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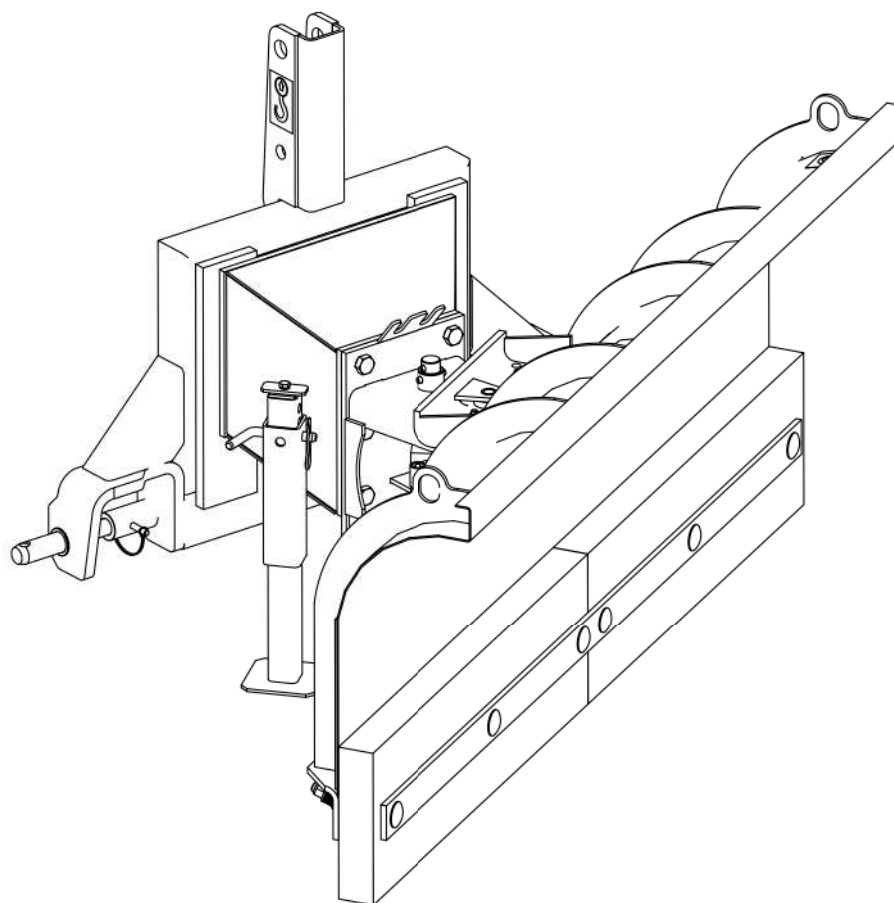
[www.pronar.pl](http://www.pronar.pl)

# **OPERATOR'S MANUAL**

## **SNOW PLOUGH**

### **PRONAR PU-1400**

TRANSLATION OF THE ORIGINAL INSTRUCTIONS



EDITION 1A-08-2011

PUBLICATION NO 157N-00000000-UM





# SNOW PLOUGH

## PRONAR PU-1400

### MACHINE IDENTIFICATION

TYPE:

*PU-1400*

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-1400 snow plough. 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>Snow plough PRONAR</b>
Type:	<b>PUV-1400</b>
Model:	—
Serial number:	
Commercial name:	<b>Snow plough PRONAR PUV-1400</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 2011 -10- 0 6

*Place and date*

Z-CIA DYREKTORA  
d/s technicznych  
członk zarządu

*Roman Omelianiuk*

*Full name of the empowered person  
position, signature*

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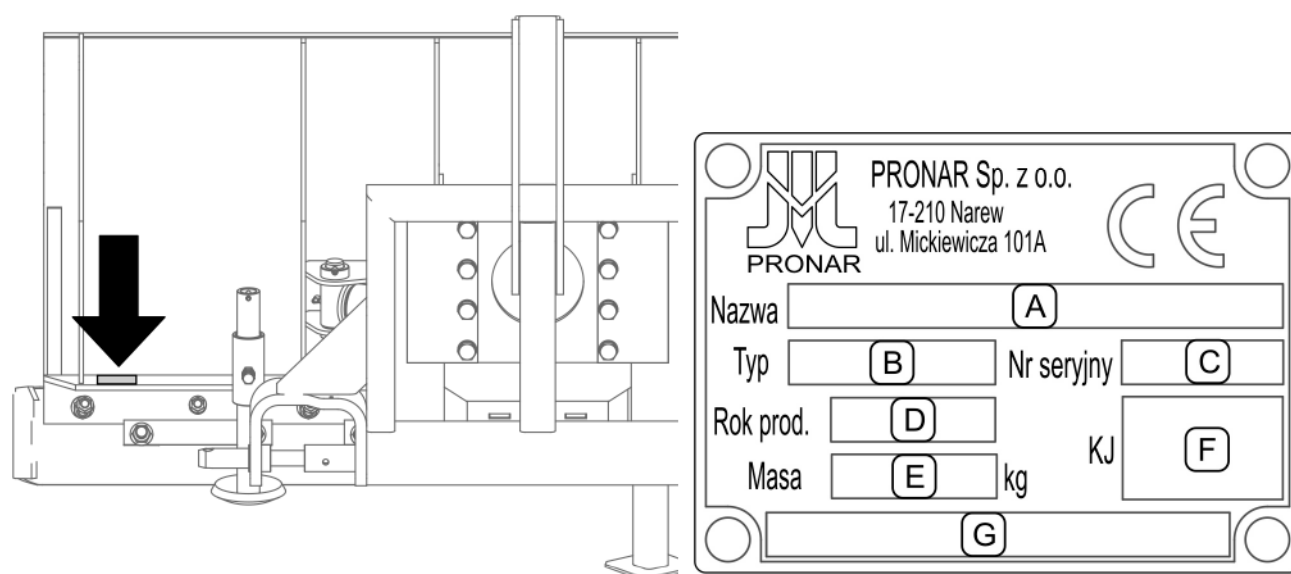
***SECTION***

**1**

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**BASIC INFORMATION**

## 1.1 IDENTIFICATION



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

Meaning of each field depending on the type of data plate located on the machine (FIG. 1.1):

- A - machine name
- B – machine type
- C – serial number
- D – year of manufacture
- E – machine tare weight [kg]
- F – Quality Control stamp
- G – Unfilled box or extension of name (box A)

The factory number is stamped into the data plate (FIG. 1.1) and on mounting base beside the data plate. Data plate is located on the 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

PU-1400 snow plough is designed for clearing surfaces of narrow roads, squares, parking spaces and all other hard road and footpath surfaces such as asphalt, concrete paving blocks, cobblestone, concrete. Use for other purposes is not in accord with design. Depending on the equipment ploughs can be mounted on agricultural tractors, front loaders and other slow-moving vehicles 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 agricultural tractor (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 plough must not be used for purposes other than those for which it is intended, in particular:

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

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

	UNIT	REQUIREMENTS
<b>Hydraulic system</b>		
Hydraulic oil	-	HL32
Nominal pressure	MPa	16 - 20
Hydraulic sockets	-	2 sockets of one section with the possibility of changing the direction of oil circulation installed on the front of the carrying vehicle
<b>Other requirements</b>		
Beacon light	-	orange light

## 1.3 OPTIONAL EQUIPMENT

The plough equipment includes:

- Operator's Manual,
- Warranty Book.

Equipment version:

- metal collecting blades
- rubber collecting blades

## 1.4 WARRANTY TERMS

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

- rubber and metal collecting blades,

- slides;

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

In the event of damage arising from:

- mechanical damage which is the user's fault, caused by road accidents,
- 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 guarantee repair coupons. A missing date of purchase or sale point stamp, may make the user ineligible for any warranty repair or refund.**

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

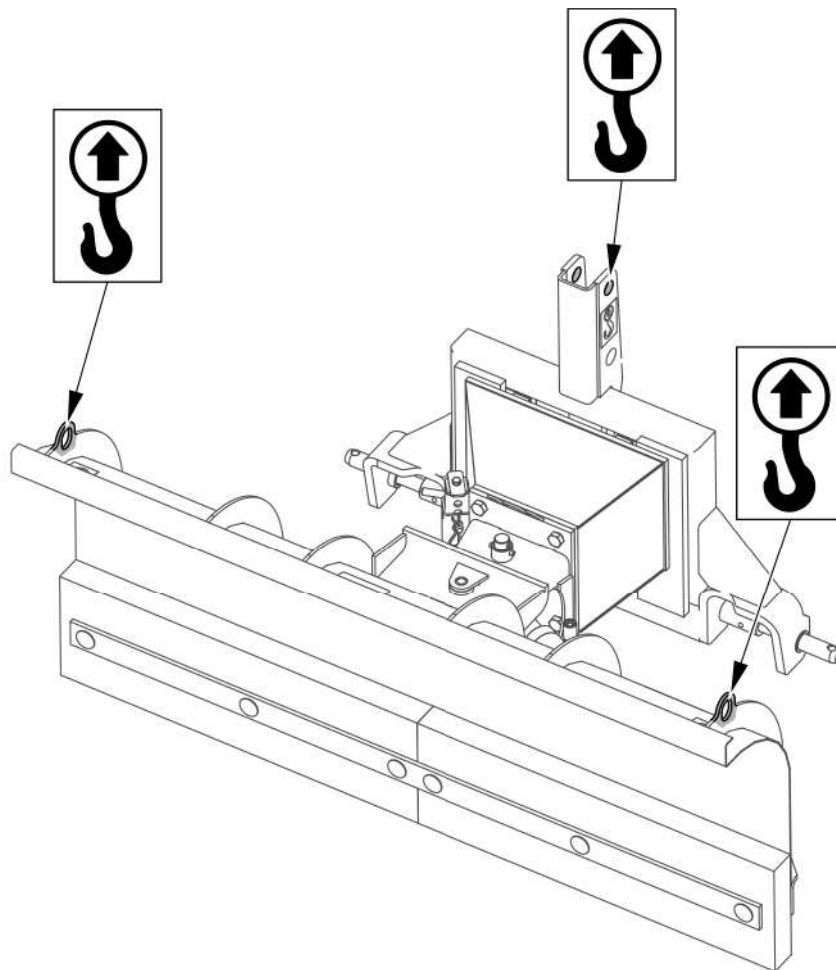
Modification of the machine without the written consent of the Manufacturer is forbidden. In particular, do NOT weld, drill holes in, cut or heat the main structural elements, which have a direct impact on the machine operation safety.

