from the ground



#### TIP

Optimum angle of inclination of cutter bar to the front is from 4° to 5° . Inclination to the rear causes faster wearing of cutter bar slide surfaces.



**FIGURE 4.8 Setting cutting height**

(1)- cutter bar; (2)- top link; (B)- cutter bar inclination  $4^{\circ} \div 5^{\circ}$

Adjust the length of the top link (2) so that the angle (B) inclination of the cutter bar to the ground surface is from  $4^{\circ}$  to  $5^{\circ}$ . Cutting height can be set higher by extending the top link, or set lower by shortening the top link.

### 4.5.3 CONNECTING DRIVE SHAFT

#### **DANGER**



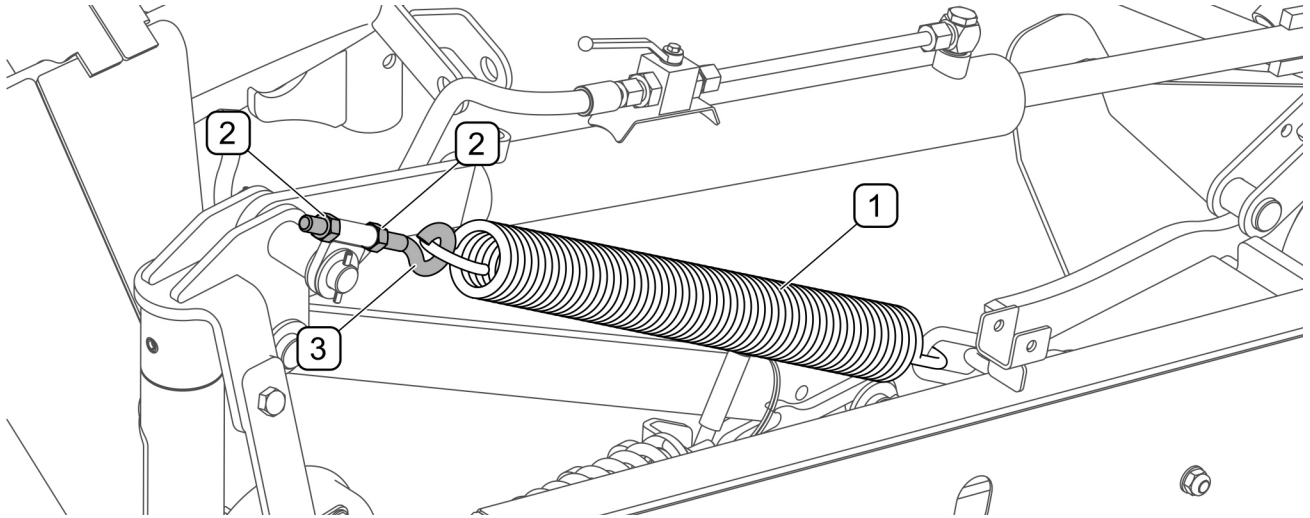
Before connecting the shaft, turn off the tractor's engine and remove the key from the ignition. Ensure that unauthorised persons do not have access to the tractor.

The use of PTO shaft and its technical condition must be in accord with the Operator's Manual of PTO shaft.

Before connecting the mower it is absolutely necessary to carefully read the Operator's Manual attached by the Manufacturer of the shaft and observe the instructions contained in it. Before connection to the tractor check the technical condition of the shaft guard, the completeness and condition of the protecting chains and the general technical condition of the shaft. The PDK210 mower has a factory mounted PTO shaft and it should not be disconnected from the mower. The PTO shaft of the PDK210 mower is equipped with a single direction clutch, which is at the end of the shaft from the side of the mower.



#### 4.5.4 ADJUSTMENT OF STAY SPRING



**FIGURE 4.9 Adjustment of stay spring**

(1)- stay spring; (2)- adjustment nut; (3)- tensioner;

Stay spring (1) of cutting unit is able to adjust pressure of cutting unit on the ground during cutting (FIGURE 4.9). Depending on ground and surface undulation, the pressure may be changed using the appropriate adjustment nut (2) of tensioner (3).

#### 4.5.5 MOWING

##### **DANGER**



The mower may only be started when all guards are in place and the cutting unit is set in working position.

Before engaging drive to PTO shaft make sure that there are no bystanders, especially children, near the mower.

Other persons should be at a safe distance from the mower during work because of the danger that objects may be thrown (stones, branches from beneath rotating disks).

After setting mower in working position, setting cutter bar, observe the following procedure: Lower the cutter bar lifting arm until the cutter bar rests on the ground. Engage the PTO in the tractor at a suitably low speed and then gradually increase the speed until PTO speed of 540 rpm is reached. During starting the cutting unit generates considerable noise. Noise is reduced when mower is driven into standing crop. During cutting the lever controlling the hydraulic circuit, lifting the cutting unit, should be set in "floating" position.



## HIGH NOISE LEVEL WARNING

Depending on the working conditions, the tractor with the machine may generate noise exceeding the level of 85dB at the driver position. In such conditions the driver should apply individual protection (protective ear guards).

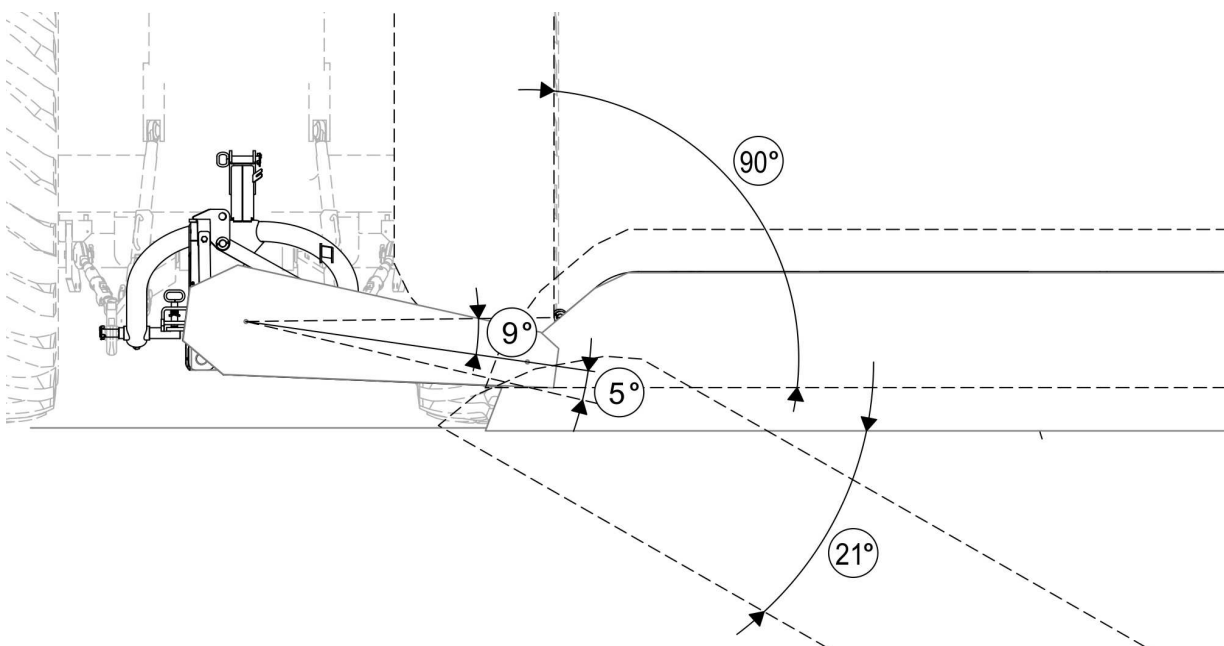
In order to reduce the level of noise during work the tractor cab window and door should be closed.

