



PRONAR Sp. z o.o.

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

phone:	+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

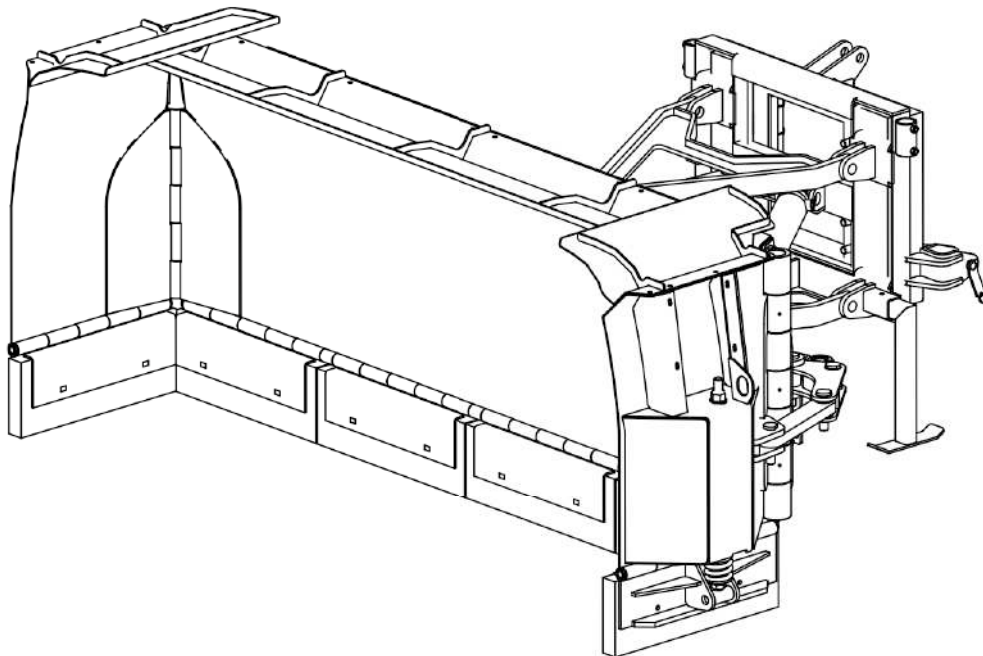
www.pronar.pl

OPERATOR'S MANUAL

UNIVERSAL SCRAPER

PRONAR PUU-3700

TRANSLATION OF THE ORIGINAL COPY OF THE MANUAL



EDITION 1B-10-2013

PUBLICATION NO 380N -00000000-UM



UNIVERSAL SCRAPER

PRONAR PUU-3700

MACHINE IDENTIFICATION

TYPE:

PUU-3700

SERIAL NUMBER:

--	--	--	--	--	--

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 PUU-3700 universal scraper. 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

+48 085 681 63 29	+48 085 681 64 29
+48 085 681 63 81	+48 085 681 63 82

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.

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

ul. Mickiewicza 101 A

17-210 Narew, Polska

tel./fax (+48 85) 681 63 29, 681 63 81, 681 63 82,
681 63 84, 681 64 29

fax (+48 85) 681 63 83

<http://www.pronar.pl>e-mail: pronar@pronar.pl

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:	Universal scraper
Type:	PUU-3700
Model:	—
Serial number:	
Commercial name:	Universal scraper PRONAR PUU-3700

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 2013-12-11

Place and date

Z-CIA DYREKTORA
działu technicznych
ciężkiego sprzętu

Roman Melianiuk

*Full name of the empowered person
position, signature*

TABLE OF CONTENTS

1	BASIC INFORMATION	1.1
1.1	IDENTIFICATION	1.2
1.2	PROPER USE	1.3
1.3	EQUIPMENT	1.4
1.4	TERMS & CONDITIONS OF WARRANTY	1.5
1.5	TRANSPORT	1.6
1.6	ENVIRONMENTAL HAZARDS	1.9
1.7	WITHDRAWAL FROM USE	1.9
2	SAFETY ADVICE	2.1
2.1	BASIC SAFETY RULES	2.2
2.1.1	USE OF MACHINE	2.2
2.1.2	HITCHING AND UNHITCHING FROM CARRYING VEHICLE	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	MACHINE OPERATION	2.6
2.2	DESCRIPTION OF RESIDUAL RISK	2.6
2.3	INFORMATION AND WARNING DECALS	2.7
3	DESIGN AND OPERATION	3.1
3.1	TECHNICAL SPECIFICATION	3.2
3.2	GENERAL DESIGN	3.3
3.3	HYDRAULIC SYSTEM	3.5
3.4	ELECTRICAL SYSTEM	3.6

4	CORRECT USE	4.1
4.1	PREPARING FOR WORK	4.2
4.2	CHECKING TECHNICAL CONDITION	4.4
4.3	HITCHING TO VEHICLE	4.5
4.4	UNIVERSAL SCRAPER BLADE OPERATION	4.9
4.4.1	CONTROL PANEL	4.9
4.4.2	SETTING WORKING HEIGHT (OPTION)	4.11
4.5	DRIVING ON PUBLIC ROADS	4.12
4.6	UNHITCHING THE MACHINE FROM CARRYING VEHICLE	4.13
4.7	ADDITIONAL FITTINGS AND OPTIONAL EQUIPMENT	4.14
4.7.1	MOULDBOARD EXTENSIONS AND SHIELDS	4.14
4.7.2	INSTALLING SUPPORT WHEELS	4.19
4.7.3	INSTALLING LINKAGE SYSTEM	4.20
5	MAINTENANCE	5.1
5.1	CHECKING AND REPLACEMENT OF COLLECTING BLADES	5.2
5.2	ADJUSTMENT OF COLLECTING BLADE SPRINGS	5.4
5.3	ADJUSTMENT OF BALANCER	5.5
5.4	HYDRAULIC SYSTEM OPERATION	5.6
5.5	ELECTRICAL SYSTEM MAINTENANCE	5.9
5.6	LUBRICATION	5.11
5.7	STORAGE	5.13
5.8	TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS	5.14
5.9	TROUBLESHOOTING	5.15

SECTION

1

**BASIC
INFORMATION**

1.1 IDENTIFICATION

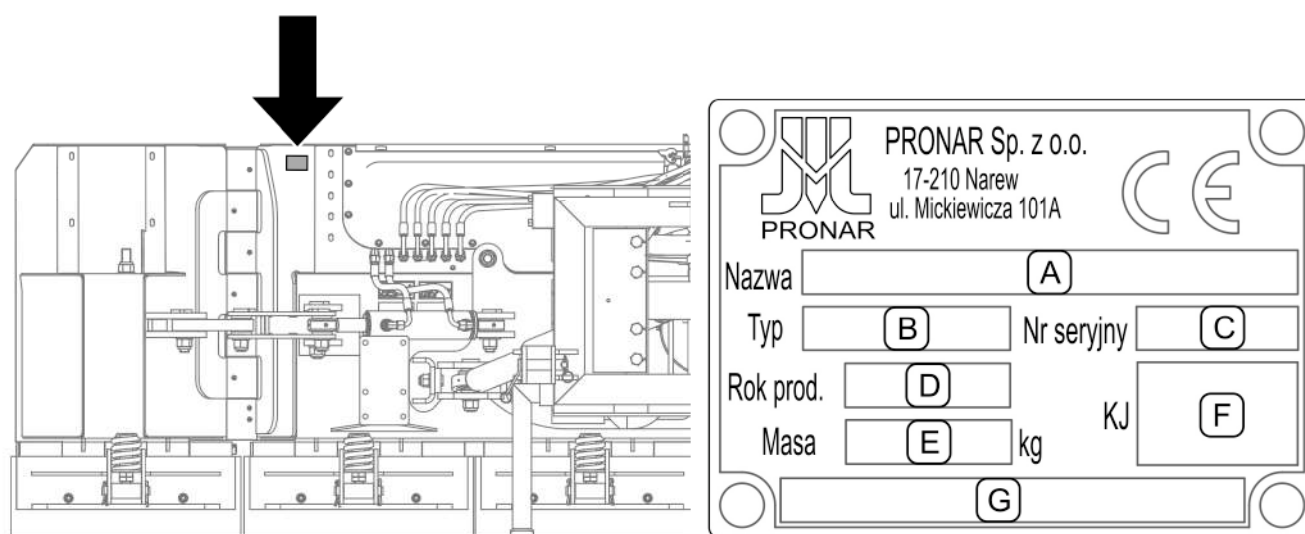


FIG. 1.1 Location of the data plate

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 – additional information

The factory number is stamped into the data plate and on mouldboard underneath the data plate. Data plate is located on the middle mouldboard on the left side of the machine. 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

Scraper – blade PRONAR PUU-3700 is used for feathering out and scraping silage and haylage and for removing snow from roads, squares, parking spaces and other hard road surfaces such as asphalt, concrete paving blocks, paving, concrete. Use for other purposes should be regarded as improper.

Depending on the equipment, the machine can be mounted on slow-moving vehicles, for example on agricultural tractors, loaders etc. or on vehicles equipped with front mounting plate according to DIN standard, that meet the requirements set out 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 the vehicle 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:

- levelling of roads, terrain;
- transport of people, animals and items on the machine

TAB. 1.1 Carrying vehicle requirements

		REQUIREMENTS
Electrical system		
Electrical system voltage	V	12 or 24 *
Connection type	–	3-pin electric socket on the front of the carrying vehicle
Hydraulic system		
The system pressure range	MPa	16 - 20 **
Hydraulic sockets	-	Two ISO 7241-1 sockets of one hydraulic section, located on the front of the carrying vehicle
Other requirements		
Mounting method	-	compatible with the scraper – blade's mounting system
Maximum power of carrying vehicle	hp (kW)	300 (220,7)

* - depending on the machine version, ** - optimum values are given; declared performance and durability of the machine are not guaranteed for other values.

1.3 EQUIPMENT

The scraper – blade equipment includes:

- Operator's Manual
- Warranty Book

Equipment versions:

- rubber or steel collecting blades
- 12V or 24V electrical system (depending on voltage in carrying vehicle's electrical system)
- rising interlock or float rising interlock or hydraulic rising system
- balancer or hydraulic rotation

Additional fittings and optional equipment

- jockey wheel
- mouldboard extensions for snow (*made of steel*)
- mouldboard extensions for silage (*made of perforated sheet metal*)
- dust shield (*made of tarpaulin*)
- additional lights 12V or 24 (*clearance lights, dipped lights and road lights*)

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:

- collecting blades,
- wheels (*if present*).
- light bulbs, fuses

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 operator's manual and electrical system components.

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.

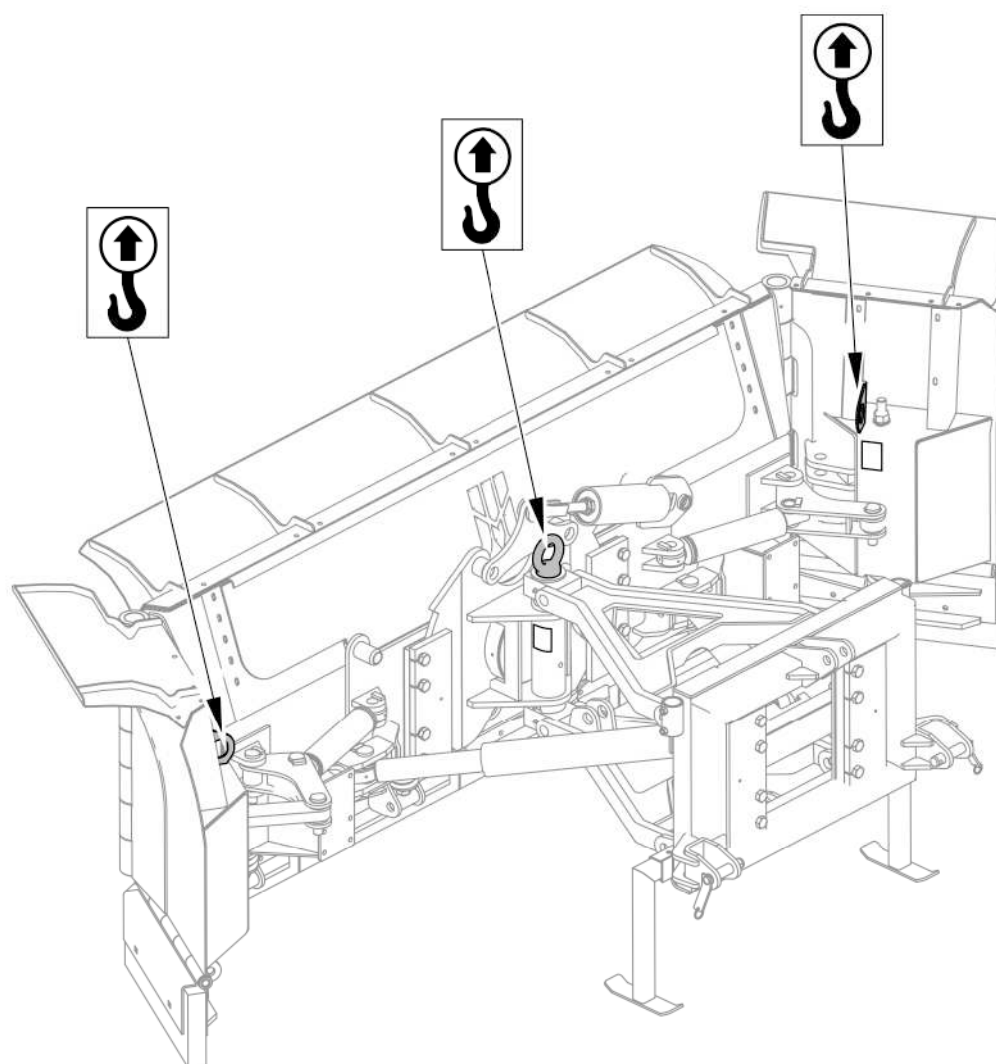


FIG. 1.2 **Transport lugs**



ATTENTION!

When rising the machine by the transport lugs, the central mouldboard should be set straight and the side mouldboards should be folded to the rear (FIG. 1.2)

The machine should be attached to lifting equipment in places specially designed for this purpose (FIG. 1.2), i.e. by the lugs on the right mouldboard and left mouldboard and by the lug of the central mouldboard rotation pin. 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.

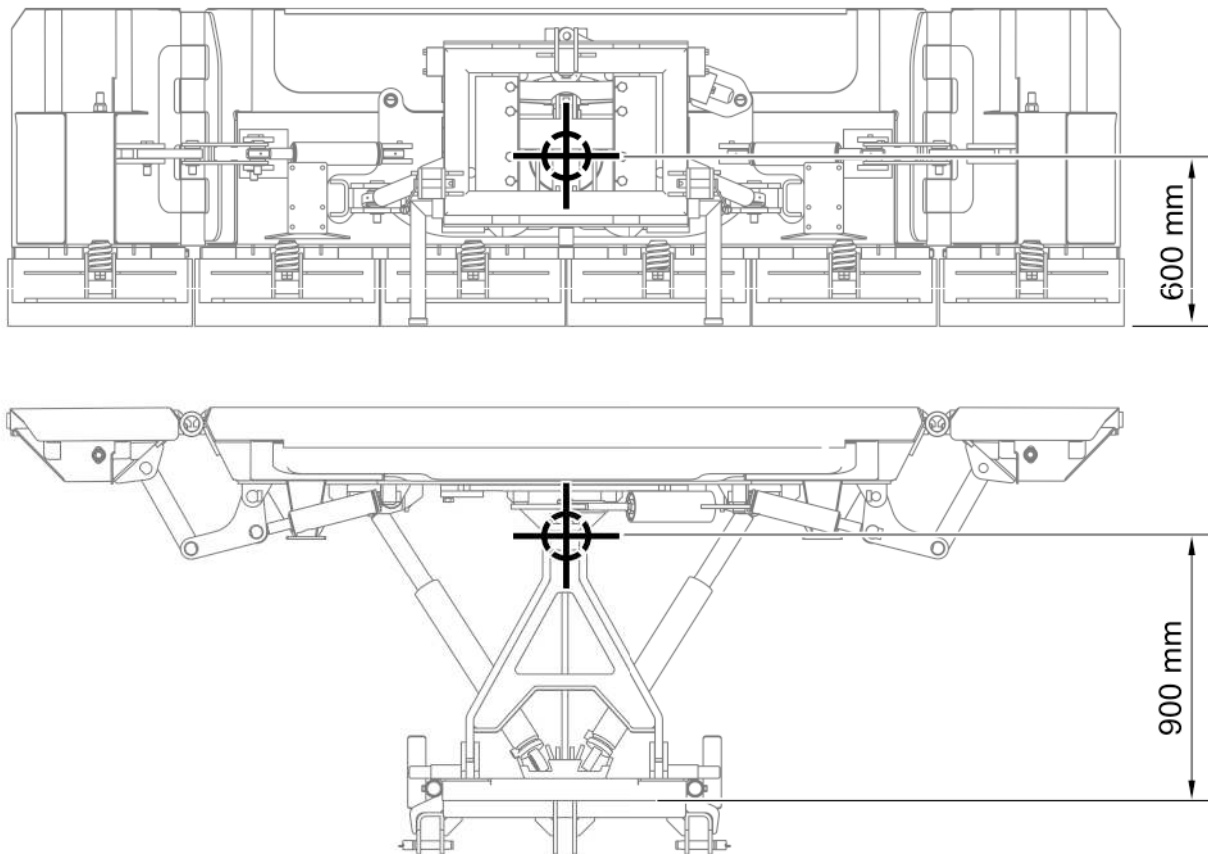


FIG. 1.3 Centre of gravity

The machine without additional equipment. The mouldboards are set straight.



ATTENTION!

Centre of gravity, depending on the version varies in the ± 100 mm range.



ATTENTION!

Do NOT secure lifting slings or any types of load securing elements to hydraulic and electrical system components and fragile elements of the machine



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

**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 carrying vehicle 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 residual 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.
- 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. safety guards, 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 HITCHING AND UNHITCHING FROM CARRYING VEHICLE

- Do NOT hitch the machine to a carrying vehicle, if the linkage system of the machine is not compatible with the linkage system of the carrying vehicle.
- Be especially careful when hitching the machine to carrying vehicle.
- When hitching, there must be nobody between the machine and the carrying vehicle. Exercise caution when unhitching the sweeper.
- 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 specified by the machine Manufacturer.
- After completion of hitching the machine, check the safeguards. Carefully read the carrying vehicle Operator's Manual.
- The machine disconnected from the carrying vehicle must be supported on the parking stands, collecting blade or wheels (depending on the machine's equipment) 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

- 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.
- Hydraulic lines must be changed 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 carrying vehicle is parked. When parked, the machine should be lowered.
- 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 and hydraulic and electrical system.
- When driving with raised implement, the carrying vehicle's 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 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).
- 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 carrying vehicle engine turned off and the ignition key removed. Immobilise the carrying vehicle with parking brake and ensure that unauthorised persons do not have access to the tractor cab.
- 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.
- 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 MACHINE OPERATION

- Before lowering or lifting the machine mounted on carrying vehicle make sure there are no bystanders, especially children, near the machine.
- Before starting the machine make sure that there are no bystanders (especially children) or animals in the danger zone. The carrying vehicle operator is obliged to ensure proper visibility of the machine and the working area.
- 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.
- Do NOT operate the machine while reversing. While reversing raise the multifunction arm.

