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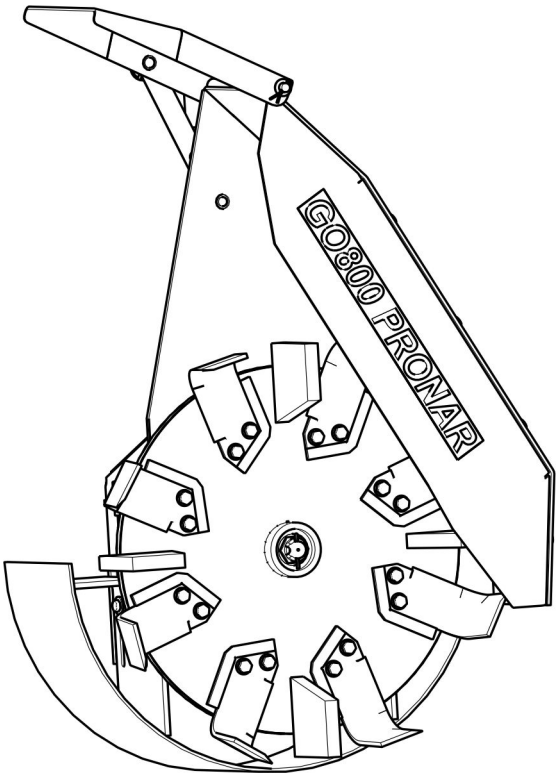
OPERATOR MANUAL

DITCH DIGGER

PRONAR GO800

TRANSLATION OF THE ORIGINAL COPY OF THE MANUAL



EDITION 1B-06-2012 PUBLICATION NO. 268N-00000000-UM

EN

DITCH DIGGER

PRONAR GO800

MACHINE IDENTIFICATION

SYMBOL /TYPE:

SERIAL NUMBER:

INTRODUCTION

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

This Operator Manual is an integral part of the machine documentation. Before using the machine, the user must carefully read this Operator Manual and observe all recommendations. This guarantees safe operation and ensures failure-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 principles of safe use and operation of the GO800 ditch digger. If the information in this Operator Manual needs clarification, refer for assistance to the sale point where the machine was purchased or to the Manufacturer.

MANUFACTURER'S ADDRESS:

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SYMBOLS APPEARING IN THIS OPERATOR 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.

Vital information and instructions that must be observed are by the symbol:

and also preceded by the word **"IMPORTANT".** 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 Manual is marked with the pictogram:

Additional tips and advice for machine operation are marked with the sign:

and also preceded by the word **"TIP".**

DIRECTIONS USED IN THIS OPERATOR 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:	**Ditch digger**
Type:	**GO800**
Model:	–
Serial number:	
Commercial name:	**Ditch digger PRONAR GO800**

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 -03- 24

Place and date

Z-CA DYREKTORA
d/s technicznych
członek zarządu
Roman Kielianiuk

Full name of the empowered person position, signature

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SECTION

1

BASIC INFORMATION

1.1 IDENTIFICATION

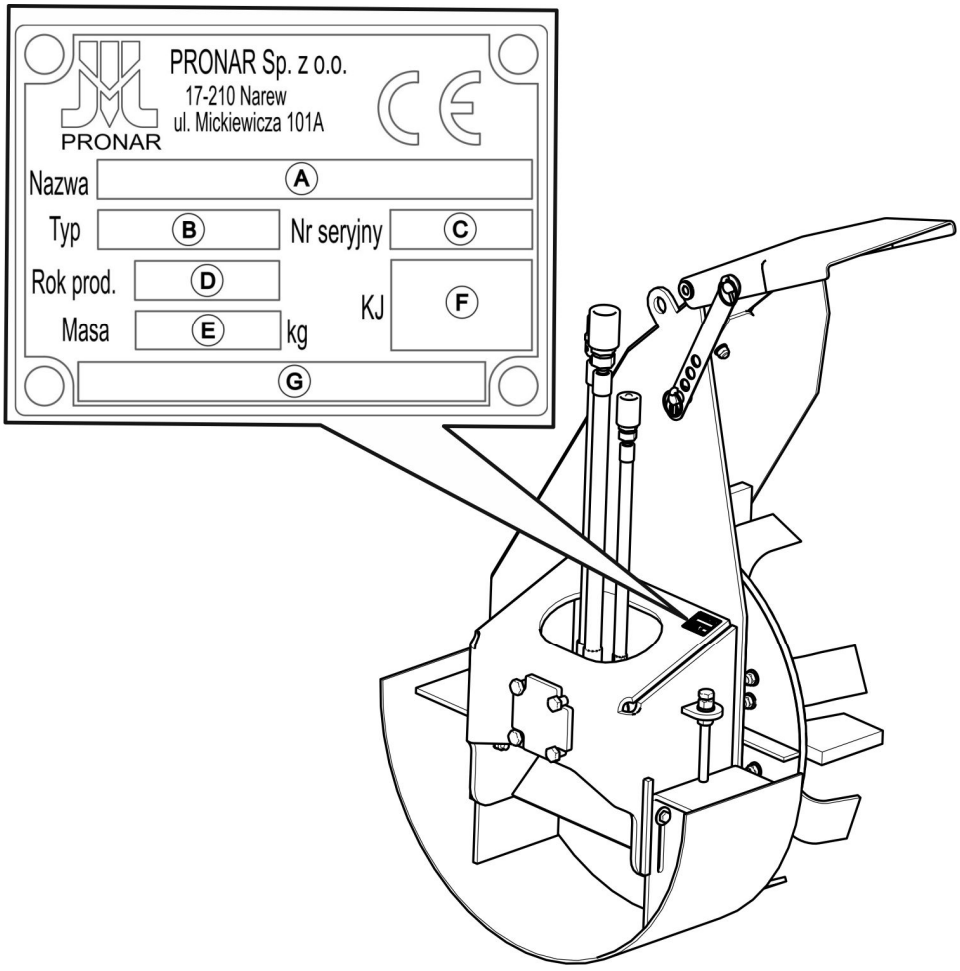


FIGURE 1.1 Location of the nameplate.

The PRONAR GO800 ditch digger is marked with the nameplate located on its body. When purchasing the machine, make sure that the serial numbers on the machine are the same as entered in the *WARRANTY BOOK*, in sales documents and in the *OPERATOR MANUAL*.

The meaning of individual items of the nameplate – figure (FIGURE 1.1) are presented in the table below:

A - machine name, B - machine type/symbol

C – serial number, D – year of manufacture,

E - tare weight [kg], F – Quality Control stamp,

G – machine name, name extension

1.2 INTENDED USE

IMPORTANT

The PRONAR GO800 is compatible only with the multifunction arm: PRONAR WWP600 / 500 / 500U / 500UH.

PRONAR WWT600 / 604D / 600P / 604P / 700T / 704T (TYPE 80 connector)

PRONAR WWT420 / 424C / 480 / 480C (TYPE 80 connector)

PRONAR WWT800T / 804T

The PRONAR GO800 ditch digger on a multifunctional arm is used to clean roadside ditches and drainage ditches from vegetation, silt, sand and sediments deposited by the water. Design of multifunction arm enables operation in hard to reach areas such as roadside ditches or drainage ditches behind protective barriers. The ditch digger is mounted on the floating multifunction arm, which allows for perfect ground contour following.

Transporting people, animals or other loose materials using the ditch digger is prohibited and regarded as contrary to the intended purpose. During the use of the machine comply with all road traffic regulations and transport regulations in force in the given country, and any breach of these regulations is regarded by the Manufacturer as use contrary to the intended use of the machine.

IMPORTANT

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

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

Using it as intended 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 MANUAL* and comply with its recommendations,
- understand the machine's operating principle and how to operate it safely and correctly,
- adhere to the established maintenance and adjustment plans,
- comply with general safety regulations while working,
- prevent accidents,
- comply with the road traffic regulations and transport regulations in force in the given country, in which the machine is used,
- carefully read the Operator Manual of the agricultural tractor or implement carrier and the Operator Manual of the multifunction arm and comply with their recommendations.

The machine may only be used by persons, who:

- are familiar with the contents of this publication and with the contents of the Operator Manual of the agricultural tractor or implement carrier and the Operator Manual of the multifunction arm,
- have been trained in the machine operation and work safety,
- have the required authorisation to drive and are familiar with the road traffic regulations and transport regulations.

1.3 EQUIPMENT

TABLE 1.1 The PRONAR GO800 ditch digger equipment

EQUIPMENT	STANDARD	OPTION
Operator Manual	•	
Warranty Book	•	

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 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 cover those parts and sub-assemblies of the machine which are subject to wear in normal usage conditions, regardless of the warranty period. These elements include blades, among other things.

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, damage caused by road accidents,
- by incorrect use, adjustment or maintenance, use of the ditch digger for purposes other than those for which it is intended,
- use of damaged machine,
- repairs carried out by unauthorised persons, repairs carried out improperly,
- making unauthorised alterations to machine design,

the user will lose the right to warranty service.

TIP

Demand that the seller carefully and accurately 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.

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 warranty or not. For detailed Terms & Conditions of Warranty, please refer to the WARRANTY BOOK attached to each newly purchased machine.

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

1.5 TRANSPORT

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

IMPORTANT

When transporting independently, the user must carefully read this Operator Manual and observe all its instructions. 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 use extreme caution while driving. This is due to the vehicle's centre of gravity shifting upwards when the machine is loaded.