When mowing pay special attention to uneven surface and any large objects lying in the grass. Mowing speed depends on the quantity and quality of mown crop but also on the type of terrain.

Mowing speed must be reduced if:

- mown ground is uneven,
- crop is laid, or very tall and dense,
- there is a great risk of running into foreign bodies e.g. stones, branches and heaps of soil.

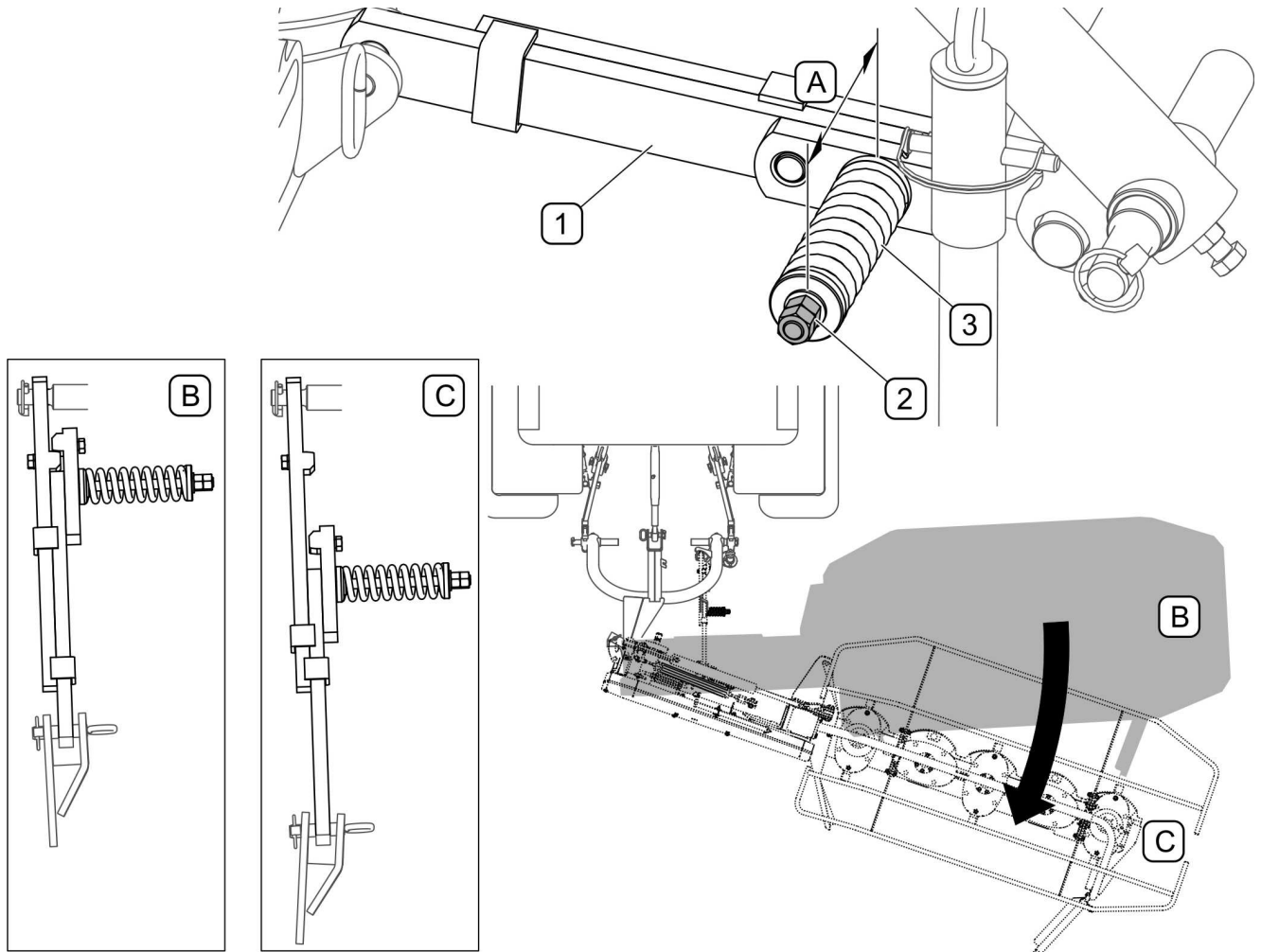
Be especially careful when mowing along ditches, furrows and slopes. When making turns, raise the cutting unit using the lifting cylinder arm without the need to use lifting levers in the tractor. When mowing on hilly terrain or on slopes make turns so that the cutting unit is set up the slope.



**FIGURE 4.10** Range of inclination of cutting unit during mowing

**ATTENTION!**


Do NOT operate mower while reversing.