2.2 DESCRIPTION OF RESIDUAL RISK

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

- using the sweeper 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.

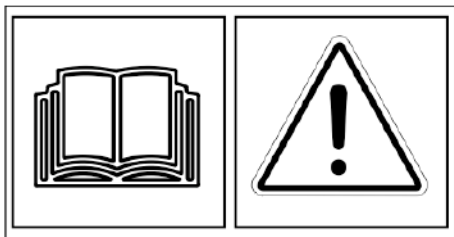
The residual risk may be kept to a minimum by following the recommendations below:


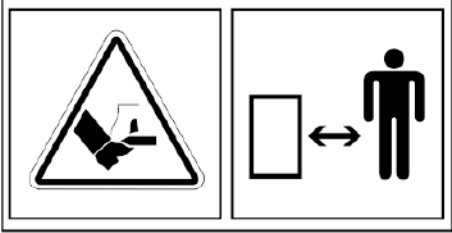
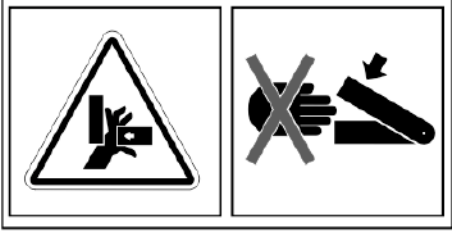




- prudent and unhurried operation of the machine,
- sensible application of the remarks and recommendations stated in the Operator's Manual,
- carrying out repair and maintenance work in line with operating safety rules,
- carrying out repair and maintenance work by persons trained to do so,
- using 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		Risk of injury to foot or leg. Keep a safe distance.
4		Do not reach into crushing space because elements may move. Danger of crushing hands or fingers.
5		Machine model
6		Lifting equipment attachment points while loading the machine
7		Outline marking
8		Manufacturer

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

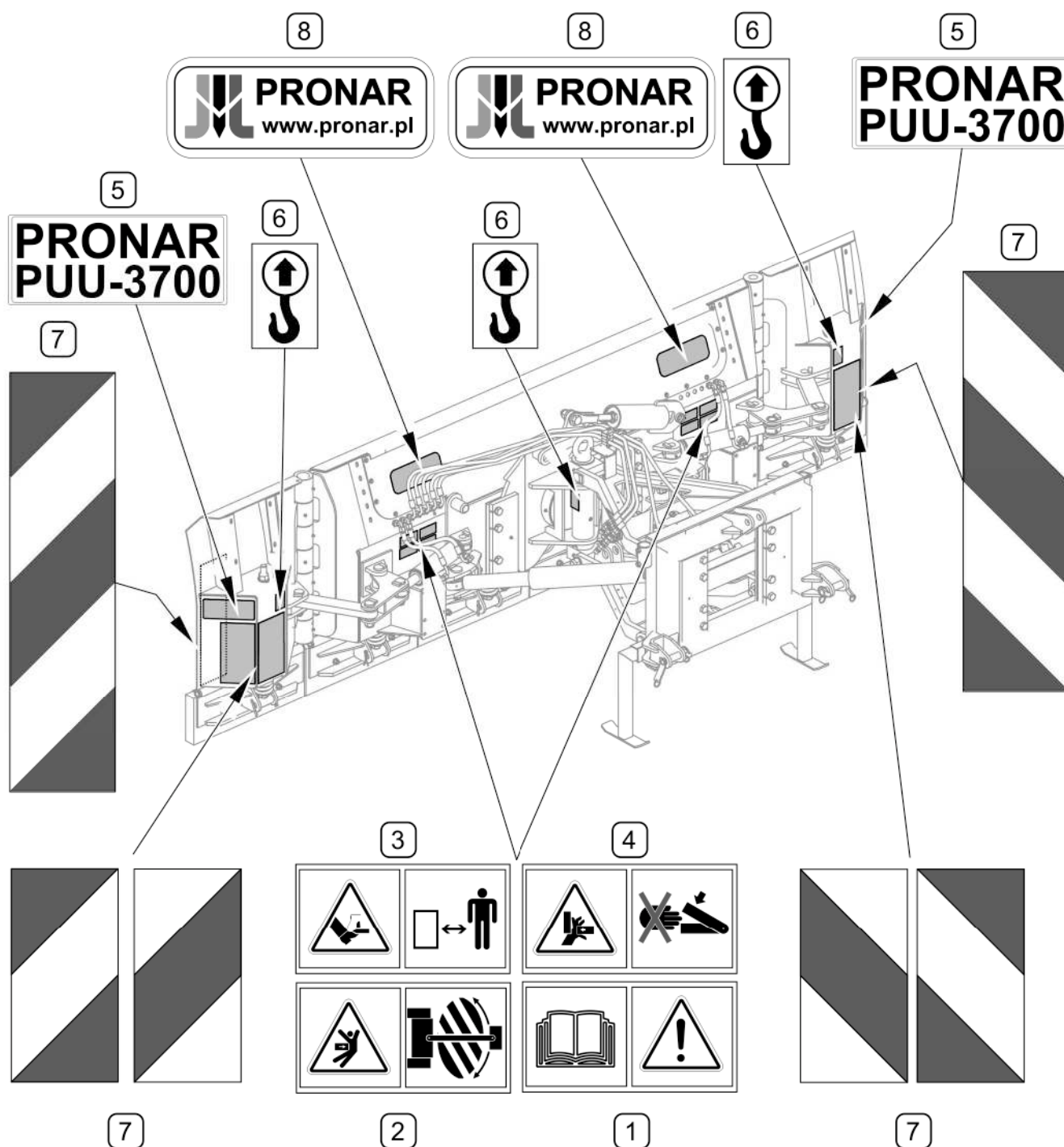


FIG. 2.1 Locations of information and warning decals.

Meaning of symbols (TAB. 2.1)

SECTION

3

**DESIGN
AND OPERATION**

3.1 TECHNICAL SPECIFICATION

TAB. 3.1 BASIC TECHNICAL SPECIFICATION

	Unit	
Scraper – blade model	–	PUU-3700
Working width minimum / maximum	mm	2 140 / 3 690
Working height: - without mouldboard extensions - with mouldboard extensions for snow - with mouldboard extensions for silage	mm	975 1 050 1 650
Total width minimum / maximum	mm	1 530 / 3 690
Total height: - without mouldboard extensions - with mouldboard extensions for snow - with mouldboard extensions for silage	mm	1 050 1 130 1 650
Total minimum / maximum length	mm	1 530 / 2 650
Working angles (FIG. 3.1): - mouldboard turn - side mouldboards turn - mouldboard rotation	°	±30° +90° (forward), -60° (to the rear) ±12°
Power supply	–	the electrical system and the external hydraulic system of the carrying vehicle
Operation	–	with the aid of the control panel and the external hydraulic system of the carrying vehicle
Electrical system voltage	V	24 or 12
Types of collecting blades	–	made of steel or rubber
Working speed (<i>maximum</i>)	km/h	20
Weight*	kg	1,275
Other information	–	Single person operation

* - for the machine equipped with rubber collecting blades, balancer, rising interlock and three-point linkage cat. II)

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

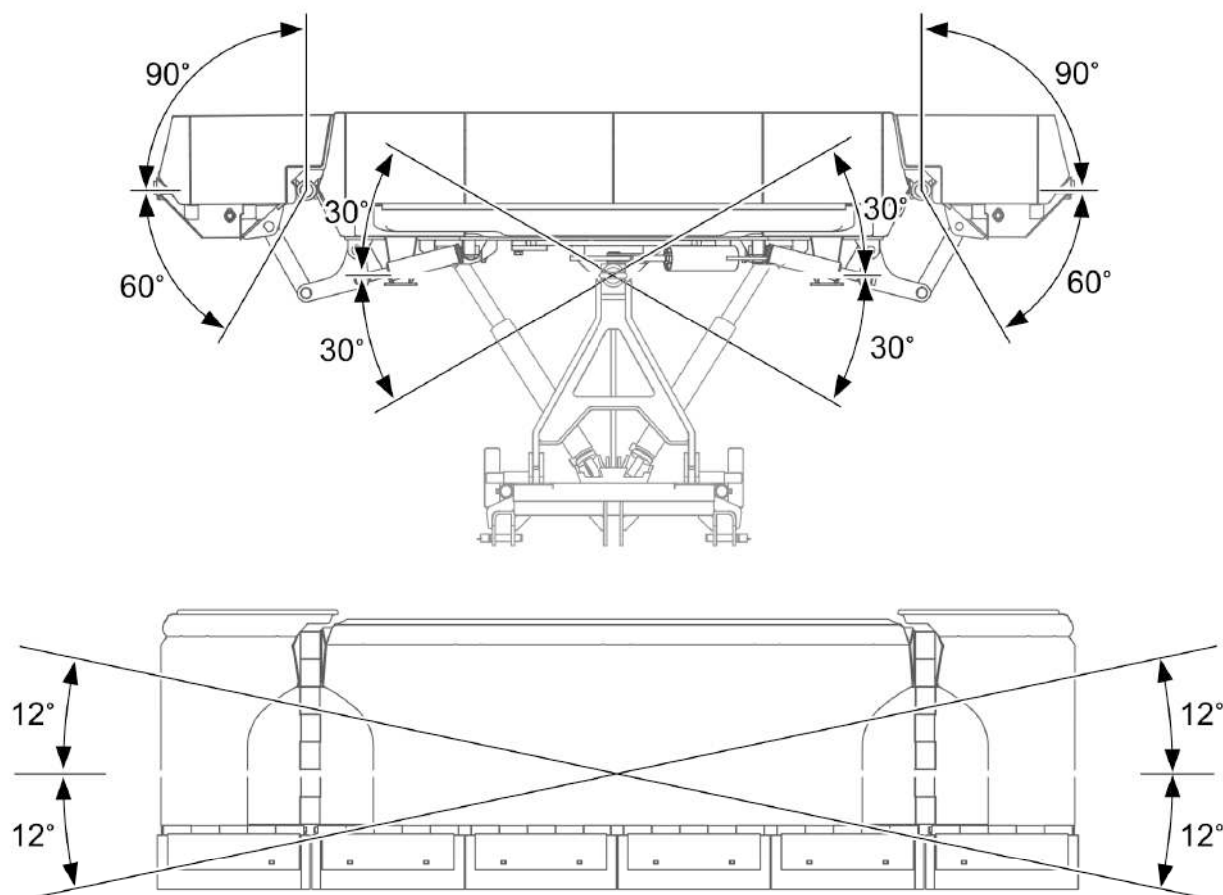


FIG. 3.1 Range of movement of the scraper – blade's mouldboards

3.2 GENERAL DESIGN

Scraper – blade PUU-3700 (FIG. 3.2) has a movable central mouldboard (1) and two movable side mouldboards (2) installed on both sides of the central mouldboard. Collecting blades (4) made of rubber or steel (depending on machine equipment) with spring shock absorbers are attached to the mouldboards. The scraper – blade functions are managed by means of hydraulic cylinders (5) that are electro-hydraulically controlled from the operator cab using the control panel. Optionally, the scraper – blade can be equipped with adjustable supporting wheels (8), mouldboard extensions for silage, mouldboard extensions for snow (9) or dust shield. Depending on the machine version, the scraper – blade can be equipped with various mounting systems (6) for hitching the scraper – blade to a wide range of carrying vehicles. Parking stands (7) are used to support the machine when it is disconnected from the carrying vehicle.

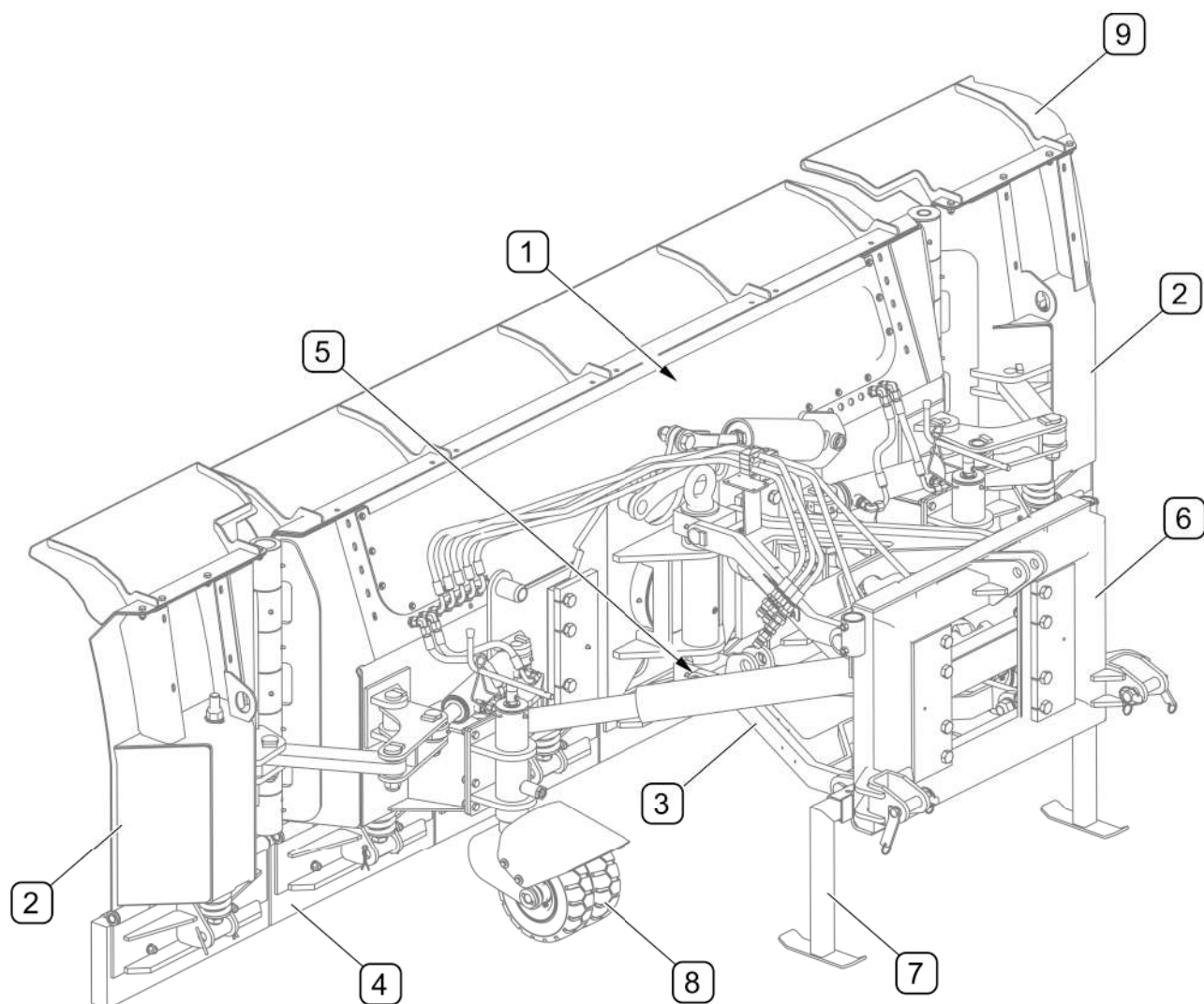


FIG. 3.2 **General design**

(1) - central mouldboard; (2) - side mouldboard; (3) - rocker arm; (4) - collecting blade;
(5) - hydraulic system; (6) - mounting system (7) - parking stands; (8) - supporting wheels
(option); (9) - mouldboard extensions (option)

3.3 HYDRAULIC SYSTEM

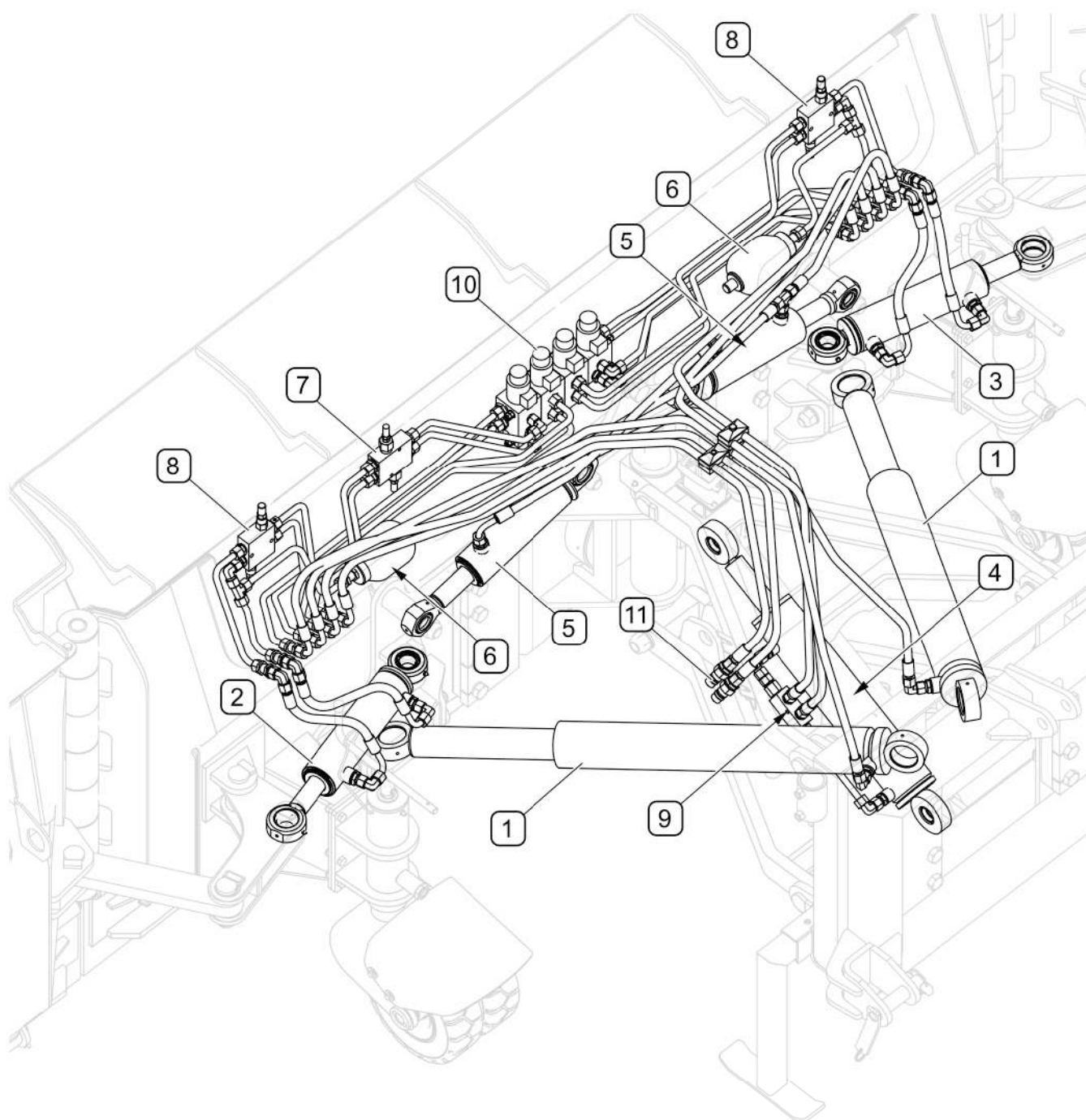


FIG. 3.3 Hydraulic system design

(1) - mouldboard turning cylinder; (2) - left mouldboard cylinder; (3) - right mouldboard cylinder; (4) - rising cylinder (option); (5) - mouldboard rotation cylinder (option); (6) - hydraulic accumulator; (7) - valve block; (8) - cross valve; (9) - hydraulic lock; (10) - solenoid valve; (11) - hydraulic conduit connectors