## 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.

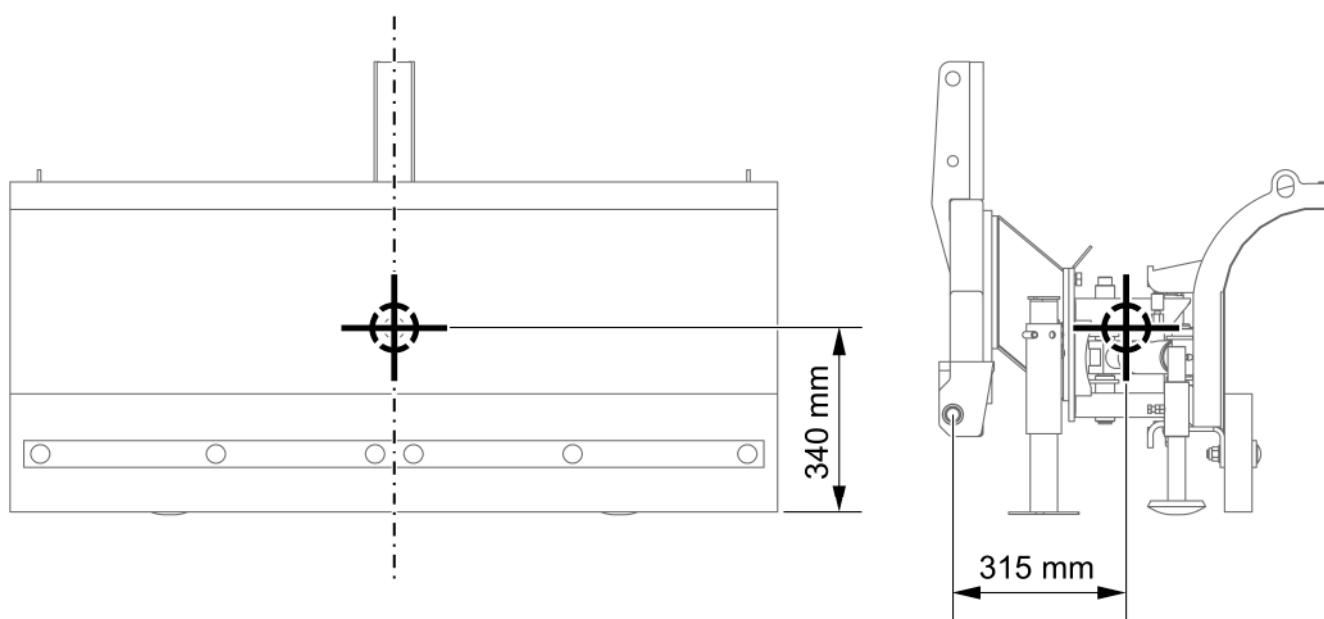


**FIG. 1.2**      **Transport lugs**

The machine should be attached to lifting equipment in places specially designed for this purpose (FIG. 1.2), i.e. by the lugs on the mouldboard edges and attachment point of the upper link of the linkage (*in other linkage system the machine should be attached to lifting equipment by the upper hook or opening*). 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 ropes. During the loading work particular care should be taken not to damage paint coating.

**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.



**FIG. 1.3 Centre of gravity**

*Location of centre of gravity is given for three-point linkage cat. I and II (mouldboard position: straight)*

**ATTENTION!**

Location of centre of gravity, depending on the version (rubber or metal collecting blades, various linkage systems), may vary in the range  $\pm 50$  mm

**ATTENTION!**

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

## 1.6 ENVIRONMENTAL HAZARDS

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

Oil, which has been used up or is unsuitable for further use owing to a loss of its properties should be stored in its original packaging in the conditions described above.

## 1.7 WITHDRAWAL FROM USE

In the event of decision by the user to withdraw the mower from use, comply with the regulations in force in the given country concerning withdrawal from use and recycling of machines withdrawn from use.

Before proceeding to dismantle 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 carrying vehicles and trained in the use of the machine.
- If the information contained in the Operator's Manual is difficult to understand, contact a seller, who runs an authorised technical service on behalf of the manufacturer, or contact the manufacturer directly.
- Careless and improper use and operation of the machine, and non-compliance with the recommendations given in this operator's manual is dangerous to your health.
- Be aware of the existence of a minimal risk, and for this reason the fundamental basis for using this machine should be the application of safety rules and sensible behaviour.
- The machine must never be used by persons, who are not authorised to drive 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.
- 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 guarantee.
- The machine may only be used when all the protective elements are technically sound and correctly positioned. In the event of loss or destruction of the safety guards, they must be replaced with new ones.

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

- Do NOT link the machine to a tractor, if hydraulic oil applied in both machines are of different types, or if the three point linkage system of the machine is not compatible with the category of the linkage system of the tractor or other carrying vehicle.
- After completion of coupling the machine, check the safeguards. Carefully read the carrying vehicle Operator's Manual.
- To mount machine on tractor (carrying vehicle) use only genuine pins and safeguard linchpins.
- The carrying vehicle to which the machine will be linked and coupled must be technically reliable and must fulfil the requirements of machine Manufacturer.
- Be especially careful when hitching the machine.
- When hitching, there must be nobody between the machine and the tractor.
- Exercise caution when disconnecting mower.
- Machine disconnected from the carrying vehicle must be supported on the blade and 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 conduits 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 conduits. There must be no oil leaks.
- In the event of malfunction of the hydraulic system, the machine shall be disconnected from use until the malfunction is corrected.
- 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 conduits must be replaced every 4 years regardless of their technical condition.
- Repair and replacement of hydraulic system elements should be entrusted to the appropriately qualified persons.

#### **2.1.4 TRANSPORTING THE MACHINE**

- When 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 (carrying vehicle) is parked. When parked, the machine should be lowered.
- Do NOT ride on the machine or transport any materials on it.
- When driving with the raised machine, the carrying vehicle'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 carrying vehicle'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 carrying vehicle engine switched off and the ignition key removed. The vehicle shall be immobilized with the parking brake and secured against unauthorized access.

### 2.1.6 PLOUGH OPERATION

- Before lowering or lifting the machine mounted tractor (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 machine 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.
- Do NOT stand within the machine's working zone and also between the carrying vehicle and the machine.
- Do NOT operate the plough while reversing. Lift machine when reversing.

## 2.2 DESCRIPTION OF MINIMAL RISK

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

- using the mower for purposes other than those for which it is intended,
- being between the tractor and the machine while the engine is working and when the machine is being attached,
- being on the machine while the engine is working,
- 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 persons under the influence of alcohol,
- cleaning, maintenance and technical checks when tractor is connected and engine is running.

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

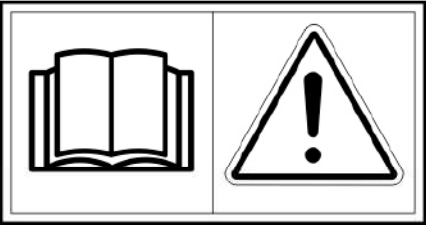
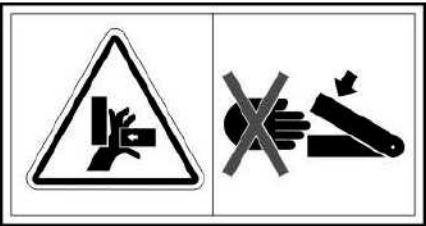
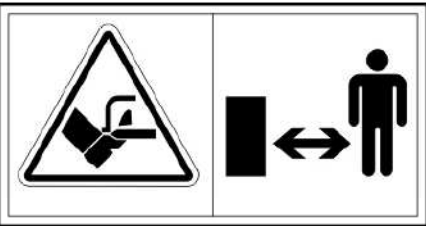
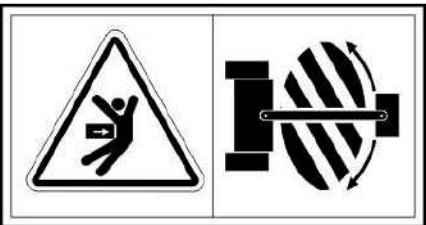



- prudent and unhurried operation of the machine,

- sensible application of the remarks and recommendations contained in the Operator's Manual,
- carrying out repair and maintenance work in line with operating safety rules,
- carrying out repair and maintenance work by persons trained to do so,
- using 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**

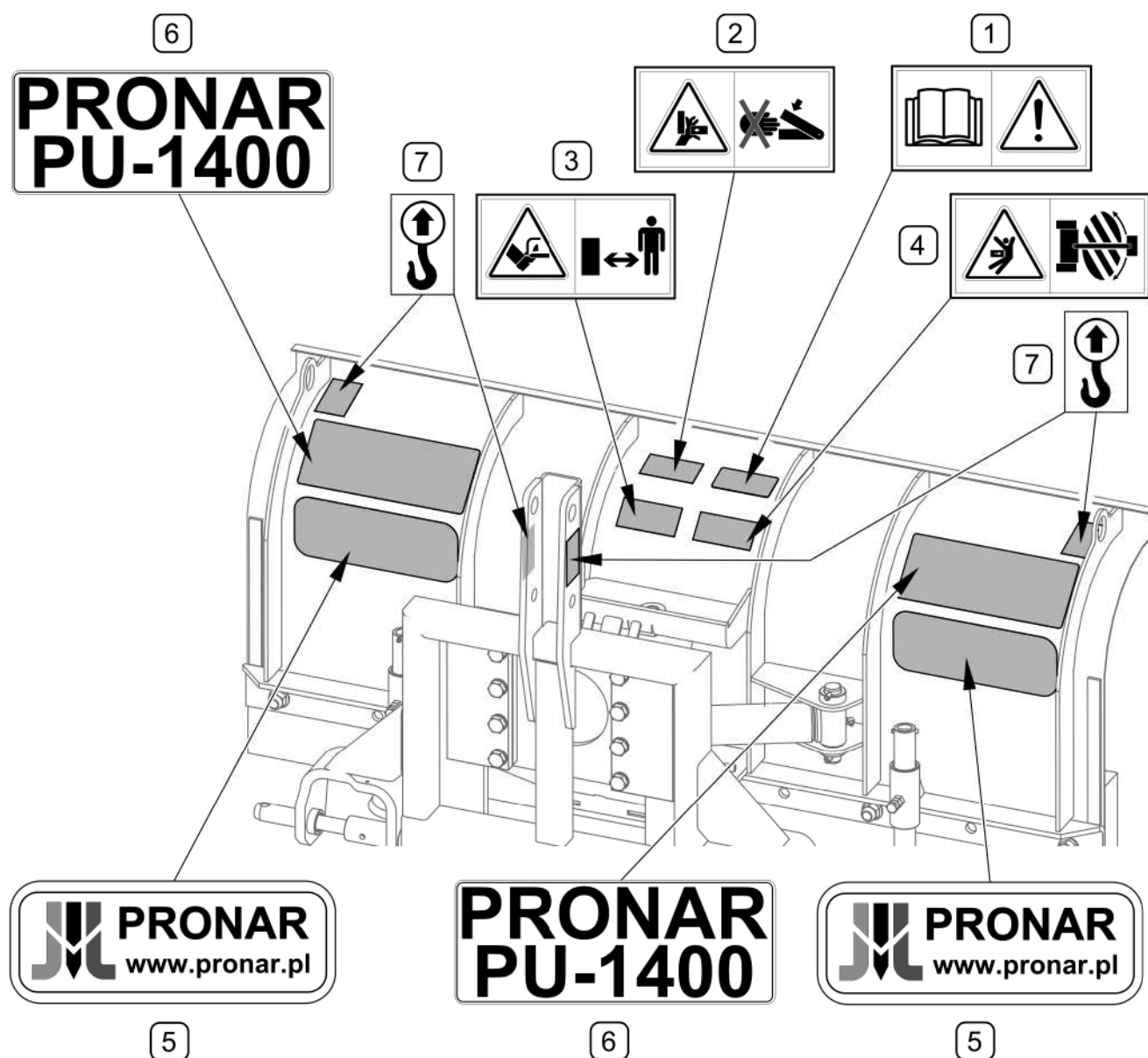
All signs should always be legible and clean, visible to the operator and also to persons possibly being in the vicinity of working machine. If any safety sign is lost or illegible, it should be replaced with a new one. All elements having safety signs replaced during repairs should be affixed with these 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.
2		Do not reach into crushing space because elements may move. Danger of crushing hands or fingers.
3		Keep a safe distance from machine when engine is running. Risk of injury to foot or leg!
4		There must be no bystanders within the machine working zone during its operation. If any work is required in these areas, make sure the tractor is stationary, and whether the implement is disconnected from the power source.
5		Manufacturer
6		Machine model
7		Transport suspension points

