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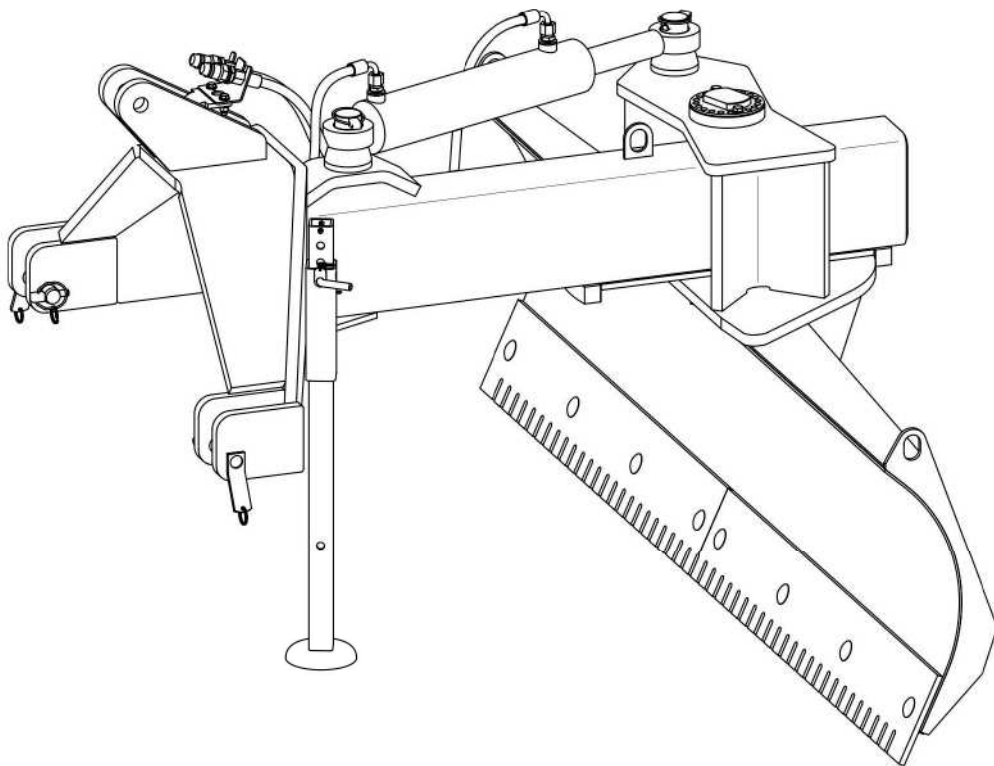
[www.pronar.pl](http://www.pronar.pl)

# **OPERATOR'S MANUAL**

## **UNIVERSAL SCRAPER-BLADE**

### **PRONAR PU-T20**

TRANSLATION OF THE ORIGINAL COPY OF THE MANUAL





# UNIVERSAL SCRAPER-BLADE

## PRONAR PU-T20

### MACHINE IDENTIFICATION

TYPE:

*PU-T20*

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 PU-T20 universal scraper-blade. 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:

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## CONTACT TELEPHONES

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## SYMBOLS APPEARING IN THIS OPERATOR'S MANUAL

Information, descriptions of danger and precautions and also recommendations and prohibitions 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 by the 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 by the word „**TIP**”.

## DIRECTIONS USED IN THIS OPERATOR'S MANUAL

Left side — side to the left hand of the operator facing in the direction of machine's forward travel.

Right side — side to the right hand of the operator facing in the direction of machine's forward travel.



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## EC DECLARATION OF CONFORMITY OF THE MACHINERY

PRONAR Sp. z o.o. declares with full responsibility, that the machine:

Description and identification of the machinery	
Generic denomination and function:	<b>Universal scraper – blade</b>
Type:	<b>PU-T20</b>
Model:	–
Serial number:	
Commercial name:	<b>Universal scraper – blade PRONAR PU-T20</b>

to which this declaration relates, fulfills all the relevant provisions of the Directive **2006/42/EC** of The European Parliament and of The Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (Official Journal of the EU, L 157/24 of 09.06.2006).

The person authorized to compile the technical file is the Head of Research and Development Department at PRONAR Sp. z o.o., 17-210 Narew, ul. Mickiewicza 101A, Poland.

This declaration relates exclusively to the machinery in the state in which it was placed on the market, and excludes components which are added and/or operations carried out subsequently by the final user.

Narew, the 2010 -12- 1 6

*Place and date*

Z-CA DYREKTORA  
d/s technicznych  
członek zarządu  
*Roman Omelianiuk*

*Full name of the empowered person  
position, signature*

# TABLE OF CONTENTS

<b>1</b>	<b>BASIC INFORMATION</b>	<b>1.1</b>
1.1	IDENTIFICATION	1.2
1.2	PROPER USE	1.3
1.3	OPTIONAL EQUIPMENT	1.4
1.4	TERMS & CONDITIONS OF WARRANTY	1.4
1.5	TRANSPORT	1.6
1.6	ENVIRONMENTAL HAZARDS	1.8
1.7	WITHDRAWAL FROM USE	1.8
<b>2</b>	<b>SAFETY ADVICE</b>	<b>2.1</b>
2.1	BASIC SAFETY RULES	2.2
2.1.1	USE OF MACHINE	2.2
2.1.2	LINKING AND DISCONNECTING FROM TRACTOR	2.3
2.1.3	HYDRAULIC SYSTEM	2.3
2.1.4	TRANSPORTING THE MACHINE	2.4
2.1.5	MAINTENANCE	2.4
2.1.6	UNIVERSAL SCRAPER – BLADE OPERATION	2.6
2.2	DESCRIPTION OF MINIMAL RISK	2.6
2.3	INFORMATION AND WARNING DECALS	2.7
<b>3</b>	<b>DESIGN AND OPERATION</b>	<b>3.1</b>
3.1	TECHNICAL SPECIFICATION	3.2
3.2	GENERAL DESIGN	3.4
3.3	HYDRAULIC SYSTEM DESIGN	3.5
<b>4</b>	<b>CORRECT USE ADVICE</b>	<b>4.1</b>
4.1	PREPARING FOR WORK	4.2

4.2 CHECKING TECHNICAL CONDITION	4.4
4.3 HITCHING TO TRACTOR	4.5
4.4 UNIVERSAL SCRAPER – BLADE OPERATION	4.8
4.4.1 SETTING WORKING POSITION	4.8
4.4.2 CHANGING THE UNIVERSAL SCRAPER – BLADE MOUNTING METHOD	4.9
4.5 TRANSPORTING THE MACHINE	4.11
4.6 DISCONNECTING FROM TRACTOR	4.11
<b>5 MAINTENANCE</b>	<b>5.1</b>
5.1 CHECKING AND REPLACEMENT OF COLLECTING BLADES	5.2
5.2 HYDRAULIC SYSTEM OPERATION	5.4
5.3 LUBRICATION	5.6
5.4 STORAGE	5.8
5.5 TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS	5.8
5.6 TROUBLESHOOTING	5.9



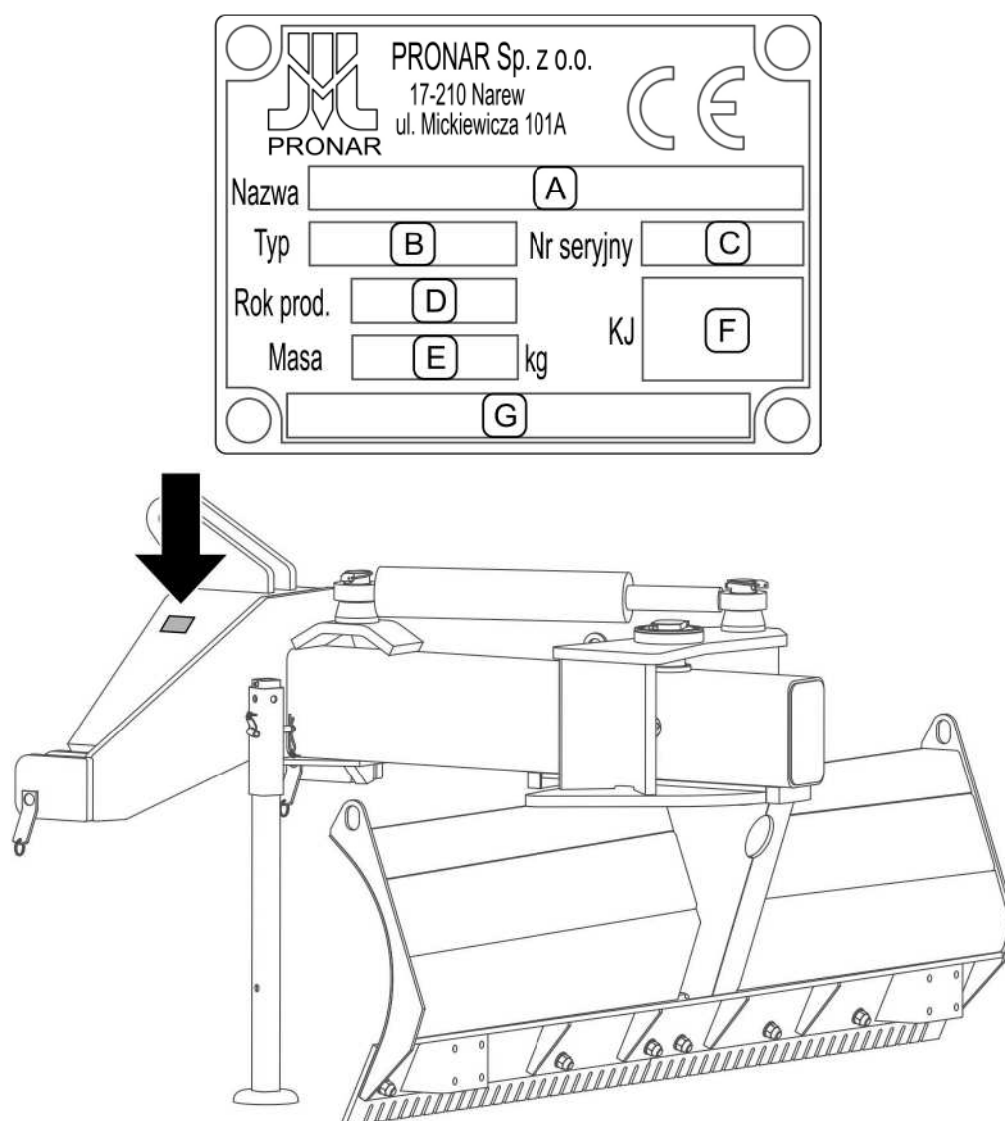
***SECTION***

**1**

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**BASIC INFORMATION**

## 1.1 IDENTIFICATION



**FIG. 1.1 Location of the data plate**

Meaning of data plate items (FIG. 1.1):

- A - machine name
- B – type,
- C – serial number
- D – year of manufacture
- E – machine tare weight [kg]
- F – Quality Control stamp
- G – unfilled box

Serial number is stamped on the data plate. Data plate is located in the front part of the frame (FIG. 1.1). When buying the machine, check that the serial number corresponds with that indicated in the *WARRANTY BOOK*, in the sales documents and in the *OPERATOR'S MANUAL*.