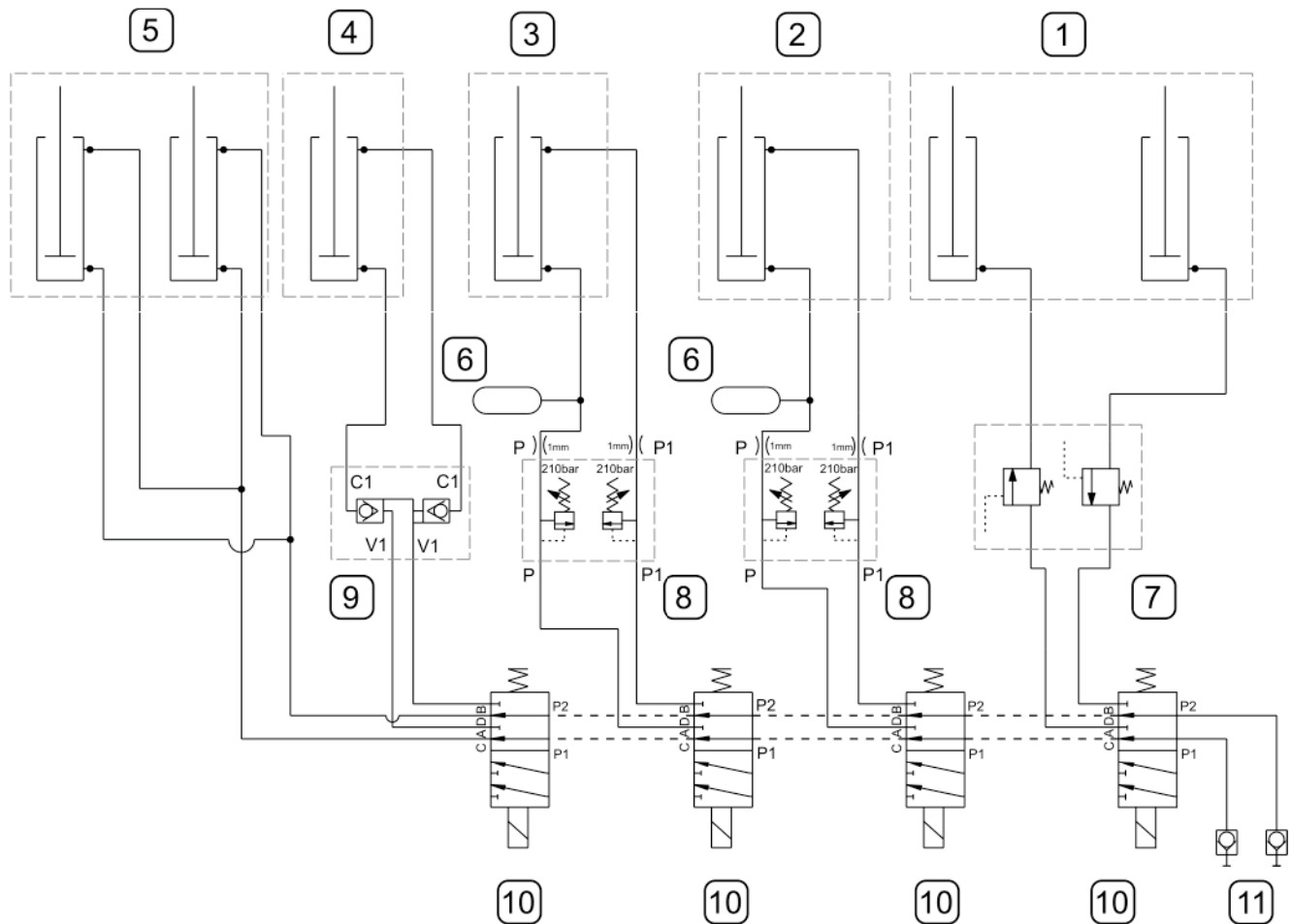


FIG. 3.4 Hydraulic system concept diagram

(1) - mouldboard turning cylinder; (2) - left mouldboard cylinder; (3) - right mouldboard cylinder; (4) - rising cylinder (option); (5) - mouldboard rotation cylinder (option); (6) - hydraulic accumulator; (7) - valve block; (8) - cross valve; (9) - hydraulic lock; (10) - solenoid valve; (11) - hydraulic conduit connectors

3.4 ELECTRICAL SYSTEM

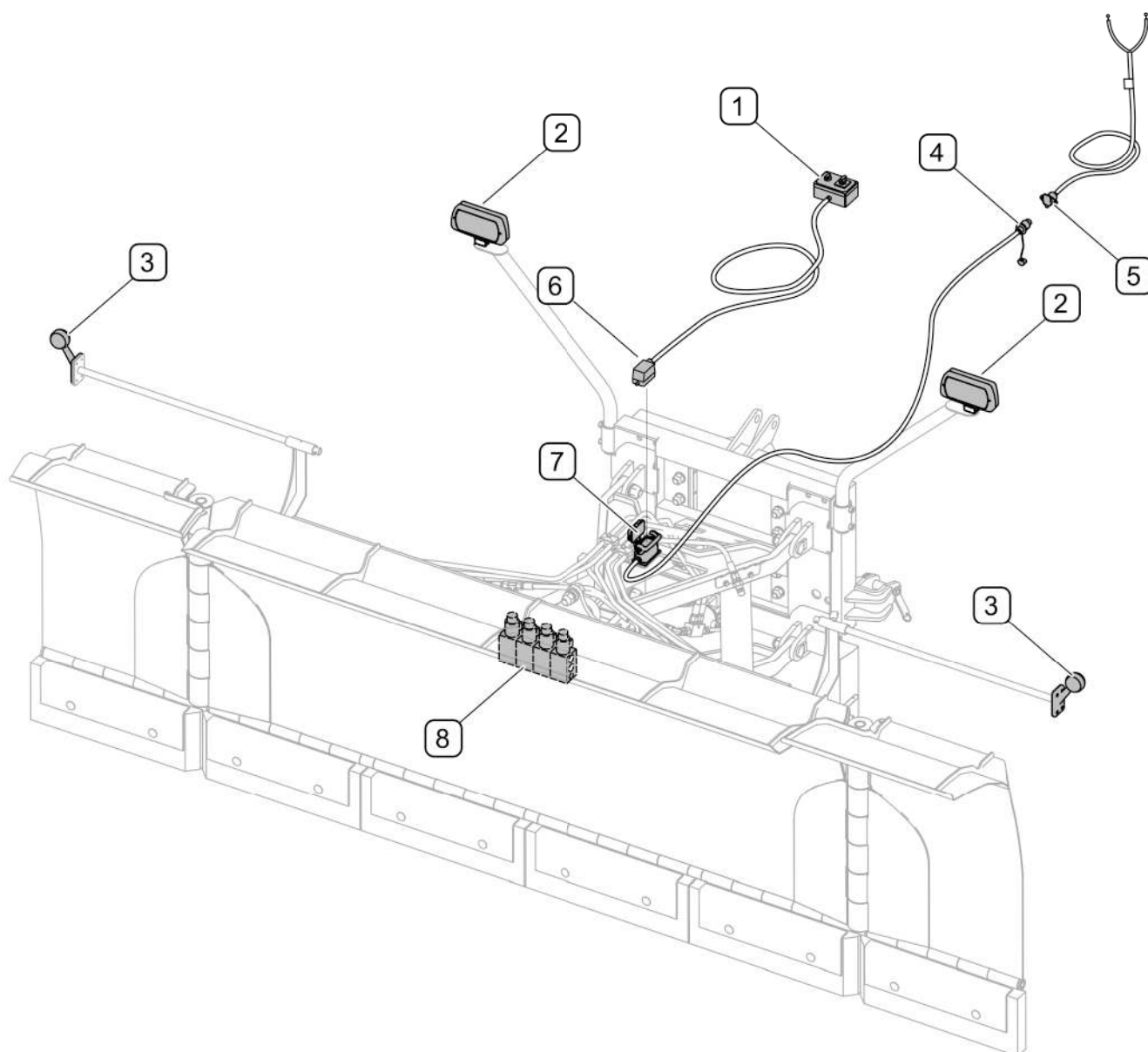


FIG. 3.5 Electrical system design

(1) - control panel; (2) - working lights; (3) - clearance lights; (4) - 3-pin plug; (5) - 3-pin socket; (6) - control panel plug; (7) - control panel socket; (8) - solenoid valves

The electrical system controls solenoid valves and lighting system (option). The machine's electrical system is supplied through a 3-pin connector that is connected to the carrying vehicle's electrical system. Clearance lights (3) are installed on width adjustable brackets.

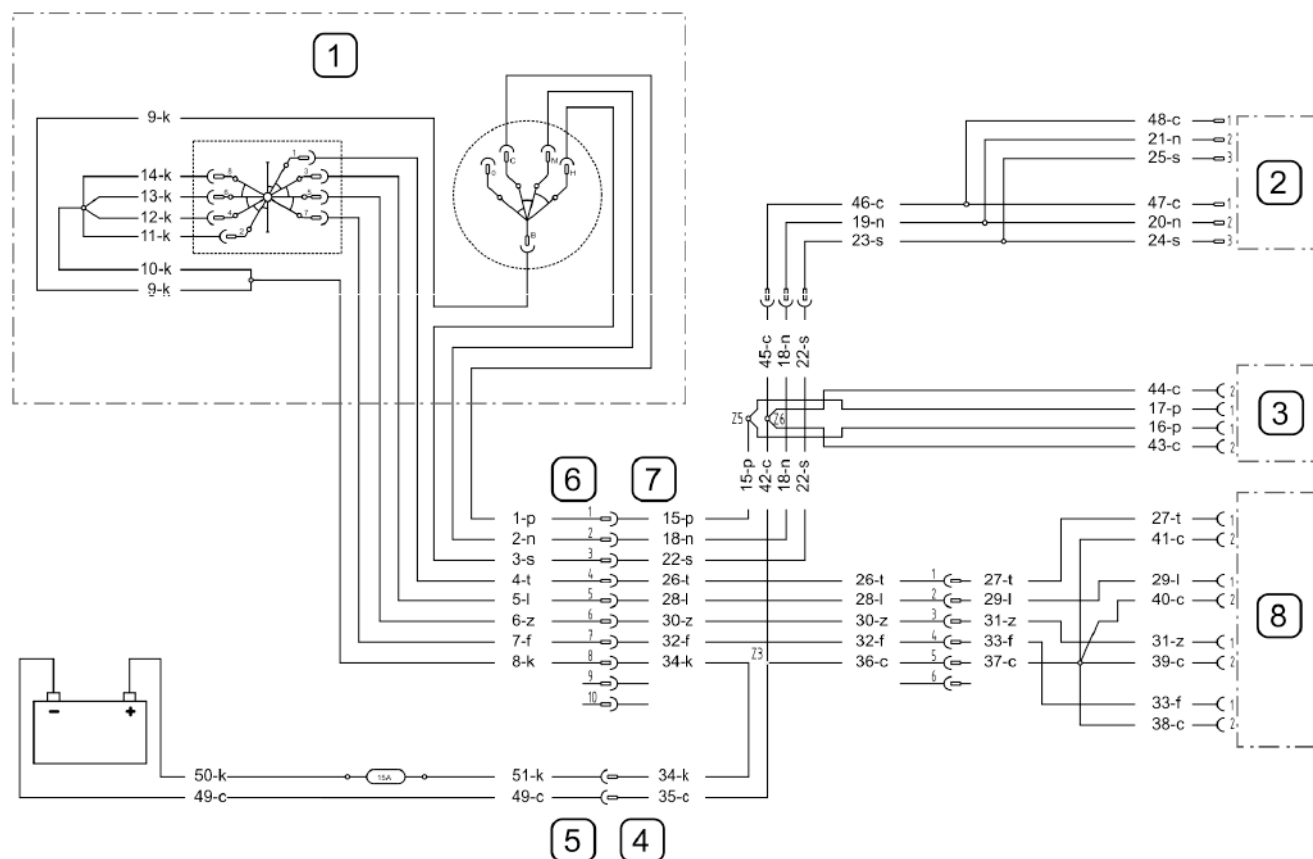


FIG. 3.6 Electrical system diagram

(1) - control panel; (2) - working lights; (3) - clearance lights; (4) - 3-pin plug; (5) - 3-pin socket; (6) - control panel plug; (7) - control panel socket; (8) - solenoid valves

SECTION

4

**CORRECT
USE**

4.1 PREPARING FOR WORK

DANGER



Before using the machine, 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 (*unless otherwise agreed with the customer*). 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 machine's linkage with the carrying vehicle's linkage,
- make sure that electrical system parameters as well as connection sockets are compatible,
- make sure that hydraulic system parameters as well as connection sockets are compatible,
- 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 according to recommendations provided in section 5 "MAINTENANCE",
- check technical condition of the hydraulic and electrical system;

- check technical condition of mouldboard, collecting blades and support wheels,
- 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:

- hitch the machine to a carrying vehicle (see point 4.3 Hitching to vehicle),
- after connecting the electrical and hydraulic system wiring, check the correct operation of individual machine functions and operation of lighting system and inspect tightness of the system and hydraulic cylinders,

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.

**ATTENTION!**

After mounting the scraper – blade equipped with lighting system on the carrying vehicle, set working lights in such a manner as not to dazzle oncoming drivers.

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 blades	Visually inspect and if necessary replace according to section 5 CHECKING AND REPLACEMENT OF COLLECTING BLADES	Before beginning work
Technical condition of support wheels (option)	Check technical condition, if complete and correctly mounted.	
Technical condition of the linkage, locking bolts and pins.	Check the technical condition, if complete and correctly mounted.	
Technical condition of the hydraulic system.	Visually inspect the technical condition	
Technical condition of the electrical system and lighting system components (option)	Visually inspect the technical condition, check the operation	
Tightening of all main nut and bolt connections	Torque values should be according to table 5.5	Once a week
Lubrication	Lubricate elements according to table „LUBRICATION“.	According to table 5.4



ATTENTION!

The machine must not be used when not in working order.

4.3 HITCHING TO VEHICLE

Scraper – blade PUU-3700 may be hitched to a carrying vehicle that meets the requirements contained in Table 1.1 „REQUIREMENTS FOR CARRYING VEHICLE”.

DANGER



Before hitching the machine to carrying vehicle, read the carrying vehicle operator's manual.

When hitching, there must be nobody between the machine and the carrying vehicle. Exercise particular caution.

Depending on machine version, the scraper – blade can be equipped with a wide range of linkage systems. Before mounting the machine on the carrying vehicle, check the linkage compatibility.

DANGER



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

ATTENTION!



Before mounting the machine on the carrying vehicle, check the linkage compatibility.

Use rising (1) interlock (FIG. 4.1) if the scraper – blade is hitched to a tractor equipped with three-point linkage with float position. The scraper – blade that is hitched to a tractor or a loader with linkage system without float position should be equipped with float rising interlock (2).

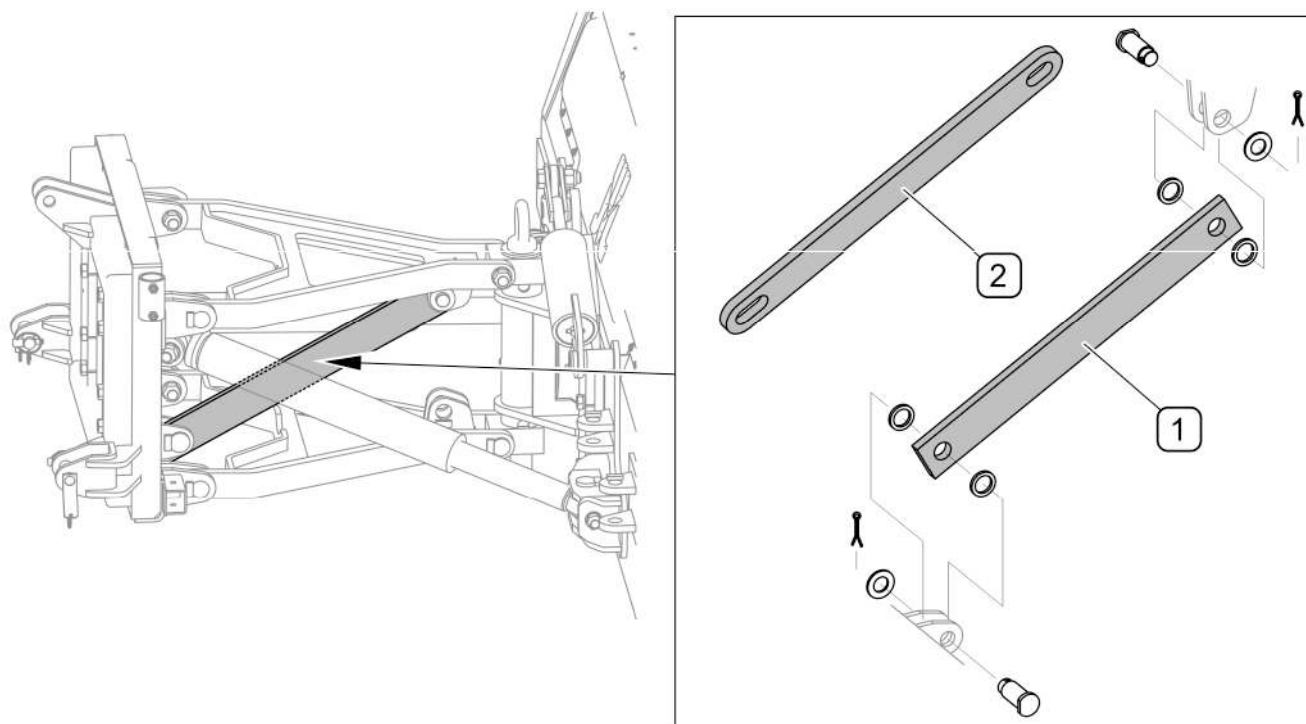


FIG. 4.1 Rising interlock

(1) - rising interlock; (2) - float rising interlock

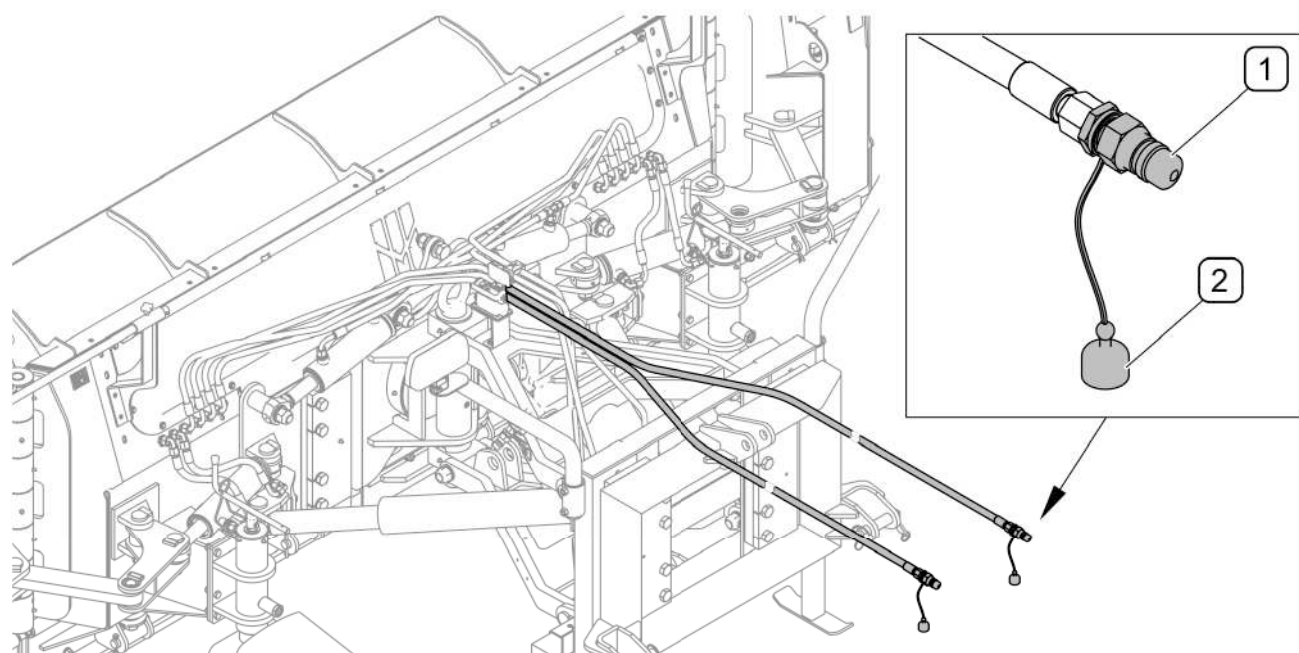


FIG. 4.2 Connecting hydraulic system

(1) - quick coupler plug; (2) - protective cap



ATTENTION!