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**

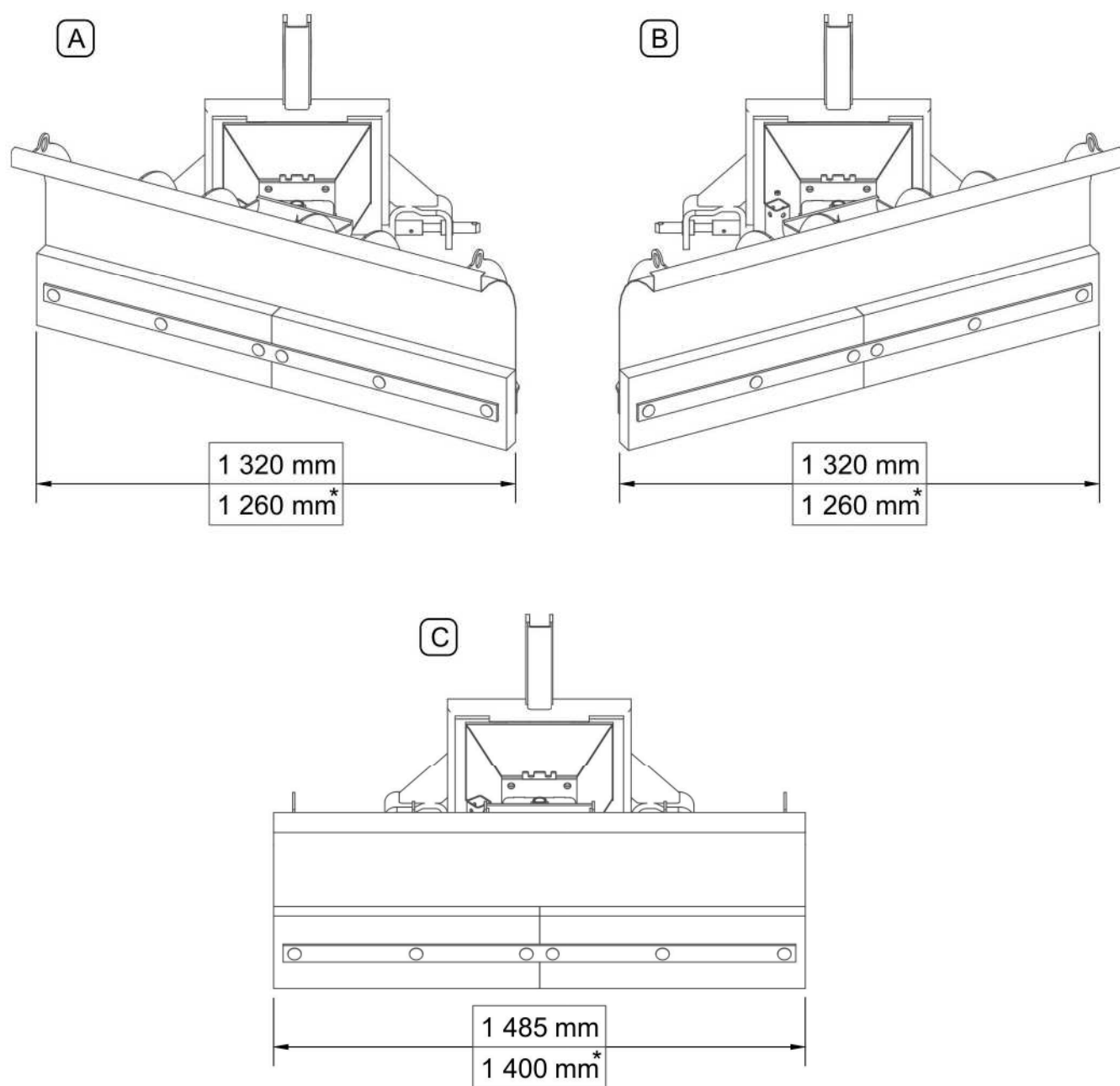
## 3.1 TECHNICAL SPECIFICATION

**TAB. 3.1 BASIC TECHNICAL SPECIFICATION**

	Unit	
Plough model	-	PU-1400
Mounting method: - three point linkage - front loader - wheeled loaders  - other	- - - - - -	cat. I or II according to ISO 730-1 EURO mounting ATLAS AR 35 GEHL WILLE 455 WEIDEMANN 2070 CX50 mounting plate for installation
Working width (FIG. 3.1) - mouldboard position: straight - mouldboard position: angled, to the right or left	mm mm	1,485 (1,400*) 1,320 (1,260*)
Height: - working height of mouldboard - total height (with three-point linkage)	mm mm	600 850
Type of collecting blades	-	steel blades (tilting), rubber blades
Power supply and control	-	external carrying vehicle hydraulic system
Number of hydraulic cylinders	item	2
Machine weight depending on component configuration	kg	150 - 200
Power demand	HP (kW)	up to 30 (22)
Maximum working speed	km/h	10 6 – for front loaders
Other information	-	Single person operation

\* - for rubber plough blades

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

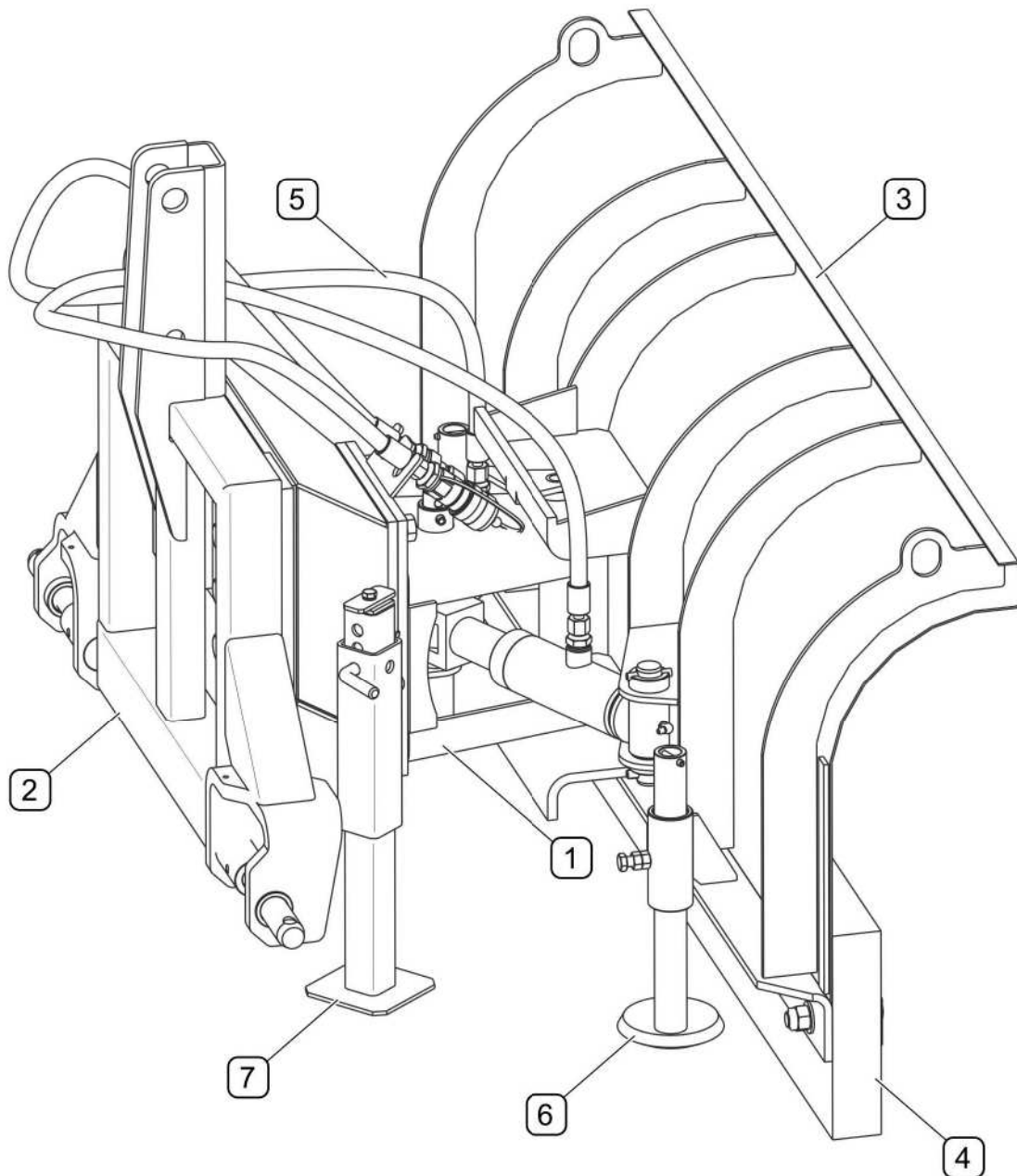


\* – for rubber plough blades

**FIG. 3.1** Width depending on the operating position:

(A), (B), (C) - individual working positions

## 3.2 GENERAL DESIGN



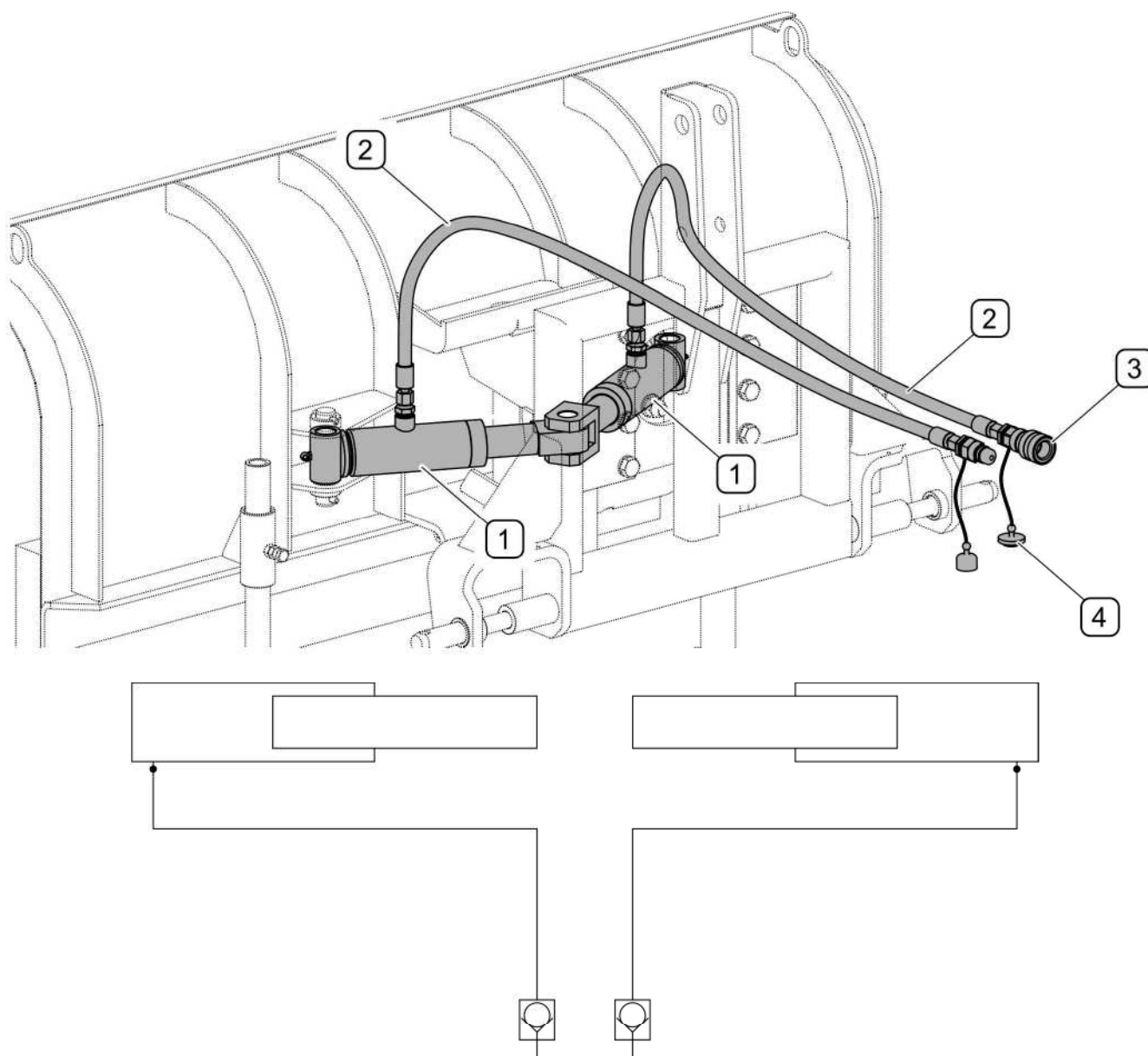
**FIG. 3.2**      **General design**

(1) - frame; (2) - linkage; (3) - mouldboard; (4) - plough blade (collecting strip); (5) - hydraulic system; (6) - slide; (7) - parking stand;

PU-1400 plough consists of a frame (1) to which mouldboard (3) is connected. Using a suitable suspension system (2) plough is linked to a tractor or other carrying vehicle. Plough blade (4) can be fitted with rubber or metal collecting strips (rigid collecting strips or collecting strips with shock absorbers). Working height can be smoothly adjusted by means of slides (6). Parking stand (7) is used to support the plough when it is disconnected from the carrying

vehicle. Optionally, the plough can be equipped with different linkage systems, for example, linkage systems for front loaders, wheeled loaders, etc.