**4.5.6 SAFETY DEVICE**

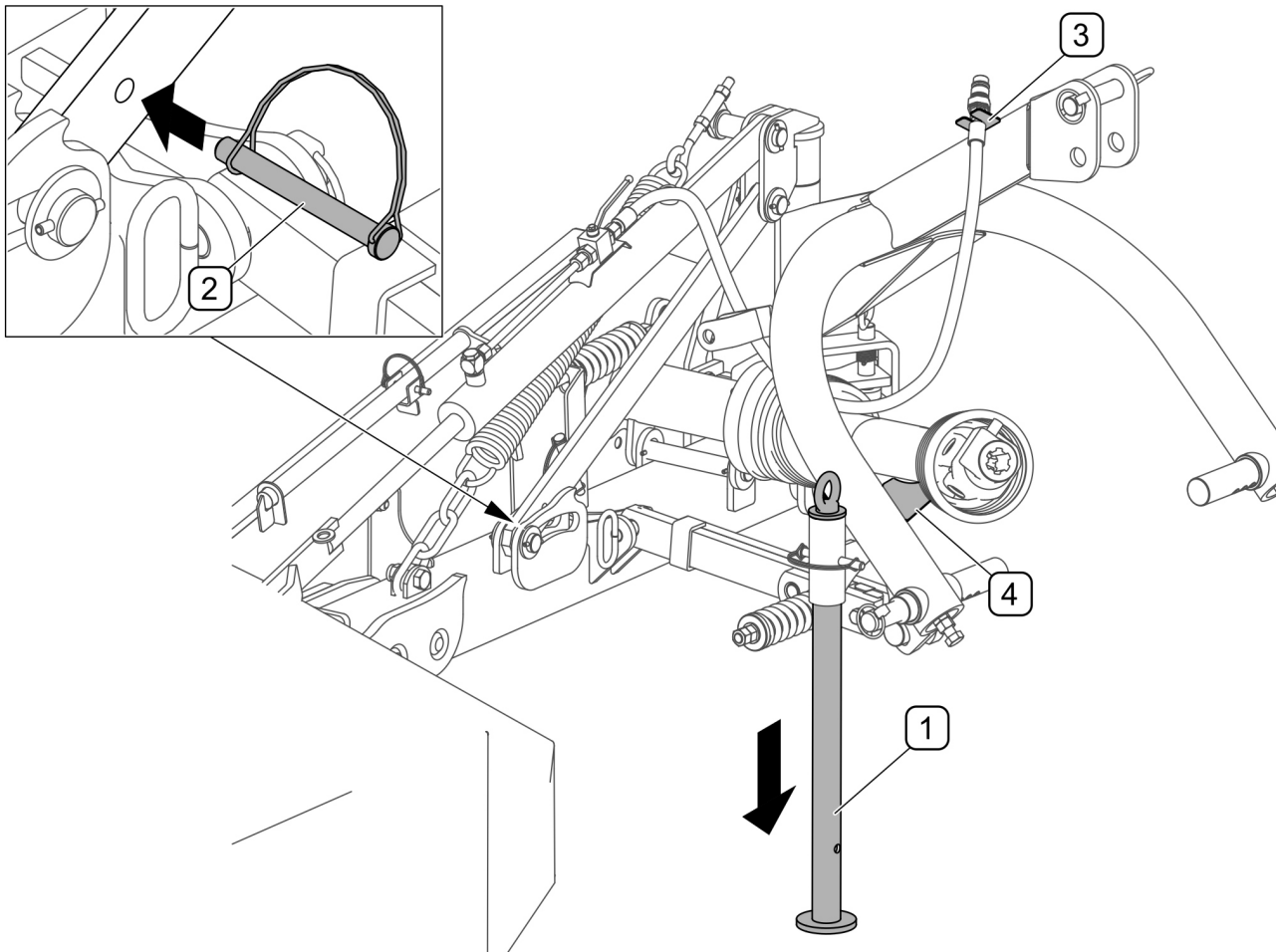
**FIGURE 4.11 Safety device**

(1)- safety device; (2)- tensioning nut; (3)- safety device spring (A)- factory spring setting  $A=142$  mm; (B)- working position; (C)- safety device action

The PDK210 mower is equipped with a safety device, which protects the machine against damage resulting from collision with obstacles (FIGURE 4.11). When colliding with an obstacle the bearing beam swings backwards (C). In such a case stop tractor and disconnect drive and then reverse until the safety device blocks itself in setting (B). The safety device is set in the factory in such a manner that the length of the compressed spring (3) amounts to  $A=142$  mm. In the event of frequent unjustified action of the safety device one may using nut (2) reduce the dimension (A) of the spring by 1 - 2 mm.


 **ATTENTION!**  
Excessive tension of the spring prevents action of safety device and may cause damage to machine as a result of driving over obstacle.


## 4.6 DISCONNECTING FROM TRACTOR



**FIGURE 4.12** Disconnecting mower from tractor

(1)- parking support leg; (2)- safety catch; (3)- hydraulic connection bracket; (4)- shaft bracket

 **DANGER**  
Reduce pressure prior to disconnecting the hydraulic system.

 **DANGER**  
Before disconnecting mower from suspension system of tractor unblock bearing beam with the aid of catch (2) (FIGURE 4.12). Do NOT disconnect mower from tractor without unblocking the beam.

In order to disconnect the mower from the tractor (FIGURE 4.12) proceed as follows:

- set the cutting unit in working position;
- lower support leg (1);
- using pin (2) block bearing beam;
- lower mower using three-point linkage to rest position,
- switch off tractor engine and remove key from ignition,
- reduce residual pressure in the hydraulic system by movement of appropriate lever controlling hydraulic circuit,
- disconnect conduits from tractor sockets and secure plugs and place in bracket (3) on mower frame,
- disconnect PTO shaft from tractor's PTO drive and place on special bracket (4) on mower frame,
- disconnect top link of three-point linkage,
- disconnect lower pins and drive tractor away.

After disconnection from the tractor mower should be set in the appropriate position supported on support and on cutting bar.



***SECTION***

**5**

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**MAINTENANCE**

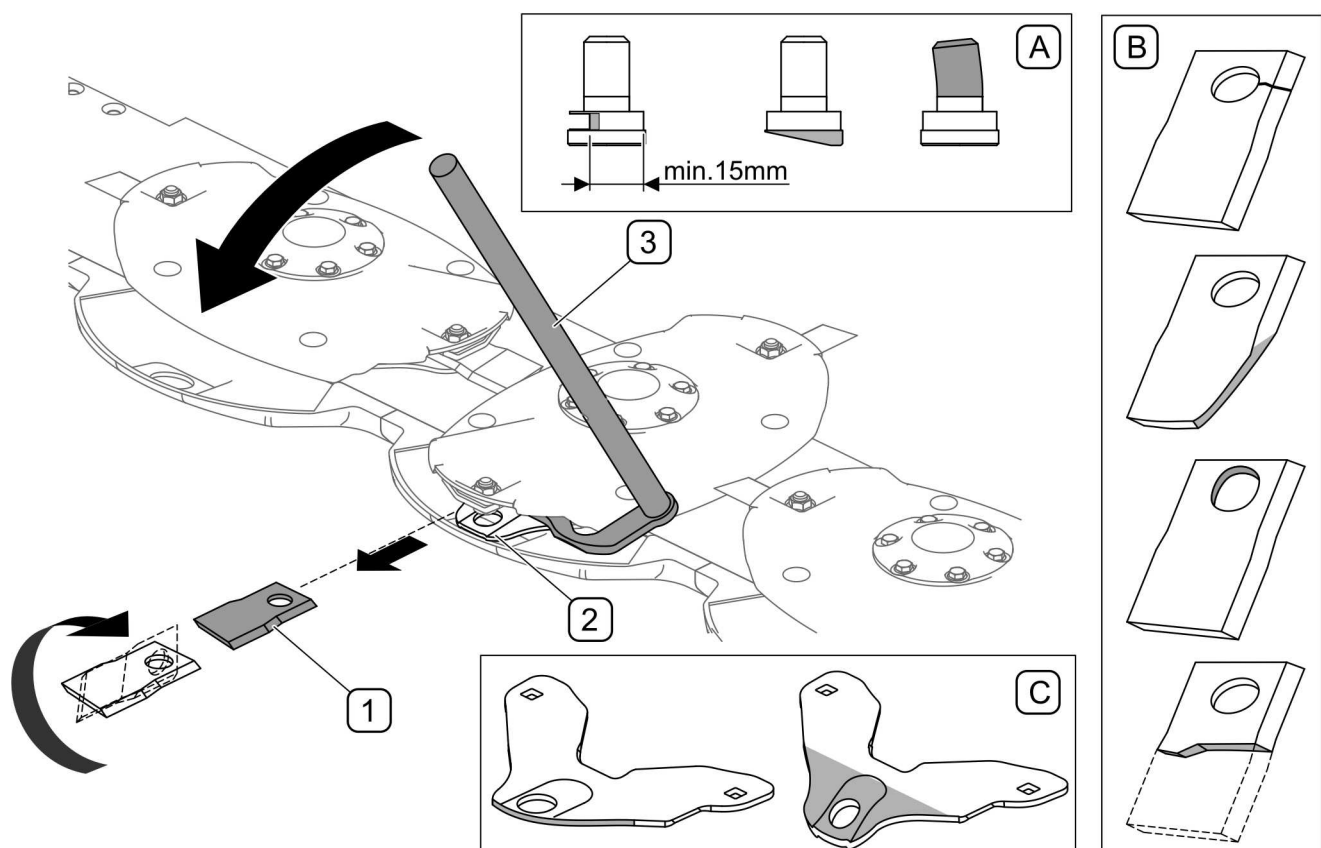
## 5.1 CHECKING AND REPLACING CUTTING KNIVES