## 1.2 PROPER USE

Universal scraper – blade is used for snow removal on roads, squares and car parks as well as for light earthworks. Use for other purposes should be regarded as improper.

The scraper – blade can be mounted on the front or rear of a tractor or another carrying vehicle that meets the requirements contained in Table 1.1.

Using it as intended also involves all actions connected with the safe and proper operation and maintenance of the machine. Due to the above, 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,
- comply with general safety regulations while working,
- prevent accidents,
- comply with road traffic regulations.

The machine may only be used by persons, who:

- are familiar with the contents of this publication and with the contents of the carrying vehicle Operator's Manual,
- have been trained in machine operation and safe working conditions,
- have the required authorisation to drive and are familiar with the road traffic regulations and transport regulations.



### **IMPORTANT!**

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

- transport of people, animals and other items on the machine

**TAB. 1.1      Agricultural tractor (carrying vehicle) requirements**

	UNIT	REQUIREMENTS
<b>Linkage</b>		
Three-point linkage (TPL)	-	front or rear Category II according to ISO 730-1
<b>Hydraulic system</b>		
Hydraulic oil	-	HL32
Pressure in the system	MPa	16 ÷ 20
Hydraulic sockets	-	2 sockets of one section
<b>Other requirements</b>		
Maximum power	hp (kW)	to 150 (110)

## 1.3 OPTIONAL EQUIPMENT

The universal scraper – blade equipment includes:

- Operator's Manual
- Warranty Book

Equipment version:

- rubber plough blades,
- steel plough blades,

## 1.4 TERMS & CONDITIONS OF WARRANTY

PRONAR Sp. z o.o., Narew guarantees the reliable operation of the machine when it is used according to its intended purpose as described in the *OPERATOR'S MANUAL*. Defects discovered during the warranty period will be removed by the Warranty Service. The repair period is specified in the *WARRANTY BOOK*.

The warranty 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:

- rubber collecting blades,
- steel collecting blades,

The warranty service only applies to factory defects and mechanical damage that is not due to the user's fault.

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 or malfunctioning 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**

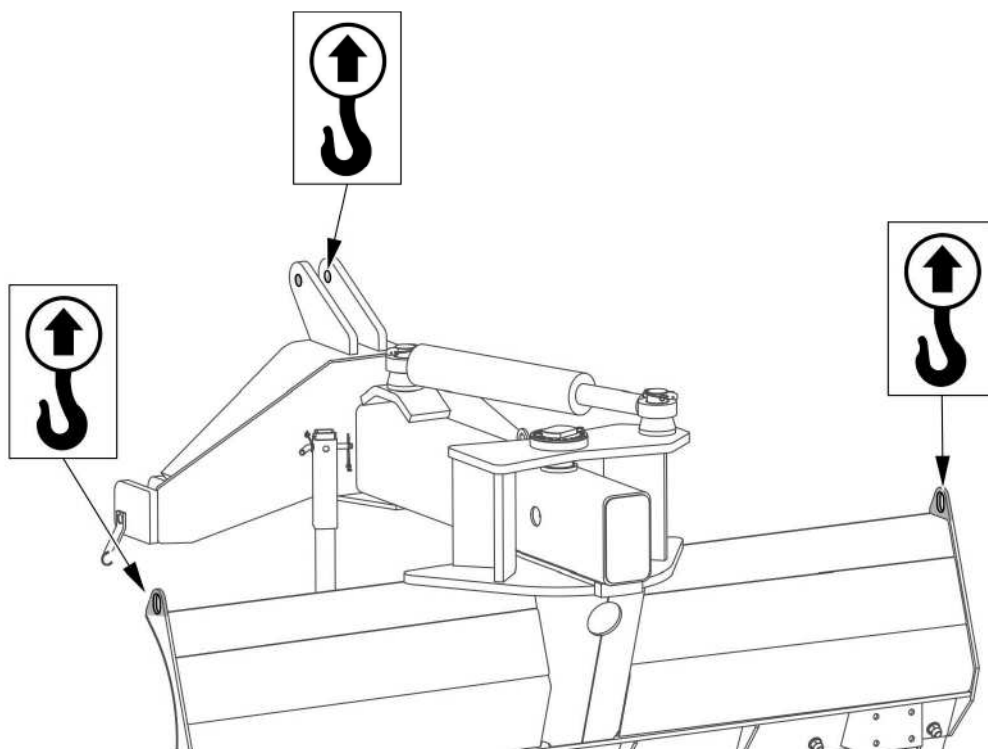
**Demand that the seller carefully and precisely fills out the *WARRANTY BOOK* and warranty repair coupons. A missing date of purchase or sale point stamp, may make the user ineligible for any warranty repair or refund.**

For detailed Terms & Conditions of Warranty, please refer to the **WARRANTY BOOK** attached to each machine.

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

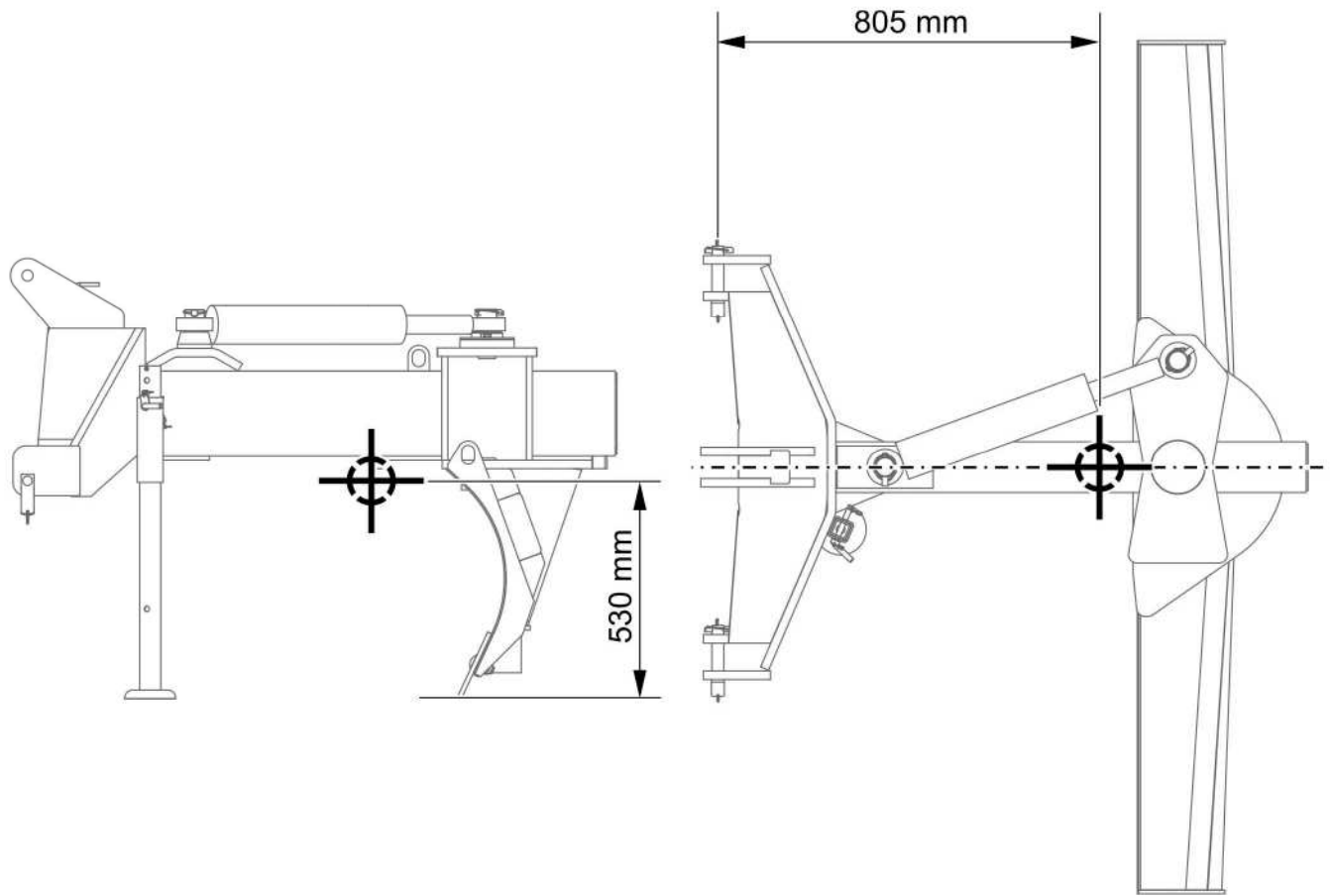
## 1.5 TRANSPORT

The machine is prepared for sale completely assembled and does not require packing. Packing is only required for the machine's technical documentation. Delivery is either by transport on a vehicle or independently, after being attached to a tractor. Transport of the machine is permissible connected to a carrying vehicle provided the vehicle's driver familiarises himself with the machine's Operator's Manual and particularly with information concerning safety and principles of connection and transport on public roads. During road transport the machine should be secured on the carrier platform by certified straps or chains fitted with pulley. When loading and unloading the machine, 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.



**FIG. 1.2**      **Transport lugs**

The machine should be attached to lifting equipment in places specially designed for this purpose (FIG. 1.2), i.e. by the holes in the mouldboard ends and by the central link securing hole. Suspension points are identified with information decals. When lifting the machine take particular care due to the possibility of tipping over the machine and the risk of injuries from protruding parts. To keep lifted machine in the correct direction it is recommended to apply additional guy cables. During the loading work particular care should be taken not to damage paint coating.



**FIG. 1.3** Centre of gravity



**ATTENTION!**

Centre of gravity, depending on the version varies in the  $\pm 50$  mm range.



**ATTENTION!**

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



**DANGER**

When transporting independently, the user must carefully read this Operator's Manual and observe all recommendations. When being transported on a motor vehicle the machine 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 transporting the machine. This is due to the vehicle's centre of gravity shifting upwards when loaded with the machine.

## 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 machine 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 machine, oil shall be completely removed from hydraulic system.

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 carefully read this Operator's Manual and the *WARRANTY BOOK*. When operating the machine, the operator must comply with the recommendations.
- The machine may only be used and operated by persons qualified to drive agricultural tractors and trained in the use of the machine.
- If the information stated 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 carrying vehicle, 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 machine other than the way intended takes full responsibility for himself for any consequences of this use. Use of the machine for purposes other than those for which it is intended by the Manufacturer may invalidate the warranty.
- The machine may only be used when all the protective elements (i.e. bolts, cotter pins) are technically sound and correctly positioned. In the event of loss or destruction of the safety guards, they must be replaced with new ones.

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

- Carefully read the tractor Operator's Manual.
- Do not link the machine to the tractor when the linkage systems of machine and tractor are not compatible.
- After completion of coupling the machine, check the safeguards. Carefully read the carrying vehicle Operator's Manual.
- To link the machine to the carrying vehicle use only linking elements envisaged by the Manufacturer.
- The carrying vehicle to which the machine will be coupled must be technically reliable and must fulfil the requirements of machine Manufacturer.
- Be especially careful when linking and disconnecting the machine.
- When hitching, there must be nobody between the machine and the tractor.
- The machine disconnected from the carrying vehicle must be supported on the blade and the parking stand and placed on level, sufficiently hard surface in such a manner as to ensure that it is possible to connect it again.