Delivery is either by transport on a vehicle or independently. Transporting the machine connected to the multifunction arm is allowed provided that the tractor or implement carrier driver is familiar with the Operator Manual of the machine and of the multifunction arm, and in particular, familiar with all the relevant safety information and how to hitch and transport the machine on public roads. Do NOT drive the tractor or implement carrier with the multifunction arm and the machine connected when visibility is limited.

When loading and unloading the machine, follow the general health and safety regulations for reloading work. Persons operating reloading equipment must have the qualifications required to operate these machines.

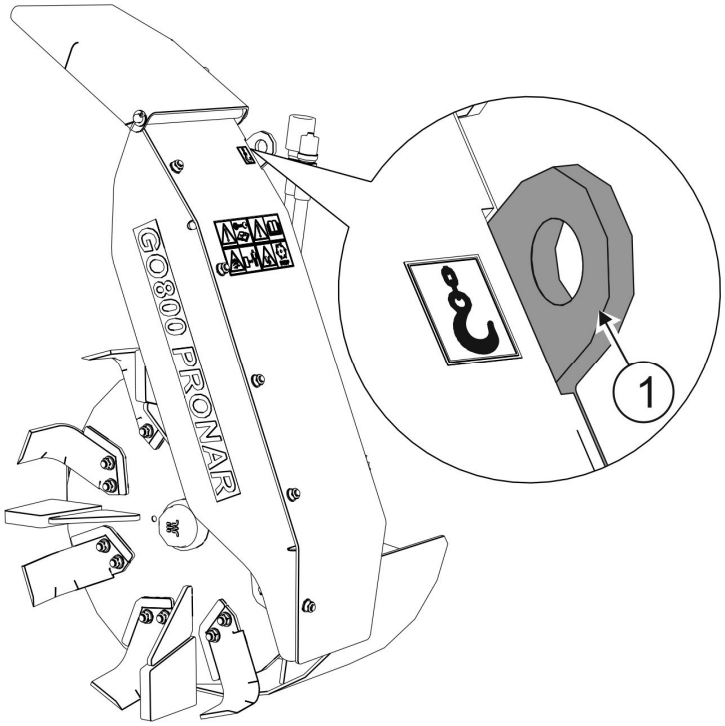


FIGURE 1.2 Transport lugs.

(1) transport lug

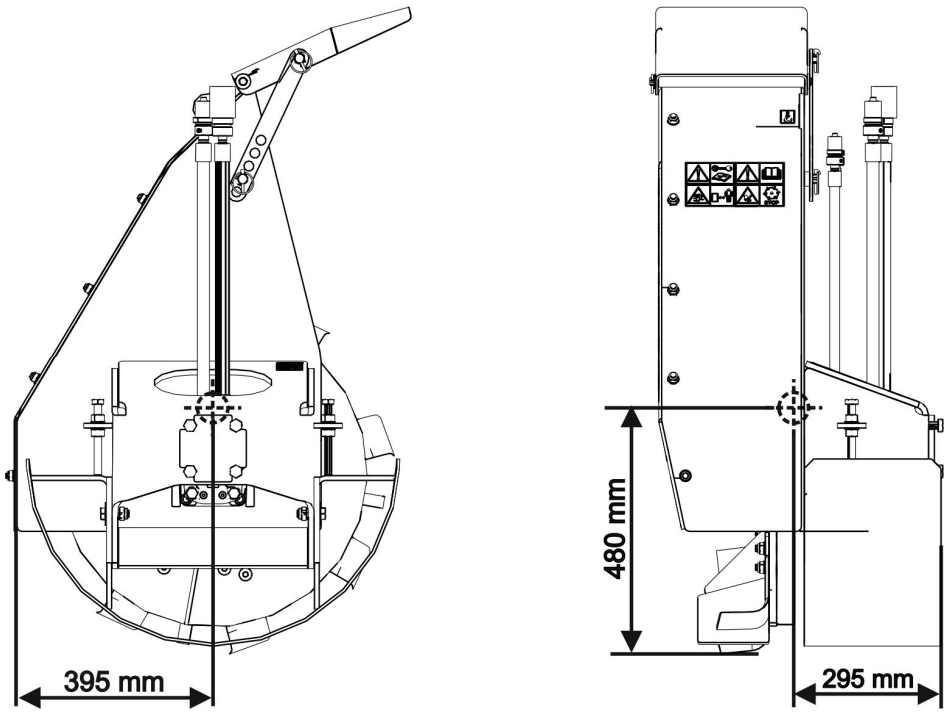


FIGURE 1.3 Location of the centre of gravity.

The ditch vacuum cleaner should be attached to lifting devices in specially designed places (FIGURE 1.2), i.e. to the transport lug in the upper part of the machine body.

The machine should be firmly secured on the transportation platform with belts or chains equipped with a tensioning mechanism. The fastening equipment used must have a valid safety certificate. Exercise due caution when lifting the machine. To keep lifted machine in the correct direction it is recommended to apply additional guy cables. During reloading work, special care should be taken not to damage the paint coating.

IMPORTANT

Persons must NOT be present in the manoeuvring zone during transferring the machine to another means of transport.

1.6 ENVIRONMENTAL RISK

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 contaminations, 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 loss of its properties should be stored in its original packaging in the conditions described above.

1.7 WITHDRAWAL FROM USE

Should you decide to withdraw the machine from use, comply with the regulations in force in the given country regarding 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. Used oil and also rubber and plastic elements should be taken to the appropriate facilities dealing with the recycling of this type of waste.

IMPORTANT

During dismantling, use the appropriate tools, equipment and use personal protection equipment, i.e. protective clothing, footwear, gloves and eye protection 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 MACHINE USE

- Before use, the user must carefully read this Operator Manual and the *WARRANTY BOOK*. When operating the machine, follow all instructions in these documents.
- The machine may only be used and operated by persons qualified to drive agricultural tractors and carrier vehicles and trained in the use of the machine. Machine can be operated by a single person only.
- If the information in this Operator Manual is difficult to understand, contact the seller who runs the authorised technical service on behalf of the Manufacturer, or contact the Manufacturer directly.
- Careless and improper use and operation of the machine, and failure to comply with the instructions of this operator manual is dangerous to your health.
- Be aware of the residual risk. Use caution when operating this machine and follow all relevant safety instructions.
- This machine must never be used by persons who are not authorised to drive agricultural tractors or implement carrier, including children and people under the influence of alcohol, drugs 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 in any other way than the way intended takes full responsibility 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 safety guards and other protective elements are technically sound and correctly positioned. In the event of loss or damage to the protective guards , they must be replaced with new ones.
- In order to limit occupational risks associated with exposure to noise during the machine operation, use individual protection (hearing protectors). In order to

reduce the level of noise during work, the operator cab windows and door should be closed.

2.1.2 HITCHING AND UNHITCHING THE MACHINE

- Do NOT connect the machine to a multifunction arm of other type than the recommended by the manufacturer.
- After hitching the machine, check the safeguards. Carefully read the tractor (carrier vehicle) Operator Manual.
- Use only original bolts and protections to hitch the machine to the multifunction arm.
- The multi-functional arm to which the machine will be attached must be technically reliable and must meet all manufacturer's requirements.
- Be especially careful when hitching the machine.
- When hitching, there must be nobody between the ditch digger and the multifunction arm and the tractor.
- Do NOT uncouple the ditch digger from the multifunction arm when it is lifted. Exercise caution when unhitching the machine.
- Coupling and uncoupling may only take place when the machine and tractor (carrying vehicle) are turned off.
- The ditch digger disconnected from the multifunction arm, must be placed on a stable, even, horizontal surface.

2.1.3 HYDRAULIC SYSTEM

- The hydraulic system is under high pressure when operating.
- Regularly check the technical condition of the hydraulic lines and connections. There must be no oil leaks.
- In the event of the hydraulic system malfunction, discontinue using the machine until the malfunction is corrected.

- When connecting the hydraulic lines to the hydraulic motor, make sure that the hydraulic system of the multifunction arm is not under pressure. If necessary, reduce residual pressure in the system.
- In the event of injuries being caused by pressurised hydraulic oil, contact a doctor immediately. Hydraulic oil may penetrate the skin and cause infections. In the event of contact of oil with eye, rinse with large quantity of water and in the event of the occurrence of irritation consult a doctor. In the event of contact of oil with skin wash the area of contact with water and soap. Do NOT apply organic solvents (petrol, kerosene).
- Use the hydraulic oil recommended by the Manufacturer. Never mix two types of oil.
- After changing the hydraulic oil, the used oil should be properly disposed of. Used oil or deteriorated oil should be stored in original containers or replacement containers resistant to hydrocarbons. Replacement containers must be clearly marked and appropriately stored.
- Do not store hydraulic oil in packaging designed for storing food or foodstuffs.
- Rubber hydraulic lines must be replaced every 4 years regardless of their technical condition.
- Repair and replacement of hydraulic system elements should be entrusted to the appropriately qualified persons.

2.1.4 TRANSPORTING THE MACHINE

- When driving on public roads, observe all road traffic regulations in force in the country, in which the machine is used.
- Do not exceed the maximum speed resulting from road conditions and design restrictions. Adjust speed to the prevailing road conditions and other limitations arising from road traffic regulations.
- Before driving off, the ditch digger must be folded to transport position and mounted on the hitch of the multifunction arm head.
- Do NOT leave machine raised and unsecured while the tractor (implement carrier) is parked. When parked, the machine should be lowered.