### 3.3 HYDRAULIC SYSTEM



**FIG. 3.3 Hydraulic system design**

(1) - hydraulic cylinder; (2) - conduits; (3) - hydraulic couplers; (4) - protective caps

Plough working position can be changed by means of two plunger hydraulic cylinders (1) supplied with oil from tractor or other carrying vehicle by two conduits (2) terminated with couplers (3).





***SECTION***

**4**

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**CORRECT USE**

## 4.1 PREPARING FOR WORK

### DANGER



Before using the plough, 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 agricultural tractors (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 normal use. This does not release the user from an obligation to check the machine's condition after delivery and before first use. The machine is delivered to the user completely assembled (except for individually packed wiring).

Prior to connecting to the tractor, machine operator must verify the machine's 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 plough linkage with suspension system of the carrying vehicle,
- 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 plough blades,

- check the technical condition of the linkage components,

**ATTENTION!**

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

The technical condition before starting the machine must be a 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 tractor or other carrying vehicle (see "*HITCHING TO CARRYING VEHICLE*")
- after connection of hydraulic system conduits, check the correct operation and inspect tightness of the system and hydraulic 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 guarantee, 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 STRIPS	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 technical condition, check tightness and correct operation	
Check if all main nut and bolt connections are properly tightened	Torque values should be according to table 5.7	Once a week
Lubrication	Lubricate elements according to section 5.4 LUBRICATION.	According to table 5.6



### ATTENTION!

Do not use a malfunctioning or deficient machine.

## 4.3 HITCHING TO VEHICLE



### ATTENTION!

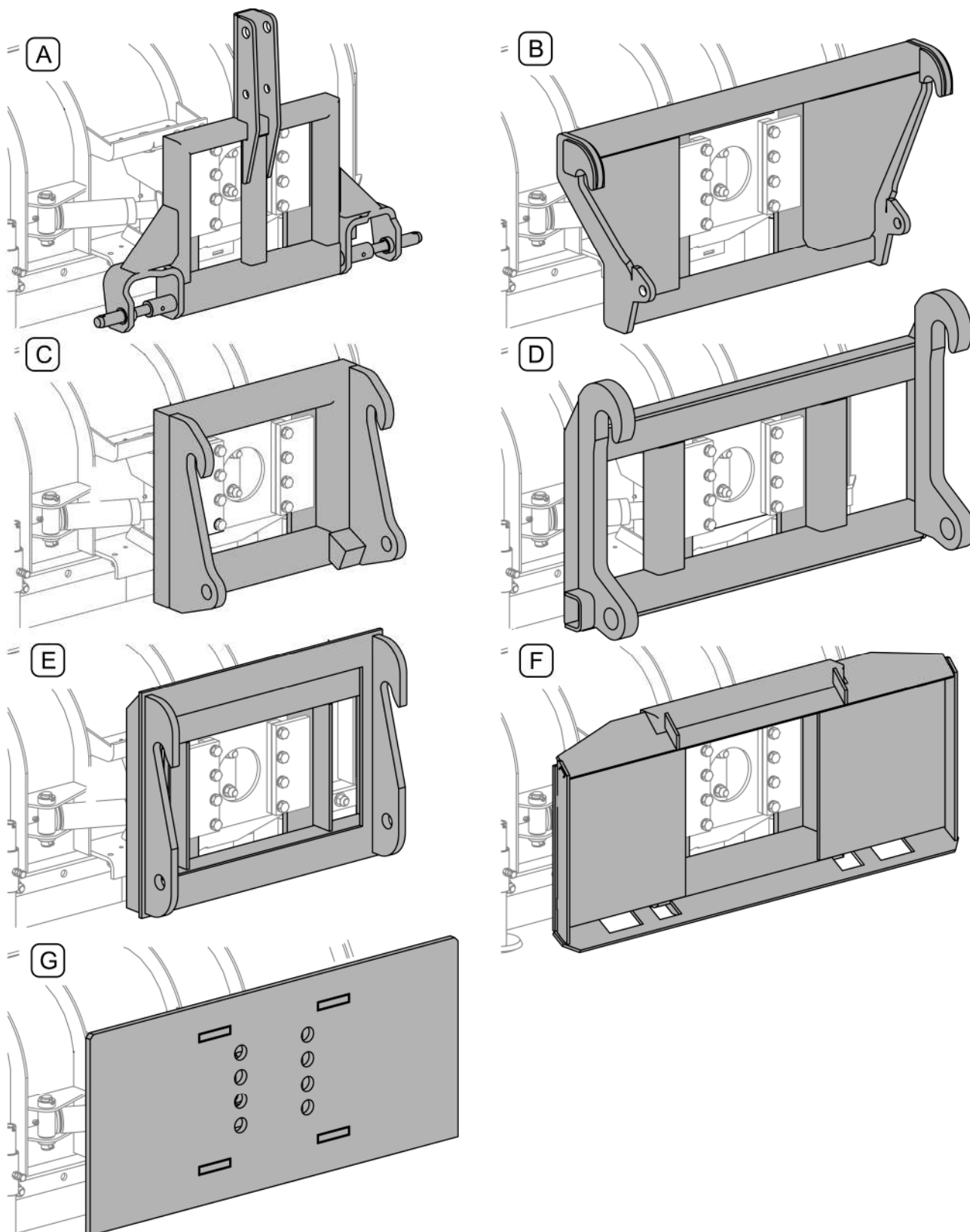
Before hitching the plough to carrying vehicle, the user must read the carrying vehicle operator's manual.



### DANGER

Exercise caution when hitching the machine to tractor.

Do NOT link the machine to the tractor when the engine is running.



**FIG. 4.1**      **Types of linkage systems**

(A) - three-point linkage of category I - II according to ISO 730-1 ; (B) - loaders with EURO mount; (C) - ATLAS AR 35; (D) - WILLE 455; (E) - WEIDEMANN 2070 CX50; (F) - GEHL; (G) - mounting plate for individual installation, without mounting components.

PU-1400 plough is designed for front-hitching to a tractor (carrying vehicle) which fulfils the requirements contained in table 1.1 „TRACTOR (CARRYING VEHICLE) REQUIREMENTS”.

#### 4.3.1 HITCHING TO THE THREE POINT LINKAGE

Before hitching the plough to tractor three-point linkage, make sure that the category of the tractor linkage is compatible with that of the plough.

In order to hitch the machine to the tractor, proceed as follows: (FIG. 4.2):

- Drive the tractor and bring the lower connection arms of the tractor's three point linkage close to mounting points (A) in the plough linkage.
- Set connection arms of tractor at appropriate height.
- Switch off tractor's engine and prevent it from rolling.
- Using pins (1) connect lower mounting points (A) with lower connection arms of the tractor's three point linkage and secure them with linchpins (2).
- Connect the upper connection arm (B) of the tractor's three point linkage with upper mounting point (B) and secure the connection.
- 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 linchpin (FIG. 4.3).

Both lower arms of the tractor three-point linkage are recommended to be set at the same height and in the position in which they can move vertically with regard to each other.



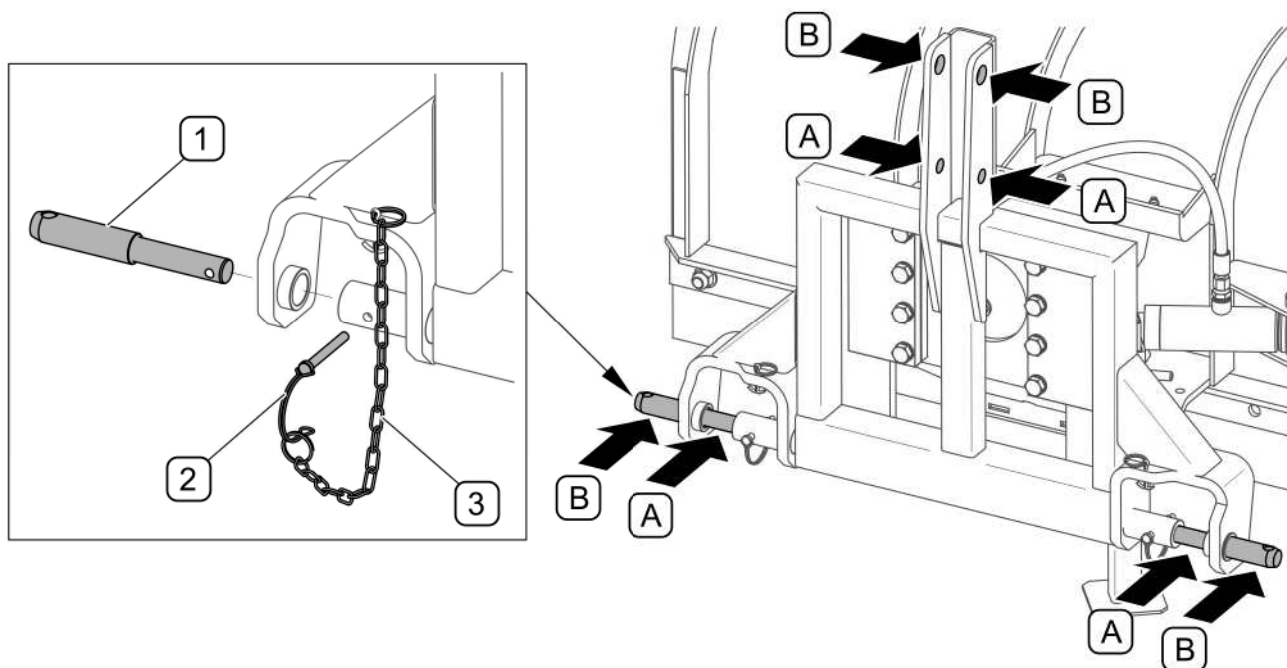
#### **DANGER**

To mount machine on tractor (carrying vehicle) use only genuine pins and safeguard linchpins.