### **2.1.3 HYDRAULIC SYSTEM**

- When connecting the hydraulic lines to the tractor, make sure that the tractor hydraulic system and machine are not under pressure. If necessary reduce residual pressure in the system.
- The hydraulic system is under high pressure when operating.
- Regularly check the technical condition of the connections and the hydraulic lines. 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.
- 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.
- Used oil or oil, which has lost its properties, should be stored in original containers or replacement containers resistant to action of hydrocarbons. Replacement containers must be clearly marked and appropriately stored.
- Do not store hydraulic oil in packaging designed for storing food or foodstuffs.
- Rubber hydraulic lines 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 driving on public roads, comply with the road traffic regulations. in force in the country, in which the machine is used.
- Do not exceed the permitted speed arising from road conditions and design limitations. Adjust travel speed to the prevailing road conditions and other limitations arising from road traffic regulations limits.
- Do NOT leave machine raised and unsecured while the tractor is parked. When parked, the machine should be lowered.
- Do NOT ride on the machine or transport any materials on it.
- When driving with raised implement, the tractor's three-point linkage should be locked in the up position to prevent its accidental lowering.
- Reckless driving and excessive speed may cause accidents.

#### **2.1.5 MAINTENANCE**

- During the warranty period, any repairs may only be carried out by 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 machine 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 PRONAR from any responsibility for damage or detriment to health which may arise as a result.
- 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.
- In the event of work requiring the machine 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 the machine, which has been raised only with the tractor's three point linkage.
- The machine must not be supported using fragile elements (bricks or concrete blocks).
- 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 turned off and the ignition key removed. Immobilise tractor with parking brake. Ensure that unauthorised persons do not have access to the vehicle.
- Should it be necessary to change individual parts, use only original parts. Non-adherence to these requirements may put the user and other people's health and life at risk, and also damage the machine and invalidate the warranty.
- Do NOT weld, drill holes in, cut or heat the main structural elements, which have a direct impact on the machine operation safety.
- Before beginning repair works on hydraulic systems, reduce oil pressure.
- After completing work associated with lubrication, remove excess oil or grease.

- In order to reduce the danger of fire the machine must be kept in a clean condition.

### **2.1.6 UNIVERSAL SCRAPER – BLADE OPERATION**

- Before lifting or lowering the machine mounted on the tractor, make sure there are no bystanders near the machine.
- Before starting the machine make sure that there are no bystanders (especially children) or animals in the danger zone. The tractor (carrying vehicle) operator is obliged to ensure proper visibility of the machine and the working area.
- While working a universal scraper – blade turn the orange beacon light (the tractor equipment)
- During machine operation do not occupy a different position than that of the operator in the vehicle's cab. Do NOT leave the cab, when the machine is in operation.
- Person must not stand in the machine operation area and also between the carrying vehicle and the machine.
- Machine can be operated by a single person only.

## **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 universal scraper – blade for purposes other than those for which it is intended,
- being between the carrying vehicle 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 machine with removed or faulty safety guards,
- not maintaining safe distance from the danger zone or being within the zones while the machine is operating,

- operation of the machine by unauthorised persons or persons under the influence of alcohol or other intoxicating substances,
- cleaning, maintenance and technical checks when carrying vehicle is connected and engine is running.


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

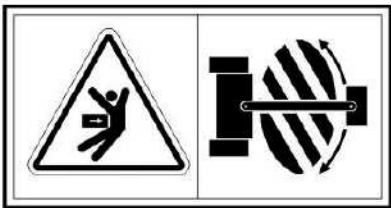
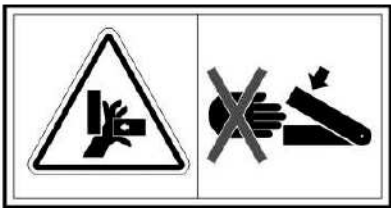
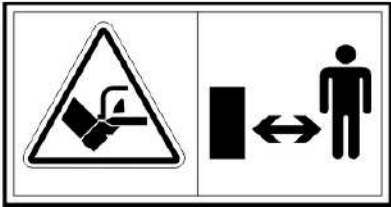




- prudent and unhurried operation of the machine,
- sensible application of the remarks and recommendations stated in the Operator's Manual,
- carrying out repair and maintenance work in line with operating safety rules,
- carrying out repair and maintenance work by persons trained to do so,
- using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

## 2.3 INFORMATION AND WARNING DECALS

All signs should always be legible and clean, visible to the operator and also to persons possibly being in the vicinity of the machine in operation. If any safety sign is lost or illegible, it should be replaced with a new one. All elements having safety signs replaced during repairs should be affixed with these signs. Safety signs and decals may be purchased from the Manufacturer or the Seller.

**TAB. 2.1 Information and warning decals**

ITEM	SYMBOL	DESCRIPTION
1		Before starting work, carefully read the Operator's Manual.

ITEM	SYMBOL	DESCRIPTION
2		When implement is in use there must be no bystanders in designated areas. If any work is required in these areas, make sure the carrying vehicle is stationary, and whether the implement is disconnected from the power source.
3		Do not reach into crushing space because elements may move. Danger of crushing hands or fingers.
4		Risk of injury to foot or leg. Keep a safe distance.
5		Thrown out objects, endanger the whole body. Keep a safe distance from the operating machine.
6		Pressurised liquid. Keep a safe distance.
7		Lifting equipment attachment points while loading the machine
8		Manufacturer
9	<b>PRONAR PU-T20</b>	Machine model

Numbers in the item column correspond to decals (FIG. 2.1)



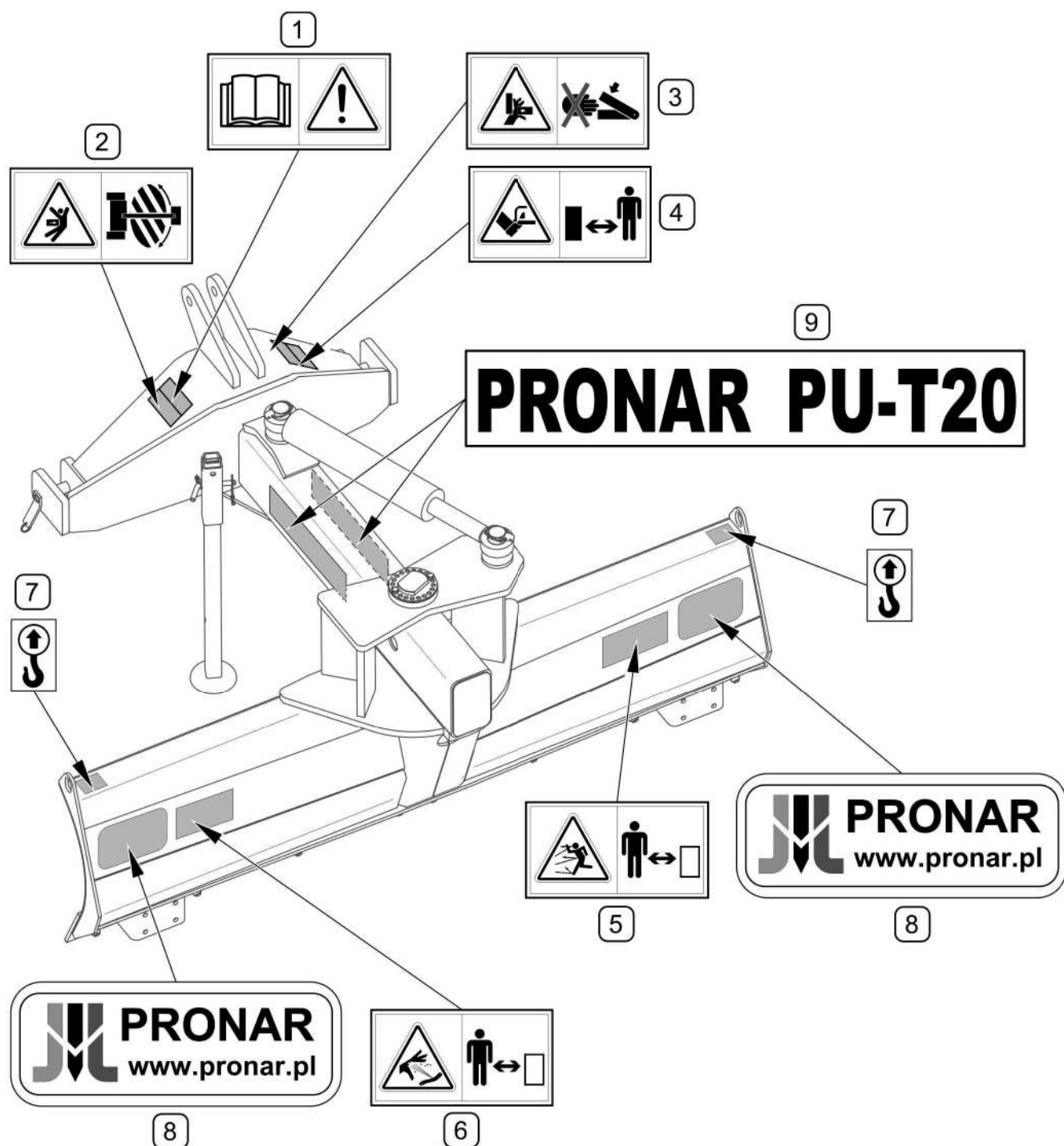


FIG. 2.1 Locations of information and warning decals.

Meaning of symbols (TAB. 2.1)