**DANGER**

During inspection and replacement of knives, switch off tractor engine and remove the key from the ignition and disengage articulated telescopic shaft. Cutter bar must rest on the ground.

Knife inspections must be carried out regularly. Visual inspection involves checking of the knife's blade and mounting. Knives should be worn down uniformly. If knife's blade is worn down naturally it can be reversed and reinstalled on the cutting disk (this applies to double edged knives). A bent or damaged knife must be replaced with a new one. Cutting knives must be replaced in pairs in order to maintain the balance of the cutting disc. Before proceeding to replace the knives, clean the residue of mown material from the cutter bar.



**FIGURE 5.1 Replacement of cutting knives**  
 (1)- cutting knife; (2)- knife holder; (3)- knife changing key; (A)- arbor damage example; (B)- knife damage example; (C)- knife holder damage example



Use key to change parts (3) placing it between knife holder (2) and cutting disc, next press on key (3) till the moment that it is possible to take out the (1). When changing knives check the condition of the arbor securing the knife to the cutting disk and also the knife holder. An excessively worn or damaged arbor or knife holder should be replaced with a new part. Tighten arbor nuts with torque of 120 Nm.

**TIP**

Damaged or worn knives must be changed in pairs in order to maintain balance of cutting disc.

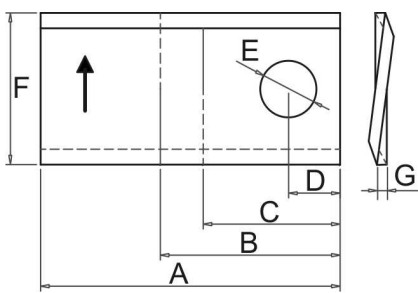
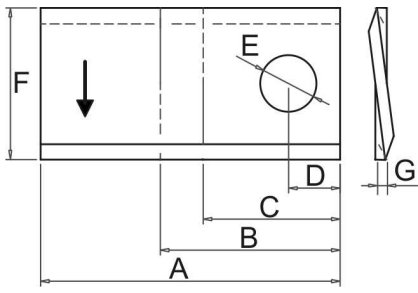
**ATTENTION!**

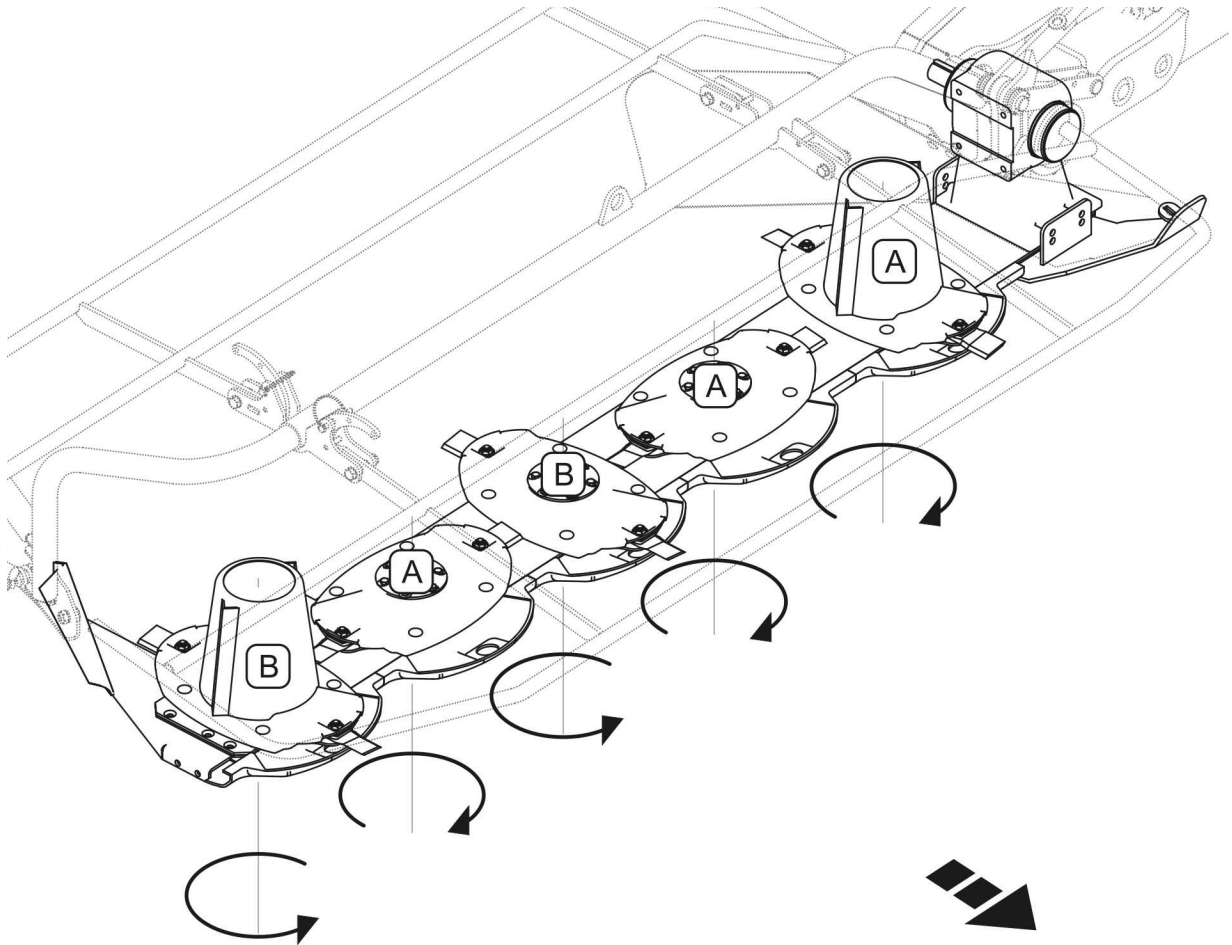
Missing knife or its fragment will cause imbalance and excessive cutting disk vibration and may damage the cutter bar.