#### **ATTENTION!**

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



**FIG. 4.2 Hitching to the three point linkage**

(A) - mounting points of category I according to ISO 730-1; (B) - mounting points of category II according to ISO 730-1, (1) - lower arm pin; (2) - securing cotter pin; (3) - chain

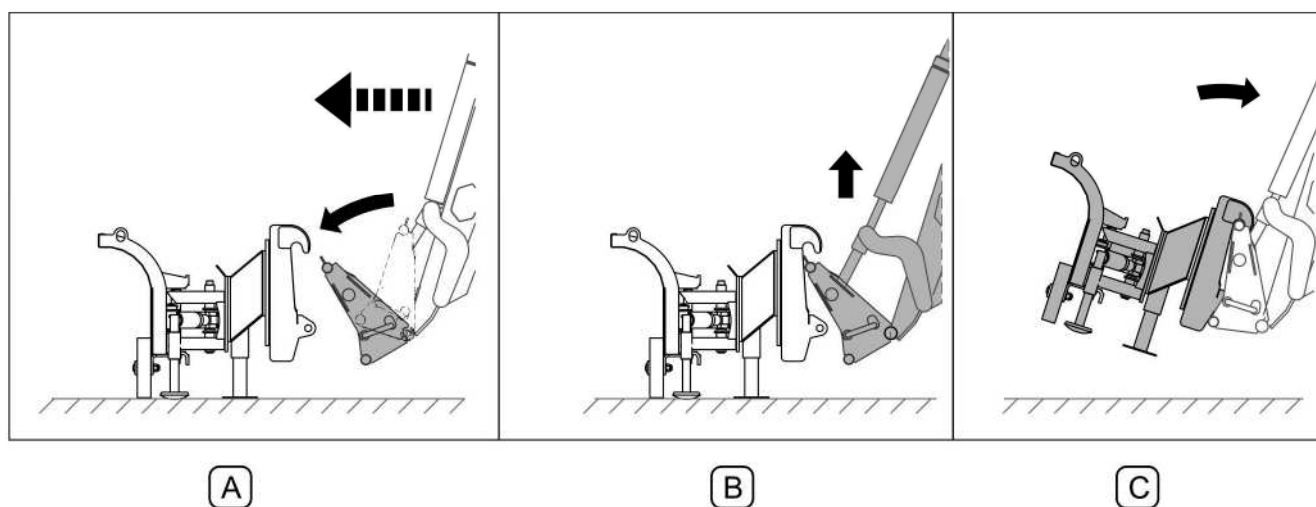
#### 4.3.2 HITCHING TO FRONT LOADER OR ANOTHER CARRYING VEHICLE

In order to hitch plough to front loader (FIG. 4.3):

- unlock quick securing mechanism in loader frame;
- lower arm and turn frame downwards (A) so that mounting points on quick mounting frame are below the mounting points of the plough;
- drive loader close to the plough and insert mounting points in the appropriate places in the quick mounting frame;
- lift the arm (B) so that the upper mounting points are in the plough hooks; controlling the loader frame tilt it back (C), causing the locking of the quick mounting mechanism;
- check if mounting is secure;
- engage the quick securing mechanism (depending on loader type)
- raise the parking stand (FIG. 4.3).

The described method of connecting is indicative and may vary depending on the loader model. A detailed method of connecting attachments is provided in front loader operator's manual.

Prior to connecting the plough to another carrying vehicle the user must read the carrying vehicle operator's manual and observe all recommendations of the Manufacturer.

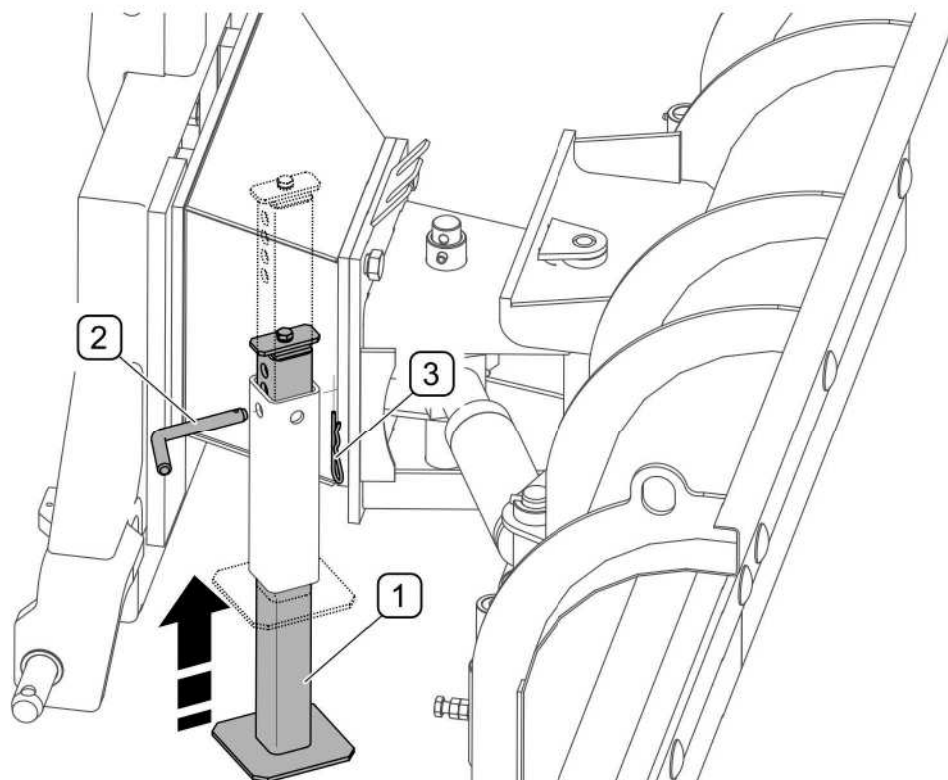


**FIG. 4.3 Hitching to front loader**  
(A), (B), (C)- successive stages of connecting



### IMPORTANT!

It is not recommended to operate a snowplough attached to front loader with a speed of more than 6 km/h.



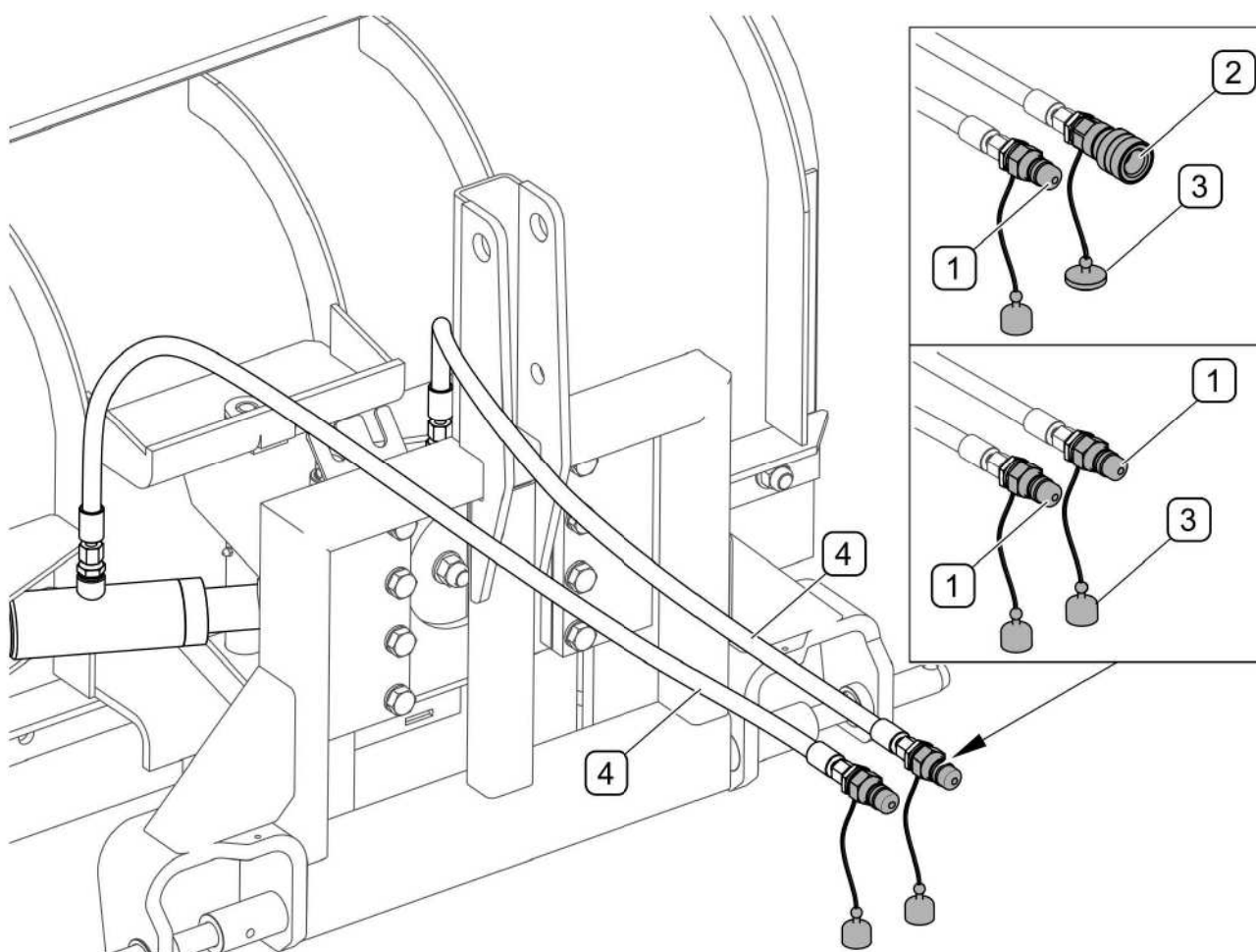
**FIG. 4.4 Raising of parking stand**  
(1) - parking stand; (2) - pin; (3) - linchpin;



To raise the parking stand (FIG. 4.4):

- lift the machine mounted on a carrying vehicle,
- take out cotter pin (3) and securing pin (2)
- lift the parking stand (1) and lock it in its upper position.

## 4.4 CONNECTING HYDRAULIC SYSTEM



**FIG. 4.5** Connecting hydraulic system

(1) - hydraulic coupler – plug; (2) - hydraulic coupler – socket; (3) - protective cap;  
(3) - hydraulic conduit;



### **DANGER**

Prior to connecting hydraulic system conduits the user must carefully read the carrying vehicle operator's manual and observe all recommendations of the Manufacturer.

Plough control hydraulic couplers (FIG. 4.5) should be connected to the carrying vehicle's external hydraulic system outlets. Depending on the version, the plough can be equipped with two hydraulic plugs (1) or with a plug (1) and a socket (2)

When connecting hydraulic conduits to the tractor make sure they are arranged without bends and twists, and are protected from damage.

**DANGER**

When connecting the hydraulic conduits to the carrying vehicle, make sure that the carrying vehicle hydraulic system is not under pressure.

**ATTENTION!**

During operation, the hydraulic conduits should be so arranged as to not prevent entangling with the machine and tractor moving parts.