***SECTION***

**3**

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**DESIGN  
AND OPERATION**

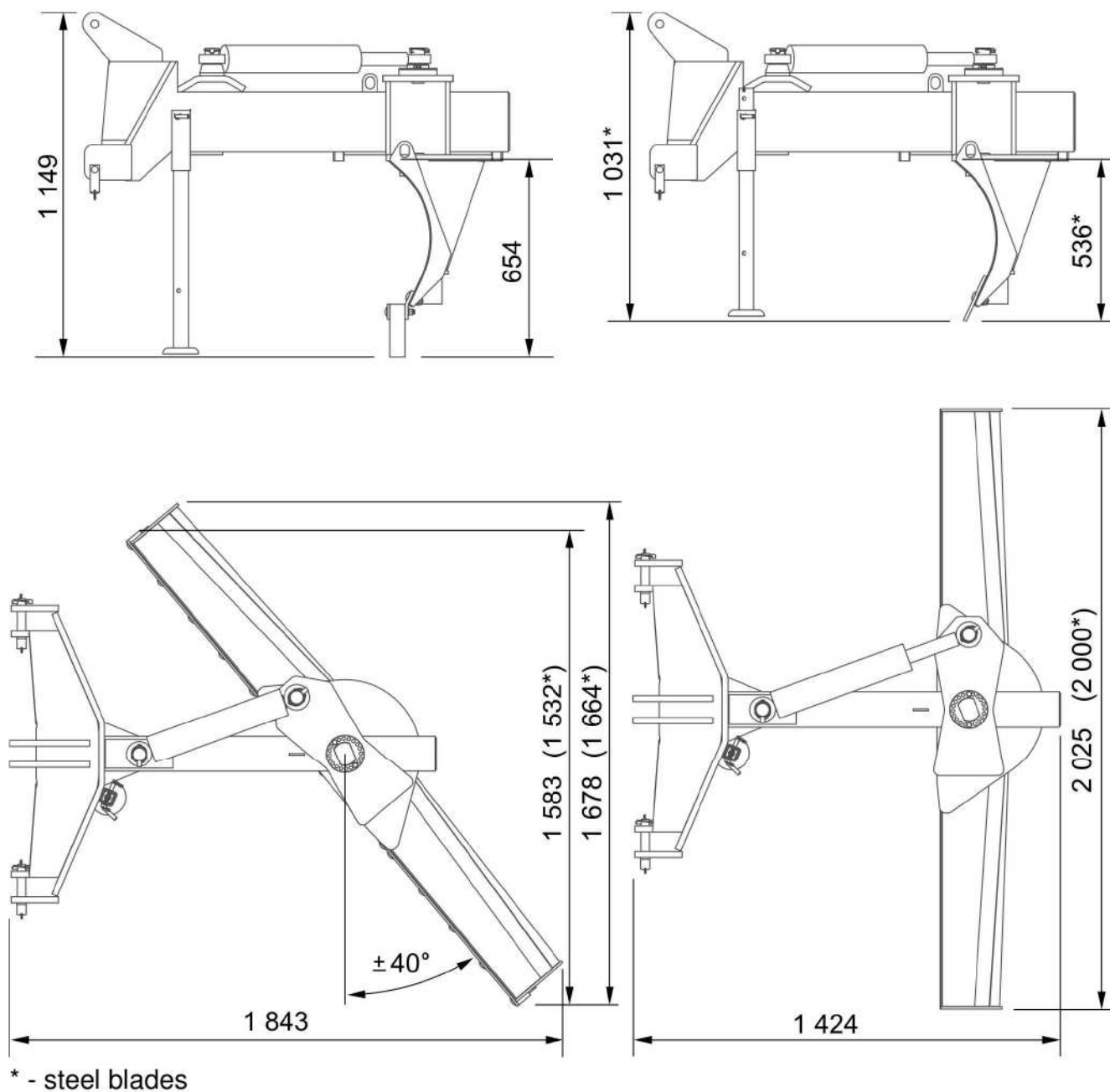
## 3.1 TECHNICAL SPECIFICATION

**TAB. 3.1 BASIC TECHNICAL SPECIFICATION**

	Unit	
Scraper – blade model	-	PU-T20
Mounting method	-	Front or rear three-point linkage Cat II according to ISO 730-1
Working width (FIG. 3.1)		
- straight	mm	2 025 (2 000*)
– angle of 40°	mm	1 583 (1 532*)
Mouldboard working height	mm	654 (536*)
Types of collecting blades	-	– smooth - ribbed steel blades, – rubber blades
Operation	-	external tractor hydraulic system
Number of hydraulic cylinders	item	1
Weight of machine ready for operation:		
- with rubber blades	kg	410
- with steel blades	kg	390
Maximum working speed	km/h	10
Other information	-	Single person operation

\* - for steel blades

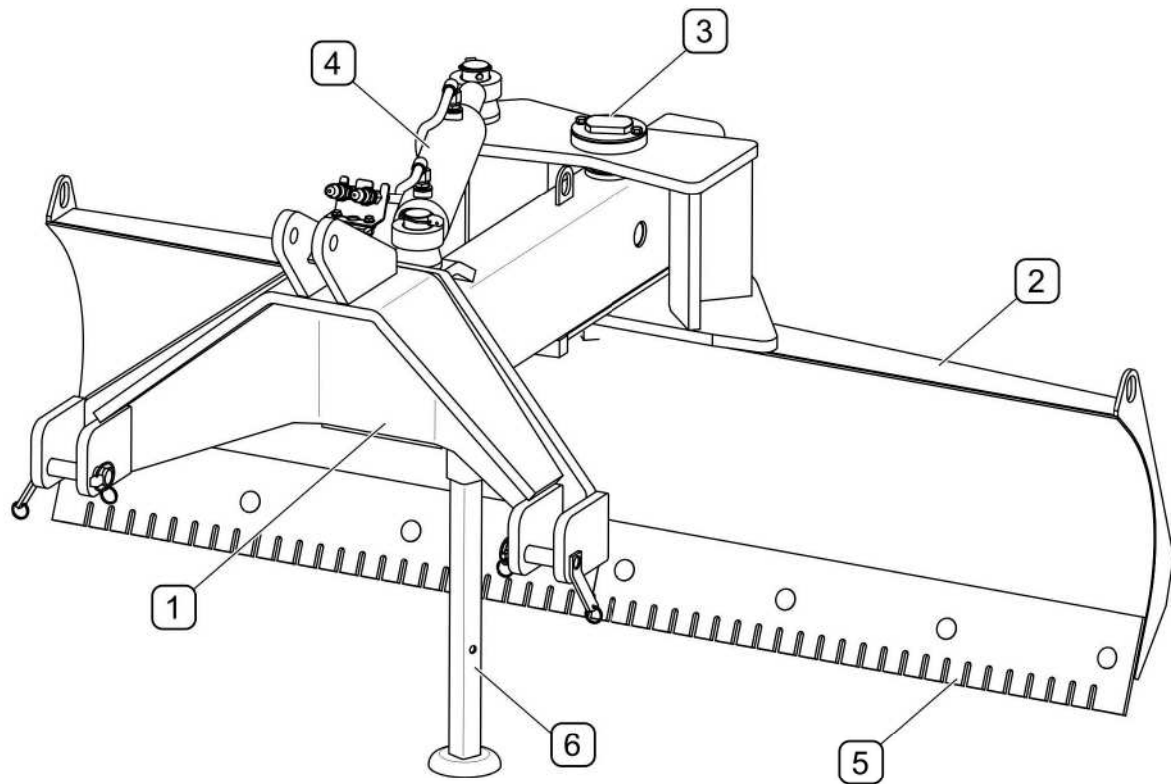
Level of noise emitted by machine does not exceed 70 dB(A)



**FIG. 3.1 Dimensions of universal scraper – blade PU-T20**

*Dimensions on the drawing are given in millimetres [mm]*

## 3.2 GENERAL DESIGN



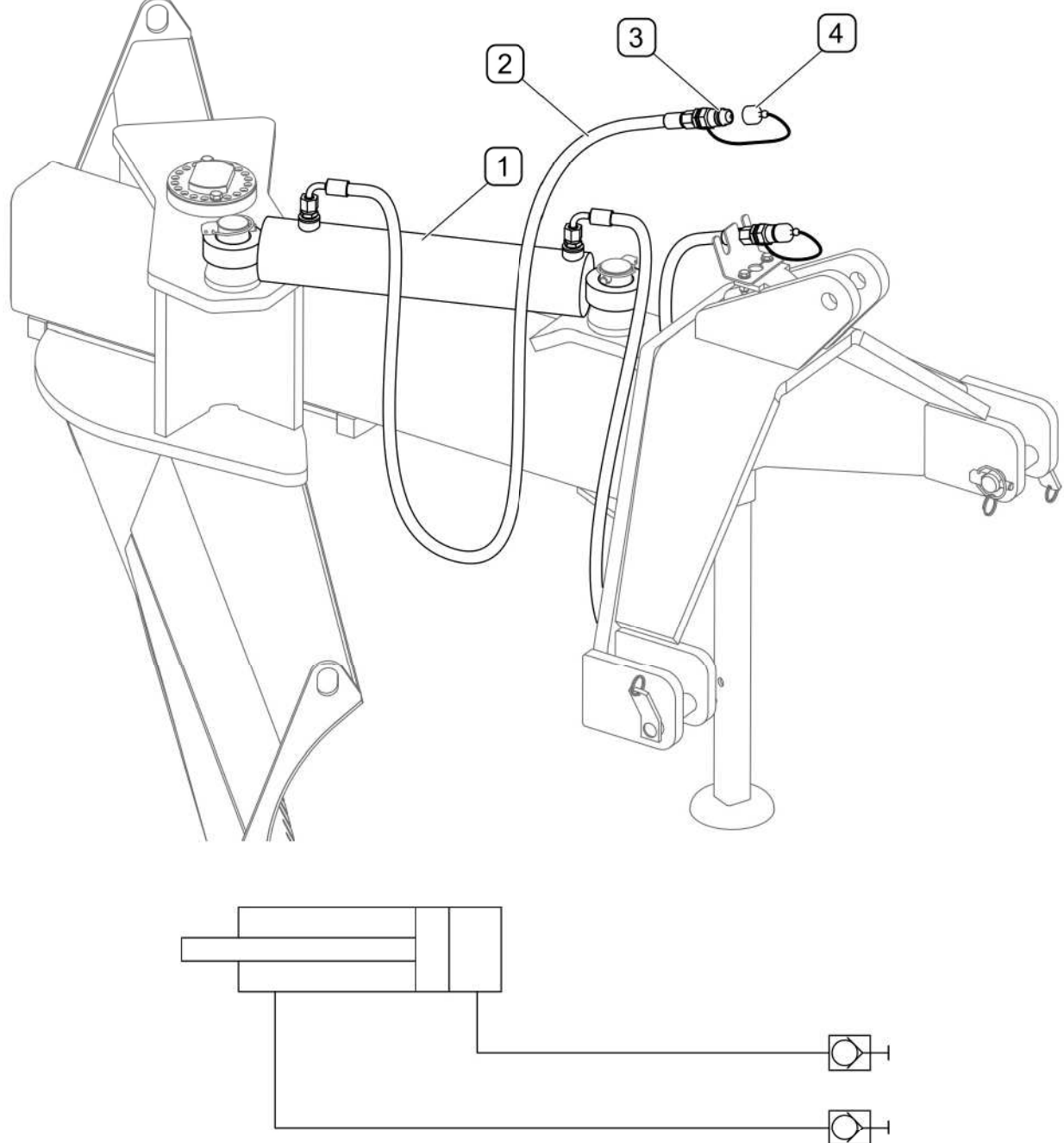
**FIG. 3.2**      **General design**

(1) - frame; (2) - mouldboard; (3) - main pin; (4) - hydraulic system; (5) - blade; (6) - parking stand

PU-T20 universal scraper – blade consists of a frame (1) with suspension system, to which a mouldboard (2) is attached using a pin (3). The mouldboard inclination angle is changed by means of a hydraulic system (4). The mouldboard can be equipped with a smooth-ribbed steel blade (5) or a rubber blade. Parking stand (6) is used to support the machine when it is disconnected from the tractor.

The scraper – blade can be assembled in the version designed to connect to the tractor front three-point linkage.

### 3.3 HYDRAULIC SYSTEM DESIGN



**FIG. 3.3** Hydraulic system design

(1) - hydraulic cylinder; (2) - conduits; (3) - hydraulic conduit connectors; (4) - stoppers

Mouldboard of universal scraper – blade is controlled from the tractor driver's cab using the hydraulic cylinder (1). Hydraulic conduits (2) terminated with connectors (3) are used for connecting the scraper – blade's hydraulic system with the tractor's external hydraulic system.