**DANGER**

Use only CE certified knives meeting the requirements of ISO 5718 standard.

**TABLE 5.1** Cutting knife characteristics

MARKING KNIFE	FIGURE	DIMENSIONS [mm]						
		A	B	C	D	E	F	G
BRZW 100/49/4 P (RIGHT)		100	57	42	20	21	49	4
BRZW 100/49/4 L (LEFT)		100	57	42	20	21	49	4



**FIGURE 5.2 Knife types depending on cutting disc rotation direction**

*(A)- right knives; (B)- left knives*

Due to different cutting disc rotation direction, cutter bar (FIGURE 5.2) is equipped with the right knives (A) and left knives (B). Rotation direction is indicated on the knife.

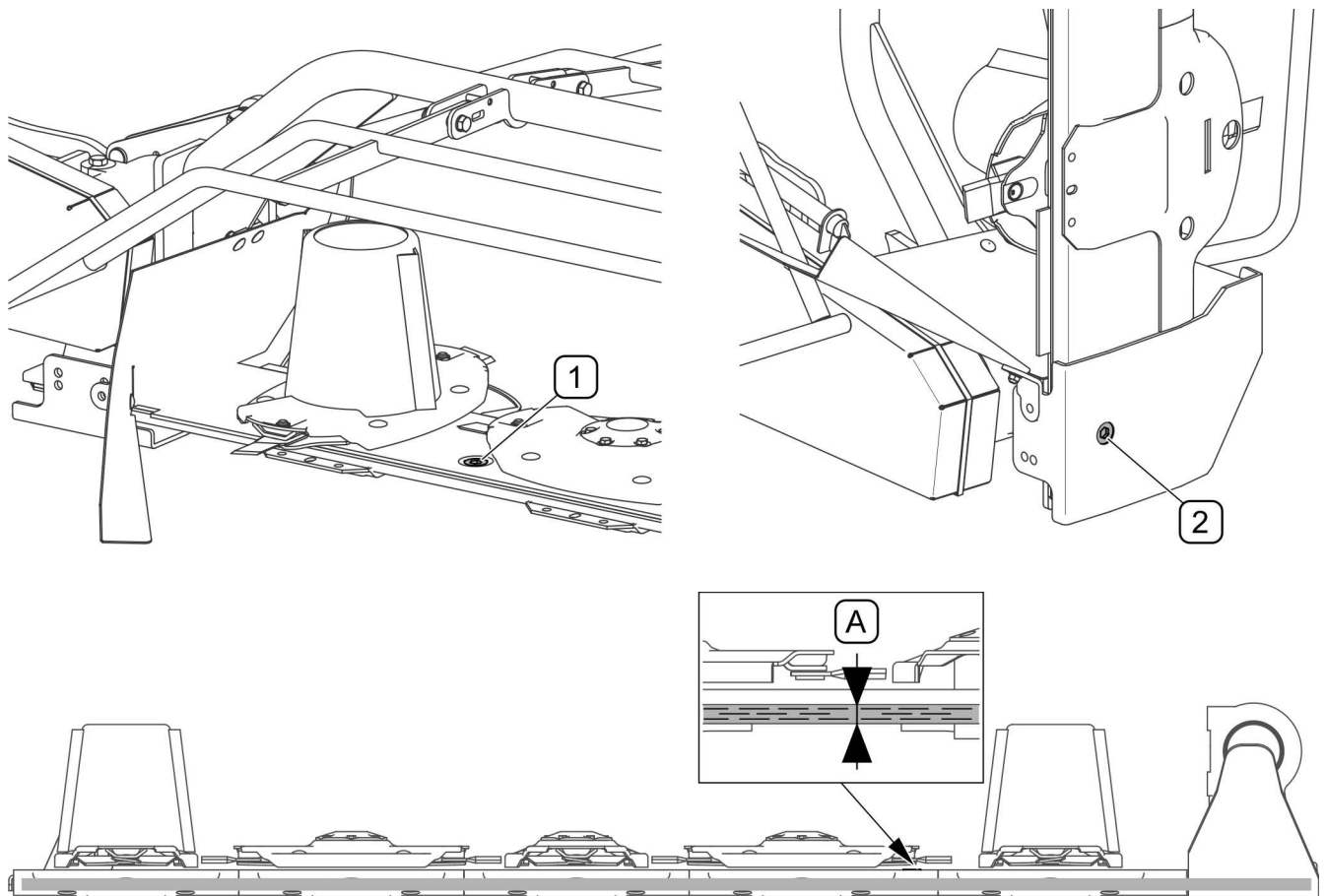


**ATTENTION!**

Check the technical condition of knives and then mounting on each occasion after driving over obstacle e.g. stone, piece of wood, metal etc.

## 5.2 CUTTING UNIT SERVICE

Service of cutting unit involves periodic inspection and change of oil in cutter bar and in intersecting axis gear.



**FIGURE 5.3** Checking and change oil in cutter bar

(1)- inlet plug; (2)- drain plug; (A)- correct oil level in cutter bar 5÷7 mm from bottom of bar

Correct oil level (A) with cutter bar in horizontal position is 5 ÷ 7 mm from the cutter bar bottom. To check oil level remove inlet plug (1) placed between the first and second disc. In the case of cold oil after lowering the bar to horizontal position, wait approximately 15 minutes before checking.



**Check oil level in cutter bar daily before beginning work.**

First oil change should be made after 50 hours mower operation and then, after each 500 hours of operation or at least once in the season, whichever occurs first. 2.1 litres of SAE90EP gear oil can be poured into cutter bar. It is best to change oil immediately after completing work when cutter bar is still hot and impurities are suspended in oil.

In order to change oil in cutter bar:

- unscrew inlet plug,
- raise cutterbar,
- unscrew drain plug and drain oil to previously prepared basin
- tighten drain plug
- Position cutting unit horizontally and pour the required quantity of oil through the inlet,



**Oil in cutter bar must be changed after the first 50 hours of work. The next oil change should be made after 500 hours of work or once a year, whichever occurs first.**

If a leak is noticed, carefully inspect seals and check oil level. Mower operation with low oil level in cutter bar may cause lasting damage. Repairs of cutter bar during guarantee period (except knife replacement) may only be performed at authorised mechanical workshops.