- Do not transport the ditch digger in the working position.
- The ditch digger may not be used or transported in conditions of limited visibility.
- Do NOT ride on the machine or transport any materials on it.
- Before using the machine always check its technical condition, especially in terms of safety. In particular, check the technical condition of the linkage, guards, rotor and hydraulic system connections.
- 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 ditch digger until the fault has been fixed.
- During work, use appropriate, close-fitting protective clothing, gloves and appropriate tools. When working on hydraulic system it is recommended to use oil resistant gloves and protective goggles.
- Any modification of the ditch digger releases the manufacturer from any responsibility for damage or detriment to health which may arise as a result.
- Before commencing any work on the dust collector, turn off the tractor (carrying vehicle) engine and wait until all rotating parts have come to a stop.
- Regularly check the technical condition of the safety devices and correct tightening of bolt connections.
- Regularly perform service inspections of machine as recommended by the Manufacturer.
- Do NOT perform maintenance or repair work under raised and unsupported machine.
- Before beginning repairs on hydraulic systems, reduce oil pressure.
- Servicing and repair work should be carried out in line with the general principles of workplace health and safety. In the event of injury, the wound must be immediately

cleaned and disinfected. In the event of more serious injuries, seek a doctor's advice.

- Repair, maintenance and cleaning work should be carried out with the tractor/carrier vehicle engine turned off and the ignition key removed. Immobilise the tractor/carrier vehicle with parking brake. Ensure that unauthorised persons do not have access to the vehicle 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.
- Regularly check technical condition and mounting of all guards and protective elements.
- In the event of work requiring the ditch digger 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 only been raised with the multifunction arm.
- The machine must not be supported using fragile elements (bricks or concrete blocks).
- After completing work associated with lubrication, remove excess oil or grease.
- Damaged, missing or excessively worn blades must be replaced in pairs (simultaneously with the blade located on the opposite side of the rotor disk) in order to keep the rotor disk balanced.
- In order to reduce the danger of fire the machine must be kept in a clean condition.

2.1.6 OPERATE THE DITCH DIGGER

- Before lowering or lifting the ditch digger mounted on the multifunction arm, make sure there are no bystanders near the machine.
- Before starting the drive, the ditch digger must be in working position.
- 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.

- Digging should begin after reaching the nominal speed of the multifunction arm's PTO. Do NOT overload the machine.
- When digging on the edges of streets, public roads, on stony ground there is a risk that thrown out stones and foreign objects may pose a risk to bystanders and other vehicle passing by.
- Do NOT leave the tractor/carrier vehicle cab, when the machine drive is engaged.
- Do NOT stand within the machine's working zone.
- Do NOT approach the guards of the working disc until the rotating prats have come to a complete stop.
- Do NOT operate the machine while reversing. Raise the machine while reversing.
- When driving with a raised ditch digger, keep a safe distance from electric lines.

2.2 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 machine for purposes other than those for which it is intended,
- being between the tractor/carrier 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 ditch digger with removed or faulty safety guards,
- failure to maintain a safe distance from the danger zone or being within the zones while the machine is operating,
- machine operation by unauthorized persons or persons under the influence of alcohol
- cleaning, maintenance and technical inspection with the multifunction arm connected and in operation.

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

- operate the machine in prudent and unhurried manner,

- sensibly apply the remarks and recommendations contained in the Operator Manual,
- carry out repairs and maintenance work in line with operating safety rules,
- repair and maintenance work should be carried out by persons trained to do so,
- use close fitting protective clothing,
- ensure unauthorised persons have no access to the machine, especially children.
- maintain a safe distance from forbidden or dangerous places
- do not climb on the machine when it is operating

2.3 INFORMATION AND WARNING DECALS

The ditch digger is labelled with the information and warning decals listed in table (*2.1*). The arrangement of symbols is shown in figure (*2.1*). Throughout the machine use, you must ensure that any warning messages and information decals located on the machine are clear and legible. If any are destroyed or damaged, they must be replaced with new. Safety decals are available from your PRONAR dealer or directly from PRONAR customer service. New assemblies, changed during repair, must be labelled once again with the appropriate safety signs. When cleaning the ditch digger, do not use solvents that can damage the coating of information decals and do not subject them to strong water jets.

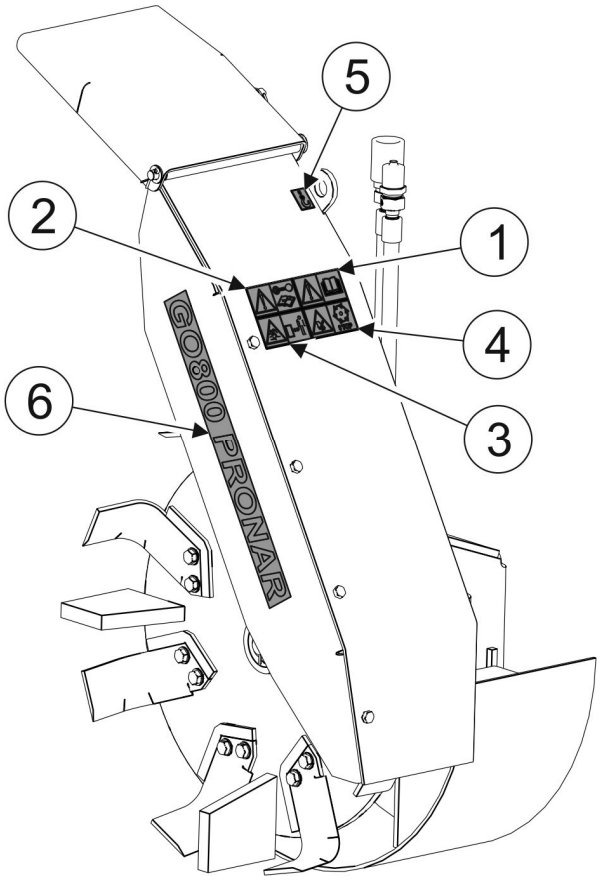
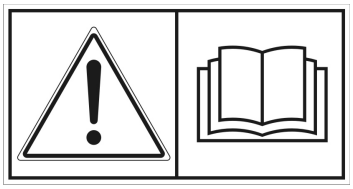
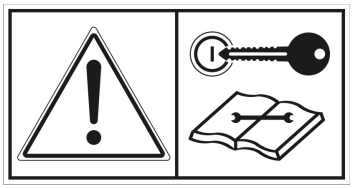
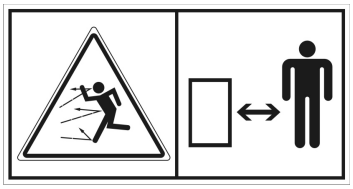


FIGURE 2.1 Locations of information and warning decals

Meaning of symbols (TABLE 2.1)

TABLE 2.1 Information and warning decals

ITEM	DECAL	MEANING
1		Before starting work, carefully read the Operator Manual.
2		Before maintenance or repairs, turn off engine and remove key from ignition.
3		Thrown out objects endanger the whole body. Keep a safe distance from the operating machine.

ITEM	DECAL	MEANING
4		Do not touch any rotating elements until they come to a complete stop.
5		Transport lug points marking.
6	**GO800 PRONAR**	Machine type

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

SECTION

3

DESIGN AND OPERATION

3.1 TECHNICAL SPECIFICATION

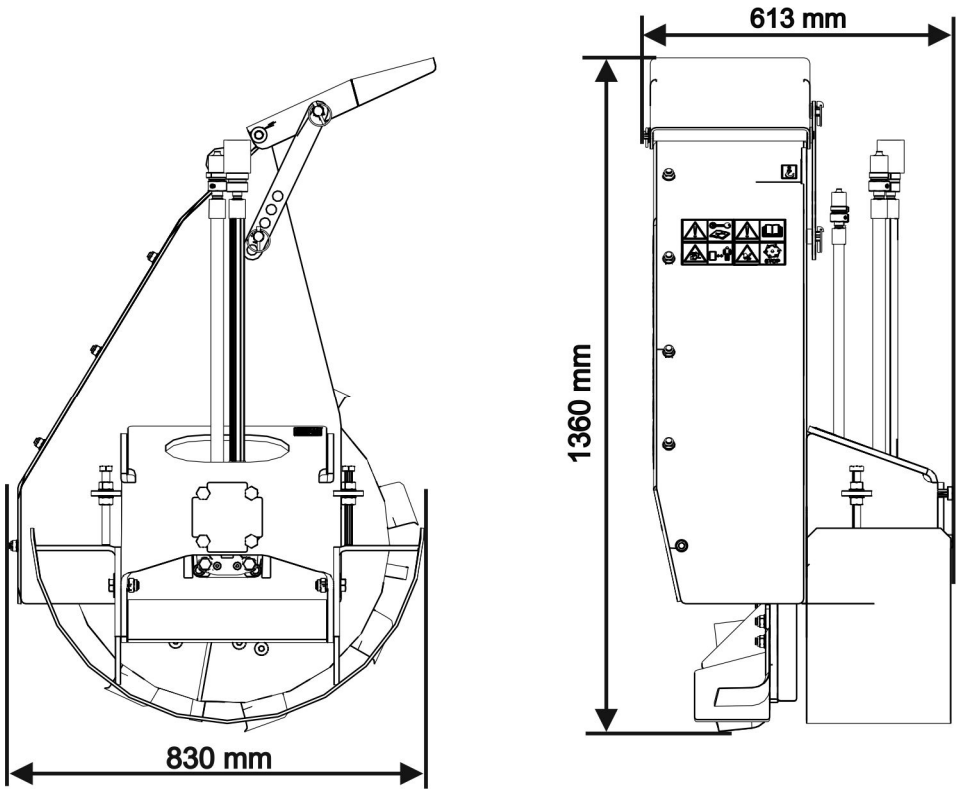


FIGURE 3.1 Basic dimensions

TABLE 3.1 BASIC TECHNICAL DATA

	Unit	**GO800**
Dimensions and weight		
Length	mm	613
Width	mm	830
Height	mm	1360
Tare weight	kg	220
Technical specification		
Working disc diameter	mm	∅800
Number of blades	pc.	8
Nominal oil working pressure	bar	220
Nominal oil flow rate	l/min	90
Hydraulic motor power	kW	35
Adjustable discharge direction	-	-