***SECTION***

**4**

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**CORRECT USE  
ADVICE**

## 4.1 PREPARING FOR WORK

### DANGER



Before using the universal scraper – blade, the user must carefully read this operator's manual.

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.

The machine must never be used by persons, who are not authorised to drive carrying vehicles, 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 machine, make sure that there are no bystanders in the danger zone.

The manufacturer guarantees that the machine is fully operational and has been checked according to quality control procedures and is ready for 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. Prior to connecting to the carrying vehicle, machine operator must verify the machine technical condition. 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 compatibility of the universal scraper – blade linkage with the tractor's linkage,
- check the compatibility of connection sockets,
- 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 technical condition of mouldboard, collecting blades,
- check technical condition of the linkage components,

**ATTENTION!**

Non-adherence to the recommendations stated in the Operator's Manual or improper use may cause damage to the machine.

The technical condition before starting the machine must be no cause for concern.

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 carrying vehicle, started and all its individual systems checked. In order to do this:

- connect the machine to the tractor (see HITCHING TO TRACTOR)
- after connection of hydraulic system conduits, confirm correctness of operation and check tightness of the system and cylinder,

In the event of a disruption in the operation of the machine immediately discontinue its use, locate and remove the fault. If a fault cannot be rectified or the repair could void the warranty, please contact the Manufacturer for additional clarifications.

**ATTENTION!**

Before using the machine always check its technical condition. In particular, check the technical condition of the hitch and hydraulic system.

## 4.2 CHECKING TECHNICAL CONDITION

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

**TAB. 4.1 TECHNICAL INSPECTION SCHEDULE**

DESCRIPTION	SERVICE OPERATION	FREQUENCY
Technical condition of mouldboard and collecting plough blades	Visually inspect and if necessary replace according to section 5.1 CHECKING AND REPLACEMENT OF COLLECTING PLOUGH BLADES	Before beginning work
Technical condition of linkage components	Check the technical condition, if complete and correctly mounted.	
Technical condition of the hydraulic system.	Visually inspect the technical condition, check tightness and confirm correctness of operation	
Tightening of all main nut and bolt connections	Torque values should be according to table 5.4	Once a week
Lubrication	Lubricate elements according to section 5.3 LUBRICATION.	According to table 5.3



### ATTENTION!

Do NOT use a malfunctioning or incomplete machine.

## 4.3 HITCHING TO TRACTOR

Universal scraper – blade PU-T20 may be hitched to a tractor that meets the requirements contained in Table 1.1 „*REQUIREMENTS FOR CARRYING VEHICLE*”.



### **DANGER**

Exercise caution when hitching the machine to tractor.

Do NOT hitch the machine to the tractor when the tractor's engine is running.



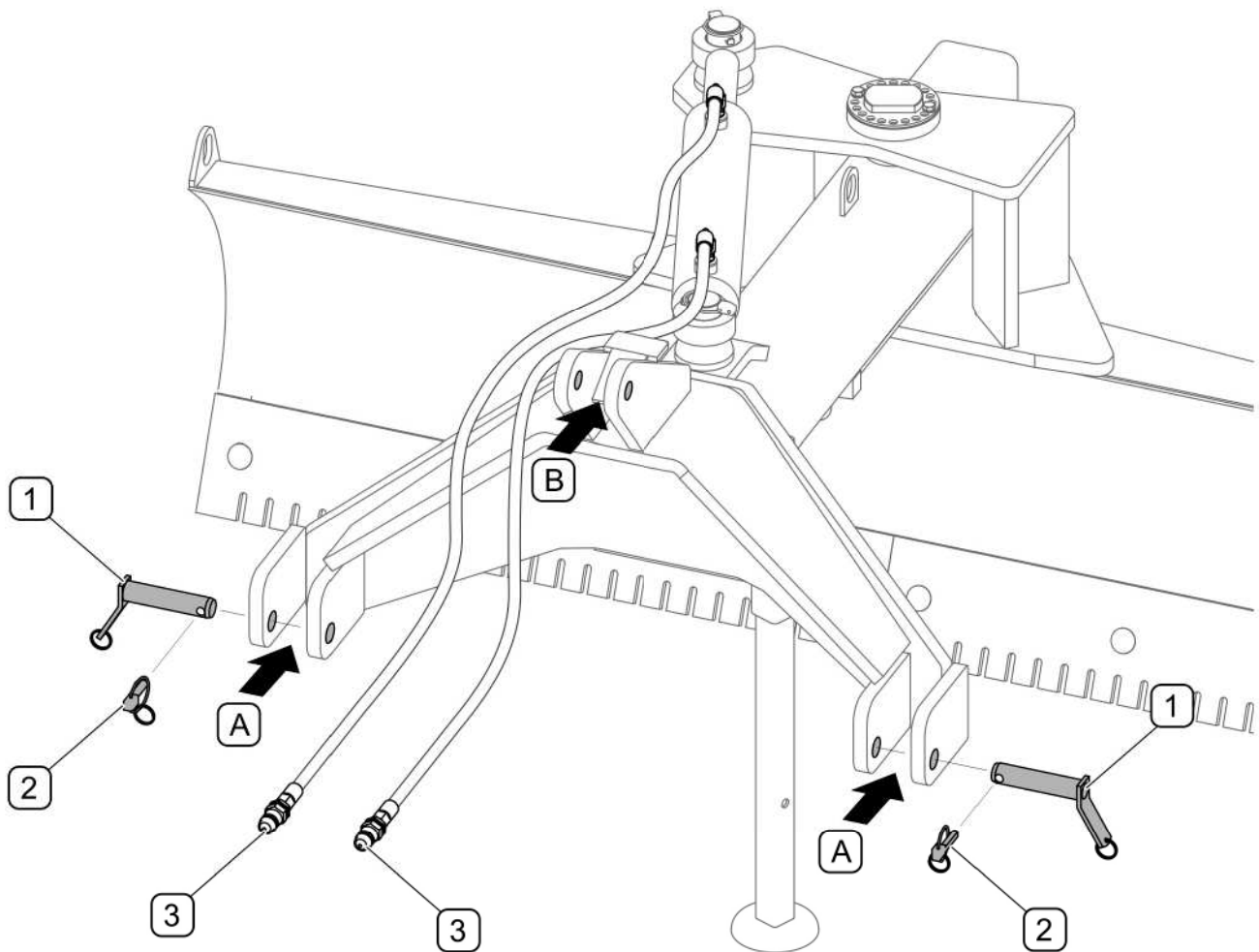
### **ATTENTION!**

Before hitching the machine to tractor, the user must carefully read the tractor operator's manual.

In order to hitch the machine to the tractor (FIG. 4.1):

- Reverse the tractor and bring the lower links of the tractor's three point linkage close to mounting points (A) on the scraper – blade frame.
- Set lower links of the tractor three-point linkage at appropriate height.
- switch off tractor's engine and prevent it from moving,
- Connect the lower mounting points (A) with the lower links of the tractor's three point linkage using pins (1) and secure them with cotter pins (2).
- Connect top link (B) of the tractor's three point linkage with upper mounting point (B) and secure it.
- Connect quick couplers (3) of hydraulic conduits to the tractor's external hydraulic system.
- Lift the machine using tractor three point linkage.
- Raise parking stand and secure with pin and cotter pin (FIG. 4.2).

Both lower links of the tractor's three point linkage are recommended to be set at the same height and in the position that enables their vertical movement with regard to each other.



**FIG. 4.1 Hitching to tractor**

(A) - mounting points for the lower links of the tractor's three point linkage; (B) - mounting point for the top link (central link), (1) - pins of lower links; (2) - securing cotter pin; (3) - hydraulic quick couplers



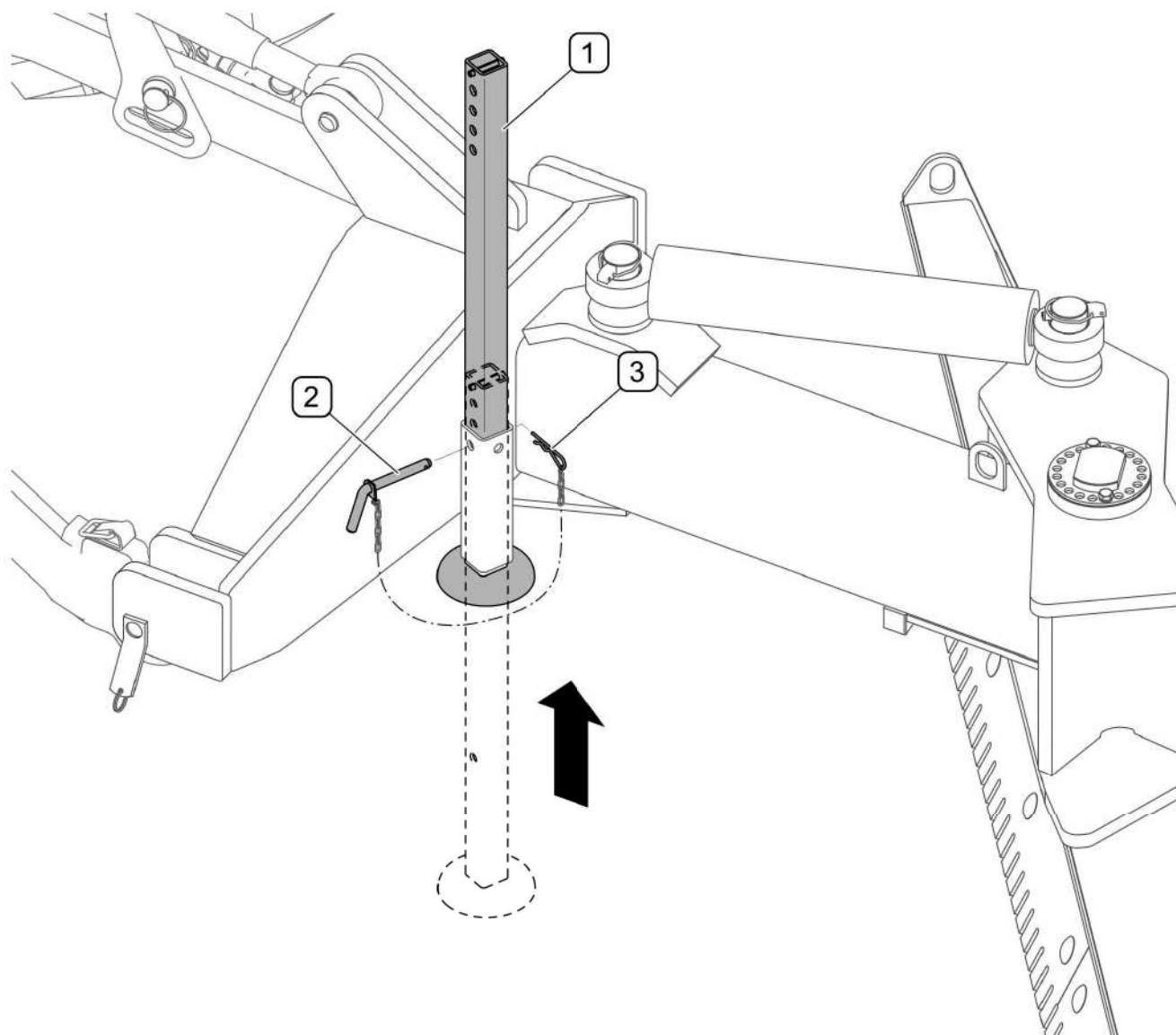
### **DANGER**

To link the machine to the carrying vehicle use only linking elements envisaged by the Manufacturer.