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

Connect hydraulic conduit connectors (FIG. 4.2) to one section of front sockets of the carrying vehicle's external hydraulic system.

In order to cooperate correctly with the machine, the carrying vehicle should be equipped with a 3-pin electric socket connected to the vehicle's battery. If the carrying vehicle is not equipped with such a socket or is equipped with a different type of socket, carry out the socket installation according to the diagram (FIGURE 4.19FIG. 4.3). Connect power lead (5) to the carrying vehicle's electrical system and place socket (2) in the front of the vehicle. Power lead (5) has an UNIVAL 15 A fuse (6) on the supply lead „+”. Connect plug (1) to socket (2) of the carrying vehicle's electrical system. Connect the control panel plug (3) to socket (4) on the scraper – blade. Place the control panel in an accessible place in the operator cab.

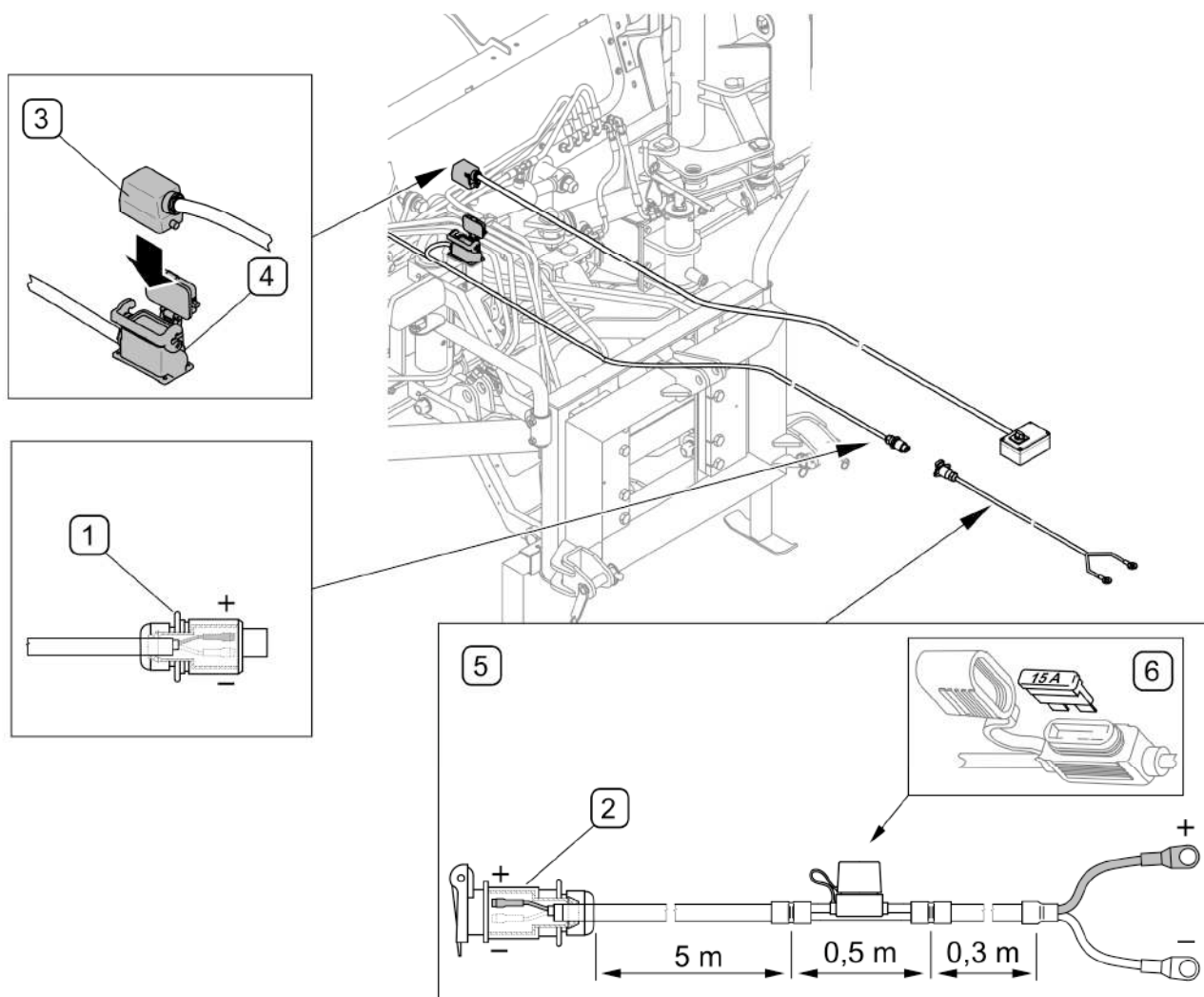


FIG. 4.3 Connecting electrical system

(1) - 3-pin plug; (2) - 3-pin socket; (3) - control panel lead plug; (4) - control panel socket; (5) - supply lead in the carrying vehicle; (6) - UNIVAL 15A fuse

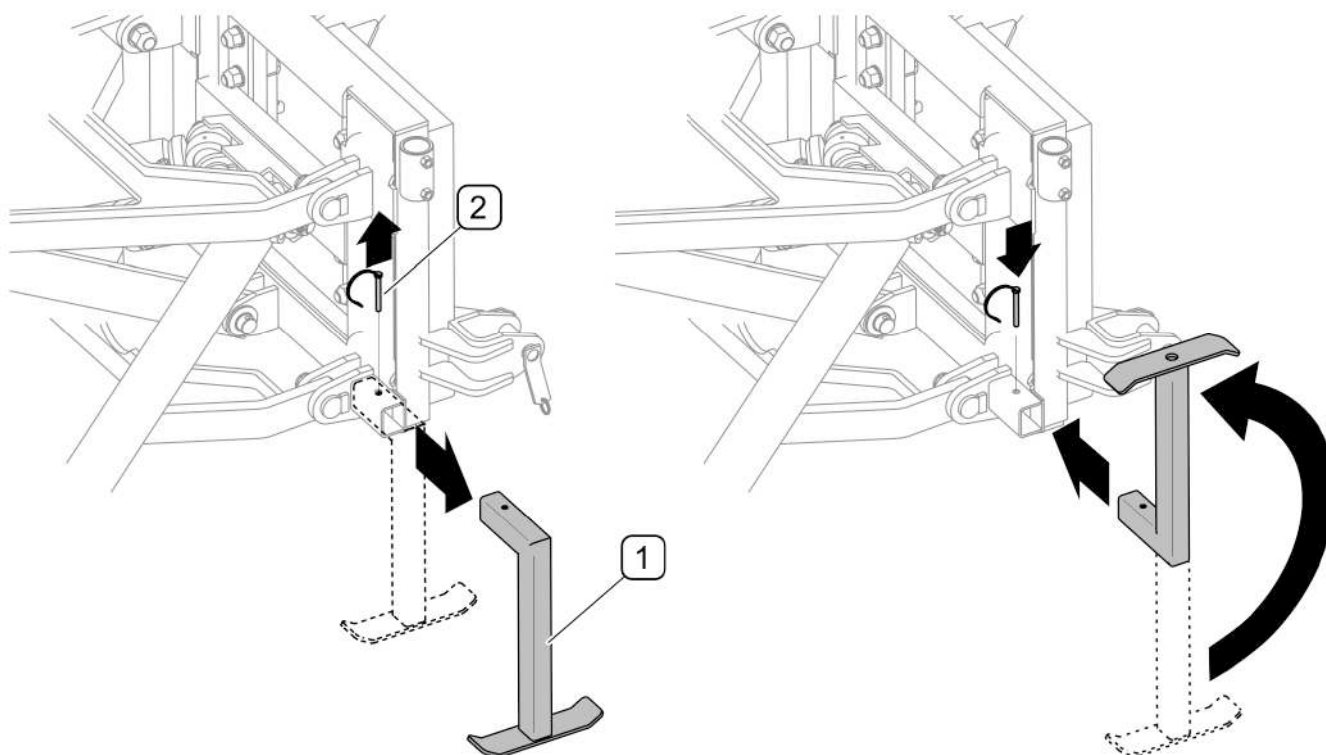


FIG. 4.4 **Dismantling parking stands**

(1) - parking stand; (2) - locking cotter pin

The scraper – blade is equipped with two parking stands (FIG. 4.4). When the machine is hitched and raised, lift the parking stands in the following manner:

- take out locking cotter pin (2) and slide parking stand (1) from the guide,
- turn parking stand (1) so as to position its foot upwards, insert parking stand into guide and lock with cotter pin (2),
- install the second parking stand in the same way.

4.4 UNIVERSAL SCRAPER BLADE OPERATION

4.4.1 CONTROL PANEL

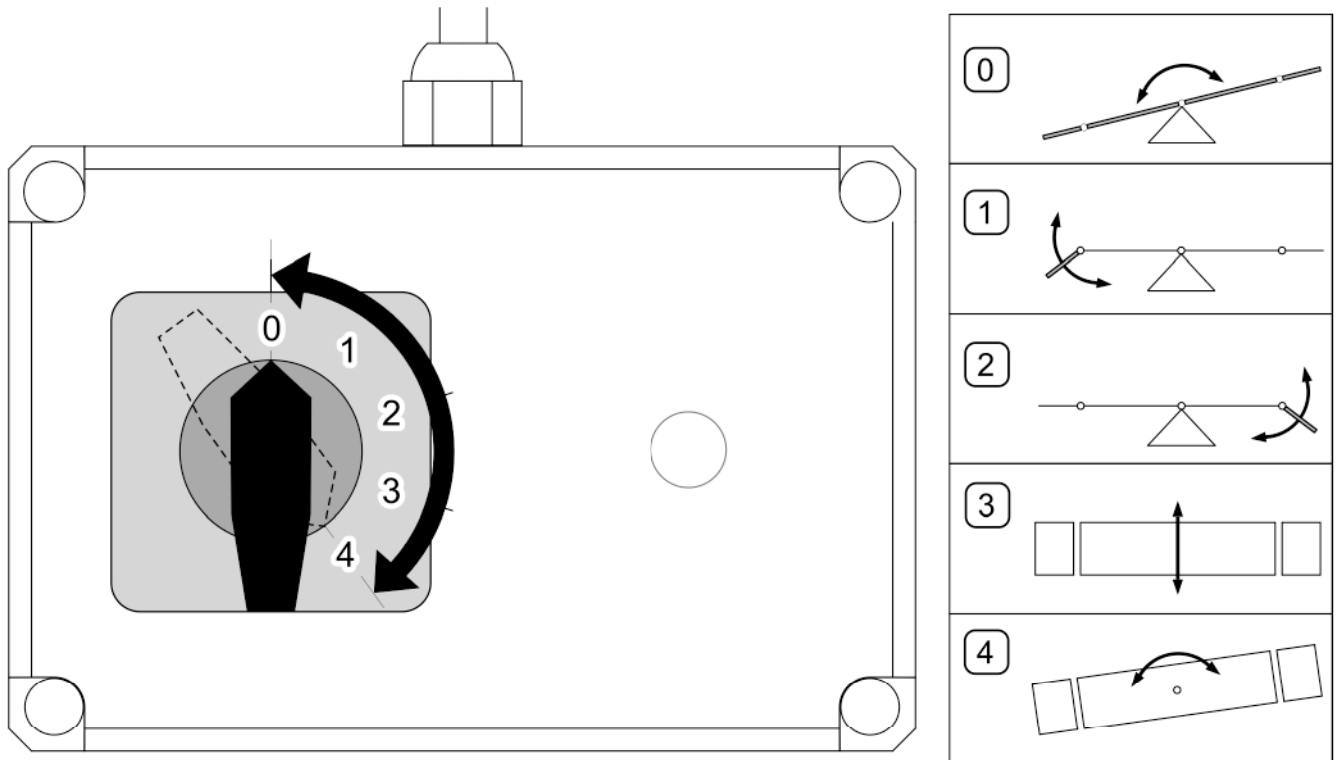


FIG. 4.5 Mouldboard control switch

(0) - controlling the mouldboard right/left turn; (1) - controlling the movement of the left side mouldboard; (2) - controlling the movement of the right side mouldboard; (3) - controlling the mouldboard rising/lowering (option); (4) - controlling the mouldboard tilt (option)

The scraper – blade is controlled with the aid of the external hydraulic system of the carrying vehicle. Depending on a selected position (0 ÷ 4) of the switch on the control panel (FIG. 4.5), individual functions of the machine can be controlled (0)



DANGER

When scraper-blade is in use there must be no bystanders near the machine.



ATTENTION!

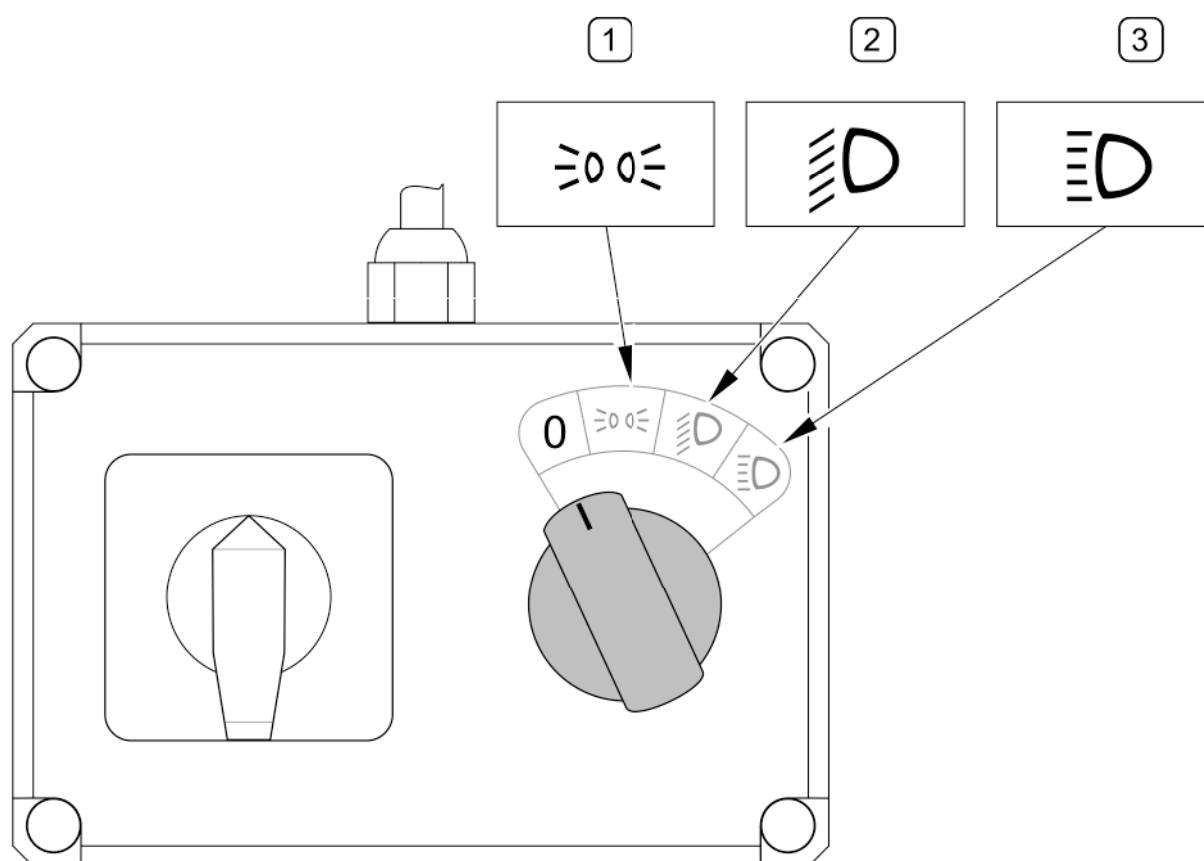
Before titling the side mouldboards backwards, fold clearance light brackets (FIG. 4.12) - this applies to scraper-blades that are equipped with mouldboard extensions for silage and with lighting system)

TAB. 4.2 Functions of the scraper-blade control switch

Switch position (FIG. 4.5)	Function description
0	Controlling the mouldboard right/left turn
1	Controlling the movement of the left side mouldboard
2	Controlling the movement of the right side mouldboard
3	Controlling the mouldboard rising/lowering (option)
4	Controlling the mouldboard right/left tilt (option)

**IMPORTANT!**

Do NOT operate the scraper-blade while reversing. While reversing raise the machine.