### **DANGER**

**Do NOT perform service or repair work under raised and unsupported machine.**



**Check oil level in intersecting axis gear daily before beginning work.**

To check the oil level in mower intersecting axis gear:

- set mower level horizontally,
- unscrew inlet plug (1) (FIGURE 5.4),
- Check oil level on dipstick of plug,
- if necessary, supplement oil to the required level.



### **DANGER**

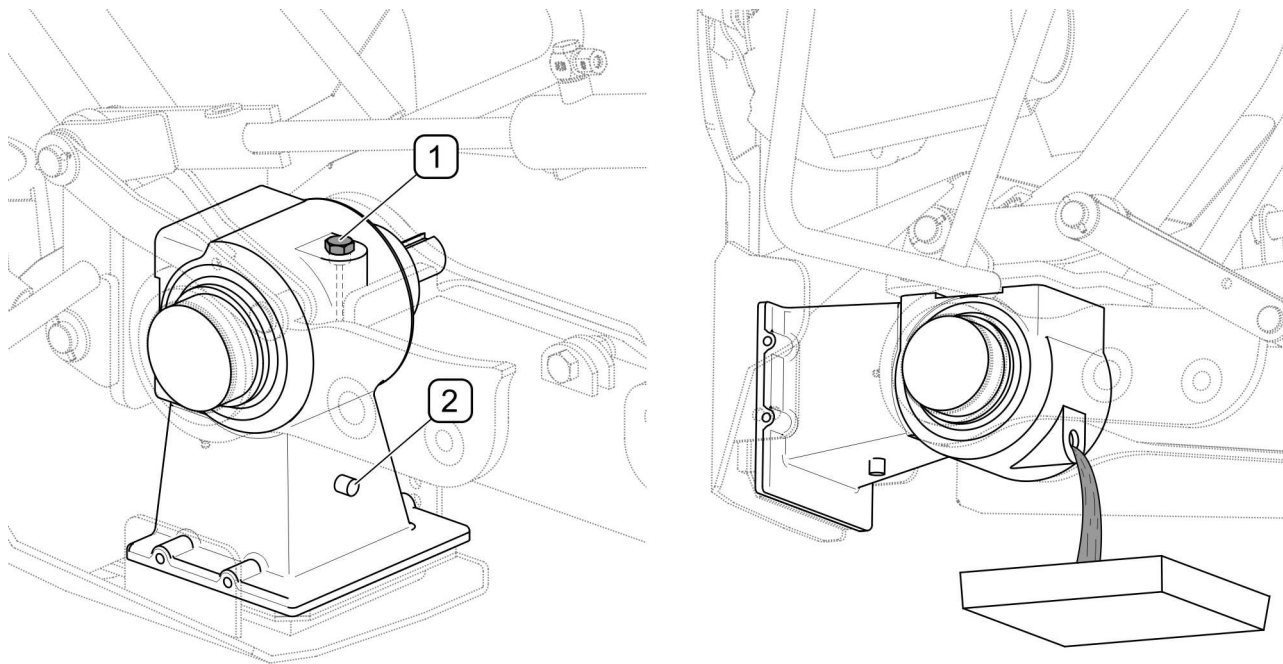
When checking oil level and changing oil use the appropriate personal protection equipment i.e. protective clothing, footwear, gloves eye protection. Avoid contact of skin with oil.



Oil in intersecting axis gear must be changed after the first 50 hours of work. The next oil change should be made after 500 hours of work or once a year, whichever occurs first.

To change oil in intersecting axis gear:

- set mower level horizontally,
- unscrew inlet plug (1) (FIGURE 5.4),
- raise cutting unit to vertical and drain of oil to previously prepared vessel;
- if oil Manufacturer recommends flushing transmission, that operation should be performed according to the guidelines of the oil Manufacturer (guidelines may be detailed on packaging),
- add to the level of oil until the required level is marked on the plug dipstick;
- tighten plug.



**FIGURE 5.4** Checking and change of oil in intersecting axis gear

(1) inspection, inlet, drain plug, (2) air bleed plug

Used oil should be taken to the appropriate facility dealing with the re-use of this type of waste.

To lubricate intersecting axis gear use gear oil SAE90EP to quantity of 0.7 litres.

If a leak is noticed, carefully inspect seals and check oil level. Transmission operation with insufficient oil may cause permanent damage of the mechanism.

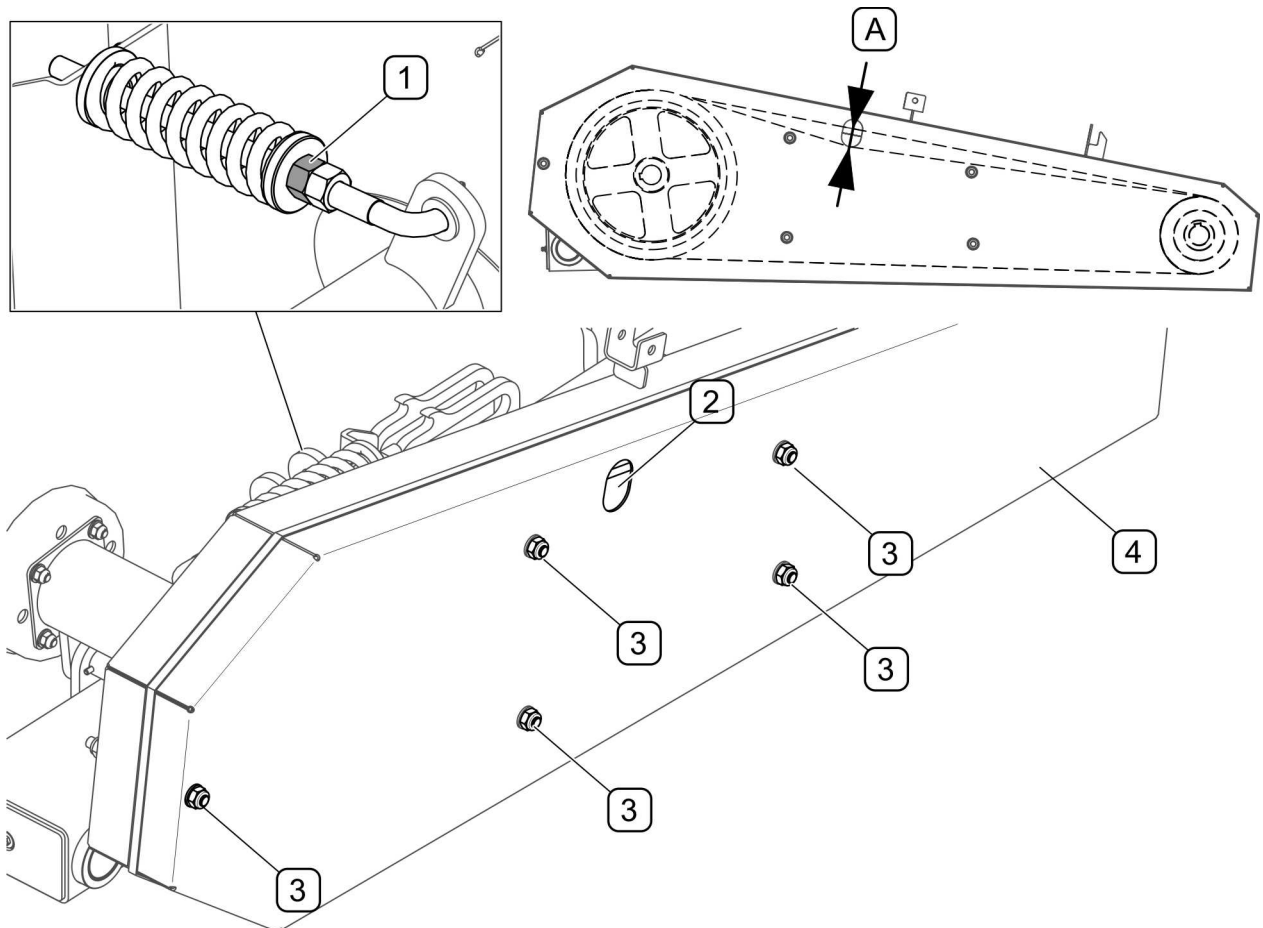
Repair of transmission during guarantee period may only be performed at authorised mechanical workshops.