### **ATTENTION!**

The connecting cables should be routed so that they do not get entangled in moving machine parts.



**FIG. 4.2**      **Parking stand**

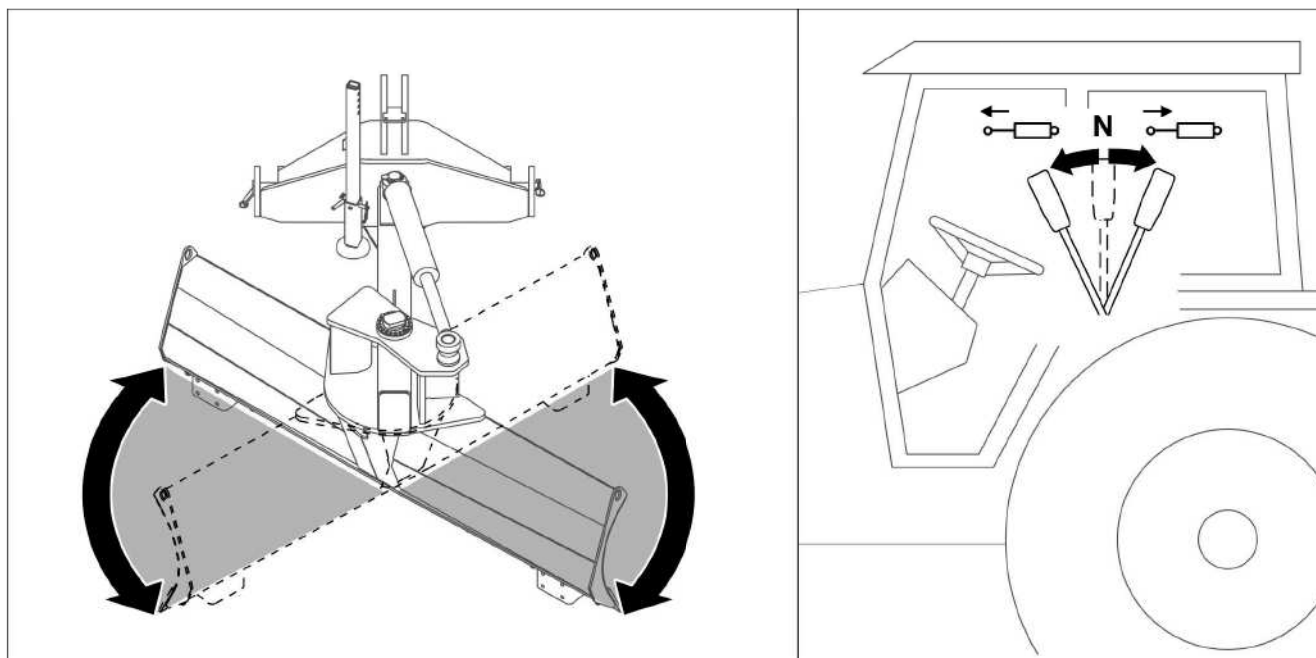
(1) - parking stand; (2) - linchpin; (3) - securing cotter pin

To dismantle the parking stand:

- lift the machine mounted on a carrying vehicle,
- remove cotter pin (3) and pin (2);
- raise parking stand (1) and lock it in upper position

## 4.4 UNIVERSAL SCRAPER – BLADE OPERATION

### 4.4.1 SETTING WORKING POSITION



**FIG. 4.3**      **Setting working position**

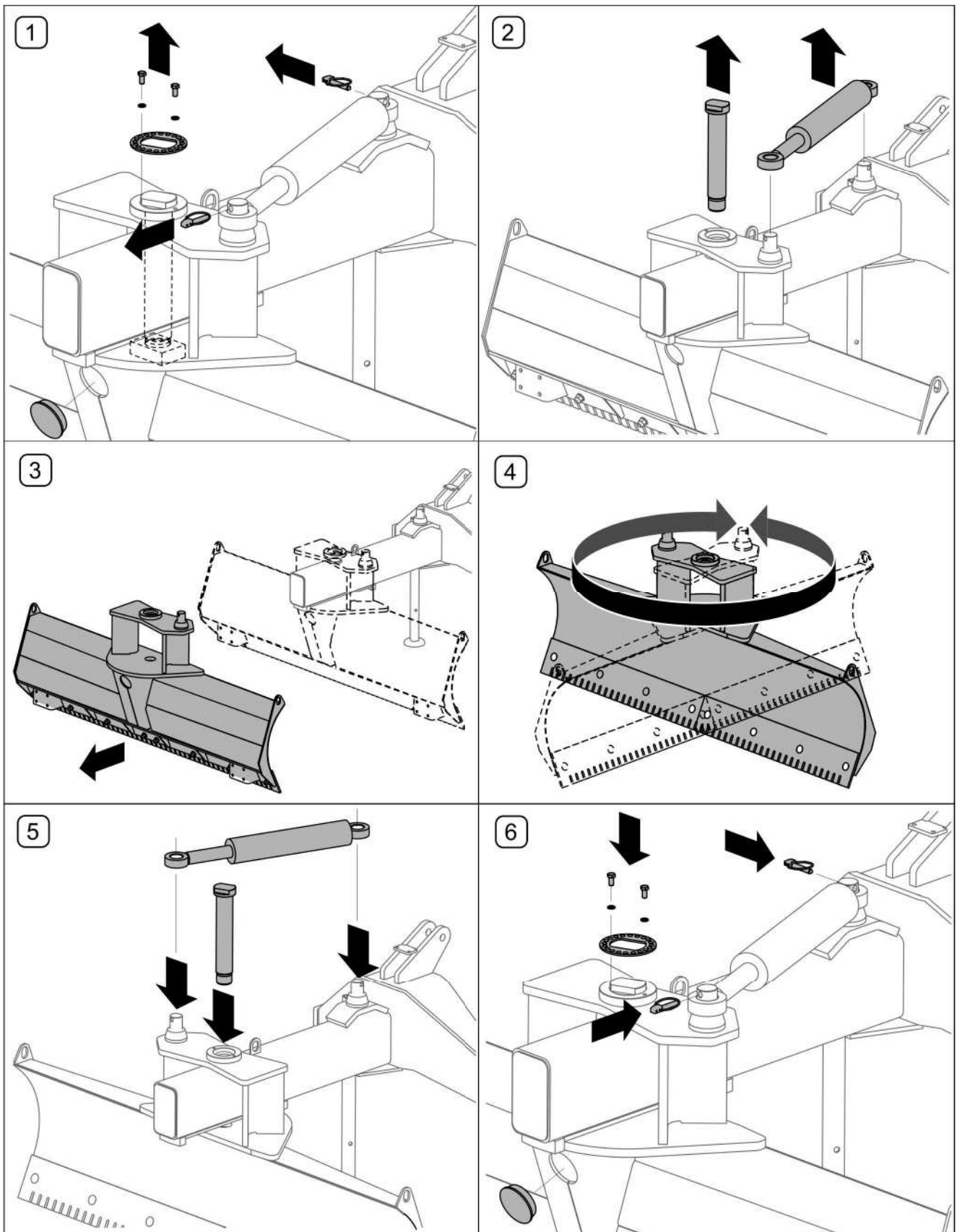
Universal scraper – blade PU-T20 can be set in two extreme working positions and intermediate positions. In order to change the universal scraper – blade working position use a selective control valve lever that controls a relevant section of tractor external hydraulics.



### **DANGER**

When the universal scraper – blade is in use there must be nobody within the mouldboard working area.



**4.4.2 CHANGING THE UNIVERSAL SCRAPER – BLADE MOUNTING METHOD****FIG. 4.4** Changing the mounting method

(1); (2)....(6) – successive stages

PU-T20 universal scraper – blade is factory adjusted for hitching to the tractor's rear three-point linkage. After proper readjustment of the mouldboard, the universal scraper – blade can be hitched to the tractor front.

Readjustment of the mouldboard is recommended to be carried out in a properly equipped workshop.

Raised universal scraper – blade should be secured against dropping or accidental lowering.

Next stages of changing the universal scraper – blade mounting method (FIG. 4.4):

- 1) Remove cotter pins from the cylinder pins and unscrew bolts securing the pin lock.
- 2) Dismount the cylinder from pins and screw out the pin connecting the frame with the mouldboard (the pin is secured from below with a nut that is accessible after removal of the stopper)
- 3) Dismount the mouldboard from the universal scraper – blade frame.
- 4) Turn the mouldboard by 180° and reinstall on the frame.
- 5) Screw in the main pin (secure it from below with a nut) and install the cylinder on the pins.
- 6) Secure the cylinder with cotter pins, install the pin lock and secure it with bolts.

**IMPORTANT!**

The use of floating function is recommended in order to protect the machine against damage. The tractor weight must not be transferred to the universal scraper – blade.

## 4.5 TRANSPORTING THE MACHINE

When driving on public or private roads, respect the road traffic regulations, exercise caution and prudence. Listed below are the key guidelines.

- Make sure that the machine is correctly attached to the tractor, and linkage is properly secured.
- The maximum working speed and the maximum speed allowed by road traffic regulations must not be exceeded. Speed of travel should be adjusted to prevailing road conditions, pavement condition and other conditions.
- When driving with raised machine set it so as not to obscure the lights or restrict the visibility of the operator.
- Avoid ruts, depressions, ditches or driving on roadside slopes. Driving across such obstacles could cause the machine or the tractor to suddenly tilt. Driving near ditches or canals is dangerous as there is a risk of the slope collapsing.
- Speed must be sufficiently reduced before making a turn or driving on an uneven road or a slope.
- When driving on uneven terrain with the machine raised reduce speed due to dynamic loads and the risk of damaging the machine or carrying vehicle.
- When driving with raised implement, secure the tractor linkage against falling or accidental dropping.

## 4.6 DISCONNECTING FROM TRACTOR



### **DANGER**

Before disconnecting the machine from the tractor, turn off the tractor engine, engage the parking brake and secure cab against access of third persons.

Be especially careful when disconnecting the machine from the tractor.