3.2 GENERAL DESIGN

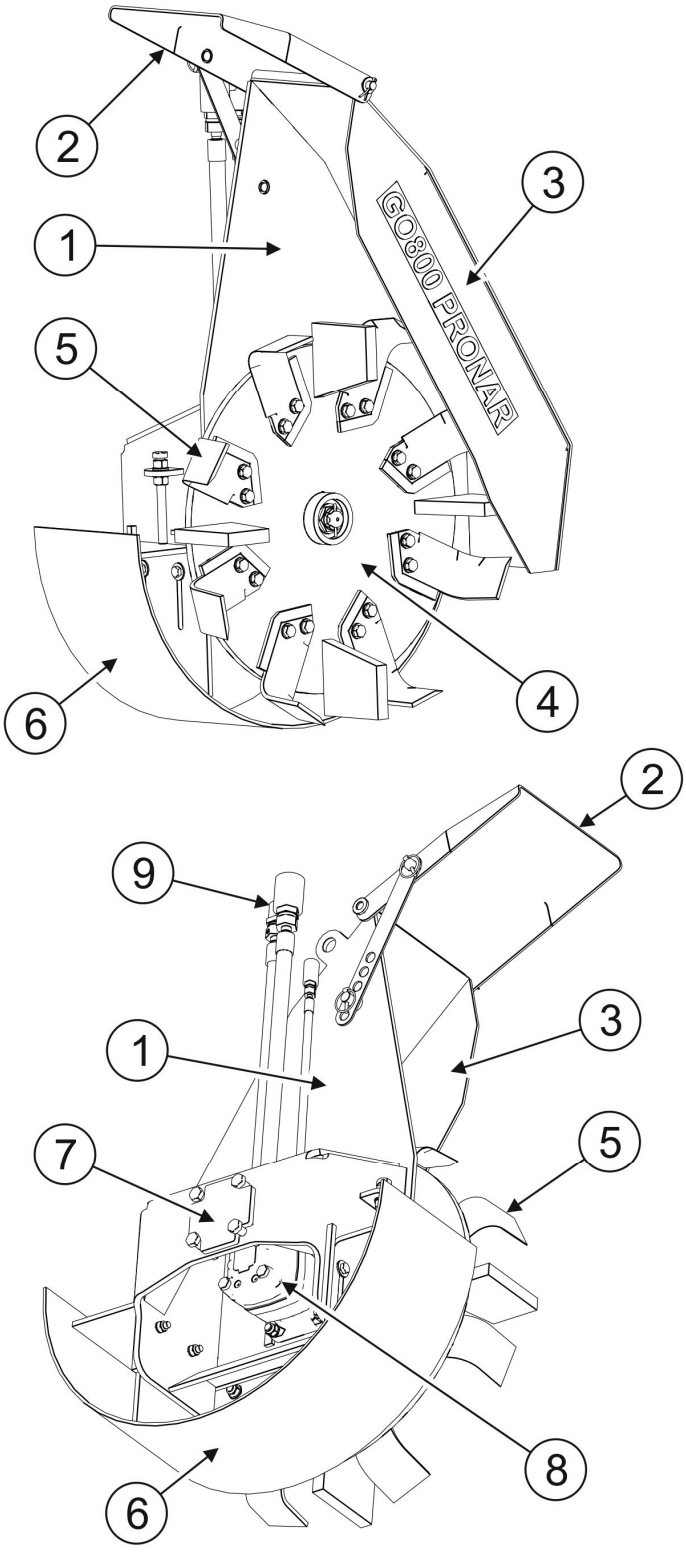


FIGURE 3.2 General design.

(1) - ditch digger body; (2) - adjustable deflector; (3) - side cover; (4) - rotor; (5) - angular blades ; (6) - skid; (7) - head connection; (8) - hydraulic motor; (9) - hydraulic lines;

The ditch digger consists of the body (1) (FIGURE 3.2) with a connection (7) allowing coupling the ditch digger with the head of the multifunction arm.

The ditch digger saw is driven by hydraulic motor (8) that is supplied through hydraulic lines (9) running from the multifunction arm. The drive from the hydraulic motor is transmitted directly to the rotor (4) with angled blades (5) mounted on it.

The rotor working depth is adjusted by changing the setting of the skid (6), which follows the contour of the ditch, in relation to the rotor disc (4). The material ejected from the bottom of the ditch is guided to the slope of the ditch by means of an appropriately constructed body (1) and an adjustable deflector (2).

SECTION

4

CORRECT USE

4.1 GET READY FOR OPERATION

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.

NOTE

Before using the ditch digger always check its technical condition. In particular, check the technical condition of the rotor, blades, drive system and the integrity of safety guards.

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

- the user must carefully read this Operator Manual and observe all recommendations, understand the design and the principle of machine operation,
- check the condition of protective paint coat,
- inspect machine's individual components for mechanical damage resulting from incorrect transport (dents, piercing, bent or broken components),
- check technical condition of the hydraulic system;
- check if angular blades, rotor disc, linkage, safety guards are correctly installed,

If all the above checks have been performed and there is no doubt as to the machine's good technical condition, hitch the machine to the multifunction arm. Start the tractor/carrier vehicle's engine, check all systems and perform a test run before beginning work. In order to inspect:

- hitch the ditch digger to the multifunction arm (see *"HITCHING TO MULTIFUNCTION ARM"*)
- set it in working position,
- power up the multifunction arm, and then use the control panel to start the ditch digger drive.

Engage ditch digger drive for 3 minutes and check the following:

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

- whether the rotor disc generates excessive vibrations,
- synchronised rotation of the rotor (FIGURE 4.1).

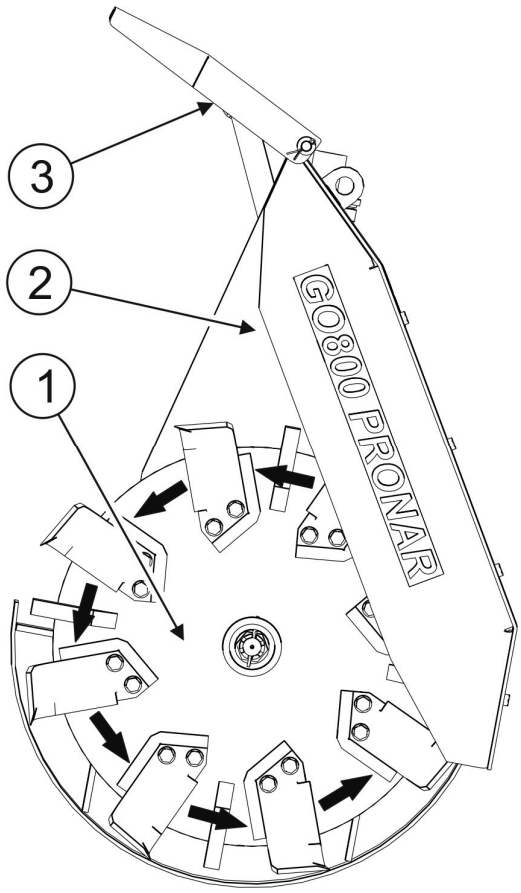


FIGURE 4.1 synchronised rotation of the rotor disc the ditch digger body.

(1) - rotor disc; (2) - ditch digger body; (3) - deflector

The direction of rotation of the rotor should be such that the material thrown out by the rotor from the bottom of the ditch is directed towards the body, cover, and then to the deflector.

NOTE

Before using the ditch digger always check its technical condition. In particular, check the technical condition of the rotor disc, linkage, drive system and integrity of safety guards.

The operation of the ditch digger at no load should be smooth. Vibrations of the hydraulic motor, rotor disc, varying noises and vibrations from loose bolted connections are unacceptable. After the rotor disk has come to a complete stop, check the mounting of the angled blades. Confirm that oil does not leak from the hydraulic motor.

DANGER

Before using the machine, the user must carefully read this Operator Manual

Careless and incorrect use and operation of the machine, and failure to follow instructions in this Operator Manual is dangerous to your health.

The ditch digger must never be used by persons who are not authorised to drive agricultural tractors/carrier 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, ensure that there are no bystanders in the danger zone.

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

4.2 TECHNICAL INSPECTION

To get the machine ready for use, check components according to guidelines presented in Table *4.1*.

TABLE 4.1 TECHNICAL INSPECTION SCHEDULE

DESCRIPTION	MAINTENANCE ACTIVITIES	FREQUENCY
Condition of safety guards	Check the technical condition of safety guards, if complete and correctly mounted.	Daily before beginning work
Check if hydraulic lines and linkage are correctly installed	Check if correctly installed	
Technical condition of angular blades	Visually inspect and, if necessary, replace according to section *"CHECK AND REPLACE BLADES"*	
Technical condition of the hydraulic system.	Check according to section "*HYDRAULIC SYSTEM MAINTENANCE"*	
Check if all main nut and bolt connections are properly tightened	Tightening torque should be according to table *5.2*	Every six months

NOTE

Do NOT use an inoperative ditch digger.