## 5.3 DRIVE TRANSMISSION SYSTEM MAINTENANCE

Drive transmission system maintenance consists of periodic inspection, regulation and possible change of vee belts. Checking vee belts (FIGURE 5.5) through inspection opening (2). Deflection (A) of vee belt measured through inspection opening (2) in housing should not exceed 30 mm. Belt tension may be altered using nut (1) of spring tensioner. If one of the belts is damaged the whole belt set should be changed. In the drive transmission system there are 4 HB-2650 belts. to change the belts loosen spring tensioner, unscrew nut (3) and remove cover shield.

**DANGER**

Before proceeding to check or regulate tension of drive transmission belt set first turn off tractor engine and remove key from ignition.



**FIGURE 5.5** Check and adjust tension of vee belts

(1)- belt tensioner nut; (2)- inspection opening; (3)- nut securing cover shield; (4)- vee belt cover shield; (A)- maximum belt deflection in inspection opening  $A=30$  mm,

## 5.4 HYDRAULIC SYSTEM OPERATION



### DANGER

Before commencing whatever work on hydraulic system reduce the pressure in the system.



### DANGER

During work on hydraulic systems use the appropriate personal protection equipment i.e. protective clothing, footwear, gloves and eye protection. Avoid contact of skin with oil.

Always adhere to the principle that the oil in the mower hydraulic system and in the tractor hydraulic system are the same type. Application of different types of oil is not permitted. In a new mower, the hydraulic system is filled with HL32 hydraulic oil.



### ATTENTION!

The condition of hydraulic system should be inspected regularly while using the machine.

The hydraulic system should be completely tight sealed. Inspect the seals when hydraulic ram cylinders are completely extended. In the event of confirmation of oil on hydraulic ram cylinder bodies ascertain origin of leak. Minimum leaks are permissible with symptoms of "sweating", however in the event of noticing leaks in the form of "droplets" stop using the machine until the fault is remedied.

In the event of confirmation of an oil leak on hydraulic conduit connections, tighten connections, and if this does not remedy faults then change conduit or connection elements. Change of sub assemblies is equally required in each instance of mechanical damage.



Flexible hydraulic conduits should be replaced after 4 years of use.



**TABLE 5.2 HL32 HYDRAULIC OIL CHARACTERISTICS**

ITEM	NAME	VALUE
1	ISO 3448VG viscosity classification	32
2	Kinematic viscosity at 40°C	28.8 ÷ 35.2 mm <sup>2</sup> /s
3	ISO 6743/99 quality classification	HL
4	DIN 51502 quality classification	HL
5	Ignition temperature	above 210°C

The oil applied because of its composition is not classified as a dangerous substance, however long-term action on the skin or eyes may cause irritation. In the event of contact of oil with skin wash the place of contact with water and soap. Do NOT apply organic solvents (petrol, kerosene). Contaminated clothing should be changed to prevent access of oil to skin. In the event of contact of oil with eye, rinse with large quantity of water and in the event of the occurrence of irritation consult a doctor. Hydraulic oil in normal conditions is not harmful to the respiratory tract. A hazard only occurs when oil is strongly atomised (oil vapour), or in the case of fire during which toxic compounds may be released. Oil fires should be quenched with the use of carbon dioxide (CO<sub>2</sub>), foam or extinguisher steam. Do NOT use water for fire extinguishing.

Spilt oil should be immediately collected and placed in marked tight container. Used oil should be taken to the appropriate facility dealing with the re-use of this type of waste.

## 5.5 STORAGE

After finishing work, mower should be thoroughly cleaned and washed with water jet. While washing do not direct a strong water or steam jet at information and warning decals, bearings or hydraulic conduits. Nozzle of pressure or steam washer should be kept at a distance of not less than 30 cm from cleaned surface.

After cleaning, inspect the whole machine, inspect technical condition of individual elements. Used or damaged elements should be repaired or replaced.

In the event of damage to the paint coat, clean rust and dust from damaged area, degrease and then paint with undercoat and after it is dry paint with surface coat paint retaining colour uniformity and even thickness of protective coating. Until the time of touch-up painting, the damaged place may be covered with a thin layer of grease or anticorrosion preparation. Mower should be kept in closed or roofed building.

If the mower shall not be used for a long period of time, protect it against adverse weather conditions. Lubricate mower according to the instructions provided. In the event of prolonged work stoppage, it is essential to lubricate all elements regardless of the period of the last lubrication process. Additionally before the winter period hitching system pins should be smeared with grease.