**FIG. 4.6 Light switch (option)**

(0) - lights OFF; (1) - clearance lights of the scraper – blade's mouldboard are switched on;
 (2) - dipped beams of working lights and clearance lights are switched on; (3) - high beams of working lights and clearance lights are switched on.

The scraper-blade equipped with lighting system (option) has an additional switch on the control panel (FIG. 4.6). The lighting system is controlled by setting the switch to a proper position (TAB. 4.3).

TAB. 4.3 Functions of the light switch (FIG. 4.6)

Switch position (FIG. 4.6)	Function description
0	Lights OFF
1	Clearance lights of the scraper – blade's mouldboard are switched on
2	Dipped beams of working lights and clearance lights are switched on
3	High beams of working lights and clearance lights are switched on

4.4.2 SETTING WORKING HEIGHT (OPTION)



DANGER

Setting the working height should be performed only when the engine is stopped, and the machine is raised and secured.

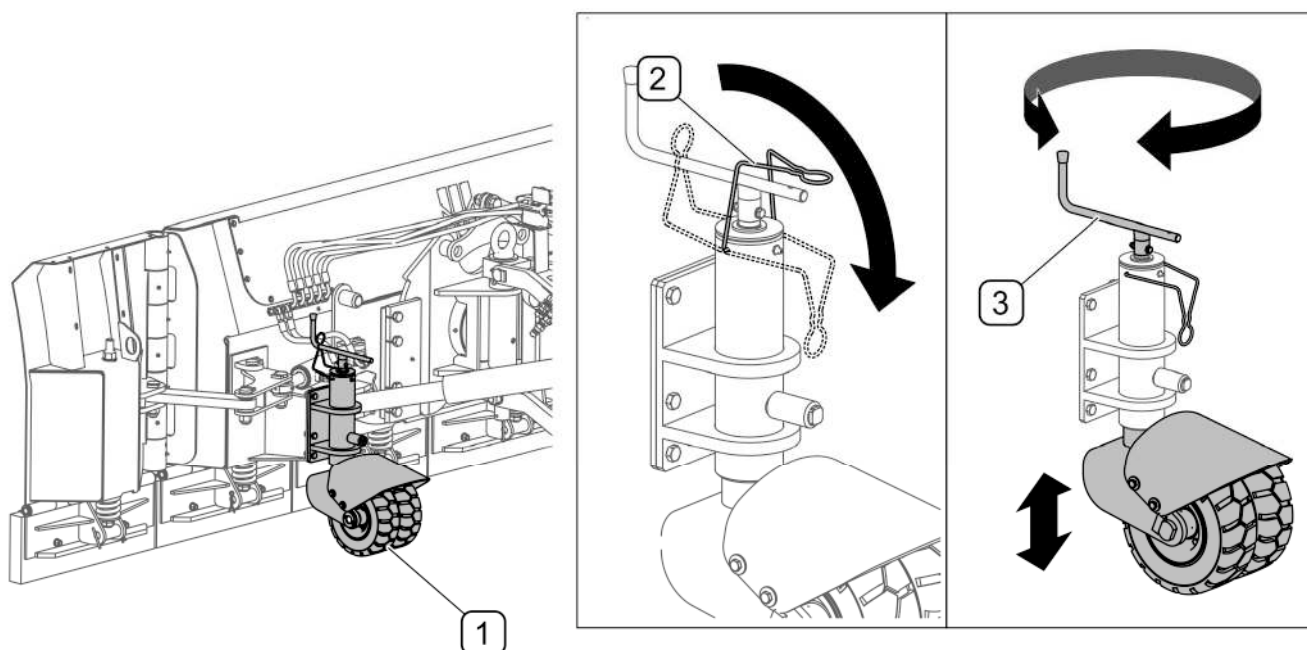


FIG. 4.7 Working height adjustment in scraper – blade with wheels (option)

(1) - wheels; (2) - handle lock; (3) - handle

In order to adjust working height (FIG. 4.7) of the scraper – blade with wheels (option), slide wheel (1) and its housing by turning handle (3). The handle is protected by a lock (4). After

setting wheel height, appropriately set handle (3) and secure it with lock (4). It is recommended that right and left wheels are set at the same height. The wheels are used in order to maintain a proper distance between the ground and collecting blades, to reduce thickness of scraped material layer and to limit the depth of blade sinking into soft ground.

4.5 DRIVING ON PUBLIC ROADS

When driving on public roads, respect the road traffic regulations, exercise caution and prudence. If the clearing with machine is done on a pavement or promenade special attention should be paid to the bystanders likely to be near the working machine. Listed below are the key guidelines.

- Before moving off make sure that there are no bystanders, especially children, near the machine and the carrying vehicle. Take care that the driver has sufficient visibility.
- Make sure that the machine is correctly attached to the carrying vehicle, 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 and other conditions.
- While driving on public roads turn on the lights.
- While working with the scraper-blade, turn on the orange beacon light (included in the carrying vehicle equipment).
- Avoid ruts, depressions, ditches or driving on roadside slopes. Driving across such obstacles could cause the machine and the carrying vehicle 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 scraper-blade raised reduce speed due to dynamic loads and the risk of damaging the machine or carrying vehicle.

4.6 UNHITCHING THE MACHINE FROM CARRYING VEHICLE

To disconnect the scraper-blade, park the carrying vehicle on level surface and immobilise with parking brake. Install both parking stands (FIG. 4.8) in the following manner:

- take out locking cotter pin (2) and dismantle parking stand (1) from the guide,
- turn parking stand (1) so as to position its foot downwards, insert parking stand into guide and lock with cotter pin (2)
- install the second parking stand in the same way.
- Lower the machine until it fully rests on the ground.

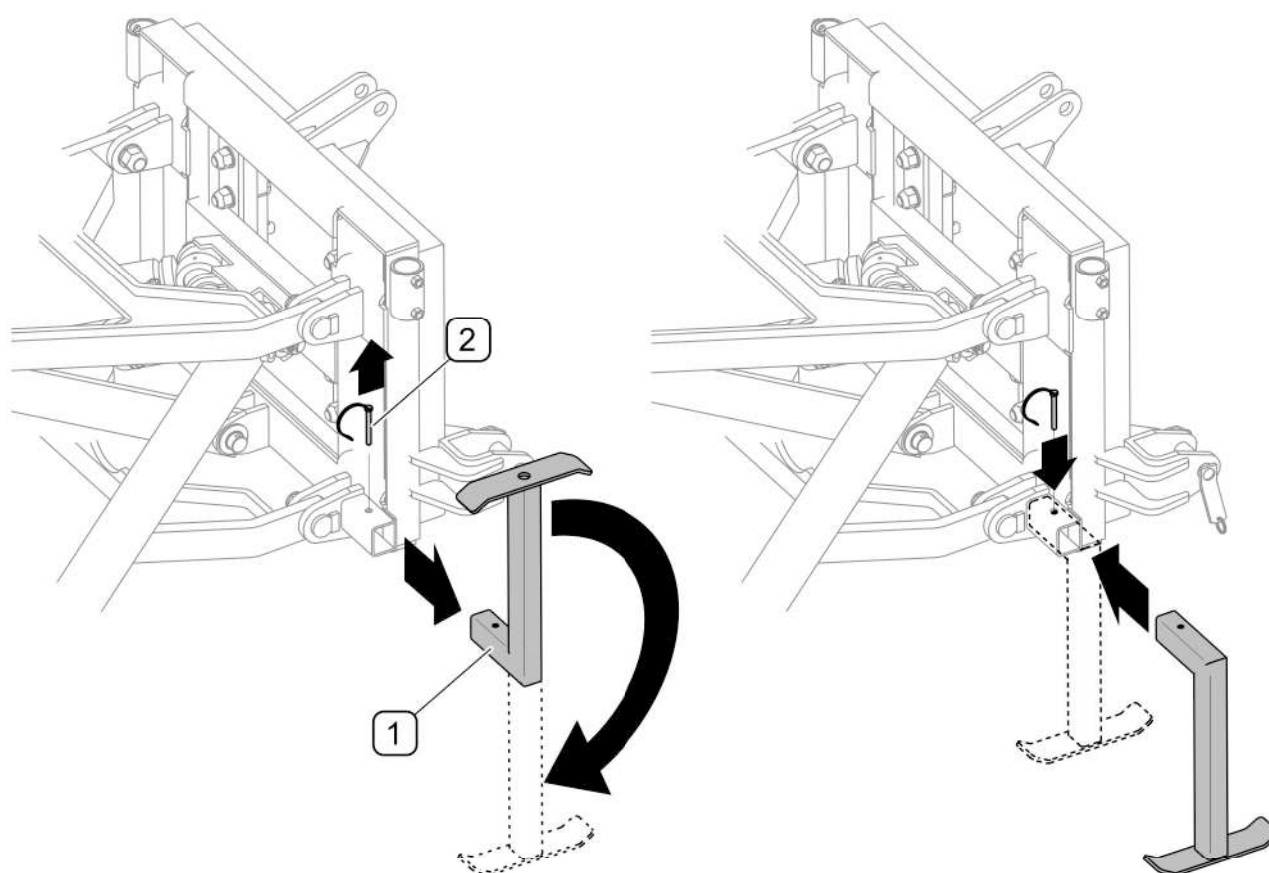


FIG. 4.8 **Installing the parking stands**

(1) - parking stand; (2) - locking cotter pin

After lowering the machine to the ground, disconnect the control panel plug and secure the socket on the machine with a cap. Disconnect 3-pin plug from electrical socket on carrying vehicle. Secure hydraulic conduit connectors with stoppers and place them in bracket (FIG. 4.9) on upper rocker arm of the scraper-blade.

Protect the control panel against adverse weather conditions.

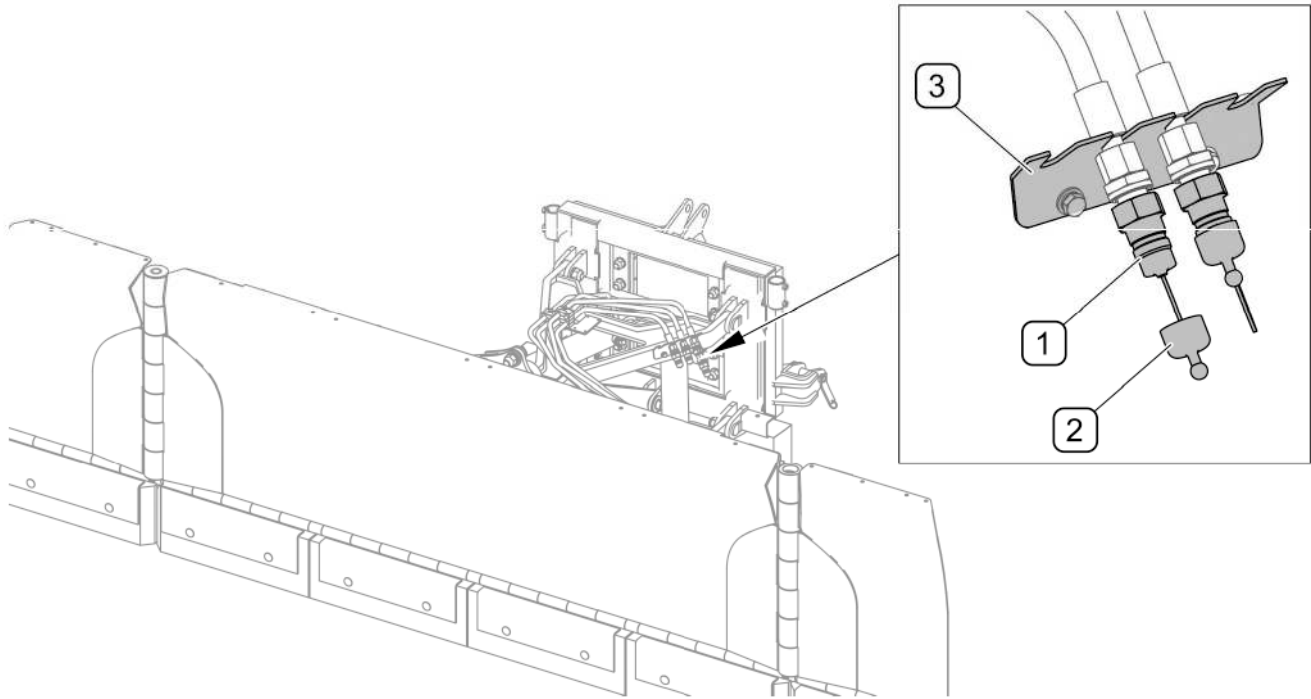


FIG. 4.9 Protection of hydraulic conduit connectors

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

4.7 ADDITIONAL FITTINGS AND OPTIONAL EQUIPMENT

4.7.1 MOULDBOARD EXTENSIONS AND SHIELDS

Optionally, scraper-blade PUU-3700 can be equipped with the following mouldboard extensions:

- Mouldboard extensions for snow - catalogue no. 380N-13000000 (FIG. 4.10)
- Mouldboard extensions for silage - catalogue no. 380N-07000000 (FIG. 4.11)
- Dust shield - catalogue no. 380N-08000000 (FIG. 4.13)



ATTENTION!

Additional equipment should be installed using proper tools and fasteners recommended by the Manufacturer. Tightening torque values for nut and bolt connections are given in TABLE 5.5 in chapter 5.

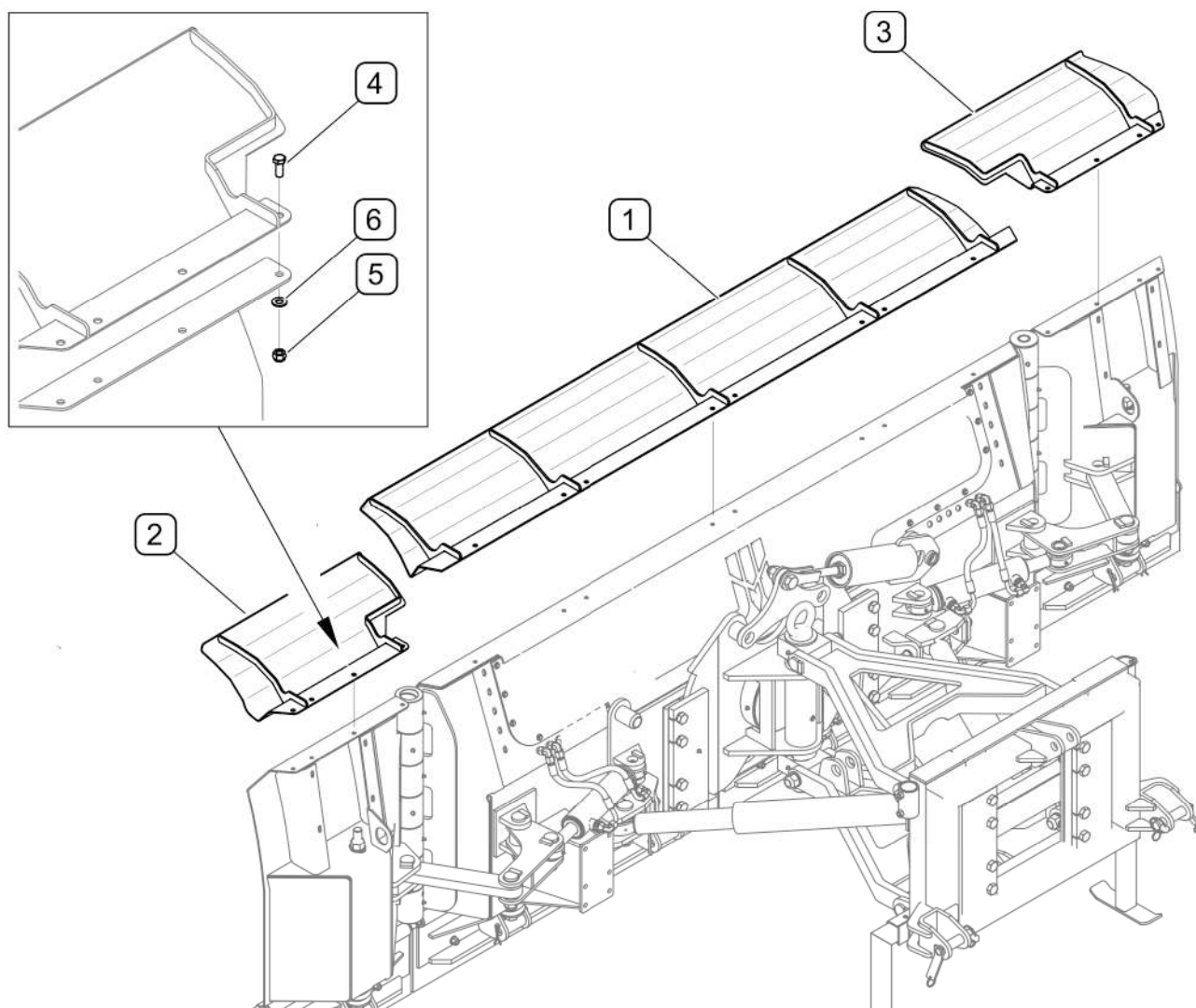


FIG. 4.10 Mouldboard extensions for snow

(1) - central mouldboard extension; (2) left mouldboard extension; (3) - right mouldboard extension; (4) - bolt M10x25; (5) - M10 nut; (6) - 10-100HV washer

TAB. 4.4 List of mounting elements for mouldboard extensions for snow (option)

Item No. (FIG. 4.10)	Name	Catalogue No. or standard No.	Quantity (item)
–	Mouldboard extensions for snow, set	380N-13000000	1
1	Central mouldboard extension	380N-13010000	1
2	Left mouldboard extension	380N-13020000	1
3	Right mouldboard extension	380N-13030000	1
4	Bolt M10x25-8.8-A2J	PN-EN ISO 4017	16
5	Self-locking nut M10-8-A2J	PN-EN ISO 7040	16
6	Washer 10-100HV Fe//Zn6//A	PN-EN ISO 7091	16