4.3 HITCHING TO MULTIFUNCTION ARM

NOTE

Before aggregating the ditch digger, read the operating instructions for the ditch digger, tractor (carrying vehicle) and multifunction arm, and observe all instructions provided.

DANGER

When hitching, there must be nobody between the machine and the tractor/carrier vehicle.

Exercise caution when hitching the machine.

DANGER

Before hitching the ditch digger, turn off the tractor/carrier vehicle engine and remove the key from the ignition. Ensure that unauthorised persons do not have access to the tractor/carrier vehicle cab.

Check technical condition of the ditch digger guards and general technical condition of the machine.

In order to hitch the ditch digger to the multifunction arm head (FIGURE 4.2), proceed as follows:

- Control the multifunction arm and bring its head *(1)* close to the connection *(2)* of the ditch digger.
- Using the control panel, set the multifunction arm head *(1)* at the same height with the connection of the ditch digger.
- Immobilize the tractor/carrier vehicle and prevent it from moving.
- Connect the multifunction arm head *(1)* to the connection of the ditch digger *(2)* using four fixing bolts (3).
- Connect the hydraulic lines of the multifunction arm with the quick couplers (5) of the hydraulic motor (4) of the ditch digger.
- Raise the ditch digger using control panel of multifunction arm.

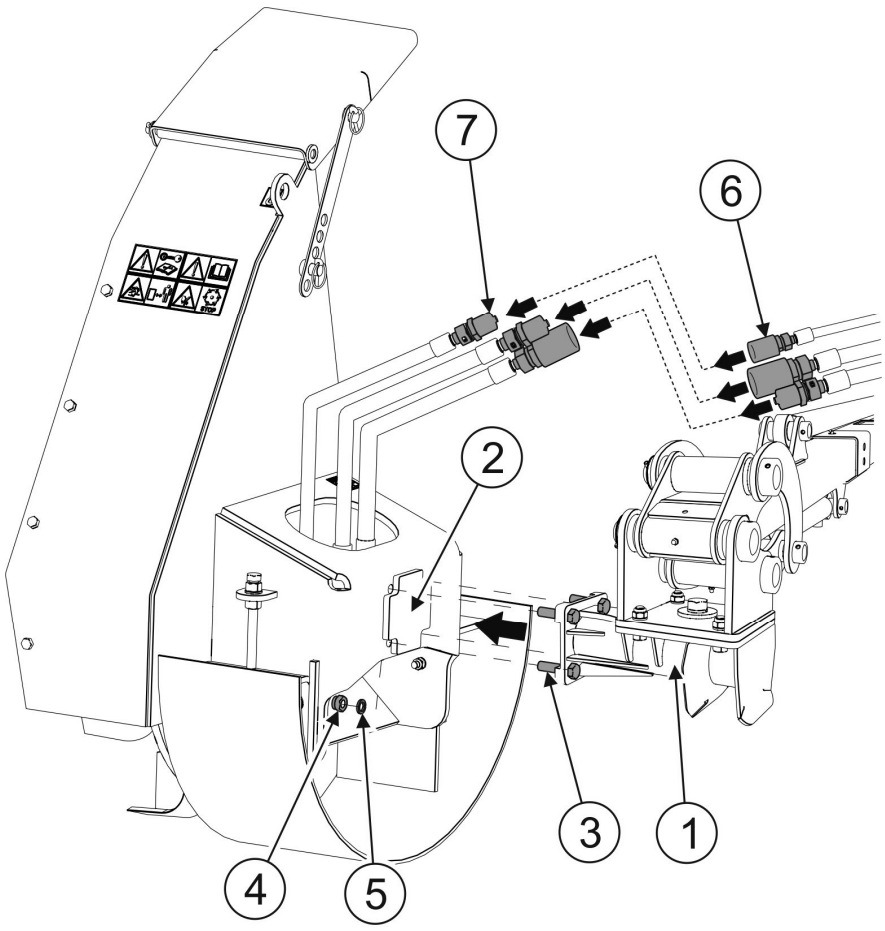


FIGURE 4.2 Hitching to multifunction arm

(1) - multifunction arm's head; (2) - ditch digger connection; (3) - mounting bolts; (4) - nut; (5) - washer; (6) - quick couplers of the multifunction arm. (7) - quick couplers of the ditch digger hydraulic motor.

DANGER

Prior to connecting individual hydraulic system lines, the user must carefully read the Operator Manual of the multifunction arm and observe all recommendations of the Manufacturer.

DANGER

When connecting the hydraulic lines to the ditch digger, make sure that the hydraulic system of the multifunction arm is not under pressure.

4.4 TRANSPORTING THE MACHINE

For transport to place of work and back, raise the ditch digger and mount it on hitch (2) of multifunction arm head (3) (FIGURE 4.3).

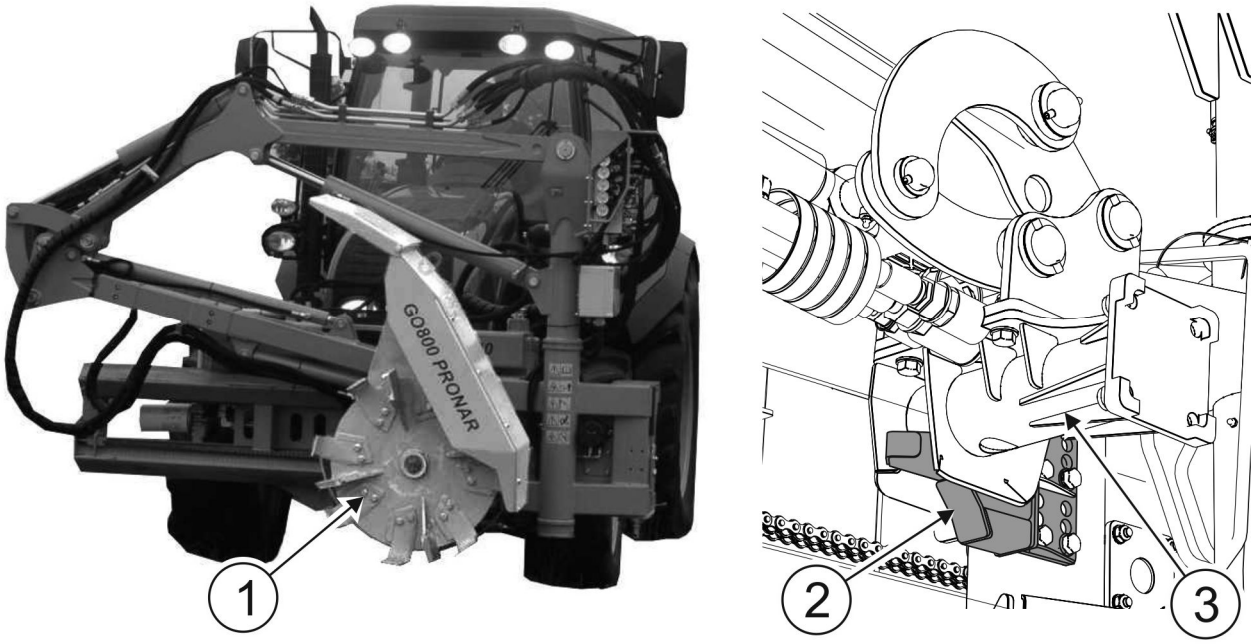


FIGURE 4.3 Transport position

(1)- ditch digger in transport position; (2)- hitch of multifunction arm head; (3)- multifunction arm head.

4.5 DITCH DIGGER SETTINGS AND OPERATION

4.5.1 SET THE DITCH DIGGER IN WORKING POSITION

To set the ditch digger in working position:

- raise the ditch digger above the hitch of the multifunction arm head
- Control the relevant hydraulic circuits and position the multifunction arm so as to place the ditch digger in the working area (FIGURE 4.4)

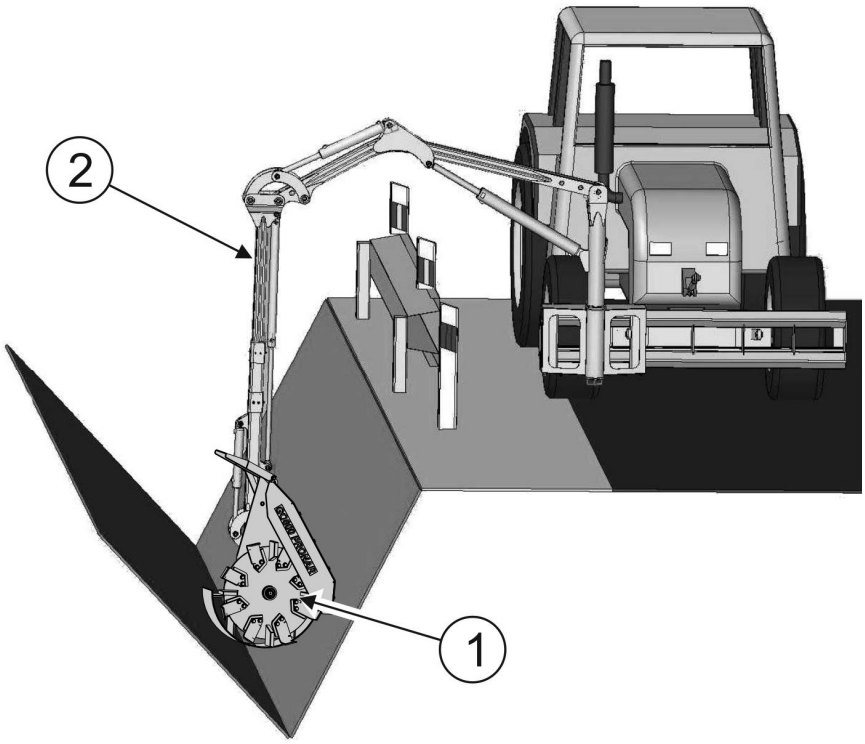


FIGURE 4.4 Set the ditch digger in working position

(1) - ditch digger in working position; (2) - multifunction arm.