## 4.5 PLOUGH OPERATION

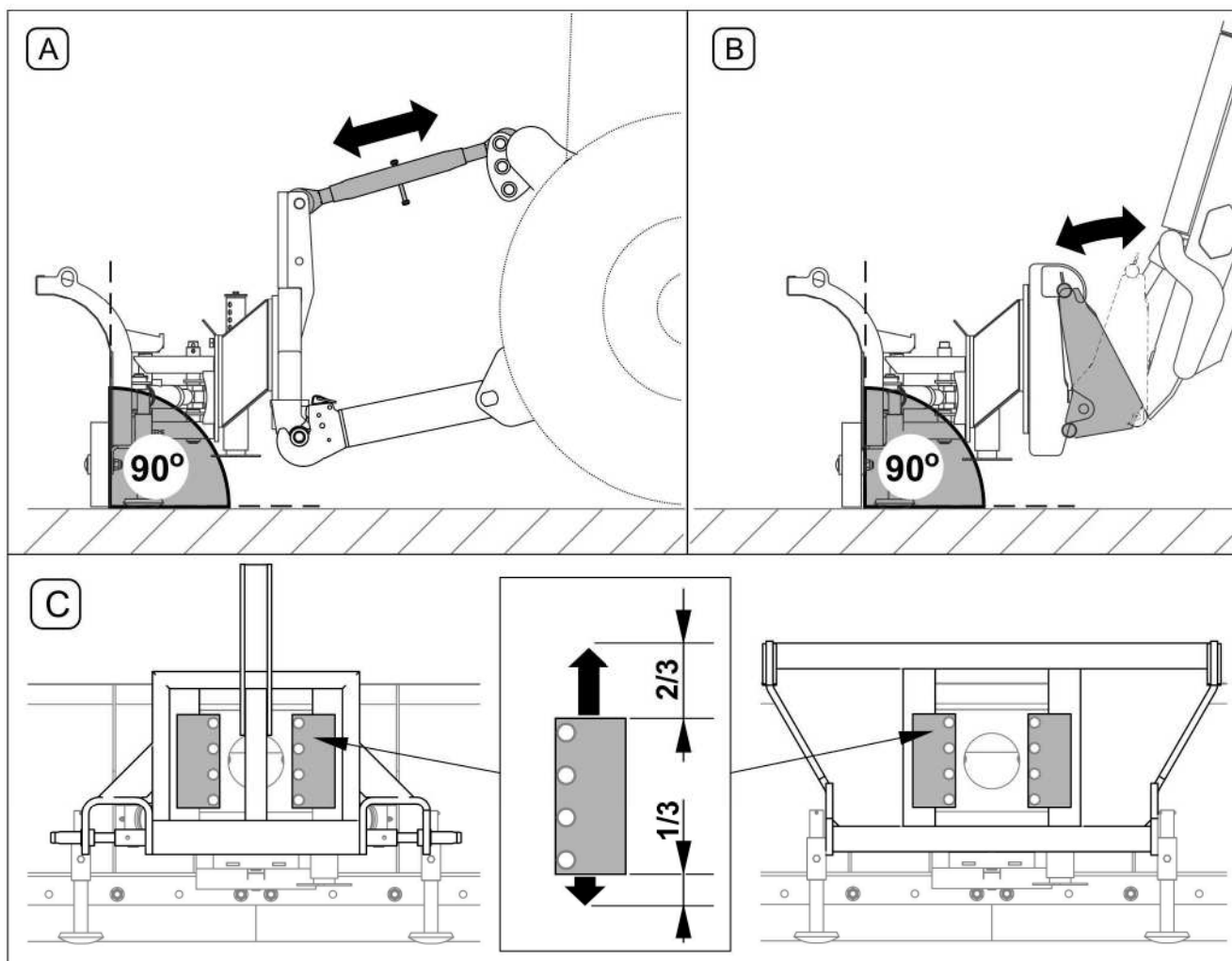
### 4.5.1 POSITIONING PLOUGH BODY

For optimum operation, plough body should be level (the main blades pivot axis should be perpendicular to the ground and collecting strips vertical). Levelling of plough body in carrying vehicles with three-point linkage is done by controlling the central link (FIG. 4.6) while in front loaders by proper positioning a working implement mounting frame (*e.g. using implement position indicator, if any*). Otherwise, collecting strips will wear unevenly.

Plough with the swing linkage must be set so that when the plough rests on the ground the range of plough body movement relative to the linkage during ground surface tracking is 1/3 down and 2/3 up of the total stroke (FIG. 4.6). When working with the plough, make sure that carrying vehicle (*tractor three-point linkage or loader boom*) linkage is fixed - do not work in a floating position.

**ATTENTION!**

Tractor weight (carrying vehicle weight) must not be transferred to the plough, as it could result in damaging it.



**FIG. 4.6 Positioning plough body**

(A) - carrying vehicles with three-point linkage; (B) - front loaders and others; (C) - setting the ground tracking range

#### 4.5.2 ADJUSTING PLOUGH WORKING POSITIONS



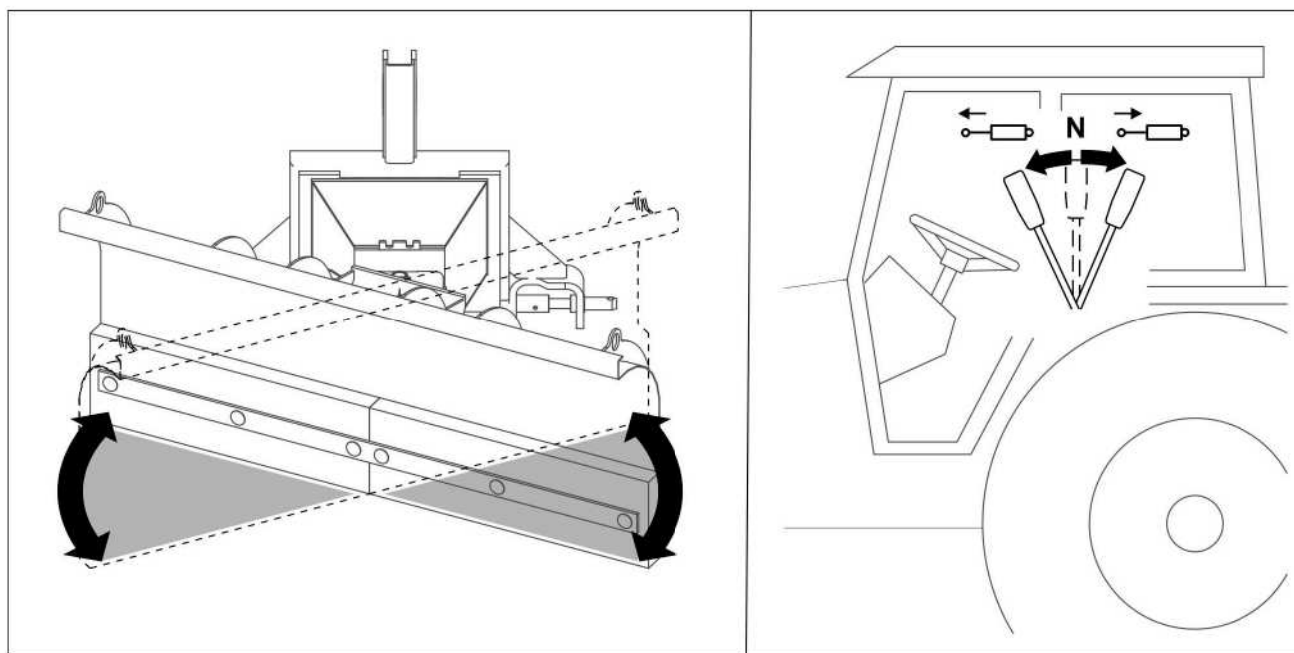
##### **DANGER**

The plough is controlled from the operator cab.  
When plough is in use there must be no bystanders near the machine.



##### **IMPORTANT!**

It is not recommended to operate the machine in heavy duty condition with a speed of more than 6 km/h.



**FIG. 4.7**      **Setting working position**

In order to change the plough working position use a single manifold lever in the tractor (carrying vehicle) (FIG. 4.7)

Working speed depends on the quantity and quality of collected material but also on the type of terrain. It is not recommended to operate plough mounted on front loaders when blades are set (right or left) in severe conditions, i.e.:

- uneven terrain,
- unknown terrain and obstacles
- packed or frozen snow or ice,
- snow layer thicker than 30 cm.

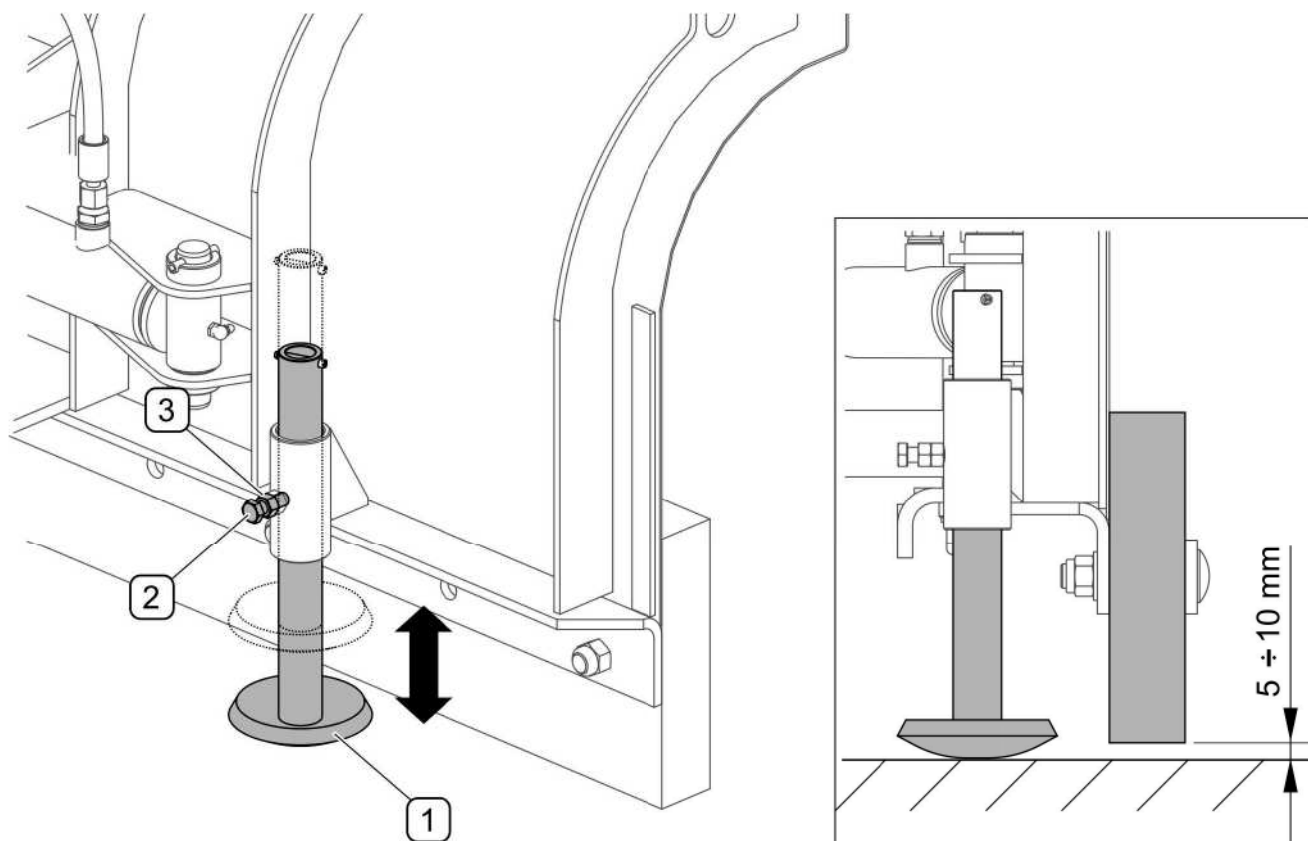


**IMPORTANT!**

It is not recommended to operate a snowplough attached to front loader with a speed of more than 6 km/h.

### 4.5.3 SETTING WORKING HEIGHT

In ploughs equipped with slides (FIG. 4.8) height adjustment is performed by loosening nut (3) and bolt (4) and proper ejection or withdrawal of slide (1) in the guide. The right and left slides should be put forward at the same height. The recommended distance of the collecting strips from the swept area is 5 to 10 mm. Adjustment of the left and right slide is carried out in the same way.