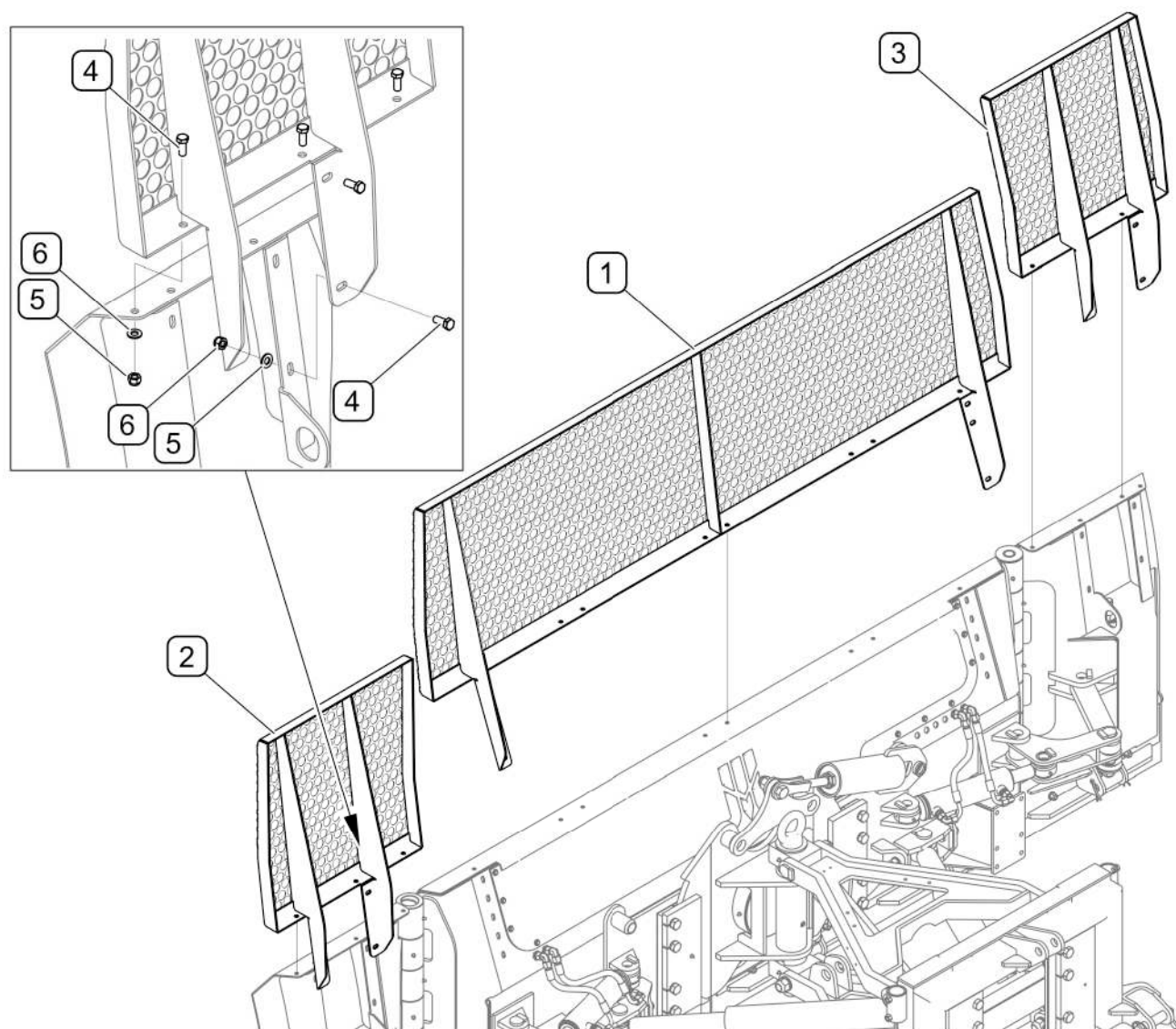


FIG. 4.11 Mouldboard extensions for silage

(1) - central mouldboard extension; (2) left mouldboard extension; (3) - right mouldboard extension; (4) - bolt M10x25; (5) - M10 nut; (6) - 10-100HV washer

TAB. 4.5 List of mounting elements for mouldboard extensions for silage (option)

Item No. (FIG. 4.11)	Name	Catalogue No. or standard No.	Quantity (item)
–	Mouldboard extensions for silage, set	380N-07000000	1
1	Central mouldboard extension	380N-07010000	1
2	Left mouldboard extension	380N-07020000	1
3	Right mouldboard extension	380N-07030000	1
4	Bolt M10x25-8.8-A2J	PN-EN ISO 4017	30
5	Self-locking nut M10-8-A2J	PN-EN ISO 7040	30
6	Washer 10-100HV Fe//Zn6//A	PN-EN ISO 7091	30

**ATTENTION!**

Before titling the side mouldboards backwards, fold clearance light brackets (FIG. 4.12) - this applies to scraper-blades that are equipped with mouldboard extensions for silage and with lighting system)

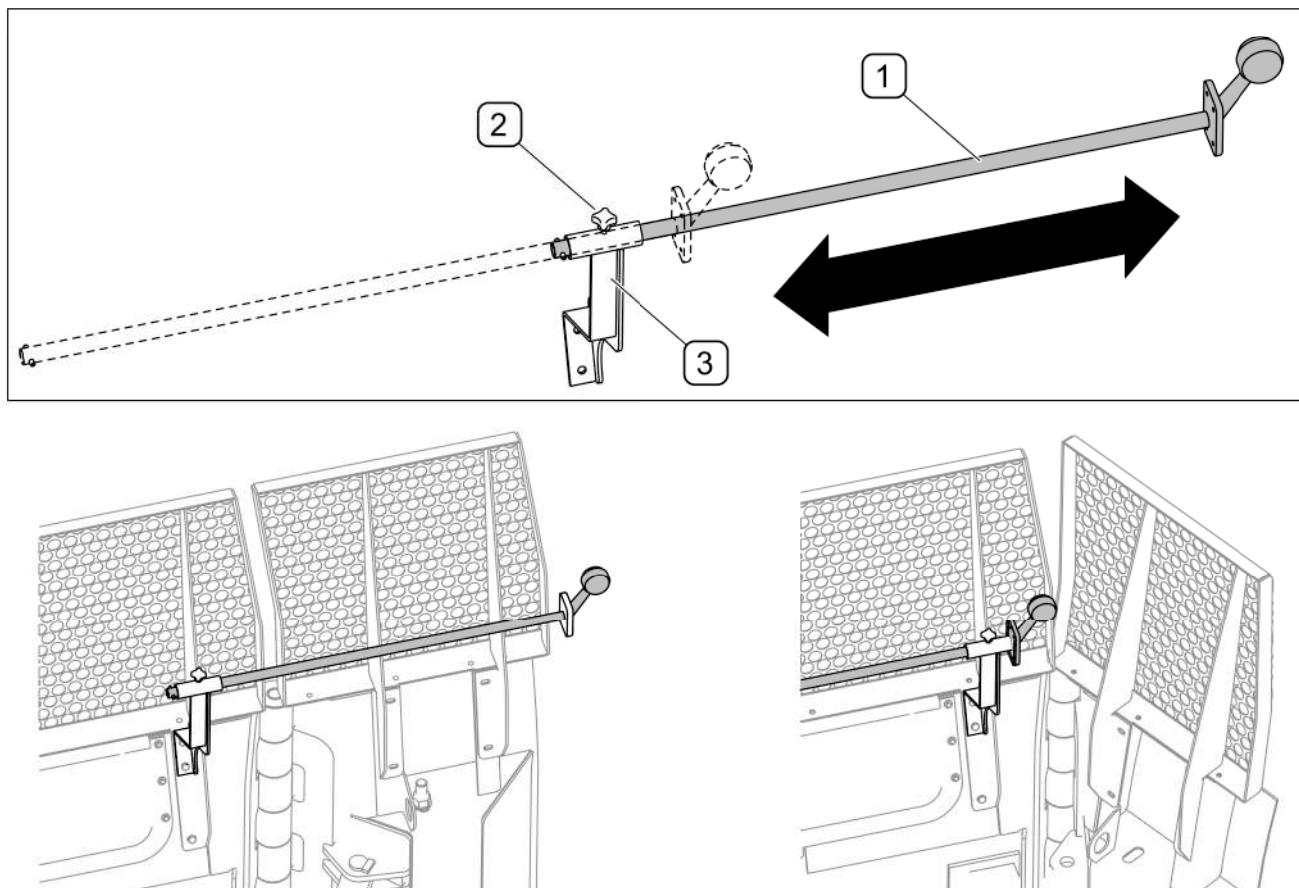
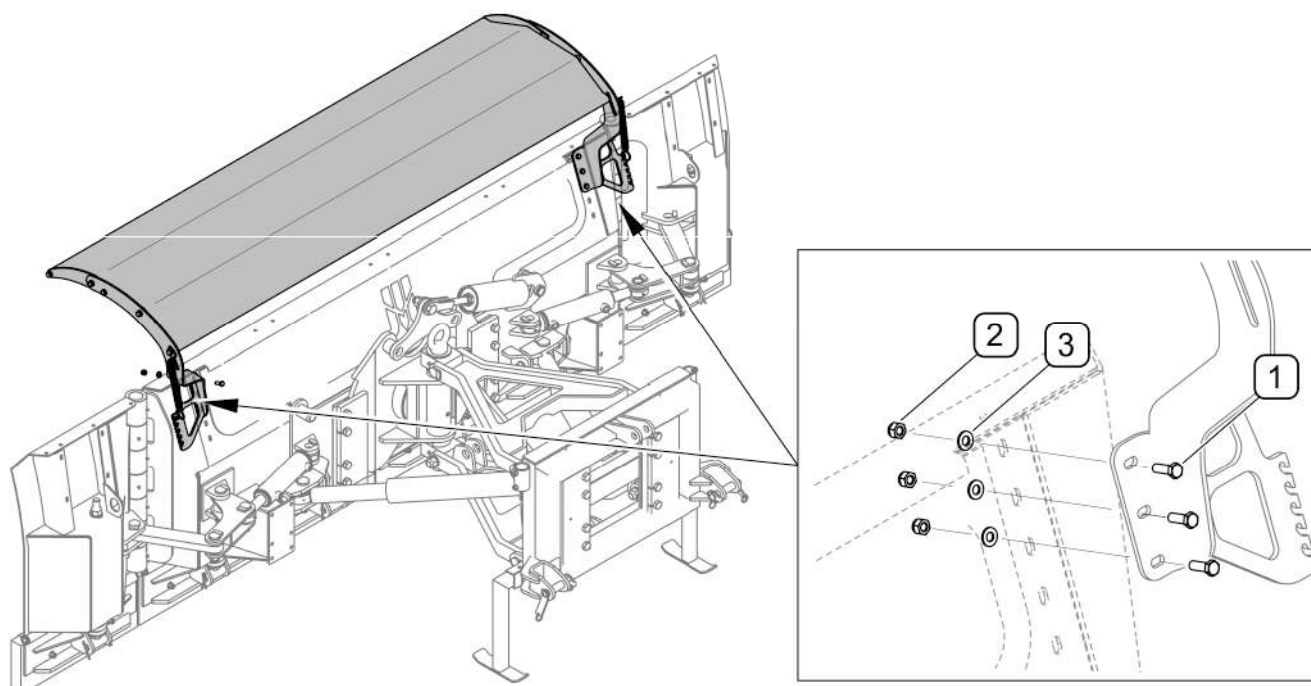


FIG. 4.12 Clearance light brackets

(1) - clearance light bracket; (2) - clamp bolt; (3) - guide

In order to enable titling the side mouldboards backwards (*this applies to scraper-blades that are equipped with mouldboard extensions for silage and with lighting system*), fold clearance light brackets (1) (FIG. 4.12) by loosening clamp bolt (3) and sliding the bracket with a clearance light as close as possible to guide (3).

**FIG. 4.13** **Dust shield**

(1) - dust shield, set; (2) - bolt M10x30-8.8; (3) - nut M10; (4) - washer 10-100HV

TAB. 4.6 **List of dust shield components (option)**

Item No. (FIG. 4.13)	Name	Catalogue No. or standard No.	Quantity (item)
–	Dust shield, set	380N-08000000	1
1	Bolt M10x30-8,8-A2J	PN-EN ISO 4017	6
2	Self-locking nut M10-8-A2J	PN-EN ISO 7040	6
3	Washer 10-100HV-Fe//Zn6//A	PN-EN ISO 7091	6

**TIP**

Dust shield (FIG. 4.13) can be used together with mouldboard extensions for snow (FIG. 4.10)

4.7.2 INSTALLING SUPPORT WHEELS

The scraper-blade can be additionally equipped with two support wheels (*catalogue no. 380N-29000000*) that are used in order to maintain a proper distance between the ground and collecting blades, to reduce thickness of scraped material layer and to limit the depth of blade sinking into soft ground.

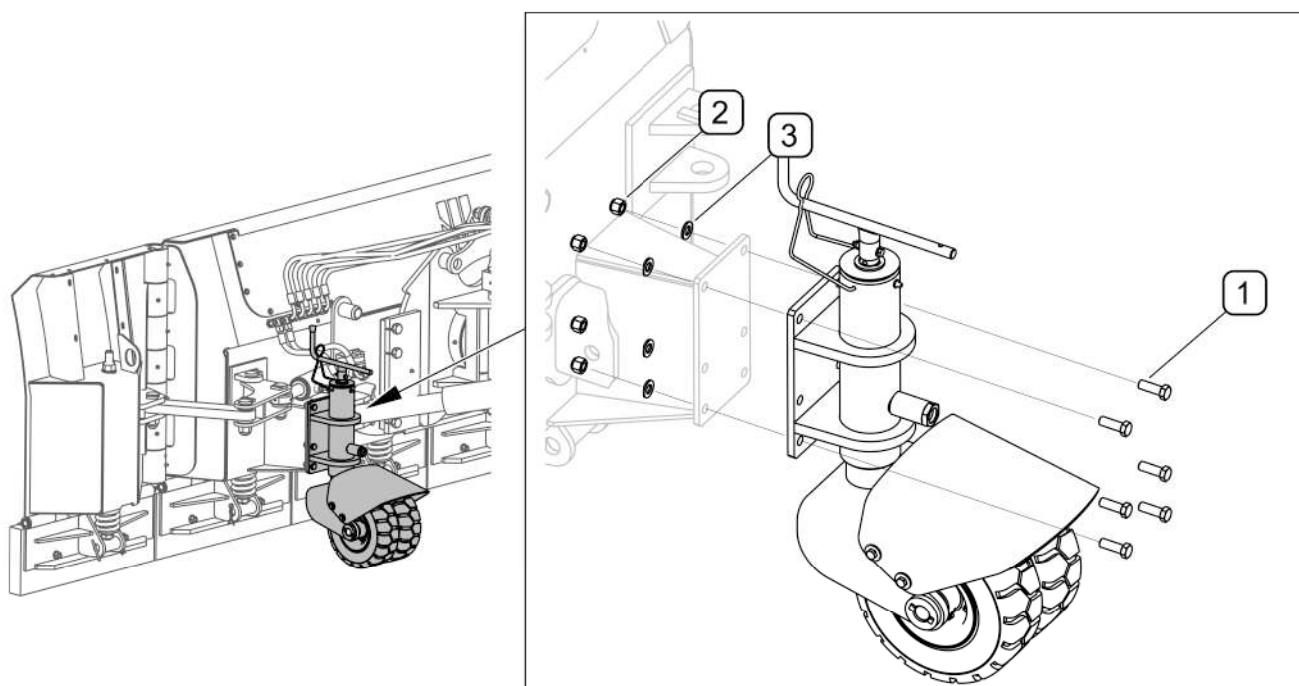


FIG. 4.14 Installing support wheels

(1) - M12x35 bolt; (2) - M12 nut; (3) - 12-100HV washer

TAB. 4.7 List of mounting elements of a support wheel (option)

Item No. (FIG. 4.13)	Name	Catalogue No. or standard No.	Quantity (item)
–	Support wheel, set	380N-29000000	1
1	Bolt M12x35-8,8-A2J	PN-EN ISO 4017	6
2	Self-locking nut M12-8-A2J	PN-EN ISO 7040	6
3	Washer 12-100HV-Fe//Zn6//A	PN-EN ISO 7091	6

Quantity of parts for one support wheel is given in the table.

4.7.3 INSTALLING LINKAGE SYSTEM

As standard, scraper-blade PUU-3700 is equipped with cat. II three-point linkage. A proper linkage can be installed if the scraper-blade is to be hitched to another carrying vehicle.

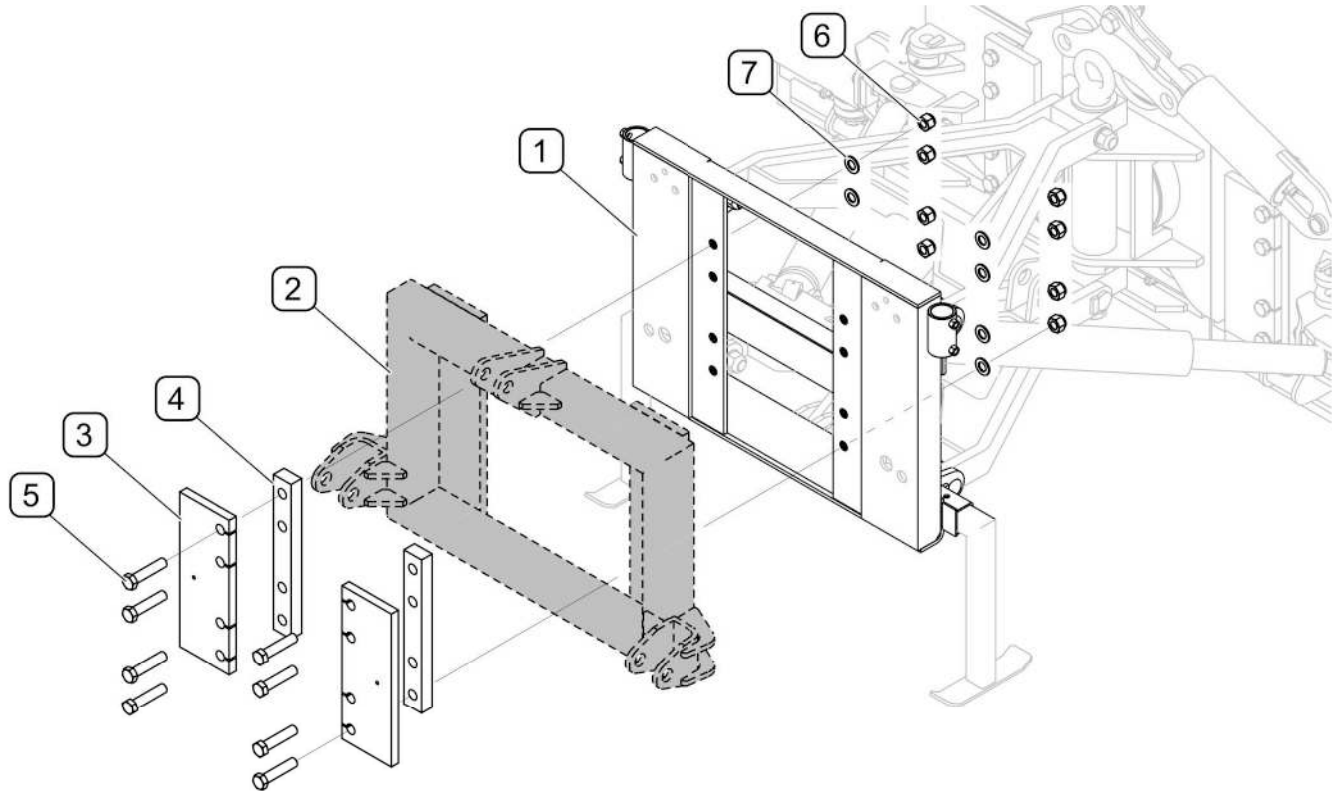


FIG. 4.15 Installation of swinging linkage systems

(1) - hitch; (2)- linkage; (3) - holding plate; (4) - cover plate; (5) - bolt M20x90-8.8; (6) - nut M20; (7) - washer 20-100HV