- the ditch digger should rest freely on the ground on the ground contour following skid. The rotor disc (6) (FIGURE 4.5) should be perpendicular to the ground so that the material is ejected towards the slope of the ditch or beyond the slope of the ditch.

4.5.2 ADJUST THE WORKING DEPTH OF THE DITCH DIGGER ROTOR

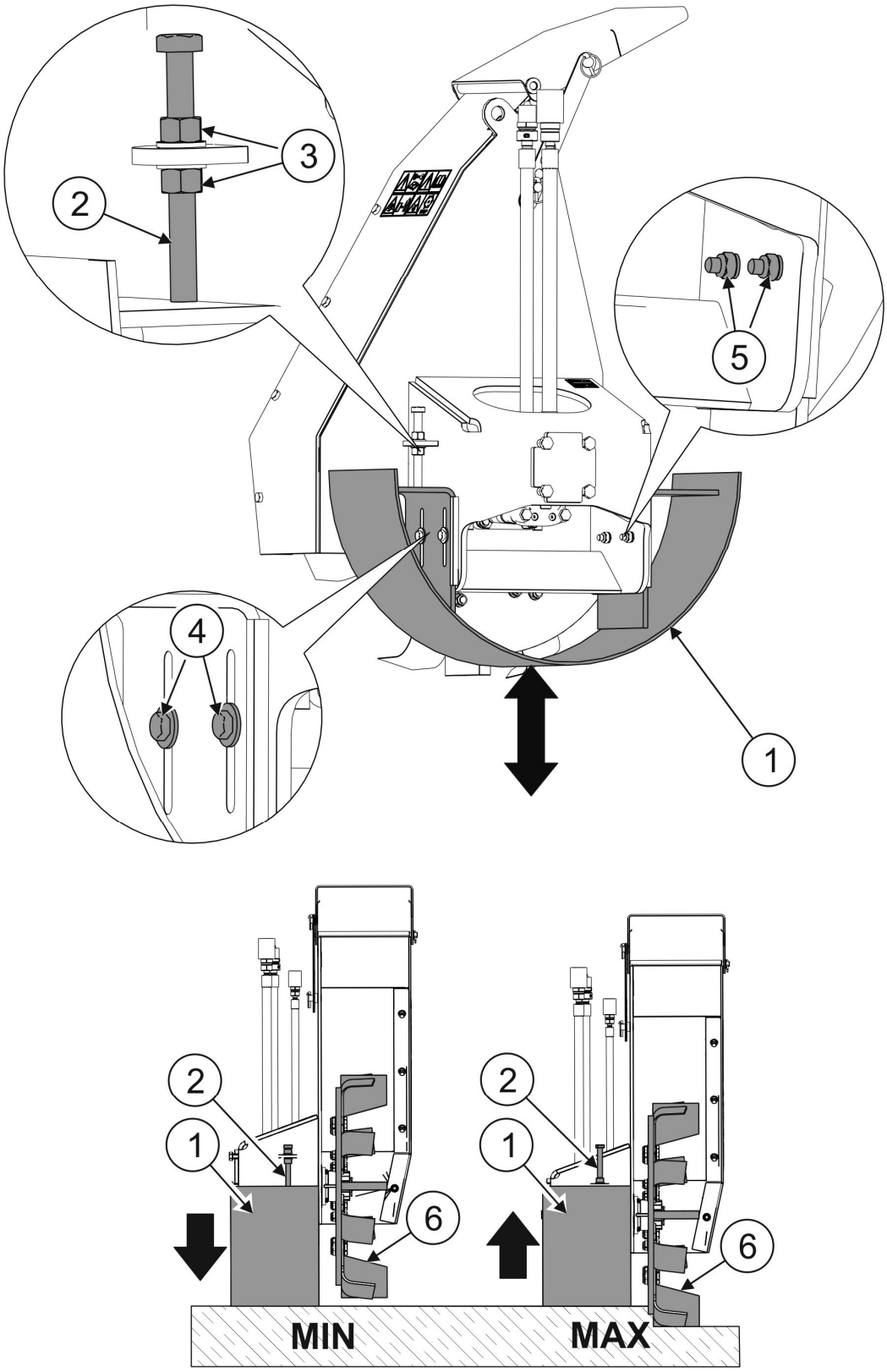


FIGURE 4.5 Set the working depth of the ditch digger head rotor. .

(1) - skid; (2) - skid fixing bolts; (3) - retaining nuts; (4) - skid mounting bolts; (5) - nuts; (6) - ditch digger rotor; (MIN) - minimum rotor working depth; (MAX) - maximum rotor working depth.

DANGER

When adjusting the working depth of the rotor, turn off the power to the multifunction arm and remove the key from the ignition. The ditch digger must be mounted on the hitch of the multifunction arm head in transport position and supported on stable and strong supports.

To change the working depth of the rotor change the position of the skid *(1)* in relation to the rotor disc. In order to do this (FIGURE 4.5):

- loosen the nuts (5) on the four bolts (4) securing the skid to the machine body;
- loosen the nuts (3) of the two bolts (2) fixing the skid at the correct height;
- by screwing the bolts (2) in or out, set the required working depth of the rotor. The bolts should be screwed in or out to the same length;
- tighten fixing nuts (3) of the retaining bolts (2);
- adjust the skid until the upper part of the skid touches the retaining bolts (2);
- tighten the nuts (5) of the bolts (4) securing the skid to the machine body.

4.5.3 ADJUST THE EJECTED MATERIAL DEFLECTOR

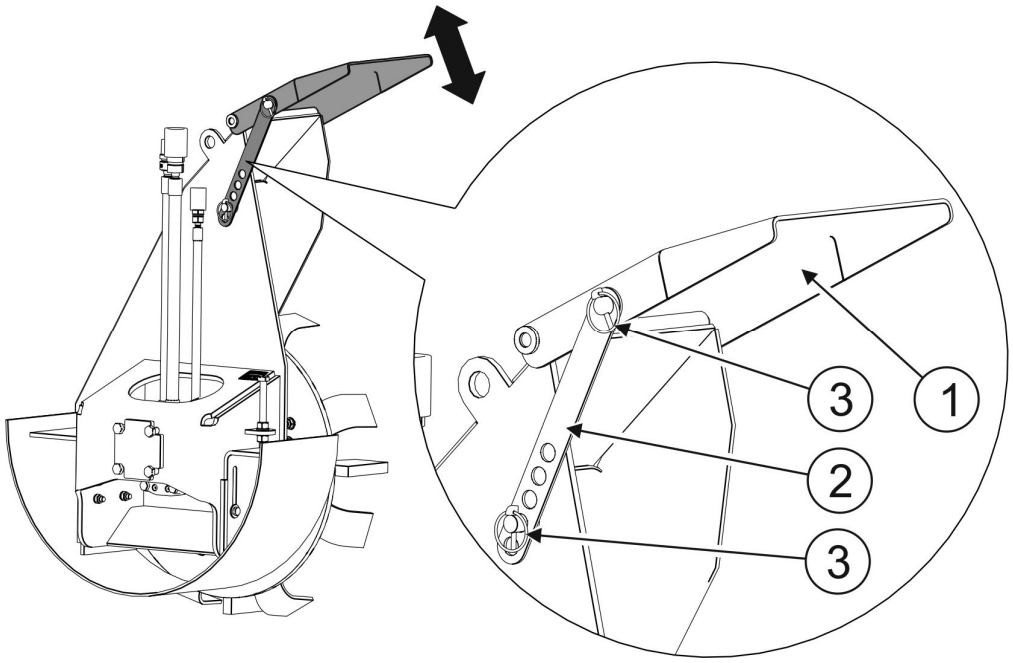


FIGURE 4.6 Adjust the ejected material deflector

(1) - adjustable deflector; (2) - deflector bracket with holes; (3) - cotter pins.

To adjust how high the material is ejected onto the ditch slope, adjust the deflector (1) (FIGURE 4.6). In order to do this:

- remove the cotter pins *(3)* securing the deflector bracket *(2)*;
- remove the bracket *(2)* from the bolts and determine the appropriate deflector *(1)* position by fixing the bracket on the bolt in one of the five available holes;
- secure the bracket *(2)* with the cotter pins *(3)*.

4.5.4 OPERATE THE DITCH DIGGER

DANGER

The ditch digger may only be started when all guards are complete and the ditch digger is in the working position.

Before engaging the machine drive, make sure that there are no bystanders, especially children, near the machine.

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

Once the ditch digger has been placed in the working position and the working depth of the rotor has been set, you can start to start the rotor drive.