**FIG. 4.8 Working height adjustment by means of slides**

(1) - slide; (2) - press bolt; (3) - counter-nut;

## 4.6 DRIVING ON PUBLIC ROADS

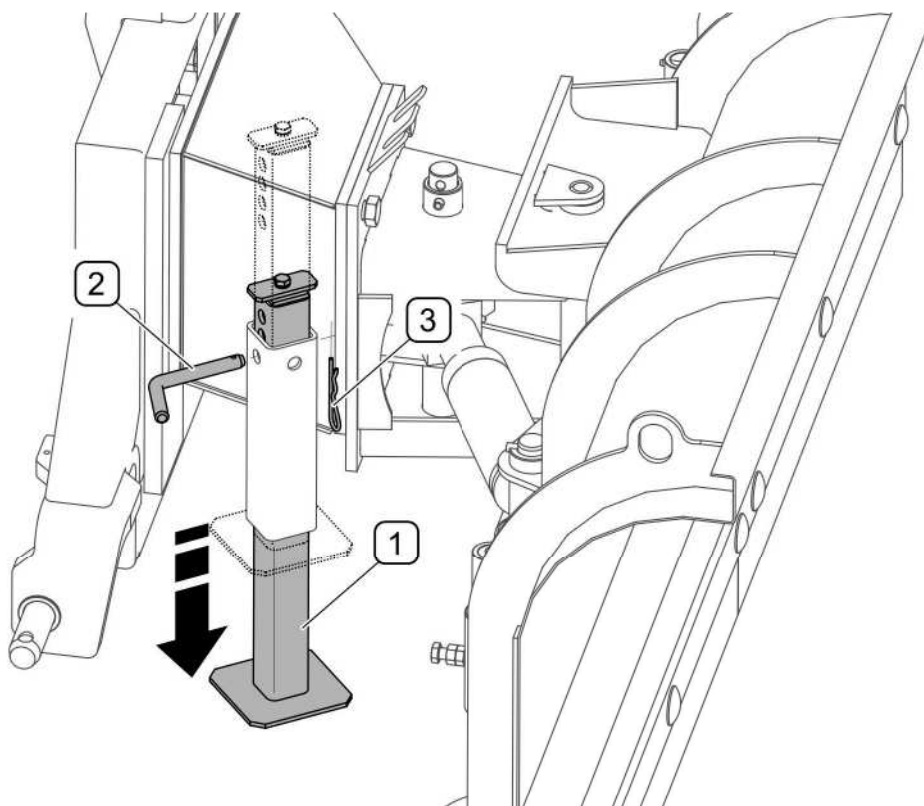
When driving on public roads, respect the road traffic regulations, exercise caution and prudence. If the clearing with plough is done on a pavement special attention should be paid to the bystanders likely to be near the machine. Listed below are the key guidelines.

- Before moving off make sure that there are no bystanders, especially children, near the machine or the tractor. Take care that the driver has sufficient visibility.
- Make sure that the plough is correctly attached to the tractor (carrying vehicle), and linkage is properly secured.
- Permissible design speed and maximum speed allowed by road traffic law must not be exceeded. Speed of travel should be adjusted to prevailing road conditions and other conditions.
- While working a plough turn the orange beacon light in tractor.
- Avoid ruts, depressions, ditches or driving on roadside slopes. Driving across such obstacles could cause the trailer or the tractor to suddenly tilt. Driving near ditches or canals is dangerous as there is a risk of the wheels sliding down the slope or 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 implement raised reduce speed due to dynamic loads and the risk of damaging the machine or carrying vehicle.
- When driving with raised plough set it so as not to obscure the lights or restrict the visibility of the operator.
- When driving with raised implement, secure the tractor (carrying vehicle) linkage against falling or accidental dropping.

## 4.7 DISCONNECTING THE PLOUGH

In order to disconnect the plough from the tractor, proceed as follows:

- with the plough in lifted position, take out securing cotter pin (3) and securing pin (2) (FIG. 4.9)
- lower the support (1) and lock it with securing pin (2) and cotter pin (3).
- lower the plough until it fully rests on the ground,
- turn off the engine in the carrying vehicle, engage the parking brake,
- reduce residual pressure in the hydraulic system by movement of appropriate lever controlling hydraulic circuit,
- disconnect plugs of hydraulic couplers (1), secure them with caps (2) and place in bracket (3) on the plough frame (FIG. 4.10)
- disconnect the plough from the carrying vehicle linkage.



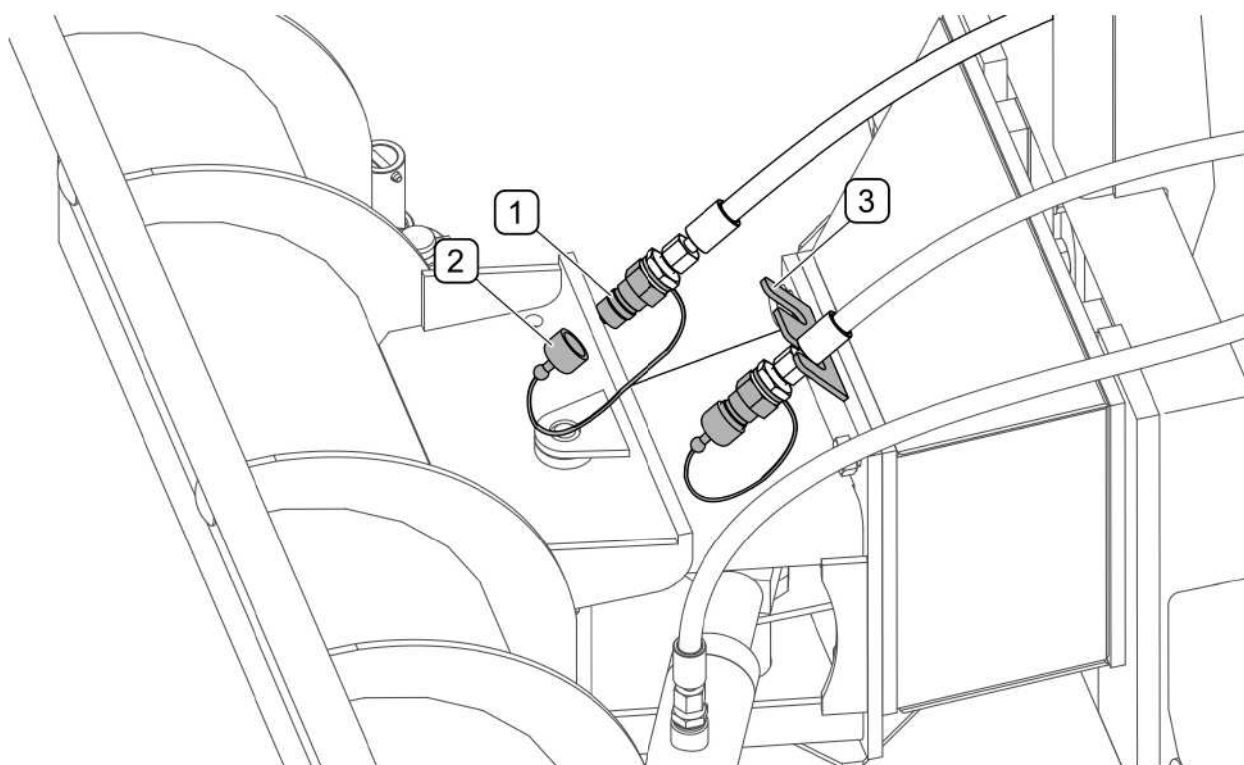
**FIG. 4.9** Lowering of parking stand

(1) - parking stand; (2) - pin, (2) - securing cotter pin

**DANGER**

Reduce pressure prior to disconnecting the hydraulic system.

After disconnecting from carrying vehicle, plough should rest on the ground leaning against slides and parking stand.



**FIG. 4.10**      **Protection of hydraulic couplers**

*(1) - hydraulic coupler; (2) - protective cap; (3) - bracket*



***SECTION***

**5**

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**MAINTENANCE**

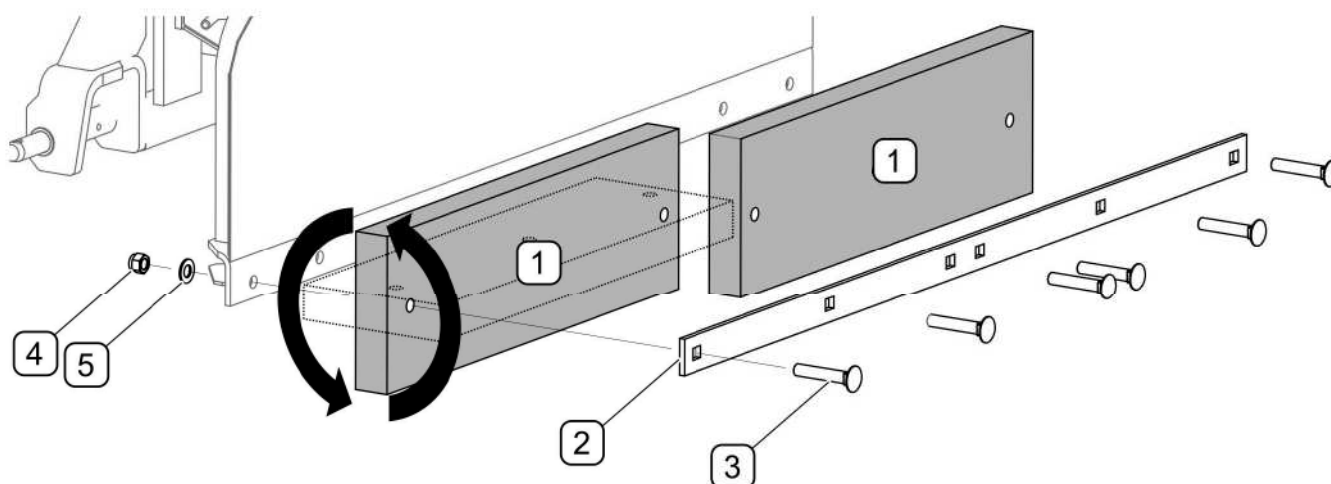
## 5.1 CHECKING AND REPLACEMENT OF COLLECTING STRIPS



### DANGER

During inspection and replacement of collecting strips, switch off tractor engine and remove the key from the ignition.

Before replacing collecting strip raise the plough and support with sufficiently stable and strong supports. If the plough is hitched and raised on the front three-point linkage or other carrying vehicle, protect it from falling and immobilise the vehicle (turn off the engine and engage the parking brake).



**FIG. 5.1** Replacing rubber collecting strip

(1) - rubber collecting strip; (2) - clamping strip; (3) - bolt Z M16x70-8.8;  
(4) - nut M16; (5) - washer 16-100HV

**TAB. 5.1** THE LIST OF COMPONENTS OF RUBBER COLLECTING STRIP

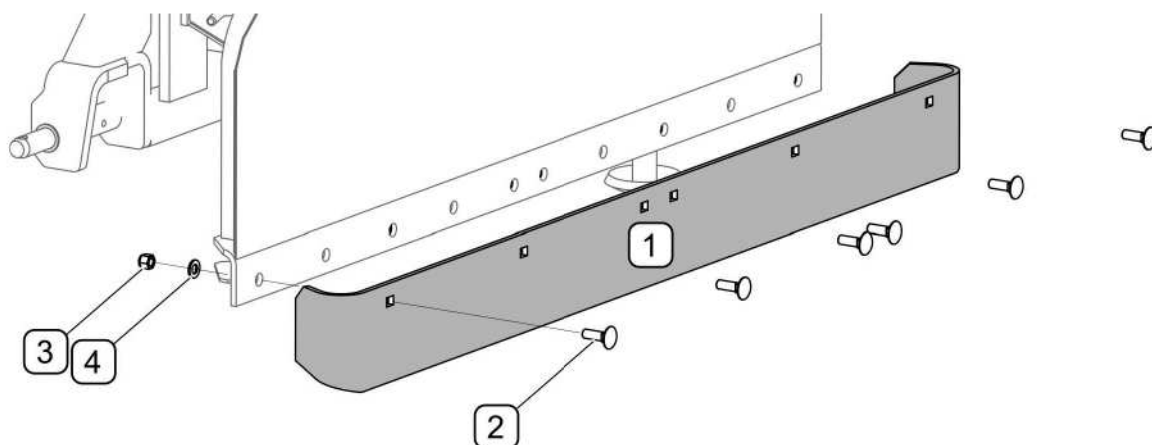
Marking FIG. 5.1	Name / Catalogue No.	Number of items
1	Rubber plough blade / 126N-12000002	2
2	Clamping strip / 157N-05000001	1
3	Bolt Z M16x90-8.8-A2J / PN-M-82406	6
4	Nut M16-8-A2J / PN-EN ISO 7040	6
5	Washer 16-100HV-Fe//Zn / PN-EN ISO 7091	6

In ploughs equipped with rubber collecting strips (FIG. 5.1), a worn strip can be inverted and reinstalled. When collecting strips are worn on both sides, they must be replaced. The list of components of rubber collecting strip is presented in TAB. 5.1. To dismount rubber collecting strips, undo nuts (4), take out bolts (3) and remove clamping strip (2). Install in reverse order.