Swinging linkage systems (FIG. 4.15) are attached to the scraper-blade's hitch (1) using holding plates (3) and cover plates (4). List of mounting elements for linkage systems is shown in TAB. 4.8



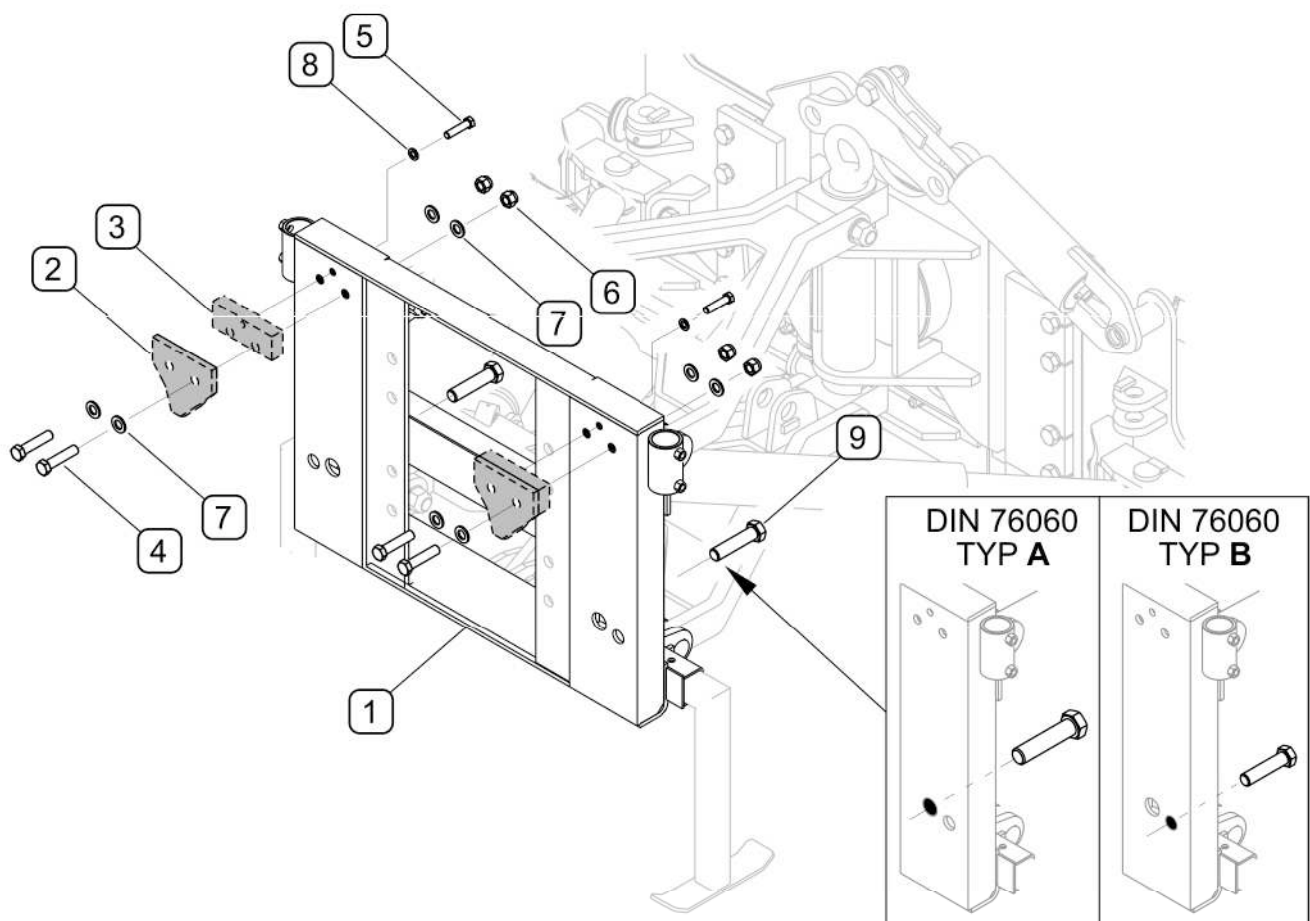
DANGER

Linkage system may be installed and disassembled only if the machine is disconnected from the carrying vehicle and placed on parking stands.

TAB. 4.8 List of mounting elements for linkage systems

Item No. (FIG. 4.15)	Name	Catalogue No. or standard No.	Quantity (item)
3	Holding plate	380N-01000001	2
4	Cover plate	380N-14000001	2
5	Bolt M20x90-8.8-A2J	PN-EN ISO 4014	8
6	Nut M20-8-A2JA	PN-EN ISO 4014	8
7	Washer 20-100HV-Fe//Zn6//A	PN-EN ISO 7091	8

Item 3 - 7 installing linkage system (set) with catalogue number 380N-14000000

**FIG. 4.16 Installing DIN 76060 TYPE A linkage and TYPE B linkage**

(1) - scraper-blade's hitch; (2) ..(9) - DIN linkage - (see TAB. 4.9, TAB. 4.10)

DIN 76060 type A and type B linkage systems are attached to the scraper-blade's hitch (1) . List of mounting elements for DIN 76060 type A linkage and type B linkage is shown in TAB. 4.9 i TAB. 4.10

TAB. 4.9 List of mounting elements for DIN 76060 TYPE A linkage

Item No. (FIG. 4.16)	Name	Catalogue No. or standard No.	Quantity (item)
2	Hook	359N-04000003	2
3	Panel	359N-04000004	2
4	Bolt M16x70-8.8-A2J	PN-EN ISO 4014	4
5	Bolt M12x50-8.8-A2J	PN-EN ISO 4017	2
6	Self-locking nut M16-8-A2J	PN-EN ISO 7040	4
7	Washer 16-100HV-Fe//Zn6//A	PN-EN ISO 7091	8
8	Spring washer 12,2-Fe//Zn9//A	PN-77/M-82008	2
9	Bolt M30x70-8.8-A2J	PN-EN ISO 4017	2

Item 2 - 9 DIN TYPE A linkage (set), catalogue number 380N-15000000

TAB. 4.10 List of mounting elements for DIN 76060 TYPE B linkage

Item No. (FIG. 4.16)	Name	Catalogue No. or standard No.	Quantity (item)
2	Hook	220N-57000001	2
3	Panel	220N-57000002	2
4	Bolt M16x65-8.8-A2J	PN-EN ISO 4014	4
5	Bolt M12X45-8.8-A2J	PN-EN ISO 4014	2
6	Self-locking nut M16-8-A2J	PN-EN ISO 7040	4
7	Washer 16-100HV-Fe//Zn6//A	PN-EN ISO 7091	8
8	Spring washer 12,2-Fe//Zn9//A	PN-77/M-82008	2
9	Bolt M24x60-8.8-A2J	PN-EN ISO 4017	2

Item 2 - 9 DIN TYPE B linkage (set), catalogue number 380N-16000000

SECTION

5

MAINTENANCE

5.1 CHECKING AND REPLACEMENT OF COLLECTING BLADES



DANGER

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



DANGER

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

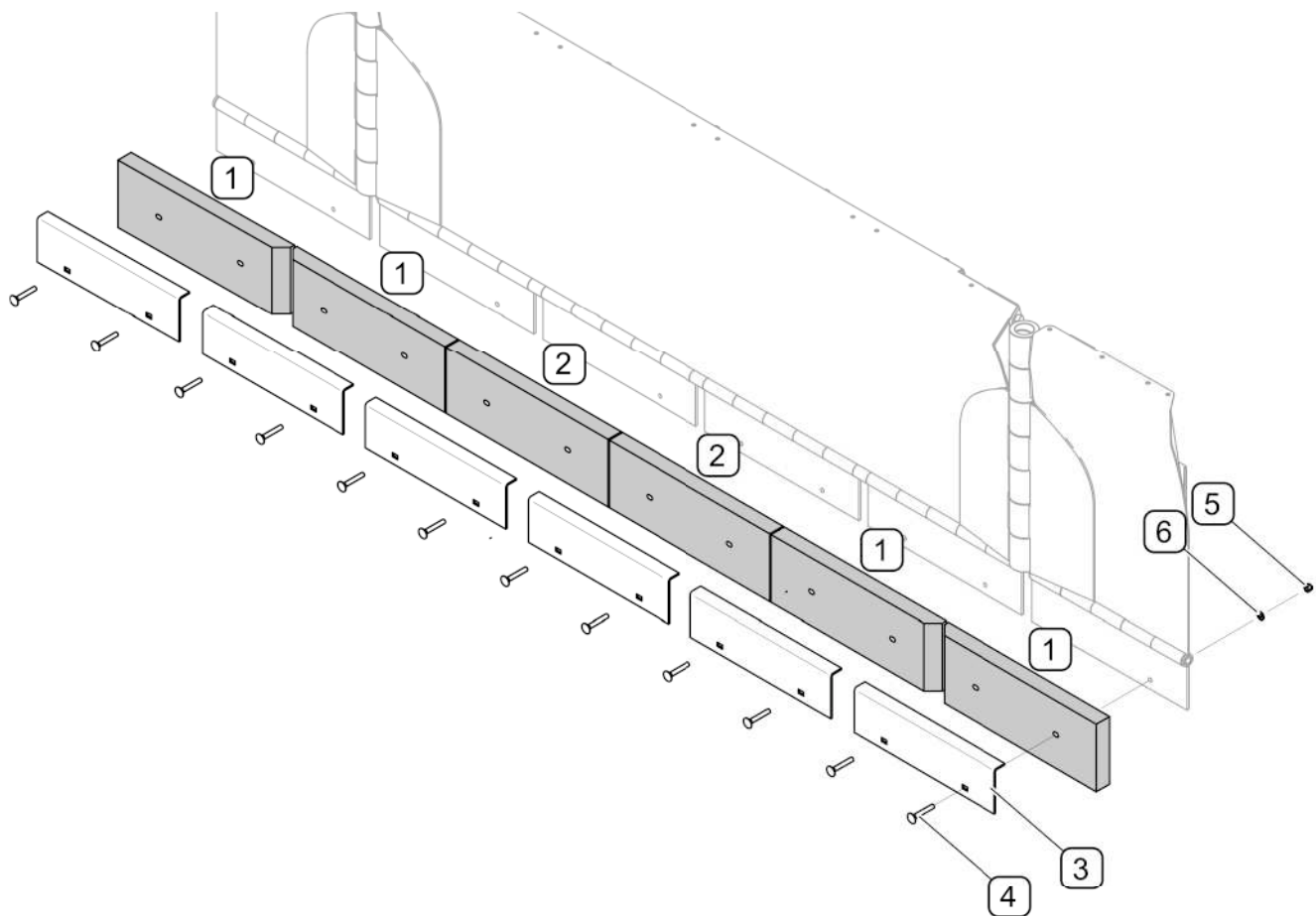


FIG. 5.1 Replacement of rubber blades

(1) - external rubber blade; (2) - internal rubber blade; (3) - clamping strip; (4) - bolt M12x80-8.8; (5) - self-locking nut M12; (6) - washer 12-100HV;

Excessively worn or damaged blades must be replaced. Before replacing the blades, raise the machine and support it with stable supports, turn off the engine and immobilise vehicle with parking brake.

Rubber blades of the scraper – blade's mouldboards (FIG. 5.1) consist of external segments (1) and internal segments (2). To remove a blade, unscrew proper nuts (5), remove bolts (4) and remove clamping strip (3). Install a new blade and assemble it performing the above activities in reverse sequence. The blades that are worn on one side can be turned on the other side. To do this, turn internal blades (2) and turn and swap external blades (1). List of blades is shown in (TAB. 5.1)

TAB. 5.1 Rubber blades of scraper-blade PUU-3700

Marking FIG. 5.1	Name / Catalogue No.	Quantity [item]
1	External blade / 380N-05000001	4
2	Internal blade / 380N-05000002	2

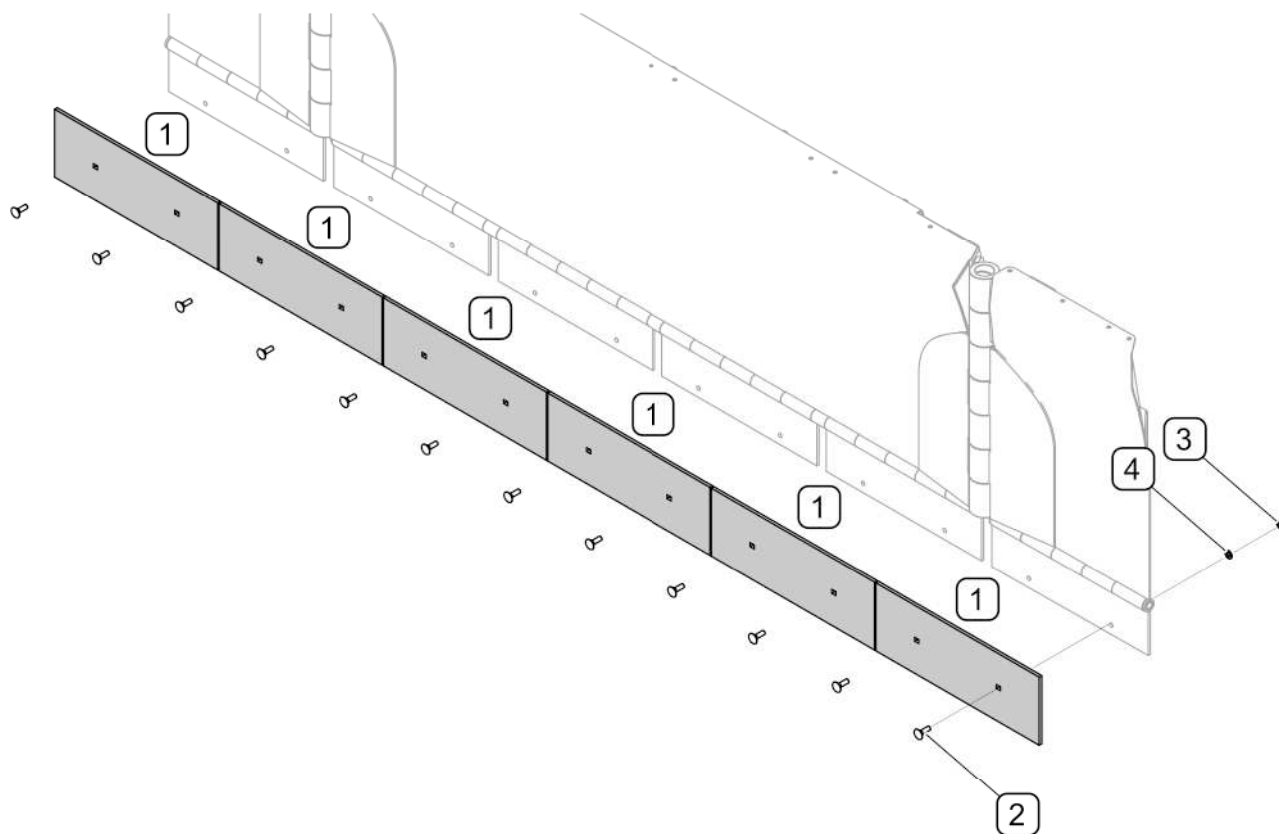


FIG. 5.2 Replacement of steel blades

(1) - steel blade; (2) - bolt M12x40-8.8; (3) - nut M12-8; (4) - washer 12-100HV

Steel blades of the scraper – blade's mouldboards (FIG. 5.2) consist of 6 identical segments (1). To remove a steel blade (1), unscrew proper nuts (3), remove bolts (2) that fix the blade to the mouldboard. Install a new blade and assemble it performing the above activities in reverse sequence. The blades that are worn on one side can be turned on the other side and

reused. All steel blade segments are replaced in the same way. List of steel blades is shown in TAB. 5.2

TAB. 5.2 Steel blades of scraper-blade PUU-3700

Marking FIG. 5.2	Name / Catalogue No.	Quantity [item]
1	Steel blade / 380N-06000001	6



ATTENTION!

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

5.2 ADJUSTMENT OF COLLECTING BLADE SPRINGS



DANGER

Adjustment of collecting blade springs should be performed only when the engine is stopped, and the machine is raised and secured.

Scraper-blade PUU-3700 is equipped with swinging segments of collecting blades. When an obstacle is encountered, individual segments of collecting blades (FIG. 5.3) can independently swing backward and return to working position thanks to shock absorbing springs. Inclination of blades and tension of springs can be adjusted. Blade segment inclination angle is adjusted using nut (1) while spring (4) tension can be adjusted using nut (2) after loosening counter nut (3).



TIP

During the adjustment, set the collecting blades in such a manner as to ensure that front surfaces of individual blade segments form a single plane parallel to the mouldboard front plane.

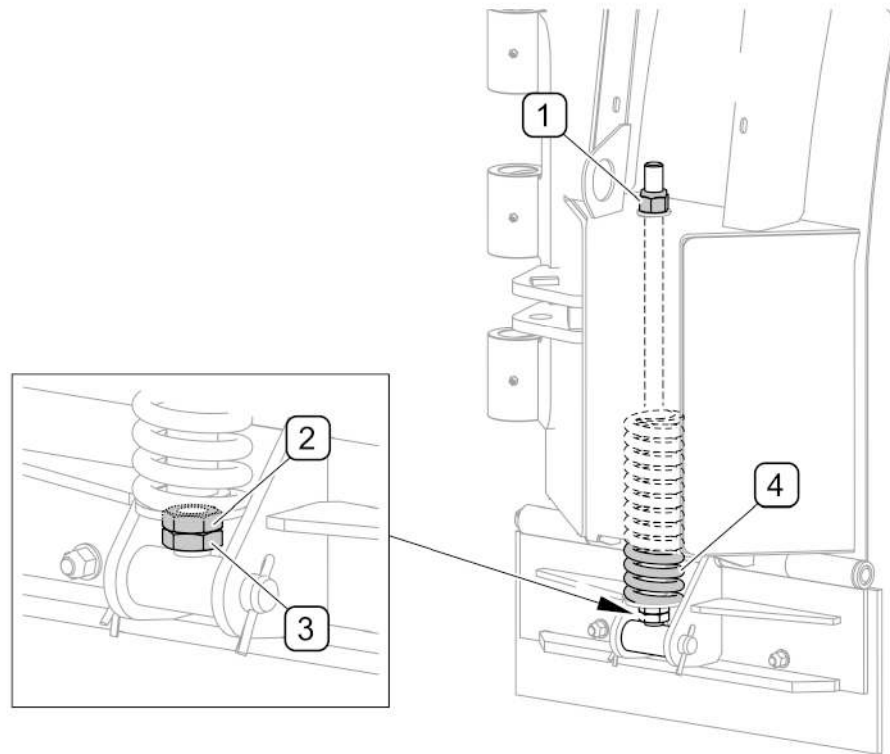


FIG. 5.3 Adjustment of collecting blades

(1) - blade inclination adjusting nut; (2) - blade spring tension adjusting nut; (3) - counter-nut; (4) - spring

5.3 ADJUSTMENT OF BALANCER



DANGER

Adjustment of balancer is performed when the machine is raised. Switch off carrying vehicle's engine, secure the cab to prevent access of third persons. Secure the linkage against lowering.