HIGH NOISE LEVEL WARNING

Depending on the working conditions, the tractor (carrier vehicle) with the machine may generate noise exceeding the level of 85dB at the driver position. In these conditions, the operator should use personal protective equipment (ear protectors).

In order to reduce the level of noise during work, the operator cab windows and door should be closed.

When operating the ditch digger, pay attention to uneven surface and obstacles in the drainage ditch. The working speed of the ditch digger depends on the working depth and the type of terrain.

The speed of the ditch digger should be limited if:

- the ditch digger rotor is set to the maximum working depth,
- the terrain is uneven
- the material thrown from the bottom of the ditch is very dense,
- there is a great risk of running into foreign objects e.g. stones, thick branches, steel or concrete objects.

When driving across the road, pavement or other obstacles and when making turns, raise the machine by means of the multifunction arm and disengage the rotor drive.

Exercise due caution during operation. If the ditch digger drive system is stopped during operation, disengage the drive and check the cause of overload.

4.5.5 REMOVE BLOCKAGES

DANGER

In the event of blockage or clogging of the rotor drive, turn off the power to the multifunction arm and remove the key from the ignition. Secure tractor (carrying vehicle) using parking brake and ensure that unauthorised persons, especially children, have no access to the tractor.

If the event of work requiring the ditch digger to be raised, stable and durable supports must be used when lifting the machine. Do NOT carry out work under the machine, which has only been raised with the multifunction arm.

The machine must not be supported using fragile elements (bricks or concrete blocks).

If blockage occurs as a result of accumulation or wrapping of material around the machines rotor or as a result of contact with foreign objects (stones, branches, heaps of soil), remove accumulated material (using a sharp tool) and check condition of rotor component and their mounting.

In order to reduce the risk of block age of rotor components to a minimum, machine speed must be reduced if:

- the ditch digger rotor is set to the maximum working depth,
- the terrain is uneven
- the material thrown from the bottom of the ditch is very dense,
- there is a great risk of running into foreign bodies e.g. stones, thick branches, steel or concrete objects.

4.6 UNHITCHING FROM MULTIFUNCTION ARM

DANGER

Reduce pressure prior to disconnecting the hydraulic system.

In order to unhitch the ditch digger from the multifunction arm (FIGURE 4.2), proceed as follows:

- lower the ditch digger by means of the multifunction arm to rest position, on a level surface,
- power off the multifunction arm and remove the key from ignition
- Reduce residual pressure in the hydraulic system using the appropriate hydraulic circuit control lever.
- disconnect quick couplers *(6)* of hydraulic system lines from the ditch digger hydraulic motor and protect with plugs,
- disconnect multifunction arm head (1) from the ditch digger socket (2) by unscrewing four bolts (3) that fix the head to the socket,

After disconnecting from the multifunction arm, the ditch digger should rest on the skid.

SECTION

5

MAINTENANCE

5.1 INSPECTION AND DISASSEMBLY OF SAFETY GUARDS

The machine may only be used when all the safety guards and other protective elements are technically sound and correctly positioned. Safety guards should protect against stones and other foreign objects thrown from the mower. In the event of loss or damage to the protective guards , they must be replaced with new ones.

DANGER

When inspecting and dismounting safety guards be sure to power off the multifunction arm. The strainer must rest on the ground. Ensure unauthorised persons, especially children, have no access to the machine.

Method of disassembly of safety guards is shown in FIGURE 5.1.

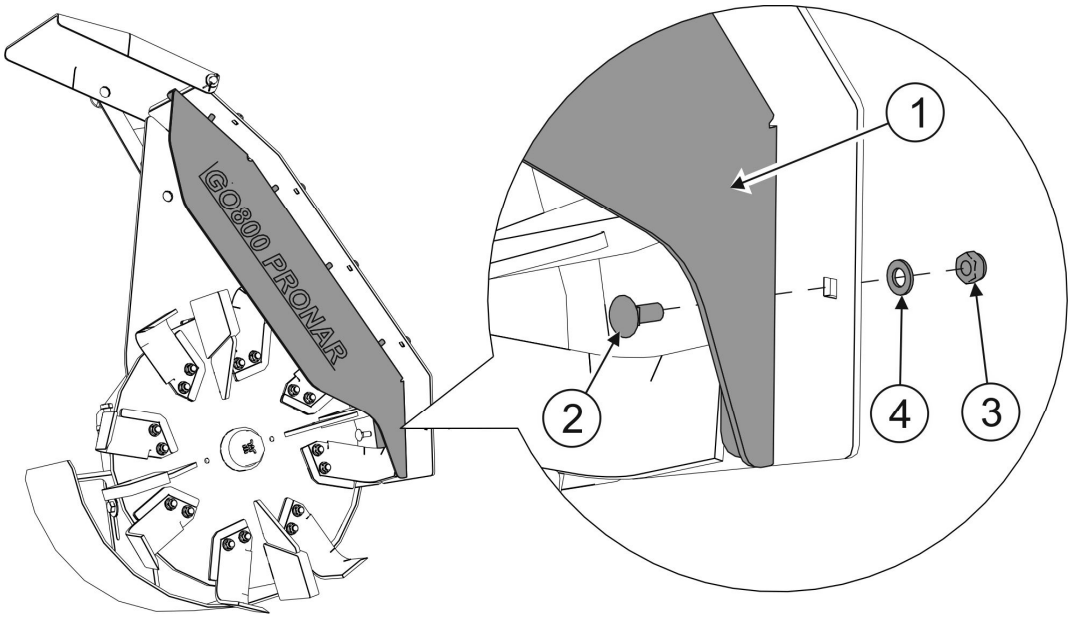


FIGURE 5.1 Disassemble safety guards.

(1) - side cover; (2) - cover fixing bolts; (3) - nut; (4) - washer.

When disassembling the side cover *(1)*, unscrew the nuts *(3)* and remove the bolts *(2)* (5 pieces) securing the cover to the ditch digger body.

Pay special attention to correct mounting of safety cover. Bolts should be tightened using the correct tightening torque according to TABLE 5.2. TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS**.**

IMPORTANT

Do NOT start the ditch digger when the protective covers are damaged, incorrectly fitted or unsecured.

5.2 CHECK AND REPLACE BLADES

DANGER

Before inspecting or replacing the blades, turn off the tractor/implement carrier engine and remove the key from the ignition. The ditch digger must be mounted on the hitch of the multifunction arm head in transport position and supported on stable and strong supports.

Regularly inspect the blades. Visual inspection involves checking the blade condition and its mounting. Blades should be worn down uniformly and have the same weight and be of the same type. A bent or damaged blade must be replaced with a new one provided by the manufacturer (Catalogue No.: 180MAL-03L). To keep the rotor balanced, blades must be replaced in pairs (together with the blade located on the opposite side of the rotor disk). Before replacing the blades, clean the rotor of the material thrown out from the bottom of the ditch.

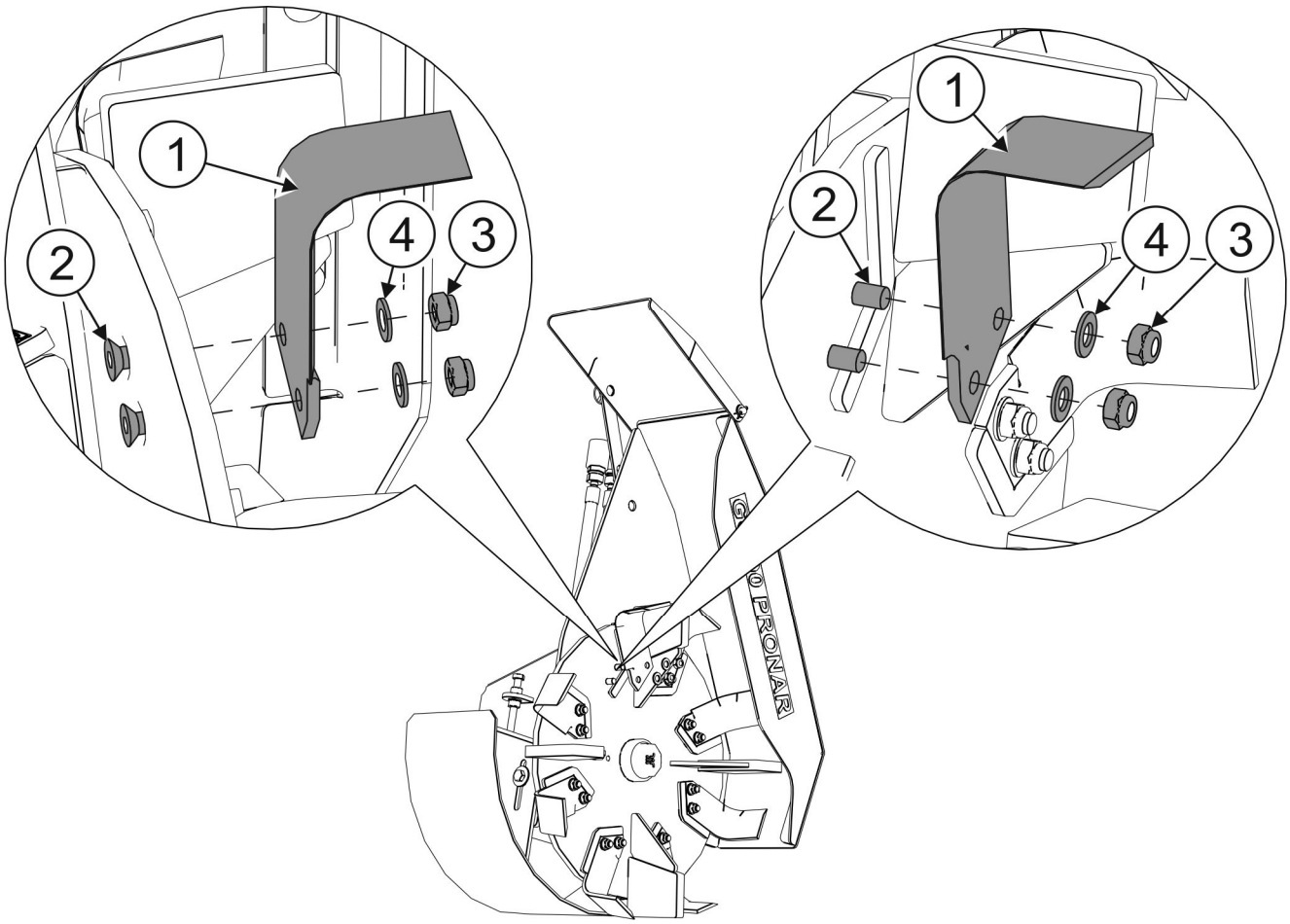


FIGURE 5.2 Replacement of cutting blades

(1) - left angled blade ; (2) - hexagon socket countersunk screw securing the blade ; (3) - self-locking nut; (4) - washer.