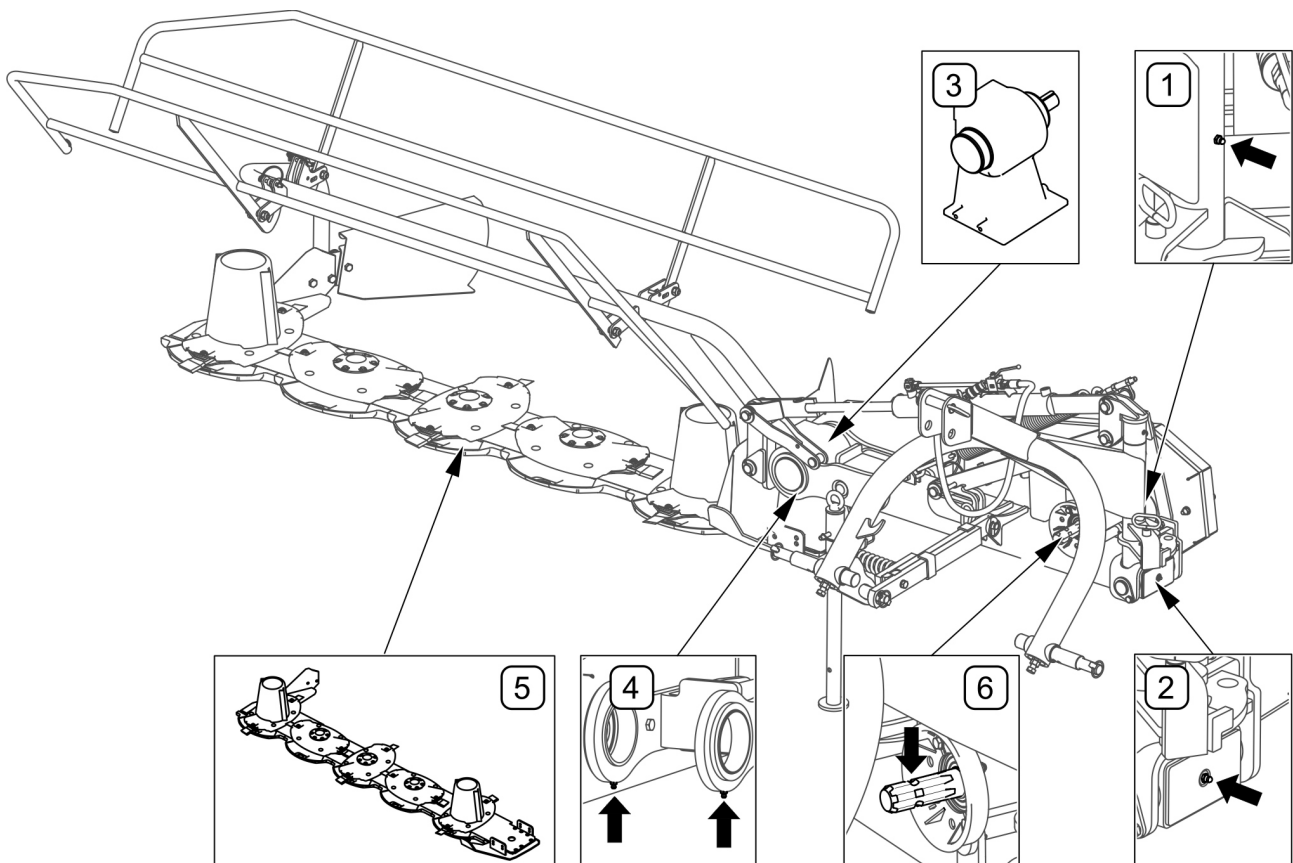
## 5.6 LUBRICATION

Machine lubrication should be performed with the aid of a manually or foot operated grease gun, filled with generally available permanent grease. Before commencing lubrication insofar as is possible remove old grease and other contamination. Remove and wipe off excess oil or grease



When using the mower the user is obliged to observe lubrication instructions according to attached schedule. Excess lubrication substance causes depositing additional contaminants in places requiring lubrication, therefore it is essential to keep individual machine elements clean.

Gear oil in cutter bar and intersecting axis gear should be changed according to recommendations contained in section 5.2 *CUTTING UNIT MAINTENANCE*



**FIGURE 5.6** Lubrication points

*Lubrication points described in table 5.3*

**TABLE 5.3 LUBRICATION POINTS AND LUBRICATION FREQUENCY**


ITEM	NAME	NUMBER OF LUBRICATION POINTS	TYPE OF GREASE	LUBRICATION FREQUENCY
1	Suspension rotation system pin	1	permanent grease	20 hours
2	Drive transmission bearing pin	1	permanent grease	20 hours
3	Intersecting axis gear	1	oil	500 hours
4	Intersecting axis gear rotation sleeves	2	permanent grease	20 hours
5	Cutter bar	1	oil	500 hours
6	Surface of multi-splined drive shaft	1	permanent grease	20 hours
7	PTO shaft *	*	*	*

Marking description in Item column (TABLE 5.3) conforms with numbering shown (FIGURE 5.6)

\* For detailed information on maintenance please refer to maintenance instructions attached to the shaft.

## 5.7 TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS

Unless other tightening parameters are given, during maintenance repair work apply appropriate torque to tightening nut and bolt connections. Recommended torque values apply to non-greased steel bolts.

	<p><b>ATTENTION!</b></p> <p>Should it be necessary to change individual parts, use only original parts or those indicated by the Manufacturer. Non-adherence to these requirements may put the user and other people's health and life at risk, and also damage the machine.</p>
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**TABLE 5.4 TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS**

THREAD DIAMETER [mm]	5.8	8.8	10.9
	TIGHTENING TORQUE [Nm]		
M6	8	10	15
M8	18	25	36
M10	37	49	72
M12	64	85	125
M14	100	135	200
M16	160	210	310
M20	300	425	610
M24	530	730	1 050
M27	820	1 150	1 650

Tighten cutting knife arbor nuts with torque of 120 Nm.

## 5.8 TROUBLESHOOTING

**TABLE 5.5 TROUBLESHOOTING**

<b>TYPE OF FAULT</b>	<b>CAUSE</b>	<b>REMEDY</b>
Mower beam cannot be lifted or lowered.	Mower beam blocked	Remove blocking pin
	Incorrect connection or damaged quick coupler	Check quick coupler and manner of connection
	Unreliable tractor hydraulic system	Check condition of tractor hydraulic system
Stubble is uneven	Cutter bar is excessively load relieved	Set load relief spring appropriately
	Tractor PTO rotation speed too low	Maintain correct, constant PTO speed
	Worn cutting knives	Turn knives onto the second side or replace
	Incorrect cutting angle	Set appropriate cutterbar inclination by adjustment of top link
Excessive vibration during work	Damaged or missing knife	Check knives, if necessary replace
	Damaged PTO shaft	Check shafts, if necessary replace
	Damaged cutterbar bearing	Repair at authorised service point
Excessive heating of intersecting axis gear or cutter bar	Incorrect oil level	Check oil level.
	Damaged bearing	Repair at authorised service point
Safety device does not act or acts too frequently	Incorrect adjustment of safety device spring	Adjust spring, check state of wear of safety device.
Mower drive stops during cutting	Belt slip on belt drive transmission	Disconnect power from mower; remove collected grass or foreign body from cutting unit. Check condition and tension of belts
	Damaged cog in cutterbar	Repair at authorised service point
	Damaged belt transmission	Repair at authorised service point

# NOTES

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