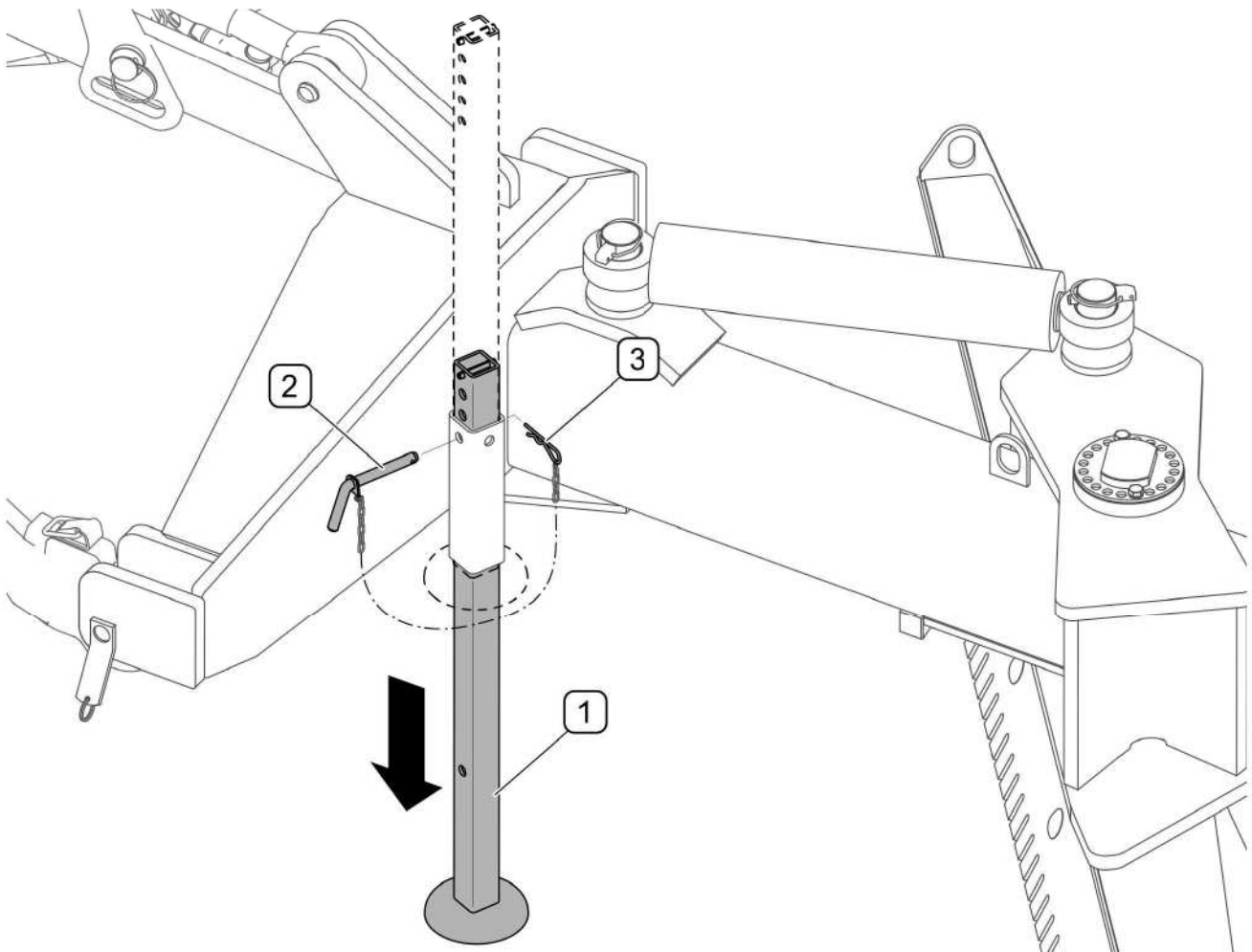


### **DANGER**

Reduce pressure prior to disconnecting the hydraulic system.

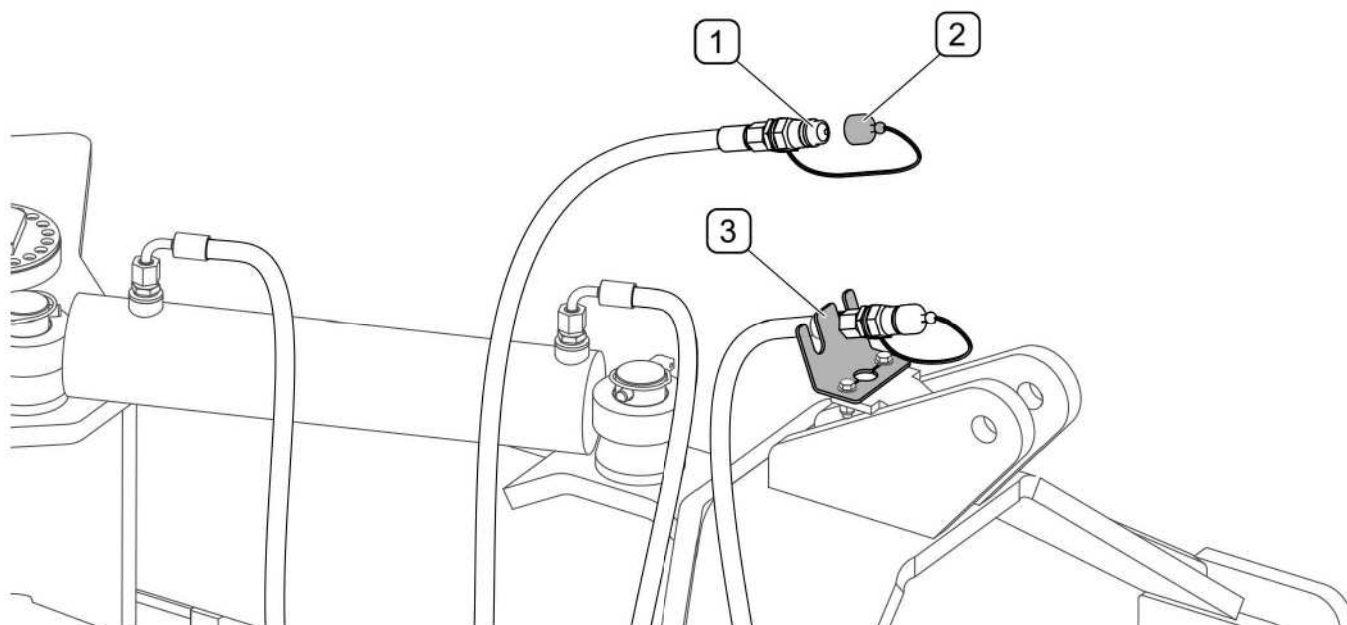
To disconnect machine from the tractor:

- when the universal scraper – blade is raised, take out securing cotter pin (3) and linchpin (2)
- lower parking stand (1) and secure it with linchpin (2) and cotter pin (3) (FIG. 4.5)
- lower the universal scraper – blade until it fully rests on the ground,
- turn off the engine in the tractor, engage the parking brake,
- reduce residual pressure in the hydraulic system by movement of appropriate lever controlling hydraulic circuit,
- disconnect hydraulic conduit connectors (1), secure them with stoppers (2) and place in bracket (3) (FIG. 4.6)
- disconnect upper link (central connector) and lower links of the tractor's three point linkage and drive tractor away from the machine.



**FIG. 4.5** Lowering of parking stand

(1) - parking stand; (2) - linchpin; (3) - securing cotter pin



**FIG. 4.6**      **Protection of hydraulic conduit connectors**

(1) - hydraulic conduit connector; (2) - stopper; (3) - bracket

Machine disconnected from the tractor must be placed on level, sufficiently hard surface in such a manner as to ensure that it is possible to connect it again.



***SECTION***

**5**

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**MAINTENANCE**

## 5.1 CHECKING AND REPLACEMENT OF COLLECTING BLADES



### DANGER

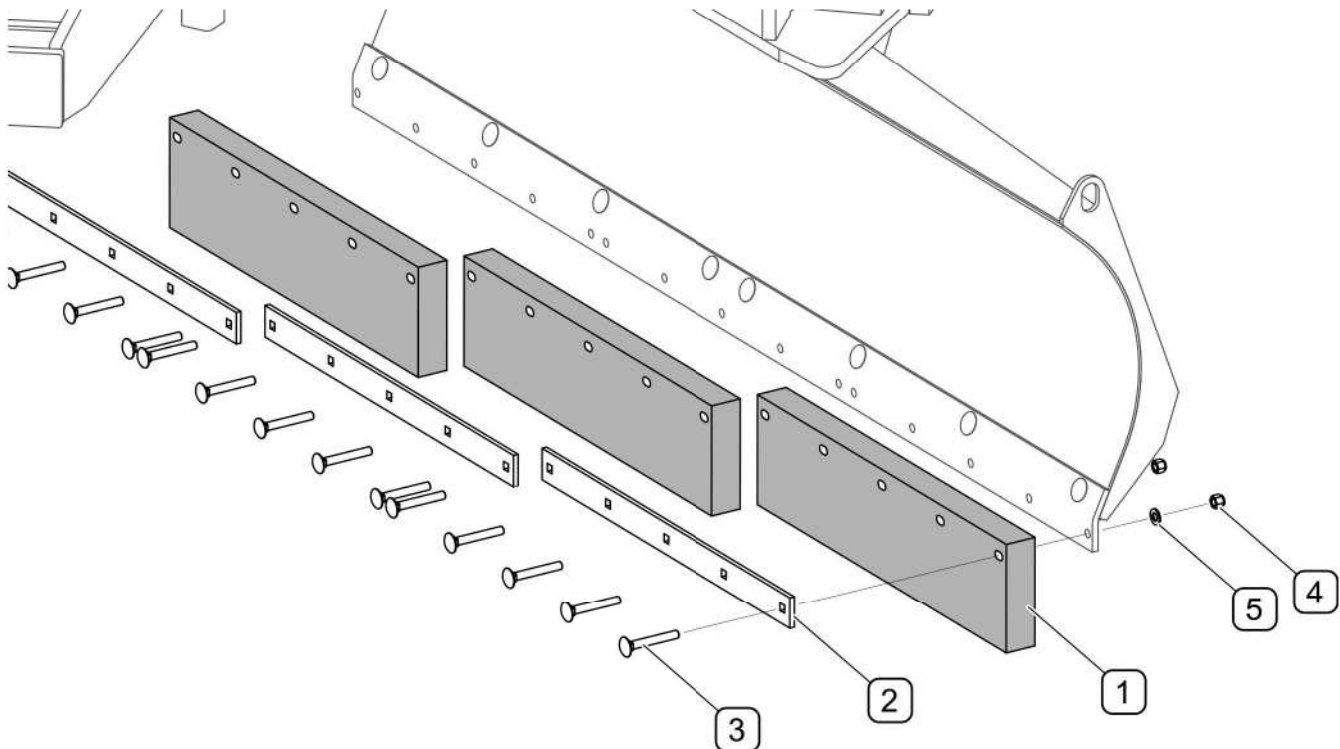
During inspection and replacement of blades, switch off tractor's engine and remove the key from the ignition.



### DANGER

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

Excessively worn or damaged blades must be replaced. Raise the universal scraper – blade and support with sufficiently stable and strong supports. If the universal scraper – blade is hitched and raised on the front three-point linkage, protect it from falling and immobilise the tractor (turn off the engine and engage the parking brake.) Depending on machine version, the universal scraper – blade can be equipped with steel or rubber blades.