When replacing the blades (1) (FIGURE 5.2), pay attention to the condition of the bolts *(2)* securing the blade to the rotor disk. Excessively worn or damaged blade fixing bolt should be replaced with a new one of the same type. The threaded connection should be pre-cleaned and degreased with Loctite 7063, then secured with *Loctite 243* thread locker. Tighten the nuts (3) of the bolts (2) tightening the blade with a torque of 50 Nm.

TIP

To keep the rotor balanced, damaged or worn blades must be replaced in pairs (together with the blade located on the opposite side of the rotor disk).

NOTE

Missing blade or its fragment will cause imbalance and excessive vibration of the rotor disc and may damage the ditch digger.

DANGER

Use only the blades provided by the machine Manufacturer.

NOTE

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

5.3 HYDRAULIC SYSTEM MAINTENANCE

DANGER

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

Connections of hydraulic lines supplying hydraulic motor should be checked daily.

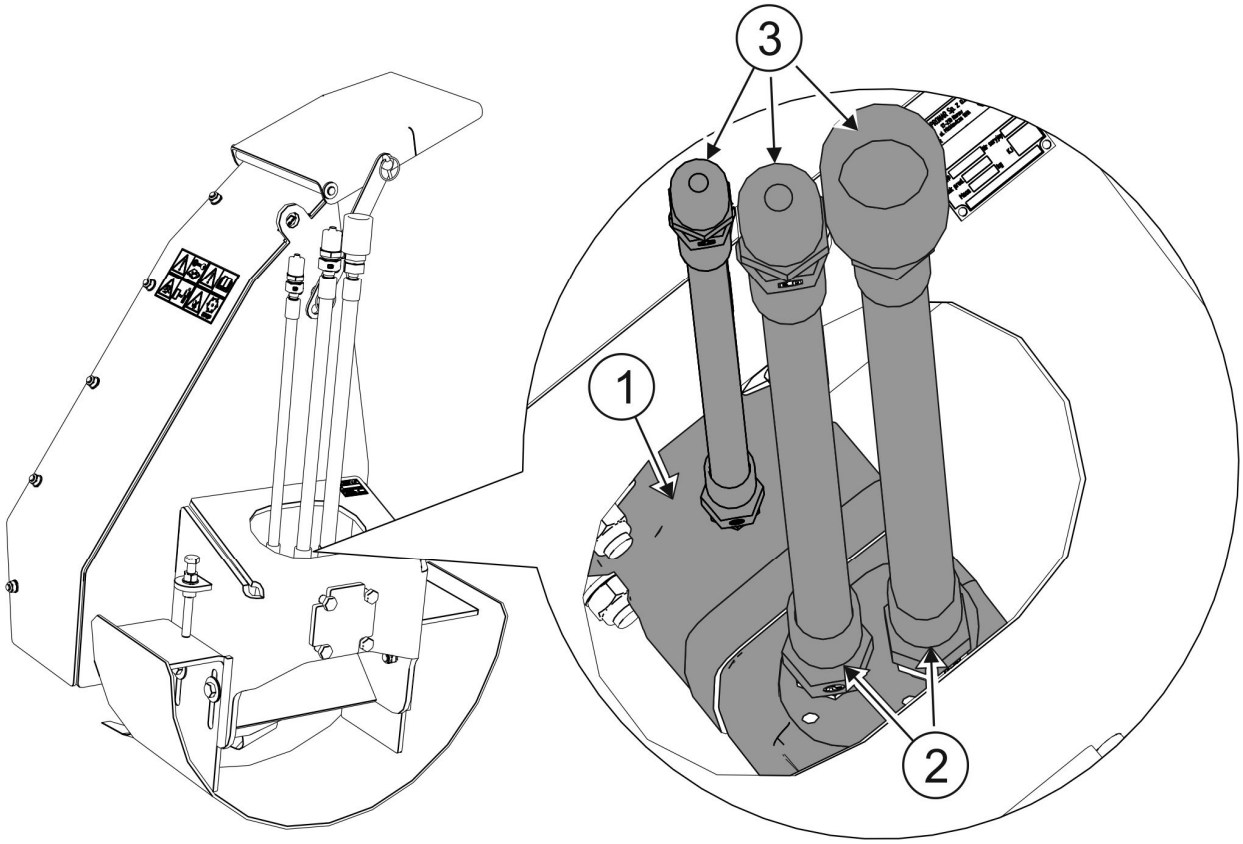


FIGURE 5.3 Inspect connections of quick couplers of the hydraulic motor's hydraulic lines.

(1) - hydraulic motor, (2) - hydraulic line connectors, (3) - quick couplers of the motor's hydraulic lines.

DANGER

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

DANGER

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

Make sure that the oil in the ditch digger hydraulic system is of adequate grade. Do not add hydraulic oil of other grade. In a new ditch digger, the hydraulic system is filled with HL32 hydraulic oil.

NOTE

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

The hydraulic system must be tight. If oil leak is detected on hydraulic motor body (1) (FIGURE 5.3), ascertain origin of leak. In the event of noticing leaks stop using the machine until faults are remedied.

Connections of hydraulic lines (2) to hydraulic motor (1) and quick couplers (3) of the branch cutting saw should be tight.

If an oil leak is found on hydraulic connections, tighten the connections. If this does not remedy the problem, replace the lines and connection components. Always exchange each mechanically damaged component. Also, pay attention to ensure that flexible hydraulic lines are not fractured.

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

TABLE 5.1 HL32 hydraulic oil specification

ITEM	NAME	VALUE
1	ISO 3448VG viscosity classification	32
2	Kinematic viscosity at 40°C	28.8 ÷ 35.2 mm²/s
3	ISO 6743/99 quality classification	HL
4	DIN 51502 quality classification	HL
5	Flash-point	above 210°C

Because of its composition, the oil is not classified as a dangerous substance, however long-term action on the skin or eyes may cause irritation. In the event of contact of oil with skin wash the place of contact with water and soap. Do NOT apply organic solvents (petrol, kerosene). Contaminated clothing should be changed to prevent access of oil to skin. In the event of contact of oil with eye, rinse with large quantity of water and in the event of the occurrence of irritation consult a doctor. Hydraulic oil in normal conditions is not harmful to the respiratory tract. A hazard only occurs when oil is strongly atomised (oil vapour), or in the case of fire during which toxic compounds may be released. Oil fires should be quenched with carbon dioxide (CO_2), foam or extinguisher steam. Do NOT use water for fire extinguishing.

Spilt oil should be immediately collected and placed in a marked tight container. Used oil should be taken to the appropriate facility dealing with recycling or regeneration of oils.

5.4 STORAGE

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

After cleaning, inspect the whole machine, inspect technical condition of individual elements. Repair or replace any used or damaged components.

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 will not be used for an extended period of time, protect it against adverse weather conditions.

5.5 TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS

During maintenance or repair work, apply appropriate torque when tightening bolt and nut connections, unless other tightening torque values are given. Recommended torque values apply to non-greased steel bolts.

NOTE

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 cause damage to the machine.

The tightening torque of the nut securing the rotor disk to the hydraulic motor - 500 Nm

The tightening torque of the nut securing the angular blade to the rotor disc - 50 Nm

TABLE 5.2 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
M30	1050	1,450	2,100
M32	1050	1,450	2,100

5.6 TROUBLESHOOTING

TABLE 5.3 TROUBLESHOOTING

TYPE OF FAULT	POSSIBLE CAUSE	REMEDY
Ditch digger drive cannot be started	Incorrectly connected or damaged quick couplers of the multifunction arm	Check quick couplers and manner of their connection
	Hydraulic system of multifunction arm is out of order	Check condition of the multifunction arm's hydraulic system
It is not possible to set the ditch digger using the multifunction arm	Hydraulic system of multifunction arm is out of order	Check condition of the multifunction arm's hydraulic system
Excessive vibration during work	Damaged or missing blade	Check blades, if necessary replace
	Damaged rotor disc	Check the rotor disc, replace if necessary
The ditch digger drive stops during operation	Damaged hydraulic system of the multifunction arm or damaged hydraulic motor of the ditch digger	Repair at an authorised service point

NOTES