Depending on machine version, the scraper – blade can be equipped with hydraulic rotation system or balancer. The balancer maintains the scraper – blade's mouldboards in horizontal position when the machine is raised and during transport. If mouldboards are tipped to the side after raising the scraper – blade, the balancer should be adjusted in the following manner:

- raise the machine, switch off the carrying vehicle's engine;
- loosen counter nut (1);
- set mouldboards in horizontal position using bolt (2).
- after adjustment, tighten counter nut (2).

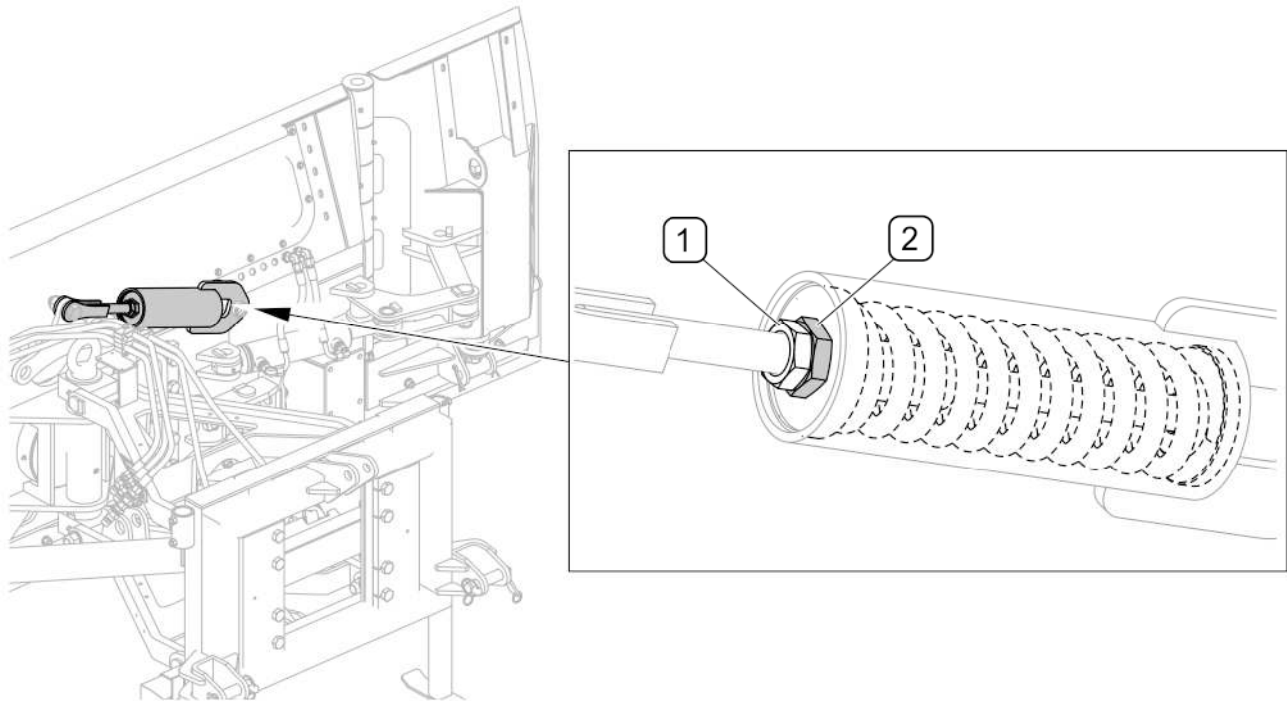


FIG. 5.4 **Adjustment of balancer**

(1) - counter-nut; (2) - adjustment bolt

5.4 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;
- checking technical condition and leak tightness of hydraulic connectors



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.

Because of its composition, the oil in the hydraulic system 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 (CO₂), foam or extinguisher steam. Do NOT use water for fire extinguishing!

TAB. 5.3 HL32 HYDRAULIC OIL CHARACTERISTICS

ITEM	NAME	VALUE
1	ISO 3448VG viscosity classification	32
2	Kinematic viscosity at 40°C	28,8 – 35,2 mm ² /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



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.

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 trailer's 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 faults are remedied.

**DANGER**

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



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

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.



Rubber hydraulic lines should be replaced after 4 years of machine use.

5.5 ELECTRICAL SYSTEM MAINTENANCE

Electrical system maintenance involves periodical checking the operation of the lighting system and hydraulic solenoid valves. After hitching the machine to the carrying vehicle, connect power lead of the electrical system and control panel wiring harness. Connect hydraulic conduits to the carrying vehicle's external hydraulic system. Check operation of clearance lights, dipped lights, road lights and individual functions of the machine.



DANGER

Do not independently repair electrical system, except items described in chapter ELECTRICAL SYSTEM MAINTENANCE. All electrical system repairs must be performed only by suitably qualified personnel.

Additional working lights of the machine are equipped with a H4 60/55W 12V bulb (or 75/70W 24V bulb, depending on the electrical system version). Bulb (2) is accessible after unscrewing screws (3) and removing lens (1). The sweeper's clearance lights are maintenance-free LED lights.

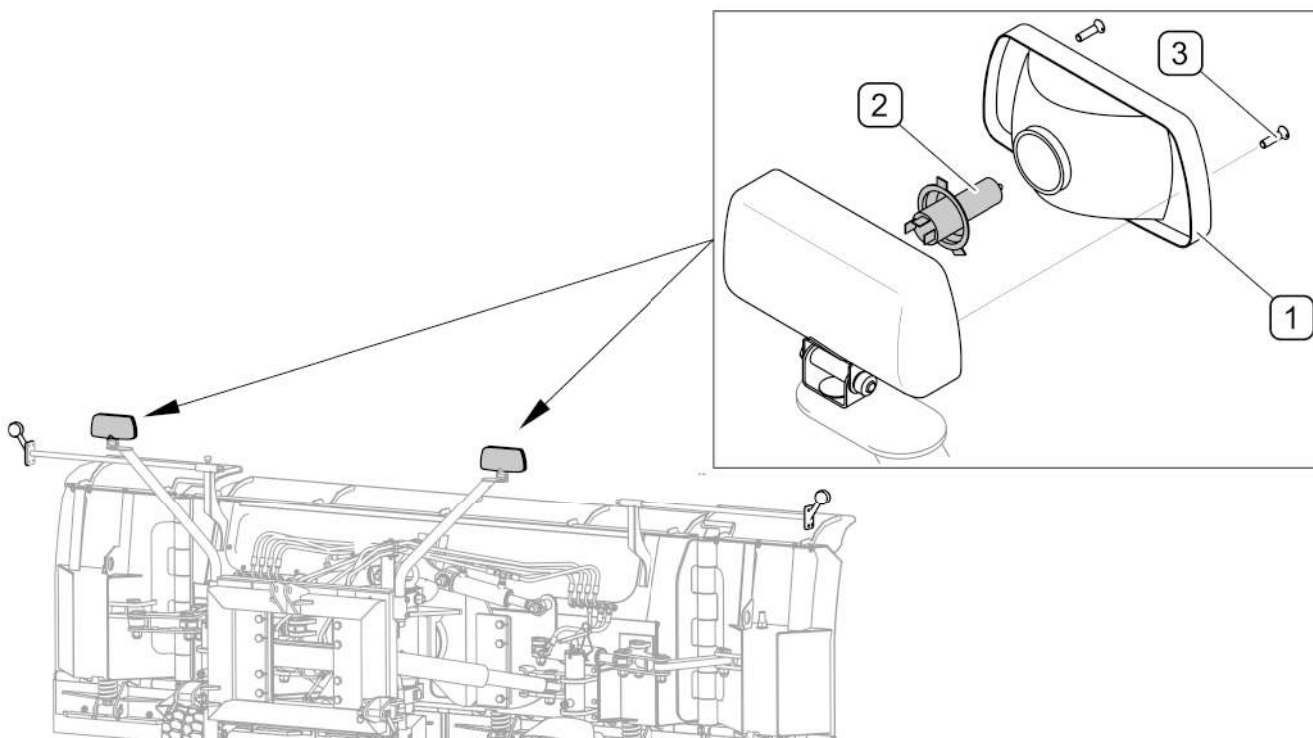


FIG. 5.5 Changing bulbs

(1) - light lens; (2) - H4 60/55W 12V bulb or 75/70W 24V bulb (depending on the electrical system version)

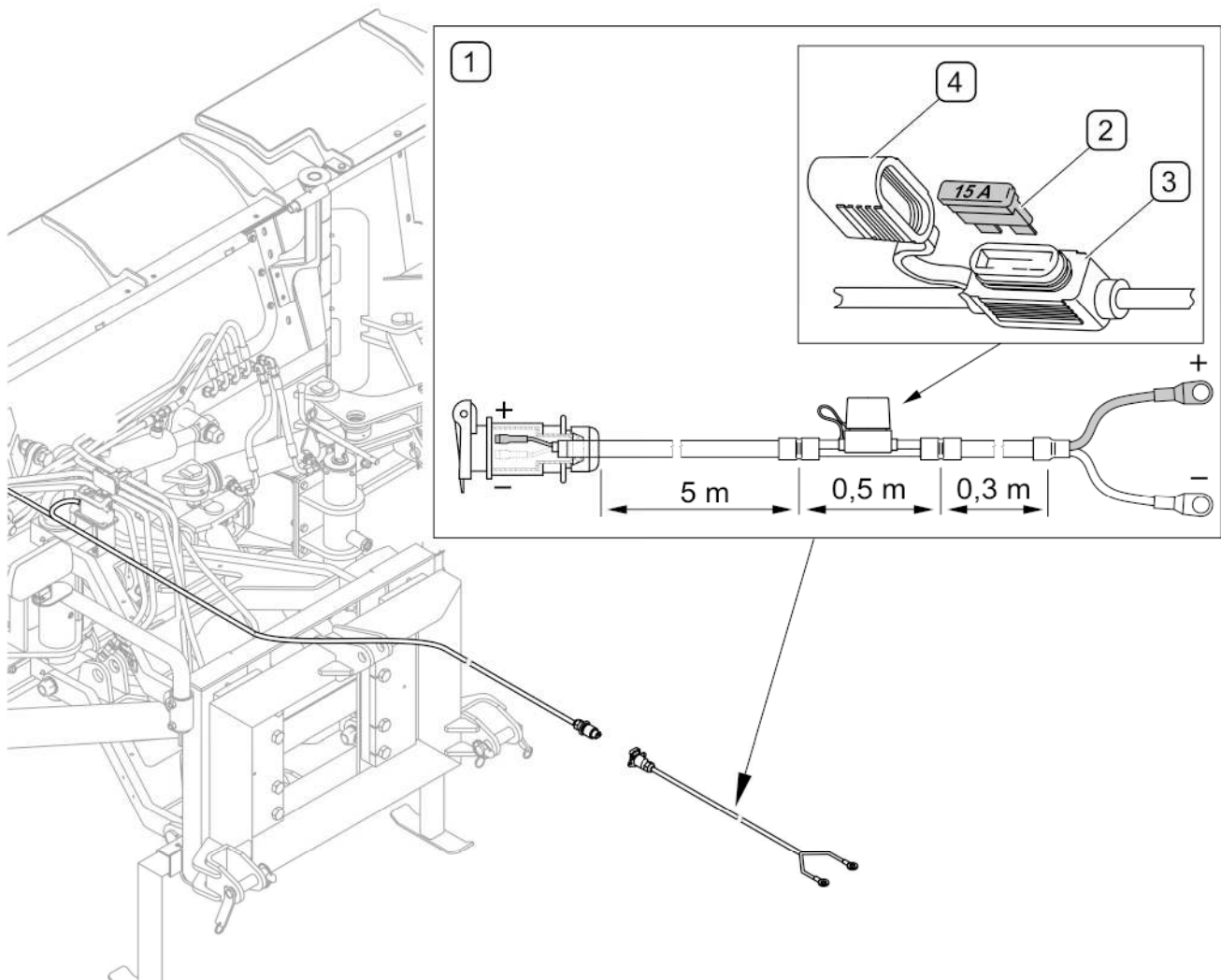


FIG. 5.6 Replacement of fuse on power lead

(1) - power lead; (2) - UNIVAL 15A fuse; (3) - fuse holder; (4) - protective cover

There is a UNIVAL 15A fuse (2) on the power lead of the scraper – blade's electrical system (FIG. 5.5) that is connected to the carrying vehicle's electrical system. To replace the fuse, remove protective cover (4) and take the fuse (2) out from holder (3).

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



DANGER

Lubrication may only be performed when plough is lowered, and resting on the ground. Before lubricating, switch off engine, remove key from ignition and engage carrying vehicle brake.

TAB. 5.4 LUBRICATION POINTS AND LUBRICATION FREQUENCY

ITEM	NAME	NUMBER OF LUBRICATION POINTS	TYPE OF GREASE	LUBRICATION FREQUENCY
A	Central mouldboard rotation sleeves	2	grease	50 hours
B	Central mouldboard tilting mechanism	4		50 hours
C	Right mouldboard sleeves Left mouldboard sleeves	7 7		50 hours
D	Wheel column * Wheel bearings *	4 2		50 hours 10 hours
E	Eye of side mouldboard turning cylinder	4		50 hours
F	Eye of central mouldboard turning cylinder	4		50 hours
G	Eye of mouldboard tilting cylinder *	4		50 hours
H	Eye of mouldboard rising cylinder *	2		50 hours

* – depending on the machine version

Marking description in Item column (TAB. 5.4) conforms with numbering shown (FIG. 5.7)

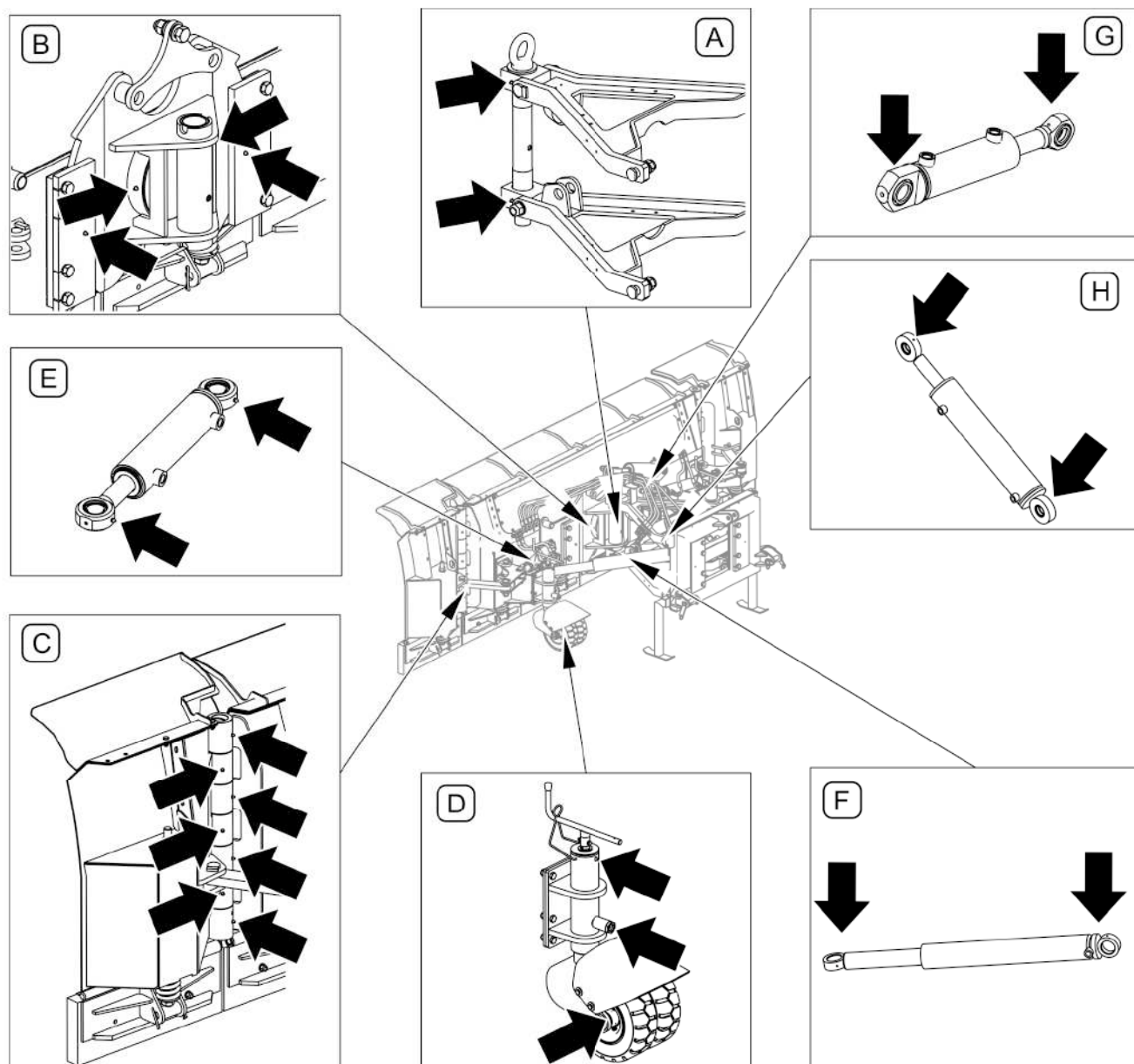


FIG. 5.7 Lubrication points

Lubrication points are described in TAB. 5.6



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.

5.7 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 and electrical components. 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 scraper-blade 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.

Machine disconnected from the carrying vehicle should be placed on parking stands, on level, sufficiently hard surface in such a manner as to ensure that it is possible to connect it again.

Control panel should be disconnected from the machine and protected against adverse weather conditions.

5.8 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 bolt tightening torque values are given in TAB. 5.5.



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.

TAB. 5.5 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

The tightening torque values given in the table apply to non-greased steel bolts.

5.9 TROUBLESHOOTING

TAB. 5.6 TROUBLESHOOTING

TYPE OF FAULT	CAUSE	REMEDY
Mouldboard position cannot be changed	The electrical system is not connected to the carrying vehicle	Connect the plug to the 3-pin socket in the carrying vehicle.
	The hydraulic system is not connected to the carrying vehicle	Connect hydraulic quick-couplers to a proper section of the carrying vehicle's hydraulic system.
	Control panel is not connected	Connect control panel
	Damaged fuse on power lead	Check and, if necessary, replace the fuse in the power lead in the carrying vehicle (if installed)
	The machine hydraulic system is damaged	Repair at authorised service point
Machine scoops snow unevenly	Incorrectly positioned wheels (option)	Check and adjust according to operator's manual
	Excessively worn collecting plough blades	Check and replace if necessary
No lighting	Electrical system not connected. Lights on the control panel are not switched on	Connect electrical system to the carrying vehicle; switch on a proper function on the control panel.
	Fuse is blown	Check and, if necessary, replace the fuse in the power lead in the carrying vehicle (if installed)
	Burned-out bulb in lamp	Replace light bulb
	The machine electrical system is damaged	Repair at authorised service point

[illegible]