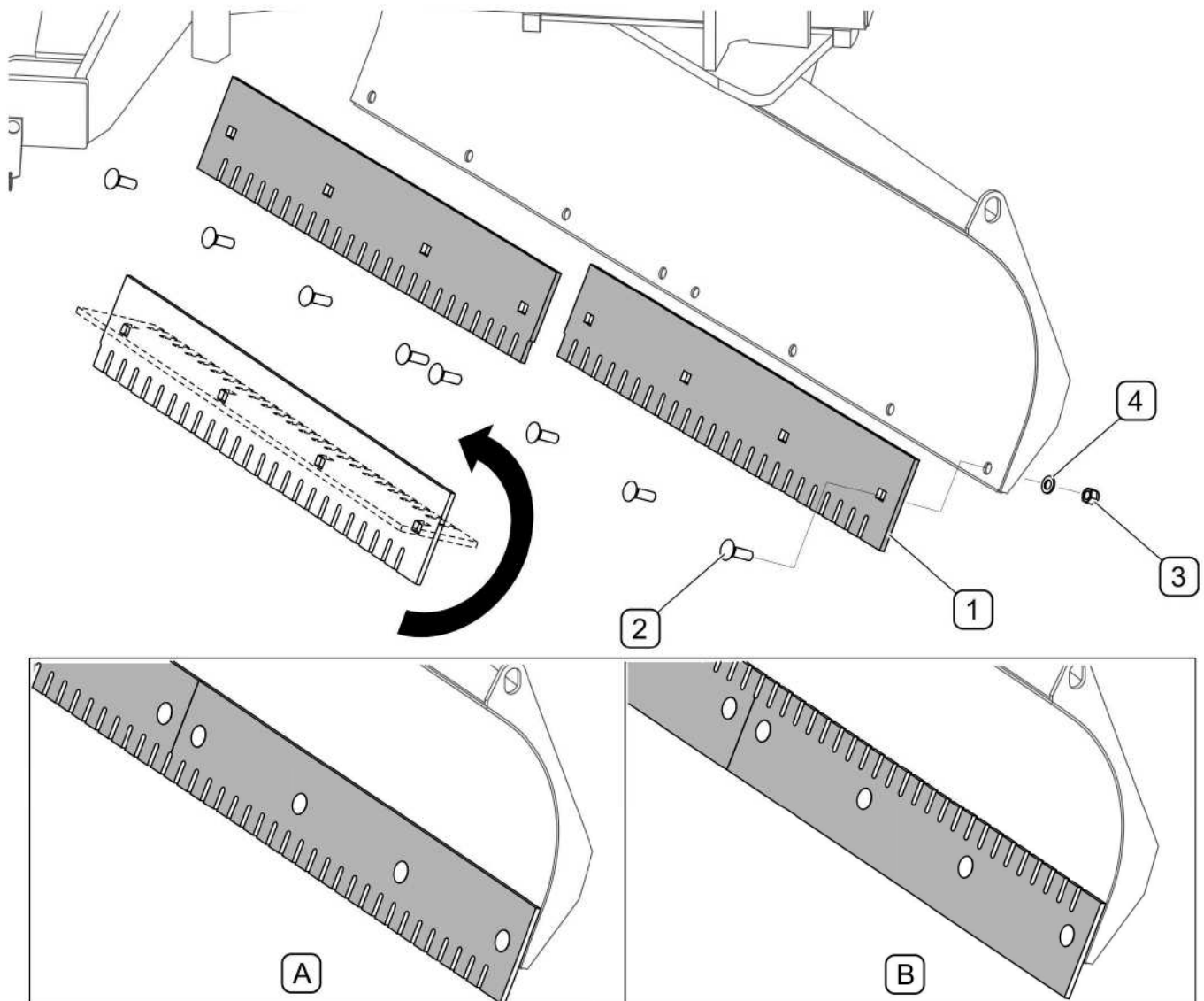


**FIGURE 5.1**    **FIG.5.1 Replacement of rubber plough blades**

(1) - rubber blade; (2) - clamping strip; (3) - bolt M12x90; (4) - self-locking nut M12; (5) - washer 12

To remove a rubber blade (FIGURE 5.1), unscrew nuts (4) of an appropriate segment, remove bolts (2). Install a new blade segment (TABLE 5.1).





**FIGURE 5.2 Replacement of steel blades**

(1) - steel blade; (2) - bolt M16x50; (3) - self-locking nut M16; (4) - washer 16; (A) - ribbed working edge; (B) - smooth working edge

To remove a steel blade, (FIGURE 5.2) undo nuts (3), remove washers (4) and take out bolts (2). Steel blades are two-sided and can be set with a smooth edge (B) or ribbed edge (A) facing the ground. Excessively worn or damaged blades should be replaced (TABLE 5.1).

**TABLE 5.1**    **Types of collecting blades**

<b>Name / Catalogue No.</b>	<b>Figure number</b>	<b>Number of items</b>
rubber blade / 220N-05000006	5.1	3
steel blade segment / 237N-00000006	5.2	2

**ATTENTION!**

Each time the machine hits an obstacle, technical condition of blades and their mounting should be checked.

## 5.2 HYDRAULIC SYSTEM OPERATION

The duties of the operator connected with the hydraulic system include:

- checking tightness of cylinders hydraulic connections,
- checking technical condition of hydraulic lines;

**DANGER**

Do not repair hydraulic system on your own. All hydraulic system repairs must be performed only by suitably qualified personnel.

**ATTENTION!**

Before you begin, visually inspect the hydraulic system components.

The hydraulic system of new machine is factory filled with HL32 hydraulic oil. Because of its composition the oil applied 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.

**DANGER**

Oil fires should be quenched with carbon dioxide (CO<sub>2</sub>), foam or extinguisher steam. Do NOT use water for fire extinguishing!

**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	Flash point, °C	Above 210°C
6	Maximum operating temperature, °C	80

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.

The hydraulic system should be completely tight sealed. Inspect the seals when hydraulic cylinders are completely extended. In the event of confirmation of oil on hydraulic 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 faults are remedied.



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

**DANGER**

Before commencing whatever work on hydraulic system reduce the residual 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.

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

**ATTENTION!**

The hydraulic system is vented automatically during machine operation.

## 5.3 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. LT-43-PN/C-96134 grease is recommended for lubrication.

**DANGER**

Lubrication may only be performed when universal scraper – blade is lowered, and resting on the ground.

Before lubricating, switch off engine, remove key from ignition and engage carrying vehicle brake.

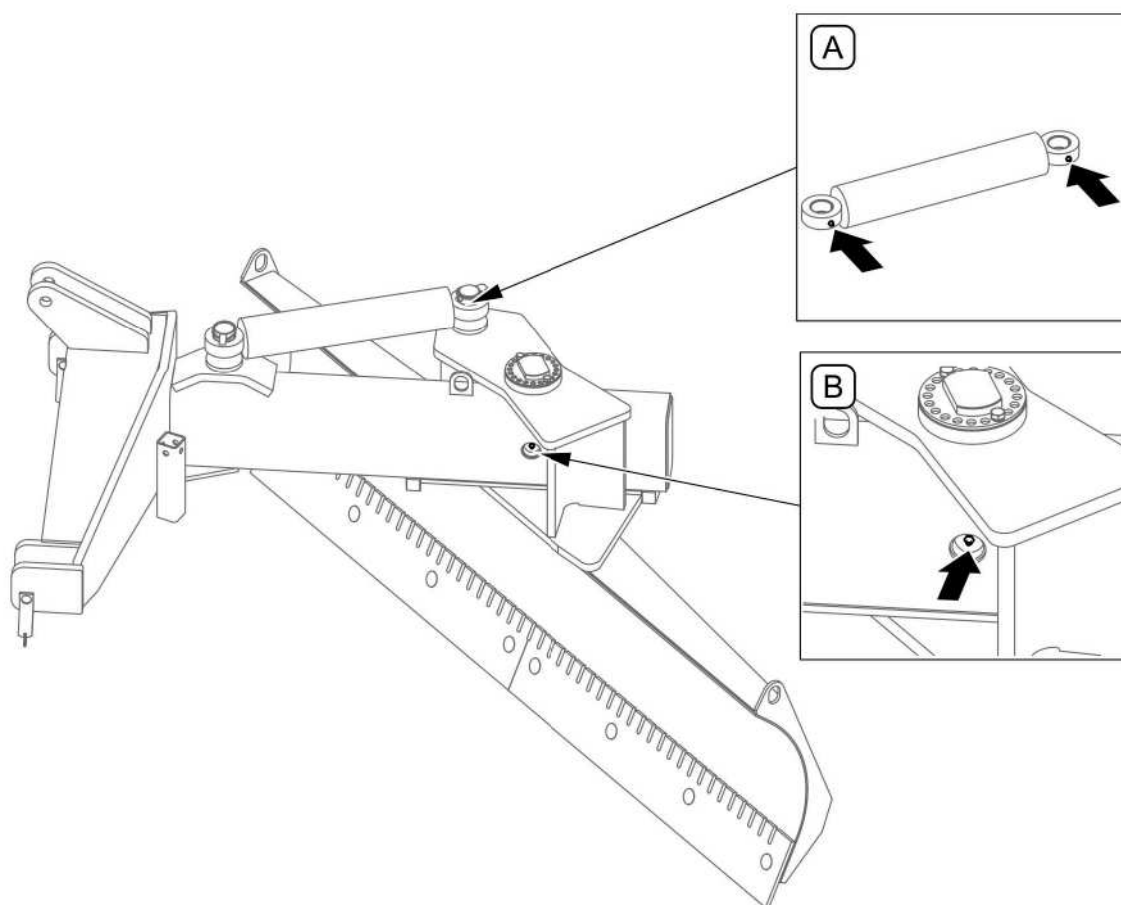


When using the machine the user is obliged to observe lubrication instructions according to attached schedule. Excess lubrication substance causes depositing additional contaminants in places requiring lubrication, therefore it is essential to keep individual machine elements clean.

**TABLE 5.3 LUBRICATION POINTS AND LUBRICATION FREQUENCY**

ITEM	NAME	NUMBER OF LUBRICATION POINTS	TYPE OF GREASE	LUBRICATION FREQUENCY
A	Cylinder ram eye and hydraulic cylinder eye	2	grease	50 hours
B	Mouldboard rotation sleeves	1		50 hours

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

**FIGURE 5.3 Lubrication points**

Lubrication points described in table 5.3

## 5.4 STORAGE

After finishing work, machine 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 or hydraulic lines. 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. Machine should be kept in closed or roofed building.

If the machine shall not be used for a long period of time, protect it against adverse weather conditions. Lubricate machine 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.

Universal scraper – blade should be placed on a parking stand.

## 5.5 TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS

During maintenance and repairs use appropriate torque for bolt connections (unless other is specified for a particular connection). Recommended torque values apply to non-greased steel bolts TABLE 5.4



### ATTENTION!

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.

**TABLE 5.4 TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS**

<b>THREAD DIAMETER</b> [mm]	<b>5.8</b>	<b>8.8</b>	<b>10.9</b>
	<b>TIGHTENING TORQUE [Nm]</b>		
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

## 5.6 TROUBLESHOOTING

**TABLE 5.5 TROUBLESHOOTING**

<b>TYPE OF FAULT</b>	<b>CAUSE</b>	<b>REMEDY</b>
Universal scraper – blade working position cannot be changed	The hydraulic system is not connected	Connect scraper – blade quick couplers to tractor system.
	Tractor hydraulic system unreliable switched off	Check the tractor hydraulic system
	Damaged hydraulic quick couplers	Check quick couplers for damage, refer repair to service, if necessary
	The machine hydraulic system is damaged	Repair at authorised service point





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