### DANGER

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



**FIG. 5.2 Replacing metal collecting strip**

(1) - metal collecting strip; (2) - bolt Z M12x40-8.8; (3) - nut M12; (4) - washer 12-100HV

To remove the metal collecting strips (FIG. 5.2) undo nuts (3), remove fixing bolts (2) and remove collecting strip (1). Install the new strip in reverse order.

**TAB. 5.2 THE LIST OF COMPONENTS OF METAL COLLECTING STRIP**

Marking FIG. 5.2	Name / Catalogue No.	Number of items
1	Collecting strip / 157N-06000001	1
2	Bolt M12x40-8.8-A2J / PN-M-82406	6
3	Nut M12-8-A2J/ PN-EN ISO 7040	6
4	Washer 12-100HV-Fe//Zn / PN-EN ISO 7091	6

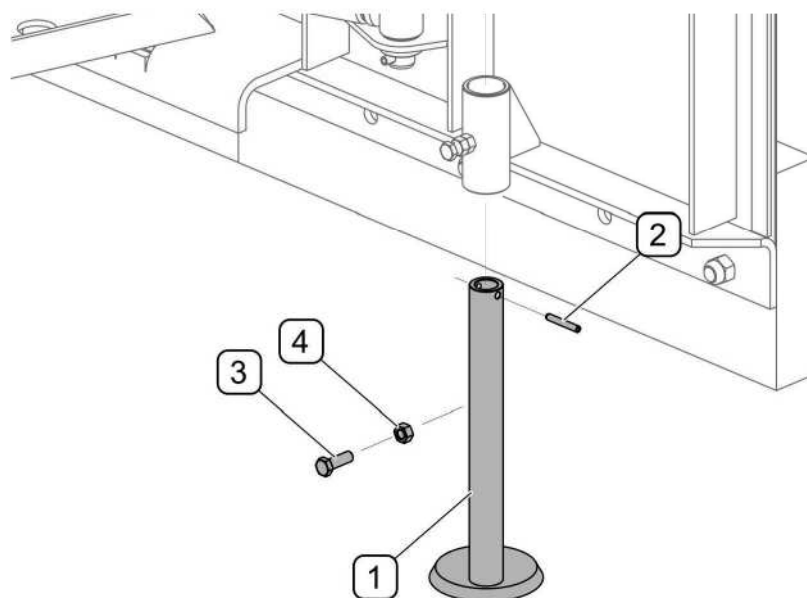
Checking and, if necessary, adjustment of working height is recommended after replacement of collecting strips (see *SETTING OF WORKING HEIGHT*)



### ATTENTION!

Each time snowplough hits an obstacle technical condition of collecting strips and their mounting should be carried out.

## 5.2 SLIDE REPLACEMENT



**FIG. 5.3 Slide replacement**

(1) - slide; (2) - spring pin; (3) - bolt; (4) - counter nut;

Excessively worn or damaged slide must be replaced (FIG. 5.3). In order to do this raise the plough and support with sufficiently stable and strong supports. If the plough is hitched and raised on the carrying vehicle, protect it from falling and immobilise the carrying vehicle (turn off the engine and engage the parking brake). Remove spring pin (2), loosen counter nut (4) and unscrew bolt (3) fixing the slide (1). Check the slide and other components for damage or excessive wear. Install in reverse order. The right slide and the left slide are replaced in the same way. The list of slide components including catalogue numbers is shown in TAB. 5.3

**TAB. 5.3 THE LIST OF SLIDE COMPONENTS**

Marking FIG. 5.3	Name / Catalogue No.	Number of items
1	Slide / 157N-35010000	1
2	Spring pin 6x40 C / PN-EN ISO 8752	1
3	Bolt M10x30-8.8-A2J / PN-EN ISO 4017	1
4	Nut M10-8-A2J / PN-EN ISO 4032	1

Checking and, if necessary, adjustment of working height is recommended after replacement of slides (see *SETTING OF WORKING HEIGHT*)

## 5.3 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 conduits and quick couplers;



### **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.

In a new machine, the hydraulic system is factory-filled with HL32 hydraulic oil. The oil applied because of its composition is not classified as a dangerous substance, however long-term action on the skin or eyes may cause irritation. In the event of contact of oil with skin wash the place of contact with water and soap. Do NOT apply organic solvents (petrol, kerosene). Contaminated clothing should be changed to prevent access of oil to skin. In the event of contact of oil with eye, rinse with large quantity of water and in the event of the occurrence of irritation consult a doctor. Hydraulic oil in normal conditions is not harmful to the respiratory tract. A hazard only occurs when oil is strongly atomised (oil vapour), or in the case of fire during which toxic compounds may be released.



### **DANGER**

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



### **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.

**TAB. 5.4 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 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.



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

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



### **ATTENTION!**

**The hydraulic system is vented automatically during machine operation.**



**Hydraulic conduits should be replaced after 4 years of machine use.**

## 5.4 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 permanent grease is recommended for lubrication.



### DANGER

Lubrication may only be performed when plough is lowered, and resting on the ground. Before commencing lubrication switch off engine, remove key from ignition and engage tractor parking brake.

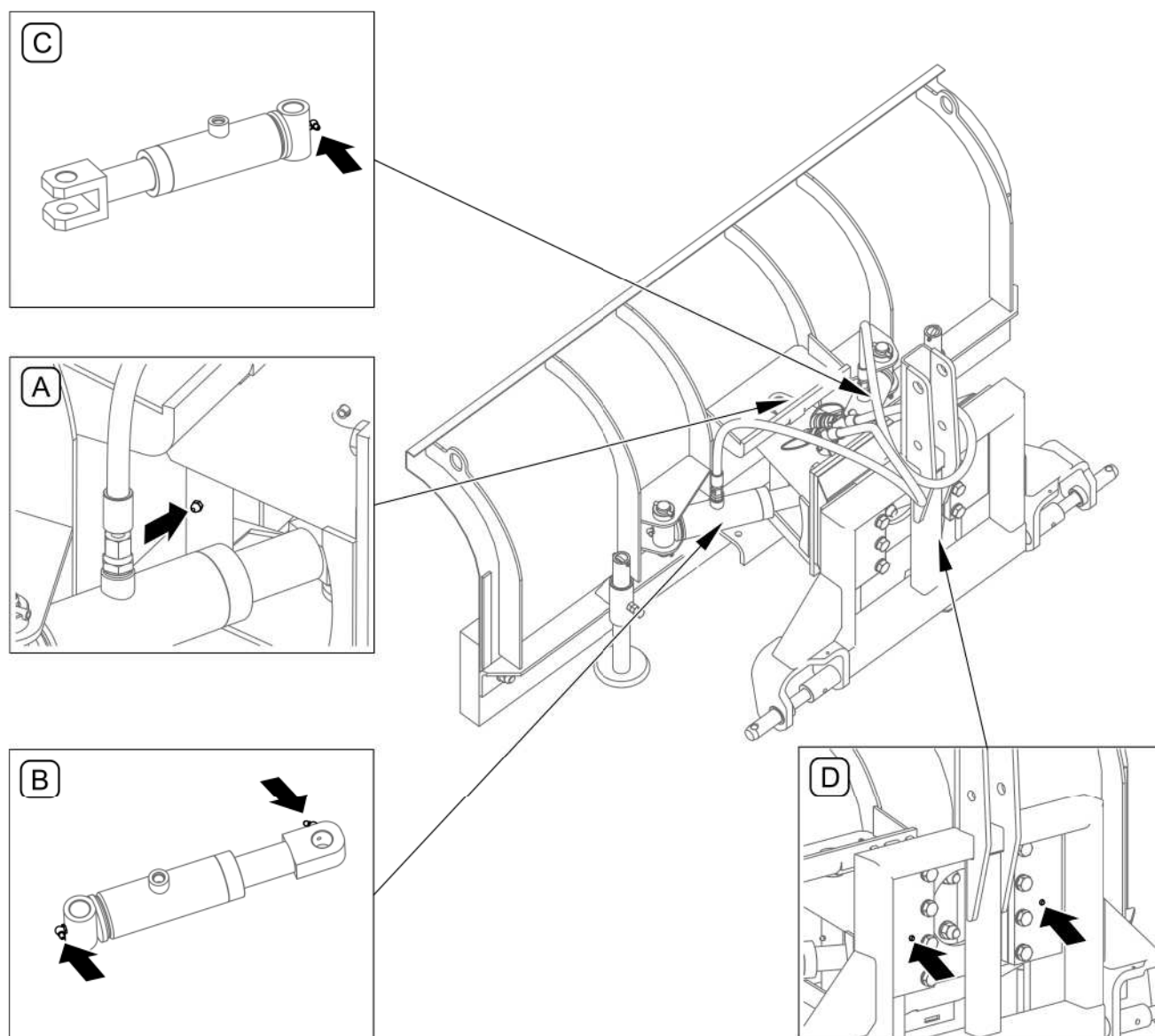


When using the mower the user is obliged to observe lubrication instructions according to attached schedule. Excess lubrication substance causes depositing additional contaminants in places requiring lubrication, therefore it is essential to keep individual machine elements clean.

**TAB. 5.5 LUBRICATION POINTS AND LUBRICATION FREQUENCY**

ITEM	NAME	NUMBER OF LUBRICATION POINTS	TYPE OF GREASE	LUBRICATION FREQUENCY
A	Mouldboard rotation pivot	1	permanent grease	50 hours
B	Cylinder ram eye and left cylinder eye	2		50 hours
C	Right cylinder eye	1		50 hours
D	Linkage plates	2		20 hours

Marking description in Item column (0) conforms with numbering shown (FIG. 5.4)



**FIG. 5.4 Lubrication points**

*Lubrication points described in table 5.5*

## 5.5 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 conduits. Nozzle of pressure or steam washer should be kept at a distance of not less than 30 cm from cleaned surface.

After cleaning, inspect the whole machine, inspect technical condition of individual components. Used or damaged components 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 components regardless of the period of the last lubrication process. Additionally before the winter period apply grease to hitching system pins.

## 5.6 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 (TAB. 5.6).



### 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. 5.6 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

## 5.7 TROUBLESHOOTING

**TAB. 5.7 TROUBLESHOOTING**

TYPE OF FAULT	CAUSE	REMEDY
Mouldboard does not move as you control the working position	The hydraulic system is not connected	Connect quick couplers to tractor (carrying vehicle) system.
	Damaged hydraulic quick couplers	Check quick couplers for damage, refer repair to service, if necessary
	Tractor hydraulic system unreliable switched off	Check the tractor (carrying vehicle) hydraulic system
Plough scoops snow unevenly	Plough improperly mounted (set) on a carrying vehicle	Check and adjust according to operator's manual
	Slide incorrectly positioned	Check and adjust according to operator's manual
	Excessively worn or damaged collecting strips	Check and replace if necessary

[illegible]